



# REVISED CONSTRUCTION COMPLETION REPORT REMEDIAL SYSTEM OPTIMIZATION PUMP AND TREAT SYSTEM

**FORMER CHROMALLOY FACILITY  
OPERABLE UNIT NO. 1  
169 WESTERN HIGHWAY  
WEST NYACK, ROCKLAND COUNTY, NEW YORK 12233  
NYSDEC SITE NO. 344039**

Submitted to:



**Department of  
Environmental  
Conservation**

## **Division of Environmental Remediation**

625 Broadway, 12<sup>th</sup> Floor  
Albany, New York 12233

Prepared for:

### **Chromalloy Gas Turbine, LLC**

4100 RCA Boulevard, Suite 100  
Palm Beach Gardens, Florida, 33410

Prepared by:

### **TRC Engineers, Inc.**

3 Corporate Drive, Suite 202  
Clifton Park, NY 12065

TRC Project No. 190273.2021.0000

**APRIL 17, 2026**



## TABLE OF CONTENTS

TABLE OF CONTENTS .....	i
CERTIFICATION .....	iii
ACRONYMS AND ABBREVIATIONS .....	iv
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
<b>2.0 SITE DESCRIPTION AND HISTORY.....</b>	<b>2</b>
2.1 Site Location and Setting .....	2
2.2 Site Features and Use .....	2
2.3 Pertinent Regulatory History .....	3
2.4 Former Treatment System Status .....	3
<b>3.0 PRE-CONSTRUCTION ACTIVITIES.....</b>	<b>5</b>
3.1 Health and Safety Plan .....	5
3.2 Contractor Workplans .....	5
3.3 Public and Private Utility Locating .....	5
<b>4.0 CONSTRUCTION ACTIVITIES .....</b>	<b>7</b>
4.1 Former Pump and Treat System Decommissioning .....	7
4.2 Installation.....	7
4.3 RW-1 Corrective Action.....	8
4.4 Waste Disposal.....	10
<b>5.0 SYSTEM START-UP ACTIVITIES .....</b>	<b>11</b>
5.1 Start-Up Operations .....	11
5.2 System OM&M Plan.....	12
5.3 System OM&M Schedule .....	12
5.4 Initial Quarterly Sampling .....	12
<b>6.0 SUMMARY.....</b>	<b>14</b>

## **TABLES**

Table 1	Summary of RW-1 Backfill Sample Analytical Results
Table 2	Summary of Pump and Treat System Analytical Results

## **FIGURES**

Figure 1	Site Location Map
Figure 2	Site Layout Map
Figure 3	System Plan View
Figure 4	Process and Instrumentation Diagram

## **APPENDICES**

Appendix A	NYSDEC Letter (July 8, 2025)
Appendix B	Contractor Work Plans
Appendix C	One-Call Notification
Appendix D	Project Progress Photographs
Appendix E	Community Air Monitoring Program Tabulated Reports
Appendix F	RW-1 Corrective Action Backfill Laboratory Analytical Report
Appendix G	Waste Disposal Manifests
Appendix H	System Operations Maintenance & Monitoring Plan
Appendix I	Pump and Treat System Sample Laboratory Analytical Report
Appendix J	Effluent Limitations and Monitoring Requirements

## CERTIFICATION

I, Marie Dowd, certify that I am currently a New York State-registered professional engineer (License No. 080977) and that this Revised Construction Completion Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved September 26, 2022 Remedial System Optimization Work Plan and any DER-approved modifications.



April 17, 2026  
Date

---

## ACRONYMS AND ABBREVIATIONS

AARCO	AARCO Environmental Services Inc, of Lindenhurst, New York
AES	Associated Environmental Services of Hauppauge, New York
Alpha	Alpha Analytical of Westborough, Massachusetts
APWA	American Public Works Association
bgs	Below Ground Surface
CAMP	Community Air Monitoring Program
CCR	Construction Completion Report
Chromalloy	Chromalloy Gas Turbine, LLC
Consent Order	March 2001 Order on Consent
CSXT	CSX Transportation, Inc.
DER-10	Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation
DPE	Dual Phase Extraction
EnviroTrac	EnviroTrac Ltd of Yaphank, New York
GAC	Granular Activated Carbon
GIS	Global Information System
gpm	Gallons Per Minute
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HMI	Human-Machine Interface
LGAC	Liquid-Phase Granular Activated Carbon
LEDs	Light Emitting Diodes
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
OM&M	Operations, Maintenance, and Monitoring
OU-1	Operable Unit 1
P&ID	Process and Instrumentation Diagram
P&T	Pump and Treat
PCBs	Polychlorinated Biphenyls
PID	Photo-ionization Detector
PPE	Personal Protective Equipment
PPL	Priority Pollutant List
psi	Pounds Per Square Inch
PVC	Poly Vinyl Chloride
ROD	March 1999 Record of Decision

---

## ACRONYMS AND ABBREVIATIONS CONTINUED

RSO	Remedial System Optimization
SPDES	State Pollution Discharge Elimination System
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
TOGS	NYSDEC Technical Guidance and Operational Series 1.1.1
TRC	TRC Engineers, Inc.
ug/l	Micrograms Per Liter
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UUSCOs	Unrestricted Use Soil Cleanup Objectives
VFDs	Variable Frequency Drives
VOCs	Volatile Organic Compounds

## 1.0 INTRODUCTION

This Revised Construction Completion Report (CCR) has been prepared on behalf of Chromalloy Gas Turbine, LLC (Chromalloy), to document the activities implemented based on the September 26, 2022 Remedial System Optimization (RSO) Work Plan for Operable Unit 1 (OU-1) at the Former Chromalloy Facility (Site No. 344039) located at 169 Western Highway in West Nyack, New York (the Site). In January 2025, TRC submitted the initial CCR to the New York State Department of Environmental Conservation (NYSDEC) for review and approval. The NYSDEC conditionally approved the January 2025 CCR provided the Community Air Monitoring Program (CAMP) data was added and the CCR appendices were updated per their July 8, 2025 letter. A copy of the NYSDEC's July 8, 2025 letter is included in **Appendix A**.

The primary purpose of the CCR is to detail the work completed per the RSO Work Plan, and document the current configuration of the pump and treat (P&T) system at the Site, which was retrofitted as part of the RSO work. The CCR will also discuss the initial startup activities for the new P&T system, and will document the proposed operations, maintenance, and monitoring (OM&M) plan for the new P&T system.

This CCR is arranged as follows:

**Section 1.0 Introduction** – Describes the purpose and outline of the CCR.

**Section 2.0 Site Description and History** – Discusses the Site and surrounding property land uses.

**Section 3.0 Pre-Construction Activities** – Discusses the pre-mobilization activities to be conducted in support of the CCR.

**Section 4.0 Construction Activities** – Discusses the Site preparations, soil removal, waste management, soil sampling, and restoration activities.

**Section 5.0 System Start-up** – Discusses activities completed during system start-up.

**Section 6.0 Summary** – Discusses completion of work and the path forward.

---

## 2.0 SITE DESCRIPTION AND HISTORY

### 2.1 Site Location and Setting

The Site, identified as NYSDEC Site No. 344039, is located within the central portion of West Nyack, New York. The physical site address is 169 Western Highway, West Nyack, Rockland County, New York, and encompasses areas/properties near and adjacent to the intersection of Western Highway and Pineview Road, also located in West Nyack. The Site is bordered to the north by residential properties, to the east by woodlands followed by the Clarkstown Landfill, to the south by commercial properties, and to the west by a CSX Transportation, Inc. (CSXT) railroad line followed by commercial properties and the Hackensack River. The Hackensack River is approximately 0.1 miles west of the Site and the Hudson River is located approximately 2.3 miles east of the Site. A United States Geological Survey (USGS) 7.5-minute topographic map showing the Site's location and surrounding features is provided on **Figure 1**.

The property historically included three subdivision parcels, including the Former Chromalloy Facility. According to the Rockland County online Global Information System (GIS), the northern historical subdivision consisting of a residential home is zoned as one family residential, the Former Chromalloy Facility historical subdivision including the main/ancillary buildings and northern parking lot is zoned as heavy industrial, and the southern historical subdivision consisting of a parking lot is zoned as vacant. As identified on 2024 Rockland County tax mapping, the property now consists of one irregularly shaped parcel approximately 19.86 acres in size, parcel no. 65.13-2-11. It is zoned as Manufacturing.

The Site is currently owned by PG-OE 169 Western Highway Owner, LLC, and accessed via Western Highway and Pineview Road. Pineview Road traverses through the northwestern corner of the parcel and leads to the residential neighborhood. A chain link fence with secured access exists between the main building and southern parking lot and between the southern parking lot and western CSXT railroad line.

### 2.2 Site Features and Use

The main building located on-Site is currently used to store and prepare new vehicles for sale. Vehicle cleaning and detailing operations are completed in the southern portion of the main building. Vehicle maintenance is performed on hydraulic lifts located in the central and western portions of the main building. The main office space is in the northern portion of the building. Other than the aforementioned areas, the main building is largely an open warehouse utilized for vehicle storage. Multiple overhead doors are either continually open or periodically opened/closed throughout the workday to allow entry/exit of vehicles. Large parking areas, used for the storage

of cleaned/detailed cars, are located to the north and south of the main building. A figure showing Site layout can be found on **Figure 2**.

### **2.3 Pertinent Regulatory History**

TRC Engineers, Inc. (TRC), on behalf of Chromalloy, manages Site remedial actions under the NYSDEC *March 1999 Record of Decision (ROD)* and *March 2001 Order on Consent (Consent Order)*, for OU-1 to address volatile organic compounds (VOCs) in soil and groundwater. The NYSDEC - approved OU-1 remedial actions include P&T system operations to address bedrock groundwater impacts and dual phase extraction (DPE) system operations to treat localized shallow overburden soils and groundwater. The OU-1 remediation systems began operation in October 2002 and have shown to be effective in capturing and containing VOC constituent, trichloroethylene (TCE), to the Site boundaries.

The operation of the DPE system was shut down upon NYSDEC approval following a February 2014 Site status meeting since asymptotic conditions were achieved. The DPE System was decommissioned in accordance with the NYSDEC-approved *September 2019 OU-1 DPE System Decommissioning Request* in May and July 2020.

An RSO Work Plan, dated September 2022, was prepared by TRC to propose upgrades to the existing P&T system. The Work Plan was approved by NYSDEC on November 15, 2022. This report discusses the construction activities related to the upgrades that were completed between June 2023 and March 2024, in compliance with the RSO Work Plan, proposed design alterations to the treatment system, and the modifications to the January 2025 CCR requested by the NYSDEC in their July 8, 2025 letter.

### **2.4 Former Treatment System Status**

To prepare for the treatment system repair/replacement work described in the RSO Work Plan, TRC conducted an evaluation of the system components and building housing the treatment system. The treatment system is housed in a building that shares the eastern wall with the main building. The interior footprint of the remediation system building is approximately 18.5 feet by 26.25 feet, or approximately 485 square feet. The concrete block portion of the building is approximately 12.5 feet in height, followed by structural and corrugated steel, to a total height of approximately 20 feet. There is a roll-top door on the north side of the building and a regular man-door on the west side of the building. The cooling fan, heater, and lights in the building were powered by the primary electrical panel. Lights in the building required replacement, the heater was not functional, and the fan was quite worn. Most of the remaining remediation system

equipment had been in operation for over 18 years. At the time of the preparation and implementation of the RSO Work Plan, much of equipment was dilapidated and approached the end of its useful life, while other pieces were in serviceable condition.

---

### 3.0 PRE-CONSTRUCTION ACTIVITIES

Pre-construction activities performed in support of the RSO project consisted primarily of preparation of a Health and Safety Plan (HASP), public and private utility locating, and review of Contractor submittals required by the RSO Work Plan. These pre-construction activities are discussed in the following subsections.

#### 3.1 Health and Safety Plan

A Site-specific HASP was prepared for the work in compliance with 29 CFR 1910.120, the Hazardous Waste Operations and Emergency Response regulations. All subcontractors utilized on the project were also required to prepare and adhere to their own HASP that is commensurate with the work and activities.

A copy of the Site-specific HASP was made available at the Site during the construction activities to which it is applicable.

#### 3.2 Contractor Workplans

On May 8, 2023, TRC received contractor work plans and submittals from EnviroTrac. This submittal included a process and instrumentation diagram (P&ID), specification sheets for the various equipment and trench drain to be installed. TRC reviewed the initial submittals and provided comments. On May 30, 2023, EnviroTrac provided a revision to the submittal which addressed TRC's comments. TRC reviewed the revisions and provided another round of comments, which were addressed in EnviroTrac's June 7, 2023 submittal. This submittal also included a proposed system layout figure and an updated equalization tank connection details sheet. TRC provided additional comments which were addressed in EnviroTrac's August 3, 2023 submittal, which included a modified proposed system layout. The final submittal was presented by EnviroTrac to TRC on August 17, 2023. This final submittal included specification sheets for the transfer pump, the water flow transmitter, the pH probe, and the pH sensor. Finalized contractor work plans and submittals are included in **Appendix B**.

#### 3.3 Public and Private Utility Locating

Prior to the commencement of each ground-intrusive activity, TRC confirmed that the subcontractor, EnviroTrac Ltd of Yaphank, New York (EnviroTrac), contacted UDig New York, received/reviewed confirmation receipts from each utility, and verified public mark-outs prior to intrusive work. No changes or modifications to the design were made due to the utility mark-outs. A natural gas line and a private electrical line were identified within the work area. To avoid

damaging any utility lines, EnviroTrac opted to hand-dig within the work area. Information regarding the one-call notifications can be found in **Appendix C**.

## 4.0 CONSTRUCTION ACTIVITIES

The construction was based on the NYSDEC approved RSO Work Plan, dated September 26, 2022. The construction activities including the decommissioning of the former P&T system; installation of the optimized P&T system; and repairs to the RW-1 well piping system are described in the following subsections.

The system layout and a P&ID showing the final system configuration are provided on **Figures 3 and 4**. Progress photographs can be found in **Appendix D**.

### 4.1 Former Pump and Treat System Decommissioning

On June 13, 2023, EnviroTrac began decommissioning the former P&T system. EnviroTrac removed the air strippers (previously identified as AST-1 and AST-2) and all other equipment (control panel, piping, etc.) within the treatment building. EnviroTrac cleaned and refurbished the former bag filter housings at their facility located in Yaphank, NY, prior to returning them to the Site.

Following removal of the former P&T system, the building's interior was power washed and cleaned on June 14, 2023. The former personnel door into the building was replaced and equipped with an electronic lock. All water generated from the construction activities was containerized in 55-gallon steel drums and processed through the optimized P&T system following installation.

### 4.2 Installation

On June 14, 2023, EnviroTrac began installation of an under-slab trench drain and a 3.5-foot-deep sump using a jackhammer and a concrete saw. Work was temporarily paused due to equipment procurement delays and resumed on August 14, 2023, when the RW-1 well pump (approximately 230 feet below ground surface [bgs]) was removed by Associated Environmental Services of Hauppauge, New York (AES) for cleaning and servicing by EnviroTrac. Additionally in August 2023, EnviroTrac installed two manufacturer refurbished liquid-phase granular activated carbon (LGAC) vessels and filled them with 2,000-lbs of granular activated carbon (GAC), installed two new electric heaters, and replaced old fluorescent light fixtures with light emitting diodes (LEDs). The holes on the roof from the former air strippers were covered with dome caps. EnviroTrac began installation of the equalization tank, new manifolds, and the refurbished bag filter housings, according to the approved design configuration.

In September 2023, EnviroTrac continued piping and support installation for the optimized P&T system. EnviroTrac began working on the conduits, electric system, and the transfer pump and concrete pad. Work was temporarily put on hold due to back-orders of the Variable Frequency Drives (VFDs) for the downhole RW-1 and transfer pumps.

Work resumed on December 18, 2023, with the installation of conduits, valves, pressure gauges, sampling ports, pH meter, and flow meters for the P&T system. A new transducer was also installed in RW-1 to a depth of 200 feet bgs. EnviroTrac also installed vent caps on the roof.

Beginning on January 17, 2024, EnviroTrac continued the installation of conduits, the VFDs, and the process logic control (PLC) screen, and they also prepared hoses for the LGAC backwashes. EnviroTrac also installed a pressure gauge and a bleed valve for the transfer pump. EnviroTrac completed the installation of all equipment within the treatment building on January 26, 2024. The as-built layout is shown in **Figure 3**.

#### **4.3 RW-1 Corrective Action**

In February 2024, EnviroTrac began shakedown testing of the newly installed system and identified a leak adjacent to the RW-1 vault. EnviroTrac hand-dug an approximately 2-foot-wide by 2-foot-long area to 4 feet bgs. Within the exposed hand excavation, the leak source was identified at a steel piping union for the RW-1 well-head and connecting poly vinyl chloride (PVC) piping leading to the treatment building. TRC notified the NYSDEC of the leak and the required repair in a letter dated February 15, 2024. The NYSDEC approved TRC's request to excavate outside the RW-1 vault to repair the leaking piping in a subsequent letter dated February 16, 2024.

Prior to starting excavation work, EnviroTrac contacted UDig New York, received/reviewed confirmation receipts from each utility, and verified public mark-outs prior to intrusive work. On February 21, 2024, in addition to the public utility mark-outs, EnviroTrac identified all subsurface utilities or anomalies within a 5-foot radius around the RW-1 well vault using ground penetrating radar (GPR). Any detected subsurface structure within the investigated radius was identified on the ground surface with paint using the American Public Works Association (APWA) utility color codes.

Additionally, a representative from Orange and Rockland counties was on-Site during excavation work to identify a private electrical service line located near the work area. In accordance with NYSDEC Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation 10 (DER-10), TRC implemented a CAMP at the Site during the intrusive work.

The CAMP equipment deployed at the Site on a daily basis during the excavation work included two equipment stations: one in the upwind direction and one in the downwind direction of the excavation work area. The enclosures each contained a DustTrak II particulate meter and a MiniRae 3000 photo-ionization detector (PID) for VOC monitoring. Each enclosure was connected to an Aethair Thiamis datalogger and telemetry unit that uploads real-time data and automatically calculates continuous 15-minute average concentrations measured by both the DustTrak II and PID. The system will notify field personnel via short message service (SMS) text message and email in the instance of an exceedance in order to facilitate rapid investigation and corrective action. Additionally, one additional handheld PID was utilized within the excavation work area to field screen soil samples and monitor breathing zone air VOC concentrations.

During the piping repair work, the NYSDOH Generic CAMP action levels were not exceeded for either fugitive particulates or organic vapors. It should be noted that on February 21, 2024, the upwind telemetry modem experienced connectivity issues and some of the collected data were not transmitted to the cloud-based data server and on February 22, 2024, the VOC measurements did not transmit to the closed-based data server. Additionally, the difference ( $\Delta$ ) between the upwind and downwind CAMP stations were calculated, where applicable. The CAMP summary tables from February 21 and 22, 2024 are included as **Appendix E**.

EnviroTrac replaced the PVC coupling and reconnected the PVC pipe to the steel pipe. EnviroTrac backfilled the excavation with clean sand and topsoil, which were tested per NYSDEC requirements, placed with 6-inch lifts and compacted with a hand tamper. EnviroTrac containerized the excavated soil into three 55-gallon steel drums. All water generated from the excavation activities and decontamination activities were containerized in one 55-gallon steel drum to be processed through the P&T system.

TRC collected a composite sample of both backfill material and submitted it to Alpha Analytical of Westborough, Massachusetts (Alpha) for the following analyses, in general accordance with the NYSDEC DER-10 Table 5.4(e)10.:

- Target Compound List (TCL) VOCs by United States Environmental Protection Agency (USEPA) Method 8260D
- TCL Semi-Volatile Organic Compounds (SVOCs) by USEPA Method 8270E
- Target Analyte List (TAL) Metals by USEPA Method 6010D/7471B
- Polychlorinated Biphenyls (PCBs) by USEPA Method 8082A
- TCL Pesticides by USEPA Method 8081B

- TCL Herbicides by USEPA Method 8151A

Fill sample analytical results were compared to 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs). As indicated on **Table 1**, all analytes were either not detected above laboratory quantitation limits or were detected at concentrations below their respective UUSCOs. The laboratory analytical report for the fill material is provided in **Appendix F**.

#### **4.4 Waste Disposal**

TRC processed all generated groundwater and construction wash water (approximately 125 gallons) through the newly installed P&T system. Former equipment was disposed of by EnviroTrac at Teplitz, located at 108 West Nyack Road, Nanuet, New York 10954. Three 55-gallon steel drum of solids and four empty drums were removed from the Site by AARCO Environmental Services Inc, of Lindenhurst, New York (AARCO) in May 2024. The waste disposal manifest can be found in **Appendix G**.

## **5.0 SYSTEM START-UP ACTIVITIES**

P&T system start-up activities began following installation of all new equipment installation and repairs to RW-1. The start-up activities included the initial testing of system components and activating system operations to ensure there were no defective connections and verify the functionality of the PLC, sensors, VFDs, and pumps. The initial startup activities, or system shake-down, were conducted by EnviroTrac and minor repairs and revisions to PLC programming were conducted until the system functioned as intended. A discussion of the transition to full-scale operations, along with a description of the routine OM&M activities is provided below. Further, a discussion of the initial round of quarterly water quality sampling results is discussed, along with the proposed future sampling frequency.

### **5.1 Start-Up Operations**

On March 17, 2024, following completion of system shake-down activities, EnviroTrac provided TRC a walkthrough of system operations and training on the system controls and telemetry. TRC was provided with remote access to the treatment system controls through the telemetry system. The telemetry system provides near equivalent remote control and monitoring of the system operations via an identical human-machine interface (HMI). The treatment system PLC also records the operating parameters visible on the HMI and uses the telemetry system to send daily operating summaries to TRC staff via email.

TRC and EnviroTrac remained on-Site for the full day to monitor system operations. The system was operating in automatic mode, with near continuous pumping from RW-1 and batch treatment of extracted groundwater through the bag filters and the LGAC treatment vessels. Additionally, TRC and EnviroTrac conducted an initial bag filter change, reviewed the written procedure, and reviewed the written procedure for LGAC vessel backwashes to confirm accuracy and usability of the System OM&M Plan.

The treatment system flow rate is controlled by the water yield from RW-1. The system equalization tank is filled with extracted groundwater, up to the high-level sensor setting. The high-level sensor activates the transfer pump which then pumps water through the bag filters and LGAC vessels and to the off-Site outfall location. The RW-1 influent flow rate was held constant, at a rate of approximately 12 gallons per minute (gpm). The transfer pump drains the equalization tank at approximately 100 gpm, resulting in periodic treatment system operations but constant groundwater extraction.

## 5.2 System OM&M Plan

Based on the information that EnviroTrac provided, TRC prepared a System OM&M Plan that describes routine OM&M tasks and objectives for system inspection events. The System OM&M Plan can be found in **Appendix H**. The System OM&M Plan includes procedures for system monitoring, replacing bag filters, collecting quarterly water samples, and LGAC backwashing. Additionally, EnviroTrac provided an attachment to the System OM&M Plan that includes specification sheets and the routine preventative maintenance schedule for all installed equipment based on vendor/manufacturer information.

## 5.3 System OM&M Schedule

For the first six weeks, TRC completed weekly visits to collect system readings and to prepare the P&T system for long-term operations. Tools, personal protective equipment (PPE), spare sampling ports, and tubing were brought to and stored at the Site to support long-term operations. TRC labeled on all sample ports, pressure gauges, and valves within the P&T building.

Following the successful initial six weeks of operation, TRC transitioned to a schedule of bi-weekly site inspections. Treatment system readings are collected during both inspection events while bag filters are changed on a monthly basis. When the high differential pressure alarm is triggered, indicating the pressure drop across the bag filters exceed 10 pounds per square inch (psi), an additional Site visit is conducted for the purpose of changing bag filters.

## 5.4 Initial Quarterly Sampling

On May 6, 2024, the first round of quarterly samples was collected from the P&T system. Influent, mid-treatment, and effluent samples were collected and sent to Alpha for the analysis of TCL VOCs and Priority Pollutant List (PPL) Metals by USEPA Methods 8260D and 200.7, respectively. The sample results were compared to the NYSDEC Technical Guidance and Operational Series 1.1.1 (TOGS) Ambient Water Quality Standards and Guidance Values for Class GA water (drinking water) and are presented on **Table 2**.

Analytical results indicated that the following compounds were detected above Class GA Values in the influent sample: TCE (190 micrograms per liter [ug/l]), cis-1,2-dichloroethene (6.4 ug/l), and lead (51 ug/l). There were no Class GA Value exceedances detected in the effluent sample. Laboratory analytical reports for the completed sampling events are included in **Appendix I**.

The quarterly sampling follows the schedule and requirements of the State Pollution Discharge Elimination System (SPDES) permit that was formerly executed at the Site. The Site was formally

assigned SPDES permit identification numbers NY 010 5180 and DEC ID: 3-3920-00002. During operation of the P&T system, samples will continue to be collected on a quarterly basis. The Effluent Limitations and Monitoring Requirements governing the P&T system discharge are provided in **Appendix J**.

## 6.0 SUMMARY

The P&T System began full-time operations on March 17, 2024. Daily e-mails are sent to TRC and EnviroTrac from the on-Site PLC using the telemetry system, which summarizes minute-by-minute readings for pH, influent and effluent flowrates, operating pressures, and bag filter differential pressures. Site visits are routinely conducted to confirm proper operation, change bag filters, collect quarterly water samples for laboratory analyses, and verify the telemetry readings.

Site visits began on a weekly basis for the first six weeks to ensure proper operations and confirm system controls and automations functioned correctly. The frequent monitoring allowed TRC to develop a schedule for required bag filter changes, to maintain differential pressure readings below 10 psi. Based on initial operations, the bag filters will be changed monthly. Routine inspections will be conducted on a bi-weekly schedule, with every other event including a bag filter changeout. In the future, if operations proceed smoothly, the site visit frequency may be decreased to a monthly basis.

TRC has prepared System OM&M Standard Operating Procedures for routine tasks including bag filter changes, LGAC backwashes, and quarterly water sampling. The first quarterly sampling was conducted in May 2024, and the results (discussed herein previously) demonstrate that the system is adequately treating water to adhere to the discharge requirements.

## TABLES

**Table 1**  
**Summary of RW-1 Backfill Sample Analytical Results**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

	<b>LOCATION</b>	FILL_20240222
	<b>SAMPLING DATE</b>	2/22/2024
	<b>LAB SAMPLE ID</b>	L2409772-01
<b>Analyte</b>	<b>UUSCO*</b>	<b>Results (mg/kg)</b>
<b>VOCs</b>		
Methylene chloride	0.05	0.0054 U
1,1-Dichloroethane	0.27	0.0011 U
Chloroform	0.37	0.0016 U
Carbon tetrachloride	0.76	0.0011 U
1,2-Dichloropropane	NC	0.0011 U
Dibromochloromethane	NC	0.0011 U
1,1,2-Trichloroethane	NC	0.0011 U
Tetrachloroethene	1.3	0.00054 U
Chlorobenzene	1.1	0.00054 U
Trichlorofluoromethane	NC	0.0043 U
1,2-Dichloroethane	0.02	0.0011 U
1,1,1-Trichloroethane	0.68	0.00054 U
Bromodichloromethane	NC	0.00054 U
trans-1,3-Dichloropropene	NC	0.0011 U
cis-1,3-Dichloropropene	NC	0.00054 U
Bromoform	NC	0.0043 U
1,1,2,2-Tetrachloroethane	NC	0.00054 U
Benzene	0.06	0.00054 U
Toluene	0.7	0.0011 U
Ethylbenzene	1	0.0011 U
Chloromethane	NC	0.0043 U
Bromomethane	NC	0.0022 U
Vinyl chloride	0.02	0.0011 U
Chloroethane	NC	0.0022 U
1,1-Dichloroethene	0.33	0.0011 U
trans-1,2-Dichloroethene	0.19	0.0016 U
Trichloroethene	0.47	0.00054 U
1,2-Dichlorobenzene	1.1	0.0022 U
1,3-Dichlorobenzene	2.4	0.0022 U
1,4-Dichlorobenzene	1.8	0.0022 U
Methyl tert butyl ether	0.93	0.0022 U
p/m-Xylene	NC	0.0022 U
o-Xylene	NC	0.0011 U
cis-1,2-Dichloroethene	0.25	0.0011 U
Styrene	NC	0.0011 U
Dichlorodifluoromethane	NC	0.011 U
Acetone	0.05	0.011 U
Carbon disulfide	NC	0.011 U
2-Butanone	0.12	0.011 U
4-Methyl-2-pentanone	NC	0.011 U
2-Hexanone	NC	0.011 U
Bromochloromethane	NC	0.0022 U
1,2-Dibromoethane	NC	0.0011 U
1,2-Dibromo-3-chloropropane	NC	0.0032 U
Isopropylbenzene	NC	0.0011 U
1,2,3-Trichlorobenzene	NC	0.0022 U
1,2,4-Trichlorobenzene	NC	0.0022 U
Methyl Acetate	NC	0.0043 U

**Table 1**  
**Summary of RW-1 Backfill Sample Analytical Results**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

	<b>LOCATION</b>	FILL_20240222
	<b>SAMPLING DATE</b>	2/22/2024
	<b>LAB SAMPLE ID</b>	L2409772-01
<b>Analyte</b>	<b>UUSCO*</b>	<b>Results (mg/kg)</b>
<b>VOCs (cont.)</b>		
Cyclohexane	NC	0.011 U
1,4-Dioxane	0.1	0.087 U
Freon-113	NC	0.0043 U
Methyl cyclohexane	NC	0.0043 U
<b>SVOCs</b>		
Acenaphthene	20	0.14 U
Hexachlorobenzene	0.33	0.1 U
Bis(2-chloroethyl)ether	NC	0.15 U
2-Chloronaphthalene	NC	0.17 U
3,3'-Dichlorobenzidine	NC	0.17 U
2,4-Dinitrotoluene	NC	0.17 U
2,6-Dinitrotoluene	NC	0.17 U
Fluoranthene	100	0.1 U
4-Chlorophenyl phenyl ether	NC	0.17 U
4-Bromophenyl phenyl ether	NC	0.17 U
Bis(2-chloroisopropyl)ether	NC	0.2 U
Bis(2-chloroethoxy)methane	NC	0.18 U
Hexachlorobutadiene	NC	0.17 U
Hexachlorocyclopentadiene	NC	0.48 U
Hexachloroethane	NC	0.14 U
Isophorone	NC	0.15 U
Naphthalene	12	0.17 U
Nitrobenzene	NC	0.15 U
NDPA/DPA	NC	0.14 U
n-Nitrosodi-n-propylamine	NC	0.17 U
Bis(2-ethylhexyl)phthalate	NC	0.17 U
Butyl benzyl phthalate	NC	0.17 U
Di-n-butylphthalate	NC	0.17 U
Di-n-octylphthalate	NC	0.17 U
Diethyl phthalate	NC	0.17 U
Dimethyl phthalate	NC	0.17 U
Benzo(a)anthracene	1	0.1 U
Benzo(a)pyrene	1	0.14 U
Benzo(b)fluoranthene	1	0.1 U
Benzo(k)fluoranthene	0.8	0.1 U
Chrysene	1	0.1 U
Acenaphthylene	100	0.14 U
Anthracene	100	0.1 U
Benzo(ghi)perylene	100	0.14 U
Fluorene	30	0.17 U
Phenanthrene	100	0.1 U
Dibenzo(a,h)anthracene	0.33	0.1 U
Indeno(1,2,3-cd)pyrene	0.5	0.14 U
Pyrene	100	0.1 U
Biphenyl	NC	0.38 U
4-Chloroaniline	NC	0.17 U
2-Nitroaniline	NC	0.17 U
3-Nitroaniline	NC	0.17 U

**Table 1**  
**Summary of RW-1 Backfill Sample Analytical Results**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

	<b>LOCATION</b>	FILL_20240222
	<b>SAMPLING DATE</b>	2/22/2024
	<b>LAB SAMPLE ID</b>	L2409772-01
<b>Analyte</b>	<b>UUSCO*</b>	<b>Results (mg/kg)</b>
<b>SVOCs (cont.)</b>		
4-Nitroaniline	NC	0.17 U
Dibenzofuran	7	0.17 U
2-Methylnaphthalene	NC	0.2 U
1,2,4,5-Tetrachlorobenzene	NC	0.17 U
Acetophenone	NC	0.17 U
2,4,6-Trichlorophenol	NC	0.1 U
p-Chloro-m-cresol	NC	0.17 U
2-Chlorophenol	NC	0.17 U
2,4-Dichlorophenol	NC	0.15 U
2,4-Dimethylphenol	NC	0.17 U
2-Nitrophenol	NC	0.36 U
4-Nitrophenol	NC	0.24 U
2,4-Dinitrophenol	NC	0.81 U
4,6-Dinitro-o-cresol	NC	0.44 U
Pentachlorophenol	0.8	0.14 U
Phenol	0.33	0.17 U
2-Methylphenol	0.33	0.17 U
3-Methylphenol/4-Methylphenol	0.33	0.24 U
2,4,5-Trichlorophenol	NC	0.17 U
Carbazole	NC	0.17 U
Atrazine	NC	0.14 U
Benzaldehyde	NC	0.22 U
Caprolactam	NC	0.17 U
2,3,4,6-Tetrachlorophenol	NC	0.17 U
<b>Herbicides</b>		
2,4-D	NC	0.169 U
2,4,5-T	NC	0.169 U
2,4,5-TP (Silvex)	3.8	0.169 U
<b>Pesticides</b>		
Delta-BHC	0.04	0.00156 U
Lindane	0.1	0.000651 U
Alpha-BHC	0.02	0.000651 U
Beta-BHC	0.036	0.00156 U
Heptachlor	0.042	0.000781 U
Aldrin	0.005	0.00156 U
Heptachlor epoxide	NC	0.00293 U
Endrin	0.014	0.000651 U
Endrin aldehyde	NC	0.00195 U
Endrin ketone	NC	0.00156 U
Dieldrin	0.005	0.000976 U
4,4'-DDE	0.0033	0.00156 U
4,4'-DDD	0.0033	0.00156 U
4,4'-DDT	0.0033	0.00156 U
Endosulfan I	2.4	0.00156 U
Endosulfan II	2.4	0.00156 U
Endosulfan sulfate	2.4	0.000651 U
Methoxychlor	NC	0.00293 U
Toxaphene	NC	0.0293 U

**Table 1**  
**Summary of RW-1 Backfill Sample Analytical Results**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

<b>LOCATION</b>		FILL_20240222
<b>SAMPLING DATE</b>		2/22/2024
<b>LAB SAMPLE ID</b>		L2409772-01
<b>Analyte</b>	<b>UUSCO*</b>	<b>Results (mg/kg)</b>
<b>Pesticides (cont.)</b>		
cis-Chlordane	0.094	0.00195 U
trans-Chlordane	NC	0.00195 U
Chlordane	NC	0.013 U
<b>PCBs</b>		
Aroclor 1016	0.1	0.0487 U
Aroclor 1221	0.1	0.0487 U
Aroclor 1232	0.1	0.0487 U
Aroclor 1242	0.1	0.0487 U
Aroclor 1248	0.1	0.00808 J
Aroclor 1254	0.1	0.0487 U
Aroclor 1260	0.1	0.0487 U
Aroclor 1262	0.1	0.0487 U
Aroclor 1268	0.1	0.0487 U
PCBs, Total	0.1	0.00808 J
<b>Metals, Total</b>		
Aluminum, Total	NC	322
Antimony, Total	NC	10 U
Arsenic, Total	13	2.01 U
Barium, Total	350	2.23
Beryllium, Total	7.2	1 U
Cadmium, Total	2.5	2.01 U
Calcium, Total	NC	120
Chromium, Total	NC	1.1 J
Cobalt, Total	NC	4.02 U
Copper, Total	50	1.24 J
Iron, Total	NC	1340
Lead, Total	63	0.722 J
Magnesium, Total	NC	118
Manganese, Total	1600	21.1
Mercury, Total	0.18	0.07 U
Nickel, Total	30	0.517 J
Potassium, Total	NC	43.1 J
Selenium, Total	3.9	4.02 U
Silver, Total	2	1 U
Sodium, Total	NC	20.6 J
Thallium, Total	NC	4.02 U
Vanadium, Total	NC	2.36
Zinc, Total	109	1.74 J

**Notes**

- mg/kg : milligrams per kilogram
- J : estimated value
- U : analyte was not detected at the specified quantitation limit
- NC : no criteria
- VOCs : volatile organic compounds
- SVOCs : semi-volatile organic compounds
- PCBs : polychlorinated biphenyls
- \* : 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use Soil Cleanup Objectives

**Table 2**  
**Summary of Pump and Treat System Analytical Results**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, NY

LOCATION		INFLUENT	MIDFLUENT	EFFLUENT
SAMPLING DATE		5/6/2024	5/6/2024	5/6/2024
LAB SAMPLE ID		L2424744-01	L2424744-03	L2424744-02
Analyte	Class GA Value*	Results (ug/l)		
<b>VOCs</b>				
Methylene chloride	5	2.5 U	2.5 U	2.5 U
1,1-Dichloroethane	5	2.5 U	2.5 U	2.5 U
Chloroform	7	2.5 U	2.5 U	2.5 U
Carbon tetrachloride	5	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	1	1 U	1 U	1 U
Dibromochloromethane	50	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	1	1.5 U	1.5 U	1.5 U
Tetrachloroethene	5	2.4	0.5 U	0.5 U
Chlorobenzene	5	2.5 U	2.5 U	2.5 U
Trichlorofluoromethane	5	2.5 U	2.5 U	2.5 U
1,2-Dichloroethane	0.6	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	5	2.5 U	2.5 U	2.5 U
Bromodichloromethane	50	0.5 U	0.2 J	0.5 U
trans-1,3-Dichloropropene	0.4	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	0.4	0.5 U	0.5 U	0.5 U
Bromoform	50	2 U	2 U	2 U
1,1,2,2-Tetrachloroethane	5	0.5 U	0.5 U	0.5 U
Benzene	1	0.53	0.74	0.62
Toluene	5	2.5 U	2.5 U	2.5 U
Ethylbenzene	5	2.5 U	2.5 U	2.5 U
Chloromethane	NC	2.5 U	2.5 U	2.5 U
Bromomethane	5	2.5 U	2.5 U	2.5 U
Vinyl chloride	2	0.09 J	0.07 J	1 U
Chloroethane	5	2.5 U	2.5 U	2.5 U
1,1-Dichloroethene	5	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	5	2.5 U	2.5 U	2.5 U
Trichloroethene	5	190	29	0.4 J
1,2-Dichlorobenzene	3	2.5 U	2.5 U	2.5 U
1,3-Dichlorobenzene	3	2.5 U	2.5 U	2.5 U
1,4-Dichlorobenzene	3	2.5 U	2.5 U	2.5 U
Methyl tert butyl ether	10	0.75 J	0.55 J	0.4 J
p/m-Xylene	5	2.5 U	2.5 U	2.5 U
o-Xylene	5	2.5 U	2.5 U	2.5 U
cis-1,2-Dichloroethene	5	6.4	3.2	2.5 U
Styrene	5	2.5 U	2.5 U	2.5 U
Dichlorodifluoromethane	5	5 U	5 U	5 U
Acetone	50	5 U	5 U	3.3 J
Carbon disulfide	60	5 U	5 U	5 U
2-Butanone	50	5 U	5 U	5 U
4-Methyl-2-pentanone	NC	5 U	5 U	5 U
2-Hexanone	50	5 U	5 U	5 U
Bromochloromethane	5	2.5 U	2.5 U	2.5 U
1,2-Dibromoethane	0.0006	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane	0.04	2.5 U	2.5 U	2.5 U
Isopropylbenzene	5	1.2 J	1.5 J	2.5 U
1,2,3-Trichlorobenzene	5	2.5 U	2.5 U	2.5 U
1,2,4-Trichlorobenzene	5	2.5 U	2.5 U	2.5 U
Methyl Acetate	NC	2 U	2 U	2 U

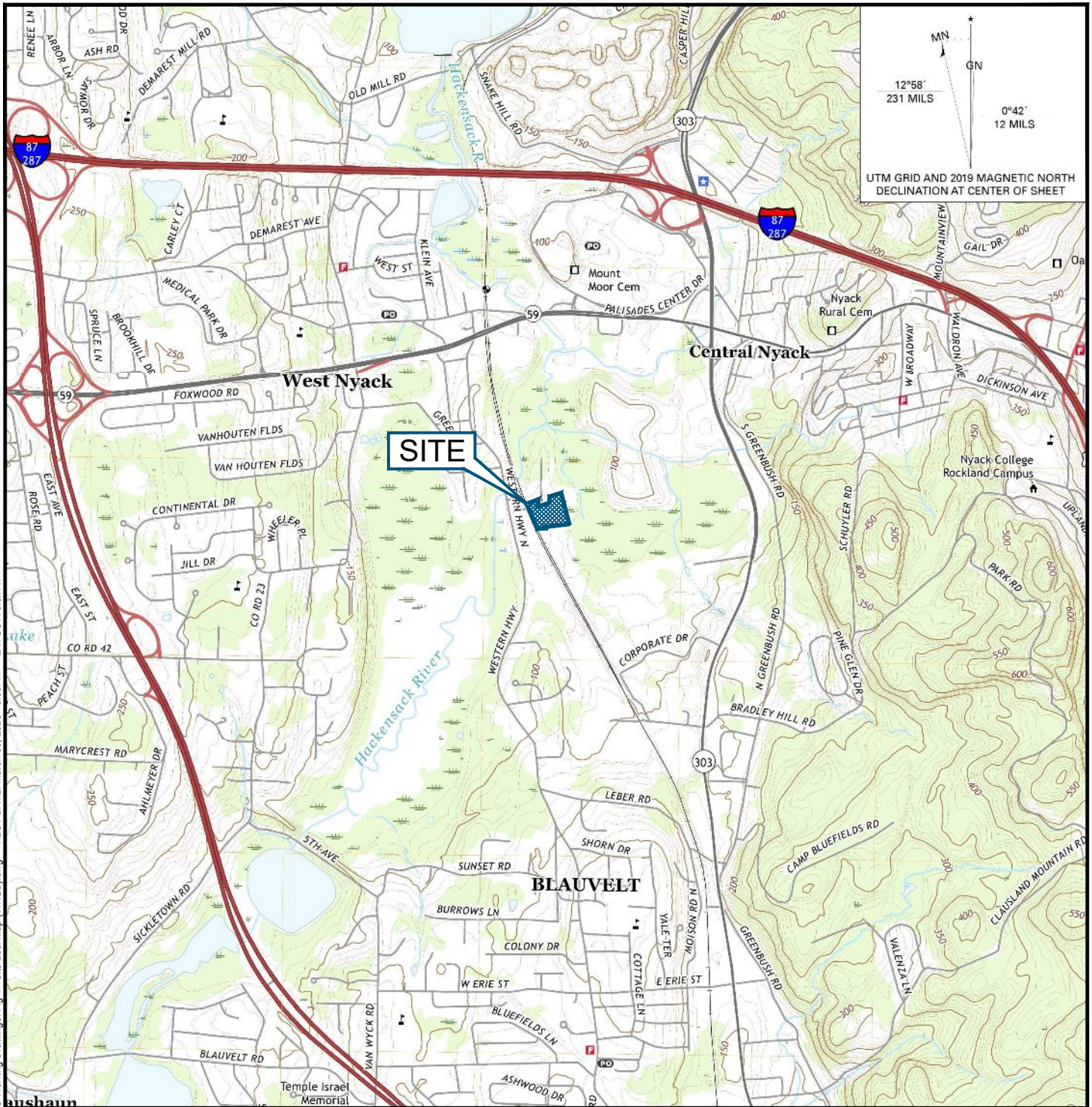
**Table 2**  
**Summary of Pump and Treat System Analytical Results**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, NY

LOCATION		INFLUENT	MIDFLUENT	EFFLUENT
SAMPLING DATE		5/6/2024	5/6/2024	5/6/2024
LAB SAMPLE ID		L2424744-01	L2424744-03	L2424744-02
Analyte	Class GA Value*	Results (ug/l)		
<b>VOCs (cont.)</b>				
Cyclohexane	NC	10 U	10 U	10 U
1,4-Dioxane	0.35	250 U	250 U	250 U
Freon-113	5	2.5 U	2.5 U	2.5 U
Methyl cyclohexane	NC	10 U	10 U	10 U
<b>Metals, total</b>				
Arsenic, Total	25	2.7 J	5 U	2.9 J
Cadmium, Total	5	5 U	5 U	5 U
Chromium, Total	50	5.2 J	3.9 J	4.3 J
Copper, Total	200	115	15.6	24.4
Lead, Total	25	<b>51</b>	11.9	18.9
Nickel, Total	100	4 J	4.1 J	4.7 J
Zinc, Total	2000	143	31.8	55

**Notes**

- ug/l : micrograms per liter
- J : estimated value
- NC : no criteria
- U : analyte was not detected at the specified quantitation limit
- VOCs : volatile organic compounds
- \* : New York State Department of Environmental Conservation Ambient Water Quality Standards and Guidance Values for Class GA Water, June 1998 with the April 2000 Addendum
- Bold** : indicates that the detected value exceeds the listed standard or guidance value

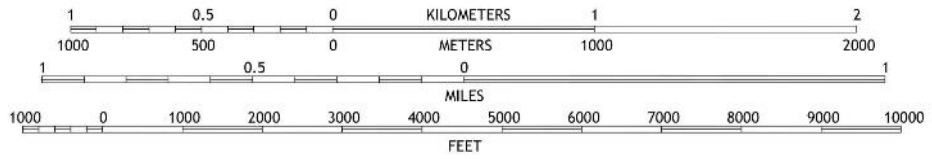
## FIGURES



MN  
 GN  
 12°58' 231 MILS  
 0°42' 12 MILS  
 UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

**SITE**

SCALE: 1:2400



NEW YORK  
 QUADRANGLE LOCATION  
 MAP OBTAINED THROUGH USE OF TOPOVIEW WITH THE INTERFACE CREATED BY THE NATIONAL GEOLOGIC MAP DATABASE PROJECT (NGMDB), IN SUPPORT OF THE TOPOGRAPHIC MAPPING PROGRAM, MANAGED BY THE USGS NATIONAL GEOSPATIAL PROGRAM (NGP).  
 MAP INCLUDES INFORMATION FROM THE FOLLOWING MAP SHEET(S):  
 TP, NYACK, NY, NJ, 7.5 MINUTE DATED 2019.

6.5411 - ATTACHED REFS: - ATTACHED IMAGES: NY\_Nyack\_20190930\_TN; DRAWING NAME: I:\Projects\190273 - West Nyack - Sequa Corp\Figures\TRC Working Drawings\Fig 1 - Site Loc. Map (WNCS).dwg - PLOT DATE: March 30, 2023 - 3:00PM - LAYOUT: 8.5x11P

3 Corporate Drive, Suite 202  
 Clifton Park, NY 12065  
 Phone: 518.348.1190  
 www.trccompanies.com

PROJECT: **CHROMALLOY  
 FORMER CHROMALLOY FACILITY (NYSDEC SITE NO. 344039)  
 169 WESTERN HIGHWAY  
 WEST NYACK, NEW YORK 10994**

TITLE: **SITE LOCATION MAP**

DRAWN BY: H. DELGADO  
 CHECKED BY: J. KING  
 APPROVED BY: J. LAROCK  
 DATE: FEBRUARY 2024  
 PROJ. NO.: 190273.2021.0000  
 FILE: Fig 1 - Site Loc. Map (WNCS).dwg

**FIGURE 1**

Coordinate System: NAD 1983 StatePlane New York East FIPS 3101 Feet; Map Rotation: 90  
 - Saved By: L.LILL on 11/26/2024, 08:55:17 AM; File Path: T:\1-PROJECTS\Sequoia\Chromalloy\2-APRX\2-APRX.aprx; Layout Name: Figure 1 - Chromalloy Site Layout Map



**LEGEND**

- MONITORING WELL LOCATION
- FORMER PRODUCTION WELL
- RECOVERY WELL
- PUMP AND TREAT SYSTEM OUTFALL
- SUB-SLAB VAPOR POINT
- DECOMMISSIONED DUAL PHASE EXTRACTION WELL OR MONITORING POINT
- PUMP AND TREAT SYSTEM
- FORMER CHROMALLOY FACILITY PROPERTY
- CHROMIUM EXCAVATION EXTENTS - OCTOBER 2017

**NOTES:**

1. FORMER CHROMALLOY FACILITY PROPERTY BOUNDARY IS APPROXIMATE.
2. MONITORING WELL LOCATIONS WERE SURVEYED BY A NEW YORK STATE LICENSED SURVEYOR IN JUNE 2011.
3. ALL DEPICTED WELL LOCATIONS, SUB-SLAB VAPOR POINT LOCATIONS, AND EXCAVATION EXTENTS ARE APPROXIMATE.
4. PROPERTY BOUNDARY PROVIDED FROM DIGITAL MAP PRODUCTS.

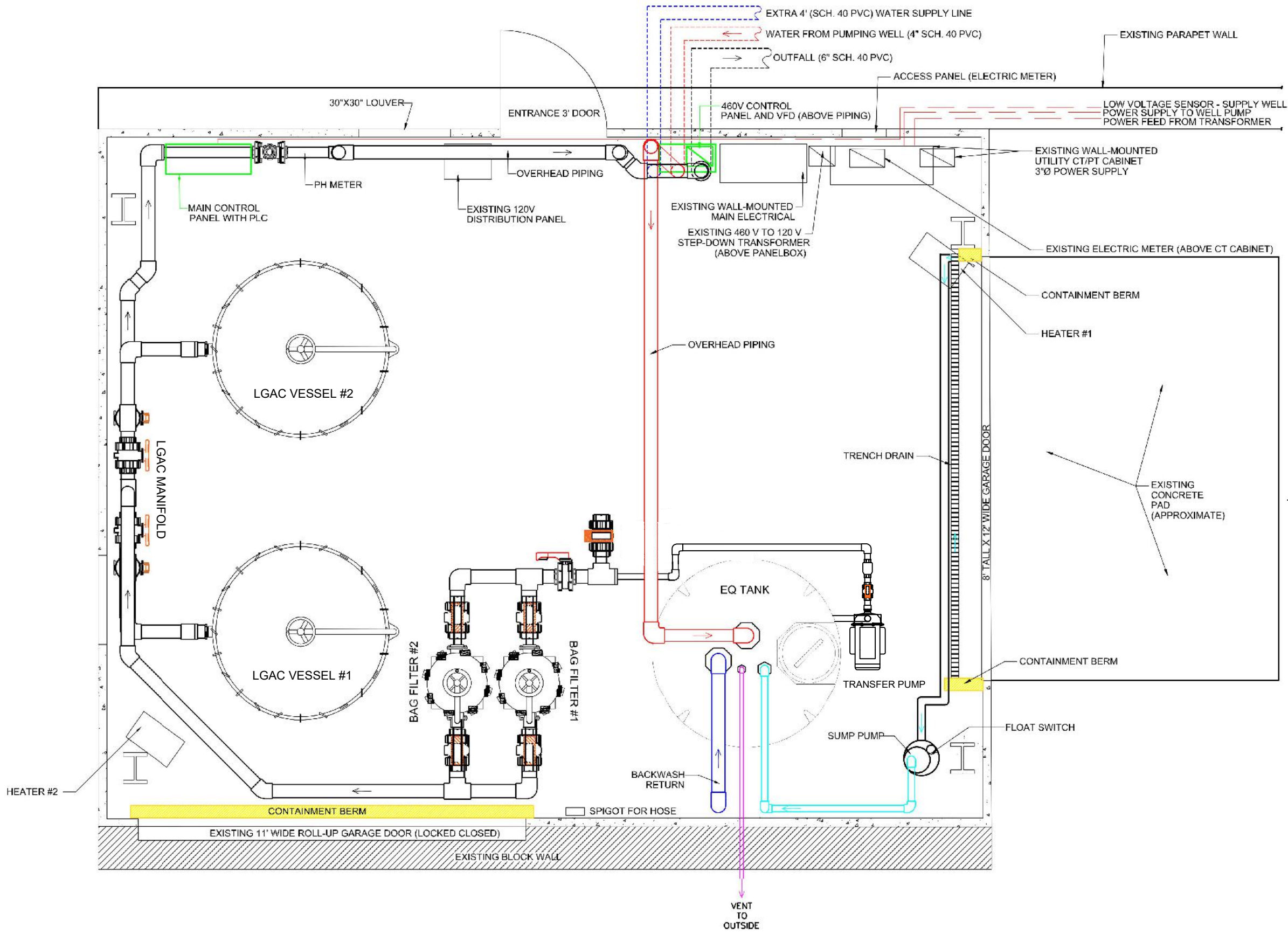
BASE MAP: NEAR MAP  
 DATA SOURCES: TRC



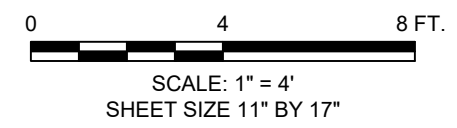
1:900  
 1" = 75'  
 0 75 150 FEET

PROJECT:		CHROMALLOY FORMER CHROMALLOY FACILITY WEST NYACK, ROCKLAND COUNTY, NEW YORK NYSDEC SITE NO. 344039	
TITLE: <b>SITE LAYOUT MAP</b>			
DRAWN BY:	L. LILL	PROJ. NO.:	190273.2021.0000
CHECKED BY:	J. KING	<b>FIGURE 1</b>	
APPROVED BY:	J. LAROCK		
DATE:	JANUARY 2025		
		3 Corporate Drive Suite 202 Clifton Park, NY 12065 Phone: 518.348.1190	
FILE:	2-APRX.aprx		

11x17 -- ATTACHED REFS: -- ATTACHED IMAGES: -- DRAWING NAME: \\CLIFTONPARK\VP\Drawings\2024\2024\_11\_RSO\_CCR\DNU\Fig. 3 - System Layout.dwg --- PLOT DATE: November 25, 2024 - 11:45AM --- LAYOUT: PDF



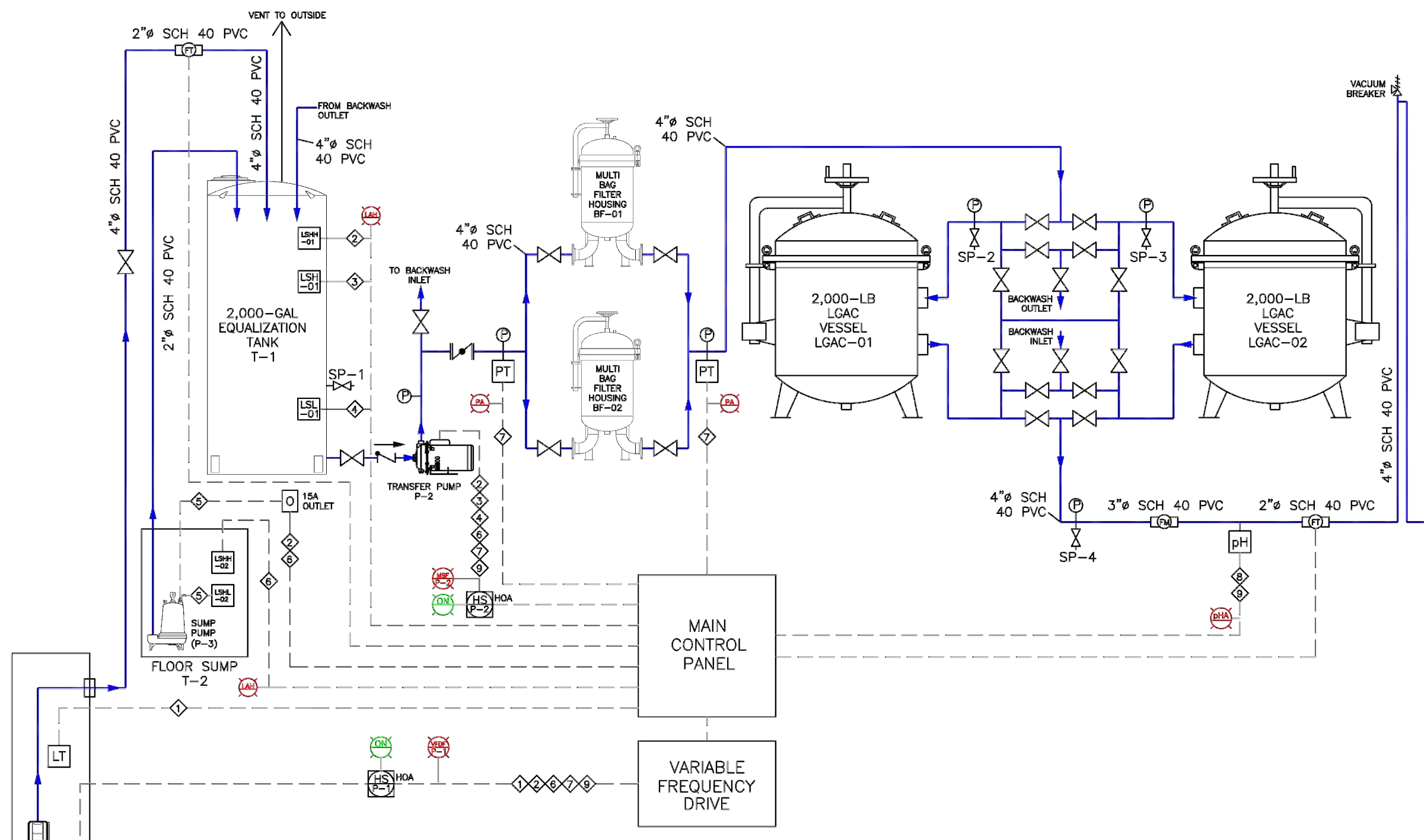
- NOTES:**
- FIGURE WAS PREPARED BY ENVIROTRAC LTD OF YAPHANK, NEW YORK (ET).
  - THE EQUALIZATION (EQ) TANK HOLDS 2,000-GALLONS OF UNTREATED GROUNDWATER.
  - EACH LIQUID-PHASE GRANULAR ACTIVATED CARBON (LGAC) VESSEL HOLDS 2,000-LBS OF LGAC.
  - THE PROGRAMMABLE LOGIC CONTROLLER (PLC) IS USED TO CONTROL ALL THE COMPONENTS OF THE TREATMENT SYSTEM.



PROJECT:		CHROMALLOY FORMER CHROMALLOY FACILITY WEST NYACK, ROCKLAND COUNTY, NEW YORK NYSDEC SITE NO. 344039	
TITLE:		SYSTEM LAYOUT	
DRAWN BY:	B. ABRERA	PROJ NO.:	474150.0000.0000
CHECKED BY:	J. KING	FIGURE 3	
APPROVED BY:	J. LAROCK		
DATE:	JANUARY 2025		
FILE NO.:		Fig. 3 - System Layout.dwg	



11x17 -- ATTACHED REFS: -- ATTACHED IMAGES: --  
 DRAWING NAME: \\CLIFTONPARK-VFP\proj\mark\ECR\Projects\Sequn\190273 - Sequa W Nyack\Deliverables\2024\2024.11 - RSO CGR\LDNU\Fig.4 - P&ID.dwg --- PLOT DATE: November 25, 2024 - 11:16AM --- LAYOUT: PDF  
 Version: 2017-03-03



**SYSTEM LEGEND:**

- PRESSURE GAUGE
- LEVEL SWITCH
- LEVEL TRANSMITTER
- PRESSURE TRANSMITTER
- pH TRANSMITTER
- FLOW METER/TOTALIZER
- FLOW TRANSMITTER
- BALL VALVE
- BUTTERFLY VALVE
- SAMPLE PORT
- CHECK VALVE
- HMI SWITCH
- CONTROL PANEL INTERLOCK
- ELECTRIC LINE
- AIR FLOW DIRECTION
- WATER FLOW DIRECTION
- ENCLOSURE LIMITS

- NOTES:**
- FIGURE WAS PREPARED BY ENVIROTRAC LTD OF YAPHANK, NEW YORK (ET).
  - 10-PIPE DIAMETERS OF STRAIGHT PIPE RUN WAS INSTALLED BEFORE EACH FLOW METER OR FLOW TRANSMITTER.
  - 5-PIPE DIAMETERS OF STRAIGHT PIPE RUN WAS INSTALLED AFTER EACH FLOW METER/TRANSMITTER.

- HMI INDICATOR INDEX:**
- LEVEL ALARM HIGH
  - PRESSURE ALARM HIGH
  - pH ALARM HIGH OR LOW
  - VARIABLE FREQUENCY DRIVE FAULT
  - MOTOR STARTER FAULT
  - MOTOR RUN INDICATOR

- INTERLOCK SCHEDULE:**
- PLC TO CONTROL VFD TO MAINTAIN GROUNDWATER LEVEL SETPOINT.
  - LEVEL AT LSHH-01 - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3 OUTLET.
  - LEVEL AT LSH-01 - TURN ON P-2.
  - LEVEL BELOW LSL-01 - TURN OFF P-2.
  - INTEGRAL SUMP PUMP FLOAT SWITCH LSHL-02 ENGAGED - SUMP PUMP TURNS ON AUTOMATICALLY. INTEGRAL SUMP PUMP FLOAT SWITCH LSHL-02 DISENGAGED - SUMP PUMP TURNS OFF AUTOMATICALLY.
  - LEVEL AT LSHH-02 - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3 OUTLET.
  - HIGH DIFFERENTIAL PRESSURE ACROSS BAG FILTERS - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.
  - HIGH OR LOW AVERAGE DISCHARGE pH - SEND WARNING NOTIFICATION.
  - HIGH OR LOW AVERAGE DISCHARGE pH - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.

PROJECT:		CHROMALLOY FORMER CHROMALLOY FACILITY WEST NYACK, ROCKLAND COUNTY, NEW YORK NYSDEC SITE NO. 344039	
TITLE: <b>PROCESS AND INSTRUMENTATION DIAGRAM (P&amp;ID)</b>			
DRAWN BY:	B. ABRERA	PROJ NO.:	474150.0000.0000
CHECKED BY:	J. KING	<b>FIGURE 4</b>	
APPROVED BY:	J. LAROCK		
DATE:	JANUARY 2025		
		3 Corporate Drive, Suite 202 Clifton Park, NY 12065 Phone: 518.348.1190 www.TRCompanies.com	
FILE NO.:	Fig.4 - P&ID.dwg		

## APPENDIX A



**Transmitted via Email**

July 8, 2025

Justin King  
TRC Engineers, Inc.  
3 Corporate Drive, Suite 202  
Clifton Park, NY 12065  
[jking@trccompanies.com](mailto:jking@trccompanies.com)

**Re: Construction Completion Report for Remedial System Optimization  
NYSDEC Site 344039 Chromalloy (SEQUA)  
West Nyack, Rockland County**

Dear Mr. King,

The New York State Department of Environmental Conservation and the New York State Department of Health (the Departments) have reviewed the Construction Completion Report for Remedial System Optimization (the Report) received on January 14, 2025. The Departments hereby approve the Report with the following modifications:

- Section 4.3 RW-1 Corrective Action, states "...TRC implemented a community air monitoring program (CAMP) at the Site during the intrusive work." Please provide CAMP data for the outlined activities.
- In the last sentence under Section 5.4 Initial Quarterly Sampling, please correct from Appendix G to Appendix H.

Please provide an updated Report with the requested modifications per 6 NYCRR Part 375-1.6(d)(3). If you have any questions or comments, please contact me at 518-402-9546 or [michael.squire@dec.ny.gov](mailto:michael.squire@dec.ny.gov)

Sincerely,

Michael Squire  
Project Manager  
Remedial Bureau C  
Division of Environmental Remediation

EC: Amen Omorogbe, NYSDEC  
Steven McCague, NYSDEC  
Michele Dolan, NYSDOH  
John Lambert, Chromalloy [jlambert@chromalloy.com](mailto:jlambert@chromalloy.com)

## APPENDIX B



## SUBMITTAL/TRANSMITTAL FORM

<b>FROM:</b>	EnviroTrac Ltd. 5 Old Dock Road Yaphank, New York 11980 Phone: (631) 924-3001 Fax: (631) 924-5001	<b>DATE SENT:</b> 05/08/23
<b>TO:</b>	<b>TRC</b> 10 Maxwell Drive Suite 200 Clifton Park, NY 12065  Attn: Peter Wanfried	<b>DATE RECEIVED:</b> _____

**PROJECT:**

**Remedial System Optimization (RSO) RFP  
 Former Chromalloy Facility, West Nyack, New York**

We are transmitting (Herewith , Under separate cover , Electronic , Hard copy ) the following:

Item No.(s)	Submittal Description	Submittal No.	Revision to Previous Submittal:
1	Figure 1 – Pump and Treat System P&ID	01	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2	LGAC Vessels Specifications	02	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
3	Transfer Pump Specifications	03	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
4	Equalization Tank Specifications	04	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5	EQ Tank Float Switches Specifications	05	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
6	Sump Pump Specifications	06	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
7	Floor Sump High Level Float Specifications	07	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
8	RW-1 Level Transducer Specifications	08	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
9	Transfer Pump Pressure Transmitter Specifications	09	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
10	Mechanical Flow Totalizer Specifications	10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
11	Water Flow Transmitter Specifications	11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
12	pH Transmitter Specifications	12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13	pH Sensor Specifications	13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

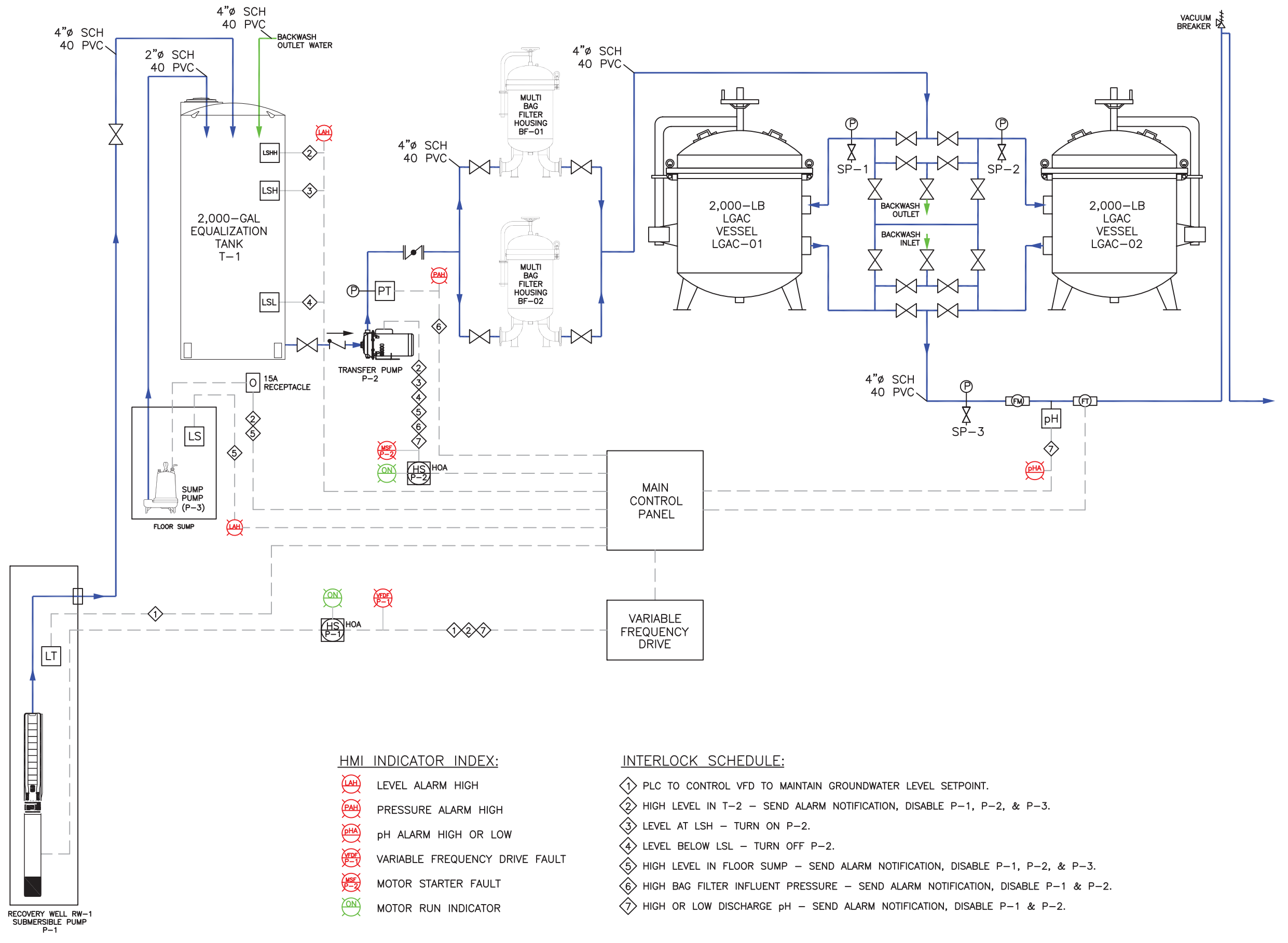
14	Pressure Gauge Specifications	14	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
15	Heater Specifications	15	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
16	HMI Touchscreen Specifications	16	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
17	PLC Specifications	17	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
18	Variable Frequency Drive Specifications	18	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
19	Steel Access Door Specifications	19	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
20	Keyless Door Lock Installation/User Guide	20	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
21	Trench Drain Specifications	21	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
22	Sump Pump Basin Specifications	22	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
23	Roof Drain Cover Specifications	23	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
24	Containment Berm Specifications	24	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Remarks: \_\_\_\_\_

Copy to: File

Signed:



**SYSTEM LEGEND:**

- PRESSURE GAUGE
- LEVEL SWITCH
- LEVEL TRANSMITTER
- PRESSURE TRANSMITTER
- pH TRANSMITTER
- FLOW METER/TOTALIZER
- FLOW TRANSMITTER
- BALL VALVE
- BUTTERFLY VALVE
- SAMPLE PORT
- CHECK VALVE
- HMI SWITCH
- CONTROL PANEL INTERLOCK
- ELECTRIC LINE
- AIR FLOW DIRECTION
- CONDENSATE WATER FLOW DIRECTION
- ENCLOSURE LIMITS

**HMI INDICATOR INDEX:**

- LEVEL ALARM HIGH
- PRESSURE ALARM HIGH
- pH ALARM HIGH OR LOW
- VARIABLE FREQUENCY DRIVE FAULT
- MOTOR STARTER FAULT
- MOTOR RUN INDICATOR

**INTERLOCK SCHEDULE:**

- ① PLC TO CONTROL VFD TO MAINTAIN GROUNDWATER LEVEL SETPOINT.
- ② HIGH LEVEL IN T-2 - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3.
- ③ LEVEL AT LSH - TURN ON P-2.
- ④ LEVEL BELOW LSL - TURN OFF P-2.
- ⑤ HIGH LEVEL IN FLOOR SUMP - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3.
- ⑥ HIGH BAG FILTER INFLUENT PRESSURE - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.
- ⑦ HIGH OR LOW DISCHARGE pH - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.

## PRM Carbon Systems - HP-2000-RDL



The HP Series Carbon units are used on remediation systems where standard flow volumes are required with minimal back-pressure. These units offer a 25% freeboard area for excellent backwash ratios. Typical applications are groundwater remediation for VOCs or industrial sites with similar applications. Several media types are available for removal of more specific compounds such as metals and other contaminants. Aggregate media specifically designed to be backwashed is also available.

### APPLICATIONS:

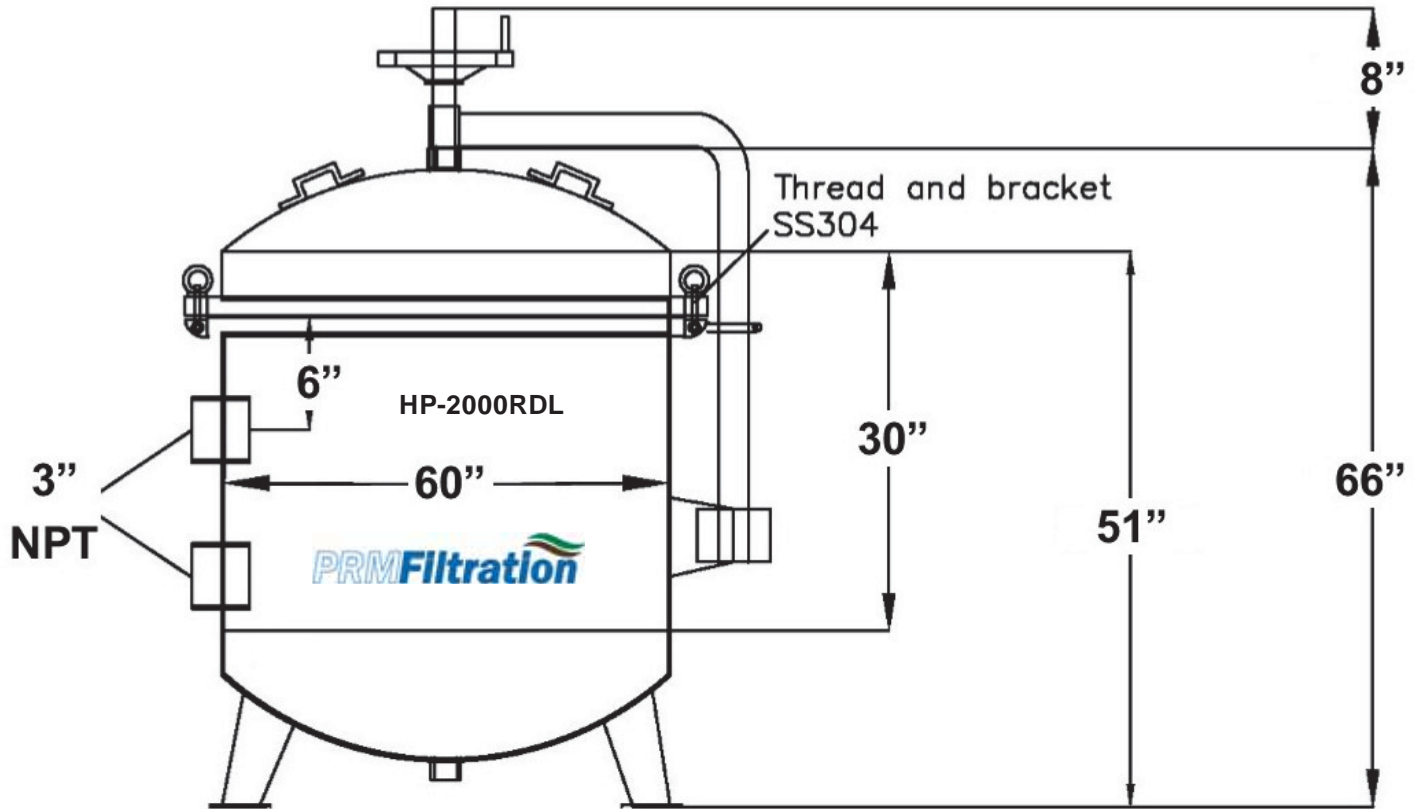
- Remediation of contaminated water streams

### STANDARD SPECIFICATIONS:

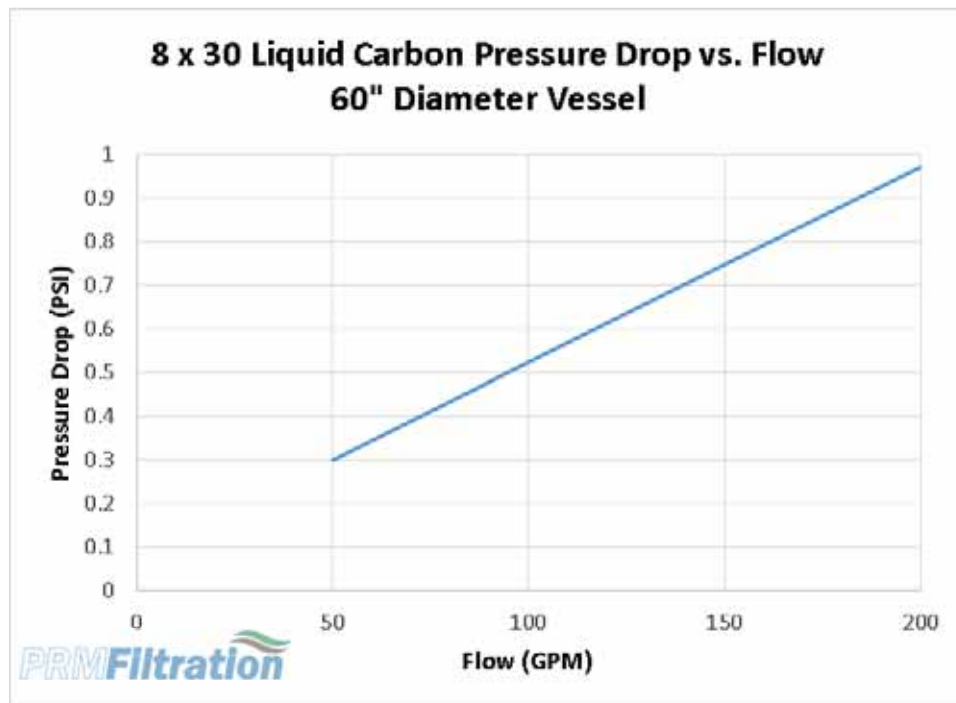
- 60"D x 73"H Tank Vessel With Removable Lid for easy access when changing your carbon media without affecting efficiency or performance
- 3 Inch Inlet/Outlet
- 80 psig maximum pressure
- High Flow Distributor Manifold
- Heavy Duty Welded Legs
- Approx. 2000 lbs. of GAC media based on a packed density bed of 30lbs/ft<sup>3</sup>



888-TREAT-IT • [www.prmfiltration.com](http://www.prmfiltration.com) • [sales@prmfiltration.com](mailto:sales@prmfiltration.com)



Dimensions shown in inches.



AVAILABILITY: Build Item: Allow 3 to 6 weeks for manufacturing and shipping

**888-TREAT-IT • [www.prmfiltration.com](http://www.prmfiltration.com) • [sales@prmfiltration.com](mailto:sales@prmfiltration.com)**

[Straight Centrifugal Pumps](#) / Centrifugal Pump: 1 1/2 hp, 208-230/460V...



## Centrifugal Pump: 1 1/2 hp, 208-230/460V AC, 119 ft Max Head, 1 1/2 in , 1 1/4 in Intake and Disch

Item 784RN3 Mfr. Model 2ST1F9H4

### Product Details

---

Pump Housing Material **Stainless Steel**

---

Phase **Three**

---

Horsepower **1-1/2 hp**

---

Nameplate Voltage **208-230/460V AC**

---

Maximum Flow Rate @ 60 Feet of Head **131 gpm**

---

Maximum Flow Rate @ 70 Feet of Head **122 gpm**

---

Maximum Flow Rate @ 80 Feet of Head **111 gpm**

---

Maximum Flow Rate @ 90 Feet of Head **99 gpm**

---

Maximum Flow Rate @ 100 Feet of Head **80 gpm**

---

Maximum Feet of Head **119 ft**

---

Connection Type **NPT**

---

Motor Enclosure **Totally Enclosed Fan Cooled**

---

Brand **GOULDS WATER TECHNOLOGY**

---

Compatible Intake Pipe Size **1-1/2 in**

---

Compatible Discharge Pipe Size **1-1/4 in**

---

Impeller Material **Stainless Steel**

---

Seal Material **316 Stainless Steel; Carbon; Silicon Carbide; Viton**

---

Wetted Material **316 Stainless Steel; Carbon; Silicon Carbide; Stainless Steel; Viton**

---

RPM (Maximum) **3,500 RPM**

---

Specific Gravity (Maximum) **1**

---

Shut Off Pressure **125 psi**

---

Standards **CSA Certified; NSF 61 Certified**

---

Mounting Orientation **Horizontal; Vertical**

---

Compatible with Media Type **Water**

---

Priming **Manual**

---

Shaft Material **Stainless Steel**

---

For Use With Potable Systems **Yes**

---

Best Efficiency Head **98 ft**

---

Discharge Type **NPT**

---

Frequency **60 Hz**

---

Best Efficiency Flow **90 gpm**

---

Flow Rate (Maximum) **91.1 gpm**

---

Duty Cycle **Continuous**

---

Manufacturer Part Number **2ST1F9H4**

---

Flow Rate (Minimum) **59.4 gpm**

---

Series **NPE**

---

Overall Height **8.7 in**

---

Overall Length **20 in**

---

Overall Width **8.5 in**

---

UNSPSC **40151503**

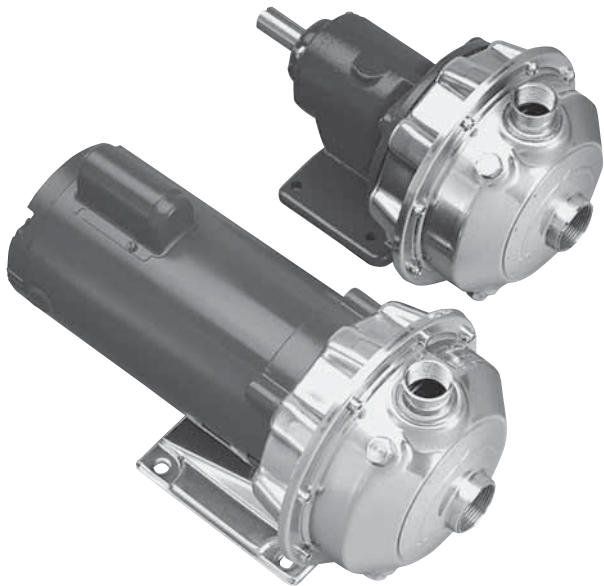
---

Country of Origin **USA (subject to change)**

---

Product Description

Straight centrifugal pumps with motors between 1 and 1-1/2 HP achieve higher head and flow rates than pumps with a lower HP motor.



# NPE

316L SS

NPE SERIES END SUCTION CENTRIFUGAL PUMPS

*BOMBAS CENTRÍFUGAS DE SUCCIÓN FINAL SERIE NPE*

### A FULL RANGE OF PRODUCT FEATURES UNA GAMA TOTAL DE CARACTERÍSTICAS DEL PRODUCTO

#### Superior Materials of Construction:

Complete AISI 316L stainless steel liquid handling components and mounting bracket for corrosion resistance, quality appearance, and improved strength and ductility.

#### High Efficiency Impeller:

Enclosed impeller with unique floating seal ring design maintains maximum efficiencies over the life of the pump without adjustment.

#### Casing and Adapter Features:

Stainless steel construction with NPT threaded, centerline connections, easily accessible vent, prime and drain connections with stainless steel plugs. Optional seal face vent/flush available.

**Mechanical Seal:** Standard John Crane Type 21 with carbon versus silicon-carbide faces, Viton elastomers, and 316 stainless metal parts. Optional high temperature and chemical duty seals available.

**Motors:** NEMA standard open drip-proof, totally enclosed fan cooled or explosion proof enclosures. Rugged ball bearing design for continuous duty under all operating conditions.



#### NSF 61 Certification:

Pumps assembled at the factory are certified to the NSF/ANSI 61 Drinking Water System Components Standard.

\* Premium efficiency where required by Department of Energy regulations.

The various versions of the NPE are identified by a product code number on the pump label. This number is also the catalog number for the pump. The meaning of each digit in the product code number is shown at left.

#### Materiales Superiores de Construcción:

Componentes completos para manejo de líquidos en acero inoxidable AISI 316L y consola para el montaje para resistencia a la corrosión, apariencia de calidad, y fuerza y ductilidad mejoradas.

#### Impulsor de Eficiencia Superior:

El impulsor encerrado con un diseño único de anillo del sello flotante, mantiene sin ajustes, la eficiencia máxima sobre la vida de la bomba.

**Características de la Carcasa y del Adaptador:** Construcción en acero inoxidable con NPT roscado, conexiones centrales, válvulas de fácil acceso, conexiones de cebado y drenaje con enchufes de acero inoxidable. Cara del sello válvula/chorro opcional disponible.

**Sello Mecánico:** Estándar John Crane Tipo 21 con carbón en contraste con caras de silicón-carbide, elastómeros de Viton, y partes metálicas de acero inoxidable 316. Sellos de alta temperatura y productos químicos están disponibles.

**Motores:** Estándar NEMA a prueba de goteo, ventilador totalmente encerrado o recintos a prueba de explosión. Diseño robusto de balineras de bolas para trabajo continuo en todas las condiciones de funcionamiento.

#### Certificación del NSF 61:

Las bombas ensambladas en la fábrica se certifican a los componentes de consumición del circuito de agua de NSF/ANSI 61 estándar.

\* Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

Las diferentes versiones de la NPE se identifican con un número de código del producto en la etiqueta de la bomba. Este número es también el número del catálogo para la bomba. El significado de cada dígito en el número de código del producto se muestra a la izquierda.

### NPE PRODUCT LINE NUMBERING SYSTEM LÍNEA DE PRODUCTO NPE SISTEMA DE NUMERACIÓN

#### Example Product Code, Ejemplo Código del Producto

1 ST 2 C 1 A 4 F R

#### Casing Rotation, Optional

R = 3 o'clock L = 9 o'clock  
B = 6 o'clock

**NOTE:** Rotation when viewed from suction end of pump. Standard discharge position is 12 o'clock.

#### Rotación de la cubierta, opcional

R = 3 hora L = 9 hora  
B = 6 hora

**NOTA:** Rotación cuando está visto del extremo de la succión de la bomba. La posición estándar de la descarga es las 12.

#### Seal Vent/Flush Option, Opción de Sello Válvula/Chorro Seal Ven

#### Mechanical Seal and O-ring

4 = Pre-engineered standard  
For optional mechanical seal modify catalog order no. with seal code listed below.

#### Sello Mecánico y Anillo 'O'

4 = Estándar aprobado  
Para sello mecánico opcional modificar el número de orden del catálogo con el código del sello anotado abajo.

John Crane Type 21 Mechanical Seal (% seal), Sello Mecánico John Crane Tipo 21 (sello de %)					
Seal Code, Código del Sello	Rotary, Rotativo	Stationary, Estacionario	Elastomers, Elastómeros	Metal Parts, Partes Metálicas	Part No., Pieza Número
2	Carbon, Carbón	Silicon Carbide, Carburo de silicón	EPR	316 SS, 316 Acero inoxidable	10K18
4			Viton		10K55
5	Silicon Carbide		EPR		10K81
6			Viton		10K62
8*			EPR		10K167
9	Carbon		Ceramic		Teflon

\* This is a JC Type 2100 unutilized seal ideal for glycol applications.

#### Impeller Option . . . No Adder Required

For optional impeller diameters modify catalog order no. with impeller code listed. Select optional impeller diameter from pump performance curve.

#### Código del Impulsor Opcional

Para impulsores con diámetros opcionales modificar el número de orden del catálogo con el código del impulsor anotado. Escoger el impulsor con diámetro opcional de la curva de funcionamiento de la bomba.

Impeller Code, Código del impulsor	Pump Size, Tamaño de la bomba		
	1 x 1 1/4 - 6 Diameter	1 1/4 x 1 1/2 - 6 Diameter	1 1/2 x 2 - 6 Diameter
A	6 1/8	6 1/8	5 1/8
B	5 3/4	5 15/16	5
C	5 7/16	5 3/4	4 3/4
D	4 3/4	5 11/32	4 1/2
E	4 7/16	5 1/16	4 3/8
F	4 1/16	4 7/8	4
G		4 5/8	3 5/8
H		4 1/4	
J		4	

#### Driver, Conductor

1 = 1 PH, ODP    7 = 3 PH, XP    C = 3 PH, 575 TE PE  
2 = 3 PH, ODP    8 = 575 V, XP    D = 3 PH, XP PE  
3 = 575 V, ODP    9 = 3 PH, TE PE    E = 3 PH, WD PE  
4 = 1 PH, TEFC    0 = 1 PH, XP    F = 1 PH, ODP PE  
5 = 3 PH, TEFC    A = 3 PH, ODP PE    G = 1 PH, TEFC PE  
6 = 575 V, TEFC    B = 3 PH, 575 ODP PE    H = 1 PH, XP PE

For frame mounted version, substitute the letters "FRM" in these positions.

#### HP Rating, HP Potencia

C = 1/2 HP    E = 1 HP    G = 2 HP    J = 5 HP  
D = 3/4 HP    F = 1 1/2 HP    H = 3 HP    K = 7.5 HP

#### Driver: Hertz/Pole/RPM, Conductor: Hercios/Polo/RPM

1 = 60 Hz, 2 pole, 3500 RPM  
2 = 60 Hz, 4 pole, 1750 RPM  
3 = 60 Hz, 6 pole, 1150 RPM  
4 = 50 Hz, 2 pole, 2900 RPM  
5 = 50 Hz, 4 pole, 1450 RPM

Para la versión con el armazón montado, sustituya las letras "FRM" en estas posiciones.

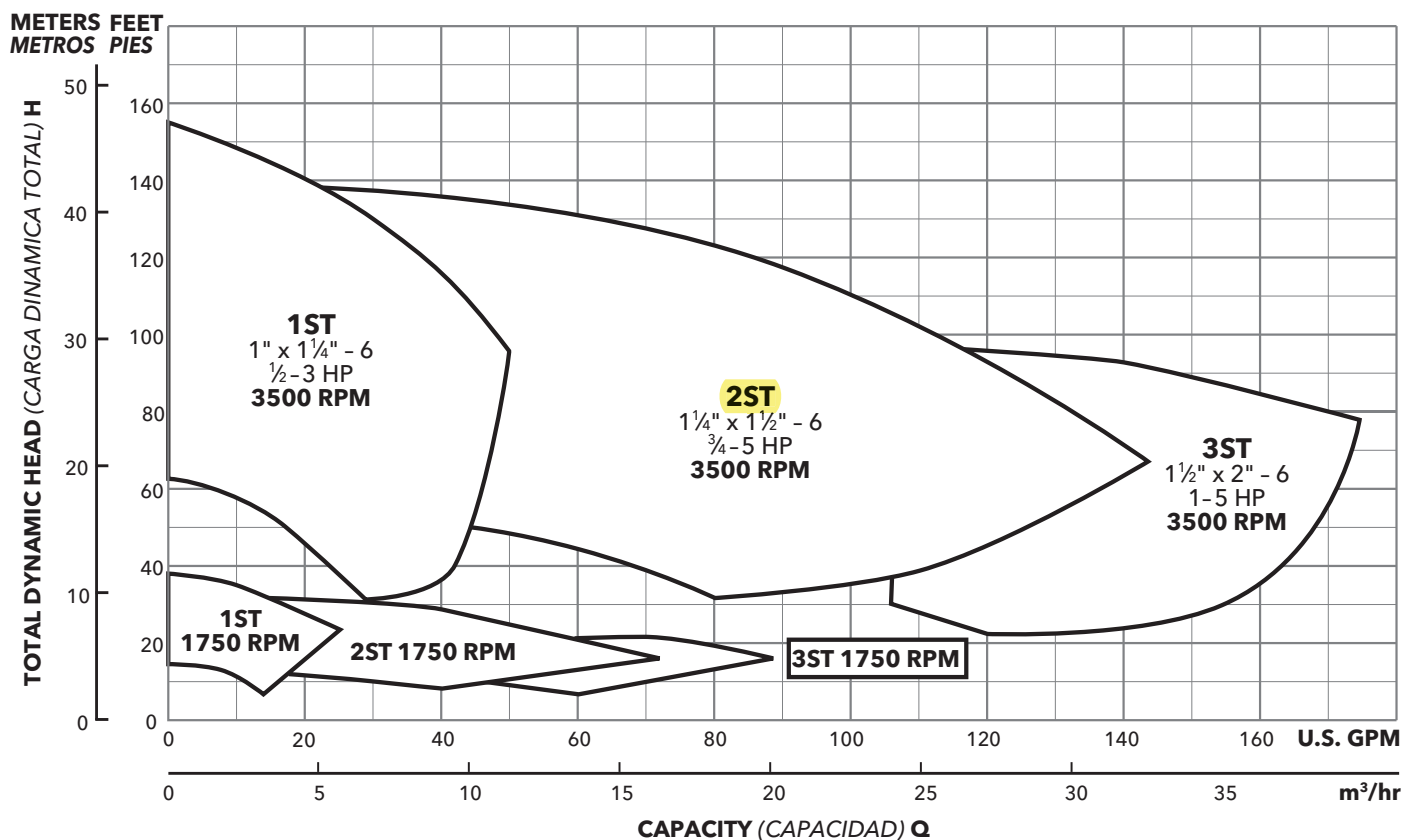
#### Material

ST = Stainless steel, Acero inoxidable

#### Pump Size, Tamaño de la Bomba

1 = 1 x 1 1/4 - 6    2 = 1 1/4 x 1 1/2 - 6    3 = 1 1/2 x 2 - 6

### PERFORMANCE COVERAGE (60 HZ) ALCANCE DE FUNCIONAMIENTO (60 HZ)



#### NOTES:

Not recommended for operation beyond printed H-Q curve.

For critical application conditions consult factory.

Not all combinations of motor, impeller and seal options are available for every pump model. Please check with G&L on non-cataloged numbers.

All standard 3500 RPM ODP\* and TEFC\* motors supplied by Goulds Water Technology, have minimum of 1.15 service factor. Standard catalog units may utilize available service factor. Any motors supplied other than Goulds Water Technology check available service factor.

\* Premium efficiency where required by Department of Energy regulations.

#### NOTAS:

No se recomienda para funcionamiento superior al impreso en la curva H-Q.

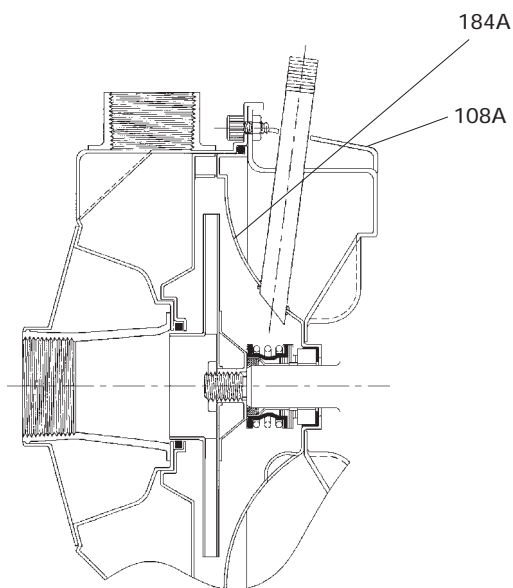
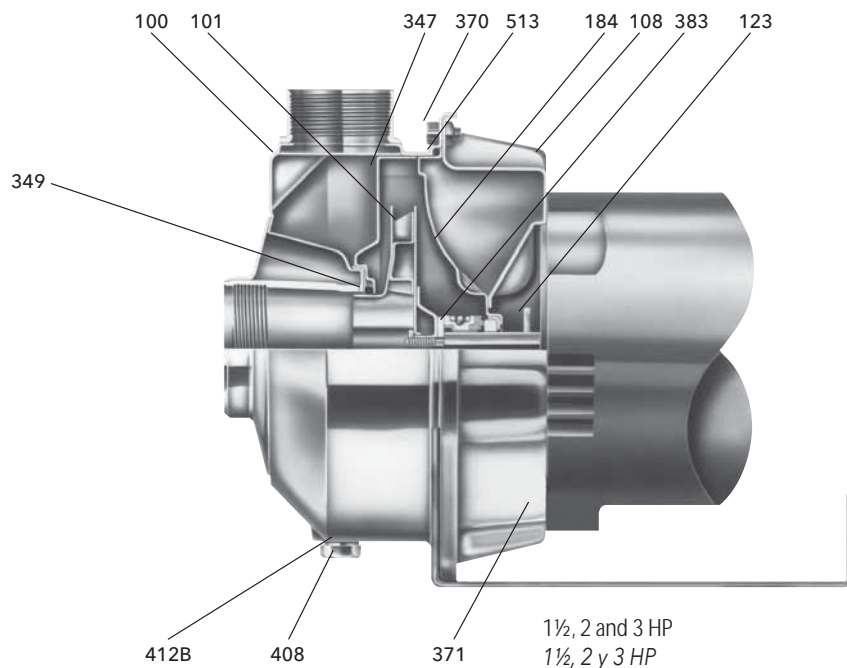
Para condiciones de aplicaciones críticas consultar con la fábrica.

No todas las combinaciones de las opciones de motor, impulsor y sello están disponibles para cada modelo de bombas. Por favor verifique con G&L en los números no catalogados.

Todos los motores estándar de 3500 RPM, ODP\* (abiertos resguardados) y TEFC\* (totalmente encerrados con enfriamiento forzado) provistos por Goulds Water Technology tienen un factor mínimo de servicio de 1,15. Las unidades estándar de catálogo pueden utilizar el factor de servicio disponible. Verificar el factor de servicio disponible de todo motor no provisto por Goulds Water Technology.

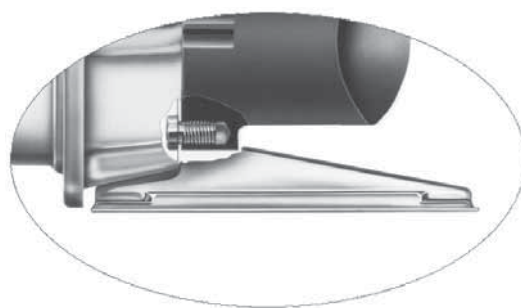
\* Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

### NPE CLOSE COUPLED PUMP MAJOR COMPONENTS: MATERIALS OF CONSTRUCTION BOMBA CERRADA ACOPLADA NPE COMPONENTES PRINCIPALES: MATERIALES DE CONSTRUCCIÓN



Seal Face Vent/Flush Option,  
Opción Cara del Sello Válvula/Chorro

Item No., Parte No.	Description, Descripción	Materials, Materiales
100	Casing; <i>Carcasa</i>	
101	Impeller; <i>Impulsor</i>	AISI 316L SS;
108	Motor adapter; <i>Adaptador del motor</i>	AISI 316L
108A	Motor adapter seal vent/flush; <i>Sello válvula/chorro del adaptador del motor</i>	Acero inoxidable
123	Deflector; <i>Deflector</i>	BUNA-N
184	Seal housing; <i>Alojamiento del sello</i>	AISI 316L SS;
184 A	Seal housing seal vent/flush; <i>Sello válvula/chorro del alojamiento del sello</i>	AISI 316L
347	Guidevane; <i>Difusor</i>	Acero inoxidable
349	Seal ring, guidevane; <i>Anillo del sello, difusor</i>	Viton
370	Socket head screws, casing; <i>Encajes cabezas de tornillos, carcasa</i>	AISI 410 SS;
		AISI 410 Acero inoxidable
371	Bolts, motor; <i>Tornillos, motor</i>	Plated steel;
		Acero chapeado
383	Mechanical seal; <i>Sello mecánico</i>	**see chart, ver tabla
408	Drain and vent plug, casing; <i>Enchufes de drenaje y válvula, carcasa</i>	AISI 316L SS;
		AISI 316L Acero inoxidable
412B	O-ring, drain and vent plug; <i>Anillo 'O', enchufe de drenaje y válvula</i>	Viton (Standard, estándar)
513	O-ring, casing; <i>Anillo 'O', carcasa</i>	EPR (Optional, Opcional)
Motor	NEMA standard, 56J flange;	
Motor	NEMA estándar, brida 56J	



1/2, 3/4 and 1 HP  
1/2, 3/4 y 1 HP

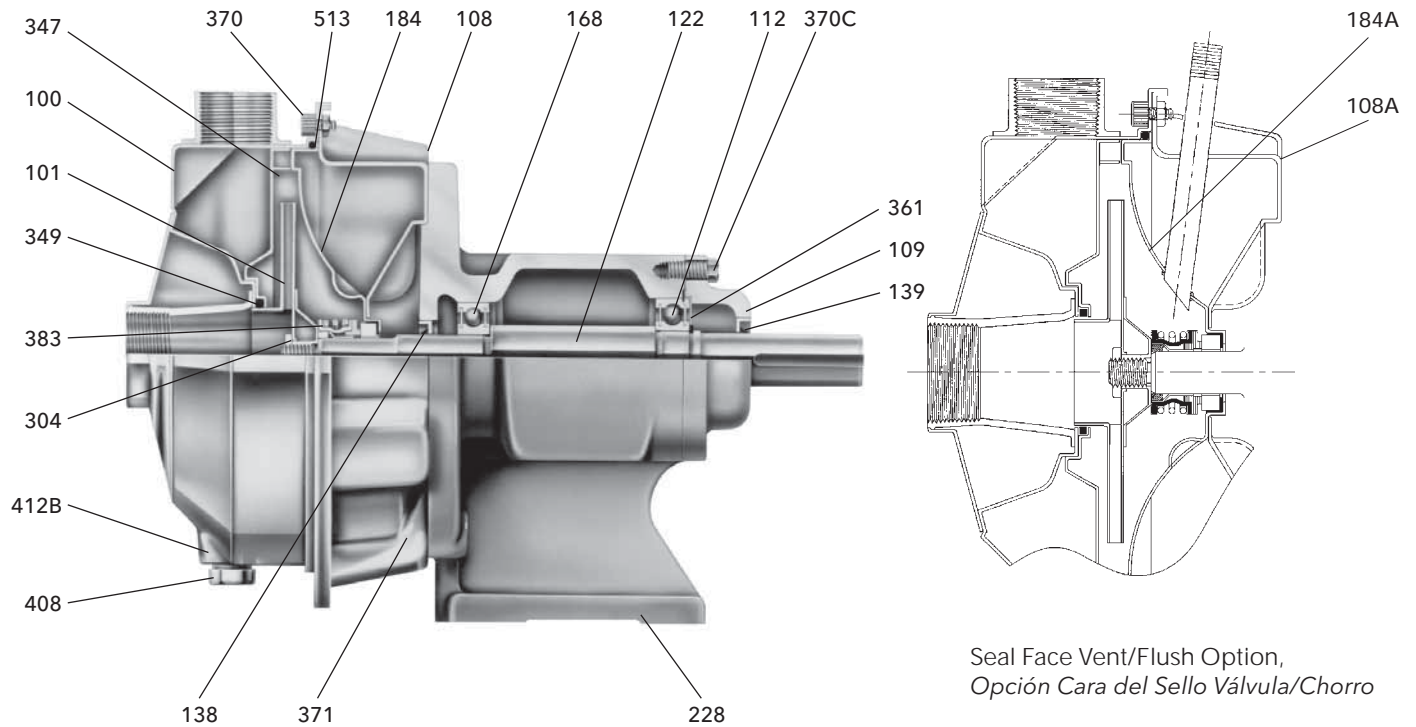
Footed motor for 5 & 7.5 HP ODP\* and TEFC\*, all explosion proof motors, see page 13.

Motor con pie para 5 y 7.5 HP ODP\* y TEFC\*, a prueba de explosiones motores, en la página 13.

\* Premium efficiency where required by Department of Energy regulations.

Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

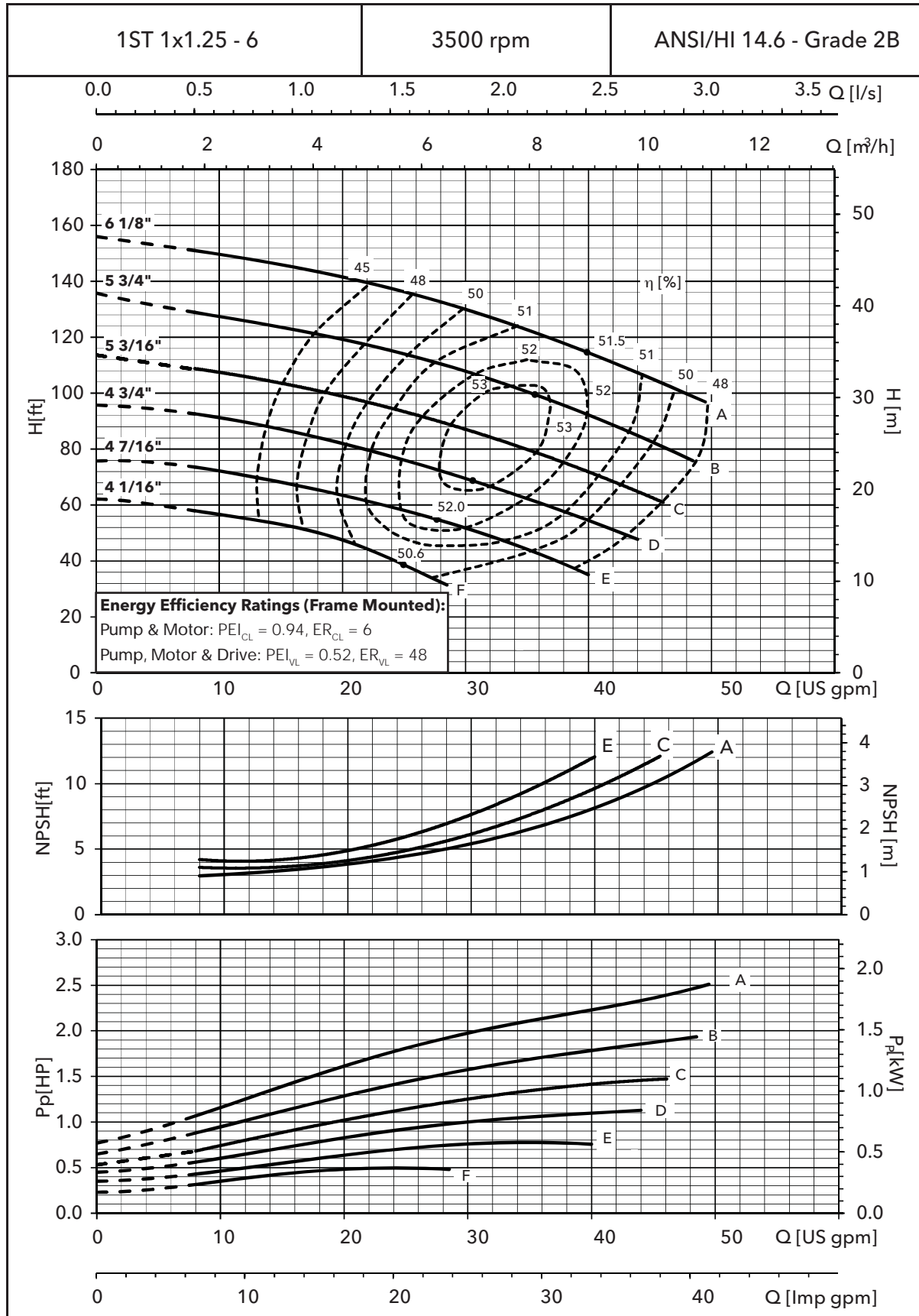
### NPE FRAME MOUNTED PUMP MAJOR COMPONENTS: MATERIALS OF CONSTRUCTION BOMBA NPE DE ARMAZÓN MONTADO COMPONENTES PRINCIPALES: MATERIALES DE CONSTRUCCIÓN



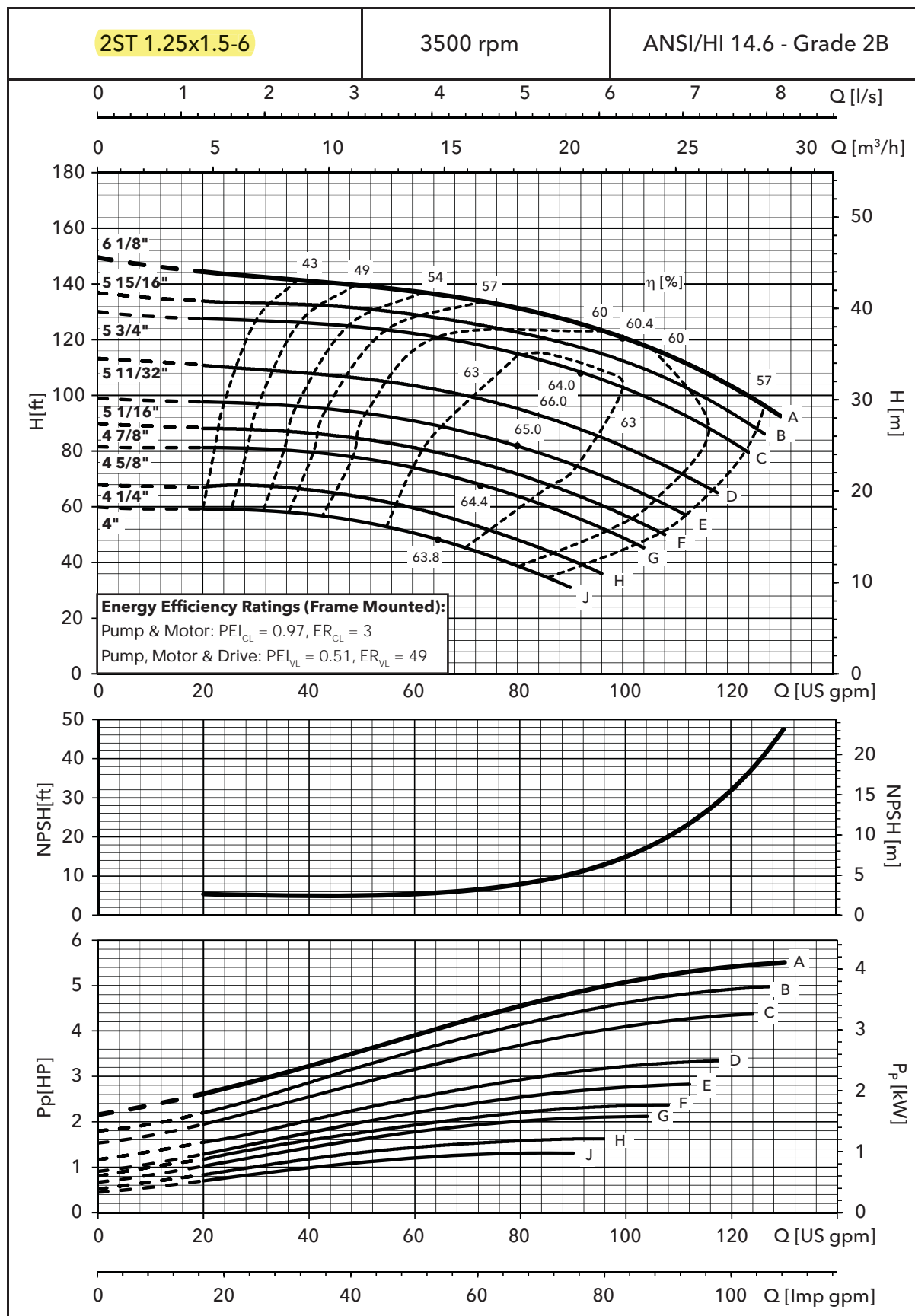
Item No., Parte No.	Description, Descripción	Materials, Materiales
100	Casing; <i>Carcasa</i>	
101	Impeller; <i>Impulsor</i>	AISI 316L SS;
108	Adapter; <i>Adaptador</i>	AISI 316L Acero inoxidable
108A	Motor adapter seal vent/flush; <i>Sello válvula/chorro del adaptador del motor</i>	
109	Bearing cover; <i>Cubierta de balineras</i>	Cast iron; <i>Hierro fundido</i>
112	Ball bearing (outboard); <i>Balineras de bolas (exterior)</i>	Steel; Acero
122	Shaft; <i>Eje</i>	AISI 316 SS; AISI 316 Acero inoxidable
138	Lip-seal (inboard); <i>Sello cubierto (interior)</i>	BUNA/steel; <i>BUNA/acero</i>
139	Lip-seal (outboard); <i>Sello cubierto (exterior)</i>	BUNA/steel; <i>BUNA/acero</i>
168	Ball bearing (inboard); <i>Balineras de bolas (interior)</i>	Steel; Acero
184	Seal housing; <i>Alojamiento del sello</i>	AISI 316L SS;
184 A	Seal housing seal vent/flush; <i>Sello válvula/chorro del alojamiento del sello</i>	AISI 316L Acero inoxidable
228	Bearing frame; <i>Armadura de balineras</i>	Cast iron, <i>Hierro fundido</i>

Item No., Parte No.	Description, Descripción	Materials, Materiales
304	Impeller locknut; <i>Contratuercas del impulsor</i>	AISI 316 SS;
347	Guidevane; <i>Difusor</i>	AISI 316 Acero inoxidable
349	Seal ring, guidevane; <i>Anillo del sello, difusor</i>	Viton
361	Retaining ring; <i>Anillo de retención</i>	Steel; Acero
370	Socket head screws, casing; <i>Encaje cabeza del tornillo, carcasa</i>	AISI 410 SS; AISI 410 Acero inoxidable
370C	Hex head screw, bearing cover; <i>Tornillo de cabeza hexagonal, cubierta de balineras</i>	Plated steel; Acero chapado
371	Hex head screw, bearing frame; <i>Tornillo de cabeza hexagonal, armazón de balineras</i>	Plated steel; Acero chapado
383	Mechanical seal; <i>Sello mecánico</i>	**see chart; ver tabla
400	Shaft key; <i>Llave del eje</i>	Steel; Acero
408	Drain and vent plug, casing; <i>Enchufes de drenaje y válvula, carcasa</i>	AISI 316 SS; AISI 316 Acero inoxidable
412B	O-ring, drain and vent plug; <i>Anillo 'O', enchufe de drenaje y válvula</i>	Viton (Standard, estándar) EPR (Optional, Opcional)
513	O-ring, casing; <i>Anillo 'O', carcasa</i>	

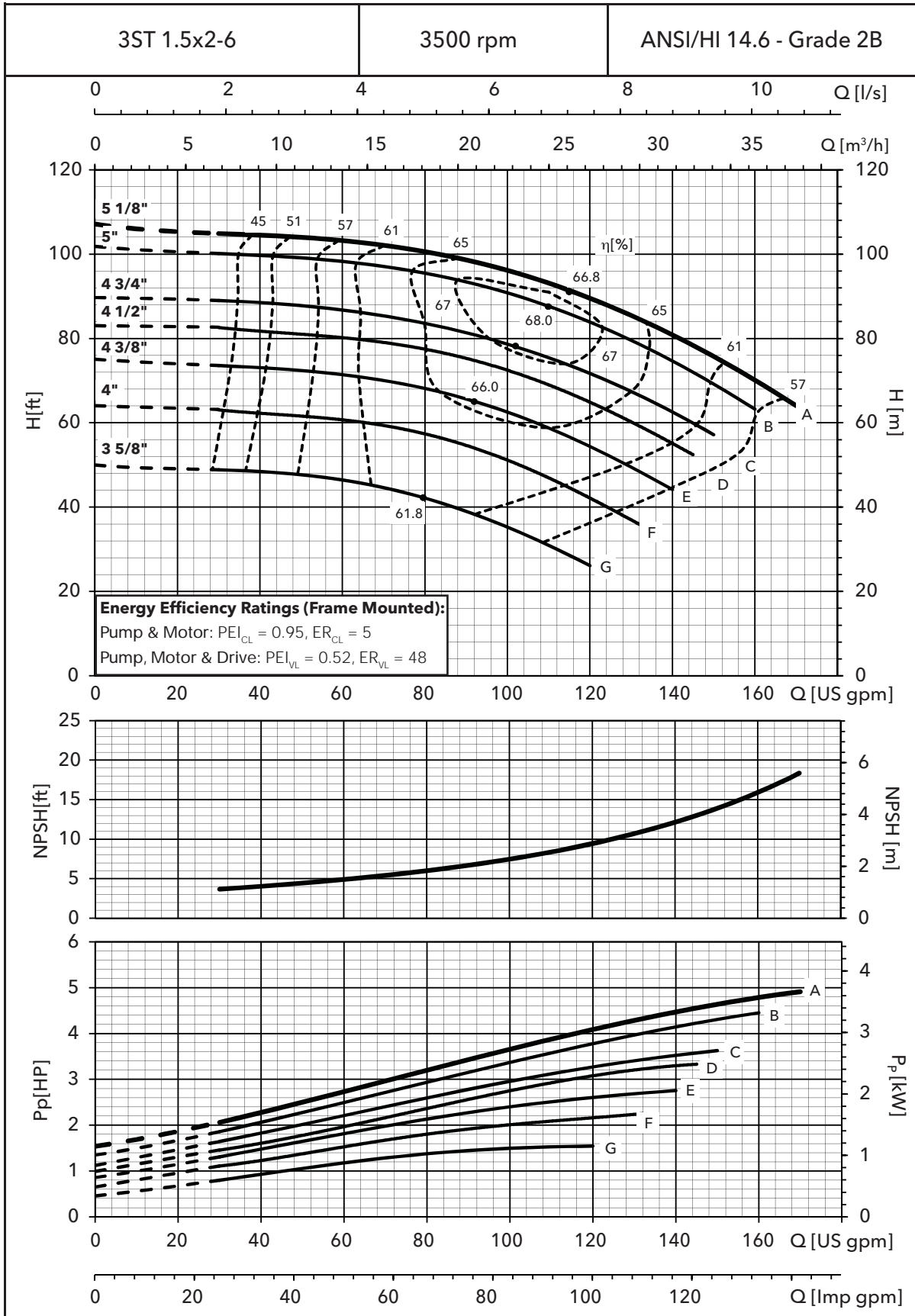
### PERFORMANCE CURVES - 60 HZ, 3500 RPM CURVAS DE FUNCIONAMIENTO - 60 HZ, 3500 RPM



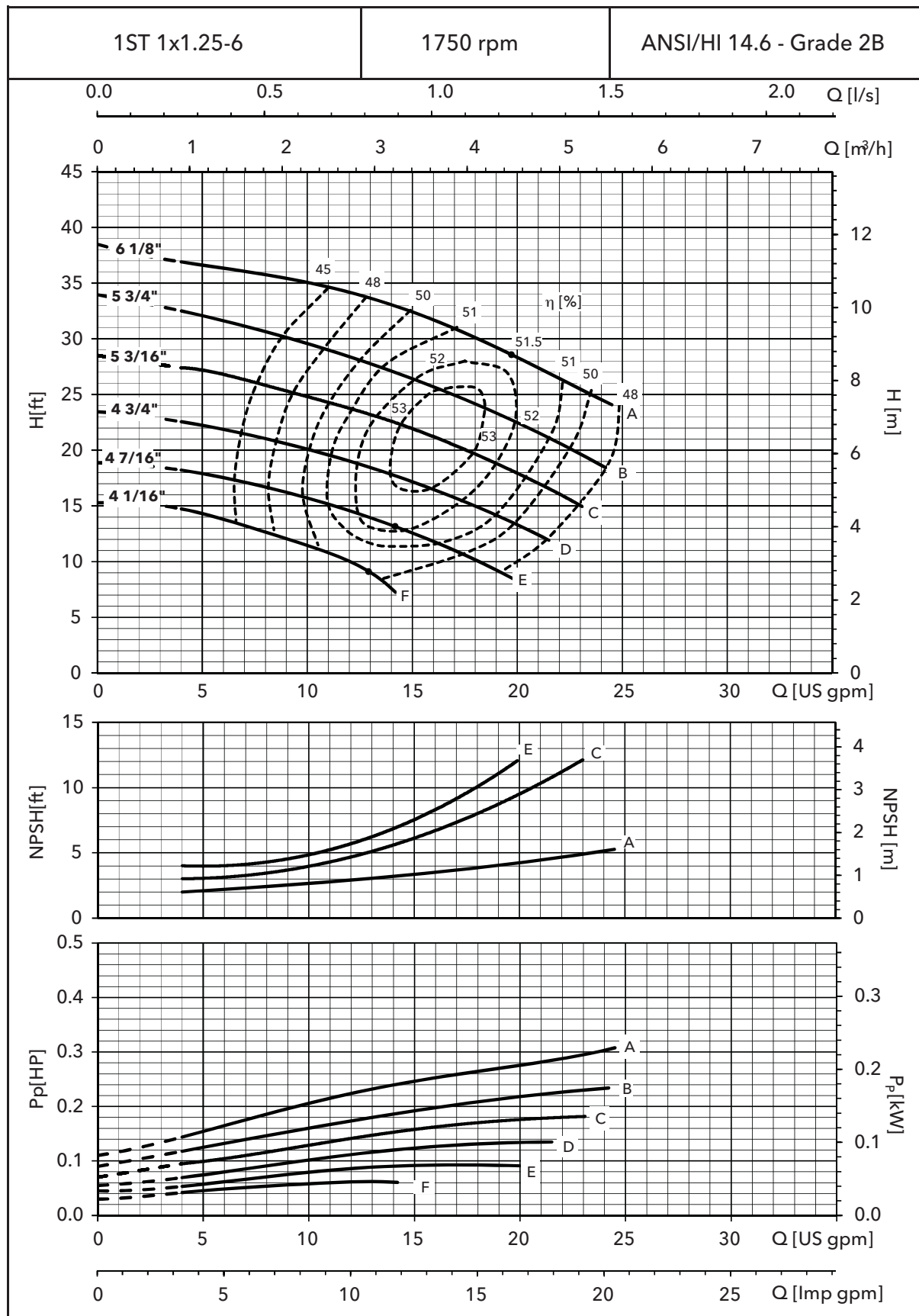
### PERFORMANCE CURVES - 60 HZ, 3500 RPM CURVAS DE FUNCIONAMIENTO - 60 HZ, 3500 RPM



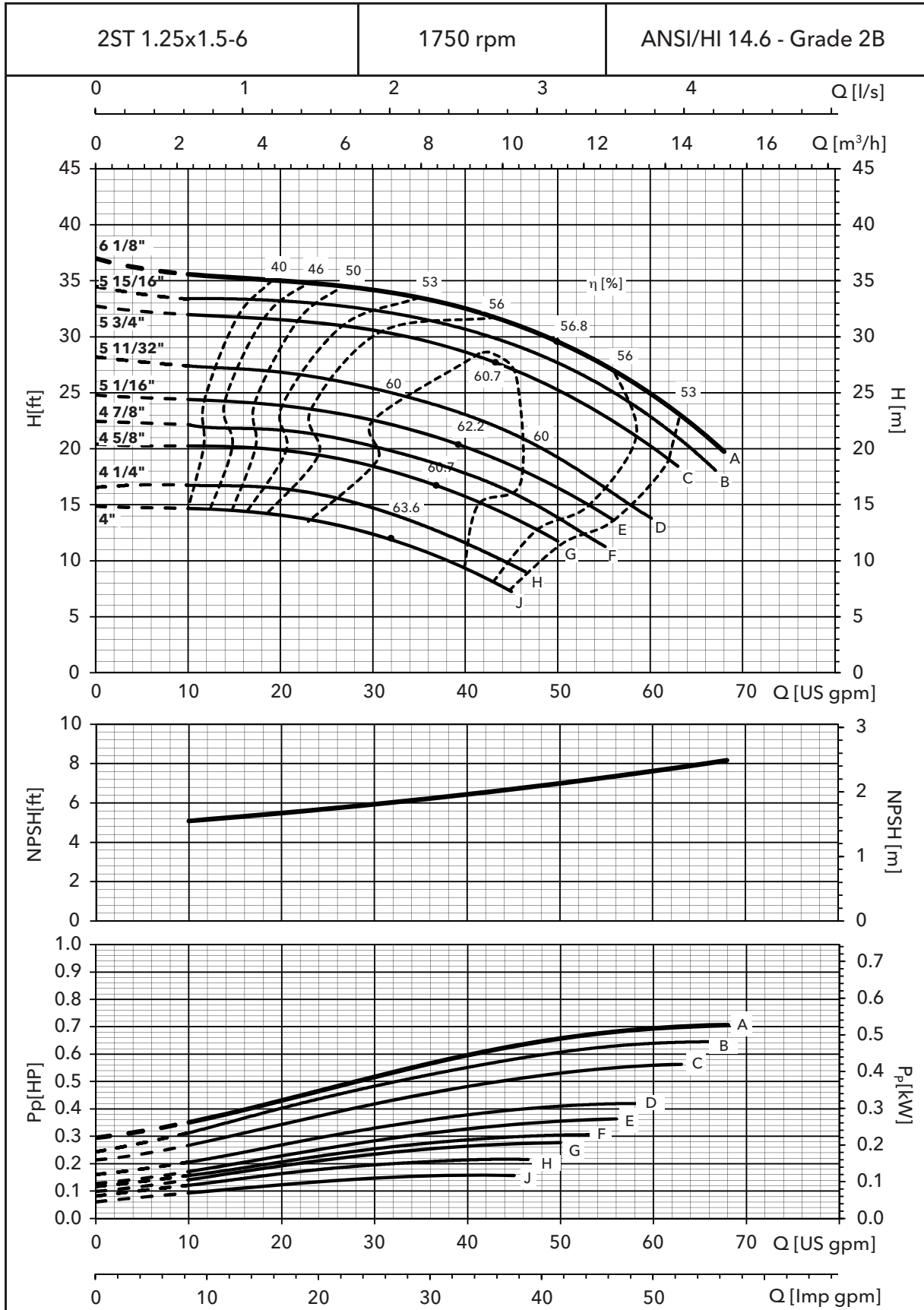
### PERFORMANCE CURVES - 60 HZ, 3500 RPM CURVAS DE FUNCIONAMIENTO - 60 HZ, 3500 RPM



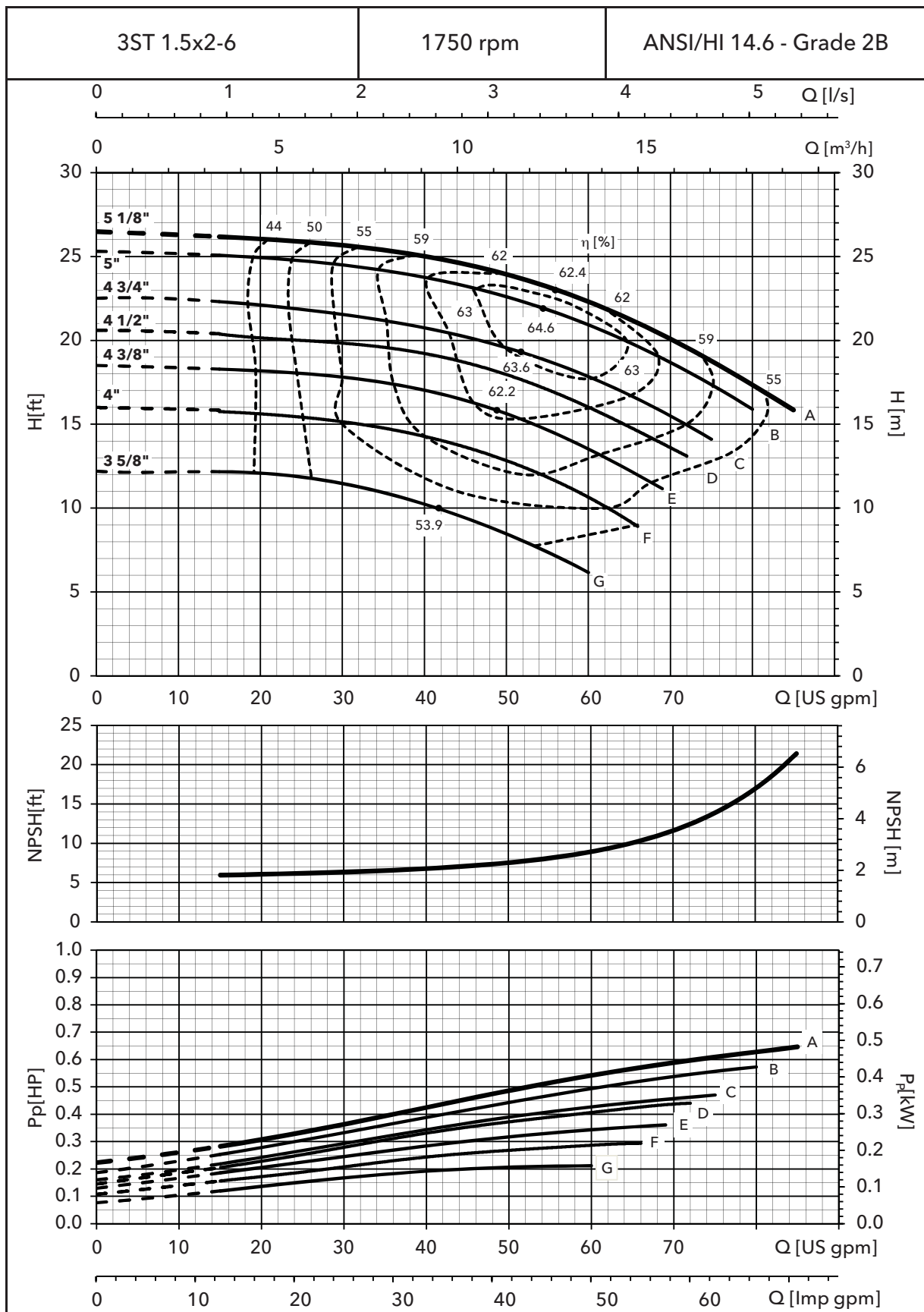
### PERFORMANCE CURVES - 60 HZ, 1750 RPM CURVAS DE FUNCIONAMIENTO - 60 HZ, 1750 RPM



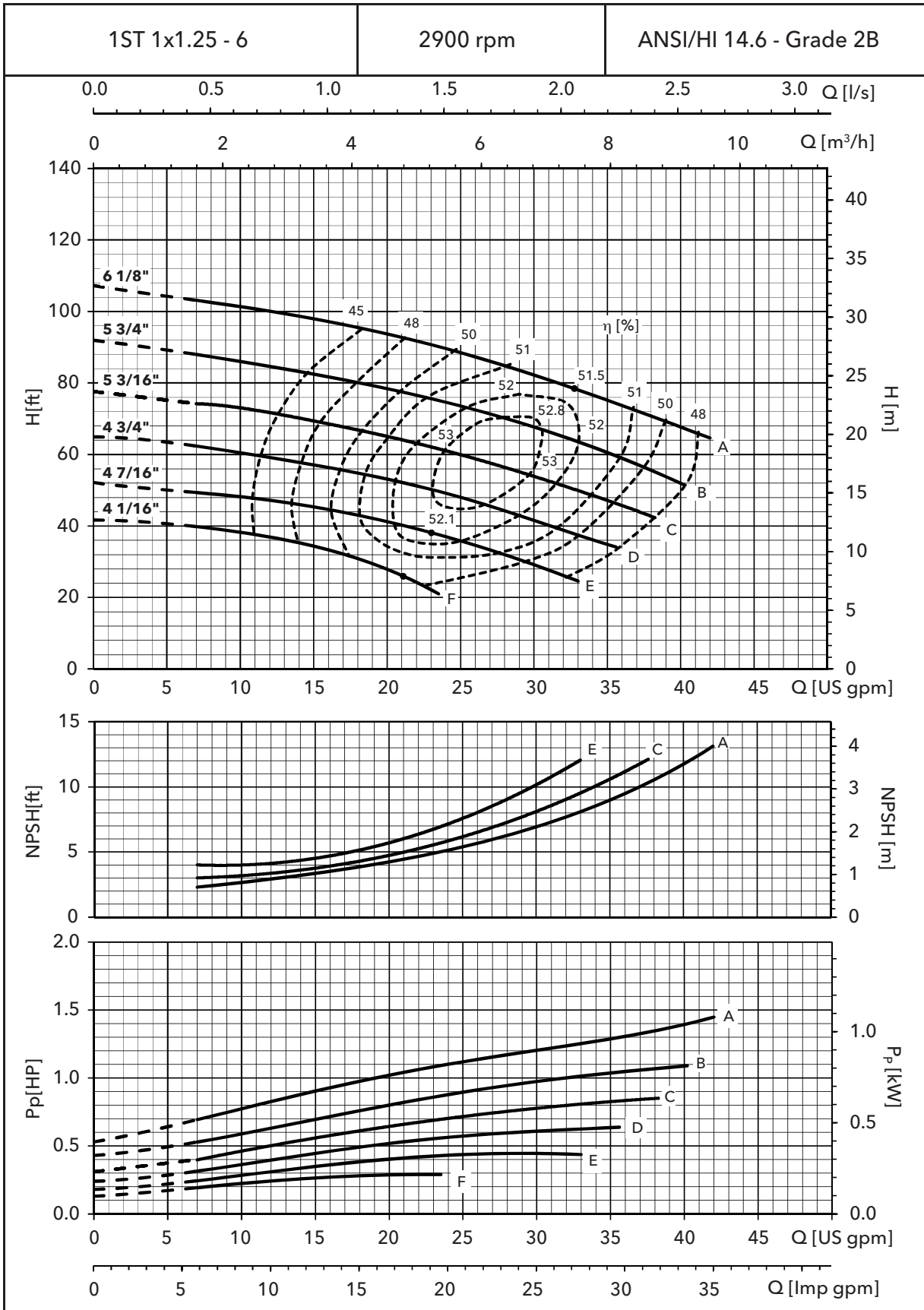
### PERFORMANCE CURVES - 60 HZ, 1750 RPM CURVAS DE FUNCIONAMIENTO - 60 HZ, 1750 RPM



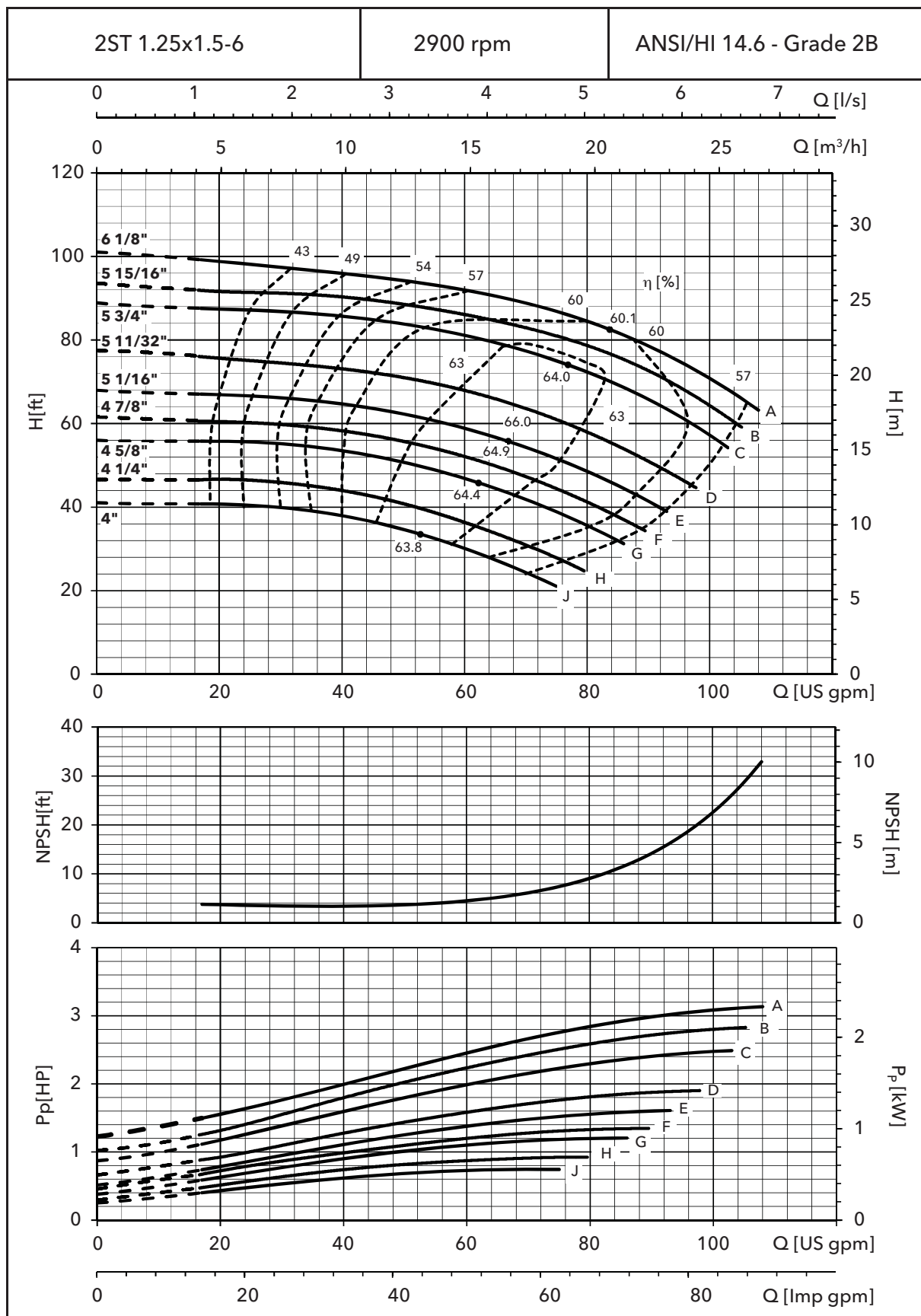
### PERFORMANCE CURVES - 60 HZ, 1750 RPM CURVAS DE FUNCIONAMIENTO - 60 HZ, 1750 RPM



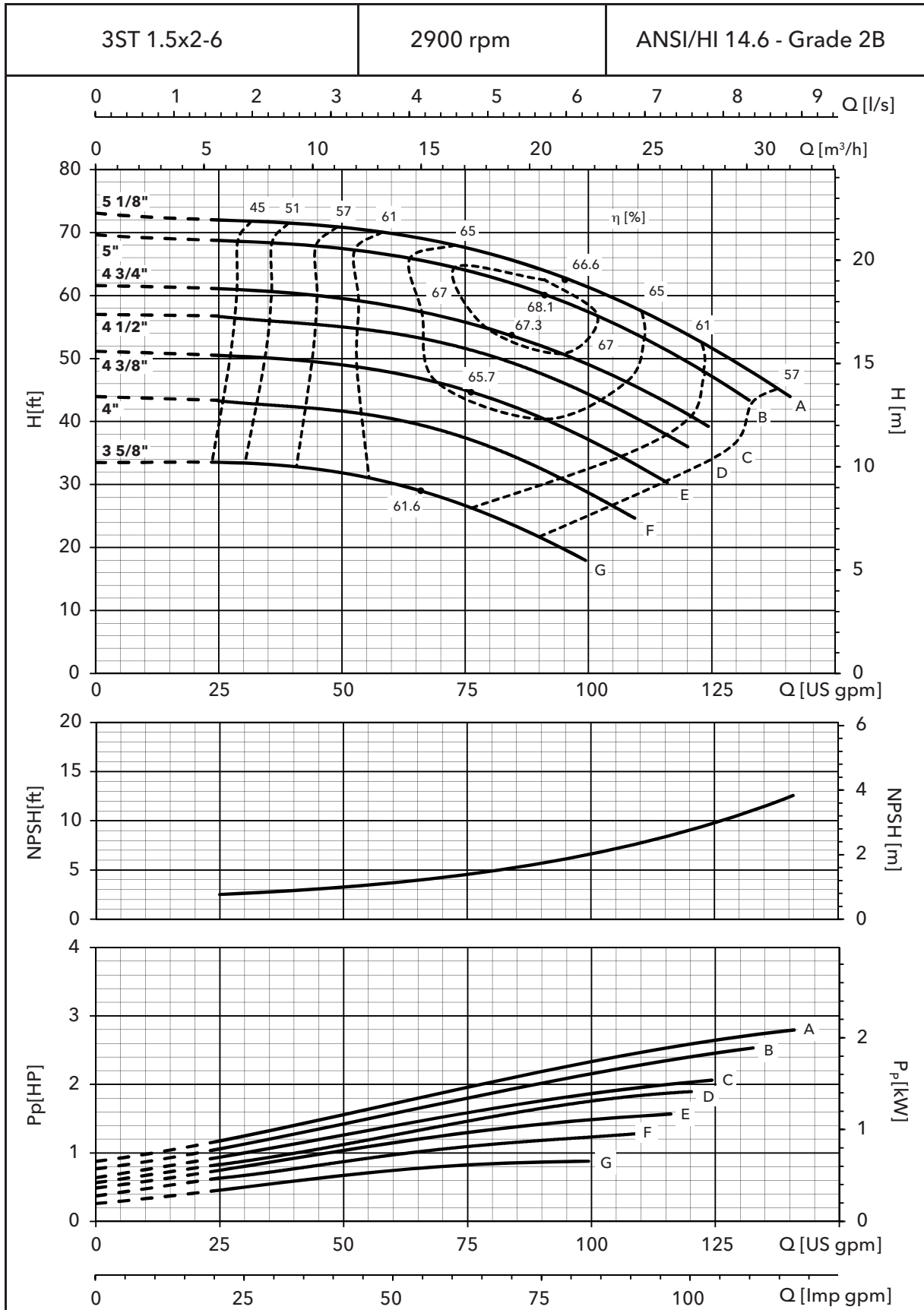
### PERFORMANCE CURVES - 50 HZ, 2900 RPM CURVAS DE FUNCIONAMIENTO - 50 HZ, 2900 RPM



### PERFORMANCE CURVES - 50 HZ, 2900 RPM CURVAS DE FUNCIONAMIENTO - 50 HZ, 2900 RPM



### PERFORMANCE CURVES - 50 HZ, 2900 RPM CURVAS DE FUNCIONAMIENTO - 50 HZ, 2900 RPM



### MOTOR SIZING TABLES

#### TABLAS DE DIMENSIONAMIENTO DE MOTORES

##### 1ST MOTOR SIZING (2-POLE, 3500 RPM)

Impeller Code, Código de impulsor	Impeller Dia. (in), Diá. del impulsor (pulg.)	Motor Selection 1.15SF (HP), Selección de motor	Motor Selection 1.0SF (HP), Selección de motor
A	6.13	2	2
B	5.75	1.5	2
C	5.19	1.5	1.5
D	4.75	1	1.5
E	4.44	0.75	1
F	4.06	0.50	0.50

##### 1ST MOTOR SIZING (4-POLE, 1750 RPM)

Impeller Code, Código de impulsor	Impeller Dia. (in), Diá. del impulsor (pulg.)	Motor Selection 1.15SF (HP), Selección de motor	Motor Selection 1.0SF (HP), Selección de motor
A	6.13	0.50	0.50
B	5.75	0.50	0.50
C	5.19	0.50	0.50
D	4.75	0.50	0.50
E	4.44	0.50	0.50
F	4.06	0.50	0.50

##### 2ST MOTOR SIZING (2-POLE, 3500 RPM)

Impeller Code, Código de impulsor	Impeller Dia. (in), Diá. del impulsor (pulg.)	Motor Selection 1.15SF (HP), Selección de motor	Motor Selection 1.0SF (HP), Selección de motor
A	6.13	5	7.5
B	5.94	5	5
C	5.75	5	5
D	5.34	3	5
E	5.06	2	3
F	4.88	2	3
G	4.63	2	3
H	4.25	1.5	2
J	4.00	1	1.5

##### 2ST MOTOR SIZING (4-POLE, 1750 RPM)

Impeller Code, Código de impulsor	Impeller Dia. (in), Diá. del impulsor (pulg.)	Motor Selection 1.15SF (HP), Selección de motor	Motor Selection 1.0SF (HP), Selección de motor
A	6.13	0.75	0.75
B	5.94	0.75	0.75
C	5.75	0.50	0.75
D	5.34	0.50	0.50
E	5.06	0.50	0.50
F	4.88	0.50	0.50
G	4.63	0.50	0.50
H	4.25	0.50	0.50
J	4.00	0.50	0.50

##### 3ST MOTOR SIZING (2-POLE, 3500 RPM)

Impeller Code, Código de impulsor	Impeller Dia. (in), Diá. del impulsor (pulg.)	Motor Selection 1.15SF (HP), Selección de motor	Motor Selection 1.0SF (HP), Selección de motor
A	5.13	5	5
B	5.00	5	5
C	4.75	3	5
D	4.50	3	5
E	4.38	2	3
F	4.06	2	2
G	3.63	1.5	1.5

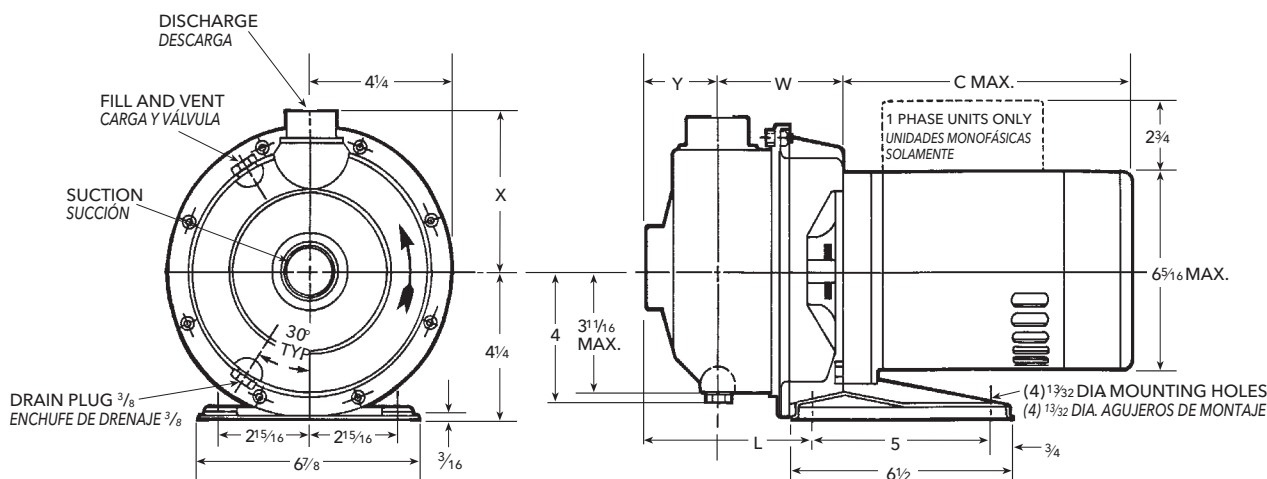
##### 3ST MOTOR SIZING (4-POLE, 1750 RPM)

Impeller Code, Código de impulsor	Impeller Dia. (in), Diá. del impulsor (pulg.)	Motor Selection 1.15SF (HP), Selección de motor	Motor Selection 1.0SF (HP), Selección de motor
A	5.13	0.75	0.75
B	5.00	0.75	0.75
C	4.75	0.5	0.5
D	4.50	0.5	0.5
E	4.38	0.5	0.5
F	4.06	0.5	0.5
G	3.63	0.5	0.5

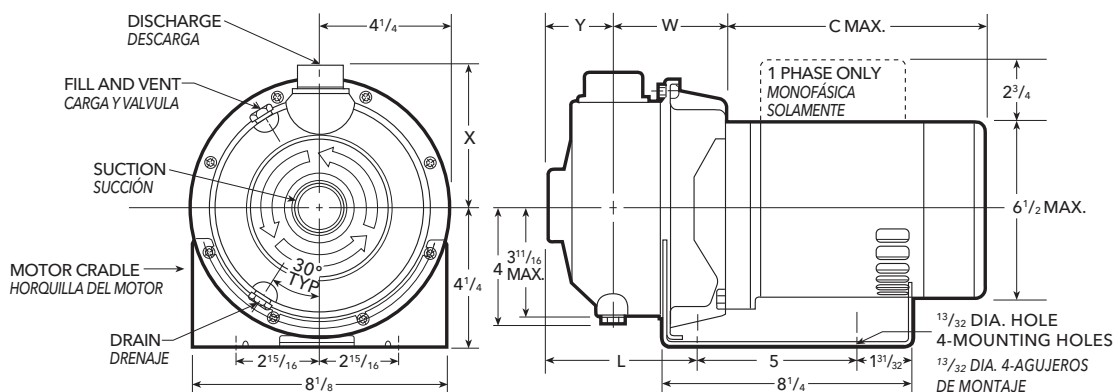
### NPE CLOSE COUPLED - DIMENSIONS, WEIGHTS AND SPECIFICATIONS NPE ACOPLE CERRADO - DIMENSIONES, PESOS Y ESPECIFICACIONES

#### Clockwise Rotation Viewed from Drive End

Rotación en Dirección de las Agujas del Reloj Visto desde el Extremo del Motor



ODP\* and TEFC\* 1/2, 3/4 and 1 HP (standard), ODP\* y TEFC\* 1/2, 3/4 y 1 HP (estándar)



ODP\* and TEFC\* 1 1/2, 2, 3 and 5 HP (standard), ODP\* y TEFC\* 1 1/2, 2, 3 y 5 HP (estándar)

### SPECIFICATIONS - ESPECIFICACIONES

#### Capacities to:

85 GPM (322L/min) at 1750 RPM  
170 GPM (643L/min) at 3500 RPM

#### Heads to:

39 feet (12 m) at 1750 RPM  
150 feet (46 m) at 3500 RPM

#### Working pressures to:

125 PSIG (9 bars)

#### Maximum temperatures to:

250° F (121° C)

#### Direction of rotation:

Clockwise when viewed from motor end.

#### Motor specifications:

NEMA 56J frame, 1750 RPM, 1/2 HP. 3500 RPM 1/2 through 5 HP. Open drip-proof, totally enclosed fan-cooled or explosion proof enclosures\*. Stainless steel shaft with ball bearings.

#### Single phase: Voltage 115/230

ODP\* and TEFC\*. (3 and 5 HP model - 230 V only) Built-in overload with auto-reset provided.

**Three phase:** Voltage 208-230/460 ODP\*, TEFC\* and EX PROOF\*.

**NOTE:** For three phase motors, overload protection must be provided in starter unit. Starter and heaters must be ordered separately.

\* Premium efficiency where required by Department of Energy regulations.

#### Capacidades:

85 GPM (322L/min) a 1750 RPM  
170 GPM (643L/min) a 3500 RPM

#### Cargas:

39 pies (12 m) a 1750 RPM  
150 pies (46 m) a 3500 RPM

#### Presión de trabajo:

125 PSIG (9 baras)

#### Temperatura máxima:

250° F (121° C)

#### Dirección de rotación:

En dirección de las agujas del reloj visto desde el extremo final del motor.

#### Motores:

Armazón 56J NEMA, 1750 RPM 1/2 HP. 3500 RPM 1/2 a 5 HP. Cubiertas abiertas resguardadas, totalmente encerradas enfriadas por ventilador o a prueba de explosiones\*. Eje de acero inoxidable con balineras de bolas.

#### Monofásicos: Voltaje

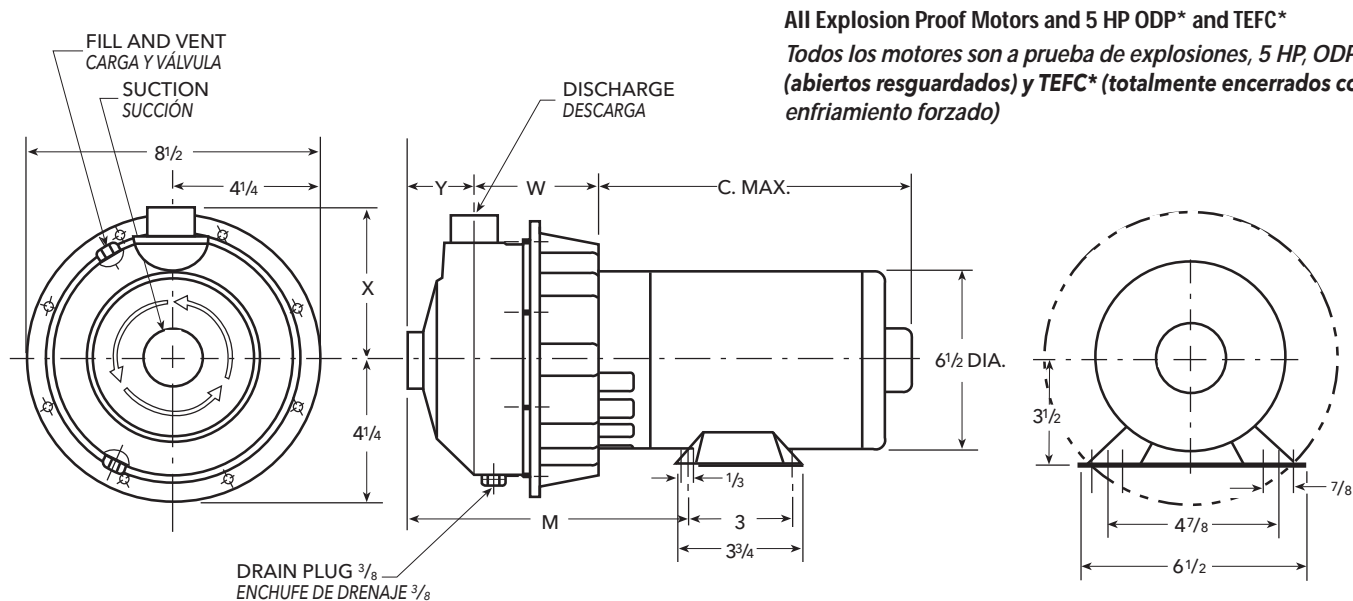
115/230 ODP\* y TEFC\*. (modelo 3 y 5 HP - 230 voltios solamente) Se proporciona protección térmica contra sobrecarga construida con reseteo automático.

**Trifásicos:** Voltaje 208-230/460 ODP\*, TEFC\* y EX PROOF\*.

**NOTA:** Para motores trifásicos se debe de proporcionar la protección térmica contra sobrecarga en la unidad de arranque. El arrancador y los calentadores se deben pedir por separado.

\* Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

### NPE CLOSE COUPLED WITH FOOTED MOTOR, EXPLOSION-PROOF\* AND 5 AND 7.5 HP MOTORS NPE ACOPLÉ CERRADO CON MOTOR CON PATAS, MOTORES A PRUEBA DE EXPLOSIÓN Y 5 Y 7.5 HP



#### Dimensions - Determined by Pump, Dimensiones - Determinadas por la Bomba

Pump, Bomba	Suction, Succión	Discharge, Descarga	HP	W	X	Y	L	M
1ST	1 1/4	1	1/2 - 3	3 5/16	4 7/8	2	4 1/16	7 5/16
2ST	1 1/2	1 1/4	3/4 - 5	3 3/4	4 1/2	2 1/8	5 1/8	8 1/2
3ST	2	1 1/2	1 - 5	3 3/4	4 5/8	2 1/8	5 1/8	8 1/2

#### Available Motor Weights and Dimensions Pesos y Dimensiones Disponibles del Motor

HP	Motor Weights, Pesos del Motor						C Max. Length, (Longitud)	P Max.
	1 Phase, Monofásicos			3 Phase, Trifásicos				
	ODP*	TEFC*	EXP*	ODP*	TEFC*	EXP*		
1/2	23	29	45	24	23	27	11 3/16	7 1/16
3/4	30	35	41	24	26	30	11 5/16	7
1	26	36	49	25	34	30	11 5/16	7 3/16
1 1/2	28	51	56	29	34	37	13 3/16	7 3/16
2	34	46	60	35	34	44	13 7/16	7
3	42	51	-	39	45	44	13 13/16	7 3/16
5	48	-	-	45	48	-	12 5/16	6 1/2

Dimensions in inches, weights in pounds.  
Dimensiones en pulgadas, pesos en libras.

\* Premium efficiency where required by Department of Energy regulations.

\* Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

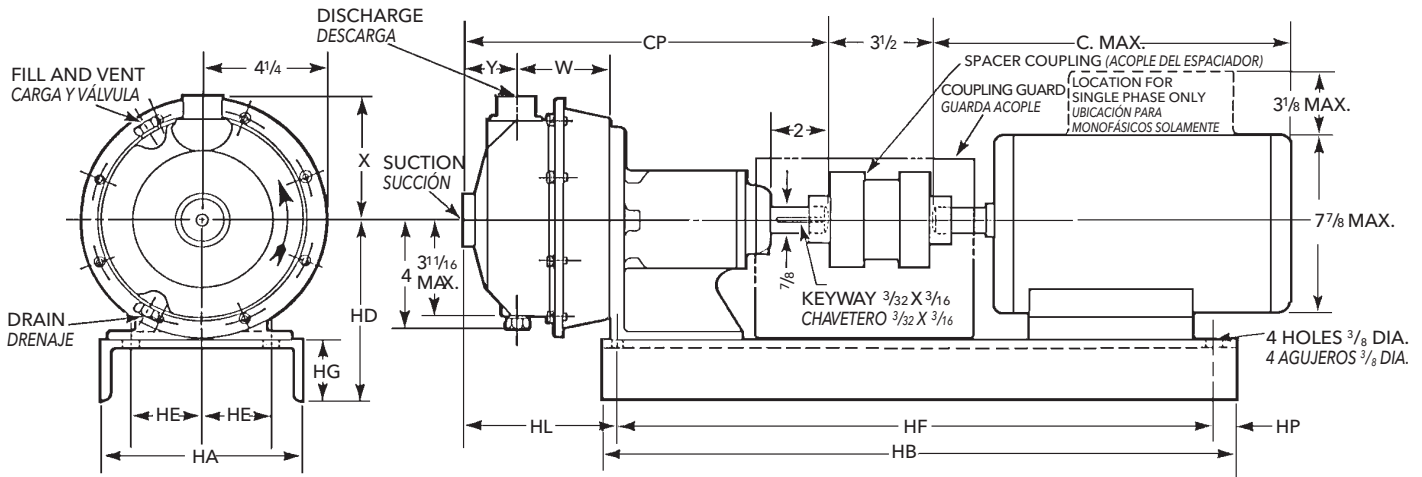
#### NOTES:

- Pump will be shipped with top vertical discharge position as standard. For other orientations, remove casing bolts, rotate discharge to desired position, replace and tighten 6mm bolts to 5 - 6 lbs.-ft.
- Motor dimensions may vary with motor manufacturers.
- Dimensions in inches, weights in pounds.
- For explosion proof\* motor dimensions consult factory for information.
- Not to be used for construction purposes unless certified.

#### NOTAS:

- Las bombas se transportarán con la descarga vertical superior como estándar. Para otras orientaciones, retirar los tornillos de la carcasa, rotar la descarga a la posición deseada, y reemplazar y apretar los tornillos de 6mm a 5 - 6 libras-pies.
- Las dimensiones del motor puede que varíen con los fabricantes.
- Dimensiones en pulgadas, pesos en libras.
- Para las dimensiones de los motores a prueba de explosión\* consultar con la fábrica para información.
- No usar para propósitos de construcción sin certificar.

### NPE FRAME MOUNTED - DIMENSIONS, WEIGHTS AND SPECIFICATIONS NPE ARMAZÓN MONTADO - DIMENSIONES, PESOS Y ESPECIFICACIONES



### SPECIFICATIONS ESPECIFICACIONES

#### Capacities to:

85 GPM (322L/min) at 1750 RPM  
170 GPM (643L/min) at 3500 RPM

#### Heads to:

39 feet (12 m) at 1750 RPM  
150 feet (47 m) at 3500 RPM

#### Working pressures to:

125 PSIG (9 bars)

#### Maximum temperatures to:

250°F (121°C)

#### Direction of rotation:

Clockwise when viewed from motor end.

#### Motor specifications:

T-frame single and three phase. Open drip-proof\*, TEFC\* or explosion proof\* enclosures are available for 60 Hz, 3500 and 1750 RPM operation.

For three phase motors, overload protection must be provided in starter unit. Starter and heaters must be ordered separately.

\* Premium efficiency where required by Department of Energy regulations.

#### Capacidades:

85 GPM (322L/min) a 1750 RPM  
170 GPM (643L/min) a 3500 RPM

#### Cargas:

39 pies (12 m) a 1750 RPM  
150 pies (47 m) a 3500 RPM

#### Presión de trabajo:

125 PSIG (9 bars)

#### Temperatura máxima:

250°F (121°C)

**Dirección de rotación:** En dirección de las agujas del reloj visto desde el extremo final del motor.

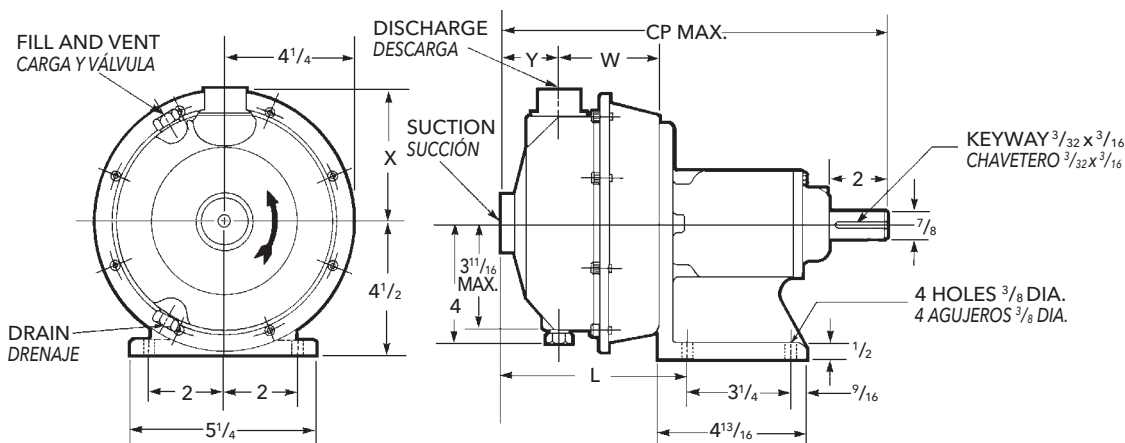
#### Motores:

Armazón T- monofásico y trifásico. A prueba de goteo\*, TEFC\* o recintos a prueba de explosión\* están disponibles para funcionamiento de 60 Hz, 3500 y 1750 RPM.

Para motores trifásicos se debe de proporcionar la protección térmica contra sobrecarga en la unidad de arranque. El arrancador y los calentadores se deben pedir por separado.

\* Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

### NPE-F



### NPE FRAME MOUNTED - DIMENSIONS, WEIGHTS AND SPECIFICATIONS NPE ARMAZÓN MONTADO - DIMENSIONES, PESOS Y ESPECIFICACIONES

#### Dimensions and Weights Dimensiones y Pesos

Dimensions and Weights - Determined by Pump,  
Dimensiones y Pesos - Determinados por la Bomba

Dim. "HL" Determined by Pump and Motor,  
Dim. "HL" Determinadas por la Bomba y el Motor

Pump, Bomba	Suct. NPT, Succión NPT	Disch. NPT, Descarga NPT	CP	L	W	X	Y	Wt., Peso	Frame, Armazón		
									56	140	180
1ST	1¼	1	12 <sup>5</sup> / <sub>16</sub>	6 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	2	22½	4 <sup>9</sup> / <sub>16</sub>	6 <sup>7</sup> / <sub>16</sub>	
2ST	1½	1¼	13½	7	3¾	4½	2 <sup>1</sup> / <sub>8</sub>	23	5 <sup>5</sup> / <sub>8</sub>	7	
3ST	2	1½				4 <sup>5</sup> / <sub>8</sub>					

Available Motor and Bedplate Dimensions and Weights,  
Pesos y Dimensiones Disponibles de la Fundación y del Motor

Motor Frame, Armazón del Motor	HA	HB	HD	HE	HF	HG	HP	Wt. Max., Peso Máx	Shims, Deflector
56									
143T	8	26	6 <sup>7</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	22 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1	30	1"
145T									
182T	10	26	7¼	3¾	24	2¼	7/8	43	-
184T									

Frame Size, Tamaño del Armazón	Horsepower, Fuerza				C Max.	Wt. Max., Peso Máx.	P Max.
	3500 RPM						
	Single Phase, Monofásicos		Three Phase, Trifásicos				
	ODP	TEFC	ODP	TEFC			
56	½ - 1½	½ - 1½	½ - 1	½ - 1	10 <sup>1</sup> / <sub>16</sub>	37	7 <sup>3</sup> / <sub>16</sub>
143T	-	-	1½	1½	9 <sup>3</sup> / <sub>16</sub>	41	7 <sup>3</sup> / <sub>16</sub>
145T	2	2	1½ - 3	1½ - 2	11 <sup>11</sup> / <sub>16</sub>	52	7 <sup>3</sup> / <sub>16</sub>
182T	3	3	5	3	12 <sup>3</sup> / <sub>16</sub>	76	7 <sup>7</sup> / <sub>8</sub>
184T	5	5	-	5	15 <sup>5</sup> / <sub>8</sub>	117	10¼

#### NOTES:

- Pump will be shipped with top vertical discharge position as standard. For other orientations, remove casing bolts, rotate discharge to desired position, replace and tighten 6mm bolts to 5 - 6 lbs.-ft.
- Motor dimensions may vary with motor manufacturers.
- Dimensions in inches, weights in pounds.
- For explosion proof\* motor dimensions consult factory for information.
- Not to be used for construction purposes unless certified.

#### NOTAS:

- Las bombas se transportarán con la descarga vertical superior como estándar. Para otras orientaciones, retirar los tornillos de la carcasa, rotar la descarga a la posición deseada, y reemplazar y apretar los tornillos de 6mm a 5 - 6 libras-pies.
- Las dimensiones del motor puede que varíen con los fabricantes.
- Dimensiones en pulgadas, pesos en libras.
- Para las dimensiones de los motores a prueba de explosión\* consultar con la fábrica para información.
- No usar para propósitos de construcción sin certificar.

\* Premium efficiency where required by Department of Energy regulations.

\* Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

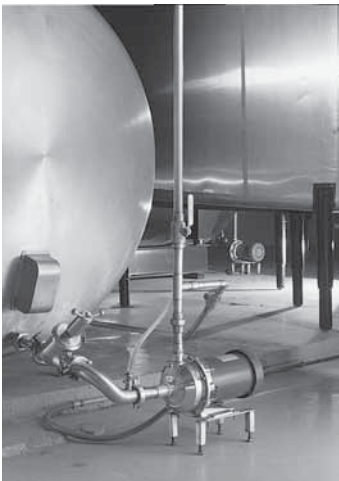
## TYPICAL APPLICATIONS, APLICACIONES TÍPICAS

Specifically designed for a broad range of general applications traditionally requiring various materials such as all iron, bronze fitted or all bronze construction.

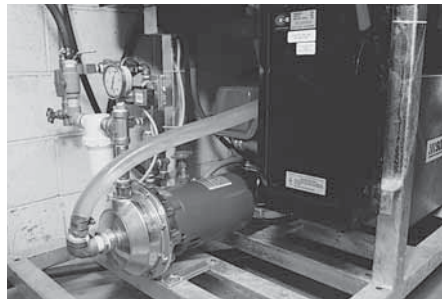
- Water circulation
- Booster service
- Liquid transfer
- Spray system
- Chillers
- Washing/cleaning systems
- Injection molding cooling
- Reverse osmosis
- Air scrubbers
- Heat exchangers
- Filtration systems
- Jockey pumps
- OEM applications
- General water services

*Diseñadas específicamente para una amplia variedad de aplicaciones generales, requiriendo tradicionalmente varios materiales, tales como hierro, bronce empotrado o todas las construcciones de bronce.*

- *Circulación de agua*
- *Aumento de presión*
- *Transferencia de líquidos*
- *Sistemas de aspersión*
- *Enfriadores*
- *Sistemas de lavado/limpieza*
- *Enfriamiento con molde por inyección*
- *Osmosis reversa*
- *Depuradores de aire*
- *Termopermutadores*
- *Sistemas de filtración*
- *Bombas auxiliares*
- *Aplicaciones OEM*
- *Servicios generales de agua*



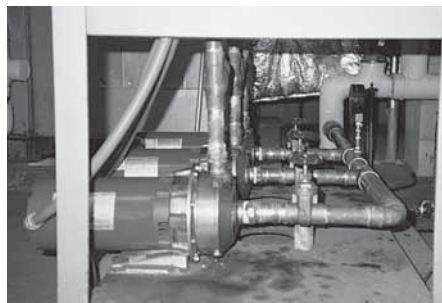
**Brewery, Fábrica de Cerveza**



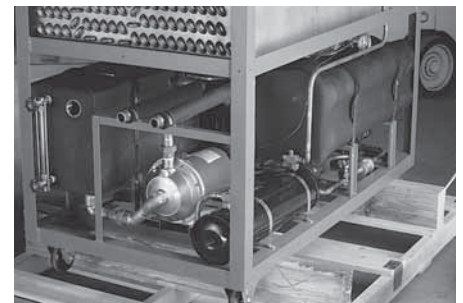
**Car Wash, Lavadero de Autos**



**Pure Water/OEM, Agua Pura/OEM**



**Pressure Booster System, Sistema de Aumento de Presión**



**Chiller, Enfriador**



Xylem Inc.  
2881 East Bayard Street Ext., Suite A  
Seneca Falls, NY 13148  
Phone (Teléfono): (866) 673-0428  
Fax: (888) 322-5877  
[www.xylem.com/goulds](http://www.xylem.com/goulds)

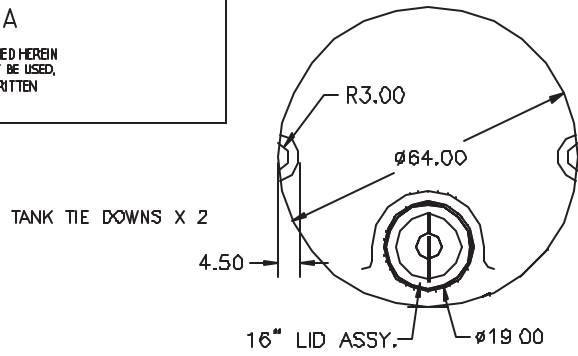
Goulds is a registered trademark of Goulds Pumps, Inc. and is used under license.  
*Goulds es una marca registrada de Goulds Pumps, Inc. y se utiliza bajo licencia.*  
© 2020 Xylem Inc. BNPE R8 February (Febrero) 2020

Submittal #4 Equalization Tank

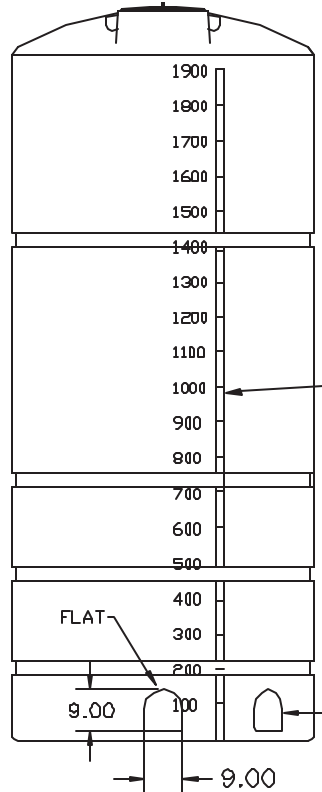
PROPRIETARY DATA

PROPERTY OF ACE ROTO-MOLD MFG. INC. INFORMATION FURNISHED HEREIN IS THE PROPERTY OF ACE ROTO-MOLD MFG. INC. AND SHALL NOT BE USED, DISCLOSED TO OTHERS, OR COPIED WITHOUT THE EXPRESSED WRITTEN CONSENT OF ACE ROTO-MOLD MFG. INC. ALL RIGHTS RESERVED.

VT2000-64

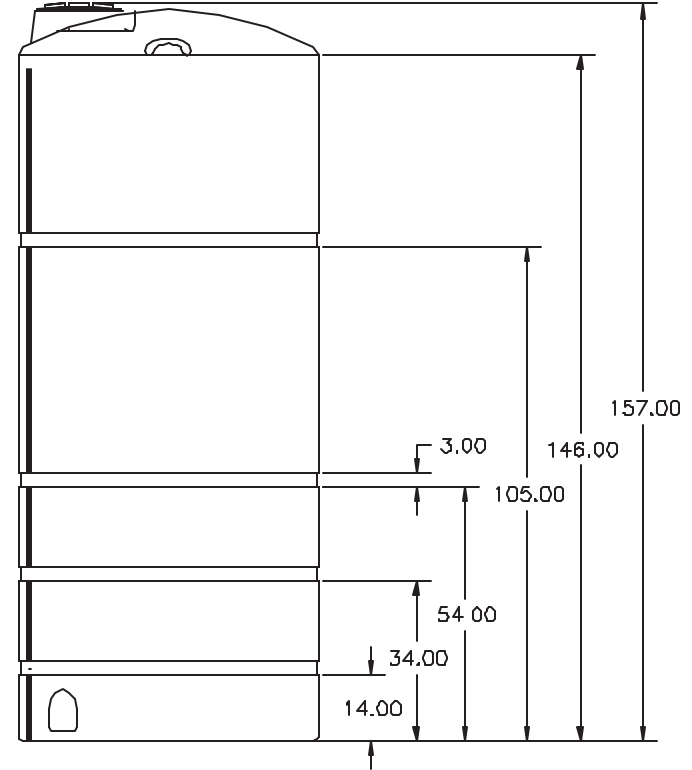



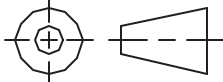
1. HEAVY DUTY POLYETHYLENE CONSTRUCTION
2. 1 PIECE ROTATIONALLY MOLDED
3. TRANSLUCENT
4. FDA APPROVED RESIN
5. CALIBRATED IN GALLONS
6. THREE YEAR WARRANTY
7. UV STABILIZED



GALLON INDICATORS

FRONT FLAT



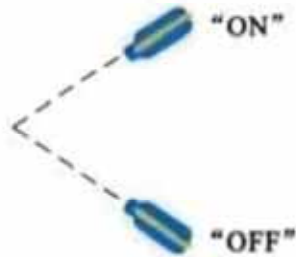
		DRAWN / DATE REH 5/8/98		MATERIAL HOPE OR EQUIVALENT REFERENCE MATERIAL DATA SHEET FOR SPECIFK PROPERTIES.		 A DIVISION OF DEN HARTOG INDUSTRIES INC. 4118 HWY. 611 BLVD., BOX 421, HDSPERS, IOWA 51238	
		APPRD. / DATE REH 5/8/98					
REV	DESCRIPTION	DATE	APPRD	NOTES: 1. 2.7 % SHRINK ALLOWANCE 2. SHOT WEIGHT 654 LBS. 3. BLUE, GREEN, BLACK, WHITE OR YELLOW COLOR		CLIENT / DESCRIPTION 2000 GALLON VERTICAL TANK	
ALL DIMENSIONS ARE IN DECIMAL INCHES TOLERANCES UNLESS OTHERWISE SPECIFIED ± 1% @ 68° F				THIRD ANGLE PROJECTION ANSI 14.5M 		SCALE N.S.	PART NO. VT2000-64

# FLOAT SWITCH

**AUTOMATIC ADJUSTABLE**  
**EASY TO INSTALL**  
**RELIABLE**  
**MAINTENANCE FREE**  
**ENVIRONMENTAL PROTECTION**

## WIRING CONNECTION

to empty: core connection  
**BLACK/BROWN**



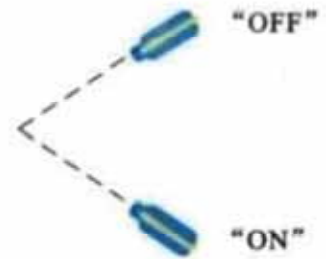
**Blue**=the "ON" switch action below is to fill

**Black**



**brown**=the "ON" switch on high is to empty

to fill: core connection  
**BLACK/BLUE**



## TECHNICAL DATA

Microswitch:  
Switch current:

Protective connection:

Protection:

Max. temperature:

Working pressure:

Circuitbreaking capacity:

10(8)A 250V~10 (4) A 380V



≥ 50 000 switch workings

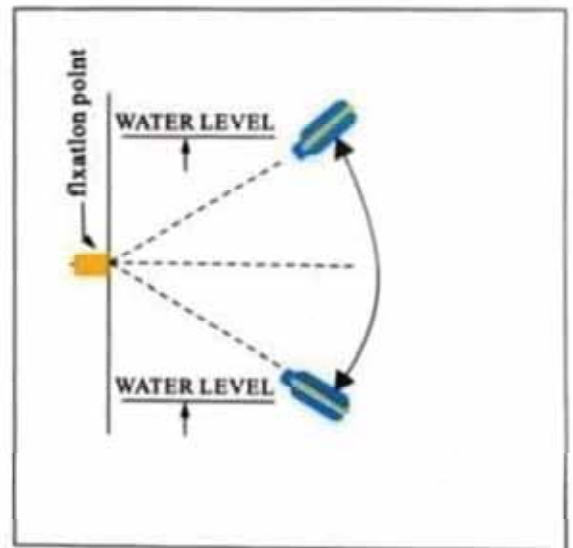
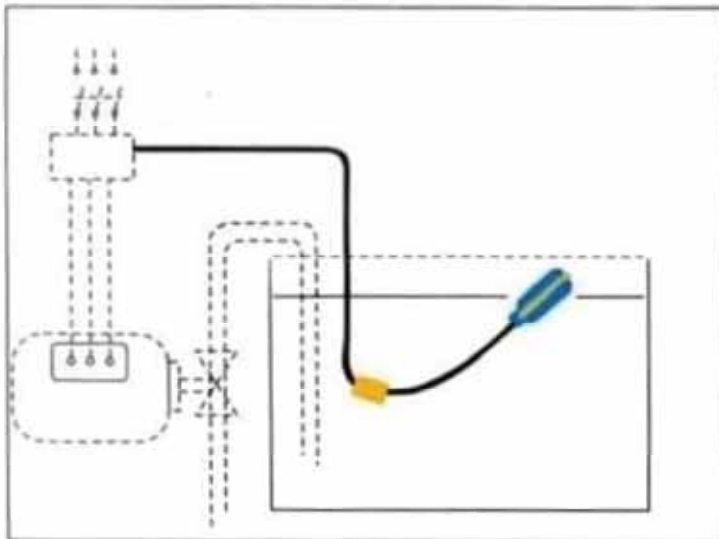
□ T70U" Ⓢ

Waterproof"

70°C

max. 1 bar

directly 2KW with 250V



## EASY OPERATION

The desired "ON" or "OFF" differential is obtained by simply lengthening or shortening the free cord fixation point. "ON" and "OFF" switch action may be adjusted to any desired liquid level by moving the cord fixation in up or down direction.

## APPLICATION

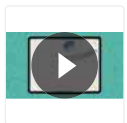
The float switch "HUTO" is a switch which regulates fluid level in the tank or well etc. The float switch is resistant to water (sewage water), it is relative capable of being used for oil, most acids and alkalis. The float switch is not explosion proof.

Top Rated

Everbilt

## 1/3 HP Submersible Aluminum Sump Pump with Tethered Switch

★★★★★ (298) Questions & Answers (31)



Hover Image to Zoom

Live Chat

Feedback

**Have a question?**  
Chat with a Home Depot expert.  
**CHAT NOW**

\$119<sup>00</sup>

Pay \$94.00 after \$25 OFF your total qualifying purchase upon opening a new card. [Apply for a Pro Xtra Credit Card](#)

Maximum Horsepower (hp): 1/3


- 1/4
- 1/3**
- 1/2

Pickup at Bellport


Delivering to 11980


**Pickup**  
Unavailable

**Delivery**  
Today  
51 available

 Get it as soon as today. Schedule your delivery in checkout.

Leave Your Next Project To Us

 **Get Expert Plumbing Repair**  
Need help fast? Call [1-855-466-3337](tel:1-855-466-3337)  
 Request plumbing repair service  
[What to Expect](#) ⓘ

 **Protect This Item**  
Select a Home Depot Protection Plan by Allstate for:  
 2 Year / \$18.00  
 No thanks  
[What to Expect](#) ⓘ

- 1 + [Add to Cart](#)  
[Add to List](#) [Add to Quote](#)

Product Details

Specifications

Dimensions: H 10.63 in, W 8.27 in, D 6.3 in

Dimensions



Product Depth (in.)	6.3 in
Product Height (in.)	10.63 in
Product Width (in.)	8.27 in
Switch-Off Height (in.)	3.94
Switch-On Height (in.)	11.81

Details

Amperage (amps)	15
Cord Length (ft.)	8.25

 Live Chat

 Feedback

  **Have a question?**  
Chat with a Home Depot expert.  
[CHAT NOW](#)

Discharge Flow @ 0 ft. (gallons/hour)	2580
Discharge Flow @ 0 ft. (gallons/min)	43
Discharge Flow @ 10 ft. (gallons/hour)	2160
Discharge Flow @ 10 ft. (gallons/min)	36
Discharge Flow @ 15 ft. (gallons/min)	33
Features	Bottom/End Suction, Non-Clogging, Self-Priming, Solids Handling, Submersible, Thermal Overload Protection
Housing Material	Aluminum
Impeller Material	Plastic
Maximum Horsepower (hp)	1/3
Maximum Pressure (psi)	9.96
Maximum Working Temperature (F)	100
Minimum Sump Basin Diameter	18 or More
Minimum working temperature (F)	35
Outlet Diameter Connection (in.)	1-1/2 FPT
Pack Size	1
Power Type Required	AC
Product Weight (lb.)	8.49 lb
Pump Switch Type	Tethered
Returnable	90-Day
Vertical Lift (ft.)	23
Voltage	115v

Live Chat

Feedback

### Warranty / Certifications

Certifications and Listings	CSA Certified
Manufacturer Warranty	1 year

How can we improve our product information? [Provide feedback.](#)

### Questions & Answers


31 Questions

### Customer Reviews

4.2 out of 5  (298)

### Frequently Bought Together

- Select 
- Select
- Select
- Select



Live Chat

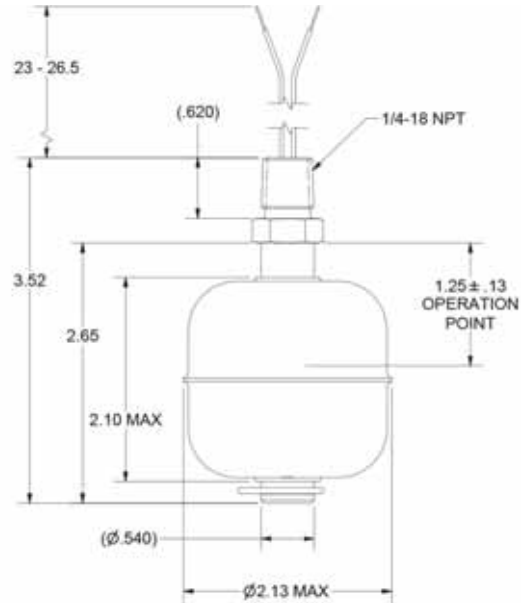
Have a question?

Chat with a Home Depot expert.

CHAT NOW



Madison Home » Point Level Float Switch Series » Float switch, stainless steel, 1/4" NPT, 60 watt



## Applications:

- Detects high/low levels in a container
- 316 SS is frequently used in food processing
- Ideal for high-temperature, medical and petrochemical applications, as well as plating processes
- Suitable in applications where superior corrosion resistance is required
- All NPT vertical switches can be extended with pipe to meet custom tank depths



## Specifications:

Approvals	CE, UL Haz. Loc., CSA Haz. Loc., NSF
Electrical Ratings	240 VAC, 0.40A; 120 VAC, 0.50A; 120 VDC, 0.20A; 24 VDC, 0.50A
Float Material	316 Stainless Steel
Float SG	0.55
Lead Wires	24", 22 AWG, Teflon Insulated
Max Pressure	200 PSI
Max Temperature	392°F (200°C)
Mounting	1/4" NPT
Note	Electrical Switch Ratings are shown for resistive loads as tested by UL at different voltages. See our Electrical Considerations for typical inductive or capacitive load considerations. The wire clips are made to be removed and replaced up to 10 times, while maintaining a holding force of 3 lb.
Stem Material	316 Stainless Steel
Switch Rating	60 Watt, SPST
Type	Full Size Switch

© 2021 Madison Company, Inc.



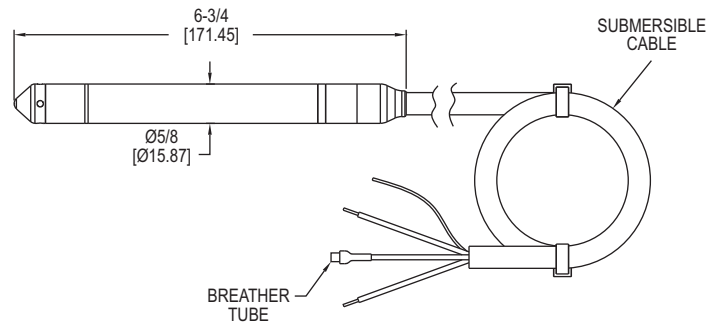
SERIES MBLT



LEVEL

# MINIATURE SUBMERSIBLE LEVEL TRANSMITTER

Only 0.63" (16 mm) in Diameter, Perfect for Wells and Boreholes, Low Power Models for Telemetry Systems



The Series MBLT Miniature Submersible Level Transmitter measures the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitter consists of a piezoresistive sensing element, encased in a 0.63" (16 mm) diameter 316 SS housing.

**BENEFITS/FEATURES**

- Fits narrow installation openings with slender 0.63" (16 mm) diameter design
- Constructed for years of trouble free service with welded 316 SS body and 316 SS nose cap
- Prevents damage or snares when removing the unit from the installation with tapered 316 SS body top
- More precise than BFSL or BSL rated output with ±0.10% or ±0.25% FS accuracy output
- Eliminates particulate or water droplets from entering the transducer using maintenance-free filter
- Excellent chemical compatibility with choice of polyether polyurethane or ETFE cable materials
- Eliminate both power supply surges and lightning ground strike transients with incorporated lightning and surge protection, (surge protection is not guaranteed and is not covered by warranty)

**APPLICATIONS**

- Ballast tanks
- Ground water monitoring
- Surface water monitoring
- Dewatering
- Down hole
- Remote telemetry
- Remote flood monitoring
- Narrow conduit or pipe installations
- Remediation and environmental monitoring

**SPECIFICATIONS**

**Service:** Compatible liquids.  
**Wetted Materials:** Body and nose: 316 SS; Cable: Polyether polyurethane or ETFE; Seals: Fluoroelastomer; Label: Polyolefin.  
**Accuracy:** ±0.25% or ±0.10% FS\*\*  
**Temperature Limits:** -4 to 176°F (-20 to 80°C).  
**Compensated Temperature Limits:** 0.25%: (0 to 70°C); 0.10%: (0 to 60°C).  
**Thermal Effect:** 0.25%: ±0.45% FS TEB; 0.10%: ±0.30% FS TEB.  
**Pressure Limit:** 2x FS.  
**Power Requirements:** Current output: 10-33 VDC; Voltage output: 8-33 VDC; 5 mA max (no load).  
**Output Signal:** 4-20 mA DC 2-wire or 0-5 V\* (model depending).  
**Response Time:** < 50 ms.  
**Max Loop Resistance:** 1000 Ω @ 30 VDC (current output).  
**Voltage Output Impedance:** 10 Ω + 4.4 Ω / 100' cable (voltage output).  
**Electrical Connections:** Wire pigtail.  
**Mounting Connection:** Suspended below point being monitored.  
**Electrical Protection:** Surge/lightning protected per EN61000-4-5, Class 5.  
**Weight:** Body: 0.235 lb (0.107 kg); Cable: 0.037 lb (0.017 kg) per foot.  
**Compliance:** CE.

\*Consult factory for additional outputs.  
 \*\*4.3 to 4.9 psi (10 to 11.54 in w.c.) configured ranges ±0.30% FS accuracy.

MODEL CHART					
4-20 mA output Model ±0.10%	4-20 mA output Model ±0.25%**	0-5 V output Model ±0.25%**	Range psi (' w.c.) [m w.c.]	Cable Length	Cable Type
-	MBLT-2SC-IVPP-5-40	MBLT-2SC-VVPP-5-40	5 (11.54) [3.52]	40'	Polyether polyurethane
-	MBLT-2SC-IVPF-15-40	MBLT-2SC-VVPF-15-40	6.50 (15) [4.57]	40'	Polyether polyurethane
-	MBLT-2SC-IVPM-5-12.2	MBLT-2SC-VVPM-5-12.2	7.10 (16.40) [5]	12.2 m	Polyether polyurethane
-	MBLT-2SC-IVPM-10-30**	MBLT-2SC-VVPM-10-30**	14.22 (32.84) [10]	9.14 m	Polyether polyurethane
MBLT-2SB-IVPF-20-40	MBLT-2SC-IVPF-20-40	MBLT-2SC-VVPF-20-40	8.66 (20) [6.10]	40'	Polyether polyurethane
MBLT-2SB-IVPF-30-50	MBLT-2SC-IVPF-30-50	MBLT-2SC-VVPF-30-50	12.99 (30) [9.14]	50'	Polyether polyurethane
MBLT-2SB-IVPM-10-15.2	MBLT-2SC-IVPM-10-15.2	MBLT-2SC-VVPM-10-15.2	14.21 (32.81) [10]	15.2 m	Polyether polyurethane
MBLT-2SB-IVPF-50-70	MBLT-2SC-IVPF-50-70	MBLT-2SC-VVPF-50-70	21.65 (50) [15.24]	70'	Polyether polyurethane
MBLT-2SB-IVPM-20-26	MBLT-2SC-IVPM-20-26	MBLT-2SC-VVPM-20-26	28.42 (65.62) [20]	26 m	Polyether polyurethane
MBLT-2SB-IVPM-30-36	MBLT-2SC-IVPM-30-36	MBLT-2SC-VVPM-30-36	42.63 (98.43) [30]	36 m	Polyether polyurethane
MBLT-2SB-IVPF-100-120	MBLT-2SC-IVPF-100-120	MBLT-2SC-VVPF-100-120	43.31 (100) [30.48]	120'	Polyether polyurethane
MBLT-2SB-IVPM-40-46	MBLT-2SC-IVPM-40-46	MBLT-2SC-VVPM-40-46	56.83 (131.23) [40]	46 m	Polyether polyurethane
MBLT-2SB-IVPF-150-170	MBLT-2SC-IVPF-150-170	MBLT-2SC-VVPF-150-170	64.96 (150) [45.72]	170'	Polyether polyurethane
MBLT-2SB-IVPM-60-66	MBLT-2SC-IVPM-60-66	MBLT-2SC-VVPM-60-66	85.25 (196.85) [60]	66 m	Polyether polyurethane
MBLT-2SB-IVPF-200-220	MBLT-2SC-IVPF-200-220	MBLT-2SC-VVPF-200-220	86.62 (200) [60.96]	220'	Polyether polyurethane
MBLT-2SB-IVPF-350-370	MBLT-2SC-IVPF-350-370	MBLT-2SC-VVPF-350-370	151.58 (350) [106.68]	370'	Polyether polyurethane
MBLT-2SB-IVPM-100-106	MBLT-2SC-IVPM-100-106	MBLT-2SC-VVPM-100-106	142.09 (328.08) [100]	106 m	Polyether polyurethane
MBLT-2SB-IVPM-200-206	MBLT-2SC-IVPM-200-206	MBLT-2SC-VVPM-200-206	284.18 (656.17) [200]	206 m	Polyether polyurethane
MBLT-2SB-IVPF-690-710	MBLT-2SC-IVPF-690-710	MBLT-2SC-VVPF-690-710	298.83 (690) [210.31]	710'	Polyether polyurethane

\*\*4.3 to 4.9 psi (10 to 11.54 in w.c.) configured ranges ±0.30% FS accuracy.

**OPTIONS**

For custom ranges, cable lengths, or ETFE cable, contact the website.

**ACCESSORIES**

Model	Description
A-297	Dessicant filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation



A-297

Level Transmitters, Submersible

# proSense® SPT25 Series Pressure Transmitters



The ProSense SPT25 pressure transmitter series is engineered to meet many industrial, commercial, and OEM pressure measurement applications. The all stainless steel welded thin film sensing element provides very fast response time and is compatible with many different media sensing applications. With a robust design resistant to vibration, shock, and EMI/RFI, the SPT25 series provides high accuracy over a wide compensated temperature range. Pressure sensing ranges from vacuum to 5000 psig are available along with a 1/4 inch NPT male threaded process connection. Choose from linear outputs of 4-20 mA or 0-10VDC with electrical connections of either a DIN 175301-803C L-connector or 6.6 foot (2 m) integral shielded cable.

## Applications

- Process control & automation
- Pump & compressor control
- Hydraulic systems
- Pneumatic systems
- Engine monitoring
- Refrigeration equipment
- Presses
- Machine tools

## Features

- All stainless steel welded sensing element
- Fast response time
- Pressure sensing ranges from vacuum to 5000 psig
- 1/4 inch NPT male threaded process connection
- Output options: 4-20 mA or 0-10 VDC
- Integral 6.6 foot shielded cable or DIN form C electrical connections
- Made in the USA
- CE marked
- 3-year warranty



Click on the thumbnail or go to <https://www.automationdirect.com/VID-PR-0001> for a short video on ProSense Air Differential and Pressure Transmitters

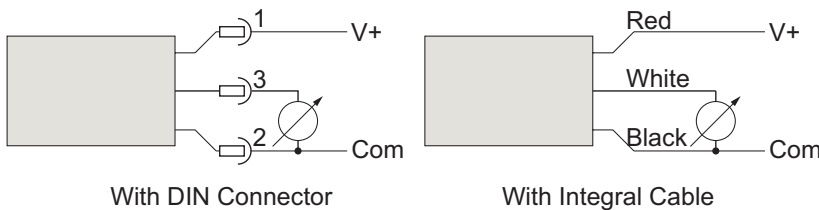


ProSense SPT25 Series Pressure Transmitters (Shielded Cable)					
Part Number	Description	Electrical Connection	Input Voltage	Wt(lb)	Price
<a href="#">SPT25-20-V30A</a>	Pressure transmitter, 4 to 20 mA output, -14.7 vacuum to 30 psig range, 1/4" NPT male port	Integral 6.6 ft (2m) shielded cable	9 - 36 VDC	0.38	\$153.00
<a href="#">SPT25-20-0030A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 30 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0060A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 60 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0100A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 100 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0150A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 150 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0200A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 200 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0300A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 300 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0500A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 500 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-1000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-1500A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1500 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-2000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 2000 psig range, 1/4" NPT male port		\$153.00		
<a href="#">SPT25-20-3000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 3000 psig range, 1/4" NPT male port		\$153.00		
<a href="#">SPT25-20-5000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 5000 psig range, 1/4" NPT male port		\$153.00		
<a href="#">SPT25-10-V30A</a>	Pressure transmitter, 0 to 10 V output, -14.7 vacuum to 30 psig range, 1/4" NPT male port		14 - 36 VDC		\$153.00
<a href="#">SPT25-10-0030A</a>	Pressure transmitter, 0 to 10 V output, 0 to 30 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0060A</a>	Pressure transmitter, 0 to 10 V output, 0 to 60 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0100A</a>	Pressure transmitter, 0 to 10 V output, 0 to 100 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0150A</a>	Pressure transmitter, 0 to 10 V output, 0 to 150 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0200A</a>	Pressure transmitter, 0 to 10 V output, 0 to 200 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0300A</a>	Pressure transmitter, 0 to 10 V output, 0 to 300 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0500A</a>	Pressure transmitter, 0 to 10 V output, 0 to 500 psig range, 1/4" NPT male port	\$153.00			
<a href="#">SPT25-10-1000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 1000 psig range, 1/4" NPT male port	\$153.00			
<a href="#">SPT25-10-1500A</a>	Pressure transmitter, 0 to 10 V output, 0 to 1500 psig range, 1/4" NPT male port	\$153.00			
<a href="#">SPT25-10-2000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 2000 psig range, 1/4" NPT male port	\$153.00			
<a href="#">SPT25-10-3000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 3000 psig range, 1/4" NPT male port	\$153.00			
<a href="#">SPT25-10-5000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 5000 psig range, 1/4" NPT male port	\$153.00			

# pro<sup>sense</sup> SPT25 Series Pressure Transmitters

ProSense SPT25 Series Pressure Transmitters (DIN Connector)					
Part Number	Description	Electrical Connection	Input Voltage	Wt(lb)	Price
<a href="#">SPT25-20-V30D</a>	Pressure transmitter, 4 to 20 mA output, -14.7 vacuum to 30 psig range, 1/4" NPT male port	DIN 175301-803C L-connector	9 - 36 VDC	0.30	\$147.00
<a href="#">SPT25-20-0030D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 30 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0060D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 60 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0100D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 100 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0150D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 150 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0200D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 200 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0300D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 300 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0500D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 500 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-1000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1000 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-1500D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1500 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-2000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 2000 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-3000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 3000 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-5000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 5000 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-10-V30D</a>	Pressure transmitter, 0 to 10 V output, -14.7 vacuum to 30 psig range, 1/4" NPT male port				14 - 36 VDC
<a href="#">SPT25-10-0030D</a>	Pressure transmitter, 0 to 10 V output, 0 to 30 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-0060D</a>	Pressure transmitter, 0 to 10 V output, 0 to 60 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-0100D</a>	Pressure transmitter, 0 to 10 V output, 0 to 100 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-0150D</a>	Pressure transmitter, 0 to 10 V output, 0 to 150 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-0200D</a>	Pressure transmitter, 0 to 10 V output, 0 to 200 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-0300D</a>	Pressure transmitter, 0 to 10 V output, 0 to 300 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-0500D</a>	Pressure transmitter, 0 to 10 V output, 0 to 500 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-1000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 1000 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-1500D</a>	Pressure transmitter, 0 to 10 V output, 0 to 1500 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-2000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 2000 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-3000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 3000 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-5000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 5000 psig range, 1/4" NPT male port		\$147.00		

## 0 to 10 VDC Output Wiring Diagram

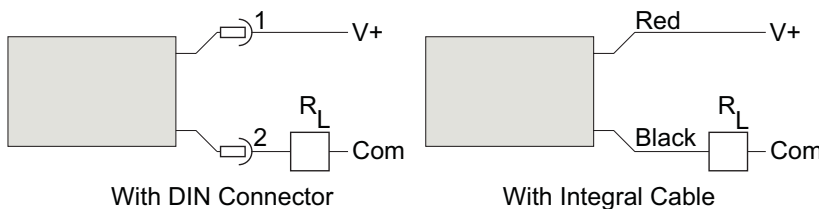


## Shielded Cable Models Wire Designation

Wire Color	0 - 10 VDC Output	4 - 20 mA Output
Red	V +	V +
Black	Com	Output
White	Output	None
Bare *	Shield Drain Wire	Shield Drain Wire

\* Where shielded wiring is being used: Connect the drain wire to the guard terminal on the read out device or measuring instrument if available. In all other cases connect to the power supply negative terminal.

## 4 to 20 mA Output Wiring Diagrams



## DIN Form C Models Pin Designation

Pin No.	0 - 10 VDC Output	4 - 20 mA Output
1	V+	V+
2	Com	Output
3	Output	None
4	Case Ground	Case Ground

# ProSense® SPT25 Series Pressure Transmitters

## ProSense SPT25 Series General Specifications

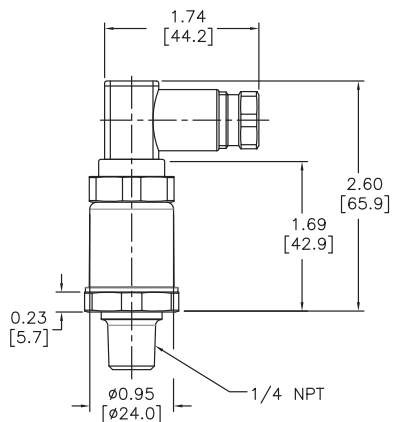
<b>Housing Material</b>	20% Glass Reinforced Nylon, Fire retardant to UL94 V1 / 304 Series Stainless steel
<b>Materials (wetted parts)**</b>	304 Series Stainless steel / 17-4PH Stainless Steel
<b>Operating Temperature</b>	-40 to 257°F (-40 to 125°C)
<b>Medium Temperature</b>	-40 to 257°F (-40 to 125°C)
<b>Storage Temperature</b>	-40 to 257°F (-40 to 125°C)
<b>Protection</b>	IP 67 for cabled models IP 65 For DIN connector models
<b>Accuracy*</b>	± 0.50% of full range
<b>Temperature Coefficient</b>	0.15% of full range / 10°F (0.25% of full range / 10°C)
<b>Reference Temperature</b>	70°F ± 1°F (21°C ± 1°C)
<b>Compensated Temperature</b>	-4 to 185°F (-20 to 85°C)
<b>Insulation Resistance</b>	Greater than 100 megohms at 100 VDC
<b>Shock Resistance</b>	100 gs, 6 ms
<b>Vibration Resistance</b>	Random vibration (20 g) over temperature range (-40° to 125°C). Exceeds typical MIL. STD. requirements
<b>Drop Test</b>	Withstands 1 meter on concrete 3 axis
<b>Response Time</b>	Less than 1 msec
<b>Warm-up time</b>	Less than 500 msec
<b>Position Effect</b>	Less than ±0.01% span, typical
<b>Insulation Breakdown Voltage</b>	100 VAC
<b>Reverse Polarity &amp; Miswired Protected</b>	Yes
<b>Durability</b>	Tested to 50 million cycles
<b>Humidity</b>	0 to 100% R.H., no effect
<b>Stability</b>	Less than ±0.25% full range / year
<b>Agency Approvals</b>	CE
<i>*Note - Includes non-linearity, hysteresis &amp; non-repeatability.</i>	
<i>** Not cleaned for oxygen service</i>	

## DIN Connector Specifications

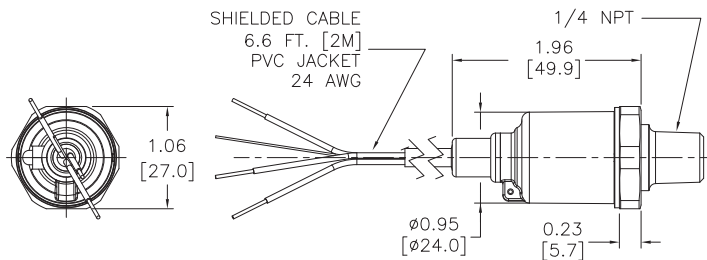
<b>Number of contacts</b>	3 + PE
<b>Cable glands</b>	PG 7
<b>Conductor size max.</b>	0.75 mm² / 18AWG
<b>Type of termination</b>	Screw
<b>Suitable cables</b>	4.5 mm to 6mm
<b>Standard DIN</b>	EN 175 301-803-C

## Dimensions

inches [mm]



DIN Connector Models

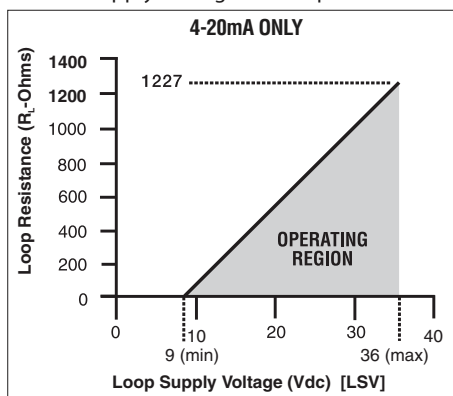


Shielded Cable Models

## ProSense SPT25 Series Technical Specifications

<b>Technical Specifications SPT25-20-xxxx</b>	
<b>Operating Voltage</b>	9 – 36 VDC
<b>Analog Output</b>	4 – 20 mA
<b>Maximum Load</b>	Determine Maximum Loop Resistances $V_L - 9 \text{ VDC}$ $0.022 \text{ amps} = R_L$ For example [(24 VDC - 9 VDC) / 0.022 amps] = 681Ω
<b>Technical Specifications SPT25-10-xxxx</b>	
<b>Operating Voltage</b>	14 – 36 VDC
<b>Current Consumption</b>	4 mA
<b>Minimum Load</b>	10 kΩ

Power Supply Voltage vs Loop Resistance



## ProSense SPT25 Proof & Burst Pressures

	<b>Proof</b>	<b>Burst</b>
<b>500 psig &amp; below</b>	200% full scale	1000% full scale
<b>1000 – 2000 psig</b>	200% full scale	500% full scale
<b>3000 psig</b>	200% full scale	500% full scale
<b>5000 psig</b>	150% full scale	500% full scale

See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.

### 3 Inch Totalizing Water Meter with Pulse Output

**Cast Iron Flanged Water Meters for indicating flow totalization of water with pulse output. Woltmann Helix style water meter for industrial use. Designed for long service life and maintenance-free operation, even under harsh conditions.**

**Features:**

- Pulse Output Components
- All Meters have Hydrocarbon Resistant Seals and will not be damaged by dissolved amounts of free product
- Sealed Dry Dial for Clear Readings

**Specifications:**

- Woltmann Helix Style Water Meter
- 150# Flange
- Pulse Rate: 100 gal/pulse
- Accuracy Class: B  
Transitional Flow:  $\pm 5\%$   
Nominal Flow:  $\pm 2\%$
- 6 Digit Mechanical Roller Counter
- Maximum Water Temperature: 86°F
- Maximum Water Pressure: 150 psi
- Mounting Orientation: Horizontal

**Materials:**

- Body: Cast Iron Body, Epoxy Coated
- Measuring Components: Polyethylene
- Seals: Viton

*PRM meters are ideal for Environmental and Industrial companies to measure process water for environmental treatment, manufacturing, or irrigation. These meters are for any application that does not require potable water measurement and are excluded from federal Lead Free Standards for drinking water.*



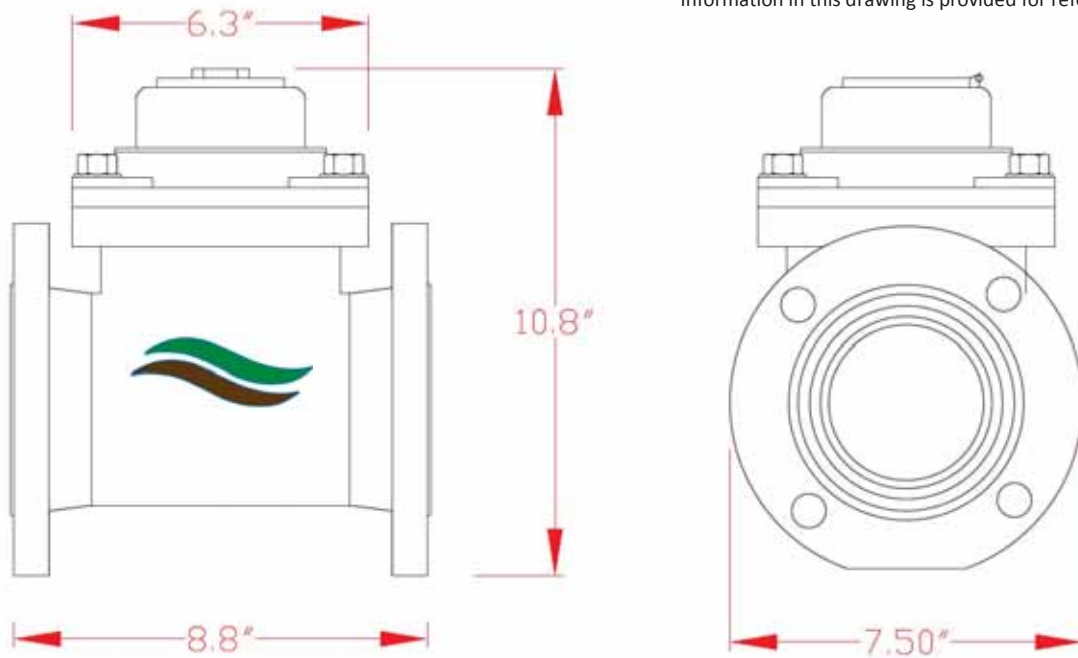
**PRM Part Number:**

**WM300PVX: 3" Flanged Multi-Jet Water Meter**

# 3 Inch Totalizing Water Meter with Pulse Output



Information in this drawing is provided for reference only.



## WM300PVX:

### Materials:

- Body: Cast Iron
- Measuring Chamber: Polyethylene
- Paint: Epoxy Coated
- Seal: Viton
- Mounting Orientation: Horizontal

Not for use with Potable Water

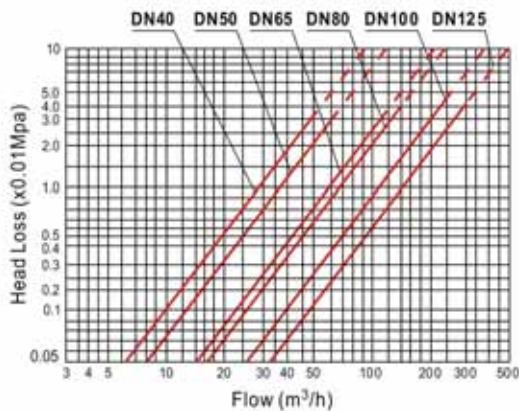
Connection: 3 Inch 150# Flange  
Pulse Rate: 100 gallons/pulse

Height: 10.8 Inches  
Length: 8.8 Inches  
Weight: 31 lbs.

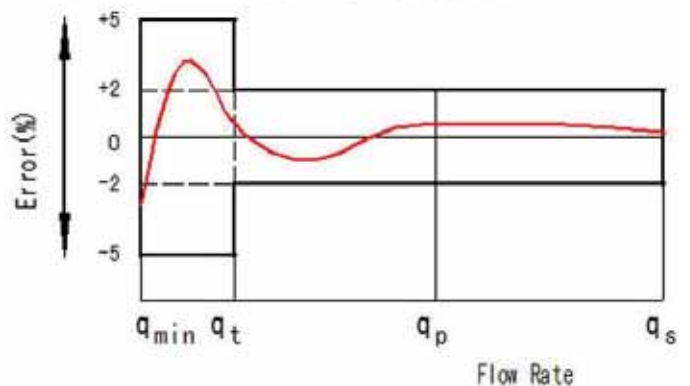
### Flow Specifications:

Qmin: 5.3 GPM  
Qt: 35 GPM  
Qp: 176 GPM  
Qmax: 352 GPM

## Head Loss Curve



## Flow Error Curve



(888-TREAT-IT) • [www.prmfiltration.com](http://www.prmfiltration.com) • [sales@prmfiltration.com](mailto:sales@prmfiltration.com)

# pro<sup>sense</sup> FMM Series (-1002) Magnetic-Inductive Flow Meters

## Overview



Part No. FMM75-1002



Part No. FMM200-1002

AutomationDirect's ProSense FMM Series (-1002) Magmeters are designed to reliably detect the flow rate of conductive media up to 158.5 gallons per minute. The stainless steel, mechanically-robust design mounts directly in-line providing a compact, low-profile installation for process control. A 4-digit numeric display with pushbutton setup indicates flow rate and fluid temperature with selectable engineering units. Two outputs are available to remotely monitor the analog status of flow rate and temperature parameters. Simple to set up, easy to install and with no moving parts, the FMM series is a reliable alternative to traditional flow meters and mechanical flow switches.

## Features

- 1/2 to 2" NPT female process connections
- Measure up to 158.5 GPM
- Measure fluid temperature in addition to flow
- 4-digit numeric display with pushbutton setup
- Selectable engineering units: GPM, GPH, LPM, m<sup>3</sup>/h, °F, °C
- Two analog output signals
- 4-pin M12 quick disconnect
- 5-year warranty



#E320431

See the end of the section for a series of Overview and Setup Videos



## Output Function Selections

Output 1:  
Analog temperature

Output 2:  
Analog flow rate



ProSense FMM Series (-1002) Magnetic Flow Meters					
Model	FMM50-1002	FMM75-1002	FMM100-1002	FMM150-1002	FMM200-1002
Weight	1.14 lb	1.23 lb	1.36 lb	6.76 lb	6.76 lb
Range	0 to 6.6 GPM	0 to 13.2 GPM	0 to 26.4 GPM	0 to 79.3 GPM	0 to 158.5 GPM
Process Connection	1/2" FNPT	3/4" FNPT	1" FNPT	1-1/2" FNPT	2" FNPT
Application	Conductive liquids: ≥ 20 μS/cm (micro Siemens per centimeter) liquids / viscosity: < 70cSt (centiStoke) at 104°F				
Pressure Rating	232PSIG [16bar]				
Medium Temperature	14 to 158°F [-10 to 70°C]				
Operating Voltage	20 to 30VDC			18 to 32VDC	
Current Consumption	120mA			< 150mA	
Insulation Resistance	> 100MΩ (500VDC)				
Protection Class	III				
Reverse Polarity Protection	YES				
<b>Output Functions</b>					
Output Type / Function	OUT1: analog signal / temperature OUT2: analog signal / flow				
Analog Output	4-20 mA max 22mA Max. load: 500Ω (4-20 mA) Overload protection: Yes				
<b>Flow Rate Monitoring</b>					
Measuring Range	0.030 to 6.600 GPM	0.020 to 13.200 GPM	0.100 to 26.400 GPM	1.300 to 79.300 GPM	1.300 to 158.500 GPM
Display Range	-7.920 to 7.920 GPM	-15.860 to 15.860 GPM	-31.700 to 31.700 GPM	-95.100 to 95.100 GPM	-190.200 to 190.200 GPM
Resolution	0.010 GPM	0.020 GPM	0.050 GPM	0.100 GPM	0.100 GPM
Analog Start Point, ASP	0.000 to 5.280 GPM	0.000 to 10.580 GPM	0.000 to 21.100 GPM	0.000 to 63.400 GPM	0.000 to 126.800 GPM
Analog End Point, AEP	1.320 to 6.600 GPM	2.640 to 13.220 GPM	5.300 to 26.400 GPM	15.900 to 79.300 GPM	31.700 to 158.500 GPM
In Steps Of	0.010 GPM	0.020 GPM	0.050 GPM	0.100 GPM	0.100 GPM

# proSense® FMM Series (-1002) Magnetic-Inductive Flow Meters

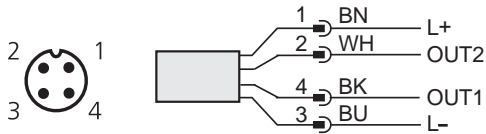
ProSense FMM Series (-1002) Magnetic Flow Meters					
Model	FMM50-1002	FMM75-1002	FMM100-1002	FMM150-1002	FMM200-1002
<b>Temperature Monitoring</b>					
Measuring Range	-4 to 176°F [-20 to 80°C]				
Resolution	0.5°F [0.2°C]				
Analog Start Point, ASP	-4.0 to 140°F [-20 to 60°C]				
Analog End Point, AEP	32 to 176.0°F [0.0 to 80°C]				
In Steps Of	0.5°F [0.28°C]				
<b>Accuracy / Deviations</b>					
<b>Flow Monitoring</b>					
Accuracy <sup>1</sup>	± (2% MW + 0.5% VMR)			± (0.8% MW + 0.5% VMR)	
Repeatability <sup>1</sup>	± 0.2% VMR				
<b>Temperature Monitoring</b>					
Accuracy	± 2.5°K (Q > 0.26 GPM)			± 1°K (Q > 4.00 GPM)	
<b>Reaction Times</b>					
Power-On Delay Time	5s				
<b>Flow Monitoring</b>					
Response Time	< 0.150s (dAP = 0)			< 0.350s (dAP = 0)	
Display Damping, dAP	0.0 to 3.0s			0.0 to 5.0s	
<b>Temperature Monitoring</b>					
Response Time	T09 = 3s (Q > 4.00 GPM)				
<b>Environment</b>					
Ambient Temperature	14 to 140°F [-10 to 60°C]				
Storage Temperature	-13 to 176°F [-25 to 80°F]				
Protection	IP 67			IP 65, IP 67	
<b>Mechanical Data</b>					
Process Connection	1/2" NPT female	3/4" NPT female	1" NPT female	1-1/2" NPT female	2" NPT female
Materials (wetted parts)	Stainless steel 316L / 1.4404; PEEK (polyether ether ketone); FKM			Stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEEK (polyether ether ketone); Hastelloy C-4 (2.4610); Celullen; FKM	
Housing Materials	Stainless steel 316L / 1.4404; PBT-GF 20; PC; EPDM/X			Stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEI; FKM; PBT-GF 20; elastolan	
<b>Displays / Operating Elements</b>					
Display	Display unit: 6 x LED green (l/min, m³/h, GPM, GPH, °C, °F) Measured values: 4-digit alphanumeric display (7.5 mm) Programming: 4-digit alphanumeric display (7.5 mm)			Display unit: 6 x LED green (l/min, m³/h, GPM, GPH, °C, °F) Function display: 1 x LED yellow (10³) Measured values: 4-digit alphanumeric display (7.5 mm) Programming: 4-digit alphanumeric display (7.5 mm)	
<b>Electrical Connection</b>					
Connection	M12 connector; gold-plated contacts				
<b>Tests / Approvals</b>					
EMC	EN 61000-4-2: 4kV CD / 8kV AD EN 61000-4-3 HF radiated: 10 V/m EN 61000-4-4 Burst: 2kV EN 61000-4-5 Surge: 0.5 kV EN 61000-4-6 HF conducted: 10V				
Shock Resistance	DIN IEC 68-2-27: 20g (11ms)				
Vibration Resistance	DIN IEC 68-2-6: 5g (10 to 2,000Hz)				
Approvals*	UL (E320431), CE, RoHS				
* To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page at <a href="http://www.automationdirect.com">www.automationdirect.com</a>					
<sup>1</sup> MW = Measured value; VMR = Final value of the measuring range					



NOTE: CHECK THE CHEMICAL COMPATIBILITY OF THE SENSOR'S WETTED PARTS WITH THE MEDIUM TO BE MEASURED.

# proense® FMM Series (-1002) Magnetic-Inductive Flow Meters

## Wiring Diagram



### Cable Assembly Wiring Colors:

Pin 1 - Brown

Pin 2 - White

Pin 3 - Blue

Pin 4 - Black

### Colors to DIN EN 60947-5-2

For additional wiring details see individual product manuals.

Use FMM-GND1 if meter is installed in ungrounded pipe system.

## Output Function Selections

### Models:

FMM50-1002, FMM75-1002, FMM100-1002, FMM150-1002, FMM200-1002

### Output 1:

Analog temperature

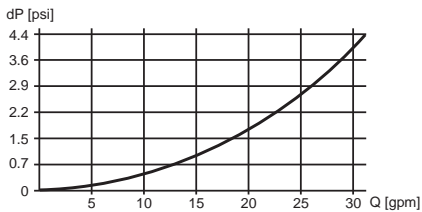
### Output 2:

Analog flow rate

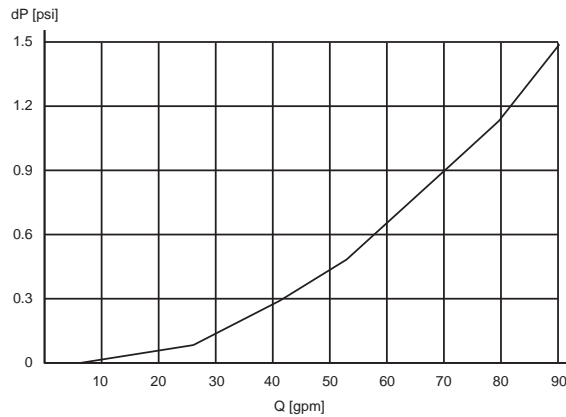
Note: Wiring colors are based on AutomationDirect CD12L and CD12M 4-pole cable assemblies.

## Pressure Loss/Flow Rate\*

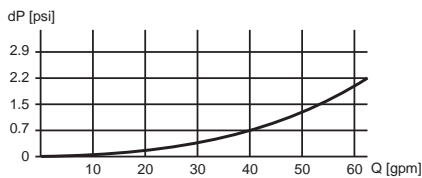
FMM50-1002



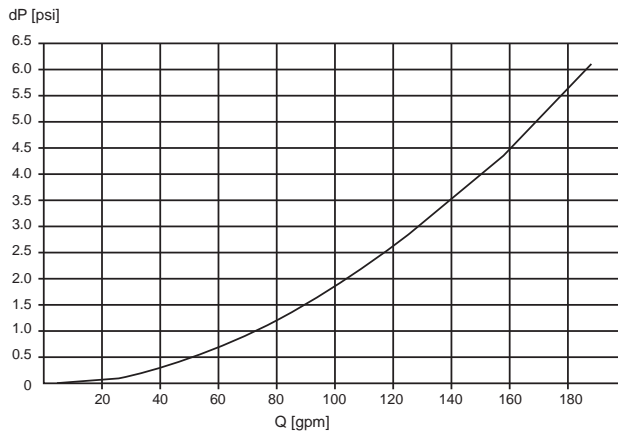
FMM150-1002



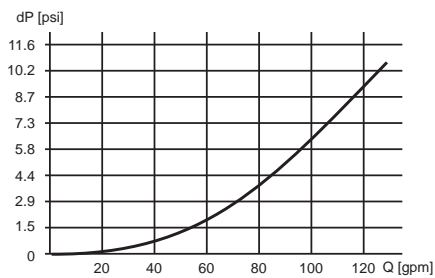
FMM75-1002



FMM200-1002



FMM100-1002

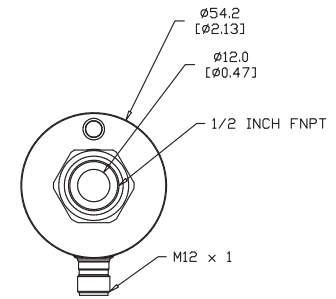
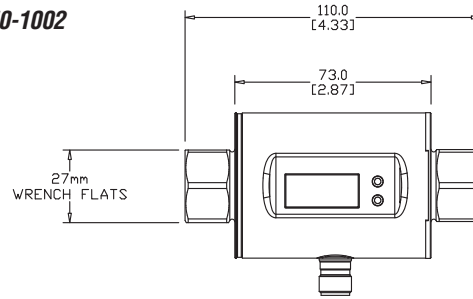


\* when used with water @ 68°F [20°C]

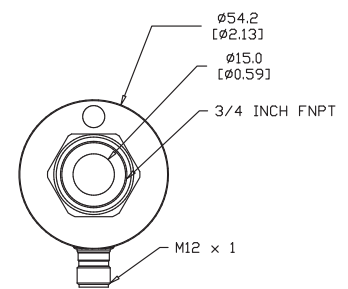
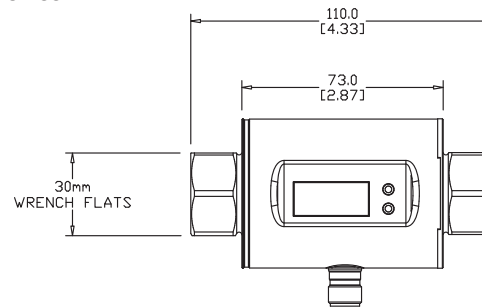
# pro<sup>ense</sup>® FMM Series (-1002) Magnetic-Inductive Flow Meters

Dimensions  
mm [inches]

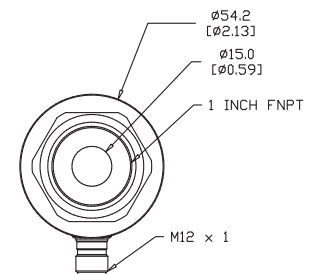
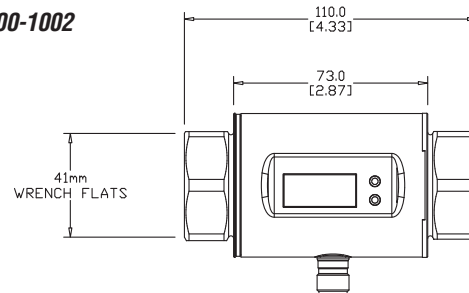
Part No. **FMM50-1002**



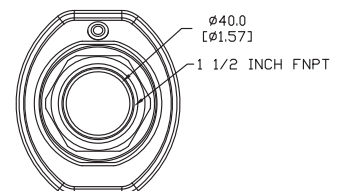
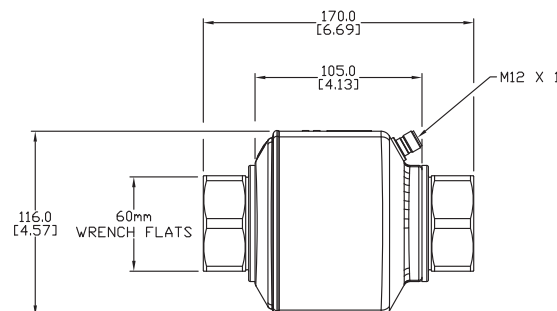
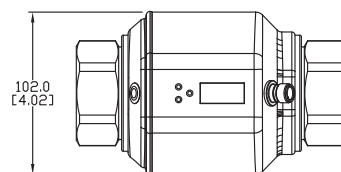
Part No. **FMM75-1002**



Part No. **FMM100-1002**



Part No. **FMM150-1002**



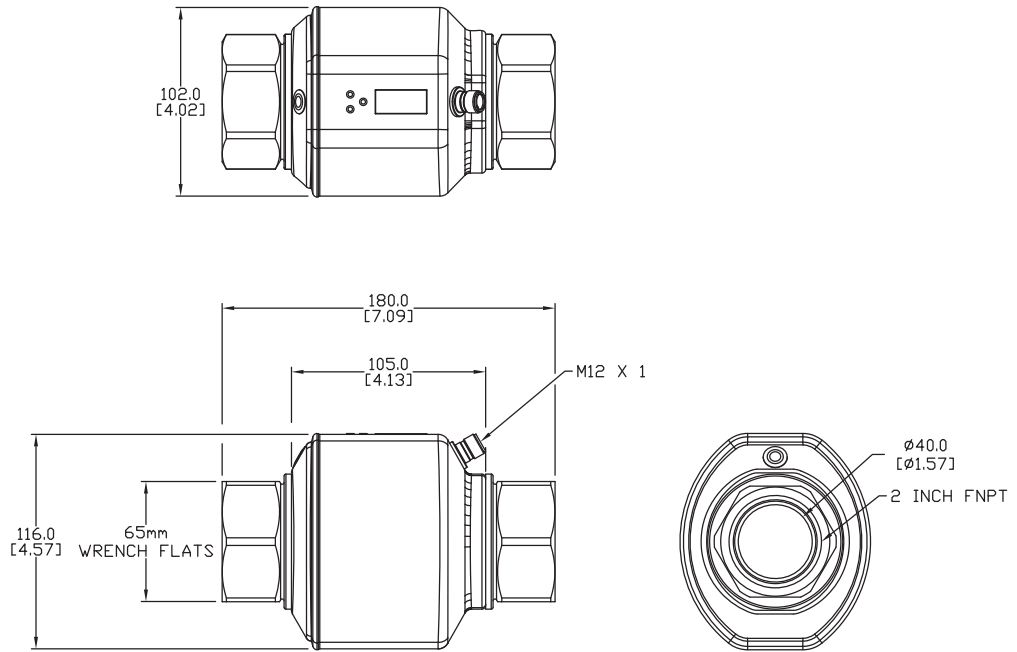
See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.

# proense® FMM Series (-1002) Magnetic-Inductive Flow Meters

## Dimensions

Part No. **FMM200-1002**

mm [inches]



See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.

## Video Links



Click on the thumbnail or go to <https://www.automationdirect.com/VID-FL-0003> for a short Quick Start video for the 0.5", 0.75 and 1" FMM Series Magnetic-Inductive Flow Meters



Click on the thumbnail or go to <https://www.automationdirect.com/VID-FL-0004> for a short Quick Start video for the 1.5" and 2.0" FMM Series Magnetic-Inductive Flow Meters



Click on the thumbnail or go to <https://www.automationdirect.com/VID-FL-0005> for a short Parameter Setup video of the FMM Series Magnetic-Inductive Flow Meters using live demos.

# pro<sup>sense</sup>® Magnetic-Inductive Flow Meter Accessories



The FMM-GND1 Grounding Clamp is used when an FMM series Magnetic-Inductive Flow Meter is installed in an ungrounded pipe system (e.g. PVC pipe).

Simply place the FMM-GND1 Grounding Clamp around the base of the M12 connector and attach a grounded wire to FMM-GND1 Grounding Clamp with the supplied machine screw and nut.

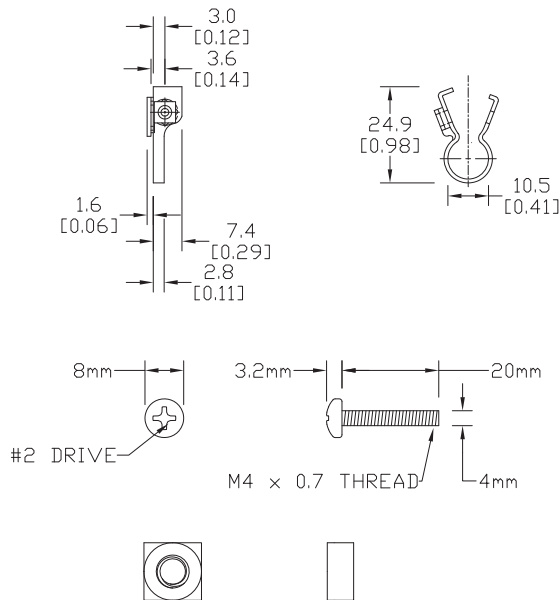
Note: Improper grounding may cause inaccurate readings

ProSense Magnetic Flow Meter Accessories			
Part No.	Description	Price	Weight
FMM-GND1	ProSense 316 stainless steel grounding clamp for magnetic flow meters with an M12 connector.	\$6.25	0.015 lb

## Dimensions

mm [inches]

Part No. FMM-GND1



## Grounding Clamp Installation

The ProSense magnetic flow meter grounding clamp is installed as shown above.

Note: the ground wire shown above is not included.

See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.

# pro<sup>sense</sup>® FMM Series Magnetic-Inductive Flow Meters

## Magnetic-Inductive Flow Meter Application



Magnetic-inductive flow meters (Magmeters) are one of the most widely used technologies for liquid flow monitoring in industrial process markets such as wastewater, mining and minerals, utilities, food and beverage, and pharmaceuticals. To ensure reliable and accurate operation, some important application requirements should be considered. Meeting the minimum conductivity of the liquid and properly installing with a full pipe are required in order to avoid significant error or the

meter not functioning at all. Additionally, the presences of air bubbles should be avoided as they will affect the accuracy of the meter's measurements. Installation location in the piping is important because disturbances in the flow caused by bends in the pipe, valves, reductions, etc. can cause inaccuracies. Refer to the magmeter's specifications and operating instruction documents for specific information regarding application and installation requirements.

Click on the thumbnail or go to <https://www.automationdirect.com/VID-FL-0002> for a short overview video of the FMM Series Magnetic-Inductive Flow Meters



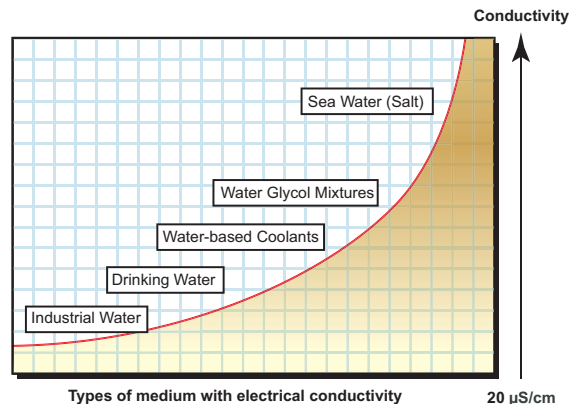
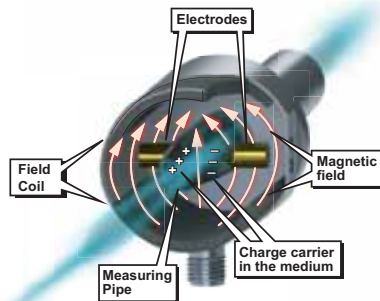
## Magnetic-Inductive Flow Meter Measuring Principle

Magmeters operate by using the magnetic-inductive measuring principle in which a magnetic field is generated in the specified measuring pipe by current-carrying coils. When the media flows through the pipe, the ions of the conductive media are diverted perpendicularly to the magnetic field with the positive and negative charge carriers flowing in opposite directions. The two electrodes that are in contact with

the medium then measure the voltage that is induced. The measured signal voltage is proportional to the average flow velocity. By knowing the inside pipe diameter of the unit, the volumetric flow rate is determined. Magmeters are suitable for use with a variety of conductive liquids in industrial process applications such as those in the following graph:



Click on the thumbnail or go to <https://www.automationdirect.com/VID-FL-0006> for a short video to learn how Magnetic Inductive Flow Meters works



ProSense FMM Series Magnetic Flow Meter Selection Guide							
Model	Process Connection	Flow Range	Temperature Range	Display Units	Output 1	Output 2	Empty Pipe Detection
FMM50-1001	1/2" FNPT	0 to 6.6 GPM	-4 to 176°F [-20 to 80°C]	GPM, GPH, GAL, or °F	Switch or pulse (flow)	Switch, analog or reset input (flow or temperature)	No
FMM75-1001	3/4" FNPT	0 to 13.2 GPM					
FMM100-1001	1" FNPT	0 to 26.4 GPM					
FMM150-1001	1-1/2" FNPT	0 to 80 GPM					
FMM200-1001	2" FNPT	0 to 160 GPM					
FMM50-1002	1/2" FNPT	0 to 6.6 GPM		GPM, GPH, LPM, m³/h, °F, °C	Analog 4-20 mA (temperature)	Analog 4-20 mA (flow)	No
FMM75-1002	3/4" FNPT	0 to 13.2 GPM					
FMM100-1002	1" FNPT	0 to 26.4 GPM					
FMM150-1002	1-1/2" FNPT	0 to 79.3 GPM					
FMM200-1002	2" FNPT	0 to 158.5 GPM					



# TX100 pH/ORP TRANSMITTER

## PRODUCT SPECIFICATION SHEET



Displays readings in pH or mV alongside temperature

Mounts on wall, panel, pipe or DIN-rail

Simple, easy to read user interface

Probe cleaning reminder for easy maintenance

Stores calibration and other data in case of power loss

Water resistant case included

### PARTS COVERED BY THIS SPECIFICATION SHEET:

- TX100

### SPECIFICATIONS:

The TX100 pH/mV transmitter is a loop-powered 4-20mA transmitter with a wide range of useful features and programmable options. Five buffer choices are available in two-point calibration mode. The 4-20mA output is scalable in pH or mV units and has 500V input to output isolation. Temperature is always displayed and is selectable in °C or °F. All stored parameters and calibration data are retained in the non-volatile memory during transmitter power down or power loss. A useful probe clean reminder icon flashes when it is time to clean the probe. Probe cleaning interval is user programmable from 1 to 250 days. The TX100 can be used for wall mounting, panel mounting, pipe mounting and DIN-rail mounting. Cable grips for inlet/outlet to box are included as well as all mounting hardware. The case meets NEMA and IP ratings for water resistance.

### RECOMMENDED APPLICATIONS INCLUDE:

- Swimming pool control
- Industrial water treatment
- Potable water systems
  - Boiler feedwater
- Municipal wastewater plants

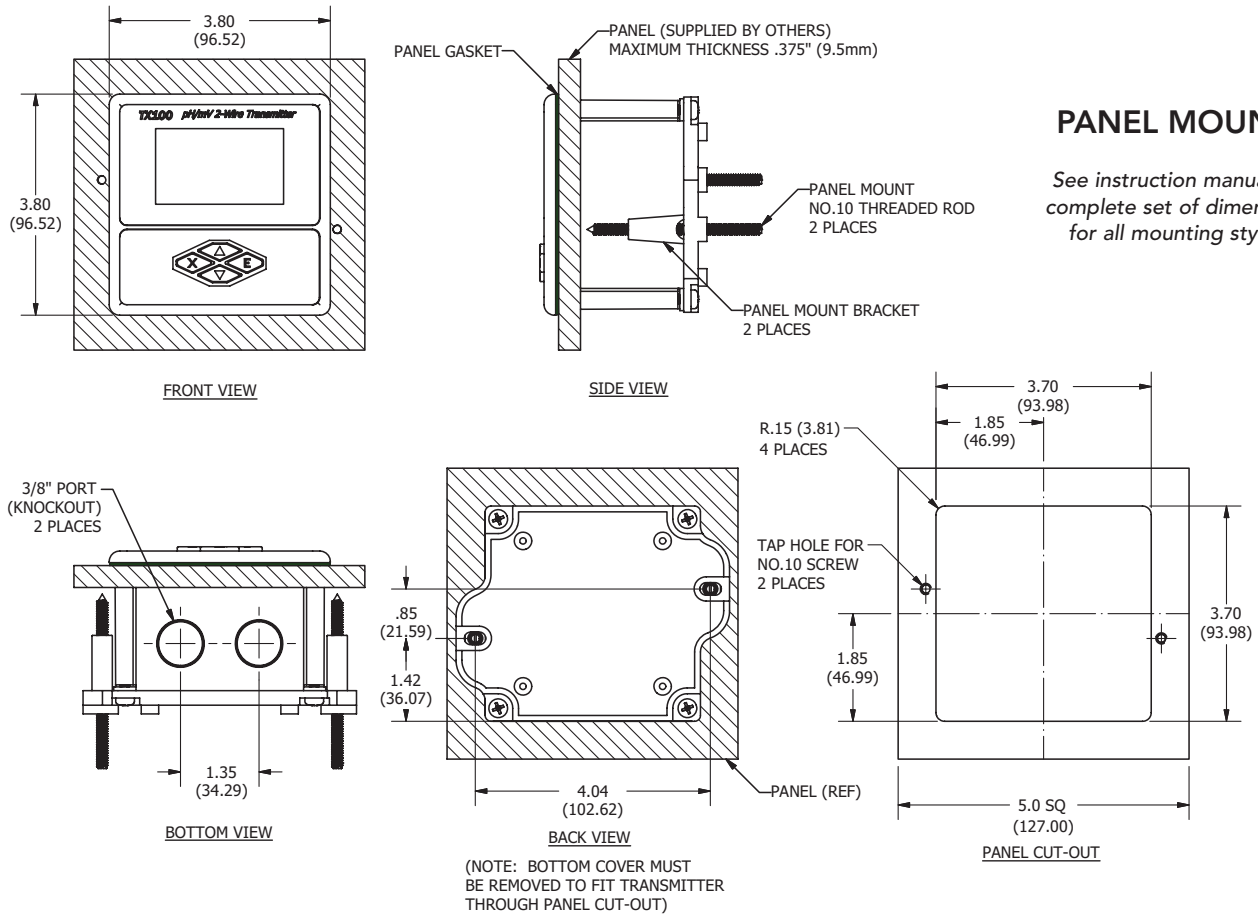
<b>Measuring Range (pH)</b>	0.00 to 14.00 pH, 0.01 pH resolution, ± 0.01 accuracy
<b>Measuring Range (ORP/mV)</b>	-1999mV to 1999mV, 1mV resolution, ± 2mV accuracy
<b>Temperature Range</b>	-20°C (-4°F) to 110°C (230°F), 0.1° C/F resolution
<b>Current Output Range</b>	2.00mA to 24mA, .01mA resolution, ±0.005mA accuracy, 500V input/output isolation
<b>Enclosure</b>	NEMA 4X IP65, ABS case with push-button control pad HWD: 3.9" (99.1 mm) x 3.9" (99.1mm) x 2.9" (74.7mm)
<b>Weight</b>	approx. 1lb (0.45 kg)
<b>Mounting Options</b>	Wall, panel, din rail, and pipe
<b>Conduit Openings</b>	2 each 3/8" NPT openings (cordgrips included)
<b>Ambient Temperature</b>	Transmitter Service, 0°C (32°F) to 60°C (140°F)
<b>Ambient Humidity</b>	0-95%, non-condensing
<b>Location</b>	Designed for non-hazardous areas
<b>Temperature Input</b>	2-wire Pt1000 RTD with automatic compensation
<b>Max Sensor to Transmitter Distance</b>	30 feet (9.1 meters)
<b>Power Requirement</b>	12-24 VDC, max 600 Ohm load

DESIGNED AND ASSEMBLED IN CALIFORNIA, USA

11751 MARKON DRIVE • GARDEN GROVE, CA 92841 • 714.895.4344 • WWW.SENSOREX.COM

© Sensorex Corporation. All rights reserved. In the interest of improving and updating its equipment, Sensorex reserves the right to alter specifications to equipment at any time.

### OUTLINE AND DIMENSIONS



### PANEL MOUNT

See instruction manual for complete set of dimensions for all mounting styles.

Wall Mount, DIN Rail Mount and Pipe Mount Hardware are all included.

### ORDERING INFORMATION

The TX100 2-wire isolated pH/ORP transmitter is supplied complete with mounting hardware for panel, wall, din rail and pipe mounting with instructions. Power supply is not included.

#### Part Number Description

##### Model:

**TX100** Isolated pH/ORP 2-wire transmitter in 1/4 DIN case, requires 24V DC power supply (customer supplied)

##### Accessories:

**B225** Zobell ORP calibration solution, 473 mL

**B104** pH 4.01 buffer solution, 473mL

**B107** pH 7.00 buffer solution, 473mL

**B110** pH 10.00 buffer solution, 473mL

**B125** ORP Calibration Kit - incl. B104, B107, B115 quinhydrone powder (20g), 3 plastic beakers, stir sticks

Submittal #13 pH Sensor #S271CD

# Low Cost Submersion and In-Line pH Electrodes


**S270 Series Ryton Sensors**

**S260 Series Ryton Sensors**

**S222 Series Quick Disconnect Models**


---

**Economical design for in-line or submersion use**


---

**Choose from single or double junction models**


---

**Threaded 1/2" or 3/4" NPT connections**


---

**Choose from spherical or flat pH measuring surfaces**


---

**Special models for low ionic and other specialty applications available**


---

This series of electrodes is designed to provide an economical multi-purpose solution for in-line or submersion pH measurements. Based on our proven S200C bulb and S350CD flat surface pH glass technology, these rugged and durable electrodes are available in Ryton nipples with 1/2" or 3/4" NPT threads; or in our durable epoxy body with or without quick disconnect top caps. Choose from single or double junction designs, flat or recessed measuring surface configurations and cable lengths and connectors as required. For special configurations such as low ionic models, fluoride resistant pH glass and other specialty sensors, please contact the Sensorex sales or technical support department.

## Specifications

---

Measuring Range	0-14 pH (Sodium ion error >12.3pH)
Body material	Epoxy (S200,S222, S353, S354 Series) or Ryton (S265-S269 Series, S271CD, S272CD & S273CD)
Max Temp/Pressure	S265-S269 Series : 32-176 deg F ( 0-80 deg C)/70 psig S271CD,S272CD & S273CD : 170 deg F (75 de C)/100 psig, 180 deg F (81 deg C)/85 psig, 212 deg F (100 deg C)/50 psig
Connector	BNC, tinned wires (other connectors available for an additional charge), S353CD AND S353CD have DIN Cap and require DIN-EL mating connector
Cable length	30" or longer for S200 Series lengths at additional cost user specified (Cap-cable S653 required for S222 Series). 10ft length for S265-S269 series, 10ft waterproof cable for S271CD, S272CD & S273CD
Process Connection	1/2" or 3/4" MNPT for submersion or in-line, S354CD has DIN 13.5mm threads

---

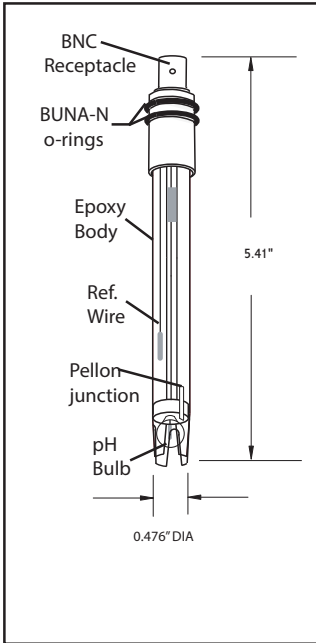
**Parts covered by this product data sheet include:**

S200C, S200CD, S222C, S222CD, S223C, S223CD, S224C, S224CD, S265C-S269CD, S271CD, S272CD, S272CDTC, S273CD, S273CDTC, S353CD, S354CD

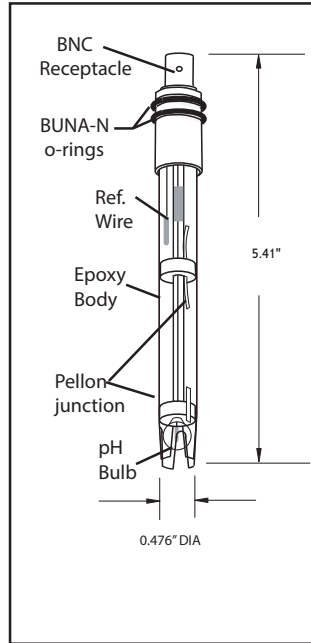
# Low Cost Submersion and In-Line pH Electrodes

Designed to provide an economical multi-purpose solution for in-line or submersion pH measurements.

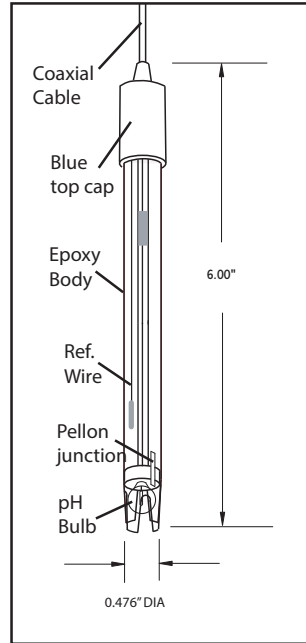
**S222C**



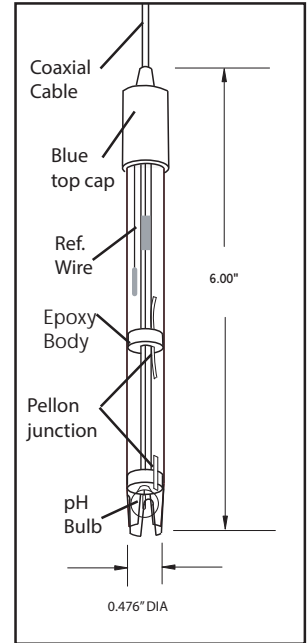
**S222CD**



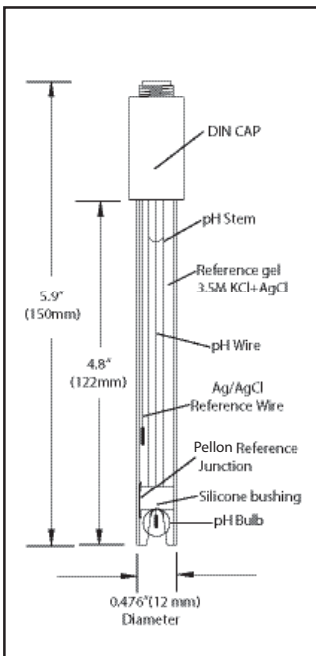
**S200C**



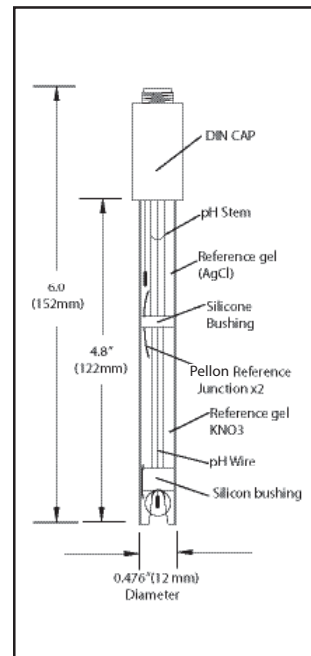
**S200CD & S200CD-LC**



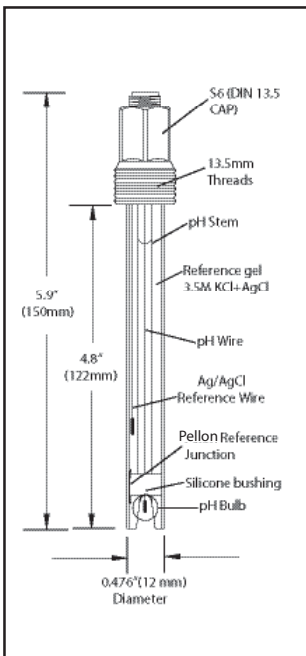
**S223C**



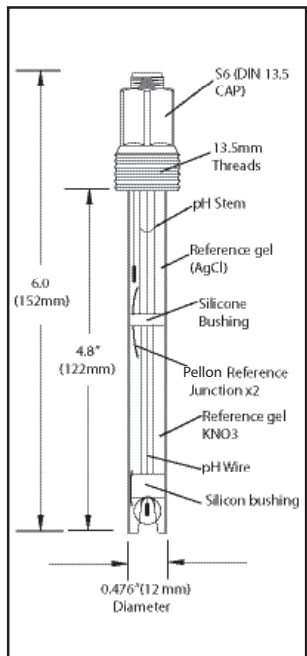
**S223CD**



**S224C**



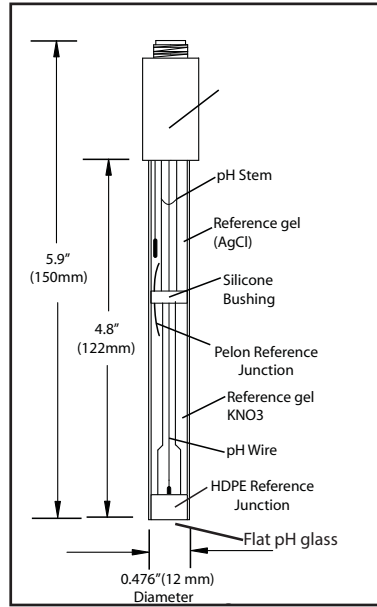
**S224CD**



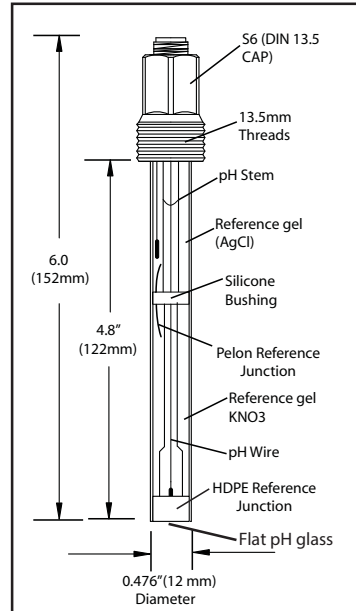
# Low Cost Submersion and In-Line pH Electrodes

Designed to provide an economical multi-purpose solution for in-line or submersion pH measurements.

## S353CD



## S354CD



## S653 Cap and Cable

for Conduit use

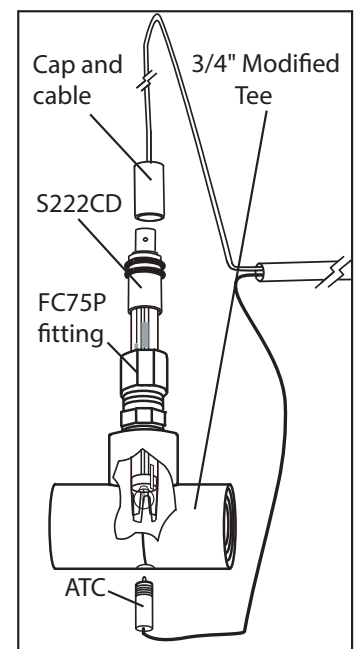
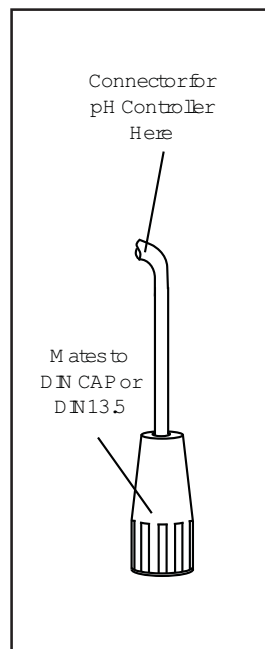
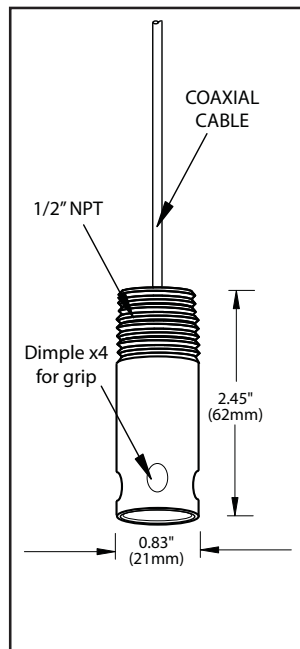
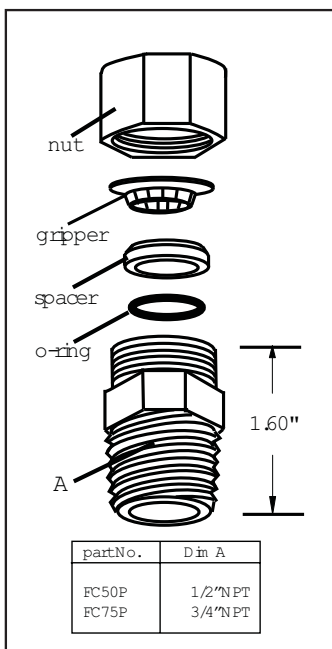
## DIN-EL

Ext. Cable for  
DIN Cap Models

## FC75TC

Installation

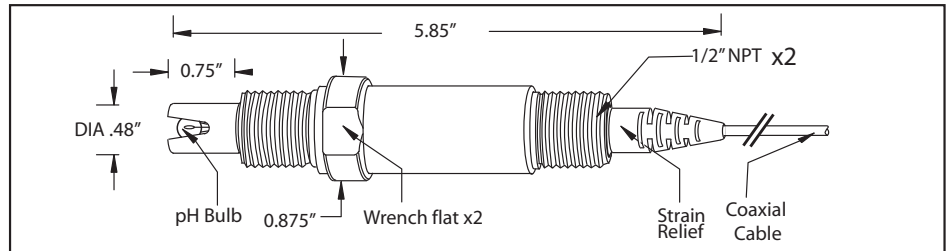
## FC50P and FC75P



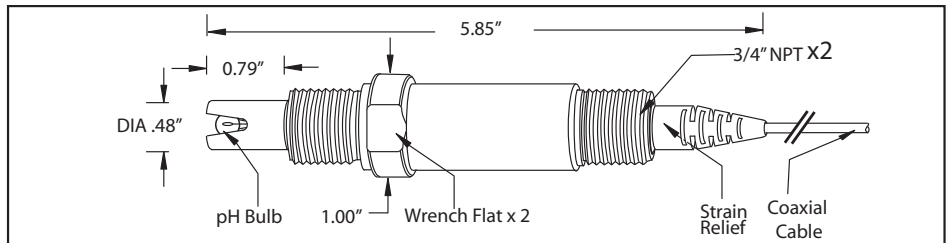
# Low Cost Submersion and In-Line pH Electrodes

Designed to provide an economical multi-purpose solution for in-line or submersion pH measurements.

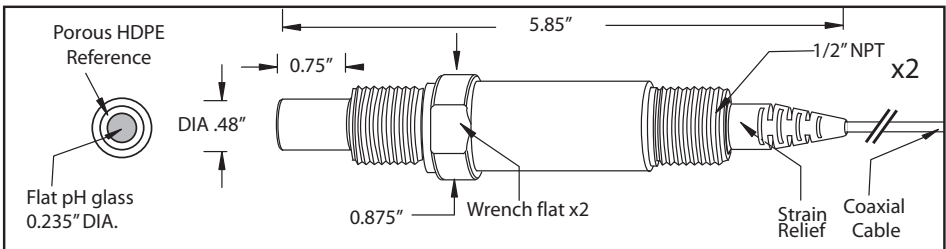
**S265C/CD**



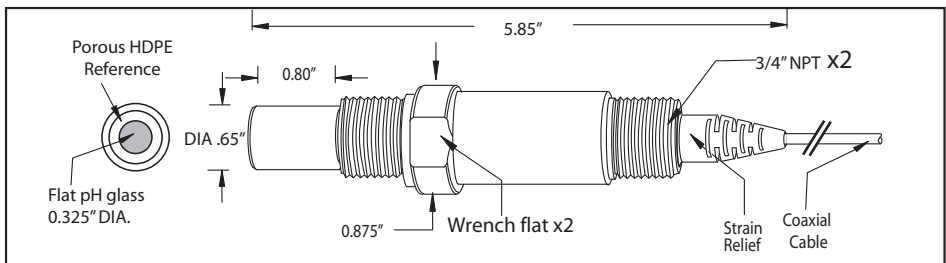
**S267C/CD**



**S268CD**



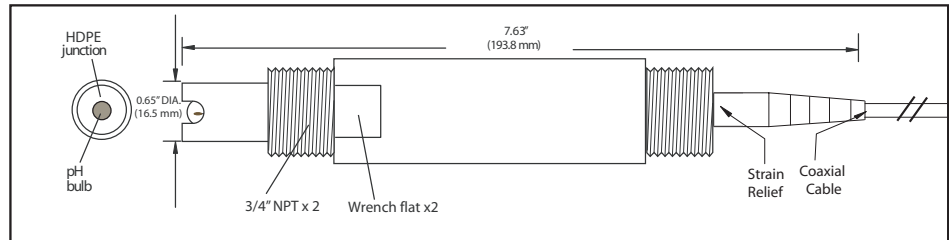
**S269CD**



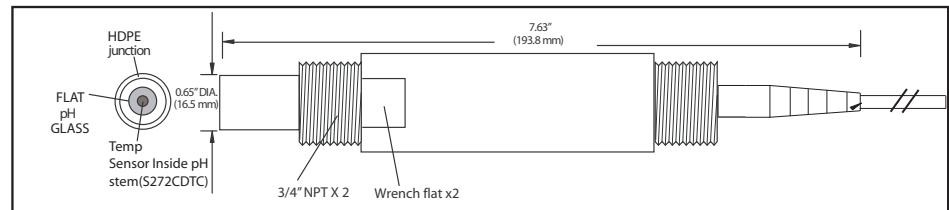
# Low Cost Submersion and In-Line pH Electrodes

Designed to provide an economical multi-purpose solution for in-line or submersion pH measurements.

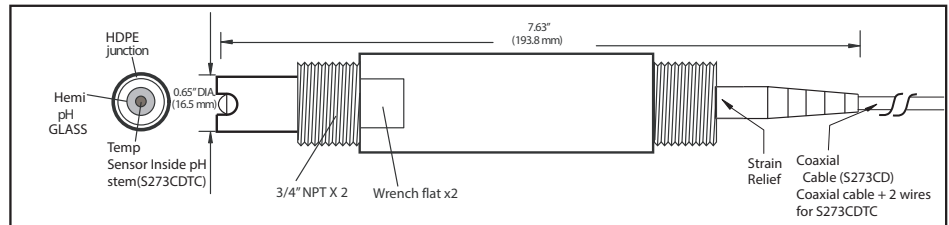
**S271CD**



**S272CD &  
S272CDTC**



**S273CD &  
S273CDTC**



## Ordering Information

These economical sensors are submersion and in-line ready by utilizing the 1/2" or 3/4" MNPT threads on the sensor. 10ft cable length is standard. Special lengths available upon request.

pH Sensors	Body Material	Key Features
(To order an ORP model instead of pH, simply add - ORP to the model numbers below.)		
S265C	PPS	Single junction 1/2" NPT spherical bulb
S265CD	PPS	Double junction 1/2" NPT spherical bulb
S267C	PPS	Single junction 3/4" NPT spherical bulb
S267CD	PPS	Double junction 3/4" NPT spherical bulb
S268CD	PPS	Double junction 1/2" NPT flat surface
S269CD	PPS	Double junction 3/4" NPT flat surface
<b>S271CD</b>	PPS	Double junction 3/4" NPT spherical bulb, heavy duty
S272CD	PPS	Double junction 3/4" NPT flat surface , heavy duty
S272CDTC	PPS	Double junction 3/4" NPT flat surface , heavy duty with Temperature Sensor, Pt100 or Pt1000RTD
S273CD	PPS	Double junction 3/4" NPT hemi pH glass surface , heavy duty
S273CDTC	PPS	Double junction 3/4" NPT hemi pH glass surface , heavy duty with Temperature Sensor, Pt100 or Pt1000RTD

# Low Cost Submersion and In-Line pH Electrodes

Designed to provide an economical multi-purpose solution for in-line or submersion pH measurements.



Mounting glands



Color coded pH buffers



TX100 2-wire pH transmitter

## Ordering Information

These economical sensors can be used for submersion or in-line use. Mounting is accomplished by ordering the appropriate mounting gland listed below.

Sensor	Type
S200C	Single junction spherical style bulb
S200CD	Double junction spherical style bulb
S200CD-LC	Low ionic, double junction, spherical style bulb
S222C	Single junction spherical style bulb-Quick disconnect
S222CD	Double junction spherical style bulb-Quick disconnect
970796	Double junction flat pH glass-Quick disconnect
S223C	Single junction spherical style bulb- DIN Cap
S223CD	Double junction spherical style bulb-DIN Cap
S353CD	Double junction flat pH glass-DIN Cap

DIN 13.5 Threaded Cap Sensors - (Do not require mounting fitting. Mount via DIN 13.5 thread)

Sensor	Type
S224C	Single junction spherical style bulb- DIN 13.5 Cap(S6)
S224CD	Double junction spherical style bulb-DIN 13.5 Cap(S6)
S354CD	Double junction flat pH glass-DIN 13.5 Cap(S6)

## Accessories

FC50P	1/2 " NPT mounting gland for 12mm electrodes
FC75P	3/4 " NPT mounting gland for 12mm electrodes
FC75TC	3/4 "flow cell, mounting gland and ATC cable for 12mm electrodes
S653	Cap Cable assembly for S222 series (Specify cable length and connector termination when ordering)
EXT Cable - DIN EL/"X"	Extension cable for DIN cap and DIN 13.5 electrodes (Series S223, S224, S354)
TX100	4-20mA loop-powered pH transmitter
B104	1 pint 4.01 pH Buffer
B107	1 Pint 7.00 pH Buffer
B110	1 Pint 10.00 pH Buffer

Dial Industrial Pressure Gauges / PIC GAUGES Industrial Pressure Gauge: 0...



**PIC GAUGES Industrial Pressure Gauge: 0 to 60 psi, 2 1/2 in Dial, Liquid-Filled, 1/4 in NPT Male**

Item 20TV21  
Mfr. Model PRO-201L-254D

Compare

**Product Details**    Catalog Page N/A

Pressure Gauge Type Industrial Pressure Gauge

Pressure Range Type Pressure

Nominal Dial Size 2-1/2 in

Pressure Range 0 to 60 psi

Vibration Resistance Liquid-Filled

Gauge Case Liquid Glycerin

Process Connection 1/4 in NPT Male

Process Connection Location Bottom

Secondary Pressure Range 0 to 4

Secondary Scale Units bar

Gauge Case Material Stainless Steel

Case Material Stainless Steel

Dial Face Color White

Dial Color White

Accuracy ±2-1-2%

Gauge Accuracy Grade Grade A - Industrial

Accuracy Scale Mid-Scale

Accuracy Grade ASME B40.100 Grade A

Includes Calibration Certificate No

Scale Type Dual

Your Price ⓘ  
**\$21.42** / each

Qty  
1

**Add to Cart**

Setup Auto Reorder

Ship

Pickup

Expected to arrive  
Mon. May 01.


Ship to 11980 | [Change](#)


Shipping Weight 0.47 lbs

[Ship Availability Terms](#)

[Add to List](#)

**Compliance & Restrictions**

 **WARNING: Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

 Chat with an Agent

Gauge Wetted Parts Copper

Wetted Parts Material Copper Alloy

Socket Material Copper Alloy

Sensor Material Copper Alloy

Hazardous Location Rating Not Rated

IP/NEMA Rating Not Rated

Includes Vent Plug Yes

Blowout Safety Back No

Lens Material Polycarbonate

Lens Material - Gauge Plastic

Bezel Material Stainless Steel

Bezel Mounting Type Fixed

Removable Bezel No

Dry Dampening Feature None

Field Fillable No

Liquid-Filled Case Yes

Primary Scale Minor Graduations 0.5

Mounting Type Stem-Mount

Primary Pressure Range 0 to 60

Primary Scale Units psi

Process Connection Gender Male

Process Connection Size 1/4 in

Process Connection Type NPT

Ambient Operating Temperature Range -30° to 180°F

Application General Purpose

Case Color Metallic

Case Depth 1.2 in

Case Diameter 2.65 in

Cleaned for Oxygen Service No

Freeze Resistant Movement No

Includes Vent Plug

Includes Mounting Hardware No

Manufacturer Part Number PRO-201L-254D

Manufacturer Warranty Length 1 yr

---

Non-Sparking No

---

Panel-Mountable No

---

Pointer Color Black

---

Pointer Material Aluminum

---

Brand PIC GAUGES

---

Series 201L

---

Standards ASME

---

UNSPSC 23151820

---

Country of Origin China (subject to change)

---

#### Product Description

These dial pressure gauges have heavy-duty construction for many industrial applications. They have non-ferrous sockets or process connections for applications where all-stainless construction is not necessary. They are available with liquid-filled cases that are good for applications where there is significant vibration and pulsation. Select gauges are built with a proprietary dry case that also dampens the impact of vibration and pulsation.

# Electric Unit Heater

HVAC/R fact sheet



shown with optional  
Outlet Mesh (Bird Screen)



## One Product, Multiple Solutions

- The perfect solution for factories, warehouses, garages, power stations and similar areas
- Mounts horizontally or vertically
- Primary or supplementary heat
- Summer fan kit are available to adapt heater into a fan for cooling

## Multi Wattage Units

- 3 to 50 kW heating output
- 208, 240, 277, and 480V
- 10,000 to 170,500 BTU/hr

## Durable Heavy Duty

- Rugged, light weight construction
- Enclosed fan motor, offers protection against the elements

## Safe and Reliable

- Meets all UL, NEC, and OSHA requirements
- 5 Year Element Warranty
- Auto Thermal Cut-out protects from overheating

## Control Your Comfort

- Custom designed venturi outlet for added throw
- Fan delay to eliminates cold drafts.
- Individually adjustable discharge louvers to control air flow



**Exclusively from Grainger.**

Call or visit your local branch or go to [grainger.com/dayton](http://grainger.com/dayton) for complete product line information

## Specifications

Catalog Number	kW Rating	BTU/HR (1,000's)	Heater/ Motor Voltage	Phase	Control Voltage	Amps Per Phase	-Fan Motor-		CFM at Outlet	FPM at Outlet	Air Temp. Rise (°F)	Air Throw (Horiz)
							HP	RPM				
2YU58*	3.0/2.2	10.2/7.5	240/208	1	240/208	12.5/11.0	1/100	1600	350	800	27	12'
2YU59	3.0	10.2	480	3	24	3.6	1/100	1600	350	800	27	12
2YU60*	3.0	10.2	277	1	277	11.0	1/100	1600	350	800	27	12
2YU61*	3.0	10.2	208	1	208	14.5	1/100	1600	350	800	27	12
2YU62*	5.0/3.7	17.0/12.6	240/208	1-3	240/208	21.0/18.0	1/100	1600	350	800	45	12
2YU63	5.0	17.0	480	3	24	6.0	1/100	1600	350	800	45	12
2YU64*	5.0	17.0	277	1	277	18.0	1/100	1600	350	800	45	12
2YU65*	5.0	17.0	208	1-3	208	24.0	1/100	1600	350	800	45	12
2YU66	7.5/5.6	25.6/19.1	240/208	1-3	24	31.3/27.0	1/30	1600	650	970	37	18
2YU67	7.5	25.6	480	3	24	9.0	1/30	1600	650	970	37	18
2YU68	7.5	25.6	208	1-3	24	36.0	1/30	1600	650	970	37	18
2YU69	10.0/7.5	34.1/25.6	240/208	1-3	24	42.0/36.0	1/30	1600	650	970	49	18
2YU70	10.0	34.1	480	3	24	12.0	1/30	1600	650	970	49	18
2YU71	10.0	34.1	208	1-3	24	48.0	1/30	1600	650	970	49	18
2YU72	15.0/11.2	51.2/38.2	240/208	3	24	36.1/33.3	1/20	1530	910	1640	52	35
2YU73	15.0	51.2	480	3	24	18.0	1/20	1530	910	1640	52	35
2YU74	15.0	51.2	208	1-3	24	72.0	1/20	1530	910	1640	52	35
2YU75	20.0/15.0	68.2/51.2	240/208	3	24	48.0/41.2	1/10	1500	1320	2060	48	41
2YU76	20.0	68.2	480	3	24	24.0	1/10	1500	1320	2060	48	41
3END3	25	85.2	480	3	24	30	1/4	1600/1375	2100/1800	2100/2030	45/53	50
2YU77	30.0/22.5	102/77	240/208	3	24	72.0/63.0	1/4	1600/1375	2100/1800	2100/2030	45/53	50
2YU78	30.0	102.3	480	3	24	36.0	1/4	1600/1375	2100/1800	2100/2030	45/53	50
2YU79	30.0	102.3	208	3	24	84.0	1/4	1600/1375	2100/1800	2100/2030	45/53	50
3END4	40	136.4	480	3	24	48	1/2	1524/1420	3000/2600	3260/2900	49/42	60
2YU80	50.0/37.5	170/127	240/208	3	24	120.4/104.2	1/2	1525/1420	3000/2600	3260/2900	53/61	60
2YU81	50.0	170.5	480	3	24	60.2	1/2	1525/1420	3000/2600	3260/2900	53/61	60

## Accessories

Grainger Sku #	Description
25D242	Universal Wall-Ceiling Mount 3-10KW
25D243	Universal Wall-Ceiling Mount 15-20KW
25D244	Dust Shield for 3-10KW units
25D245	Dust Shield for 15-20KW units
25D246	Thermostat 40 to 80 temp range
25D247	Summer/Winter Fan Switch
25D248	3pole disconnect switch 25A
25D249	Radial Diffuser for 3-5KW units
25D250	Radial Diffuser for 7.5 to 15KW units



Universal Wall Ceiling Mount



Radial Diffuser

**Exclusively from Grainger.**

Call or visit your local branch or go to [grainger.com/dayton](http://grainger.com/dayton) for complete product line information

# C-more Operator Panels Overview

## Getting started

Installing the software and configuring the C-more panel is simple. You will need the following to successfully connect, configure and send a project to the panel:

- C-more HMI - 6in, 7in wide, 8in, 10in, 10in wide, 12in, 15in or [EA9-RHMI](#)
- C-more Programming Software, p/n [EA9-PGMSW](#)
- C-more programming cable, USB or Ethernet
- 12-24 VDC switching power supply or the optional C-more AC Power Adapter, p/n [EA-AC](#)
- Personal Computer - to run C-more programming software
- PLC communications cable (serial or Ethernet) to connect the C-more HMI to your controller

Part Number	Description	Price
<a href="#">EA9-T6CL-R</a>	C-more EA9 series touch screen HMI, 6in color TFT LCD, analog resistive, 320 x 240 pixel, QVGA, LED backlight, (1) serial, (2) USB ports and (1) memory card slot.	\$691.00
<a href="#">EA9-T6CL</a>	C-more EA9 series touch screen HMI, 6in color TFT LCD, analog resistive, 320 x 240 pixel, QVGA, LED backlight, (3) serial, (1) Ethernet, (2) USB ports, (1) memory card slot and (1) audio line out.	\$965.00
<a href="#">EA9-T7CL-R</a>	C-more EA9 series touch screen HMI, 7in color TFT LCD, analog resistive, widescreen, 800 x 480 pixel, WVGA, LED backlight, (1) serial, (1) Ethernet, (2) USB ports and (1) memory card slot.	\$668.00
<a href="#">EA9-T7CL</a>	C-more EA9 series touch screen HMI, 7in color TFT LCD, analog resistive, widescreen, 800 x 480 pixel, WVGA, LED backlight, (3) serial, (1) Ethernet, (2) USB ports, (1) memory card slot and (1) audio line out.	\$771.00
<a href="#">EA9-T8CL</a>	C-more EA9 series touch screen HMI, 8in color TFT LCD, analog resistive, 800 x 600 pixel, SVGA, LED backlight, (3) serial, (1) Ethernet, (2) USB ports, (1) memory card slot and (1) audio line out.	\$1,343.00
<a href="#">EA9-T10CL</a>	C-more EA9 series touch screen HMI, 10in color TFT LCD, analog resistive, 800 x 600 pixel, SVGA, LED backlight, (3) serial, (1) Ethernet, (2) USB ports, (1) memory card slot and (1) audio line out.	\$1,726.00
<a href="#">EA9-T10WCL</a>	C-more EA9 series touch screen HMI, 10in color TFT LCD, analog resistive, widescreen, 1024 x 600 pixel, WSVGA, LED backlight, (3) serial, (1) Ethernet, (2) USB ports, (1) memory card slot and (1) audio line out.	\$939.00
<a href="#">EA9-T12CL</a>	C-more EA9 series touch screen HMI, 12in color TFT LCD, analog resistive, 800 x 600 pixel, SVGA, LED backlight, (3) serial, (1) Ethernet, (2) USB ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	\$1,500.00
<a href="#">EA9-T15CL-R</a>	C-more EA9 series touch screen HMI, 15in color TFT LCD, analog resistive, 1024 x 768 pixel, XGA, LED backlight, (1) serial, (1) Ethernet, (2) USB ports and (2) memory card slots.	\$1,777.00
<a href="#">EA9-T15CL</a>	C-more EA9 series touch screen HMI, 15in color TFT LCD, analog resistive, 1024 x 768 pixel, XGA, LED backlight, (3) serial, (1) Ethernet, (2) USB ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	\$2,722.00
<a href="#">EA9-RHMI</a>	C-more EA9 series headless HMI, (2) serial, (1) Ethernet and (2) USB ports, (1) HDMI audio/video out and (1) memory card slot.	\$506.00
<a href="#">EA9-PGMSW</a>	C-more Windows programming software, CD or free download. For use with C-more EA9 series touch panels. Requires USB or Ethernet connection to touch panel.	\$13.00 on CD, or FREE download
<a href="#">USB-CBL-AB3</a>	AutomationDirect programming cable, USB A to USB B, 3ft cable length. For use with C-more HMIs, Do-more and Productivity series CPUs and most USB devices.	\$12.00
<a href="#">USB-CBL-AB6</a>	AutomationDirect programming cable, USB A to USB B, 6ft cable length. For use with C-more HMIs, Do-more and Productivity series CPUs and most USB devices.	\$16.00
<a href="#">USB-CBL-AB10</a>	AutomationDirect programming cable, USB A to USB B, 10ft cable length. For use with C-more HMIs, Do-more and Productivity series CPUs and most USB devices.	\$36.50
<a href="#">USB-CBL-AB15</a>	AutomationDirect programming cable, USB A to USB B, 15ft cable length. For use with C-more HMIs, Do-more and Productivity series CPUs and most USB devices.	\$42.50

# C-more Selection Guide & Specifications

Model	6" TFT color w/ base features	6" TFT color w/ full features	7" TFT color w/ base features	7" TFT color w/ full features
<b>Part Number</b>	<a href="#">EA9-T6CL-R</a>	<a href="#">EA9-T6CL</a>	<a href="#">EA9-T7CL-R</a>	<a href="#">EA9-T7CL</a>
<b>Price</b>	\$691.00	\$965.00	\$668.00	\$771.00
<b>Display Actual Size and Type</b>	5.7" TFT color		7.0" TFT color	
<b>Display Viewing Area</b>	4.54" x 3.40" [115.2 mm x 86.4 mm]		6.00" x 3.60" [152.4 mm x 91.4 mm]	
<b>Weight</b>	1.56 lb [710g]	1.59 lb [720g]	1.46 lb [660g]	1.48 lb [670g]
<b>Screen Pixel</b>	320 x 240 (QVGA)		800 x 480 (WVGA)	
<b>Display Brightness</b>	280 nits (typ)		350 nits (typ)	
<b>LCD Panel Dot Pitch</b>	0.18 mm x 0.18 mm		0.190 mm x 0.190 mm	
<b>Color Scale</b>	65,536 colors			
<b>Backlight Average Lifetime*</b>	50,000 hours @ 25°C			
<b>Touch Panel Type**</b>	Four-wire analog resistive, single touch			
<b>Project Memory</b>	26MB			
<b>Number of Screens</b>	Up to 999 screens – limited by project memory			
<b>Realtime Clock</b>	Realtime clock built into panel, backed up for 30 days at 25°C			
<b>Calendar – Month / Day / Year</b>	Yes - monthly deviation 60sec (Reference)			
<b>Serial Port 1</b>	15-pin D-sub female – RS232C, RS-422/485			
<b>Serial Port 2</b>	N/A	3-wire terminal block – RS-485	N/A	3-wire terminal block – RS-485
<b>Serial Port 3</b>	N/A	RJ-12 modular jack – RS-232C	N/A	RJ-12 modular jack – RS-232C
<b>USB Port – Type B</b>	USB 2.0 High speed (480 Mbps) Type B – Download/Program – Max. cable length 15-feet			
<b>USB Port – Type A</b>	USB 2.0 High speed (480 Mbps) Type A – for USB device options – Max. cable length 15-feet – Bus Power – Less than 200mA at 5VDC			
<b>Ethernet Port</b>	N/A	10/100 Base-T, auto MDI/MDI-X		
<b>Ethernet Port - Expansion Module</b>	N/A	<a href="#">EA-ECOM</a>	N/A	<a href="#">EA-ECOM</a>
<b>Audio Line Out</b>	N/A	3.5 mm mini jack – requires amplifier and speaker(s)	N/A	3.5 mm mini jack – requires amplifier and speaker(s)
<b>Mic In (Future)</b>	N/A	3.5 mm mini jack	N/A	3.5 mm mini jack
<b>SD Card Slot</b>	1 slot supports max 2GB (SD,) max 32GB (SDHC)			
<b>HDMI Video Out</b>	N/A			
<b>HDMI Supported Resolution</b>	N/A			
<b>Supply Power</b>	10.2-26.4 VDC Class 2 or SELV (Safety Extra-Low Voltage) Circuit or Limited Energy Circuit (LEC), or use the AC/DC Power Adapter, <a href="#">EA-AC</a> , to power the touch panel from a 100-240 VAC, 50/60 Hz power source. Reverse Polarity Protected			
<b>Power Consumption</b>	16.0 W 1.30 A @ 12VDC 0.66 A @ 24VDC			
<b>Internal Fuse (non-replaceable)</b>	4.0 A			
<b>Altitude</b>	Up to 2000m (6562ft)			
<b>Operating Temperature</b>	0 to 50°C (32 to 122°F) Maximum surrounding air temperature rating: 50°C (122°F) IEC 60068-2-14 (Test Nb, Thermal Shock)			
<b>Storage Temperature</b>	-20 to +60°C (-4 to +140°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)			
<b>Humidity</b>	5-95% RH (non-condensing)			
<b>Environment</b>	For use in Pollution Degree 2 environment, no corrosive gases permitted			
<b>Noise Immunity</b>	(EN61131-2), EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Serge), EN61000-4-6 (Conducted) EN61000-4-8 (Power frequency magnetic field immunity) (Local Test) RFI, (145MHz, 440Mhz 10W @ 10cm), Impulse 1000V @ 1µs pulse			
<b>Withstand Voltage</b>	1000VAC, 1min. (FG to Power supply )			
<b>Insulation Resistance</b>	> 10M ohm @ 500VDC (FG to Power supply )			
<b>Vibration</b>	IEC60068-2-6 (Test Fc)			
<b>Shock</b>	IEC60068-2-27 (Test Ea)			
<b>Emission</b>	EN55011 Class A (Radiated RF emission)			
<b>Enclosure</b>	NEMA 250 type 4/4X indoor use only UL50 type 4X indoor use only IP-65 indoor use only (When mounted correctly)		NEMA 250 type 4/4X indoor use only UL50 type 4X indoor use only IP-65 (not tested by UL) (When mounted correctly)	
<b>Agency Approvals</b>	UL508, E157382, Class 1, Div 2, Groups A, B, C CE (EN61131-2), RoHS (2011/65/EU) CUL Canadian C22.2		UL61010, E157382 CE (EN61131-2), RoHS (2011/65/EU) CUL Canadian C22.2	
<b>NOTES:</b>	*The backlight average lifetime is defined as the average usage time it takes before the brightness becomes 50% of the initial brightness. The lifetime of the backlight depends on the ambient temperature. The lifetime will decrease under low or high temperature usage. **The touchscreen is designed to respond to a single touch. If it is touched at multiple points at the same time, an unexpected object may be activated.			

# C-more 7" TFT Color Touch Panel - Full Model

**EA9-T7CL**

C-more EA9 series touch screen interface panel, 7-inch color TFT (7.0 inch viewable screen), 64K colors, 800 x 480 pixel WVGA screen resolution, 800MHz CPU, 12-24 VDC powered, NEMA 4/4X, IP65 (when mounted correctly; for indoor use only)(not tested by UL), non-replaceable LED backlight. Includes (3) serial ports, USB 2.0 Type A and B ports and Ethernet port; supports SD memory card. Compatible with EA9-PGMSW programming software version 6.3 or later.



**\$771.00**

## Features

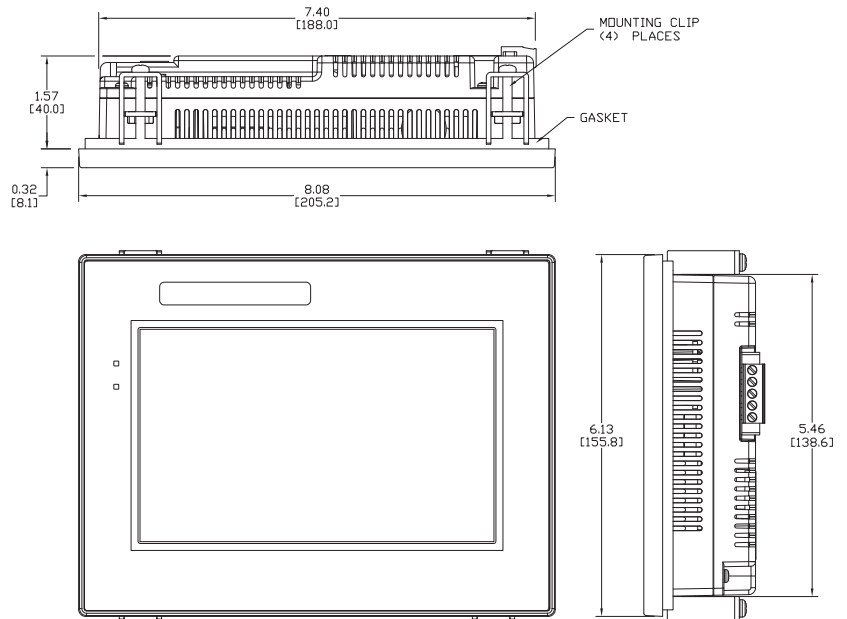
- 7.0" diagonal color TFT (Thin Film Transistor) LCD display with 64K colors
- 800 x 480 pixel resolution
- 350 NITS display brightness
- 50,000 hour average backlight half-life
- Analog resistive (1024 X 1024) touch screen allowing unlimited touch areas
- USB port B (program/download) and USB port A (USB device options)
- Ethernet 10/100 Base-T port (program/download & PLC communication)
- Expansion Module Support
- Use EA-ECOM for second Ethernet Port
- Remote Internet access
- Serial PLC interface (RS-232/422/485)
- One built-in SD memory card slot
- 12-24 VDC powered, 110VAC power adapter (optional)
- Audio Line Out, stereo - requires amplifier and speaker(s)
- 26MB project memory
- Data logging
- 0 to 50°C [32 to 122°F] operating temperature range
- NEMA 4/4X, IP65(not tested by UL) when mounted correctly, indoor use only
- Slim design saves panel space
- UL, cUL & CE agency approvals
- 2-year warranty from date of purchase



Function	Available
Ethernet	Yes
USB	Yes
SD Card	Yes
Audio Out	Yes
HDMI Video Out	No
Expansion Module	Yes

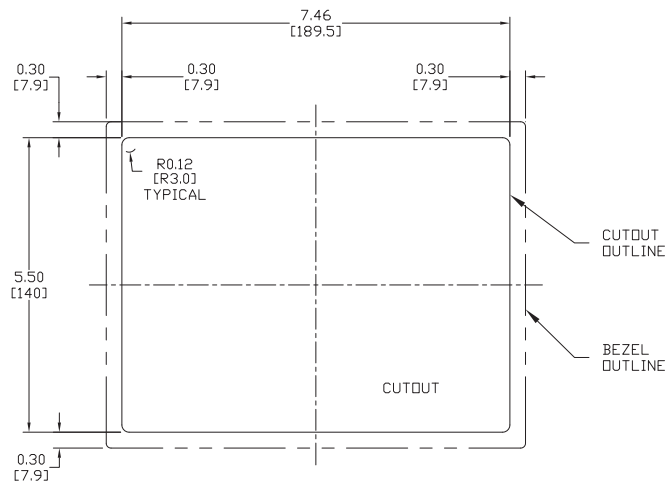
## Dimensions

Units: inches [mm]

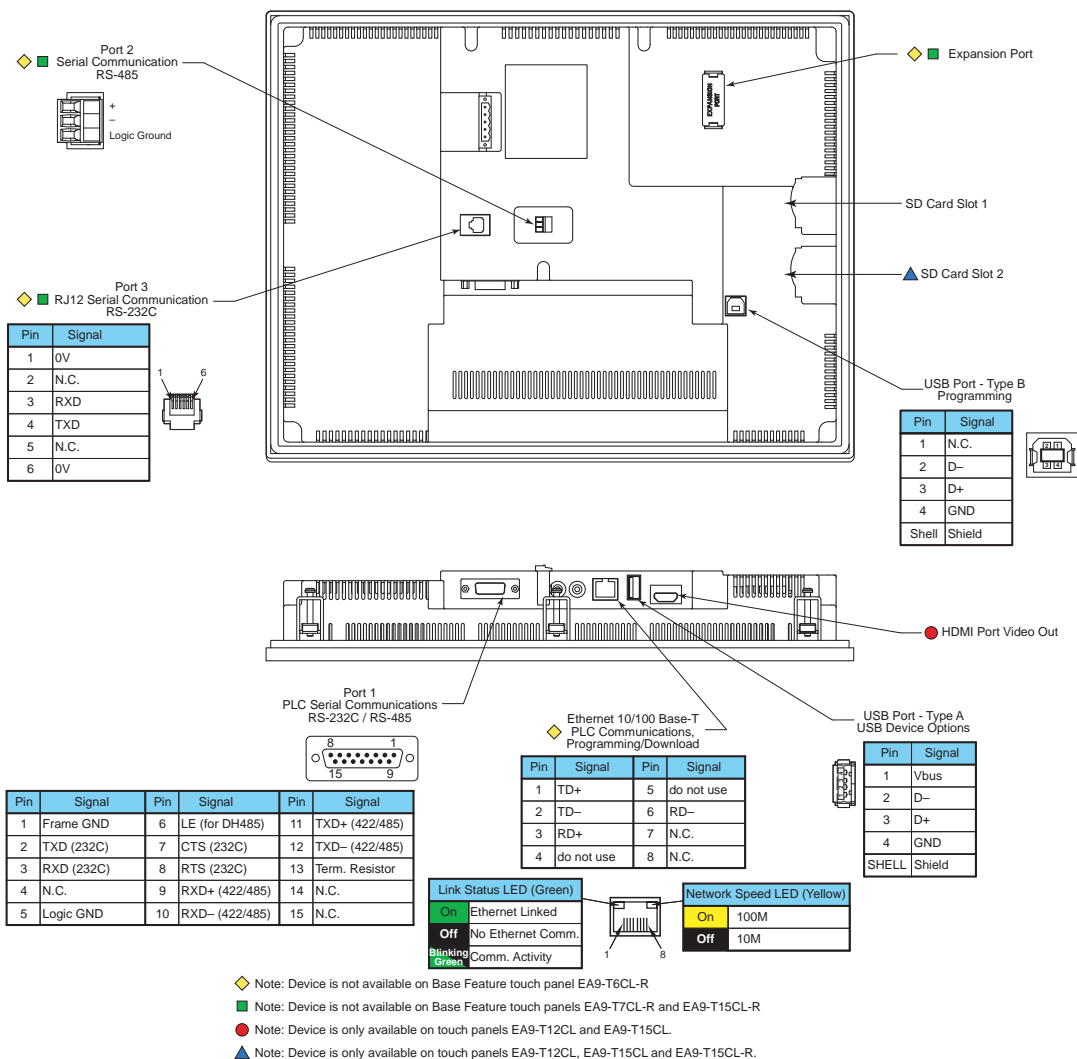


See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.

## Mounting Cutout



# C-more Communication Ports



## Ethernet Port

The Ethernet port has several uses:

- Download program to panel
- Communicate to PLCs/PCs
- Send e-mail
- Access FTP server
- Act as a Web server
- Remote Internet access

The Ethernet port has an RJ-45 8-wire modular connector with green and yellow LEDs.

- The yellow LED indicates network speed – off for a 10 Mbps connection and illuminated for a 100 Mbps connection.
- The green LED indicates link status and illuminates when a link is established.

Note: EA6-T6CL-R does not include an Ethernet port, and does not have these capabilities.

## Expansion Port

The expansion port supports the EA-ECOM module to provide a second Ethernet Port for all full featured models.

## USB Port B

Program C-more via the USB programming port. It's fast and easy, with no baud rate settings, parity, or stop bits to worry about. We stock standard USB cables for your convenience. USB Port B can be used to upload or download projects to and from a PC.

## USB Port A

The Universal Serial Bus (USB) Port A is a standard feature on all models and can be used to connect various USB HID (Human Input Device) devices to the panel, such as the following:

- USB flash drives (USB-FLASH)
- USB keyboards
- USB barcode scanners
- USB card scanners

C-more can log data to the USB flash drive as well as load projects to the panel from the pen drive. You can also back up project files and panel firmware.

## Sound Interface (Audio Line Out)

When attached to an amplifier and speaker(s), C-more can play warning sounds or pre-recorded messages such as "conveyor is jammed". C-more supports WAV type files. The output is stereo.

## Serial Port

**Port 1** - Connect to your serial controller network via Port 1. Port 1 is a 15-pin port that supports RS-232 or RS-422/485.

**Port 2** - Connect your RS-485 network via Port 2. Port 2 is provided with a 3-wire removable terminal block.

**Port 3** - Connect to your RS-232C device via Port 3. Port 3 is an RJ12 connection.

## HDMI Video Out

EA9-T12CL and EA9-T15CL include an HDMI Type A port to provide video output to a projector or remote monitor.

# C-more Communication Protocols & Cables

Compatibility Table			
PLC Family	Model	Protocols	
<b>Allen-Bradley</b>	MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-/01/02/03	DH485/AIC/AIC+	
	MicroLogix 1000, 1100, 1200, 1400 and 1500 SLC 5-03/04/05	DF1 Half Duplex; DF1 Full Duplex	
	ControlLogix™, CompactLogix™, FlexLogix™		
	PLC-5	DF1 Full Duplex	
	ControlLogix, CompactLogix, FlexLogix - Tag Based	DF1 Half Duplex; DF1 Full Duplex	
	ControlLogix, CompactLogix, FlexLogix - Generic I/O Messaging	EtherNet/IP Server	
	ControlLogix, CompactLogix, FlexLogix - Tag Based		
	Micrologix 1100, 1400 & SLC5/05, all via native Ethernet port	EtherNet/IP Client	
	MicroLogix 1000, 1100, 1200, 1400,1500 & SLC 5-03/04/05, all via ENI Adapter		
	Micro 800 series	Modbus RTU Modbus TCP	
Micro 800 series - Tag Based	DF1 Full Duplex EtherNet/IP Client		
<b>Modbus RTU</b>	Modbus RTU devices	Modbus RTU	
<b>Modbus TCP/IP</b>	Modbus TCP/IP devices	Modbus TCP/IP	
<b>GE</b>	90/30, 90/70, Micro 90, VersaMax Micro	SNPX	
	90/30, Rx3i	SRTP Ethernet	
<b>Mitsubishi</b>	FX Series	FX Direct	
	Q02, Q02H, Q06H, Q12H, Q25H	Q CPU	
	Q, QnA Serial	QnA Serial	
	Q, QnA Ethernet	QnA Ethernet	
<b>Omron</b>	C200 Adapter, C500	Host Link	
	CJ1/CS1 Serial, CJ1/CS1 Ethernet	FINS	
<b>Modicon</b>	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU: 311-xx, 411-xx, 512-xx, 612-xx	Modbus RTU	
<b>Siemens</b>	S7-200 CPU, RS-485 Serial	PPI	
	S7-200 CPU, S7-300 CPU, S7-400, S7-1200 CPU, S7-1500; Ethernet	Ethernet ISO over TCP	
<b>Productivity Series</b>	all	Productivity Serial Productivity Ethernet	
	<b>Do-more</b>	all	Do-more Serial Do-more Ethernet
<b>CLICK</b>	all	Modbus (CLICK addressing) Modbus TCP (CLICK addressing)	
	<b>Direct LOGIC</b>	DL05/DL06	all
H0-ECOM/H0-ECOM100			Direct LOGIC Ethernet
DL105			all
DL205		D2-230	K-Sequence
		D2-240	K-Sequence DirectNET
		D2-250/D2-250-1/D2-260/D2-262	K-Sequence
			DirectNET Modbus (Koyo addressing)
		D2-240/D2-250-1/D2-260 using D2-DCM	DirectNET Modbus (Koyo addressing)
		H2-ECOM/H2-ECOM100	Direct LOGIC Ethernet
DL305		D3-330/330P (Requires the use of a Data Communications Unit)	DirectNET
		D3-340	DirectNET
		D3-350	K-Sequence DirectNET Modbus (Koyo addressing)
			DirectNET
DL405		D3-350 using D3-DCM	Modbus (Koyo addressing)
		D4-430	K-Sequence DirectNET
		D4-440	K-Sequence DirectNET
		D4-450/D4-454	K-Sequence DirectNET Modbus (Koyo addressing)
			DirectNET
		All with D4-DCM	Modbus (Koyo addressing)
		H4-ECOM/H4-ECOM100	Direct LOGIC Ethernet
H2-WinPLC (Think & Do) Live V5.2 or later and Studio any version	Think & Do Modbus RTU (serial port)		
H2-WinPLC (Think & Do) Live V5.5.1 or later and Studio V7.2.1 or later	Think & Do Modbus TCP/IP (Ethernet port)		

Cable Description	Cable Part Number	Price
AutomationDirect communication cable, 15-pin male D-sub to 6-pin RJ12, shielded, 9.8ft/3m cable length. For use with C-more or C-more Micro panel and AutomationDirect PLCs with RJ12 ports.	<a href="#"><u>EA-2CBL</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 15-pin D-sub HD15 male, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and a DL06, D2-250(-1), D2-260 or D2-262 (bottom port) CPU.	<a href="#"><u>EA-2CBL-1</u></a>	\$31.50
AutomationDirect communication cable, 15-pin male D-sub to 4-pin RJ11, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and a D3-340 CPU top or bottom port.	<a href="#"><u>EA-3CBL</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 15-pin male D-sub, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and a DL405 (top port) CPU.	<a href="#"><u>EA-4CBL-1</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 25-pin male D-sub, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and a D2-DCM, D3-232-DCU, D3-350 (bottom port) or DL405 (bottom port) CPU.	<a href="#"><u>EA-4CBL-2</u></a>	\$32.00
AutomationDirect communication cable, 15-pin male D-sub to 8-pin male mini DIN, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and an Allen-Bradley Micrologix CPU.	<a href="#"><u>EA-MLOGIX-CBL</u></a>	\$47.50
AutomationDirect communication cable, 15-pin male D-sub to 9-pin female D-sub, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and an Allen-Bradley SLC 5/03, 5/04 or 5/05 CPU with DF-1 port.	<a href="#"><u>EA-SLC-232-CBL</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 25-pin male D-sub, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and an Allen-Bradley PLC-5 CPU with a DF1 port.	<a href="#"><u>EA-PLC5-232-CBL</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 6-pin RJ45, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and an Allen-Bradley SLC 5/01, 5/02 or 5/03 CPU with a DH485 port cable.	<a href="#"><u>EA-DH485-CBL</u></a>	\$30.50
AutomationDirect communication cable, 15-pin male D-sub to 15-pin male D-sub, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro and GE Fanuc Series 90/30 or 90/70 serial port.	<a href="#"><u>EA-90-30-CBL</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 25-pin male D-sub, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and a Mitsubishi FX Series CPU.	<a href="#"><u>EA-MITSU-CBL</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 8-pin male mini DIN, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and a Mitsubishi FX Series CPU.	<a href="#"><u>EA-MITSU-CBL-1</u></a>	\$31.00
AutomationDirect communication cable, 15-pin male D-sub to 25-pin male D-sub, shielded, 3m/9.8ft cable length. For use with C-more or C-more Micro panel and an Omron C200 or C500 CPU.	<a href="#"><u>EA-OMRON-CBL</u></a>	\$31.00

## Example Cables:

**EA-2CBL**



**EA-2CBL-1**



# CLICK PLC Family Overview

## CLICK PLUS PLC Units and Option Slot Modules

CLICK PLUS PLC Units											
PLC	Number of Option Slots	Communication Ports						MicroSD Slot	Battery Backup	Run-Time Edit	Price
		USB	Ethernet (Port 1)	RS-232 (Port 2)	RS-485 (Port 3)	Bluetooth	WLAN				
<a href="#">C2-01CPU</a>	1	Yes (MicroB)	Yes (10/100)	Yes	None	None	None	None	Yes	Yes	\$97.00
<a href="#">C2-01CPU-2</a>	2		Yes (10/100)	Yes	None	None	None	None			\$136.00
<a href="#">C2-02CPU</a>	1		None	None	None	Yes (external antenna required)	Yes (external antenna required)	None			\$151.00
<a href="#">C2-02CPU-2</a>	2		None	None	None	Yes (external antenna required)	Yes (external antenna required)	None			\$193.00
<a href="#">C2-03CPU</a>	1		Yes (10/100)	Yes	Yes	Yes (external antenna required)	Yes (external antenna required)	Yes			\$205.00
<a href="#">C2-03CPU-2</a>	2		Yes (10/100)	Yes	Yes	Yes (external antenna required)	Yes (external antenna required)	Yes			\$255.00



[C2-01CPU](#)



[C2-01CPU-2](#)



[C2-02CPU](#)



[C2-02CPU-2](#)



[C2-03CPU](#)



[C2-03CPU-2](#)



[C2-14xx](#)



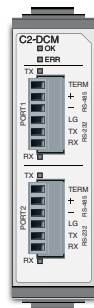
[C2-08xx-4VC](#)



[C2-08xx-6C](#)



[C2-08xx-6V](#)



[C2-DCM](#)

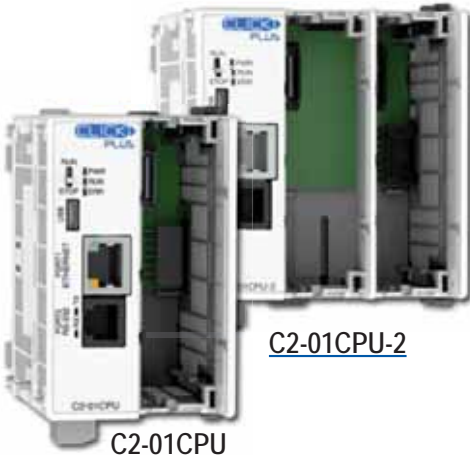
CLICK PLUS Option Slot I/O Modules					
Part Number	Discrete Input Types	Discrete Output Types	Analog Input Types	Analog Output Types	Price
<a href="#">C2-14D1</a>	8 DC (sink/source) 8 points high-speed**	6 DC (sink) 3 points high-speed**	None	None	\$58.00
<a href="#">C2-14D2</a>		6 DC (source) 3 points high-speed**			\$58.00
<a href="#">C2-14DR</a>		6 relay			\$70.00
<a href="#">C2-14AR</a>					8 AC
<a href="#">C2-08D1-4VC*</a>	4 DC (sink/source) 4 points high-speed**	4 DC (sink) 2 points high-speed**	2 channel; voltage (0–5 VDC) / current (4–20 mA); selectable separately per channel, 12-bit	2 channel; voltage (0–5 VDC) / current (4–20 mA); selectable separately per channel, 12-bit	\$90.00
<a href="#">C2-08D2-4VC*</a>		4 DC (source) 2 points high-speed**			\$90.00
<a href="#">C2-08DR-4VC*</a>		4 relay			\$103.00
<a href="#">C2-08AR-4VC*</a>					4 AC
<a href="#">C2-08D1-6C</a>	4 DC (sink/source) 4 points high-speed**	4 DC (sink) 2 points high-speed**	4 channel; current (0–20 mA), 12-bit	2 channel; current (4–20 mA), 12-bit	\$90.00
<a href="#">C2-08D2-6C</a>		4 DC (source) 2 points high-speed**			\$90.00
<a href="#">C2-08DR-6C</a>		4 relay			\$103.00
<a href="#">C2-08AR-6C</a>					4 AC
<a href="#">C2-08D1-6V</a>	4 DC (sink/source) 4 points high-speed**	4 DC (sink) 2 points high-speed**	4 channel; voltage (0–10 VDC), 12-bit	2 channel; voltage (0–10 VDC), 12-bit	\$90.00
<a href="#">C2-08D2-6V</a>		4 DC (source) 2 points high-speed**			\$90.00
<a href="#">C2-08DR-6V</a>		4 relay			\$103.00
<a href="#">C2-08AR-6V</a>					4 AC

\* -4VC Option Slot modules require that you select analog I/O type (voltage or current) in the CLICK programming software.  
 \*\* High-speed Inputs and Outputs are only available when the Option Slot I/O Module is installed in Slot 0.

CLICK PLUS Option Slot Intelligent Modules		
Part Number	Description	Price
<a href="#">C2-DCM</a>	Communications module, 2x RS-232/RS-485 ports, supports Modbus RTU and ASCII protocols	\$118.00

# CLICK PLUS PLC Specifications

## PLC Unit Specifications (continued)



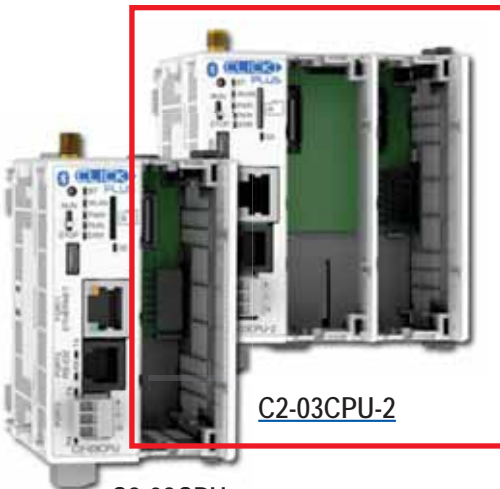
C2-01CPU-2

C2-01CPU



C2-02CPU-2

C2-02CPU



C2-03CPU-2

C2-03CPU

CLICK PLUS PLC Unit Specifications				
	<u>C2-01CPU</u> <u>C2-01CPU-2</u>	<u>C2-02CPU</u> <u>C2-02CPU-2</u>	<u>C2-03CPU</u> <u>C2-03CPU-2</u>	
<b>Control Method</b>	Stored Program/Cyclic execution method			
<b>I/O Numbering System</b>	Fixed in Decimal			
<b>Ladder Memory (steps)</b>	8000			
<b>Total Data Memory (words)</b>	8000			
<b>Contact Execution (boolean)</b>	< 0.2 μs			
<b>Typical Scan (1k boolean)</b>	< 1ms			
<b>RLL Ladder Style Programming</b>	Yes			
<b>Run Time Edits</b>	Yes			
<b>Scan</b>	Variable / fixed			
<b>PLC Mode Switch</b>	1 (RUN/STOP)			
<b>FLASH Memory</b>	Standard on PLC			
<b>Protocol</b>	<b>Modbus RTU (master/slave)</b>	Yes	No	Yes
	<b>ASCII (in/out)</b>	Yes	No	Yes
	<b>Modbus TCP (client server)</b>	Yes	Yes	Yes
	<b>EtherNet/IP Implicit and Explicit (adapter server)</b>	Yes	No	Yes*
<b>MQTT</b>	Publisher: 4 publishers, 3 blocks each Subscriber: 10 blocks			
<b>Data Logging</b>	N/A	N/A	Time, date, 16 addresses	
<b>CLICK Programming Software</b>	Yes (Windows)			
<b>Number of Instructions Available</b>	21			
<b>Control Relays</b>	2000			
<b>System Control Relays</b>	1000			
<b>Timers</b>	500			
<b>Counters</b>	250			
<b>Interrupt</b>	Yes (external: 8 / timed: 4)			
<b>Subroutines</b>	Yes			
<b>For/Next Loops</b>	Yes			
<b>Math (Integer and Hex)</b>	Yes			
<b>Drum Sequencer Instruction</b>	Yes			
<b>Internal Diagnostics</b>	Yes			
<b>Password Security</b>	Yes			
<b>System Error Log</b>	Yes			
<b>User Error Log</b>	No			
<b>Memory Backup</b>	Super capacitor + battery			
<b>Battery Backup</b>	Yes (battery part #D0-MC-BAT)			
<b>Calendar/Clock</b>	Yes			

\* EtherNet/IP available on the Ethernet RJ45 port only. Not available over Wi-Fi.

# CLICK PLUS PLC Specifications

## PLC Unit Specifications (continued)

CLICK PLUS PLC Unit Specifications							
		<i>C2-01CPU</i>	<i>C2-01CPU-2</i>	<i>C2-02CPU</i>	<i>C2-02CPU-2</i>	<i>C2-03CPU</i>	<i>C2-03CPU-2</i>
<b>I/O Slot</b>	<b>Internal I/O</b>	N/A (optional)					
	<b>Option Slot Support</b>	Yes, 1	Yes, 2	Yes, 1	Yes, 2	Yes, 1	Yes, 2
	<b>Expansion I/O</b>	Yes (max. 8 modules)					
<b>Com. Ports</b>	<b>USB Port (programming)</b>	Yes (device) (For programming and providing 5VDC power, microB USB)					
	<b>Ethernet (RJ45)</b>	Yes (10/100)		No		Yes (10/100)	
	<b>Serial Port RS-232 (RJ12)</b>	Yes		No		Yes	
	<b>Serial Port RS-485 (terminal block)</b>	No				Yes	
	<b>WLAN</b>	No		Yes (RP-SMA connection for optional external antenna, shared)			
	<b>Bluetooth</b>	No					
<b>Status Indicators</b>	<b>WLAN Status LED</b>	None		1			
	<b>Bluetooth Status LED</b>	None		1			
	<b>CPU Status LED</b>	3 (PWR/RUN/ERR)					
	<b>Ethernet Status LED</b>	2 (LINK/ACT 10/100)		None		2 (LINK/ACT 10/100)	
	<b>Serial Status LED</b>	2 (TX/RX)		None		2 (TX/RX)	
	<b>SD Card Status LED</b>	None				1	
<b>Other</b>	<b>MicroSD Card Slot (SDHC-compatible)</b>	No				Yes	
<b>Power</b>	<b>Nominal Input Voltage</b>	24VDC (4-pin terminal block)					
	<b>Operating Voltage Range</b>	24VDC, Class 2 or SELV (Safety Extra-Low Voltage) or Limited Energy Circuit power supply					
	<b>Input Voltage Range</b>	20.0–28.0 VDC					
	<b>Maximum Inrush Current</b>	30A @ 1ms					
	<b>Power Consumption</b>	20W	22W	20W	22W	20W	22W
	<b>Acceptable External Power Drop</b>	Max 10ms (AC power failure with C0-00AC or C0-01AC)					
	<b>Current Required</b>	110mA	120mA	105mA	115mA	130mA	140mA
	<b>Fuse</b>	None					
	<b>External Fuse Recommended</b>	No					
	<b>Polarity Protection</b>	Power input is reverse polarity protected					
	<b>USB Supply</b>	5VDC (via USB programming port)					
<b>Communication Port &amp; Terminal Block Replacement</b>		N/A		N/A		AutomationDirect p/n C0-3TB	
<b>24VDC Power Terminal Block Replacement</b>		AutomationDirect p/n C0-4TB					
<b>Antenna Requirements</b>		N/A		2.4 GHz antenna, RP-SMA connector (AutomationDirect p/n SE-ANT250 or SE-ANT210)			
<b>Drawing Link</b>		<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>
<b>Weight</b>		3.5 oz [99g]	4.0 oz [114g]	3.3 oz [94g]	3.8 oz [109g]	4.0 oz [114g]	4.6 oz [129g]

# CLICK PLUS PLC Specifications

## General Specifications For All CLICK PLUS PLC Products

These general specifications apply to all CLICK PLUS PLCs. Please refer to the appropriate I/O temperature derating charts under the Option Slot module and Stackable I/O module specifications to determine best operating conditions based on the ambient temperature of your particular application.

General Specifications	
<b>Operating Temperature</b>	32°F to 131°F [0°C to 55°C]
<b>Storage Temperature</b>	-4°F to 158°F [-20°C to 70°C] IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
<b>Ambient Humidity</b>	30% to 95% relative humidity (non-condensing)
<b>Environmental Air</b>	No corrosive gases. Environmental pollution level is 2 (UL840)
<b>Environment</b>	For Indoor Use Only
<b>Vibration</b>	IEC60068-2-6 (Test Fc) 5-9Hz:3.5mm amplitude, 9-150Hz 1.0G 10 sweep cycles per axis on each of 3 mutually perpendicular axes.
<b>Shock</b>	IEC60068-2-27 (Test Ea) 15G peak, 11ms duration, 3 shocks in each direction per axis, on 3 mutually perpendicular axes.
<b>Voltage Withstand (Dielectric)</b>	1000VAC, 1 minute (between G and 24V IN)
<b>Insulation Resistance</b>	500VDC, 10M ohm (between G and 24V IN)
<b>Noise Immunity</b>	<EN61131-2> EN61000-4-2 (ESD): 4kV(Contact Discharge) 8kV(Air Discharge) EN61000-4-3 (RFI): 10V/m (80MHz-1GHz) ,3V/m (1.4 GHz-2.0 GHz) 1V/m (2.0 GHz-2.7 GHz) EN61000-4-4 (FTB) : 2kV ,positive/negative , 5kHz (DC Power Port) 1kV ,positive/negative, 5kHz (I/O and Communication Port) EN61000-4-5 (Surge): 0.5 kV/1kV line to line 0.5 kV/1kV line to earth EN61000-4-6 (Conducted): 10V ,0.15 MHz – 80MHz EN61000-4-8 (Power frequency magnetic field immunity) : 30A/m <Local Test> Impulse Immunity : 1000V @ 1µs pulse
<b>Emissions</b>	EN55011 Class A (Radiated RF emission)
<b>Agency Approvals</b>	UL61010 (File No. E157382, E316037); CE (EN61131-2); CUL Canadian C22.2
<b>Radio Standards</b>	FCC part15C (US), RED Article3.2 (CE), IC RSS-247 (Canada), MIC Item 19 of Article 2-1 (Japan), AS/NZS 4268 (Australia/New Zealand)
<b>Other</b>	RoHS 2011/65/EU Amendment (EU)2015/863

# CLICK PLUS PLC Specifications

## CLICK PLUS PLC Hardware/Software Compatibility

The table below shows the minimum software and hardware versions required for the CLICK PLUS PLCs and Option Slot Modules. The CLICK PLUS PLC can also utilize the CLICK Stackable I/O Modules, as any software and hardware version compatible with CLICK PLUS is also compatible with the CLICK Stackable I/O Modules.

CLICK PLUS PLC Features Software Compatibility						
Device Type	Part Number	Minimum CLICK Software Version				
		Hardware	High-Speed Inputs*	High-Speed Outputs*	EtherNet/IP	PID, DHCP, DNS, SNTP, MQTT
<b>CLICK PLUS CPU</b>	<a href="#">C2-01CPU</a>	v3.00	v3.00	v3.30	v3.00	v3.00
	<a href="#">C2-02CPU</a>				N/A	
	<a href="#">C2-03CPU</a>				v3.00	
	<a href="#">C2-01CPU-2</a>	v3.20	v3.20	v3.20	v3.20	v3.20
	<a href="#">C2-02CPU-2</a>				N/A	
	<a href="#">C2-03CPU-2</a>				v3.20	
<b>Option Slot I/O Modules</b>	<a href="#">C2-14D1</a>	v3.00	v3.00	v3.30	N/A	N/A
	<a href="#">C2-14D2</a>			N/A		
	<a href="#">C2-14DR</a>					
	<a href="#">C2-14AR</a>		N/A			
	<a href="#">C2-08D1-4VC</a>	v3.00	v3.00	v3.30	N/A	N/A
	<a href="#">C2-08D2-4VC</a>			N/A		
	<a href="#">C2-08DR-4VC</a>					
	<a href="#">C2-08AR-4VC</a>		N/A			
	<a href="#">C2-08D1-6C</a>	v3.00	v3.00	v3.30	N/A	N/A
	<a href="#">C2-08D2-6C</a>			N/A		
	<a href="#">C2-08DR-6C</a>					
	<a href="#">C2-08AR-6C</a>		N/A			
	<a href="#">C2-08D1-6V</a>	v3.00	v3.00	v3.30	N/A	N/A
	<a href="#">C2-08D2-6V</a>			N/A		
	<a href="#">C2-08DR-6V</a>					
<a href="#">C2-08AR-6V</a>		N/A				
<b>Option Slot Intelligent Modules</b>	<a href="#">C2-DCM</a>	v3.20	N/A	N/A	N/A	N/A

\* High-speed Inputs and Outputs are only available when the Option Slot I/O Module is installed in Slot 0.

# DURAPULSE GS4 AC Drives – Introduction

DURAPULSE GS4 AC Drives																						
Motor Rating	HP	1	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	175	215	250	300
	kW	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220
230V Single-Phase Input / 230V Three-Phase Output		✓	✓	✓	✓	✓	✓	✓	✓	✓												
230V Three-Phase Input/Output		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
460V Three-Phase Input/Output		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



## Overview

The DURAPULSE GS4 series of AC drives includes many of the same standard features as our GS family of drives including dynamic braking, PID, removable keypad, and RS-485 Modbus communication.

The GS4 drive expands the DURAPULSE family by adding single-phase input capability (ALL 230VAC drives can be supplied single-phase), a built-in PLC, serial BACnet, and optional EtherNet/IP and ModTCP cards. GS4 QuickStart menus simplify configuration by consolidating the most-often-used parameters into concise groups.

DURAPULSE GS4 AC drives also offer sensorless vector control for improved speed regulation. The smart keypad is designed with defaults to quickly allow you to configure the drive, set the speed, start and stop the drive, and monitor critical parameters of your application. In addition, up to four drive configurations can be stored in the keypad, and transferred to additional DURAPULSE GS4 drives of the same model. Users can also store up to 32 parameters of their choice in a custom Quick-Start menu.

DURAPULSE GS4 offers three analog inputs, two analog outputs, one frequency output, ten digital inputs, two digital outputs, two SPDT relay outputs, and two STO inputs. All of the analog and digital I/O (except the Start/Stop and STO inputs) can be configured for a wide variety of input or output functions. Three option cards expand the I/O offering with a relay output card, an AC input card, and a combo DC I/O card.

## Features

- Wide Offering from 1 to 300 hp
- Single-Phase/Three-Phase 230VAC Three-Phase 460VAC
- Single-Phase UL Ratings – 230VAC input for 1 to 100 hp models (see selection tables for derated output)
- Dual Rating Design – CT/VT Ratings (Light & Heavy Duty)
- Flexible Carrier Frequency to 15khz and Output Frequency to 600Hz
- STO – Safe Torque Off (TUV Certified)
- Built-in PLC to support up to 10k steps
- Free downloadable software for Drive Configuration and PLC Programming
- Field-upgradable Firmware via USB port (Drive, Keypad, & Communication Option Cards)
- Hot-Pluggable LCD Text-Based Keypad (IP20/ NEMA 1) can be remotely mounted
- Embedded Quick-Start Menus
- Local/Remote control mode selection from the Keypad or digital/comm input with Hand/Off/Auto Control
- Display Units of Measure of your choice (GPM, FPM, etc.)
- Momentary Power Loss Restarts
- 100KA Short Circuit Current Rating
- Built-In DC Choke (some models)
- Flange-Mount Capability for frame sizes A to F (1 to 215 hp)
- Conduit Box(s) for NEMA 1 (Frame sizes D0 to G)
- Expanded I/O capability – 110V Inputs, Relay Outputs, combo DC I/O card
- Analog I/O – Configurable 3 Inputs and 2 Outputs
- Auto Speed Search capability
- Multi-Motor (Motor#1,#2) Control
- Dynamic Braking – Optional Dynamic Braking Units and Comprehensive offering of Resistors
- PID Controller – Including Sleep and Wake
- Password Protection
- RTD and/or PTC Input Motor Protection
- Parameter Organization similar to GS3 – GS3 Operational (External User PLC) control will work with minimal changes required.
- Calendar function allows a user to program the PLC with ON/OFF control in chronological order, daylight savings time, etc.
- Modularized design eases maintenance and expansion, including quick replacement of fans
- High speed communication interfaces with MODBUS RTU and BACnet protocols built in, with optional communication cards: MODBUS

TCP, EtherNet/IP

- Circuit boards have conformal coating for improved environmental tolerance
- Excellent heat-sink design; able to operate at 50°C ambient temperature
- Fire Mode – Run fire mode during emergencies to have uninterrupted smoke removal and system pressure
- Multi-pump control: fixed quantity, fixed displacement, and fixed time-circulating control; able to control up to 8 pumps (Optional multi-control relay output card is required.)
- Two-year warranty
- CE, TUV, UL, cUL

## Accessories

- AC line reactors
- EMI filters
- RF filter
- Braking resistors
- Braking units (for models 20hp and above)
- Fuses
- Conduit boxes
- Flange-Mount Kits
- Replacement cooling fans
- Replacement keypad (and remote-mount bezel kit)
- I/O Option Cards
- EtherNet/IP comm card
- Modbus TCP comm card
- Four and eight-port RS-485 multi-drop termination boards
- GSoft2 drive configuration software
- GSLogic PLC programming software
- USB-485M – USB to RS-485 PC adapter (see “Communications Products” chapter for detailed information)
- Detailed descriptions and specifications for GS accessories are available in the “GS/ DURApulse Accessories” section.

## Typical Applications

- Conveyors
- Compressors
- Material handling
- Extruding
- Grinding
- Shop tools
- Fans
- Pumps
- HVAC
- Mixing

# DURAPULSE GS4 AC Drives – Selection Specifications

460V Class GS4 Specifications – Constant & Variable Torque Frame Sizes A, B (1hp–20hp)												
Model Name				GS4-41P0	GS4-42P0	GS4-43P0	GS4-45P0	GS4-47P5	GS4-4010	GS4-4015	GS4-4020	
Frame Size				A						B		
Output Rating	Constant Torque (CT)	Max Motor Output	hp	1	2	3	5	7.5	10	15	20	
			kW	0.75	1.5	2.2	3.7	5.5	7.5	11	15	
		Rated Output Capacity	kVA	2.3	3.0	4.5	6.5	8.8	14	18	24	
		Rated Output Current	A	2.9	3.8	5.7	8.1	11	17	23	30	
		Carrier Frequency	kHz	2 to 6								
	Variable Torque (VT)	Max Motor Output	hp	1	2	3	5	7.5	10	15	20	
			kW	0.75	1.5	2.2	3.7	5.5	7.5	11	15	
		Rated Output Capacity	kVA	2.4	3.2	4.8	7.2	9.6	14	19	25	
Rated Output Current		A	3	4	6	9	12	18	24	32		
	Carrier Frequency	kHz	2 to 15									
Input Rating *	CT	Rated Input Current	A	4.1	5.6	8.3	13	16	19	25	33	
	VT		A	4.3	5.9	8.7	14	17	20	26	35	
	Rated Voltage/Frequency			3-phase 380–480 VAC (-15% to +10%), 50/60Hz								
	Operating Voltage Range			323–528 VAC								
	Frequency Tolerance			47–63 Hz								
	Short Circuit Withstand (SCCR) (A, rms symmetrical)			100kA								
IE2 Efficiency - Relative Power Loss				2.6%	2.3%	2.2%	2.0%	1.9%	2.1%	2.0%	1.8%	
Weight (kg [lb])				2.6 [5.7]						5.4 [11.9]		
Watt Loss @ 100% I (W) **				59	74	104	141	180	292	380	518	
Cooling Method				natural convection		fan						
Dynamic Braking				built in								
DC Choke				optional								
EMI Filter				optional								

\* For Use With Three-Phase Motors Only.  
 If 3-phase power source is non-symmetrical, refer to "Circuit Connections – RFI Jumper" in the GS4 AC Drives User Manual, Chapter 2 ([www.automationdirect.com](http://www.automationdirect.com)).  
 Please refer to "GS4 DURApulse Accessories – Fusing" (pg.tGSX-162) for input fusing information.  
 \*\* Watt loss is reduced if the GS4 drive is flange mounted (frame sizes A through F).

# DURAPULSE GS4 AC Drives – General Specifications





GS4 General Specifications (Applicable to All Models)		
<b>Control Characteristics</b>	<b>Control Method</b>	1: V/F (V/Hz control); 2: SVC (sensorless vector control)
	<b>Starting Torque</b>	Up to 120% Variable Torque (VT) or 150% Constant Torque (CT) for one minute
	<b>V/F Curve</b>	4 point adjustable V/Hz curve and square curve
	<b>Speed Response Ability</b>	5Hz
	<b>Torque Limit</b>	VT: 170% output current CT: 180% output current
	<b>Torque Accuracy</b>	±5%
	<b>Max Output Frequency (Hz)</b>	230V series: 600.00 Hz (75hp & above: 400.00 Hz) 460V series: 600.00 Hz (125hp & above: 400.00 Hz)
	<b>Output Frequency Accuracy</b>	Digital command: ±0.01%, -10°C to +40°C Analog command: ±0.1%, 25±10°C
	<b>Output Frequency Resolution</b>	Digital command: 0.01Hz Analog command: (0.03) x (max output frequency) / 60Hz [±11 bit]
	<b>Overload Tolerance</b>	VT duty: rated output current is 120% for 60 seconds CT duty: rated output current is 150% for 60 seconds
	<b>Frequency Setting Signal</b>	+10V to -10V, 0 to 10V, 4–20mA, 0–20mA
	<b>Accel/Decel Time</b>	0.00–600.00 / 0.0–6000.0 seconds
	<b>Main Control Function</b>	Fault restart; Parameter copy; Dwell; BACnet communication; Momentary power loss ride-through; Speed search; Over-torque detection; Torque limit; 16-step speed (max); Accel/Decel time switch; S-curve accel/decel; 3-wire sequence; Auto-Tuning (rotational, stationary); Frequency upper/lower limit settings; Cooling fan on/off switch; Slip compensation; Torque compensation; JOG frequency; MODBUS communication (RS-485 RJ45, max 115.2 kbps); DC injection braking at start/stop; Smart stall; PID control (with sleep function); Energy saving control; Optional ModbusTCP or EtherNet/IP communication/control
<b>Fan Control</b>	230V model GS4-2020 and above: PMW control 230V model GS4-2015 and below: ON/OFF switch control 460V model GS4-4025 and above: PMW control 460V model GS4-4020 and below: ON/OFF switch control	
<b>Protection Characteristics</b>	<b>Motor Protection</b>	Electronic thermal relay protection
	<b>Over-current Protection</b>	For drive model 230V and 460V: Over-current protection for 240% rated current Current clamp: VT duty 170–175%; CT duty 180–185%
	<b>Over-voltage Protection</b>	230V: drive will stop when DC-BUS voltage exceeds 410V 460V: drive will stop when DC-BUS voltage exceeds 820V
	<b>Over-temperature Protection</b>	Built-in temperature sensor
	<b>Stall Prevention</b>	Independent stall prevention during acceleration, deceleration, and running
	<b>Restart After Instantaneous Power Failure</b>	Up to 20 seconds (parameter settable)
	<b>Ground Leakage Current Protection</b>	Leakage current is higher than 50% of rated current of the AC motor drive
	<b>Hi-Pot Test</b>	UL508C; EN 61800-5-1
<b>Conformal Coating</b>	IEC-60721-3-3	
<b>Agency Approvals</b>	CE, Reach, RoHS, TUV, cULus; (Accessories are CE; Agency approvals other than CE do not apply to accessory conduit box kits, fan kits, flange mount kits, and braking resistors.) To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.	

# GS4-Specific Optional Accessories – Flange Mounting Kits

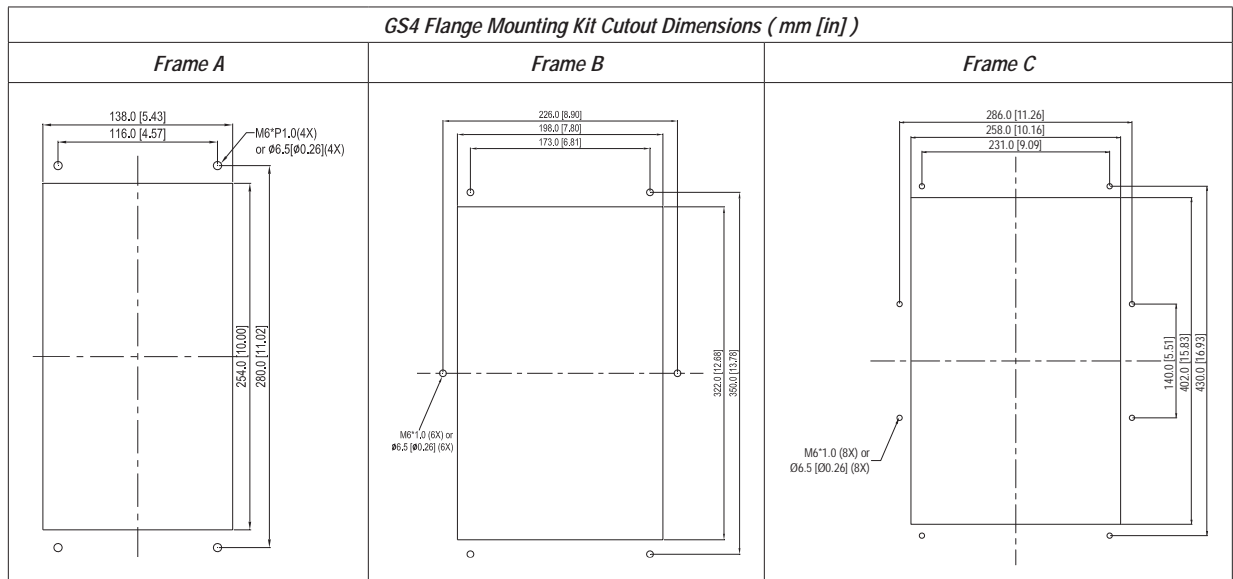
## Flange Mounting Kits

Optional GS4 drive flange mounting kits allow the heat sinks on the back of select GS4 drives to be positioned through the back of the control enclosure. Since a majority of the heat generated by the GS4 drive will be outside the enclosure, heat load will be reduced and a smaller enclosure may possibly be used. These flange mounting kits are applicable to GS4 drive frame sizes A through C.

**NOTE:** GS4 Frames D0, D, E, and F have integral flange mounting hardware; additional Flange Mounting Kit not required (see cutout dimensions below).  
Frame size G cannot be flange-mounted.

GS4 Frame Sizes A–C – Flange Mounting Kit Selection Table					
Drive		Flange Mounting Kit **			Description
Model	Frame*	Part #	Price	Photo	
GS4-22P0 GS4-23P0 GS4-43P0	A	<a href="#"><u>GS4-FMKIT-1</u></a>	\$74.00		GS4 series Flange Mounting Kit, NEMA 1; for use with multiple GS4 Frame A drives; adapter plate and mounting hardware included
GS4-21P0 GS4-25P0 GS4-41P0 GS4-42P0 GS4-45P0 GS4-47P5	A	<a href="#"><u>GS4-FMKIT-A</u></a>	\$62.00		GS4 series Flange Mounting Kit, NEMA 1; for use with multiple GS4 Frame A drives; mounting hardware included
GS4-27P5 GS4-2010 GS4-2015 GS4-4010 GS4-4015 GS4-4020	B	<a href="#"><u>GS4-FMKIT-B</u></a>	\$70.00		GS4 series Flange Mounting Kit, NEMA 1; for use with GS4 Frame B drives; mounting hardware included
GS4-2020 GS4-2025 GS4-2030 GS4-4025 GS4-4030 GS4-4040	C	<a href="#"><u>GS4-FMKIT-C</u></a>	\$79.00		GS4 series Flange Mounting Kit, NEMA 1; for use with GS4 Frame C drives; mounting hardware included

\* See panel cutout dimensions below for GS4 Frames A, B, C.  
 \* GS4 Frames D0, D, E, and F have integral flange mounting hardware; additional Flange Mounting Kit not required. See Appendix A of the GS4 User Manual for panel cut-out dimensions for frames D0, E, F.  
 \* Frame size G cannot be flange-mounted.



# DURAPULSE GS4 AC Drives Specifications – Installation

Understanding the installation requirements for your DURAPULSE AC drive will help to ensure that it operates within its environmental and electrical limits.

*Note: Never use only this catalog for installation instructions or operation of equipment; refer to the User Manual, GS4\_UMW.*

Environmental Conditions for GS4 AC Drives			
Condition	Operation	Storage	Transportation
Installation Location	IEC60364-1/IEC60664-1 Pollution degree 2, Indoor use only	n/a	n/a
Ambient Temperature	see separate Operating Temperature table below	-25°C to +70°C	
Relative Humidity	Max 90%, non-condensing, non-frozen	Max 95%, non-condensing, non-frozen	
Air Pressure	86 to 106 kPa	70 to 106 kPa	
Pollution Level	IEC721-3-3, no concentrate		
	Class 3C2; Class 3S2	Class 2C2; Class 2S2	Class 1C2; Class 1S2
Altitude	0–1000m (see separate derating section for altitudes of 1000–3000m)	n/a	n/a
Package Drop	n/a	ISTA procedure 1A (according to weight) IEC60068-2-31	
Vibration	1.0mm, peak to peak value range from 2Hz to 13.2Hz; 0.7G–1.0G range from 13.2Hz to 55Hz; 1.0G range from 55Hz to 512Hz. Comply with IEC 60068-2-6		
Impact	IEC/EN 60068-2-27		
Installation Orientation	<div style="text-align: center;"> <p>Max allowed offset angle <math>\pm 10^\circ</math> (from vertical installation position)</p> </div>		

Operating Temperature and Protection Level					
Frame Size	Top cover	Conduit Box	Protection Level	Operating Temperature	
A–C	230V: 1.0–30 hp 460V: 1.0–40 hp	With top cover removed	Standard conduit plate	IP20 / UL Open Type	-10–50°C [14–122°F]
		With top cover in place		IP20 / UL Type1 / NEMA 1	-10–40°C [14–104°F]
D0–G	230V: >30hp 460V: >40hp	N/A	With conduit box	IP20 / UL Type1 / NEMA 1	-10–40°C [14–104°F]
	230V: >30hp 460V: >40hp	N/A	Without conduit box	IP00 / IP20 / UL Open Type * <b>Only the circled area is IP00.</b> <b>Other parts are IP20.</b>	-10–50°C [14–122°F]

\* Only the exposed terminal blocks are IP00; the other components are IP20



**WARNING:** AC DRIVES GENERATE A LARGE AMOUNT OF HEAT WHICH MAY DAMAGE THE AC DRIVE. AUXILIARY COOLING METHODS MAY BE REQUIRED TO AVOID EXCEEDING MAXIMUM OPERATING TEMPERATURE. WHEN POSSIBLE, CONSIDER FLANGE MOUNTING TO LOWER ENCLOSURE TEMPERATURES.



**WARNING:** MAXIMUM AMBIENT TEMPERATURES MUST NOT EXCEED 50°C (122°F), OR 40°C (104°F), FOR ALL GS4 MODELS.

# DURAPULSE GS4 AC Drives Specifications – Air Flow and Power (Heat) Dissipation

GS4 AC Drives Air Flow and Power (Heat) Dissipation									
Model Number	Airflow Rate <sup>1)</sup> for Cooling						Power (Heat) Dissipation <sup>2)</sup>		
	Flow Rate <sup>1)</sup> (cfm)			Flow Rate <sup>1)</sup> (m <sup>3</sup> /hr)			Power Dissipation <sup>2)</sup> (Watt)		
	External	Internal	Total	External	Internal	Total	External (Heat sink)	Internal	Total
<a href="#">GS4-21P0</a>	–	–	–	–	–	–	33	27	60
<a href="#">GS4-22P0</a>	14	–	14	24	–	24	56	31	87
<a href="#">GS4-23P0</a>	14	–	14	24	–	24	79	36	115
<a href="#">GS4-25P0</a>	10	–	10	17	–	17	113	46	159
<a href="#">GS4-27P5</a>	40	14	54	68	24	92	197	67	264
<a href="#">GS4-2010</a>	66	14	80	112	24	136	249	86	335
<a href="#">GS4-2015</a>	58	14	73	99	24	123	409	121	530
<a href="#">GS4-2020</a>	166	12	178	282	20	302	455	161	616
<a href="#">GS4-2025</a>	166	12	178	282	20	302	549	184	733
<a href="#">GS4-2030</a>	166	12	178	282	20	302	649	216	865
<a href="#">GS4-2040</a>	179	30	209	304	51	355	913	186	1099
<a href="#">GS4-2050</a>	179	30	209	304	51	355	1091	220	1311
<a href="#">GS4-2060</a>	228	73	301	387	124	511	1251	267	1518
<a href="#">GS4-2075</a>	228	73	301	387	124	511	1401	308	1709
<a href="#">GS4-2100</a>	246	73	319	418	124	542	1770	369	2139
<a href="#">GS4-41P0</a>	–	–	–	–	–	–	33	25	58
<a href="#">GS4-42P0</a>	–	–	–	–	–	–	45	29	74
<a href="#">GS4-43P0</a>	14	–	14	24	–	24	71	33	104
<a href="#">GS4-45P0</a>	10	–	10	17	–	17	103	38	141
<a href="#">GS4-47P5</a>	10	–	10	17	–	17	134	46	180
<a href="#">GS4-4010</a>	40	14	54	68	24	92	216	76	292
<a href="#">GS4-4015</a>	66	14	80	112	24	136	287	93	380
<a href="#">GS4-4020</a>	58	14	73	99	24	123	396	122	518
<a href="#">GS4-4025</a>	99	21	120	168	36	204	369	138	507
<a href="#">GS4-4030</a>	99	21	120	168	36	204	476	158	634
<a href="#">GS4-4040</a>	126	21	147	214	36	250	655	211	866
<a href="#">GS4-4050</a>	179	30	209	304	51	355	809	184	993
<a href="#">GS4-4060</a>	179	30	209	304	51	355	929	218	1147
<a href="#">GS4-4075</a>	179	30	209	304	51	355	1156	257	1413
<a href="#">GS4-4100</a>	186	30	216	316	51	367	1408	334	1742
<a href="#">GS4-4125</a>	257	73	330	437	124	561	1693	399	2092
<a href="#">GS4-4150</a>	223	73	296	379	124	503	2107	491	2598
<a href="#">GS4-4175</a>	224	112	336	381	190	571	2502	579	3081
<a href="#">GS4-4200</a>	289	112	401	491	190	681	3096	687	3783
<a href="#">GS4-4250</a>			454			771			4589
<a href="#">GS4-4300</a>			454			771			5772

The required airflow shown in chart is for installing a single GS4 drive in a confined space. When installing multiple GS4 drives, the required air volume would be the cumulative air volume for all drives in the enclosure.

Heat dissipation shown in the chart is for installing a single GS4 drive in a confined space. When installing multiple drives, the volume of heat dissipation should be the cumulative heat dissipation of all drives in the enclosure. Heat dissipation for each model is calculated by rated voltage, current and default carrier frequency.

- 1) **External flow rate** is across the heat sink. **Internal flow rate** is through the chassis. Published flow rates are the result of active cooling using fans; factory-installed in the drive. Unpublished flow rates (-) are the result of passive cooling in drives without factory-installed fans.
- 2) When calculating power dissipation (Watt Loss) use the **total** value if the drive is foot mounted, or the **internal** value if the drive is flange mounted. Where only a total value is published, these models cannot be flange mounted.

Dimensions for Minimum Clearance * (mm / in)				
Frame Size	Above & Below	Side to Non-Heat Source	Side to Heat Source	Front
A–C	60 / 2.4	30 / 1.2	10 / 0.4	0 / 0
D(0)–F	100 / 4.0	50 / 2.0	n/a	0 / 0
G	200 / 7.9	100 / 4.0	2 x B	0 / 0

\* The minimum mounting clearances stated in this table applies to GS4 drives frames A to G. Failure to follow the minimum mounting clearances may cause the fan to malfunction and cause a heat dissipation problem.

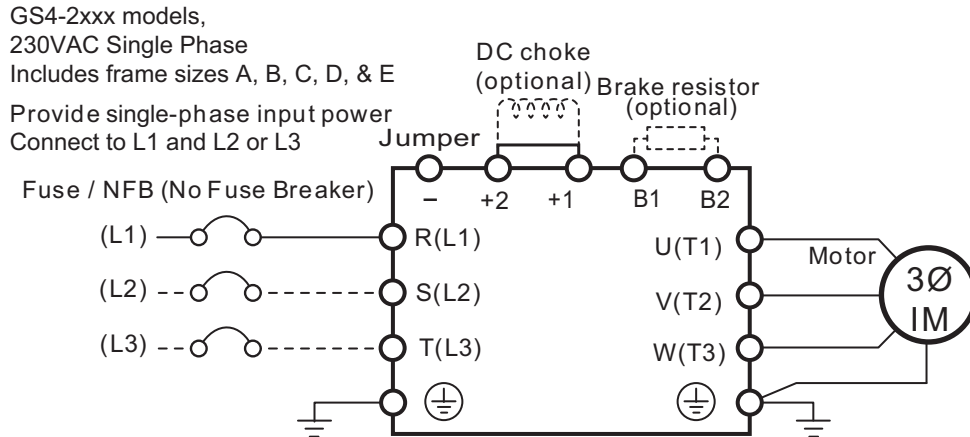
# DURAPULSE GS4 AC Drives Specifications – Terminals

Control Circuit Terminals			Main Circuit Terminals	
Terminal	Description	Remarks	Terminal	Description
+10V	Potentiometer Power Supply	Analog frequency setting: +10VDC 20mA max output	R/L1	Input Power – phase 1
-10V		Analog frequency setting: -10VDC 20mA max output	S/L2	Input Power – phase 2
+24V		Digital Control Signal Source	+24V±5%, 200mA max output; use with DCM	T/L3
AI1	Analog Input 1	Range: 0–10V or 0/4–20mA = 0–Max Output Frequency AI1 switch = SW3; factory setting is 0–10V Impedance: 20kΩ (SW3 = 0–10V); 250Ω (SW3 = 0/4–20mA)	U/T1, V/T2, W/T3	AC Drive Output
AI2	Analog Input 2	Range: 0/4–20mA or 0–10V = 0–Max Output Frequency AI2 Switch = SW4; factory setting is 0–20mA Impedance: 250Ω (SW4 = 0/4–20mA); 20kΩ (SW4 = 0–10V);	+1, +2	DC Choke Connection (frames A–C)
AI3	Analog Input 3	Impedance: 20kΩ Range: -10VDC to +10 VDC = 0–Max Output Frequency <i>Note: For -10V to +10V operation, connect the pot to +10V and -10V. Keep the pot wiper connected to AI3.</i>	B1, B2	Braking Resistor Connection (frames A–C)
ACM	Analog Common	Common for analog terminals	+1/DC+, -/DC-	External Dynamic Brake Unit (frames D–G)
AO1	Analog Output 1	-10 to +10V max output current 2mA; max load 5kΩ Resolution: 0–10V corresponds to max operation frequency Range: 0–10V or -10 to +10V AO1 Switch = SW1, factory setting is 0–10V	⏏	Ground
AO2	Analog Output 2 (internal circuit same as AO1)	0–10V max output current 2mA; max load 5kΩ 0–20mA max output current 20mA; max load 500Ω Resolution: 0–10V corresponds to max operation frequency Range: 0–10V or 0/4–20mA AO2 Switch = SW2; factory setting is 0–10V		
DIC	Digital Input Common Rail	Common terminal for multi-function inputs; Can be tied to DCM (for sinking) or to +24V (for sourcing)		
DI1–DI8	Digital Inputs 1 thru 8	ON: the activation current is 3.3mA ≥ 11VDC OFF: leakage current tolerance is 1.4mA ≤ 5VDC		
DCM	Digital Signal Common	Refer to terminals FO, FWD, REV		
DO1	Digital Output 1	The AC motor drive releases various monitor signals such as drive in operation, frequency attained, and overload indication via transistor (open collector). Range: 5–48 VDC. Use with DOC.		
DO2	Digital Output 2 (internal circuit same as DO1)	Multi-function Output 2 (photocoupler). Range: 5–48 VDC. Use with DOC.		
DOC	Digital Output Common	Max 5–48 VDC, 50mA (user supplied)		
+24V	STO Control Signal Source			
ECM	EStop Common			
SCM1	STO Input 1 Common	Safe Torque Off function.		
SCM2	STO Input 2 Common	Refer to Appendix E: Safe Torque Off for more details.		
STO1	STO Input 1			
STO2	STO Input 2			
FO	Digital Frequency Output	High-speed pulse output. Use with DCM. Digital Frequency Out = Drive Output Frequency [Hz] × P3.38 [Frequency Output Multiplier]. Duty-cycle: 50% ±1% Min load impedance: 1kΩ/100pf Max current: 30mA Max voltage: 30VDC		
FWD	Forward Command	Use with DCM. ON = forward running OFF = deceleration to stop		
R1	R1 Relay Common	Resistive Load: 3A(N.O.) / 3A(N.C.); 250VAC 5A(N.O.) / 3A(N.C.); 30VDC Inductive Load (COS 0.4): 1.2A(N.O.) / 1.2A(N.C.); 250VAC These terminals are to output monitoring signals, such as drive in operation, frequency attained, or overload indication. Note: R1 and R2 have N.O. and N.C. contacts.		
R1C	R1 Relay N.C.			
R1O	R1 Relay N.O.			
R2	R2 Relay Common			
R2C	R2 Relay N.C.			
R2O	R2 Relay N.O.			
REV	Reverse Command	Use with DCM. ON = reverse running OFF = deceleration to stop		
RJ45-1	RJ45 Port 1 (RS-485)	Pins 1,2,7,8: Reserved Pins 3,6: SGND		
RJ45-2	RJ45 Port 2 (RS-485)	Pin 4: SG- Pin 5: SG+ (RJ45-1 and RJ45-2 are connected internally to ports SG+ and SG- below)		
SG+, SG-, SGND	Modbus RS-485 (SG+ and SG- are connected internally to the two RJ45 ports above)			
⏏	Digital Control Ground			

# DURAPULSE GS4 AC Drives – Basic Wiring Diagram

## Power Wiring Diagram: GS4 230V Models – Single-Phase

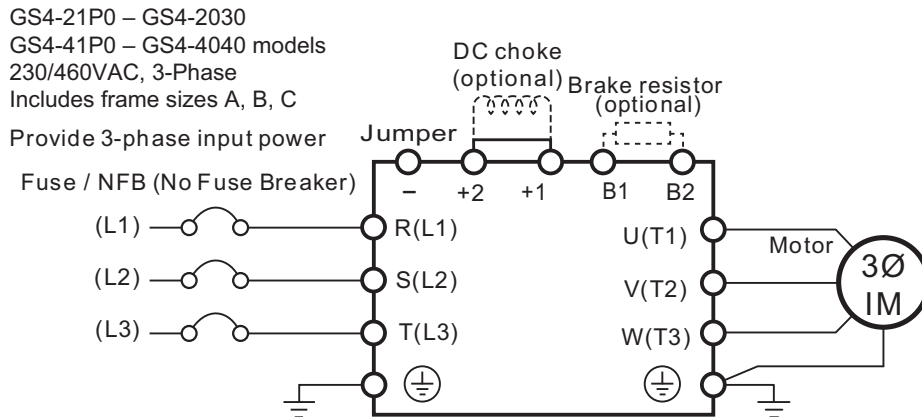
**Note:** Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to user manual GS4-UMW for additional specific wiring information.)  
**Note:** We specify DC chokes, but we do not stock them.



Connect 230VAC, Single-Phase power to any two of the R, S, or T terminals

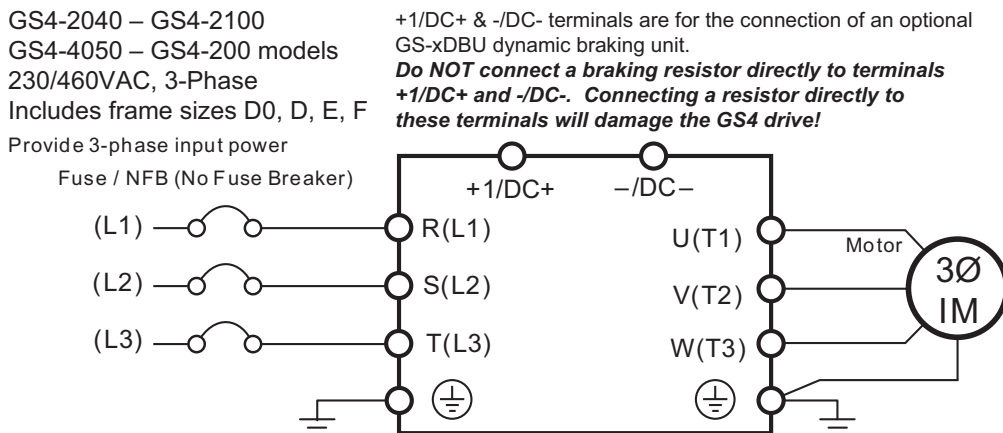
## Power Wiring Diagram: GS4 Frame Size A, B, C Models – Three-Phase

**Note:** Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to user manual GS4-UMW for additional specific wiring information.)  
**Note:** We specify DC chokes, but we do not stock them.



## Power Wiring Diagram: GS4 Frame Size D0, D, E, F Models – Three-Phase

**Note:** Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to user manual GS4-UMW for additional specific wiring information.)



# DURAPULSE GS4 AC Drives – Basic Wiring Diagram

## Power Wiring Diagram: GS4 Frame Size G Models – Three-Phase

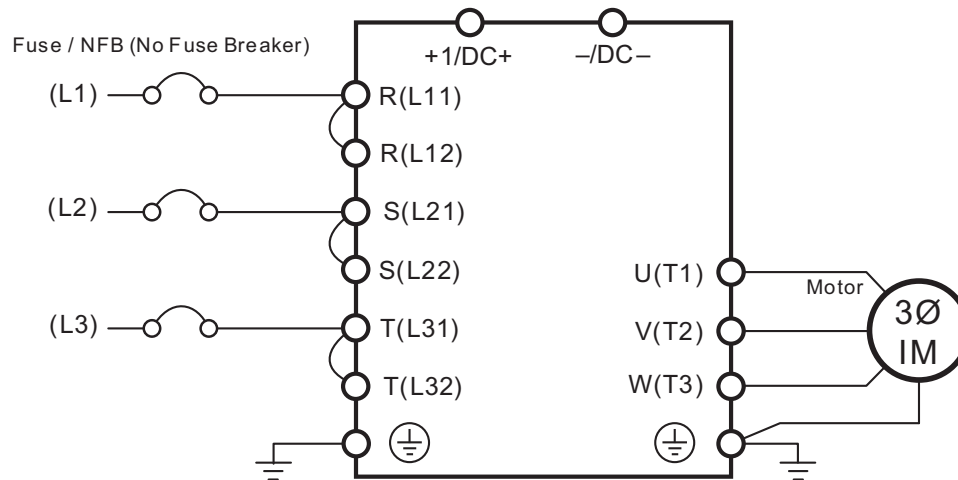
*Note: Users MUST connect wiring according to the circuit diagram shown below. (Refer to user manual GS4-UMW for additional specific wiring information.)*

GS4-4250 &  
GS4-4300 models  
460VAC, 3-Phase

Provide 3-phase input power

+1/DC+ & -/DC- terminals are for the connection of an optional GS-xDBU dynamic braking unit.

**Do NOT connect a braking resistor directly to terminals +1/DC+ and -/DC-. Connecting a resistor directly to these terminals will damage the GS4 drive!**



# DURAPULSE GS4 AC Drives – Basic Wiring Diagram

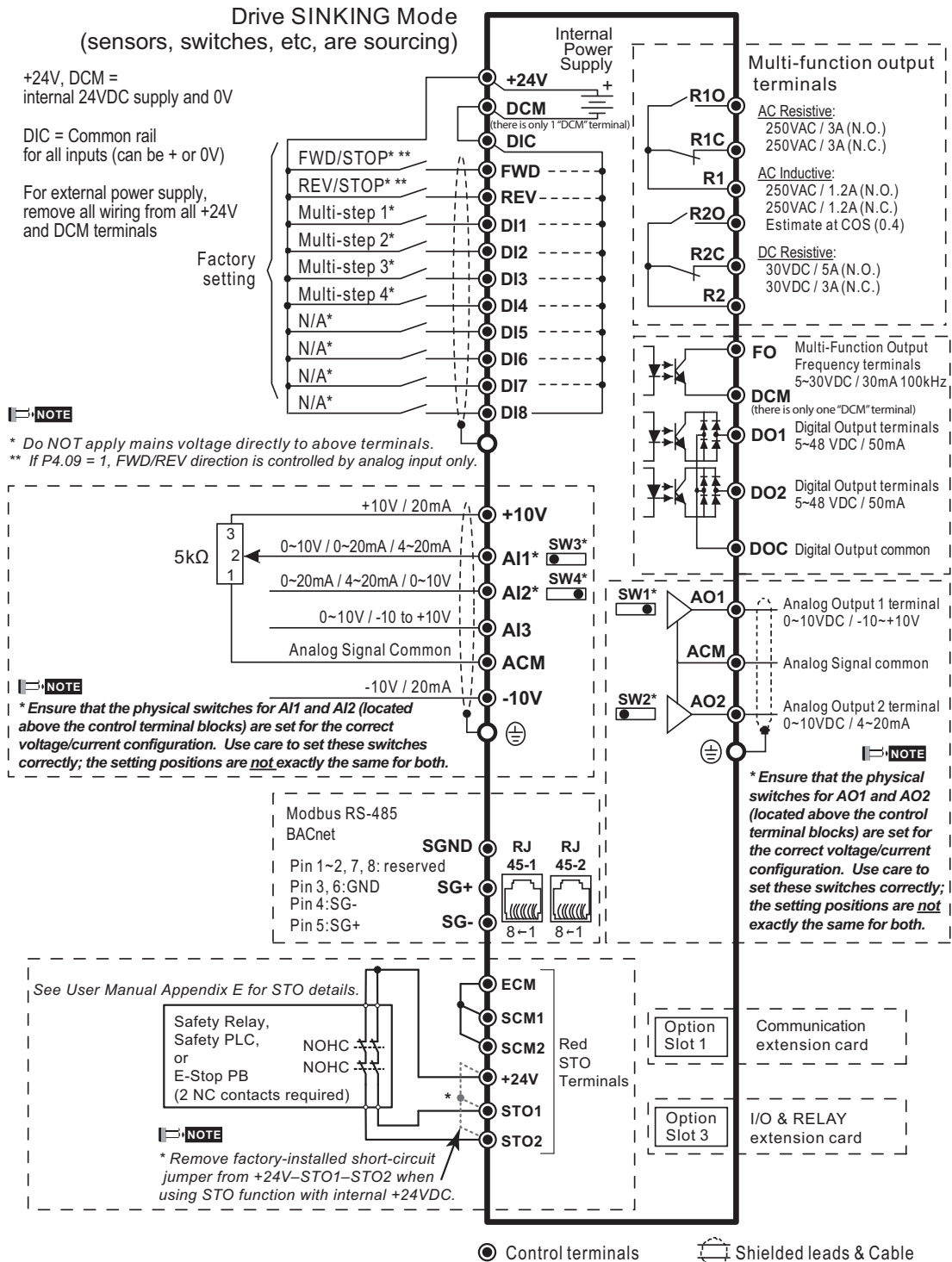
## Control Wiring Diagram: Full I/O with Sinking Inputs (field devices are sourcing)



Note: Users must connect wiring according to the circuit diagram shown below.



**WARNING: DO NOT PLUG A MODEM OR TELEPHONE INTO THE DURAPULSE RJ45 SERIAL COMM PORT, OR PERMANENT DAMAGE MAY RESULT.**



**NOTE**

\* Do NOT apply mains voltage directly to above terminals.  
\*\* If P4.09 = 1, FWD/REV direction is controlled by analog input only.

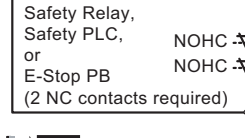
**NOTE**

\* Ensure that the physical switches for AI1 and AI2 (located above the control terminal blocks) are set for the correct voltage/current configuration. Use care to set these switches correctly; the setting positions are not exactly the same for both.

**NOTE**

\* Ensure that the physical switches for AO1 and AO2 (located above the control terminal blocks) are set for the correct voltage/current configuration. Use care to set these switches correctly; the setting positions are not exactly the same for both.

See User Manual Appendix E for STO details.



**NOTE**

\* Remove factory-installed short-circuit jumper from +24V-STO1-STO2 when using STO function with internal +24VDC.

# DURAPULSE GS4 AC Drives – Basic Wiring Diagram

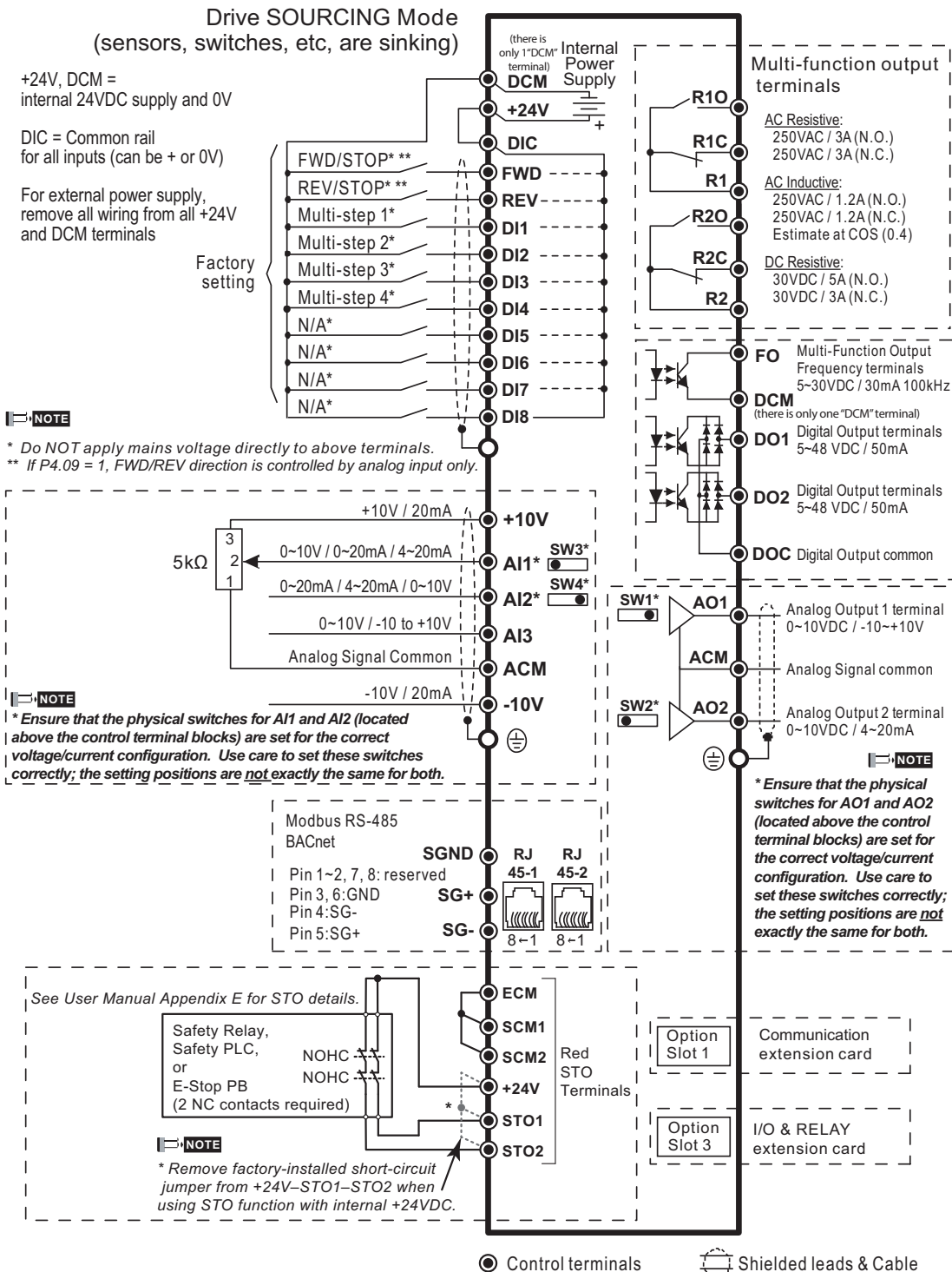
## Control Wiring Diagram: Full I/O with Sourcing Inputs (field devices are sinking)



Note: Users must connect wiring according to the circuit diagram shown below.



**WARNING: DO NOT PLUG A MODEM OR TELEPHONE INTO THE DURAPULSE RJ45 SERIAL COMM PORT, OR PERMANENT DAMAGE MAY RESULT.**



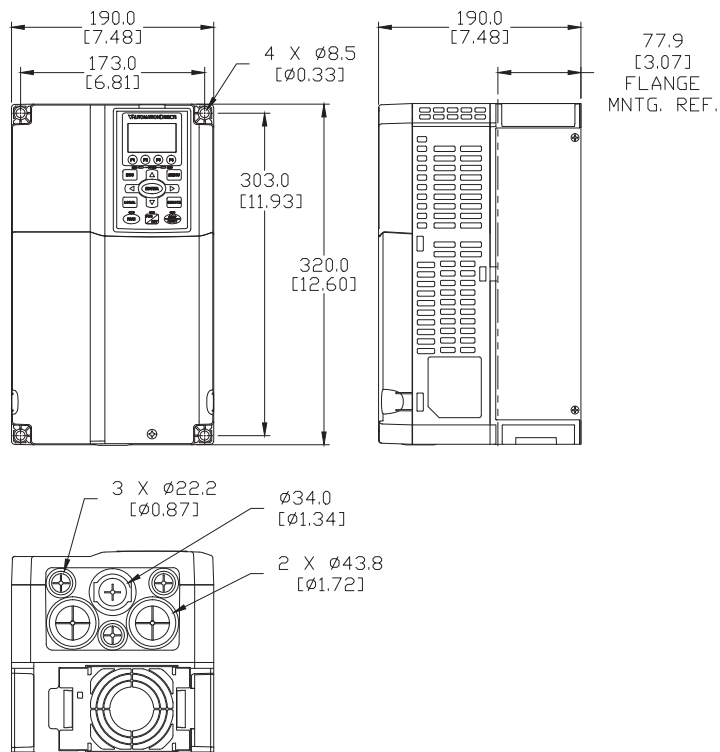
# DURAPULSE GS4 AC Drives – Dimensions

## Dimensions – GS4 AC Drives

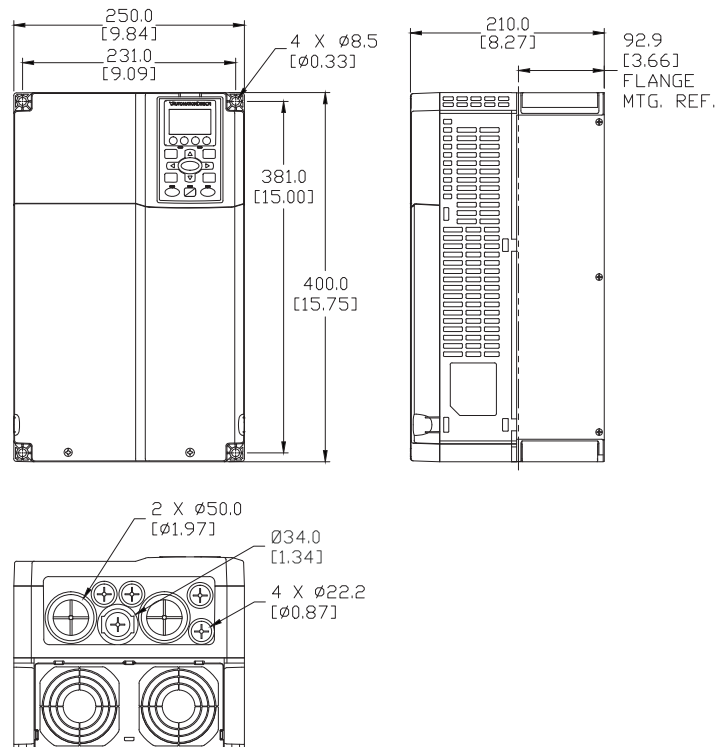
( Units = mm [in] )

See our website: [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.

### Dimensions – Frame Size B



### Dimensions – Frame Size C



COSMO WIND AND DR LLC- HIC  
 C/O NASSAU DOOR & WINDOW  
 487 W JOHN ST

HICKSVILLE NY 11801  
 (631)944-3400

Reference:

Quantity	UOM	Item/Description
1.0000	EA	EXT SU EXTERIOR DOOR UNIT STEEL DOOR, STEEL FRAME, CONTOUR 90MIN, SGL, LH, OS, 3-0, 6-8 HGT, FD90CT100, NO REINFORCE, SGL BORE & 218 DBLT BORE, ZINCROME STRIKE, NO DBLT STRIKE, STAIN STEEL RADIUS NRP, 3 NRP, C53 (4-1/2 - 5-1/2), BRONZE W/S, 90MIN DR LABEL, PUBLIC ACCESS MILL, NO CASING



COSMO WIND AND DR LLC- HIC  
C/O NASSAU DOOR & WINDOW  
487 W JOHN ST

HICKSVILLE NY 11801  
(631)944-3400

Reference:

Quantity	UOM	Item/Description
1.0000	EA	EXT SU EXTERIOR DOOR UNIT STEEL DOOR, STEEL FRAME, CONTOUR 90MIN, SGL, RH, OS, 3-0, 6-8 HGT, FD90CT100, NO REINFORCE, SGL BORE & 218 DBLT BORE, ZINCROME STRIKE, NO DBLT STRIKE, STAIN STEEL RADIUS NRP, 3 NRP, C53 (4-1/2 - 5-1/2), BRONZE W/S, 90MIN DR LABEL, PUBLIC ACCESS MILL, NO CASING



66895  
Rev 03

**Kwikset**



Installation and User Guide

**Required tools**

4 AA Batteries   Ruler   Phillips screwdriver

**Additional Tools (depending on application)**

Hammer   Wood block   Pliers

**Kwikset  
Technical Support**

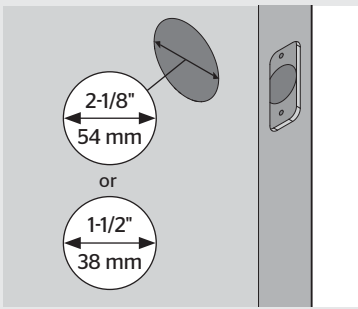
1-800-327-5625  
www.kwikset.com

Parts List			
Latch 	Drive-In Collar 	Strike 	SmartKey Tool 
Exterior Assembly 	Keys 	Mounting Plate 	Interior Assembly 
Interior Cover 	Latch and Strike Screws 	Interior Assembly Screws 	Mounting Plate Screws 

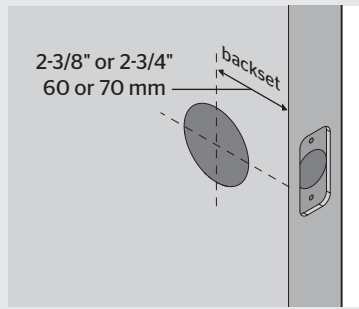
**1 Prepare the door and check dimensions**

If drilling a new door, use the supplied template and the complete door drilling instructions available at [www.kwikset.com/doorprep](http://www.kwikset.com/doorprep)

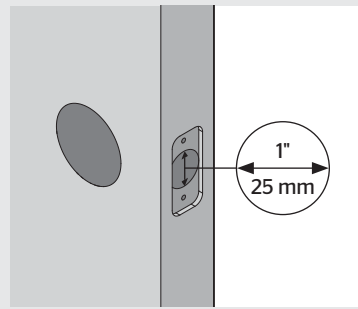
**A** Measure to confirm that the hole in the door is either 2-1/8" (54 mm) or 1-1/2" (38 mm).



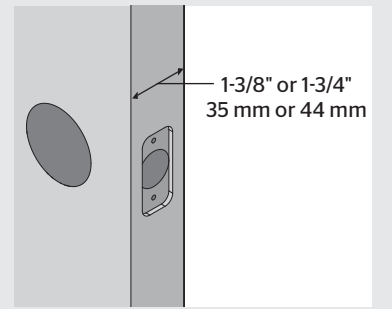
**B** Measure to confirm that the backset is either 2-3/8" or 2-3/4" (60 or 70 mm).



**C** Measure to confirm that the hole in the door edge is 1" (25 mm).



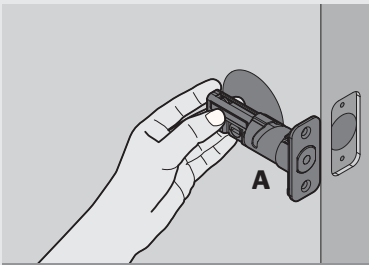
**D** Measure to confirm that the door is either 1-3/8" or 1-3/4" (35 mm or 44 mm) thick.



Note: Additional door preparation may be required for doors with 1-1/2" (38 mm) holes. Consult the deadbolt drilling instructions at [www.kwikset.com/doorprep](http://www.kwikset.com/doorprep)

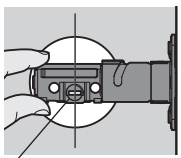
**2 Install the latch and strike**

**A** Hold the latch in front of the door hole, with the latch face flush against the door edge.



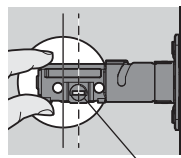
Is the slotted hole centered in the door hole?

**YES**



slotted hole is centered

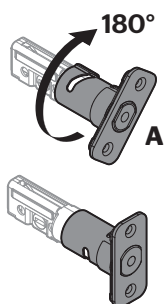
**NO**



slotted hole is NOT centered

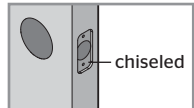
No adjustment is required. Proceed to next step.

Rotate latch face as shown to extend latch.



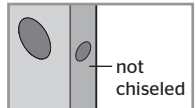
**B** Is the door edge chiseled?

**YES**

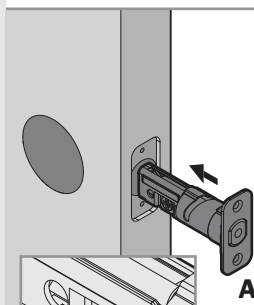


Install latch in door with supplied screws.

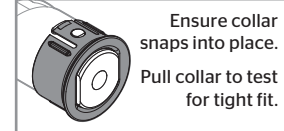
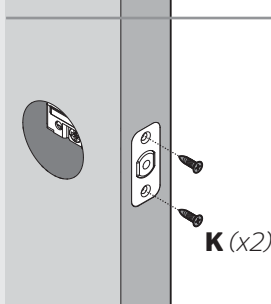
**NO**



Use a flathead screwdriver to lift tabs on collar of rectangular face to remove it from latch. Install drive-in collar.

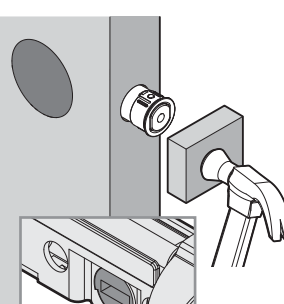


Make sure slotted hole is at bottom of latch.



Ensure collar snaps into place. Pull collar to test for tight fit.

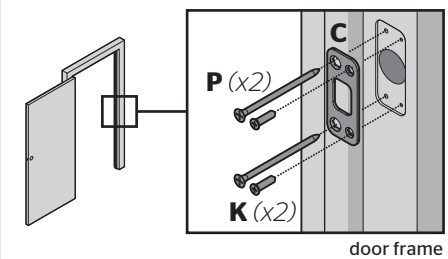
Install latch in door with wood block and hammer.



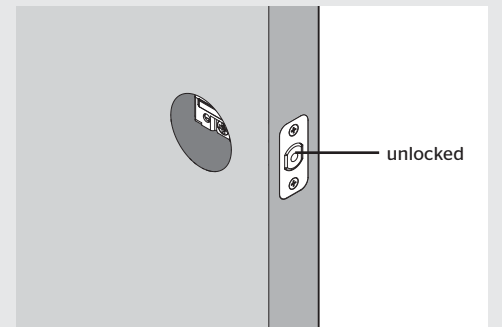
Make sure slotted hole is at bottom of latch.

**C** Install strike on the door frame.

⚠ Make sure hole in door frame is drilled a minimum of 1" (25 mm) deep.



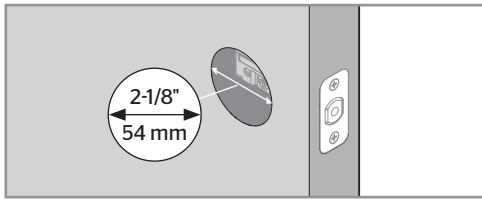
**D** ⚠ **IMPORTANT:** Make sure the latch bolt is fully retracted (in the unlocked position).



### 3 Prepare keypad and mounting plate (only for doors with smaller holes)

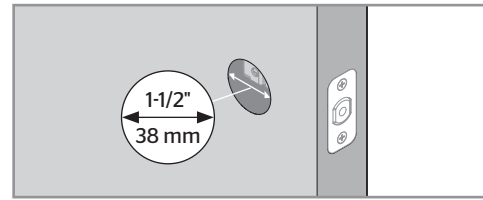
What is the diameter of the hole in the door?

Diameter is 2-1/8" (54 mm)



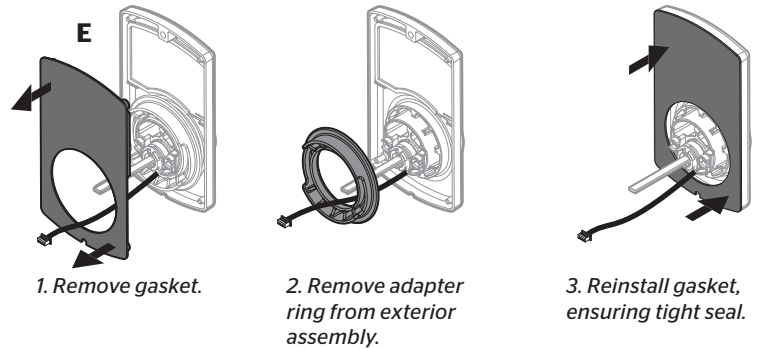
or

Diameter is 1-1/2" (38 mm)

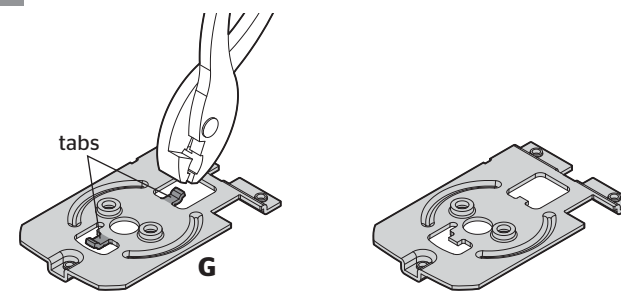


No adjustment is required.  
Proceed to step 4.

**A** Remove adapter ring from exterior assembly:

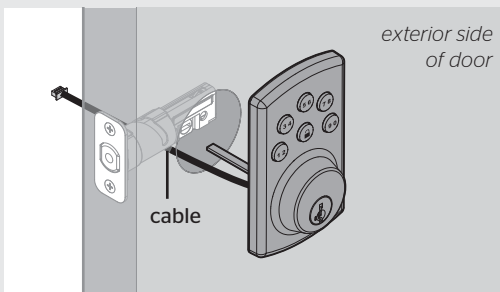


**B** Use pliers to remove two tabs from mounting plate:

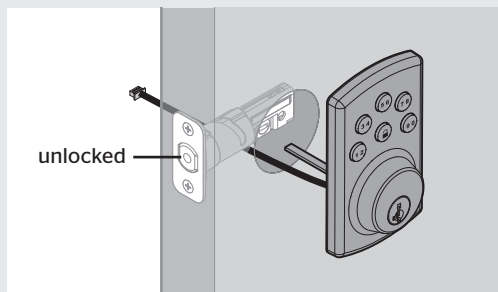


### 4 Install exterior assembly

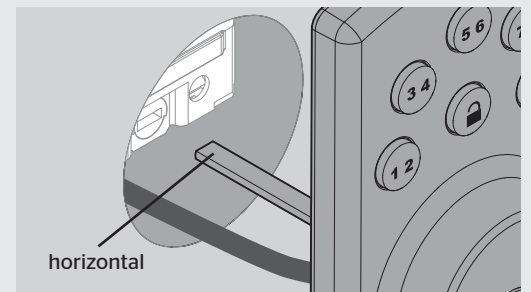
**A** Route the cable below the latch.



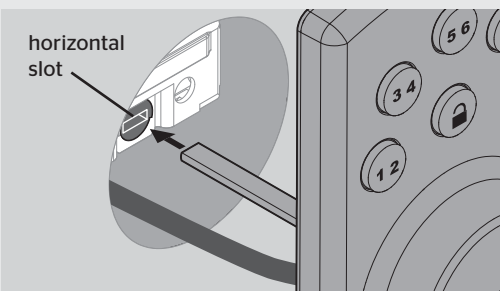
**B** **IMPORTANT:** Make sure the latch is fully retracted (in the unlocked position).



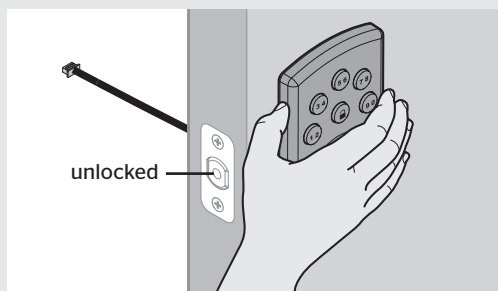
**C** **IMPORTANT:** Make sure the torque blade is in the horizontal position.



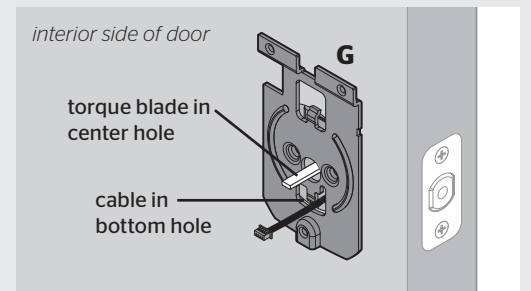
**D** Insert the torque blade through the horizontal slot in the latch.



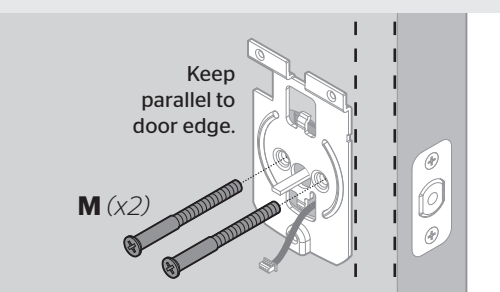
**E** **IMPORTANT:** Hold the exterior assembly on the outside firmly (or have a second pair of hands) for the next steps.



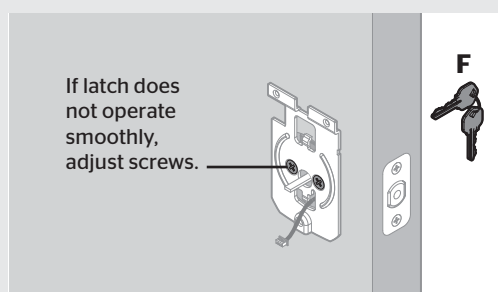
**F** Push the torque blade through the center hole in the mounting plate and send the cable through the bottom hole.



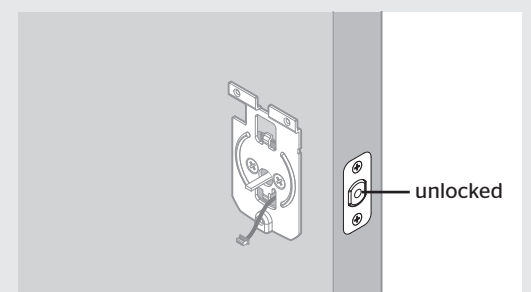
**G** Secure the mounting plate with the supplied screws.



**H** Insert the key and test the latch for smooth operation.

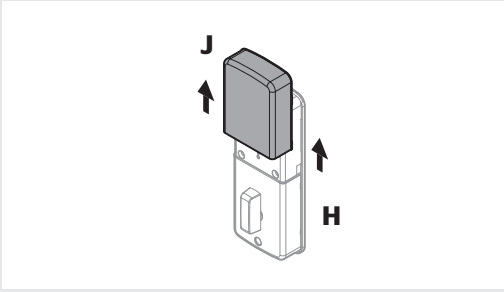


**I** Remove the key and make sure the latch bolt is still in the unlocked position.

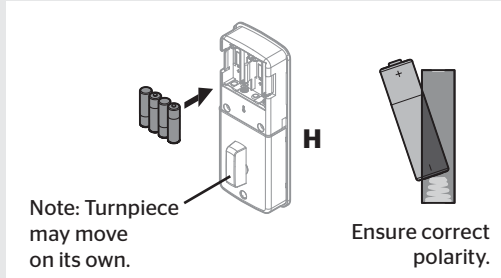


## 5 Install interior assembly

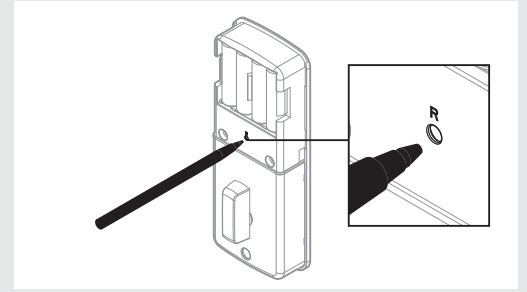
**A** Remove the battery cover.



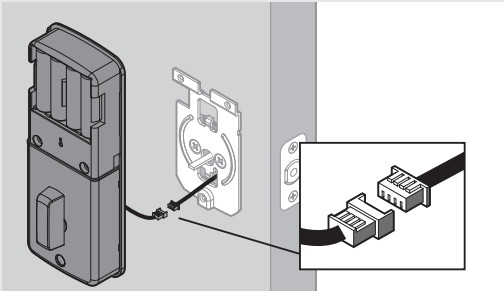
**B** Load 4 AA batteries into the interior assembly. For best results, use new, non-rechargeable Alkaline batteries only.



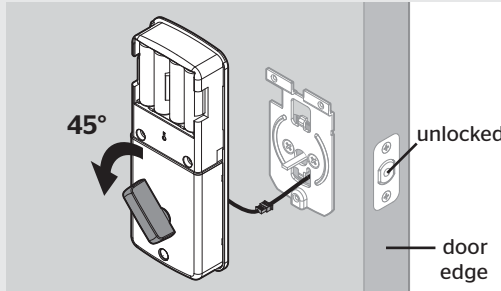
**C** Press and hold the Reset button on the interior assembly for 5 seconds, until you hear 3 long beeps.



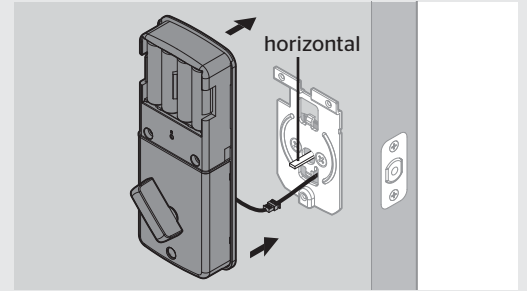
**D** Align the colored edges of the connectors and ensure a tight cable connection.



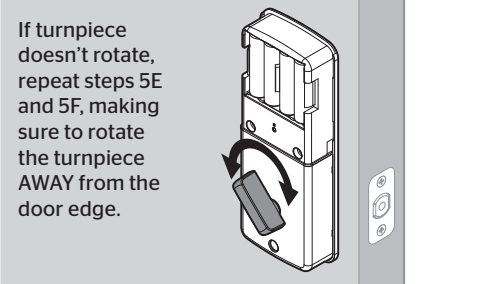
**E** **IMPORTANT:** Rotate the turnpiece AWAY from the door edge and make sure the latch is fully retracted (in the unlocked position).



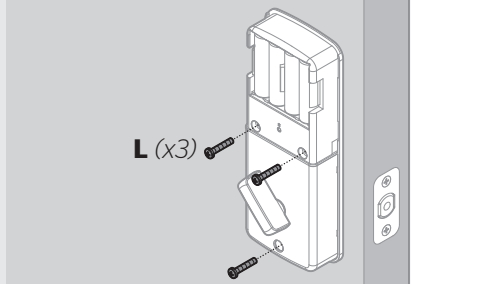
**F** Make sure the torque blade is still in the horizontal position and install the interior assembly.



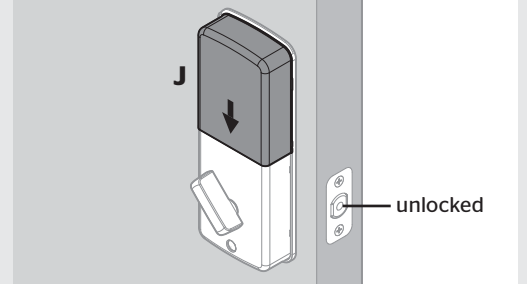
**G** Test the turnpiece for smooth rotation.



**H** Secure the interior assembly with the supplied screws.



**I** Reinstall battery cover and make sure the latch is still in the unlocked position.



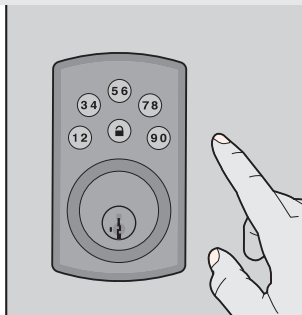
## 6 Set locking and unlocking direction

**A** While the door is OPEN and UNLOCKED, enter the following code to teach the lock the orientation of the door:

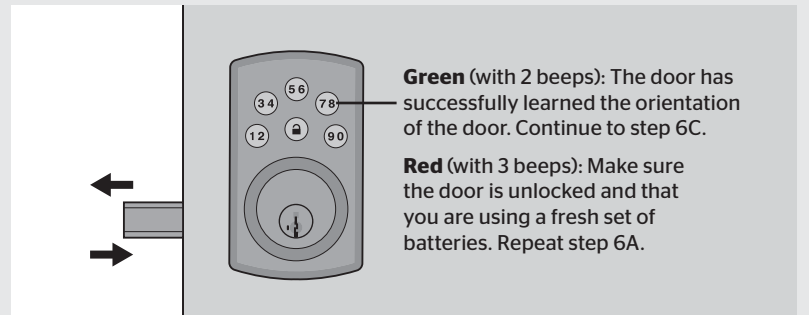
This is your default Mastercode.

1. Press 0-0-0-0.
2. Press . You will hear one beep.
3. Press 0.
4. Press .

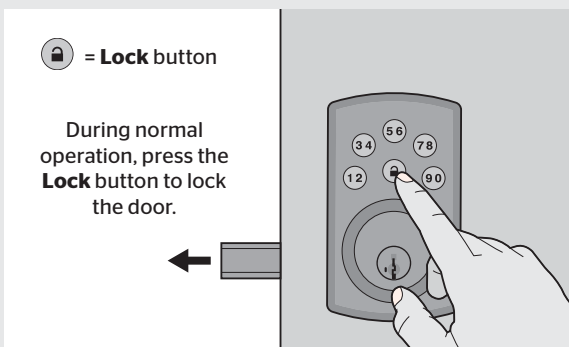
Note: Each button on the keypad represents two numbers. You only need to push the button once to get either number.



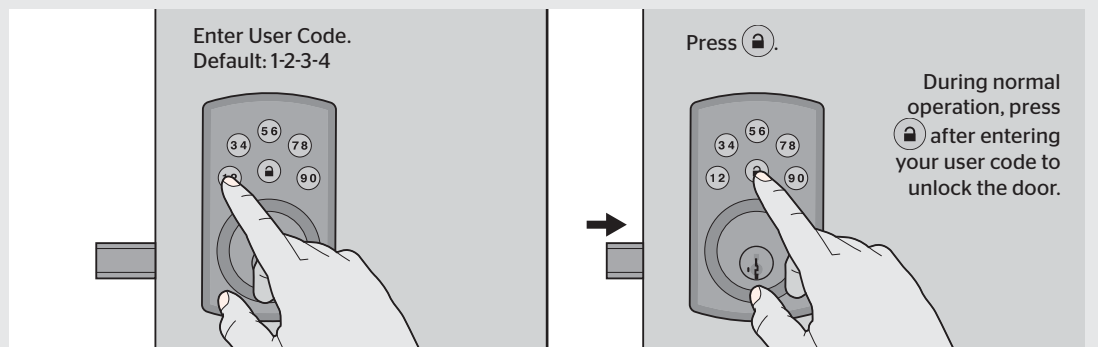
**B** The latch bolt will extend and retract. The lock will beep and the keypad will turn green or red.



**C** Press the **Lock** button. The latch bolt will extend to lock.



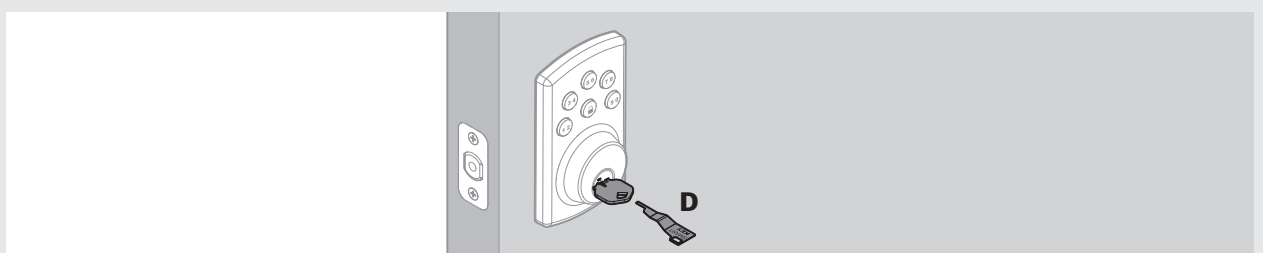
**D** Enter the default User Code (1-2-3-4), then press the **Lock** button. The door will unlock.



**IMPORTANT:** It is recommended that you replace the default Mastercode and default User Code with codes of your own. See page 4.

## 7 Optional: Re-key the lock

If needed, re-key the lock to work with your existing key. See the supplied SmartKey Re-Key instructions for more information.



## 8 Quick Setup and Use

Move swiftly during programming. If no digit is pressed for 10 seconds, the system will time out and you will need to restart the procedure.

### A How to delete all User Codes

**CAUTION:** A User Code is used to unlock the door while a Mastercode is a password for making changes to the lock features.

1. Make sure the lock is unlocked and the door is open.
2. Enter your existing Mastercode - for new install, default is 0-0-0-0.
3. Press . You will hear one beep.
4. Press **5**.
5. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.

For a new installation, this will delete the default User Code 1-2-3-4. For subsequent instances, this will delete all User Codes in the lock.

Now the lock can only be operated by the key and turnpiece until a new User Code is added in step B.

### B How to add User Codes

A total of 6 User Codes (and a temporary one-time User Code) may be programmed. Do not program a User Code that is the same as your Mastercode.

**CAUTION:** A User Code is used to unlock the door while a Mastercode is a password for making changes to the lock features.

1. Make sure the lock is unlocked and the door is open.
2. Enter your Mastercode - for new install, default is 0-0-0-0.
3. Press . You will hear one beep.
4. Press **1**.
5. Press . You will hear one beep.
6. Enter a new User Code. It must be 4-10 digits.
7. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.
8. Test the code: While your door is open, lock it. Enter your new User Code, then press . The door should unlock.

### C How to change your Mastercode

The Mastercode will not unlock your door. It is an added security feature that is used to set up all functions.

**CAUTION:** The default Mastercode is 0-0-0-0. It is recommended that you change it to a code of your own.

1. Make sure the lock is unlocked and the door is open.
2. Enter your Mastercode - for new install, default is 0-0-0-0.
3. Press . You will hear one beep.
4. Press **7**.
5. Press . You will hear one beep.
6. Enter a new Mastercode. It must be between 4 and 10 digits.
7. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.

## 9 Additional Programming Features

### How to enable/disable Auto-Lock

The Auto-Lock feature automatically re-locks your door 30 seconds after unlocking. This feature is off by default.

1. Make sure the lock is unlocked and the door is open.
2. Enter your existing Mastercode.
3. Press . You will hear one beep.
4. Press **1-1**.
5. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.

### How to enable/disable User Codes

If User Codes are disabled (example: when you go on vacation), the lock can only be operated by the key and turnpiece until they are enabled again.

1. Make sure the lock is unlocked and the door is open.
2. Enter your existing Mastercode.
3. Press . You will hear one beep.
4. Press **1-7**.
5. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.

### How to add a one-time User Code

A one-time user code may be used only once, and then it will be deleted immediately after use.

1. Make sure the lock is unlocked and the door is open.
2. Enter your existing Mastercode.
3. Press . You will hear one beep.
4. Press **1-9**.
5. Press . You will hear one beep.
6. Enter a new User Code. It must be 4-10 digits.
7. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.

### How to change Auto-Lock time delay

You can set the Auto-Lock time delay to 10, 20, 30, 40, or 50 seconds.

1. Make sure the lock is unlocked and the door is open.
2. Enter your existing Mastercode.
3. Press . You will hear one beep.
4. Press **1-3**.
5. Press . You will hear one beep.
6. For 10 seconds, press **1**.  
For 20 seconds, press **3**.  
For 30 seconds, press **5**.  
For 40 seconds, press **7**.  
For 50 seconds, press **9**.
7. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.

### How to delete individual User Codes

**CAUTION:** The lock is pre-programmed with a default User Code of 1-2-3-4. It is recommended that you delete this code.

1. Make sure the lock is unlocked and the door is open.
2. Enter your existing Mastercode.
3. Press . You will hear one beep.
4. Press **3**.
5. Press . You will hear one beep.
6. Enter the User Code you wish to delete.
7. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.
8. Test the code: While your door is open, lock it. Enter the User Code, then press . The door should not unlock.

### How to mute/unmute lock

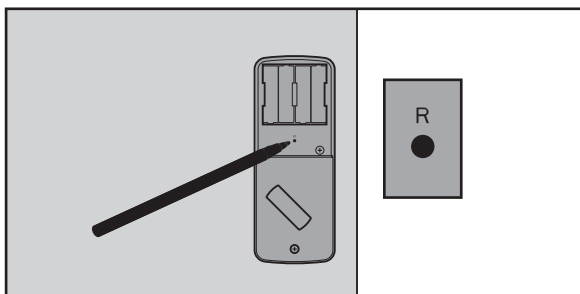
If the lock is muted, you will not hear beeping during programming, normal operation, low battery indicators, or system alerts.

1. Make sure the lock is unlocked and the door is open.
2. Enter your Mastercode.
3. Press . You will hear one beep.
4. Press **1-5**.
5. Press . You will hear two beeps if successful. If you hear three beeps, it was unsuccessful. Repeat from step 1 slowly.

### How to restore default settings

This procedure will delete all User Codes associated with the lock, and the default Mastercode (0-0-0-0) and User Code (1-2-3-4) will be restored.

1. Make sure the door is open and unlocked. Press and hold the Reset button for 5 seconds, until you hear 3 long beeps.



2. Enter the default Mastercode (0-0-0-0).
3. Press . You will hear one beep.
4. Press **0**.
5. Press . The latch bolt will extend and retract to learn the orientation of the door. If successful, the keypad will flash green and you will hear 2 beeps. If unsuccessful, the keypad will flash red and you will hear 3 beeps (make sure the door is open and unlocked and that you are using a fresh set of batteries).
6. Test the lock: With the door open and unlocked, press . Make sure it locks the door.
7. Test the default User Code: Enter the default User Code (1-2-3-4), then press . Make sure it unlocks the door.

**CAUTION:** The default Mastercode is 0-0-0-0. It is recommended that you change it to a code of your own.  
The lock is pre-programmed with a default User Code of 1-2-3-4. It is recommended that you delete this code.

### System Alerts

Alert	Reason	Solution
Keypad flashes red 3 times with 3 beeps.	Door jammed while attempting to lock.	Manually re-lock door. If needed, reposition strike.
	Door handing code has not been entered.	Enter door handing code.
	No User Code programmed, or User Codes are disabled.	Program at least one User Code, or re-enable User Codes.
	Unsuccessful programming.	Attempt programming procedure again.
Keypad flashes red 5 times with 5 beeps.	Incorrect User Code entered.	Re-enter User Code.
	5 incorrect User Codes entered within one minute.	Re-enter User Code after 45-second keypad lockout.
Keypad flashes red 10 times with 10 beeps.	Low battery.	Replace batteries.

### Regulatory Compliance

This product complies with standards established by the following regulatory bodies:

- Federal Communications Commission (FCC)
- Industry Canada

#### FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**IMPORTANT!** Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

#### Industry Canada

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

### Troubleshooting

#### The lock cannot be locked or unlocked by the keypad.

Make sure the lock is programmed with at least one User Code and that the User Codes are not disabled. If needed, restore the lock's default settings.

#### The keypad doesn't respond when touched (no lights are visible and no beeping is heard).

Make sure the cables are properly connected, and make sure the batteries are new and installed correctly.

#### The door can be locked with the Lock button, but the User Code will not unlock the door.

Make sure the User Code is correct and that the Lock button is pushed after entering the User Code. If the door still won't unlock, use a key to unlock the door. Call technical support for further troubleshooting.

#### When the door is closed and the Lock button is pressed to lock the door, the lock beeps 3 times. When the door is open and the Lock button is pressed to lock the door, the lock doesn't beep.

Make sure that the hole in the door frame behind the strike is drilled at least 1 inch (25 mm) deep. Also make sure the strike plate is aligned with the latch bolt. If needed, reposition the strike.

### Important Safeguards

1. Read all instructions in their entirety.
2. Familiarize yourself with all warning and caution statements.
3. Remind all family members of safety precautions.
4. Restrict access to your lock's interior assembly and routinely check your settings to ensure they have not been altered without your knowledge.
5. Protect your User Codes and Mastercode.
6. Dispose of used batteries according to local laws and regulations.

**CAUTION:** Prevent unauthorized entry. This lock has a pre-set User Code and Mastercode. Upon installation and set-up, replace both of these codes with your own. Since anyone with access to the interior assembly can reset the lock and change the User Codes, you must restrict access to the interior assembly and routinely check the User Codes to ensure they have not been altered without your knowledge.

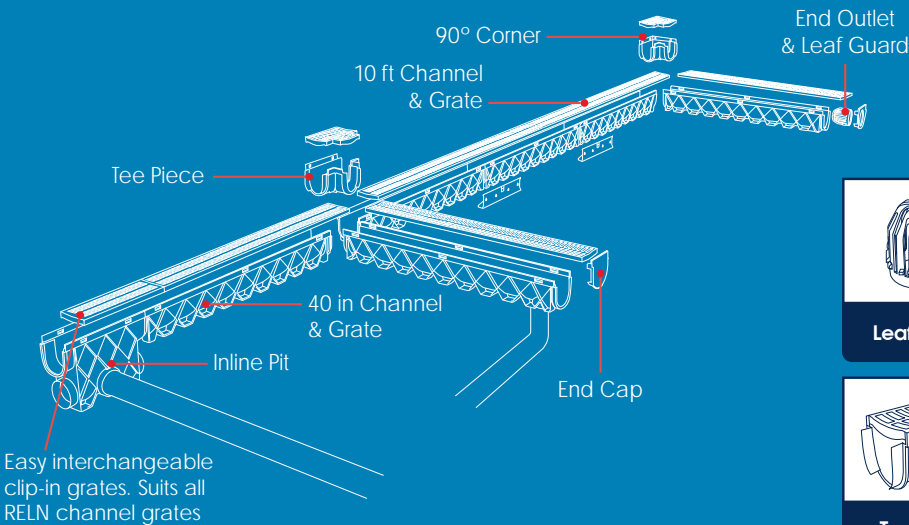
**WARNING:** This Manufacturer advises that no lock can provide complete security by itself. This lock may be defeated by forcible or technical means, or evaded by entry elsewhere on the property. No lock can substitute for caution, awareness of your environment, and common sense. Builder's hardware is available in multiple performance grades to suit the application. In order to enhance security and reduce risk, you should consult a qualified locksmith or other security professional.



## Complete Drainage System

- Ideal for paths, driveways and domestic areas with corners & T sections
- Made in Australia from tough, durable and light-weight, UV-stabilised recycled plastic
- Hold down feet to stop flotation during pouring of concrete
- Available in 40 in & 10 ft lengths, plus a whole range of accessories
- All grates comply to Australian Standards

### Components:



40 in & 10 ft Channel	End Cap/Outlet
Leaf Guard	Joiner
Tee Piece	Corner
Inline Pit	Deep Profile

F Foundation L Landscape Y Yard

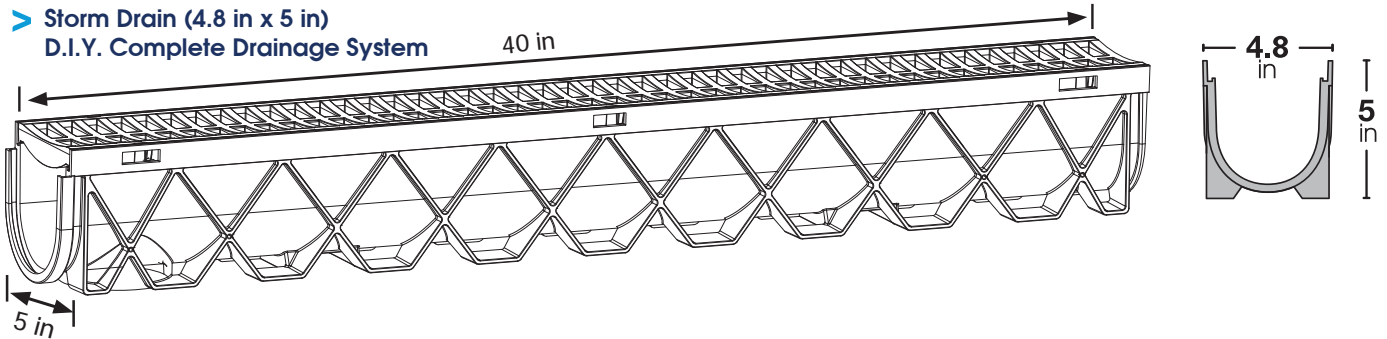


# Storm Drain - D.I.Y. Complete Drainage System

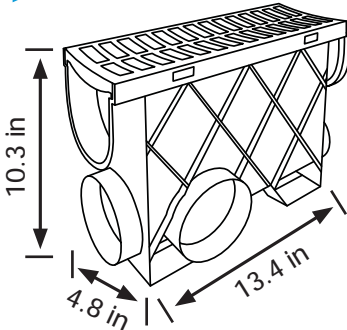


RELN Storm Drain is the complete DIY drainage system designed for paths, driveways and any domestic areas with corners and T sections. With a complete range of accessories available and easily interchangeable clip in grates, Storm Drain is designed to make life easy!

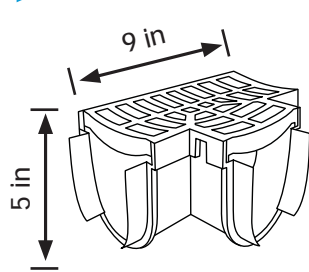
> Storm Drain (4.8 in x 5 in)  
D.I.Y. Complete Drainage System



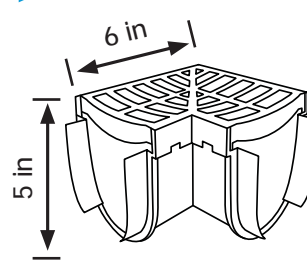
> Inline Pit



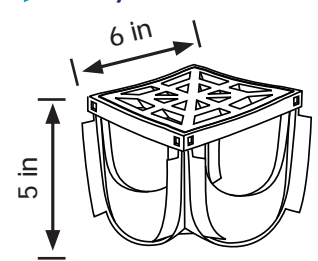
> Tee Piece



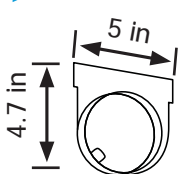
> Corner



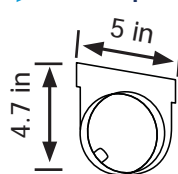
> 4-way connector



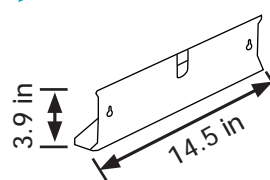
> End Outlet



> End Cap



> Joiner



- Ideal for paths, driveways and domestic areas with corners and T sections
- Designed to withstand 5.5 ton vehicle weight when correctly installed
- Tough, durable and lightweight UV stabilised recycled plastic
- Available in 40 in and 10 ft lengths
- 100% recycled material
- Australian Made
- Available in all RELN grates
- Easily interchangeable clip in grates
- Hold down feet to stop flotation during pouring of concrete
- Bottom outlet, End Outlet and Inline pit can be glued to 4 in PVC stormwater pipe
- Leaf Guard prevents blocking outlets and pipes for use on channel and Inline Pit
- 90° corner and T-piece for left or right extensions

Easy clip-together joining for all Storm Drain range accessories

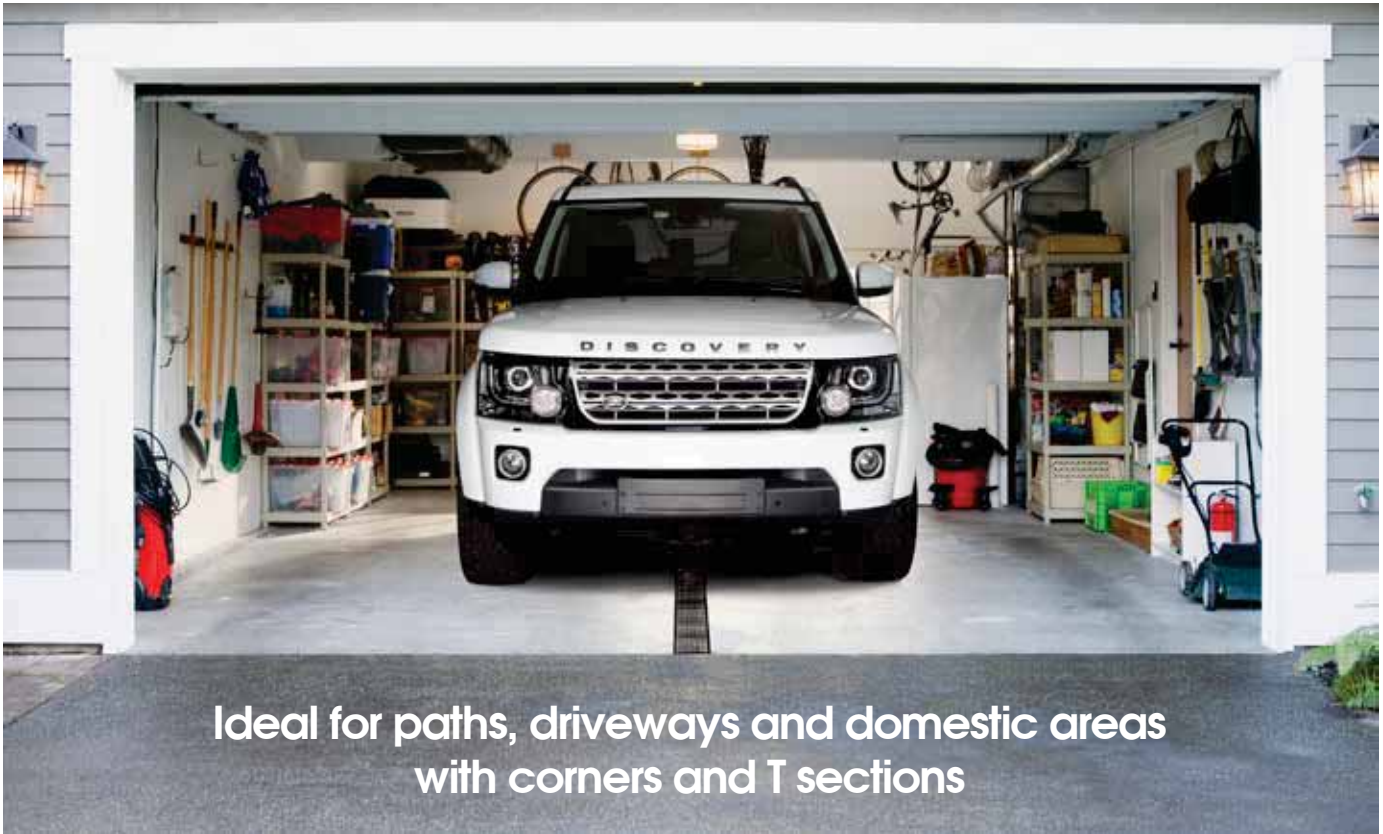
**Grate Options:** (4.4 in x 1 in x 40 in): Plastic in Black and Portland Grey. Black Heel Guard Plastic, Architectural, Stainless Steel, Galvanised Steel

**Range:** 40 in and 10 ft Channels, Inline Pit, Joiner, Leaf Guard, End Outlet, 90° Corner, End Cap, Tee Piece, Bottom Outlet, 4-Way Connector

**Displays:** Hang Pad and Flyer available



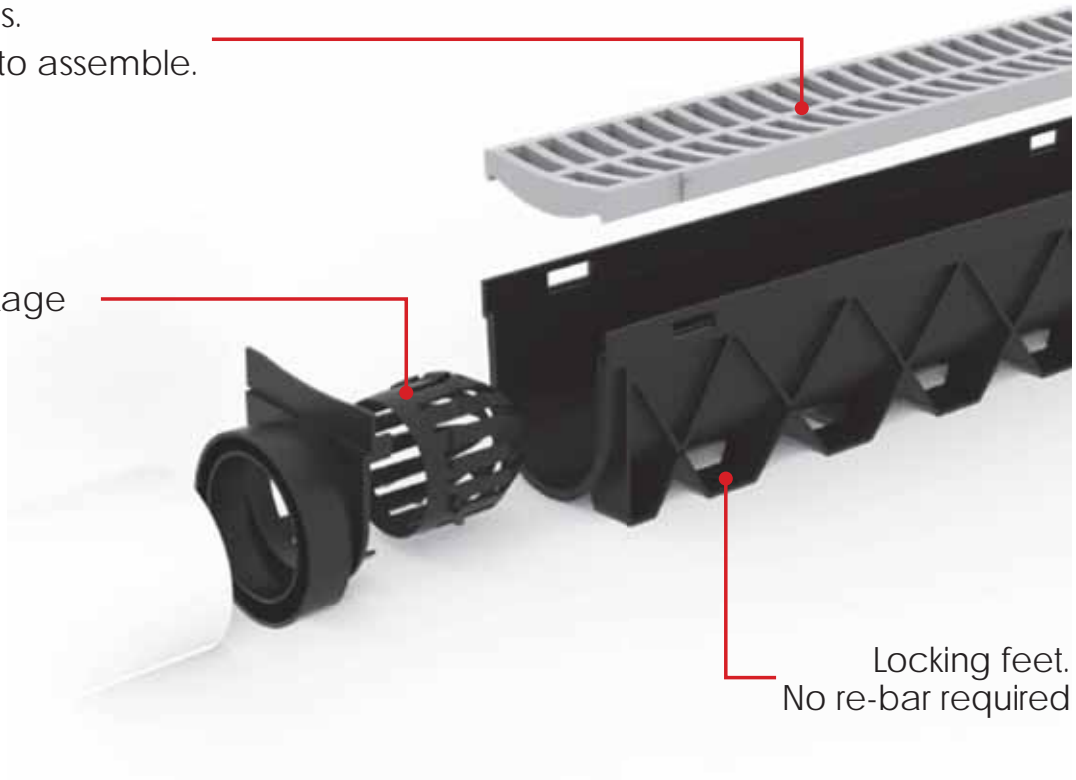
## FEATURES



Ideal for paths, driveways and domestic areas  
with corners and T sections

Easy clip-on grates.  
No tools required to assemble.

Prevents pipe blockage



Locking feet.  
No re-bar required



**5 Tonne Vehicle  
Safe**



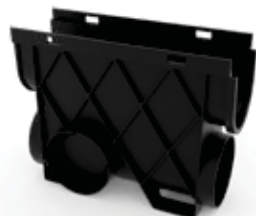
# COMPONENTS



### Channel

Designed with unique feet, no re-bar required

- P/N 003102 (Grey)
- P/N 003017 (Steel)
- P/N 003107 (Grey 10')
- P/N 003018 (Steel 10')



### Inline pit

Easy interlocking design for lower pipe in ground.

- P/N 003431 (Grey)
- P/N 003441 (Steel)



### Joiner

Connects two channels

- P/N 003005 (Grey)



### End Cap

Easy fit design

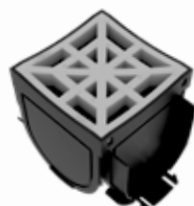
- P/N 003407 (Grey)



### End outlet

Compatible with 4" sewer pipe

- P/N 003408



### 4 Way Channel

Changes direction of channels

- P/N 003125 (Grey)
- P/N 0031241 (Steel)



### Leaf Guard

Prevents pipe blockage

- P/N 0034048

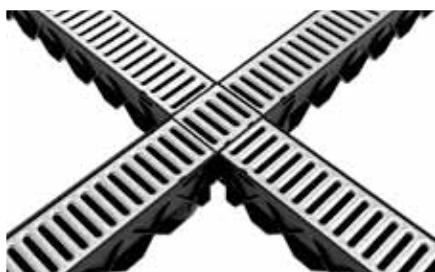


### Concrete Tape 9m

Protect your grates for a clean finish

- P/N 000070

## UNIQUE AND INNOVATIVE OPTIONS THAT PROVIDE SOLUTIONS TO SUIT VARIOUS APPLICATIONS AROUND THE HOME



### 4 Way Channel

Can change direction of channels 4 ways



### Stake Kit

Secure Storm Drain™ channel in your yard and lawn  
P/N 003103



### Inline Pit

Addresses issues in an interlocking stone application



## EASE OF INSTALL TIME-SAVING FEATURES



### Anti-Rotation fee

Innovative Anti-Rotation feet, no re-bar required



### Snap-in Grates

Easy install and removal, no tools required



### Interlocking Channel

Easily create desired lengths by snapping channel lengths together



### Concrete Tape

Protect your grate during Install for best results



### Stake Kit

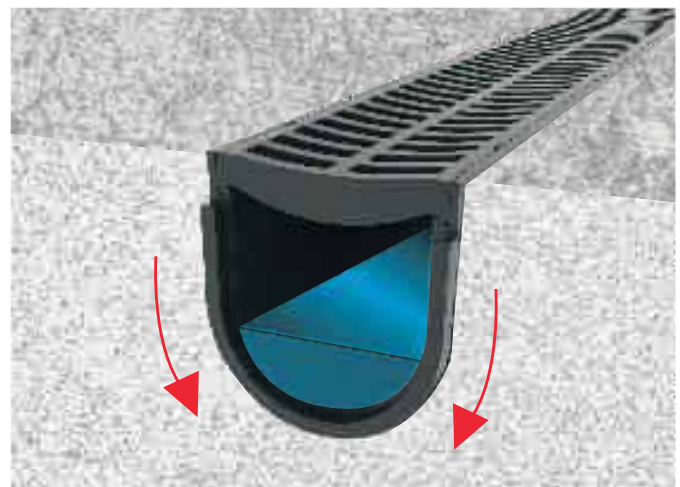
Secure directly in ground, No re-bars required

## EASE OF MAINTENANCE



### Leaf Guard

Smart system clogging prevention leaf guard.z`

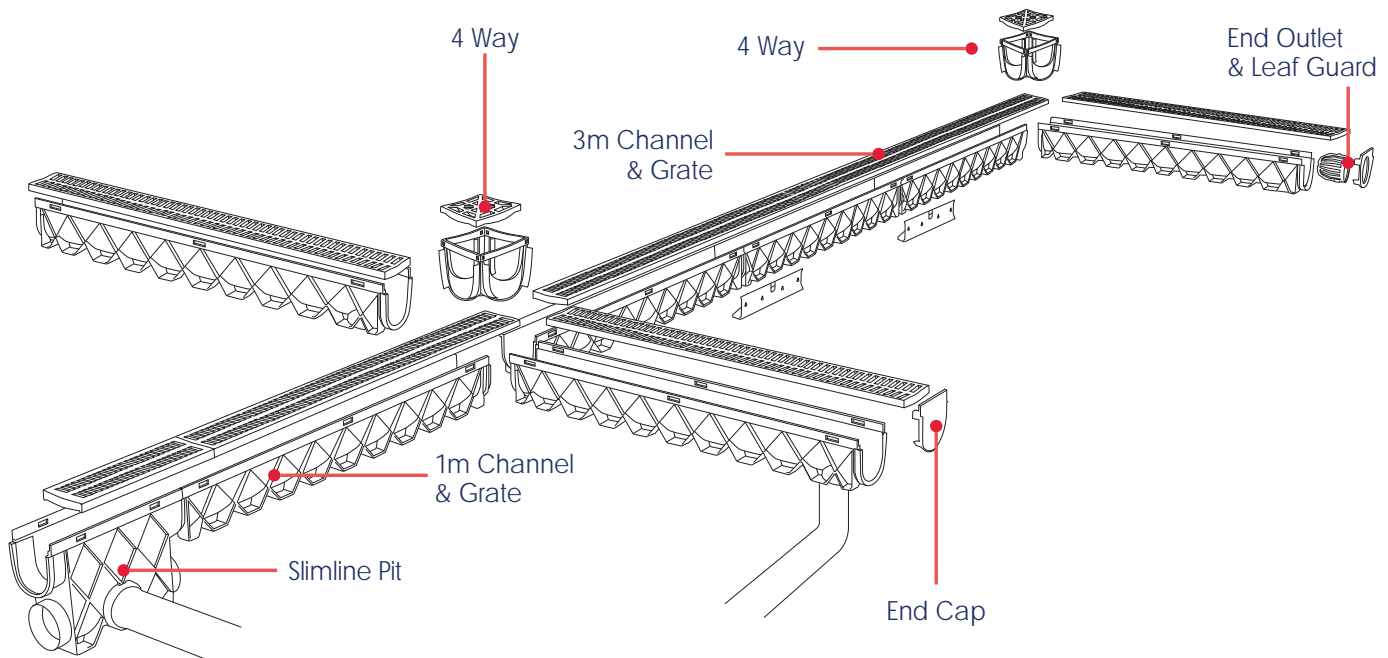


### Stake Kit

Intelligent self-cleaning u-shaped Design



## Storm Drain system setup using 4 way



## FREQUENTLY ASKED QUESTIONS

### > Features

#### Can the RELN Channel Drains with Grates be cut to size?

Yes, the RELN Channel Drains with either Plastic or Metal grates can be cut with an appropriate saw at the desired length.

#### Can the RELN Channel Drains support a passenger vehicle?

Yes, with the appropriate concrete installation the RELN Storm Drain and Storm Mate Channels can support medium duty pneumatic tire traffic, autos and light trucks at speeds less than 12mph (20kmh).

#### Are the channel grates removable once the drains are installed in a concrete application?

The RELN channels and grates are designed with pry slots which allows the grates to clip in and out, with just a flat head screwdriver.

#### Can grates be interchangeable with other RELN Channel Drains?

Yes, the Storm Mate and Storm Drain Channels are the same width and length which allows the grates to be interchangeable.

#### What material is the RELN channel and grate made of?

The channel is manufactured from 100% recycled plastic polypropylene. The Grey grate and Black Heel Guard grate are made from a tough, durable, structurally foamed impact polymer.

#### What lengths are the RELN Channel Drains available in?

The Channels are sold in lengths of 40 inches (1 meter) or 10 feet (3 meter) lengths.

#### Can the RELN Channel Drains support forklift traffic?

To support a forklift, we recommend using the Ductile Iron grates (please reach out to sales@ftrproducts.ca). These grates can clip into the Storm Mate or Storm Drain channels. Suitable design of the concrete slab is required by an engineer to cater for the type of forklift load the concrete will be subjected to.

#### What is the recommended slope the channels should be installed at to ensure adequate drainage?

Water will always find its own level, so the drain must always be graded towards the outlet, whether the grade be less or more than the ideal. The ideal minimum grade is a slope of 2/10" per 40inch length (5mm per 1m).

#### Where should the runoff water that is captured from the Channel Drains be drained to?

Preplanning should be completed prior to installation. Any discharge water should be away from the property foundation and in an area where erosion will not be an issue. It is also beneficial in reusing the runoff water to hydrate garden beds and/or flowers. Checking with your council/local authority will also ensure that any drainage works complies with local regulations.



## FREQUENTLY ASKED QUESTIONS

### > Installation

#### **What is the recommended slope the channels should be installed at to ensure adequate drainage?**

Water will always find its own level, so the drain must always be graded towards the outlet, whether the grade be less or more than the ideal. The ideal minimum grade is a slope of 2/10" per 40inch length (5mm per 1m).

#### **Where should the runoff water that is captured from the Channel Drains be drained to?**

Preplanning should be completed prior to installation. Any discharge water should be away from the property foundation and in an area where erosion will not be an issue. It is also beneficial in reusing the runoff water to hydrate garden beds and/or flowers. Checking with your council/local authority will also ensure that any drainage works complies with local regulations.

#### **How do you secure the End Cap to a cut end of the channel drain?**

The End Caps for both the Storm Drain and Storm Mate series have pressure tabs to allow them to hold in place. Silicone can be added to seal the connection point. For additional support, a screw can be inserted from the tabs into the channel section.

#### **In a non-concrete (lawn) application, what is the recommended installation method to secure the Storm Drain channels?**

RELN part 003103 Channel Drain Stake Kit securely holds the channel drain in place in softscape applications.

#### **I have an interlock stone driveway, and I would like to have the stone installed at the edge of the channel, is this approved?**

Encase RELN Channel Drain in concrete, minimum of 4 inches. Ensure concrete is consolidated around the channel to eliminate any air pockets. Secure pavers adjacent to the RELN channel in high strength mortar.

#### **I have a pre-existing concrete slab; can I just cut the width of the channel and sit it in place?**

If the application is not to support vehicle traffic, we recommend cutting a slightly larger cavity and encase with fill material to secure the channel drains. For an application to support a passenger vehicle, we recommend you encase the channel drains in concrete, minimum of 4 inches around each side of the channel drains.

#### **How do you install rebar with the RELN Channel Drains?**

The RELN Storm Mate and Storm Drain channels are designed with Anti-Floating Channel "Feet" prevent floating when encased in fill material. With this feature, rebar is not required. If the applications require the use of rebar support, RELN part 003103 Channel Drain Stake Kit allows for the installation of rebar.

#### **Can you connect 4 in. corrugated drain pipe to the RELN Storm Drain channels?**

By using RELN part 000225 Corrugated Adapter, you can connect corrugated pipe to the Storm Drain End Outlet part 003408 or to the Storm Drain Inline basin part 003431 & 003441.

#### **Can you connect MOLE-Pipe to a Storm Drain channel section?**

Yes, MOLE-Pipe can be connected to the Storm Drain channel section by using the MOLE-Pipe Female connector (part 1003FA-FTR) and the RELN 4 in. Corrugated Pipe adapter (part 000225). The two fittings snap into each other to create a secure connection and the opposite end of the Corrugated adapter can glue into the Storm Drain End Outlet (part 003408) which is connected to the channel section.

#### **Can you connect a drain pipe to the end of the RELN Channel Drains?**

With the Storm Drain channel system you can discharge water off the end by using part 003408 Storm Drain End Outlet. The End Outlet is compatible with 4 in. PVC pipe, or with the RELN part 000225 or 000226, you can connect 4 in. corrugated or sch 40 pipe. The Storm Mate channel system is only designed to discharge water from the bottom and not the ends. Storm Drain and Storm Mate channels have built-in bottom outlet which accommodates 4 in. sch 20 PVC pipe.

#### **How do you protect the grates and channels during installation?**

RELN part 000070 Channel Drain Tape is used to protect the grates and channel drains during install. The RELN tape is the same width of the channels and leaves no residue.

#### **How do you connect two lengths of the RELN channel drains together?**

Both Storm Mate and Storm Drain channels have interlocking clip-in connections. If additional support is required, joiners' (part 003005) are available for the Storm Drain channel series. This would be an ideal solution for a long run of channel.

#### **What do you recommend for sealing connections points?**

Outdoor weather rated silicone can be used to seal any connection points.

#### **When connecting PVC pipe to the Storm Drain End Outlet, what adhesive should be used?**

The Storm Drain End Outlet part 003408 is made of ABS plastic. ABS to PVC transition glue is required when using PVC pipe.

#### **Can the RELN Channel Drains be installed as a sewer drainage system inside a home?**

The RELN Channel Drains are only approved and designed to manage storm water around the outside of a home and should at no time be used for sewage applications.

#### **Can the RELN Channel Drains be installed around a perimeter?**

Yes, the Storm Drain part 003124 & 003125 4 Way Adapter allows for 90-degree corners as well, Tee and intersections.

#### **Can heating cables (ice melting) be used within the RELN Channel Drains?**

Heating cables should only be used if they are approved for use with polypropylene plastic. It is recommended to discuss with the heating cable manufacture.

#### **What should be considered when designing a new driveway?**

Drainage should be considered in the design of a new driveway so that water will run off into a suitable drainage system and not be directed into the garage or home.



## FREQUENTLY ASKED QUESTIONS

### > Maintenance

**If water remains in the RELN Channel Drains during the cold winter temperature will this have any impact on the drains?**

Small pockets of water in the channel will indicate that it has not been suitably graded to ensure complete run-off. Small pockets of water will freeze but not cause and damage to Storm Drain or Storm Mate.

**Do the drains require any maintenance?**

We suggest you periodically inspect your drains for any debris or leaves that may have entered the channels, and have any build-up cleaned out to eliminate pipe clogging. We recommend installing the Storm Drain Leaf Guard (RELN Part 003410) with your system.

**How can I prevent my drain pipe lines from getting clogged with leaves and debris?**

RELN part 003410, Storm Drain Leaf guard is designed to clip into any outlet point for the Storm Drain channel series to prevent pipe blockage.

**Are the Channel Drains water tight?**

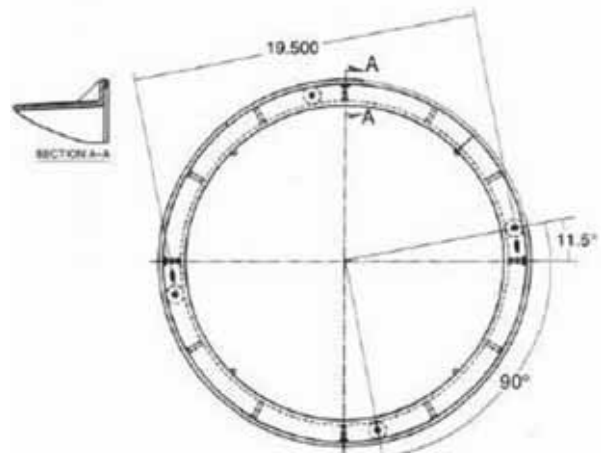
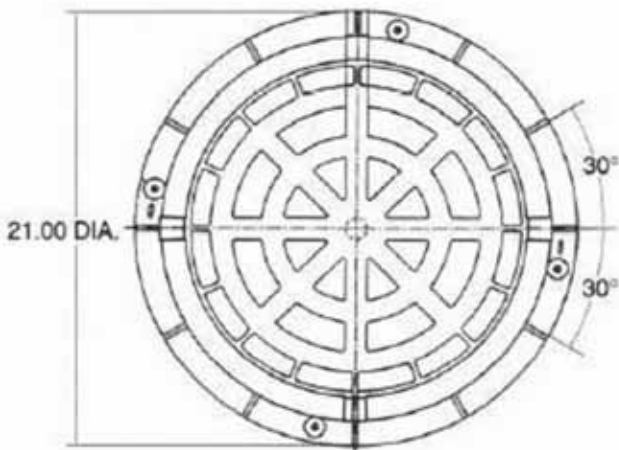
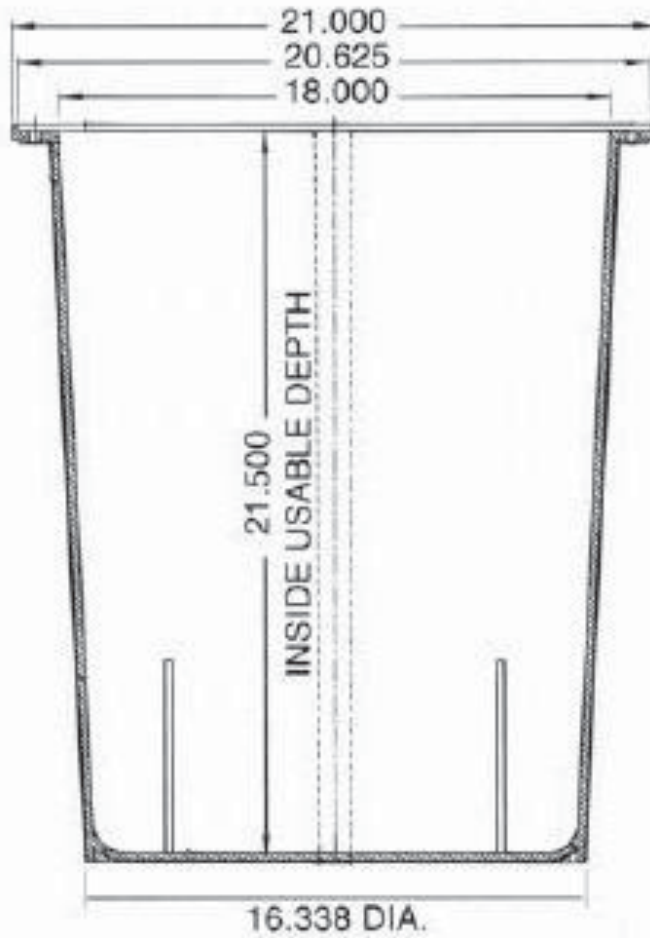
The sump area in the bottom of the channels is water tight. The connections between channel sections, end outlets, end caps and inline basins are soil tight, not water tight. Adding a bead of water proof silicone on each connection point will create a water tight connection.



SUBMITTAL #22 SUMP PUMP BASIN

# 18 in. x 22 in. Sump Pump Basin

Store SKU #1000027544 | Model SF20

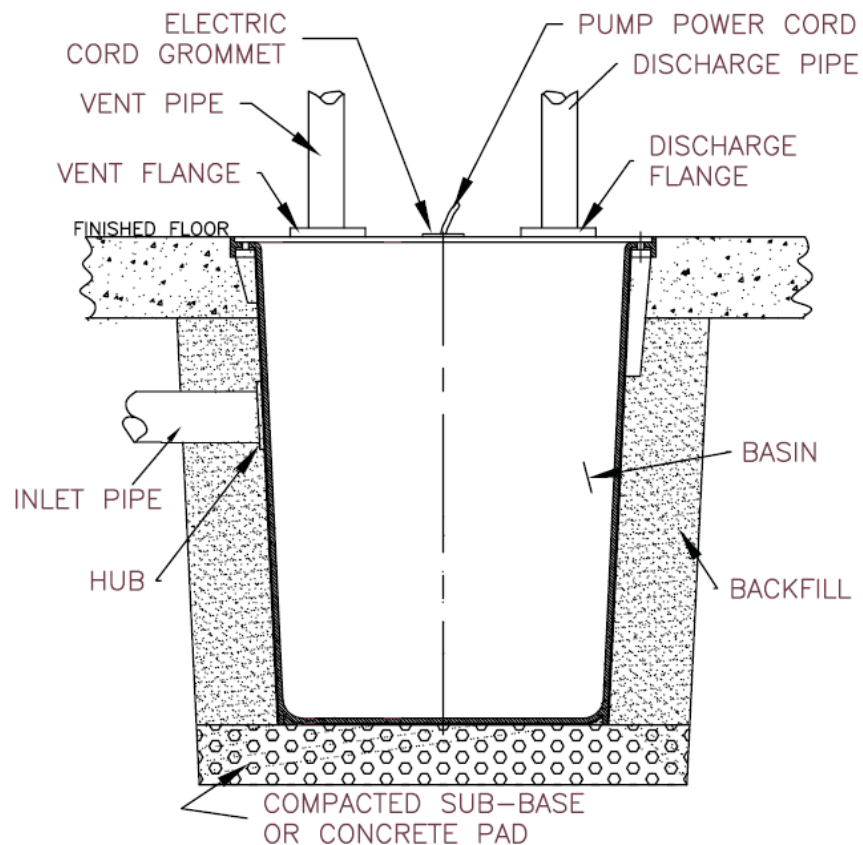


Please contact 1-877-297-6069 for further assistance • [HOMEDEPOT.com](https://www.homedepot.com)

© 2018 Jackel, Inc.  
EverbiltTHDSF60913, 06/18

The below serves only as an installation guide for Everbilt™ molded sump and sewage basins. Please refer to your state and/or local plumbing or onsite wastewater treatment and disposal regulations for details pertaining to your systems design, installation and maintenance requirements.

1. Inspect all parts and materials supplied by The Home Depot to assure that no shipping damage occurred.
2. Excavate hole large enough to accommodate basin, backfill material and inlet piping.
3. Add 4" - 6" of clean backfill material or concrete to the bottom of the hole. Assure that it is level, compacted and smooth.
4. Place the basin in the hole making sure that it is level.
5. Carefully backfill with naturally rounded gravel or stone, larger than 3/8" and smaller than 3/4" diameter, around the periphery of the basin.
6. Connect all piping as required.
7. Finish floor around the basin as required.



Questions, problems, missing parts? Before returning to the store,  
call Everbilt Customer Service  
8 a.m. - 7 p.m. EST, Monday - Friday and Saturday 9 a.m. - 6 p.m. EST

1-877-297-6069

HOMEDEPOT.COM

# SPECIFICATION SUBMITTAL SHEET

jones stephens corporation

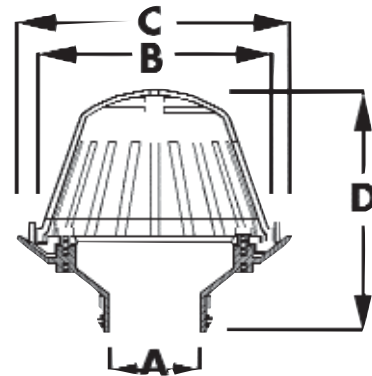
## ROOF DRAIN



### features and benefits:

*FITS OVER SCHEDULE 40 DWV PIPE*

- Brass inserts in underside for underdeck clamps
- Dome has 50 square inches of free area



### CAST IRON DOME

PVC	ABS	SIZE	A	B	C	D
<input type="checkbox"/> R18-001	<input type="checkbox"/> R18-009	2"	Over 2" pipe	8 1/4"	11"	9"
<input type="checkbox"/> R18-005	<input type="checkbox"/> R18-007	3"	Over 3" pipe	8 1/4"	11"	9"
<input type="checkbox"/> R18-006	<input type="checkbox"/> R18-008	4"	Over 4" pipe	8 1/4"	11"	9"
<input type="checkbox"/> R18-026	<input type="checkbox"/> -----	6"	Over 6" pipe	8 1/4"	11"	8"

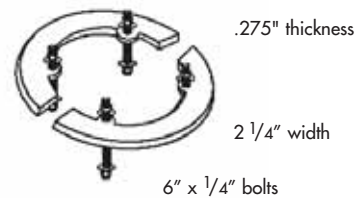
### PLASTIC DOME

PVC	ABS	SIZE	A	B	C	D
<input type="checkbox"/> R18-013	<input type="checkbox"/> R18-016	2"	Over 2" pipe	8 1/4"	11"	8"
<input type="checkbox"/> R18-014	<input type="checkbox"/> R18-017	3"	Over 3" pipe	8 1/4"	11"	8"
<input type="checkbox"/> R18-015	<input type="checkbox"/> R18-018	4"	Over 4" pipe	8 1/4"	11"	8"
<input type="checkbox"/> R18-027	<input type="checkbox"/> -----	6"	Over 6" pipe	8 1/4"	11"	8"

### ACCESSORIES

PART NO.	DESCRIPTION
R18-011	2", 3" & 4" Underdeck clamp
R18-028	6" underdeck clamp
R18-012	16" receiving pan
R18-019	Plastic roof dome
R18-020	Cast iron roof dome

### UNDERDECK CLAMP



jones stephens corporation  
 3249 moody parkway • moody, alabama 35004  
 toll free phone: 1-800-355-6637 • toll free fax: 1-800-462-6991  
 www.plumbest.com

## PIG® Build-A-Berm® Barrier Straight Section

PLR278 Ideal For Long-Term Custom Containment, 4.5" x 15' x 1.5", 1 each

Build a semi-permanent barrier around your machinery or storage areas with our crush-resistant spill berms.

- Barriers can be constructed into a semi-permanent, high-visibility barrier that's exactly the size and shape you need - indoors or out
- Pliable open-cell foam barrier springs back into shape after you walk or roll over it with light, wheeled equipment
- Durable, 18-oz. all-vinyl covering resists oils, coolants and most chemicals
- Cut to length with utility knife; for best installation results, secure to a smooth, sealed surface with sealant (sold separately) and join seams with vinyl cement (sold separately)
- Combine with Build-A-Berm Barrier Corners (sold separately) to create liquid-proof containment; ends overlap and seams can be sealed together with Industrial-Strength Vinyl Cement (sold separately)
- Contain leaks and spills around your machinery without building expensive concrete curbs or cutting and installing angle iron
- High-visibility yellow color draws attention to barrier for increased safety
- Easy removal requires only a flat-bladed shovel
- Great for use around battery charging stations, machinery or any other leak-prone areas
- Sealant, industrial-strength vinyl cement and barrier corner pieces sold separately



### Specifications

Style	Straight Section
Dimensions	4.5" W x 15' L x 1.5" H
Barrier Height	1.5" H
Brand	PIG
Ideal For	Long-Term Custom Containment
Install/Deploy Type	Glued In Place Barrier

<b>Color</b>	Yellow
<b>Temperature Limit</b>	Works from -22°F to 160°F
<b>Traffic</b>	Cart Traffic
<b>Sold as</b>	1 each
<b>Weight</b>	4.3 lbs.
<b>New Pig Patent</b>	5,820,297
<b># per Pallet</b>	36
<b>Composition</b>	Cover: 18 oz. Vinyl-Coated Fabric Core: Open-Cell Polyurethane Foam
<b>UNSPSC</b>	24101907
<b>Pigalog® Page Number</b>	<a href="#">Page 151</a>

## Metric Equivalent

<b>Weight</b>	2 kg
<b>Dimensions</b>	11cm W x 4.6m L x 3.8cm H

## Technical Information

### Technical Documents

[PIG Build-A-Berm® Barrier](#)

[Instructions for Using PIG® Build-A-Berm® Barrier](#)

[40 CFR 112.7](#)

[40 CFR 122.26](#)

[40 CFR 264.175](#)



**One Pork Avenue • Tipton, PA 16684-0304**

1-855-493-4647 • Fax: 1-800-621-7447 • [newpig.com](http://newpig.com) • [hothogs@newpig.com](mailto:hothogs@newpig.com)



## SUBMITTAL/TRANSMITTAL FORM

<b>FROM:</b>	EnviroTrac Ltd. 5 Old Dock Road Yaphank, New York 11980 Phone: (631) 924-3001 Fax: (631) 924-5001	<b>DATE SENT: 05/30/23</b>
<b>TO:</b>	<b>TRC</b> 10 Maxwell Drive Suite 200 Clifton Park, NY 12065  Attn: Peter Wanfried	<b>DATE RECEIVED: _____</b>

**PROJECT:**

**Remedial System Optimization (RSO) RFP  
 Former Chromalloy Facility, West Nyack, New York**

We are transmitting (Herewith , Under separate cover , Electronic , Hard copy ) the following:

Item No.(s)	Submittal Description	Submittal No.	Revision to Previous Submittal:
1	Figure 1 – Pump and Treat System P&ID	01	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2	EQ Tank Float Switches Specifications	05	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Bag Filter Inlet/Outlet Pressure Transmitter Specifications	09	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	Mechanical Flow Totalizer Specifications and Manual	10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5	pH Monitor/Probe Specifications and Operation Manual	12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	Variable Frequency Drive Specifications	18	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Figure 2 – EQ Tank Connection Details	25	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
8	LGAC Media Specifications	26	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Copy to: File

Signed:

## **TRC Comments w/ ET Responses**

- Check valve not needed in well pump and sump pump lines if connections go through top of EQ tank. Please confirm the discharge will be to the top of the tank.

**Three (3) influent ports and one (1) vent port to the EQ tank will be top mounted.**

- Include sump pump's integral float switch in the P&ID

**Included on updated Figure 1 P&ID.**

- Include a drawing of the well and sump pump connections to the EQ tank (please specify how the lines will be secured)

**Included as Figure 2.**

- Describe backwash discharge location and include on EQ tank drawing

**4" male camlock and cap to be installed for backwash discharge connection to EQ tank.**

- Call out how many floats are needed in the EQ tank

**Three (3) separate floats to be used for EQ tank LSL, LSH, and LSHH level switches.**

- Add a sample port to the lower portion of the EQ tank

**Included on updated Figure 1 P&ID.**

- Include a pressure gauge after the bag filters

**Included on updated Figure 1 P&ID.**

- Include interlocks 5 and 6 in VFD and well pump connection

**Included on updated Figure 1 P&ID.**

- For interlock 2, change T-2 to T-1

**Corrected on updated Figure 1 P&ID.**

- Provide information on pH transmitter calibration frequency, and the cleaning and maintenance frequency for the transmitter and probe.

**New pH probe/monitor specifications and manual & submittal attached.**



- pH running average, lag time, and warning or system shut down triggers TBD based upon permit

**Warning notification added to updated Figure 1 P&ID.**

- Provide estimate of friction loss through flow totalizer in English units

**Manual with pressure drop curve attached.**

- Pertaining to flow totalizer and flow transmitters, show pipe diameters on the P&ID (2" for manual and 3" for magnetic)
  - Need 10 pipe diameters of un-interrupted straight flow before and 5 after so they can't be within 20 inches of each other

**Included on updated Figure 1 P&ID.**

### **ET Comments**

**1, Revised VFD submittal included due to better availability and easier ability to program and test.**

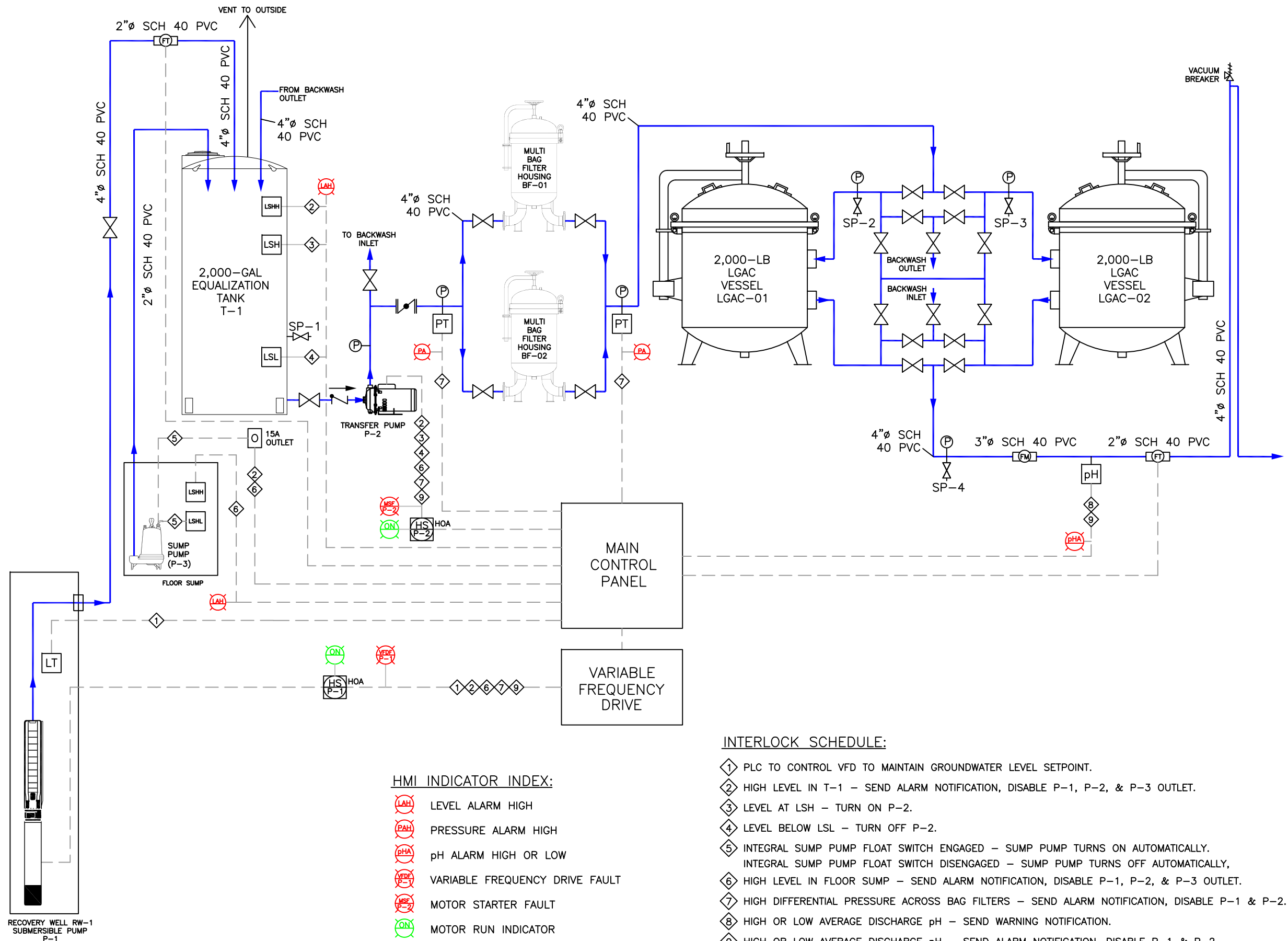


**NOTES:**

1. 10-PIPE DIAMETERS OF STRAIGHT PIPE RUN TO BE INSTALLED BEFORE EACH FLOW METER OR FLOW TRANSMITTER.
2. 5-PIPE DIAMETERS OF STRAIGHT PIPE RUN TO BE INSTALLED AFTER EACH FLOW METER/TRANSMITTER.

**SYSTEM LEGEND:**

- PRESSURE GAUGE
- LEVEL SWITCH
- LEVEL TRANSMITTER
- PRESSURE TRANSMITTER
- pH TRANSMITTER
- FLOW METER/TOTALIZER
- FLOW TRANSMITTER
- BALL VALVE
- BUTTERFLY VALVE
- SAMPLE PORT
- CHECK VALVE
- HMI SWITCH
- CONTROL PANEL INTERLOCK
- ELECTRIC LINE
- AIR FLOW DIRECTION
- WATER FLOW DIRECTION
- ENCLOSURE LIMITS



**HMI INDICATOR INDEX:**

- LEVEL ALARM HIGH
- PRESSURE ALARM HIGH
- pH ALARM HIGH OR LOW
- VARIABLE FREQUENCY DRIVE FAULT
- MOTOR STARTER FAULT
- MOTOR RUN INDICATOR

**INTERLOCK SCHEDULE:**

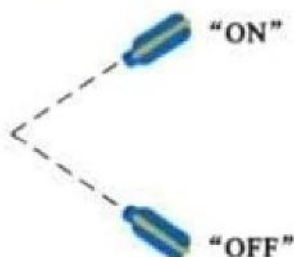
1. PLC TO CONTROL VFD TO MAINTAIN GROUNDWATER LEVEL SETPOINT.
2. HIGH LEVEL IN T-1 - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3 OUTLET.
3. LEVEL AT LSH - TURN ON P-2.
4. LEVEL BELOW LSL - TURN OFF P-2.
5. INTEGRAL SUMP PUMP FLOAT SWITCH ENGAGED - SUMP PUMP TURNS ON AUTOMATICALLY. INTEGRAL SUMP PUMP FLOAT SWITCH DISENGAGED - SUMP PUMP TURNS OFF AUTOMATICALLY.
6. HIGH LEVEL IN FLOOR SUMP - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3 OUTLET.
7. HIGH DIFFERENTIAL PRESSURE ACROSS BAG FILTERS - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.
8. HIGH OR LOW AVERAGE DISCHARGE pH - SEND WARNING NOTIFICATION.
9. HIGH OR LOW AVERAGE DISCHARGE pH - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.

# FLOAT SWITCH

AUTOMATIC ADJUSTABLE  
EASY TO INSTALL  
RELIABLE  
MAINTENANCE FREE  
ENVIRONMENTAL PROTECTION

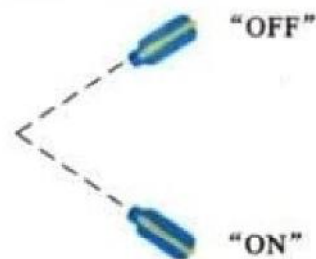
## WIRING CONNECTION

to empty: core connection  
BLACK/BROWN



Blue—the "ON" switch action below is to fill  
Black  
brown—the "ON" switch on high is to empty

to fill: core connection  
BLACK/BLUE



## TECHNICAL DATA

Microswitch:  
Switch current:

Protective connection:

Protection:

Max. temperature:

Working pressure:

Circuitbreaking capacity:

10(8)A 250V~10 (4) A 380V

—|—|—|—

≥ 50 000 switch workings

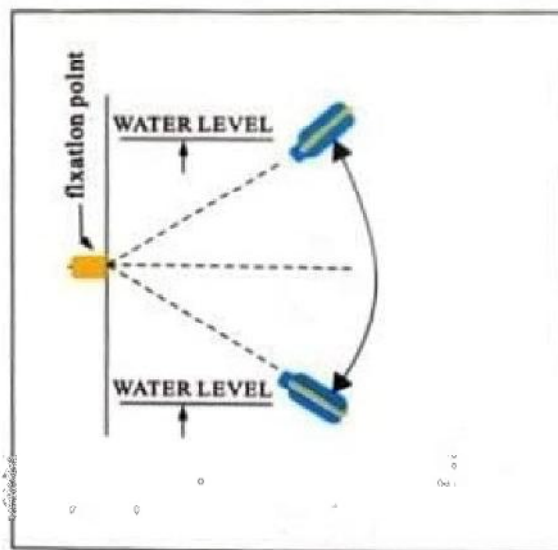
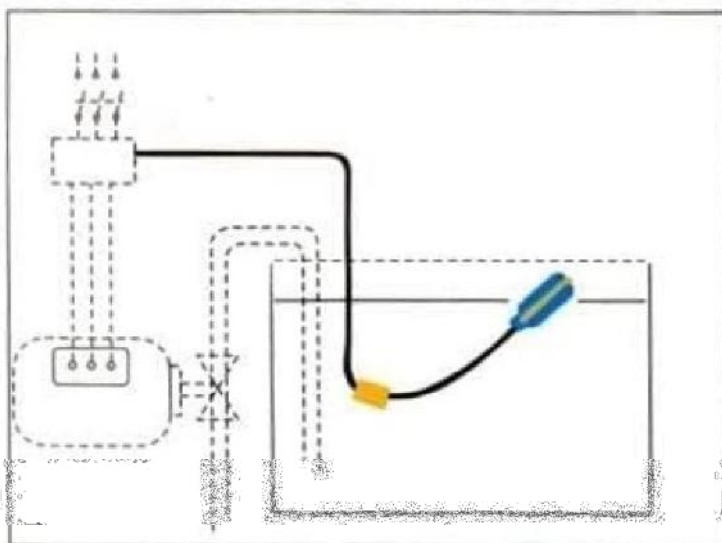
□ T70U" Ⓢ

Waterproof"

70°C

max. 1 bar

directly 2KW with 250V



## EASY OPERATION

The desired "ON" or "OFF" differential is obtained by simply lengthening or shortening the free cord fixation point. "ON" and "OFF" switch action may be adjusted to any desired liquid level by moving the cord fixation in up or down direction.

## APPLICATION

The float switch "HUTO" is a switch which regulates fluid level in the tank or well etc. The float switch is resistant to water (sewage water), it is relative capable of being used for oil, most acids and alkalis. The float switch is not explosion proof.

# pro<sup>sense</sup> SPT25 Series Pressure Transmitters



The ProSense SPT25 pressure transmitter series is engineered to meet many industrial, commercial, and OEM pressure measurement applications. The all stainless steel welded thin film sensing element provides very fast response time and is compatible with many different media sensing applications. With a robust design resistant to vibration, shock, and EMI/RFI, the SPT25 series provides high accuracy over a wide compensated temperature range. Pressure sensing ranges from vacuum to 5000 psig are available along with a 1/4 inch NPT male threaded process connection. Choose from linear outputs of 4-20 mA or 0-10VDC with electrical connections of either a DIN 175301-803C L-connector or 6.6 foot (2 m) integral shielded cable.

## Applications

- Process control & automation
- Pump & compressor control
- Hydraulic systems
- Pneumatic systems
- Engine monitoring
- Refrigeration equipment
- Presses
- Machine tools

## Features

- All stainless steel welded sensing element
- Fast response time
- Pressure sensing ranges from vacuum to 5000 psig
- 1/4 inch NPT male threaded process connection
- Output options: 4-20 mA or 0-10 VDC
- Integral 6.6 foot shielded cable or DIN form C electrical connections
- Made in the USA
- CE marked
- 3-year warranty



Click on the thumbnail or go to <https://www.automationdirect.com/VID-PR-0001> for a short video on ProSense Air Differential and Pressure Transmitters



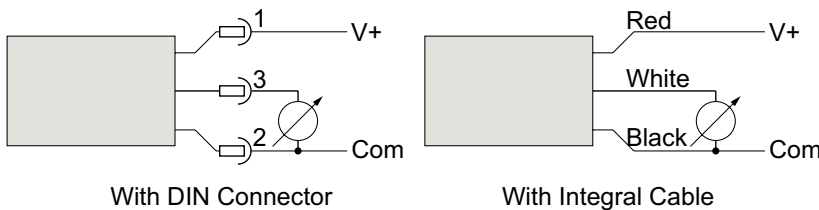
ProSense SPT25 Series Pressure Transmitters (Shielded Cable)					
Part Number	Description	Electrical Connection	Input Voltage	Wt(lb)	Price
<a href="#">SPT25-20-V30A</a>	Pressure transmitter, 4 to 20 mA output, -14.7 vacuum to 30 psig range, 1/4" NPT male port	Integral 6.6 ft (2m) shielded cable	9 - 36 VDC	0.38	\$153.00
<a href="#">SPT25-20-0030A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 30 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0060A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 60 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0100A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 100 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0150A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 150 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0200A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 200 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0300A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 300 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-0500A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 500 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-1000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-1500A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1500 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-2000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 2000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-3000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 3000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-20-5000A</a>	Pressure transmitter, 4 to 20 mA output, 0 to 5000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-V30A</a>	Pressure transmitter, 0 to 10 V output, -14.7 vacuum to 30 psig range, 1/4" NPT male port		14 - 36 VDC		\$153.00
<a href="#">SPT25-10-0030A</a>	Pressure transmitter, 0 to 10 V output, 0 to 30 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0060A</a>	Pressure transmitter, 0 to 10 V output, 0 to 60 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0100A</a>	Pressure transmitter, 0 to 10 V output, 0 to 100 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0150A</a>	Pressure transmitter, 0 to 10 V output, 0 to 150 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0200A</a>	Pressure transmitter, 0 to 10 V output, 0 to 200 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0300A</a>	Pressure transmitter, 0 to 10 V output, 0 to 300 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-0500A</a>	Pressure transmitter, 0 to 10 V output, 0 to 500 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-1000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 1000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-1500A</a>	Pressure transmitter, 0 to 10 V output, 0 to 1500 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-2000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 2000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-3000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 3000 psig range, 1/4" NPT male port				\$153.00
<a href="#">SPT25-10-5000A</a>	Pressure transmitter, 0 to 10 V output, 0 to 5000 psig range, 1/4" NPT male port				\$153.00

# pro<sup>sense</sup> SPT25 Series Pressure Transmitters

## ProSense SPT25 Series Pressure Transmitters (DIN Connector)

Part Number	Description	Electrical Connection	Input Voltage	Wt(lb)	Price
<a href="#">SPT25-20-V30D</a>	Pressure transmitter, 4 to 20 mA output, -14.7 vacuum to 30 psig range, 1/4" NPT male port	DIN 175301-803C L-connector	9 - 36 VDC	0.30	\$147.00
<a href="#">SPT25-20-0030D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 30 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0060D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 60 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0100D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 100 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0150D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 150 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0200D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 200 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0300D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 300 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-0500D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 500 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-1000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1000 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-1500D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 1500 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-20-2000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 2000 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-20-3000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 3000 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-20-5000D</a>	Pressure transmitter, 4 to 20 mA output, 0 to 5000 psig range, 1/4" NPT male port		\$147.00		
<a href="#">SPT25-10-V30D</a>	Pressure transmitter, 0 to 10 V output, -14.7 vacuum to 30 psig range, 1/4" NPT male port		14 - 36 VDC		\$147.00
<a href="#">SPT25-10-0030D</a>	Pressure transmitter, 0 to 10 V output, 0 to 30 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-10-0060D</a>	Pressure transmitter, 0 to 10 V output, 0 to 60 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-10-0100D</a>	Pressure transmitter, 0 to 10 V output, 0 to 100 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-10-0150D</a>	Pressure transmitter, 0 to 10 V output, 0 to 150 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-10-0200D</a>	Pressure transmitter, 0 to 10 V output, 0 to 200 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-10-0300D</a>	Pressure transmitter, 0 to 10 V output, 0 to 300 psig range, 1/4" NPT male port				\$147.00
<a href="#">SPT25-10-0500D</a>	Pressure transmitter, 0 to 10 V output, 0 to 500 psig range, 1/4" NPT male port	\$147.00			
<a href="#">SPT25-10-1000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 1000 psig range, 1/4" NPT male port	\$147.00			
<a href="#">SPT25-10-1500D</a>	Pressure transmitter, 0 to 10 V output, 0 to 1500 psig range, 1/4" NPT male port	\$147.00			
<a href="#">SPT25-10-2000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 2000 psig range, 1/4" NPT male port	\$147.00			
<a href="#">SPT25-10-3000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 3000 psig range, 1/4" NPT male port	\$147.00			
<a href="#">SPT25-10-5000D</a>	Pressure transmitter, 0 to 10 V output, 0 to 5000 psig range, 1/4" NPT male port	\$147.00			

### 0 to 10 VDC Output Wiring Diagram

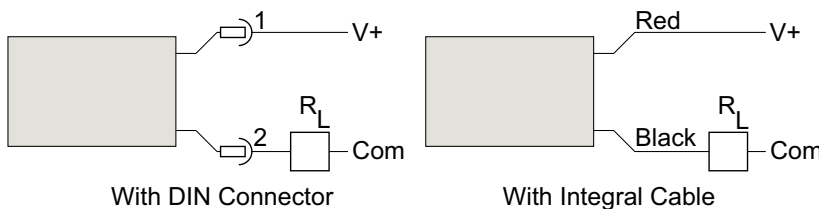


### Shielded Cable Models Wire Designation

Wire Color	0 - 10 VDC Output	4 - 20 mA Output
Red	V +	V +
Black	Com	Output
White	Output	None
Bare*	Shield Drain Wire	Shield Drain Wire

\* Where shielded wiring is being used; Connect the drain wire to the guard terminal on the read out device or measuring instrument if available. In all other cases connect to the power supply negative terminal.

### 4 to 20 mA Output Wiring Diagrams



### DIN Form C Models Pin Designation

Pin No.	0 - 10 VDC Output	4 - 20 mA Output
1	V+	V+
2	Com	Output
3	Output	None
4	Case Ground	Case Ground

# ProSense® SPT25 Series Pressure Transmitters

## ProSense SPT25 Series General Specifications

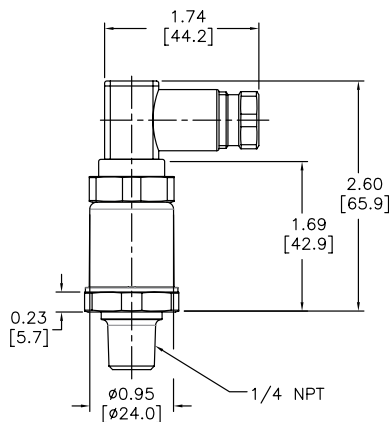
<b>Housing Material</b>	20% Glass Reinforced Nylon, Fire retardant to UL94 V1 / 304 Series Stainless steel
<b>Materials (wetted parts)**</b>	304 Series Stainless steel / 17-4PH Stainless Steel
<b>Operating Temperature</b>	-40 to 257°F (-40 to 125°C)
<b>Medium Temperature</b>	-40 to 257°F (-40 to 125°C)
<b>Storage Temperature</b>	-40 to 257°F (-40 to 125°C)
<b>Protection</b>	IP 67 for cabled models IP 65 For DIN connector models
<b>Accuracy*</b>	± 0.50% of full range
<b>Temperature Coefficient</b>	0.15% of full range / 10°F (0.25% of full range / 10°C)
<b>Reference Temperature</b>	70°F ± 1°F (21°C ± 1°C)
<b>Compensated Temperature</b>	-4 to 185°F (-20 to 85°C)
<b>Insulation Resistance</b>	Greater than 100 megohms at 100 VDC
<b>Shock Resistance</b>	100 gs, 6 ms
<b>Vibration Resistance</b>	Random vibration (20 g) over temperature range (-40° to 125°C). Exceeds typical MIL. STD. requirements
<b>Drop Test</b>	Withstands 1 meter on concrete 3 axis
<b>Response Time</b>	Less than 1 msec
<b>Warm-up time</b>	Less than 500 msec
<b>Position Effect</b>	Less than ±0.01% span, typical
<b>Insulation Breakdown Voltage</b>	100 VAC
<b>Reverse Polarity &amp; Miswired Protected</b>	Yes
<b>Durability</b>	Tested to 50 million cycles
<b>Humidity</b>	0 to 100% R.H., no effect
<b>Stability</b>	Less than ±0.25% full range / year
<b>Agency Approvals</b>	CE
<i>*Note - Includes non-linearity, hysteresis &amp; non-repeatability.</i>	
<i>** Not cleaned for oxygen service</i>	

## DIN Connector Specifications

<b>Number of contacts</b>	3 + PE
<b>Cable glands</b>	PG 7
<b>Conductor size max.</b>	0.75 mm <sup>2</sup> / 18AWG
<b>Type of termination</b>	Screw
<b>Suitable cables</b>	4.5 mm to 6mm
<b>Standard DIN</b>	EN 175 301-803-C

## Dimensions

inches [mm]

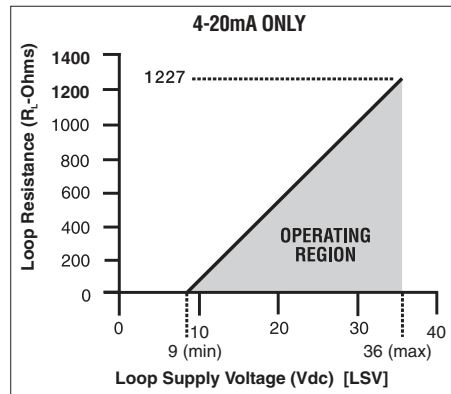


**DIN Connector Models**

## ProSense SPT25 Series Technical Specifications

Technical Specifications SPT25-20-xxxx	
<b>Operating Voltage</b>	9 – 36 VDC
<b>Analog Output</b>	4 – 20 mA
<b>Maximum Load</b>	Determine Maximum Loop Resistances $\frac{V_L - 9 \text{ VDC}}{0.022 \text{ amps}} = R_L$ For example $[(24 \text{ VDC} - 9 \text{ VDC}) / 0.022 \text{ amps}] = 681\Omega$
Technical Specifications SPT25-10-xxxx	
<b>Operating Voltage</b>	14 – 36 VDC
<b>Current Consumption</b>	4 mA
<b>Minimum Load</b>	10 kΩ

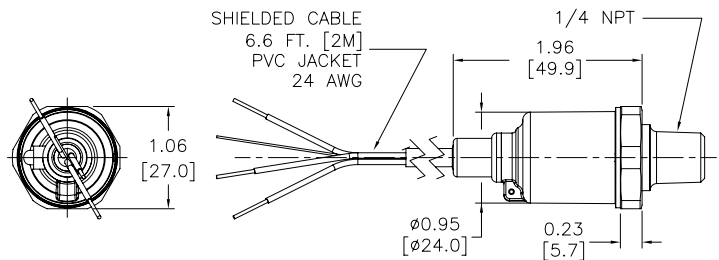
Power Supply Voltage vs Loop Resistance



## ProSense SPT25 Proof & Burst Pressures

	<b>Proof</b>	<b>Burst</b>
<b>500 psig &amp; below</b>	200% full scale	1000% full scale
<b>1000 – 2000 psig</b>	200% full scale	500% full scale
<b>3000 psig</b>	200% full scale	500% full scale
<b>5000 psig</b>	150% full scale	500% full scale

See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.



**Shielded Cable Models**

## 3 Inch Totalizing Water Meter with Pulse Output



Cast Iron Flanged Water Meters for indicating flow totalization of water with pulse output. Woltmann Helix style water meter for industrial use. Designed for long service life and maintenance-free operation, even under harsh conditions.

### Features:

- Pulse Output Components
- All Meters have Hydrocarbon Resistant Seals and will not be damaged by dissolved amounts of free product
- Sealed Dry Dial for Clear Readings

### Specifications:

- Woltmann Helix Style Water Meter
- 150# Flange
- Pulse Rate: 100 gal/pulse
- Accuracy Class: B  
Transitional Flow:  $\pm 5\%$   
Nominal Flow:  $\pm 2\%$
- 6 Digit Mechanical Roller Counter
- Maximum Water Temperature: 86°F
- Maximum Water Pressure: 150 psi
- Mounting Orientation: Horizontal

### Materials:

- Body: Cast Iron Body, Epoxy Coated
- Measuring Components: Polyethylene
- Seals: Viton

*PRM meters are ideal for Environmental and Industrial companies to measure process water for environmental treatment, manufacturing, or irrigation. These meters are for any application that does not require potable water measurement and are excluded from federal Lead Free Standards for drinking water.*



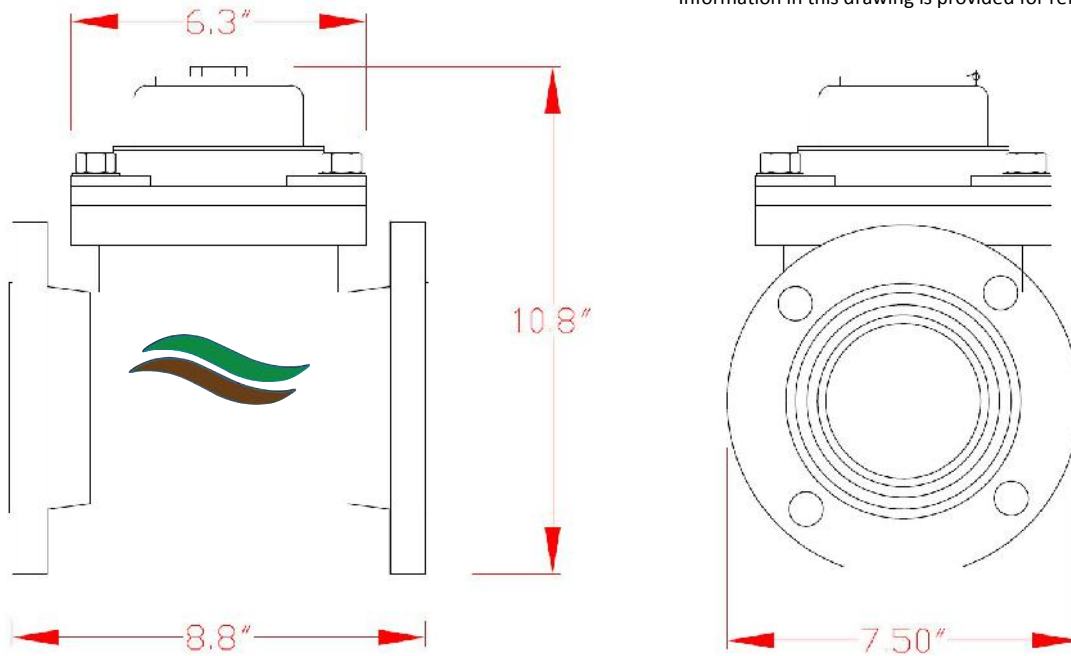
**PRM Part Number:**

**WM300PVX: 3" Flanged Multi-Jet Water Meter**

# 3 Inch Totalizing Water Meter with Pulse Output



Information in this drawing is provided for reference only.



## WM300PVX:

### Materials:

- Body: Cast Iron
- Measuring Chamber: Polyethylene
- Paint: Epoxy Coated
- Seal: Viton
- Mounting Orientation: Horizontal

Not for use with Potable Water

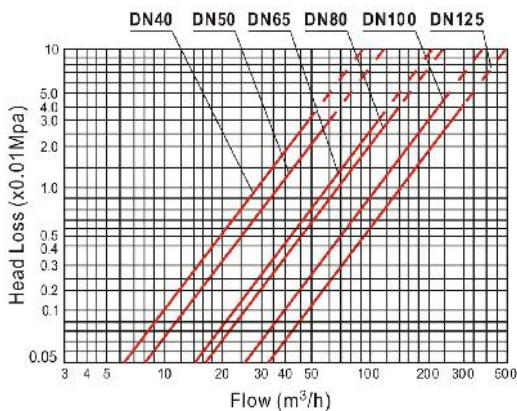
Connection: 3 Inch 150# Flange  
Pulse Rate: 100 gallons/pulse

Height: 10.8 Inches  
Length: 8.8 Inches  
Weight: 31 lbs.

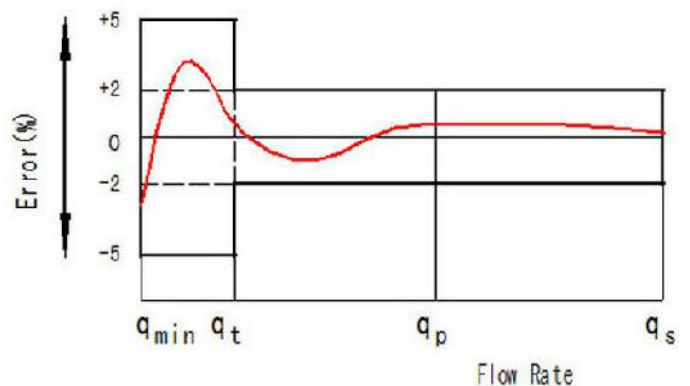
### Flow Specifications:

Qmin: 5.3 GPM  
Qt: 35 GPM  
Qp: 176 GPM  
Qmax: 352 GPM

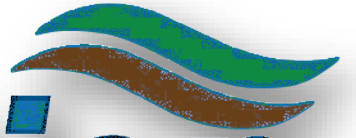
## Head Loss Curve



## Flow Error Curve



(888-TREAT-IT) • [www.prmfiltration.com](http://www.prmfiltration.com) • [sales@prmfiltration.com](mailto:sales@prmfiltration.com)



# PRM Filtration

**Water Meter Manual**





The PRM Multi-Jet Water Meter is ideal for commercial and industrial applications. PRM water meters are based on a vertical axis turbine. The water enters the meter body and is directed to a chamber around the measuring insert. The water then flows to the turbine via multiple passages spaced at intervals around the circumference of the insert. These passages form the “multiple” jets of water that act to rotate the turbine. This rotation is transferred to the counter dials via the counter gearing. The multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications. The hermetically sealed register will not leak or fog and is completely separated from the water. These water meters are designed for long service life and maintenance-free operation. Brass water meters not for potable water use.

### **Specifications:**

#### **Brass Cold Water Meters: (Blue)**

Wetted Materials: Body: Brass, polyethylene; Couplings: Brass; Measuring Chamber: Polyethylene.

O-Rings: FKM (Viton)

Accuracy: Transitional Flow:  $\pm 5\%$ ; Nominal Flow:  $\pm 2\%$ .

Temperature Limit: 104°F (40°C).

Pressure Limit: 150 psi (10 bar).

Output Signal (pulse output units only): Pulse output with frequency proportional to flow rate.

Pulse:  $\frac{1}{2}$ " and  $\frac{3}{4}$ " 1 pulse per gallon; 1" to 2" 1 pulse per 10 gallons

Mounting Orientation: Horizontal with register facing up.

#### **Stainless Steel Cold Water Meters: (Silver)**

Wetted Materials: Body: 304 Stainless Steel, polyethylene; Couplings: 304 Stainless Steel;

Measuring Chamber: Polyethylene; O-Rings: FKM (Viton)

Accuracy: Transitional Flow:  $\pm 5\%$ ; Nominal Flow:  $\pm 2\%$ .

Temperature Limit: 104°F (40°C).

Pressure Limit: 150 psi (10 bar).

Output Signal (pulse output units only): Pulse output with frequency proportional to flow rate.

Pulse:  $\frac{1}{2}$ " and  $\frac{3}{4}$ " 1 pulse per gallon; 1" to 2" 1 pulse per 10 gallons

Mounting Orientation: Horizontal with register facing up.

#### **Brass Hot Water Meters: (Red)**

Wetted Materials: Body: Brass, heat resistant polymer; Couplings: Brass;

Measuring Chamber: Heat resistant polymer; O-Rings: FKM (Viton)

Accuracy: Transitional Flow:  $\pm 5\%$ ; Nominal Flow:  $\pm 2\%$ .

Temperature Limit: 194°F (90°C).

Pressure Limit: 150 psi (10 bar).

Output Signal: Pulse output with frequency proportional to flow rate.

Pulse:  $\frac{1}{2}$ " and  $\frac{3}{4}$ " 1 pulse per gallon

Mounting Orientation: Horizontal with register facing up.

#### **Nylon Cold Water Meters: (Black)**

Wetted Materials: Body: Nylon 66; Couplings: Nylon 66; Measuring Chamber: ABS Plastic.

Accuracy: Transitional Flow:  $\pm 5\%$ ; Nominal Flow:  $\pm 2\%$ .

Temperature Limit: 104°F (40°C).

Pressure Limit: 150 psi (10 bar).

Mounting Orientation: Horizontal with register facing up.

## Water Meter Classification and Accuracy

Water meters are primarily classified by size, or the nominal diameter of the water meter is matched to the size of the pipe to which it is being connected. However, it should always be confirmed that the expected flow rates through the meter fall within the accurate flow range of the meter. The meters flow range is defined as follows:

Nominal flow rate  $Q_p$  The designation flow rate of the meter. This is the ideal amount of water flow through the meter.

Maximum flow rate  $Q_{max}$  The highest flow rate at which the meter accuracy will be within the Maximum permitted error

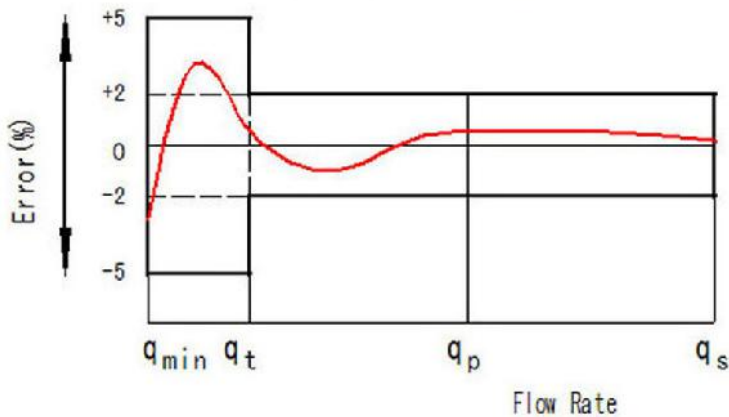
Minimum flow rate  $Q_{min}$  The lowest flow at which the meter accuracy will be within the maximum permitted error.

Transitional flow Rate  $Q_t$  The flow rate at which the maximum permitted error of the meter changes from +/-5% to +/-2%.

Max. permitted error from  $Q_{min}$  to  $Q_t$ : +/-5%

Max. permitted error from  $Q_t$  to  $Q_{max}$ : +/-2%

Flow Error Curve



PRM Meters are Class B meters and conform to AWWA Standards.

Nominal Diameter	$Q_{min}$ (GPM)	$Q_t$ (GPM)	$Q_p$ (GPM)	$Q_{max}$ (GPM)
0.5 Inch	0.25	1	5	10
0.75 Inch	0.5	2	10	20
1 Inch	0.75	3	15	30
1.25 Inch	0.75	3	25	50
1.5 Inch	1.5	5	40	75
2 Inch	2	8	65	130

PRM Woltmann Style Flanged Meters

Nominal Diameter	$Q_{min}$ (GPM)	$Q_t$ (GPM)	$Q_p$ (GPM)	$Q_{max}$ (GPM)
3 Inch	5	35	176	352
4 Inch	8	53	264	528
6 Inch	20	132	660	1320

## Water Meter Reading

Turbine type meters use a combination of inline digits and clock dials to show the volume of water that has been measured. The inline digits are in black and show the whole gallons. The clock dials have pointers that indicate the fractions of the gallons. On the larger meters this may change as often there is a x100 multiplier on the counter so the dial will show the whole gallons to give you an accurate reading.

## Maintenance/Repair

Preventative maintenance consists of periodic inspections and cleaning procedures.

The procedures should be performed at regular intervals, and any defects discovered should be corrected before further operation of the meter.

All water meters with registers should be protected from weather and not be exposed to direct sunlight.

Visually inspect the meter for missing hardware, broken resistor glass, or other signs of wear or deterioration. Verify proper flow rate and pressure for meter. A loss in pressure, with the resulting flow rate decrease, may indicate the meter screen is clogged and requires cleaning.

Clean the strainer yearly, or as required, depending on water condition. Pull out the strainer or back flush the meter to loosen trapped particulates.

## Installation Instructions

1. Thoroughly flush the service line upstream of the meter to remove dirt and debris.
2. Remove meter thread protectors. Note: To protect meter spud threads, store the meter with thread protectors in place. Attach included NPT adapters for easy connection to piping.
3. Set the meter in the line. Install in a horizontal plane, with the register upright, in a location accessible for reading, service and inspection. Arrows on the side of the meter and above the outlet indicate the direction of flow.

INSTALLATION



4. For accurate measurement, the tap height should be higher than the meter.
5. Do not over-tighten connections; tighten only as required to seal.
6. With upstream shut-off valve only: Open shut-off valve slowly to remove air from meter and service line. Open a valve slowly to allow entrapped air to escape. Close the valve.
7. With both upstream and downstream shut-off valves installed, test the installation for leaks: Close the outlet (downstream) shutoff valve. Open the inlet (upstream) shut-off slowly until meter is full of water. Open the outlet (downstream) valve slowly until air is out of the meter and service line. Open valve slowly to allow entrapped air to escape. Close the valve.

# Wiring Diagram (Pulse Units)

**METERS WITH (1) PULSE OUTPUT (2 WIRE)**

**METERS WITH (2) PULSE OUTPUTS (3 WIRE)**

**\*NOTE**  
x0,1 = 1 PULSE PER 1 GALLON  
x1 = 1 PULSE PER 10 GALLONS  
x10 = 1 PULSE PER 100 GALLONS

**\*NOTE**  
SELECT METERS COME WITH (2) PULSE OUTPUTS. BOTH ARE BASED ON THE SAME FLOW RATE. IF ONLY ONE PULSE IS NEEDED, CAP OFF UNUSED WIRE.

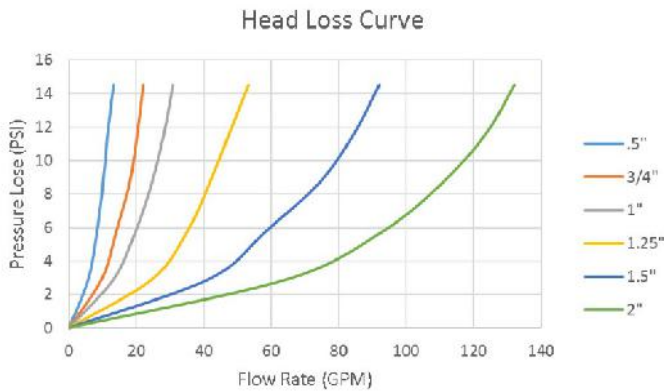
**\*NOTE**  
PULSE SENSOR MAY BE MOVED, BASED ON REQUIRED PULSE RATE.

- 1) REMOVE BRASS CAP BY UNSCREWING COUNTER-CLOCKWISE.
- 2) 3 POSITIONS ARE INDICATED AS NOTCHES THAT CORRESPOND TO THE DESIRED DIAL.
- 3) WITH A SMALL FLATHEAD SCREWDRIVER, GENTLY PRY UP FROM THE CURRENTLY SELECTED NOTCH.
- 4) ONCE THE PLASTIC COVER IS REMOVED, THE CURRENT DIAL WILL HAVE A RED ARROW WITH A MAGNET ATTACHED. GENTLY, PULL STRAIGHT UP ON THE ARROW AND INSTALL GENTLY ON THE DESIRED DIAL.
- 5) PLACE THE PLASTIC COVER INTO THE NOTCH CORRESPONDING TO THE DESIRED DIAL.
- 6) REINSTALL BRASS CAP.

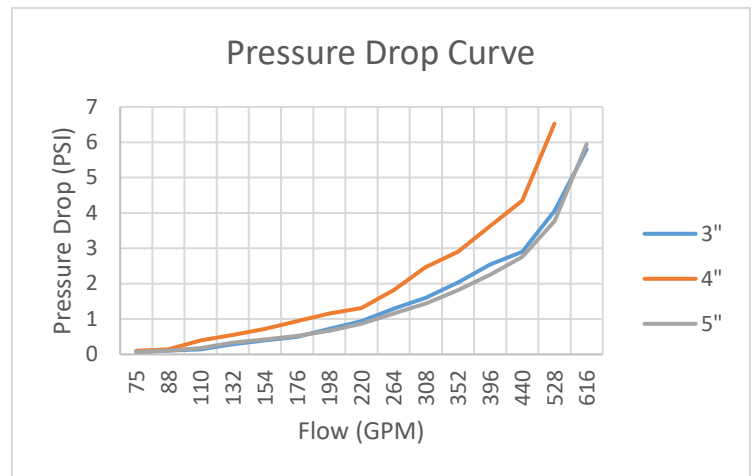
Product Recovery Management Inc.  
200 20th Street  
Butner, NC, 27509  
919-957-8890

PRM MULTI-JET WATERMETERS - TOTALIZING AND RATE INDICATION

## Head Loss Curves



½ Inch to 2 Inch Multi Jet Meters



3, 4, and 6 inch Flanged Meters

## pH and ORP Monitor and Probe

Measurement and control of pH is important in a wide variety of industries.

The pH Transmitter provides the combination of durability, accuracy, and versatility required for virtually any pH monitoring application.

The ORP Transmitter provides the same reliable monitoring system for Oxidation-Reduction Potential (ORP) applications.

PRM offers pH/ORP monitors and probes for accurate measurement and diagnostics of process water.

### Features:

- White backlight LCD screen
- Compatible for six kinds of buffer solutions
- 4~20 mA output
- Double relay high/low and delay control function



**PRM PART #:**

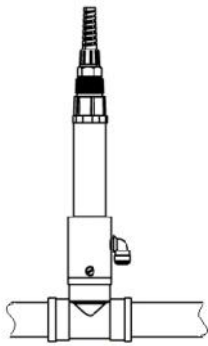
**pH Probe:**  
MISCPHMONITOR5500X

**ORP Transmitter:**  
MISCORPMONITOR5500X

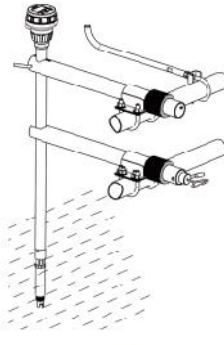
Contact [sales@prmfiltration.com](mailto:sales@prmfiltration.com) to find more information on pH and ORP Monitoring Applications.

[www.prmfiltration.com](http://www.prmfiltration.com)

## Installation method



P34A adjustment flow device



Immersion installation

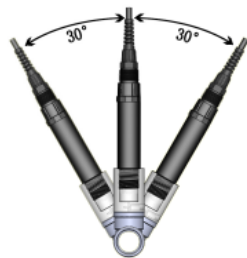
### Regarding installation method

1. User should cut off the flow before replacing sensor.
2. Fast flow and air bulbs will cause instable measurement.
3. Higher pipeline pressure will damage the sensor
4. There will be big error when testing pure water or ultra pure water.
5. The sensor will fail very soon if for testing pure water.
6. Conductivity will rise if electrode electrolyte diffuses in water through liquid junction.
7. Negative pressure will damage the sensor.
8. Water particles and fibrous material will damage the sensor.

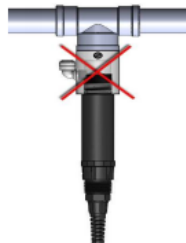
### Measurement equipment

1. The patented product P34, installed between pipeline and sensor.
2. The sensor can be replaced without cutting off water flow.
3. The reading will be accurate and stable when testing pure water and the working life is longer.
4. There is no electrode electrolyte diffuses in water

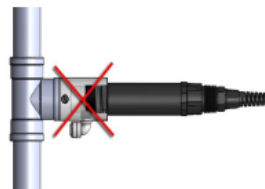
### [NOTE 2]: Installation notes



• Installation angle is Less than 30 degree



Inverse installation is incorrect



Horizontal installation is incorrect

**pH/ORP-5500**  
**pH/ORP Transmitting controller**

**Operation manual**

V1.1

## Introduction

Thanks for choosing pH/ORP-5500 series pH/ORP meter manufactured by Hebei Create Instrumentation Technologies Co., Ltd. Proper sensor installation and parameter setting would give maximum performance and advantage of this instrument for your good usage. So please carefully read this manual before installation.

This instrument is a precise electrochemical analysis Dosing & Control Integration System, which should be operated by technicians with relevant professional knowledge.

Please contact technical backup of CREATE when you meet any problems during installation and usage.

Check the actual product with complete set after you receive the package, and contact us if any missing or damage.

Our serious promise:

1. The meter's quality guarantee is one year from the date of purchasing. During this period, if the meter has quality problems, manufacturer is responsible for maintenance for free or replacement.
2. We provide lifelong maintenance service for the product whatever you purchase from us or distributors.
3. If the damage of the meter is caused by the following reasons, it is out of the maintenance service:
  - A). The meter is burned caused by misconnection with high voltage power supply or soggy.
  - B). The meter is refitted or misused without permission.
  - C). The meter is damaged under the condition out of use environment.
  - D). The relevant damage caused by choosing the wrong type.
  - E). The physical damage caused by ultimate load
  - F). The meter is out of operation caused by improper storage and transportation (refer to SJ/T10463-93 standard)
  - G). Consumable material is out of maintenance service.



Please take care of the items which with this sign. !

\*Without the influence on the operation, any small change or improvement on the products by the manufacturer will not be notified separately. Please make the object as the standard

# CATALOG

1、 CONCEPTION .....	1
1.1 Working principle.....	1
1.2 Application.....	1
1.3 Classification.....	2
1.4 Technique index .....	2
2、 INSTALLATION .....	3
2.1 Installation of instrument .....	4
2.2 Electrical connection.....	4
2.3 Diagram of 4-20ma output.....	5
2.4 Relay control connection .....	6
2.5 Control mode.....	6
2.6 Installation of sensor .....	7
2.6.1 Assembling and replacement .....	7
2.6.2 Installation method of sensor .....	8
2.6.3 Installation requirement .....	9
3、 SETTINGS.....	9
3.1 Measurement mode .....	11
3.1.1 Normal display.....	11
3.1.2 Transient display .....	11
3.2 Setting mode .....	12
3.2.1 Function selection .....	12
3.2.2 4mA setting .....	12
3.2.3 20mA setting .....	12
3.2.4 High-limit alarm setting.....	12
3.2.5 Low-limit alarm setting.....	12
3.2.6 Alarm Hystersis setting.....	12
3.2.7 Temperature setting.....	12
3.3 Sensor calibration.....	13
3.3.1 System Calibration.....	13
3.3.2 Buffer solution calibration .....	13
3.3.3 Off-line calibration.....	14
4. MAINTENANCE .....	15
4.1 Sensor Maintenance .....	15
4.2 Usage of sensors.....	15
5. INSTRUMENT AND PROBE FAULT COMMON TROUBLE SHOOTING .....	16
6. COMPLETE SET .....	16
7. ORDER DIRECTORY .....	16
7.1 Sensor selection.....	16
7.2 Flow device selection.....	17

## 1、 conception

pH/ORP-5500 series is a kind of popular and cost-effective online pH and ORP controller , with plug-in pH/ORP-1220 sensor, which have good measurement accuracy, anti-interference,easy to install and operation features.



- White backlight LCD screen,several operations, easy for operation
- Be compatible for six kinds of buffer solution which suitable for international standard.
- Selectable temperature sensor which reduce the replacement cost;
- Manual calibration is easy for on-site calibration.
- EMC enhancement type could run smoothly under kinds of industry environment.
- (4~20) mA output support instrument/transmitter modes and satisfy all 4-20mA receiving unit.
- Double relay high/low and delay control function could fulfill pH or ORP interval control and adjustment.
- Several power supply to be selection according to the different models.Input AC/DC power, no polarity connection.

### 1.1 Working principle

The weak voltage change is generated when  $H^+$  affected the inserted sensor, the changeable value will transmit to the instrument. After converting and calculating the generated pH/ORP signal, the instrument will show the values on the screen.

### 1.2 Application

This series instruments are widely used for online pH/ORP monitoring in environment protection water treatment, pure water treatment, industrial process and so on.

### 1.3 Classification

Model	Power supply	Frequency (Hz)	Current mode	Sensor selection
pH/ORP-5500	DC 24V	-----	Instrument/transmitter	pH-1220A plug-in sensor; ORP-1220A plug-in sensor or other sensors; TE-1230-14temperature sensor
pH/ORP-5510	AC 110V	50/60	Instrument/transmitter	
pH/ORP-5520	AC 220V	50/60	Instrument/transmitter	

#### 【NOTE】

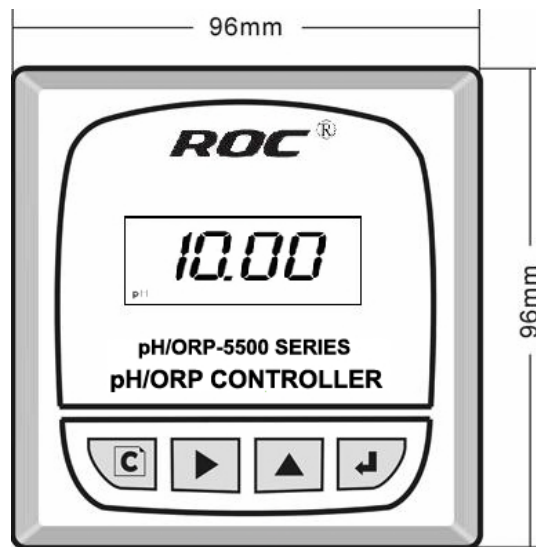
- 1、 Put the instrument in dry environment and the water-drop or moisture will cause the damage or measurement error;
- 2、 Pay more attention on the power supply before wiring connection.

### 1.4 Technique index

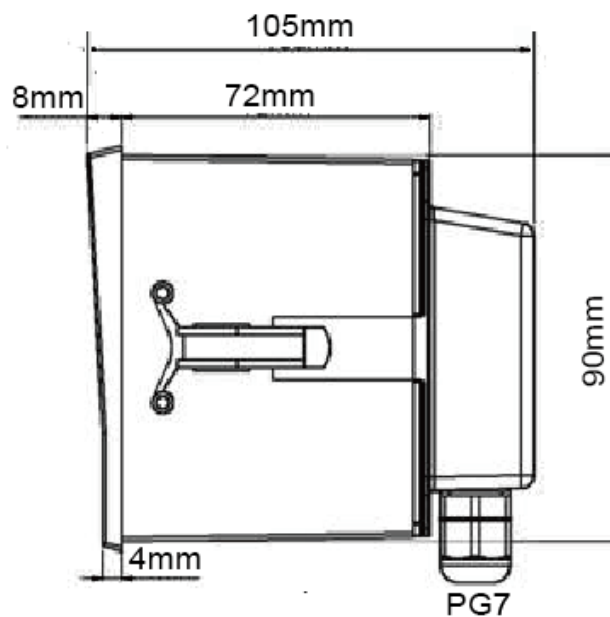
model		pH/ORP-5500 series pH/ORP online transmitting controller
Measurement range	pH	0.00~14.00
	ORP	-2000mV~2000mV
	Temp.	( 0.0~50.0 ) °C ( temperature compensation component:NTC10K)
Resolution	pH	0.01
	ORP	1mV
	Temp.	0.1°C
accuracy	pH	0.1
	ORP	±5mV (electronic unit)
	Temp.	±0.5°C
Approximate input impedance		$3 \times 10^{11} \Omega$
Buffer solution		pH value: 10.00; 9.18; 7.00; 6.86; 4.01; 4.00
Temp. compensation range		( 0~50 ) °C ( with 25°C as standard ) Manual and automatic temperature compensation
(4~20)mA	characteristics	Isolated,fully adjustable,reverible,instrument/transmitter for selection
	Loop resistance	500Ω (Max), DC 24V
	accuracy	±0.1mA
Control contact	Electrical contacts	Double relay SPST-NO,return model
	Loop capacity	AC 220V/AC 110V 2A(Max); DC 24V 2A(Max)

Power consumption		<3W
Working environment	temperature	(0~50)°C
	humidity	≤85%RH(none condensation)
Storage environment		Temp.(-20-60) °C;relative humidity:≤85%RH(none condensation)
Outline dimension		96mm×96mm×105mm (H×W×D)
Hole dimension		91mm×91mm(H×W)
installation		Panel mounted,fast installation

## 2、Installation



Top view

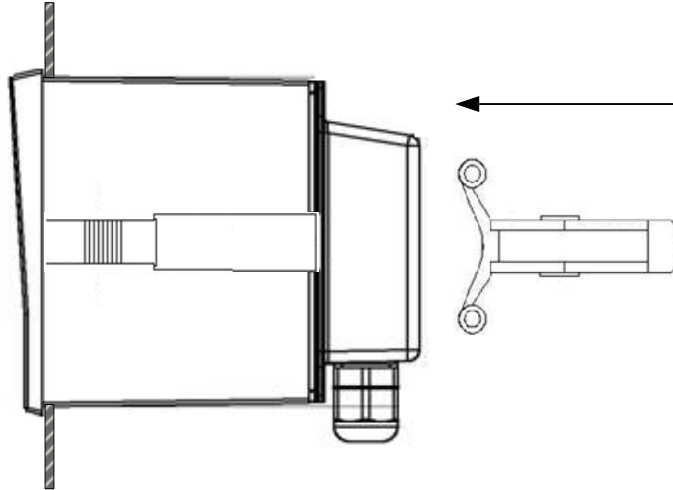


Side view

## 2.1 Installation of Instrument

pH/ORP-5500 series is adopted panel mounted type, which could be installed easily. Please follow the steps:

1. Put the instrument into the fixed hole 44mmX92mm(HxW)
2. Then push the quick clamp along with the trench and fasten the instrument.



3. Do not let the instrument drop on the floor when dismantling the meter. Withdraw the quick clamp and take the instrument down.

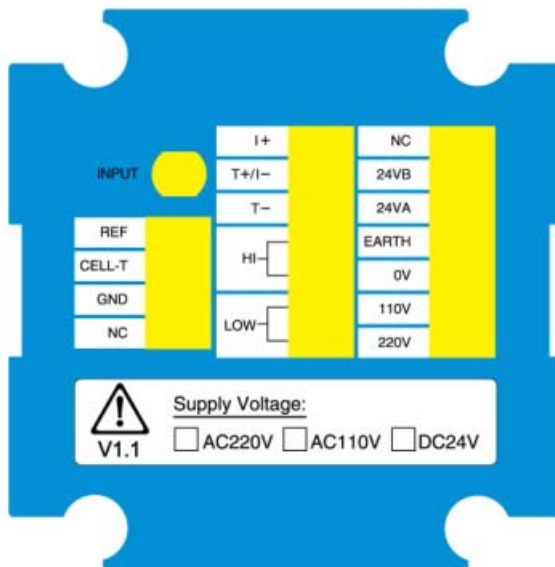


Do not put the instrument under the sun since the UV will damage the LED screen.

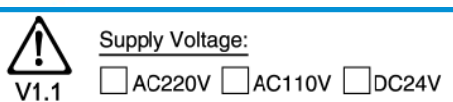
## 2.2 Electrical Connection

The measurement cable can not be mixed with high-pressure and high frequency cable. To avoid any interference, the cables should be 30cm distance and connect with the ground.

Connect the power line and signal line according to the below diagrams: .



The actual power supply must be the same

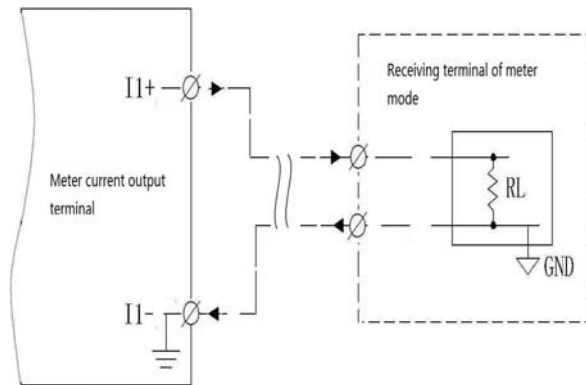


with marked power supply !

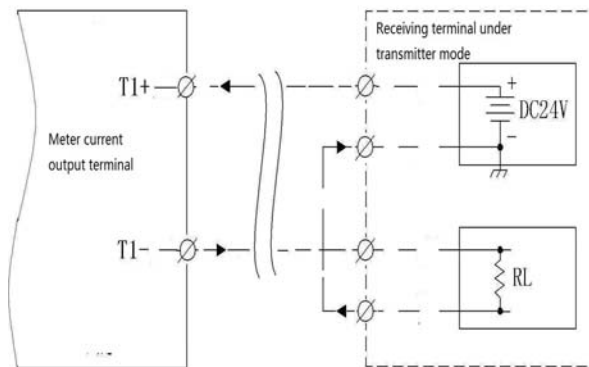
**Wiring connection:**

INPUT	Connect pH/ORP measuring sensor (transparent line)
REF	Connect pH/ORP reference sensor (shielded line)
CELL-T	Connect the receiving terminal of the temp.sensor(red)
GND	Connect grounding terminal of the temp. sensor (black)
I+/I-	Instrument mode (powered by instrument)
T+/T-	Transmitting model (external feed)
Hi	High limit alarm control terminal blocks
Low	Low limit alarm control terminal blocks
24VA/B	DC 24V input interface (pH/ORP-5500) ( Internal automatic recognition of polarity )
0V/110V	AC 110V input interface(pH/ORP-5510)
0V/220V	AC 220V input interface(pH/ORP-5520)
NC	Empty terminal
EARTH	Electromagnetic compatibility group protection terminal

**2.3 Diagram of 4-20mA output**

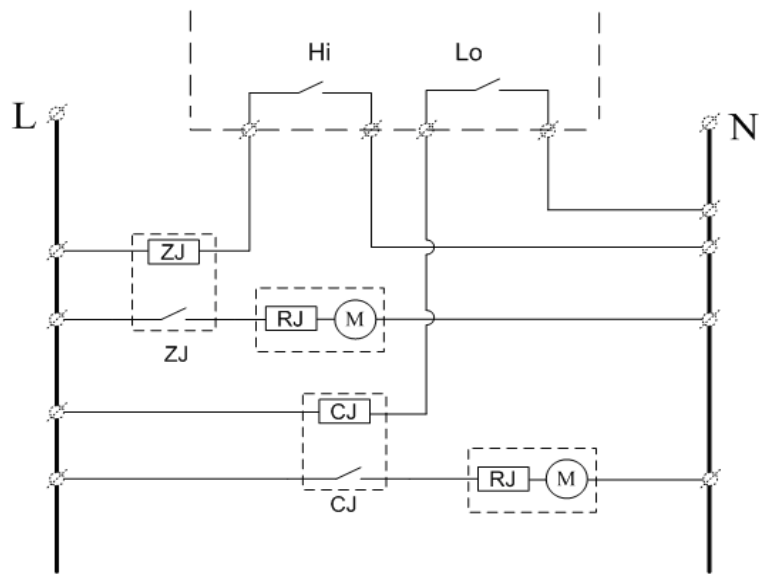


**Instrument mode**



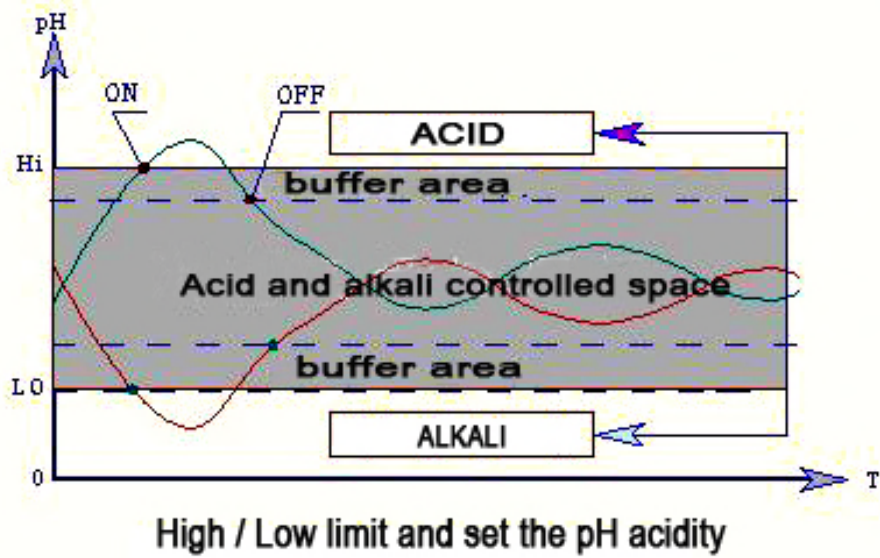
**Transmitting mode**

## 2.4 Relay control connection

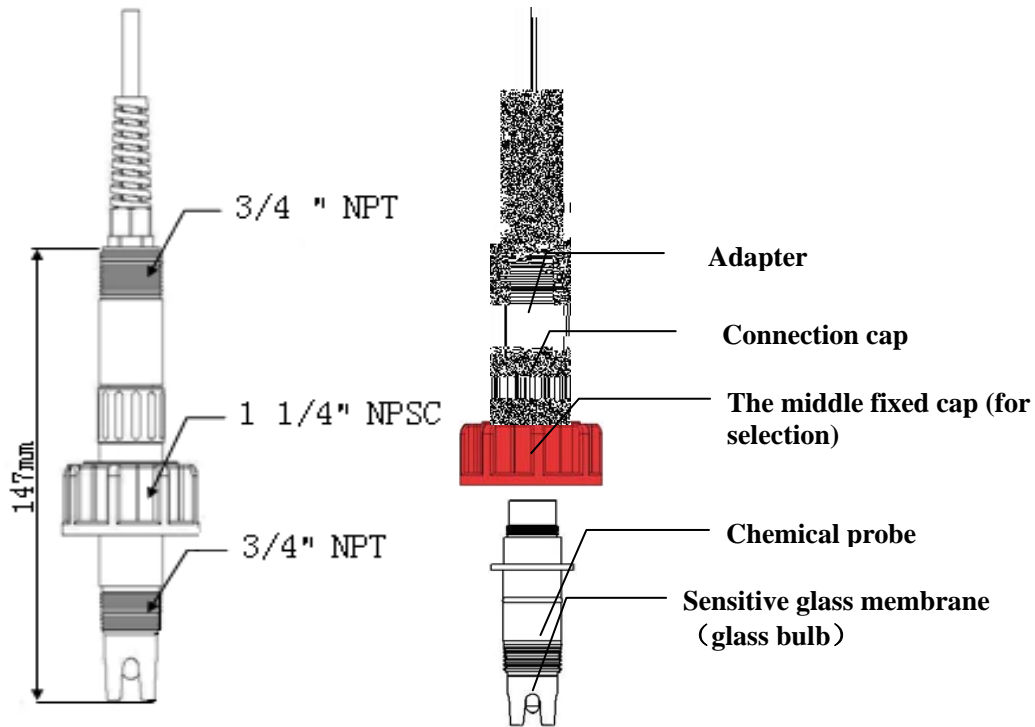


Relay ON/OFF contact component control wiring diagram

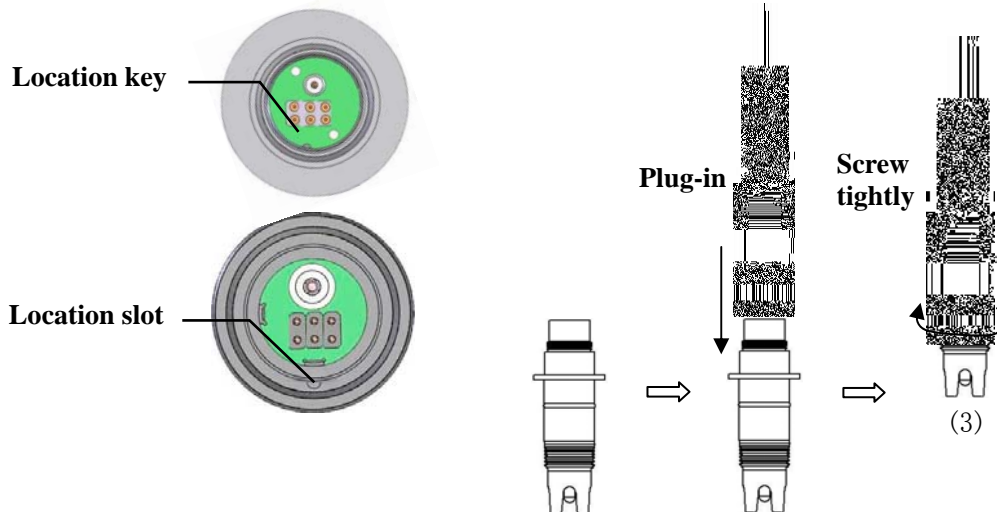
## 2.5 Control mode



## 2.6 Installation of sensor

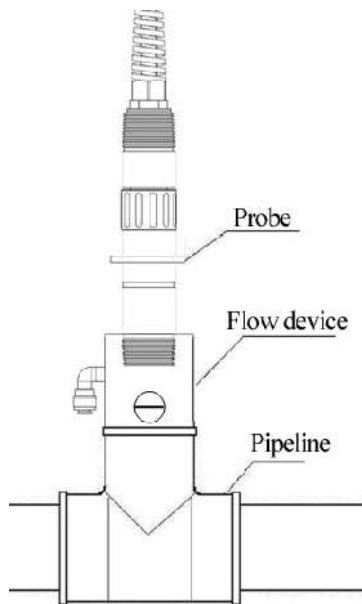


### 2.6.1 Assembling and replacement

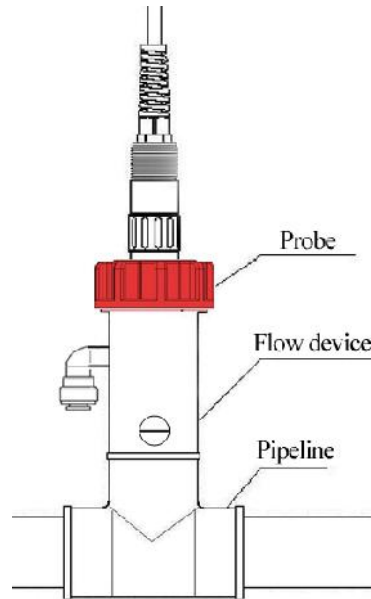


The location key and location slot must be occlusive exactly. No rough installation.

## 2.6.2 Installation method of sensor



Flow device P34A



Flow device P34B



[ **Note** ] : Recommend using the flow device with needle valve (P34)

1. Needle valve flow device (model P34A/B) is recommended when pipeline installation, which can change probe under pressure-bearing、continue condition;
2. Round sensitive glass steep pH probe direct install in the pipeline, it will threaten the probe when the pipeline pressure change, water hammer or siphon effect, after using flow device, the probe and atmosphere will communicate, operational states safe and measure stability
3. When direct install pipeline, pure water measurement value will instability because the water is weak electrolyte, sensitive glass film (glass bubble) and salt bridge present discontinuity open circuit, result the measure value instability
4. When direct install the pipeline to measure pure water, high concentration KCL of pH probe and pure water form huge concentration difference, trough liquid abutment spread into the water largely. Cause the probe lose effectiveness, pollute the pure water meantime., make the conductivity under probe downstream of pH probe rise hugely.

## 2.6.3 Installation requirement



Middle 1 1/4 " NPSC straight pipe thread fitting Upright install or slant install no more than 30 °



bottom 3/4 " NPT taper thread fitting; Upright install or slant install no more than 30 °



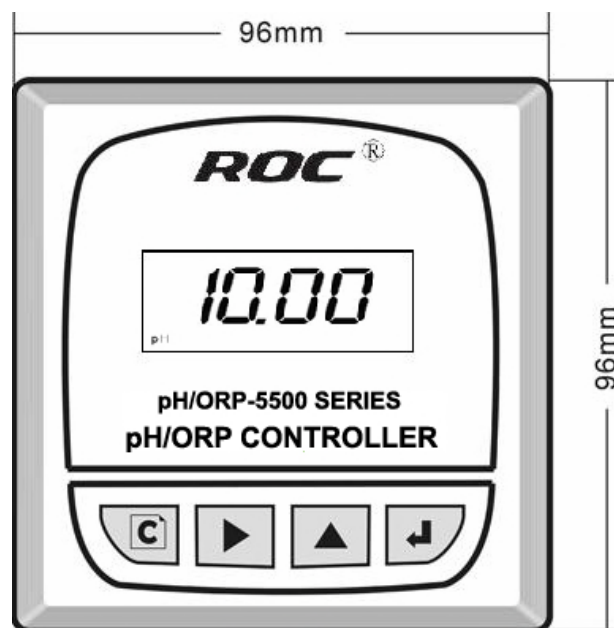
Horizontal installation does not work



Backward installation does not work





## 3、 Settings

You could set the relative parameter after connect the instrument and sensor. Please enter into the setting mode to check and set the relative parameters for your first use. These parameters are in different menus.

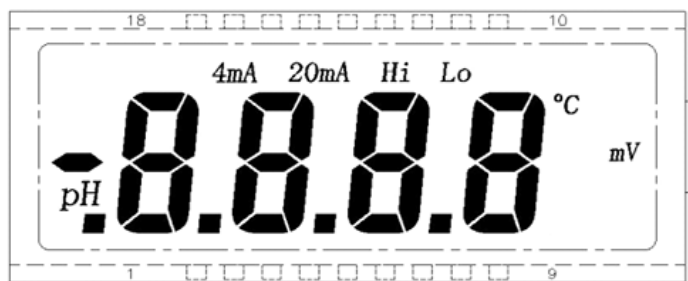


Main menu

Please operate the meter with the keys. Under the different mode, the function will be different.:

Sign	Name	Function
	ESC	1.Check the temperature compensation value under pH measurement status. 2.Exit or skip the setting parameter.
	Select	1. select thousand, hundred ,ten and unit circularly under parameter setting interface; 2. long-time press the key under pH measurement status, it will enter into pH mV calibration interface;
	Add key	1. set the 0-9 figure under parameter setting status 2. long-press the key under pH measurement status, it will enter into the buffer calibration interface; 3. check mV value under pH measurement status.
	Enter key	1.Enter into the main function menu 2. save the parameter settings

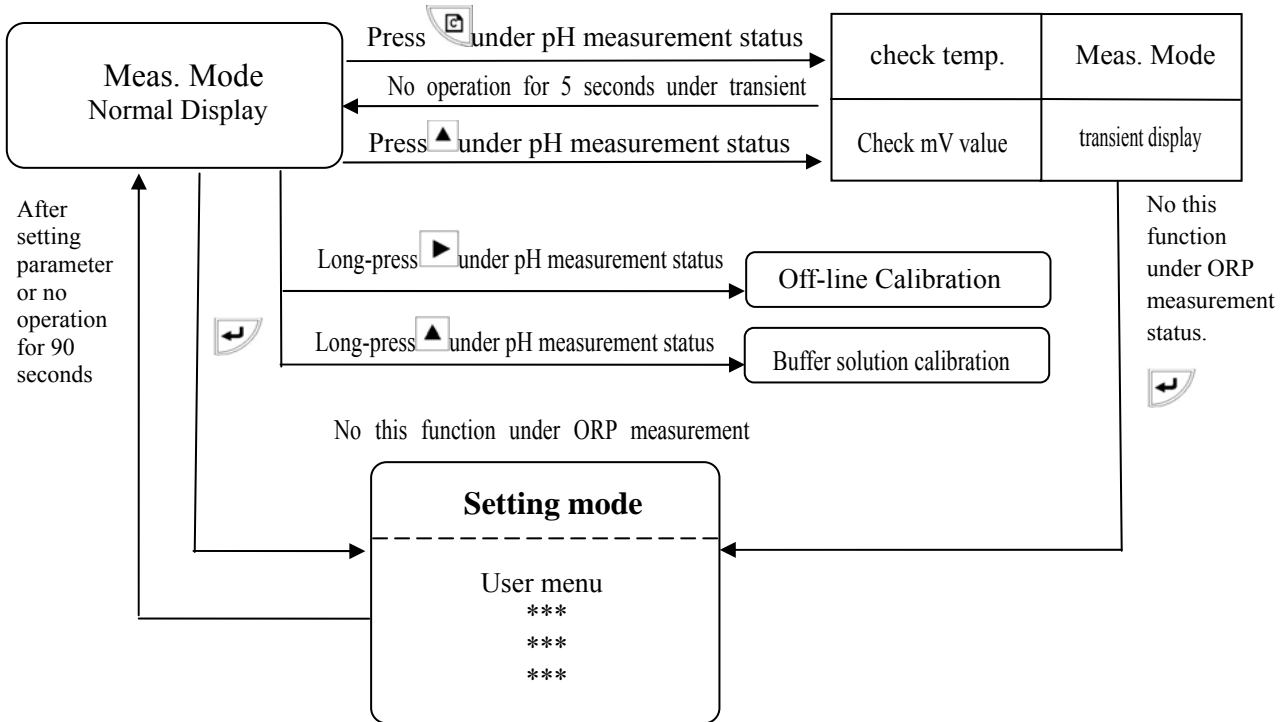
Three functions shows on the main interface: the upper area is menu bar which guide the operation; the right area displays the measurement unit of the current time; the figures means the measurement data or menu items.



pH/ORP-5500 working mode:

- ◆ Measurement mode: Normal display、transient display
- ◆ Setting mode: Parameter setting

## Switch the mode as following:



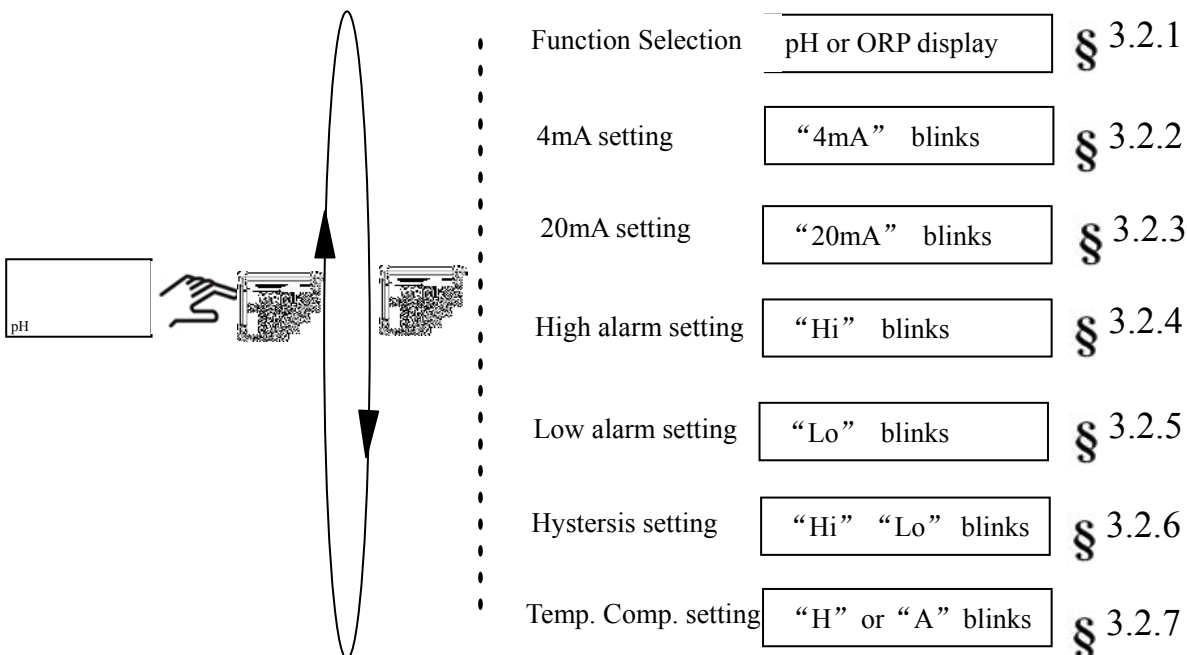
## 3.1 Measurement mode

### 3.1.1 Normal display

The instrument will display the current pH/ORP value after powered on.

### 3.1.2 Transient display



Check the current temp. value by pressing under pH measurement status and check current mV value by pressing . The instrument will return to normal display without any operation in five seconds.






## 3.2 Setting mode

Some parameters have been set before ex-factory. If the test environment changes (such as replacement of electrode, reset the alarm setting), please check the parameter which is in different menus. The specific content and operations as following




### 3.2.1 Function selection

Choose “pH” or “ORP” function selection by pressing  press  for saving the setting and enter into the next parameter setting.




### 3.2.2 4mA setting

When the screen displays “4mA”,press  to select the position of input figures.Then press  to input the actual pH/ORP value, press  to save the settings and enter into the next menu setting.


### 3.2.3 20mA setting

When the screen displays “20mA”,press  to select the position of input figures.Then press  to input the actual pH/ORP value, press  to save the settings and enter into the next menu setting.




### 3.2.4 High-limit alarm setting


The screen will displays “Hi” after entering the interface of high-limit alarm setting, press  to select the digital position and input the actual value by pressing , and save and enter into the next menu setting by pressing  .

### 3.2.5 Low-limit alarm setting



Same operation as the high-limit alarm setting, and press  after setting.

### 3.2.6 Alarm Hysteresis setting

When “Hi”and“Lo”appear at the same time, set the pH/ORP hysteresis value by pressing“  ” and“  ”, and press  save and enter into the next menu.

 THE MIN VALUE: PH $\geq$ 0.1; ORP $\geq$ 10MV!

### 3.2.7 Temperature setting

When“H”or“A”blinks, press “” to do the manual temperature compensation (H25.0 $^{\circ}$ C) or automatic temperature compensation (A25.0 $^{\circ}$ C) (automatic temperature compensation need to connect a temp. sensor NTC10K.). Then press  save and return to measurement status.

 **No this operation for ORP measurement!**





## 3.3 Sensor calibration

### 3.3.1 System Calibration

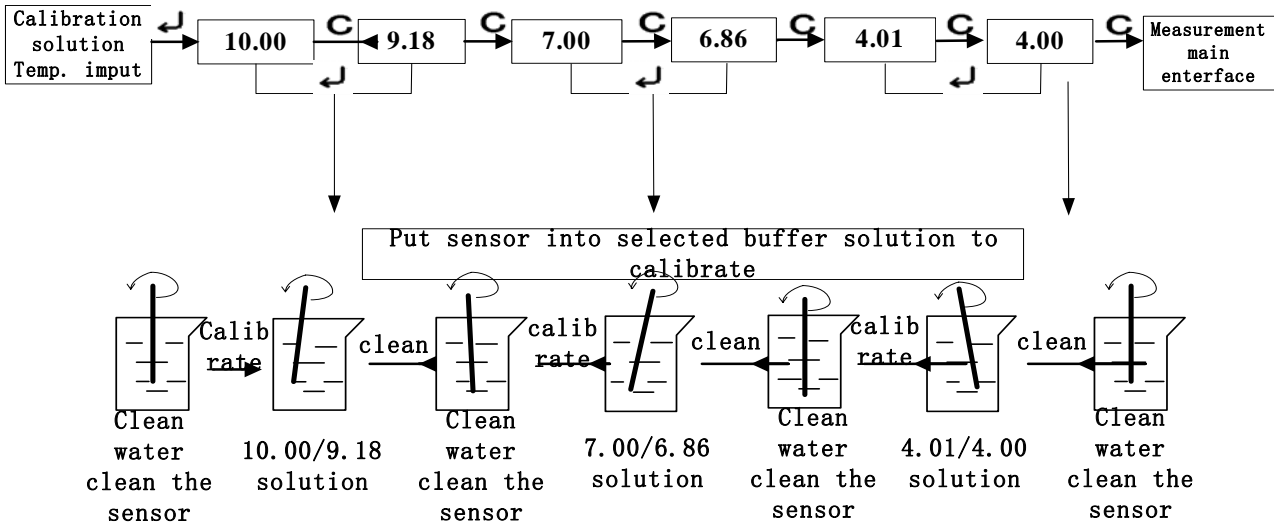
pH/ORP sensors are electrochemical and their sensitivity decreases with influence of time and medium. In order to get an accurate measurement, it is suggested to often calibrate sensor's slope. The calibration period relays on the influence from the measured medium.


1. Normal buffer solution ,10.00\9.18\7.00\6.86\4.00\4.01
2. If the medium are acid or alkali, please choose two point slope calibration, use two kind buffer solution.;
3. Before the calibration, please read the instruction carefully , and prepare the standard buffer solution;
4. The meter with directly input calibration method, please reference the calibration steps.;
5. If the sensor with long time storage, please put it in the water or KCL solution for 12 hours , and then calibrate it.

### 3.3.2 Buffer solution calibration

1. Choose the correct buffer solution to calibrate.;
2. Press the  for 3 seconds and enter into buffer solution calibration interface under pH measurement interface, input the current temperature , Press  save and enter into buffer solution calibration by pressing
3. When the “C10.0” and pH blinks, it means to enter into the buffer solution selection; press “  ” and enter into the next calibration menu.
4. Put the clean sensor into the buffer solution for 3-5 minutes.
5. Press“  ”to save the settings and enter into the next calibration, fetch the sensor out and clean, then put it into the suggestive buffer solution and finish the calibration in turn.
6. Check the buffer solution and recalibrated when“ERRO” comes out and then recalibrate.



**Please follow the below detailed calibration process:**

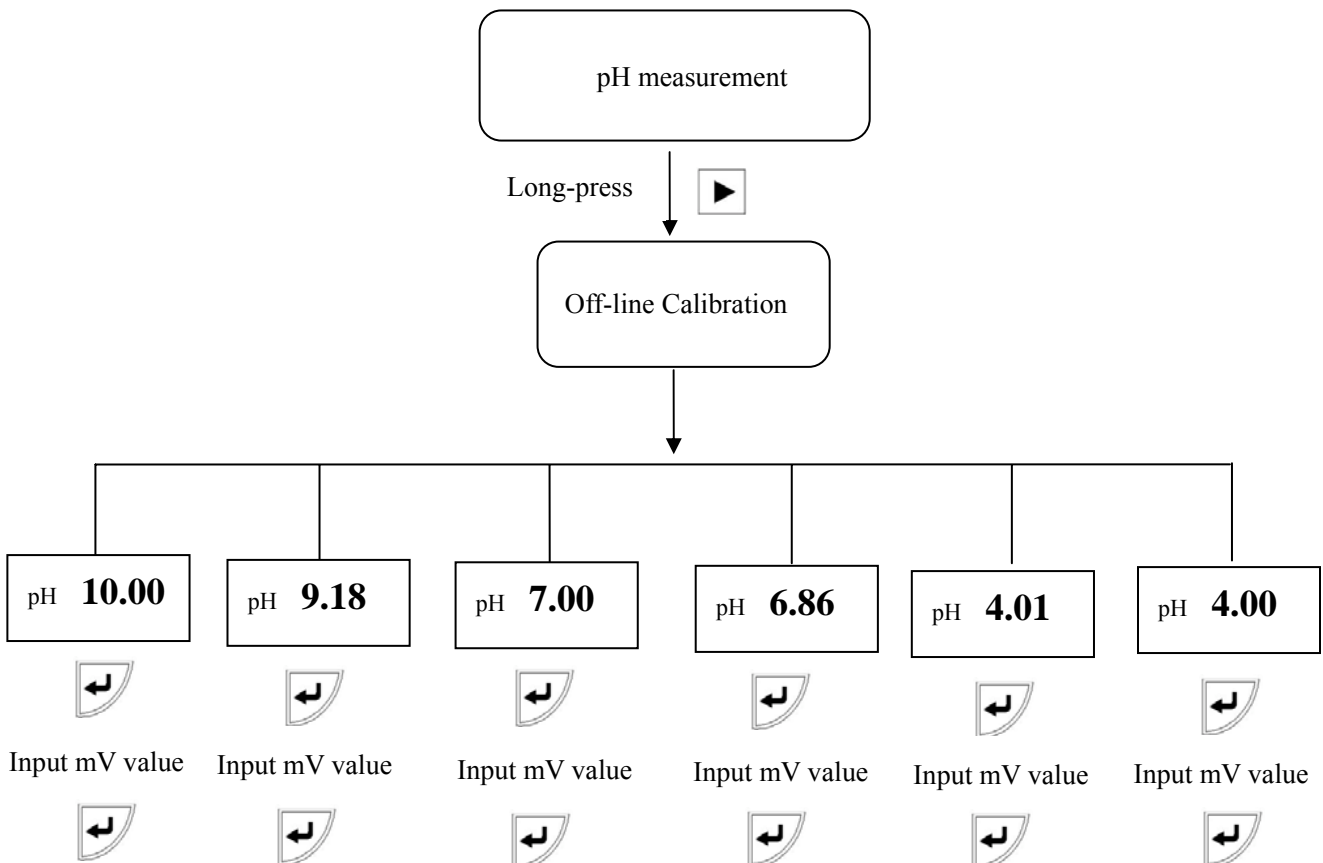


means skip this operation; and “” means enter the operation.



### 3.3.3 Off-line calibration

When field calibration is not good to carry on, the calibration to sensor’s slope by using lab devices and buffer solution is recommended. Take notes of corresponding mV value of buffer solution in room temperature. Input of this record value to off-line calibration is called as manual input calibration.

Press “” for 3 seconds under pH measurement status, input the corresponding mV value in different buffer solution, press “” to save and enter into the main menu.



Incorrect mV value input during calibration process, the screen will display “Error” .

Press “” to continue the calibration, and press “” to enter into the next calibration.

## 4. Maintenance

### 4.1 Sensor Maintenance

1. To avoid long time dry store, the sensor should be kept in the protection cap with KCl solution in 3.0mol/L.;
2. Clean the sensor and calibrate the same on the indicator regularly.;
3. In case of suspended stuff attached, wash it with HCl or NaOH solution in 0.01mol/L and rinse with clean water;
4. If the above methods are invalid to reset slope, it means that the sensor should be replaced.;
5. The platinum surface of ORP sensor should be shining. In case of smudginess, wash it with HCl or NaOH solution in 0.01mol/L and rinse with distilled water. If the surface of platinum is polluted and formed oxidation film, the platinum could be polished with sand paper and toothpaste, then clean it with distilled water;
6. Place the sensor into 3.5 mol/L KCl solution for 6 hours before usage;
7. Buffer solution gets different value at different temperature so please confirm the temperature of buffer solution at calibration.

### 4.2 Usage of sensors

1. pH/ORP sensors are consumables .Long time storage is not suggested;
2. Sensitive glass film (glass bubble) is forbidden to use when the medium with hydrofluoric acid, fluorine and high-concentration sulfide.
3. pH/ORP sensors are not allowed to measure any organic solution which will damage or dissolve PVC or ABS(such as carbon tetrachloride, trichloro ethylene or tetrahydrofuran etc....);
4. The chemical part of the sensor is glass, please protect carefully during transportation and storage.
5. Please clean the sensor at a regular time by using swab and neutral cleanser; do not use the acid and corrosive solution to clean the sensor.
6. High-temp. pH glass sensor is recommended for biopharmacy and high-pressure autoclaved sterilization. The protection part is optional;
7. pH signal is weak signal, the collecting cable should run separately. Do not mix the cable together.
8. Measurement cable is for special use, it's not allowed to cut or lengthened privately or replaced by other cables.

9. Install a filter before sensor when there is molecule in the medium to protect the pH glass bubble.

## 5. Instrument and probe fault common trouble shooting

Problem	Possible causes	Trouble shooting
No display when powered on	A. Bad connection of power supply B. Instrument fault	A check to see if there is 24V voltage between power terminals 24VA and 24VB. B. Check by professional technicians.
Unstable display	A. Improper wire connection of sensor B. Air bubbles in the pipeline C. Unstable water quality D. badness connection	A. refer to the instruction manuals B. select the proper measurement point or change the pipeline C. stabilizing the water quality D. Check the connector to be connected
Big deviation	Sensor fault The cable is damaged incorrect installation setting problem	A. Take out the sensor from the pipeline and calibrate B. replace the sensor which can not be calibrated C. find the correct measurement point and use the flow device D. reset the parameter of the instrument
Difference at transmitting data	loop resistance is too large incorrect connection mode unusual power supply wrong transfer volume	replace the cable to reduce the loop resistance check the connection right or not powered by the standard reset the transferred volume

## 6. Complete set

Transmitter	1pc (including quick clamp)
Ph/ORP-1220A sensor	1pc (cable length 10m)
Operation manual	1pc
Certificate	1pc

## 7. Order directory

Choose the right power supply, sensor and flow device to meet the requirements before ordering according to the below table:

### 7.1 Sensor selection

Model	Power supply	sensor	Cable length
pH/ORP-5500	DC 24V	pH-1220A sensor	1m
pH/ORP-5510	AC 110V	ORP-1220A sensor	5m
pH/ORP-5520	AC 220V	TE-1230-14 temp. sensor	10m (standard)
Other sensor selection	High-temp. glass sensor High-pure glass sensor		

## 7.2 Flow device selection

Quote the instrument/sensor/flow device separately, different price for different selection.。

Flow device	sensors	applications
P33flow device	glass sensor	Automatically controller or lab system
P34A flow device	pH/ORP1220A sensor	Pipeline installation
P34B flow device	pH/ORP1220A sensor	Pipeline installation
P16 used for submersible installation	pH/ORP1110A sensor	Channel or reservoir
P17 used for flange installation	pH/ORP1110A sensor	reaction still or material tank
Accessories for fold submersible installation	pH/ORP1110A sensor	Wastewater pool oraeration tank
Floating accessories	pH/ORP1110A sensor	Channel, river oraquaculture
Jacket (protection part)accessories	High temp. glass sensor	Bio-pharmaceuticals and food fermentation
Noble metal protection	pH/ORP1110A sensor	Metallurgy orfloatation system

\*Without the influence on the operation, any small change or improvement on the products by the manufacturer will not be notified separately. Please make the object as the standard.

# DURAPULSE GS20(X) AC Drives – Introduction



DURAPULSE GS20(X) AC Drives													
Motor Rating	HP	1/4	1/2	1	2	3	5	7.5	10	15	20	25	30
	kW	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22
120V Single-phase		✓	✓	✓									
230V Single-phase		✓	★	★	★	★							
230V Three-phase		✓	★	★	★	★	★	★	✓	✓	✓		
460V Three-phase			★	★	★	★	★	★	✓	✓	✓	✓	✓
575V Three phase				✓	✓	✓	✓	✓	✓	✓			

✓ = GS20 model available    ★ = GS20 and GS20X models available

## Overview

The DuraPulse GS20(X) new generation high performance vector control drives provide many standard and advanced functions—all in a compact unit that has been reduced 40% in size. A NEMA 4X version provides service in the harshest of environments.

The drives include many of the same standard features as our GS family of drives including dynamic braking, PID, removable keypad, and RS-485 Modbus communication.

The GS20(X) drive expands the DURAPULSE family by adding single-phase input capability (ALL 230VAC drives can be supplied single-phase), a built-in PLC, and optional EtherNet/IP and ModbusTCP communication card. The drive supports up to four (4) independent IM motor parameter sets or supports control of a single AC PM motor.

DURAPULSE GS20(X) AC drives offer several different speed control modes: standard V/Hz with pulse input feedback, sensorless vector (SVC) for Induction Motors (IM) and Permanent Motors (PM), and ultra precise Field Oriented Vector control (FOC) for maximum open loop speed regulation control.

DURAPULSE GS20(X) offers two analog inputs, one analog output, one frequency output, seven digital inputs (including one pulse train input up to 33kHz), two digital outputs, one SPDT relay output, and two STO inputs. All of the analog and digital I/O can be configured for a wide variety of input or output functions. One option card slot is available for either the backup control power option card or Ethernet/IP and Modbus TCP communication option card.

## Features

- Broad offering from 1/4 to 30 hp
- NEMA 4X available up to 10hp
- Single-phase 120VAC up to 1hp
- Single-phase/three-Phase 230VAC up to 20HP
- Three-phase 460VAC and 575VAC
- Single-phase UL Ratings – 230VAC input for 1 to 20 hp models (see selection tables for derated output)
- Dual rating design – CT/VT Ratings (Light & Heavy Duty)
- “Zero Stack” side-by-side zero gap installation
- Compact Design
- Spring clamp terminal blocks
- Speed control potentiometer built in
- Flexible carrier frequency to 15khz and output frequency to 600Hz
- STO – Safe Torque Off (TUV Certified)
- Built-in PLC to support up to 2K steps
- Built-in USB port for fast & easy programming
- Free downloadable software for drive configuration and PLC programming
- Field-upgradable firmware (drive & communication option card)
- Optional LCD text-based advanced keypad (IP66/NEMA 1) can be remotely mounted
- Local/Remote control mode selection or digital/comm input with Hand/Off/Auto control
- Display custom values on keypad
- Momentary power loss restarts
- 100kA Short Circuit Current Rating
- DC Bus Connection Terminals (except 120VAC models)
- Conduit Box(s) for NEMA 1
- Analog I/O – configurable 2 Inputs and 1 Output
- Multi-Motor Control (4 total)
- Built-in Dynamic Braking – optional resistors
- PID Controller – including sleep and wake
- Password protection
- RTD and/or PTC input motor protection
- GS2 mode duplicates exact parameter configuration of GS2
- Modularized design eases maintenance and expansion, including quick replacement of cooling fan
- High speed communication interfaces

with MODBUS RTU built in, with optional EtherNet/IP and ModbusTCP Communication Card

- Circuit boards have conformal coating for improved environmental tolerance
- Excellent heat-sink design; able to operate at 50°C ambient temperature
- Fire Mode – Run fire mode during emergencies to have uninterrupted smoke removal and system pressure
- Two-year warranty
- CE, TUV, UL, cUL

## Accessories

- AC line reactors
- dV/dT output filters
- EMI filters
- RF filter
- Braking resistors
- Fuses
- Conduit boxes
- Mounting Kits
- Replacement cooling fans
- Replacement keypad
- Extension cable for remote keypad placement
- Optional advanced LCD keypad (and remote-mount bezel kit)
- EtherNet/IP and ModbusTCP comm card
- Four and eight-port RS-485 multi-drop termination boards
- GSoft2 drive configuration software
- GSLogic PLC programming software
- Type A to B USB cable
- Detailed descriptions and specifications for GS accessories are available in the “GS/ DURAPulse Accessories” section.

## Typical Applications

- Conveyors
- Compressors
- Material handling
- Extruding
- Grinding
- Shop tools
- Fans
- Pumps
- HVAC
- Mixing

# DURAPULSE GS20(X) AC Drives – Selection

## Selecting the Proper Drive Rating

Selecting the Proper Drive Rating																						
<b>Determine Motor Voltage and Full-Load Amperage (FLA)</b>																						
Motor voltage and FLA are located on the nameplate of the motor. <i>NOTE: FLA of motors that have been rewound may be higher than stated.</i>																						
<b>Determine Motor Overload Requirements</b>																						
Many applications experience temporary overload conditions due to starting requirements or impact loading. Most AC drives are designed to operate at 150% overload for 60 seconds. If the application requires an overload greater than 150% or longer than 60 seconds, the AC drive must be oversized. <i>NOTE: Applications that require replacement of existing motor starters with AC drives may require up to 600% overload.</i>																						
<b>Determine Application Type: Constant Torque or Variable Torque</b>																						
This torque requirement has a direct effect on which drive to select. Variable Torque applications are generally easier to start; typically fans and pumps. Most other applications outside fans and pumps fall into the Constant Torque category (machine control, conveyors, etc.). If you are unsure of the application, assume Constant Torque. The specification, derating, and selection tables are generally segregated by Constant Torque and Variable Torque.																						
<b>Installation Altitude</b>																						
AC drives rely on air flow for cooling. As the altitude increases, the air becomes less dense, and this drop in air density decreases the cooling properties of the air. Therefore, the AC drive must be oversized to compensate for the decrease in cooling. GS20(X) drives are designed to operate at 100% capacity at altitudes up to 1000 meters. <i>NOTE: For use above 1000m, the AC drive must be derated as described below.</i>																						
<b>Derate Output Current Based on Altitude Above 1000 Meters</b>																						
<ul style="list-style-type: none"> <li>• If the AC drive is installed at an altitude of 0–1000m, follow normal operation restrictions.</li> <li>• If installed at an altitude of 1000–2000m, decrease 1% of the rated current or lower 0.5°C of temperature for every 100m increase in altitude.</li> <li>• Maximum altitude for Corner Grounded is 2000m. If installation at an altitude higher than 2000m is required, please contact AutomationDirect.</li> </ul>																						
<p><b>Derating for Altitude</b></p> <table border="1"> <caption>Derating for Altitude Data</caption> <thead> <tr> <th>Altitude (m)</th> <th>Current Rated Ratio (%) - 50°C (IP20/UL Open Type)</th> <th>Current Rated Ratio (%) - 40°C (IP66/NEMA 4X/UL Type 4X)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>100</td> <td>100</td> </tr> <tr> <td>1000</td> <td>100</td> <td>100</td> </tr> <tr> <td>1500</td> <td>95</td> <td>90</td> </tr> <tr> <td>2000</td> <td>90</td> <td>90</td> </tr> <tr> <td>2000</td> <td>90</td> <td>70</td> </tr> <tr> <td>2500</td> <td>90</td> <td>70</td> </tr> </tbody> </table>		Altitude (m)	Current Rated Ratio (%) - 50°C (IP20/UL Open Type)	Current Rated Ratio (%) - 40°C (IP66/NEMA 4X/UL Type 4X)	0	100	100	1000	100	100	1500	95	90	2000	90	90	2000	90	70	2500	90	70
Altitude (m)	Current Rated Ratio (%) - 50°C (IP20/UL Open Type)	Current Rated Ratio (%) - 40°C (IP66/NEMA 4X/UL Type 4X)																				
0	100	100																				
1000	100	100																				
1500	95	90																				
2000	90	90																				
2000	90	70																				
2500	90	70																				

# DURAPULSE GS20(X) AC Drives – Selection

## Selecting the Proper Drive Rating, continued

### Determine Maximum Enclosure Internal Temperature

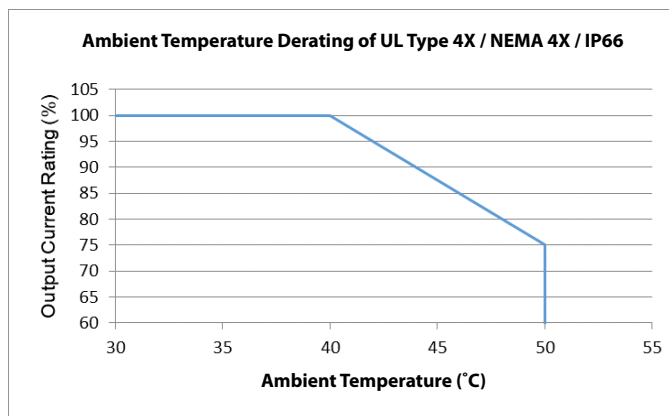
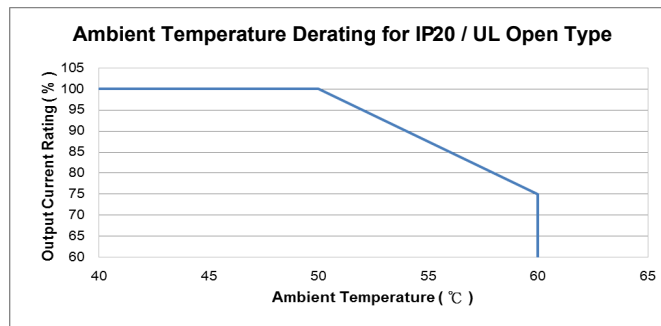
AC drives generate a significant amount of heat and can cause the internal temperature of an enclosure to exceed the rating of the GS20(X) drive, even when the ambient temperature is less than 104°F (40°C). Enclosure ventilation and/or cooling may be required to reduce maximum internal temperature to 104°F (40°C) or less. Ambient temperature measurements/calculations should be made for the maximum expected temperature.

**NOTE:** For use above 104°F (40°C), the AC drive must be derated as described below.

### Derate Output Current Based on Temperature Above 104°F (40°C) or 122°F (50°C)

Drive Derating by Temperature and Protection Level	
Protection Level	Derating
<b>UL Open Type / IP20*</b>	When the GS20(X) drive is operating at rated current, the ambient temperature has to be between -10°C and +50°C. When ambient temperature exceeds 50°C, decrease the rated current by 2.5% for every 1°C temperature increase. Maximum allowable temperature is 60°C.
<b>UL Type 4X / NEMA 4X / IP66*</b>	When the GS20(X) drive is operating at rated current, the ambient temperature has to be between -10°C and +40°C. When ambient temperature exceeds 40°C, decrease the rated current by 2.5% for every 1°C temperature increase. Maximum allowable temperature is 50°C.

\* For more information about environmental ratings, refer to the "Operating Temperature and Protection Level" table (pg.tGSX-37).



# DURAPULSE GS20(X) AC Drives – Selection

## Selecting the Proper Drive Rating, continued

<b>Derate Output Current Based on Carrier Frequency (if necessary)</b>	
<b>Carrier Frequency Effects</b>	
AC Drives rectify the incoming 50 or 60Hz line power resulting in DC power at 0Hz. The resulting DC power is then pulse-width modulated and supplied to the motor by the drive's power electronics. IGBTs invert the DC power, simulating a sine wave at the desired frequency (that's what allows variable speed in AC induction motors). The speed at which the IGBTs are turned ON and OFF is called Carrier Frequency. In GS20(X) drives, the Carrier Frequency can range from 2kHz to 15kHz. Though Carrier Frequency can be adjusted, there are trade-offs between high Carrier Frequencies and low Carrier Frequencies.	
<b>Benefits of Higher Carrier Frequencies:</b>	
<ul style="list-style-type: none"> <li>• Better efficiency (lower harmonic losses) in the motor</li> <li>• Lower audible noise</li> </ul>	
<b>Benefits of Lower Carrier Frequencies:</b>	
<ul style="list-style-type: none"> <li>• Better efficiency in the drive</li> <li>• Lower EMI (electrical noise)</li> <li>• Reduced reflective wave peak voltage</li> </ul> <p>As a general rule, the Carrier Frequency should be set as low as possible without creating unacceptable audible noise in the motor. Smaller systems can have higher Carrier Frequencies, but larger drives (&gt;20 or 30hp) should not have Carrier Frequencies set higher than 6kHz. Heavy duty applications typically run around 2–4 kHz.</p>	
<b>Derating Tables</b>	
<p>The tables below show the derating curves for both GS20 and GS20X drives running in two different modes under variable torque and constant torque conditions.</p> <p>Line 1: Ta = 50°C / Load = 100%</p> <p>Line 2: Ta = 50°C / Load = 75% or Ta = 40°C / Load = 100%</p> <p>Line 3: Ta = 50°C / Load = 50% or Ta = 35°C / Load = 100%</p> <p>Set PWM mode via P11.41.                      SVPWM = Space Vector Pulse Width Modulation mode                      DPWM = Two Phase Pulse Width Modulation mode</p>	
<b>Variable Torque Carrier Frequency Derating</b>	
<b>SVPWM Mode</b>	<b>DPWM Mode</b>
<b>Constant Torque Carrier Frequency Derating</b>	
<b>SVPWM Mode</b>	<b>DPWM Mode</b>

# DURAPULSE GS20 AC Drives – Selection Specifications

## GS20 Drive Model Selection Tables, continued

GS20 460V <sup>1</sup> 3-Phase Specifications – Frame Sizes A, B, C								
Model Name			GS23-40P5	GS23-41P0	GS23-42P0	GS23-43P0	GS23-45P0	
Price			\$193.00	\$198.00	\$228.00	\$255.00	\$310.00	
Frame Size			A	A	B	C	C	
Drawing			<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	
Output Rating	Max Motor Output	hp	1/2	1	2	3	5	
		kW	0.4	0.75	1.5	2.2	3.7	
	CT	Rated Output Capacity	kVA	1.1	2.1	3.2	4.2	6.9
		Rated Output Current	A	1.5	2.7	4.2	5.5	9
		Carrier Frequency <sup>3</sup>	kHz	2–15 (default 4)				
	VT	Rated Output Capacity	kVA	1.4	2.3	3.5	5	8
Rated Output Current		A	1.8	3	4.6	6.5	10.5	
Carrier Frequency <sup>3</sup>		kHz	2–15 (default 4)					
Input Rating <sup>2</sup>	CT	Rated Input Current	A	1.7	3	5.6	6.1	9.9
	VT	Rated Input Current	A	2	3.3	5.1	7.2	11.6
	Rated Voltage/Frequency		Three-phase 380-480 VAC (-15% to +10%), 50/60 Hz					
	Operating Voltage Range (VAC)		323–528					
Frequency Tolerance (Hz)		47–63						
IE2 Efficiency - Relative Power Loss			4.0%	2.6%	2.3%	2.3%	2.0%	
Weight (kg [lb])			0.75 [1.65]	0.81 [1.79]	1 [2.20]	1.24 [2.73]	1.24 [2.73]	
Cooling Method			Convective		Fan			
IP Rating			IP20					
<p>1 - For Use With Three-Phase Motors Only.</p> <p>2 - If 3-phase power source is non-symmetrical, refer to "Circuit Connections – RFI Jumper" in the GS20(X) AC Drives User Manual, Chapter 2. Please refer to "GS20(X) DURApulse Accessories – Fusing" (pg.tGSX-55) for input fusing information.</p> <p>3 - The carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to "Derate Output Current Based on Carrier Frequency".</p>								

GS20 460V <sup>1</sup> 3-Phase Specifications – Frame Sizes D, E, F									
Model Name			GS23-47P5	GS23-4010	GS23-4015	GS23-4020	GS23-4025	GS23-4030	
Frame Size			D	D	E	E	F	F	
Drawing			<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>	
Output Rating	Max Motor Output	hp	7 1/2	10	15	20	25	30	
		kW	5.5	7.5	11	15	18.5	22	
	CT	Rated Output Capacity	kVA	9.9	13	19.1	24.4	29	34.3
		Rated Output Current	A	12	17	25	32	38	45
		Carrier Frequency <sup>3</sup>	kHz	2–15 (default 4)					
	VT	Rated Output Capacity	kVA	12	15.6	21.3	27.4	31.6	37.3
Rated Output Current		A	15.7	20.5	28	36	41.5	49	
Carrier Frequency <sup>3</sup>		kHz	2–15 (default 4)						
Input Rating <sup>2</sup>	CT	Rated Input Current	A	14.3	18.7	27.5	35.2	41.8	49.5
	VT	Rated Input Current	A	17.3	22.6	30.8	39.6	45.7	53.9
	Rated Voltage/Frequency		Three-phase 380-480 VAC (-15% to +10%), 50/60 Hz						
	Operating Voltage Range (VAC)		323–528						
Frequency Tolerance (Hz)		47–63							
IE2 Efficiency - Relative Power Loss			2.0%	1.9%	1.8%	1.7%	1.5%	1.5%	
Weight (kg [lb])			2.07 [4.56]	2.07 [4.56]	3.97 [8.75]	3.97 [8.75]	6.25 [13.78]	6.25 [13.78]	
Cooling Method			Fan						
IP Rating			IP20						
<p>1 - For Use With Three-Phase Motors Only.</p> <p>2 - If 3-phase power source is non-symmetrical, refer to "Circuit Connections – RFI Jumper" in the GS20(X) AC Drives User Manual, Chapter 2. Please refer to "GS20(X) DURApulse Accessories – Fusing" (pg.tGSX-55) for input fusing information.</p> <p>3 - The carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to "Derate Output Current Based on Carrier Frequency".</p>									

# DURAPULSE GS20(X) AC Drives – General Specifications

## GS20(X) Drive Model Selection Tables, continued

GS20(X) General Specifications (Applicable to All Models)				
<b>Control Characteristics</b>	<b>Control Method</b>	V/F, Sensorless Vector (SVC), Field Oriented Control (FOC) Sensorless, Volt/Frequency with Pulse Generator input (VFPG), Torque (TQC Sensorless)		
	<b>Applicable Motor</b>	3-phase AC Induction Motor, 3-phase Permanent Magnet AC motor		
	<b>Starting Torque<sup>1</sup></b>	150% / 3Hz 100% / (motor rated frequency/20) 200% / 0.5 Hz	(V/F, SVC control for IM, CT, rated) (SVC control for PM, CT, rated) (FOC control for IM, CT, rated)	
	<b>Torque Accuracy</b>	± 15% TQC Sensorless		
	<b>Torque Limits</b>	<b>120/230/460V</b>	VT: 160% of output current, max CT: 180% of output current, max	
		<b>575V</b>	200% of output current, max	
	<b>Speed Control Range<sup>1</sup></b>	1: 50 (V/F, SVC control for IM, CT, rated) 1: 20 (SVC control for PM, CT, rated) 1: 100 (FOC control for IM, CT, rated)		
	<b>Max. Output Frequency</b>	0.00–599.00 Hz		
	<b>Overload Capacity</b>	VT: rated output current of 120% 60 sec, 150% 3 sec. CT: rated output current of 150% 60 sec, 200% 3 sec.		
	<b>Frequency Setting Signal</b>	0–10 V / -10–10 V 4–20 mA / 0–10 V 1 channel pulse input (33kHz), 1 channel pulse output (33kHz)		
	<b>Digital Inputs</b>	Seven (7) - 24VDC NPN or PNP, includes 1 pulse train frequency input 33kHz		
	<b>Digital Outputs</b>	Three (3) - (2)-48VDC, (1) Relay-250VAC/30VDC		
	<b>Analog Inputs</b>	Two (2) - (1) voltage, (1) selectable Voltage or Current		
	<b>Analog Outputs</b>	One (1) - selectable voltage or current		
	<b>Frequency Output</b>	One (1) - 30VDC, 33kHz		
<b>Safe Torque Off</b>	STO1 and STO2 inputs- 24VDC			
<b>Main Functions</b>	Multiple motor switching (a maximum of four independent motor parameter settings), Fast start-up, Deceleration Energy Back (DEB) function, Wobble frequency function, Fast deceleration function, Master and Auxiliary frequency source selectable, Restart after momentary power loss, Speed tracking, Over-torque detection, 16-step speed (including the master speed), Accel./decel. time switch, S-curve accel./decel., three-wire operation control, JOG frequency, Frequency upper/lower limit settings, DC brake at start-up and stop, PID control, Built-in PLC (2000 steps), and Simple positioning function.			
<b>Application Macro</b>	Built-in application parameter groups (selected by industry) and user-defined application parameter groups.			
<b>Protection Characteristics</b>	<b>Motor Protection</b>	Over-current, over-voltage, over-heating, phase loss.		
	<b>Stall Prevention</b>	Stall prevention during acceleration, deceleration, and running (independent settings).		
<b>Accessory</b>	<b>Communication Card</b>	GS20A-CM-ENETIP (EtherNet/IP and Modbus TCP)		
	<b>External DC Power Supply</b>	GS20A-BPS (24V power backup supply card)		
<b>Agency Approvals</b>	UL, CE <sup>2</sup> , TUV (SIL 2), RoHS, REACH			
1: Control accuracy may vary depending on the environment, application conditions, or different motors. For more information, contact AutomationDirect.				
2: See CE declaration here: <a href="https://support.automationdirect.com/docs/GS20A-GS20AX-CE.pdf">https://support.automationdirect.com/docs/GS20A-GS20AX-CE.pdf</a>				

# DURAPULSE GS20(X) AC Drives – Environmental Specifications

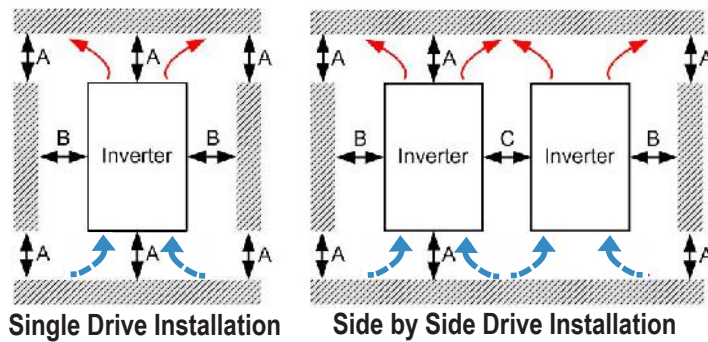
## GS20(X) Environmental Specifications

Environmental Conditions for GS20 AC Drives			
Condition	Operation	Storage	Transportation
Installation Location	IEC 60364-1/ IEC 60664-1 Pollution degree 2, Indoor use only.	n/a	n/a
Ambient Temperature	IP20/UL Open Type: -20–50°C (-20–60°C w/derating)	-40–85°C	-20–70°C
	Non-condensing, non-freezing		
Relative Humidity	90%, no water condensation	95%, no water condensation	
Air Pressure	86–106 kPa	70–106 kPa	
Pollution Level	IEC 60721-3, concentrate prohibited		
	Class 3C2; Class 3S2	Class 2C2; Class 2S2	Class 1C2; Class 1S2
Environmental Air	No corrosive/inflammable gases permitted		
Altitude	<1000 m (For altitudes > 1000 m, derate to use it.)		
Package Drop	n/a	ISTA procedure 1A (according to weight) IEC 60068-2-31	
Vibration	1.0 mm, peak to peak value range from 2–13.2 Hz; 0.7–2.0 G range from 13.2–55 Hz; 2.0 G range from 55–512 Hz. Compliance with IEC 60068-2-6	2.5 G peak, 5 Hz–2 kHz 0.015" maximum displacement	
Impact	15G, 11ms Compliance with IEC/EN60068-2-27	30G	
<b>DO NOT expose the GS20 AC Drive to harsh environments such as dust, direct sunlight, corrosive/flammable gases, humidity, liquid, or vibrations. The salts in the air must be less than 0.01 mg/cm<sup>2</sup> every year.</b>			

Environmental Conditions for GS20X AC Drives			
Condition	Operation	Storage	Transportation
Installation Location	PCB design is compliant with IEC 60364-1 / IEC 60664-1 Pollution Degree 2. The outer case meets IP66 standard for indoor use. If the drive is for outdoor application, avoid direct sunlight.	n/a	n/a
Ambient Temperature	IP66 / NEMA 4X / UL Type 4X: -20–40°C (-20–50°C w/derating)	-40–85°C	-20–70°C
	Non-condensing, non-freezing		
Relative Humidity	0-100%, no water condensation	95%, no water condensation	
Air Pressure	86–106 kPa	70–106 kPa	
Pollution Level	IEC 60721-3, concentrate prohibited		
	Class 3C2; Class 3S2	Class 2C2; Class 2S2	Class 1C2; Class 1S2
Altitude	<1000m (For altitudes > 1000m, derate to use it.)		
Package Drop	n/a	ISTA procedure 1A (according to weight) IEC 60068-2-31	
Vibration	1.0 mm, peak to peak value range from 2–13.2 Hz; 0.7–2.0 G range from 13.2–55 Hz; 2.0 G range from 55–512 Hz; complies with IEC 60068-2-6.	2.5 G peak, 5 Hz–2 kHz 0.015" maximum displacement	
Impact	15G, 11ms Compliance with IEC/EN60068-2-27	30G	
<b>DO NOT expose the GS20X AC Drive to harsh environments such as direct contact with chemical substance and solvent, and exposure to direct sunlight.</b>			

# DURAPULSE GS20(X) AC Drives Specifications – Air Flow and Power (Heat) Dissipation

## Minimum Clearances and Air Flow for GS20 Series Drives



GS20 Minimum Mounting Clearances*					
Installation Method	A (mm)	B (mm)	C (mm)	Operation Temperature (°C)	
				Max (w/out derating)	Max (Derating)
Single drive installation	50	30	–	50	60
Side-by-side horizontal installation	50	30	30	50	60
Zero stack installation	50	30	0	40	50

\* Failure to follow the minimum mounting clearances may cause the fan to malfunction and cause a heat dissipation problem.

## GS20 Airflow and Power Dissipation

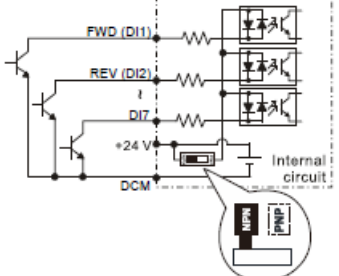
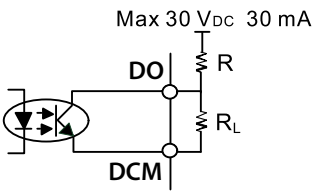
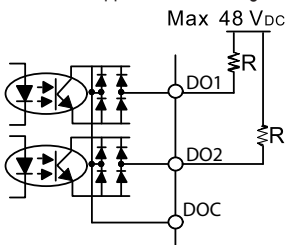
Model Number	Frame Size	Airflow Rate for Cooling		Power Dissipation (Watts)		
		Flow Rate (cfm)	Flow Rate (m³/hr)	Loss External (Heat sink)	Internal	Total
GS21-10P2	A	0.0	0.0	8.0	10.0	18.0
GS21-10P5				14.2	13.1	27.3
GS21-11P0	C	16.0	27.2	29.1	23.9	53.0
GS21-20P2	A	0.0	0.0	8.0	10.3	18.3
GS21-20P5				16.3	14.5	30.8
GS21-21P0	B			29.1	20.1	49.2
GS21-22P0	C	16.0	27.2	29.1	23.9	53.0
GS21-23P0				70.0	35	105
GS23-2010	E	53.7	91.2	244.5	79.6	324.1
GS23-2015				374.2	86.2	460.4
GS23-2020	F	67.9	115.2	492.0	198.2	690.2
GS23-20P2	A	0.0	0.0	8.6	10.0	18.6
GS23-20P5				16.5	12.6	29.1
GS23-21P0				31.0	13.2	44.2
GS23-22P0	B	10.0	16.99	50.1	24.2	74.3
GS23-23P0	C	16.0	27.2	76.0	30.7	106.7
GS23-25P0				108.2	40.1	148.3
GS23-27P5	D	23.4	39.7	192.8	53.3	246.1
GS23-4010	E	53.7	91.2	164.7	55.8	220.5
GS23-4015				234.5	69.8	304.3
GS23-4020	F	67.9	115.2	319.8	74.3	394.1
GS23-4025				423.5	181.6	605.1
GS23-4030				501.1	200.3	701.4
GS23-40P5	A	10.0	16.99	17.6	11.1	28.7
GS23-41P0				30.5	17.8	48.3
GS23-42P0	B			45.9	21.7	67.6
GS23-43P0	C	16.0	27.2	60.6	22.8	83.4
GS23-45P0				93.1	42	135.1
GS23-47P5	D	23.4	39.7	132.8	39.5	172.3
GS23-5010	A	0.0	0.0	108.4	51	159.4
GS23-51P0				23.5	12.5	36
GS23-52P0	B	10.0	16.99	38.1	19	57.1
GS23-53P0	C	16.0	27.2	56.6	22.2	68.8
GS23-55P0				76.1	30	106.1
GS23-57P5	D	23.4	39.7	93.9	37	130.9

- Published flow rates are the result of active cooling using factory installed fans.
- Flow rates of (0.0) are the result of passive cooling in drives without fans.
- The required airflow shown in the chart is for installing a single GS20 drive in a confined space.
- When installing multiple GS20 drives, the required air volume would be the required air volume for a single GS20 drive multiplied by the number of GS20 drives.
- When calculating power dissipation (Watt Loss), use the Total value. Heat dissipation shown in the chart is for installing a single GS20 drive in a confined space.
- When installing multiple drives, the volume of heat/power dissipation should be the heat/power dissipated by a single GS20 drive multiplied by the number of GS20 drives.
- Heat dissipation for each model is calculated by rated voltage, current and default carrier frequency.

# DURAPULSE GS20(X) AC Drives Specifications

## - Terminals

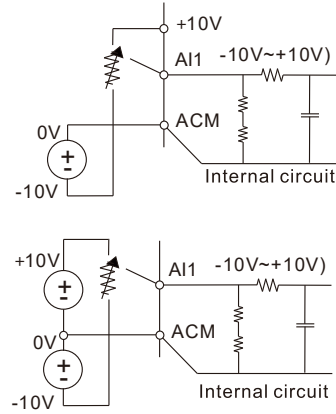
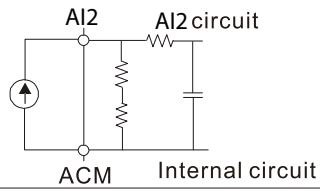
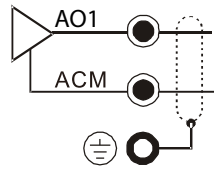
### Control Circuit Terminal Names and Definitions

Control Circuit Terminals		
Terminal Symbol	Terminal Function	Description
<b>+24V</b>	Digital control signal common (Source)	+24V ± 10% 100mA
<b>FWD (DI1) REV (DI2) DI3 - DI7</b>	Digital input 1-7 ① Sink Mode with internal power (+24 V <sub>DC</sub> ) 	<p><b>Source Mode:</b> ON: activation current 3.3 mA ≥ 11VDC OFF: cut-off voltage ≤ 5VDC</p> <p><b>Sink Mode:</b> ON: activation current 3.3 mA ≤ 13VDC OFF: cut-off voltage ≥ 19VDC</p> <p>DI7: Single pulse input, maximum input frequency=33kHz.</p> <p>Digital inputs can be configured by the user for many different functions. Refer to P02.01-02.07 to program the digital inputs FWD (DI1), REV (DI2), DI3-DI7. When P02.00=0, FWD (DI1) and REV (DI2) can be programmed.</p> <ul style="list-style-type: none"> <li>When P02.00≠0, the functions of FWD (DI1) and REV (DI2) act according to P02.00 setting.</li> <li>When P02.07=0, DI7 is pulse input terminal.</li> <li>DI7 uses pulse input can be used as frequency command source or connect it to the encoder for motor closed-loop control.</li> <li>DI7 motor closed-loop control only supports VFG control mode.</li> </ul> <p>See pg.tGSX-42 for sinking/sourcing wiring examples.</p>
<b>DO</b>	Digital frequency signal output 	DO uses pulse voltage as an output monitoring signal; Duty-cycle: 50% Min. load impedance RL: 1kΩ / 100pF Max. current endurance: 30 mA Max. voltage: 30VDC ± 1% (when 30VDC / 30mA / RL=100pF) Max. output frequency: 33kHz Current-limiting resistor R: ≥ 1KΩ Output load impedance RL Capacitive load ≤ 100pF Resistive load ≥ 1kΩ, resistance determines the output voltage value. DO-DCM voltage = external voltage * ( RL / (RL+R) )
<b>DCM</b>	Digital control / Frequency signal common (Sink)	
<b>DO1</b>	Digital Output 1 (photo coupler)	The AC motor drive outputs various monitoring signals, such as drive in operation, frequency reached, and overload indication through a transistor (open collector). Outputs can be wired as sinking or sourcing. See User manual Appendix D for wiring examples.
<b>DO2</b>	Digital Output 2 (photo coupler)	
<b>DOC</b>	Digital Output Common (photo coupler)	
<b>R10</b>	Relay Output 1 (N.O.)	<p><b>Resistive Load</b></p> <ul style="list-style-type: none"> <li>3A (N.O.) / 3A (N.C.) 250VAC</li> <li>5A (N.O.) / 3A (N.C.) 30VDC</li> </ul> <p><b>Inductive Load (COS 0.4)</b></p> <ul style="list-style-type: none"> <li>1.2 A (N.O.) / 1.2 A (N.C.) 250VAC</li> <li>2.0 A (N.O.) / 1.2 A (N.C.) 30VDC</li> </ul> To output different kinds of monitoring signals such as motor drive in operation, frequency reached, and overload indication.
<b>R1C</b>	Relay Output 1 (N.C.)	
<b>R1</b>	Relay Output 1 Common	
<b>+10V</b>	Potentiometer power supply	Power supply for analog frequency setting: +10.5 ± 0.5 VDC / 20mA

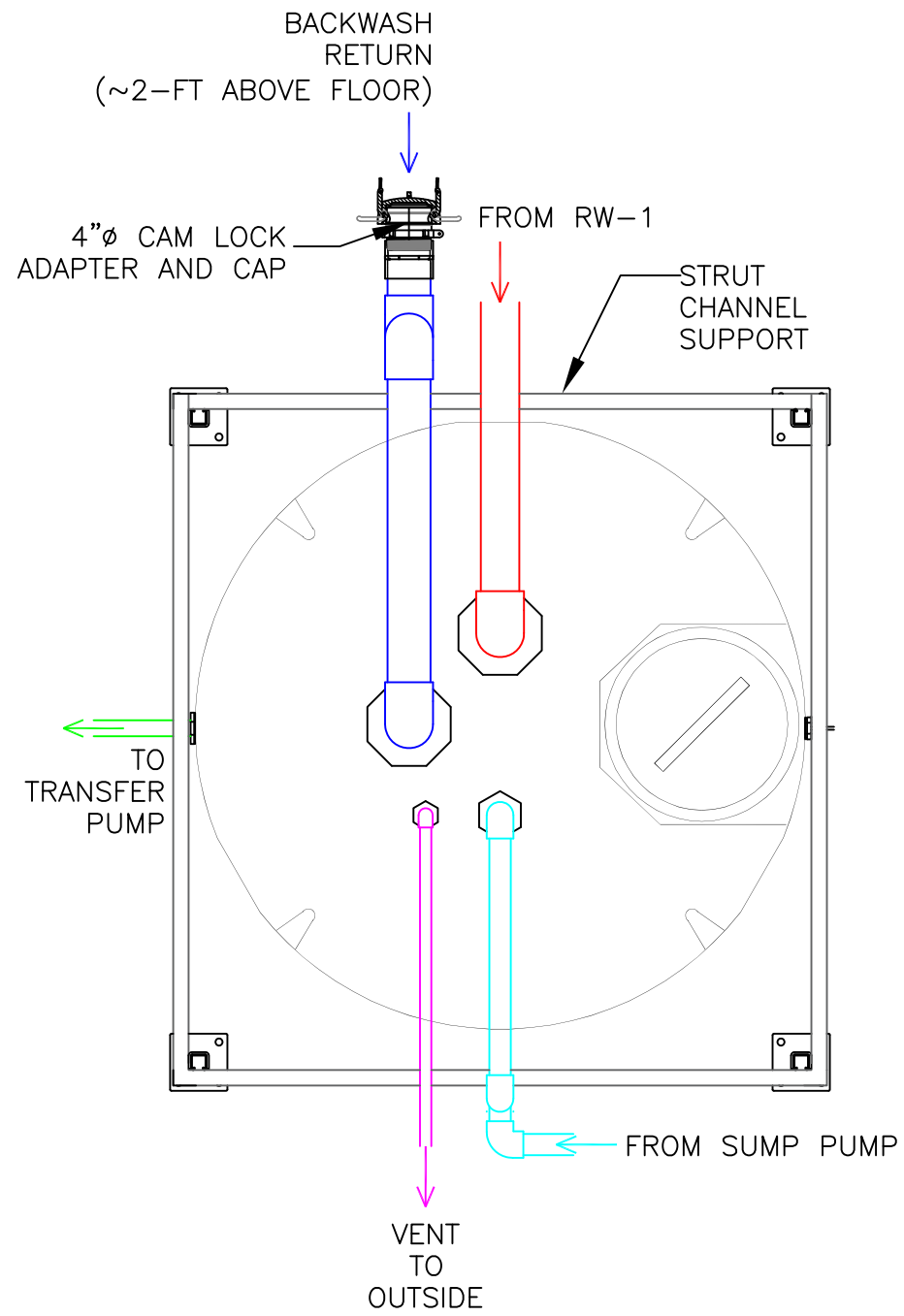
# DURAPULSE GS20(X) AC Drives Specifications

## - Terminals

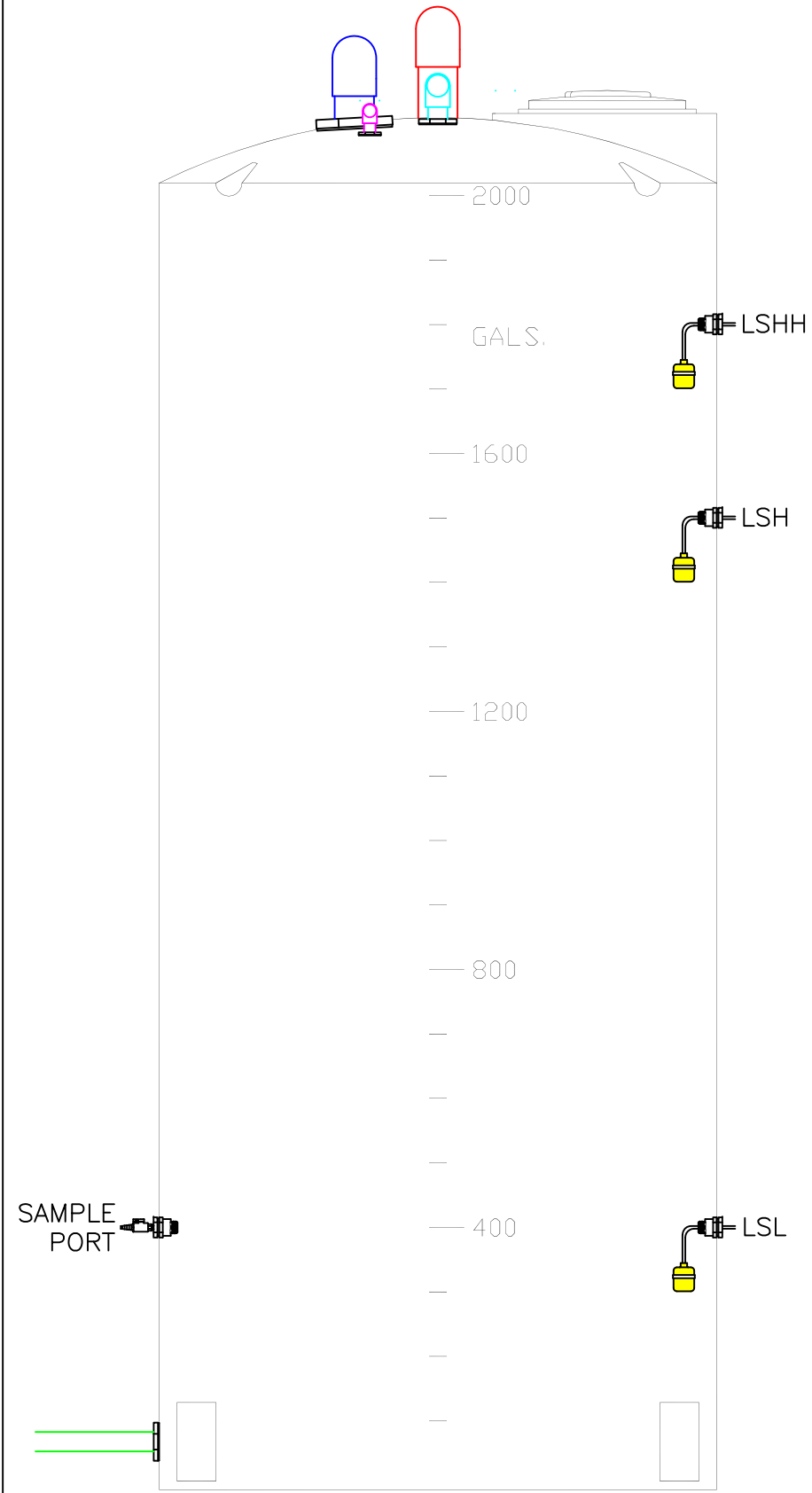
### Control Circuit Terminal Names and Definitions

Control Circuit Terminals (continued)		
Terminal Symbol	Terminal Function	Description
<b>AI1</b>	Analog voltage frequency command 	Impedance: 20kΩ Range: 0–10 V / -10–10 V = 0–Maximum Operation Frequency (P01.00) Mode switching by setting P03.00, P03.28 AI1 resolution=10 bits
<b>AI2</b>	Analog current frequency command 	Impedance: Current mode=250 Ω, Voltage mode=20kΩ Range: 0–20 mA / 4–20 mA / 0–10 V = 0–Maximum Operation Frequency (P01.00) Mode switching by setting P03.01, P03.29 Switch: The AI2 default is 0–20 mA / 4–20 mA (current mode) AI2 resolution = 12 bits
<b>AO1</b>	Multi-function analog voltage output 	Switch: The AO1 default is 0–10 V (voltage mode). To switch to the current mode, two steps are required: 1. A dip switch must be configured (follow the instructions on the inner side of the front cover). 2. Change P03.31 to 1 or 2 (see Chapter 4 of the GS20(X) User Manual). <b>Voltage mode</b> Range: 0–10 V (P03.31=0) corresponds to the maximum operating range of the control target Max. output current: 2mA Max. Load: 5kΩ <b>Current mode</b> Range: 0–20 mA (P03.31=1) / 4–20 mA (P03.31=2) corresponds to the maximum operating range of the control target, maximum load 500Ω AO1 resolution=10 bits
<b>ACM</b>	Analog Signal Common	Analog signal common terminal
<b>+24V (red)</b>	STO 24V power terminal	
<b>STO1, STO2 (red)</b>	Default: STO1 / STO2 short-circuited to +24V Rated voltage: 24VDC ± 10 %; maximum voltage: 30VDC ± 10 % Rated current: 6.67 mA ± 10 % <b>STO activation mode</b> Input voltage level: 0VDC < STO1-SCM or STO2-SCM < 5VDC STO response time ≤ 20ms (STO1 / STO2 operates until the AC motor drive stops outputting current) <b>STO cut-off mode</b> Input voltage level: 11VDC < STO1-SCM and STO2-SCM < 30VDC Power removal safety function per EN 954-1 and IEC / EN 61508 <b>Note:</b> Refer to Chapter 17 SAFE TORQUE OFF FUNCTION for details.	
<b>SCM (red)</b>	STO Common - Signal Terminal	
<b>SG+</b>	Modbus RS-485	
<b>SG-</b>	<b>Note:</b> Refer to GS20(X) User Manual Chapter 4 Descriptions of Parameter Settings, Parameter Group 09: Communication Parameters for details.	
<b>SGND</b>		
<b>RJ45</b>	PIN 1, 2, 6: Reserved PIN 3, 7: SGND PIN 4: SG- PIN 5: SG+ PIN 8: +10V supply GS4-KPD (provides optional) power supply)	The RJ45 port provides a serial communications connection. Max Baud Rate = 115.2 kbps

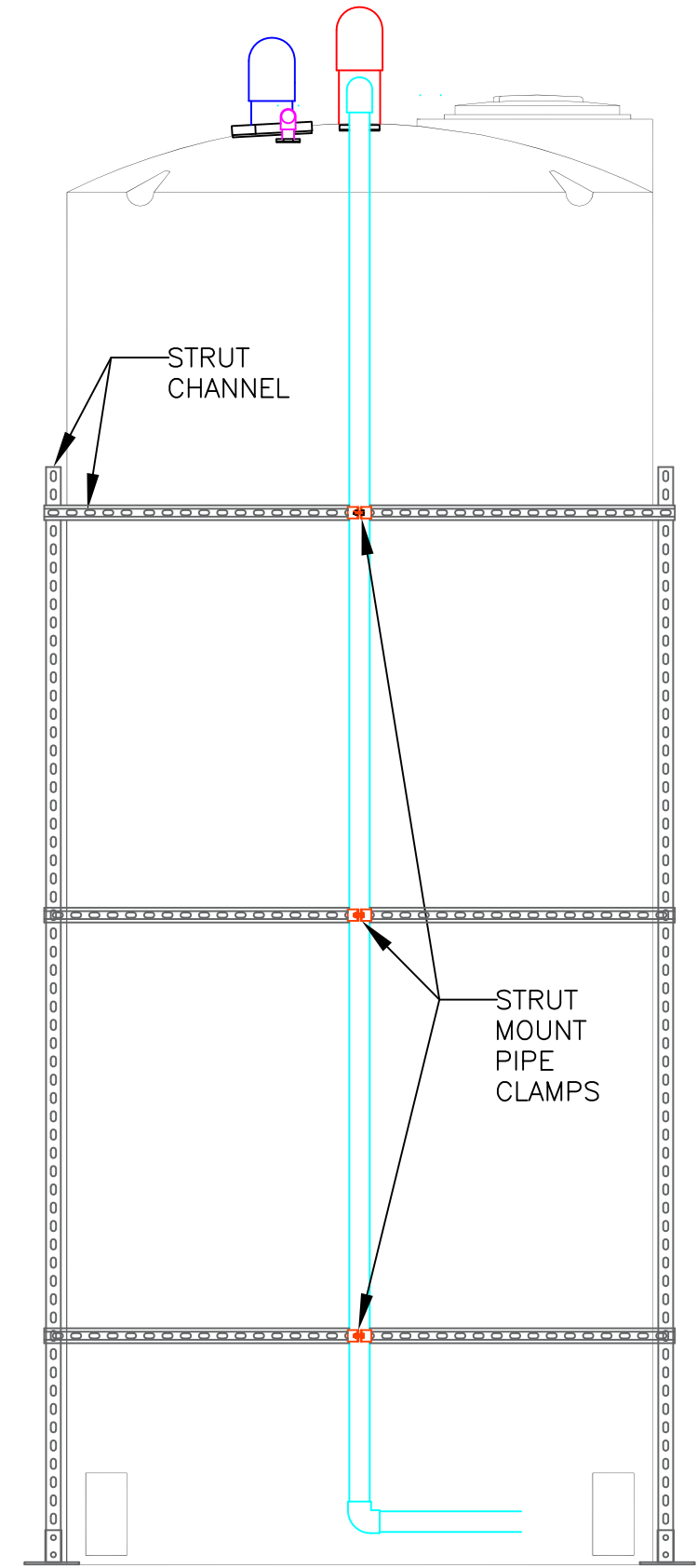
TOP VIEW



SIDE VIEW



TYPICAL VERTICAL PIPE SUPPORT





## **GC 8 x 30R**

regenerated activated carbon

**GC 8x30R** is a regenerated carbon which is granular in form. Made from bituminous coal, it is ideal for many liquid phase applications including the removal of organic contaminants from liquid streams. Its size makes it appealing where low pressure drop is needed. It is not recommended for use in the purification of drinking water or other food grade applications.

### **Specifications**

Mesh size – 8 x 30, %:	90 (min)
Less than No. 8, %:	5 (max)
Greater than No. 30, %:	5 (max)
Iodine No., mg/g:	800 (min)
Surface Area, m <sup>2</sup> /g:	800 (min)
Moisture, % (as packaged):	5 (max)
Typical Density, lbs./cu.ft.:	28-32
g/cc:	0.45-0.51

\*Standard packaging is in 1,000lb vinyl bags. Other packaging is available upon request with an additional cost.

### **Caution!**

*Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels. Confined space/low oxygen procedures should be put in place before any entry is made. Such procedures should comply with all applicable Local, State and Federal guidelines.*



## SUBMITTAL/TRANSMITTAL FORM

<b>FROM:</b>	EnviroTrac Ltd. 5 Old Dock Road Yaphank, New York 11980 Phone: (631) 924-3001 Fax: (631) 924-5001	<b>DATE SENT: 06/07/23</b>
<b>TO:</b>	<b>TRC</b> 3 Corporate Drive Suite 202 Clifton Park, NY 12065  Attn: Jeffrey LaRock	<b>DATE RECEIVED: _____</b>

**PROJECT:**

**Remedial System Optimization (RSO) RFP  
 Former Chromalloy Facility, West Nyack, New York**

We are transmitting (Herewith , Under separate cover , Electronic , Hard copy ) the following:

Item No.(s)	Submittal Description	Submittal No.	Revision to Previous Submittal:
1	Figure 1 – Pump and Treat System P&ID	01	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

Copy to: File

Signed:

## TRC Comments w/ ET Responses

- Change TRC address to 3 Corporate Drive, Suite 202, Clifton Park, NY 12065 Attn: Jeffrey LaRock

**Acknowledged. Address has been changed**

- Interlock 2 – If high-high switch is triggered, send alarm notification, and disable pumps P1 and P3

**Figure 1 P&ID is revised to note this. EnviroTrac recommends shutting down P2 also. The LSHH may also trigger in the event something is wrong with P-2 or any downstream component from this pump.**

- Interlock 6 – If high-high, the high switch turns on the sump pump.

**Figure 2 has been clarified. The intent of the HH switch is to act as a safety interlock. The pump control of P-3 is done through its own integrated float switch, which is now noted as LSHL-02 (Level Switch High-Low). The high-high safety switch is noted as LSHH-02.**

## ET Comments

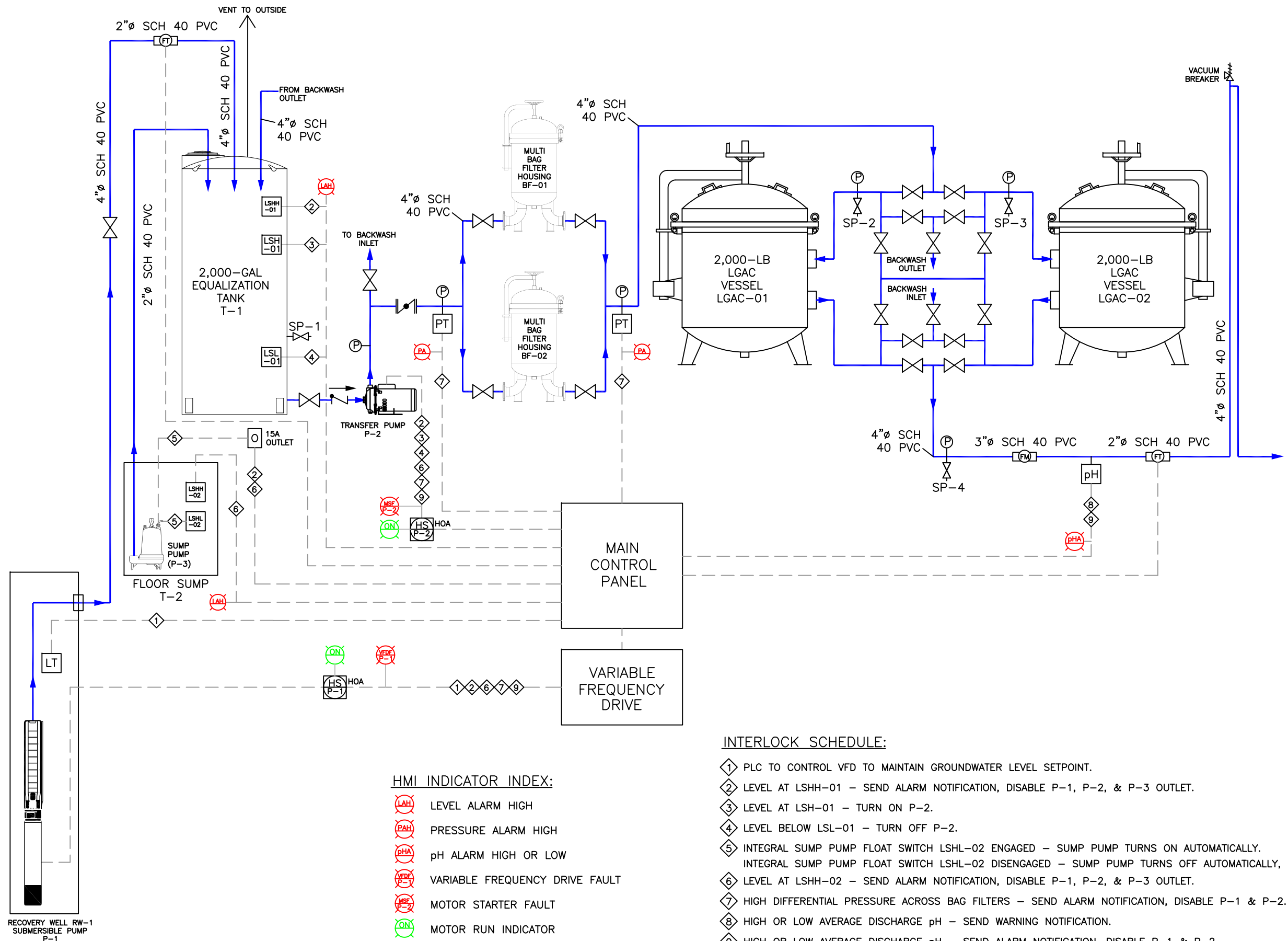
None

**NOTES:**

1. 10-PIPE DIAMETERS OF STRAIGHT PIPE RUN TO BE INSTALLED BEFORE EACH FLOW METER OR FLOW TRANSMITTER.
2. 5-PIPE DIAMETERS OF STRAIGHT PIPE RUN TO BE INSTALLED AFTER EACH FLOW METER/TRANSMITTER.

**SYSTEM LEGEND:**

- PRESSURE GAUGE
- LEVEL SWITCH
- LEVEL TRANSMITTER
- PRESSURE TRANSMITTER
- pH TRANSMITTER
- FLOW METER/TOTALIZER
- FLOW TRANSMITTER
- BALL VALVE
- BUTTERFLY VALVE
- SAMPLE PORT
- CHECK VALVE
- HMI SWITCH
- CONTROL PANEL INTERLOCK
- ELECTRIC LINE
- AIR FLOW DIRECTION
- WATER FLOW DIRECTION
- ENCLOSURE LIMITS



**HMI INDICATOR INDEX:**

- LEVEL ALARM HIGH
- PRESSURE ALARM HIGH
- pH ALARM HIGH OR LOW
- VARIABLE FREQUENCY DRIVE FAULT
- MOTOR STARTER FAULT
- MOTOR RUN INDICATOR

**INTERLOCK SCHEDULE:**

1. PLC TO CONTROL VFD TO MAINTAIN GROUNDWATER LEVEL SETPOINT.
2. LEVEL AT LSHH-01 - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3 OUTLET.
3. LEVEL AT LSH-01 - TURN ON P-2.
4. LEVEL BELOW LSL-01 - TURN OFF P-2.
5. INTEGRAL SUMP PUMP FLOAT SWITCH LSHL-02 ENGAGED - SUMP PUMP TURNS ON AUTOMATICALLY. INTEGRAL SUMP PUMP FLOAT SWITCH LSHL-02 DISENGAGED - SUMP PUMP TURNS OFF AUTOMATICALLY.
6. LEVEL AT LSHH-02 - SEND ALARM NOTIFICATION, DISABLE P-1, P-2, & P-3 OUTLET.
7. HIGH DIFFERENTIAL PRESSURE ACROSS BAG FILTERS - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.
8. HIGH OR LOW AVERAGE DISCHARGE pH - SEND WARNING NOTIFICATION.
9. HIGH OR LOW AVERAGE DISCHARGE pH - SEND ALARM NOTIFICATION, DISABLE P-1 & P-2.



## SUBMITTAL/TRANSMITTAL FORM

<b>FROM:</b>	EnviroTrac Ltd. 5 Old Dock Road Yaphank, New York 11980 Phone: (631) 924-3001 Fax: (631) 924-5001	<b>DATE SENT: 06/15/23</b>
<b>TO:</b>	<b>TRC</b> 3 Corporate Drive Suite 202 Clifton Park, NY 12065  Attn: Jeffrey LaRock	<b>DATE RECEIVED: _____</b>

**PROJECT:**

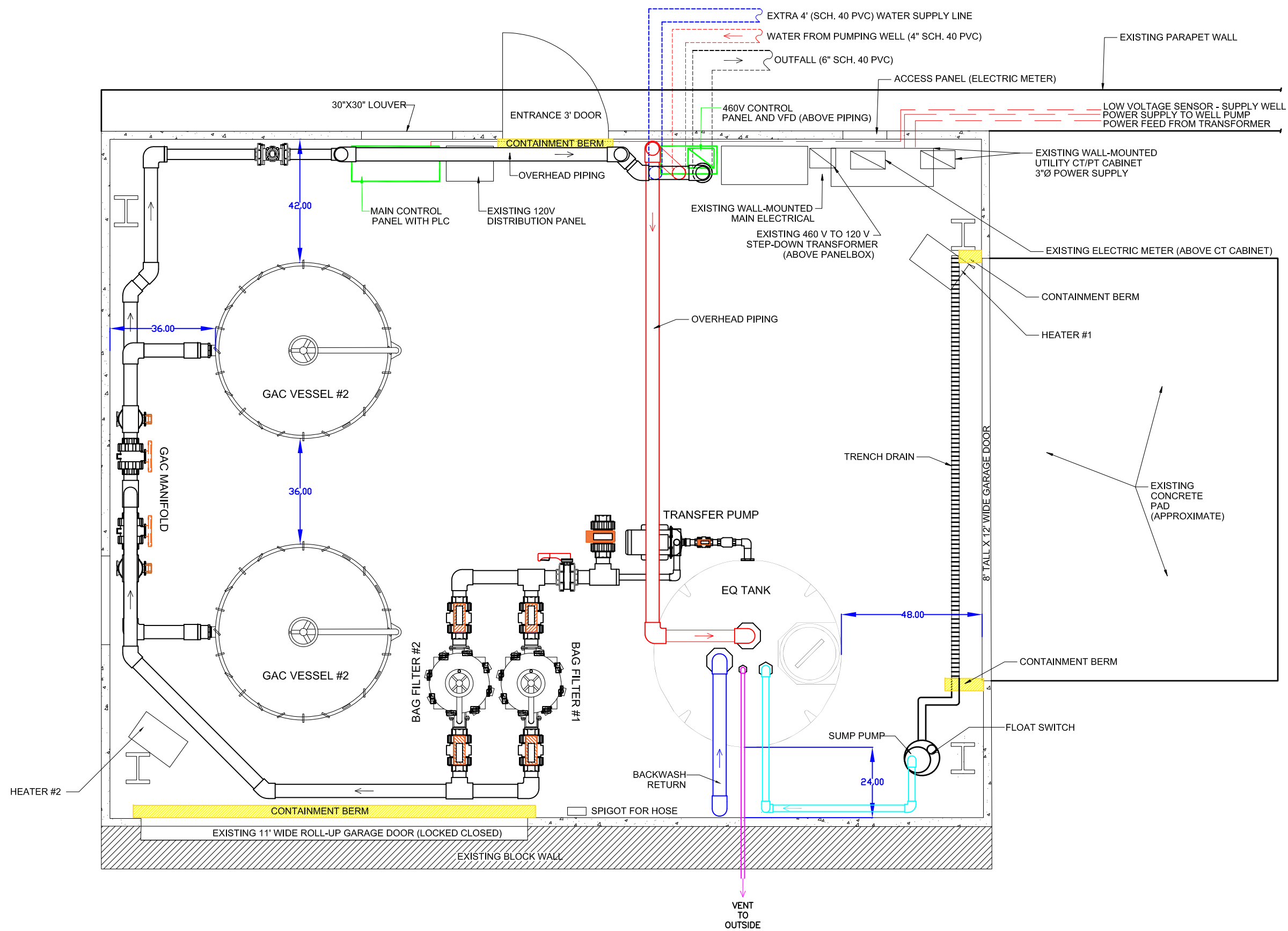
**Remedial System Optimization (RSO) RFP  
 Former Chromalloy Facility, West Nyack, New York**

We are transmitting (Herewith , Under separate cover , Electronic , Hard copy ) the following:

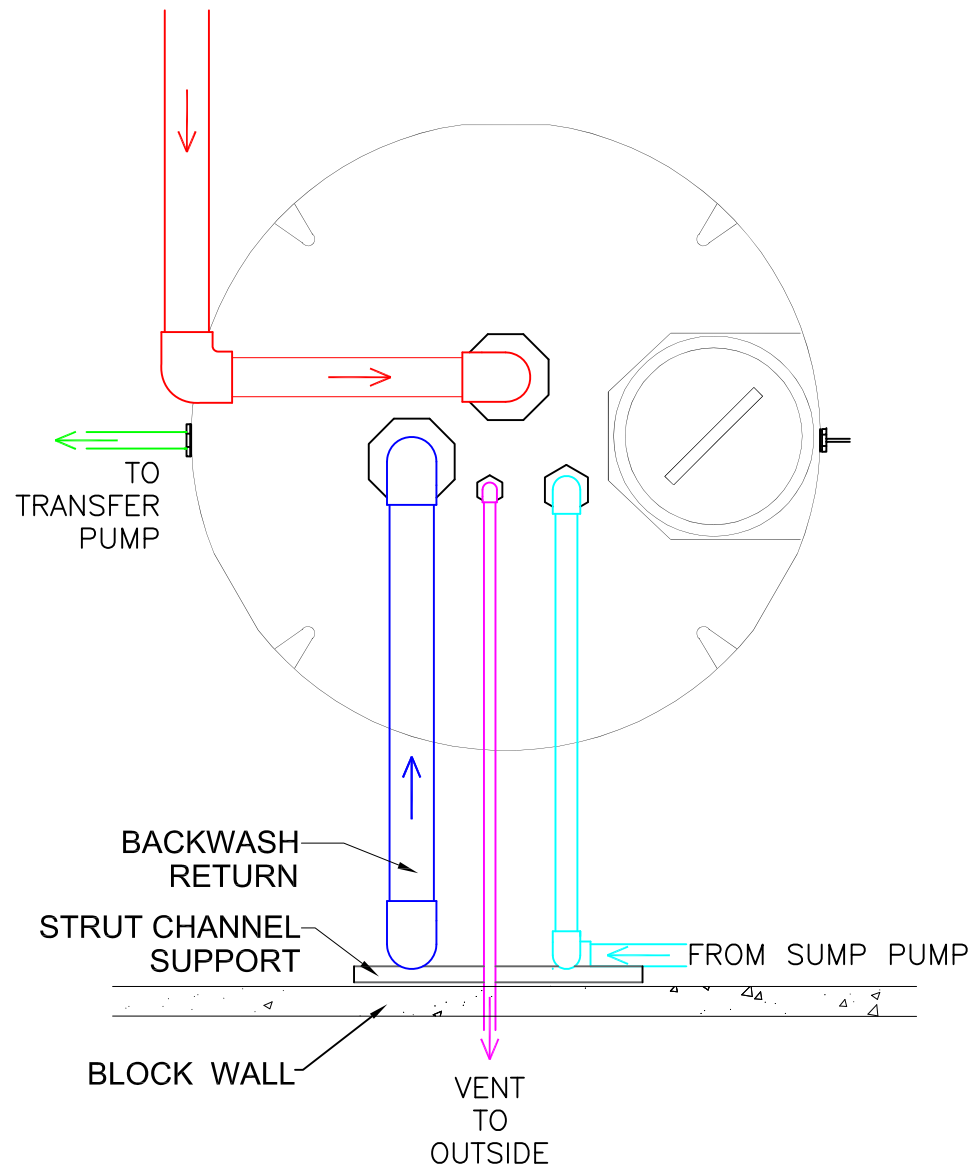
Item No.(s)	Submittal Description	Submittal No.	Revision to Previous Submittal:
1	Figure 3 – Proposed System Layout	27	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2	Figure 2 – EQ Tank Connection Details - Resubmittal	25	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

Copy to: File

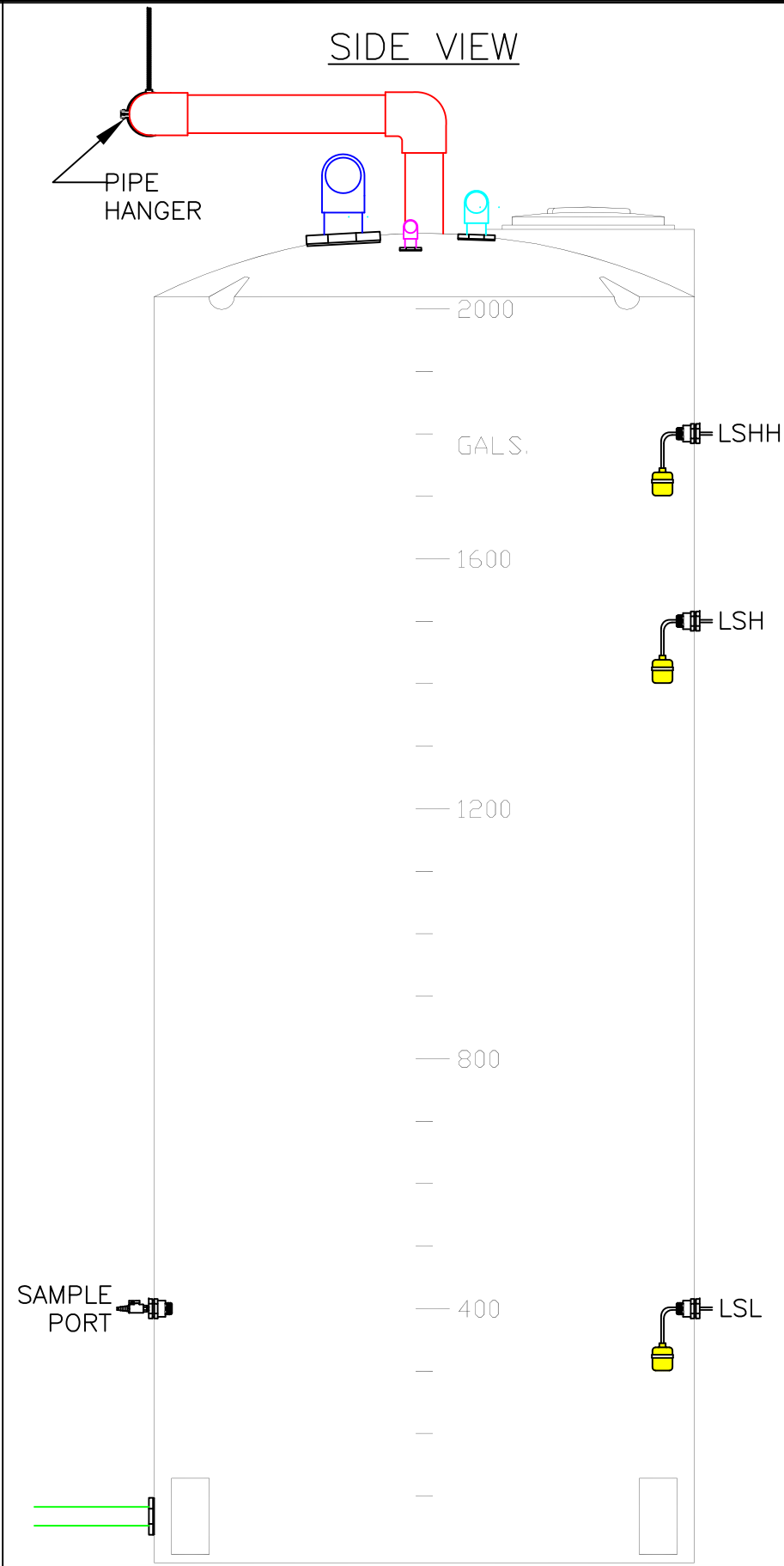
Signed:



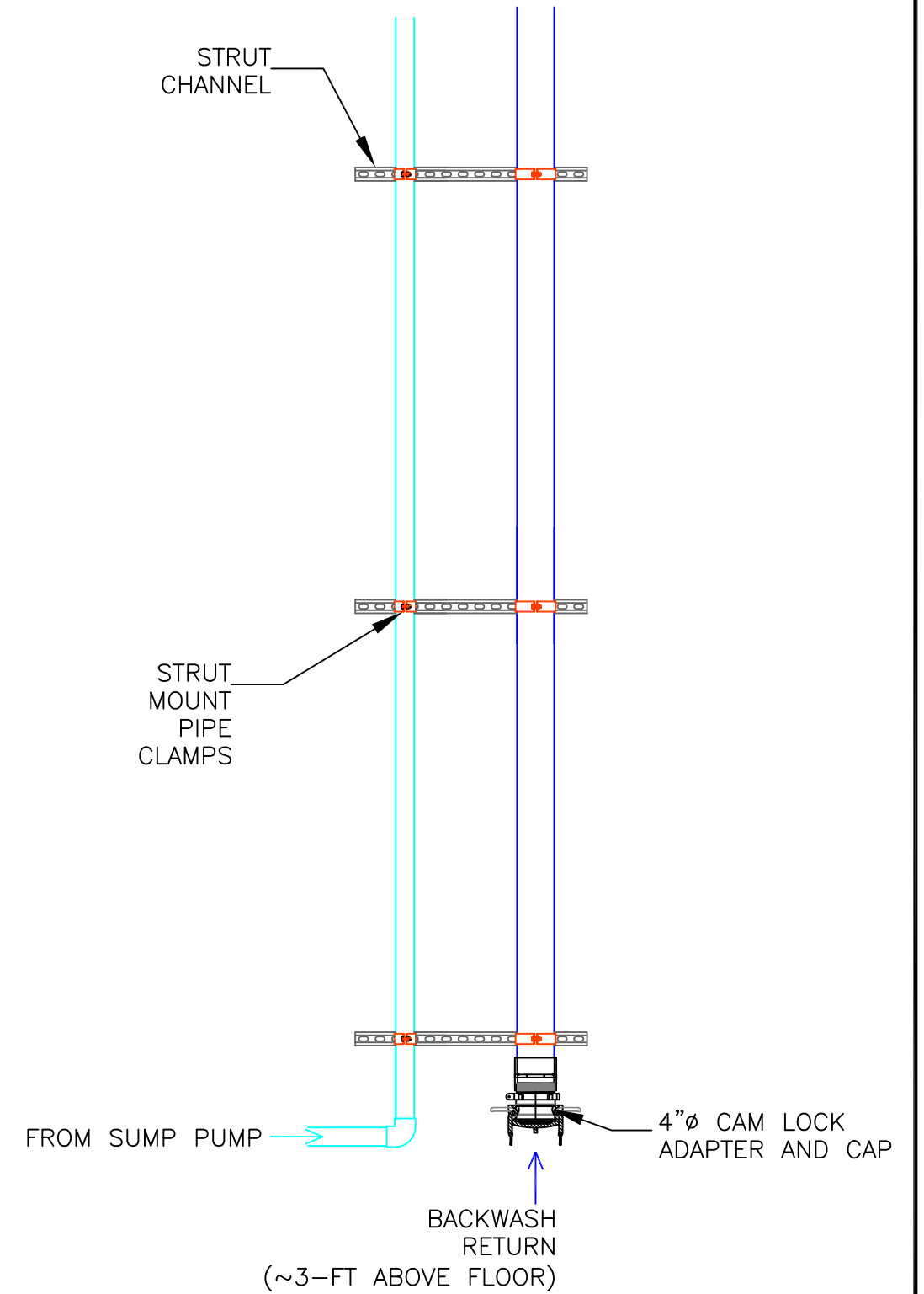
TOP VIEW



SIDE VIEW



TYPICAL VERTICAL PIPE SUPPORT ON BLOCK WALL





## SUBMITTAL/TRANSMITTAL FORM

<b>FROM:</b>	EnviroTrac Ltd. 5 Old Dock Road Yaphank, New York 11980 Phone: (631) 924-3001 Fax: (631) 924-5001	<b>DATE SENT: 08/03/23</b>
<b>TO:</b>	<b>TRC</b> 3 Corporate Drive Suite 202 Clifton Park, NY 12065  Attn: Jeffrey LaRock	<b>DATE RECEIVED: _____</b>

**PROJECT:**

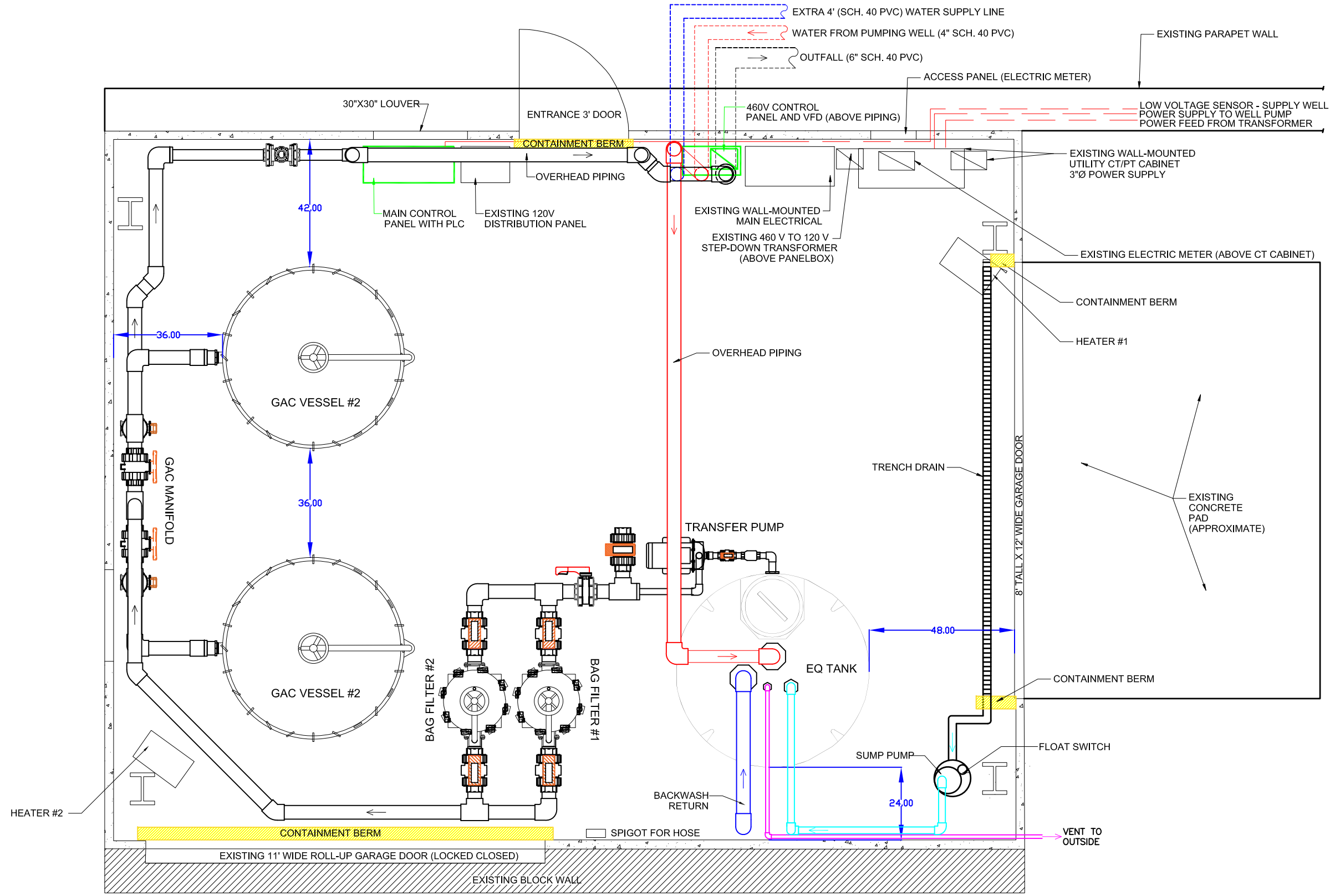
**Remedial System Optimization (RSO) RFP  
 Former Chromalloy Facility, West Nyack, New York**

We are transmitting (Herewith , Under separate cover , Electronic , Hard copy ) the following:

Item No.(s)	Submittal Description	Submittal No.	Revision to Previous Submittal:
1	Figure 3 – Re-submittal Proposed System Layout	27	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

Copy to: File

Signed:





## SUBMITTAL/TRANSMITTAL FORM

<b>FROM:</b>	EnviroTrac Ltd. 5 Old Dock Road Yaphank, New York 11980 Phone: (631) 924-3001 Fax: (631) 924-5001	<b>DATE SENT: 08/17/23</b>
<b>TO:</b>	<b>TRC</b> 3 Corporate Drive Suite 202 Clifton Park, NY 12065  Attn: Jeffrey LaRock	<b>DATE RECEIVED: _____</b>

**PROJECT:**

**Remedial System Optimization (RSO) RFP  
 Former Chromalloy Facility, West Nyack, New York**

We are transmitting (Herewith , Under separate cover , Electronic , Hard copy ) the following:

Item No.(s)	Submittal Description	Submittal No.	Revision to Previous Submittal:
1	Transfer Pump	3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2	Water Flow Transmitter Specifications	11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	pH Probe Specifications	12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	pH Sensor Specifications	13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

Copy to: File

Signed:

# Heavy Duty Straight Centrifugal Pumps

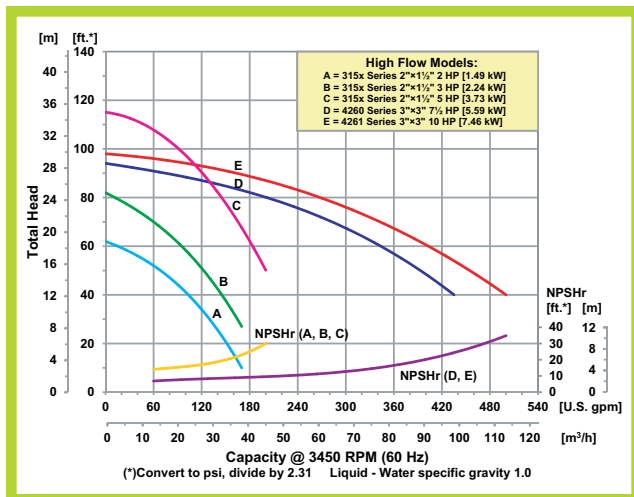
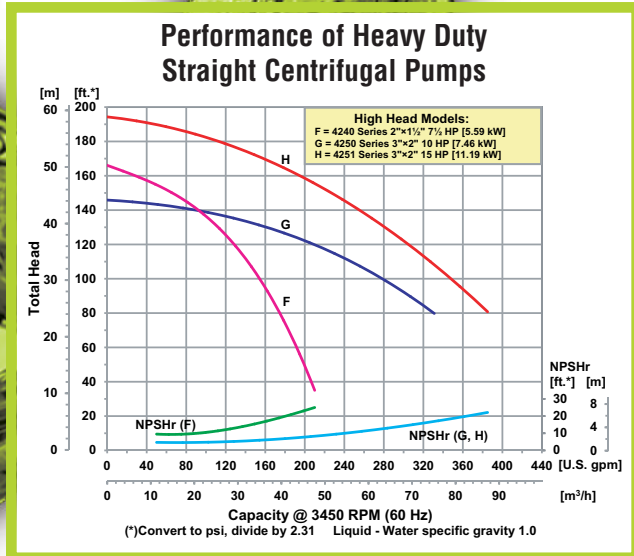


High Head Pump



High Flow Pump

- **Available in: 300 Series Investment Cast Stainless Steel, Cast Bronze and Cast Iron Construction with Stainless Steel Impeller**
- **Buna-N Mechanical Seal and O-Ring on Cast Iron Models**
- **Viton® Mechanical Seal and O-Ring on Stainless Steel and Bronze Models**
- **Optional Silicon Carbide Seals Available**
- **Front Drain Plugs Located 90° Apart**
- **Maximum Head 194 Feet (84 PSI)**
- **Maximum Flow 500 GPM**
- **2 HP to 15 HP NEMA Motors, Single and Three Phase**
- **Optional Mounting Base Available**



AMT Heavy Duty Solids Handling End Suction Centrifugal pumps are suited for liquid and chemical transfer, heating and cooling, recirculation, booster service, dirty water and other industrial applications. Stainless steel units are especially effective in applications where rust and/or corrosion can develop in systems. Semi-open impeller features self-cleaning ability that makes the unit useful in applications involving up to 1/8" diameter solids and muddy or dirty liquids, as well as clean, clear fluids. Discharge position can be adjusted in 90° increments with vent and drain plugs for all positions. Type 21 mechanical seal and O-ring casing seal. Pumps are close coupled to Totally Enclosed Fan Cooled (TEFC) motors. **Pumps are not self-priming and require flooded suction.**

## Pump Dimensional & Specification Data

Model ‡	Curve	HP	PH	Frame	ENC	Voltage @ 60 Hz +	Full Load Amps	SUC*	DIS*	A**	B**	C**	D**	E	F**	G	J**	K	L**	W**	H	‡ Ship Wt. (Lbs.)
3156			1	56J		115/230	22/11			5.4 [13.8]	5.0 [12.7]	8.5 [21.8]	3.5 [8.9]	2.5 [6.4]	4.0 [10.2]	4.3 [11.0]	2.4 [6.2]	1.3 [3.5]	17.4 [44.2]	10.6 [26.9]	9.6 [24.4]	78
3150	A	2	3	145JM	TEFC	230/460	6/3	2	1½	6.1 [15.5]	3.5 [8.9]	10.7 [27.1]	3.5 [8.9]	2.5 [6.4]	4.0 [10.2]	4.4 [11.3]	2.7 [7.0]	1.3 [3.5]	19.2 [48.7]	11.4 [28.9]	9.6 [24.4]	84
3157			3	56J		230/460	6/3			5.4 [13.8]	3.6 [9.1]	8.5 [21.8]	3.5 [8.9]	2.5 [6.4]	4.0 [10.2]	4.3 [11.0]	2.4 [6.2]	1.3 [3.5]	16.9 [42.9]	10.6 [26.9]	9.6 [24.4]	71
315A			1	56J		230	12			5.4 [13.8]	5.0 [12.7]	8.6 [21.8]	3.5 [8.9]	2.5 [6.4]	4.0 [10.2]	4.3 [11.0]	2.4 [6.2]	1.3 [3.5]	17.9 [45.4]	10.6 [26.9]	9.6 [24.4]	87
3151	B	3	3	182JM	TEFC	230/460	8/4	2	1½	7.1 [18.0]	6.6 [16.8]	10.9 [27.6]	4.5 [11.4]	2.5 [6.4]	4.0 [10.2]	4.4 [11.3]	3.7 [9.5]	0.3 [0.9]	20.0 [50.8]	12.8 [32.5]	9.6 [24.4]	137
315B			3	56J		230/460	8/4			5.4 [13.8]	3.6 [9.1]	8.5 [21.8]	3.5 [8.9]	2.5 [6.4]	4.0 [10.2]	4.3 [11.0]	2.4 [6.2]	1.3 [3.5]	17.4 [44.2]	10.6 [26.9]	9.6 [24.4]	75
315E			1	184JM		230	16			7.8 [19.9]	6.6 [16.8]	10.8 [27.6]	4.5 [11.4]	2.5 [6.4]	4.0 [10.2]	4.4 [11.3]	3.7 [9.5]	0.3 [0.9]	24.2 [61.4]	13.9 [35.3]	9.6 [24.4]	143
3152	C	5	3	184JM	TEFC	230/460	17/9	2	1½	7.1 [18.0]	6.6 [16.8]	10.8 [27.6]	4.5 [11.4]	2.5 [6.4]	4.0 [10.2]	4.4 [11.3]	3.7 [9.5]	0.3 [0.9]	21.7 [55.1]	12.8 [32.5]	9.6 [24.4]	145
4264			1	213JM		230	32			9.0 [22.9]	7.3 [18.7]	12.3 [31.4]	5.2 [13.3]	2.7 [7.0]	4.5 [11.4]	4.7 [12.1]	4.2 [10.8]	0.2 [0.7]	27.0 [68.6]	16.2 [41.1]	12.0 [30.4]	205
4260	D	7½	3	184JM	TEFC	230/460	22/11	3	3	7.0 [18.0]	6.6 [16.8]	11.6 [29.5]	4.5 [11.4]	2.7 [7.0]	4.5 [11.4]	4.7 [12.1]	3.7 [9.5]	1.0 [2.6]	22.5 [57.1]	14.3 [36.3]	12.0 [30.4]	172
4265			1	215JM		230	40			9.0 [22.9]	6.2 [15.7]	12.3 [31.4]	5.2 [13.3]	2.7 [7.0]	4.5 [11.4]	4.7 [12.1]	4.2 [10.8]	0.2 [0.7]	27.0 [68.5]	16.2 [41.1]	12.0 [30.4]	213
4261	E	10	3	215JM	TEFC	230/460	26/13	3	3	8.1 [20.7]	7.3 [18.7]	12.3 [31.4]	5.2 [13.3]	2.7 [7.0]	4.5 [11.4]	4.7 [12.1]	4.2 [10.8]	0.2 [0.7]	26.0 [66.0]	15.0 [38.1]	12.0 [30.4]	204
4242			1	213JM		230	32			9.0 [22.9]	7.3 [18.7]	11.3 [28.9]	5.2 [13.3]	2.4 [6.2]	3.8 [9.7]	4.4 [11.3]	4.2 [10.8]	N/A	26.0 [66.0]	14.6 [37.1]	11.1 [28.1]	196
4240	F	7½	3	184JM	TEFC	230/460	22/11	2	1½	7.1 [18.0]	6.6 [16.8]	10.6 [27.0]	4.5 [11.4]	2.4 [6.2]	4.5 [11.4]	4.5 [11.4]	3.7 [9.5]	0.1 [0.3]	21.5 [54.6]	12.6 [32.0]	10.5 [30.6]	163
4253			1	215JM		230	40			9.0 [22.9]	5.5 [14.2]	11.5 [29.3]	5.2 [13.3]	2.7 [7.1]	4.7 [12.1]	5.0 [12.9]	4.2 [10.8]	0.3 [0.9]	26.1 [66.3]	15.9 [40.4]	10.6 [26.9]	217
4250	G	10	3	215JM	TEFC	230/460	26/13	3	2	8.1 [20.7]	7.3 [18.7]	11.5 [29.3]	5.2 [13.3]	2.7 [7.1]	4.7 [12.1]	5.0 [12.9]	4.2 [10.8]	0.3 [0.9]	25.2 [64.0]	14.7 [37.3]	10.6 [26.9]	208
4251	H	15	3	215JM	TEFC	230/460	47/24	3	2	8.1 [20.7]	7.3 [18.7]	11.5 [29.3]	5.2 [13.3]	2.7 [7.1]	4.7 [12.1]	5.0 [12.9]	4.2 [10.8]	0.3 [0.9]	25.2 [64.0]	14.7 [37.3]	10.6 [26.9]	218

(\*) Standard NPT (Female) pipe thread.

(\*\*) This dimension may vary due to motor manufacturer's specifications.

(+) 3-Phase motors can also operate on 50 Hz. (This will change full load amps, service factor and RPM)

NOTE: Dimensions are in inches (centimeters) and have a tolerance of ± 1/4".

NOTE: Electric supply for ALL motors must be within ±10% of nameplate voltage rating (e.g. 230V ±10%= 207 to 253).

**NOTE: Check Price Book for Specific Pump Construction/Material Availability. Maximum Solids Handling Capacity: 1/4" Diameter**

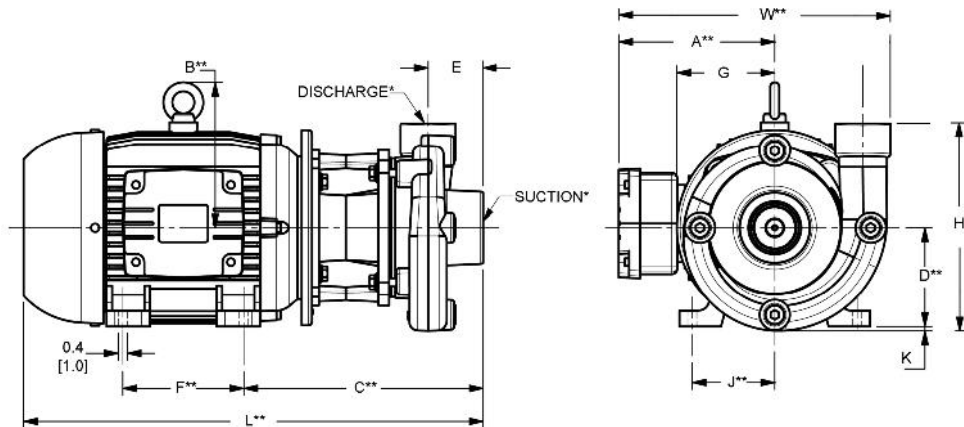
‡ When Ordering, Add the Correct (-9X) Suffix to Model Number Indicating Material Selection (Ex. 315A-95)

**XCI (-95)** Cast Iron Construction with Buna-N Seals

**XB (-94)** Cast Bronze Construction with Viton® Seals

**XSS (-98)** Cast Stainless Steel Construction with Viton® Seals

(All Models Come Standard with Stainless Steel Impeller)



## Standard Features

- Stainless Steel, Bronze and Cast Bronze Construction
- Buna-N or Viton® Mechanical Seal and O-ring, Depending on Model
- Optional Silicon Carbide Mechanical Seals Available
- Stainless Steel Motor Shaft and Hardware
- NEMA TEFC Single and Three Phase Motors, Depending on Model
- Optional Mounting Base Available for 182/184/215 JM Frames
- Self-cleaning Stainless Steel Impeller
- Maximum Working Pressure 150 PSI
- Maximum Temperature
  - ♦ Viton® 200° F
  - ♦ Buna-N 180° F
- Optional Seal Wash Port and Hose Available on All Models
- Pedestal Version Models Available for Frame Models 145/182/184JM
- QSP – Quick Ship Pump for Many Models

**Hazardous Duty/Xplosion Proof motors available from stock ranging from 1 to 10 HP; CALL FOR QUOTATION & LEAD TIME!**



The Signet 2537 Flowmeter is the next generation in fluid measurement technology from the inventor of the original paddlewheel flowmeter. This sensor is an improvement on what's already an industry standard. It has the added functionality of various output options including flow switch, multi-functional pulse, digital (S<sup>3</sup>L) or 4 to 20 mA. Additionally, it offers low flow, low power and high resolution and can be configured on-site directly through the built-in user interface.

Installation is simple because the Signet 2537 utilizes the same fittings as the popular Signet 515 and 2536 Paddlewheel Sensors and fits into pipe sizes ranging from DN15 to DN200 (½ to 8 inches). Available in Polypropylene and PVDF, it is ideal for a variety of applications including chemical processing, water and wastewater monitoring and scrubber control.

## Features

- Digital (S<sup>3</sup>L) or 4 to 20 mA outputs or (Multi-function)
- Allows for up to six sensors to Signet 8900 Controller
- Low flow capabilities down to 0.1 m/s (0.3 ft/s)
- Polypropylene or PVDF sensor bodies
- Polypropylene or PVDF retaining nuts
- Installs into pipe sizes DN15 to DN200 (½ to 8 in.)
- Test certificate included for -X0, -X1
- Low power and high resolution



## Applications

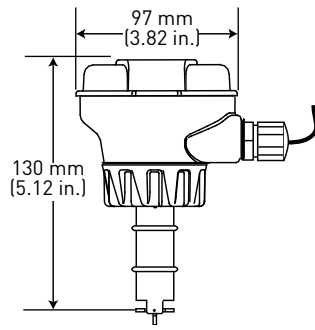
- Process Flow Monitoring
- Pump Protection
- Pure Water Production
- Filtration Systems
- Chemical Production
- Reverse Osmosis
- Demineralization/Regeneration
- Fume Scrubbers
- Cooling Towers
- Proportional Metering Pump

# Specifications

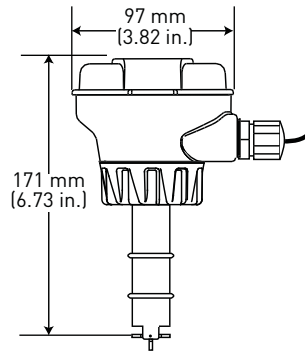
General				
Operating Range	0.1 m/s to 6 m/s	0.3 ft/s to 20 ft/s		
Pipe Size Range	DN15 to DN200	½ to 8 in.		
Linearity	±1% of max. range @ 25 °C (77 °F)			
Repeatability	±0.5% of max. range @ 25 °C (77 °F)			
System Response	100 ms update rate nominal			
Wetted Materials				
Sensor Body	Glass-filled PP (black) or PVDF (natural)			
O-rings	FPM (std) optional EPR (EPDM) or FFKM			
Rotor Pin	Titanium, Hastelloy-C or PVDF; optional Ceramic, Tantalum or Stainless Steel			
Rotor	Black PVDF or Natural PVDF; optional ETFE, with or w/o carbon fiber reinforced PTFE sleeve for rotor pin			
Electrical				
Multi	With Dry-Contact Relay	24 VDC nominal, ±10%, regulated, 30 mA max current		
	With Solid-State Relay	6 V to 24 VDC, ±10%, regulated, 30 mA max current		
	Digital (S <sup>3</sup> L)	5.0 VDC min to 6.5 VDC max., 30 mA max current (1.5 mA nominal)		
	4 to 20 mA	400 mV max ripple voltage, 30 mA max current		
	Maximum Pulse Rate	300 Hz		
	Maximum Pulse Width	50 ms		
	Minimum Pulse Rate	0.5 Hz		
	Compatible with PLC, PC or similar equipment Compatible with customer supplied metering pump			
Digital (S <sup>3</sup> L) Version	5 VDC nominal, regulated, 3 mA max current			
	Type	Serial ASCII, TTL level 9600 bps		
	Max. Cable Length	Refer to Signet 8900 wiring specifications.		
	Compatible with Model Signet 8900 controller			
4 to 20 mA Version	12 to 32 VDC nominal, ±10%, regulated, 21 mA max current			
	Loop Accuracy	±32 µA @ 25 °C @ 24 VDC		
	Loop Resolution	5 µA		
	Temp. Drift	±1µA per °C max.		
	Power Supply Rejection	±1µA per V		
	Max. Cable	305 m	1000 ft	
	Maximum Loop Resistance	600 Ω @ 24 VDC	1 KΩ @ 32 VDC	
	Load Impedance	375 Ω		
Reverse Polarity and Short Circuit Protected	Up to 40 V, 1 hour			
Over-voltage Protection	> 40 VDC over 1 hour			
Relay Specifications				
	Mechanical SPDT	5 A @ 30 VDC, 5 A @ 250 VAC		
	Solid-State Relay	100 mA @ 40 VDC, 70 mA @ 33 VAC		
	Relay Modes	Low, High		
	Time Delay	0.0 to 6400.0 seconds		
	Hysteresis	Adjustable for exiting alarm condition		
Max. Temperature/Pressure Rating				
Storage Temperature	-10 °C to 75 °C	14 °F to 167 °F		
Operating Temperature	0 °C to 65 °C	32 °F to 149 °F		
Relative Humidity	0 to 90%, non-condensing			
Flow Sensor/ Retaining Nut	PP	12.5 bar @ 20 °C	181 psi @ 68 °F	
		1.7 bar @ 85 °C	25 psi @ 185 °F	
	PVDF	14 bar @ 20 °C	203 psi @ 68 °F	
		1.7 bar @ 85 °C	25 psi @ 185 °F	
Operating Temperature				
	PP	-18 °C to 85 °C	0 °F to 185 °F	
	PVDF	-18 °C to 85 °C	0 °F to 185 °F	
Environmental				
Enclosure	NEMA 4X/IP65			
Shipping Weight				
	0.640 kg	1.41 lb		
Standards and Approvals				
	CE, FCC, UL			
	RoHS compliant, China RoHS			
	Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety.			

# Dimensions

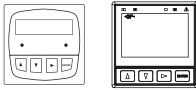


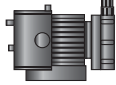

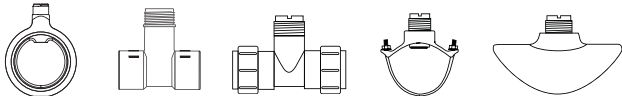
1/2 in. to 4 in. pipe



5 to 8 in. pipe



## In-Line Installation

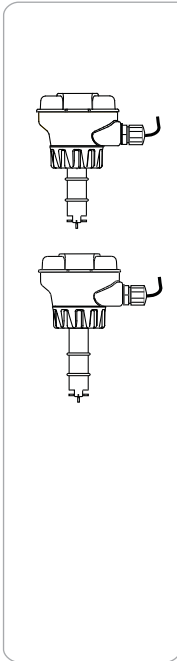
System Overview	<b>Panel Mount</b>	<b>4 to 20 mA Input</b>	<b>4 to 20 mA Dry Contact, Solid State</b>
	Signet Instruments 8900    9900	Customer Supplied Chart Recorder or Programmable Logic Controller	Customer supplied Metering Pump
		 OR 	
	<b>Signet 2537 Paddlewheel Flowmeter</b>		
Signet Fittings			All sold separately

### Application Tips

- Select PVDF Rotor Pin for use in Deionized Water.
- Use a sleeved rotor in abrasive liquids to reduce wear.
- Sensor plug is used to plug installation fitting after extraction of sensor from pipe.
- For liquids containing ferrous particles, use Signet Magmeters.
- For systems with components of more than one material, the maximum temperature/pressure specification must always be referenced to the component with the lowest rating.

Please refer to Wiring, Installation, and Accessories sections for more information.

## Ordering Information



Mfr. Part No.	Code	Output
Paddlewheel Flowmeter - Integral Mount (8512 sensors)		
DN15 to DN100 - ½ to 4 in.		
Polypropylene body, black Polypropylene retaining nut, black PVDF rotor, Titanium pin, FPM O-rings		
3-2537-1C-P0	<b>159 001 291</b>	Pulse/Flow Switch DCR
3-2537-2C-P0	<b>159 001 292</b>	Pulse/Flow Switch SSR
3-2537-5C-P0	<b>159 001 295</b>	Digital (S <sup>3</sup> L)
3-2537-6C-P0	<b>159 001 296</b>	4 to 20 mA
Natural PVDF body, Natural PVDF retaining nut, rotor and pin, FPM O-rings		
3-2537-1C-T0	<b>159 001 315</b>	Pulse/Flow Switch DCR
3-2537-2C-T0	<b>159 001 316</b>	Pulse/Flow Switch SSR
3-2537-5C-T0	<b>159 001 319</b>	Digital (S <sup>3</sup> L)
3-2537-6C-T0	<b>159 001 320</b>	4 to 20 mA
DN125 to DN200 - 5 to 8 in.*		
Polypropylene body, black Polypropylene retaining nut, black PVDF rotor, Titanium pin, FPM O-rings		
3-2537-1C-P1	<b>159 001 303</b>	Pulse/Flow Switch DCR
3-2537-2C-P1	<b>159 001 304</b>	Pulse/Flow Switch SSR
3-2537-5C-P1	<b>159 001 307</b>	Digital (S <sup>3</sup> L)
3-2537-6C-P1	<b>159 001 308</b>	4 to 20 mA

\*PVDF available ½ in. to 4 in. only

## Accessories and Replacement Parts

Mfr. Part No.	Code	Description
<b>Rotors</b>		
3-2536.320-1	<b>198 820 052</b>	Rotor, PVDF Black
3-2536.320-2	<b>159 000 272</b>	Rotor, PVDF Natural
3-2536.320-3	<b>159 000 273</b>	Rotor, ETFE
3-2536.322-1	<b>198 820 056</b>	Sleeved rotor, PVDF Black
3-2536.322-2	<b>198 820 057</b>	Sleeved rotor, PVDF Natural
3-2536.322-3	<b>198 820 058</b>	Sleeved rotor, ETFE
<b>Rotor Pins</b>		
M1546-1	<b>198 801 182</b>	Pin, Titanium
M1546-2	<b>198 801 183</b>	Pin, Hastelloy-C
M1546-3	<b>198 820 014</b>	Pin, Tantalum
M1546-4	<b>198 820 015</b>	Pin, Stainless Steel
P51545	<b>198 820 016</b>	Pin, Ceramic
<b>O-Rings</b>		
1220-0021	<b>198 801 186</b>	O-ring, FPM (2 required per sensor)
1224-0021	<b>198 820 006</b>	O-ring, EPR (EPDM) (2 required per sensor)
1228-0021	<b>198 820 007</b>	O-ring, FFPM (2 required per sensor)
<b>Miscellaneous</b>		
P31536	<b>198 840 201</b>	Sensor plug, Polypropylene
3-2536.321	<b>198 820 054</b>	PVDF Natural, Rotor kit
3-8050.391	<b>159 001 703</b>	Retaining Nut Replacement Kit, NPT, Stainless Steel
3-8050.390-1	<b>159 001 702</b>	Retaining Nut Replacement Kit, NPT, Valox
3-8050.390-3	<b>159 310 116</b>	Retaining Nut Replacement Kit, NPT, PP
3-8050.390-4	<b>159 310 117</b>	Retaining Nut Replacement Kit, NPT, PVDF
3-8050.396	<b>159 000 617</b>	RC Filter kit (for relay use)
3-9000.392-1	<b>159 000 839</b>	Liquid tight connector kit, NPT (1 piece)
3-9000.392-2	<b>159 000 841</b>	Liquid tight connector kit, PG13.5 (1 piece)
7310-1024	<b>159 873 004</b>	24 VDC Power Supply, 10W, 0.42 A
7310-2024	<b>159 873 005</b>	24 VDC Power Supply, 24W, 1.0 A
7310-4024	<b>159 873 006</b>	24 VDC Power Supply, 40W, 1.7 A
7310-6024	<b>159 873 007</b>	24 VDC Power Supply, 60W, 2.5 A
7310-7024	<b>159 873 008</b>	24 VDC Power Supply, 96W, 4.0 A

3-2537.099 Rev G (4/13)

© Georg Fischer Signet LLC

3401 Aero Jet Avenue, El Monte, CA 91731-2882 U.S.A. • Tel. (626) 571-2770 • Fax (626) 573-2057 • www.gfsignet.com • e-mail: signet.ps@georgfischer.com  
 Specifications subject to change without notice. All rights reserved. All corporate names and trademarks stated herein are the property of their respective companies.

# GF 2724-2726 pH/ORP Electrodes

## General Purpose



Compatible with ALL GF pH/ORP instruments and SmartPro transmitters



The 2724-2726 pH and ORP electrodes are general purpose sensors ideal for a wide range of applications. These feature a patented reference design and uses the unique foul-proof patented DryLoc® connector. The large area PE reference junction and pathway is constructed to increase the total reference effectiveness and ensures long service life.

The DryLoc® connector with corrosion resistant gold plated contacts readily connects the sensor to the mating 2751 pH/ORP Smart Sensor Electronics or the 2760 Preamplifier. The robust PPS threaded sensor body and choice of flat pH, bulb pH, or flat ORP sensing elements allows a broad range of chemical and mechanical compatibility for a wide variety of applications.

There are two optional pH sensing versions available, HF and LC. The HF version is for applications where traces of hydrofluoric acid (2% or less) will attack standard pH glass. The LC version can be used for low conductivity fluids 20 - 100  $\mu\text{S}/\text{cm}$  nominal and below 20  $\mu\text{S}/\text{cm}$  when mounted under controlled conditions.

The quick temperature response is available in either a Pt1000 or 3 K $\Omega$  temperature sensor and allows compatibility with all pH/ORP instruments. The 2724-2726 electrodes incorporate  $\frac{3}{4}$  inch NPT or ISO 7/1-R 3/4 threads for installing into GF standard pipe-tees. They can also be mounted directly into standard fittings, DN15 to DN100 ( $\frac{1}{2}$  to 4 inch).

## Features

- Patented reference design for exceptional performance and prolonged life in harsh environments\*
- Memory chip enabled for access to a wide range of unique features when connected to the 2751 pH/ORP Smart Sensor Electronics
- PPS body for broad range of chemical compatibility
- Patented DryLoc® connector with gold plated contacts
- Special design allows for installation at any angle, even inverted or horizontal
- $\frac{3}{4}$ " NPT or ISO 7/1-R 3/4 threaded sensors for use with reducing tees DN15 to DN100 ( $\frac{1}{2}$  to 4 in.)
- Mounts in GF standard fittings from DN15 to DN100 ( $\frac{1}{2}$  to 4 in.)
- Quick temperature response
- Bulb and flat HF resistant glass available for trace HF, in less than 2% concentration applications
- Low conductivity sensor available for liquids down to 20  $\mu\text{S}/\text{cm}$



## Applications

- Water & Wastewater Treatment
- Neutralization Systems
- Effluent Monitoring
- Sanitization Systems
- Pool & Spa Control
- Aquatic Animal Life Support Systems
- Process Control
- Cooling Towers

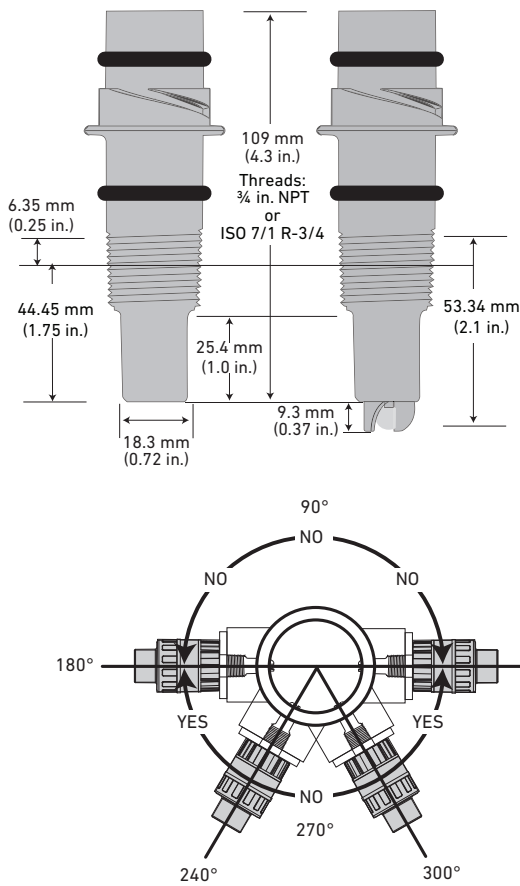
\*U.S. Patent Nos.: 6,666,701, 7,799,193 B2, 7,867,371 B2 and 8,211,282 B2

# Specifications

General			
Performance	Efficiency	>97% @ 25 °C (77 ° F)	
Operating Range	pH	0 to 14 pH	
	ORP	±2000 mV	
	3-2726-LC	Low conductivity fluids; 20 - 100 µS/cm nominal < 20 µS; flow must be less than 150 ml/min in a properly grounded system	
	3-2724-HF, 3-2726-HF	Hydrofluoric acid resistant glass, pH 6 or below; trace HF ≤2%	
Compatibility			
	2751 Smart Sensor Electronics (for 8900, 9900, 9950, 4 to 20 mA or Profibus Concentrator), 2760 Pre-amplifier		
Temperature Sensor			
	Pt1000 versions	Compatible with 2751 pH/ORP Smart Sensor Electronics for connection to a PLC or to the 8900, 9900 or 9950 instruments	
	3 KΩ Balco versions	Compatible with 2751 pH/ORP Smart Sensor Electronics or with 2760 pH/ORP Pre-amplifier for connection to the 8750 pH/ORP Transmitter	
Process Connection			
	¾ in. NPT	ISO 7/1-R 3/4	Mounts into fittings
Wetted Materials			
	pH	PPS, glass, UHMW PE, FKM	
	ORP	PPS, glass, UHMW PE, FKM, Platinum	
Max. Temperature/Pressure Rating			
Operating Temperature Range*	bulb tip design	0 °C to 85 °C	32 °F to 185 °F
	flat tip design	10 °C to 85 °C	50 °F to 185 °F
Operating Pressure Range		6.8 bar @ 0 to 65 °C (100 psi @ 32 to 150 °F)	
		4 bar @ 65 to 85 °C (58 psi @ 150 to 185 °F)	
*Best performance for 2724-HF, 2726-HF sensors is above 10 °C (50 °F)			
Recommended Storage Temperature			
		0 °C to 50 °C	32 °F to 122 °F
The electrode glass will shatter if shipped or stored at temperature below 0 °C (32 °F)			
The performance life of the electrode will shorten if stored at temperatures above 50 °C (122 °F)			
Mounting			
In-line Mounting	Use the sensor threads		
	Use a standard fitting up to 4 in.		
	Sensor can be mounted at any angle		
Submersible Mounting	Use threads on models 2751 or 2760		
	Requires ¾ inch NPT or ISO 7/1-R 3/4 male threaded liquid tight extension conduit.		
Shipping Weight			
	0.25 kg	0.55 lb	
Standards and Approvals			
	RoHS compliant, China RoHS		
	Manufactured under ISO 9001, ISO 14001 and ISO 45001		

See Temperature and Pressure graphs for more information

# Dimensions

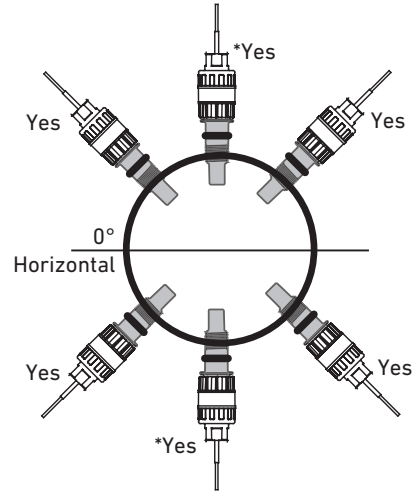


## Mounting Angle

Models 2724-2726 may be mounted at any angle without affecting the performance.

\*Avoid locations with air pockets and sediment

When mounting in standard threaded fittings the electrode must be mounted horizontally to 60 degrees below horizontal position only.



# System Overview

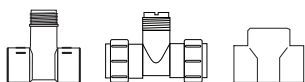
Panel Mount	Pipe, Tank, Wall	4 to 20 mA Output	Automation System
GF Instruments with 2751 Smart Sensor Electronics - 8900 - 9900 - 9950	GF Instruments with 2751 Smart Sensor Electronics - 9900 and Rear Enclosure	2751 Smart Sensor Electronics with - Customer Supplied Chart Recorder or Programmable Logic Controller or - Programmable Automation Controller	2751 Smart Sensor Electronics with - 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or - Programmable Automation Controller

**GF 2724-2726  
DryLoc® pH/ORP  
Electrodes**



All sold separately

**In-Line Installation -**  
GF and threaded 1/2 in to 4 in fittings only

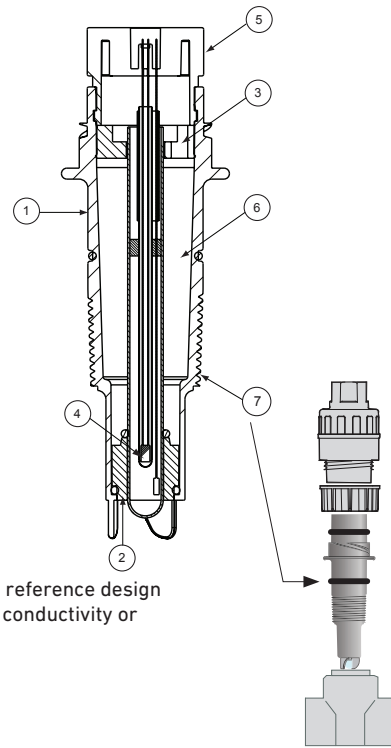


**Submersible Installation -**  
Customer supplied pipe extension or conduit with 3/4 in. NPT or ISO 7/1-R 3/4 threads



## Electrode Key Features and Benefits:

1. PPS body for chemical compatibility with most harsh chemicals.
2. Porous UHMW PE (ultra high molecular weight polyethylene) junction resists fouling and build-up.
3. Memory chip enabled for convenient data storage and access (calibration data, operational data, and manufacturing data), electrode health monitoring via glass impedance measurement when used in connection with the 2751 pH/ORP Smart Sensor Electronics.
4. Internal temperature sensor located in the glass stem for a quick temperature response.
5. DryLoc® connector with corrosion resistant gold plated pins for quick and easy sensor removal. Resists moisture and dirt intrusion.
6. Dual-patented reference design with a 406 mm (16 in.) reference pathway for prolonged life in harsh environments. This enables the sensor to last significantly longer than other standard pH/ORP electrodes in most applications.
- 6a. With the patented reference design, the 2726-LC version performs better in low conductivity water between 20 - 100  $\mu\text{S}$  and lasts longer than previous "DI" electrodes.
- 6b. The 2726-LC sensor also performs in applications with extremely low (less than 20  $\mu\text{S}/\text{cm}$ ) conductivity. Special precautions must be taken to avoid measurement complications. Please note the following.
  - Electrostatic charges (streaming potentials) can cause dramatic offsets in a system with very low conductivity water. To minimize this, sensors should be placed in a well grounded system.
  - To enhance performance, a low flow cell is recommended to provide a steady flow rate (150 ml/minute). Sensors placed in high flow applications will experience noisier readings due to streaming potential.
7. Threads for NPT or ISO process connection into reducing tees
  - Use off-the-shelf GF reducing tees DN20 to DN100 ( $\frac{3}{4}$  to 4 in.).
8. Mounts directly into fittings ( $\frac{1}{2}$  to 4 in.) for easy sensor retrofitting.
9. Mount submersed into a tank via the 2751 or 2760 back threads.

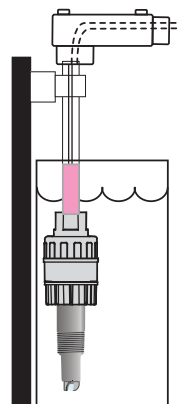


Dual-patented reference design for long life in conductivity or chemicals.

Sensor in threaded reducing tee



⑧ Sensor in fitting

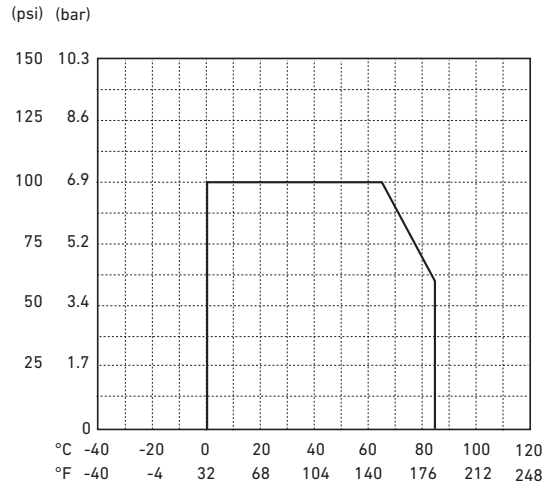


⑨ Sensor submersible installation

# Temperature/Pressure Graph

**Note:**

The pressure/temperature graphs are specifically for the GF sensor. During system design the specifications of all components must be considered. In the case of a metal piping system, a plastic sensor will reduce the system specification.



**Application Tips**

- Use the flat glass electrodes when a self-cleaning feature is desired; especially useful in applications with abrasive chemicals for in-line installations.
- Use bulb protected electrodes for low temperature applications or where fast response is required.
- ORP electrodes are generally used for chemical reaction monitoring, not control.
- Ensure that sensor materials are chemically compatible with the process liquid.
- Keep electrode tip wet, avoid air pockets and sediment.

**Model 2724-2726 Ordering Notes**

- 1) pH and ORP electrodes require connection to model 2751 pH/ORP Smart Sensor Electronics or 2760 Preamplifier.
- 2) The 2751 “EasyCal” feature recognizes common pH and ORP buffer values of 4, 7 and 10 pH and +87, +264 and +469 mV for ORP.

**Buffer Solutions**

- 3822-7004
- 3822-7007
- 3822-7010

**Quinhydrone**

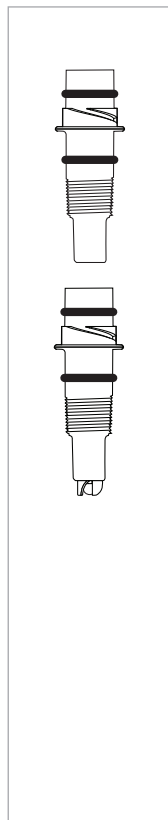
3822-7115



The GF pH buffers are ideal for calibration. The liquid solutions are conveniently packaged in one pint (473 ml) bottles. pH buffer kits in powder pillows are available for mixing fresh solutions with water at the time of use.

All pH buffers are color coded for easy identification; 4.01 pH is red, 7.00 pH is yellow, and 10.00 pH is blue. All pH buffers are traceable to NIST standards. The 4.01 and 7.00 pH buffer solutions can be used to calibrate ORP sensors when saturated with quinhydrone.

## Ordering Information



Mfr. Part No.	Code	Tip Design	Process Connection Thread Options
<b>pH Electrodes</b>			
Temperature Element Pt1000; use with 2751 pH/ORP Smart Sensor Electronics* and Profibus Concentrator			
3-2724-00	<b>159 001 545</b>	Flat	¾ in. MNPT, Thread
3-2724-01	<b>159 001 546</b>	Flat	ISO 7/1-R 3/4 Thread
3-2726-00	<b>159 001 553</b>	Bulb	¾ in. MNPT, Thread
3-2726-01	<b>159 001 554</b>	Bulb	ISO 7/1-R 3/4 Thread
3-2726-HF-00	<b>159 001 549</b>	Bulb, HF Resistant <sup>1</sup>	¾ in. MNPT, Thread
3-2726-HF-01	<b>159 001 550</b>	Bulb, HF Resistant <sup>1</sup>	ISO 7/1-R 3/4 Thread
3-2726-LC-00	<b>159 001 557</b>	Bulb, Low Conductivity <sup>2</sup>	¾ in. MNPT, Thread
3-2726-LC-01	<b>159 001 558</b>	Bulb, Low Conductivity <sup>2</sup>	ISO 7/1-R 3/4 Thread
Temperature Element 3 KΩ Balco; Compatible with both the 2751 pH/ORP Smart Sensor Electronics* and the 2760 Preamplifier**			
3-2724-10	<b>159 001 547</b>	Flat	¾ in. MNPT, Thread
3-2724-11	<b>159 001 548</b>	Flat	ISO 7/1-R 3/4 Thread
3-2724-HF-10	<b>159 001 771</b>	Flat, HF Resistant <sup>1</sup>	3/4 in. NPT, Thread
3-2724-HF-11	<b>159 001 772</b>	Flat, HF Resistant <sup>1</sup>	ISO 7/1-R 3/4 Thread
3-2726-10	<b>159 001 555</b>	Bulb	¾ in. MNPT, Thread
3-2726-11	<b>159 001 556</b>	Bulb	ISO 7/1-R 3/4 Thread
3-2726-HF-10	<b>159 001 551</b>	Bulb HF Resistant <sup>1</sup>	¾ in. MNPT, Thread
3-2726-HF-11	<b>159 001 552</b>	Bulb HF Resistant <sup>1</sup>	ISO 7/1-R 3/4 Thread
3-2726-LC-10	<b>159 001 559</b>	Bulb, Low Conductivity <sup>2</sup>	¾ in. MNPT, Thread
3-2726-LC-11	<b>159 001 560</b>	Bulb, Low Conductivity <sup>2</sup>	ISO 7/1-R 3/4 Thread
ORP Electrodes; Compatible with both the 2751 pH/ORP Smart Sensor Electronics* and the 2760 Preamplifier**			
3-2725-60	<b>159 001 561</b>	Platinum, Flat, 10 KΩ ID, ¾ in. NPT	¾ in. MNPT, Thread
3-2725-61	<b>159 001 562</b>	Platinum, Flat, 10 KΩ ID, ISO 7/1 R¾	ISO 7/1-R 3/4 Thread

\*The 2751 pH/ORP Smart Sensor Electronics has a digital (S<sup>3</sup>L) output which is used with 8900, 9900 or 9950 instruments, and the Profibus Concentrator.

It also has a 4 to 20 mA output for connections to PLC's, data recorders, etc.

\*\*The 2760 Preamplifier is used for connection directly to 8750 transmitter or other analog transmitters.

<sup>1</sup>HF resistant <2%HF

<sup>2</sup>Low conductivity applications, 20 - 100 μS/cm recommended

## Accessories and Replacement Parts

Mfr. Part No.	Code	Description
1220-0021	<b>198 801 000</b>	O-ring, FKM (2 required per sensor)
3-2700.395	<b>159 001 605</b>	Calibration Kit: includes 3 polypropylene cups, box used as cup stand, 1 pint pH 4.01, 1 pint pH 7.00
3822-7115	<b>159 001 606</b>	20 gm Bottle Quinhydrone for ORP Calibration (must use pH 4.01 and/or pH 7.00 buffer solutions)
3-2759	<b>159 000 762</b>	pH/ORP System Tester (adapter cable sold separately)
3-2759.391	<b>159 000 764</b>	2759 DryLoc Adapter Cable (for use with 2751 and 2760)
3-0700.390	<b>198 864 403</b>	pH Buffer Kit (1 each 4, 7, 10 pH buffer in powder form, makes 50 ml of each)
3822-7004	<b>159 001 581</b>	pH 4.01 Buffer Solution, 1 pint (473 ml) bottle
3822-7007	<b>159 001 582</b>	pH 7.00 Buffer Solution, 1 pint (473 ml) bottle
3822-7010	<b>159 001 583</b>	pH 10.00 Buffer Solution, 1 pint (473 ml) bottle
3800-5000	<b>159 838 107</b>	3.0M KCl Storage Solution for pH and ORP, 1 pint (473 ml) bottle
3-2700.397	<b>159 001 870</b>	Protective Cap for pH/ORP Electrodes, 5 pieces
3-2700.398	<b>159 001 886</b>	O-ring Lubricant Kit (5 packs of Super Lube, 1cc each)

3-2724.099 Rev M (02/21)

© Georg Fischer Signet LLC

3401 Aero Jet Avenue, El Monte, CA 91731-2882 U.S.A. • Tel. (626) 571-2770 • Fax (626) 573-2057 • www.gfsignet.com • e-mail: signet.ps@georgfischer.com

Specifications subject to change without notice. All rights reserved. All corporate names and trademarks stated herein are the property of their respective companies.

# Signet 2751 DryLoc® pH/ORP Smart Sensor Electronics



In-line  
2751-1

In-line EasyCal  
2751-2

Submersible  
2751-3 or 2751-4

DryLoc® Electrodes sold separately

The Signet 2751 pH/ORP Smart Sensor Electronics featuring the DryLoc® connector, is the solution for field-free calibration, out of range glass impedance and broken glass detection, alerting the operator to probe failure or maintenance needs.

The 2751 features two different outputs: a two-wire 4 to 20 mA loop output with optional EasyCal function or a digital (S<sup>3</sup>L) output which allows for longer cable lengths and is compatible with all Signet 8900, 9900 and 9950\* instruments or in blind, 4 to 20 mA.

The Smart Sensor Electronics will allow for calibration of electrodes in a laboratory setting and installation of pre-calibrated probes in the field, reducing system downtime. Memory chip enabled electrodes will store operational data such as minimum and maximum pH/mV readings, runtime, minimum and maximum temperature (pH only), for troubleshooting and operational evaluation. To take full advantage of all features and benefits of the 2751, use with Signet 9900 (Generation IV or later), 9950 Transmitter or 0486 Profibus Concentrator.

The 2751 self-configures for pH or ORP operation via automatic recognition of the electrode type. The optional EasyCal feature allows simple push-button calibration and includes an LED indicator for visual feedback.

The 2751 submersible Smart Sensor Electronic can also be used in-line when used with the 3/4" or 1" threaded sensors including the 272X, 273X, 275X, 276X and 277X series of electrodes. The 2751 in-line sensor electronics can be used with Signet fittings up to DN100 (4 in.) and Wet-Tap assemblies.

## Features

- Probe health monitoring, glass impedance and broken glass detection
- Memory chip interface that allows for transferable calibration, runtime data, and manufacturing information
- In-line integral mount and submersible installation versions
- Automatic temperature compensation
- Auto configuration for pH or ORP operation
- Optional EasyCal calibration aid with automatic pH buffer recognition for 4, 7 and 10 pH and ORP solutions: quinhydrone saturated pH 4 or 7 buffers and Light's Solution +469 mV
- Junction boxes for convenient wiring
- Patented DryLoc® connector provides a quick and secure connection to the sensor\*\*



## Applications

- Water and Wastewater Treatment
- Neutralization Systems
- Scrubber Control
- Effluent Monitoring
- Surface Finishing
- Flocculent Coagulation
- Heavy Metal Removal and Recovery
- Toxics Destruction
- Sanitization Systems
- Pool & Spa Control
- Aquatic Animal Life Support Systems

\*Users of 9950 Gen I and 9950 (Gen 2a) should update to 9950 (Gen 2b, available in Q4) to take full advantage of the 2751 features and benefits. Visit [www.gfsignet.com](http://www.gfsignet.com) for the latest software update.

\*\*U.S. Patent No.: 6,666,701

# Specifications

## General

### Compatible Electrodes

Signet DryLoc® pH and ORP Electrodes, Models 2724-2726, 2734-2736, 2756-2757 Wet-Tap, 2764-2767, 2774-2777

Operating Range	pH	-1 to 15 pH
	ORP	±2000 mV
Response Time	pH	< 6 sec. for 95% of change
	ORP	Application dependent
Materials	In-line	PBT (thermal plastic polyester) and polypropylene (retaining nut)
	Submersible	CPVC

## Electrical

Cable	4.6 m	15 ft	3-conductor shielded (3-2751-1 in-line and the 3-2751-3 or -4 submersible sensor electronics only)	
	22 AWG		For 9900, 9950 and 4 to 20 mA max. cable length is 300 m (1000 ft.). For 8900, please refer to the Cable Calculation Table of the Signet catalog for max. cable length.	
Power	12 to 24 VDC		±10%, regulated for 4 to 20 mA output	
	5 to 6.5 VDC		±5% regulated recommended, 3 mA max., for digital (S <sup>3</sup> L) output	
Current Output	pH		Fixed 4 to 20 mA, isolated, = 0 to 14 pH (custom scaling available with 0252 tool)	
	ORP		Fixed 4 to 20 mA, isolated, = -1000 to +2000 mV (custom scaling available from ± 2000 mV with 0252 tool)	
Max Loop Resistance	100 Ω max. @ 12 V	325 Ω max. @ 18 V	600 Ω max. @ 24 V	
Accuracy	±32 µA			
Resolution	±5 µA			
Update Rate	0.5 seconds			
Error Indication	3.6 mA, 22 mA, or none			
Digital (S <sup>3</sup> L) Output	Serial ASCII, TTL level 9600 bps			
Accuracy	pH	± 0.02 pH @ 25 °C	± 0.02 pH @ 77 °F	
	ORP	± 1.5 mV @ 25 °C	± 1.5 mV @ 77 °F	
	Temperature	≤ 0.4 °C	0.72 °F	
Resolution	pH	≤ 0.01 pH		
	ORP	1.5 mV		
Update Rate	0.5 seconds			
Available Data	Raw mV, pH or ORP, Temperature (pH), Glass Impedance (pH), Minimum mV (pH), Maximum mV (pH), Minimum Temperature (pH), Maximum Temperature (pH), Model Number, Serial Number, Manufacturing Date, Runtime, Slope pH/mV, Measurement Offset, and Temperature			
Error Indication	Open input diagnostic, broken glass detection (pH), High Impedance			
Input Impedance, Z	>10 <sup>11</sup> Ω			

## Environmental

Enclosure	3-2751-1 & -2	NEMA 4X/IP65 with electrode connected
	3-2751-3 & -4	NEMA 6P/IP68 with electrode and watertight conduit and/or extension pipe connected

## Max. Temperature/Pressure Rating

### Operating Temperature

Submersible	0 °C to 85 °C	32 °F to 185 °F
	0 °C to 85 °C	32 °F to 185 °F
In-line	0 °C to 85 °C	32 °F to 185 °F
Storage Temperature	-20 °C to 85 °C	-4 °F to 185 °F
Relative Humidity	0 to 95%, non-condensing (without electrode connected)	

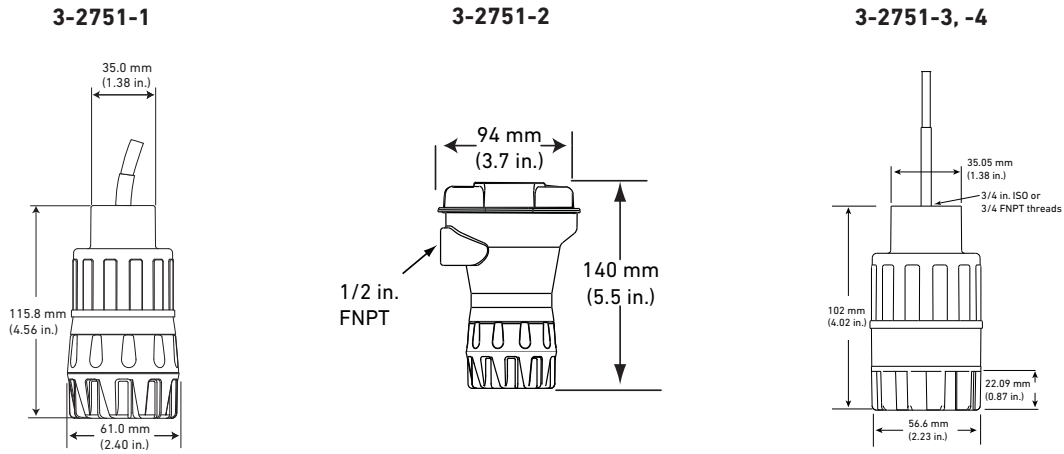
## Shipping Weight

2751-2	0.75 kg	1.65 lb
2751-1, -3 & -4	0.64 kg	1.41 lb

## Standards and Approvals

CE, FCC
RoHS compliant, China RoHS
Manufactured under ISO 9001 for Quality and ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety

# Dimensions



## In-Line Installation

System Overview	Panel Mount	Pipe, Tank, Wall	4 to 20 mA Input	Automation System
	Signet Instruments 9900 9950	Signet Instrument 9900 and Rear Enclosure	3-2751 Smart Sensor Electronics and Customer Supplied Chart Recorder, Programmable Logic Controller, or Programmable Automation Controller	3-0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or Programmable Automation Controller
	Signet 2751 Smart Sensor Electronics 	Signet 2751 Smart Sensor Electronics with Signet 3-8050-2 Universal Junction Box (EasyCal) 	Signet 2751 Smart Sensor Electronics 	
Signet Electrodes 2724-2726 2734-2736 2764-2767 2774-2777				All sold separately
2724-2726 and 2734-2736 DryLoc Electrodes: Use GF fittings* or customer supplied 3/4 in. NPT fittings		2764-2767 and 2774-2777 DryLoc Electrodes: Use customer supplied 3/4 in. or 1 in. NPT fittings		

## Submersible Installation




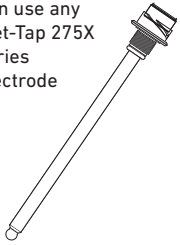
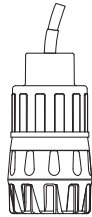
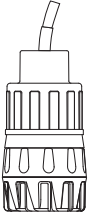

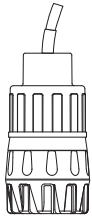
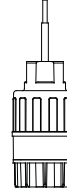
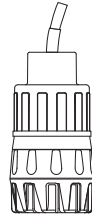

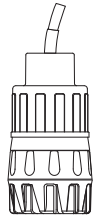
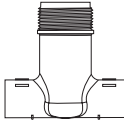
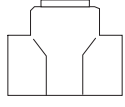
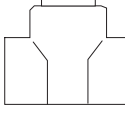
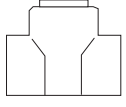


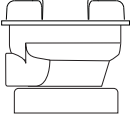

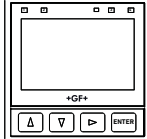
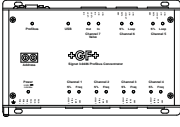


## Wet-Tap Installation

Panel Mount	Pipe, Tank, Wall	4 to 20 mA Input	Automation System
Signet Instruments 9900 9950	Signet Instrument 9900 and Rear Enclosure	2751 Smart Sensor Electronics and Customer Supplied Chart Recorder, Programmable Logic Controller , or Programmable Automation Controller	0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or Programmable Automation Controller
Signet 2751 Smart Sensor Electronics with customer supplied pipe extension or conduit, 3/4 in. NPT or ISO 7/1-R 3/4 threads** 	Signet 2751 Smart Sensor Electronics with Signet Wet-Tap Electrode 2756, 2757 and Signet 3719 Wet-Tap 	Signet Electrodes 2724-2726 2734-2736 2764-2767 2774-2777 	
GF Tees and Fittings see model 3719 for more info 		All sold separately	

\* See fittings section for more information.

\*\*Refer to the Signet Submersion Kit brochure (3-0000.707) located on our website for installation suggestions and options.

# 2751 Product Selection Guide

<p><b>1. Choose the Electrode</b></p>	<p>2724-2726, 2734-2736</p> <p>Can use Any 3-272X or 273X series Electrode</p> 	<p>2764-2767 Differential</p> <p>3-2764-1 3-2764-2 3-2766-1 3-2766-2</p> 	<p>2774-2777</p> <p>ORP electrodes must have 10K ID resistor use: 3-2775, 3-2777</p> <p>pH Electrodes can be either the 1K or 3K use: 3-2774, 3-2774-1, 3-2776, 3-2776-1</p> 	<p>2756 and 2757 Wet-Tap</p> <p>Can use any Wet-Tap 275X series electrode</p> 	
<p><b>2. Determine the mounting style:</b></p>	<p>In-line</p>  <p>2751-1 or -2</p>	<p>In-line</p>  <p>2751-1 or -2</p>  <p>2751-3 or -4</p>	<p>In-line</p>  <p>2751-1 or -2</p>  <p>2751-3 or -4</p>	<p>In-line</p>  <p>2751-1 or -2</p>  <p>2751-3 or -4</p>	<p>In-line</p>  <p>2751-1 or -2</p> <p>-In-line fitting</p>  <p>Signet fitting</p>  <p>3/4" reducing tee</p>  <p>1" threaded tee</p>  <p>3/4" reducing tee</p> <p>Submersible</p> <p>2751-3 or -4 and cable conduit (customer supplied) connected to 3/4" sensor electronics</p>  <p>+</p>  <p>3719 Wet-Tap Assembly</p> <p>(Submersible not applicable with Wet-Tap assembly)</p>
<p><b>3. Junction Boxes</b></p>	<p>3-8050-1: Use when extending the submersible cable over long distance. 3-8050-2: Use with the submersible 2751-3 or -4 and the in-line 2751-1 for best calibration results with the EasyCal function when using the blind 4 to 20 mA output.</p>				
<p><b>4. Choose the output instrument</b></p>	<p>Digital (S<sup>L</sup>)</p>    <p>9900 or 9950 Instruments, Profibus Concentrator</p> <p>OR</p>   <p>PLCs or Chart Recorders</p> <p>Or</p> <p>4 to 20 mA</p>				

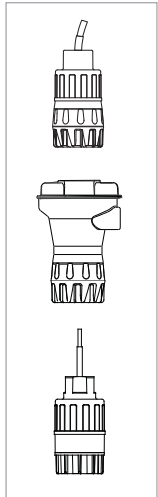
## Model 2751 Ordering Information

- 1) Model 2751 requires 12 to 24 VDC to function as a blind 4 to 20 mA output transmitter.
- 2) Order a 3-2751-2 or any other 2751 with a junction box 3-8050-2 if the EasyCal feature is desired.
- 3) Conduit and mounting brackets for submersion installation must always be used (customer supplied).
- 4) The 3-2759 System Tester must be ordered with the adapter cable 3-2759.391 for exclusive use with the 2751.
- 5) All sensor electronics, preamplifiers and connectors require a DryLoc electrode for full system installation.
- 6) The 2751 Smart Sensor Electronics is compatible with all Signet 8900, 9900 and 9950 instruments. To take full advantage of the advanced features use the 9900 SmartPro Transmitters (Generation IV or greater), 9950 and 0486 Profibus Concentrator.

## Application Tips

- The EasyCal feature automatically recognizes standard 4.0, 7.0, and 10.0 pH buffer or ORP quinhydrone solutions of +87 and +264 mV or Light's Solution, +469 mV, and simplifies calibration. For EasyCal ORP only single point calibration is used.
- Frequency of calibration of electrodes is dependent upon the application.

## Ordering Information



Mfr. Part No.	Code	Description
In-line Smart Sensor Electronics (Yellow body)		
3-2751-1	<b>159 001 804</b>	with 4.6 m (15 ft) cable, recommended for 9900 or 9950 instruments
3-2751-2	<b>159 001 805</b>	with junction box and EasyCal, recommended for 4 to 20 mA use
Submersible Smart Sensor Electronics (Gray body)		
3-2751-3	<b>159 001 806</b>	with 4.6 m (15 ft) cable and 3/4 in. NPT threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal
3-2751-4	<b>159 001 807</b>	with 4.6 m (15 ft) cable and ISO 7/1-R 3/4 threads - when 4 to 20 mA is required use the 3-8050-2 junction box with EasyCal

Sensor Electronics with preamplified signal and Digital (S<sup>3</sup>L) output (for use with the SmartPro Instruments) or 4 to 20 mA output - power supplied to unit dictates output type.

**Note:**

The 2751 Smart Sensor Electronics is compatible with 8900, 9900 and 9950 SmartPro Transmitters, and Signet 0486 Profibus Concentrator. To take full advantage of the 2751 features, use 9900 (Generation IV or later), 9950 or 0486 Profibus Concentrator.

## Accessories and Replacement Parts

Mfr. Part No.	Code	Description
<b>Calibration</b>		
3-2700.395	<b>159 001 605</b>	Calibration kit: includes 3 polypropylene cups, box used as cup stand, 1 pint pH 4.01, 1 pint pH 7.00
3822-7115	<b>159 001 606</b>	20 gm bottle quinhydrone for ORP calibration (must use pH 4.01 and/or pH 7.00 buffer solutions)
3-2759	<b>159 000 762</b>	pH/ORP system tester (adapter cable sold separately)
3-2759.391	<b>159 000 764</b>	2759 adapter cable for use with 2751 DryLoc sensor electronics
3-0700.390	<b>198 864 403</b>	pH buffer kit (1 each 4, 7, 10 pH buffer in powder form, makes 50 ml of each)
3822-7004	<b>159 001 581</b>	pH 4 buffer solution, 1 pint (473 ml) bottle
3822-7007	<b>159 001 582</b>	pH 7 buffer solution, 1 pint (473 ml) bottle
3822-7010	<b>159 001 583</b>	pH 10 buffer solution, 1 pint (473 ml) bottle
<b>Mounting</b>		
3-8050.390-3	<b>159 310 116</b>	Retaining nut replacement kit, Black Polypropylene
3-8050-1	<b>159 000 753</b>	Universal mount junction box
3-8050-2	<b>159 000 754</b>	Universal mount junction box w/EasyCal (for submersible applications, use with 3-2751-3 and -4 where 4 to 20 mA is required)
3-9000.392-1	<b>159 000 839</b>	Liquid tight connector kit, NPT (1 connector)
3-9000.392-2	<b>159 000 841</b>	Liquid tight connector kit, PG 13.5 (1 connector)
<b>Other</b>		
5523-0322	<b>159 000 761</b>	Sensor cable (per ft), 3-cond. plus shield, 22 AWG, black/red/white (for use with 2751)
P31515-0P200	<b>159 000 630</b>	Universal Pipe Adapter PVC
P31515-0C200	<b>159 000 631</b>	Universal Pipe Adapter CPVC
P31515-0V200	<b>159 000 459</b>	Universal Pipe Adapter PVDF
7310-1024	<b>159 873 004</b>	24 VDC power supply, 10W, 0.42 A
7310-2024	<b>159 873 005</b>	24 VDC power supply, 24W, 1.0 A
7310-4024	<b>159 873 006</b>	24 VDC power supply, 40W, 1.7 A
7310-6024	<b>159 873 007</b>	24 VDC power supply, 60W, 2.5 A
7310-7024	<b>159 873 008</b>	24 VDC power supply, 96W, 4.0 A

3-2751.099 Rev A (07/17)

© Georg Fischer Signet LLC

3401 Aero Jet Avenue, El Monte, CA 91731-2882 U.S.A. • Tel. (626) 571-2770 • Fax (626) 573-2057 • www.gfsignet.com • e-mail: signet.ps@georgfischer.com  
 Specifications subject to change without notice. All rights reserved. All corporate names and trademarks stated herein are the property of their respective companies.

## APPENDIX C

## Abrera, Bianca

---

**From:** Dale Konas, PE <dalek@envirotrac.com>  
**Sent:** Monday, May 13, 2024 11:03 AM  
**To:** Abrera, Bianca  
**Cc:** Nichols, Howard  
**Subject:** [EXTERNAL] FW: Message from UDig NY - West Nyack

This is an **External** email. Do not click links or open attachments unless you validate the sender and know the content is safe.

**ALWAYS** hover over the link to preview the actual URL/site and confirm its legitimacy.

---

## Dale Konas

Principal Engineer  
Office: Yaphank, New York

phone: 631.924.3001  
mobile: 516.807.7978

---

**From:** Stephen Sussman <stephens@envirotrac.com>  
**Sent:** Friday, May 10, 2024 4:08 PM  
**To:** Dale Konas, PE <dalek@envirotrac.com>  
**Subject:** FW: Message from UDig NY - West Nyack

I might have a few to send you

---

## Stephen Sussman

Field Services Manager  
Office: Yaphank, New York

phone: 631.924.3001  
mobile: 631.484.9348

---

**From:** UDig NY Exactix <[tickets@exactix.udigny.org](mailto:tickets@exactix.udigny.org)>  
**Sent:** Monday, February 5, 2024 2:33 PM  
**To:** Stephen Sussman <[stephens@envirotrac.com](mailto:stephens@envirotrac.com)>  
**Subject:** Message from UDig NY

Ticket: 02054-001-338-00 Type: Regular

Previous Ticket:

-----  
State: NY County: ROCKLAND Place: WEST NYACK  
Addr: From: 8 To: Name: PINEVIEW RD  
Cross: From: To: Name:  
Offset:

-----  
Locate: FRONT OF PROPERTY, REAR OF PROPERTY, RIGHT SIDE OF PROPERTY AS FACING,  
: LEFT SIDE OF PROPERTY AS FACING, WORK IN DRIVEWAY AREA, INCLUDE STREET  
: TO CENTERLINE

NearSt: PINEVIEW RD

Means of Excavation: MINI EXCAVATOR Blasting: N

Site marked with white: N

Boring/Directional Drilling: N

Within 25ft of Edge of Road: Y

Work Type: PIPELINE MAINTENANCE / REPAIR

Estimated Work Complete Date: 02/14/2024

Depth of excavation: 4 FEET

Site dimensions: Length 10 FEET Width 5 FEET

Start Date and Time: 02/09/2024 08:00

Must Start By: 02/26/2024

-----  
Contact Name: STEPHEN SUSSMAN

Company: ENVIROTRAC, YAPHANK

Addr1: 5 OLD DOCK RD

Addr2:

City: YAPHANK

State: NY Zip: 11980

Phone: 631-484-9348

Fax:

Email: [stephens@envirotrac.com](mailto:stephens@envirotrac.com)

Field Contact: STEPHEN SUSSMAN

Alt Phone: 631-484-9348

Email: [stephens@envirotrac.com](mailto:stephens@envirotrac.com)

Working for: NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

-----  
Comments: WORK LOCATION DIRT AREA ON NORTHWEST BUILDING SIDE NEAR GAS METER.  
: LARGE WHITE BUILDING JUST OVER THE RXR TRACKS.  
: Lookup Type: ADDRESS

-----  
Members:

CABLEVISION OF WEST NYACK	609-758-4700
ORANGE & ROCKLAND UTILITIES INC.   ROCK ORANGE	845-577-2374
ROCKLAND COUNTY SEWER DISTRICT 1	845-365-6056
SUEZ WATER NEW YORK	800-262-8600
TOWN OF CLARKSTOWN SEWER	845-517-7039
TOWN OF ORANGETOWN	845-359-6502 x4209
VERIZON   VALHALLA HUDSON VALLEY	844-661-0660
VILLAGE OF NYACK WATER DEPARTMENT	845-358-3734
ZAYO	800-961-6500

## **Abrera, Bianca**

---

**From:** Dale Konas, PE <dalek@envirotrac.com>  
**Sent:** Monday, May 13, 2024 11:03 AM  
**To:** Abrera, Bianca  
**Cc:** Nichols, Howard  
**Subject:** [EXTERNAL] FW: Responses for UDig NY locate request 02054-001-338 - West Nyack

This is an External email. Do not click links or open attachments unless you validate the sender and know the content is safe.

ALWAYS hover over the link to preview the actual URL/site and confirm its legitimacy.

-----Original Message-----

From: Stephen Sussman <stephens@envirotrac.com>  
Sent: Friday, May 10, 2024 4:10 PM  
To: Dale Konas, PE <dalek@envirotrac.com>  
Subject: FW: Responses for UDig NY locate request 02054-001-338 - West Nyack

-----Original Message-----

From: UDig NY Exactix <tickets@exactix.udign.org>  
Sent: Thursday, February 8, 2024 2:54 PM  
To: Stephen Sussman <stephens@envirotrac.com>  
Subject: Responses for UDig NY locate request 02054-001-338

This is a message from UDig NY's Automated Positive Response System (APR). Below is the response status from the facility operators associated with

Ticket # 02054-001-338

NY : ROCKLAND County, WEST NYACK  
8 PINEVIEW RD

CABLEVISION OF WEST NYACK

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA  
Comment - No Comment

ORANGE & ROCKLAND UTILITIES INC. | ROCK ORANGE

- UNMARKED, MARKING AND DIG DELAY REQUESTED. LOCATE TECHNICIAN HAS OR IS ATTEMPTING TO CONTACT THE EXCAVATOR. EXCAVATION SITE REMAINS UNMARKED OR INCOMPLETE. A NEW DEADLINE FOR MARKING IS TO BE OR HAS BEEN SCHEDULED.  
Comment - MARKED GM IN FRONT, COULD NOT MARK GS STUB DUE TO PROPERTY BEING FENCED IN. TRIED CALLING CONTACT, NO ANSWER AND NO VOICEMAIL SET UP.

ROCKLAND COUNTY SEWER DISTRICT 1

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA
- Comment - No Comment

SUEZ WATER NEW YORK

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA
- Comment - No Comment

TOWN OF CLARKSTOWN SEWER

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA
- Comment - No Comment

TOWN OF ORANGETOWN

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA
- Comment - No Comment

VERIZON | VALHALLA HUDSON VALLEY

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA
- Comment - No Comment

VILLAGE OF NYACK WATER DEPARTMENT

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA
- Comment - NOT IN OUR SERVICE AREA

ZAYO

- CLEAR, NO FACILITIES WITHIN 15 FT OF THE EXCAVATOR DEFINED WORK AREA
- Comment - No Comment

For the most up-to-date response status please visit [exactix.udignny.org](http://exactix.udignny.org) or call 888-DIGGERS(344-4377).

For location requests which provide the legal 2 full working days' notice, facility operators have until the stated commencement date and time to provide a response status.

## Abrera, Bianca

---

**From:** Dale Konas, PE <dalek@envirotrac.com>  
**Sent:** Monday, May 13, 2024 11:03 AM  
**To:** Abrera, Bianca  
**Cc:** Nichols, Howard  
**Subject:** [EXTERNAL] FW: Message from UDig NY - West Nyack

This is an **External** email. Do not click links or open attachments unless you validate the sender and know the content is safe.

**ALWAYS** hover over the link to preview the actual URL/site and confirm its legitimacy.

---

## Dale Konas

Principal Engineer  
Office: Yaphank, New York

phone: 631.924.3001  
mobile: 516.807.7978

---

**From:** Stephen Sussman <stephens@envirotrac.com>  
**Sent:** Friday, May 10, 2024 4:12 PM  
**To:** Dale Konas, PE <dalek@envirotrac.com>  
**Subject:** FW: Message from UDig NY - West Nyack

This was 2<sup>nd</sup> call ticket due snow after the 1<sup>st</sup> locate

---

## Stephen Sussman

Field Services Manager  
Office: Yaphank, New York

phone: 631.924.3001  
mobile: 631.484.9348

---

**From:** UDig NY Exactix <[tickets@exactix.udigny.org](mailto:tickets@exactix.udigny.org)>  
**Sent:** Wednesday, February 14, 2024 3:54 PM  
**To:** Stephen Sussman <[stephens@envirotrac.com](mailto:stephens@envirotrac.com)>  
**Subject:** Message from UDig NY

-----  
State: NY County: ROCKLAND Place: WEST NYACK  
Addr: From: 8 To: Name: PINEVIEW RD  
Cross: From: To: Name:  
Offset:

-----  
Locate: FRONT OF PROPERTY, REAR OF PROPERTY, RIGHT SIDE OF PROPERTY AS FACING,  
: LEFT SIDE OF PROPERTY AS FACING, WORK IN DRIVEWAY AREA, INCLUDE STREET  
: TO CENTERLINE

NearSt: PINEVIEW RD

Means of Excavation: MINI EXCAVATOR Blasting: N

Site marked with white: N

Boring/Directional Drilling: N

Within 25ft of Edge of Road: Y

Work Type: PIPELINE MAINTENANCE / REPAIR

Estimated Work Complete Date: 02/22/2024

Depth of excavation: 4 FEET

Site dimensions: Length 10 FEET Width 5 FEET

Start Date and Time: 02/20/2024 10:00

Must Start By: 03/05/2024

-----  
Contact Name: STEPHEN SUSSMAN

Company: ENVIROTRAC

Addr1: 5 OLD DOCK RD

Addr2:

City: YAPHANK

State: NY Zip: 11980

Phone: 631-484-9348

Fax:

Email: [stephens@envirotrac.com](mailto:stephens@envirotrac.com)

Field Contact: STEPHEN SUSSMAN

Alt Phone: 631-484-9348

Email: [stephens@envirotrac.com](mailto:stephens@envirotrac.com)

Working for: NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

-----  
Comments: WORK LOCATION DIRT AREA ON NORTHWEST BUILDING SIDE NEAR GAS METER.  
: LARGE WHITE BUILDING JUST OVER THE RXR TRACKS.  
: Lookup Type: ADDRESS

-----  
Members:

CABLEVISION OF WEST NYACK	609-758-4700
ORANGE & ROCKLAND UTILITIES INC.   ROCK ORANGE	845-925-0333
ROCKLAND COUNTY SEWER DISTRICT 1	845-365-6056
SUEZ WATER NEW YORK	800-262-8600
TOWN OF CLARKSTOWN SEWER	845-517-7039
TOWN OF ORANGETOWN	845-359-6502 x4209
VERIZON   VALHALLA HUDSON VALLEY	844-661-0660
VILLAGE OF NYACK WATER DEPARTMENT	845-358-3734
ZAYO	800-961-6500

## Ticket Status Notification

To: ENVIROTRAC  
Email: STEPHENS@ENVIROTRAC.COM

Below lists utilities that were stasured by USIC. Please note there may be other Utilities which include private facilities that may be present in the work area and are NOT the responsibility of USIC to locate or mark.

You are receiving this notification because your contact information is listed on the above ticket from the One Call System. If you have any questions regarding this notification, please contact USIC at 1-800-762-0592.

<b><u>Ticket</u></b>	<b><u>Address</u></b>			
02054-001-338	8 PINEVIEW RD, WEST NYACK, NY			
<b><u>Utility</u></b>	<b><u>Locate Date /</u></b>	<b><u>Status</u></b>	<b><u>Detail</u></b>	
Suez Wtr	02/7/24 09:38 AM	Not Marked	Excavation Site Clear	

---

Stay Up-to-Date with Real-Time Access to USIC's assigned Tickets through our DigCheck Pro App. You will have the flexibility to see Open and Closed Tickets, Post Locate Photos, and Street Views! There is no cost to access our DigCheck Pro App.

Sign up by emailing [DigCheck@usicl.com](mailto:DigCheck@usicl.com) and provide your  
First Name:  
Last Name:  
Company Name:  
Email Address:  
State or States:  
Phone Number:

You can download DigCheck Pro from Apple App Store or Google Play Store Now!

It's Free!

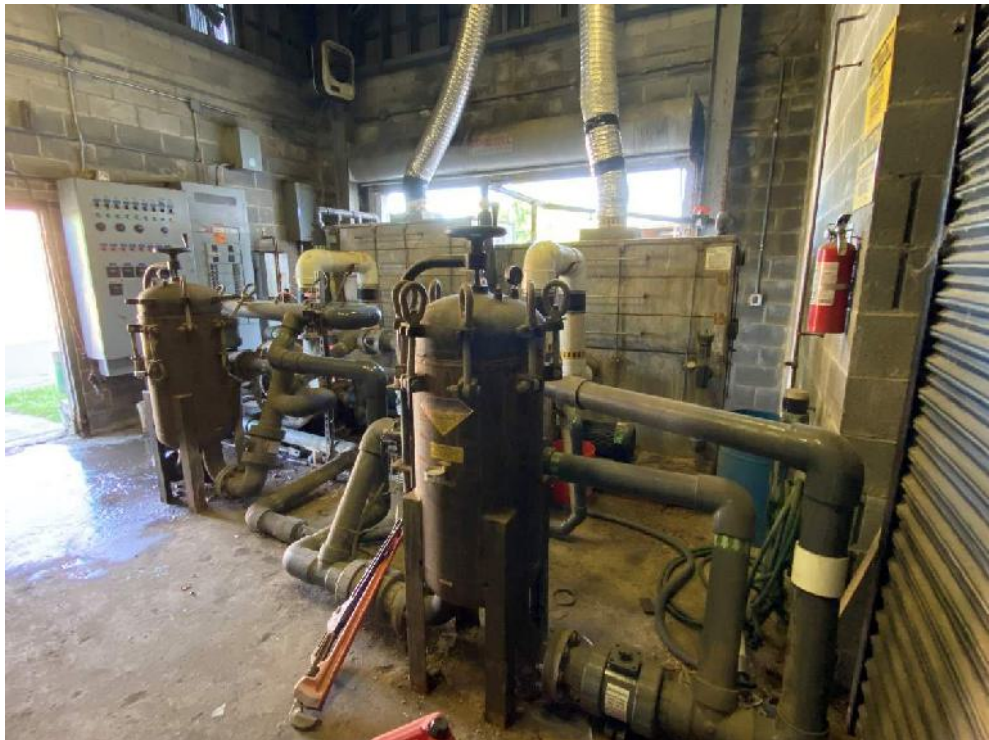



Questions or Comments:

[DigCheck@usicl.com](mailto:DigCheck@usicl.com)


## APPENDIX D


# PHOTOGRAPHIC LOG

<b>Photo 1</b>	
<b>Date:</b> 06/13/2023	
<b>Direction:</b> N	
<b>Photographer:</b> TS	
<b>Description:</b> View of former P&T system equipment.	

<b>Photo 2</b>	
<b>Date:</b> 06/13/2023	
<b>Direction:</b> N	
<b>Photographer:</b> TS	
<b>Description:</b> Removal of former P&T system equipment.	

# PHOTOGRAPHIC LOG

<b>Photo 3</b>	
<b>Date:</b> 06/14/2023	
<b>Direction:</b> N	
<b>Photographer:</b> TS	
<b>Description:</b> Concrete removal for French drain installation within the treatment building.	


<b>Photo 4</b>	
<b>Date:</b> 06/15/2023	
<b>Direction:</b> N	
<b>Photographer:</b> TS	
<b>Description:</b> Installation of French drain and sump drain.	

# PHOTOGRAPHIC LOG

<b>Photo 5</b>	
<b>Date:</b> 08/14/2023	
<b>Direction:</b> N	
<b>Photographer:</b> TS	
<b>Description:</b> Completed installation of French drain and sump drain along the roll-up door of the treatment building.	

<b>Photo 6</b>	
<b>Date:</b> 08/14/2023	
<b>Direction:</b> E	
<b>Photographer:</b> TS	
<b>Description:</b> RW-1 well vault.	

# PHOTOGRAPHIC LOG

<b>Photo 7</b>	
<b>Date:</b> 08/14/2023	
<b>Direction:</b> SE	
<b>Photographer:</b> TS	
<b>Description:</b> Lifting RW-1 well pump for servicing prior to reinstallation.	

<b>Photo 8</b>	
<b>Date:</b> 08/14/2023	
<b>Direction:</b> N	
<b>Photographer:</b> TS	
<b>Description:</b> View of RW-1 pump after servicing and cleaning.	

# PHOTOGRAPHIC LOG

**Photo 9**

**Date:** 08/14/2023

**Direction:** SE

**Photographer:** TS

**Description:**  
RW-1 well pump  
reinstalled after servicing  
and cleaning.



**Photo 10**

**Date:** 08/16/2023


**Direction:** S


**Photographer:** TS

**Description:**  
Installation of LGAC  
vessels.



# PHOTOGRAPHIC LOG

<b>Photo 11</b>	
<b>Date:</b> 08/17/2023	
<b>Direction:</b> S	
<b>Photographer:</b> TS	
<b>Description:</b> Filling LGAC vessels with carbon.	

<b>Photo 12</b>	
<b>Date:</b> 09/05/2023	
<b>Direction:</b> S	
<b>Photographer:</b> TS	
<b>Description:</b> Installation of bag filter housings, and manifold and system piping.	

# PHOTOGRAPHIC LOG

<b>Photo 13</b>
<b>Date:</b> 09/05/2023
<b>Direction:</b> S
<b>Photographer:</b> TS
<b>Description:</b> Installation of Equalization Tank.




<b>Photo 14</b>
<b>Date:</b> 09/13/2023
<b>Direction:</b> S
<b>Photographer:</b> TS
<b>Description:</b> Installation of transfer pump and additional system piping.





## PHOTOGRAPHIC LOG

<b>Photo 15</b>	
<b>Date:</b> 12/20/2023	
<b>Direction:</b> NA	
<b>Photographer:</b> TS	
<b>Description:</b> Installation of transducer at RW-1.	

<b>Photo 16</b>	
<b>Date:</b> 01/24/2024	
<b>Direction:</b> W	
<b>Photographer:</b> BA	
<b>Description:</b> Installing VFDs and conduits for system operations.	

# PHOTOGRAPHIC LOG

<b>Photo 17</b>	
<b>Date:</b> 01/25/2024	
<b>Direction:</b> W	
<b>Photographer:</b> CB	
<b>Description:</b> Installation of main control panel and PLC screen.	

<b>Photo 18</b>	
<b>Date:</b> 01/26/2024	
<b>Direction:</b> NA	
<b>Photographer:</b> BA	
<b>Description:</b> Leak observed within RW-1 vault.	

# PHOTOGRAPHIC LOG

<b>Photo 19</b>
<b>Date:</b> 02/22/2024
<b>Direction:</b> SW
<b>Photographer:</b> BA
<b>Description:</b> ET removing broken PVC coupling at RW-1.



<b>Photo 20</b>
<b>Date:</b> 02/22/2024
<b>Direction:</b> NA
<b>Photographer:</b> BA
<b>Description:</b> Broken PVC coupling observed by ET.



# PHOTOGRAPHIC LOG

<b>Photo 21</b>
<b>Date:</b> 02/22/2024
<b>Direction:</b> W
<b>Photographer:</b> BA
<b>Description:</b> PVC couplings replaced by ET at RW-1.



<b>Photo 22</b>
<b>Date:</b> 02/22/2024
<b>Direction:</b> SW
<b>Photographer:</b> BA
<b>Description:</b> Backfilling of excavation at RW-1.



# PHOTOGRAPHIC LOG

<b>Photo 23</b>
<b>Date:</b> 02/22/2024
<b>Direction:</b> E
<b>Photographer:</b> BA
<b>Description:</b> RW-1 backfilled with sand and topsoil, protected with orange fencing.

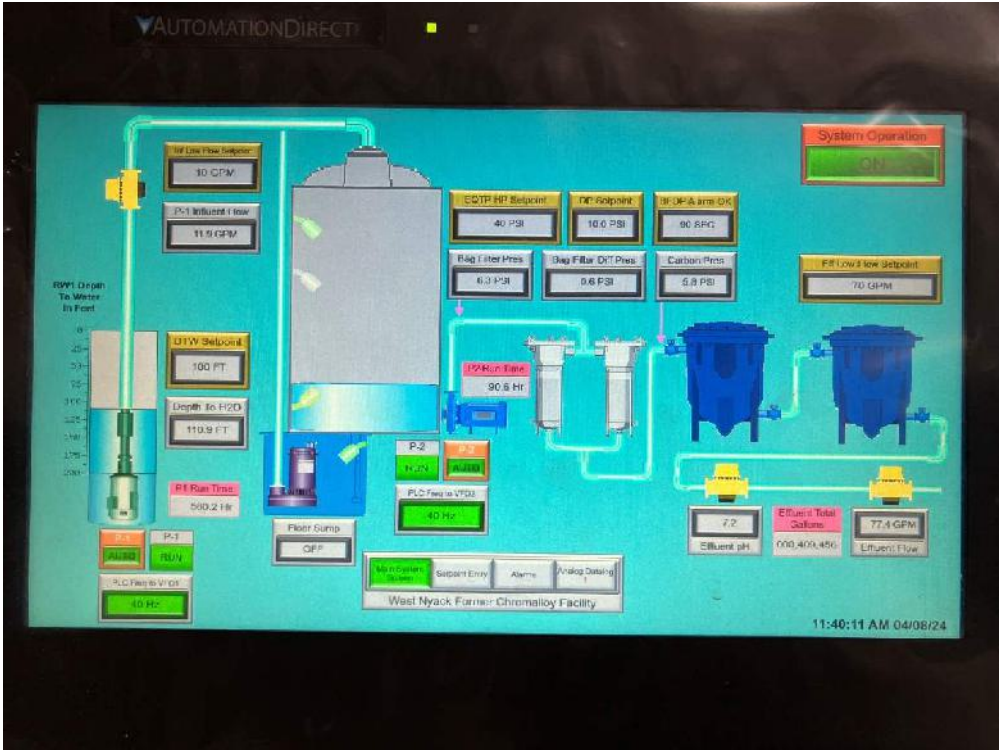


<b>Photo 24</b>
<b>Date:</b> 04/12/2024
<b>Direction:</b> S
<b>Photographer:</b> BA
<b>Description:</b> View of manifold and LGAC vessels.



# PHOTOGRAPHIC LOG

<b>Photo 25</b>	
<b>Date:</b> 04/12/2024	
<b>Direction:</b> E	
<b>Photographer:</b> BA	
<b>Description:</b> View of equalization tank, transfer pump, and bag filter housings.	

<b>Photo 26</b>	
<b>Date:</b> 04/12/2024	
<b>Direction:</b> NA	
<b>Photographer:</b> BA	
<b>Description:</b> View of HMI Screen	

## APPENDIX E

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/21/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	Δ	Upwind VOC Concentration	Downwind VOC Concentration	Δ
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/21/2024 13:48	0.0200	0.0133	-0.0067	0	0	0
2/21/2024 13:49	0.0205	0.0134	-0.0071	0	0	0
2/21/2024 13:50	0.0210	0.0135	-0.0075	0	0	0
2/21/2024 13:51	0.0215	0.0136	-0.0079	0	0	0
2/21/2024 13:52	0.0216	0.0137	-0.0079	0	0	0
2/21/2024 13:53	0.0218	0.0141	-0.0077	0	0	0
2/21/2024 13:54	0.0219	0.0145	-0.0074	0	0	0
2/21/2024 13:55	0.0220	0.0148	-0.0072	0	0	0
2/21/2024 13:56	0.0221	0.0152	-0.0069	0	0	0
2/21/2024 13:57	0.0222	0.0157	-0.0065	0	0	0
2/21/2024 13:58	0.0223	0.0159	-0.0064	0	0	0
2/21/2024 13:59	0.0223	0.0163	-0.0060	0	0	0
2/21/2024 14:00	0.0224	0.0175	-0.0049	0	0	0
2/21/2024 14:01	0.0226	0.0177	-0.0049	0	0	0
2/21/2024 14:02	0.0227	0.0171	-0.0056	0	0	0
2/21/2024 14:03	0.0230	0.0173	-0.0057	0	0	0
2/21/2024 14:04	0.0233	0.0175	-0.0058	0	0	0
2/21/2024 14:05	0.0234	0.0177	-0.0057	0	0	0
2/21/2024 14:06		0.0179	-		0	-
2/21/2024 14:07		0.0182	-		0	-
2/21/2024 14:08		0.0183	-		0	-
2/21/2024 14:09		0.0185	-		0	-
2/21/2024 14:10		0.0185	-		0	-
2/22/2024 14:11		0.0185	-		0	-
2/21/2024 14:12	0.0240	0.0183	-0.0057		0	-
2/21/2024 14:13	0.0242	0.0183	-0.0059		0	-
2/21/2024 14:14	0.0243	0.0182	-0.0061		0	-
2/21/2024 14:15	0.0246	0.0174	-0.0072		0	-
2/21/2024 14:16	0.0250	0.0175	-0.0075		0	-
2/21/2024 14:17	0.0253	0.0175	-0.0078		0	-
2/21/2024 14:18	0.0252	0.0177	-0.0075		0	-
2/21/2024 14:19	0.0300	0.0187	-0.0113		0	-
2/21/2024 14:20	0.0314	0.0199	-0.0115		0	-
2/21/2024 14:21	0.0313	0.0210	-0.0103		0	-
2/21/2024 14:22	0.0310	0.0211	-0.0099		0	-
2/21/2024 14:23	0.0303	0.0264	-0.0039		0	-
2/21/2024 14:24	0.0297	0.0270	-0.0027		0	-
2/21/2024 14:25	0.0293	0.0271	-0.0022		0	-
2/21/2024 14:26	0.0289	0.0275	-0.0014		0	-
2/21/2024 14:27	0.0291	0.0277	-0.0014		0	-
2/21/2024 14:28	0.0289	0.0281	-0.0008		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/21/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	$\Delta$	Upwind VOC Concentration	Downwind VOC Concentration	$\Delta$
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/21/2024 14:29	0.0287	0.0281	-0.0006		0	-
2/21/2024 14:30	0.0285	0.0281	-0.0004		0	-
2/21/2024 14:31	0.0280	0.0282	0.0002		0	-
2/21/2024 14:32	0.0277	0.0282	0.0005		0	-
2/21/2024 14:33	0.0276	0.0281	0.0005		0	-
2/21/2024 14:34	0.0250	0.0275	0.0025		0	-
2/21/2024 14:35	0.0241	0.0265	0.0024		0	-
2/21/2024 14:36	0.0237	0.0255	0.0018		0	-
2/21/2024 14:37	0.0233	0.0255	0.0022		0	-
2/21/2024 14:38	0.0233	0.0204	-0.0029		0	-
2/21/2024 14:39	0.0255	0.0201	-0.0054		0	-
2/21/2024 14:40	0.0256	0.0205	-0.0051		0	-
2/21/2024 14:41	0.0255	0.0205	-0.0050		0	-
2/21/2024 14:42	0.0252	0.0205	-0.0047		0	-
2/21/2024 14:43	0.0253	0.0204	-0.0049		0	-
2/21/2024 14:44	0.0254	0.0205	-0.0049		0	-
2/21/2024 14:45	0.0257	0.0207	-0.0050		0	-
2/21/2024 14:46	0.0256	0.0207	-0.0049		0	-
2/21/2024 14:47	0.0255	0.0207	-0.0048		0	-
2/21/2024 14:48	0.0254	0.0209	-0.0045		0	-
2/21/2024 14:49	0.0250	0.0207	-0.0043		0	-
2/21/2024 14:50	0.0250	0.0205	-0.0045		0	-
2/21/2024 14:51	0.0253	0.0209	-0.0044		0	-
2/21/2024 14:52		0.0208	-		0	-
2/21/2024 14:53		0.0207	-		0	-
2/21/2024 14:54		0.0205	-		0	-
2/21/2024 14:55	0.0230	0.0201	-0.0029		0	-
2/21/2024 14:56	0.0238	0.0200	-0.0038		0	-
2/21/2024 14:57	0.0239	0.0199	-0.0040		0	-
2/21/2024 14:58	0.0240	0.0203	-0.0037		0	-
2/21/2024 14:59	0.0241	0.0203	-0.0038		0	-
2/21/2024 15:00	0.0237	0.0202	-0.0035		0	-
2/21/2024 15:01	0.0242	0.0210	-0.0032		0	-
2/21/2024 15:02	0.0278	0.0219	-0.0059		0	-
2/21/2024 15:03	0.0286	0.0219	-0.0067		0	-
2/21/2024 15:04	0.0285	0.0221	-0.0064		0	-
2/21/2024 15:05	0.0312	0.0223	-0.0089		0	-
2/21/2024 15:06	0.0307	0.0225	-0.0082		0	-
2/21/2024 15:07	0.0299	0.0226	-0.0073		0	-
2/21/2024 15:08		0.0227	-		0	-
2/21/2024 15:09		0.0227	-		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/21/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	$\Delta$	Upwind VOC Concentration	Downwind VOC Concentration	$\Delta$
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/21/2024 15:10	0.0348	0.0226	-0.0122	0	0	0
2/21/2024 15:11	0.0342	0.0233	-0.0109	0	0	0
2/21/2024 15:12	0.0340	0.0238	-0.0102	0	0	0
2/21/2024 15:13	0.0335	0.0236	-0.0099	0	0	0
2/21/2024 15:14	0.0331	0.0237	-0.0094	0	0	0
2/21/2024 15:15	0.0329	0.0237	-0.0092	0	0	0
2/21/2024 15:16	0.0324	0.0229	-0.0095	0	0	0
2/21/2024 15:17	0.0291	0.0219	-0.0072	0	0	0
2/21/2024 15:18	0.0283	0.0219	-0.0064	0	0	0
2/21/2024 15:19	0.0288	0.0221	-0.0067	0	0	0
2/21/2024 15:20	0.0264	0.0221	-0.0043	0	0	0
2/21/2024 15:21	0.0265	0.0217	-0.0048	0	0	0
2/21/2024 15:22	0.0265	0.0215	-0.0050	0	0	0
2/21/2024 15:23	0.0262	0.0215	-0.0047	0	0	0
2/21/2024 15:24	0.0258	0.0214	-0.0044	0	0	0
2/21/2024 15:25	0.0219	0.0213	-0.0006	0	0	0
2/21/2024 15:26	0.0219	0.0205	-0.0014	0	0	0
2/21/2024 15:27	0.0216	0.0199	-0.0017	0	0	0
2/21/2024 15:28	0.0216	0.0196	-0.0020	0	0	0
2/21/2024 15:29	0.0219	0.0196	-0.0023	0	0	0
2/21/2024 15:30	0.0217	0.0193	-0.0024	0	0	0
2/21/2024 15:31	0.0213	0.0190	-0.0023	0	0	0
2/21/2024 15:32	0.0209	0.0190	-0.0019	0	0	0
2/21/2024 15:33	0.0205	0.0184	-0.0021	0	0	0
2/21/2024 15:34	0.0194	0.0175	-0.0019	0	0	0
2/21/2024 15:35	0.0187	0.0171	-0.0016	0	0	0
2/21/2024 15:36	0.0181	0.0163	-0.0018	0	0	0
2/21/2024 15:37	0.0175	0.0157	-0.0018	0	0	0
2/21/2024 15:38	0.0168	0.0151	-0.0017	0	0	0
2/21/2024 15:39	0.0163	0.0145	-0.0018	0	0	0
2/21/2024 15:40	0.0153	0.0141	-0.0012	0	0	0
2/21/2024 15:41	0.0147	0.0137	-0.0010	0	0	0
2/21/2024 15:42	0.0145	0.0133	-0.0012	0	0	0
2/21/2024 15:43	0.0141	0.0130	-0.0011	0	0	0
2/21/2024 15:44	0.0145	0.0127	-0.0018	0	0	0
2/21/2024 15:45	0.0152	0.0127	-0.0025	0	0	0
2/21/2024 15:46	0.0153	0.0126	-0.0027	0	0	0
2/21/2024 15:47	0.0151	0.0121	-0.0030	0	0	0
2/21/2024 15:48	0.0149	0.0119	-0.0030	0	0	0
2/21/2024 15:49	0.0147	0.0119	-0.0028	0	0	0
2/21/2024 15:50	0.0147	0.0117	-0.0030	0	0	0

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/21/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	Δ	Upwind VOC Concentration	Downwind VOC Concentration	Δ
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/21/2024 15:51	0.0146	0.0117	-0.0029	0	0	0
2/21/2024 15:52	0.0146	0.0117	-0.0029	0	0	0
2/21/2024 15:53	0.0145	0.0116	-0.0029	0	0	0
2/21/2024 15:54	0.0145	0.0115	-0.0030	0	0	0
2/21/2024 15:55	0.0143	0.0115	-0.0028	0	0	0
2/21/2024 15:56	0.0141	0.0114	-0.0027	0	0	0
2/21/2024 15:57	0.0140	0.0113	-0.0027	0	0	0
2/21/2024 15:58	0.0142	0.0112	-0.0030	0	0	0
2/21/2024 15:59	0.0137	0.0107	-0.0030	0	0	0
2/21/2024 16:00	0.0127	0.0107	-0.0020	0	0	0
2/21/2024 16:01	0.0125	0.0108	-0.0017	0	0	0
2/21/2024 16:02	0.0126	0.0110	-0.0016	0	0	0
2/21/2024 16:03	0.0129	0.0115	-0.0014	0	0	0
2/21/2024 16:04	0.0133	0.0116	-0.0017	0	0	0
2/21/2024 16:05		0.0122	-		0	-
2/21/2024 16:06		0.0124	-		0	-
2/21/2024 16:07		0.0124	-		0	-
2/21/2024 16:08		0.0123	-		0	-
2/21/2024 16:09		0.0123	-		0	-

**Notes**

Telemetry clock was not synchronized. Site work performed 09:00 - 11:33.

Upwind telemetry modem experienced connectivity issues on this day.

Particulate concentrations are in micrograms per cubic meter and shown as 15-minute time-weighted averages.

Volatile Organic Compounds (VOCs) concentrations are in parts per million and shown as 15-minute time-weighted averages.

Δ - Difference between upwind and downwind measurements.

Blank cells indicate readings were not uploaded via telemetry

- indicates Delta (Δ) could not be calculated

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	Δ	Upwind VOC Concentration	Downwind VOC Concentration	Δ
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 13:07	0.0140	0.0207	0.0067		0	-
2/22/2024 13:08	0.0155	0.0210	0.0055		0	-
2/22/2024 13:09	0.0163	0.0214	0.0051		0	-
2/22/2024 13:10	0.0168	0.0217	0.0049		0	-
2/22/2024 13:11	0.0170	0.0217	0.0047		0	-
2/22/2024 13:12	0.0168	0.0216	0.0048		0	-
2/22/2024 13:13	0.0167	0.0217	0.0050		0	-
2/22/2024 13:14	0.0175	0.0216	0.0041		0	-
2/22/2024 13:15	0.0176	0.0216	0.0040		0	-
2/22/2024 13:16	0.0174	0.0217	0.0043		0	-
2/22/2024 13:17	0.0172	0.0216	0.0044		0	-
2/22/2024 13:18	0.0170	0.0216	0.0046		0	-
2/22/2024 13:19	0.0168	0.0215	0.0047		0	-
2/22/2024 13:20	0.0167	0.0217	0.0050		0	-
2/22/2024 13:21	0.0167	0.0215	0.0048		0	-
2/22/2024 13:22	0.0168	0.0213	0.0045		0	-
2/22/2024 13:23	0.0168	0.0211	0.0043		0	-
2/22/2024 13:24	0.0168	0.0210	0.0042		0	-
2/22/2024 13:25	0.0169	0.0209	0.0040		0	-
2/22/2024 13:26	0.0170	0.0209	0.0039		0	-
2/22/2024 13:27	0.0175	0.0210	0.0035		0	-
2/22/2024 13:28	0.0179	0.0211	0.0032		0	-
2/22/2024 13:29	0.0178	0.0213	0.0035		0	-
2/22/2024 13:30	0.0180	0.0215	0.0035		0	-
2/22/2024 13:31	0.0183	0.0216	0.0033		0	-
2/22/2024 13:32	0.0188	0.0218	0.0030		0	-
2/22/2024 13:33	0.0193	0.0220	0.0027		0	-
2/22/2024 13:34	0.0197	0.0223	0.0026		0	-
2/22/2024 13:35	0.0202	0.0227	0.0025		0	-
2/22/2024 13:36	0.0206	0.0231	0.0025		0	-
2/22/2024 13:37	0.0210	0.0235	0.0025		0	-
2/22/2024 13:38	0.0213	0.0239	0.0026		0	-
2/22/2024 13:39	0.0216	0.0242	0.0026		0	-
2/22/2024 13:40	0.0219	0.0245	0.0026		0	-
2/22/2024 13:41	0.0221	0.0248	0.0027		0	-
2/22/2024 13:42	0.0223	0.0251	0.0028		0	-
2/22/2024 13:43	0.0224	0.0252	0.0028		0	-
2/22/2024 13:44	0.0225	0.0253	0.0028		0	-
2/22/2024 13:45	0.0226	0.0255	0.0029		0	-
2/22/2024 13:46	0.0227	0.0255	0.0028		0	-
2/22/2024 13:47	0.0228	0.0255	0.0027		0	-
2/22/2024 13:48	0.0227	0.0255	0.0028		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	$\Delta$	Upwind VOC Concentration	Downwind VOC Concentration	$\Delta$
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 13:49	0.0227	0.0254	0.0027		0	-
2/22/2024 13:50	0.0228	0.0253	0.0025		0	-
2/22/2024 13:51	0.0227	0.0252	0.0025		0	-
2/22/2024 13:52	0.0227	0.0251	0.0024		0	-
2/22/2024 13:53	0.0226	0.0249	0.0023		0	-
2/22/2024 13:54	0.0225	0.0247	0.0022		0	-
2/22/2024 13:55	0.0224	0.0246	0.0022		0	-
2/22/2024 13:56	0.0223	0.0245	0.0022		0	-
2/22/2024 13:57	0.0221	0.0243	0.0022		0	-
2/22/2024 13:58	0.0219	0.0242	0.0023		0	-
2/22/2024 13:59	0.0217	0.0240	0.0023		0	-
2/22/2024 14:00	0.0216	0.0238	0.0022		0	-
2/22/2024 14:01		0.0237	0.0237		0	-
2/22/2024 14:02	0.0214	0.0237	0.0023		0	-
2/22/2024 14:03	0.0214	0.0237	0.0023		0	-
2/22/2024 14:04	0.0216	0.0237	0.0021		0	-
2/22/2024 14:05	0.0218	0.0239	0.0021		0	-
2/22/2024 14:06	0.0219	0.0239	0.0020		0	-
2/22/2024 14:07	0.0221	0.0239	0.0018		0	-
2/22/2024 14:08	0.0221	0.0240	0.0019		0	-
2/22/2024 14:09	0.0223	0.0241	0.0018		0	-
2/22/2024 14:10	0.0226	0.0243	0.0017		0	-
2/22/2024 14:11	0.0231	0.0245	0.0014		0	-
2/22/2024 14:12	0.0233	0.0245	0.0012		0	-
2/22/2024 14:13	0.0237	0.0245	0.0008		0	-
2/22/2024 14:14	0.0241	0.0248	0.0007		0	-
2/22/2024 14:15	0.0246	0.0251	0.0005		0	-
2/22/2024 14:16	0.0246	0.0253	0.0007		0	-
2/22/2024 14:17	0.0249	0.0254	0.0005		0	-
2/22/2024 14:18	0.0254	0.0255	0.0001		0	-
2/22/2024 14:19	0.0255	0.0258	0.0003		0	-
2/22/2024 14:20	0.0253	0.0256	0.0003		0	-
2/22/2024 14:21	0.0257	0.0257	0.0000		0	-
2/22/2024 14:22	0.0259	0.0259	0.0000		0	-
2/22/2024 14:23	0.0261	0.0259	-0.0002		0	-
2/22/2024 14:24	0.0261	0.0260	-0.0001		0	-
2/22/2024 14:25	0.0262	0.0259	-0.0003		0	-
2/22/2024 14:26	0.0287	0.0268	-0.0019		0	-
2/22/2024 14:27	0.0289	0.0270	-0.0019		0	-
2/22/2024 14:28	0.0291	0.0270	-0.0021		0	-
2/22/2024 14:29	0.0290	0.0269	-0.0021		0	-
2/22/2024 14:30	0.0289	0.0267	-0.0022		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	$\Delta$	Upwind VOC Concentration	Downwind VOC Concentration	$\Delta$
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 14:31	0.0291	0.0267	-0.0024		0	-
2/22/2024 14:32	0.0295	0.0266	-0.0029		0	-
2/22/2024 14:33	0.0291	0.0265	-0.0026		0	-
2/22/2024 14:34	0.0293	0.0263	-0.0030		0	-
2/22/2024 14:35	0.0293	0.0262	-0.0031		0	-
2/22/2024 14:36	0.0297	0.0261	-0.0036		0	-
2/22/2024 14:37	0.0295	0.0260	-0.0035		0	-
2/22/2024 14:38	0.0295	0.0259	-0.0036		0	-
2/22/2024 14:39	0.0296	0.0258	-0.0038		0	-
2/22/2024 14:40	0.0301	0.0258	-0.0043		0	-
2/22/2024 14:41	0.0273	0.0246	-0.0027		0	-
2/22/2024 14:42	0.0290	0.0244	-0.0046		0	-
2/22/2024 14:43	0.0289	0.0245	-0.0044		0	-
2/22/2024 14:44	0.0289	0.0245	-0.0044		0	-
2/22/2024 14:45	0.0287	0.0244	-0.0043		0	-
2/22/2024 14:46	0.0284	0.0242	-0.0042		0	-
2/22/2024 14:47	0.0277	0.0242	-0.0035		0	-
2/22/2024 14:48	0.0275	0.0241	-0.0034		0	-
2/22/2024 14:49	0.0275	0.0241	-0.0034		0	-
2/22/2024 14:50	0.0276	0.0241	-0.0035		0	-
2/22/2024 14:51	0.0269	0.0240	-0.0029		0	-
2/22/2024 14:52	0.0270	0.0241	-0.0029		0	-
2/22/2024 14:53	0.0270	0.0242	-0.0028		0	-
2/22/2024 14:54	0.0279	0.0244	-0.0035		0	-
2/22/2024 14:55	0.0273	0.0242	-0.0031		0	-
2/22/2024 14:56	0.0273	0.0251	-0.0022		0	-
2/22/2024 14:57	0.0253	0.0251	-0.0002		0	-
2/22/2024 14:58	0.0249	0.0249	0.0000		0	-
2/22/2024 14:59	0.0245	0.0247	0.0002		0	-
2/22/2024 15:00	0.0248	0.0245	-0.0003		0	-
2/22/2024 15:01	0.0251	0.0245	-0.0006		0	-
2/22/2024 15:02	0.0251	0.0246	-0.0005		0	-
2/22/2024 15:03	0.0252	0.0246	-0.0006		0	-
2/22/2024 15:04	0.0255	0.0247	-0.0008		0	-
2/22/2024 15:05	0.0253	0.0247	-0.0006		0	-
2/22/2024 15:06	0.0253	0.0247	-0.0006		0	-
2/22/2024 15:07	0.0251	0.0245	-0.0006		0	-
2/22/2024 15:08	0.0255	0.0243	-0.0012		0	-
2/22/2024 15:09	0.0247	0.0239	-0.0008		0	-
2/22/2024 15:10	0.0247	0.0242	-0.0005		0	-
2/22/2024 15:11	0.0246	0.0231	-0.0015		0	-
2/22/2024 15:12	0.0246	0.0229	-0.0017		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	Δ	Upwind VOC Concentration	Downwind VOC Concentration	Δ
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 15:13	0.0247	0.0229	-0.0018		0	-
2/22/2024 15:14	0.0249	0.0229	-0.0020		0	-
2/22/2024 15:15	0.0246	0.0230	-0.0016		0	-
2/22/2024 15:16	0.0246	0.0227	-0.0019		0	-
2/22/2024 15:17	0.0243	0.0221	-0.0022		0	-
2/22/2024 15:18	0.0244	0.0217	-0.0027		0	-
2/22/2024 15:19	0.0242	0.0211	-0.0031		0	-
2/22/2024 15:20	0.0239	0.0209	-0.0030		0	-
2/22/2024 15:21	0.0235	0.0207	-0.0028		0	-
2/22/2024 15:22	0.0233	0.0205	-0.0028		0	-
2/22/2024 15:23	0.0228	0.0203	-0.0025		0	-
2/22/2024 15:24	0.0224	0.0200	-0.0024		0	-
2/22/2024 15:25	0.0219	0.0205	-0.0014		0	-
2/22/2024 15:26	0.0218	0.0203	-0.0015		0	-
2/22/2024 15:27	0.0219	0.0205	-0.0014		0	-
2/22/2024 15:28	0.0219	0.0203	-0.0016		0	-
2/22/2024 15:29	0.0217	0.0201	-0.0016		0	-
2/22/2024 15:30	0.0217	0.0201	-0.0016		0	-
2/22/2024 15:31	0.0213	0.0201	-0.0012		0	-
2/22/2024 15:32	0.0215	0.0203	-0.0012		0	-
2/22/2024 15:33	0.0216	0.0205	-0.0011		0	-
2/22/2024 15:34	0.0215	0.0207	-0.0008		0	-
2/22/2024 15:35	0.0217	0.0209	-0.0008		0	-
2/22/2024 15:36	0.0225	0.0213	-0.0012		0	-
2/22/2024 15:37	0.0233	0.0218	-0.0015		0.07	-
2/22/2024 15:38	0.0239	0.0222	-0.0017		0.07	-
2/22/2024 15:39	0.0240	0.0225	-0.0015		0.07	-
2/22/2024 15:40	0.0242	0.0216	-0.0026		0.07	-
2/22/2024 15:41	0.0239	0.0215	-0.0024		0.07	-
2/22/2024 15:42	0.0241	0.0211	-0.0030		0.07	-
2/22/2024 15:43	0.0252	0.0213	-0.0039		0.07	-
2/22/2024 15:44	0.0257	0.0215	-0.0042		0.07	-
2/22/2024 15:45	0.0259	0.0213	-0.0046		0.07	-
2/22/2024 15:46	0.0259	0.0212	-0.0047		0.07	-
2/22/2024 15:47	0.0259	0.0211	-0.0048		0.07	-
2/22/2024 15:48	0.0258	0.0214	-0.0044		0.07	-
2/22/2024 15:49	0.0255	0.0215	-0.0040		0.07	-
2/22/2024 15:50	0.0254	0.0214	-0.0040		0.07	-
2/22/2024 15:51	0.0250	0.0211	-0.0039		0.07	-
2/22/2024 15:52	0.0245	0.0207	-0.0038		0.01	-
2/22/2024 15:53	0.0240	0.0205	-0.0035		0	-
2/22/2024 15:54	0.0240	0.0206	-0.0034		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	Δ	Upwind VOC Concentration	Downwind VOC Concentration	Δ
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 15:55	0.0241	0.0207	-0.0034		0	-
2/22/2024 15:56	0.0244	0.0210	-0.0034		0.01	-
2/22/2024 15:57	0.0243	0.0213	-0.0030		0.01	-
2/22/2024 15:58	0.0229	0.0217	-0.0012		0.01	-
2/22/2024 15:59	0.0225	0.0215	-0.0010		0.01	-
2/22/2024 16:00	0.0225	0.0217	-0.0008		0.01	-
2/22/2024 16:01	0.0226	0.0219	-0.0007		0.01	-
2/22/2024 16:02	0.0224	0.0219	-0.0005		0.01	-
2/22/2024 16:03	0.0225	0.0219	-0.0006		0.01	-
2/22/2024 16:04	0.0224	0.0217	-0.0007		0.01	-
2/22/2024 16:05	0.0226	0.0216	-0.0010		0.01	-
2/22/2024 16:06	0.0229	0.0215	-0.0014		0.01	-
2/22/2024 16:07	0.0232	0.0214	-0.0018		0.01	-
2/22/2024 16:08	0.0230	0.0212	-0.0018		0.01	-
2/22/2024 16:09	0.0227	0.0210	-0.0017		0.01	-
2/22/2024 16:10	0.0230	0.0207	-0.0023		0.01	-
2/22/2024 16:11	0.0228	0.0206	-0.0022		0	-
2/22/2024 16:12	0.0227	0.0210	-0.0017		0	-
2/22/2024 16:13	0.0229	0.0209	-0.0020		0	-
2/22/2024 16:14	0.0247	0.0211	-0.0036		0	-
2/22/2024 16:15	0.0246	0.0207	-0.0039		0	-
2/22/2024 16:16	0.0243	0.0205	-0.0038		0	-
2/22/2024 16:17	0.0245	0.0205	-0.0040		0	-
2/22/2024 16:18	0.0243	0.0203	-0.0040		0	-
2/22/2024 16:19	0.0243	0.0204	-0.0039		0	-
2/22/2024 16:20	0.0241	0.0203	-0.0038		0	-
2/22/2024 16:21	0.0239	0.0208	-0.0031		0	-
2/22/2024 16:22	0.0233	0.0210	-0.0023		0	-
2/22/2024 16:23	0.0233	0.0214	-0.0019		0	-
2/22/2024 16:24	0.0233	0.0213	-0.0020		0	-
2/22/2024 16:25	0.0236	0.0214	-0.0022		0	-
2/22/2024 16:26	0.0238	0.0214	-0.0024		0	-
2/22/2024 16:27	0.0239	0.0208	-0.0031		0	-
2/22/2024 16:28	0.0245	0.0204	-0.0041		0	-
2/22/2024 16:29	0.0228	0.0203	-0.0025		0	-
2/22/2024 16:30	0.0233	0.0205	-0.0028		0	-
2/22/2024 16:31	0.0248	0.0207	-0.0041		0	-
2/22/2024 16:32	0.0248	0.0207	-0.0041		0	-
2/22/2024 16:33	0.0249	0.0207	-0.0042		0	-
2/22/2024 16:34	0.0257	0.0206	-0.0051		0	-
2/22/2024 16:35	0.0257	0.0207	-0.0050		0	-
2/22/2024 16:36	0.0255	0.0202	-0.0053		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	Δ	Upwind VOC Concentration	Downwind VOC Concentration	Δ
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 16:37	0.0258	0.0199	-0.0059		0	-
2/22/2024 16:38	0.0261	0.0195	-0.0066		0	-
2/22/2024 16:39	0.0265	0.0196	-0.0069		0	-
2/22/2024 16:40	0.0261	0.0195	-0.0066		0	-
2/22/2024 16:41	0.0259	0.0199	-0.0060		0	-
2/22/2024 16:42	0.0259	0.0199	-0.0060		0	-
2/22/2024 16:43	0.0253	0.0199	-0.0054		0	-
2/22/2024 16:44	0.0254	0.0199	-0.0055		0	-
2/22/2024 16:45	0.0250	0.0201	-0.0049		0	-
2/22/2024 16:46	0.0237	0.0199	-0.0038		0	-
2/22/2024 16:47	0.0239	0.0201	-0.0038		0	-
2/22/2024 16:48	0.0241	0.0205	-0.0036		0	-
2/22/2024 16:49	0.0237	0.0207	-0.0030		0	-
2/22/2024 16:50	0.0237	0.0208	-0.0029		0	-
2/22/2024 16:51	0.0239	0.0208	-0.0031		0	-
2/22/2024 16:52	0.0237	0.0208	-0.0029		0	-
2/22/2024 16:53	0.0235	0.0209	-0.0026		0	-
2/22/2024 16:54	0.0232	0.0207	-0.0025		0	-
2/22/2024 16:55	0.0231	0.0207	-0.0024		0	-
2/22/2024 16:56	0.0231	0.0203	-0.0028		0	-
2/22/2024 16:57	0.0230	0.0201	-0.0029		0	-
2/22/2024 16:58	0.0228	0.0199	-0.0029		0	-
2/22/2024 16:59	0.0225	0.0197	-0.0028		0	-
2/22/2024 17:00	0.0223	0.0195	-0.0028		0	-
2/22/2024 17:01	0.0227	0.0197	-0.0030		0	-
2/22/2024 17:02	0.0224	0.0195	-0.0029		0	-
2/22/2024 17:03	0.0223	0.0199	-0.0024		0	-
2/22/2024 17:04	0.0222	0.0196	-0.0026		0	-
2/22/2024 17:05	0.0222	0.0195	-0.0027		0	-
2/22/2024 17:06	0.0223	0.0197	-0.0026		0	-
2/22/2024 17:07	0.0230	0.0202	-0.0028		0	-
2/22/2024 17:08	0.0241	0.0204	-0.0037		0	-
2/22/2024 17:09	0.0244	0.0207	-0.0037		0	-
2/22/2024 17:10	0.0243	0.0210	-0.0033		0	-
2/22/2024 17:11	0.0245	0.0217	-0.0028		0	-
2/22/2024 17:12	0.0246	0.0220	-0.0026		0	-
2/22/2024 17:13	0.0247	0.0220	-0.0027		0	-
2/22/2024 17:14	0.0248	0.0222	-0.0026		0	-
2/22/2024 17:15	0.0247	0.0221	-0.0026		0	-
2/22/2024 17:16	0.0245	0.0225	-0.0020		0	-
2/22/2024 17:17	0.0255	0.0231	-0.0024		0	-
2/22/2024 17:18	0.0258	0.0229	-0.0029		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	$\Delta$	Upwind VOC Concentration	Downwind VOC Concentration	$\Delta$
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 17:19	0.0261	0.0230	-0.0031		0	-
2/22/2024 17:20	0.0261	0.0231	-0.0030		0	-
2/22/2024 17:21	0.0260	0.0230	-0.0030		0	-
2/22/2024 17:22	0.0254	0.0228	-0.0026		0	-
2/22/2024 17:23	0.0250	0.0226	-0.0024		0	-
2/22/2024 17:24	0.0253	0.0223	-0.0030		0	-
2/22/2024 17:25	0.0253	0.0218	-0.0035		0	-
2/22/2024 17:26	0.0250	0.0209	-0.0041		0	-
2/22/2024 17:27	0.0251	0.0207	-0.0044		0	-
2/22/2024 17:28	0.0251	0.0209	-0.0042		0	-
2/22/2024 17:29	0.0250	0.0207	-0.0043		0	-
2/22/2024 17:30	0.0250	0.0207	-0.0043		0	-
2/22/2024 17:31	0.0250	0.0202	-0.0048		0	-
2/22/2024 17:32	0.0247	0.0197	-0.0050		0	-
2/22/2024 17:33	0.0244	0.0196	-0.0048		0	-
2/22/2024 17:34	0.0242	0.0196	-0.0046		0	-
2/22/2024 17:35	0.0241	0.0195	-0.0046		0	-
2/22/2024 17:36	0.0239	0.0194	-0.0045		0	-
2/22/2024 17:37	0.0238	0.0190	-0.0048		0	-
2/22/2024 17:38	0.0238	0.0189	-0.0049		0	-
2/22/2024 17:39	0.0236	0.0198	-0.0038		0	-
2/22/2024 17:40	0.0237	0.0200	-0.0037		0	-
2/22/2024 17:41	0.0238	0.0200	-0.0038		0	-
2/22/2024 17:42	0.0239	0.0202	-0.0037		0	-
2/22/2024 17:43	0.0256	0.0201	-0.0055		0	-
2/22/2024 17:44	0.0277	0.0208	-0.0069		0	-
2/22/2024 17:45	0.0279	0.0206	-0.0073		0	-
2/22/2024 17:46	0.0282	0.0205	-0.0077		0	-
2/22/2024 17:47	0.0274	0.0201	-0.0073		0	-
2/22/2024 17:48	0.0273	0.0195	-0.0078		0	-
2/22/2024 17:49	0.0275	0.0195	-0.0080		0	-
2/22/2024 17:50	0.0277	0.0194	-0.0083		0	-
2/22/2024 17:51	0.0280	0.0193	-0.0087		0	-
2/22/2024 17:52	0.0285	0.0195	-0.0090		0	-
2/22/2024 17:53	0.0278	0.0194	-0.0084		0	-
2/22/2024 17:54	0.0276	0.0187	-0.0089		0	-
2/22/2024 17:55	0.0279	0.0187	-0.0092		0	-
2/22/2024 17:56	0.0281	0.0188	-0.0093		0	-
2/22/2024 17:57	0.0279	0.0199	-0.0080		0	-
2/22/2024 17:58	0.0262	0.0197	-0.0065		0	-
2/22/2024 17:59	0.0243	0.0190	-0.0053		0	-
2/22/2024 18:00	0.0243	0.0193	-0.0050		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	$\Delta$	Upwind VOC Concentration	Downwind VOC Concentration	$\Delta$
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 18:01	0.0239	0.0192	-0.0047		0	-
2/22/2024 18:02	0.0239	0.0192	-0.0047		0	-
2/22/2024 18:03	0.0242	0.0193	-0.0049		0	-
2/22/2024 18:04	0.0240	0.0193	-0.0047		0	-
2/22/2024 18:05	0.0239	0.0195	-0.0044		0	-
2/22/2024 18:06	0.0234	0.0193	-0.0041		0	-
2/22/2024 18:07	0.0231	0.0191	-0.0040		0	-
2/22/2024 18:08	0.0231	0.0190	-0.0041		0	-
2/22/2024 18:09	0.0230	0.0187	-0.0043		0	-
2/22/2024 18:10	0.0227	0.0185	-0.0042		0	-
2/22/2024 18:11	0.0225	0.0184	-0.0041		0	-
2/22/2024 18:12	0.0224	0.0171	-0.0053		0	-
2/22/2024 18:13	0.0223	0.0172	-0.0051		0	-
2/22/2024 18:14	0.0223	0.0171	-0.0052		0	-
2/22/2024 18:15	0.0226	0.0170	-0.0056		0	-
2/22/2024 18:16	0.0226	0.0170	-0.0056		0	-
2/22/2024 18:17	0.0225	0.0170	-0.0055		0	-
2/22/2024 18:18	0.0223	0.0171	-0.0052		0	-
2/22/2024 18:19	0.0221	0.0169	-0.0052		0	-
2/22/2024 18:20	0.0220	0.0171	-0.0049		0	-
2/22/2024 18:21	0.0223	0.0174	-0.0049		0	-
2/22/2024 18:22	0.0221	0.0175	-0.0046		0	-
2/22/2024 18:23	0.0223	0.0176	-0.0047		0	-
2/22/2024 18:24	0.0225	0.0177	-0.0048		0	-
2/22/2024 18:25	0.0227	0.0198	-0.0029		0	-
2/22/2024 18:26	0.0229	0.0199	-0.0030		0	-
2/22/2024 18:27	0.0232	0.0199	-0.0033		0	-
2/22/2024 18:28	0.0233	0.0197	-0.0036		0	-
2/22/2024 18:29	0.0233	0.0198	-0.0035		0	-
2/22/2024 18:30	0.0229	0.0196	-0.0033		0	-
2/22/2024 18:31	0.0229	0.0196	-0.0033		0	-
2/22/2024 18:32	0.0234	0.0197	-0.0037		0	-
2/22/2024 18:33	0.0236	0.0197	-0.0039		0	-
2/22/2024 18:34	0.0236	0.0202	-0.0034		0	-
2/22/2024 18:35	0.0236	0.0200	-0.0036		0	-
2/22/2024 18:36	0.0233	0.0197	-0.0036		0	-
2/22/2024 18:37	0.0233	0.0196	-0.0037		0	-
2/22/2024 18:38	0.0235	0.0198	-0.0037		0	-
2/22/2024 18:39	0.0233	0.0199	-0.0034		0	-
2/22/2024 18:40	0.0233	0.0182	-0.0051		0	-
2/22/2024 18:41	0.0233	0.0184	-0.0049		0	-
2/22/2024 18:42	0.0231	0.0186	-0.0045		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	$\Delta$	Upwind VOC Concentration	Downwind VOC Concentration	$\Delta$
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 18:43	0.0231	0.0189	-0.0042		0	-
2/22/2024 18:44	0.0232	0.0192	-0.0040		0	-
2/22/2024 18:45	0.0233	0.0196	-0.0037		0	-
2/22/2024 18:46	0.0235	0.0199	-0.0036		0	-
2/22/2024 18:47	0.0233	0.0203	-0.0030		0	-
2/22/2024 18:48	0.0231	0.0207	-0.0024		0	-
2/22/2024 18:49	0.0231	0.0201	-0.0030		0	-
2/22/2024 18:50	0.0231	0.0200	-0.0031		0	-
2/22/2024 18:51	0.0235	0.0202	-0.0033		0	-
2/22/2024 18:52	0.0239	0.0206	-0.0033		0	-
2/22/2024 18:53	0.0237	0.0205	-0.0032		0	-
2/22/2024 18:54	0.0235	0.0208	-0.0027		0	-
2/22/2024 18:55	0.0235	0.0209	-0.0026		0	-
2/22/2024 18:56	0.0235	0.0207	-0.0028		0	-
2/22/2024 18:57	0.0233	0.0208	-0.0025		0	-
2/22/2024 18:58	0.0232	0.0207	-0.0025		0	-
2/22/2024 18:59	0.0229	0.0203	-0.0026		0	-
2/22/2024 19:00	0.0230	0.0201	-0.0029		0	-
2/22/2024 19:01	0.0227	0.0197	-0.0030		0	-
2/22/2024 19:02	0.0224	0.0193	-0.0031		0	-
2/22/2024 19:03	0.0226	0.0188	-0.0038		0	-
2/22/2024 19:04	0.0228	0.0188	-0.0040		0	-
2/22/2024 19:05	0.0228	0.0189	-0.0039		0	-
2/22/2024 19:06	0.0225	0.0189	-0.0036		0	-
2/22/2024 19:07	0.0222	0.0189	-0.0033		0	-
2/22/2024 19:08	0.0225	0.0190	-0.0035		0	-
2/22/2024 19:09	0.0230	0.0190	-0.0040		0	-
2/22/2024 19:10	0.0233	0.0190	-0.0043		0	-
2/22/2024 19:11	0.0232	0.0190	-0.0042		0	-
2/22/2024 19:12	0.0233	0.0191	-0.0042		0	-
2/22/2024 19:13	0.0233	0.0191	-0.0042		0	-
2/22/2024 19:14	0.0233	0.0191	-0.0042		0	-
2/22/2024 19:15	0.0231	0.0189	-0.0042		0	-
2/22/2024 19:16	0.0232	0.0192	-0.0040		0	-
2/22/2024 19:17	0.0233	0.0191	-0.0042		0	-
2/22/2024 19:18	0.0241	0.0207	-0.0034		0	-
2/22/2024 19:19	0.0244	0.0211	-0.0033		0	-
2/22/2024 19:20	0.0247	0.0212	-0.0035		0	-
2/22/2024 19:21	0.0247	0.0211	-0.0036		0	-
2/22/2024 19:22	0.0247	0.0209	-0.0038		0	-
2/22/2024 19:23	0.0245	0.0210	-0.0035		0	-
2/22/2024 19:24	0.0242	0.0205	-0.0037		0	-

**Community Air Monitoring Program Summary**  
Former Chromalloy Facility (NYSDEC Site No. 344039)  
West Nyack, New York

2/22/2024						
Date/Time	Upwind Particulate Matter Concentration	Downwind Particulate Matter Concentration	Δ	Upwind VOC Concentration	Downwind VOC Concentration	Δ
	Serial No. 0B352750	Serial No. 0B345893		Serial No. 0B352750	Serial No. 0B345893	
2/22/2024 19:25	0.0245	0.0207	-0.0038		0	-
2/22/2024 19:26	0.0248	0.0208	-0.0040		0	-
2/22/2024 19:27	0.0246	0.0205	-0.0041		0	-
2/22/2024 19:28	0.0250	0.0205	-0.0045		0	-
2/22/2024 19:29	0.0255	0.0207	-0.0048		0	-
2/22/2024 19:30	0.0255	0.0207	-0.0048		0	-
2/22/2024 19:31	0.0259	0.0205	-0.0054		0	-
2/22/2024 19:32	0.0265	0.0209	-0.0056		0	-
2/22/2024 19:33	0.0257	0.0193	-0.0064		0	-
2/22/2024 19:34	0.0251	0.0189	-0.0062		0	-
2/22/2024 19:35	0.0249	0.0185	-0.0064		0	-
2/22/2024 19:36	0.0250	0.0185	-0.0065		0	-
2/22/2024 19:37	0.0248	0.0183	-0.0065		0	-
2/22/2024 19:38	0.0245	0.0179	-0.0066		0	-
2/22/2024 19:39	0.0244	0.0177	-0.0067		0.03	-
2/22/2024 19:40	0.0237	0.0170	-0.0067		0.04	-
2/22/2024 19:41	0.0231	0.0165	-0.0066		0.04	-
2/22/2024 19:42	0.0231	0.0162	-0.0069		0.04	-
2/22/2024 19:43	0.0227	0.0159	-0.0068		0.05	-
2/22/2024 19:44	0.0221	0.0155	-0.0066		0.05	-
2/22/2024 19:45	0.0219	0.0154	-0.0065		0.07	-
2/22/2024 19:46	0.0213	0.0153	-0.0060		0.09	-
2/22/2024 19:47	0.0209	0.0148	-0.0061		0.17	-
2/22/2024 19:48	0.0205	0.0146	-0.0059		0.25	-
2/22/2024 19:49	0.0205	0.0146	-0.0059		0.25	-
2/22/2024 19:50	0.0203		-			-
2/22/2024 19:51	0.0200		-			-
2/22/2024 19:52	0.0199		-			-
2/22/2024 19:53	0.0197		-			-

**Notes**

Telemetry clock was not synchronized. Site work performed 09:00 - 11:33.

Upwind telemetry modem experienced connectivity issues on this day.

Particulate concentrations are in micrograms per cubic meter and shown as 15-minute time-weighted averages.

Volatile Organic Compounds (VOCs) concentrations are in parts per million and shown as 15-minute time-weighted averages.

Δ - Difference between upwind and downwind measurements.

Blank cells indicate readings were not uploaded via telemetry

- indicates Delta (Δ) could not be calculated

## APPENDIX F



## ANALYTICAL REPORT

Lab Number:	L2409772
Client:	TRC Solutions 3 Corporate Drive Suite 202 Clifton Park, NY 12065
ATTN:	Justin King
Phone:	(518) 688-3109
Project Name:	FORMER CHROMALLOY
Project Number:	190273.2021
Report Date:	03/01/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

---

Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

<b>Alpha Sample ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sample Location</b>	<b>Collection Date/Time</b>	<b>Receive Date</b>
L2409772-01	FILL_20240222	SOIL	WEST NYACK, NY	02/22/24 13:45	02/22/24

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

---

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

### Case Narrative (continued)

#### Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

#### Total Metals

L2409772-01: The sample has elevated detection limits for all elements, with the exception of mercury, due to the dilution required by the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 03/01/24

# ORGANICS

# VOLATILES

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8260D  
 Analytical Date: 02/26/24 14:58  
 Analyst: AJK  
 Percent Solids: 97%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
<b>Volatile Organics by EPA 5035 Low - Westborough Lab</b>						
Methylene chloride	ND		ug/kg	5.4	2.5	1
1,1-Dichloroethane	ND		ug/kg	1.1	0.16	1
Chloroform	ND		ug/kg	1.6	0.15	1
Carbon tetrachloride	ND		ug/kg	1.1	0.25	1
1,2-Dichloropropane	ND		ug/kg	1.1	0.14	1
Dibromochloromethane	ND		ug/kg	1.1	0.15	1
1,1,2-Trichloroethane	ND		ug/kg	1.1	0.29	1
Tetrachloroethene	ND		ug/kg	0.54	0.21	1
Chlorobenzene	ND		ug/kg	0.54	0.14	1
Trichlorofluoromethane	ND		ug/kg	4.3	0.75	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.28	1
1,1,1-Trichloroethane	ND		ug/kg	0.54	0.18	1
Bromodichloromethane	ND		ug/kg	0.54	0.12	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.30	1
cis-1,3-Dichloropropene	ND		ug/kg	0.54	0.17	1
Bromoform	ND		ug/kg	4.3	0.27	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.54	0.18	1
Benzene	ND		ug/kg	0.54	0.18	1
Toluene	ND		ug/kg	1.1	0.59	1
Ethylbenzene	ND		ug/kg	1.1	0.15	1
Chloromethane	ND		ug/kg	4.3	1.0	1
Bromomethane	ND		ug/kg	2.2	0.63	1
Vinyl chloride	ND		ug/kg	1.1	0.36	1
Chloroethane	ND		ug/kg	2.2	0.49	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.26	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	0.15	1
Trichloroethene	ND		ug/kg	0.54	0.15	1
1,2-Dichlorobenzene	ND		ug/kg	2.2	0.16	1

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

**Lab ID:** L2409772-01  
**Client ID:** FILL\_20240222  
**Sample Location:** WEST NYACK, NY

**Date Collected:** 02/22/24 13:45  
**Date Received:** 02/22/24  
**Field Prep:** Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 Low - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	2.2	0.16	1
1,4-Dichlorobenzene	ND		ug/kg	2.2	0.18	1
Methyl tert butyl ether	ND		ug/kg	2.2	0.22	1
p/m-Xylene	ND		ug/kg	2.2	0.61	1
o-Xylene	ND		ug/kg	1.1	0.32	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.19	1
Styrene	ND		ug/kg	1.1	0.21	1
Dichlorodifluoromethane	ND		ug/kg	11	0.99	1
Acetone	ND		ug/kg	11	5.2	1
Carbon disulfide	ND		ug/kg	11	4.9	1
2-Butanone	ND		ug/kg	11	2.4	1
4-Methyl-2-pentanone	ND		ug/kg	11	1.4	1
2-Hexanone	ND		ug/kg	11	1.3	1
Bromochloromethane	ND		ug/kg	2.2	0.22	1
1,2-Dibromoethane	ND		ug/kg	1.1	0.30	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.2	1.1	1
Isopropylbenzene	ND		ug/kg	1.1	0.12	1
1,2,3-Trichlorobenzene	ND		ug/kg	2.2	0.35	1
1,2,4-Trichlorobenzene	ND		ug/kg	2.2	0.29	1
Methyl Acetate	ND		ug/kg	4.3	1.0	1
Cyclohexane	ND		ug/kg	11	0.59	1
1,4-Dioxane	ND		ug/kg	87	38.	1
Freon-113	ND		ug/kg	4.3	0.75	1
Methyl cyclohexane	ND		ug/kg	4.3	0.65	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	104		70-130

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8260D  
Analytical Date: 02/26/24 08:27  
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1889794-5					
Methylene chloride	ND		ug/kg	5.0	2.3
1,1-Dichloroethane	ND		ug/kg	1.0	0.14
Chloroform	ND		ug/kg	1.5	0.14
Carbon tetrachloride	ND		ug/kg	1.0	0.23
1,2-Dichloropropane	ND		ug/kg	1.0	0.12
Dibromochloromethane	ND		ug/kg	1.0	0.14
1,1,2-Trichloroethane	ND		ug/kg	1.0	0.27
Tetrachloroethene	ND		ug/kg	0.50	0.20
Chlorobenzene	ND		ug/kg	0.50	0.13
Trichlorofluoromethane	ND		ug/kg	4.0	0.70
1,2-Dichloroethane	ND		ug/kg	1.0	0.26
1,1,1-Trichloroethane	ND		ug/kg	0.50	0.17
Bromodichloromethane	ND		ug/kg	0.50	0.11
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.27
cis-1,3-Dichloropropene	ND		ug/kg	0.50	0.16
Bromoform	ND		ug/kg	4.0	0.25
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	0.17
Benzene	ND		ug/kg	0.50	0.17
Toluene	ND		ug/kg	1.0	0.54
Ethylbenzene	ND		ug/kg	1.0	0.14
Chloromethane	ND		ug/kg	4.0	0.93
Bromomethane	ND		ug/kg	2.0	0.58
Vinyl chloride	ND		ug/kg	1.0	0.34
Chloroethane	ND		ug/kg	2.0	0.45
1,1-Dichloroethene	ND		ug/kg	1.0	0.24
trans-1,2-Dichloroethene	ND		ug/kg	1.5	0.14
Trichloroethene	ND		ug/kg	0.50	0.14
1,2-Dichlorobenzene	ND		ug/kg	2.0	0.14
1,3-Dichlorobenzene	ND		ug/kg	2.0	0.15

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8260D  
Analytical Date: 02/26/24 08:27  
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1889794-5					
1,4-Dichlorobenzene	ND		ug/kg	2.0	0.17
Methyl tert butyl ether	ND		ug/kg	2.0	0.20
p/m-Xylene	ND		ug/kg	2.0	0.56
o-Xylene	ND		ug/kg	1.0	0.29
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.18
Styrene	ND		ug/kg	1.0	0.20
Dichlorodifluoromethane	ND		ug/kg	10	0.92
Acetone	ND		ug/kg	10	4.8
Carbon disulfide	ND		ug/kg	10	4.6
2-Butanone	ND		ug/kg	10	2.2
4-Methyl-2-pentanone	ND		ug/kg	10	1.3
2-Hexanone	ND		ug/kg	10	1.2
Bromochloromethane	ND		ug/kg	2.0	0.20
1,2-Dibromoethane	ND		ug/kg	1.0	0.28
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	1.0
Isopropylbenzene	ND		ug/kg	1.0	0.11
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	0.32
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	0.27
Methyl Acetate	ND		ug/kg	4.0	0.95
Cyclohexane	ND		ug/kg	10	0.54
1,4-Dioxane	ND		ug/kg	80	35.
Freon-113	ND		ug/kg	4.0	0.69
Methyl cyclohexane	ND		ug/kg	4.0	0.60

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8260D  
Analytical Date: 02/26/24 08:27  
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1889794-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	116		70-130

## Lab Control Sample Analysis

### Batch Quality Control

Project Name: FORMER CHROMALLOY

Lab Number: L2409772

Project Number: 190273.2021

Report Date: 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1889794-3 WG1889794-4								
Methylene chloride	98		96		70-130	2		30
1,1-Dichloroethane	105		96		70-130	9		30
Chloroform	101		99		70-130	2		30
Carbon tetrachloride	93		94		70-130	1		30
1,2-Dichloropropane	90		91		70-130	1		30
Dibromochloromethane	98		101		70-130	3		30
1,1,2-Trichloroethane	91		93		70-130	2		30
Tetrachloroethene	104		99		70-130	5		30
Chlorobenzene	94		91		70-130	3		30
Trichlorofluoromethane	118		120		70-139	2		30
1,2-Dichloroethane	92		96		70-130	4		30
1,1,1-Trichloroethane	98		98		70-130	0		30
Bromodichloromethane	92		95		70-130	3		30
trans-1,3-Dichloropropene	93		93		70-130	0		30
cis-1,3-Dichloropropene	93		96		70-130	3		30
Bromoform	94		95		70-130	1		30
1,1,2,2-Tetrachloroethane	89		89		70-130	0		30
Benzene	94		93		70-130	1		30
Toluene	94		90		70-130	4		30
Ethylbenzene	93		91		70-130	2		30
Chloromethane	100		95		52-130	5		30
Bromomethane	105		103		57-147	2		30
Vinyl chloride	114		105		67-130	8		30

## Lab Control Sample Analysis

### Batch Quality Control

Project Name: FORMER CHROMALLOY

Lab Number: L2409772

Project Number: 190273.2021

Report Date: 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1889794-3 WG1889794-4								
Chloroethane	114		117		50-151	3		30
1,1-Dichloroethene	96		119		65-135	21		30
trans-1,2-Dichloroethene	115		108		70-130	6		30
Trichloroethene	95		96		70-130	1		30
1,2-Dichlorobenzene	92		91		70-130	1		30
1,3-Dichlorobenzene	93		91		70-130	2		30
1,4-Dichlorobenzene	93		90		70-130	3		30
Methyl tert butyl ether	96		92		66-130	4		30
p/m-Xylene	94		92		70-130	2		30
o-Xylene	92		90		70-130	2		30
cis-1,2-Dichloroethene	109		102		70-130	7		30
Styrene	93		94		70-130	1		30
Dichlorodifluoromethane	105		95		30-146	10		30
Acetone	77		84		54-140	9		30
Carbon disulfide	86		110		59-130	24		30
2-Butanone	67	Q	75		70-130	11		30
4-Methyl-2-pentanone	76		81		70-130	6		30
2-Hexanone	71		77		70-130	8		30
Bromochloromethane	107		103		70-130	4		30
1,2-Dibromoethane	96		98		70-130	2		30
1,2-Dibromo-3-chloropropane	77		82		68-130	6		30
Isopropylbenzene	95		91		70-130	4		30
1,2,3-Trichlorobenzene	95		95		70-130	0		30

## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** FORMER CHROMALLOY

**Project Number:** 190273.2021

**Lab Number:** L2409772

**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1889794-3 WG1889794-4								
1,2,4-Trichlorobenzene	99		97		70-130	2		30
Methyl Acetate	80		83		51-146	4		30
Cyclohexane	83		78		59-142	6		30
1,4-Dioxane	86		92		65-136	7		30
Freon-113	88		110		50-139	22		30
Methyl cyclohexane	87		84		70-130	4		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		102		70-130
Toluene-d8	101		97		70-130
4-Bromofluorobenzene	99		97		70-130
Dibromofluoromethane	105		108		70-130

# SEMIVOLATILES

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8270E  
 Analytical Date: 02/26/24 03:40  
 Analyst: HNY  
 Percent Solids: 97%

Extraction Method: EPA 3546  
 Extraction Date: 02/25/24 04:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
<b>Semivolatile Organics by GC/MS - Westborough Lab</b>						
Acenaphthene	ND		ug/kg	140	18.	1
Hexachlorobenzene	ND		ug/kg	100	19.	1
Bis(2-chloroethyl)ether	ND		ug/kg	150	23.	1
2-Chloronaphthalene	ND		ug/kg	170	17.	1
3,3'-Dichlorobenzidine	ND		ug/kg	170	45.	1
2,4-Dinitrotoluene	ND		ug/kg	170	34.	1
2,6-Dinitrotoluene	ND		ug/kg	170	29.	1
Fluoranthene	ND		ug/kg	100	19.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	170	18.	1
4-Bromophenyl phenyl ether	ND		ug/kg	170	26.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	29.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	180	17.	1
Hexachlorobutadiene	ND		ug/kg	170	25.	1
Hexachlorocyclopentadiene	ND		ug/kg	480	150	1
Hexachloroethane	ND		ug/kg	140	27.	1
Isophorone	ND		ug/kg	150	22.	1
Naphthalene	ND		ug/kg	170	21.	1
Nitrobenzene	ND		ug/kg	150	25.	1
NDPA/DPA	ND		ug/kg	140	19.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	170	26.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	170	58.	1
Butyl benzyl phthalate	ND		ug/kg	170	43.	1
Di-n-butylphthalate	ND		ug/kg	170	32.	1
Di-n-octylphthalate	ND		ug/kg	170	58.	1
Diethyl phthalate	ND		ug/kg	170	16.	1
Dimethyl phthalate	ND		ug/kg	170	36.	1
Benzo(a)anthracene	ND		ug/kg	100	19.	1
Benzo(a)pyrene	ND		ug/kg	140	41.	1

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
<b>Semivolatile Organics by GC/MS - Westborough Lab</b>						
Benzo(b)fluoranthene	ND		ug/kg	100	28.	1
Benzo(k)fluoranthene	ND		ug/kg	100	27.	1
Chrysene	ND		ug/kg	100	18.	1
Acenaphthylene	ND		ug/kg	140	26.	1
Anthracene	ND		ug/kg	100	33.	1
Benzo(ghi)perylene	ND		ug/kg	140	20.	1
Fluorene	ND		ug/kg	170	16.	1
Phenanthrene	ND		ug/kg	100	20.	1
Dibenzo(a,h)anthracene	ND		ug/kg	100	20.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	24.	1
Pyrene	ND		ug/kg	100	17.	1
Biphenyl	ND		ug/kg	380	22.	1
4-Chloroaniline	ND		ug/kg	170	31.	1
2-Nitroaniline	ND		ug/kg	170	33.	1
3-Nitroaniline	ND		ug/kg	170	32.	1
4-Nitroaniline	ND		ug/kg	170	70.	1
Dibenzofuran	ND		ug/kg	170	16.	1
2-Methylnaphthalene	ND		ug/kg	200	20.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	170	18.	1
Acetophenone	ND		ug/kg	170	21.	1
2,4,6-Trichlorophenol	ND		ug/kg	100	32.	1
p-Chloro-m-cresol	ND		ug/kg	170	25.	1
2-Chlorophenol	ND		ug/kg	170	20.	1
2,4-Dichlorophenol	ND		ug/kg	150	27.	1
2,4-Dimethylphenol	ND		ug/kg	170	56.	1
2-Nitrophenol	ND		ug/kg	360	64.	1
4-Nitrophenol	ND		ug/kg	240	69.	1
2,4-Dinitrophenol	ND		ug/kg	810	79.	1
4,6-Dinitro-o-cresol	ND		ug/kg	440	81.	1
Pentachlorophenol	ND		ug/kg	140	37.	1
Phenol	ND		ug/kg	170	26.	1
2-Methylphenol	ND		ug/kg	170	26.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	26.	1
2,4,5-Trichlorophenol	ND		ug/kg	170	32.	1
Carbazole	ND		ug/kg	170	16.	1
Atrazine	ND		ug/kg	140	59.	1
Benzaldehyde	ND		ug/kg	220	46.	1

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Caprolactam	ND		ug/kg	170	51.	1
2,3,4,6-Tetrachlorophenol	ND		ug/kg	170	34.	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	65		25-120
Phenol-d6	68		10-120
Nitrobenzene-d5	63		23-120
2-Fluorobiphenyl	58		30-120
2,4,6-Tribromophenol	78		10-136
4-Terphenyl-d14	65		18-120

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8270E  
Analytical Date: 02/25/24 20:47  
Analyst: IM

Extraction Method: EPA 3546  
Extraction Date: 02/25/24 04:50

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1888943-1					
Acenaphthene	ND		ug/kg	130	17.
Hexachlorobenzene	ND		ug/kg	97	18.
Bis(2-chloroethyl)ether	ND		ug/kg	140	22.
2-Chloronaphthalene	ND		ug/kg	160	16.
3,3'-Dichlorobenzidine	ND		ug/kg	160	43.
2,4-Dinitrotoluene	ND		ug/kg	160	32.
2,6-Dinitrotoluene	ND		ug/kg	160	28.
Fluoranthene	ND		ug/kg	97	18.
4-Chlorophenyl phenyl ether	ND		ug/kg	160	17.
4-Bromophenyl phenyl ether	ND		ug/kg	160	25.
Bis(2-chloroisopropyl)ether	ND		ug/kg	190	28.
Bis(2-chloroethoxy)methane	ND		ug/kg	170	16.
Hexachlorobutadiene	ND		ug/kg	160	24.
Hexachlorocyclopentadiene	ND		ug/kg	460	150
Hexachloroethane	ND		ug/kg	130	26.
Isophorone	ND		ug/kg	140	21.
Naphthalene	ND		ug/kg	160	20.
Nitrobenzene	ND		ug/kg	140	24.
NDPA/DPA	ND		ug/kg	130	18.
n-Nitrosodi-n-propylamine	ND		ug/kg	160	25.
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	56.
Butyl benzyl phthalate	ND		ug/kg	160	41.
Di-n-butylphthalate	ND		ug/kg	160	31.
Di-n-octylphthalate	ND		ug/kg	160	55.
Diethyl phthalate	ND		ug/kg	160	15.
Dimethyl phthalate	ND		ug/kg	160	34.
Benzo(a)anthracene	ND		ug/kg	97	18.
Benzo(a)pyrene	ND		ug/kg	130	40.
Benzo(b)fluoranthene	ND		ug/kg	97	27.

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8270E  
Analytical Date: 02/25/24 20:47  
Analyst: IM

Extraction Method: EPA 3546  
Extraction Date: 02/25/24 04:50

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1888943-1					
Benzo(k)fluoranthene	ND		ug/kg	97	26.
Chrysene	ND		ug/kg	97	17.
Acenaphthylene	ND		ug/kg	130	25.
Anthracene	ND		ug/kg	97	32.
Benzo(ghi)perylene	ND		ug/kg	130	19.
Fluorene	ND		ug/kg	160	16.
Phenanthrene	ND		ug/kg	97	20.
Dibenzo(a,h)anthracene	ND		ug/kg	97	19.
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	22.
Pyrene	ND		ug/kg	97	16.
Biphenyl	ND		ug/kg	370	21.
4-Chloroaniline	ND		ug/kg	160	29.
2-Nitroaniline	ND		ug/kg	160	31.
3-Nitroaniline	ND		ug/kg	160	30.
4-Nitroaniline	ND		ug/kg	160	67.
Dibenzofuran	ND		ug/kg	160	15.
2-Methylnaphthalene	ND		ug/kg	190	20.
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	160	17.
Acetophenone	ND		ug/kg	160	20.
2,4,6-Trichlorophenol	ND		ug/kg	97	31.
p-Chloro-m-cresol	ND		ug/kg	160	24.
2-Chlorophenol	ND		ug/kg	160	19.
2,4-Dichlorophenol	ND		ug/kg	140	26.
2,4-Dimethylphenol	ND		ug/kg	160	53.
2-Nitrophenol	ND		ug/kg	350	61.
4-Nitrophenol	ND		ug/kg	230	66.
2,4-Dinitrophenol	ND		ug/kg	780	75.
4,6-Dinitro-o-cresol	ND		ug/kg	420	78.
Pentachlorophenol	ND		ug/kg	130	36.

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8270E  
Analytical Date: 02/25/24 20:47  
Analyst: IM

Extraction Method: EPA 3546  
Extraction Date: 02/25/24 04:50

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1888943-1					
Phenol	ND		ug/kg	160	24.
2-Methylphenol	ND		ug/kg	160	25.
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	25.
2,4,5-Trichlorophenol	ND		ug/kg	160	31.
Carbazole	ND		ug/kg	160	16.
Atrazine	ND		ug/kg	130	57.
Benzaldehyde	ND		ug/kg	210	44.
Caprolactam	ND		ug/kg	160	49.
2,3,4,6-Tetrachlorophenol	ND		ug/kg	160	33.

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	82		25-120
Phenol-d6	87		10-120
Nitrobenzene-d5	80		23-120
2-Fluorobiphenyl	74		30-120
2,4,6-Tribromophenol	92		10-136
4-Terphenyl-d14	80		18-120

## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** FORMER CHROMALLOY

**Lab Number:** L2409772

**Project Number:** 190273.2021

**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1888943-2 WG1888943-3								
Acenaphthene	61		59		31-137	3		50
Hexachlorobenzene	64		60		40-140	6		50
Bis(2-chloroethyl)ether	60		58		40-140	3		50
2-Chloronaphthalene	62		58		40-140	7		50
3,3'-Dichlorobenzidine	46		46		40-140	0		50
2,4-Dinitrotoluene	67		63		40-132	6		50
2,6-Dinitrotoluene	67		62		40-140	8		50
Fluoranthene	62		59		40-140	5		50
4-Chlorophenyl phenyl ether	61		57		40-140	7		50
4-Bromophenyl phenyl ether	64		59		40-140	8		50
Bis(2-chloroisopropyl)ether	41		40		40-140	2		50
Bis(2-chloroethoxy)methane	70		66		40-117	6		50
Hexachlorobutadiene	58		59		40-140	2		50
Hexachlorocyclopentadiene	80		77		40-140	4		50
Hexachloroethane	59		57		40-140	3		50
Isophorone	68		64		40-140	6		50
Naphthalene	59		56		40-140	5		50
Nitrobenzene	68		65		40-140	5		50
NDPA/DPA	63		62		36-157	2		50
n-Nitrosodi-n-propylamine	67		63		32-121	6		50
Bis(2-ethylhexyl)phthalate	71		71		40-140	0		50
Butyl benzyl phthalate	71		68		40-140	4		50
Di-n-butylphthalate	68		66		40-140	3		50

## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** FORMER CHROMALLOY

**Lab Number:** L2409772

**Project Number:** 190273.2021

**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1888943-2 WG1888943-3								
Di-n-octylphthalate	73		72		40-140	1		50
Diethyl phthalate	67		62		40-140	8		50
Dimethyl phthalate	66		58		40-140	13		50
Benzo(a)anthracene	59		57		40-140	3		50
Benzo(a)pyrene	59		59		40-140	0		50
Benzo(b)fluoranthene	57		56		40-140	2		50
Benzo(k)fluoranthene	60		59		40-140	2		50
Chrysene	56		57		40-140	2		50
Acenaphthylene	62		59		40-140	5		50
Anthracene	62		61		40-140	2		50
Benzo(ghi)perylene	57		57		40-140	0		50
Fluorene	62		59		40-140	5		50
Phenanthrene	60		58		40-140	3		50
Dibenzo(a,h)anthracene	56		55		40-140	2		50
Indeno(1,2,3-cd)pyrene	58		58		40-140	0		50
Pyrene	62		59		35-142	5		50
Biphenyl	64		61		37-127	5		50
4-Chloroaniline	57		55		40-140	4		50
2-Nitroaniline	72		66		47-134	9		50
3-Nitroaniline	53		49		26-129	8		50
4-Nitroaniline	64		61		41-125	5		50
Dibenzofuran	60		57		40-140	5		50
2-Methylnaphthalene	62		59		40-140	5		50

## Lab Control Sample Analysis

### Batch Quality Control

Project Name: FORMER CHROMALLOY

Lab Number: L2409772

Project Number: 190273.2021

Report Date: 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1888943-2 WG1888943-3								
1,2,4,5-Tetrachlorobenzene	63		60		40-117	5		50
Acetophenone	69		66		14-144	4		50
2,4,6-Trichlorophenol	66		61		30-130	8		50
p-Chloro-m-cresol	72		66		26-103	9		50
2-Chlorophenol	65		62		25-102	5		50
2,4-Dichlorophenol	68		64		30-130	6		50
2,4-Dimethylphenol	81		75		30-130	8		50
2-Nitrophenol	70		65		30-130	7		50
4-Nitrophenol	72		68		11-114	6		50
2,4-Dinitrophenol	59		58		4-130	2		50
4,6-Dinitro-o-cresol	63		58		10-130	8		50
Pentachlorophenol	66		62		17-109	6		50
Phenol	70		66		26-90	6		50
2-Methylphenol	74		67		30-130	10		50
3-Methylphenol/4-Methylphenol	74		69		30-130	7		50
2,4,5-Trichlorophenol	67		61		30-130	9		50
Carbazole	61		59		54-128	3		50
Atrazine	67		64		40-140	5		50
Benzaldehyde	68		64		40-140	6		50
Caprolactam	60		55		15-130	9		50
2,3,4,6-Tetrachlorophenol	66		63		40-140	5		50

## Lab Control Sample Analysis

Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1888943-2 WG1888943-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	66		65		25-120
Phenol-d6	71		66		10-120
Nitrobenzene-d5	65		62		23-120
2-Fluorobiphenyl	60		55		30-120
2,4,6-Tribromophenol	71		68		10-136
4-Terphenyl-d14	60		58		18-120

# PCBS

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8082A  
 Analytical Date: 02/25/24 17:52  
 Analyst: MEO  
 Percent Solids: 97%

Extraction Method: EPA 3546  
 Extraction Date: 02/25/24 03:23  
 Cleanup Method: EPA 3665A  
 Cleanup Date: 02/25/24  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 02/25/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Polychlorinated Biphenyls by GC - Westborough Lab</b>							
Aroclor 1016	ND		ug/kg	48.7	4.33	1	A
Aroclor 1221	ND		ug/kg	48.7	4.88	1	A
Aroclor 1232	ND		ug/kg	48.7	10.3	1	A
Aroclor 1242	ND		ug/kg	48.7	6.57	1	A
Aroclor 1248	8.08	J	ug/kg	48.7	7.31	1	B
Aroclor 1254	ND		ug/kg	48.7	5.33	1	A
Aroclor 1260	ND		ug/kg	48.7	9.01	1	A
Aroclor 1262	ND		ug/kg	48.7	6.19	1	A
Aroclor 1268	ND		ug/kg	48.7	5.05	1	A
PCBs, Total	8.08	J	ug/kg	48.7	4.33	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	58		30-150	A
2,4,5,6-Tetrachloro-m-xylene	60		30-150	B
Decachlorobiphenyl	58		30-150	B

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8082A  
Analytical Date: 02/25/24 16:40  
Analyst: MHG

Extraction Method: EPA 3546  
Extraction Date: 02/25/24 03:23  
Cleanup Method: EPA 3665A  
Cleanup Date: 02/25/24  
Cleanup Method: EPA 3660B  
Cleanup Date: 02/25/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1888938-1						
Aroclor 1016	ND		ug/kg	47.5	4.22	A
Aroclor 1221	ND		ug/kg	47.5	4.76	A
Aroclor 1232	ND		ug/kg	47.5	10.1	A
Aroclor 1242	ND		ug/kg	47.5	6.40	A
Aroclor 1248	11.0	J	ug/kg	47.5	7.12	A
Aroclor 1254	ND		ug/kg	47.5	5.19	A
Aroclor 1260	ND		ug/kg	47.5	8.77	A
Aroclor 1262	ND		ug/kg	47.5	6.03	A
Aroclor 1268	ND		ug/kg	47.5	4.92	A
PCBs, Total	11.0	J	ug/kg	47.5	4.22	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	66		30-150	A
Decachlorobiphenyl	71		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		30-150	B
Decachlorobiphenyl	73		30-150	B

### Lab Control Sample Analysis Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 Batch: WG1888938-2 WG1888938-3									
Aroclor 1016	62		52		40-140	18		50	A
Aroclor 1260	57		51		40-140	11		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		53		30-150	A
Decachlorobiphenyl	60		52		30-150	A
2,4,5,6-Tetrachloro-m-xylene	62		55		30-150	B
Decachlorobiphenyl	60		53		30-150	B

# PESTICIDES

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

## Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8081B  
 Analytical Date: 02/26/24 11:24  
 Analyst: PEG  
 Percent Solids: 97%

Extraction Method: EPA 3546  
 Extraction Date: 02/25/24 01:38  
 Cleanup Method: EPA 3620B  
 Cleanup Date: 02/25/24  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 02/25/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Organochlorine Pesticides by GC - Westborough Lab</b>							
Delta-BHC	ND		ug/kg	1.56	0.306	1	A
Lindane	ND		ug/kg	0.651	0.291	1	A
Alpha-BHC	ND		ug/kg	0.651	0.185	1	A
Beta-BHC	ND		ug/kg	1.56	0.592	1	A
Heptachlor	ND		ug/kg	0.781	0.350	1	A
Aldrin	ND		ug/kg	1.56	0.550	1	A
Heptachlor epoxide	ND		ug/kg	2.93	0.878	1	A
Endrin	ND		ug/kg	0.651	0.267	1	A
Endrin aldehyde	ND		ug/kg	1.95	0.683	1	A
Endrin ketone	ND		ug/kg	1.56	0.402	1	A
Dieldrin	ND		ug/kg	0.976	0.488	1	A
4,4'-DDE	ND		ug/kg	1.56	0.361	1	A
4,4'-DDD	ND		ug/kg	1.56	0.557	1	A
4,4'-DDT	ND		ug/kg	1.56	1.26	1	A
Endosulfan I	ND		ug/kg	1.56	0.369	1	A
Endosulfan II	ND		ug/kg	1.56	0.522	1	A
Endosulfan sulfate	ND		ug/kg	0.651	0.310	1	A
Methoxychlor	ND		ug/kg	2.93	0.911	1	A
Toxaphene	ND		ug/kg	29.3	8.20	1	A
cis-Chlordane	ND		ug/kg	1.95	0.544	1	A
trans-Chlordane	ND		ug/kg	1.95	0.515	1	A
Chlordane	ND		ug/kg	13.0	5.17	1	A

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		30-150	A
Decachlorobiphenyl	84		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	77		30-150	B

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

Lab ID: L2409772-01  
 Client ID: FILL\_20240222  
 Sample Location: WEST NYACK, NY

Date Collected: 02/22/24 13:45  
 Date Received: 02/22/24  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8151A  
 Analytical Date: 02/27/24 22:31  
 Analyst: MMG  
 Percent Solids: 97%  
 Methylation Date: 02/27/24 12:11

Extraction Method: EPA 8151A  
 Extraction Date: 02/26/24 17:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
<b>Chlorinated Herbicides by GC - Westborough Lab</b>							
2,4-D	ND		ug/kg	169	10.6	1	A
2,4,5-T	ND		ug/kg	169	5.24	1	A
2,4,5-TP (Silvex)	ND		ug/kg	169	4.50	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	75		30-150	A
DCAA	74		30-150	B

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

### Method Blank Analysis Batch Quality Control

Analytical Method: 1,8081B  
 Analytical Date: 02/26/24 08:05  
 Analyst: PEG

Extraction Method: EPA 3546  
 Extraction Date: 02/25/24 01:38  
 Cleanup Method: EPA 3620B  
 Cleanup Date: 02/25/24  
 Cleanup Method: EPA 3660B  
 Cleanup Date: 02/25/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01 Batch: WG1888932-1						
Delta-BHC	ND		ug/kg	1.57	0.307	A
Lindane	ND		ug/kg	0.654	0.292	A
Alpha-BHC	ND		ug/kg	0.654	0.186	A
Beta-BHC	ND		ug/kg	1.57	0.595	A
Heptachlor	ND		ug/kg	0.784	0.352	A
Aldrin	ND		ug/kg	1.57	0.552	A
Heptachlor epoxide	ND		ug/kg	2.94	0.882	A
Endrin	ND		ug/kg	0.654	0.268	A
Endrin aldehyde	ND		ug/kg	1.96	0.686	A
Endrin ketone	ND		ug/kg	1.57	0.404	A
Dieldrin	ND		ug/kg	0.980	0.490	A
4,4'-DDE	ND		ug/kg	1.57	0.363	A
4,4'-DDD	ND		ug/kg	1.57	0.559	A
4,4'-DDT	ND		ug/kg	1.57	1.26	A
Endosulfan I	ND		ug/kg	1.57	0.370	A
Endosulfan II	ND		ug/kg	1.57	0.524	A
Endosulfan sulfate	ND		ug/kg	0.654	0.311	A
Methoxychlor	ND		ug/kg	2.94	0.915	A
Toxaphene	ND		ug/kg	29.4	8.24	A
cis-Chlordane	ND		ug/kg	1.96	0.546	A
trans-Chlordane	ND		ug/kg	1.96	0.518	A
Chlordane	ND		ug/kg	13.1	5.20	A

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8081B  
Analytical Date: 02/26/24 08:05  
Analyst: PEG

Extraction Method: EPA 3546  
Extraction Date: 02/25/24 01:38  
Cleanup Method: EPA 3620B  
Cleanup Date: 02/25/24  
Cleanup Method: EPA 3660B  
Cleanup Date: 02/25/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01 Batch: WG1888932-1						

Surrogate	%Recovery	Qualifier	Acceptance	
			Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		30-150	A
Decachlorobiphenyl	102		30-150	A
2,4,5,6-Tetrachloro-m-xylene	73		30-150	B
Decachlorobiphenyl	100		30-150	B

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8151A  
Analytical Date: 02/27/24 17:37  
Analyst: MMG

Extraction Method: EPA 8151A  
Extraction Date: 02/26/24 16:59

Methylation Date: 02/27/24 12:11

Parameter	Result	Qualifier	Units	RL	MDL	Column
Chlorinated Herbicides by GC - Westborough Lab for sample(s): 01 Batch: WG1889428-1						
2,4-D	ND		ug/kg	165	10.4	A
2,4,5-T	ND		ug/kg	165	5.11	A
2,4,5-TP (Silvex)	ND		ug/kg	165	4.38	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DCAA	62		30-150	A
DCAA	64		30-150	B

## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 Batch: WG1888932-2 WG1888932-3									
Delta-BHC	86		87		30-150	1		30	A
Lindane	81		81		30-150	0		30	A
Alpha-BHC	82		82		30-150	0		30	A
Beta-BHC	93		99		30-150	6		30	A
Heptachlor	103		104		30-150	1		30	A
Aldrin	82		82		30-150	0		30	A
Heptachlor epoxide	92		93		30-150	1		30	A
Endrin	93		93		30-150	0		30	A
Endrin aldehyde	90		95		30-150	5		30	A
Endrin ketone	103		103		30-150	0		30	A
Dieldrin	96		96		30-150	0		30	A
4,4'-DDE	84		86		30-150	2		30	A
4,4'-DDD	98		98		30-150	0		30	A
4,4'-DDT	102		103		30-150	1		30	A
Endosulfan I	95		96		30-150	1		30	A
Endosulfan II	94		95		30-150	1		30	A
Endosulfan sulfate	90		90		30-150	0		30	A
Methoxychlor	128		133		30-150	4		30	A
cis-Chlordane	91		91		30-150	0		30	A

## Lab Control Sample Analysis

### Batch Quality Control

Project Name: FORMER CHROMALLOY

Lab Number: L2409772

Project Number: 190273.2021

Report Date: 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 Batch: WG1888932-2 WG1888932-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		76		30-150	A
Decachlorobiphenyl	94		97		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		73		30-150	B
Decachlorobiphenyl	96		97		30-150	B

## Lab Control Sample Analysis

Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 Batch: WG1888932-2 WG1888932-3									
trans-Chlordane	88		87		30-150	1		30	B

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		76		30-150	A
Decachlorobiphenyl	94		97		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		73		30-150	B
Decachlorobiphenyl	96		97		30-150	B

## Lab Control Sample Analysis

Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Chlorinated Herbicides by GC - Westborough Lab Associated sample(s): 01 Batch: WG1889428-2 WG1889428-3									
2,4-D	80		61		30-150	27		30	A
2,4,5-T	85		62		30-150	31	Q	30	A
2,4,5-TP (Silvex)	80		62		30-150	25		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DCAA	74		52		30-150	A
DCAA	84		59		30-150	B

## METALS

**Project Name:** FORMER CHROMALLOY**Lab Number:** L2409772**Project Number:** 190273.2021**Report Date:** 03/01/24**SAMPLE RESULTS**

Lab ID: L2409772-01

Date Collected: 02/22/24 13:45

Client ID: FILL\_20240222

Date Received: 02/22/24

Sample Location: WEST NYACK, NY

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 97%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
<b>Total Metals - Mansfield Lab</b>											
Aluminum, Total	322		mg/kg	20.1	5.43	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Antimony, Total	ND		mg/kg	10.0	0.764	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Arsenic, Total	ND		mg/kg	2.01	0.418	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Barium, Total	2.23		mg/kg	2.01	0.350	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Beryllium, Total	ND		mg/kg	1.00	0.066	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Cadmium, Total	ND		mg/kg	2.01	0.197	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Calcium, Total	120		mg/kg	20.1	7.04	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Chromium, Total	1.10	J	mg/kg	2.01	0.193	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Cobalt, Total	ND		mg/kg	4.02	0.334	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Copper, Total	1.24	J	mg/kg	2.01	0.519	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Iron, Total	1340		mg/kg	10.0	1.82	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Lead, Total	0.722	J	mg/kg	10.0	0.539	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Magnesium, Total	118		mg/kg	20.1	3.10	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Manganese, Total	21.1		mg/kg	2.01	0.320	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Mercury, Total	ND		mg/kg	0.070	0.045	1	02/28/24 15:30	02/29/24 14:09	EPA 7471B	1,7471B	GMG
Nickel, Total	0.517	J	mg/kg	5.03	0.487	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Potassium, Total	43.1	J	mg/kg	503	29.0	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Selenium, Total	ND		mg/kg	4.02	0.519	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Silver, Total	ND		mg/kg	1.00	0.569	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Sodium, Total	20.6	J	mg/kg	402	6.33	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Thallium, Total	ND		mg/kg	4.02	0.633	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Vanadium, Total	2.36		mg/kg	2.01	0.408	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC
Zinc, Total	1.74	J	mg/kg	10.0	0.589	5	02/28/24 13:17	03/01/24 14:35	EPA 3050B	1,6010D	DMC



**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

## Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1890222-1										
Aluminum, Total	ND		mg/kg	4.00	1.08	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Antimony, Total	ND		mg/kg	2.00	0.152	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	0.083	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Barium, Total	ND		mg/kg	0.400	0.070	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	0.013	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	0.039	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Calcium, Total	ND		mg/kg	4.00	1.40	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	0.038	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Cobalt, Total	ND		mg/kg	0.800	0.066	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Copper, Total	ND		mg/kg	0.400	0.103	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Iron, Total	1.05	J	mg/kg	2.00	0.361	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Lead, Total	ND		mg/kg	2.00	0.107	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Magnesium, Total	ND		mg/kg	4.00	0.616	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Manganese, Total	ND		mg/kg	0.400	0.064	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	0.097	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Potassium, Total	8.23	J	mg/kg	100	5.76	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Selenium, Total	ND		mg/kg	0.800	0.103	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Silver, Total	ND		mg/kg	0.200	0.113	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Sodium, Total	12.4	J	mg/kg	80.0	1.26	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Thallium, Total	ND		mg/kg	0.800	0.126	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	0.081	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	0.117	1	02/28/24 13:17	03/01/24 11:12	1,6010D	DMC

### Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1890225-1										
Mercury, Total	ND		mg/kg	0.083	0.054	1	02/28/24 15:30	02/29/24 13:16	1,7471B	GMG



**Project Name:** FORMER CHROMALLOY

**Lab Number:** L2409772

**Project Number:** 190273.2021

**Report Date:** 03/01/24

## Method Blank Analysis Batch Quality Control

### Prep Information

---

Digestion Method: EPA 7471B

## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1890222-2 SRM Lot Number: D123-540								
Aluminum, Total	64		-		53-147	-		
Antimony, Total	177		-		2-201	-		
Arsenic, Total	100		-		82-118	-		
Barium, Total	101		-		82-118	-		
Beryllium, Total	95		-		83-117	-		
Cadmium, Total	97		-		83-118	-		
Calcium, Total	99		-		82-118	-		
Chromium, Total	99		-		81-118	-		
Cobalt, Total	105		-		83-117	-		
Copper, Total	102		-		83-117	-		
Iron, Total	89		-		58-142	-		
Lead, Total	104		-		82-119	-		
Magnesium, Total	81		-		75-124	-		
Manganese, Total	98		-		81-119	-		
Nickel, Total	102		-		82-118	-		
Potassium, Total	83		-		72-128	-		
Selenium, Total	102		-		81-119	-		
Silver, Total	100		-		79-120	-		
Sodium, Total	108		-		74-126	-		
Thallium, Total	101		-		81-120	-		
Vanadium, Total	96		-		78-122	-		

## Lab Control Sample Analysis

Batch Quality Control

**Project Name:** FORMER CHROMALLOY

**Project Number:** 190273.2021

**Lab Number:** L2409772

**Report Date:** 03/01/24

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1890222-2 SRM Lot Number: D123-540					
Zinc, Total	98	-	80-120	-	
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1890225-2 SRM Lot Number: D123-540					
Mercury, Total	101	-	67-132	-	

### Matrix Spike Analysis Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1890222-3 WG1890222-4 QC Sample: L2409961-16 Client ID: MS Sample												
Aluminum, Total	8760	190	8270	0	Q	8840	44	Q	75-125	7		20
Antimony, Total	13.1	47.6	69.3	118		57.7	97		75-125	18		20
Arsenic, Total	7.71	11.4	20.1	108		21.4	124		75-125	6		20
Barium, Total	143	190	316	91		317	95		75-125	0		20
Beryllium, Total	0.531J	4.76	5.08	107		4.89	106		75-125	4		20
Cadmium, Total	2.20J	5.04	6.30	125		6.53	134	Q	75-125	4		20
Calcium, Total	14300	951	51400	3900	Q	12400	0	Q	75-125	122	Q	20
Chromium, Total	37.7	19	56.4	98		52.1	78		75-125	8		20
Cobalt, Total	10.4	47.6	55.7	95		56.6	101		75-125	2		20
Copper, Total	879	23.8	715	0	Q	810	0	Q	75-125	12		20
Iron, Total	35000	95.1	31800	0	Q	31200	0	Q	75-125	2		20
Lead, Total	549	50.4	597	95		563	29	Q	75-125	6		20
Magnesium, Total	4650	951	10900	657	Q	4860	23	Q	75-125	77	Q	20
Manganese, Total	602	47.6	1220	1300	Q	646	96		75-125	62	Q	20
Nickel, Total	40.7	47.6	129	186	Q	87.0	101		75-125	39	Q	20
Potassium, Total	691	951	1740	110		1530	91		75-125	13		20
Selenium, Total	ND	11.4	11.5	101		11.4	103		75-125	1		20
Silver, Total	ND	4.76	5.18	109		4.86	106		75-125	6		20
Sodium, Total	154J	951	1190	125		1130	123		75-125	5		20
Thallium, Total	ND	11.4	8.50	74	Q	9.34	85		75-125	9		20
Vanadium, Total	24.6	47.6	71.8	99		68.5	96		75-125	5		20

**Matrix Spike Analysis**  
Batch Quality Control

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1890222-3 WG1890222-4 QC Sample: L2409961-16 Client ID: MS Sample									
Zinc, Total	520	47.6	378	0	Q 627	233	Q 75-125	50	Q 20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1890225-3 WG1890225-4 QC Sample: L2409778-08 Client ID: MS Sample									
Mercury, Total	0.887	1.59	2.27	87	3.01	166	Q 80-120	28	Q 20

# **INORGANICS & MISCELLANEOUS**

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

**SAMPLE RESULTS**

**Lab ID:** L2409772-01  
**Client ID:** FILL\_20240222  
**Sample Location:** WEST NYACK, NY

**Date Collected:** 02/22/24 13:45  
**Date Received:** 02/22/24  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>General Chemistry - Westborough Lab</b>										
Solids, Total	96.6		%	0.100	NA	1	-	02/23/24 15:49	121,2540G	SJB



**Lab Duplicate Analysis**  
*Batch Quality Control*

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1888634-1 QC Sample: L2409705-06 Client ID: DUP Sample						
Solids, Total	84.3	85.1	%	1		20



**Project Name:** FORMER CHROMALLOY**Lab Number:** L2409772**Project Number:** 190273.2021**Report Date:** 03/01/24**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

Cooler	Custody Seal
A	Absent

**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2409772-01A	Vial MeOH preserved	A	NA		3.6	Y	Absent		NYTCL-8260HLW-R2(14)
L2409772-01B	Vial water preserved	A	NA		3.6	Y	Absent	23-FEB-24 12:11	NYTCL-8260HLW-R2(14)
L2409772-01C	Vial water preserved	A	NA		3.6	Y	Absent	23-FEB-24 12:11	NYTCL-8260HLW-R2(14)
L2409772-01D	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		TS(7)
L2409772-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		BE-TI(180),BA-TI(180),AS-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),TL-TI(180),NI-TI(180),SB-TI(180),CU-TI(180),PB-TI(180),ZN-TI(180),SE-TI(180),CO-TI(180),V-TI(180),HG-T(28),FE-TI(180),MG-TI(180),MN-TI(180),K-TI(180),NA-TI(180),CA-TI(180),CD-TI(180)
L2409772-01F	Glass 500ml/16oz unpreserved	A	NA		3.6	Y	Absent		NYTCL-8270(14),HERB-APA(14),NYTCL-8081(14),NYTCL-8082(365)

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Chlordane:** The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Gasoline Range Organics (GRO):** Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers



**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

#### Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

**Project Name:** FORMER CHROMALLOY  
**Project Number:** 190273.2021

**Lab Number:** L2409772  
**Report Date:** 03/01/24

## REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



## Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

### Westborough Facility

**EPA 624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625.1:** alpha-Terpineol

**EPA 8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

### Mansfield Facility

**SM 2540D:** TSS.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

### Westborough Facility:

#### Drinking Water

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

#### Non-Potable Water

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables).

**Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

### Mansfield Facility:

#### Drinking Water

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

**EPA 522, EPA 537.1.**

#### Non-Potable Water

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1** Hg.

**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



## APPENDIX G

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator ID Number

2. Page 1 of

3. Emergency Response Phone

4. Waste Tracking Number

1

631-586-5900

NHWM 221955

5. Generator's Name and Mailing Address

**SEQUA CORPORATION**  
4100 RCA BOULEVARD  
PALM BEACH GARDENS, FL, 33410

Generator's Site Address (if different than mailing address)

**FORMER CHROMALLOY FACILITY**  
169 WESTERN HYGHWAY  
WEST NYACK, NY 10994

Generator's Phone:

6. Transporter 1 Company Name

**AARCO ENVIRONMENTAL SERVICES**

U.S. EPA ID Number

NYR000107326

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

**DALE TRANSFER CORPORATION**  
129 DALE STREET, WEST BABYLON NY 11704  
631-393-2882

U.S. EPA ID Number

N/A

Facility's Phone:

9. Waste Shipping Name and Description

10. Containers

11. Total  
Quantity

12. Unit  
Wt./Vol.

No.

Type

1. NON-REGULATED SOLIDS (SOIL)

3

DW

1500

P

2. NON-REGULATED SOLIDS (RCRA EMPTY DRUMS)

4

DW

50

13. Special Handling Instructions and Additional Information

1. APPROVAL # 2023-989 (3 x 55 gal)  
2. APPROVAL # 2024-421 (4 x 55 gal empty)  
AARCO WO# 221955 TRUCK# B 507

14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Generator's/Officer's Printed/Typed Name

Andrew Fishman as agent of Chromalloy

Signature

Andrew Fishman as agent of Chromalloy

Month Day Year  
5 17 24

15. International Shipments

Import to U.S.

Export from U.S.

Port of entry/exit:

Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Kevin J. Conner

Signature

Kevin J. Conner

Month Day Year  
5 17 24

Transporter 2 Printed/Typed Name

Signature

Month Day Year

17. Discrepancy

17a. Discrepancy Indication Space

Quantity

Type

Residue

Partial Rejection

Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Q. Dwyne

Signature

Q. Dwyne

Month Day Year  
5 17 24

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY