88 INGRAHAM STREET
BROOKLYN, NEW YORK 11237
SITE NO: V00170 INDEX NO: W2-0977-03-11

MARCH 2011

AS/SVE SYSTEM DESIGN ENGINEERING REPORT

Prepared For:
88 Ingraham Realty Corp.
7700 Bella Verde Way
Delray Beach, Florida 33446

Submitted to:
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION (NYSDEC)
and
NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH)

Volunteer Clean-up by:
MR. WILLIAM EISEN

Harry Tenenbaum P.E.

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631-868-7234

TABLE OF CONTENTS

APPENDICES

1.0 Introduction

Tyree Environmental Corp. (Tyree) was retained to install an Air Sparge (AS) and Soil Vapor Extraction (SVE) system at 88 Ingraham Street, Brooklyn, New York hereafter referred to as the Site. The work was conducted on the behalf of Mr. William Eisen the former owner of the subject property. The remedial system was installed in order to address residual subsurface soil and groundwater contamination.

2.0 Project Background

The following subsections detail the site description, history and environmental setting. This information is based upon previous reports, research, interviews and investigations.

2.1 Subject Site

The Site is located in Brooklyn, Kings County, New York, identified as Section 10, Block 19, Lot 2998. The Site measures approximately 0.2 acres. The Site is improved with a two (2) story commercial warehouse building which occupies nearly the entire property. The Site is depicted on Figure 1 – Aerial Photograph contained in Appendix A.

2.2 Site History

Site Assessments and Voluntary Cleanup activities for the property have been conducted since December 1996. Dvirka and Bartilucci Consulting Engineers (D&B) Woodbury, New York and Miller Environmental Group Inc. (MEG) Calverton, New York were previously involved in site assessment and remediation activities.

In December 1996, an assessment entitled "Voluntary Cleanup Site Assessment and Supplemental Site Assessment Report" was prepared by D&B. During that reporting period, one (1) air, five (5) soil, and four (4) groundwater samples were collected. The samples were analyzed for VOCs via Method 91-1, SVOCs via Method 91-2 and TAL metals. The analytical data revealed elevated concentrations of volatile organic compounds (VOCs) in both the subsurface soil and groundwater.

On request by NYSDOH, an Exposure Assessment was prepared by D&B in March 1997. It was found that the closest residential building was located approximately 150 feet south-southwest of the property. The closest dewatering activities relevant to exposure were 500 to 2,000 feet from the Site.

In September 1998, a Voluntary Cleanup Agreement was executed by NYSDEC with 88 Ingraham Realty Corp. as former Site Owner, and Popular Hand Laundry and Cleaners of Richmond Hill, Inc. as former Site Operator. A Remedial Work Plan was approved. In May 2001 a Remedial Design Plan was prepared by D&B and submitted to the NYSDEC.

On August 27, 2001, Miller Environmental Group (MEG) collected groundwater samples via Geoprobe® along the front of the building, traversing west to east. Groundwater sample results revealed elevated concentrations of VOCs.

By October 2001, a Soil Vapor Extraction (SVE) and Air Sparging (AS) system had been installed by MEG. The AS/SVE system was maintained by MEG until October 21, 2004. During this time SVE system effluent air samples were collected and the results reported to the NYSDOH. MEG also removed a 3000-gallon heating oil tank on January 17, 2002.

A Work Plan for a soil gas survey was proposed by MEG on July 2, 2004 and submitted to NYSDOH. Using direct push technology, soil gas samples were collected at four (4) locations from 0 to 8 feet below grade in October 2004. The soil gas survey points were finished with flush mounted bolt down manholes. The analytical data revealed the presence of VOCs.

In 2005, Tyree was retained by 88 Ingraham Realty Corp. (former Site Owner under the terms of the VCA), to assume responsibility for environmental testing and design of remedial measures to resolve the issues related to subsurface contamination. On March 23, 2006 a meeting was held at the New York State Department of Environmental Conservation (NYSDEC) office in Long Island City, with Jane H. O'Connell (NYSDEC), Bryan Wong (NYSDEC), Roland Fisher (Tyree) and Hesna Aksehirli (Tyree). Stephanie Selmer (New York State Department of Health - NYSDOH) joined the meeting via conference call. The meeting addressed the shortcomings of the remedial system installed by former consultants. Subsequent remediation work by Tyree is the direct result of that meeting.

2.3 Environmental Setting

The Site is approximately 50 feet above mean sea level. The regional topography in the area of the Site is flat. In general the geology at the site consists of primarily sand interbedded with lenses of silt, clay and gravel. The principal aquifers underlying the Site are the upper glacial deposits and Magothy formation. Groundwater is present at approximately fifteen (15) feet below grade.

3.0 Project Objectives

The specific objectives of the project are to mitigate subsurface soil and groundwater contamination in the vicinity of the Site through the implementation of air sparging and soil vapor extraction.

4.0 Summary of Pre-Design Activities

The following sections provide a brief summary of the methodology and results for the pre-design investigatory testing activities conducted at the Site.

4.1 Pre-Design Investigation Activities

Tyree visited the site on June 1, 2005. During the site visit, the existing remediation system was inspected, air concentrations were measured with a photoionization detector (PID) from points SG-1 through SG-4 (soil gas points installed previously by MEG). Groundwater samples were collected from the wells located in the front of the building. During the Tyree site visit, the remediation system was operating. The AS system pressure gauge showed 8 psi; however, the SVE system vacuum gauge was not functioning. PID indicated no measurable volatile organic compounds (VOCs) at any of the air monitoring points.

Tyree conducted a comprehensive subsurface investigation on December 14 and 15, 2005. Six (6) sampling points were installed and eighteen (18) soil samples and six (6) water samples were collected. Three 1-inch diameter permanent monitoring wells were installed inside the building: wells G1 and G3 which were installed to a depth of 30 feet (5 feet riser-25 feet screen) below grade, and well G2 which was installed to a depth of 40 feet (5 feet riser-35 feet screen). Due to height restrictions inside the building a small vehicle mounted Geoprobe® was used to collect samples beneath the floor. As seen from the results, the soil samples from 0-4 feet below grade exceeded NYSDEC's Soil Guidance Values at G1 and B4. Contaminant levels of compounds in the soil in the remaining sixteen (16) soil samples were either not detected in the samples or at levels below the NYSDEC Soil Guidance Values. Laboratory analysis revealed that all soil samples obtained below the depth of 4 feet met the NYSDEC Soil Guidance Values. Groundwater samples exceeded NYSDEC Groundwater Standards at the three (3) sampling locations.

Tyree prepared an Air Quality Investigation Report in August 2006. The soil vapor extraction/air sparging (SVE/AS) Pilot Test Work Plan was submitted for review in June 2007 and revised in July 2007. The Final AS/SVE System Design report, which included the Operation, Monitoring and Maintenance (OM & M) was submitted in September 2008 and approved in April 2009. The AS/SVE system installation was completed in October 2009. The AS/SVE was initially started in May 2010.

4.2 Results, Conclusions and Recommendations

The above noted reports were previously submitted to and reviewed by the NYSDEC as such the details are not presented herein. Based upon the pilot test data it was determined that the effective Radius of Influence (ROI) for the sparge wells was approximately nineteen (19) feet. The effective ROI for the SVE wells was determined to be thirty–eight (38) feet. The data obtained during the pilot tests was utilized for equipment selection, well design and overall remedial strategy.

5.0 Remedial System Design

The following sections describe the specific components of the remedial AS/SVE system that was installed at the site. The remedial system design report was approved in April 2009.

5.1 Groundwater Monitoring Wells

A series of groundwater monitoring wells were installed throughout the Site as well as offsite. A total of two (2) nested wells designated as NW-1 and NW-2 were installed. Nested well NW-1 consists of four (4) individual wells designated as NW-1 (20 ft.), NW-1 (30 ft.), NW-1 (40 ft.) and NW-1 (50 ft.). The wells are constructed with schedule 40 PVC casing and 0.020-inch slotted screen. NW-1 (20 ft.) is constructed with 0.75-inch diameter PVC, wells NW-1 (30 ft.), NW-1 (40 ft.) and NW-1 (50 ft.) are constructed with 0.50-inch PVC. Nested well NW-2 consists of five (5) separate wells designated as NW-1 (10 ft.), NW-1 (20 ft.), NW-1 (30 ft.), NW-1 (40 ft.) and NW-1 (50 ft.). The wells are constructed with 1-inch diameter schedule 40 PVC casing and 0.202-inch slotted screen. Well MW-2 is constructed of 2-inch diameter schedule 40 PVC casing and 0.020-inch slotted screen and is completed to a depth of twenty-five (25) feet below grade. Well MW-3 is constructed of 0.75-inch diameter schedule 40 PVC casing and 0.020-inch slotted screen and is completed to a depth of twenty (20) feet below grade. Well MW-4 is constructed of 2-inch diameter schedule 40 PVC casing and 0.020-inch slotted screen and is completed to a depth of thirty-three (33) feet below grade. Wells MW-5, MW-6 and G-2 are constructed of 1-inch diameter schedule 40 PVC casing and 0.020-inch slotted screen. MW-5 and MW-6 are completed at thirty (30) feet and G-2 at thirty-six (36) feet below grade.

5.2 Soil Vapor Extraction (SVE) Wells

A total of two (2) SVE wells designated as SV-5 and SV-6 were installed. The wells are constructed with five (5) feet of 2-inch diameter schedule 40 PVC casing and fifteen (15) feet of 0.020-inch screen.

5.3 Air Sparge (AS) Wells

A total of two (2) AS wells designated as AS-3 and AS-4 were installed. The wells are constructed with thirty-three (33) feet of 2-inch diameter schedule 40 PVC casing and two (2) feet of 0.020-inch screen.

5.4 Vapor Point Wells

A total of three (3) vapor point wells designated as VP-1, VP-2 and VP-3 were installed at the site. The wells are constructed with 1-inch diameter, 0.020-inch slotted screen and are completed to a depth of one (1) foot below grade. One vapor point well VP-4, which was previously utilized as an SVE well, is constructed of 2-inch diameter PVC and is completed to a depth of twelve (12) feet below grade. The monitoring well network is depicted on Figure 2 in Appendix A.

5.5 AS/SVE System Components

The AS/SVE system was built by Fliteway Technologies, Inc. for Tyree. The SVE system utilizes a 10-hp explosion proof 230/460 3 Phase 1740 rpm motor, a Roots 47 URAI-J-DSL positive displacement rotary lobe vacuum pump, a Fliteway "Cyclonic Action" 82-gallon knockout tank. The system is fitted with vacuum gauges, a mini-magnehelic and sample ports. The SVE effluent air stream is directed through two (2) 55-gallon carbon drums prior to discharge in to the ambient air.

The AS system consists of a 5-hp explosion proof 230-460 3 Phase 1740 rpm motor and a Roots 33 URAI-j-DSL positive displacement rotary lobe vacuum pump. The system is fitted with a mini magnehelic, pressure gauges and relief valve.

The AS/SVE system is housed in a prefabricated metal shed that measures approximately nine (9) feet wide by five (5) feet deep and six (6) feet high. The Fliteway Operations and Maintenance Manual is included in Appendix B.

6.0 Conclusions

Based upon preliminary data obtained during the routine site visits and sampling events it appears that the system is operating to design criteria and is effectively removing subsurface contaminants.

7.0 DISCLAIMER

This design report was prepared for review agency use, and reasonable due diligence was exercised by Harry Tenenbaum P.E. in conducting this compilation. The conclusions provided by Mr. Tenenbaum are based solely on the information reported in this document. Future site information that was not available to Mr. Tenenbaum at the time may result in a modification of the above. The directives represented are based upon the current regulatory climate and may require revision if future regulatory changes occur. This report has been conducted in accordance with generally accepted practices. No other warranty, expressed or implied, is made.

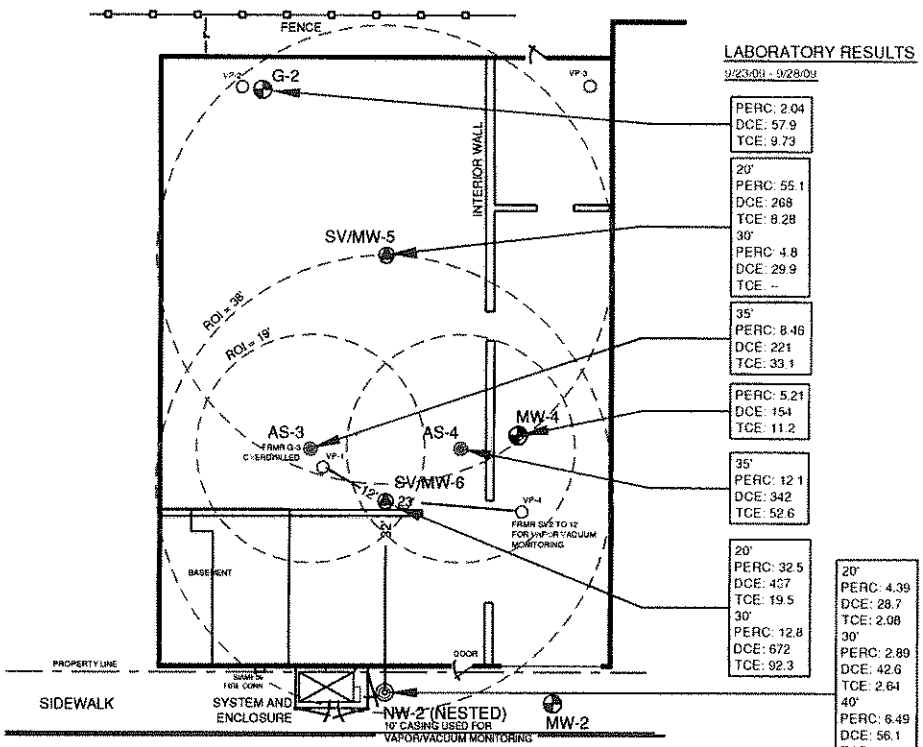
Harry Tenenbaum P.E.

Appendix A - Figures

FIGURE 1 – AERIAL PHOTOGRAPH

88 INGRAHAM STREET

BROOKLYN, NEW YORK 11237



LABORATORY RESULTS

9/23/09 - 9/28/09

PERC: 2.04
DCE: 57.9
TCE: 9.73

20'
PERC: 55.1
DCE: 268
TCE: 8.28
30'
PERC: 4.8
DCE: 29.9
TCE: --

35'
PERC: 8.46
DCE: 221
TCE: 33.1

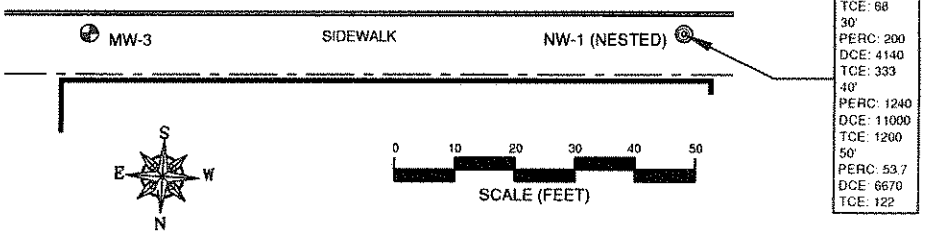
PERC: 5.21
DCE: 154
TCE: 11.2

35'
PERC: 12.1
DCE: 342
TCE: 52.6

20'
PERC: 32.5
DCE: 457
TCE: 19.5
30'
PERC: 12.8
DCE: 672
TCE: 92.3

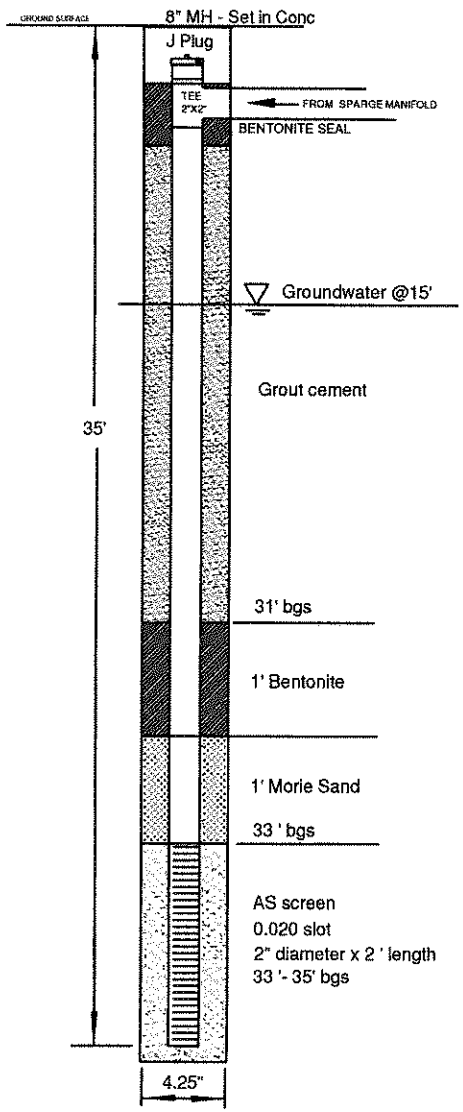
20'
PERC: 4.39
DCE: 28.7
TCE: 2.08
30'
PERC: 2.89
DCE: 42.6
TCE: 2.64
40'
PERC: 6.49
DCE: 56.1
TCE: 5.5
50'
PERC: 3.06
DCE: 48.4
TCE: 2.49

20'
PERC: 60.1
DCE: 962
TCE: 68
30'
PERC: 200
DCE: 4140
TCE: 333
40'
PERC: 1240
DCE: 11000
TCE: 1200
50'
PERC: 53.7
DCE: 6670
TCE: 122



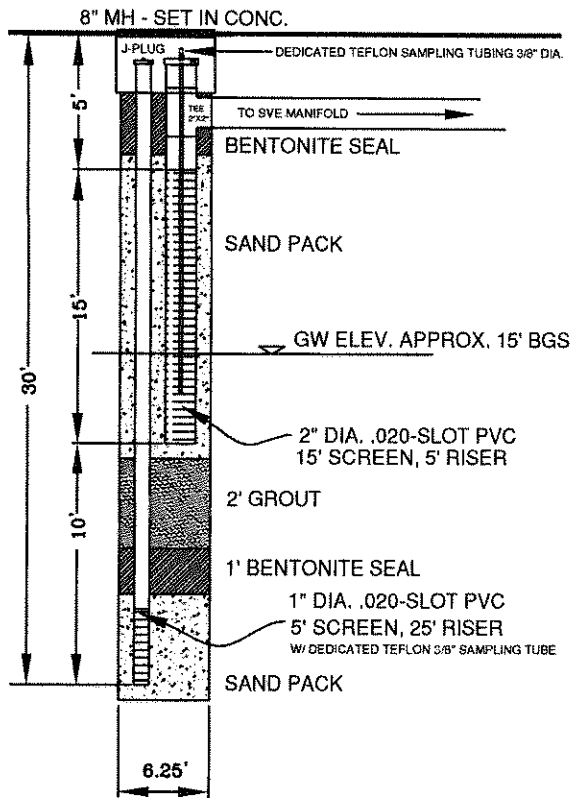
LOCATION PLAN

3/8" = 1'



AIR SPARGE (AS) WELL DETAIL

NTS



SVE/MW WELL DETAIL

NTS

NOTES:
1. WELL CASINGS INCLUDE DEDICATED 3/8" TEFLON SAMPLING TUBE, WITH THE EXCEPTION OF SPARGE WELLS.
2. FOR DETAILS OF VAPOR POINTS AND NESTED WELLS NW-1,2 REFER TO DETAILS SUBMITTED WITH FINAL AS/SVE SYSTEM DESIGN REPORT.

LEGEND

AS-3 / SV/MW-5 — SPARGE / EXTRACTION WELL

VP-4 — VAPOR/VACUUM MONITORING POINT

G-2 / MW-2 — MONITORING WELL

GW FLOW
PER REGIONAL MAPPING
WITH FIELD CONFIRMATION

Tyree Environmental Corp.
Phone: (631) 249-3150
208 Route 109
FARMINGDALE, NY 11735
Fax: (631) 249-3281

Figure 2 - Site Plan

DRAWN BY:	RO
DATE:	3/18/2011
REV:	
SCALE:	3/8" = 1'
CLIENT:	INGRAHAM REALTY

88 INGRAHAM STREET
BROOKLYN, NY 10452

Appendix B – Fliteway Operations and Maintenance Manual

Fliteway Technologies, Inc.
2129 E. Birchwood Ave • Cudahy, WI 53110
(414) 483-5600 • 1-800-236-3580 • FAX (414) 483-1957

Q13475 Rev 7

Tyree Brothers Environmental Services, Inc.

88 Ingraham Street

- SVE System

Fliteway FV1082X3-R47 URAI-J-DSL rated for 130 to 182 ACFM at 12" HG pulling through carbon with the following equipment:

- **10 HP Explosion Proof 230/460 3 Phase 1740** RPM motor
- **Roots 47 URAI –J-DSL** positive displacement rotary lobe vacuum pump with Blower manufacturer's warranty
- **Fliteway "Cyclonic Action" 82 Gallon Vertical** knockout tank, carbon steel with site gauge, 6" cleanout, and bottom drain.
- 4" **inlet**, with vacuum gauge, and sample port.
- 4" Premium 10 micron inline filter between tank and vacuum pump.
- Mini Magnehelic to monitor differential pressure across filter element.
- 2 ½"" Premium carbon steel discharge silencer with temperature gauge and Sample Port
- 2 ½" Averaging Pitot Tube Flow Sensor with Magnehelic Gauge on Discharge
- Vacuum relief valve on inlet side of pump, field adjustable
- Dilution valve with filter
- Explosion Proof Automatic Drain System
    - ½ HP Explosion Proof Pump
    - Three Float Switches
        - HHL
        - Pump On
        - Pump Off
    - Inlet Check Valve, and Wye Strainer
    - Discharge gate valve, check valve, sample port, and pressure gauge

- 4" Inlet Manifold with Two (2) 4" Legs with
    - Two (2) 4" Gate Valves
    - Two (2) Sample ports
    - Two (2) Vacuum Gauges

- Two (2) Fliteway VFD-85 Vapor Phase carbon Vessel with 250 lb Vapor phase carbon and 3" inlet and discharge installed in series with Valves and sample ports

- **Air Sparging System**

Fliteway Model FS5X3-R33 URAI –J-DSL rated for 25 to 80 ACFM at 7 PSIG

- **5 HP Explosion Proof 230/460 3 Phase 1740** RPM motor
- **Roots 33 URAI –J-DSL** positive displacement rotary lobe vacuum pump with Blower manufacturers warranty
- 10 micron filter stubbed through trailer wall with rain cap
- Mini Magnahelic to monitor differential pressure across filter element
- Discharge Silencer
  Bleed Valve with Filter/Silencer
- **Weighted Pressure relief valve** on discharge side of pump.
- High Dwyer Pressure Switch
- Discharge Check Valve
- Pressure Gauge
- Passive Finned Heat Exchanger mounted outside Building

- 2" Steel Discharge Manifold with Two (2) 1" Legs with
  - Two (2) 1" Gate Valves
  - Two (2) Pressure Gauges
  - Two (2) Rotometers

- **NEMA 4 Control Panel (240 VAC Three Phase)**

- NEMA 4 Box with inner panel
- 100 Amp Fused Disconnect
- 3 KVA Power Transformer
- Circuit breakers for branch circuit protection
  - Enclosure Heater
  - Enclosure Vent Fan
- Starters and overload protection for:
  - 10 HP SVE
  - ½ HP SVE Transfer Pump
  - 5 HP Air Sparge
- Three (3) HOA switches
  - SVE
  - SVE Transfer Pump
  - Air Sparge
- Two (2) Hour meter
- Program Timers for SVE and Air Sparge
- Run lights
- Two (2) Alarm Lights
  - SVE HHL
  - SVE Motor Fault
- One (1) Dual Intrinsically Safe Switch Repeater
- One (1) Intrinsically Safe Pump Controller
- Surge Protection
- Lightning Protection
- Control Box heater with thermostat
- GFI Receptacle
- UL Certification

- **Steel Framed Sheet metal Enclosure (Approximately 9' wide by 5' deep, by 6'high)**

  - Sheet metal Enclosure with hinged Access Panels
  - Roof Hatch for changing out carbon
  - Forklift pockets and lifting eyes
  - One (1) Layer 0f 1 ½" Acoustical Foam Insulation on Interior Walls
  - Vents
  - Explosion Proof Light with Switch
  - Explosion Proof Vent Fan with Thermostat
  - 1,800 Watt Explosion Proof Convection Heater with Thermostat
  - Exhaust Stack with Rain Cap
  - All Equipment Installed per Class 1, Div 2, Hazardous Location

  - **UL Inspection and Classification of Systems to meet NEC and UL Codes for Class 1, Div 2, Hazardous Location before shipment**

INTRODUCTION

This O&M manual is intended to serve as a handbook and guide for the initial start-up operation of your remediation equipment. A description of the process, various components, start-up, and troubleshooting procedure is included.

The O&M manual contains detailed step-by-step instructions in some instances, but only a general description in other cases. It is not possible to present all possible operating instructions in written form. Familiarity and experience with the equipment may provide a more desirable procedure than is outlined here.

It is imperative that this manual be read prior to start-up on equipment and that a copy of this manual remains with the equipment at all times.

It must be noted that no O&M manual or set of instructions can foresee all possible situations due to the myriad combinations of operating conditions possible. The services of an on-site technical consultant during start-up and initial operation of the remediation system is essential to prudent and safe operation. This O&M manual is furnished for informational purposes only and Fliteway Technologies, Inc. shall not be liable for the use of this manual or any of the information contained, in whole or in part.

SAFETY PRECAUTIONS

- Explosion Hazards

Hydrocarbon vapors are potentially combustible with air. Only qualified personnel should be allowed to work on or around this equipment.

- Electrical Equipment

Failure to observe these notices could result in damage to equipment.

- Stop the unit if any repairs or adjustments on or around the blower are required.

- Disconnect the blower unit from the power source, tank and lockout before working on the unit, this machine may be automatically controlled and may start at any time.

- Do not exceed the rated maximum speed shown on the nameplate.

- Do not operate unit if safety devices are not operating properly. Check periodically. Never bypass safety devices.

UNLOADING PROCEDURE

When off loading your equipment, consider the condition of the area and the weight of your equipment when choosing a means to off load it. If the ground is broken and uneven, a forklift with soft tires is better able to navigate the terrain than one with hard rubber tires. If the equipment if too heavy for a forklift, then a cherry picker of crane should be utilized. Your rental company will be able to help you determine the proper moving equipment for your job.

EQUIPMENT INSTALLATION

All equipment should be set on a level surface with easy access on all sides. All piping and utilities should be brought in by the least obtrusive path and kept protected to maintain a safe work environment.

The air discharge from the SVE blower is hot due to the blower compressing the air. Some of the heat generated by this compression is transferred to the system piping. Metal piping should be installed on the exhaust side of the SVE blower. Plastic piping can be damaged by the heat.

All electrical services should be wired according to the electrical prints supplied with the equipment. Your electrician should make all terminations and conduit runs to the equipment per the applicable NEC codes.

START-UP PROCEDURES

1) Upon receipt of unit look it over carefully. Look for broken or cracked switches or gauges. Report any damages to Fliteway Technologies, Inc., Inc. immediately.

2) Check oil level in blower. It should be at thread level at the threaded hole on lower side of blower (consult blower manual for directions).

3) Connect power to control panel or motor (consult wiring schematic).

4) Open all vacuum inlet valves when starting or stopping unit.

5) Jog motor to make sure it is turning in the proper direction (see arrow decal on blower). If motor rotates in the wrong direction, disengage power and reverse any two of the three incoming power leads.

SERIAL NUMBER	MODEL NUMBER	CUSTOMER/JOBSITE	DATE	QUOTE
9095R47I095981	FV1082X3-R47	TYREE BROS / 88 INGRAHAM STREET	9/1/09	Q13475R7
6469R33I095982	FS5X3-R33	TYREE BROS / 88 INGRAHAM STREET	9/1/09	Q13475R7
CPQ13475R7I095983	CPQ13475R7	TYREE BROS / 88 INGRAHAM STREET	9/1/09	Q13475R7
95BVSQ13475R7I095984	95BVS	TYREE BROS / 88 INGRAHAM STREET	9/1/09	Q13475R7

Q13475R7 - TYREE BROS. - 88 INGRHAM STREET

ITEM	MANUFACTURER	MODEL	FLITEWAY ASSIGNED SERIAL NUMBER	MANUFACTURER ASSIGNED SERIAL NUMBER
SVE SYSTEM	FLITEWAY	FV1082X3-R47	9095R47I095981	N/A
BLOWER	DRESSER ROOTS	47URAI-J-DSL-BL	N/A	0908990734
BLOWER MOTOR	WEG	01018XP3E215T	N/A	03JUN09 4064838243
DRAIN PUMP	GOULD	1ST1E7D4	N/A	BX727779
CARBON	TETRASOLV	VFD-85	N/A	H0603
CARBON	TETRASOLV	VFD-85	N/A	H0604
SPARGE SYSTEM	FLITEWAY	FS5X3-R33	6469R33I095982	N/A
BLOWER	DRESSER ROOTS	33 URAI-J-DSL-BL	N/A	0908990787
BLOWER MOTOR	WEG	00518XP3E184T	N/A	29MA109 1004613283
CONTROL PANEL	FLITEWAY	CPQ13475R7	CPQ13475R7I095983	N/A
9' X 5' X 6' ENCLOSURE	FLITEWAY	95BVS	95BVSQ13475R7I095984	N/A
VENT FAN MOTOR	BALDOR	M6002A	N/A	W0901051955

Warehouse 13 *** INDENTED B.O.M. REPORT *** Batch Qty. 1
From VQ13475R7 to VQ13475R7 Scrap/Yield OFF

Level	Seq	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
**Top Assembly*		13-VQ13475R7	FV1082X3-R47 TYREE 88 INGRAHAM	01 Soil Remediation	100.00	N			
1********	001	30-FTK-82-4	TANK, 82 GALLON 4" STANDARD	05 Fabrication	100.00	N		ea	1
2	001	00-PF-6 GP	GRIPPER PLUG, 6in	01 Soil Remediation		N		ea	1.000
2	002	00-ST-SM48X120-11	SHEET METAL 11 GA 48X120"	05 Fabrication		N		IN	120.000
2	003	00-PF-G-2 C	COUPLING, 2" GALV	05 Fabrication		N		ea	3.000
2	004	00-PF-2 HALF C	HALF COUPLING 2"	05 Fabrication		N		ea	3.000
2	005	00-PF-4 HALF C	HALF COUPLING 4"	05 Fabrication		N		ea	2.000
2	006	00-PF-1/4 HALF C	HALF COUPLING 1/4" BLACK	05 Fabrication		N		ea	2.000
2	007	00-ST-PIPEB4SCHD40	STEEL PIPE,BLACK,4 in,SCHED 40	05 Fabrication		N		FT	3.000
2	008	00-ST-PIPEB6SCHD40	STEEL PIPE,BLACK,6 in, SCHD40	05 Fabrication		N		FT	0.500
2	009	00-ST-AI2X2X1/8	ANGLE IRON, 2X2X1/8	05 Fabrication		N		FT	1.000
1	002	35-CA-VFD-85	VAPOR PHASE CARBON VESSEL 250#	01 Soil Remediation		N		EA	2.000
1	003	00-BL-RT-47URAI-J-	BLOWER 47URAI-J-DSL-V-BL VERTI	01 Soil Remediation		N		EA	1.000
1	004	00-EM-01018XP3E215	MOTOR 10HP 1800 RPM EXP 3Q	01 Soil Remediation		N		EA	1.000
1	005	00-MB-215T	MOTORBASE 215T ADJUSTABLE	01 Soil Remediation		N		EA	1.000
1	006	00-PU-BK90H	PULLEY, BK90H	01 Soil Remediation		N		ea	1.000
1	007	00-PU-H1 3/8	BUSHING, H, 1 3/8in	01 Soil Remediation		N		EA	1.000
1	008	00-PU-BK95H	PULLEY	01 Soil Remediation		N		EA	1.000
1	009	00-PU-H7/8	BUSHING, H, 7/8in	01 Soil Remediation		N		EA	1.000
1	010	00-BT-BX64	BELT	01 Soil Remediation		N		ea	1.000
1 ******	011	30-FIF-ILFV-2	INLINE FILTER 2"	05 Fabrication	100.00	N		ea	1
	001	00-ST-SM48X120-18	SHEET METAL 18GA CRS 48X120"	05 Fabrication		N		IN	12.000
2	002	00-ST-SM48X120-7G	SHEET METAL 48 X 120 X 7 GA HR	05 Fabrication		N		IN	7.000
2	003	00-ST-SM48X120-11	SHEET METAL 11 GA 48X120"	05 Fabrication		N		IN	7.000
2	004	00-IF-81-1063	FILTER ELEMENT ILFV 2,3,4, & C	05 Fabrication		N		EA	1.000
2	005	00-PF-4 HALF C	HALF COUPLING 4"	05 Fabrication		N		ea	1.000
2	006	00-PF-1/4 HALF C	HALF COUPLING 1/4" BLACK	05 Fabrication		N		ea	3.000
2	007	00-PF-2 HALF C	HALF COUPLING 2"	05 Fabrication		N		ea	2.000
1	012	00-SL-CB-2	SILENCER, CB-2 LITTLE HUMMER	01 Soil Remediation		N		EA	1.000
1	013	00-SL-DC31-3	SILENCER 3" COMPACT DESIGN	01 Soil Remediation		N		EA	1.000
1	014	04-WP-1ST1E7D4	WATER PUMP, GOULD 1HP 3PH EXP	01 Soil Remediation		N		EA	1.000
1	015	00-FS-4YM36	SWITCH, LIQUID LEVEL	01 Soil Remediation		N		EA	3.000
1	016	00-FM-DS-300-3	FLOW METER, 3IN PITOT TUBE, CO	01 Soil Remediation		N		EA	1.000
1	017	00-GU-2SQRT #22	MAGNEHELIC GAUGE 1.322"WC @ 20	01 Soil Remediation		N		EA	1.000
1********	018	30-FBK-MAGNEHELIC	BRACKET, MAGNEHELIC GAUGE	05 Fabrication	100.00	N		ea	1
2	001	00-ST-SM48X120-18	SHEET METAL 18GA CRS 48X120"	05 Fabrication		N		IN	18.000
1	019	00-GU-2-5020	GAUGE, MINIHELIC, 2-5020	01 Soil Remediation		N		EA	1.000
1	020	00-GU-SEC201L254C	GAUGE 0-30 PSI PIC 2-1/2" SS L	01 Soil Remediation		N		EA	1.000
1	021	00-GU-LP1-254-30	GAUGE 0-30" WC PRESSURE PIC	01 Soil Remediation		N		EA	1.000
1	022	00-GU-SEC201L254A	GAUGE 0-30" HG VAC	01 Soil Remediation		N		EA	8.000
1	023	00-GU-T20025B5	GAUGE TEMP 25 - 125 DEG WINTER	01 Soil Remediation		N		EA	1.000
1	024	00-GU-L1110S	GAUGE TEMPERATURE 0-250 F MARS	01 Soil Remediation		N		EA	1.000
1********	025	30-FRV-2	RELIEF VALVE 2"	05 Fabrication	100.00	N		EA	1
2	001	00-PF-G-2X1/4 RB	REDUCER BUSHING 2 X 1/4 GALV	05 Fabrication		N		ea	1.000
2	002	00-ST-SM60X120-11G	SHEET METAL 60 X 120 X 11 GA	05 Fabrication		N		IN	2.000
1	026	00-PF-CL-40C-AL	COUPLER, HOSE SHANK 4" ALUMINU	01 Soil Remediation		N		EA	6.000
	027	00-PF-G-1/8 CN	NIPPLE 1/8" CLOSE	01 Soil Remediation		N		EA	1.000
1	028	00-PF-B-1/4X1/8-90	BARB 1/4 X 1/8 90 BRASS MALE E	01 Soil Remediation		N		EA	4.000
1	029	00-PF-B-1/4X1/4	BARB 1/4 X 1/4 BARB X NPT MALE	01 Soil Remediation		N		EA	8.000

Warehouse 13 *** INDENTED B.O.M. REPORT *** Batch Qty. 1
From VQ13475R7 to VQ13475R7 Scrap/Yield OFF

Level	Seq	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
1	030	00-PF-B-1/4X1/4-90	BARB 1/4 X 1/4 90 BRASS MALE E	01 Soil Remediation		N		EA	11.000
1	031	00-VA-1/4 BV	BALL VALVE 1/4"	01 Soil Remediation		N		EA	11.000
1	032	00-PF-G-1/4 CN	NIPPLE, CLOSE, 1/4" GALV	01 Soil Remediation		N		ea	11.000
1	033	00-PF-G-1/4 C	COUPLER GALV 1/4"	01 Soil Remediation		N		ea	1.000
1	034	00-PF-G-1/4 T	TEE GALV. 1/4"	01 Soil Remediation		N		ea	11.000
1	035	00-CV-1	CHECK VALVE 1"	01 Soil Remediation		N		EA	1.000
1	036	00-PF-G-1 CN	NIPPLE, 1" GALV CLOSE	01 Soil Remediation		N		ea	6.000
1	037	00-VA-1 GATE	GATE VALVE 1"	01 Soil Remediation		N		EA	1.000
1	038	00-PF-G-1 T	TEE, 1" GALV	01 Soil Remediation		N		ea	1.000
1	039	00-PF-G-1 U	UNION, 1" GALV	01 Soil Remediation		N		ea	1.000
1	040	00-PF-G-1X1/4 RB	REDUCER BUSHING, 1 X 1/4 GALV	01 Soil Remediation		N		ea	1.000
1	041	00-PF-WYE 1	WYE STRAINER 1"	01 Soil Remediation		N		EA	1.000
1	042	00-PS-1823-80	PRESSURE SW DIFF, 9-85" WC,	01 Soil Remediation		N		EA	1.000
1	043	00-PF-G-1-1/2X1 RB	REDUCER BUSHING GALV 1-1/2X1"	01 Soil Remediation		N		ea	1.000
1	044	00-PF-G-2 CN	NIPPLE, GALV. 2" CLS	01 Soil Remediation		N		ea	10.000
1	045	00-PF-G-2 90	ELBOW, GALV. 2" 90	01 Soil Remediation		N		ea	1.000
1	046	00-VA-2 GATE	GATE VALVE 2"	01 Soil Remediation		N		EA	1.000
1	047	00-PF-G-2 P	PLUG, 2" GALV	01 Soil Remediation		N		ea	4.000
1	048	00-PF-G-2 T	TEE, GALV. 2"	01 Soil Remediation		N		ea	8.000
1	049	00-PF-G-2X1/4 RB	REDUCER BUSHING 2 X 1/4 GALV	01 Soil Remediation		N		ea	5.000
1	050	00-PF-G-2X1/2 RB	REDUCER BUSHING GALV 2 X 1/2"	01 Soil Remediation		N		ea	3.000
1	051	00-PF-G-2X1 RB	REDUCER BUSHING, 2X1, GALV	01 Soil Remediation		N		ea	1.000
1	052	00-PF-G-3 CN	NIPPLE, GALV. 3" CLOSED	01 Soil Remediation		N		EA	3.000
1	053	00-PF-G-3 90	ELBOW, GALV. 3" 90	01 Soil Remediation		N		ea	4.000
1	054	00-PF-G-3 T	TEE, GALV. 3"	01 Soil Remediation		N		ea	1.000
1	055	00-PF-G-3 U	UNION GALV 3"	01 Soil Remediation		N		ea	2.000
1	056	00-PF-G-3X2 RB	REDUCER BUSHING GALV. 3 X 2	01 Soil Remediation		N		ea	1.000
1	057	00-PF-G-3X4 N	NIPPLE GALV 3X4	01 Soil Remediation		N		ea	1.000
1	058	00-PF-G-3X7 N	NIPPLE 3 X 7 EXT	01 Soil Remediation		N		EA	1.000
1	059	00-PF-G-4X2 RB	REDUCER BUSHING, 4X2 GALV	01 Soil Remediation		N		ea	2.000
1	060	00-ST-G-PIPE-3	PIPE, GALV. 3"	01 Soil Remediation		N		FT	3.000
1	061	00-HO-210HFG-1	HOSE SUCTION 1" CLEAR RIBBED	01 Soil Remediation		N		FT	6.000
1	062	00-PF-PVC1413-010	BARB 1" 90, (1"BARB X 1"BARB)	01 Soil Remediation		N		ea	3.000
1	063	00-PF-PVC1436-010	BARB 1" MALE PIPE THREAD	01 Soil Remediation		N		ea	1.000
1	064	00-PF-PVC435-010	ADAPTER FEMALE 1" PVC SCH 40 S	01 Soil Remediation		N		ea	1.000
1	065	00-PF-PVC436-010	ADAPTER MALE 1in	01 Soil Remediation		N		ea	1.000
1	066	00-PF-PVC-1 BV	BALL VALVE 1" PVC THD TU EPDM	01 Soil Remediation		N		ea	1.000
1	067	00-PF-PVC406-020	ELBOWS, 2" 90	01 Soil Remediation		N		ea	3.000
1	068	00-PF-PVC436-020	ADAPTER, 2in MALE	01 Soil Remediation		N		EA	2.000
1	069	00-PF-PVC457-020	UNION 2, SXS BUNA O-RING SEAL	01 Soil Remediation		N		ea	1.000
1	070	00-PF-PVC401-040	TEE 4" SCH 40	01 Soil Remediation		N		ea	1.000
1	071	00-PF-PVC406-040	ELBOW 4" 90 DEG SCH 40	01 Soil Remediation		N		ea	6.000
1	072	00-PF-PVC457-040	UNION 4" PVC	01 Soil Remediation		N		ea	2.000
1	073	00-VA-18252	VALTERRA SLIDE VALVE 4"	01 Soil Remediation		N		EA	2.000
1	074	00-PF-PVCS40PVC1	PIPE 1" SCH 40	01 Soil Remediation		N		FT	6.000
1	075	00-PF-PVCS40PVC2	PIPE, 2" SCH 40	01 Soil Remediation		N		FT	4.000
1	076	00-PF-PVCS40PVC4	PIPE 4" SCHED 40	01 Soil Remediation		N		FT	25.000
1	077	00-ST-SQT1.5X1/8	SQUARE TUBE, 1-1/2X1-1/2X1/8	01 Soil Remediation		N		FT	3.000
1	078	00-EX-IMC3	CONDUIT,IMC,3IN,(STACK)	01 Soil Remediation		N		FT	10.000
1	079	00-EH-B22SH10FTGAL	UNISTRUT 1-5/8X1-5/8 12GA HOLE	01 Soil Remediation		N		FT	2.000

Warehouse 13 *** INDENTED B.O.M. REPORT *** Batch Qty. 1
From VQ13475R7 to VQ13475R7 Scrap/Yield OFF

Level	Seq	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
1	080	00-EH-B2017	CLAMP PIPE 4"	01 Soil Remediation		N		ea	4.000
1	081	00-HO-300EPDM-2	HOSE SUCTION 2"	01 Soil Remediation		N		FT	24.000
1	082	00-PF-CL-20C-AL	COUPLER HOSE SHANK 2" AL	01 Soil Remediation		N		EA	12.000
1	083	00-PF-CL-CP11	CLAMP - 5/8" W GS	01 Soil Remediation		N		EA	12.000
1	084	00-PF-CL-SA20X20AL	SPOOL ADAPTER 2" X 2" AL	01 Soil Remediation		N		EA	3.000
1	085	00-PF-CL-CF200E-AL	ADAPTER HOSE SHANK 2" AL	01 Soil Remediation		N		EA	1.000

** END OF REPORT **

Warehouse 16 *** INDENTED B.O.M. REPORT *** Batch Qty. 1

From SQ13475R7 to SQ13475R7 Scrap/Yield OFF

Level	Seq	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
**Top Assembly*		16-SQ13475R7	FS5X3-R33 TYREE 88 INGRAHAM ST	01 Soil Remediation	100.00	N			
1	001	00-BL-RT-33URAI-J-	BLOWER 33URAI-J-DSL-V-BL VERTI	01 Soil Remediation		N		EA	1.000
1	002	00-EM-00518XP3E184	MOTOR WEG 5HP EXP 3Q 1800 RPM	01 Soil Remediation		N		EA	1.000
1	003	00-MB-184T	MOTORBASE 184T ADJUSTABLE	01 Soil Remediation		N		ea	1.000
1	004	00-PU-AK64H	PULLEY, H, AK64H	01 Soil Remediation		N		EA	1.000
1	005	00-PU-H1 1/8	BUSHING, H, 1 1/8in	01 Soil Remediation		N		EA	1.000
1	006	00-PU-AK69H	PULLEY	01 Soil Remediation		N		EA	1.000
1	007	00-PU-H3/4	BUSHING, H, 3/4in	01 Soil Remediation		N		EA	1.000
1	008	00-BT-AX59	BELT AX59	01 Soil Remediation		N		EA	1.000
1********	009	30-FIF-ILFV-2	INLINE FILTER 2"	01 Soil Remediation	100.00	N		ea	1
2	001	00-ST-SM48X120-18	SHEET METAL 18GA CRS 48X120"	05 Fabrication		N		IN	12.000
2	002	00-ST-SM48X120-7G	SHEET METAL 48 X 120 X 7 GA HR	05 Fabrication		N		IN	7.000
2	003	00-ST-SM48X120-11	SHEET METAL 11 GA 48X120"	05 Fabrication		N		IN	7.000
2	004	00-IF-81-1063	FILTER ELEMENT ILFV 2,3,4, & C	05 Fabrication		N		EA	1.000
2	005	00-PF-4 HALF C	HALF COUPLING 4"	05 Fabrication		N		ea	1.000
2	006	00-PF-1/4 HALF C	HALF COUPLING 1/4" BLACK	05 Fabrication		N		ea	3.000
2	007	00-PF-2 HALF C	HALF COUPLING 2"	05 Fabrication		N		ea	2.000
1	010	00-SL-CB-2	SILENCER, CB-2 LITTLE HUMMER	01 Soil Remediation		N		EA	1.000
1	011	00-SL-US-1	SILENCER, UNIVERSAL, 1in ABSOR	01 Soil Remediation		N		EA	1.000
1	012	00-FM-VFCII-122EC	FLOW METER 5-50 SCFM 1" MALE N	01 Soil Remediation		N		EA	2.000
1	013	00-GU-2-5020	GAUGE, MINIHELIC, 2-5020	01 Soil Remediation		N		EA	1.000
1	014	00-PS-CS-30	PRESSURE SWITCH MERCOID, 1-30	01 Soil Remediation		N		ea	1.000
1	015	00-GU-SEC201L254B	GAUGE 0-15 PSI PIC	01 Soil Remediation		N		EA	3.000
1	016	00-GU-T20025B8	GAUGE TEMP WINTERS 0-250 -20/1	01 Soil Remediation		N		EA	1.000
1	017	00-VA-909861010524	1" WEIGHTED PRESS RELIEF, 15#	01 Soil Remediation		N		EA	1.000
1	018	00-HE-106-003-4	HEAT EXCHANGER 2" IPS STEEL 2"	01 Soil Remediation		N		EA	1.000
1	019	00-PF-B-1/4X1/4	BARB 1/4 X 1/4 BARB X NPT MALE	01 Soil Remediation		N		EA	1.000
1	020	00-PF-B-1/4X1/4-90	BARB 1/4 X 1/4 90 BRASS MALE E	01 Soil Remediation		N		EA	4.000
1	021	00-VA-1/4 BV	BALL VALVE 1/4"	01 Soil Remediation		N		EA	2.000
1	022	00-PF-G-1/4 CN	NIPPLE, CLOSE, 1/4" GALV	01 Soil Remediation		N		ea	4.000
1	023	00-PF-G-1/4 C	COUPLER GALV 1/4"	01 Soil Remediation		N		ea	1.000
1	024	00-PF-G-1/4 90	ELBOW, GALV. 1/4" 90	01 Soil Remediation		N		ea	1.000
1	025	00-PF-1/4 P	PLUG 1/4	01 Soil Remediation		N		ea	2.000
1	026	00-PF-G-1/4 T	TEE GALV. 1/4"	01 Soil Remediation		N		ea	3.000
1	027	00-PF-G-1/4X2 N	NIPPLE GALV NIPPLE 1/4 X 2"	01 Soil Remediation		N		ea	1.000
1	028	00-PF-G-1 CN	NIPPLE, 1" GALV CLOSE	01 Soil Remediation		N		ea	9.000
1	029	00-PF-G-1 90	ELBOW, 1" GALV	01 Soil Remediation		N		ea	4.000
1	030	00-VA-1 GATE	GATE VALVE 1"	01 Soil Remediation		N		EA	3.000
1	031	00-PF-G-2 CN	NIPPLE, GALV. 2" CLS	01 Soil Remediation		N		ea	10.000
1	032	00-PF-G-2 90	ELBOW, GALV. 2" 90	01 Soil Remediation		N		ea	6.000
1	033	00-PF-G-2 P	PLUG, 2" GALV	01 Soil Remediation		N		ea	1.000
1	034	00-PF-G-2 T	TEE, GALV. 2"	01 Soil Remediation		N		ea	4.000
1	035	00-PF-G-2 U	UNION, GALV. 2"	01 Soil Remediation		N		ea	4.000
1	036	00-PF-G-2X1 RB	REDUCER BUSHING, 2X1, GALV	01 Soil Remediation		N		ea	3.000
1	037	00-ST-G-PIPE-1	PIPE, GALV. 1in	01 Soil Remediation		N		FT	10.000
1	038	00-ST-G-PIPE-2	PIPE, GALV. 2"	01 Soil Remediation		N		FT	15.000
1	039	00-PF-PVC884-005	NIPPLE CLOSE 1" PVC SCH 80	01 Soil Remediation		N		ea	4.000
1	040	00-PF-PVC458-010	UNION 1" FPTXFPT BUNA O-RING S	01 Soil Remediation		N		EA	4.000
1	041	00-PF-PVC406-020	ELBOWS, 2" 90	01 Soil Remediation		N		ea	2.000

Warehouse 16 *** INDENTED B.O.M. REPORT *** Batch Qty. 1

From SQ13475R7 to SQ13475R7 Scrap/Yield OFF

Level	Seq.	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
1	042	00-PF-PVC436-020	ADAPTER, 2in MALE	01 Soil Remediation		N		EA	1.000
1	043	00-PF-PVCS40PVC2	PIPE, 2" SCH 40	01 Soil Remediation		N		FT	3.000
1	044	00-ST-SQT1.5X1/8	SQUARE TUBE, 1-1/2X1-1/2X1/8	01 Soil Remediation		N		FT	2.000
1	045	00-EH-B22SH10FTGAL	UNISTRUT 1-5/8X1-5/8 12GA HOLE	01 Soil Remediation		N		FT	2.000
1	046	00-EH-B2013	CLAMP PIPE 2"	01 Soil Remediation		N		ea	3.000

** END OF REPORT **

Warehouse 15 *** INDENTED B.O.M. REPORT *** Batch Qty. 1

From CQ13475R7 to CQ13475R7 Scrap/Yield OFF

Level	Seq	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
**Top Assembly*		15-CQ13475R7	CONTROL PANEL TYREE 88 INGRAHA	03 Electrical	100.00	N			
1	001	00-EB-C-SD363012	ENCLOSURE,HOFF	03 Electrical		N		EA	1.000
1	002	00-EB-C-MPK	KIT,HOFF,FOOT MTG,CONCEPT	03 Electrical		N		ea	1.000
1	003	00-EB-C-P3630	PANEL,HOFF	03 Electrical		N		EA	1.000
1	004	00-EB-C-SP3630	SWING PANEL,HOFF	03 Electrical		N		EA	1.000
1	005	00-EB-C-WHPTO	KIT,HOFF,PADLOCK,CONCEPT	03 Electrical		N		EA	1.000
1	006	00-EC-3AE11	HOUR METER,120V,ROUND,PANEL M	03 Electrical		N		ea	1.000
1	007	00-EC-6WU91	TRANSFORMER, 240/208/120 - 24V	03 Electrical		N		EA	1.000
1	008	00-EC-AAHC-30	HEATER, ANTI-CONDENSATION, 30W	03 Electrical		N		ea	1.000
1	009	00-EC-2A517	TIMER, DIEHL, 24 HR.	03 Electrical		N		EA	2.000
1	010	00-EC-PDS23100LPHB	DISCONNECT 100A 3P PDS2-3100-L	03 Electrical		N		EA	1.000
1	011	00-EC-TR100R	FUSE,100A,250V,RESTRICTED	03 Electrical		N		EA	3.000
1	012	00-EC-IC-105	SURGE SUPRESSOR,5A,CC(NEW)	03 Electrical		N		EA	1.000
1	013	00-EC-21008R	FUSE HOLDER,240V,100A,RESTR	03 Electrical		N		ea	1.000
1	014	00-EC-330T25S2D25	MOTOR STARTER, MANUAL 1.6-2.5	03 Electrical		N		EA	2.000
1	015	00-EC-330T25S2U16	MOTOR STARTER, MANUAL 10-16 AM	03 Electrical		N		EA	1.000
1	016	00-EC-330T25S2U32	MOTOR STARTER, MANUAL 25-32 AM	03 Electrical		N		EA	1.000
1	017	00-EC-330FA11S2S	CONTACT, FRONT MOUNTED 1 NO AN	03 Electrical		N		EA	5.000
1	018	00-EC-300S09N30D10	CONTACTOR 9 AMP 110V AC 1 NO	03 Electrical		N		EA	3.000
1	019	00-EC-300S18N30D10	CONTACTOR 18 AMP 110V AC 1 NO	03 Electrical		N		EA	1.000
1	020	00-EC-300S32N30D10	CONTACTOR 32 AMP 110V AC 1 NO	03 Electrical		N		EA	1.000
1	021	00-EC-300SFA10	CONTACT, AUXILLIARY FRONT MOUN	03 Electrical		N		EA	2.000
1	022	00-EC-RTE-P11AC120	TIMER	03 Electrical		N		ea	2.000
1	023	00-EC-RY4SU-AC120V	RELAY IDEC 4P CUBE	03 Electrical		N		ea	7.000
1	024	00-EC-GPRA-SB14U1	RELAY SOCKET,14-PIN,C3	03 Electrical		N		EA	7.000
1	025	00-EC-CBK-KLF1R	SWITCH,ABB,PILOTLITE,RED,22M	03 Electrical		N		ea	5.000
1	026	00-EC-CBK-KLFL1W	PILOT, 120V, LED, WHITE	03 Electrical		N		ea	1.000
1	027	00-EC-W22PB-FK-10	LIGHT -10/01 NON-ILL PUSH FLSH	03 Electrical		N		EA	2.000
1	028	00-EC-6HO08	SPR RET 3 POS. SW. ALL6KIT	03 Electrical		N		ea	3.000
1	029	00-EC-6HZ61	120V LITE MOD 3POS ALL6KIT	03 Electrical		N		ea	3.000
1	030	00-EC-6HZ06	N.O. CONT 3POS SW ALL6KIT	03 Electrical		N		ea	6.000
1	031	00-EC-PLMU-11	PHASE MONITOR	03 Electrical		N		ea	1.000
1	032	00-EC-5X852	TIMER,DAYTON,8 PIN SOCKET	03 Electrical		N		ea	3.000
1	033	00-EC-57.504.0055	TERMINALS, STANDARD GRAY	03 Electrical		N		ea	75.000
1	034	00-EC-07.311.0155	END BARRIER, WIELAND GRAY	03 Electrical		N		EA	2.000
1	035	00-EC-57.504.9055	TERMINAL BLOCKS DIN RAIL GROUN	03 Electrical		N		ea	4.000
1	036	00-EC-2S.523.9353	WIELAND END BARRIER,PLASTIC *	03 Electrical		N		EA	10.000
1	037	00-EC-98.300.1000	DIN RAIL 35X7.5, SLOT 6' LENGT	03 Electrical		N		ea	3.000
1	038	00-EC-6SC30A3	FUSE MOD, 3P, 30A/CC, GOULD RE	03 Electrical		N		EA	1.000
1	039	00-EC-ATQR 2	FUSE,2AMP, FERRAZ SHAWMUT	03 Electrical		N		ea	3.000
1	040	00-EC-1403404	DISTRIBUTION BLOCK,200 AMP,3P	03 Electrical		N		ea	1.000
1	041	00-EC-CC1403	DISTRIBUTION BLOCK COVER MARAT	03 Electrical		N		EA	1.000
1	042	00-EC-S201-K5	CIRCUIT BREAKER,5 AMP,SUPP,ABB	03 Electrical		N		ea	1.000
1	043	00-EC-S201-K15	CIRCUIT BREAKER 15A 1P	03 Electrical		N		EA	2.000
1	044	00-EC-S201-K30	CIRCUIT BREAKER 30 AMP 1P	03 Electrical		N		EA	1.000
1	045	00-EC-S202-K8	2P,8AMP CIR BRKR	03 Electrical		N		ea	1.000
1	046	00-EC-S202-K30	CIRCUIT BREAKER 30 AMP 2P	03 Electrical		N		EA	1.000
1	047	00-EC-GDL-2	FUSE, G/S, 2 AMP	03 Electrical		N		ea	3.000
1	048	00-EC-57.904.6355	FUSEHOLDER 1P GLASS ABB	03 Electrical		N		ea	3.000

Warehouse 15 *** INDENTED B.O.M. REPORT *** Batch Qty. 1

From CQ13475R7 to CQ13475R7 Scrap/Yield OFF

Level	Seq	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
1	049	00-EC-AG2403C	LIGHTNING ARRESTOR	03 Electrical		N		EA	1.000
1	050	00-EC-ISR-24V-100K	RELAY, 2-CH, 24V, 100K	03 Electrical		N		EA	3.000
1	051	00-EC-ISL-24V-100K	RELAY LATCHING, 24V, 100K	03 Electrical		N		EA	1.000
1	052	00-ED-G003K1KF1A03	TRANSFORMER 3KVA	03 Electrical		N		EA	1.000

** END OF REPORT **

Warehouse 38 *** INDENTED B.O.M. REPORT *** Batch Qty. 1
From ENQ13475R7 to ENQ13475R7 Scrap/Yield OFF

Level	Seq	Stock Code	Description	Category Code/Description	Scrap/ Yield %	Inst.	Lead Time	U/M	Usage Qty.
**Top Assembly*		38-ENQ13475R7	9X5 ENCLOSURE TYREE 88 INGRAHA	05 Fabrication	100.00	N			
1	001	00-ST-C7X12.25	CHANNEL, 7" X 12.25	05 Fabrication		N		FT	28.000
1	002	00-ST-SQT1.5X1/8	SQUARE TUBE, 1-1/2X1-1/2X1/8	05 Fabrication		N		FT	80.000
1	003	00-ST-SM60X120-16	SHEET METAL 60X120 16GA CRS	05 Fabrication		N		IN	960.000
1	004	00-ST-60X120X3/16	DIAMOND PLATE 60 X 120 X 3/16"	05 Fabrication		N		IN	120.000
1	005	00-ST-RT4X2X.25	STEEL,RECT TUBING, 4X2X1/4	05 Fabrication		N		FT	20.000
1	006	00-IN-FLT00005	FOAM 3"X24"x96" (2" PEAK, 1" B	01 Soil Remediation		N		EA	14.000
1********	007	01-K-VENTFAN-HZD	VENT FAN HAZARDOUS 1/4 HP 3Q 1	01 Soil Remediation	100.00	N		EA	1
2	001	00-EM-M6002A	MOTOR, BALDOR, 1/4 HP 3Q EXP 1	01 Soil Remediation		N		ea	1.000
2	002	00-EH-4C348	FAN BLADE 12"	01 Soil Remediation		N		EA	1.000
2	003	00-EH-94-0034	WIRE GUARD FOR EN122 PROPELLER	01 Soil Remediation		N		ea	1.000
2	004	00-EH-1C742	SHUTTER, WALL 12" GALV, OPENS/	01 Soil Remediation		N		ea	1.000
2	005	00-ST-SM48X120-11	SHEET METAL 11 GA 48X120"	01 Soil Remediation		N		IN	22.000
1	008	00-EX-1752K73	HEATER HZD 240 VAC 1800 WATTS	01 Soil Remediation		N		EA	1.000
1	009	00-EC-AG2403C	LIGHTNING ARRESTOR	01 Soil Remediation		N		EA	1.000
1	010	00-EX-KILLFXS-41C	SWITCH, TUMBLER 1/2" 1P2	01 Soil Remediation		N		EA	1.000
1	011	00-EX-VUXGG1100PX	LIGHT FIXTURE, KILLARK CL5.1 D	01 Soil Remediation		N		EA	1.000
1	012	00-EF-WH-1	HUB, 1/2" WEATHERPROOF CONDUIT	01 Soil Remediation		N		EA	6.000
1	013	00-EF-WH-2	HUB, 3/4" WEATHERPROOF CONDUIT	01 Soil Remediation		N		EA	1.000
1	014	00-EF-UNF-1	UNION, 1/2" MALE	01 Soil Remediation		N		EA	4.000
	015	00-EF-OLB-1M	CONDUIT LB 1/2" MALLEABLE	01 Soil Remediation		N		EA	5.000
	016	00-EF-OLB-2M	CONDUIT LB 3/4" MALLEABLE	01 Soil Remediation		N		EA	1.000
1	017	00-EF-OT-1M	1/2" LB "T" MALLEABLE	01 Soil Remediation		N		EA	1.000
1	018	00-EF-Y-1M	ELBOW, CAP 1/2" LBY	01 Soil Remediation		N		EA	5.000
1	019	00-EX-LBY-75	ELBOW,OZG,N7 CAPPED 3/4"	01 Soil Remediation		N		EA	1.000
1	020	00-EF-ENY-1M	FITTING, 1/2" SEALING	01 Soil Remediation		N		EA	9.000
1	021	00-EF-ENY-2M	FITTING, 3/4" SEALING	01 Soil Remediation		N		EA	1.000
1	022	00-EX-IMC-1/2	CONDUIT IMC 1/2"	01 Soil Remediation		N		FT	45.000
1	023	00-EH-B22SH10FTGAL	UNISTRUT 1-5/8X1-5/8 12GA HOLE	01 Soil Remediation		N		FT	3.000
1	024	00-EH-B52SH10FTGAL	STRUT 3/4" W/ SLOTS	01 Soil Remediation		N		FT	7.000
1	025	00-EF-1/2-UA	CONDUIT, FLEX 1/2"	01 Soil Remediation		N		FT	30.000
1	026	00-EH-ANAUAGRY-34	CONDUIT, FLEX 3/4"	01 Soil Remediation		N		FT	3.000
1	027	00-EF-K0501	FITTING, 1/2" STRAIGHT LIQUIDT	01 Soil Remediation		N		EA	8.000
1	028	00-EF-K05041	FITTING, 1/2" 45 LIQUIDTITE	01 Soil Remediation		N		EA	10.000
1	029	00-EF-K05091	FITTING, 1/2 90 LIQUIDTITE	01 Soil Remediation		N		EA	14.000
1	030	00-EF-K0751	FITTING, 3/4" STRAIGHT LIQUIDT	01 Soil Remediation		N		EA	1.000
1	031	00-EF-K07591	FITTING, 3/4 90 LIQUIDTITE	01 Soil Remediation		N		EA	1.000
1	032	00-EX-CPP25020501	COND 1/2" CLOSE NIPPLE	01 Soil Remediation		N		EA	20.000
1	033	00-EX-CPP25020701	COND 3/4" CLOSE NIPPLE	01 Soil Remediation		N		EA	3.000
1	034	00-EF-3/4X1/2 RB	REDUCER BUSHING 3/4" X 1/2"	01 Soil Remediation		N		EA	2.000
1	035	00-EX-OZGRB322S	REDUCER BUSHING, 1"X3/4" (ELEC	01 Soil Remediation		N		EA	1.000
1	036	00-EH-B2008	CLAMP PIPE 1/2"	01 Soil Remediation		N		ea	8.000
1	037	00-EH-3MU96	THERMOSTAT,HEATER,(480 VOLT IS	01 Soil Remediation		N		EA	1.000
1	038	00-EH-3MU97	THERMOSTAT, EXHAUST FAN 3Q	01 Soil Remediation		N		EA	1.000
1	039	00-PF-1/2 P	PLUG,1/2 ,NPT	01 Soil Remediation		N		ea	7.000

END OF REPORT **

CLASSIFIED UL

STATIONARY UNIT FOR COMMERCIAL USE
IN ACCORDANCE WITH THE FOLLOWING CODES OR STANDARDS
IN COMPLIANCE WITH 2008 NEC

ISSUE NO. 1002

UNIT SERIAL NO. 95BVSQ13475R71095984

MANUFACTURED BY Fliteway Technologies, Inc.
2129 East Birchwood Ave.
Cudahy, WI 53110

DATA PLATE

Fliteway Technologies, Inc.
2129 East Birchwood Ave.
Cudahy, WI 53110

Serial Number –95BVSQ13475R71095984

Wiring – Insulated conductors in IMC and EMT and Liquid Tight

Main Disconnect – 100 Amp, 240 VAC Three Phase, 3 Wire, 60 Hz

Quantity of Circuits Provided - 3

Factory Installed Appliances- 3

Appliance	Manufacture	Model Number
Motor	WEG	00518XP3E184T
Motor	WEG	01018XP3E215T
Motor	Baldor	BY220512

Field Completed Electrical Constructions Subject to Inspection by Local Authority-

1. Connection and bonding of electrical Service.
2. Working clearance at Industrial control panel.

The interior of this trailer is intended for use as a Class1, Division 2, Group D hazardous location and is not intended for storage.

For processing materials with ignition temperature not less than T2 (300C/572F) temperature code.

If ignition temperature of materials processed exceeds 80% of the fixture temperature rating, then fixture must be replaced with a UL Listed - Class I, Division I, Group D fixture.

File : E225974

ENCLOSED INDUSTRIAL CONTROL PANEL

Fliteway Technologies, Inc.
2129 E. Birchwood Ave. - Cudahy, WI 53110

240 Volts – 3 Phase 3 Wire Power - 60 Hz
Full Load Amps : 84 amps
Largest Motor : 10 Hp
Drawing No : CPQ13475R771095983
Enclosure : NEMA TYPE 4

Short circuit current __10_kA rms symmetrical,
230 V maximum

LISTED
ENCLOSED INDUSTRIAL CONTROL PANEL
RELATING TO HAZARDOUS LOCATIONS
WITH INTRINSICALLY SAFE CIRCUIT EXTENSIONS
No. BG - 900259

FLITEWAY TECHNOLOGIES, INC.

SVE SYSTEM TEST RUN AND DATA SHEET

12/10/2009

FLITEWAY PROJECT	Q13475R7			
CUSTOMER	TYREE BROS			
JOB NAME	88 INGRAHAM STREET			
UNIT MODEL NUMBER	FV1082X3-R47			
UNIT SERIAL NUMBER	9095R471095981			
SET POINT CONDITION	130 TO 182 ACFM @ 12" HG PULLING			
SITE POWER	240 VOLTS	60 HZ	3 PHASE	4 WIRE

TEST DATA

ACTUAL BLOWER RPM	
MOTOR AMP DRAW @ SET POINT CONDITION	

	MOTOR	BLOWER	INLET FILTER	TRANSFER PUMP MOTOR
MANUFACTURER	WEG	ROOTS	FLITEWAY	GOULD
MODEL	01018XP3E215T	47 URAI-J-DSL-BL	ILFV-2	1ST1E7D4
SERIAL NO	03JUN09 4064838243	908990734	N/A	BX727779
HP	10	N/A	N/A	1
RPM	1800	N/A	N/A	3450
FRAME	215T	N/A	N/A	N/A
PULLEY SIZE	BK90H	BK95H	N/A	N/A
BUSHING TYPE	H1-3/8	H7/8	N/A	N/A
BELT	N/A	BX64	N/A	N/A
VOLTAGE	N/A	N/A	N/A	N/A
PHASE	1Ø	N/A	N/A	3Ø

12/10/2009

FLITEWAY TECHNOLOGIES, INC.
SPARGE TEST RUN AND DATA SHEET

FLITEWAY PROJECT	Q13475R7			
CUSTOMER	TYREE BROS.			
JOB NAME	88 INGRAHAM STREET			
UNIT MODEL NUMBER	FS5X3-R33			
UNIT SERIAL NUMBER	FS5X3-R33			
SET POINT CONDITION	25 TO 80 ACFM @ 7 PSIG			
SITE POWER	460 VOLTS	60 HZ	3 PHASE	4 WIRE

TEST DATA

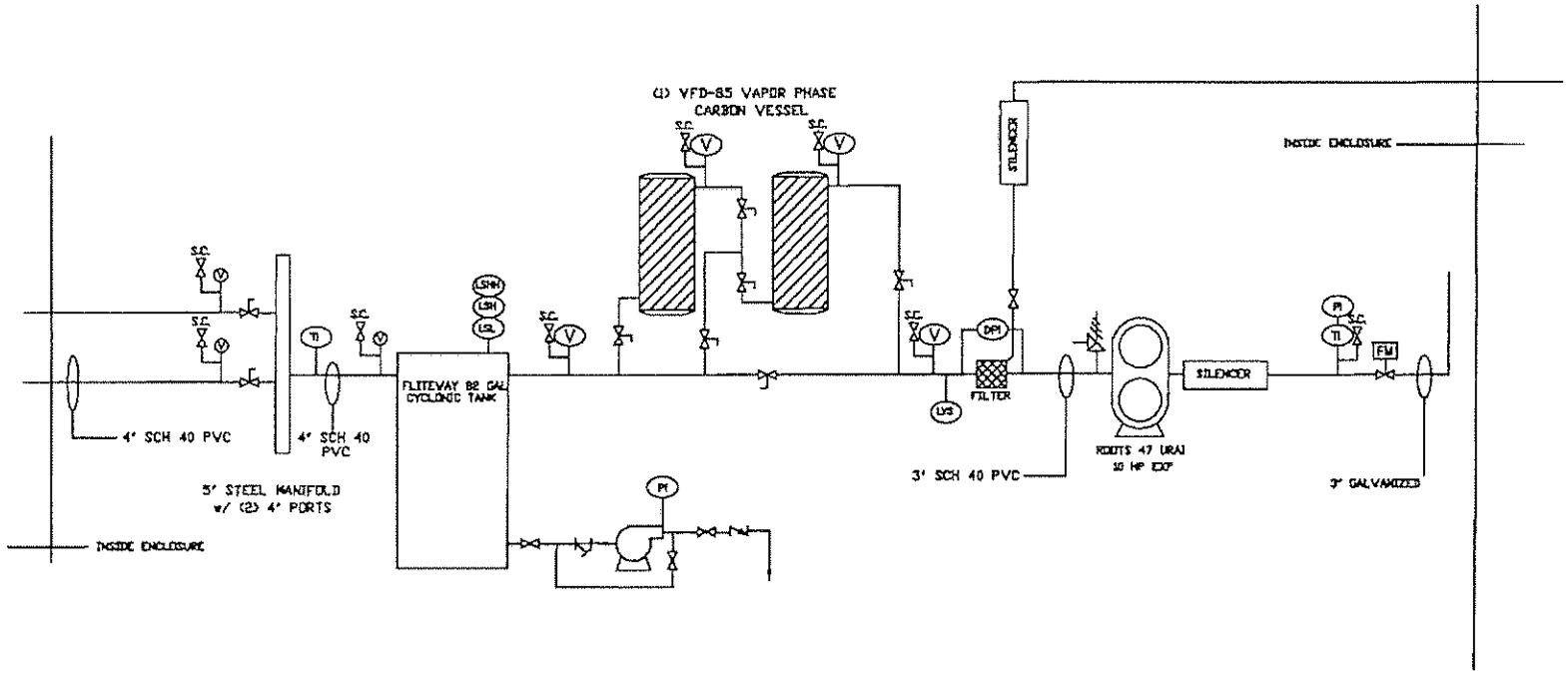
MOTOR AMP DRAW @ SET POINT CONDITION				
	BLOWER MOTOR	**BLOWER**	**INLET FILTER**	
MANUFACTURER	WEG	DRESSER ROOTS	FLITEWAY	
MODEL	00518XP3E184T	33URAI-J-DSL-BL	ILFV-2	
SERIAL NO	29MA109 1004613283	908990787	N/A	
HP	5	N/A	N/A	
RPM	1800	N/A	N/A	
FRAME	184T	N/A	N/A	
PULLEY SIZE	AK64H	AK69H	N/A	
BUSHING TYPE	H1-1/8	H3/4	N/A	
BELT	N/A	AX59	N/A	
VOLTAGE	N/A	N/A	N/A	
PHASE	3Ø	N/A	N/A	

Fliteway Technologies, Inc.

Soil Vapor Extraction System

2129 East Birchwood Ave. Cudahy, WI 53110

(414) 483-5600 1-800-236-3580 FAX (414) 483-1957



- GATE VALVE
- SAMPLE CONNECTION/PORT
- CHECK VALVE
- BALL VALVE
- WYE STRAINER
- AVERAGING PITOT FLOW SENSOR (WITH GAUGE)
- VACUUM TRANSMITTER
- RELIEF VALVE

- PRESSURE INDICATOR
- DIFFERINTIAL PRESSURE INDICATOR
- LEVEL SWITCH HIGH-HIGH LEVEL
- LEVEL SWITCH HIGH LEVEL
- LEVEL SWITCH LOW LEVEL
- TEMPERATURE INDICATOR
- PRESSURE INDICATOR
- VACUUM INDICATOR
- LOW VAC SWITCH

APPROVED BY _____

DATE _____

Fliteway Technologies, Inc
2129 E. Birchwood Ave.
Cudahy, WI 53110
414.483.5600 414.483.1957

4/8/08

SVE PROCESS AND INSTRUMENTATION DIAGRAM

TYREE BROTHERS

SIZE	FSCM NO.	DWG NO.
		Q13475 Rev 3

SCALE NONE

SHEET 1 OF 1

Company: Fliteway Technologies, Inc.
Address: 2129 East Birchwood Ave., Cudahy, WI 531109
414-428-5600 / 414-483-1957
Contact: William E, Diehl
Dated : 07/28/2009
Customer: Tyree Brothers
Project: Q13475 SVE Blower at 130 ACFM

ROOTS BLOWER PERFORMANCE SUMMARY : Program Version 1.4 Release Date 31/03/2004

AMBIENT CONDITIONS:

Gas	AIR	
Relative Humidity	36%	
Molecular Weight	28.81	
k-Value	1.395	
Specific Gravity	.994	
Ambient Temperature	68	deg F
Ambient Pressure	14.65	PSIA
Elevation	100	feet

STANDARD CONDITIONS:

Pressure	14.7	PSIA
Temperature	68	deg F
Relative Humidity	36	%

INPUT CONDITIONS:

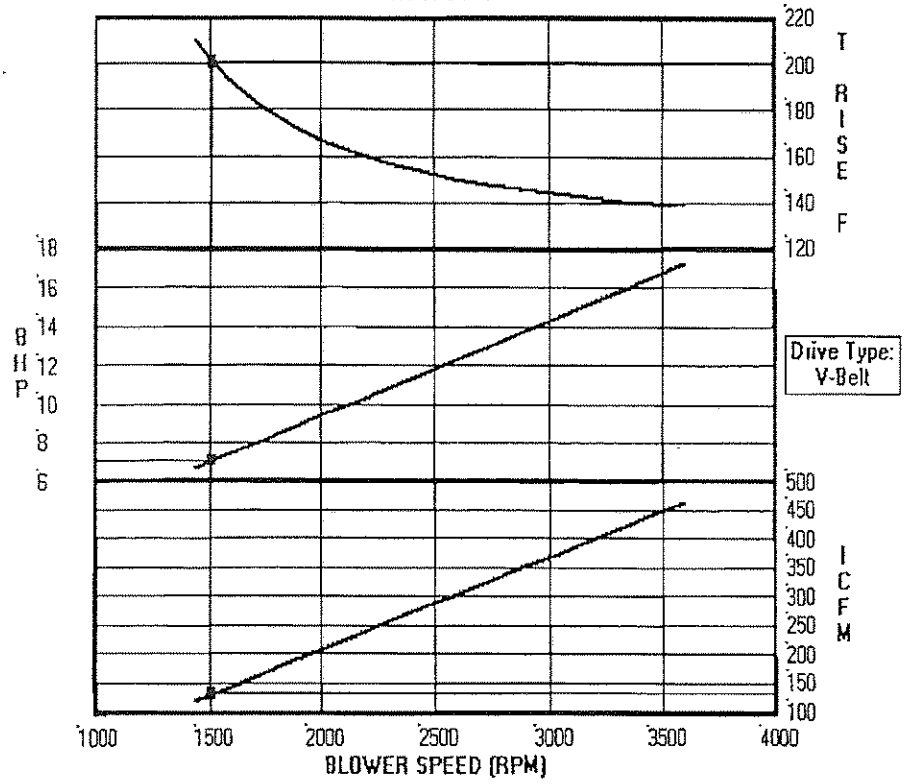
Actual Volume	131	ICFM +/-10 %
Standard Volume	74	SCFM
Mass/Weight Flow	6	#/min +/-10 %
System Inlet Pressure	12	in Hg Vac
Inlet Pressure Loss	0.5	PSI
Blower Inlet Pressure	8.28	PSIA
System Discharge Pressure	14.65	PSIA
Discharge Pressure Loss	0.3	PSI
Blower Discharge Pressure	14.95	PSIA
Inlet Temperature	68	deg F

SELECTED UNIT DETAIL:

Model	47	URAI-J-DSL
Speed	1511	RPM 42%
Blower Differential Pressure	6.67	PSI 91%
Power at Blower Shaft	7.0	BHP +/- 4%
Temperature Rise	201	deg F 89%
Discharge Temperature	269	deg F
Discharge Volume	100	ACFM
Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Power at the relief valve Setting	NO RELIEF VALVE SPECIFIED	
Temp. Rise at the Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Discharge Temp At Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Gear Tip Speed	1584	FPM
V-Belt: Est. B10 Brg Life:	316867	hours
Coupling: Est. B10 Brg Life:	316867	hours
Est. Free Field Noise @ 1 m.	79.5	dBa
CFR	0.1595	
Weight	141	lbs.
Shaft Dia.	0.875	in.
Min. Sheave Dia.	5	in.
Inlet/Disch Conn.	3T	

47 URAI-J-DSL: Variable Speed Performance

Dresser ROOTS



Drive Type: V-Belt

Enter a new Speed

Recalc

Close Form

Print Curve

You must press the Print Screen keyboard button before the Print Curve Button.

```
INLET CONDITIONS: AIR
                  RH = 36.00%, MW = 28.81, k = 1.395, Tin = 68 deg F
          DESIGN: Speed = 1511 RPM
                  System Inlet P = 12 in Hg Vac, Inlet P Loss = 0.5 PSI
                  System Disch P = 14.65 PSIA, Disch P Loss = 0.3 PSI
```

CUSTOMER: Tyree Brothers
PROJECT: Q13475 SVE Blower at 130 ACFM

ESTIMATED NOISE LEVEL

TYPICAL BLOWER PACKAGE WITH PREMIUM GRADE SILENCERS

Customer: Tyree Brothers

Unit: 47 URAI-J-DSL

Blower RPM: 1511

Delta-P (PSI): 6.7

Noise (dBa): 79.5

Octave Band	Sound Pressure Level (dB)
31.5	64.5
63.0	64.5
125	71.5
250	75.5
500	78.5
1000	74.5
2000	71.5
4000	67.5
8000	64.5
16000	49.5

NOTE: 1) Above are average "Free Field" sound level estimates at 1 meter from a single operating unit.

2) Due to environmental influences beyond ROOTS' control, these levels cannot be guaranteed on jobsite.

3) Premium Grade Silencers are assumed.

Company: Fliteway Technologies, Inc.
Address: 2129 East Birchwood Ave., Cudahy, WI 531109
414-428-5600 / 414-483-1957
Contact: William E, Diehl
Dated : 07/28/2009
Customer: Tyree Brothers
Project: Q13475 SVE Blower at 182 ACFM

ROOTS BLOWER PERFORMANCE SUMMARY : Program Version 1.4 Release Date 31/03/2004

AMBIENT CONDITIONS:

Gas	AIR	
Relative Humidity	36%	
Molecular Weight	28.81	
k-Value	1.395	
Specific Gravity	.994	
Ambient Temperature	68	deg F
Ambient Pressure	14.65	PSIA
Elevation	100	feet

STANDARD CONDITIONS:

Pressure	14.7	PSIA
Temperature	68	deg F
Relative Humidity	36	%

INPUT CONDITIONS:

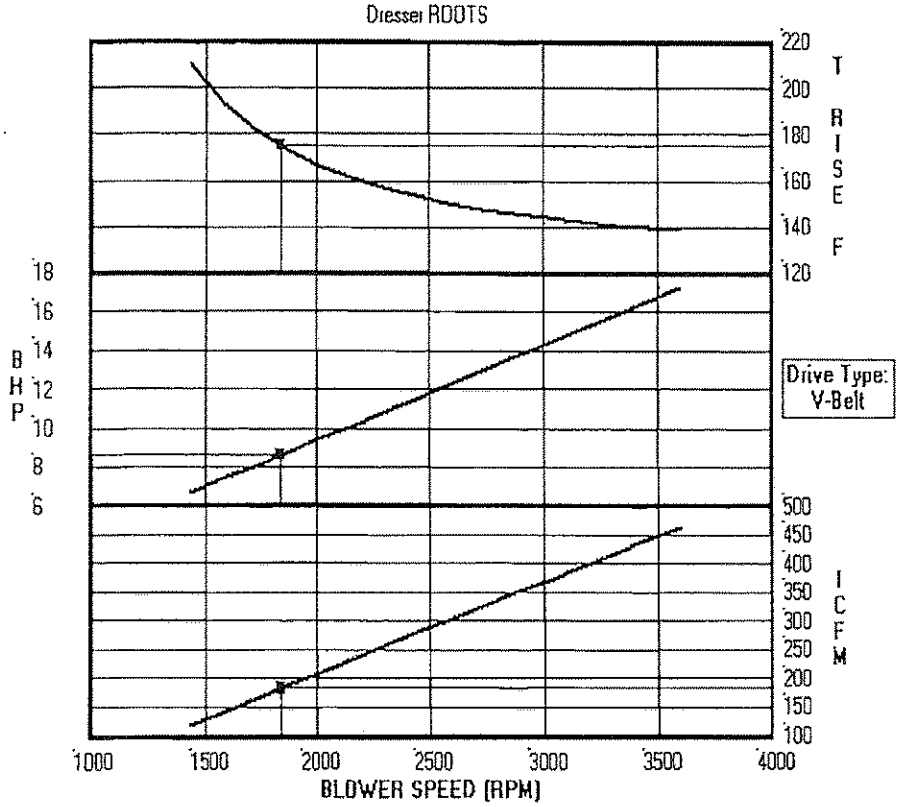
Actual Volume	183	ICFM +/-7 %
Standard Volume	103	SCFM
Mass/Weight Flow	8	#/min +/-7 %
System Inlet Pressure	12	in Hg Vac
Inlet Pressure Loss	0.5	PSI
Blower Inlet Pressure	8.28	PSIA
System Discharge Pressure	14.65	PSIA
Discharge Pressure Loss	0.3	PSI
Blower Discharge Pressure	14.95	PSIA
Inlet Temperature	68	deg F

SELECTED UNIT DETAIL:

Model	47	URAI-J-DSL
Speed	1835	RPM 51%
Blower Differential Pressure	6.67	PSI 91%
Power at Blower Shaft	8.6	BHP +/- 4%
Temperature Rise	175	deg F 78%
Discharge Temperature	243	deg F
Discharge Volume	134	ACFM
Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Power at the relief valve Setting	NO RELIEF VALVE SPECIFIED	
Temp. Rise at the Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Discharge Temp At Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Gear Tip Speed	1923	FPM
V-Belt: Est. B10 Brg Life:	260919	hours
Coupling: Est. B10 Brg Life:	260919	hours
Est. Free Field Noise @ 1 m.	82.2	dBa
CFR	0.1595	
Weight	141	lbs.
Shaft Dia.	0.875	in.
Min. Sheave Dia.	5	in.
Inlet/Disch Conn.	3T	

47 URAI-J-DSL: Variable Speed Performance

Dresser ROOTS



Drive Type: V-Belt

Enter a new Speed

Recalc

Close Form

Print Curve

You must press the Print Screen keyboard button before the Print Curve Button

```
INLET CONDITIONS: AIR
                  RH = 36.00%, MW = 28.81, k = 1.395, Tin = 68 deg F
          DESIGN: Speed = 1835 RPM
                  System Inlet P = 12 in Hg Vac, Inlet P Loss = 0.5 PSI
                  System Disch P = 14.65 PSIR, Disch P Loss = 0.3 PSI
```

CUSTOMER: Tyree Brothers
PROJECT: Q13475 SVE Blower at 182 ACFM

ESTIMATED NOISE LEVEL

TYPICAL BLOWER PACKAGE WITH PREMIUM GRADE SILENCERS

Customer: Tyree Brothers

Unit: 47 URAI-J-DSL

Blower RPM: 1835

Delta-P (PSI): 6.7

Noise (dBa): 82.2

Octave Band	Sound Pressure Level (dB)
31.5	67.2
63.0	67.2
125	74.2
250	78.2
500	81.2
1000	77.2
2000	74.2
4000	70.2
8000	67.2
16000	52.2

NOTE: 1) Above are average "Free Field" sound level estimates at 1 meter from a single operating unit.

2) Due to environmental influences beyond ROOTS' control, these levels cannot be guaranteed on jobsite.

3) Premium Grade Silencers are assumed.

Nr.:

Date: 20 - May, 08

DATA SHEET

Customer: Q13475 Rev 3 SVE Motor

Motor line: **EXPLOSION PROOF - UL**

Rated Output	: 10.0 HP (cv)	Duty cycle	: S1
Frame	: 215T	Altitude	: 1000 m.a.s.l
Poles	: 4 Poles	Ambient temperature	: 40 °C
Frequency	: 60 Hz	Degree of protection	: IP54
Full load speed	: 1760 rpm	Slip	: 2.22 %
Voltage	: 208-230/460 V	No load current	: 12.0/6.00 A
Full load current	: 25.8/12.9 A	Locked rotor time	: 7 s
Service factor	: 1.15	Moment of inertia	: 1.0119 sq.ft.lb
Locked rotor amps	: 194/96.8 A	Aprox. weight	: 132 lb
Locked rotor current (Il/In)	: 7.50 - Code J	Noise level	: 61 dB(A)
Insulation class	: F		
Temperature rise	: 80 K		
Full load torque	: 29.4 ft.lb		
Locked rotor torque	: 230 %		
Breakdown torque	: 300 %		
Design	: A		

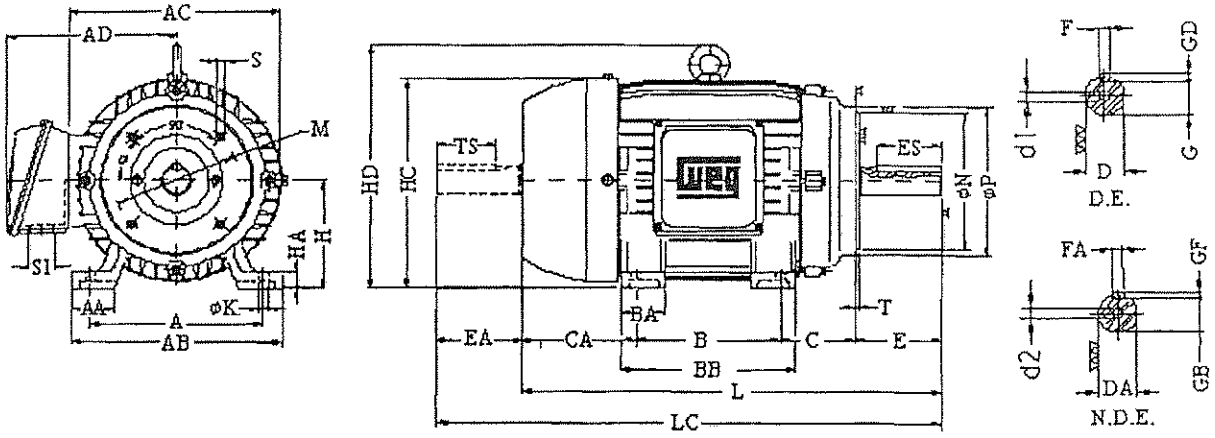
Performance under load

Load	cos ø	Efficiency(%)
100 %	0.84	86.9
75 %	0.78	85.0
50 %	0.67	83.6

	Bearings	Regreasing int.	Grease amount
D.E.	6308-ZZ	---	---
N.D.E.	6207-ZZ	---	---

NOTE:

DRAWING AND DIMENSIONS



2E	2F	H	BA	A	B	C	D
8.500	7.000	0.406	3.500	9.765	9.312	19.593	5.250
G	**J**	**K**	**O**	**P**	**T**	**Width**	**Depth**
0.750	2.000	2.359	10.364	10.250	2.682	0.312	0.156
key length	**N-W**	**U**	**AB**	**AA**	**d1**		
2.375	3.375	1.375	9.015	NPT 1"	A4		

Performed: Checked:

* Note: The values shown are subject to change without prior notice

EXPLOSION PROOF - UL

Standard features:
-UL approved - FILE E87848
Division I Class I Groups C and D
Division I Class II Groups F and G (143T-326T)
Division I Class II Group F (364T-586/7T)
-Temperature code: T4 (Frames 143T up to 326T)
T3C (Frames 364T up to 586/7T)
-Cast iron frame
-Squirrel cage rotor/Aluminum die cast
-Enclosure: TEFC - XP
-Design A
-Degree of protection: IP 54
-Ball bearings (roller bearings - 404T and up for 4, 6 and 8 poles)
-Insulation: Class F
-Service factor: 1.15
-Temperature rise: Class B (80 K)
-Dimensions according to NEMA standard
-Continuous duty (S1)
-Ambient temperature: 40°C (104°F)
-Altitude:1000 m (3300 ft)
-1045 carbon steel shaft (4140 for roller bearing motors)
-Mounting: F1
-Stainless steel nameplate AISI 316
-Painting: synthetic enamel alkyd resin base
-Regreasable bearing system (frame 364 and up)
-Thermostat NC (1 per phase)
-NPT thread terminal box
-Double VPI (364 - 587)
-Non sparking fan

Certification List
Laboratory: UNDERWRITERS LABORATORIES INC. - UL - USA

Line: Explosion Proof

File Number: E87848

Standards: UL 674

Certification Characteristics
1. EXT 143/5T up to 324/6T, max 50 hp, max. 600 V,
50 Hz, 60 Hz
Division I Class I Groups C and D
Division I Class II Groups F and G

2. EXT 364/5T up to 586/7T, max 400 hp, max. 600 V,
50 Hz, 60 Hz
Division I Class I Groups C and D
Division I Class II Groups F
Division I Class II Groups G - 364/5 up to 505 (Service Factor 1.0)

Optional:
-Flanged motor C - 143 up to 504
-Flanged motor D - 143 up to 445

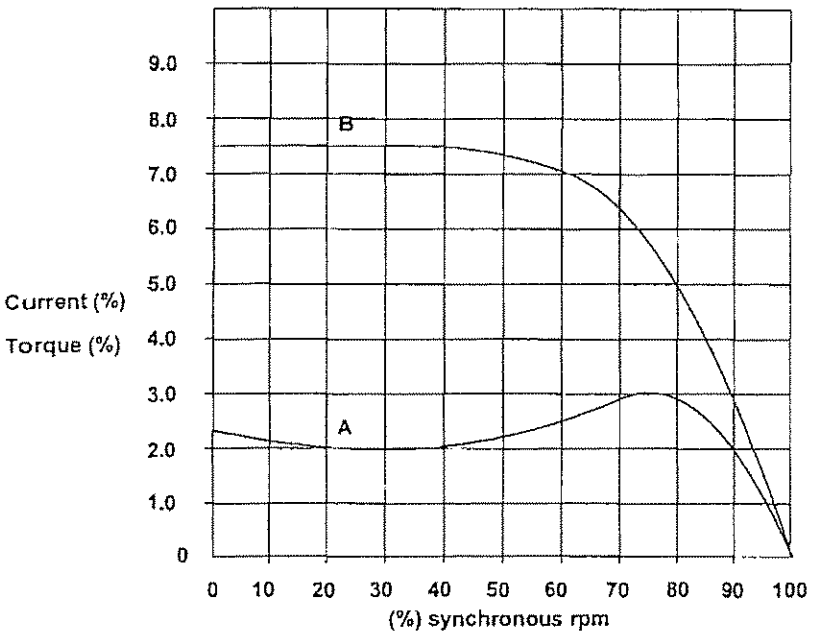
Optional on request:
-Ball bearings (404 and up - 4, 6 and 8 poles)
-Special shaft
-50 Hz

Date: 20 - May, 08

Customer : Q13475 Rev 3 SVE Motor

Motor line: EXPLOSION PROOF - UL

TORQUE AND CURRENT CURVES

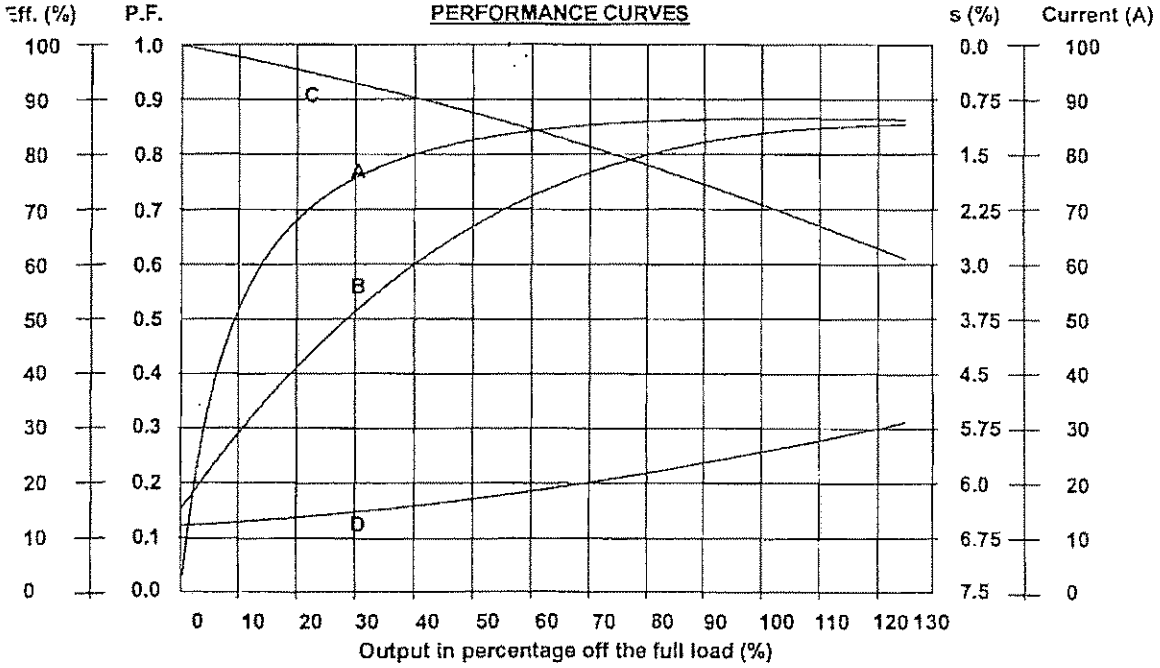


Output:	10.0 HP (cv)
Poles:	4 Poles
Frequency:	60 Hz
LRT (%):	2.3
BDT (%):	3
Ip (%):	7.5
Voltage:	230 Volts

B - Current curve

A - Torque curve

PERFORMANCE CURVES



A - Efficiency

B - Power Factor

C - Slip

D - Current

rformed :	Checked :

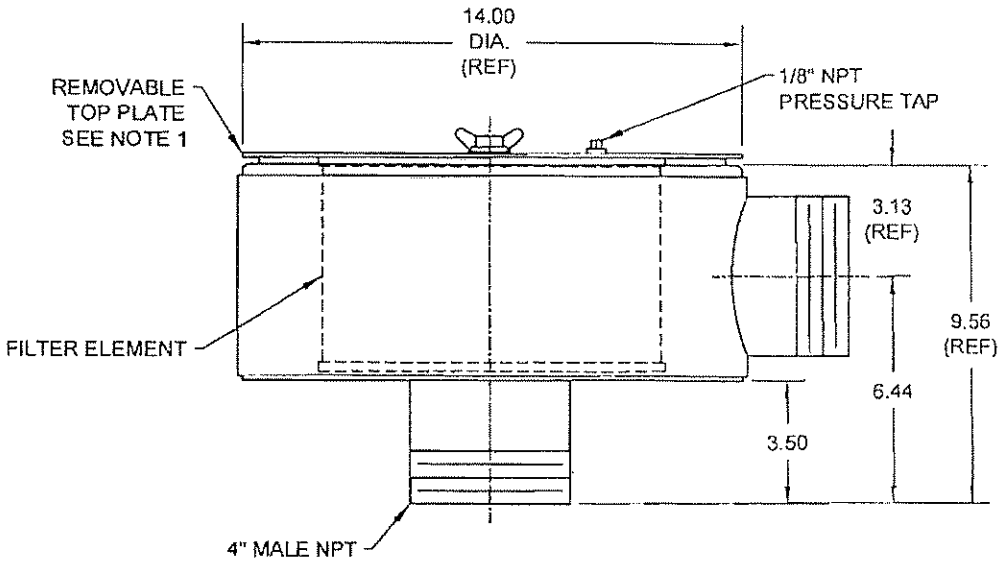
* Note: The values shown are subject to change without prior notice

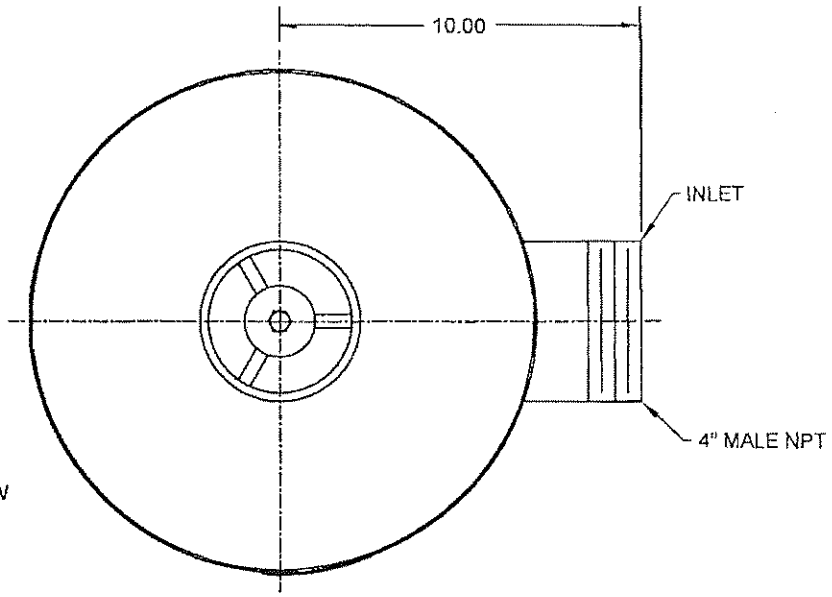
UNIVERSAL SILENCER
A FLEETGUARD/NELSON COMPANY
P.O. Box 411, Stoughton, Wisconsin 53589
608-873-4272 Fax 608-873-4298

STANDARD ILFV-4 INLINE AIR FILTER

DATE 02-05-02
SHEET OF
SCALE NTS

NO.	REVISION	DRAWN	APP'D
6	REDRAWN AND REVISED HEIGHT	DY 02-13-02	MB 02-14-02





NOTES:

1. CLEARANCE REQUIRED FOR FILTER ACCESS IS 7.00"

2. CLEAN OR REPLACE FILTER WHEN ΔP INCREASES 4" H_2O OVER CLEAN FILTER

3. NOMINAL CAPACITY: 500 CFM AT FLOW VELOCITY OF APPROX. 5,500 FT/MN

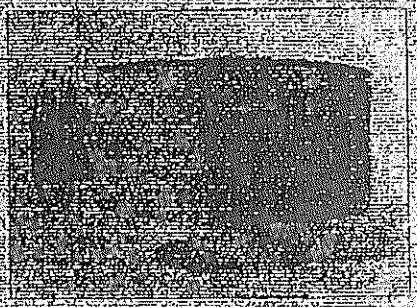
DIMENSIONAL DRAWING NO. 34-D04-AP

FILTER ELEMENTS INCLUDED (APPLIED ONLY TO ORDER FOR WHICH DRAWING IS CERTIFIED)				DIMENSIONS CERTIFIED FOR:
FILTER TYPE AND PART NUMBER	SINGLE STAGE	DUAL STAGE		
		PRE-FILTER	FINAL FILTER	
CC-4P (PAPER) 81-1063	1			P.O. NO:
				U.S. S.O. NO:
				BY
				DATE

REV.					
6	APPROX WT 25 LBS.	MATERIAL STEEL	DRAWN DY	DIMENSIONAL DRAWING NO. 34-D04-AP	REV. 6
	FINISH 88-1085 BLUE ENAMEL		CHECK MB 02-14-02		

PRODUCT SELECTION GUIDE

ILFV Series Vacuum Service Inline Air Filters



ILFV-4 filter

Built to Suit Your Application

- Designed for vacuum service application requirements.
- Optional design features for special production and assembly conditions are available.
- Special materials such as stainless steel are available.
- Interchangeable paper or felt elements, for desired filtration characteristics in the same housing.
- Filter restriction gauges are optional for all units.

Durable Construction

- Carbon steel construction with a high-quality blue semi-gloss enamel finish.
- Removable top plate for easy access to the filter element.

Immediate Availability

- Fast delivery for most sizes.

Advanced Design and Testing

- Our extensive in-house engineering, manufacturing, and testing facilities ensure optimized process, mechanical, and acoustic performance for your application.

Quality You Can Count On

Universal Silencer's new ILFV Series of inline air filters has been designed especially for vacuum applications as an economical alternative to our ILF Series. Choose from ten standard pipe sizes ranging from 2 in. to 14 in. and flow capacities ranging from 120 to 5900 CFM. Two choices of filter element media — pleated paper or pleated felt — are available to suit your specific application.

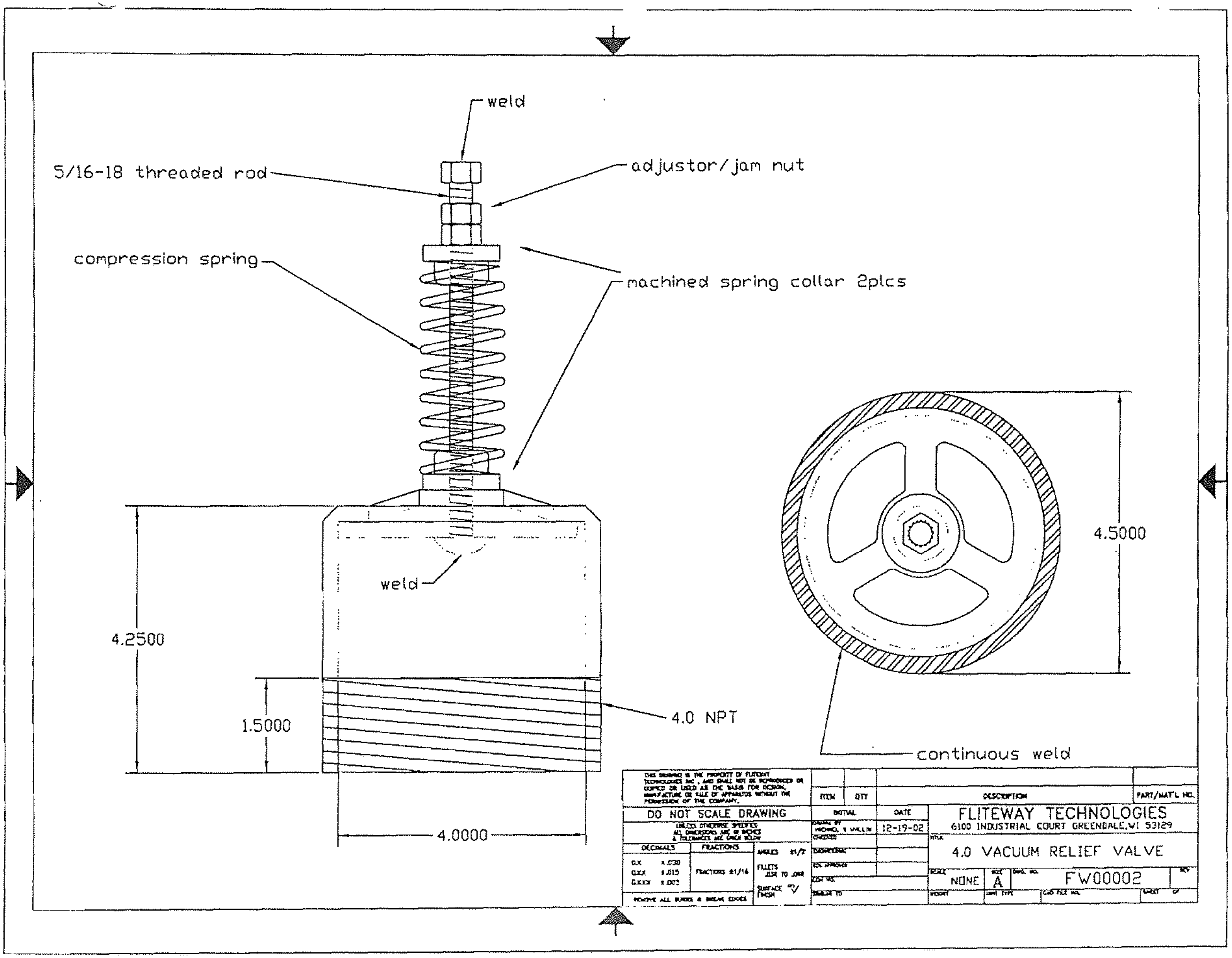
Universal's Filter Restriction Gauge provides a convenient, accurate means of monitoring filter pressure drop as the filter element becomes increasingly loaded with dirt. Inline air filters are standard with threaded connections for directly mounting the gauge. See product bulletin 81-1234 for a complete description.

DNV ANSI-RAB REGISTERED FIRM
ISO 9001 REGISTERED FIRM

40 YEARS OF PRODUCT EXCELLENCE

UNIVERSAL

UNIVERSAL SILENCER
A FLEETGUARD/NELSON COMPANY
Noise Control and Air Filtration

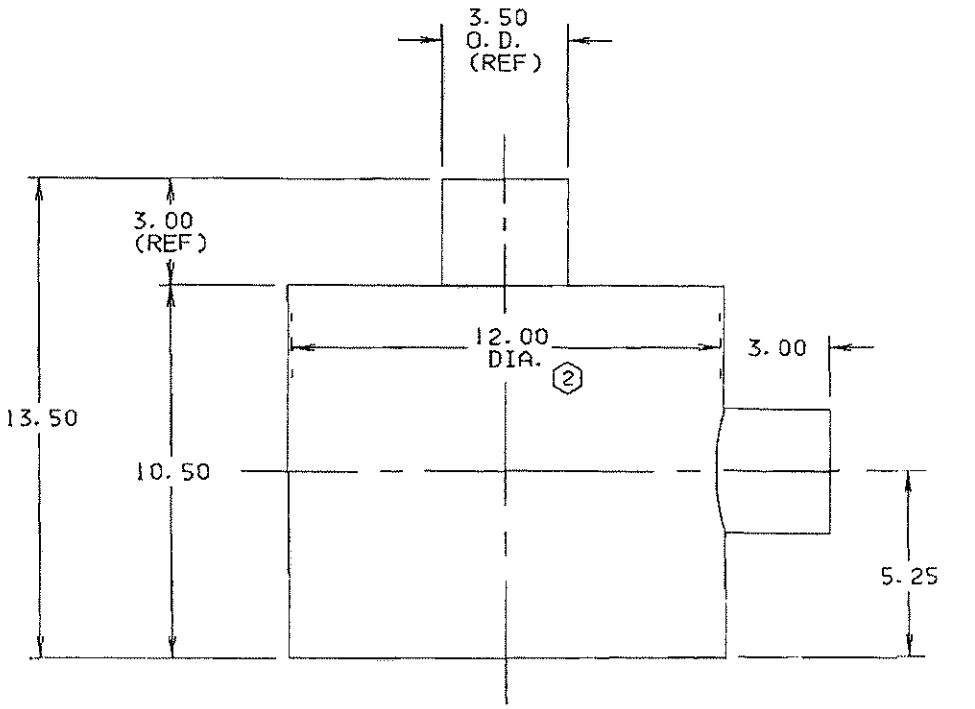

weld
5/16-18 threaded rod
adjustor/jam nut
compression spring
machined spring collar 2plcs
weld
4.2500
1.5000
4.0 NPT
4.0000
4.5000
continuous weld
DO NOT SCALE DRAWING
12-19-02
FLITEWAY TECHNOLOGIES
6100 INDUSTRIAL COURT GREENDALE,WI 53129
4.0 VACUUM RELIEF VALVE
NONE
A
FW00002

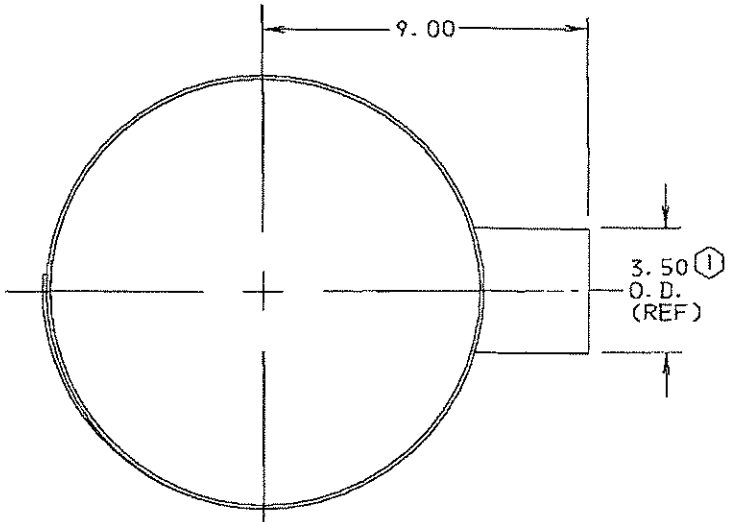
UNIVERSAL SILENCER
A FLEETGUARD/NELSON COMPANY
P.O. Box 411, Stoughton, Wisconsin 53589
608-873-4272 Fax 608-873-4298

STANDARD
CB-3 SILENCER

DATE 9-10-97
SHEET OF
SCALE NTS

NO.	REVISION	DRAWN	APP'D
2	ADDED DIA. TO 12.00 DIM.	7-7-98	BGL
1	UPDATED PER ECRHE00399.	2-02-98	DY





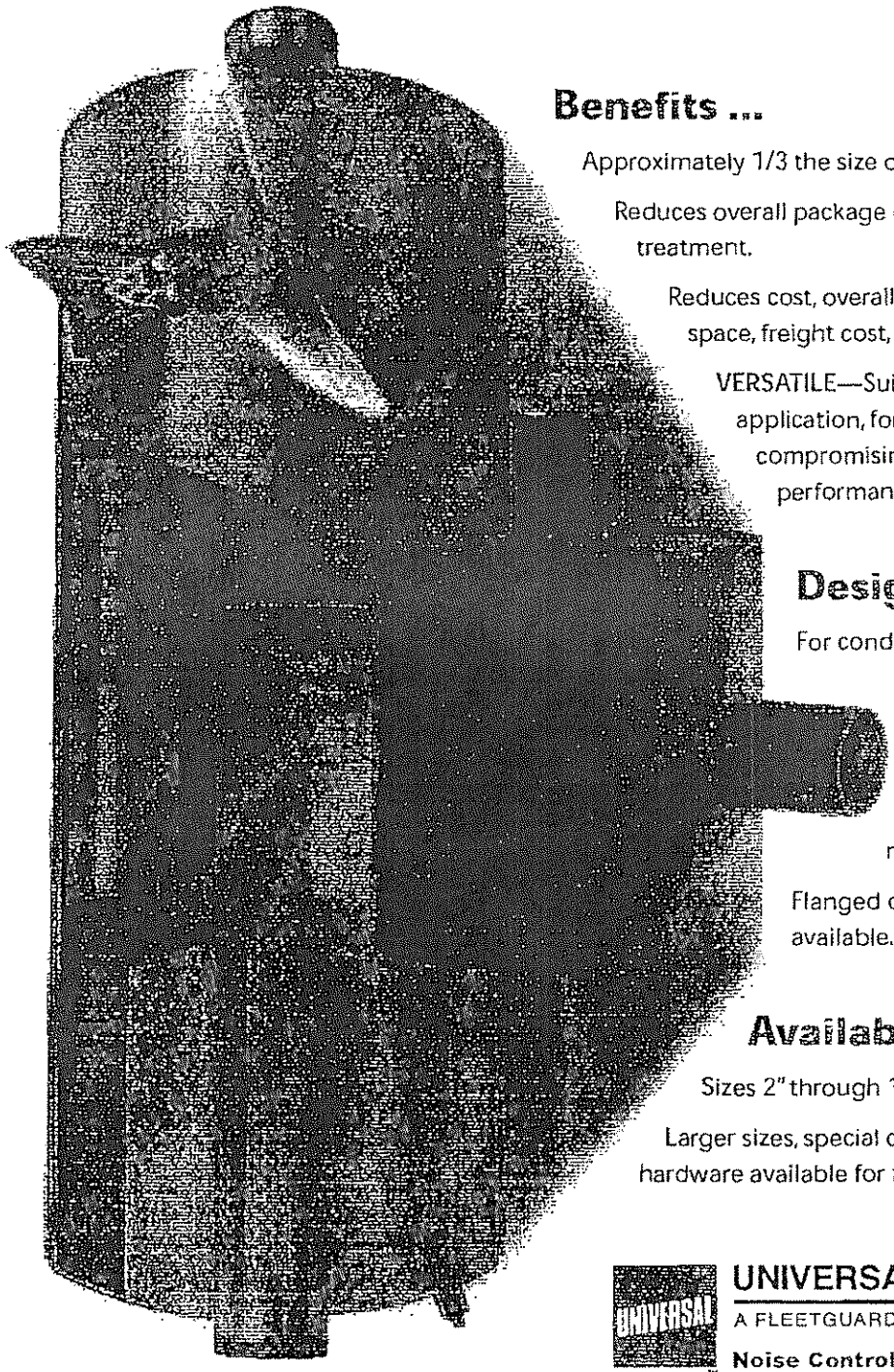
DIMENSIONAL DRAWING NO. 56-703-AA REV. 2

DIMENSIONS CERTIFIED FOR:
P.O. NO:
U.S. S.O. NO:
BY

APPROX WT 40 | MATERIAL STEEL | DRAWN PWT | DIMENSIONAL DRAWING NO. 56-703-AA | REV. 2
FINISH 88-0102 SHOP COAT PRIMER | CHECK DWO 7-7-98

CB 'LIL HUMMER™
Compact Blower Silencer

INLET OR DISCHARGE SILENCER
FOR POSITIVE DISPLACEMENT BLOWERS



Benefits ...

Approximately 1/3 the size of conventional blower silencers.

Reduces overall package noise without further acoustic treatment.

Reduces cost, overall package size, weight, storage space, freight cost, and damage.

VERSATILE—Suitable for inlet or discharge application, forward or reverse flow, all without compromising acoustic or pressure drop performance.

Design Advantages ...

For conditions up to 15 PSIG.

Internal pack material suitable for temperatures up to 325 degrees F.

Standard connections, plain nominal pipe ends.

Flanged or threaded connections available.

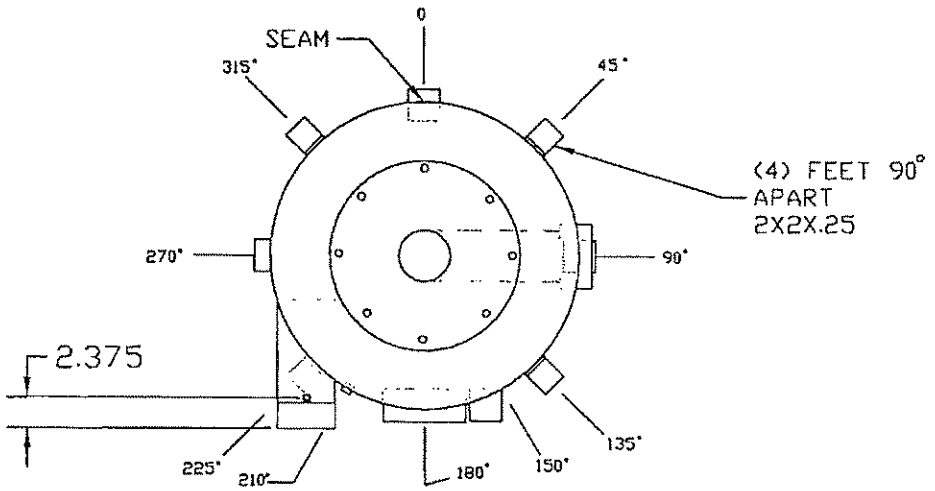
Availability ...

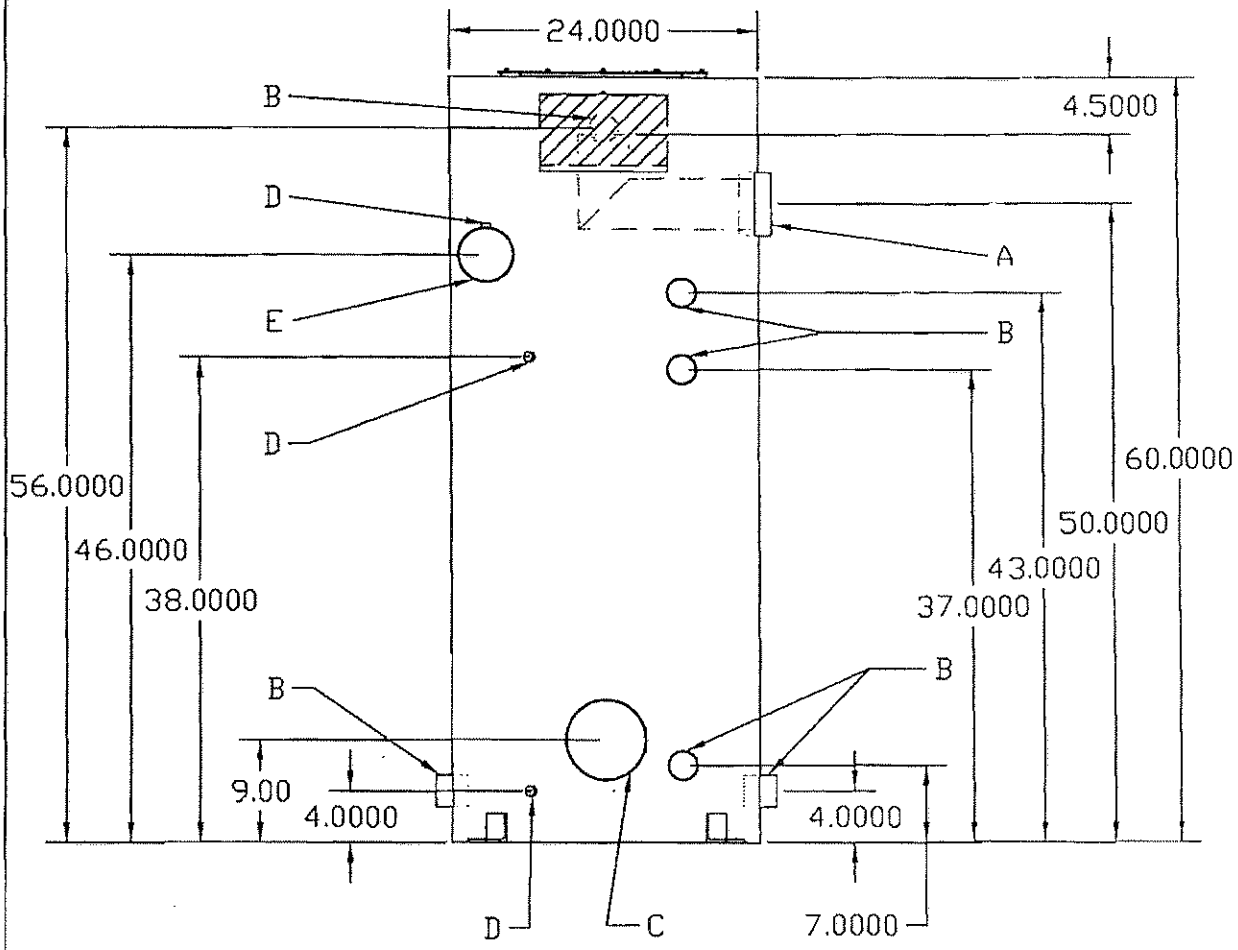
Sizes 2" through 12" stock.

Larger sizes, special connections, and mounting hardware available for fast delivery.

UNIVERSAL SILENCER
A FLEETGUARD/NELSON COMPANY
Noise Control and Air Filtration

UNIVERSAL SILENCER

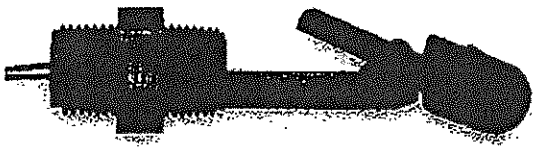




	PART NAME	QTY
A	4" NPT FEMALE WELDMENT	1
B	2" NPT FEMALE WELDMENT	6
C	6" CLEANOUT PORT	1
D	.25" FEMALE WELDMENT	3
E	4" NPT MALE WELDMENT	1

Fliteway Technologies Inc. 6901 Industrial Loop Greendale, WI 53129	117 GALLON CYCLONIC KNOCKOUT TANK	Part #: TK-V117-4NPT-W/D Quote #: Rev: Date: 7/06/00
	Drawn By: Tom Schneeberg	Approval

GRAINGER
FOR THE ONES WHO GET IT DONE



SWITCH,LIQUID LEVEL

Horizontal Liquid Level Switch, Float Material PBT, Maximum Power 30 Watts, Maximum Pressure 100 PSI, Maximum Temperature 105 Degrees Celsius, Stem Material PBT

Grainger Item #	4YM36
Price (ea.)	
Brand	MADISON
Mfr. Model #	M7700
Ship Qty.	1
Sell Qty. (Will-Call)	1
Ship Weight (lbs.)	0.01
Usually Ships	Today
Catalog Page No.	438

Additional Info

- **Liquid Level Controls**
- Used for alarm circuits that control motor starters, contactors, solenoids, and relays.
- Magnetically-activated dry reed switch has 22-gauge, 24" leads. User selectable, normally open or normally closed switch operation. No. 4YM30 control is normally open operation only.

- **Buna N PBT**
- Polybutylene Terephthalate switch is ideal for small diameter fuel and lubricating oil applications.
- Not for water over 65 DegreeC. Mounts inside or outside of tank. Not NSF approved.

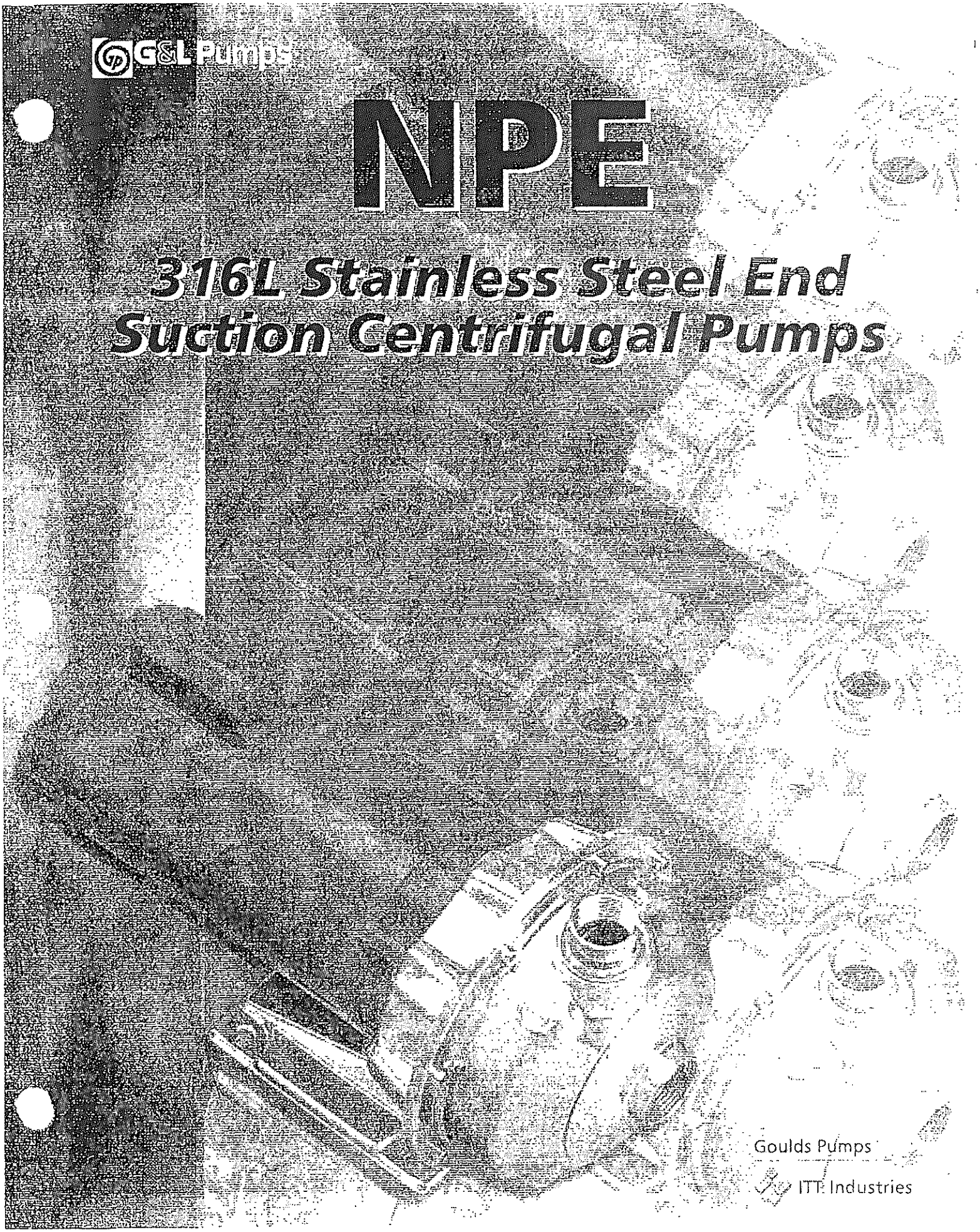
Tech Specs

- **Switch Type:** Horizontal, Magnetically Actuated Dry Reed Switch, Have 22 Gauge, 24 Inch Leads
- **Mounts:** Inside or Outside of Tank
- **Fitting Size (NPT):** 1/2 x 1/2
- **Float Material:** PBT

G&L Pumps

NPE

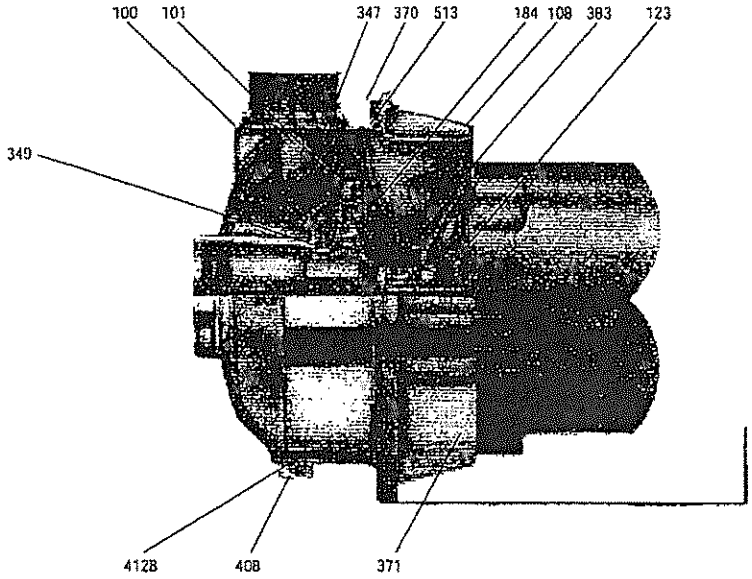
316L Stainless Steel End Suction Centrifugal Pumps

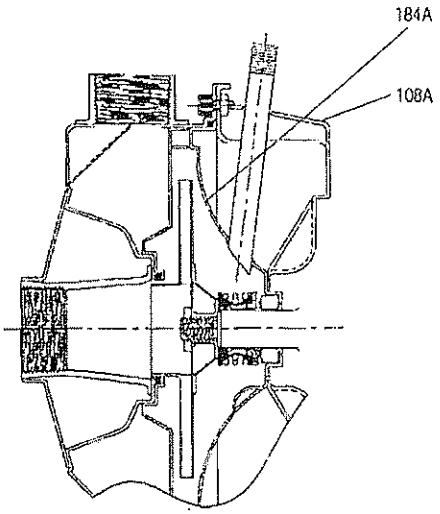


Goulds Pumps

ITT Industries

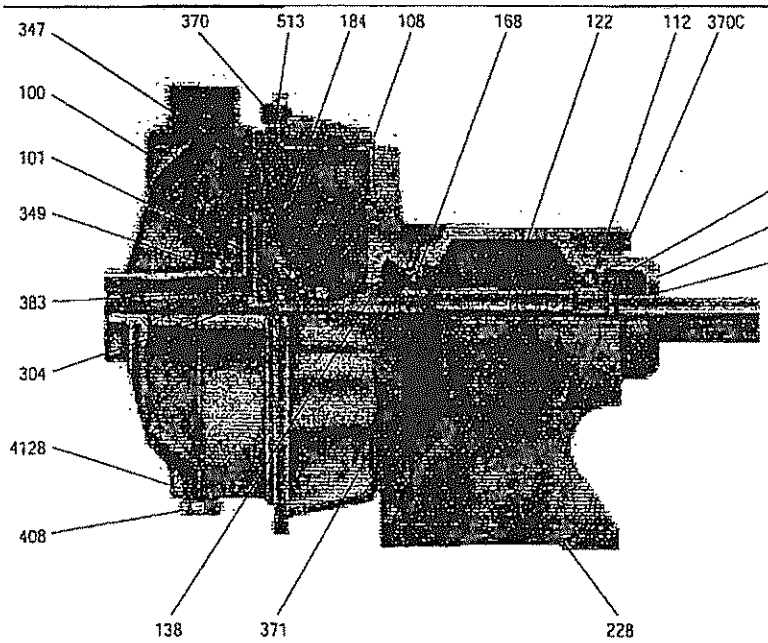
NPE CLOSE COUPLED MAJOR COMPONENTS: MATERIALS OF CONSTRUCTION

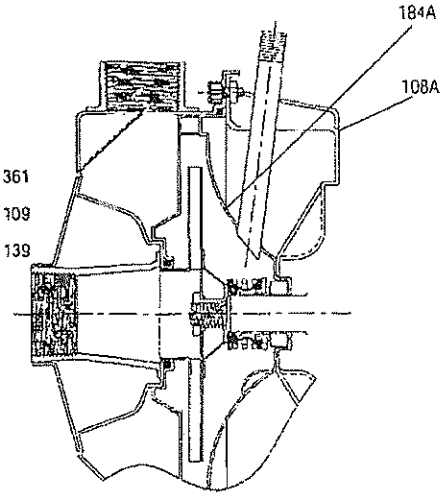




Seal Face Vent/Flush Option

NPE FRAME MOUNTED MAJOR COMPONENTS: MATERIALS OF CONSTRUCTION





Seal Face Vent/Flush Option

Item No.	Description	Materials
100	Casing	AISI 316 SS
101	Impeller	AISI 316 SS
108	Motor adapter	AISI 304 SS
108A	Motor adapter seal vent/flush	AISI 304 SS
109	Bearing cover	Cast iron
112	Ball bearing (outboard)	Steel
122	Shaft	AISI 316 SS
123	Deflector	BUNA-N
138	Lip-seal (inboard)	BUNA/steel
139	Lip-seal (outboard)	BUNA/steel
168	Ball bearing (inboard)	Steel
184	Seal housing	AISI 316 SS
184A	Seal housing seal vent/flush	AISI 316 SS
228	Bearing frame	Cast iron
304	Impeller locknut	AISI 316 SS
347	Guidevane	AISI 316 SS

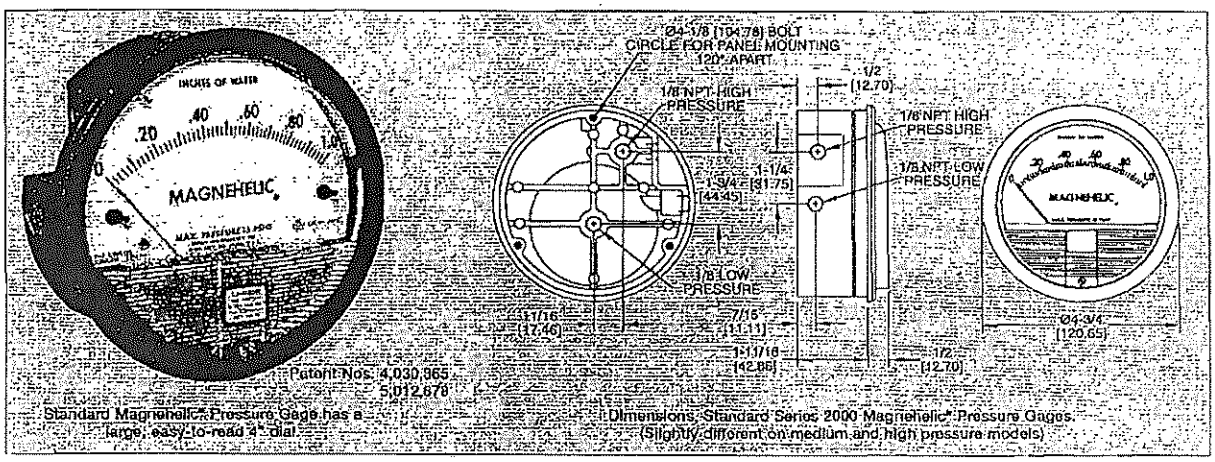
Item No.	Description	Materials
349	O-ring	Viton
361	Retaining ring	Steel
370	Socket head screws, casing	AISI 430 SS
370C	Hex head screw, bearing cover	Plated steel
371	Bolts, motor	Plated steel
383	Mechanical seal	Carbon/Sil-Carbide, Viton elastomers, 316 Stainless metal parts*
400	Shaft key	316
408	Drain and vent plug, casing	AISI 316 SS
412B	O-ring, drain and vent plug	Viton
513	O-ring, casing	Viton
Motor	NEMA standard, 56J flange	

**Optional high temperature and chemical duty seals available*

Pressure

Series 2000 Magnehelic® Differential Pressure Gages

Indicate positive, negative or differential. Accurate within 2%.



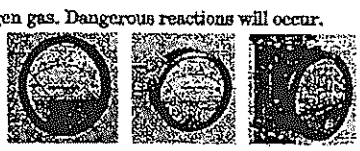
Standard Magnehelic® Pressure Gage has a large, easy-to-read 4" dial.

Dimensions, Standard Series 2000 Magnehelic® Pressure Gages. (Slightly different on medium and high pressure models)

Select the Dwyer Magnehelic® gage for high accuracy – guaranteed within 2% of full scale – and for the wide choice of 81 models available to suit your needs precisely. Using Dwyer's simple, frictionless Magnehelic® movement, it quickly indicates low air or non-corrosive gas pressures – either positive, negative (vacuum) or differential. The design resists shock, vibration and over-pressures. No manometer fluid to evaporate, freeze or cause toxic or leveling problems. It's inexpensive, too.

The Magnehelic® is the industry standard to measure fan and blower pressures, filter resistance, air velocity, furnace draft, pressure drop across orifice plates, liquid levels with bubbler systems and pressures in fluid amplifier or fluidic systems. It also checks gas-air ratio controls and automatic valves, and monitors blood and respiratory pressures in medical care equipment.

NOTE: Do Not use with Hydrogen gas. Dangerous reactions will occur.



Flush ...Surface...or Pipe Mounted

MOUNTING. A single case size is used for most models of Magnehelic® gages. They can be flush or surface mounted with standard hardware supplied. With the optional A-610 Pipe Mounting Kit they may be conveniently installed on horizontal or vertical 1¼" - 2" pipe. Although calibrated for vertical position, many ranges above 1" may be used at any angle by simply re-zeroing. However, for maximum accuracy, they must be calibrated in the same position in which they are used. These characteristics make Magnehelic® gages ideal for both stationary and portable applications. A 4⅝" hole is required for flush panel mounting. Complete mounting and connection fittings plus instructions are furnished with each instrument.

VENT VALVES

In applications where pressure is continuous and the Magnehelic® gage is connected by metal or plastic tubing which cannot be easily removed, we suggest using Dwyer A-310A vent valves to connect gage. Pressure can then be removed to check or re-zero the gage.

HIGH AND MEDIUM PRESSURE MODELS

Installation is similar to standard gages except that a 4⅜" hole is needed for flush mounting. The medium pressure construction is rated for internal pressures up to 35 psig and the high pressure up to 80 psig. Available for all models. Because of larger case, the medium pressure and high pressure models will not fit in a portable case size. Weight 1 lb., 10 oz. Installation of the A-321 safety relief valve on standard Magnehelic® gages often provides adequate protection against infrequent overpressure.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases. (Natural Gas option available.)
Wetted Materials: Consult Factory.
Housing: Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test.
Accuracy: +/- 2% of full scale (±3% on - 0 and ±4% on - 00 ranges), throughout range at 70°F. (21.1°C)
Pressure Limits: -20" Hg. to 15 psig.† (-0.677 bar to 1.034 bar); MP option; - 35 psig (2.41 bar), HP option: 80 psig (5.52 bar).
Overpressure: Relief plug opens at approximately 25 psig (1.72 kPa), standard gages only.
Temperature Limits: 20 to 140°F.* (-6.67 to 60°C).
Size: 4" (101.6 mm) Diameter dial face.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Process Connections: 1/8" female NPT duplicate high and low pressure taps - one pair side and one pair back.
Weight: 1 lb. 2 oz. (510g), MP & HP 2 Lb. 2 oz. (963g).
Standard Accessories: Two 1/8" NPT plugs for duplicate pressure taps, two 1/8" pipe thread to rubber tubing adapter and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for 3 adapters in MP & HP gage accessories.)

*Low temperature models available as special option.
†For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Medium and High pressure options at lower left.

OPTIONS AND ACCESSORIES

Transparent overlays

Furnished in red and green to highlight and emphasize critical pressures.

Adjustable signal flag

Integral with plastic gage cover. Available for most models except those with medium or high pressure construction. Can be ordered with gage or separate.

LED Setpoint Indicator

Bright red LED on right of scale shows when setpoint is reached. Field adjustable from gage face, unit operates on 12-24 VDC. Requires MP or HP style cover and bezel.

Portable units

Combine carrying case with any Magnehelic® gage of standard range,except high pressure connection. Includes 9 ft. (2.7 m) of ⅛" I.D. rubber tubing, standhang bracket and terminal tube with holder.

Air filter gage accessory package

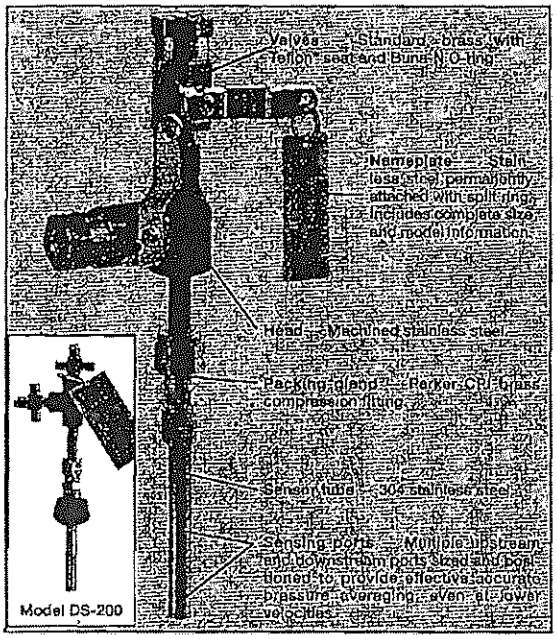
Adapts any standard Magnehelic® for use as an air filter gage. Includes aluminum surface mounting bracket with screws, two 5 ft. (1.5 m) lengths of ¼" aluminum tubing two static pressure tips and two molded plastic vent valves, integral compression fittings on both tips and valves.

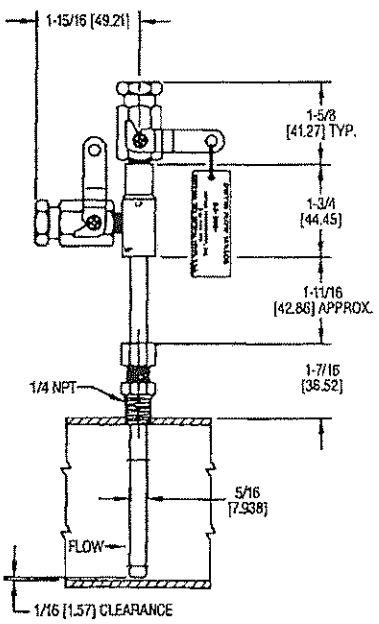
Dwyer Instruments, Inc./P.O. Box 373/Michigan City, Indiana 46361/Phone 219 879-8000/Fax 219 872-9057 • U.K. Phone (01494)-461707 • Australia Phone (02) 9756-5355

Series DS

In-Line Flow Sensors

Use with the Dwyer Differential Pressure Gages or Transmitters





Dwyer Flow Sensors are averaging pitot tubes that provide accurate and convenient flow rate sensing for schedule 40 pipe. When purchased with a Dwyer Capsuhelic® differential pressure gage of appropriate range, the result is a flow indicating system delivered off the shelf at an economical price.

Pitot tubes have been used in flow measurement for years. Conventional pitot tubes sense velocity pressure at only one point in the flowing stream. Therefore, a series of measurements must be taken across the stream to obtain a meaningful average flow rate. The Dwyer flow sensor eliminates the need for "traversing" the flowing stream because of its multiple sensing points and built-in averaging capability.

Series DS-200 models are available in ten insertion lengths from 1" - 10". Operation is similar to DS-300 units. Basic differences are the multi-turn shut-off valves, ⅜" NPT mounting and installed ¼" SAE 45° flared pressure connections.

Dwyer Series DS-300 flow sensors are designed to be inserted in the pipeline through a compression fitting. They are furnished with instrument shut-off valves on both pressure connections. Valves are fitted with ⅛" female NPT connections. Accessories include adapters with ¼" SAE 45° flared ends compatible with hoses supplied with the Model A-471 Portable Capsuhelic kit. Standard valves are rated at 200 psig (13.7 bar) and 200°F (93.3°C). Where valves are not required, they can be omitted at reduced cost. Series DS-300 flow sensors are available for pipe sizes from 1" to 10". If replacing a DS-200 flow sensor or using an A-160 thredolet with a DS-300, an optional ¼" × ⅜" bushing, P/N A-161 is required.

DS-400 Averaging Flow Sensors are quality constructed from extra strong ¾" dia. stainless steel to resist increased forces encountered at higher flow rates with both air and water. This extra strength also allows them to be made in longer insertion lengths up to 24 inches (61 cm). All models include convenient and quick-acting quarter-turn ball valves to isolate the sensor for zeroing. Process connections to the valve assembly are ⅛" female NPT. A pair of ⅛" NPT × ¼" SAE 45° flared adapters are included, compatible with hoses used in the Model A-471 Portable Capsuhelic® Gage Kit. Supplied solid brass mounting adapter has a ¾" dia. compression fitting to lock in required insertion length and a ¾" male NPT thread for mounting in a thred-o-let (not included).

STOCKED MODELS in bold

— Select model with suffix which matches pipe size

DS-200-1"	DS-300-1"
DS-200-1¼"	DS-300-1¼"
DS-200-1½"	DS-300-1½"
DS-200-2"	DS-300-2"
DS-200-2½"	DS-300-2½"
DS-200-3"	DS-300-3"
DS-200-4"	DS-300-4"
DS-200-6"	DS-300-6"
DS-200-8"	DS-300-8"
DS-200-10"	DS-300-10"

DS-400-6"
DS-400-8"
DS-400-10"
DS-400-12"
DS-400-14"
DS-400-16"
DS-400-18"
DS-400-20"
DS-400-24"

Options and Accessories

A-160 Thredolet, ¾" NPT, forged steel, 3000 psi
A-161 Brass Bushing, ¼" x ⅜"
DS-200-VK Series DS Flow Sensors Valve Kit
Less Valves (DS-300) To order, add suffix -LV

LP SERIES LOW PRESSURE

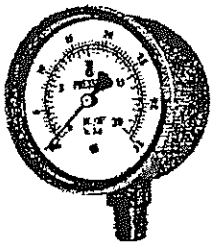
SPECIFICATIONS

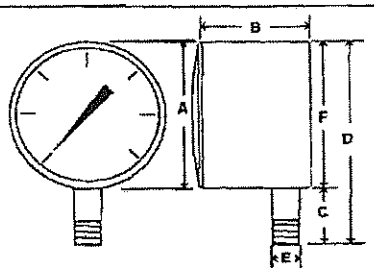
- Chrome plated case
- Black steel case (u-clamp panel mnt)
- Brass internals and connection
- Dry non-filiable
- +/- 1.5 % accuracy

FEATURES

- 2 1/2"dial size with twist lock plastic lens
- zero adjustment screw on back of case
- 1/4"mnpt bottom or back connection
- Capsule type diaphragm to measure low pressures

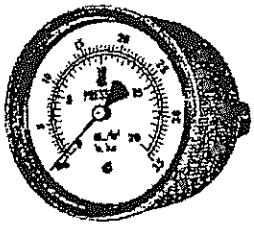
LP1

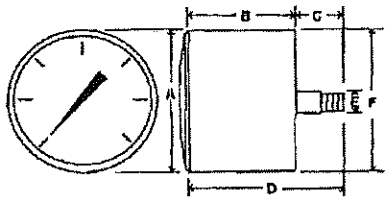




	2 ½"		4"	
	IN	MM	IN	MM
A	2.60"	66	3.98"	101
B	1.70"	44	2.21"	56
C	.85"	22	1.56"	40
D	3.45"	87.5	5.49"	139
E	1/4"NPT		1/4" OR 1/2" NPT	
F	2.60"	66	3.98"	101
G				

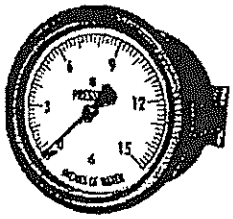
LP2

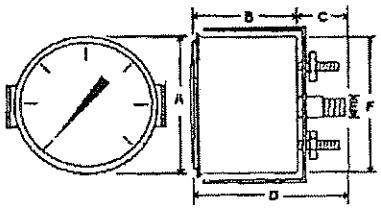




	2 ½"		4"	
	IN	MM	IN	MM
A	2.62"	66.5	—	—
B	1.92"	49	—	—
C	.84"	21.5	—	—
D	2.75"	71	—	—
E	1/4"NPT		—	—
F	2.60"	66	—	—
G			—	—

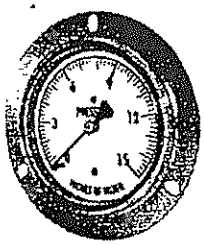
LP3

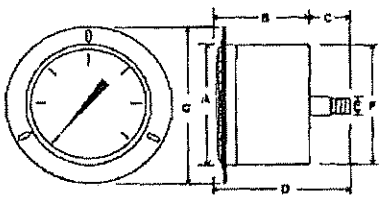




	2 ½"		4"	
	IN	MM	IN	MM
A	2.84"	72	—	—
B	1.88"	48	—	—
C	.84"	21.5	—	—
D	2.74"	69.5	—	—
E	1/4"NPT		—	—
F	2.60"	66.2	—	—
G	2.84	72	—	—

LP4





	2 ½"		4"	
	IN	MM	IN	MM
A	2.61	66	—	—
B	1.89	48	—	—
C	.875	22.2	—	—
D	2.74	69.5	—	—
E	1/4"NPT		—	—
F	2.67	68	—	—
G	3.44	87.4	—	—

AVAILABLE RANGES:

200-0"wc Vacuum (2"Minor inc)
160-0"wc Vacuum (2"Minor inc.)
100-0"wc Vacuum (1"Minor inc.)
60-0"wc vacuum (1"Minor Inc.)
30-0"wc vacuum (.5"wc minor)
0-10"wc (.5"wc minor inc.)
0-15"wc (.2"wc minor inc.)
0-30"wc (.5"wc minor inc.)
20 oz./35"wc (.5"wc minor inc.)
35 oz./60"wc (1"wc minor inc.)
0-60"wc (1"wc minor inc.)
0-100"wc (2"wc minor inc.)
0-160"wc (5"wc minor inc.)
0-200"wc (5"wc minor inc.)
0-3 psi (.05 psi minor inc.)
0-5 psi (.1 psi minor inc.)
0-10 psi (.2 psi minor inc.)

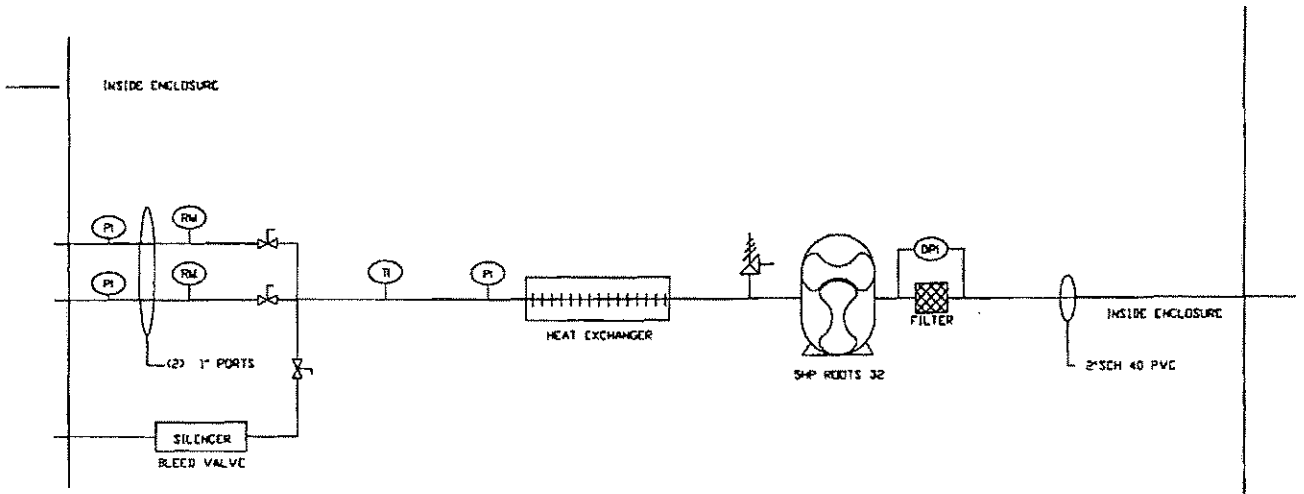
NOTE: OTHER RANGES AVAILABLE UPON REQUEST, PLEASE CALL WITH ANY INQUIRIES

Fliteway Technologies, Inc.

Air Sparging System

2129 East Birchwood Ave. Cudahy, WI 53110

(414) 483-5600 1-800-236-3580 FAX (414) 483-1957



APPROVED BY _____

DATE _____

GATE VALVE
CHECK VALVE
BALL VALVE
HIGH PRESSURE SWITCH (PS)
RELIEF VALVE

PI PRESSURE INDICATOR
DPI DIFFERINTIAL PRESSURE INDICATOR
TI TEMPERATURE INDICATOR
LPS LOW PRESSURE SWITCH
FS FLOW SENSOR
RM ROTOMETERS

Fliteway Technologies, Inc
2129 EAST BIRCHWOOD AVENUE
CUDAHY, WI 53110
414.483.5600 414.483.9007

PROCESS AND INSTRUMENTATION DIAGRAM AIR SPARGE

TYREE BROTHERS

4/8/08	SIZE	FSCM NO.	DWG NO. Q13475 REV 1
	SCALE NONE		SHEET 1 OF 1

Company: Fliteway Technologies, Inc.
Address: 2129 East Birchwood Ave., Cudahy, WI 531109
414-428-5600 / 414-483-1957
Contact: William E, Diehl
Dated : 03/24/2008
Customer: Tyree Brothers
Project: Q13475 Rev 1 Air Sparge Blower

ROOTS BLOWER PERFORMANCE SUMMARY : Program Version 1.4 Release Date 31/03/2004

AMBIENT CONDITIONS:

Gas	AIR	
Relative Humidity	36%	
Molecular Weight	28.877	
k-Value	1.396	
Specific Gravity	.997	
Ambient Temperature	80	deg F
Ambient Pressure	14.54	PSIA
Elevation	300	feet

STANDARD CONDITIONS:

Pressure	14.7	PSIA
Temperature	68	deg F
Relative Humidity	36	%

INPUT CONDITIONS:

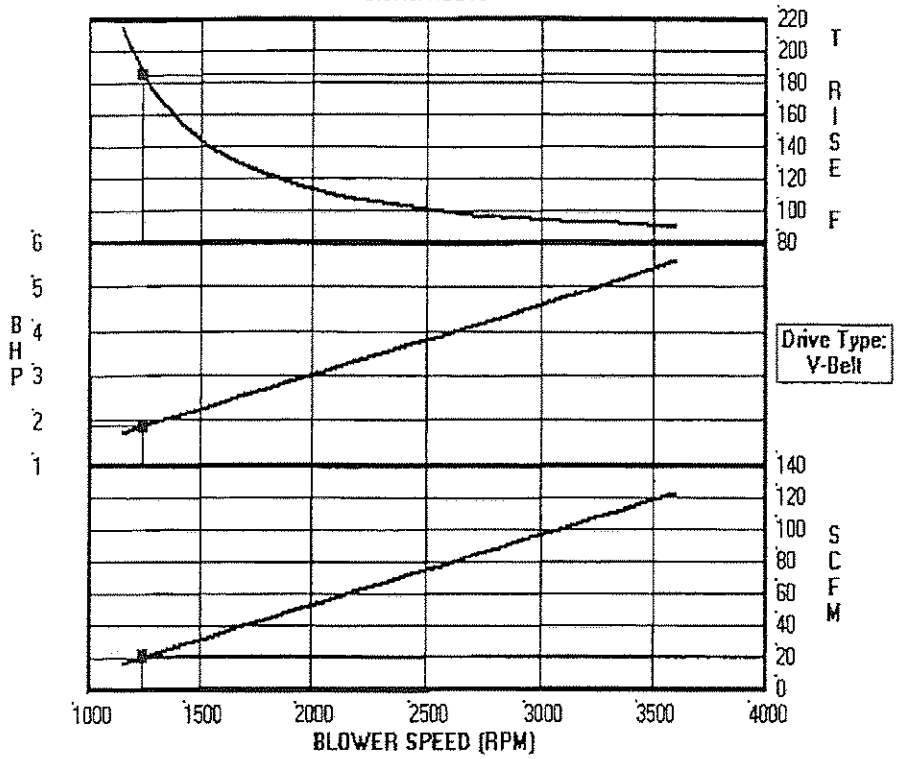
Actual Volume	21	ICFM	+/-9 %
Standard Volume	20	SCFM	
Mass/Weight Flow	2	#/min	+/-9 %
System Inlet Pressure	14.54	PSIA	
Inlet Pressure Loss	0.3	PSI	
Blower Inlet Pressure	14.24	PSIA	
System Discharge Pressure	7	PSIG	
Discharge Pressure Loss	0.3	PSI	
Blower Discharge Pressure	21.84	PSIA	
Inlet Temperature	68	deg F	

SELECTED UNIT DETAIL:

Model	32	URAI-DSL	
Speed	1244	RPM	35%
Blower Differential Pressure	7.60	PSI	51%
Power at Blower Shaft	1.9	BHP	+/- 4%
Temperature Rise	185	deg F	77%
Discharge Temperature	253	deg F	
Discharge Volume	18	ACFM	
Relief Valve Setting	NO RELIEF VALVE SPECIFIED		
Power at the relief valve Setting	NO RELIEF VALVE SPECIFIED		
Temp. Rise at the Relief Valve Setting	NO RELIEF VALVE SPECIFIED		
Discharge Temp At Relief Valve Setting	NO RELIEF VALVE SPECIFIED		
Gear Tip Speed	1141	FPM	
V-Belt: Est. B10 Brg Life:	2261063	hours	
Coupling: Est. B10 Brg Life:	2261063	hours	
Est. Free Field Noise @ 1 m.	76.9	dBa	
CFR	0.045		
Weight	72	lbs.	
Shaft Dia.	0.75	in.	
Min. Sheave Dia.	5	in.	
Inlet/Disch Conn.	1.25T		

32 URAI-DSL: Variable Speed Performance

Dresser ROOTS



Drive Type: V-Belt

Enter a new Speed

Recalc

Close Form

Print Curve

You must press the Print Screen keyboard button before the Print Curve Button.

```
INLET CONDITIONS: AIR
                  RH = 36.00%, MW = 28.877, k = 1.396, Tin = 68 deg F
          DESIGN: Speed = 1244 RPM
                  System Inlet P = 14.64 PSIA, Inlet P Loss = 0.3 PSI
                  System Disch P = 7 PSIG, Disch P Loss = 0.3 PSI
          ...:     RH = 36%, T = 68 deg F, P = 14.7 PSIA .
```

JSTOMER: Tyree Brothers
ROJECT: Q13475 Rev 1 Air Sparge Blower

ESTIMATED NOISE LEVEL

TYPICAL BLOWER PACKAGE WITH PREMIUM GRADE SILENCERS

Customer: Tyree Brothers

Unit: 32 URAI-DSL

Blower RPM: 1244

Delta-P (PSI): 7.6

Noise (dBa): 76.9

Octave Band	Sound Pressure Level (dB)
31.5	61.9
63.0	61.9
125	68.9
250	72.9
500	75.9
1000	71.9
2000	68.9
4000	64.9
8000	61.9
16000	46.9

NOTE: 1) Above are average "Free Field" sound level estimates at 1 meter from a single operating unit.
2) Due to environmental influences beyond ROOTS' control, these levels cannot be guaranteed on jobsite.
3) Premium Grade Silencers are assumed.

Company: Fliteway Technologies, Inc.
Address: 2129 East Birchwood Ave., Cudahy, WI 531109
414-428-5600 / 414-483-1957
Contact: William E, Diehl
Dated : 03/24/2008
Customer: Tyree Brothers
Project: Q13475 Rev 1 Air Sparge Blower

ROOTS BLOWER PERFORMANCE SUMMARY : Program Version 1.4 Release Date 31/03/2004

AMBIENT CONDITIONS:

Gas	AIR	
Relative Humidity	36%	
Molecular Weight	28.877	
k-Value	1.396	
Specific Gravity	.997	
Ambient Temperature	80	deg F
Ambient Pressure	14.54	PSIA
Elevation	300	feet

STANDARD CONDITIONS:

Pressure	14.7	PSIA
Temperature	68	deg F
Relative Humidity	36	%

INPUT CONDITIONS:

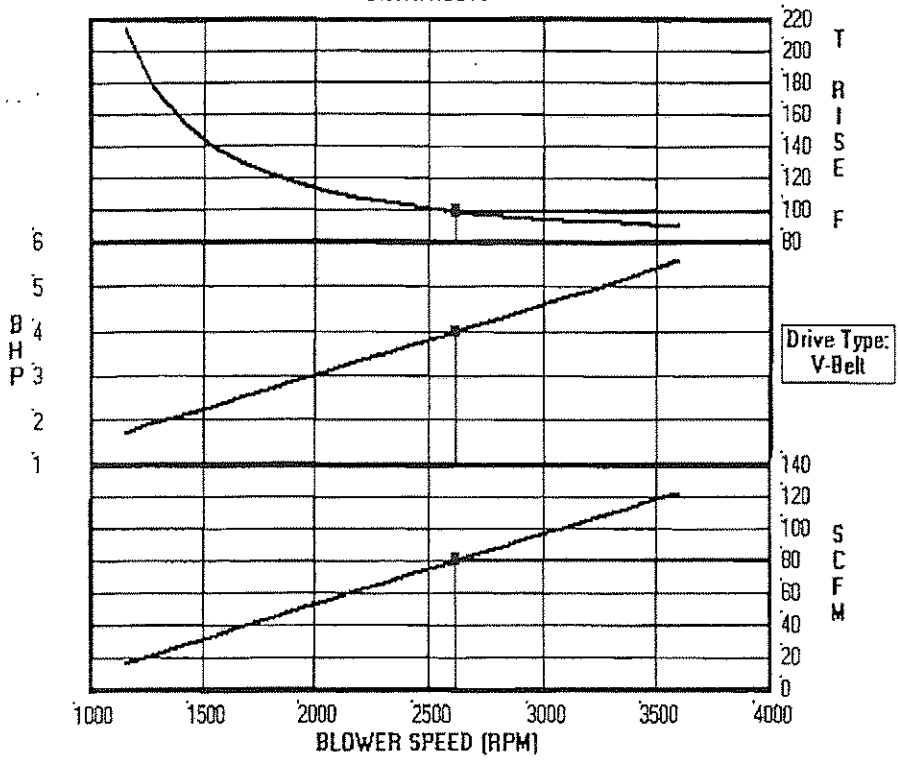
Actual Volume	83	ICFM	+/-5 %
Standard Volume	80	SCFM	
Mass/Weight Flow	6	#/min	+/-5 %
System Inlet Pressure	14.54	PSIA	
Inlet Pressure Loss	0.3	PSI	
Blower Inlet Pressure	14.24	PSIA	
System Discharge Pressure	7	PSIG	
Discharge Pressure Loss	0.3	PSI	
Blower Discharge Pressure	21.84	PSIA	
Inlet Temperature	68	deg F	

SELECTED UNIT DETAIL:

Model	32	URAI-DSL
Speed	2621	RPM 73%
Blower Differential Pressure	7.60	PSI 51%
Power at Blower Shaft	4.0	BHP +/- 4%
Temperature Rise	99	deg F 41%
Discharge Temperature	167	deg F
Discharge Volume	63	ACFM
Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Power at the relief valve Setting	NO RELIEF VALVE SPECIFIED	
Temp. Rise at the Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Discharge Temp At Relief Valve Setting	NO RELIEF VALVE SPECIFIED	
Gear Tip Speed	2403	FPM
V-Belt: Est. B10 Brg Life:	1073164	hours
Coupling: Est. B10 Brg Life:	1073164	hours
Est. Free Field Noise @ 1 m.	87.5	dBa
CFR	0.045	
Weight	72	lbs.
Shaft Dia.	0.75	in.
Min. Sheave Dia.	5	in.
Inlet/Disch Conn.	1.25T	

32 URAI-DSL: Variable Speed Performance

Dresser ROOTS



Drive Type: V-Belt

Enter a new Speed

Recalc

Close Form

Print Curve

You must press the Print Screen keyboard button before the Print Curve Button

```
INLET CONDITIONS: RIR
                  RH = 36.00%, MW = 28.877, k = 1.396, Tin = 68 deg F
          DESIGN: Speed = 2621 RPM
                  System Inlet P = 14.54 PSIA, Inlet P Loss = 0.3 PSI
                  System Disch P = 7 PSIG, Disch P Loss = 0.3 PSI
          ..O:      RH = 36%, T = 68 deg F, P = 14.7 PSIA
```

USTOMER: Tyree Brothers
ROJECT: Q13475 Rev 1 Air Sparge Blower

ESTIMATED NOISE LEVEL

TYPICAL BLOWER PACKAGE WITH PREMIUM GRADE SILENCERS

Customer: Tyree Brothers

Unit: 32 URAI-DSL

Blower RPM: 2621

Delta-P (PSI): 7.6

Noise (dBa): 87.5

Octave Band	Sound Pressure Level (dB)
31.5	72.5
63.0	72.5
125	79.5
250	83.5
500	86.5
1000	82.5
2000	79.5
4000	75.5
8000	72.5
16000	57.5

NOTE: 1) Above are average "Free Field" sound level estimates at 1 meter from a single operating unit.
2) Due to environmental influences beyond ROOTS' control, these levels cannot be guaranteed on jobsite.
3) Premium Grade Silencers are assumed.

	Nr.:
	Date: 20 - May, 08

DATA SHEET

Customer: Q13475 Rev 3 Air Spage Motor
Motor line: **EXPLOSION PROOF - UL**

Rated Output	: 5.00 HP (cv)	Duty cycle	: S1
Frame	: 184T	Altitude	: 1000 m.a.s.l
Poles	: 4 Poles	Ambient temperature	: 40 °C
Frequency	: 60 Hz	Degree of protection	: IP54
Full load speed	: 1740 rpm	Slip	: 3.33 %
Voltage	: 208-230/460 V	No load current	: 6.60/3.30 A
Full load current	: 13.9/6.95 A	Locked rotor time	: 7 s
Service factor	: 1.15	Moment of inertia	: 0.3814 sq.ft.lb
Locked rotor amps	: 110/54.9 A	Aprox. weight	: 92.6 lb
Locked rotor current (Il/In)	: 7.90 - Code K	Noise level	: 58 dB(A)
Insulation class	: F		
Temperature rise	: 80 K		
Full load torque	: 14.9 ft.lb		
Locked rotor torque	: 250 %		
Breakdown torque	: 250 %		
Design	: A		

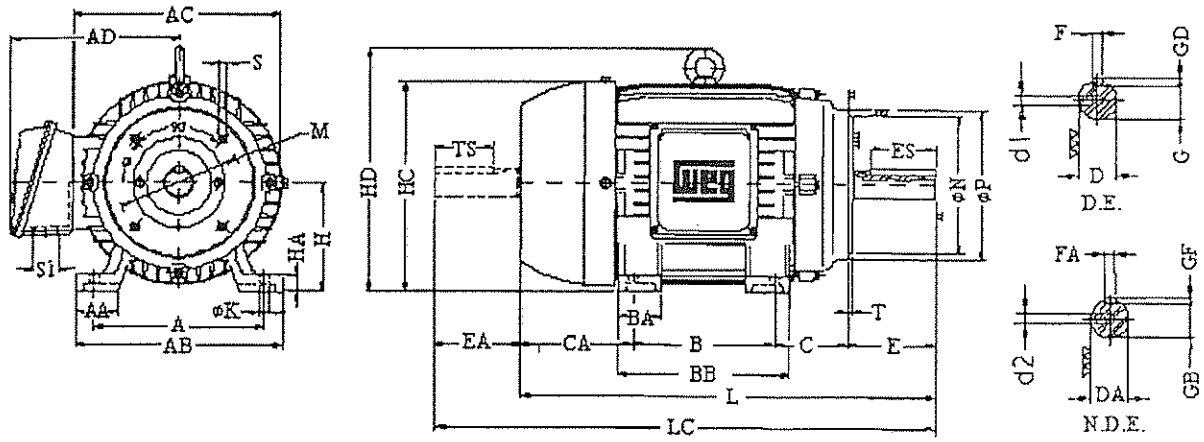
Performance under load

Load	cos ø	Efficiency(%)
100 %	0.81	82.5
75 %	0.76	81.5
50 %	0.67	78.3

	Bearings	Regreasing int.	Grease amount
D.E.	6307-ZZ	---	---
N.D.E.	6206-ZZ	---	---

NOTE:

DRAWING AND DIMENSIONS



2E	2F	H	BA	A	B	C	D
7.500	5.500	0.406	2.750	8.656	7.156	15.875	4.500
G	**J**	**K**	**O**	**P**	**T**	**Width**	**Depth**
0.750	1.889	2.171	8.846	8.830	2.435	0.250	0.125
key length	**N-W**	**U**	**AB**	**AA**	**d1**		
1.750	2.750	1.125	8.281	NPT 3/4"	A4		

Performed:	Checked:

* Note: The values shown are subject to change without prior notice

EXPLOSION PROOF - UL

Standard features:
-UL approved - FILE E87848
Division I Class I Groups C and D
Division I Class II Groups F and G (143T-326T)
Division I Class II Group F (364T-586/7T)
-Temperature code: T4 (Frames 143T up to 326T)
T3C (Frames 364T up to 586/7T)
-Cast iron frame
-Squirrel cage rotor/Aluminum die cast
-Enclosure: TEFC - XP
-Design A
-Degree of protection: IP 54
-Ball bearings (roller bearings - 404T and up for 4, 6 and 8 poles)
-Insulation: Class F
-Service factor: 1.15
-Temperature rise: Class B (80 K)
-Dimensions according to NEMA standard
-Continuous duty (S1)
-Ambient temperature: 40°C (104°F)
-Altitude:1000 m (3300 ft)
-1045 carbon steel shaft (4140 for roller bearing motors)
-Mounting: F1
-Stainless steel nameplate AISI 316
-Painting: synthetic enamel alkyd resin base
-Regreasable bearing system (frame 364 and up)
-Thermostat NC (1 per phase)
-NPT thread terminal box
-Double VPI (364 - 587)
-Non sparking fan

Certification List
Laboratory: UNDERWRITERS LABORATORIES INC. - UL - USA

Line: Explosion Proof

File Number: E87848

Standards: UL 674

Certification Characteristics
1. EXT 143/5T up to 324/6T, max 50 hp, max. 600 V,
50 Hz, 60 Hz
Division I Class I Groups C and D
Division I Class II Groups F and G

2. EXT 364/5T up to 586/7T, max 400 hp, max. 600 V,
50 Hz, 60 Hz
Division I Class I Groups C and D
Division I Class II Groups F
Division I Class II Groups G - 364/5 up to 505 (Service Factor 1.0)

Optional:
-Flanged motor C - 143 up to 504
-Flanged motor D - 143 up to 445

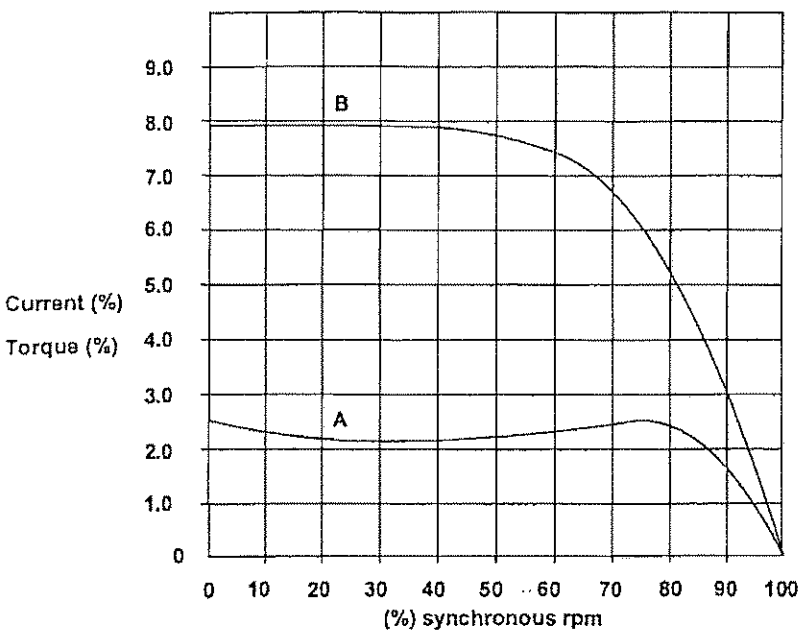
Optional on request:
-Ball bearings (404 and up - 4, 6 and 8 poles)
-Special shaft
-50 Hz

	Nr.:
	Date: 20 - May, 08

Customer : Q13475 Rev 3 Air Spage Motor

Motor line: EXPLOSION PROOF - UL

TORQUE AND CURRENT CURVES

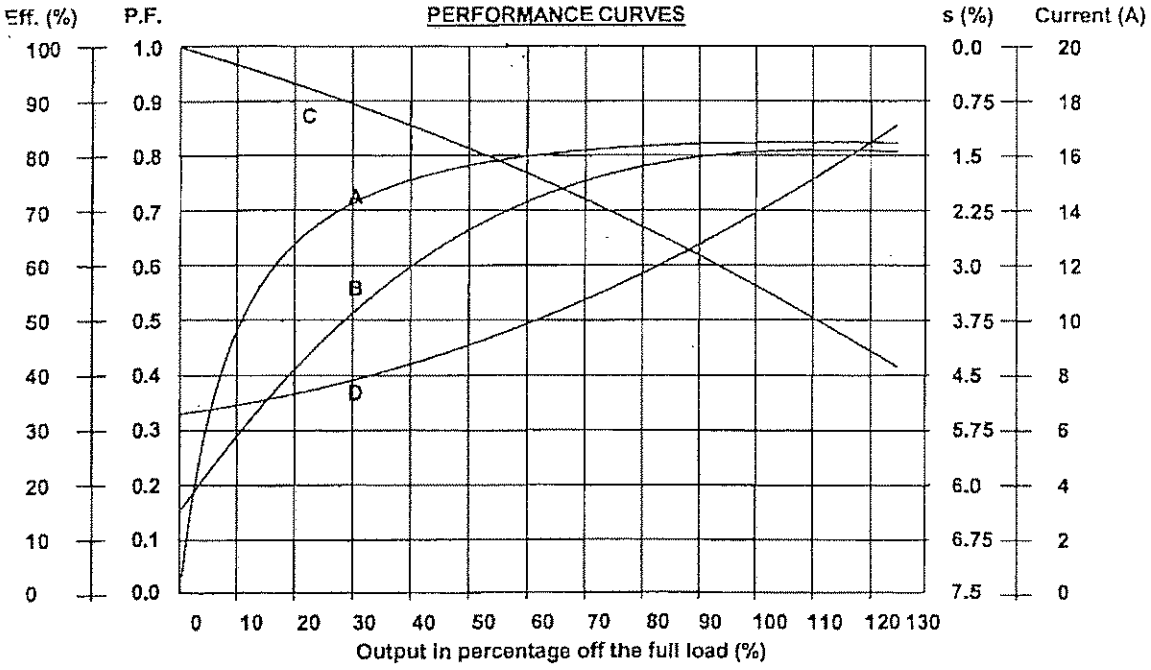


Output:	5.00 HP (cv)
Poles:	4 Poles
Frequency:	60 Hz
LRT (%):	2.5
BDT (%):	2.5
Ip (%):	7.9
Voltage:	230 Volts

B - Current curve

A - Torque curve

PERFORMANCE CURVES



A - Efficiency

B - Power Factor

C - Slip

D - Current

rformed :	Checked :

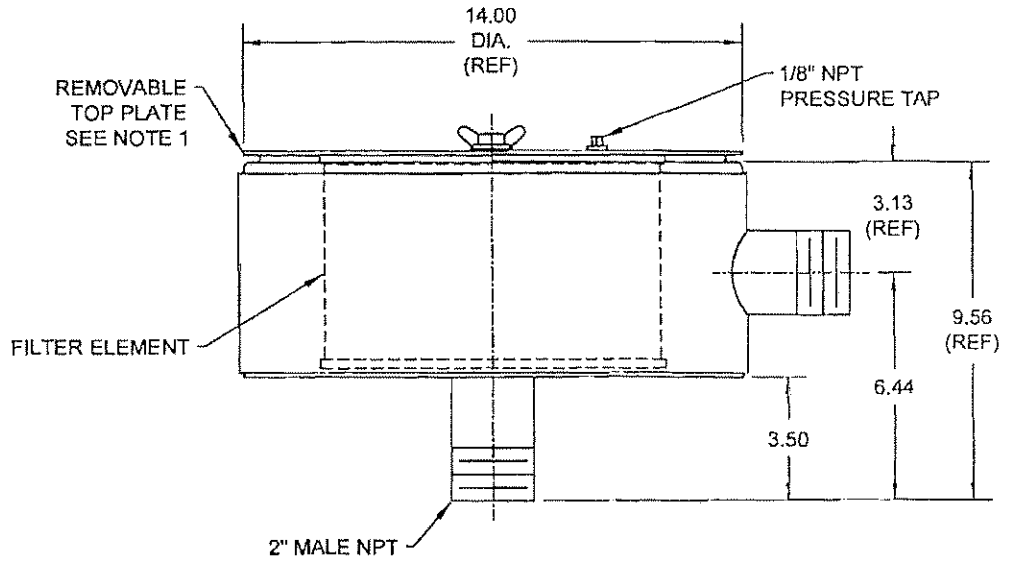
* Note: The values shown are subject to change without prior notice

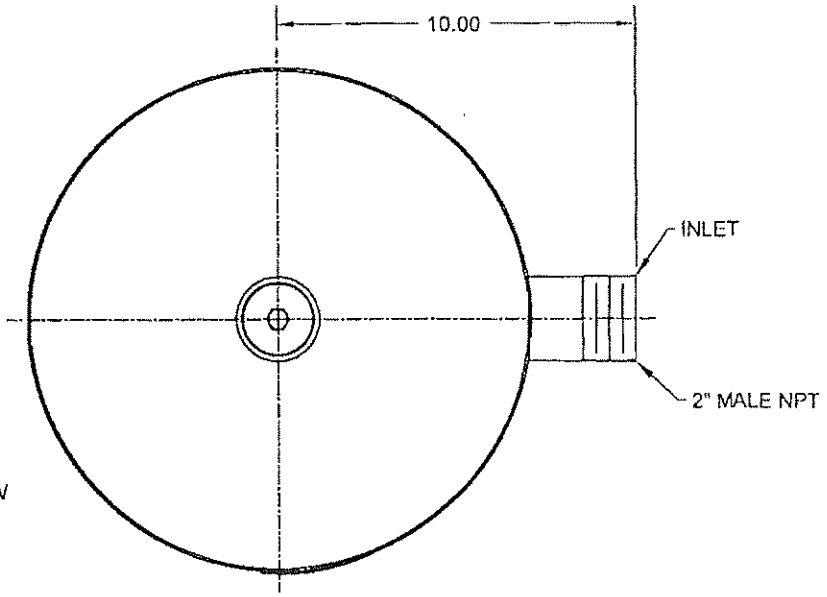
UNIVERSAL SILENCER
A FLEETGUARD/NELSON COMPANY
P.O. Box 411, Stoughton, Wisconsin 53589
608-873-4272 Fax 608-873-4298

STANDARD ILFV-2 INLINE AIR FILTER

DATE 02-12-02
SHEET OF
SCALE NTS

NO.	REVISION	DRAWN	APP'D
3	REDRAWN AND REVISED HEIGHT	DY 02-12-02	MB 02-14-02





NOTES:

1. CLEARANCE REQUIRED FOR FILTER ACCESS IS 7.00"

2. CLEAN OR REPLACE FILTER WHEN ΔP INCREASES 4" H_2O OVER CLEAN FILTER

3. NOMINAL CAPACITY: 120 CFM AT FLOW VELOCITY OF APPROX. 5,500 FT/MN

DIMENSIONAL DRAWING NO. 34-D02-AP

FILTER ELEMENTS INCLUDED (APPLIED ONLY TO ORDER FOR WHICH DRAWING IS CERTIFIED)				DIMENSIONS CERTIFIED FOR:
FILTER TYPE AND PART NUMBER	SINGLE STAGE	DUAL STAGE		
		PRE-FILTER	FINAL FILTER	
CC-4P (PAPER) 81-1063	1			P.O. NO:
				U.S. S.O. NO:
				BY
				DATE

REV.	APPROX WT	MATERIAL	DRAWN	DIMENSIONAL DRAWING NO.	REV.
3	25 LBS.	STEEL	DY	34-D02-AP	3
	FINISH 88-1085 BLUE ENAMEL		CHECK MB 02-14-02		

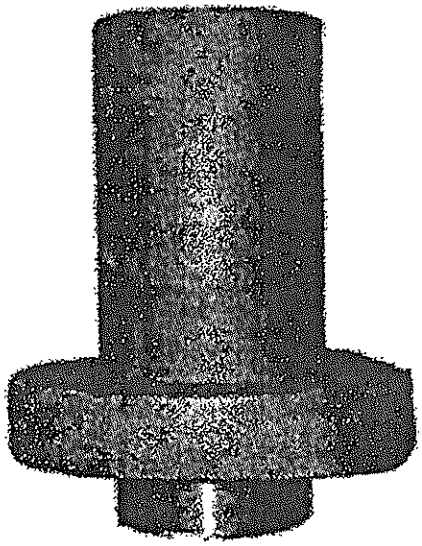
Sutorbilt

GARDNER DENVER

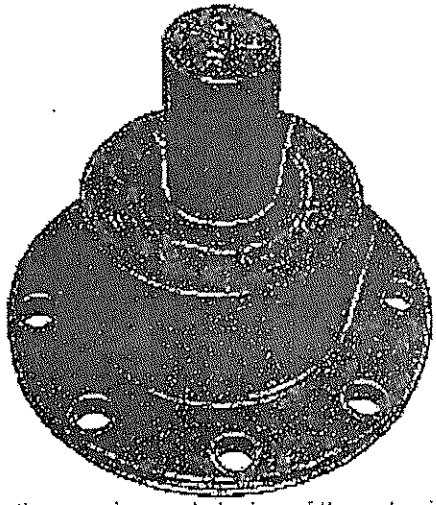
Date Sheet	SB-5-415
	July 31, 1989
Supersedes	90912-B
Dated	10-25-69

SUTORBILT(R) WEIGHT LOADED PRESSURE RELIEF VALVES

THREADED - 1" THRU 4"



FLANGED 125# ANSI - 6" AND 8"



The SUTORBILT[r] weight loaded pressure relief valve offers inexpensive relief capacity in a sturdy, trouble free design in 1" through 8" sizes.

Sizes 1" through 4" have sandard male threaded connections. Sizes 6" and 8" have standard 125# ANSI flange drilings.

Removable weights have been carefully designed to permit accurate pressure settings in 1/2 PSI increments in the 1" through 4" size and 1/2 and 1 PSI increments in 6" and 8" size.

The operation of the relief valve is simple. As the service line air pressure reaches the pressure setting, the weight loaded cap is forced upwards off the valve seat. As pressure increases, the cap rises to expose the discharge ports. The flow-through capacity of the valve is such that no damage can be caused to the blower or related systems.

The valve automatically reseats itself as line pressure is reduced.

Since the opening and closing of the valve is essentially the sliding of a piston in a cylinder, the valve is virtually chatter-free.

The body and cap of the valve are made of cast iron with close tolerance machined surfaces in the operating areas. The weights are cut from uniform steel plate or uniformly cast to give accurate pressure adjustment.

Application of light oil to the mating surfaces of the cap and body periodically is all the maintenance required on this valve.

The SUTORBILT weight loaded relief valve was engineered to provide long life and dependable protection for the SUTORBILT blower and associated systems by its simplicity of design. Weight loaded pressure relief valves are designed to protect the blower against damage caused by operation at greater than design pressure or vacuum. **However, they are not intended as pressure regulators.**

For proper operation, the valve must be mounted in exact upright position.

Use only FULL FLANGE gasket.

For prices, see Price List SB-5-134

Absorption Silencers

L21

Application

Silencing of intake and discharge of centrifugal compressors in areas requiring standard silencing.

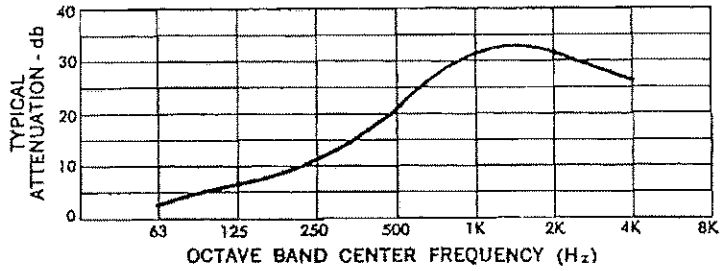
Design

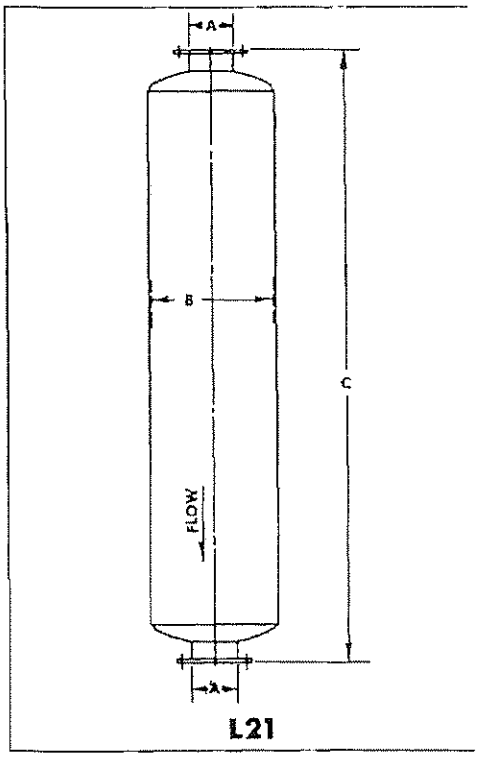
This silencer employs a perforated tube surrounded by acoustic absorption material at a controlled density to achieve silencing. Exterior shell retains acoustical pack and reflects noise back into pack to achieve maximum noise reduction. Designed for very low pressure drop and long service life. They can be installed either in vertical or horizontal position.

Construction

All welded sheet and plate steel. Absorption material appropriate for operating conditions. Exterior surfaces are prime coated. Flanges are drilled to match 125 lb. American Standard Flanges. Side connections, mounting brackets, or special paint available at extra cost.

Typical Attenuation Curve





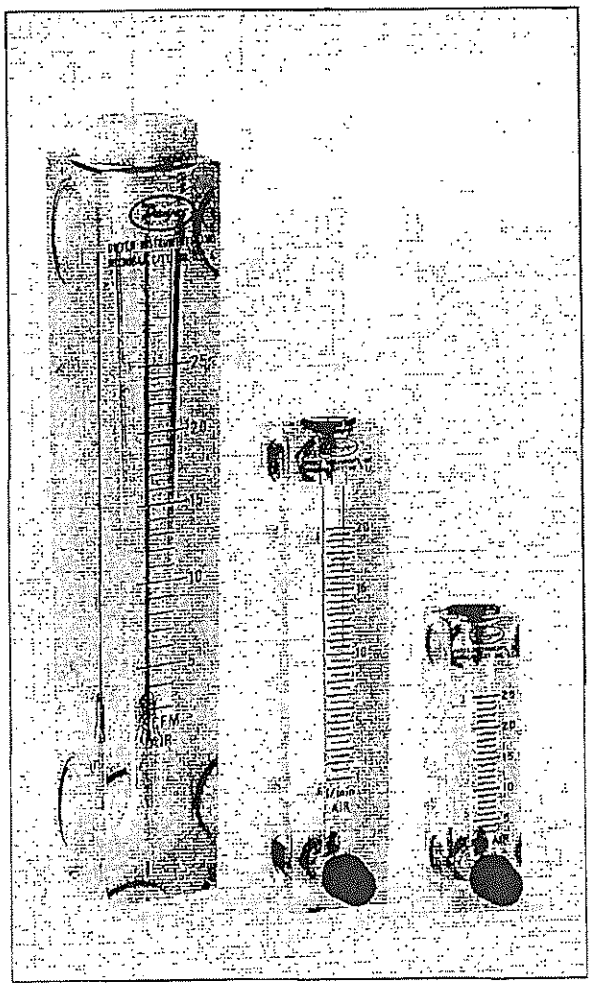
Model	A	B	C	Wt.
L21-½	½"	3¼	10	2
L21-¾	¾"	3¼	13	3
L21-1	1 "	3¼	16	4
L21-1½	1½"	4½	23	8
L21-2	2 "	5	34½	13
L21-2½	2½"	6	35½	18
L21-3	3 "	6½	43½	28
L21-3½	3½"	8	44	27
L21-4	4	10	53	55
L21-5	5	12	56	70
L21-6	6	12	66	90
L21-8	8	14	58	138
L21-10	10	16	70	160
L21-12	12	18	80	250
L21-14	14	20	92	300
L21-16	16	22	107	340
L21-18	18	24	116	650
L21-20	20	26	128	705
L21-22	22	28	147	885
L21-24	24	30	152	1026

*NPT Connections

Series VF

Visi-Float® Flowmeters

Precision machined from solid acrylic — Used to indicate or manually control air or gas flow from .1 SCFH to 100 SCFM . . . water from .6 GPH to 20 GPM



(VFCII shown above)

Dwyer Visi-Float® flowmeter bodies are cut and precision machined from solid, clear acrylic plastic blocks. This construction not only produces a handsome finished product, but permits complete visual inspection. As a result, the Dwyer Visi-Float® flowmeters are especially popular for medical and laboratory equipment applications.

Scales are easy to read – The front scale location and white background provides excellent visibility. The direct reading scales are hot stamped into the plastic and will not wear off. Mid-range calibration is established with a master flowmeter. Accuracy is ±5% of full scale for VFA models, ±3% for VFB, and ±2% for VFC. Scales average 2" long on the VFA models, 4" long on VFB, and 5" long on VFC.

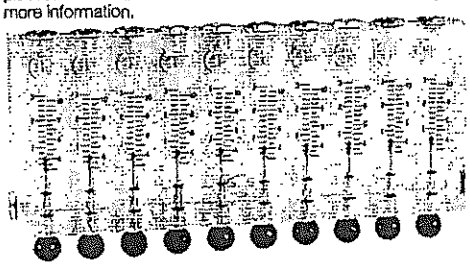
Durable and attractive construction – The machined acrylic bodies of the Dwyer Visi-Float flowmeters are practically unbreakable. Fabrication is backed by over 60 years of experience in acrylic instrument machining. The tapered bore is precision machined to a smooth surface that provides perfect visibility of the indicating float. The VFA and VFB models are available with either brass or stainless steel inlet and outlet connections and are tapped for ⅛" NPT Thread. VFB models 85 and 86 have either ¼" back or ¾" end connections. The VFC models have PVC 1" female NPT connections and VFCII units are equipped with acetal thermoplastic 1" male NPT fittings. VFCII fittings also include hex wrench flats to prevent stripped threads. All standard models employ Buna-N "O" rings for leak proof operation and are available with either back or end connections for horizontal or vertical piping. Precision metering valves in brass or stainless steel are available for most VFA and VFB models. VFC models, intended for use with external metering valves, include a stainless steel guide rod and large diameter float for excellent stability and visibility at higher flow rates. Two options are offered for VFCII units, specifically designed for applications requiring FDA approved materials. Choose 316 stainless steel float and guide rod and Viton® "O" rings. See OPTIONS for ordering codes.

Easy installation – All Visi-Float® flowmeters have metal mounting inserts on rear for panel mounting. They can also be supported directly by system piping.

OEM specials – Special flowmeter designs can be supplied to meet a wide range of requirements and specific applications. These include: on-off plunger and push-to-test valves, special gas or fluid calibration, special ranges, scales, name brand or other identification. Pointer flags can be furnished for instant visual reference. For specific information, please supply an outline of your requirements.

Special Multi-Column Visi-Float Flowmeters

Perfect for OEM applications, Visi-Float flowmeters can be custom made with up to 10 columns in a single block of acrylic plastic. Available with or without valves. Consult factory for more information.



How To Order

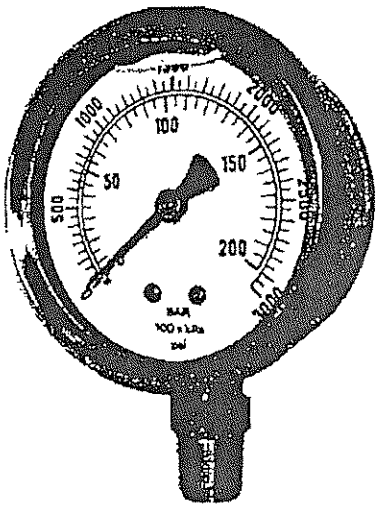
1. Select series by letter designation, VFA, VFA–EC, VFA–SS, VFA–EC–SS, VFB, VFB–EC, VFB–SS, VFB–EC–SS, VFC, VFC–EC, VFCII or VFCII–EC.
2. Add ordering number to specify range. Example: VFB–50.
3. Add suffix BV for brass valve, SSV for stainless steel valve. Example: VFB–50–SSV.
4. For adjustable pointer flag add –PF. Available only on VFA and VFB. Example: VFB–50–SSV–PF.
5. Add additional options or accessories as required.

201L LIQUID FILLED

Our '200' series gauge line is a high quality line of liquid filled gauges. The glycerine filling helps dampen the effects of pulsation and vibration, while also perpetually lubricating the movement (and keeping contaminates such as dirt away from all moving parts) which will extend the life of the gauge.

This gauge has been specifically designed with original equipment manufacturers in mind and are typically used on hydraulic & pneumatic systems as well as any commercial or industrial application not corrosive to brass and bronze wetted parts where glycerine filling is suitable for use.

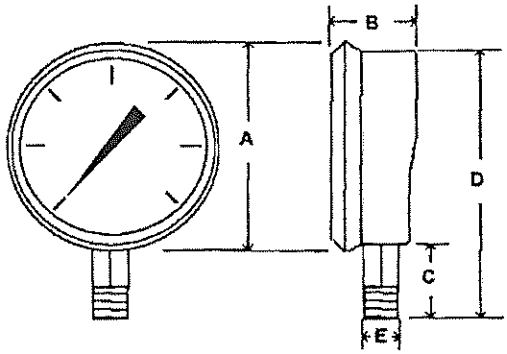
SPECIFICATIONS:



- **Available Dial Sizes:** 1 ½", 2", 2 ½", 4", 6"
- **Available Connection Sizes:**
  1/8"MNPT on 1 ½" and 2"
  1/4"MNPT on 2", 2 ½" and 4"
  1/2"MNPT on 4" and 6"
- **Stainless Steel Case And Bezel**
- **Brass Internals & Connection**
- **Phosphour Bronze Bourdon Tube**
- **Liquid Filled (Dry Available)**
- **Accuracy :** 1 ½" or 2"Dial Size = 3-2-3 %
  2 ½"Dial Size = 1.5 %
  4" or 6"Dial Size = 1 %
- **Dual Scale: PSI & Bar (x100=kPa)**
  Single Scale available from stock
- **Ambient temperature:** FILLED: 30'F to 160'F
  DRY: -30'F to 180'F

RANGE	CODE	Major In	Minor In
30/0"VAC	A	5	0.5
30/0/15	CB	5	0.5
30/0/30	CC	10	1
30/0/60	CD	10	1
30/0/100	CE	20	2
30/0/150	CF	20	2
30/0/300	CH	50	10
0/15	B	2	0.2
0/30	C	5	0.5
0/60	D	10	1
0/100	E	20	2
0/160	F	20	2
0/200	G	40	4
0/300	H	50	5
0/400	I	50	5
0/500	J	100	10
0/600	K	100	10
0/800	L	100	10
0/1000	M	200	20
0/1500	N	200	20
0/2000	O	400	50
0/3000	P	500	50
0/4000	Q	500	50
0/5000	R	1000	100
0/6000	S	2000	200
0/10,000	U	2000	200
0/15,000	V	2000	200

Some ranges not available in all dial sizes, please call with your particular application



		A	B	C	D	E
1 ½" Dial	In	1.88	1.06	.89	2.77	1/8" NPT
	MM	48	27	23	58	
2" Dial	In	2.24	1.27	.71	2.80	1/8" or ¼" NPT
	MM	57	32	23	71	
2 ½" Dial	In	2.80	1.28	1.07	3.55	1/4" NPT
	MM	71	33	27	90	
4" Dial	In	4.32	1.63	1.25	5.57	1/4" or ½" NPT
	MM	110	42	32	141	
6" Dial	In	6.54	1.70	1.68	8.22	1/4" or ½" NPT
	MM	166	43	43	210	

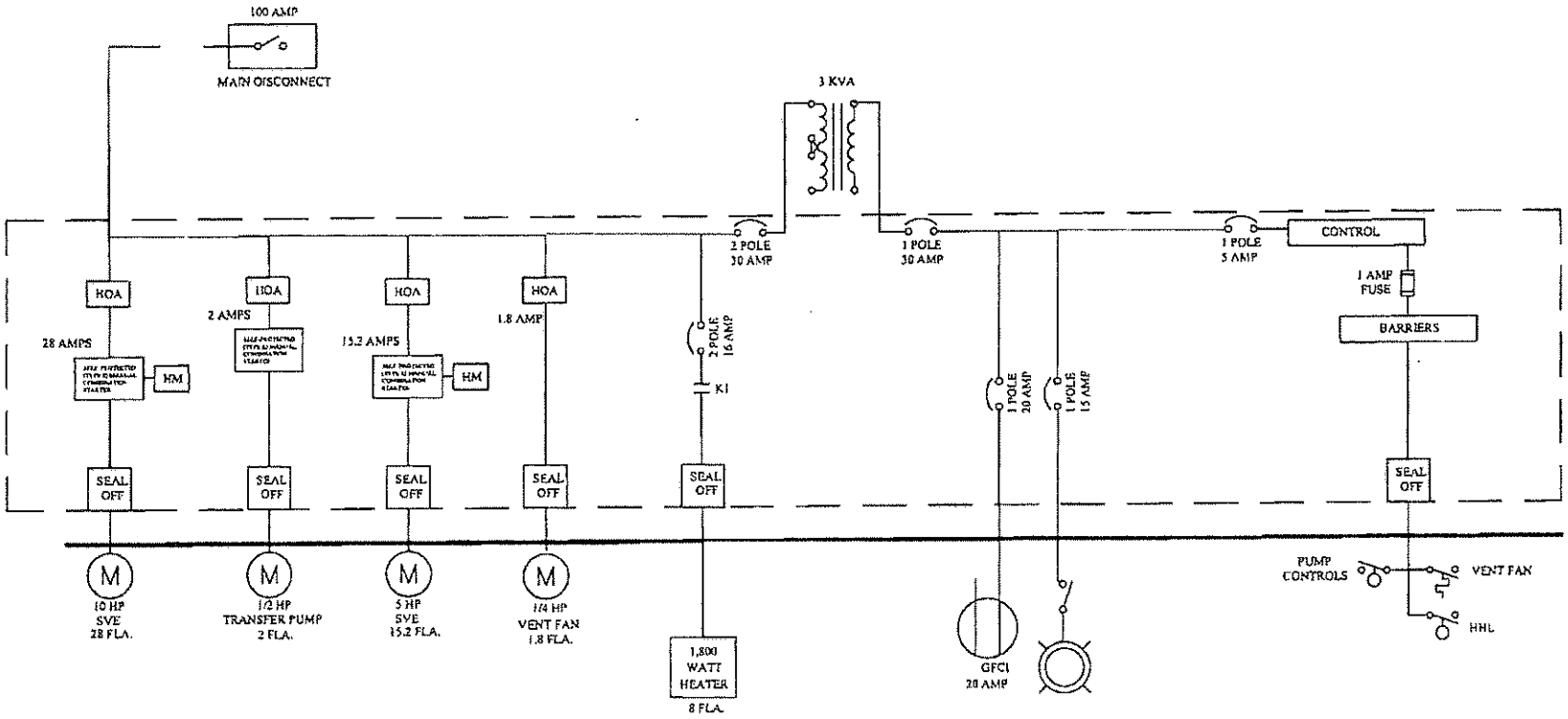
(3)

Fliteway Technologies, Inc.

System Control Panel

2129 East Birchwood Ave. Cudahy, WI 53110

(414) 483-5600 1-800-236-3580 FAX (414) 483-1957



3/26/08

ONE LINE ELECTRICAL DIAGRAM

TYREE BROTHERS

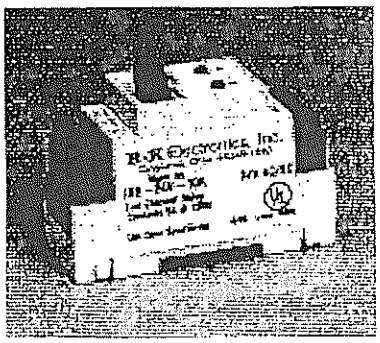
SIZE	FSCM NO.	DWG NO.	REV
		Q13475	

SCALE NONE

SHEET

Two Channel Relay with Intrinsically Safe Outputs

ISR



Specifications

Electrical
Supply Voltage: 12 or 24 AC/DC ±10%
Power: 1.5 watts
Inputs: Switch Closure or Probe
Input Sensitivity: 10k - 100k Ω
Pick-up & Drop-out Delays: 0.5 second
Max. Open Circuit Voltage: 7 volts
Max. Source Current: 0.1 milliamps
Output Rating @ 25°C:
5 Amps @ 125VAC
5 Amps @ 30VDC or 250VAC
20,000,000 Mechanical Cycles

Physical
Mounting: Din Rail mount
Termination: Touch safe screw terminals, with lift mechanism, #12 AWG max.
Weight: 10 Oz.

Ambient Temperatures
Operating: 0°C to 55°C
Storage: -40°C to 85°C

UL-913
Class 1, Division 1
Groups A, B, C, and D
Hazardous Locations

- 2 Independent Relays
- Compact Design
- Contact or Probe Input
- Built-in De-bounce Delays
- Power and Output status LEDs
- Low Voltage Design for 12 or 24VAC/DC
- Din Mounting
- 12 or 24VDC Battery Back-Up

E199046
Standard UL 913

Ordering Information

ISR - 24V - 10K

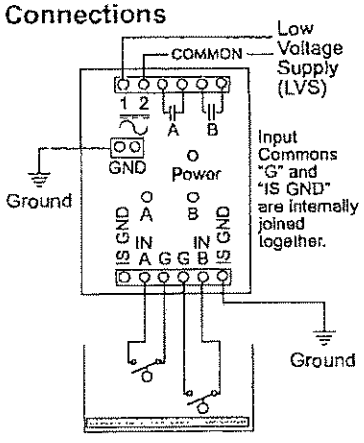
R-K Model

Sensitivity
10K - 10k Ω

(Consult factory for other sensitivity options.)

Operating Voltage
12V - 12VAC/DC
24V - 24VAC/DC

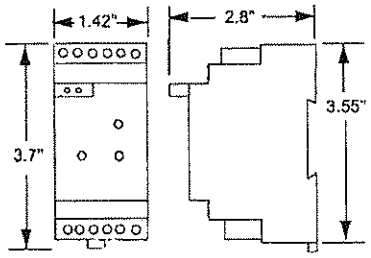
Connections

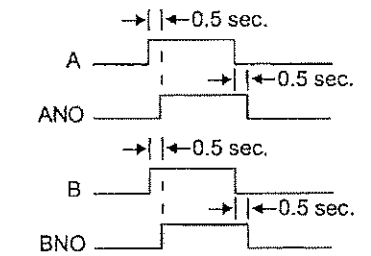


See control drawing A6757-4 for other input examples.

If Low Voltage Supply is grounded, the ground must be connected to terminal 2.

Dimensions





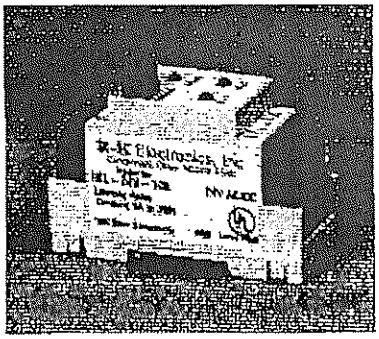
Operation

Two Channel Relay

The ISR has two independent outputs to the hazardous area and two independent (dry contact) relay outputs. The outputs to the hazardous area can be switches or, when used with a conductive liquid, electrodes. When output "A" is completed (contact closed or low resistance), 0.5 second later the dry output contact "A" is closed and the "A" LED turns On. When output "A" is opened (contact opened or high resistance), 0.5 second later the dry output contact "A" opens and the "A" LED turns Off. "B" operates the same way, but is independent of "A." There is also a supply power LED indicator. The ISR must be located and grounded in a non-hazardous location.

Latching Relay with Intrinsically Safe Outputs

ISL



Specifications

Electrical
Supply Voltage: 12 or 24 AC/DC ±10%
Power: 0.8 watts
Inputs: Switch Closure or Probe
Input Sensitivity: 10k - 100k Ω
Pick-up & Drop-out Delays: 1 second
Max. Open Circuit Voltage: 7 volts
Max. Source Current: 0.1 milliamps
Output Rating @ 25°C:
5 Amps @ 125VAC
5 Amps @ 30VDC or 250VAC
20,000,000 Mechanical Cycles

Physical
Mounting: Din Rail mount
Termination: Touch safe screw terminals, with lift mechanism, #12 AWG max.
Weight: 10 Oz.

Ambient Temperatures
Operating: 0°C to 55°C
Storage: -40°C to 85°C

UL-913
Class 1, Division 1
Groups A, B, C, and D
Hazardous Locations

- Two Inputs - Latching Function
- Compact Design
- Contact or Probe Input
- Built-in De-bounce Delays
- Output and Input status LEDs
- Low Voltage Design for 12 or 24VAC/DC
- Din Mounting
- 12 or 24VDC Battery Back-Up

E199046
Standard UL 913

Ordering Information

ISL - 24V - 10K

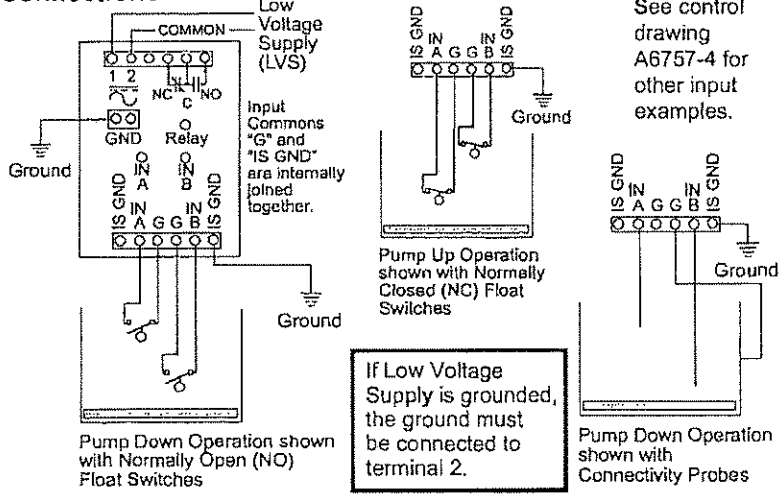
R-K Model

Operating Voltage
12V - 12VAC/DC
24V - 24VAC/DC

Sensitivity (Max. contact resistance)
10K - 10k Ω

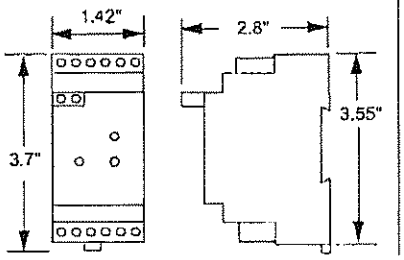
(Consult factory for other sensitivity options.)

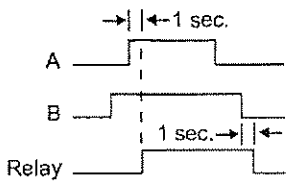
Connections



If Low Voltage Supply is grounded, the ground must be connected to terminal 2.

Dimensions





Operation

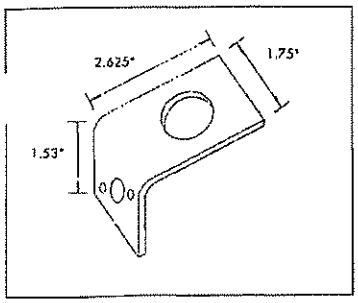
Latching Relay

The ISL has two independent outputs to the hazardous area and one (dry contact) relay output with a latching function. The outputs can be switches or, when used with a conductive liquid, electrodes. For pump down when output "A" is completed (contact closed or low resistance), 1 second later LED "A" turns On and the dry output contact is energized. When output "B" is completed (contact closed or low resistance), 1 second later LED "B" turns On and the dry output contact is unlatched and de-energized. For pump up applications use normally closed input devices and switch the position of "A" and "B."This device must be located and grounded in a non-hazardous location.

U.S. Patent No. 5,502,612

The Complete Family of Metal Oxide Surge Protection With Advanced Fault Withstand Capabilities

JOSLYN
Manufacturing Co.



Bracket

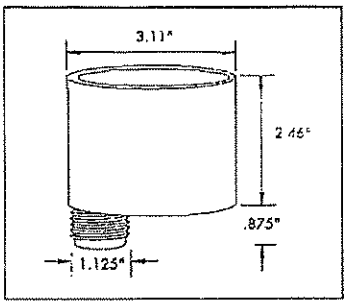


Figure 1

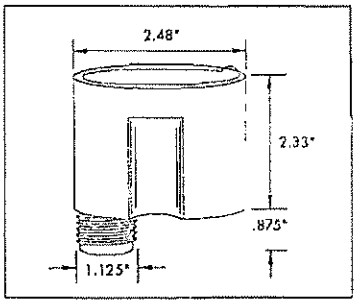


Figure 2

TYPICAL WIRING CONNECTIONS

Maximum Phase-Phase/Phase-Ground Voltages

Figure No.	Z1-175	Z2-175	Z3-175	Z1-480	Z2-480	Z3-480	Z1-650	Z2-650	Z3-650
3	175/NA			480/NA			650/NA		
4		350/NA			960/NA			1300/NA	
5		350/175			960/480			1300/650	
6			303/175			831/480			1125/650
7			303/175			831/480			1125/650
8		175			480			650	
9			175/101			480/277			650/375
10			175/101			480/277			650/375

For severe duty applications select arrester with next highest voltage rating.

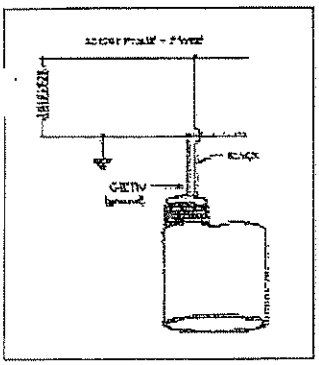


Figure 3

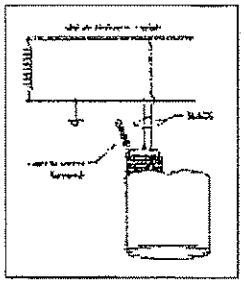


Figure 4

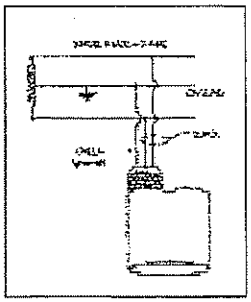


Figure 5

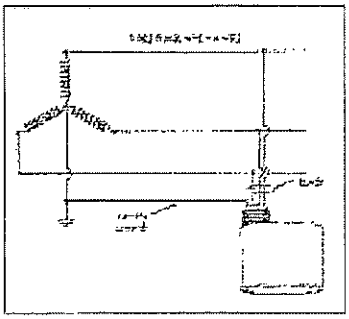


Figure 6

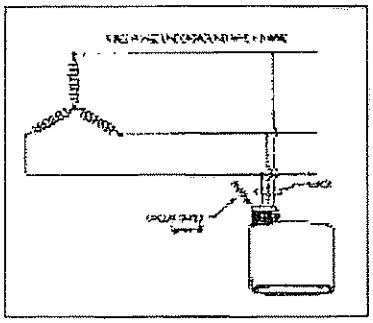


Figure 7

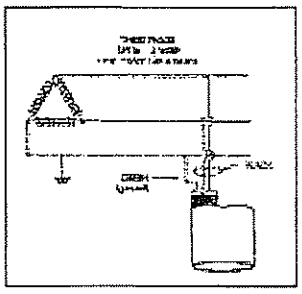


Figure 8

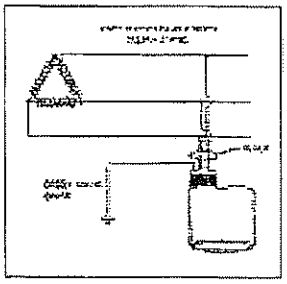


Figure 9

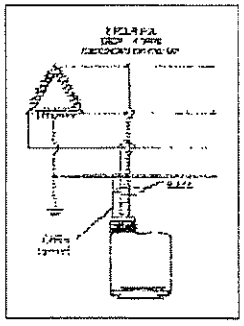
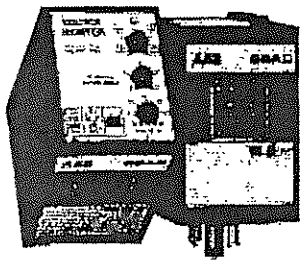


Figure 10

3 Phase Voltage Monitor
PLMU Series
Universal Plug-in Monitor



ANSI Device #27/47/59

- Protects Against: Phase Loss, Phase Reversal, Overvoltage, Undervoltage, & Unbalanced Voltages
- Octal Plug-in with SPDT Isolated 10 A Contacts
- Operates from 200 ... 480 V AC
- LED Indicator Glows Green when Voltages are Acceptable, Red for Faults
- Simple 3-Wire Connection for Delta or Wye Systems

Description

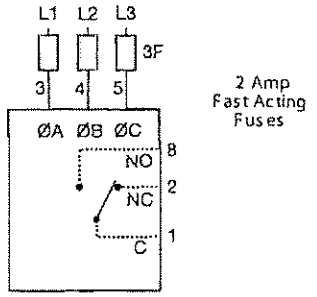
The PLMU Series continuously measures the voltage of each of the three phases to provide protection for three phase motors and sensitive loads. Its microcontroller senses under and over voltage, voltage unbalance, phase loss, and phase reversal. Protection is provided even when regenerated voltages are present. Universal voltage operation and standard base connection allows the PLMU to replace hundreds of competitive part numbers.

Operation

Upon application of power, a 0.6 s random start delay begins and the PLMU measures the voltage levels and line frequency and selects the voltage range. The output relay is energized and the LED glows green when all voltages are acceptable and the phase sequence is correct. LED flashes green during trip delay, glows red when output de-energizes. Undervoltage, overvoltage, and voltage unbalance must be sensed for continuous trip delay before the relay de-energizes. Re-energization is automatic upon fault correction. The output relay will not energize if a fault condition is sensed as three phase input voltage is applied. Line voltage is selected with the knob, setting the over and under voltage trip points. Voltage range is automatically selected by the microcontroller.

ASME A17.1 rule 210.6; NEMA MG1 14:30, 14:35; IEEE C62.41-1991 Level B

- Approvals: - Pending



F = Fuses
ØA = Phase A = L1
ØB = Phase B = L2
ØC = Phase C = L3
NO = Normally Open
NC = Normally Closed

Relay contacts are isolated. Dashed lines are internal connections.

CAUTION: 2 amp max fast acting fuses should be installed externally in series with each input. (3) (Bussman KTK-2 or equivalent)

Voltage Unbalance	Trip Delay	Part Number
Adjustable 2 ... 10%	Adjustable 0.25 ... 30 s	PLMU11

Available with Fixed Unbalance and Trip Delay

Technical Data

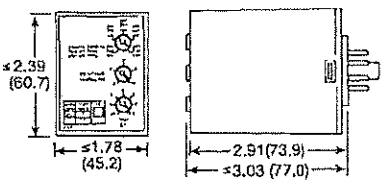
Line Voltage	
Type	Three phase Delta or Wye with no connection to neutral
Line Voltage	200 ... 480 V AC +/-15%; 50 ... 60 Hz +/-2 Hz
Adjustable Voltage Ranges (Automatic Range Selection)	200 ... 240 V AC, 50 ... 60 Hz 340 ... 420 V AC, 50 Hz 400 ... 480 V AC, 60 Hz Maximum voltage 552 V AC
Phase Sequence	ABC
Overvoltage, Undervoltage, & Voltage Unbalance	
Type	Voltage detection with delayed trip & automatic reset
Overvoltage & Undervoltage	
Undervoltage Trip Point	88 ... 92% of adjusted line voltage
Reset Voltage	+2% of trip voltage
Overvoltage Trip Point	109 ... 113% of adjusted line voltage
Reset Voltage	-2% of trip voltage
Voltage Unbalance Trip Point	Adjustable from 2 ... 10% or fixed 4 ... 10%

Reset on Balance (%):									
Selected Unbalance	2	3	4	5	6	7	8	9	10
Reset	1.5	2.5	3.5	4.5	5.4	6.3	7.2	8.1	9

Trip Delay Range	Adj. from 0.25 ... 30 s or fixed 2 ... 30 s +/-15%
Severe Unbalance - 2X Selected Unbalance	0.25 ... 2 s; if trip delay is less than 2 s; the trip delay is used
Random Start Delay	0.6 s
Phase Reversal & Phase Loss Trip Time	150 ms
Phase Loss Set Point	15% unbalance
Reset Type	Automatic
Output Type	Energized when voltages are acceptable
Rating	10 A resistive @ 240 V AC; 1/4 hp @ 125 V AC; 1/3 hp @ 250 V AC; max. voltage 277 V AC
Life	Mechanical -- 1 x 10^6; Electrical -- 1 x 10^5
Protection	
Surge	IEEE C62.41-1991 Level B
Isolation Voltage	2500 V RMS input to output
Mechanical	
Mounting*	Plug-in socket rated 600 V AC
Termination	8-Pin octal plug
Package	3.03 x 2.39 x 1.78 in. (77.0 x 60.7 x 45.2 mm)
Environmental	
Operating Temperature	-40°C ... +60°C
Storage Temperature	-40°C ... +85°C
Weight	8.6 oz (244 g)

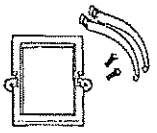
*CAUTION: Select an octal socket rated for 600 V AC operation.

Faceplate View

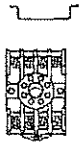


Inches (Millimeters)

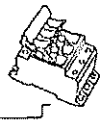
Accessories



Panel mount kit
P/N: 8Z1



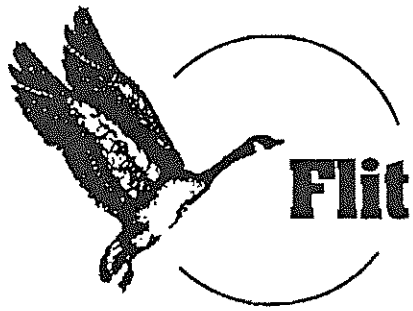
Octal 8-pin socket
P/N: OT08



3-phase fuse block/disconnect
P/N: P0700-241
2 AMP fuse
P/N: P0600-11

DIN rail
P/Ns: C103PM (Al)
17322005 (Steel)

See accessory page at the end of this section.

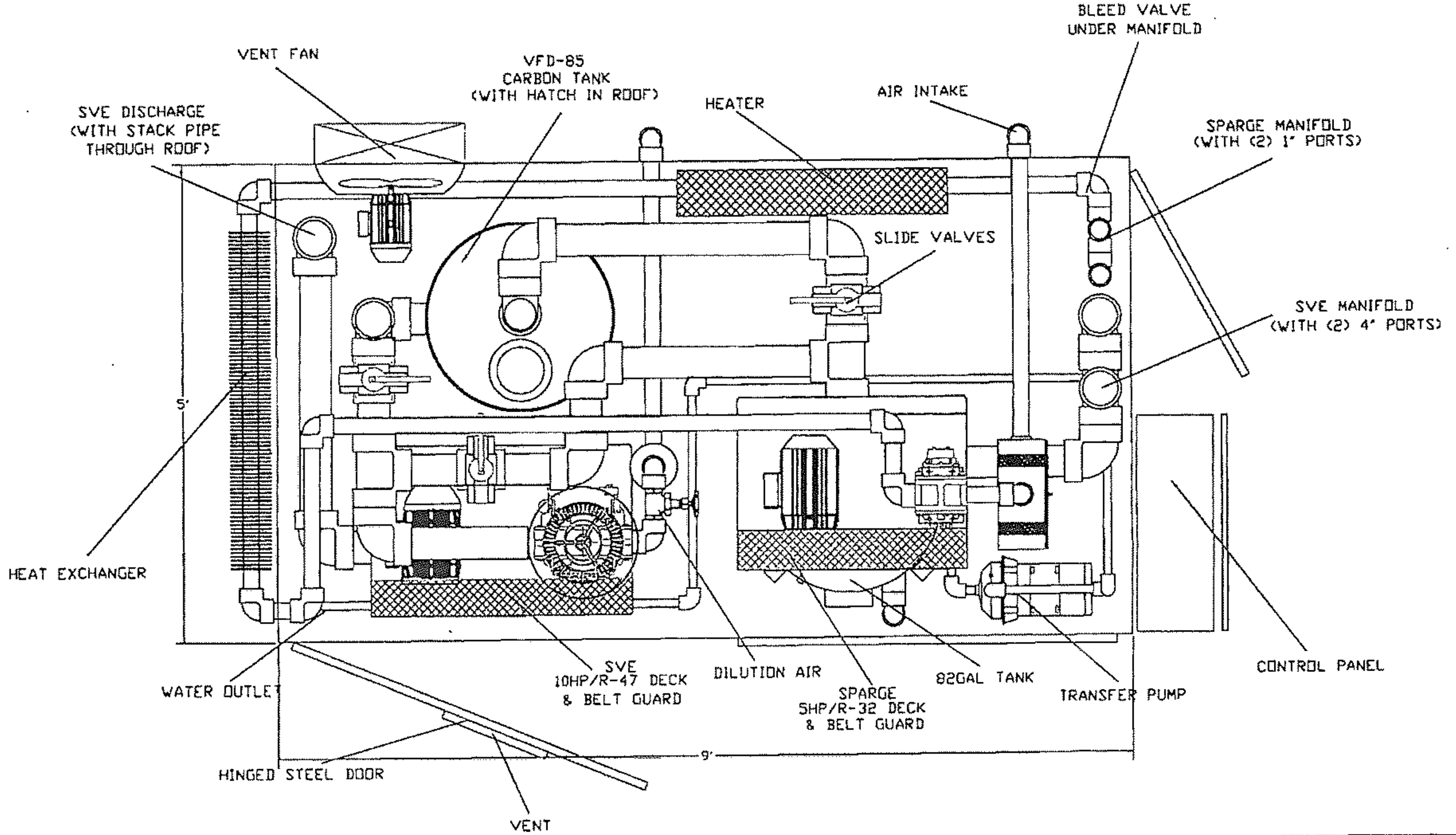


Fliteway Technologies, Inc.

Remediation Equipment Enclosure

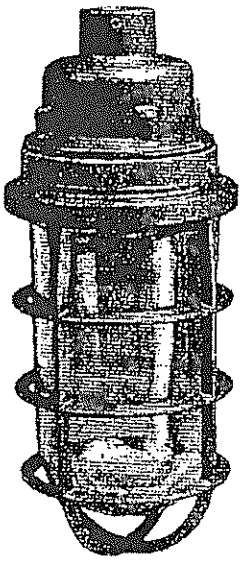
2129 East Birchwood Ave. Cudahy, WI 53110

(414) 483-5600 1-800-236-3580 FAX (414) 483-1957



ITEM	QTY	EQUIPMENT LAYOUT	PART/MAT'L NO.
INITIAL	DATE	FLITEWAY TECHNOLOGIES 2129 EAST BIRCHWOOD AVENUE-CUDAHY, WI 53110	
DRAWN BY KEVIN FEHN	4/2/08		
CHECKED		TYREE BROTHERS	
ENGINEERING			
EST APPROVED		SCALE NONE / SIZE A / Q13475 REV 2	REV
EST NO.		WEIGHT / UNIT TYPE / CAD FILE NO.	SHEET OF
SIMILAR TO			

DO NOT SCALE DRAWING



Enclosed & Gasketed*

UL Listed - File E10514

CSA Certified - File LR11713

V SERIES
ENCLOSED & GASKETED

Applications

Locations requiring durable, protected lighting fixtures

Wet and dirt laden locations, such as industrial environments requiring enclosed and gasketed (vaportight) fixtures

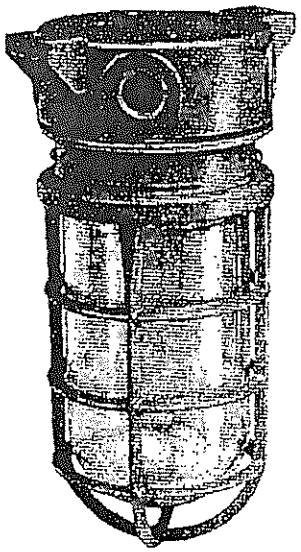
Lighting walkways, tunnels, loading docks, exits, stairwells, etc

Fixtures intended for base-up mounting

Heat resistant glass globes recommended for wet locations

Features

- Electrostatically applied epoxy/polyester finish
- Enclosed and gasketed fixture (vaportight). Joint gaskets provided to seal out moisture and dirt
- Splice box selections include pendant, ceiling, bracket and stanchion mounting types
- Modular design permits selection of splice box, fixture body, globe, guard and reflector for specific or custom applications
- Hubs are threaded for attachment to conduit and set screws are provided in pendant fixtures
- Copper-free aluminum (less than 4/10 of 1%) construction with electrostatically applied epoxy/polyester finish resists corrosion



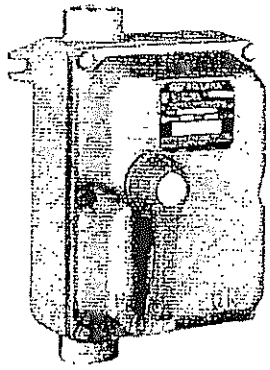
Class I, Div. 2, Groups A,B,C,D
Class I, Zone 2, Groups IIC,IIB,IIA
NEMA 3, 4 - When used with tempered glass

UL Listed - File E10514
UL-1571 Standard for Incandescent fixtures
UL-844 Standard for hazardous location fixtures

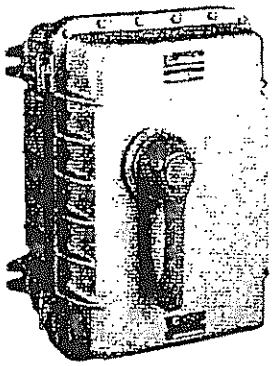
CSA Certified - File LR11713

CEILING FIXTURE WITH VGX SPLICE BOX							
FIXTURE TYPE	LAMP WATT	HUB SIZE	CATALOG NUMBER	CONSISTS OF			
			FIXTURE W/ GLOBE & GUARD	MOUNTING BOX	FIXTURE BODY	CLEAR GLOBE*	GUARD
100	150	1/2"	VUXGG-1-100PX①	VGX-1	VXFC-100 N34	VCGP-100	VAG-100
		3/4"	VUXGG-2-100PX①	VGX-2	VXFC-100 N34	VCGP-100	VAG-100
200	300	1/2"	VUXGG-1-200PX①	VGX-1	VXFC-200 N34	VCGP-200	VAG-200
		3/4"	VUXGG-2-200PX①	VGX-2	VXFC-200 N34	VCGP-200	VAG-200

HUBBELL
KILLARK



XEDS-30



XDS-2003

Class I, Div. 1 & 2, Groups C,D
Class I, Zones 1 & 2, Groups IIB, IIA
Class II, Div. 1 & 2, Groups E,F,G
Class III
NEMA 7(C,D) 9(E,F,G)

(UL) Listed - File E53290

(SP) Certified - File LR1171

See files for details or call Killark.

Applications

- Hazardous areas due to the presence of flammable gases or vapors, combustible dusts or easily ignitable fibers or flyings
- Use in accordance with the NEC/CEC where a horsepower rated quick make-quick break disconnect means for a motor and its controller is permitted

30-60-100-200 Amp Housing

- External handle is vault type with standard provisions for locking in "OFF" position with up to three padlocks
- Provisions for locking in "ON" position available as factory modification (add suffix SU40 to catalog number)
- Enclosure and external handle is cast copper-free aluminum alloy (less than 4/10 of 1%)
- Cover bolts are stainless steel
- Cutler-Hammer Type-DS Switches

30-60-100 Amp Housing

- Two cast conduit hubs; one top and one bottom
- Internal disconnect handle mechanism is a sliding plate mounted to the cover

200 Amp Housing

- Two drilled and tapped conduit openings, one top and one bottom
- Custom drilled and tapped conduit openings available on any of the four sides. (See Conduit Opening Data Chart, page E37, or consult factory.)
- Drilled and tapped holes are provided with close-up plugs for field assembly of drain and breather
- Handle mechanism interlocks with disconnect switch to prevent opening of enclosure when in the "ON" position
- Aluminum hinges are supplied as standard on left side of all 200 AMP assemblies

XEDS DISCONNECT SWITCHES

CATALOG NUMBER				SWITCH RATING
ENCLOSURE WITH SWITCH	ENCLOSURE WITH SWITCH AND AUXILIARY CONTACTS	ENCLOSURE WITH SWITCH AND TWO AUXILIARY CONTACTS	ENCLOSURE ONLY (WITHOUT SWITCH OR AUXILIARY CONTACTS)	
XEDS-30	XEDS-30A	XEDS-30AA	XEDS-A	30
XEDS-60	XEDS-60A	XEDS-60AA	XEDS-B	60
XEDS-100①	XEDS-100A①	XEDS-100AA①	XEDS-B①	100
XDS-2003	XDS-2003A	XDS-2003AA	XDS000C	200

MODIFICATIONS

SUFFIX NUMBER	DESCRIPTION
SU3	Drain and breather
SU17	100 Amp solid neutral
SU18	225 Amp solid neutral
SU40	Lock "on" for handle
KIT-251	100 Amp ground lug
KIT-252	225 Amp ground lug

Auxiliary switch kits are available for separate control circuit applications. Each auxiliary switch has one normally open and one normally closed contact. Each switch includes three soldered, identified leads. Rated 15 amps at 250 volts maximum.

① Due to wire gutter space, this unit must be wired with incoming (line) connection through the top hub and outgoing (load) connection to the bottom hub.

DE

XEDS ELECTRICAL RATINGS

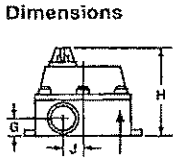
SWITCH AMPERES	MAXIMUM HORSEPOWER–THREE PHASE–3-POLE				
	120 VAC	240 VAC	480 VAC	600 VAC	250 VDC
30	5	10	20	25	7-1/2
60	10	20	40	60	15
100	15	30	75	75	25
200	–	60	125	150	40

XEDS DIMENSIONS

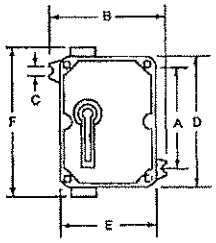
CATALOG NUMBER	HUB SIZE	A	B	C	D	E	F	G	H	J
XEDS-A	1-1/4"	8-3/8" (213)	8-3/4" (222)	7/16" (11)	10-1/4" (260)	7-3/8" (187)	11-7/8" (302)	1-3/8" (35)	6-7/8" (175)	2" (51)
XEDS-B	2"	10-7/8" (276)	9-1/8" (232)	7/16" (11)	13-7/8" (352)	7-3/4" (197)	16" (406)	1-3/4" (44)	7" (178)	2" (51)
XDS000C	3"	14-1/2" (368)	13-7/8" (352)	1/2" (13)	22" (559)	15" (381)	—	3-1/8" (79)	12-7/8" (327)	—

NOTE: A & B dimensions are for mounting.

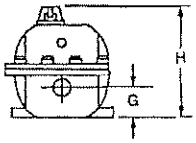
Dimensions

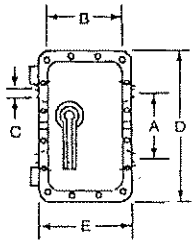


NOTE: Space for additional drill & tap conduit opening
1-1/4" for XEDS-30
2" for XEDS-60+100
Also is location for SU3 drain and breather when requested.



XEDS

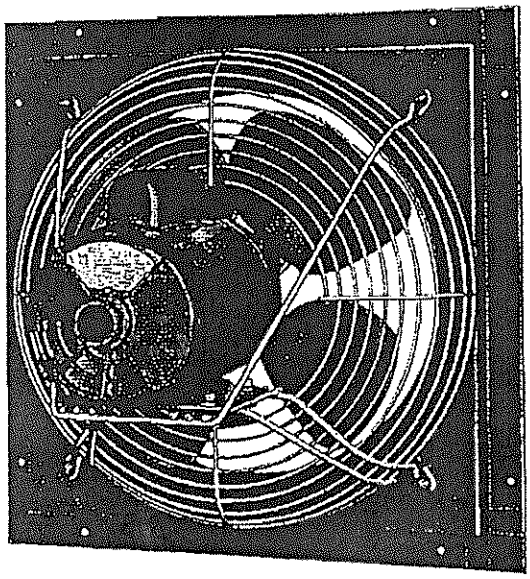




XDS-2003

HUBBELL
KILLARK

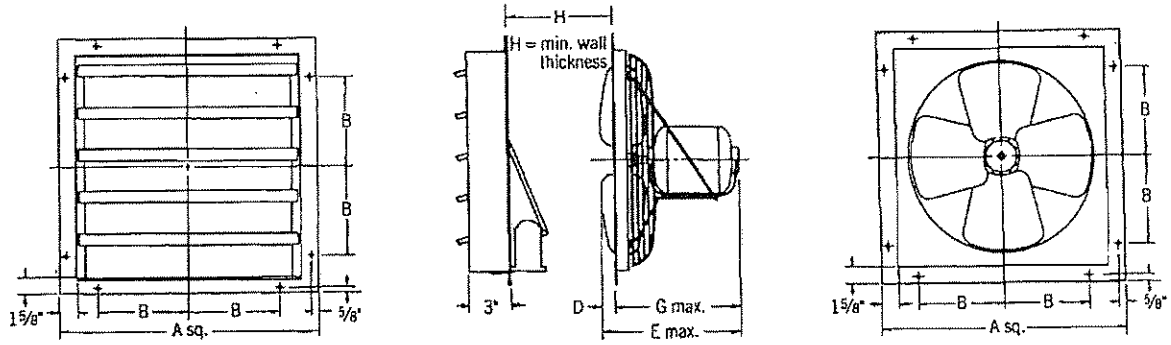
DIRECT-DRIVE PROPELLER FANS



MODEL N

EXHAUST or SUPPLY

- **Eight wheel diameters**—8" through 24".
- **250 to 6400 CFM**—up to ½" static pressure.
- **Panels**—square steel construction with streamlined venturi inlet...venturi is reversed in supply-fan panels...baked-green enamel finish.
- **Wheels**—aluminum blades with steel hubs.
- **Motor mounts**—wire-guard-type motor mount [see photo at left] is standard on all Model N units...guard is zinc-plated steel.
- **Motors**—standard motors are totally enclosed air over with pre-lubricated ball bearings except 1/12 and 1/20 HP motors, which are shaded-pole totally enclosed permanently lubricated sleeve-bearing type. Motors ¼ HP and larger are suitable for either horizontal or vertical service...specify "for vertical mounting" to have wheel locked to motor shaft...1/20 and 1/12 HP motors are not suitable for vertical service.



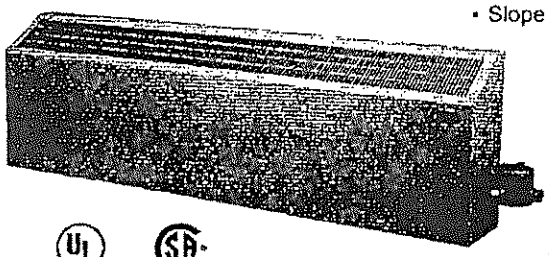
SPECIFICATIONS DIMENSIONS IN INCHES.

Application	Model	Wheel diameter	A	B	D	E†	G†	H minimum		Mounting hole no. and diameter		Weight* [lbs.]
								Automatic	Motor-operated	Fan	Shutter	
EXHAUST	EN82-	8	13¼	3		10¼	10¼	1⅝	4½	8 - 5/16	8 - 9/32	25
	EN102-	10	15¼	4	¼	10⅜	10⅛	1⅝	4¾	8 - 5/16	8 - 9/32	29
	EN122-	12	17¼	5	⅞	11½	10¾	2	5⅜	8 - 5/16	8 - 9/32	35
	EN142-	14	20¼	6½	⅝	11¼	10⅝	2	5⅛	8 - 5/16	8 - 9/32	40
	EN162-	16	23¼	8	1	12	11	2	5½	8 - 5/16	8 - 9/32	50
	EN182-	18	24¼	8½	⅝	11½	10⅞	2	5⅛	8 - 5/16	8 - 9/32	65
	EN202-	20	27¼	10	⅞	12⅞	12	2	5⅜	8 - 5/16	8 - 9/32	80
	EN242-	24	30¼	11½	1	13⅜	12⅜	2	5½	8 - 5/16	8 - 9/32	95
SUPPLY	SN82-	8	13¼	3		10¼	10¼	Automatic shutter not available	9½	8 - 5/16	8 - 9/32	25
	SN102-	10	15¼	4		10¼	10¼		9½	8 - 5/16	8 - 9/32	29
	SN122-	12	17¼	5		11	11		9½	8 - 5/16	8 - 9/32	35
	SN142-	14	20¼	6½		11⅝	11⅝		9½	8 - 5/16	8 - 9/32	40
	SN162-	16	23¼	8	⅛	11¼	11⅛		9½	8 - 5/16	8 - 9/32	50
	SN182-	18	24¼	8½		12	12		9½	8 - 5/16	8 - 9/32	65
	SN202-	20	27¼	10		12½	12½		9½	8 - 5/16	8 - 9/32	80
	SN242-	24	30¼	11½	¼	12½	12¼		9½	8 - 5/16	8 - 9/32	95

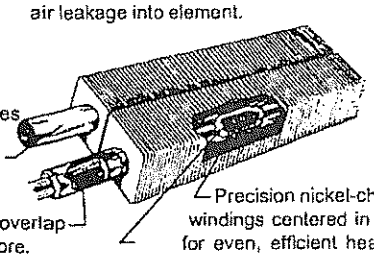
† E and G based on longest motor used for each size fan. * Shipping weights shown are maximum and include totally enclosed motors and weight of packaging.
NOTE: Exhaust units are available with either automatic or motorized shutters. Supply units require motorized supply shutter.
When ordering, specify complete model number as shown on page 3. Dimensions not to be used for construction unless certified. Tolerance: ± 1/8"

HAZARDOUS LOCATION CONVECTION HEATER

- Cabinet size 18" high, 9" wide
- Color beige powder coat textured finish
- Heavy duty 16 Ga. Steel
- Fully assembled unit
- Slope Top Design



Element assembly pressure tested to 100 pounds per square inch to protect against air leakage into element.



Corrosion-Resistant Sheath provides resistance to oxidation, corrosion, plus a broad range of chemicals and atmospheres.

Precision nickel-chromium windings centered in the unit for even, efficient heat.

Lead Arrangement. Solid nickel pins overlap the resistance windings inside the core. Pins are permanently connected during the swaging operation for trouble-free electrical continuity.

Efficient dielectric compacted to a predetermined density results in good heat transfer, and strength to withstand normal shock and vibration.

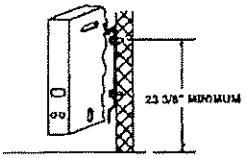
NEMA 4 Hose Down Rated

ALL T-2A Models normal stock items, contact Factory for lead-time on all T-3A Models

LISTINGS	UPC 686334	MODEL	WATTS	BTU	VOLTS	AMPS	CABINET LENGTH	NO. OF ELEMENTS	MAX FUSE SIZE	WT.
CLASS 1, GROUP B, C & D DIVISION 1 & 2 (T-2A) 280° C / 536° F UL LISTED & CSA NRTL/C CERTIFIED	655002	FEP-1612-1RA	1800	6143	120	15.0	34"	1	20	50 lbs.
	655019	FEP-1620-1RA			208	8.7			10	
	655026	FEP-1624-1RA			240	7.5			10	
	655033	FEP-1627-1RA			277	6.5			10	
	655040	FEP-1648-1RA			480	3.8			5	
	655057	FEP-3620-1RA	3600	12286	208	17.3	34"	2	20	54 lbs.
	655064	FEP-3624-1RA			240	15.0			20	
	655071	FEP-3627-1RA			277	13.0			15	
	655088	FEP-3648-1RA			480	7.5			10	
	655170	FEP-3657-1RA			600	6.0			10	
	655095	FEP-3820-1RA	3800	12969	208	18.3	58"	1	20	80 lbs.
	655101	FEP-3824-1RA			240	15.8			20	
	655118	FEP-38271-RA			277	13.7			15	
	655125	FEP-3848-1RA			480	7.9			10	
	655132	FEP-7620-1RA	7600	25938	208	36.5	58"	2	40	85 lbs.
	655149	FEP-7624-1RA			240	31.7			35	
	655156	FEP-7627-1RA			277	27.4			30	
	655163	FEP-7648-1RA			480	15.8			20	
	655187	FEP-7657-1RA			600	12.7			15	
CLASS 1, GROUP B, C & D DIVISION 1 & 2 (T-3A) 180° C / 356° F CSA NRTL/C CERTIFIED	655194	FEP-0812-1RA	800	2730	120	6.7	34"	1	10	50 lbs.
	655200	FEP-0820-1RA			208	3.8			5	
	655217	FEP-0824-1RA			240	3.3			5	
	655224	FEP-0827-1RA			277	2.9			5	
	655231	FEP-0848-1RA			480	1.7			5	
	655248	FEP-1612-1RA	1600	5460	120	13.3	34"	2	15	54 lbs.
	655255	FEP-1620-1RA			208	7.7			10	
	655262	FEP-1624-1RA			240	6.7			10	
	655279	FEP-1627-1RA			277	5.8			10	
	655286	FEP-1648-1RA			480	3.3			5	
	655385	FEP-1657-1RA			600	2.7			5	
	655293	FEP-1712-1RA	1700	5802	120	14.2	58"	1	20	80 lbs.
	655309	FEP-1720-1RA			208	8.2			10	
	655316	FEP-1724-1RA			240	7.1			10	
	655323	FEP-1727-1RA			277	6.1			10	
	655330	FEP-1748-1RA			480	3.5			5	
	655347	FEP-3420-1RA	3400	11604	208	16.3	58"	2	20	65 lbs.
	655354	FEP-3424-1RA			240	14.2			20	
	655361	FEP-3427-1RA			277	12.3			15	
	655378	FEP-3448-1RA			480	7.1			10	
	655392	FEP-3457-1RA			600	5.7			10	

WARNING: Do not operate heaters in ambient temperatures exceeding 40°C (104°F).

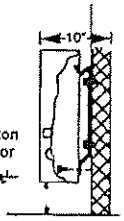
Wall Mounting Brackets
(standard with Heater)

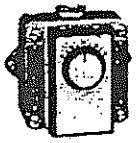


Hazardous Location Heater is easily installed by one person.

Junction box extends 5-1/2" from the right end of the housing

A 9 inch minimum space from botton of heater to the floor is required for ample air flow.

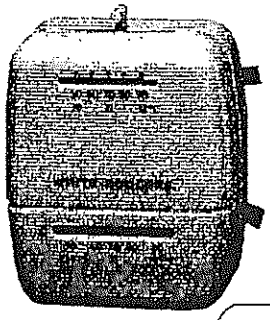




HAZARDOUS LOCATION THERMOSTAT - REMOTE MOUNTED

UPC 686334	MODEL	DESCRIPTION	WT.
538107	EPETD8S	50 - 90 °F 24-277 VOLT SPST	5 lbs.
835077	EPETD8D	50 - 90 °F 24-277 VOLT DPST	5 lbs.

1C20-101



1C26-101

ECONOMY MECHANICAL THERMOSTATS

Reliable Performance in an Attractive Design

FEATURES

- Rugged snap-action contacts.
- Adjustable heat anticipator.
- Bi-Metal thermometer.
- Heat/Cool model includes switching subbase.
- Heat/Cool model compatible with Electric Heat systems.
- Classic White color.

SPECIFICATIONS

Anticipation Rating, Heating	Adjustable from 0.15 to 1.2 Amps
Anticipation Rating, Cooling	Fixed
Differential, Heating	2°F (1.1°C)
Differential, Cooling	4°F (2.2°C)
Dimensions	3¾"H x 2⅞"W x 1½"D
Dimensions, Switching Models	3¾"H x 3⅛"W x 1⅝"D
Electrical Rating	mV to 30V, 50/60 Hz or DC

PARTS AND ACCESSORIES

See end of this section for parts and accessories

- Thermostat Guards — see pages 23-24
- Wallplate F61-2499 — 5⅛"H x 5"W

TECHNICAL HELP

Configuration/Wiring ..... See page 198

Model Number	Typical Application	Stages Heat/Cool	System Switch	Fan Switch	Contacts	Anticipation Heat/Cool	Range	Shape	Terminals
1C20-101	Heat Only ②	1	None ①	None	Snap-Action	Adjustable	50-90°F (10-32°C)	Vertical	R, W
1C20-102	Heat Only	1	None	None	Snap-Action	Adjustable	50-90°F (10-32°C)	Vertical	R, W
1C21-101	Cool Only	1	None	None	Snap-Action	Fixed	50-90°F (10-32°C)	Vertical	R, Y
1C26-101	Heat/Cool ② ③	1/1	Heat-Off-Cool	Auto-On	Snap-Action	Adjustable/Fixed	50-90°F (10-32°C)	Vertical	RC, RH, W, Y, G, O, B, A

① Lowest temperature setting is "OFF" position

② Includes optional "A" terminal connection for Electric Heat systems that require the thermostat to energize the Blower (G terminal) on a call for heat

③ Includes F61-2499 wall mounting plate to cover marks left by previous thermostat

CONFIGURATION

Electric Heat Furnaces (Single Transformer Systems Only)

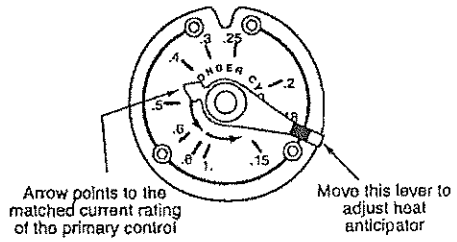
The thermostat as shipped may not operate the fan correctly. If both the heating and cooling system must operate the fan relay, remove the yellow factory-installed jumper wire from the Y terminal and connect it to the A terminal. The fan should now cycle when the termostat calls for either heat or cool.

Heat Pump Applications

This thermostat WILL NOT provide multi-stage heating or cooling operation. For single-stage heat pump applications, install a short jumper wire across terminals W and Y. If the old thermostat has a terminal that is continuously energized, disconnect the wire from the old thermostat's terminal and connect it either to the: 1) B terminal, if the reversing valve is energized on a call for heat; or to the 2) O terminal, if the reversing valve is energized on a call for cool. If the system heats on a call for cool, or vice versa, this wire has been connected to the wrong terminal.

Special Application Terminals

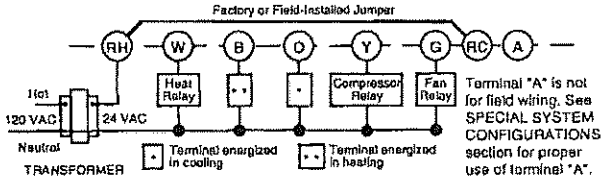
The B and O terminals can provide switching for special functions other than heat pump operation. When the system switch is in the HEAT position, the B terminal is energized. When the system switch is in the COOL position, the O terminal is energized.



Anticipator adjustment

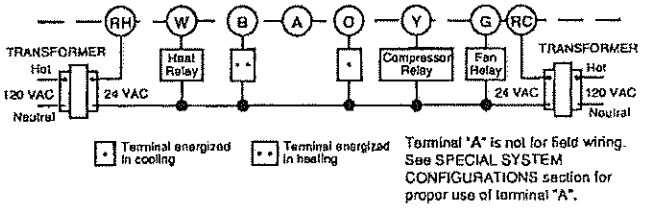
TYPICAL WIRING DIAGRAMS

NOTE: Some thermostat models don't include all terminals as shown here.

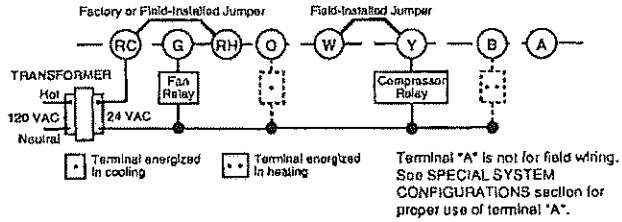


Single transformer heating/cooling system

NOTE: Remove factory-installed jumper between RC and RH terminals for this application.



Two-transformer heating/cooling system



Single transformer, single stage heat pump system

TECHNICAL HELP

WHITE-RODGERS

Installation Instructions for

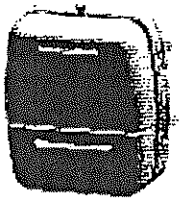
Heating only

1C20

and

Heating & Cooling

1C26



CONTENTS

YOUR THERMOSTAT REPLACES

Description	1C20	1C26
Standard Heating & Cooling Systems - 4 or 5 wires	No	Yes
Standard Heat Only Systems	Yes	Yes
Millivolt Heat Only Systems - Floor or Wall Furnaces	Yes	Yes
Standard Central Air Conditioning	No	Yes
Gas or Oil Heat	Yes	Yes
Electric Furnace	Yes	Yes
Hydronic (Hot Water) Zone Heat - 2 Wires	Yes	Yes
Hydronic (Hot Water) Zone Heat - 3 Wires	No	No
Heat Pump (No Aux or Emergency Heat)	No	Yes
Heat Pump (with Aux or Emergency Heat)	No	No
Baseboard Electric Heating or Line Voltage (120 or 240 Volt)	No	No

1 PREPARATIONS

Assemble tools required as shown below.

Failure to follow and read all instructions carefully before installing or operating this control could cause personal injury and/or property damage.

2 THERMOSTAT FEATURES

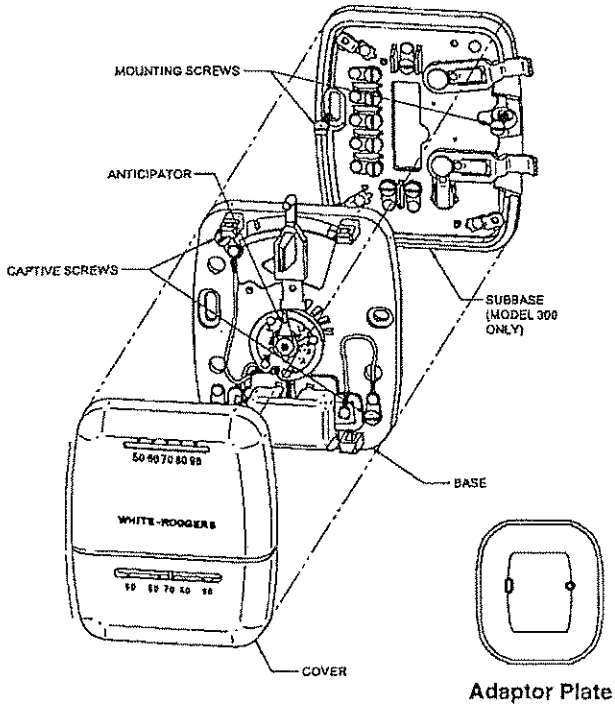


Figure 1.

Adaptor Plate (optional)

3 REMOVING OLD THERMOSTAT

⚠ CAUTION

To prevent electrical shock and/or equipment damage, disconnect electrical power to the system at the main fuse or circuit breaker until installation is complete.

Before removing wires from old thermostat's switching subbase, **label each wire** with the terminal designation it was removed from.

Some models also include an **adaptor plate** to cover unpainted surfaces. Thermostat wires pass through the adaptor plate center opening.

1. **Remove Old Thermostat:** A standard heat/cool thermostat consists of three basic parts:
   a. The cover, which may be either a snap-on or hinge type.
   b. The base, which is removed by loosening all captive screws.
   c. The switching subbase, which is removed by unscrewing the mounting screws that hold it on the wall or adaptor plate.

Make a note here [ ] of the anticipator setting on the old thermostat for future reference and use in step 5.

The heat anticipator pointer, if adjustable, will be set at one of a series of numbers representing the current rating of the primary control in your furnace. The number will be one of the following: .2, .4, .8, etc. or 0.2, 0.4, 0.8, etc.

If no heat anticipator/indication is showing, do not be concerned; move on to the next step.

WHITE-RODGERS
EMERSON ELECTRIC CO.
9797 REAVIS ROAD
ST. LOUIS, MISSOURI 63123-5398
www.white-rodgers.com

Printed in U.S.A.

PART NO. 37-6335A

0142

5 SET HEAT ANTICIPATOR

Set anticipator to match the setting of your old thermostat you noted in Step 3, or, the anticipator should be set to match the current rating stamped on your main heating control. The heat anticipator is adjustable from 0.15 to 1.2 amps. Adjust the anticipator by rotating the contact arm (see fig. 5). The anticipator setting is indicated by the numbers on the base that the pointer points to. If you are unsure where to set the anticipator contact the heater manufacturer for a recommended setting.

Move the pointer **counterclockwise to lengthen** heating system cycles; move **clockwise to shorten** heating cycles. Adjustments should not be greater than 1/2 marking at a time.

Snap on Cover: Carefully align the cover with the base and snap the cover onto the base.

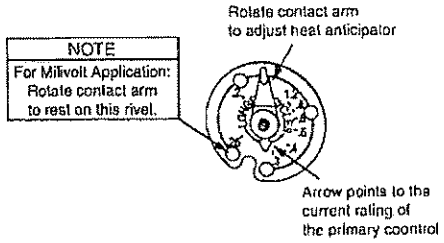
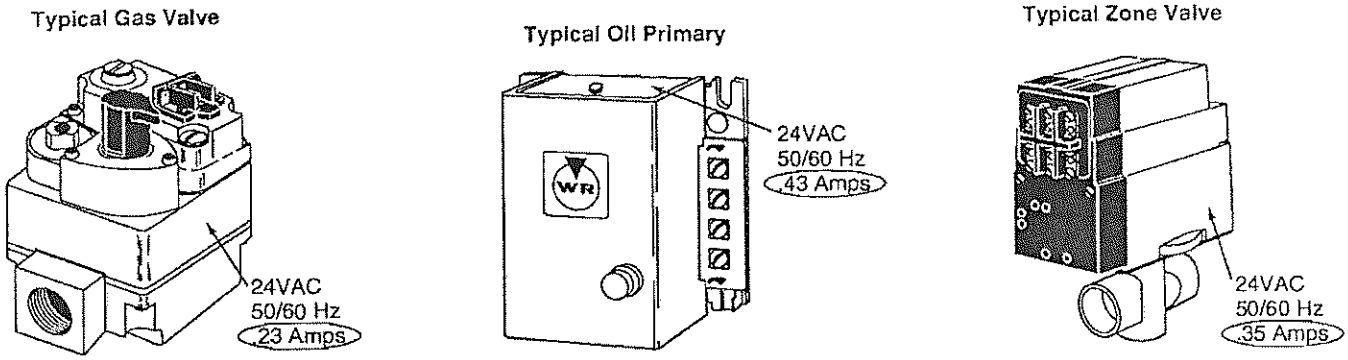


Figure 5. Anticipator adjustment



6 NEW THERMOSTAT OPERATION

1C20 Heat Only – After power is turned on, slide temperature lever to desired setting. To turn heat off, slide lever all the way to the left until it clicks.

1C26 – This thermostat is easy to operate. Fig. 6 shows how the heating/cooling system and fan operate when the switches are in various positions. After power is turned on, use the system switch to select either heating or cooling, or to turn the heating/cooling system off. Use the fan switch to control fan operation. When the fan switch is in the **AUTO** position, the fan will cycle with the heating or cooling system (the fan will not run if the system switch is in the **OFF** position and the fan switch is in the **AUTO** position). When the fan switch is in the **ON** position, the fan will run continuously, regardless of system switch position (even if the system switch is set to **OFF**, the fan will run if the fan switch is in the **ON** position).

■ Shows switch position

FAN		SYSTEM			OPERATION
AUTO	ON	COOL	OFF	HEAT	
■			■		No heating; no cooling; no fan
	■		■		No heating; no cooling; fan runs continuously
	■	■			Cooling system cycles from thermostat; fan runs continuously
■		■			Cooling system and fan cycle from thermostat
■				■	Heating system cycles from thermostat; fan cycles from fan control on furnace
	■			■	Heating system cycles from thermostat; fan runs continuously

Figure 6. Subbase switching and thermostat/system operation (1C26 only)

7 SPECIFICATIONS

ELECTRICAL DATA

Switch Rating ..... 24 VAC (30 VAC max.)
Heating ..... 0.15 to 1.2 Amps
Cooling ..... 0 to 1.5 Amps
Switch Action ..... Snap Action
Anticipator Rating:
Heating ..... Adjustable from 0.15 to 1.2 Amps
Cooling ..... Fixed

THERMAL DATA:

Temperature Range ..... 50°F to 90°F (10°C to 32°C)
Operating Humidity Range ... 0 – 90% noncondensing