



Prepared for

Basic Remediation Company
875 West Warm Springs Road
Henderson, NV 89015

FINAL LEACHATE MONITORING PLAN

BASIC REMEDIATION COMPANY

CORRECTIVE ACTION MANAGEMENT UNIT

HENDERSON, NEVADA

Prepared by

Geosyntec 
consultants

engineers | scientists | innovators
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Project Number SC0313

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TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1	Terms of Reference	1
1.2	Purpose	1
1.3	Responsible parties	1
2.	BACKGROUND	3
2.1	Sump Construction	3
3.	MONITORING EQUIPMENT	5
3.1	Control Panels.....	5
3.2	Transducers.....	5
3.3	LCRS Sump Pumps	6
3.4	Vadose Zone Sump Pumps.....	7
4.	LEACHATE MONITORING	8
4.1	Leachate Depth Monitoring.....	8
4.2	Sample Collection.....	9
4.2.1	Purge Volume	9
4.2.2	Analytical Testing	10
4.3	Leachate Removal	11
4.4	Leachate Disposal.....	11
4.5	Decontamination.....	11
5.	REPORTING.....	12
6.	REFERENCES	14

LIST OF FIGURES

Figure 1: Location of CAMU Sumps

Figure 2: Typical Sump Cross-Section

Figure 3: Phase I Vadose Zone and LCRS Monitoring Measurements

Figure 4: Phase II Vadose Zone and LCRS Monitoring Measurements

Figure 5: Phase IIIB Vadose Zone and LCRS Monitoring Measurements

Figure 6: Phase V Vadose Zone and LCRS Monitoring Measurements

LIST OF TABLES

Table 1 – Leachate Testing Analytes

LIST OF APPENDICES

Appendix A – CAMU Sump Pump Product Information

Appendix B – CAMU Sump Pump O&M Manual

1. INTRODUCTION

1.1 Terms of Reference

This document comprises the Final Leachate Monitoring Plan for the leachate and vadose zone sumps at the Basic Remediation Company (BRC) Corrective Action Management Unit (CAMU).

1.2 Purpose

The purpose of this monitoring plan is to outline the general monitoring procedures and manufacturer information relevant to the leachate monitoring and removal systems. This plan includes procedures for monitoring the integrity of the system, which is comprised of leachate and vadose zone sump pumps, pump controls, and water level transducers.

1.3 Responsible parties

BRC is ultimately responsible for maintaining the integrity of the systems. ENTACT, currently under contract to BRC, is responsible for operating and maintaining the system, troubleshooting the system, and notifying BRC of potential problems during the construction and operation of the CAMU. This Plan shall be amended if conditions and/or responsibilities change.

The following parties are currently involved with the monitoring of the system. NDEP will be notified and this monitoring plan will be revised if BRC changes the involved parties or their roles.

Owner

Basic Remediation Company
875 West Warm Springs Road
Henderson, Nevada 89011
Contact: Lee Farris
Phone: (702) 567-0400
Fax: (702) 567-0475

Monitoring Contractor

ENTACT
3030 Tara Murphy Drive
Henderson, Nevada 89044
Contact: Erik Gehringer
Phone: (561) 707-7088

Environmental Consultant

Geotechnical and Environmental Services, Inc
7150 Placid Street
Las Vegas, Nevada, 89119
Contact: Richard A. Cooke
Phone: (702) 365-1001

2. BACKGROUND

The BRC CAMU is an approximately 52-acre composite lined landfill currently being constructed in 6 phases concurrently with the BMI Common Areas Remediation Project. The CAMU is designed with storage capacity for approximately 3.4 million cubic yards (MCY) of soil and sludge waste received from the Eastside Area, Western Ditch, and Slit Trenches. The CAMU has been designed as a “dry landfill,” meaning that the waste to be placed in the CAMU will not generate leachate. This was demonstrated in the Waste Processing and Placement Plan (WPPP) (Geosyntec 2008). The WPPP has established, through laboratory and field testing, minimum placement requirements for the material such that leachate will not be generated from the waste materials being placed in the CAMU.

Following rain events in February 2009, leachate was discovered in the Phase I and II LCRS sumps and liquid was detected in the Phase I vadose zone sump. The Phase II vadose zone sump did not have any detectable liquid present. Nevada Division of Environmental Protection (NDEP) has requested a Leachate Management Plan as a result of the discovery of leachate in the leachate collection and recovery system (LCRS) sump in Phases I and II and vadose zone monitoring sump in Phase I.

At the time of this Plan completion, Phase I, II, and IIIB sumps have been constructed. This report will be amended following construction of the Phase V sumps. The locations of the sumps are shown in Figure 1.

2.1 Sump Construction

Four LCRS sumps with underlying vadose zone monitoring sumps are designed for the BRC CAMU in Phases I, II, IIIB, and V. The LCRS sumps have bottom dimensions of 10 feet (ft) wide (W) by 10 ft long (L) by 2 ft deep (D) with 2:1 horizontal to vertical (H:V) side slopes (Figure 2). The underlying vadose zone sump is 4 ft W by 4 ft L at the bottom of the sump by 1.5 ft D with 2:1 H:V side slopes (Figure 2).

The sumps are constructed, from bottom to top, with the following components:

- Geosynthetic clay liner, CETCO Bentomat DN®;
- 60 mil Agru Microspike[™] High Density Polyethylene (HDPE) Geomembrane;
- SKAPS 240 mil Geocomposite;
- 1.5 ft Drainage Aggregate;
- Geosynthetic clay liner, CETCO Bentomat DN®;

- 60 mil Agru Microspike[™] HDPE Geomembrane;
- SKAPS 240 mil Geocomposite;
- 2 ft Drainage Aggregate; and
- Filtration Geotextile.

The sumps are accessed by a 12 inch (in.) diameter HDPE pipe and an 18 in. diameter HDPE pipe for the vadose zone and LCRS sump, respectively. The pipe layouts for Phases I through IIIB vadose zone and LCRS sumps are shown on Figures 3 through 5. The pipe layout for Phase V will be included following construction of the sumps.

3. MONITORING EQUIPMENT

The sumps are equipped with a transducer, leachate pump, and associated control equipment. Manufacturer's information is provided in Appendix A.

3.1 Control Panels

The LCRS and vadose zone pump and level sensor control panels are EPG Model No. L975PTG. Each control panel will operate each pump independently via generator supplied power. The control panel includes simulators, 2 flow meters, pump call light, voltage monitor and disconnect for 12 volt DC battery backup and 12 volt DC terminals. The enclosure is NEMA 4 rated.

3.2 Transducers

Each LCRS and vadose zone sump contains an EPG LevelMasterTM pressure transducer calibrated to measure the depth of liquid in each sump. The pressure transducers are installed in each sump with the sump pumps; however, they can monitor the depth of liquid in the sumps without the pump present.

The transducers are suspended by polyurethane jacketed shielded cable with a polyethylene vent tube and Kevlar tension members. The cable has self-healing properties; in the event of damage to the cable, the water block feature just inside the jacket will self-seal. The depth reading of the transducer is accurate from 0 to 138.4 inches (0 – 5 pounds per square inch [psi]) with built-in temperature compensation.

3.3 LCRS Sump Pumps

The following table presents the pump information for each LCRS sump.

Phase	Model	Motor	Motor Lead	Level Sensor Lead	Suspension Cable
I	WSDPT5-3, EPG SurePump	¾ HP 230 VAC 1 phase	14 AWG Jacketed (110 ft)	(110 ft)	1/8 inch cable with clamps (110 ft)
II	WSDPT5-3, EPG SurePump	¾ HP 230 VAC 1 phase	14 AWG Jacketed (120 ft)	(120 ft)	1/8 inch cable with clamps (120 ft)
IIIB	WSDPT5-3, EPG SurePump	¾ HP 230 VAC 1 phase	14 AWG Jacketed (70 ft)	(70 ft)	1/8 inch cable with clamps (70 ft)
V	WSDPT5-3, EPG SurePump	¾ HP 230 VAC 1 phase	14 AWG Jacketed (70 ft)	(70 ft)	1/8 inch cable with clamps (70 ft)

3.4 Vadose Zone Sump Pumps

The following table presents the pump information for each vadose zone sump.

Phase	Model	Motor	Motor Lead	Level Sensor Lead	Suspension Cable
I	WSDPT2-3, EPG SurePump	½ HP 230 VAC 1 phase	14 AWG Jacketed (110 ft)	(110 ft)	1/8 inch cable with clamps (110 ft)
II	WSDPT2-3, EPG SurePump	½ HP 230 VAC 1 phase	14 AWG Jacketed (120 ft)	(120 ft)	1/8 inch cable with clamps (120 ft)
IIIB	WSDPT2-3, EPG SurePump	½ HP 230 VAC 1 phase	14 AWG Jacketed (70 ft)	(70 ft)	1/8 inch cable with clamps (70 ft)
V	WSDPT2-3, EPG SurePump	½ HP 230 VAC 1 phase	14 AWG Jacketed (70 ft)	(70 ft)	1/8 inch cable with clamps (70 ft)

4. LEACHATE MONITORING

4.1 Leachate Depth Monitoring

Leachate depth monitoring in both the LCRS and vadose zone sumps will be performed by the Monitoring Contractor listed in Section 1. Monitoring will be conducted as follows:

LCRS Sumps

Monitoring Frequency	LCRS Leachate Accumulation Rate (gpd)
Daily	>480
Every other day	320 – 480
Twice weekly	135 – 320
Weekly	30 – 135
Monthly	0 – 30
Quarterly	0

Vadose Zone Sumps

Monitoring Frequency	Vadose Zone Leachate Accumulation Rate (gpd)
Daily	>90
Every other day	60 – 90
Twice weekly	25 – 60
Weekly	5 – 25
Monthly	0 – 5
Quarterly	0

Upon completion of three years of quarterly monitoring with results of 0 gpd, monitoring will be reduced to annual.

Following 0.25-inch storm events, prior to cell closure, monitoring during quarterly and annual monitoring events will be conducted daily for 3 consecutive days after the event. If monitoring indicates a rise in leachate generation, monitoring will continue per frequency specified previously. For example, monthly while greater than 0 gpd and less than 30 gpd, weekly while greater than 30 gpd and less than 135 gpd, etc. If monitoring

indicates no rise in leachate generation, monitoring will return to the previous quarterly or annual monitoring.

Monitoring will be performed by recording the depth indicated by the transducer on the digital read out screen for each sump. The depth of the leachate will be recorded prior to and after leachate removal from each sump pumped.

4.2 Sample Collection

Following leachate depth monitoring, and before commencement of any pumping, liquid sample collection will be performed under the following conditions:

- Both the LCRS and vadose zone monitoring sumps will be sampled if transducers indicate liquid in the vadose zone monitoring sump not previously present;
- Both the LCRS and vadose zone monitoring sumps will be sampled if liquid levels in the vadose zone sump increase in depth by 1 inch or more from the previous monitoring event; and/or
- The LCRS sump will be sampled monthly, if sufficient liquids are present to collect a sample, while LCRS monitoring is daily, weekly, or monthly. The LCRS sump will be sampled during each monitoring event, if sufficient liquids are present to collect a sample, while LCRS monitoring is quarterly or annually.

If no change or decreasing liquid levels are recorded, no additional samples will be collected from the LCRS or vadose zone sumps. All samples will be collected from the respective sample port located at the top of the sump riser pipe.

If sample collection is required, the Monitoring Contractor will alert BRC. BRC will be responsible for coordinating sample collection with the Environmental Consultant. Sample collection will be performed by the Environmental Consultant listed in Section 1.

4.2.1 Purge Volume

Prior to sample collection, if liquid was previously pumped from the sump, the remaining liquid in the discharge piping will be purged. A sample will be collected after the following minimum volumes are removed from the pipes:

Sump	Volume (gallons)
Phase I Vadose	3.24
Phase I LCRS	7.5
Phase II Vadose	3.63
Phase II LCRS	8.4
Phase IIIB Vadose	1.66
Phase IIIB LCRS	3.8

If the volume of leachate or liquid required for sample collection is unavailable following the pipe purge, samples will not be collected.

4.2.2 Analytical Testing

The following analyses will be conducted on the leachate samples:

1. Metals by EPA Method 6010B;
2. Total Dissolved Solids by 2540C;
3. Volatile Organic Compounds by EPA 8260B;
4. Pesticides by EPA 8081A; and
5. Other analytes as requested by NDEP. It is noted that NDEP must provide sufficient advance notice to allow GES to acquire the proper sample containers.

Specific analytes are included in Table 1. Samples will be sent to a laboratory certified by the State of Nevada for analyses under chain-of-custody procedures. Results of analytical testing will be provided to NDEP during routine reporting as specified in Section 5.

4.3 Leachate Removal

Following leachate sample collection, if applicable, the leachate removal from the LCRS sumps will be required if depth is recorded at greater than 36-inches. The vadose zone sump will be pumped if the depth is recorded at greater than 8-inches. NDEP will be notified when the depth is recorded at greater than 36-inches in the LCRS sump.

Leachate will be removed by connecting permanent pumps to the generator provided by the Monitoring Contractor. Pump will be activated manually and will automatically stop pumping when liquid levels fall to 8 inches. The pumped volume (gallons) of leachate will be recorded for each sump based on the pumped volume indicated by the respective inline flow meter.

4.4 Leachate Disposal

During continued CAMU construction and operation, leachate will be disposed of in accordance with the Monitoring Contractor's Water Management Plan and the Technical Specifications. Following CAMU closure, leachate will be disposed of off-site in an appropriately permitted facility.

4.5 Decontamination

All equipment placed within the LCRS and/or vadose zone monitoring side slope riser pipes and sumps shall be decontaminated before placement and after removal. The equipment will be washed in water with a non-phosphate detergent, rinsed with potable water, followed by a final rinse with distilled water.

5. REPORTING

During each monitoring event, the Monitoring Contractor will document the following:

- level of leachate in each sump before and after any required pumping;
- document if samples are collected; and
- record the volume of leachate pumped from each sump.

The Monitoring Contractor will provide BRC with monitoring documentation no later than 1 day following the monitoring event via a cumulative spreadsheet that documents all historical monitoring performed.

The Environmental Consultant will provide BRC with the sample collection field forms, chain-of-custody, and analytical data. Sample collection field forms shall include the following at a minimum:

- weather;
- date/time;
- leachate depth before sample collection;
- purge volume; and
- name of field personnel.

NDEP reporting will be dependent on monitoring frequency. NDEP reporting will occur as follows:

Reporting Frequency	Monitoring Frequency	LCRS Leachate Accumulation Rate (gpd)
Weekly ¹	Daily	>480
Monthly	Every other day	320 – 480
Monthly	Twice weekly	135 – 320
Monthly	Weekly	30 – 135
Monthly	Monthly	0 – 30
Quarterly	Quarterly	0
Annually	Annually	0

Note: 1 – Weekly reporting will be conducted by summary email containing, at a minimum, leachate depths, historical leachate depths, volume(s) of leachate removed,

and total leachate removed. A monthly report will be provided which will include the weekly report information and a summary table of current and past analytical testing and laboratory results of current analytical testing.

If liquid is detected in a previously dry vadose zone sump, NDEP will be notified within one day of the detection. Following the initial notification, vadose zone monitoring reporting will be as follows:

Reporting Frequency	Monitoring Frequency	Vadose Zone Leachate Accumulation Rate (gpd)
Weekly	Daily	>90
Weekly	Every other day	60 – 90
Weekly	Twice weekly	25 – 60
Weekly	Weekly	5 – 25
Monthly	Monthly	0 – 5
Quarterly	Quarterly	0
Annually	Annually	0

NDEP reporting will include a summary of the monitoring event(s) that occurred since the previous report. The summary will include, at a minimum, leachate depths, historical leachate depths, volume(s) of leachate removed, total leachate removed, a summary table of current and past analytical testing, and laboratory results of current analytical testing.

Samples will have expedited, or “rush” turnaround times, as necessary, so analytical reports are included in the report.

6. REFERENCES

Geosyntec, 2008, Waste Placement and Processing Plan, October.

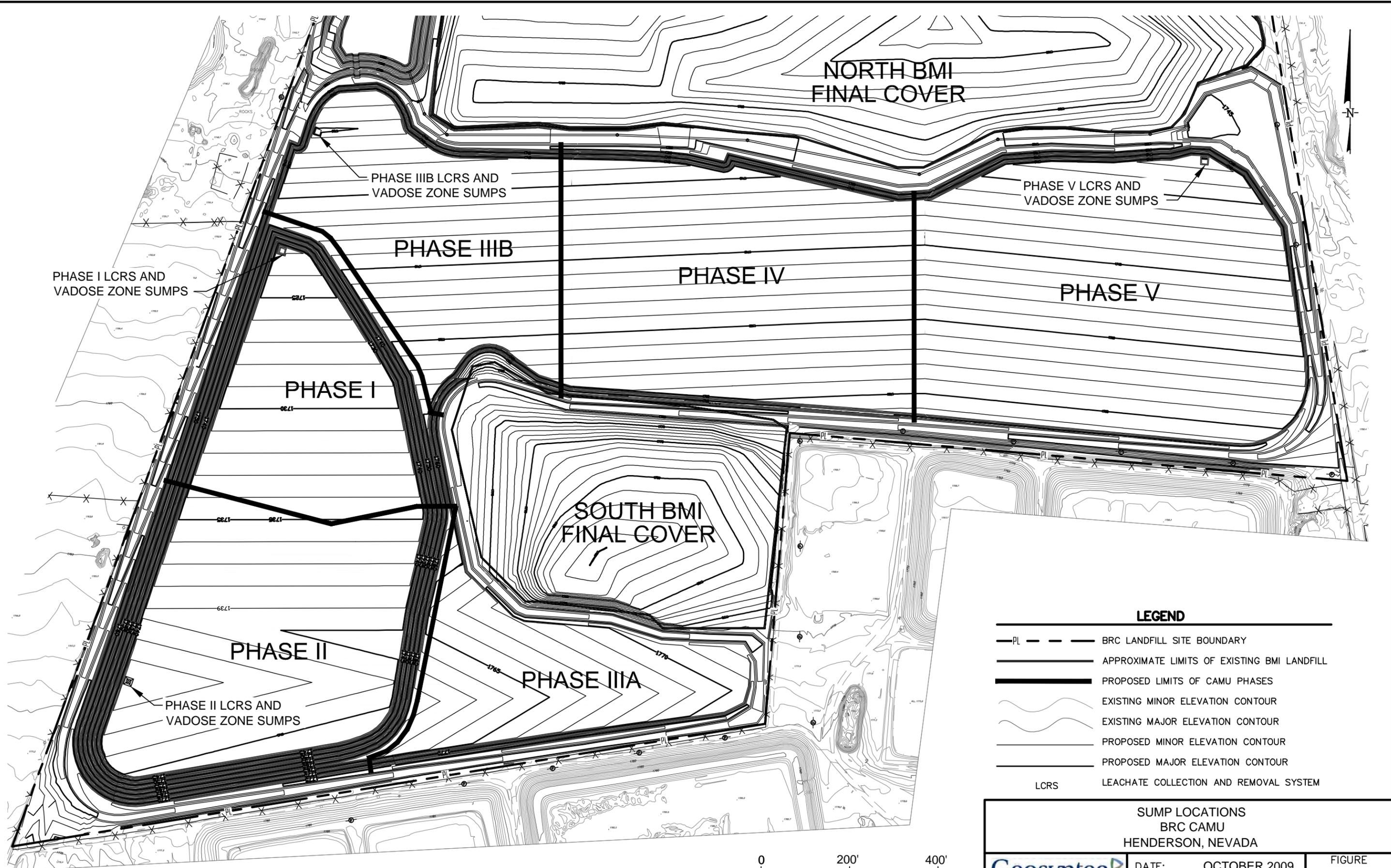
TABLES

Table 1
Leachate Testing Analytes
BRC CAMU
Henderson, Nevada

Volatile Organic Compounds	Pesticides
1,1,1,2-Tetrachloroethane	4,4'-DDD
1,1,1-Trichloroethane	4,4'-DDE
1,1,2,2-Tetrachloroethane	4,4'-DDT
1,1,2-Trichloroethane	Aldrin
1,1-Dichloroethane	alpha-BHC
1,1-Dichloroethene	beta-BHC
1,1-Dichloropropene	Chlordane (Technical)
1,2,3-Trichlorobenzene	delta-BHC
1,2,3-Trichloropropane	Dieldrin
1,2,4-Trichlorobenzene	Endosulfan I
1,2,4-Trimethylbenzene	Endosulfan II
1,2-Dibromo-3-chloropropane (DBCP)	Endosulfan sulfate
1,2-Dibromoethane (EDB)	Endrin
1,2-Dichlorobenzene	Endrin aldehyde
1,2-Dichloroethane	gamma-BHC (Lindane)
1,2-Dichloropropane	Heptachlor
1,3,5-Trimethylbenzene	Heptachlor epoxide
1,3-Dichlorobenzene	Methoxychlor
1,3-Dichloropropane	Mirex
1,4-Dichlorobenzene	Toxaphene
2,2-Dichloropropane	Metals
2-Chlorotoluene	Antimony (Sb)
4-Chlorotoluene	Arsenic (As)
4-Isopropyltoluene	Barium (Ba)
Benzene	Beryllium (Be)
Bromobenzene	Cadmium (Cd)
Bromochloromethane	Chromium (Cr)
Bromodichloromethane	Cobalt (Co)
Bromoform	Copper (Cu)
Bromomethane	Lead (Pb)
Carbon tetrachloride	Mercury (Hg)
Chlorobenzene	Molybdenum (Mo)
Chloroethane	Nickel (Ni)
Chloroform	Selenium (Se)
Chloromethane	Silver (Ag)
cis-1,2-Dichloroethene	Thallium (Tl)
cis-1,3-Dichloropropene	Vanadium (V)
Dibromochloromethane	Zinc (Zn)
Dibromomethane	Total Dissolved Solids
Dichlorodifluoromethane	Solids, Total Dissolved (TDS)
Dichloromethane	
Ethylbenzene	
Hexachlorobutadiene	
Isopropylbenzene	
m,p-Xylene	
Methyl tert-butyl ether (MTBE)	
Naphthalene	
n-Butylbenzene	
n-Propylbenzene	
o-Xylene	
sec-Butylbenzene	
Styrene	
tert-Butylbenzene	
Tetrachloroethene	
Toluene	
trans-1,2-Dichloroethene	
trans-1,3-Dichloropropene	
Trichloroethene	
Trichlorofluoromethane	
Vinyl chloride	

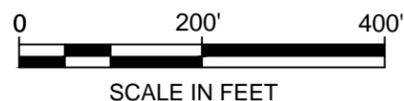
FIGURES

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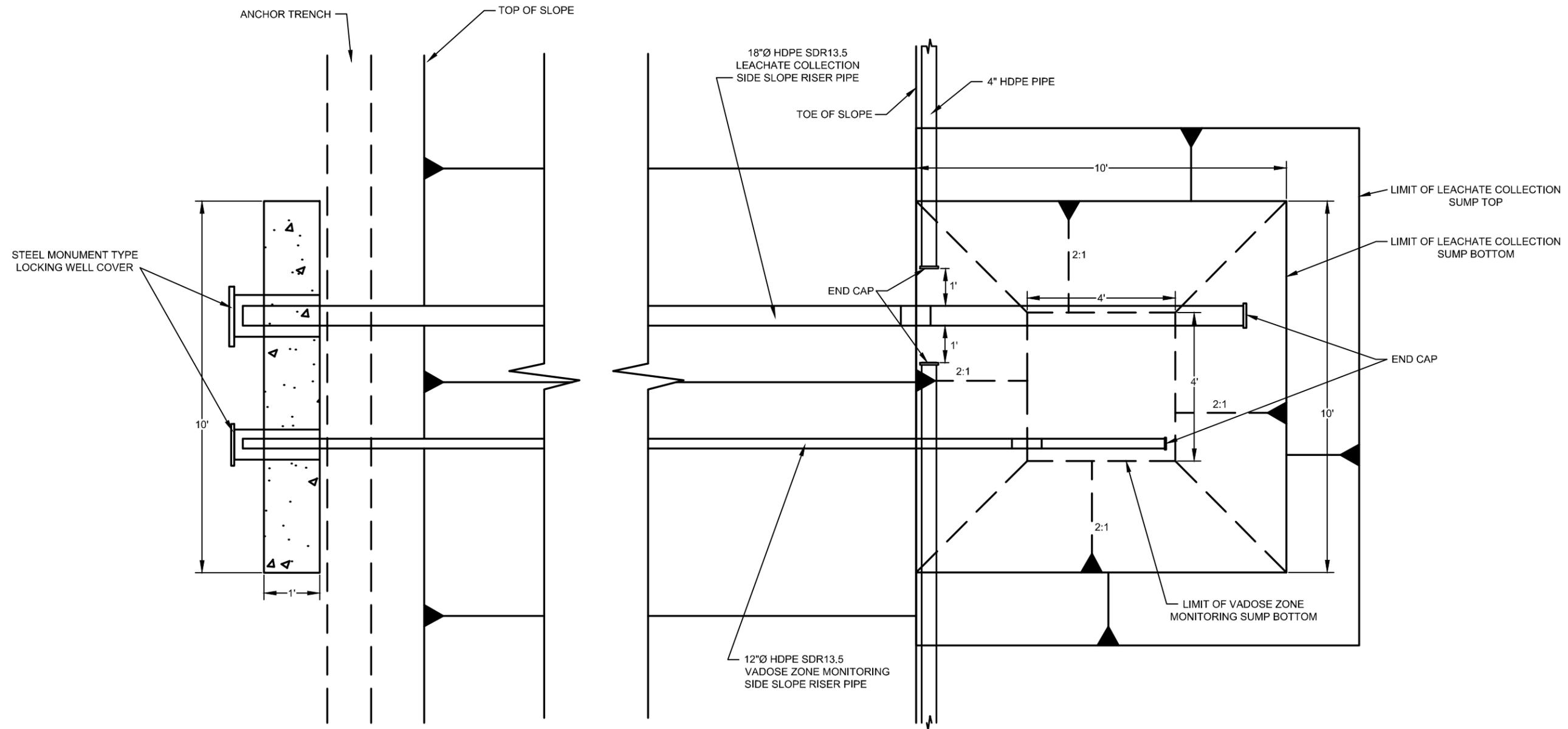
LEGEND

	BRC LANDFILL SITE BOUNDARY
	APPROXIMATE LIMITS OF EXISTING BMI LANDFILL
	PROPOSED LIMITS OF CAMU PHASES
	EXISTING MINOR ELEVATION CONTOUR
	EXISTING MAJOR ELEVATION CONTOUR
	PROPOSED MINOR ELEVATION CONTOUR
	PROPOSED MAJOR ELEVATION CONTOUR
	LCRS LEACHATE COLLECTION AND REMOVAL SYSTEM



SUMP LOCATIONS BRC CAMU HENDERSON, NEVADA		
	DATE: OCTOBER 2009	FIGURE 1
	PROJECT NO. SC0313-10	

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PLAN VIEW

SCALE: 1" = 3'

TYPICAL LEACHATE COLLECTION AND VADOSE ZONE SUMP BRC CAMU HENDERSON, NEVADA		
	DATE: OCTOBER 2009	FIGURE 2
	PROJECT NO. SC0313-10	

1754.57 FT MSL TOP INVERT
 1752.59 FT MSL TOP OF SLOPE (SG)
 ANCHOR TRENCH

VERTICAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 35.07'
 HORIZONTAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 73.68'

$$\theta = \tan^{-1}\left(\frac{35.07}{73.68}\right) = 25.45^\circ$$

SLOPE DISTANCE TO WATER LEVEL INDICATION = X

$$\sin(\theta) * X = Y$$

$$\frac{1754.57 \text{ FT MSL}}{=} \frac{Y}{Z} \text{ VADOSE WATER ELEVATION}$$

NOTES:
 12" VADOSE SYSTEM AND SUBGRADE AS-BUILT ELEVATIONS PER KENNY LAND SURVEYING

1719.5 FT MSL ANGLE POINT INVERT
 1719.17 FT MSL TOE OF SLOPE (SG)

81.6' PIPE RUN TO ANGLE POINT



PHASE I 12" VADOSE MONITORING SIDE SLOPE RISER

1755.03 FT MSL TOP INVERT
 1752.535 FT MSL TOP OF SLOPE (SG)
 ANCHOR TRENCH

VERTICAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 33.62'
 HORIZONTAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 72.05'

$$\alpha = \tan^{-1}\left(\frac{33.62}{72.05}\right) = 25.015^\circ$$

SLOPE DISTANCE TO WATER LEVEL INDICATION = X

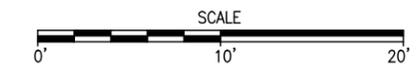
$$\sin(\alpha) * X = Y$$

$$\frac{1755.03 \text{ FT MSL}}{=} \frac{Y}{Z} \text{ LCRS WATER ELEVATION}$$

NOTES:
 18" LCRS SYSTEM AND SUBGRADE AS-BUILT ELEVATIONS PER KENNY LAND SURVEYING

1721.41 FT MSL ANGLE POINT INVERT
 1720.65 FT MSL TOE OF SLOPE (SG)

79.51' PIPE RUN TO ANGLE POINT



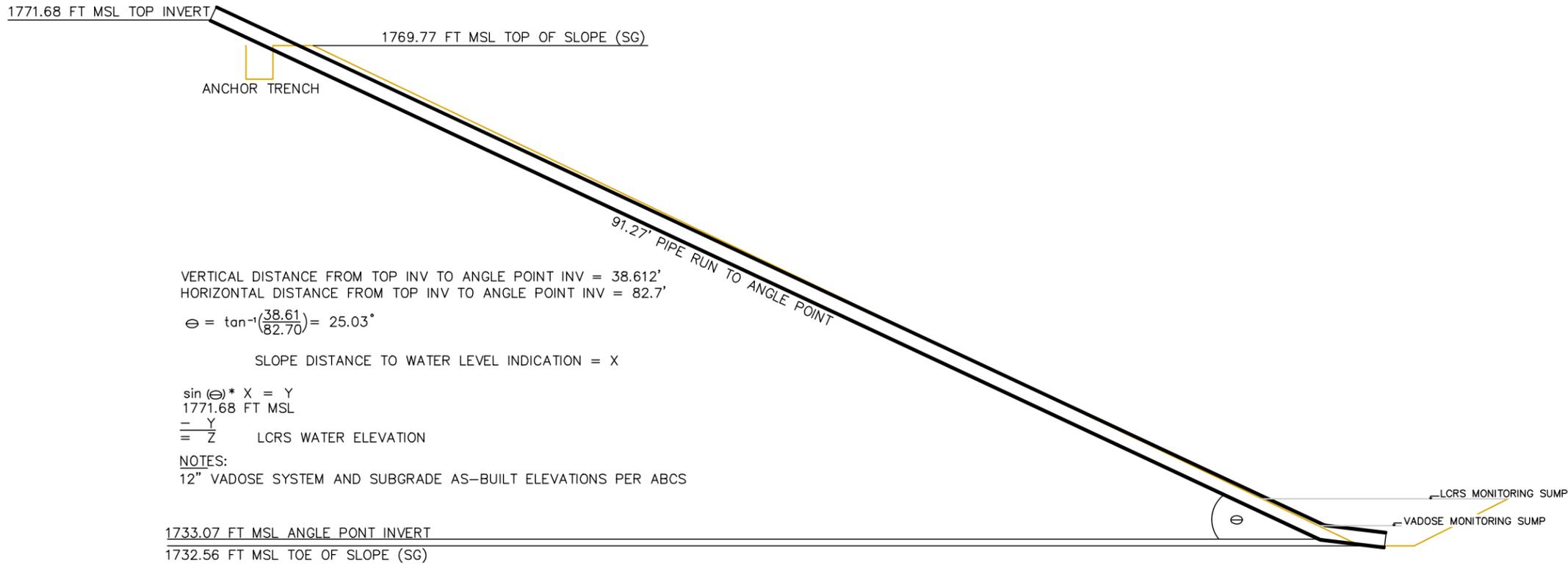
NOTES:
 1. CROSS-SECTION DETAILS PROVIDED BY ENTACT.
 2. FT MSL: FEET MEAN SEA LEVEL

PHASE I 18" LCRS MONITORING SIDE SLOPE RISER

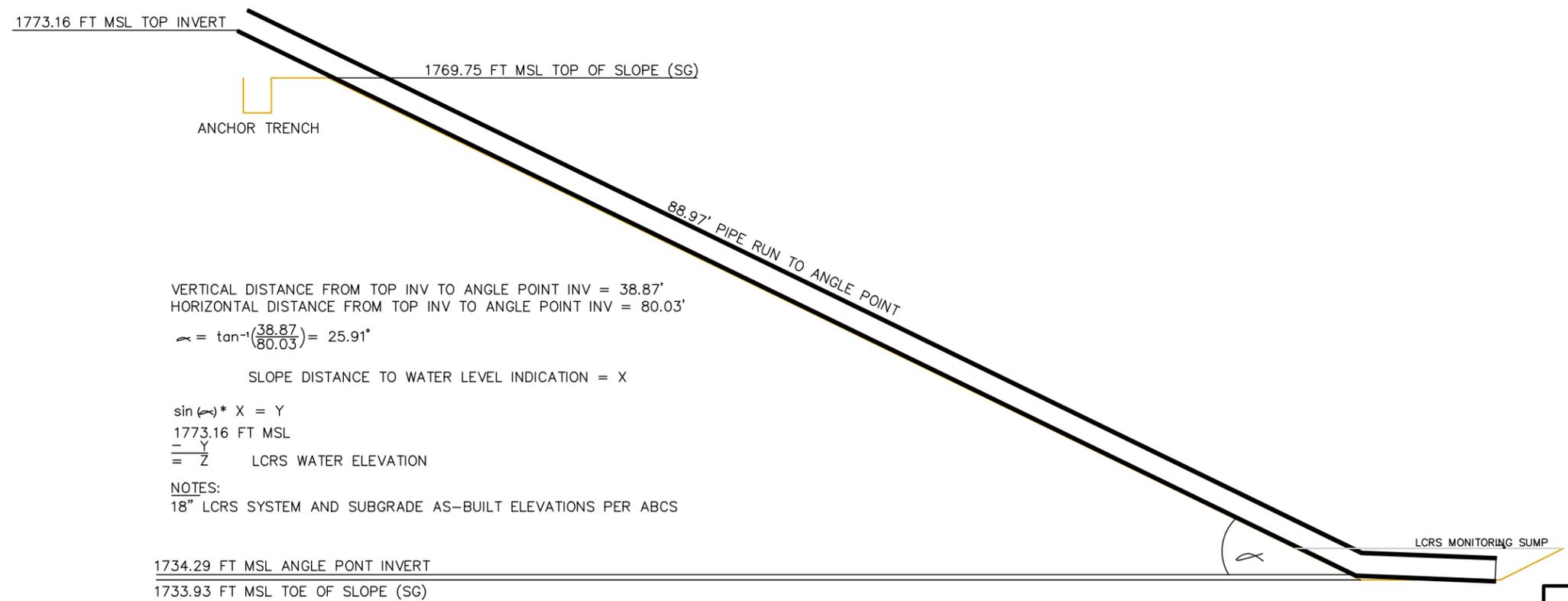
PHASE I SIDE SLOPE RISER DETAILS
 BRC CAMU
 HENDERSON, NEVADA

	DATE: OCTOBER 2009	FIGURE 3
	PROJECT NO. SC0313-10	

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PHASE II 12" VADOSE MONITORING SIDE SLOPE RISER



PHASE II 18" LCRS MONITORING SIDE SLOPE RISER

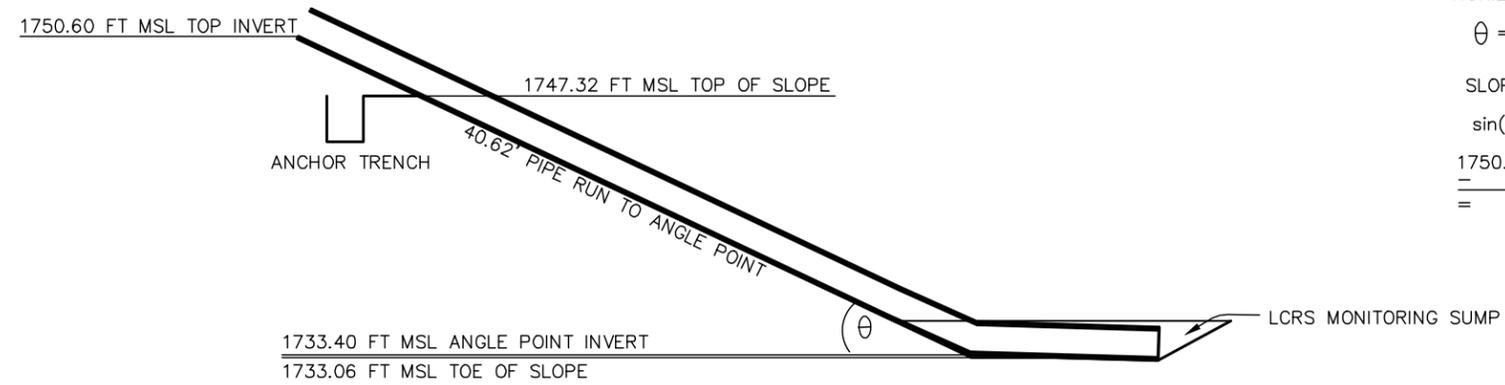


- NOTES:
 1. CROSS-SECTION DETAILS PROVIDED BY ENTACT.
 2. FT MSL: FEET MEAN SEA LEVEL

PHASE II SIDE SLOPE RISER DETAILS BRC CAMU HENDERSON, NEVADA		
Geosyntec consultants	DATE: OCTOBER 2009	FIGURE 4
	PROJECT NO. SC0313-10	

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P:\PRJ\SDCadd\CADD\SC0313\Figures\side slope figures\SC0313.04-FIG5.dwg



VERTICAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 38.61'
 HORIZONTAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 82.70'

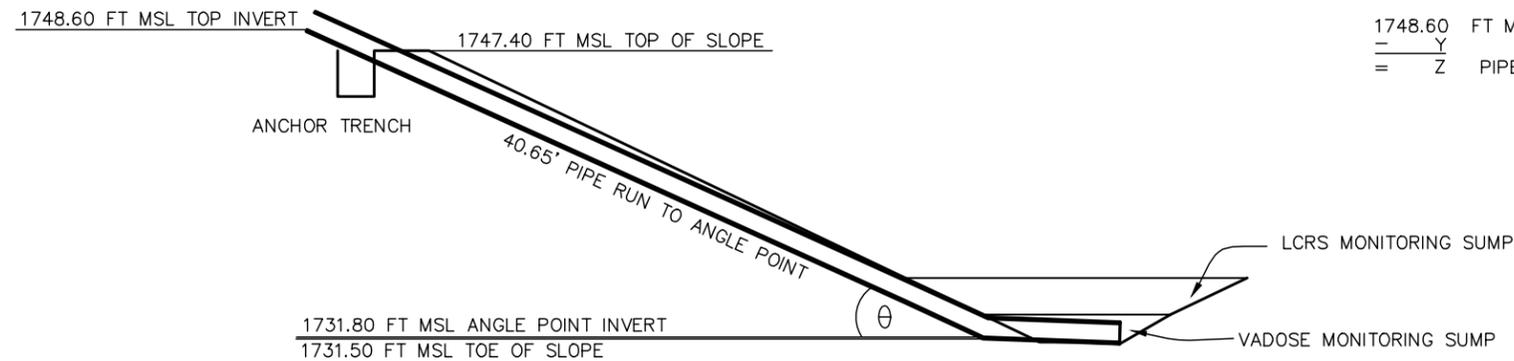
VERTICAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 17.20'
 HORIZONTAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 36.80'
 $\theta = \tan^{-1}\left(\frac{17.20'}{36.80'}\right) = 25.05^\circ$

SLOPE DISTANCE TO WATER LEVEL INDICATION = X

$$\sin(\theta) * X = Y$$

$$\frac{1750.60 \text{ FT MSL}}{= \frac{Y}{Z}} = \text{PIPE WATER ELEVATION}$$

PHASE IIIB 18" LCRS MONITORING SIDE SLOPE RISER



VERTICAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 16.80'
 HORIZONTAL DISTANCE FROM TOP INV TO ANGLE POINT INV = 37.05'

$$\theta = \tan^{-1}\left(\frac{16.80'}{37.05'}\right) = 24.39^\circ$$

SLOPE DISTANCE TO WATER LEVEL INDICATION = X

$$\sin(\theta) * X = Y$$

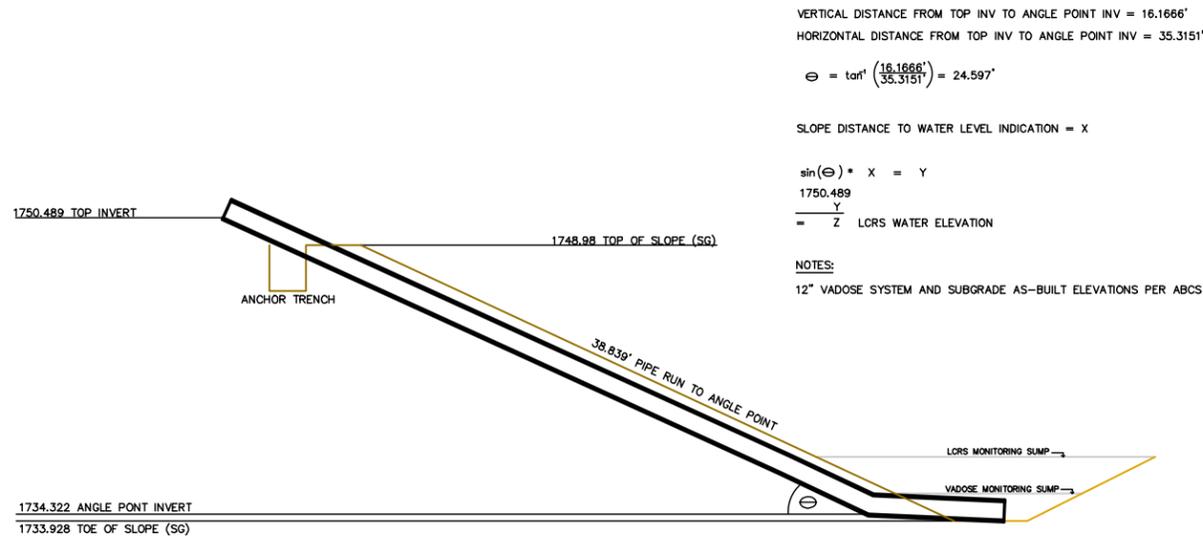
$$\frac{1748.60 \text{ FT MSL}}{= \frac{Y}{Z}} = \text{PIPE WATER ELEVATION}$$

PHASE IIIB 12" VADOSE MONITORING SIDE SLOPE RISER

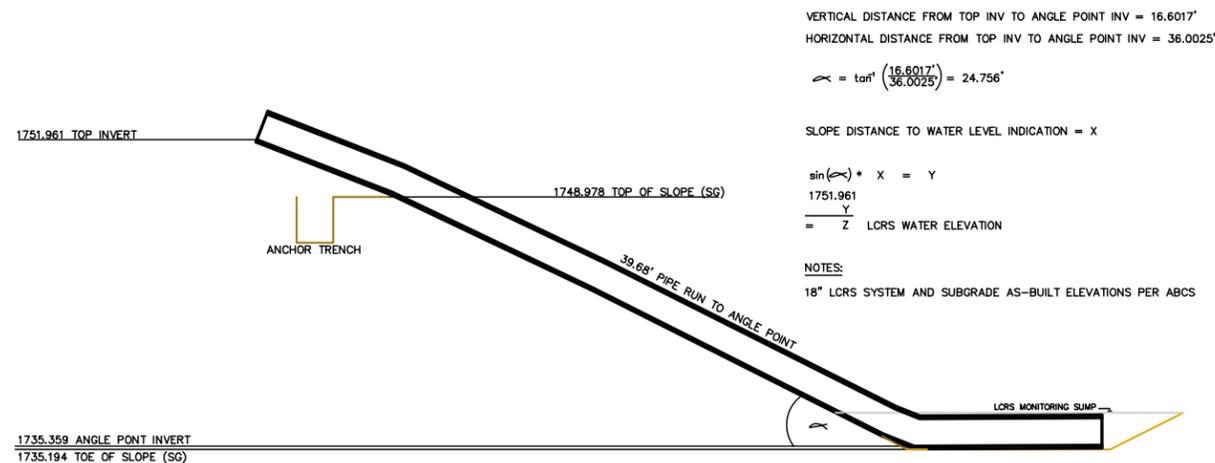
- NOTES:
 1. CROSS-SECTION DETAILS PROVIDED BY ENTACT.
 2. FT MSL: FEET MEAN SEA LEVEL

PHASE IIIB SIDE SLOPE RISER DETAILS BRC CAMU HNEDERSON, NEVADA		
	DATE: OCTOBER 2009	FIGURE 5
	PROJECT NO. SC0313-10	

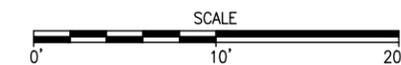
P:\PRJ\SDGadd\CADD\SC0313\Figures\side slope figures\SC0313.04-FIG6.dwg



PHASE V 12" VADOSE MONITORING SIDE SLOPE RISER



PHASE V 18" LCRS MONITORING SIDE SLOPE RISER



- NOTES:
 1. CROSS-SECTION DETAILS PROVIDED BY ENTACT.
 2. FT MSL: FEET MEAN SEA LEVEL

PHASE I SIDE SLOPE RISER DETAILS
 BRC CAMU
 HENDERSON, NEVADA



DATE: OCTOBER 2009
 PROJECT NO. SC0313-10

FIGURE
6

APPENDIX A

EPG Companies Inc.

SUBMITTAL

FOR

**Entact Environmental
Services, Inc.
Henderson, NV**

<input checked="" type="checkbox"/> No Exception Taken	<input type="checkbox"/> Correct As Noted
<input type="checkbox"/> Revise And Resubmit	<input type="checkbox"/> Submit Specified Item <input type="checkbox"/> Rejected
<small>The review of these drawings is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the contractor from compliance with the project plans and specifications nor departures therefrom, nor shall they relieve the contractor from responsibility for all quantities and dimensions, for selecting fabrication processes, for techniques of assembly, and for performing the work in a safe manner.</small>	
Checked By <i>[Signature]</i>	Date <i>5/27/28</i>
BRC Initials <i>LCF</i>	
BASIC REMEDIATION COMPANY	

EPG Job #09-9356

EPG Companies Inc.

Submittal Index

Entact Environmental Services, Inc. – Henderson, NV

Job #09-9356

Bulletin	1055	Equipment List
Drawing	05773-0000	Series 5 SurePump™
Drawing	05773-0010	Series 5 Size 4 Sump Drainer
Bulletin	0335g	Engineer's Specification EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor
Bulletin	0335g	Engineer's Specification EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor
Bulletin	0335g	Engineer's Specification EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor
Drawing	05771-0000	Series 2 SurePump™
Drawing	05771-0010	Series 2 Size 4 Sump Drainer
Bulletin	0335g	Engineer's Specification EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor
Bulletin	0335g	Engineer's Specification EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor
Bulletin	0335g	Engineer's Specification EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor
Bulletin	0480e	Materials of Construction
Drawing	08373-0250	L975PTG Control Panel Schematics
Bulletin	0121c	Engineer's Specification EPG LevelMaster™ Submersible Level Sensor
Drawing	02523-0605	BJBL600B Breakout Junction Box for Level Sensor
Drawing	03626-0500	BJBP500 Breakout Junction Box for Motor Lead
Bulletin	1010c	Sensor Data Sheet E-Series Liquid Flow Sensor
Bulletin	0170d	Flow Meter Operations
Bulletin	1005	Caution
Drawing	05392-0000C	PVC Flow Spool 1 ½" MNPT Ends
Drawing	07761-0000C	1" PVC SCH 40 Flow Spool with 1" MNPT Ends
Bulletin	0200c	Limited Warranty
Form	127a	Submittal Acceptance Form

EPG Companies Inc.

List of Equipment

Entact Environmental Services, Inc. – Henderson, NV

EPG Job # 09-9356

Phase 1 Control Panel and Pumps

- 1 each L975PTG
PumpMaster control panel to operate (1)ea. 1/2 HP 230 VAC 1 phase motor and (1)ea. 3/4 HP 230 VAC 1 phase motor independently via generator supplied power. Includes LevelMaster level control meters with simulators, 2 ea. flow meters, pump call light, voltage monitor and disconnect for 12 volt DC battery backup, includes 12 Volt DC terminals. Enclosure is rated NEMA 4.

Note: Panel logic- 12 volt DC level meters call for either pump, operator turns on site supplied generator, pump called will run, flow meters will register.

Note: Site will need to supply marine batteries, battery boxes, cables and hardwire to control panel.

LCRS Pump

- 1 each WSDPT5-3
EPG SurePump patented, wheeled, stainless steel sump drainer with a 3/4 HP 230 VAC 1 phase motor. Includes 110' of 14 AWG jacketed motor lead, submersible level sensor with 110' lead, and a 110' length of 1/8" cable with clamps.

Vadose Pump

- 1 each WSDPT2-3
EPG SurePump patented, wheeled, stainless steel # 4 sump drainer with a 1/2 HP 230 VAC 1 phase motor. Includes 110' of 14 AWG jacketed motor lead, submersible level sensor with 110' lead, and a 110' length of 1/8" stainless steel suspension cable with clamps.

Phase 2 Control Panel and Pumps

- 1 each L975PTG
PumpMaster control panel to operate (1)ea. 1/2 HP 230 VAC 1 phase motor and (1)ea. 3/4 HP 230 VAC 1 phase motor independently via generator supplied power. Includes LevelMaster level control meters with simulators, 2 ea. flow meters, pump call light, voltage monitor and disconnect for 12 volt DC battery backup, includes 12 Volt DC terminals. Enclosure is rated NEMA 4.

Note: Panel logic- 12 volt DC level meters call for either pump, operator turns on site supplied generator, pump called will run, flow meters will register.

Note: Site will need to supply marine batteries, battery boxes, cables and hardwire to control panel.

EPG Companies Inc.

LCRS Pump

- 1 each WSDPT5-3
EPG SurePump patented, wheeled, stainless steel sump drainer with a 3/4 HP 230 VAC 1 phase motor. Includes 120' of 14 AWG jacketed motor lead, submersible level sensor with 120' lead, and a 120' length of 1/8" cable with clamps.

Vadose Pump

- 1 each WSDPT2-3
EPG SurePump patented, wheeled, stainless steel # 4 sump drainer with a 1/2 HP 230 VAC 1 phase motor. Includes 120' of 14 AWG jacketed motor lead, submersible level sensor with 120' lead, and a 120' length of 1/8" stainless steel suspension cable with clamps.

Phase 3 Control Panels and Pumps

- 2 each L975PTG
PumpMaster control panel to operate (1)ea. 1/2 HP 230 VAC 1 phase motor and (1)ea. 3/4 HP 230 VAC 1 phase motor independently via generator supplied power. Includes LevelMaster level control meters with simulators, 2 ea. flow meters, pump call light, voltage monitor and disconnect for 12 volt DC battery backup, includes 12 Volt DC terminals. Enclosure is rated NEMA 4.

Note: Panel logic- 12 volt DC level meters call for either pump, operator turns on site supplied generator, pump called will run, flow meters will register.

Note: Site will need to supply marine batteries, battery boxes, cables and hardwire to control panel.

LCRS Pumps

- 2 each WSDPT5-3
EPG SurePump patented, wheeled, stainless steel sump drainer with a 3/4 HP 230 VAC 1 phase motor. Includes 70' of 14 AWG jacketed motor lead, submersible level sensor with 70' lead, and a 70' length of 1/8" cable with clamps.

Vadose Pumps

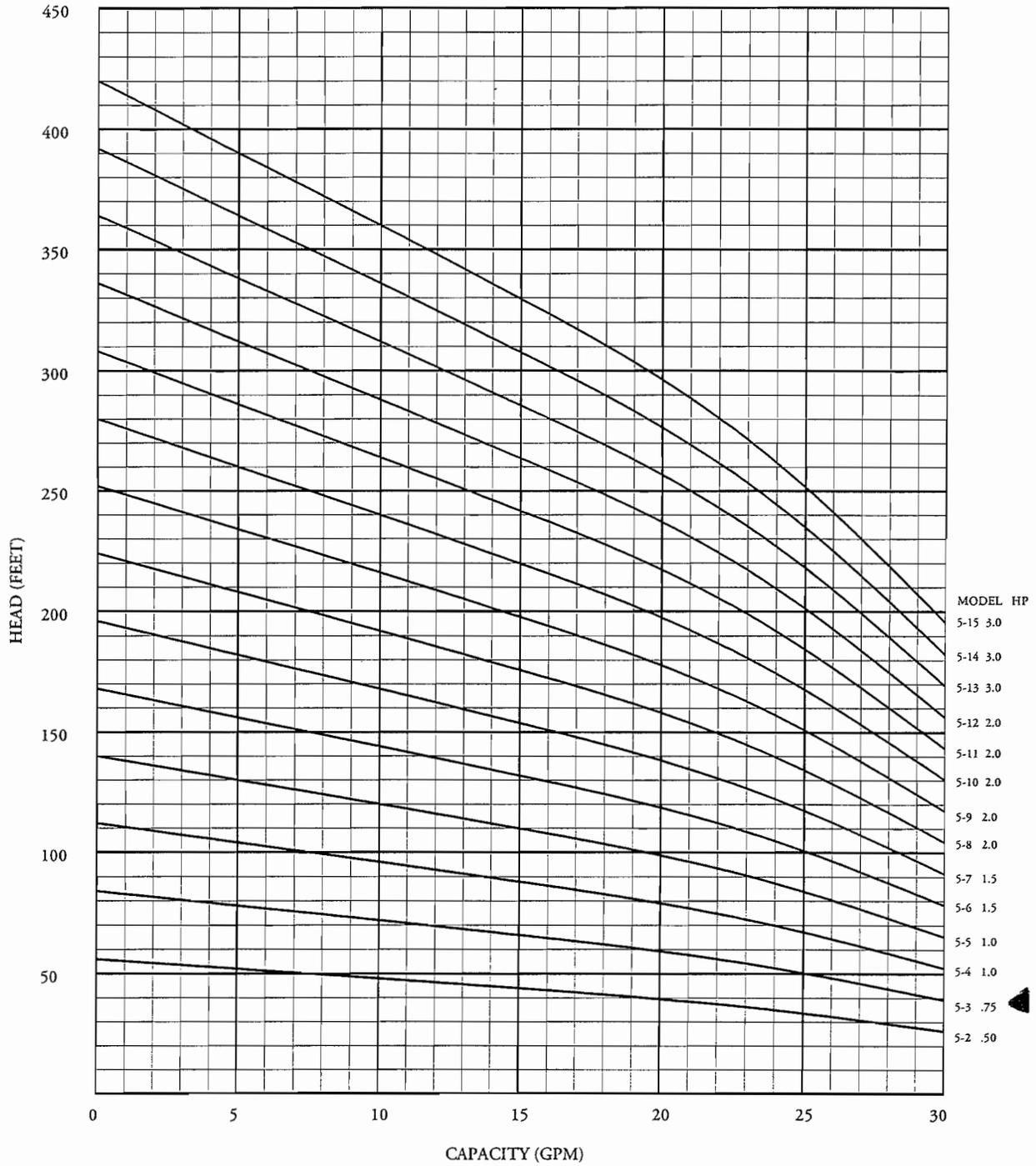
- 2 each WSDPT2-3
EPG SurePump patented, wheeled, stainless steel # 4 sump drainer with a 1/2 HP 230 VAC 1 phase motor. Includes 70' of 14 AWG jacketed motor lead, submersible level sensor with 70' lead, and a 70' length of 1/8" stainless steel suspension cable with clamps.

EPG Companies Inc.

Junction Boxes Power and Sensor

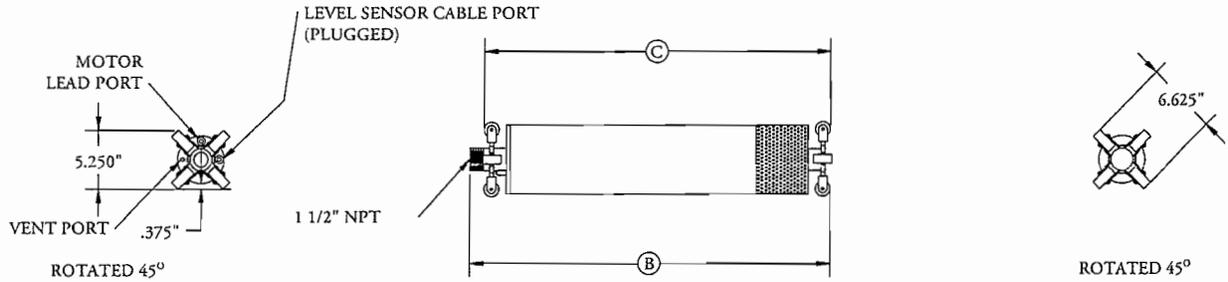
- 8 each BJBL600B
EPG Breakout Box, NEMA 4X non-metallic enclosure, junction box for 1 ea. level sensor. Includes desiccant dryer, bellows, and connection terminals.
- 8 each BJBP500
EPG Breakout Box, NEMA 4X non-metallic enclosure for 1 ea. motor lead, includes connection terminals.
- 4 each EP15P04M15M15S
EPG Paddlewheel Flow Sensor, 1.5", PVC schedule 40 flow sensor with MNPT 1.5" inlet end, MNPT 1.5" outlet end, and paddlewheel sensor with 25' lead.
- 4 each EP10P04M10M10S
EPG Flow Sensor, 1", SCH 40 PVC with 1" MNPT ends, and paddlewheel sensor with 25' lead.

SERIES 5 SurePump™
 Flow Range 15-30 GPM
 60 Hz

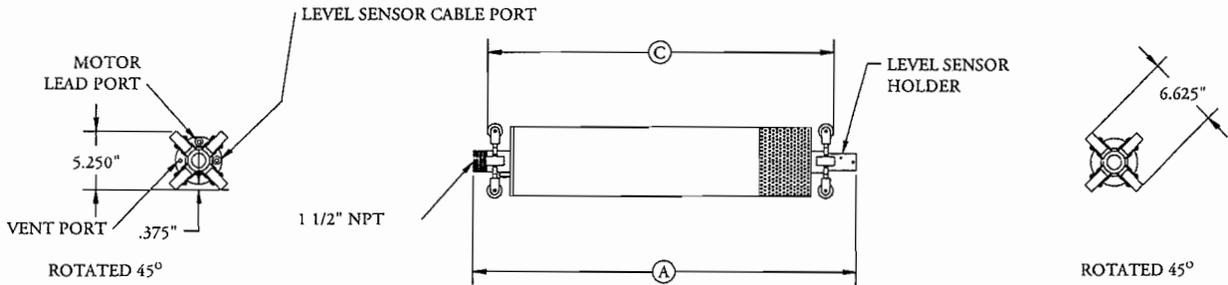


DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 5 SIZE 4 WHEELED SUMP DRAINER



WSD



WSDPT

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-2	0.50	1	31.02	29.90	29.15	61.47	66.47
5-2	0.50	3	31.02	29.90	29.15	61.47	66.47
5-3	0.75	1	32.98	31.86	31.11	66.24	71.24
5-3	0.75	3	32.98	31.86	31.11	66.24	71.24
5-4	1.00	1	34.90	33.78	33.03	70.98	75.98
5-4	1.00	3	34.90	33.78	33.03	70.98	75.98
5-5	1.00	1	35.73	34.61	33.86	71.88	76.88
5-5	1.00	3	35.73	34.61	33.86	71.88	76.88
5-6	1.50	1	38.43	37.31	36.56	79.22	84.22
5-6	1.50	3	36.56	35.44	34.69	72.77	77.77
5-7	1.50	1	39.26	38.14	37.39	80.12	85.12
5-7	1.50	3	37.39	36.27	35.52	73.67	78.67
5-8	2.00	1	41.59	40.47	39.72	85.17	90.17
5-8	2.00	3	40.09	38.97	38.22	81.01	86.01

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-9	2.00	1	42.42	41.30	40.55	86.07	91.07
5-9	2.00	3	40.92	39.80	39.05	81.90	86.90
5-10	2.00	1	43.25	42.13	41.38	86.96	91.96
5-10	2.00	3	41.75	40.63	39.88	82.80	87.80
5-11	2.00	1	44.08	42.96	42.21	87.86	92.86
5-11	2.00	3	42.58	41.46	40.71	83.69	88.69
5-12	2.00	1	44.91	43.79	43.04	88.75	93.75
5-12	2.00	3	53.41	52.29	51.54	92.35	97.35
5-13	3.00	1	54.24	53.12	52.37	119.24	124.24
5-13	3.00	3	51.24	50.12	49.37	105.91	110.91
5-14	3.00	1	55.07	53.95	53.20	120.14	125.14
5-14	3.00	3	52.07	50.95	50.20	106.81	111.81
5-15	3.00	1	55.90	54.78	54.03	121.03	126.03
5-15	3.00	3	52.90	51.78	51.03	107.70	112.70

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
 WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
 WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
 LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 5 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a ¾ HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 110 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 ½ inch MNPT threaded discharge nozzle and be capable of delivering 25 GPM at 50 feet of TDH. Each SurePump will be fitted with 110 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in ½ HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 5 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 3/4 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 120 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/2 inch MNPT threaded discharge nozzle and be capable of delivering 25 GPM at 50 feet of TDH. Each SurePump will be fitted with 120 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer for side slope riser installations with built-in level sensor

Furnish 2 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 5 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a ¾ HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 70 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 ½ inch MNPT threaded discharge nozzle and be capable of delivering 25 GPM at 50 feet of TDH. Each SurePump will be fitted with 70 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

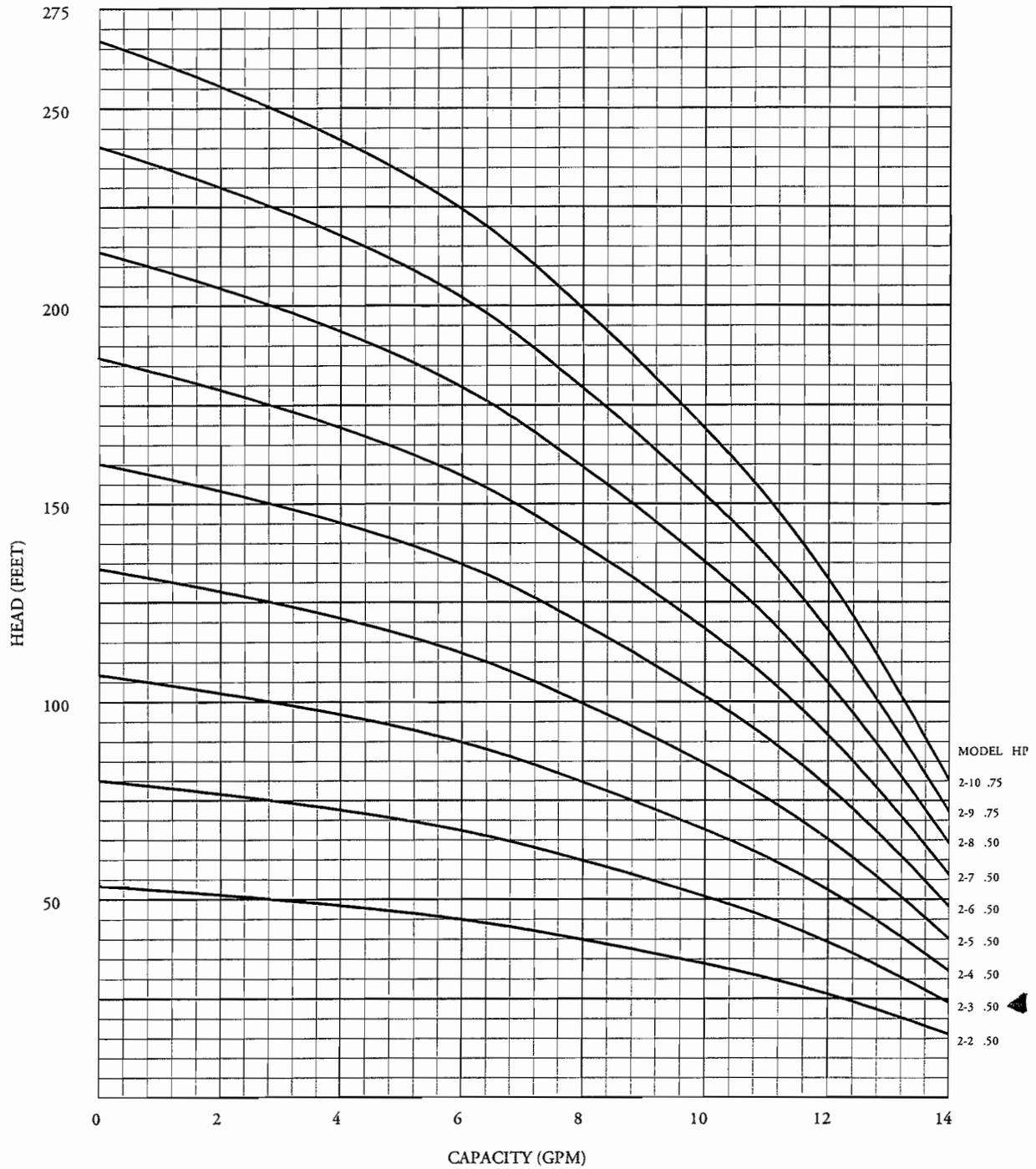
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in ½ HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

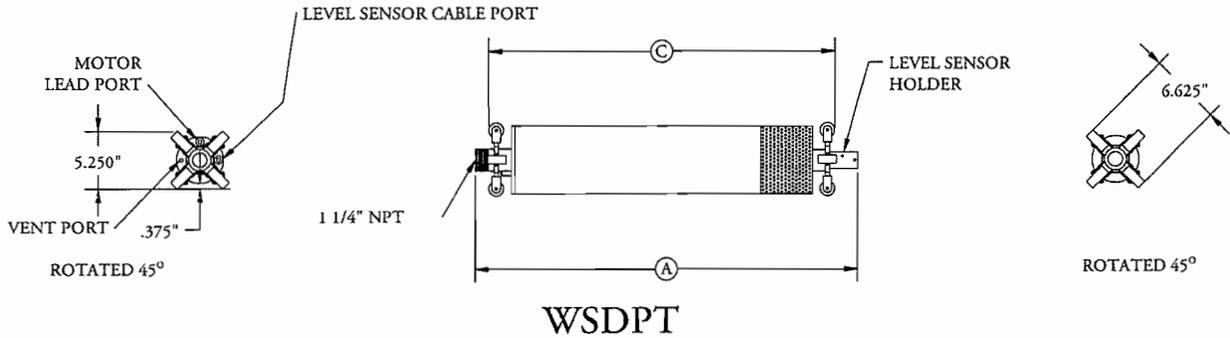
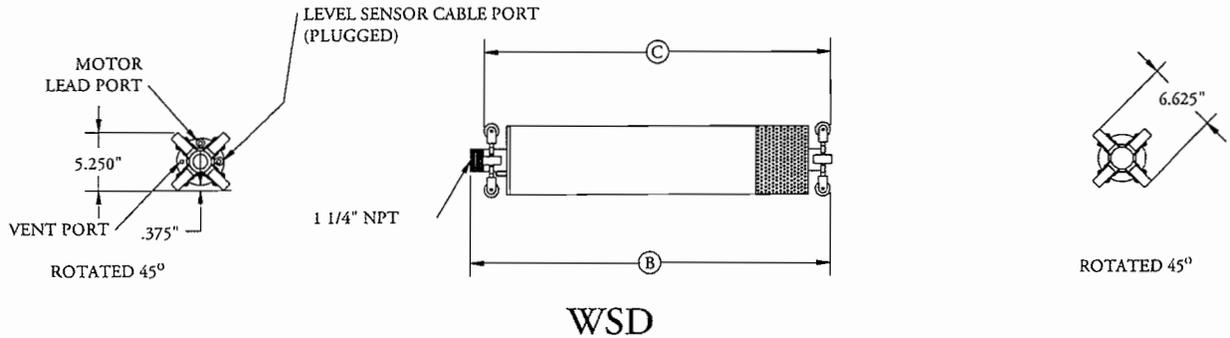
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 2 SurePump™
 Flow Range 4-14 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 2 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
2-2	0.50	1	31.02	29.90	29.15	61.47	66.47
2-2	0.50	3	31.02	29.90	29.15	61.47	66.47
2-3	0.50	1	31.85	30.73	29.98	62.37	67.37
2-3	0.50	3	31.85	30.73	29.98	62.37	67.37
2-4	0.50	1	32.68	31.56	30.81	63.26	68.26
2-4	0.50	3	32.68	31.56	30.81	63.26	68.26
2-5	0.50	1	33.51	32.39	31.64	64.15	69.15
2-5	0.50	3	33.51	32.39	31.64	64.15	69.15
2-6	0.50	1	34.34	33.22	32.47	65.05	70.05
2-6	0.50	3	34.34	33.22	32.47	65.05	70.05
2-7	0.50	1	35.17	34.05	33.30	65.94	70.94
2-7	0.50	3	35.17	34.05	33.30	65.94	70.94
2-8	0.50	1	36.00	34.88	34.13	66.84	71.84
2-8	0.50	3	36.00	34.88	34.13	66.84	71.84
2-9	0.75	1	37.96	36.84	36.09	71.61	76.61
2-9	0.75	3	37.96	36.84	36.09	71.61	76.61
2-10	0.75	1	38.79	37.67	36.92	72.50	77.50
2-10	0.75	3	38.79	37.67	36.92	72.50	77.50

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 2 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 1/2 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 110 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/4 inch MNPT threaded discharge nozzle and be capable of delivering 10 GPM at 50 feet of TDH. Each SurePump will be fitted with 110 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 2 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 1/2 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 120 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/4 inch MNPT threaded discharge nozzle and be capable of delivering 10 GPM at 50 feet of TDH. Each SurePump will be fitted with 120 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

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CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

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MOTOR LEAD WIRE

The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 2 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 2 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 1/2 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 70 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/4 inch MNPT threaded discharge nozzle and be capable of delivering 10 GPM at 50 feet of TDH. Each SurePump will be fitted with 70 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

Materials of Construction

EPG SurePump™

	STANDARD
Check Valve Housing	304 Stainless Steel
Check Valve	304 Stainless Steel
Check Valve Seat	E-Glide™
Diffuser Chamber	304 Stainless Steel
Impeller Seal Ring	E-Glide™
Impeller	304 Stainless Steel
Motor Adapter	304 Stainless Steel
Inlet Screen	304 Stainless Steel
Pump Shaft	304 Stainless Steel
Coupling	329/420/431 Stainless Steel
Fasteners	304 Stainless Steel
Bearings	E-Glide™

FRANKLIN ELECTRIC MOTORS

	1/3 to 2 HORSEPOWER	3 to 5 HORSEPOWER	5 to 10 HORSEPOWER
End Bell Castings	304 Stainless Steel over Iron	304 Stainless Steel over Iron	304 Stainless Steel over Iron
Stator Shell	301 Stainless Steel	301 Stainless Steel	301 Stainless Steel
Shaft Extension	303 Stainless Steel	303 Stainless steel	303 Stainless Steel
Fasteners	316 Stainless Steel	300 Stainless Steel	316 Stainless Steel
Seal Cover	Tefzel	Sintered Bronze	Tefzel
Shaft Seal	Viton	Viton, Carbon, Ceramic Face Seal	Viton
Diaphragm	Viton	Nitrile Rubber	Viton
Diaphragm Plate	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel
Diaphragm Spring	302 Stainless Steel	302 Stainless Steel	302 Stainless Steel
Diaphragm Cover	316 Stainless Steel	304 Stainless Steel	316 Stainless Steel
Slinger	Viton	Nitrile Rubber	Viton
Lead Sleeve	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel
Lead Jam Nut	316 Stainless Steel	N/A	316 Stainless Steel
Lead Jam Clamp	N/A	300 Stainless Steel	N/A
Lead Potting	Epoxy	Epoxy	Epoxy
Lead Bushing	Viton	Viton	Viton

MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
LCRS PUMP	1/2	230	5.0	8A
VADOSE PUMP	3/4	230	6.8	10A

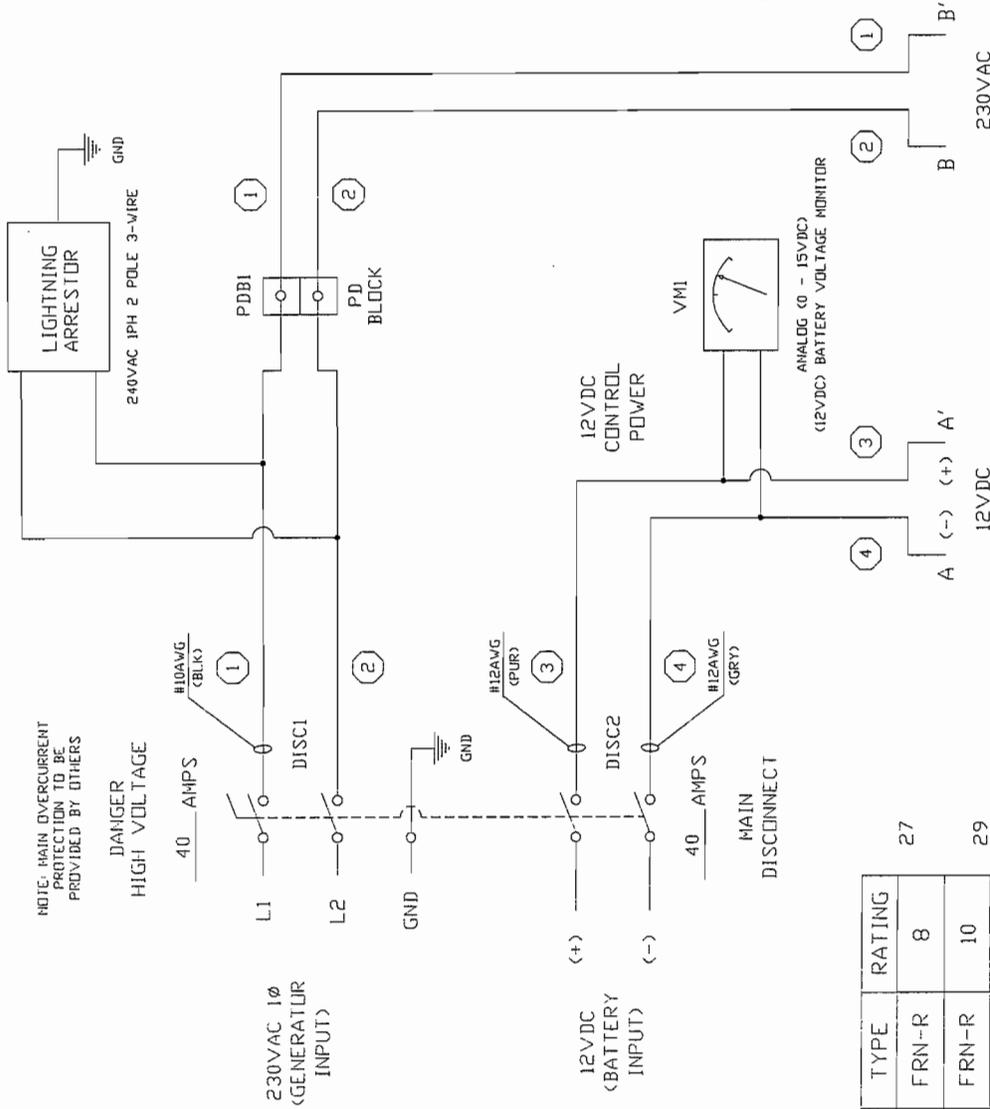
PHASE 1, 2 & 3B
CONTROL PANELS AND PUMPS

FIELD WIRING TERMINALS

LINE (GENERATOR)



LINE (BATTERY)



FUSE	TYPE	RATING
F1-F2	FRN-R	8
F3-F4	FRN-R	10
F5-F6	FRN-R	2-1/2
F7	FNM	1-1/4
F8	FNM	3-1/2
F9	ABC	1-1/2
F10	MDL	1/2
F11	ABC	1/2
F12	ABC	1/2

FOR NOTES AND REVISIONS SEE SHEET 8

JOB No. 09-9356ABC

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TOLERANCES (EXCEPT AS NOTED)

NO.	DATE	BY
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REVISIONS

EPG COMPANIES

L975PTG CONTROL PANEL

230VAC 1Ø SH 1 OF 8

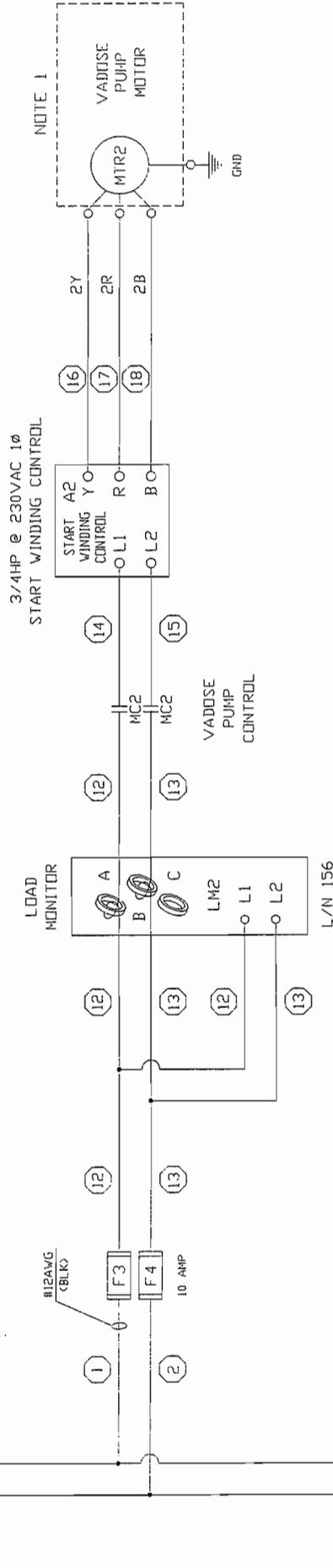
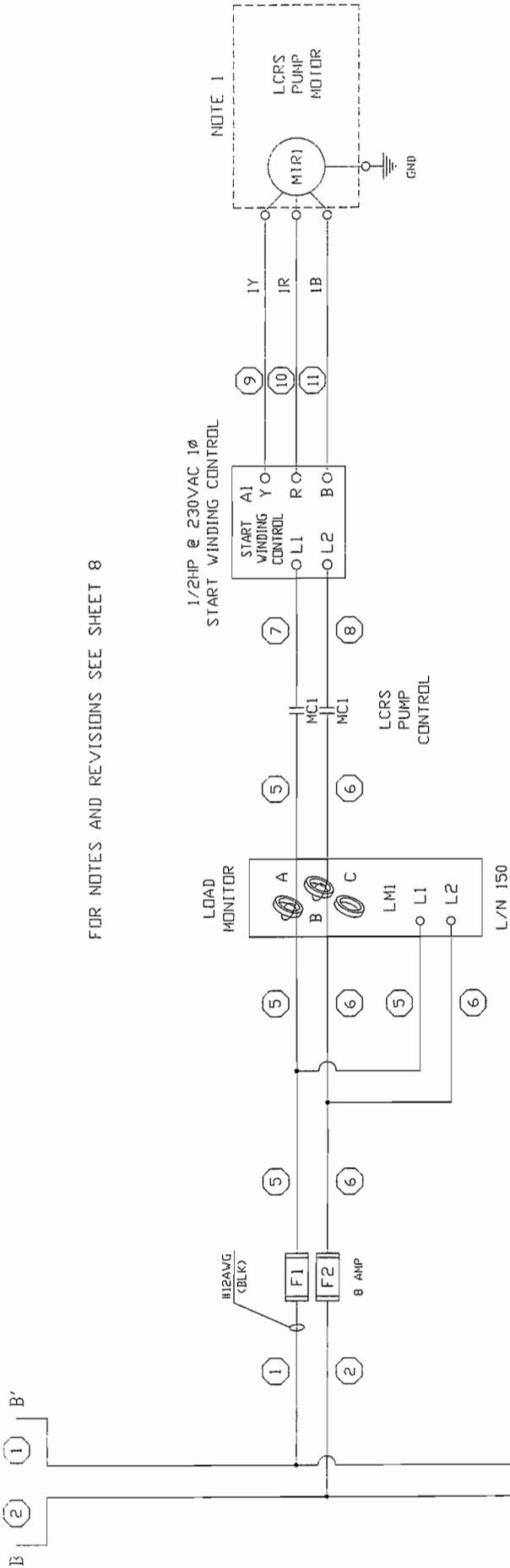
DESIGNER: RCK

CHECKER: RCK

DATE: 05-20-09

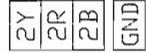
DRAWING NO: 08373-0250

FOR NOTES AND REVISIONS SEE SHEET 8



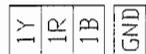
FIELD WIRING TERMINALS FIELD WIRING TERMINALS

LOAD (230VAC)



VADOSE PUMP MOTOR

LOAD (230VAC)



LCRS PUMP MOTOR

JOB NO. 09--9356ABC

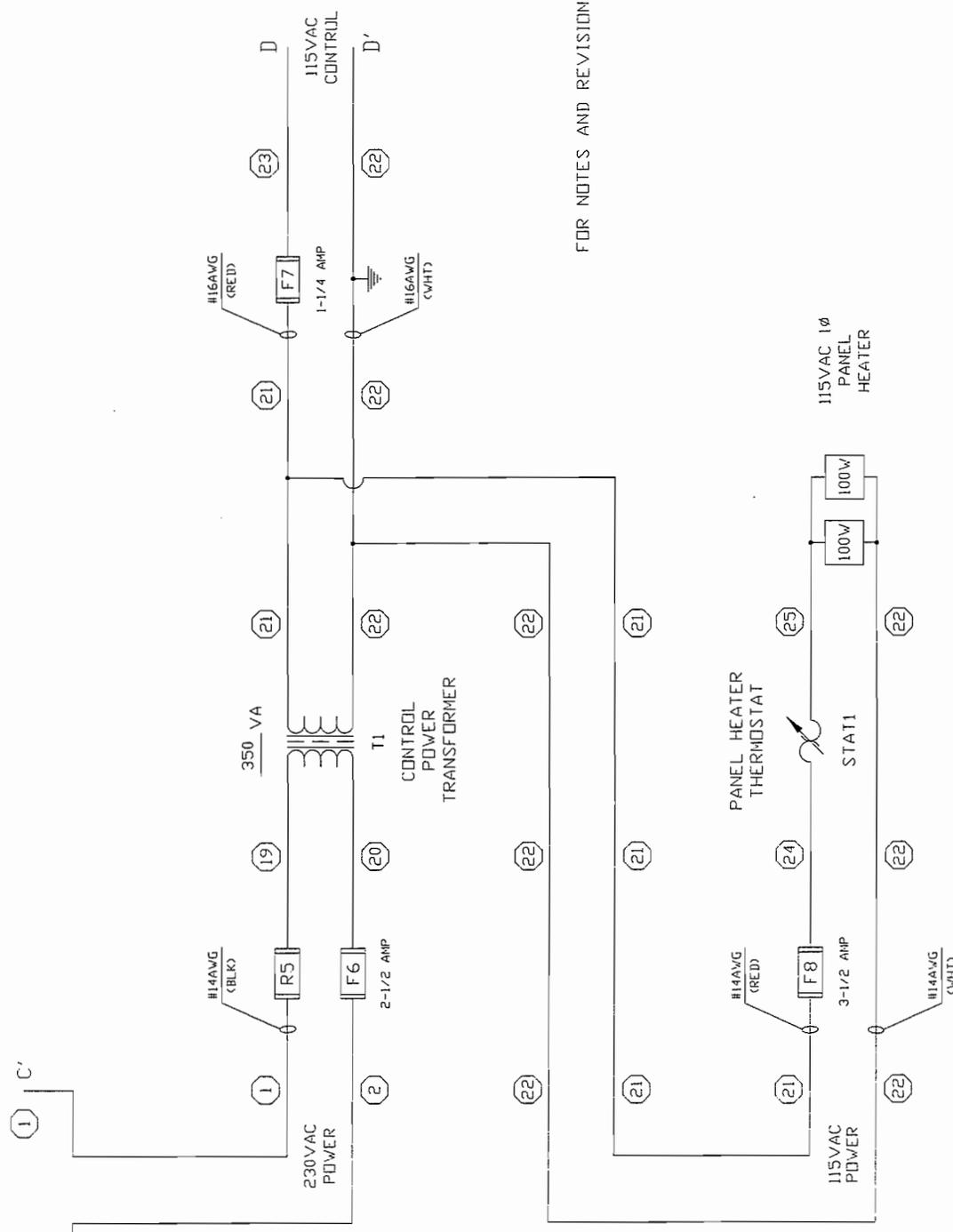
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EPG COMPANIES
L975PTG CONTROL PANEL
230VAC 1 ϕ SH 2 OF 8

DESIGN: RCK
DRAWN: RCK
CHECKED: RCK
DATE: 05-20-09
PROJECT NO: 08373-0251



FOR NOTES AND REVISIONS SEE SHEET 8

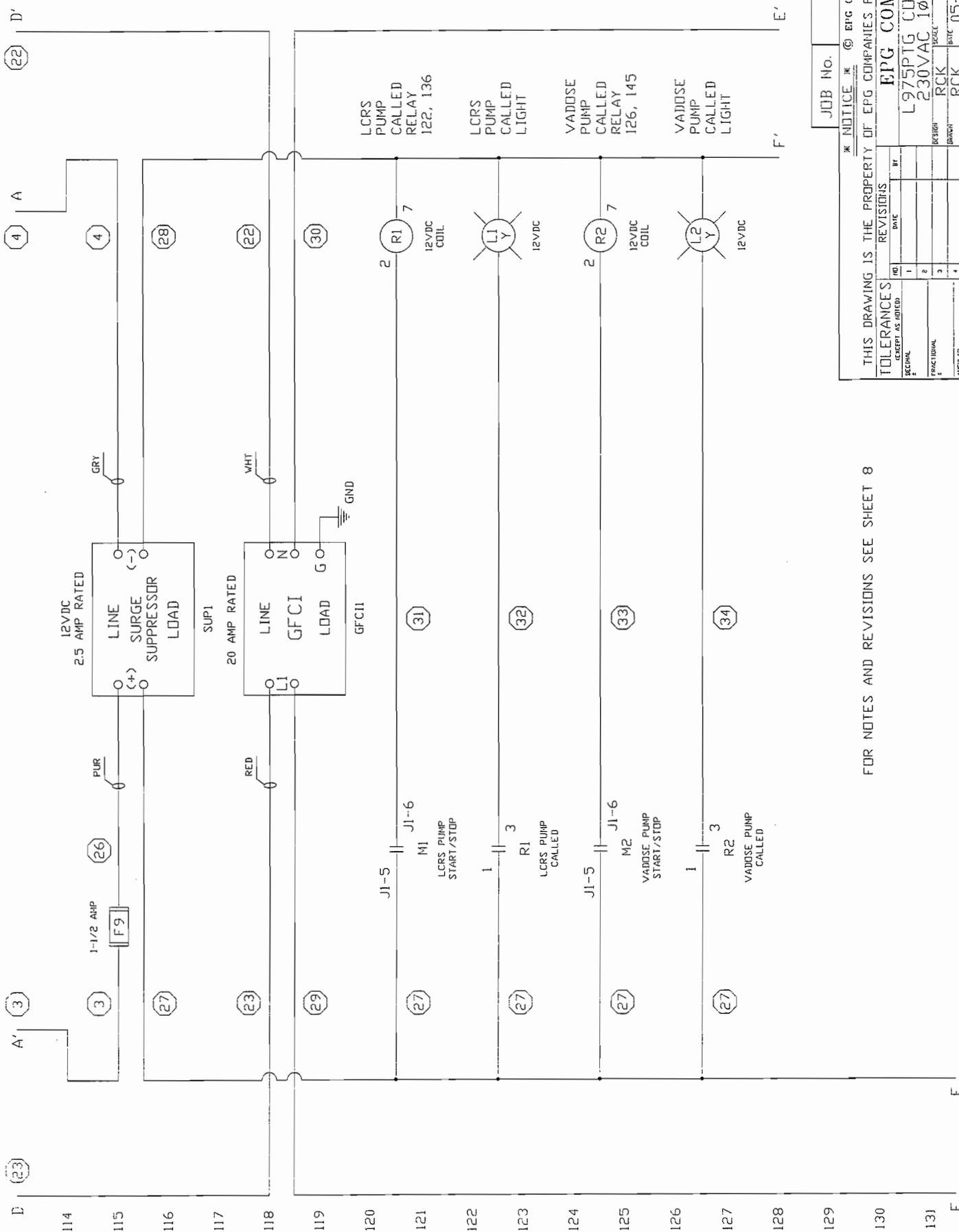
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TOLERANCES		EPG COMPANIES	
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L975PTG CONTROL PANEL 230VAC 1φ SH 3 OF 8		DRAWING ID: 08373-0252	
RCK		DATE: 05-20-09	
RCK		APP'D:	

115VAC D' (23)

c-12VDC (4) A

c-12VDC (3) A'

115VAC (23) D



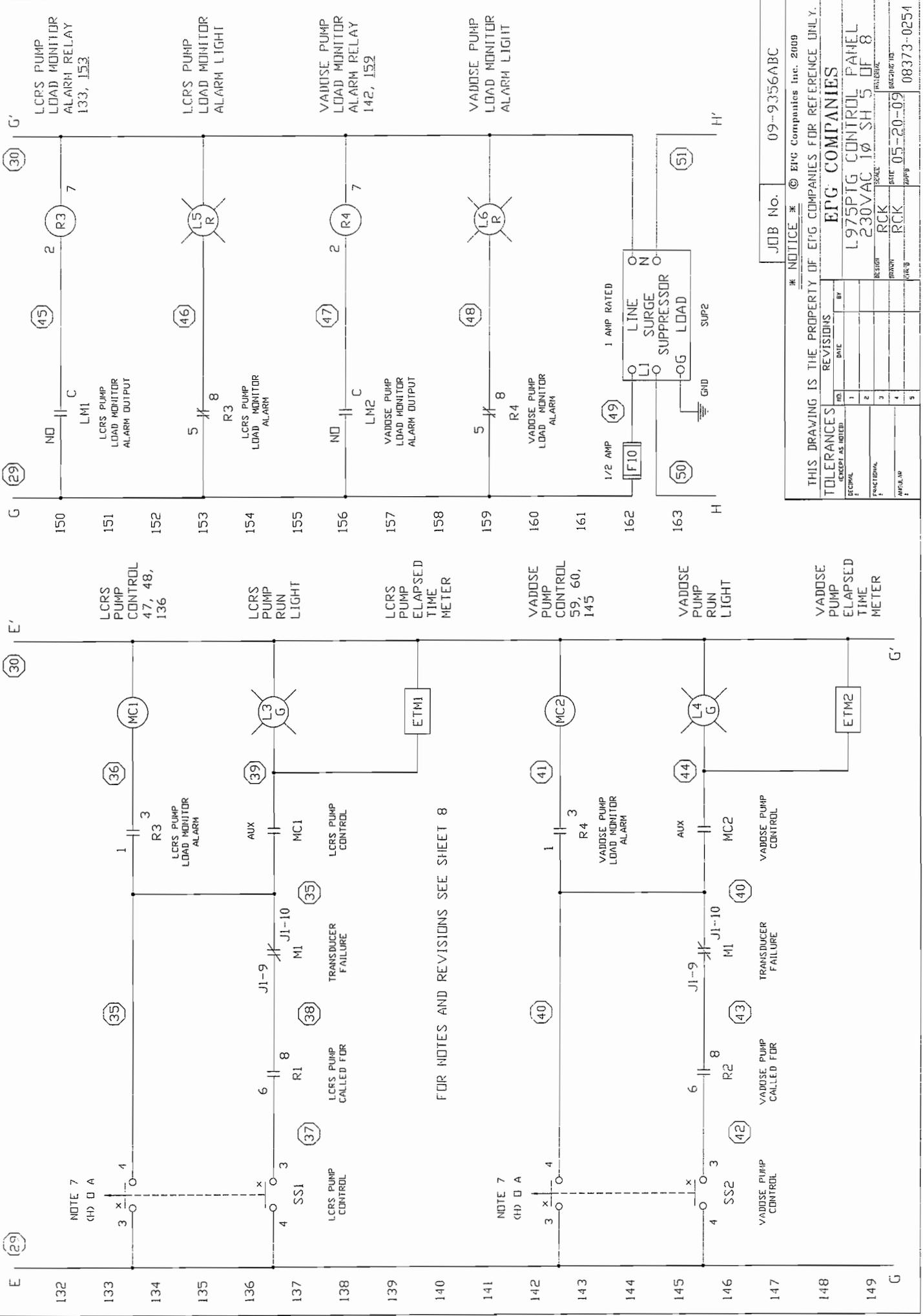
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EPG COMPANIES
L975PTG CONTROL PANEL
230VAC 1Ø SH 4 DF 8
RCK SCALE
RCK
RCK
05-20-09
08373-0253

FOR NOTES AND REVISIONS SEE SHEET 8



FOR NOTES AND REVISIONS SEE SHEET 8

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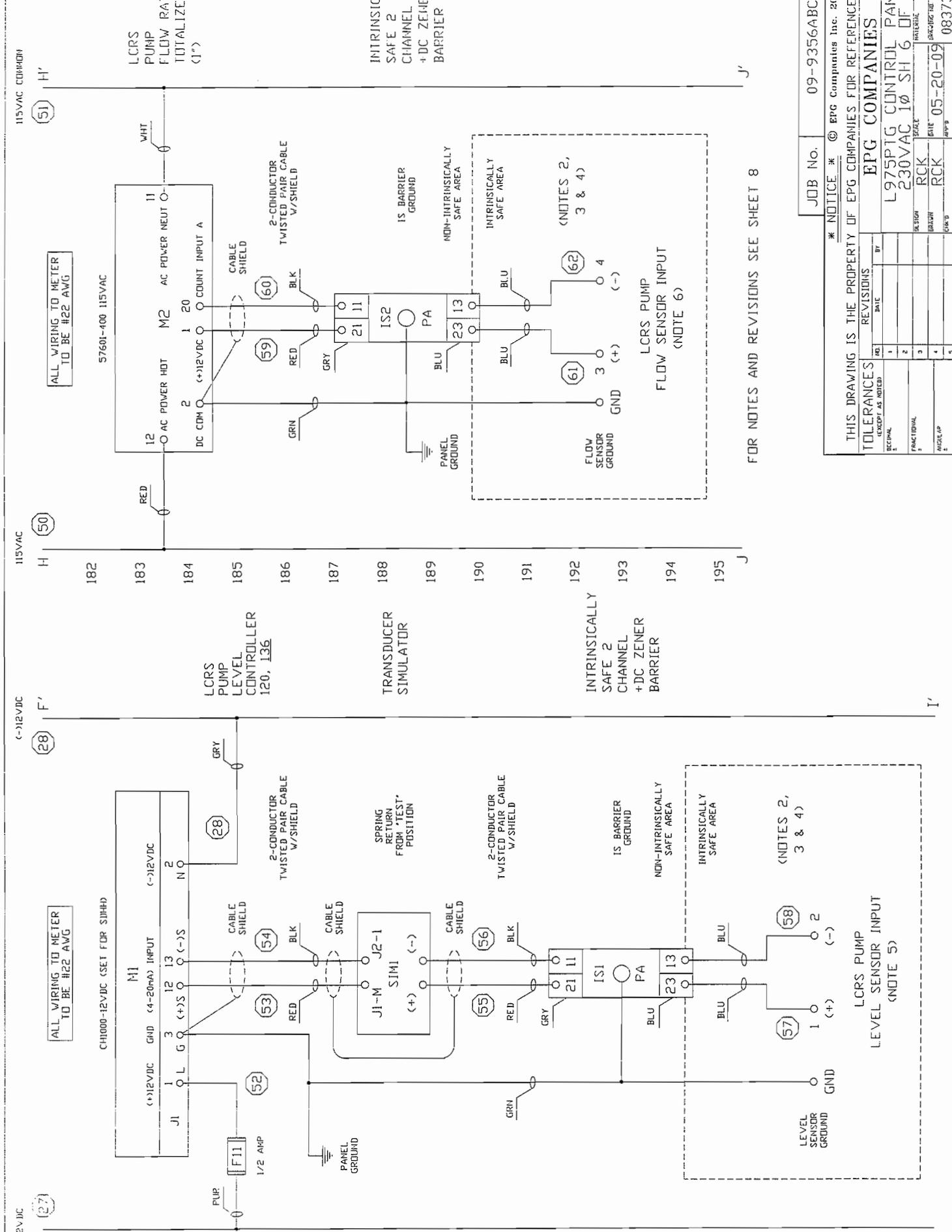
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REVISIONS

EPG COMPANIES

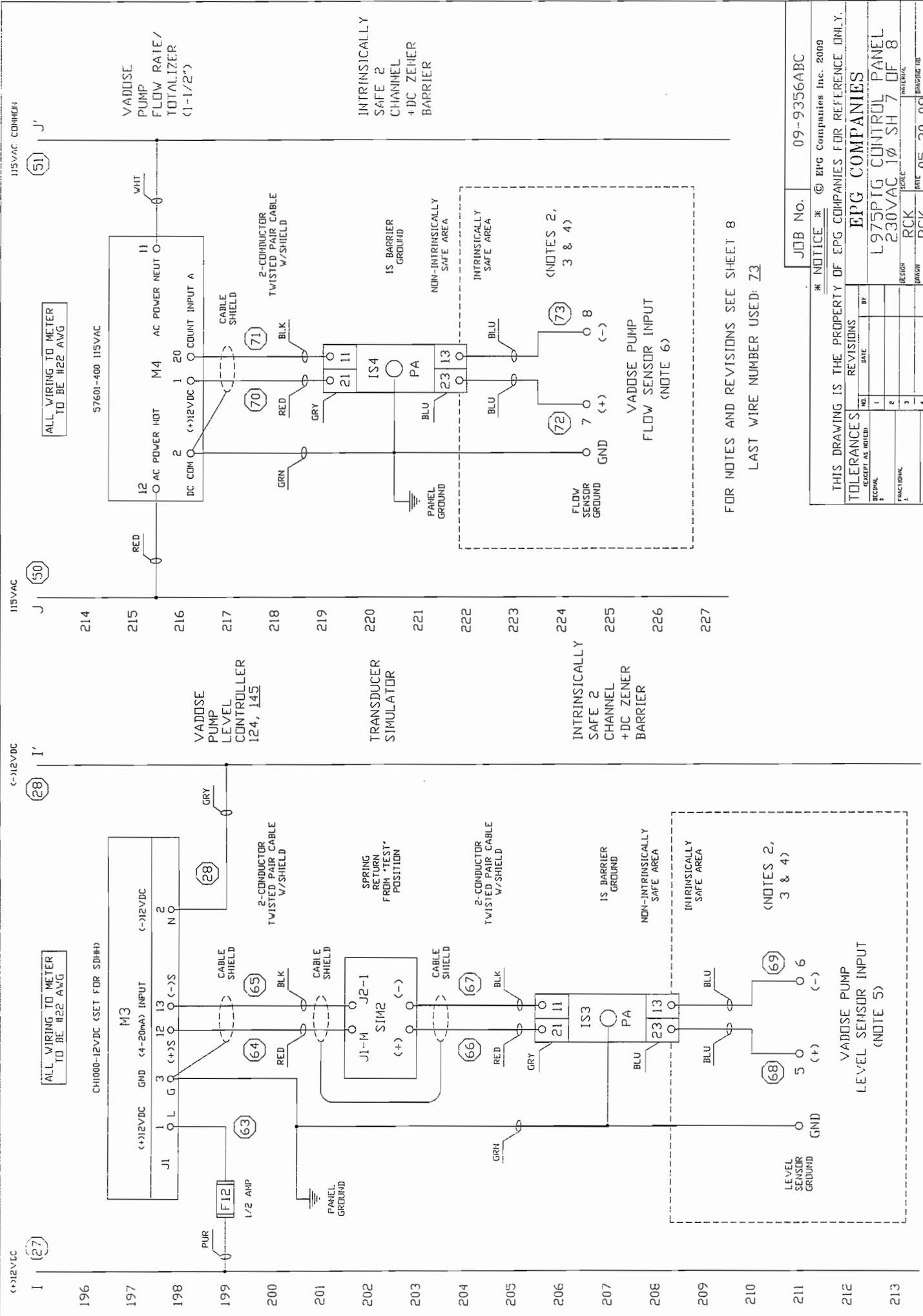
L975PTG CONTROL PANEL
230VAC 1Ø SH 5 OF 8

REVISION RCK DATE 05-20-09 DRAWING NO. 08373-0254



FOR NOTES AND REVISIONS SEE SHEET 8

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TOLERANCES UNLESS NOTED		EPG COMPANIES	
1	REVISIONS	L975PTG CONTROL PANEL	
2	BY	230VAC IØ SH 6 DF 8	
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5		CHK'D	APP'D
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		RCK	08373-0255

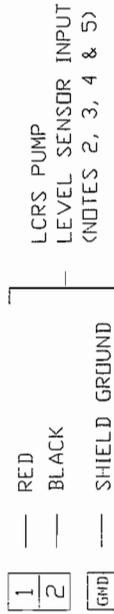


FOR NOTES AND REVISIONS SEE SHEET 8
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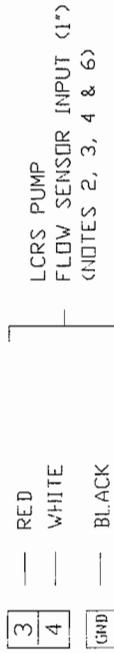
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EPG COMPANIES	
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230VAC 1Ø SH 7 OF 8	
DESIGN	RCK
DRAWN	RCK
CHECKED	
DATE	05-20-09
PROJECT	08373-0256

FIELD WIRING TERMINALS

LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



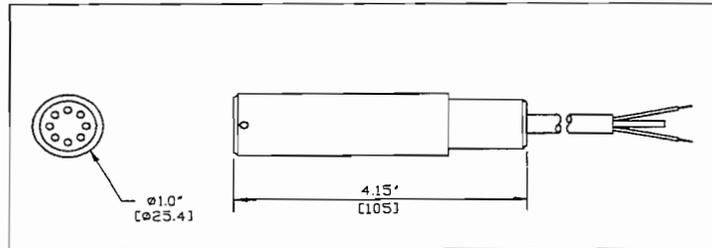
NOTE:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
5. MAXIMUM CABLE LENGTH TO THE LEVEL SENSOR IS 3000 FEET
6. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR IS 500 FEET
7. SELECTOR SWITCHES, (SSI-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION

JOB No.	09-9356ABC	* NOTICE * © EPG Companies Inc. 2009	THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.
EPG COMPANIES		EPG COMPANIES	
L975PTG CONTROL PANEL 230VAC 1Ø SH 8 DF 8		L975PTG CONTROL PANEL 230VAC 1Ø SH 8 DF 8	
REVISIONS	DATE	BY	REASON
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DECIMAL		DECIMAL	
ANGULAR		ANGULAR	
DATE		DATE	
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DRAWN		DRAWN	
RCK		RCK	
CHECKED		CHECKED	
RCK		RCK	
APPROVED		APPROVED	
08373-0257		08373-0257	

ENGINEER'S SPECIFICATION

EPG LevelMaster™ PT Submersible Level Sensor



GENERAL FEATURES

- * **Application:** The LevelMaster sensor is designed specifically to work with the EPG SurePump™, but its durability, accuracy and weight make it the logical choice for stand alone level applications. The chemical resistant jacketed cable with water block contains a vent tube for atmospheric pressure compensation.
- * **Ranges Available:** 0-55" through 0-690' models are standard. Call EPG for other available ranges.
- * **Accuracy:** The LevelMaster sensor has built-in temperature compensation as well as precise calibration giving an accuracy of $\pm 1.0\%$ at ambient temperature and a combined repeatability and hysteresis error of $\pm 0.125\%$.
- * **Fully Submersible:** The LevelMaster sensor is fully submersible in any liquid compatible with 316 stainless steel and the chemical resistant polyurethane cable jacket. It is designed for submergence at depths greater than operating level without sustaining damage. Call EPG for more severe service.
- * **Self-Sealing Cable:** If a cut occurs in the outer jacket of the cable, a water block feature just inside the outer jacket will self-seal in most cases guarding against the incursion of water.
- * **Superior Noise Immunity:** Designed for heavy duty use in hostile environments, the LevelMaster sensor gives outstanding noise immunity. Unlike transducers, whose signals may be distorted by outside interference, the LevelMaster sensor utilizes a conditioned compensated 4-20 mA output to maximize signal strength and accuracy. The sensor also features a shielded lead to help prevent signal disruption from outside sources.

PERFORMANCE

- * **Depth Range:** 0-55" thru 0-690' (0-2 PSI thru 0-300 PSI)
- * **Static Accuracy¹:** $\pm 1.0\%$ BFSL FSL maximum
- * **Thermal Error²:** 0.05% FSO/°C worst case
- * **Proof Depth:** 1.5 X rated depth
- * **Burst Depth:** 2.0 X rated depth
- * **Resolution:** Infinitesimal

1. Static accuracy includes the combined errors due to nonlinearity, hysteresis and non-repeatability on a Best Fit Straight Line basis, at 25°C per ISA S51.1.
2. Thermal error is the maximum allowable deviation from the Best Fit Straight Line due to a change in temperature, per ISA S51.1.

ELECTRICAL

- * Excitation: 10 to 40 VDC, Red = (+) excitation, Black = (-) excitation
- * Input Current: 20 mA maximum
- * Output: 4-20 mA (2 wire)
- * Zero offset (max): 4-20 mA, ± 12 mA
- * Output impedance: <10 ohms
- * Insulation resistance: 100 megohms at 50VDC
- * Circuit protection: Polarity, surge & shorted output
- * Power supply rejection: $<\pm 0.05\%$ FSO/VDC (mA output)
- * Electrical termination: 2-24 AWG conductors in a shielded cable with sensor breather and polyurethane jacket

ENVIRONMENTAL

- * Compensated temp range: 0° to 50°C
- * Operating temp range: -20° to 70°C

PHYSICAL

- * Dimensions: Nominal diameter of 1.0" X 4.15" length
- * Weight: 7 oz. (not including cable)
- * Cable: Polyurethane jacketed shielded cable with polyethylene vent tube and Kevlar tension members
- * Wetted materials: 316 SS, Viton
- * Mounting provision: Suspended by cable
- * Lightning Protection: Increases length to 8.15"

MODEL {Call EPG for other ranges available – specify length (---)}

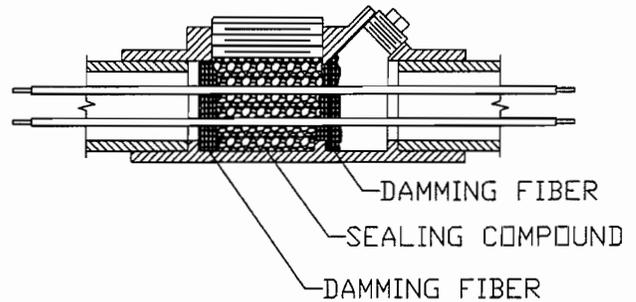
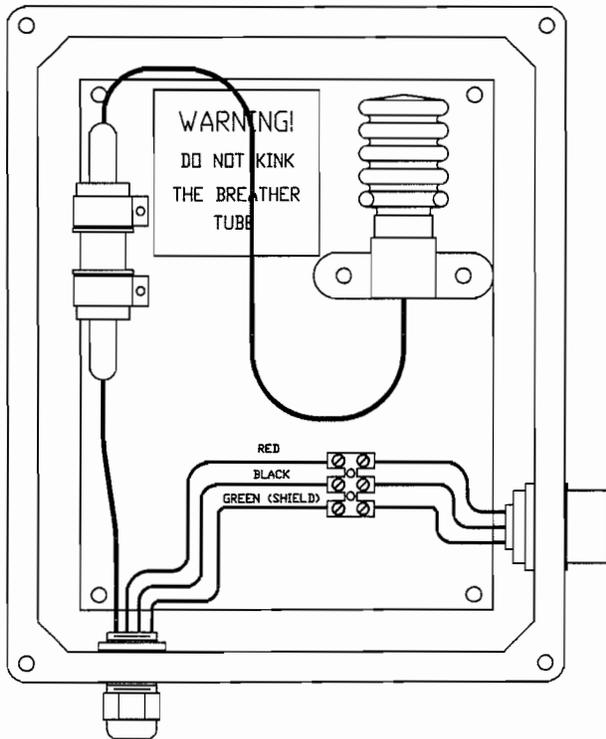
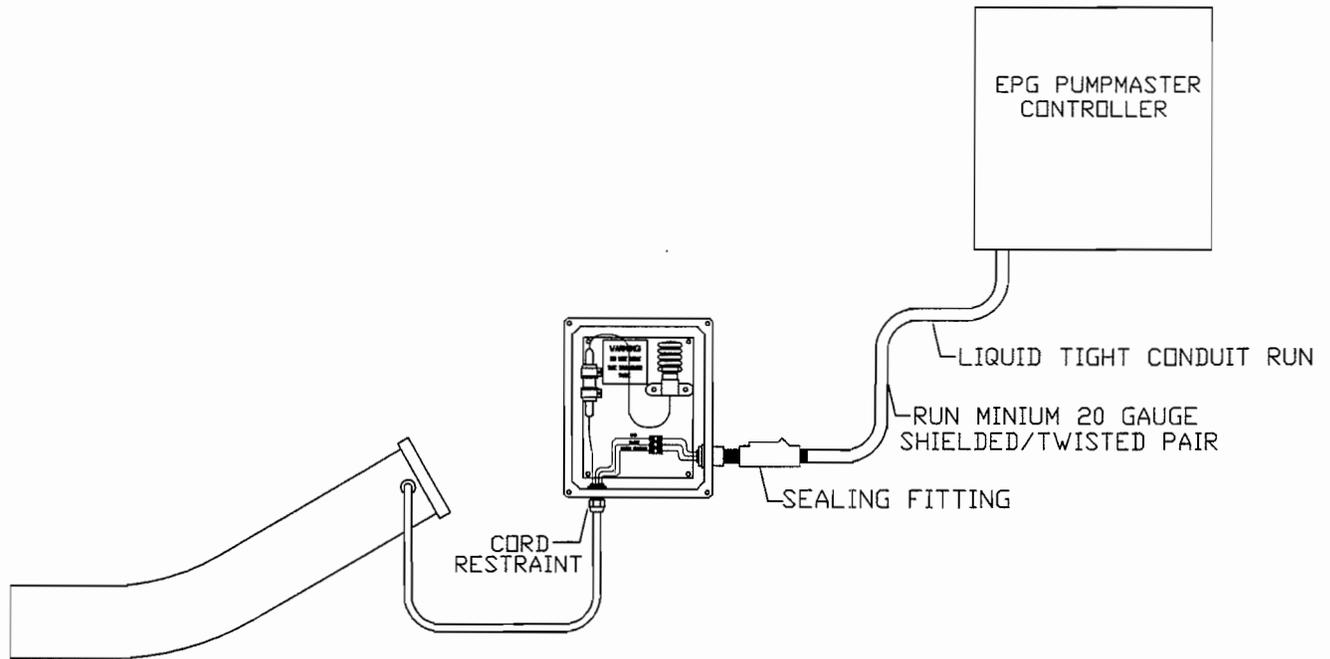
PART #	DESCRIPTION	RANGE
PT05X---	Submersible Pressure Transmitter	0-11'
PT07X---	" " "	0-16'
PT10X---	" " "	0-23'
PT20X---	" " "	0-46'
PT25X---	" " "	0-57'

OPTIONS

- * Tefzel® Cable: Used for highly corrosive environments
- * Titanium Housing: Used for highly corrosive environments
- * Lightning Protection: Protects against transient voltages and lightning associated surges up to 20,000 amperes with proper grounding
- * Temperature Sensor: A sensor with 4-20 mA output for temperature (0-50°C) is available – Excitation: 9-30 VDC, White = (+) excitation, Green = (-) excitation

BJBL 600B

BREAKOUT JUNCTION BOX FOR LEVEL SENSOR



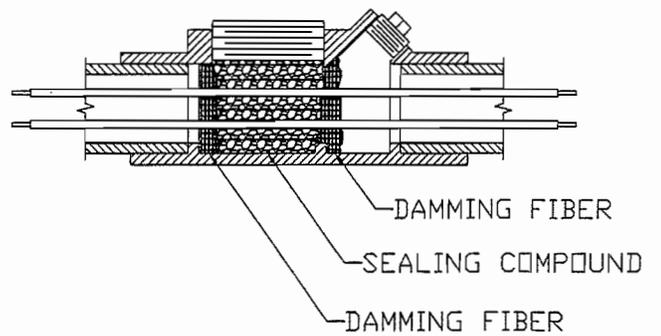
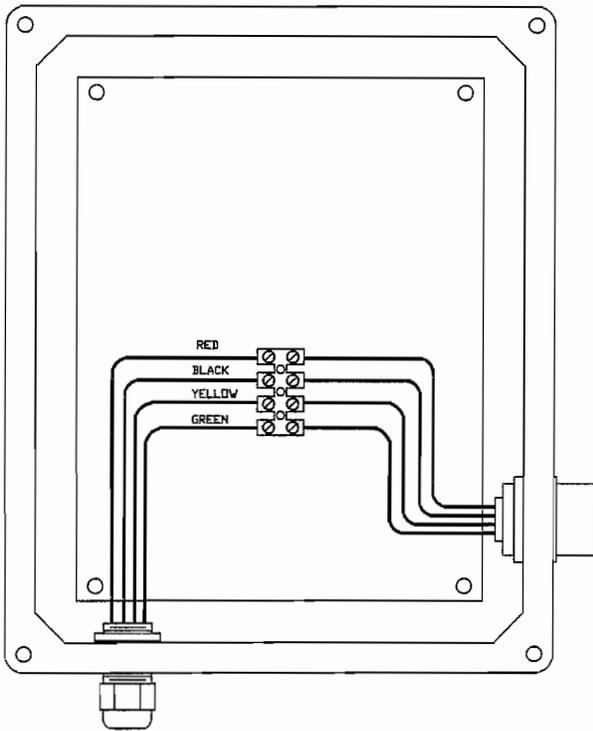
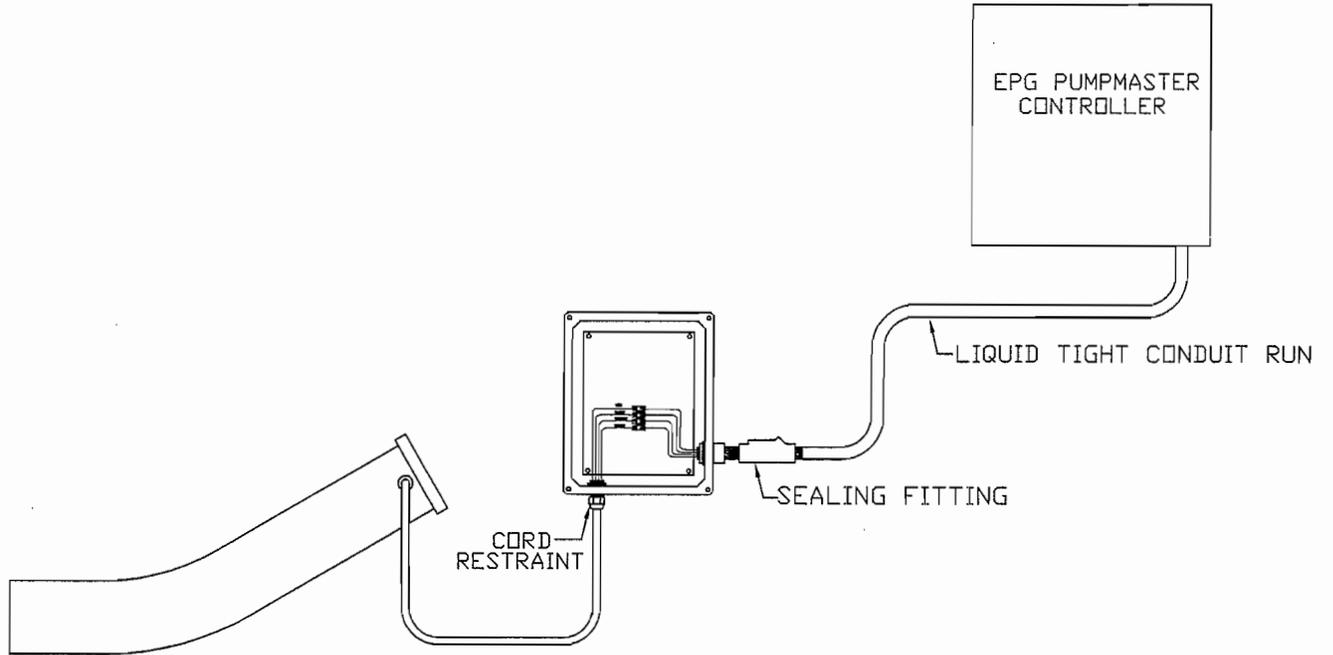
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REFERENCE

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(EXCEPT AS NOTED)		NO.	DATE	BY	TYPICAL INSTALLATION				
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ANGULAR	±	3			CHK'D		APP'D		02523-0605
		4							
		5							

BJBP 500

BREAKOUT JUNCTION BOX FOR MOTOR LEAD



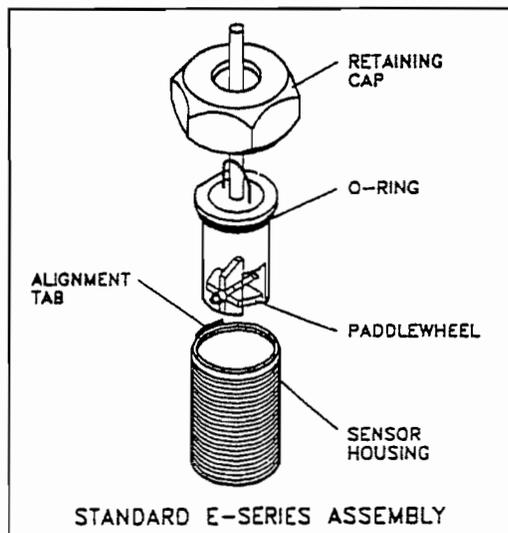
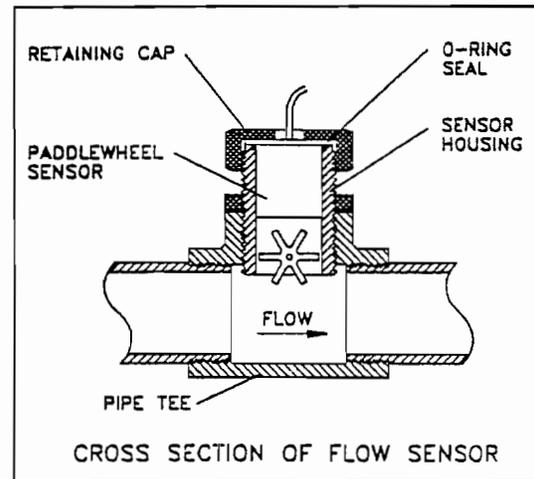
* NOTICE * © EPG Companies Inc. 2002				
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EXCEPT AS NOTED		REL.	DATE	BY
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EPG COMPANIES			
TYPICAL INSTALLATION			
DESIGN	C.A.S.	SCALE	NONE
DRAWN	C.A.S.	DATE	05/07/02
CHK'D		APP'D	
			DRAWING NO. 03626-0500

SENSOR DATA SHEET

EPG E-Series Liquid Flow Sensor

- * Low cost
- * High reliability
- * Wide range
2 – 10,000 GPM
- * Patented six blade, non-magnetic design
- * Available in DELRIN or KYNAR
- * One paddlewheel fits ALL SIZES
- * Transmits up to 1000 feet without the need for additional amplifiers
- * Direct logic pulse output
- * Flow velocities range of 1.5 to 27 fps
- * Operating pressure to 200 PSIG
- * Liquid temperatures to 250° F
- * 2 Year Warranty
- * High sensitivity
- * Pipe sizes from
3/4" - 14"



One major problem with most paddlewheel type flow sensors having magnets in the paddles is that metal particles tend to stick to the magnets. The collecting material then causes a change in the flow characteristics in the paddle. To eliminate this problem, EPG Companies flow sensor uses a special axle and dual magnet drum design that takes the magnets out of the paddles. This dual magnetic drum design with rapidly changing polarity, along with fluid velocity causes the metallic particles to drop off into the flow stream and are swept away.

INSTALLATION HINTS

1. Pipe must be full for accurate reading.
2. Minimum velocity is 1.5 ft./second. Recommended maximum velocity is 27 ft./second.
3. The flow must be uniform at the point where the flow sensor is installed or an incorrect reading will result. To accommodate a uniform flow allow at least ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the flow sensor. Non-uniform flow is often caused by elbows, partially open valves or an increase in pipe diameter.

Model Number	Nominal Pipe Size	Recommended Range	
		1.5 ft/sec Flow Rate GPM	27 ft/sec Flow Rate GPM
EP 075	¾"	2.0	37.2
EP 100	1"	3.7	66.2
EP 125	1¼"	5.7	103.4
EP 150	1½"	8.3	148.8
EP 200	2"	14.7	264.6
EP 250	2½"	23.0	413.4
EP 300	3"	33.1	595.4
EP 400	4"	58.8	1058.4
EP 500	5"	91.9	1653.8
EP 600	6"	132.3	2381.4

Flow Meter Operation

EPG's meter system is an 8 digit Flow Rate/Totalizer. The meter counts pulses from a flow sensor and converts this information into flow rate and total flow using programmed scaling factors.

The meter features menu driven programming to simplify meter set-up. The meter stores parameters entered into non-volatile memory. This memory retains the parameters even when power to the panel is shut off.

Figure 1 shows the meter display and keypad and gives a brief description of each key's function.

Two Line LCD Display - Shows totalizer and rate values when the unit is in the run mode. Displays programming information when the unit is in the program mode.

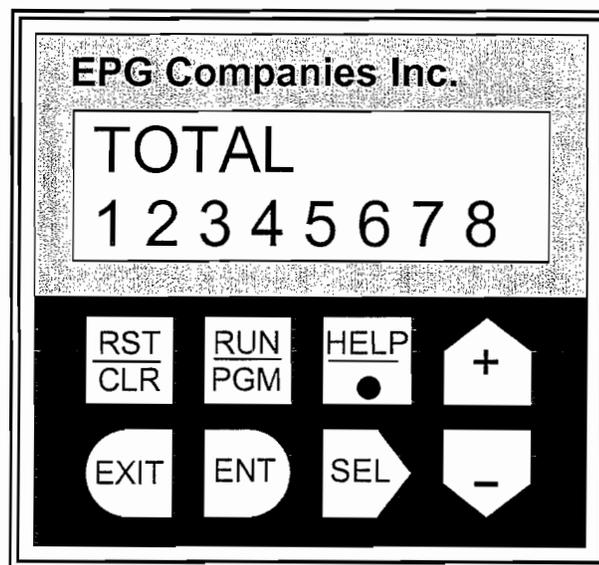


Figure 1. Meter Display and Keypad

Key Functions

<p>Reset/Clear Key - This key can be programmed to reset the totalizer when in the run mode. In the program mode it zeros numeric data that is selected for editing.</p>	<p>Exit Key - This key is used in the program mode to exit program changes that have been selected but not yet entered.</p>
<p>Run/Program Key - Press this key followed by the Enter key (ENT) to enter the program mode. Pressing this key while in the program mode returns the control to the run mode.</p>	<p>Enter Key - This key is used in the program mode to cause the displayed program changes to be entered.</p>
<p>Help Key - In the run mode this key causes the Help Screens to be displayed. In the program mode this key is used to set the decimal point positions for totalizer and rate scaler displays.</p>	<p>Select Key - This key is used in the program mode to move into more detailed menus and select the digits of numeric values needed for programming.</p>
<p>Up Arrow/Plus (+) Key - In the run mode this key is used to select one of the three different display screens. In the program mode this key is used to step vertically up through the menus and increment the value of selected digits when changing numeric values.</p>	<p>Down Arrow/Minus (-) Key - In the run mode this key is used to select one of the two different display screens. In the program mode this key is used to step vertically down through the menus and decrease the value of selected digits when changing numeric values.</p>

Program Scalers:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
C DEC PT	-----	Sets decimal point to the right of the last digit on the TOTAL Display.
R DEC PT	-----	Sets decimal point to the right of the last digit on the FLOW RATE Display.
C SCALER	See Below	Used to convert sensor pulses into Total Gallons.
R SCALER	See Below	Used to convert sensor pulses into Gallons/Minute.

Program Options:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
RST KEY	RST EDG	Reset Key will Clear Totalizer Count.

Tables 1 and 2 show the keystroke operations necessary to change scale parameters and "Reset Key" enable/disable function.

Flow meter setup procedures for scalers

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press - to scroll through main menu. Find "Program Scalers" on the meter display.
4	Press SEL to enter "SCALERS" menu.
5	Press - to scroll the "SCALERS" menu and bring up the "C SCALER" option on the meter display.
6	Press SEL to select the "C SCALER" and begin operation on the left most digit of the "C SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the meter displays the desired value for the "C SCALER"
7	Press ENT to enter the "C SCALER " value into non-volatile memory.
8	Press - to display the "C DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
9	Press ENT to enter this selection into memory.
10	Press - to bring up the "R SCALER" option on the meter display.
11	Press SEL to select the "R SCALER" and begin operation on the left most digit of the "R SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the desired value for the "R SCALER" is in the meter display. Also use the SEL and HELP/. Keys to position the decimal point to the desired position.
12	Press ENT to enter this value into the non-volatile memory.
13	Press - to display the "R DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
14	Press ENT to enter this selection into non-volatile memory.
15	Press EXIT to exit "Program" mode.
16	Press RUN/PGM to enter "Run" mode.

Table 1. Flow Meter Scaler Sequence

Flow meter setup procedures for reset key

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press + to scroll through main menu. Find "Program Options" on the meter display.
4	Press SEL to enter "OPTIONS" menu.
5	Press + to scroll the "OPTIONS" menu and bring up the "RST KEY" option on the meter display.
6	Press SEL to select the "RST KEY" menu.
7	Press + to display the desired key option. Options include: RST KEY DISABLED This option prevents the reset key from clearing the totalizer count. RST KEY RST EDG This option allows clearing of the totalizer count using the reset key.
8	Press ENT to select the desired option.
9	Press EXIT to exit "Program" mode.
10	Press RUN/PGM to enter "Run" mode.

Table 2. Reset Key Programming Sequence

The programmed scaling factors used are dependent upon the inside pipe diameter of the flow sensor tube. Tables 3 to 6 list the various scaling factors used for the different diameter (nominal O.D.) and schedule (wall thickness) of Stainless Steel and PVC pipes.

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

Table 3. Flow Meter Settings – Stainless Steel Schedule 40

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

Table 4. Flow Meter Settings – Stainless Steel Schedule 80

Pipe Size	C SCALER	R SCALER
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

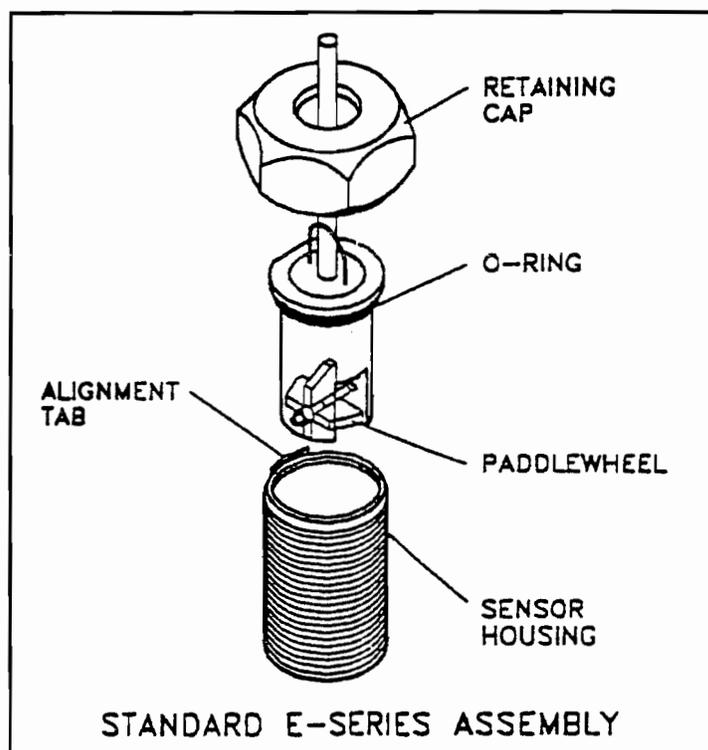
Table 5. Flow Meter Settings – PVC Schedule 40

Pipe Size	C SCALER	R SCALER
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

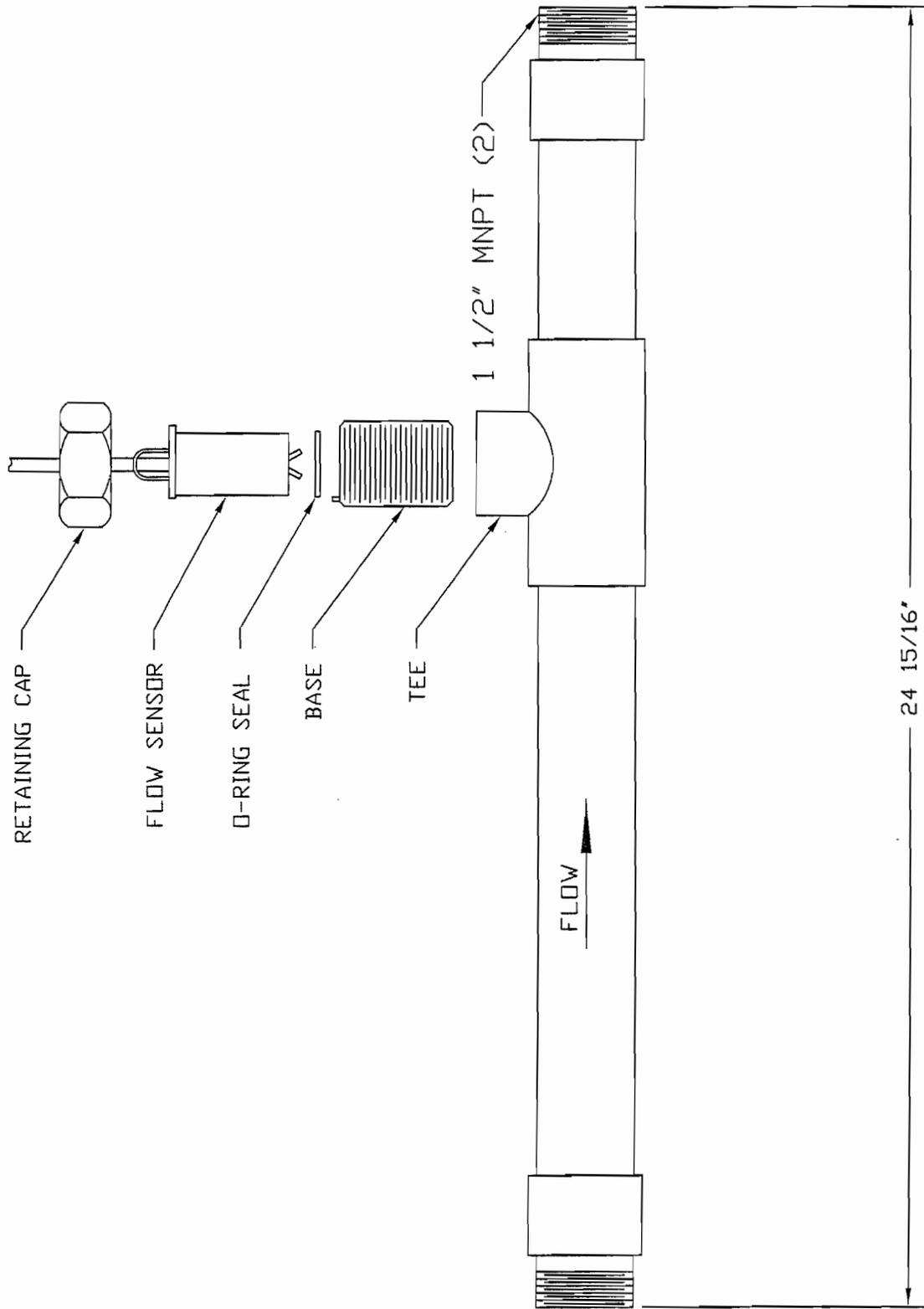
Table 6. Flow Meter Settings – PVC Schedule 80

CAUTION

DO NOT OVERTIGHTEN PADDLEWHEEL FLOW SENSOR NUT!



Damage can be caused to the paddlewheel sensor, o-ring, or sensor housing. Please hand tighten nut only!



NOTICE * © EPG Companies Inc. 2001

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EPG COMPANIES

PVC FLOW SPOOL
(1 1/2" MNPT ENDS)

REV	DATE	BY
1		
2		
3		
4		

REVISIONS	DATE	BY
1		
2		
3		
4		

TOLERANCES EXCEPT AS NOTED

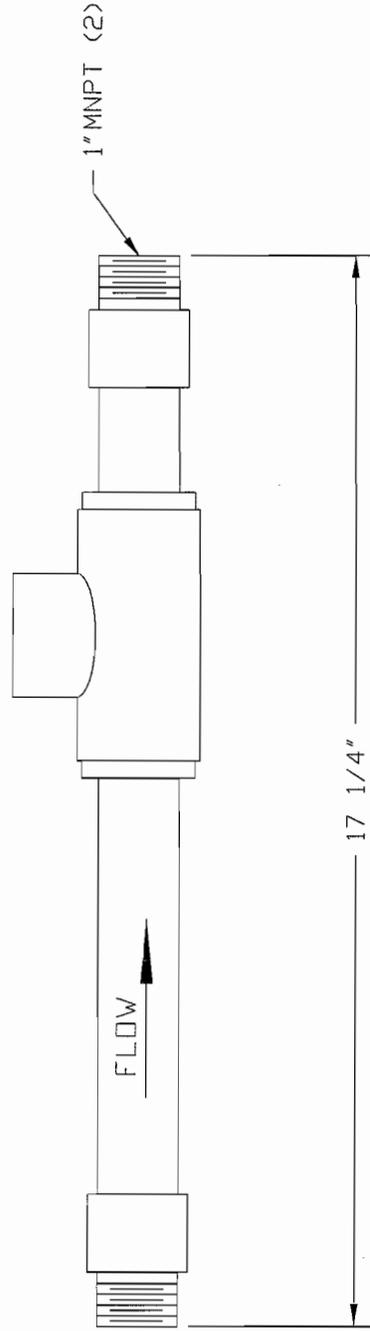
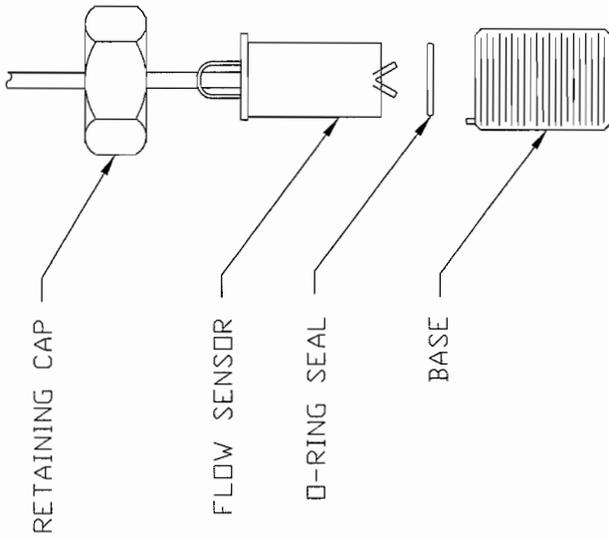
DIMENSIONAL .06

FRACTIONAL 1/16

DECIMAL 1°

DESIGN C.A.S. DATE 07/30/01

DRAWING NO. 05392-0000C



JOB No.

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TOLERANCES UNLESS NOTED		REVISIONS	
#	DESCRIPTION	NO.	DATE
1	GENERAL .06		
2	FUNCTIONAL 1/16		
3	ANGULAR 1°		

EPG COMPANIES	
1" PVC, SCH. 40, FLOW SPOOL	SCALE 4" = 1"
(W/1" MNPT ENDS)	DATE 11/01/06
C.A.S.	DESIGNER
C.A.S.	CHECKED
	APP'D

07761-0000C

LIMITED WARRANTY

This agreement shall be deemed to have been entered into in the State of Minnesota, and shall be construed in accordance with the laws of the State of Minnesota, including Minnesota's enactment of the Uniform Commercial Code. Buyer hereby stipulates and agrees that Hennepin County, Minnesota shall be the proper jurisdiction for adjudicating all claims and controversies arising from this agreement.

Products manufactured by EPG Companies Inc. are warranted for a period of 12 months from date of installation or eighteen (18) months from date of manufacture* to be free from defects of materials and workmanship. It is expressly agreed that the exclusive remedy under this warranty is limited solely to the repair or replacement, at the sole discretion of EPG, of the part that failed. The cost of labor for any field repairs is not covered by this warranty. EPG Companies will not be liable for any damage or wear due to abnormal conditions or improper installation.

Products not manufactured by EPG Companies Inc. are covered by the original manufacturer's warranty, which EPG Companies passes through to the purchaser. The actual manufacturer will make warranty determination.

To have a defective part repaired or replaced, you must return the defective product to EPG Companies. Please call (800) 443-7426 or (763) 424-2613 to obtain a Return Goods Authorization (RGA) number. Send defective product (freight prepaid) with RGA #, description of installation, installation data and failure date to EPG Companies Inc., 19900 County Rd. 81, Maple Grove, MN 55311.

EPG Companies will not be held liable for any incidental or consequential damages, losses or expenses incurred from installation, use or any other reason. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF EITHER FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY, WHICH EXTEND BEYOND THOSE SPECIFICALLY LISTED HERE.

If equipment is to be stored for a period greater than six months, proper storage precautions must be taken if the warranty is to be maintained. Please call EPG Companies for specific requirements regarding product storage.

The following is a partial list of items, which will void the warranty:

- Opening the motor for any reason.
- Using undersized electrical wire.
- Making unauthorized circuit changes. Please call EPG Companies before making any changes.
- Operating a three phase submersible motor from single phase power through a phase converter unless 3-leg ambient-compensated quick trip overload protectors are used and complete details are sent in writing to EPG Companies.

* To qualify for the delayed installation warranty you must contact EPG Companies Inc., at (800) 443-7426 or (763) 424-2613 within 60 days of purchase.

SUBMITTAL ACCEPTANCE FORM

IMPORTANT NOTICE: These submittals have been provided for your prompt review. **Your order will not be entered into production until we receive this signed acceptance form.** Shipment of your order **will not be scheduled** until after we receive this submittal acceptance form.

Submitted to: Entact Environmental Services, Inc. – Henderson, NV
(Company Name)

Date of Submittals: 5-20-09

Submittals Accepted by: _____

Print Name: _____

Title: _____

Date of Acceptance: _____

EPG Job No.: 09-9356

Return to: EPG Companies Inc.
P.O. Box 427
Rogers, MN 55374
Fax (763) 493-4812

APPENDIX B

EPG Companies Inc.

**Operations & Maintenance
Manual**

FOR

**Entact Environmental
Services Inc.
Henderson, NV**

EPG Job #09-9356

Operations & Maintenance Manual

Index

- List of EPG Equipment
- Sump Pump System Design/As-Built Installation Information by Phase
 - Phase I Engineer's Specification
 - Phase I As-Built Control Panel Schematics
 - Phase I Installation Records
 - Phase I As-Built Control Panel Setup Parameters
 - Phase I As-Built Photos

 - Phase II Engineer's Specification
 - Phase II As-Built Control Panel Schematics
 - Phase II Installation Records
 - Phase II As-Built Control Panel Setup Parameters
 - Phase II As-Built Photos

 - Phase IIIB Engineer's Specification
 - Phase IIIB As-Built Control Panel Schematics
 - Phase IIIB Installation Records
 - Phase IIIB As-Built Control Panel Setup Parameters
 - Phase IIIB As-Built Photos

 - Phase V Engineer's Specification
 - Phase V As-Built Control Panel Schematics
 - Phase V Installation Records
 - Phase V As-Built Control Panel Setup Parameters
 - Phase V As-Built Photos
- Installation / O&M Instructions
- Pump Operation Standard Operating Procedures

List of EPG Equipment Installed

EPG Companies Inc.

List of Equipment

Entact Environmental Services, Inc. – Henderson, NV

EPG Job # 09-9356

Phase 1 Control Panel and Pumps

1 each

L975PTG

PumpMaster control panel to operate (1)ea. 1/2 HP 230 VAC 1 phase motor and (1)ea. 3/4 HP 230 VAC 1 phase motor independently via generator supplied power. Includes LevelMaster level control meters with simulators, 2 ea. flow meters, pump call light, voltage monitor and disconnect for 12 volt DC battery backup, includes 12 Volt DC terminals. Enclosure is rated NEMA 4.

Note: Panel logic- 12 volt DC level meters call for either pump, operator turns on site supplied generator, pump called will run, flow meters will register.

Note: Site will need to supply marine batteries, battery boxes, cables and hardware to control panel.

LCRS Pump

1 each

WSDPT5-3

EPG SurePump patented, wheeled, stainless steel sump drainer with a 3/4 HP 230 VAC 1 phase motor. Includes 110' of 14 AWG jacketed motor lead, submersible level sensor with 110' lead, and a 110' length of 1/8" cable with clamps.

Vadose Pump

1 each

WSDPT2-3

EPG SurePump patented, wheeled, stainless steel # 4 sump drainer with a 1/2 HP 230 VAC 1 phase motor. Includes 110' of 14 AWG jacketed motor lead, submersible level sensor with 110' lead, and a 110' length of 1/8" stainless steel suspension cable with clamps.

Phase 2 Control Panel and Pumps

1 each

L975PTG

PumpMaster control panel to operate (1)ea. 1/2 HP 230 VAC 1 phase motor and (1)ea. 3/4 HP 230 VAC 1 phase motor independently via generator supplied power. Includes LevelMaster level control meters with simulators, 2 ea. flow meters, pump call light, voltage monitor and disconnect for 12 volt DC battery backup, includes 12 Volt DC terminals. Enclosure is rated NEMA 4.

Note: Panel logic- 12 volt DC level meters call for either pump, operator turns on site supplied generator, pump called will run, flow meters will register.

Note: Site will need to supply marine batteries, battery boxes, cables and hardware to control panel.

EPG Companies Inc.

LCRS Pump

1 each

WSDPT5-3

EPG SurePump patented, wheeled, stainless steel sump drainer with a 3/4 HP 230 VAC 1 phase motor. Includes 120' of 14 AWG jacketed motor lead, submersible level sensor with 120' lead, and a 120' length of 1/8" cable with clamps.

Vadose Pump

1 each

WSDPT2-3

EPG SurePump patented, wheeled, stainless steel # 4 sump drainer with a 1/2 HP 230 VAC 1 phase motor. Includes 120' of 14 AWG jacketed motor lead, submersible level sensor with 120' lead, and a 120' length of 1/8" stainless steel suspension cable with clamps.

Phase 3 Control Panels and Pumps

2 each

L975PTG

PumpMaster control panel to operate (1)ea. 1/2 HP 230 VAC 1 phase motor and (1)ea. 3/4 HP 230 VAC 1 phase motor independently via generator supplied power. Includes LevelMaster level control meters with simulators, 2 ea. flow meters, pump call light, voltage monitor and disconnect for 12 volt DC battery backup, includes 12 Volt DC terminals. Enclosure is rated NEMA 4.

Note: Panel logic- 12 volt DC level meters call for either pump, operator turns on site supplied generator, pump called will run, flow meters will register.

Note: Site will need to supply marine batteries, battery boxes, cables and hardware to control panel.

LCRS Pumps

2 each

WSDPT5-3

EPG SurePump patented, wheeled, stainless steel sump drainer with a 3/4 HP 230 VAC 1 phase motor. Includes 70' of 14 AWG jacketed motor lead, submersible level sensor with 70' lead, and a 70' length of 1/8" cable with clamps.

Vadose Pumps

2 each

WSDPT2-3

EPG SurePump patented, wheeled, stainless steel # 4 sump drainer with a 1/2 HP 230 VAC 1 phase motor. Includes 70' of 14 AWG jacketed motor lead, submersible level sensor with 70' lead, and a 70' length of 1/8" stainless steel suspension cable with clamps.

EPG Companies Inc.

Junction Boxes Power and Sensor

- 8 each BJBL600B
EPG Breakout Box, NEMA 4X non-metallic enclosure, junction box for 1 ea. level sensor. Includes desiccant dryer, bellows, and connection terminals.
- 8 each BJBP500
EPG Breakout Box, NEMA 4X non-metallic enclosure for 1 ea. motor lead, includes connection terminals.
- 4 each EP15P04M15M15S
EPG Paddlewheel Flow Sensor, 1.5", PVC schedule 40 flow sensor with MNPT 1.5" inlet end, MNPT 1.5" outlet end, and paddlewheel sensor with 25' lead.
- 4 each EP10P04M10M10S
EPG Flow Sensor, 1", SCH 40 PVC with 1" MNPT ends, and paddlewheel sensor with 25' lead.

Phase I
Engineer's Specification

ENGINEER'S SPECIFICATION

PHASE I LCRS

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 5 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 3/4 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 110 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/2 inch MNPT threaded discharge nozzle and be capable of delivering 25 GPM at 50 feet of TDH. Each SurePump will be fitted with 110 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

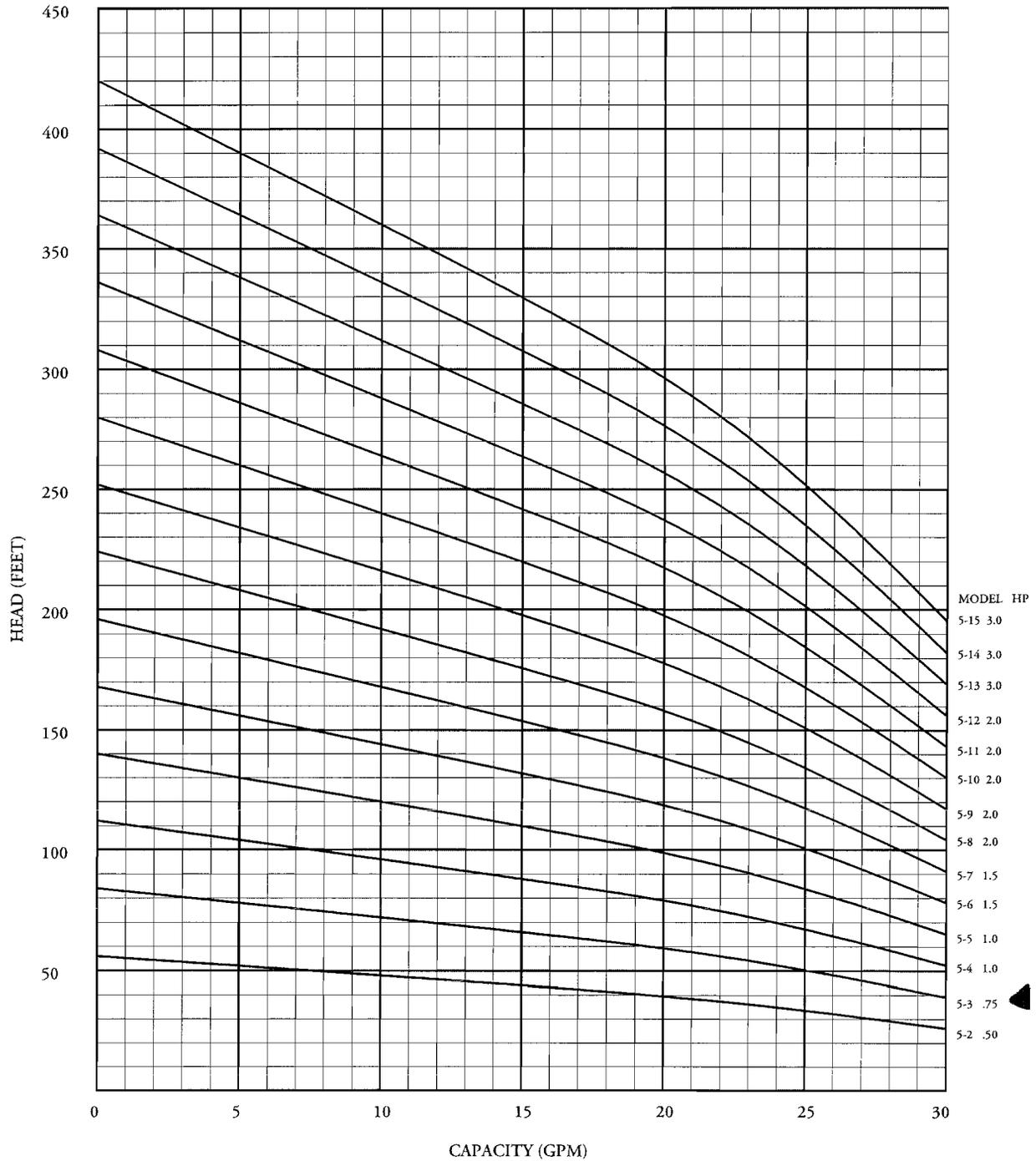
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

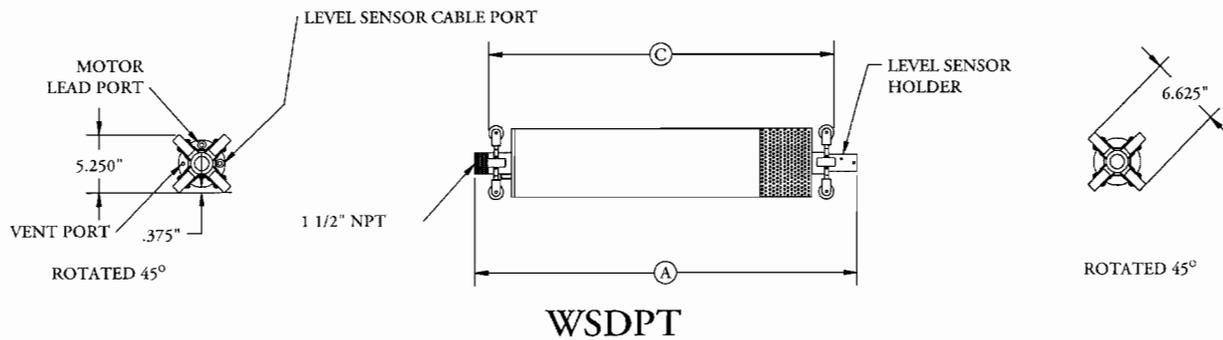
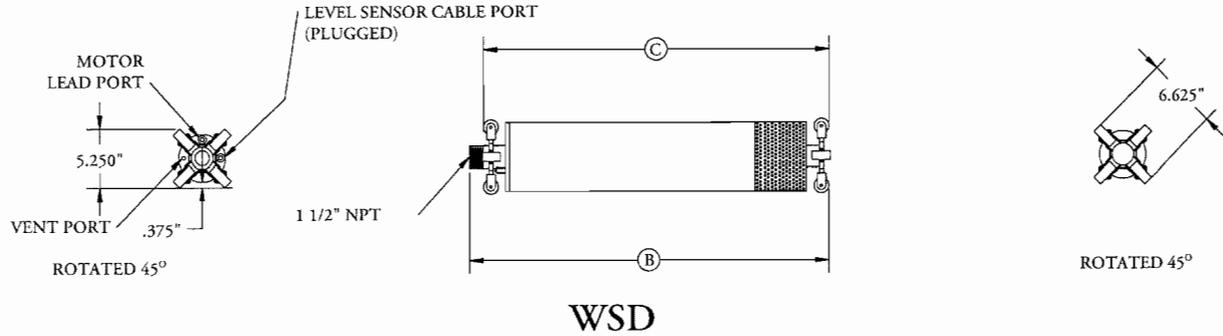
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 5 SurePump™
 Flow Range 15-30 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 5 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-2	0.50	1	31.02	29.90	29.15	61.47	66.47
5-2	0.50	3	31.02	29.90	29.15	61.47	66.47
5-3	0.75	1	32.98	31.86	31.11	66.24	71.24
5-3	0.75	3	32.98	31.86	31.11	66.24	71.24
5-4	1.00	1	34.90	33.78	33.03	70.98	75.98
5-4	1.00	3	34.90	33.78	33.03	70.98	75.98
5-5	1.00	1	35.73	34.61	33.86	71.88	76.88
5-5	1.00	3	35.73	34.61	33.86	71.88	76.88
5-6	1.50	1	38.43	37.31	36.56	79.22	84.22
5-6	1.50	3	36.56	35.44	34.69	72.77	77.77
5-7	1.50	1	39.26	38.14	37.39	80.12	85.12
5-7	1.50	3	37.39	36.27	35.52	73.67	78.67
5-8	2.00	1	41.59	40.47	39.72	85.17	90.17
5-8	2.00	3	40.09	38.97	38.22	81.01	86.01

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-9	2.00	1	42.42	41.30	40.55	86.07	91.07
5-9	2.00	3	40.92	39.80	39.05	81.90	86.90
5-10	2.00	1	43.25	42.13	41.38	86.96	91.96
5-10	2.00	3	41.75	40.63	39.88	82.80	87.80
5-11	2.00	1	44.08	42.96	42.21	87.86	92.86
5-11	2.00	3	42.58	41.46	40.71	83.69	88.69
5-12	2.00	1	44.91	43.79	43.04	88.75	93.75
5-12	2.00	3	53.41	52.29	51.54	92.35	97.35
5-13	3.00	1	54.24	53.12	52.37	119.24	124.24
5-13	3.00	3	51.24	50.12	49.37	105.91	110.91
5-14	3.00	1	55.07	53.95	53.20	120.14	125.14
5-14	3.00	3	52.07	50.95	50.20	106.81	111.81
5-15	3.00	1	55.90	54.78	54.03	121.03	126.03
5-15	3.00	3	52.90	51.78	51.03	107.70	112.70

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
 WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
 WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
 LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

PHASE I VADOSE

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 2 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 1/2 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 110 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/4 inch MNPT threaded discharge nozzle and be capable of delivering 10 GPM at 50 feet of TDH. Each SurePump will be fitted with 110 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

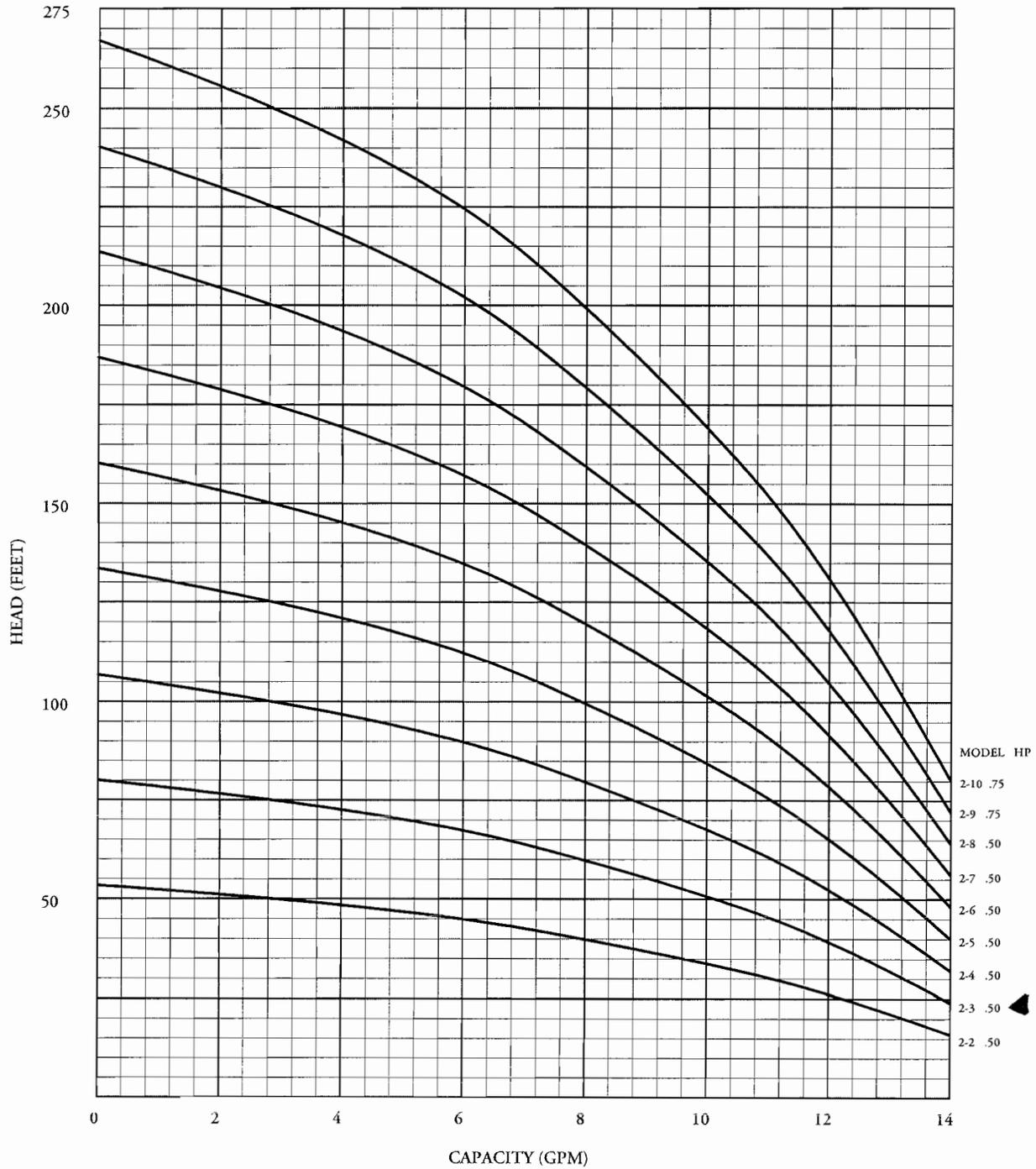
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

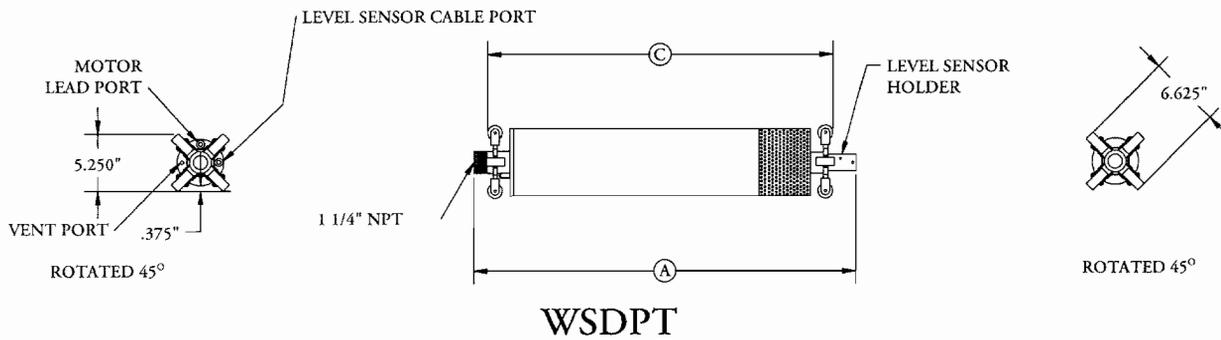
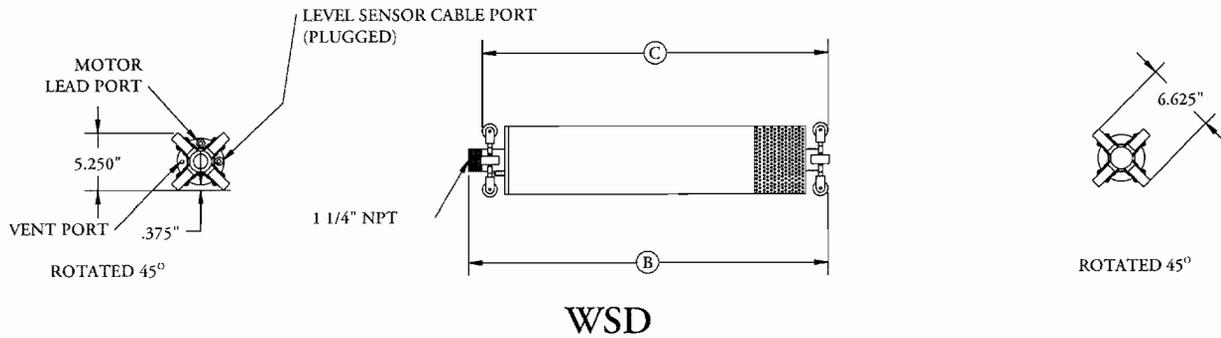
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 2 SurePump™
 Flow Range 4-14 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 2 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
2-2	0.50	1	31.02	29.90	29.15	61.47	66.47
2-2	0.50	3	31.02	29.90	29.15	61.47	66.47
2-3	0.50	1	31.85	30.73	29.98	62.37	67.37
2-3	0.50	3	31.85	30.73	29.98	62.37	67.37
2-4	0.50	1	32.68	31.56	30.81	63.26	68.26
2-4	0.50	3	32.68	31.56	30.81	63.26	68.26
2-5	0.50	1	33.51	32.39	31.64	64.15	69.15
2-5	0.50	3	33.51	32.39	31.64	64.15	69.15
2-6	0.50	1	34.34	33.22	32.47	65.05	70.05
2-6	0.50	3	34.34	33.22	32.47	65.05	70.05
2-7	0.50	1	35.17	34.05	33.30	65.94	70.94
2-7	0.50	3	35.17	34.05	33.30	65.94	70.94
2-8	0.50	1	36.00	34.88	34.13	66.84	71.84
2-8	0.50	3	36.00	34.88	34.13	66.84	71.84
2-9	0.75	1	37.96	36.84	36.09	71.61	76.61
2-9	0.75	3	37.96	36.84	36.09	71.61	76.61
2-10	0.75	1	38.79	37.67	36.92	72.50	77.50
2-10	0.75	3	38.79	37.67	36.92	72.50	77.50

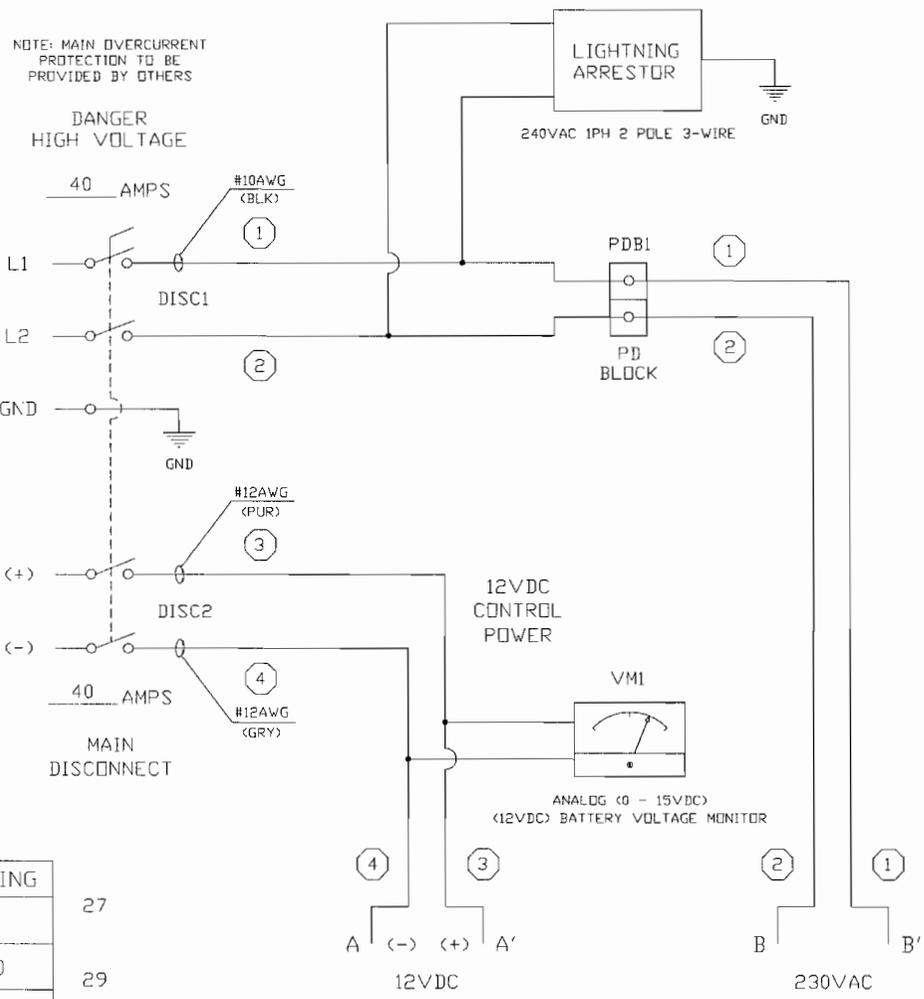
NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
 WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
 WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
 LEVEL SENSOR AND CABLE.

Phase I
As-Built Control Panel Schematics

MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
VADOSE PUMP	1/2	230	5.0	8A
LCRS PUMP	3/4	230	6.8	10A

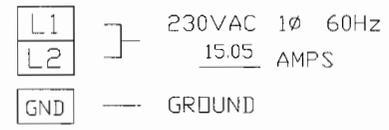
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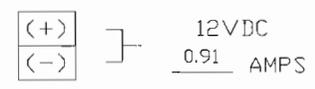
PHASES 1, 2 & 3B
CONTROL PANEL AND PUMPS

FIELD WIRING TERMINALS

LINE (GENERATOR)



LINE (BATTERY)



FUSE	TYPE	RATING
F1-F2	FRN-R	8
F3-F4	FRN-R	10
F5-F6	FRN-R	2-1/2
F7	FNM	1-1/4
F8	FNM	3-1/2
F9	ABC	1-1/2
F10	MDL	1/2
F11	ABC	1/2
F12	ABC	1/2

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FOR NOTES AND REVISIONS SEE SHEET 8

AS BUILT

JOB No. 09-9356A

* NOTICE * © EPG Companies Inc. 2009

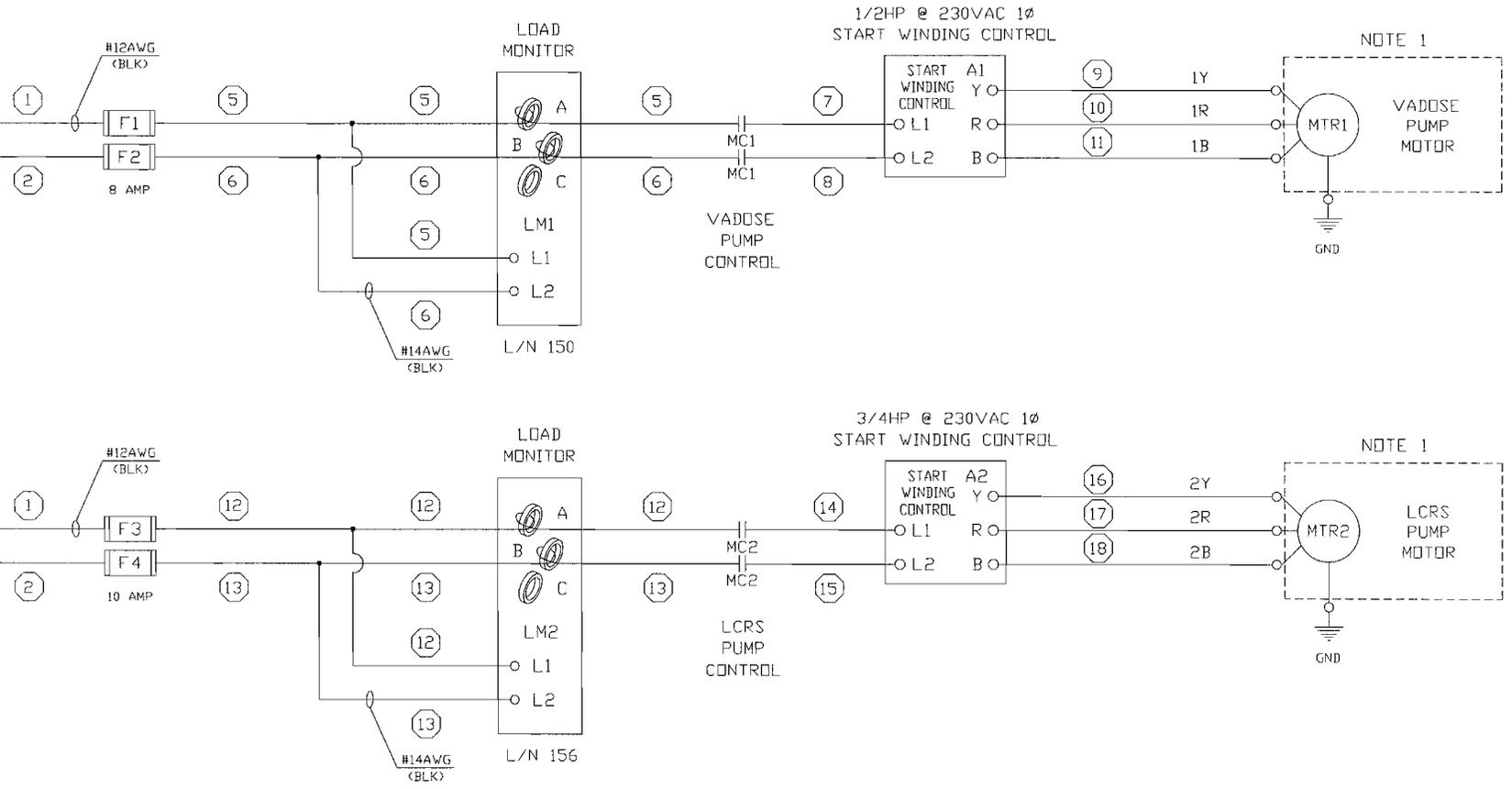
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.

TOLERANCES		REVISIONS		EPG COMPANIES		
(EXCEPT AS NOTED)	N/L	DATE	BY	DESIGN	SCALE	MATERIAL
DECIMAL	1			L975PTG CONTROL PANEL		
FRACTIONAL	2			230VAC 1Ø SH 1 OF 8		
ANGULAR	3			DRAWN	RCK	DATE 06-02-09
	4			CHK'D	RCK	DRAWING NO. 08373-0250
	5					

B (2) (1) B'

FOR NOTES AND REVISIONS SEE SHEET 8

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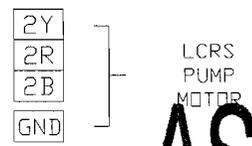
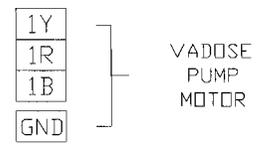


FIELD WIRING TERMINALS

FIELD WIRING TERMINALS

LOAD (230VAC)

LOAD (230VAC)



JOB No. 09-9356A

* NOTICE * © EPG Companies Inc. 2009

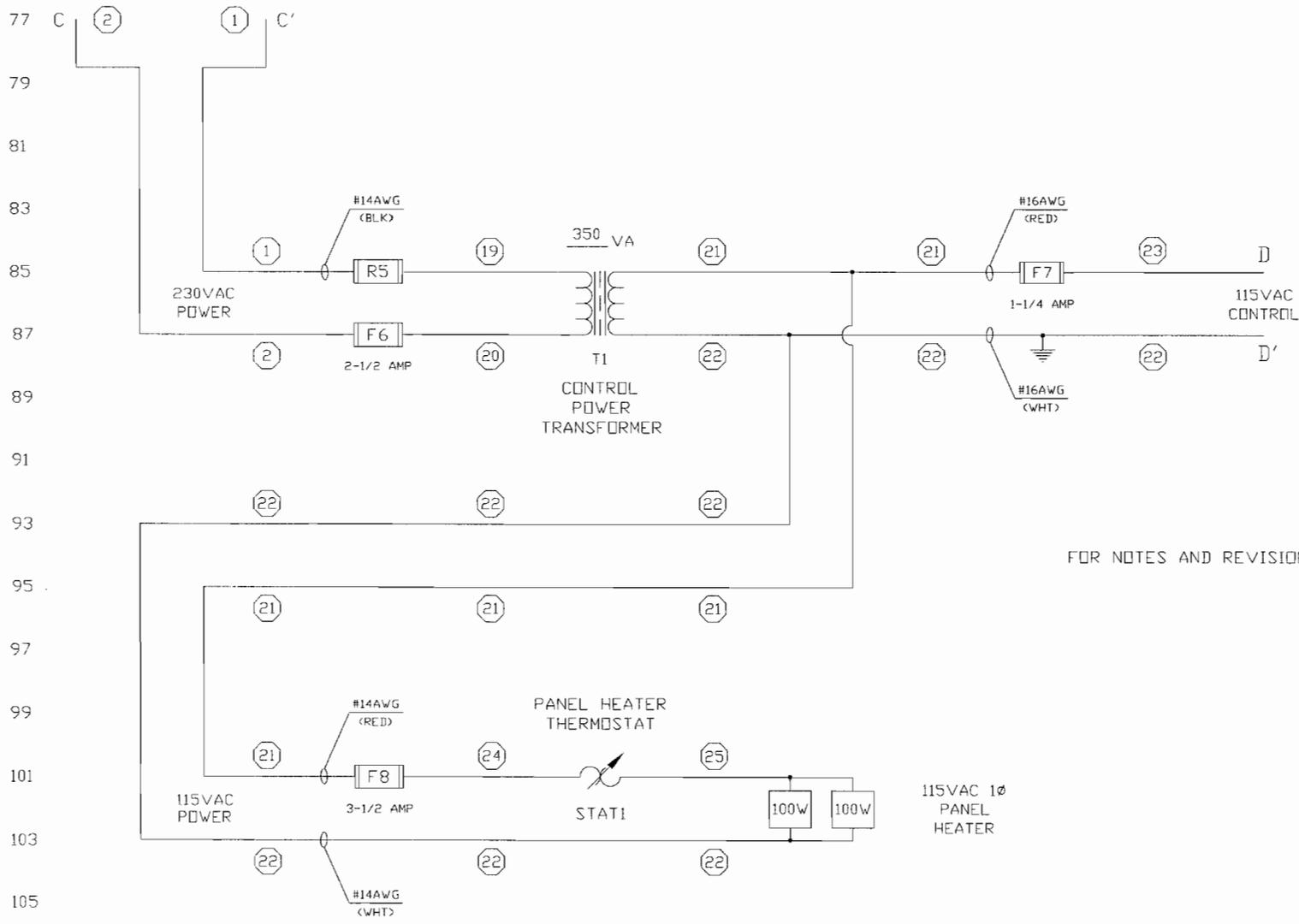
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TOLERANCES		REVISIONS		EPG COMPANIES		
(EXCEPT AS NOTED)	NC	DATE	BY	DESIGN	SCALE	MATERIAL
	1					
	2					
FUNCTIONAL	3			RCK		
ANULAR	4			RCK	06-02-09	
	5			CHK'D	APP'D	

L975PTG CONTROL PANEL
230VAC 1Ø SH 2 OF 8

DRAWING NO. 08373-0251

AS BUILT



FOR NOTES AND REVISIONS SEE SHEET 8

JOB No. 09-9356A

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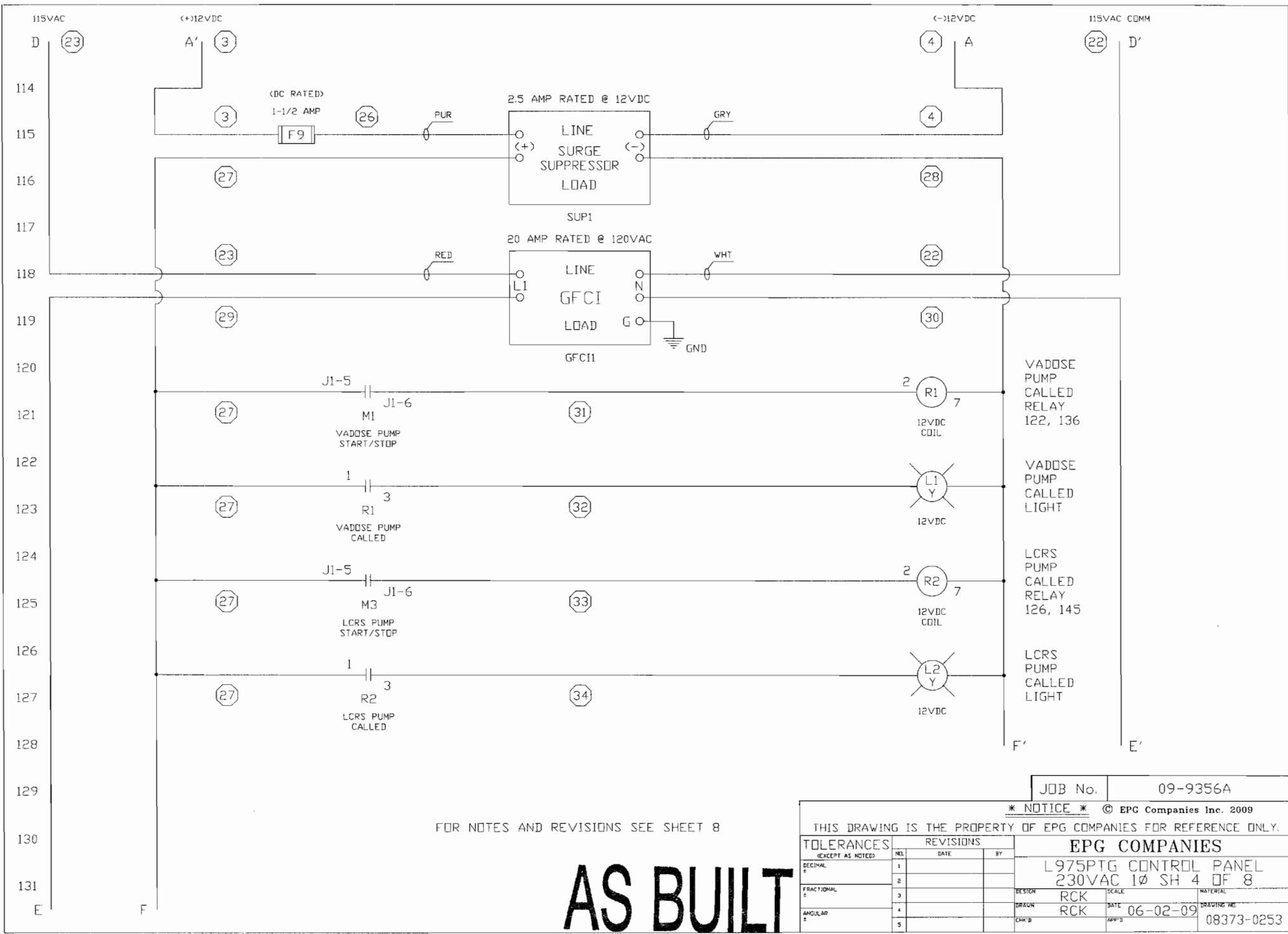
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.

TOLERANCES (EXCEPT AS NOTED)	REVISIONS		
	NO.	DATE	BY
DECIMAL	1		
	2		
FRACTIONAL	3		
	4		
ANGULAR	5		

EPG COMPANIES			
L975PTG CONTROL PANEL			
230VAC 1Ø SH 3 OF 8			
DESIGN	RCK	SCALE	MATERIAL
DRAWN	RCK	DATE	DRAWING NO.
CHK'D		06-02-09	
		APP'D	08373-0252

AS BUILT

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FOR NOTES AND REVISIONS SEE SHEET 8

AS BUILT

JOB No. 09-9356A

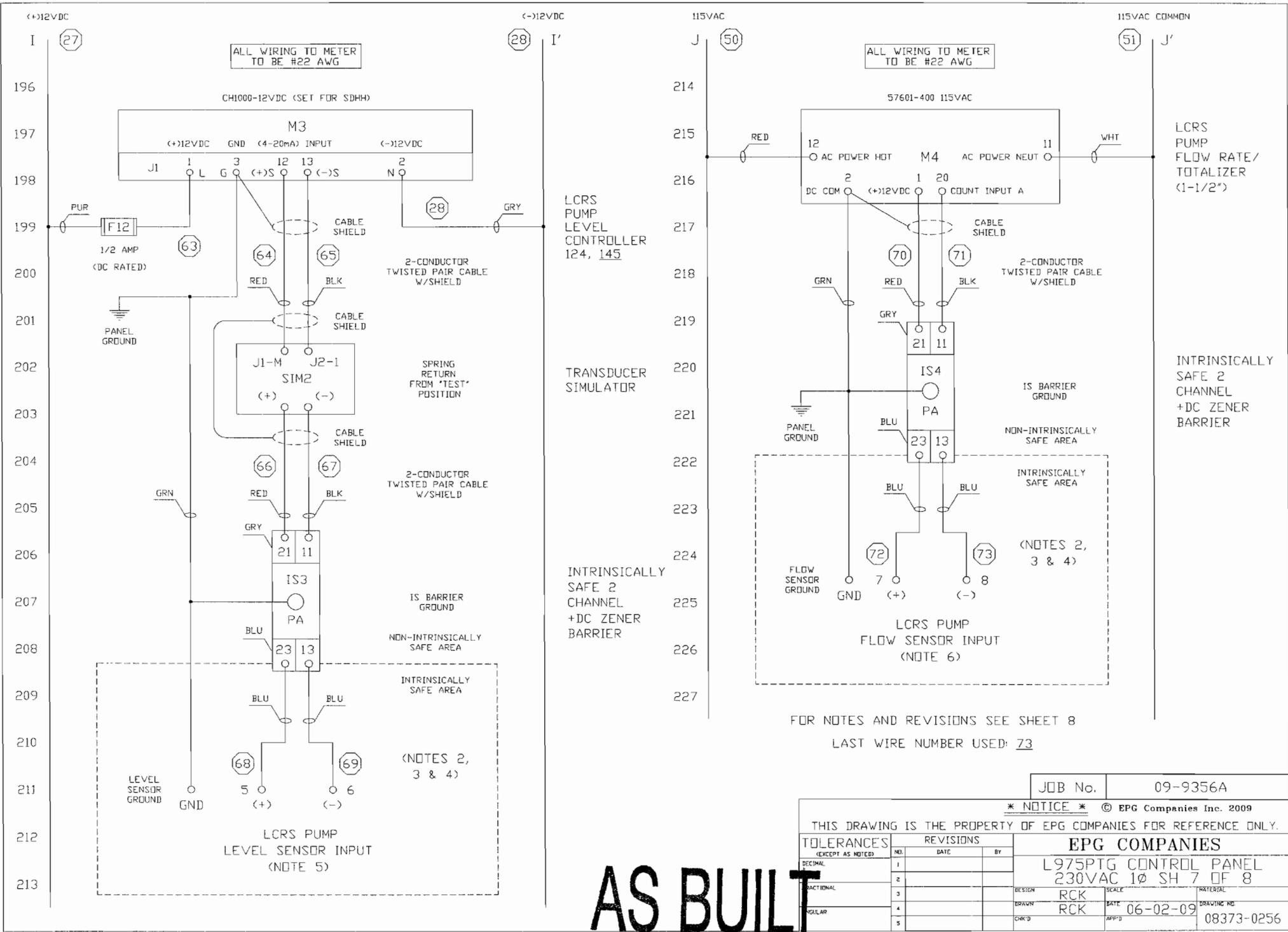
* NOTICE * © EPG Companies Inc. 2009

THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.

TOLERANCES (EXCEPT AS NOTED)		REVISIONS			EPG COMPANIES		
DECIMAL	FRACTIONAL	NO.	DATE	BY	DESIGN	SCALE	MATERIAL
1	2	1			RCK		
2	3	2			RCK		
3	4	3				DATE	
4	5	4				06-02-09	
5		5			CHK'D	APP'D	

L975PTG CONTROL PANEL
230VAC 1Ø SH 4 OF 8

DRAWING NO. 08373-0253



JOB No. 09-9356A

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TOLERANCES (EXCEPT AS NOTED)		REVISIONS		EPG COMPANIES		
DECIMAL	FRACTIONAL	NO.	DATE	BY	DESIGN	SCALE
		1			RCK	
		2			RCK	
		3			RCK	
		4			RCK	
		5			RCK	

L975PTG CONTROL PANEL
230VAC 1Ø SH 7 OF 8

DATE 06-02-09 DRAWING NO. 08373-0256

AS BUILT

FIELD WIRING TERMINALS

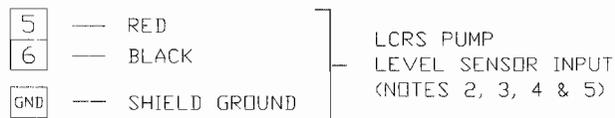
LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



NOTE:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
5. MAXIMUM CABLE LENGTH TO THE LEVEL SENSOR IS 3000 FEET
6. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR IS 500 FEET
7. SELECTOR SWITCHES, (SS1-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION

AS BUILT

JOB No.	09-9356A
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THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.					
TOLERANCES		REVISIONS		EPG COMPANIES	
(EXCEPT AS NOTED)	NO.	DATE	BY	L975PTG CONTROL PANEL	
DECIMAL	1			230VAC 1Ø SH 8 OF 8	
FRACTIONAL	2			DESIGN	SCALE
ANGULAR	3			DRAWN	DATE
	4			CHK'D	APP'D
	5			MATERIAL	DRAWING NO.
					08373-0257

**Phase I
Installation Records**

EPG Companies Inc.

SurePump™ Installation Record

Form Completed by: KEY Installation Date: 8/28/09
 Company: HAMPTON TEDDER ELECTRIC EPG Serial #: 09-9356A

PUMPS, CONTROLS AND POWER SUPPLY

Installer: <u>HTE</u>	Address: <u>4920 ALTO AVE. LAS VEGAS, NV 89115</u>	Installation Location: <u>PHASE 1 LCRS</u>		
Motor Model <u>WSDPT-5-3</u>	HP <u>3/4</u>	Volts: <u>230</u>	Max Amps Rating: <u>6.8</u>	Pump Model: <u>EPG WSDPT SURE PUMP</u>
Power Supply Transformers: Number Used: KVA Each:	Hertz: <u>60</u>	Comments:		
Pump Control Panel: Mfg. & Model #: <u>EPG LG-75PTG</u>	Motor Starter Size: <u>.75</u>	Overload Heater Part or setting range: <u>NA</u>	IEC Starters:	
Lightning Arrestors: Mfg. & Model: <u>INTERNATIONAL AG2402</u>	Surge Capacitors: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Disconnect Fuse or Circuit Breaker Amp Rating: <u>40</u>		
Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) <u>—</u>				

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS:	GPM	VOLTS			AMPS		
Pump Not Running (LINE)	<u>0</u>	R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>216</u>	<u>0</u>		
Open Discharge		R-Y <u> </u>	R-B <u> </u>	B-Y <u> </u>	R <u> </u>	Y <u> </u>	B <u> </u>
Normal Operation		R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>215</u>	R <u>0</u>	Y <u>6.6</u>	B <u>6.8</u>
Run Time							
Off Time							

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: 1.5"	Discharge Pressure:	Pump Submergence:	Fluid Temp: ____ °F ____ °C
External Check Valve Used? NO	Location:	Cable Length & Size: 14GA 75' 110'	Ground Resistance 3 Ω
Insulation Megohm Readings:	Before Installation: 36	After Installation: 6.696	After 30 min. Run: NA

SENSORS

Type of Level Sensor:	Transmitter Serial Number:
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	
Length of Sensor Lead: 110' 75' 110'	Ohm Readings Across I.S. Barrier: 230
mA Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: 12 VDC Voltage Leaving Level Meter: 12 VDC
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311 Phone: 800-762-8418 FAX: 763-493-4812

EPG SurePump™ Installation Record

EPG Job No. 09-9356

Installer's Name HAMPTON TEDDER ELECTRIC CO.

Address 4920 AUTO AVE.

City LAS VEGAS State NV.

Zip 89115

Phone (702) 646-7449

Fax (702) 453-5412

Contact name ROGER CATES

Owner's Name BASIC REMEDIATION CO.

Address 875 W. WARM SPRINGS RD.

City HERNANDON State NV.

Zip 89011

Phone (702) 567-0400

Fax (702) 567-5524

Contact name LEE C. FAARIS, PE

Sump Name ID PHASE 2 LCRS

Date Installed 8/28/09

Leachate or Condensate Temp _____ °F Or °C

Pump:

Model No. WSDPT 5-3

Rating: 30 GPM @ 60 Ft. TDH

HP .75 Voltage 230 Phase 1

Actual Pump Delivery _____ GPM @ _____ PSI

Operating Cycle _____ ON (Min Hr) _____ OFF (Min Hr)

(Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

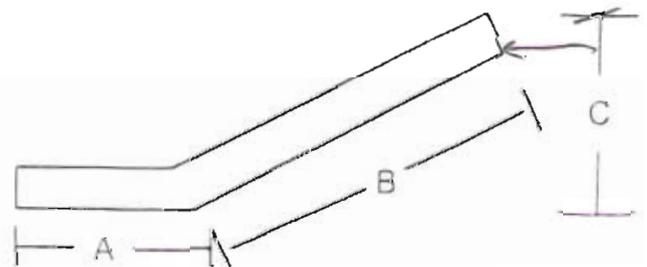
Slope 2.1 ft

Length of riser Pipe (A-B) 88.6 ft

Vertical Distance - Sump to ~~DM~~ Top of Riser Pipe (C) 34.2 ft

Riser ID PHASE 2 LCRS SDR 11

Distance From Top of Riser Pipe to Controller 15 ft



Power Supply:

Cable Service Entrance to Control Distance _____ ft Wire size _____ AWG/MCM

Copper _____ jacketed _____ aluminum _____ individual conductor

Cable Control to Motor _____ ft _____ AWG/MCM

Copper _____ jacketed _____



Transformer:

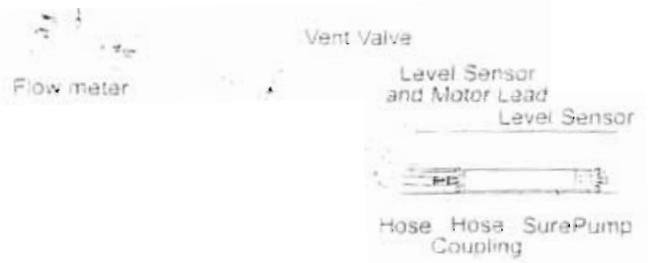
KVA #1 _____ #2 _____ #3 _____

Initial Megs - Before Installation

Motor & lead T1 2000 T2 2000 T3 _____

Final Megs - After Installation
After Running for 15 min

Motor, leads & cable T1 2000 T2 2000 T3 _____



Incoming Voltage:

No Load L1-L2 238 L2-L3 _____ L1-L3 _____
Full Load L1-L2 238 L2-L3 _____ L1-L3 _____

Running Amps:

Hookup:1 Full Load L1 8.0 L2 8.0 L3 _____ % unbalanced 0
Hookup:2 Full Load L1 _____ L2 _____ L3 _____ % unbalanced _____
Hookup:3 Full Load L1 _____ L2 _____ L3 _____ % unbalanced _____

Ground wire size _____ AWG MCM

DC Ground Current _____ mA Ground Test 3 Ohms

Motor Surge Protection Yes _____ No

Control Panel:

Model # L97PTG

Short Circuit Device

Circuit Breaker _____ Rating _____ Setting _____
Fuses FENR 10 Type 10 Rating _____
Standard Time Delay _____

Controls are Grounded to:

Motor
 Rod
 Power Supply

Start Overloads:

Set at NA amps
Date SEPT 17 09

Name HOWARD LESTER
Company EPG COMPANIES

INSTALLATION GUIDE

EPG SurePump™ Pumping System

- ✓ 1. Verify that equipment and supply voltage match
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling
- ✓ 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 10 and Table 21 for 30. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips motor leads, and sensor leads are all labeled and or color coded to simplify connections
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser you need to outfit each element
- ✓ 18. Measure resistance to ground. It must be less than 25 ohms. If greater, stop work and report to owner. It should be 1 ohm or less to protect electronic equipment

- ✓ 19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ 20. Compare these reading to voltage listed on drawing and label in control panel.
- ✓ 21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
- ✓ 22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
- ✓ 23. Turn on power at panel main disconnect.
- ✓ 24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ 25. If level and flow meter do not light up check GFCL, reset if necessary.
- ✓ 26. Are any indicator lights on?
- ✓ 27. Should they be on?
- ✓ 28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
- ✓ 29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3" of slack in the cables.
- ✓ 30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ✓ 31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- ✓ 32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
- ✓ 33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
- ☐ 34. After pump and level sensor have been tested pot seal offs.
- ✓ 35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePump™ Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- A: Were sensor and power cable tied or strapped to discharge line?
- B: On what kind of spacing? *5 FT*
- C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- D: What size cable was run for supply power? *14 GA*
- E: What is the distance from power supply transformer to pump control panel?
- F: How did they verify that pump is down into sump? *LEVEL*
- G: Did they test level sensor prior to installing?
- H: Did they test pump prior to installing or prior to your arrival?
- I: Do they have any questions or concerns?
- J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL

- A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel.
- B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- D: Are seal offs potted? If not, stop work and have them potted.
- E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- F: Make sure ground wire is in place between outer door and enclosure.

PRIOR TO ENERGIZING CONTROL PANEL

- ✓ A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- ✓ B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ C: Compare these reading to voltage listed on drawing and label in control panel.
- ✓ D: Megger motor leads resistance must be 1 megohm or greater.
- ✓ E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 10 and Table 21 for 30. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- ✓ F: Inspect inside of control panel. Look for items which may have come loose during shipping
- ✓ G: Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- ✓ J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- ✓ A: Turn on power at panel main disconnect.
- ✓ B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ C: If level and flow meter do not light up check GFCI, reset if necessary.
- ✓ D: Are any indicator lights on?
- ✓ E: Should they be on?
- ✓ F: Make sure pump is turned off. Using built in or hand held simulator verify level meter settings are correct for this site.
- ✓ G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.

- ✓ H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ✓ I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- ✓ J: When pump is running measure and record amperage and voltage. Check 30 systems for current balance within 5% of average.
- ✓ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

EPG Companies Inc.

SurePump™ Installation Record

Form Completed by: KEY Installation Date: 8/28/09
 Company: HAMPTON TROODER ELECTRIC EPG Serial #: 09-9356A

PUMPS, CONTROLS AND POWER SUPPLY

Installer: <u>HTE</u>	Address: <u>4920 ALTO AVE. LAS VEGAS, NV 89115</u>	Installation Location: <u>PHASE 1 UADOSE</u>
Motor Model <u>WSAPT-2-3</u>	HP <u>1/2</u>	Volts: <u>230</u>
	Max Amps Rating: <u>5.0</u>	Pump Model: <u>EPG WSAPT ^{SURGE} PUMP</u>
Power Supply Transformers: Number Used: KVA Each:	Hertz: <u>60</u>	Comments:
Pump Control Panel: Mfg. & Model #: <u>EPG L975PTCT</u>	Motor Starter Size: <u>5HA</u>	Overload Heater Part or setting range: <u>NA</u>
IEC Starters:		
Lightning Arrestors: Mfg. & Model: <u>Intermatic AG2401</u>	Surge Capacitors: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Disconnect Fuse or Circuit Breaker Amp Rating: <u>40A</u>
Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) <u>-</u>		

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS:	GPM	VOLTS			AMPS		
Pump Not Running (<u>line</u>)	<u>0</u>	R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>216</u>	<u>0</u>		
Open Discharge		R-Y <u> </u>	R-B <u> </u>	B-Y <u> </u>	R <u> </u>	Y <u> </u>	B <u> </u>
Normal Operation		R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>215</u>	R <u>0</u>	Y <u>4.4</u>	B <u>4.7</u>
Run Time	<u>15 sec</u>						
Off Time							

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: <i>1"</i>	Discharge Pressure:	Pump Submergence:	Fluid Temp: ____ °F ____ °C
External Check Valve Used? <i>No</i>	Location:	Cable Length & Size: <i>14 GA 113 FT</i>	Ground Resistance <i>3 Ω</i>
Insulation Megohm Readings:	Before Installation: <i>3.3 G</i>	After Installation: <i>7.17 G</i>	After 30 min Run: <i>NA</i>

SENSORS

Type of Level Sensor:	Transmitter Serial Number:
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	
Length of Sensor Lead: <i>113 FT</i>	Ohm Readings Across I.S. Barrier: <i>230</i>
mA Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: <i>12</i> VDC Voltage Leaving Level Meter: <i>11</i> VDC
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311 Phone: 800-762-8418 FAX: 763-493-4812

EPG SurePump™ Installation Record

EPG Job No. 09-9356

Installer's Name HAMPTON TEDDEN ELECTRIC CO.

Address 4920 ALTO AVE.

City LAS VEGAS State NV.

Zip 89115

Phone (702) 646-7449

Fax (702) 453-5412

Contact name ROGER CATES

Owner's Name BASIC REMEDIATION CO.

Address 875 W. WARM SPRINGS, RD

City HENDERSON State NV.

Zip 89011

Phone (702) 567-0400

Fax (702) 567-5524

Contact name LEE C. FARRIS, PE

Sump Name ID PHASE 1 VAPOSE

Date Installed 8/28/09

Leachate or Condensate Temp _____ °F Or °C

Pump:

Model No. WSDPT 2-3

Rating: 10 GPM @ 50 Ft. TDH

HP .5 Voltage 230 Phase 1

Actual Pump Delivery _____ GPM @ _____ PSI

Operating Cycle _____ ON (Min/Hr) _____ OFF (Min/Hr)

(Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

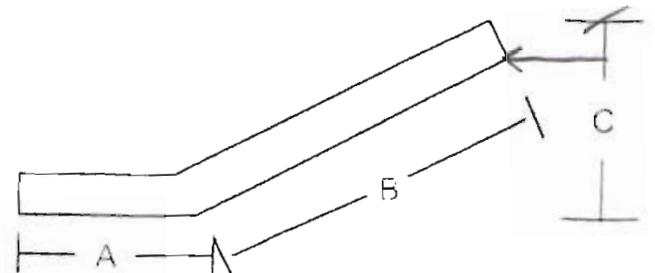
Slope 2.1 ft

Length of riser Pipe (A-B) 86.4 ft

Vertical Distance - Sump to INV. Top of Riser Pipe (C) 35.1 ft

Riser ID PHASE 1 VAPOSE SDR 11

Distance From Top of Riser Pipe to Controller 15 ft



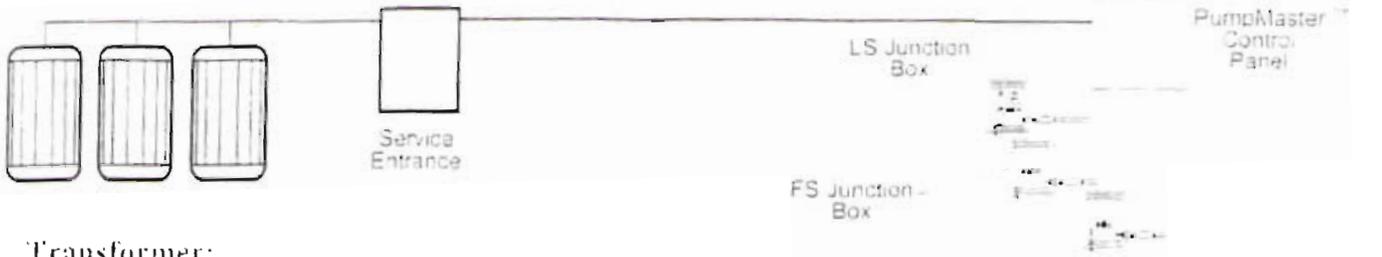
Power Supply:

Cable Service Entrance to Control Distance _____ ft Wire Size _____ AWG/MCM

Copper jacketed aluminum individual conductors

Cable Control to Motor _____ ft _____ AWG/MCM

Copper jacketed



Transformer:

KVA _____ #1 _____ #2 _____ #3 _____

Initial Megs - Before Installation

Motor & lead T1 2000 T2 2000 T3 _____

Final Megs - After Installation
After Running for 15 min

Motor, leads & cable T1 2000 T2 2000 T3 _____

Incoming Voltage:

No Load L1-L2 238 L2-L3 _____ L1-L3 _____

Full Load L1-L2 238 L2-L3 _____ L1-L3 _____

Running Amps:

Hookup:1 Full Load L1 4.9 L2 _____ L3 _____ % unbalanced 0

Hookup:2 Full Load L1 _____ L2 _____ L3 _____ % unbalanced _____

Hookup:3 Full Load L1 _____ L2 _____ L3 _____ % unbalanced _____

Ground wire size _____ AWG/RCM

DC Ground Current _____ mA Ground Test 3 Ohms

Motor Surge Protection Yes _____ No

Control Panel:

Model # L975PTG

Short Circuit Device

Circuit Breaker _____ Rating _____ Setting _____

Fuses F2NR Type 8 Rating _____

Standard Time Delay _____

Controls are Grounded to:

Motor

Rod

Power Supply

Start Overloads:

Set at N/A amps

Date SEPT 17 09

Name HOWARD LESTER

Company EPG COMPANIES

INSTALLATION GUIDE

EPG SurePump™ Pumping System

- ✓ 1. Verify that equipment and supply voltage match.
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling.
- ✓ 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping.
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c.
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump.
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater.
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color coded to simplify connections.
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ 18. Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

- ✓ 19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ 20. Compare these reading to voltage listed on drawing and label in control panel.
- ✓ 21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
- ✓ 22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
- ✓ 23. Turn on power at panel main disconnect
- ✓ 24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ 25. If level and flow meter do not light up check GFCI, reset if necessary.
- ✓ 26. Are any indicator lights on?
- ✓ 27. Should they be on?
- ✓ 28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
- ✓ 29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.
- ✓ 30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ✓ 31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- ✓ 32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
- ✓ 33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
- ✓ 34. After pump and level sensor have been tested pot seal offs.
- ✓ 35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePumpTM Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- ✓ A: Were sensor and power cable tied or strapped to discharge line?
- ✓ B: On what kind of spacing? **4 FT**
- ✓ C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- ✓ D: What size cable was run for supply power?
- ✓ E: What is the distance from power supply transformer to pump control panel?
- ✓ F: How did they verify that pump is down into sump? **LEVEL**
- ✓ G: Did they test level sensor prior to installing?
- ✓ H: Did they test pump prior to installing or prior to your arrival? **YES**
- ✓ I: Do they have any questions or concerns?
- ✓ J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL

- ✓ A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel.
- ✓ B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected
- ✓ C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- ✓ D: Are seal offs potted? If not, stop work and have them potted. **NOT AT INSPECTION**
- ✓ E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- ✓ F: Make sure ground wire is in place between outer door and enclosure

PRIOR TO ENERGIZING CONTROL PANEL

- ✓ A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- ✓ B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ C: Compare these reading to voltage listed on drawing and label in control panel.
- ✓ D: Megger motor leads resistance must be 1 megohm or greater.
- ✓ E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 10 and Table 21 for 30. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- ✓ F: Inspect inside of control panel. Look for items which may have come loose during shipping
- ✓ G: Inspect wire connections. Are they the correct colors? Are they tight?
- ☐ H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ☐ I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- ☐ J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- ✓ A: Turn on power at panel main disconnect.
- ✓ B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ C: If level and flow meter do not light up check GFCI, reset if necessary
- ✓ D: Are any indicator lights on?
- ✓ E: Should they be on?
- ✓ F: Make sure pump is turned off. Using built in or hand held simulator verify level meter settings are correct for this site
- ✓ G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables

- ✓ H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ✓ I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- ✓ J: When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- ✓ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

Phase I
As-Built Control Panel Setup Parameters

EPG LevelMaster Pump controller

Panel S/N: 09-9356A
Meter S/N: 060409-03

LCRS Pump Level Control Meter

PHASE I

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M3

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 20"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". 36.1"
Hy Hi	1	Keeps High Level Light on until level drops <u>1</u> " below AL Hi.
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

EPG LevelMaster Pump controller

Panel S/N: 09-9356A
Meter S/N: 060409-04

Vadose Pump Level Control Meter PHASE I

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M1

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 17"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". 4"
Hy Hi	1	Keeps High Level Light on until level drops <u>1</u> " below AL Hi.
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

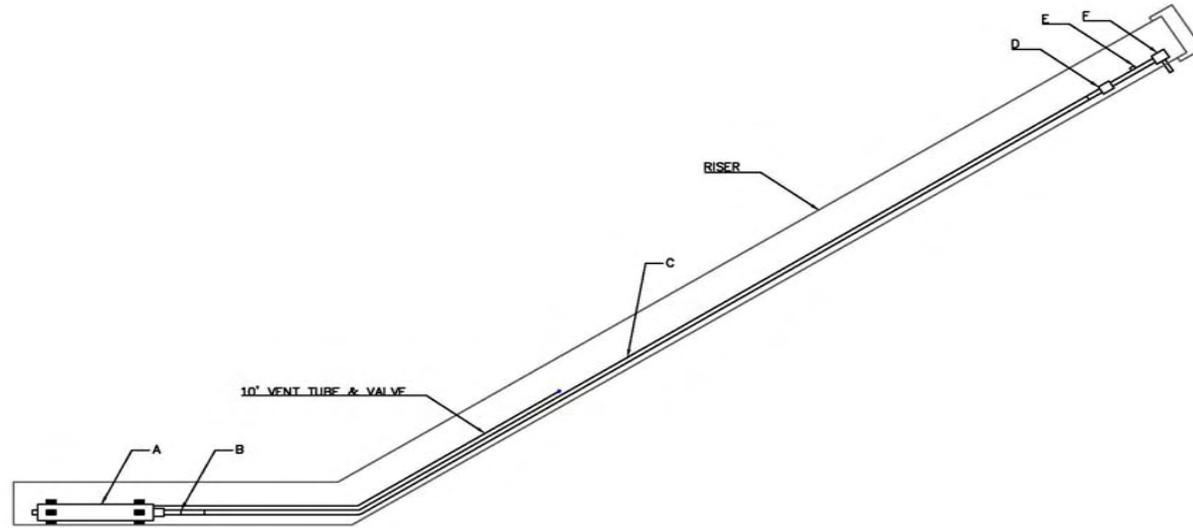
Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-32.6 -34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

Phase I
As-Built Pump Installation Cross Sections

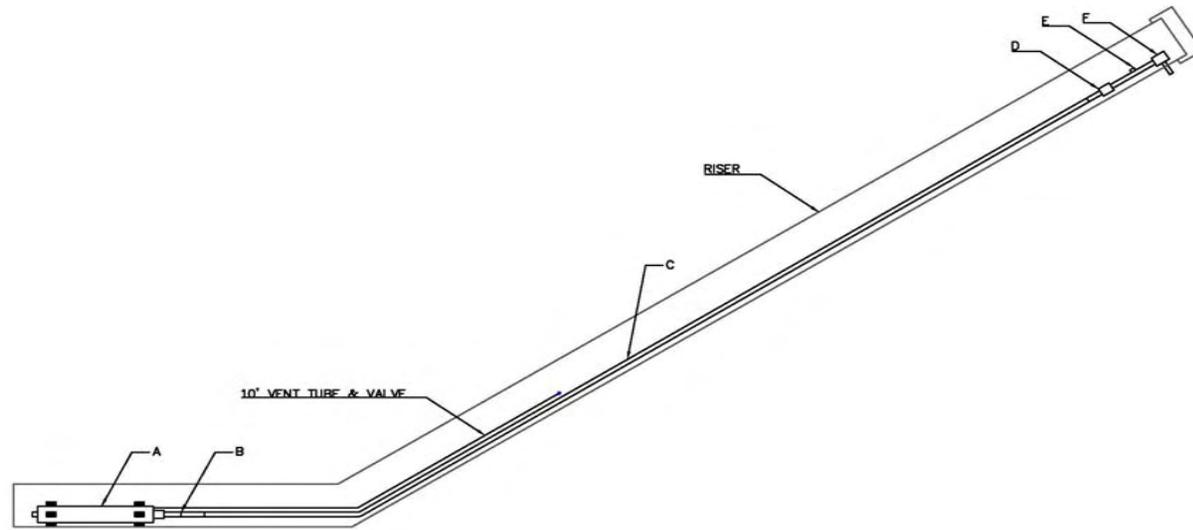
PHASE I LCRS SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT5-3 PUMP (S/N 2009-3131)	2.6
B	CONNECTIONS/FITTINGS/TRANSITIONS	1.1
C	1.5" DISCHARGE LINE	80.3
D	CONNECTIONS/FITTINGS/TRANSITIONS	1.1
E	FLOW METER	2.4
F	EPG FITTING "T"	0.4

NOT TO SCALE

PHASE I VADOSE SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT2-3 PUMP (S/N 2009-3109)	2.5
B	CONNECTIONS/FITTINGS/TRANSITIONS	1.1
C	1.0" DISCHARGE LINE	77.7
D	CONNECTIONS/FITTINGS/TRANSITIONS	0.7
E	FLOW METER	1.7
F	EPG FITTING "T"	0.3

NOT TO SCALE

Phase I
As-Built Photos

Phase I Controls & Risers

Phase I Controls & Risers



Phase I Controls

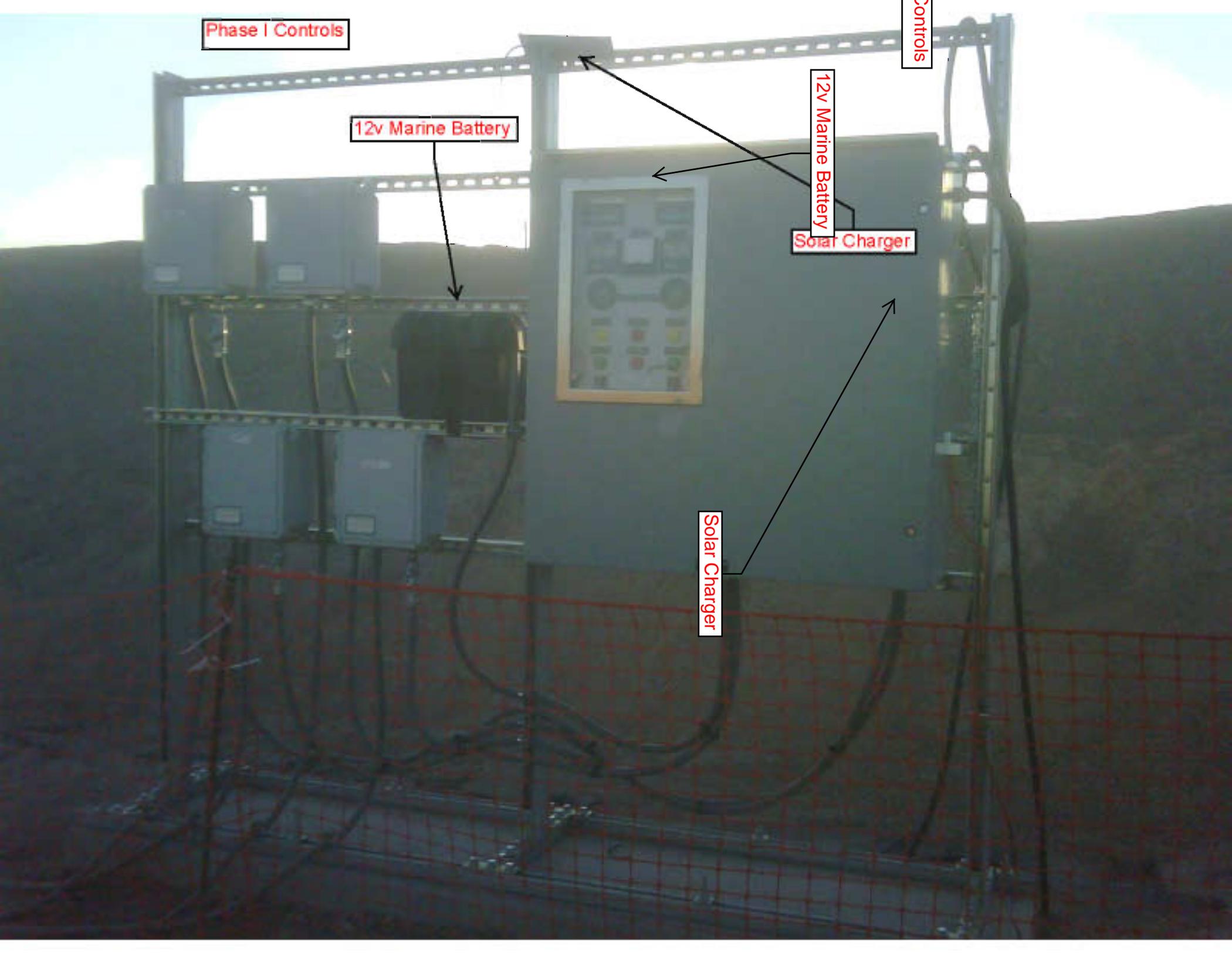
Controls

12v Marine Battery

12v Marine Battery

Solar Charger

Solar Charger



Phase II
Engineer's Specification

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

PHASE II LCRS

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 5 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 3/4 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 120 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/2 inch MNPT threaded discharge nozzle and be capable of delivering 25 GPM at 50 feet of TDH. Each SurePump will be fitted with 120 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

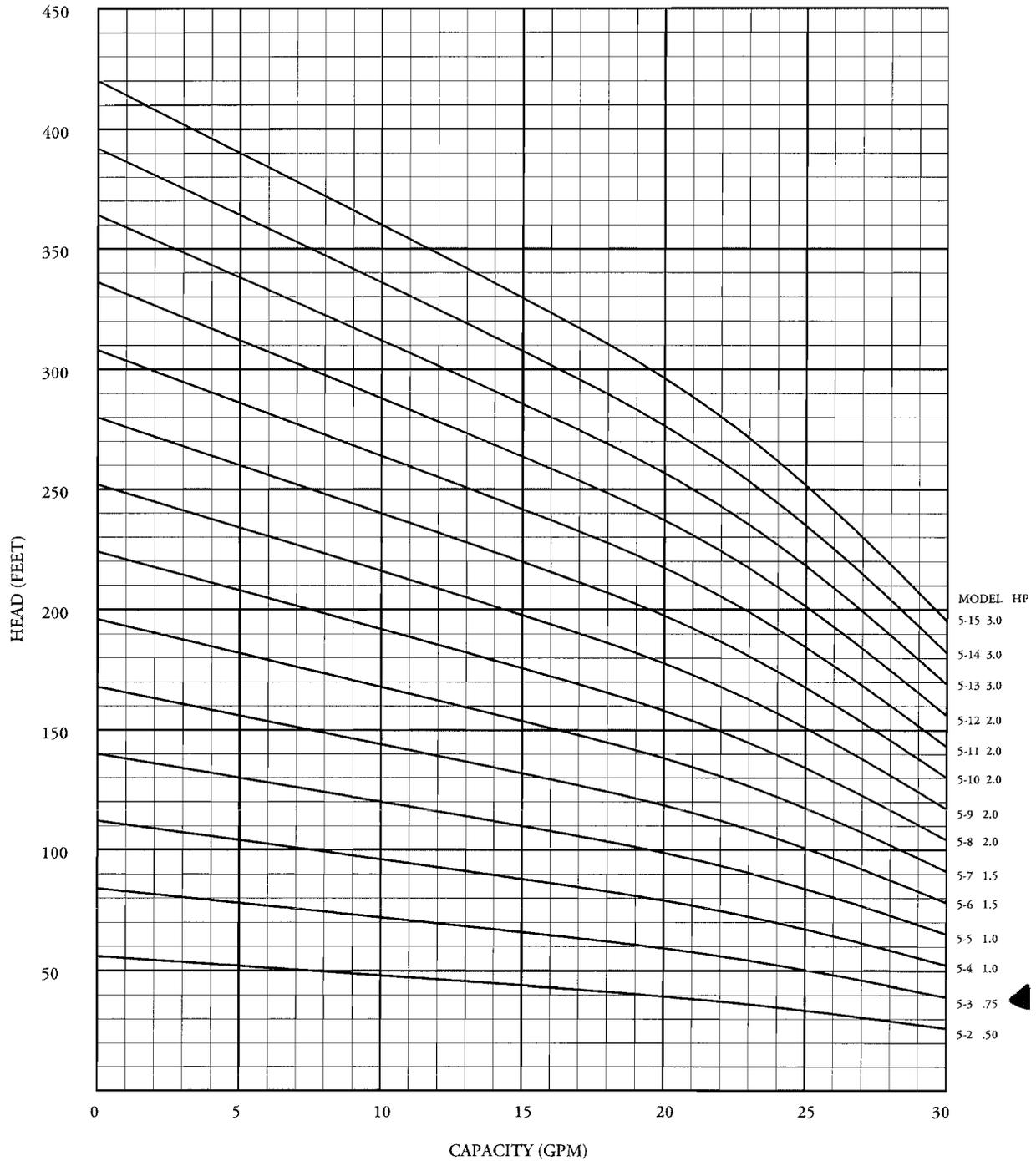
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

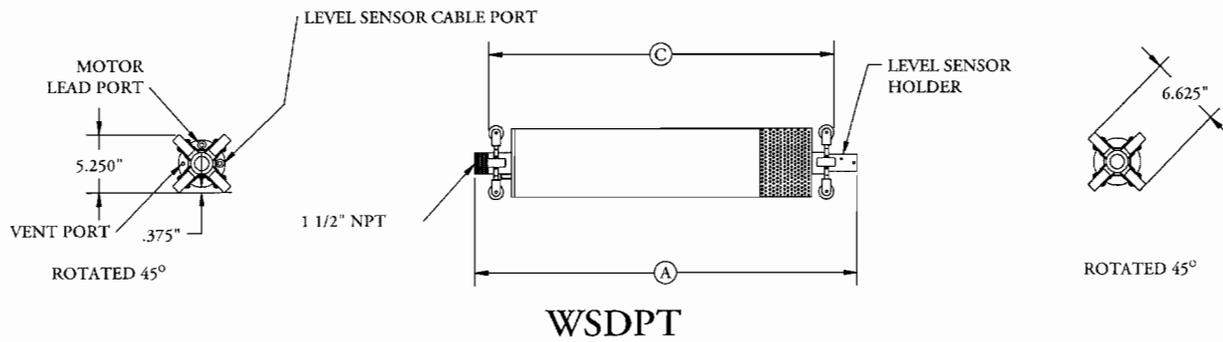
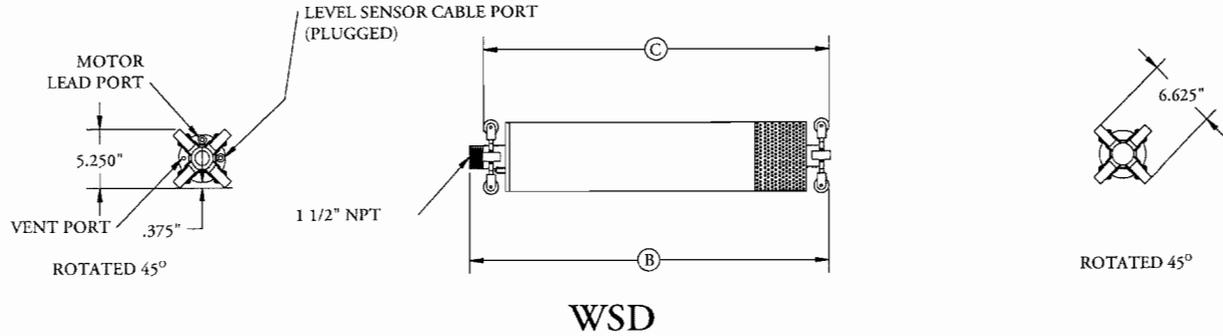
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 5 SurePump™
 Flow Range 15-30 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 5 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-2	0.50	1	31.02	29.90	29.15	61.47	66.47
5-2	0.50	3	31.02	29.90	29.15	61.47	66.47
5-3	0.75	1	32.98	31.86	31.11	66.24	71.24
5-3	0.75	3	32.98	31.86	31.11	66.24	71.24
5-4	1.00	1	34.90	33.78	33.03	70.98	75.98
5-4	1.00	3	34.90	33.78	33.03	70.98	75.98
5-5	1.00	1	35.73	34.61	33.86	71.88	76.88
5-5	1.00	3	35.73	34.61	33.86	71.88	76.88
5-6	1.50	1	38.43	37.31	36.56	79.22	84.22
5-6	1.50	3	36.56	35.44	34.69	72.77	77.77
5-7	1.50	1	39.26	38.14	37.39	80.12	85.12
5-7	1.50	3	37.39	36.27	35.52	73.67	78.67
5-8	2.00	1	41.59	40.47	39.72	85.17	90.17
5-8	2.00	3	40.09	38.97	38.22	81.01	86.01

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-9	2.00	1	42.42	41.30	40.55	86.07	91.07
5-9	2.00	3	40.92	39.80	39.05	81.90	86.90
5-10	2.00	1	43.25	42.13	41.38	86.96	91.96
5-10	2.00	3	41.75	40.63	39.88	82.80	87.80
5-11	2.00	1	44.08	42.96	42.21	87.86	92.86
5-11	2.00	3	42.58	41.46	40.71	83.69	88.69
5-12	2.00	1	44.91	43.79	43.04	88.75	93.75
5-12	2.00	3	53.41	52.29	51.54	92.35	97.35
5-13	3.00	1	54.24	53.12	52.37	119.24	124.24
5-13	3.00	3	51.24	50.12	49.37	105.91	110.91
5-14	3.00	1	55.07	53.95	53.20	120.14	125.14
5-14	3.00	3	52.07	50.95	50.20	106.81	111.81
5-15	3.00	1	55.90	54.78	54.03	121.03	126.03
5-15	3.00	3	52.90	51.78	51.03	107.70	112.70

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
 WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
 WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
 LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

PHASE II VADOSE

Furnish 1 centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 2 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 1/2 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 120 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/4 inch MNPT threaded discharge nozzle and be capable of delivering 10 GPM at 50 feet of TDH. Each SurePump will be fitted with 120 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

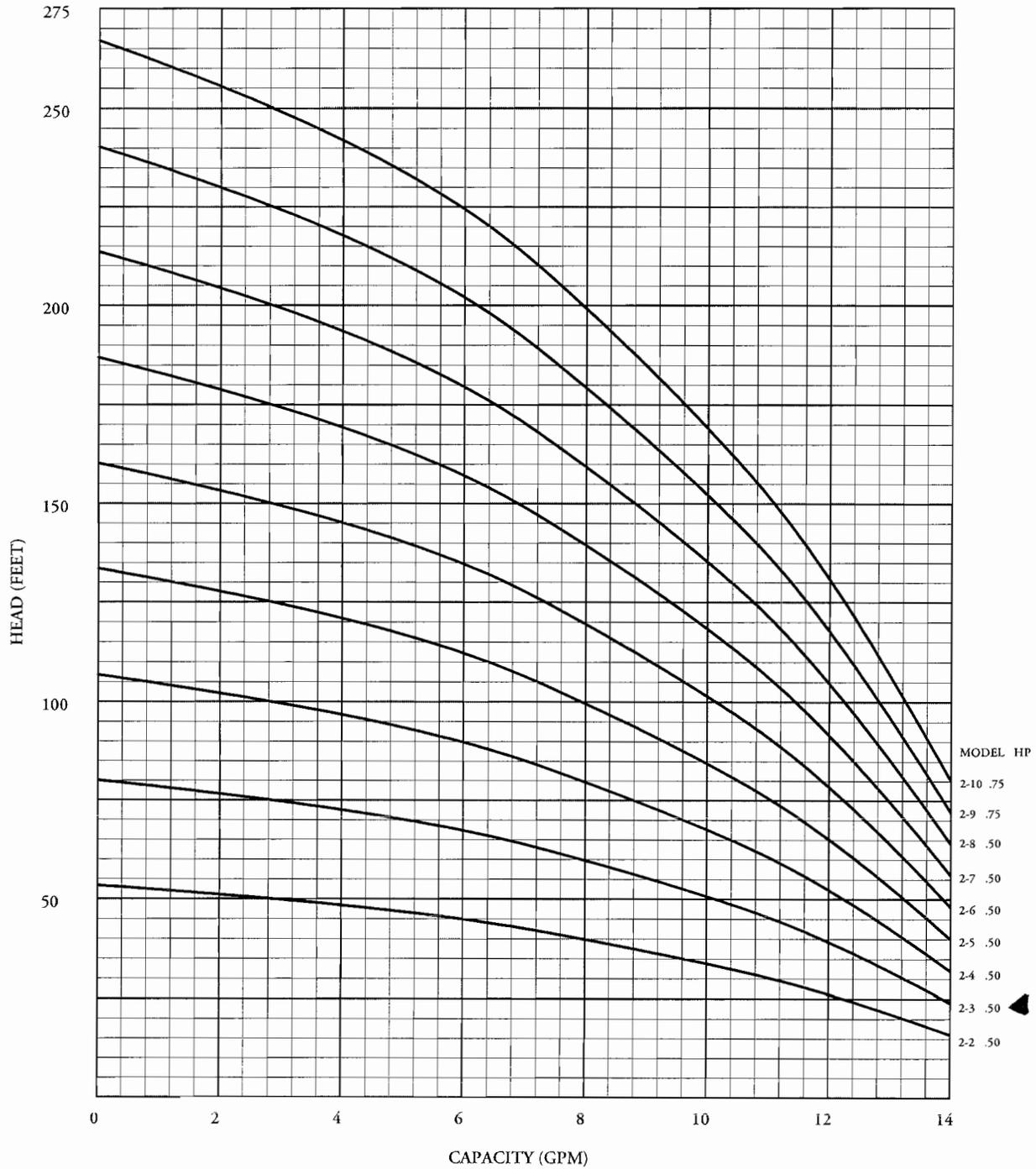
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

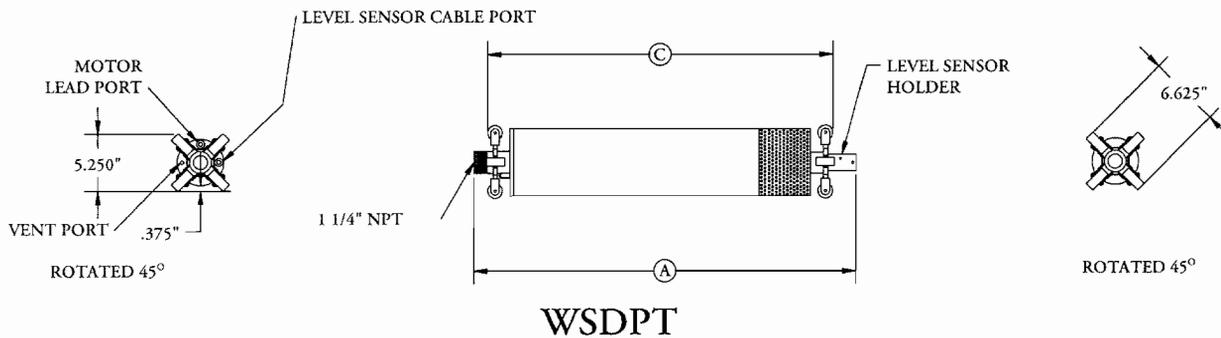
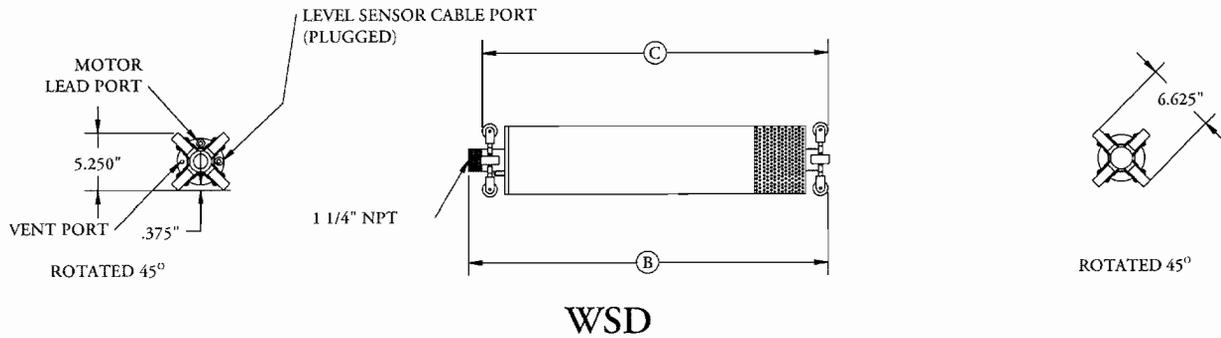
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 2 SurePump™
 Flow Range 4-14 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 2 SIZE 4 WHEELED SUMP DRAINER



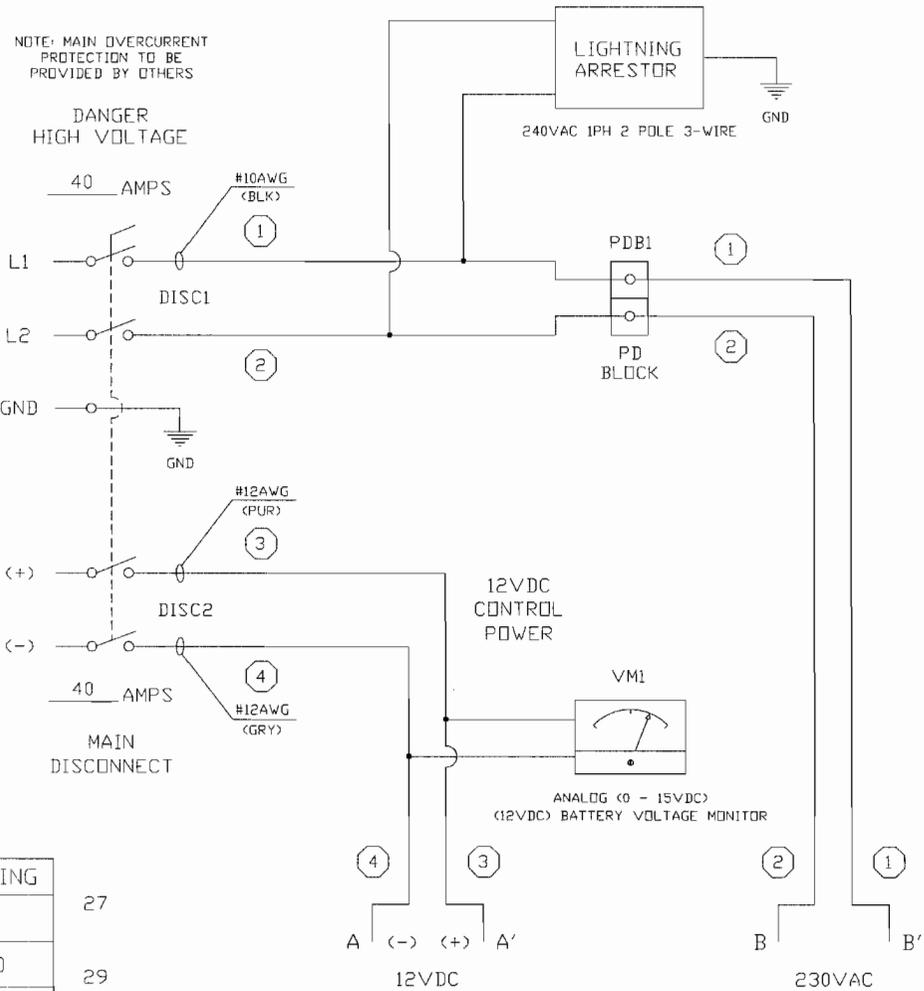
MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
2-2	0.50	1	31.02	29.90	29.15	61.47	66.47
2-2	0.50	3	31.02	29.90	29.15	61.47	66.47
2-3	0.50	1	31.85	30.73	29.98	62.37	67.37
2-3	0.50	3	31.85	30.73	29.98	62.37	67.37
2-4	0.50	1	32.68	31.56	30.81	63.26	68.26
2-4	0.50	3	32.68	31.56	30.81	63.26	68.26
2-5	0.50	1	33.51	32.39	31.64	64.15	69.15
2-5	0.50	3	33.51	32.39	31.64	64.15	69.15
2-6	0.50	1	34.34	33.22	32.47	65.05	70.05
2-6	0.50	3	34.34	33.22	32.47	65.05	70.05
2-7	0.50	1	35.17	34.05	33.30	65.94	70.94
2-7	0.50	3	35.17	34.05	33.30	65.94	70.94
2-8	0.50	1	36.00	34.88	34.13	66.84	71.84
2-8	0.50	3	36.00	34.88	34.13	66.84	71.84
2-9	0.75	1	37.96	36.84	36.09	71.61	76.61
2-9	0.75	3	37.96	36.84	36.09	71.61	76.61
2-10	0.75	1	38.79	37.67	36.92	72.50	77.50
2-10	0.75	3	38.79	37.67	36.92	72.50	77.50

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
LEVEL SENSOR AND CABLE.

Phase II
As-Built Control Panel Schematics

MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
VADDOSE PUMP	1/2	230	5.0	8A
LCRS PUMP	3/4	230	6.8	10A



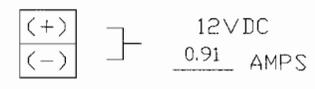
PHASE 2
CONTROL PANEL AND PUMPS

FIELD WIRING TERMINALS

LINE (GENERATOR)



LINE (BATTERY)



FUSE	TYPE	RATING
F1-F2	FRN-R	8
F3-F4	FRN-R	10
F5-F6	FRN-R	2-1/2
F7	FNM	1-1/4
F8	FNM	3-1/2
F9	ABC	1-1/2
F10	MDL	1/2
F11	ABC	1/2
F12	ABC	1/2

FOR NOTES AND REVISIONS SEE SHEET 8

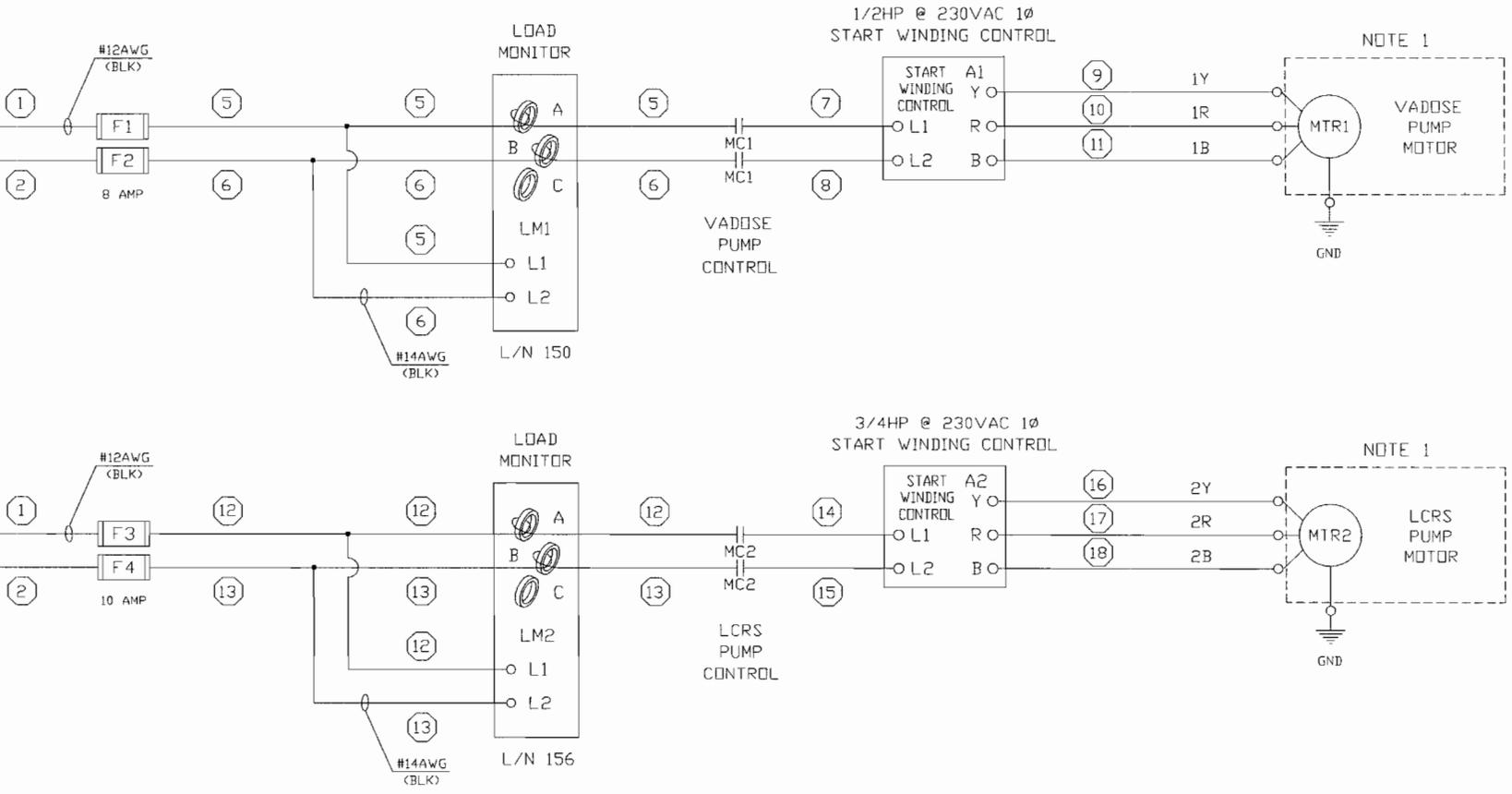
AS BUILT

JOB No.		09-9356B	
* NOTICE * © EPG Companies Inc. 2009			
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.			
TOLERANCES (EXCEPT AS NOTED)		REVISIONS	
DECIMAL ±	1	DATE	BY
FRACTIONAL ±	2		
ANGULAR ±	3		
	4		
	5		
EPG COMPANIES		L975PTG CONTROL PANEL	
230VAC 1Ø SH 1 OF 8		DESIGN RCK	SCALE RCK
		DRAWN RCK	DATE 06-02-09
		CHK'D	APP'D
		DRAWING NO. 08373-0250	

B (2) (1) B'

FOR NOTES AND REVISIONS SEE SHEET 8

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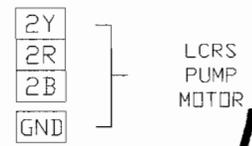
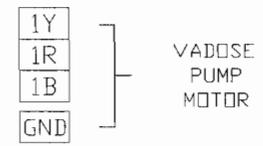


FIELD WIRING TERMINALS

FIELD WIRING TERMINALS

LOAD (230VAC)

LOAD (230VAC)



C 230VAC C'

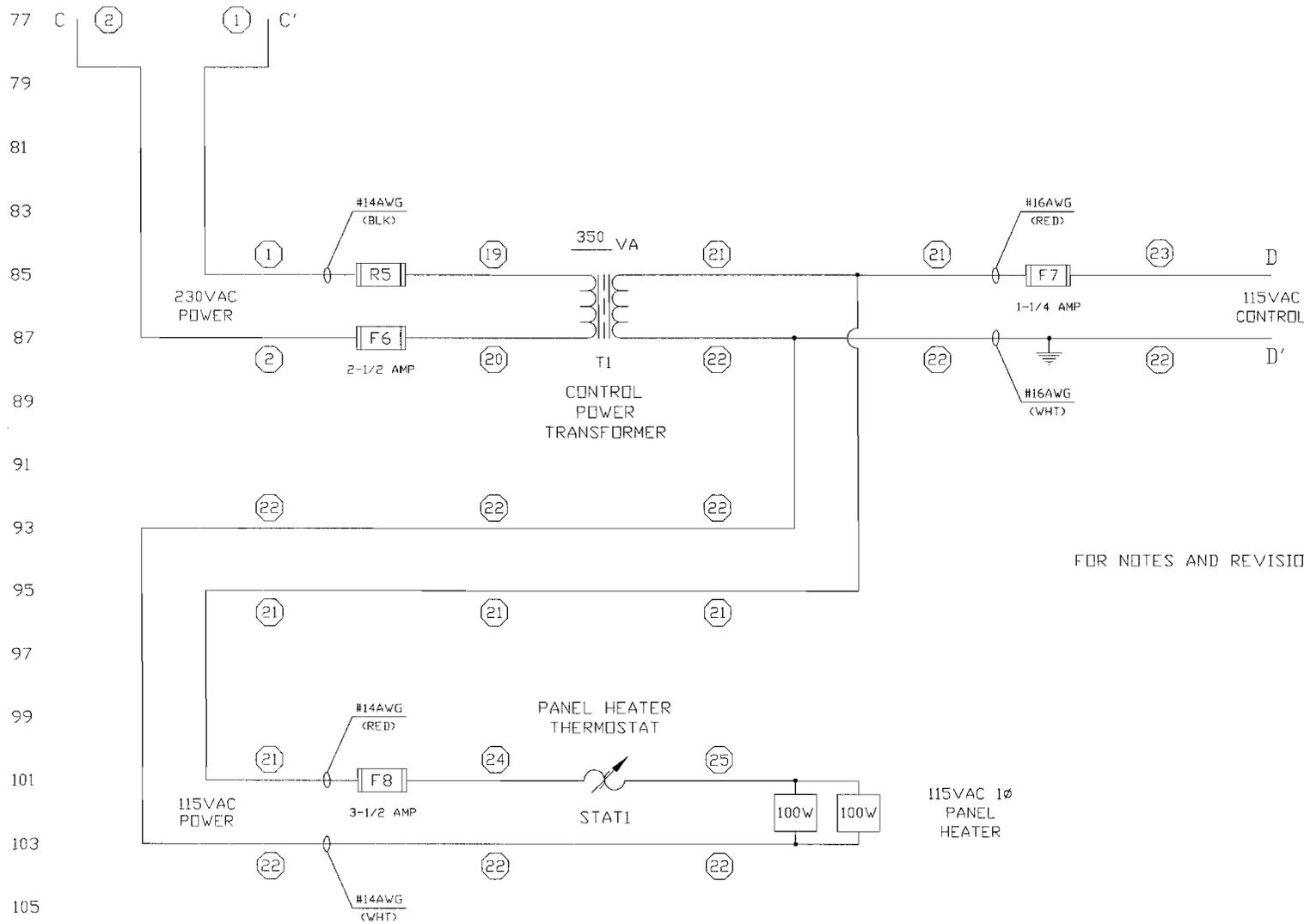
JOB No. 09-9356B

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TOLERANCES		REVISIONS			EPG COMPANIES		
(EXCEPT AS NOTED)		NO.	DATE	BY			
DECIMAL		1			L975PTG CONTROL PANEL 230VAC 1Ø SH 2 OF 8 DESIGN RCK SCALE MATERIAL DRAWN RCK DATE 06-02-09 DRAWING NO. CHK'D APP'D 08373-0251		
FRACTIONAL		2					
		3					
ANGULAR		4					
		5					

AS BUILT



FOR NOTES AND REVISIONS SEE SHEET 8

JOB No. 09-9356B

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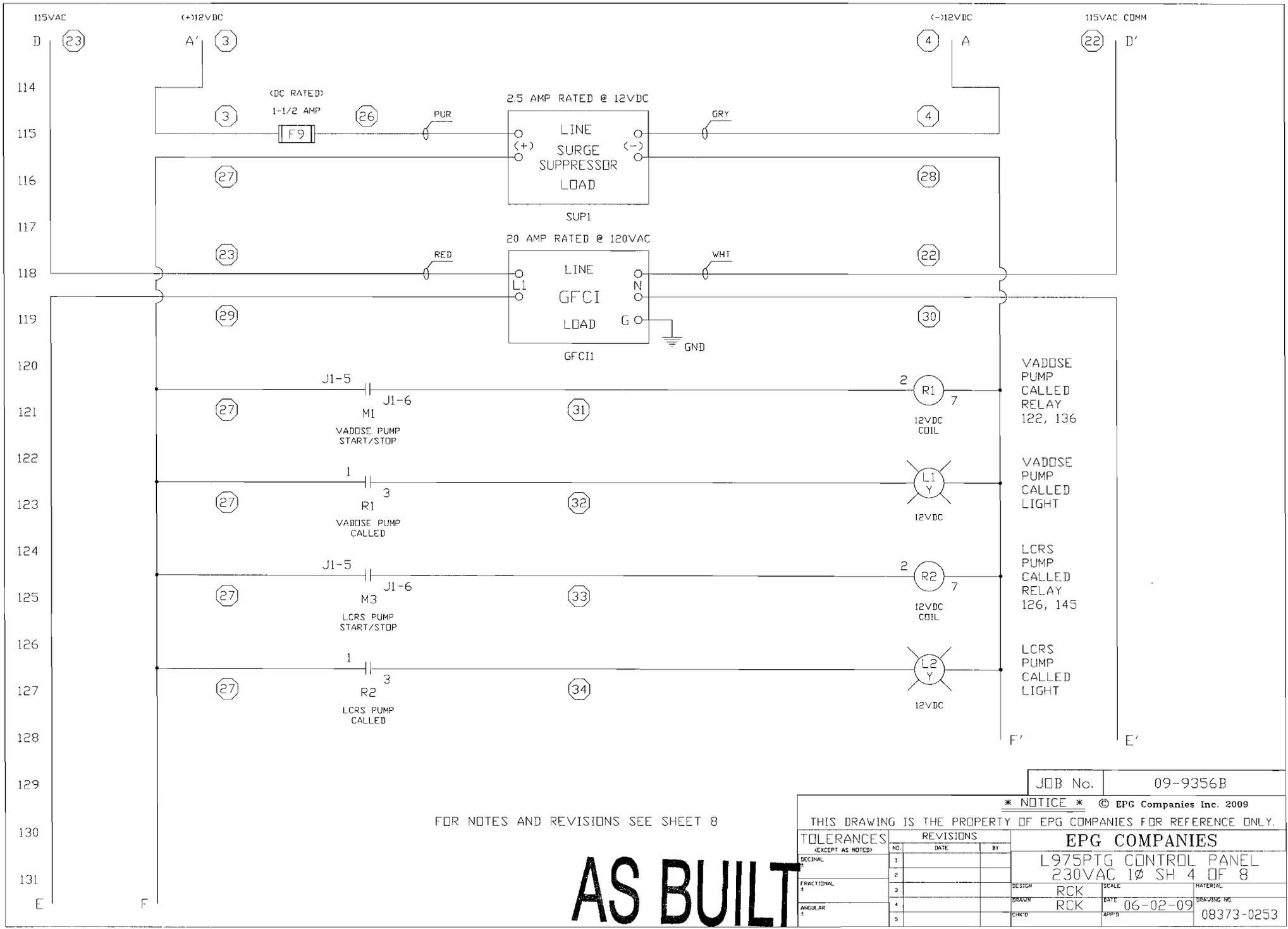
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.

TOLERANCES (EXCEPT AS NOTED)		REVISIONS		EPG COMPANIES		
	NO.	DATE	BY	DESIGN	SCALE	MATERIAL
DECIMAL	1					
FRACTIONAL	2					
ANGULAR	3			RCK		
	4			RCK	DATE 06-02-09	DRAWING NO.
	5					08373-0252

L975PTG CONTROL PANEL
230VAC 1Ø SH 3 OF 8

AS BUILT

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FOR NOTES AND REVISIONS SEE SHEET 8

AS BUILT

JOB No. 09-9356B

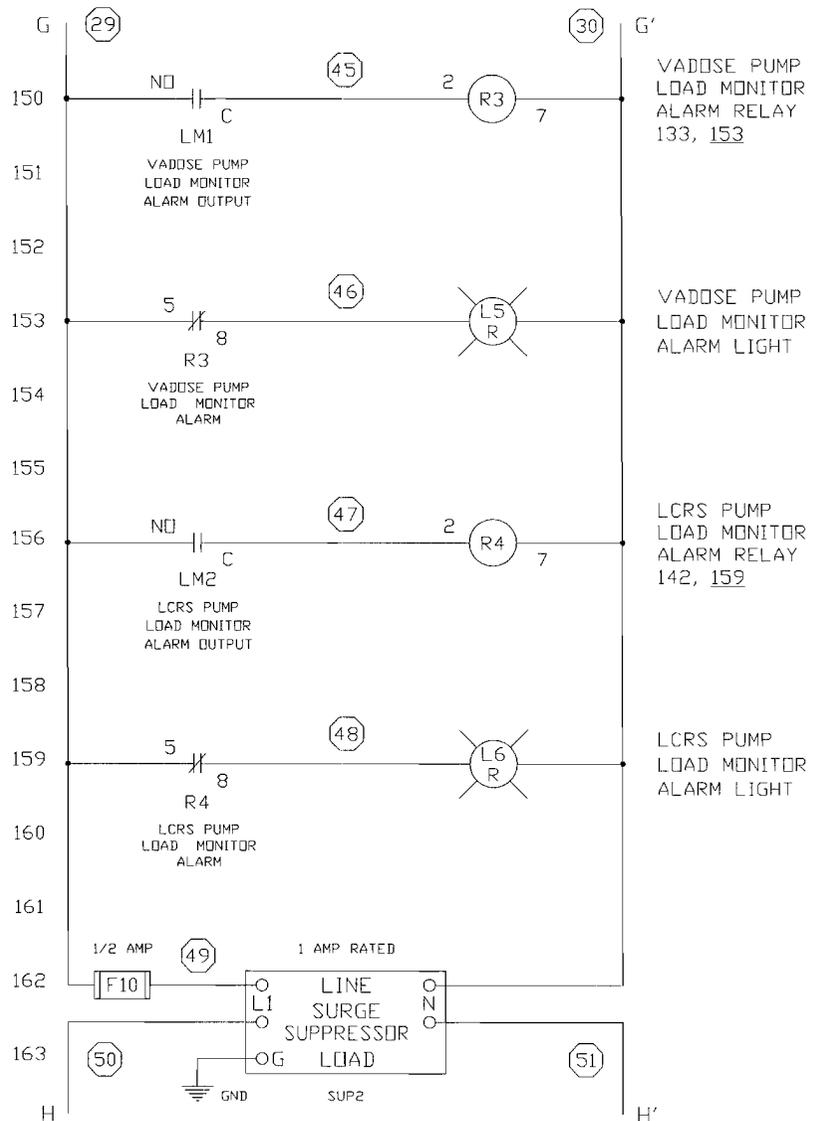
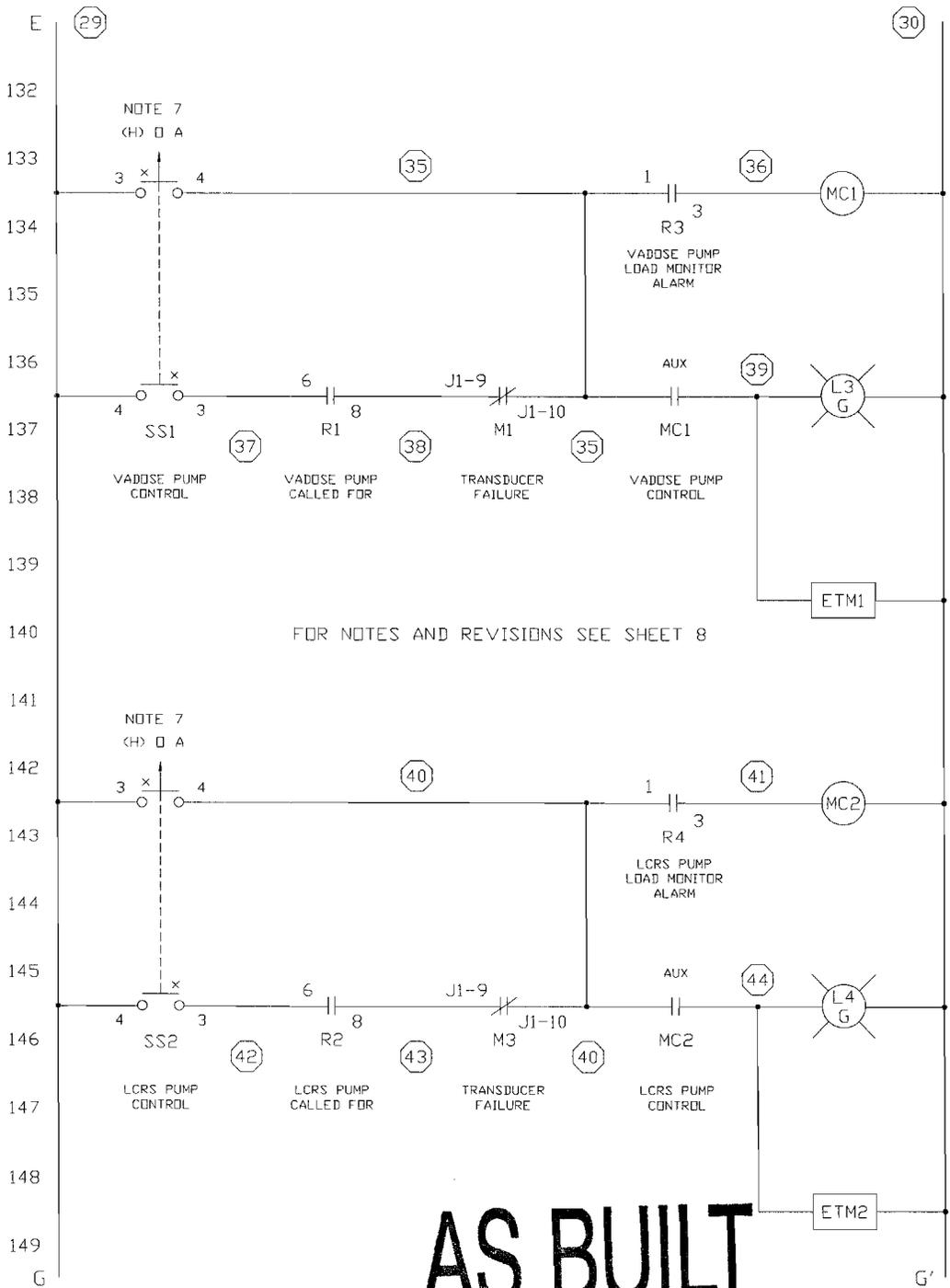
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TOLERANCES		REVISIONS			EPG COMPANIES			
(EXCEPT AS NOTED)	NO.	DATE	BY	DESIGN	SCALE	MATERIAL	DRAWN	DRAWING NO.
DECIMAL	1							
FRACTIONAL	2							
ANGULAR	3							
	4							
	5							

L975PTG CONTROL PANEL
230VAC 1Ø SH 4 OF 8

DESIGN RCK SCALE MATERIAL
DRAWN RCK DATE 06-02-09 DRAWING NO.
CHK'D APP'D 08373-0253

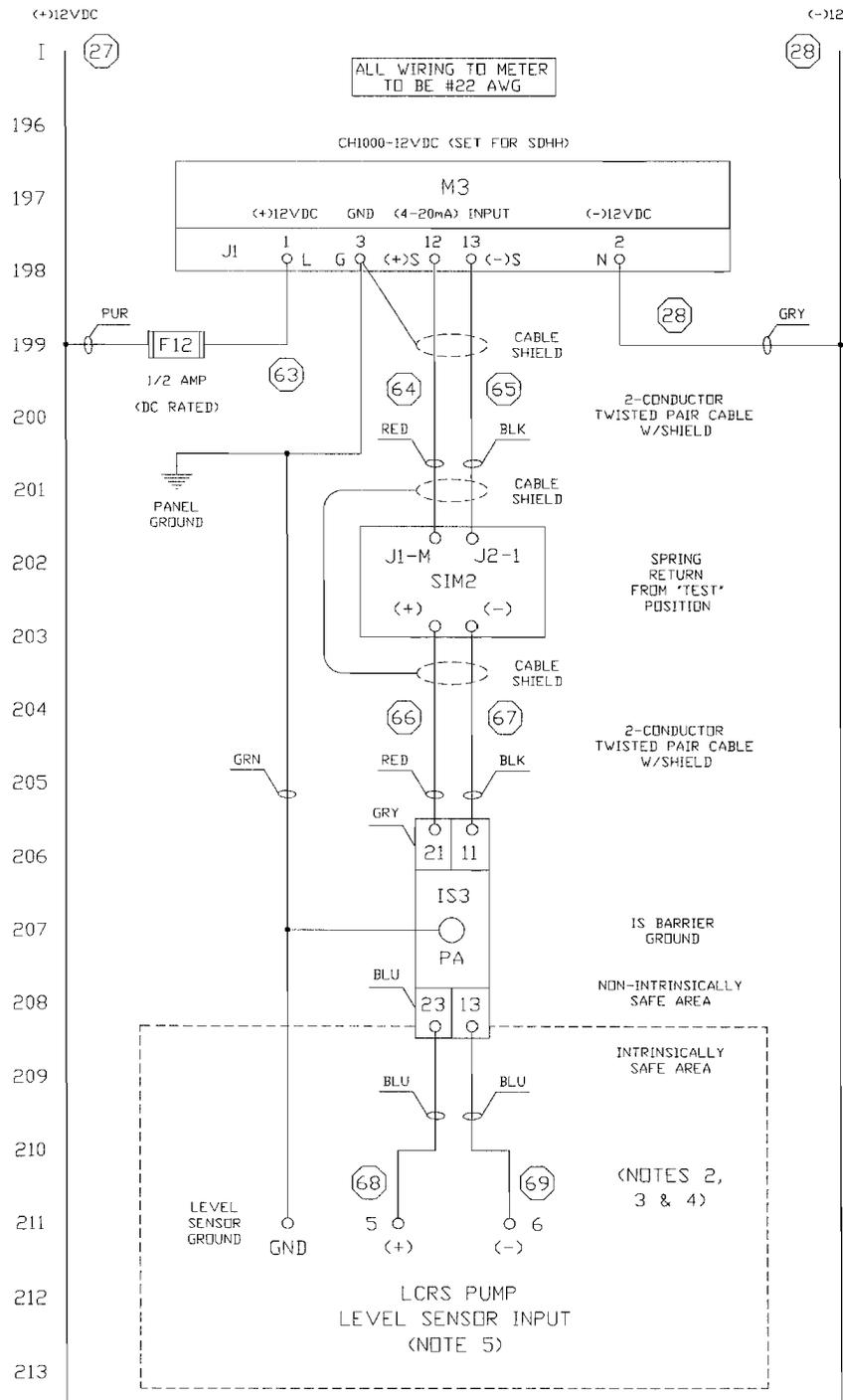


JOB No. 09-9356B

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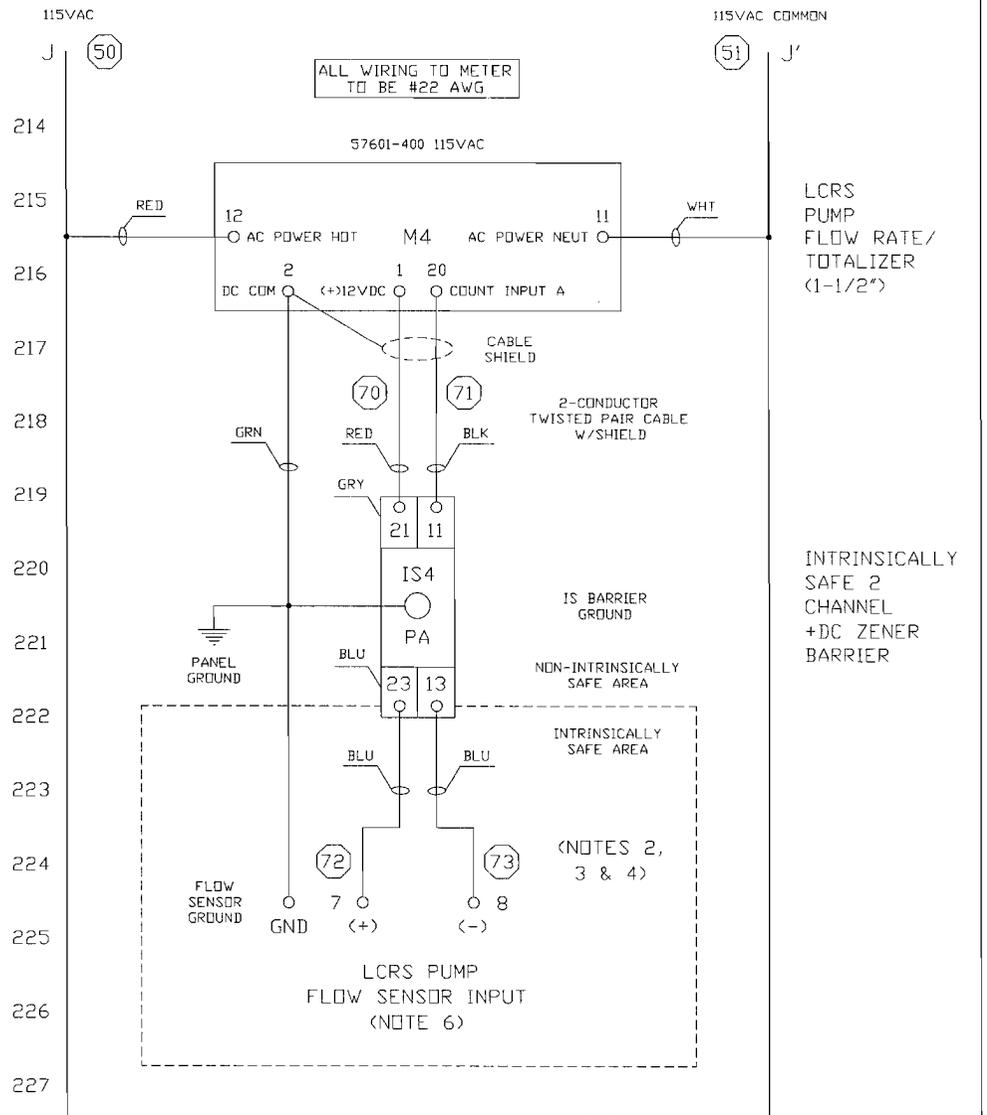
TOLERANCES		REVISIONS			EPG COMPANIES			
(EXCEPT AS NOTED)		NO.	DATE	BY				
DECIMAL	#	1			L975PTG CONTROL PANEL 230VAC 1Ø SH 5 OF 8 DESIGN RCK SCALE MATERIAL DRAWN RCK DATE 06-02-09 DRAWING NO. CHECK'D APP'D 08373-0254			
FRACTIONAL	#	2						
ANGULAR	#	3						
	#	4						
	#	5						



LCRS PUMP LEVEL CONTROLLER 124, 145

TRANSDUCER SIMULATOR

INTRINSICALLY SAFE 2 CHANNEL +DC ZENER BARRIER



LCRS PUMP FLOW RATE/TOTALIZER (1-1/2")

INTRINSICALLY SAFE 2 CHANNEL +DC ZENER BARRIER

FOR NOTES AND REVISIONS SEE SHEET 8
LAST WIRE NUMBER USED: 73

JOB No. 09-9356B

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TOLERANCES		REVISIONS			EPG COMPANIES		
(EXCEPT AS NOTED)		NO.	DATE	BY	DESIGN	SCALE	MATERIAL
DECIMAL		1					
FRACTIONAL		2					
ANGULAR		3					
		4					
		5					

L975PTG CONTROL PANEL
230VAC 1Ø SH 7 OF 8

DESIGN RCK SCALE
DRAWN RCK DATE 06-02-09 DRAWING NO.
MATERIAL 08373-0256

AS BUILT

FIELD WIRING TERMINALS

LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



NOTE:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
5. MAXIMUM CABLE LENGTH TO THE LEVEL SENSOR IS 3000 FEET
6. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR IS 500 FEET
7. SELECTOR SWITCHES, (SS1-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION

AS BUILT

JOB No. 09-9356B

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TOLERANCES (EXCEPT AS NOTED)		REVISIONS		EPG COMPANIES			
	NO.	DATE	BY	DESIGN	SCALE	MATERIAL	
DECIMAL	1					L975PTG CONTROL PANEL	
	2					230VAC 1Ø SH 8 OF 8	
FRACTIONAL	3			RCK			
	4			RCK	DATE	06-02-09	DRAWING NO.
ANGULAR	5			CHK'D	APP'D		08373-0257

**Phase II
Installation Records**

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: <u>1 1/2"</u>	Discharge Pressure:	Pump Submergence:	Fluid Temp: ____ "F ____ "C
External Check Valve Used? <u>No</u>	Location:	Cable Length & Size: <u>120' 14 GA</u>	Ground Resistance <u>3 OHMS</u>
Insulation Megohm Readings:	Before Installation:	After Installation: <u>119 Meg</u>	After 30 min. Run: <u>NA</u>

SENSORS

Type of Level Sensor:	Transmitter Serial Number:
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	
Length of Sensor Lead: <u>120'</u>	Ohm Readings Across I.S. Barrier: <u>230</u>
mA Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: <u>12</u> VAC Voltage Leaving Level Meter: <u>12</u> VAC
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311 Phone: 800-762-8418 FAX: 763-493-4812

EPG SurePump™ Installation Record

EPG Job No. 09-9356

Installer's Name HAMPTON TEDDER LETTER CO.

Address 4920 ALTO AVE

City LAS VEGAS State NV.

Zip 89115

Phone (702) 646-7449

Fax (702) 453-5412

Contact name ROGER CATES

Owner's Name BASEL REMEDIATION CO.

Address 875 W. WARM SPRINGS, RD.

City HENDERSON State NV

Zip 89011

Phone (702) 567-0400

Fax (702) 567-5524

Contact name LEE C. FARRIS, PE

Sump Name ID PHASE 2 LCAS

Date Installed 8/28/09

Leachate or Condensate Temp _____ °F Or °C

Pump:

Model No. WSOPT 5-3

Rating: 30 GPM/hr 60 Ft. TDH

HP .75 Voltage 230 Phase 1

Actual Pump Delivery _____ GPM/hr _____ PSI

Operating Cycle _____ ON (Min Hr) _____ OFF (Min Hr)

(Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

Slope 2.1 : 1

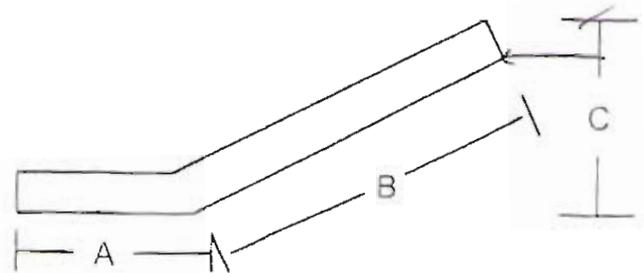
Length of riser Pipe (A+B) 101.2 ft

Vertical Distance - Sump to INW Top of Riser Pipe (C) 39.9 ft.

Riser ID PHASE 2 LCAS

Distance From Top of Riser Pipe to Controller 15 ft

SDR 11



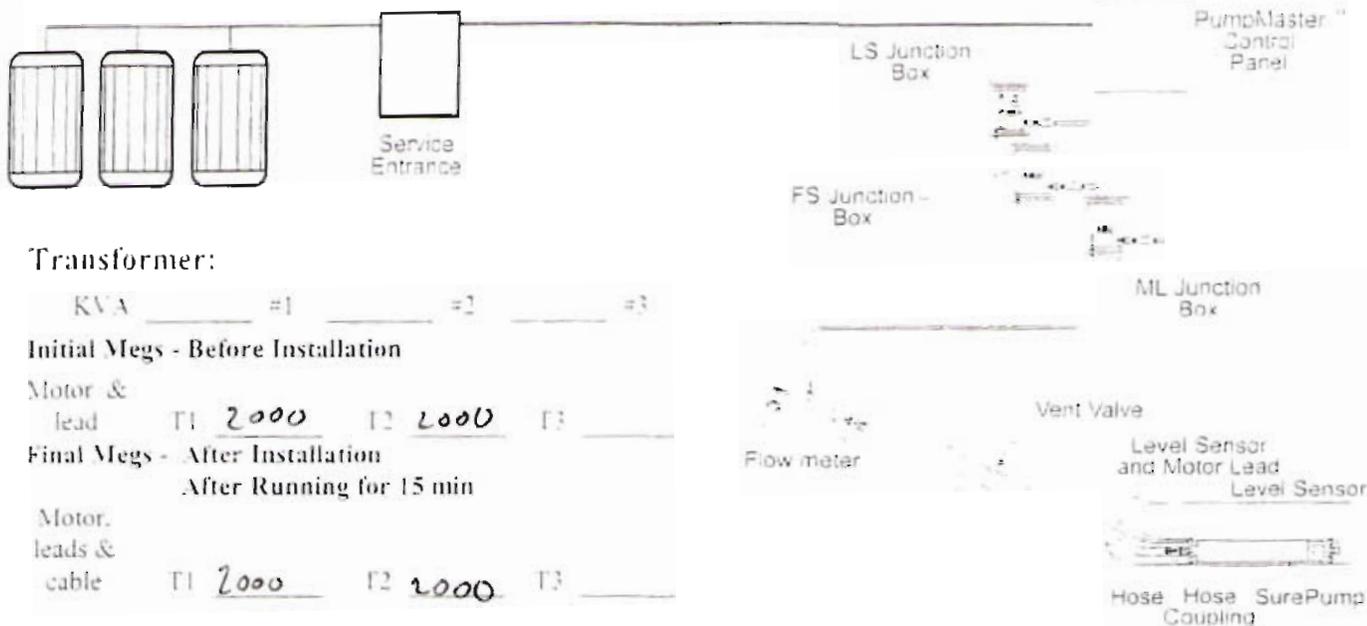
Power Supply:

Cable Service Entrance to Control Distance _____ ft Wire size _____ AWG/MCM

Copper _____ jacketed _____ minimum _____ individual conductors

Cable Control to Motor _____ ft _____ AWG/MCM

Copper _____ jacketed _____



Transformer:

KVA _____ #1 _____ #2 _____ #3 _____

Initial Megs - Before Installation
 Motor & lead T1 2000 T2 2000 T3 _____

Final Megs - After Installation
 After Running for 15 min
 Motor, leads & cable T1 2000 T2 2000 T3 _____

Incoming Voltage:

No Load	L1-L2	<u>233</u>	L2-L3	_____	L1-L3	_____
Full Load	L1-L2	<u>233</u>	L2-L3	_____	L1-L3	_____

Running Amps:

Hookup:1
 Full Load L1 8 L2 8 L3 _____ % unbalanced _____

Hookup:2
 Full Load L1 _____ L2 _____ L3 _____ % unbalanced _____

Hookup:3
 Full Load L1 _____ L2 _____ L3 _____ % unbalanced _____

Ground wire size _____ AWG/MCM

DC Ground Current _____ mA Ground Test 3 Ohms

Motor Surge Protection _____ Yes _____ No

Control Panel:

Model # L975PTG

Short Circuit Device
 Circuit Breaker _____ Rating _____ Setting _____
 Fuses FNRNR Type 10 Rating _____
 _____ Standard ✓ Time Delay _____

Name HOWARD LGSTGA

Company EPG COMPANIES

Controls are Grounded to:
 Motor
 Rod
 Power Supply

Start Overloads:
 Set at N/A amps
 Date SEPT 17 09

INSTALLATION GUIDE

EPG SurePump™ Pumping System

- ✓ 1. Verify that equipment and supply voltage match.
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling
- ✓ 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c.
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 10 and Table 21 for 30. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater.
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color coded to simplify connections.
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser, you need to ohm out each circuit.
- ✓ 18. Measure resistance to ground. It must be (2) less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

- ✓ 19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- 20. Compare these reading to voltage listed on drawing and label in control panel.
- ✓ 21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
- 22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
- 23. Turn on power at panel main disconnect
- 24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ 25. If level and flow meter do not light up check GFCI, reset if necessary.
- ✓ 26. Are any indicator lights on?
- ✓ 27. Should they be on?
- ✓ 28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
- ✓ 29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.
- ✓ 30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ✓ 31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- ✓ 32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
- ✓ 33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
- ✓ 34. After pump and level sensor have been tested pot seal offs.
- ✓ 35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePump™ Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- ✓ A: Were sensor and power cable tied or strapped to discharge line?
- ✓ B: On what kind of spacing?
- ✓ C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- ✓ D: What size cable was run for supply power?
- ✓ E: What is the distance from power supply transformer to pump control panel?
- ✓ F: How did they verify that pump is down into sump?
- ✓ G: Did they test level sensor prior to installing?
- ✓ H: Did they test pump prior to installing or prior to your arrival?
- ✓ I: Do they have any questions or concerns?
- ✓ J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL

- ✓ A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel
- ✓ B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- ✓ C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- ✓ D: Are seal offs potted? If not, stop work and have them potted.
- ✓ E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- ✓ F: Make sure ground wire is in place between outer door and enclosure

PRIOR TO ENERGIZING CONTROL PANEL

- ✓ A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- ✓ B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ C: Compare these reading to voltage listed on drawing and label in control panel.
- ✓ D: Megger motor leads resistance must be 1 megohm or greater.
- ✓ E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 10 and Table 21 for 30. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- ✓ F: Inspect inside of control panel. Look for items which may have come loose during shipping
- ✓ G: Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- ✓ J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- ✓ A: Turn on power at panel main disconnect.
- ✓ B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ C: If level and flow meter do not light up check GFCI, reset if necessary.
- ✓ D: Are any indicator lights on?
- ✓ E: Should they be on?
- ✓ F: Make sure pump is turned off. Using built in or hand held simulator verify level meter settings are correct for this site.
- ✓ G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3" of slack in the cables.

- ⌋ H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ⌋ I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- ⌋ J: When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- ⌋ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

EPG Companies Inc.

SurePump™ Installation Record

Form Completed by: KEY Installation Date: 8/28/09
 Company: HAMPTON TEDDER WORKS EPG Serial #: 09-9350B

PUMPS, CONTROLS AND POWER SUPPLY

Installer: <u>HTE</u>	Address: <u>4920 AUTO AVE LAS VEGAS, NV. 89115</u>	Installation Location: <u>PHASE 2 VADOSE</u>
Motor Model <u>WSDPT2-3</u>	HP <u>1/2</u>	Volts: <u>230</u>
	Max Amps Rating: <u>5.0A</u>	Pump Model: <u>EPG WSDPT SAND PUMP</u>
Power Supply Transformers: Number Used: <u>1</u> KVA Each: <u>350</u>	Hertz: <u>60</u>	Comments:
Pump Control Panel: Mfg. & Model #: <u>EPG L975PTG</u>	Motor Starter Size: <u>Siemens 42BF15AF(5hp)</u>	Overload Heater Part or setting range: <u>NA</u>
IEC Starters:		
Lightning Arrestors: Mfg. & Model: <u>Intermatic AG2401</u>	Surge Capacitors: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Disconnect Fuse or Circuit Breaker Amp Rating: <u>40A</u>
Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) <u>—</u>		

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS:	GPM	VOLTS			AMPS
Pump Not Running (<u>LINE</u>)	<u>0</u>	R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>233</u>	<u>0</u>
Open Discharge		R-Y <u> </u>	R-B <u> </u>	B-Y <u> </u>	R <u> </u> Y <u> </u> B <u> </u>
Normal Operation		R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>232.9</u>	R <u> </u> Y <u>4.3</u> B <u>4.4</u>
Run Time					<u>4</u>
Off Time					

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: 1"	Discharge Pressure:	Pump Submergence:	Fluid Temp: ____ °F ____ °C
External Check Valve Used? NO	Location:	Cable Length & Size: 14GA 113	Ground Resistance: 3 ohm
Insulation Megohm Readings:	Before Installation:	After Installation: 11.5G	After 30 min. Run: NA

SENSORS

Type of Level Sensor:	Transmitter Serial Number:
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	
Length of Sensor Lead: 113'	Ohm Readings Across I.S. Barrier: 230
mA Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: 12 VDC Voltage Leaving Level Meter: 12 VDC
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: ^{30 MINUTES} No able to test run due to dry sump.

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311 Phone: 800-762-8418 FAX: 763-493-4812

EPG SurePump™ Installation Record

EPG Job No. 09-9356

Installer's Name HAMPTON TODDER ELECTRIC CO.

Address 4920 N20 AVE.

City LAS VEGAS State NV. Zip 89115

Phone (702) 646-7449 Fax (702) 453-5412

Contact name ROGER CASES

Owner's Name BASSE REMEDIATION CO

Address 875 W. WARM SPRINGS RD.

City HENDERSON State NV. Zip 89011

Phone (702) 567-0400 Fax (702) 567-5524

Contact name LEE C. FARRIS, PE

Sump Name ID PHASE 2 VADOSE Date Installed 8/28/09

Leachate or Condensate Temp _____ °F Or °C

Pump:

Model No. WSDPT 2-3

Rating: 10 GPM @ 50 Ft. TDH

HP .5 Voltage 230 Phase 1

Actual Pump Delivery _____ GPM @ _____ PSI

Operating Cycle _____ ON (Min Hr) _____ OFF (Min Hr) (Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

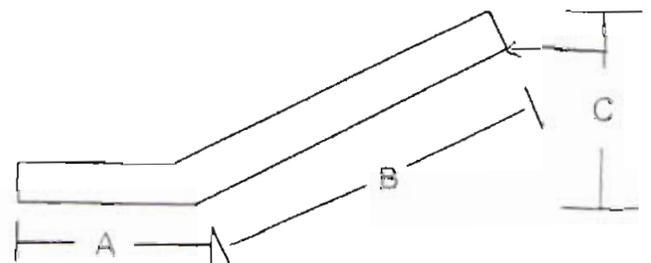
Slope 2.1 :1

Length of riser Pipe (A-B) 96.1 ft.

Vertical Distance - Sump to
± Min. Top of Riser Pipe (C) 38.6 ft.

Riser ID PHASE 2 VADOSE SDR 11

Distance From Top of Riser
Pipe to Controller 15 ft.



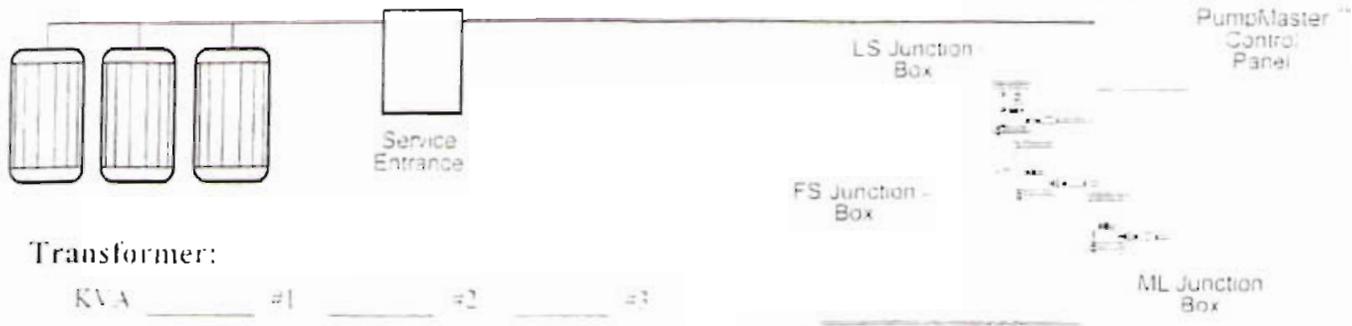
Power Supply:

Cable Service Entrance to Controller Distance _____ ft. Wire Size _____ AWG/MCM

Copper jacketed minimum individual conductors

Cable Control to Motor _____ ft. _____ AWG/MCM

Copper jacketed



Transformer:

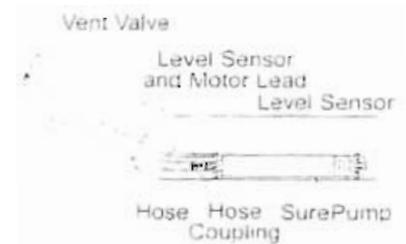
KVA #1 #2 #3

Initial Megs - Before Installation

Motor & lead T1 2000 T2 2000 T3 NA

Final Megs - After Installation
After Running for 15 min

Motor, leads & cable T1 11.5G T2 11.5G T3 NA



Incoming Voltage:

No Load	L1-L2	<u>233</u>	L2-L3	<u>NA</u>	L1-L3	<u>NA</u>
Full Load	L1-L2	<u>230</u>	L2-L3	<u>NA</u>	L1-L3	<u>NA</u>

Running Amps:

Hookup:1	Full Load	L1	<u>NA</u>	L2	_____	L3	_____	% unbalanced	_____
Hookup:2	Full Load	L1	<u>NA</u>	L2	_____	L3	_____	% unbalanced	_____
Hookup:3	Full Load	L1	<u>NA</u>	L2	_____	L3	_____	% unbalanced	_____

Ground wire size _____ AWG MCM

DC Ground Current _____ mA Ground Test 3 Ohms

Motor Surge Protection Yes No

Control Panel:

Model # See startup sheets L975PTG

Short Circuit Device

Circuit Breaker _____ Rating _____ Setting _____
Fuses FENR Type 8 Rating _____
Standard Time Delay _____

Controls are Grounded to:

_____ Motor
 Rod
_____ Power Supply

Start Overloads:

Set at N/A amps

Name HOWARD LESTER

Company EPG COMPANIES

Date SEP 17 09

INSTALLATION GUIDE

EPG SurePump¹™ Pumping System

- ✓ 1. Verify that equipment and supply voltage match.
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling.
- ✓ 3. Control panel should be mounted in a secure way at least 15" from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping.
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c.
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump.
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 10 and Table 21 for 30. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater.
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color-coded to simplify connections.
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ 18. Measure resistance to ground. It must be less than 25 ohms. If greater, stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

- 19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- 20. Compare these reading to voltage listed on drawing and label in control panel.
- 21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
- 22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
- 23. Turn on power at panel main disconnect.
- 24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- 25. If level and flow meter do not light up check GFCI, reset if necessary.
- 26. Are any indicator lights on?
- 27. Should they be on?
- 28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
- 29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.
- 30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- 31. When pump is running measure and record amperage and voltage. Check 30 systems for current balance within 5% of average. N/A
- 32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
- 33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
- 34. After pump and level sensor have been tested pot seal off's.
- 35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePump™ Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- A: Were sensor and power cable tied or strapped to discharge line?
- B: On what kind of spacing? 5'
- C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- D: What size cable was run for supply power? 14GA
- E: What is the distance from power supply transformer to pump control panel?
- F: How did they verify that pump is down into sump? LEVEL
- G: Did they test level sensor prior to installing?
- H: Did they test pump prior to installing or prior to your arrival?
- I: Do they have any questions or concerns?
- J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL.

- A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel
- B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- D: Are seal offs potted? If not, stop work and have them potted.
- E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- F: Make sure ground wire is in place between outer door and enclosure.

PRIOR TO ENERGIZING CONTROL PANEL

- A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- C: Compare these reading to voltage listed on drawing and label in control panel.
- D: Megger motor leads resistance must be 1 megohm or greater.
- E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- F: Inspect inside of control panel. Look for items which may have come loose during shipping
- G: Inspect wire connections. Are they the correct colors? Are they tight?
- H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- A: Turn on power at panel main disconnect.
- B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- C: If level and flow meter do not light up check GFCI, reset if necessary
- D: Are any indicator lights on?
- E: Should they be on?
- F: Make sure pump is turned off. Using built in or hand held simulator verify level meter settings are correct for this site.
- G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.

- ⌋ H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ⌋ I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- ✓ J: When pump is running measure and record amperage and voltage. Check 30 systems for current balance within 5% of average.
- ✓ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

Phase II
As-Built Control Panel Setup Parameters

EPG LevelMaster Pump controller

Panel S/N: 09-9356B
Meter S/N: 060409-08

LCRS Pump Level Control Meter

PHASE II

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M3

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 20"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". 36.1"
Hy Hi	1	Keeps High Level Light on until level drops <u>1</u> " below AL Hi.
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

EPG LevelMaster Pump controller

Panel S/N: 09-9356B
Meter S/N: 060509-01

Vadose Pump Level Control Meter PHASE II

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M1

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 17"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". .5"
Hy Hi	1	Keeps High Level Light on until level drops 1 " below AL Hi. .5"
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

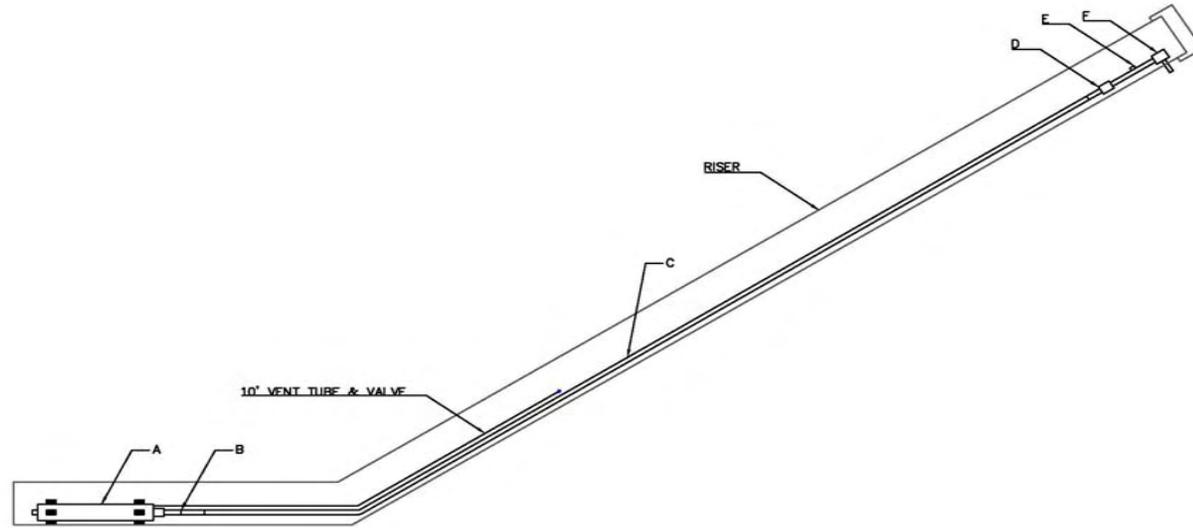
Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

Phase II
As-Built Pump Installation Cross Sections

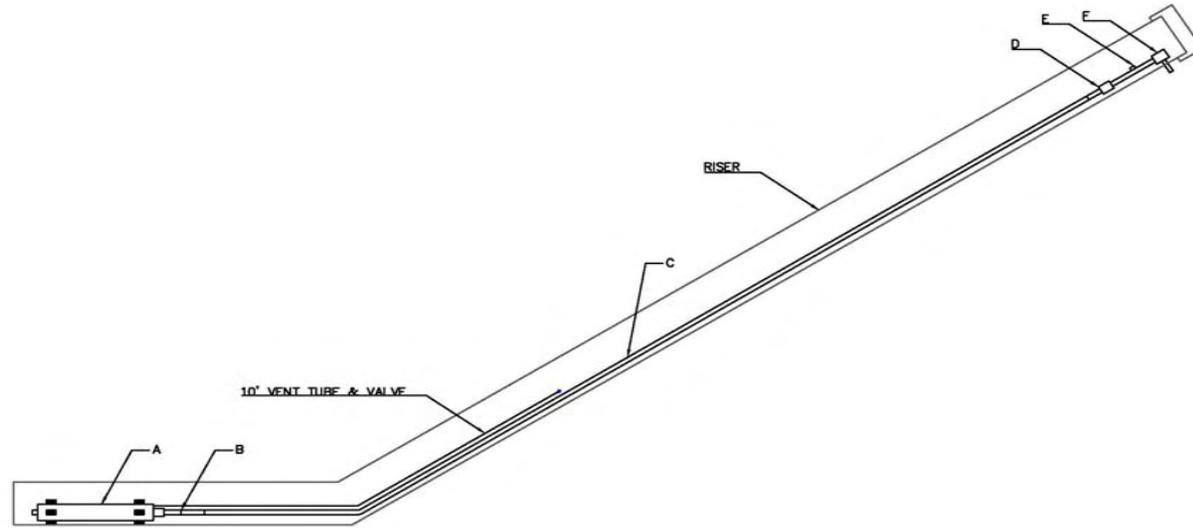
PHASE II LCRS SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT5-3 PUMP (S/N 2009-3134)	2.6
B	CONNECTIONS/FITTINGS/TRANSITIONS	0.4
C	1.5" DISCHARGE LINE	92.6
D	CONNECTIONS/FITTINGS/TRANSITIONS	0.6
E	FLOW METER	2.3
F	EPG FITTING "T"	0.4

NOT TO SCALE

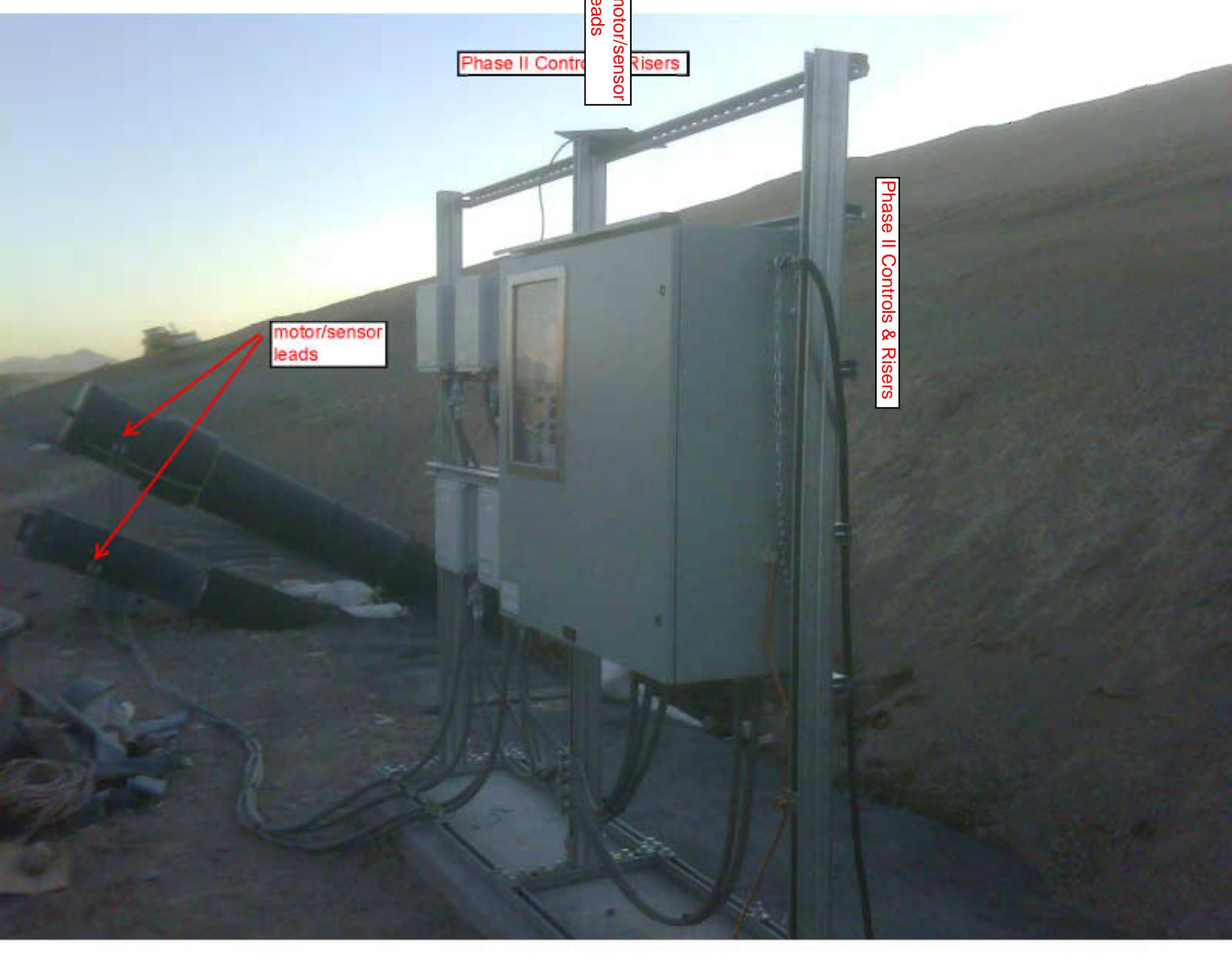
PHASE II VADOSE SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT2-3 PUMP (S/N 2009-3140)	2.6
B	CONNECTIONS/FITTINGS/TRANSITIONS	0.6
C	1.0" DISCHARGE LINE	88.8
D	CONNECTIONS/FITTINGS/TRANSITIONS	0.8
E	FLOW METER	2.5
F	EPG FITTING "T"	0.3

NOT TO SCALE

Phase II
As-Built Photos



Phase II Controls & Risers

motor/sensor leads

motor/sensor leads

Phase II Controls & Risers

Phase II Controls

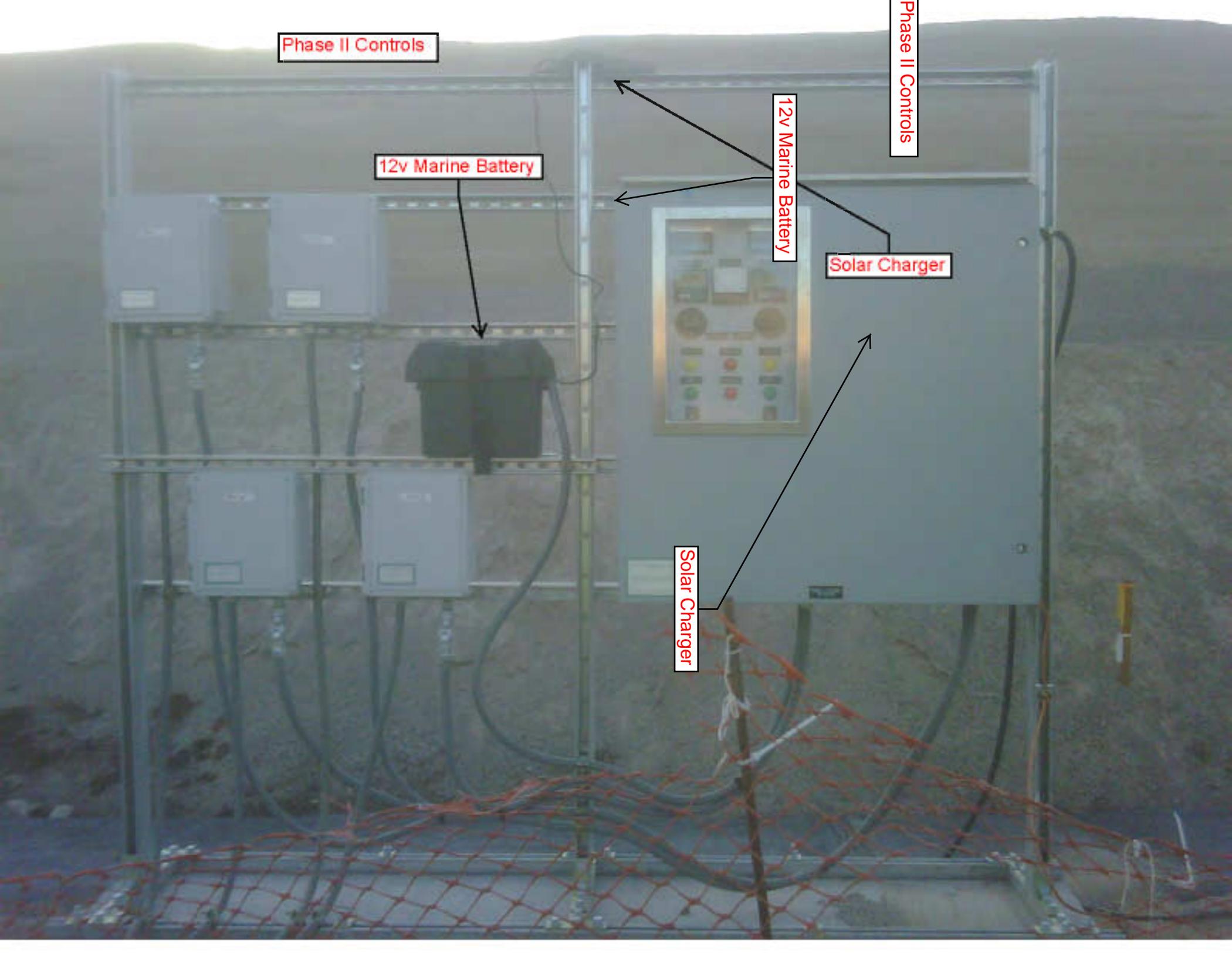
12v Marine Battery

12v Marine Battery

Solar Charger

Phase II Controls

Solar Charger



Phase IIIB
Engineer's Specification

ENGINEER'S SPECIFICATION

PHASE IIIB LCRS

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish ¹~~2~~ centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 5 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a ¾ HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 70 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 ½ inch MNPT threaded discharge nozzle and be capable of delivering 25 GPM at 50 feet of TDH. Each SurePump will be fitted with 70 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

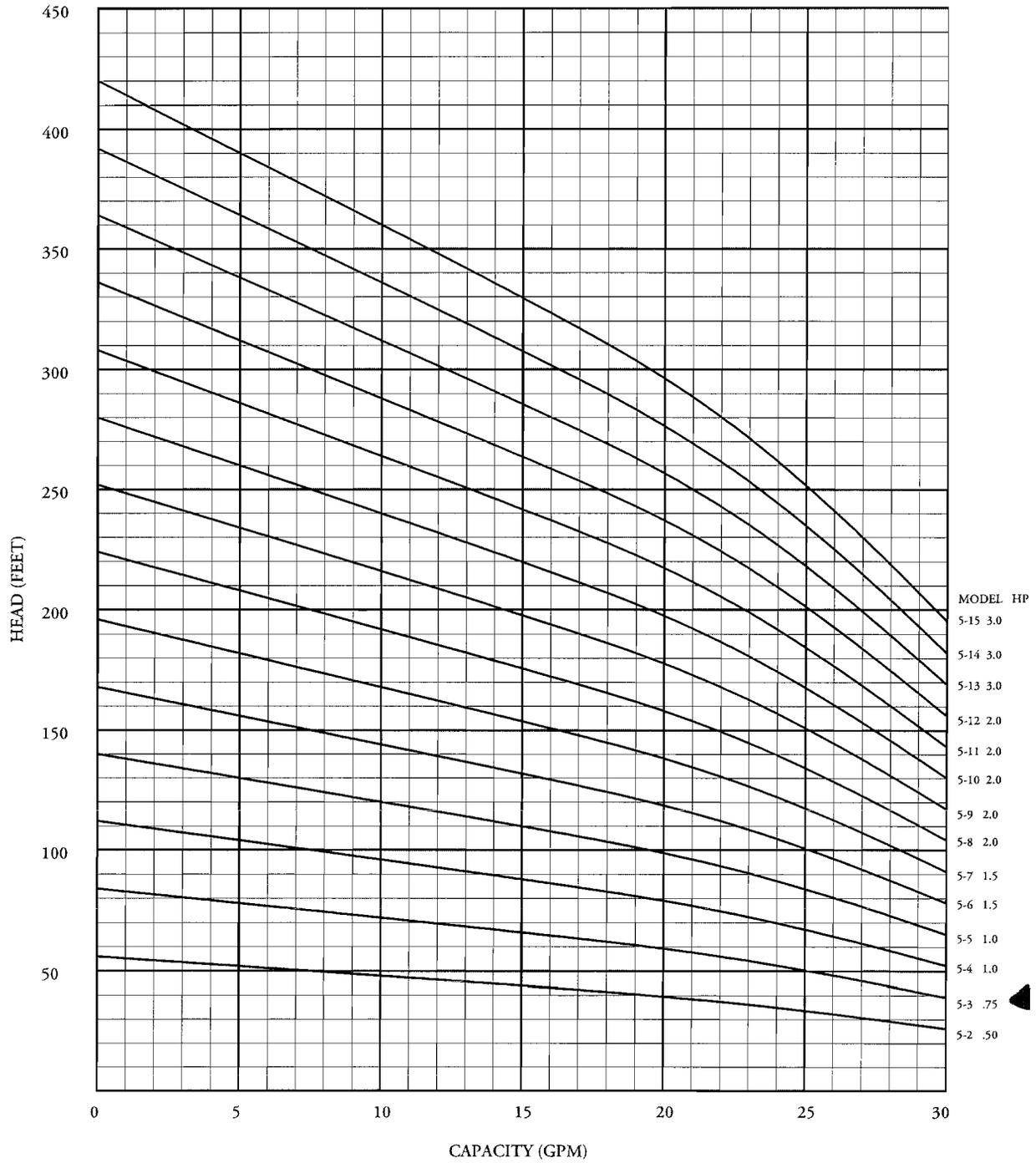
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in ½ HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

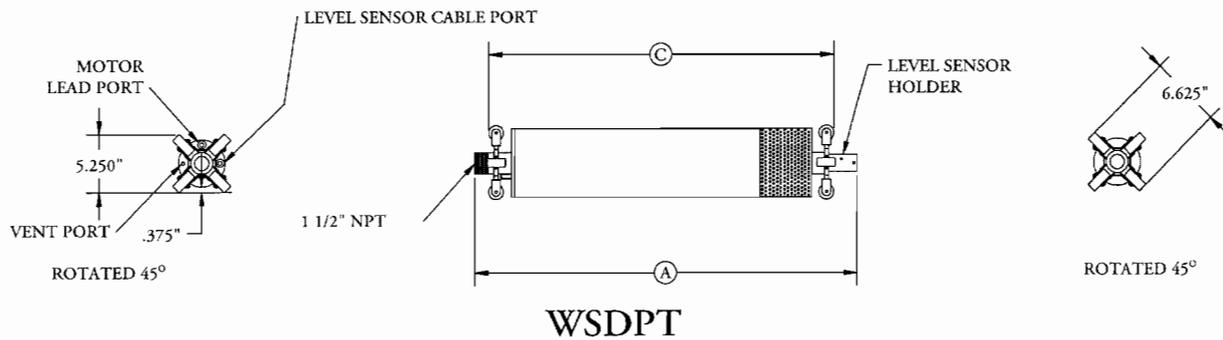
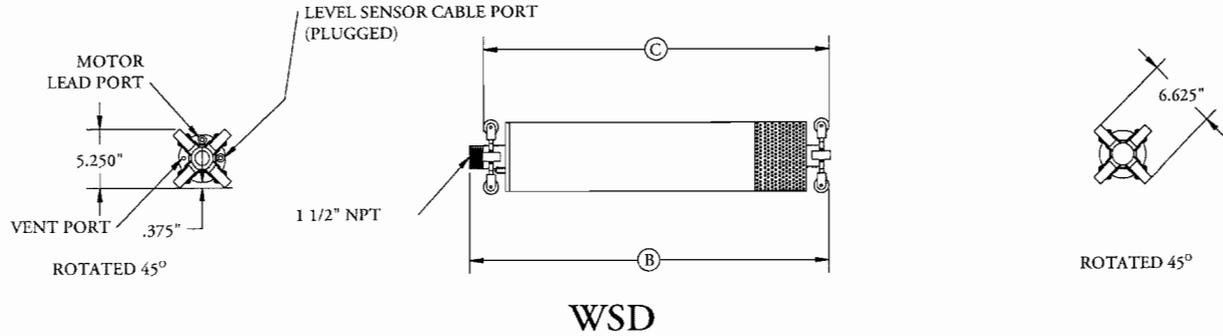
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 5 SurePump™
 Flow Range 15-30 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 5 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-2	0.50	1	31.02	29.90	29.15	61.47	66.47
5-2	0.50	3	31.02	29.90	29.15	61.47	66.47
5-3	0.75	1	32.98	31.86	31.11	66.24	71.24
5-3	0.75	3	32.98	31.86	31.11	66.24	71.24
5-4	1.00	1	34.90	33.78	33.03	70.98	75.98
5-4	1.00	3	34.90	33.78	33.03	70.98	75.98
5-5	1.00	1	35.73	34.61	33.86	71.88	76.88
5-5	1.00	3	35.73	34.61	33.86	71.88	76.88
5-6	1.50	1	38.43	37.31	36.56	79.22	84.22
5-6	1.50	3	36.56	35.44	34.69	72.77	77.77
5-7	1.50	1	39.26	38.14	37.39	80.12	85.12
5-7	1.50	3	37.39	36.27	35.52	73.67	78.67
5-8	2.00	1	41.59	40.47	39.72	85.17	90.17
5-8	2.00	3	40.09	38.97	38.22	81.01	86.01

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-9	2.00	1	42.42	41.30	40.55	86.07	91.07
5-9	2.00	3	40.92	39.80	39.05	81.90	86.90
5-10	2.00	1	43.25	42.13	41.38	86.96	91.96
5-10	2.00	3	41.75	40.63	39.88	82.80	87.80
5-11	2.00	1	44.08	42.96	42.21	87.86	92.86
5-11	2.00	3	42.58	41.46	40.71	83.69	88.69
5-12	2.00	1	44.91	43.79	43.04	88.75	93.75
5-12	2.00	3	53.41	52.29	51.54	92.35	97.35
5-13	3.00	1	54.24	53.12	52.37	119.24	124.24
5-13	3.00	3	51.24	50.12	49.37	105.91	110.91
5-14	3.00	1	55.07	53.95	53.20	120.14	125.14
5-14	3.00	3	52.07	50.95	50.20	106.81	111.81
5-15	3.00	1	55.90	54.78	54.03	121.03	126.03
5-15	3.00	3	52.90	51.78	51.03	107.70	112.70

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

PHASE IIIB VADOSE

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 2 ¹ centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 2 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 1/2 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 70 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/4 inch MNPT threaded discharge nozzle and be capable of delivering 10 GPM at 50 feet of TDH. Each SurePump will be fitted with 70 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

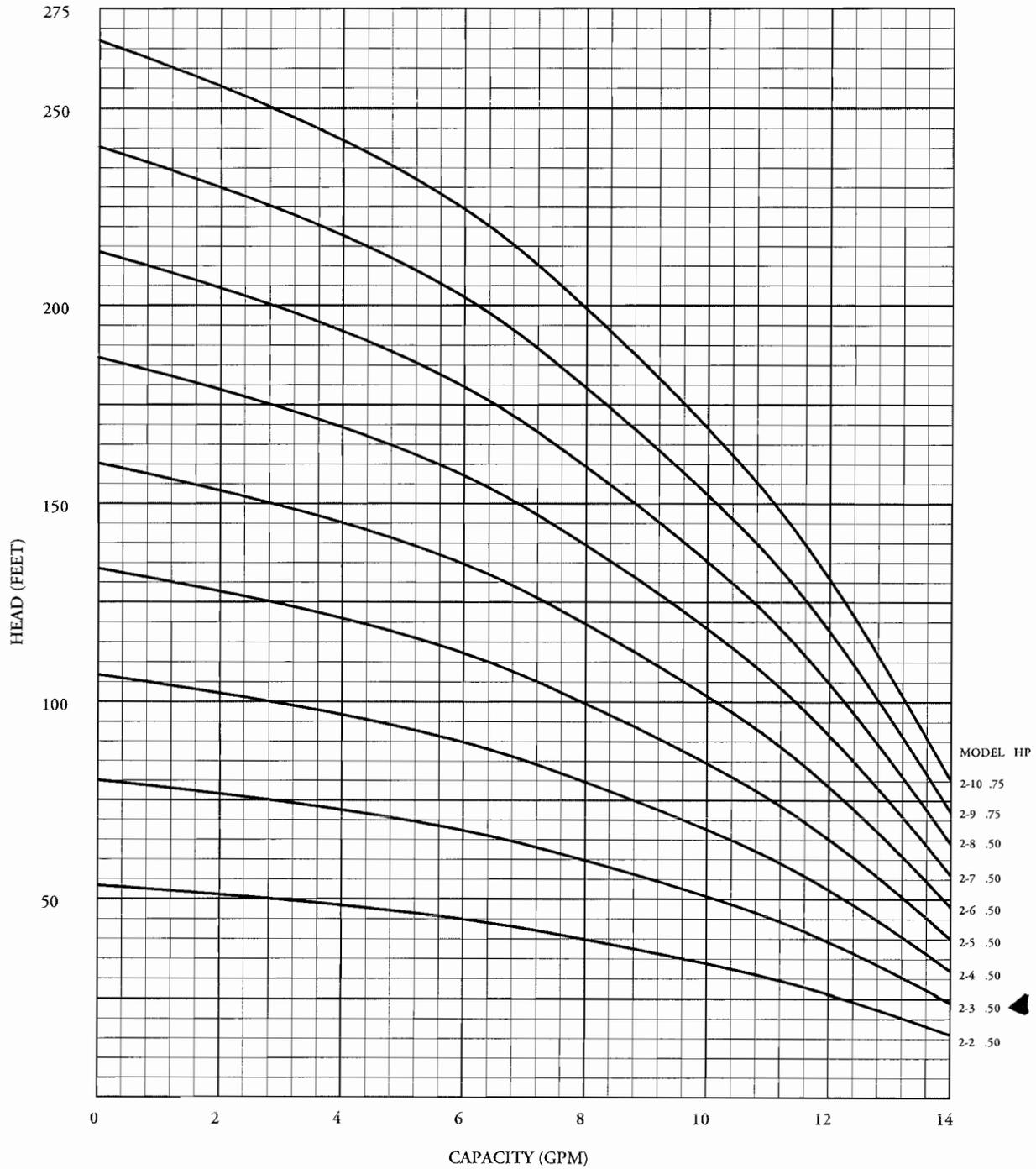
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

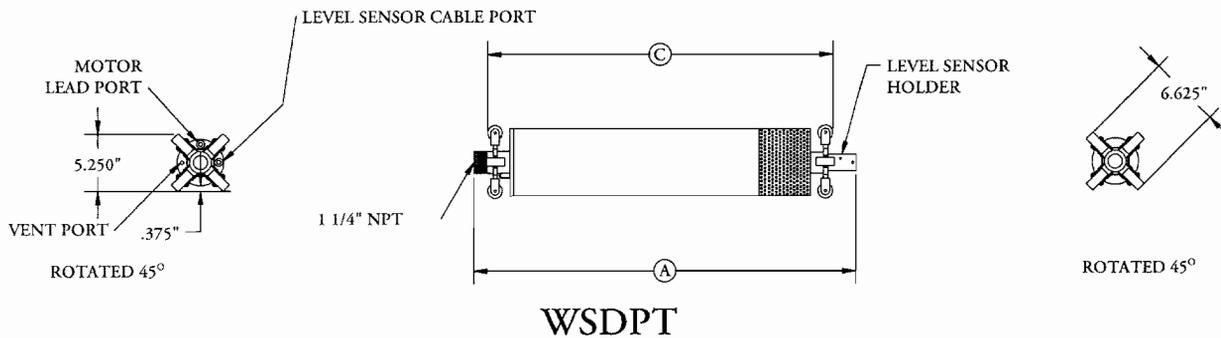
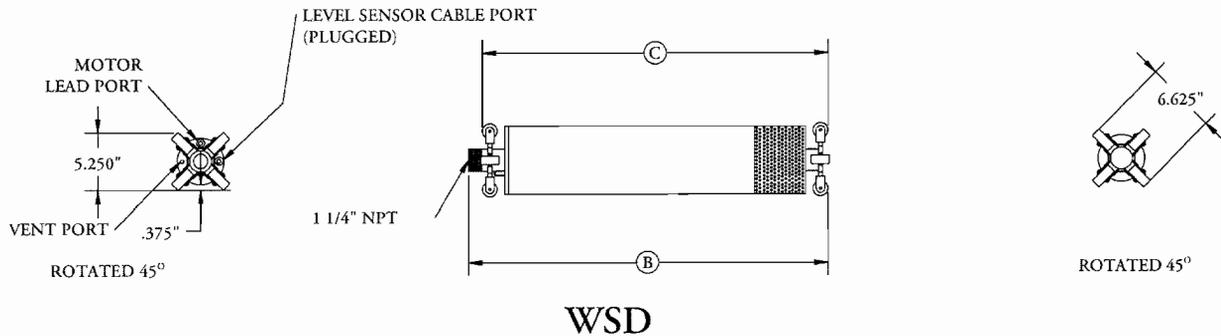
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 2 SurePump™
 Flow Range 4-14 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 2 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
2-2	0.50	1	31.02	29.90	29.15	61.47	66.47
2-2	0.50	3	31.02	29.90	29.15	61.47	66.47
2-3	0.50	1	31.85	30.73	29.98	62.37	67.37
2-3	0.50	3	31.85	30.73	29.98	62.37	67.37
2-4	0.50	1	32.68	31.56	30.81	63.26	68.26
2-4	0.50	3	32.68	31.56	30.81	63.26	68.26
2-5	0.50	1	33.51	32.39	31.64	64.15	69.15
2-5	0.50	3	33.51	32.39	31.64	64.15	69.15
2-6	0.50	1	34.34	33.22	32.47	65.05	70.05
2-6	0.50	3	34.34	33.22	32.47	65.05	70.05
2-7	0.50	1	35.17	34.05	33.30	65.94	70.94
2-7	0.50	3	35.17	34.05	33.30	65.94	70.94
2-8	0.50	1	36.00	34.88	34.13	66.84	71.84
2-8	0.50	3	36.00	34.88	34.13	66.84	71.84
2-9	0.75	1	37.96	36.84	36.09	71.61	76.61
2-9	0.75	3	37.96	36.84	36.09	71.61	76.61
2-10	0.75	1	38.79	37.67	36.92	72.50	77.50
2-10	0.75	3	38.79	37.67	36.92	72.50	77.50

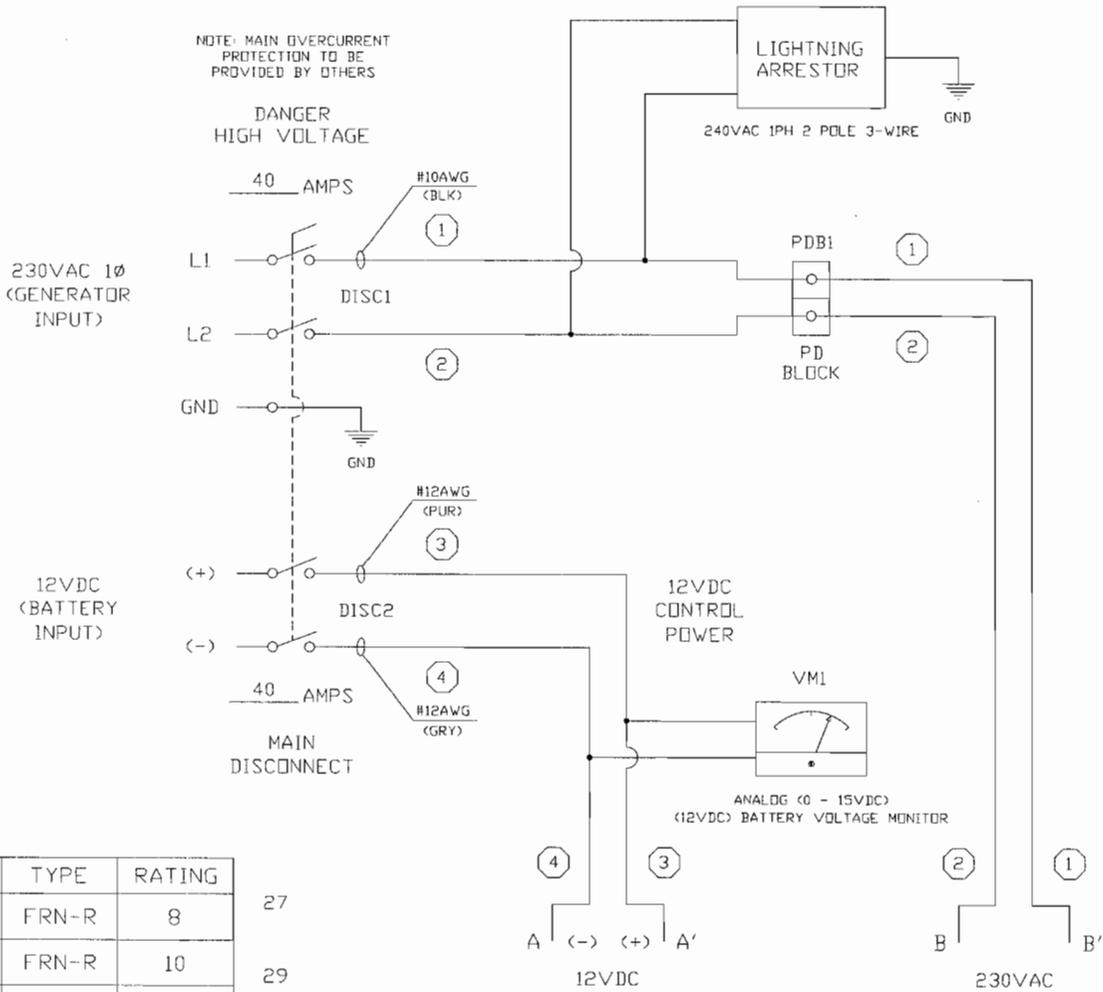
NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
 WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
 WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
 LEVEL SENSOR AND CABLE.

Phase IIIB
As-Built Control Panel Schematics

MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
VADDOSE PUMP	1/2	230	5.0	8A
LCRS PUMP	3/4	230	6.8	10A

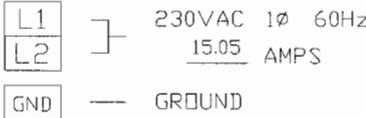
1
3
5
7
9
11
13
15
17
19
21
23
25



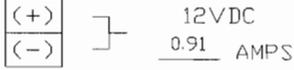
PHASE 3B
CONTROL PANEL AND PUMPS

FIELD WIRING TERMINALS

LINE (GENERATOR)



LINE (BATTERY)



FUSE	TYPE	RATING
F1-F2	FRN-R	8
F3-F4	FRN-R	10
F5-F6	FRN-R	2-1/2
F7	FNM	1-1/4
F8	FNM	3-1/2
F9	ABC	1-1/2
F10	MDL	1/2
F11	ABC	1/2
F12	ABC	1/2

27
29
31
33
35
37

FOR NOTES AND REVISIONS SEE SHEET 8

AS BUILT

JOB No. 09-9356D

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TOLERANCES		REVISIONS		EPG COMPANIES		
(EXCEPT AS NOTED)	NO.	DATE	BY	DESIGN	SCALE	MATERIAL
DECIMAL	1					
FRACTIONAL	2					
ANGULAR	3			RCK		
	4			RCK	06-02-09	
	5					

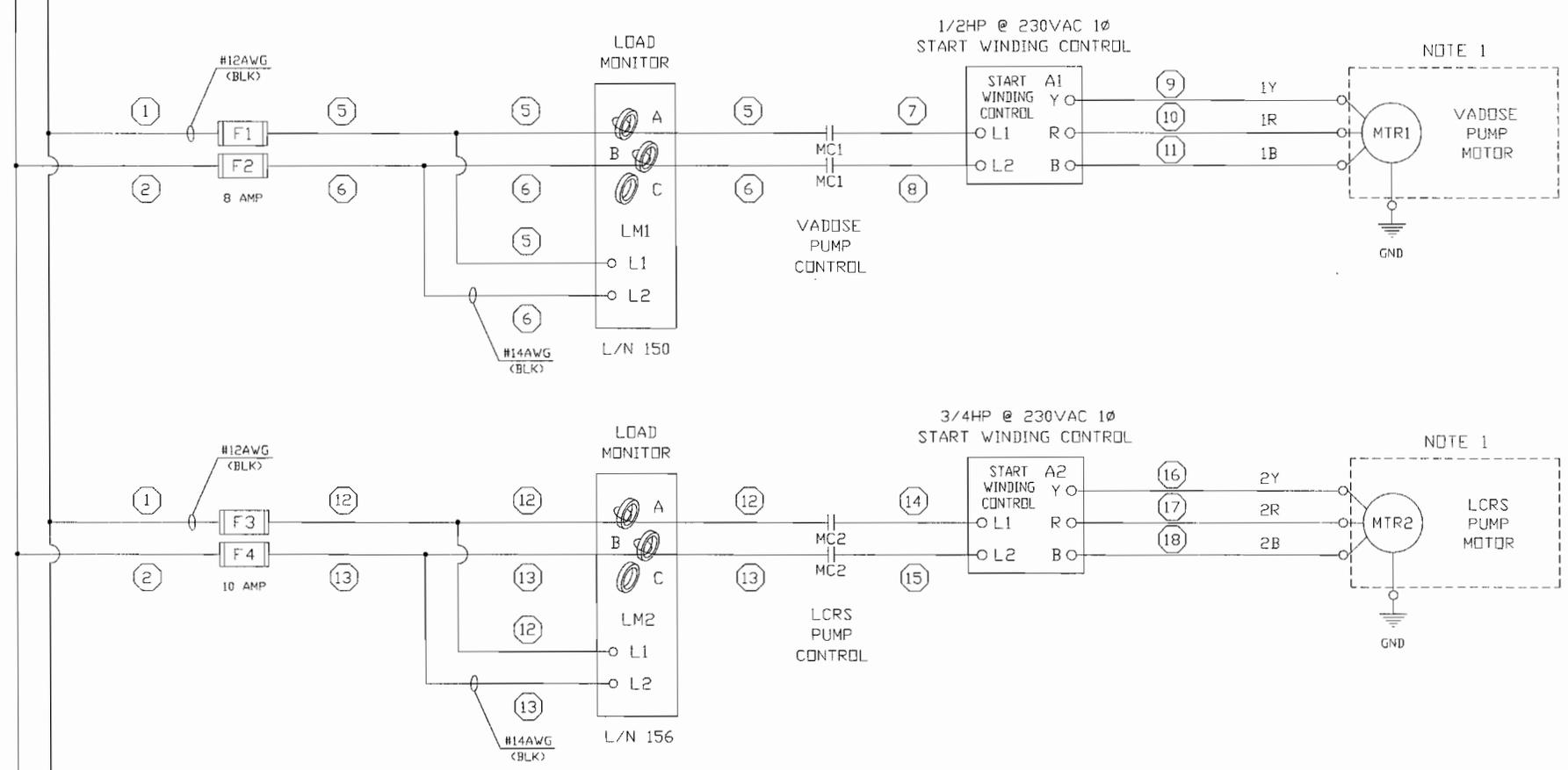
L975PTG CONTROL PANEL
230VAC 1Ø SH 1 OF 8

DRAWING NO. 08373-0250

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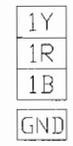
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FOR NOTES AND REVISIONS SEE SHEET 8



FIELD WIRING TERMINALS

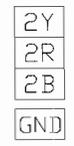
LOAD (230VAC)



VADDOSE PUMP MOTOR

FIELD WIRING TERMINALS

LOAD (230VAC)



LCRS PUMP MOTOR

AS BUILT

JOB No. 09-9356D

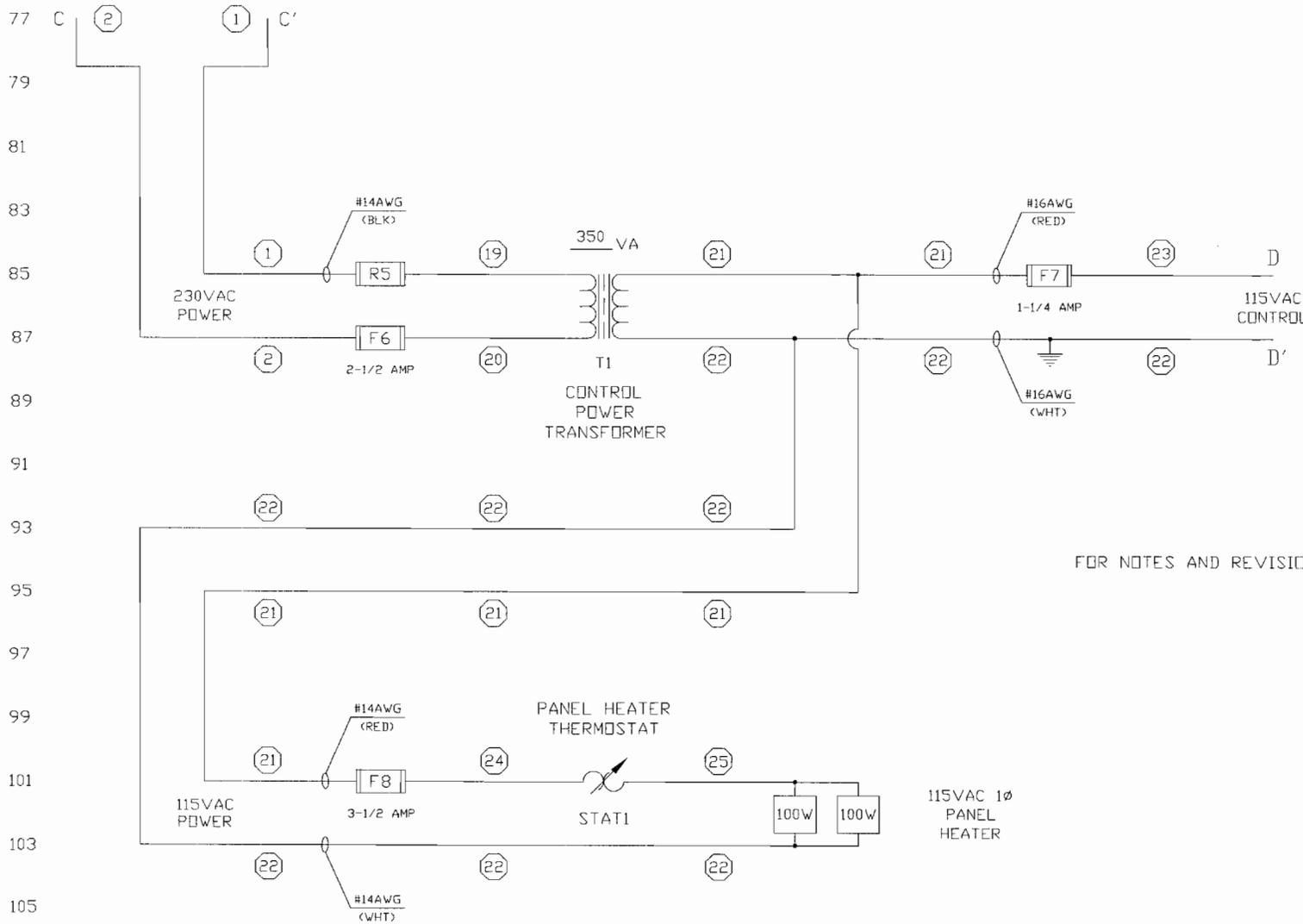
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TOLERANCES (EXCEPT AS NOTED)	REVISIONS			EPG COMPANIES			
	NO.	DATE	BY	DESIGN	SCALE	DRAWN	DRAWING NO.
DECIMAL	1			RCK			
FRACTIONAL	2			RCK			
ANGULAR	3						
	4						
	5						

L975PTG CONTROL PANEL
230VAC 1Ø SH 2 OF 8

DATE: 06-02-09
APP'D: [Signature]
DRAWING NO. 08373-0251



FOR NOTES AND REVISIONS SEE SHEET 8

JOB No. 09-9356D

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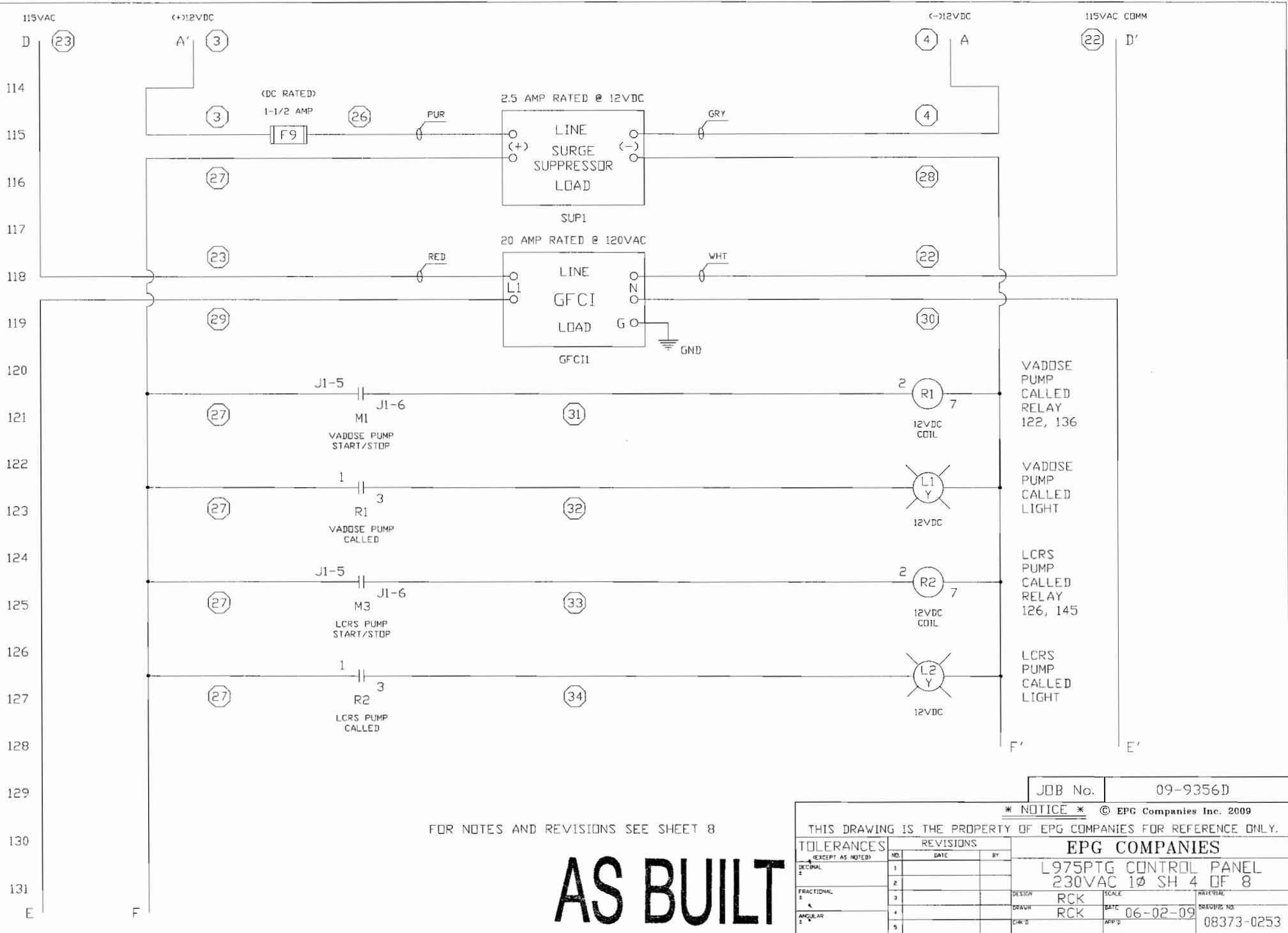
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DECIMAL	1							
FRACTIONAL	2							
	3				RCK			
ANGULAR	4				RCK	DATE		
	5				CHK'D	APP'D	06-02-09	

L975PTG CONTROL PANEL
230VAC 1Ø SH 3 OF 8

DRAWING NO. 08373-0252

AS BUILT

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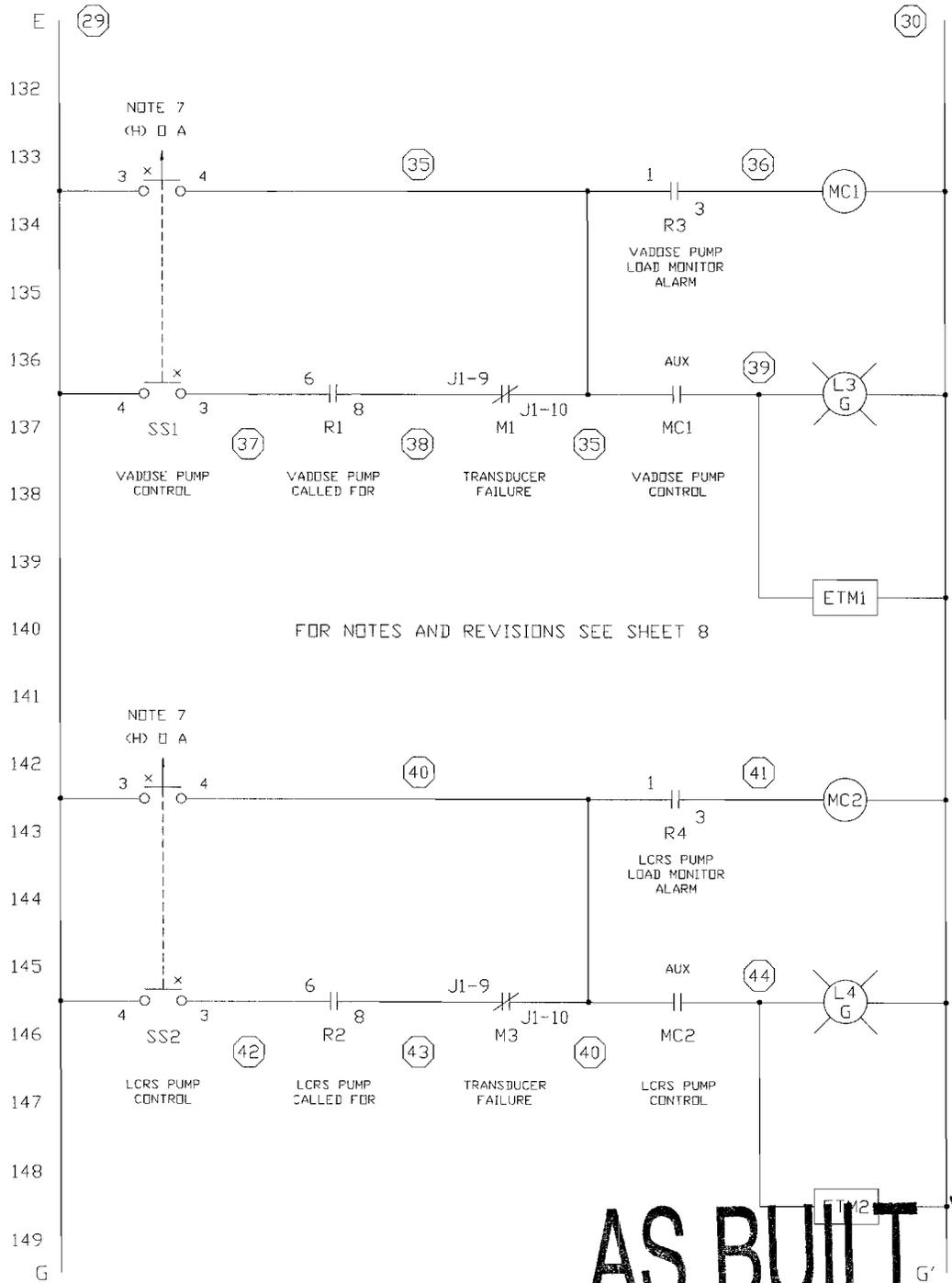


JOB No. 09-9356D

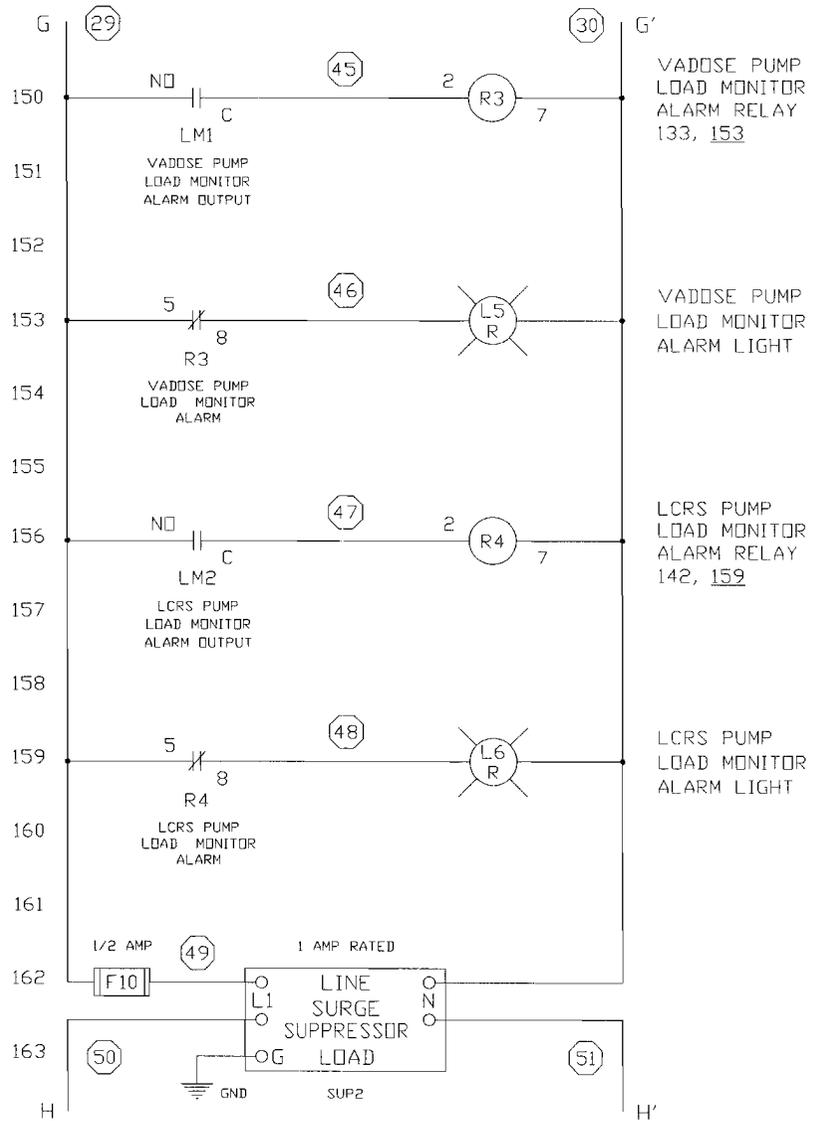
FOR NOTES AND REVISIONS SEE SHEET 8

AS BUILT

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TOLERANCES		REVISIONS	
(EXCEPT AS NOTED)	NO.	DATE	BY
DECIMAL ±	1		
FRACTIONAL ±	2		
ANGULAR ±	3		
	4		
	5		
EPG COMPANIES		DESIGN	RCK
L975PTG CONTROL PANEL		DRAWN	RCK
230VAC 1Ø SH 4 OF 8		SCALE	
DRAWING NO. 08373-0253		DATE	06-02-09
APPROV'D		DATE	



AS BUILT



JOB No. 09-9356D

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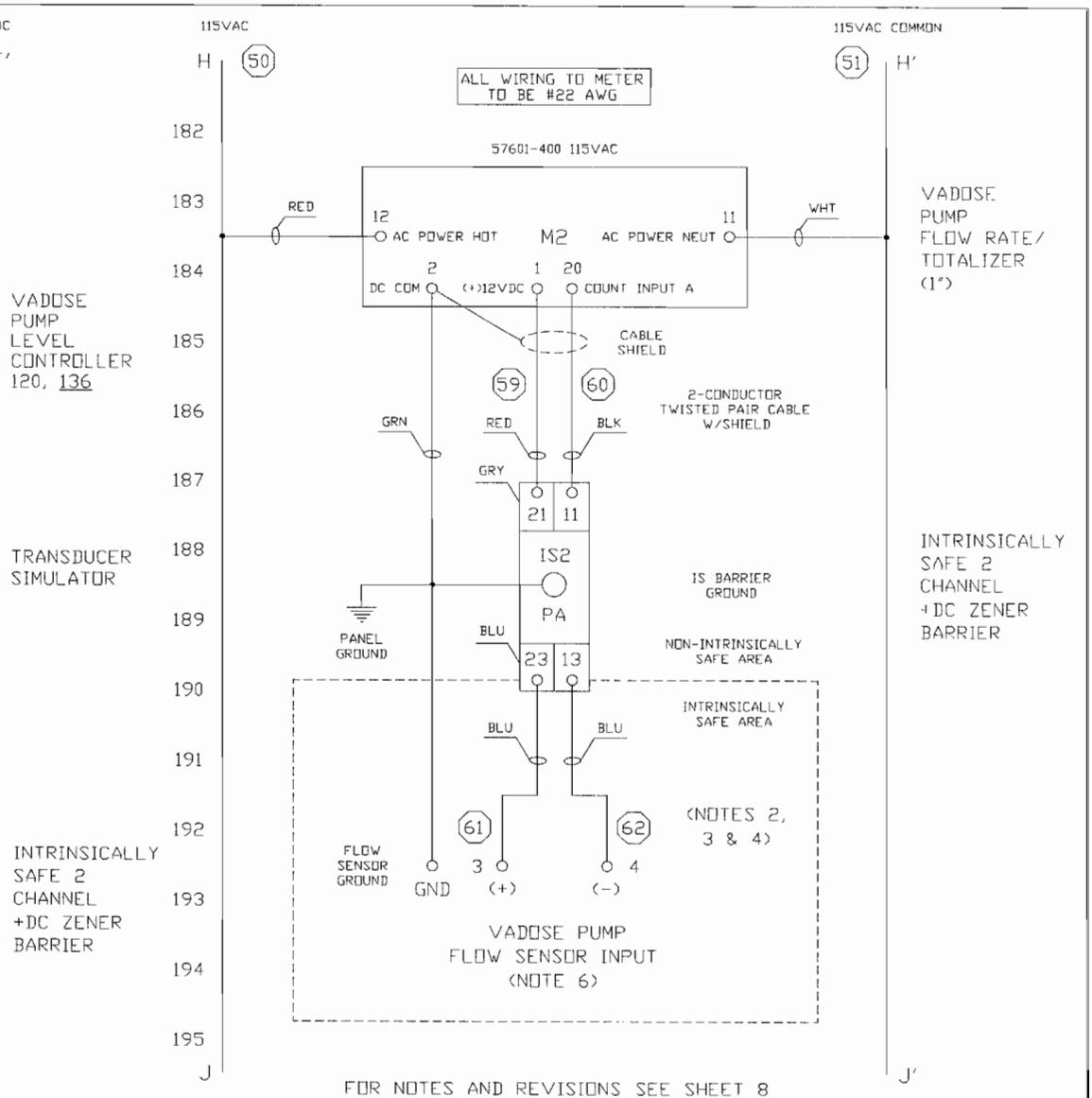
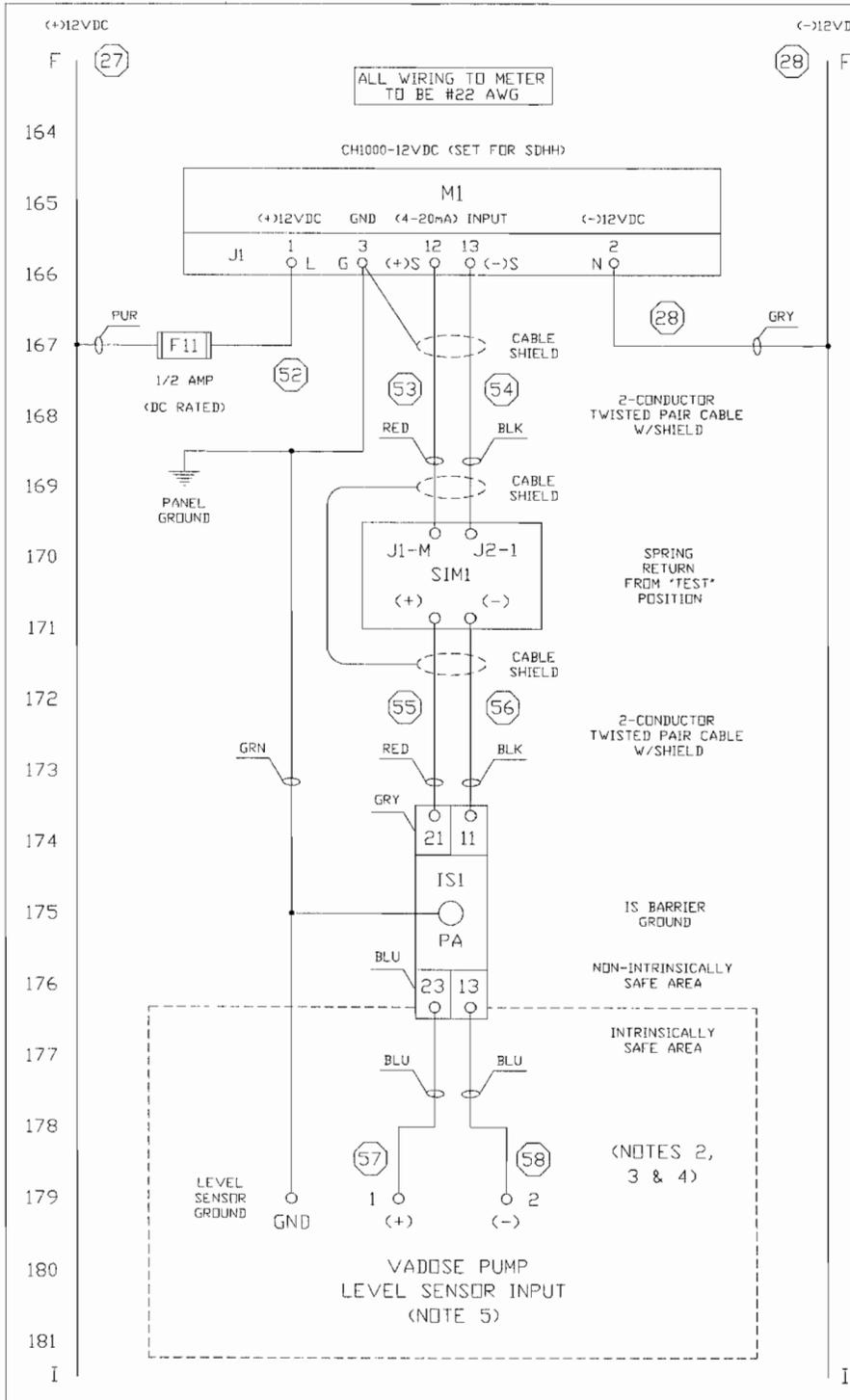
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(EXCEPT AS NOTED)		NO.	DATE	BY	DESIGN	SCALE	MATERIAL
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FRACTIONAL	±	2					
ANGULAR	±	3					
		4					
		5					

L975PTG CONTROL PANEL
230VAC 1Ø SH 5 OF 8

DESIGN RCK SCALE MATERIAL
DRAWN RCK DATE 06-02-09 DRAWING NO
CHK'D AMP'D

08373-0254



FOR NOTES AND REVISIONS SEE SHEET 8

JOB No. 09-9356D

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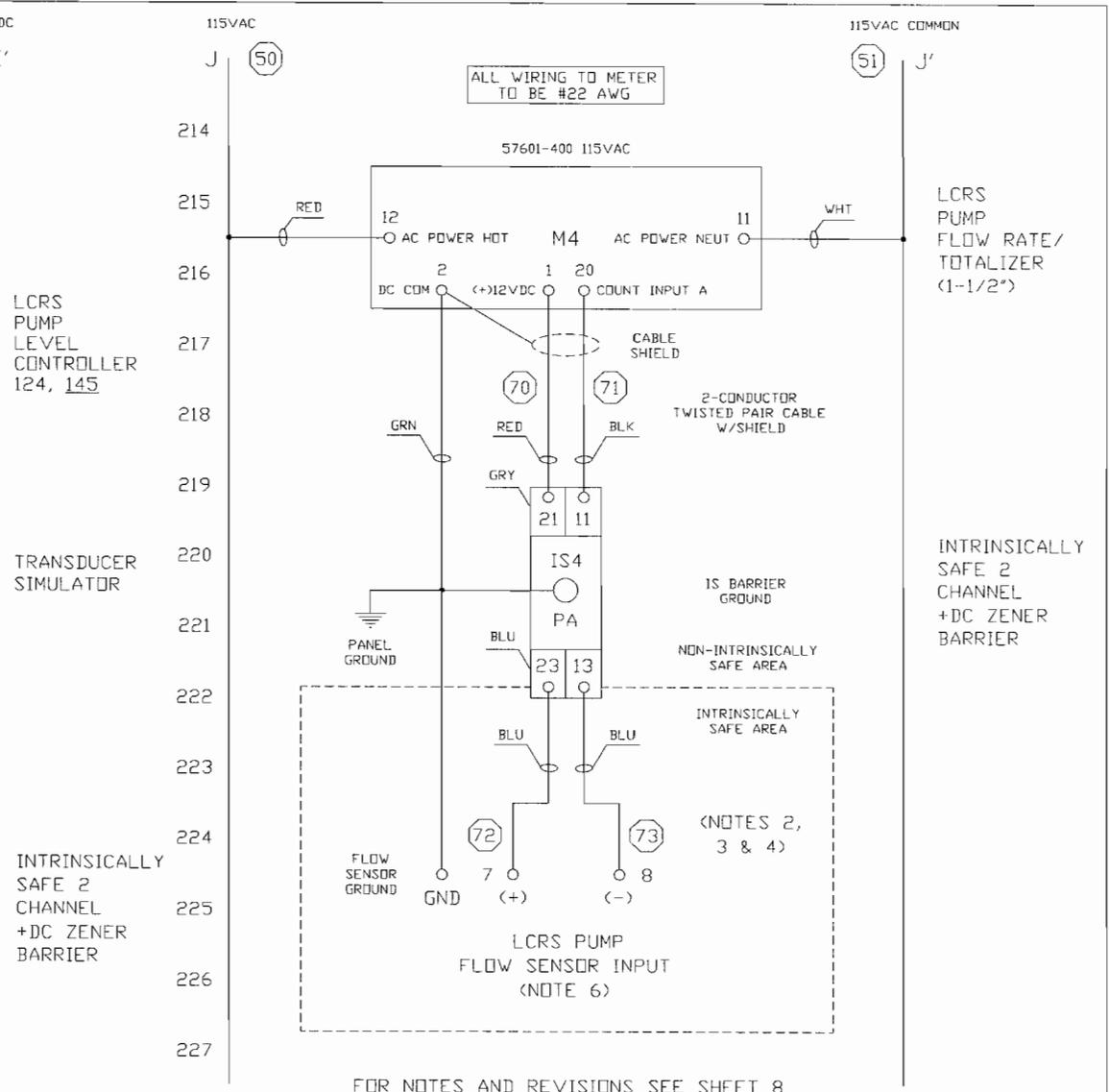
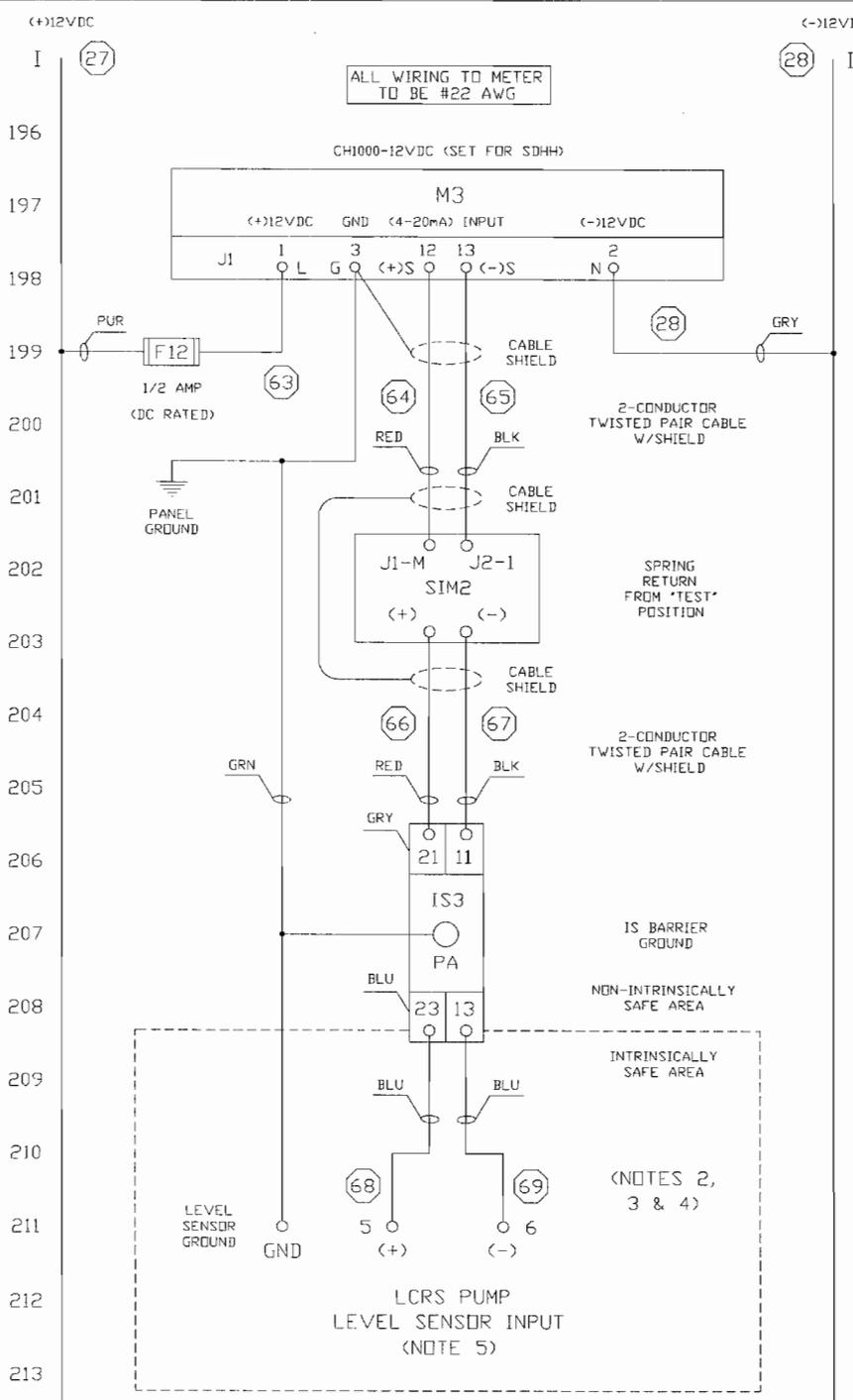
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TOLERANCES		REVISIONS			EPG COMPANIES			
(EXCEPT AS NOTED)		NO.	DATE	BY				
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		2						
		3						
		4						
		5						

L975PTG CONTROL PANEL
230VAC 1Ø SH 6 OF 8

DESIGN RCK SCALE MATERIAL
DRAWN RCK DATE 06-02-09 WORKING NO.
CHK'D APP'D 08373-0255

AS BUILT



LCRS PUMP LEVEL CONTROLLER 124, 145

TRANSDUCER SIMULATOR

INTRINSICALLY SAFE 2 CHANNEL +DC ZENER BARRIER

LCRS PUMP FLOW RATE/TOTALIZER (1-1/2")

INTRINSICALLY SAFE 2 CHANNEL +DC ZENER BARRIER

FOR NOTES AND REVISIONS SEE SHEET 8
LAST WIRE NUMBER USED: 73

JOB No. 09-9356D

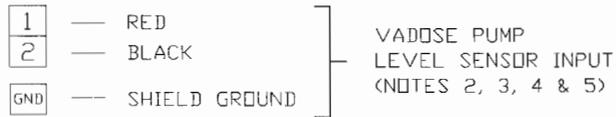
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TOLERANCES (EXCEPT AS NOTED):		REVISIONS	
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		L975PTG CONTROL PANEL	
		230VAC 1Ø SH 7 OF 8	
DESIGN	RCK	SCALE	
DRAWN	RCK	DATE	06-02-09
CHK'D		APP'D	
			DRAWING NO. 08373-0256

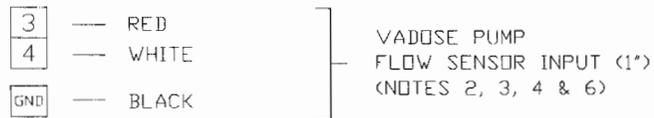
AS BUILT

FIELD WIRING TERMINALS

LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



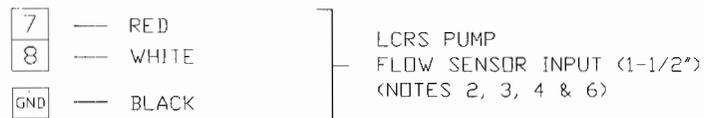
FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



NOTE:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
5. MAXIMUM CABLE LENGTH TO THE LEVEL SENSOR IS 3000 FEET
6. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR IS 500 FEET
7. SELECTOR SWITCHES, (SS1-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION

JOB No.	09-9356D
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TOLERANCES		REVISIONS		EPG COMPANIES		
(EXCEPT AS NOTED)		NO.	DATE	BY	SCALE	MATERIAL
FRACTIONAL		1				
ANGULAR		2				
		3				
		4				
		5				

L975PTG CONTROL PANEL
230VAC 1Ø SH 8 OF 8

DESIGN	SCALE	DATE	DRAWING NO.
RCK		06-02-09	08373-0257
DRAWN	RCK	APPR	
CHECK			

AS BUILT

**Phase IIIB
Installation Records**

EPG Companies Inc.

SurePump™ Installation Record

Form Completed by: KEY Installation Date: 8/28/09
 Company: HAMPTON REDDEN ELECTRIC EPG Serial #: 09-9356D

PUMPS, CONTROLS AND POWER SUPPLY

Installer: <u>HTE</u>	Address: <u>4920 ALTO AVE. LAS VEGAS, NV. 89115</u>	Installation Location: <u>PHASE 3B LCRS</u>
Motor Model <u>WSDPT-5-3</u>	HP <u>3/4</u>	Volts: <u>230 VAC</u> Max Amps Rating: <u>6.8</u>
Pump Model: <u>EPG WSDPT SURE PUMP</u>	Power Supply Transformers: Number Used: KVA Each: <u>.350</u>	Hertz: <u>60</u> Comments:
Pump Control Panel: Mfg. & Model #: <u>L975PTG</u>	Motor Starter Size: <u>5HP</u>	Overload Heater Part or setting range: <u>NA</u>
IEC Starters:	Lightning Arrestors: Mfg. & Model:	Surge Capacitors: Yes _____ No <input checked="" type="checkbox"/>
Disconnect Fuse or Circuit Breaker Amp Rating: <u>40</u>	Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) <u>-</u>	

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS:	GPM	VOLTS			AMPS		
Pump Not Running	<u>0</u>	R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>216</u>	<u>0</u>		
Open Discharge		R-Y _____	R-B _____	B-Y _____	R _____	Y _____	B _____
Normal Operation		R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>215</u>	R <u>0</u>	Y <u>6.5</u>	B <u>6.6</u>
Run Time _____							
Off Time _____							

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: <u>1 1/2</u>	Discharge Pressure:	Pump Submergence:	Fluid Temp: _____ "F" _____ "C"
External Check Valve Used? <u>NO</u>	Location:	Cable Length & Size: <u>70' 14GA</u>	Ground Resistance
Insulation Megohm Readings:	Before Installation:	After Installation: <u>5.29G</u>	After 30 min. Run: <u>NA</u>

SENSORS

Type of Level Sensor:	Transmitter Serial Number:
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	
Length of Sensor Lead: <u>70'</u>	Ohm Readings Across I.S. Barrier: <u>230</u>
mA Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: <u>20.</u> VAC Voltage Leaving Level Meter: _____ VAC <u>21.4 VDC</u>
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311 Phone: 800-762-8418 FAX: 763-493-4812

EPG SurePump™ Installation Record

EPG Job No. 09-9356

Installer's Name HAMPTON TEDDER ELECTRIC CO.

Address 4920 ALTO AVE

City LAS VEGAS State NV. Zip 89115

Phone (702) 646-7449 Fax (702) 453-5412

Contact name ROGER CATES

Owner's Name BASIL REMEDIATION CO.

Address 875 W. WARM SPRINGS RD.

City HENDERSON State NV. Zip 89011

Phone (702) 567-0400 Fax (702) 567-5524

Contact name LEE C. FARRIS, PE

Sump Name ID PHASE III B LCAS Date Installed 8/28/09

Leachate or Condensate Temp _____ °F Or °C

Pump:

Model No. WSDPT 3-3

Rating: 10 GPM/yr 50 Ft. TDH

HP .5 Voltage 230 Phase 1

Actual Pump Delivery _____ GPM/yr _____ PSI

Operating Cycle _____ ON (Min Hr) _____ OFF (Min Hr)

(Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

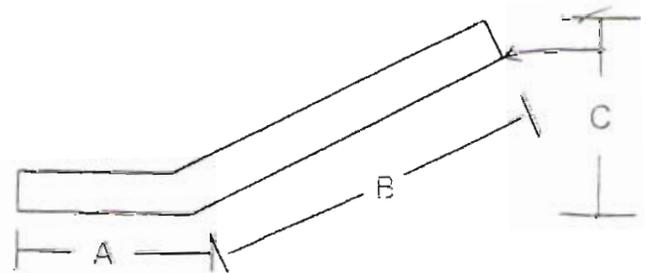
Slope 2.1 : 1

Length of riser Pipe (A-B) 50.9 ft

Vertical Distance = Sump to
INV Top of Riser Pipe (C) 17.2 ft

Riser ID PHASE III B LCAS SDR 11

Distance From Top of Riser
Pipe to Controller 15 ft



Power Supply:

Cable Service Entrance to Control Distance _____ ft Wire size _____ AWG/MCM

Copper Jacketed Aluminum Individual conductors

Cable Control to Motor _____ ft _____ AWG/MCM

Copper Jacketed

INSTALLATION GUIDE

EPG SurePump™ Pumping System

- ✓ 1. Verify that equipment and supply voltage match.
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling
- ✓ 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c.
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump.
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater.
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color coded to simplify connections
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ 18. Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
20. Compare these reading to voltage listed on drawing and label in control panel.
21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
23. Turn on power at panel main disconnect.
24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
25. If level and flow meter do not light up check GFCL, reset if necessary.
26. Are any indicator lights on?
27. Should they be on?
28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.
30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
34. After pump and level sensor have been tested pot seal offs.
35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePump™ Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- A: Were sensor and power cable tied or strapped to discharge line?
- B: On what kind of spacing?
- C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- D: What size cable was run for supply power?
- E: What is the distance from power supply transformer to pump control panel?
- F: How did they verify that pump is down into sump?
- G: Did they test level sensor prior to installing?
- H: Did they test pump prior to installing or prior to your arrival?
- I: Do they have any questions or concerns?
- J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL

- A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel.
- B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- D: Are seal offs potted? If not, stop work and have them potted.
- E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- F: Make sure ground wire is in place between outer door and enclosure.

PRIOR TO ENERGIZING CONTROL PANEL

- ✓ A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- ✓ B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ C: Compare these reading to voltage listed on drawing and label in control panel.
- ✓ D: Megger motor leads resistance must be 1 megohm or greater.
- ✓ E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- ✓ F: Inspect inside of control panel. Look for items which may have come loose during shipping
- ✓ G: Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- ✓ J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- ✓ A: Turn on power at panel main disconnect.
- ✓ B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ C: If level and flow meter do not light up check GFCI, reset if necessary.
- ✓ D: Are any indicator lights on?
- ✓ E: Should they be on?
- ✓ F: Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site.
- ✓ G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.

- H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- ⚡ J: When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- ⚡ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

EPG Companies Inc.

SurePump™ Installation Record

Form Completed by: KEY Installation Date: 8/28/09
 Company: HAMPTON TROOP WATER EPG Serial #: 09-9356D

PUMPS, CONTROLS AND POWER SUPPLY

Installer: <u>HTE</u>	Address: <u>4920 ALTO AVE. LAS VEGAS, NV. 89115</u>	Installation Location: <u>PHASE 3B VADOSE</u>		
Motor Model <u>WSDPT2-3</u>	HP <u>1/2</u>	Volts: <u>230</u>	Max Amps Rating: <u>5.0</u>	Pump Model: <u>EPG WSDPT ^{sure} PUMP</u>
Power Supply Transformers: Number Used: KVA Each: <u>.35</u>	Hertz: <u>60</u>	Comments:		
Pump Control Panel: Mfg. & Model #: <u>L975PT6</u>	Motor Starter Size: <u>.5 hp</u>	Overload Heater Part or setting range: <u>NA</u>	IEC Starters:	
Lightning Arrestors: Mfg. & Model: <u>Inkomatic AG240</u>	Surge Capacitors: Yes _____ No <input checked="" type="checkbox"/>	Disconnect Fuse or Circuit Breaker Amp Rating: <u>40</u>		
Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) <u>-</u>				

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS:	GPM	VOLTS			AMPS		
Pump Not Running (<u>Line</u>)	<u>0</u>	R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>214</u>	<u>0</u>		
Open Discharge		R-Y _____	R-B _____	B-Y _____	R _____	Y _____	B _____
Normal Operation		R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>214</u>	R <u>0</u>	Y <u>5.29</u>	B <u>5.16</u>
Run Time _____							
Off Time _____							

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: <u>1 1/2"</u>	Discharge Pressure:	Pump Submergence:	Fluid Temp: ____ °F ____ °C
External Check Valve Used? <u>NO</u>	Location:	Cable Length & Size: <u>73' 14GA</u>	Ground Resistance <u>2 ohms</u>
Insulation Megohm Readings:	Before Installation:	After Installation: <u>5.76G</u>	After 30 min. Run: <u>NA</u>

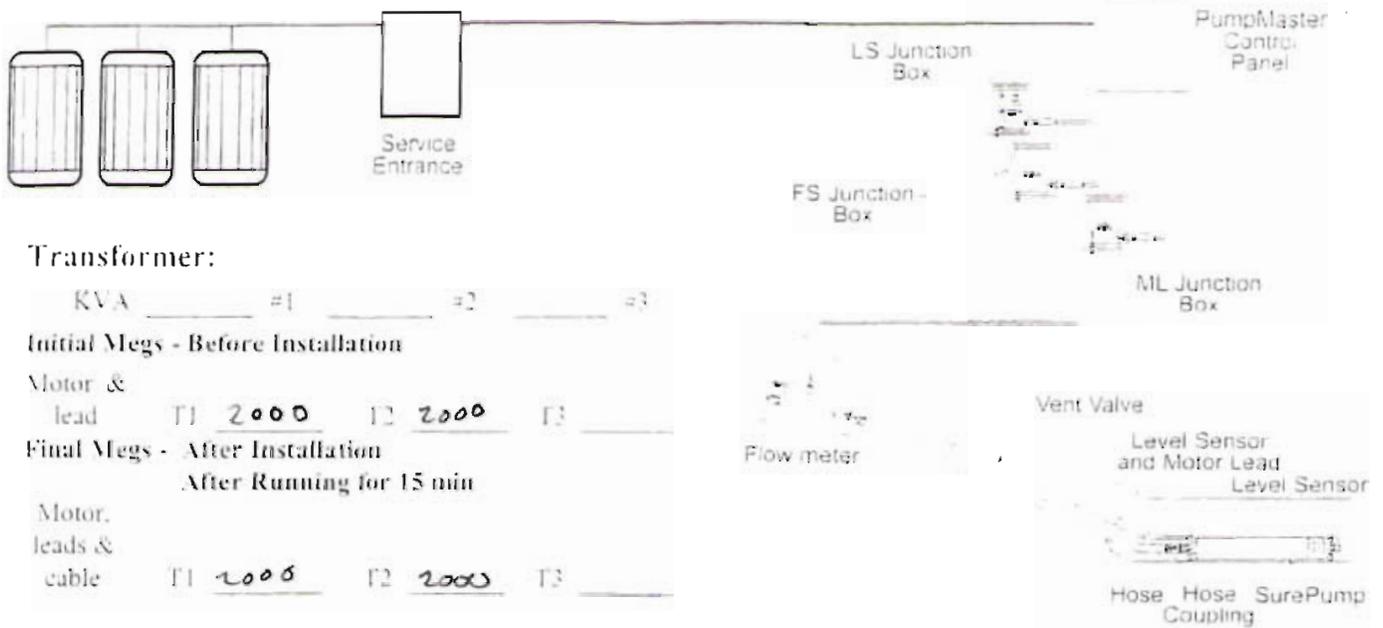
SENSORS

Type of Level Sensor:	Transmitter Serial Number:
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	
Length of Sensor Lead: <u>113' 73'</u>	Ohm Readings Across I.S. Barrier: <u>230</u>
m-A Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: <u>12 VDC</u> Voltage Leaving Level Meter: <u>12 VDC</u>
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311. Phone: 800-762-8418. FAX: 763-493-4812.



Transformer:

KVA #1 #2 #3

Initial Megs - Before Installation

Motor & lead T1 2000 T2 2000 T3 _____

Final Megs - After Installation
After Running for 15 min

Motor, leads & cable T1 2000 T2 2000 T3 _____

Incoming Voltage:

No Load	L1-L2	<u>235</u>	L2-L3	_____	L1-L3	_____
Full Load	L1-L2	<u>236</u>	L2-L3	_____	L1-L3	_____

Running Amps:

Hookup:1						
Full Load	L1	<u>5</u>	L2	<u>5</u>	L3	_____ % unbalanced <u>0</u>
Hookup:2						
Full Load	L1	_____	L2	_____	L3	_____ % unbalanced _____
Hookup:3						
Full Load	L1	_____	L2	_____	L3	_____ % unbalanced _____

Ground wire size _____ AWG/MCM
DC Ground Current _____ mA Ground Test 2 Ohms

Motor Surge Protection _____ Yes _____ No

Control Panel:

Model # L975PTG

Short Circuit Device

Circuit Breaker _____ Rating _____ Setting _____
Fuses Fenr 8 Type 8 Rating _____
_____ Standard Time Delay _____

Controls are Grounded to:

_____ Motor
 Rod
_____ Power Supply

Start Overloads:

Set at N/A amps

Name HOWARD LESTER

Company EPG COMPANIES

Date SEPT 17 09

INSTALLATION GUIDE

EPG SurePumpTM Pumping System

- ✓ 1. Verify that equipment and supply voltage match.
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling
- ✓ 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c.
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump.
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater.
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color coded to simplify connections.
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ 18. Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

- 19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- 20. Compare these reading to voltage listed on drawing and label in control panel.
- 21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
- 22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
- 23. Turn on power at panel main disconnect
- 24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- 25. If level and flow meter do not light up check GFCL, reset if necessary.
- 26. Are any indicator lights on?
- 27. Should they be on?
- 28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
- 29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3" of slack in the cables.
- 30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- 31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- 32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
- 33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
- 34. After pump and level sensor have been tested pot seal offs.
- 35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePump™ Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- ✓ A: Were sensor and power cable tied or strapped to discharge line?
- ✓ B: On what kind of spacing?
- ✓ C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- ✓ D: What size cable was run for supply power?
- ✓ E: What is the distance from power supply transformer to pump control panel?
- ✓ F: How did they verify that pump is down into sump?
- ✓ G: Did they test level sensor prior to installing?
- ✓ H: Did they test pump prior to installing or prior to your arrival?
- ✓ I: Do they have any questions or concerns?
- ✓ J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL.

- ✓ A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel.
- ✓ B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- ✓ C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- ✓ D: Are seal offs potted? If not, stop work and have them potted.
- ✓ E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- ✓ F: Make sure ground wire is in place between outer door and enclosure.

PRIOR TO ENERGIZING CONTROL PANEL

- ✓ A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- ✓ B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ C: Compare these reading to voltage listed on drawing and label in control panel.
- ✓ D: Megger motor leads resistance must be 1 megohm or greater.
- ✓ E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- ✓ F: Inspect inside of control panel. Look for items which may have come loose during shipping
- ✓ G: Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- ✓ J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- ✓ A: Turn on power at panel main disconnect.
- ✓ B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ C: If level and flow meter do not light up check GFCI, reset if necessary.
- ✓ D: Are any indicator lights on?
- ✓ E: Should they be on?
- ✓ F: Make sure pump is turned off. Using built in or hand held simulator verify level meter settings are correct for this site.
- ✓ G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3" of slack in the cables.

- H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- Ⓛ J: When pump is running measure and record amperage and voltage. Check 3O systems for current balance within 5% of average.
- Ⓛ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

Phase IIIB
As-Built Control Panel Setup Parameters

EPG LevelMaster Pump controller

Panel S/N: 09-9356D

Meter S/N: 060509-02

LCRS Pump Level Control Meter

PHASE IIIB

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M3

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 20"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". 36.1"
Hy Hi	1	Keeps High Level Light on until level drops <u>1</u> " below AL Hi.
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

EPG LevelMaster Pump controller

Panel S/N: 09-9356D
Meter S/N: 060409-05

Vadose Pump Level Control Meter PHASE IIIB

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M1

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 17"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". .5"
Hy Hi	1	Keeps High Level Light on until level drops 1 " below AL Hi. .5"
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

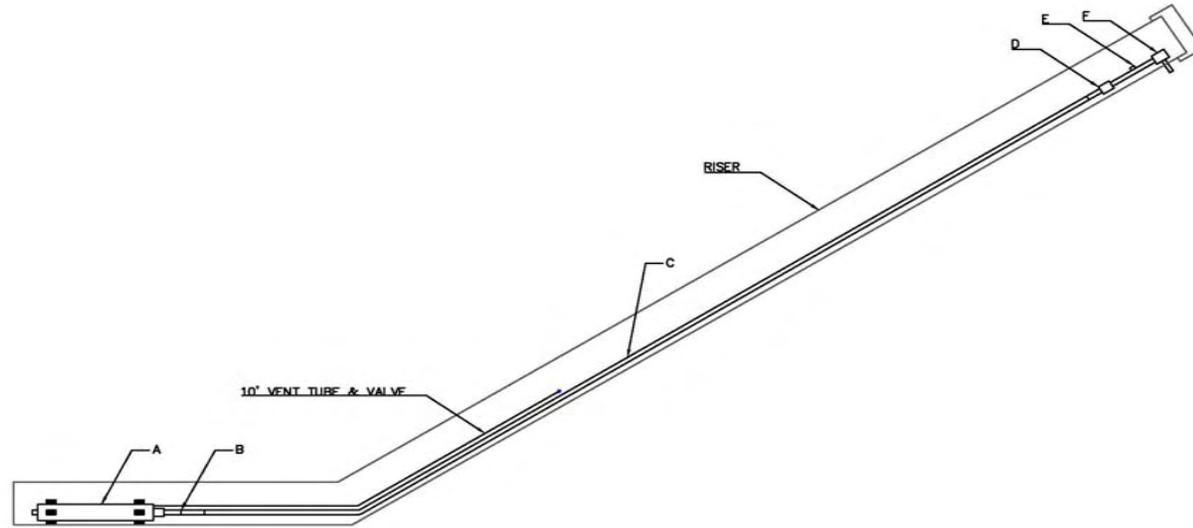
Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

Phase IIIB
As-Built Pump Installation Cross Sections

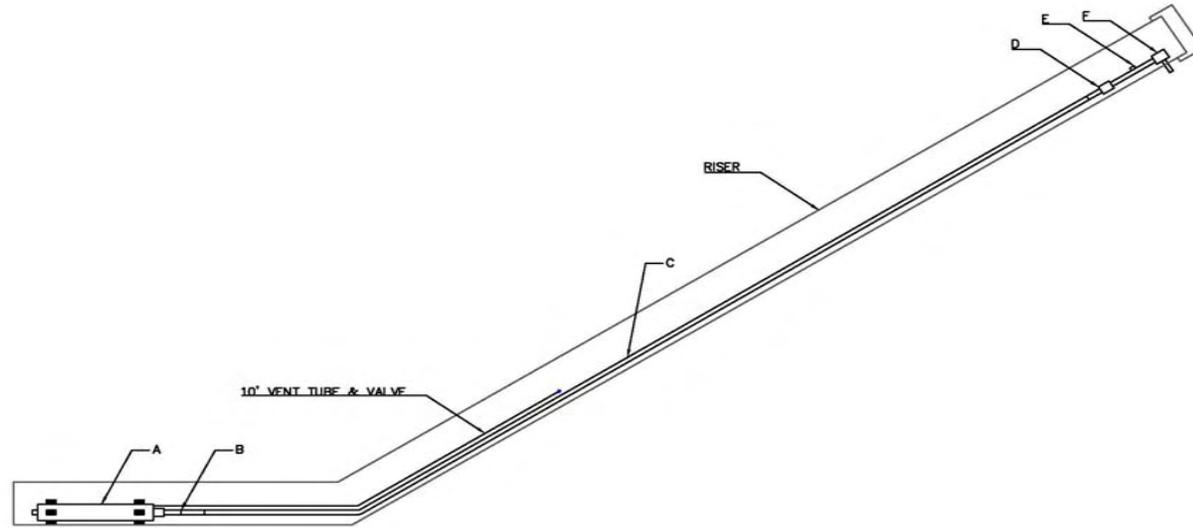
PHASE IIIB LCRS SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT5-3 PUMP (S/N 2009-3132)	2.7
B	CONNECTIONS/FITTINGS/TRANSITIONS	0.8
C	1.5" DISCHARGE LINE	36.8
D	CONNECTIONS/FITTINGS/TRANSITIONS	0.7
E	FLOW METER	2.2
F	EPG FITTING "T"	0.4

NOT TO SCALE

PHASE IIIB VADOSE SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT2-3 PUMP (S/N 2009-3136)	2.6
B	CONNECTIONS/FITTINGS/TRANSITIONS	1.1
C	1.0" DISCHARGE LINE	37.4
D	CONNECTIONS/FITTINGS/TRANSITIONS	0.5
E	FLOW METER	1.9
F	EPG FITTING "T"	0.3

NOT TO SCALE

**Phase IIIB
As-Built Photos**

Phase IIIB Controls

12v Marine Battery

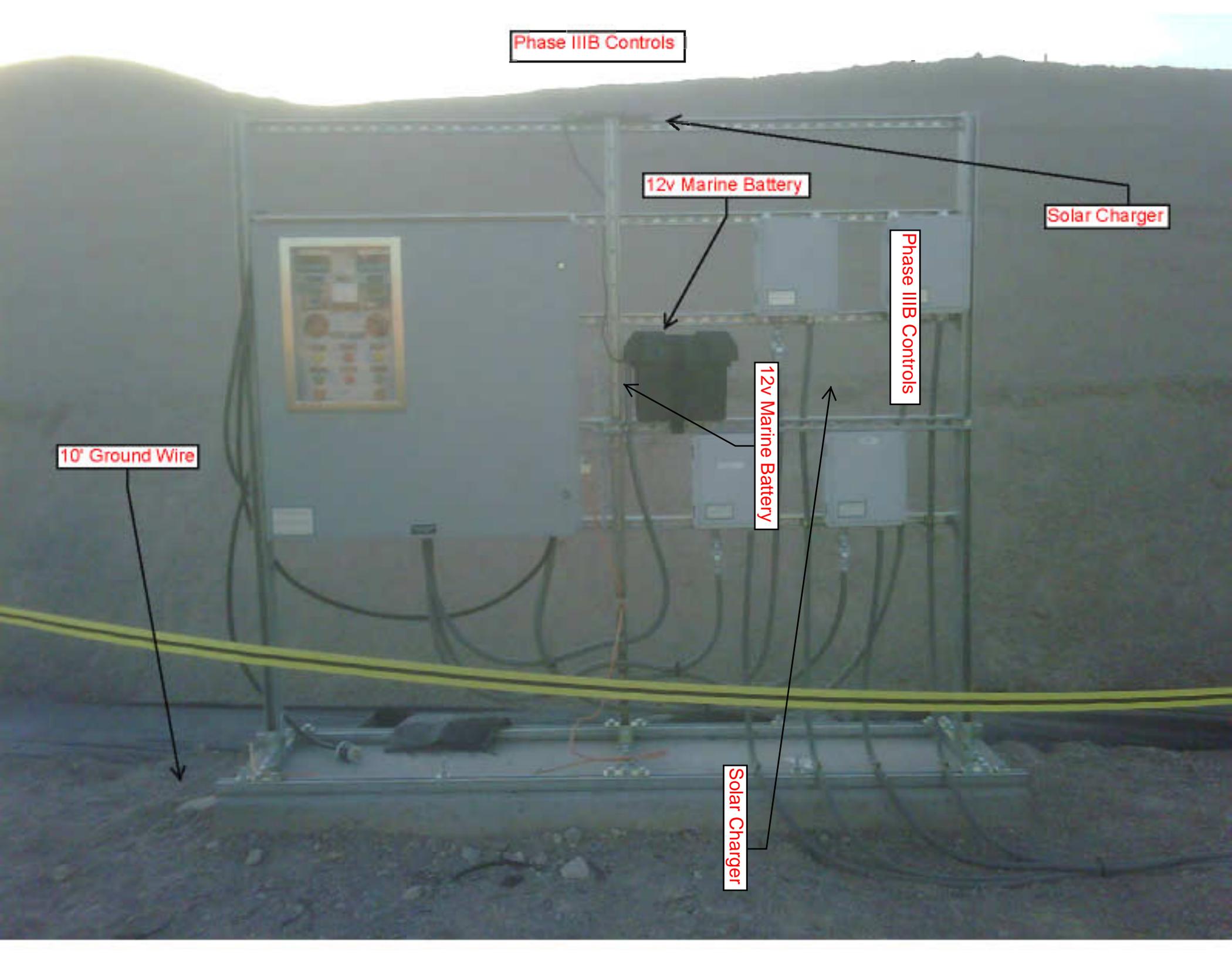
Solar Charger

Phase IIIB Controls

12v Marine Battery

10' Ground Wire

Solar Charger



Phase IIIB Controls & Risers

Phase IIIB Controls & Risers

quick connects
to discharge
lines

quick connects
to discharge
lines



Phase V
Engineer's Specification

ENGINEER'S SPECIFICATION

PHASE V LCRS

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 2¹ centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 5 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a ¾ HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 70 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 ½ inch MNPT threaded discharge nozzle and be capable of delivering 25 GPM at 50 feet of TDH. Each SurePump will be fitted with 70 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

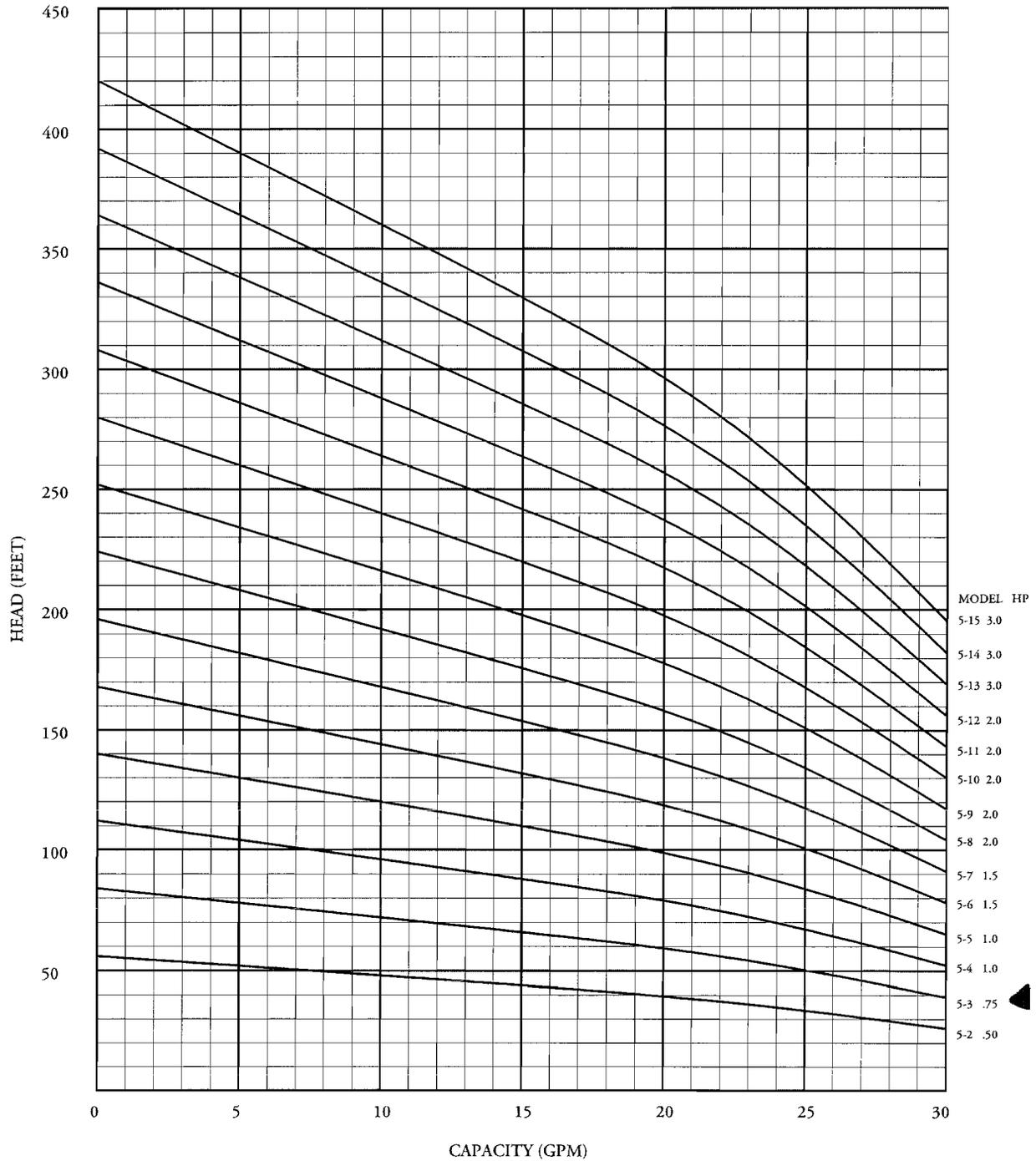
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in ½ HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

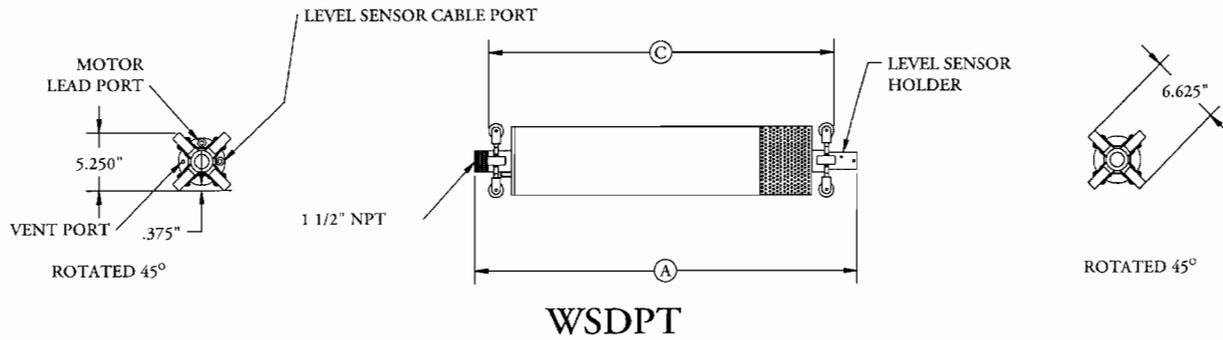
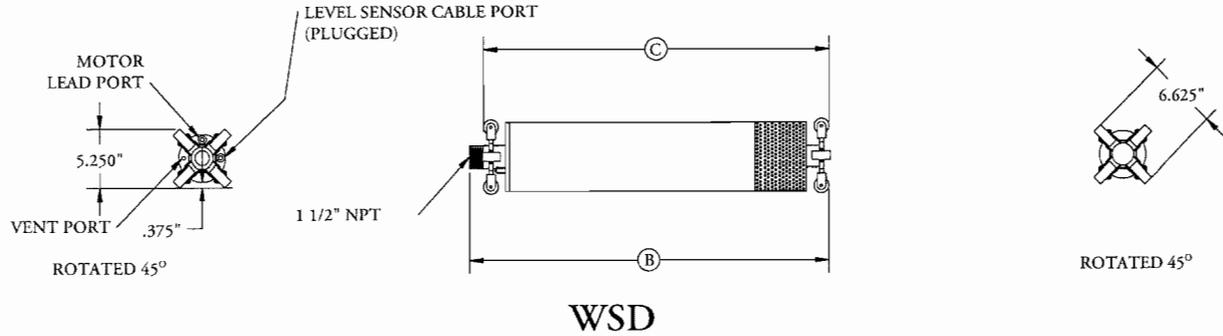
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 5 SurePump™
 Flow Range 15-30 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 5 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-2	0.50	1	31.02	29.90	29.15	61.47	66.47
5-2	0.50	3	31.02	29.90	29.15	61.47	66.47
5-3	0.75	1	32.98	31.86	31.11	66.24	71.24
5-3	0.75	3	32.98	31.86	31.11	66.24	71.24
5-4	1.00	1	34.90	33.78	33.03	70.98	75.98
5-4	1.00	3	34.90	33.78	33.03	70.98	75.98
5-5	1.00	1	35.73	34.61	33.86	71.88	76.88
5-5	1.00	3	35.73	34.61	33.86	71.88	76.88
5-6	1.50	1	38.43	37.31	36.56	79.22	84.22
5-6	1.50	3	36.56	35.44	34.69	72.77	77.77
5-7	1.50	1	39.26	38.14	37.39	80.12	85.12
5-7	1.50	3	37.39	36.27	35.52	73.67	78.67
5-8	2.00	1	41.59	40.47	39.72	85.17	90.17
5-8	2.00	3	40.09	38.97	38.22	81.01	86.01

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
5-9	2.00	1	42.42	41.30	40.55	86.07	91.07
5-9	2.00	3	40.92	39.80	39.05	81.90	86.90
5-10	2.00	1	43.25	42.13	41.38	86.96	91.96
5-10	2.00	3	41.75	40.63	39.88	82.80	87.80
5-11	2.00	1	44.08	42.96	42.21	87.86	92.86
5-11	2.00	3	42.58	41.46	40.71	83.69	88.69
5-12	2.00	1	44.91	43.79	43.04	88.75	93.75
5-12	2.00	3	53.41	52.29	51.54	92.35	97.35
5-13	3.00	1	54.24	53.12	52.37	119.24	124.24
5-13	3.00	3	51.24	50.12	49.37	105.91	110.91
5-14	3.00	1	55.07	53.95	53.20	120.14	125.14
5-14	3.00	3	52.07	50.95	50.20	106.81	111.81
5-15	3.00	1	55.90	54.78	54.03	121.03	126.03
5-15	3.00	3	52.90	51.78	51.03	107.70	112.70

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
 WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
 WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
 LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

PHASE V VADOSE

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations
with built-in level sensor

Furnish 2¹ centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT 2 - 3 with 3 impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a 1/2 HP, submersible electric motor for operation on 230 Volts, 1 phase, 60 Hertz service with 70 feet of power cable. Each SurePump Wheeled Sump Drainer shall have a 1 1/4 inch MNPT threaded discharge nozzle and be capable of delivering 10 GPM at 50 feet of TDH. Each SurePump will be fitted with 70 feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN

Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. A removable transmitter mount (patent pending) shall be installed at the center bottom of the Sump Drainer for liquid level control. The Sump Drainer shall permit the unit to "pump down" to within 8 inches of the sump bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

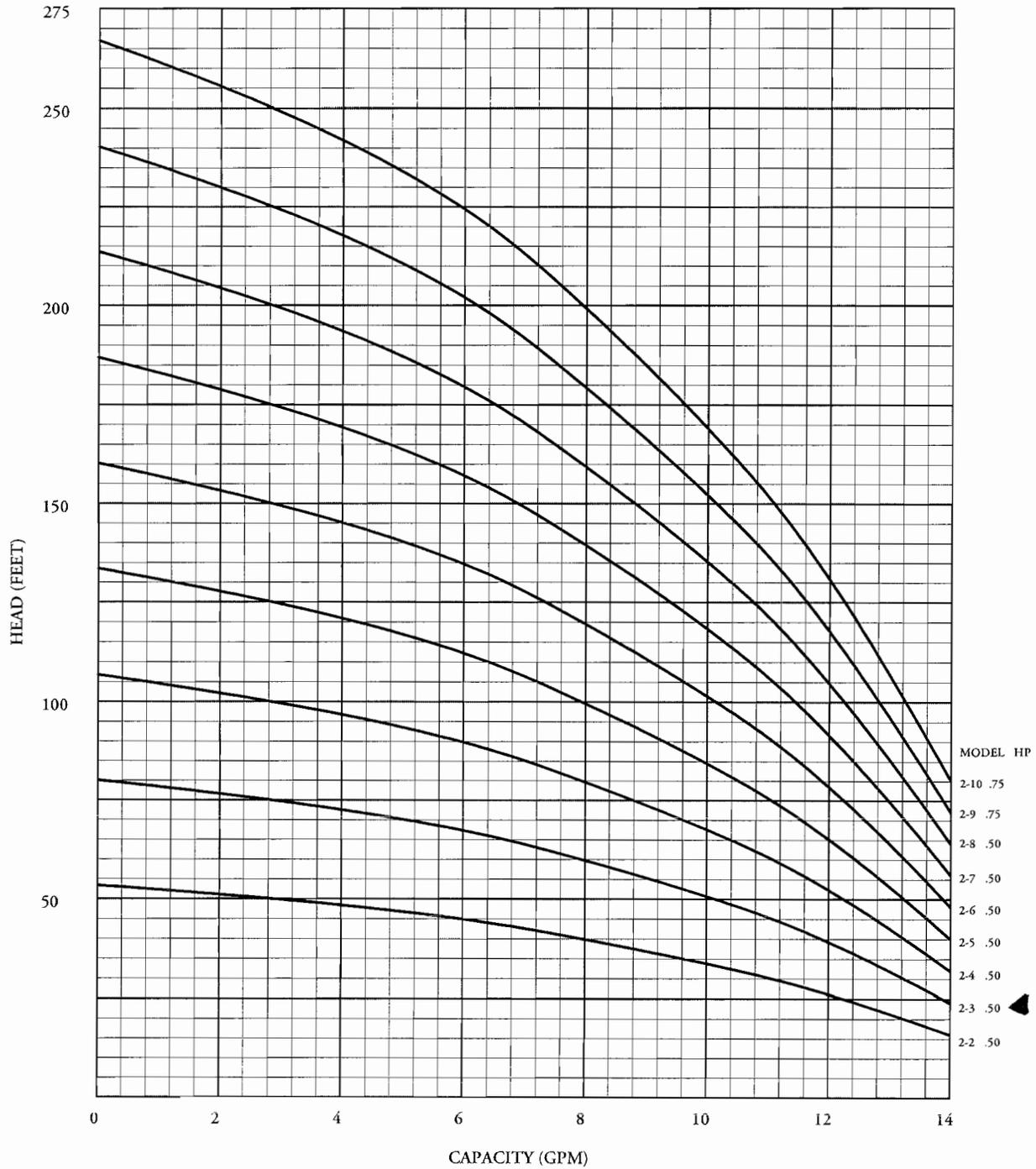
MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Pollution Recovery construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in 1/2 HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

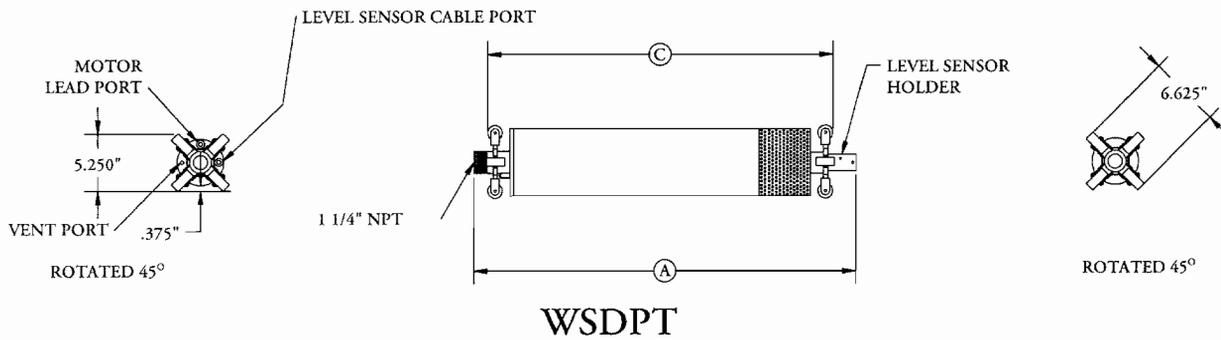
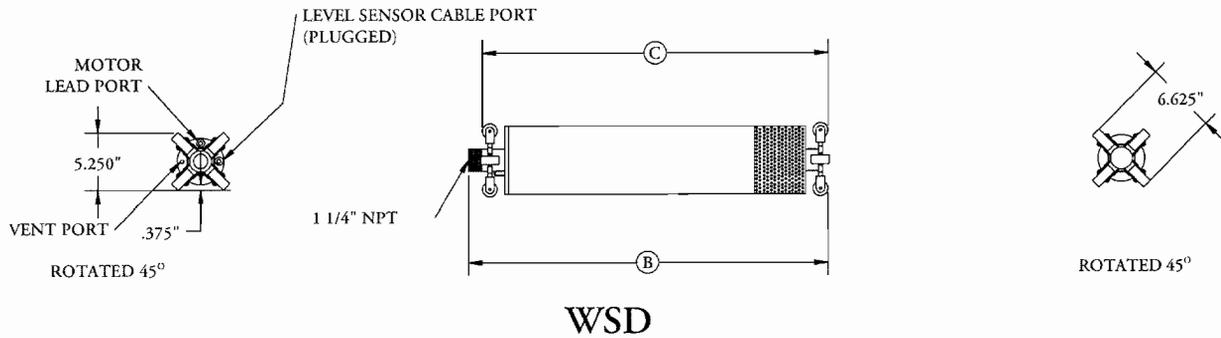
The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

SERIES 2 SurePump™
 Flow Range 4-14 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 2 SIZE 4 WHEELED SUMP DRAINER



MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
2-2	0.50	1	31.02	29.90	29.15	61.47	66.47
2-2	0.50	3	31.02	29.90	29.15	61.47	66.47
2-3	0.50	1	31.85	30.73	29.98	62.37	67.37
2-3	0.50	3	31.85	30.73	29.98	62.37	67.37
2-4	0.50	1	32.68	31.56	30.81	63.26	68.26
2-4	0.50	3	32.68	31.56	30.81	63.26	68.26
2-5	0.50	1	33.51	32.39	31.64	64.15	69.15
2-5	0.50	3	33.51	32.39	31.64	64.15	69.15
2-6	0.50	1	34.34	33.22	32.47	65.05	70.05
2-6	0.50	3	34.34	33.22	32.47	65.05	70.05
2-7	0.50	1	35.17	34.05	33.30	65.94	70.94
2-7	0.50	3	35.17	34.05	33.30	65.94	70.94
2-8	0.50	1	36.00	34.88	34.13	66.84	71.84
2-8	0.50	3	36.00	34.88	34.13	66.84	71.84
2-9	0.75	1	37.96	36.84	36.09	71.61	76.61
2-9	0.75	3	37.96	36.84	36.09	71.61	76.61
2-10	0.75	1	38.79	37.67	36.92	72.50	77.50
2-10	0.75	3	38.79	37.67	36.92	72.50	77.50

NOTE: ALL DIMENSIONS ARE IN INCHES.

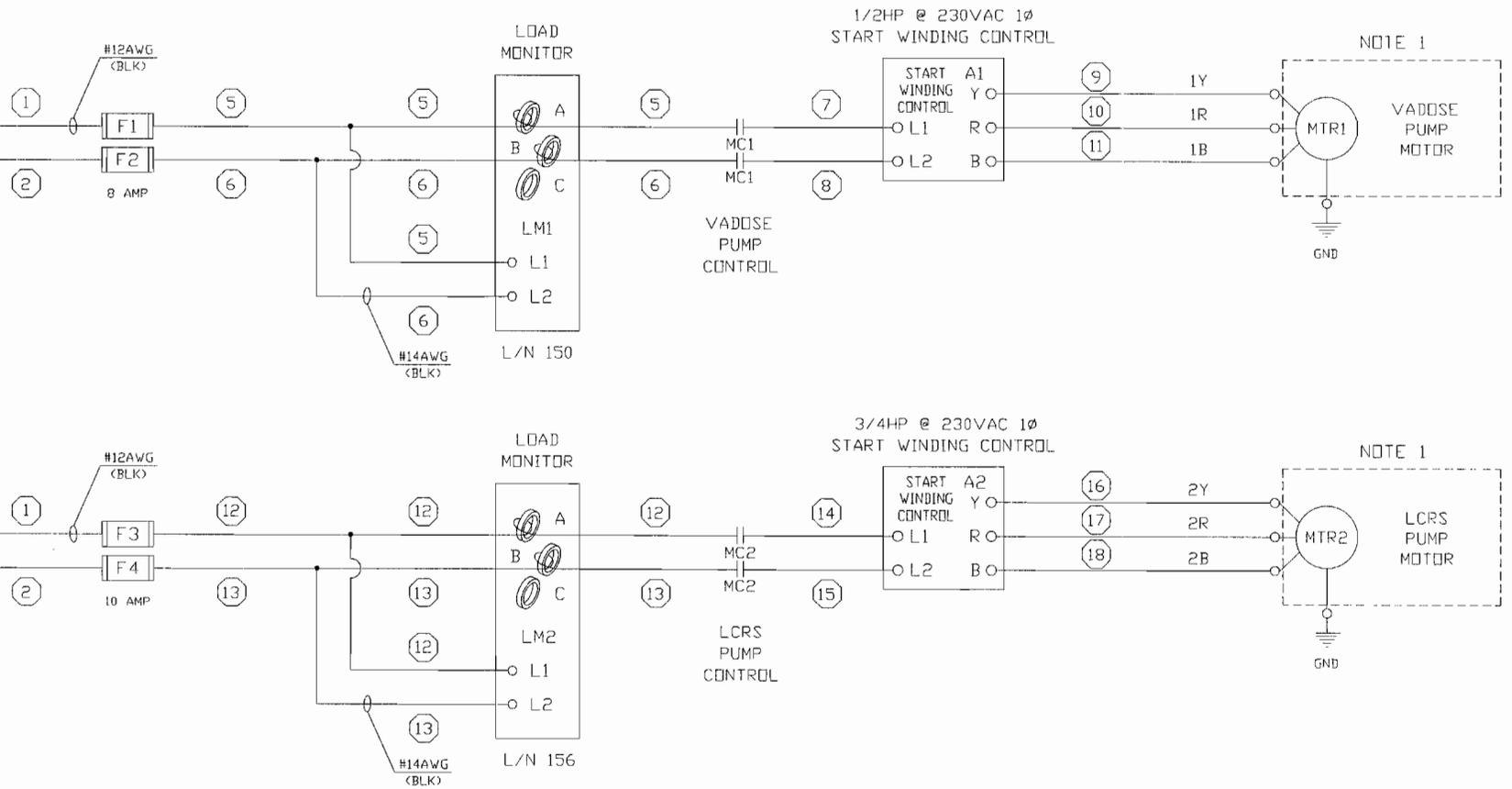
*SHIPPING WEIGHT INCLUDES
WSD: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
WSDPT: CRATE, 50' OF 14-4 MOTOR LEAD, 50' OF 1/8" SS CABLE,
LEVEL SENSOR AND CABLE.

Phase V
As-Built Control Panel Schematics

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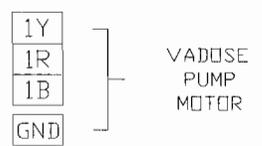
B (2) (1) B'

FOR NOTES AND REVISIONS SEE SHEET 8



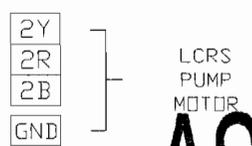
FIELD WIRING TERMINALS

LOAD (230VAC)



FIELD WIRING TERMINALS

LOAD (230VAC)



C 230VAC C'

JOB No. 09-9356C

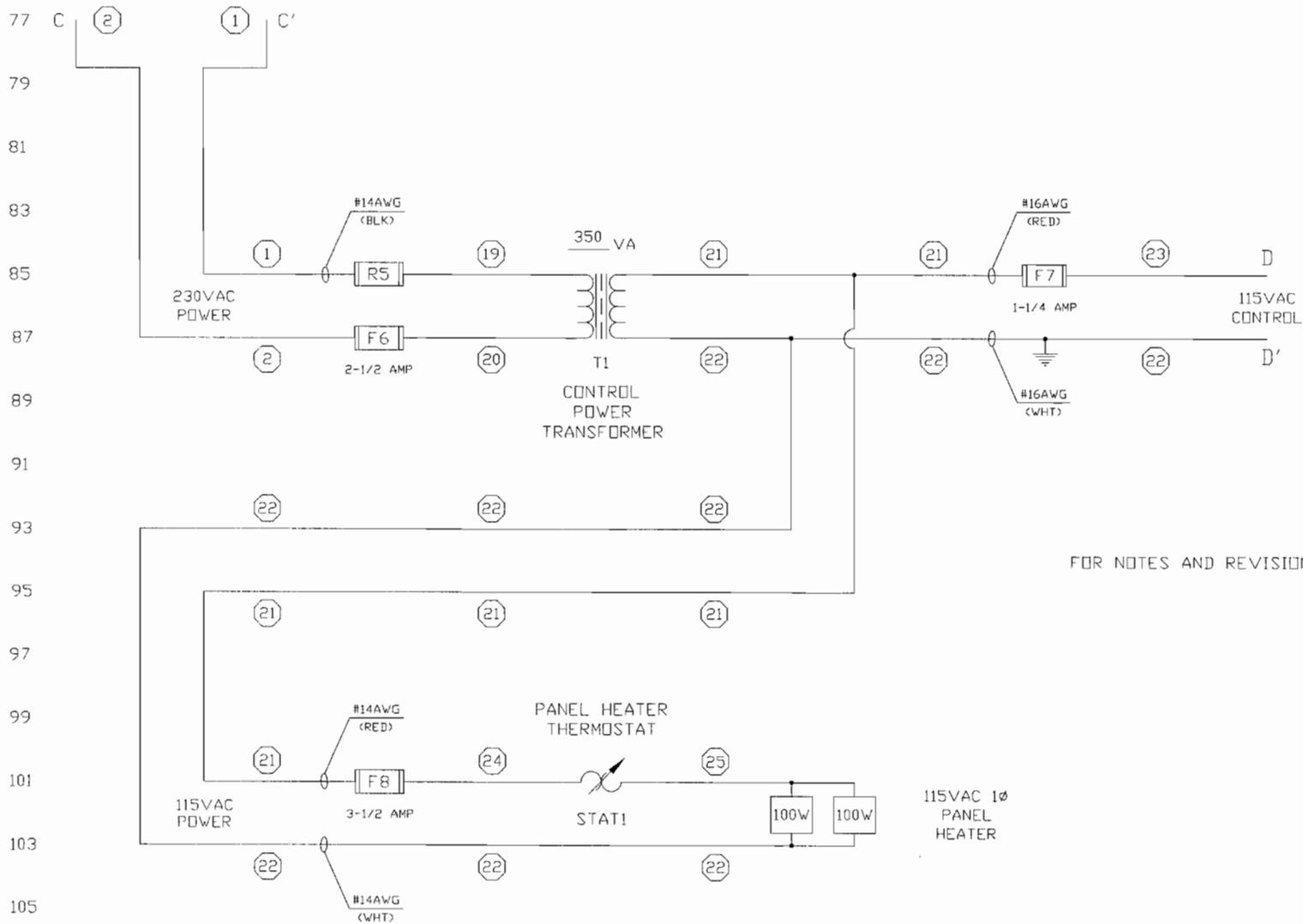
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TOLERANCES		REVISIONS		EPG COMPANIES		
(EXCEPT AS NOTED)	NO.	DATE	BY	DESIGN	SCALE	MATERIAL
	1					
	2					
	3					
	4					
	5					

L975PTG CONTROL PANEL
 230VAC 1Ø SH 2 OF 8
 DESIGN RCK
 DRAWN RCK
 DATE 06-02-09
 CHECKED
 APP'D
 DRAWING NO. 08373-0251

AS BUILT



FOR NOTES AND REVISIONS SEE SHEET 8

JOB No. 09-9356C

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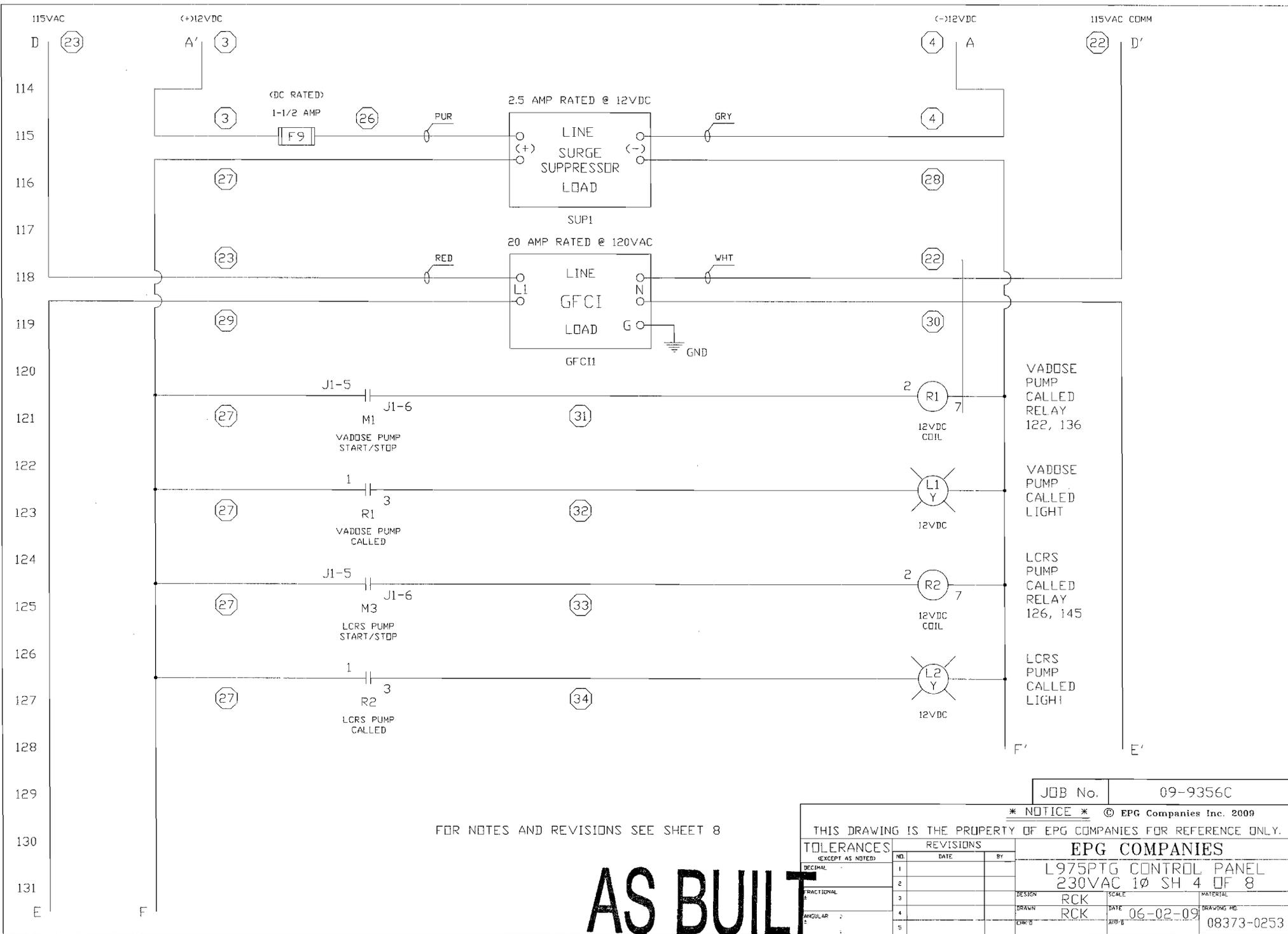
TOLERANCES		REVISIONS			EPG COMPANIES			
(EXCEPT AS NOTED)		NO.	DATE	BY	DESIGN	SCALE	MATERIAL	DRAWING NO.
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2					RCK			
3								
4								
5								

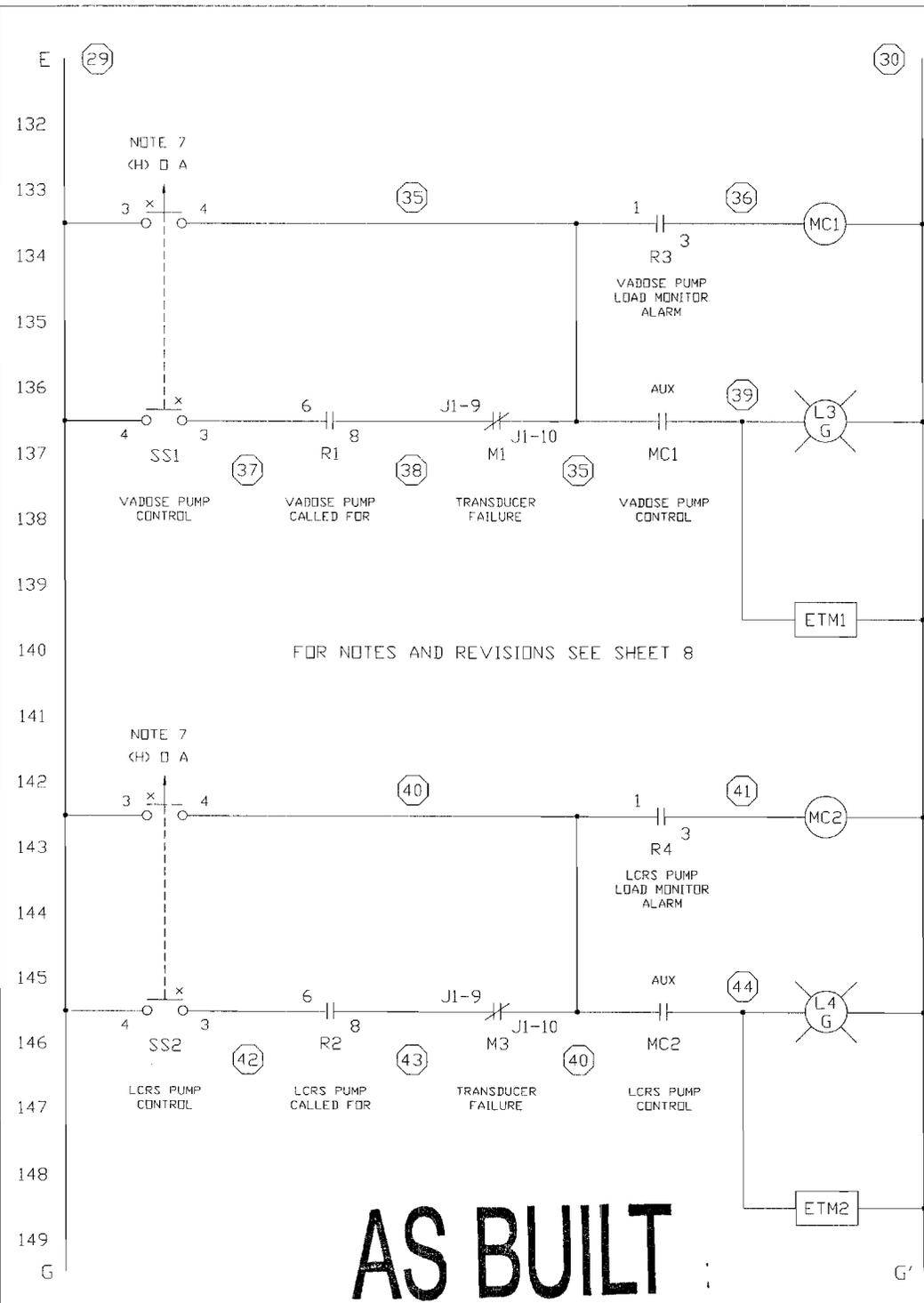
L975PTG CONTROL PANEL
230VAC 1Ø SH 3 OF 8

DATE 06-02-09
DRAWING NO. 08373-0252

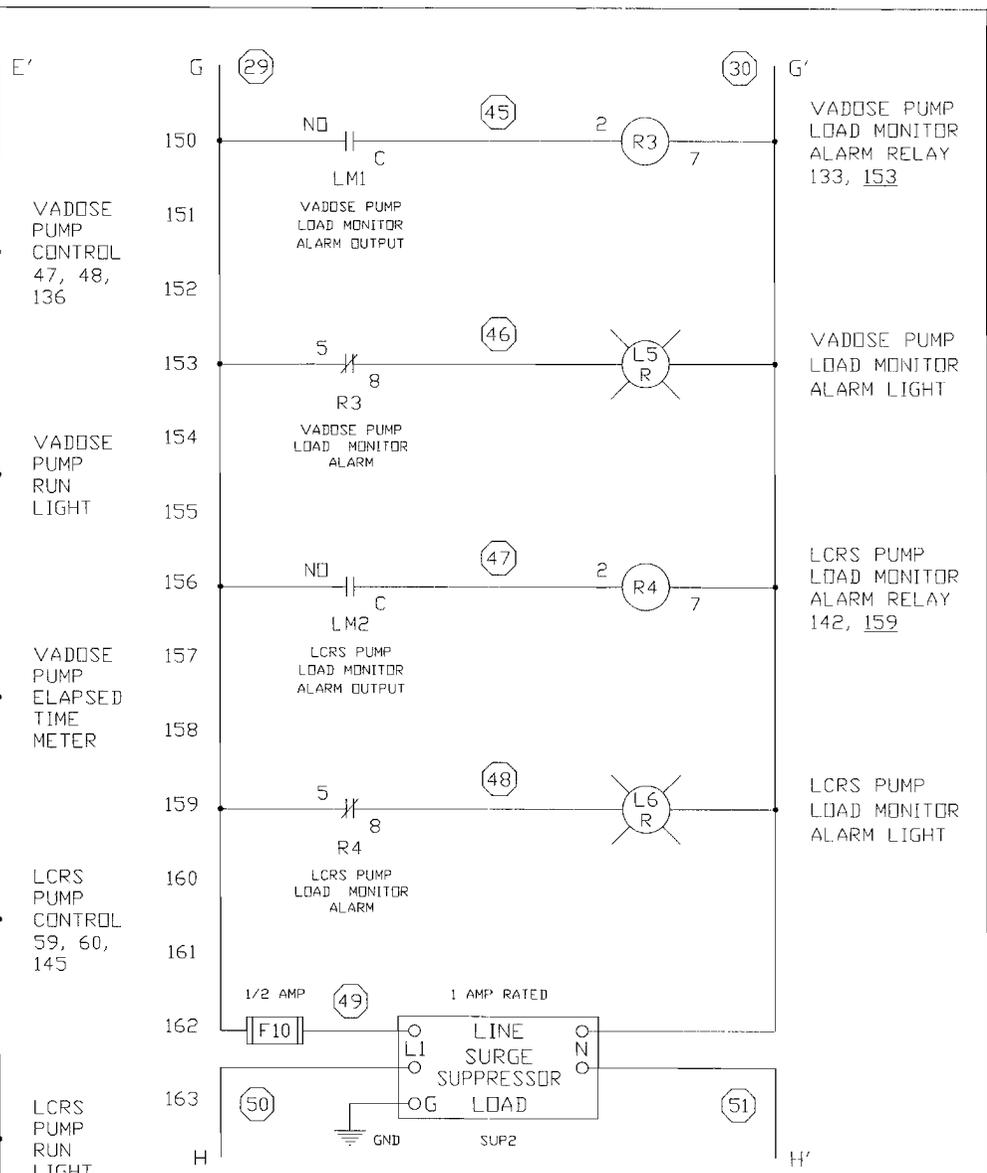
AS BUILT

111
113





AS BUILT



JOB No. 09-9356C

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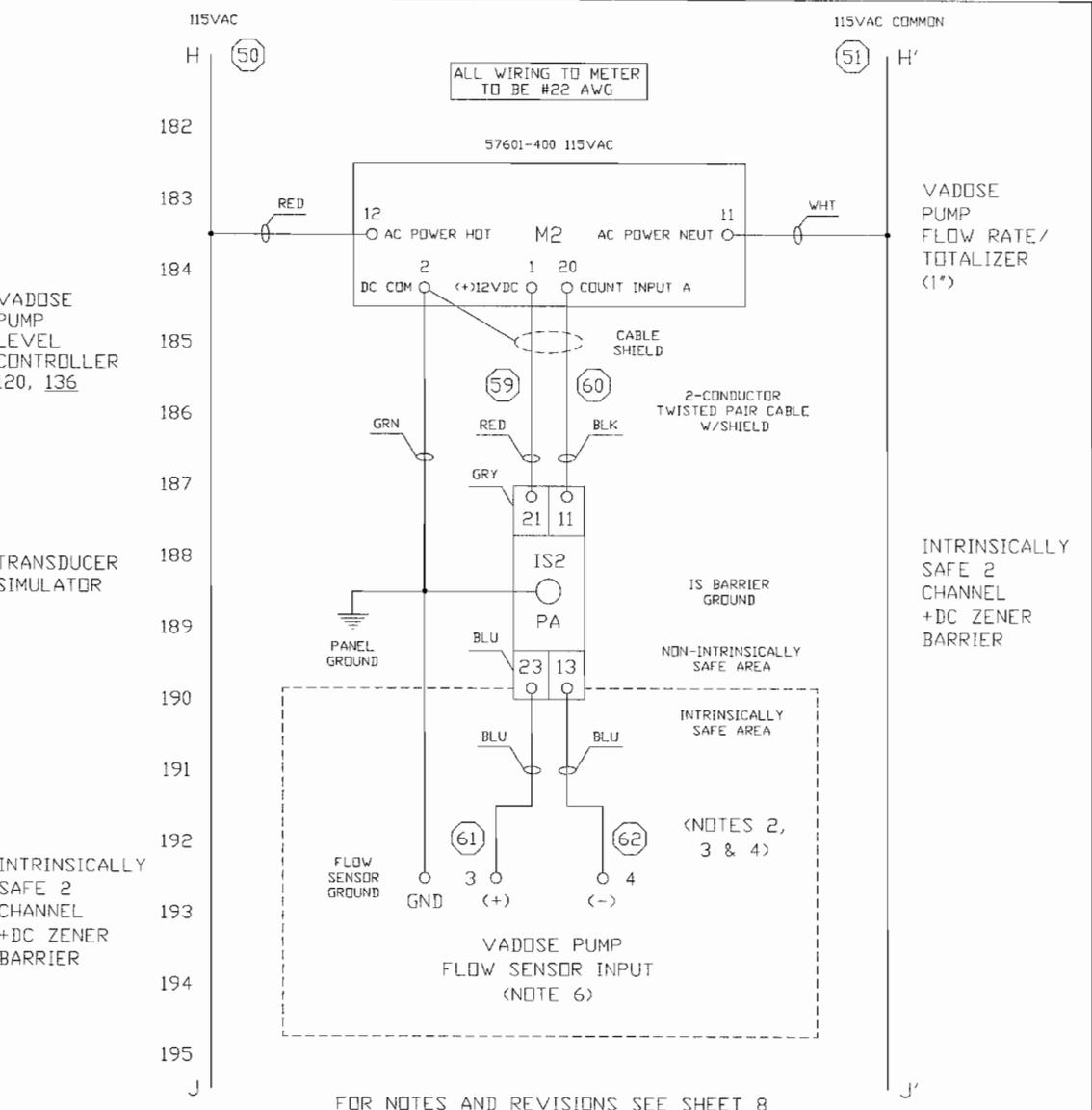
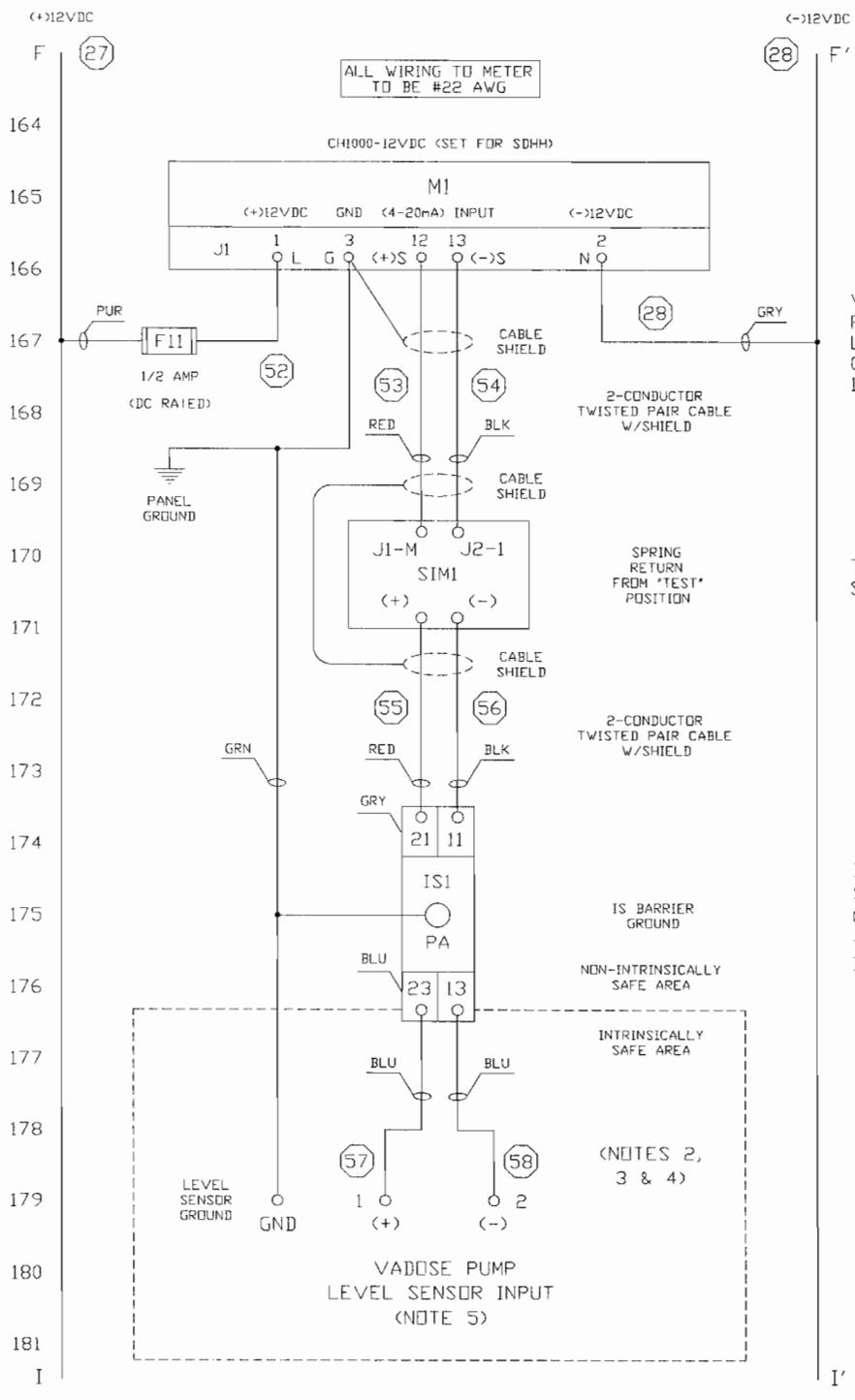
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.

TOLERANCES		REVISIONS		EPG COMPANIES		
DECIMAL	(EXCEPT AS NOTED)	NO.	DATE	BY	DESIGN	SCALE
1					RCK	
2					RCK	
3						
4						
5						

L975PTG CONTROL PANEL
230VAC 1Ø SH 5 OF 8

DATE 06-02-09

DRAWING NO. 08373-0254



FOR NOTES AND REVISIONS SEE SHEET 8

JOB No. 09-9356C

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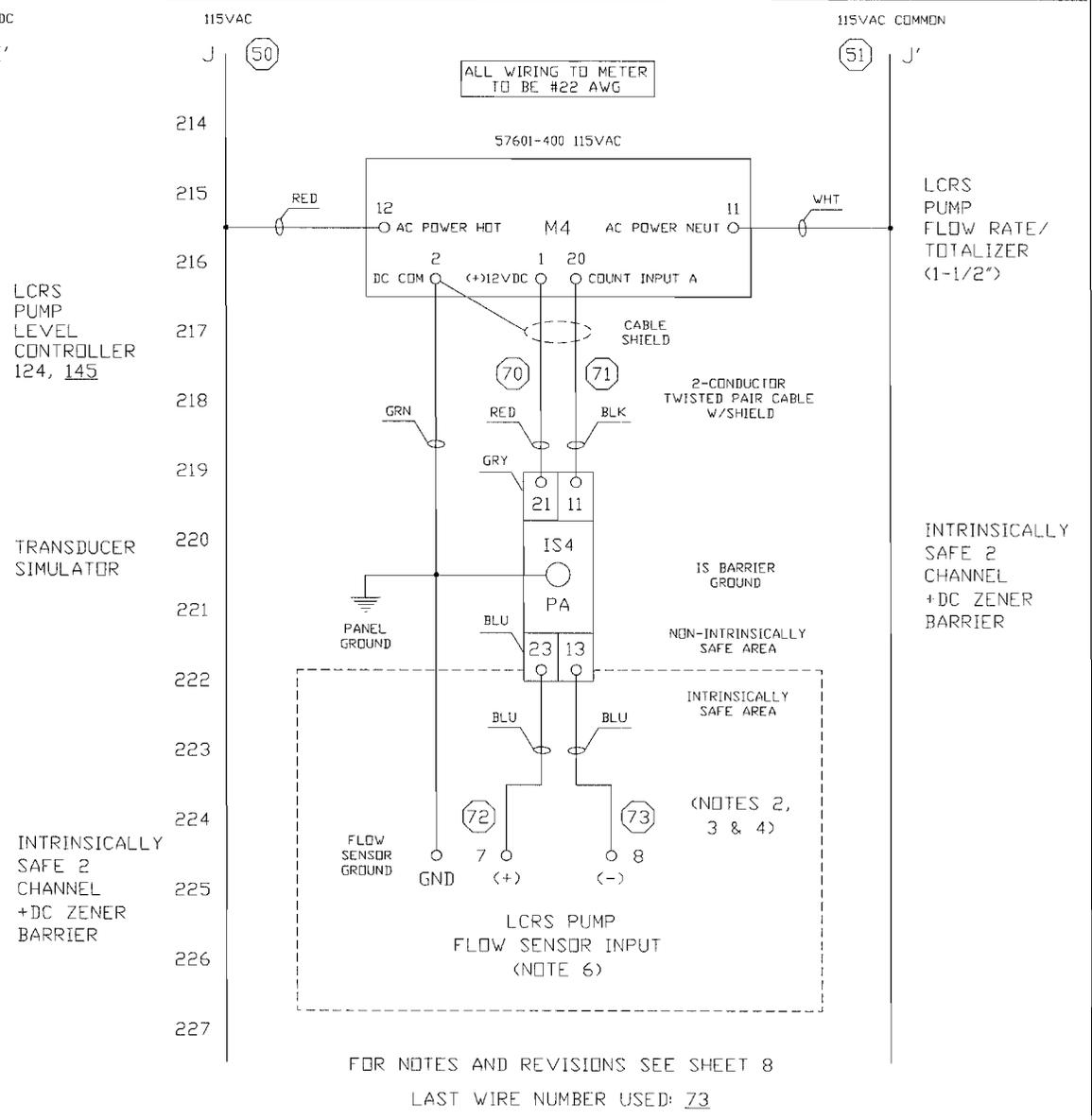
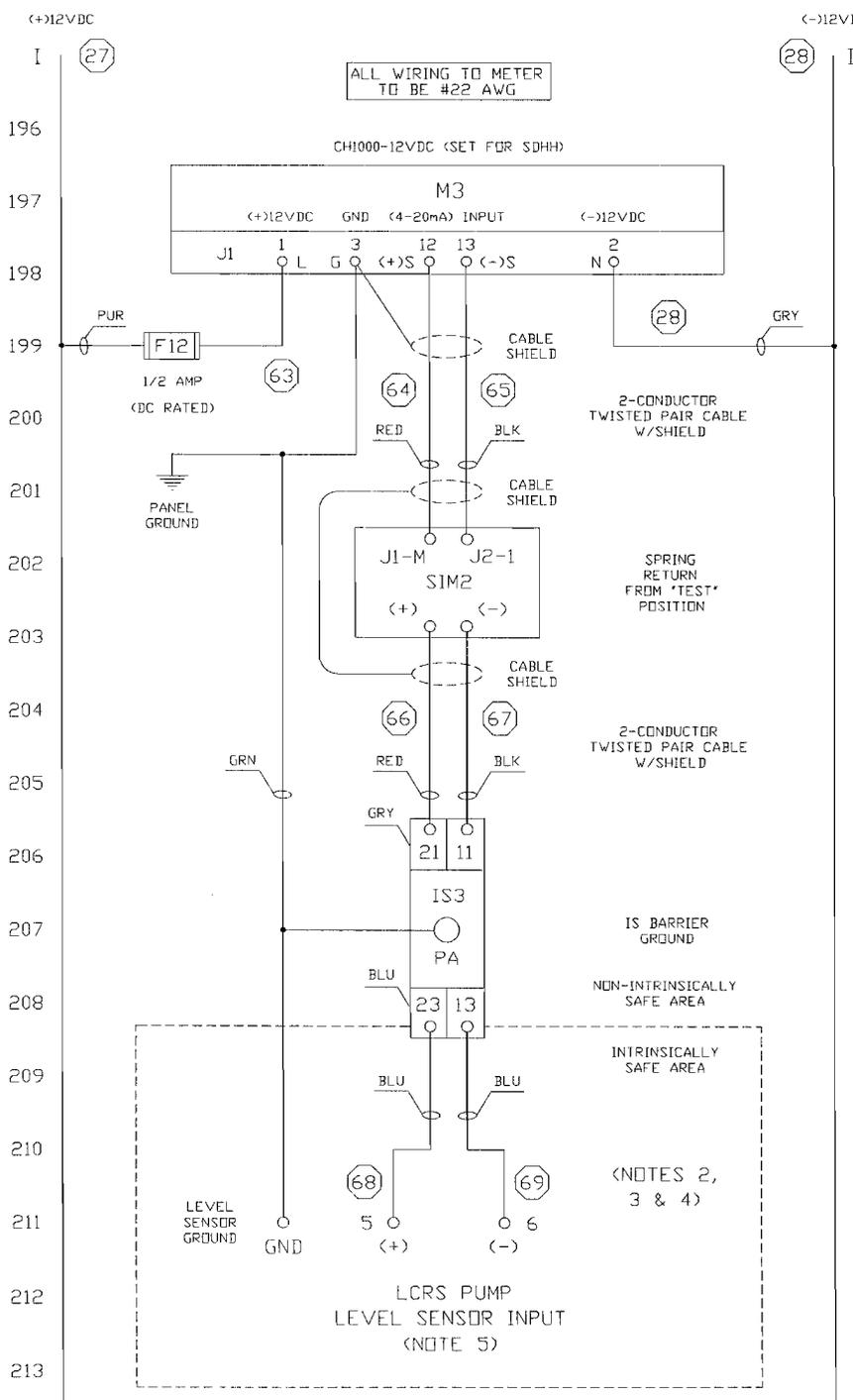
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.

TOLERANCES		REVISIONS			EPG COMPANIES		
DECIMAL	(EXCEPT AS NOTED)	NO.	DATE	BY	DESIGN	SCALE	MATERIAL
		1			RCK		
		2					
		3			RCK		
		4					
		5					

L975PTG CONTROL PANEL
230VAC 1Ø SH 6 OF 8

DATE 06-02-09 DRAWING NO. 08373-0255

AS BUILT

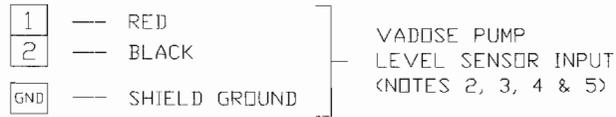


AS BUILT

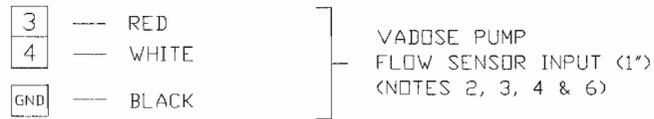
JOB No.		09-9356C	
* NOTICE * © EPG Companies Inc. 2009			
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.			
TOLERANCES (EXCEPT AS NOTED):		REVISIONS	
DECIMAL	1	DATE	BY
FRACTIONAL	2		
ANGULAR	3		
	4		
	5		
EPG COMPANIES		L975PTG CONTROL PANEL 230VAC 1Ø SH 7 OF 8	
DESIGN	RCK	SCALE	MATERIAL
DRAWN	RCK	DATE	06-02-09
CHECK'D		APP'D	08373-0256

FIELD WIRING TERMINALS

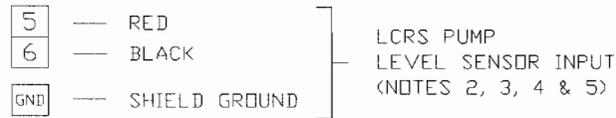
LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



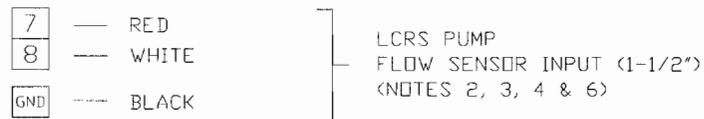
FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



NOTE:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
5. MAXIMUM CABLE LENGTH TO THE LEVEL SENSOR IS 3000 FEET
6. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR IS 500 FEET
7. SELECTOR SWITCHES, (SS1-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION

JOB No. 09-9356C

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TOLERANCES		REVISIONS			EPG COMPANIES			
(EXCEPT AS NOTED)		NO.	DATE	BY	DESIGN	SCALE	MATERIAL	DRAWING NO.
DECIMAL		1			RCK			
FRACTIONAL		2			RCK			
ANGULAR		3			RCK			
		4						
		5						

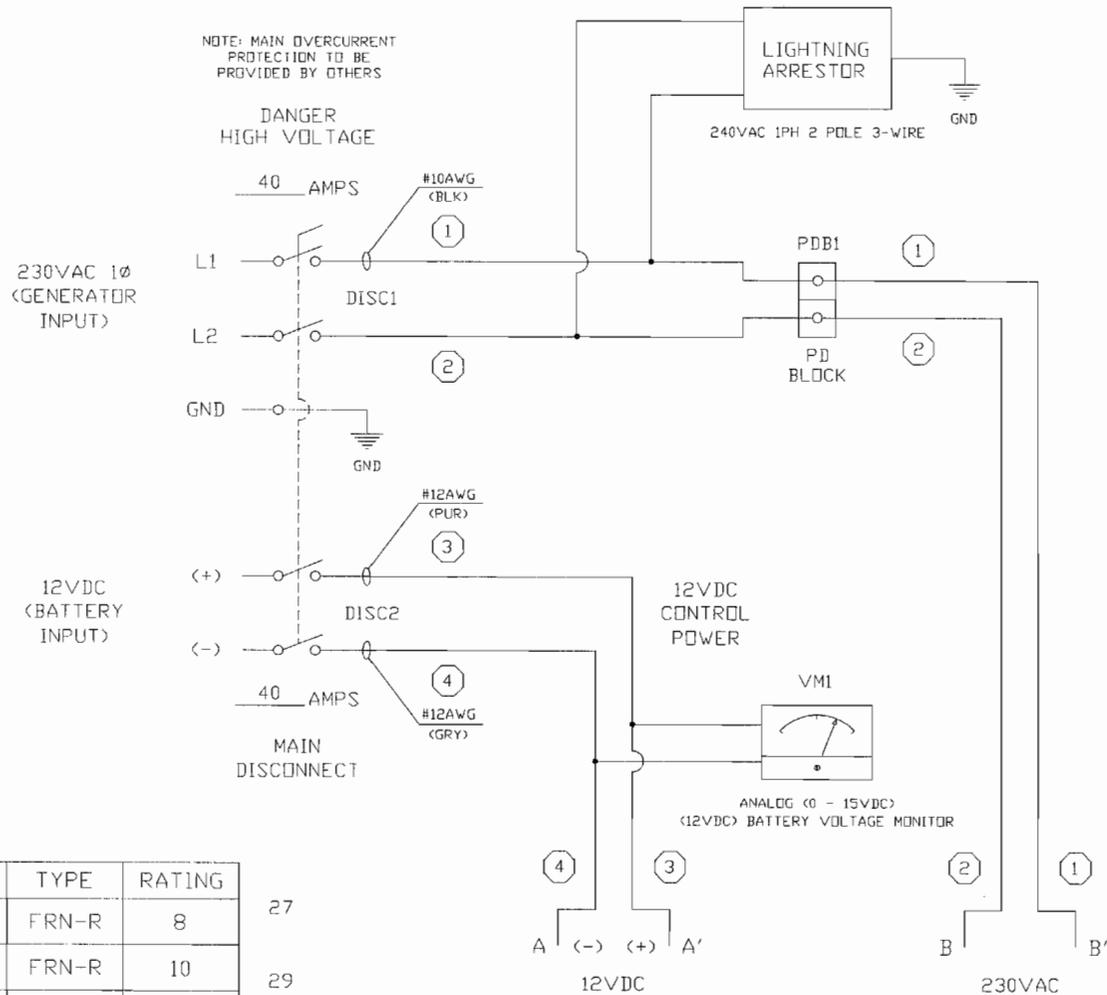
L975PTG CONTROL PANEL
230VAC 1Ø SH 8 OF 8

DATE 06-02-09
DRAWING NO. 08373-0257

AS BUILT

MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
VADDOSE PUMP	1/2	230	5.0	8A
LCRS PUMP	3/4	230	6.8	10A

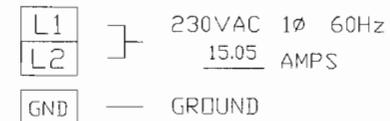
1
3
5
7
9
11
13
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17
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21
23
25



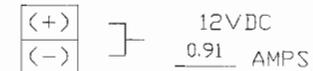
PHASE 3B
CONTROL PANEL AND PUMPS

FIELD WIRING TERMINALS

LINE (GENERATOR)



LINE (BATTERY)



FUSE	TYPE	RATING
F1-F2	FRN-R	8
F3-F4	FRN-R	10
F5-F6	FRN-R	2-1/2
F7	FNM	1-1/4
F8	FNM	3-1/2
F9	ABC	1-1/2
F10	MDL	1/2
F11	ABC	1/2
F12	ABC	1/2

27
29
31
33
35
37

FOR NOTES AND REVISIONS SEE SHEET 8

AS BUILT

JOB No. 09-9356C

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TOLERANCES	REVISIONS			EPG COMPANIES		
(EXCEPT AS NOTED)	NO.	DATE	BY	DESIGN	SCALE	MATERIAL
DECIMAL	1					
FRACTIONAL	2					
ANGULAR	3			RCK		
	4			RCK	DATE 06-02-09	DRAWING NO.
	5				APPRO	08373-0250

Phase V
Installation Records

EPG Companies Inc.

SurePump™ Installation Record

Form Completed by: KEI Installation Date: 9/17/09
 Company: HAMPTON RODGER ELECTRIC EPG Serial #: 09-9356C

PUMPS, CONTROLS AND POWER SUPPLY

Installer: <u>HTE</u>	Address: <u>4920 ALTO AVE. LAS VEGAS, NV. 89115</u>	Installation Location: <u>PHASES LCRS</u>
Motor Model <u>WSDPT-5-3</u>	HP <u>3/4</u>	Volts: <u>230</u>
	Max Amps Rating: <u>6.8</u>	Pump Model: <u>EPG WSDPT SURE PUMP</u>
Power Supply Transformers: Number Used: KVA Each: <u>.350</u>	Hertz: <u>60</u>	Comments:
Pump Control Panel: Mfg. & Model #: <u>EPG 2975PTG</u>	Motor Starter Size: <u>.75 hp</u>	Overload Heater Part or setting range: <u>NA</u>
IEC Starters:	Lightning Arrestors: Mfg. & Model: <u>International AG2401</u>	Surge Capacitors: Yes _____ No <input checked="" type="checkbox"/>
Disconnect Fuse or Circuit Breaker Amp Rating: <u>40</u>	Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) <u>-</u>	

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS:	GPM	VOLTS			AMPS		
Pump Not Running	<u>0</u>	R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>217</u>			
Open Discharge		R-Y _____	R-B _____	B-Y _____	R _____	Y _____	B _____
Normal Operation		R-Y <u>0</u>	R-B <u>0</u>	B-Y _____	R <u>0</u>	Y <u>6.63</u>	B <u>6.67</u>
Run Time _____							
Off Time _____							

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: <u>1 1/2</u>	Discharge Pressure:	Pump Submergence:	Fluid Temp: _____°F _____°C
External Check Valve Used? <u>NO</u>	Location:	Cable Length & Size: <u>73' 14GA</u>	Ground Resistance <u>6 Ohm</u>
Insulation Megohm Readings:	Before Installation:	After Installation: <u>9.754</u>	After 30 min. Run:

SENSORS

Type of Level Sensor: Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	Transmitter Serial Number:
Length of Sensor Lead: <u>73</u>	Ohm Readings Across I.S. Barrier: <u>230</u>
mA Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: <u>12</u> VDC Voltage Leaving Level Meter: <u>12</u> VAC
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311. Phone: 800-762-8418 FAX: 763-493-4812

EPG SurePump™ Installation Record

EPG Job No. 09-9356

Installer's Name HAMPTON REDDOR ELECTRIC CO.

Address 4920 ALTO AVE.

City LAS VEGAS State NV.

Zip 89115

Phone (702) 646-7449

Fax (702) 453-5412

Contact name ROLAND CATES

Owner's Name BASIC REMEDIATION CO.

Address 875 W. WARM SPRINGS RD.

City HENDERSON State NV

Zip 89011

Phone (702) 567-0400

Fax (702) 567-5524

Contact name LEE C. FARRIS, DE

Sump Name/ ID PHASE 5 LCRS

Date Installed 9/14/09

Leachate or Condensate Temp _____ °F Or °C

Pump:

Model No. WSDPT 5-3

Rating: 30 GPM@ 60 Ft. TDH

HP. 7.5 Voltage 230 Phase 1

Actual Pump Delivery _____ GPM@ _____ PSI

Operating Cycle _____ ON (Min/Hr) _____ OFF (Min/Hr) (Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

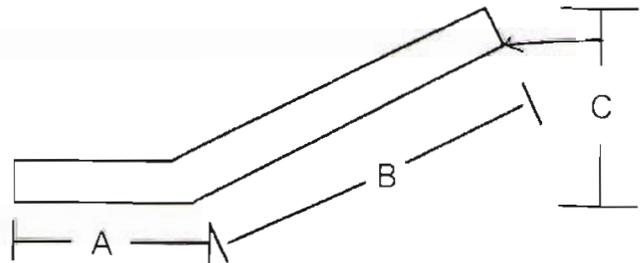
Slope 2.1 :1

Length of riser Pipe (A+B) 50' ft.

Vertical Distance = Sump to
INV. Top of Riser Pipe (C) 16.6 ft.

Riser ID PHASE 5 LCRS SDR 11

Distance From Top of Riser
Pipe to Controller 15 ft.



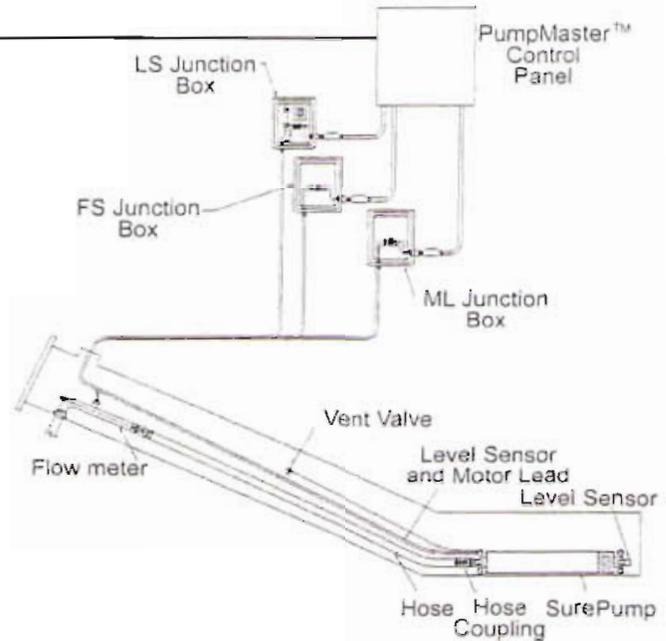
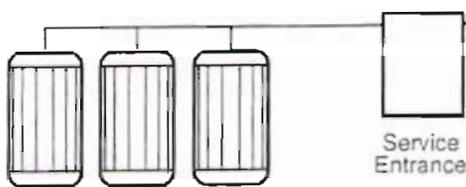
Power Supply:

Cable: Service Entrance to Control Distance _____ ft Wire Size _____ AWG/MCM

Copper _____ Jacketed _____ Aluminum _____ Individual conductors _____

Cable: Control to Motor _____ ft _____ AWG/MCM

Copper _____ Jacketed _____



Transformer:

KVA	#1	#2	#3
Initial Megs - Before Installation			
Motor & lead	T1 <u>2000</u>	T2 <u>2000</u>	T3
Final Megs - After Installation			
After Running for 15 min			
Motor, leads & cable	T1 <u>2000</u>	T2 <u>2000</u>	T3

Incoming Voltage:

No Load	L1-L2 <u>234</u>	L2-L3	L1-L3
Full Load	L1-L2 <u>236</u>	L2-L3	L1-L3

Running Amps:

Hookup:1						
Full Load	L1	<u>8</u>	L2	<u>8</u>	L3	% unbalanced <u>0</u>
Hookup:2						
Full Load	L1		L2		L3	% unbalanced
Hookup:3						
Full Load	L1		L2		L3	% unbalanced

Ground wire size _____ AWG/MCM
 DC Ground Current _____ mA Ground Test 6 Ohms

Motor Surge Protection _____ Yes _____ No

Control Panel:

Model # L975PT6

Short Circuit Device

Circuit Breaker _____ Rating _____ Setting _____
 Fuses FENR10 Type 10 Rating _____
 _____ Standard ✓ Time Delay _____

Controls are Grounded to:

_____ Motor
X Rod
 _____ Power Supply

Start Overloads:

Set at NA amps

Name: HOWARD LESTER

Company EPG COMPANIES

Date SEPT 16 09

INSTALLATION GUIDE

EPG SurePump™ Pumping System

- ✓ 1. Verify that equipment and supply voltage match.
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling
- ✓ 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c.
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump.
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater.
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color coded to simplify connections.
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ 18. Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
20. Compare these reading to voltage listed on drawing and label in control panel.
21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
23. Turn on power at panel main disconnect.
24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
25. If level and flow meter do not light up check GFCI, reset if necessary.
26. Are any indicator lights on?
27. Should they be on?
28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3" of slack in the cables.
30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
34. After pump and level sensor have been tested pot seal offs.
35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePump™ Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- ✓ A: Were sensor and power cable tied or strapped to discharge line?
- ✓ B: On what kind of spacing?
- ✓ C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- ✓ D: What size cable was run for supply power?
- ✓ E: What is the distance from power supply transformer to pump control panel?
- ✓ F: How did they verify that pump is down into sump?
- ✓ G: Did they test level sensor prior to installing?
- ✓ H: Did they test pump prior to installing or prior to your arrival?
- ✓ I: Do they have any questions or concerns?
- ✓ J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL.

- ✓ A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel.
- ✓ B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- ✓ C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- ✓ D: Are seal offs potted? If not, stop work and have them potted.
- ✓ E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- ✓ F: Make sure ground wire is in place between outer door and enclosure.

PRIOR TO ENERGIZING CONTROL PANEL

- ✓ A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- ✓ B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ C: Compare these reading to voltage listed on drawing and label in control panel.
- ✓ D: Megger motor leads resistance must be 1 megohm or greater.
- ✓ E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- ✓ F: Inspect inside of control panel. Look for items which may have come loose during shipping
- ✓ G: Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- ✓ J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- ✓ A: Turn on power at panel main disconnect.
- ✓ B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ C: If level and flow meter do not light up check GFI, reset if necessary.
- ✓ D: Are any indicator lights on?
- ✓ E: Should they be on?
- ✓ F: Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site.
- ✓ G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables

- H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- ✓ J: When pump is running measure and record amperage and voltage. Check 3O systems for current balance within 5% of average.
- ✓ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

EPG Companies Inc.

SurePumpTM Installation Record

Form Completed by: KEY Installation Date: 9/14/09
 Company: HAMPTON TOWER ELECTRIC EPG Serial #: 09-9356C

PUMPS, CONTROLS AND POWER SUPPLY

Installer: <u>HTE</u>	Address: <u>4920 ALTO AVE. LAS VEGAS, NV. 89115</u>	Installation Location: <u>PHASE 5 VA0056</u>		
Motor Model <u>WSDPT-2-3</u>	HP <u>1/2</u>	Volts: <u>230</u>	Max Amps Rating: <u>5.0</u>	Pump Model: <u>EPG WSDPT SURE PUMP</u>
Power Supply Transformers: Number Used: KVA Each: <u>350</u>	Hertz: <u>60</u>	Comments:		
Pump Control Panel: Mfg. & Model #: <u>EPG LG75 PTG</u>	Motor Starter Size: <u>.5HP</u>	Overload Heater Part or setting range: <u>NA</u>	IEC Starters:	
Lightning Arrestors: Mfg. & Model: <u>Inframat AG 2401</u>	Surge Capacitors: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Disconnect Fuse or Circuit Breaker Amp Rating: <u>40</u>		
Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) <u>-</u>				

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS:	GPM	VOLTS			AMPS		
Pump Not Running	0	R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>217</u>	<u>0</u>		
Open Discharge		R-Y <u> </u>	R-B <u> </u>	B-Y <u> </u>	R <u> </u>	Y <u> </u>	B <u> </u>
Normal Operation		R-Y <u>0</u>	R-B <u>0</u>	B-Y <u>216</u>	R <u>0</u>	Y <u>5.07</u>	B <u>5.09</u>
Run Time _____							
Off Time _____							

EPG Companies Inc.

INSTALLATION DATA

Discharge Line Size: <u>1"</u>	Discharge Pressure:	Pump Submergence:	Fluid Temp: _____°F _____°C
External Check Valve Used? <u>No</u>	Location:	Cable Length & Size: <u>73' 14GA</u>	Ground Resistance <u>4 OHM</u>
Insulation Megohm Readings:	Before Installation:	After Installation: <u>15.2 G</u>	After 30 min. Run:

SENSORS

Type of Level Sensor:	Transmitter Serial Number:
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____	
Length of Sensor Lead: <u>73' 113</u>	Ohm Readings Across I.S. Barrier: <u>230</u>
mA Readings on Transmitter Lead:	Voltage Reading Entering Level Meter: <u>12</u> VAC Voltage Leaving Level Meter: <u>12</u> VAC
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: PVC <input checked="" type="checkbox"/> Stainless Steel _____

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311. Phone: 800-762-8418 FAX: 763-493-4812

EPG SurePump™ Installation Record

EPG Job No. 09-9356

Installer's Name HAMPTON TENDER ELECTRIC CO

Address 4920 ALTO AVE.

City LAS VEGAS State NV. Zip 89115

Phone (702) 646-7449 Fax (702) 453-5412

Contact name ROGER CATES

Owner's Name BASEL REMEDIATION CO.

Address 875 W. WARM SPRINGS RD.

City HENDERSON State NV. Zip 89011

Phone (702) 567-0400 Fax (702) 567-5524

Contact name LEVE C. FARRIS, PE

Sump Name / ID PHASE 5 VADOSE Date Installed 9/14/09

Leachate or Condensate Temp _____ °F Or °C

Pump:

Model No. WSOPT 2-3

Rating: 10 GPM@ 50 Ft. TDH

HP .5 Voltage 230 Phase 1

Actual Pump Delivery _____ GPM@ _____ PSI

Operating Cycle _____ ON (Min/Hr) _____ OFF (Min/Hr) (Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

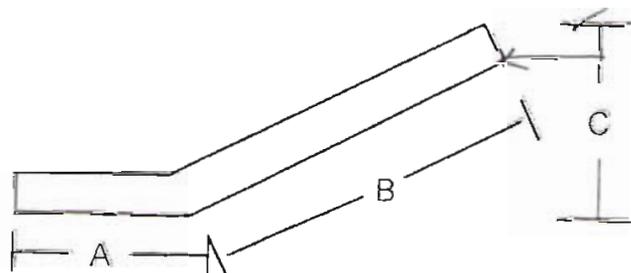
Slope 2.1 :1

Length of riser Pipe (A+B) 46.2 ft.

Vertical Distance = Sump to DN Top of Riser Pipe (C) 16.2 ft.

Riser ID PHASE 5 VADOSE SDR 11

Distance From Top of Riser Pipe to Controller 15 ft.



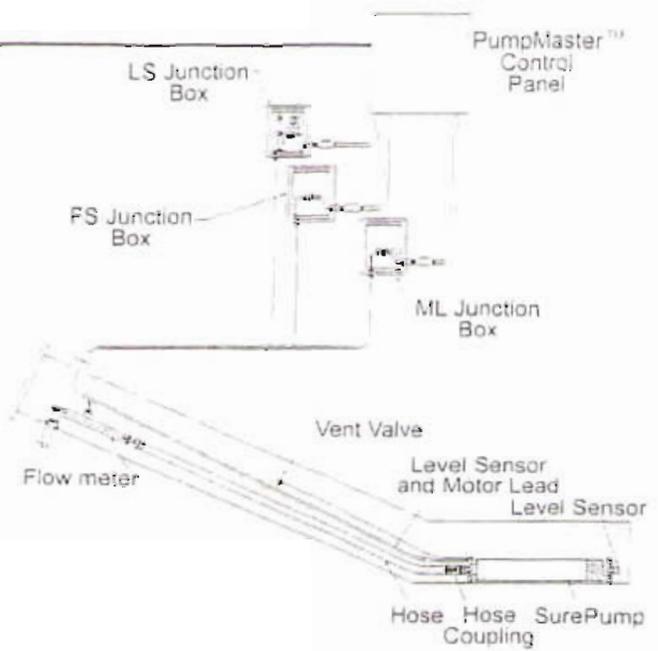
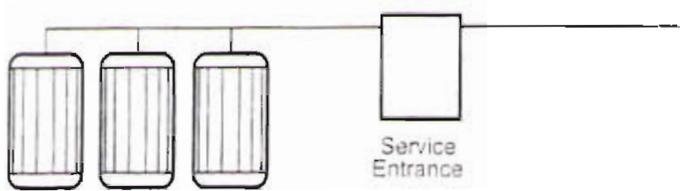
Power Supply:

Cable: Service Entrance to Control Distance _____ ft Wire Size _____ AWG/MCM

Copper _____ Jacketed _____ Aluminum _____ Individual conductors

Cable: Control to Motor _____ ft _____ AWG/MCM

Copper _____ Jacketed _____



Transformer:

KVA #1 #2 #3

Initial Megs - Before Installation

Motor & lead T1 2000 T2 2000 T3

Final Megs - After Installation
After Running for 15 min

Motor, leads & cable T1 2000 T2 2000 T3

Incoming Voltage:

No Load L1-L2 233 L2-L3 L1-L3
Full Load L1-L2 235 L2-L3 L1-L3

Running Amps:

Hookup:1 Full Load L1 5 L2 5 L3 % unbalanced 0
Hookup:2 Full Load L1 L2 L3 % unbalanced
Hookup:3 Full Load L1 L2 L3 % unbalanced

Ground wire size AWG/MCM

DC Ground Current mA Ground Test 4 Ohms

Motor Surge Protection Yes No

Control Panel:

Model # L975PT6

Short Circuit Device

Circuit Breaker Rating Setting
Fuses FRWR8 Type 8 Rating
Standard X Time Delay

Controls are Grounded to:

Motor
 Rod
 Power Supply

Start Overloads:

Set at N/A amps

Name: HOWARD LESTER

Company EPG COMPANIES

Date SEP 17 09

INSTALLATION GUIDE

EPG SurePumpTM Pumping System

- ✓ 1. Verify that equipment and supply voltage match.
- ✓ 2. Inspect equipment, look for shipping damage, dirt, and rough handling.
- ✓ 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- ✓ 4. Inspect inside of control panel. Look for items which might have come loose during shipping.
- ✓ 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
- ✓ 6. Install vent valve and tubing. See Bulletin 0130c.
- ✓ 7. Install suspension cable. See Bulletin 6090a.
- ✓ 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- ✓ 9. Run pump down riser slowly using stainless steel suspension cable as hold back. Make sure motor lead and sensor cable are slack as you lower pump.
- ✓ 10. Take ohm reading of each motor lead wire to wire and compare the values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13 & 21. See page 39 for wire resistance.
- ✓ 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- ✓ 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- ✓ 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- ✓ 14. Megger motor leads. Resistance must be 1 megohm or greater.
- ✓ 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color coded to simplify connections.
- ✓ 16. Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ 17. If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ 18. Measure resistance to ground. It must be less than 25 ohms. If greater, stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

- ✓ 19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ☞ 20. Compare these reading to voltage listed on drawing and label in control panel.
- ✓ 21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
- ☞ 22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
- ☞ 23. Turn on power at panel main disconnect.
- ☞ 24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ 25. If level and flow meter do not light up check GFCI, reset if necessary.
- ✓ 26. Are any indicator lights on?
- ✓ 27. Should they be on?
- ✓ 28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
- ✓ 29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.
- ✓ 30. To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- ✓ 31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- ☞ 32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
- ✓ 33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
- ☞ 34. After pump and level sensor have been tested pot seal offs.
- ✓ 35. Complete Form 200. Note: If this form is not completed and returned to EPG it will impact system warranty.

START UP CHECKLIST

EPG SurePump™ Pumping System

QUESTIONS FOR CONTRACTOR OR INSTALLER

- ✓ A: Were sensor and power cable tied or strapped to discharge line?
- ✓ B: On what kind of spacing?
- ✓ C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- ✓ D: What size cable was run for supply power?
- ✓ E: What is the distance from power supply transformer to pump control panel?
- ✓ F: How did they verify that pump is down into sump?
- ✓ G: Did they test level sensor prior to installing?
- ✓ H: Did they test pump prior to installing or prior to your arrival?
- ✓ I: Do they have any questions or concerns?
- ✓ J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL.

- ✓ A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel.
- ✓ B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- ✓ C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- ✓ D: Are seal offs potted? If not, stop work and have them potted.
- ✓ E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- ✓ F: Make sure ground wire is in place between outer door and enclosure.

PRIOR TO ENERGIZING CONTROL PANEL

- ✓ A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- ✓ B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- ✓ C: Compare these reading to voltage listed on drawing and label in control panel.
- ✓ D: Megger motor leads resistance must be 1 megohm or greater.
- ✓ E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- ✓ F: Inspect inside of control panel. Look for items which may have come loose during shipping
- ✓ G: Inspect wire connections. Are they the correct colors? Are they tight?
- ✓ H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- ✓ I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- ✓ J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- ✓ A: Turn on power at panel main disconnect.
- ~✓ B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- ✓ C: If level and flow meter do not light up check GFI's, reset if necessary
- ✓ D: Are any indicator lights on?
- ✓ E: Should they be on?
- ✓ F: Make sure pump is turned off. Using built in or hand held simulator verify level meter settings are correct for this site.
- ✓ G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3" of slack in the cables

- H: To verify correct rotation place hand around discharge line. It will torque right if the rotation is correct.
- I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- ↳ J: When pump is running measure and record amperage and voltage. Check 30 systems for current balance within 5% of average.
- ↳ K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

Phase V
As-Built Control Panel Setup Parameters

EPG LevelMaster Pump controller

Panel S/N: 09-9356C

Meter S/N: 060409-07

LCRS Pump Level Control Meter **PHASE V**

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M3

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 20"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". 36.1"
Hy Hi	1	Keeps High Level Light on until level drops <u>1</u> " below AL Hi.
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

EPG LevelMaster Pump controller

Panel S/N: 09-9356C

Meter S/N: 060409-06

Vadose Pump Level Control Meter

PHASE V

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M1

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	28	Turns Pump on when level on meter reads 28 ". 17"
Pr Lo	16	Turns Pump off when level on meter reads 16 ". 7"
AL H1	34	Turns High Level Light on when meter reads 34 ". .5"
Hy Hi	1	Keeps High Level Light on until level drops 1 " below AL Hi. .5"
AL H2	143	Turns Pumps off if meter reads 143" or greater. Indicates a possible sensor failure.
Hy H2	0	Not used.

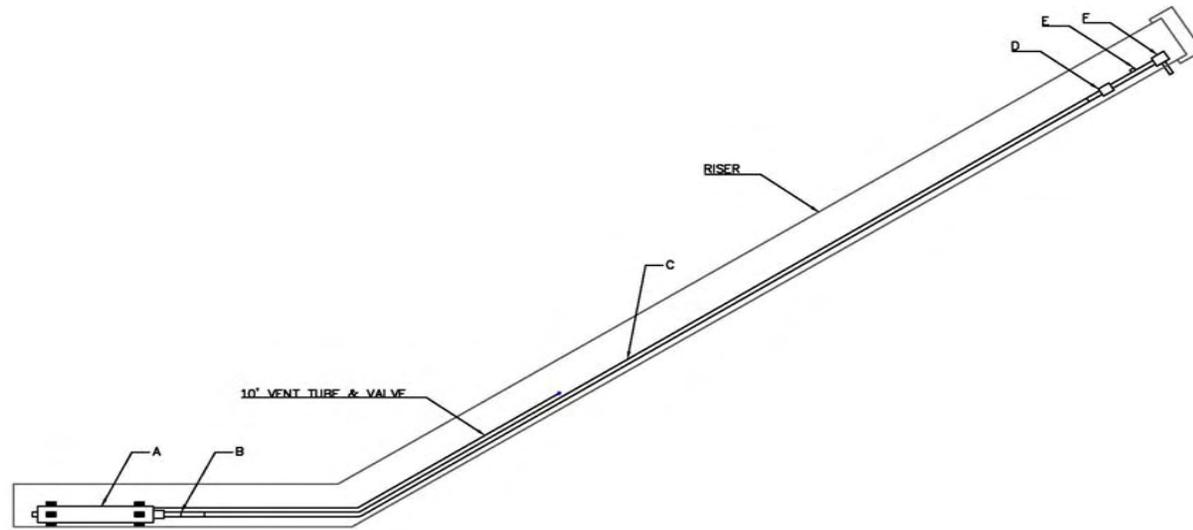
Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
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SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

Phase V
As-Built Pump Installation Cross Sections

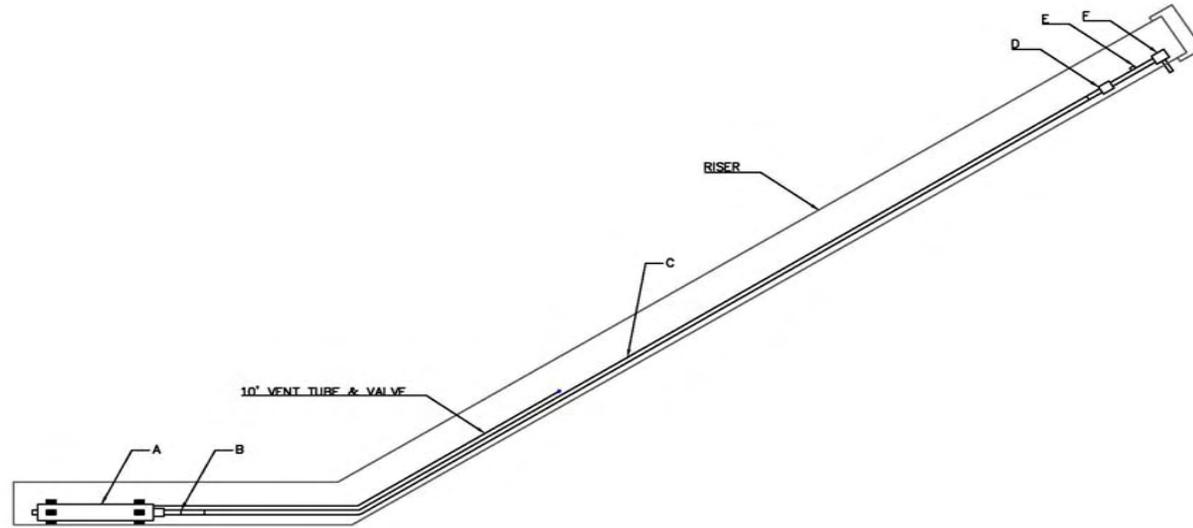
PHASE V LCRS SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT5-3 PUMP (S/N 2009-3133)	2.7
B	CONNECTIONS/FITTINGS/TRANSITIONS	1.2
C	1.5" DISCHARGE LINE	41.3
D	CONNECTIONS/FITTINGS/TRANSITIONS	0.6
E	FLOW METER	2.2
F	EPG FITTING "T"	0.4

NOT TO SCALE

PHASE V VADOSE SUMP PUMP INSTALLATION



ITEM	DESCRIPTION	LENGTH (FT)
A	WSDPT2-3 PUMP (S/N 2009-3100)	2.5
B	CONNECTIONS/FITTINGS/TRANSITIONS	1.2
C	1.0" DISCHARGE LINE	38.8
D	CONNECTIONS/FITTINGS/TRANSITIONS	0.5
E	FLOW METER	1.5
F	EPG FITTING "T"	0.3

NOT TO SCALE

Phase V
As-Built Photos



Phase V Controls

Battery

Phase V Controls

Solar Charger

12v Marine Battery

Solar Charger

Phase V Controls
& Risers

Phase V Controls
& Risers



Installation / O&M Instructions

Materials of Construction

EPG SurePump™

	STANDARD
Check Valve Housing	304 Stainless Steel
Check Valve	304 Stainless Steel
Check Valve Seat	E-Glide™
Diffuser Chamber	304 Stainless Steel
Impeller Seal Ring	E-Glide™
Impeller	304 Stainless Steel
Motor Adapter	304 Stainless Steel
Inlet Screen	304 Stainless Steel
Pump Shaft	304 Stainless Steel
Coupling	329/420/431 Stainless Steel
Fasteners	304 Stainless Steel
Bearings	E-Glide™

FRANKLIN ELECTRIC MOTORS

	1/3 to 2 HORSEPOWER	3 to 5 HORSEPOWER	5 to 10 HORSEPOWER
End Bell Castings	304 Stainless Steel over Iron	304 Stainless Steel over Iron	304 Stainless Steel over Iron
Stator Shell	301 Stainless Steel	301 Stainless Steel	301 Stainless Steel
Shaft Extension	303 Stainless Steel	303 Stainless steel	303 Stainless Steel
Fasteners	316 Stainless Steel	300 Stainless Steel	316 Stainless Steel
Seal Cover	Tefzel	Sintered Bronze	Tefzel
Shaft Seal	Viton	Viton, Carbon, Ceramic Face Seal	Viton
Diaphragm	Viton	Nitrile Rubber	Viton
Diaphragm Plate	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel
Diaphragm Spring	302 Stainless Steel	302 Stainless Steel	302 Stainless Steel
Diaphragm Cover	316 Stainless Steel	304 Stainless Steel	316 Stainless Steel
Slinger	Viton	Nitrile Rubber	Viton
Lead Sleeve	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel
Lead Jam Nut	316 Stainless Steel	N/A	316 Stainless Steel
Lead Jam Clamp	N/A	300 Stainless Steel	N/A
Lead Potting	Epoxy	Epoxy	Epoxy
Lead Bushing	Viton	Viton	Viton

EPG Sump Drainer Vent Tube / Check Valve

INSTALLATION INSTRUCTIONS

EPG's patented sump drainer* enables a submersible pump to pump down and restart in applications that would normally cause the pump to air lock.

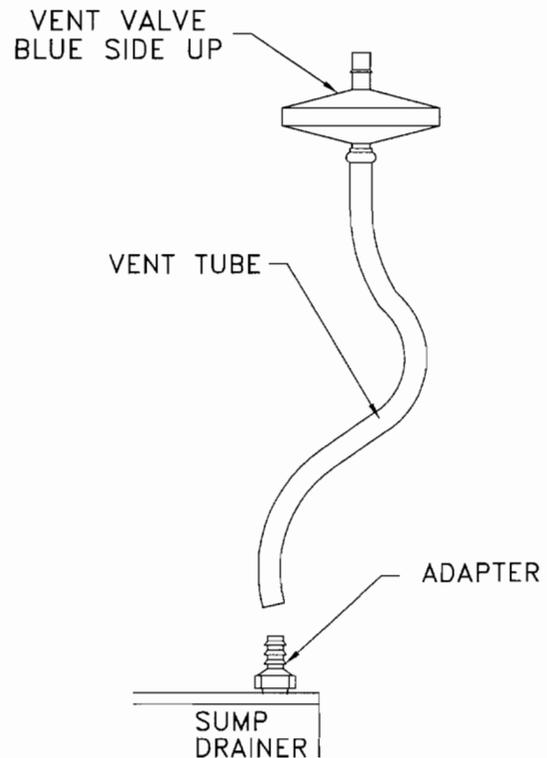
Critical to the operation of the sump drainer is the installation of the vent tube and air check valve. The vent tube / check valve assembly has two functions. First, as the sump drainer fills with fluid the vent tube assembly allows air trapped inside of the sump drainer to escape, allowing the sump drainer to completely fill with fluid. When the sump drainer pump starts the vent assembly then closes, allowing the pump to draw liquid through the screen at the opposite end of the sump drainer. The closed check valve enables the pump to continue pumping even though the fluid level in the sump is below the normal intake of the pump.

The vent tube may be tied off to the pump discharge line. The vent check valve will operate correctly even if submerged.

INSTALLATION

Refer to Figure 1 for help in completing this procedure.

1. Slip the free end of the plastic vent tube onto the adapter on the top of the sump drainer.
2. Verify the open end of the check valve is labeled "VAC".
3. As you lower the sump drainer into the sump, uncoil the vent tube and fasten it to the discharge pipe. We recommend you keep the check valve above the fluid level. The check valve will work if it is submerged, but can foul with particles in the fluid.



* U.S. Patent #4,966,534 and 4,992,030

Figure 1. Vent Tube / Check Valve Assembly

EPG SurePump™ with LevelMaster™ Level Sensor Disassembly / Assembly

OPERATION & MAINTENANCE INSTRUCTIONS

NOTE: Refer to Table B for list of tools needed for disassembly, assembly, and testing.

1. Place the pump on a suitable work surface with blocks to prevent the pump from rolling. Remove the vent tube by pulling straight out from the top. In cold weather it is better to unscrew the vent hose barb adaptor with tube attached rather than trying to pull the tube off the hose barb.
2. Unscrew the cord restraint nuts and pull inserts out about two (2) feet along the motor lead and level sensor lead. Loosen the insert from the wires so they are free to move through the cord restraint.
3. Mark the alignment of the tube and top (check for factory alignment marks). Center punch new marks in top and tube if factory marks can not be found. The alignment marks will make reassembly easier.
4. Remove the three (3) cap screws that secure the tube to the top and carefully pull the top, with pump and motor attached, out of the tube. Do not hammer, pry, or pound on tube or top. Allow the sensor lead wire to slide through the cord restraint.
5. Remove the three (3) socket head setscrews from the level sensor housing on the bottom of the tube. Carefully pull the level sensor up and out from the bottom of the tube. Carefully remove the sensor lead wire by pulling the controller end back through the top. Cover the end of the sensor lead wire with tape to prevent moisture and dirt from entering. If the sensor is unused or put into storage, remove the dryer from the controller and install on end of vent tube during storage period.
6. Remove the nuts (4) that secure the motor to the pump and pull the motor from the pump. Do not remove the motor lead from the motor unless it will be replaced with a new lead. It is recommended that a new motor lead be used whenever the old lead is removed from the motor because of possible damage to the lead or distortion of the rubber seal that may prevent resealing.
7. Unscrew the motor lead nut from the motor. Work the lead back and forth to loosen seal and unplug the lead from the motor connector. Remove the lead by pulling the controller end back through the top.
8. Unscrew the pump assembly from the top using cloth strap wrenches to prevent damage to the metal surfaces.

CAUTION

Do not attempt to disassemble level sensor or pump motor. Any disassembly will void the warranty.

ASSEMBLY

1. Apply pipe sealing compound to the top threads and screw the pump to the top. To prevent damage to the top sealing surface or the pump bowls, tighten pump to top using cloth strap wrenches.
2. Slide motor and pump together and align motor shaft splines to pump splines by turning the motor shaft. Align the motor lead connector with the cutaway in the pump flange. Secure motor to pump with four (4) nuts.
3. Slide the long end of the motor lead through the cord restraint cap and nut in the top. Insert plug into the motor connector. Tighten motor lead connector nut to secure lead to motor.
4. Inspect upper and inside surface of tube and remove any sharp edges or burrs. Wipe surface of tube and top to remove any dirt, sand, or metal filings. Remove the O-ring and clean sealing groove in the top. If original O-ring installation used a spacer / shim between the top and O-ring, clean the shim and reinstall into the sealing groove in the top.
5. Carefully slide level sensor lead wire through the top cord restraint and nut.

CAUTION

Use care while handling the level sensor lead wire to prevent damage to the conductors and center vent tube.

6. Slide the level sensor and center it within the sensor housing at the bottom of the tube. Secure it with the three (3) socket head setscrews. To prevent damage to the sensor case, do not over tighten the setscrews.
7. Position the tube vertically and carefully slide the pump and motor assembly into the tube. Guide the assembly past the sensor lead wire to prevent crushing or cutting the lead wire. Remove slack from the sensor lead wire by pulling the lead wire out through the top.
8. Install a new top O-ring and liberally apply white petroleum jelly (Vaseline or equivalent) to the O-ring and cover sealing surfaces. Align the screw holes in the top with the holes in the tube and carefully slide the top into the tube making sure that the O-ring is not damaged.
9. Remove the slack from the motor lead and sensor lead wire. Secure the top to the tube with three (3) cap screws. Tighten cap screws until sealing grease starts to bead out from the top-to-tube joint. Do not over tighten.
10. Secure motor lead and sensor lead wire with the cord restraint nuts. Tighten the nut until the edge of the insert can be seen on the inside edge. Install vent hose.

SEAL TEST PROCEDURE

NOTE: Refer to Figure 2.

1. Install mechanical plug into the discharge pipe connection located in pump top. Tighten to recommended specifications. Refer to Table A.
2. Connect gage tubing to vent fitting.
3. Connect magnehelic gage to gage tubing.
4. Fill five gallon pail with water to the rim.
5. Place pump assembly, as depicted on Figure 2, in the filled five gallon pail.
6. Observe the magnehelic gage. The pressure should read about 5" W.C. and hold steady.
 - a. If the pressure holds steady, the pump is ready to be installed. Remove the gauge tubing and the mechanical plug.
 - b. If the gauge pressure does not hold steady, there is an air leak in the top assembly.
 - b.1. Remove the pump assembly from the five gallon pail and refill the pail with water.
 - b.2. Mix a solution of soap and water in a hand pump spray application bottle and spray the top assembly.
 - b.3. Place the pump assembly in the five gallon pail and observe the top assembly for bubbles to determine point of the seal leak.
 - b.4. Make necessary adjustments to the pump assembly and repeat items b.1. through b.3. until the leak has been corrected and the gauge pressure holds steady.

INSTALLATION

1. Remove the gage tubing and the mechanical plug and install the vent tube with vent valve.
2. Run the level sensor lead wire to the PumpMaster™ control panel or breakout box and connect the sensor RED wire to the (-) terminal and BLACK wire to the (+) terminal. Connect the level sensor vent tube to the dryer and check for kinks and crushed areas in the tube connection area. The vent tube must be open to allow atmospheric pressure change compensation in the sensor.
3. Repeat bucket test to verify level sensor operation.
4. Install pump into place.
5. Check the level sensor readings before running pump. The LevelMaster meter should indicate the proper depth of the sensor when immersed in liquid. If the meter shows -34.7 the lead wires connections are reversed, not connected or damaged. Be certain to check correct voltages at the controller and measure the resistance of the motor lead and motor to assure proper wiring.

Table A**MECHANICAL PLUG SPECIFICATION**

Nominal Pipe Size	Maximum Allowable Back Pressure PSIG		Tightening Torque
	Air	Water	
1"	5	110	20 in. lbs.
1.25"	5	100	30 in. lbs.
1.5"	5	70	5 ft. lbs.
2"	5	40	10 ft. lbs.
3"	5	30	12 ft. lbs.

Table B**TOOLS AND ITEMS REQUIRED FOR
MAINTENANCE OF EPG SUREPUMP**

- * 0-32 Screw with 5/16" hex head
- * 5/16" Nut driver
- * 10-32 x 5/16" long stainless steel set screw
- * 3/32" Allen wrench
- * .0005" Shim stock (blue)
- * O-ring set 4, 5, and 6
- * White petroleum jelly (Vaseline)
- * Anti-seize compound
- * Small channel lock pliers
- * Magnehelic gage (Model 2010)
- * Scissors to cut shim stock
- * Flat blade screwdriver
- * 1/2" Open end wrench
- * 24" of 1/4" OD nylon tubing
- * Mechanical plug set -- 1", 1.25", 1.5", 2", and 3"
- * Torque wrench

Figure 1

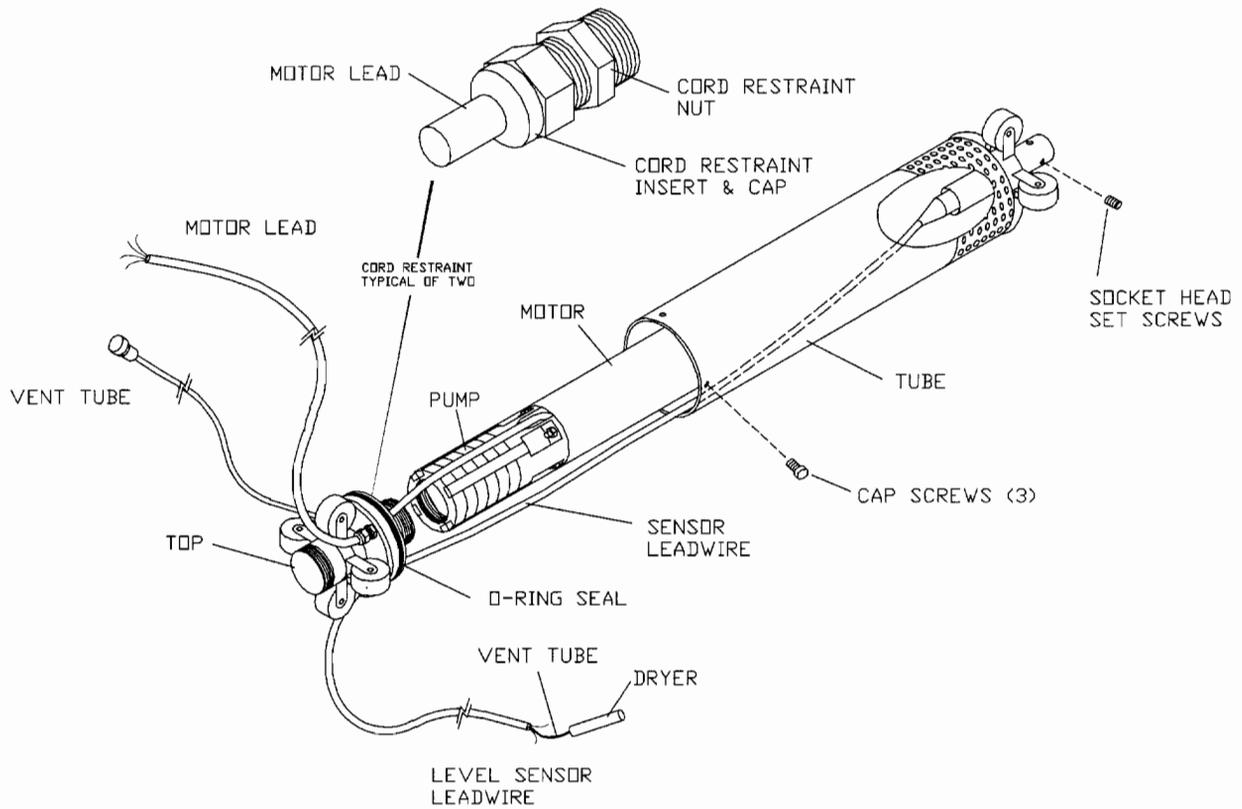
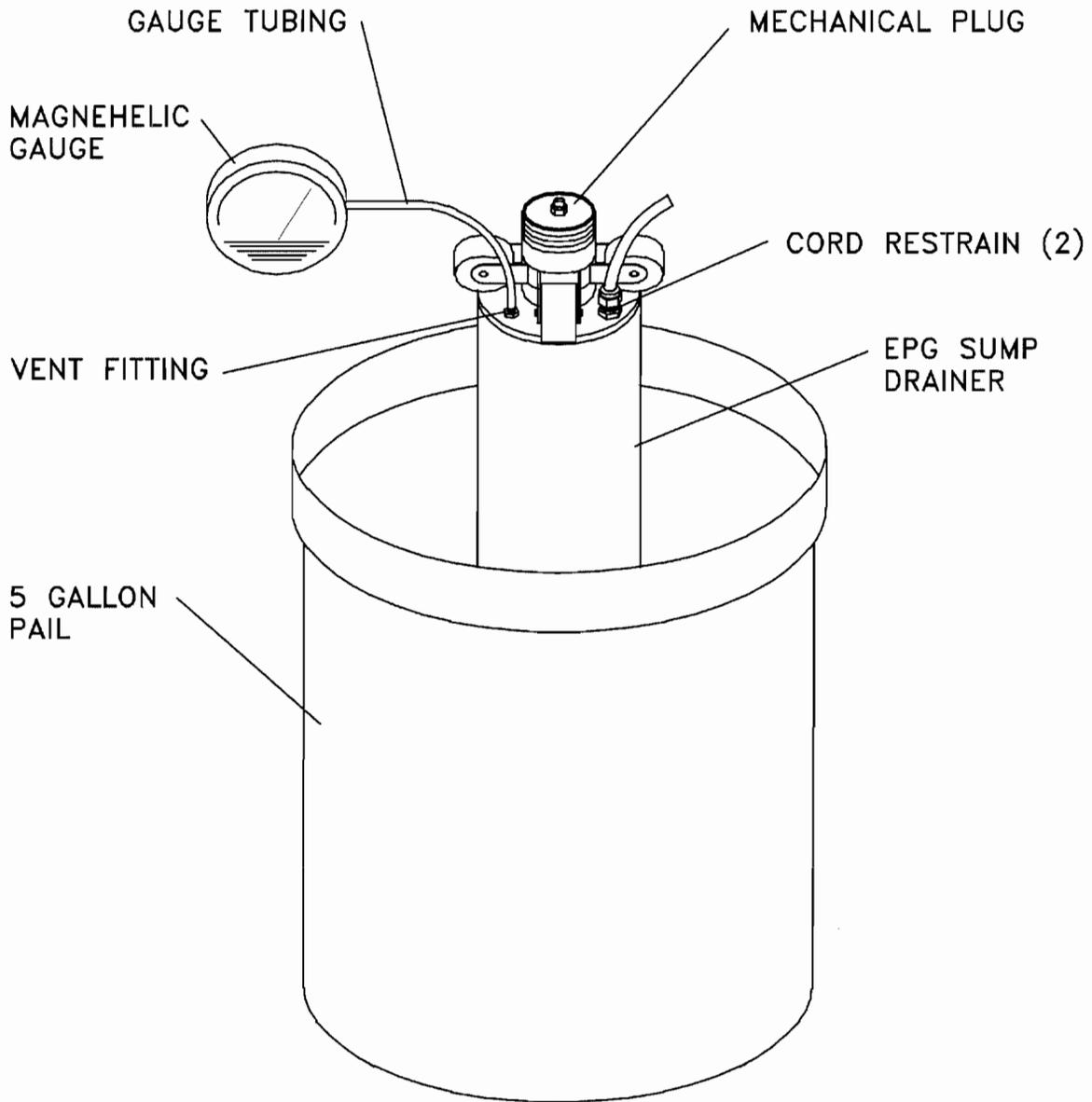


Figure 2



EPG SurePump™ with LevelMaster™™ Level Sensor

REPLACEMENT INSTRUCTIONS FOR LEVEL SENSOR IN WHEELED SUMP DRAINER

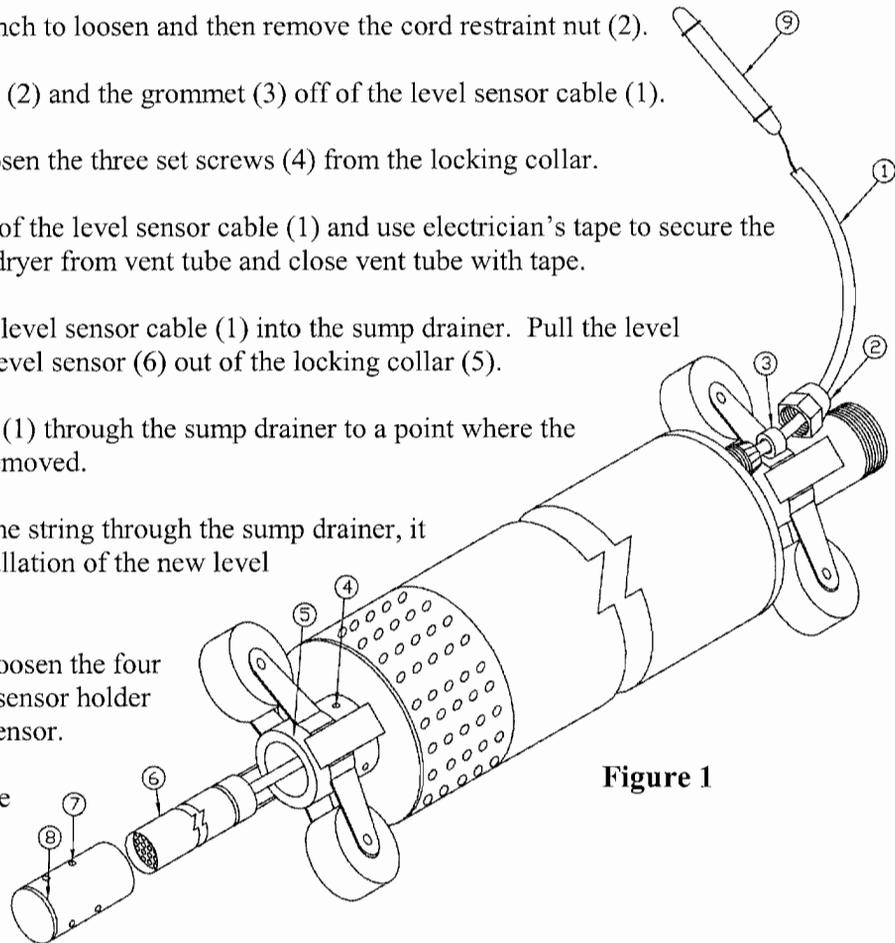
1. Use a 15/16 open end wrench to loosen and then remove the cord restraint nut (2).
2. Slide the cord restraint nut (2) and the grommet (3) off of the level sensor cable (1).
3. Use a 3/32" hex key to loosen the three set screws (4) from the locking collar.
4. Tie a string to the top end of the level sensor cable (1) and use electrician's tape to secure the string. Remove desiccant dryer from vent tube and close vent tube with tape.
5. Push several inches of the level sensor cable (1) into the sump drainer. Pull the level sensor holder (8) and the level sensor (6) out of the locking collar (5).
6. Pull the level sensor cable (1) through the sump drainer to a point where the electrician's tape can be removed.

CAUTION: Do not pull the string through the sump drainer, it will be used to assist installation of the new level sensor.

7. Use the 3/32" hex key to loosen the four set screws (7) in the level sensor holder (8) and remove the level sensor.
8. Remove the string from the level sensor cable (1).
9. Remove the foam protective cover from the new level sensor.
10. Remove the desiccant dryer tube (9) and seal the vent tube with electrician's tape.

11. Place the new level sensor (6) in the level sensor holder (8). Secure the two setscrews with the 3/32 hex key and torque to a maximum of seven-inch pounds.

CAUTION: Do not over tighten the setscrews. Over tightening can damage the level sensor. Seven-inch pounds torque will secure the level sensor (6) in place.



12. Tie the string to the new level sensor cable end (1) and use electrician's tape to secure the string.
13. At the sump drainer's discharge end, pull the string and level sensor cable (1) through the sump drainer until the level sensor holder (8) is seated in the locking collar (5).

CAUTION: Do not pull the cable tight. Allow two to three inches of slack in the sump drainer.

14. Insure the level sensor holder (8) is securely seated in the locking collar (5) and tighten the three set screws (4). Torque to 15-inch pounds.
15. Remove the electrician's tape and string from the level sensor cable.
16. Reinstall the grommet (3) and the cord restraint nut (2). Tighten with the 15/16 open end wrench
17. Remove the tape from the vent tube and reinstall the dryer (9).

Tools/Equipment needed:

- 15/16 open end wrench
- 3/32 hex key
- String-2 or 3 feet longer than the sump drainer
- Electrician's tape
- Torque wrench with inch pound scale

TEST EQUIPMENT

To insure proper installation, EPG recommends the following instruments. When working with electrical circuits, use caution to avoid electrical shock.

- Megohmmeter:** To measure insulation value of motor and motor leads to ground. The higher the reading, the better.
- Ohmmeter:** (Must be able to read less than 1 ohm) To measure resistance winding to winding in motor, check quality of any connections made in motor circuit to test coils of relays and continuity of circuits.
- Volt Meter:** To verify correct supply voltage and measure system requirements when running.
- Clamp on Amp Meter:** To measure current draw in system.

TROUBLESHOOTING GUIDE

FAULT	POSSIBLE CAUSE	HOW TO CHECK	HOW TO CORRECT
Pump or blower does not run.	No electricity at controller.	Check for voltage at controller.	If no voltage at controller, check for cause. Contact power company if voltage is incorrect.
	Fuses are blown or circuit breakers are tripped.	Check fuses for correct size and check for loose, dirty, or corroded connections in fuse receptacle, terminal strip and at splice points.	Replace with proper fuse or reset circuit breaker. If new fuses blow or circuit breaker trips, the electrical installation, motor and leads must be checked.
	Motor starter overloads have tripped out.	Check for voltage on line and load side of starter. Check megohm value of motor and lead.	Reset heaters or replace. Inspect starter for other damage. If heater trips again, check the supply voltage. Replace motor or lead as needed.
	Motor and/or cable are defective.	Turn off voltage, disconnect drop leads from controller to the motor. Measure the lead-to-lead resistances with ohmeter (RX-1). Measure lead-to-ground values with megohm meter. Record measured values.	If open winding or ground is found, remove pump and recheck values at the surface. Repair or replace motor or cable.

FAULT	POSSIBLE CAUSE	HOW TO CHECK	HOW TO CORRECT
	Starter does not energize.	Energize control circuit and check for voltage at the holding coil.	If no voltage, check control circuit. If voltage, check holding coil for shorts. Replace bad coil.
	Defective controls.	Check all sensors and safety switches for operation. Inspect contact in control devices.	Replace worn or defective parts.
	Defective capacitor. (Single phase only.)	Turn off voltage, discharge capacitor. Check with megohm meter. Record measured values.	Replace if defective.
Pump runs but does not deliver liquid.	Liquid level in sump is too low or sump infiltration rate is reduced or intranded gas.	Check sump draw down.	See pump data sheet for minimum submergence values.
	Vent valve not installed or improperly installed.	Make sure valve is attached to the to of the sump drainer and that it is not installed backward.	Replace valve if missing. Reverse valve if installed upside down.
	Inlet strainer is clogged.	Install pressure gauge, start pump, gradually close the discharge valve and read pressure at shutoff.	Remove pump and inspect for blockage. Clean screen as needed. Inspect check valve for blockage. Rinse out pump and reinstall.

FAULT	POSSIBLE CAUSE	HOW TO CHECK	HOW TO CORRECT
	Pump is defective or worn.	Same as description above.	Convert PSI to feet (PSI x 2.31 ft/PSI = ___ ft.), add elevation from pressure gauge to liquid level to the converted pressure reading. Refer to specific pump curve for shutoff head for that pump model. If calculated value is close to curve, pump is probably OK. If not, remove pump & inspect.
Pump runs continuously.	Leak in system.	Check system for leaks.	Replace damaged pipes or repair leaks.
	Worn pump.	Install pressure gauge, start pump, gradually close the discharge valve and read pressure at shut-off.	Pull pump and inspect. Replace worn impellers, bearings or other close fitting parts.
	Loose or broken motor shaft.	Little or no liquid will be delivered if the pump/motor coupling is loose or if the motor shaft has sheared off.	Check for damaged shafts if coupling is loose and replace worn or defective units.
	Pump intake or impellers blocked.	Restricted flow may indicate a clogged intake screen or partially blocked impellers. Pump may be installed in mud or sand.	Clean screen and reset pump. It may be necessary to clean impellers.

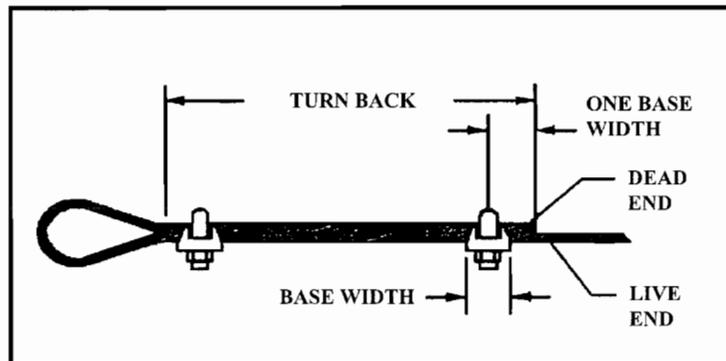
FAULT	POSSIBLE CAUSE	HOW TO CHECK	HOW TO CORRECT
Pump runs but at reduced capacity.	Wrong rotation.	Check for proper electrical connection in control box.	Correct wiring and change leads as required.
	Leak in system.	Check system for leaks.	Replace damaged pipes or repair leaks.
	Pump strainer or check valve is clogged.	Remove pump and inspect.	Clean, repair, rinse out and re-install pump. It may be necessary to take pump apart and clean impellers. Check discharge line for any obstructions.

Wire Cable Clamp

INSTALLATION INSTRUCTIONS

Recommended Method of Applying Clamps to get Maximum Holding Power

1. *Turn back* the specified amount of cable from the loop. Apply the first clamp one base width from the dead end of the wire cable (U-bolt over dead end - live end rests in clamp saddle). Tighten nuts evenly to recommended torque.
2. *Apply the next clamp* as near the loop as possible. Turn on nuts firm, take up rope slack, and tighten nuts evenly to recommended torque.
3. Do not use clamps on plastic coated wire rope.
4. Never use clamps to connect two straight lengths of wire rope.



Attaching Clamps

A termination made in accordance with instruction and using the number of clamps shown has an approximate 80% efficiency rating. This rating is based upon the catalog breaking strength of wire rope.

Number of Clamps Recommended

Clamp Size Inches	Minimum No. of Clamps	Amount of Cable to Turn Back in Inches	Breaking Strength FT/LBS	Clamp Torque FT/LBS	Cable Strength with Clamps FT/LBS
1/8	2	3 1/4	1,760	4.5	1400
3/16	2	3 3/4	3,700	7.5	2960
1/4	2	4 3/4	6,400	15	5120

STORAGE INFORMATION

SUREPUMP™

1. The ideal storage condition for SurePump is in a warm dry location. Although SurePump will tolerate a light freeze, temperatures should not fall below -3°C (27°F). Repeated freezing and thawing should be avoided to prevent possible loss of motor fluid.
2. Limit storage time to less than two years if storage area temperatures exceed 100°F. Limit storage time to one year or less if storage area temperatures exceed 130°F.
3. To prevent motor seal damage and/or fluid loss, always store SurePump vertically.

LEVELMASTER™

1. **IMPORTANT:** During any short or long term storage, to prevent moisture damage to internal components, the desiccant dryer must be installed on the vent tube of the submersible level sensor signal cable. Store in a warm dry location to prevent internal condensation in the meter enclosure.
2. If the level sensor is installed in a SurePump, pump must be stored in a vertical position. Coil the sensor signal cable and place in a box or protected area to prevent damage to the signal cable. Do not stack heavy items on top of level sensor signal cable.
3. Make certain that the desiccant dryer is attached to the end of the level sensor vent tube. Inspect dryer periodically and replace if crystals are pink or white.

PUMPMASTER™ CONTROLS

1. To prevent condensation/moisture damage within the control cabinet, store the PumpMaster in a warm dry location.
2. Check that the corrosion inhibitor cartridge is installed in the interior of the cabinet. If the PumpMaster control will be stored for over six months, contact EPG Companies Inc. for additional corrosion inhibitor cartridges

NOTE

The non-volatile memory of level and flow meters may deteriorate if left without power for periods greater than one year. If storage times are expected to exceed one year contact EPG Companies Inc. for special precautions.

CAUTION

EPG submersible level sensors are designed for rugged use. However, care should be taken to protect these devices from over pressure and sudden impact. When lowering the level sensor into a liquid, penetrate the surface slowly and only to the depth that the unit is designed for. Do not drop or wash with high pressure since this may damage the unit.

EPG Controllers With Intrinsically Safe Circuit(s)

Field Installation Instructions

PURPOSE: Provide instructions to install EPG control panels with Intrinsically Safe (IS) Circuits wired to EPG Level Sensors, EPG Flow Sensors, and Single and Dual Level Float Sensors.

PROCEDURE:

Familiarize yourself with the electrical components and the panel electrical schematics. Read these instructions thoroughly before attempting installation of intrinsically safe circuits. Reference: Installation of intrinsically safe instrument systems in CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.

Install in accordance with Article 504 of the National Electrical Code.

This control panel and its intrinsically safe circuit(s) must be connected to a ground system with very low impedance (1 OHM or less) per NEC 504-50 and 250-50.

See control panel drawings for device wiring. Only simple apparatus (NEC 504-2) and those specifically called out in the controller drawing are to be connected to the intrinsically safe circuit(s). The attached drawings show specific device wiring for level, flow, single level float and dual level float sensors

Where intrinsically safe circuits enter or exit a hazardous (classified) area, a means must be provided to prevent the passage of gases or vapors per NEC 501-5. A seal device must be installed to conduit entering the enclosure and then filled with appropriate sealant.

Wiring of intrinsically safe circuits shall be physically separated from non-intrinsically safe circuits per NEC 504. Do not run intrinsically safe and non-intrinsically safe circuits in the same conduit.

Do not exceed maximum cable lengths stated in the control panel drawings.

Field wiring supplied by others is to have 600 Volt insulation rating.

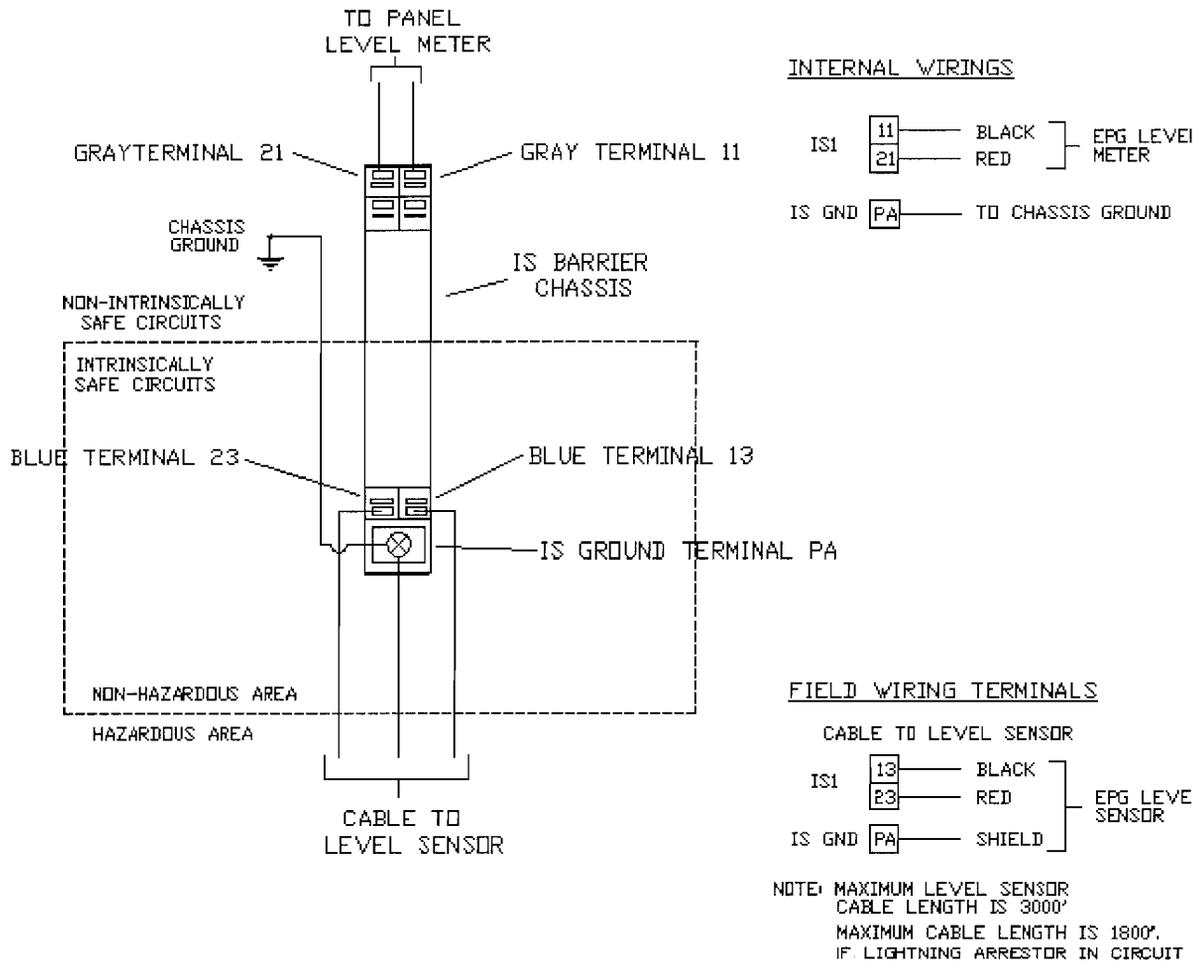
Conductors of intrinsically safe circuits must be separated by at least 5" from conductors of any non-intrinsically safe circuits

If field wiring is terminated in field supplied junction boxes there must be a minimum of 8" between intrinsically safe and non-intrinsically safe field wiring terminals.

Do not substitute parts. Use only the same make, model and part number as originally supplied.

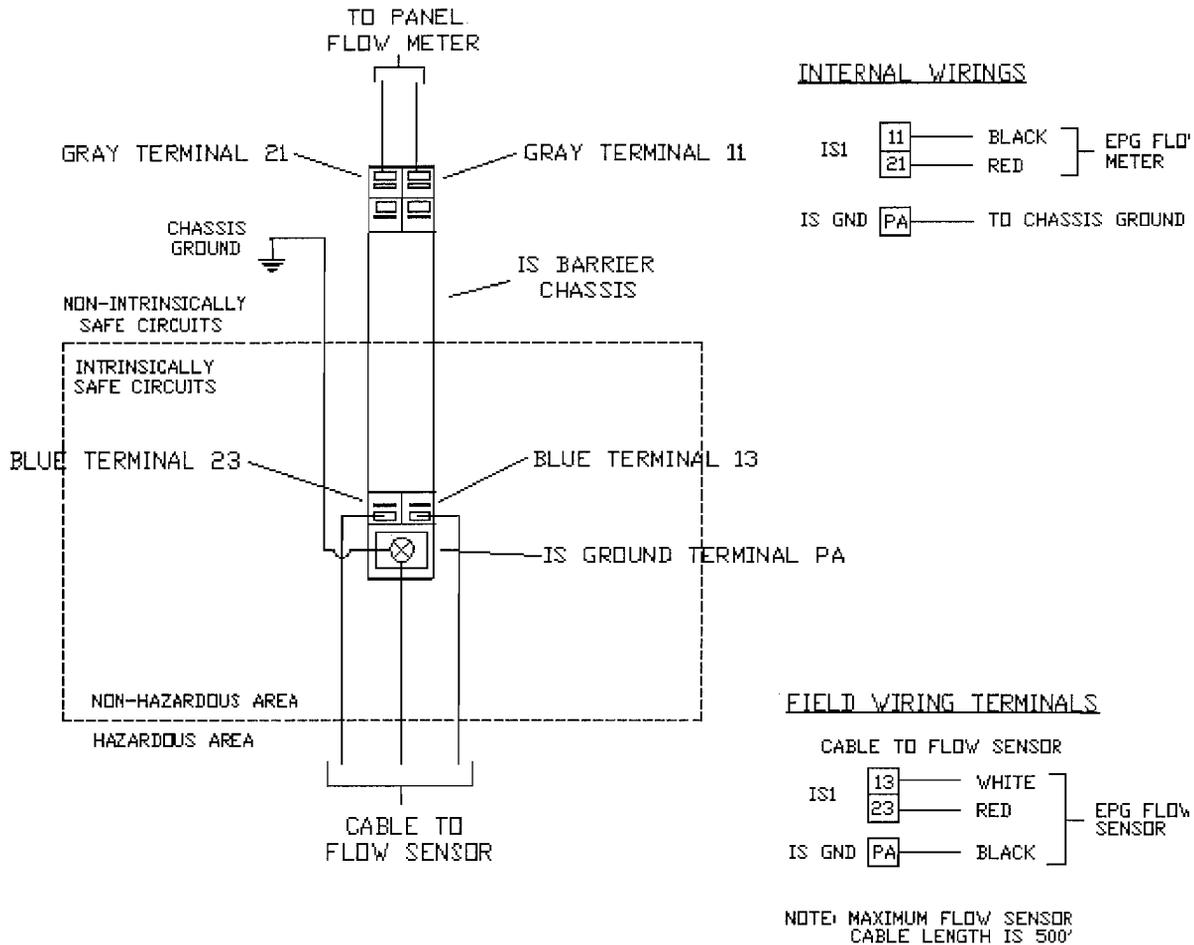
Replace fuses only with fuses of same type and rating.

I.S. BARRIER - LEVEL SENSOR



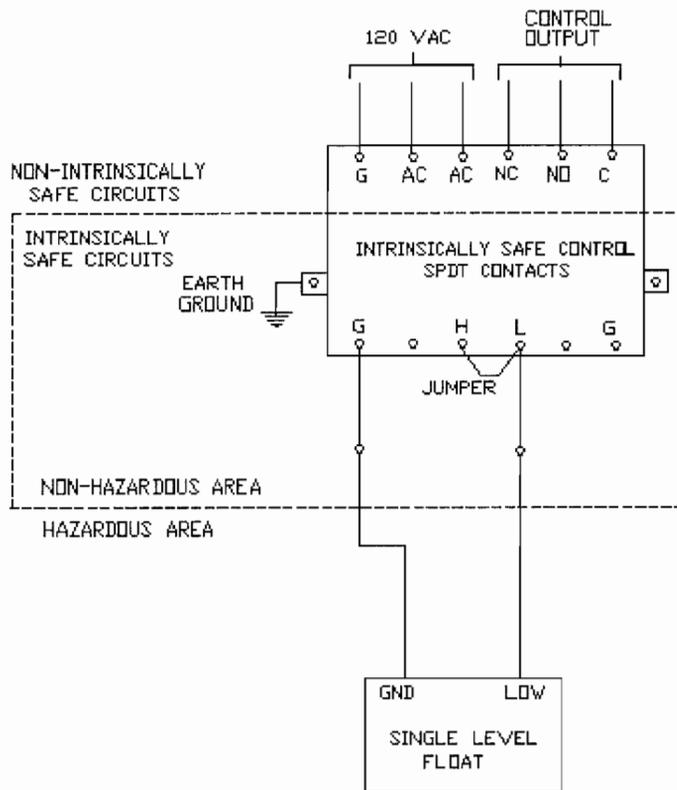
- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS C & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000.
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.
5. MAXIMUM CABLE LENGTH TO EPG LEVEL SENSOR IS 3000 FEET. MAXIMUM LENGTH IS 1800 FEET IF LIGHTNING ARRESTOR IN CIRCUIT.

I.S. BARRIER - FLOW SENSOR

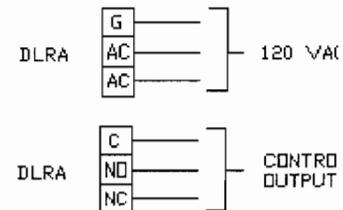


- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS C & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000.
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.
5. MAXIMUM CABLE LENGTH TO EPG FLOW SENSOR IS 500 FEET.

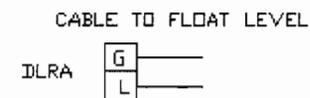
I.S. RELAY BARRIER - SINGLE LEVEL



INTERNAL WIRINGS



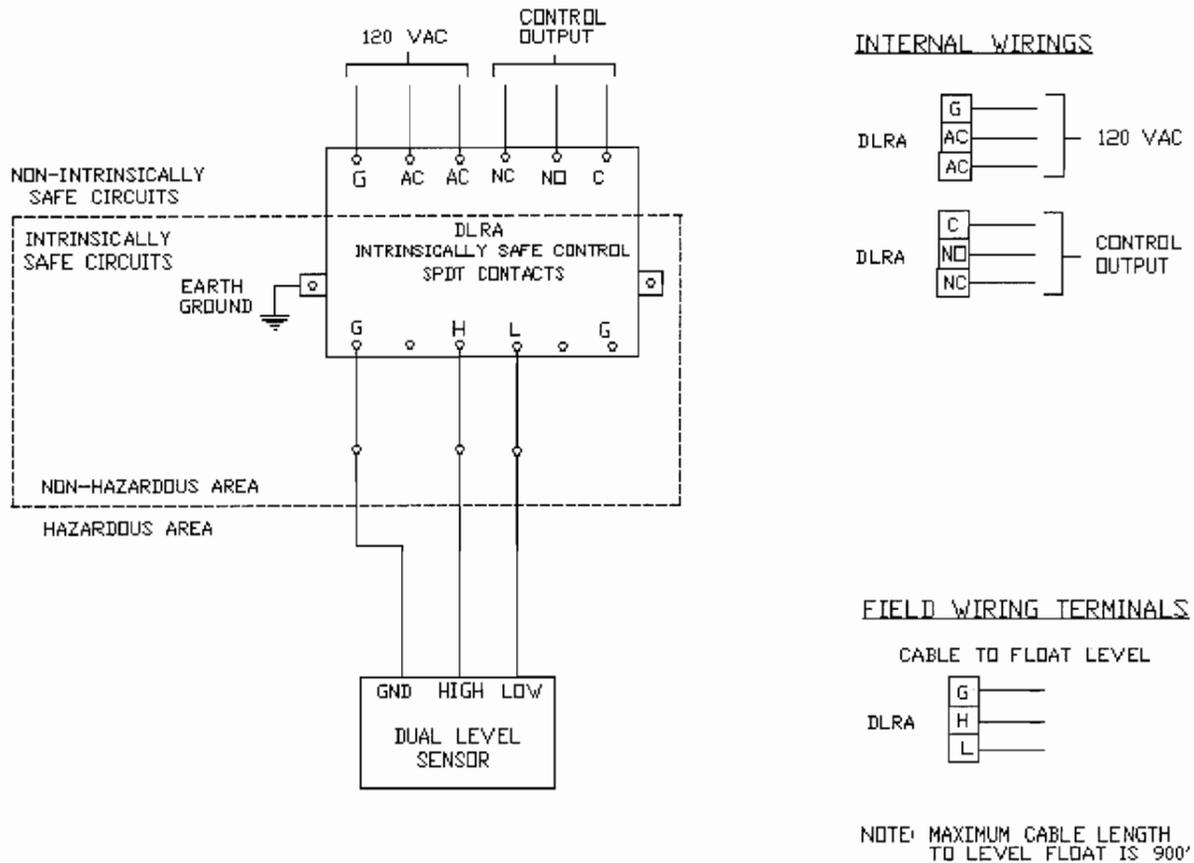
FIELD WIRING TERMINALS



NOTE: MAXIMUM CABLE LENGTH TO LEVEL FLOAT IS 901

- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS A, B, C, & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000.
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.
5. MAXIMUM CABLE LENGTH TO LEVEL FLOAT SENSOR IS 900 FEET.

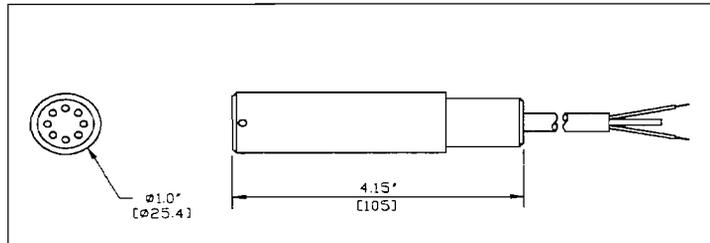
I.S. RELAY BARRIER - DUAL LEVEL



- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS A, B, C, & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000.
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.
5. MAXIMUM CABLE LENGTH TO LEVEL FLOAT SENSOR IS 900 FEET.

ENGINEER'S SPECIFICATION

EPG LevelMaster™ PT Submersible Level Sensor



GENERAL FEATURES

- * **Application:** The LevelMaster sensor is designed specifically to work with the EPG SurePump™, but its durability, accuracy and weight make it the logical choice for stand alone level applications. The chemical resistant jacketed cable with water block contains a vent tube for atmospheric pressure compensation.
- * **Ranges Available:** 0-55" through 0-690' models are standard. Call EPG for other available ranges.
- * **Accuracy:** The LevelMaster sensor has built-in temperature compensation as well as precise calibration giving an accuracy of $\pm 1.0\%$ at ambient temperature and a combined repeatability and hysteresis error of $\pm 0.125\%$.
- * **Fully Submersible:** The LevelMaster sensor is fully submersible in any liquid compatible with 316 stainless steel and the chemical resistant polyurethane cable jacket. It is designed for submergence at depths greater than operating level without sustaining damage. Call EPG for more severe service.
- * **Self-Sealing Cable:** If a cut occurs in the outer jacket of the cable, a water block feature just inside the outer jacket will self-seal in most cases guarding against the incursion of water.
- * **Superior Noise Immunity:** Designed for heavy duty use in hostile environments, the LevelMaster sensor gives outstanding noise immunity. Unlike transducers, whose signals may be distorted by outside interference, the LevelMaster sensor utilizes a conditioned compensated 4-20 mA output to maximize signal strength and accuracy. The sensor also features a shielded lead to help prevent signal disruption from outside sources.

PERFORMANCE

- * **Depth Range:** 0-55" thru 0-690' (0-2 PSI thru 0-300 PSI)
- * **Static Accuracy¹:** $\pm 1.0\%$ BFS/LSL maximum
- * **Thermal Error²:** 0.05% FSO/ $^{\circ}\text{C}$ worst case
- * **Proof Depth:** 1.5 X rated depth
- * **Burst Depth:** 2.0 X rated depth
- * **Resolution:** Infinitesimal

1. Static accuracy includes the combined errors due to nonlinearity, hysteresis and non-repeatability on a Best Fit Straight Line basis, at 25 $^{\circ}\text{C}$ per ISA S51.1.
2. Thermal error is the maximum allowable deviation from the Best Fit Straight Line due to a change in temperature, per ISA S51.1.

ELECTRICAL

- * Excitation: 10 to 40 VDC, Red = (+) excitation, Black = (-) excitation
- * Input Current: 20 mA maximum
- * Output: 4-20 mA (2 wire)
- * Zero offset (max): 4-20 mA, ± 12 mA
- * Output impedance: <10 ohms
- * Insulation resistance: 100 megohms at 50VDC
- * Circuit protection: Polarity, surge & shorted output
- * Power supply rejection: $< \pm 0.05\%$ FSO/VDC (mA output)
- * Electrical termination: 2-24 AWG conductors in a shielded cable with sensor breather and polyurethane jacket

ENVIRONMENTAL

- * Compensated temp range: 0° to 50°C
- * Operating temp range: -20° to 70°C

PHYSICAL

- * Dimensions: Nominal diameter of 1.0" X 4.15" length
- * Weight: 7 oz. (not including cable)
- * Cable: Polyurethane jacketed shielded cable with polyethylene vent tube and Kevlar tension members
- * Wetted materials: 316 SS, Viton
- * Mounting provision: Suspended by cable
- * Lightning Protection: Increases length to 8.15"

MODEL {Call EPG for other ranges available – specify length (---)}

PART #	DESCRIPTION	RANGE
PT05X---	Submersible Pressure Transmitter	0-11'
PT07X---	" " "	0-16'
PT10X---	" " "	0-23'
PT20X---	" " "	0-46'
PT25X---	" " "	0-57'

OPTIONS

- * Tefzel® Cable: Used for highly corrosive environments
- * Titanium Housing: Used for highly corrosive environments
- * Lightning Protection: Protects against transient voltages and lightning associated surges up to 20,000 amperes with proper grounding
- * Temperature Sensor: A sensor with 4-20 mA output for temperature (0-50°C) is available –
Excitation: 9-30 VDC, White = (+) excitation, Green = (-) excitation

EPG LevelMaster™ Level Sensor

OPERATION & MAINTENANCE INSTRUCTIONS

Characteristics of the LevelMaster Level Sensor

EPG Companies Inc. LevelMaster level sensor is a submersible pressure transmitter. The pressure transmitter is a precision measurement device that incorporates isolated diaphragm sensors that are specifically designed for use with hostile fluids and gases. The sensor utilizes a silicon pressure cell that has been fitted into a stainless steel package with a stainless steel barrier diaphragm. The sensor assembly is housed in a rugged 316 stainless steel case.

The device features a high performance internal signal conditioning. Standard output is 4 to 20 mA. All units have surge and reverse polarity protection.

All EPG transmitters are permanently etched with wiring information, part number (P/N), serial number (S/N), date of manufacture (DOM), range, excitation, and output.

All EPG transmitters are designed for rugged use. However, care should be taken to protect these devices from overpressure and sharp impact. When lowering submersible pressure transmitters into a liquid, penetrate the surface slowly and only to the depth necessary. Do not drop the unit from above the surface. All transmitters can be cleaned by rinsing them in mild detergent. Do not pressure wash.

Vent Filter / Water Vapor Trap

The vent filter and water vapor trap is a replaceable vent tube dehumidifier intended for use with the submersible pressure transmitters. This device is specifically designed to protect sensitive electronic components from mildew, corrosion, rust, and other forms of deterioration while at the same time preventing the formation of a liquid column.

Vent filters should be changed when they are 85% spent. Do not remove the old filter until a new one is available. The number one failure mode is moisture and corrosion damage due to lack of maintenance of the vent filter. The vent filter connects to the existing vent tube as it exits the cable at the junction box via a tube.

Replacement vent filters can be ordered by calling EPG at 800-443-7426. The vent filter and water vapor trap can be exposed to air, industrial gases, refrigerants, organic liquids, and solvents. However, they should not be used when ammonia is present.

Specifications

Most installations of submersible pressure transmitters connect the cable directly to the control panel or to a breakout box (junction box). From this breakout box, end users must run cable to the required instrumentation. Specifications for the polyurethane or Tefzel jacketed cable is as follows:

- * Excitation: 10 to 40 VDC, Red = (+) excitation, Black = (-) excitation
- * Input Current: 20 mA maximum
- * Output: 4-20 mA (2 wire)
- * Zero offset (max): 4-20 mA, ± 0.12 mA
- * Output impedance: <10 ohms
- * Insulation resistance: 100 megohms at 50VDC
- * Circuit protection: Polarity, surge & shorted output
- * Power supply rejection: < $\pm 0.05\%$ FSO/VDC (mA output)
- * Electrical termination: 2-24 AWG conductors in a shielded cable with sensor breather, water block, and polyurethane jacket
- * Compensated temp range: 0° to 50°C
- * Operating temp range: -20° to 70°C
- * Dimensions: Nominal diameter of 1.0" X 4.15" length
- * Weight: 7 oz. (not including cable)
- * Cable: Polyurethane jacketed shielded cable with polyethylene vent tube and Kevlar tension members
- * Wetted materials: 316 SS, Viton
- * Mounting provision: Suspended by cable

Polyurethane Cable

The standard cable is polyurethane and will handle most environments and has a self-sealing feature. If a cut occurs in the outer jacket of the cable, a water block feature below the outer jacket will self-seal in most cases to guard against the incursion of water.

Chemical Resistance of Polyurethane

Potable Water, Waste Water, Borax, Butane, Animal Fat, Carbonic Acid, Citric Acid, Cod Liver Oil, Corn Oil, Glycerin, Glycol, Mineral Oils, Potassium Nitrate, Potassium Sulfate, Silicone Oils, Stoddard Solvent, Tannic Acid (10), Tartaric Acid, Turbine Oil, and most Leachate.

Tefzel® Cable

Optional Tefzel cable is recommended for use in highly corrosive environments. It offers additional resistance in corrosive environments over the standard polyurethane cable.

Chemical Resistance of Tefzel

Acetic Acid (Glacial), Acetic Anhydride, Acetone, Aluminum Chloride, Anti-Freeze, Bromine, Calcium Chloride, Calcium Hydroxide, Chlorine, Copper Chloride, Ferrous Chloride, Hydrochloric Acid, Ketones, Lacquer Thinners, Leachate, and Sulfuric Acid.

Cable Lengths

The maximum length of cable to be used with the submersible pressure transmitter is up to 10,000 feet.

OPTIONS

- * Titanium Housing: Used for highly corrosive environments
- * Lightning Protection: Protects against transient voltages and lightning associated surges up to 20,000 amperes
- * Temperature Sensor: A sensor with 4-20 mA output for temperature (0-50°C) is available – Excitation: 9-30 VDC, White = (+) excitation, Green = (-) excitation.

EPG LevelMaster™ Level Meter

Model CH1000-SDHH

OPERATION & SET UP INSTRUCTIONS

The EPG LevelMaster system uses a submersible pressure transmitter to detect changes in fluid levels and a programmable meter featuring a digital LED display and front panel keypad to monitor and control fluid levels. The user can program the desired control parameters for a single pump and one other high level control function. The LevelMaster display is in inches unless otherwise programmed. During a pumping and/or an alarm condition, the display alternates between the message and the current liquid level reading. The message indicates which function is active (see below).

GENERAL SETUP OPERATIONS

IMPORTANT: During setup, if three (3) minutes elapse without a keypad entry the meter automatically returns to the run mode without the entered changes being stored. **DO NOT USE FINGERNAIL OR OTHER SHARP OBJECT TO PROGRAM METER. DAMAGE TO KEYPAD MAY RESULT.**

DISPLAY	INSTRUCTION
SETUP	At this prompt, enter the lockout code (35) in order to enter the set point setup mode.
Pr HI	At this prompt, followed by the current setting, select the Pump Relay High set point. This is the pump ON set point.
Pr Lo	At this prompt, followed by the current setting, select the Pump Relay Low set point. This is the pump OFF set point.
AL HI	At this prompt, followed by the current setting, select the Alarm High Relay set point. This is the high level alarm set point.
Hy HI	At this prompt, followed by the current setting, select the hysteresis for the Alarm High Relay set point. This value, when subtracted from the high level alarm set point, sets the shut off point for the high level alarm .
AL H2	At this prompt, followed by the current setting, select the Alarm High-High Relay set point. This is the high-high alarm level set point and is factory set.
Hy H2	At this prompt, followed by the current setting, select the hysteresis for the Alarm High-High Relay set point. This value, when subtracted from the high-high level alarm set point, sets the shut off point for the high-high level alarm and is factory set.

DISPLAY	MESSAGE
P	Pump activated. "P" and the current level reading will alternate on the display.
HiP	High alarm & pump activated. "HiP" and the current level reading will alternate on the display.
HiPH2	High-High alarm & pump deactivated. "HiPH2" and the current level reading will alternate on the display.

SET UP PROCEDURES FOR SIMPLEX OPERATION – SDHH METER

STEP NO.	ACTION
1	Push SETUP/ENTER button. Wait for the meter to display 0.
2	Push arrow buttons to set a value of 35 on meter display. Push SETUP/ENTER.
3	Meter shows Pr HI (pump ON set point) followed by current value.
4	Push arrow buttons to set the desired level for pump ON. Push SETUP/ENTER button.
5	Meter shows Pr Lo (pump OFF set point) followed by current value.
6	Push arrow buttons to set the desired pump OFF level. Push SETUP/ENTER button.
7	Meter shows AL Hi (High Level Alarm) followed by current value.
8	Press arrow buttons to set desired high level alarm point. Push SETUP/ENTER button.
9	Meter shows Hy Hi . Press arrow buttons to select how far below the high level point the alarm will shut off. Push SETUP/ENTER button.
10	Meter shows AL H2 (High-High level alarm set point) followed by current value. Factory setting is 150.0". NOTE: This fail safe feature shuts off the pump if the level sensor fails and should not be changed in the field.
11	Meter shows Hy H2 . Press arrow buttons to select value of 0.0". Not used.
12	Push SETUP/ENTER button. Meter returns to normal operation.

EXAMPLE:

If the desired levels for the pump were:

Pump ON	18.0"
Pump OFF	12.0"
High Level Alarm	30.0"
High Level Alarm Hys.	1.0"

Complete steps 1 – 3 above.

Select **18.0** with arrow buttons for the **Pr HI** value. Push SETUP/ENTER.

Pr Lo is displayed, select **12.0** with the arrow buttons for the Pump OFF value. Push SETUP/ENTER.

AL Hi is displayed, select **30.0** with the arrow buttons for the High Alarm value. Push SETUP/ENTER.

Hy Hi is displayed, select **1.0** with the arrow buttons for the High Level Alarm OFF value (value determined by subtracting from high-level-alarm set-point). Push SETUP/ENTER.

INSTALLATION NOTES AND TROUBLESHOOTING

BACKGROUND: Numerous installations of the EPG LevelMaster system have proven its long-term reliability. The majority of malfunctions of the LevelMaster system are the result of improper installation and handling of the pressure transmitter sensor. During new installations, be certain to check for any shipping damage, loose controller connections or parts that may have come loose during shipment.

CAUTION

Do not use any other programming codes other than setup code (35).

SYMPTOM / DISPLAY	PROBABLE CAUSES	HOW TO CORRECT
Continuous above full scale reading (above 139"), or Continuous reading.	If pump has been off for a long period of time, liquid level may actually be quite high. Loose connections in circuit. Short circuit in sensor lead wire or connector or circuit. Faulty sensor.	Reprogram meter if above 150" or pull pump up slightly to initiate pump start. Repair connections in controller. Inspect for shorted connections at breakout box (junction box) and at controller. If connections are good, replace sensor. Replace sensor.
-34.6 reading.	Lead wire damaged or reversed connections. Open circuit in sensor lead wire or controller connections. Faulty power supply in meter.	Check schematic, repair connections. Replace sensor and lead wire. Test IS barrier and meter with simulator. Replace meter.
Erratic readings.	Damaged sensor lead wire. Improper connections. Faulty meter.	Check schematic, repair connections. Replace sensor and lead wire. Test meter with simulator. If faulty meter, replace meter.

Pump starts at normal reading, runs for a few seconds and stops.	Low liquid recovery rate. Screen on pump may be clogged.	Remove pump and clean screen. May also need to disassemble pump and clean pump impellers.
	Sump clogged or plugged.	Remove pump and clean out sump.

FACTORY SETTINGS

LevelMaster Model SDHH Meter

Panel S/N: _____

Meter S/N: _____

Meter Designation: _____

Operating Parameters – Setup Code 35

PARAMETER	VALUE	OPERATION
Pr H1	inches	Turns Pump ON when level on meter reads ____
Pr Lo	"	Turns Pump OFF when level on meter reads ____
AL Hi	"	Turns High Level Light ON when level on meter reads ____
Hy Hi	"	Keeps High Level Light ON until level drops ____ below AL Hi
AL H2	150.0	Turns Pump OFF when level meter reads 150.0". Greater indicates a probable level sensor failure.
Hy H2	0.0	Not used

NOTE: If the up arrow is pressed any time that the meter is operating, the highest level that the meter has observed since power was applied will be displayed.

S3070-PT TRANSDUCER SIMULATOR Operation

The model 3070-PT Transducer Simulator is a device designed for testing an EPG LevelMaster™ level controller circuit while temporarily bypassing the existing level sensor.

In the “Run” (normal operation) mode liquid level in the sump applies pressure on the level sensor. The sensor converts that force into an electrical signal. The electrical signal is transmitted by the sensor cable to the level meter where it is converted into a liquid level display.

The “Test” mode simulates a level sensor signal. Rotating the potentiometer changes the electrical signal forcing the system to function as if a level sensor were in the circuit. Varying the electrical signal changes the level meter display in the same manner in which the level sensor signal would effect the system. By turning the simulator knob slowly clockwise from top to bottom the meter will display each set point such as start, stop and alarms. With the toggle switch turned back to the “Run” position the potentiometer is removed from the circuit and the level sensor controls according to the set points. Meter values register actual liquid level.

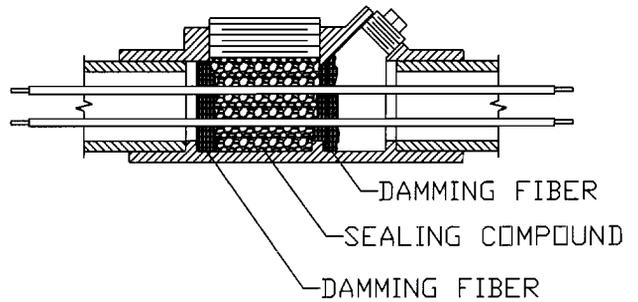
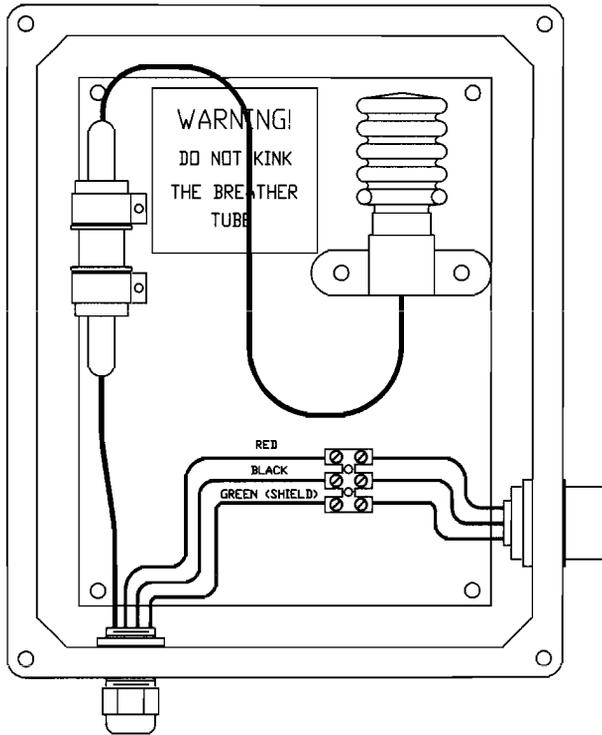
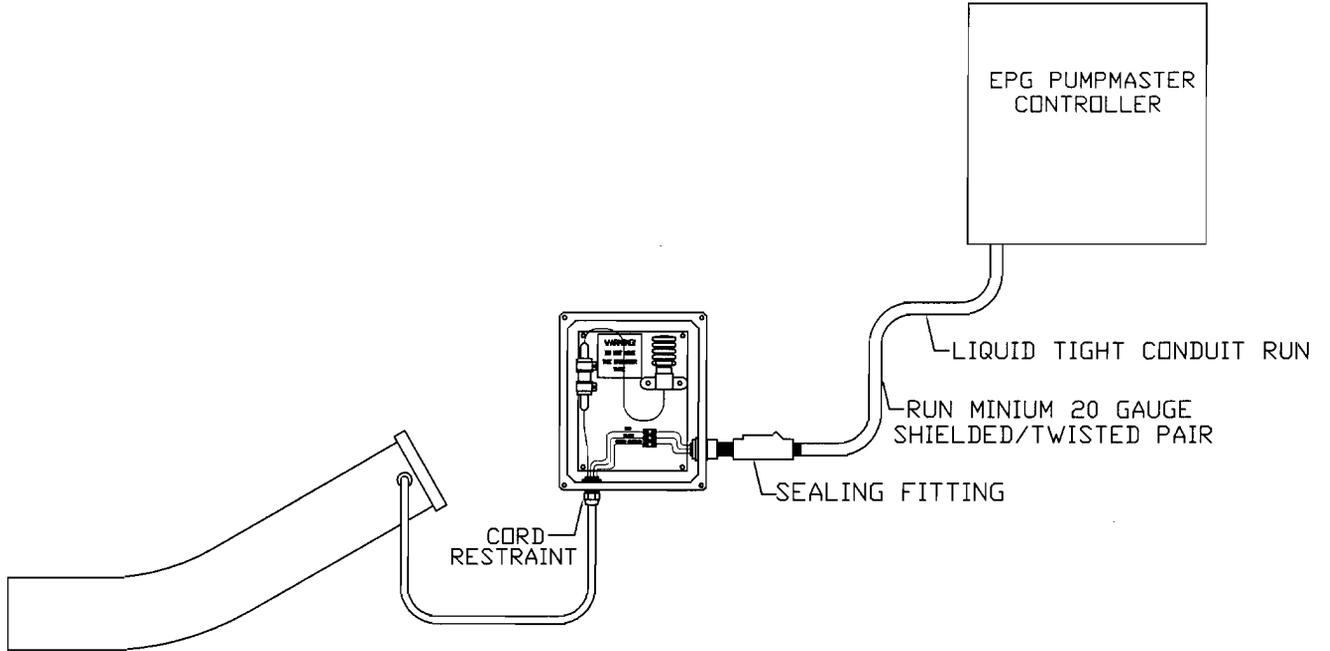
“**CAUTION**”, care must be taken when using this device in “Test” mode to avoid damaging the motor by running it dry. In normal test mode the pump switch should be turned to OFF.

S3070-PT TRANSDUCER SIMULATOR Test Procedure

1. When the toggle switch is in the “Run” position the controls should function normally.
2. When the toggle switch is in the “Test” position (pressure transducer temporarily removed from the control circuit) the level meter should display the liquid level. By turning the simulator knob slowly clockwise from top to bottom the meter will display each set point such as start, stop, and alarms. Care must be taken when using this device in the “Test” mode to avoid damaging the motor by running it dry. In normal test mode the pump switches should be off.
3. Make sure that the potentiometer has full travel (270 degrees maximum) in both clockwise and counter-clockwise directions.
4. Make sure that all of the wires on the rear of the simulator (wires 200, 201, 202, 203) are connected in the proper position.
5. Replace the transducer simulator if it does not function as described above.

BJBL 600B

BREAKOUT JUNCTION BOX FOR LEVEL SENSOR



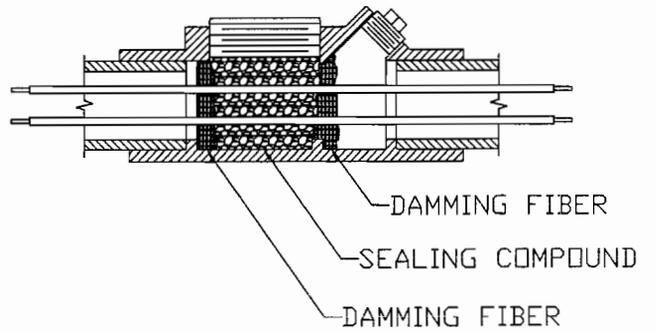
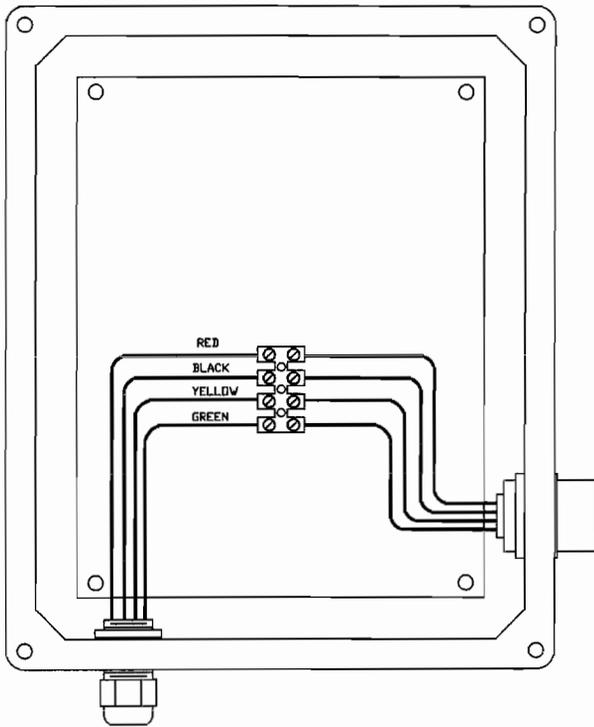
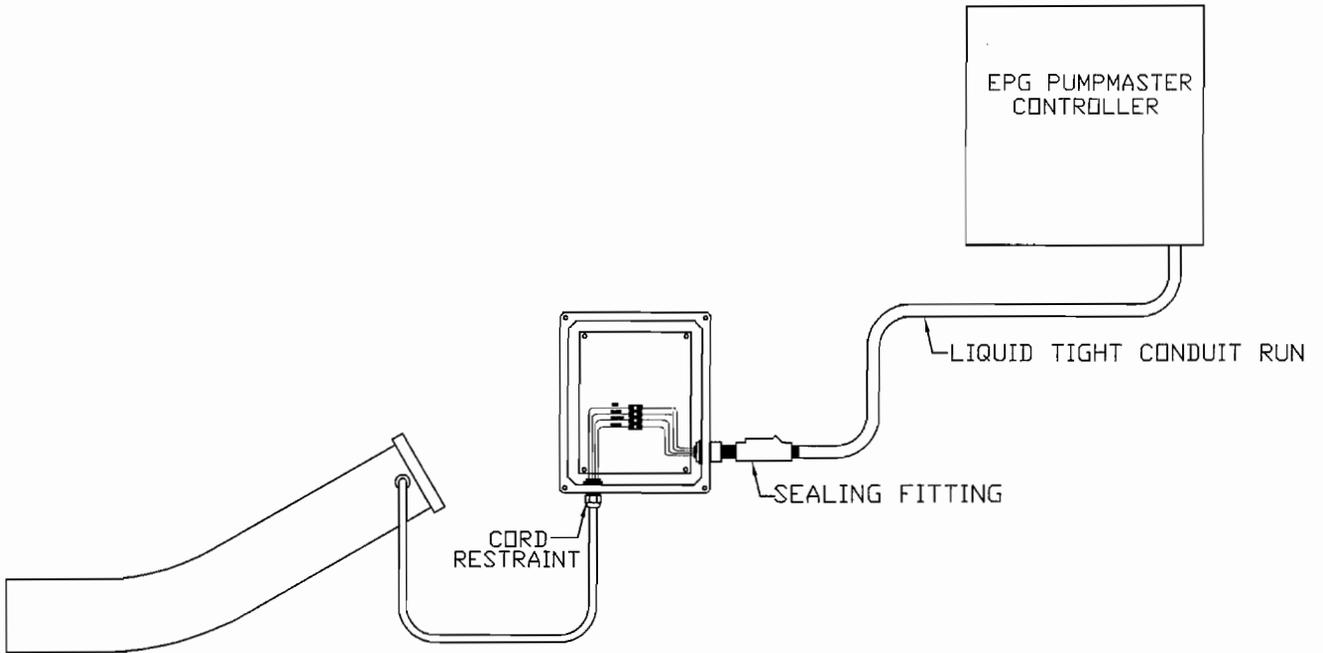
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REFERENCE

TOLERANCES (EXCEPT AS NOTED)	REVISIONS			EPG COMPANIES			
	NO.	DATE	BY	TYPICAL INSTALLATION			
DECIMAL 2	1			DESIGN C.A.S.	SCALE NONE	DATE 05/07/02	MATERIAL DRAWING NO. APPD 02523-0605
	2						
FRACTIONAL 2	3						
	4						
ANGULAR 2	5						

BJBP 500

BREAKOUT JUNCTION BOX FOR MOTOR LEAD



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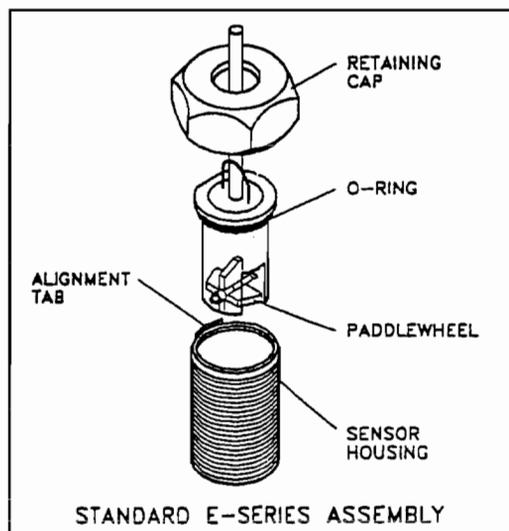
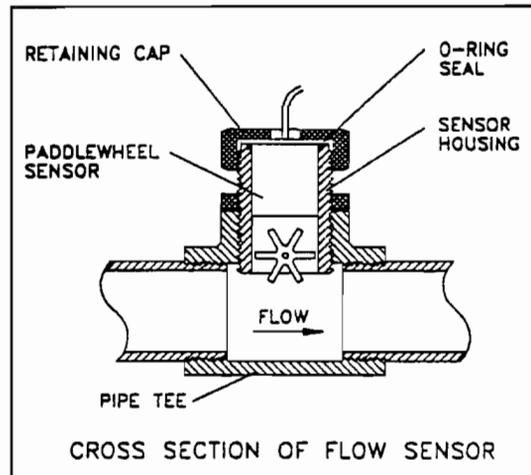
REFERENCE

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DECIMAL ±	FRACTIONAL ±	ANGULAR ±	REV. NO.	DATE	BY	DESIGN	SCALE	MATERIAL	
			1			C.A.S.	NONE		
			2						
			3			C.A.S.	05/07/02		
			4						
			5						
						DRAWING NO.	03626-0500		

SENSOR DATA SHEET

EPG E-Series Liquid Flow Sensor

- * Low cost
- * High reliability
- * Wide range
2 – 10,000 GPM
- * Patented six blade, non-magnetic design
- * Available in DELRIN or KYNAR
- * One paddlewheel fits ALL SIZES
- * Transmits up to 1000 feet without the need for additional amplifiers
- * Direct logic pulse output
- * Flow velocities range of 1.5 to 27 fps
- * Operating pressure to 200 PSIG
- * Liquid temperatures to 250° F
- * 2 Year Warranty
- * High sensitivity
- * Pipe sizes from 3/4" - 14"



One major problem with most paddlewheel type flow sensors having magnets in the paddles is that metal particles tend to stick to the magnets. The collecting material then causes a change in the flow characteristics in the paddle. To eliminate this problem, EPG Companies flow sensor uses a special axle and dual magnet drum design that takes the magnets out of the paddles. This dual magnetic drum design with rapidly changing polarity, along with fluid velocity causes the metallic particles to drop off into the flow stream and are swept away.

INSTALLATION HINTS

1. Pipe must be full for accurate reading.
2. Minimum velocity is 1.5 ft./second. Recommended maximum velocity is 27 ft./second.
3. The flow must be uniform at the point where the flow sensor is installed or an incorrect reading will result. To accommodate a uniform flow allow at least ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the flow sensor. Non-uniform flow is often caused by elbows, partially open valves or an increase in pipe diameter.

Model Number	Nominal Pipe Size	Recommended Range	
		1.5 ft/sec Flow Rate GPM	27 ft/sec Flow Rate GPM
EP 075	¾"	2.0	37.2
EP 100	1"	3.7	66.2
EP 125	1¼"	5.7	103.4
EP 150	1½"	8.3	148.8
EP 200	2"	14.7	264.6
EP 250	2½"	23.0	413.4
EP 300	3"	33.1	595.4
EP 400	4"	58.8	1058.4
EP 500	5"	91.9	1653.8
EP 600	6"	132.3	2381.4

Flow Meter Operation

EPG's meter system is an 8 digit Flow Rate/Totalizer. The meter counts pulses from a flow sensor and converts this information into flow rate and total flow using programmed scaling factors.

The meter features menu driven programming to simplify meter set-up. The meter stores parameters entered into non-volatile memory. This memory retains the parameters even when power to the panel is shut off.

Figure 1 shows the meter display and keypad and gives a brief description of each key's function.

Two Line LCD Display - Shows totalizer and rate values when the unit is in the run mode. Displays programming information when the unit is in the program mode.

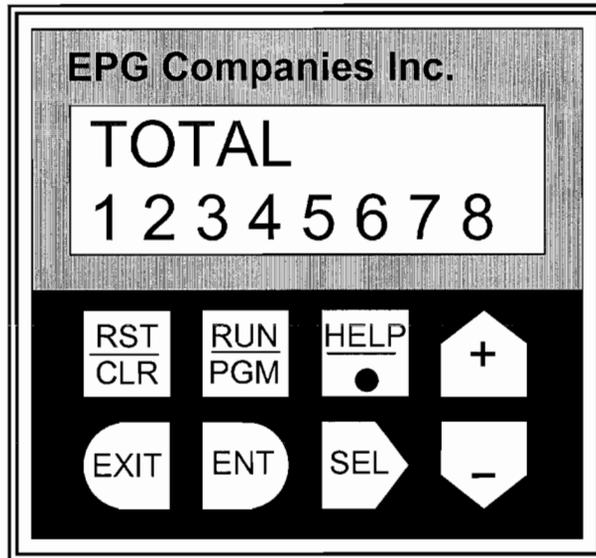


Figure 1. Meter Display and Keypad

Key Functions

Reset/Clear Key - This key can be programmed to reset the totalizer when in the run mode. In the program mode it zeros numeric data that is selected for editing.

Run/Program Key - Press this key followed by the Enter key (ENT) to enter the program mode. Pressing this key while in the program mode returns the control to the run mode.

Help Key - In the run mode this key causes the Help Screens to be displayed. In the program mode this key is used to set the decimal point positions for totalizer and rate scaler displays.

Up Arrow/Plus (+) Key - In the run mode this key is used to select one of the three different display screens. In the program mode this key is used to step vertically up through the menus and increment the value of selected digits when changing numeric values.

Exit Key - This key is used in the program mode to exit program changes that have been selected but not yet entered.

Enter Key - This key is used in the program mode to cause the displayed program changes to be entered.

Select Key - This key is used in the program to move into more detailed menus and select the digits of numeric values needed for programming.

Down Arrow/Minus (-) Key - In the run mode this key is used to select one of the two different display screens. In the program mode this key is used to step vertically down through the menus and decrease the value of selected digits when changing numeric values.

Program Scalers:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
C DEC PT	-----	Sets decimal point to the right of the last digit on the TOTAL Display.
R DEC PT	-----	Sets decimal point to the right of the last digit on the FLOW RATE Display.
C SCALER	See Below	Used to convert sensor pulses into Total Gallons.
R SCALER	See Below	Used to convert sensor pulses into Gallons/Minute.

Program Options:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
RST KEY	RST EDG	Reset Key will Clear Totalizer Count.

Tables 1 and 2 show the keystroke operations necessary to change scale parameters and "Reset Key" enable/disable function.

Flow meter setup procedures for scalers

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press - to scroll through main menu. Find "Program Scalers" on the meter display.
4	Press SEL to enter "SCALERS" menu.
5	Press - to scroll the "SCALERS" menu and bring up the "C SCALER" option on the meter display.
6	Press SEL to select the "C SCALER" and begin operation on the left most digit of the "C SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the meter displays the desired value for the "C SCALER"
7	Press ENT to enter the "C SCALER " value into non-volatile memory.
8	Press - to display the "C DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
9	Press ENT to enter this selection into memory.
10	Press - to bring up the "R SCALER" option on the meter display.
11	Press SEL to select the "R SCALER" and begin operation on the left most digit of the "R SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the desired value for the "R SCALER" is in the meter display. Also use the SEL and HELP/. Keys to position the decimal point to the desired position.
12	Press ENT to enter this value into the non-volatile memory.
13	Press - to display the "R DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
14	Press ENT to enter this selection into non-volatile memory.
15	Press EXIT to exit "Program" mode.
16	Press RUN/PGM to enter "Run" mode.

Table 1. Flow Meter Scaler Sequence

Flow meter setup procedures for reset key

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press + to scroll through main menu. Find "Program Options" on the meter display.
4	Press SEL to enter "OPTIONS" menu.
5	Press + to scroll the "OPTIONS" menu and bring up the "RST KEY" option on the meter display.
6	Press SEL to select the "RST KEY" menu.
7	Press + to display the desired key option. Options include: RST KEY DISABLED This option prevents the reset key from clearing the totalizer count. RST KEY RST EDG This option allows clearing of the totalizer count using the reset key.
8	Press ENT to select the desired option.
9	Press EXIT to exit "Program" mode.
10	Press RUN/PGM to enter "Run" mode.

Table 2. Reset Key Programming Sequence

The programmed scaling factors used are dependent upon the inside pipe diameter of the flow sensor tube. Tables 3 to 6 list the various scaling factors used for the different diameter (nominal O.D.) and schedule (wall thickness) of Stainless Steel and PVC pipes.

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

Table 3. Flow Meter Settings – Stainless Steel Schedule 40

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

Table 4. Flow Meter Settings – Stainless Steel Schedule 80

Pipe Size	C SCALER	R SCALER
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

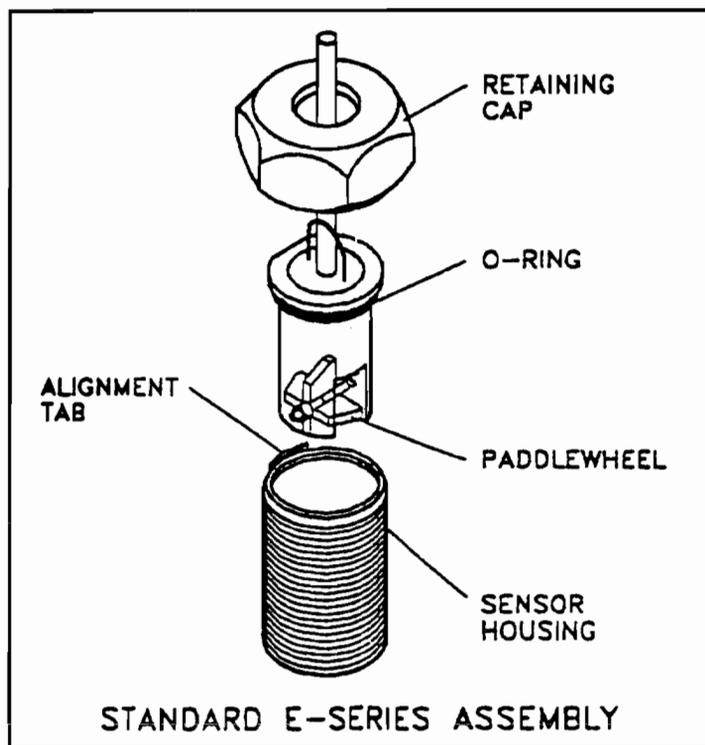
Table 5. Flow Meter Settings – PVC Schedule 40

Pipe Size	C SCALER	R SCALER
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

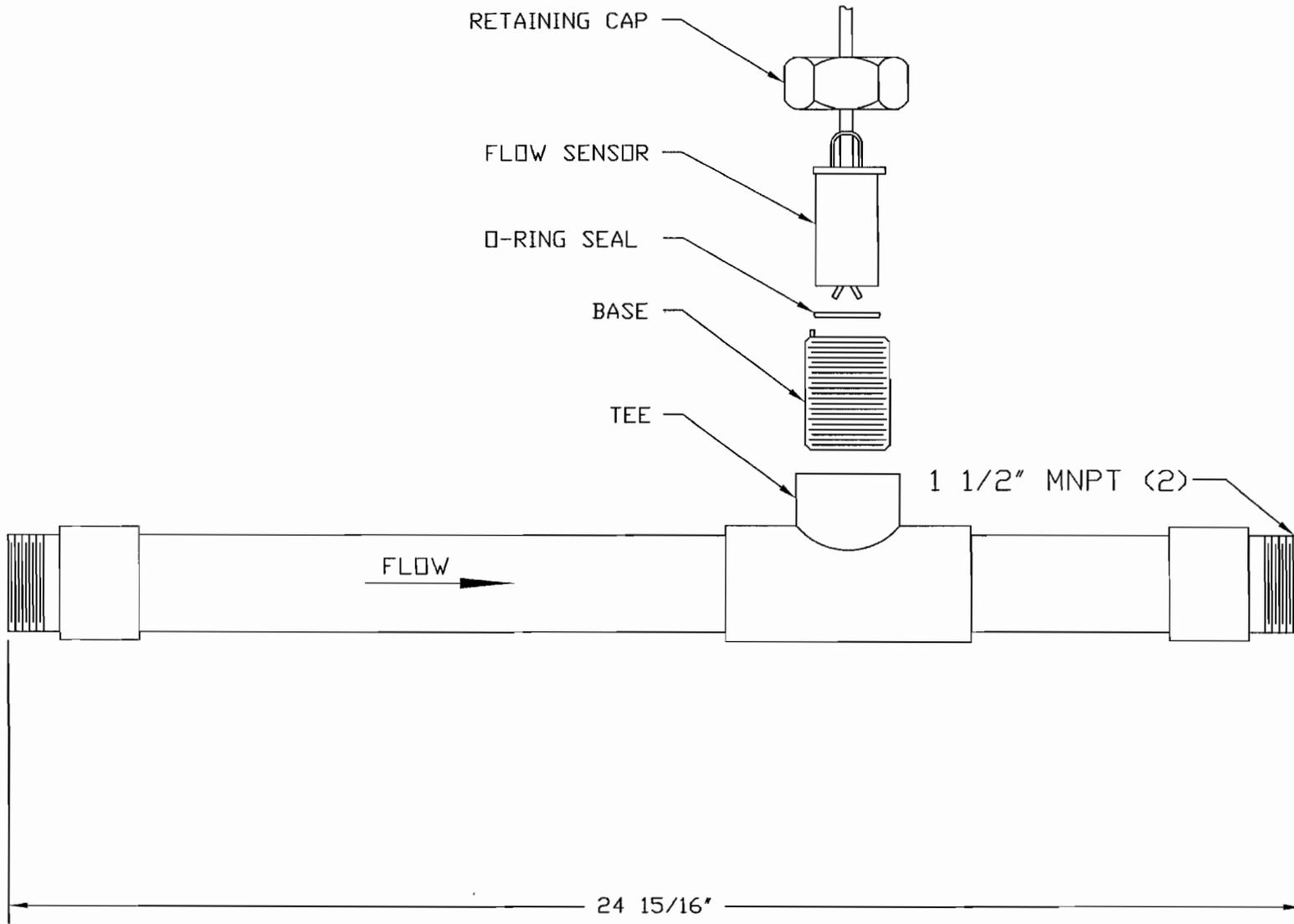
Table 6. Flow Meter Settings – PVC Schedule 80

CAUTION

DO NOT OVERTIGHTEN PADDLEWHEEL FLOW SENSOR NUT!



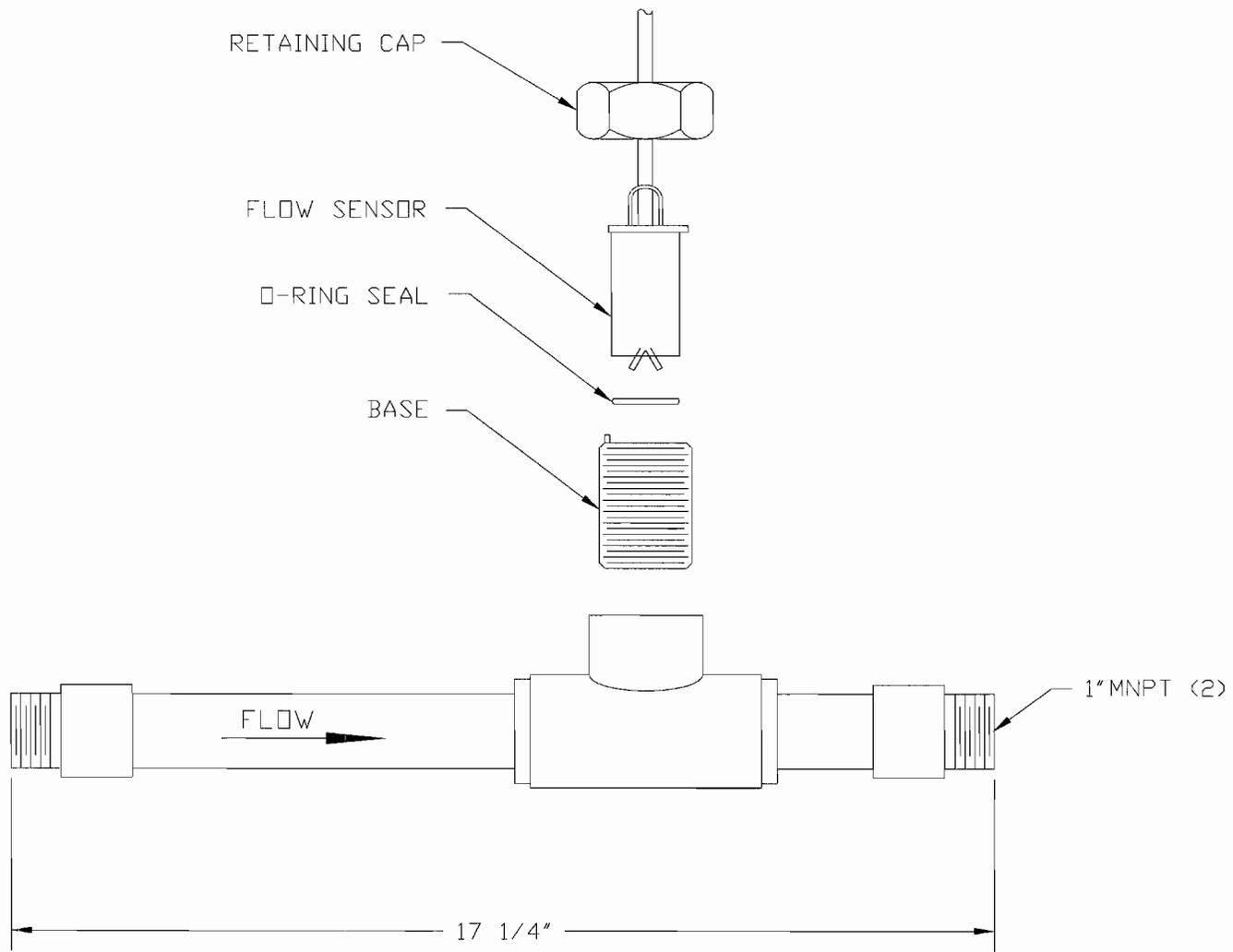
Damage can be caused to the paddlewheel sensor, o-ring, or sensor housing. Please hand tighten nut only!



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TOLERANCES		REVISIONS			EPG COMPANIES		
EXCEPT AS NOTED		NO.	DATE	BY	DESIGN	SCALE	MATERIAL
DECIMAL	.06	1			C.A.S.	NONE	PVC FLOW SPOOL (1 1/2" MNPT ENDS)
FRACTIONAL	1/16	2					
ANGULAR	1°	3					
		4					
		5					
					DATE	07/30/01	DRAWING NO.
					APP'D		05392-0000C



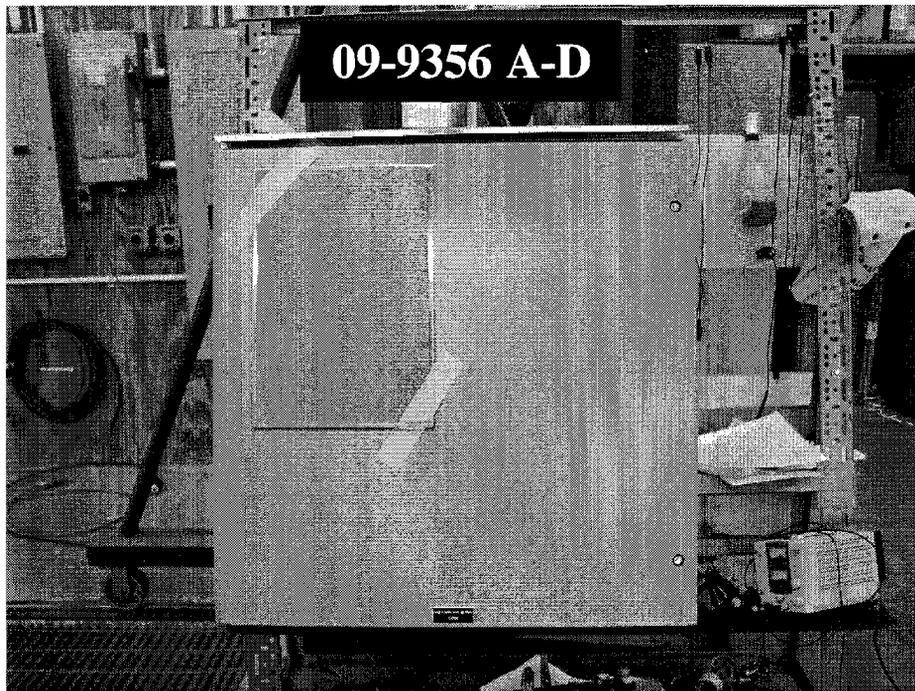
JOB No. _____

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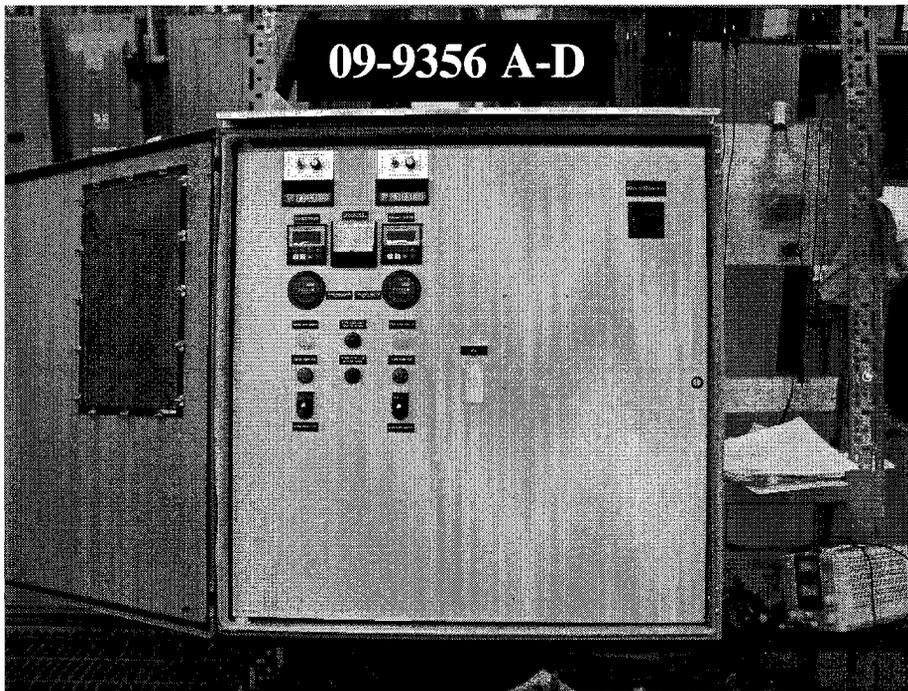
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TOLERANCES		REVISIONS			EPG COMPANIES			
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DECIMAL	.06	1			C.A.S.	4"=1'	1" PVC, SCH.40, FLOW SPOOL (W/1" MNPT ENDS)	07761-0000C
FRACTIONAL	1/16	2						
ANGULAR	1°	3						
		4						
		5						
					DATE	11/01/06		
					APP'D			

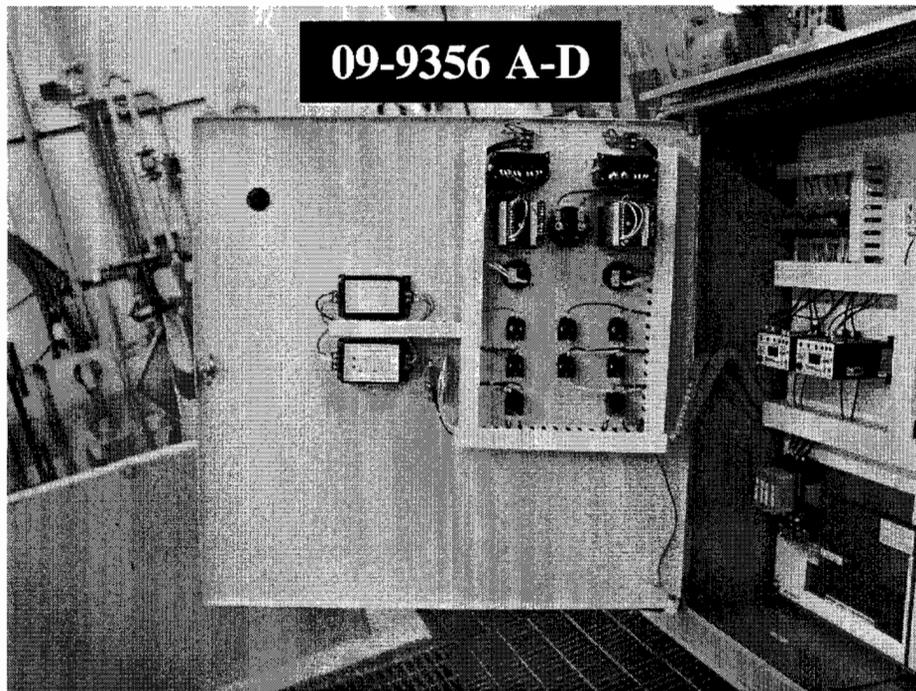
EPG Companies Inc.



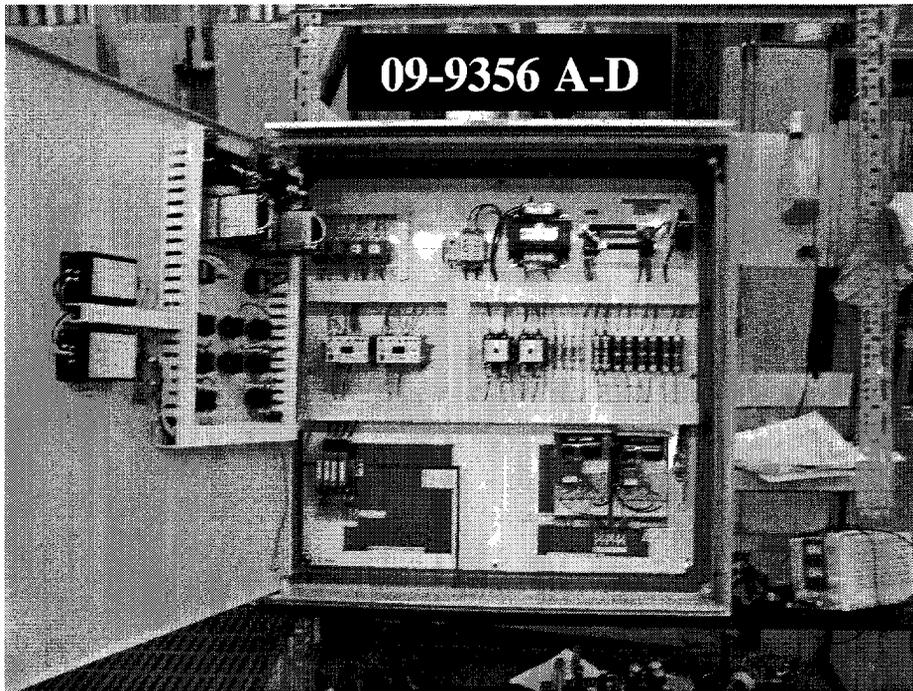
EPG Companies Inc.



EPG Companies Inc.



EPG Companies Inc.



LIMITED WARRANTY

This agreement shall be deemed to have been entered into in the State of Minnesota, and shall be construed in accordance with the laws of the State of Minnesota, including Minnesota's enactment of the Uniform Commercial Code. Buyer hereby stipulates and agrees that Hennepin County, Minnesota shall be the proper jurisdiction for adjudicating all claims and controversies arising from this agreement.

Products manufactured by EPG Companies Inc. are warranted for a period of 12 months from date of installation or eighteen (18) months from date of manufacture* to be free from defects of materials and workmanship. It is expressly agreed that the exclusive remedy under this warranty is limited solely to the repair or replacement, at the sole discretion of EPG, of the part that failed. The cost of labor for any field repairs is not covered by this warranty. EPG Companies will not be liable for any damage or wear due to abnormal conditions or improper installation.

Products not manufactured by EPG Companies Inc. are covered by the original manufacturer's warranty, which EPG Companies passes through to the purchaser. The actual manufacturer will make warranty determination.

To have a defective part repaired or replaced, you must return the defective product to EPG Companies. Please call (800) 443-7426 or (763) 424-2613 to obtain a Return Goods Authorization (RGA) number. Send defective product (freight prepaid) with RGA #, description of installation, installation data and failure date to EPG Companies Inc., 19900 County Rd. 81, Maple Grove, MN 55311.

EPG Companies will not be held liable for any incidental or consequential damages, losses or expenses incurred from installation, use or any other reason. **THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF EITHER FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY, WHICH EXTEND BEYOND THOSE SPECIFICALLY LISTED HERE.**

If equipment is to be stored for a period greater than six months, proper storage precautions must be taken if the warranty is to be maintained. Please call EPG Companies for specific requirements regarding product storage.

The following is a partial list of items, which will void the warranty:

- Opening the motor for any reason.
- Using undersized electrical wire.
- Making unauthorized circuit changes. Please call EPG Companies before making any changes.
- Operating a three phase submersible motor from single phase power through a phase converter unless 3-leg ambient-compensated quick trip overload protectors are used and complete details are sent in writing to EPG Companies.

* To qualify for the delayed installation warranty you must contact EPG Companies Inc., at (800) 443-7426 or (763) 424-2613 within 60 days of purchase.

Pump Operation Standard Operating Procedures

Pump Operation Standard Operating Procedure

1. Evaluate current leachate levels by referencing the appropriate level sensor meters.
2. If there is sufficient leachate present in the sump in accordance with the Pump System Control Panel parameters specified in this plan, then proceed to the following steps.
3. Securely connect discharge hose to the riser outlet and to the water truck.
4. Temporarily turn off the Control Panel Main Power Switch and connect Control Panel plug into 230VAC 1 Phase compatible generator.
5. Start Generator.
6. Turn back on Control Panel Main Power Switch.
7. Note current Flow Meter value or press clear to start with 0 gal.
8. Turn pump switch to "Auto"...the pump is now activated and you should see the flow meter total gallons pumped and flow rate readings update.
9. Flow rates should be in general accordance with design specifications...If not, straighten out discharge line to ensure unhindered flow.
10. Pump will remain on until minimum draw down parameters are met, as specified in this plan.
11. Once the draw down parameters are met, the pump will turn off.
12. Turn pump switch to off position (middle position between "Hand" and "Auto").
13. Note gallons pumped.
14. Temporarily turn off Control Panel Main Power Switch and turn off generator.
15. Turn back on Control Panel Main Power Switch and ensure level sensor meter is on.
16. Carefully disconnect discharge line from riser.
17. Carefully dispense of excess leachate within the hose into a 5 gallon bucket.
18. Dispose of leachate within the 5 gallon bucket into the water truck.
19. Carefully disconnect discharge line from water truck and repeat steps 17 and 18 above.

Other points of consideration when operating system

1. If you have to remove the pump from the riser for maintenance, you must utilize the pumps 1/8" stainless steel suspension cable (DO NOT PULL ON THE DISCHARGE LINE COMPONENTS).
2. As you remove the pump from the riser, you must 1st remove the flow meter and then clip the zip ties that connect the motor and level sensor leads to the discharge line...once you see the blue vent valve, you can stop cutting the zip ties and pull the pump out.
3. Place pump on a garbage bag to prevent dirt from entering the pump inlet.

4. When you are ready to insert the pump components back into the riser, lower the pump SLOWLY and replace the zip ties removed during extraction.