

**SIEMENS INDUSTRY
BAU**

**15201 NW GREENBRIER
PARKWAY SUITE A4
BEAVERTON OR 97006
USA**

**PHONE: 503-207-1900
FAX: 503-207-1901**

07/10/13

**FOR INFORMATION CONTACT
BOB DAVIS**

**ENGINEERING DATA FOR
FOUNTAIN RO SKID**

14202 NE SALMON CREEK AVE

Vancouver, WA 98686

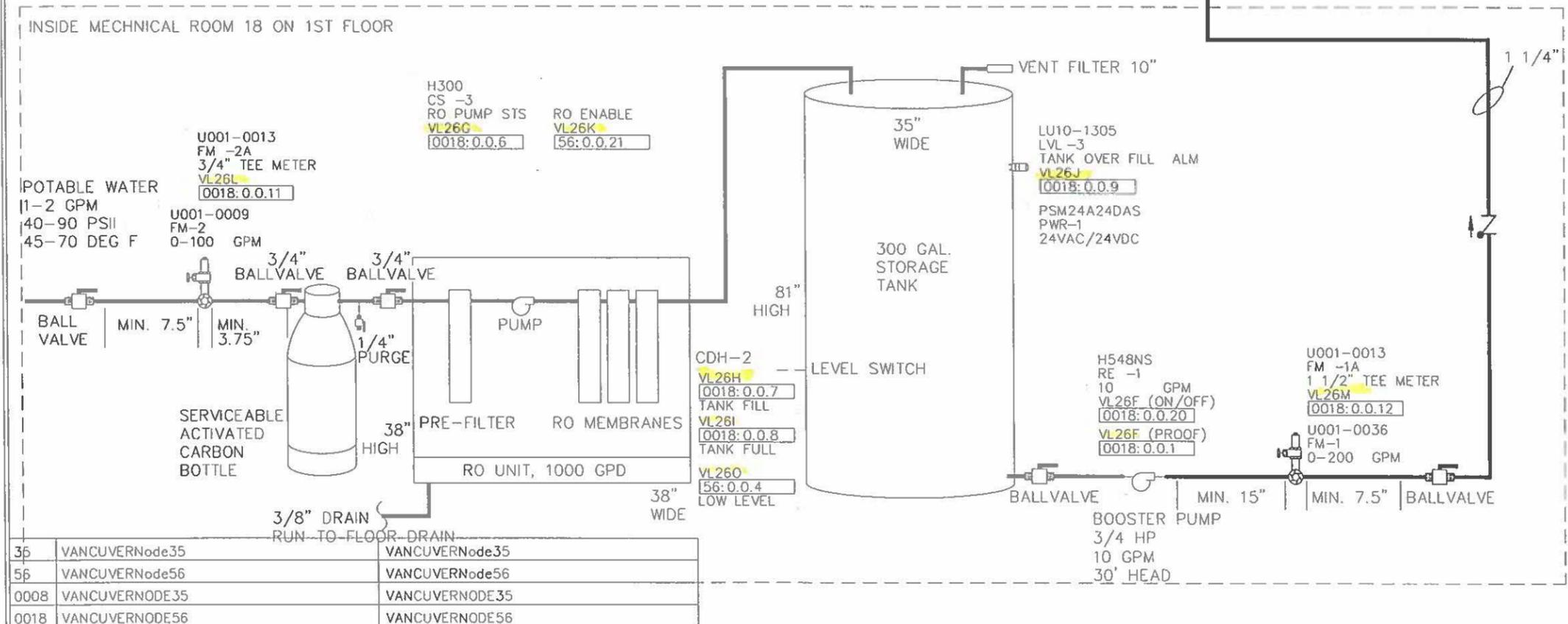
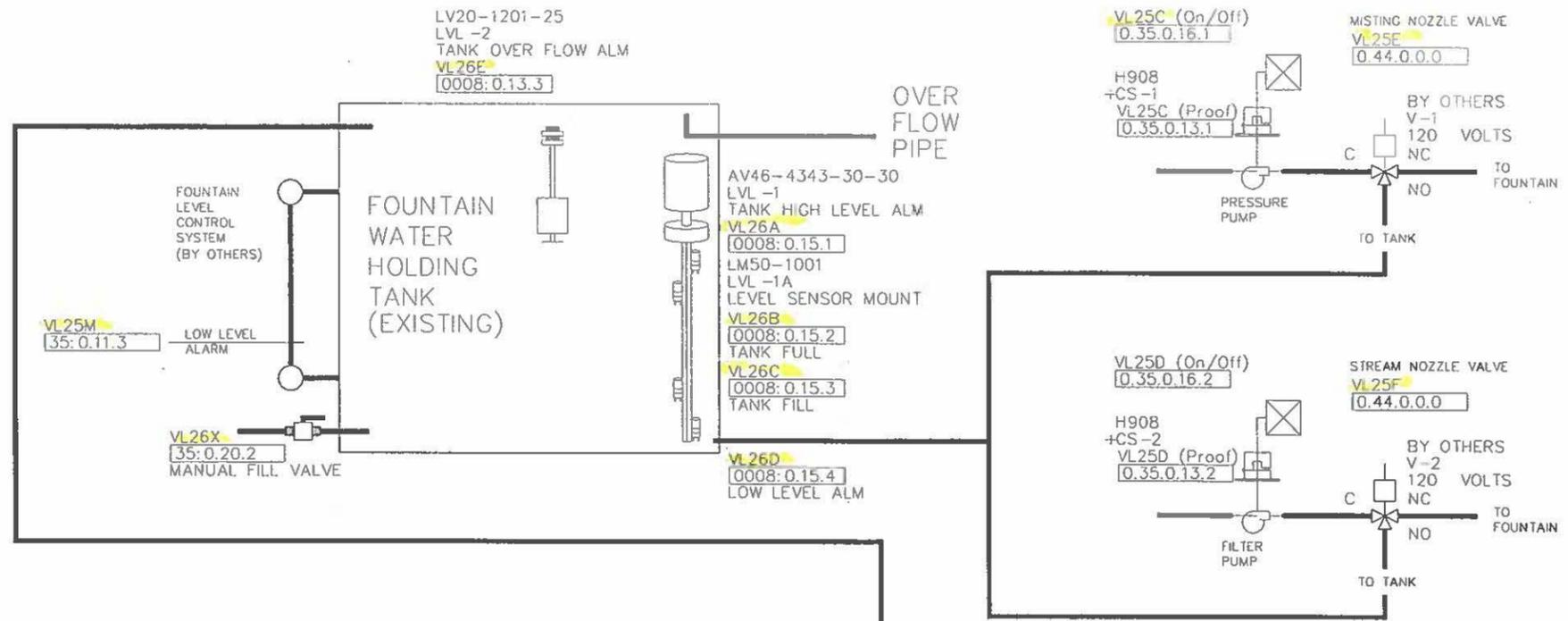
USA

-- Project --
SIEMENS JOB # 44OP-135684

General

Updated 7/15/2013

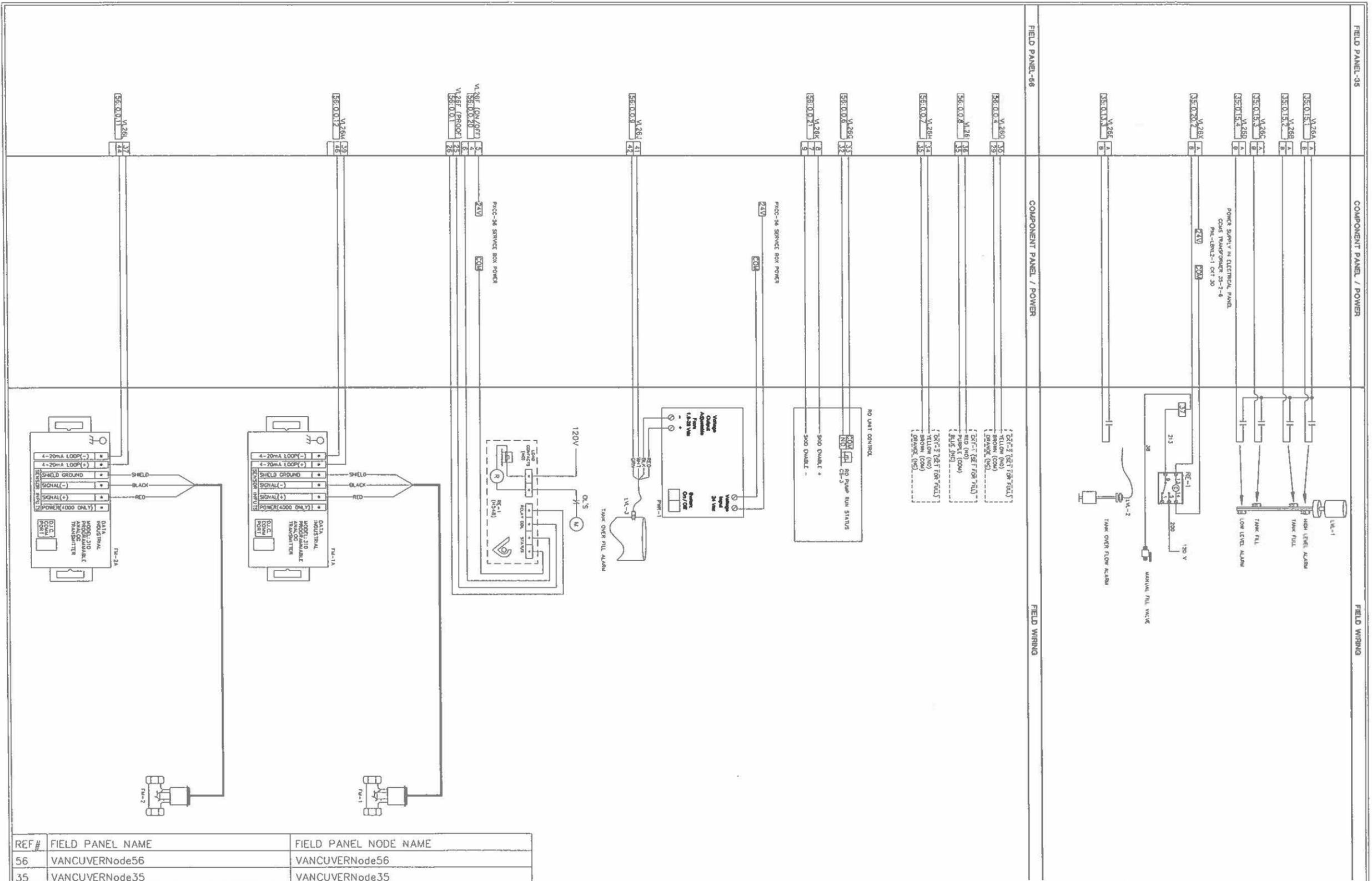
- RO skid submittal to follow.
- ABB VFD submittal to follow.



35	VANCUVERNNode35	VANCUVERNNode35
56	VANCUVERNNode56	VANCUVERNNode56
0008	VANCUVERNNode35	VANCUVERNNode35
0018	VANCUVERNNode56	VANCUVERNNode56

REVISION HISTORY	

SIEMENS SIEMENS INDUSTRY BAU	15201 NW GREENBRIER PARKWAY SUITE A4 BEAVERTON OR 97008 USA Phone: 503-207-1900 Fax: 503-207-1901	WSU-V Vancouver, WA <table border="1"> <tr> <th>ENGINEER</th> <th>DRAFTER</th> <th>CHECKED BY</th> <th>INITIAL RELEASE</th> <th>LAST EDIT DATE</th> </tr> <tr> <td>TAJ</td> <td>TAJ</td> <td>JBW</td> <td>07/10/13</td> <td>03/26/14</td> </tr> </table> WSU PLAZA FOUNTAIN	ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE	TAJ	TAJ	JBW	07/10/13	03/26/14	- 0 001
			ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE						
TAJ	TAJ	JBW	07/10/13	03/26/14									
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REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
56	VANCUVERNNode56	VANCUVERNNode56
35	VANCUVERNNode35	VANCUVERNNode35

REVISION HISTORY	

SIEMENS

SIEMENS INDUSTRY
BAU

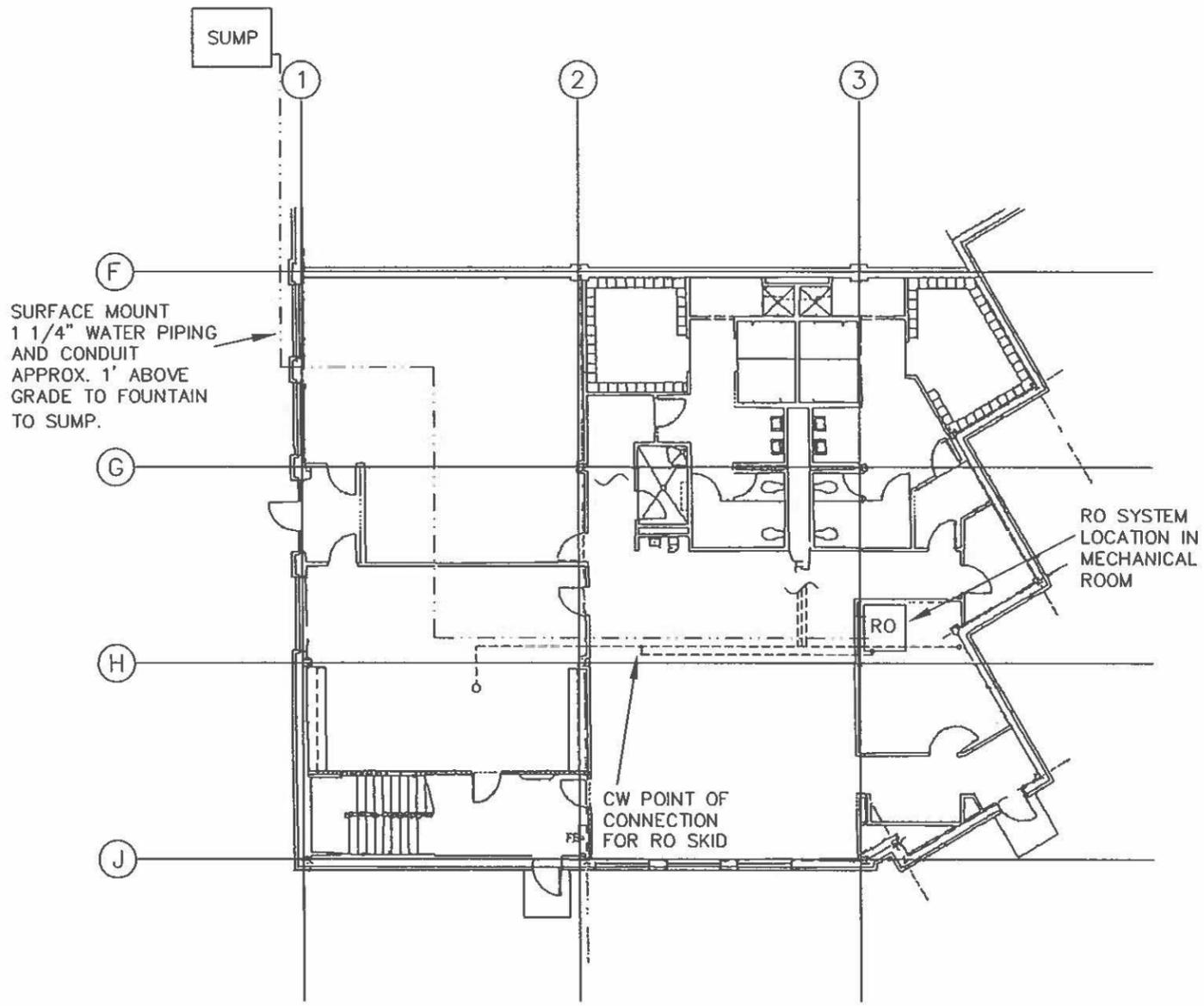
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TAJ	TAJ	JBW	07/10/13	03/26/14

WSU PLAZA FOUNTAIN ELE

001B



SURFACE MOUNT
1 1/4" WATER PIPING
AND CONDUIT
APPROX. 1' ABOVE
GRADE TO FOUNTAIN
TO SUMP.

RO SYSTEM
LOCATION IN
MECHANICAL
ROOM

CW POINT OF
CONNECTION
FOR RO SKID

1 LIBRARY BUILDING
001C BASEMENT LEVEL
RO WATER SYSTEM FOR WATER FOUNTAIN.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
56	VANCUVERNNode56	VANCUVERNNode56

REVISION HISTORY				
1	7/25/2013	TAJ	WATER LINE TIE IN'S REVISED & ADD WORKOUT AREA FLOW METER	

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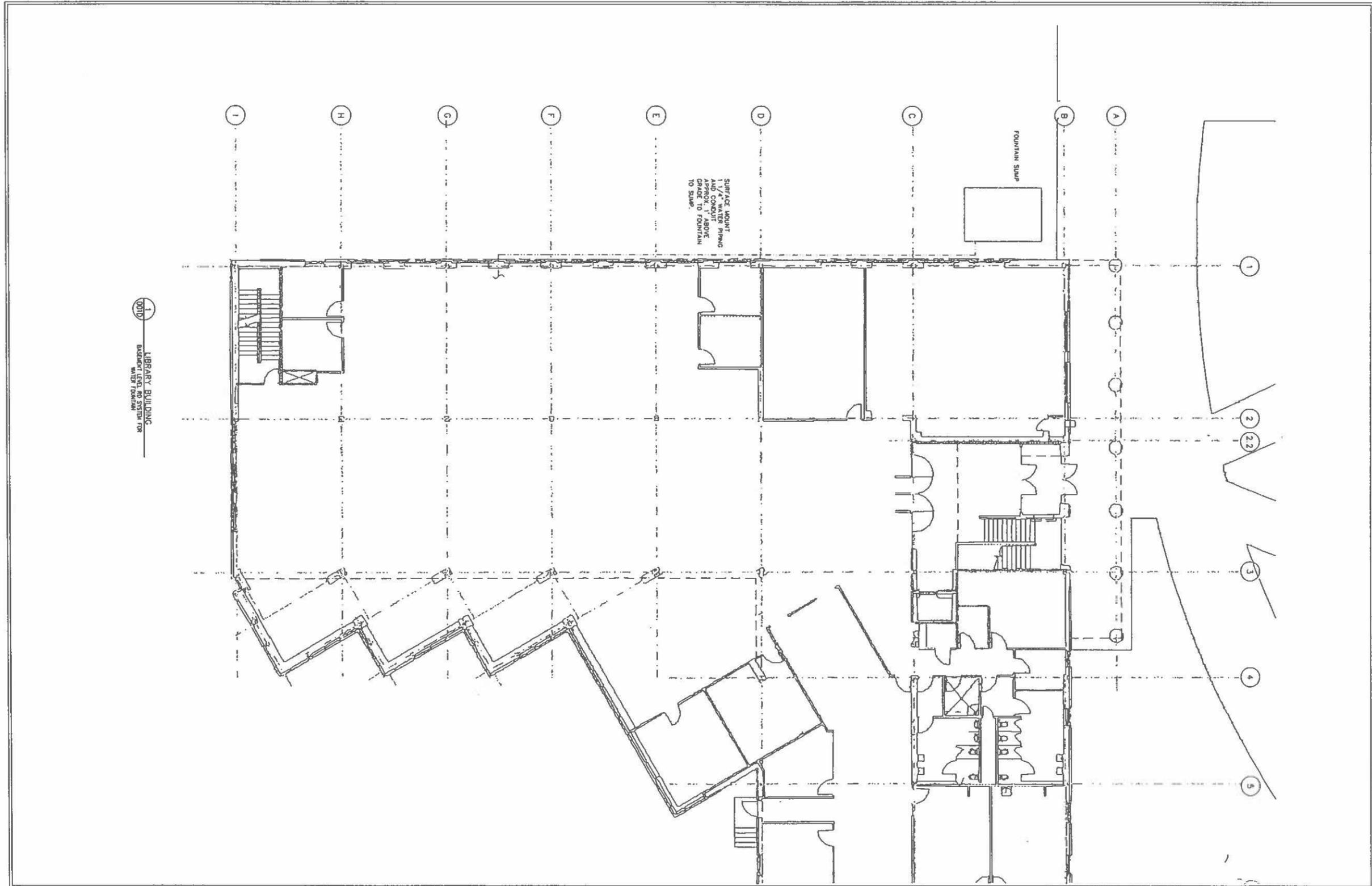
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Vancouver, WA

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
TAJ	TAJ	JBW	07/10/13	11/08/13

WSU PLAZA FOUNTAIN

001C



1
0010
LIBRARY BUILDING
BASEMENT LEVEL. NO SYSTEM FOR
WATER FOUNTAIN

REVISION HISTORY

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
TAJ	TAJ	JBW	07/10/13	07/15/13

WSU PLAZA FOUNTAIN

001D

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 3	1	H300	VERIS INDU	N/A	H300 MICRO-SPLITCORE GO/NO GO .15-60Amps
FM 1	1	U001-0036	VERIS	N/A	INSERTION FLOW METER 1 1/2" PLASTIC
FM 2	1	U001-0009	VERIS	N/A	INSERTION T FLOW METER 3/4"
FM 1A	1	U001-0013	VERIS	N/A	PROGRAMMABLE ANALOG TRANSMITTER
FM 2A	1	U001-0013	VERIS	N/A	PROGRAMMABLE ANALOG TRANSMITTER
LVL 1	1	AV46-4343-30-30	FLOWLINE	N/A	4 BUOYANCY LEVEL SWT, 30" SMARTTRAK
LVL 2	1	LV20-1201-25	FLOWLINE	N/A	MINI FLOAT LEVEL SWITCH W/25' CABLE
LVL 3	1	LU10-1305	FLOWLINE	N/A	LEVEL SWITCH
LVL 1A	1	LM50-1001	FLOWLINE	N/A	2" NPT MOUNTING BRACKET
PWR 1	1	PSM24A24DAS	FUNCTIONAL DEVICES	1208cut036	ADJDC PWRSPLY ISOL 24VAC
RE 1	1	H548NS	VERIS INDU	1006cut015	FRAC HP MOTOR CONT W/O HOA
BP 1	1	CRI 1-4	GRUNDFOS	96082304	VERTICAL, NON-SELF PRIMING, MULTISTAGE, IN-LINE PUMP
LVL 4	2	CD2H	BARKSDALE CONTROL	N/A	HOUSED DIAPHRAGM PRESSURE SWITCH

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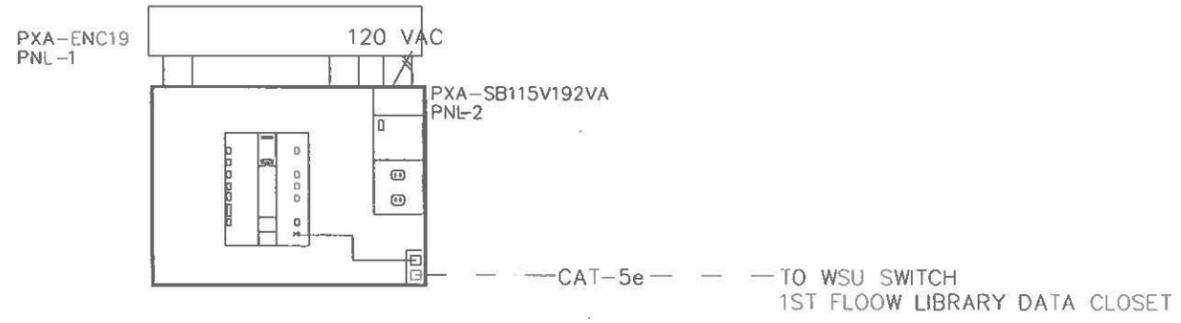
WSU PLAZA FOUNTAIN

001E

NODE-56



Panel System Name	VANCUVERN56
Node Identifier	56
Using DHCP	NA
IF NOT DHCP	
IP Address	172.16.101.38
Subnet Mask	255.255.255.0
Gateway	172.16.101.1



REVISION HISTORY	SIEMENS SIEMENS INDUSTRY BAU	15201 NW GREENBRIER PARKWAY SUITE A4 BEAVERTON OR 97008 USA Phone: 503-207-1900 Fax: 503-207-1901	WSU-V Vancouver, WA					N56				
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TAJ	TAJ	JBW	07/10/13	03/26/14								

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
PNL 1	1	PXA-ENC19	SIEMENS	149475	ENCLOSURE ASSY 19"
PNL 2	1	PXA-SB115V192VA	SIEMENS	149475	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

SIEMENS

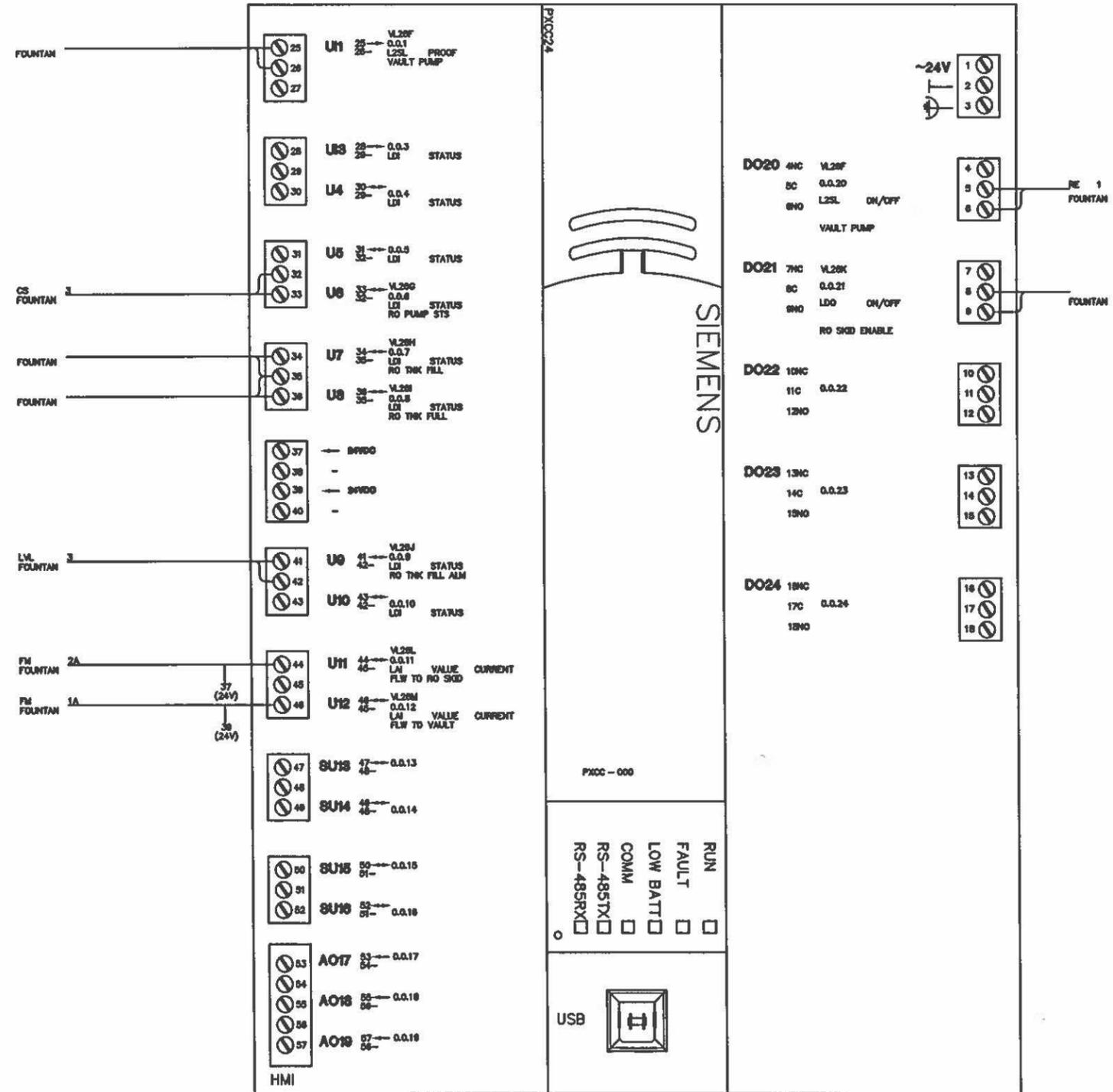
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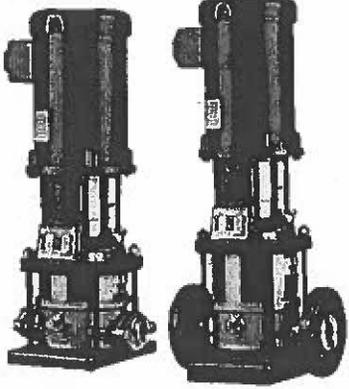
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
TAJ	TAJ	JBW		07/15/13

PXCC-56

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N56A

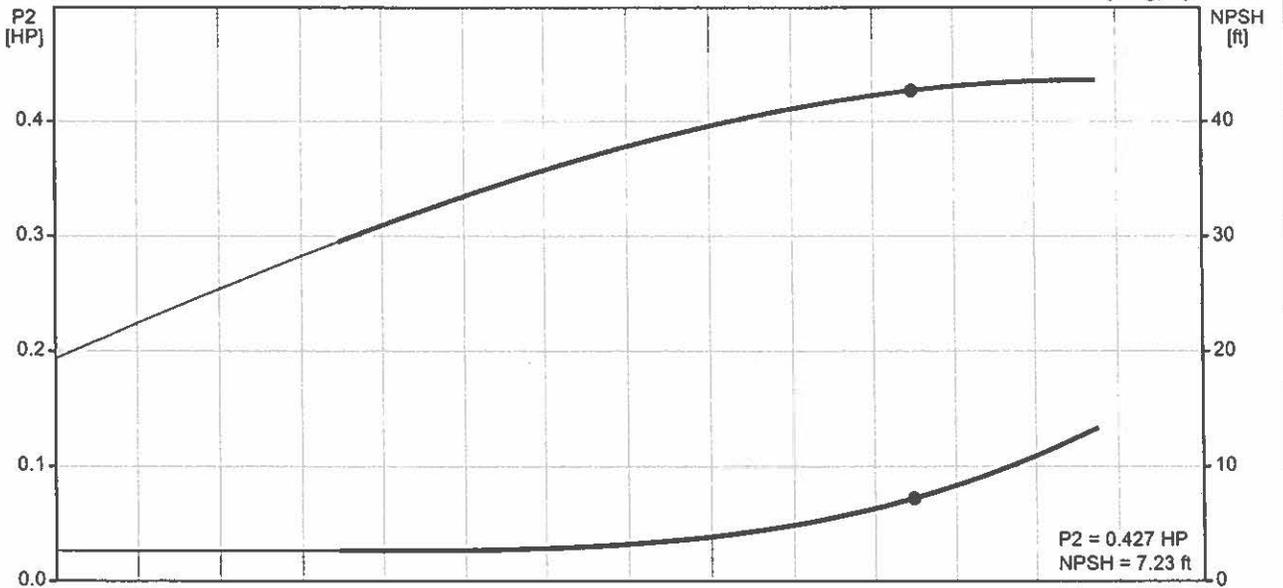
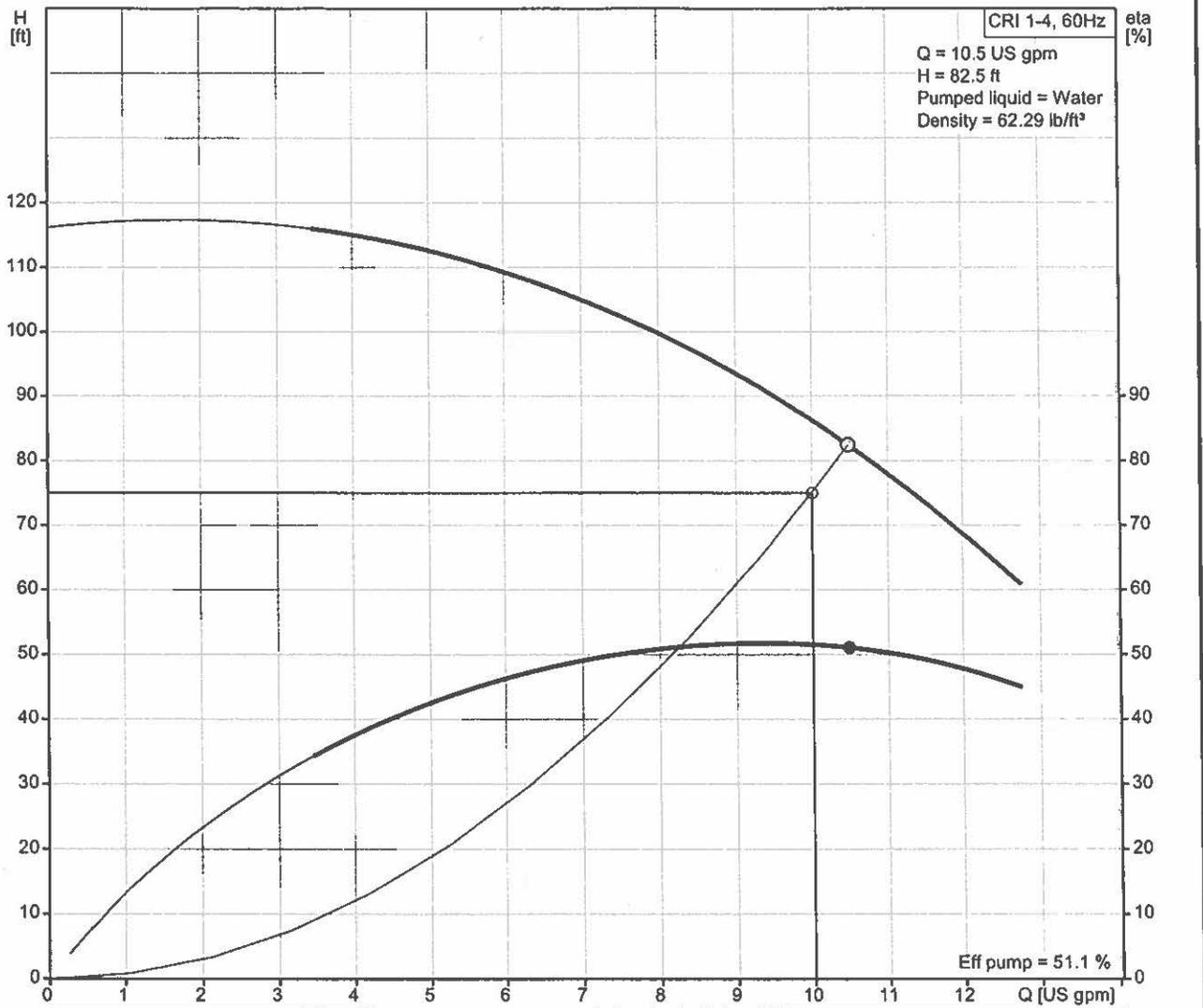


REVISION HISTORY	SIEMENS SIEMENS INDUSTRY BAU	15201 NW GREENBRIER PARKWAY SUITE A4 BEAVERTON OR 97008 USA Phone: 503-207-1900 Fax: 503-207-1901	WSU-V Vancouver, WA					PXC56
			ENGINEER TAJ	DRAFTER TAJ	CHECKED BY JBW	INITIAL RELEASE 07/10/13	LAST EDIT DATE 10/02/13	

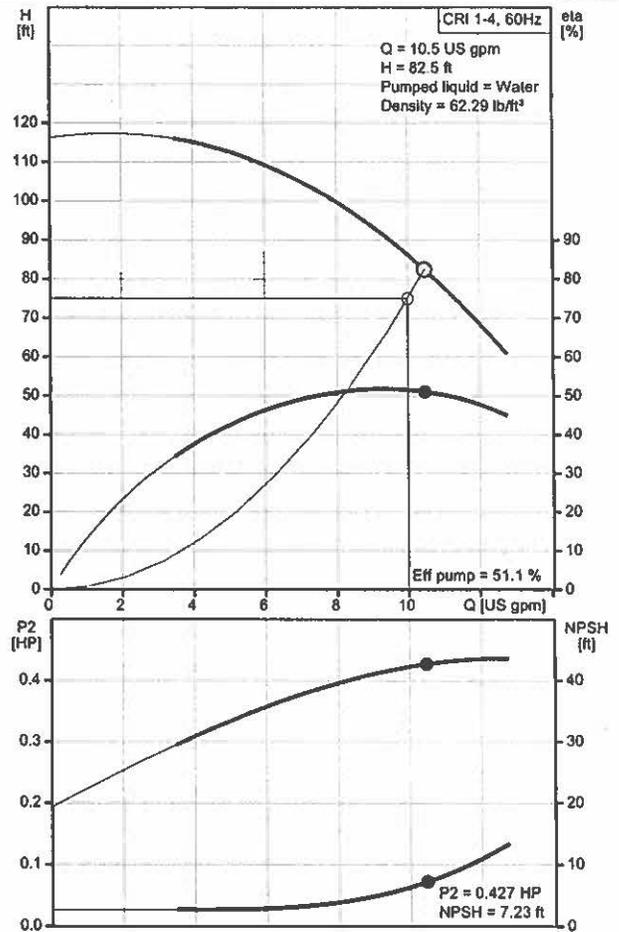
Position	Count	Description
	1	<p data-bbox="422 199 682 231">CRI 1-4 A-CA-I-E-HQQE</p>  <p data-bbox="795 609 1226 640">Product photo could vary from the actual product</p> <p data-bbox="422 640 925 756">Product No.: 96082304 Vertical, non-self-priming, multistage, in-line, centrifugal pump for installation in pipe systems and mounting on a foundation.</p> <p data-bbox="422 787 876 819">The pump has the following characteristics:</p> <ul data-bbox="422 819 974 1134" style="list-style-type: none"> - Impellers, intermediate chambers and outer sleeve are made of Stainless steel, DIN W.-Nr. 1.4301. - Pump head cover and base are made of Stainless steel, DIN W.-Nr. 1.4408. - The shaft seal has assembly length according to EN 12756. - Power transmission is via cast iron split coupling. - Pipework connection is via FlexiClamp / Oval flanges/couplings. <p data-bbox="422 1155 787 1186">The motor is a 1-phase AC motor.</p> <p data-bbox="422 1207 511 1239">Liquid:</p> <p data-bbox="422 1239 893 1302">Liquid temperature range: -4 .. 248 °F Density: 62.29 lb/ft³</p> <p data-bbox="422 1323 552 1354">Technical:</p> <p data-bbox="422 1354 1039 1533">Speed for pump data: 3443 rpm Rated flow: 9.69 US gpm Rated head: 92.2 ft Shaft seal: HQQE Approvals on nameplate: ANSI/NSF61 Curve tolerance: ISO 9906:1999 Annex A</p> <p data-bbox="422 1554 552 1585">Materials:</p> <p data-bbox="422 1585 998 1764">Pump housing: Stainless steel DIN W.-Nr. 1.4408 ASTM A 351 CF 8M Impeller: Stainless steel DIN W.-Nr. 1.4301 AISI 304</p> <p data-bbox="422 1785 576 1816">Installation:</p> <p data-bbox="422 1816 1015 1879">Maximum ambient temperature: 104 °F Max pressure at stated temperature: 363 psi / 250 °F</p>

Position	Count	Description
		<p style="text-align: right;">363 psi / -4 °F</p> <p>Flange standard: FlexiClamp / Oval Pipe connection: 2 5/16" / 1" NPT Flange size for motor: 56C</p> <p>Electrical data:</p> <p>Motor type: BALDOR Number of poles: 2 Rated power - P2: 0.5 HP Power (P2) required by pump: 0.5 HP Main frequency: 60 Hz Rated voltage: 1 x 115/230 V Rated current: 7,4/3,7 A Rated speed: 3450 rpm Enclosure class (IEC 34-5): 54 (Protect. splashing/dust) Insulation class (IEC 85): B</p> <p>Others:</p> <p>Net weight: 48 lb Gross weight: 59 lb Shipping volume: 1.77 ft³</p>

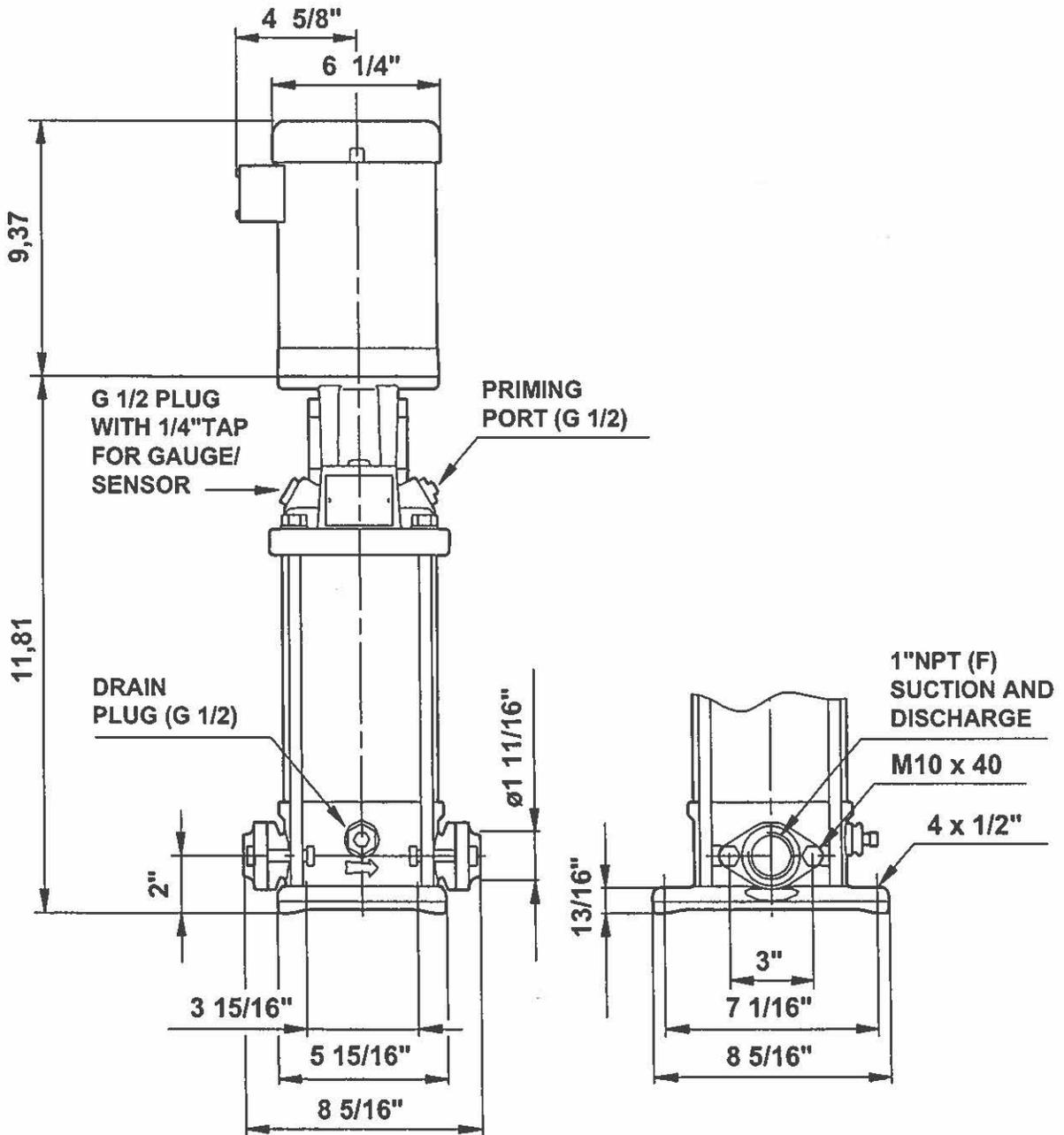
96082304 CRI 1-4 60 Hz



Description	Value
Product name:	CRI 1-4 A-CA-I-E-HQQE A-CA-I-E HQQE
Product Number:	96082304
EAN number:	5700395170429
Technical:	
Speed for pump data:	3443 rpm
Actual calculated flow:	10.5 US gpm
Resulting head of the pump:	82.5 ft
Impellers:	4
Shaft seal:	HQQE
Approvals on nameplate:	ANSI/NSF61
Curve tolerance:	ISO 9906:1999 Annex A
Stages:	4
Pump version:	A
Model:	A
Cooling:	TEFC
Materials:	
Pump housing:	Stainless steel DIN W.-Nr. 1.4408 ASTM A 351 CF 8M
Impeller:	Stainless steel DIN W.-Nr. 1.4301 AISI 304
Material code:	I
Code for rubber:	E
Installation:	
Maximum ambient temperature:	104 °F
Max pressure at stated temperature:	363 psi / 250 °F
Flange standard:	363 psi / -4 °F FlexiClamp / Oval
Connect code:	CA
Pipe connection:	2 5/16" / 1" NPT
Flange size for motor:	56C
Liquid:	
Liquid temperature range:	-4 .. 248 °F
Density:	62.29 lb/ft ³
Electrical data:	
Motor type:	BALDOR
Number of poles:	2
Rated power - P2:	0.5 HP
Power (P2) required by pump:	0.5 HP
Main frequency:	60 Hz
Rated voltage:	1 x 115/230 V
Rated current:	7,4/3,7 A
Rated speed:	3450 rpm
Enclosure class (IEC 34-5):	54 (Protect. splashing/dust)
Insulation class (IEC 85):	B
Motor Number:	85700002
Others:	
Net weight:	48 lb
Gross weight:	59 lb
Shipping volume:	1.77 ft ³



96082304 CRI 1-4 60 Hz



Note! All units are in [mm] unless others are stated.
 Disclaimer: This simplified dimensional drawing does not show all details.

Diaphragm Switch

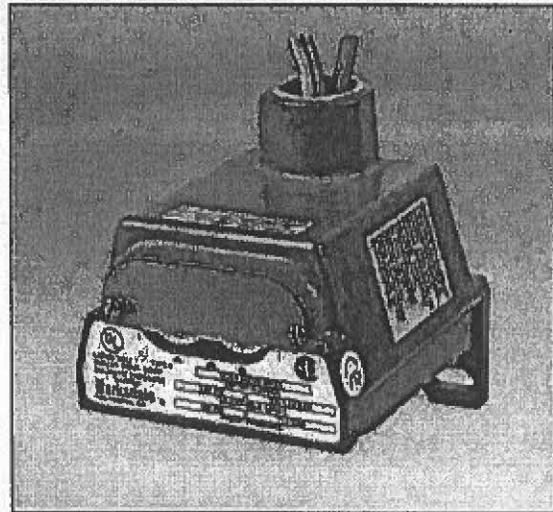
CD1H, CD2H Series

Features

- ▶ High reliability
- ▶ Extremely versatile
- ▶ Calibrated dial for easy setpoint adjustment
- ▶ Ideal for pressure or vacuum

Applications

- ▶ Medical
- ▶ Water equipment
- ▶ Food & beverage
- ▶ Air proving in HVAC systems
- ▶ Engine monitoring
- ▶ Factory automation



General Specifications*

Accuracy:	+/- 0.5% of the adjustable range
Switch Type:	Single pole double throw (SPDT) single or dual circuit
Rating:	10 amps @ 125/250 VAC, 3 amps @ 480 VAC (Class A or H limit switch); Consult sales drawing for ratings of optional limit switches.
Wetted Parts:	
Process Fitting:	304 stainless steel
Diaphragm:	17-7 PH stainless steel
Enclosure:	Anodized aluminum
Electrical Connection:	Free leads approximately 18" long, 16 AWG through 3/4" NPT conduit connector.
Enclosure Ratings:	NEMA 4
Pressure Connection:	1/4" NPT female
Approvals:	
UL:	All models are Underwriters' Laboratories listed in the Electrical Construction Materials Directory under Industrial Control Equipment, float and pressure-operated; File E42816, and Canadian Standards Association listed under Guide 380-W-1.16, Class 3231, File 22355.

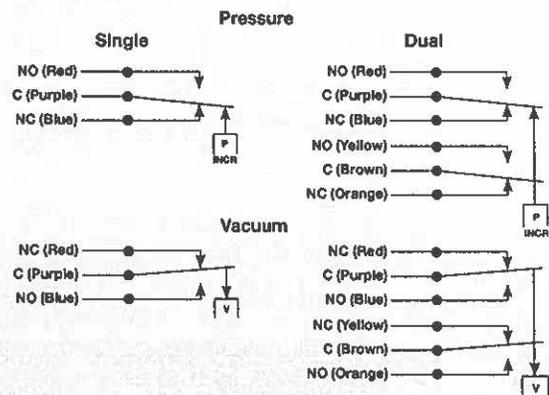
* See product configurator for additional options.

Approvals (Cont.): CSA:	Listed under Guide 380-W-1.16, Class 3231, File 22355
Temperature Range: Operating:	-65° to +165°F (-54° to +74°C)
Storage:	-65° to +200°F (-54° to +93°C)
Adjustment Instructions: Pressure:	Turn self-locking adjustment screw counter clockwise to increase pressure setting
Vacuum:	Turn self-locking adjustment screw clockwise to increase vacuum setting
Options:	-Cleaned for Oxygen Service -1/2" NPT Pressure Port -NEMA 4X enclosure
Shipping Weight:	Approximate 1.75 lbs.

Wiring Code

Lead	Circuit #1		Circuit #2	
	Pressure	Vacuum	Pressure	Vacuum
Normally Closed	Blue	Red	Orange	Yellow
Common	Purple	Purple	Brown	Brown
Normally Open	Red	Blue	Yellow	Orange

Wiring Diagram

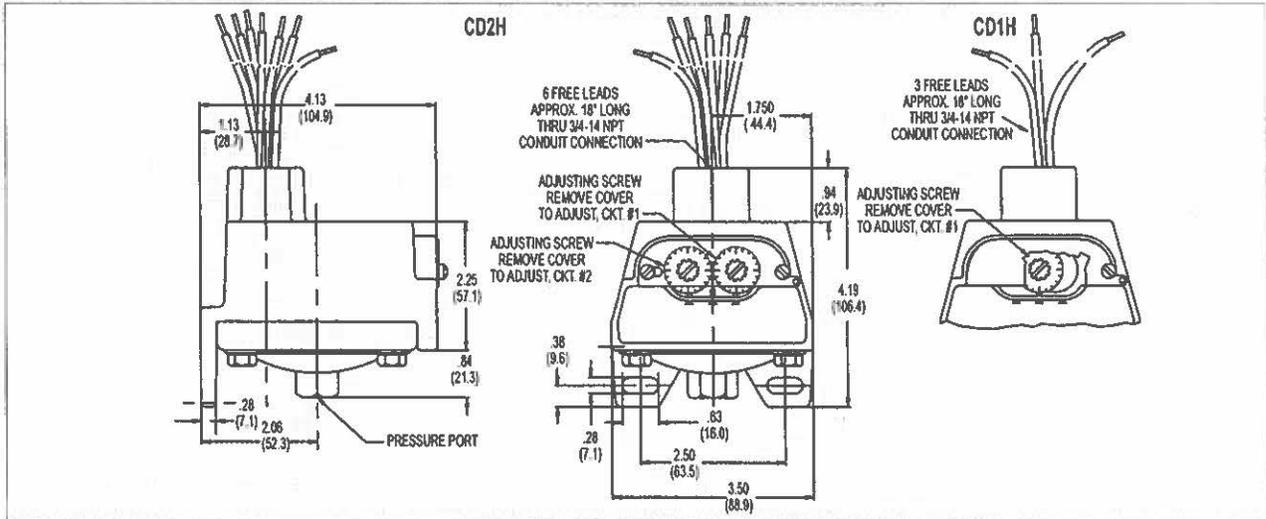


Barksdale
CONTROL PRODUCTS
Barksdale, Inc./Barksdale GmbH
A Subsidiary of Crane Co.

Diaphragm Switch

CD1H, CD2H Series

Technical Drawing



Product Configurator

Example	CD1H	-A	3SS			
---------	------	----	-----	--	--	--

H Hermetically sealed limit switch option - Class I, Division II (requires AA, CC, GH, HH limit switch, not available in vacuum models)

Base Configuration

CD1H	Single setpoint housed
CD2H	Dual setpoint housed
VCD1H	Single setpoint housed - Vacuum
VCD2H	Dual setpoint housed - Vacuum

Limit Switch¹

-A	10 amps @ 125/250 VAC; 3 amps @ 480 VAC; (standard for pressure range 3SS, 80SS or 150SS)
C	10 amps @ 125/250/480 VAC; 2 amps @ 600 VAC; 0.1 amps @ 125 VDC; 0.05 amps @ 250 VDC
-H	10 amps @ 125/250 VAC; 3 amps @ 480 VAC; (standard for pressure range 2SS or 18SS)
-M	10 amps @ 125/250 VAC; 3 amps @ 480 VAC; 0.5 amps @ 125 VDC; 0.25 amps @ 250 VDC
-GH	1 amp @ 125 VAC; 1 amp @ 24 VDC with gold contacts
-CC	Hermetically sealed; 10 amps @ 125/250 VAC (not available on 2SS or vacuum models)
-GH	Hermetically sealed; 1 amp @ 125 VAC with gold contacts (not available on 2SS or vacuum models)
-HH	Hermetically sealed; 5 amps @ 125/250 VAC (not available on 2SS or vacuum models)

Options

-Z1	Oxygen cleaned
-FX	NEMA 4X Enclosure
-Wxxx	Extra wire length (XXX = inches)
-Sxxx	Factory pre-set (consult factory)

Pressure Connection

Blank	Standard 1/4" NPT female
-P2	1/2" NPT female pressure fitting

Adjustable Range

	Adjustable Range (PRESSURE)				Approx. Deadband ² (Actuation Value)	Proof Pressure
	Decreasing - psi (bar)		Increasing - psi (bar)			
	Min	Max	Min	Max		
2SS ³	.5 (.03)	34.6 (2.4)	1.9 (.13)	36 (2.4)	.6 - 1.4 (.04 - .1)	83.3" H ₂ O
3SS	.3 (.02)	2.85 (.2)	.18 (.01)	3 (.2)	.07 - .15 (0 - .01)	10 (.7)
18SS	.4 (.03)	17.74 (1.2)	.66 (.04)	18 (1.2)	.12 - .26 (.01 - .02)	60 (4.1)
80SS	.5 (.03)	76.6 (5.2)	3.9 (.3)	80 (5.4)	1.8 - 3.4 (1 - .2)	180 (10.9)
150SS	1.5 (.1)	144.0 (9.8)	7.5 (.5)	150 (10.2)	2.3 - 6.0 (.2 - .4)	300 (20.4)

	Adjustable Range (VACUUM)				Approx. Deadband ² (Actuation Value)	Proof Pressure
	Decreasing - In. Hg		Increasing - In. Hg			
	Min	Max	Min	Max		
3SS	0.06	5.72	0.34	6	.14 - .28	6
18SS	0.8	29.2	1.6	30	.4 - .8	30

NOTES:

- Consult Supplemental Guide for specific deadband values
- Deadband values indicated when used with the "standard" limit switch
- The "2SS" range is specified in inches of H₂O

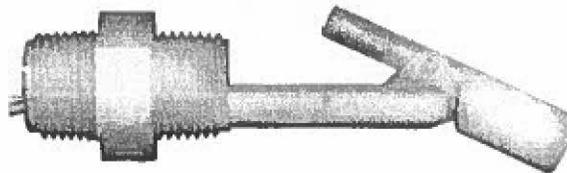
3211 Fruitland Avenue • Los Angeles, CA 90058 • 800-835-1060 • Fax: 323-589-3463 • www.barksdale.com

Barksdale
CONTROL PRODUCTS

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FLOWLINE

**Switch-Tek
Horizontal and Vertical
And Float-Point
Float Switches
LV20, LV21, LV35, LV36, LH25,
LH29, LH35, AV_6 Series
22AUG 08
Rev A**



Flowline, Inc.
10500 Humbolt Street
Los Alamitos, CA 90720
Tel: (562) 598-3015
Fax: (562) 431-8507
www.flowline.com

FLOWLINE

Preface

This manual explains how to use the Switch-Tek series of horizontal and vertical floats.

Warranty, Service & Repair

To register your product with the manufacturer, go to the Flowline website for on-line registration. The website address is as follows:

www.flowline.com

On-line Warranty Registration can be found under Contact Us in the Navigation Bar along the side of the home page. If for some reason your product must be returned for factory service, contact Flowline Inc. at (562) 598-3015 to receive a Material Return Authorization number (MRA), providing the following information:

1. Part Number, Serial Number
2. Name and telephone number of someone who can answer technical questions related to the product and its application.
3. Return Shipping Address
4. Brief Description of the Symptom
5. Brief Description of the Application

Once you have received a Material Return Authorization number, ship the product prepaid in its original packing to:

Flowline Factory Service
MRA _____
10500 Humbolt Street
Los Alamitos, CA 90720

To avoid delays in processing your repair, write the MRA on the shipping label. Please include the information about the malfunction with your product. This information enables our service technicians to process your repair order as quickly as possible.

Warranty

Flowline warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service for a period which is equal to the shorter of one year from the date of purchase of such products or two years from the date of manufacture of such products.

This warranty covers only those components of the products which are non-moving and not subject to normal wear. Moreover, products which are modified or altered, and electrical cables which are cut to length during installation are not covered by this warranty.

Flowline's obligation under this warranty is solely and exclusively limited to the repair or replacement, at Flowline's option, of the products (or components thereof) which Flowline's examination proves to its satisfaction to be defective. FLOWLINE SHALL HAVE NO OBLIGATION FOR CONSEQUENTIAL DAMAGES TO PERSONAL OR REAL PROPERTY, OR FOR INJURY TO ANY PERSON.

This warranty does not apply to products which have been subject to electrical or chemical damage due to improper use, accident, negligence, abuse or misuse. Abuse shall be assumed when indicated by electrical damage to relays, reed switches or other components. The warranty does not apply to products which are damaged during shipment back to Flowline's factory or designated service center or are returned without the original casing on the products. Moreover, this warranty becomes immediately null and void if anyone other than service personnel authorized by Flowline attempts to repair the defective products.

Products which are thought to be defective must be shipped prepaid and insured to Flowline's factory or a designated service center (the identity and address of which will be provided upon request) within 30 days of the discovery of the defect. Such defective products must be accompanied by proof of the date of purchase.

Flowline further reserves the right to unilaterally waive this warranty and to dispose of any product returned to Flowline where:

- a. There is evidence of a potentially hazardous material present with product.
- b. The product has remained unclaimed at Flowline for longer than 30 days after dutifully requesting disposition of the product.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. This warranty and the obligations and liabilities of Flowline under it are exclusive and instead of, and the original purchaser hereby waives, all other remedies, warranties, guarantees or liabilities, express or implied. EXCLUDED FROM THIS WARRANTY IS THE IMPLIED WARRANTY OF FITNESS OF THE PRODUCTS FOR A PARTICULAR PURPOSE OR USE AND THE IMPLIED WARRANTY OF MERCHANTABILITY OF THE PRODUCTS.

This warranty may not be extended, altered or varied except by a written instrument signed by a duly-authorized officer of Flowline, Inc.

FLOWLINE

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Introduction

1. Switches should be installed rigidly so the float or floats are free to move as the liquid level changes.
2. Switches should be mounted in a tank area free of severe turbulence or protected from such turbulence by appropriate and adequate slosh shields.
3. Vertical switch stems should be vertical for best results, but satisfactory operation is possible in most liquids with the stem at up to a 30° angle from vertical.
4. Side mount switch stems must be mounted with the arrow vertically either up or down depending on switch operation.
5. Care should be taken that switches are always operated within electrical ratings.
6. Orientation for standard Vertical switches can be changed from normally open to normally closed dry or vice versa by removing the float and reversing it in the stem, except with the LV20-2101, LV20-2201, LV21-1101 and LV21-1201.

Technology

Float switches consist of a float, magnet, reed switch and body/stem with mounting threads. When the probe is dry, the float rests on the bottom of the stem such that the magnet does not influence the reed switch. As the probe becomes immersed in liquid, the float becomes buoyant and the magnet elevates causing the reed switch to change state.

FLOWLINE

Installation

Operation is stated in the tank dry position.

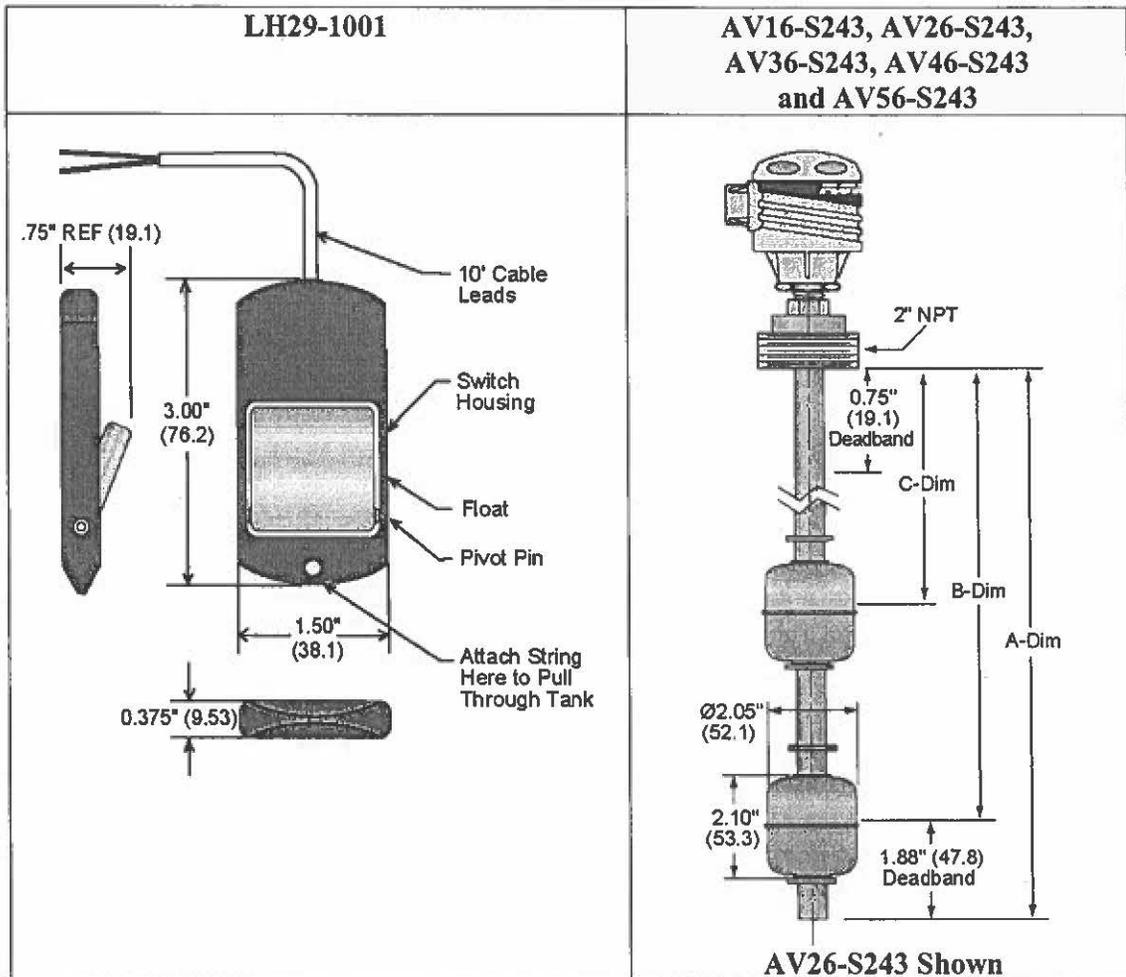
- Vertical Mounted Switches:
 - NC Operation:
 - SS Floats: Witness mark (round circle) down.
 - Plastic Floats: Magnets up.
 - NO Operation:
 - SS Floats: Witness mark (round circle) up.
 - Plastic Floats: Magnets down.
 - *Note: LV20-2101, LV20-2201, LV21-1101 and LV21-1201 are not reversible. The LV20-2101 and LV21-1101 are Normally Closed. The LV20-2201 and LV21-1201 are Normally Open
- Horizontal Mounted Switches:
 - NC Operation:
 - Arrow mounted vertically pointed down.
 - NO Operation:
 - Arrow mounted vertically pointed up.

Environmental Dimensions

<p style="text-align: center;">LV35-S201</p>	<p style="text-align: center;">LV35-S401</p>	<p style="text-align: center;">LV36-S201</p>
<p style="text-align: center;">LV36-S401</p>	<p style="text-align: center;">LV36-S501</p>	<p style="text-align: center;">LV20-1501</p>
<p style="text-align: center;">LH35-S201</p>	<p style="text-align: center;">LH25-1201</p>	<p style="text-align: center;">LH25-1401</p>
<p style="text-align: center;">LV20-2101 & LV20-2201</p>	<p style="text-align: center;">LV21-1101 & LV21-1201</p>	

FLOWLINE

Dimensions (continued)



Material Compatibility:

- The LV36-S201, LV36-S401, LV35-S201, LV35-S401, LH35-S201 and LV36-S501 are made of 316 stainless steel (316 SS) with 22 AWG, Teflon 24" wire.
- The LH25-1201, LH25-2401, LV21-1101, LV21-1201 and LV20-1501 are made of Polypropylene (PP) with 22 AWG, Teflon 24" wire.
- The LV20-2101 and LV20-2201 are made of Polytetrafluoroethylene (PTFE) with 22 AWG, Teflon 24" wire.
- The LH29-1001 is made of Polypropylene (PP) with a Valox 420 stem and 22 AWG, HALAR jacketed 120" wire.
- The AV16-S243, AV26-S243, AV36-S243, AV46-S243 and AV56-S243 are made of 316 Stainless Steel (316 SS) with a Polypropylene (PP) enclosure.
- Make sure that the switch is compatible with the application liquids. To determine the chemical compatibility between the sensor and its application liquids, refer to the Compass Corrosion Guide, available from Compass Publications (858-589-9636).

Electrical Interface

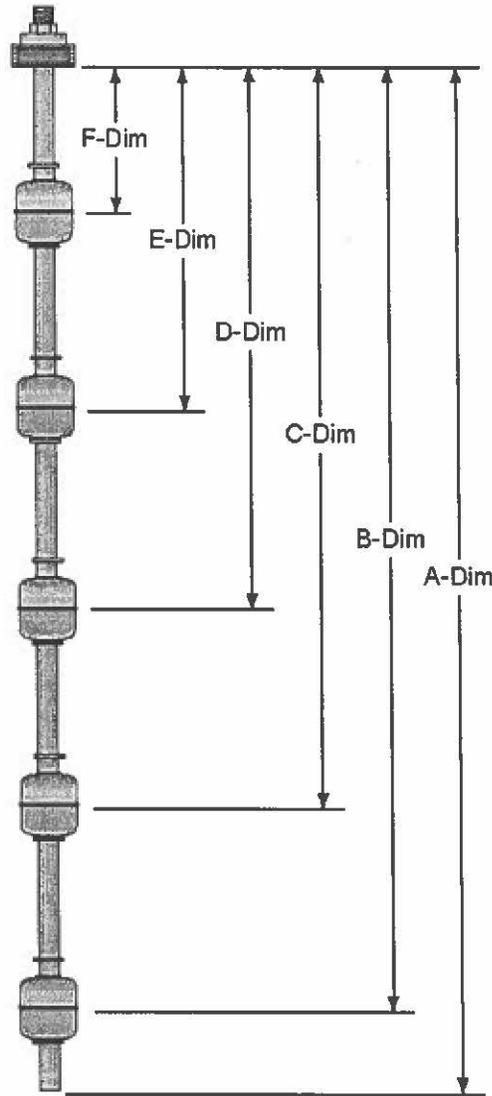
Typical Current and Voltage Ratings

Watts	Voltage	Current Amps
15	240 AC	-
	120 AC	0.12
	100 DC	0.10
	24 DC	0.30
30	240 AC	0.14
	120 AC	0.28
	100 DC	0.07
	24 DC	0.28
60	240 AC	0.40
	120 AC	0.50
	100 DC	0.20
	24 DC	0.50
100	240 AC	0.40
	120 AC	1.00
	100 DC	0.40
	24 DC	1.00

- Note: The ratings at right are for resistive loads only. For inductive loads, maximum switch life will be achieved if appropriate arc suppression is used.
- The following part numbers; LV36-S201, LV36-S401, LV35-S201, LV35-S401, LV20-2101, LV20-2201, LV21-1101, LV21-1201, LH35-S201, LH25-1201, LH25-1401 and LH29-1001, are all two wire reed switch outputs where polarity does not matter.
- Part numbers LV36-S501 and LV20-1501 are reed switch outputs with two additional wires that are used to output the 100-ohm RTD used to measure the temperature of the environment.

FLOWLINE

AV_6 Series Float and Wire Key



SPST Switches	AV16-S243 (1) Switch	AV26-S243 (2) Switches	AV36-S243 (4) Switches	AV46-S243 (4) Switches	AV56-S243 (5) Switches
F-Dim					RED
E-Dim				RED	WHITE
D-Dim			RED	WHITE	BLUE
C-Dim		RED	WHITE	BLUE	GREEN
B-Dim	BLACK	BLACK	BLACK	BLACK	BLACK
A-Dim	Total Stem Length				

- **Note:** Each float will have a pair of colored wires for each level. For example, With a AV56-S243, the B-Dim float will have two black wires as the switch contact.

Specifications

Part Number	Description	Float Mat'l	Stem Mat'l	Max. Oper. Temp (°C)	Max Pressure (PSIG)	Float SG	Nominal VA	Fitting
Standard Full-Size Vertical								
LV36-S201	Vertical small	316 SS	316 SS	200	500	0.70	100	¼" NPT
LV36-S401	Vertical small w/ slosh shield	316 SS	316 SS	200	500	0.70	100	¼" NPT
LV35-S201	Vertical large	316 SS	316 SS	200	300	0.70	30	1/8" NPT
LV35-S401	Vertical large w/ slosh shield	316 SS	316 SS	200	300	0.70	30	1/8" NPT
LV20-2101	Teflon, NC	PFTE	PFTE	150	25	0.69	60W SPST	1/8 – 27 NPT
LV20-2201	Teflon, NO	PFTE	PTFE	150	25	0.69	60W SPST	1/8 – 27 NPT
LV21-1101	Sub-miniature, NC	PP	PP	105	50	0.85	15	3/8 – 16 NPT
LV21-1201	Sub-miniature, NO	PP	PP	105	50	0.85	15	3/8 – 16 NPT
Standard Horizontal								
LH35-S201	Horizontal side mount	316 SS	316 SS	200	500	0.60	30	½" NPT
LH25-1201	Horz. side mount	PP	PP	105	100	0.60	30	½" NPT
LH25-1401	Horz. side mount w/ slosh shield	PP	PP	105	100	0.60	30	½" NPT
Vertical Floats with 100 Ohm RTD								
LV36-S501	Vertical SS	316 SS	316 SS	200	500	0.70	100	¼" NPT
LV20-1501	Vertical PP	PP	PP	105	100	0.85	30	1/8" NPT
Configured (Multi-Level) Vertical Assembly								
AV16-S243	1-point float system	316 SS	316 SS	200	200	0.55	60	2" NPT
AV26-S243	2-point float system	316 SS	316 SS	200	200	0.55	60	2" NPT
AV36-S243	3-point float system	316 SS	316 SS	200	200	0.55	60	2" NPT
AV46-S243	4-point float system	316 SS	316 SS	200	200	0.55	60	2" NPT
AV56-S243	5-point float system	316 SS	316 SS	200	200	0.55	60	2" NPT
Interstitial Switch								
LH29-1001		PP	Valox 420	105	50	N/A	30W SPST	N/A

Notes:

- Also applies to models with slosh shields
- The LV20-2101 and LV21-1101 are Normally Closed. The LV20-2201 and LV21-1201 are Normally Open.

FLOWLINE

Maintenance

Maintenance should consist of inspection to see that the float is free to move and not coated with any substance, which would change its weight or volume significantly. If this occurs, the float should be cleaned. This is easily accomplished without disturbing the installation. In addition, the stem may be wiped down to remove any build-up. The only repair possible in the field is replacement of either the float or stem. Dents or nicks on the float are usually of no consequence to operation.

Cautions

FLOWLINE manufactures a wide range of liquid level switches and technologies. While each of these switches are designed to operate in a wide variety of applications, it is the user's responsibility to select a switch model that is appropriate for the application, install it properly, perform tests of the installed system, and maintain all components. The failure to do so could result in property damage or serious injury.

1. The pressure, temperature and electrical limitations shown for the specified level switches must not be exceeded.
2. The pressures and temperatures must take into consideration possible surges in the temperature and pressure of the system.
3. The liquids used must be compatible with the materials of construction. Specifications of materials will be given upon request.
4. Life expectancy of the switch varies with applications. Contact the factory if life cycle testing is required.
5. Ambient temperature changes can affect switch set points, since specific gravities of liquids vary with temperature. Consult factory for assistance.
6. Level switches have been designed to be shock and vibration resistant. For maximum life, both shock and vibration should be minimized. Consult factory for assistance.
7. Excessive contaminants in fluid may inhibit float operation, and occasional wipe down may be necessary.
8. Level switches must not be field repaired
9. Physical damage to product may render product unserviceable.
10. Installation in a vessel made from magnetic materials may affect operation.

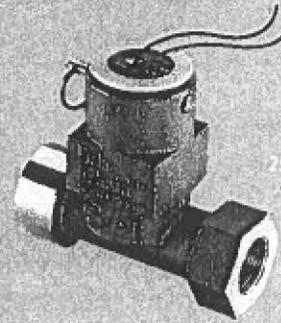
Testing the installation:

1. Power: Turn on power to the controller and/or power supply.
2. Immersing the switch: Immerse the sensing tip in its application liquid, by filling the tank up to the switches point of actuation. An alternate method of immersing the switch during preliminary testing is to hold a cup filled with application liquid up to the switch's tip.
3. Test: With the switch being fluctuated between wet and dry states, the switch indicator light in the controller should turn on and off. If the controller doesn't have an input indicator, use a voltmeter or ammeter to ensure that the switch produces the correct signal.
4. Point of actuation: Observe the point at which the rising or falling fluid level causes the switch to change state, and adjust the installation of the switch if necessary.

Cleaning procedure:

1. Power: Make sure that all power to the switch, controller and/or power supply is completely disconnected.
2. Switch removal: If necessary, make sure that the tank is drained well below the switch prior to removal. Carefully, remove the sensor from the installation. Remove the outer screen by pushing on the screen and turning it slightly to disconnect it from the bayonet connector so that the float is exposed.
3. Cleaning the switch: Using a soft bristle brush and mild detergent, carefully wash the switch. Do not use harsh abrasives such as steel wool or sandpaper, which might damage the surface of the sensor. Do not use incompatible solvents, which may damage the sensor's PP or PVDF plastic body. Take particular care to remove any scaling from the float body and make sure that it moves freely.
4. Sensor installation: Follow the appropriate steps of installation as outlined in the Installation section of this manual.

Tee Meter, Brass



2308R0305-1217

For Pipe Sizes 1/2" To 1.5" NPT

DESCRIPTION

Metal tee-style liquid flow sensor with cast brass housing fits 1/2" to 1.5" NPT. These sensors are accurate, even at low flow rates. Use in conjunction with a Veris flow monitor or transmitter for a complete flow monitoring system.

APPLICATIONS

- Measuring liquid flow rates
- Accounting for total accumulated flow

FEATURES

- PPS electronics housing...highly durable
- Six-bladed impeller design with a proprietary, non-magnetic sensing mechanism...high accuracy and repeatability
- Forward-swept impeller is less prone to fouling by water-borne debris...reliable performance with minimal downtime
- Operation and repeatability even at low flow rates
- Signal can travel up to 2000 ft (609 m) between the sensor and the display unit without the need for amplification
- Supplied with 20 ft (6 m) of 2-conductor AWG 20 UL type PTLC cable (105°C rated)
- Sensors of similar type are interchangeable,...need for recalibration after servicing or replacement...quick install and fast maintenance



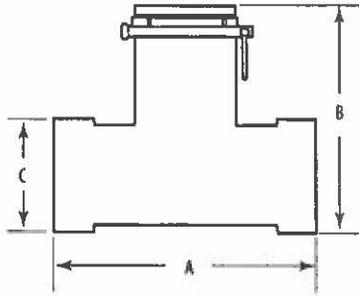
SPECIFICATIONS



Maximum Pressure	At 38°C (100°F) 400 psi; At 105°C (221°F) 325 psi
Wetted Materials	UHMW-PE bearing, polyamide impeller, tungsten carbide shaft, EPDM O-rings
Recommended Flow	0.3 to 15 ft/sec (0.09 to 4.5 m/sec)
Accuracy	±1.0% of rate
Repeatability	±0.7% over recommended design flow range*
Linearity	±0.7% over recommended design flow range*
Rangeability	60:1
Output Frequency	0.8 to 80 Hz

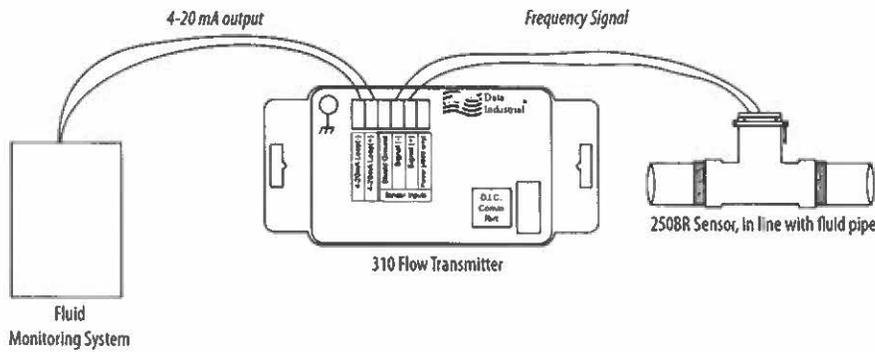
* ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.

DIMENSIONAL DRAWING



Model	A	B	C
U001-			
0008	4.0" (102 mm)	4.7" (120 mm)	1.7" (44 mm)
0009	4.0" (102 mm)	4.7" (120 mm)	1.7" (44 mm)
0010	5.5" (140 mm)	4.8" (121 mm)	2.2" (56 mm)
0011	6.1" (155 mm)	5.0" (127 mm)	2.4" (61 mm)
0012	6.5" (165 mm)	5.2" (132 mm)	2.7" (69 mm)

APPLICATION DIAGRAM



FLOW

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0008	250BR0505-1211	Flow, Sensor, 1/2" Cast Brass Tee
U001-0009	250BR0705-1211	Flow, Sensor, 3/4" Cast Brass Tee
U001-0010	250BR1005-1211	Flow, Sensor, 1" Cast Brass Tee
U001-0011	250BR1205-1211	Flow, Sensor, 1 1/4" Cast Brass Tee
U001-0012	250BR1505-1211	Flow, Sensor, 1 1/2" Cast Brass Tee

Transmitter: Analog, BTU, Pulse and Protocol Output

Converts Flow Signal To A Linear 4-20mA Analog or a Protocol Signal



DESCRIPTION

3xO programmable transmitters are capable of converting the frequency signal from any of our flow sensors to a preferred output type (analog, scaled pulse, protocol). In addition to standard square wave signals, it can also accept a sine wave, making it a versatile transmitter for numerous applications. The 310 and 320 offer analog and scaled pulse output, respectively, while the 340 models offer communication protocols (N2, BACnet/Modbus, or LonWorks), with energy (BTU) measurement (appropriate software and programming cables are required for installation; see Ordering Information).

FEATURES

- Programmable (units of measure, calibration, etc.) using computer with Windows™-based operating system...save installation time in the field by pre-programming the device
- Accepts sine wave input from a variety of other sources for application flexibility
- Compact size...saves space in crowded enclosures
- Communication protocols available on the 340 models

APPLICATIONS

- Converting sine/square wave signals to 4-20 mA and protocol
- Increasing wire run length limit for flow sensors
- Connecting flow sensors to BAS panels

310 SPECIFICATIONS



Power Requirements	Loop input voltage 9-35VDC
Input Frequency	0.4 Hz to 10 kHz
Load Resistance	Max 750Ω@24VDC
Operating Temperature Range	-29° to 70°C (-20° to 158°F)
Storage Temperature Range	-40° to 85°C (-40° to 185°F)
Accuracy	±0.04% of reading over entire span
Linearity	0.1% of full scale

320 SPECIFICATIONS

Power Requirements	12-30VACm 85mA max.; 12-40VDC, 30mA max.; Reverse and over voltage protected to 40VDC
Input Frequency	0.4 to 10 kHz
Transient Suppression	Complies with IEC-801-4 electrical burst, fast transient specification
Pulse Output	Isolated solid state switch in any standard or custom flow total units; Adjustable 50 msec to 1.0 sec pulse output width in 50 msec increments
Maximum Sinking Current	100mA@36VDC
Operating Temperature Range	-29° to 70°C (-20° to 158°F)
Storage Temperature Range	-40° to 85°C (-40° to 185°F)

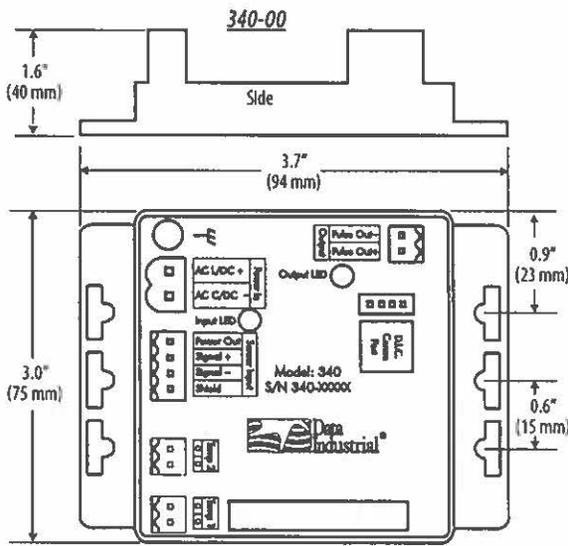
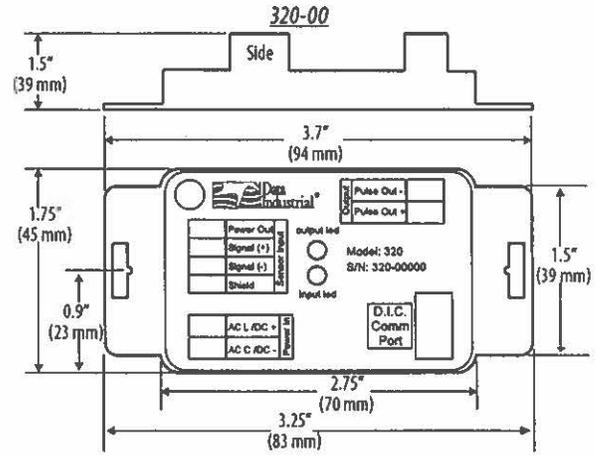
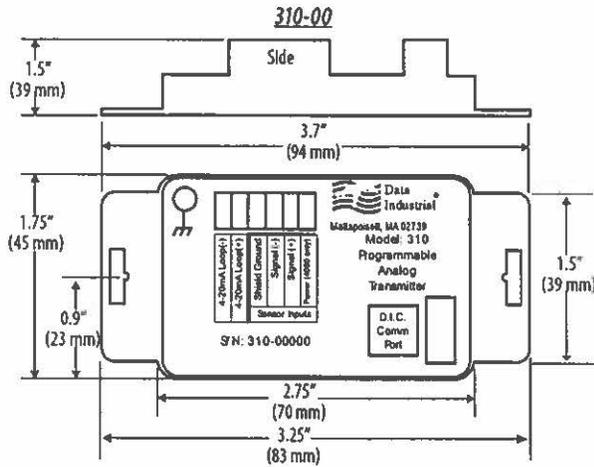
340 SPECIFICATIONS

Power Requirements	12-24VDC or 12-24VAC, 70mA max.
Flow Sensor Input	Excitation voltage 3-wire sensors: 9.1VDC 500Ω source impedance
Frequency	4-10000 Hz
Temperature Sensor Input	10k Dale Thermistor (requires 2, sold separately)
Operating Temperature Range	-29° to 70°C (-20° to 158°F)
Storage Temperature Range	-40° to 85°C (-40° to 185°F)

Units of Measure:

Flow Rate	gpm, gph, l/sec, l/min, l/hr, ft3/sec, ft3/min, ft3/hr, m3/sec, m3/min, m3/hr
Total Flow	gallons, liters, cubic feet, cubic meters
Energy Rate	kBTU/min, kBTU/hr, kW, MW, hp, tons
Total Energy	BTU, kBTU, MBTU, kWh, MWh, kJ, MJ

DIMENSIONAL DRAWINGS



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0013	310-00*	Flow Transmitter, Analog, Programmable, 4-20mA output
U001-0027	340LW-00*	Flow Transmitter, BTU, Analog, Programmable, LonWorks output
U001-0029	340N2-00**	Flow Transmitter, BTU, Analog, Programmable, N2 output
U001-0035	310-04*	Flow Transmitter, Analog, 4-20mA, DIN mounting
U001-0038	340N2-02**	Flow Transmitter, BTU, Analog, Programmable, N2 output, metal enclosure
U001-0042	310-01*	Flow Transmitter, Analog, 4-20mA, NEMA 4X enclosure
U001-0136	340BN/MB-00*.*.*	Flow Transmitter, BTU, BN-MB, No enclosure
U001-0137	340BN/MB-02*.*.*	Flow Transmitter, BTU, BN-MB, Metal Enclosure
U001-0138	340BN/MB-03*.*.*	Flow Transmitter, BTU, BN-MB, Plastic Enclosure
U001-0139	340BN/MB-04*.*.*	Flow Transmitter, BTU, BN-MB, with DIN Clips
U001-0060	320-00*	Flow Transmitter, Programmable, Scaled pulse output
U001-0109	340-00*.*.*	Flow Transmitter, Programmable, frequency output
U001-0020	A301-20	Programming cable with CD for analog/Modbus/BACnet/LonWorks outputs, serial PC connector
U001-0075	A302-20	Programming cable with CD for N2 output, serial PC connector
U001-0149	40134-0002	Programming cable with CD for analog/Modbus/BACnet/LonWorks outputs, USB PC connector

Other models available:

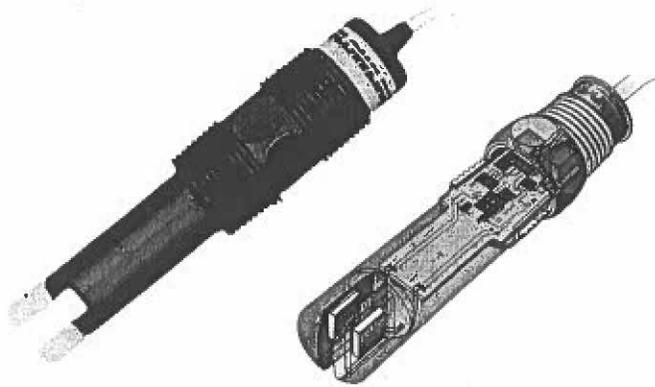
Model	Options
<input type="checkbox"/> 310 = Analog	<input type="checkbox"/> 00 = Transmitter only
<input type="checkbox"/> 320 = Pulse	<input type="checkbox"/> 01 = NEMA 4 enclosure (310, 320 only)
<input type="checkbox"/> 340 = BTU	<input type="checkbox"/> 02 = Metal weathertight enclosure
<input type="checkbox"/> 340N2 = BTU; N2 protocol	<input type="checkbox"/> 03 = Plastic weathertight enclosure
<input type="checkbox"/> 340BN/MB = BTU; Bacnet and Modbus protocol	<input type="checkbox"/> 04 = DIN rail mounting clips
<input type="checkbox"/> 340LW = BTU; LonWorks	

Example:

340 02

FLOW

Application



CSA approved for hazardous environments, the intrinsically safe ultrasonic point level switch provides reliable liquid level detection of chemical, solvent, hydrocarbon and petroleum based liquids with a 1A relay output. Media examples include fuel, acetone and hydrochloric acid. The submersible polypropylene or PFA liquid level sensor is universally mounted through the tank wall or inside the tank as a high level alarm or low level alarm.



Features

- ✓ CSA approved intrinsically safe for use in hazardous environments
- ✓ Submersible polypropylene or PFA Teflon® sensor and cable for corrosive liquids
- ✓ 60VA relay selectable NO or NC via power supply wiring polarity
- ✓ Compatible with Smart Trak and Switch-Pak installation fittings

Key Benefits

- ✓ Ideal for highly corrosive liquids
- ✓ Able to mount through the side wall or top wall of tank
- ✓ Compatible with Smart Track or Switch-Pak mounting options
- ✓ Use as redundant alarm in classified applications

Compatible Products

Switch-Pro™
Remote Level Controller

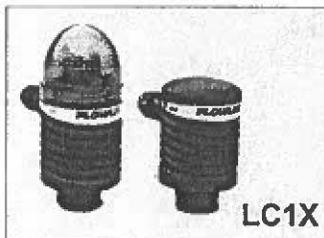


LCXX

Application

Available in CSA approved general purpose (LC4X) or isolation (with built-in intrinsic safety barriers for use with associated apparatus, LC9X) classifications, the level controller is offered in three configurations for pump and valve control. The LC40/90 accepts one level sensor input and provides one 10A relay. The LC41 accepts two level sensor inputs and provides one latching 10A relay for automatic fill or empty control. The LC42/92 accepts three level sensor inputs with one latching 10A relay output for automatic fill or empty control, and a second non-latching 10A relay for high level alarm or low level alarm. For field mount installation, add a single or dual indicator NEMA box.

Switch-Pro™
Compact Level Controller



LC1X

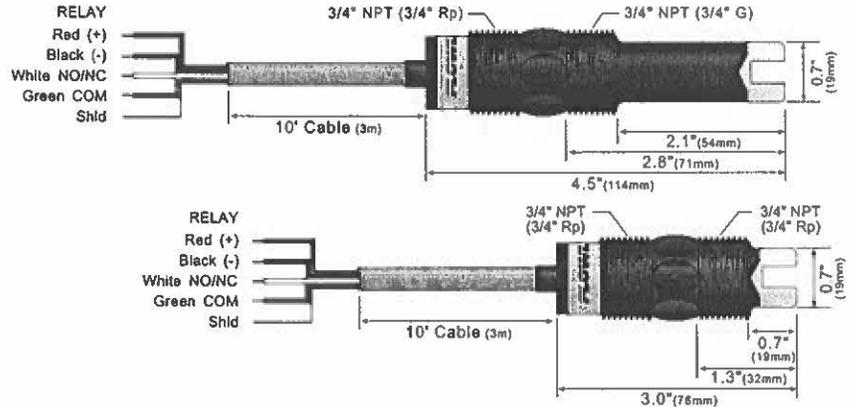
Application

The general purpose level controller is offered in two configurations for pump and valve control. The LC10 accepts one level sensor input and provides one 16A relay for high level control or low level control. The LC11 accepts two level sensor inputs and provides one latching 16A relay for automatic fill or empty control. The optional flash alarm brings attention to level alarm conditions. Package this level controller with our liquid level switch sensors and fittings.

Specifications

Orientation: Universal
 Accuracy: ± 1mm in water
 Repeatability: ± 0.5mm in water
 Supply voltage: 12-36 VDC
 Consumption: 25 mA maximum
 Contact type: (1) SPST relay
 Contact rating: GP: 60 VA
 IS: 32 VDC @ 0.5A
 Contact output: Selectable NO / NC
 Process temp.: F: -40° to 176°
 C: -40° to 80°
 Pressure: 150 psi (10 bar) @
 25° C, derated @ 1.667
 psi (0.113 bar) per °C
 above 25° C
 Sensor rating: -1XX5: NEMA 6 (IP68)
 -2XX5: NEMA 4X (IP65)
 Sensor material: -1XX5: PP
 -2XX5: PFA
 Cable jack. mat.: -1XX5: PP
 -2XX5: PFA
 Cable type: 4-conductor, #22 AWG,
 shielded
 Cable length: 10' (3m)
 Process mount: 3/4" NPT (3/4" G / Rp)
 Mount. gasket: Viton®
 Classification: Intrinsically safe
 Certificate: CSA, LR 79326
 Compliance: CE
 Approvals: Class I, Groups A, B, C
 & D; Class II, Groups E,
 F & G; Class III
 Parameters: Vmax = 32V, Imax = 300
 mA, Pmax = 1.3W,
 Ci = 0 µF, Li = 0 µH

Dimensions

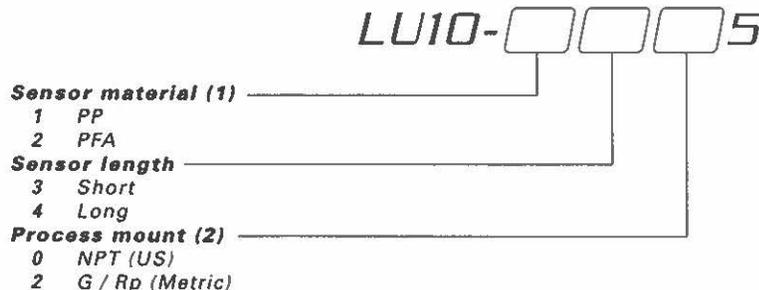


Fittings

For optimum performance, install the level sensor using the below recommended or direct equivalent fittings.

P/N	Description
Switch-Pak Single-Point Switch Fitting	
LM45-7001	2" NPT Plug, 3/4" NPT Adapter & Nipple, PVC
LM45-1001	2" NPT Plug, 3/4" NPT Adapter & Nipple, PP
LM45-5001	2" NPT Plug, 3/4" NPT Adapter & Nipple, PVDF
Smart Trak Multi-Point Switch Fitting	
LM10-1201	2' Track, 2" NPT Plug, 3/4" NPT Nipple, PP
LM10-1401	4' Track, 2" NPT Plug, 3/4" NPT Nipple, PP
LM10-1601	6' Track, 2" NPT Plug, 3/4" NPT Nipple, PP
LM10-1801	8' Track, 2" NPT Plug, 3/4" NPT Nipple, PP
LM10-1001	10' Track, 2" NPT Plug, 3/4" NPT Nipple, PP
LM10-1101	1m Track, 2" NPT Plug, 3/4" NPT Nipple, PP
LM10-1301	2m Track, 2" NPT Plug, 3/4" NPT Nipple, PP
LM10-1701	3m Track, 2" NPT Plug, 3/4" NPT Nipple, PP
Smart Trak Level Switch Car Kit	
LM30-1001	Switch Car Kit, 3/4" NPT, Polypropylene
LM30-1061	Switch Car Kit, 3/4" Rp, Polypropylene
LM52-2890	2" NPT Bulkhead Fitting, PVC

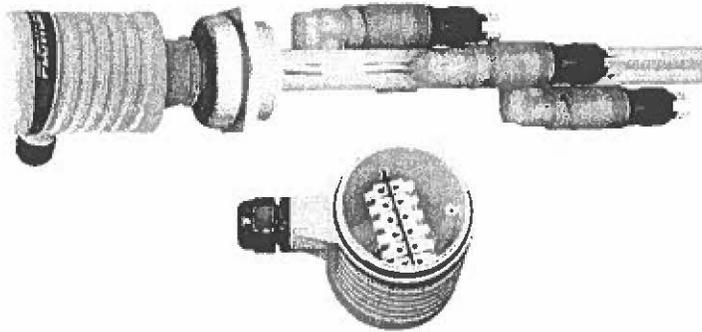
Ordering



Notes

- To special order a 25' (7.6m) or 50' (15.2 m) level sensor cable, place the cable length at the end of the part number (ie: LU10-1305-25'). For PP, add \$20 for 25' (7.6m) or \$40 for 50' (15.2m) to the price. For PFA, add \$75 for 25' (7.6m) or \$150 for 50' (15.2m) to the price.
- The short Metric level sensor has conical Rp threads on both sides of the wrench flat. The long Metric level sensor has straight G threads on the sensing side and conical Rp threads on the cable side of the wrench flat.

Application



The general purpose level switch package provides reliable, multi-point liquid level detection up to 10' (3m) with 1-4 adjustable level switch points and a compact junction box for integral wiring termination. Available in three level sensor technologies, select the sensor type based upon your application media. This PP liquid level switch package is widely applied in process, sump and day tank level applications for automatic filling or emptying with high level alarm and/or low level alarm.



Features

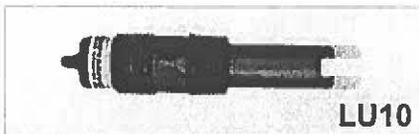
- ✓ Rugged polypropylene multi-point level switch package for corrosive liquids
- ✓ 60VA relay or 15VA dry contact selectable NO or NC via wiring
- ✓ Offered in 3 sensing technologies for broad application coverage: ultrasonic, vibration & buoyancy
- ✓ Adjustable level switch cars enable sensor adjustment in the field
- ✓ Available in intrinsically safe and general purpose classifications
- ✓ Polypropylene junction box or controller enclosure rated NEMA 4X with swivel base and terminal strip

Key Benefits

- ✓ Mounts on the top wall of tank
- ✓ Select from 1 to 4 switch points and the custom switch points
- ✓ Each switch connects directly to a PLC/SCADA
- ✓ Ideal for multi-point switch operation
- ✓ Switch points are fully adjustable

Compatible Products

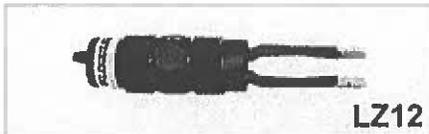
Switch-Tek™
Ultrasonic Level Switch



LU10

Broadly applied in chemicals and light weight oils

Switch-Tek™
Vibration Level Switch



LZ12

Applied in wastewater with light coating or scaling

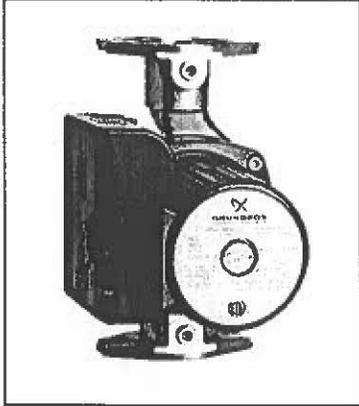
Switch-Tek™
Vertical Buoyancy Level Switch



LV10

Applied in clean water and non-coating chemicals



Position	Count	Description	Unit price
	-1	<p>UPS 43-100 SF</p>  <p>Product photo could vary from the actual product</p> <p>Product No.: 95906638</p> <p>The pump is of the canned rotor type, i.e. pump and motor form an integral unit without shaft seal and with only two gaskets for sealing. The bearings are lubricated by the pumped liquid. The pump is characterized by:</p> <ul style="list-style-type: none"> * Ceramic shaft and radial bearings. * Carbon axial bearing. * Stainless steel rotor can and bearing plate. * Corrosion-resistant impeller, Composite, PES. * Stainless steel pump housing. <p>The motor is a 1-phase motor. No additional motor protection is required.</p> <p>Liquid: Liquid temperature range: 32 .. 230 °F Density: 62.4 lb/ft³</p> <p>Technical: Approvals on nameplate: ETL, CSA</p> <p>Materials: Pump housing: Stainless steel DIN W.-Nr. 1.4301 Impeller: Composite, PES</p> <p>Installation: Maximum ambient temperature: 104 °F Ambient max at 176°F liquid: 176 °F Maximum operating pressure: 145 psi Flange standard: USA Oval Type of connection: S.S. Flange Pipe connection: 2 - Bolt Flange Pressure stage: 10 Port-to-port length: 8 1/2 in</p>	On request

GRUNDFOS®

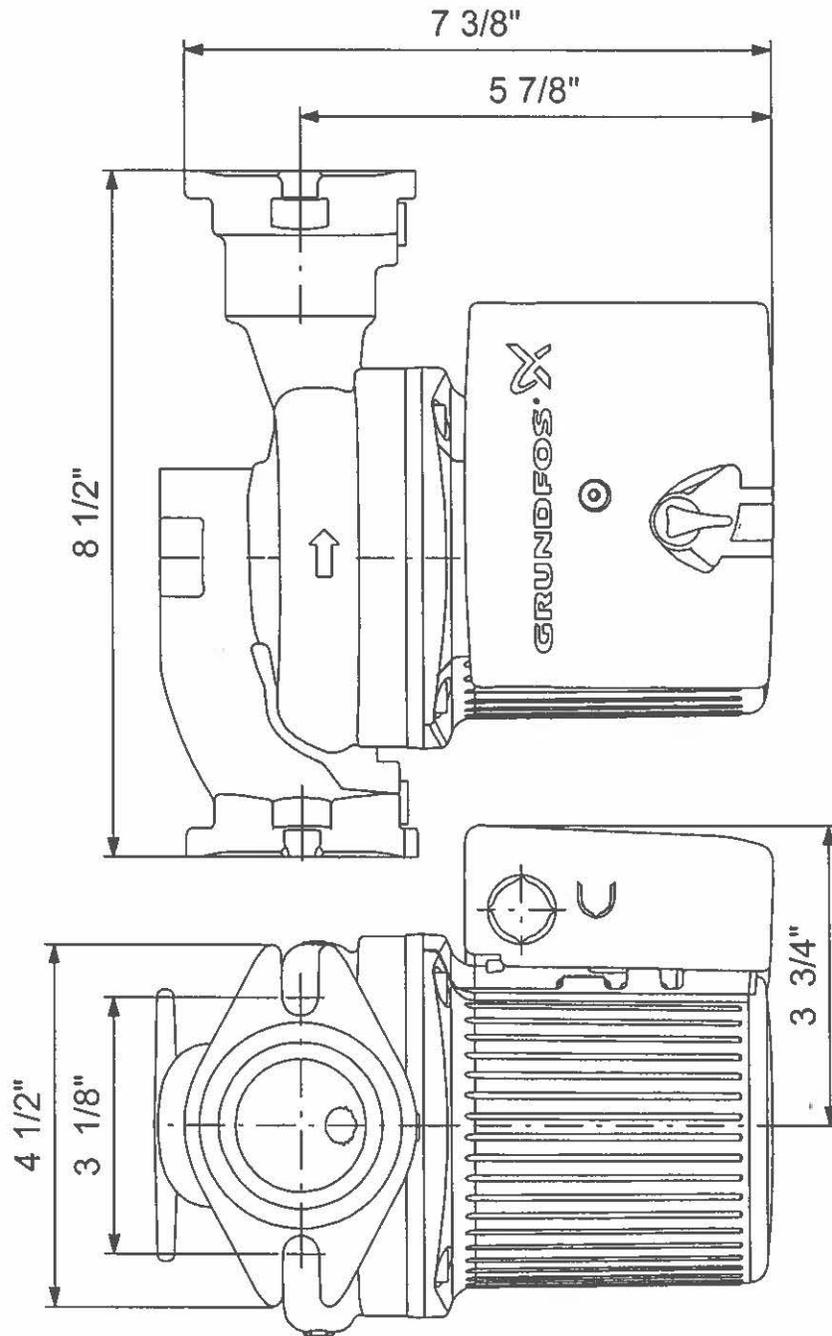


Company name: -
Created by: -
Phone: -
Fax: -
Date: -

Position	Count	Description	Unit price
		Electrical data: Number of poles: 2 Power input in speed 1: 265 W Power input in speed 2: 335 W Max. power input: 370 W Rated power - P2: 0.335 HP Main frequency: 60 Hz Rated voltage: 1 x 115 V Current in speed 1: 2.5 A Current in speed 2: 3.1 A Current in speed 3: 3.5 A Capacitor size - run: 40 µF/180 V Insulation class (IEC 85): H	
		Others: Gross weight: 17.7 lb	

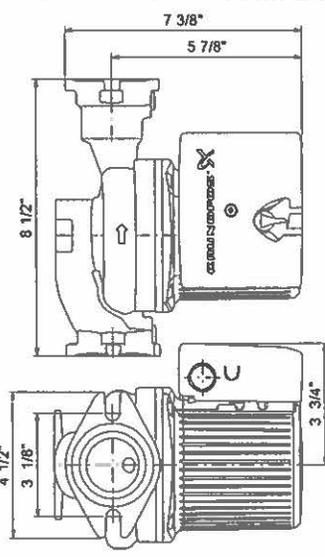
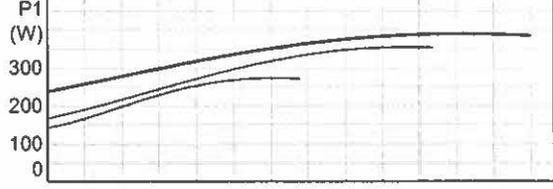
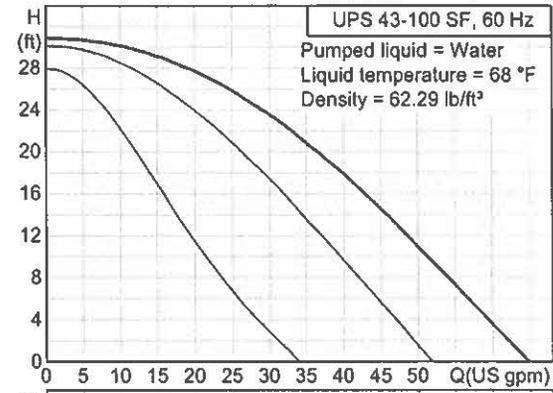


95906638 UPS 43-100 SF 60 Hz



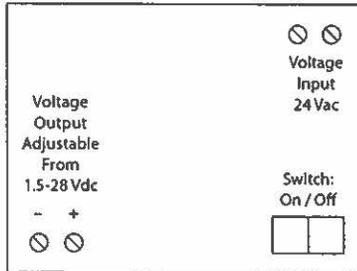
Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

Description	Value
Product name:	UPS 43-100 SF
Product Number:	95906638
EAN number:	5700313291762
Technical:	
Speed Number:	3
Actual calculated flow:	30.9 US gpm
Max flow:	65 US gpm
Resulting head of the pump:	23.1 ft
Head max:	30.8 ft
Maximum operating pressure:	145 psi
Approvals on nameplate:	ETL, CSA
Materials:	
Pump housing:	Stainless steel DIN W.-Nr. 1.4301
Impeller:	Composite, PES
Installation:	
Maximum ambient temperature:	104 °F
Ambient max at 176°F liquid:	176 °F
Maximum operating pressure:	145 psi
Flange standard:	USA Oval
Type of connection:	S.S. Flange
Pipe connection:	2 - Bolt Flange
Pressure stage:	10
Port-to-port length:	8 1/2 in
Liquid:	
Liquid temperature range:	32 .. 230 °F
Liquid temp:	68 °F
Density:	998.2 kg/m³
Electrical data:	
Number of poles:	2
Power input in speed 1:	260 W
Power input in speed 2:	340 W
Max. power input:	375 W
Rated power - P2:	0.335 HP
Main frequency:	60 Hz
Rated voltage:	1 x 115 V
Current in speed 1:	2.7 A
Current in speed 2:	3.4 A
Current in speed 3:	3.8 A
Capacitor size - run:	40 µF/180 V
Insulation class (IEC 85):	H
Motor protection:	CONTACT
Thermal protec:	internal
Controls:	
Pos term box:	9H
Others:	
Gross weight:	17.7 lb



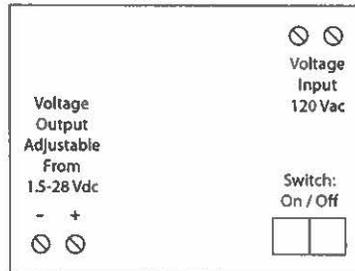
PSM24A24DAS

4.00" & 2.75" Track Mount Isolated Linear DC Power Supply, 24 Vac to 1.5-28 Vdc, 300 mA Adjustable Output

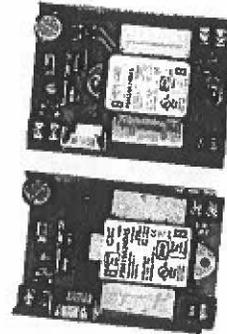


PSM19A24DAS

4.00" & 2.75" Track Mount Isolated Linear DC Power Supply, 120 Vac to 1.5-28 Vdc, 300 mA Adjustable Output



DC Power Supply



Specifications

<p>Voltage Input: 24 Vac (PSM24A24DAS) 120 Vac (PSM19A24DAS)</p> <p>Voltage Output: 1.5 - 28 Vdc Isolated</p> <p>Frequency: 50/60 Hz</p> <p>Overload Protection: Electrical and Thermal, Auto-Reset</p> <p>Operating Temperature: -30 to 140° F</p> <p>Humidity Range: 5 to 95% (noncondensing)</p> <p>Status: LED On = Activated</p> <p>Dimensions: 1.625" x 2.750" x 4.000"</p> <p>Track Mount: 4.000" and 2.750" MT212-4 Mounting Track Supplied</p> <p>Weight: 1.10 lbs.</p> <p>ON/OFF Switch: 2 Position</p> <p>Approvals: Class 2 (UL Approved UL5085-3), UL916, C-UL, CE, RoHS</p>	<p>Output Current Ratings: 116 mA @ 10 Vdc 125 mA @ 12 Vdc 300 mA @ 24 Vdc</p> <p>Input Current Rating: 950 mA Maximum (PSM24A24DAS) 150 mA Maximum (PSM19A24DAS)</p>	<p>Percent Ripple: 0.0016%, 24 Vdc @ 300 mA</p> <p>Regulation: Load: 0.04% No Load to Full Load Line: 0.0080 mV/V (PSM24A24DAS) Line: 0.6250 mV/V (PSM19A24DAS)</p>
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Vantage™ MicRO Reverse Osmosis Systems

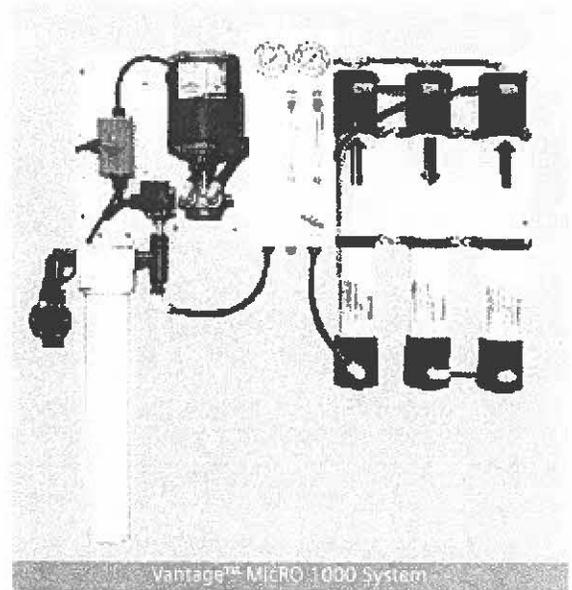
The Clear Advantage in Membrane Systems

Vantage™ MicRO systems by Siemens Water Technologies are pre-assembled, wall mount Reverse Osmosis (RO) systems designed for a wide range of commercial applications. This packaged line of products is engineered to increase recovery rates while minimizing installation and operation costs.

The factory tested Vantage™ MicRO system offers you the quality of single-pass RO water combined with flexible mounting options: innovative compact wall mount design or traditional floor bracket.

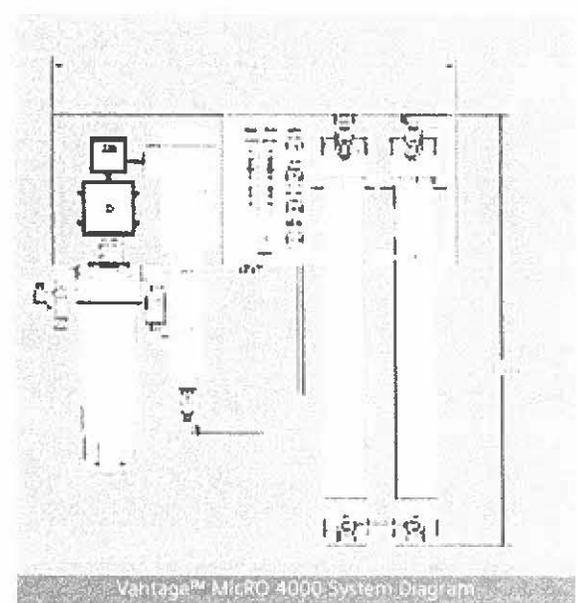
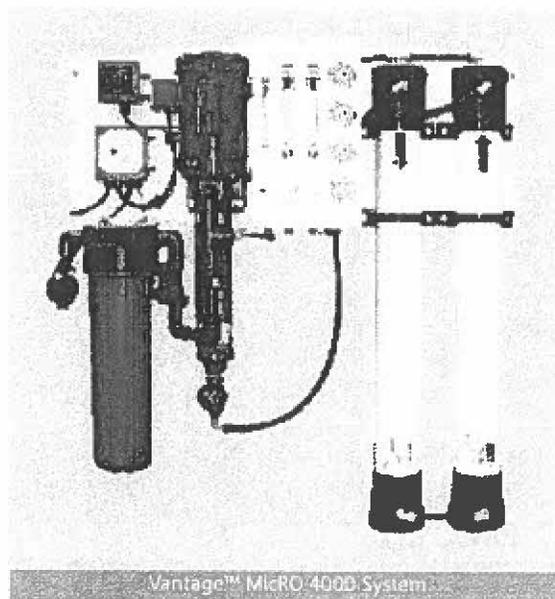
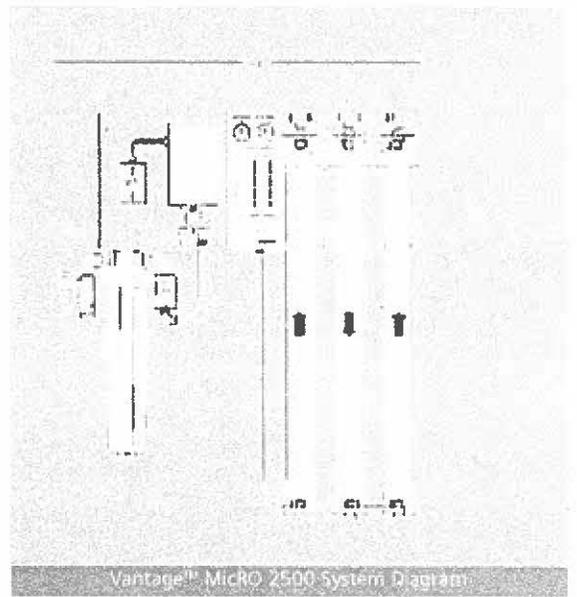
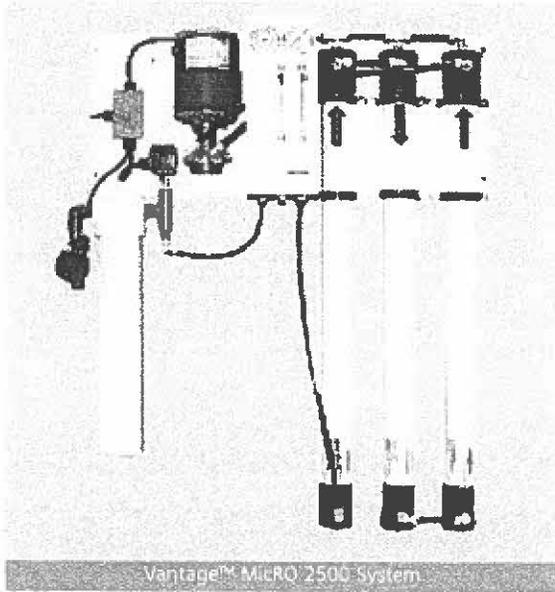
The Vantage™ MicRO2 and MicRO4 systems come with pre-installed thin-film composite (TFC) membranes, set up for simple utility connections and immediate startup.

The MicRO system operating flow rates range from 0.17 to 2.77 gallons per minute (0.04 to 0.63 m³/hr). The MicRO2 system includes a positive displacement, rotary vane pump, while the MicRO4 system is equipped with a Goulds multistage pump.



Vantage™ MicRO System Features and Benefits

- Compact wall mount design or floor bracket frame for maximum space efficiency
- Vantage™ LPR low pressure and XLPR extra low pressure RO membranes ensure optimal water quality
- Rapid installation and startup of equipment
- Low maintenance and operational costs
- Comprehensive factory testing
- Adaptable systems with wide selection of design options and instrumentation upgrades
- High quality components ensure continuous reliable operation
- Reject recycle maximizes water recovery and minimizes loss



Design Parameters	
Configurations	Multi-Stage, Single Pass
Inlet Pressure Requirements	30 – 85 PSIG
Feed Water Temperature	25 °C (77 °F)
Feed Water Source	Well or Softened
Prefiltration Requirements	5 µm nominal
Feed Water Fouling Index	Silt Density Index (SDI) < 3
System Recovery (Nominal)	75% with reject recycle
Performance Basis	30 – 85 PSIG
If any of the feed water requirements are not within the limits given, contact Siemens Water Technologies technical support	

Specifications													
Model Number ¹	Flow Rates Specifications GPM Nominal (m ³ /hr)				Vessel Staging	Membrane Qty	Customer Connection Specifications		Utility Requirements			Approx. Shipping Weight	
	Product ²	Feed	Reject	Recycle			Feed	Product/Reject	High Voltage Service	High Voltage FLA	Pump HP	Lb (kg)	
MicRO2	0250	0.17 (.04)	0.23 (.05)	0.06 (.01)	0.95 (.22)	1	1	3/4" FNPT	3/8" tube	120 VAC ³	6.6	1/3	60 (27)
	0500	0.34 (.08)	0.45 (.10)	0.11 (.03)	0.89 (.20)	1:1	2	3/4" FNPT	3/8" tube	120 VAC ³	6.6	1/3	65 (29)
	1000	0.69 (.16)	0.92 (.21)	0.23 (.05)	0.78 (.18)	1:1:1	3	3/4" FNPT	3/8" tube	120 VAC ³	8.2	1/2	70 (32)
	1500	1.00 (.23)	1.30 (.30)	0.30 (.07)	1.70 (.39)	1:1	2	3/4" FNPT	3/8" tube	120 VAC ³	11.0	3/4	95 (43)
	2500	1.70 (.39)	2.40 (.55)	0.70 (.16)	1.65 (.38)	1:1:1	3	3/4" FNPT	3/8" tube	120 VAC ³	11.0	3/4	105 (48)
MicRO4	2000	1.38 (.31)	1.84 (.42)	0.46 (.10)	3.5 (.79)	1	1	3/4" FNPT	3/8" tube	120 VAC ⁴	13.8	1.0	80 (36)
	4000	2.77 (.63)	3.69 (.84)	0.92 (.21)	3.5 (.79)	1:1	2	3/4" FNPT	1/2" tube	120 VAC ⁴	13.8	1.0	100 (45)

¹ The 2 in the MicRO2 model name designates 2.5" RO membranes, the 4 in the MicRO4 model name designates 4" membranes. The model number (ex: 0250, 0500) indicates gallons/day.

² Product flow rates are based on equipment design parameters listed below. Product flow rates may not be appropriate for other feed waters.

³ Optional voltage available in 220 VAC 1PH on all MicRO2 systems.

⁴ Optional voltage available in 220 VAC 1PH and 3PH as well as 460 VAC 3PH on all MicRO4 systems.

Description	MicRO2			MicRO4		
	Economy	Plus	Deluxe	Economy	Plus	Deluxe
Controls						
System Control	On/Off Switch	Controller	Controller	Controller	Controller	Controller
Feed Solenoid Valve	X	X	X	X	X	X
Concentrate Recycle	X	X	X	X	X	X
Feed Low Pressure Switch	X	X	X	X	X	X
Instrumentation						
Product Flow Meter	X	X	X	X	X	X
Concentrate Recycle Flow Meter	X	X	X	X	X	X
concentrate Flow Meter	X	X	X	X	X	X
Pre-Filter IN PI	X	X	X	X	X	X
Pre-Filter OUT PI	X	X	X	X	X	X
Pump Discharge PI	X	X	X	X	X	X
Final Concentrate PI	X	X	X	X	X	X
Feed TDS Monitor						X
Product TDS Monitor			X	X	X	X
Standard Options						
Pretreatment Lockout*		X	X	X	X	X
Tank Level Input*		X	X	X	X	X
Status Light*		X	X	X	X	X
Auto Flash Valve			X		X	X
Vantage™ LPR RO Membrane	X			X		
Vantage™ XLPR RO Membrane		X	X		X	X
SS Pump			X			X
Permeate Sample Valve			X		X	X
Chemical Pump Switch			X			X
Voltage Options						
120VAC 1PH 60Hz	X	X	X	X	X	X
220VAC 1PH 60Hz	X	X	X	X	X	X
220VAC 3PH 60Hz				X	X	X
460VAC 3PH 60Hz				X	X	X
Options to be Ordered Separately						
Bladder Tank Kit and HP Switch	X	X	X	X	X	X
Floor Stand	X	X	X	X	X	X
*Pretreatment Lockout, Tank Level Input and Status Light are all included in the Mini-Trol Microprocessor Controller. The Mini-Trol controller is packaged with the MicRO2 Plus and Deluxe systems as well as all of the MicRO4 systems.						

Siemens
Water Technologies
10 Technology Drive
Lowell, MA 01851
Technical Support: 800.875.7873 ext 5000
Customer Support: 800.466.7873
Phone: 978.934.9349 ext 5000
Fax: 978.441.6025

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PWS-MICRO-DS-1009
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MINI-TROL IF RO CONTROLLER

Specifications

Power: 120VAC or 240VAC, 50/60 Hz, +10/-15%, 2.5 watts (Optional 24V)
Inputs: 3 switch inputs, selectable normally open or normally closed
Outputs: RO pump (20A MAX), inlet and flush solenoids (5A MAX ea.). TOTAL LOAD - 20A MAX
Enclosure: 6.0 x 6.0 x 4.0 NEMA 4X

OPERATION

When the power switch is turned ON, the status LED will light Green, the inlet valve will OPEN and after a 5 second delay the RO pump will START.

Under normal operation the RO unit will run until: (A) the storage tank is full (status LED Amber) or (B) Pretreat lockout has occurred (status LED Flashing Green). When A or B has cleared, after a time delay, the RO unit will restart, and the status LED will return to Green. Jumper setting J-6 selects a 2 second or 15 minute tank full restart time delay.

Upon an alarm signal for Pressure Fault, the status LED will turn RED, the RO pump will stop and the inlet valve will close.

If jumper J-4 and J-5 are in Position **B** (disabled), the status LED will flash RED and the RO will not restart until the Power Switch has been manually cycled OFF then ON to reset the unit.

If jumper J-4 is in Position **A** (auto reset), every 60 minutes the controller will check the pressure fault, and either stay OFF or START accordingly.

If jumper J-5 is in Position **A** (pressure fault retry), the RO will attempt to restart after 30 seconds, then 5 minutes, then 30 minutes. If the pressure alarm has not cleared after the third try, the RO unit will remain off until manually reset.

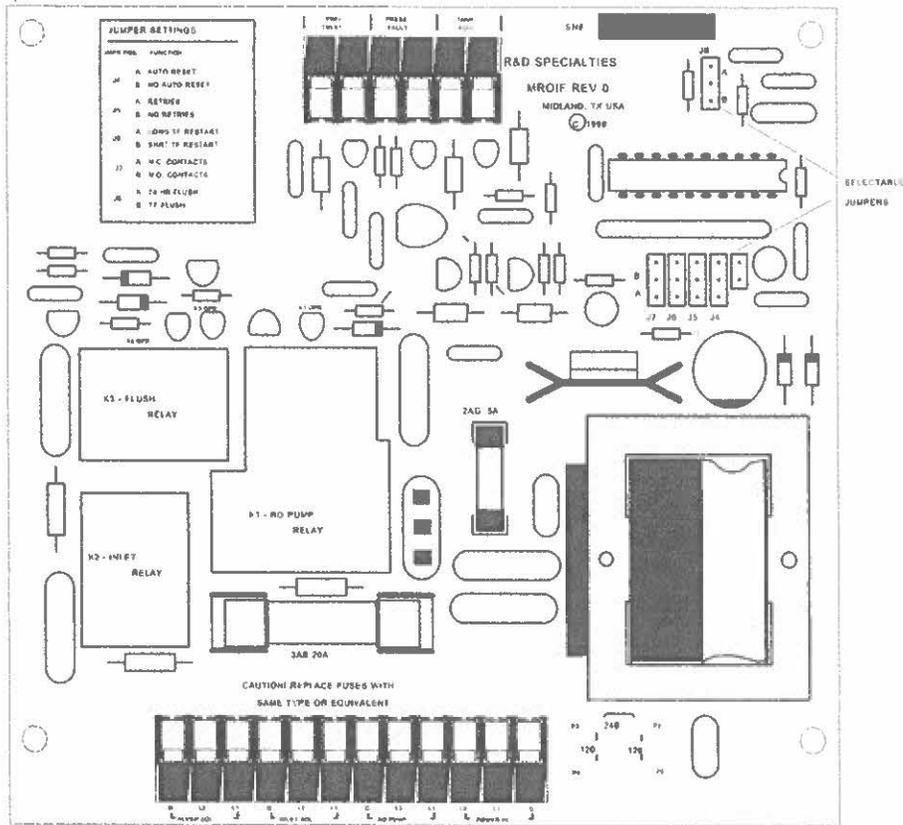
If jumper J-4 and J-5 are in Position **A** after a pressure fault condition, the RO unit will continually attempt to restart after each 60 minute cycle, until the pressure switch input has cleared.

If jumper J8 is in position **A** the RO unit will flush every 24 hours elapsed time. If jumper J8 is in position **B** the RO unit will flush on tank full. During Flush, the inlet and flush valves are open and the RO pump is ON. The flush time is 5 minutes. The status LED will double flash amber.

Installation

1. Confirm that the controller is configured for the proper voltage 120, 240 or 24 volt. See ID label, also a label is located on top of the transformer designating voltage (See Fig. 1)
2. The RO pump motor or motor starter and the solenoid valves must be of the same voltage 120, 240 or 24 volt.
3. Confirm that the (3) input signals - pressure switch, tank level switch and pretreat switch are all of the same configuration, normally open or normally closed.
4. Confirm the desired jumper settings for your operation. The jumpers are factory set to Position **B** Auto Reset (disabled), Pressure Fault Retry (disabled), Tank Full restart time delay (2 seconds), Input contact type (NC, open to operate), and flush on tank full. If you desire to change any jumper function, move that jumper to Position **A** [See Table 1, Jumper Selection].
5. If a wire harness is provided with this controller, skip this section and proceed to step 6. If wiring to the controller is required, proceed as follows:
 - A. Remove the enclosure cover.
 - B. Mark and drill necessary electrical entry holes in the empty enclosure.
 - C. Terminate necessary wiring to the terminal strips as required (See Fig. 1). Each terminal is labeled for the proper connection. Terminal strip P1 is high voltage for power, motor, inlet and flush solenoid. Utilize proper 3 conductor wire size for the appliance. **CAUTION:** The controller is rated for maximum 20 amp total load. Terminal strip P2 is low voltage for input signals from tank full, pressure fault and pretreat lockout. Use small gauge 2 conductor cable for these wire connections.
6. Position and mount the enclosure in the desired location.
7. Connect all wiring to the appropriate appliances (Do not connect to the power source at this time).
8. Reassemble the enclosure, be sure to coil and leave some slack wire inside the enclosure.
9. Turn the power switch to the OFF position.
10. Connect the power wire 120, 240 or 24 volt to its source.
11. Proceed to turn the power switch ON and test the completed unit as necessary.
12. Notice the status LED color to confirm system status.

MINITROL IF



FOR 120VAC OPERATION, JUMP
P3 TO P4 & P5 TO P6

FOR 240VAC OPERATION, JUMP
P5 TO P6

Figure 1

JUMPER	POSITION B	POSITION A
J4	AUTO RESET DISABLED	AUTO RESET ENABLED
J5	RETRIES DISABLED	RETRIES ENABLED
J6	2 SEC RESTART	15 MIN RESTART
J7	N.O SWITCHES	N.C. SWITCHES
J8	TANK FULL FLUSH	24 HOUR FLUSH

Table 1

NOTES

ALL SWITCH INPUTS MUST BE DRY CONTACT ONLY!! IF VOLTAGE IS APPLIED TO THESE INPUTS, DAMAGE TO THE CONTROLLER WILL RESULT.

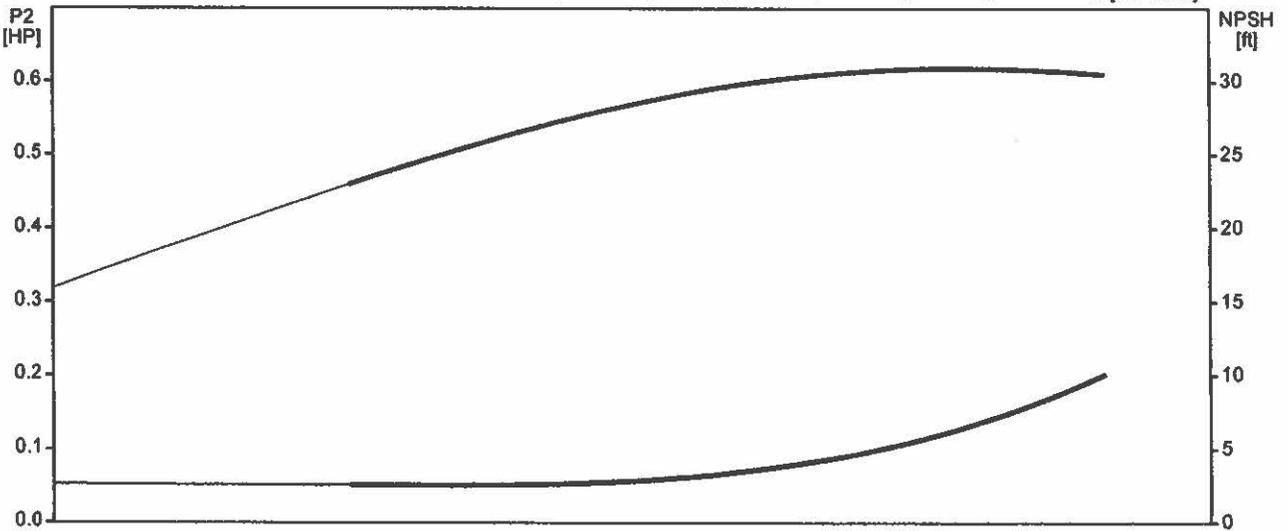
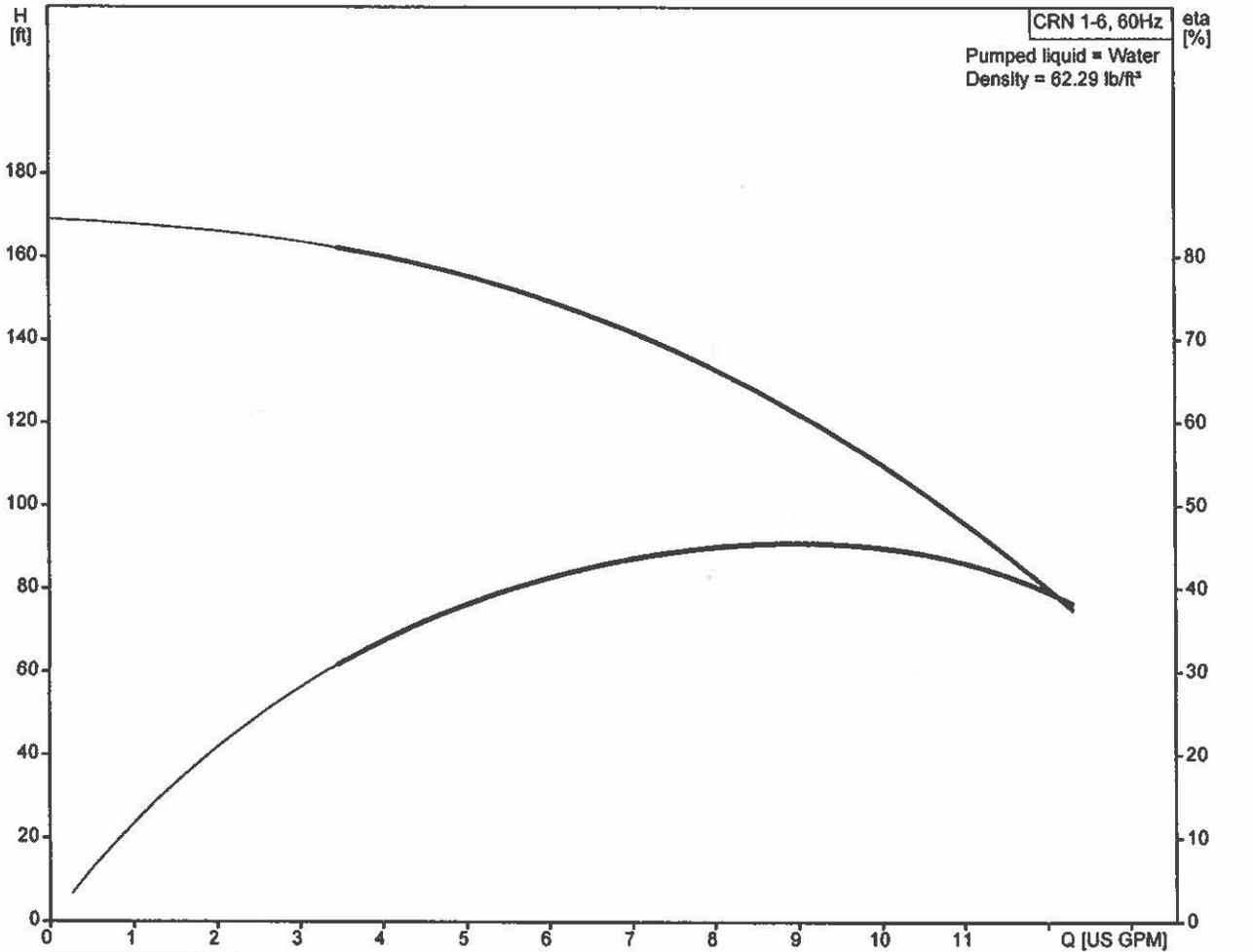
FOR POWER WITH NEUTRAL AND HOT LEADS, L1 IS HOT AND L2 IS NEUTRAL

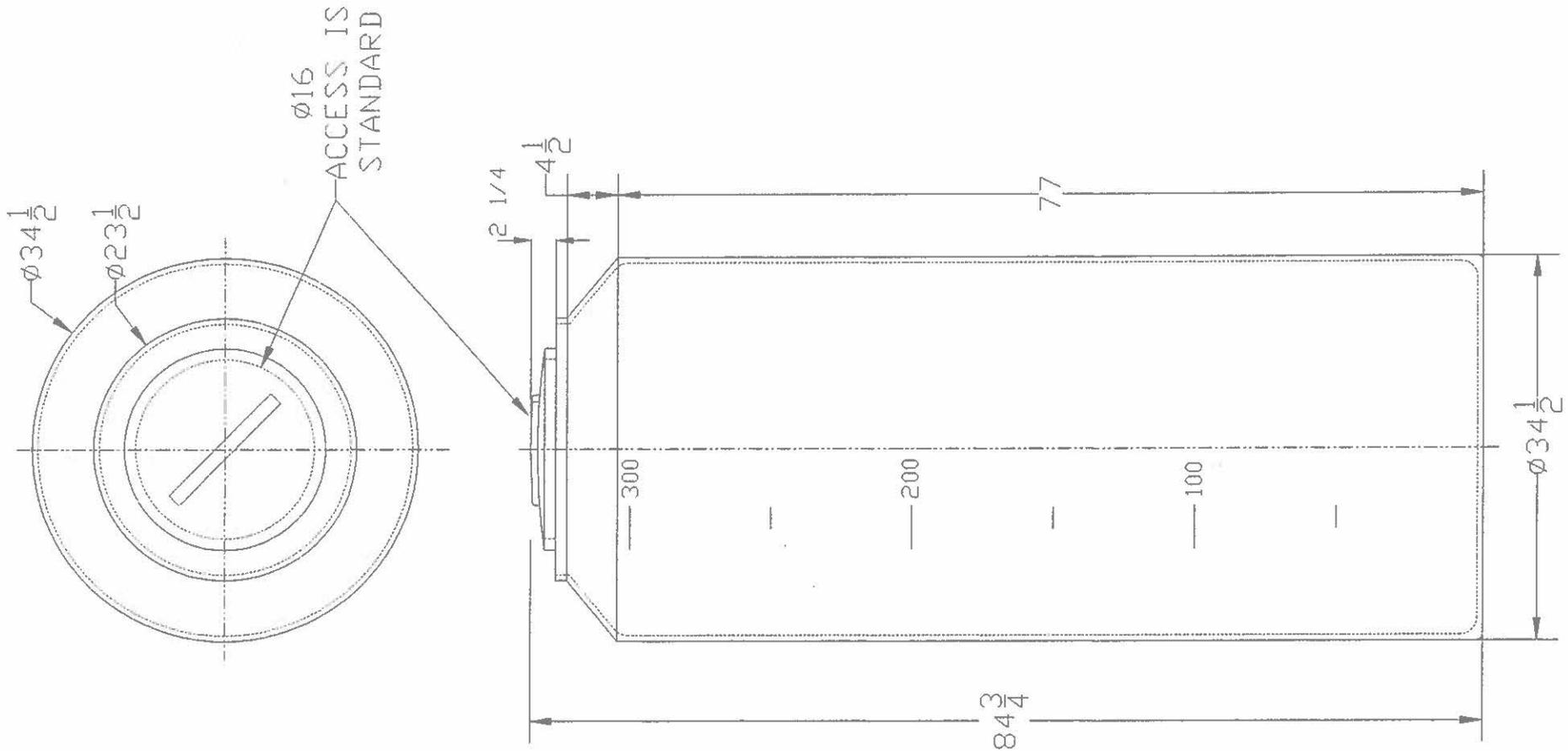
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Company name: -
Created by: -
Phone: -
Fax: -
Date: -

96557523 CRN 1-6 60 Hz





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Rev. 0	Date 05/13/99	File Name IA3581-1	
CHEM-TAINER Industries Inc. 361 Neptune Ave W. Babylon, NY 11704 (631) 661-8300 Fax: (631) 661-8209		Date 05/13/99	Mold Location CA
		Drawn By: EJS	Cust. Rep.
TITLE 300 GALLON VERTICAL BULK STORAGE TANK			
Part # TC3581IA/IC		Dwg. # C-3581-15	

Plaza Fountain

Fountain Staging

MBC-35 (located in Library Building) controls the fountain. Fountain will be started and stopped based on a Time-of-Day schedule to start at 8 A.M. and stop at 8 P.M. (adjustable). Prior to enabling fountain to run, MBC will evaluate Outside Air Temperature. If temperature is above 40 DEG F (adjustable), the fountain will start. If at any time during fountain operation, Outside Air Temperature falls below 40 DEG F (adjustable), the fountain will be disabled.

If temperature conditions are satisfactory, the MBC will start the Pressure Pump and Filter Pump and begin the Fountain Staging Sequence. There are 4 user selectable stages. Available stages are: "Mist", "Stream", "Mist/Stream", and "Rest". Each stage has a user adjustable duration. Dependent on selected stage and duration, the Mist and Stream valves will cycle on and off accordingly. During the "Rest" cycle (if selected), the Mist and Stream valves are closed. The Fountain Pressure Pump and Fountain Filter Pump remain running for all stages. At 8 P.M. (adjustable), the fountain will shut down, the Pressure and Filter Pumps will shut off, and the Mist and Stream valves will close.

If during fountain operation, the Campus Photocell detects a low light condition, the MBC will energize the Fountain Lights. The lights will remain on until the fountain is shut down or the low light condition clears.

The RO system enable is on when the fountain system pump is on and enabled.

The building automation system (BAS) monitors (PXCC-56) the RO skid that supplies the makeup water storage tank. The RO skid has its own internal controls. If the RO system enable point is on, Siemens will cycle on/off the filter pump to fill the 300 gallon tank. If the water level drops below the RO "tank fill" line, the RO skid will be commanded on. Once the water level reaches the "tank full" line, the RO skid will be commanded off.

The BAS monitors (PXCC-56) the fountain water vault for fill pump enable, tank full pump disable, low water alarm, high water alarm and overflow alarm. The booster pump draws water from the 300 gallon storage tank (which is fed from the RO skid). When water level drops to the 'vault fill level' the booster pump will be enabled. The pump will run continuously until the water level has reached the 'tank full level'. When the 'vault full level' has been reached the pump will be disabled. When the RO system is disabled and the water level drops to the "vault fill level", the manual fill valve out from MBC-35 will be commanded on and fill the vault until the water level reaches the "vault full level" is reached.

The incoming water to the RO skid and the water leaving the 300 gallon storage tank is metered and trended by the BAS system.

The RO system is off when the 300 gallon storage tank is full and the fountain system is disabled.

There is a manual fill valve that can be controlled by operator only. Once the fountain vault is full, the manual fill valve will automatically shut off. The manual fill valve will turn back on automatically unless an operator commands the manual fill enable to "OFF".

Alarms

MBC will monitor the status of the Fountain Pressure Pump and Fountain Filter Pump through the use of a current sensing switch. The MBC will alarm the operator's terminal if the status does not match the command of the MBC.

PXCC-56 will alarm the operator's terminal upon receipt of a *low water alarm or high water alarm* condition from the Fountain *Sump* Level Control System.

The RO skid points that are monitored through the BAS are filter pump run status, storage vault low level alarm, storage vault high level alarm, storage vault overflow alarm, tank overflow alarm, and RO skid general alarm. All alarms are reported to the BAS system.

If the fill pump status does not match the commanded value an alarm will be generated at the BAS system.

If the manual fill valve has been on for at least 3 hours (alarm adjustable) an alarm will be generated.

