VICKERS VILLAGE RE-SUBMITTALS

ROSWELL, GEORGIA

PLUMBING SUBMITTALS

Project #10287

1976 Airport Industrial Park Drive Marietta, GA 30060 770-952-3864 Fax 770-952-0299

STERLING WATER CLOSET:

S4033150	STERLING	1.6/1.28 GALLONS PER FLUSH 12 ELONGATED BOWL ADA WINDHAM WHITE
S4045510	STERLING	WINDHAM CLOSET TANK WHITE 1.28 GALLONS PER FLUSH
PFTSE2000WH	PROFLO	ELONGATED CLOSET SEAT PLASTIC ECONOMY WHITE

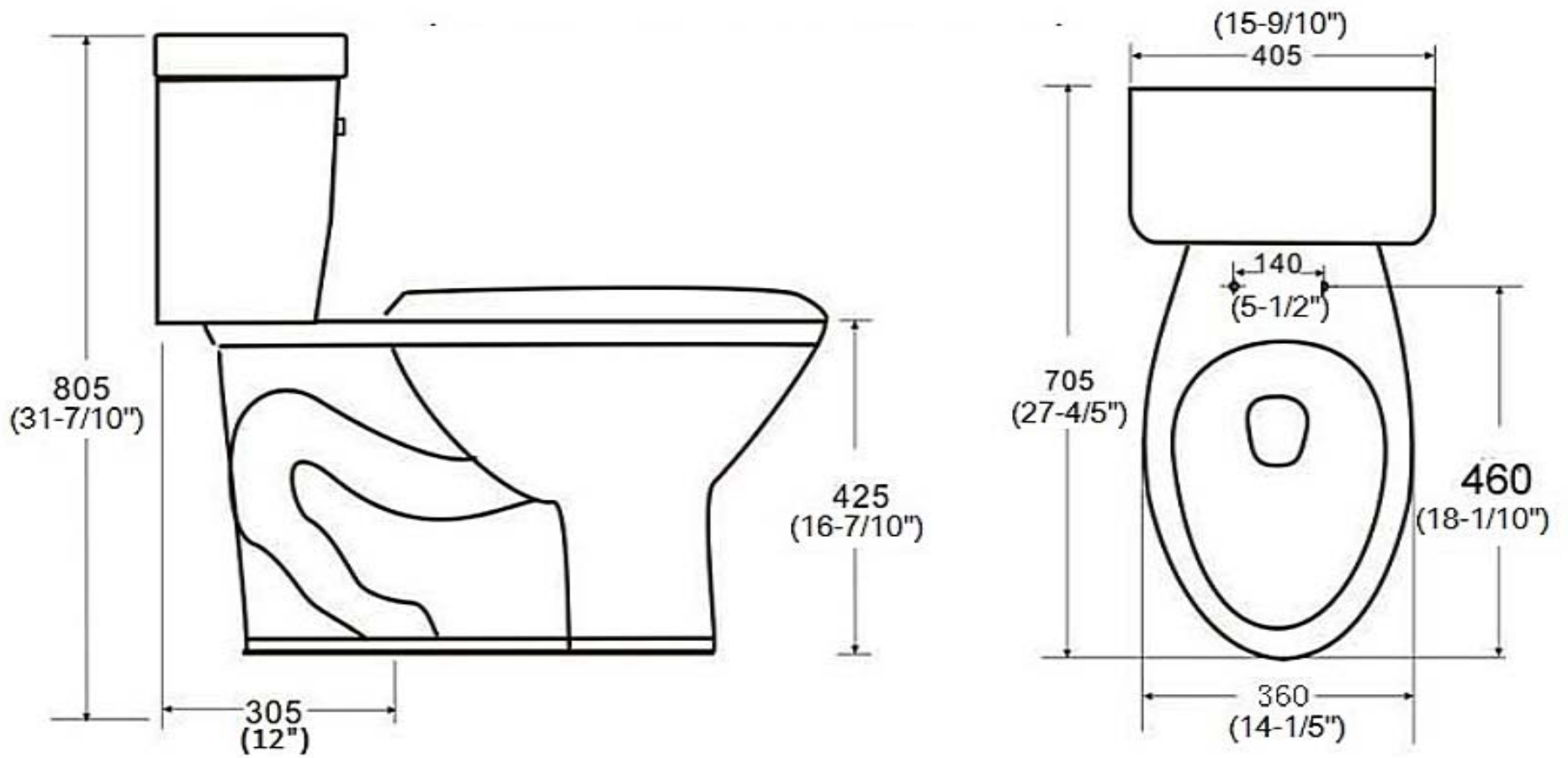
RJTR GENERAL NOTES:

1. TOILET FLUSH HANDLES ALWAYS TO BE ON THE ‘OPEN’ SIDE OF THE ROOM.

BE ADVISED THAT THE CELDON WATER CLOSET HANDLE WILL NOT BE ON THE OPEN SIDE FOR ADA UNITS (THEY ARE NOT MADE THAT WAY)

AN5888

Size:705x405x805mm
(27-4/5" *15-9/10"*31-7/10")



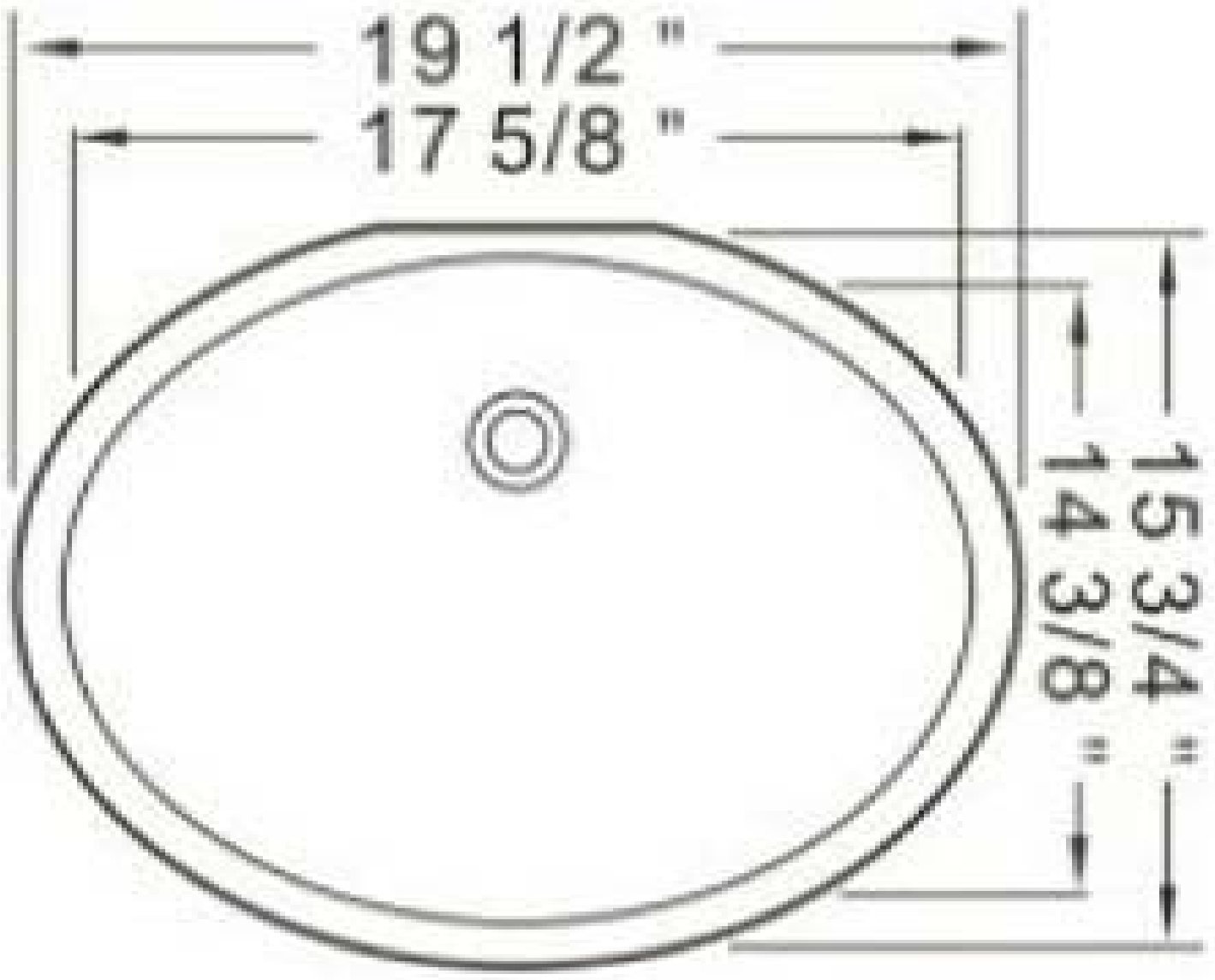
* IAPMO / CUPC
* EPA Water Sense
* ASME A112.19.2-2013
* CSA B45.1-13

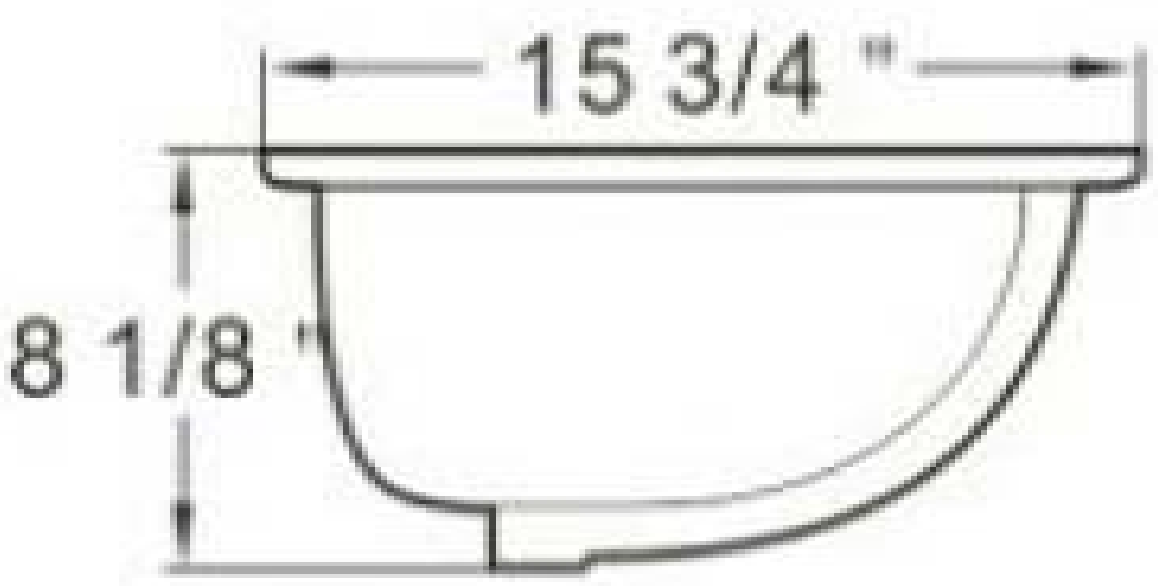
Two-Piece Elongated Toilet
* 1.28 GPF High Efficiency
* Water Sense Certified
* Comfort Height Bowl
* 2" Fully Glazed Trapway

LAVATORY:

K2210-0	KOHLER	17"X14" VC UNDERCOUNTER LAVATORY BOWL W/ MOUNTING HARDWARE
PFWSC8850CP	PROFLO	LEAD LAW COMPLIANT 1.2 GPM 1 HANDLE LAVATORY FAUCET WITH POP UP POLISHED CHROME

CELDON LAVATORY BASIN AND FAUCET





CELADON

QUALITY. DESIGN. VALUE.

CELADON
QUALITY. DESIGN. VALUE.

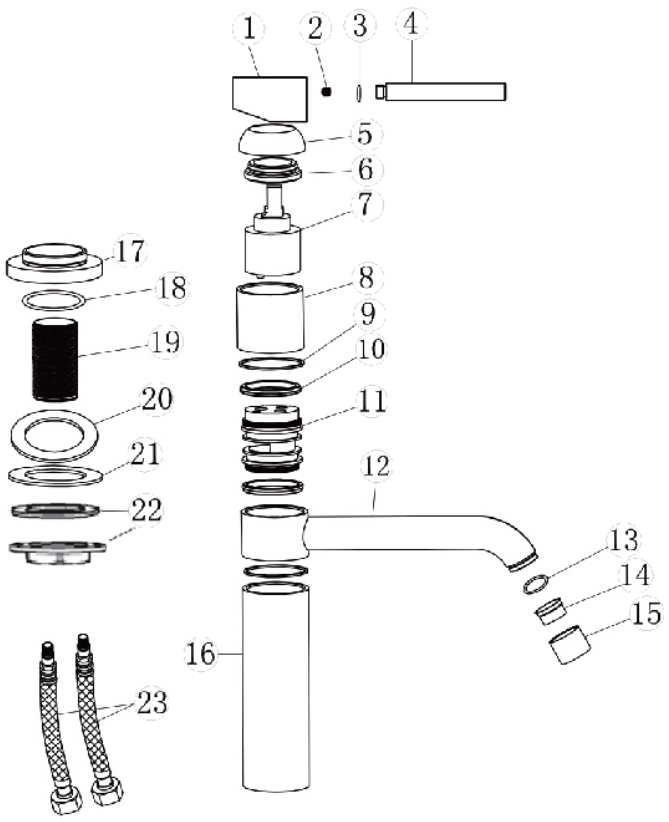
BASIN

Features:

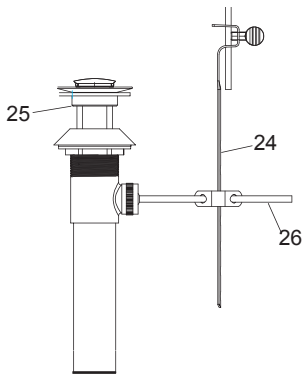
- Metal lever Handle
- Ceramic Cartridge
- Max Flow Rate 1.5GPM(5.7LPM) at 60 PSI(ASME.A112.18.1M)

BF8331PG-P02 Polish gold

BF8331MB-P02 Matte black



No.	Component Description	Material
1	Handle Base	Zinc
2	Screw	SS
3	O-ring	Rubber
4	Handle Arm	Zinc
5	Dome Nut	Brass
6	Adjustment Ring	Brass
7	Cartridge	POM
8	Sleeve	Brass
9	O-ring	Rubber
10	Adjustment Ring	Brass
11	Cartridge-Base	Brass
12	Spout	Brass
13	Gasket	Rubber
14	Aerator	POM
15	Aerator Cover	Brass
16	Main Body	Brass
17	Base Ring	Brass
18	O-ring	Rubber
19	Shank	Brass
20	Rubber Gasket	Rubber
21	Metal Gasket	Brass
22	Fixing Nut	Brass
23	Flexible Hose	SS
24	Lift Rod	SS
25	Poo-up Body	Brass
26	Horizontal Rod	SS



Approval:

Meets or Exceeds The following

*ANSI/ASME A112.18.1M

*ANSI/NSF 61-Sec.9

*IAPMO/UPC

NSF61-9 UPC C ®

BATHTUB:

S711011100	STERLING	60X36 LH VIKRELL BATH ENSEMBLE WHITE
PF2830CP	PROFLO	CCY 1.8 1 HANDLE LEVER TUB AND SHOWER FAUCET TRIM POLISHED CHROME
PF3001	PROFLO	CERAMIC TUB AND SHOWER VALVE MIP AND SWEAT WITH STOPS

CELDON TUB AND SHOWER VALVE

STERLING
A KOHLER COMPANY

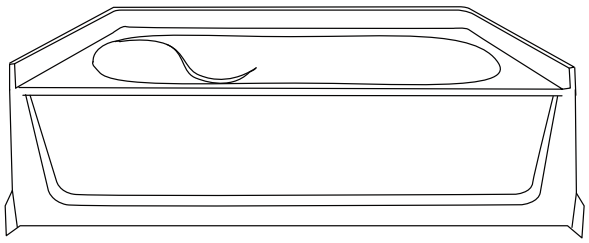
ENSEMBLE™

Features

- *Compression molded from Sterling's exclusive solid Vikrell® material*
- *Gentle sloping back, neck, and armrest in bath design*
- *Bath and integral apron eliminates installation step*
- *Lightly pebbled bottom surface for sure footing*
- *Durable high gloss finish*
- *10 year consumer/3 year commercial limited warranty*
- *16″ (40.6 cm) bath depth (floor to top of dam)*
- *3″ (7.6 cm) wainscot/tile ledge*
- *60″ (152.4 cm) x 37-1/2″ (95.3 cm) x 20″ (50.8 cm) rough-in dimensions include flanges*
- *60″ (152.4 cm) x 36″ (91.4 cm) x 19″ (48.3 cm) finished dimensions*

36″ (91.4 cm) OVAL BATH
71101110
ALSO 71101120

SOLID VIKRELL MATERIAL



Codes/Standards Applicable

Specified model meets or exceeds the following:

- *ASTM E162*
- *ASTM E662*
- *ANSI Z124.1.2*
- *IAPMO/UPC*
- *HUD, UM Bulletin 73A*
- *NAHB Research Foundation, Inc.*

Colors/Finishes

- 0: White
- Other: Refer to Price Book for additional colors/finishes

Specified Model

Model	Description	Colors/Finishes	
71101110	36″ (91.4 cm) oval bath, left drain	❑ 0	❑ Other_____
71101120	36″ (91.4 cm) oval bath, right drain	❑ 0	❑ Other_____
71101310	36″ (91.4 cm) oval bath, 3 pack, right drain	❑ 0	❑ Other_____
71101320	36″ (91.4 cm) oval bath, 3 pack, right drain	❑ 0	❑ Other_____

SterlingPlumbing.com

Visit us online for fixture color choices, detailed product information, color photos, installation instructions, care guides, and warranties. Sterling offers additional lines of plumbing products to complement the Sterling product you've chosen. Sign up for the Sterling monthly e-newsletter which showcases our latest product innovations. You may also call our Sterling Plumbing Answer Center from within the USA at 1-888-STERLING in addition to consulting with your local dealer. Sterling. Strong. Professional. Design.

ENSEMBLE™

Technical Information

Fixture*:	basin area	top area
Bathing well	40″ (101.6 cm) x 21″ (53.3 cm)	52″ (132.1 cm) x 29″ (73.7 cm)
To overflow	water depth	capacity
	11″ (27.9 cm)	40 gal (151.4 L)
* Approximate measurements for comparison only.		

Model	door maximum width	door maximum height
71101110 71101120	58-1/2″ (148.6 cm)*	NA*
* Varies with alternative walls.		

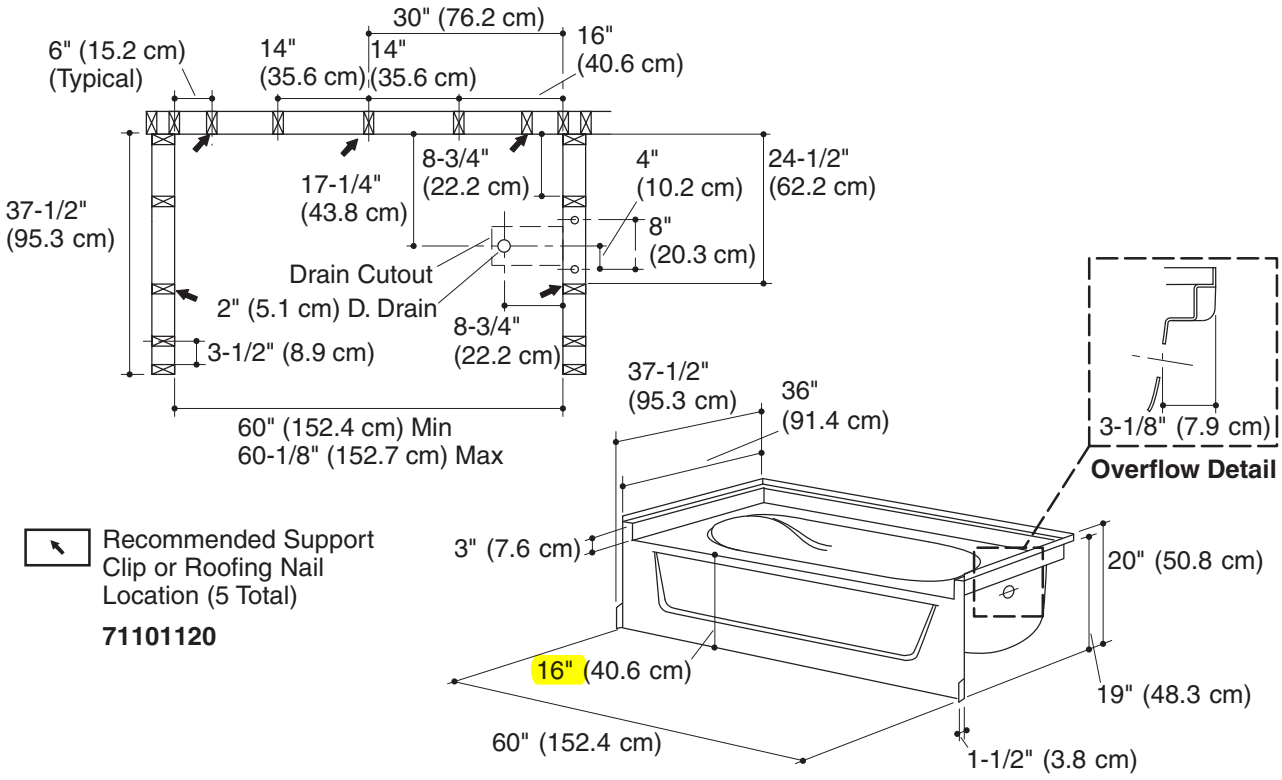
Installation Notes

Install this product according to the installation guide.

Size the drain cutout to fit the drain assembly that will be used.

Stud positioning is critical.

Studs should be positioned roughly as shown for support clip or roofing nail installation.

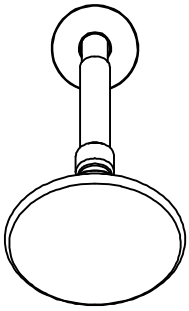


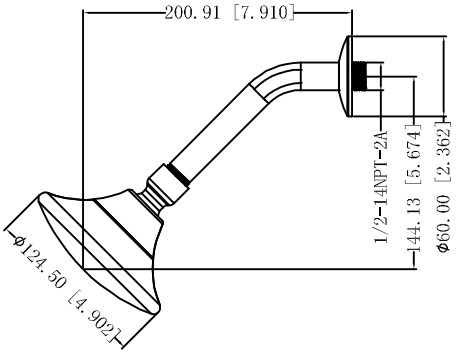
Product Diagram

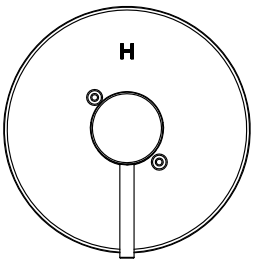
BATH

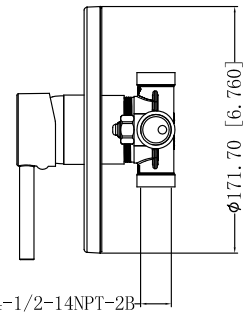
Features:

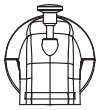
- Metal Lever Handle
- Pressure Balance Valve, Ceramic cartridge
- Max Flow Rate 2.0GPM(7.52LPM) at 80 PSI(ASME.A112.18.1M)

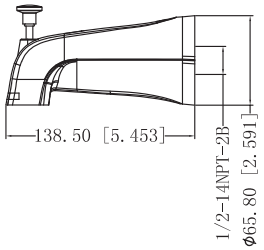












TSP10349CP
Chrome Finish

Approval:

Meets or Exceeds The following

*ANSI/ASME A112.18.1M

*ANSI/NSF 61-Sec.9

*IAPMO/UPC

SHOWER:

S721311000	STERLING	60 ENSEMBLE SHOWER RECEPTOR WHT
PF2820CP	PROFLO	CCY 1.8 1 HANDLE LEVER SHOWER FAUCET TRIM POLISHED CHROME
PF3001	PROFLO	CERAMIC TUB AND SHOWER VALVE MIP AND SWEAT WITH STOPS

CELDON SHOWER VALVE LESS SPOUT

STERLING®
A KOHLER® COMPANY

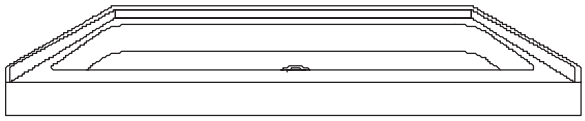
ENSEMBLE™

60″ (152.4 cm) SHOWER RECEPTOR
72131100

VIKRELL®
MATERIAL STRENGTH.
PROVEN PERFORMANCE.™

Features

- *Compression molded from our exclusive solid Vikrell® material*
- *Available with tile or curve wall surrounds*
- *Durable high-gloss finish*
- *10-year consumer/3-year commercial limited warranty*
- *60-1/4″ (153 cm) x 34″ (86.4 cm) x 5-1/2″ (14 cm) receptor rough-in dimensions include nailing flange*
- *60″ (152.4 cm) x 34″ (86.4 cm) x 4-1/2″ (11.4 cm) unit finished dimensions*



Codes/Standards Applicable

Specified model meets or exceeds the following:

- *ANSI Z124.1.2*
- *CSA B45*
- *ASTM E162*
- *ASTM E662*

Colors/Finishes

- 0: White
- Other: Refer to Price Book for additional colors/finishes

Specified Model

Model	Description	Colors/Finishes	
72131100	60″ (152.4 cm) shower receptor	☑ 0	❑ Other_____

For more information visit SterlingPlumbing.com or call 1-800-STERLING

ENSEMBLE™

Technical Information

Model	door maximum width	door maximum height
72131100	*56-5/8″ (143.8 cm)	*NA
* Varies with alternative walls.		

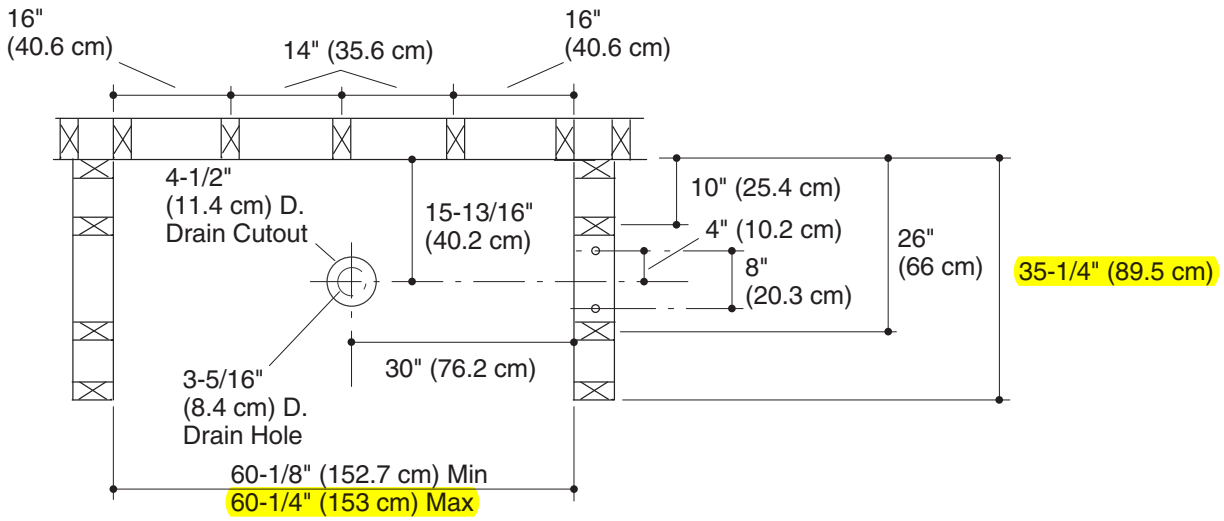
Size the drain cutout to fit the drain assembly that will be used.

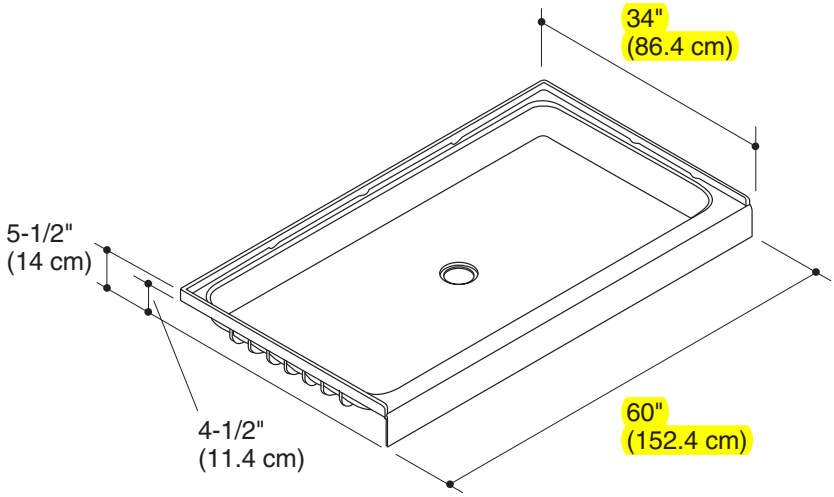
Double studding is recommended for pivot shower door installations.

Studs should be positioned roughly as shown.

Installation Notes

Install this product according to the installation guide.





Product Diagram

LESS SPOUT SHOWER VALVE

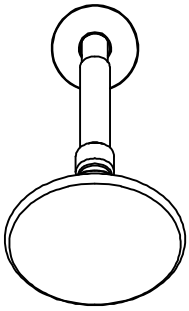
CELADON
QUALITY. DESIGN. VALUE.

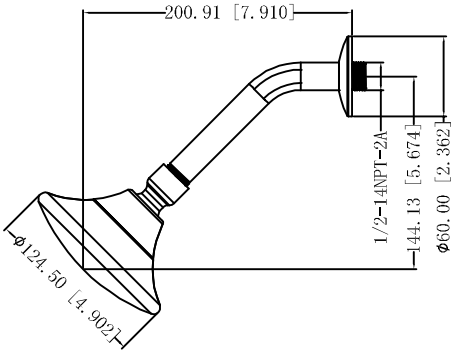
BATH

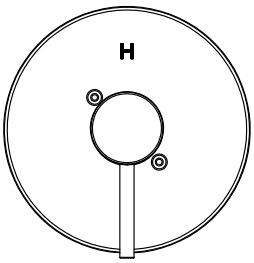
Features:

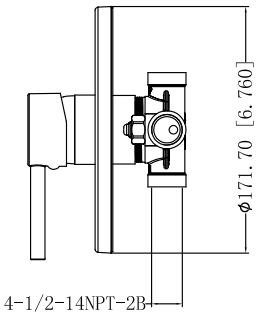
- Metal Lever Handle
- Pressure Balance Valve, Ceramic cartridge
- Max Flow Rate 2.0GPM(7.52LPM) at 80 PSI(ASME.A112.18.1M)

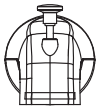
TSP10349CP
Chrome Finish

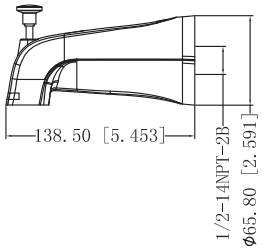












Approval:

Meets or Exceeds The following

*ANSI/ASME A112.18.1M

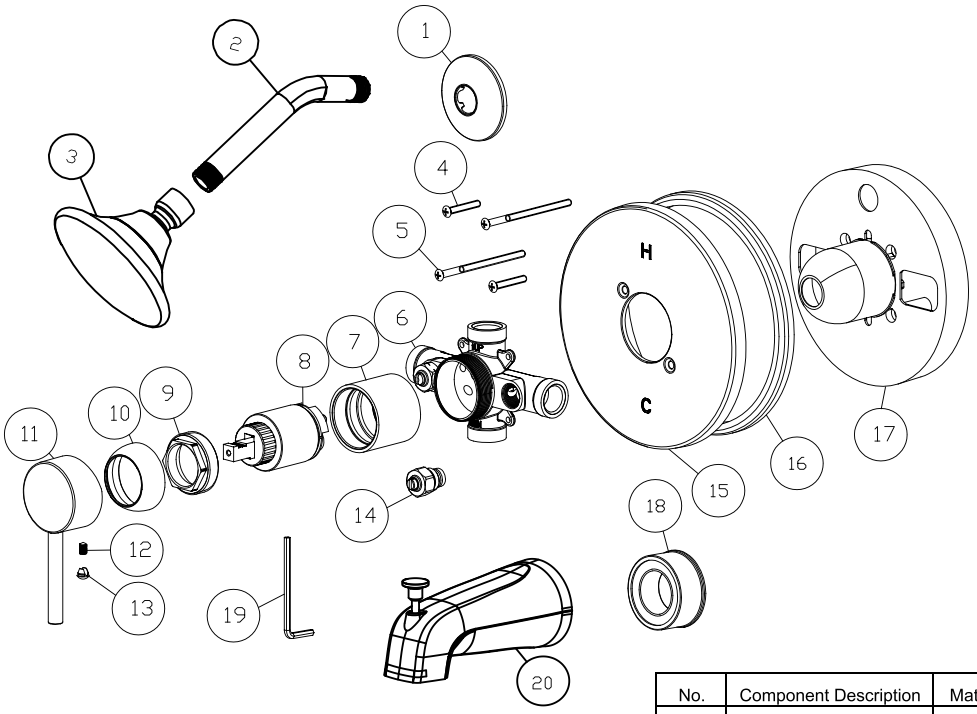
*ANSI/NSF 61-Sec.9

*IAPMO/UPC

BATH

Features:

- Metal Lever Handle
- Pressure Balance Valve, Ceramic cartridge
- Max Flow Rate 2.0GPM(7.52LPM) at 80 PSI(ASME.A112.18.1M)



No.	Component Description	Material
1	Flange	SS
2	Shower Arm	SS
3	Shower Head	Plastic
4	Screw	SS
5	Fixing Screw	SS
6	Valve Body	Brass
7	Sleeve	SS
8	Cartridge	Plastic
9	Adjustment Ring	Brass
10	Dome Nut	Plastic
11	Handle	Zinc
12	Screw	SS
13	Index Button	ABS
14	Check Valve	Brass
15	Cover Plate	SS
16	Bottom Plate	Rubber
17	Protection Hat	SS
18	Teflon Tape	ABS
19	Wrench	Plastic
20	Spout	Alloy

TSP10349CP
Chrome Finish

Approval:

Meets or Exceeds The following

*ANSI/ASME A112.18.1M

*ANSI/NSF 61-Sec.9

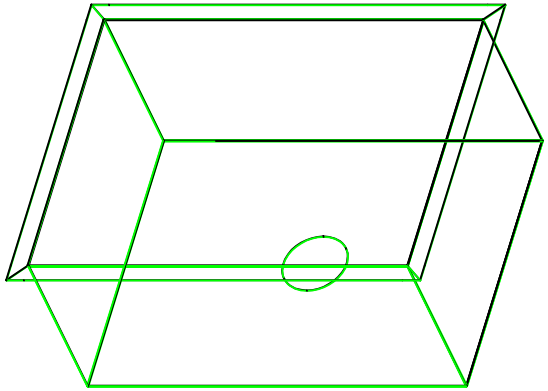
*IAPMO/UPC

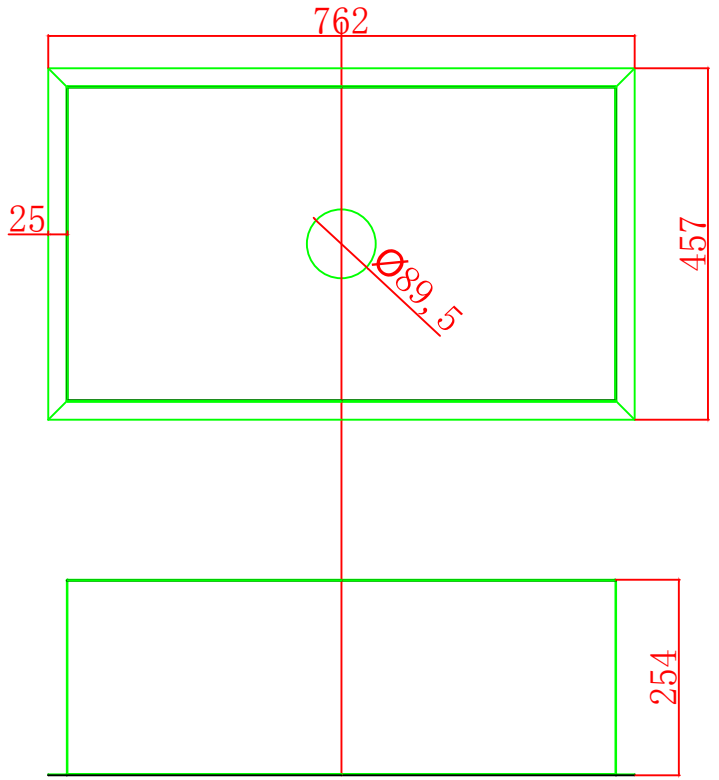
FERGUSON ENTERPRISES, INC.®

KITCHEN SINK:

PFUC301A	PROFLO	23-5/16X17-5/8 1 BOWL 18 GAUGE UNDERCOUNTER STAINLESS STEEL SINK
PFXC7011CP	PROFLO	LEAD LAW COMPLIANT 1 HANDLE LEVER KITCHEN FAUCET WITH PULL DOWN STANDING PILOT POLISHED CHROME

CELDON KITCHEN SINK AND KITCHEN FAUCET





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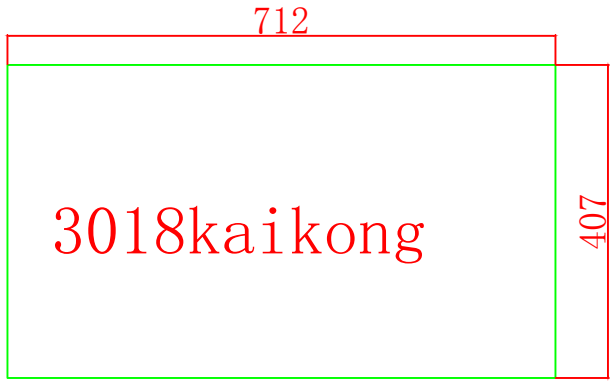
产品图



JS3018

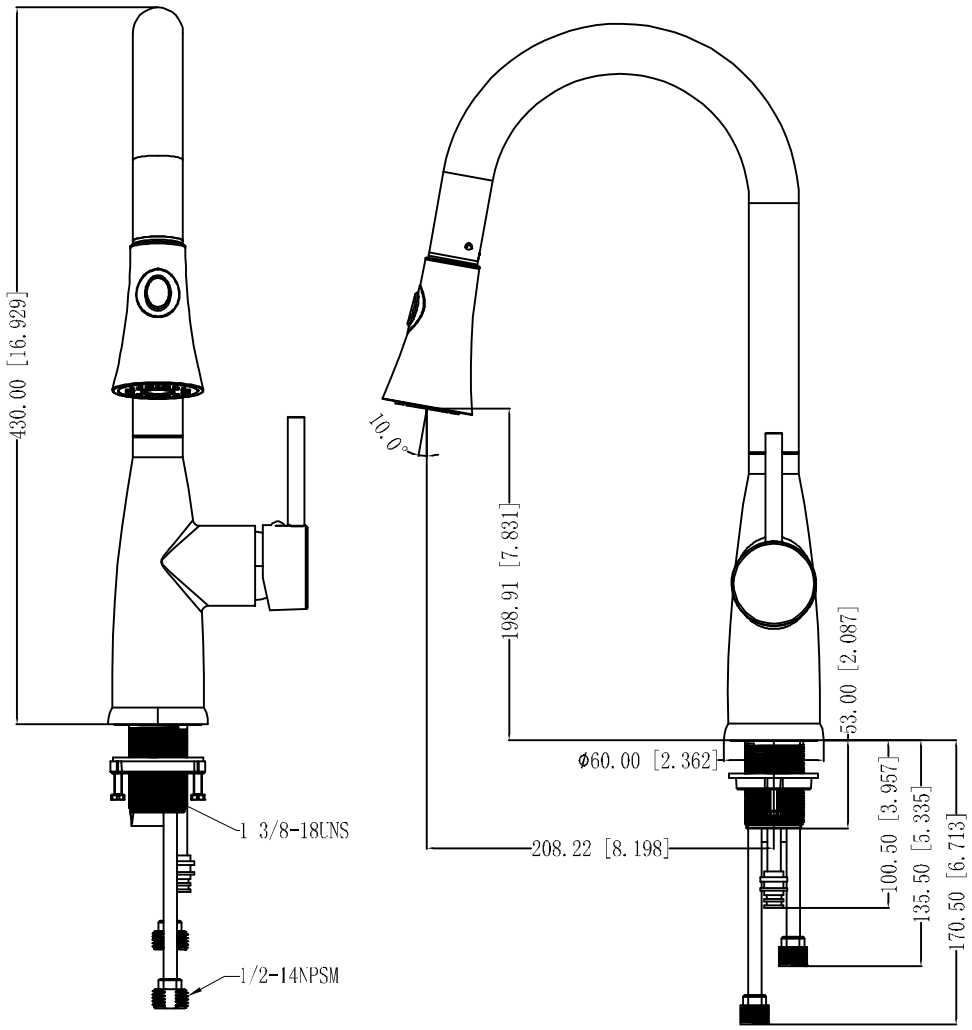
ERALL: 30"x18"
PTH: 5.5" , 9" , 10"
ISH: All Satin / Deck Polish, Bowl Satin

CERAMIC KITCHEN

Features:

- Metal Lever Handle
- Ceramic Cartridge
- Max Flow Rate 2.2GPM(8.3LPM) at 60 PSI(ASME.A112.18.1M)

PO8887BN Brush Nickel



APPROVAL

Meets or Exceeds The following

*ANSI/ASME A112.18.1M

*ANSI/NSF 61-Sec.9

*IAPMO/CUPC

Jordan & Skala Engineers

Atlanta • Austin • Charlotte • Dallas • Houston • Las Vegas • Washington, DC

Submittal Review

Project Name: Vickers
JSE Project Number: 1510801
Description Domestic Booster Pumps Index #4
Date Received: 12/15/2016
Date Returned: 12/27/2016
Reviewed By: Rick Beverly

Review is for general compliance with the contract documents. Corrections and/or comments made do not relieve the contractor from compliance with contract documents. No responsibility is assumed for correctness of dimensions, details, and/or quantities. The contractor shall correlate and confirm all weights, dimensions, and electrical characteristics with other trades and disciplines and at the jobsite.

Item	Response	Comment
Domestic Booster Pump - DBP-1A	Rejected - See Comments	The submitted system has been designed for a system capacity with 50% / 50% split in lieu of 100% redundant system as specified. Provide system equivalent to specified.
Domestic Booster Pump - DBP-1B	Rejected - See Comments	The submitted system has been designed for a system capacity with 50% / 50% split in lieu of 100% redundant system as specified. Provide system equivalent to specified.

4

SALES REP: Peacock Sales
PROJECT: Vickers Building A
ENGINEER:

PREPARED BY: Mark Howell
LOCATION: Georgia
DATE:

Duplex VFD IronHeart Pump System Scope

Motor HP	3
Motor Voltage	208
Pump Flow (GPM)	50
Pump Head (TDH)	70
Min. Suction (PSI)	40

Nominal System Flow (GPM)	100
Differential System Pressure (PSI)	30
Suction-Discharge Header Sizes	3" Flanged
Pump & Valve Branch Size	2"
Max. Suction (PSI)	45

SyncroFlo prefabricated pumping system. Pumps, controls and headers are all mounted on a common bent steel skid base for indoor installation in a pump house. The complete pump station will be ETL and UL listed, NSF certified and will be completely tested prior to shipment. System comprises of the following components:

- (2) SyncroFlo NSF Certified end suction pumps. Pump construction is formed 304 Stainless Steel with mechanical seal. Pump is close coupled to a 3600 RPM, ODP, 3 Phase, 60 Cycle, 1.15 Service Factor, class F insulation, High Efficiency motor, which will meet or exceed NEMA MG-1 Table 12-11 for epact motor efficiencies.
- (2) Suction Side, NSF Certified, lug style 150# Isolating butterfly valves,
- (2) Discharge Side, NSF Certified, lug style 150# Isolating butterfly valves
- (2) NSF Certified non-slam, wafer style, check valves
- (1) Flanged, 304 Stainless Steel Suction Header with Branch Connections
- (1) Flanged, 304 Stainless Steel Discharge Header with Branch Connections
- (1) Bent Carbon Steel System Skid and Bolted Panel Stand
- (1) NEMA 1 control panel with the following standard options:
  - Main Non-Fused Disconnect
  - Fusible Disconnect, Touch Safe with rated fuses for each VFD
  - Programmable Logic Controller (PLC) based operation
  - Sequencing by Horsepower and/or Pressure-VFD speed sequencing
  - Customer Accessible data and fault logs
  - Mounted and wired Suction & System Discharge Pressure Transducers
  - Alarm horn
  - 5.7” HMI Color Touchscreen with Compact Flash Drive Data Port
  - (2) Enclosure Mounted, Micro-Processor based Variable Frequency Drives
  - Minimum 10,000 Amp SCCR rating
  - Ventilated and fan-cooled enclosure, with positive cabinet pressure
- NSF Certified Plastic Tubing for instrumentation and system controls
- (2) NSF Certified Mechanical Thermal Purge Valve (shipped loose)
- (2) NSF System pressure gauges, 2.5” face dial, glycerin filled
- System Certified to NSF, ETL and UL certified to OSHA safety standards
- Factory assembled, wired, and FLOW TESTED at design conditions listed above
- 1 year part-only warranty, 5 Year PLC-VFD-HMI Warranty
- Standard SyncroFlo Terms and Conditions Apply

Job Name:	Vickers Building A	Reference #:	
Location:	Georgia	Prepared by:	Mark Howell
Sales Rep:	Peacock Sales	Date:	10/24/2016
Engineer:		System Dwg:	**22DA03XXX-3H-XX-SWF44-1**
Contractor:			

SYSTEM DATA

System Information

Model:	**22DA03XXX-3H-XX-SWF44-1**	
Design Flow rate:	100	Gpm
System Pressure:	70	Psig
Min. Suction Pressure:	40	Psig
Max. Suction Pressure:	45	Psig
Max. Boost Pressure:	30	Psig
Control Valve:	**2**	In
Headers:	**3 ”** **SS**	
Configuration:	**Horizontal**	
Connection:	**Flange**	

Nominal Pump Information

Pump #:	1&2	
Pump Type:	**CCES**	
Construction:	**SS**	
Pump Model:	**A3U-32-125**	
Design Split:	**50**	% Each
Design Flow:	50	Gpm
Pump Head:	70	Ft
Pump Shutoff:	**45**	Psig
Seal Type:	**Mechanical**	
Motor Size:	**3**	Hp
Motor Speed:	**3500**	Rpm
Motor Enclosure:	**ODP**	
Motor S.F.	**1.15**	

Power Data

Incoming Power Requirement:

Voltage:	3Ø/60~/	208	V
Connection FLA:		21.7	A
Wire Size:		10	G
Control panel:		**NEMA 12**	
Panel SCCR:		**10,000**	A

Special Comments

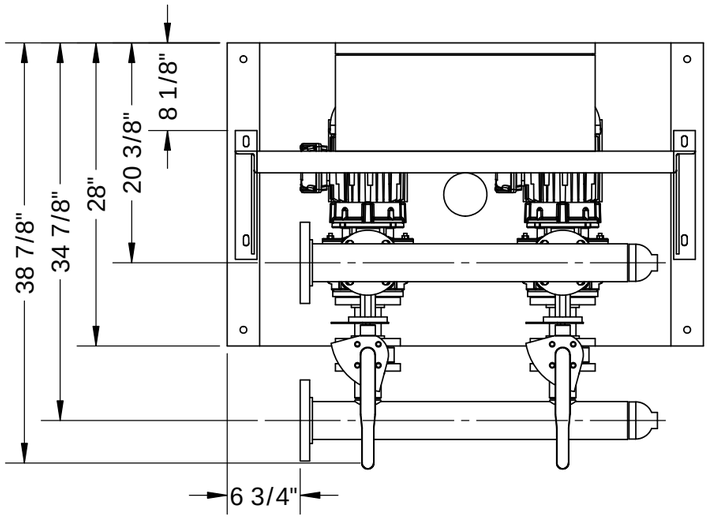
PRESSURE SET POINTS

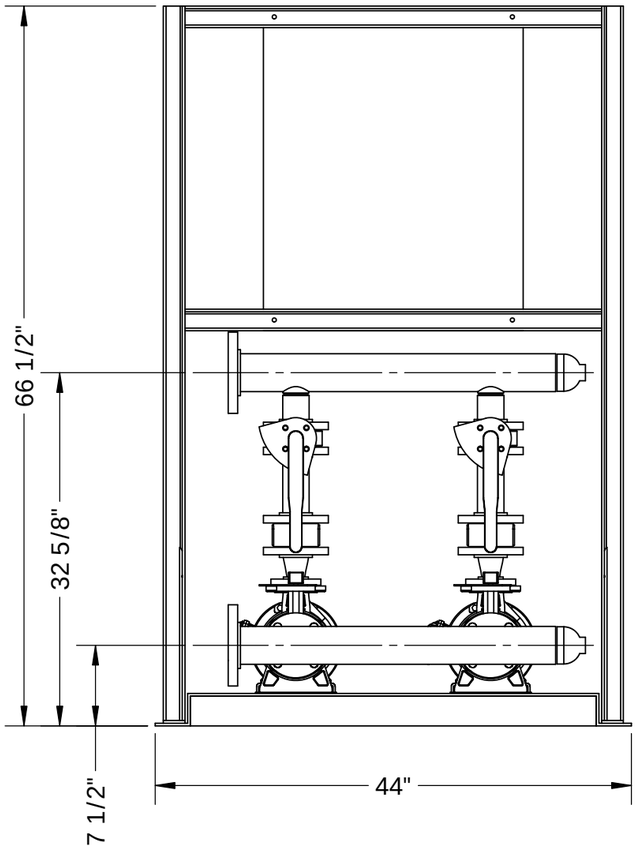
Low System set at:	**Sys Pr - 5**	Psig
Low Suction set at:	**5**	Psig
Horsepower set at:	**3**	Hp
Shutoff Boost:	**10**	Psid

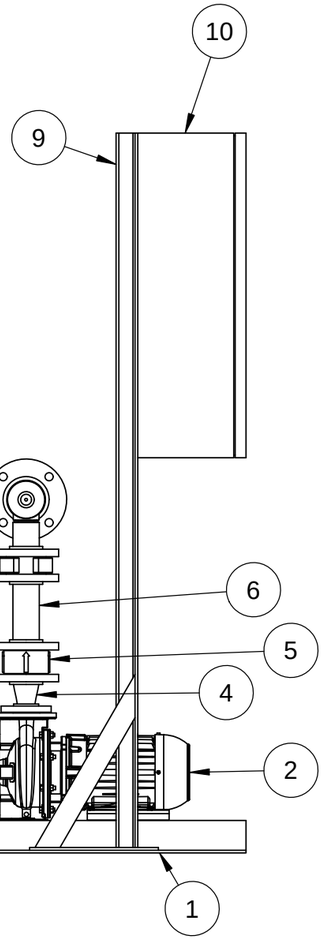
ITEM NO.	DESCRIPTION	Inventory #	QTY.
1	DUPLEX IRONHEART SKID	09-200-4428	1
2	A 3HP PUMP/MOTOR	12-511-4003	2
3	2" x 4.5" 150-150#	S770-020-0045	2
4	REDUCER SPOOL 2" X 1.25" 150-150#	S771-020-0012	2
5	CHECK VALVE WAFER STYLE 2"	43-022-1020	2
6	2" x 7" 150-150#	S770-020-0070	2
7	2" LUG ISOLATION BUTTERFLY VALVE NSF	42-447-3020	4
8	DUPLEX HEADER 3" X 2"	S772-030-0020	2
9	DUPLEX PANEL STAND 30" X 24"	779-200-3024	1
10	SYSTEM POWER AND CONTROL PANEL	SF952-0030-208S	1

PLEASE ENSURE THE USE OF PROVIDED
PIPE SUPPORT DURING SYSTEM INSTALLATION

APPROX. DRY WEIGHT: 661 LBS







NOTES:
1. ALL DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE
2. PURGE VALVE DRAIN LINE TO BE PIPED TO FLOOR DRAIN IN PROXIMITY OF BOOSTER SYSTEM (BY OTHERS)
3. SEE DATA SHEET FOR L/H OR R/H HEADERS ENTRY/EXIT CONNECTION

SYNCROFLO PACKAGED PUMPING SYSTEMS COMPLY WITH OSHA REGULATIONS AND FEDERAL REGULATION 29 CFR 1910.399. THE ENTIRE PACKAGED SYSTEM IS THIRD PARTY CERTIFIED.

REV	DESCRIPTION	BY DATE

ALL DIMENSIONS +/- TOLERANCE OF 1/2"

DUPLEX IRONHEART A 3HP

DRAWN BY: MWA	ENG. BY: MWA	CHK. BY:
DATE: 4/10/15	SIGN:	DATE:

SyncroFlo
Pumping System Solutions
6700 Best Friend Road - Norcross, GA 30071 - (770) 447-4443 - Fax (770) 447-0230

SCALE	DWG
1:14	22DA03XXX-3H-XX-SWF44-3

Model 32-125-3HP Data Sheet

Model No.: A3U-32-12530D3CSF

NSF61/ Annex G certified

Pump Data		
Size	1¼ x 2 x 5 3/16	
Flange - Suction	2" ANSI Equivalent	150 lb. ANSI R.F. equivalent
Flange - Discharge	1¼" ANSI Equivalent	150 lb. ANSI R.F. equivalent
Materials		
Casing	304L Stainless Steel	
Impeller (closed)	304L Stainless Steel	
Shaft Sleeve	304L Stainless Steel	
Mechanical Seal	Type 21, Carbon-Ceramic-Viton, Cup Seat	

Motor Data*

3 HP, 3 Phase, 60 Hertz, 208-230/460V, 3500 RPM, ODP, Frame 145JM

Amps: 8.3-7.6/3.8 Max. Temp.: 40C

Service Factor: 1.15 Power Factor: 89

Nominal Full Load Efficiency: 84% (NEMA MG-1 Table 12-11)

Direction of Rotation: Clockwise when viewed from motor end

**Values may vary with motor manufacturer.*

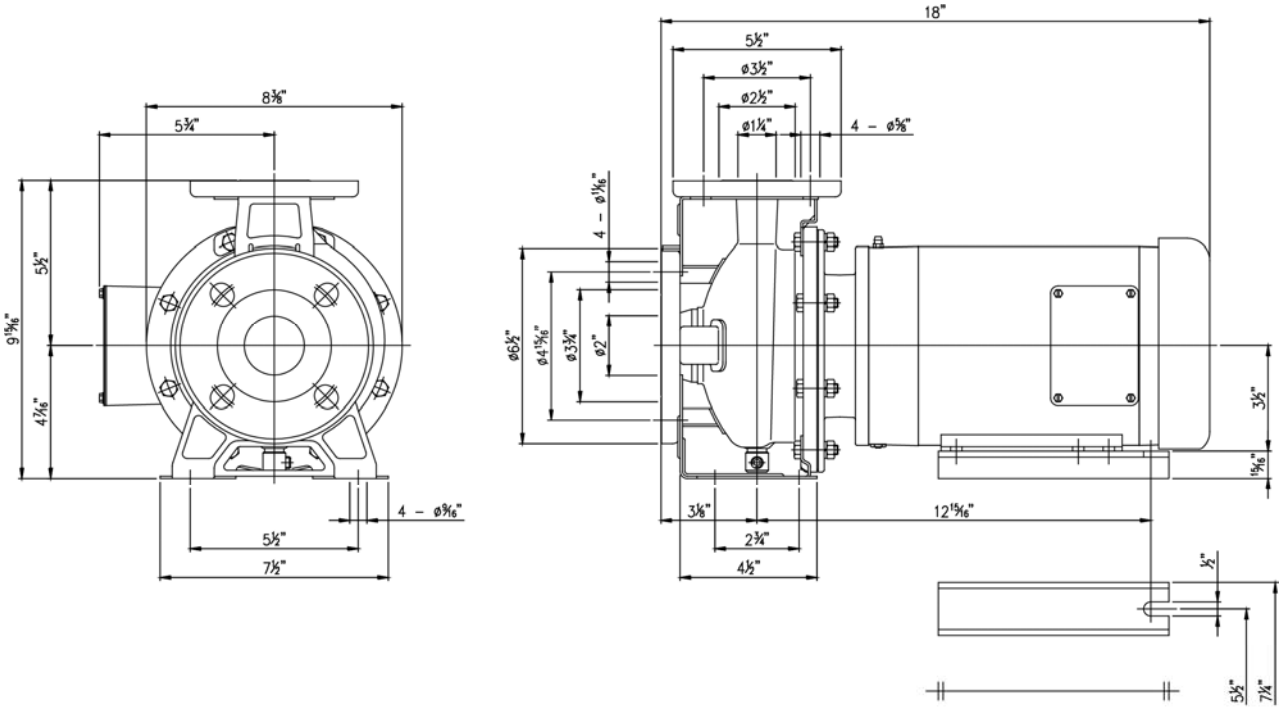
Limitations

Temperature: 212°F (100°C)

Working Pressure: 230 PSI

Approx. Weight (lbs) **76**

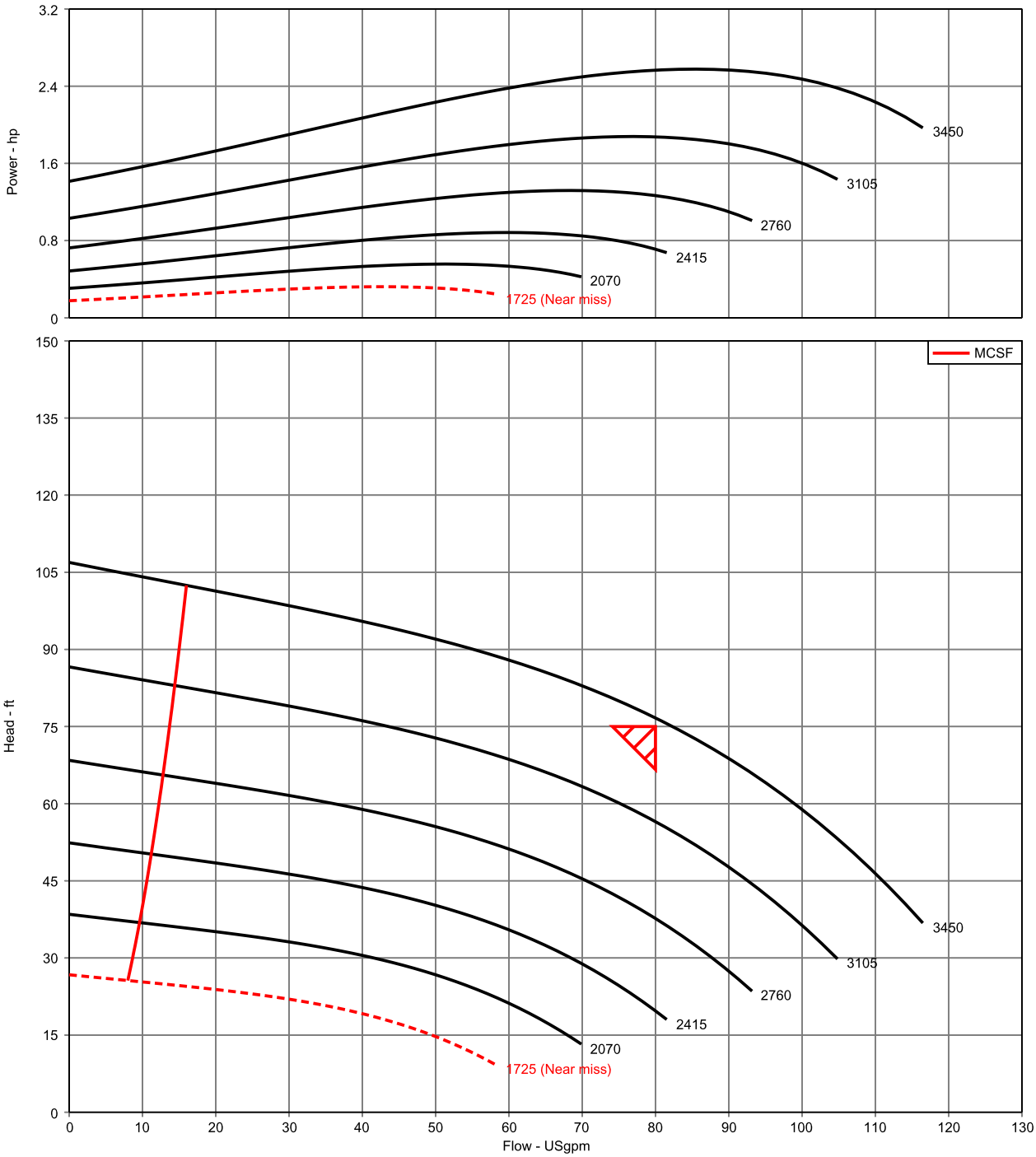
Dimensions



3U 32/125 133/3

SyncroFlo
Pumping System Solutions

Multi-Speed Performance Curve



Customer	:	Size	: 3U-32-125-3HP
Customer reference	:	Stages	: 1
Item number	: Default	Speed, rated	: 3,450 rpm
Service	:	Based on curve number	: 3S-C601-9309
Quantity	: 1	Efficiency	: 60.37 %
Quote number	:	Power, rated	: 2.57 hp
Date last saved	: 06 Mar 2014 1:31 PM	NPSH required	: 9.33 ft
Flow, rated	: 80.00 USgpm	Viscosity	: 1.00 cP
Differential head / pressure, rated	: 75.00 ft	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
Fluid density, rated / max	: 1.000 / 1.000 SG	Impeller diameter, rated	: 5.16 in

SyncroFlo

Pumping System Solutions

Certifications

Personnel

Steve Bradley, PE, Commercial Engineering Manager, is a registered controls engineer in Georgia.

12 degreed engineers on staff – (3) EIT, (3) NFPA 20 certified

9 Engineering Support Staff plus Certified Draftsman

James Blackburn, Operations Manager, is a Six-Sigma Black Belt.

Product

Quality Management System – ISO 9001:2008

BSI America, Inc. certifies the assembly of custom packaged pumping systems accessories and controls for use in commercial, irrigation, municipal, industrial and fire applications are in accordance with ISO 9001: 2008. (Certificate # FM 555054)

Safety Management System

All SyncroFlo packages are tested to applicable UL standards, per below. In addition, systems may be purchased to meet the ANSI/NSF 61 standard. All booster packages comply with ANSI/NSF 372 – Drinking Water System Components – Lead Content.

IAPMO certifies to NSF / ANSI 61 standards for safe drinking water that complies with Lead Plumbing Law (Files # N-5408 & 6961)

UL certifies SyncroFlo's compliance to OSHA standards for packaged pumping systems (UL508, UL508A, and UL778, File # E189340) plus control panels (UL 508A, File # E59076).

Intertek Testing Services certifies SyncroFlo's compliance to OSHA standards for packaged pumping systems (UL 508 and 778) for ETL, a nationally recognized third-party testing laboratory. (Report # 519309)

ETL certifies SyncroFlo's compliance to OSHA standards for packaged fire pumping systems (UL 508, 448, 1004, and 1247).

NTA certifies to various state modular building codes (project in progress)

In addition to these safety and quality certifications, SyncroFlo tests the performance of each and every pump system or control panel that it builds.

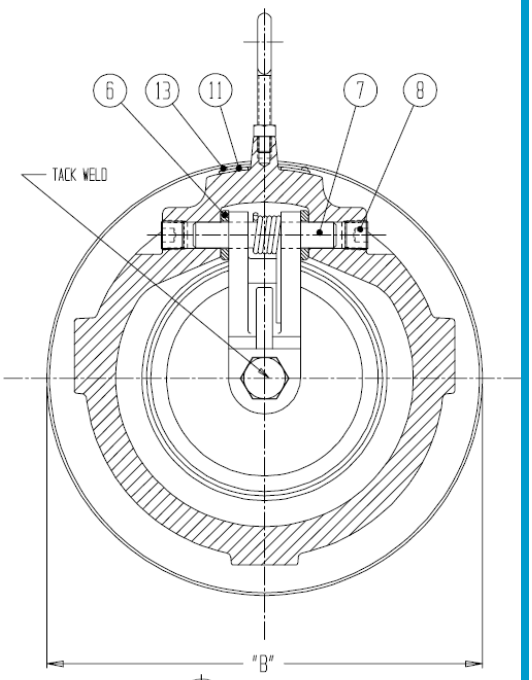
NTA INC. Smart Quality. Assured.℠

SyncroFlo
Pumping System Solutions

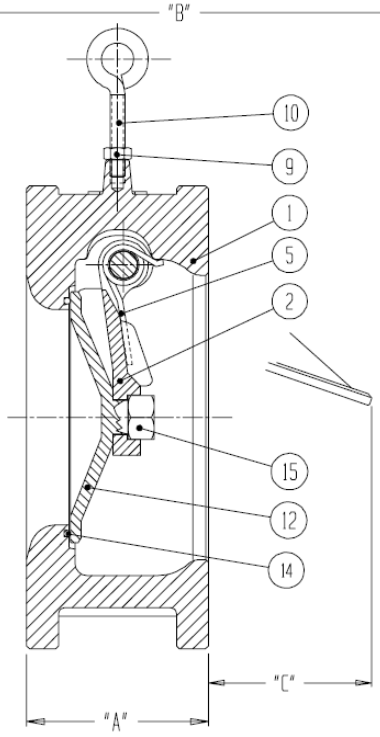
Check Valve Wafer Style
(Check Rite CETNSF)

Flanges, Bolts, Nuts and gaskets are not included

PART NO.	NAME	MATERIAL
1	BODY	ASTM A126-CLB
2	HINGE	ASTM A351-CF8M
5	SPRING	ASTM 313-316
6	SPACER	TEFLON
7	PIN	ASTM A479-316
8	PLUG	STEEL
9	LOCK NUT	STEEL ZINC PLATED
10	EYE BOLT	STEEL ZINC PLATED
11	NAME PLATE	NSF IDENT/ALUM.
12	DISC	ASTM A351-CF8M
13	RIVET	STEEL CAD. PLATED
14	O-RING	NSF EPDM
15	NUT	STAINLESS STEEL



ANSI CLASS 125				
Size (in)	Weight Lbs.	A (in)	B (in)	C (in)
2	3.50	2.13	4.29	1.19
2 1/2	5.00	2.38	5.08	1.50
3	6.50	2.63	5.67	1.69
4	11.00	2.25	6.46	2.44
5	15.00	2.50	7.64	3.38
6	20.00	2.75	8.66	4.25
8	30.00	2.88	10.83	5.38
10	47.00	3.13	13.03	7.00
12	70.00	3.38	15.19	8.13



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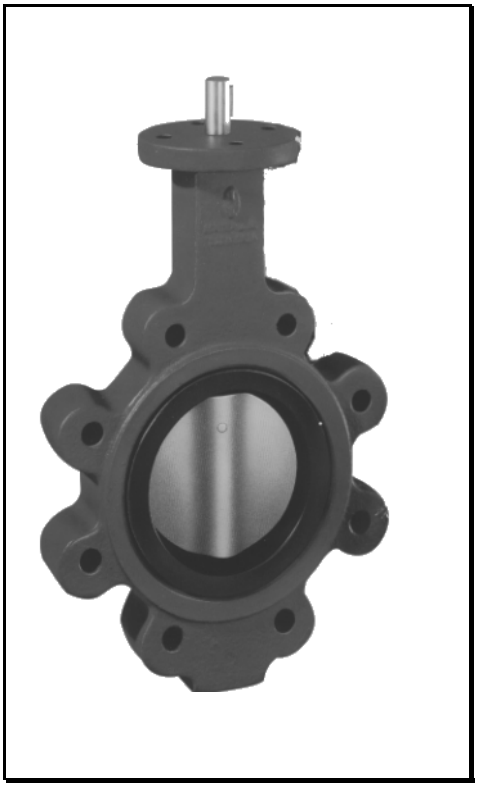
Effective: August 4, 2010

SyncroFlo
Pumping System Solutions

NSF 61 Butterfly Valve

Features:

- **Pressure Rating:** Bi-directional or dead end service, bubble-tight shut off, 250 psig.
- **Pressure Profile Disc:** Assures minimum torque and longer seat life.
- **One-Piece Thru Stem:** Blow out proof, ensures dependability and positive disc positioning.
- **Seat Face:** Negates need for flange gaskets. Valve interior completely isolated from the body.
- **Supported Stem Seal:** Blow out proof with packing gland to prevent entry of external substances.



Materials of Construction	
Body:	Cast Iron
Disc:	Nylon 11 Coated Ductile Iron
Seat:	EPDM
Stem:	416 Stainless Steel

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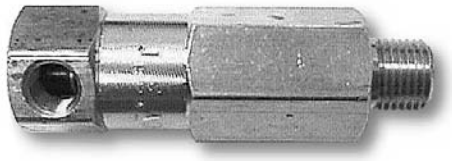
SyncroFlo

Pumping System Solutions

Mechanical Thermal Purge Valve

Operation



To prevent overheating and pump failure a thermal relief valve is installed in each pump casing, discharge head, or discharge piping. The valve will automatically sense the rise in temperature and discharge some of the hot fluid allowing cooler fluid to enter the pump casing. The valve will then close. On factory built pump systems, the thermal relief valves are piped to a common discharge tube. After installation, this discharge tube should be continued to a nearby drain. The discharge tube should be piped in a manner that discharge or leaks are visible to maintenance personnel.

Specifications	
Operating Pressure:	175 psig
Max Pressure Rating:	600 psi
Temperature Setting:	140° F

Materials of Construction	
Body:	Brass
Internal Seal:	Viton®
External Seal:	Buna
Spring:	Stainless Steel
Mounting Connection:	3/8” MPT
Tubing Connection:	¼” FPT

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Pressure Gauge Glycerin Filled

Applications

- Adverse service conditions where pulsating or vibration exists

Special Features

- Vibration and shock resistant
- Stainless steel case for better corrosion resistance
- Pressure ranges up to 15,000 psi

Specifications

- Design standard: ASME B40.100 & EN 837-1
- Protection: Nema 4X
- Face Dial: 2.5” standard, 4” optional
- Accuracy: 4” -/+1% of span
  2.5” -/+ 2.5% of span
- Operating Temperature: -4° F to +160° F

Materials of Construction

- Case: 304SS
- Window: Polycarbonate with Buna-N gasket
- Dial: White ABS with stop pin
- Movement: Copper alloy
- Bourdon Tube: Copper alloy
- Pointer: Black aluminum

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NSF 61 Pressure Transmitter Digital

Overview

The 40-801 is a high quality all stainless steel media isolated Pressure Sensor intended for use in the measurement of liquids compatible with stainless steel. 40-801 pressure sensors and transducers have been designed specifically for applications with demanding performance requirements.

40-801 sensors and transducers high strength stainless steel sensing element is machined from a solid piece of stainless steel, resulting in construction that contains no silicone oil, no welds and no internal O-rings.

Features

- High Accuracy
- High Strength Stainless Steel Construction
- No Silicone Oil. No Internal O-rings, no welds (50 PSI & above)
- Wide operating temperature range
- Fully welded case provides rugged design
- Compatible with wide range of gases and liquids
- Suitable for high shock and vibration applications
- Superior signal clarity compared to analog transmitters

Detailed Specifications

Performance @ 25°C (77°F)	
Accuracy[1]:	<±0.25% BFSL
Stability:	(1 year) ±0.25%FS,typ.
Over Range Protection:	2X Rated Pressure
Burst Pressure:	5X Rated Pressure
Pressure Cycles:	>100 Million
[1]Accuracy includes: Non-linearity, Hysteresis and Non-repeatability	

Environmental Data	
Temperature	
Operating:	-40 to 85°C (-40 to 185°F)
Storage:	-40 to 125°C (-40 to 250°F)
Thermal Limits	
Compensated Range:	0 to 55°C (30 to 130°F)
TC Zero:	<±1.5% of FS
TC Span:	<±1.5% of FS
Other	
Shock:	100G, 11msec, ½ sine
Vibration:	20G peak, 20 to 2400 Hz.
EMI / RFI Protection:	Yes
Rating:	IP-66

PHYSICAL DESCRIPTION	
Wetted Material:	17-4PH stainless steel NACE compatible
Electrical Connection:	Cable
Case (housing):	304 stainless steel

ELECTRICAL DATA	
Excitation:	10-28VDC, Typ.
Output:	Digital Pulse
Current Consumption:	<15mA
Bandwidth:	(-3dB): DC to 250Hz
Zero Offset:	<±1% of FS
Span Tolerance:	<±1.5% of FS
Output Noise:	<2mV RMS
Reverse Polarity Protection:	Ye

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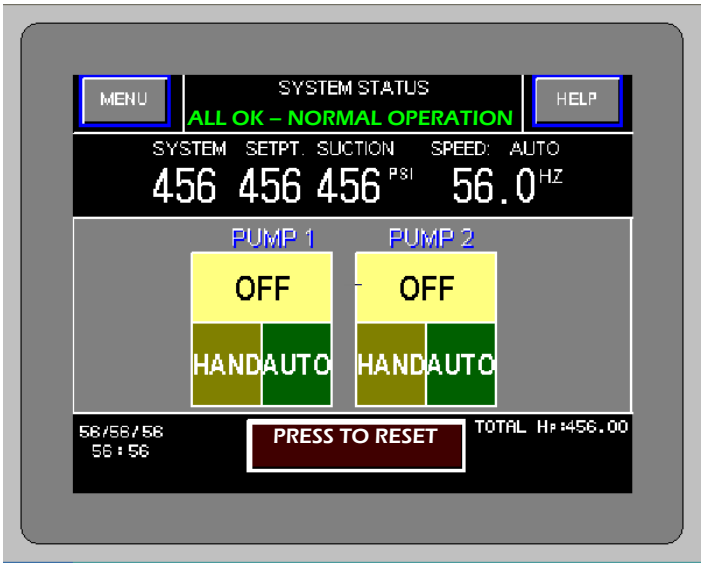
Effective: March 1, 2013

Human Machine Interface Model GT1455



(Illustration only)

SPECIFICATIONS

Display
Screen: 5.7" diagonal, 65,536 color, 320 x 240 dot
Type: Backlit TFT liquid crystal
Viewing Angle: 60 degrees minimum
Operational Life: Approx. 50,000 hrs / 1,000,000 touches min. (at 0.98N operating force)
Power Usage: 8.4 W

SDHC Card (for data retrieval)
4 GB max.
Writes in .CSV format, exportable to Excel
Performance data stored in daily files for up to one year (data recorded every 10 seconds or on alarm)
Data includes: Date, time, flow (if available), system pressure, set point, suction pressure, pumps on, individual drive Hz, V, A, and kW

Environmental
Equivalent to IP67F protection (frost panel with USB environmental protective cover attached)
Operating Temperature: 32 to 122° F [0 to 50°C]
Storage Temperature: -4 to 140°F [-20 to 60°C]

Certifications
UL listed and CE compliant

SyncroFlo

Pumping System Solutions

Mitsubishi D-700 VFD
(10 Hp and Less)

Control Specifications	
Control Method	Soft-PWM control / high carrier frequency PWM control (V/F control, general-purpose magnetic flux vector control, optimum excitation control can be selected)
Output Frequency Range	0.2 to 400Hz
Frequency Setting Resolution	0.01Hz
Frequency Accuracy	Within 0.01% of the set output frequency
Starting Torque	150% or more (at 1Hz) when general purpose magnetic flux vector control and slip compensation is set
Acceleration / Deceleration Time Setting	0.1 to 3600s (acceleration and deceleration can be set individually). Linear or S-pattern acceleration / deceleration mode can be selected
DC Injection Brake	Operation frequency (0 to 150Hz), operation time (0 to 10s), operation voltage (0 to 30%) variable
Stall Prevention Operation Level	Operation current level can be set (0 to 200% adjustable), whether to use the function or not can be selected

Protective / Warning Function	
Protective Function	Overcurrent during acceleration, overcurrent during constant speed, overcurrent during deceleration, overvoltage during acceleration, overvoltage constant speed, overvoltage during deceleration, inverter protection thermal operation, motor protection thermal operation, heatsink overheat, input phase failure* , output side earth (ground) fault overcurrent at start*, output phase failure, external thermal relay operation *, PTC thermistor operation*, parameter error, PU disconnection, retry count excess *, CPU fault, brake transistor alarm, inrush resistance overheat, analog input error, stall prevention operation, output current detection value exceeded
Warning Function	2Hp and above, overcurrent stall prevention, overvoltage stall prevention, PU stop, parameter write error, regenerative brake prealarm *, electronic thermal relay function prealarm, maintenance output *, undervoltage, operation panel lock, password locked, inverter reset

Operational Environment	
Ambient Temperature	-10°C to +50°C (non-freezing)
Ambient Humidity	90%RH maximum (non-condensing)
Storage Temperature	-20°C to + 65°C
Atmosphere	Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt, etc.)
Altitude / Vibration	Maximum 1000m above sea level, 5.9m/s² or less

* If Enabled

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Effective: August 9, 2010

SyncroFlo

Pumping System Solutions

Mitsubishi F-700 VFD

Control Specifications	
Control System	High carrier frequency PWM control (V/F control)/optimum excitation control/simple magnetic flux vector control
Output Frequency Range	0.5 to 400Hz
Frequency Setting Resolution	0.01HZ
Frequency Accuracy	Within 0.01% of the set output frequency
Starting Torque	120% (3Hz) when set to simple magnetic flux vector control and slip compensation
Acceleration / Deceleration Time Setting	0 to 3600s (acceleration and deceleration can be set individually), linear or S-pattern acceleration/deceleration mode can be selected
DC Injection Brake	Operation Frequency (0 to 120Hz), operation time (0 to 10s), operation voltage (0 to 30%) variable
Stall Prevention Operation Level	Operation current level can be set (0 to 150% adjustable), whether to use the function or not can be selected

Protective / Warning Function
Overcurrent during acceleration, overcurrent during constant speed, overcurrent during deceleration, overvoltage during acceleration, overvoltage during constant speed, overvoltage during deceleration, inverter protection thermal operation, heatsink overheat, instantaneous power failure occurrence, undervoltage, input phase failure, motor overload, output side earth (ground) fault overcurrent, output phase failure, external thermal relay operation, PTC thermistor operation, option alarm, parameter error, PU disconnection, retry count excess, CPU alarm, power supply short for operation panel, 24VDC power output short, output current detection value over, inrush resistance overheat, communication alarm (inverter), analog input alarm, internal circuit alarm (15V power supply), fan fault, overcurrent stall prevention, overvoltage stall prevention, electronic thermal prealarm, PU stop, maintenance timer alarm*1, parameter write error, copy operation error, operation panel lock

Operational Environment	
Ambient Temperature	-10°C to +50°C (non-freezing)
Ambient Humidity	90%RH or less (non-condensing)
Storage Temperature	-20°C to +65°C
Atmosphere	Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt, etc.)
Altitude, Vibration	Maximum 1000m above sea level, 5.9m/s² or less (conforms to JIS C 0040)

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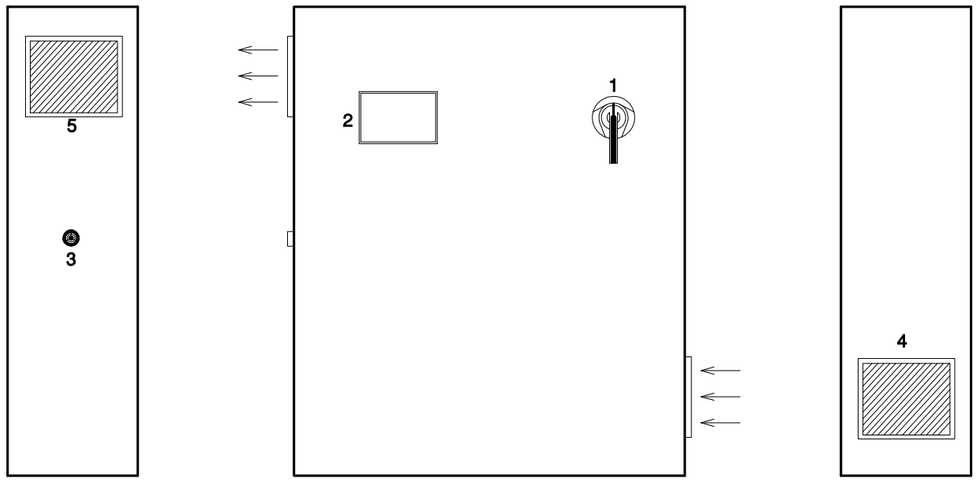

DUPLEX	TRIPLEX	FAN/VENT SIZE	ENCLOSURE SIZE
1-7.5 HP	1-5 HP	8"	30"Hx24"Wx10"D
10-15 HP	7.5-15 HP	10"	42"Hx36"Wx12"D

EQUIPMENT DESCRIPTION

1. MAIN DISCONNECT SWITCH
2. HUMAN MACHINE INTERFACE (TOUCHSCREEN)
3. HORN
4. COOLING FAN
5. COOLING VENT

SyncroFlo
PumpingSystemSolutions
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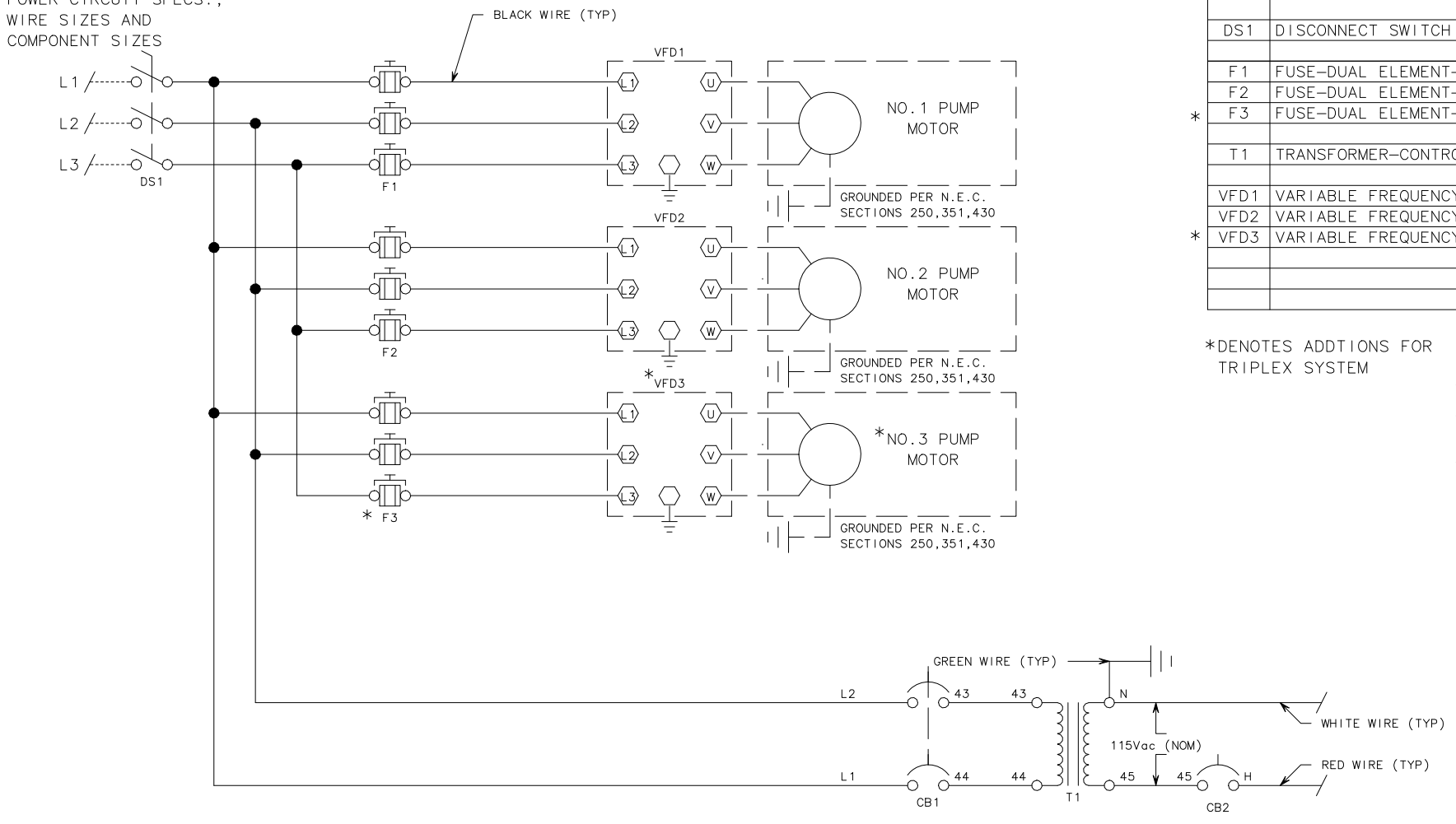
(770) 447-4443 - Fax (770) 447-0230

IRONHEART EXPRESS
TYPE "VFD"

BULLETIN NUMBER: _	REVISION: _
EFFECTIVE DATE: JUNE 2, 2014	
SUPERSEDES:	

1- SEE CONTROL PANEL DATA SHEET FOR ALL
2- POWER CIRCUIT SPECS., WIRE SIZES AND
3- COMPONENT SIZES



	COMPONENT	DESCRIPTION
	CB1	CIRCUIT BREAKER–PRIMARY (TRANSFORMER)
	CB2	CIRCUIT BREAKER–SECONDARY(TRANSFORMER)
	DS1	DISCONNECT SWITCH
	F1	FUSE–DUAL ELEMENT– –QTY. 3
	F2	FUSE–DUAL ELEMENT– –QTY. 3
*	F3	FUSE–DUAL ELEMENT– –QTY. 3
	T1	TRANSFORMER–CONTROL POWER
	VFD1	VARIABLE FREQUENCY DRIVE
	VFD2	VARIABLE FREQUENCY DRIVE
*	VFD3	VARIABLE FREQUENCY DRIVE

*DENOTES ADDTIONS FOR TRIPLEX SYSTEM

NOTES

THIS SCHEMATIC CONFORMS TO ALL APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. SCHEMATIC DESIGNER DOES NOT WARRANT THAT IT WILL COMPLY WITH MORE RESTRICTIVE LOCAL ELECTRICAL CODES AND DOES NOT WARRANT THE DESIGN OR INSTALLATION OF CONNECTING CIRCUITS OR CIRCUIT DEVICES INSTALLED BY OTHERS WHETHER OR NOT REQUIRED BY NATIONAL OR LOCAL CODES OR BOTH.

ANY MODIFICATIONS OF, OR ADDITIONS TO, THESE CIRCUITS WITHOUT THE WRITTEN CONSENT OF THE DESIGNER WILL VOID ANY WRITTEN OR IMPLIED WARRANTIES.

ELECTRICAL SYMBOLS CONFORM TO NEMA STANDARDS.

ALL ELECTRICAL COMPONENTS SHOWN IN THE DE-ENERGIZED AND DE-PRESSURIZED POSITION.

CONTROL PANEL TO BE GROUNDED BY USER.

ALL WIRE TO BE TYPE THHN, THWN 600V. UNLESS OTHERWISE SPECIFIED.

U. L. LISTED ENCLOSED INDUSTRIAL CONTROL PANEL

A891-SBV

TWO OR THREE PUMP

FUSED DISCONNECT

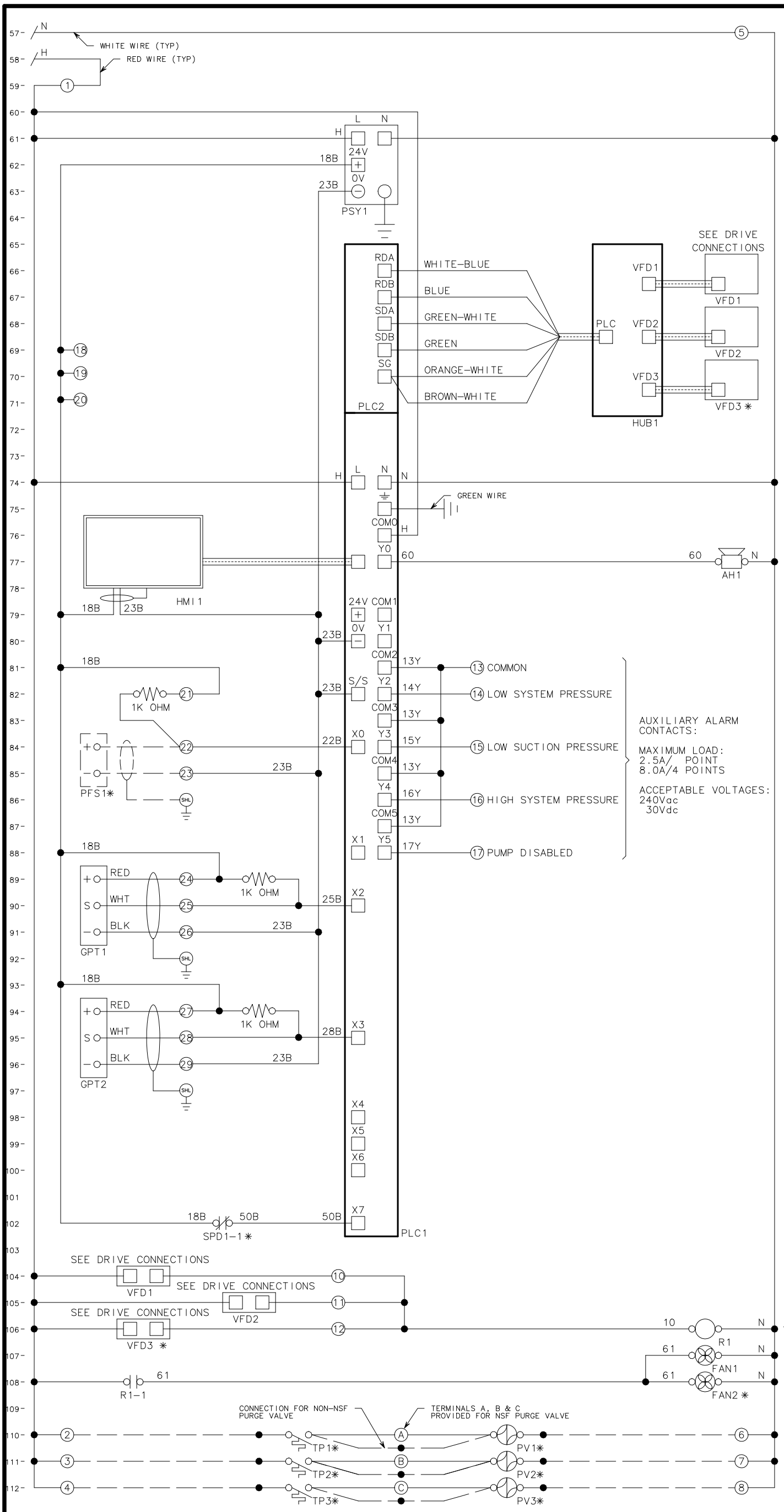
SINGLE CONNECTION - TYPE 'B'

SyncroFlo
PumpingSystemSolutions
2905 Pacific Drive - Norcross, GA 30071
(770) 447-4443 - Fax (770) 447-0230

MOTOR BRANCH
CIRCUIT DIAGRAM

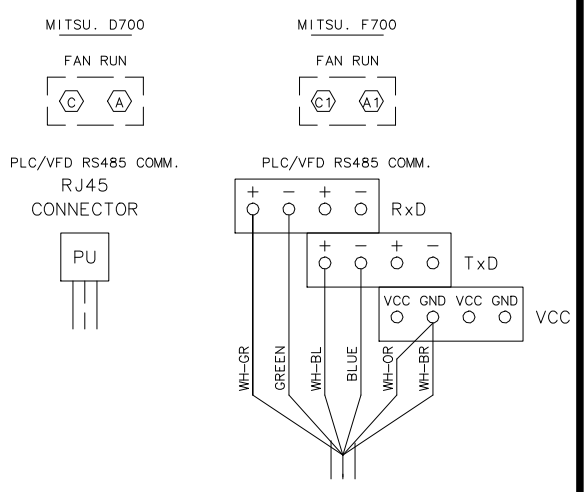
PRODUCTION NUMBER:			
DATE:	JUNE 2, 2014		
ENGINEER:	ACD	CHECKED BY:	
DRAWN BY:	BMP	SCALE:	NONE
DRAWING NUMBER:	A891–SBV	REVISION:	

LET.	REVISION	DATE/BY



		COMPONENT DESCRIPTION
	AH1	ALARM HORN
	FAN1	COOLING FAN
✳	FAN2	COOLING FAN
	GPT1	GAGE PRESSURE TRANSMITTER–SYSTEM (1–6KHz)
	GPT2	GAGE PRESSURE TRANSMITTER–SUCTION(1–6KHz)
	HMI1	HUMAN MACHINE INTERFACE
	HUB1	RJ–45 HUB
✳	PFS1	PADDLEWHEEL FLOW SENSOR
	PLC1	PROGRAMMABLE LOGIC CONTROLLER
	PLC2	PROGRAMMABLE LOGIC CONTROLLER–RS485
	PSY1	POWER SUPPLY–120Vac/24Vdc
✳	PV1	PURGE VALVE
✳	PV2	PURGE VALVE
✳	PV3	PURGE VALVE
	R1	RELAY – FAN RUN INTERFACE
✳	SPD1	SURGE PROTECTION DEVICE
	(TBC)	TERMINAL BOARD–36 POLE–CONTROL
✳	TP1	TEMPERATURE PROBE
✳	TP2	TEMPERATURE PROBE
✳	TP3	TEMPERATURE PROBE
	VFD1	VARIABLE FREQUENCY DRIVE
	VFD2	VARIABLE FREQUENCY DRIVE
✳	VFD3	VARIABLE FREQUENCY DRIVE

DRIVE CONNECTIONS



NOTES

THIS SCHEMATIC CONFORMS TO ALL APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. SCHEMATIC DESIGNER DOES NOT WARRANT THAT IT WILL COMPLY WITH MORE RESTRICTIVE LOCAL ELECTRICAL CODES AND DOES NOT WARRANT THE DESIGN OR INSTALLATION OF CONNECTING CIRCUITS OR CIRCUIT DEVICES INSTALLED BY OTHERS WHETHER OR NOT REQUIRED BY NATIONAL OR LOCAL CODES OR BOTH.

ANY MODIFICATIONS OF, OR ADDITIONS TO, THESE CIRCUITS WITHOUT THE WRITTEN CONSENT OF THE DESIGNER WILL VOID ANY WRITTEN OR IMPLIED WARRANTIES.

ELECTRICAL SYMBOLS CONFORM TO NEMA STANDARDS.

ALL ELECTRICAL COMPONENTS SHOWN IN THE DE–ENERGIZED AND DE–PRESSURIZED POSITION.

CONTROL PANEL TO BE GROUNDED BY USER.

ALL WIRE TO BE TYPE THHN, THWN 600V. UNLESS OTHERWISE SPECIFIED.

◯ DENOTES TERMINAL NUMBER OF (TBC).

✳ DENOTES OPTIONAL EQUIPMENT (SEE CONTROL PANEL DATA SHEET FOR WHICH ITEMS APPLY).

U. L. LISTED ENCLOSED INDUSTRIAL CONTROL PANEL

A805-3226-402

2 OR 3 PUMP WITH VFD'S, SYSTEM AND SUCTION PRESSURE TRANSDUCERS

SyncroFlo
PumpingSystemSolutions
2905 Pacific Drive - Norcross, GA 30071
(770) 447-4443 - Fax (770) 447-0230

2 OR 3 PUMP
TYPE D700/F700 "VFD"
WITH FX3G–14

PRODUCTION NUMBER:			
DATE:	MARCH 5 2010		
ENGINEER:	SHB	CHECKED BY:	
DRAWN BY:	ACD	SCALE:	NONE
DRAWING NUMBER:	A805–3226–402	REV.:	E

Appendix 1 - Set Points

A. Non-Adjustable Set Points

Reset Delay after Alarm Silence	5 sec.
Pressure Transmitter Failed Low Delay	2 sec.
Pressure Transmitter Failed High Delay	8 sec.
VFD Fault Delay	0 sec.

B. Adjustable Set Points

i. Time Delay Set Points

	Default	Range
Low System Press. Alarm Delay	30 sec.	10 - 60 sec.
Low Suction Press. / Lev. Alarm Delay	5 sec.	0 - 30 sec.
Tank Charge Timer (if shutdown enabled)	30 sec.	0 - 999 sec.
Pump Pressure Start Time Delay	5 sec.	2 - 30 sec.
Lag Pump Power Start Time Delay	2 sec.	2 – 30 sec.
Lag Pump Flow Start Time Delay (if provided)	2 sec.	2 - 30 sec.
Pump Minimum Run Time (Manual or Auto-Adjust Set)	300 sec.	30 - 300 sec.

ii. Pressure Set Points

	Default	Range
System Pressure	(See Sys. Data Sheet)	0 - 999 psig
Pressure Sequencing Deadband	5 psid	0 - 999 psid
Low System Pressure Deadband	10 psid	0 - 999 psid
High System Pressure Deadband	30 psid	0 - 999 psid
Low Suction Press. Alarm (if available)	5 psig	0 - 999 psig
High Suction Press. Stop (if available)	System Pressure + 1	0 - 999 psig

iii. Power Set Points

	Default	Range
Lag 1 On Power	See Factory Default Sticker (inside control panel door)	0 – 999 Hp
Lag 1 Off Power	See Sticker	0 – 999 Hp
Lag 2 On Power (if available)	See Sticker	0 – 999 Hp
Lag 2 Off Power (if available)	See Sticker	0 – 999 Hp

iv. Flow Rate Set Points (optional)

	Default	Range
Lag 1 On Flow Rate	One Pump Capacity	0 - 9999 gpm
Lag 1 Off Flow Rate	85% of Pump Cap.	0 - 9999 gpm
Lag 2 On Flow Rate (if available)	200% of Pump Cap.	0 - 9999 gpm
Lag 2 Off Flow Rate (if available)	185% of Pump Cap.	0 - 9999 gpm

v. Speed Control

	Default	Range
VFD Minimum Speed	30 Hz	15 – 60 Hz
VFD Maximum Speed	60 Hz	15 – 60 Hz
VFD Manual Speed	50 Hz	Min. - Max. Speed
Lag Pump Start Speed	50 Hz	Min. - Max. Speed

vi. PID Set Points

	Default	Range
Proportional Gain	500 %	1 - 32767 %
Integral Time Constant	30 decisec.	0 - 32767 sec./10
Derivative Gain	100 %	1 - 100 %
Derivative Time Constant	5 centisec.	0 - 32767 sec./100

SyncroFlo
Pumping System Solutions

SALES REP: Peacock Sales
PROJECT: Vickers Building B
ENGINEER:

PREPARED BY: Mark Howell
LOCATION: Georgia
DATE:

Duplex VFD IronHeart Pump System Scope

Motor HP	5
Motor Voltage	208
Pump Flow (GPM)	70
Pump Head (TDH)	70
Min. Suction (PSI)	40

Nominal System Flow (GPM)	140
Differential System Pressure (PSI)	30
Suction-Discharge Header Sizes	3" Flanged
Pump & Valve Branch Size	2"
Max. Suction (PSI)	45

SyncroFlo prefabricated pumping system. Pumps, controls and headers are all mounted on a common bent steel skid base for indoor installation in a pump house. The complete pump station will be ETL and UL listed, NSF certified and will be completely tested prior to shipment. System comprises of the following components:

- (2) SyncroFlo NSF Certified end suction pumps. Pump construction is formed 304 Stainless Steel with mechanical seal. Pump is close coupled to a 3600 RPM, ODP, 3 Phase, 60 Cycle, 1.15 Service Factor, class F insulation, High Efficiency motor, which will meet or exceed NEMA MG-1 Table 12-11 for epact motor efficiencies.
- (2) Suction Side, NSF Certified, lug style 150# Isolating butterfly valves,
- (2) Discharge Side, NSF Certified, lug style 150# Isolating butterfly valves
- (2) NSF Certified non-slam, wafer style, check valves
- (1) Flanged, 304 Stainless Steel Suction Header with Branch Connections
- (1) Flanged, 304 Stainless Steel Discharge Header with Branch Connections
- (1) Bent Carbon Steel System Skid and Bolted Panel Stand
- (1) NEMA 1 control panel with the following standard options:
  - Main Non-Fused Disconnect
  - Fusible Disconnect, Touch Safe with rated fuses for each VFD
  - Programmable Logic Controller (PLC) based operation
  - Sequencing by Horsepower and/or Pressure-VFD speed sequencing
  - Customer Accessible data and fault logs
  - Mounted and wired Suction & System Discharge Pressure Transducers
  - Alarm horn
  - 5.7” HMI Color Touchscreen with Compact Flash Drive Data Port
  - (2) Enclosure Mounted, Micro-Processor based Variable Frequency Drives
  - Minimum 10,000 Amp SCCR rating
  - Ventilated and fan-cooled enclosure, with positive cabinet pressure
- NSF Certified Plastic Tubing for instrumentation and system controls
- (2) NSF Certified Mechanical Thermal Purge Valve (shipped loose)
- (2) NSF System pressure gauges, 2.5” face dial, glycerin filled
- System Certified to NSF, ETL and UL certified to OSHA safety standards
- Factory assembled, wired, and FLOW TESTED at design conditions listed above
- 1 year part-only warranty, 5 Year PLC-VFD-HMI Warranty
- Standard SyncroFlo Terms and Conditions Apply

Job Name:	Vickers Building B	Reference #:	
Location:	Georgia	Prepared by:	Mark Howell
Sales Rep:	Peacock Sales	Date:	10/24/2016
Engineer:		System Dwg:	**22DC05XXX-3H-XX-SWF44-1**
Contractor:			

SYSTEM DATA

System Information

Model:	**22DC05XXX-3H-XX-SWF44-1**	
Design Flow rate:	140	Gpm
System Pressure:	70	Psig
Min. Suction Pressure:	40	Psig
Max. Suction Pressure:	45	Psig
Boost Pressure:	30	Psig
Control Valve:	**2**	In
Headers:	**3 ”**	**SS**
Configuration:	**Horizontal**	
Connection:	**Flange**	

Nominal Pump Information

Pump #:	1&2	
Pump Type:	**CCES**	
Construction:	**SS**	
Pump Model:	**A3U-32-160B**	
Design Split:	**50**	% Each
Design Flow:	70	Gpm
Pump Head:	70	Ft
Pump Shutoff:	**76**	Psig
Seal Type:	**Mechanical**	
Motor Size:	**5**	Hp
Motor Speed:	**3500**	Rpm
Motor Enclosure:	**ODP**	
Motor S.F.	**1.15**	

Power Data

Incoming Power Requirement:

Voltage:	3Ø/60~/	208	V
Connection FLA:		37.3	A
Wire Size:		8	G
Control panel:		**NEMA 12**	
Panel SCCR:		**10,000**	A

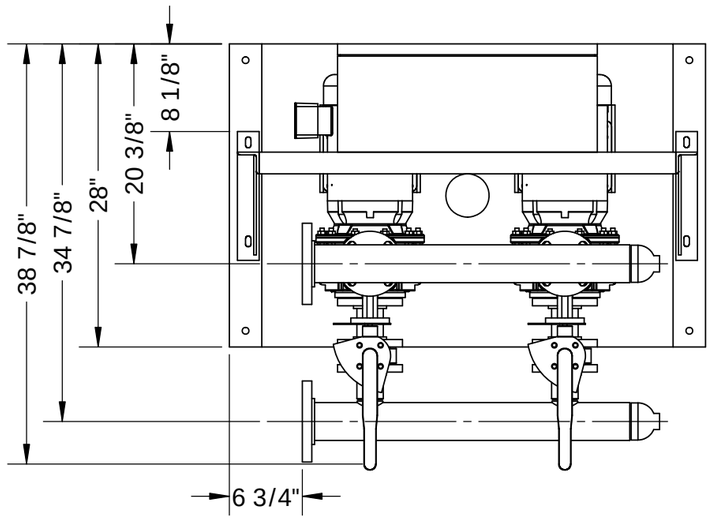
PRESSURE SET POINTS

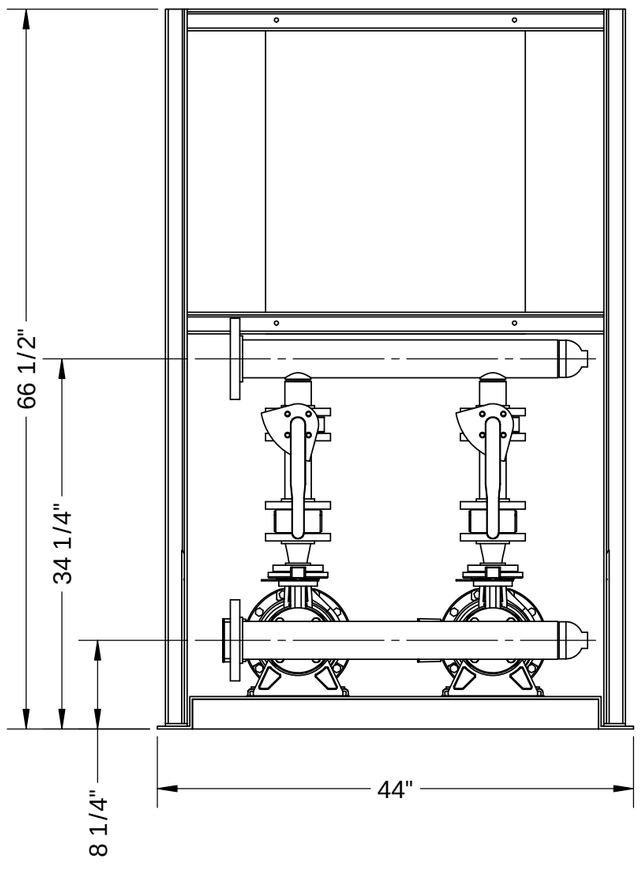
Low System set at:	**Sys Pr - 5**	Psig
Low Suction set at:	**5**	Psig
Horsepower set at:	**5**	Hp
Shutoff Boost:	**10**	Psid

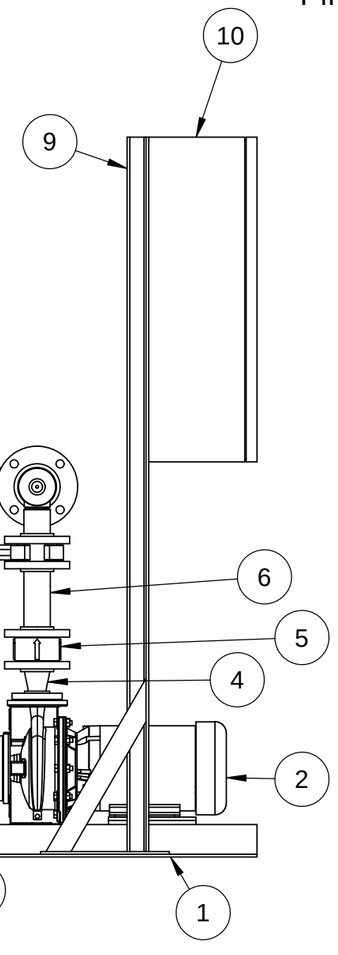
Special Comments

2905 Pacific Drive • Norcross, GA 30071 • Phone: 770-447-4443 • Fax: 770-447-0230

ITEM NO.	DESCRIPTION	Inventory #	QTY.
1	DUPLEX IRONHEART SKID	09-200-4428	1
2	C 5 HP PUMP/MOTOR	12-511-4006	2
3	2" x 4.5" 150-150#	S770-020-0045	2
4	REDUCER SPOOL 2" X 1.25" 150-150#	S771-020-0012	2
5	CHECK VALVE WAFER STYLE 2"	43-022-1020	2
6	2" x 7" 150-150#	S770-020-0070	2
7	2" LUG ISOLATION BUTTERFLY VALVE NSF	42-447-3020	4
8	DUPLEX HEADER 3" X 2"	S772-030-0020	2
9	DUPLEX PANEL STAND 30" X 24"	779-200-3024	1
10	SYSTEM POWER AND CONTROL PANEL	SF952-0050-208S	1







PLEASE ENSURE THE USE OF PROVIDED
PIPE SUPPORT DURING SYSTEM INSTALLATION

APPROX. DRY WEIGHT: 836 LBS

NOTES:
1. ALL DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE
2. PURGE VALVE DRAIN LINE TO BE PIPED TO FLOOR DRAIN IN PROXIMITY OF BOOSTER SYSTEM (BY OTHERS)
3. SEE DATA SHEET FOR L/H OR R/H HEADERS ENTRY/EXIT CONNECTION

SYNCROFLO PACKAGED PUMPING SYSTEMS COMPLY WITH OSHA REGULATIONS AND FEDERAL REGULATION 29 CFR 1910.399. THE ENTIRE PACKAGED SYSTEM IS THIRD PARTY CERTIFIED.

REV	DESCRIPTION	BY DATE

ALL DIMENSIONS +/- TOLERANCE OF 1/2"

DUPLEX IRONHEART
C 5 HP

DRAWN BY: MWA	ENG. BY: MWA	CHK. BY:
DATE: 4/10/15	SIGN:	DATE:

SyncroFlo
Pumping System Solutions
6700 Best Friend Road - Norcross, GA 30071 - (770) 447-4443 - Fax (770) 447-0230

SCALE 1:14

DWG 22DC05XXX-3H-XX-SWF44-3

Model 32-160B-5HP Data Sheet

Model No.: A3U-32-160B50D3CSF

NSF61/ Annex G certified

Pump Data		
Size	1¼ x 2 x 6 9/16	
Flange - Suction	2" ANSI Equivalent	150 lb. ANSI R.F. equivalent
Flange - Discharge	1¼" ANSI Equivalent	150 lb. ANSI R.F. equivalent
Materials		
Casing	304L Stainless Steel	
Impeller (closed)	304L Stainless Steel	
Shaft Sleeve	304L Stainless Steel	
Mechanical Seal	Type 21, Carbon-Ceramic-Viton, Cup Seat	

Motor Data*

5 HP, 3 Phase, 60 Hertz, 208-230/460V, 3500 RPM, ODP, Frame 182JM
Amps: 14.1-12.8/6.4 Max. Temp.: 40C
Service Factor: 1.15 Power Factor: 85
Nominal Full Load Efficiency: 85.5% (NEMA MG-1 Table 12-11)
Direction of Rotation: Clockwise when viewed from motor end

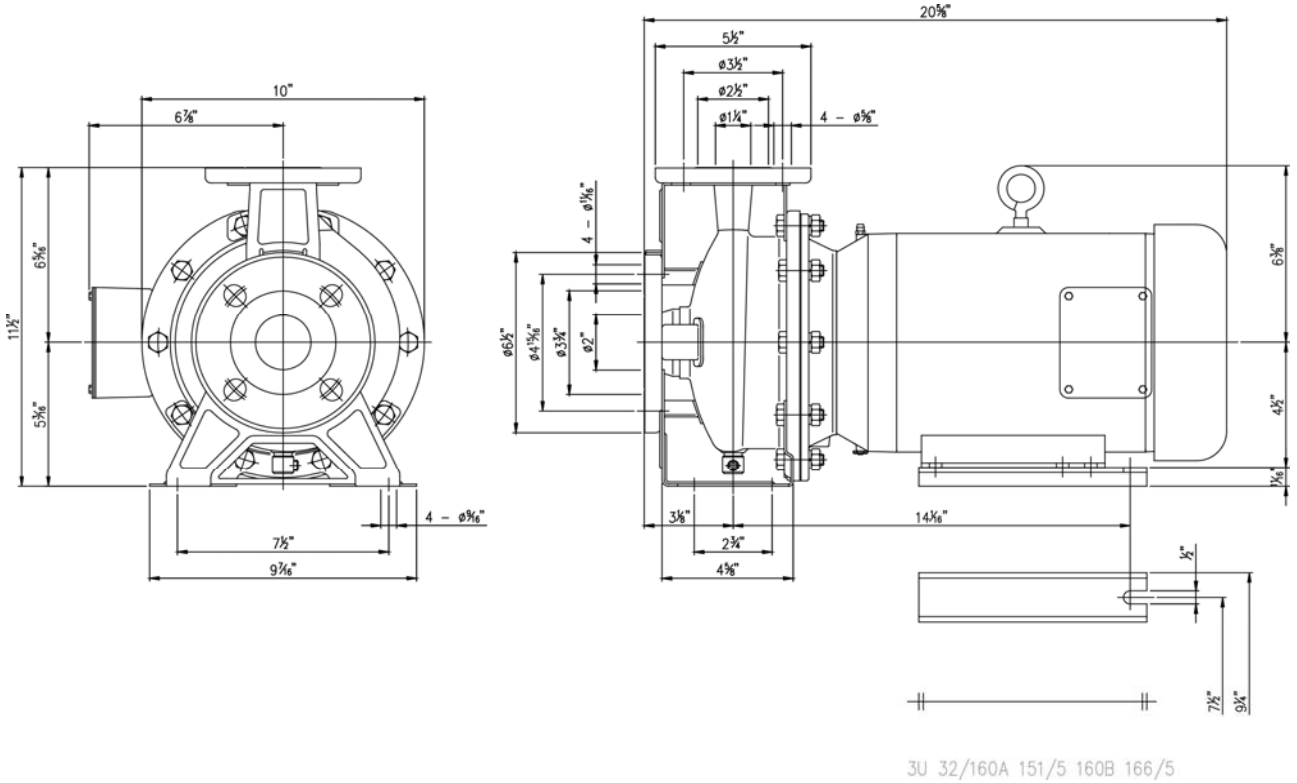
**Values may vary with motor manufacturer.*

Limitations

Temperature: 212°F (100°C)
Working Pressure: 230 PSI

Approx. Weight (lbs) **98**

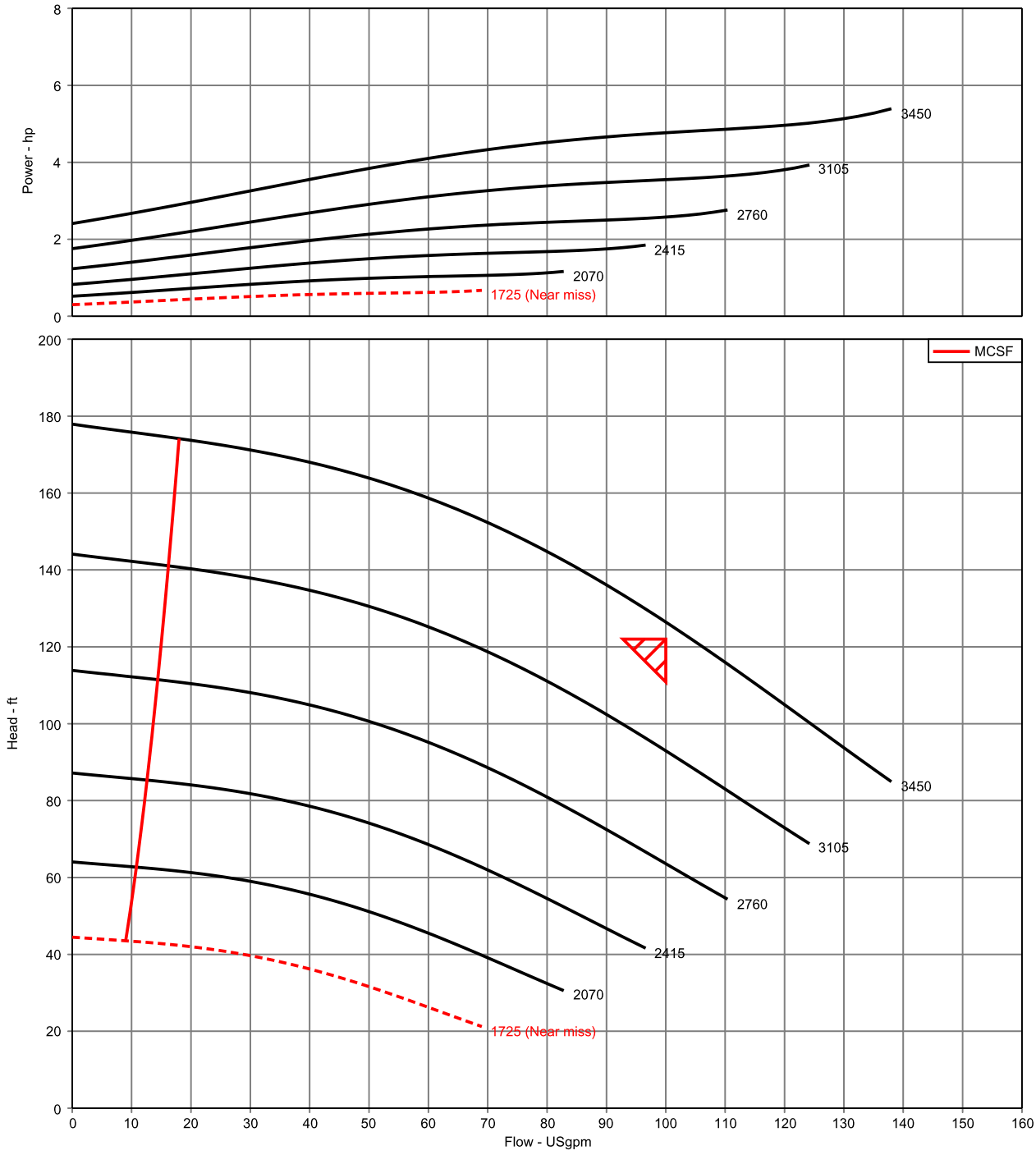
Dimensions



3U 32/160A 151/5 160B 166/5

SyncroFlo
Pumping System Solutions

Multi-Speed Performance Curve



Customer	:	Size	: 3U-32-160B-5HP
Customer reference	:	Stages	: 1
Item number	: Default	Speed, rated	: 3,450 rpm
Service	:	Based on curve number	: 3S-C603-9309
Quantity	: 1	Efficiency	: 66.95 %
Quote number	:	Power, rated	: 4.77 hp
Date last saved	: 06 Mar 2014 3:17 PM	NPSH required	: 9.44 ft
Flow, rated	: 100.0 USgpm	Viscosity	: 1.00 cP
Differential head / pressure, rated	: 122.0 ft	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
Fluid density, rated / max	: 1.000 / 1.000 SG	Impeller diameter, rated	: 6.54 in

SyncroFlo

Pumping System Solutions

Certifications

Personnel

Steve Bradley, PE, Commercial Engineering Manager, is a registered controls engineer in Georgia.

12 degreed engineers on staff – (3) EIT, (3) NFPA 20 certified

9 Engineering Support Staff plus Certified Draftsman

James Blackburn, Operations Manager, is a Six-Sigma Black Belt.

Product

Quality Management System – ISO 9001:2008

BSI America, Inc. certifies the assembly of custom packaged pumping systems accessories and controls for use in commercial, irrigation, municipal, industrial and fire applications are in accordance with ISO 9001: 2008. (Certificate # FM 555054)

Safety Management System

All SyncroFlo packages are tested to applicable UL standards, per below. In addition, systems may be purchased to meet the ANSI/NSF 61 standard. All booster packages comply with ANSI/NSF 372 – Drinking Water System Components – Lead Content.

IAPMO certifies to NSF / ANSI 61 standards for safe drinking water that complies with Lead Plumbing Law (Files # N-5408 & 6961)

UL certifies SyncroFlo's compliance to OSHA standards for packaged pumping systems (UL508, UL508A, and UL778, File # E189340) plus control panels (UL 508A, File # E59076).

Intertek Testing Services certifies SyncroFlo's compliance to OSHA standards for packaged pumping systems (UL 508 and 778) for ETL, a nationally recognized third-party testing laboratory. (Report # 519309)

ETL certifies SyncroFlo's compliance to OSHA standards for packaged fire pumping systems (UL 508, 448, 1004, and 1247).

NTA certifies to various state modular building codes (project in progress)

In addition to these safety and quality certifications, SyncroFlo tests the performance of each and every pump system or control panel that it builds.

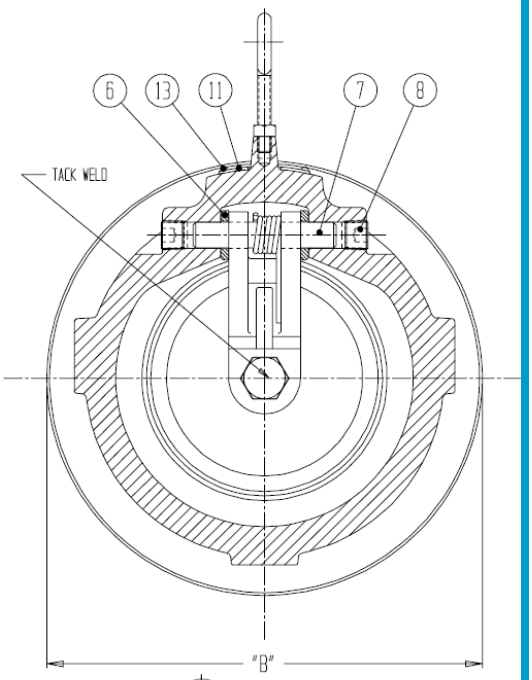
NTA INC. Smart Quality. Assured.℠

SyncroFlo
Pumping System Solutions

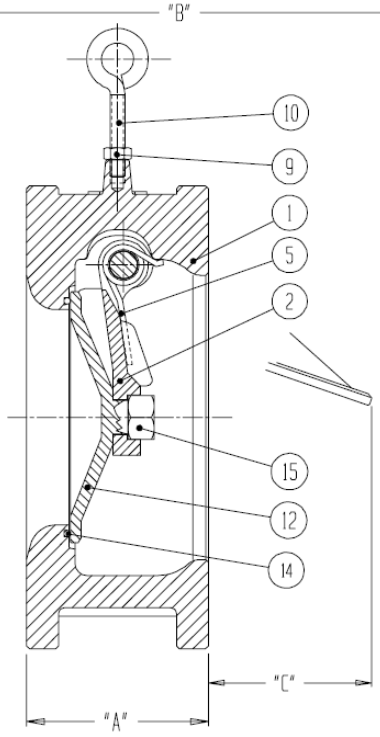
Check Valve Wafer Style
(Check Rite CETNSF)

Flanges, Bolts, Nuts and gaskets are not included

PART NO.	NAME	MATERIAL
1	BODY	ASTM A126-CLB
2	HINGE	ASTM A351-CF8M
5	SPRING	ASTM 313-316
6	SPACER	TEFLON
7	PIN	ASTM A479-316
8	PLUG	STEEL
9	LOCK NUT	STEEL ZINC PLATED
10	EYE BOLT	STEEL ZINC PLATED
11	NAME PLATE	NSF IDENT/ALUM.
12	DISC	ASTM A351-CF8M
13	RIVET	STEEL CAD. PLATED
14	O-RING	NSF EPDM
15	NUT	STAINLESS STEEL



ANSI CLASS 125				
Size (in)	Weight Lbs.	A (in)	B (in)	C (in)
2	3.50	2.13	4.29	1.19
2 1/2	5.00	2.38	5.08	1.50
3	6.50	2.63	5.67	1.69
4	11.00	2.25	6.46	2.44
5	15.00	2.50	7.64	3.38
6	20.00	2.75	8.66	4.25
8	30.00	2.88	10.83	5.38
10	47.00	3.13	13.03	7.00
12	70.00	3.38	15.19	8.13



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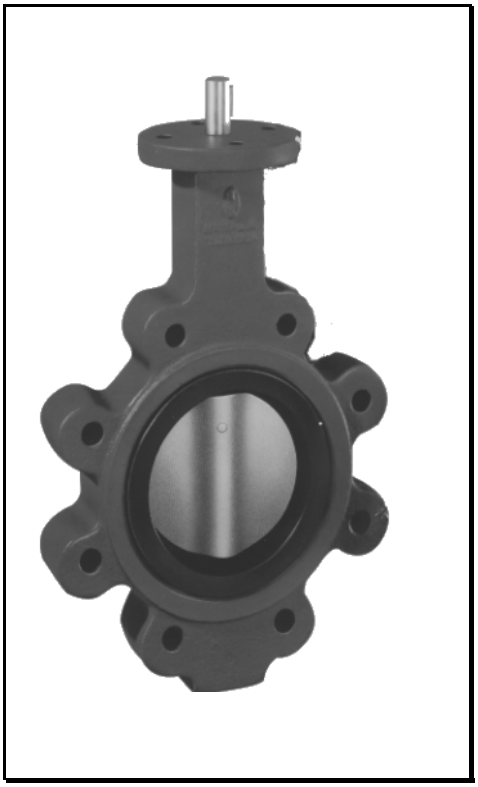
Effective: August 4, 2010

SyncroFlo
Pumping System Solutions

NSF 61 Butterfly Valve

Features:

- **Pressure Rating:** Bi-directional or dead end service, bubble-tight shut off, 250 psig.
- **Pressure Profile Disc:** Assures minimum torque and longer seat life.
- **One-Piece Thru Stem:** Blow out proof, ensures dependability and positive disc positioning.
- **Seat Face:** Negates need for flange gaskets. Valve interior completely isolated from the body.
- **Supported Stem Seal:** Blow out proof with packing gland to prevent entry of external substances.



Materials of Construction	
Body:	Cast Iron
Disc:	Nylon 11 Coated Ductile Iron
Seat:	EPDM
Stem:	416 Stainless Steel

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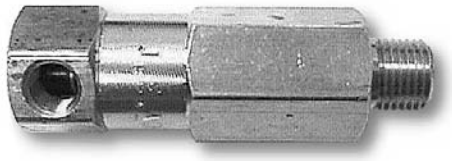
SyncroFlo

Pumping System Solutions

Mechanical Thermal Purge Valve

Operation



To prevent overheating and pump failure a thermal relief valve is installed in each pump casing, discharge head, or discharge piping. The valve will automatically sense the rise in temperature and discharge some of the hot fluid allowing cooler fluid to enter the pump casing. The valve will then close. On factory built pump systems, the thermal relief valves are piped to a common discharge tube. After installation, this discharge tube should be continued to a nearby drain. The discharge tube should be piped in a manner that discharge or leaks are visible to maintenance personnel.

Specifications	
Operating Pressure:	175 psig
Max Pressure Rating:	600 psi
Temperature Setting:	140° F

Materials of Construction	
Body:	Brass
Internal Seal:	Viton®
External Seal:	Buna
Spring:	Stainless Steel
Mounting Connection:	3/8” MPT
Tubing Connection:	¼” FPT

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Pressure Gauge Glycerin Filled

Applications

- Adverse service conditions where pulsating or vibration exists

Special Features

- Vibration and shock resistant
- Stainless steel case for better corrosion resistance
- Pressure ranges up to 15,000 psi

Specifications

- Design standard: ASME B40.100 & EN 837-1
- Protection: Nema 4X
- Face Dial: 2.5” standard, 4” optional
- Accuracy: 4” -/+1% of span
  2.5” -/+ 2.5% of span
- Operating Temperature: -4° F to +160° F

Materials of Construction

- Case: 304SS
- Window: Polycarbonate with Buna-N gasket
- Dial: White ABS with stop pin
- Movement: Copper alloy
- Bourdon Tube: Copper alloy
- Pointer: Black aluminum

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Effective: August 4, 2010

NSF 61 Pressure Transmitter Digital

Overview

The 40-801 is a high quality all stainless steel media isolated Pressure Sensor intended for use in the measurement of liquids compatible with stainless steel. 40-801 pressure sensors and transducers have been designed specifically for applications with demanding performance requirements.

40-801 sensors and transducers high strength stainless steel sensing element is machined from a solid piece of stainless steel, resulting in construction that contains no silicone oil, no welds and no internal O-rings.

Features

- High Accuracy
- High Strength Stainless Steel Construction
- No Silicone Oil. No Internal O-rings, no welds (50 PSI & above)
- Wide operating temperature range
- Fully welded case provides rugged design
- Compatible with wide range of gases and liquids
- Suitable for high shock and vibration applications
- Superior signal clarity compared to analog transmitters

Detailed Specifications

Performance @ 25°C (77°F)	
Accuracy[1]:	<±0.25% BFSL
Stability:	(1 year) ±0.25%FS,typ.
Over Range Protection:	2X Rated Pressure
Burst Pressure:	5X Rated Pressure
Pressure Cycles:	>100 Million
[1]Accuracy includes: Non-linearity, Hysteresis and Non-repeatability	

Environmental Data	
Temperature	
Operating:	-40 to 85°C (-40 to 185°F)
Storage:	-40 to 125°C (-40 to 250°F)
Thermal Limits	
Compensated Range:	0 to 55°C (30 to 130°F)
TC Zero:	<±1.5% of FS
TC Span:	<±1.5% of FS
Other	
Shock:	100G, 11msec, ½ sine
Vibration:	20G peak, 20 to 2400 Hz.
EMI / RFI Protection:	Yes
Rating:	IP-66

PHYSICAL DESCRIPTION	
Wetted Material:	17-4PH stainless steel NACE compatible
Electrical Connection:	Cable
Case (housing):	304 stainless steel

ELECTRICAL DATA	
Excitation:	10-28VDC, Typ.
Output:	Digital Pulse
Current Consumption:	<15mA
Bandwidth:	(-3dB): DC to 250Hz
Zero Offset:	<±1% of FS
Span Tolerance:	<±1.5% of FS
Output Noise:	<2mV RMS
Reverse Polarity Protection:	Ye

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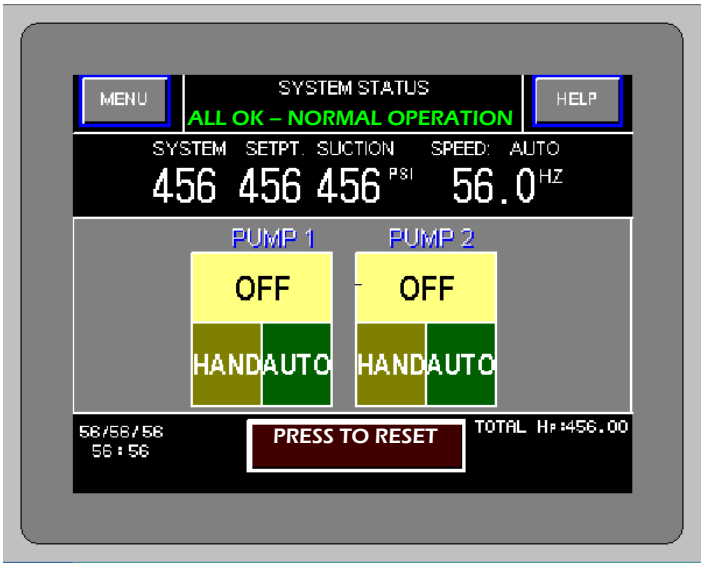
Effective: March 1, 2013

Human Machine Interface Model GT1455



(Illustration only)

SPECIFICATIONS

Display
Screen: 5.7" diagonal, 65,536 color, 320 x 240 dot
Type: Backlit TFT liquid crystal
Viewing Angle: 60 degrees minimum
Operational Life: Approx. 50,000 hrs / 1,000,000 touches min. (at 0.98N operating force)
Power Usage: 8.4 W

SDHC Card (for data retrieval)
4 GB max.
Writes in .CSV format, exportable to Excel
Performance data stored in daily files for up to one year (data recorded every 10 seconds or on alarm)
Data includes: Date, time, flow (if available), system pressure, set point, suction pressure, pumps on, individual drive Hz, V, A, and kW

Environmental
Equivalent to IP67F protection (frost panel with USB environmental protective cover attached)
Operating Temperature: 32 to 122° F [0 to 50°C]
Storage Temperature: -4 to 140°F [-20 to 60°C]

Certifications
UL listed and CE compliant

SyncroFlo

Pumping System Solutions

Mitsubishi D-700 VFD
(10 Hp and Less)

Control Specifications	
Control Method	Soft-PWM control / high carrier frequency PWM control (V/F control, general-purpose magnetic flux vector control, optimum excitation control can be selected)
Output Frequency Range	0.2 to 400Hz
Frequency Setting Resolution	0.01Hz
Frequency Accuracy	Within 0.01% of the set output frequency
Starting Torque	150% or more (at 1Hz) when general purpose magnetic flux vector control and slip compensation is set
Acceleration / Deceleration Time Setting	0.1 to 3600s (acceleration and deceleration can be set individually). Linear or S-pattern acceleration / deceleration mode can be selected
DC Injection Brake	Operation frequency (0 to 150Hz), operation time (0 to 10s), operation voltage (0 to 30%) variable
Stall Prevention Operation Level	Operation current level can be set (0 to 200% adjustable), whether to use the function or not can be selected

Protective / Warning Function	
Protective Function	Overcurrent during acceleration, overcurrent during constant speed, overcurrent during deceleration, overvoltage during acceleration, overvoltage constant speed, overvoltage during deceleration, inverter protection thermal operation, motor protection thermal operation, heatsink overheat, input phase failure* , output side earth (ground) fault overcurrent at start*, output phase failure, external thermal relay operation *, PTC thermistor operation*, parameter error, PU disconnection, retry count excess *, CPU fault, brake transistor alarm, inrush resistance overheat, analog input error, stall prevention operation, output current detection value exceeded
Warning Function	2Hp and above, overcurrent stall prevention, overvoltage stall prevention, PU stop, parameter write error, regenerative brake prealarm *, electronic thermal relay function prealarm, maintenance output *, undervoltage, operation panel lock, password locked, inverter reset

Operational Environment	
Ambient Temperature	-10°C to +50°C (non-freezing)
Ambient Humidity	90%RH maximum (non-condensing)
Storage Temperature	-20°C to + 65°C
Atmosphere	Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt, etc.)
Altitude / Vibration	Maximum 1000m above sea level, 5.9m/s² or less

* If Enabled

2905 Pacific Drive • Norcross, GA 30071 • Phone: 770-447-4443 • Fax: 770-447-0230 • http://www.syncroflo.com
Effective: August 9, 2010

SyncroFlo

Pumping System Solutions

Mitsubishi F-700 VFD

Control Specifications	
Control System	High carrier frequency PWM control (V/F control)/optimum excitation control/simple magnetic flux vector control
Output Frequency Range	0.5 to 400Hz
Frequency Setting Resolution	0.01HZ
Frequency Accuracy	Within 0.01% of the set output frequency
Starting Torque	120% (3Hz) when set to simple magnetic flux vector control and slip compensation
Acceleration / Deceleration Time Setting	0 to 3600s (acceleration and deceleration can be set individually), linear or S-pattern acceleration/deceleration mode can be selected
DC Injection Brake	Operation Frequency (0 to 120Hz), operation time (0 to 10s), operation voltage (0 to 30%) variable
Stall Prevention Operation Level	Operation current level can be set (0 to 150% adjustable), whether to use the function or not can be selected

Protective / Warning Function
Overcurrent during acceleration, overcurrent during constant speed, overcurrent during deceleration, overvoltage during acceleration, overvoltage during constant speed, overvoltage during deceleration, inverter protection thermal operation, heatsink overheat, instantaneous power failure occurrence, undervoltage, input phase failure, motor overload, output side earth (ground) fault overcurrent, output phase failure, external thermal relay operation, PTC thermistor operation, option alarm, parameter error, PU disconnection, retry count excess, CPU alarm, power supply short for operation panel, 24VDC power output short, output current detection value over, inrush resistance overheat, communication alarm (inverter), analog input alarm, internal circuit alarm (15V power supply), fan fault, overcurrent stall prevention, overvoltage stall prevention, electronic thermal prealarm, PU stop, maintenance timer alarm*1, parameter write error, copy operation error, operation panel lock

Operational Environment	
Ambient Temperature	-10°C to +50°C (non-freezing)
Ambient Humidity	90%RH or less (non-condensing)
Storage Temperature	-20°C to +65°C
Atmosphere	Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt, etc.)
Altitude, Vibration	Maximum 1000m above sea level, 5.9m/s² or less (conforms to JIS C 0040)

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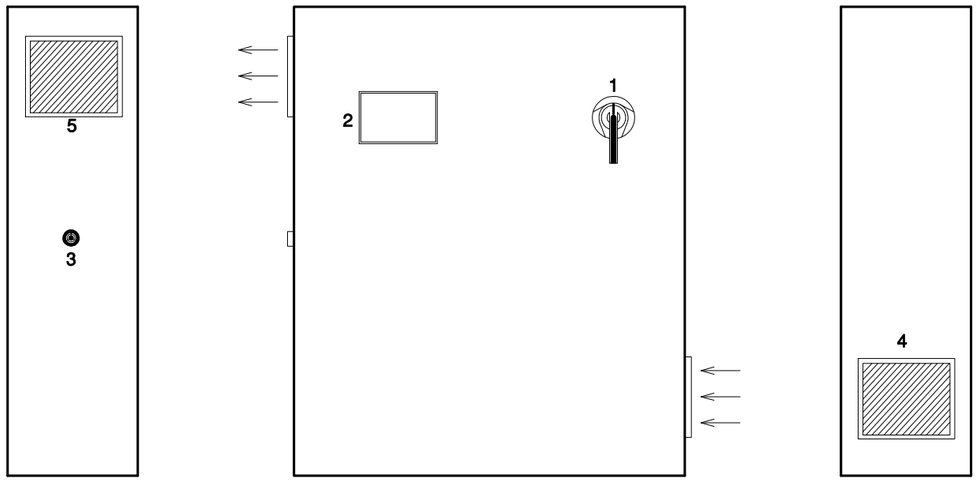
Effective: August 9, 2010



DUPLEX	TRIPLEX	FAN/VENT SIZE	ENCLOSURE SIZE
1-7.5 HP	1-5 HP	8"	30"Hx24"Wx10"D
10-15 HP	7.5-15 HP	10"	42"Hx36"Wx12"D

EQUIPMENT DESCRIPTION

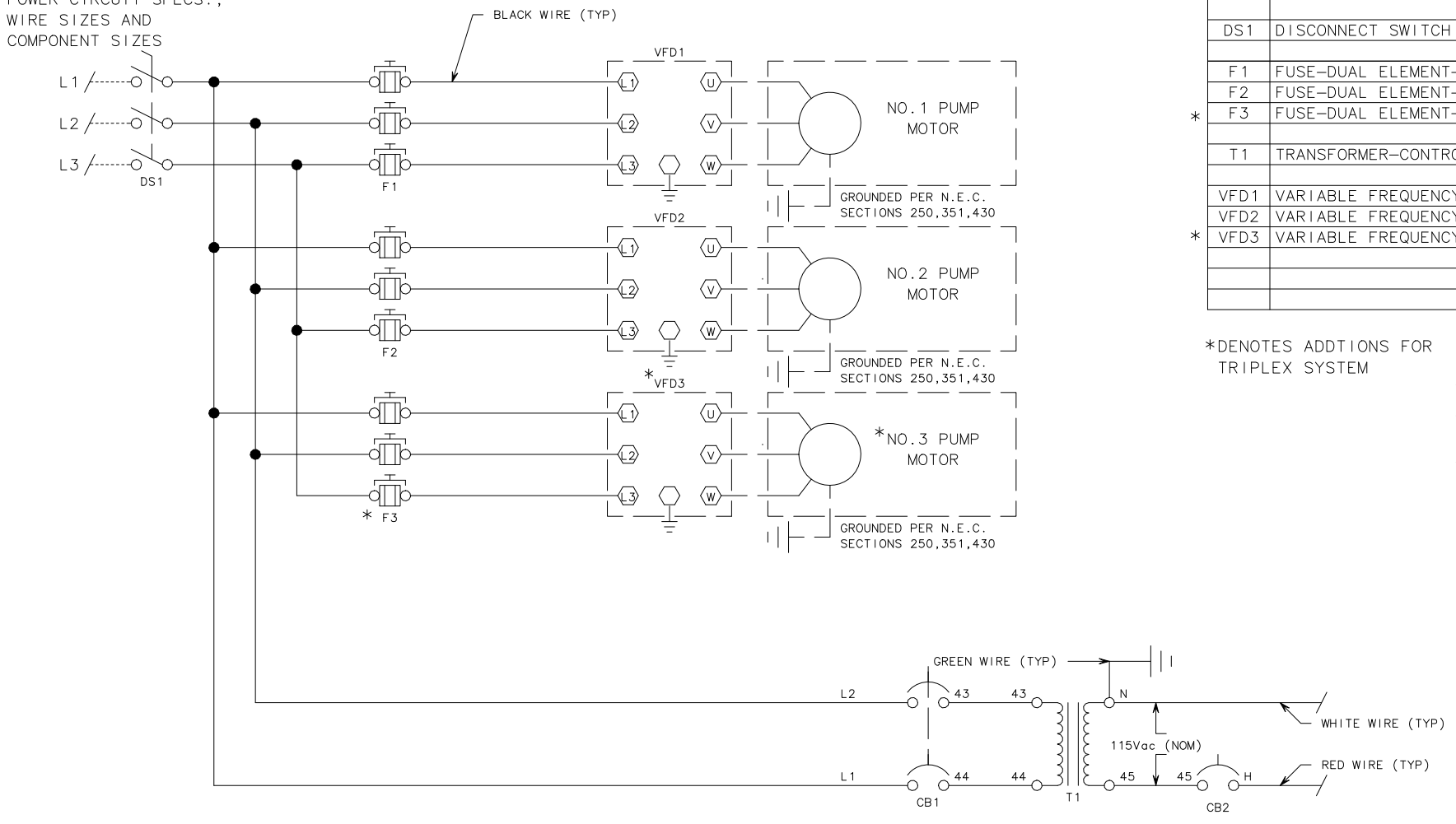
1. MAIN DISCONNECT SWITCH
2. HUMAN MACHINE INTERFACE (TOUCHSCREEN)
3. HORN
4. COOLING FAN
5. COOLING VENT

SyncroFlo
PumpingSystemSolutions
2905 Pacific Drive - Norcross, GA 30071
(770) 447-4443 - Fax (770) 447-0230

IRONHEART EXPRESS
TYPE "VFD"

BULLETIN NUMBER: _	REVISION: _
EFFECTIVE DATE: JUNE 2, 2014	
SUPERSEDES:	

1- SEE CONTROL PANEL DATA SHEET FOR ALL
2- POWER CIRCUIT SPECS., WIRE SIZES AND
3- COMPONENT SIZES



	COMPONENT	DESCRIPTION
	CB1	CIRCUIT BREAKER–PRIMARY (TRANSFORMER)
	CB2	CIRCUIT BREAKER–SECONDARY(TRANSFORMER)
	DS1	DISCONNECT SWITCH
	F1	FUSE–DUAL ELEMENT– –QTY. 3
	F2	FUSE–DUAL ELEMENT– –QTY. 3
*	F3	FUSE–DUAL ELEMENT– –QTY. 3
	T1	TRANSFORMER–CONTROL POWER
	VFD1	VARIABLE FREQUENCY DRIVE
	VFD2	VARIABLE FREQUENCY DRIVE
*	VFD3	VARIABLE FREQUENCY DRIVE

*DENOTES ADDTIONS FOR TRIPLEX SYSTEM

NOTES

THIS SCHEMATIC CONFORMS TO ALL APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. SCHEMATIC DESIGNER DOES NOT WARRANT THAT IT WILL COMPLY WITH MORE RESTRICTIVE LOCAL ELECTRICAL CODES AND DOES NOT WARRANT THE DESIGN OR INSTALLATION OF CONNECTING CIRCUITS OR CIRCUIT DEVICES INSTALLED BY OTHERS WHETHER OR NOT REQUIRED BY NATIONAL OR LOCAL CODES OR BOTH.

ANY MODIFICATIONS OF, OR ADDITIONS TO, THESE CIRCUITS WITHOUT THE WRITTEN CONSENT OF THE DESIGNER WILL VOID ANY WRITTEN OR IMPLIED WARRANTIES.

ELECTRICAL SYMBOLS CONFORM TO NEMA STANDARDS.

ALL ELECTRICAL COMPONENTS SHOWN IN THE DE-ENERGIZED AND DE-PRESSURIZED POSITION.

CONTROL PANEL TO BE GROUNDED BY USER.

ALL WIRE TO BE TYPE THHN, THWN 600V. UNLESS OTHERWISE SPECIFIED.

U. L. LISTED ENCLOSED INDUSTRIAL CONTROL PANEL

A891-SBV

TWO OR THREE PUMP

FUSED DISCONNECT

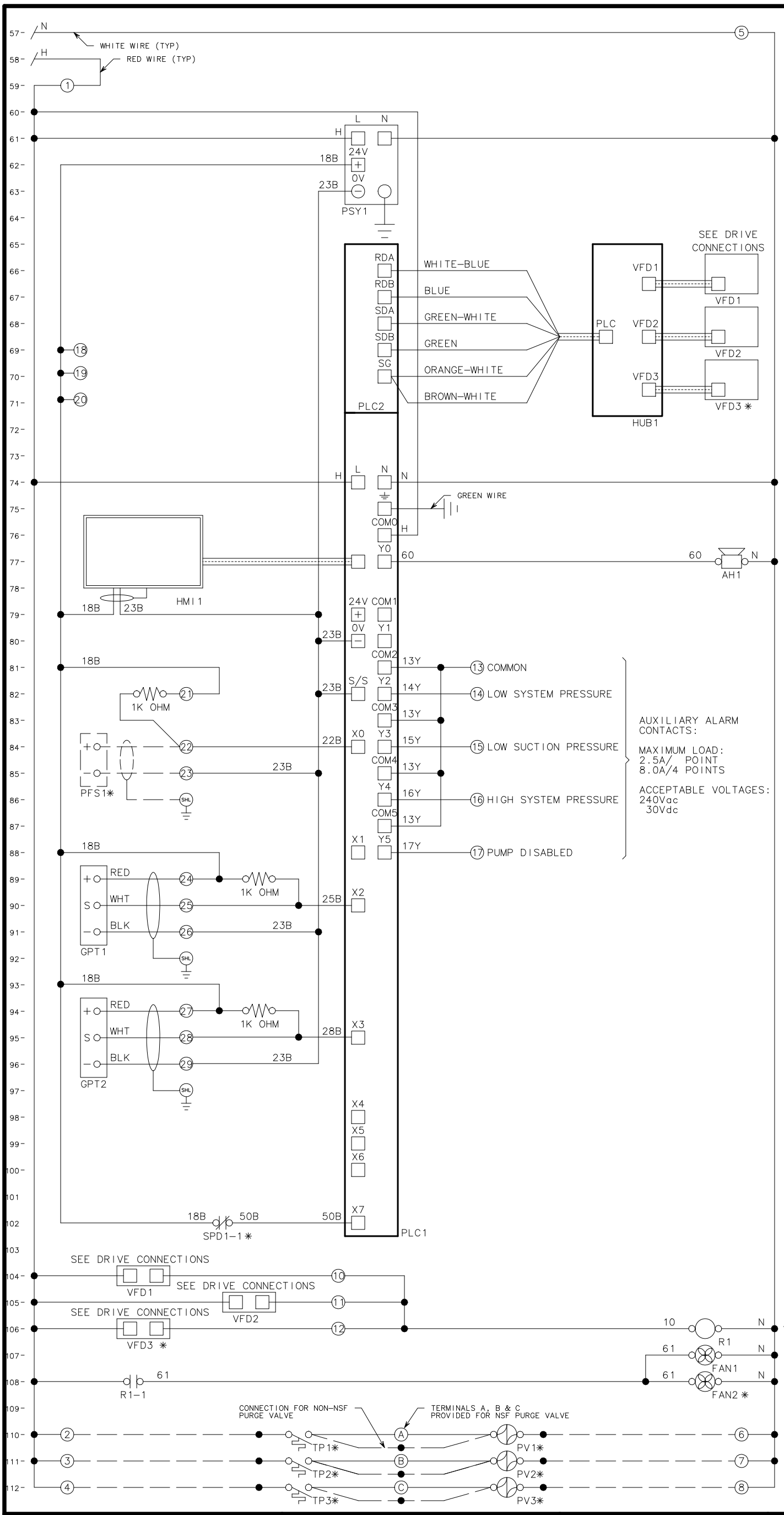
SINGLE CONNECTION - TYPE 'B'

SyncroFlo
PumpingSystemSolutions
2905 Pacific Drive - Norcross, GA 30071
(770) 447-4443 - Fax (770) 447-0230

MOTOR BRANCH
CIRCUIT DIAGRAM

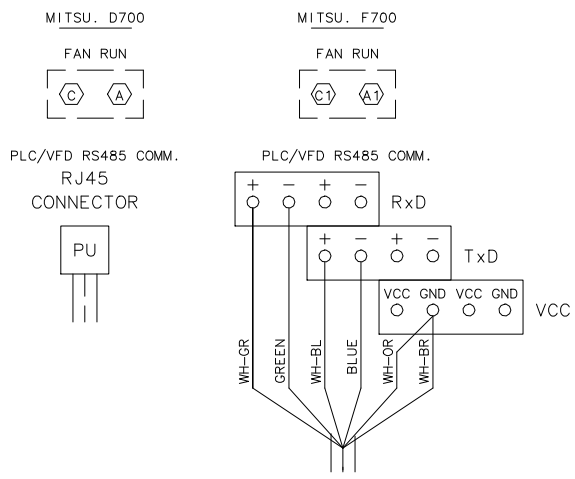
PRODUCTION NUMBER:			
DATE:	JUNE 2, 2014		
ENGINEER:	ACD	CHECKED BY:	
DRAWN BY:	BMP	SCALE:	NONE
DRAWING NUMBER:	A891–SBV	REVISION:	

LET.	REVISION	DATE/BY



		COMPONENT DESCRIPTION
	AH1	ALARM HORN
	FAN1	COOLING FAN
✳	FAN2	COOLING FAN
	GPT1	GAGE PRESSURE TRANSMITTER–SYSTEM (1–6KHz)
	GPT2	GAGE PRESSURE TRANSMITTER–SUCTION(1–6KHz)
	HMI1	HUMAN MACHINE INTERFACE
	HUB1	RJ–45 HUB
✳	PFS1	PADDLEWHEEL FLOW SENSOR
	PLC1	PROGRAMMABLE LOGIC CONTROLLER
	PLC2	PROGRAMMABLE LOGIC CONTROLLER–RS485
	PSY1	POWER SUPPLY–120Vac/24Vdc
✳	PV1	PURGE VALVE
✳	PV2	PURGE VALVE
✳	PV3	PURGE VALVE
	R1	RELAY – FAN RUN INTERFACE
✳	SPD1	SURGE PROTECTION DEVICE
	(TBC)	TERMINAL BOARD–36 POLE–CONTROL
✳	TP1	TEMPERATURE PROBE
✳	TP2	TEMPERATURE PROBE
✳	TP3	TEMPERATURE PROBE
	VFD1	VARIABLE FREQUENCY DRIVE
	VFD2	VARIABLE FREQUENCY DRIVE
✳	VFD3	VARIABLE FREQUENCY DRIVE

DRIVE CONNECTIONS



NOTES

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ANY MODIFICATIONS OF, OR ADDITIONS TO, THESE CIRCUITS WITHOUT THE WRITTEN CONSENT OF THE DESIGNER WILL VOID ANY WRITTEN OR IMPLIED WARRANTIES.

ELECTRICAL SYMBOLS CONFORM TO NEMA STANDARDS.

ALL ELECTRICAL COMPONENTS SHOWN IN THE DE–ENERGIZED AND DE–PRESSURIZED POSITION.

CONTROL PANEL TO BE GROUNDED BY USER.

ALL WIRE TO BE TYPE THHN, THWN 600V. UNLESS OTHERWISE SPECIFIED.

◯ DENOTES TERMINAL NUMBER OF (TBC).

✳ DENOTES OPTIONAL EQUIPMENT (SEE CONTROL PANEL DATA SHEET FOR WHICH ITEMS APPLY).

U. L. LISTED
ENCLOSED INDUSTRIAL CONTROL PANEL

A805-3226-402

2 OR 3 PUMP WITH VFD'S, SYSTEM AND SUCTION PRESSURE TRANSDUCERS

SyncroFlo
PumpingSystemSolutions
2905 Pacific Drive - Norcross, GA 30071
(770) 447-4443 - Fax (770) 447-0230

2 OR 3 PUMP
TYPE D700/F700 "VFD"
WITH FX3G–14

PRODUCTION NUMBER:			
DATE:	MARCH 5 2010		
ENGINEER:	SHB	CHECKED BY:	
DRAWN BY:	ACD	SCALE:	NONE
DRAWING NUMBER:	A805–3226–402	REV.:	E

Appendix 1 - Set Points

A. Non-Adjustable Set Points

Reset Delay after Alarm Silence	5 sec.
Pressure Transmitter Failed Low Delay	2 sec.
Pressure Transmitter Failed High Delay	8 sec.
VFD Fault Delay	0 sec.

B. Adjustable Set Points

i. Time Delay Set Points

	Default	Range
Low System Press. Alarm Delay	30 sec.	10 - 60 sec.
Low Suction Press. / Lev. Alarm Delay	5 sec.	0 - 30 sec.
Tank Charge Timer (if shutdown enabled)	30 sec.	0 - 999 sec.
Pump Pressure Start Time Delay	5 sec.	2 - 30 sec.
Lag Pump Power Start Time Delay	2 sec.	2 – 30 sec.
Lag Pump Flow Start Time Delay (if provided)	2 sec.	2 - 30 sec.
Pump Minimum Run Time (Manual or Auto-Adjust Set)	300 sec.	30 - 300 sec.

ii. Pressure Set Points

	Default	Range
System Pressure	(See Sys. Data Sheet)	0 - 999 psig
Pressure Sequencing Deadband	5 psid	0 - 999 psid
Low System Pressure Deadband	10 psid	0 - 999 psid
High System Pressure Deadband	30 psid	0 - 999 psid
Low Suction Press. Alarm (if available)	5 psig	0 - 999 psig
High Suction Press. Stop (if available)	System Pressure + 1	0 - 999 psig

iii. Power Set Points

	Default	Range
Lag 1 On Power	See Factory Default Sticker (inside control panel door)	0 – 999 Hp
Lag 1 Off Power	See Sticker	0 – 999 Hp
Lag 2 On Power (if available)	See Sticker	0 – 999 Hp
Lag 2 Off Power (if available)	See Sticker	0 – 999 Hp

iv. Flow Rate Set Points (optional)

	Default	Range
Lag 1 On Flow Rate	One Pump Capacity	0 - 9999 gpm
Lag 1 Off Flow Rate	85% of Pump Cap.	0 - 9999 gpm
Lag 2 On Flow Rate (if available)	200% of Pump Cap.	0 - 9999 gpm
Lag 2 Off Flow Rate (if available)	185% of Pump Cap.	0 - 9999 gpm

v. Speed Control

	Default	Range
VFD Minimum Speed	30 Hz	15 – 60 Hz
VFD Maximum Speed	60 Hz	15 – 60 Hz
VFD Manual Speed	50 Hz	Min. - Max. Speed
Lag Pump Start Speed	50 Hz	Min. - Max. Speed

vi. PID Set Points

	Default	Range
Proportional Gain	500 %	1 - 32767 %
Integral Time Constant	30 decisec.	0 - 32767 sec./10
Derivative Gain	100 %	1 - 100 %
Derivative Time Constant	5 centisec.	0 - 32767 sec./100

SP – Sump Pump

Liberty ELV280 Oil Minder Type Sump Pump

Liberty Pumps®

ELV-Series

Elevator Sump Pump Systems with OilTector® Control

Ideal for elevators, garages and areas where the discharge of oil/hydrocarbons into the environment is prohibited. Compliant with ASME A17.1 and local building and safety codes.

Features:

- Complete packaged system
- 1/3, 1/2 or 3/4 hp Sump Pump
- 1-1/2" Discharge
- OilTector® Control
- Remote Alarm
- 115 or 230 volt models
- Easy clamp-mount installation, with plug-in ready wiring

POWDER COATED TOUGH™

innovate. evolve.

ELV-Series System with OilTector® Control

The OilTector® control system is designed and approved for safe operation of pumping, alarming and monitoring of elevator sump pits, transformer vaults and other applications where oil and water must be detected. The OilTector® system will activate the pump to remove water from elevator pits in accordance with ASME A17.1, and will provide pumping of only water - even if an oil condition is detected. The OilTector® cycles the pump only in the water range. Oil and other harmful substances are not discharged into the environment. An alarm is activated in the event of a high water condition or high oil condition.

OilTector® Description of Operation

On water rise, the pump will activate when the water level reaches the "start" probe. Pump will remain on until the water level is below the "off" probe. When the "off" probe no longer senses water it turns the pump off, air or oil are ignored and an oil layer (if present) will not be pumped out of the sump. If the liquid level reaches the "alarm" probe and mechanical float, the system will differentiate between water and oil and activate the appropriate alarm.

ELV-Series Complete Sump Pump Systems (Pump, OilTector® Control, Alarm)

Model	*hp.*	*Volts*	*Wgt. lbs.*
ELV250	1/3	115 v.	34
ELV280	1/2	115 v.	40
ELV280HV	1/2	230 v.	40
ELV290	3/4	115 v.	42
ELV290HV	3/4	230 v.	42

Pump Only Models

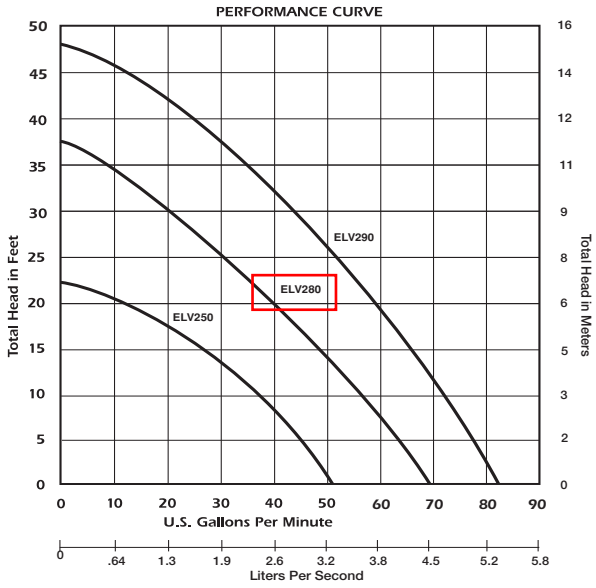
Model	*hp.*	*Volts*	*Wgt. lbs.*
EV250	1/3	115 v.	24
EV280	1/2	115 v.	30
EV280HV	1/2	230 v.	30
EV290	3/4	115 v.	32
EV290HV	3/4	230 v.	32

See 250-Series, 280-Series and 290-Series literature for complete pump specifications

OilTector® Control and Alarm Only

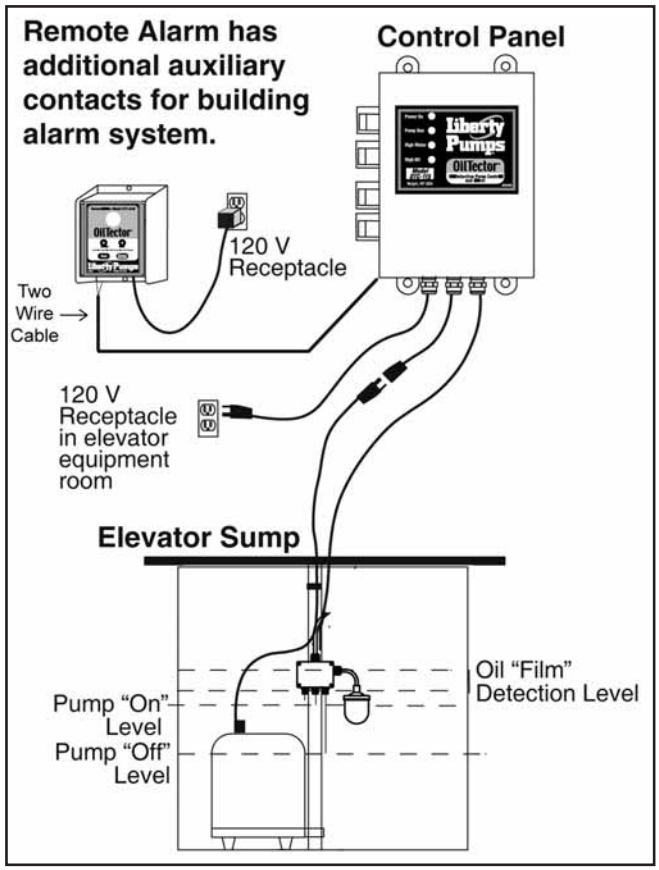
Model	*Volts*	*Max. hp*	*Wgt. lbs.*
OTC-115	115	1	9
OTC-230	230	2	9

Pump Performance Curve



Features:

- Heavy-duty 1/3, 1/2 or 3/4 hp. cast iron sump pump
- Oil resistant SJEOOW cord (25' standard length)
- Easy, clamp mounted pre-set level sensor holder
- No field adjustments required. OilTector® will turn pumps on and off, sound the high water alarm and high oil alarm with one easy installation.
- Control panel with separate pump and control circuits - Nema 1 enclosure. Height 8.75" x Width 6.5" x Depth 5"
- Plug-in ready pump cord and power to panel cord for quick and easy installation
- Remote alarm with additional auxiliary (24 VDC) contacts for connection to building automation system or SCADA system. Audio/visual warning.120 volt primary and 9 volt back-up powered.
- Power on, Pump Run, High water and High oil lights.
- **ASME A17.1 Compliant**



SSPMA Certified Pump Member ® c UL us LISTED c SA us Certified Pumps

Specifications subject to change without notice.

Liberty Pumps • 7000 Apple Tree Avenue • Bergen, New York 14416 • Phone 800-543-2550 Fax (585) 494-1839
www.libertypumps.com