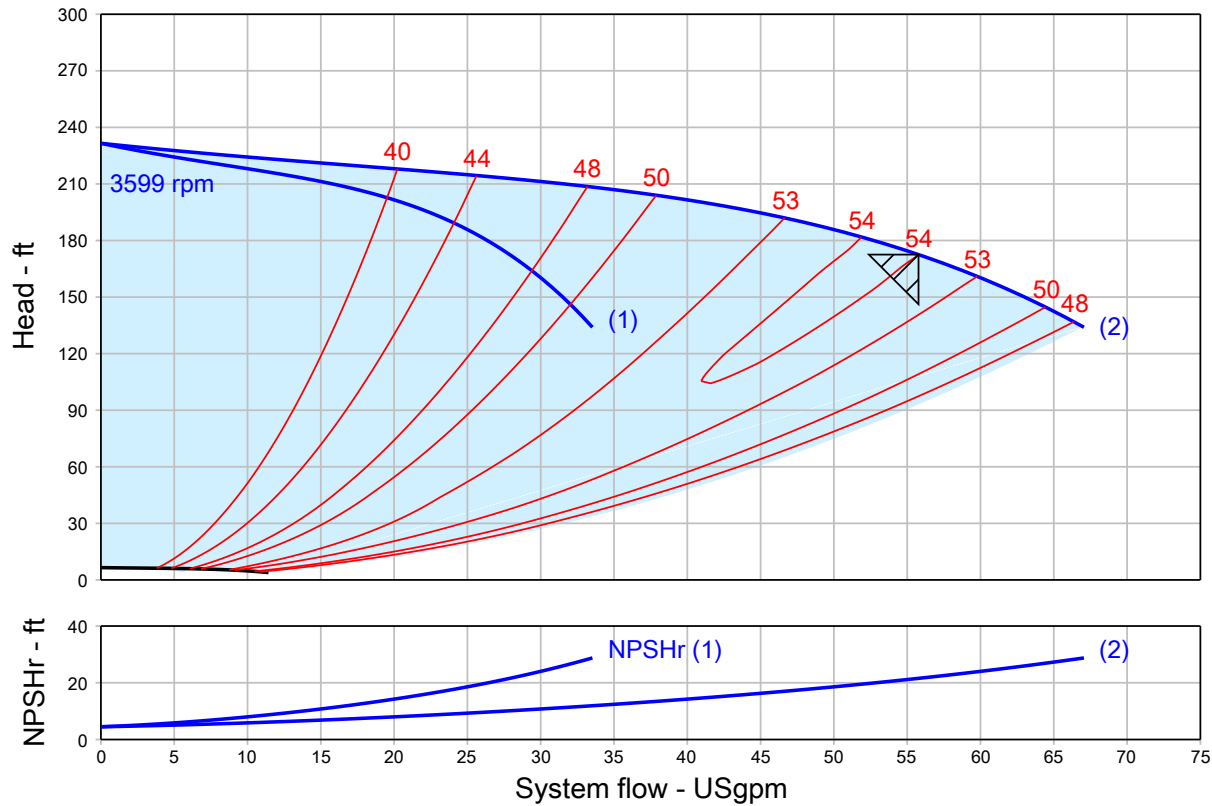


## Pump Performance Datasheet

Customer :	Quote Number / ID :	1561369
Customer ref. / PO :	Model :	Hydro MPC 2CME 5-5 3x230V 60Hz
Tag Number : Hydro MPC 2CME 5-5 3x230V 60Hz	Part Number :	99659063
Service :	Stages :	5
Quantity : 1	Based on curve number :	99381471
Quantity of pumps : 2 active + 0 standby	Date last saved :	12/29/2021 2:32 PM

Operating Conditions		Liquid	
System flowrate	: 55.77 USgpm	Liquid type	: Cold Water
Flowrate per pump	: 27.89 USgpm	Additional liquid description	:
Differential head / pressure, rated (requested)	: 172.5 ft	Temperature, max	: 68.00 deg F
Differential head / pressure, rated (actual)	: 172.5 ft	Fluid density, rated / max	: 1.000 / 1.000 SG
Suction pressure, min / max	: 0.00 / 0.00 psi.g	Viscosity, rated	: 1.00 cP
NPSH available, rated	: Ample	Vapor pressure, rated	: 0.34 psi.a
Site Supply Frequency	: 60 Hz	<b>Material</b>	
Power Supply	: 3ph 230V	Material selected	: Standard - Cast Iron / 304 Stainless Steel

Performance		Pressure Data	
Speed, rated	: 3599 rpm	Pump shut off pressure	: 100.2 psi.g
Speed, maximum	: 3599 rpm	Maximum allowable suction pressure	: 50.00 psi.g
Speed, minimum	: 600 rpm	<b>Driver &amp; Power Data (@Max density)</b>	
Pump efficiency	: 54.00 %	Motor sizing specification	: Max power (non-overloading)
NPSH required / margin required	: 21.56 / 0.00 ft	Margin over specification	: 0.00 %
nq (imp. eye flow) / S (imp. eye flow)	: 24 / 36 Metric units	Service factor	: 1.15
Head maximum, rated speed	: 231.5 ft	Rated power (based on duty point)	: 2 x 2.25 hp
Head rise to shutoff	: 34.21 %	Max power (non-overloading)	: 2 x 2.40 hp
Flow, best eff. point	: 26.95 USgpm	Motor rating	: 2 x 3.00 hp / 2.24 kW (Fixed)
Flow ratio, rated / BEP	: 103.46 %		
Speed ratio (rated / max)	: 100.00 %		
Head ratio (rated speed / max speed)	: 100.00 %		
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 0.98 / 1.00		
Selection status	: Acceptable		



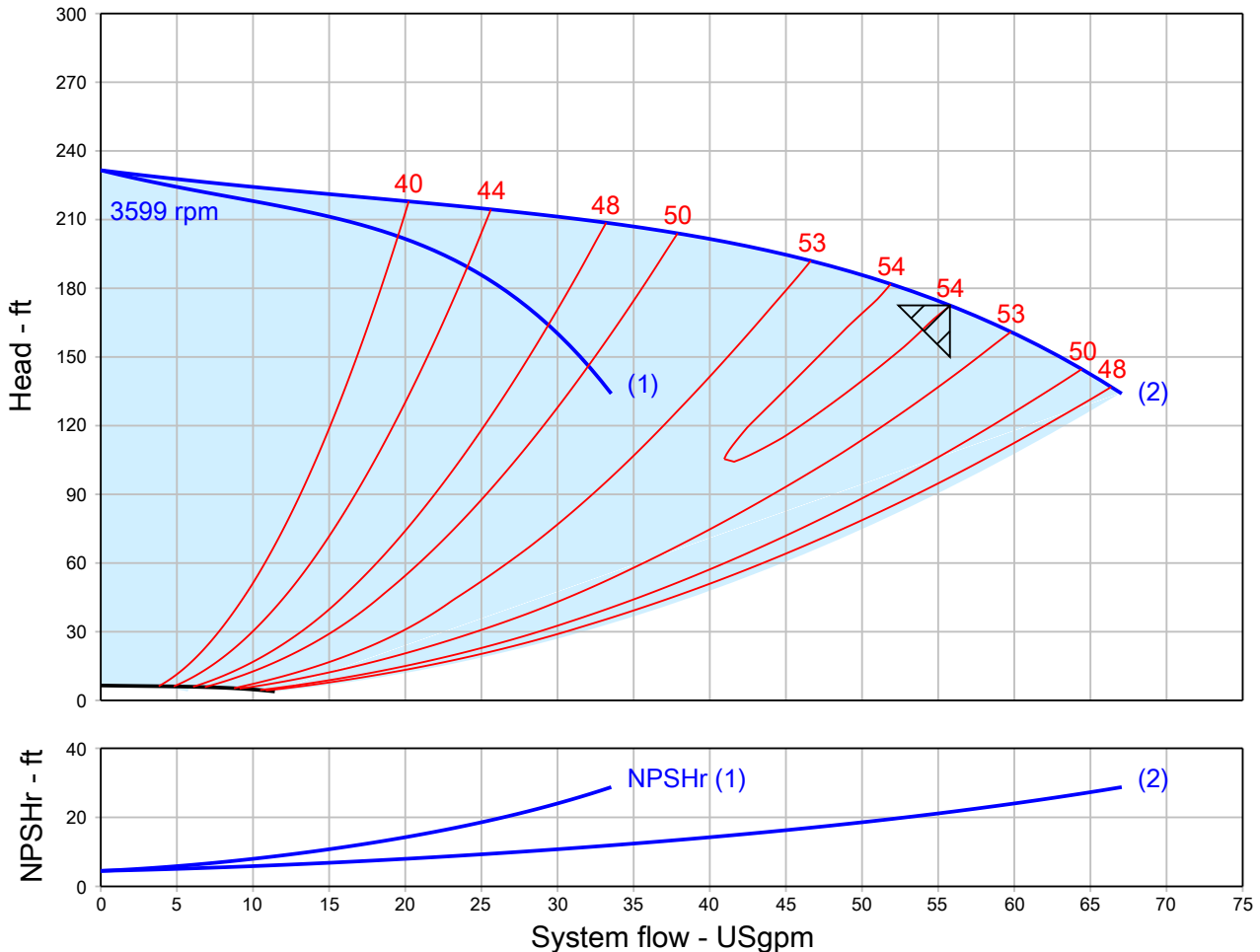
**Hydro MPC E with CME pumps**

QUOTE NUMBER / ID 1561369	UNIT TAG Hydro MPC 2CME 5-5 3x230V 60Hz	QUANTITY 1
REPRESENTATIVE	SERVICE	DATE
ENGINEER	SUBMITTED BY	DATE
CONTRACTOR	APPROVED BY	DATE
	ORDER #	

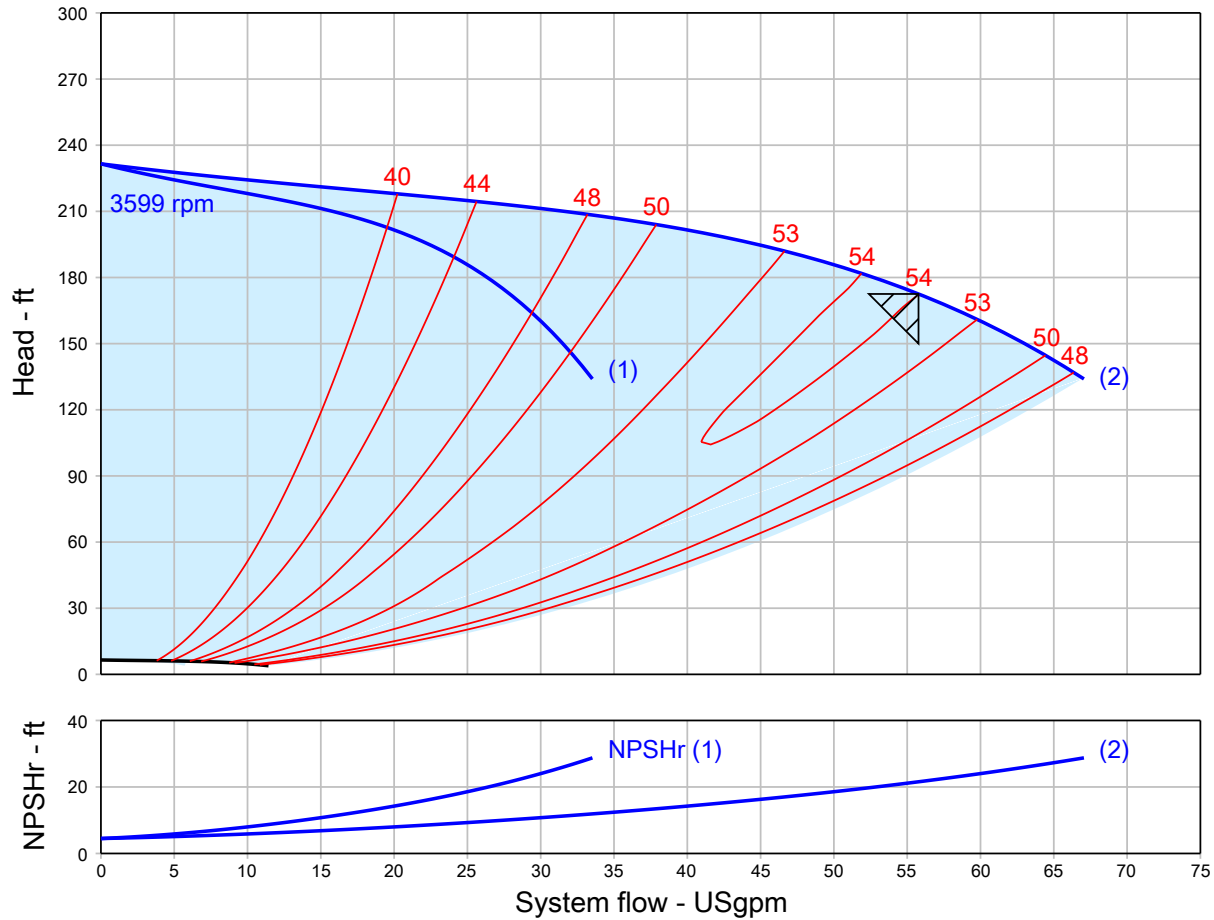


**Hydro MPC 2CME 5-5 3x230V 60Hz** Part Number 99659063  
**3480 rpm**

Conditions of Service		Pump Data		Motor Data	
Flow	27.89 USgpm	Material	Standard - Cast Iron / 304 Stainless Steel	Motor HP	3 HP
Head	172.5 ft	Pump shut off pressure	100.2 psi.g	BHP	2.25 HP
Liquid	Cold Water	Max Allowable Suction Pressure	50.00 psi.g	Enclosure	TEFC
Temperature	68.00 deg F	Efficiency	54 %	Voltage	200-240 V
NPSHr	21.56 ft			Phase	3 Phase
Viscosity	1.00 cP				
Specific Gravity	1.000 SG				

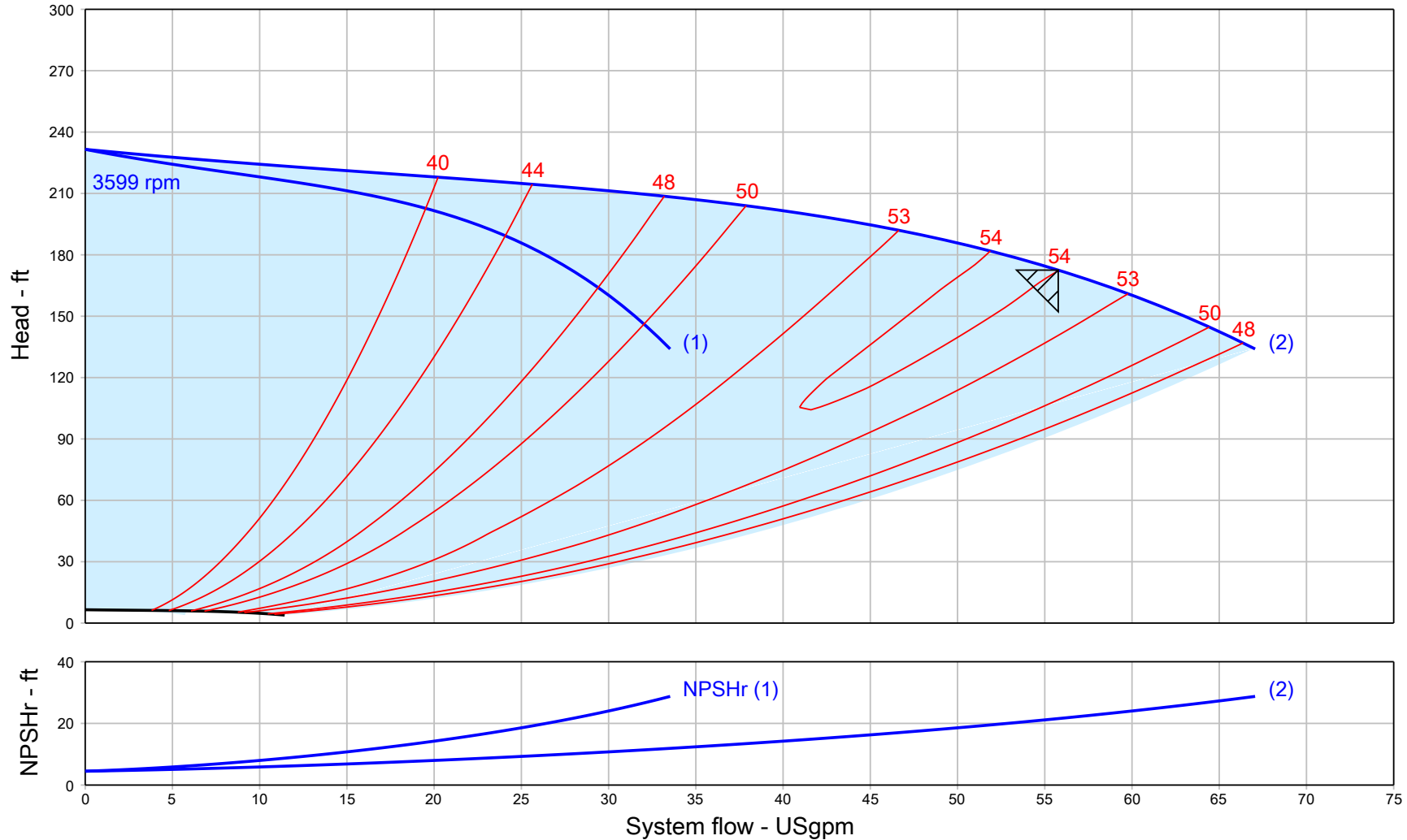


**Pump Performance Curve**



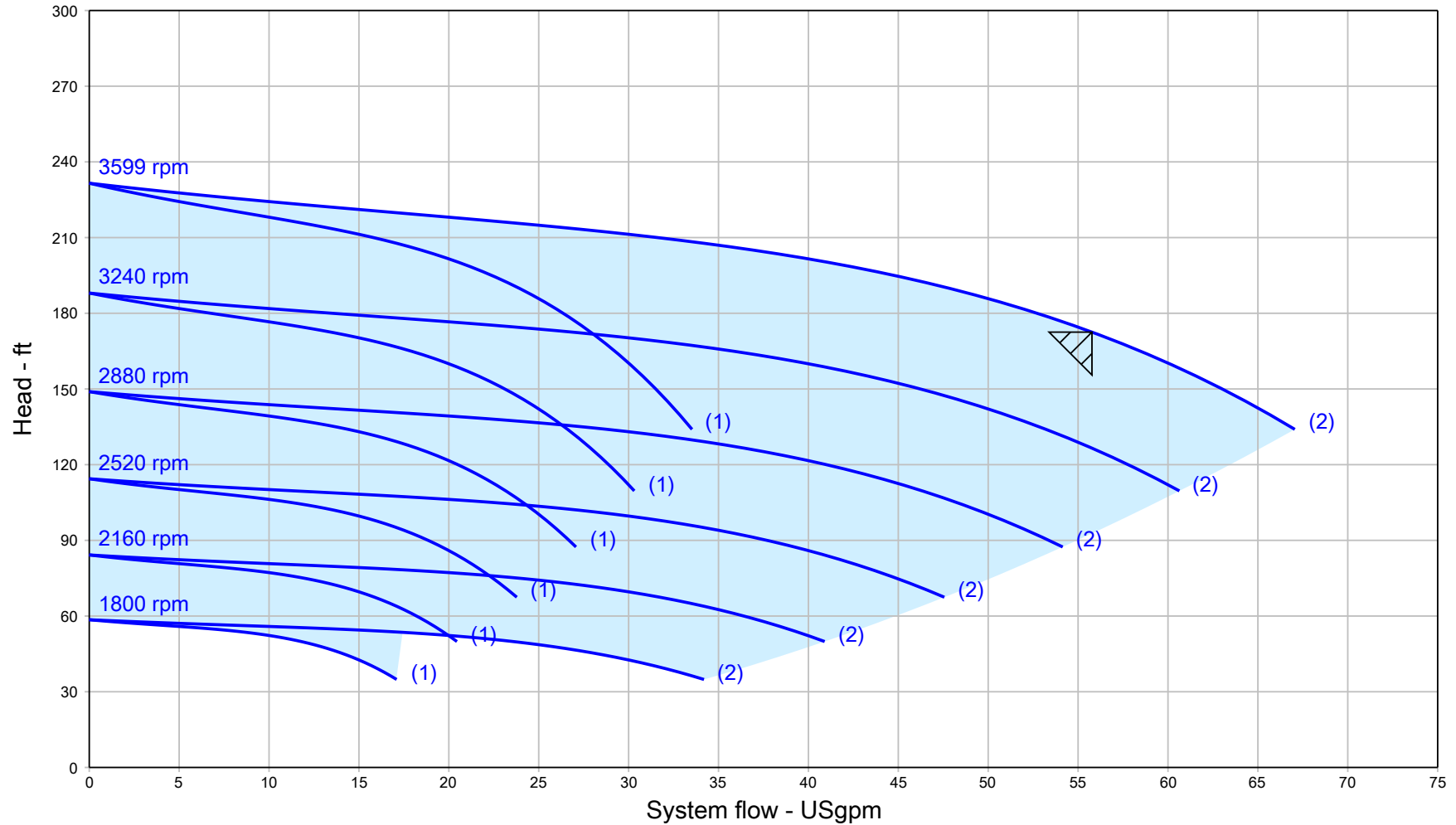
Customer	:	Model	: Hydro MPC 2CME 5-5 3x230V 60Hz
Customer ref. / PO	:	Stages	: 5
Tag Number	: Hydro MPC 2CME 5-5 3x230V 60Hz	Speed, rated	: 3599 rpm
Service	:	Based on curve number	: 99381471
Quantity	: 1	Pump efficiency	: 54.00 %
Quote Number / ID	: 1561369	Rated power (based on duty point)	: 2 x 2.25 hp
Date last saved	: 12/29/2021 2:32 PM	NPSH required	: 21.56 ft
System flowrate	: 55.77 USgpm	Fluid density, rated / max	: 1.000 / 1.000 SG
Flowrate per pump	: 27.89 USgpm	Viscosity	: 1.00 cP
Differential head / pressure, rated	: 172.5 ft		
Pressure control curve	: None		

**Pump Performance Curve**



Project name : gogrundfos.com	Tag Number : Hydro MPC 2CME 5-5 3x230V	Speed, rated : 3599 rpm
Consulting engineer :	60Hz	System flowrate : 55.77 USgpm
Customer :	Service :	Flowrate per pump : 27.89 USgpm
Customer ref. / PO :	Model : Hydro MPC 2CME 5-5 3x230V	Differential head / pressure, rated : 172.5 ft
Quote Number / ID : 1561369	60Hz	Rated power (based on duty point) : 2 x 2.25 hp
Date last saved : 12/29/2021 2:32 PM	Quantity : 1	Max power (non-overloading) : 2 x 2.40 hp
Pressure control curve : None	Quoted By (Sales Office) : HURLEY ENGINEERING COMPANY	Pump efficiency : 54.00 %
	Quoted By (Sales Engineer) : Devin Carle	Based on curve number : 99381471

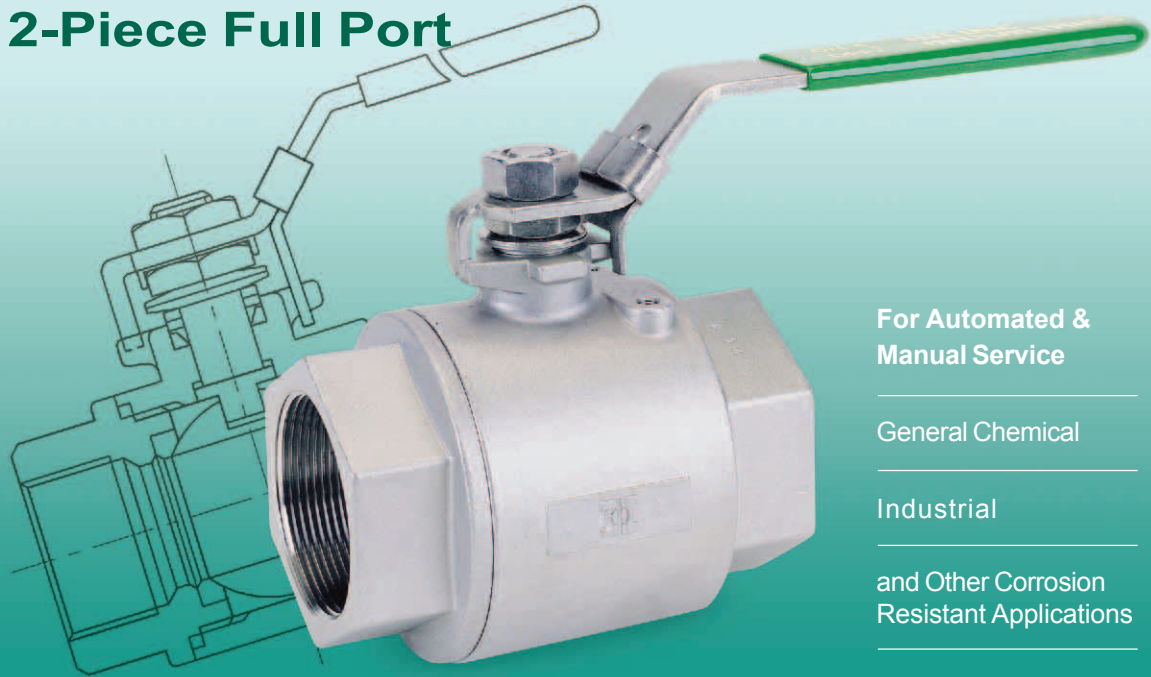
**Multi-Speed Performance Curve**



Project name	: gogrundfos.com	Tag Number	: Hydro MPC 2CME 5-5 3x230V 60Hz	Speed, rated	: 3599 rpm
Consulting engineer	:	Service	:	System flowrate	: 55.77 USgpm
Customer	:	Model	: Hydro MPC 2CME 5-5 3x230V 60Hz	Flowrate per pump	: 27.89 USgpm
Customer ref. / PO	:	Quantity	: 1	Differential head / pressure, rated	: 172.5 ft
Quote Number / ID	: 1561369	Quoted By (Sales Office)	: HURLEY ENGINEERING COMPANY	Fluid density, rated / max	: 1.000 / 1.000 SG
Date last saved	: 12/29/2021 2:32 PM	Quoted By (Sales Engineer)	: Devin Carle	Viscosity	: 1.00 cP
Pressure control curve	: None			Based on curve number	: 99381471

# 202F Ball Valve

## 2-Piece Full Port



For Automated &  
Manual Service

General Chemical

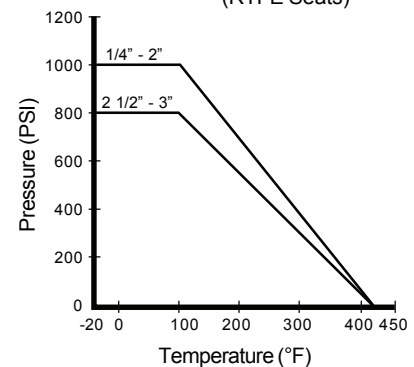
Industrial

and Other Corrosion  
Resistant Applications

## Standard Features and Benefits

- **Economical 2-Piece Design**
- **Full Port**  
Improves flow resulting in increased process efficiencies
- **Blow-Out-Proof Stem**  
Stem is bottom loaded to prevent removal when valve is in service
- **Live-Loaded Stem Packing**  
Provides constant load on the stem seal and extends service life
- **Locking Device**  
Enables plant personnel to secure valve in open or closed position when manually operated
- **Corrosion Resistant**  
Made of 316 stainless steel (A351 Gr. CF8M) for superior chemical resistance and longer service life
- **Investment Cast**  
Improves dimensional control and reduces porosity

202F Pressure / Temperature Chart  
(RTFE Seats)



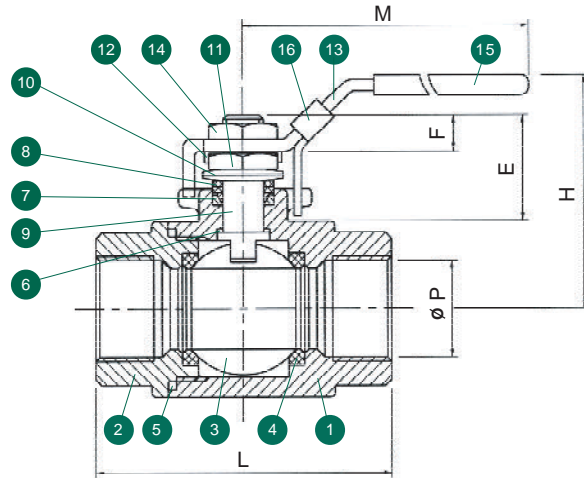
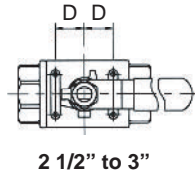
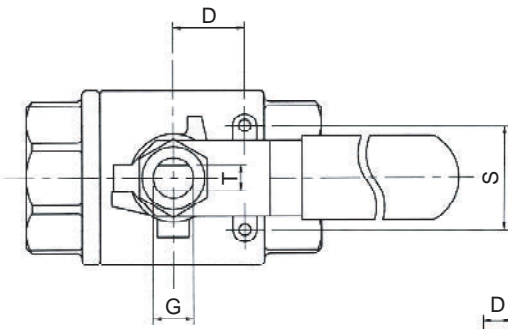
## Operating Conditions

- Temperature range (RTFE):  
-20°F ~ 420°F
- Maximum pressure (RTFE):  
1000 PSI WOG (1/4" ~ 2")  
800 PSI WOG (2 1/2" ~ 3")

## Specifications

- All valves shell and seat tested to ANSI/ASME B16.34 and API 598





Valve Components			
#	Part Name	Material	Qty.
1	Body	A351 Gr. CF8M	1
2	End Cap	A351 Gr. CF8M	1
3	Ball	316SS	1
4	Seat	RTFE (15% G.F.)	2
5	Body Seal	PTFE	1
6	Thrust Washer	RTFE (15% C.F.)	1
7	Stem Packing Set	PTFE	1
8	Packing Gland	304SS	1
9	Stem	316SS	1
10	Belleville Washer	304SS	2
11	Gland Nut	304SS	1
12	Gland Nut Lock Washer	304SS	1
13	Handle	304SS	1
14	Handle Nut	304SS	1
15	Handle Cover	Vinyl	1
16	Locking Device	304SS	1

Dimensions (Inches)											
Size	L	P	H	E	F	M	D	S	T	G	Weight (lbs)
1/4	2.16	0.44	1.90	0.82	0.30	4.40	0.50	1.10	0.197	0.31	0.60
3/8	2.16	0.50	1.90	0.82	0.30	4.40	0.50	1.10	0.197	0.31	0.63
1/2	2.36	0.60	2.00	0.82	0.30	4.40	0.50	1.10	0.197	0.31	0.72
3/4	2.95	0.78	2.20	0.89	0.30	5.00	0.88	1.38	0.256	0.39	1.30
1	3.26	0.98	2.50	1.20	0.35	6.10	0.88	1.38	0.315	0.47	1.75
1 1/4	3.82	1.25	2.75	1.20	0.35	6.10	0.94	1.50	0.315	0.47	3.00
1 1/2	4.29	1.50	3.30	1.40	0.51	7.40	0.94	1.50	0.381	0.55	4.60
2	5.08	2.00	3.75	1.40	0.51	7.40	0.94	1.50	0.381	0.55	7.70

Discharge Isolation Valves

## 202F Ordering Information

Example: 2" Full Port Ball Valve with Lever Handle and Locking Device, 316SS Body and Trim, RTFE (15% G.F.) Seats and PTFE Seal, NPT Ends

202F	D	6	6	6	6	R	T	TT	2	S
Valve Series	Valve Size	Body Material	End Material*	Ball Material	Stem Material	Seat	Seal	End Connection	Port	Ball Config.
202F - Full Port	2 1/4"	6 - A351 Gr. CF8M (316)	6 - A351 Gr. CF8M (316)	6 - A351 Gr. CF8M (316)	6 - A351 Gr. CF8M (316)	R - RTFE (15% G.F.)	T - PTFE	T - NPT	2 - 2 Way	S - Straight Port
	3 3/8"									
	5 1/2"	2 - A216 Gr. WCB	2 - A216 Gr. WCB			C - RTFE (15% C.F.)	F - 50% 316SS Filled PTFE			7 - ASEV Ball
	7 3/4"									
	A 1"									
	B 1 1/4"									
	C 1 1/2"									
	D 2"									

\* End Material must be the same as Body Material  
 Due to continuous product development, information may change without notice.

**INLINE**  
 BALLVALVE.COM  
 INLINE INDUSTRIES, INC.  
 4701-A Littlejohn Street  
 Baldwin Park, CA 91706  
 Tel: (626) 813-6188  
 Fax: (626) 813-6186  
 www.ballvalve.com  
 info@ballvalve.com

Distributed by:

Ball Valves



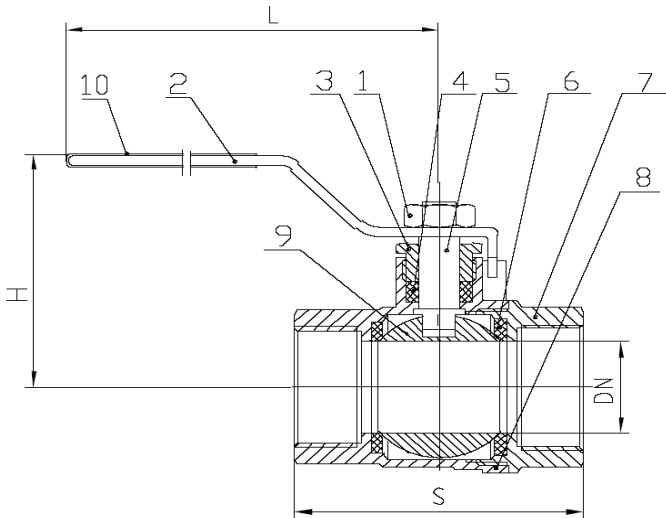
General

- Threaded Ends
- Blow Out Proof Stem
- 600 WOG
- 2-Piece Body
- Teflon Seats
- Teflon Packing

Dimensions & Weights

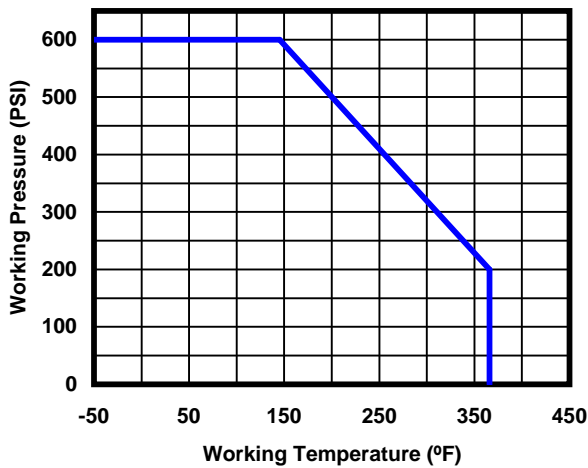
Size	DN (in)	S (in)	H (in)	L (in)	WT. (lb)
1/4"	0.39	1.76	1.75	3.54	0.35
3/4"	0.75	2.50	2.18	3.94	0.79
1-1/4"	1.26	3.42	2.87	4.80	1.75
1-1/2"	1.57	3.76	3.48	5.91	2.47
2"	1.97	4.25	3.82	5.91	3.46

Suction Isolation Valves



MATERIAL SPECIFICATIONS

NO.	PART	MATERIAL (ASTM)
1	NUT	ZINC PLATED STEEL
2	HANDLE	ZINC PLATED STEEL
3	BONNET	BRASS (C37000)
4	PACKING	TEFLON
5	STEM	BRASS (C37000)
6	BALL SEAT	TEFLON
7	END PIECE	LOW LEAD BRASS (LTN60-6)
8	BODY	LOW LEAD BRASS (LTN60-6)
9	BALL	LOW LEAD BRASS (LTN60-6)
10	SLEEVE	PVC



APPROVALS

- NSF 61, IAPMO - N4359
- AB1953, IAPMO - 5653





# GNVP 32

## Check Valve

GNVP Valves are designed exclusively for Grundfos CR pumps with threaded (oval) flanges.



## Applications

GNVP valves are used in Grundfos Booster systems in domestic water systems, municipal water systems, irrigation and industrial applications where a one-way water flow is required.

Maximum Operating Pressure: 232 psi (16 bar)

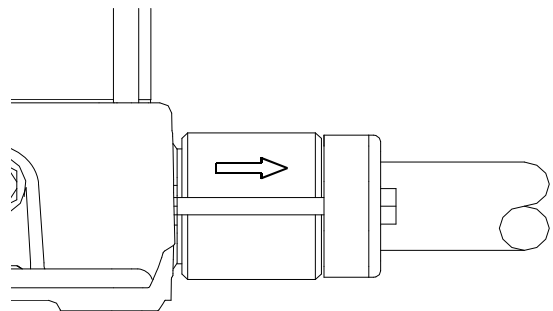
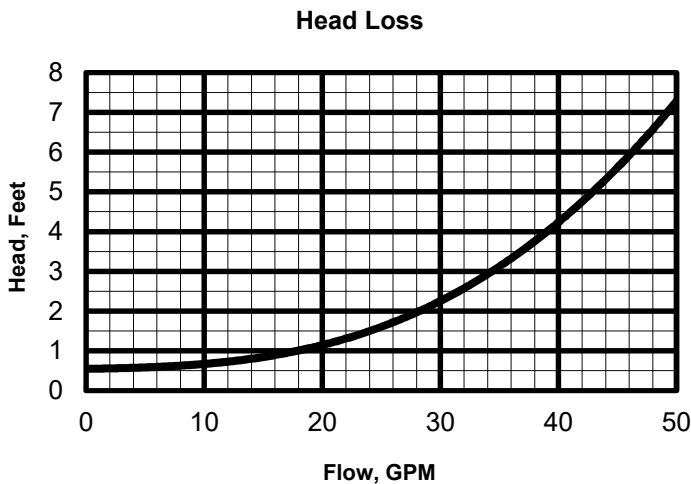
Liquid Temperature: 32°F to 140°F (0°C to 60°C)

## Construction

The valve body and poppet are made of high strength, corrosion resistant polyacetal. When fitted between two flanges, the EPDM o-rings provide the necessary seal for leak free operation.

## Materials

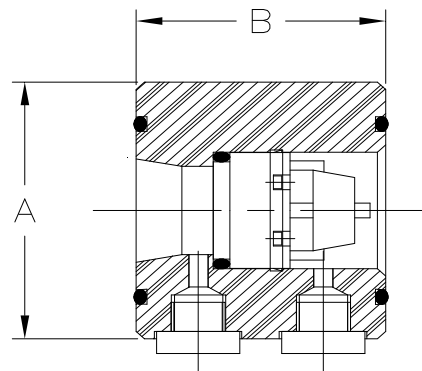
Component	Materials
Valve Body	Polyacetal (POM)
Valve Cone	Polyacetal (POM)
Spring	Stainless Steel
O-rings	EPDM



The GNVP valve is fitted between the base and flange of Grundfos CR 1s/1/3/5 pumps by means of bolts and nuts. An arrow on the valve body indicates direction of flow.

## Dimensions and weights

Type	A		B		Weight	
	mm	in	mm	in	kg	lb
GNVP 32, 1 1/4"	70	2.76	60	2.36	0.24	0.53



Part Number: 91040183

# D80 Series

Dry or Liquid Filled • Stainless Steel Case

UTILITY GAUGES



D82LFB shown



Standard

Optional

- ▶ 1 1/2", 2", 2 1/2", 4" Dial Sizes
- ▶ ±1.6% Accuracy (1% Optional)
- ▶ Stainless Steel Case
- ▶ Glycerine Fill Standard

The Trerice **D80 Series** Industrial Gauge is designed for rugged performance requirements at an economical cost. This liquid filled gauge is furnished with a stainless steel case and crimped ring. Wetted parts are either bronze tube with Lead-Free (PBF) brass socket or stainless steel.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

## Specifications

Models	Wetted Parts
D82B (dry)	Bronze tube, brass socket
D82LFB (liquid filled)	Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
D83SS (dry)	316 Stainless steel tube & socket
D83LFSS (liquid filled)	
Dial Sizes	1 1/2", 2", 2 1/2", 4"
Fill	Glycerine, other fills available See Optional Features Section
Movement	D82: Brass D83: 316 Stainless steel
Connection	Lower male or center back male, (Lower back male 4" Dial only)
Case	304 stainless steel, stem-mounted flangeless
Ring	Crimped 304 stainless steel
Window	Acrylic
Pointer	Plain, black finished
Dial Face	Aluminum, white background with black graduations and markings
Accuracy	±1.6% Full Scale (1% available as an option)
Maximum Temperature	150°F (65°C)
Approximate Shipping Weight	1 1/2" Dial Size: 0.4 lbs [0.18 kg] 2" Dial Size: 0.4 lbs [0.18 kg] 2 1/2" Dial Size: 0.5 lbs [0.23 kg] 4" Dial Size: 1.0 lbs [0.45 kg]

## HOW TO ORDER

Sample Order Number: **D82LFB 25 02 L A 110**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
D82LFB	15 1 1/2"	01 1/8 NPT*	L Lower	A psi	See Standard Ranges
D83LFSS	20 2"	02 1/4 NPT**	B Back	D psi/kPa	
D82B	25 2 1/2"	04 1/2 NPT***			
D83SS	40 4"				

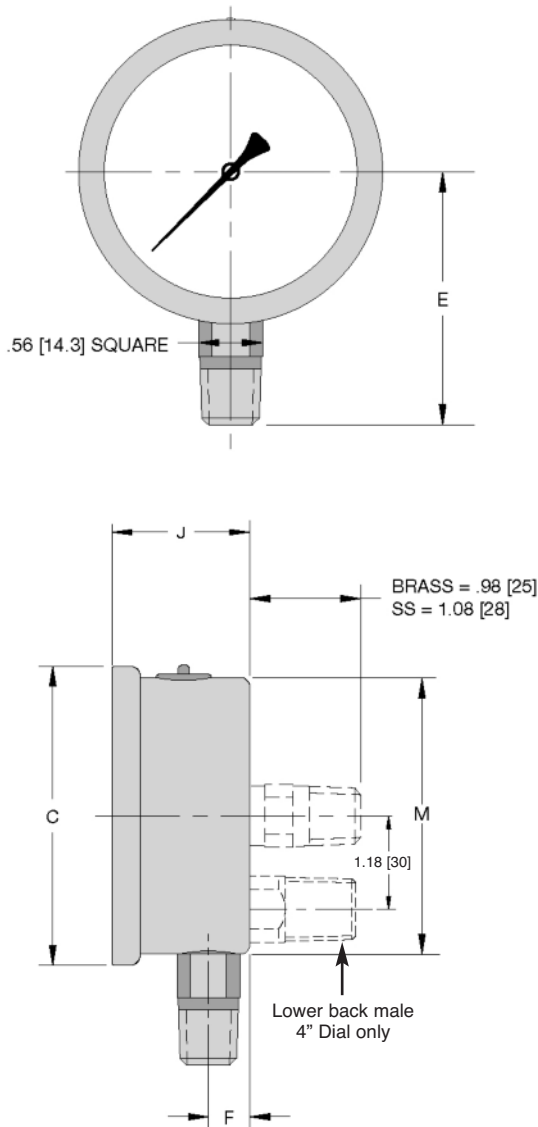
\* 1/8 NPT connection size not available with 4" dial size.  
 \*\* 1/4 NPT connection size not available with 1 1/2" dial size.  
 \*\*\* 1/2 NPT connection size only available with 4" dial size.

# D80 Series

## Dry or Liquid Filled • Stainless Steel Case

All dimensions are nominal. Dimensions in [ ] are in millimeters.

UTILITY GAUGES



### Standard Ranges

psi Ranges (A)		D82		D83	
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5	5	0.5
020	30" Hg to 15 psi	10/5	1/0.5	10/5	1/0.5
030	30" Hg to 30 psi	10/5	1/1	10/5	1/1
040	30" Hg to 60 psi	10/10	2/1	10/10	2/1
050	30" Hg to 100 psi	30/20	2/2	30/20	2/2
060	30" Hg to 150 psi	30/30	5/2	30/30	5/2
070	30" Hg to 300 psi	30/50	5/5	30/50	5/5
080	0 to 15 psi	3	0.2	3	0.2
090	0 to 30 psi	5	0.5	5	0.5
100	0 to 60 psi	10	1	10	1
110	0 to 100 psi	10	1	10	1
120	0 to 160 psi	20	2	20	2
130	0 to 200 psi	20	2	20	2
140	0 to 300 psi	50	5	50	5
150	0 to 400 psi	50	5	50	5
160	0 to 600 psi	100	10	100	10
180	0 to 1000 psi	100	20	100	20
190	0 to 1500 psi	300	20	300	20
200	0 to 2000 psi	200	20	200	20
210	0 to 3000 psi	500	50	500	50
220	0 to 5000 psi	1000	100	1000	100

Ranges over 5000 PSI are not available on D82LFB.

230	0 to 10000 psi	N/A	N/A	2000	200
240	0 to 15000 psi	N/A	N/A	3000	200

For dual scale ranges specify the appropriate **Units of Measure: D** (psi/kPa) followed by the corresponding **A** (psi) **Range Code**

Dial Size	C	E	F	J	M
1 1/2" D82	1.85 [47]	1.50 [38]	0.32 [8]	1.06 [27]	1.61 [41]
1 1/2" D83	1.85 [47]	1.50 [38]	0.32 [8]	1.06 [27]	1.61 [41]
2" D82	2.28 [58]	1.89 [48]	0.39 [10]	1.14 [29]	2.05 [52]
2" D83	2.28 [58]	2.05 [52]	0.35 [9]	1.18 [30]	2.05 [52]
2 1/2" D82	2.68 [68]	2.24 [57]	0.39 [10]	1.18 [30]	2.44 [62]
2 1/2" D83	2.68 [68]	2.32 [59]	0.51 [13]	1.38 [35]	2.44 [62]
4" D82	4.29 [109]	3.07 [78]	0.47 [12]	1.42 [36]	3.90 [99]
4" D83	4.29 [109]	3.94 [100]	0.75 [19]	1.93 [49]	3.94 [100]

# Data sheet

# MBS 3000 pressure transmitter for industrial applications

## Introduction

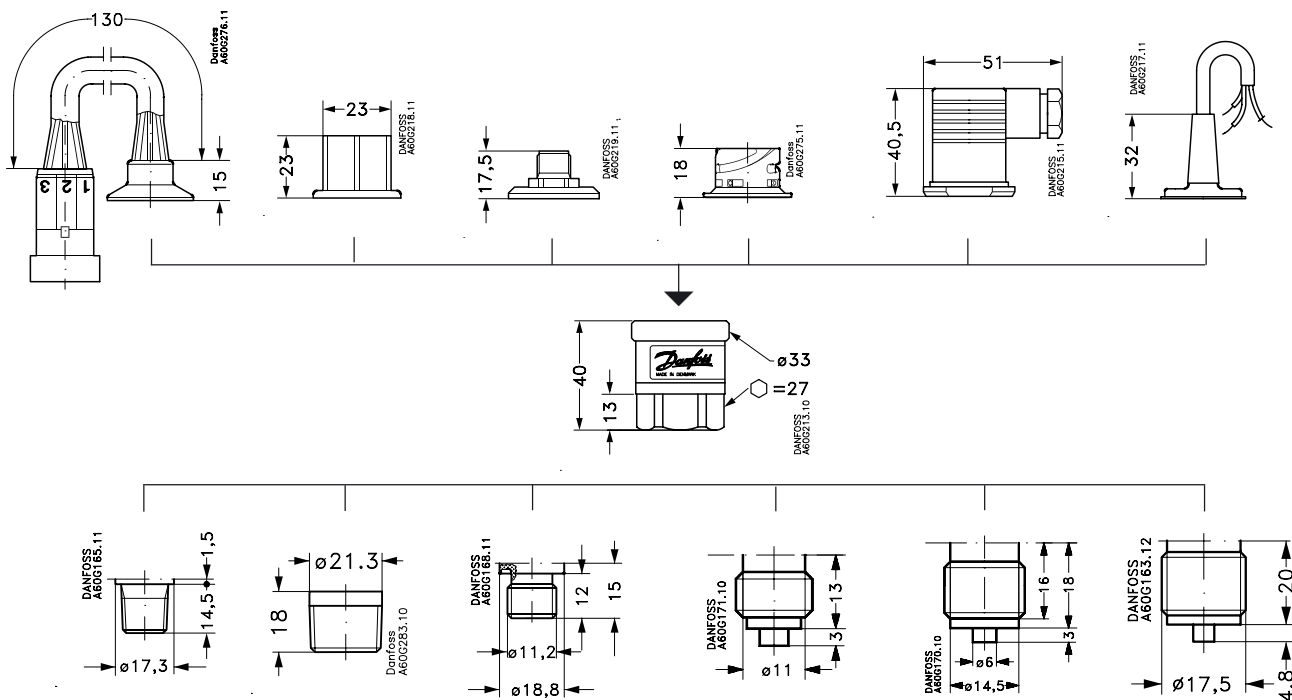


- Designed for use in severe industrial environments
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- All standard output signals: 4-20 mA, 0-5 V, 1-5 V, 1-6 V, 0-10 V
- A wide range of pressure and electrical connections
- Temperature compensated and laser calibrated
- Typical applications:
  - Pumps
  - Compressors
  - Pneumatics
  - Water treatment

## Dimensions

### Ordering

Type code Page 4	8	2	5	7	1	3
	AMP Superseal 1.5 series (male)	AMP Econoseal J series (male)	IEC 947-5-2 M12x1, 4-pin	ISO 15170-A1-3.2-Sn (Bayonet plug)	DIN 43650, Pg 9	2 m screened cable



### Ordering

	1/4 - 18 NPT	1/2 - 14 NPT	DIN 3852-E-G1/4 Gasket: DIN 3869-14	G 1/4 A (EN 837)	G 3/8 A (EN 837)	G 1/2 A (EN 837)
Type code page 4	AC04	AC08	GB04	AB04	AB06	AB08

Technical data

Main specifications

Pressure connections	see page 1							
Measuring ranges [bar]	0-1 0-25	0-1.6 0-40	0-2.5 0-60	0-4 0-100	0-6 0-160	0-10 0-250	0-16 0-400	0-600
Output signals	4-20 mA	0-5 V	1-5 V	1-6 V	0-10 V			
Electrical connections	see page 3							

Performance (IEC 770)

Accuracy	±0.5% FS (typ.) ±1% FS (max.)
Non-linearity (best fit straight line)	≤ ±0.5% FS
Hysteresis and repeatability	≤ ±0.1% FS
Thermal zero point shift	≤ ±0.1% FS/10K (typ.) ≤ ±0.2% FS/10K (max.)
Thermal sensitivity (span) shift	≤ ±0.1% FS/10K (typ.) ≤ ±0.2% FS/10K (max.)
Response time	< 4 ms
Overload pressure	6 × FS (max. 1500 bar)
Burst pressure	6 × FS (max. 2000 bar)
Durability, P: 10-90% FS	>10×10 <sup>6</sup> cycles

Electrical specifications

	Nom. output signal (short-circuit protected)		
	4 – 20 mA	0-5, 1-5, 1-6 V d.c.	0-10 V d.c.
Supply voltage [U <sub>B</sub> ], polarity protected	9 → 32 V d.c.	9 → 30 V d.c.	15 → 30 V d.c.
Supply - current consumption	-	≤ 5 mA	≤ 8 mA
Supply voltage dependency	≤ ±0.05% FS/10 V		
Current limitation (linear output up to 1.5x nom. range)	34 mA (typ.)	-	
Output impedance	≤ 25Ω		
Load [R <sub>L</sub> ] (load connected to 0V)	R <sub>L</sub> ≤ (U <sub>B</sub> -9V)/0.02	R <sub>L</sub> ≥ 10 kΩ	R <sub>L</sub> ≥ 15 kΩ

Environmental conditions

Medium temperature range	-40 → +85°C		
Ambient temperature range (depending on electrical connection)	see page 3		
Compensated temperature range	0 → +80°C		
Transport temperature range	-50 → +85°C		
EMC - Emission	EN 61000-6-3		
EMC - Immunity	Electrostatic discharge	Air mode 8 kV	EN 61000-6-2
		Contact mode 4 kV	EN 61000-6-2
	RF field	10 V/m, 26 MHz - 1 GHz	EN 61000-6-2
		conducted 10 V <sub>rms</sub> , 150 kHz - 30 MHz	EN 61000-6-2
	Transient	burst 4 kV (CM), Clamp	EN 61000-6-2
surge 1 kV (CM,DM), Rg = 42Ω		EN 61000-6-2	
Insulation resistance	> 100 MΩ at 100 V d.c.		
Mains frequency test	500 V, 50 Hz	SEN 361503	
Vibration stability	Sinusoidal	15.9 mm-pp, 5Hz-25Hz	IEC 60068-2-6
		20 g, 25 Hz - 2 kHz	
	Random	7.5 g <sub>rms</sub> , 5 Hz - 1 kHz	IEC 60068-2-34, IEC 60068-2-36
Shock resistance	Shock	500 g / 1 ms	IEC 60068-2-27
	Free fall		IEC 60068-2-32
Enclosure (depending on electrical connection)	see page 3		

Mechanical characteristics

Materials	Wetted parts	DIN 17440-1.4404 (AISI 316 L)
	Enclosure	DIN 17440-1.4404 (AISI 316 L)
	Electrical connections	see page 3
Weight (depending on pressure connection and electrical connection)	0.2-0.3 kg	

Electrical connections

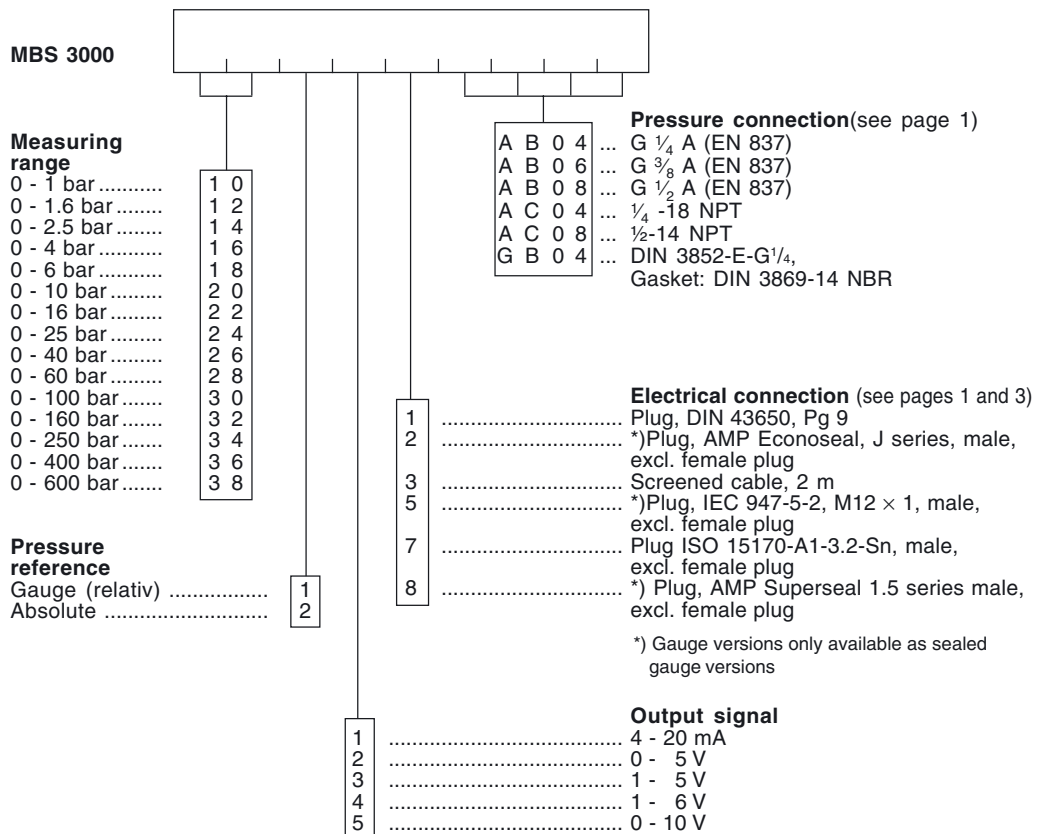
Type code, page 4					
1	2	5	7	8	3
DIN 43650, Pg 9 	AMP Econoseal J series (male) 	IEC 947-5-2 M12x1 	ISO 15170-A1-3.2-Sn (Bayonet plug) 	AMP Superseal 1.5 series (male) 	2 m screened cable 
<i>Ambient temperature</i>					
-40 → + 85 °C	-40 → + 85 °C	-25 → +85 °C	-40 → +85 °C	-40 → +85 °C	-30 → +85 °C
<i>Enclosure</i>					
IP 65	IP 67	IP 67	IP 67 / IP 69K	IP 67	IP67
<i>Materials</i>					
Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6 <sup>1)</sup>	Nickel plated brass, CuZn/Ni	Glass filled polyester, PBT	Glass filled polyamid, PA 6.6 <sup>2)</sup>	Polyolifin cable with PE shrinkage tubing
<i>Electrical connection, 4-20 mA output (2 wire)</i>					
Pin 1: +supply Pin 2: ÷supply Pin 3: Not used Earth: Connected to MBS housing	Pin 1: +supply Pin 2: ÷supply Pin 3: Not used	Pin 1: +supply Pin 2: Not used Pin 3: Not used Pin 4: ÷supply	Pin 1: +supply Pin 2: ÷supply Pin 3: Ventilation Pin 4: Not used	Pin 1: +supply Pin 2: ÷supply Pin 3: Not used	Brown wire: +supply Black wire: ÷supply Red wire: Not used Orange: Not used Screen: Not connected to MBS housing
<i>Electrical connection, 0-5V, 1-5V, 1-6V, 0-10V output</i>					
Pin 1: +supply Pin 2: ÷supply Pin 3: Output Earth: Connected to MBS housing	Pin 1: +supply Pin 2: ÷supply Pin 3: Output	Pin 1: +supply Pin 2: not used Pin 3: Output Pin 4: ÷supply	Pin 1: +supply Pin 2: Output Pin 3: Ventilation Pin 4: ÷supply	Pin 1: +supply Pin 2: ÷supply Pin 3: Output	Brown wire: Output Black wire: ÷supply Red wire: + supply Orange: Not used Screen: Not connected to MBS housing

1) Female plug: Glass filled polyester, PBT  
 2) Wire: PETFE (teflon)  
 Protection sleeve: PBT mesh (polyester)

**Ordering of standard MBS 3000 with DIN 43650 plug Pg 9**

Pressure connection	Pressure range Pe	Type	Code no.
G 1/4 A (EN 837)	0 - 1 bar	MBS 3000 1011-1 AB04	060G1113
	0 - 1.6 bar	MBS 3000 1211-1 AB04	060G1429
	0 - 2.5 bar	MBS 3000 1411-1 AB04	060G1122
	0 - 4 bar	MBS 3000 1611-1 AB04	060G1123
	0 - 6 bar	MBS 3000 1811-1 AB04	060G1124
	0 - 10 bar	MBS 3000 2011-1 AB04	060G1125
	0 - 16 bar	MBS 3000 2211-1 AB04	060G1133
	0 - 25 bar	MBS 3000 2411-1 AB04	060G1430
	0 - 40 bar	MBS 3000 2611-1 AB04	060G1105
	0 - 60 bar	MBS 3000 2811-1 AB04	060G1106
	0 - 100 bar	MBS 3000 3011-1 AB04	060G1107
	0 - 160 bar	MBS 3000 3211-1 AB04	060G1112
	0 - 250 bar	MBS 3000 3411-1 AB04	060G1111
	0 - 400 bar	MBS 3000 3611-1 AB04	060G1109
0 - 600 bar	MBS 3000 3811-1 AB04	060G1110	

**Ordering of special versions**




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# GRUNDFOS

Panel Part Number:  
99651208

Description  
Control MPC E  
2 X 2HP  
3 X 208/240V

Selected Options: System Fault Light, Audible Alarm, Surge Protection, Pump Run Light, Normal/Emergency Switch

0	6/19/2019	Control MPC E 2 X 2HP 3 X 208/240V	This drawing and its content is the property of GRUNDFOS. It may not be copied for third parties or competitors. Changes are only to be made by GRUNDFOS.	PROJECT: 99651208		Panel Part Number: 99651208	SHEET: 1/10
1	8/7/2019						
2	8/16/2019						
EDM/Rev	Date			EDW-WD-GPC-1299			



### Feeder Circuit Protection:

Feeder circuit protection to be provided by others.  
Type and size to be based on local, state and national electrical codes

**SCCR Rating:** 100 kA RMS Symmetric, 240V

**UL Type Rating:** 3R

### Largest Motor FLA and Panel Maximum FLA:

Motor Horsepower	2HP
Motor FLA	5.4FLA
Panel Max. FLA	11.8FLA

Wire Type	Color	Abbr.
+12/24VDC Power/PLC Input(s)	Blue	BU
-12/24VDC Power/PLC Input(s)	Blue w/White Stripe	BUWH
115VAC Primary Line Power	Black	BK
115VAC Neutral	White	WH
Ground/PE	Green/Yellow Stripe	GNYE
Analog Inputs	Orange	OG
Analog Outputs	Orange	OG
Digital Inputs (CU Components)	Violet	VT
Ground for Digital Inputs (CU Components)	Violet w/White Stripe	VTWH
Digital Outputs	Yellow	YE
Power L1	Black	BK
Power L2	Orange	OG
Power L3	Red	RD
Power Neutral	White	WH
All Other Wiring	Brown	BN

### Safety / Application Notes:

**\*\* Please Reference the "BOOSTERPAQ - HYDRO MPC"**

**Installation and Operation Instructions "BEFORE" Applying power to Panel.**

\*\* Power supply wires in front of main disconnect switch have dangerous voltage even though the main disconnect switch is off.



\*\* Control panel must be connected professionally to the earth / ground.

\*\* GRUNDFOS MLE motors have an integrated variable frequency drive (VFD) which provides motor overload protection. If a system utilizes MLE motors, the motor overload protection is provided by the VFD and does not require any additional motor overload protection.

#### Cross Reference Definition

(##-##)  
Sheet-Row

#### Wire Types

Internal Panel Wire   
External Wire 

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2 X 2HP  
3 X 208/240V

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EDW-WD-GPC-1299



Panel Part Number: 99651208

SHEET: 2/10

1 1-Table of Contents

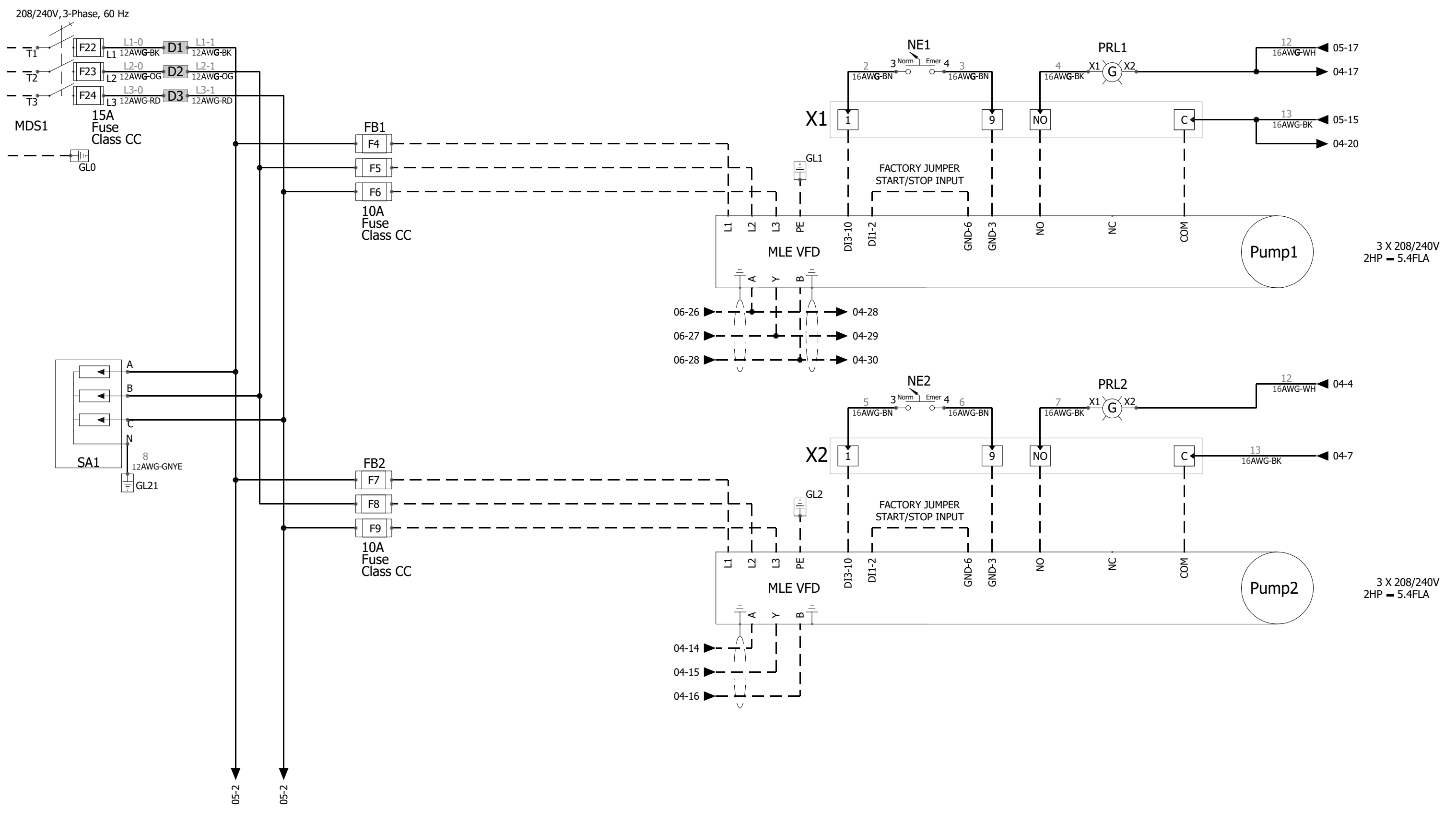
2	Drawing	Revision	Date	Created by	Description
3	<u>01</u>	1	8/7/2019	kharen	Cover Page 01
4	<u>02</u>	1	8/7/2019	kharen	Cover Page 02
5	<u>03</u>	1	8/7/2019	kharen	Drawings list
6	<u>04</u>	1	8/7/2019	kharen	Power 01
7	<u>05</u>	1	8/7/2019	kharen	Control 01
8	<u>06</u>	1	8/7/2019	kharen	Control 02
9	<u>07</u>	1	8/7/2019	kharen	Panel Layout
10	<u>08</u>	1	8/7/2019	kharen	Panel Views
11	<u>09</u>	1	8/7/2019	kharen	Bill Of Materials grouped by manufacturer Rev1.0 (Components)
12	<u>10</u>	1	8/7/2019	kharen	Bill Of Materials grouped by manufacturer Rev1.0 (Components)
13	<u>11</u>	1	8/7/2019	kharen	MPC Multi B Hybrid 3pumps

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<b>GRUNDFOS</b> 	
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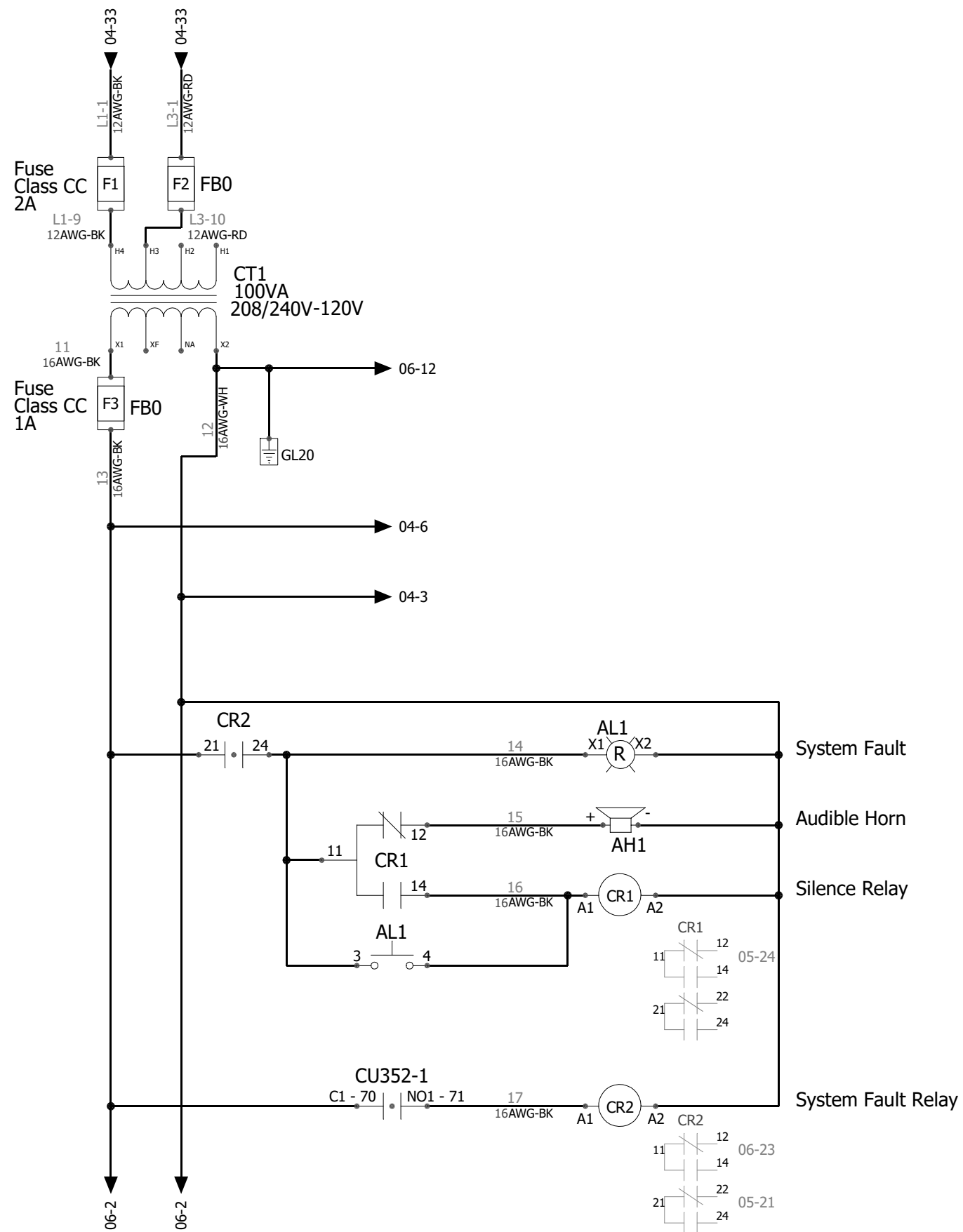
**Control MPC E**  
**2 X 2HP**  
**3 X 208/240V**

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PROJECT: 99651208  
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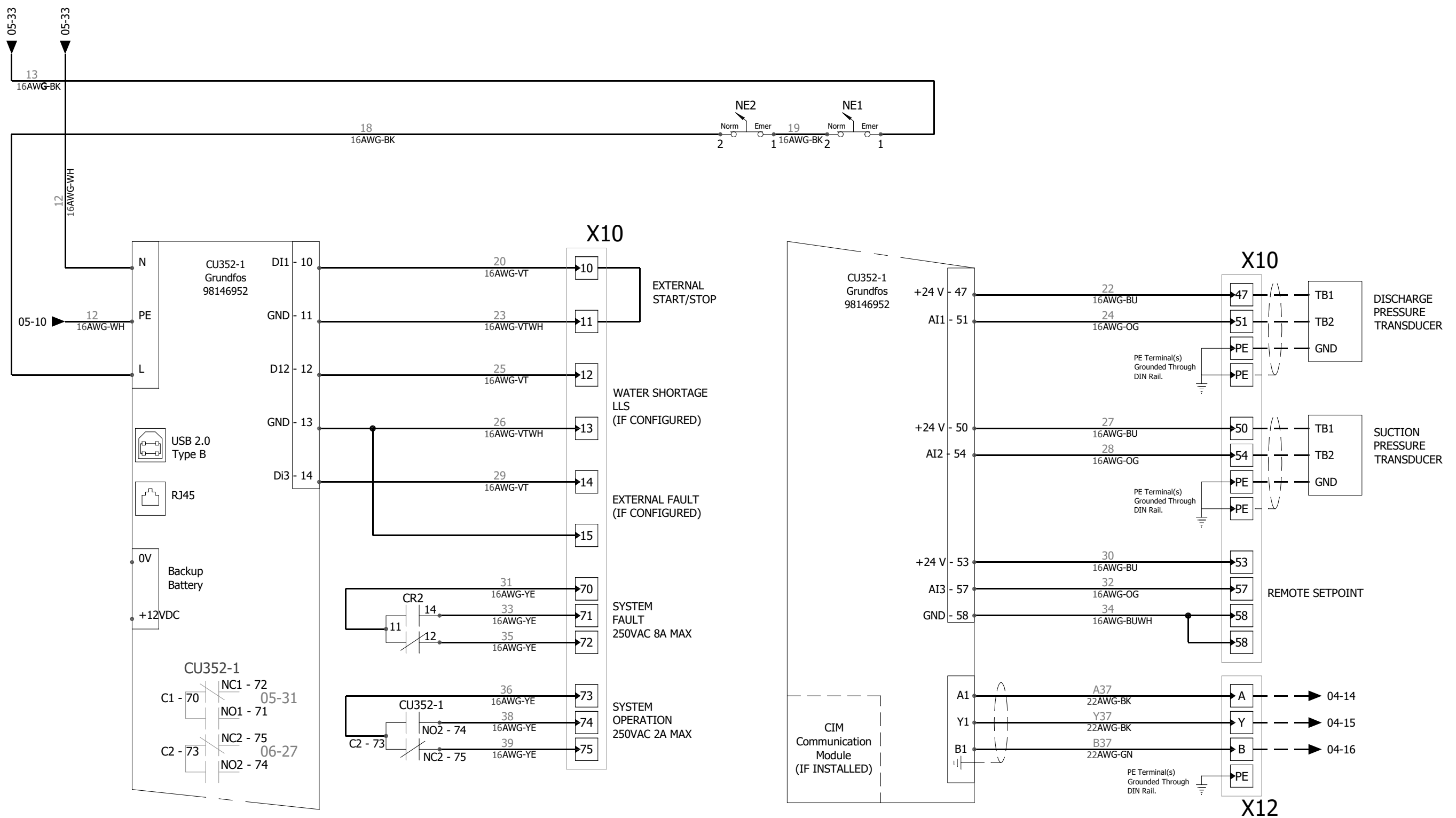
**GRUNDFOS** 

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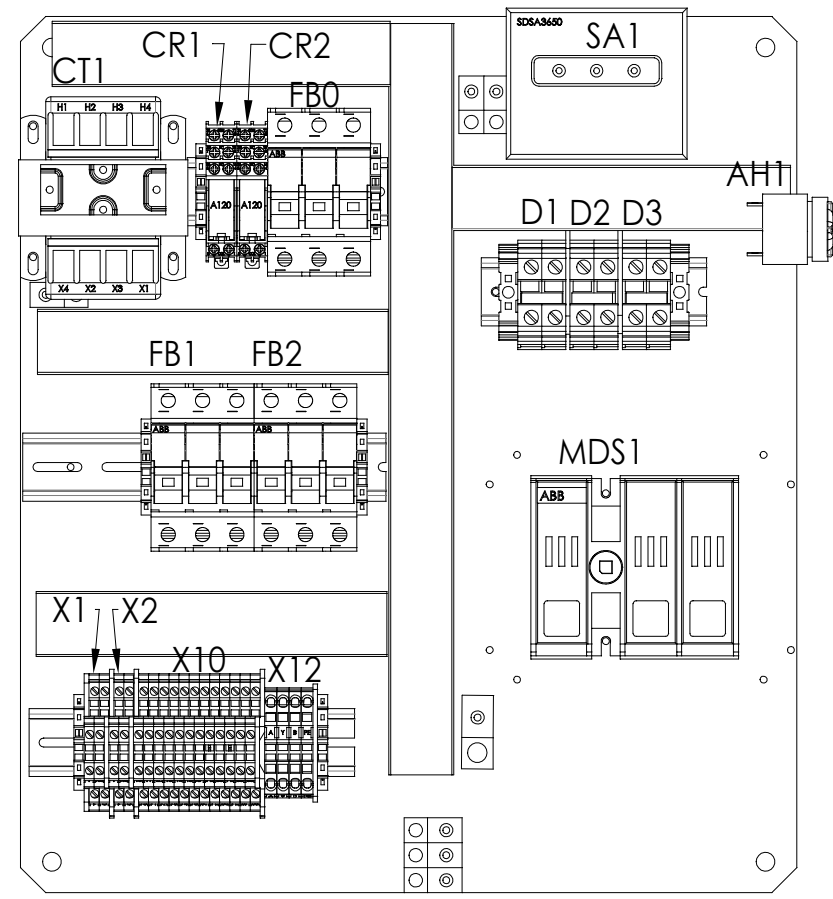
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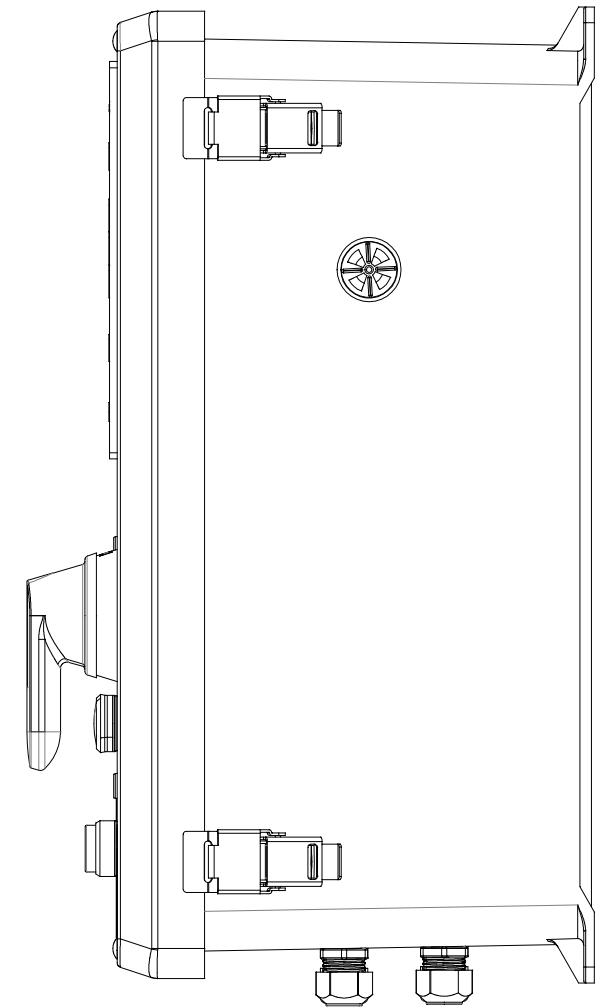
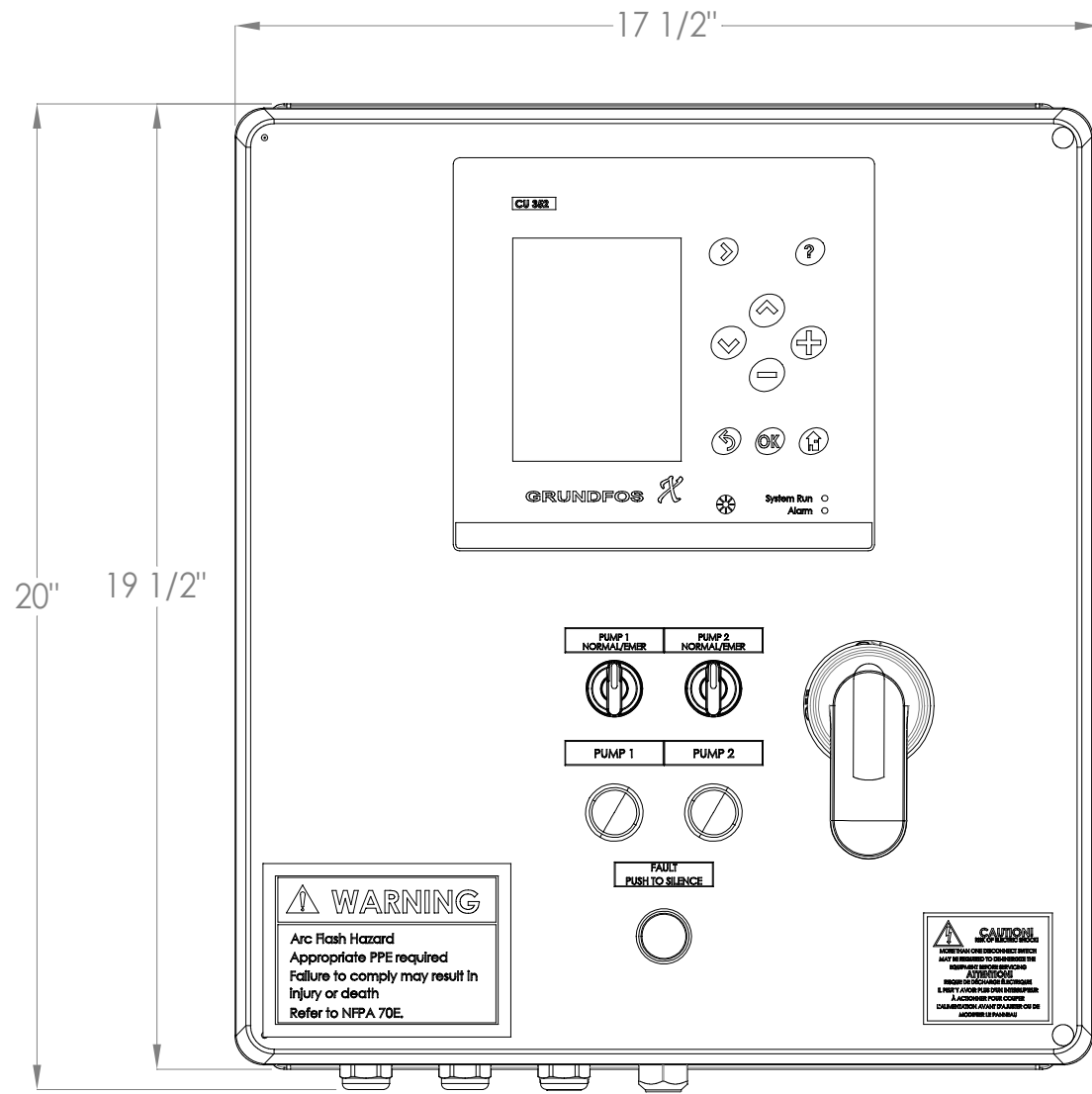
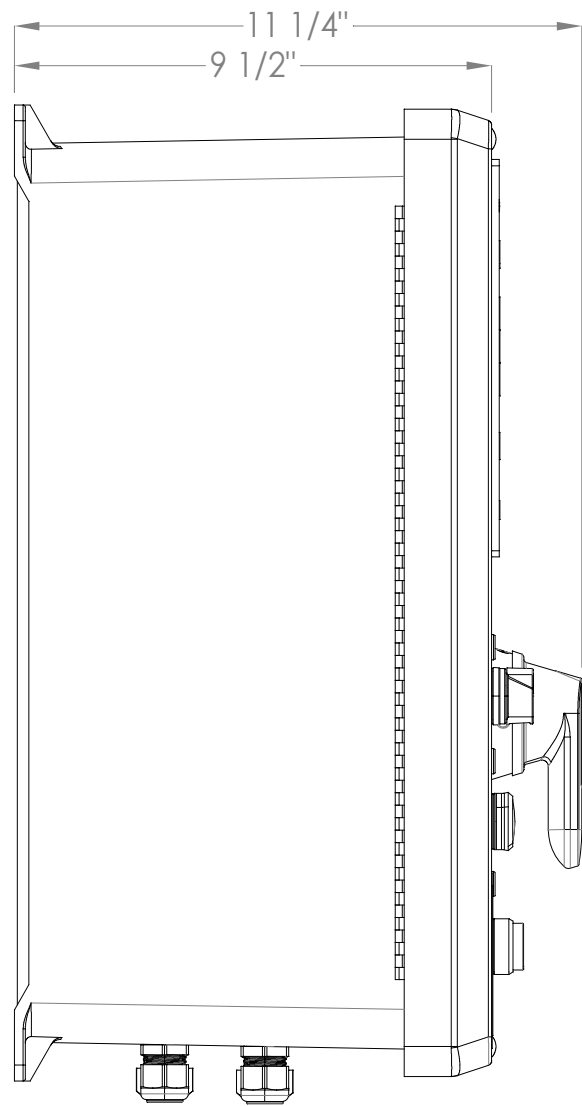
**CIM COMMUNICATION MODULE TERMINATIONS**

CIM	Terminal 1	Terminal 2	Terminal 3	Terminal 4
CIM 110	LON	LON terminal A	LON terminal B	LON terminal for cable screen
CIM 150	PROFIBUS DP	PROFIBUS terminal B	PROFIBUS terminal A	PROFIBUS terminal DGND
CIM 200	Modbus RTU	Modbus terminal D1	Modbus terminal D0	Modbus terminal common/GND
CIM 300	BACnet MS/TP	BACnet Plus terminal	BACnet Minus terminal	BACnet Ground terminal
CIM 500	BACnet IP, Modbus TCP, PROFINET IO	RJ45	RJ45	

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CLEARANCE FROM FRONT OF ENCLOSURE MUST BE 36"

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Article Number	Mark	Manufacturer	Reference	Description	Quantity	Component Type
13-16-26-1241	FB0 , FB1 , FB2	ABB	E9330CCS	Fuse Block; 3P, 30 A, Class CC, Indicator, Padlockable	3	Fuse Block 3-pole
13-16-66-1615	<u>MDS1</u>	ABB	OHY80L6	Disconnect Handle; Red/Yellow, 30/60/100/250A, Type 4, 4X, 3R, 12	1	Main Disconnect
13-16-66-1506	<u>MDS1</u>	ABB	OHZX10	Alignment Ring; Use on all Pistol Grip Handles	1	Main Disconnect
13-16-66-1431	<u>MDS1</u>	ABB	OS30FACC12	Disconnect Switch; 30A, Fuseable, 600V, 3-Pole, UL98, Class CC, Center Shaft	1	Main Disconnect
13-16-66-1610	<u>MDS1</u>	ABB	OXF6X500	Disconnect Shaft; 19.7", 6x500	1	Main Disconnect
13-16-81-1463	<u>CT1</u>	Acme	TB100A005C	Transformer; 100VA, P/208/230/460V, S/115V	1	Controls Transformer
13-16-26-1060	<u>F3</u>	F.Shaw	ATQR1	Fuse; 1A, 600V, 13/32" x 1 1/2", Class CC	1	Fuse
13-16-26-1061	F1 , F2	F.Shaw	ATQR2	Fuse; 2A, 600V, 13/32" x 1 1/2", Class CC	2	Fuse
13-16-26-1066	F4 , F5 , F6 , F7 , F8 , F9	F.Shaw	ATQR10	Fuse; 10A, 600V, 13/32" x 1 1/2", Class CC	6	Fuse
13-16-26-1068	F22 , F23 , F24	F.Shaw	ATQR15	Fuse; 15A, 600V, 13/32" x 1 1/2", Class CC	3	Fuse
13-16-56-1029	<u>AH1</u>	Floyd Bell	SP-1081	Alarm; 120V, 95db, Reduced Sensitivity, Extra Fast Warble, Panel Mount	1	Audible Horn
13-16-39-1093	<u>CU352-1</u>	Grundfos	98146952	(CM) Logic Module; Grundfos MPC Controller (CU352)	1	CU352
13-16-86-1034	L1	Heyco	Hey-M3231 UL Listed	Cord Grip, 1/2" NPT Black Liquid tight Nema 6x Rated	2	Main electrical closet
13-16-86-1035	L1	Heyco	Hey-M4518	Cord Grip, 1/2 NPT Black-No Nut	5	Main electrical closet
13-16-46-1073	CR1 , CR2	Idec	RJ2S-CL-A120	Relay; 120V, DPDT, 8A, Indicator	2	Silence Relay , System Fault Relay
13-16-46-1283	CR1 , CR2	Idec	SJ2S-07LW	Socket; 8 Pin, DIN/Pnl Mt, for RJ Relays	2	Silence Relay , System Fault Relay
13-66-11-1130	SAB1	OSI	13-66-11-1130	Bracket; Surge Arrestor	1	SA Bracket
65-BP-1816-MPC-CME	L1	OSI	65-BP-1816-MPC-CME	Backplate; MPC-CME-Hybrid-1816	1	Main electrical closet
65-ENCL-1816-2P-MPC-CME	L1	OSI	65-ENCL-1816-2P-MPC-CME	Enclosure; 18X16 MPC-CME 2pump	1	Main electrical closet
65-LIGHT-1R-032	<u>AL1</u>	OSI	65-light-1R-032	Push Button Light; Fault, Push to Silence	1	System Fault
65-SWITCH-2-12	NE1 , NE2	OSI	65-SWITCH-2-12	Switch; Two Position, 1-NO, 1-NC	2	Normal/Emergency Switch
65-TB-CU352-DB	<u>X10 1</u>	OSI	65-TB-CU352-DB	Terminal Blocks; Double Stack, X10 CU352 Terminals	1	CU352 Terminal Blocks

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Article Number	Mark	Manufacturer	Reference	Description	Quantity	Component Type
65-TB-GENI	X12 1	OSI	65-TB-GENI	Terminal Blocks; X12 Geni Bus Terminals	1	Geni Bus Terminal Blocks
65-TB-SINGLE-PUMP-DB	X1 1 , X2 1	OSI	65-TB-SINGLE-PUMP-DB	Terminal Blocks; MLE Pump Control	2	Pump Control Terminal Blocks
13-16-71-1516	D1 , D2 , D3	Phoenix	3005950 (FBS 2-12)	Terminal Link; for UT 16 terminal blocks, 2 pole, red, 85 Amp, 600 V, 16-4 AWG	3	Distribution Terminals
13-16-71-1455	D1 , D2 , D3	Phoenix	3044199 (UT-16)	Terminal Block; 16/4AWG, 85A, 1P, 600V, 12mm	6	Distribution Terminals
13-16-86-1680	GL0 , GL1 , GL2 , GL20 , GL21	Raco	TA2-Bulk	Ground Lug; 2AWG, Burndy	5	Ground Lug
13-16-61-1010	SA1	Schneider Electric	SDSA 3650	Surge Arrestor; 3 Phase, 600V, WYE	1	Surge Arrestor
13-16-36-1421	PRL1 , PRL2	Siemens	3SU11036AA401AA0	Pilot Light; Green, 110 VAC Complete	2	Pump 1 Run Light , Pump 2 Run Light

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Control MPC E  
2 X 2HP  
3 X 208/240V

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PROJECT: 99651208  
EDW-WD-GPC-1299

**GRUNDFOS** 

Panel Part Number: 99651208 SHEET: 10/10