

## Packaged Pumping System

# GRUNDFOS HYDRO MPC CME

The Grundfos Hydro MPC CME is a compact, reliable, and energy efficient packaged pumping system ideal for pressure boosting and HVAC applications in apartments, large homes, and multistory buildings.

The advanced Grundfos controls and MLE motor, in combination with variable speed multistage pumps, deliver unsurpassed system efficiency. This plug-and-pump system is easy to specify, install and will provide energy efficient and reliable operation for years.



### KEY FEATURES AND BENEFITS

- **Single source responsibility** ensures one point of contact for all questions and service
- **Affordable packaged system** with the most advanced controller; offered in 2–3 pump configurations
- **Compact design** fits into tight spaces — through a 36" standard door — making it ideal for retrofits
- **Drinking water approvals** from UL Listed Packaged Pumping System and NSF 61/372 drinking water certified; plus ASHRAE 90.1 compliant

### CU 352 CONTROLLER

- **Pump cascade control**, using efficiency-based sequencing, delivers the most efficient operation and protects pumps from running outside their duty range
- **SCADA communication capable** via Ethernet and all industry standard BUS protocols utilizing CIM expansion cards, with BACnet MSTP as standard
- **100kA SCCR fault current** rated panel
- **Built-in logging capability** records operational data such as system built-in performance, flow estimation and energy consumption for troubleshooting and energy analysis
- **Proportional pressure control** makes possible to simulate remote mounted sensor for simplified installation
- **Secondary (fallback) sensor** allows for system control from local sensor, with corresponding setpoint, if remote sensor fails
- **Check valve failure notification** warns or alarms, based on check valve leak rate
- **HVAC controls** includes differential pressure control from the two integrated sensors and multizone control for up to six zones

### CME PUMP

- **Horizontal multistage pump** that is a compact, reliable and quiet solution
- **Materials of Construction:** cast iron (ASTM A48), stainless steel (AISI 304 and AISI 316)

### MLE MOTOR

- **Grundfos Permanent Magnet MLE motors'** offer significant energy savings over NEMA Premium motors with conventional VFD's
- **Built-in protection** against power supply interruptions, along with environment and motor load
- **Innovative design mitigates** against bearing currents

### MANIFOLDS

- **316 stainless steel manifolds** are engineered to reduce pressure loss and protect against corrosion

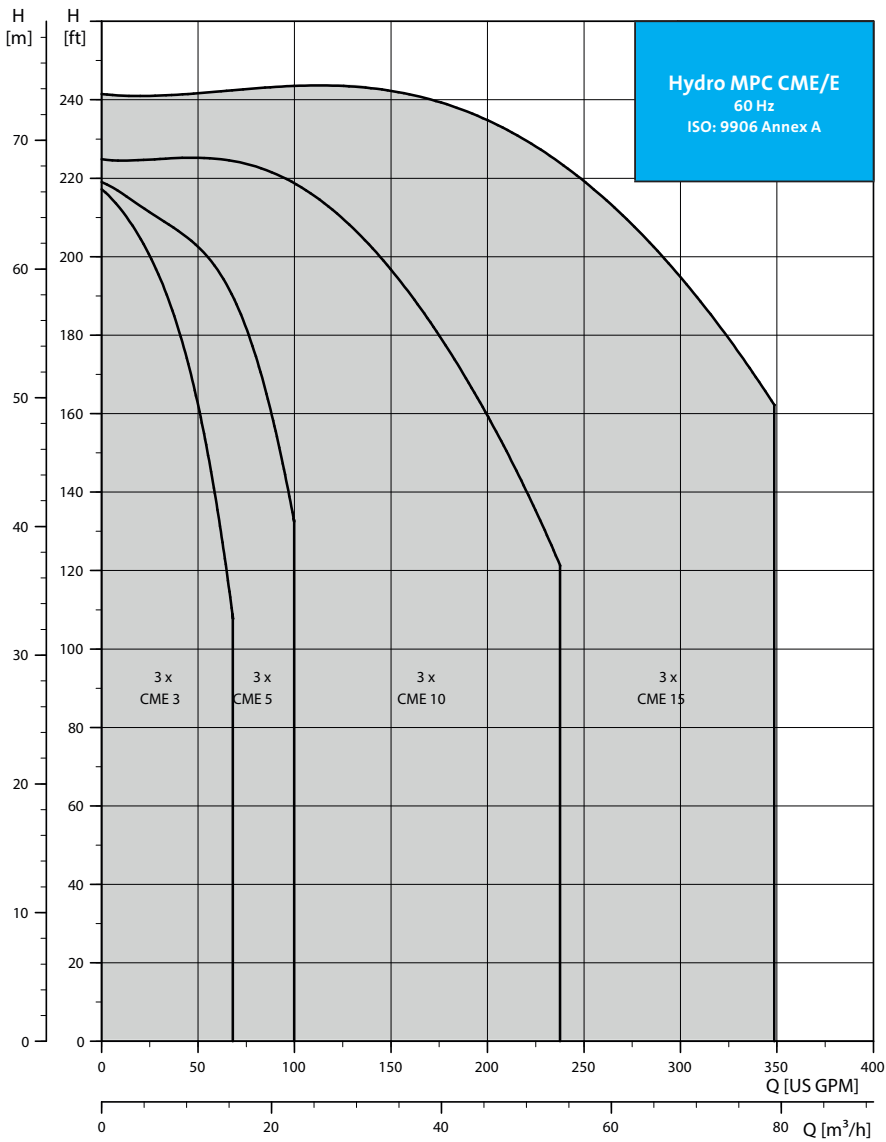
### APPLICATIONS

- Pressure Boosting
- Hydronic Heating and Cooling

**TECHNICAL DATA**

HYDRO MPC CME	
<b>FLOW, Q (2–3 PUMPS):</b>	max. 345 gpm (78.36 m <sup>3</sup> /h)
<b>HEAD, H:</b>	max. 230 ft (70 m)
<b>WORKING PRESSURE:</b>	max. 145 psi (10 bar)
<b>LIQUID TEMPERATURE:</b>	<ul style="list-style-type: none"> <li>• CME3-5: 32° F to 140° F (0° C to 60° C)</li> <li>• CME10-15: 32° F to 180° F (0° C to 82° C)</li> </ul>
<b>APPROVALS:</b>	<ul style="list-style-type: none"> <li>• System NSF 61/372 Certified</li> <li>• UL Listed Packaged Pumping System</li> </ul>

**PERFORMANCE DATA**



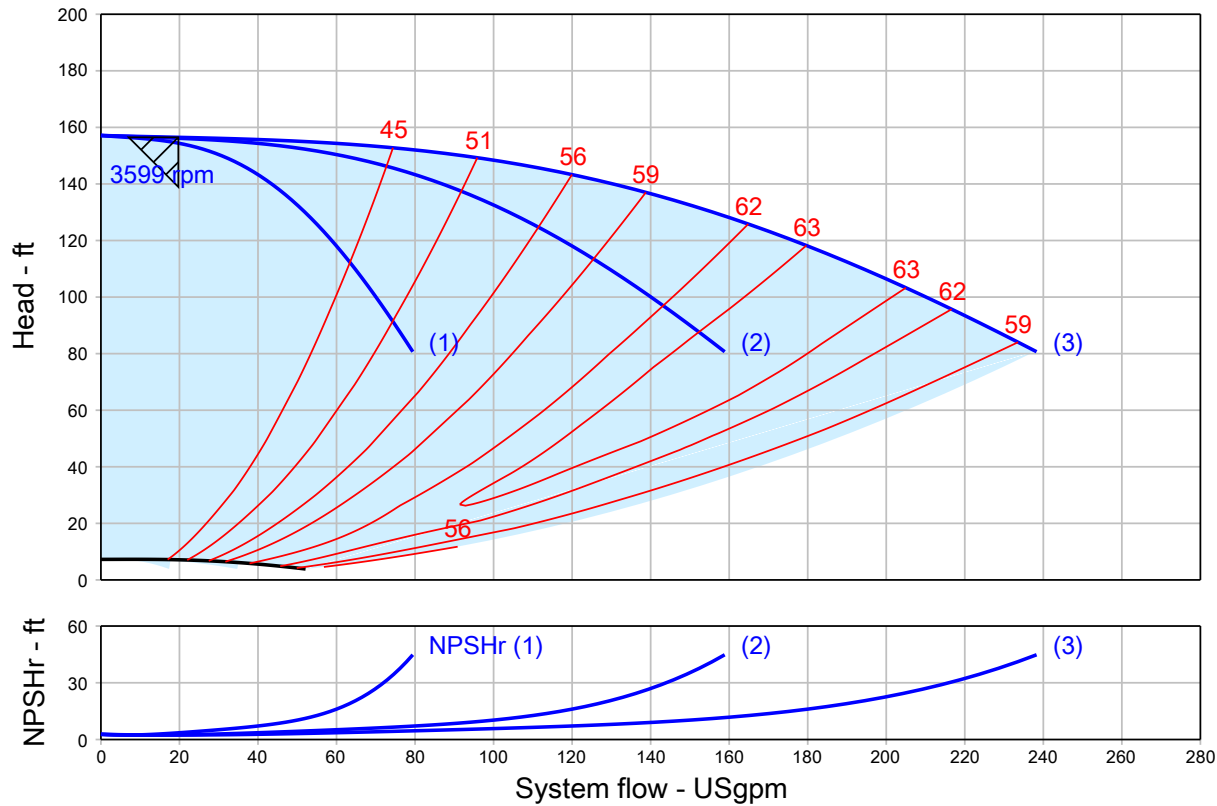
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## Pump Performance Datasheet

Customer :	Quote Number / ID : 1561369
Customer ref. / PO :	Model : Hydro MPC 3CME 10-2 3x460V 60Hz
Tag Number : Hydro MPC 3CME 10-2 3x460V 60Hz	Part Number : 99659083
Service :	Stages : 2
Quantity : 1	Based on curve number : 99329881
Quantity of pumps : 3 active + 0 standby	Date last saved : 12/27/2021 9:23 PM

Operating Conditions		Liquid	
System flowrate	: 19.72 USgpm	Liquid type	: Cold Water
Flowrate per pump	: 6.57 USgpm	Additional liquid description	:
Differential head / pressure, rated (requested)	: 156.5 ft	Temperature, max	: 68.00 deg F
Differential head / pressure, rated (actual)	: 156.5 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 460V	Material selected	: Standard - Cast Iron / 304 Stainless Steel

Performance		Pressure Data	
Speed, rated	: 3599 rpm	Pump shut off pressure	: 68.00 psi.g
Speed, maximum	: 3599 rpm	Maximum allowable suction pressure	: 80.00 psi.g
Speed, minimum	: 764 rpm	<b>Driver &amp; Power Data (@Max density)</b>	
Pump efficiency	: 17.31 %	Motor sizing specification	: Max power (non-overloading)
NPSH required / margin required	: 2.35 / 0.00 ft	Margin over specification	: 0.00 %
nq (imp. eye flow) / S (imp. eye flow)	: 27 / 57 Metric units	Service factor	: 1.15
Head maximum, rated speed	: 157.1 ft	Rated power (based on duty point)	: 3 x 1.50 hp
Head rise to shutoff	: 0.42 %	Max power (non-overloading)	: 3 x 2.84 hp
Flow, best eff. point	: 64.28 USgpm	Motor rating	: 3 x 3.00 hp / 2.24 kW (Fixed)
Flow ratio, rated / BEP	: 10.22 %		
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 / 1.00 / 1.00		
Selection status	: Acceptable		



**Hydro MPC E with CME pumps**

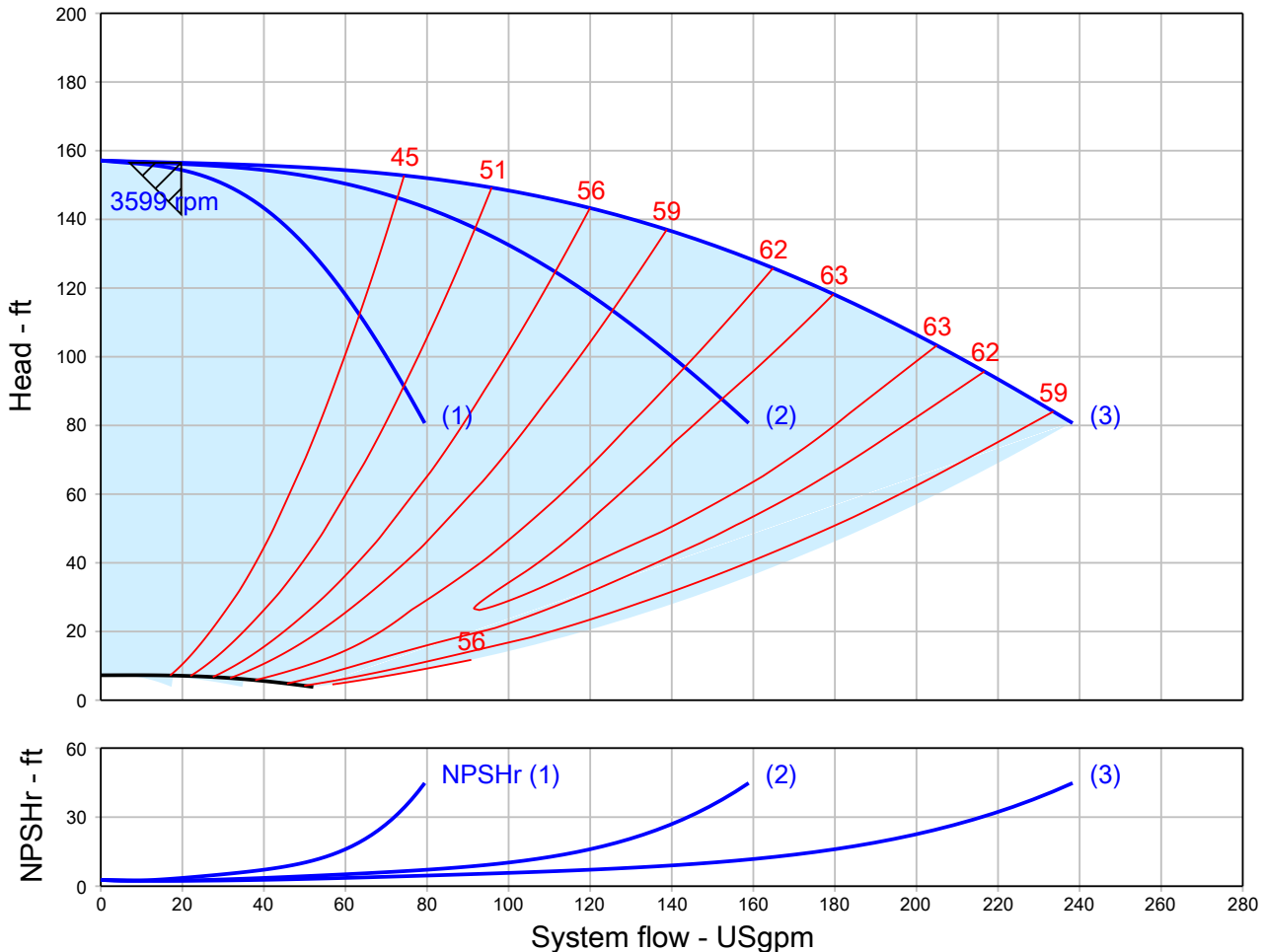
<b>QUOTE NUMBER / ID</b> 1561369	<b>UNIT TAG</b> Hydro MPC 3CME 10-2 3x460V 60Hz	<b>QUANTITY</b> 1
<b>REPRESENTATIVE</b>	<b>SERVICE</b>	<b>DATE</b>
<b>ENGINEER</b>	<b>SUBMITTED BY</b>	<b>DATE</b>
<b>CONTRACTOR</b>	<b>APPROVED BY</b>	<b>DATE</b>
	<b>ORDER #</b>	



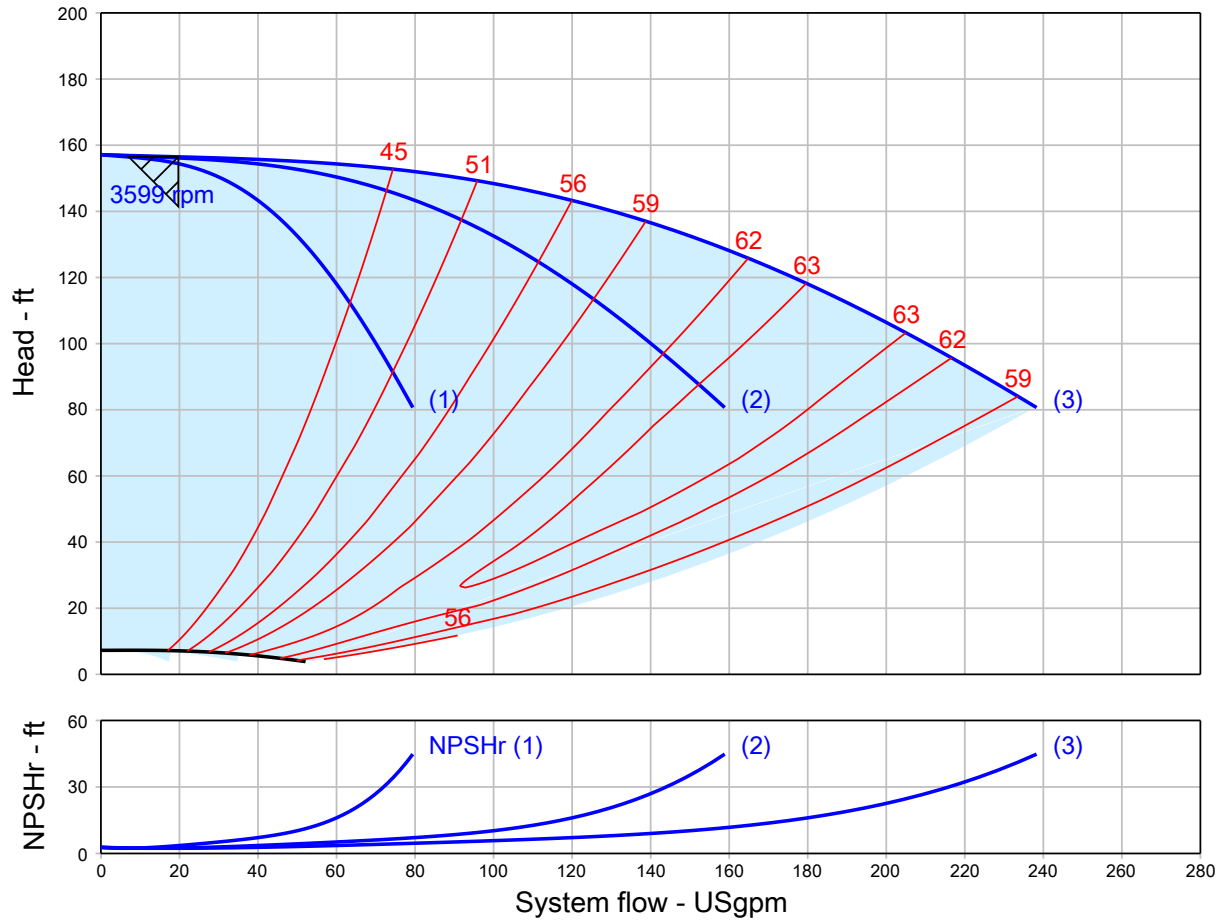
**Hydro MPC 3CME  
10-2 3x460V 60Hz  
3480 rpm**

Part Number 99659083

Conditions of Service		Pump Data		Motor Data	
Flow	6.57 USgpm	Material	Standard - Cast Iron / 304 Stainless Steel	Motor HP	3 HP
Head	156.5 ft	Pump shut off pressure	68.00 psi.g	BHP	1.5 HP
Liquid	Cold Water	Max Allowable Suction Pressure	80.00 psi.g	Enclosure	TEFC
Temperature	68.00 deg F	Efficiency	17.31 %	Voltage	440-480 V
NPSHr	2.35 ft			Phase	3 Phase
Viscosity	1.00 cP				
Specific Gravity	1.000 SG				

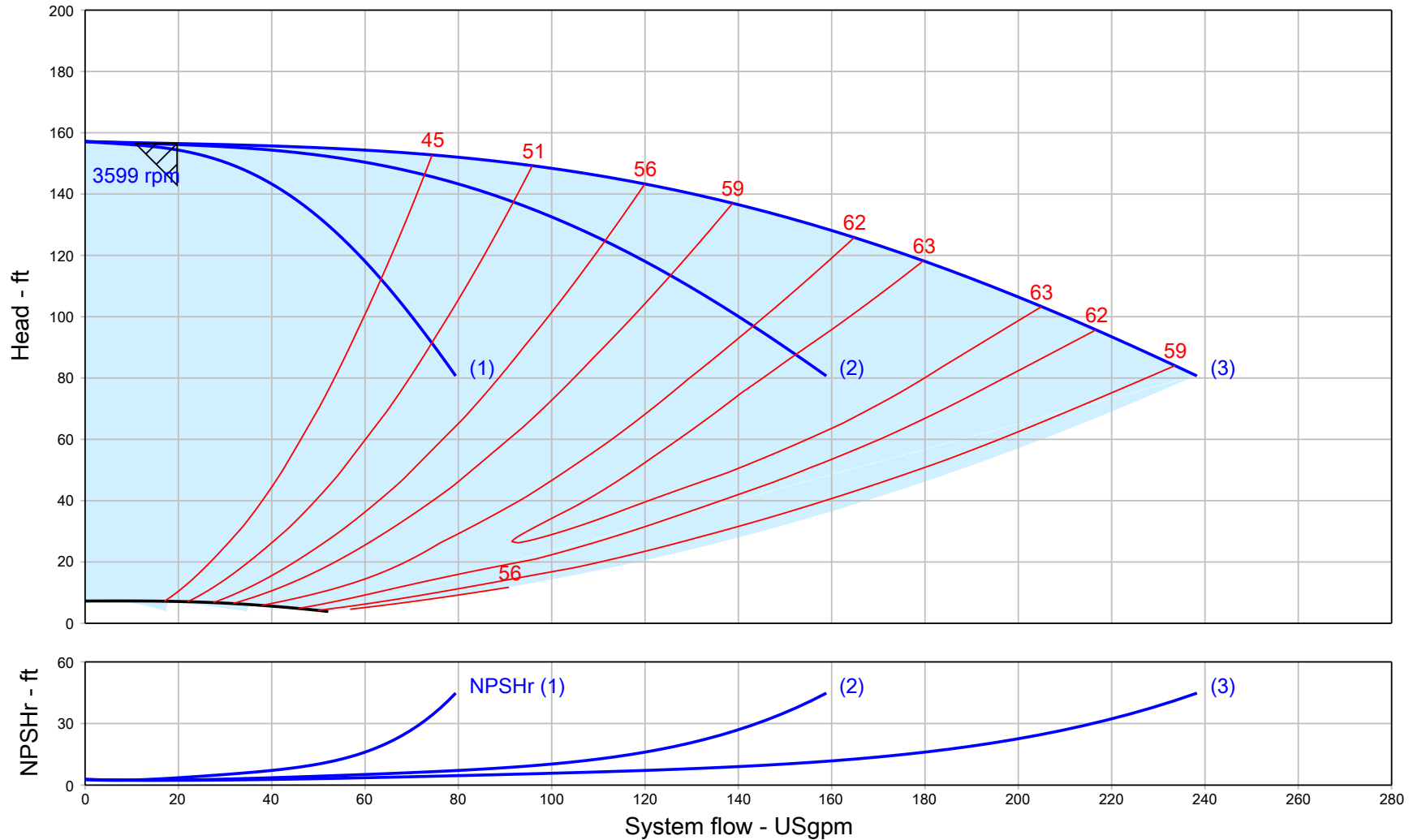


**Pump Performance Curve**



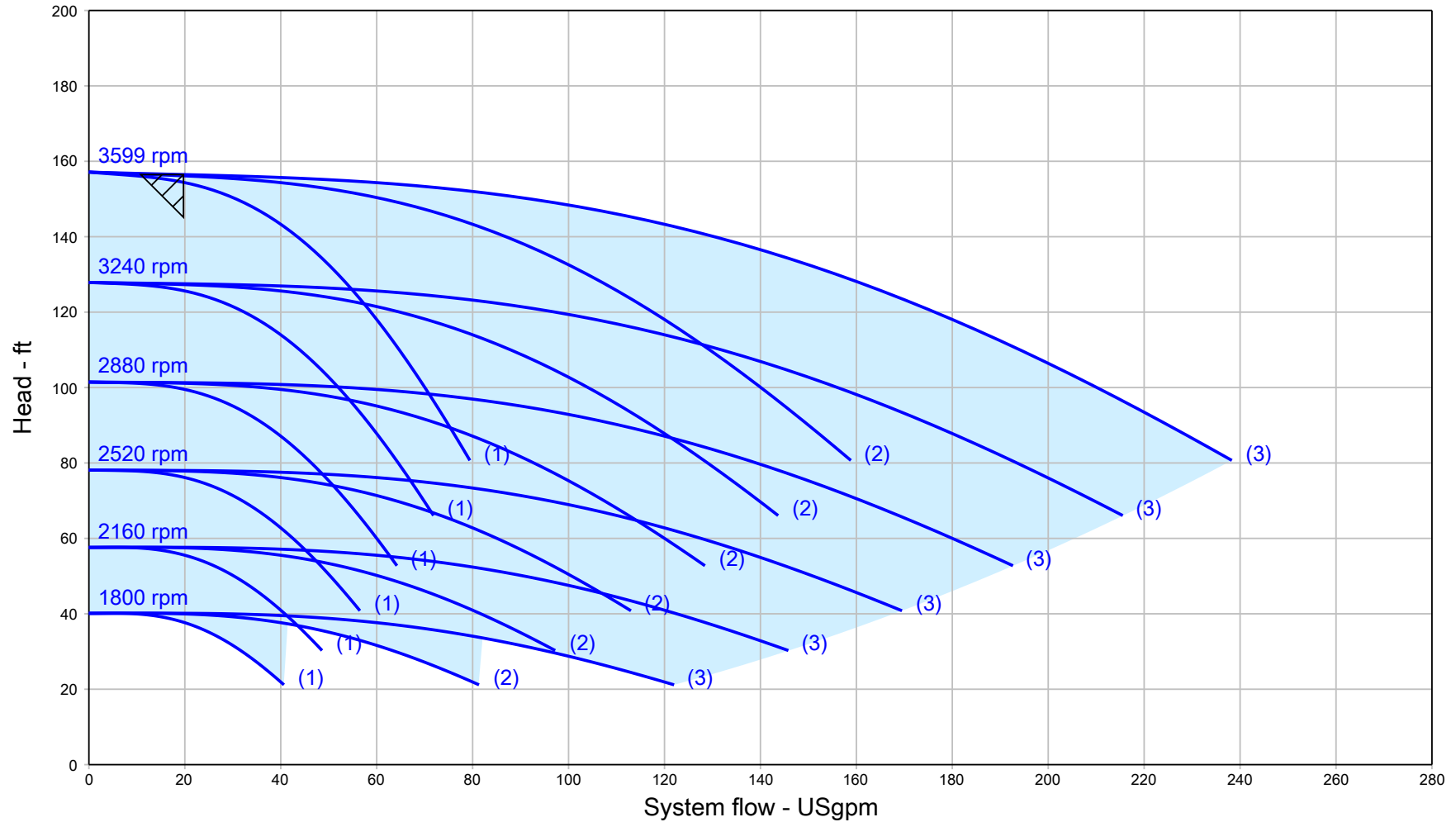
Customer	:	Model	: Hydro MPC 3CME 10-2 3x460V
Customer ref. / PO	:		60Hz
Tag Number	: Hydro MPC 3CME 10-2 3x460V 60Hz	Stages	: 2
Service	:	Speed, rated	: 3599 rpm
Quantity	: 1	Based on curve number	: 99329881
Quote Number / ID	: 1561369	Pump efficiency	: 17.31 %
Date last saved	: 12/27/2021 9:23 PM	Rated power (based on duty point)	: 3 x 1.50 hp
System flowrate	: 19.72 USgpm	NPSH required	: 2.35 ft
Flowrate per pump	: 6.57 USgpm	Fluid density, rated / max	: 1.000 / 1.000 SG
Differential head / pressure, rated	: 156.5 ft	Viscosity	: 1.00 cP
Pressure control curve	: None		

**Pump Performance Curve**



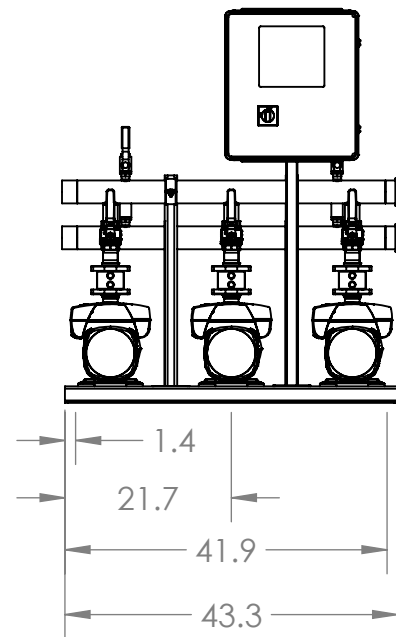
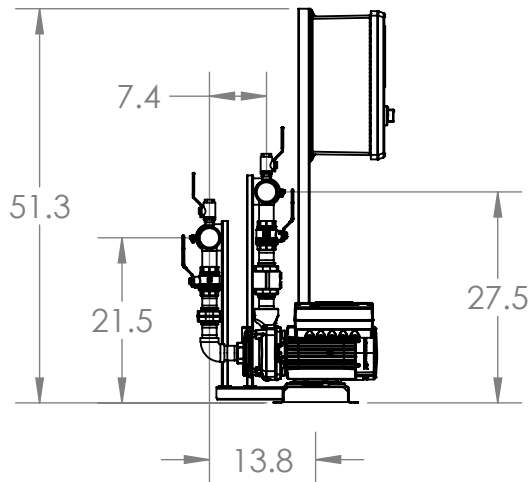
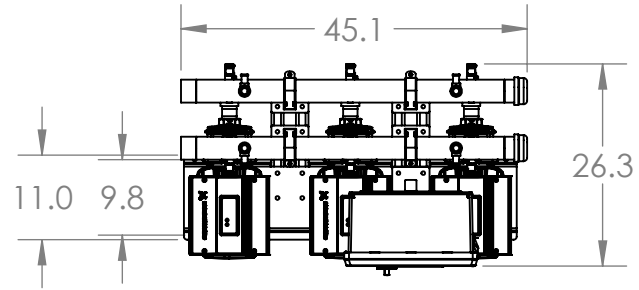
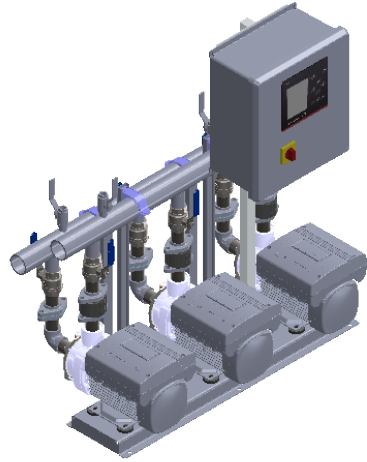
Project name : gogrundfos.com	Tag Number : Hydro MPC 3CME 10-2	Speed, rated : 3599 rpm
Consulting engineer :	3x460V 60Hz	System flowrate : 19.72 USgpm
Customer :	Service :	Flowrate per pump : 6.57 USgpm
Customer ref. / PO :	Model : Hydro MPC 3CME 10-2	Differential head / pressure, rated : 156.5 ft
Quote Number / ID : 1561369	3x460V 60Hz	Rated power (based on duty point) : 3 x 1.50 hp
Date last saved : 12/27/2021 9:23 PM	Quantity : 1	Max power (non-overloading) : 3 x 2.84 hp
Pressure control curve : None	Quoted By (Sales Office) : HURLEY ENGINEERING COMPANY	Pump efficiency : 17.31 %
	Quoted By (Sales Engineer) : Devin Carle	Based on curve number : 99329881

**Multi-Speed Performance Curve**



Project name : gogrundfos.com	Tag Number : Hydro MPC 3CME 10-2	Speed, rated : 3599 rpm
Consulting engineer :	3x460V 60Hz	System flowrate : 19.72 USgpm
Customer :	Service :	Flowrate per pump : 6.57 USgpm
Customer ref. / PO :	Model : Hydro MPC 3CME 10-2	Differential head / pressure, rated : 156.5 ft
Quote Number / ID : 1561369	3x460V 60Hz	Fluid density, rated / max : 1.000 / 1.000 SG
Date last saved : 12/27/2021 9:23 PM	Quantity : 1	Viscosity : 1.00 cP
Pressure control curve : None	Quoted By (Sales Office) : HURLEY ENGINEERING COMPANY	Based on curve number : 99329881
	Quoted By (Sales Engineer) : Devin Carle	

1. Manifolds 2.5" NPT Class 150 AISI 316SS Schedule 10s ASTM A312 or  $\phi 76.1\text{mm} \times 2\text{mm}$
2. Base/Frame AISI 304SS
3. Full port ball valve ASTM
4. UL Type 3R/12 rated electrical panel





**Ball Valves**

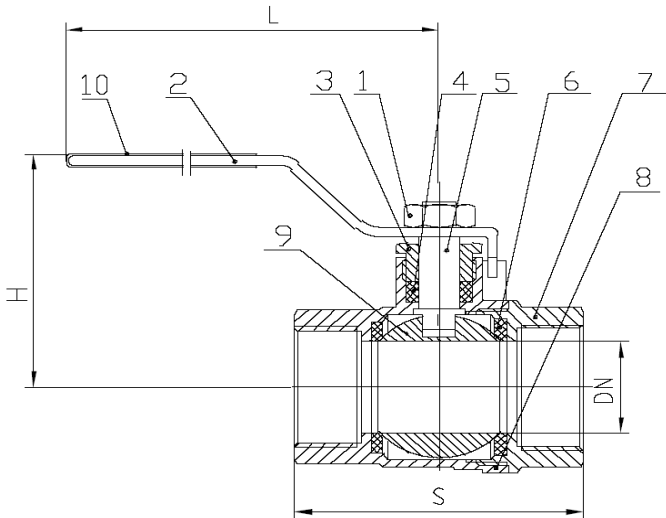


**General**

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

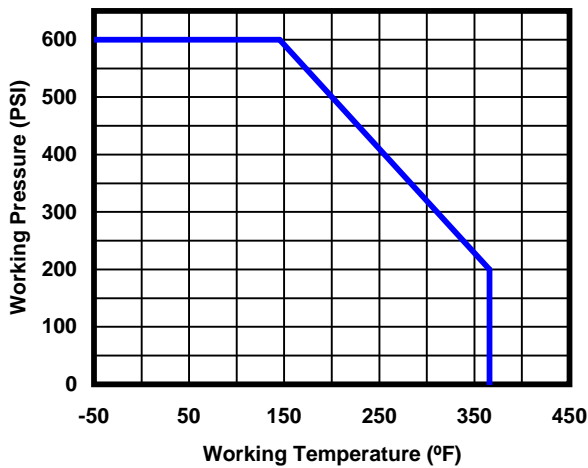
**Dimensions & Weights**

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



**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



# 1. Non-return valves, type GNVP



Fig. 1 GNVP valves

GNVP non-return valves are designed for installation in pipe systems between two DIN flanges. Thanks to their compact design, the GNVP valves are easy to install. All composite parts have a wide range of drinking water approvals, maintained at regular test intervals. According to the DIN EN 13959 standard, all GNVP non-return valves incorporate two test/drainage plugs for user-friendly usage.

## Applications

The GNVP non-return valves are designed exclusively for installation in Grundfos booster systems where a one-way water flow is required.

Maximum operating pressure: 16 bar (PN 16).

Liquid temperature: 0 °C to +60 °C.

## Drinking water approvals

KIWA no.: 26819 (Netherlands)

WRAS no.: 1710375 (Great Britain)

DVGW no.: NW-6312AT2526 (Germany)

ACS no.: 17 ACC NY 338 (France)

BELGAQUA no.: 10/16a/EA (Belgium)

## Construction

The polyoxymethylene (POM) valve housing is equipped with one or several insert valve cartridges, depending on the size. GNVP DN 32, DN 40 and DN 50-I are equipped with one valve cartridge. GNVP DN 50, DN 65, DN 80 and DN 100 are equipped with several valve cartridges. The DN 50-I is a special version with a smaller seal diameter.

The valve cartridge components are made of POM, the seals are made of NBR, and the spring is made of stainless steel, for optimum functionality and reliability.

## Head loss

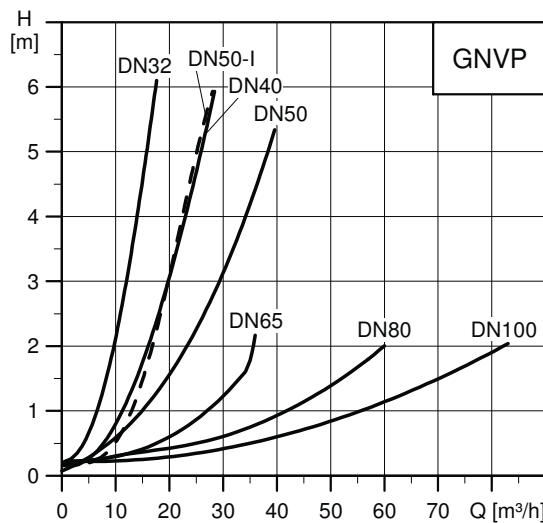
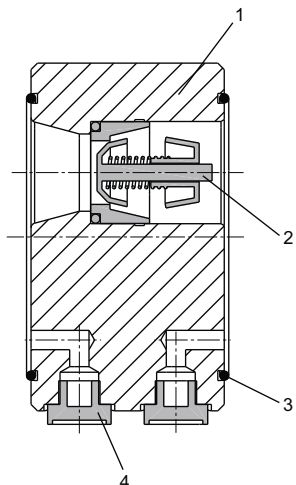


Fig. 2 Head loss curves for non-return valves, type GNVP

## Dimensions

Type	Outer diameter [mm]	Width [mm]	Size of O-ring seal [mm]	Product numbers
GNVP DN 32 (1 1/4")	70	60	Ø45 x 3	91040183
GNVP DN 40 (1 1/2")	90	60	Ø56 x 3	91040184
GNVP DN 50-I (2")	108	60	Ø76 x 3	96155179
GNVP DN 50 (2")	108	60	Ø83 x 3	98595908
GNVP DN 65 (2 1/2")	125	60	Ø94 x 3	91040186
GNVP DN 80 (3")	143	60	Ø110 x 3	91069032
GNVP DN 100 (4")	160	60	Ø130 x 3	91040187

**Materials**

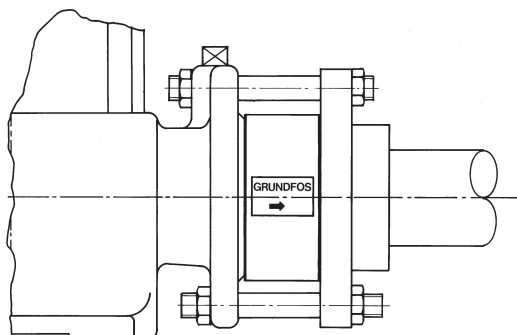


TM04 9403 4417

**Fig. 3** Components of a GNVP, DN 50 valve

**Installation**

Pos.	Valve components	Materials
1	Housing	POM - Ultraform H4320
2	Cartridge	POM - Hostaform/NBR
3	O-ring	EPDM
4	Plug	POM - Ultraform H4320
	O-ring	EPDM



TM00 0551 3292

**Fig. 4** Installation example, GNVP

The GNVP non-return valve is fitted between two DIN flanges, such as pump flange and counter flange, by means of bolts and nuts. The valve can be fitted in any position required. The arrow on the nameplate indicates the direction of the water flow.

**Note:** The GNVP valves have factory-fitted O-rings on both mating surfaces for optimum sealing against the flanges. As a result, no additional gaskets are required.

# 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)	
<b>Dial Sizes</b>	1 1/2", 2", 2 1/2", 4"	
<b>Fill</b>	Glycerine, other fills available See Optional Features Section	
<b>Movement</b>	D82: Brass D83: 316 Stainless steel	
<b>Connection</b>	Lower male or center back male, (Lower back male 4" Dial only)	
<b>Case</b>	304 stainless steel, stem-mounted flangeless	
<b>Ring</b>	Crimped 304 stainless steel	
<b>Window</b>	Acrylic	
<b>Pointer</b>	Plain, black finished	
<b>Dial Face</b>	Aluminum, white background with black graduations and markings	
<b>Accuracy</b>	±1.6% Full Scale (1% available as an option)	
<b>Maximum Temperature</b>	150°F (65°C)	
<b>Approximate Shipping Weight</b>	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"				

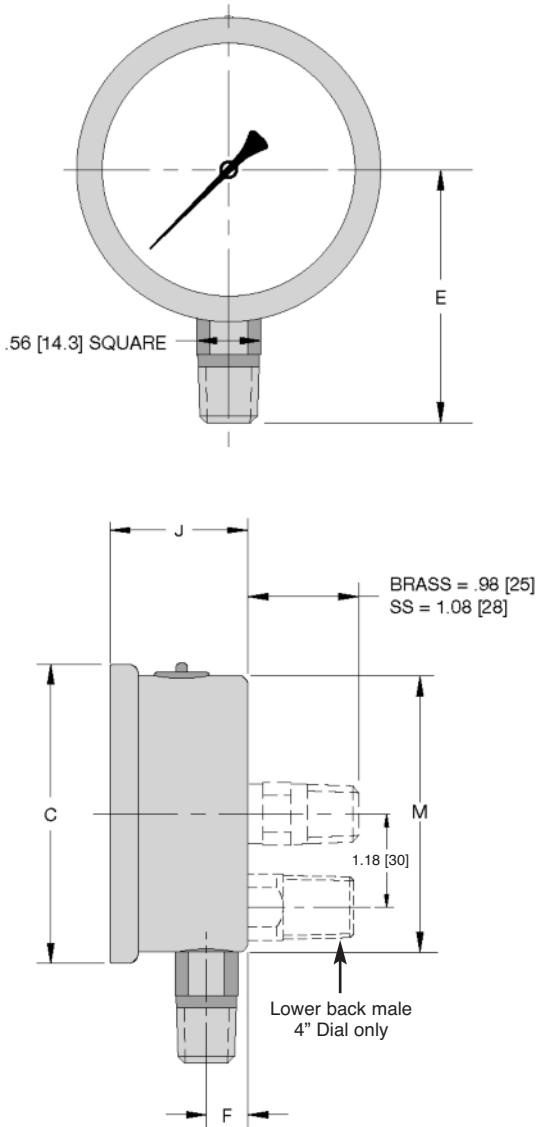
- \* 1/8 NPT connection size not available with 4" dial size.
- \*\* 1/4 NPT connection size not available with 1 1/2" dial size.
- \*\*\* 1/2 NPT connection size only available with 4" dial size.

# 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

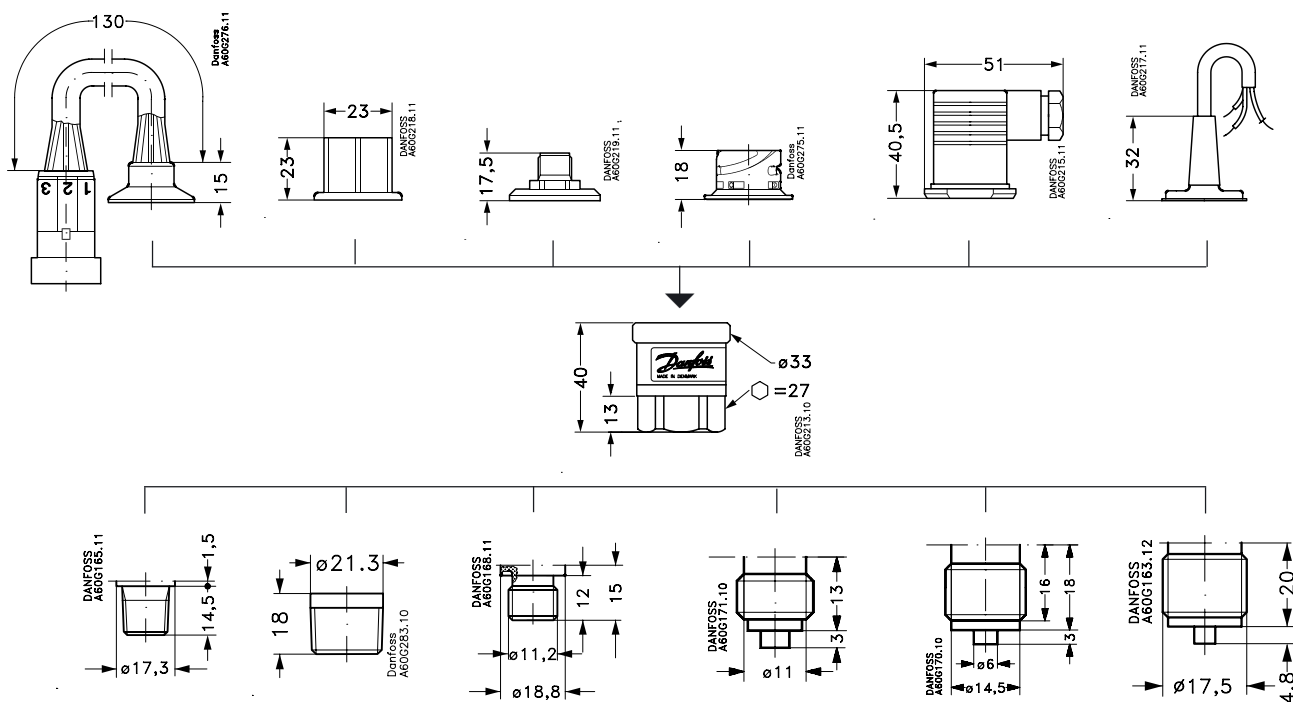


- Designed for use in severe industrial environments
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- All standard output signals: 4-20 mA, 0-5 V, 1-5 V, 1-6 V, 0-10 V
- A wide range of pressure and electrical connections
- Temperature compensated and laser calibrated
- Typical 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	conducted	10 V/m, 26 MHz - 1 GHz	EN 61000-6-2
		radiated	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		
Shock resistance	Random	7.5 g <sub>rms</sub> , 5 Hz - 1 kHz		IEC 60068-2-34, IEC 60068-2-36
	Shock	500 g / 1 ms		
Enclosure (depending on electrical connection)	Shock	500 g / 1 ms		IEC 60068-2-27
	Free fall			IEC 60068-2-32

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

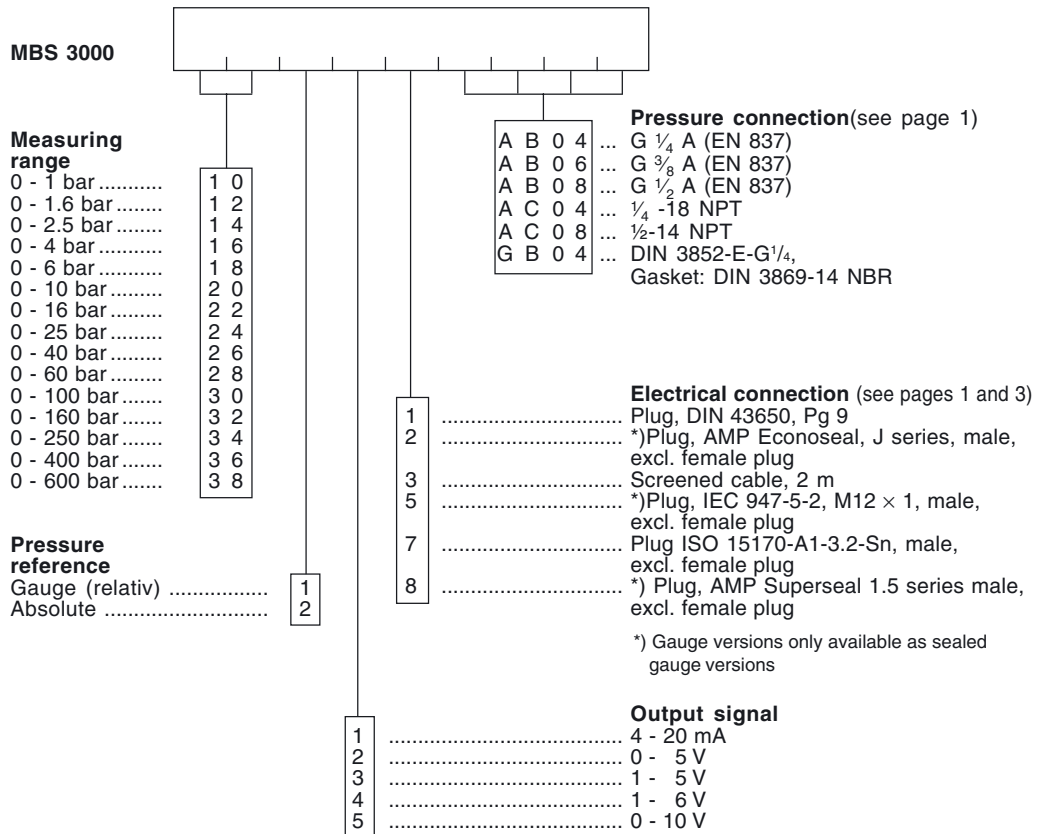
1) Female plug: Glass filled polyester, PBT  
 2) Wire: PETFE (teflon)  
 Protection sleeve: PBT mesh (polyester)



**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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Panel Part Number:  
99651229

Description  
Control MPC E  
3 X 3HP  
3 X 480V

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

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1	8/7/2019						
2	8/16/2019						
				EDW-WD-GPC-1310			
ECM/Rev	Date						

### 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,  
480V

**UL Type Rating:** 3R

### Largest Motor FLA and Panel Maximum FLA:

Motor Horsepower	3HP
Motor FLA	3.8FLA
Panel Max. FLA	12.4FLA

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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3 X 3HP  
3 X 480V

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Panel Part Number: 99651229

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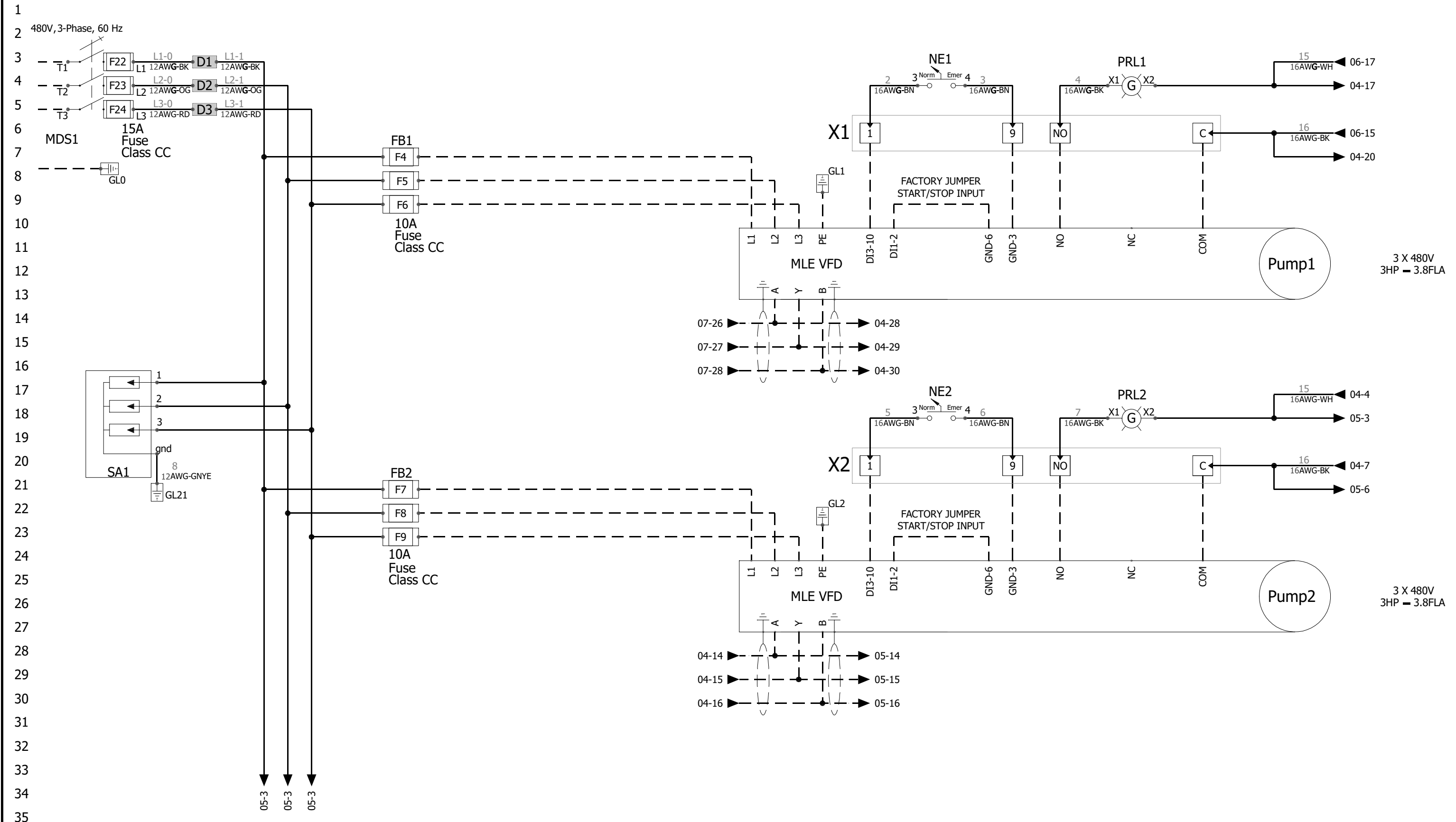
1 1-Table of Contents

2	Drawing	Revision	Date	Created by	Description
3	<u>01</u>	0	6/18/2019	mfischer	Cover Page 01
4	<u>02</u>	0	6/18/2019	mfischer	Cover Page 02
5	<u>03</u>	0	6/18/2019	mfischer	Drawings list
6	<u>04</u>	0	6/18/2019	mfischer	Power 01
7	<u>05</u>	0	6/18/2019	mfischer	Power 02
8	<u>06</u>	0	6/18/2019	mfischer	Control 01
9	<u>07</u>	0	6/18/2019	mfischer	Control 02
10	<u>08</u>	0	6/18/2019	mfischer	Panel Layout
11	<u>09</u>	0	6/18/2019	mfischer	Panel Views
12	<u>10</u>	0	6/18/2019	mfischer	Bill Of Materials grouped by manufacturer Rev1.0 (Components)
13	<u>11</u>	0	6/18/2019	mfischer	Bill Of Materials grouped by manufacturer Rev1.0 (Components)
14	<u>12</u>	0	6/18/2019	mfischer	MPC Multi B Hybrid 3pumps

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<b>GRUNDFOS</b> 	
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**Control MPC E**  
**3 X 3HP**  
**3 X 480V**

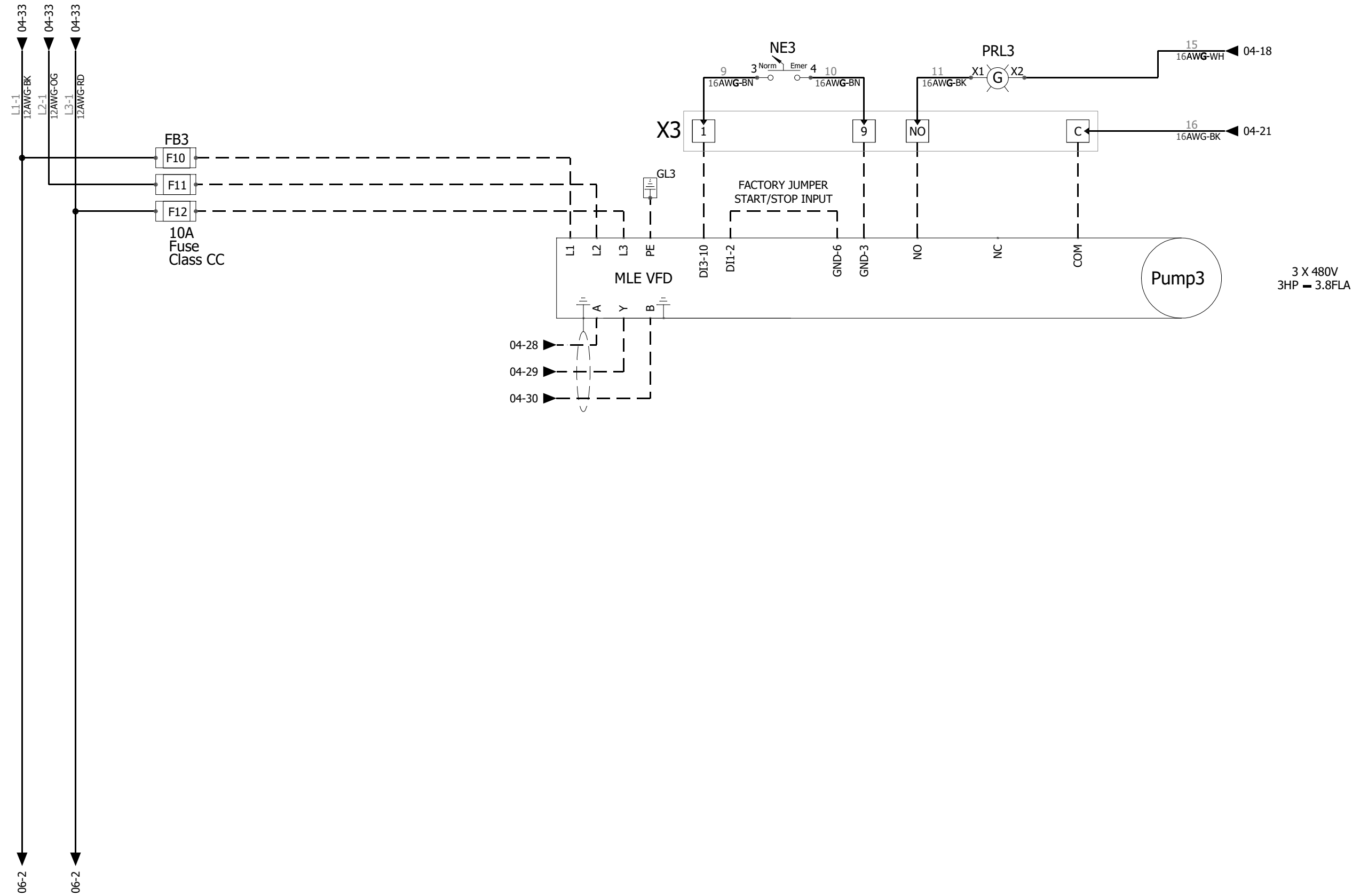
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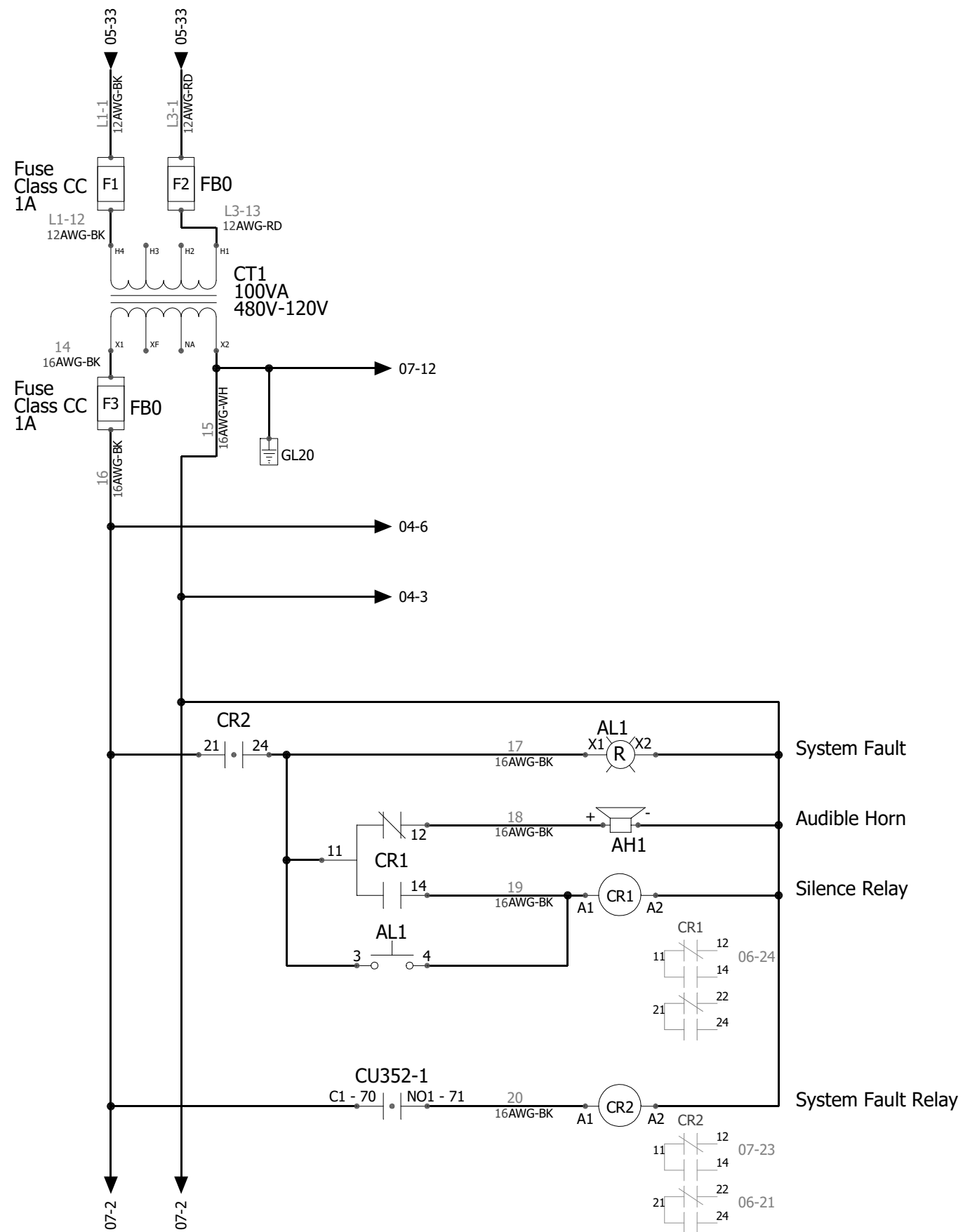
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EDW-WD-GPC-1310						Panel Part Number: 99651229
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**Control MPC E**  
**3 X 3HP**  
**3 X 480V**

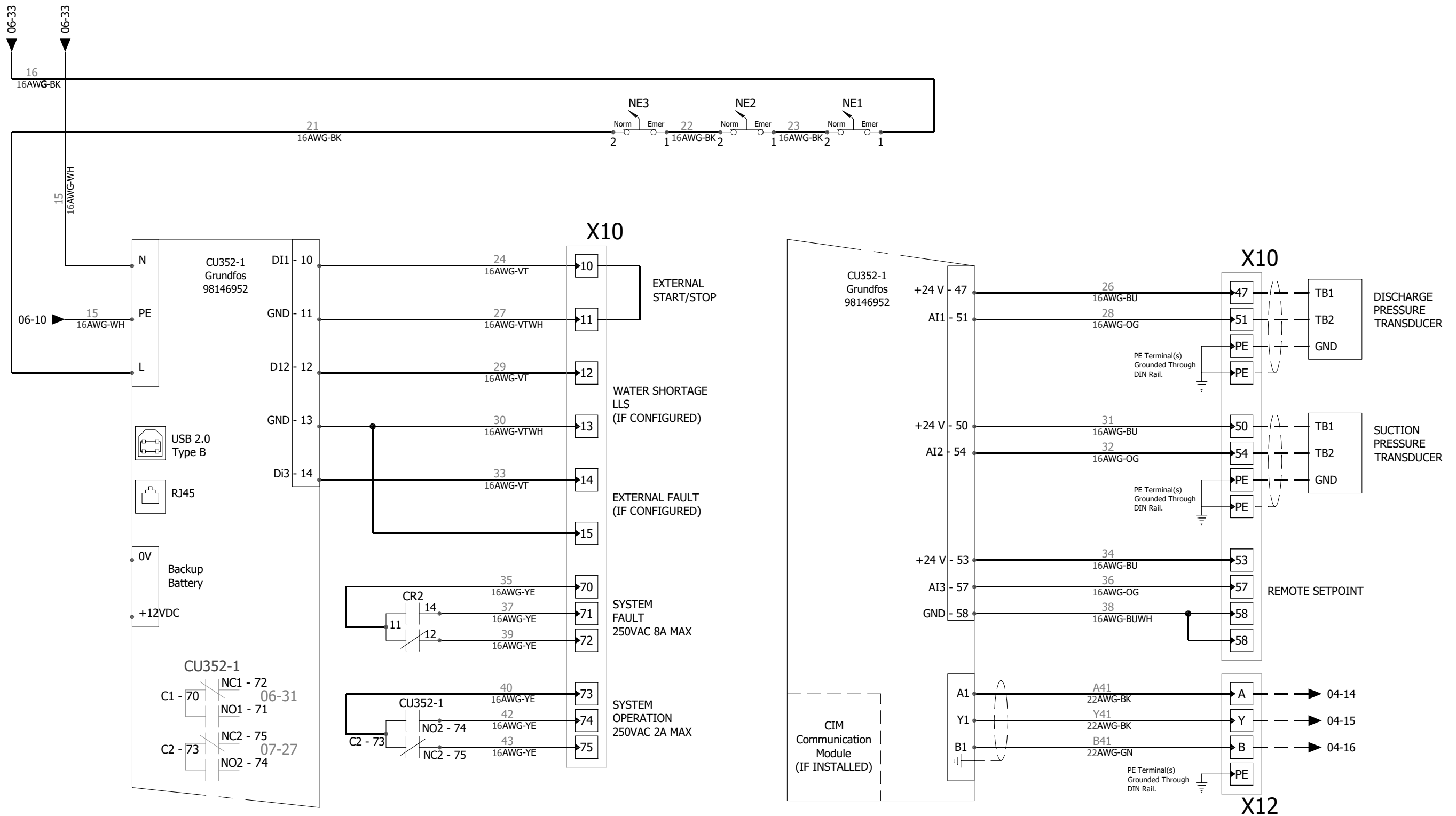
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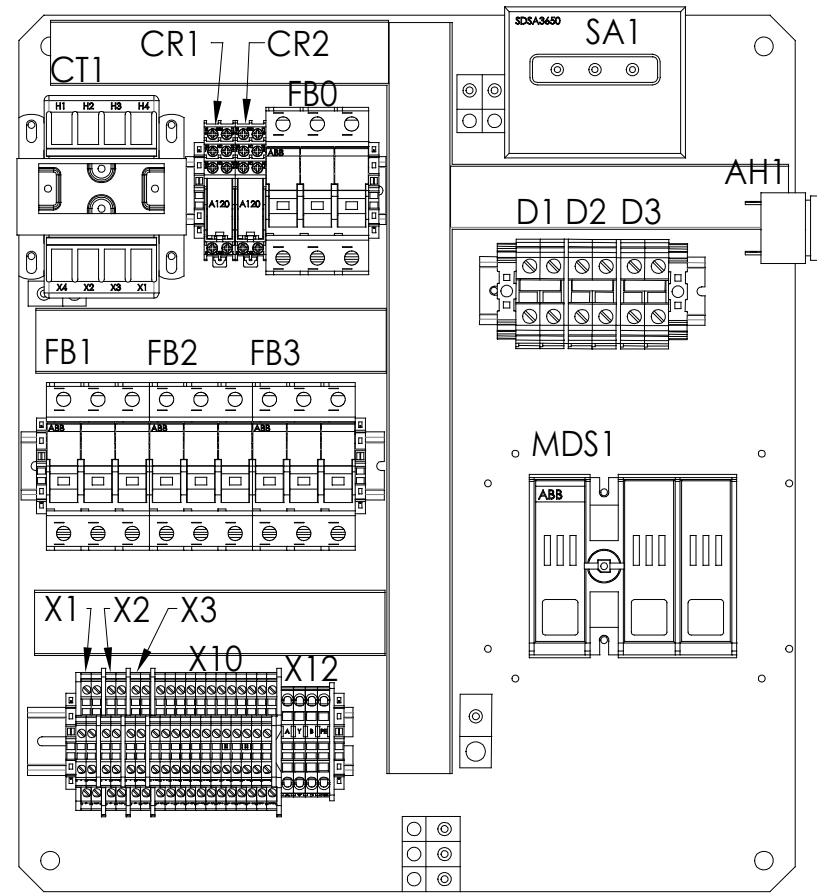


**CIM COMMUNICATION MODULE TERMINATIONS**

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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Control MPC E  
3 X 3HP  
3 X 480V

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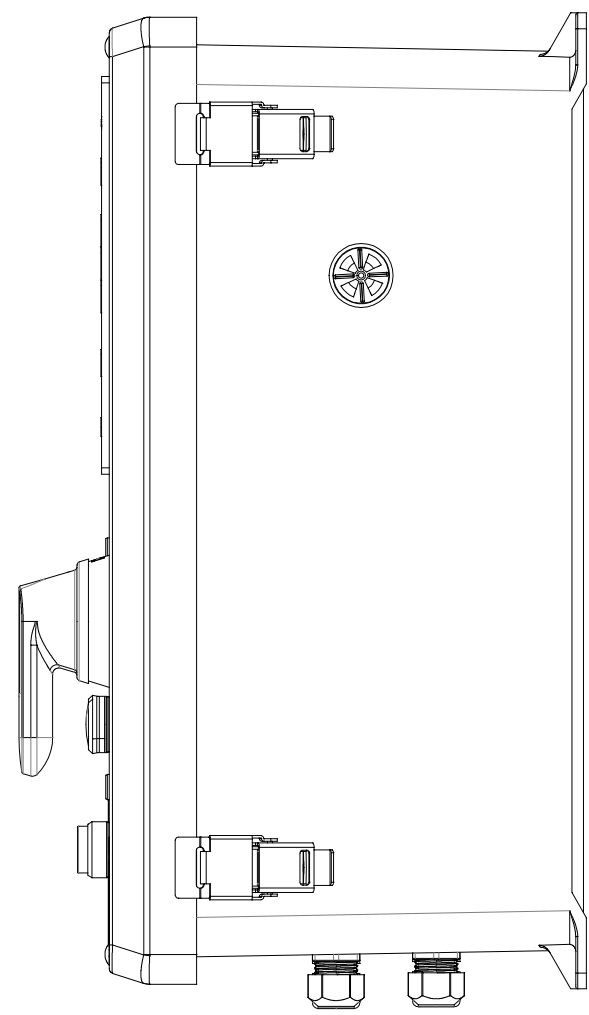
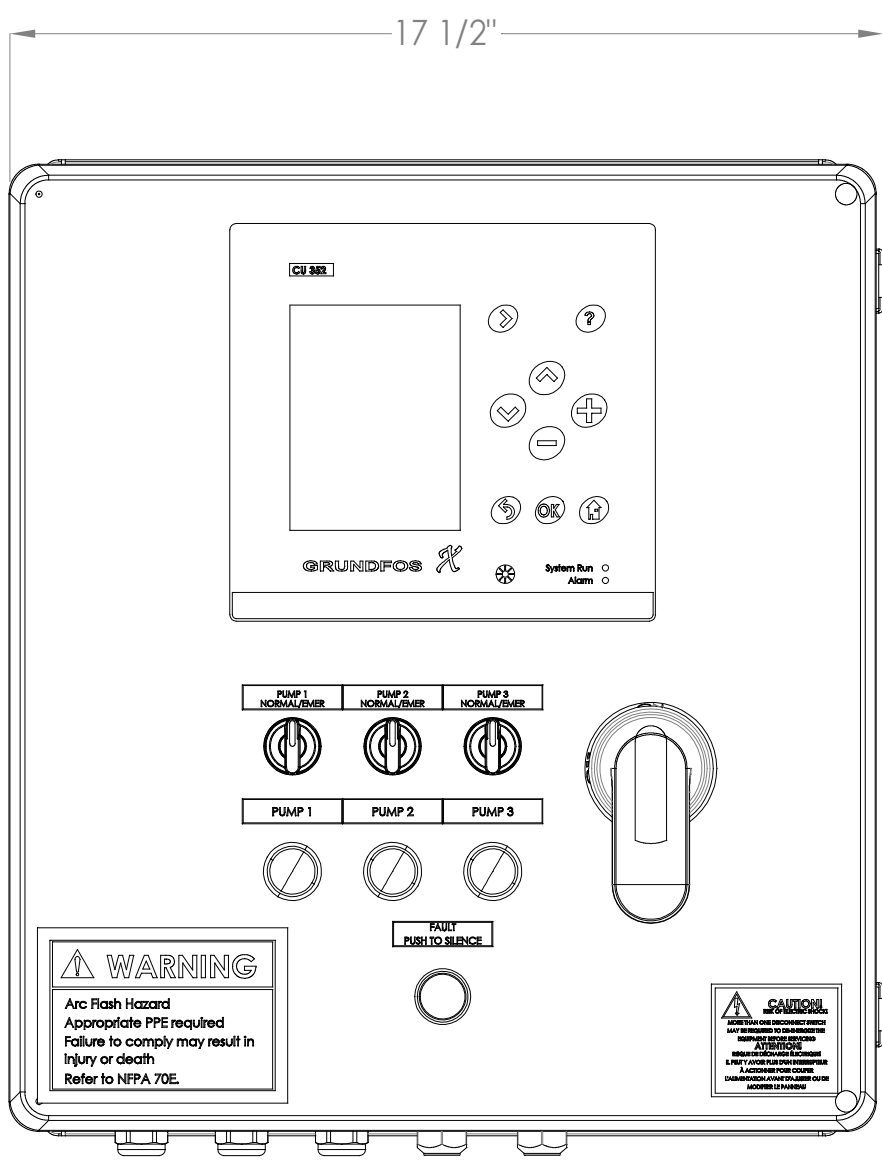
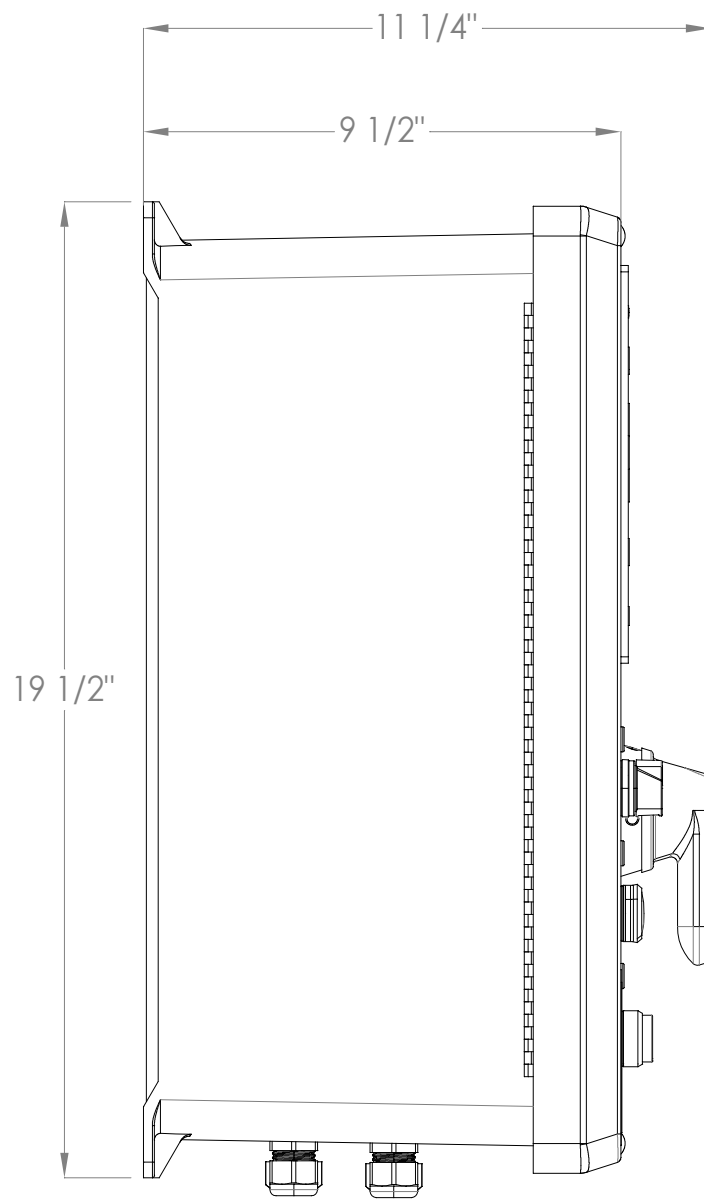
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CLEARANCE FROM FRONT OF ENCLOSURE MUST BE 36"

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**Control MPC E**  
3 X 3HP  
3 X 480V

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Article Number	Mark	Manufacturer	Reference	Description	Quantity	Component Type
13-16-26-1241	FB0 , FB1 , FB2 , FB3	ABB	E9330CCS	Fuse Block; 3P, 30 A, Class CC, Indicator, Padlockable	4	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	OXp6X500	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	F1 , F2 , F3	F.Shaw	ATQR1	Fuse; 1A, 600V, 13/32" x 1 1/2", Class CC	3	Fuse
13-16-26-1066	F4 , F5 , F6 , F7 , F8 , F9 , F10 , F11 , F12	F.Shaw	ATQR10	Fuse; 10A, 600V, 13/32" x 1 1/2", Class CC	9	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	3	Main electrical closet
13-16-86-1035	L1	Heyco	Hey-M4518	Cord Grip, 1/2 NPT Black-No Nut	6	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-1816-3P-MPC-CME	L1	OSI	65-ENCL-1816-3P-MPC-CME	Enclosure; 18X16 MPC-CME 3pump	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 , NE3	OSI	65-SWITCH-2-12	Switch; Two Position, 1-NO, 1-NC	3	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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**Control MPC E**  
**3 X 3HP**  
**3 X 480V**

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 EDW-WD-GPC-1310



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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 , X3 1	OSI	65-TB-SINGLE-PUMP-DB	Terminal Blocks; MLE Pump Control	3	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 , GL3 , GL20 , GL21	Raco	TA2-Bulk	Ground Lug; 2AWG, Burndy	6	Ground Lug
13-16-61-1010	SA1	Schneider	SDSA 3650	Surge Arrestor; 3 Phase, 600V, WYE	1	Surge Arrestor
13-16-36-1421	PRL1 , PRL2 , PRL3	Siemens	3SU11036AA401AA0	Pilot Light; Green, 110 VAC Complete	3	Pump 1 Run Light , Pump 2 Run Light

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**Control MPC E**  
3 X 3HP  
3 X 480V

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**GRUNDFOS**

Panel Part Number: 99651229	SHEET: 11/11
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