

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

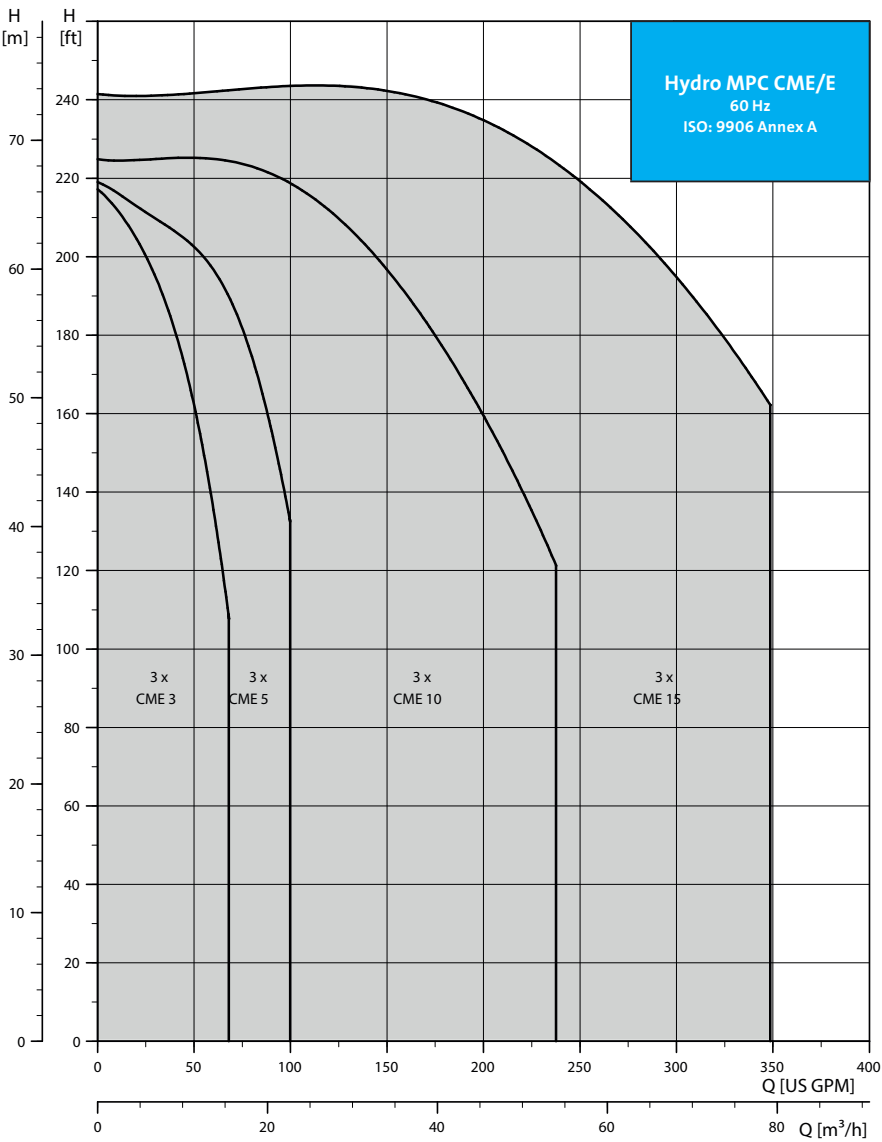
APPLICATIONS

- Pressure Boosting
- Hydronic Heating and Cooling

TECHNICAL DATA

HYDRO MPC CME	
FLOW, Q (2–3 PUMPS):	max. 345 gpm (78.36 m³/h)
HEAD, H:	max. 230 ft (70 m)
WORKING PRESSURE:	max. 145 psi (10 bar)
LIQUID TEMPERATURE:	• CME3-5: 32° F to 140° F (0° C to 60 °C) • CME10-15: 32° F to 180° F (0° C to 82 °C)
APPROVALS:	• System NSF 61/372 Certified • UL Listed Packaged Pumping System

PERFORMANCE DATA

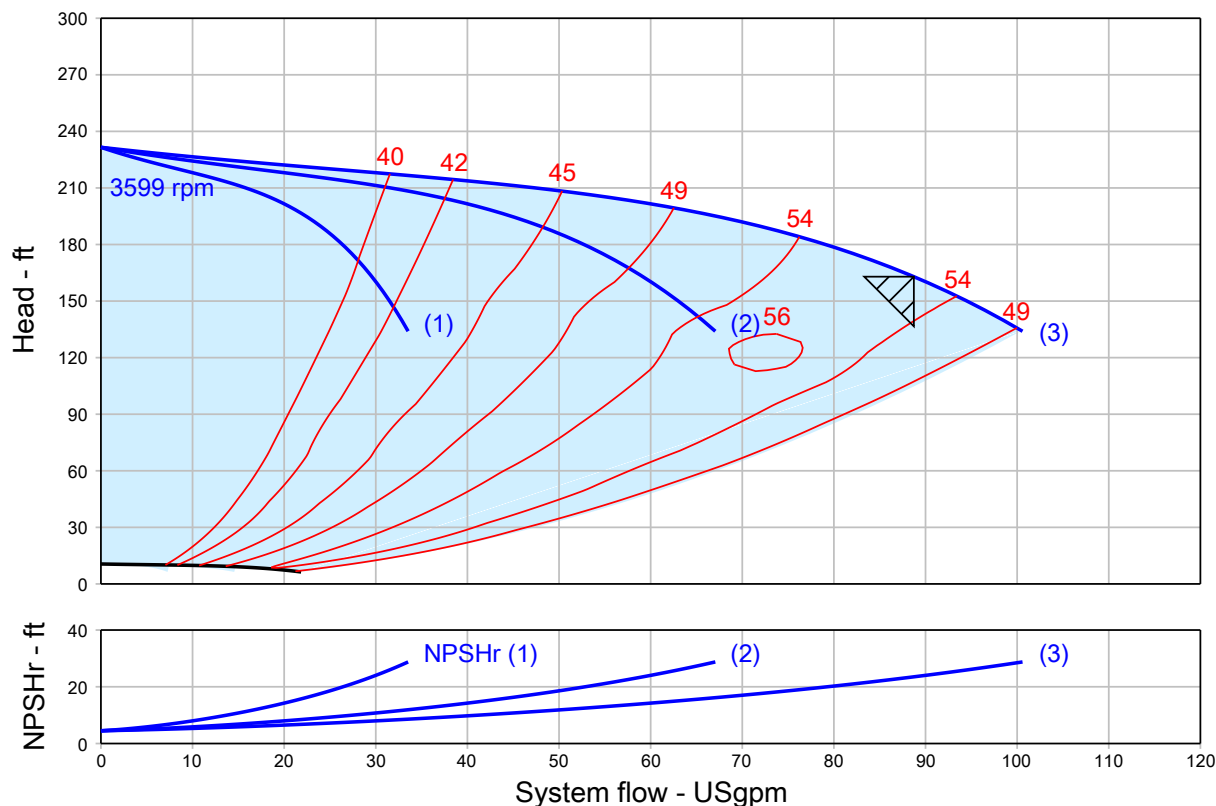


Pump Performance Datasheet

Customer	:		Quote Number / ID	:	1561369
Customer ref. / PO	:		Model	:	Hydro MPC 3CME 5-5 3x460V 60Hz
Tag Number	:	Hydro MPC 3CME 5-5 3x460V 60Hz	Part Number	:	99659080
Service	:		Stages	:	5
Quantity	:	1	Based on curve number	:	99406754
Quantity of pumps	:	3 active + 0 standby	Date last saved	:	12/27/2021 9:21 PM

Operating Conditions			Liquid		
System flowrate	:	88.73 USgpm	Liquid type	:	Cold Water
Flowrate per pump	:	29.58 USgpm	Additional liquid description	:	
Differential head / pressure, rated (requested)	:	162.9 ft	Temperature, max	:	68.00 deg F
Differential head / pressure, rated (actual)	:	162.9 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	Material		
Power Supply	:	3ph 460V	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	:	764 rpm	Driver & Power Data (@Max density)		
Pump efficiency	:	55.44 %	Motor sizing specification	:	Max power (non-overloading)
NPSH required / margin required	:	23.51 / 0.00 ft	Margin over specification	:	0.00 %
nq (imp. eye flow) / S (imp. eye flow)	:	26 / 35 Metric units	Service factor	:	1.15
Head maximum, rated speed	:	231.5 ft	Rated power (based on duty point)	:	3 x 2.19 hp
Head rise to shutoff	:	42.11 %	Max power (non-overloading)	:	3 x 2.35 hp
Flow, best eff. point	:	28.59 USgpm	Motor rating	:	3 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 / 0.99 / 1.00			
Selection status	:	Acceptable			



Hydro MPC E with CME pumps

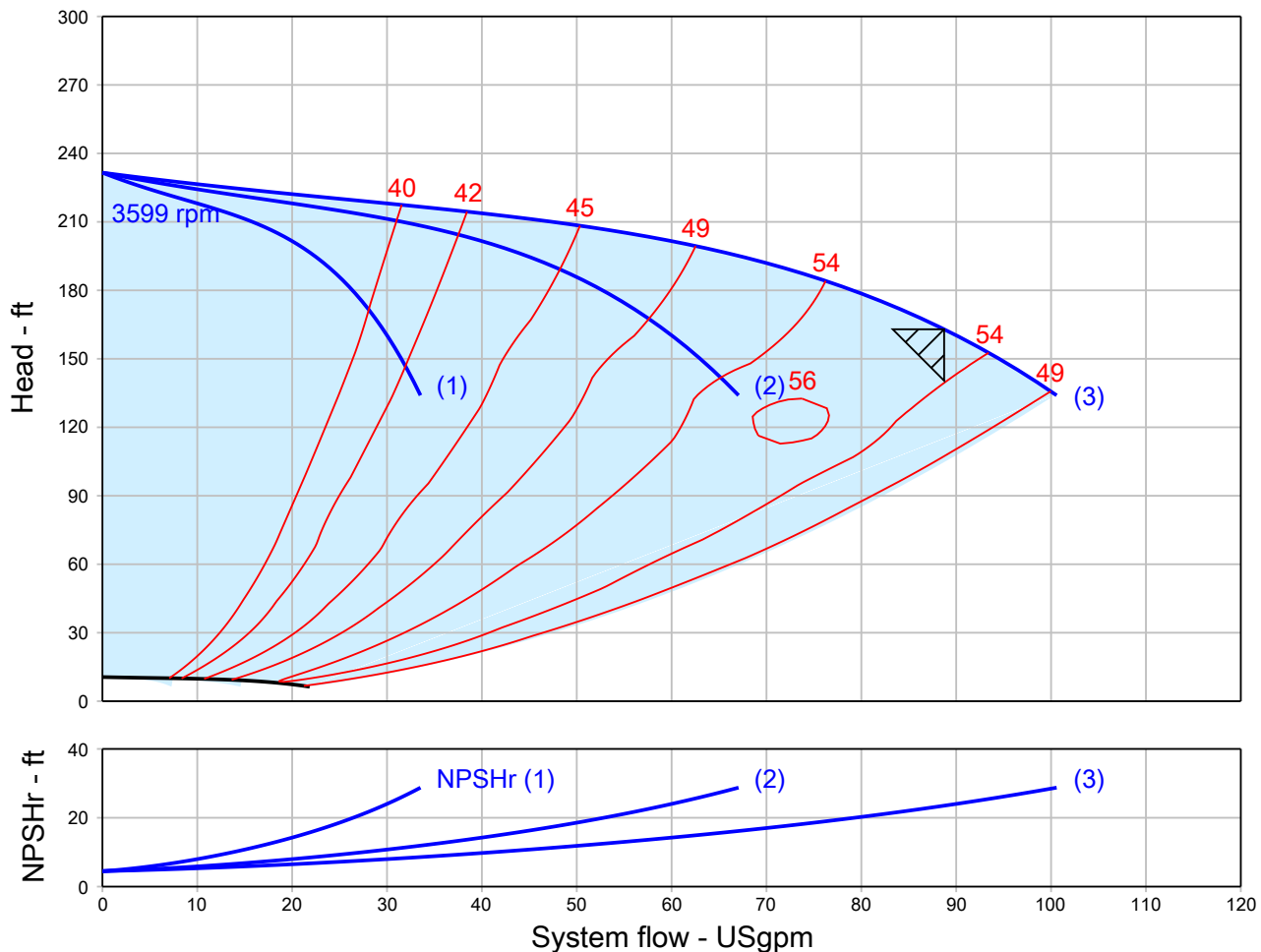
QUOTE NUMBER / ID 1561369	UNIT TAG Hydro MPC 3CME 5-5 3x460V 60Hz	QUANTITY 1
REPRESENTATIVE	SERVICE	DATE
ENGINEER	SUBMITTED BY	DATE
CONTRACTOR	APPROVED BY	DATE
	ORDER #	



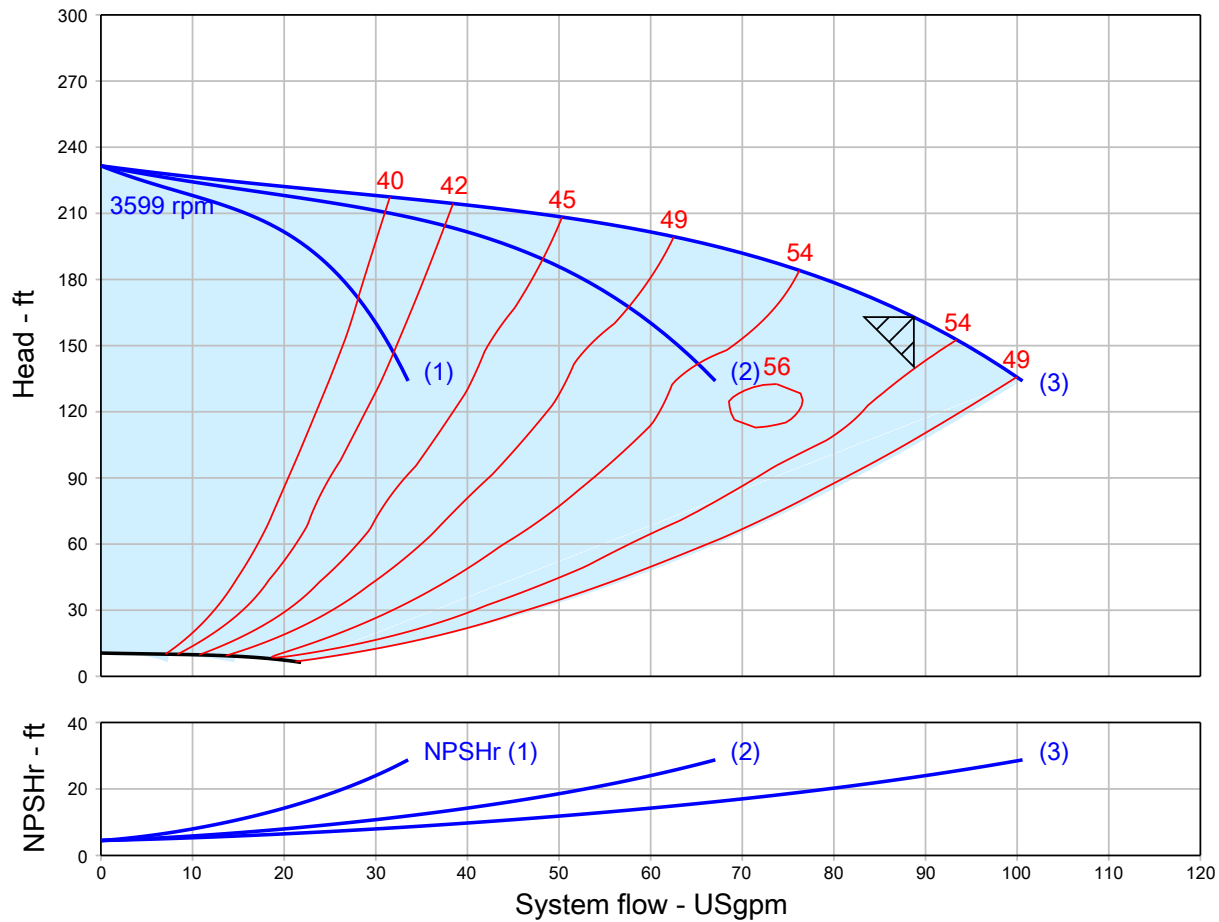
**Hydro MPC 3CME 5-5 3x460V 60Hz
3480 rpm**

Part Number 99659080

Conditions of Service		Pump Data		Motor Data	
Flow	29.58 USgpm	Material	Standard - Cast Iron / 304 Stainless Steel	Motor HP	3 HP
Head	162.9 ft			BHP	2.19 HP
Liquid	Cold Water			Enclosure	TEFC
Temperature	68.00 deg F	Pump shut off pressure	100.2 psi.g	Voltage	440-480 V
NPSHr	23.51 ft	Max Allowable Suction Pressure	50.00 psi.g	Phase	3 Phase
Viscosity	1.00 cP	Efficiency	55.44 %		
Specific Gravity	1.000 SG				

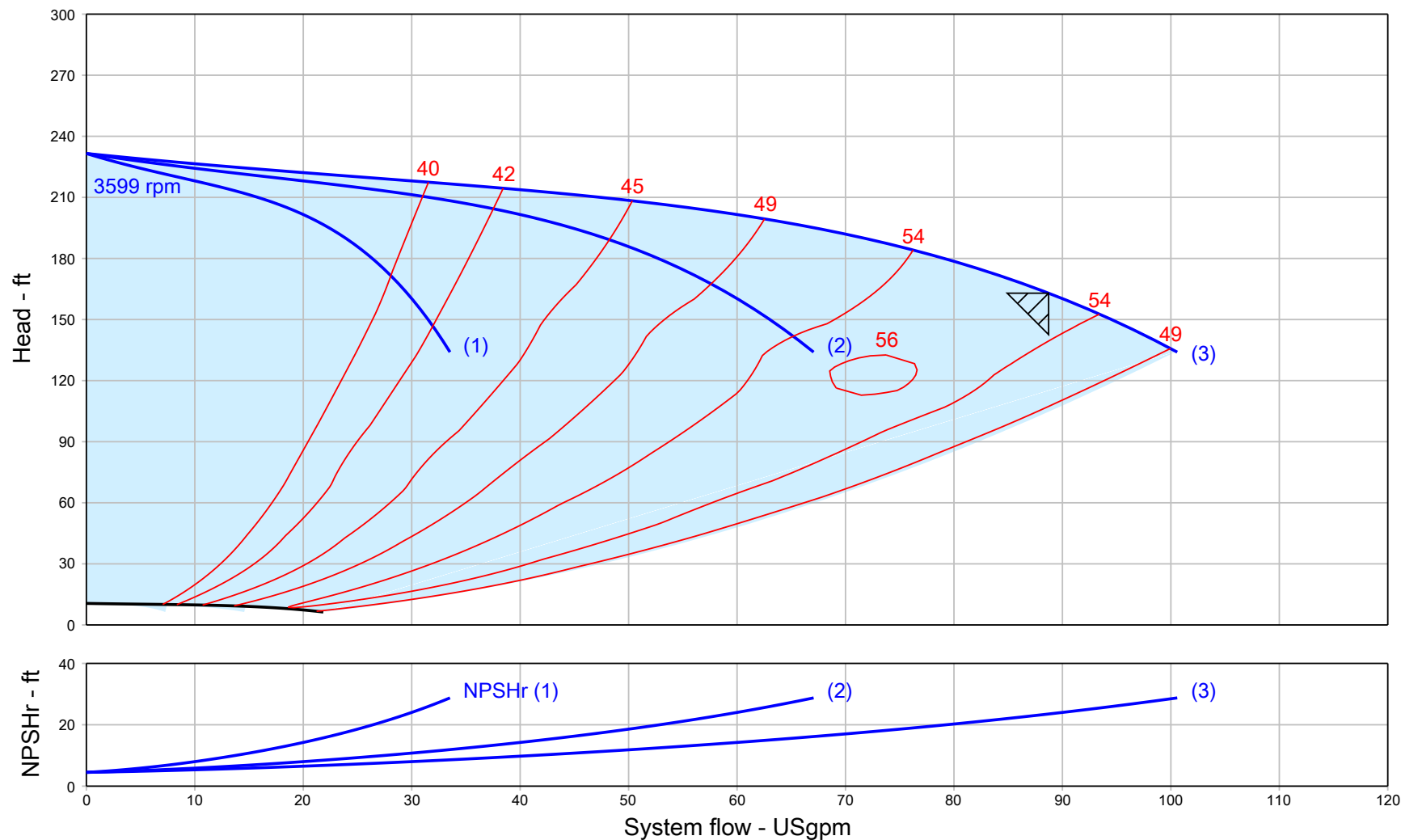


Pump Performance Curve



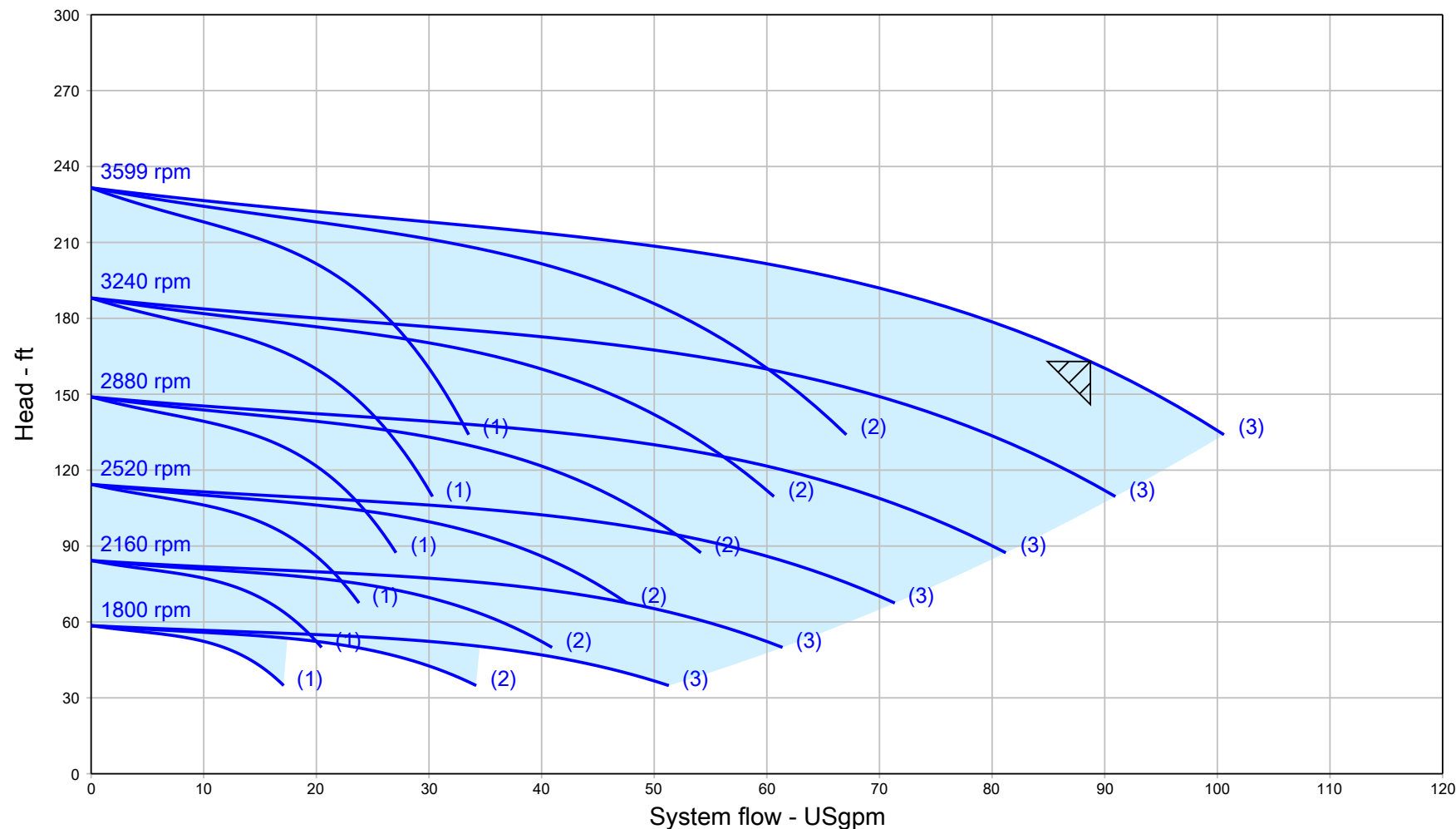
Customer	:	Model	: Hydro MPC 3CME 5-5 3x460V 60Hz
Customer ref. / PO	:	Stages	: 5
Tag Number	: Hydro MPC 3CME 5-5 3x460V 60Hz	Speed, rated	: 3599 rpm
Service	:	Based on curve number	: 99406754
Quantity	: 1	Pump efficiency	: 55.44 %
Quote Number / ID	: 1561369	Rated power (based on duty point)	: 3 x 2.19 hp
Date last saved	: 12/27/2021 9:21 PM	NPSH required	: 23.51 ft
System flowrate	: 88.73 USgpm	Fluid density, rated / max	: 1.000 / 1.000 SG
Flowrate per pump	: 29.58 USgpm	Viscosity	: 1.00 cP
Differential head / pressure, rated	: 162.9 ft		
Pressure control curve	: None		

Pump Performance Curve



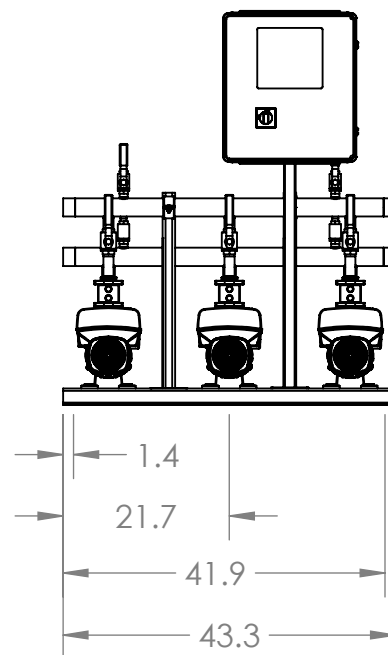
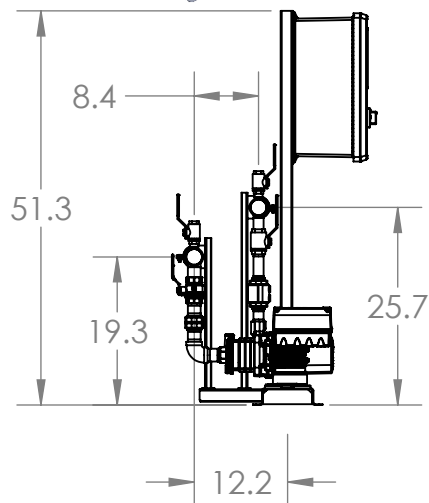
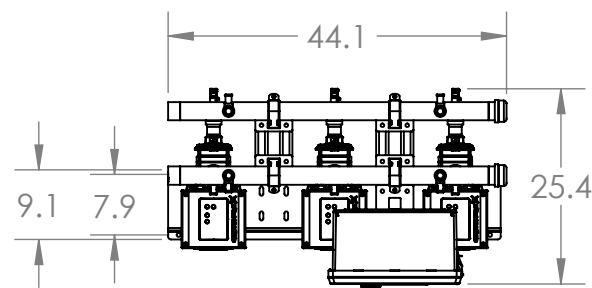
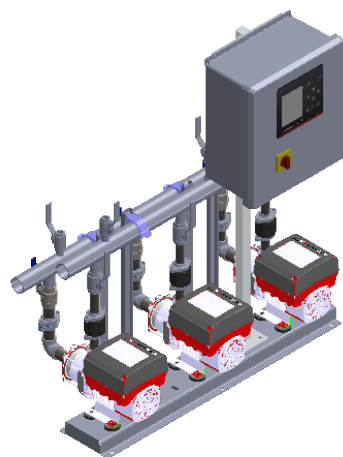
Project name	: gogrundfos.com	Tag Number	: Hydro MPC 3CME 5-5 3x460V	Speed, rated	: 3599 rpm
Consulting engineer	:		60Hz	System flowrate	: 88.73 USgpm
Customer	:	Service	:	Flowrate per pump	: 29.58 USgpm
Customer ref. / PO	:	Model	: Hydro MPC 3CME 5-5 3x460V	Differential head / pressure, rated	: 162.9 ft
Quote Number / ID	: 1561369		60Hz	Rated power (based on duty point)	: 3 x 2.19 hp
Date last saved	: 12/27/2021 9:21 PM	Quantity	: 1	Max power (non-overloading)	: 3 x 2.35 hp
Pressure control curve	: None	Quoted By (Sales Office)	: HURLEY ENGINEERING	Pump efficiency	: 55.44 %
			COMPANY	Based on curve number	: 99406754
		Quoted By (Sales Engineer)	: Devin Carle		

Multi-Speed Performance Curve



Project name	: gogrundfos.com	Tag Number	: Hydro MPC 3CME 5-5 3x460V	Speed, rated	: 3599 rpm
Consulting engineer	:		60Hz	System flowrate	: 88.73 USgpm
Customer	:	Service	:	Flowrate per pump	: 29.58 USgpm
Customer ref. / PO	:	Model	: Hydro MPC 3CME 5-5 3x460V	Differential head / pressure, rated	: 162.9 ft
Quote Number / ID	: 1561369		60Hz	Fluid density, rated / max	: 1.000 / 1.000 SG
Date last saved	: 12/27/2021 9:21 PM	Quantity	: 1	Viscosity	: 1.00 cP
Pressure control curve	: None	Quoted By (Sales Office)	: HURLEY ENGINEERING COMPANY	Based on curve number	: 99406754
		Quoted By (Sales Engineer)	: Devin Carle		

1. Manifolds 2" NPT AISI 316SS Schedule 10s ASTM A312 or ϕ 60.3mm x2mm
2. Base/Frame AISI 304SS
3. Full port ball valve ASTM
4. UL Type 3R/12 rated electrical panel



GRUNDFOS 
FRESNO, CALIFORNIA 93727 USA

Note:
All dimensions are $\pm 0.5"$
Not for Construction
All dimensions subject to
changewithout notice.

BoosterpaQ Model: HYDRO MPC E 3CME5-5

Power: 3x460 60HZ 3x2HP

Job:

Scale: 1:25

Dwg No:

Rev: 0

Date:

6/20/2019

Drawer

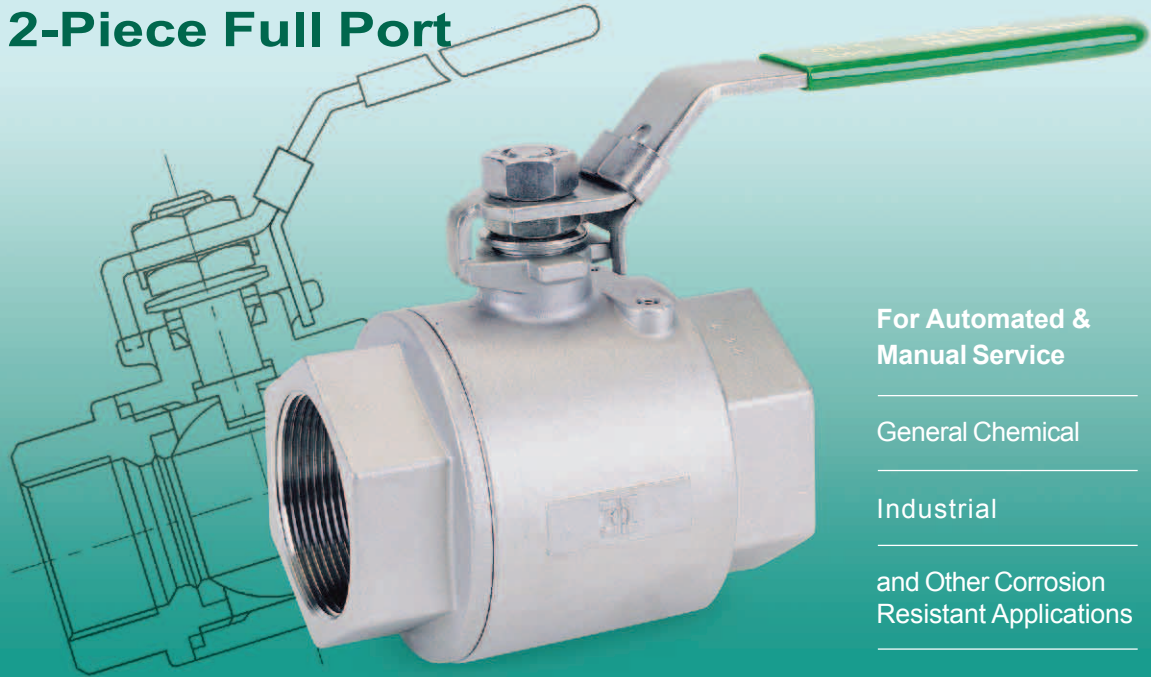
71999

Page:

1 of 1

202F Ball Valve

2-Piece Full Port



For Automated &
Manual Service

General Chemical

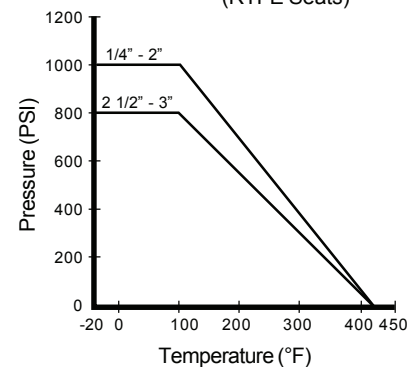
Industrial

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)



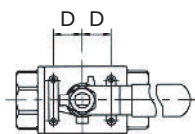
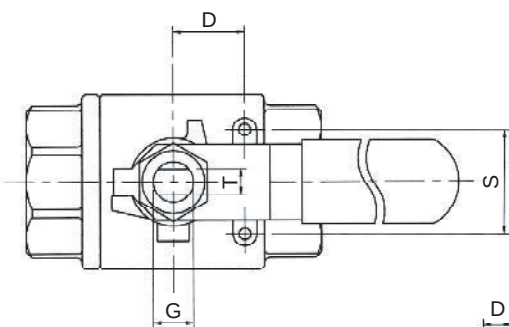
Operating Conditions

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

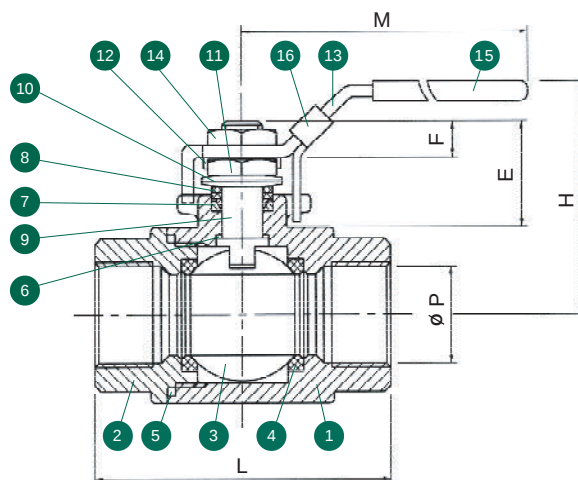
Specifications

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





2 1/2" to 3"



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.) C - RTFE (15% C.F.) T - PTFE	T - PTFE F - 50% 316SS Filled PTFE	T - NPT	2 - 2 Way	S - Straight Port 7 - ASEV Ball
	3 3/8"									
	5 1/2"	2 - A216 Gr. WCB	2 - A216 Gr. WCB							
	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 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:

© 2007 Inline Industries. All rights reserved.

0704.1

Ball Valves



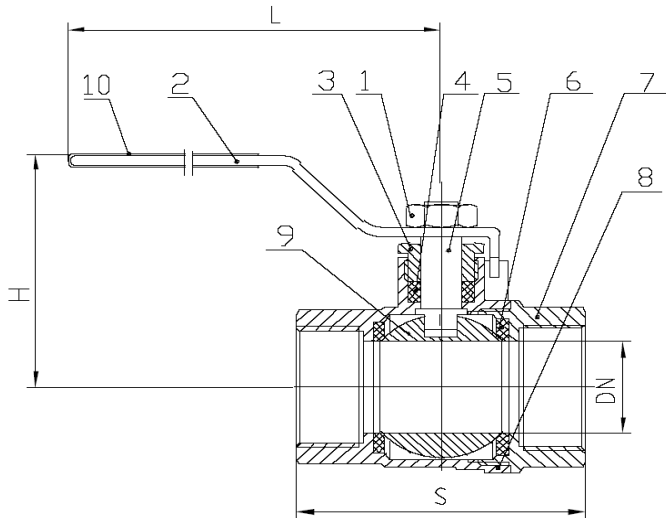
General

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

Dimensions & Weights

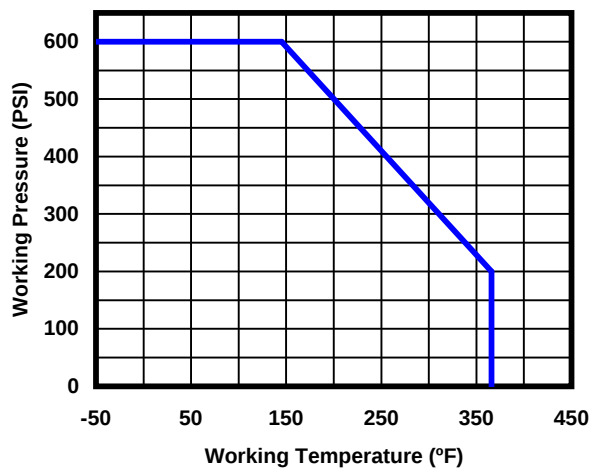
Size	DN (in)	S (in)	H (in)	L (in)	WT. (lb)
1/4"	0.39	1.76	1.75	3.54	0.35
3/4"	0.75	2.50	2.18	3.94	0.79
1-1/4"	1.26	3.42	2.87	4.80	1.75
1-1/2"	1.57	3.76	3.48	5.91	2.47
2"	1.97	4.25	3.82	5.91	3.46

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)

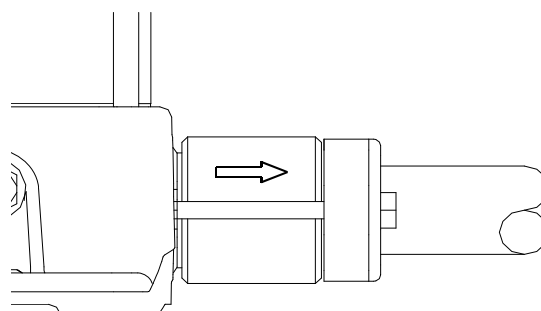
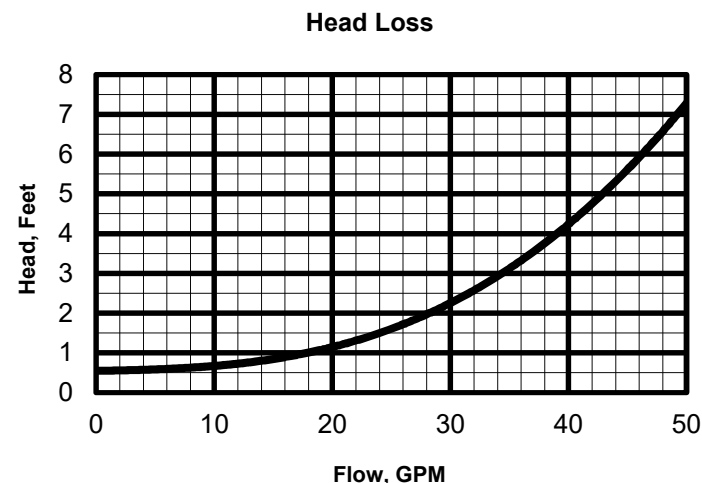
Construction

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

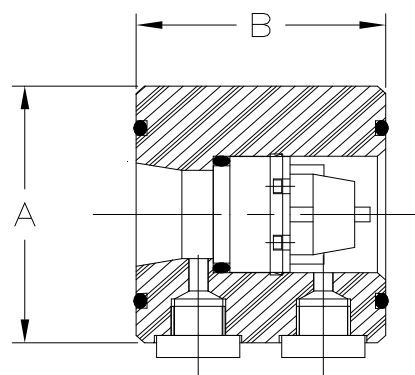


The GNVP valve is fitted between the base and flange of Grundfos CR 1s/1/3/5 pumps by means of bolts and nuts. An arrow on the valve body indicates direction of flow.

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) D82LFB (liquid filled)	Bronze tube, brass socket Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
D83SS (dry) D83LFSS (liquid filled)	316 Stainless steel tube & socket
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"				

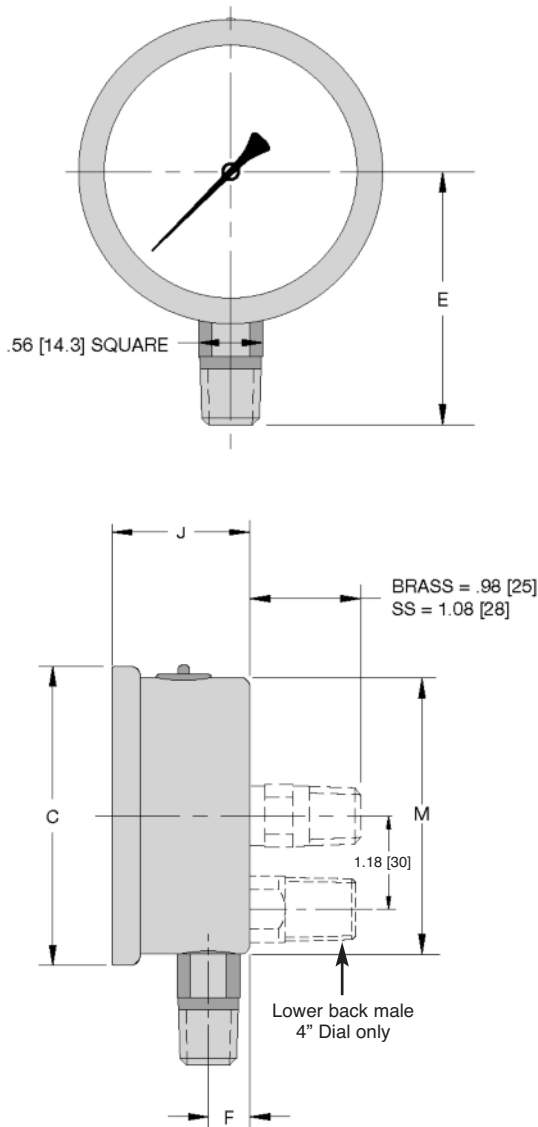
- * 1/8 NPT connection size not available with 4" dial size.
- ** 1/4 NPT connection size not available with 1 1/2" dial size.
- *** 1/2 NPT connection size only available with 4" dial size.

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

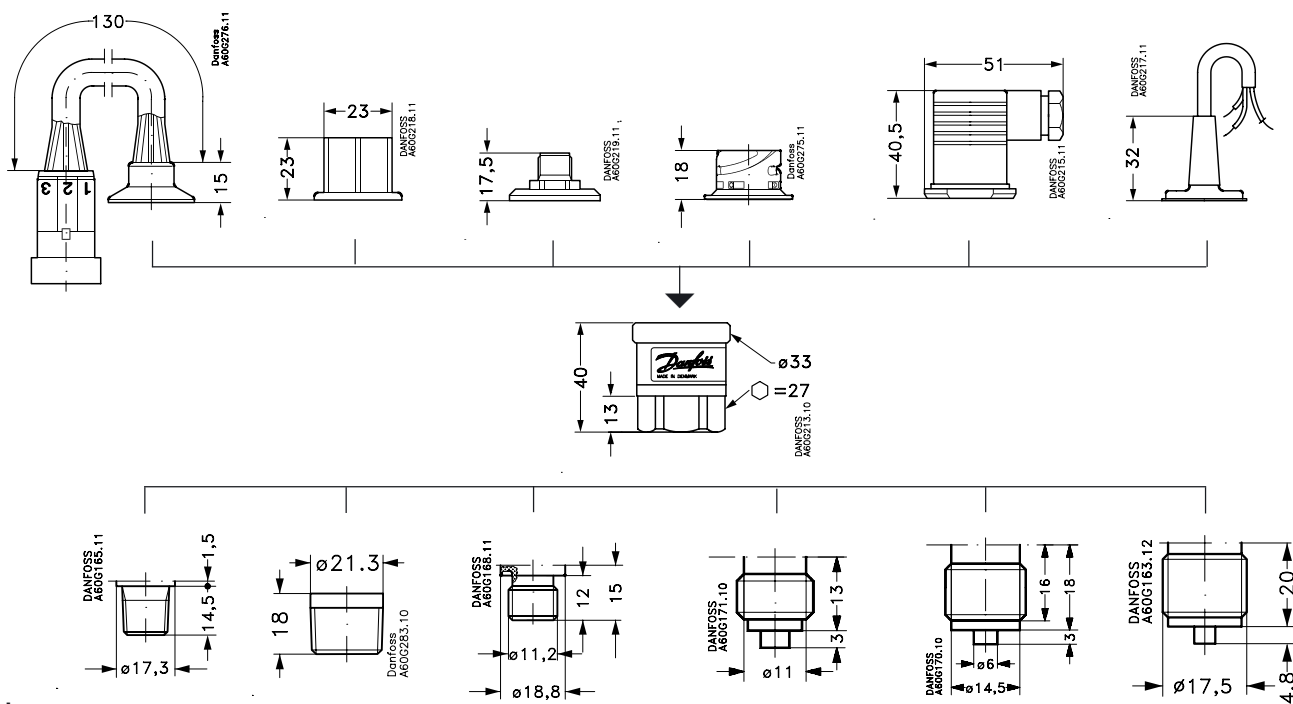


- Designed for use in severe industrial environments
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- All standard output signals: 4-20 mA, 0-5 V, 1-5 V, 1-6 V, 0-10 V
- A wide range of pressure and electrical connections
- Temperature compensated and laser calibrated
- Typical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

Type code page 4	1/4 - 18 NPT	1/2 - 14 NPT	DIN 3852-E-G 1/4 Gasket: DIN 3869-14	G 1/4 A (EN 837)	G 3/8 A (EN 837)	G 1/2 A (EN 837)
	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 ⁶ 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 _B], 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 _L] (load connected to 0V)	$R_L \leq (U_B - 9V)/0.02$	$R_L \geq 10 \text{ k}\Omega$	$R_L \geq 15 \text{ k}\Omega$

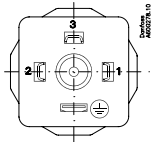
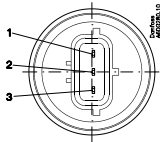
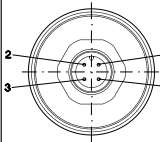
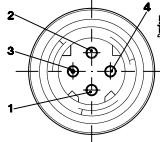
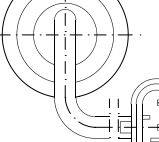
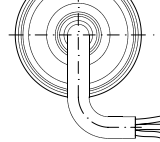
Environmental conditions

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 _{rms} , 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 _{rms} , 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 M12×1	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 ¹⁾	Nickel plated brass, CuZn/Ni	Glass filled polyester, PBT	Glass filled polyamid, PA 6.6 ²⁾	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

MBS 3000

Measuring range

0 - 1 bar	1 0
0 - 1.6 bar	1 2
0 - 2.5 bar	1 4
0 - 4 bar	1 6
0 - 6 bar	1 8
0 - 10 bar	2 0
0 - 16 bar	2 2
0 - 25 bar	2 4
0 - 40 bar	2 6
0 - 60 bar	2 8
0 - 100 bar	3 0
0 - 160 bar	3 2
0 - 250 bar	3 4
0 - 400 bar	3 6
0 - 600 bar	3 8

Pressure reference

Gauge (relativ)	1
Absolute	2

A B 0 4 ...	G 1/4 A (EN 837)
A B 0 6 ...	G 3/8 A (EN 837)
A B 0 8 ...	G 1/2 A (EN 837)
A C 0 4 ...	1/4 -18 NPT
A C 0 8 ...	1/2-14 NPT
G B 0 4 ...	DIN 3852-E-G1/4,

Pressure connection(see page 1)

Gasket: DIN 3869-14 NBR

Electrical connection (see pages 1 and 3)

Plug, DIN 43650, Pg 9
 *) Plug, AMP Econoseal, J series, male, excl. female plug
 Screened cable, 2 m
 *) Plug, IEC 947-5-2, M12 x 1, male, excl. female plug
 Plug ISO 15170-A1-3.2-Sn, male, excl. female plug
 *) Plug, AMP Superseal 1.5 series male, excl. female plug

*) Gauge versions only available as sealed gauge versions

Output signal

1	4 - 20 mA
2	0 - 5 V
3	1 - 5 V
4	1 - 6 V
5	0 - 10 V

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.



Panel Part Number:
99651227

Description
Control MPC E
3 X 2HP
3 X 480V

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

0	6/18/2019	Control MPC E 3 X 2HP 3 X 480V	This drawing and its content is the property of GRUNDFOS. It may not be copied for third third parties or competitors. Changes are only to be made by GRUNDFOS.	PROJECT: 99651227		
1	8/7/2019					
2	8/16/2019			EDW-WD-GPC-1308	Panel Part Number: 99651227	SHEET: 1/11
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	2HP
Motor FLA	2.65FLA
Panel Max. FLA	8.95FLA

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 

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

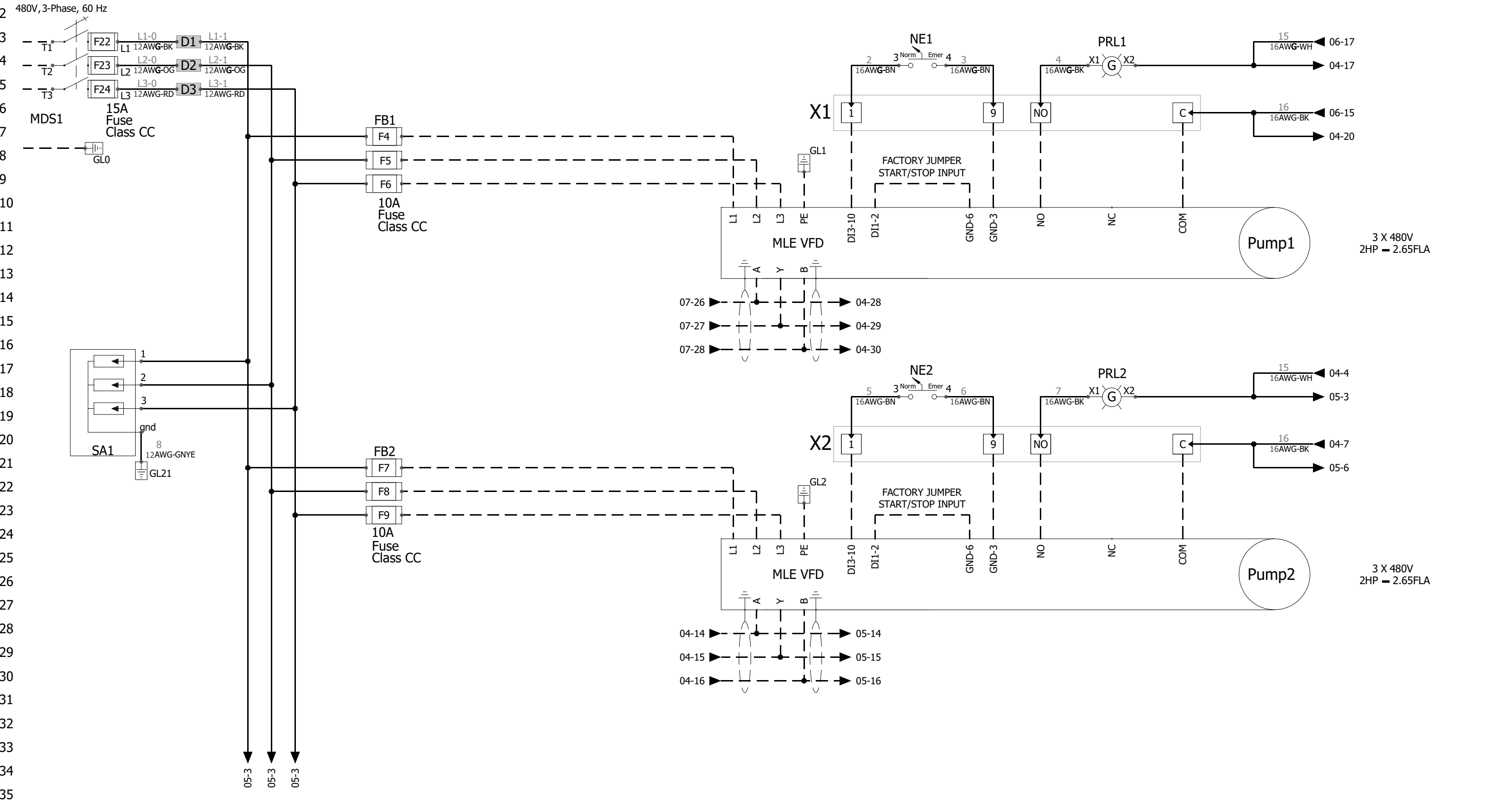
34

35

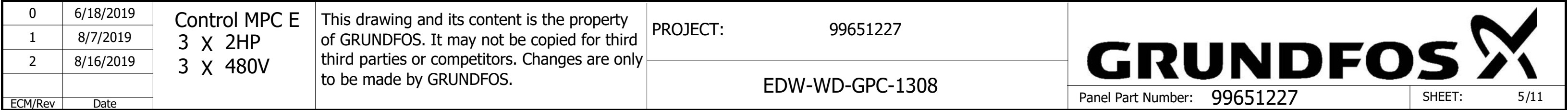
1-Table of Contents

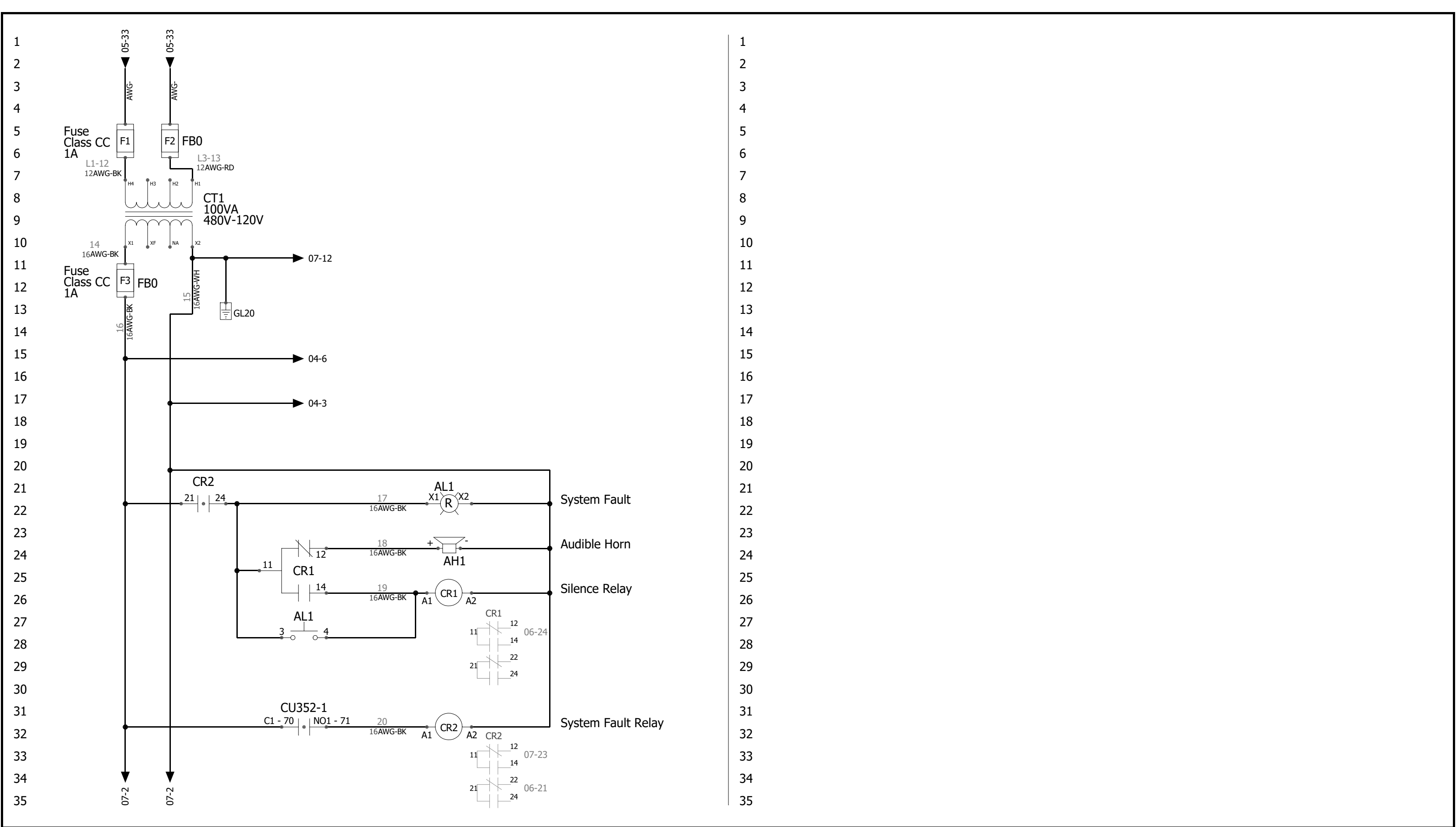
Drawing	Revision	Date	Created by	Description
<u>01</u>	0	6/18/2019	mfischer	Cover Page 01
<u>02</u>	0	6/18/2019	mfischer	Cover Page 02
<u>03</u>	0	6/18/2019	mfischer	Drawings list
<u>04</u>	0	6/18/2019	mfischer	Power 01
<u>05</u>	0	6/18/2019	mfischer	Power 02
<u>06</u>	0	6/18/2019	mfischer	Control 01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

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

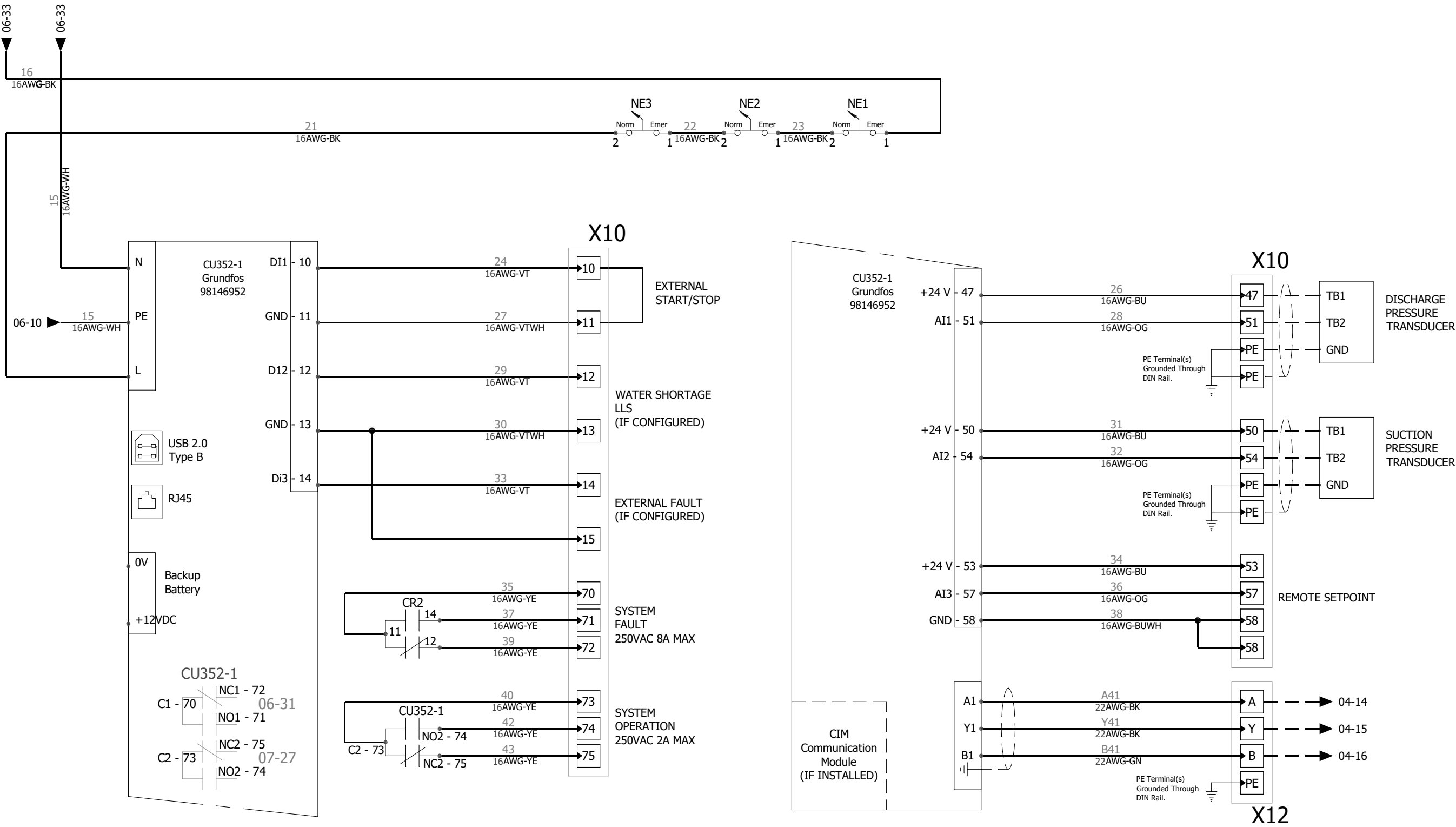


0	6/18/2019	Control MPC E 3 X 2HP 3 X 480V	This drawing and its content is the property of GRUNDFOS. It may not be copied for third third parties or competitors. Changes are only to be made by GRUNDFOS.	PROJECT:	99651227	GRUNDFOS 	
1	8/7/2019						
2	8/16/2019						
					EDW-WD-GPC-1308		
CM/Rev	Date					Panel Part Number: 99651227	SHEET: 4/11





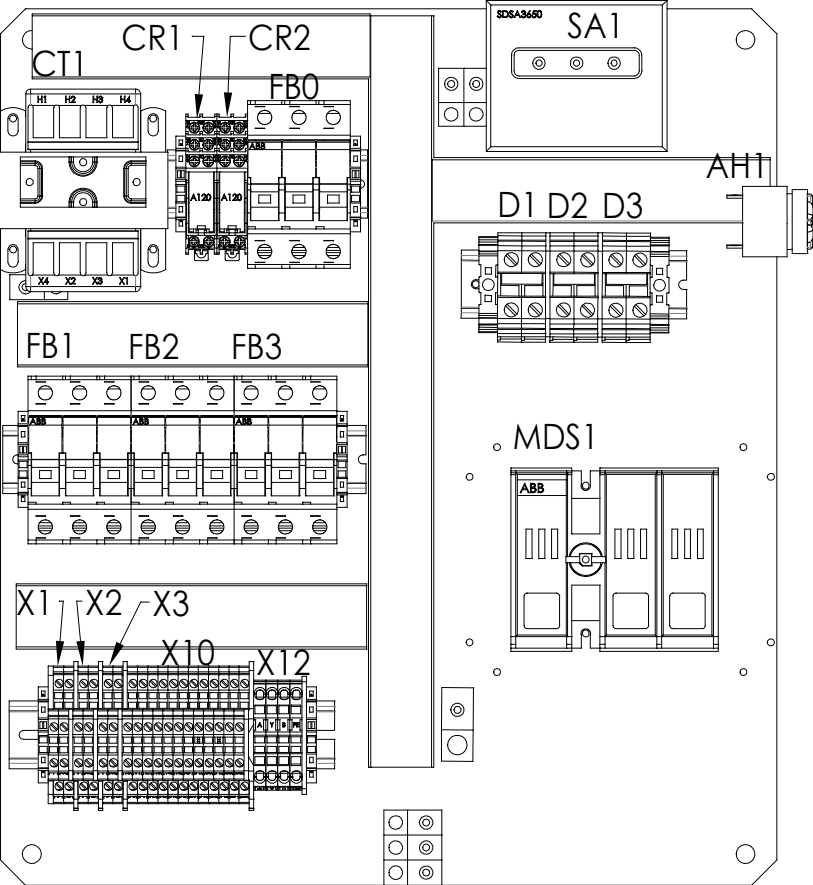
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35



CIM COMMUNICATION MODULE TERMINATIONS

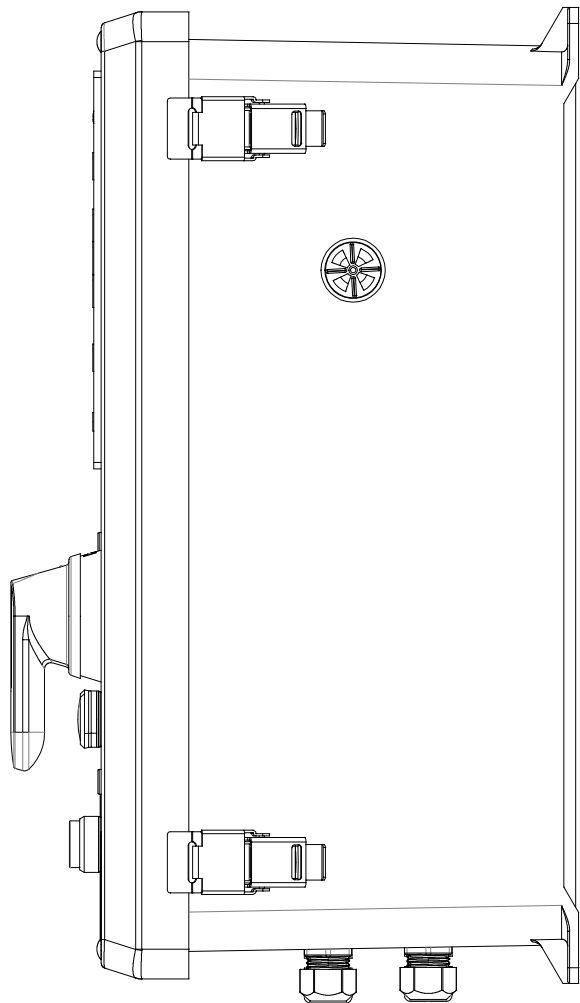
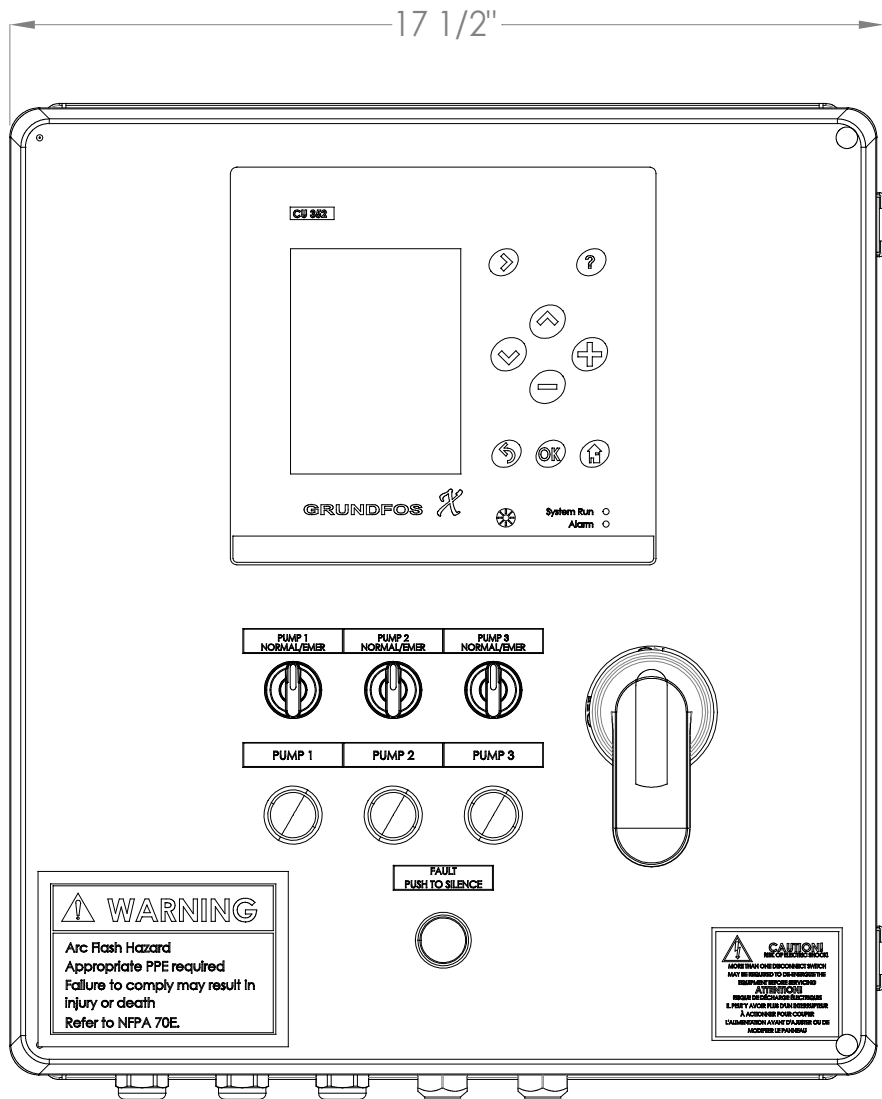
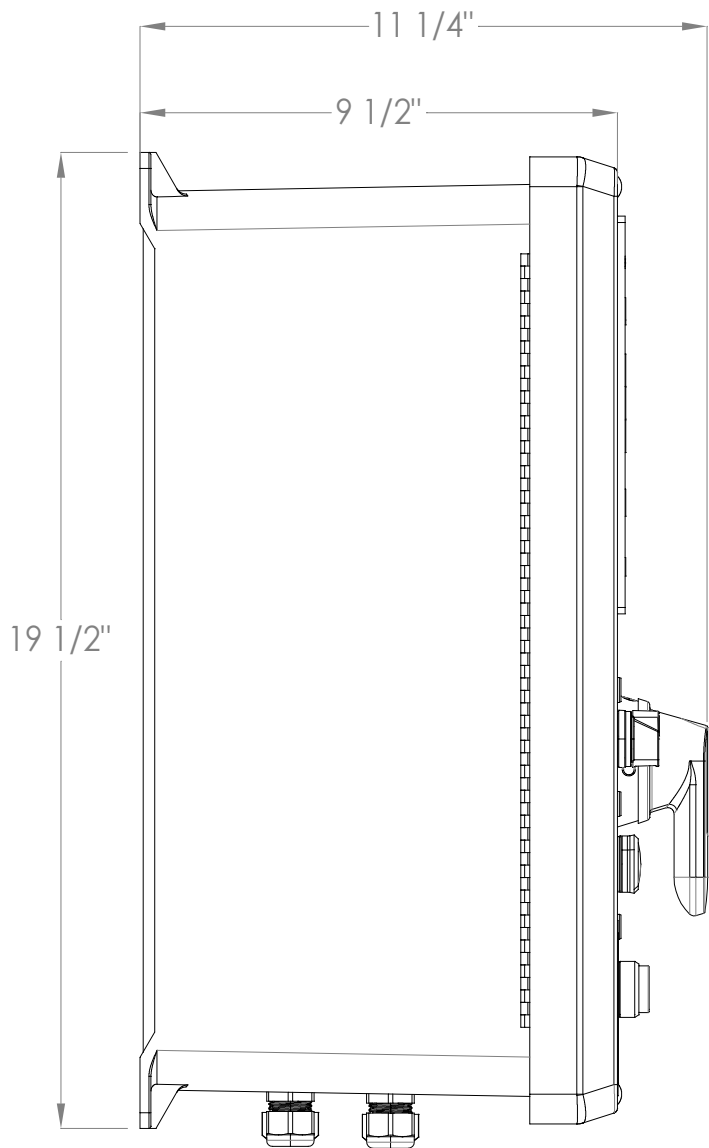
CIM	Terminal 1	Terminal 2	Terminal 3	Terminal 4
CIM 110 LON	LON terminal A	LON terminal B	LON terminal for cable screen	N/A
CIM 150 PROFIBUS DP	PROFIBUS terminal B	PROFIBUS terminal A	PROFIBUS terminal DGND	+5VDC
CIM 200 Modbus RTU	Modbus terminal D1	Modbus terminal D0	Modbus terminal common/GND	N/A
CIM 300 BACnet MS/TP	BACnet Plus terminal	BACnet Minus terminal	BACnet Ground terminal	N/A
CIM 500 BACnet IP, Modbus TCP, PROFINET IO	RJ45	RJ45		

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35



0	6/18/2019	Control MPC E 3 X 2HP 3 X 480V	This drawing and its content is the property of GRUNDFOS. It may not be copied for third third parties or competitors. Changes are only to be made by GRUNDFOS.	PROJECT: 99651227	GRUNDFOS	
1	8/7/2019					
2	8/16/2019			EDW-WD-GPC-1308	Panel Part Number: 99651227	SHEET: 8/11
ECM/Rev	Date					

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35



CLEARANCE FROM FRONT OF ENCLOSURE MUST BE 36"

0	6/18/2019	Control MPC E 3 X 2HP 3 X 480V	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: 99651227	GRUNDFOS 	Panel Part Number: 99651227	SHEET: 9/11
1	8/7/2019						
2	8/16/2019			EDW-WD-GPC-1308			
ECM/Rev	Date						

1							
2	Article Number	Mark	Manufacturer	Reference	Description	Quantity	Component Type
3	13-16-26-1241	FB0 , FB1 , FB2 , FB3	ABB	E9330CCS	Fuse Block; 3P, 30 A, Class CC, Indicator, Padlockable	4	Fuse Block 3-pole
5	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
6	13-16-66-1506	<u>MDS1</u>	ABB	OHZX10	Alignment Ring; Use on all Pistol Grip Handles	1	Main Disconnect
8	13-16-66-1431	<u>MDS1</u>	ABB	OS30FACC12	Disconnect Switch; 30A, Fuseable, 600V, 3-Pole, UL98, Class CC, Center Shaft	1	Main Disconnect
9	13-16-66-1610	<u>MDS1</u>	ABB	OXp6X500	Disconnect Shaft; 19.7", 6x500	1	Main Disconnect
10	13-16-81-1463	<u>CT1</u>	Acme	TB100A005C	Transformer; 100VA, P/208/230/460V, S/115V	1	Controls Transformer
12	13-16-26-1060	F1 , F2 , F3	F.Shaw	ATQR1	Fuse; 1A, 600V, 13/32" x 1 1/2", Class CC	3	Fuse
13	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
16	13-16-26-1068	F22 , F23 , F24	F.Shaw	ATQR15	Fuse; 15A, 600V, 13/32" x 1 1/2", Class CC	3	Fuse
17	13-16-56-1029	<u>AH1</u>	Floyd Bell	SP-1081	Alarm; 120V, 95db, Reduced Sensitivity, Extra Fast Warble, Panel Mount	1	Audible Horn
19	13-16-39-1093	<u>CU352-1</u>	Grundfos	98146952	(CM) Logic Module; Grundfos MPC Controller (CU352)	1	CU352
20	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
21	13-16-86-1035	L1	Heyco	Hey-M4518	Cord Grip, 1/2 NPT Black-No Nut	6	Main electrical closet
23	13-16-46-1073	CR1 , CR2	Idec	RJ2S-CL-A120	Relay; 120V, DPDT, 8A, Indicator	2	Silence Relay , System Fault Relay
25	13-16-46-1283	CR1 , CR2	Idec	SJ2S-07LW	Socket; 8 Pin, DIN/Pnl Mt, for RJ Relays	2	Silence Relay , System Fault Relay
27	13-66-11-1130	SAB1	OSI	13-66-11-1130	Bracket; Surge Arrestor	1	SA Bracket
28	65-BP-1816-MPC-CME	L1	OSI	65-BP-1816-MPC-CME	Backplate; MPC-CME-Hybrid-1816	1	Main electrical closet
30	65-ENCL-1816-3P-MPC-CME	L1	OSI	65-ENCL-1816-3P-MPC-CME	Enclosure; 18X16 MPC-CME 3pump	1	Main electrical closet
32	65-LIGHT-1R-032	<u>AL1</u>	OSI	65-light-1R-032	Push Button Light; Fault, Push to Silence	1	System Fault
33	65-SWITCH-2-12	NE1 , NE2 , NE3	OSI	65-SWITCH-2-12	Switch; Two Position, 1-NO, 1-NC	3	Normal/Emergency Switch
34	65-TB-CU352-DB	<u>X10 1</u>	OSI	65-TB-CU352-DB	Terminal Blocks; Double Stack, X10 CU352 Terminals	1	CU352 Terminal Blocks
35							

0	6/18/2019	Control MPC E 3 X 2HP 3 X 480V	This drawing and its content is the property of GRUNDFOS. It may not be copied for third third parties or competitors. Changes are only to be made by GRUNDFOS.	PROJECT: 99651227		
1	8/7/2019					
2	8/16/2019					
ECM/Rev	Date					
				EDW-WD-GPC-1308	Panel Part Number: 99651227	SHEET: 10/11

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

Article Number	Mark	Manufacturer	Reference	Description	Quantity	Component Type
65-TB-GENI	<u>X12 1</u>	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	<u>SA1</u>	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