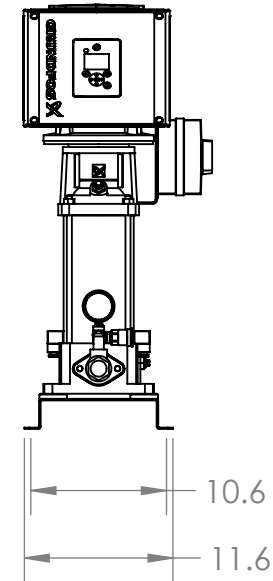
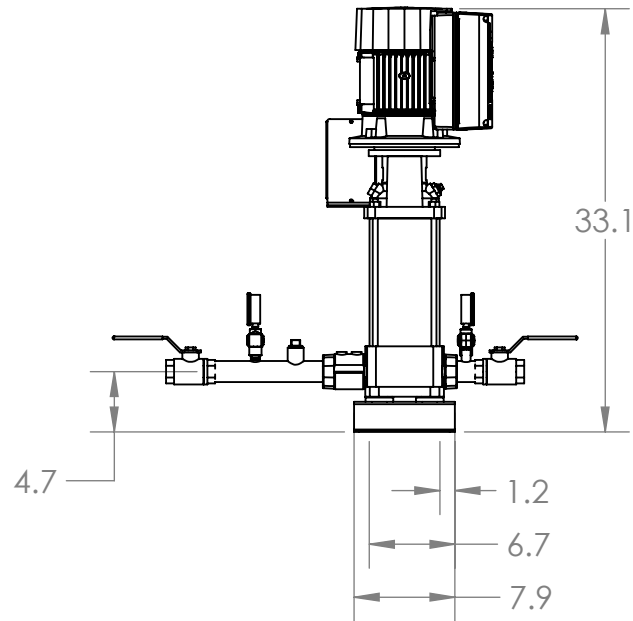
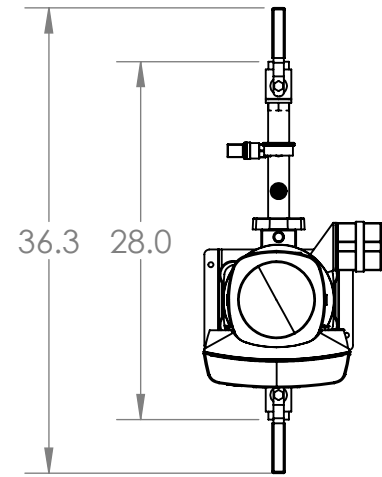
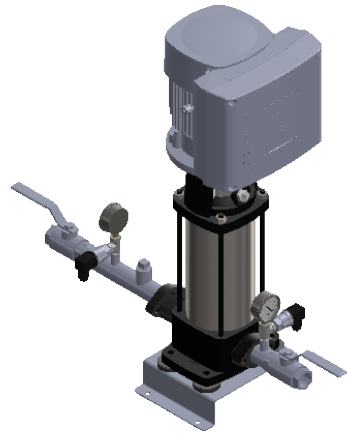


1. Manifolds connections 1.25" NPT
2. Base/Frame AISI 304SS
3. Full port ball valve ASTM



**GRUNDFOS**   
 FRESNO, CALIFORNIA 93727 USA

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

Model:		CRE-PLUS CRE5-9	
Power:		3x208-230 60HZ	1x3HP
Job:			
Dwg No:	Rev:	Date:	Drawer:
91138476	0	11/26/2019	71999
Scale:			1:15
Page:			1 of 1

PROJECT: _____	UNIT TAG: _____	QUANTITY: _____
REPRESENTATIVE: _____	TYPE OF SERVICE: _____	DATE: _____
ENGINEER: _____	SUBMITTED BY: _____	DATE: _____
CONTRACTOR: _____	APPROVED BY: _____	DATE: _____
	ORDER NO.: _____	DATE: _____

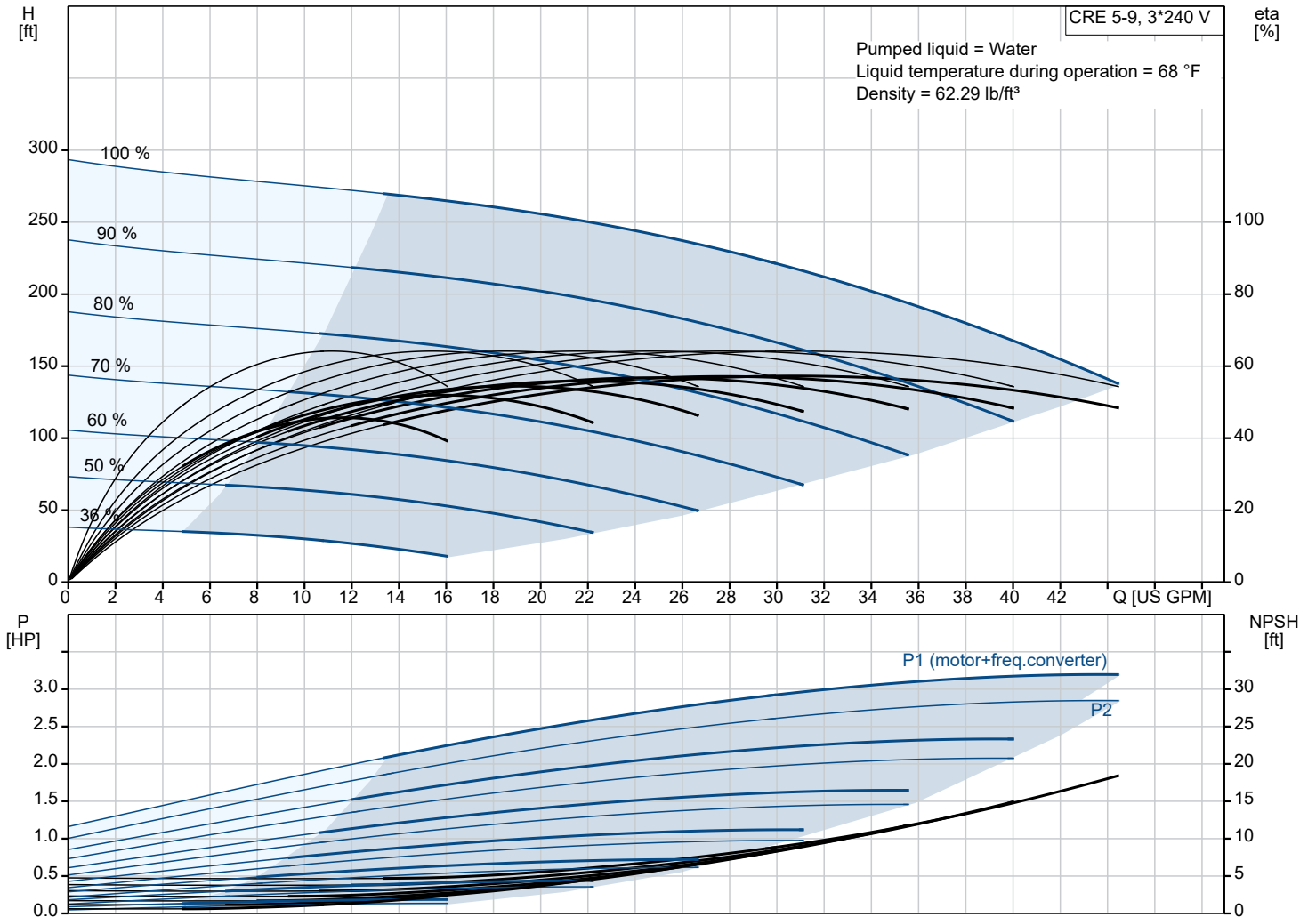


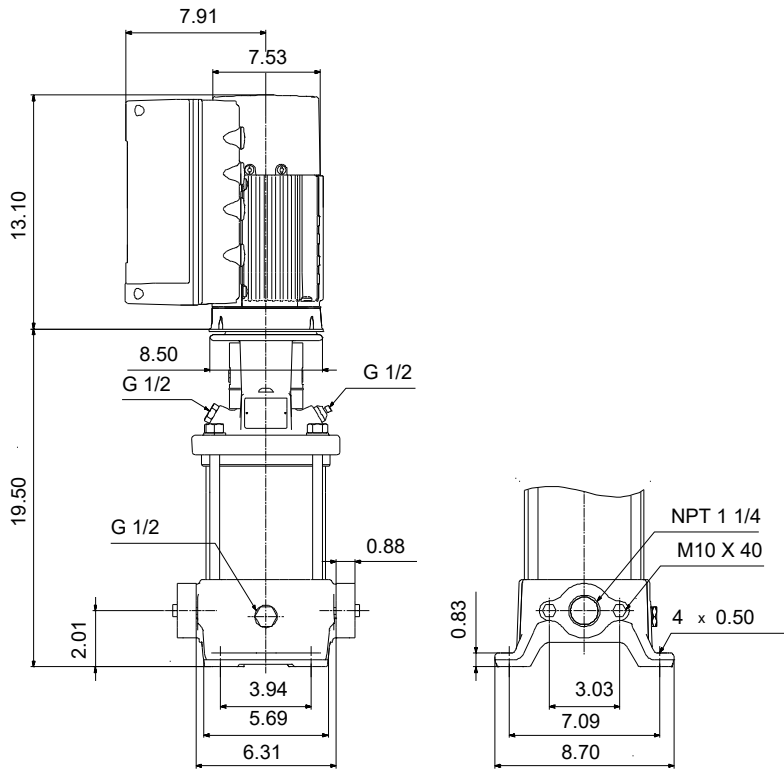
## CRE 5-9 N-B-A-E-HQQE

Vertical, multistage centrifugal pump with integrated frequency converter. The pump head and base are in cast iron - all other wetted parts are in stainless steel (EN 1.4301)

Note! Product picture may differ from actual product

Conditions of Service		Pump Data		Motor Data	
Liquid:	Water	Max pressure at stated temp:	232 psi / 250 °F	Rated power - P2:	3 HP
Temperature:	68 °F	Liquid temperature range:	-4 .. 248 °F	Rated voltage:	200-240 V
Specific Gravity:	1.000	Maximum ambient temperature:	104 °F	Mains frequency:	60 Hz
		Shaft seal:	HQQE	Enclosure class:	IP55
		Product number:	99389081	Insulation class:	F
				Motor protection:	ELEC
				Motor type:	100A
				Eta 1/1:	88.7 %





**Materials:**

Base: Cast iron  
 Base: EN 1561 EN-GJL-200  
 Base: ASTM A48-25B  
 Impeller: Stainless steel  
 Impeller: AISI 304  
 Impeller: EN 1.4301  
 Material code: A  
 Code for rubber: E

Qty.	Description
------	-------------

1 **CRE 5-9 N-B-A-E-HQQE**



**Note! Product picture may differ from actual product**

Product No.: [99389081](#)

Vertical, multistage centrifugal pump with inlet and outlet ports on same the level (inline). The pump head and base are in cast iron – all other wetted parts are in stainless steel. A cartridge shaft seal ensures high reliability, safe handling, and easy access and service. Power transmission is via a rigid split coupling. Pipe connection is via oval flanges with internal NPT threads.

The pump is fitted with a 3-phase, fan-cooled, permanent-magnet, synchronous motor.

The motor efficiency is classified as IE5 in accordance with IEC 60034-30-2.

The motor includes a frequency converter and PI controller in the motor terminal box. This enables continuously variable control of the motor speed, which again enables adaptation of the performance to a given requirement.

The operating panel on the motor terminal box features a four-inch TFT display, push-buttons and the Grundfos Eye indicator.

The display gives an intuitive and user-friendly interface to all functions.

The push-buttons are used to navigate through the menu structure to access pump and performance data on site and enable setting of required setpoint as well as setting of pump to "Min." or "Max." operation or to "Stop".

Communication with the pump is also possible by means of Grundfos GO Remote (accessory). The remote control enables further settings as well as reading out of a number of parameters such as "Actual value", "Speed", "Power input" and total "Power consumption".

The Grundfos Eye indicator on the operating panel provides visual indication of pump status:

- "Power on": Motor is running (rotating green indicator lights) or not running (permanently green indicator lights)
- "Warning": Motor is still running (rotating yellow indicator lights) or has stopped (permanently yellow indicator lights)
- "Alarm": Motor has stopped (flashing red indicator lights).

The terminal box has a number of inputs and outputs enabling the motor to be used in advanced applications where many inputs and outputs are required:

- two dedicated digital inputs
- three analog inputs, 0(4)-20 mA, 0-5 V, 0-10 V, 0.5 - 3.5 V; the factory-fitted pressure sensor is connected to one of these inputs
- 5 V voltage supply to potentiometer and sensor
- one analog output, 0-10 V, 0(4)-20 mA
- two configurable digital inputs or open-collector outputs
- two Pt100/Pt1000 inputs
- LiqTec, dry-running protection sensor input
- Grundfos Digital Sensor input and output
- 24 V voltage supply for sensors
- two signal-relay outputs (potential-free contacts)
- GENIbus connection
- interface for Grundfos CIM fieldbus module.

Liquid:

Pumped liquid: Water  
 Liquid temperature range: -4 .. 248 °F  
 Selected liquid temperature: 68 °F  
 Density: 62.29 lb/ft<sup>3</sup>

Technical:

Pump speed on which pump data are based: 3461 rpm  
 Rated flow: 30.4 US GPM  
 Rated head: 222.8 ft  
 Pump orientation: Vertical  
 Shaft seal arrangement: Single  
 Code for shaft seal: HQQE  
 Approvals: CURUS  
 Approvals for drinking water: NSF/ANSI 61  
 Curve tolerance: ISO9906:2012 3B

Materials:

Qty.	Description
	<p>Base: Cast iron EN 1561 EN-GJL-200 ASTM A48-25B</p> <p>Impeller: Stainless steel EN 1.4301 AISI 304</p> <p>Bearing: SIC</p> <p>Installation: t max amb: 104 °F Maximum operating pressure: 232.06 psi Max pressure at stated temp: 232 psi / 250 °F 232 psi / -4 °F</p> <p>Type of connection: Oval / NPT(F) Size of inlet connection: 1 1/4 inch Size of outlet connection: 1 1/4 inch Pressure rating for connection: PN 16 Flange size for motor: 182TC</p> <p>Electrical data: Motor standard: NEMA Motor type: 100A IE Efficiency class: IE5 Rated power - P2: 3 HP Power (P2) required by pump: 3 HP Mains frequency: 60 Hz Rated voltage: 3 x 200-240 V Service factor: 1.15 Rated current: 7.90-6.60 A Cos phi - power factor: 0.94 Rated speed: 360-4000 rpm Efficiency: 88.7% Motor efficiency at full load: 88.7 % Enclosure class (IEC 34-5): IP55 Insulation class (IEC 85): F Motor No: 99302693</p> <p>Controls: Frequency converter: Built-in Pressure sensor: Y</p> <p>Others: Net weight: 90.4 lb Gross weight: 174 lb Shipping volume: 8.26 ft³</p>

# 99389081 CRE 5-9 N-B-A-E-HQQE 60 Hz



Note! All units are in [in] unless others are stated.

**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

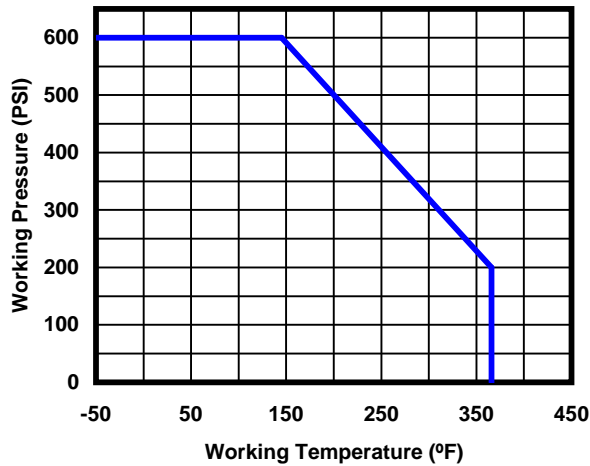


**MATERIAL SPECIFICATIONS**

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



## 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 194°F (0°C to 90°C)

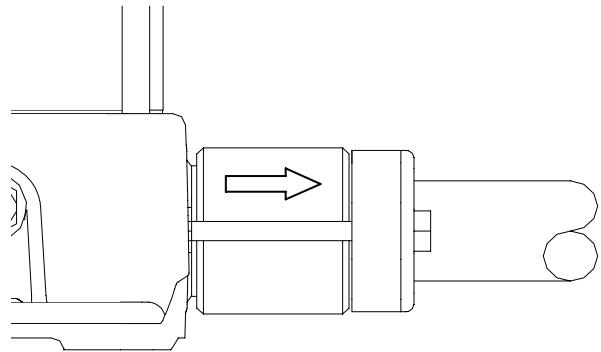
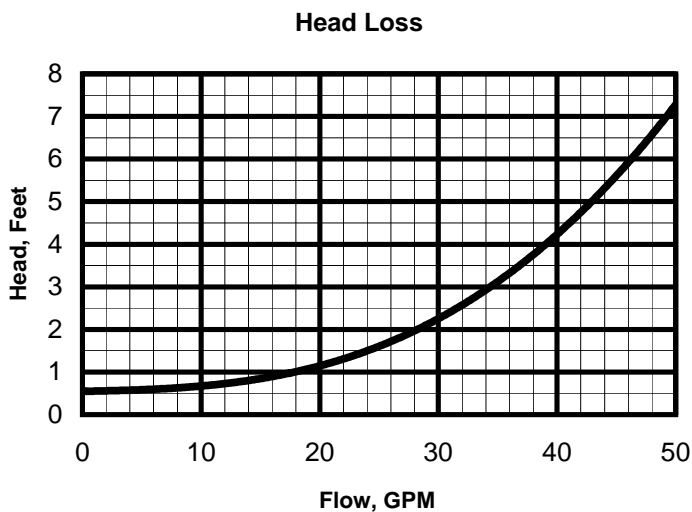
### Construction

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

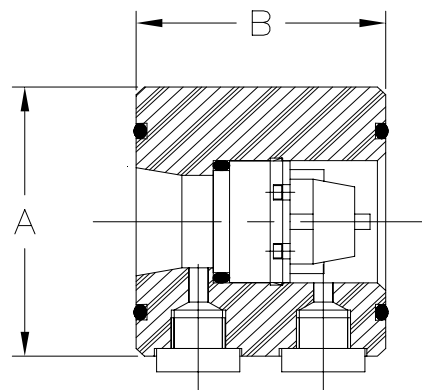
Component	Materials
Valve Body	Polyacetal (POM)
Valve Cone	Polyacetal (POM)
Spring	Stainless Steel
O-rings	EPDM



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



- ▶ 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	
<b>D82B</b>	(dry)	Bronze tube, brass socket
<b>D82LFB</b>	(liquid filled)	Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
<b>D83SS</b>	(dry)	316 Stainless steel tube & socket
<b>D83LFSS</b>	(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>	<b>D82:</b> Brass <b>D83:</b> 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>	<b>150°F (65°C)</b>	

### 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
<b>D82LFB</b>	15 1 1/2"	01 1/8 NPT*	L Lower	A psi	See Standard Ranges
<b>D83LFSS</b>	20 2"	02 1/4 NPT**	B Back	D psi/kPa	
<b>D82B</b>	25 2 1/2"	04 1/2 NPT***			
<b>D83SS</b>	40 4"				

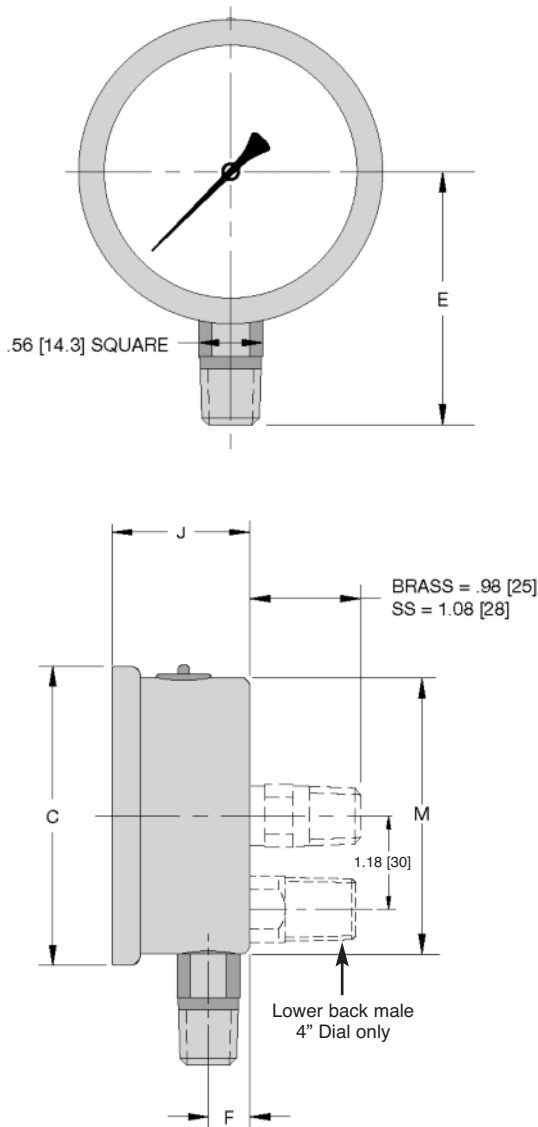
\* 1/8 NPT connection size not available with 4" dial size.  
 \*\* 1/4 NPT connection size not available with 1 1/2" dial size.  
 \*\*\* 1/2 NPT connection size only available with 4" dial size.

# 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

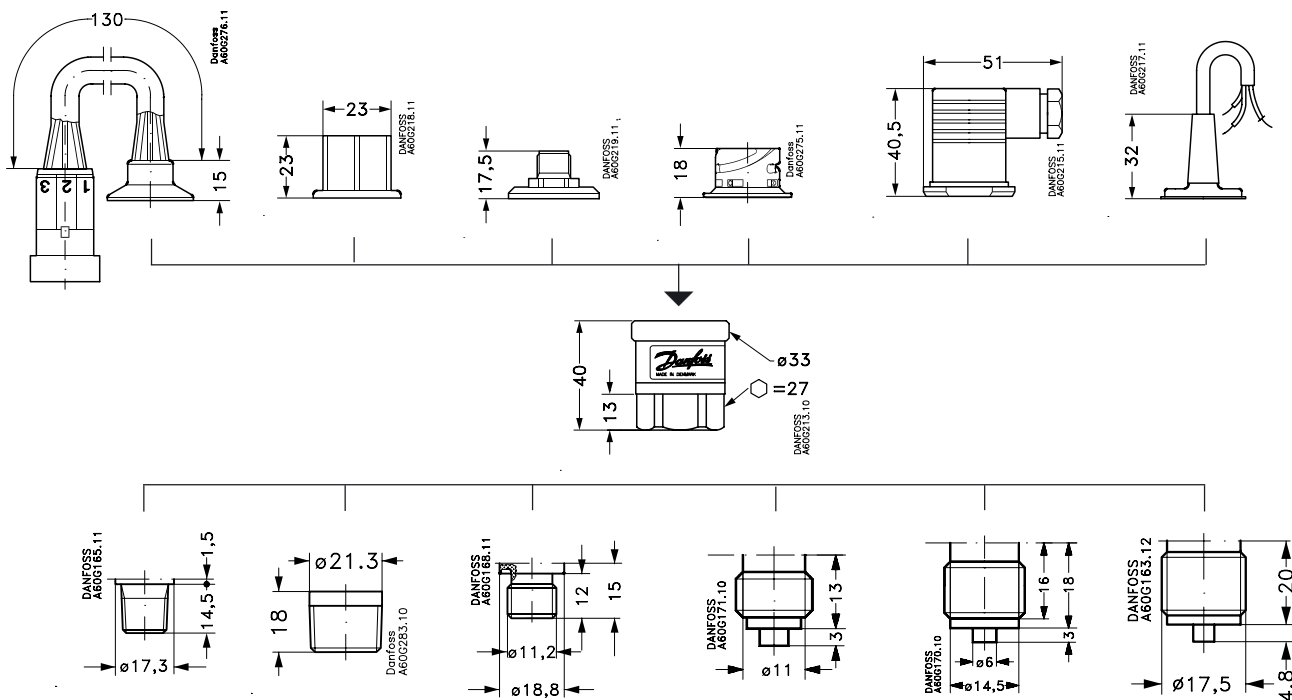


- Designed for use in severe industrial environments
- Enclosure and wetted parts of acid-resistant stainless steel (AISI 316L)
- All standard output signals: 4-20 mA, 0-5 V, 1-5 V, 1-6 V, 0-10 V
- A wide range of pressure and electrical connections
- Temperature compensated and laser calibrated
- Typical 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	-		
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
		burst	10 V <sub>rms</sub> , 150 kHz - 30 MHz	EN 61000-6-2
	Transient surge	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 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

<sup>1)</sup> Female plug: Glass filled polyester, PBT

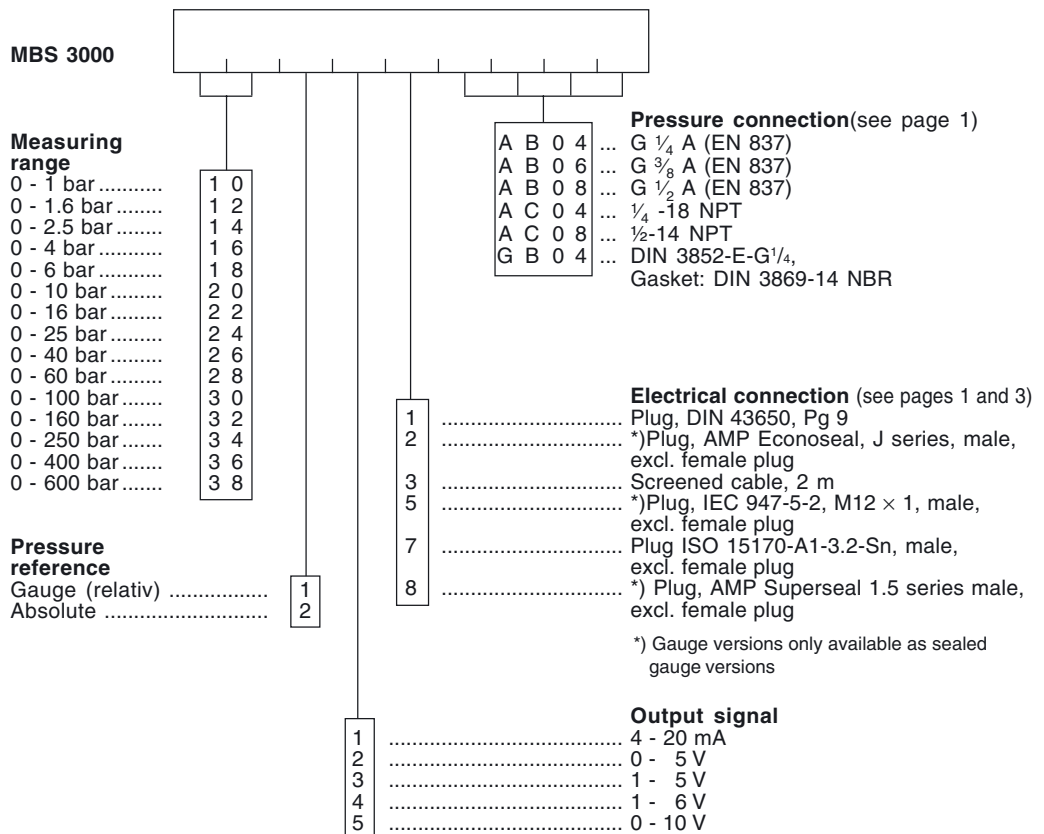
<sup>2)</sup> Wire: PETFE (teflon)

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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