

OEM Industrial Pressure Transmitter

M20



Applications

- Water treatment
- Pump & compressor
- Hydraulic & pneumatic system
- Refrigeration
- Measurement & control
- Shipbuilding
- OEM Integration

Introduction

The M20 is a highly cost-effective solution for general, industrial pressure measurements. Through digital temperature compensation, the M20 pressure transmitter offers performance and high reliability.

Its' modular construction allows for different configurations of pressure and electrical connections and the performance specification options make the M20 a versatile option for industrial pressure measurement applications.

Specifications

- Pressure Reference: Gauge, Absolute, Compound
- Range: 0-250 mbar to 600 bar
- Electrical connection:
DIN 175301-803A
M12 x1 (4 pin) IEC 61076-2-101
Cable $\Phi 5.0\text{mm}$ 5× 0.12mm² PUR
- Accuracy: see "Measurement Range & Accuracy Table"
- Process connection: M20×1.5 ISO 9974-2/EN 837
G1/4A ISO 1179-2
NPT1/4 ANSI/ASME B1.20.1
R1/4 ISO 7
Other threads are available on request
- Output signal: 4mA - 20mA DC
0V - 5V DC
1V - 5V DC
0V - 10V DC
0.5V - 4.5V DC
- Structural features: Fully welded
- Media: Fluids compatible with Stainless Steel 316L
- Reverse Polarity: Reverse Polarity & Overvoltage Protected
- Lightning Protection: 1kV Line-Line, 1kV Line to Earth

Certificates



Measurement Range & Accuracy Table

Gauge Pressure G									
Unit	Range	Accuracy	Overpressure	Code	Unit	Range	Accuracy	Overpressure	Code
kPa	0 - 25	±0.5%FS	50	K025	mbar	0 - 250	±0.5%FS	500	m250
	0 - 40		100	K040		0 - 400		1000	m400
	0 - 50		100	K050		0 - 500		1000	m500
	0 - 60		100	K060		0 - 600		1200	m600
	0 - 70		100	K070		0 - 700		1400	m700
	0 - 80		200	K080		0 - 800		1600	m800
	0 - 90		200	K090		0 - 900		1800	m900
	0 - 100	±0.25%FS /±0.5%FS	200	K100	bar	0 - 1	±0.25%FS /±0.5%FS	2	B001
	0 - 160		300	K160		0 - 1.6		3	B1D6
	0 - 200		400	K200		0 - 2		4	B002
	0 - 250		500	K250		0 - 2.5		5	B2D5
	0 - 300		600	K300		0 - 3		6	B003
	0 - 400		1000	K400		0 - 4		10	B004
	0 - 500		1000	K500		0 - 5		10	B005
	0 - 600		1000	K600		0 - 6		10	B006
	0 - 700		1400	K700		0 - 7		14	B007
	0 - 800		1600	K800		0 - 8		16	B008
	0 - 900		1800	K900		0 - 9		18	B009
MPa	0 - 1	±0.25%FS /±0.5%FS	2	M1D0		0 - 10		20	B010
	0 - 1.6		3	M1D6		0 - 16		30	B016
	0 - 2		4	M2D0		0 - 20		40	B020
	0 - 2.5		5	M2D5		0 - 25		50	B025
	0 - 3		6	M3D0		0 - 30		60	B030
	0 - 3.5		6	M3D5		0 - 35		60	B035
	0 - 4		10	M4D0		0 - 40		100	B040
	0 - 5		10	M5D0		0 - 50		100	B050
	0 - 6		10	M6D0		0 - 60		100	B060
	0 - 7		10	M7D0		0 - 70		100	B070
	0 - 8		15	M8D0		0 - 80		150	B080
	0 - 9		15	M9D0		0 - 90		150	B090
	0 - 10		15	M100		0 - 100		150	B100
	0 - 16		30	M016		0 - 160		300	B160
psi	0 - 20		30	M020		0 - 200		300	B200
	0 - 25		37.5	M025		0 - 250		450	B250
	0 - 3	±0.5%FS	6	P003					
	0 - 5		10	P005					
	0 - 10		15	P010					
	0 - 15		20	P015					
	0 - 30	±0.25%FS /±0.5%FS	45	P030					
	0 - 60		150	P060					
	0 - 100		150	P100					
	0 - 160		300	P160					
	0 - 200		300	P200					
	0 - 300		450	P300					
	0 - 500		750	P500					
	0 - 600		1500	P600					
	0 - 700		1500	P700					
	0 - 800		1500	P800					
	0 - 900		1500	P900					
	0 - 1000		1500	P01K					
	0 - 2000		3000	P02K					
	0 - 3000		4500	P03K					
	0 - 4000		6000	P04K					

Absolute Pressure A											
Unit	Range	Accuracy	Overpressure	Code	Unit	Range	Accuracy	Overpressure	Code		
kPa	0 - 25	±0.5%FS	50	K025	mbar	0 - 250	±0.5%FS	500	m250		
	0 - 40		100	K040		0 - 400		1000	m400		
	0 - 50		100	K050		0 - 500		1000	m500		
	0 - 60		100	K060		0 - 600		1200	m600		
	0 - 70		100	K070		0 - 700		1400	m700		
	0 - 80		200	K080		0 - 800		1600	m800		
	0 - 90		200	K090		0 - 900		1800	m900		
	0 - 100		200	K100		bar		0 – 1	±0.5%FS	2	B001
	0 - 160		300	K160				0 - 1.6		3	B1D6
	0 - 200	400	K200	0 - 2	4		B002				
	0 - 250	±0.25%FS /±0.5%FS	500	K250	0 - 2.5		±0.25%FS /±0.5%FS	5		B2D5	
	0 - 300		600	K300	0 - 3			6		B003	
	0 - 400		1000	K400	0 - 4			10		B004	
	0 - 500		1000	K500	0 - 5			10		B005	
	0 - 600		1000	K600	0 - 6			10		B006	
	0 - 700		1400	K700	0 - 7			14		B007	
	0 - 800		1600	K800	0 - 8	16		B008			
	0 - 900		1800	K900	0 - 9	18		B009			
MPa	0 - 1		±0.25%FS	2	M1D0	0 - 10		±0.25%FS /±0.5%FS	20	B010	
	0 - 1.6	3		M1D6	0 - 16	30	B016				
	0 - 2	4		M2D0	0 - 20	40	B020				
	0 - 2.5	5		M2D5	0 - 25	50	B025				
psi	0 - 3	±0.5%FS	6	P003							
	0 - 5		10	P005							
	0 - 10		15	P010							
	0 - 15		20	P015							
	0 - 30		45	P030							
	0 - 60	±0.25%FS /±0.5%FS	150	P060							
	0 - 100		150	P100							
	0 - 160		300	P160							
	0 - 200		300	P200							
	0 - 300		450	P300							

Compound Pressure N										
Unit	Range	Accuracy	Overpressure	Code		Unit	Range	Accuracy	Overpressure	Code
kPa	- 25 - 0	±0.5%FS	50	V025	bar	- 0.25 - 0	±0.5%FS	0.5	VD25	
	- 40 - 0		100	V040		- 0.4 - 0		1	V0D4	
	- 60 - 0		100	V060		- 0.6 - 0		1	V0D6	
	- 100 - 0		150	V100		- 1 - 0		1.5	V1D0	
	- 3 - +3		10	C033		- 0.03 - +0.03		0.1	C0D3	
	- 5 - +20		30	C520		- 0.05 - +0.2		0.3	C052	
	- 5 - +25		30	C525		- 0.05 - +0.25		0.3	C5D5	
	- 15 - +15		30	C015		- 0.15 - +0.15		0.3	CD15	
	- 20 - +20		30	C020		- 0.2 - +0.2		0.3	C0D2	
	- 25 - +25		50	C025		- 0.25 - +0.25		0.5	CD25	
	- 30 - +30		50	C030		- 0.3 - +0.3		0.5	C003	
	- 50 - +50		100	C050		- 0.5 - +0.5		1	C005	
	- 100 - +60		150	C16B		- 1 - +0.6		1.5	C0D6	
	- 100 - +100	±0.25%FS /±0.5%FS	300	C11B		- 1 - +1	±0.25%FS /±0.5%FS	2	C101	
	- 100 - +150		300	C1B5		- 1 - +1.5		3	C1D5	
	- 100 - +300		500	C13B		- 1 - +3		5	C103	
	- 100 - +500		1000	C15B		- 1 - +5		10	C105	
	- 100 - +900		2000	C19B		- 1 - +9		20	C109	
	- 100 - +1000		2500	C11K		- 1 - +10		25	C110	
	- 100 - +1500		3000	C1K5		- 1 - +15		30	C115	
	- 100 - +1600		3000	C1K6		- 1 - +16		30	C116	
	- 100 - +2000		3000	C12K		- 1 - +20		30	C120	
	- 100 - +2400		5000	C24K		- 1 - +24		50	C124	
psi	-15 - 0	±0.5%FS	20	PF00						
	-15 - +10		20	PF10						
	-15- +15	±0.25%FS /±0.5%FS	45	PF15						
	-15- +30		150	PF30						
	-15 - +50		150	PF50						
	-15 - +80		300	PF80						
	-15- +100		300	PF1B						
	-15 - +150		450	P1B5						

Test standard: GB/T 17614.1-2015/IEC60770-1:2010
 Ambient temperature: 20°C± 5°C
 Relative humidity: 45% - 75%

For other measurement ranges, please contact Strainsense.

Pressure Unit Conversion Table ISO 31-3

Standard Unit	Pa(N/m ²)	kPa	MPa	bar	mbar
1 Pa(N/m ²)	1	0.001	0.000001	0.00001	0.01
1 kPa	1000	1	0.001	0.01	10
1 MPa	1000000	1000	1	10	10000
1 bar	100000	100	0.1	1	1000
1 mbar	100	0.1	0.0001	0.001	1
1 mmH ₂ O	9.807	0.009807	0.000009807	0.00009807	0.09807
1 kg/cm ²	98070	98.07	0.0981	0.9807	980.7
1 atm	101300	101.3	0.1013	1.013	1013
1 mmHg	133.3	0.1333	0.0001333	0.001333	1.333
1 psi	6895	6.895	0.006895	0.0689	68.948
Standard Unit	mmH ₂ O	kg/cm ²	atm	mmHg	psi
1 Pa(N/m ²)	0.102	0.0000102	0.000009869	0.007501	0.000145
1 kPa	101.9716	0.0102	0.009869	7.501	0.145
1 MPa	101972	10.2	9.869	7501	145.038
1 bar	10197	1.02	0.9869	750.1	14.5038
1 mbar	10.1972	0.00102	0.0009869	0.7501	0.0145
1 mmH ₂ O	1	0.0001	0.00009678	0.0734	0.001422
1 kg/cm ²	10000	1	0.9678	734.2	14.224
1 atm	10330	1.033	1	760.1	14.68
1 mmHg	13.62	0.001362	0.001316	1	0.0193
1 psi	704.3	0.0703	0.068	51.71	1

Output Signal

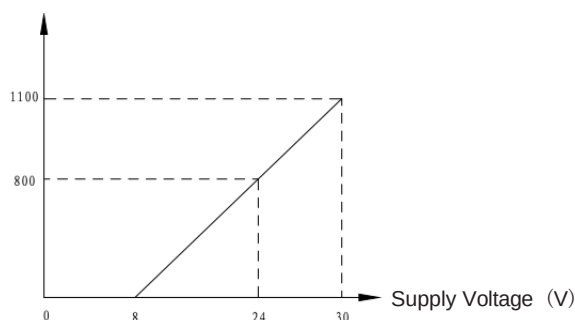
Type	Output Signal	Code
Current (2-wire)	4 mA - 20mA DC	1
Voltage (3-wire)	0V - 5V DC	2
	1V - 5V DC	3
	0V - 10V DC	4
	0.5V - 4.5V DC	5
	0.5V - 4.5V DC	6
Ratio voltage (3-wire)	0.5V - 4.5V DC	6

Load (Ω)

Current (2-wire): ≤ (Supply voltage - 8 V)/0.02 A

Voltage (3-wire): > 10 k

Load Resistor (Ω)



Current Output Mode (Load Resistor Range)

Supply Voltage

Output Signal	Supply Voltage	Output Ripple	Voltage Effect
4mA - 20mA DC	8V - 30V DC	≤1%	≤±0.1%FS
0V - 5V DC	8V - 30V DC		
1V - 5V DC	8V - 30V DC		
0V - 10V DC	14V - 30V DC		
0.5V - 4.5V DC	8V - 30V DC		
(10% - 90%)V DC	(5±0.1) V DC Ratiometric	≤20 mV	

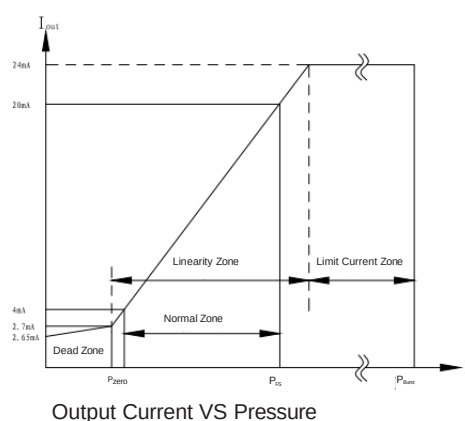
The power supply of the pressure transmitter should be the electrical connection that meets the standard of the 9.3 part of UL/EN/IEC 61010-1, UL/EN/IEC 60950-1 LPS or UL 1310/UL 1585(NEC or CEC) Class 2 standard requirement.

If the pressure transmitter is used at altitudes above 2000m, ensure that the power supply can operate correctly at that altitude.

Total Current Consumption

Current (2-wire): Signal current, 23mA (max.)

Voltage (3-wire): < 8 mA



Output Current VS Pressure

Accuracy

Conforms to IEC 61298-2		
Accuracy	≤±0.25%FS	≤±0.5%FS
Nonlinearity (BFSL)	≤±0.2%FS	≤±0.25%FS
Code	3	4
Conforms to JJG 882 (Chinese National Regulation for Verification)		
Accuracy class	0.25	0.5
Max.error	≤±0.25%FS	≤±0.5%FS
Code	7	8

Note: Accuracy class 0.25 range: ≥100kPa (G), ≥250kPa (A),≥200kPa (N)

Total error band: 0 - 50°C ±0.75%FS (max.)

Note: Total error band includes nonlinearity, hysteresis, repeatability, temperature effect, zero and span thermal error.

Specifications

Hysteresis: ≤0.1%FS

Repeatability: ≤0.1%FS

Overpressure: See Table " Measurement Range & Accuracy Table"

Long-term stability: ≤±0.1%FS/year(typ.)

≤±0.2%FS/year (max.)

Response time

Liquid viscosity (<100 cSt): <4 ms

Gas: <35 ms

Environmental Conditions

Item	Temp. Range
Medium temp.	-30°C -85°C
Ambient temp.	-30°C -85°C
Storage temp.	-40°C - 100°C

The selected process connection sealing element will have limit on temp. range (please check the "Sealing Element")

Environmental Conditions

Protection Class

IP65 、 IP67 IEC 60529

Atmospheric Pressure

86kPa - 106kPa

Vibration Environment

10g (@10Hz - 2000Hz) IEC 60068-2-6

Shock Resistance

100g/11ms IEC 60068-2-27

Service Life

>10 million times load cycle

Position Influence

≤±0.1%FS

Reference Conditions IEC 61298-1

Temperature

15°C - 25°C

Relative humidity

45% - 75%

Supply voltage

(24±0.24) VDC, (5±0.05) VDC

Installation direction

The pressure port should be vertically downward

EMC

SN	Test Item	Standard	Test Condition	Performance Level
1	Electrostatic discharge immunity test	GB/T 17626.2/IEC 61000-4-2	±6kV (Contact), ±8kV (Air)	B
2	Immunity to radio frequency EM-fields	GB/T 17626.3/IEC 61000-4-3	10V/m; 80MHz - 6GHz; 80%AM (1kHz)	A
3	Power frequency magnetic field immunity test	GB/T 17626.8/IEC 61000-4-8	Stable sustained magnetic field strength 50Hz, 60Hz, 100A/m	A
4	Electrical fast transient/burst immunity test (power port)	GB/T 17626.4/IEC 61000-4-4	±2kV; 5/50 Tr/Tk ns, 5kHz	B
5	Surge immunity test (power port)	GB/T 17626.5/IEC 61000-4-5	±2kV; 1.2/50 (8/20) Tr/Th us	B
6	Immunity to conducted disturbances, induced by radio-frequency fields (power port)	GB/T 17626.6/IEC 61000-4-6	10V (150kHz - 80MHz); 80%AM (1kHz)	A

Note: At performance level A, the performance is normal within the limits of the technical specifications:

At performance level B, functions or performance are temporarily reduced or lost, but can be restored by themselves, and the actual operating status, storage and data remain unchanged.

Certificates

Mark	Description	Country or Region
	EU Declaration of Conformity EMC Directive, Electromagnetic Emission and Immunity Standards. Pressure Equipment Directive.	EU
	RoHS Conformity	EU
	Chemical Prevention Compliance	EU
	UL Safety certificate (such as electrical safety, overpressure ...)	USA Canada

Manufacturer Information and Certificate

Mark	Description
	Chinese RoHS Conformity SJ/T 11364

Material

Wetted parts

316L stainless steel

Sealing Element

NBR/FKM/Copper

Non-wetted Part

316L stainless steel, nylon

Pressure transmission Media

Silicone oil

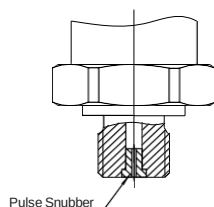
Process Connection

Standard	Pressure port	Code
EN 837	G1/8 B	01
	G1/4 B	02
	G3/8 B	03
	G1/2 B	04
	M20×1.5	05
	G1/8 Female	06
	G1/4 Female	07
ISO 7	R1/4	10
	R3/8	11
	R1/2	12
ISO 1179-1	G1/4 Female	20
ISO 1179-2	G1/4 A	30
	G3/8 A	31
	G1/2 A	32
	G1/4 A +Pulse buffer *	33
	G3/8 A +Pulse buffer *	34
	G1/2 A +Pulse buffer *	35
ISO 9974-2	M12×1.5	40
	M14×1.5	41
	M20×1.5	42
	M20×1.5 +Pulse buffer	43
ANSI/ASME B1.20.1	NPT1/8	50
	NPT1/4	51
	NPT1/2	52
	NPT1/8 Female	53
	NPT1/4 Female	54
	NPT1/2 Female	55
SAE J514 E	7/16-20UNF-74°Taper	60

Defaulted pressure port is $\Phi 4$ mm;
*Note: With $\phi 0.8$ mm pulse buffer.

Torque

The max. torque during installation of the transmitter should be 20Nm to 35Nm.



Sealing (Process connection)

Standard	Configuration	Temp.	Code
ISO 7/ANSI/SAE J514 E /ASMEB1.20.1	PTFE tape		0
ISO 1179 / ISO 9974-2	NBR	-30°C - 85°C	1
ISO 1179 / ISO 9974-2	FKM	-10°C - 85°C	2
EN 837	Copper		4

Note: When the code is "0", the recommended sealing material is PTFE tape.
The other material for each code is as above.

Electrical Connection

Item	IP Rating	Cable Model	Length	Code
Connector DIN 175301-803A	IP65			
• With mating connector				1
Circular Connector M12×1 (4-Pin) IEC 61076-2-101	IP65/IP67*			
• Without mating connector				3
• Straight connector integrated with cable		MS903	2m	4
• Right-angle connector integrated with cable		MS904	2m	5
Cable	IP67	PUR		6

Note: Circular connector M12×1 ≤ 25bar IP65
> 25bar IP67

With Reverse Polarity Protection (Except for ratiometric output)

V+ vs. GND

Cable Length

Length (m)	Code
01	L001
1.5	L1D5
2	L002
3	L003
4	L004
5	L005
6	L006
7	L007
8	L008
9	L009
10	L010
No cable required	N

Version

Version Code	Description
S	Fixed code, internal controls

Electrical Definition

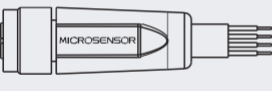
DIN 175301-803 A 4-pin connector

	Definition	Code	2-wire	3-wire
	Positive	V+	1	1
	Negative	GND	2	2
	Output	VOUT	-	3
	Ground			

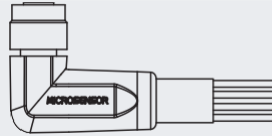
M12×1(4 pin) Circular aviation connector

	Definition	Code	2-wire	3-wire
	Positive	V+	4	4
	Negative	GND	2	2
	Output	VOUT	-	1
	Ground		3	3

M12×1 Straight connector wire harness (MS903)

	Definition	Code	Color
	Positive	V+	Brown
	Negative	GND	Blue
	Output	VOUT	Black
	Ground		Yellow Green

M12 × 1 Right-angle connector wire harness (MS904)

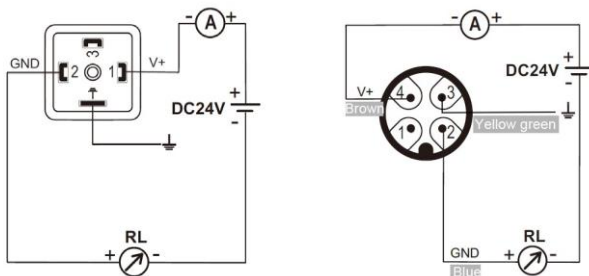
	Definition	Code	Color
	Positive	V+	Black
	Negative	GND	White
	Output	VOUT	Brown
	Ground		Blue

Cable

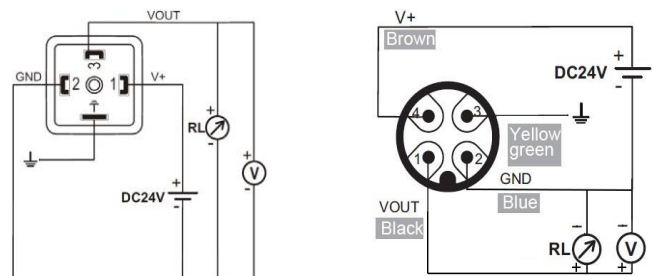
	Definition	Code	Color
	Positive	V+	Red
	Negative	GND	Black
	Output	VOUT	White
	Ground		Green

Wiring

2-wire 4mA - 20mA output



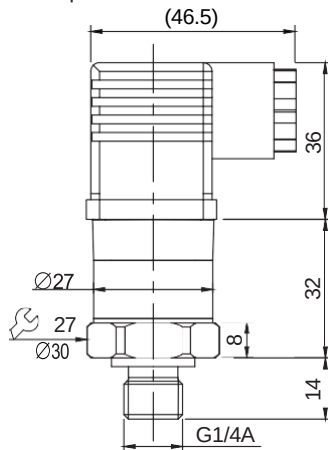
3-wire voltage output



Dimensions

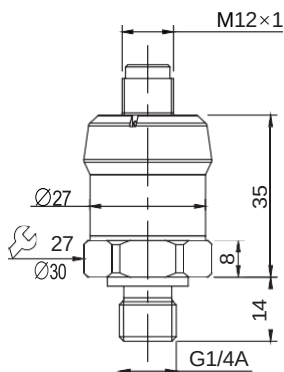
Overall Dimensions (Take G1/4A pressure port as an example. Unit: mm)

4-pin connector A



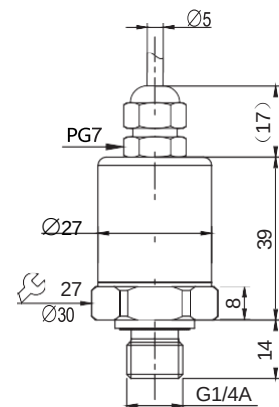
Weight: ≤135g

M12×1(4pin) connector



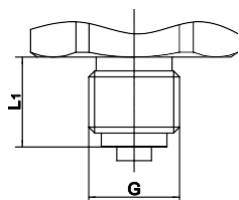
Weight: ≤95g

Cable

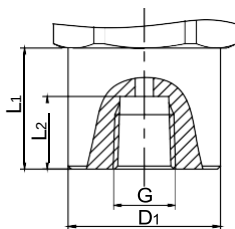


Weight: ≤160g

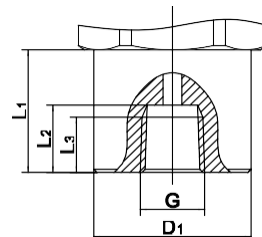
Process Connection (unit: mm)



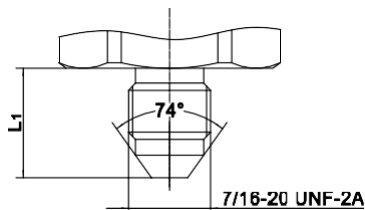
G	L ₁	Standard
G1/4 B	13	EN 837
G3/8 B	16	
G1/2 B	20	
M20×1.5	20	



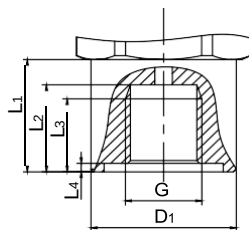
G	D ₁	L ₁	L ₂	Standard
NPT1/8	Φ25	20	12	ANSI/ASME B1.20.1
NPT1/4	Φ25	20	14	
NPT1/2	Φ25	25	19	



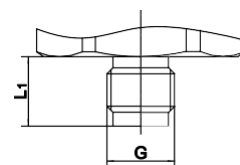
G	D ₁	L ₁	L ₂	L ₃	Standard
G1/8	Φ25	20	10	7.5	EN 837
G1/4	Φ25	20	13	10	



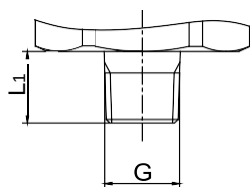
G	L ₁	Standard
7/16-20 UNF-74°cone	14	SAE J514 E



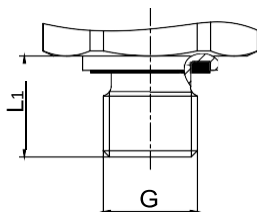
G	D ₁	L ₁	L ₂	L ₃	L ₄	Standard
G1/4	Φ25	20	15.5	13	1.5	ISO 1179-1



G	L ₁	Standard
G1/8 B	10	EN 837



G	L ₁	Standard
NPT1/8	10	ANSI/ASME B1.20.1
NPT1/4	13	
NPT1/2	19	
R1/4	13	ISO 7
R3/8	15	
R1/2	19	



G	L ₁	Standard
G1/4 A	14	ISO 1179-2
G3/8 A	14.5	
G1/2 A	17	
M12×1.5	14	ISO 9974-2
M14×1.5	14	
M20×1.5	16.5	

Order Information

Model	Pressure Type	Code	Output	Accuracy	Process Connection	Sealing	Electrical Connection	Length	Version Code
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Example:

M20	Gauge pressure	0 - 5 psi	4mA ~ 20mA	±0.5%FS	G1/4A	FKM	Cable connection	1.5	S
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Code Example:

M20	G	P005	1	4	30	2	6	L1D5	S
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Optional Accessories

Cable Model	Specification	Conductor Cross-sectional Area	Material	Weight	Color
MS903	M12×1 - Straight connector - 4 pin - Length 2 m	4×0.3mm ²	TPUR	≤90g	Black
MS904	M12×1 - Angled connector - 4 pin - Length 2m	4×0.3mm ²	TPUR	≤95g	Black

If a metrology verification certificate (calibration certificate) is required, or there are any other special requirements, please kindly consult with our company.