ALTHEN SENSORS & CONTROLS

bar **M20**

APPLICATION

- Water Treatment
- Pump & Compressor
- Hydraulic Pressure & Pneumatic Device
- Mechanical Equipment
- Refrigerating System
- Measurement & Control
- Shipbuilding

MICROSENSOR
AUTHORIZED DISTRIBUTOR

M20 pressure transmitter has precise design, highly integrated electrical structure, full digital temperature compensation and calibration, exquisite materials, good electromagnetic compatibility design. It is highly cost-effective while achieving high reliability.

M20 pressure transmitter has many international certifications. It has many different and flexible selections and options. It is suitable for various pressure monitoring and measurements in general industrial occasions.

SPECIFICATIONS

Pressure Type	Gauge, Absolute, Positive/Negative
Pressure Range	0kPa ~ 25kPa to 0MPa ~ 25MPa
Electrical Connection	Angular Connector DIN 175301-803A
	Circular Aviation Plug M12×1(4pin) IEC 61076-2-101
	Cable Φ5.0mm 5×0.12mm² Polyurethane
Accuracy	±0.25%FS (@25°C) ±0.5%FS (@25°C)
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 available on request
Output	4mA ~ 20mA DC 0V~ 5V DC 1V~ 5V DC 0V~ 10V DC 0.5V~ 4.5V DC
Structure Specification	Full welded, molecular sieve
Medium	Air, water, mixed oil or other fluid that can be compatible with wetted part

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PRESSURE RANGE

Gauge Pressure G

Unit	Pressure Range	Overpressure	Code
kPa	0 ~ 25	50	343
	0 ~ 40	100	344
	0 ~ 60	100	345
	0 ~ 100	200	351
	0 ~ 160	300	352
	0 ~ 250	500	353
	0 ~ 400	1000	354
	0 ~ 600	1000	355

Unit	Pressure Range	Overpressure	Code
mbar	0 ~ 250	500	543
	0 ~ 400	1000	544
	0 ~ 600	1000	545
	0 ~ 1000	2000	551
	0 ~ 1600	3000	552
	0 ~ 2500	5000	553
	0 ~ 4000	10000	554
	0 ~ 6000	10000	555

Unit	Pressure Range	Overpressure	Code
MPa	0 ~ 0.25	0.5	123
	0 ~ 0.4	1	124
	0 ~ 0.6	1	125
	0 ~ 1	2	131
	0 ~ 1.6	3	132
	0 ~ 2.5	5	133
	0 ~ 4	10	134
	0 ~ 6	10	135
	0 ~ 10	15	141
	0 ~ 16	30	142
	0 ~ 25	37.5	143

Unit	Pressure Range	Overpressure	Code
bar	0 ~ 2.5	5	233
	0 ~ 4	10	234
	0 ~ 6	10	235
	0 ~ 10	20	241
	0 ~ 16	30	242
	0 ~ 25	50	243
	0 ~ 40	100	244
	0 ~ 60	100	245
	0 ~ 100	150	251
	0 ~ 160	300	252
	0 ~ 250	375	253

Unit	Pressure Range	Overpressure	Code
psi	0 ~ 5	10	835
	0 ~ 10	15	841
	0 ~ 15	20	842
	0 ~ 30	45	844
	0 ~ 60	150	845
	0 ~ 100	150	851
	0 ~ 160	300	852
	0 ~ 200	300	853
	0 ~ 300	450	854
	0 ~ 600	1500	855
	0 ~ 1000	1500	861
	0 ~ 1500	2000	862
	0 ~ 2000	3000	863
	0 ~ 3000	4500	864

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Absolute Pressure A

Unit	Pressure Range	Overpressure	Code
kPa	0 ~ 25	50	343
	0 ~ 40	100	344
	0 ~ 60	100	345
	0 ~ 100	200	351
	0 ~ 160	300	352
	0 ~ 250	500	353
	0 ~ 400	1000	354
	0 ~ 600	1000	355

Unit	Pressure Range	Overpressure	Code
mbar	0 ~ 250	500	543
	0 ~ 400	1000	544
	0 ~ 600	1000	545
	0 ~ 1000	2000	551
	0 ~ 1600	3000	552
	0 ~ 2500	5000	553
	0 ~ 4000	10000	554
	0 ~ 6000	10000	555

Unit	Pressure Range	Overpressure	Code
MPa	0 ~ 0.25	0.5	123
	0 ~ 0.4	1	124
	0 ~ 0.6	1	125
	0 ~ 1	2	131
	0 ~ 1.6	3	132
	0 ~ 2.5	5	133

Unit	Pressure Range	Overpressure	Code
bar	0 ~ 2.5	5	233
	0 ~ 4	10	234
	0 ~ 6	10	235
	0 ~ 10	20	241
	0 ~ 16	30	242
	0 ~ 25	50	243

Unit	Pressure Range	Overpressure	Code
psi	0 ~ 10	15	841
	0 ~ 15	20	842
	0 ~ 30	45	844
	0 ~ 60	150	845
	0 ~ 100	150	851
	0 ~ 160	300	852
	0 ~ 200	300	853
	0 ~ 300	450	854

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Positive/Negative Pressure N

Unit	Pressure Range	Overpressure	Code
kPa	-5 ~ + 20	±30	3A5
	-5 ~ + 25	±50	3A7
	-15 ~ + 15	±30	3A6
	-20 ~ + 20	±30	3A8
	-25 ~ 0	±50	313
	-25 ~ + 25	±50	3AA
	-30 ~ + 30	±50	3AC
	-40 ~ 0	±100	314
	-50 ~ + 50	100	3AE
	-60 ~ 0	100	315
	-100 ~ 0	150	321
	-100 ~ + 60	150	322
	-100 ~ + 150	300	323
	-100 ~ + 300	500	324
	-100 ~ + 500	1000	325
	-100 ~ + 900	2000	331
MPa	-0.015 ~ + 0.015	±0.03	1A6
	-0.02 ~ + 0.02	±0.03	1A8
	-0.025 ~ 0	±0.05	113
	-0.025 ~ + 0.025	±0.05	1AA
	-0.03 ~ + 0.03	±0.05	1AC
	-0.04 ~ 0	±0.1	114
	-0.05 ~ + 0.05	0.1	1AE
	-0.06 ~ 0	0.1	115
	-0.1 ~ 0	0.15	121
	-0.1 ~ + 0.06	0.15	122
	-0.1 ~ + 0.15	0.3	123
	-0.1 ~ + 0.3	0.5	124
	-0.1 ~ + 0.5	1	125
	-0.1 ~ + 0.9	2	131
	-0.1 ~ + 1.5	3	132
	-0.1 ~ + 2.4	5	133
psi	-30 inHg ~ 0	20	821
	-30 inHg ~ +15	20	822
	-30 inHg ~ +30	45	823
	-30 inHg ~ +60	150	825
	-30 inHg ~ +100	150	826
	-30 inHg ~ +160	300	831
	-30 inHg ~ +200	300	832
	-30 inHg ~ +300	450	833

Unit	Pressure Range	Overpressure	Code
mbar	-50 ~ + 200	±300	5A5
	-50 ~ + 250	±500	5A7
	-150 ~ + 150	±300	5A6
	-200 ~ + 200	±300	5A8
	-250 ~ 0	±500	513
	-250 ~ + 250	±500	5AA
	-300 ~ + 300	±500	5AC
	-400 ~ 0	±1000	514
	-500 ~ + 500	1000	5AE
	-600 ~ 0	1000	515
	-1000 ~ 0	1500	521
	-1000 ~ + 600	1500	522
	-1000 ~ + 1500	3000	523
	-1000 ~ + 3000	5000	524
	-1000 ~ + 5000	10000	525
	-1000 ~ + 9000	20000	531
bar	-0.15 ~ + 0.15	±0.3	2A6
	-0.2 ~ + 0.2	±0.3	2A8
	-0.25 ~ 0	±0.5	213
	-0.25 ~ + 0.25	±0.5	2AA
	-0.3 ~ + 0.3	±0.5	2AC
	-0.4 ~ 0	±1	214
	-0.5 ~ + 0.5	1	2AE
	-0.6 ~ 0	1	215
	-1 ~ 0	1.5	221
	-1 ~ + 0.6	1.5	222
	-1 ~ + 1.5	3	223
	-1 ~ + 3	5	224
	-1 ~ + 5	10	225
	-1 ~ + 9	20	231
	-1 ~ + 15	30	232
	-1 ~ + 24	50	233

If the pressure range you need is not in the table, please kindly contact us, or refer to the Pressure Unit Conversion Table.

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PRESSURE UNIT CONVERSION TABLE ISO 31-3

Standard Unit	Pa(N/m²)	kPa	MPa	bar	mbar
1 Pa(N/m²)	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_2O	9.807	0.009807	0.000009807	0.00009807	0.09807
1 kg/cm²	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_2O	kg/cm²	atm	mmHg	psi
1 Pa(N/m²)	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_2O	1	0.0001	0.00009678	0.0734	0.001422
1 kg/cm²	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

POWER SUPPLY

Output	Power Supply	Voltage Effect	Output Ripple
4mA ~ 20mA DC	8V ~ 30V DC	±0.1%FS	≤1%
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		
0.5V ~ 4.5V DC	(5±0.5) V DC Ratio		≤20 mV

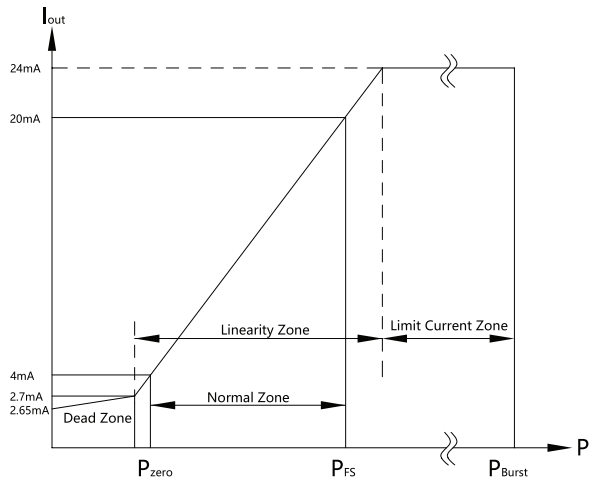
The power supply of the pressure transmitter should be the electrical connection that meets the standard of the 9.3 part of UL/EN/IEC 61010-1, UL/ EN/IEC 60950-1 LPS or UL 1310/UL 1585(NEC or CEC) Class 2 standard requirement.

If the pressure transmitter is used in where the altitude is higher than 2000m, the power supply should be workable normally under the certain condition.

Total Current Consumption

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

Voltage(3-wire): <8 mA



Output Current VS Pressure

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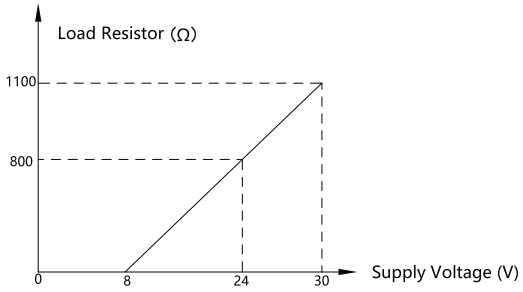
OUTPUT SIGNAL

Type	Output	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
Ratio Voltage (3-wire)	0.5V ~ 4.5V DC	6

Load(Ω)

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

Voltage(3-wire) : >10 k



Current Output Mode(Load Resistor Range)

OPERATION CONDITION

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

Within Measuring Range: >10 million times load cycle

Position Influence

≤±0.1%FS

REFERENCE CONDITION IEC 61298-1

Temperature	15°C ~ 25°C
Relative Humidity	45% ~ 75%
Power Supply	(24±0.24)V DC; (5±0.05)V DC
Installation Direction	Pressure Port should be vertically downward

ACCURACY

Conform To IEC 61298-2		
Accuracy	≤±0.25%FS	≤±0.5%FS
Nonlinearity(BFSL)	≤±0.2%FS	≤±0.25%FS
Code	3	4
Conform To JJG 882 (Chinese National Metrological Verification Regulations)		
Accuracy Class	0.25	0.5
Max. Error	≤±0.25%FS	≤±0.5%FS
Code	7	8

Note:

0.25%FS is available in the following ranges:

Upper Range Limit ≥ 100 kPa (G), ≥ 250 kPa (A), ≥ 200 kPa (N)

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

-10 °C ~ 80°C ±1.25%FS(max.)

Note:

Total error band includes nonlinearity, hysteresis, repeatability, temperature

effect, zero and span thermal error.

Specification

Hysteresis: ≤0.1%FS Repeatability: ≤0.1%FS

Overpressure: See Table "Pressure Range" Long-term Stability: ≤±0.1%FS/year(typ.)

≤±0.2%FS/year(max.)

Response Time

Fluid Viscosity (<100 cSt): <4 ms

Gas: <35 ms

ENVIRONMENT CONDITION

Item	Temp. Range
Medium Temp.	-30°C ~ 85°C
Environment Temp.	-30°C ~ 85°C
Storage Temp.	-40°C ~ 100°C

When the pressure transmitter is working normally, the measured medium should not be solid or semisolid;

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

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ELECTROMAGNETIC COMPATIBILITY

Code	Test Item	Standard	Test Condition	Performance Class
1	Electrostatic Discharge Immunity	GB/T 17626.2/IEC 61000-4-2	6kV(Contact), 8kV(Air)	B
2	Radio-frequency Field	GB/T 17626.3/IEC 61000-4-3	10V/m;80MHz ~ 6GHz; 80%AM(1kHz)	A
3	Power Frequency Magnetic Field	GB/T 17626.8/IEC 61000-4-8	Stable sustained magnetic field strength50Hz,60Hz,100A/m	A
4	Immunity of Electrical Fast Pulse Group	GB/T 17626.4/IEC 61000-4-4	±2kV; 5/50 Tr/Tk ns, 5kHz	B
5	Surge Immunity	GB/T 17626.5/IEC 61000-4-5	±2kV; 1.2/50(8/20) Tr/Th us	B
6	RF Induction Conduction Anti-harassment	GB/T 17626.6/IEC 61000-4-6	10V(150kHz ~ 80MHz); 80%AM(1kHz)	A
Note: Level A means that the performance is normal within the limit of technical specification. Level B means that during testing, function or performance is temporarily reduced or lost, but can recover by itself, and the actual operation status, storage and data remain unchanged.				

CERTIFICATE

Sign	Instruction	Country Or Region
CE	**EU Declaration of Conformity** EMC instruction of radiated interference and noise immunity standard for pressure devices	EU
MICRO SENSOR RoHS COMPLIANT	**RoHS Conformity**	EU
REACH SVHC	**Chemical Prevention Compliance**	EU
UL LISTED	**UL** Safety-Certification (For example, electrical safety, pressure overload..)	USA Canada

INFORMATION OF MANUFACTURER AND CERTIFICATE

Sign	Instruction
	Chinese RoHS Conformity SJ/T 11364

MATERIAL

Wetted Part

Stainless Steel 316L

Sealing Element

FKM/NBR/Cuprum

Non-wetted Part

Stainless Steel 316L,Nylon

Pressure Transmission Medium

Silicone Oil

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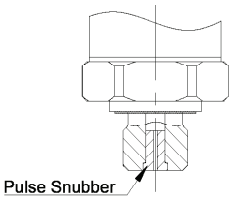
PROCESS CONNECTION

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 Snubber*	33
	G3/8 A + Pulse Snubber*	34
	G1/2 A + Pulse Snubber*	35
ISO 9974-2	M12×1.5	40
	M14×1.5	41
	M20×1.5	42
	M20×1.5 + Pulse Snubber*	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 leading hole is of Φ4mm; *Note: With φ0.8mm Pulse Snubber.		

Torque

The max. torque during the installation and uninstallation of the transmitter is about 20N•m ~ 35N•m.



GASKET MATERIAL

Standard	Default	Applicable Temperature	Code
ISO 7/ANSI/SAE J514 E/ ASMEB1.20.1			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		3
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	Protection	Cable	Length	Code
Angular Connector DIN 175301-803A	IP65			
With assorted connector				1
Circular Aviation Connector M12×1(4pin) IEC 61076-2-101	IP65/ IP67*			
Without assorted connector				3
Straight connector integrated with cable		MS903	2m	4
Right-angle plug harness		MS904	2m	5
Cable	IP67		1.5m	6

Note: Circular Aviation Connector M12×1 :≤ 2.5MPa IP65
> 2.5MPa IP67

With Reverse Polarity Protection(Except for ratiometric output)

V+ vs GND

VERSION

Version Code	Description
S	Fixed code for corporate internal use

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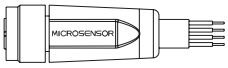
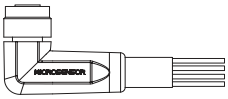
ELECTRICAL DEFINITION

DIN 175301-803 A Angular Connector				
	Definition	**Code**	**2-wire**	**3-wire**
	V+	V+	1	1
	V-	GND	2	2
	Output	VOUT	-	3
	Grounding		⏚	⏚

M12×1(4pin) Circular Aviation Connector				
	Definition	**Code**	**2-wire**	**3-wire**
	V+	V+	4	4
	V-	GND	2	2
	Output	VOUT	-	1
	Grounding		3	3

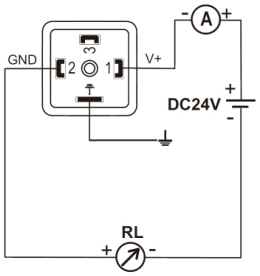
M12×1 Straight Connector Integrated with Cable(MS903)			
	Definition	**Code**	**Line color**
	V+	V+	Brown
	V-	GND	Blue
	Output	VOUT	Black
	Grounding		Yellow green

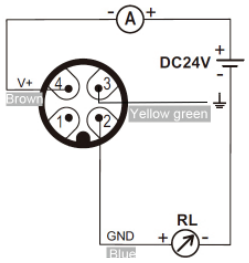
M12×1 Right-angle plug harness(MS904)			
	Definition	**Code**	**Line color**
	V+	V+	Brown
	V-	GND	Blue
	Output	VOUT	Black
	Grounding		Yellow green

Cable			
	Definition	**Code**	**Line color**
	V+	V+	Red
	V-	GND	Black
	Output	VOUT	White
	Grounding		Green

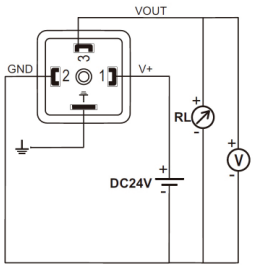
WIRING

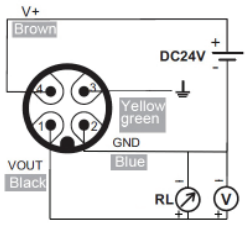
2-wire 4mA ~ 20mA Output





3-wire Voltage Output





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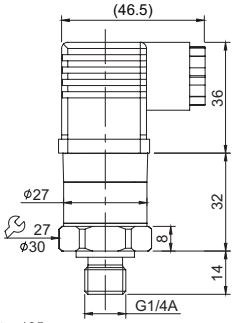
DIMENSION (UNIT:mm)

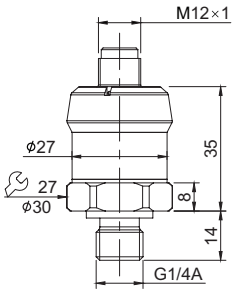
Overall Dimension (Take G1/4A pressure port as an example)

Angular Connector A Type



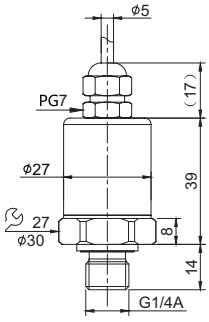
Weight: ≤135g

M12×1(4-pin) Plug Type



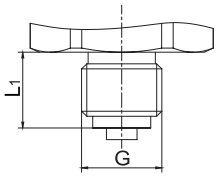
Weight: ≤95g

Cable Type

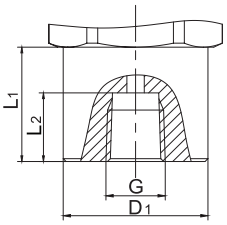


Weight: ≤160g

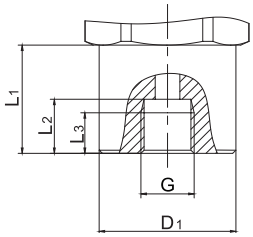
Process Connection(Unit: mm)



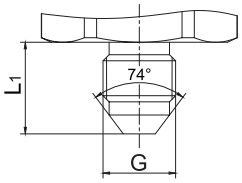
G	L1	Standard
G1/4 B	13	EN 837
G3/8 B	16	
G1/2 B	20	
M20×1.5	20	



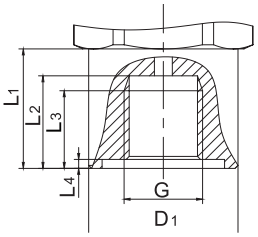
G	D1	L1	L2	Standard
NPT1/8	Φ25	20	12	ANSI/ASME B1.20.1
NPT1/4	Φ25	20	14	
NPT1/2	Φ25	25	19	



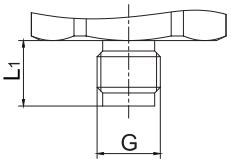
G	D1	L1	L2	L3	Standard
G1/8	Φ25	20	10	7.5	EN 837
G1/4	Φ25	20	13	10	



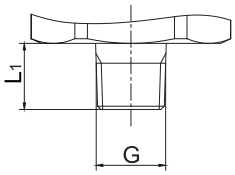
G	L1	Standard
7/16-20 UNF-74°Taper	14	SAE J514 E



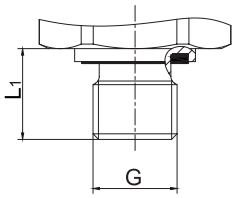
G	D1	L1	L2	L3	Standard
G1/4	Φ25	20	15.5	13	ISO 1179-1



G	L1	Standard
G1/8 B	10	EN 837



G	L1	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	L1	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	

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ORDER GUIDE

Model	Pressure Type	Range	Output	Accuracy	Process Connection	Sealing Element	Electrical Connection	Version Code

Example:

M20	**Gauge**	**0MPa ~ 2.5MPa**	**4mA ~ 20mA**	**0.5**	**G1/4 A**	**NBR**	**Angular Connector**	**S**

Code Example:

M20	G	133	1	8	30	1	1	S

OPTIONAL ACCESSORIES

Cable Model	Specification	Cross sectional area of conductor	Material	Weight	Color
MS903	M12×1 Straight Connector 4 core Length 2m	4×0.3mm²	TPUR	≤90g	Matte Black
MS904	M12×1 Angle Plug 4 core Length 2m	4×0.3mm²	TPUR	≤95g	Matte Black

If a metrological verification certificate (calibration certificate) of the ordered product is required, or there is any other special requirements, please kindly consult with our company.

The information provided herein is to the best of our knowledge true and accurate, it is provided for guidance only. All specifications are subject to change without prior notification.

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