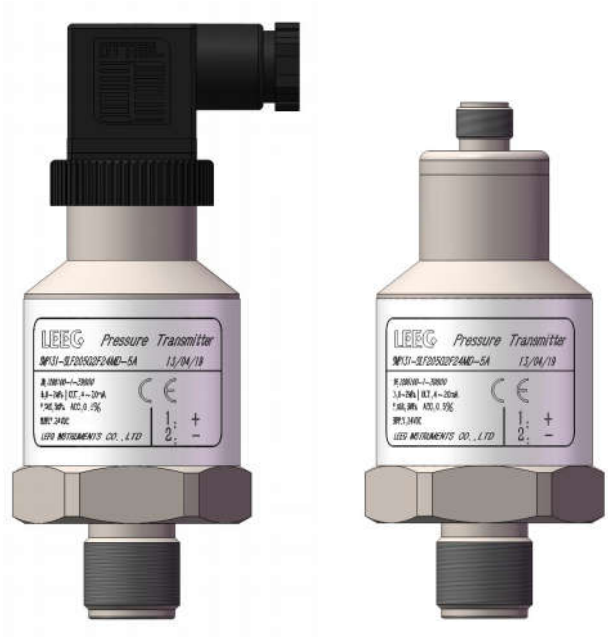
Product introduction

Description



SMP131-TCD SMP131-TCH

Capacitive ceramic gauge pressure transmitter

Capacitive ceramic gauge pressure transmitter combined with all the latest available technologies of the modern electronic pressure measurement fields. It's the most cost-effective products after 10 year's research and development. The sensor adopts full-automatic linear and temperature compensation technology to ensure the efficiency and quality of mass production. Fully-sealed and isolated air cavity design to ensure the long term reliability. Signal transmitting module adopts original calibration technology to realize parameters setting easily without any tools.

Main parameters

Pressure types	Gauge pressure
Measuring range	2.5kPa-4MPa, please refer to the ordering information chapter
Output signal	4-20mA, 4-20mA+HART, 0-5VDC, Modbus RTU/RS485, others
Reference accuracy	±0.2% URL, ±0.5% URL, optional ±0.1% URL

Application

Pressure and level measurement

Approvals

CE MC

Measuring medium

The fluids which compatible with wetted parts

Disclaimer: all the data used in the product description is not legally binding. Relevant technical details may be changed due to further improve

Technical Specifications

Measuring range and limit

Nominal value	Smallest calibratable span	Lower range limit (LRL)	Upper range limit (URL)	Overload limit
5kPa	2.5kPa	0kPa	5kPa	400kPa
10kPa	5kPa	0kPa	10kPa	400kPa
20kPa	10kPa	0kPa	20kPa	600kPa
40kPa	20kPa	0kPa	40kPa	600kPa
100kPa	40kPa	0kPa	100kPa	1MPa
200kPa	100kPa	0kPa	200kPa	1.8MPa
400kPa	200kPa	0kPa	400kPa	2.5MPa
1MPa	400kPa	0kPa	1MPa	4MPa
2MPa	1MPa	0kPa	2MPa	4MPa
4MPa	2MPa	0kPa	4MPa	6MPa
Above measurement range can be replaced by kg/cm2, MPa and kPa units .Which can provide other measurement range according to the requirements. Adjust requirements: lower range value (LRV) and upper range value (URV) can be adjusted within the scope of the upper and lower range limit, smallest calibratable span≤ | URV-LRV | ≤ upper range limit				

Standard specifications and reference conditions

Test standard: GB/T28474 / IEC60770; Zero based-calibration span

Performance specifications

The overall performance including but not limited to 【reference accuracy】, 【environment temperature effects】and other comprehensive error
Typical accuracy: ±0.2%URL (HART output accuracy: ±0.1%URL)
Stability: ±0.1% URL/ year

Reference accuracy

Including linearity, hysteresis and repeatability.
calibration temperature: 20℃±5℃

Linear output accuracy	Typical	±0.2%URL (HART output accuracy: ±0.1% URL)	Nominal value: 5kPa, 10kPa 20kPa, 40kPa 100kPa,200kPa 400kPa, 1MPa 2MPa,4MPa
	Max/Voltage output	±0.5% URL	

Ambient temperature effects(Typical)

Within the range -20-80℃ total impact	±0.2% URL/10K

Power supply effects

Zero and span change should not be more than ± 0.005% URL/V

Loading effects

Zero and span change should not be more than ± 0.05% URL/kΩ

Vibration effects

Vibration resistence	According to IEC60068-2-6, 10g RMS (25-2000Hz)
Impact resistance	According to IEC60068-2-27, 500g/1ms

Output signal

Signal	Type	Output
4-20mA	Linearity	Two wire
4-20mA+HART	Linearity	Two wire
0-5VDC	Linearity	Three wire
Modbus-RTU/RS485	Linearity	Four wire

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Technical Specifications

Damping time

Total damping time constant: equal to the sum of damping time of amplifer and sensor capsule
Damping time of amplifer : 0-100S adjustable(with HART protocol
Reaction time of sensor: ≤1mS
Startup after power off : ≤3S (HART output time: ≤ 6S)
Normal services after data recovery : ≤4S (HART output time:≤31S)

Environment condition

Items	Operational condition
Working temperature	-40-85℃
Storage temperature	-40-100℃
Media temperature	-30-80℃
Working environment humidity	0-95%RH
Protection class	IP65

Technical Specifications

Signal output	4-20mA	4-20mA+HART*	0-5VDC	RS485
Power supply voltage	12-30VDC	10.5/16.5-55VDC	8-30VDC	5VDC/9-30VDC
Electric current	≤20.8mA		≤6.5mA	≤7mA
Load resistance(Ω)	<(U-12)/0.0208	<(U-10.5)/0.0208**	≥5k, recommend 100k	/
Transmission distance	<1000m		<5m	<1200m
Power consumption	≤500mW(20.8mA output@24VDC)		≤156mW(0-5VDCoutput, @24VDC)	≤168mW(RS485 output@24VDC)

*For this output type, the load resistance value in communication is 250Ω
**The load resistance value 0-2119Ω is in nominal working condition, 250-600Ω is HART communication

EMC environment(not RS485 signal output)

NO.	Test items	Basic standards	Test conditions	Performance level
1	Radiated interference	GB/T 9254/CISPR22	30MHz-1000MHz	OK
2	Conducted interference (DC power port)	GB/T 9254/CISPR22	0.15MHz-30MHz	OK
3	Electrostatic discharge immunity test (ESD)	GB/T 17626.2/IEC61000-4-2	4kV(Contact),8kV(Air)	B(Note2)
4	Immunity to radio frequency EM-fields	GB/T 17626.3/IEC61000-4-3	10V/m(80MHz-1GHz)	A(Note1)
5	Power frequency magnetic field immunity test	GB/T 17626.8/IEC61000-4-8	30A/m	A(Note1)
6	Electrical fast transient / Burst immunity test	GB/T 17626.4/IEC61000-4-4	2kV(5/50ns,100kHz)	B(Note2)
7	Surge immunity requirements	GB/T 17626.5/IEC61000-4-5	1kV(Line to line) 2kV(Line to ground) (1.2us/50us)	B(Note2)
8	Immunity to conducted disturbances induced by radio frequency fields	GB/T 17626.6/IEC61000-4-6	3V(150kHz-80MHz)	A(Note1)

(Note 1)Performance level A: The preformance within the limits of normal technical specifications.
(Note 2)Performance level B: Temporary reduction or loss of functionality or preformance, it can restore itself. The actual operating conditions, storage and data will not be changed.

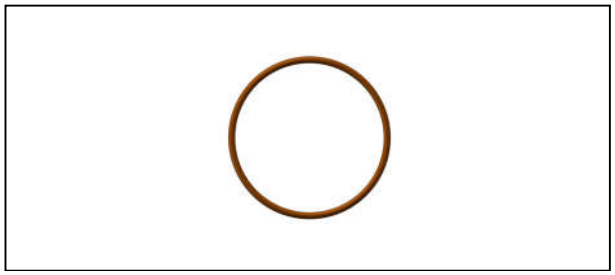
Product selection instruction

Sensor select instruction

Code	Nominal value	Description
C502G	5kPa	Range 0-5kPa, smallest calibratable span 2.5kPa
C103G	10kPa	Range 0-10kPa, smallest calibratable span 5kPa
C203G	20kPa	Range 0-20kPa, smallest calibratable span 10kPa
C403G	40kPa	Range 0-40kPa, smallest calibratable span 20kPa
C104G	100kPa	Range 0-100kPa, smallest calibratable span 40kPa
C204G	200kPa	Range 0-200kPa, smallest calibratable span 100kPa
C404G	400kPa	Range 0-400kPa, smallest calibratable span 200kPa
C105G	1MPa	Range 0-1MPa, smallest calibratable span 400kPa
C205G	2MPa	Range 0-2MPa, smallest calibratable span 1MPa
C405G	4MPa	Range 0-4MPa, smallest calibrateble span2MPa
Adjust requirements: lower range value (LRV) and upper range value (URV) can be adjusted within the scope of the upper and lower range limit, smallest calibratable span≤ | URV-LRV | ≤ upper range limit		

Code	Parts	Description
C	Isolated diaphragm material	Ceramic(99.9% AL203)
N	Isolated filling fluid	None
S	Sensor seal	O-ring, FKM(Process tempetature: -20-200℃)

Seal(S)

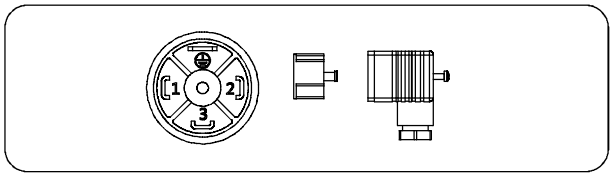


Electrical connection select instruction

Code	Description
D1	DIN43650, IP65
H1	Aviation plug, M12*1, 4 pin, IP67

DIN43650 (D1)

DIN43650(D 1)

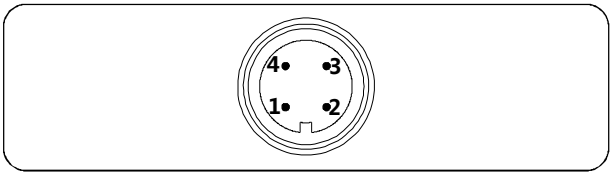


Label	Two wires	Three wires	Four wires	Modbus-RTU/RS485
1	Power+	Power+	Power+	Power+
2	Power-	Power-	Power-	Power-
3	Key-z	Signal+	Signal+	A+
⏚			Signal-	B-

Note: Key-z is modified zero pressure

Aviation plug, M12*1(4 pin)(H1)

Aviation plug, M12*1(4 pin)(H1)

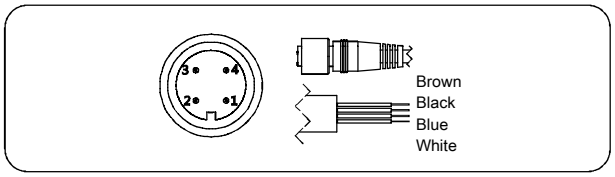


Label	Two wires	Three wires	Four wires	Modbus-RTU/RS485
1	Power+	Power+	Power+	Power+
2			Signal-	B-
3	Key-z	Signal+	Signal+	A+
4	Power-	Power-	Power-	Power-

Product selection instruction

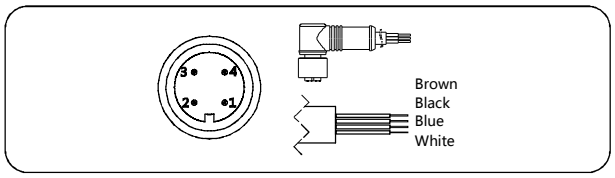
Electrical connection accessory

Aviation plug straighter(J1)



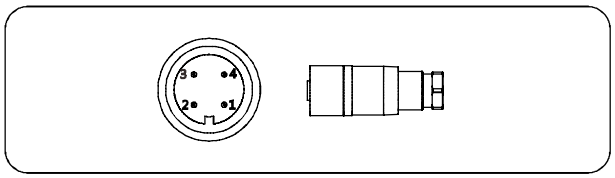
label	Two wires	Three wires	Four wires	Modbus-TRU/RS485
1/Brown	Powe+	Power+	Power+	Power+
2/White			Power-	B-
3/Blue	Key-z	Signal+	Signal+	A+
4/Black	Power-	Power-	Power-	Power-

Aviation plug elbow (J2)



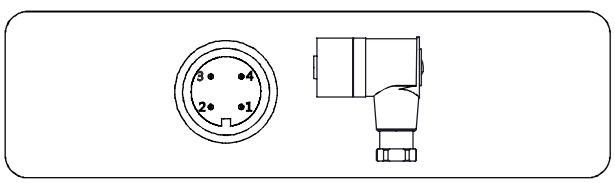
label	Two wires	Three wires	Four wires	Modbus-TRU/RS485
1/Brown	Power+	Power+	Power+	Power+
2/White			Signal-	B-
3/Blue	Key-z	Signal+	Signal+	A+
4/Black	Power-	Power-	Power-	Power-

Air plug straighter(J4)



label	Two wires	Three wires	Four wires	Modbus-TRU/RS485
1	Power+	Power+	Power+	Power+
2			Signal-	B-
3	Key-z	Signal+	Signal+	A+
4	Power-	Power-	Power-	Power-

Aviation plug elbow (J5)



label	Two wires	Three wires	Four wires	Modbus-TRU/RS485
1	Power+	Power+	Power+	Power+
2			Signal-	B-
3	Key-z	Signal+	Signal+	A+
4	Power-	Power-	Power-	Power-

Electrical connection select instruction

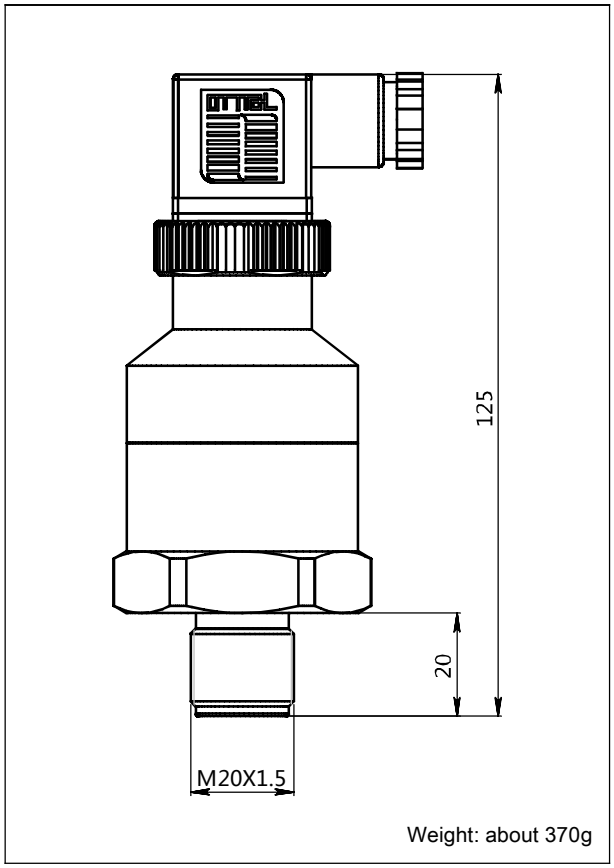
Code	Description
F	4-20mA two wire, power supply: 12-30VDC
H	4-20mA+ HART two wire, power supply: 16.5-55VDC
R	Modbus-RTU/RS485 5V/9-30VDC
1	1-5VDC three wire, power supply: 12-30VDC
2	0-5VDC three wire, power supply: 8-30VDC

Process connection select instruction

Code	Type	Description
4	Material	SUS304
6		SUS316
M01	Specification	M20*1.5(M), Φ8 pressure lead hole, GB/T193-2003, ISO261
G01		G1/2(M), Φ8 pressure lead hole, EN837
G21		G1-1/2(M), flush diaphragm sensor, EN837
R02		1/4-18NPT(M), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1

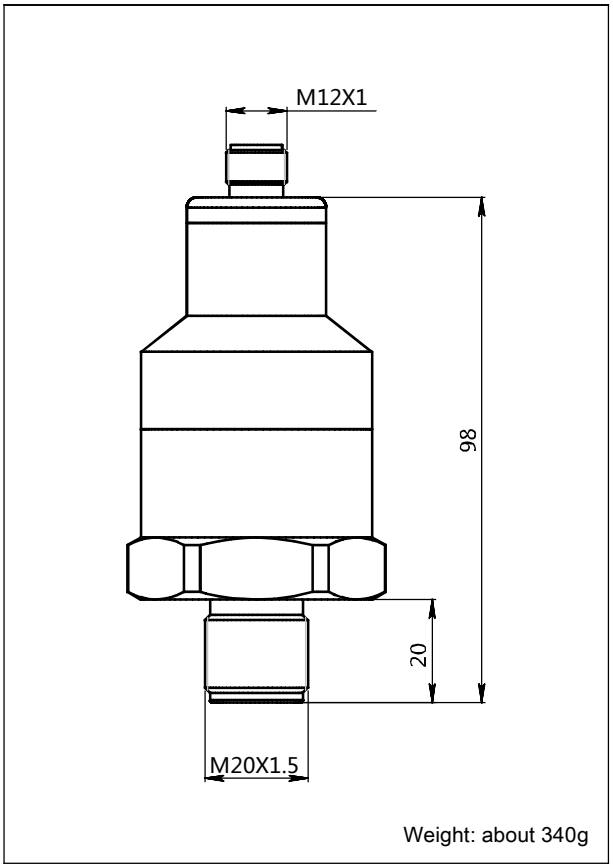
Product drawing and dimension

Drawing and dimension with DIN43650(D1) (unit: mm)



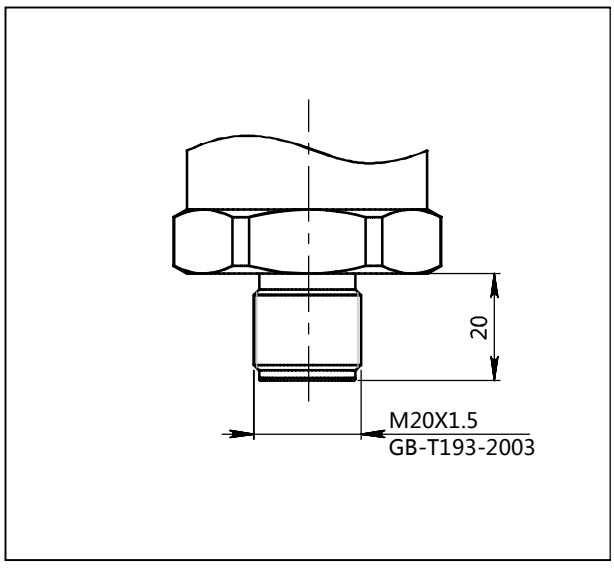
Weight: about 370g

Drawing and dimension with aviation plug(H1) (unit: mm)

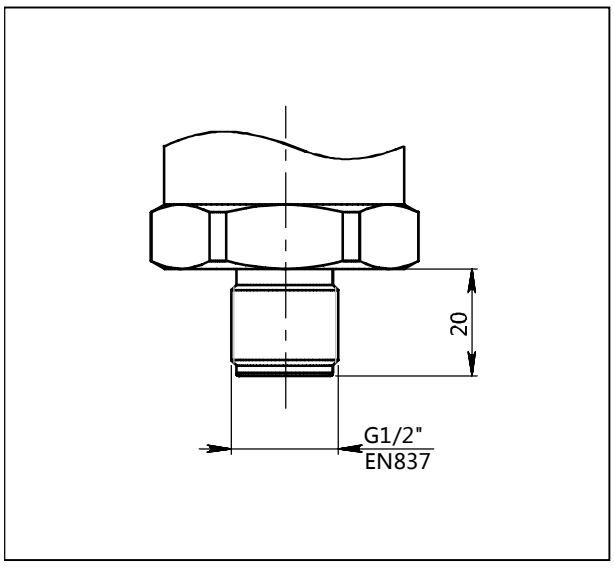


Weight: about 340g

Process connection(M05) (unit: mm)



Process connection(G01) (unit: mm)



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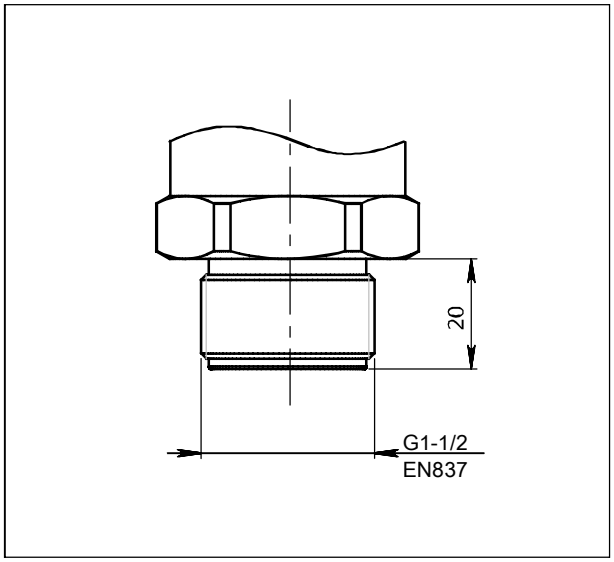
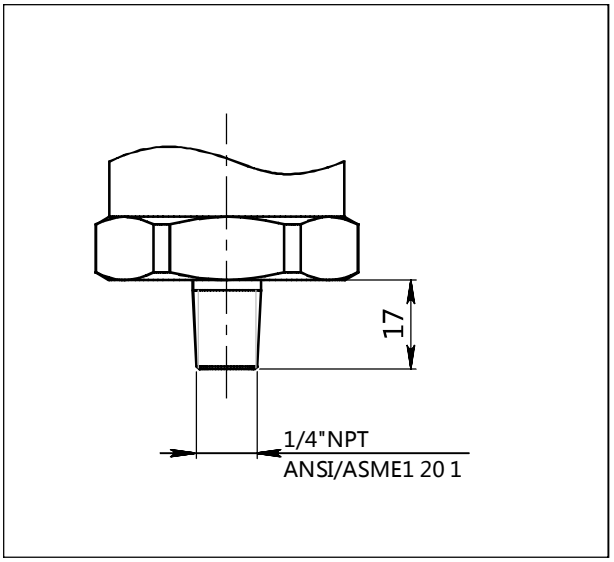
Product drawing and dimension

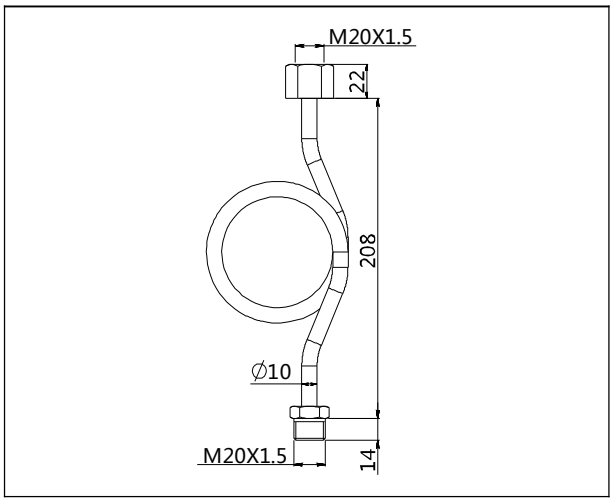
Process connection(G21) (unit: mm)



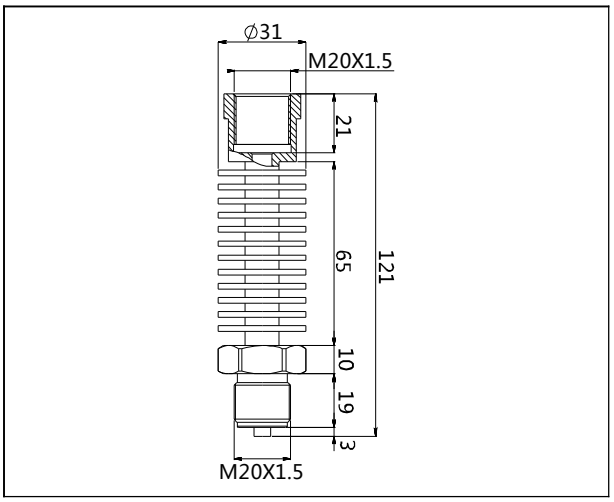
Process connection(R02) (unit: mm)



Heat exchange connector(N1) (unit: mm)



Heat exchange connector(N2)(unit: mm)



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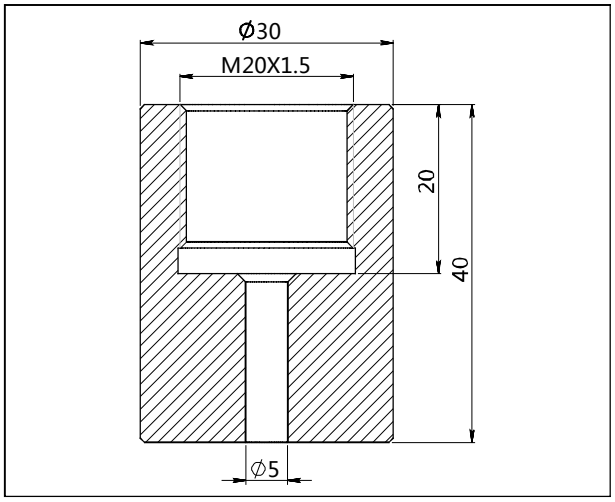
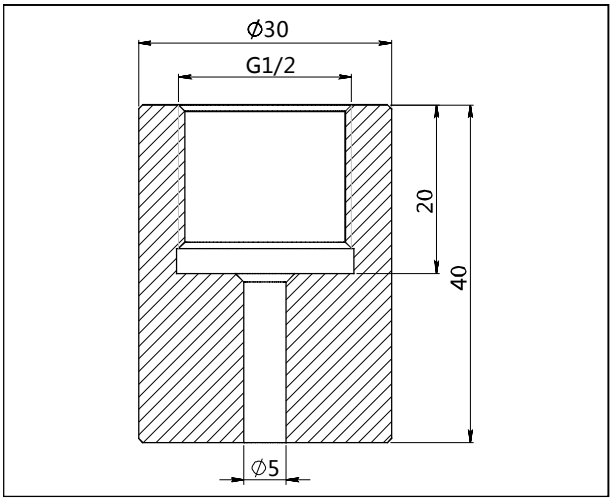
Product drawing and dimension

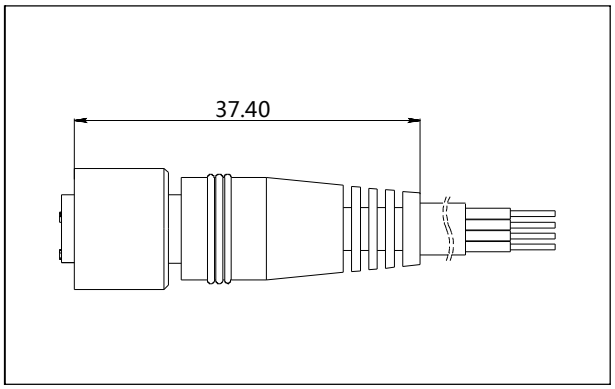
Welding adaptor(Z1) (unit: mm)



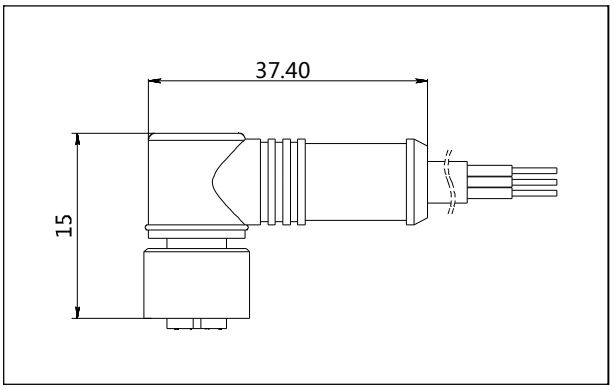
Welding adaptor(Z2) (unit: mm)



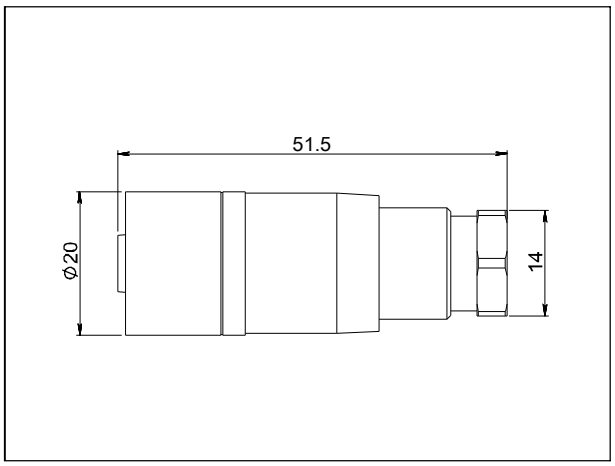
Aviation female plug straighter(J1) (unit: mm)



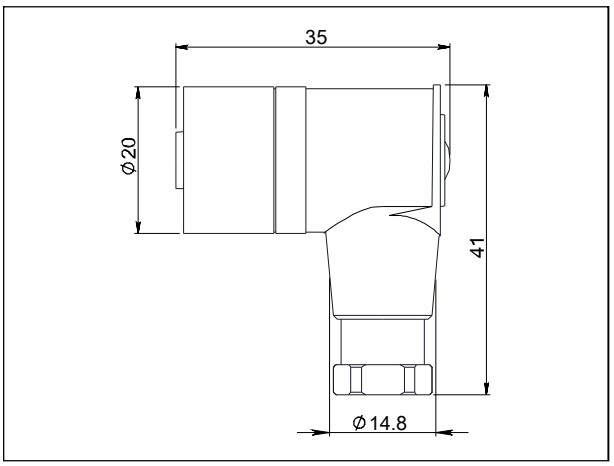
Aviation female plug elbow(J2) (unit: mm)



Aviation female plug straighter(J4) (unit: mm)



Aviation female plug elbow(J5) (unit: mm)



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Ordering information chapter

Item	Parameters	Code	Instruction	(*)fast delivery available
	Model	SMP131-TCD	Capacitive ceramic gauge pressure transmitter (The first letter of electrical connection tpye is D)	*
		SMP131-TCH	Capacitive ceramic gauge pressure transmitter (The first letter of electrical connection tpye is H)	*
Sensor	Separator	-	Detailed specifications as following	
	Pressure range code	C502G	Nominal value(URL): 5kPa	
		C103G	Nominal value(URL): 10kPa	
		C203G	Nominal value(URL): 20kPa	*
		C403G	Nominal value(URL):40kPa	*
		C104G	Nominal value(URL): 100kPa	*
		C204G	Nominal value(URL): 200kPa	*
		C404G	Nominal value(URL): 400kPa	*
		C105G	Nominal value(URL): 1MPa	*
		C205G	Nominal value(URL): 2MPa	*
		C405G	Nominal value(URL):4MPa	*
	Diaphragm material	C	Ceramic(99.9% AL203)	*
	Filling fluid	N	None	*
	Sensor seal	S	O-ring, FKM(Process tempetature: -20-200℃)	*
Electrical connection	Separator	-	Detailed specifications as following	
	Electrical connection	D1	DIN43650, IP65	*
		H1	Aviation plug, M12*1(4pin), IP67	*
	Cable entry protector	R0	None	
Output	Separator	-	Detailed specifications as following	
	Output signal	F	4-20mA two wire, power supply: 12-30VDC	*
		H	4-20mA+HART two wire, power supply: 16.5-55VDC	
		R	Modbus-RTU/RS485 four wire, power supply: 5VDC/9-30VDC	
		1	1-5VDC three wire, power supply: 12-30VDC	
		2	0-5VDC three wire, power supply: 8-30VDC	
Body tube	Separator	-	Detailed specifications as following	
	Body tube	L3	Specialized body tube of capacitive ceramic pressure sensor	*
Process connection	Separator	-	Detailed specifications as following	
	Material	4	SUS304	*
		6	SUS316	
	Specification	M05	M20*1.5(M), Φ8 pressure lead hole, GB/T193-2003, ISO261	*
		M08	M42*1.5(M),flush diaphragm,EN837	
		G01	G1/2(M), Φ8pressure lead hole, EN837	*

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Ordering information chapter

		G21	G1-1/2(M), flush diaphragm, EN837	
		R02	1/4-18NPT(M), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1	
Additional options	Separator	-	Detailed specifications as following	
	Process connection mounting accessory	/N1	Heat exchange connector, M20*1.5 (F) change to M20*1.5(M), SUS304	*
		/N2	Heat exchange connector, M20*1.5 (F) change to M20*1.5(M), SUS304	
	Process connection accessory	/Z1	Welding adaptor, M20*1.5(F), SUS304	
		/Z2	Welding adaptor, G1/2(F), SUS304	
	Electrical connection accessory	/J1	Aviation female plug (straighter) with 2m cable, 4 pin, M12*1, IP67	
		/J2	Aviation female plug (elbow) with 2m cable, 4 pin, M12*1, IP67	
		/J4	Aviation female plug (straighter) without cable, 4 pin, M12*1, IP67	*
		/J5	Aviation female plug (elbow) without cable, 4 pin, M12*1, IP67	
	Approvals	/F3	CE certificate	
	Wetted parts treatment	/G1	Degrease treatment	
		/G2	Electropolishing treatment	

Approvals

Factory certificate

Certification organization	Intertek
Quality management system	ISO9001-2008
Scope of certification	Design and production of pressure transmitter
Registration number	110804039

CE

Certificate organization	ISET
License scope	SMP131 series pressure transmitter
Mark	CE
EMC instruction	2014/30/EU
Standard	EN61326-1:2013
Registration number	IT031353LG161207

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