Product introduction

Description

SMP131-TLD

SMP131-TLH

High performance pressure transmitter

SMP131 compact 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. SMP131 compact pressure transmitter has unique technological advantage which is different from other ordinary products with the same price and its' capabilities are equivalent to the most of the high-end products, which is the first selection of the most cost-effective products.

Main parameters

Pressure types	Gauge pressure
Measuring range	5kPa-100MPa, please refer to the ordering information chapter
Output signal	4-20mA, 4-20mA+HART, 0.5-4.5VDC, Modbus-RTU/RS485, others
Reference accuracy	±0.2% URL, ±0.5% URL, optional ±0.1% URL

Field of application

Pressure and level measurement

Approvals

CE MC Ex VEPS

Measuring medium

The fluid which compatible with wetted parts

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Technical specifications

Measuring range and limit

Nominal value	Smallest calibratable span	Lower range limit (LRL)	Upper range limit (URL)	Over load limit
7kPa	5kPa	-7kPa	7kPa	10.5kPa
20kPa	10kPa	-20kPa	20kPa	30kPa
35kPa	20kPa	-35kPa	35kPa	52.5kPa
100kPa	35kPa	-100kPa	100kPa	150kPa
200kPa	100kPa	-100kPa	200kPa	300kPa
700kPa	200kPa	-100kPa	700kPa	1050kPa
1MPa	500kPa	-0.1MPa	1MPa	1.5MPa
1.7MPa	1MPa	-0.1MPa	1.7MPa	2.55MPa
3.5MPa	1.7MPa	-0.1MPa	3.5MPa	5.25MPa
7MPa	3.5MPa	-0.1MPa	7MPa	10.5MPa
17MPa	7MPa	-0.1MPa	17MPa	25.5MPa
35MPa	17MPa	-0.1MPa	35MPa	52.5MPa
40MPa	20MPa	-0.1MPa	40MPa	60MPa
60MPa	30MPa	-0.1MPa	60MPa	90MPa
70MPa	35MPa	-0.1MPa	70MPa	105MPa
100MPa	50MPa	-0.1MPa	100MPa	150MPa
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				

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: 7kPa, 20kPa, 35kPa, 100kPa, 200kPa, 700kPa, 1MPa, 1.7MPa, 3.5MPa, 7MPa 17MPa, 35MPa, 40MPa, 60MPa, 70MPa, 100MPa
	Max/Voltage output	±0.5% URL	

Standard specifications and reference conditions

Test standard: GB/T28474 / IEC60770; Zero based-calibration span, Linear output, Silicon oil filling, 316L stainless steel isolated diaphragm.

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

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

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Technical specifications

Vibration effects

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

Output signal

Signal	Type	Output
4-20mA	Linearity	Two wire
4-20mA+HART	Linearity	Two wire
0.5-4.5VDC	Linearity	Three wire
Modbus-RTU/RS485	Linearity	Four wire

Working life

>10 million max pressure circulation

Insulation resistance

≥ 20M Ω@, 100VDC

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)
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	IP 65, IP67
Dangerous condition	ExiaIICT4(GYB16.1964X)*
*Only for 4-20mA output	

Technical Specifications

Signal output	4-20mA	4-20mA+HART*	0.5-4.5VDC	0.5-4.5VDC(ratiometric output)	RS485
Power supply voltage	10-30VDC	10.5/16.5-55VDC	6-15VDC	5VDC	5VDC/9-30VDC
Electric current	≤20.8mA		≤3.5mA		≤7mA
Load resistance(Ω)	<(U-10)/0.0208	<(U-10.5)/0.0208**	≥5k, recommend 100k		/
Transmission distance	<1000m		<5m		<1200m
Power consumption	≤500mW(20.8mA output@24VDC)		≤42mW(0.5-4.5VDC output, @12VDC)		≤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

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Technical specifications

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.

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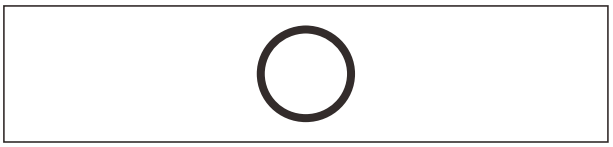
Product selection instruction

Sensor select instruction

Code	Nominal value	Description
L702G	7kPa	Range -7-7kPa, smallest calibratable span 5kPa
L203G	20kPa	Range -20-20kPa, smallest calibratable span 10kPa
L353G	35kPa	Range -35-35kPa, smallest calibratable span 20kPa
L104G	100kPa	Range -100-100kPa, smallest calibratable span 35kPa
L204G	200kPa	Range -100-200kPa, smallest calibratable span 100kPa
L704G	700kPa	Range -100-700kPa, smallest calibratable span 200kPa
L105G	1MPa	Range -0.1-1MPa, smallest calibratable span 500kPa
L175G	1.7MPa	Range -0.1-1.7MPa, smallest calibratable span 1MPa
L355G	3.5MPa	Range -0.1-3.5MPa, smallest calibratable span 1.7MPa
L705S	7MPa	Range -0.1-7MPa, smallest calibratable span 3.5MPa
L176S	17MPa	Range -0.1-17MPa, smallest calibratable span 7MPa
L356S	35MPa	Range -0.1-35MPa, smallest calibratable span 17MPa
L406S	40MPa	Range -0.1-40MPa, smallest calibratable span 20MPa
L606S	60MPa	Range -0.1-60MPa, smallest calibratable span30MPa
L706S	70MPa	Range -0.1-70MPa, smallest calibratable span 35MPa
L107S	100MPa	Range -0.1-100MPa, smallest calibratable span 50MPa
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	Position	Description
S	Isolated diaphragm material	SUS316
S	Isolated filling fluid	Silicon oil, process temperature: -45-205℃
S	Sensor seal	O-ring, FKM, process temperature: -20-200℃
F		Stainless steel welding seal

Seal(S)

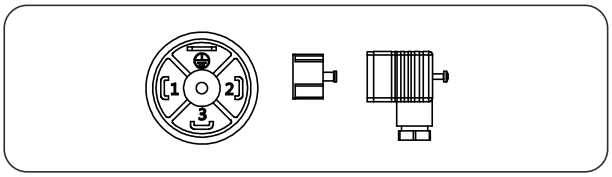


Electrical connection select instruction

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)

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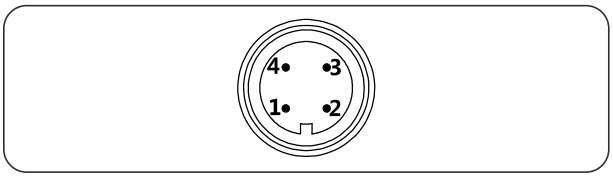
Product selection instruction

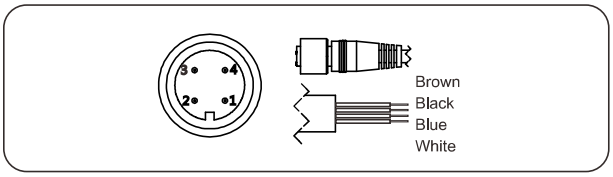
Aviation plug, M12*1, 4 pin(H1)



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-

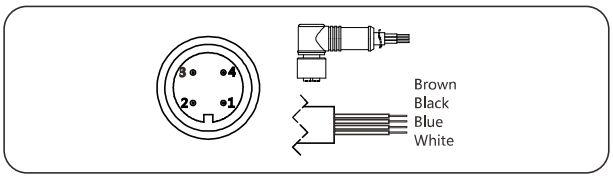
Electrical connection accessory

Aviation plug straighter(J1)



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

Aviation plug elbow (J2)

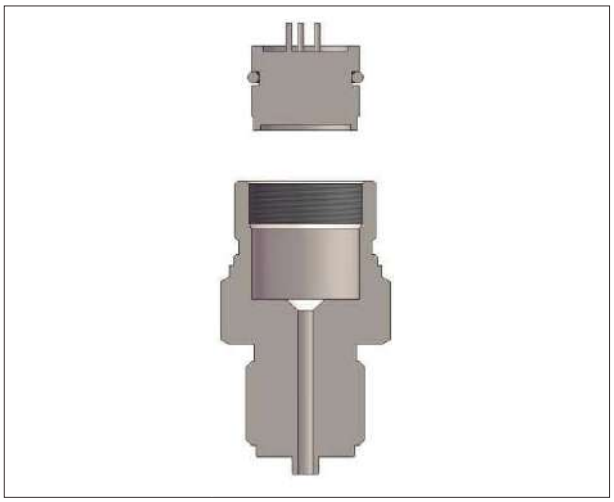


label	Two wires	Three wires	Four wires	Modbus-RTU/RS485
1/Brown	Power+	Power+	Power+	Power+
2/White			Signal-	B-
3/Blue	Key-z	Signal+	Signal+	A+
4/Black	Power-	Power-	Power-	Power-

Output signal select instruction

Code	Description
F	4-20mA two wire, power supply: 10-30VDC
H	4-20mA+ HART two wire, power supply: 16.5-55VDC
R	Modbus-RTU/RS485 5V/9-30VDC
5	0.5-4.5V DC three wire, power supply: 6-30VDC
6	0.5-4.5V DC three wire, ratiometric output, power supply: 5VDC
A	4-20mA two wire, intrinisic safety, power supply: 10-30VDC

Wetted Parts



Process connection select instruction

Code	Type	Description
4	Material	SUS304
6		SUS316
M01	Specification	M20*1.5(M), Φ3 pressure lead hole, GB/T193-2003, ISO261
G01		G1/2(M), Φ3 pressure lead hole, EN837
G02		G1/4(M), Φ3 pressure lead hole, EN837
G08		G1/4(M), Φ3 pressure lead hole , GB/T7307, ISO228, DIN16288, BS2779, seal reference DIN3852-E (back-end seal) Max measuring range 60MPa
R01		1/2-14NPT(M), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1
R02		1/4-18NPT(M), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1
R03		1/2-14NPT(F), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1
R04		1/4-18NPT(F), Φ3 pressure lead hole GB/T12716, ANSI/ASME B1.20.1

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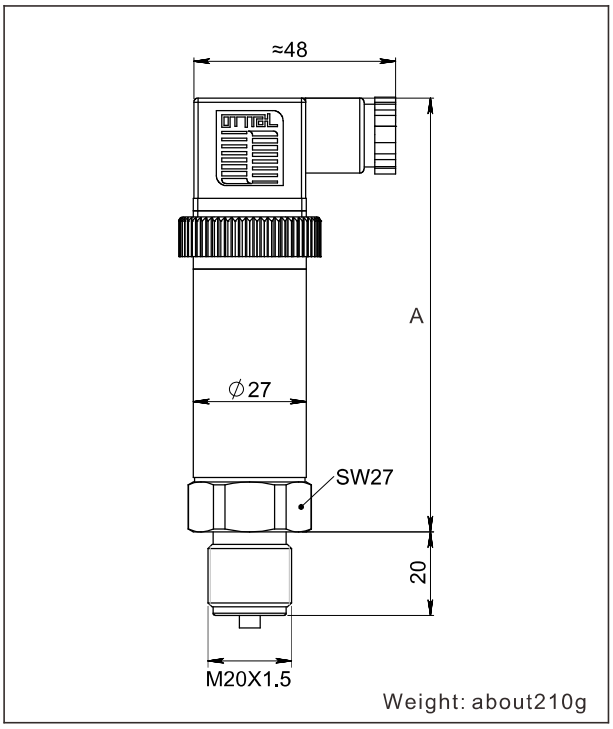
Product drawing and dimension

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

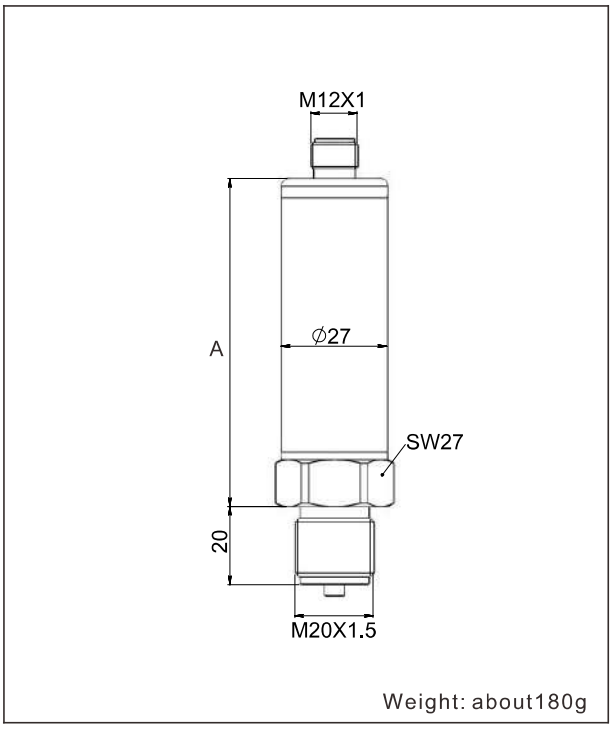


Weight: about210g

Value of A in different output signal types(DIN43650 adaptor)

Output signal code	(Accuracy≤0.1% URL)	Other accuracy
F, H, A	123	108
5, 6	-	108
R	123	123

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

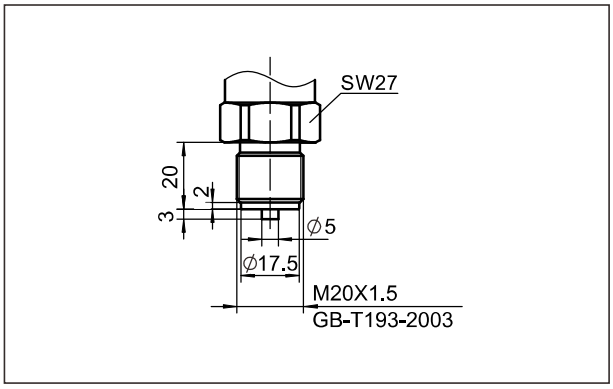


Weight: about180g

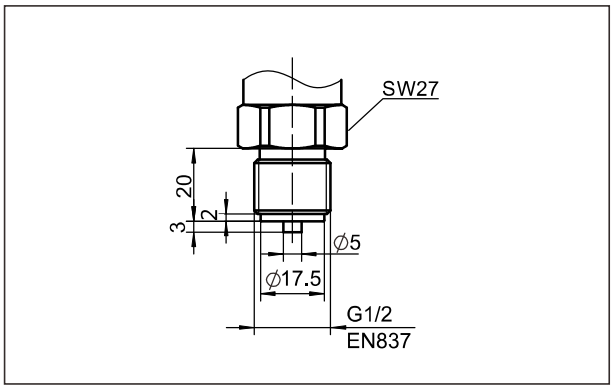
Value of A in different output signal types(Aviation plug)

Output signal code	(Accuracy≤0.1% URL)	Other accuracy
F, H, A	83	68
5, 6	-	68
R	83	83

Process connection(M01) (unit: mm)



Process connection(G01) (unit: mm)



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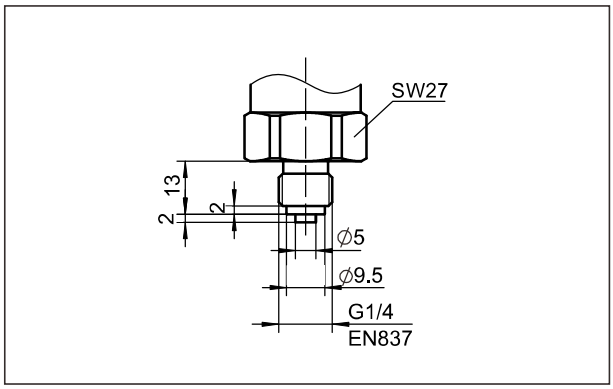
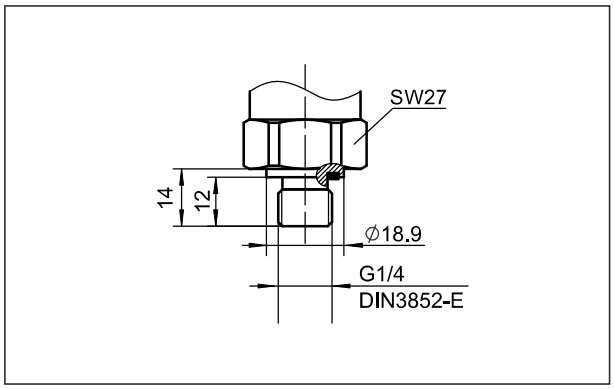
Product drawing and dimension

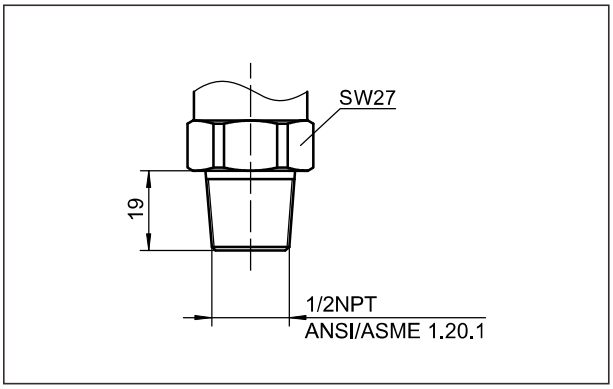
Process connection(G02) (unit: mm)



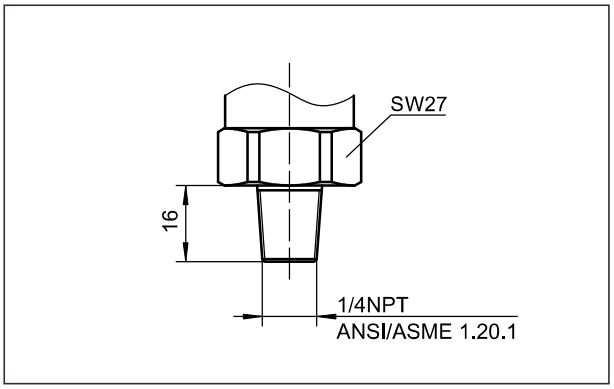
Process connection(G08) (unit: mm)



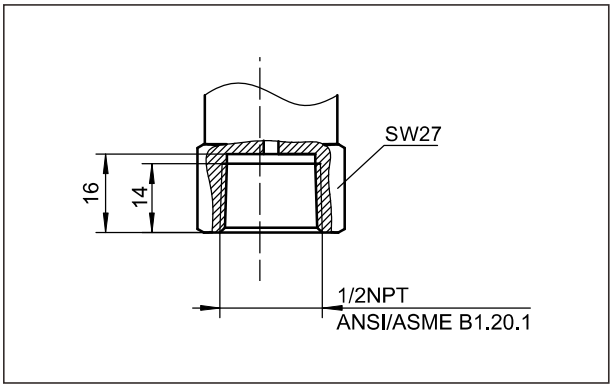
Process connection(R01) (unit: mm)



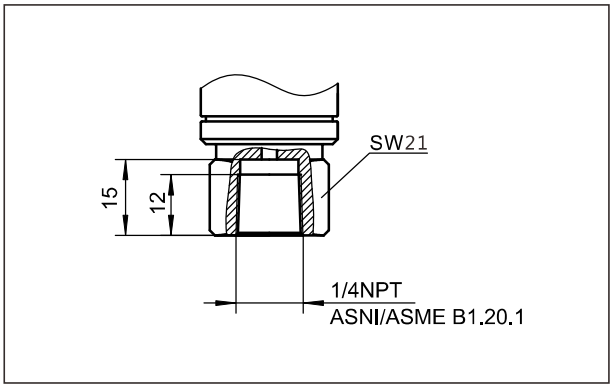
Process connection(R02) (unit: mm)



Process connection(R03) (unit: mm)



Process connection(R04) (unit: mm)



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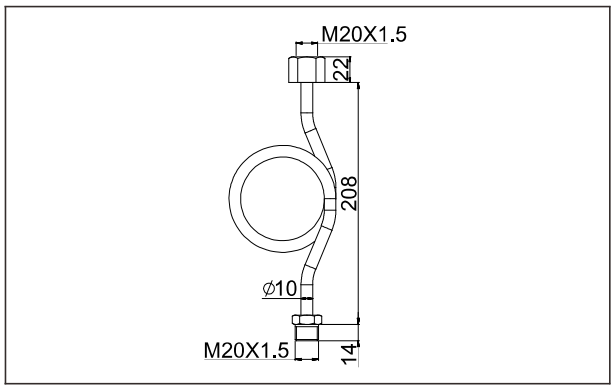
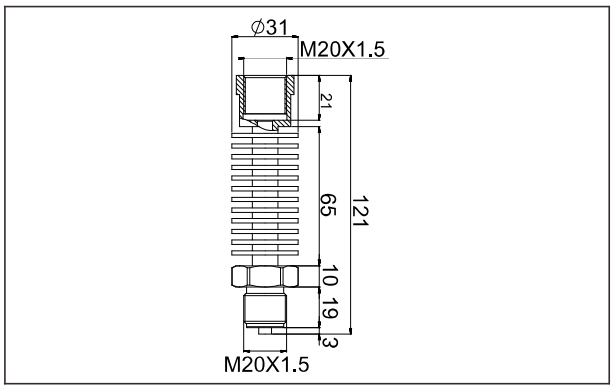
Product drawing and dimension

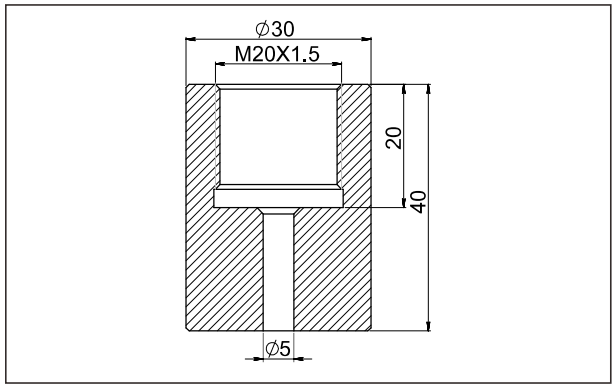
Heat exchange connector(N1) (unit: mm)



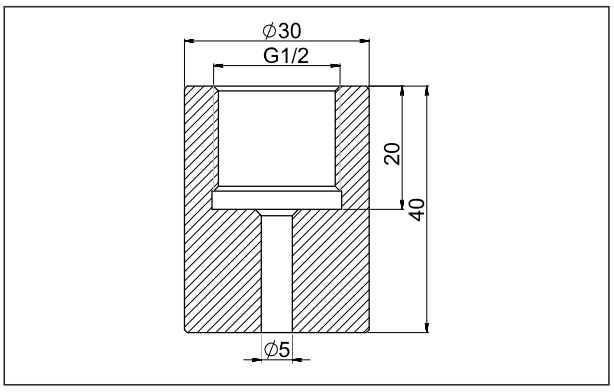
Heat exchange connector(N2)(unit: mm)



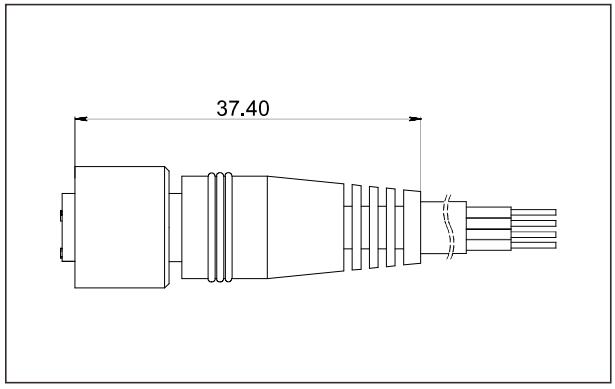
Welding adaptor(Z1) (unit: mm)



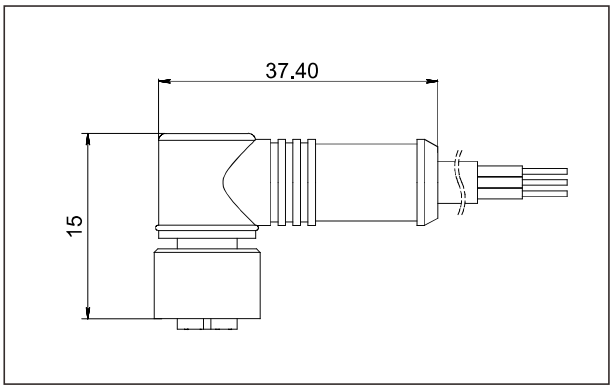
Welding adaptor(Z2) (unit: mm)



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



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



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Ordering information chapter

Item	Parameters	Code	Instruction	(*) fast delivery available
	Model	SMP131-TLD	Piezoresistive silicon gauge pressure transmitter (The first letter of electrical connection type is D)	*
		SMP131-TLH	Piezoresistive silicon gauge pressure transmitter(The first letter of electrical connection type is H)	*
Sensor	Separator	-	Detailed specifications as following	
	Pressure range code	L702G	Nominal value(URL): 7kPa	
		L203G	Nominal value(URL): 20kPa	
		L353G	Nominal value(URL): 35kPa	*
		L104G	Nominal value(URL): 100kPa	*
		L204G	Nominal value(URL): 200kPa	*
		L704G	Nominal value(URL): 700kPa	*
		L105G	Nominal value(URL): 1000kPa	*
		L175G	Nominal value(URL): 1700kPa	*
		L355G	Nominal value(URL): 3.5MPa	*
		L705S	Nominal value(URL): 7MPa	*
		L176S	Nominal value(URL): 17MPa	
		L356S	Nominal value(URL): 35MPa	
		L406S	Nominal value(URL): 40MPa	
		L606S	Nominal value(URL): 60MPa	
		L706S	Nominal value(URL): 70MPa	
		L107S	Nominal value(URL): 100MPa	
	Isolated diaphragm material	S	SUS316	*
	Isolated filling fluid	S	Silicon oil filling, process temperature: -45-205℃	*
	Sensor seal	S	O-ring, FKM, process temperature: -20~200℃	*
		F	Stainless steel welding	
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: 10-30VDC	*
		H	4-20mA+HART two wire, power supply: 16.5-55VDC	
		R	Modbus-RTU/RS485 four wire, power supply:5vdc/9-30VDC	
		5	0.5-4.5VDC three wire, power supply: 6-15VDC	
		6	0.5-4.5VDC three wire, ratiometric output, power supply: 5VDC	
		A	4-20mA two wire, intrinsic safety, power supply: 10-30VDC	

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Ordering information chapter

Body tube	Separator	-	Detailed specifications as following	
	Tube	53	Stainless steel tube length: 53mm (HART、Modbus-RTU/RS485 is not available)	*
		37	Stainless steel tube length: 37mm (HART、Modbus-RTU/RS485 is not available)	
		65	Stainless steel tube length: 65mm (with HART、Modbus-RTU/RS485, accuracy≤0.1%)	
		85	Stainless steel tube length: 85mm (with HART、Modbus-RTU/RS485, accuracy≤0.1%)	
Process connection	Separator	-	Detailed specifications as following	
	Material	4	SUS304	*
		6	SUS316	
	Specification	M01	M20*1.5 (M), Φ3 pressure lead hole, GB/T193-2003, ISO261	*
		G01	G1/2 (M), Φ3 pressure lead hole, EN837	*
		G02	G1/4(M), Φ3 pressure lead hole, EN837	
		G08	G1/4(M), Φ3 pressure lead hole, GB/T7307, ISO228, DIN16288, BS2779, seal refers to DIN3852-E (back-end seal), maximum measuring range:60 MPa	
		R01	1/2-14NPT(M), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1	
		R02	1/4-18NPT(M), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1	
		R03	1/2-14NPT(F), Φ3 pressure lead hole, GB/T12716, ANSI/ASME B1.20.1	
		R04	1/4-18NPT(F), 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 (Condenser pipe)	*
		/N2	Heat exchange connector, M20*1.5 (F) change to M20*1.5(M), SUS304 (Cooling fin)	*
	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 (multiple)	/I1	Intrinsic safety certificate, ExiaIICT4, NEPSI	
		/F3	CE certificate	
	Wetted parts treatment	/G1	Ungrease treatment	
		/G2	Electropolishing treatment	

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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	EU
EMC instruction	2014/30/EU
Standard	AC/0100708
Registration number	IT031353LG161207

Intrinsic safety certificate

Certification organization name	NEPSI
License range	SMP131 series pressure transmitter
Explosion-proof mark	ExiaIICT4
Ambient temperature	-40-+60℃
Medium maximum temperature	+120℃
Registration number	GYB16.1964X
Intrinsically safe parameter description	Maximum input voltage: 28VDC
	Maximum input current: 100mA
	Maximum input power: 0.7w
	Maximum internal equivalent parametersCi(uF): 0
	Maximum internal equivalent parametersLi(mH): 0

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