

**Product introduction****Description**

Strong monosilicon gauge pressure transmitter

SMP858 monosilicon pressure transmitter is a high performance pressure transmitter with international leading technology meticulously designed by LEEG instrument, using the world's most advanced monosilicon pressure sensor technology and patent encapsulation technology. Monosilicon pressure sensor locates on the top of the metal body and stay away from the medium interface to realizes mechanical isolation and thermal isolation. Glass sintering sensor wire realizes high strength electrical insulation of metal base and improves the capability of flexibility of electronic circuit and transient voltage resistance protection. All these original encapsulation technologies enable SMP858 to easily cope with extreme chemical occasion and mechanical load, and own strong resistance to EMI, sufficient to respond to the most rigorous industrial environment applications, which are the genuine invisible instruments.

**Main parameters**

Pressure types	Gauge pressure
Measuring range	10kPa-10MPa, please refer to the ordering information chapter
Output signal	4-20mA,4-20mA+HART,0.5-4.5VDC, Modbus-RTU/RS485customer
Reference accuracy	±0.2% URL, ±0.5% URL

**Field of application**

Pressure, level

**Approvals****Measuring medium**

The fluids which compatible with wetted parts

**Technical specifications****Measuring range and limit**

Nominal value	Smallest calibratable span	Lower range limit ( LRL )	Upper range limit ( URL )	Overpressure limit *
40kPa	10kPa	-40kPa	40kPa	25MPa
250kPa	25kPa	-100kPa	250kPa	25MPa
1MPa	100kPa	-100kPa	1MPa	25MPa
3MPa	300kPa	-0.1MPa	3MPa	25MPa
10MPa	1MPa	-0.1MPa	10MPa	25MPa

The unit of the measuring range above can be converted into kg/cm<sup>2</sup>、 MPa and kPa. Provide other measuring range according to 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, minimum measuring range≤| URV - LRV |≤maximum measuring range.

\*Limit value of overpressure: depends on the pressure value of the parts with lowest pressure capacity

**Standard specifications and reference conditions**

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

**Power supply effects**

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

**Performance specifications**

The overall performance including but not limited to 【reference accuracy】 , 【environment temperature effects】 and other comprehensive error

Typical accuracy: ±0.2%URL

Stability: ±0.2% URL/ 1 year

**Loading effects**

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

**Reference accuracy**

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

Linear output accuracy	Typical value	±0.2%URL	Nominal value: 40kPa , 250kPa 1MPa, 3MPa 10MPa
	Max value	±0.5%URL	

**Ambient temperature effects(Typical)**

Within the range - 20-80 °C total impact ±0.2%URL/10k

**Vibration effects**

Vibration resistance	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
0.5-4.5VDC	Linearity	Three wire
Modbus-RTU/RS485	Linearity	Four wire

**Insulation resistance**

≥ 20M Ω@ reference, 100VDC

**Technical Specifications****Damping time**

Total damping time constant: equal to the sum of damping time of amplifier and sensor capsule
Damping time of amplifier: 0-100S adjustable
Diaphragm capsule (isolated diaphragm and silicon oil filling) damping time: ≤0.2S
Startup after power off: ≤3S (with HART communication: ≤6S)
Normal services after data recovery: ≤4S (with HART communication: ≤31S)

**Environment condition**

Items	Operational condition
Working temperature	-40-85°C
Storage temperature	-40-100°C
Media temperature	Hygienic fluid filling: -10-125°C
	Silicon oil filling: -40-120°C
Working humidity	0-95%RH
Protection class	IP67
Dangerous condition	ExialIICt4(GYB16.1965X)

**Technical Specifications**

Signal output	4-20mA	4-20mA+HART*	0.5-4.5VDC	0.5-4.5VDC(ratiometric output)	RS485
Power supply voltage	12-30VDC	10.5/16.5-55VDC	6-15VDC	5VDC	5VDC/9-30VDC
Electric current	≤20.8mA		≤3.5mA		≤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)		≤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

**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 performance 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**

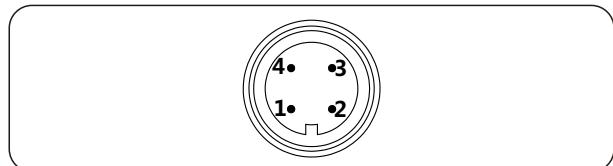
Code	Nominal value	Description
H403G	40kPa	Range -40kPa-40kPa, smallest calibratable span 10kPa
H254G	250kPa	Range -100kPa-250kPa, smallest calibratable span 25kPa
H105G	1MPa	Range -0.1MPa-1MPa, smallest calibratable span 100kPa
H305G	3MPa	Range -0.1MPa-3MPa, smallest calibratable span 300kPa
H106G	10MPa	Range -0.1MPa-10MPa, smallest calibratable span 1MPa

Adjust requirements: lower range value (LRV) and upper range value (URV) can be adjusted within the scope of the upper and lower range limit, minimum measuring range  $\leq$  URV - LRV  $\leq$  maximum measuring range

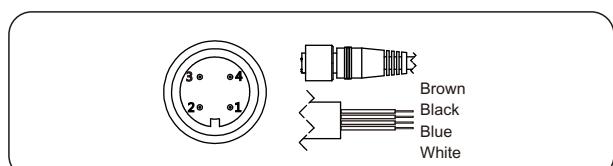
Code	Position	Instruction
F	Sensor seal	Stainless steel welding seal

**Electrical connection**

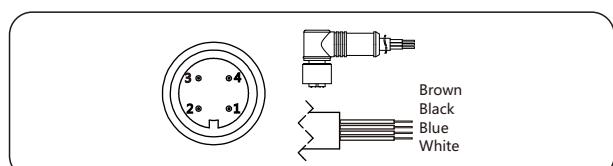
Code	Description
H1	Aviation plug, M12*1(4 pin), IP67

**M12\*1(4 pin), Aviation plug (H1)****Electrical connection****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)**

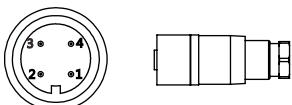
label	Two wires	Three wires	Four wires	Modbus-RTU/RS485
1/Brown	Power+	Power+	Power+	Power+
2/White			Signal-	B-
3/Blue	Key-z	Signal+	Signal+	A+
4/Black	Power-	Power-	Power-	Power-

**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-

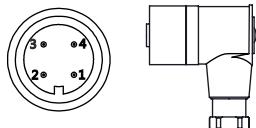
## Product selection instruction

Aviation plug straighter(J4)



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-

Aviation plug elbow(J5)



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-

## Output selection

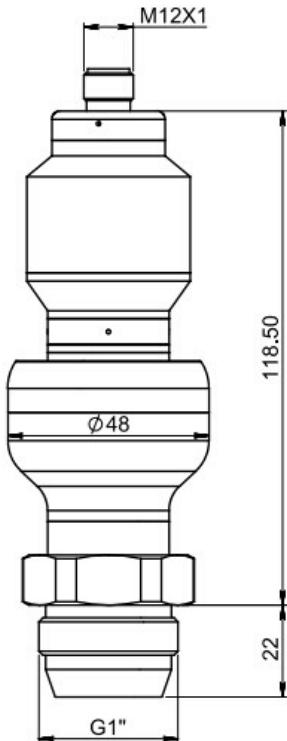
Code	Description
F	4-20mA two wire, power supply: 12-30VDC
H	4-20mA+ HART two wire ,power supply: 16.5-55VDC
R	Modbus-RTU/RS485 5V/9-30VDC
5	0.5-4.5VDC three wire, power supply: 6-15VDC
6	0.5-4.5VDC three wire, ratiometric output power supply: 5VDC
A	4-20mA two wire, intrinsic safety, power supply: 12-30VDC

## Process connection select instruction

Code	Items	Description
6	Process connection material	Stainless steel, SUS316
NT	Connection type	Standard connection, medium temperature: -25-150°C
F	Isolated filling fluid	Hygienic fluid filling, Neobee M-20, process temperature: -10-180°C
		Silicon oil filling, process temperature: -45-205°C
S	Isolated diaphragm material	Stainless steel, SUS316L
H		Hastelloy C
M01	Process connection specifications	M20*1.5(M), GB/T193-2003, ISO261
G01		G1/2(M), GB/T7307,ISO228, BS2779
G07		G1-1/2(M), GB/T7307,ISO228, BS2779
G12		G1(M), metal seal GB/T7307, ISO228,BS2779

## Product drawing and dimension

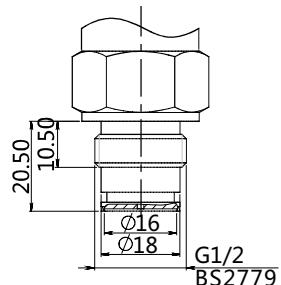
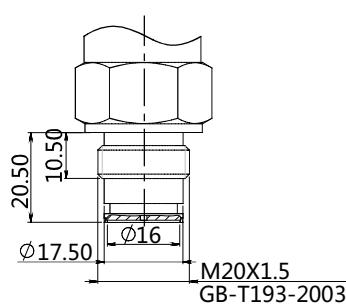
SMP858-TSH-H drawing and dimension ( Unit:mm)



Weight: about 860g

Process connection (M01)(unit: mm)

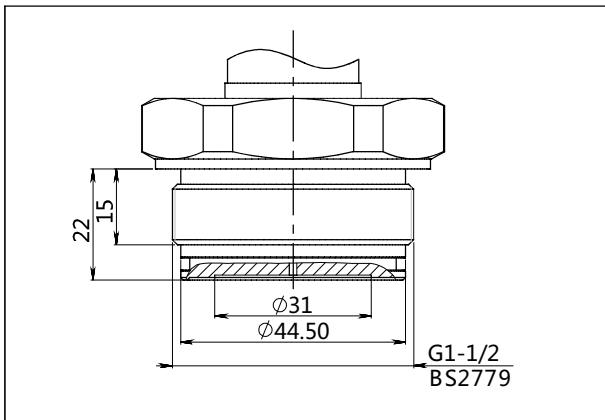
Process connection (G01)(unit: mm)



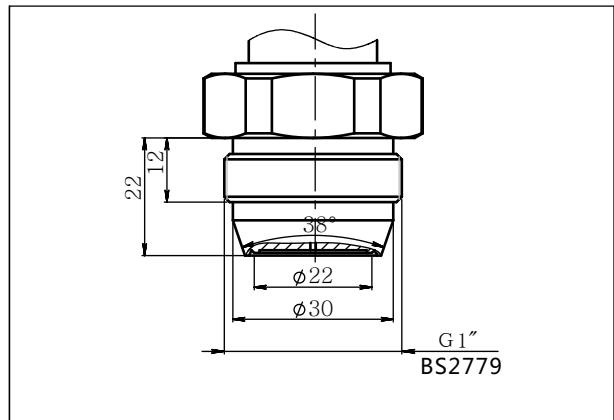
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## Product drawing and dimension

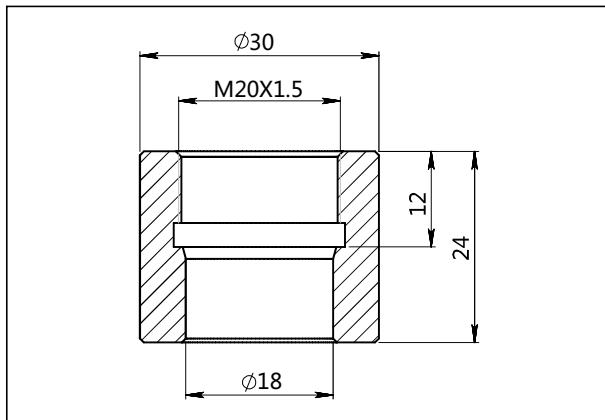
Process connection (G07)(unit: mm)



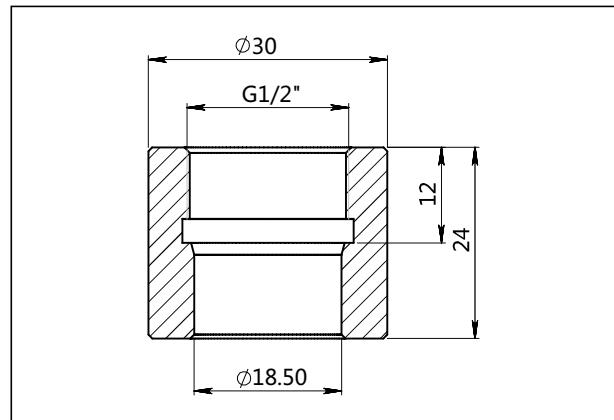
Process connection (G12)(unit: mm)



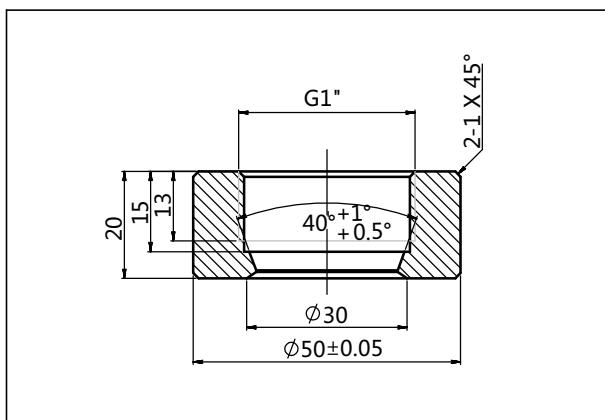
Welding adaptor(Z3)(unit:mm)



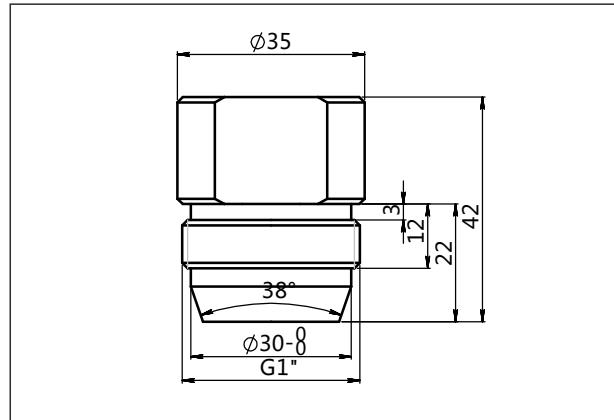
Welding adaptor(Z4)(unit:mm)



Welding adaptor(Z5)(unit:mm)



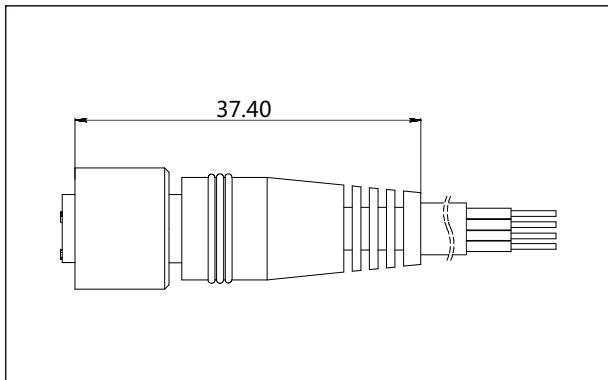
Welding accessory (H1)(unit:mm)



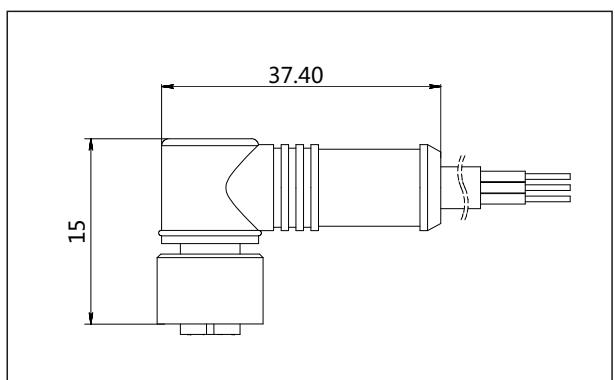
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**Product drawing and dimension**

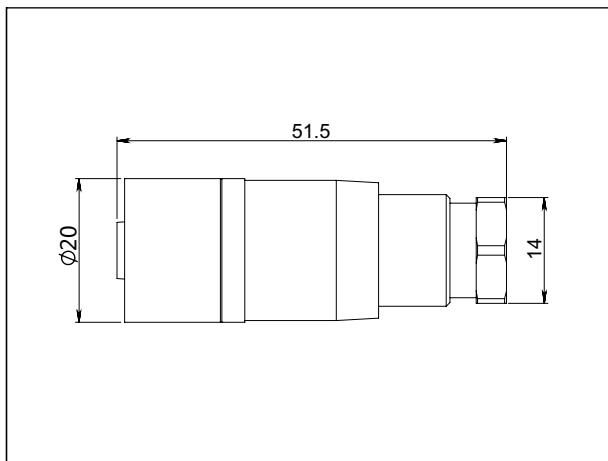
Aviation female plug straighter(J1) (unit: mm)



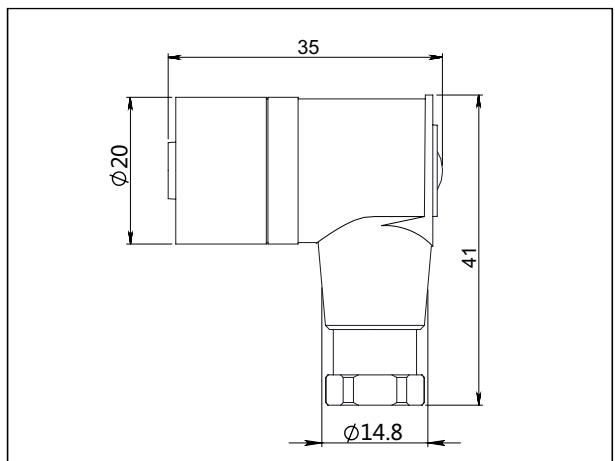
Aviation female plug elbow(J2) (unit: mm)



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



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



## Ordering information chapter

Item	Parameters	Code	Instruction	(*) fast delivery available
	Model	SMP858-TSH	Monosilicon gauge pressure transmitter	
Sensor	Separator	-	Detailed specifications as following	
	Pressure range code	H403G	Nominal value(URL): 40kPa	*
		H254G	Nominal value(URL): 250kPa	*
		H105G	Nominal value(URL): 1MPa	*
		H305G	Nominal value(URL): 3MPa	*
		H106G	Nominal value(URL): 10MPa	
	Sensor seal	F	Stainless steel welding seal	*
Electrical connection	Separator	-	Detailed specifications as following	
	Electrical connection	H1	Aviation plug M12*1 (4 pin) , 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 5V/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: 12-30VDC	
Tube type	Separator	-	Detailed specifications as following	
	Tube body	65	Stainless steel tube length: 65mm	
		85	Stainless steel tube length: 85mm	
Process connection	Separator	-	Detailed specifications as following	
	Process connection material	6	Stainless steel SUS316	
	Connection type	NT	Standard connection, suitable for medium temperature -25-150°C	*
	Isolated filling fluid	F	Hygienic filling fluid, Neobee M-20, process temperature: -10-180°C	*
		S	Silicon oil, process temperature: -45-205°C	*
	Isolated diaphragm material	S	SUS316L stainless steel	*
		H	Hastelloy C	
	Process connection specifications	M01	M20*1.5(M), GB/T193-2003, ISO261, suitable range:250kPa-40MPa	*
		G01	G1/2(M), GB/T7307,ISO228, BS2779, suitable range:250kPa-40MPa	*

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## Ordering information chapter

		G07	G1-1/2(M), GB/T7307,ISO228, Bs2779, suitable range:10kPa-5MPa	
		G12	G1(M), metal seal GB/T7307, ISO228,BS2779 Suitable range:20kPa-10MPa	*
Additional options	Separator	-	Detailed specifications as following	
	Welding adaptor	/Z3	Welding adaptor, M20*1.5 (Female), SUS316	*
		/Z4	Welding adaptor, G1/2 (Female), SUS316	
		/Z5	Welding adaptor, G1 (Female), SUS316	
	Welding accessory	/H1	Adapter plug for welding adaptor, G1 (M), material: copper	*
	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	
	Calibration report	/Q1	Calibration report provided by our company	*
	Approvals (multiple)	/I1	Intrinsic safety certificate, ExiaIICT4, NEPSI	*
		/F3	CE certificate	*
	Wetted parts treatments	/G1	Degrease treatment	
		/G2	Electropolishing	

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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	SMP858 series pressure transmitter
Mark	CE
EMC instruction	2014/30/EU
Standard	EN61326-1: 2013
Registration number	IT051353LG161207

**Intrinsic safety certificate**

Certification organization name	NEPSI
License scope	SMP858 series pressure transmitter
Explosion-proof mark	ExiaIICT4
Ambient temperature	-40-+60°C
Medium maximum temperature	+120°C
Registration number	GYB16.1965X
Intrinsically safe parameter description	Maximum input voltage: 28VDC Maximum input current: 100mA Maximum input power: 0.7w Maximum internal equivalent parameters Ci(uF): 0 Maximum internal equivalent parameters Li(mH): 0.01



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