ISEN-WD10/PT100

Integrated temperature transmitter/thermocouple

The integrated digital temperature transmitter is used in conjunction with industrial thermocouples and thermal resistors, and adopts a two-wire transmission method (two wires are used as common transmission lines for power input and signal output). The integrated temperature transmitter converts the industrial thermocouple and thermal resistor signals into 4-20mA, 0-10mA output signals that are linear with the input signal or the temperature signal. It can be directlyinstalled in the junction box of the thermocouple and thermal resistor to form an integrated structure with them

Product Features

1. It adopts silicone rubber or epoxy resin sealing structure, so it is shock-resistant, corrosion-resistant, and suitable for installation and use in harsh on-site environments.
2. It can be installed on-site in the junction box of thermocouples and thermal resistors, and directly output 4-20mA and 0-10mA output signals. This not onlysaves the expensive compensation wire costs, but also improves the anti-interference abilityof the signal during long-distance t r an smi ssi on ;
3. The thermocouple transmitter has the function of automatic cold end temperature compensation;
4. High precision, low power consumption, wide operating temperature range, stable and reliable operation;
5. Wide range of applications, can form an integrated field installation structure with thermocouples and thermal resistors, and can also be installed as a functional module in detection equipment and instrument panels;
6. The intelligent temperature transmitter can communicate with the host computer through the HART modem or with the handheld device and PC to perform remote information management, configuration, variable monitoring, calibration and maintenance functions on the transmitter model, graduation number, and range;
7. The intelligent temperature transmitter can adjust the display direction of the transmitter accordingto the actual needs of the user, and displaythe medium temperature measured bythe transmitter, the change of sensor value, the output current and the percentage.

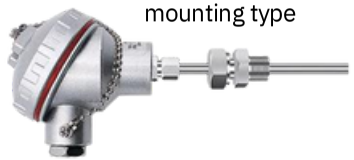
Working Principle

Thermocouple or thermal resistor sensor converts the measured temperature into an electrical signal, and then sends the signal to the input network of the transmitter, which contains relevant circuits such as zero adjustment and thermocouple compensation. The signal after zero adjustment is input to the operational amplifier for signal amplification. The amplified signal is processed bythe V/I converter and output as a 4-20mA DC current; the other signal is processed bythe A/D converter and displayed on the meter. There are two types of linearization circuits for the transmitter, both of which use feedback. For thermal resistor sensors, positive feedback is use d for correction, and for thermocouple sensors, multi-segment broken line approximation is used for correction. There are two displaymodes. The temperature transmitter with LCD displayuses a two-wire output, and the temperature transmitter with LED displayuses a three-wire output.

Application Field

A temperature transmitter is a device that converts temperature signals into measurable electrical signals and is commonlyused in various fields. Power industry: used to monitor the operating temperature of wind turbines to ensure the stable operation of the power system; petrochemical industry: can be used to monitor the temperature in the reactor to avoid explosions or accidents. Environmental monitoring: it can be installed in various environmental monitoring equipment to monitor temperature changes in the atmosphere, water bodies, soil and other environments; for example, in a meteorological observation station, the temperature transmitter can monitor the air in real time.

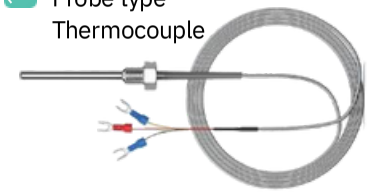
4 ISEN-PT100
Thermocouple threaded mounting type



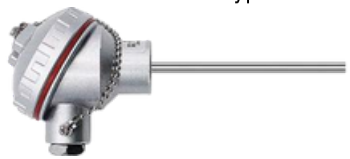
8 ISEN-PT100
Thermocouple explosion-proof flange type

12 ISEN-WD10- Hirschmann Standard

16 ISEN-PT100
Probe type Thermocouple



3 ISEN-PT100
Thermocouple direct-insert installation type



7 ISEN-PT100 Thermocouple Cable Type

11 ISEN-WD10- Hirschmann digital display

15 ISEN-WD10
Aviation plug type

2 ISEN-WD10-2088
Head flange type

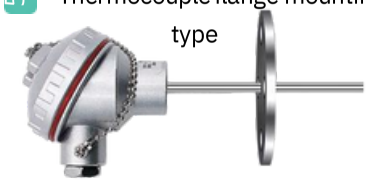
6 ISEN-PT100
Thermocouple chuck mounting type

10 ISEN-PT100 Thermocouple explosion-proof threaded type

14 ISEN-WD10
Aviation plug type

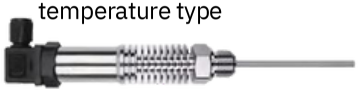
1 ISEN-WD10-2088
Head thread type

5 ISEN-PT100
Thermocouple flange mounting type



9 ISEN-PT100 Thermocouple explosion-proof plug-in type

13 ISEN-WD10
Hirschmann high temperature type



TechnicalSpecification

1. Technical parameters of 2088 digital temperature transmitter Two-wire working mode

Input signal: Pt100/-199.9～600.0℃, full range with one decimal point.

Within the range of -199.9～600.0℃, the zero point and range of the transmitter output can be freelyset; the keyoperation and calibration method are simple and fast;
The integrated intelligent temperature transmitter adopts a single-chip microcomputer circuit to reliablyand accuratelycomplete the acquisition and conditioning of sensor signals and the output of loop current changes

Power supply	DC13～36V; Load resistance ≤600Ω (when powered by 24V)
Signal range	Pt100/-199.9～600.0℃
Input impedance	>1MΩ
Sampling rate	5 times/second
Measurement accuracy	±0.2%FS
Output accuracy	±0.2%
Display range	-199.9℃～600.0℃
Display mode	0.36" four-digit red digital tub e
Temperature drift	<50ppm/℃
Working temperature	－20～80℃
Relative humidity	<85%RH
Protection level	IP65

2. Hirschmann jointtechnical parameters

On-site display	Without display With display
Output signal	4-20mA
Accuracy	0.5%
Power supply	24V±10%
Temperature measurement range	50°C-600°C
Stable performance	<0.2F.S/year
Case protection	IP65 (waterproof and dustproof)
Case material	304 stainless steel (conventional); others can be customized

Technical Specification (Continued)

3. Thermocoupletechnical parameters

Product name	Assembled hot couple/resistor
Graduation number	Default K type (can be made into PT100/E/CU50, etc.)
Probe length L1	200 (custo mizable length)
Probe length R	Default pipe diameter 16mm (others can be customized 8, 10, 12, 20, 25, etc.)
Thread	Thread default M27*2 (customizable)
Cold end lengthL2	100mm (customizable length)
Transmitter output	4-20mA 1-5V optional (transmitter required)
Special requirements	Transm itter, waterproof, anti-corrosion
Installation requirements	Flange, clamp, straight plug, threaded base
Terminal boxlength L3	80mm
Terminal boxlength L4	(default) 76.7mm

t is the absolute value of th e measured temperature

Category (code)	Graduation number	Casing outer diameter (d)	Used temperature (°C)	Maximum operating temperature (°C)	Temperature range	Allowable deviation △t
Nickel-chromium-constantan	E	≥φ3	600	700	0~700	± 2.5°COr
Nickel-chromium-nickel- silicon	K	≥φ3	800	950	0~900	± 2.5°Cor
Copper-constantan	T	≥φ3	350	400	<-200	Not regulated
					-40~350	±1°Cor

When the tem perature changes step bystep, the time it takes for the output of the thermocouple to change to 50% of the step change is called the thermal response time, which is represe nted byT0.5. Insulation resistanc e When the ambient air temperature is 20±1.5℃ and the relative humidityis not greater than 80%, the insulation resistance va lue between the wi re and the outer sleeve of the insulated armored thermocouple shall complywith the provisions of the following table.

Wire diameter (mm)	Test voltage (V-DC)	Insulation resistance (MΩ.m)
1.5	50±10%	≥100 0
>1.5	500±10%	≥100 0

The radius of curvature of the flexible armored thermocouple shall not be less than 5 times its oute r diameter. Thermal response time of armored thermocouple:

Technical Specification (Continued)

Thermal res ponse timeT0.5S Casing diameter (m m)	Shell type	Insulation type
2.0	0.4	0.5
3.0	0.6	1.2
4.0	0.8	2.5
5.0	1.2	4.0
6.0	2.0	6.0
8.0	4.0	8.0

Standard Specifica tions for Outer Diameter and Nominal Length of Armored Thermocouples

φ 8	φ 6	φ 5	φ 4	φ 3
50	50	50	50	50
75	75	75	75	75
100	100	100	100	100
150	150	150	150	150
200	200	200	200	200
250	250	250	250	250
300	300	300	300	300
400	400	400	400	400
500	500	500	500	500
750	750	750	750	750
1000	1000	1000	1000	1000
	1250	1250	1250	1250
	1500	1500	1500	1500
	2000	2000	2000	2000
		2500	2500	2500
		3000	3000	3000
		4000	4000	4000
			5000	5000
			7500	7500
			10000	10000
				15000

Armored thermocouple outerdiameter d (mm)

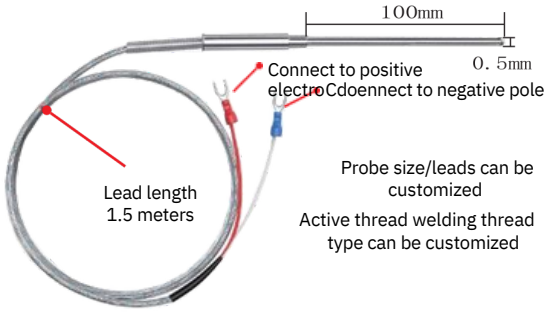
Note: 1. The nominal totallength L of the ¢3 insulated armored thermocouple shall not exceed 10000mm.

2. For armored thermocoupleswith an outer diameter d≤¢5mm and products with splash-proof or waterproof junction boxes, users should payattentionduring installation that the exposed part of the thermocouple must be equipped with auxiliarysupports such as brackets to increaserigidityand ensure firmness to prevent the junction box from shaking back and forth and damaging the thermocouple.

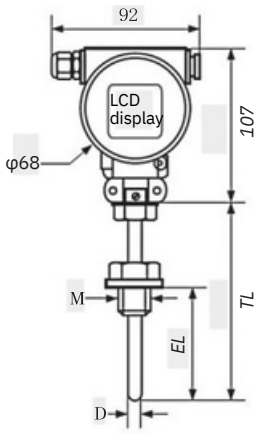
Technical Specification (continued)

4. Probe thermocouple technicalparameters

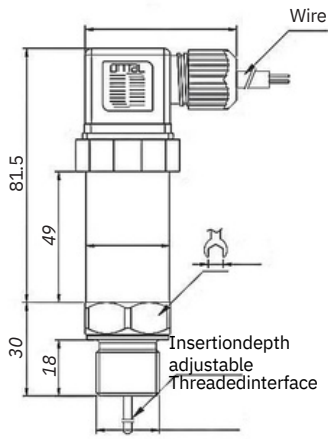
Product name	Probe type thermocouple
Wire length	1~5 meters optional
Mounting thread	M8*1.25mm
Measurement temperature	0~400°C
Probe diameter	Diameters are 0.5, 1.5, 2, 2.3, 2.5,3,4,5,6,8,10mm, etc. forselection
Probe length	50~200mmoptional
Probe material	Stainlesssteel
Terminal	U-shapedterminal



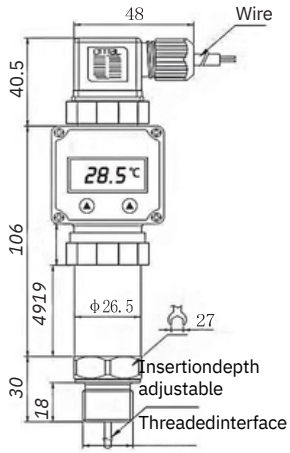
Outline Dimension Drawing (For Reference)



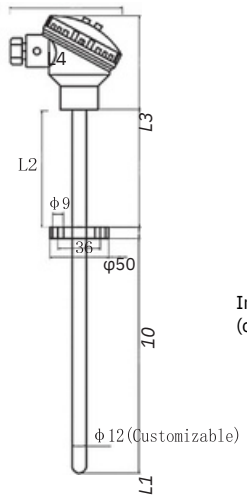
2088 digital display type

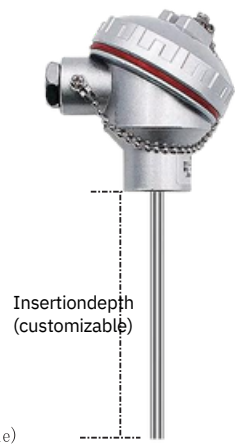


Hirschmann non-display type

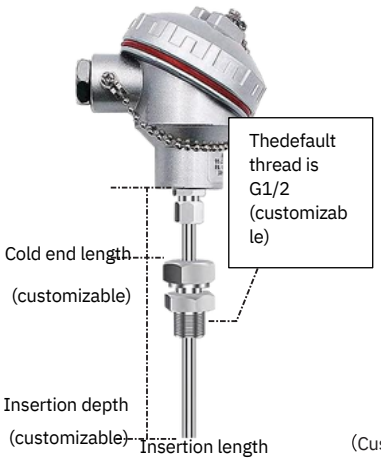


Hirschmann with display type





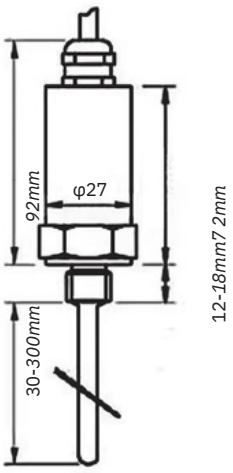
Thermocoupledirect installationtype



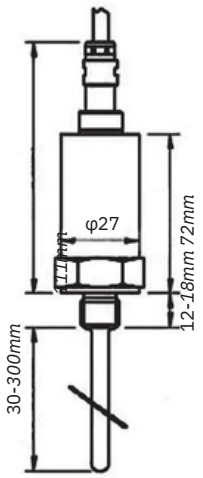
Thermocouple thread installationtype

Thermocouple flange installatio n type

Outline Dimension Drawing (Cont'd, For Reference)



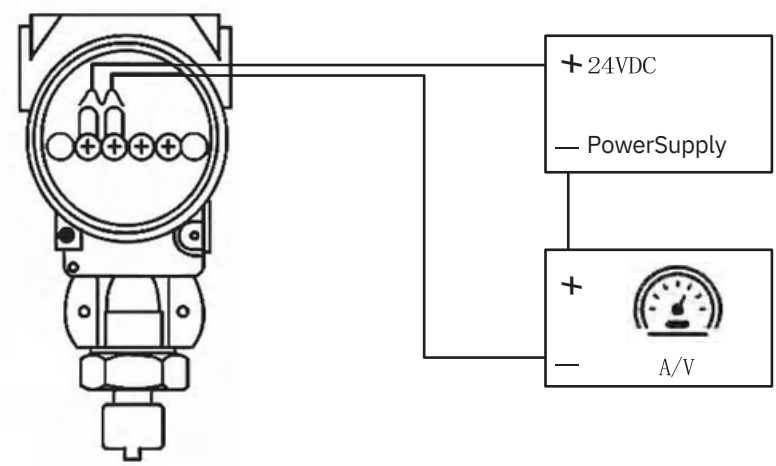
Aviation outlet type



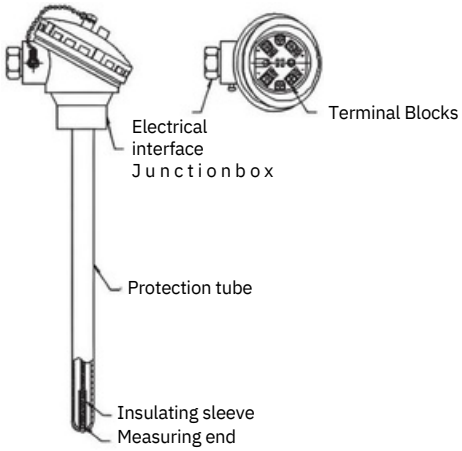
Aviation plug outlettype

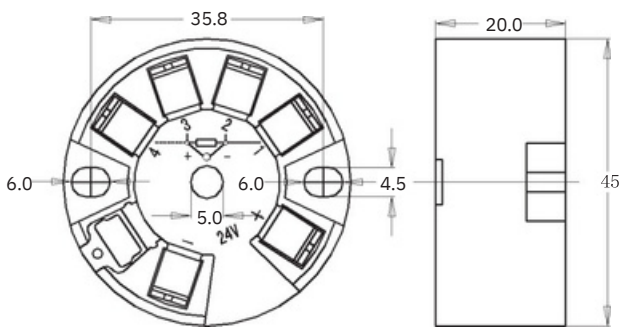
Wiring Diagram

1. 2088 digital temperature transmitter wiring diagra m



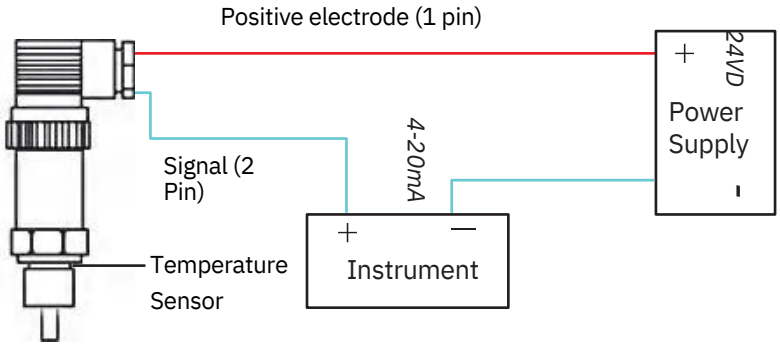
2.The dimensions and wiring diagram of the thermocouple terminal are as follows:





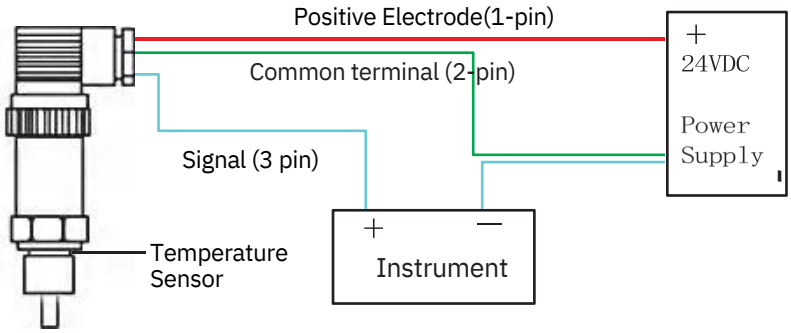
Wiring Diagram (Continued)

3. Wiring diagram of Hirschmann temperature transmitte r



Red line: 24VDC Blue line: current output

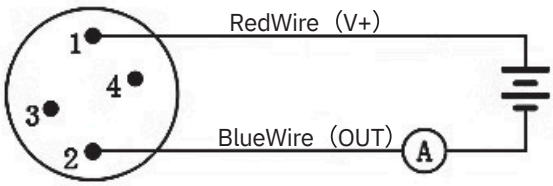
Two-line current output wiring diagram



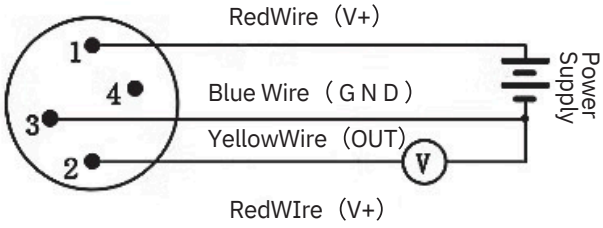
Red wire:24VDC Bluewire:Voltageoutput+Greenwire:Powersupply -Three-wire voltage output wiring diagram

4. Aviation temperature transmitter wiring diagram

Current output wiring diagram (two-wire system)



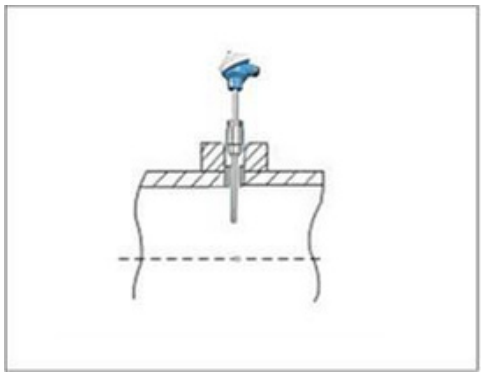
Voltage output wiring diagram (three-wire system)



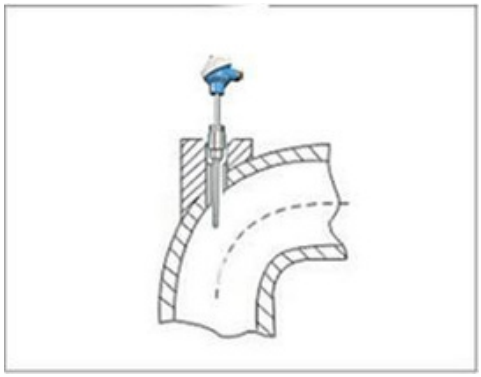
RS485 (digital signal) output wiring diagram (four-wire system)

Product Installation

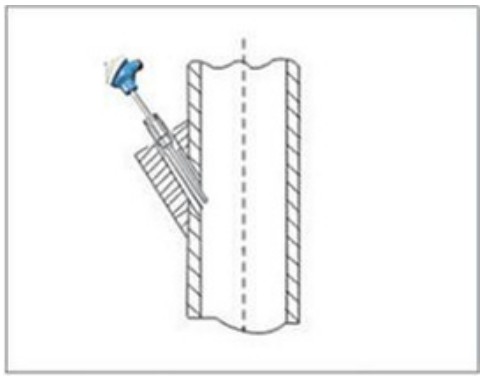
Installation method on vertical pipe axis



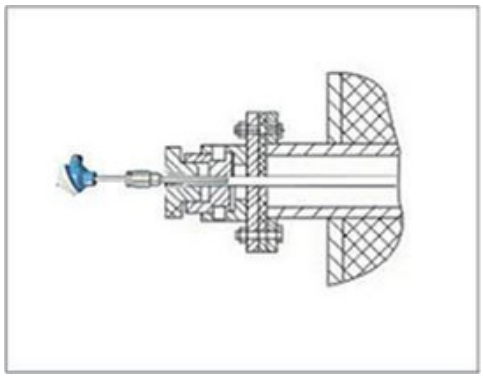
Installation method on curved pipe



Installation method for inclined pipe axi s



Seal installation method in boiler flue



Selection Example

Example: ISEN-WD10-PS142112LDBP200, integrated temperature transmitter, input type PT100 thermal resistor,connection method G1/2" thread, protection tube material 304 stainless steel, protection tube diameter φ12, output signal 4~20mA two-wire system, temperature range 0~+100℃, display method LED digital display,junction box aluminum alloy,power supply method 24VDC, junction box blue, explosion-proof form standard type, insertion depth 200mm.

ISEN-PT100-KS241111LDSP100, thermocouple, input K-division thermocouple, connection method 1/2" NPT thread , protection tube material 304 stainless steel, protection tube diameter φ8, output signal 4~20mA two-ire system, temperature r a nge 0~+100℃, no display, junction box aluminum alloy, power supply method 24VDC, junction box silver, explosion -proof form standard type, insertion depth 100mm.

Selection Chart

Model	Product Name
ISEN-WD10	Integrated temperature transmitter
ISEN-PT100	Thermocouple

Code	Input type
P	PT100 thermal resistor
C	Cu50 thermal resistor
K	K-graded thermocouple
E	E-graded thermocouple
S	S-graded thermocouple
M	mV (customized)

Code	Connection method
S	Thread connection: 1, G1/2" thread; 2, 1/2" NPT thread; 3, M20*1.5 thread; 4, M27*2 thread
F	Flange connection: 1, movable flange; 2, fixed flange; 3, DN25 flange; 4, DN50 flange; 5, DN80 flange; 6, DN100 flange
T	Chuck connection: 1, Chuck 50.5mm; 2, Chuck 64mm
Y	Special specifications can be customized

Code	Protection tube material
1	1Cr18Ni9Ti
4	304 stainless steel
6	316L stainless steel
7	Ceramic
8	Corundum tube

Code	Protection tube diameter
1	φ8
2	φ12
3	φ16
Y	Customizable

Code	Output signal
1	4~20mA two-wire system
2	0-5VDC three-wire system
3	1-5VDC three-wire system
4	1-10VDC three-wire system
5	RS485 communication interface four-wire system
Y	Customizable

Code	Temperature range
0	-50~100℃
1	0~100℃
2	0~200℃
3	0~300℃
4	0~400℃
Y	Customizable

Selection Chart （Continued）

	Code	Display mode
	1	No display
	2	LED digital display
	3	LCD liquid crystal display

	Code	Junction Box
	L	Aluminum alloy
	4	304 stainless steel
	6	316L stainless steel

	Code	Lead mode
	H	Hirschmann lead
	A	Aviation plug lead
	Z	Direct lead

	Code	Power supply mode
	D	24VDC

	Code	Junction box color
	B	Blue
	S	Silver
	G	Green
	Y	Yellow

	Code	Explosion-proof type
	P	Standard type
	E	Explosion-proof type

	Code	Insertion depth
	XXXX	( )mm Customizable

Website

WhatsApp

VALVE Link

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