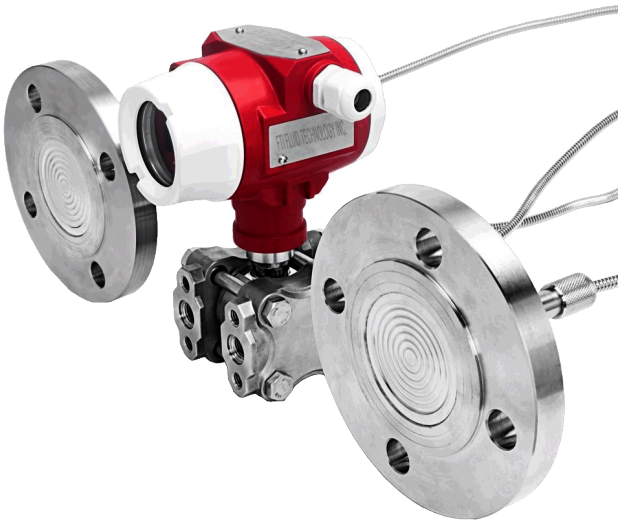
APPLICATIONS

- Oil and gas industry
- Chemical industry
- Energy production/industry
- Metal industry
- Mechanical engineering



SPECIAL FEATURES

● Originally patented fully-sealed, fully-isolated monosilicon pressure sensor.
● Double diaphragm overload protection structure can easily cope with high overload test.
● ASIC and SMT signal transmitting module. Friendly button parameters operation function, display measured data quickly.
● Multiple temperature and linearity compensation to improve accuracy.
● High strength metal electrical protection housing to assure long performance life.
● Solid and superior stainless steel process flange. Strong safeguard with high static pressure and high overload.

Description

LB410series monosilicon pressure transmitter is a high performance pressure transmitter with international leading technology meticulously designed by FTI 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 PB400 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.

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Main parameters

Pressure types	differential pressure , level
Measuring range	4KPa - 1MPa, Please refer to the ordering information chapter
Output signal	4-20mA、4-20mA+HART, customer
Reference accuracy	±0.2% ..±0.5%URL, optional ±0.05% URL

Measuring medium

Liquid

Field of application

Pressure, level

Approvals

CE

Technical specifications

Measuring range and limit

Nominal value	Smallest calibratable span	Lower range limit (LRL)	Upper range limit (URL)	Static pressure limit	High pressure side overload limit	Low pressure side overload limit
6kPa	200Pa	-6kPa	6kPa	25MPa	25MPa	16MPa
40kPa	400Pa	-40kPa	40kPa	40MPa	25MPa	16MPa
250kPa	2.5kPa	-250kPa	250kPa	40MPa	25MPa	16MPa
1MPa	10kPa	-500kPa	1MPa	40MPa	25MPa	16MPa

Adjust requirements: lower range value (LRV) and upper range value (URV) can be adjusted within the scope of the upper and lower range limit, when | URV | ≥ | LRV | , needs | URV | ≥ smallest calibratable span
when | URV | ≤ | LRV |, needs | LRV | ≥ smallest calibratable span

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Standard specifications and reference conditions

Test standard: IEC60770; zero based-calibration span, linear output, silicone oil filling, 316L stainless steel isolation diaphragm.

Performance specifications

The overall performance including but not limited to 【Reference accuracy】,【Environment temperature effects】, 【Static pressure effects】and other comprehensive error
Typical accuracy: ±0.25% ,±0.5% URL
Stability: ±0.2% URL/5 years

Reference accuracy

Including linearity, hysteresis and repeatability. calibration temperature: 20℃ ± 5℃			
Linear output accuracy	TD ≤10 (note 1)	±0.1% URL	Nominal value 6kPa、40kPa 250kPa、1MPa 3MPa、10MPa
	10<TD≤100	±0.0075TD% URL	
Square root output accuracy is 1.5 times linear output accuracy			
Note 1: TD is Turn down, when | URV | ≥ | LRV | , TD=URL/ | URV | when | URV | ≤ | LRV | , TD=URL/ | LRV |			

Ambient temperature effects

Within the range -20-80℃ total impact	±(0.1+0.1TD)% URL

Static pressure effects

Effect on zero	±0.15TD % URL/10MPa
Effect on full scale	±0.2% URL/10MPa

Power supply effects

When power supply voltage is within 10.5/16.5-55VDC, zero and span change should not more than ±0.005% URL/V

Mounting position effects

Install error less than 400Pa, which can be corrected by PV=0 reset.

Vibration effects

According to IEC61298-3,<0.1% URL

Output signal

Two wire 4-20 mA output with digital communications, linear or square root output programmable, HART protocol is superimposed on the 4-20mA signal.

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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
Damping time of sensor capsule (isolation sensor diaphragm and silicon filling oil)≤0.2S
Startup after power off: ≤6S
Normal services after data recovery : ≤31S

Weight

Net weight: about 4 kg (without mounting bracket and process connection adaptor)

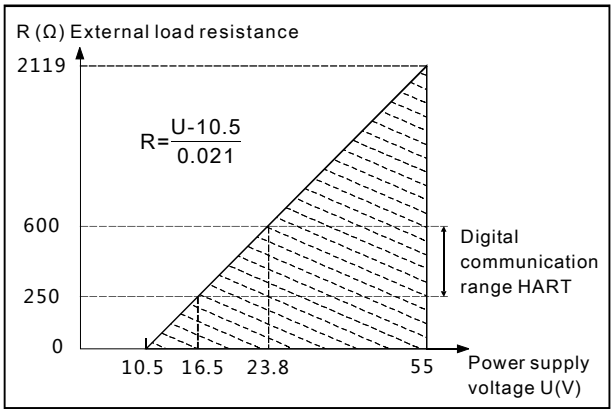
Environment condition

Items	Operational condition
Working temperature	-40-85℃, LCD display unit: -20-70℃
Storage temperature	-40-110℃, integrated LCD display :-40-85℃
Media temperature	Silicone oil filling:-40-120℃
	Inert oil filling:-10-80℃
Working humidity	5-100%RH@40℃
Protection class	IP67
Dangerous condition	Ⅱ 1/2G ExiaIICT4
＊Please consult engineers for details	

Power supply

Item	Operating conditions
Standard/flame proof	10.5-55VDC
HART protocol	16.5-55VDC,communication load resistance 250Ω
Load resistance	0-2119Ω for operation, 250-600Ω for HART protocol
Transmission distance	<1000 meters
Power consumption	≤500mW@24VDC,20.8mA

Power supply and load requirements



EMC environment

NO.	Test items	Basic standards	Test conditions	Performance level
1	Radiated interference	CISPR22	30MHz-1000MHz	OK
2	Conducted interference (DC power sport)	CISPR22	0.15MHz-30MHz	OK
3	Electrostatic discharge immunity test (ESD)	IEC61000-4-2	4kV(Contact),8kV(Air)	B(Note2)
4	Immunity to radio frequency EM-fields	IEC61000-4-3	10V/m(80MHz-1GHz)	A(Note1)
5	Power frequency magnetic field Immunity test	IEC61000-4-8	30A/m	A(Note1)
6	Electrical fast transient / Burst Immunity Test	IEC61000-4-4	2kV(5/50ns,100kHz)	B(Note2)
7	Surge immunity requirements	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	/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 performance, it can restore itself. The actual operating conditions, storage and data will not be changed.

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Specific menu

Transmission module type

Output signal	Local control	Remote control
4-20mA+HART	LCD/3 buttons on body	HART
4-20mA	LCD/3 buttons on body	-

LCD display unit

Display mode	Details
PV	Process variable shows on main screen, percentage and progress bar shows on secondary screen
mA	Current shows on main screen, percentage and progress bar shows on secondary screen
%	Percentage shows on main screen, percentage and progress bar shows on secondary screen

Unit

Unit	Definition
kPa	Kilopascal
MPa	Megapascals
bar	Bar
psi	Pounds per square inch
mmHg	Millimetre(s) of mercury@0℃
mmH2O	Millimeter of water@4℃
mH2O	Meter of water@4℃
inH2O	Inches of water@4℃
ftH2O	Feet of water@4℃
inHg	Inches of mercury@0℃
mHg	Meter mercury column@0℃
TORR	Torr
mbar	Millibar
g/cm2	Gram per square centimeter
kg/cm2	Kilogram per square centimeter
Pa	PA
ATM	Standard atmospheric pressure
mm	Millimeter(Note1)
m	Meter(Note1)
Note1: length unit need mark medium density	

Measuring menu set

Mark	State
URV	Upper range value, 20mA
LRV	Lower range value, 4mA

Damping time

Units	Setting range
S	0-100

Analog output type

Parameters	Output type
mA LINER	Linearity
mA $\sqrt{\ }$	Square root

Alarm signal

Parameters	Alarm signal
ALARM NO	None
ALARM H	20.8mA
ALARM L	3.8mA

Fix output

Parameters	Fix output value
FIX/C NO	None
3.8000	3.8000mA
4.0000	4.0000mA
8.0000	8.0000mA
12.000	12.000mA
16.000	16.000mA
20.000	20.000mA
20.800	20.800mA

Quick menu

Parameter	Instruction
PV=0	Set current output to zero value, used to correct the error cased by static pressure and installation.
Zero adjustment	4mA re-range with pressure
Span adjustment	20mA re-range with pressure
Restore factory setting	Restore backup data when error

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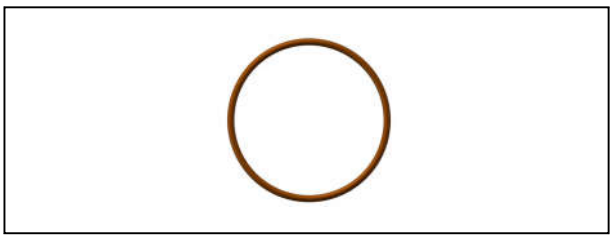
Sensor select instruction

Code	Nominal value	Description
1	6kPa	Range -6-6kPa, smallest calibratable span 200Pa
2	40kPa	Range -40-40kPa, smallest calibratable span 400Pa
3	250kPa	Range -250-250kPa, smallest calibratable span 2.5kPa
4	1MPa	Range -0.1-1MPa, smallest calibratable span 10kPa

Code	Position	Instruction
S	Diaphragm material	SS 316L
H		Hastelloy C
S	Fluid filling	Sillicon oil, temperature limit: -45-205℃
D		Inert oil, temperature limit: -45-160℃
S	Sensor seal	O-ring, FKM, temperature limit:-20-200℃

Diaphragm(S/H)

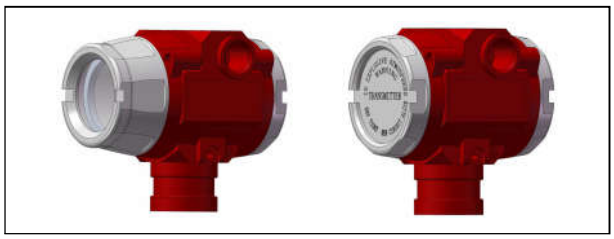
Seal(S)



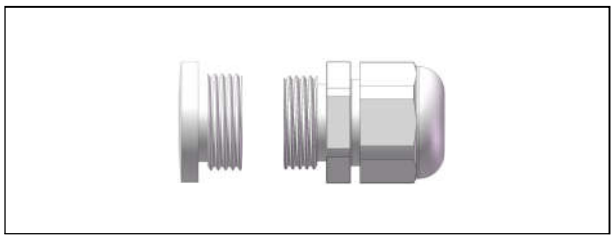
Electrical connection select instruction

Code	Item	Description
T1	Electrical connection	Aluminum-alloy terminal,2 cable entry M20*1.5(F), red body, white cover
R1	Cable entry protector	Waterproof connector M20X1.5 one side , blind plug another side, PVC material,6-8mm diameter cable only, IP67
R2		Flame proof, 1/2 NPT(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67
R3		Flame proof, M20X1.5(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP67

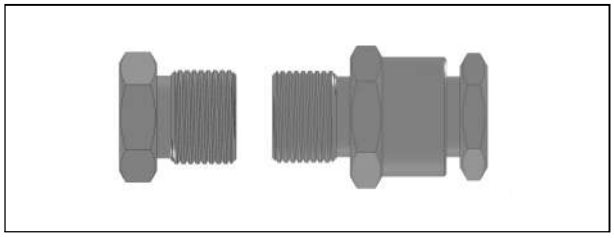
Housing (T1)



Standard cable entry protective adaptor(R1)



Flame proof cable entry protective adaptor(R2/R3)



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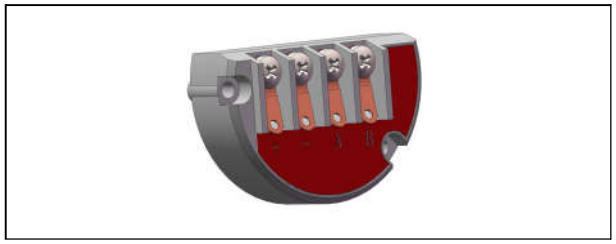
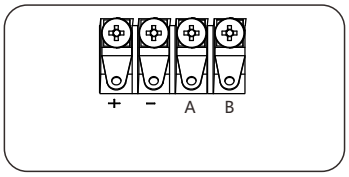
Transmission module

Code	Items	Description
1	Output signal	4-20mA two wire, power supply: 10.5-55VDC
2		4-20mA+HART two wire, power supply:16.5-55VDC
3	Display	Without display
4		With LCD display

Terminals (N1)



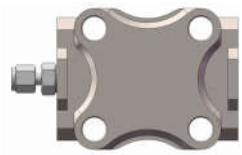


CODE	2-wire	3-wire	4-wire	Modbus-RTU/RS485
+	24V+	24V+	24V+	24V+
-	signal+	24V-	24V-	24V-
A		signal+	signal+	A+
B			signal-	B-

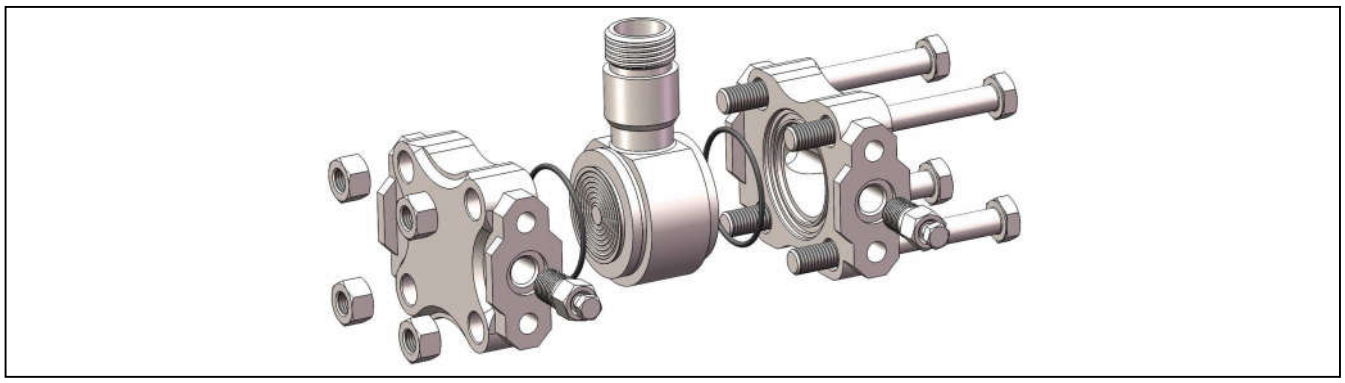
Process connection selection

Code	Item	Description
H1	Flange/ Drain Valve	H structure, double flanges, process connection 1/4-18NPT(F) ,drain valve on the rear end of flange, material SS 316
H2		H structure, double flanges, process connection 1/4-18NPT(F), drain valve on the up part of flange, material SS 316
H3		H structure, double flanges, process connection 1/4-18NPT(F),drain valve on the down part of flange, material SS 316

Flange

H1	
H2	
H3	

Wetted parts



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Process connection adaptor

Code	Item	Description
1	Process connection adaptor	Adaptor, M20*1.5 (M) with pressure-guided pipe Φ14*2*30,SS304, apply to H-structure
2		Adaptor, 1/2-14NPT(F), SS 304, apply to H-structure

Brackets

Code	Items	Details
1	Fixed mounting	Pipe mounting bent bracket,2" pipe, carbon steel, apply to H-structure
2		Plate mounting bent bracket, carbon steel, apply to H-structure
3		Pipe mounting flat bracket,2" pipe, carbon steel, apply to H-structure

Pipe mounting bent bracket(B1)

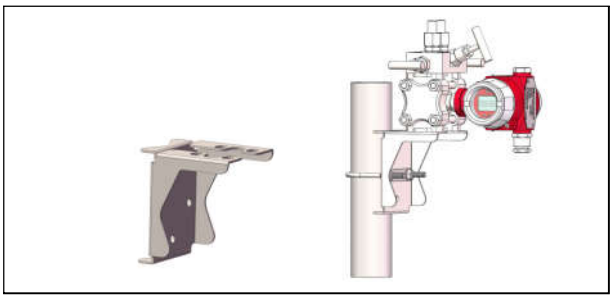
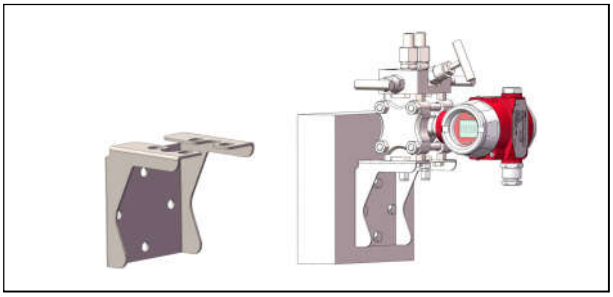
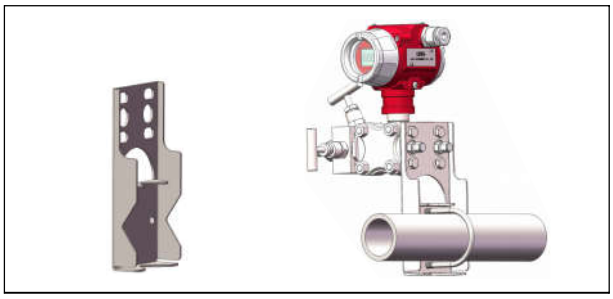


Plate mounting bent bracket(B2)



Pipe mounting flat bracket(B3)



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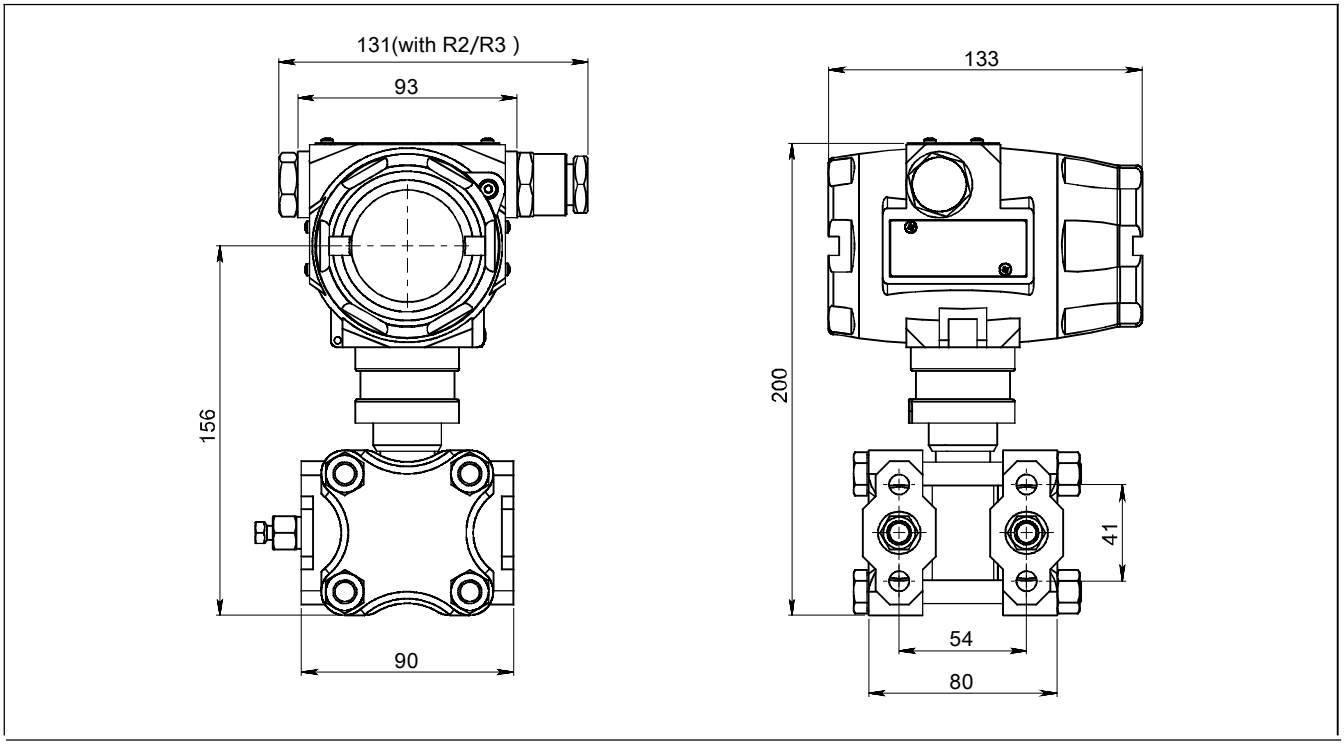
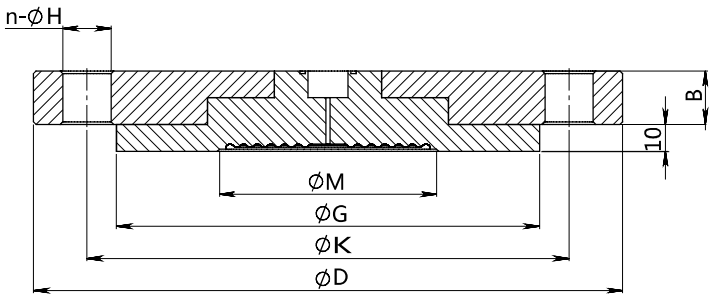
Drawing and dimension with display(C)(unit:mm)





standard	Specifications	（ΦD）	（B）	（ΦK）
HG/T20592-2009	DN50PN10	165	19	125
HG/T20592-2009	DN80PN10	200	20	160
HG/T20592-2009	DN100PN10	220	22	180
（ΦG）	（ΦH）	（n）	（ΦM）	
102	18	4	56	
138	18	8	71	
158	18	8	71	

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Factory settings and parameters

Item	Menu mark	Factory setting value
Tag position	None	0(No specific settings)
Analog output type	mA	Liner(No specific settings)
Display mode	DISP	PV(No specific settings)
Alarm signal	ALARM	No(No specific settings)

Item	Menu mark	Factory setting value
Damping value	DAMP	0(No specific settings)
4mA Lower range value	LRV	According to the order
20mA Upper range value	URV	According to the order
Process unit	U	According to the order

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

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