
SJ


4ManPro
Elements For
Manufacturing Processes

Product introduction

Description

Monosilicon pressure transmitter

MSMSDMP305X-DST differential pressure transmitter with monosilicon sensor is typically used in process or environmental applications for continuous measurement of pressure differences in liquids, vapors and gases.
With reliable ex-proof construction and electronics, suitable in EX areas.

Main parameters

Pressure types	Differential pressure
Measuring range	6kPa-10MPa, Please refer to the ordering information chapter
Output signal	4-20mA,4-20mA+HART, Modbus-RTU/RS485 customer
Reference accuracy	±0.075%URL, optional ±0.05%URL

Approvals

RoHS

Measuring medium

Liquid, gas, or steam flow as well as liquid level, density and pressure

For any changes to the specifications of this catalogue，the latest version shall prevail.

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
3MPa	30kPa	-500kPa	3MPa	40MPa	25MPa	16MPa
10MPa	100kPa	-500kPa	10MPa	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						

Performance specifications

Test standard: GB/T284 74 / IEC60770; reference conditions: measure from zero, silicone oil filling,316L stainless steel isolation diaphragm, 4-20mA anloge output,

Ambient temperature effects

6kPa	± (0.05TD+0.1) %/10℃ of span
40kPa, 250kPa, 1MPa, 3MPa, 10MPa	± (0.0375TD+0.075) %/10℃ of span

Performance specifications

The overall performance including but not limited to 【Reference accuracy】,【Environment temperature effects】,【Static pressure effects】and other comprehensive error
Stability:±0.2% URL/5 years
Note: SPAN= |URV-LRV|

Static pressure effects

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

Reference accuracy

1.Standard and reference conditions, include linear (BFSL), linearity,h ysteresis and repeatability. Calibration temperature: 20°C±5°C, Calibrated based on zero.

2. The total performance of the product includes reference accuracy and ambient temperature effects, calculated according to the formula.Total amount of influence=$\pm\sqrt{[(E1)^2+(E2)^2+(E3)^2]}$
E1=Reference accuracy E2=Ambient temperature effects E3=Static pressure effects

Reference accuracy	TD ≤5	0.075%	6kPa,10MPa
		0.05%	40kPa,250kPa,1MPa,3MPa
	TD>5	±(0.001+0.0148TD)%	6kPa,10MPa
		±(0.0025+0.0095TD)%	40kPa,250kPa,1MPa,3MPa
Square root output accuracy is 1.5 times linear output accuracy			
Note 1: TD is Turn down, TD=URL/SPAN, URL: Range starting from 0, same as factory calibration range; SPAN:|URV-LRV|			

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Technical specifications

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

Output	Type	Wires
4-20mA	Linear	Tow wire
4-20mA+HART	Linear	Tow wire
1-5VDC	Linear	Three wire
Modbus-RTU/RS485	Linear	Four wire
Modbus-RTU/RS485+4-20A	Linear	Four wire

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
Response time: ≤150ms

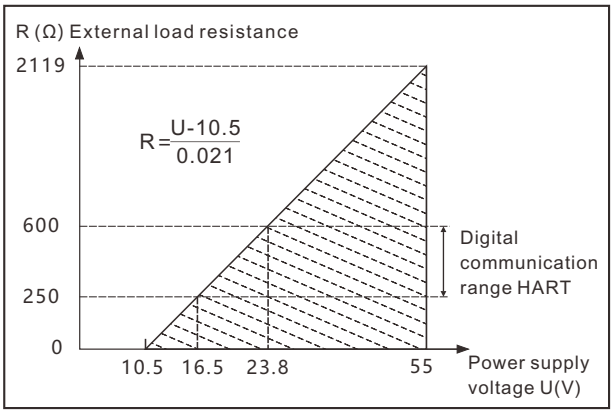
Weight

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

Power supply

Item	Operating conditions
Standard/flame proof	10.5-55VDC
HART protocol	16.5-55VDC,communication load resistance 250Ω
Modbus-RTU/RS485	5-32VDC
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



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Technical specifications

Environment condition

Items	Operational condition	
Working temperature	-20-85℃, integrated LCD display :-20-70℃	
Storage temperature	-40-85℃, integrated LCD display :-20-70℃	
Media temperature	Silicone oil filling:-45-205℃	
	Inert oil filling:-45-160℃	
	Hygienic fluid filling:-10-180℃	
Working humidity	5-100%RH@40℃	
Protection class	IP66/IP67	
Dangerous condition	NEPSI	ExialICT4(GYB21.1692X)* ExdIICT6(GYB21.4030X)*
	ATEX	Ex db IIC T6 Gb, Ex tb IIIC T80℃ Db(CML 19ATEX1078X)* Ex ia IIC T4 Ga(CML 19ATEX1078)*
	IECEx	Ex db IIC T6 Gb, Ex tb IIIC T80℃ Db(IECEx NEP 18.0008X)* Ex ia IIC T4 Ga(IECEx NEP 18.0008X)*
	CSA	Class I, Division 1, Group A, B, C and D T6 Class II, Division 1 Group E, F and G T80ºC Class III (No.: 80020805)*
*Please consult engineers for details		

EMC environment

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 performance, it can restore itself. The actual operating conditions, storage and data will not be changed.

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Menu function

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
NO	Saturated output to 20.8mA
H	20.8mA
L	3.8mA

Fix output

Parameters	Fix output value
FIX/C NO	None
3.8000	3.8mA
4.0000	4mA
8.0000	8mA
12.000	12mA
16.000	16mA
20.000	20mA
20.800	20mA

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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Product selection instruction

Sensor select instruction

Code	Nominal value	Description
S602D	6kPa	Range -6-6kPa, smallest calibratable span 200Pa
S403D	40kPa	Range -40-40kPa, smallest calibratable span 400Pa
S254D	250kPa	Range -250-250kPa, smallest calibratable span 2.5kPa
S105D	1MPa	Range -0.1-1MPa, smallest calibratable span 1MPa
S305D	3MPa	Range -0.5-3MPa, smallest calibratable span 3MPa
S106D	10MPa	Range -0.5-10MPa, smallest calibratable span 1MPa

Code	Position	Instruction
S	Diaphragm material	SUS316L
H		Hastelloy C
J		SUS316+Gold plating(range >250kPa)
T		Tantalum(range > 250kPa)
S	Fluid filling	Silicon oil, oil temperature resistance: -45-205℃
D		Inert oil, oil temperature resistance: -45-160℃
F		Hygienic fluid filling, Neobee M-20, temperature resistance: -10-180℃
S	Sensor seal	O-ring. PTFE, temperature resisitance: -20-85℃

Diaphragm (S/H)

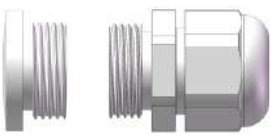
Seal(S)

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)



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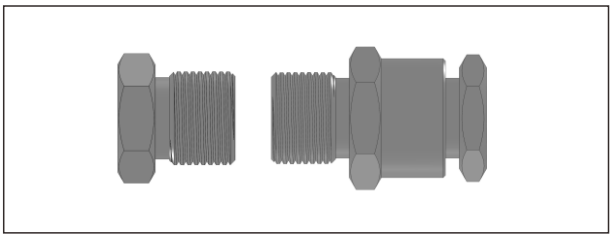
Product selection instruction

Flame proof cable entry protective adaptor (R2/R3)

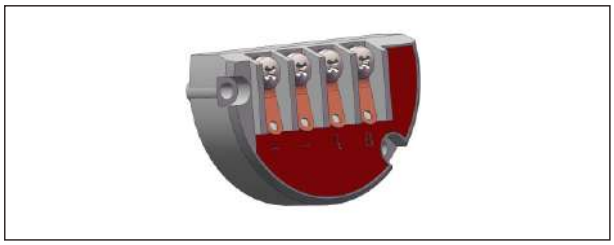


Display module ©

Transmission module

Code	Items	Description
F	Output signal	4-20mA two wire, power supply: 10.5-55VDC
H		4-20mA+HART two wire, power supply:16.5-55VDC
1		1-5VDC three wire, power supply:10.5-55VDC
R		Modbus-RTU/RS485, power supply: 5-32VDC
C		Modbus-RTU/RS485+4-20mA
A	Display	Without display
C		With LCD display

Terminals (N1)



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Product selection instruction

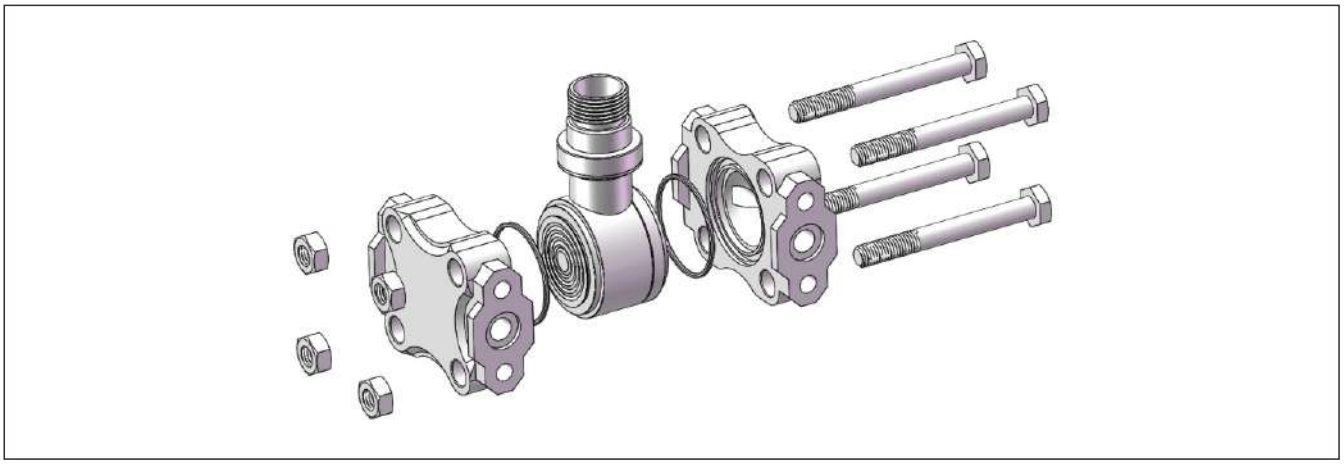
Process connection selection

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
H4		H structure, double flanges, process connection 1/4-18NPT(F) , drain valve on the rear end of flange, material SS 304, thread size M10*1.5
H7		H structure, double flanges, process connection 1/4-18NPT(F) , drain valve on the rear end of flange, material SS 316, thread size 7/16-20UNF

Flange

H1/H4/ H7	
H2	
H3	

Wetted parts



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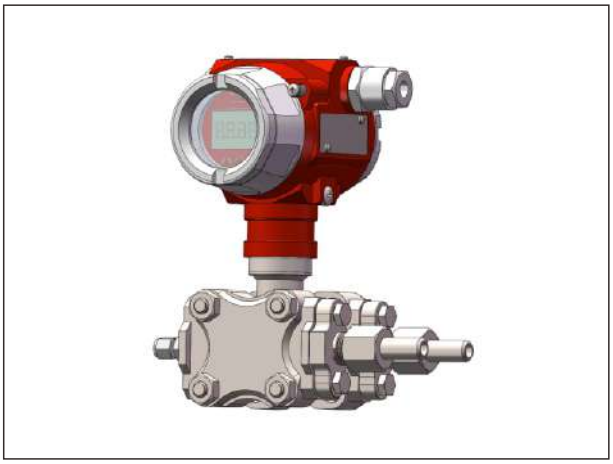
Product selection instruction

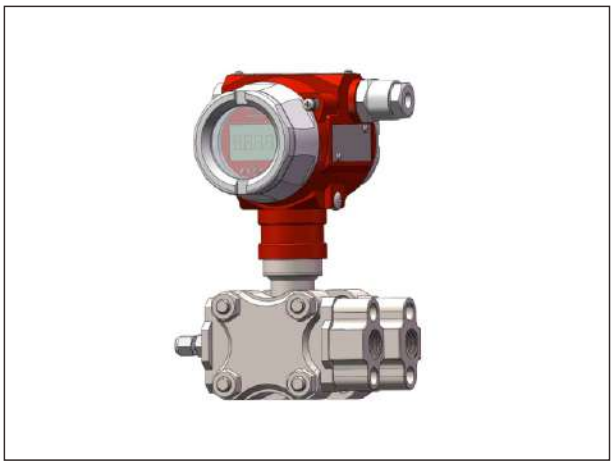
Process connection adaptor

Code	Item	Description
A1	Process connection adaptor	Adaptor, M20*1.5 (M) with pressure-guided pipe Φ14*2*30,SS304, apply to H-structure
A2		Adaptor, 1/2-14NPT(F), SS 304, apply to H-structure

Adaptor, M20*1.5 (M) with pressure-guided pipe (A1)



Adaptor, 1/2-14NPT (F) (A2)



Brackets

Code	Items	Details
B1	Fixed mounting	Pipe mounting bent bracket,2" pipe, carbon steel, apply to H-structure
B2		Plate mounting bent bracket, carbon steel, apply to H-structure
B3		Pipe mounting flat bracket,2" pipe, carbon steel, apply to H-structure

Pipe mounting bent bracket (B1)

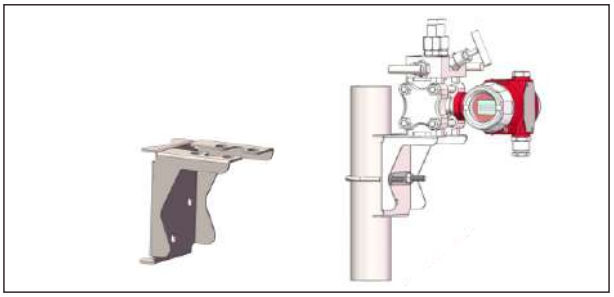
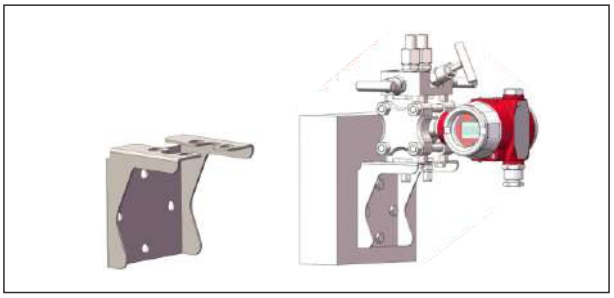
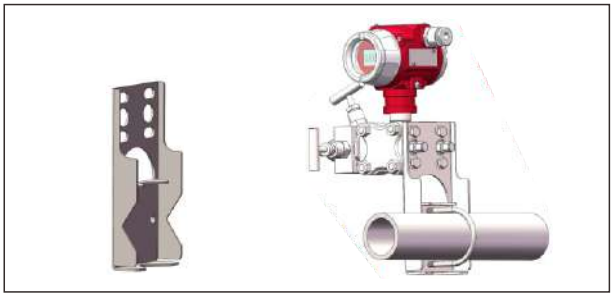


Plate mounting bent bracket (B2)



Pipe mounting flat bracket (B3)



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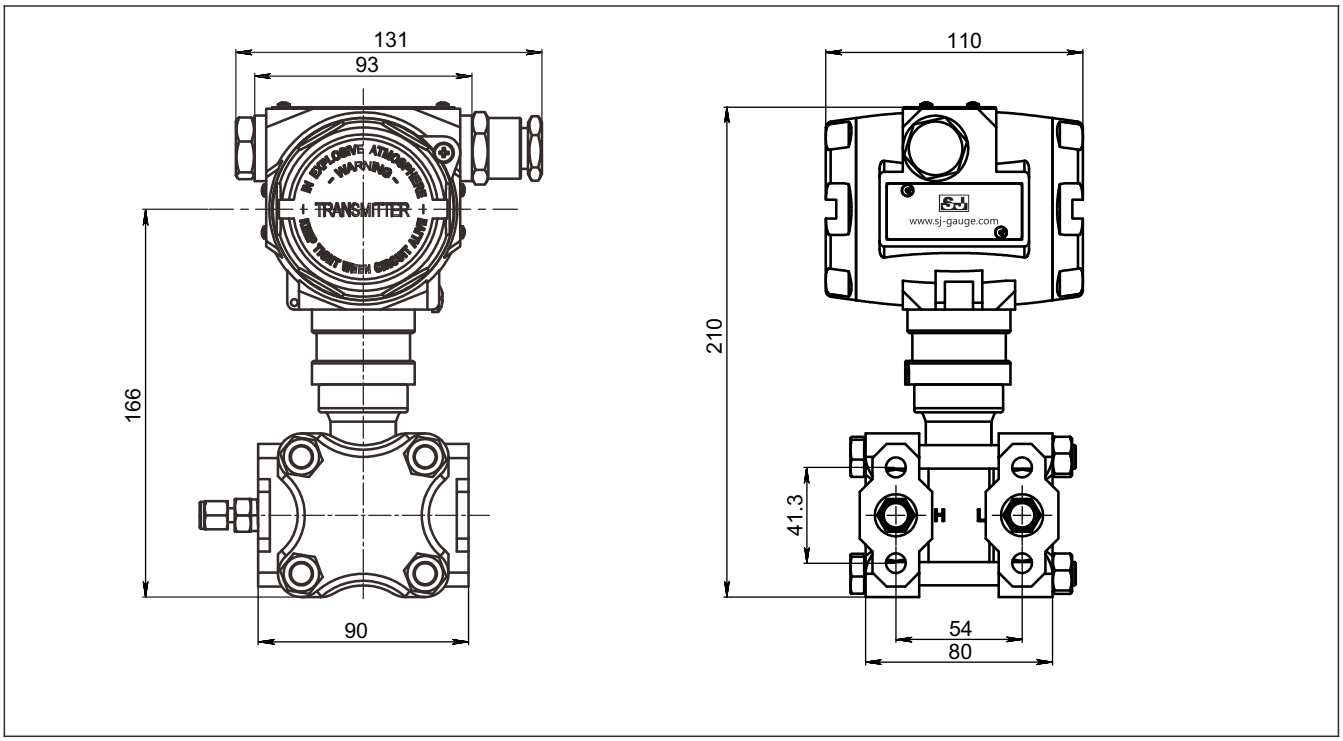
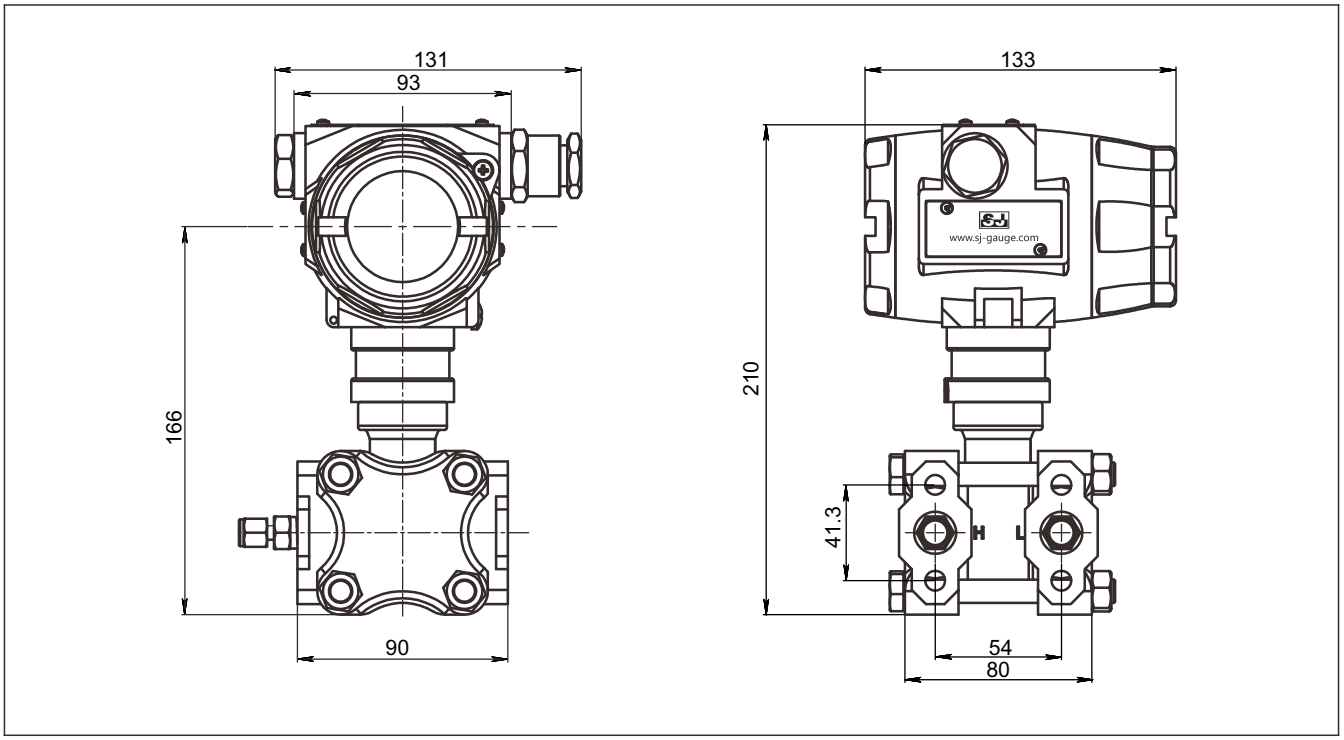
Product drawing and dimension

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



Drawing and dimension without display (A) (unit: mm)



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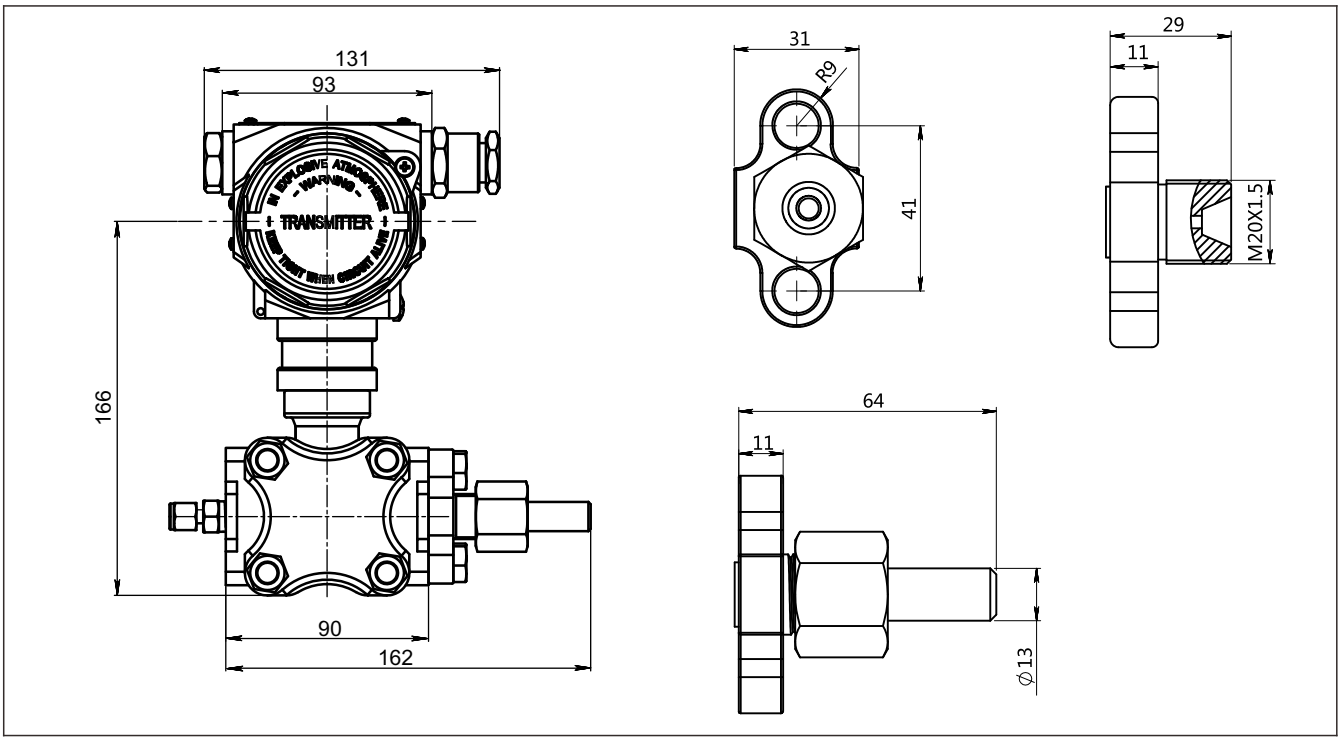
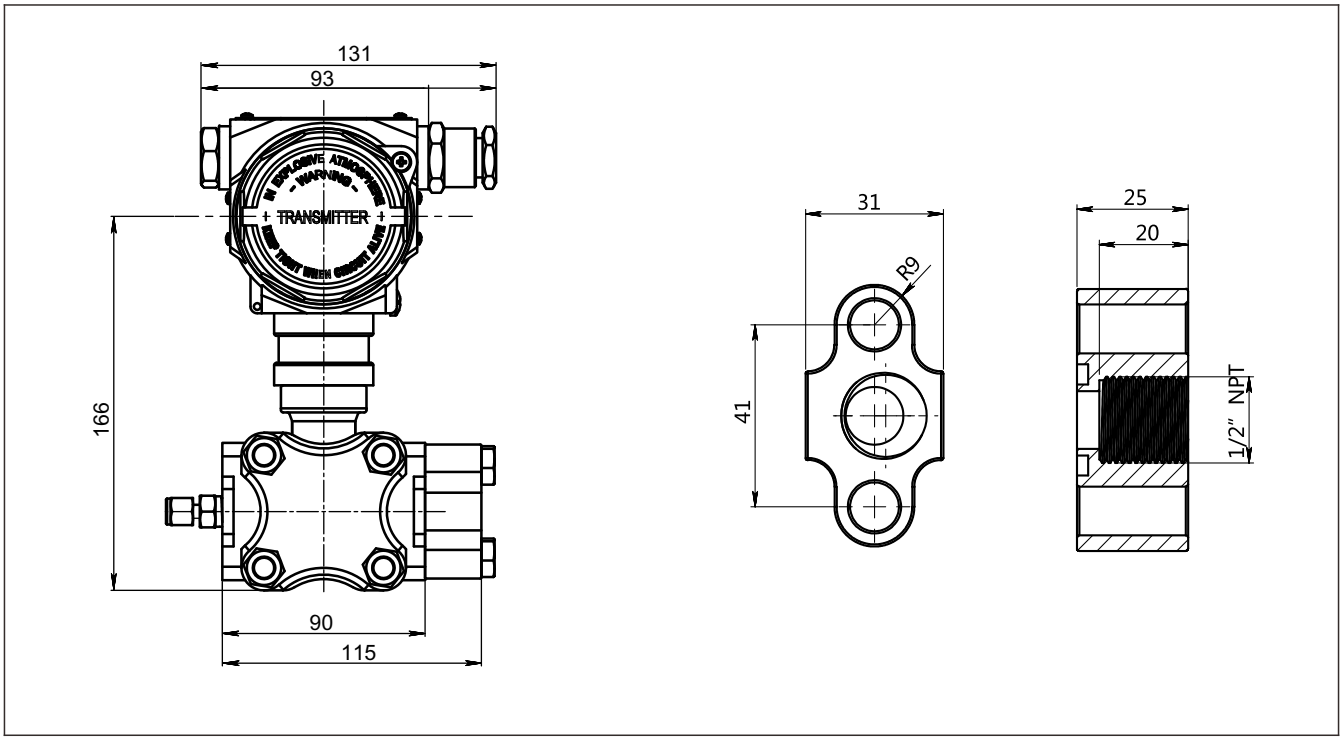
Product drawing and dimension

Adaptor (A1) drawing and dimension (unit: mm)



Adaptor (A2) drawing and dimension (unit: mm)



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Installation drawing and dimension

Pipe mounting bent bracket (B1) drawing and dimension (unit: mm)

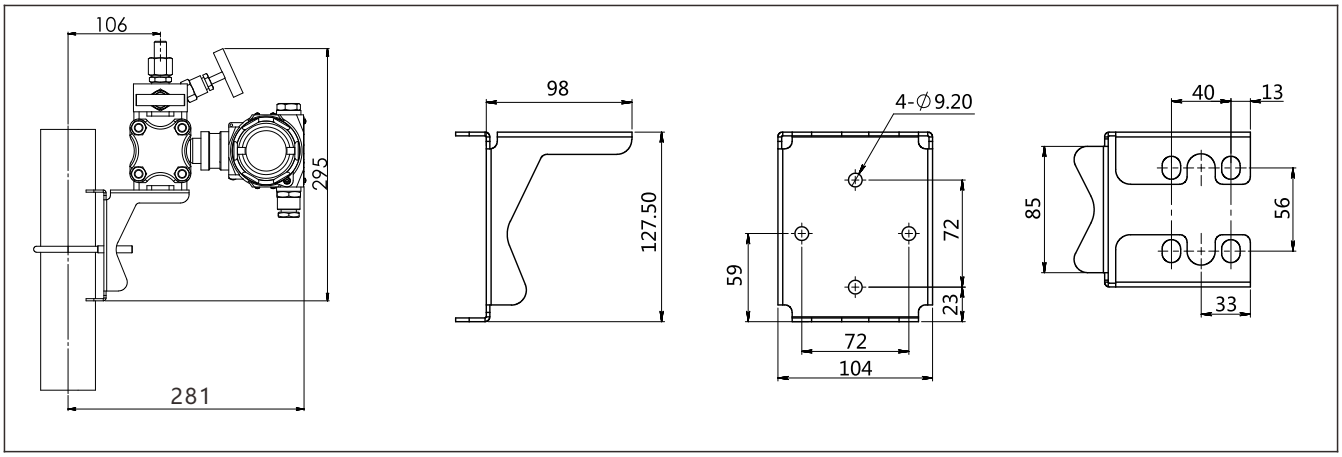
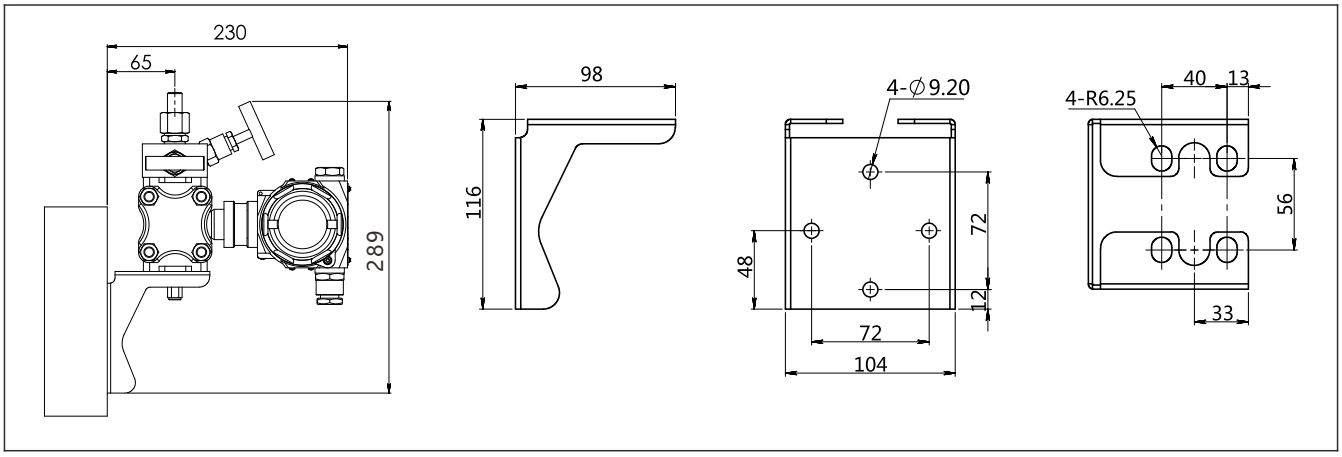
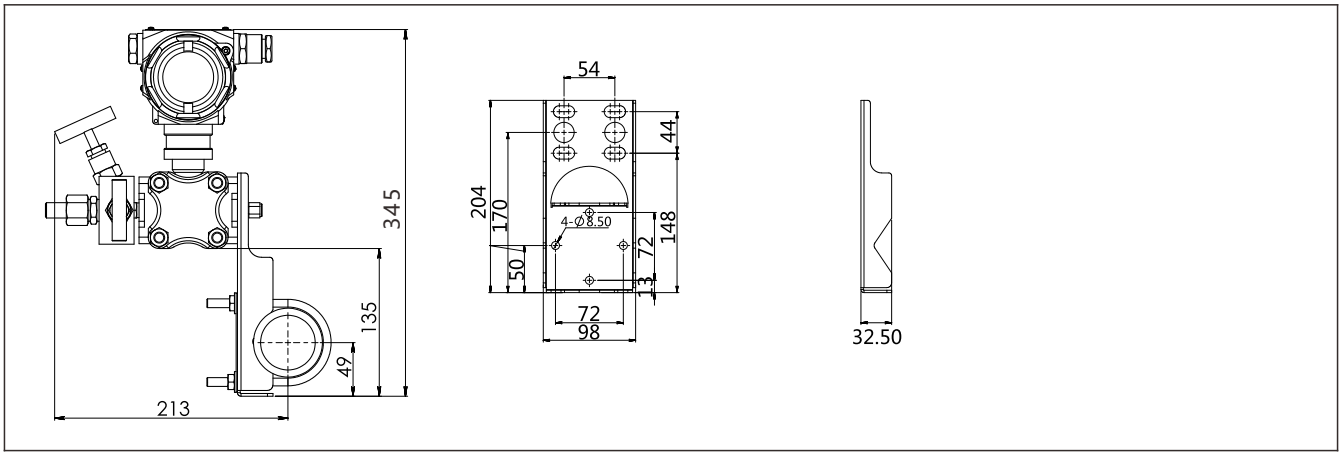


Plate mounting bent bracket (B2) drawing and dimension (unit: mm)



Pipe mounting flat bracket (B3) drawing and dimension (unit: mm)



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Ordering information chapter

Item	Parameters	Code	Instruction	(*)fast delivery available
	Model	MSDMP305X-DST	Monosilicon differential pressure transmitter	
Sensor	Separator	-	Detailed specifications as following	
	Pressure range code	S602D	Nominal value(URL): 6kPa	*
		S403D	Nominal value(URL): 40kPa	*
		S254D	Nominal value(URL): 250kPa	*
		S105D	Nominal value(URL): 1MPa	
		S305D	Nominal value(URL): 3MPa	
		S106D	Nominal value(URL): 10MPa	
	Diaphragm material	S	SS316L	*
		H	Hastelloy C	
		J	SUS316+Gold plating(range >250kPa)	
		T	Tantalum(range >250kPa)	
	Isolated filling fluid	S	Silicone oil, oil temperature resistance: -45-205℃	*
		D	Inert oil, oil temperature resistance: -45-160℃	
		F	Hygienic fluid filling, Neobee M-20, temperature resistance: -10-180℃	
	Sensor seal	S	O-ring, PTFE, temperature resistance:-100-280℃	
Electrical connection	Separator	-	Detailed specifications as following	
	Electrical connection	T1	Aluminum-alloy terminal,2 cable entry M20*1.5(F), red body, white cover	*
	Cable entry protector	R1	Waterproof connector M20X1.5 one side , blind plug another side, PVC material,6-8mm diameter cable only, IP66/IP67	*
		R2	Flame proof, 1/2 NPT(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP66/IP67	
		R3	Flame proof, M20X1.5(F) one side, blind plug another side, stainless steel material, 6-8mm diameter cable only, IP66/IP67	*
Output	Separator	-	Detailed specifications as following	
	Output signal	H	4-20mA+HART two wire, power supply:16.5-55VDC	*
		F	4-20mA two wire, power supply: 10.5-55VDC	
		R	Modbus-RTU/RS485, power supply: 5-32VDC	
	Display	C	LCD display	*
		A	Without LCD display	
Process connection	Separator	-	Detailed specifications as following	
	Process connection	H1	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	

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Selection

		H3	H structure, double flanges, process connection 1/4-18NPT(F),drain valve on the down part of flange, material SS 316	*
		H4	H structure, double flanges, process connection 1/4-18NPT(F) ,drain valve on the rear end of flange, material SS 304, thread size M10*1.5	
		H7	H structure, double flanges, process connection 1/4-18NPT(F) ,drain valve on the rear end of flange, material SS 316, thread size 7/16-20UNF	
Additional options	Separator	-	Detailed specifications as following	( )fast delivery available
	Process connection accessory	/A1	Adaptor, M20*1.5 (M) with pressure-guided pipe Φ 14*2*30,SS304, apply to H-structure	*
		/A2	Adaptor, 1/2-14NPT(F), SS 304, apply to H-structure	
	Fix mounting accessory	/B1	Pipe mounting bent bracket, 2" pipe, carbon steel, apply to H-structure	
		/B2	Plate mounting bent bracket, carbon steel, apply to H-structure	
		/B3	Pipe mounting flat bracket, 2" pipe, carbon steel, apply to H-structure	*
	Calibration report	/Q1	Calibration report provide by our company	
		/Q2	Calibration report provide by chinese authorised third party	
		/Q3	Static pressure report (Differential pressure only)	
	Approvals	/E1	Flame proof certificate NEPSI, ExdbIICT6 IECEx or ATEX,Ex db IIC T6 Gb Ex tb IIIC T80℃ CDb	1
		/I1	Intrinsic safety certificate IECEx or ATEX,ExiaIICT4Ga NEPSI, ExiaIICT4	2
		/E2	Flame proof certificate, CSA Class I, Division 1, Group A, B, C and D T6 Class II, Division 1 Group E, F and G T80ºC Class III	
		/F3	CE certificate	
	Wetted parts treatment	/G1	Ungrease treatment	
		/G2	Electropolishing treatment	

Note:
1. Please indicate ATEX or IECEx or NEPSI when ordering
2. Please indicate ATEX or IECEx or NEPSI when ordering

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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

Factory certificate

Certification organization	Intertek
Quality management system	ISO9001-2015
Scope of certification	Design and production of pressure transmitter
Registration number	110804039

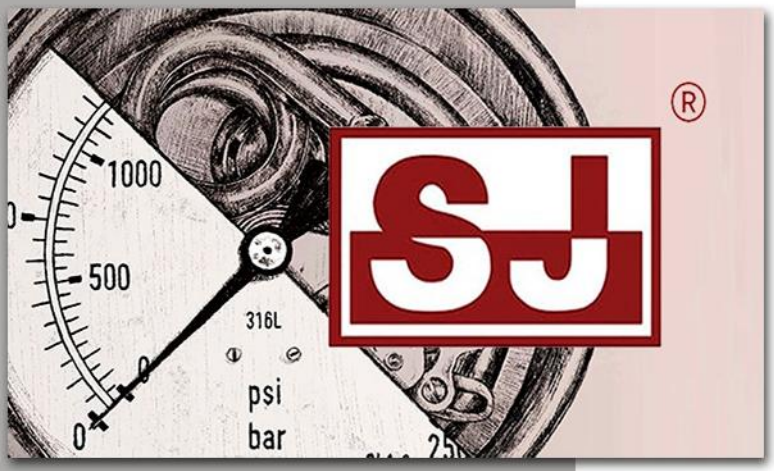
CE

Certificate organization	ISET
License scope	MSDMP305X series pressure/ differential pressure transmitter
Mark	EU
EMC instruction	2014/30/EU
Standard	AC/0100708
Registration number	IT41353LG161207

Flame proof certificate

Certificate organizzation	NEPSI	ATEX	IECEx	CSA
License scope	MSDMP305X pressure/differential pressure transmitter			
Explosion-proof mark	ExdIICT6	Ex db IIC T6 Gb, Ex tb IIIC T80℃ Db		Class I, Division 1, Group A, B, C and D T6 Class II, Division 1 Group E, F and G T80℃ Class III
Working temperature	-20℃ to +55℃	-20℃ to +60℃		-40-60℃
Maximum medium temperature	+80℃			
Registration number	GYB21.4030X	CML 19ATEX1078X	IECEx NEP 18.0008X	80020805

For any changes to the specifications of this catalogue，the latest version shall prevail.



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