

3051S Monocrystalline Silicon Differential Pressure Transmitter

◆ Product Selection Guide

3051S DP-Differential Pressure Transmitter

3051S DP Differential Pressure Transmitter

Product Introduction

3051S DP is suitable to measure liquid, gas, or steam flow as well as liquid level, density and pressure. 3051S outputs a 4~20 mA DC signal corresponding to the measured differential pressure. Its highly accurate and stable sensor can also measure the static pressure which can be shown on integral indicator or remotely monitored via HART communications. Key features include quick response, remote set-up using communications, self-diagnostics and optional status output for pressure high/low alarm.

Standard Specification

Adjust the range based on the standard zero point, 316L stainless steel diaphragm, the filling solution is silicone oil.



Technical Parameter

Code	Span	Range
B	0.2kPa~6kPa	-6kPa~6kPa
C	0.4kPa~40kPa	-40kPa~40kPa
D	2.5kPa~250kPa	-250kPa~250kPa
F	30kPa~3MPa	-500kPa~3MPa

Reference Accuracy of Calibrated Span

(includes terminal-based linearity, hysteresis, and repeatability)

FD3051S DP-B	± 0.075%
FD3051S DP-C	± 0.1%
If TD>10(TD=URL/SPAN):	
FD3051S DP-B	± (0.0075 × TD)%
FD3051S DP-C	± (0.01 × TD)%

The square root accuracy is 1.5 times of reference accuracy of calibrated span

Ambient Temperature Effects

-25°C~65°C

± (0.15 × TD+0.05)% × Span

Every 10°C is ± 0.08% × Span(TD=1)

-40°C~-25°C & 65°C~85°C

± (0.20 × TD+0.05)% × Span

Over Range Effects

± 0.075% × Span

Static Pressure Effects

± (0.05%URL+0.075% × Span)/10MPa

Over Pressure Effects

± 0.1% × Span/10MPa

Stability

± 0.1% × Span/3 years

Power Supply Effects

± 0.001% /10V (12~36V DC)

Technical Parameter

Zero Adjustment Limits

Zero can be fully elevated or suppressed, within the lower and upper range limits of the capsule.

External Zero Adjustment

External zero is continuously adjustable with 0.01% incremental resolution of span.

Re-range can be done locally using the range setting switch.

Mounting Position Effects

Rotation in diaphragm plane has no effect.

Tilting up to 90° will cause zero shift up to 0.4 kPa

(40 mmH₂O) which can be corrected by the zero adjustment.

Output

Two wire 4~20 mA DC output with digital communications, linear or square root programmable.

HART FSK protocol are superimposed on the 4~20 mA DC signal.

Output range: 3.9 mA to 20.5 mA.

Failure Alarm (the mode can be selected)

Low Mode (min): 3.7 mA

High Mode (max): 21 mA

No Mode (hold): Keep the effective value before the fault.

Note: The standard setting of failure alarm is High Mode.

Response Time

The amplifier damping constant is 0.1 sec;

The sensor damping constant is 0.1~1.6 sec, it depends on the range and range compression ratio.

Amplifier damping time constant is adjustable

from 0.1 to 60 sec by software and added to response time.

UpTime

< 15s

Ambient Temperature Limits

-40°C~85°C

-20°C~65°C (with LCD display or fluorine rubber sealing)

-40°C~70°C (OLED display)

Storage and Transportation Temperature Limits

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Technical Parameter

-50°C~85°C

-25°C~85°C (with LCD display)

Working Pressure Limits (Silicone oil)

Maximum working pressure: 16MPa, 25MPa, 40MPa

Static Pressure Limits

3.5kPa abs. to maximum working pressure.

1.5 times, at the same time on both sides.

One-way Overload Pressure Limit

The maximum one-way overload pressure is maximum working pressure.

Electromagnetic Compatibility (EMC)

Look the EMC Performance Table

Explosion Protected Type

NEPSI / ATXE: Ex d II C T6

NNEPSI / ATXE: Ex ia II C T4

Amb. Temp.: -40°C ~65°C

Supply & Load Requirements

24VDC supply, load 520Ω, as follows

$R \leq (U_s - 12V) / I_{max}$ kΩ, $I_{max} = 23mA$

Power supply 15~36V DC

Load Working : 0~1040Ω

Digital communication: 230~600Ω

Technical Parameter

Material

Sensor Body 316L stainless steel

Isolating 316L stainless steel / Hastelloy

Diaphragm C/Gold plated on 316L/FEP

plated on 316L/Tantalum

Nuts and Bolts stainless steel (A4)

Process Connector 316 stainless steel

Cover Flange 316 stainless steel

Fill fluid Silicone oil/Fluorinated oil

Process Connector Perbunan (NBR) /Viton

Gasket (FKM) /Teflon(PTFE)

Amplifier Housing Aluminum with epoxy resin coat

Housing Gasket Perbunan (NBR)

Name plate tag 304 stainless steel

Electrical Connection

The electrical connection is made via cable entry

M20x1.5. The screw terminals are suitable for wire

cross-sections up to 2.5mm².

Process Connection

Pressure Connection: 1/4~18 NPT female thread on both

sides., For other connections, see the selection form.

Fixed thread bracket: M10 × 1 female thread.

Weight

3.3kg

Degrees of Protection:

IP67

EMC Performance Table

Items	Test items	Basic standards	Test conditions	Performance Level
1	Radiated interference (Housing)	GB/T 9254-2008	30MHz ~ 1000MHz	OK
2	Conducted interference (DC power port)	GB/T 9254-2008	0.15MHz ~ 30MHz	OK
3	Electrostatic Discharge (ESD) Immunity	GB/T 17626.2-2006	4kV(line) 8kV(air)	B
4	RF electromagnetic field immunity	GB/T 17626.3-2006	10V/m (80MHz ~ 1GHz)	A
5	Frequency magnetic field immunity	GB/T 17626.8-2006	30A/m	A
6	Electrical Fast Transient Burst Immunity	GB/T 17626.4-2008	2kV(5/50ns,5kHz)	B
7	Surge Immunity	GB/T 17626.5-2008	1kV (line to line) 2kV (line to ground) (1.2us/50us)	B
8	Conducted interference immunity induced by RF field	GB/T 17626.6-2008	3V (150KHz ~ 80MHz)	A

Note: (1) Performance level A description: The technical specifications within the limits of normal performance.

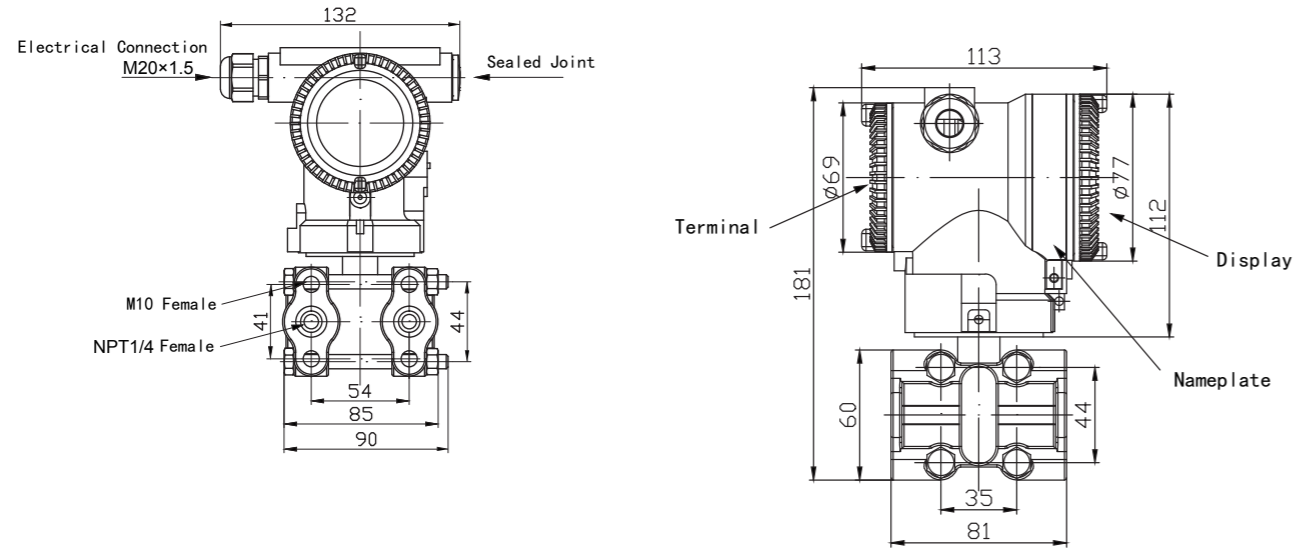
(2) Performance level B description: Temporary reduction or loss of functionality or performance, it can restore itself. The actual operating conditions, storage, and data will not be changed.

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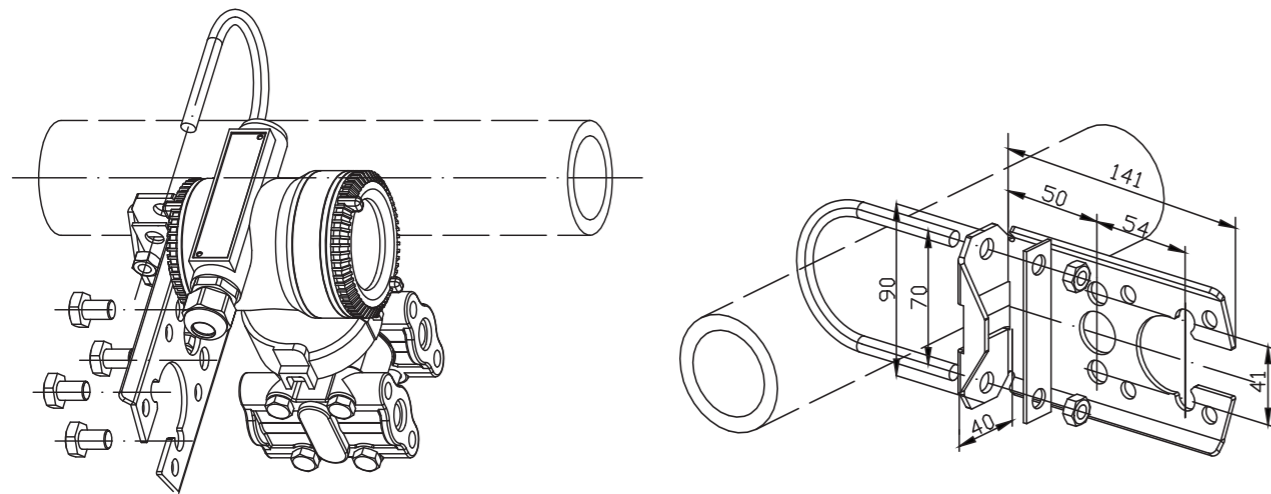
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Product Dimensions



Horizontal Piping Connection

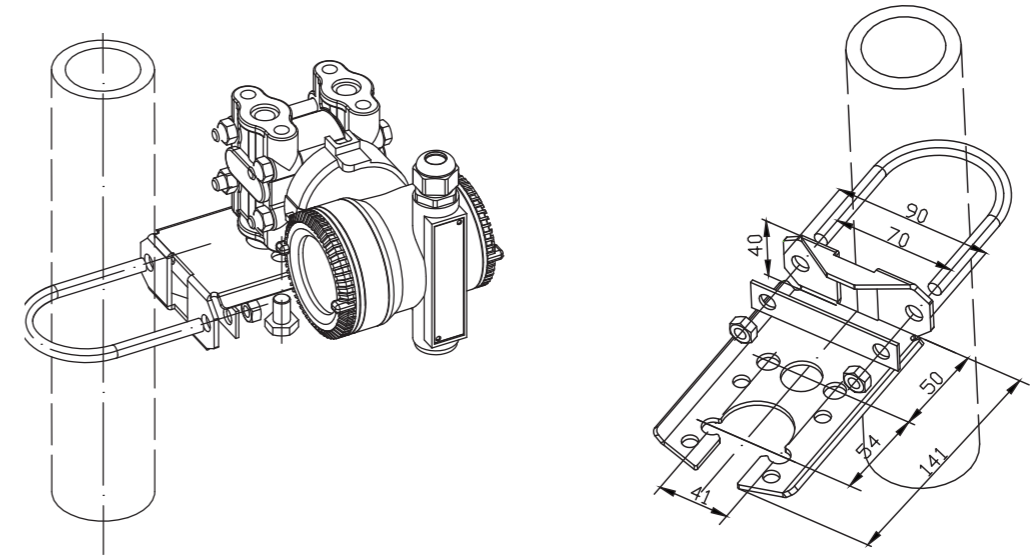


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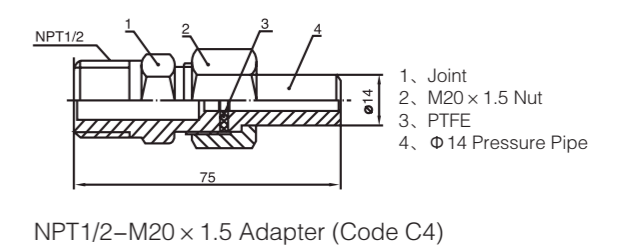
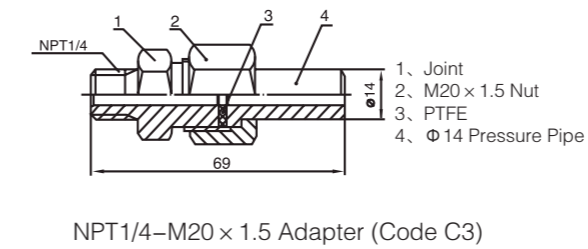
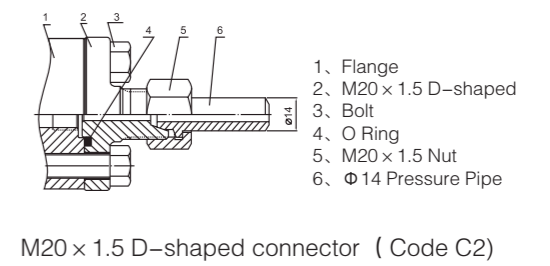
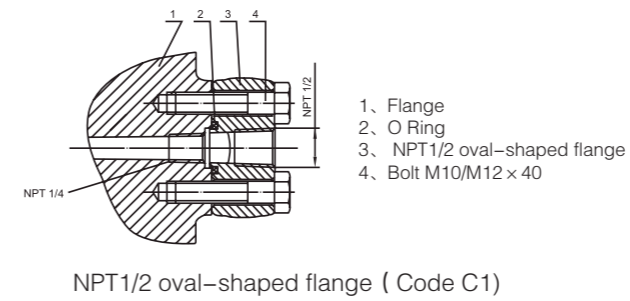
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Vertical Piping Connection



Process Connection Description

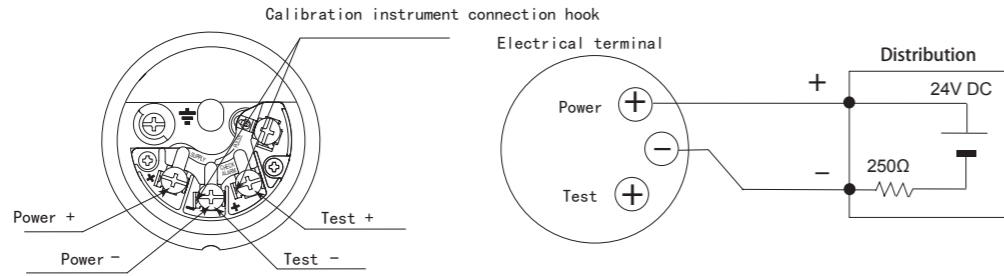


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Electrical Connection



Model and Suffix Codes

Model	Suffix codes	Description
3051S DP		Differential Pressure Transmitter
Accuracy	B	Reference Accuracy ± 0.075%
	C	Reference Accuracy ± 0.1%
Span	B	0-200Pa ~ 6kPa
	C	0-400Pa ~ 40kPa
	D	0-2.5kPa ~ 250kPa
	E	0-20kPa ~ 2MPa
Static pressure sensor	0	None
	1	40MPa
	2	10MPa
Diaphragm fill fluid	A	316L stainless steel Silicone oil
	B	316L stainless steel Fluorinated oil
	C	Hastelloy C Silicone oil
	D	Hastelloy C Fluorinated oil
	E	Gold plated on 316L Silicone oil
	F	Gold plated on 316L Fluorinated oil
	T	Tantalum Silicone oil
Working pressure	1	16MPa
	2	25MPa
	3	40MPa
Relief Valve	N	No Relief Valve
	B	Relief valves at end of flanges
Process connector gasket	N	Perbunan (NBR)
	F	Viton (FKM)
	P	Teflon (PTFE)

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Model and Suffix Codes

Model	Suffix codes	Description
Special function	N	None
	O	Degrease cleansing treatment (Oxygen measurement must be with fluorinated oil filled capsule, Viton (FKM) gasket, <6MPa ,<60°C)
	P	Anti-lightning function
Mounting bracket	N	None
	1	304 stainless steel
	2	Carbon steel galvanized
Process connections	C0	1/4 NPT female thread
	C1	Stainless steel oval-shaped flange with 1/2 NPT female thread
	C2	Stainless steel D-shaped connector with M20x1.5 male thread,with M20X1.5 to φ 14 welding tube
	C3	NPT1/4-M20 × 1.5 adapter,with φ 14 welding tube
	C4	NPT1/2-M20 × 1.5 adapter,with φ 14 welding tube
Electrical connections	M	Standard products ISO M20 × 1.5 female thread
	A	ANSI NPT1/2(F)female thread
Integral indicator	L	LCD Display (-20°C)
	S	Low Temperature LCD Display (-30°C)
	E	OLED Display (-40°C)
Explosion protected type	N	None
	i	Intrinsically safe Approval for NEPSI
	d	Flameproof Approval for NEPSI
Tag name plate	N	None
	1	Position number marked on the nameplate
	2	Hanging stainless steel plate
Manual	C	Chinese
	E	English

Order example: 3051S DP-BC2A1BNN1C1LN1C

[3051S DP]: Differential Pressure Transmitter

[B]: Reference Accuracy ± 0.075%

[C]: Span is 0-400Pa ~ 40kPa

[2]: Static pressure sensor is 10MPa

[A]: 316L stainless steel diaphragm, Silicone oil fill fluid

[1]: 1); Working pressure:16MPa

[B]: Relief valves at end of flanges

[N]: Process connector gasket is (NBR)

[N]: No Special function

[1]: 304 stainless steel Mounting bracket

[C1]: Stainless steel oval-shaped flange with 1/2 NPT female thread

[M]: Electrical connection is M20 × 1.5 female thread

[L]: LCD Display

[N]: Explosion protected type no

[1]: Position number marked on the nameplate

[C]: Chinese manual

Note: Special requirements use X or Y,giving details and instructions.