

Supmea



Data sheet

SUP-2051 High Performance Differential
Pressure Transmitter

The high performance differential pressure transmitter SUP-2051 is suitable to measure liquid, gas, or steam flow as well as liquid level, density and pressure. SUP-2051 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 the integral indicator or remotely monitored via HART communications. Other key features include quick response, remote set-up using communications, self-diagnostics and optional status output for pressure high/low alarm.

FUNCTIONAL SPECIFICATIONS

Span/ Limits	Range	kPa	inH2O	mbar	mmH2O
B	Span	0.2~6	0.8~24	2~60	20~600
	Range limits	-6~0	-24~24	-60~60	-600~600
C	Span	0.4~40	1.6~160	4~400	40~4000
	Range limits	-40~40	-160~160	-400~400	-4000~4000
D	Span	2.5~250	10~1000	25~2500	0.25~25mH2O
	Range limits	-250~250	-1000~1000	-2500~250 0	-25mH2O~25mH2O
F	Span	30~3000	120~12000	0.3~30bar	3-300mH2O
	Range limits	-500~300 0	-2000~12000	-5~30bar	-5~300mH2O

PERFORMANCE SPECIFICATIONS

Reference Accuracy of Calibrated Span:

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

±0.075%, ±0.1%

If $TD > 10$ ($TD = URL/SPAN$), $\pm(0.005 \times TD)\%$

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

Ambient Temperature Effects

-20°C~65°C: $\pm(0.075 \times TD + 0.025)\% \times \text{Span}$

Every 10°C is $\pm 0.04\% \times \text{Span}$ (TD=1)

-40°C~-20°C & 65°C~85°C: $\pm(0.1 \times TD + 0.025)\% \times \text{Span}$

Static Pressure Effects

$\pm(0.025\%URL + 0.05\%Span)/10MPa$

Over pressure Effects

$\pm 0.05\% \times \text{Span} / 10\text{MPa}$

Stability

$\pm 0.1\% \times \text{Span} / 3 \text{ years}$

Power Supply Effects

$\pm 0.001\% / 10\text{V} (12\sim 42\text{V DC})$

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 mADC output with digital communications, linear or square root programmable.

HART FSK protocol are superimposed on the 4~20 mADC 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 to 85°C / -20 to 65°C with LCD display or fluorine rubber sealing

Storage and Transportation Temperature Limits

-50 to 85°C / -40 to 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.

One-way Overload Pressure Limit

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

Electromagnetic Compatibility (EMC)

Look the EMC Performance Table

Amb. Temp.: -40~65°C



INSTALL

Supply & Load Requirements

24VDC supply, $R \leq (U_s - 12V) / I_{max}$ k Ω , $I_{max} = 23$ mA. Maximum voltage limited: 42VDC, Minimum voltage limited: 12VDC, 15VDC (with LCD display) 230 Ω to 600 Ω for digital communication

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

Flange with fixing thread 7/16-20 UNF and 1/4-18 NPT female thread on both sides.

PHYSICAL SPECIFICATIONS

Wetted Parts Materials

Sensor Body: 316L stainless steel

Isolating Diaphragm: 316L stainless steel / Hastelloy C/Gold plated on 316L/FEP plated on 316L/Tantalum

Cover Flange: 316 stainless steel

Nuts and Bolts: 304 stainless steel

Process Connector: 316 stainless steel

Fill fluid: Silicone oil/Fluorinated oil

Process Connector Gasket: Perbunan (NBR) /Miton (FKM) /Teflon(PTFE)

Amplifier Housing: Aluminum with epoxy resin coat

Housing Gasket: Perbunan (NBR)

Name plate and tag: 304 stainless steel

Weight: 3.3kg

Degrees of Protection: IP67

EMC Performance Table

Items	Test items	Test conditions	Performance Level
1	Radiated interference (Housing)	30MHz~1000MHz	OK
2	Conducted interference (DC power port)	0.15MHz~30MHz	OK
3	Electrostatic Discharge (ESD) Immunity	4kV(Line) 8kV(Air)	B
4	RF electromagnetic field immunity	10V/m (80MHz~1GHz)	A
5	Frequency magnetic field immunity	30A/m	A
6	Electrical Fast Transient Burst Immunity	2kV(5/50ns,5kHz)	B
7	Surge Immunity	0.5kV(line to line) 1kV(line to ground) (1.2us/50us)	B
8	Conducted interference immunity induced by RF field	3V (150KHz~80MHz)	A

Note:

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

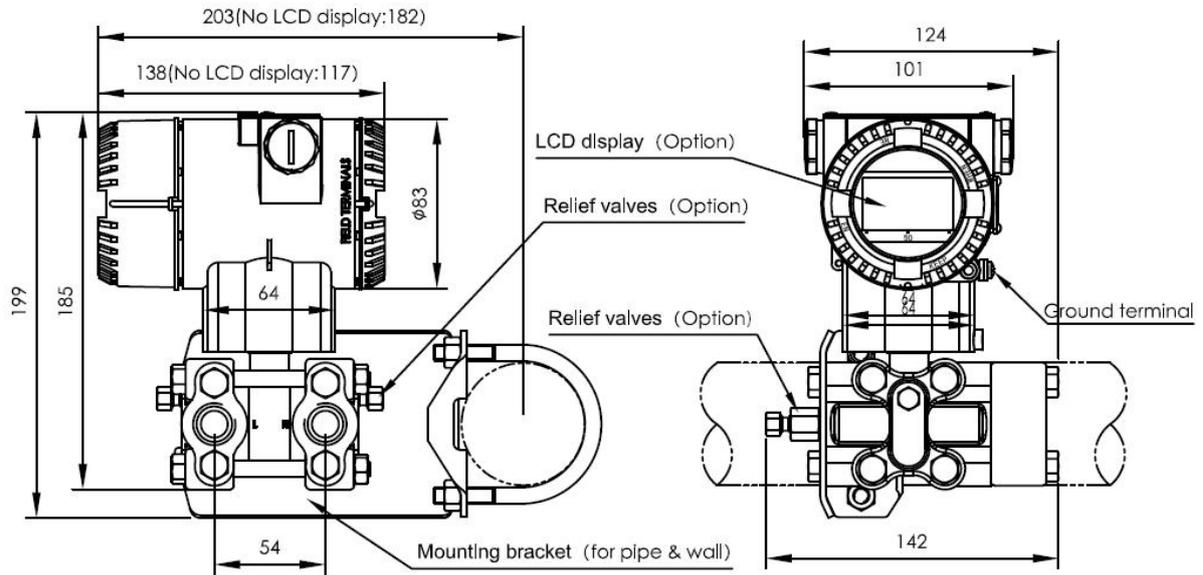
(2) Performance level B description: Temporary reduction or loss of functionality or performance, it can restore itself. The actual operating conditions, storage, and data will not be changed.

DIMENSIONS

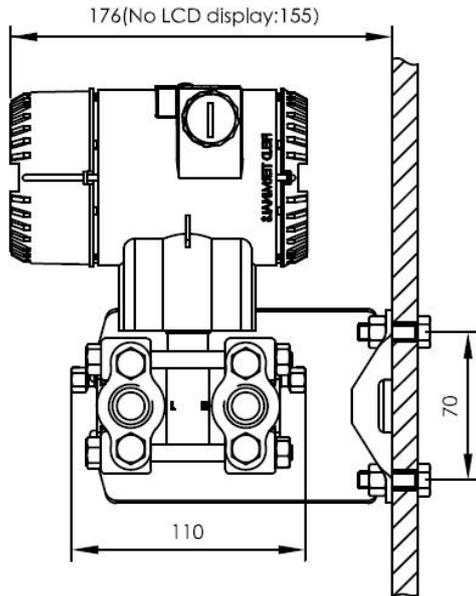
Unit : mm

1 Horizontal Impulse Piping Type (side face)

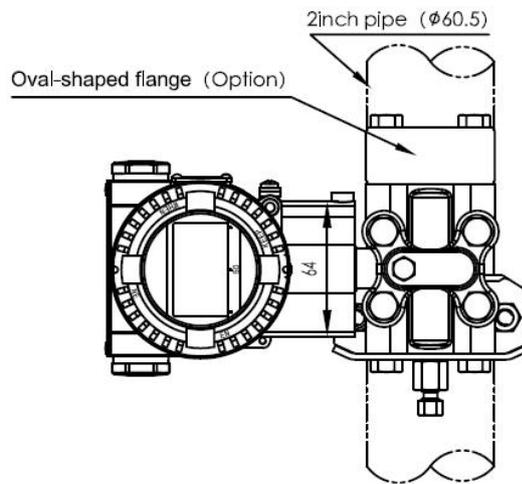
2 Horizontal Impulse Piping Type (front side)



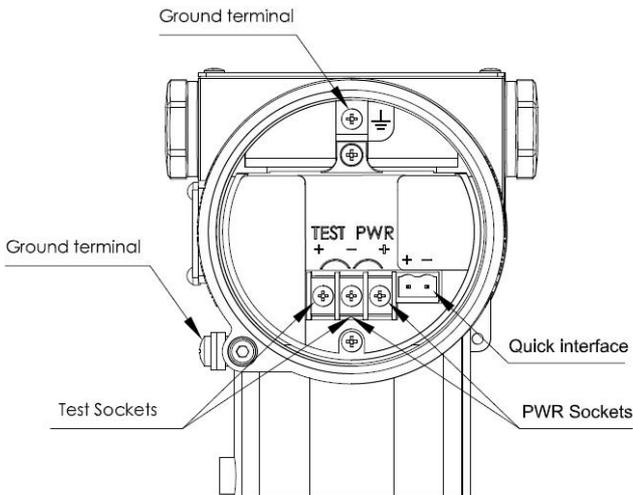
3 Horizontal Impulse Wall mounting Type



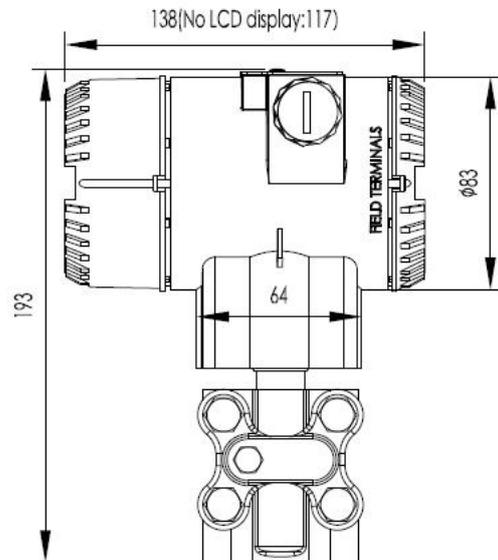
4 Vertical Impulse Piping Type



5 Terminal Configuration (Code V)



6 Vertical mounting flange



Note: Quick interface functionally equivalent to the signal terminal

7 Process connections Description

Process connections	
<p>Oval-shaped flange with 1/4-18 NPT female thread (code 1)</p> <ul style="list-style-type: none"> 1. Flange 2. O ring 3. Oval-shaped flange 4. Bolt 	<p>D-shaped connector with M20x1.5 male thread (code 2)</p> <ul style="list-style-type: none"> 1. Flange 2. D-shaped connector 3. Bolt 4. O ring 5. M20x1.5 Nut 6. Joining pipe

8 Model and suffix codes

SUP-2051										
10	Accuracy									
	A	Reference Accuracy	±0.075%			B.±1%				
20	Span									
		C	0-400Pa~40kPa (0-40~4000 mmH ₂ O)/(0-4~400mbar)							
		D	0-2.5kPa~250kPa (0-0.25~25 mH ₂ O)/(0-25~2500mbar)							
		F	0-30kPa~3MPa (0-3~300 mH ₂ O)/(0-0.3~30bar)							
30	Static pressure sensor									
			0	None						
			1	40MPa						
			2	10MPa						
40	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					
			G	FEP plated on 316L	Silicone oil					
			T	Tantalum	Silicone oil					
50	Working pressure									
				1	16MPa					
				2	25MPa					
				3	40MPa					
60	Process connections									
				N	7/16-20 UNF and 1/4-18 NPT female thread, No relief valve					
				B	7/16-20 UNF and 1/4-18 NPT female thread, Relief valves at end of flanges					
				U	7/16-20 UNF and 1/4-18 NPT female thread, Relief valves at the upper part of the flange side					
				D	7/16-20 UNF and 1/4-18 NPT female thread, Relief valve at the lower part of the flange side					
				V	Vertical mounting flange, 7/16-20 UNF and 1/4-18 NPT female thread, Relief valves at the upper part of the flange side					
				L	Level (Low side can select : B/ U/ D)					
				R	Remote Seal					
70	Process connector gasket									
				N	Perbunan (NBR)					
				F	Viton (FKM)					
				P	Teflon (PTFE)					
80	Special function									
				N	None					
				F	Square root output					
				O	Degrease cleansing treatment (Oxygen measurement must be with					

100	Process connector accessory										N	None
											1	Stainless steel oval-shaped flange with 1/2 NPT female thread
											2	Stainless steel D-shaped connector with M20x1.5 male thread
110	Integral indicator										N	None
											1	LCD display
											2	Backlit LCD display
120	Explosion protected type										N	None
											A	Intrinsically safe Approval for NEPSI
											D	Flameproof Approval for NEPSI
											B	Intrinsically safe Approval for ATEX
											E	Gas Flameproof Approval for ATEX
											G	Dust Flameproof Approval for ATEX
											H	Gas & Dust Flameproof Approval for ATEX
130	Tag name plate										N	None
											1	Position number marked on the nameplate
											2	Hanging stainless steel plate
140	Manual										C	Chinese
											E	English

Order example: **SUP-2051-AC2A1BNF111N1E**

[A]: Reference Accuracy: $\pm 0.075\%$

[C]: Span: 0-400Pa~40kPa (0-40~4000 mmH₂O)

[2]: Static pressure sensor: 10MPa

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

[1]: Working pressure: 16MPa

[B]: 7/16-20 UNF and 1/4-18 NPT female thread,
Relief valves at end of flanges

[N]: Perbunan (NBR) process connector gasket

[F]: Square root output

[1]: With 304 stainless steel mounting bracket

[1]: With stainless steel oval-shaped flange
with 1/2 NPT female thread

[1]: With LCD display

[N]: None of explosion protected type

[1]: Position number marked on the nameplate

[C]: English manual

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