MDM7000-GP/AP

Smart Pressure Transmitter

Note: Some certificates are still pending.

Range

Model	Nominal range	Minimum range	Lower (LRL)	Upper (URL)	Overload
GP	0.4bar	20mbar	-0.4bar	0.4bar	10bar
	2.5bar	125mbar	-1bar	2.5bar	40bar
	10bar	0.5bar	-1bar	10bar	60bar
	30bar	1.5bar	-1bar	30bar	150bar
	100bar	5bar	-1bar	100bar	200bar
	400bar	50bar	-1bar	400bar	800bar
AP	0.1bar	50mbar	0bar	0.1bar	6bar
	0.2bar	100mbar	0bar	0.2bar	10bar
	0.4bar	0.2bar	0bar	0.4bar	10bar
	2.5bar	0.5bar	0bar	2.5bar	40bar
	10bar	2bar	0bar	10bar	60bar
	30bar	3bar	0bar	30bar	150bar
	100bar	10bar	0bar	100bar	200bar

Note: ① LRV/URV setting: the lower limit value (LRV) and upper limit value (URV) are achieved between the upper and lower limits. If | URV |≥ | LRV |, | URV | must be larger than the minimum pressure; if | URV |≤ | LRV |, | LRV | must be larger than the minimum pressure.
It is recommended to choose a range ratio with the minimum possible value.
② When the AP range is 0.1bar or 0.2bar, the measuring diaphragm is ceramic.

Accuracy

Stated reference accuracy include best fit straight line(BFSL), hysteresis, and repeatability as per the standard and reference test conditions.
Calibration temperature: 20°C ±5°C , based on Zero value.

Linear output accuracy	GP	TD≤5	±0.1%	0.4bar
			±0.075%	2.5bar, 10bar, 30bar, 100bar, 400bar
		TD>5	±(0.025+0.015TD) %	0.4bar,
			±(0.0025+0.0145TD) %	2.5bar, 10bar, 30bar, 100bar, 400bar
	AP	TD≤5	±0.2%	0.1bar, 0.2bar, 0.4bar
			±0.1%	2.5bar, 10bar, 30bar, 100bar
		TD>5	±(0.025+0.035TD) %	0.1bar, 0.2bar, 0.4bar
			±(0.025+0.015TD) %	2.5bar, 10bar, 30bar, 100bar

Note:TD(Turn down) represents the range ratio, TD= Maximum range / Current range. [Maximum range = URL (range starts with 0, same as factory-calibrated range); Current range = SPAN (equivalent to |URV-LRV|)]
[Maximum range = URL (range starts with 0, same as factory-calibrated range); Current range = SPAN (equivalent to |URV-LRV|)].

Specifications

GP Accuracy	±0.075%, ±0.1%, ±0.2% URL, see the specifications for details
AP Accuracy	±0.1%, ±0.2% URL, see the specifications for details
GP Range	0.4bar~400bar, see the specifications for details
AP Range	0.1bar~100bar, see the specifications for details
Turn down ratio	100:1
Long-term stability	±0.2% Span/10 years
Ambient temperature effects	See the specifications for details
Voltage effects	When the power supply voltage changes within 18.3V~44V DC, its zero point and range change should not exceed ±0.005% URL/V
Mounting position effects	Less than 4mbar at any position, which can be corrected by PV(primary value)=0 reset
Vibration effects	＜ 0.1% SPAN as per GB/T18271.3/IEC61298-3
Output signal	4mA~20mA DC, HART
IP rating	IP67
Weight	About : 1.56kg (without mounting bracket and process connection accessories)

Ambient Temperature Effects

Product Model	Effect	Range
GP	±(0.075+0.0375TD) % 10°C of SPAN	0.4bar, 2.5bar, 10bar, 30bar, 100bar, 400bar
AP	±(0.125+0.075TD) % 10°C of SPAN	0.1bar, 0.2bar, 0.4bar
	±(0.115+0.065TD) % 10°C of SPAN	2.5bar,10bar, 30bar, 100bar

Environmental Conditions

Items	Conditions	
Operating temperature ①	Without LCD display: -50°C ~85°C ; with LCD display:: -40°C ~70°C	
Storage temperature	Without LCD display: -50°C ~100°C ; with LCD display: -40°C ~85°C	
Sensor operating temperature ②	-40°C ~105°C	
Medium temperature ③	Silicone oil filled: -40°C ~200°C	Fluorocarbon oil 1: -20°C ~110°C
	Low temperature silicone oil: -55°C ~200°C	Fluorocarbon oil 2: -55°C ~85°C
Operating humidity	5%RH~100%RH@40°C	

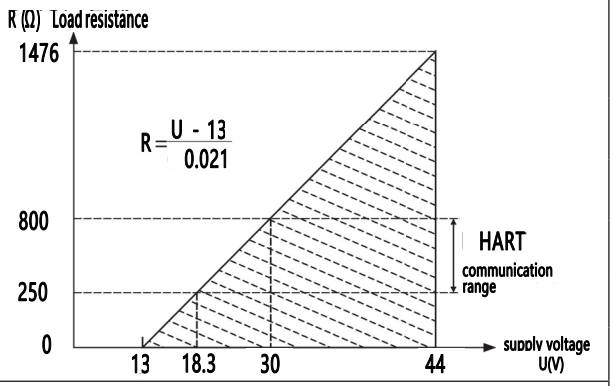
Note: ① Short pipeline explosion-proof products shall have a surface temperature ≤80°C. If uncertain, medium temp. shall be ≤T6/T80°C.

② If the medium temperature exceeds this range, heat dissipation accessories may be added. Please consult the MICROSENSOR for details.

③ The medium temperature in contact with the sensor diaphragm must be within the range of the selected oil filling, O-ring, and sensor operating conditions.

Power Supply and Load Requirements

Items	Conditions
Power supply voltage	HART communication protocol: 18.3V~44V DC ①
	Intrinsically safe HART communication protocol: 18.3V~30V DC
Load resistance	0Ω~1476Ω ② for operation mode; 250Ω~800Ω for HART communication
Transmission distance	<1000m
Power consumption	
4mA~20mA	≤500mW@24V DC, 20.8mA



Note: ① Non intrinsically safe power supply voltage can be selected as 13V. Please consult engineers for details.

② 1476Ω=(44V-13V) /21mA

EMC Effects

SN	Test items	Basic Standards	Test Conditions	Performance Level
1	Radiated interference (Casing)	GB/T 9254.1/CISPR 32	30MHz~1000MHz	Qualified
2	Conducted interference (DC power port)	GB/T 9254.1/CISPR 32	0.15MHz~30MHz	Qualified
3	Electrostatic discharge immunity test	GB/T 17626.2/IEC61000-4-2	8kV (Contact), 15kV (Air)	B
4	Immunity to radio frequency EM-fields	GB/T 17626.3/IEC61000-4-3	10V/m (80MHz~1GHz)	A
5	Power frequency magnetic field Immunity test	GB/T 17626.8/IEC61000-4-8	30A/m	B
6	Electrical fast transient / Burst Immunity test	GB/T 17626.4/IEC61000-4-4	4kV (5/50ns,100kHz)	B
7	Surge immunity requirements	GB/T 17626.5/IEC61000-4-5	2kV (line to line) 4kV (line to ground) (1.2/50μs)	B
8	Immunity to conducted disturbances induced by radio frequency fields	GB/T 17626.6/IEC61000-4-6	3V (150kHz~80MHz)	A

Note : At performance level A, the performance is normal within the limits of the technical specifications.

At performance level B, functions or performance are temporarily reduced or lost, but can be restored by themselves, and the actual operating conditions, storage and data remain unchanged.

Time Index

Damping time constant: equals to the combined damping time of electronic components and sendor module
Electronic components damping time: 0s~100s configurable
Sensor module damping time(sensor isolated diaphragm and filled silicone oil):≤ 0.2s (**Note:** This item is related to the sensor type and whether there is a diaphragm component.)
Turn-on time: ≤6s
Factory reset time: ≤31s
Response time: ≤100ms

Hazardous Area

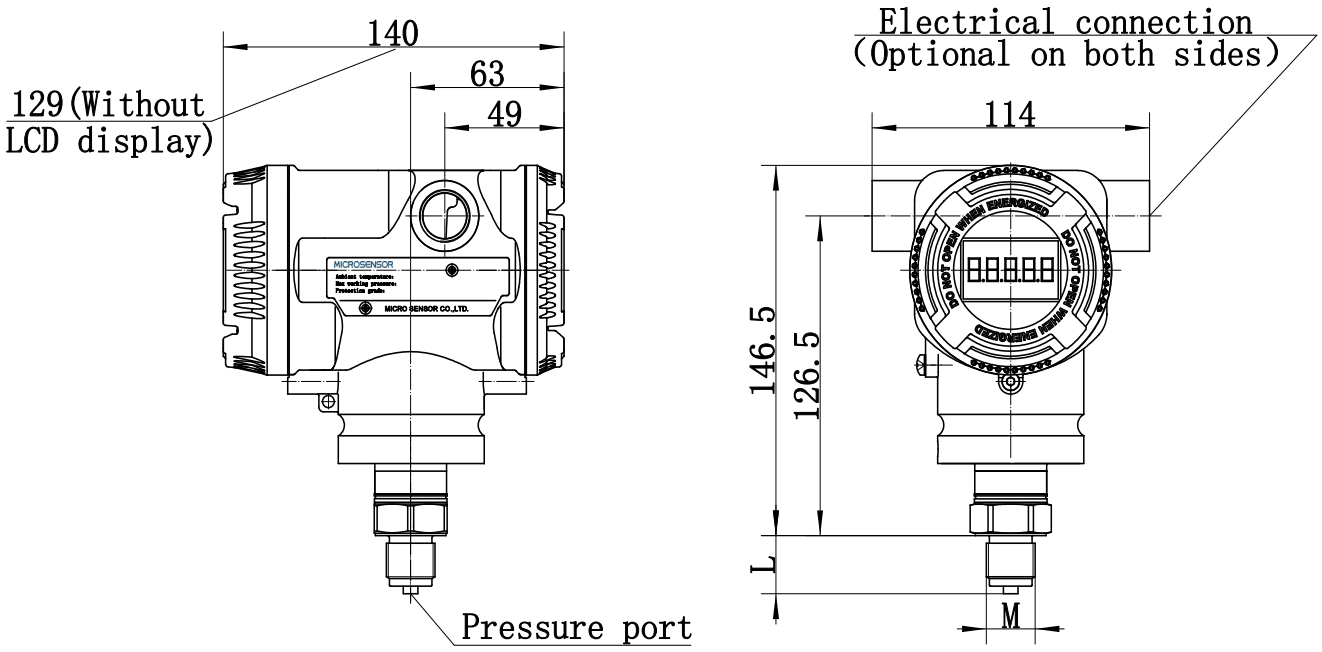
Hazardous area	Ex standards (association)	Mark	Standard
	Ex Intrinsically safe (PCEC)	Ex ia IIC T4 Ga	GB/T 3836.1-2021 GB/T 3836.4-2021
	Ex Flameproof (PCEC)	Ex db IIC T6 Gb	GB/T 3836.1-2021 GB/T 3836.2-2021
	Ex Dust explosion-proof (NEPSI)	Ex tb IIC T85°C Db	GB/T 3836.1-2021 GB/T 3836.31-2021
	ATEX Intrinsically safe (CSA)①	II 1G Ex ia IIC T4 Ga	EN IEC 60079-0:2018 EN 60079-11:2012
	ATEX Flameproof (CSA)①	II 2G Ex db IIC T6 Gb	EN IEC 60079-0:2018 EN 60079-1: 2014
	ATEX Dust explosion-proof (CSA)①	II 2D Ex tb IIIC T80°C Db	EN IEC 60079-0:2018 EN 60079-31: 2014
	IECEx Intrinsically safe (CSA)	Ex ia IIC T4 Ga	IEC 60079-0: 2017 IEC 60079-11: 2011
	IECEx Flameproof (CSA)①	Ex db IIC T6 Gb	IEC 60079-0: 2017 IEC 60079-1: 2014
	IECEx Dust explosion-proof (CSA)①	Ex tb IIIC T80°C Db	IEC 60079-0: 2017 IEC 60079-31: 2022
	NA Intrinsically safe (CSA)	Class I, Division 1, Groups A, B, C and D T4 Ex ia IIC T4 Ga Class I, Zone 0, AEx ia IIC T4 Ga	CSA C22.2 No. 60079-0:19 CAN/CSA C22.2 No. 60079-11:14(R2023) CAN/CSA C22.2 No. 61010-1-12, UPD1:2015, UPD2:2016, AMD1:2018 ANSI/UL 60079-0-2020 Seventh Edition ANSI/UL 60079-11-2018 (R2023)Sixth Edition ANSI/UL 913-2022 Eighth Edition UL 61010-1, 3rd Edition (2012), AMD1: 2018
	NA Flameproof (CSA)①	Class I, Division 1, Group A, B, C and D T6 Class II, Division 1 Group E, F and G T80°C Class III Ex db IIC T6 Gb Class I, Zone 1, AEx db IIC T6 Gb Ex tb IIIC T80°C Db Zone 21, AEx tb IIIC T80°C Db	CAN/CSA C22.2 No.61010-1-12. UPD1:2015. UPD2:2016.AMD1:2018 CSA C22.2 No.25-17 CSA C22.2 No.30-20+UPD1(2023) CSA-C22.2 No.60079-0:19 CAN/CSA-C22.2 No.60079-1:16 (R2021) CAN/CSA-C22.2 No.60079-31:15 (R2020) UL 61010-1. 3rd Edition (2012). AMD1:2018 FM 3600:2022 FM 3615:2022 FM 3616:2022 ANSI/UL 60079-0-2020 Seventh Edition ANSI/UL 60079-1-2020 Seventh Edition ANSI/UL 60079-31-2015 Second Edition
	EAC Explosion-proof	1Ex db IIC T6 Gb 0Ex ia IIC T4 Ga	TP TC012/2011 GOST 31610.0-2019 GOST 31610.11-2014 GOST IEC 60079-1-2013
Note: Please consult MICROSENSOR for details.			

Dimensions

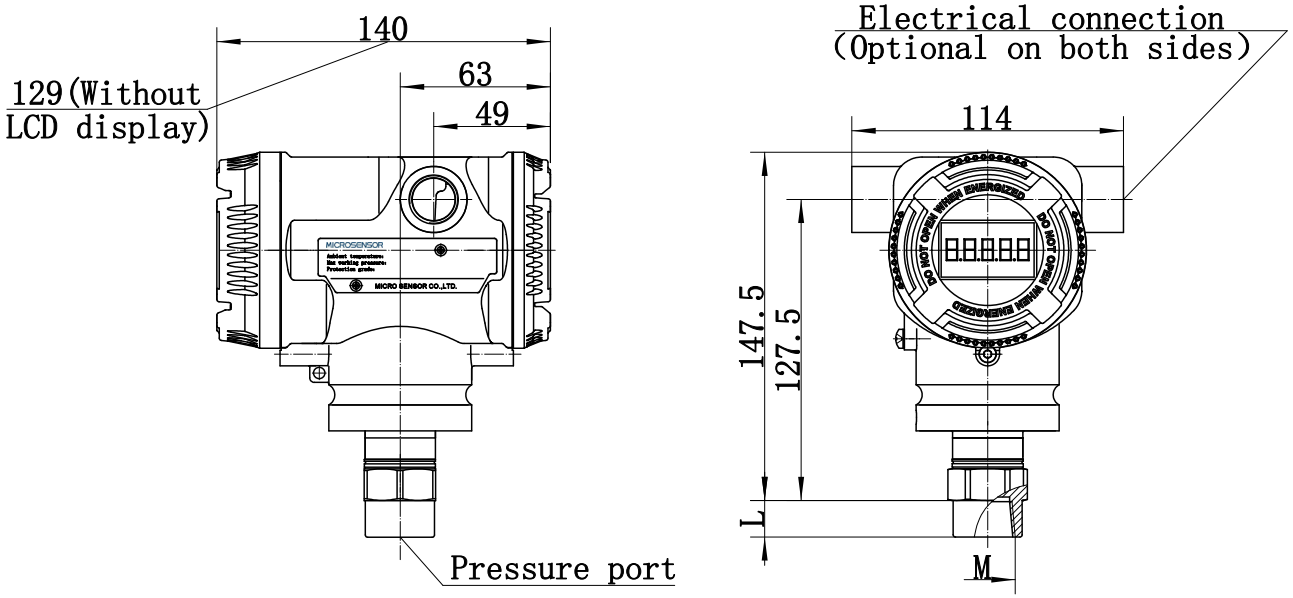
Unit: mm

Note: The gland head is sent as an accessory with the product when it leaves the factory, and it is to be installed by the user.

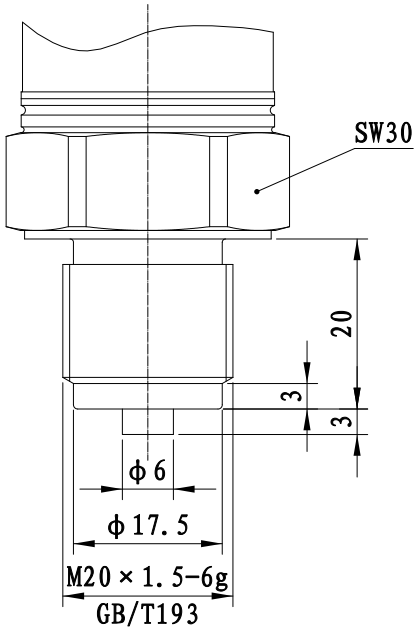
MDM7000 Transmitter With Display -Male



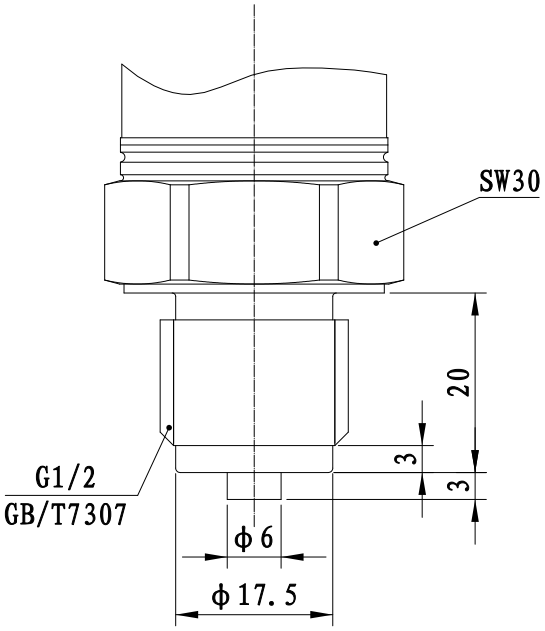
MDM7000 Transmitter With Display-Female



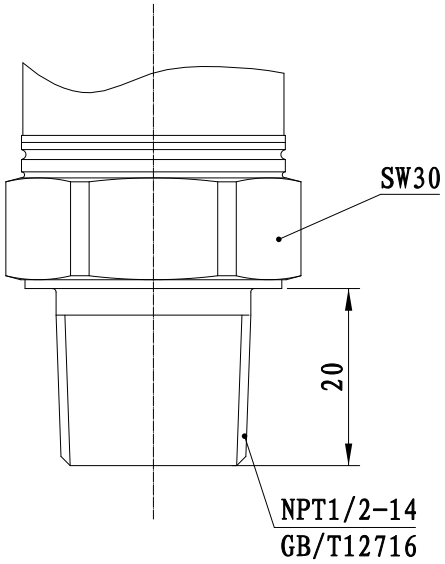
Process Connection (M)



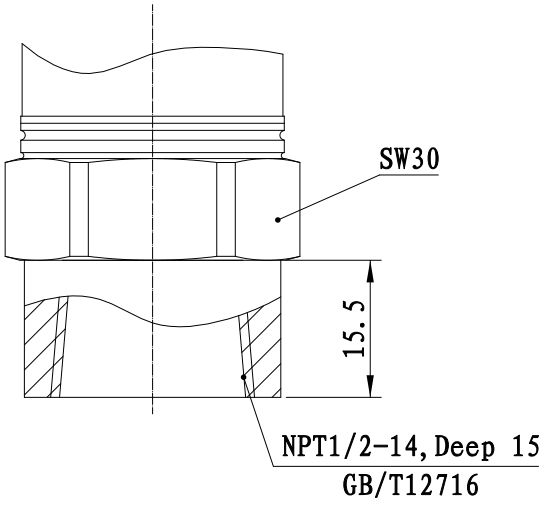
Process Connection (G)



Process Connection (A)



Process Connection (N)



Mounting Bracket Illustration

Pipe-mounted(Code: G7, G8)

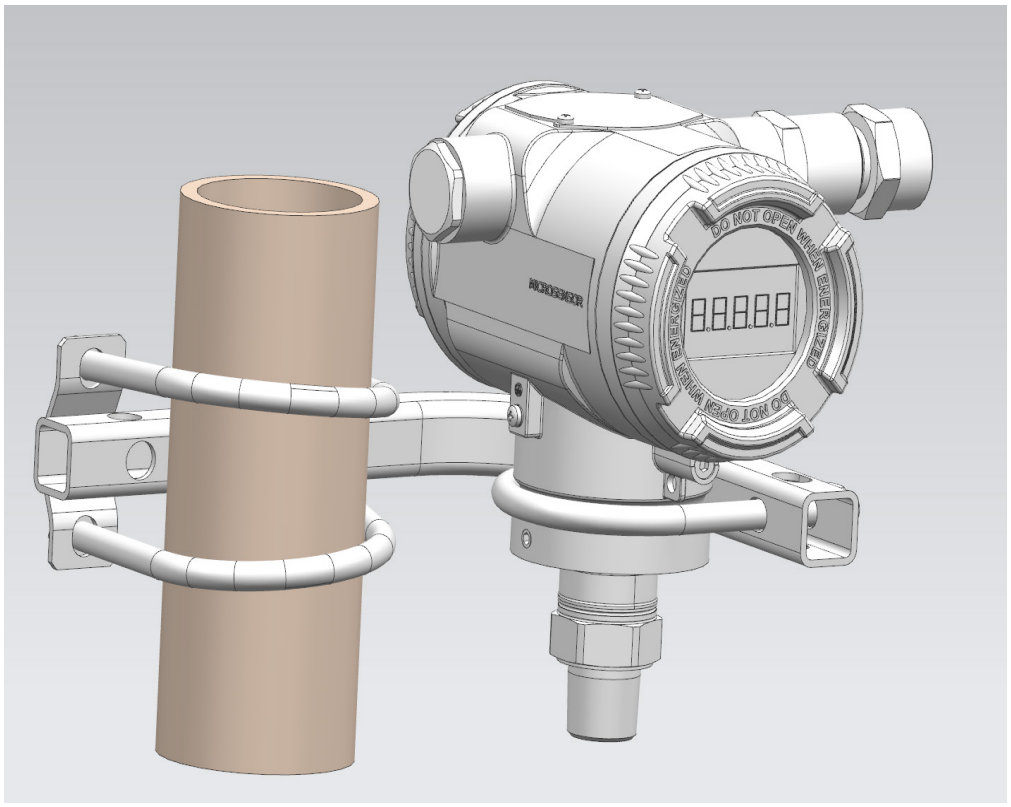
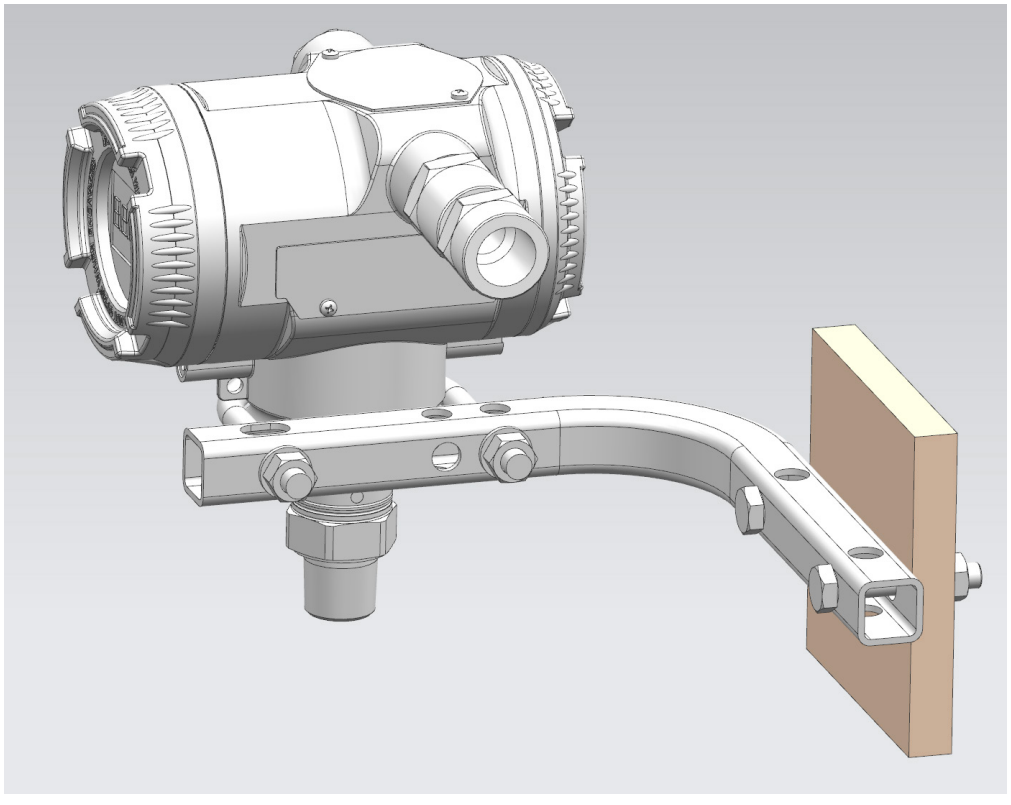


Plate-mounted(Code: G7, G8)



Order Guide

MDM7000-GP/AP Smart Pressure Transmitter

Items	Code	Description
MDM7000-GP	—	Smart Gauge Pressure Transmitter
MDM7000-AP	—	Smart Absolute Pressure Transmitter

Basic options

Application of hazardous area	1	China, Flameproof, No.CE23.6650 Ex db IIC T6 Gb, GB/T3836.1-2021, GB/T3836.2-2021	
	2	China, Intrinsically safe, No.CE23.7688X Ex ia IIC T4 Ga, GB/T3836.1-2021, GB/T3836.4-2021	
	3	China, Dust explosion-proof, GYB24.1215X Ex tb IIC T85°C Db, GB/T3836.1-2021, GB/T 3836.31-2021	
	4	China, Flameproof, Intrinsically safe	
	5	China, Flameproof, Dust explosion-proof, Intrinsically safe	
	A	CSA, Flameproof	※
	B	CSA, Intrinsically safe, CSA24CA80156531X Class I, Division 1, Groups A, B, C and D T4 Ex ia IIC T4 Ga Class I, Zone 0, AEx ia IIC T4 Ga	
	C	CSA, Flameproof, Intrinsically safe	※
	E	ATEX, Flameproof	※
	F	ATEX, Intrinsically safe, CSANe 24ATEX1178X II 1G Ex ia IIC T4 Ga	
	G	ATEX, Flameproof, Intrinsically safe	※
	J	IECEx, Flameproof	※
	K	IECEx, Intrinsically safe, IECEx CSA 24.0045X Ex ia IIC T4 Ga	
	L	IECEx, Flameproof, Intrinsically safe	※
	M	EAC, Explosion-proof, RU C-CN.АЖ58.B.05884/24 1Ex db IIC T6 Gb, 0Ex ia IIC T4 Ga	
	0	Non-hazardous area	
Output signal	H	4mA~20mA DC, HART	
	B	4mA~20mA DC, HART, bluetooth	

Note: The default is HART5, please select in Options-Specifications if HART7 is required.

Case	S	316L Stainless steel case with two outlet ports (F) M20×1.5	
	U	316L Stainless steel case with two outlet ports (F) 1/2NPT	
	P	Aluminum alloy case (Polyester resin coating) with two outlet ports (F) M20×1.5	
	N	Aluminum alloy case (Polyester resin coating) with two outlet ports (F) 1/2NPT	

Note: The outlet port, (F) 1/2NPT, without cable glands. The explosion-proof conduit is directly connected. The default material for the nameplate is 304 stainless steel. Please consult MICROSENSOR for other materials.

Waterproof/explosion-proof connector		Specification	Material	Applicable wire diameter	IP rating
	0	Without cable glands			
	A	Single-ended with a flameproof metal plug	316 SS		
	1	M20×1.5 waterproof connector, with plug	PVC	6mm~12mm	IP67
	2	Non-flameproof adapter M20x1.5 (M) to M20x1.5 (F), with plug	316 SS	6mm~8mm	IP67
	3	Flameproof adapter M20x1.5 (M) to (F), with plug	316 SS	6mm~12mm	IP67
	4	Flameproof adapter M20x1.5 (M) to M20x1.5 (F), with plug	316 SS	6mm~12mm	IP67
	5	Flameproof adapter M20x1.5 (M) to M20x1.5 (F), with plug	316 SS	6mm~12mm	IP67

Note: Flameproof configuration is applicable to PCEC/ATEX/IECEx standards.Flameproof adapter obtained CCC certificate. Please contact MICROSENSOR if double sealing is required.

Display	N	Without LCD display, explosion proof type -40°C ~70°C , non-explosion proof type -50°C ~85°C
	L	With LCD display, explosion proof type/ non-explosion proof type-40°C ~70°C

	—						
Range		Nominal range	Minimum range	Lower (LRL)	Upper(URL)	Overload	
GP	2	0.4bar	20mbar	-0.4bar	0.4bar	10bar	
	3	2.5bar	125mbar	-1bar	2.5bar	40bar	
	4	10bar	0.5bar	-1bar	10bar	60bar	
	5	30bar	1.5bar	-1bar	30bar	150bar	
	6	100bar	5bar	-1bar	100bar	200bar	
	7	400bar	50bar	-1bar	400bar	800bar	※
AP	C	0.1bar	50mbar	0bar	0.1bar	6bar	
	D	0.2bar	0.1bar	0bar	0.2bar	10bar	
	2	0.4bar	0.2bar	0bar	0.4bar	10bar	
	3	2.5bar	0.5bar	0bar	2.5bar	40bar	
	4	10bar	2bar	0bar	10bar	60bar	
	5	30bar	3bar	0bar	30bar	150bar	
	6	100bar	10bar	0bar	100bar	200bar	

Sensor structure	T	Single flange diaphragm seal	
Wetted parts material		Diaphragm	Process connection thread
	A	316L	316L
	B	HC-276	316L
	C	Tantalum	316L ※
	E	Ceramic	316L

2205 Dual phase steel =DIN 1.4462

Note: The material connection with the case is 304. When the AP range is 0.1bar or 0.2bar, the measuring diaphragm is ceramic.

Process connection	M	M20×1.5 Male, Φ3 vent hole, GB/T 193-2003	
	G	G1/2 Male, Φ3 vent hole, GB/T 7307-2001	
	A	1/2-14NPT Male, Φ6 vent hole, GB/T 12716-2011	
	N	1/2-14NPT Female, Φ14 vent hole, GB/T 12716-2011	
	H	Flange - Non-diaphragm (See Options for detailed specifications)	※

Note: Only code G is optional for the ceramic diaphragm, and the pressure port diameter must be φ10.

Oil filling	N	No oil filling (only optional for ceramic diaphragm)	
	S	Silicone oil: -40°C ~105°C (Medium tempertaure)	
	L	Low temperature silicone oil:-55°C ~200°C (Medium tempertaure)	※
	D	Fluorocarbon oil 1: -20°C ~110°C (Medium temperature)	※
	E	Fluorocarbon oil 2: -55°C ~85°C (Medium temperature)	※

Note: The medium operating temperature must be within the ranges of ① oil filling temperature, ② sensor operating temperature, and ③ O-ring temperature

Factory calibration range	CAL	Provide MICROSENSOR standard verification report based on the range, default linear output. **Contract specifies**: LRL - URL, display unit*

Options-Certificates		Description (Detailed specifications as following, multiple options or null)
Approvals	/CS1	CCS, China Classification Society, TJ23PTB00014
	/CS2	DNV, Det Norske Veritas, TAA00000Y1
	/CS3	BV, Bureau Veritas, 77759/A0 BV
	/CS4	ABS, American Bureau of Shipping, 24-2536413-PDA
	/CS5	LR, Lloyd's Register, LR2520052TA
	/CS6	KR, Korean Register, NAJ50160-AE001
	/CS7	NK, Nippon Kaiji Kyokai, TA24376M
	/CS8	RS, Russian Maritime Register of Shipping, 24.44.01.01398.266

Metrological certificates in Russia and CIS	/PAC	Pattern Approval Certificate of Measuring Instruments, Russian, 94159-24		
	/PBY	Pattern Approval Certificate of Measuring Instruments, Belarus		※

Options-Specifications		Description (Detailed specifications as following, multiple options or null)	
Mounting bracket accessories	/G7	L-shaped brackets (sq), 316 SS	
	/G8	L-shaped brackets (sq), Q235 carbon steel	
Flange (non-diaphragm)	/H01	HG/T 20592-2009 DN50PN10-PN40 RF Raised face flange	※
	/H02	HG/T 20592-2009 DN25PN10-PN40 RF Raised face flange	※
	/H08	HG/T 20592-2009 DN20PN10-PN40 RF Raised face flange	※
Verification report	/Q1	Provide the MICROSENSOR standard verification report according to the range, default linear output **Contract specifies:** LRL - URL, display unit and other requirements*	※
Damping time setting	/ST	Adjustable range 0s~100s, default 0s **Contract specifies:** Damping time*	
Fault alarm setting	/WH	High alarm current value, 20.8mA(HART5), 21mA(HART7)	
	/WL	Low alarm current value, 3.8mA(HART5), 3.6mA(HART7), default	
Identification plate	/PT	Product is shipped with a identification plate, 316 SS **Contract specifies:** Identification number, not exceeding 16 characters*	
Integrated value manifold	/VT	Transmitter is factory assembled with MICROSENSOR valve manifold. See attachment for order guide of valve manifold. **Contract specifies:** Complete model of MICROSENSOR valve manifold*	
Leakage test report	/QS1	Nitrogen (N_2) or air, 10bar, pressure holding for 10 minutes, provide MICROSENSOR standard leakage test report (Applicable to nominal range 0.4bar)	※
	/QS2	Nitrogen (N_2) or air, 40bar, pressure holding for 10 minutes, provide MICROSENSOR standard leakage test report(Applicable to nominal range 2.5bar)	※
	/QS3	Nitrogen (N_2) or air, 60bar, pressure holding for 10 minutes, provide MICROSENSOR standard leakage test report(Applicable to nominal range 10bar)	※
	/QS4	Nitrogen (N_2) or air, 150bar, pressure holding for 10 minutes, provide MICROSENSOR standard leakage test report(Applicable to nominal range 30bar)	※
	/QS5	Nitrogen (N_2) or air, 200bar, pressure holding for 10 minutes, provide MICROSENSOR standard leakage test report(Applicable to nominal range 100bar)	※
	/QS6	Water or hydraulic oil, 800bar, pressure holding for 10 minutes, provide MICROSENSOR standard leakage test report(Applicable to nominal range 400bar)	※
HART configuration	/H5	HART5 configuration, default	
	/H7	HART7 configuration	
Diaphragm with gold plated	/J1	Single diaphragm with gold plated (5μ)	※
Oil-free treatment	/CL1	Degreasing and cleaning treatment of the wetted parts	※
Note: Select this item; fluorocarbon oil is needed in oxygen environments (code: D, E)			
Lithium battery	/LD	General requirements for low copper and zinc in the lithium battery industry	
High-accuracy	/HAC	High-accuracy calibration according to the user's specified range **Contract specifies:** Range of use (within sensor's limit), LRL - URL, display unit, accuracy*	※
Language	/LE	English nameplate, operation manual, certificate of conformity, etc.	
	/LR	Russian nameplate, operation manual, certificate of conformity, etc.	
Delivery service	/XM	Provide customer requested content according to project delivery standards	
Warranty period	/Y2	2-year warranty	
	/Y3	3-year warranty	
	/Y5	5-year warranty	

***Note:** The specifications required for these options should be specified in the contract. Products with ※ have longer dilivery times.

Example: MDM7000-GP-0HS1L-2TAMS/G1-【CAL: 0-0.4bar】