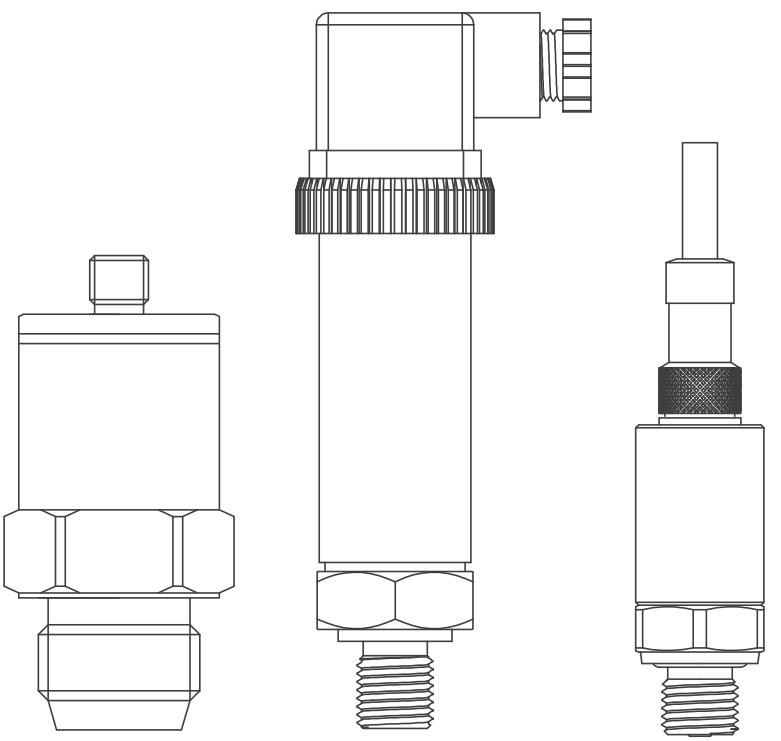
Sensor and controller

■ Flow ■ pressure ■ temperature ■ level ■ position

KATU卡图

Pressure transmitter operating manual

PM series



summarize

- The pressure transmitters described in this operating instruction are designed and manufactured using state-of-the-art technology. All components comply with strict quality and environmental standards during production. Our management systems are ISO 9001 and ISO 14001 certified.
- This operating instruction includes important instructions for operating the pressure transmitter. To operate safely, follow all safety instructions and operation instructions.
- Follow local accident prevention regulations and general safety procedures in force within the range of use of the pressure transmitter.
- The operating instructions are part of the pressure transmitter and must be placed near the instrument so that technicians can use them at any time.
- Before starting the operation, the technician must read and understand the operation instructions carefully.
- The manufacturer shall not be liable for any damage caused by the use of the product against the specified purpose, failure to follow the operating instructions, arrangement of unqualified technicians or unauthorized alteration of the pressure transmitter.
- The general terms and conditions contained in the sales documentation apply.
- We reserve the right to make technical changes.

1、Identification specification

Warning!

... Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

Attention!

.. Indicates a potentially hazardous situation which, if not avoided, could result in minor injury, property damage, or environmental hazard.

Message

... Provides useful tips, suggestions, and information for efficient and trouble-free operation.

2、Designated use

Pressure transmitters are used to measure pressure and convert it into an electrical signal.

Pressure transmitters should only be used within the limits of their technical performance (e.g. maximum ambient temperature, material compatibility,...). .

→ See "Specifications" for more operating restrictions.

Products are designed and manufactured exclusively for the use described in this operating manual and are not intended for use in other areas.
The manufacturer shall not be liable for all operations contrary to the specified use.

1、transport

Check whether the instrument was damaged in transit.
Report any visible damage immediately.

2、Packaging and storage

Do not remove the package before installation.
Keep the packaging because it provides the best protection for the instrument during transportation (e.g. change of installation location, sending for service).

Conditions allowed for storage:

- Storage temperature: -40 ~ +70℃
- Storage humidity: 45 ~ 75% relative humidity (no condensation)

1、Installation equipment

The pressure transmitter should only be used under good safety conditions. Before commissioning, the pressure transmitter must undergo a visual inspection.

- Fluid leakage indicates product damage.

Installation point requirements
Installation points must meet the following conditions:

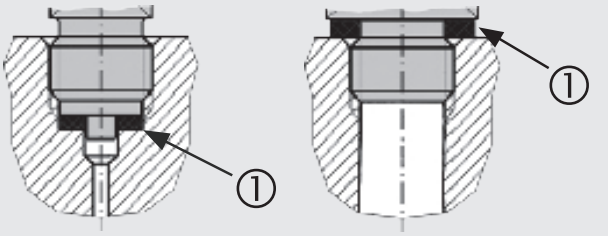
- The sealing surface is clean and undamaged.
- Sufficient space for safe electrical installation
- For information on threaded holes and welded bushings, see Technical information or consult a product engineer.
- The temperature of the allowable environment and medium should be within the product performance range. Consider possible limitations in the ambient temperature range that are caused by mating connectors.

Seal type

Straight thread

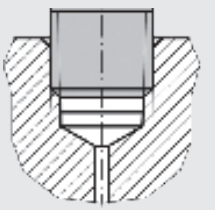
Sealing face ① With flat washer,

Seal ring or special seal.



Conforms to EN838 Conforms to DIN 3852-E

Taper thread
Wrap the joint with a sealing material
(such as PTFE tape)



NPT、R and PT

Installation equipment

The maximum torque depends on the mounting point (such as material and shape), if you have any questions, please contact our product engineer.
→ Contact details with shopping guide business personnel to obtain.

① Sealing surface of the seal (→ see "sealing variant").
② At the installation point, tighten the pressure transmitter by hand
③ Reinforce with a wrench

2、Electrical system voltage requirements of the product

→ For details about power supply requirements, see the product label

The power supply of the pressure transmitter must comply with UL/EN/IEC 61010-1 Article 9.3 or UL/EN/IEC 60950-1 low energy design, or UL1310 / Ul1585 (UL/EN/IEC) Class II power limitation design, And the power supply must be suitable for the transmitter installed at an altitude of 2000 meters above the environment.

Electrical connection requirements

- Select a cable with a diameter that matches the plug cable seal sleeve.
- The cable seal cover and plug must be intact.
- Ensure that no moisture enters the cable outlet.

Protection and grounding

- According to the equipment grounding requirements, the pressure transmitter must be protected ground.

Instrument connection

① Assemble plug and output cable

→ See the product label for pin assignment

① Establish plug connection

3、Install DIN 175301-803 Hersman plugs

① Loosen the screw (1).

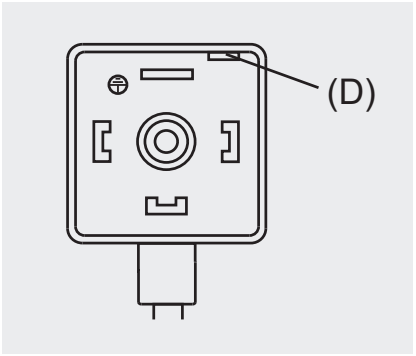
② Loosen the cable seal sleeve (2).

③ Unplug Hersman (5)+(6).

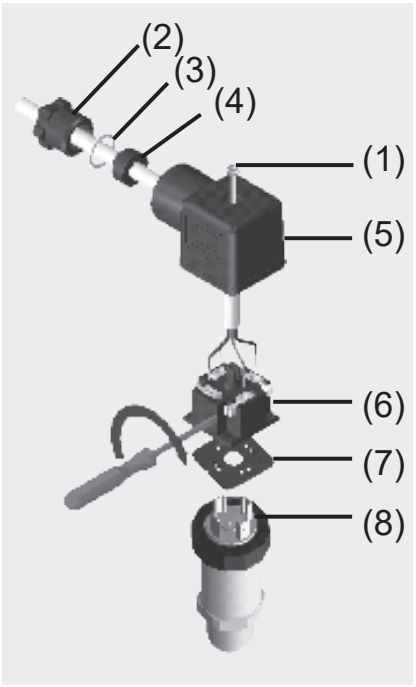
④

Attention!

Improper installation of the seal of the rectangular housing will be damaged.



▶ Do not press the junction box (6) through the screw hole (1) or cable seal sleeve (2). Remove the junction box (6) from the rectangular housing (5) through the mounting hole (D).



⑤ Pass the cable through the cable sealing sleeve (2), washer (3), sealing sleeve (4), and rectangular housing (5) in turn.

⑥ Connect the end of the cable to the junction box (6) according to the wiring diagram.

⑦ Press the rectangular housing (5) down onto the junction box (6).

⑧ Ensure that the sealing housing is not damaged and that the cable sealing sleeve and gasket are properly installed to ensure the level of protection.

⑨ Tighten the cable sealing sleeve.

⑩ Ensure that the flat gasket (7) passes through the pressure transmitter's connecting pins.

⑪ Insert the Hersman plug (5)+(6) into the pressure transmitter.

⑫ Tighten the screws (1)

Attention!

Personal injury, property damage and environmental damage

Once a fault with the product cannot be eliminated, the pressure sensor must be removed immediately.

- Ensure that there is no pressure or signal to prevent the equipment from continuing to operate.
- Contact Katu.
- If you need to repair, please refer to the "repair" instructions.

Warning!

Personal injury, property damage and environmental damage caused by hazardous media

Once in contact with hazardous media (such as oxygen, acetylene, flammable or toxic substances), harmful media (such as corrosive, toxic, carcinogenic, radioactive), as well as refrigeration equipment and compressors, personal injury, property damage and environmental damage are inevitable.

- Once an error occurs, high-temperature harmful media will enter the pressure transmitter under high pressure or vacuum.
- For these media, in addition to standard provisions, existing norms or regulations need to be followed.
- Wear necessary protective equipment

See the back cover of the "Overview" or operating instructions for more details.

In the event of any failure, first check the correct installation of the pressure sensor from both mechanical and electronic aspects. If the complaint is not justified, we will charge you a complaint handling fee.

breakdown

breakdown	reason	solution
No output signal	Cable break	Check connection
Zero signal deviation	The overpressure limit is exceeded	Comply with permitted overvoltage limits
Zero signal deviation	The operating temperature is too high or too low	Follow the allowed temperature
The pressure varies, but the output is constant	Mechanical overload caused by overvoltage	Replace the instrument; If there's still a problem,Please contact the manufacturer
Signal range fluctuation	The work environment has EMC Interference sources, such as frequency converters	Shielding instrument; Shielded cable; Remove the source of interference
Signal range fluctuation /misalignment	The operating temperature is too high or too low	Follow the allowed temperature
The signal range is small /too small	Mechanical overload caused by overvoltage	Replace the instrument; If there's still a problem, Please contact the manufacturer

If the complaint is not justified, we will charge you a complaint processing fee.

1、maintenance

The pressure transmitter requires no maintenance.
Can only be maintained by the manufacturer.

2、clean

Attention!
Wrong cleaner

Using the wrong cleaner can damage the product's label

- ▶ Harsh cleaning agents are prohibited.
- ▶ Do not use harmful or sharp sanitary ware.
- ▶ Do not use abrasive rags or sponges.

The right cleaner

- clear water
- Conventional detergent

Cleaning product

① Before cleaning, the pressure transmitter needs to be decompressed and powered off.

② Wipe the surface of the transmitter with a soft cloth.

1、Disassembly

Warning!

Personal injury, property damage and environmental damage caused by hazardous media

Once in contact with hazardous media (such as oxygen, acetylene, flammable or toxic substances), harmful media (such as corrosive, toxic, carcinogenic, radioactive), as well as refrigeration equipment and compressors, personal injury, property damage and environmental damage are inevitable.

- Once an error occurs, high-temperature harmful media will enter the pressure transmitter under high pressure or vacuum.
- Wear necessary protective equipment.

Product disassembly

① The pressure transmitter needs to be depressurized and powered off

② Disconnect electrical connection

③ Use a wrench to unscrew the pressure transmitter

2、repair

When transporting pressure transmitters, it is important to note the following: All instruments delivered to Catu must be free of any harmful substances (such as acids, bases, solutions, etc.) and must be cleaned before returning.

Warning!

Residual media can cause personal injury, property loss and environmental damage

The residual media on the removed pressure transmitter can pose a hazard to personnel, the environment and equipment.

- Material safety data with hazardous substances and corresponding media.
- To clean the instrument, see "Cleaning".

When repairing the instrument, use the original packaging or suitable shipping packaging

For repair information, please contact your product supplier or Katu service contact information

3、handle

Improper handling of products can cause harm to the environment.
Dispose of instrument components and packaging materials in an environmentally compatible manner and in accordance with nationally specified waste disposal regulations.

Technical parameter

Range and overpressure limit							
Mpa	range	0~0.005	0~0.01	0~0.016	0~0.025	0~0.04	0~0.06
	Overvoltage limit	0.02	0.02	0.1	0.1	0.1	0.3
	range	0~1	0~1.6	0~2.5	0~4	0~6	0~10
	Overvoltage limit	0.3	0.32	0.5	0.8	1.2	2
	range	0~1.6	0~2.5	0~4	0~6	0~10	0~16
	Overvoltage limit	3.2	5	8	12	20	32
	range	0~25	0~40	0~60	0~100		
	Overvoltage limit	50	80	120	150		
inWC	range	0~20	0~40	0~60	0~80	0~100	0~120
	Overvoltage limit	84	84	400	400	400	400
	range	0~150	0~200	0~250	0~400		
	Overvoltage limit	400	400	1,200	1,200		
psi	range	0~1	0~5	0~15	0~25	0~30	0~50
	Overvoltage limit	3	14.5	45	60	60	100
	range	0~100	0~160	0~200	0~300	0~500	0~1,000
	Overvoltage limit	200	290	400	600	1,000	1,740
	range	0~1,500	0~2,000	0~3,000	0~5,000	0~10,000	
	Overvoltage limit	2,900	4,000	6,000	10,000	17,400	

Technical parameter

Range and overpressure limit (absolute pressure)								
Mpa	range	0~0.01	0~0.016	0~0.025	0~0.04	0~0.06	0~0.1	0~0.16
	Overvoltage limit	0.1	0.1	0.1	0.1	0.3	0.3	0.32
	range	0~0.25	0~0.4	0~0.6	0~1	0~1.6	0~2.5	
	Overvoltage limit	0.5	0.8	1.2	2	3.2	5	
inWC	range	0~40	0~60	0~80	0~100	0~120	0~150	0~200
	Overvoltage limit	400	400	400	400	400	400	400
	range	0~250	0~400					
	Overvoltage limit	1,200	1,200					
psi	range	0~5	0~15	0~25	0~30	0~50	0~100	0~150
	Overvoltage limit	14.5	45	60	60	100	200	290
	range	0~200	0~300					
	Overvoltage limit	400	600					

Range and overpressure limits (vacuum and +/- range)						
Mpa	range	-0.0025~+0.0025	-0.005~0	-0.005~+0.005	-0.005~+0.015	-0.005~+0.02
	Overvoltage limit	±0.02	±0.02	±0.02	0.1	0.1
	range	-0.005~+0.025	-0.01~0	-0.01~+0.01	-0.015~+0.015	-0.016~0
	Overvoltage limit	0.1	±0.02	0.1	0.1	0.1
	range	-0.02~+0.02	-0.025~0	-0.025~+0.025	-0.03~+0.03	-0.04~0
	Overvoltage limit	0.1	0.1	0.1	0.3	0.1
	range	-0.05~+0.05	-0.06~0	-0.1~0	-0.1~+0.06	-0.1~+0.15
	Overvoltage limit	0.3	0.3	0.3	0.32	0.5
	range	-0.1~+0.3	-0.1~+0.5	-0.1~+0.9	-0.1~+1.5	-0.1~+2.4
	Overvoltage limit	0.8	1.2	2	3.2	5

Technical parameter

Range and overpressure limits (vacuum and +/- range)						
inWC	range	-10~+10	-20~0	-20~+20	-40~0	-40~+40
	Overvoltage limit	±80	±80	±80	±80	±80
	range	-50~+50	-60~0	-75~+75	-80~0	-100~0
	Overvoltage limit	400	400	400	400	400
	range	-100~+100	-120~0	-125~+125	-150~0	-200~+200
	Overvoltage limit	400	400	1,200	400	1,200
	range	-250~0				
	Overvoltage limit	1,200				
psi	range	-1~0	-30 inHg~0	-30 inHg~+15	-30 inHg~+30	-30 inHg ~+60
	Overvoltage limit	3	45	60	60	150
	range	-30 inHg~+100	-30 inHg~+160	-30 inHg~+200	-30 inHg~+300	
	Overvoltage limit	250	350	450	600	

Technical parameter

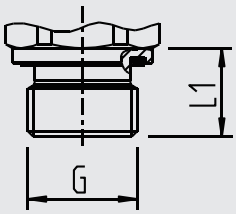
Vacuum protection	Yes (refer to overvoltage limit)	
Output signal	See product label	
load	Current (2-wire system)	≤ (Power supply -8V) /0.02A
	Voltage (3-wire system)	>> Maximum output signal /1mA
	Ratio meter (3-wire)	> 10k
Power source	See product label	
Total energy consumption	Current (2-wire system)	Maximum current signal 25mA
	Voltage (3-wire system)	< 20mA
	Ratio meter (3-wire)	< 20 mA

Technical parameter

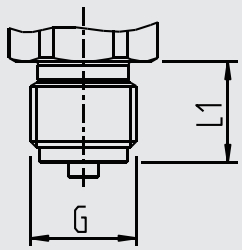
Specification parameter		
non-repeatability	range≤ 0.01MPa ： ≤ ±0.2%FS range> 0.01MPa ： ≤ ±0.1%FS	
Measurement accuracy	≤±0.5% range	
Temperature error at 0~80℃	normal：≤±1%FS Max：≤ ±2.5%FS	
Reference condition	Ambient temperature	15 ... 25 ℃
	Environmental pressure	860 ... 1,060 mbar
	humidness	45 ... 75 % r. h.
	Power source	DC 24 V
	Installation position	According to actual demand
Settling time	range≥ 0.04 MPa ： < 4 ms range≥ 5 kPa ： ≤ 1min	
Turn-on time	range≥ 0.04 MPa ： < 15 ms range≥ 5 kPa ： ≤ 1min	
Class of protection	The protection level takes effect only when the butt plug is inserted	
	Hersman joint DIN 175301-803 A	IP65
	Hersman joint DIN 175301-803 C	IP65
	Circular aviation joint M12 x 1	IP67
	Cable output	IP67
Impact resistance	500 g (IEC 60068-2-27，mechanical) -40℃时，100g	
Service life	Measuring range > 0.01MPa: 10,000 load cycles Measuring range ≤ 0.01MPa: 10 million load cycles	
Short-circuit resistance	S+ vs. 0V	
Polarity reverse protection	UB vs. 0V Products with ratio output signal non-polar reverse protection	

Technical parameter

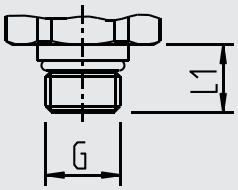
Specification parameter		
Insulation voltage	DC 500 V	
Liquid connection unit	range＜ 1 MPa	304SS/316L Stainless steel
	range≥ 1 MPa	304SS/316L Stainless steel and PH steel
	range≤ 0…2.5 MPa abs.	304SS/316L Stainless steel
Non-liquid parts	304SS, 316L stainless steel, HNBR, PA, polyurethane cable	
Pressure transfer medium	Range < 0... 1 MPa gauge pressure	Synthetic oil
	Range ≤ 0 ... 2.5 MPa gauge pressure	Synthetic oil
	Range ≥ 0 ...1 MPa gauge pressure	Synthetic oil/dry measuring unit
CE certification	Pressure equipment instruction	
	EMC Directive, Electromagnetic Radiation (Group 1, Class B) and Immunity (Industrial applications) standards	



G	L1
G ¼ A DIN 3852-E	14
G ½ A DIN 3852-E	17
M14 x 1.5	14

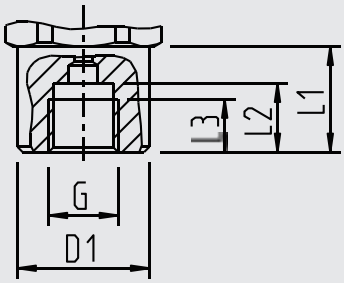


G	L1
G ¼ B EN 837	13
G ⅜ B EN 837	16
G ½ B EN 837	20
M20 x 1.5	20



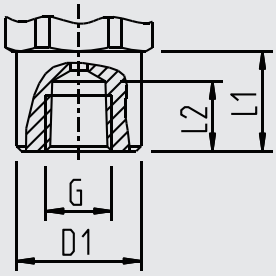
G	L1
7/16-20 UNF BOSS	12.85

Internal thread

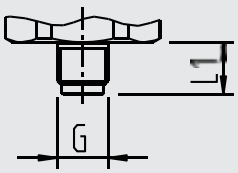


G	L1	L2	L3	D1
G ¼ EN 837	20	13	10	Ø25

Internal thread

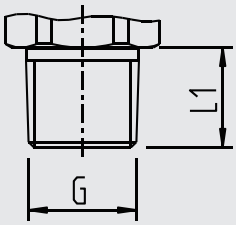


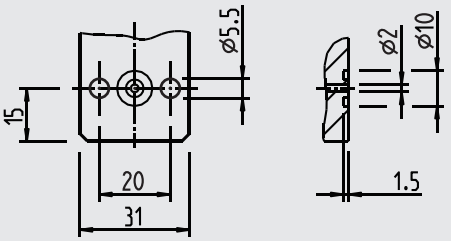
G	L1	L2	D1
¼ NPT	20	14	Ø25



G	L1
G ⅛ BEN 837	10

Technical parameter





G	L1
⅛ NPT	10
¼ NPT	13
½ NPT	19
R ¼	13
R ⅜	15
R ½	19
PT ¼	13
PT ⅜	15
PT ½	19

G ¼	Internal thread with flange connection	Please refer to the drawing for detailed dimensions

Katu Electronic （Kunshan）Co.,Ltd.

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