

- Accuracy 0.25%, 0.5%
- Temperature Compensated
- Front Ceramic Diaphragm to minimize the dead space
- Shock and Vibration Resistance
- Zero and Span Adjustments (4-20mA)
- False System Shutdown Prevention

PT 2 Series



HAWK PT2 series pressure transmitters and transducers have been designed for measurement of viscous and contaminated fluids at high quality performance, reliability and cost. The semi-flush front ceramic diaphragm design minimizes the dead space in order to avoid the highly viscous medium to clog the pressure sensing element. It's good ideal for the system to require flushing to prevent contamination when changing pressure medium. The ceramic cell and metallic wetted parts can be compatible with majority of aggressive process fluids. Each transmitter is inspected and calibrated to ensure it's 100% quality.

Typical Applications

- Pharmaceutical Industry
- Wastewater and Sewage Treatment

- Chemical Industries
- Tank Level Measurement

- Continuous Fluid Level Measurement

Specifications

PERFORMANCE

Accuracy at 25 C° (Linearity, Hysteresis, Repeatability):

- < ±0.25% F.S.....PT23
- < ±0.5% F.S.....PT24

Stability at 25 C°:

- < ±0.2% F.S.(PT23)
- < ±0.4% F.S.(PT24)

Thermal Zero Shift:

- < ±0.02% F.S./ C°.....PT23
- < ±0.04% F.S./ C°.....PT24

Thermal Span Shift:

- < ±0.03% F.S./ C°

ENVIRONMENTAL

Operating Temperature Range:

- 25.....85 C°

Storage Temperature Range:

- 25.....100 C°

Compensated Range:

- 40.....135 C°

Weatherproof Rating (Enclosure):

- IP65, NEMA4/4X or better

PHYSICAL DATA

Housing (Case):

- 304 Stainless Steel (316SS Option)

Fitting Materials:

- 304SS, 316SS, 316LSS, Monel or Hast'C

Ceramic Sensor:

- Aluminum Oxide Al₂O₃ (96%)

Seal Material:

- FPM(Viton), NBR (Buna Rubber), MVQ (Silicone Rubber), CR(Neoprene), EPDM(Ethylene Propylene), FFKM

Note: The wetted parts including fitting, ceramic sensor and sealing will be contacted with the media directly, please choose the appropriate material complied to your application.

Process Fitting (Connection):

- G3/4 (3/4"PF), G1/2 (1/2"PF)-Standard
- 1/2" NPT, 3/4" NPT
- Others on request

Electrical Connector:

- Terminal Box to DIN43650 (IP 65)
- Shutter Type Cable (IP 65)

Flexible Cable (IP 65)

Female 1/2" DIN (IP 65)

M12 Cable (IP 65)

ELECTRICAL DATA

Voltage Output

Output Signal (Voltage, 3 Wires):

- 0-10V, 0-5V, 0.5-4.5V, 1-5V, 1-6V

Power Requirement (Voltage):

- 15-32VDC(Normal 24VDC, Voltage)

Load Resistance (Voltage):

- >10K Ohms

Current Output

Output Signal (Current, 2 Wires):

- 4-20 mA

Power Requirement (Current):

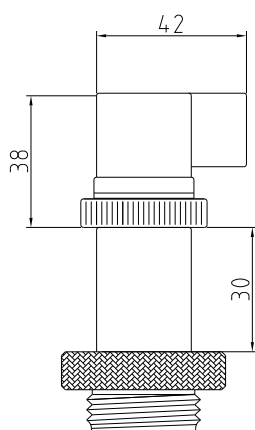
- 10-32VDC(Normal 24VDC, Current)

Load Resistance (Current):

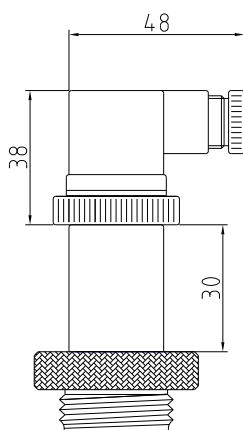
- ≧(Supply Voltage -10V) / (0.02A)Ohms

Dimensions

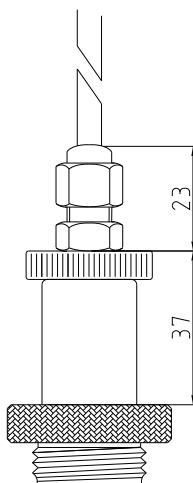
DIN 1/2" FEMALE



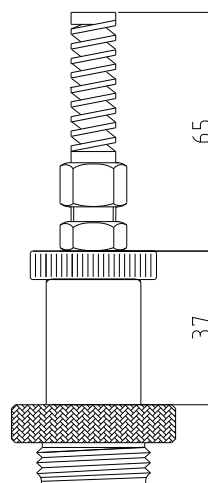
DIN 43650 A



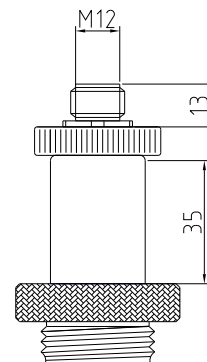
**SHUTTER
Cable**



Flexible Cable



**M12
Conduit**

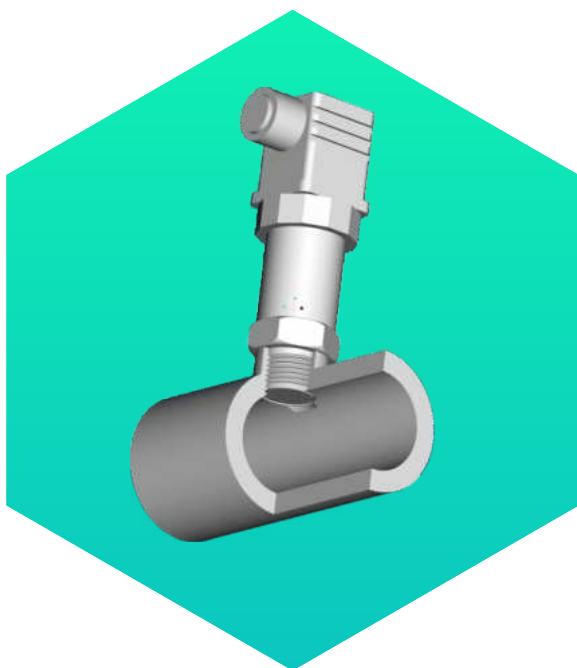


Electrical Compatibility

CE-Conformity

■ 2014/30/EU(EMC) EN 61326-1:2013

Flushing Design



The flushing front diaphragm design let the measuring point closed to the process line in order to minimize the dead space happened

Media Compatibility and Applications

Media compatibility must be considered when purchasing a pressure transducers and transmitters, Improper selection and application of the pressure transmitters and transducers could possible cause sensor failure and lead to possible damage or personal injury. The media to which the pressure sensors are going to be in contact with, must have compatibility with the Al_2O_3 . In particular the data of weight loss found after a dipping of 80 hours at room temperature in some media have shown a good resistance to HCl (at 30% wt) and HNO_3 (at 60% wt). Therefore the ceramic cell has a very good chemical resistance. But the alumina is instead easily etched by even 1% solution of Fluorine acid (HF). For such applications, you can use HAWK ceramic pressure sensor combined diaphragm seal or the other HAWK Pressure sensors such as stainless steel thin film sensor or diaphragm micro-machined silicon sensor instead. The wetted parts of the transmitter including pressure fitting, ceramic cell and sealing will contact with the media directly. Selecting the suitable pressure fitting material and sealing material is very important.

Please refer to HAWK Corrosion table for detailed information.

Sealing Materials vs Common Applications

Sealing Materials	Common Application Conditions														
	Gasoline, Naphtha	Benzene, Toluene	Aliphatic Hydrocarbon	Alcohol	Ester	Ketones (MEK)	Ethyl Acetate	Water	Organic Acid	Animal/Vegetable Oil	Aromatic Solvent	Oxidized Solvent	High Consistency Alkali	Low Consistency Alkali	High Consistency Inorganic Acid
1=Recommended, 2=Satisfactory, 3=Poor, 4=Marginal, 5=Not Recommended A=Available N/N=Not Available															
Buna N(Nitile), NBR	1	3	5	1	4	4	4	1	4	1	3	5	2	2	4
Fluorocarbon(Viton), FPM	1	1	2	1	4	2	5	1	5	1	1	5	5	4	1
Ethylene-Propylene(EPDM), P.C	5	3	5	1	2	1	1	1	5	2	5	1	1	1	2
Fluorosilicone, VMQ	4	4	3	1	4	2	3	2	2	3	5	4	1	1	4
Neoprene, CR	2	5	5	1	4	3	5	1	4	2	4	5	1	1	2

The materials and applications listed are the most commonly used. There are a lot of compound variations designed for specific applications. For demanding applications, please supply all detailed to our application engineers for a recommendation or go to: www.efunda.com

Sealing Materials	Common Application Conditions																
	High Temp Limit CO	Low Temp Limit CO	Steam< 250 (C°)	Steam< 120 (C°)	Permeation/Vacuum	Fluorescent/Sunlight	Weathering/Ozone	Refrigerant/Freon(most)	Wear/Abrasion	Compression Set	Brake Fluids	Transmission Fluids	Steering Fluids	Fuels/Gasoline(most)	Chemicals/Solvents(most)	Petroleum Oils(most)	Dynamic Applications
1=Recommended, 2=Satisfactory, 3=Poor, 4=Marginal, 5=Not Recommended A=Available N/N=Not Available																	
Buna N(Nitile), NBR	120	-40	5	4	2	4	4	4	2	2	5	2	5	3	4	3	2
Fluorocarbon(Viton), FPM	200	-15	4	3	1	1	1	3	2	1	4	3	2	2	2	1	1
Ethylene-Propylene(EPDM), P.C	150	-55	4	1	2	1	1	5	2	2	1	3	5	5	2	5	1
Fluorosilicone, VMQ	180	-60	5	5	4	1	1	1	4	3	3	3	2	1	3	3	3
Neoprene, CR	120	-35	5	5	2	2	2	2	2	3	5	3	3	5	5	2	1

Pressure Range

Scale:psi

Code	P09	P1	P2	P2C	P3	P4	P5	P5A	P6	P7	P7A	P8	P8A	P9	P9A	P10	P11	P12	P13
Range	3	15	30	50	60	100	150	160	200	300	400	500	600	750	800	1000	1500	2000	3000
Overload	6	30	60	100	120	200	300	320	400	600	800	1000	1200	1500	1600	2000	3000	4000	6000

Code	P14	P141	P15	P16	PV1	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
Range	5000	6000	7500	10000	VAC/0	VAC/15	VAC/30	VAC/60	VAC/100	VAC/150	VAC/160	VAC/200	VAC/300	VAC/600
Overload	10000	12000	15000	20000	15	30	60	120	200	300	320	400	600	1200

Scale:bar

Code	R1	R09	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18
Range	0.4	0.5	0.6	1	1.6	2	2.5	3	3.5	4	5	6	7	10	16	20	25	30	35
Overload	0.8	1	1.2	2	3.2	4	5	6	7	8	10	12	14	20	32	40	50	60	70

Code	R19	R20	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30	R31	R32	RV1	RC1	RC11	RC2	RC21
Range	40	50	60	70	100	160	200	250	300	350	400	500	600	700	-1/0	-1/0.6	-1/1	-1/1.5	-1/2
Overload	80	100	120	140	200	320	400	500	600	700	800	1000	1200	1400	1	1.2	2	3	4

Code	RC22	RC3	RC31	RC4	RC41	RC5	RC6	RC62	RC7	RC8	RC9
Range	-1/2.5	-1/3	-1/4	-1/5	-1/6	-1/9	-1/15	-1/19	-1/24	-1/30	-1/40
Overload	5	6	7	10	12	18	30	38	48	60	80

Scale:kg/cm²

Code	G1	G09	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18
Range	0.4	0.5	0.6	1	1.6	2	2.5	3	3.5	4	5	6	7	10	16	20	25	30	35
Overload	0.8	1.0	1.2	2	3.2	4	5	6	7	8	10	12	14	20	32	40	50	60	70

Code	G19	G20	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	GV1	GC1	GC11	GC2	GC21
Range	40	50	60	70	100	160	200	250	300	350	400	500	600	700	1	-1/0.6	-1/1	-1/1.5	-1/2
Overload	80	100	120	140	200	320	400	500	600	700	800	1000	1200	1400	2	-1/1.2	-1/2	-1/3	-1/4

Code	GC22	GC3	GC31	GC4	GC41	GC42	GC5	GC51	GC6	GC63	GC7	GC8	GC9
Range	-1/2.5	-1/3	-1/4	-1/5	-1/6	-1/7	-1/9	-1/10	-1/15	-1/20	-1/24	-1/30	-1/40
Overload	-1/5	-1/6	-1/8	-1/10	-1/12	-1/14	-1/18	-1/20	-1/30	-1/40	-1/48	-1/60	-1/80

Note: If you need the other ranges not listed, please contact with our distributors.

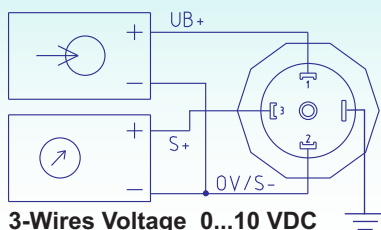
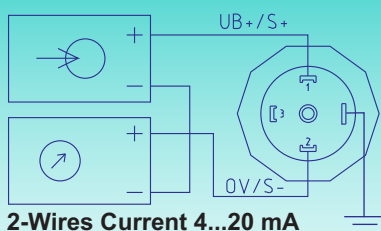
Electrical Connection



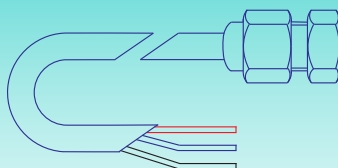
Note: If you need the other electrical connections not listed, please contact with our distributors.

Writing

DIN Connection

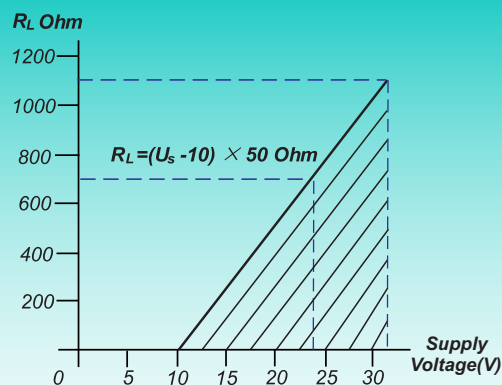


Cable Connection



RED-SEE TABLE
WHITE-SEE TABLE
BLACK-SEE TABLE

Output	Red	Black	White
Voltage	+ V Supply	- V Supply	Output
Current	+ V Supply	- V Supply	Grounding



The diagram shows the optimum ratio between the load and supply voltage of the 4-20mA transmitter. For a correct use, any combination of load resistance and supply voltage, choose the slant line area.

Order Information

Example:

P-2A-PT2 **3** **R** **S** **M** **2** **A** **000** **F** **K3** **V** **H** **Z** **X**

3 0.25% **4** 0.5%

P-2A-PT23RSM2A000FK3VH-ZX

R Relative **A** Absolute

S 316SS	M Monel	H Hast'C
W 316LSS	A 304SS	L Others

M Male	F Female	W Weld	OL Others
2 1/2"NPT	3 3/8"NPT	4 1/4"NPT	
D G1/2	H G3/8	E G1/4	
G R3/8	B R1/4	J M20*1.5	
K M14*1.0	9 9/16"-18UNF	7 7/16"-20UNF	

A DIN 43650	D 1/2" Female DIN	F Gland Cable
P Flexible Cable	M M12 Cable	L Others

000 No Wire	0M1 0.1m	1M1 1.1m
05M 5m	10M 10m	01F 1 Feet
10F 10 Feet	25F 25 Feetand so on.

A 0...10 VDC	B 0...5 VDC	C 1...5 VDC
D 0.5..4.5 VDC	E 1...6 VDC	F 4...20 mA
L Others		

Please refer to the range table and write down the code you need.

Vacuum Compound Pressure

B NBR (Buna Rubber)	V FPM (Viton)	S MVQ (Silicone Rubber)
N CR (Neoprene)	E EPDM(Ethylene Propylene)	K FFKM
L Others		

ZX Cleaned for Oxygen Service	ZC Certificate of Accuracy (Factory)	ZE Certificate of Accuracy (TAF)
ZN NACE-MR0175-2002 Heat Treatment	PH Extra High Purity Treatment	ZI Certificate of Accuracy (NIST)
ZY Stainless Steel Tag Plate	Z3 316SS Housing	0Q Customized Laser Mark

3 **R** **S** **M** **2** **A** **000** **F** **K3** **V** **H** **Z** **X**

Option

Certificate of Accuracy
(NIST)

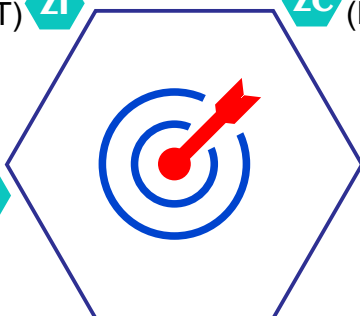
ZI

Certificate of Accuracy
(Factory)

ZC

Certificate of Accuracy
(TAF)

ZE



316SS Housing

Z3

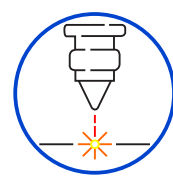
Stainless Steel Tag Plate

ZY



00

Customized Laser Mark

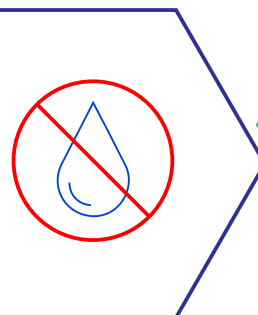
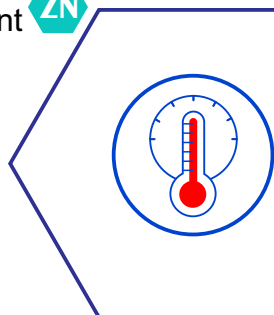


PH

Extra High Purity Treatment

NACE-MR0175-2002
Heat Treatment

ZN

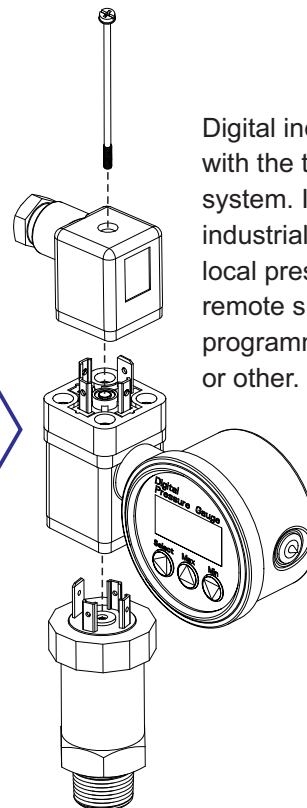


ZX

Cleaned for Oxygen
Service

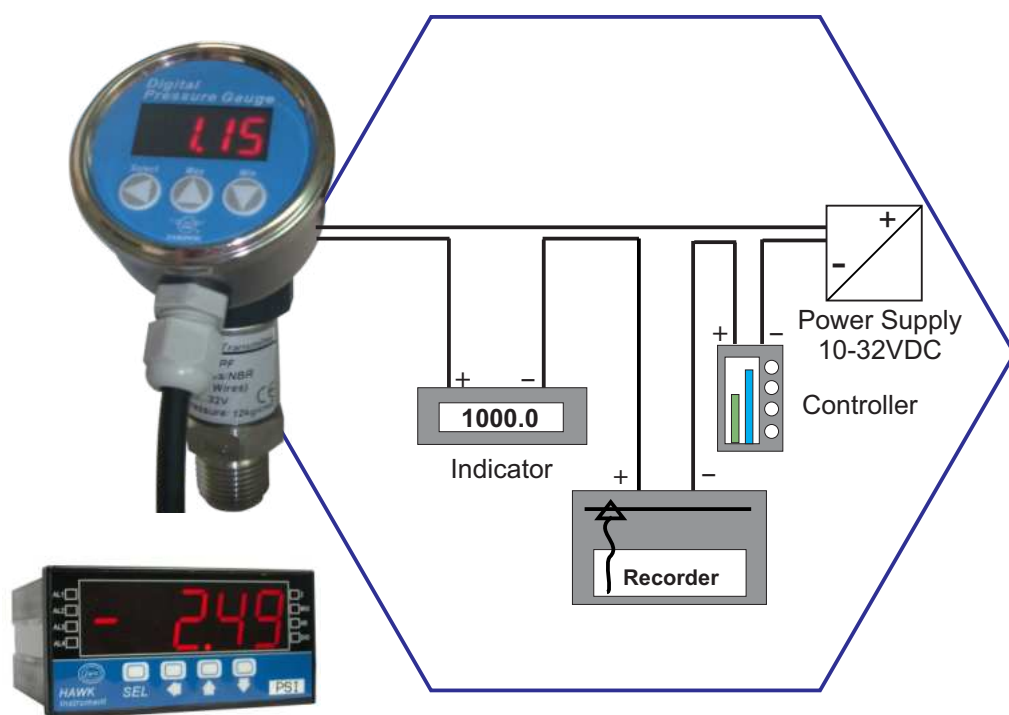
Accessories

Plug-in Digital Indicator



Digital indicating can be used with the transmitter for your system. It is ideal for all industrial applications when a local pressure reading and a remote signal transmitter to a programmable logic controller or other.

High Level Current Wiring Connecting (4-20 mA 2 wires Loop Power)



The pressure transmitter 4-20mA output units are designed to have current flow in one direction only. The maximum supply voltage for 4-20mA current output transmitter is 32VDC. The minimum supply voltage is dependent upon the loop resistance of the circuit. The load limitation chart shows the minimum supply voltage required for given loop resistance. We suggest that the electrical shield should be connected to the system loop circuit ground to improve electrical noise rejection. For minimum noise susceptibility, avoid installing the transducer and transmitter's cable in a conduit that may contains a high current AC power cables. If possible, avoid installing the cable near inductive equipments.

Limited Warranty and Liability

HAWK GAUGE CO.,LTD warrants all its mechanical instruments to be free from defects in materials and workmanship. HAWK agrees to repair or replace any thermometers if returned to our factory, transportation charges prepaid, and after which examination reveals is to be defective due to faculty workmanship or material. This warrant should not apply to subject to the following terms and conditions:

- A. The product has not been subjected to misuse, neglect, abuse , accident, incorrect mounting, improper use or misapplication such as negligence, accident, vandalism, shock or vibration.
- B. The performance of any system of which HAWK's products are a component part.
- C. The product has not been exposed to any other service, range or environment of greater severity than that for which the products were designed.
- D. The product has not been altered or repaired by anyone except HAWK GAUGE or its authorized service agencies.
- E. The serial number or date code has not been removed, defaced or changed.
- F. The actual pressure&temperature occurring exceed the values specified for HAWK Thermometer.

Unless otherwise specified in a manual or warranty card, or agree to in a writing signed by HAWK GAUGE office, HAWK Thermometer products shall be warranted for one years from the date of sale.

This warranty is in lieu of all other warranties expressed or implied, and of all obligations or liabilities on its part for damages including but not limited to consequential damages, following the use of misuse of instruments sold by it. No agent is authorized to assume for it any liability except as set forth above.

Note

HAWK GAUGE CO.,LTD reserves the right to make product improvements and change its specifications at any time stated throughout this brochure without notification. Please contact the factory on all critical dimensions and specifications for verification.

HAWK GAUGE is not expert in the customer's technical field and therefore doesn't warrant suitability of it's product for the application selected by customer.



Data Sheet No: MKDP2APT2A1-E