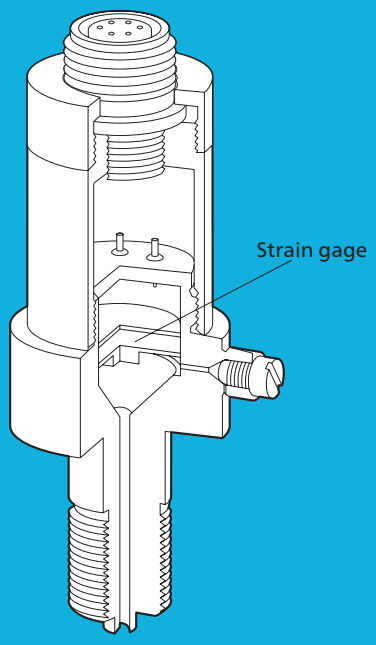
Pressure Transducers

■Pressure Transducers



Pressure transducers convert liquid or gas pressures into electric quantities. According to measuring purposes, they are connected to various instruments for monitoring, recording and controlling pressures.
They have highly precise dedicated self-temperature-compensated strain gages incorporated as pressure detecting elements and feature a hermetically-sealed structure with inert gas filled in, ensuring superior linearity, thermal characteristics and waterproofness. Thus, they enable highly precise and stable pressure measurement for a long period of time in a wide range of fields including chemical, machinery and steelmaking.

Features

- Long-term stable operation
- Highly precise
- Excellent thermal characteristics

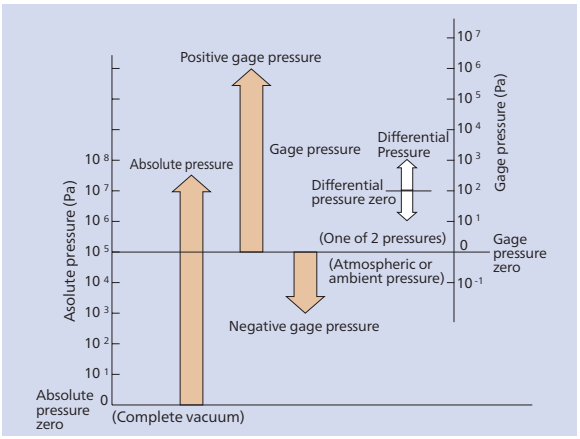
Important Notice
Pressure transducers cannot be used in hydrogen environment.
They cannot be used if the object pressure medium is hydrogen.

■Types of Pressure

1) Absolute Pressure
Absolute pressure is a pressure expressed by referring to vacuum (complete) pressure as zero. It is mainly used in physical science for expressing atmospheric pressure, etc. Absolute pressure is calculated by following formula :
absolute pressure = atmospheric pressure + gage pressure.
Kyowa mentions absolute pressure as "abs." to differentiate absolute pressures to gage pressures.

2) Gage Pressure
Gage pressure is a pressure expressed by referring to atmospheric or ambient pressure as zero. Industrially, it is merely called pressure unless otherwise noted. Pressure higher than atmospheric or ambient pressure is called positive gage pressure and pressure lower than atmospheric or ambient pressure, negative gage pressure. Though ISO recommends to affix "Pe" or "Gauge" to gage pressure, Kyowa does not affix either of them to gage pressure.

3) Differential Pressure
Differential pressure is a difference between a specific pressure and other. Thus, it may be either positive or negative.



Relations between Pressure Units

Pa	bar	kgf/cm²	atm	mmH_2O(mmAq)
1	1×10^{-5}	1.01972×10^{-5}	9.86923×10^{-6}	1.01972×10^{-1}
1×10^{5}	1	1.01972	9.86923×10^{-1}	1.01972×10^{4}
9.80665×10^{4}	9.80665×10^{-1}	1	9.67841×10^{-1}	1×10^{4}
1.01325×10^{5}	1.01325	1.03323	1	1.03323×10^{4}
9.80665	9.80665×10^{-5}	1×10^{-4}	9.67841×10^{-5}	1

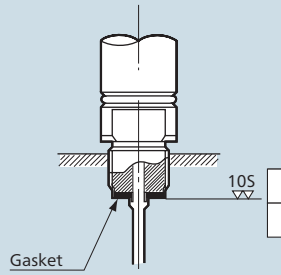
1 Pa=1 N/m^2
1 Torr=1 mmHg=1.33322×10^{2} Pa=1.33322×10^{-3} bar=1.35951×10^{-3} kgf/cm^2
=1.31579×10^{-3} atm=1.35951×10 mmH_2O(mmAq)
1 psi=6894.7 Pa=7.0307×10^{-2} kgf/cm^2

To Ensure Safe Usage

- Install each pressure transducer with the tightening torque stated in the Instruction Manual.
- Do not apply any load exceeding the safe overload rating. Excess load may break the pressure transducer.
- If pressure is applied repetitively, select a model which satisfies the following 2 requirements:
  - The rated capacity covers the peak pressure.
  - 50% the rated capacity covers the maximum pressure amplitude.
- If the pressure transducer may receive an unexpected excess pressure, select a model with a higher rated capacity. Especially, in the case of a pressure transducer with a higher rated capacity, if there exists air in the measuring medium, install a protective case around the pressure transducer for safety assurance.

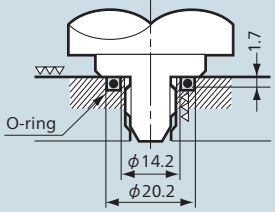
Typical Installation with Standard Accessories

For other methods of installation, contact us.

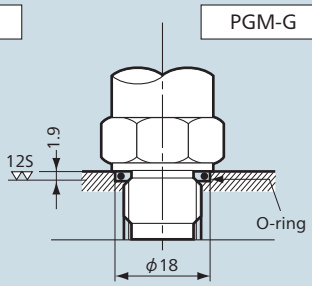


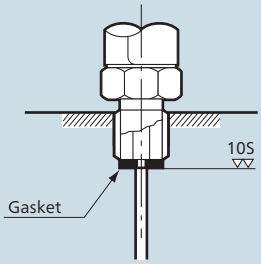
PG-U
PHB-A

PAB-A



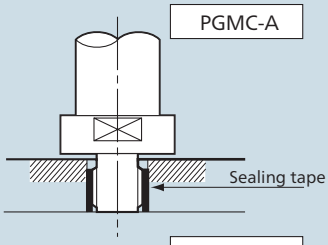
PGM-G



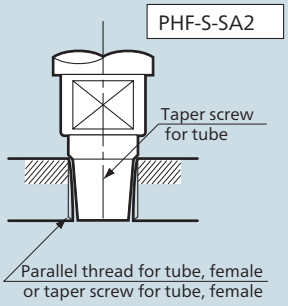


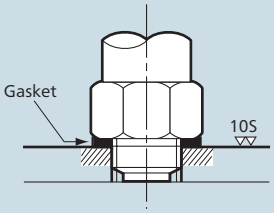
PGS-A	PAV-R,U
PG-H	PAA-R,U
PGR-A	PAG-A
PHS-A	

PGMC-A



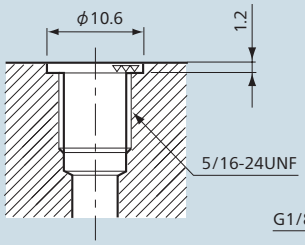
PHF-S-SA2



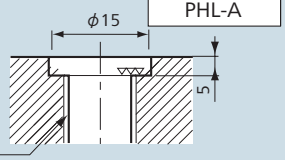


PGM-D	PHC-B
PGM-E	PVL-A,B,C,D
PGM-H	PAL-A,B
PE-RMT	
PE-F	

PHF-S-SA4

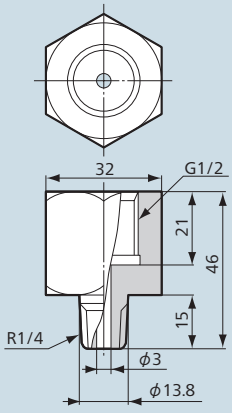


PGL-A
PHL-A



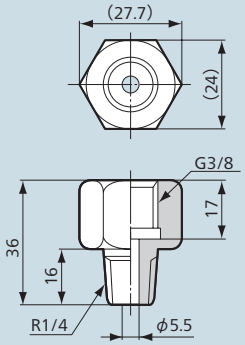
Screw Standard Conversion Adapters (G-to-R Conversion)

H-3832 G1/2→R1/4



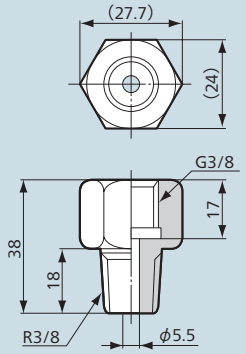
Material: SUS303

H-5237 G3/8→R1/4



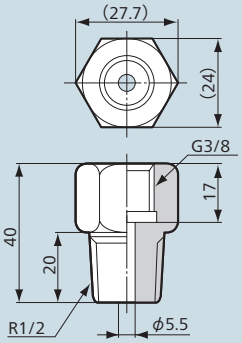
Material: SUS304

H-5238 G3/8→R3/8



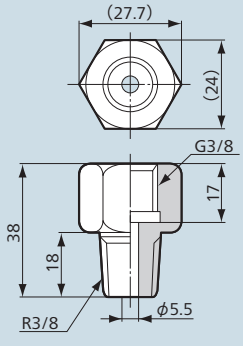
Material: SUS304

H-5239 G3/8→R1/2



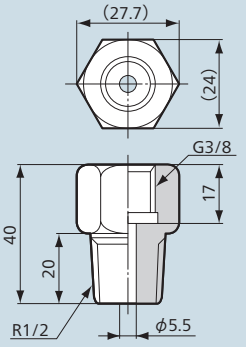
Material: SUS304

H-20109 G3/8→R3/8



Material: C3601-5B

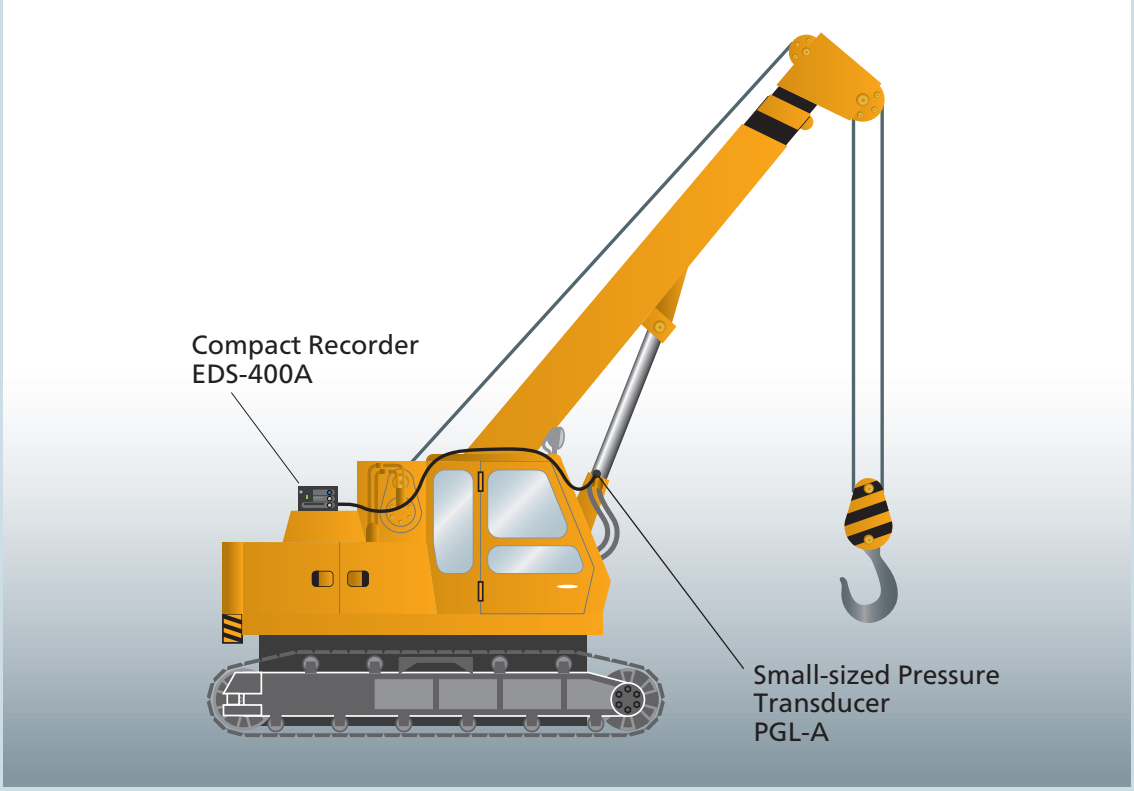
H-20110 G3/8→R1/2



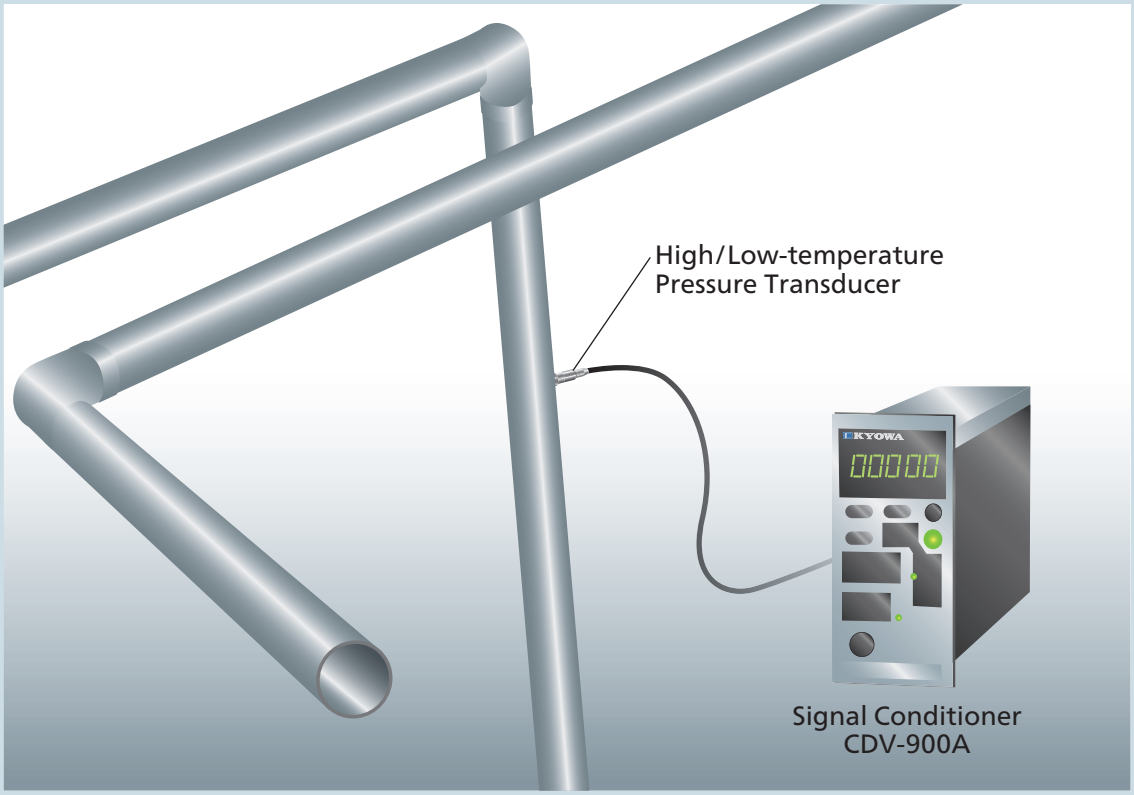
Material: C3601-5B

Pressure Transducers Examples of Measurement (Image)

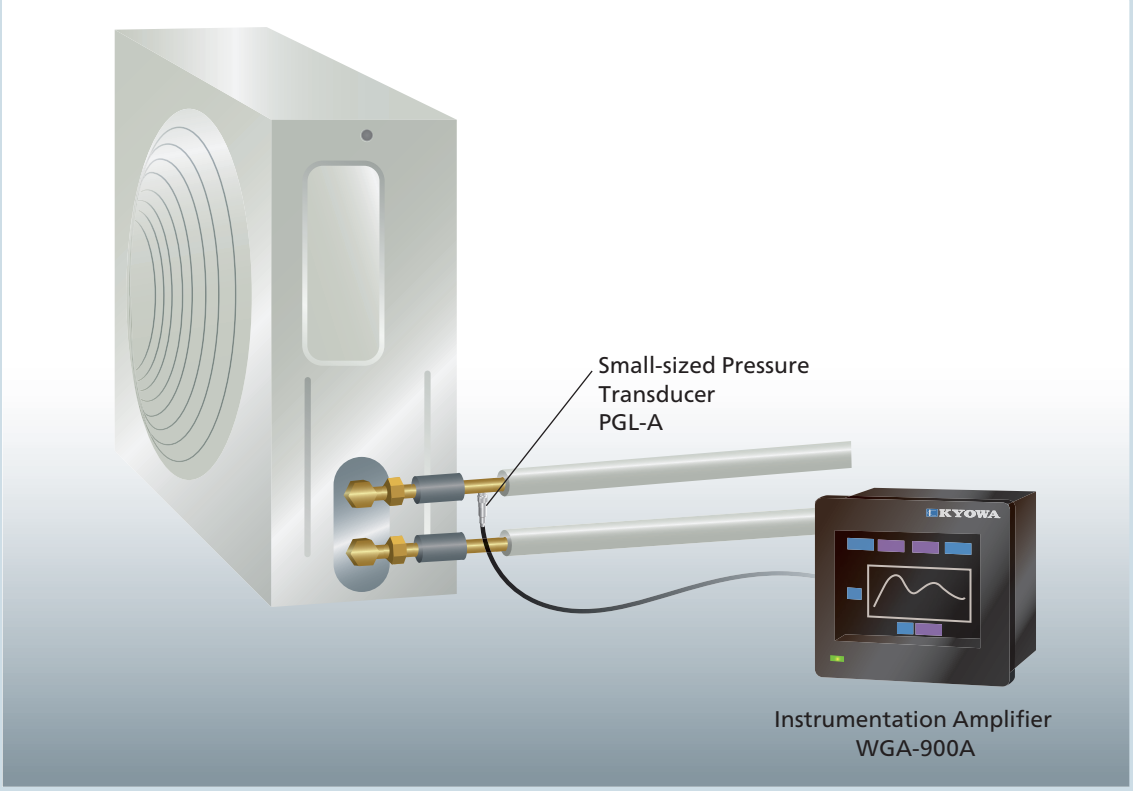
●Hydraulic Pressure monitor or control of construction machine



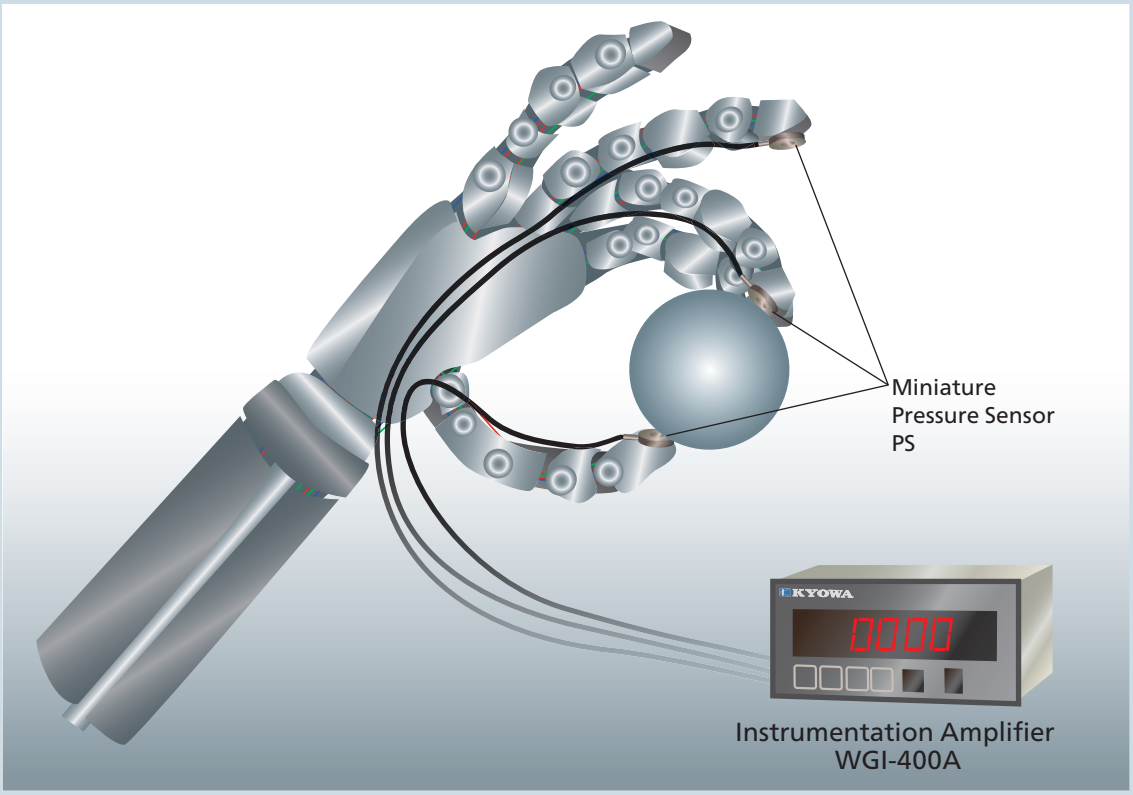
●Pressure measurement in pipes etc.



●Refrigerant pressure monitor of air conditioning facilities.



●Usable as a touch sensor for built-in robot parts.



Pressure Transducers Selection Chart

General Purpose

	Models	Rated Capacity kPa 20	50	100	200	500	MPa 1	2	3	5	10	20	30	50	100	200	300	Pages
Low Pressure	Highly Accurate **PGM-G**	Yes	Yes	Yes														2-90
Small-sized	Sensing Surface Diameter 5.5 mm **PGMC-A**				Yes	Yes	Yes											2-91
	Highly Reliable **PG-U**				Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes				2-85
	Highly Accurate **PGM-H**					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				2-88
	Highly Accurate **PGL-A**						Yes	Yes		Yes	Yes	Yes		Yes				2-83
	Flush Diaphragm Type **PGM-E**						Yes	Yes		Yes	Yes	Yes		Yes				2-89
	Low-cost **PGS-A**						Yes	Yes		Yes	Yes	Yes	Yes	Yes				2-86
	High Response Flush Diaphragm **PGM-D**									Yes	Yes	Yes		Yes				2-92
High Pressure	High Pressure **PG-H**														Yes	Yes		2-87
	-20 to 150°C NEW **PGH-S-100MPSA17**														Yes			2-101
	Large Capacity NEW **PGH-S-300MPSA19**																Yes	2-102

High/Low Temperature

	Models	Rated Capacity MPa 1	2	3	5	10	20	30	50	Pages
High/Low Temperature	-196 to 200°C **PHB-A**	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2-97
High/Low Temperature Small-sized	-196 to 200°C **PHL-A**	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2-84
High/Low Temperature Small-sized	-40 to 150°C **PHF-S-S1 Series** NEW		Yes		Yes	Yes	Yes			2-98
High/Low Temperature Small-sized	-40 to 150°C **PHF-S-SA2**		Yes		Yes	Yes	Yes			2-99
High/Low Temperature Small-sized	-40 to 150°C **PHF-S-SA4**		Yes		Yes	Yes				2-100
Flush diaphragm High Temperature	23 to 230°C **PHC-B**		Yes		Yes	Yes	Yes			2-96

For Absolute·High Pressure

	Models	Rated Capacity kPa 200	500	MPa 1	2	5	10	20	Pages
Absolute	Measurement Referring to Vacuum **PAB-A**	Yes	Yes	Yes	Yes				2-94
High Reliable (Sputter Gage Type)	-30 to 200°C **PHS-B**	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2-95
High Pressure Resistant	Critical Overload 117.7 MPa **PGR-A**			Yes	Yes	Yes	Yes	Yes	2-93

Water-cooled Type

Models		Rated Capacity: kPa 200	Rated Capacity: kPa 500	Rated Capacity: MPa 3	Pages
Engine Pressure Transducer (Matsuoka Type)	300°C or Lower **PE-RMT** 	Yes	Yes		5-10
Engine Pressure Transducer	300°C **PE-F** 			Yes	5-11

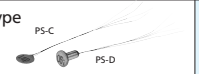
Pressure Transmitter

Models		Rated Capacity: kPa 200	kPa 500	MPa 1	MPa 2	MPa 5	MPa 10	MPa 20	MPa 30	MPa 50	Pages
Highly Stable Current Output	Output 4 to 20 mA Highly Reliable **PAG-2KA** 	Yes									2-107
Voltage Output	Output 0 to 5 V **PAV-R/U** 			Yes		Yes	Yes	Yes	Yes	Yes	2-103
Current Output	Output 4 to 20 mA **PAA-R/U** 		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2-104
Voltage Output	Output 0 to 50 V, 1 to 5 V **PVL** 		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2-105
Current Output	Output 4 to 20 mA **PAL** 		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2-106

Differential Pressure Measurement

Models		Rated Capacity: kPa 1	kPa 2.5	kPa 5	kPa 7	kPa 10	kPa 20	kPa 50	kPa 100	kPa 200	kPa 500	MPa 1	MPa 2	Pages
Minute Differential Pressure Transducer	For Wind Pressure Measurement **PDS-A** 	Yes	Yes	Yes	Yes									2-111
	For Wind Pressure Measurement **PDV-A** 	Yes	Yes	Yes	Yes									2-112
Minute Differential Pressure	Max.Line Pressure 2.94MPa **PD-A** 					Yes	Yes	Yes	Yes	Yes				2-113
Stainless steel Differential Transducer	Max.Line Pressure 30 MPa **PDU-A** 							Yes	Yes	Yes	Yes	Yes	Yes	2-114

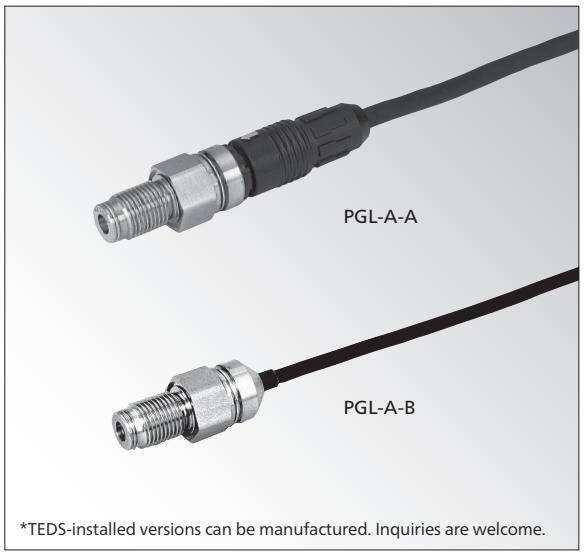
Distributed Pressure Measurement

Models		Rated Capacity: kPa 20	kPa 50	kPa 100	kPa 200	kPa 500	MPa 1	MPa 2	MPa 3	MPa 5	MPa 7	Pages
Small -sized Type	For GAS **PSS** 	Yes	Yes	Yes								2-109
	Ultra-thin type **PS-C/D** 		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2-108
	Smallest size **PSM-AB** 			Yes	Yes							2-110

PGL-A

Small-sized Pressure Transducer

●1 to 50 MPa



*TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact & Lightweight
Highly stable
High Frequency Response

PGL-A series pressure transducers are suitable for pressure measurement in limited space. The semi-flush diaphragm at the top end ensures excellent response and dynamic characteristics. There are 2 types: A type with removable cable and B type with integrated cable.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO (PGL-A-1 and 2MP-A/B)
	Within ±0.3% RO (PGL-A-5 to 50MP-A/B)
Hysteresis	Within ±0.5% RO (PGL-A-1 and 2MP-A/B)
	Within ±0.2% RO (PGL-A-5 to 50MP-A/B)
Repeatability	0.2% RO or less
Rated Output	2 mV/V (4000 μm/m) ±20% (±30% with PGL-A-1 and 2MP-A/B)

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	-10 to 60°C
Temperature Effect on Zero Balance	Within ±0.05% RO/°C (PGL-A-1 to 2MP-A/B)
	Within ±0.03% RO/°C (PGL-A-5 to 50MP-A/B)
Temperature Effect on Output	Within ±0.03%/°C

Electrical Characteristics

Safe Excitation Voltage	6 V AC or DC
Recommended Excitation Voltage	1 to 3 V AC or DC
Input Resistance	350 Ω±2%
Output Resistance	350 Ω±2%
Cable	PGL-A-A: 4-conductor (0.18 mm²) vinyl shielded cable,
	4.6 mm diameter by 3 m long, terminated with connector plug
	PGL-A-B: 4-conductor (0.08 mm²) vinyl shielded cable,
	3.2 mm diameter by 30 cm long, terminated with connector plug
	(Shield wire is not connected to mainframe.)

Mechanical Properties

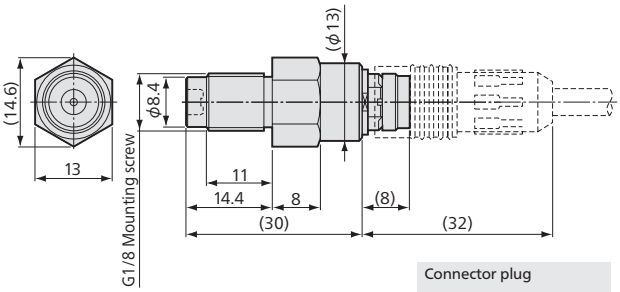
Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	SUS 630 (Liquid-contacting part)
Weight	Approx. 20 g (Excluding cable)
Degree of Protection	PGL-A-A: IP67 (IEC 60529)
	PGL-A-B: IP64 (IEC 60529)
Mounting Screw	G1/8, male

Standard Accessories

Gasket (Mild copper) (SS-105 O-ring is also usable.)

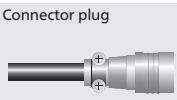
Models		Rated Capacity	Natural Frequencies (Approx.)
Connector Type	Cable Integrated Type		
PGL-A-1MP-A	PGL-A-1MP-B	1 MPa	48 kHz
PGL-A-2MP-A	PGL-A-2MP-B	2 MPa	74 kHz
PGL-A-5MP-A	PGL-A-5MP-B	5 MPa	122 kHz
PGL-A-10MP-A	PGL-A-10MP-B	10 MPa	149 kHz
PGL-A-20MP-A	PGL-A-20MP-B	20 MPa	210 kHz
PGL-A-50MP-A	PGL-A-50MP-B	50 MPa	294 kHz

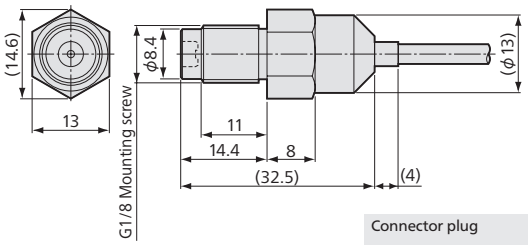
Dimensions



PGL-A-A

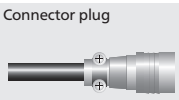
Connector plug





PGL-A-B

Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PGL-A Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55

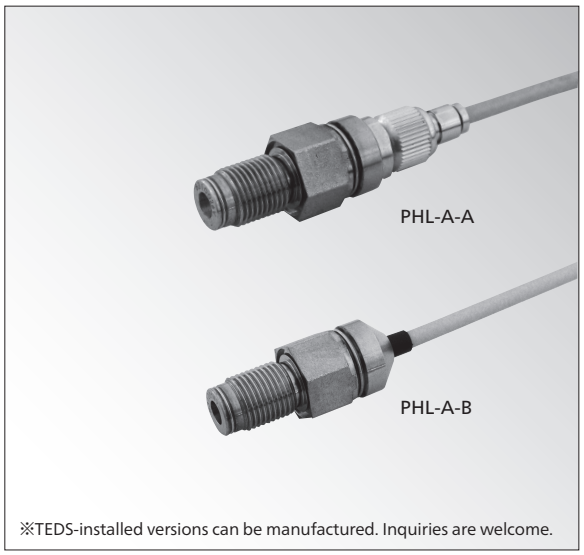

Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PHL-A

●1 to 50 MPa

Small-sized High/Low-Temperature Pressure Transducer



※TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact & Lightweight High and Low Temperature High Frequency Response

PHL-A- series pressure transducers are suitable for pressure measurement in not only limited space under both high and low temperature environments but also highly viscous heated fluids like melt resin, high-temperature gases and LPG/LNG tanks. A semi-flush diaphragm at the top not only ensures excellent response and dynamic characteristics.
Connector-equipped PHL-A-A is also available.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO (PHL-A-1 and 2MP)
	Within ±0.3% RO (PHL-A-3 to 50MP)
Hysteresis	Within ±0.5% RO (PHL-A-1 and 2MP)
	Within ±0.2% RO (PHL-A-3 to 50MP)
Repeatability	0.2% RO or less
Rated Output	2 mV/V (4000 μm/m) ±20% (±30% with PHL-A-1 and 2MP)

Environmental Characteristics

Safe Temperature Range	PHL-A-A: -40 to 150°C
	PHL-A-B: -196 to 210°C
	Cable connectors:-25 to 85°C
Compensated Temperature Range	PHL-A-A: -20 to 150°C
	PHL-A-B: -196 to 200°C
	Cable connectors:-25 to 85°C
Temperature Effect on Zero Balance	Within ±0.05% RO/°C (PHL-A-1 and 2MP)
	Within ±0.03% RO/°C (PHL-A-3 to 50MP)
Temperature Effect on Output	Within ±0.03%/°C

Electrical Characteristics

Safe Excitation Voltage	6 V AC or DC
Recommended Excitation Voltage	1 to 3 V AC or DC
Input Resistance	350 Ω±2%
Output Resistance	350 Ω±2%
Cable	PHL-A-A: 4-conductor (0.09 mm²) fluoroplastic shielded cable,
	3.1 mm diameter by 4 m long,
	terminated with connector plug
	PHL-A-B: 4-conductor (0.09 mm²) fluoroplastic shielded cable,
	3.1 mm diameter by 30 cm long,
	terminated with connector plug
	(Shield wire is not connected to mainframe.)

Mechanical Properties

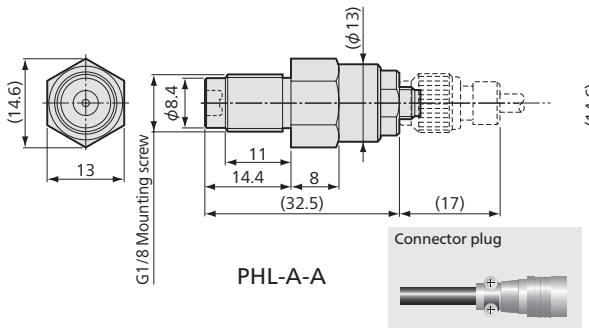
Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	SUS 630 (Liquid-contacting part)
Weight	Approx. 20 g ((Excluding cable)
Degree of Protection	PHL-A-A: IP67 (IEC 60529)
	PHL-A-B: IP64 (IEC 60529)
Mounting Screw	G1/8, male

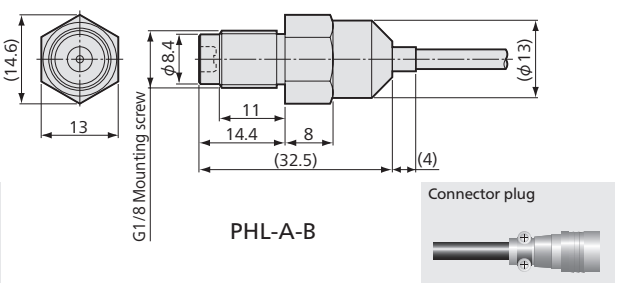
Standard Accessories

Gasket (Mild copper) (SS-105 O-ring is also usable.)

Models		Rated Capacity	Natural Frequencies (Approx.)
Connector Type	Cable Integrated Type		
PHL-A-1MP-A	**PHL-A-1MP-B**	1 MPa	48 kHz
PHL-A-2MP-A	**PHL-A-2MP-B**	2 MPa	74 kHz
——	**PHL-A-3MP-B**	3 MPa	94 kHz
PHL-A-5MP-A	**PHL-A-5MP-B**	5 MPa	122 kHz
PHL-A-10MP-A	**PHL-A-10MP-B**	10 MPa	149 kHz
PHL-A-20MP-A	**PHL-A-20MP-B**	20 MPa	210 kHz
——	**PHL-A-30MP-B**	30 MPa	250 kHz
PHL-A-50MP-A	**PHL-A-50MP-B**	50 MPa	294 kHz

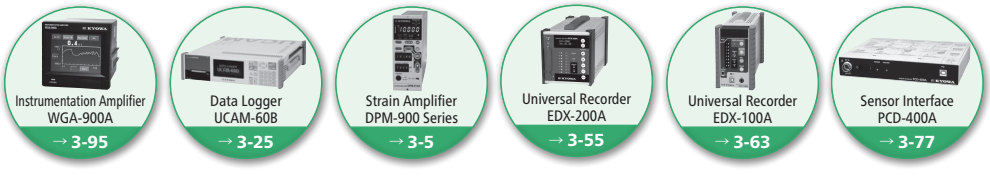
Dimensions





●Physical quantity indication ●Static measurement ●Dynamic measurement

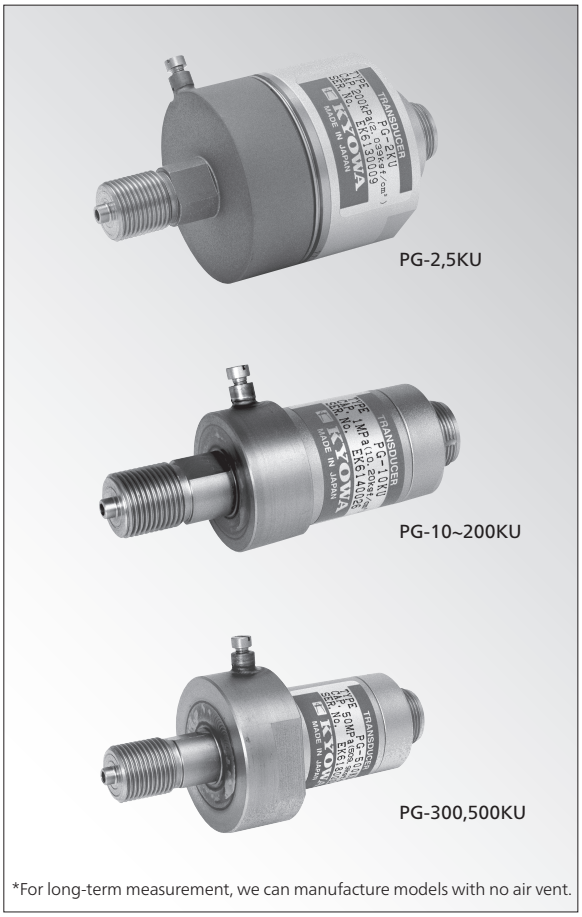
PHL-A Recommended products for combination



PG-U

Pressure Transducer

●Highly Reliable ●200 kPa to 50 MPa



*For long-term measurement, we can manufacture models with no air vent.

Highly Accurate and Reliable Pressure Transducers

●Hermetically-sealed structure with inert gas filled in
●Wide range of rated capacities
●Abundant application achievements

Highly accurate and reliable PG-U series pressure transducers are hermetically sealed with inert gas filled in to enable a long-term stable measurement. Typical applications include pressure measurement of hydraulic or pneumatic cylinder and pressure test of high-pressure water or gas pipe.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.3% RO (PG-2 to 10KU)
	Within ±0.2% RO (PG-20 to 500KU)
Hysteresis	Within ±0.3% RO (PG-2 to 10KU)
	Within ±0.2% RO (PG-20 to 500KU)
Repeatability	0.1% RO or less
Rated Output	2 mV/V (4000 μm/m) ±0.5% (±1% with PG-2 to 10KU)

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	-10 to 60°C
Temperature Effect on Zero Balance	Within ±0.02% RO/°C
Temperature Effect on Output	Within ±0.02%/°C

Electrical Characteristics

Safe Excitation Voltage	15 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	350 Ω±1%
Output Resistance	350 Ω±1%
Dedicated connection cable	TT-01
Cable	4-conductor (0.3mm²) chloroprene shielded cable, 7.6 mm diameter by 3 m long, terminated with connector plug (Shield wire is connected to mainframe.)

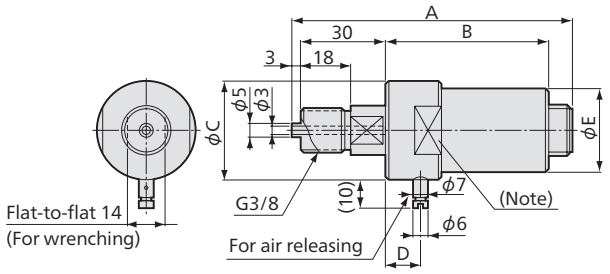
Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Case: Anode oxide coated aluminum Liquid-contacting part: SUS 630 For 10KU or more, the mainframe is die cast zinc alloy (chrome plated)
Weight	Approx. 300 g (2, 5KU is approx. 500 g) (Excluding cable)
Degree of Protection	IP54 (IEC 60529)
Mounting Screw	G3/8, male

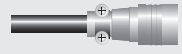
Standard Accessories Gasket (Mild copper)

*Do not use PG-200KU to PG-500KU for endurance/fatigue tests.
*Avoid using for a long-term measurement of gas pressure if much importance is attached to the stability of output in a minute range.

■Dimensions



Connector plug



Note: 2 flats are provided only for PG-300 and 500KU. Do not apply a wrench to the flats.

Models	Rated Capacity	Natural Frequencies (Approx.)	A	B	ϕC	D	ϕE
PG-2KU	200 kPa	2 kHz	104	63	54	4	54
PG-5KU	500 kPa	4 kHz					
PG-10KU	1 MPa	7 kHz	98	56	36	10	30
PG-20KU	2 MPa	13 kHz					
PG-50KU	5 MPa	21 kHz	102	60	36	13	30
PG-100KU	10 MPa	29 kHz					
PG-200KU	20 MPa	40 kHz					
PG-300KU	30 MPa	45 kHz	102	60	46	13	30
PG-500KU	50 MPa	50 kHz					

●Physical quantity indication ●Dynamic measurement

PG-U Recommended products for combination
Instrumentation Amplifier WGA-900A → 3-95
Strain Amplifier DPM-900 Series → 3-5
Universal Recorder EDX-200A → 3-55
Universal Recorder EDX-100A → 3-63
Memory Recorder/Analyzer EDX-3000B → 3-69
Sensor Interface PCD-400A → 3-77

PGS-A

●Compact & Lightweight ●1 to 50 MPa

Small-sized Pressure Transducer

Compact & Lightweight
High Vibration & Impact Resistance

●Not affected by atmospheric pressure change
●High vibration & impact resistance
Vibration acceleration 490.3 m/s² (50 G)
Impact acceleration 4903 m/s² (500 G)

PGS-A series pressure transducers are designed and manufactured to be especially compact and lightweight.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.4% RO (PGS-10KA)
	Within ±0.3% RO (PGS-20KA)
	Within ±0.2% RO (PGS-50 to 500KA)
Hysteresis	Within ±0.2% RO
Repeatability	0.1% RO or less
Rated Output	2 mV/V (4000 μm/m) ±0.5%

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	-10 to 60°C
Temperature Effect on Zero Balance	Within ±0.02% RO/°C
Temperature Effect on Output	Within ±0.01%/°C

Electrical Characteristics

Safe Excitation Voltage	15 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	600 Ω±17.5%
Output Resistance	500 Ω±1%
Cable	4-conductor (0.3 mm²) chloroprene shielded cable,
	4.5 mm diameter by 3 m long, terminated with connector plug
	(Shield wire is not connected to mainframe.)

Mechanical Properties

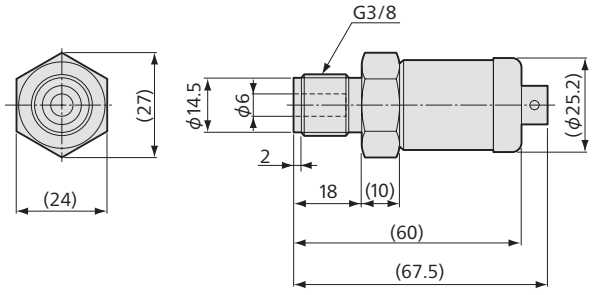
Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Case: Anode oxidized aluminum
	Liquid-contacting part: SUS 630
Weight	Approx. 120 g (Excluding cable)
Degree of Protection	IP52 (IEC 60529)
Mounting Screw	G3/8, male

Standard Accessories Gasket (Mild copper)

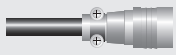
*We can also manufacture models with no air vent. When ordering, suffix "M1" to model numbers stated below.

Models	Rated Capacity	Natural Frequencies (Approx.)
PGS-10KA	1 MPa	11 kHz
PGS-20KA	2 MPa	17 kHz
PGS-50KA	5 MPa	27 kHz
PGS-100KA	10 MPa	35 kHz
PGS-200KA	20 MPa	52 kHz
PGS-300KA	30 MPa	64 kHz
PGS-500KA	50 MPa	85 kHz

Dimensions



Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PGS-A Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55


Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PG-H

High Pressure Transducer

- Highly Reliable Inert Gas Sealed Structure
- 100 & 200 MPa

Compact, lightweight, highly accurate, and highly reliable

Available with rated capacities of 100 and 200 MPa, the PG-H series pressure transducers are hermetically sealed with inert gas filled in, enabling long-term stable measurement.

Specifications

Performance

Rated Capacity	PG-1TH: 100 MPa
	PG-2TH: 200 MPa
Nonlinearity	Within ±0.2% RO
Hysteresis	Within ±0.2% RO
Rated Output	1.5 mV/V (3000 μm/m)±0.5%

Environmental Characteristics

Safe Temperature Range	-20 to 80°C
Compensated Temperature Range	-10 to 70°C
Temperature Effect on Zero Balance	Within ±0.02% RO/°C
Temperature Effect on Output	Within ±0.01%/°C

Electrical Characteristics

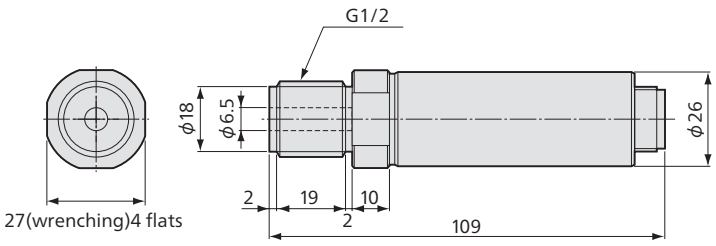
Safe Excitation Voltage	15 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	350 Ω±1.5%
Output Resistance	350 Ω±1.5%
Cable	4-conductor (0.3 mm²) chloroprene shielded cable, 7.6 mm diameter by 3 m long, terminated with waterproof connector plug to transducer and connector plug to amplifier (Shield wire is not connected to mainframe.)

Mechanical Properties

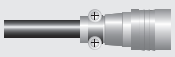
Safe Overload Rating	150%
Natural Frequencies	Approx. 250 kHz
Material	Case: SUS (Metallic finish)
	Liquid-contacting part: SUS 630
Weight	Approx. 220 g (Excluding cable)
Degree of Protection	IP52 (IEC 60529)
Mounting Screw	G1/2, male

Standard Accessories Gasket (Mild copper)

Dimensions



Connector plug



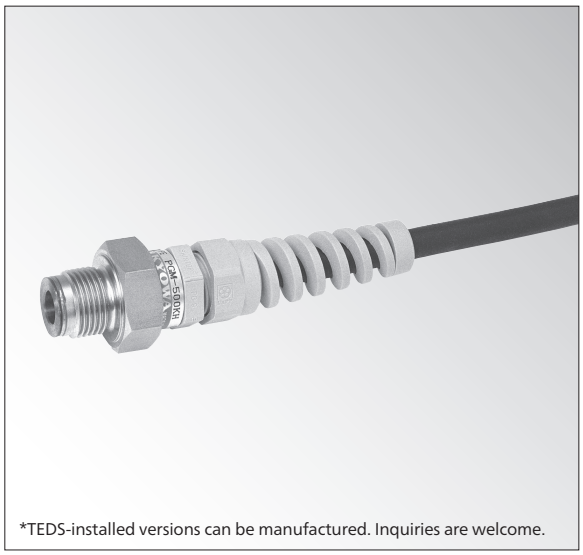
PG-H Recommended products for combination

- Physical quantity indication: Instrumentation Amplifier WGA-900A → 3-95
- Static measurement: Data Logger UCAM-60B → 3-25
- Dynamic measurement: Strain Amplifier DPM-900 Series → 3-5

PGM-H

●Highly Accurate ●500 kPa to 50 MPa

Small-Sized Pressure Transducer



*TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact Semiflush Diaphragm Type and Available in Various Rated Capacities

PGM-H series pressure transducers are suitable for pressure measurement in limited space. Because of a diaphragm at the end, it ensures excellent response and dynamic characteristics.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO (PGM-5 to 20KH)
	Within ±0.3% RO (PGM-30 to 500KH)
Hysteresis	Within ±0.2% RO
Rated Output	1.5 mV/V (3000 μm/m) or more (PGM-5KH)
	2 mV/V (4000 μm/m) or more (PGM-10 to 500KH)

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	-10 to 60°C
Temperature Effect on Zero Balance	Within ±0.05% RO/°C(PGM-5 to 20 KH)
	Within ±0.03% RO/°C(PGM-30 to 500KH)
Temperature Effect on Output	Within ±0.02%/°C

Electrical Characteristics

Safe Excitation Voltage	6 V AC or DC
Recommended Excitation Voltage	1 to 3 V AC or DC
Input Resistance	350 Ω±2%
Output Resistance	350 Ω±2%
Cable	4-conductor (0.3 mm²) chloroprene shielded cable,
	7.6 mm diameter by 3 m long, terminated with connector plug
	(Shield wire is not connected to mainframe.)

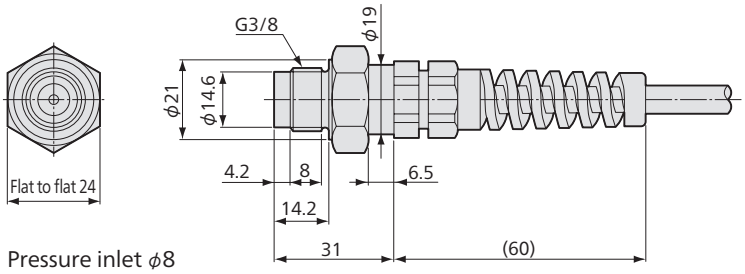
Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Case: SUS metallic finish
	Liquid-contacting part: SUS 630
Weight	Approx. 65 g (Excluding cable)
Mounting Screw	G3/8, male

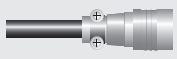
Standard Accessories: Gasket (Mild copper)

Models	Rated Capacity	Natural Frequencies (Approx.)
PGM-5KH	500 kPa	19 kHz
PGM-10KH	1 MPa	26 kHz
PGM-20KH	2 MPa	37 kHz
PGM-30KH	3 MPa	46 kHz
PGM-50KH	5 MPa	57 kHz
PGM-100KH	10 MPa	78 kHz
PGM-200KH	20 MPa	110 kHz
PGM-300KH	30 MPa	134 kHz
PGM-500KH	50 MPa	174 kHz

Dimensions



Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PGM-H Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55

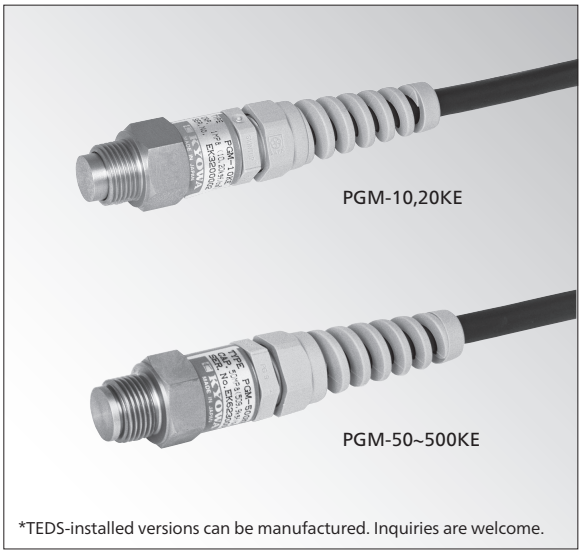

Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PGM-E

Small-sized Pressure Transducer

●Abundant Models from Low to High Pressures
●1 to 50 MPa



*TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact Semiflush Diaphragm Type and Available in Various Rated Capacities

PGM-E series pressure transducers are extremely effective for pressure measurement in limited space. A flush diaphragm ensures excellent response and dynamic characteristics. Since the pressure sensing part directly contacts the measuring object, they are applicable to highly viscous medium.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±1% RO
Hysteresis	Within ±1% RO
Rated Output	1 mV/V (2000 μm/m) or more (PGM-10 to 200KE)
	1.4 mV/V (2800 μm/m) or more (PGM-500KE)

Environmental Characteristics

Safe Temperature Range	0 to 80°C
Compensated Temperature Range	0 to 60°C

Electrical Characteristics

Safe Excitation Voltage	5 V AC or DC
Recommended Excitation Voltage	1 to 3 V AC or DC
Input Resistance	120 Ω±2%
Output Resistance	120 Ω±2%
Cable	4-conductor (0.3 mm²) chloroprene shielded cable,
	7.6 mm diameter by 3 m long, terminated with connector plug
	(Shield wire is connected to mainframe.)

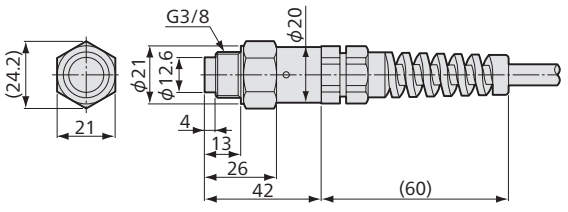
Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Case: SUS304
	Liquid-contacting part: SUS 630
Weight	Approx. 65 g (Excluding cable)
Degree of Protection	IP64 (IEC 60529)
Mounting Screw	G3/8, male

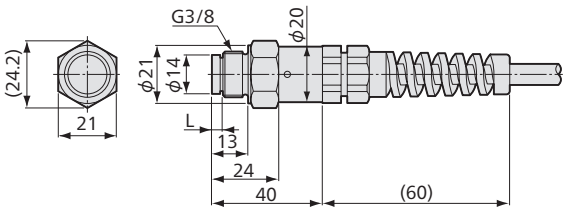
Standard Accessories Gasket (Mild copper)

Models	Rated Capacity	L	Natural Frequencies (Approx.)
PGM-10KE	1 MPa	—	22 kHz
PGM-20KE	2 MPa	—	23 kHz
PGM-50KE	5 MPa	5	46 kHz
PGM-100KE	10 MPa	5	60 kHz
PGM-200KE	20 MPa	4	73 kHz
PGM-500KE	50 MPa	3	80 kHz

Dimensions

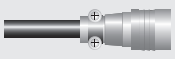


PGM-10 to 20KE



PGM-50 to 500KE

Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

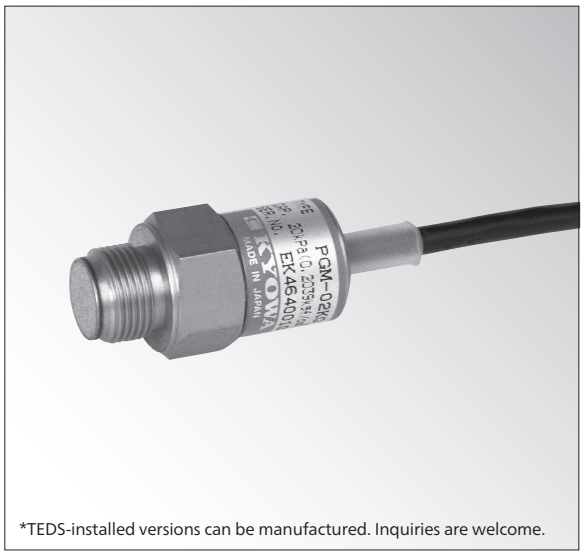
PGM-E Recommended products for combination

Instrumentation Amplifier WGA-900A → 3-95
Data Logger UCAM-60B → 3-25
Strain Amplifier DPM-900 Series → 3-5
Universal Recorder EDX-200A → 3-55
Universal Recorder EDX-100A → 3-63
Sensor Interface PCD-400A → 3-77

PGM-G

Low Pressure Transducer

●Low Pressure Measurement with High Accuracy
●20 to 100 kPa



*TEDS-installed versions can be manufactured. Inquiries are welcome.

Enable Highly Accurate and Stable Measurement of Low Pressures

PGM-G series pressure transducers come with the cable in a conduit pipe for back-pressure compensation. Thus, they are easy to handle and enable highly accurate and stable measurement of low pressures.

Specifications

Performance

Rated Capacity	See table below.	
Nonlinearity	Within ±0.5% RO	
Hysteresis	Within ±0.3% RO	
Rated Output	PGM-02KG	0.75 mV/V (1500 μm/m) or more
	PGM-05KG	1.25 mV/V (2500 μm/m) or more
	PGM-1KG	1.4 mV/V (2800 μm/m) or more

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	-10 to 60°C
Temperature Effect on Zero Balance	Within ±0.02% RO/°C
Temperature Effect on Output	Within ±0.03%/°C

Electrical Characteristics

Safe Excitation Voltage	5 V AC or DC
Recommended Excitation Voltage	1 to 3 V AC or DC
Input Resistance	350 Ω±10%
Output Resistance	350 Ω±10%
Cable	4-conductor (0.08 mm²) horizontal vinyl shielded cable in fluoroplastic tube, 4.2 mm diameter by 3 m long, terminated with connector plug (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Case: SUS metallic finish
	Liquid-contacting part: SUS 304
Weight	Approx. 40 g (Excluding cable)
Degree of Protection	IP54 (IEC 60529)
Mounting Screw	M14 P=1, male

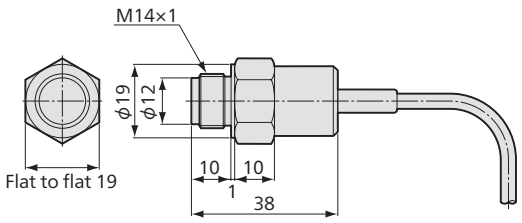
Standard Accessories: O-ring (JIS B 2401-P14)

Models	Rated Capacity	Natural Frequencies (Approx.)
PGM-02KG	20 kPa	2 kHz
PGM-05KG	50 kPa	3 kHz
PGM-1KG	100 kPa	4 kHz

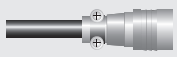
To Ensure Safe Usage

Neither bend nor vibrate the cable, otherwise, the output may be affected.
So, please fasten the cable when using.

Dimensions



Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PGM-G Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55


Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PGMC-A

Small-sized Pressure Transducer

- Sensing surface of 5.5 mm diameter
- 200 kPa to 1 MPa

*TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact & lightweight
High frequency response
Flush diaphragm type

PGMC-A series pressure transducers adopt a flush diaphragm with the sensing surface of 5.5-mm diameter. Since a high frequency response to low pressure is ensured, they are suitable for pressure measurement requiring quick response or for a complicated piping system where the attaching space is limited.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±1.5% RO
Hysteresis	Within ±1.5% RO
Rated Output	0.6 mV/V (1200 μm/m) or more(PGMC-A-200KP)
	1 mV/V (2000 μm/m)±20%(PGMC-A-500KP & 1MP)

Environmental Characteristics

Safe Temperature Range	0 to 50°C
Temperature Effect on Zero Balance	Within ±0.3% RO/°C (PGMC-A-200KP)
	Within ±0.2% RO/°C (PGMC-A-500KP & 1MP)
Temperature Effect on Output	Within ±0.3%/°C (PGMC-A-200KP)
	Within ±0.2%/°C (PGMC-A-500KP & 1MP)

Electrical Characteristics

Safe Excitation Voltage	3 V AC or DC
Recommended Excitation Voltage	1 to 2 V AC or DC
Input Resistance	350 Ω±10%
Output Resistance	350 Ω±10%
Cable	4-conductor (0.065 mm²) vinyl shielded cable, 4 mm diameter by 3 m long, terminated with connector plug (Shield wire is connected to mainframe.)

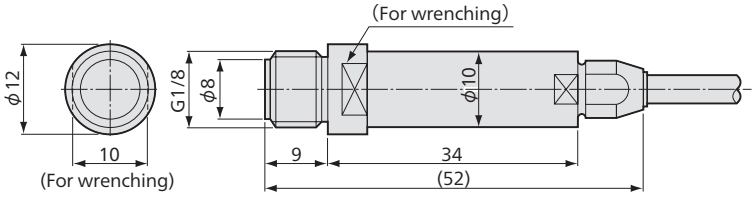
Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Liquid-contacting part: C1720
	Screw: SUS 303
Weight	Approx. 20 g (Excluding cable)
Degree of Protection	IP52 (IEC 60529)
Mounting Screw	G1/8, male

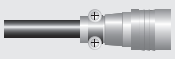
Standard Accessories Fluoroplastic sealing tape

Models	Rated Capacity	Natural Frequencies (Approx.)
PGMC-A-200KP	200 kPa	24 kHz
PGMC-A-500KP	500 kPa	34 kHz
PGMC-A-1MP	1 MPa	40 kHz

Dimensions



Connector plug



- Physical quantity indication
- Static measurement
- Dynamic measurement

PGMC-A Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55

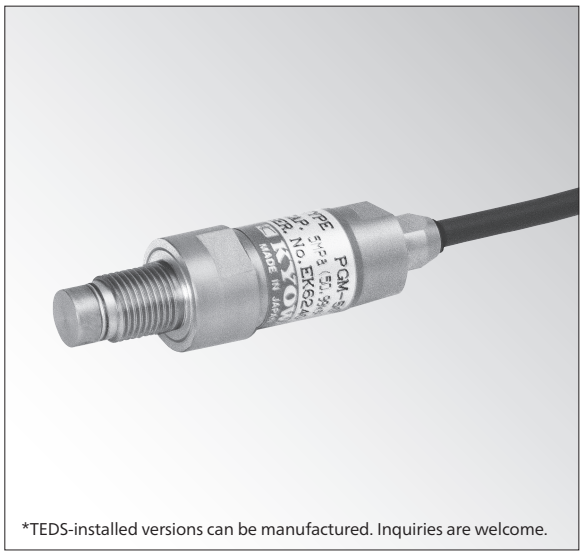

Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PGM-D

●High Frequency Response ●5 to 50 MPa

Small-sized Pressure Transducer



*TEDS-installed versions can be manufactured. Inquiries are welcome.

High Frequency Response and Highly Accurate Flush Diaphragm Type with Small Pressure Sensing Surface

●Small pressure sensing surface
●Flush diaphragm type
●High frequency response
●High accuracy

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO
Hysteresis	Within ±0.5% RO
Rated Output	1.5 mV/V (3000 μm/m) ±20%

Environmental Characteristics

Safe Temperature Range	-10 to 70°C
Compensated Temperature Range	0 to 60°C
Temperature Effect on Zero Balance	Within ±0.1% RO/°C
Temperature Effect on Output	Within ±0.1%/°C

Electrical Characteristics

Safe Excitation Voltage	3 V AC or DC
Recommended Excitation Voltage	1 to 2 V AC or DC
Input Resistance	120 Ω±2%
Output Resistance	120 Ω±2%
Cable	4-conductor (0.065 mm²) vinyl shielded cable, 4 mm diameter by 3 m long, terminated with connector plug (Shield wire is connected to mainframe.)

Mechanical Properties

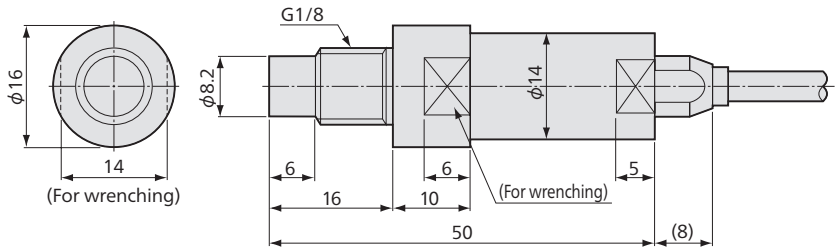
Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Case: SUS metallic finish Liquid-contacting part: SUS 630
Weight	Approx. 40 g (Excluding cable)
Mounting Screw	G1/8, male

Standard Accessories Gasket (Mild copper)

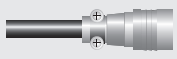
*We can also manufacture PGM-10KD M156 with the rated capacity of 1 MPa and PGM-20KD M156 with the rated capacity of 2 MPa.

Models	Rated Capacity	Natural Frequencies (Approx.)
PGM-50KD	5 MPa	83 kHz
PGM-100KD	10 MPa	113 kHz
PGM-200KD	20 MPa	150 kHz
PGM-500KD	50 MPa	250 Hz

Dimensions

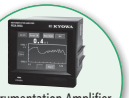


Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PGM-D Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55

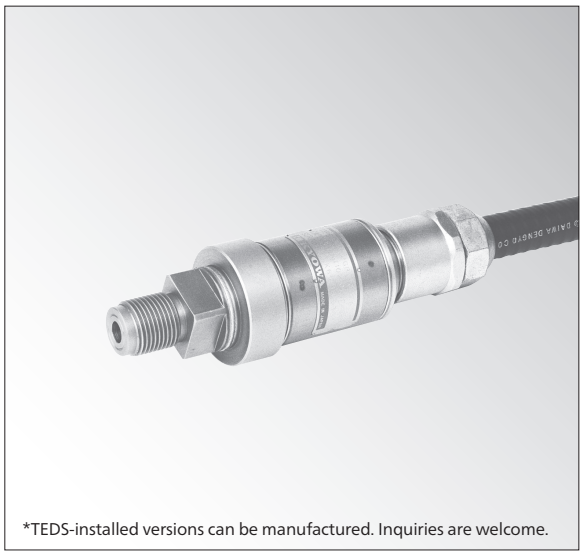

Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PGR-A

High-pressure-resistant Pressure Transducer

- Critical Overload: 117.7 MPa(1200 kgf/cm²)
- 1 to 20 MPa



*TEDS-installed versions can be manufactured. Inquiries are welcome.

High Temperatures up to 100°C High Pressure Withstanding Highly Accurate

- High temperatures up to 100°C
- High pressure withstanding
- High accuracy

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.1% RO
Hysteresis	Within ±0.1% RO
Rated Output	1.5 mV/V (3000 μm/m) ±5%

Environmental Characteristics

Safe Temperature Range	-30 to 110°C
Compensated Temperature Range	-10 to 100°C
Temperature Effect on Zero Balance	Within ±0.01% RO/°C
Temperature Effect on Output	Within ±0.01%/°C

Electrical Characteristics

Safe Excitation Voltage	12 V AC or DC
Recommended Excitation Voltage	1 to 8 V AC or DC
Input Resistance	350 Ω±1.4%
Output Resistance	350 Ω±1.4%
Cable	4-conductor (0.75 mm²) fluonlex shielded cable, 8 mm diameter by 5 m long, bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

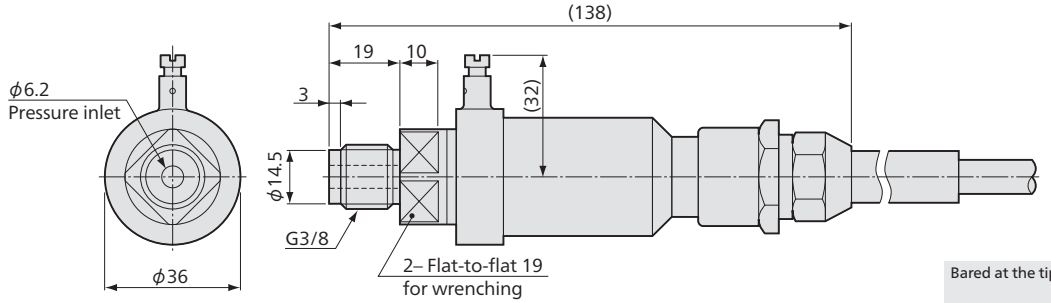
Safe Overload Rating(*1)	300%
Critical Overload(*2)	117.7 MPa (PGR-10 to 50KA)
	196.1 MPa (PGR-100 & 200KA)
Natural Frequencies	See table below.
Material	Case: SUS metallic finish
	Liquid-contacting part: SUS 630
Weight	Approx. 400 g (Excluding cable)
Mounting Screw	G3/8, male

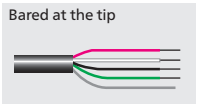
Standard Accessories: Gasket (Mild copper)

Models	Rated Capacity	Natural Frequencies (Approx.)
PGR-10KA	1 MPa	12 kHz
PGR-20KA	2 MPa	17 kHz
PGR-50KA	5 MPa	29 kHz
PGR-100KA	10 MPa	42 kHz
PGR-200KA	20 MPa	60 kHz

*1. Maximum overload which can be applied without causing any permanent change in specified characteristics
*2. Maximum overload which can be applied without causing any structural damage.

Dimensions





PGR-A Recommended products for combination

- Physical quantity indication
- Static measurement
- Dynamic measurement


Instrumentation Amplifier WGA-900A → 3-95


Instrumentation Amplifier WGA-680A → 3-97


Data Logger UCAM-60B → 3-25

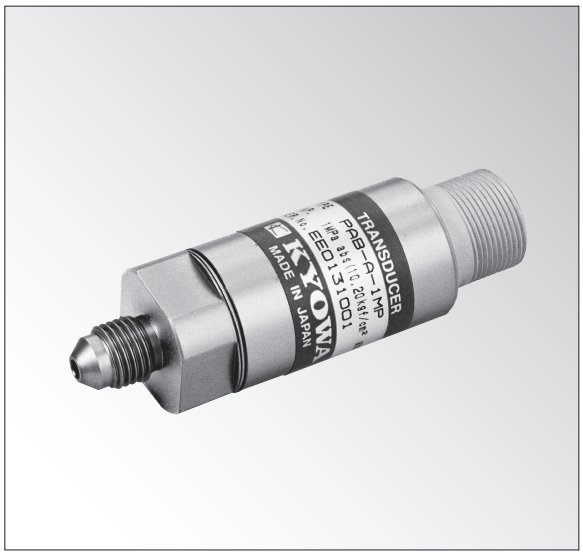

Universal Recorder EDX-200A → 3-55


Universal Recorder EDX-100A → 3-63

PAB-A

Absolute Pressure Transducer

●Measurement from Absolute Pressure Zero (Vacuum)
●200 kPa$_{abs.}$ to 2 MPa$_{abs.}$



Compact & Lightweight, Highly Stable

●Possible to measure absolute pressure
●Highly reliable (conforming to MIL-STD-810C)

PAB-A series pressure transducers can measure absolute pressures from zero to 2 MPa abs for long-term. Developed for pressure measurement on airplanes and flying objects, these transducers pass high-temperature and vibration tests in conformity to MIL-STD-810C and can widely be used in various industrial and engineering fields.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.1% RO
Hysteresis	Within ±0.1% RO
Rated Output	2 mV/V (4000 μm/m) or more

Environmental Characteristics

Safe Temperature Range	-30 to 80°C
Compensated Temperature Range	-20 to 70°C
Temperature Effect on Zero Balance	Within ±0.01% RO/°C
Temperature Effect on Output	Within ±0.01%/°C

Electrical Characteristics

Safe Excitation Voltage	8 V AC or DC
Recommended Excitation Voltage	1 to 3 V AC or DC
Input Resistance	367 Ω±2%
Output Resistance	350 Ω±2%
Cable	4-conductor (0.3 mm^2) chloroprene shielded cable, 7.6 mm diameter by 3 m long, bared at the tip (Shield wire is connected to mainframe.)

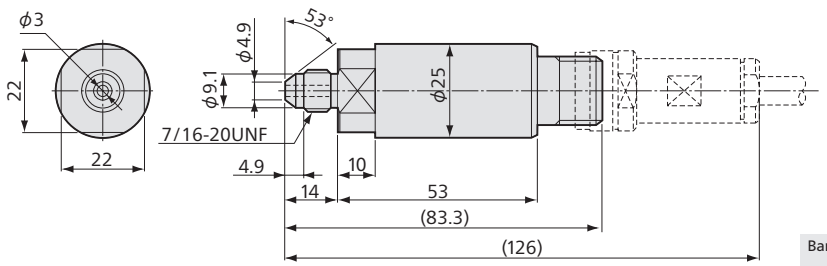
Mechanical Properties

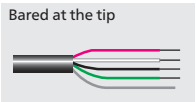
Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	SUS 630 (Liquid-contacting part)
Weight	Approx. 130 g (Excluding cable)
Mounting Screw	7/16-20UNF male

Standard Accessories: O-ring (JIS B 2401-P15)

Models	Rated Capacity	Natural Frequencies (Approx.)
PAB-A-200KP	200 kPa$_{abs.}$	5 kHz
PAB-A-500KP	500 kPa$_{abs.}$	8 kHz
PAB-A-1MP	1 MPa$_{abs.}$	10 kHz
PAB-A-2MP	2 MPa$_{abs.}$	12 kHz

■Dimensions





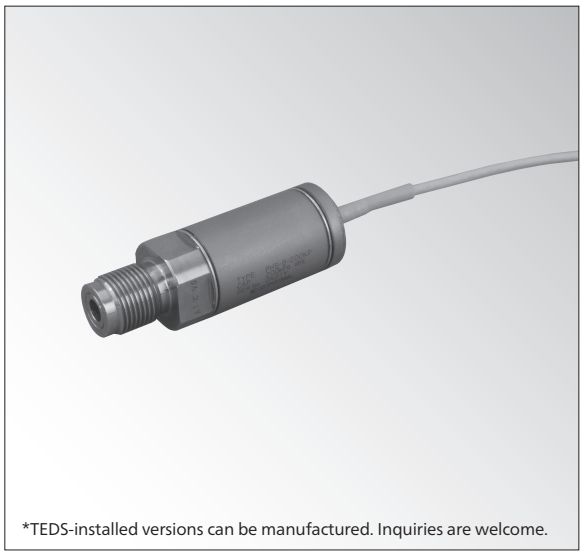
●Dynamic measurement

PAB-A Recommended products for combination

PHS-B

Highly Reliable Pressure Transducer(Sputter Gage Method)

- Long-Term Stability at 200°C
- 200 $kPa_{abs.}$ to 20 $MPa_{abs.}$



*TEDS-installed versions can be manufactured. Inquiries are welcome.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.2% RO
Hysteresis	Within ±0.2% RO
Rated Output	1.5 mV/V (3000 μm/m) or more

Environmental Characteristics

Safe Temperature Range	-196 to 230°C
Compensated Temperature Range	-30 to 200°C
Temperature Effect on Zero Balance	Within ±0.02% RO/°C
Temperature Effect on Output	Within ±0.015%/°C

Electrical Characteristics

Safe Excitation Voltage	15 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	900 Ω $^{100}_{-150}$ Ω
Output Resistance	900 Ω $^{100}_{-150}$ Ω
Cable	4-conductor (0.09 mm^2) fluoroplastic shielded cable, 5 m long, 3.1 mm diameter, bared at the tip (Shield wire is not connected to mainframe)

Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Materials	Case: SUS (Metallic finish)
	Liquid-contacting part: SUS 630
Weight	Approx. 130 g (Excluding cable)
Mounting Screw	G3/8, male

Standard Accessories Gasket (Mild copper)

Models	Rated Capacity	Natural Frequencies (Approx.)
PHS-B-200KP	200 $kPa_{abs.}$	5 kHz
PHS-B-500KP	500 $kPa_{abs.}$	7 kHz
PHS-B-1MP	1 $MPa_{abs.}$	20 kHz
PHS-B-2MP	2 $MPa_{abs.}$	30 kHz
PHS-B-5MP	5 $MPa_{abs.}$	50 kHz
PHS-B-10MP	10 $MPa_{abs.}$	70 kHz
PHS--B20MP	20 $MPa_{abs.}$	100 kHz

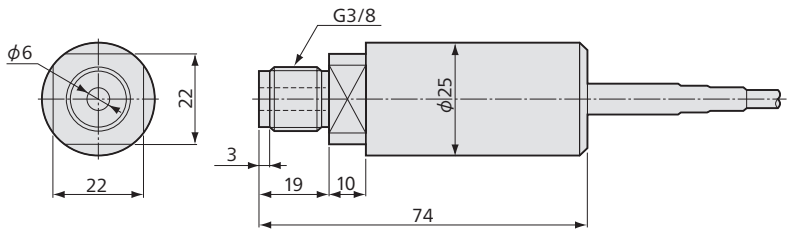
Both High and Low Temperatures Possible to Measure Absolute Pressure Excellent High-temperature

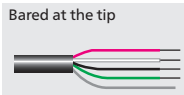
PHS-A series pressure transducers have the thin-film strain gage and temperature-compensating resistive membrane formed directly on the diaphragm by sputtering and photo-lithography, thereby enabling accurate temperature compensation even at high temperatures.

To Ensure Safe Usage

High-carrier-based dynamic strain amplifier DPM-912, 913 or 952 may not satisfy the specified rated output in some rare case. Request us to calibrate the transducer in combination with the strain amplifier. Or, if possible, use dynamic strain amplifier DPM-911 or 951 or signal conditioner CDV-900A.

Dimensions





- Physical quantity indication
- Dynamic measurement

PHS-B Recommended products for combination


Instrumentation Amplifier WGA-680A → 3-97


Strain Amplifier DPM-900 Series → 3-5


Signal Conditioner CDV-900A → 3-9

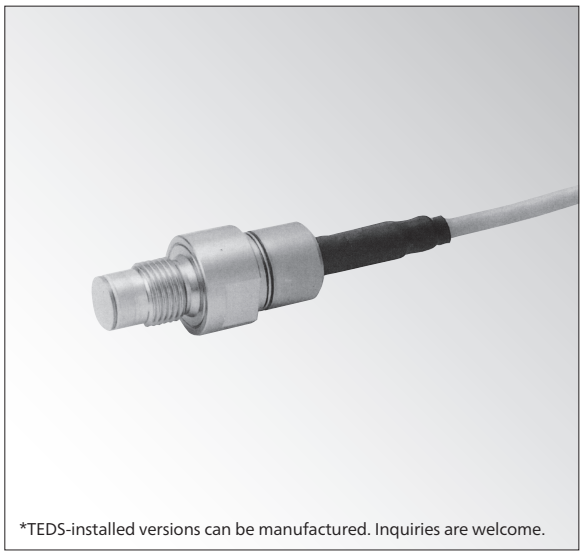

Universal Recorder EDX-100A → 3-63


Memory Recorder/Analyzer EDX-3000B → 3-69

PHC-B

●Excellent Heat Resistance ●2 to 20 MPa

Flush Diaphragm Type High-temperature Pressure Transducer



*TEDS-installed versions can be manufactured. Inquiries are welcome.

Heat-resistant Sputter Gages Achieve Pressure Measurement at High-Temperature

●Safe temperature range from -30 to 240˚C
●Flush diaphragm ensuring high frequency response
●Compact, flexible, and heat-resistant cable ensuring ease of use

To enable pressure measurement at high temperature, PHC-B series pressure transducers adopt thin-film strain gage formed by sputtering.
The sensor part is a flush, diaphragm detecting pressure directly on a flat surface without pressure medium, thus enabling pressure measurement without missing momentary pressure changes. In addition, the flush diaphragm makes these transducers suitable for measuring not only liquid or gas pressure but also pressure of highly viscous medium.
The small-sized design and flexible cable make them easy to use even in limited space.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO
Hysteresis	Within ±0.3% RO
Repeatability	0.2% RO or less
Rated Output	0.6 mV/V (1200 μm/m) or more

Environmental Characteristics

Safe Temperature Range	-30 to 240°C (200°C with cable, -25 to 80°C with connector plug)
Compensated Temperature Range	23 to 230°C
Temperature Effect on Zero Balance	Within ±0.03% RO/°C
Temperature Effect on Output	Within ±0.03%/°C

Electrical Characteristics

Safe Excitation Voltage	12 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	380 to 650 Ω
Output Resistance	380 to 650 Ω
Cable	4-conductor (0.09 mm²) fluoroplastic shielded cable, 3.1 mm diameter by 3 m long, terminated with connector plug (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Materia	Case: SUS metallic finish
	Liquid-contacting part: SUS 630
Weight	Approx. 70 g (Excluding cable)
Degree of Protection	IP62 (IEC 60529)
Mounting Screw	G1/8, male

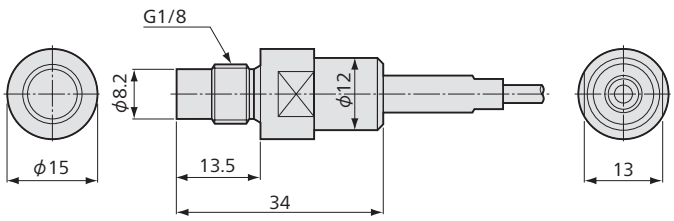
Standard Accessories Gasket (Mild copper)

Models	Rated Capacity	Natural Frequencies (Approx.)
PHC-B-2MP	2 MPa	45 kHz
PHC-B-5MP	5 MPa	75 kHz
PHC-B-10MP	10 MPa	85 kHz
PHC-B-20MP	20 MPa	85 kHz

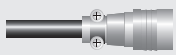
To Ensure Safe Usage

High-carrier-based dynamic strain amplifier DPM-912, 913 or 952 may not satisfy the specified rated output in some rare case. Request us to calibrate the transducer in combination with the strain amplifier. Or, if possible, use dynamic strain amplifier DPM-911 or 951or signal conditioner CDV-900A.

■Dimensions



Connector plug



●Physical quantity indication ●Dynamic measurement

PHC-B Recommended products for combination


Instrumentation Amplifier WGA-680A → 3-97


Strain Amplifier DPM-900 Series → 3-5


Signal Conditioner CDV-900A → 3-9

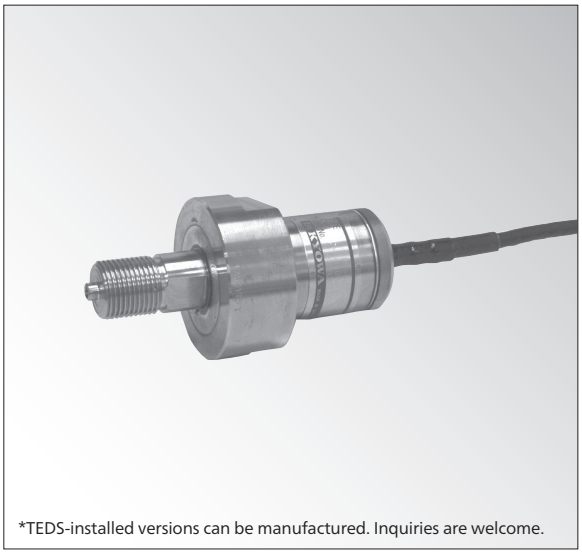

Universal Recorder EDX-100A → 3-63


Memory Recorder/Analyzer EDX-3000B → 3-69

PHB-A

●-196 to 200°C ●1 to 50 MPa

High/Low-temperature Pressure Transducer



*TEDS-installed versions can be manufactured. Inquiries are welcome.

Suitable for Pressure Measurement of LPG/LNG Tanks and Gas or Steam Turbines

●Usable at both high and low temperatures
●Corrosion resistant
●Hermetically-sealed structure with inert gas filled in
●Highly reliable

PHB-A series is designed for pressure measurement from low to high temperatures. The sensor surface is made by stainless steel diaphragm and inert gas is filled in to increase reliability.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.4% RO
Hysteresis	Within ±0.4% RO
Rated Output	2.2 mV/V (4400 μm/m)±15%

Environmental Characteristics

Safe Temperature Range	-196 to 210°C
	(connector plug: -25 to 80°C)
Compensated Temperature Range	-196 to 200°C
	(connector plug: -25 to 80°C)
Temperature Effect on Zero Balance	Within ±0.03% RO/°C
Temperature Effect on Output	Within ±0.035%/°C (PHB-A-1MP)
	Within ±0.03%/°C (PHB-A-2 to 50MP)

Electrical Characteristics

Safe Excitation Voltage	15 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	350 Ω±2%
Output Resistance	350 Ω±2%
Cable	4-conductor (0.3 mm²) fluoroplastic shielded cable,
	5 mm diameter by 3 m long, terminated with connector plug
	(Shield wire is connected to mainframe.)

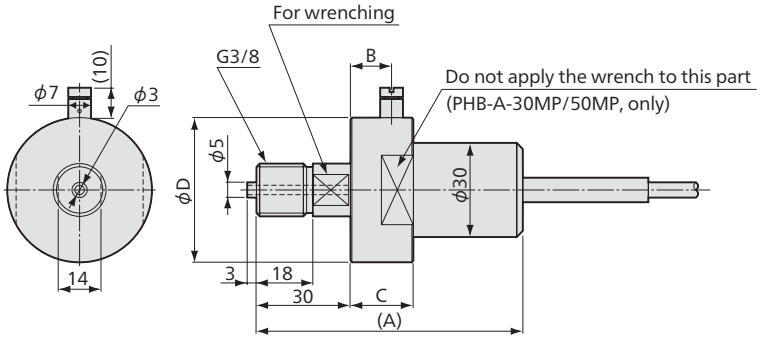
Mechanical Properties

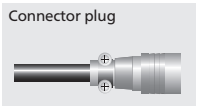
Safe Overload Rating	120%
Natural Frequencies	See table below.
Material	Case: SUS metallic finish
	Liquid-contacting part: SUS 630
Weight	See table below.
Degree of Protection	IP51 (IEC 60529)
Mounting Screw	G3/8, male

Standard Accessories Gasket (Mild copper)

*Do not use PHB-A-20MP to PHB-A-50MP for endurace/fatigue tests.
*Avoid using for a long-term measurement of gas pressure if much importance is attached to the stability of output in a minute range. For such application, we can manufacture models with no air vent.

■Dimensions





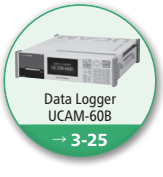
Models	Rated Capacity	A	B	C	ϕD	Natural Frequencies (Approx.)	Weight (Approx.)*
PHB-A-1MP	1 MPa	80	10	16	36	8 kHz	203 g
PHB-A-2MP	2 MPa					13 kHz	
PHB-A-5MP	5 MPa	84	13	20	36	21 kHz	270 g
PHB-A-10MP	10 MPa					29 kHz	
PHB-A-20MP	20 MPa					40 kHz	
PHB-A-30MP	30 MPa	84	13	20	46	45 kHz	360 g
PHB-A-50MP	50 MPa					50 kHz	

*Excluding cable

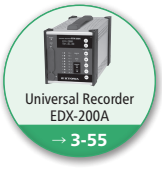
●Physical quantity indication ●Static measurement ●Dynamic measurement

PHB-A Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55

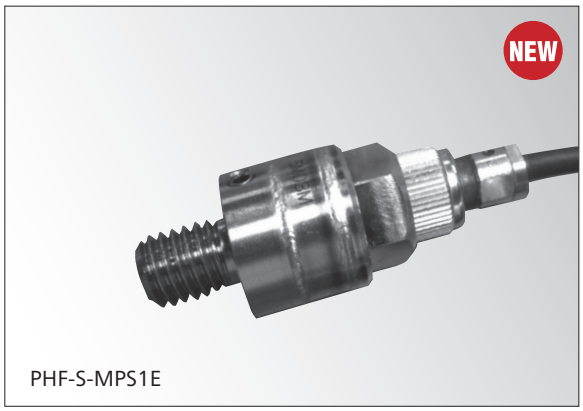

Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PHF-S-S1 Series

Small-sized High-temperature Pressure Transducer

●-40 to 150°C
●2 to 20 MPa



PHF-S-MPS1E

Excellent in environmental performance

●Enable to reduce weight effect on measuring objects
●After removing the connector, enables to install in a limited space by a socket wrench

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.3% RO
Hysteresis	Within ±0.2%RO
Rated Output	Approx. 1.75 mV/V

Environmental Characteristics

Safe Temperature Range	-40 to 160°C
Compensated Temperature Range	-40 to 150°C
Temperature Effect on Zero	Within ±0.008% RO/°C
Temperature Effect on Output	Within ±0.01%/°C

Electrical Characteristics

Safe Excitation Voltage	5 V AC or DC
Recommended Excitation Voltage	1 to 2 V AC or DC
Input Resistance	350 Ω±5%
Output Resistance	350 Ω±5%
Cable	4-conductor (0.08 mm²) silicon cable by 4 m long, terminated with connector plug (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Liquid-contact part: SUS 630
Weight	Approx. 20 g
Degree of Protection	IP45 (IEC 60529)
Mounting Screw	See table below.

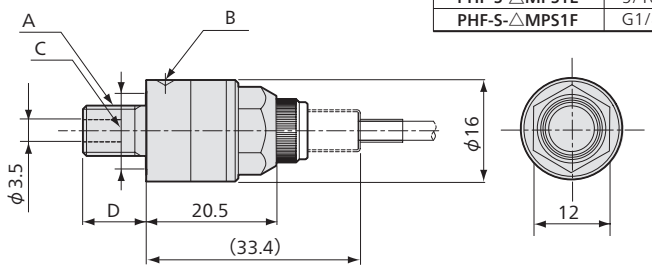
Models	Rated Capacity	Natural frequencies (Approx.)
PHF-S- 2MPS1□	2 MPa	45 kHz
PHF-S- 5MPS1□	5 MPa	60 kHz
PHF-S- 10MPS1□	10 MPa	70 kHz
PHF-S-20MPS1□	20 MPa	85 kHz

The suffix comes from A to F stands different screws and cable length.

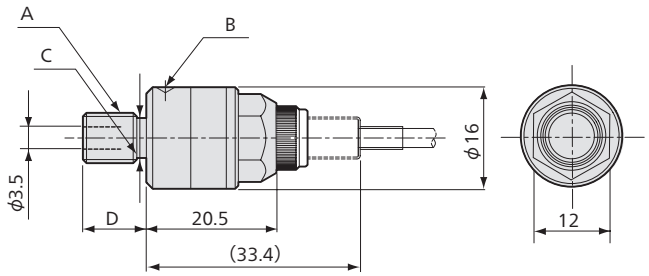
Dimensions

Models	A	B	C	D	Cable Length
PHF-S-△MPS1A	R1/8	Air-vent screw	–	7.5	4 m
PHF-S-△MPS1B	M8×1.25	Air-vent screw	ϕ12	10	4 m
PHF-S-△MPS1C	M10×1.25	Air-vent screw	ϕ14	12	4 m
PHF-S-△MPS1D	M10×1.0	Air-vent screw	ϕ8.2	10	5 m
PHF-S-△MPS1E	5/16-24UNF	–	ϕ6.3	10	4.5 m
PHF-S-△MPS1F	G1/8	Air-vent screw	–	9	4 m

*△ means capacity of each model

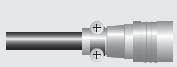


PHF-S-MPS1A/B/C/F



PHF-S-MPS1D/E

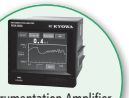
Connector plug



Note:
UNF and G type screws are available from size 8 to 12 mm.

●Physical quantity indication ●Static measurement ●Dynamic measurement

PHF-S-S1 Series Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55


Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PHF-S-SA2

●Vibration Resistance: 490.3 m/s²
●2 to 20 MPa

Small-sized High-temperature Pressure Transducer

Compact & Lightweight, Usable at up to 150°C

●High vibration resistance: 490.3 m/s² (50 G)
●Highly stable

PHF-S-SA2 series are small-sized strain-gage type pressure transducers which are usable in 150°C environment.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.4% RO (PHF-S-2MPSA2)
	Within ±0.3% RO (PHF-S-5 to 20MSA2)
Hysteresis	Within ±0.2% RO
Rated Output	2 mV/V (4000 μm/m)

Environmental Characteristics

Safe Temperature Range	-40 to 170°C
	(connector plug: -25 to 80°C)
Compensated Temperature Range	-40 to 150°C
	(connector plug: -25 to 80°C)
Temperature Effect on Zero Balance	Within ±0.008% RO/°C
Temperature Effect on Output	Within ±0.01%/°C

Electrical Characteristics

Safe Excitation Voltage	10 V AC or DC
Recommended Excitation Voltage	1 to 5 V AC or DC
Input Resistance	350 Ω±2%
Output Resistance	350 Ω±2%
Cable	4-conductor (0.09 mm²) fluoroplastic shielded cable, 3.1 mm diameter by 4 m long, terminated with connector plug

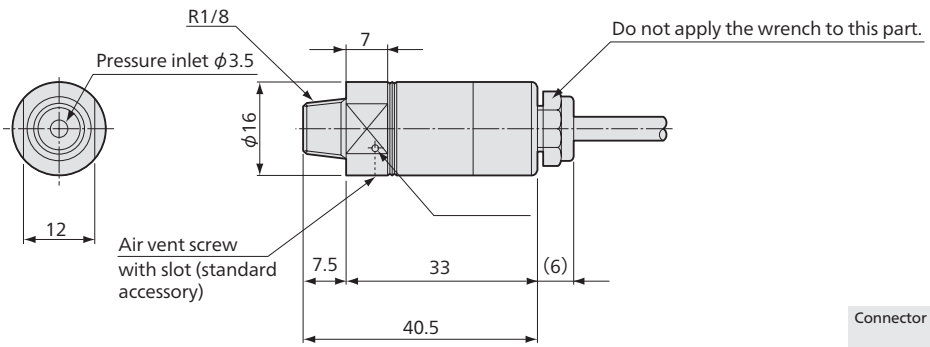
Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Liquid-contacting part: SUS 630
Weight	Approx. 50g (Excluding cable)
Mounting Screw	R1/8, male
RoHS Directive	EN50581

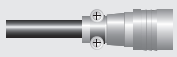
Standard Accessories: Hexagon wrench for air vent screw (M3)

Models	Rated Capacity	Natural Frequencies (Approx.)
PHF-S-2MPSA2	2 MPa	25 kHz
PHF-S-5MPSA2	5 MPa	50 kHz
PHF-S-10MPSA2	10 MPa	70 kHz
PHF-S-20MPSA2	20 MPa	100 kHz

■Dimensions



Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PHF-S-SA2 Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55


Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PHF-S-SA4

●-40 to 150°C ●2 to 10 MPa

Small-sized High-temperature Pressure Transducer

Compact & Lightweight Usable at up to 150°C

As an upgraded version of PHF-S-SA2 series, PHF-S-SA4 series is designed to be more compact and lightweight and applicable up to150°C.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.3% RO
Hysteresis	Within ±0.2% RO
Rated Output	Approx. 0.5 mV/V (1000 μm/m)

Environmental Characteristics

Safe Temperature Range	-40 to 170°C (excl. connector)
Compensated Temperature Range	-40 to 150°C (excl. connector)
Temperature Effect on Zero Balance	Within ±0.05% RO/°C
Temperature Effect on Output	Within ±0.05%/°C

Electrical Characteristics

Safe Excitation Voltage	5 V AC or DC
Recommended Excitation Voltage	1 to 2 V AC or DC
Input Resistance	350 Ω±5%
Output Resistance	350 Ω±5%
Cable	4-conductor (0.09 mm²) fluoroplastic shielded cable, 3.1 mm diameter by 50 cm long, terminated with R04-P5M connector plug (Shield wire is not connected to mainframe.)

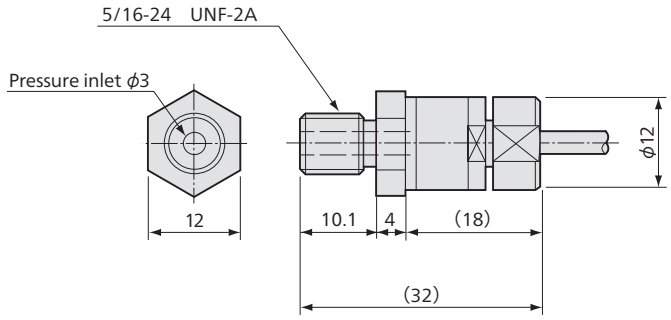
Mechanical Properties

Safe Overload Rating	150%
Natural Frequencies	See table below.
Material	Metallic finish
Degree of Protection	IP63 (IEC 60529)
Weight	Approx. 20 g (excluding cable)
Mounting Screw	5/16-24UNF, male
RoHS Directive	EN50581

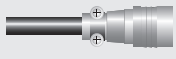
Standard Accessories Extension cable (4-conductor (0.09 mm²) fluoroplastic shielded cable, 3 mm diameter by 4 m long, terminated with R04-J5F to the sensor and PRC03-12A10-7M to measuring instruments.)
O-ring (AS568 010)

Models	Rated Capacity	Natural Frequencies (Approx.)
PHF-S-2MPSA4	2 MPa	110 kHz
PHF-S-5MPSA4	5 MPa	120 kHz
PHF-S-10MPSA4	10 MPa	170 kHz

Dimensions



Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PHF-S-SA4 Recommended products for combination


Instrumentation Amplifier WGA-900A → 3-95


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-200A → 3-55


Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-400A → 3-77

PGH-S-100MPSA17

Large-capacity Pressure Transducer

- Small-sized Large capacity
- Usable at High-temperature
- 100 MPa

Specifications

Performance

Rated Capacity	100MPa
Nonlinearity	±0.3% RO
Hysteresis	±0.2% RO
Rated Output	Approx. 1 mV/V (2000 μm/m)

Environmental Characteristics

Safe Temperature Range	-20 to 150°C
Compensated Temperature Range	-40 to 150°C
Temperature Effect on Zero Balance	±0.03% RO/°C
Temperature Effect on Output	±0.05%/°C

Electrical Characteristics

Safe Excitation Voltage	10 V AC or DC
Recommended Excitation Voltage	2 to 5 V AC or DC
Input Resistance	550 Ω±150Ω
Output Resistance	450 Ω±100Ω
Cable	4 m chloroprene shield cable
	Measuring instrument side: Connector plug

Mechanical Properties

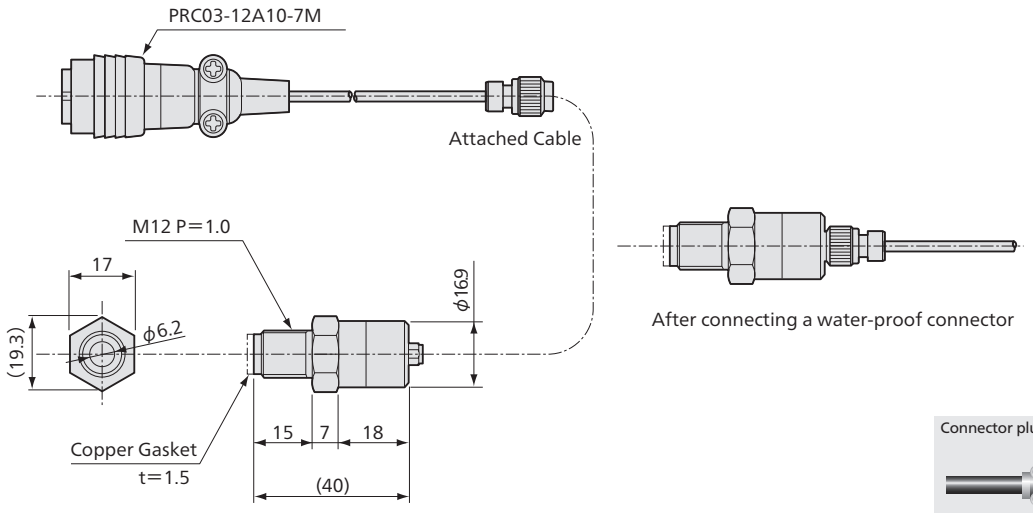
Material	Metallic finish
Mounting Screw	M12, P=1
Degree of Protection	IP64(IEC 60529)

Standard Accessories: Gasket (Mild copper)

Small-sized Large-capacity Transducer Usable at High temperature

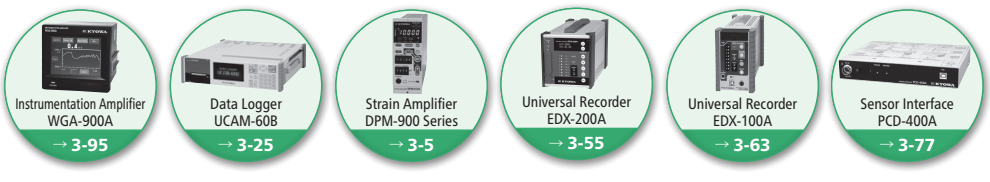
- Small Φ20x40 (Including 15 long screw portion)
- Large capacity 100 MPa
- Usable at high temperature 150˚C
- Safe design with just one SUS body without welded part.
- Removable cable
- Degree of protection IP64 (After connecting connector)
- Mounting screw M12, P=1

Dimensions



- Physical quantity indication
- Static measurement
- Dynamic measurement

PGH-S-100MPSA17 Recommended products for combination



PGH-S-300MPSA19

Large-capacity Pressure Transducer

- Large capacity
- 300 MPa

Specifications

Performance

Rated Capacity	300MPa
Nonlinearity	±1.0% RO
Hysteresis	±1.0% RO
Rated Output	Approx. 0.5 mV/V (1000 μm/m)

Environmental Characteristics

Safe Temperature Range	-0 to 60°C
Compensated Temperature Range	-10 to 70°C
Temperature Effect on Zero Balance	±0.05% RO/°C
Temperature Effect on Output	±0.05%/°C

Electrical Characteristics

Safe Excitation Voltage	10 V AC or DC
Recommended Excitation Voltage	2 to 5 V AC or DC
Input Resistance	550 Ω±150Ω
Output Resistance	450 Ω±100Ω
Cable	5 m fluoroplastic cable
	Measuring instrument side: Connector plug

Mechanical Properties

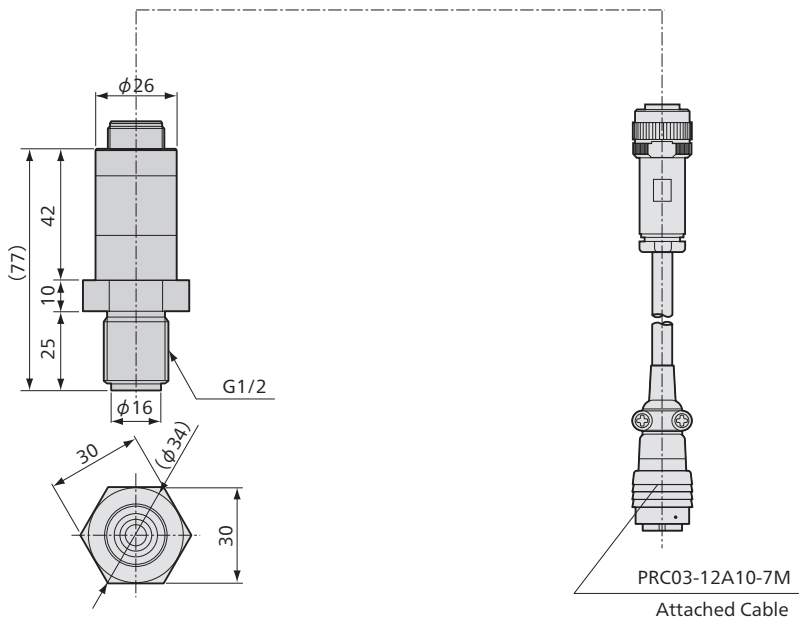
Material	Metallic finish
Mounting Screw	G1/2

Standard Accessories: Gasket (Mild copper)

Large-capacity Pressure Transducer

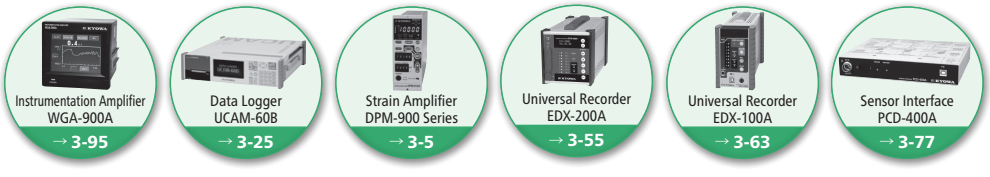
- High pressure 300 MPa measurement
- Safe design with just one SUS body without welded part.
- Removable cable
- Mounting screw G1/2

Dimensions



- Physical quantity indication
- Static measurement
- Dynamic measurement

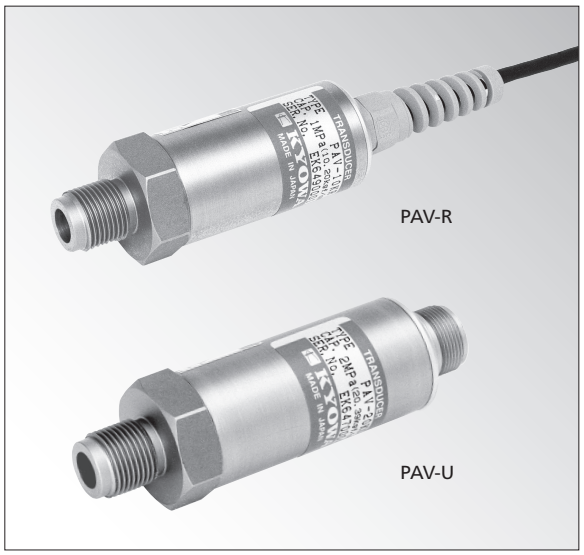
PGH-S-300MPSA19 Recommended products for combination



PAV-R/U

●Highly Resistant against Noise during Transmission
●1 to 50 MPa

Voltage-output Pressure Transducer



Suitable for Pressure Measurements of Industrial Equipments and Distant Pressure Measurement by Cable Extension

- Voltage output in a range of 0 to 5 V
- Noise resistant
- High safe overload rating of 200%
- Suitable for industrial equipment/pressure control system
- Wide range of rated capacities

PAV-R/U pressure transducers have dedicated built-in amplifier and output voltage signals from 0 to 5V. There is no connection by welding in pressure sensor section. The built-in amplifier adopts unique hybrid IC to reduce numbers of components resulting in increasing reliability. Because built-in amplifier amplifies detected slight voltage in transmission, amplified voltage signals have high resistance against noises, such as inductive interference, and ensure high accuracy.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.2% RO
Hysteresis	Within ±0.2% RO
Rated Output	0 to 5 V

Environmental Characteristics

Safe Temperature Range	-20 to 80°C
Compensated Temperature Range	-20 to 70°C
Temperature Effect on Zero Balance	Within ±0.03% RO/°C
Temperature Effect on Output	Within ±0.02%/°C

Electrical Characteristics

SN Ratio	50 dB or more
Load Resistance	1 kΩ or more
Frequency Response (Built-in Amplifier)	DC to 1 kHz
Power Supply	12 VDC (10.5 to 15 V), 30 mA
Cable	PAV-R: 4-conductor (0.18 mm²) vinyl shielded cable, 4.6 mm diameter by 3 m long, bared at the tip
	PAV-U: 4-conductor (0.3 mm²) chloroprene shielded cable, 7.6 mm diameter by 3 m long, bared at the tip
	(Shield wire is not connected to mainframe.)

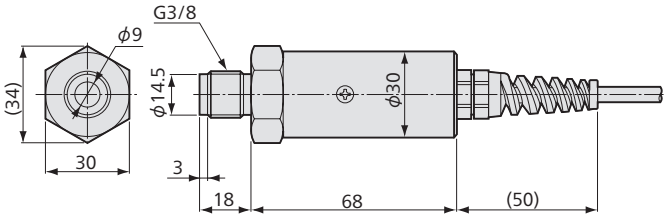
Mechanical Properties

Safe Overload Rating	200%
Materials	Case: SUS (Metallic finish)
	Liquid-contacting part: SUS 630
Weight	Approx. 200 g (Excluding cable)
Degree of Protection	IP52 (IEC 60529)
Mounting Screw	G3/8, male

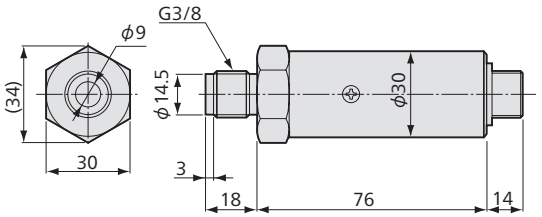
Standard Accessories Gasket (Mild copper)

Cable-integrated	Connector-equipped	Rated Capacity
PAV-10KR	PAV-10KU	1 MPa
——	PAV-50KU	5 MPa
——	PAV-100KU	10 MPa
——	PAV-200KU	20 MPa
PAV-300KR	PAV-300KU	30 MPa
——	PAV-500KU	50 MPa

Dimensions

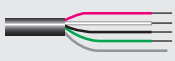


PAV-R



PAV-U

Bared at the tip



●Dynamic measurement

PAV-R/U Recommended products for combination


Universal Recorder EDX-200A
→ 3-55

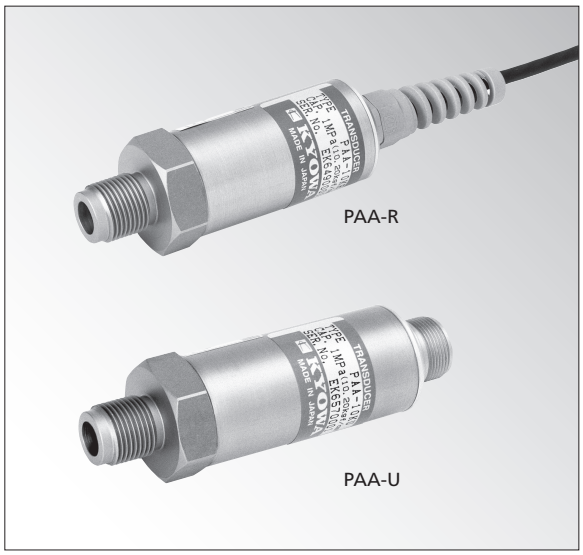

Universal Recorder EDX-100A
→ 3-63


Memory Recorder/Analyzer EDX-3000B
→ 3-69

PAA-R/U

●Highly Resistant against Noise during Transmission
●500 kPa to 50 MPa

Current-output Pressure Transducer



Suitable for Pressure Measurements of Industrial Equipments and Distant Pressure Measurement by Cable Extension

●Current output in a range of 4 to 20 mA
●Noise resistant
●High safe overload rating of 200%
●Suitable for industrial equipment/pressure control system
●Wide range of rated capacities

PAA-R/U pressure transducers have dedicated built-in amplifier and output current signals from 4 to 20 mA. There is no connection by welding in pressure sensor section. The built-in amplifier adopts unique hybrid IC to reduce numbers of components resulting in increasing reliability. Because built-in amplifier amplifies detected slight voltage in transmission, amplified signals have high resistance against noises, such as inductive interference, and ensure high accuracy.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.2% RO
Hysteresis	Within ±0.2% RO
Rated Output	4 to 20 mA

Environmental Characteristics

Safe Temperature Range	-20 to 80°C
Compensated Temperature Range	-20 to 70°C
Temperature Effect on Zero Balance	Within ±0.03% RO/°C
Temperature Effect on Output	Within ±0.02%/°C

Electrical Characteristics

SN Ratio	50 dB or more
Load Resistance	0 to 500 Ω
Frequency Response (Built-in Amplifier)	DC to 1 kHz
Power Supply	24 VDC (21 to 30 V), 30 mA
Cable	PAA-R: 4-conductor (0.18 mm²) vinyl shielded cable, 4.6 mm diameter by 3 m long, bared at the tip
	PAA-U: 4-conductor (0.3 mm²) chloroprene shielded cable, 7.6 mm diameter by 3 m long, bared at the tip
	(Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating	200%
Materials	Case: SUS (Metallic finish)
	Liquid-contacting part: SUS 630
Weight	Approx. 200 g (Excluding cable)
Degree of Protection	IP64 (IEC 60529)
Mounting Screw	G3/8, male

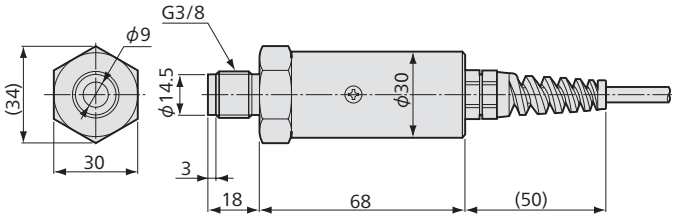
Standard Accessories: Gasket (Mild copper)

Cable-integrated	Connector-equipped	Rated Capacity
PAA-5KR	——	500 kPa
PAA-10KR	PAA-10KU	1 MPa
PAA-20KR	PAA-20KU	2 MPa
——	PAA-50KU	5 MPa
PAA-100KR	PAA-100KU	10 MPa
PAA-200KR	PAA-200KU	20 MPa
PAA-300KR	PAA-300KU	30 MPa
PAA-500KR	PAA-500KU	50 MPa

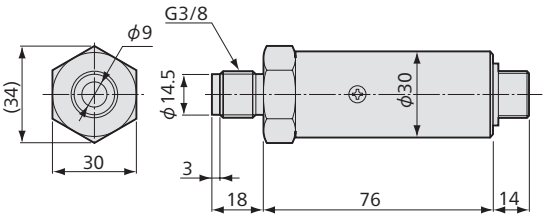
To Ensure Safe Usage

When measuring using voltage mode such as UCAM-60B, use a 250 Ω resistor to convert to voltage.

Dimensions

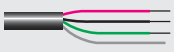


PAA-R



PAA-U

Bared at the tip



●Dynamic measurement

PAA-R/U Recommended products for combination


Universal Recorder EDX-200A
→ 3-55

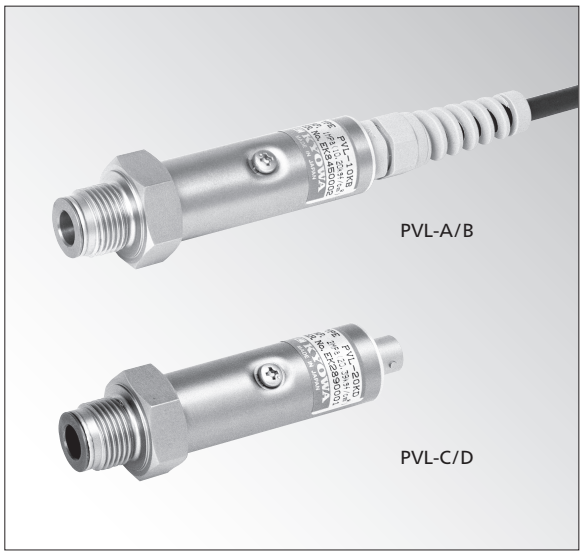

Universal Recorder EDX-100A
→ 3-63


Memory Recorder/Analyzer EDX-3000B
→ 3-69

PVL

●Output 0 to 5 V, 1 to 5 V ●500 kPa to 50 MPa

Voltage-output Pressure Transducer



Excellent Noise Resistance Type with a Built-in Amplifier

- ●Voltage output in a range of 0 to 5 V or 1 to 5 V
- ●High frequency response
- ●Compact and lightweight
- ●Applicable to highly viscous pressure medium
- ●Wide range of rated capacities
- ●Built-in negative power supply achieves to indicate 0V output as true 0V (PVL-B/D)

PVL series pressure transducers detect pressures by strain gage and then amplify these slight voltage signals by a built-in amplifier. The pressure sensor part is simply integrated structure and has high reliability. Also, the amplifier is fully tuned. Therefore, PVL series not only provide high vibration resistance, environmental resistance and stability but also without adjustment.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO(PVL-5 to 20 K)
	Within ±0.3% RO(PVL-30 to 500 K)
Hysteresis	Within ±0.5% RO(PVL-5 to 20 K)
	Within ±0.3% RO(PVL-30 to 500 K)
Rated Output	PVL-A/C: 1 to 5 V
	PVL-B/D: 0 to 5 V

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	-10 to 60°C
Temperature Effect on Zero Balance	Within ±0.05% RO/°C(PVL-5 to 20 K)
	Within ±0.03% RO/°C(PVL-30 to 500 K)
Temperature Effect on Output	Within ±0.05%/°C (PVL-5 to 20 K)
	Within ±0.03%/°C(PVL-30 to 500 K)

Electrical Characteristics

Output	See table above.
SN Ratio	50 dB or more
Load Resistance	1 kΩ or more
Frequency Response (Built-in Amplifier)	DC to 1 kHz
Power Supply	12 VDC(10.5 to 15 V), 30 mA or less
Cable	PAL-A/B: 4-conductor (0.14 mm²)chloroprene shielded cable
	6 mm diameter by 30 cm long, bared at the tip
	PAL-C/D: 4-conductor (0.18 mm²)vinyl shielded cable,
	4.6 mm diameter by 3 m long, bared at the tip
	(Shield wire is not connected to mainframe.)

Mechanical Properties

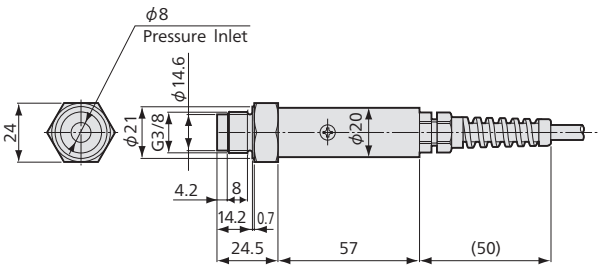
Safe Overload Rating	150%
Material	Case: SUS (Metallic finish)
	Liquid-contacting part: SUS 630
Weight	Approx. 85 g (Excluding cable)
Degree of Protection	IP52 (IEC 60529)
Mounting Screw	G3/8, male

Standard Accessories Gasket (Mild copper)

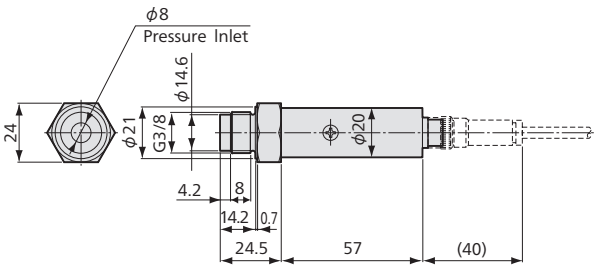
For every rated capacity, mechanical natural frequency is the same as PGM-H(2-88).

Models				Rated Capacity
Cable-integrated		Connector-equipped		
1 to 5V output	0 to 5V output	1 to 5V output	0 to 5V output	
——	PVL-5KB	PVL-5KC	PVL-5KD	500 kPa
——	PVL-10KB	PVL-10KC	PVL-10KD	1 MPa
——	PVL-20KB	PVL-20KC	PVL-20KD	2 MPa
——	PVL-50KB	PVL-50KC	PVL-50KD	5 MPa
——	PVL-100KB	PVL-100KC	PVL-100KD	10 MPa
PVL-200KA	PVL-200KB	PVL-200KC	PVL-200KD	20 MPa
——	PVL-300KB	——	PVL-300KD	30 MPa
——	PVL-500KB	PVL-500KC	PVL-500KD	50 MPa

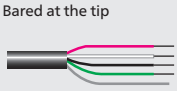
Dimensions



PVL-A/B



PVL-C/D



●Dynamic measurement

PVL Recommended products for combination


Universal Recorder EDX-200A → 3-55

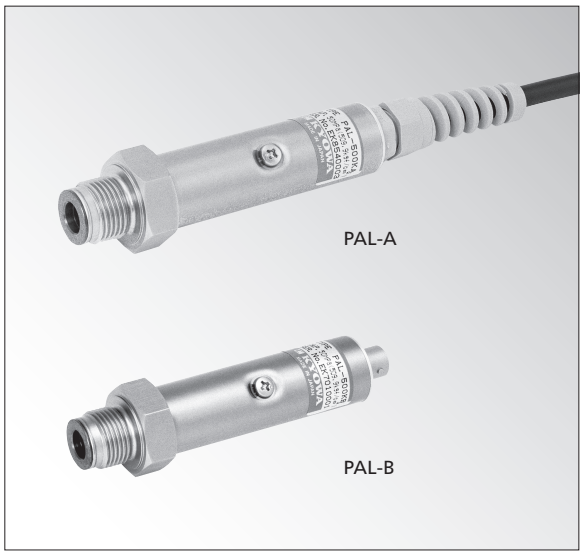

Universal Recorder EDX-100A → 3-63


Memory Recorder/Analyzer EDX-3000B → 3-69

PAL

●Output 4 to 20 mA ●500 kPa to 50 MPa

Current-output Pressure Transducer



Excellent Noise Resistance Type with a Built-in Amplifier

- ●Current output in a range from 4 to 20 mA
- ●High frequency response
- ●Small-sized and lightweight
- ●Applicable to highly viscous pressure medium
- ●Various capacity ranges

PAL series pressure transducers amplify detected slight signals by a built-in amplifier and then transmit amplified signals in current. The pressure sensor part is simply integrated structure and has high reliability. Also, the amplifier is fully tuned. Therefore, PAL series not only provide high vibration resistance, environmental resistance and stability but also measure without adjustment.

To Ensure Safe Usage

When measuring using voltage mode such as UCAM-60B, use a 250Ω resistor to convert to voltage.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5%RO(PVL-5 to 20 K)
	Within ±0.3%RO(PVL-30 to 500 K)
Hysteresis	Within ±0.5%RO(PVL-5 to 20 K)
	Within ±0.3%RO(PVL-30 to 500 K)
Rated Output	4 to 20 mA

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	-10 to 60°C
Temperature Effect on Zero Balance	Within ±0.05%RO/°C (PVL-5 to 20 KA)
	Within ±0.03%RO/°C (PVL-30 to 500 KA)
Temperature Effect on Output	Within ±0.05%/°C (PVL-5 to 20 KA)
	Within ±0.03%/°C (PVL-30 to 500 KA)

Electrical Characteristics

SN Ratio	50 dB or more
Load Resistance	0 to 500 Ω
Frequency Response (Built-in Amplifier)	DC to 1 kHz
Power Supply	24 VDC (21 to 30 V), 30 mA or less
Cable	PAL-A: 4-conductor (0.14 mm²) chloroprene shielded cable,
	6 mm diameter by 30 cm long, bared at the tip
	PAL-B: 4-conductor (0.18 mm²) vinyl shielded cable,
	4.6 mm diameter by 3 m long, bared at the tip
	(Shield wire Is not connected to mainframe)

Mechanical Properties

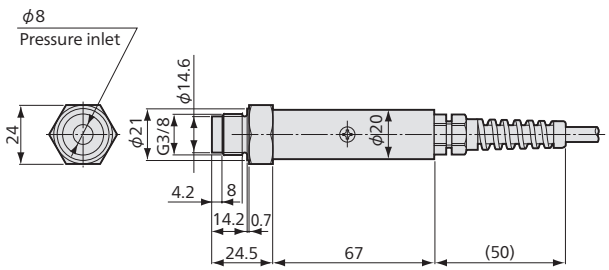
Safe Overload Rating	150%
Material	Case: SUS (Metallic finish)
	Liquid-contacting part: SUS 630
Weight	Approx. 85 g (excluding cable)
Degree of Protection	IP52 (IEC 60529)
Mounting Screw	G3/8, male

Standard Accessories Gasket (Mild copper)

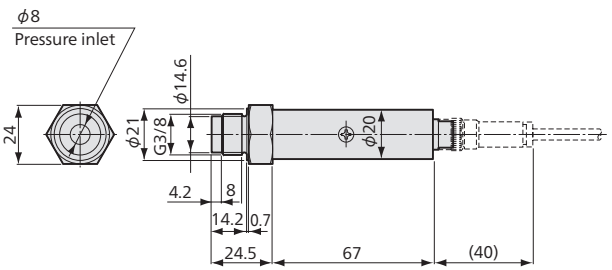
For every rated capacity, mechanical natural frequency is the same as PGM-H(2-88).

Models		Rated Capacity
Cable-integrated	Connector-equipped	
PAL-5KA	**PAL-5KB**	500 kPa
PAL-10KA	**PAL-10KB**	1 MPa
PAL-20KA	**PAL-20KB**	2 MPa
PAL-50KA	**PAL-50KB**	5 MPa
PAL-100KA	**PAL-100KB**	10 MPa
PAL-200KA	**PAL-200KB**	20 MPa
PAL-300KA	**PAL-300KB**	30 MPa
PAL-500KA	**PAL-500KB**	50 MPa

Dimensions

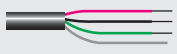


PAL-A



PAL-B

Bared at the tip



●Dynamic measurement

PAL Recommended products for combination


Universal Recorder EDX-200A → 3-55

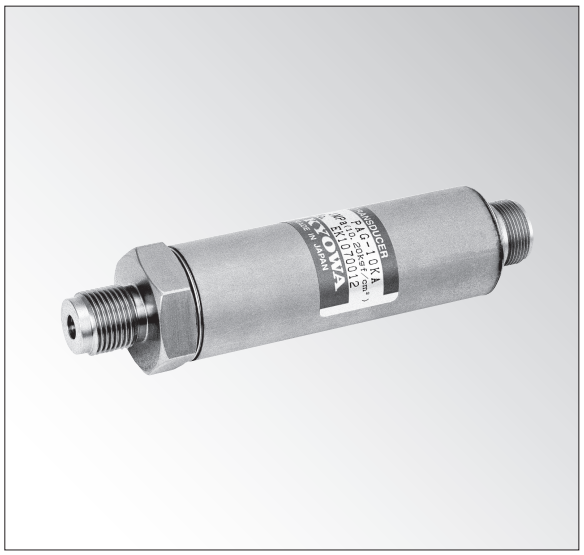

Universal Recorder EDX-100A → 3-63


Memory Recorder/Analyzer EDX-3000B → 3-69

PAG-2KA

Highly Stable Current-output Pressure Transducer

●Excellent in Reliability & Stability
●200 kPa



Excellent Reliability & Stability Fine Resolution

●Current output in a range from 4 to 20 mA
●Noise resistant

PAG-A series pressure transducers are stable and their sensor part is designed to be highly stable. Also, inert gas is sealed hermetically in sensor part, ensuring excellent reliability and stability for long-term. The built-in amplifier is composed of highly-selected reliable components and be fully tuned to provide high-frequency radio noise resistance. Therefore, PAG-A series achieves reliable, stable, and high noise resistant measurements.

Specifications

Performance

Rated Capacity	200 kPa
Nonlinearity	Within ±0.1% RO
Hysteresis	Within ±0.2% RO
Rated Output	4 to 20 mA

Environmental Characteristics

Safe Temperature Range	-20 to 75°C
Compensated Temperature Range	-20 to 70°C
Temperature Effect on Zero Balance	Within ±0.03% RO/°C
Temperature Effect on Output	Within ±0.01%/°C
Zero Stability	±0.5% RO/year

Electrical Characteristics

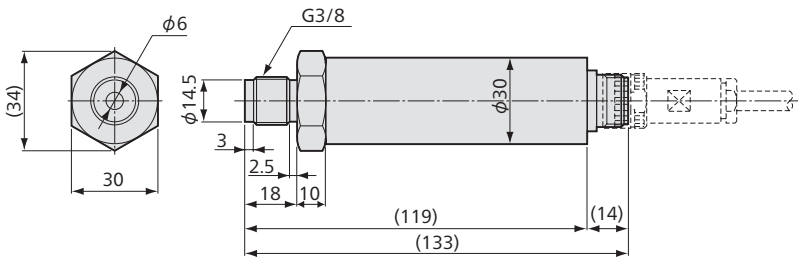
SN Ratio	60 dB or more
Load Resistance	0 to 500 Ω
Frequency Response (Built-in Amplifier)	DC to 400 Hz +0.5, -3 dB
Power Supply	24 V DC (21 to 30 V), 30 mA or less
Cable	4-conductor (0.3 mm²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, bared at the tip (3-wire) (Shield wire is not connected to mainframe.)

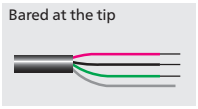
Mechanical Properties

Safe Overload Rating	150%
Material	Case: SUS (Metallic finish), SUS 630
Weight	Approx. 270 g (Excluding cable)
Degree of Protection	IP62 (IEC 60529)
Mounting Screw	G3/8, male

Standard Accessories Gasket (Mild copper)

Dimensions





●Dynamic measurement

PAG-2KA Recommended products for combination


Universal Recorder EDX-200A → 3-55

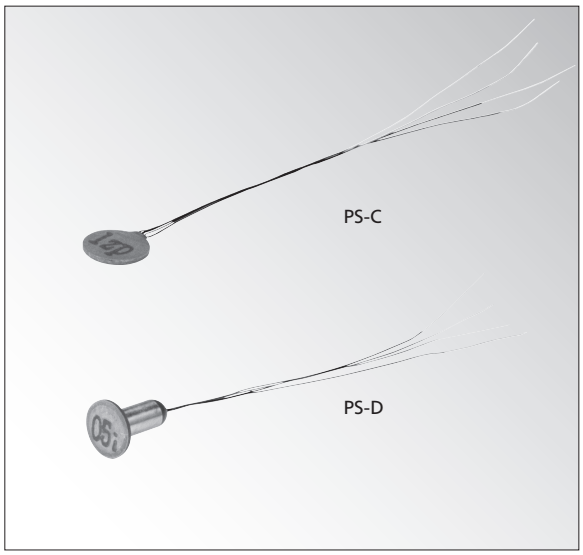

Universal Recorder EDX-100A → 3-63


Memory Recorder/Analyzer EDX-3000B → 3-69

PS

Miniature Pressure Sensor

●For Distributed Pressure Measurement
●50 kPa to 7 MPa



Ultra-thin & Compact Design Wide Range of Rated Capacity

PS series pressure transducers have a bridge of strain gages inside, achieving ultra-thin compact structure. They are installed by adhesives. They are suitable for distributed pressure measurement by using multiple units.

Note
(1) Copper alloy is used for sensing element. Avoid measuring corrosive liquid or gas.
(2) Epoxy adhesive has been used to assemble the liquid contacting section. Measuring liquids of PS-20 to 70KC/D M2 are limited to oil.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±1% RO
Hysteresis	Within ±1% RO
Rated Output	0.25 mV/V (500 μm/m) or more (PS-05KC/D)
	0.5 mV/V (1000 μm/m) or more (PS-1KC/D)
	0.85 mV/V (1700 μm/m)±30% (PS-2KC/D)
	1 mV/V (2000 μm/m)±20% (PS-5 to 70KC/D)
Note: Rated output is sorted to one of the classes divided by every 2% difference in output value. Since the rated output stated in the Test Data Sheet is the center value of the class, it may have a maximum error of ±1%.	

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	0 to 50°C
Temperature Effect on Zero Balance	Within ±0.8% RO/°C (PS-05KC/D)
	Within ±0.4% RO/°C (PS-1KC/D)
	Within ±0.3% RO/°C (PS-2KC/D)
	Within ±0.2% RO/°C (PS-5 to 70KC/D)
Temperature Effect on Output	Within ±0.3%/°C (PS-05 to 2KC/D)
	Within ±0.2%/°C (PS-5to 70KC/D)

Electrical Characteristics

Safe Excitation Voltage	3 V AC or DC
Recommended Excitation Voltage	1 to 2 V AC or DC
Input Resistance	350 Ω±10%
Output Resistance	350 Ω±10%
Cable	Polyurethane coated copper wires, 0.1 mm diameter (0.08 mm diameter with PS-05KD & 1KD) by 5 cm long, soldering finish at each tip (Shield wire is not connected to mainframe.)

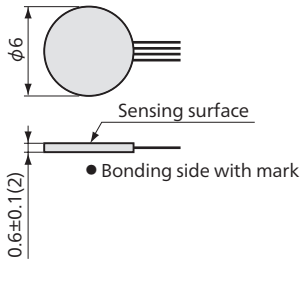
Mechanical Properties

Safe Overload Rating	150% (100% with PS-70KC/D M2)
Materials	Metallic finish
Weight	Approx. 0.5 g±20% (Including cable)

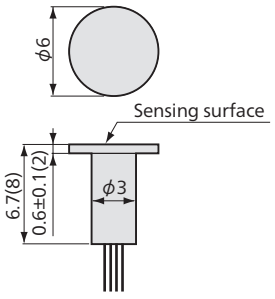
Models		Rated Capacity	Natural Frequencies (Approx.)
Cable Direction to Sensing Surface			
Horizontal	Vertical		
PS-05KC	**PS-05KD**	50 kPa	10 kHz
PS-1KC	**PS-1KD**	100 kPa	10 kHz
PS-2KC	**PS-2KD**	200 kPa	14 kHz
PS-5KC	**PS-5KD**	500 kPa	20 kHz
PS-10KC	**PS-10KD**	1 MPa	37 kHz
PS-20KC M2	**PS-20KD M2**	2 MPa	46 kHz
—	**PS-30KD M2**	3 MPa	58 kHz
PS-50KC M2	**PS-50KD M2**	5 MPa	71 kHz
PS-70KC M2	**PS-70KD M2**	7 MPa	86 kHz

Measuring liquids of PS-20 to 70KC/D M2 are limited to oils.

■Dimensions



PS-C



PS-D

Figures in parentheses are for 2 to 7MPa.

●Physical quantity indication ●Static measurement ●Dynamic measurement

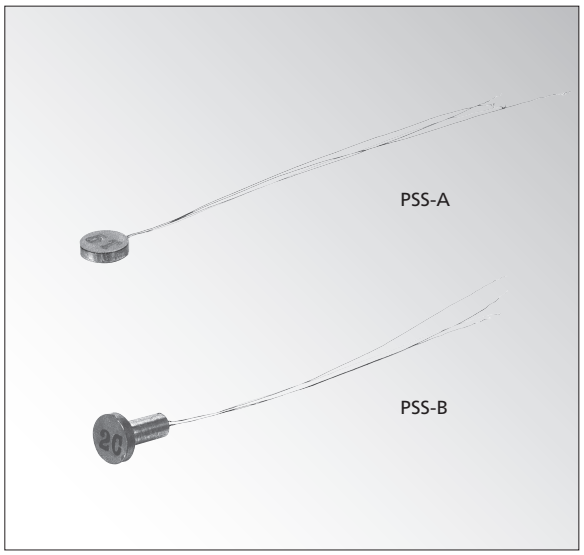
PS Recommended products for combination

Instrumentation Amplifier WGI-400A → 3-103
Fast Data Logger UCAM-550A → 3-31
Strain Amplifier DPM-900 Series → 3-5
Medium Speed Network Terminal Box NTB-500A → 3-35
Universal Recorder EDX-200A → 3-55
Sensor Interface PCD-400A → 3-77

PSS

Miniature Pressure Sensor

●For Distributed Pressure Measurement
●20 to 100 kPa



Ultra-Small and Lightweight Design with Small Rated Capacities and Suitable for Gas Pressure Measurement

PSS series pressure transducers have a bridge of strain gages inside, achieving ultra-thin compact structure. A thin-film strain gage is directly formed on a diaphragm by sputtering and photo lithography. PSS transducers are installed by adhesives and developed mainly for gas pressure measurement.

Note
(1) Copper alloy is used for sensing element. Avoid measuring corrosive liquid or gas.
(2) An epoxy adhesive is used to assemble the sensing element. Therefore, avoid using the sensor to measure organic solvents (toluene, ketone, etc.)
(3) It should not be used under high temperature and high humidity environments for a long time.
(4) It should not be used under water.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±3% RO(02K), Within ±1% RO(05K, 1K)
Hysteresis	Within ±3% RO(02K), Within ±1% RO(05K, 1K)
Rated Output	1 mV/V (2000 μm/m) or more
	0.75 mV/V (1500 μm/m) or more (PSS-02KAF/BF)
Note: Rated output is sorted to one of the classes divided by every 2% difference in output value. Since the rated output stated in the Test Data Sheet is the center value of the class, it may have a maximum error of ±1%.	

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	0 to 50°C (Non-condensing)
Temperature Effect on Zero Balance	Within ±0.8% RO/°C (PSS-05 & 1KAE/BE)
	Within ±0.6% RO/°C (PSS-02KAF/BF)
Temperature Effect on Output	Within ±0.3%/°C
	Within ±0.5%/°C (PSS-02KAF/BF)

Electrical Characteristics

Safe Excitation Voltage	4 V AC or DC
Recommended Excitation Voltage	1 to 2 V AC or DC
Input Resistance	350 to 1000 Ω
Output Resistance	350 to 1000 Ω
Cable	Polyurethane coated copper wires, 0.08 mm diameter by 5 cm long, soldering finish at each tip (Shield wire is not connected to mainframe.)

Mechanical Properties

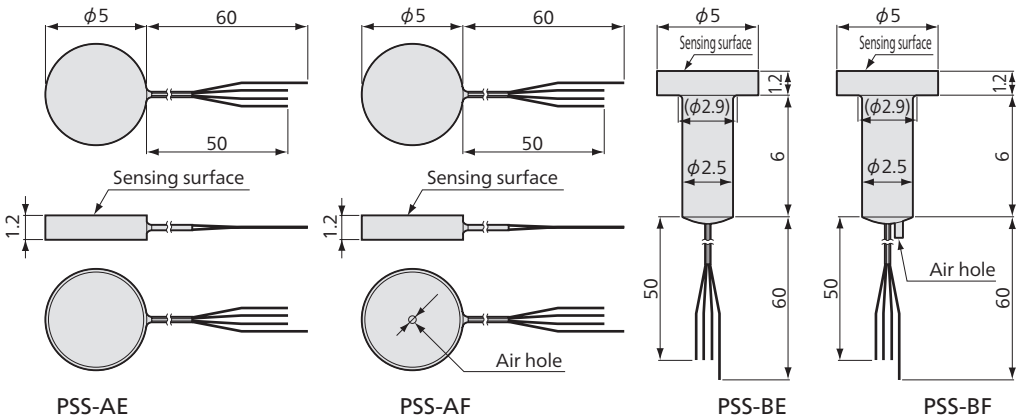
Safe Overload Rating	150%
Weight	PSS-A: Approx. 0.15 g
	PSS-B: Approx. 0.3 g

Models		Rated Capacity	Natural Frequencies (Approx.)	Remarks
Cable Direction to Sensing Surface				
Horizontal	Vertical			
PSS-05KAE	**PSS-05KBE**	50 kPa	18 kHz	Sealed type
PSS-1KAE	——	100 kPa	31 kHz	
PSS-02KAF	**PSS-02KBF**	20 kPa	6 kHz	Atmospheric

To Ensure Safe Usage

High-carrier-based dynamic strain amplifier DPM-912, 913 or 952 may not satisfy the specified rated output in some rare case. Request us to calibrate the transducer in combination with the strain amplifier. Or, if possible, use dynamic strain amplifier DPM-911 or 951 or signal conditioner CDV-900A.

Dimensions



●Static measurement ●Dynamic measurement

PSS Recommended products for combination


Fast Data Logger UCAM-550A → 3-31


Signal Conditioner CDV-900A → 3-9

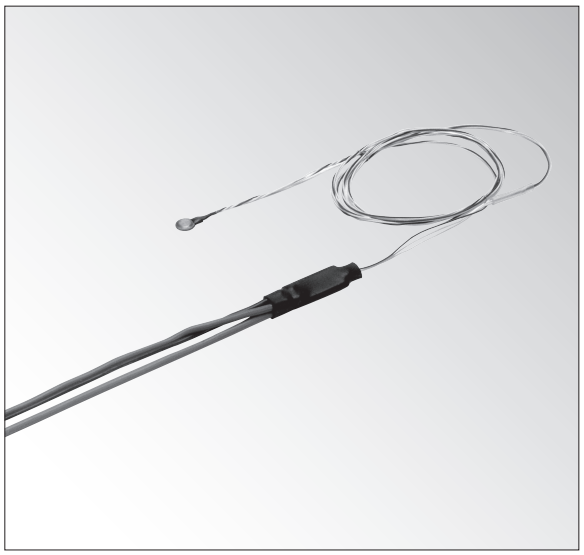

Medium Speed Network Terminal Box NTB-500A → 3-35


Universal Recorder EDX-200A → 3-55

PSM-AB

Miniature Pressure Sensor

●Kyowa's Smallest Pressure Sensors
●100 & 200 kPa



Ultra-small Sized Pressure Transducers with Strong Fluorocarbon Resin Cable

●Bridge adapter Standard Accessories

PSM-AB series are the smallest pressure sensors in Kyowa's products designed based on integration of sensor element and diaphragm. This sensor adopts 1-gage 3-wire system and configures a full bridge in a bridge adapter. In addition, this sensor is installed by adhesives. Developed mainly for gas pressure measurement, PSM-AB series can measure denser points than conventional transducers.

Note
(1) Copper alloy is used for sensing element. Avoid measuring corrosive liquid or gas.
(2) The mainframe has been assembled using an epoxy adhesive. Do not therefore use the transducer to measure organic solvent. (e.g. Toluene, ketone and others)

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±1% RO
Hysteresis	Within ±1% RO
Rated Output	0.275 mV/V (550 μm/m) ±25% (PSM-1KAB)
	0.38 mV/V (760 μm/m) ±25% (PSM-2KAB)
Note: Rated output is sorted to one of the classes divided by every 0.007 mV/V difference in output value. Since the rated output stated in the Test Data Sheet is the center value of the class, it may have a maximum error of ±0.0035 mV/V.	

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Compensated Temperature Range	0 to 50°C
Temperature Effect on Zero Balance	Within ±1% RO/°C (PSM-1KAB)
	Within ±0.5% RO/°C (PSM-2KAB)
Temperature Effect on Output	Within ±0.3%/°C

Electrical Characteristics

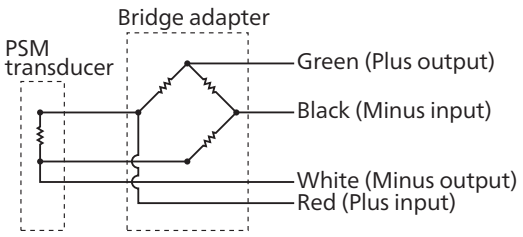
Safe Excitation Voltage	5 V AC or DC
Recommended Excitation Voltage	2 V AC or DC
Input Resistance	350 Ω±1%
Output Resistance	350 Ω±1%
Cable	Transducer: 3-conductor fluoroplastic coated cable, 0.3 mm diameter by 50 cm long
	Bridge adapter: 4-conductor vinyl coated cable, 1.3 mm diameter by 15 cm long, bared at the tip
	(Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating	150%
Weight	Approx. 0.5 g (Including cable but not bridge adapter)
Degree of Protection	IP61 (IEC 60529) (Excluding bridge adapters)

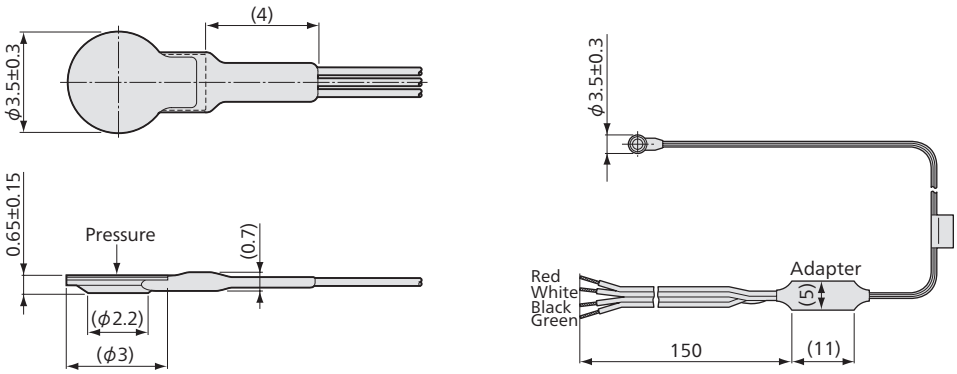
Models	Rated Capacity	Natural Frequencies(Approx.)	Remarks
PSM-1KAB	100 kPa	3 kHz	Bridge adapter Attached standard
PSM-2KAB	200 kPa	3 kHz	

Circuit Diagram



PSM-AB (Full bridge system)

Dimensions



●Physical quantity indication ●Static measurement ●Dynamic measurement

PSM-AB Recommended products for combination


Instrumentation Amplifier WGI-400A →3-103


Fast Data Logger UCAM-550A →3-31


Strain Amplifier DPM-900 Series →3-5


Medium Speed Network Terminal Box NTB-500A →3-35


Universal Recorder EDX-200A →3-55


Sensor Interface PCD-400A →3-77

PDS-A

●For Wind Pressure Measurement ●1 to 7 kPa

Minute Differential Pressure Transducer

*TEDS installation not possible.

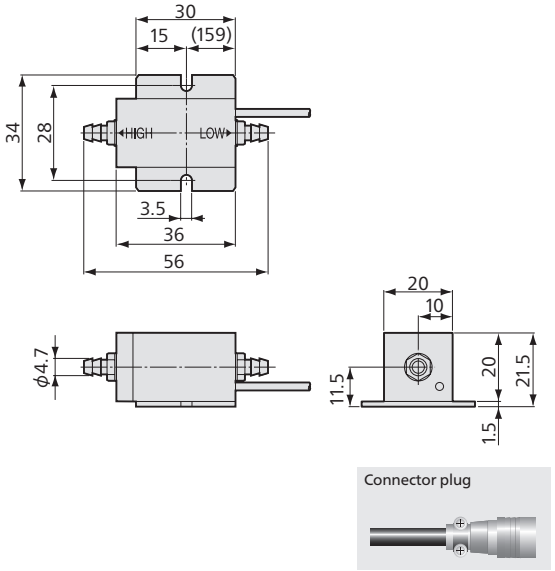
For Wind Pressure Measurement

●High frequency response
●Highly accurate
●High sensitivity
●Noise resistant
●Compact and lightweight

PDS-A series pressure transducers have diffusional semiconductor strain gages on a silicon diaphragm. PDS-A transducers detect pressures as resistance variation and then convert this variation to electrical signals. These signals are indicated by Kyowa's signal conditioners.

Note
(1) Use the transducer with general air
(2) If water or any other liquid enters the low side, the transducer gets out of order.

■Dimensions



Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO (Within ±0.7% with 25GA)
Hysteresis	Within ±0.3% RO
Rated Output	±7 to 23 mV (PDS-10GA)
	±13 to 23 mV (PDS-25 to 70GA)
Rated Output Accuracy	±1.0% RO (PDS-10 & 25GA)
	±1.5% RO (PDS-50GA), ±2.0% RO (PDS-70GA)

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Safe Humidity Range	20 to 85% RH (at 0 to 50°C)
Compensated Temperature Range	0 to 50°C
Temperature Effect on Zero Balance	Within ±0.1% RO/°C (PDS-10GA)
	Within ±0.08% RO/°C (PDS-25 to 70GA)
Temperature Effect on Output	Within ±0.1%/°C (PDS-10GA)
	Within ±0.08%/°C (PDS-25 to 70GA)
Pressure Medium	General air (Non-corrosive gas)

Electrical Characteristics

Initial Unbalance	Within ±10 mV
Bridge Output Resistance	2 to 6 kΩ
Recommended Excitation Voltage	10 VDC (9.5 to 15 V), 5 mA or less
	(Bridge power supply of signal conditioner can be used.)
Cable	PDS-A: 4-conductor (0.05 mm^2) chloroprene shielded cable,
	3 mm diameter by 3 m long, terminated with connector plug
	(Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating	300% (600% with PDS-10GA)
Maximum Line Pressure	100 kPa
Natural Frequencies	Approx. 1.7 kHz
Weight	Approx. 40 g (Excluding cable)
Posture Effect	Zero drift within ±0.3%(±0.8% with 10GA) when inclined
	by 90° referring to horizontal condition
Internal Volume	High side: Approx. 0.2 x 10^{-6} m^3 (0.2 ml)
	Low side: Approx. 1 x 10^{-6} m^3 (1 ml)
Pressure Connection	4.7 mm diameter barb fitting

Models	Rated Capacity
PDS-10GA	1 kPa
PDS-25GA	2.5 kPa
PDS-50GA	5 kPa
PDS-70GA	7 kPa

To Ensure Safe Usage

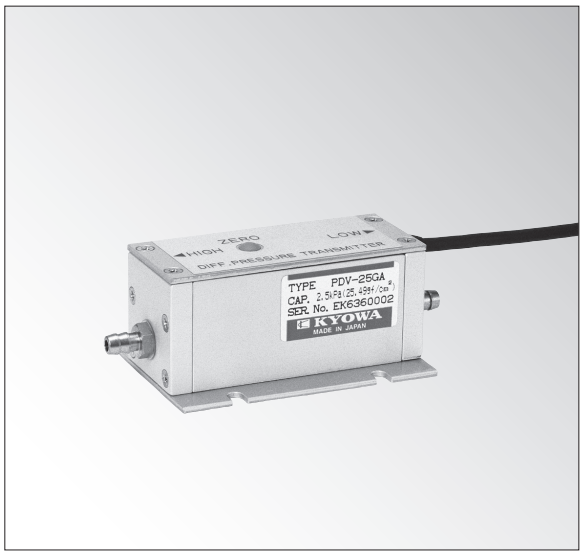
●Avoid dew condensation or freeze, because these transducers are designed for general indoor use.
●If using as a gage pressure meter, apply pressure to the HIGH side, and open the LOW side to the atmosphere.
●For atmospheric observation, prepare piping to prevent rainwater from entering the pressure inlet.
●Signal conditioners CDV-900A and instrumentation amplifiers WGA-900A,650B/710C with built-in bridge power supply of 10V DC are available for PDS-A series. In the case of WGA-650B or 710C, connection cable N-70 is required.
●Use a series type power supply.
*If dimensions of the pressure connection are desired to change, contact us.

●Dynamic measurement
PDS-A Recommended products for combination
Signal Conditioner CDV/CDA-900A
→3-9

PDV-A

●For Wind Pressure Measurement
●1 to 7 kPa

Minute Differential Pressure Transducer



Corrosion Resistance with Built-in Variable Damping Mechanism

●High frequency response
●Highly accurate
●High sensitivity
●Noise resistant
●Voltage output of 5 V
●Compact and lightweight

PDV-A series pressure transducers have diffusional semiconductor strain gages on a silicon diaphragm. PDV-A transducers detect pressures as resistance variation and then amplify this signal by built-in amplifier.

Note
(1) Use the transducer with general air.
(2) If water or any other liquid enters the low-pressure line the transducer gets out of order.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.5% RO (Within ±0.7% with 25GA)
Hysteresis	Within ±0.3% RO
Rated Output	±5 V
Rated Output Accuracy	±1.0% RO (PDV-10 & 25GA)
	±1.5% RO (PDV-50GA)
	±2.0% RO (PDV-70GA)

Environmental Characteristics

Safe Temperature Range	-20 to 70°C
Safe Humidity Range	20 to 85% RH (0 to 50°C)
Compensated Temperature Range	0 to 50°C
Temperature Effect on Zero Balance	Within ±0.1% RO/°C (PDV-10GA)
	Within ±0.08% RO/°C (PDV-25 to 70GA)
Temperature Effect on Output	Within ±0.1%/°C (PDV-10GA)
	Within ±0.08%/°C (PDV-25 to 70GA)
Pressure Medium	General air (Non-corrosive gas)

Electrical Characteristics

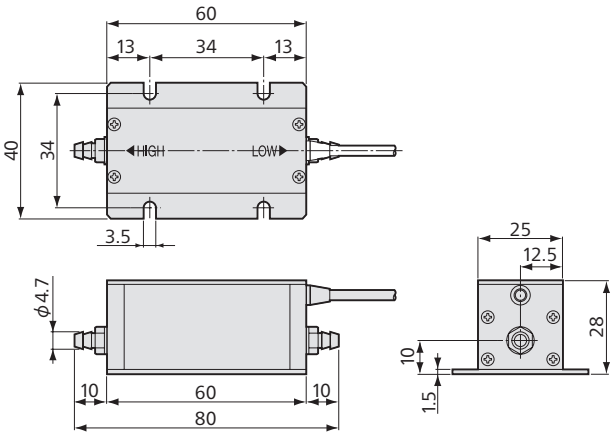
Load Resistance	5 kΩ or more
Bridge Output Resistance	2 to 6 kΩ
Power Supply	12 VDC (11 to 15 V), 30 mA or less
Cable	PDV-A: 4-conductor (0.05 mm²) chloroprene shielded cable, 3 mm diameter by 3 m long, bared at the tip

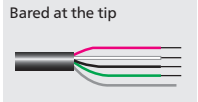
Mechanical Properties

Safe Overload Rating	300% (600% with PDV-10GA)
Maximum Line Pressure	100 kPa
Natural Frequency	Approx. 1.7 kHz
Weight	Approx. 100 g (Excluding cable)
Posture Effect	Zero drift within ±0.3%(±0.8% with 10GA) when inclined by 90°referring to horizontal
Internal Volume High side	Approx. 0.2 x 10^{-6} m³ (0.2 ml)
Low side	Approx. 1 x 10^{-6} m³ (1 ml)
Pressure Connection	4.7 mm diameter barb fitting

Models	Rated Capacity
PDV-10GA	1 kPa
PDV-25GA	2.5 kPa
PDV-50GA	5 kPa
PDV-70GA	7 kPa

Dimensions





To Ensure Safe Usage

●Avoid dew condensation or freeze, because these transducers are designed for general indoor use.
●When using for a pressure meter, apply pressure to the high side and open the low side to the atmosphere.
●For atmospheric observation, prepare piping to prevent rainwater from entering the pressure inlet.
*If dimensions of the pressure connection are desired to change, contact us.

PDV-A Recommended products for combination

●Static measurement
Data Logger UCAM-60B
→ 3-25

●Dynamic measurement
Sensor Interface PCD-430A
→ 3-77

PD-A

Differential Pressure Transducer

●Usable at Max. Line Pressure of 2.94 MPa
●10 to 200 kPa

*TEDS-installed versions can be manufactured. Inquiries are welcome.

Wide Line Pressure Margin and Highly Accurate

PD-A series pressure transducers can measure slight differential pressures highly accuracy. They are suitable for long-term measurements and measurements requiring high accuracy. Furthermore, they can be used for not only differential pressure measurement but also indication and control of automation systems based on characteristics of differential pressure sensor like flow rate measurement.

Note: Copper alloy is used for sensing element. Avoid measuring corrosive liquid or gas.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.3% RO
Hysteresis	Within ±0.2% RO
Rated Output	1.5 mV/V (3000 μm/m) ±1%

Environmental Characteristics

Safe Temperature Range	-10 to 70°C
Compensated Temperature Range	0 to 60°C
Temperature Effect on Zero Balance	Within ±0.05% RO/°C (PD-100GA)
	Within ±0.01% RO/°C (PD-200GA to 2KA)
Temperature Effect on Output	Within ±0.5%/°C (PD-100GA)
	Within ±0.03%/°C (PD-200GA to 2KA)

Electrical Characteristics

Safe Excitation Voltage	15 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	350 Ω±1%
Output Resistance	350 Ω±1%
Cable	4-conductor (0.3 mm²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, terminated with connector plug (Shield wire is connected to mainframe.)

Mechanical Properties

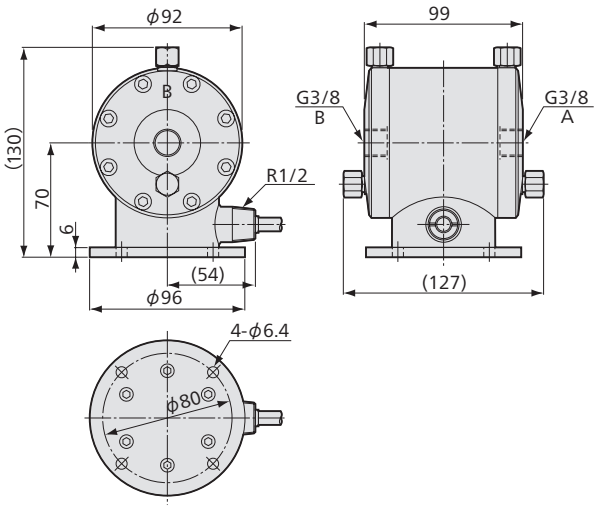
Safe Overload Rating	Differential Pressure 200% (PD-100 & 200GA)
	150% (PD-500GA & 1KA)
	125% (PD-2KA)
Maximum Line Pressure	2.94 MPa
Natural Frequencies	See table below.
Weight	Approx. 5 kg (Excluding cable)

*To use for gas, contact us.

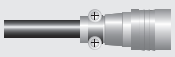
When A side is a high pressure plus output
B side is a high pressure minus output.
(Refer to A, B Dimensions)

Models	Rated Capacity	Natural Frequencies (Approx.)
PD-100GA	10 kPa	60 Hz
PD-200GA	20 kPa	110 Hz
PD-500GA	50 kPa	230 Hz
PD-1KA	100 kPa	400 Hz
PD-2KA	200 kPa	700 Hz

Dimensions



Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PD-A Recommended products for combination


Instrumentation Amplifier WGA-680A → 3-97


Instrumentation Amplifier WGA-710C → 3-100


Data Logger UCAM-60B → 3-25


Strain Amplifier DPM-900 Series → 3-5


Universal Recorder EDX-100A → 3-63


Sensor Interface PCD-430A → 3-51

PDU-A

●Usable at Max. Line Pressure of 30 MPa
●50 kPa to 2 MPa

Stainless Steel Differential Pressure Transducer

*TEDS-installed versions can be manufactured. Inquiries are welcome.

Corrosion Resistant Built-in Variable Damping Mechanism

●Overload protection mechanism

Note: Copper alloy is used for sensing element. Avoid measuring corrosive liquid or gas.

Specifications

Performance

Rated Capacity	See table below.
Nonlinearity	Within ±0.2% RO (PDU-A-50 to 500KP)
	Within ±0.25% RO (PDU-A-1 & 2MP)
Hysteresis	Within ±0.2% RO (PDU-A-50 to 500KP)
	Within ±0.25% RO (PDU-A-1 & 2MP)
Repeatability	0.1% RO or less
Rated Output	1.5 mV/V (3000 μm/m) ±0.5%

Environmental Characteristics

Safe Temperature Range	-30 to 90°C
Compensated Temperature Range	-20 to 80°C
Temperature Effect on Zero Balance	Within ±0.01% RO/°C
	(50KP, 100KP: Within ±0.02%RO/°C)
Temperature Effect onOutput	Within±0.01%/°C
	(50KP, 100KP: Within ±0.02%/°C)

Electrical Characteristics

Safe Excitation Voltage	15 V AC or DC
Recommended Excitation Voltage	1 to 10 V AC or DC
Input Resistance	350 Ω±1%
Output Resistance	350 Ω±1%
Cable	4-conductor (0.3 mm²) chloroprene shielded cable,
	7.6 mm diameter by 5 m long, terminated with connector plug
	(Shield wire is connected to mainframe.)

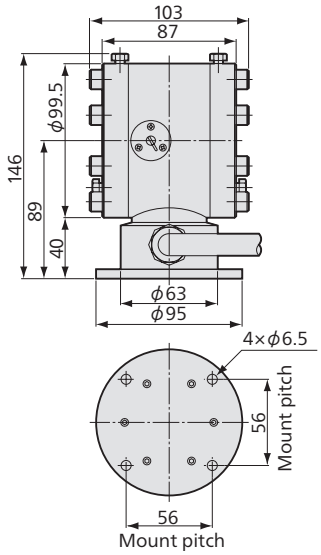
Mechanical Properties

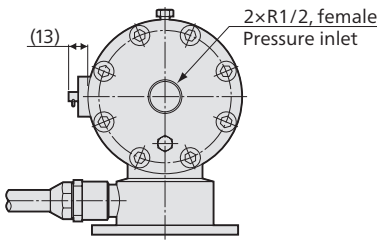
Safe Overload Rating	150% (if an overload of 30 MPa is applied to either high or low pressure side, the transducer is not damaged.)
Frequency Response Range	DC to 30 Hz
Maximum Line Pressure	30 MPa
Weight	Approx. 6 kg (Excluding cable)

*To use for gases, contact us.

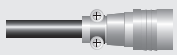
Models	Rated Capacity
PDU-A-50KP	50 kPa
PDU-A-100KP	100 kPa
PDU-A-200KP	200 kPa
PDU-A-500KP	500 kPa
PDU-A-1MP	1 MPa
PDU-A-2MP	2 MPa

■Dimensions





Connector plug



●Physical quantity indication ●Static measurement ●Dynamic measurement

PDU-A Recommended products for combination