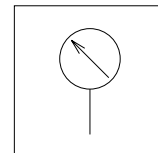


Pressure Gauge

Feature

- The compact-size pressure gauges can be installed in small spaces. With the built-in tube fitting type, tube connection is the only necessary step before pressure indication.

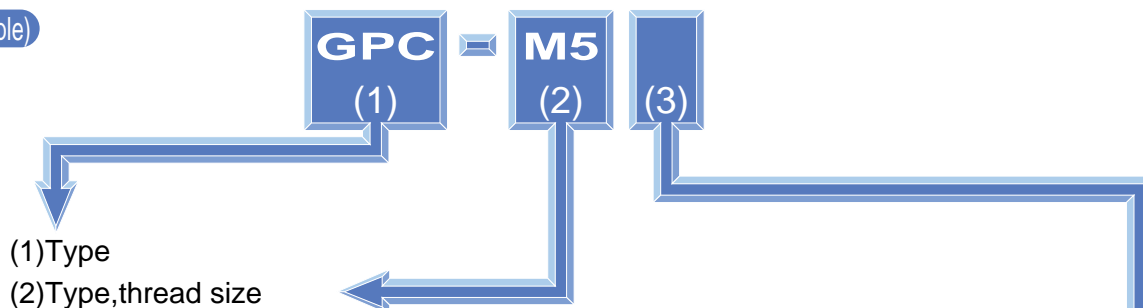
Graphical representation



Specification

Fluid admitted	Air	
Pressure indication range	0~113.8psi	0 ~ 0.8MPa
Accuracy	±5%(Full span)	
Service temperature range	32~140°F	0~60°C
Material	Cap	Acryl
	Metalic body	Nickel-plated brass
	Resin body	PBT(GPU, GPM)

Model Designation (Example)



	Tube dia (mm)			in. size			Metric thread	Taper pipe thread	
Code	4	6	8	5/32	1/4	5/16	M5	01	02
Size	φ4mm	φ6mm	φ8mm	φ5/32	φ1/4	φ5/16	M5×0.8(mm)	R1/8	R1/4

	Unified fine thread	American standard Taper pipe thread	
Code	U10	N1	N2
Size	10-32UNF	NPT1/8	NPT1/4

(3)Hexagon flat-to-flat specification

U: Hexagon flat-to-flat inch spec. (NPT)
No code: Hexagon flat-to-flat mm spec.

⚠ Detailed Safety Instructions

Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual" on pages 23~24 and "Common Safety Instructions for Controllers" on pages 167~168.

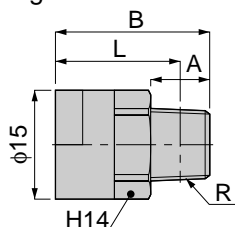
⚠ Caution

- The gauge orientation on the GPU and GPM types can not be changed by using a tool applied to the hexagon part. Direct turning of the gauge cap may damage the gauge or render the indication inaccurate.
- The gauge accuracy of Pressure Gauge is ±5%FS (full span). To confirm the accuracy, check with another gauge.

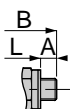
GPC

Pressure gauge
Straight

unit:mm



Model code	R	A	B	L	Mass (g)
GPC 15-M5	M5×0.8	3	16.5	13.5	6
GPC 15-01	R1/8	8	21	17	8
GPC 15-02	R1/4	11	24	18	16.5



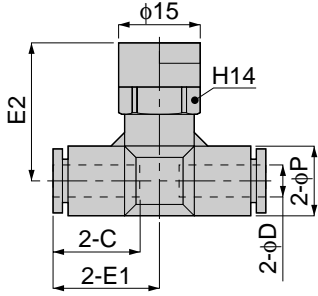
Metric thread type



Control Series Pressure Gauge

GPU

Union Straight

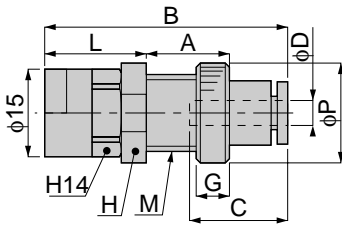


unit:mm

Model	Tube dia. φD	φP	C	E1	E2	Mass (g)
GPU 4-4	4	10	15	17	24.5	12.5
GPU 6-6	6	13	17	20	26	15.5
GPU 8-8	8	15	18.5	22	28	20

GPM

Bulkhead type

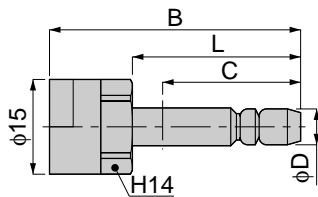


unit:mm

Model	Tube dia. φD	M	A	B	L	φP	C	G	H	Mass (g)
GPM 4	4	M12×1	16	39	17	16	15	5	14	12.5
GPM 6	6	M14×1	14	42.5	17	19	17	5	17	16
GPM 8	8	M16×1	17	45.5	18	22	18.5	6	19	21.5

GPJ

Nipple type



unit:mm

Model	φD	B	L	C	Mass (g)
GPJ 4	4	36	23	15	8
GPJ 6	6	38	25	17	9.5
GPJ 8	8	35	21	18.5	12.5

LED Digital Pressure Sensor

Package: 1 pc. in a bag

- To enhance visibility, an LED display is used for the vacuum switch.
- LED displays are used for set-up pressure and impression pressure.
- Two types of vacuum switch equipped with two-point output and analog output are provided. The application determining which should be used. In respect to wiring, a connector system has been chosen for ease of layout.
- Three pipe connection methods are offered: one-touch, M5 metric female screw, and direct connection. The application will determine which method is the most appropriate.
- Output detection accuracy is enhanced by the use of electronic switches.

Specifications

Specification	Equipped with 2-point output switch (W)	Equipped with analog output switch (A)	
Set value at shipment	-14.8in. Hg/-50kPa (SW1) -3.0in. Hg/-10kPa (SW2)	-14.8in. Hg/-50kPa	
Current consumption	40mA max.		
Pressure detection	Diffused semiconductor pressure switch		
Service pressure range	0~-29.5in. Hg (0~-100kPa)		
Pressure setting range	0~-29.3in. Hg (0~-99kPa)		
Proof pressure	29psi (0.2MPa)		
Storage temperature range	-4~176°F/20~80°C (atmospheric pressure, humidity less than 60%RH)		
Operating temperature range	32~122°F/0~50°C (no freezing)		
Operating humidity range	35~85%RH (no freezing)		
Power requirements	DC12~24V ± 1.0% Ripple (P-P) 10% max.		
Protective structure	IEC standard IP40 equiv.		
No. of pressure setting	2	1	
Operating accuracy	± 3%F.S. max. (at Ta= 77°F/25°C)		
Differential response	Fixed (2%F.S. max)	Variable (about 0~15% of set value)	
Switch output	Open collector output: 30V 80mA max. Residual voltage 0.8V max.		
Analog output			
			Output voltage: 1~5V
			Zero-point voltage: 1 ± 0.1 V
			Span voltage: 4 ± 0.1 V
	Output current: 1mA max. (load resistance 5kΩ max.)		
	LN/HYS : ± 0.5%F.S. max.		
Response	1 msec max.		
Indication	0~-29.5in. Hg/0~-99kPa (2-digit red LED display)		
No. of indications	About 4 times/sec		
Indication accuracy	± 3%F.S. ± 2digit		
Resolution	1 digit		
Operational indication	SW1: Red LED lighting up when pressure is above setting	Red LED lighting up when pressure is above setting.	
	SW2: Green LED lighting up when pressure is below setting		
Function	1. MODE selector switch (ME or S1 or S2)	1. MODE selector switch (ME or SW)	
	2. S1 setting trimmer (2/3-turn trimmer)	2. SW setting trimmer (2/3-turn trimmer)	
	3. S2 setting trimmer (2/3-turn trimmer)	3. HYS setting trimmer (about 0~15% of set value)	

Model Designation (Example)

VUS21 -

- ①. Switch output
No code: NPN opencollector output
P: PNP opencollector output
- ②. Vacuum switches (NPN Open collector)
W: With 2-point output switch
A: With analog output switch
- ③. Connecting method

	Metric thread (mm)	Quick-fitting joint			Fixed type
Code	M5	4	6	8	F
Size	M5×0.8	φ4mm	φ6mm	φ8mm	—

Detailed Safety Instructions

Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual" on page 15 to 17 and "Common Safety Instructions for Control Series" on page 59 and "Common Safety Instructions for LED Digital Pressure Sensors, Digital Pressure Sensors & Pressure Sensors" on page 77.

⚠ Warning

1. The cable can be connected to or disconnected from the connector. But avoid connection and disconnection unless it is absolutely necessary, for it will put burdens on the cable or the board.

⚠ Caution

1. Although performance will not be affected even when pressure of around 0.5MPa (72.5psi) is applied, avoid continued application of pressure greater than 0.2MPa (29psi) during vacuum breaking. Prolonged application of such pressure may possibly cause damage to the sensors.
2. To set pressure and differential response, turn trimmer slightly with a screw driver within the prescribed range of rotation. Trying to adjust trimmer rotation by applying excessive force may possibly damage to the trimmer and base board.
3. As for power, use a stable direct current.
4. Insert a surge voltage absorption circuit in relays connected to output terminals and power source terminals (relays, electromagnetic valves, etc.). Do not use an electric current exceeding 80mA.
5. Ground the FG terminal when unit power sources, such as a switching power source unit, are used.
6. Do not short-circuit output terminals (black with a gray lead wire) and other terminals.
7. Avoid strong impacts and excessive force to the sensor body.
8. To install the sensor, use the specially prepared M2.5 screw. Tighten it to the recommended torque.
9. Fluid used must be kept in a pristine state.

Tube Fitting Type	Direct Mounting Type
VUS Negative Pressure Type	VUS Negative Pressure Type
Model	Model
VUS21□□-4	VUS21□□-F
VUS21□□-6	Internal Thread Type VUS Negative Pressure Type
VUS21□□-8	
	Model
	VUS21□□-M5

Small-sized Pressure Sensor

Package: 1 pc. in a bag

Sensor Heads

- Small-sized 24.5-mm pressure sensors (width: 10mm × height, 10mm × total length).
- "Union," "Nipple," and "Male screw" are prepared.
- Use of an analog output type and indicator (SED30-series) has made a separate display system possible.
- Our small-sized pressure sensors can handle "positive pressure," "negative pressure" and "Compound pressure". Concerning output, a total of six different specifications are prepared.
- Standard cable length is 3m.

Indicators

- A large 31.4mm square size indicator is used, realizing a high level of visibility with its large-sized LED display.
- All settings can be made using just three push buttons.
- For indication units, you can choose from among 11 different types.
- Two different kinds of output methods are offered - analog output and switch output.
- Four (4) different kinds of installation stays are available depending on installation form. - for installation in the rear, on a flat surface, panel-buried, and for protection of display components.

Specifications

■ Sensor Heads (Switch type)

Specification	SEU 11 series	VUS 11 series	VUS 11-R series
Fluid admitted	Air, inert gas		
Pressure detection	Proliferated semiconductor pressure switch		
Power requirements	DC10.8 ~ 30V (ripples included)		
Power consumption	20mA or less (DC24V at no-load)		
Service pressure range	0 ~ 150psi (0 ~ 1MPa)	0 ~ -30in. Hg (-100 ~ 0kPa)	89 ~ -30in. Hg (-100 ~ 300kPa)
Proof pressure	218psi (1.5MPa)	29psi (200kPa)	87psi (600kPa)
Storage temperature range	-4 ~ 158°F (-20 ~ 70°C) (Atmospheric pressure, humidity less than 60%RH)		
Operating temperature range	32 ~ 140°F (0 ~ 60°C) (No freezing)		
Operating humidity range	35 ~ 85%RH (No freezing)		
Protective structure	IEC standard IP40 equiv.		
Switch output	No. of pressure setting	1	
	Switch output	NPN Open collector output: 30V 80mA max. Residual voltage 0.8V max.	
	Display of action	N.O. (red LED lights up when set pressure exceeded)	
	Differential response	Fixed (2%F.S. max.)	
	Operating accuracy	±3%F.S. max. (at Ta=25°C/77°F)	
	Response	Approx. 1msec	
Pressure setting range	0 ~ 150psi (0 ~ 1MPa)	0 ~ -30in. Hg (-100 ~ 0kPa)	89 ~ -30in. Hg (-100 ~ 300kPa)

■ Sensor Heads (Analog type)

Specification	SEU 11 series	VUS 11 series	VUS 11-R series
Fluid admitted	Air, inert gas		
Pressure detection	Proliferated semiconductor pressure switch		
Power requirements	DC10.8 ~ 30V (ripples included)		
Power consumption	20mA or less (DC24V at no-load)		
Service pressure range	0 ~ 150psi (0 ~ 1MPa)	0 ~ -30in. Hg (-100 ~ 0kPa)	89 ~ -30in. Hg (-100 ~ 300kPa)
Proof pressure	218psi (1.5MPa)	29psi (200kPa)	87psi (600kPa)
Storage temperature range	-4 ~ 158°F (-20 ~ 70°C) (Atmospheric pressure, humidity less than 60%RH)		
Operating temperature range	32 ~ 140°F (0 ~ 60°C) (No freezing)		
Operating humidity range	35 ~ 85%RH (No freezing)		
Protective structure	IEC standard IP40 equiv.		
Analog output	Output voltage	1 ~ 5V	
	Zero-point voltage	1 ±0.1V	
	Max. rated pressure voltage	5 ±0.1V	
	Output current	1mA max. (Load Resistance 5kΩ min.)	
	Linearity	±0.5%F.S. max.	

Small-sized Pressure Sensor

Specifications

■ Indicator			
Specification	SED-30		
Power requirements	DC10.8 ~ 30V		
Consumption current	50mA max. (supply voltage: DC10BV when a 2-point switch is turned ON for output)		
Storage temperature range	-4 ~ 158°F (-20 ~ 70°C) (Atmospheric pressure, humidity less than 60%RH)		
Operating temperature range	32 ~ 122°F (0 ~ 50°C) (No freezing)		
Operating humidity range	35 ~ 85%RH (No freezing)		
Protective structure	IEC standard IP40 equiv.		
Pressure indication method	No. of indications	4 times/sec	
	Response	Variable with a digital filter, about 5, 25, 250, 2500msec	
	Indication accuracy	±1%F.S.	
	Temperature characteristics	±0.5F.S. (32 ~ 122°F (0 ~ 50°C), reference temperature: 25°C/77°F)	
	Monitoring function	Beyond indicated numbers of digits	"9 9 9" flashes
		Beyond detection range	"- -" flashes (rated pressure: 110% or more)
		Detection of output overloads	"E - 1" flashes/overloads detected, output indication lamp flashes
	'0' adjustment function		Panel switch-operated pressure indication (zero clear)
		Monitoring of adjustment errors	Monitors '0' adjustment operation when residual pressure is impressed beyond (10%F.S.). "Error Warning E-2" flashes (cancelled using a panel switch)
	Resolution	1 digit	
Pressure indication element	3-digit 7-segmented LED (character height: 8mm), colored red		
Code indication element	LED lamp (illuminates at "minus", colored red)		
Rated pressure indication range	Pressure indication units and rated pressure ranges are selected via the panel switches listed in the table given below.		
Switch output	Number of output point	2-point outputs (SW1, Sw2)	
	Switch output method	NPN Open collector	
	Switch capacity	DC30V 100mA max.	
	Residual voltage	1.2V max. (with load current at 100mA)	
	Pressure setting method	Using a panel switch	
	Pressure setting range	-999 ~ 999 count (decimal points are to conform to the range of rated voltage as given in the tabulated specifications).	
	Operational indication	Two LEDs light up (SW1: green, SW2: red, when output is switched ON)	
	Repetitiveness	±0.2%F.S. ±1count	
	Temperature characteristics	±0.5F.S. (32 ~ 122°F (0 ~ 50°C), reference temperature: 25°C/77°F)	
	Response	Can be adjusted by setting digital filters, 5, 25, 250, 2500msec	
Setting differential responses	0 ~ 300 counts (can be adjusted via a panel switch)		
Protection against overloads	2-point output switches (SW1, SW2) are switched OFF (overload current: "200mA or beyond" or "beyond 200mA")		
Analog output	Output voltage	1 ~ 5V	
	Output current	1mA (Load resistance: 5kΩ min.)	
Sensor input specifications	Voltage input signal	1 ±0.1 ~ 5 ±0.1V	

Pressure sensors used		VUS11-□A	VUS11-□AR	SEU11-□A
Magnification (Unit)	Units of pressure	kPa		
	Pressure range setting code	-12P	32r	13P
×1 (kPa)	Rated pressure indication range (PL ~ PH)	0.0 ~ -99.9	-100 ~ 300	0 ~ 999
×0.0102 (kgf/cm ²)		0.00 ~ -1.02	-1.02 ~ 3.06	0.00 ~ (9.99)
×10.2 (gf/cm ²)		0 ~ (-999)	—	—
×7.501 (mmHg)		0 ~ -750	—	—
×102 (mmH ₂ O)		—	—	—
×0.01 (bar)		0.00 ~ -1.02	-1.00 ~ 3.00	0.0 ~ 9.99
×10 (mbar)		0 ~ -999	—	—
×0.145 (psi)		0.0 ~ -14.5	-14.5 ~ 43.5	0 ~ 145
×0.000145 (kpsi)		—	—	—
×0.001 (MPa)		—	-0.10 ~ 0.30	0.00 ~ 1.00
×0.2953 (In.Hg)	0.0 ~ -29.5	-29.5 ~ -88.5	0 ~ 295	
Analog output mode indicated		3	1	2

Model Designation of Sensor Heads (Example)



- Type
SEU11 : Positive pressure sensor
VUS11 : Negative pressure sensor
- Pressure introduction configuration
4: ø4mm nipple
6: ø6mm nipple
M5: M5×0.8 male screw
O1: R1/8 male screw
4U: ø4mm quick-fitting joint (fitted with an in-line installation holder)
6U: ø6mm quick-fitting joint (fitted with an in-line installation holder)
- Switch output
A: Analog output
AR: Compound pressure type analog output
S: NPN open collector output
SR: Compound pressure type NPN open collector output
 *Compound pressure type (□R) is only accepted when ① "VUS11" is selected.

Model Designation of Indicators (Example)

SED - 30

Model Designation of Individual Indicator accessories (Example)






- Configuration of accessories (installation stay)
O11 : Rear angles (rear angles, two M3×4 male screws)
O12 : Flat surface angles (two M3×4 male screws)
004 : Holder cover set (a panel holder cover, a panel holder)
003 : Panel holder set (a panel cover, a panel holder and panel stopper)
007 : Holder stopper set (a panel holder and panel stopper)
- In case of ordering please apply Model code in the following chart.




Detailed Safety Instructions

Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual" on page 15 to 17 and "Common Safety Instructions for Control Series" on page 59 and "Common Safety Instructions for LED Digital Pressure Sensors, Digital Pressure Sensors & Pressure Sensors" on page 77.


⚠ Caution






- For power, use stable direct currents.
- Insert surge-absorbing circuits into relays, valves, etc. Do not arbitrarily use these units at currents that exceed rated levels.
- When using unit power sources, such as switching power sources, be sure to ground their FG terminals.
- Take the utmost care to avoid short-circuiting the output terminal with other terminals.
- Do not apply excessive loads to pressure sensors. Subjecting them to excessive loads can damage them.
- Do not wire nozzles and other components in a way that will impress them with noises, etc. Do not use them in any arbitrary manner, either. Doing so can cause malfunctions.
- When conducting pressure adjustments for units fitted with switch output sensors, use small screwdrivers (included). Do not apply excessive force to these screwdrivers, and turn them slowly. Applying excessive force may damage the units.
- Our indicator (SED-30) is not constructed to be drip- or dust-proof. As such, do not use indicators that have been exposed to water or oil and/or dust.
- For the SED-30 indicator's sensor heads, use either a "VUS 11...A." or an "SEU 11...A." type head. Using different specifications with these sensor heads will not achieve the required level of accuracy.
- Do not pull or bend vacuum switch lead wires excessively. Doing so may result in lead wires being snapped off and connector components broken.

Sensor heads (Switch type)		
SEU Positive pressure type VUS Negative pressure type	SEU Positive pressure type VUS Negative pressure type	SEU Positive pressure type VUS Negative pressure type
		
Model	Model	Model
SEU11-4US	SEU11-4S	SEU11-M5S
SEU11-6US	SEU11-6S	SEU11-01S
VUS11-4US	VUS11-4S	VUS11-M5S
VUS11-6US	VUS11-6S	VUS11-01S
VUS11-4USR	VUS11-4SR	VUS11-M5SR
VUS11-6USR	VUS11-6SR	VUS11-01SR

Sensor heads (Analog type)		
SEU Positive pressure type VUS Negative pressure type	SEU Positive pressure type VUS Negative pressure type	SEU Positive pressure type VUS Negative pressure type
		
Model	Model	Model
SEU11-4UA	SEU11-4A	SEU11-M5A
SEU11-6UA	SEU11-6A	SEU11-01A
VUS11-4UA	VUS11-4A	VUS11-M5A
VUS11-6UA	VUS11-6A	VUS11-01A
VUS11-4UAR	VUS11-4AR	VUS11-M5AR
VUS11-6UAR	VUS11-6AR	VUS11-01AR

Indicator

SED Indicators

Model
SED-30

Accessories for indicators				
ACPG-003 Panel-holder set	ACPG-004 Holder-cover set	ACPG-007 Holder-stopper set	ACPG-011 Rear angles	ACPG-012 Plain angles
				
Model	Model	Model	Model	Model
ACPG-003	ACPG-004	ACPG-007	ACPG-011	ACPG-012
			*It is equipped with two screws for fixing the sensor.	*It is equipped with two screws for fixing the sensor.

Control Valve Vacuum Actuator Tube Diaphragm