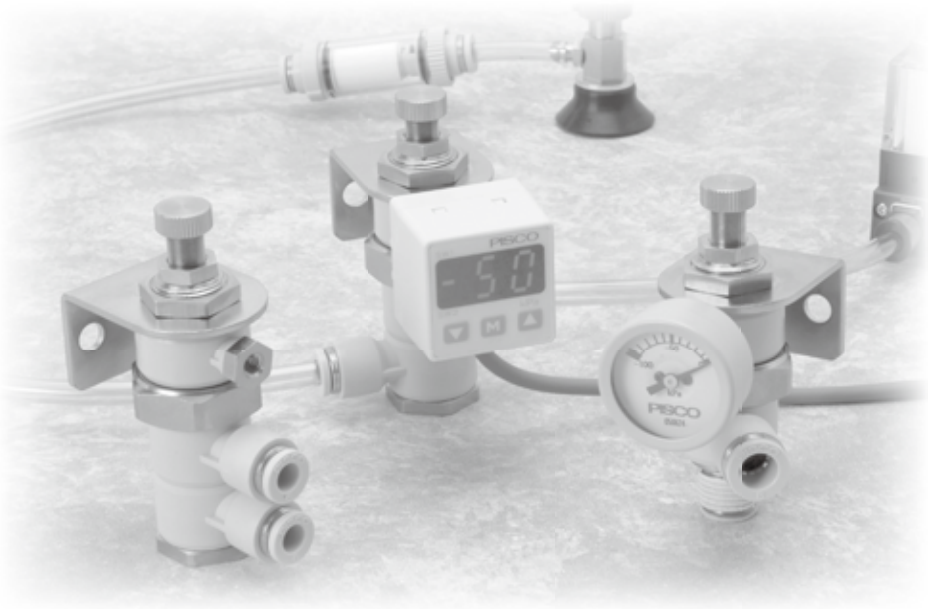
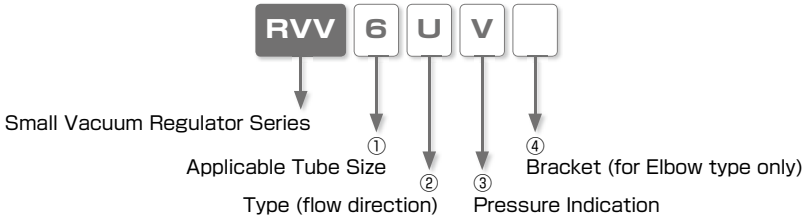


Small Regulator between Vacuum Valve and Vacuum Pad to Control Pressure

Small Vacuum Regulator Series

- *Both source pressure and terminal pressure are controllable.*
- *Suitable for controlling source pressure of small-type vacuum pump.*
- *Install the regulator between vacuum valve and vacuum pad in order to control pressure level of individual pad.*
- *Male thread type (A) is for direct connection to the vacuum pump.*
- *Male thread type (B) is for direct connection to the vacuum pad (pad dia.: ø150 and 200mm).*

Model Designation (Example)



① Applicable Tube Size

Code	6	8
O.D. (mm)	ø6mm	ø8mm

※ Male thread size for elbow type is R1/4 only.

② Type (flow direction)

Code	A	B	U
Type	Elbow A (Fitting → Thread)	Elbow B (Thread → Fitting)	Union (Fitting → Fitting)

③ Pressure Indication

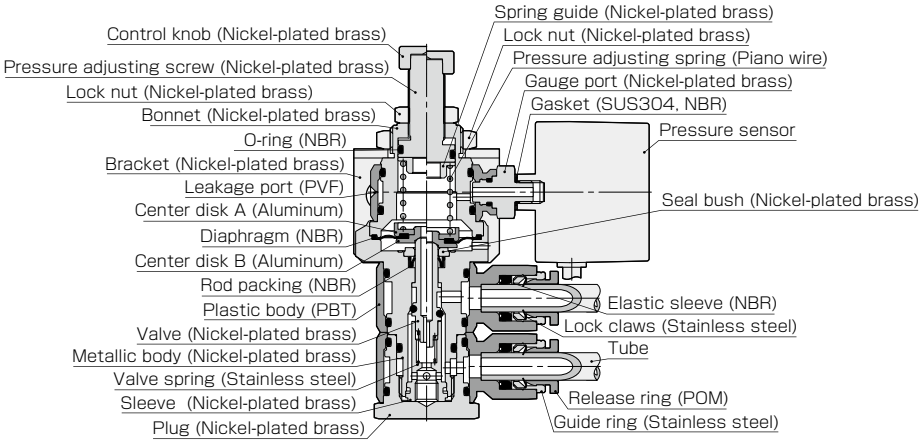
Code	G	V	M
Pressure Indication	Pressure indication (ø30mm negative pressure gauge)	Pressure indication (Digital pressure sensor with large display)	No pressure indication (with M5x0.8 female screw)

④ Bracket (for Elbow type only)

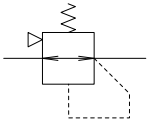
Code	No code	B
Bracket	No bracket	Bracket

※ Union type(RVV□U□)is equipped with bracket as standard.

Construction (Digital display / Union type)

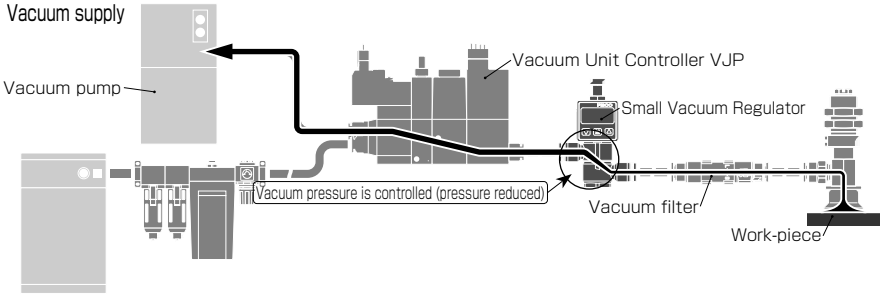


Circuit

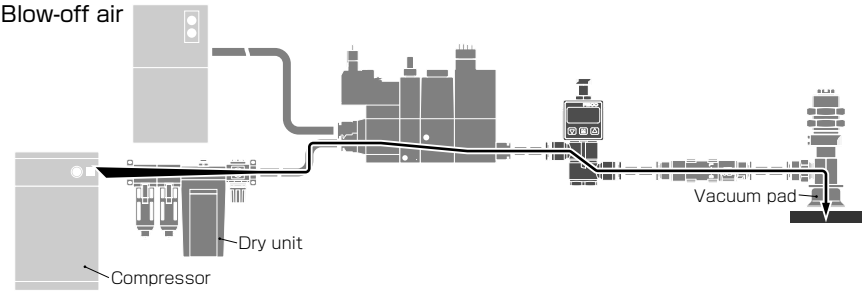


Piping Arrangement Example

Vacuum supply



Blow-off air



Specifications of Regulator

Pressure indication	No pressure indication	Digital pressure sensor with large display	ø30mm negative pressure gauge
Fluid medium	Air		
Operating pressure range	-29.5 inHg ~ 14.5psi (-100 ~ 100kPa)		-29.5 inHg ~ 0 psi (-100 ~ 0kPa)
Setting Pressure range	-29.5 ~ -0.38 inHg (-100 ~ -1.3kPa)		
Flow rate	1.06 scfm (30ℓ/min[ANR])		
Operating temp. range	32 ~ 122 °F (0 ~ 50°C) No freezing		32~104°F (0 ~ 40°C) No freezing

Specifications of Negative Pressure Gauge

Indicated pressure range	-29.5 ~ 0 inHg (-100 ~ 0kPa)
Pressure indication accuracy	5%F.S. (at 25°C)

Pressure Sensor Specifications

Spec.			VUS-30
Rated voltage			DC12-24V ± Ripple (P-P) Max. 10%
Current consumption			40mA or less
Operating pressure range			-29.5 inHg ~ 14.5psi (-100 ~ 100kPa)
Pressure resistance			72.5psi (500kPa)
Storage temperature range			-4 ~ 158 °F (-20 ~ 70°C) (Atmospheric pressure / Humidity: 60% RH or less)
Operating temp. range			14 ~ 122 °F (-10 ~ 50°C) No freezing
Operating humidity range			35 ~ 85%RH (No dew condensation)
Protective structure			Equivalent to IEC/IP40
Pressure indication	Display frequency		4 times / sec.
	Response time		Changeable by digital filter (About 5, 25 and 250m·sec)
	Indication accuracy		±1%F.S.
	Temperature characteristic		±3%F.S. (32 ~ 122 °F) (0~50℃ (Standard: 25℃))
	Monitoring system	Excessive rated pressure	Blinking display (Rated pressure: 110% or more)
		Out of pressure detection range	Lower than negative pressure display: Blinking "-L" / Higher than positive pressure display: Blinking "-H-"
		Output overload detection	Applying overload current: Blinking "E1"
	Zero point adjusting function		Zero point adjustment by panel control
		Adjusting error	More than ± 0.06Pr of residual pressure remains in a pneumatic system during Zero point adjustment: Blinking "E2". Release it by panel control.
	Sensor resolution		1 digit
	Display element		Two 1/2-digit, Height of Red LED display: 11mm
	Rated display range		According to the following "Pressure Range" (Unit is selectable from the list by panel control).
Switch Output	No. of output pressure setting		2 switch outputs (SW1, SW2)
	Switch output		NPN open collector
	Switch capacity		Max. DC30V 100mA
	Residual voltage		Max. 1.2V (load current: 100mA)
	Pressure adjusting method		by panel control
	Pressure setting range		-110 ~ 110digits (Decimal point is displayed as "Pressure Range" setting)
	Operation indicator		LED(SW1, SW2: RED) / Blinking (Output: ON)
	Accuracy of response		±0.3F.S.
	Operating accuracy		±0.5F.S. (32 ~ 122 °F) (0 ~ 50°C、Reference temperature: 25℃)
	Response time		Changeable by digital filter (About 5, 25 and 250m·sec)
	Hysteresis adjustment		0 ~ 30digits (Adjustable by panel switch)
	Overload protection		2 switch outputs (SW1, SW2) OFF (overload current: about over 200mA or more)

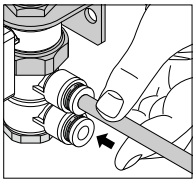
Display magnification (unit)	Pressure Range (Rated display range)
	VUS-30
×1 (kPa)	-100 ~ 100
×1 (MPa)	–
×0.75 (cmHg)	-75 ~ 75
×0.01 (bar)	-1.00 ~ 1.00
×0.145 (psi)	-14.5 ~ 14.5

How to insert and disconnect

1. How to insert and disconnect tubes (Push-In Fitting)

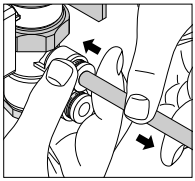
① Tube insertion

Insert a tube into Push-In Fitting up to the tube end. Lock-claws bite the tube and fix it automatically, then the elastic sleeve seals around the tube.
Refer to "2. Instructions for Tube Insertion" under "Common Safety Instructions for Fittings".



② Tube disconnection

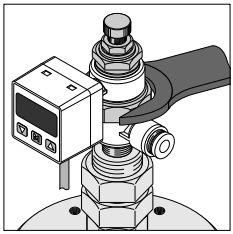
The tube is disconnected by pushing release-ring to release Lock-claws.
Make sure to stop air supply before the tube disconnection.



2. How to tighten thread

① Tightening thread

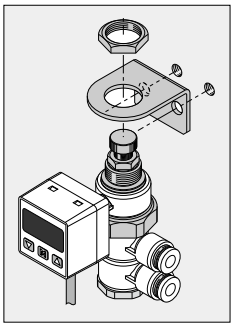
Tighten the hexagonal-column with a proper tool within the tightening torque range 12-14Nm.
Refer to the dimensional drawings for detail.



3. How to fix body with bracket

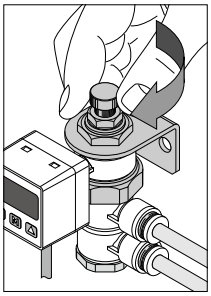
① Tightening screw

Use 2 holes on bracket to fix the body with M6 screws. Refer to the dimensional drawings of the hole pitch.

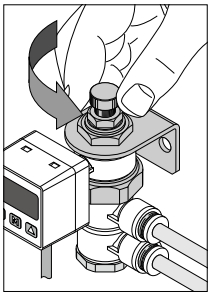


Adjusting Method of Vacuum Level

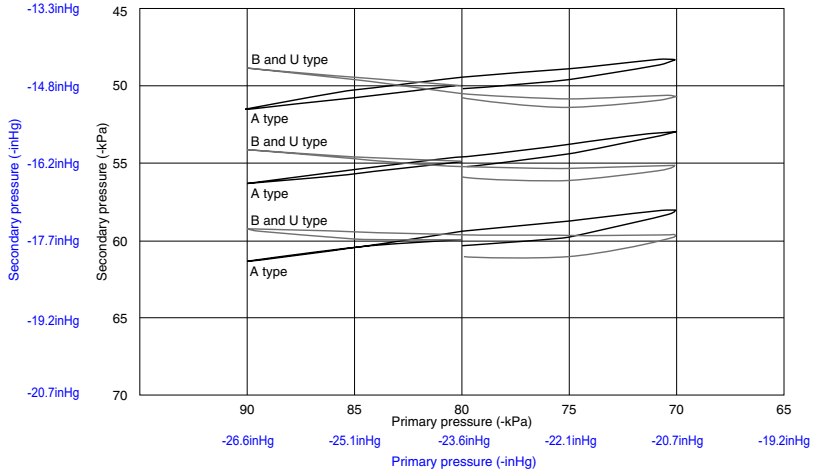
①. To raise vacuum level
Turn the pressure adjusting screw to the right from a fully open state in order to obtain a higher vacuum level.
After adjusting the desired vacuum level, make sure to tighten the locknut in order to avoid deviating from the setting.



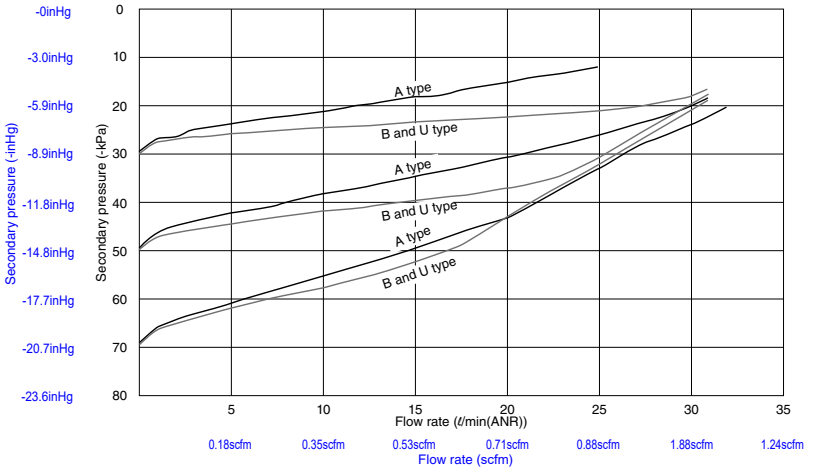
②. To lower vacuum level
When vacuum level needs to be reduced, turn the pressure adjusting screw to the left until vacuum level drops less than the required value. Then carry out ① to adjust the vacuum level.
After adjusting the desired vacuum level, make sure to tighten the locknut in order to avoid deviating from the setting.



Pressure Characteristic Curve



Flow Characteristics



⚠ Detailed Safety Instructions

Before using PISCO products, be sure to read “Safety Instructions” and “Safety Instruction Manual” and “Common Safety Instructions for Vacuum Series”.

Warning

1. Do not use a ø30mm pressure gauge for positive pressure. When positive pressure within the operating range is supplied, use a Digital pressure sensor with large display. Excessive positive pressure may cause damage to the product.
2. Before operating the product, thoroughly read users manual of Small Vacuum Regulator Series and vacuum source side product. Carry out a trial operation.

Caution

1. Avoid an excessive load or impact on display, sensor and gauge port. Otherwise, there is a possibility of damaging the product or dropping the indication accuracy.
2. Make sure to fix the product properly. Use a spanner to tighten a hexagonal-column (hex. 27mm) for thread type. Do not tighten other place except the hexagonal-column, otherwise, it may cause damage to the product.
3. When a gauge or a pipe is attached to gauge port, tighten a hexagonal-column (hex. 12mm) on the port with a spanner. Refer to the following recommended tightening torque for tightening M5x8 port. Otherwise, there is a possibility of damaging the product or dropping the indication accuracy.

■ Table: Recommended tightening torque

Thread size	Tightening torque
M5×0.8	1.0 ~ 1.5N·m

4. If there is a possibility of sucking dusts or granule, be sure to place a filter on adjusting pressure side (work-piece side) of Small Vacuum Regulator. Suction of these foreign substances may cause malfunctions.
5. Do not block the leak port and the relief port to maintain a stable secondary pressure.
6. When applying a positive pressure to Small Vacuum Regulator, a small amount of air comes out from the leak port. Be careful when it is operated in cleanroom.
7. When applying a blow-off air, consider the air released from the leak port to set the blow-off air amount.
8. Do not use a pressure gauge in a large pressure fluctuation (high-cycle).

Standard Size List

No pressure indication

Type	VAC side	SET side 6mm	SET side 8mm
RVV Elbow A	R1/4	●	●

Type	VAC side	SET side R1/4
RVV Elbow B	6mm	●
	8mm	●

Type	VAC side	SET side 6mm	SET side 8mm
RVV Union	6mm	●	
	8mm		●

Digital pressure sensor with large display

Type	VAC side	SET side 6mm	SET side 8mm
RVV Elbow A	R1/4	●	●

Type	VAC side	SET side R1/4
RVV Elbow B	6mm	●
	8mm	●

Type	VAC side	SET side 6mm	SET side 8mm
RVV Union	6mm	●	
	8mm		●

ø30mm negative pressure gauge

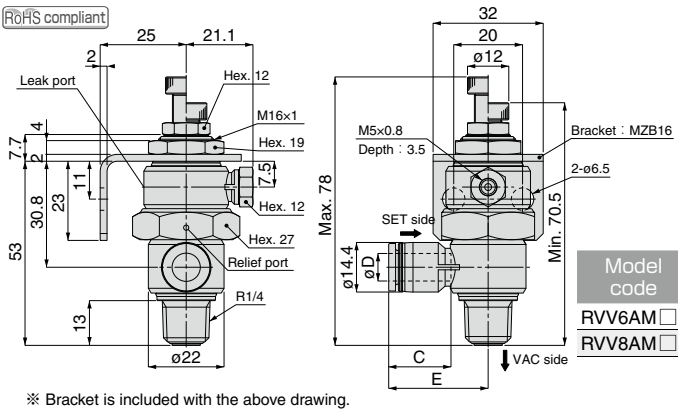
Type	VAC side	SET side 6mm	SET side 8mm
RVV Elbow A	R1/4	●	●

Type	VAC side	SET side R1/4
RVV Elbow B	6mm	●
	8mm	●

Type	VAC side	SET side 6mm	SET side 8mm
RVV Union	6mm	●	
	8mm		●

RVV No pressure indication / Elbow A

RoHS compliant



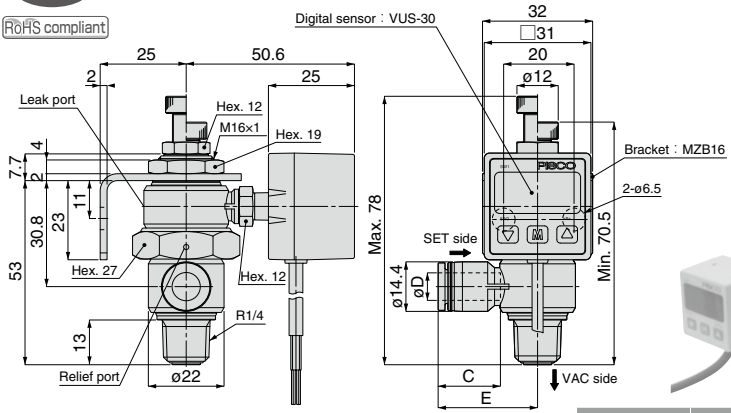
※ Bracket is included with the above drawing.

Unit：mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6AM□	6	17	29	127
RVV8AM□	8	18.1	28.9	128

RVV Digital pressure sensor with large display / Elbow A

RoHS compliant



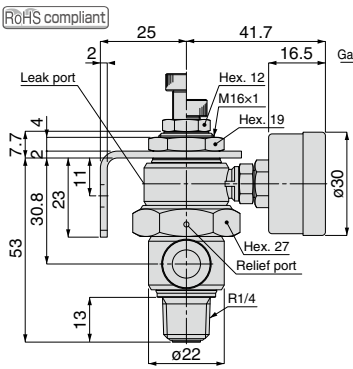
※ 1. Bracket is included with the above drawing.
※ 2. Refer to handling method of digital sensor.

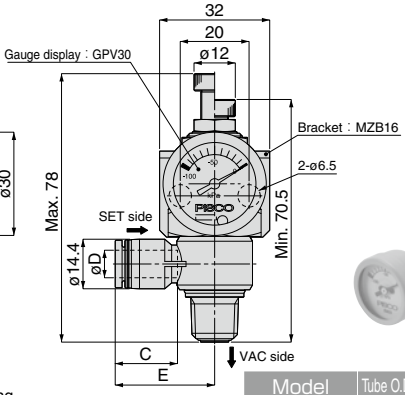
Unit：mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6AV□	6	17	29	193
RVV8AV□	8	18.1	28.9	193

RVV ø30mm negative pressure gauge / Elbow A

RoHS compliant





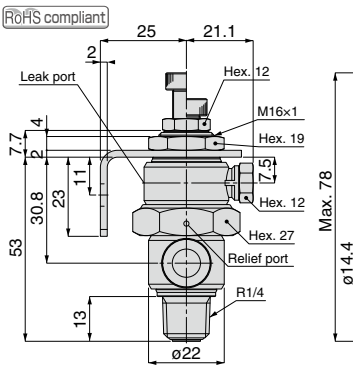
※ Bracket is included with the above drawing.

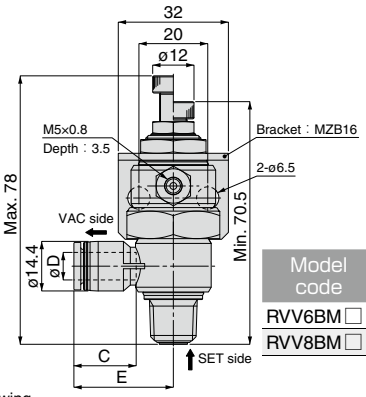
Unit : mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6AG□	6	17	29	156
RVV8AG□	8	18.1	28.9	156

RVV No pressure indication / Elbow B

RoHS compliant





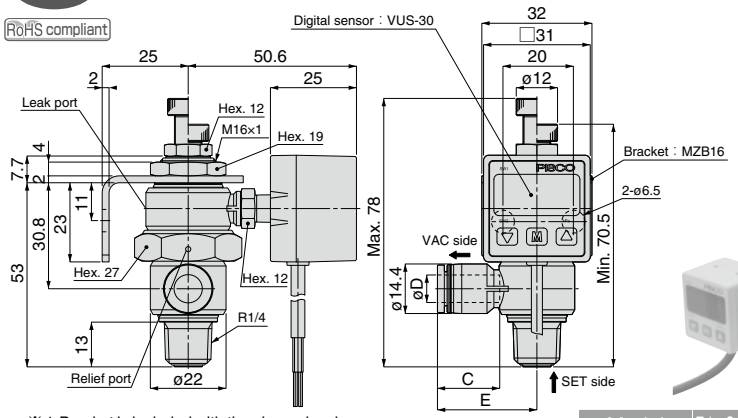
※ Bracket is included with the above drawing.

Unit : mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6BM□	6	17	29	127
RVV8BM□	8	18.1	28.9	128

RVV Digital pressure sensor with large display / Elbow B

RoHS compliant



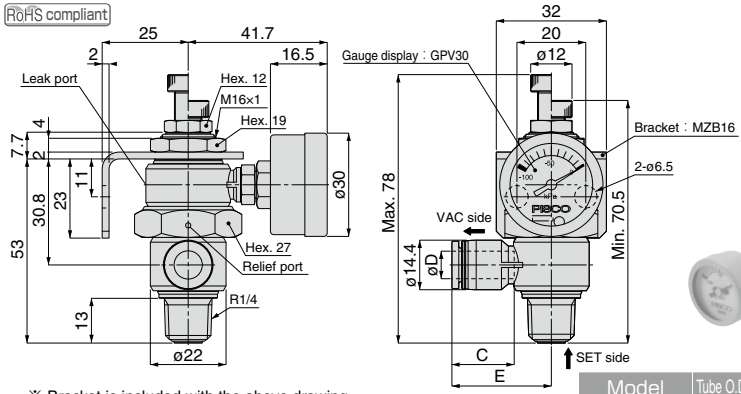
※ 1. Bracket is included with the above drawing.
※ 2. Refer to handling method of digital sensor.

Unit：mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6BV□	6	17	29	193
RVV8BV□	8	18.1	28.9	193

RVV ø30mm negative pressure gauge / Elbow B

RoHS compliant



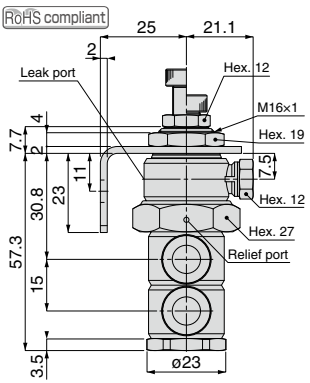
※ Bracket is included with the above drawing.

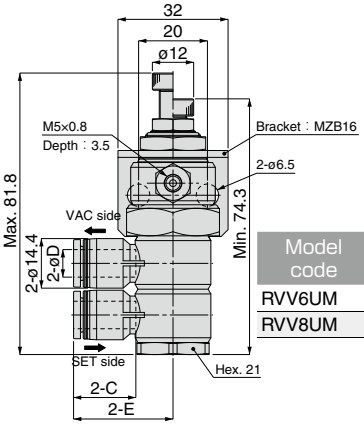
Unit：mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6BG□	6	17	29	156
RVV8BG□	8	18.1	28.9	156

RVV No pressure indication / Union

RoHS compliant



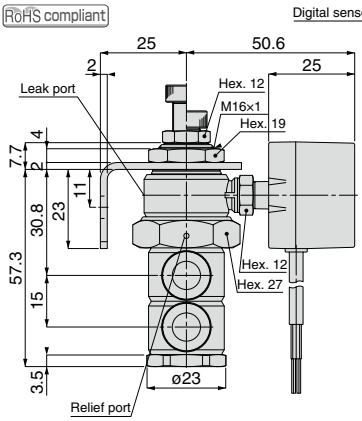


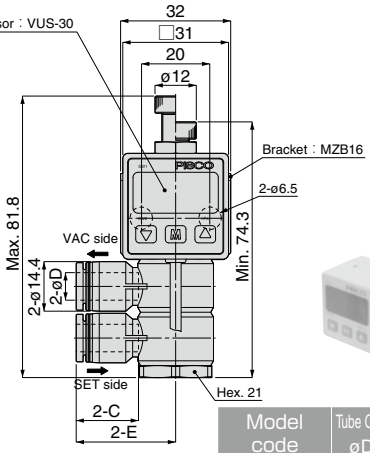
Unit : mm

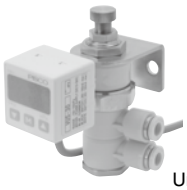
Model code	Tube O.D. øD	C	E	Weight (g)
RVV6UM	6	17	29	180
RVV8UM	8	18.1	28.9	181

RVV Digital pressure sensor with large display / Union

RoHS compliant







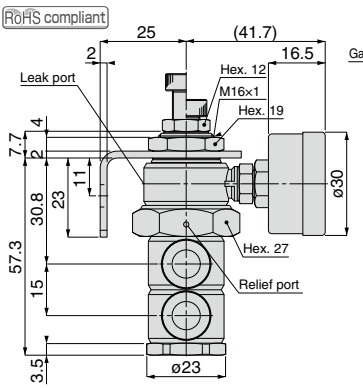
※ Refer to handling method of digital sensor.

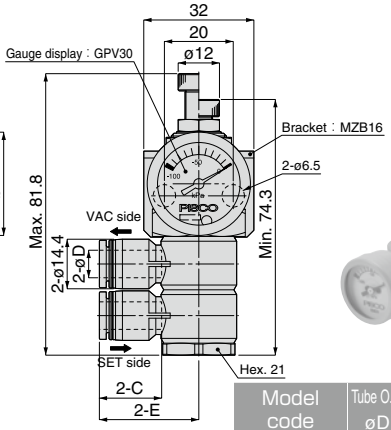
Unit : mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6UV	6	17	29	193
RVV8UV	8	18.1	28.9	193

RVV 30mm negative pressure gauge / Union

RoHS compliant





Unit：mm

Model code	Tube O.D. øD	C	E	Weight (g)
RVV6UG	6	17	29	156
RVV8UG	8	18.1	28.9	156

⚠ SAFETY Instructions

This safety instructions aim to prevent personal injury and damage to properties by requiring proper use of PISCO products.

Be certain to follow ISO 4414 and JIS B 8370

ISO 4414 : Pneumatic fluid power···Recomendations for the application of equipment to transmission and control systems.

JIS B 8370 : General rules and safety requirements for systems and their components.

This safety instructions is classified into “Danger”, “Warning” and “Caution” depending on the degree of danger or damages caused by improper use of PISCO products.

⚠ Danger	Hazardous conditions. It can cause death or serious personal injury.
⚠ Warning	Hazardous conditions depending on usages. Improper use of PISCO products can cause death or serious personal injury.
⚠ Caution	Hazardous conditions depending on usages. Improper use of PISCO products can cause personal injury or damages to properties.

⚠ Warning

1. Selection of pneumatic products
   ① A user who is a pneumatic system designer or has sufficient experience and technical expertise should select PISCO products.
   ② Due to wide variety of operating conditions and applications for PISCO products, carry out the analysis and evaluation on PISCO products. The pneumatic system designer is solely responsible for assuring that the user's requirements are met and that the application presents no health or safety hazards. All designers are required to fully understand the specifications of PISCO products and constitute all systems based on the latest catalog or information, considering any malfunctions.

2. Handle the pneumatic equipment with enough knowledge and experience
   ① Improper use of compressed air is dangerous. Assembly, operation and maintenance of machines using pneumatic equipment should be conducted by a person with enough knowledge and experience.

3. Do not operate machine / equipment or remove pneumatic equipment until safety is confirmed.
   ① Make sure that preventive measures against falling work-pieces or sudden movements of machine are completed before inspection or maintenance of these machine.
   ② Make sure the above preventive measures are completed. A compressed air supply and the power supply to the machine must be off, and also the compressed air in the systems must be exhausted.
   ③ Restart the machines with care after ensuring to take all preventive measures against sudden movements.

Disclaimer

1. PISCO does not take any responsibility for any incidental or indirect loss, such as production line stop, interruption of business, loss of benefits, personal injury, etc., caused by any failure on use or application of PISCO products.

2. PISCO does not take any responsibility for any loss caused by natural disasters, fires not related to PISCO products, acts by third parties, and intentional or accidental damages of PISCO products due to incorrect usage.

3. PISCO does not take any responsibility for any loss caused by improper usage of PISCO products such as exceeding the specification limit or not following the usage the published instructions and catalog allow.

4. PISCO does not take any responsibility for any loss caused by remodeling of PISCO products, or by combinational use with non-PISCO products and other software systems.

5. The damages caused by the defect of Pisco products shall be covered but limited to the full amount of the PISCO products paid by the customer.

⚠ SAFETY INSTRUCTION MANUAL

PISCO products are designed and manufactured for use in general industrial machines. Be sure to read and follow the instructions below.

⚠ Danger

1. Do not use PISCO products for the following applications.
   ① Equipment used for maintaining / handling human life and body.
   ② Equipment used for moving / transporting human.
   ③ Equipment specifically used for safety purposes.

⚠ Warning

1. Do not use PISCO products under the following conditions.
   ① Beyond the specifications or conditions stated in the catalog, or the instructions.
   ② Under the direct sunlight or outdoors.
   ③ Excessive vibrations and impacts.
   ④ Exposure / adhere to corrosive gas, inflammable gas, chemicals, seawater, water and vapor. *
   * Some products can be used under the condition above(④), refer to the details of specification and condition of each product.
2. Do not disassemble or modify PISCO products, which affect the performance, function, and basic structure of the product.
3. Turn off the power supply, stop the air supply to PISCO products, and make sure there is no residual air pressure in the pipes before maintenance and inspection.
4. Do not touch the release-ring of push-in fitting when there is a working pressure. The lock may be released by the physical contact, and tube may fly out or slip out.
5. Frequent switchover of compressed air may generate heat, and there is a risk of causing burn injury.
6. Avoid any load on PISCO products, such as a tensile strength, twisting and bending. Otherwise, there is a risk of causing damage to the products.
7. As for applications where threads or tubes swing / rotate, use Rotary Joints, High Rotary Joints or Multi-Circuit Rotary Block only. The other PISCO products can be damaged in these applications.
8. Use only Die Temperature Control Fitting Series, Tube Fitting Stainless SUS316 Series, Tube Fitting Stainless SUS316 Compression Fitting Series or Tube Fitting Brass Series under the condition of over 60℃ (140° F) water or thermal oil. Other PISCO products can be damaged by heat and hydrolysis under the condition above.
9. As for the condition required to dissipate static electricity or provide an antistatic performance, use EG series fitting and antistatic products only, and do not use other PISCO products. There is a risk that static electricity can cause system defects or failures.
10. Use only Fittings with a characteristic of spatter-proof such as Anti-spatter or Brass series in a place where flame and weld spatter is produced. There is a risk of causing fire by sparks.
11. Turn off the power supply to PISCO products, and make sure there is no residual air pressure in the pipes and equipment before maintenance. Follow the instructions below in order to ensure safety.
    ① Make sure the safety of all systems related to PISCO products before maintenance.
    ② Restart of operation after maintenance shall be proceeded with care after ensuring safety of the system by preventive measures against unexpected movements of machines and devices where pneumatic equipment is used.
    ③ Keep enough space for maintenance when designing a circuit.
12. Take safety measures such as providing a protection cover if there is a risk of causing damages or fires on machine / facilities by a fluid leakage.

⚠ Caution

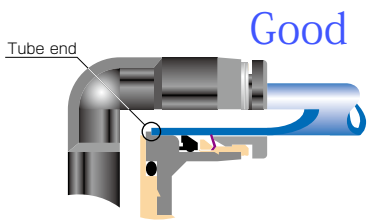
1. Remove dusts or drain before piping. They may get into the peripheral machine / facilities and cause malfunction.
2. When inserting an ultra-soft tube into push-in fitting, make sure to place an Insert Ring into the tube edge. There is a risk of causing the escape of tube and a fluid leakage without using an Insert Ring.
3. The product incorporating NBR as seal rubber material has a risk of malfunction caused by ozone crack. Ozone exists in high concentrations in static elimination air, clean-room, and near the high-voltage motors, etc. As a countermeasure, material change from NBR to HNBR or FKM is necessary. Consult with PISCO for more information.
4. Special option "Oil-free" products may cause a very small amount of a fluid leakage. When a fluid medium is liquid or the products are required to be used in harsh environments, contact us for further information.
5. In case of using non-PISCO brand tubes, make sure the tolerance of the outer tube diameter is within the limits of Table 1.

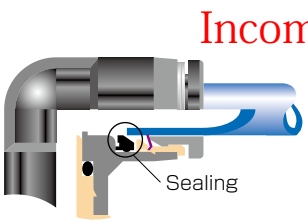
● Table 1. Tube O.D. Tolerance

mm size	Nylon tube	Polyurethane tube
ø1.8mm	—	±0.05mm
ø3mm	—	±0.15mm
ø4mm	±0.1mm	±0.15mm
ø6mm	±0.1mm	±0.15mm
ø8mm	±0.1mm	±0.15mm
ø10mm	±0.1mm	±0.15mm
ø12mm	±0.1mm	±0.15mm
ø16mm	±0.1mm	±0.15mm

inch size	Nylon tube	Polyurethane tube
ø1/8	±0.1mm	±0.15mm
ø5/32	±0.1mm	±0.15mm
ø3/16	±0.1mm	±0.15mm
ø1/4	±0.1mm	±0.15mm
ø5/16	±0.1mm	±0.15mm
ø3/8	±0.1mm	±0.15mm
ø1/2	±0.1mm	±0.15mm
ø5/8	±0.1mm	±0.15mm

6. Instructions for Tube Insertion
   ① Make sure that the cut end surface of the tube is at right angle without a scratch on the surface and deformations.
   ② When inserting a tube, the tube needs to be inserted fully into the push-in fitting until the tubing edge touches the tube end of the fitting as shown in the figure below. Otherwise, there is a risk of leakage.





Tube is not fully inserted up to tube end.

   ③ After inserting the tube, make sure it is inserted properly and not to be disconnected by pulling it moderately.

※. When inserting tubes, Lock-claws may be hardly visible in the hole, observed from the front face of the release-ring. But it does not mean the tube will surely escape. Major causes of the tube escape are the followings;
①Shear drop of the lock-claws edge
②The problem of tube diameter (usually small)
Therefore, follow the above instructions from ① to ③, even lock-claws is hardly visible.

7. Instructions for Tube Disconnection
   ① Make sure there is no air pressure inside of the tube, before disconnecting it.
   ② Push the release-ring of the push-in fitting evenly and deeply enough to pull out the tube toward oneself. By insufficient pushing of the release-ring, the tube may not be pulled out or damaged by scratch, and tube shavings may remain inside of the fitting, which may cause the leakage later.
8. Instructions for Installing a fitting
   ① When installing a fitting, use proper tools to tighten a hexagonal-column or an inner hexagonal socket. When inserting a hex key into the inner hexagonal socket of the fitting, be careful so that the tool does not touch lock-claws. The deformation of lock-claws may result in a poor performance of systems or an escape of the tube.
   ② Refer to Table 2 which shows the recommended tightening torque. Do not exceed these limits to tighten a thread. Excessive tightening may break the thread part or deform the gasket and cause a fluid leakage. Tightening thread with tightening torque lower than these limits may cause a loosened thread or a fluid leakage.
   ③ Adjust the tube direction while tightening thread within these limits, since some PISCO products are not rotatable after the installation.

● Table 2: Recommended tightening torque / Sealock color / Gasket materials

Thread type	Thread size	Tightening torque	Sealock color	Gasket materials
Metric thread	M3 × 0.5	0.7N·m	—	SUS304 NBR
	M5 × 0.8	1.0 ~ 1.5N·m		
	M6 × 1	2 ~ 2.7N·m		
	M3 × 0.5	0.5 ~ 0.6N·m		POM
	M5 × 0.8	1 ~ 1.5N·m		
	M6 × 0.75	0.8 ~ 1N·m		
	M8 × 0.75	1 ~ 2N·m		
Taper pipe thread	R1/8	7 ~ 9N·m	White	—
	R1/4	12 ~ 14N·m		
	R3/8	22 ~ 24N·m		
	R1/2	28 ~ 30N·m		
Unified thread	No.10-32UNF	1.0 ~ 1.5N·m	—	SUS304、NBR
National pipe thread taper	1/16-27NPT	7 ~ 9N·m	White	—
	1/8-27NPT	7 ~ 9N·m		
	1/4-18NPT	12 ~ 14N·m		
	3/8-18NPT	22 ~ 24N·m		
	1/2-14NPT	28 ~ 30N·m		

※ These values may differ for some products. Refer to each specification as well.

9. Instructions for removing a fitting
   ① When removing a fitting, use proper tools to loosen a hexagonal-column or an inner hex bolt.
   ② Remove the sealant stuck on the mating equipment. The remained sealant may get into the peripheral equipment and cause malfunctions.
10. Arrange piping avoiding any load on fittings and tubes such as twist, tensile, moment load, shaking and physical impact. These may cause damages to fittings, tube deformations, bursting and the escape of tubes.

⚠ Common Safety Instructions for Vacuum Series

Before selecting or using PISCO products, read the following instructions. Read the detailed instructions for individual series.

⚠ Warning

1. If there is a risk of dropping work-pieces during vacuum suction, take a safety measure against the falling of them.
2. Avoid supplying more than 0.1MPa pressure constantly in a vacuum circuit. Since vacuum generators are not explosive-proof, there is a risk of damaging the products.
3. Pay attention to drop of vacuum pressure caused by problems of the supplied air or the power supply. Decrease of suction force may lead to a danger of falling work-piece so that safety measure against the falling of them is necessary.
4. When more than 2 vacuum pads are plumbed on a single ejector and one of them has a suction problem such as vacuum leak, there is a risk of releasing work-pieces from the other pad due to the drop of the vacuum pressure.
5. Do not use in the way by which exhaust port is blocked or exhaust resistance is increased. Otherwise, there is a risk of no vacuum generation or a drop of the vacuum pressure.
6. Do not use the product in the circumstance of corrosive gas, inflammable gas, explosive gas, chemicals, seawater and vapor or do not expose the product to those. Never allow the product to suck those things.
7. Provide a protective cover on the products when it is exposed to sunlight.
8. Carry out clogging check for silencer element in an ejector and a vacuum filter periodically. Clogged element will be a cause to impair the performance or a cause of troubles.
9. Before replacing the element, thoroughly read and understand the method of filter replacement in the catalog.
10. Make sure the correct port of the vacuum generator by this catalog or marking on the products when plumbing. Wrong plumbing can be a risk to damage the product.
11. Supply clean air without sludge or dusts to an ejector. Do not lubricate by a lubricator. There is a risk of malfunction or performance impairing by impurities and oil contained in the compressed air.
12. Do not apply extreme tension, twist or bending forces on a lead wire. Otherwise, it may cause a wire breaking.
13. Locknut needs to be tightened firmly by hand. Do not use any tool to tighten. In case of using tools to tighten the locknut, it may damage the locknut or the product. Inadequate tightening may loosen the locknut and the initial setting can be changed.
14. Do not force the product to rotate or swing even its resin body is rotatable. It may cause damage to the product and a fluid leakage.
15. Do not supply an air pressure or a dry air to the products over the necessary amount. There is a risk of deteriorating rubber materials and malfunction due to oil.
16. Keep the product away from water, oil drops or dusts. These may cause malfunction. Take a proper measure to protect the product before the operation.

17. Do not use the product in the environment of inflammable or explosive gas / fluid. It can cause a fire or an explosion hazard.
18. Do not use the product in the circumstance of corrosive gas, inflammable gas, explosive gas, chemicals, seawater and vapor or do not expose the product to those. Otherwise, it may be a cause of malfunction.
19. Do not clean or paint the products by water or a solvent.

⚠ Caution

1. Operating pressure range in the catalog is the values during ejector operation. Secure the described value of the supplied air, taking a drop of the pressure into consideration. Insufficient pressure, which does not satisfy the spec, may cause abnormal noise, unstable performance and may negatively affect sensors, bringing troubles at last.
2. Effective cross-section area of the air supply side needs to be three times as large as effective cross-section area of the nozzle bore. When arranging piping or selecting PISCO products, secure required effective cross-section area. Insufficient supply pressure may be a cause to impair performance.
3. A Shorter distance of plumbing with a wider bore is preferable at vacuum system side. A long plumbing with a small bore may result in slow response time at the time of releasing work-piece as well as in failure to secure adequate suction flow rate.
4. Plumb a vacuum switch and an ejector with vacuum switch at the end of vacuum system as much as possible. A long distance between a vacuum switch and a vacuum system end may increase plumbing resistance which may lead to a high vacuum level at the sensor even when no suctioning and a malfunction of vacuum switch. Make sure to evaluate the products in an actual system.
5. Refer to “4. Instructions for Installing a fitting” and “5. Instructions for Removing a fitting” under “Common Safety Instructions for Fittings” , when installing or removing Fittings.
6. Refer to “Common Safety Instructions for Pressure Sensors” and “Detailed Safety Instructions” for the handling of digital vacuum switch sensor.
7. Refer to “Common Safety Instructions for Mechanical Vacuum Sensor” for the handling of mechanical vacuum switch.
8. The material of plastic filter cover for VG, VK, VJ, VZ and VX series is PCTG. Avoid the adherence of Chemicals below to the products, and do not use them under those chemical environments.

● Table Chemical Name

Chemical Name
Thinner
Carbon tetrachloride
Chloroform
Acetate
Aniline
Cyclohexane
Trichloroethylene
Sulfuric acid
Lactic acid
Water soluble cutting oil (alkaline)

* There are more chemicals which should be avoided. Contact us for the use under chemical circumstance.

9. The material of plastic filter cover for VQ and VFU series is PA. Avoid the adherence of chemicals below to the products, and do not use them under those chemical environments.

● Table Chemical Name

Chemical Name
Methanol
Ethanol
Nitric acid
Sulfuric acid
Hydrochloric acid
Lactic acid
Acetone
Chloroform
Aniline
Trichloroethylene
Hydrogen peroxide

* There are more chemicals which should be avoided. Contact us for the use under chemical circumstance.