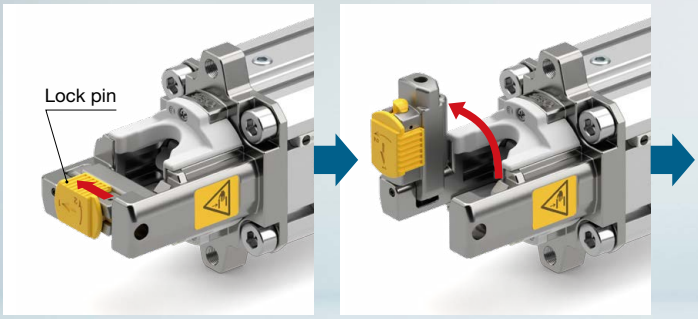
Pinch Valve
Air Operated Type

New

RoHS

Easy tube replacement from front access

Just open cover and insert tube



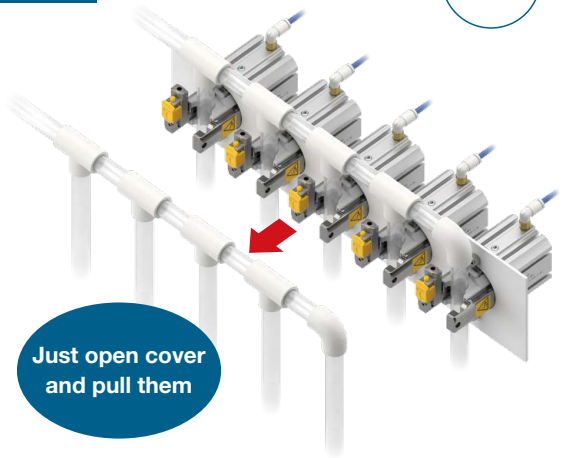
Max. 40% work time reduction

Removal together is possible: No need to remove each tube individually

LPVA

Cover opening time: 2 s x 5 times
Tube removal time: 2 s x **1 time**

12 s



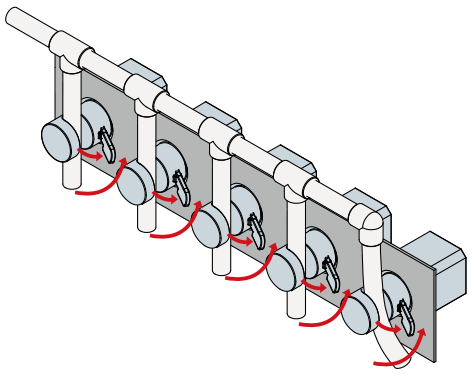
Just open cover and pull them

Existing model

Cover opening time: 2 s x 5 times
Tube removal time: 2 s x 5 times

20 s

Requires removal of each tube before replacement



＊ In case of 5 units

Series Variations

Series	Valve type	Applicable tubing O.D.
LPVA21	N.C.	ø3/8", ø7/16", ø1/2"
LPVA22	N.O.	

Compact, Lightweight

p. 1

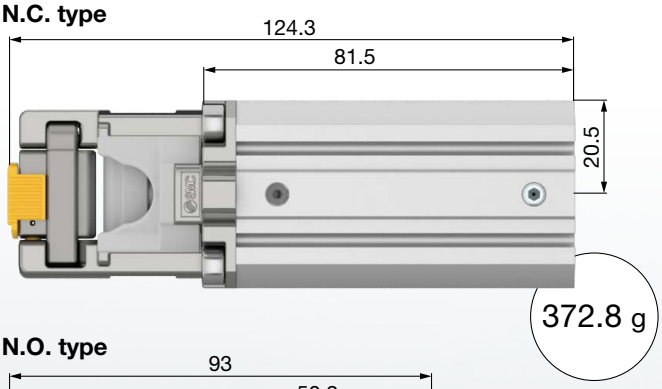
LPVA Series

SMC

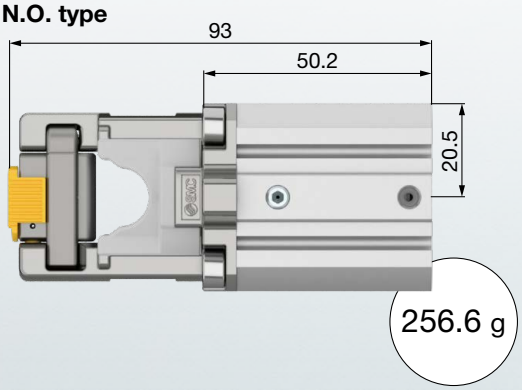
CAT.ES70-67A

Compact, Lightweight

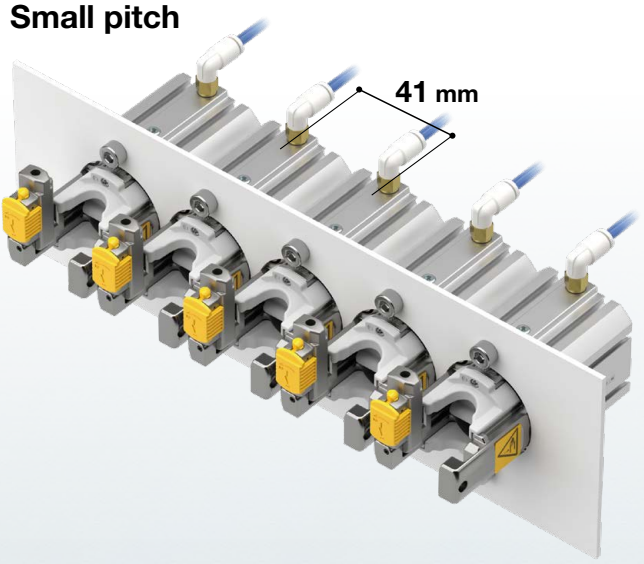
N.C. type



N.O. type

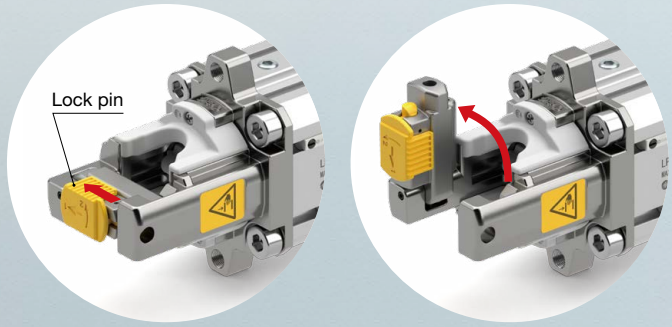


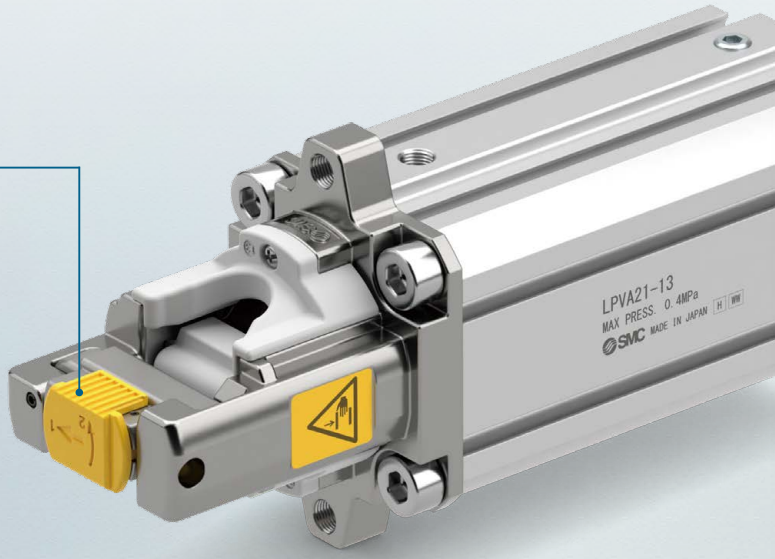
Small pitch



With cover

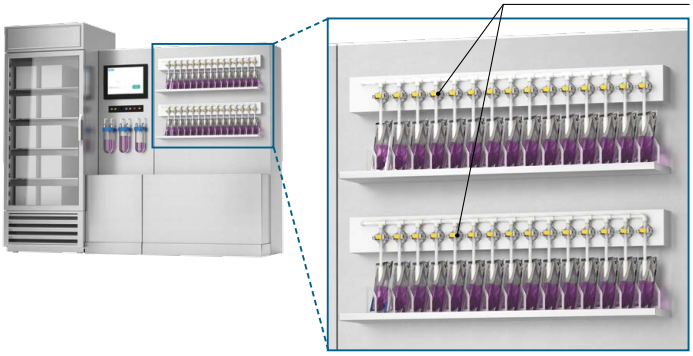
A structure that can be easily opened and closed





Application Examples

- Culture solution/Bioprocess equipment

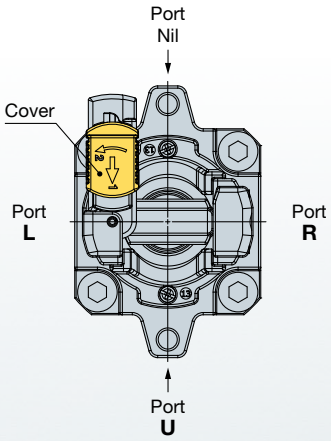


- Waste liquid line for the blood analyzer

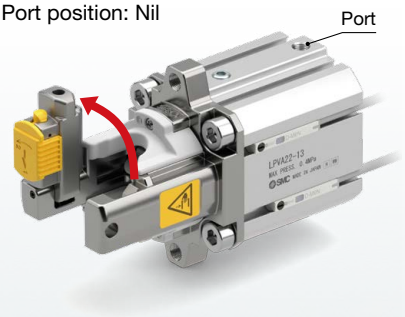
- Bacteria identification and inspection device

* Please use the product in accordance with the specifications provided in the catalogs/operation manuals.
It is your responsibility to check the suitability for your workpiece and equipment.

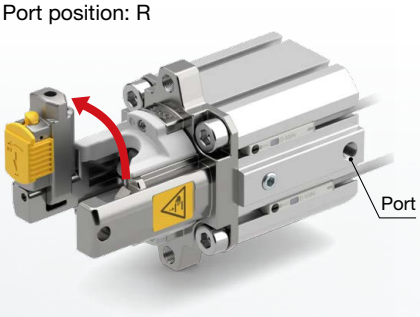
Selectable port position according to the installation conditions.



Port position: Nil

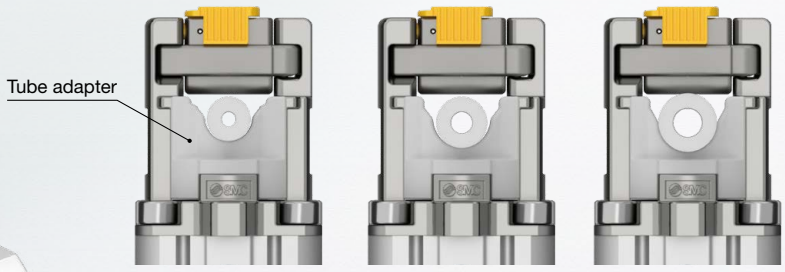


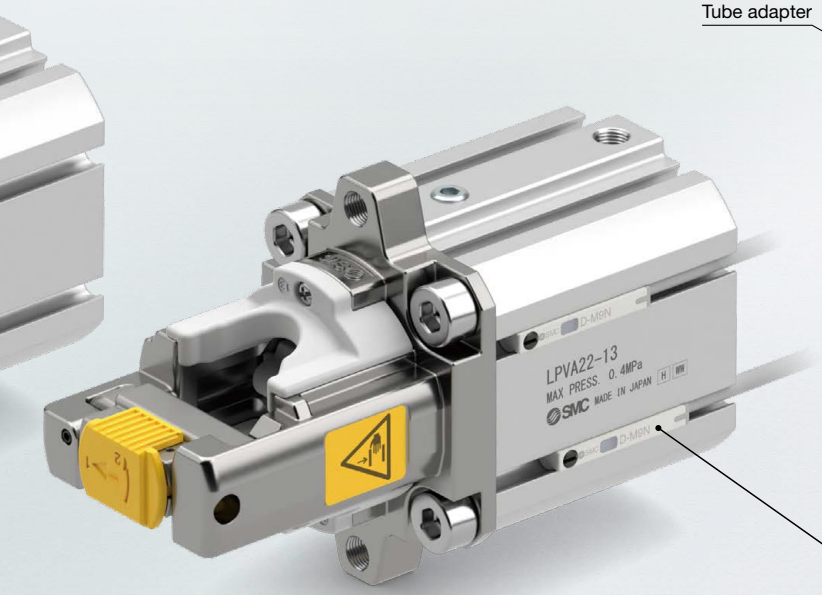
Port position: R



Tube size can be changed

Compatible with 3 tube sizes by exchanging tube adapter





ON/OFF auto switch
Can be installed on all 4 body sides

Tube pinching condition can be monitored

- DNA analyzer

- Liquid filling device

Related Equipment

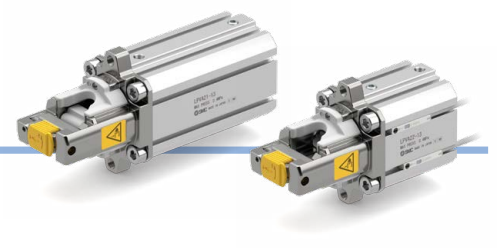
Solenoid Type Pinch Valve
LPV Series

More information can be viewed here.

Pinch Valve Air Operated Type

LPVA Series

RoHS



How to Order

LPV A 21 – 09 – ☐

Air operated type

Valve type

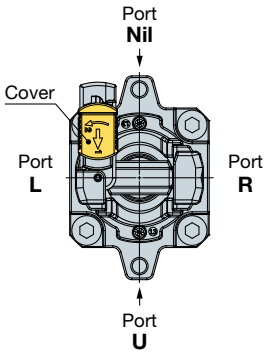
21	N.C. type
22	N.O. type

Tubing O.D. size

09	ø3/8"
11	ø7/16"
13	ø1/2"

Option (Port position)

Nil	Cover open direction 0°
R	Cover open direction 90°
U	Cover open direction 180°
L	Cover open direction 270°



Specifications

Model		LPVA21	LPVA22
Valve type		N.C. (Normally closed)	N.O. (Normally open)
Applicable fluid		Gas and liquid applicable to the tube	
Fluid temperature∗1		0 to 60°C (No freezing)	
Ambient temperature		5 to 60°C	
Pilot fluid	**Fluid**	Air	
	Compressed air purity class	ISO8573-1: 2010 [2 : 4 : 3] to [2 : 6 : 3]	
Pilot fluid pressure	**Pinch force control range**	0 to 0.35 MPa	0.1 to 0.4 MPa
	Pinch force release range	0.35 to 0.4 MPa	0.0 MPa (no pressurization)
Mounting orientation		Free	
Proof pressure		0.6 MPa	
Weight		372.8 g	256.6 g

∗1 The operating temperature conditions vary depending on the characteristics of the tube. For more details, please refer to the compatible tube table.

Option

Tubing adapter

LPVA – 09 A

Tubing O.D. size

09	ø3/8"
11	ø7/16"
13	ø1/2"

∗ 2 pcs (1 set) including M2 pan head screw

Auto Switches (To Be Ordered Separately)

Applicable Auto Switches/Refer to the **Web Catalog** for further information on auto switches.

Special function	Auto switch model		Wiring (Output)	Electrical entry	Indicator light	Load voltage (DC)		Lead wire length [m]			
	Perpendicular	In-line						0.5 (Nil)	1 (M)	3 (L)	5 (Z)
– (Standard)	**D-M9NV**	**D-M9N**	3-wire (NPN)	Grommet	Yes	24 V	5 V	●	●	●	●
	D-M9PV	**D-M9P**	3-wire (PNP)				12 V	●	●	●	●
	D-M9BV	**D-M9B**	2-wire				12 V	●	●	●	●
2-color indicator	**D-M9NWV**	**D-M9NW**	3-wire (NPN)				5 V	●	●	●	●
	D-M9PWV	**D-M9PW**	3-wire (PNP)				12 V	●	●	●	●
	D-M9BWV	**D-M9BW**	2-wire				12 V	●	●	●	●

∗ Please order auto switch separately.

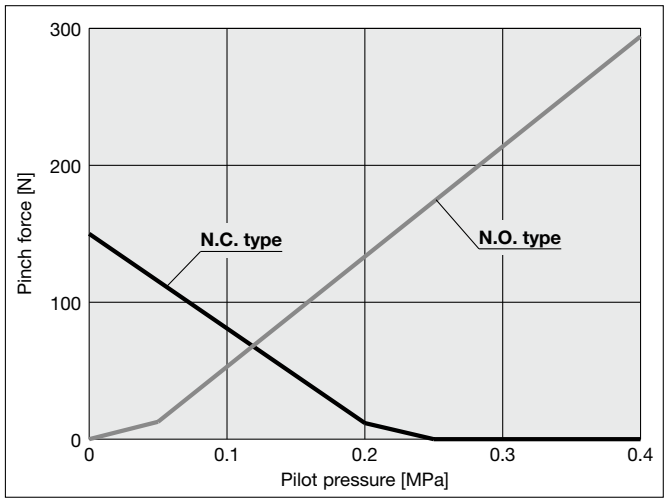
Compatible Tube Table

Model	Manufacturer	Trademark	Series	Part no.	O.D. in [mm]	I.D. in [mm]	Thickness [mm]	Shore hardness	Operating fluid pressure*1 [MPa]
LPVA2□-09	AdvantaPure	AdbantaSil	APST	APST-0125-0375	3/8" (9.5)	1/8" (3.2)	3.18	50	0.26
				APST-0188-0375	3/8" (9.5)	3/16" (4.8)	2.39	50	0.14
				APST-0250-0375	3/8" (9.5)	1/4" (6.4)	1.59	50	0.09
			APSH	APSH-P-0125	3/8" (9.5)	1/8" (3.2)	3.18	—	0.6*2
		AdvantaFlex	APAF-BP	APAF-BP-0188-0375	3/8" (9.5)	3/16" (4.8)	2.38	65	0.22
				APAF-BP-0250-0375	3/8" (9.5)	1/4" (6.4)	1.59	65	0.14
	SAINT-GOBAIN	C-FLEX	C-Flex 374	374-188-3	3/8" (9.5)	3/16" (4.8)	2.35	60	0.21
				374-250-2	3/8" (9.5)	1/4" (6.4)	1.55	60	0.11
	DuPont	Pharma	Pharma80	—	3/8" (9.5)	3/16" (4.8)	2.35	80	0.6*2
				—	3/8" (9.5)	1/4" (6.4)	1.55	80	0.6*2
LPVA2□-11	AdvantaPure	AdbantaSil	APST	APST-0188-0438	7/16" (11.1)	3/16" (4.8)	3.18	50	0.17
				APST-0250-0438	7/16" (11.1)	1/4" (6.4)	2.38	50	0.12
				APST-0313-0438	7/16" (11.1)	5/16" (7.9)	1.59	50	0.08
			APSH	APSH-P-0188	7/16" (11.7)	3/16" (4.8)	3.49	—	0.6*2
		AdvantaFlex	APAF-BP	APAF-BP-0250-0438	7/16" (11.1)	1/4" (6.4)	2.38	65	0.16
	SAINT-GOBAIN	C-FLEX	C-Flex 374	374-250-3	7/16" (11.2)	1/4" (6.4)	2.40	60	0.15
	WATSON MARLOW	Biopure	Biopure	BPSHP0188- (C,D)	7/16" (10.3)	3/16" (4.8)	—	—	0.6*2
LPVA2□-13	AdvantaPure	AdbantaSil	APST	APST-0250-0500	1/2" (12.7)	1/4" (6.4)	3.18	50	0.15
				APST-0313-0500	1/2" (12.7)	5/16" (7.9)	2.38	50	0.12
				APST-0375-0500	1/2" (12.7)	3/8" (9.5)	1.59	50	0.07
			APSH	APSH-P-0250	1/2" (12.7)	1/4" (6.4)	3.18	—	0.6*2
		AdvantaFlex	APAF-BP	APAF-BP-0250-0500	1/2" (12.7)	1/4" (6.4)	3.18	65	0.21
				APAF-BP-0313-0500	1/2" (12.7)	5/16" (7.9)	2.38	65	0.16
				APAF-BP-0375-0500	1/2" (12.7)	3/8" (9.5)	1.59	65	0.13
	SAINT-GOBAIN	C-FLEX	C-Flex 374	374-250-4	1/2" (12.7)	1/4" (6.4)	3.15	60	0.21
				374-313-3	1/2" (12.7)	5/16" (7.9)	2.40	60	0.14
				374-375-2	1/2" (12.7)	3/8" (9.6)	1.55	60	0.09
	WATSON MARLOW	Biopure	Biopure	BPSHP0250- (C,D)	1/2" (12.4)	1/4" (6.4)	3.00	—	0.6*2
	DuPont	Pharma	Pharma80	—	1/2" (12.7)	1/4" (6.4)	3.15	80	0.6*2
				—	1/2" (12.7)	3/8" (9.5)	1.60	80	0.3

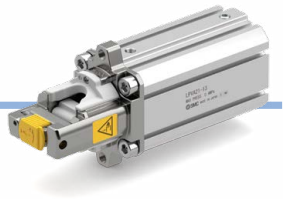
*1 The operating fluid pressure listed is the actual measured value during testing and is provided for reference only. Please note that it does not guarantee the fluid pressure is suitable for pinching. For operating pressure and temperature conditions, please refer to the usage specifications provided by each tube manufacturer.

*2 In the case of the N.C. valve type

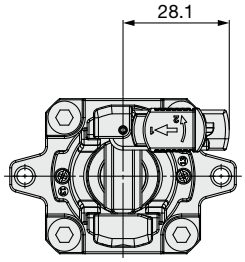
Pinch Force Characteristic Curve



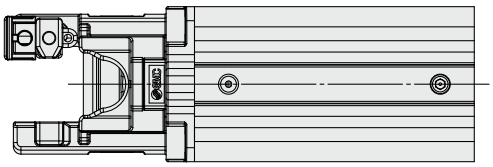
Dimensions



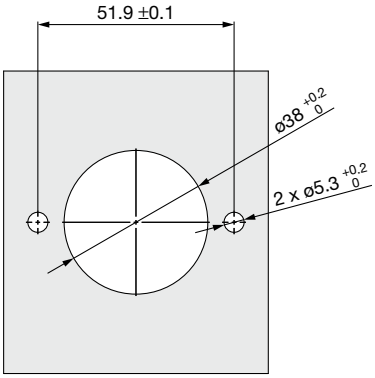
LPVA21-□

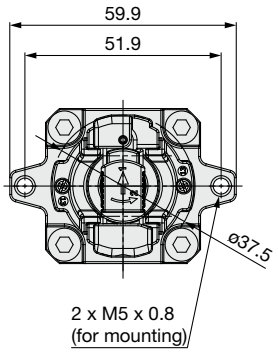


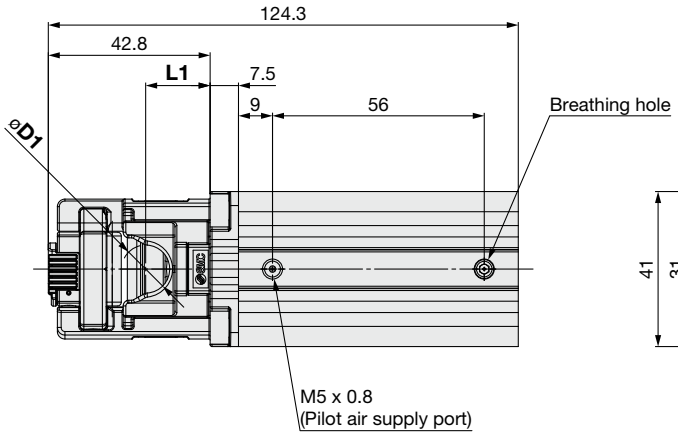
Cover open

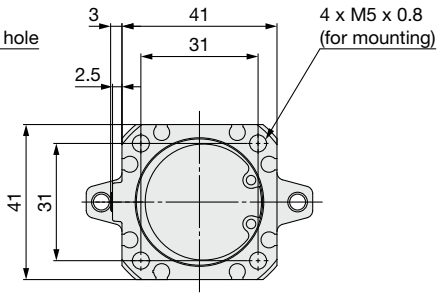


Panel fitting dimensions

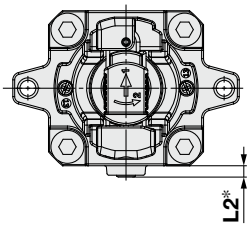


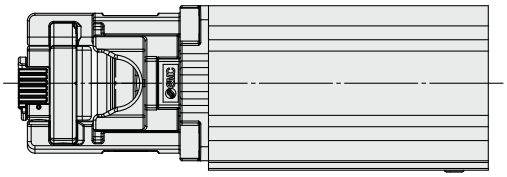






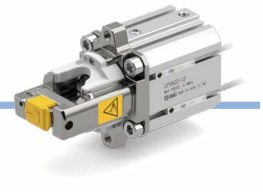
LPVA21-□-(R, L)





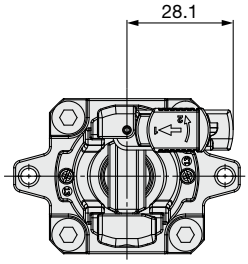
Part no.	L1	L2	D1
LPVA21-09	16.5	—	9.6
LPVA21-11	17.3	—	11.2
LPVA21-13	17.05	—	12.7
LPVA21-09-R	16.5	3	9.6
LPVA21-11-R	17.3	3	11.2
LPVA21-13-R	17.05	3	12.7
LPVA21-09-U	16.5	—	9.6
LPVA21-11-U	17.3	—	11.2
LPVA21-13-U	17.05	—	12.7
LPVA21-09-L	16.5	3	9.6
LPVA21-11-L	17.3	3	11.2
LPVA21-13-L	17.05	3	12.7

* The maximum dimension in the specified direction of the port is increased by 3 mm.

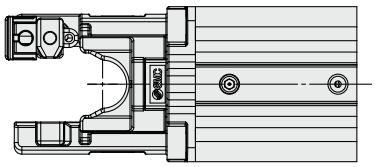


Dimensions

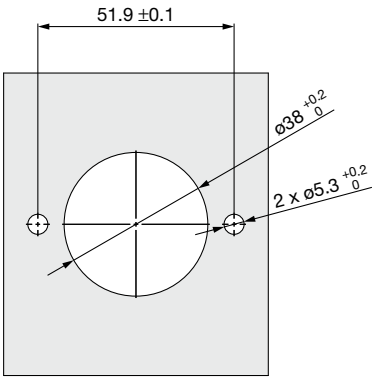
LPVA22-□

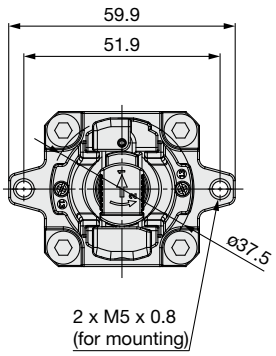


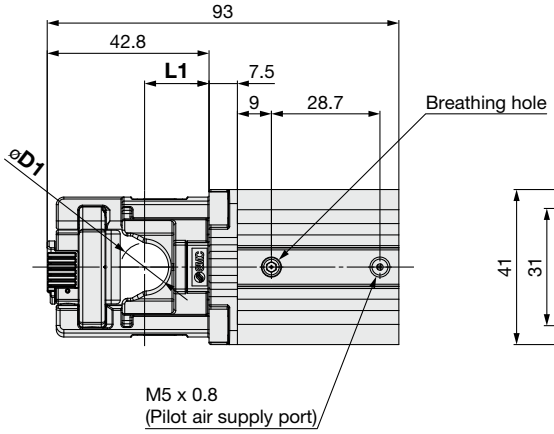
Cover open

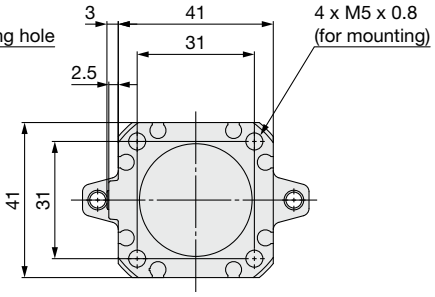


Panel fitting dimensions

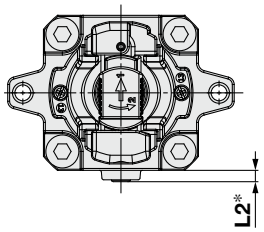


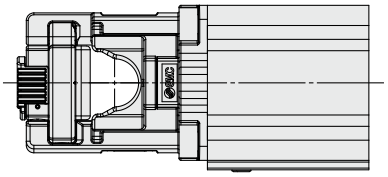






LPVA22-□-(R, L)





Part no.	L1	L2	D1
LPVA22-09	16.5	—	9.6
LPVA22-11	17.3	—	11.2
LPVA22-13	17.05	—	12.7
LPVA22-09-R	16.5	3	9.6
LPVA22-11-R	17.3	3	11.2
LPVA22-13-R	17.05	3	12.7
LPVA22-09-U	16.5	—	9.6
LPVA22-11-U	17.3	—	11.2
LPVA22-13-U	17.05	—	12.7
LPVA22-09-L	16.5	3	9.6
LPVA22-11-L	17.3	3	11.2
LPVA22-13-L	17.05	3	12.7

∗ The maximum dimension in the specified direction of the port is increased by 3 mm.

LPVA Series
Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For precautions, refer to the "Operation Manual" on the SMC website: https://www.smcworld.com

⚠ Warning

1. Do not insert fingers, hands or other objects between the tube mounting parts.

If a finger or hand is inserted between the tube fitting parts while the valve is in operation, it may become trapped or injured.
Do not insert fingers, hands or other objects between the tube mountings.

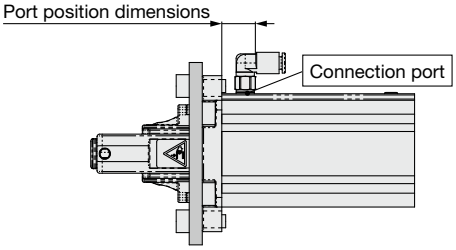
⚠ Caution

1. When directly connecting a pipe fitting to the cylinder, please use the series type shown on the right.

Refer to the Fittings and Tubing Precautions for handling One-touch fittings.

2. Do not use this product in applications which may adversely affect human life (e.g. medical equipment connected to the human body for drip infusion).

Model	Port position dimensions	Connection port	Recommended fittings		
			Model	Part no.	
				Metric size	Inch size
LPVA2□-09 LPVA2□-11 LPVA2□-13	9	M5 x 0.8 10-32UNF	Male connector (With hexagon socket head)	KQ2S04-M5□	KQ2S03-32□
				KQ2S06-M5□	KQ2S07-32□
			Male connector	KQ2H04-M5□	KQ2H03-32□
				KQ2H06-M5□	KQ2H05-32□
				–	KQ2H07-32□
			Male elbow	KQ2L04-M5□	KQ2L03-32□
				KQ2L06-M5□	KQ2L05-32□
				–	KQ2L07-32□

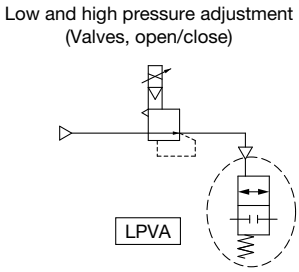


[How to adjust the pinch force when using the N.C. type]

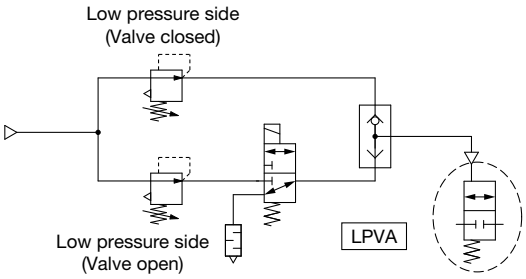
· The N.C. type uses spring force to pinch the tube, so if no adjustment is made, the pinch force will be excessive for the tube used, which may affect the tube life.

If pinch force adjustment is required, it is recommended to use a multi-stage control with a circuit like the example below.

Example 1: Example of electro-pneumatic regulator use

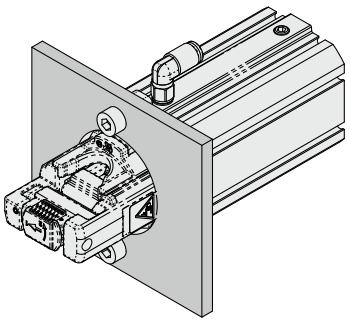


Example 2: Example of regulator valve use

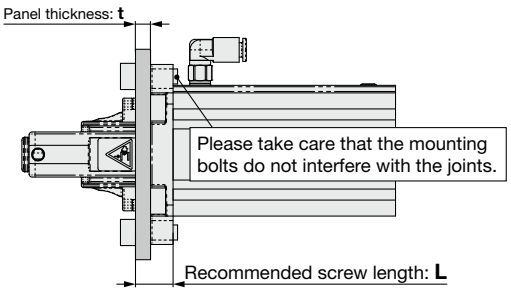


· Select the bolt length for panel mounting based on the recommended screw length and tighten the bolts properly within the recommended tightening torque.

If the screw length of the bolt is insufficient, it may cause the product to be poorly mounted on the panel or to fall off. If the screw length of the bolt is excessive, the bolt may interfere with the joint, resulting in inadequate mounting on the panel. Use the recommended tightening torque. Excessive tightening torque may cause damage to the threaded part of the bolt, while insufficient tightening torque may cause inadequate panel mounting or the product to fall.



Panel mounting



Model	Bolts used	Recommended tightening torque*1 [N·m]	Max. panel thickness **t** [max. mm]	Recommended screw length **L** [mm]
LPVA2□-09	M5 x 0.8 10-32UNF	1.5	5.0	**t** + 8.0
LPVA2□-11				
LPVA2□-13				

*1 The recommended torque range is ±10% of the recommended tightening torque value.

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1:Robots
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, combustion equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not allowed.
Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country. The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Suction cups (Vacuum pads) are excluded from this 1 year warranty.**
A suction cup (vacuum pad) is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the suction cup (vacuum pad) or failure due to the deterioration of rubber material are not allowed by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Safety Instructions	Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.