CKD

New Products

Pilot operated 3, 5-port valve
Plug-in-type block manifolds

TVG Series

ULTRA-LONG life components contribute to equipment with no downtime

IP65/IP67

HP HIGH PRODUCTIVITY

Green Power WATER

New

In-stop valve spacer and ø10 fittings added

CKD Corporation

CC-1595AA 2

Carbon neutrality comes from reducing CO_2 emissions through long service life products

What "HIGH PRODUCTIVITY" means to CKD

Lower productivity will result in loss. In addition, parts requiring maintenance will be wasted. We believe that achieving high productivity without maintenance leads to carbon neutrality. Our HP Series focuses on the manufacturing principles of such component manufacturers. To improve productivity in places with high usage frequency and high-stress environments, the series serves to create a "production facility with no downtime" and "achieves stable operation" with products that have an unprecedented long service life.

HP

HIGH PRODUCTIVITY

Reduce production loss and waste

Durable

Maintenance cost/time

Rapid replacement possible

Stopping the facility momentarily or for a long time

Early end of life notification

Labor shortage

HP1 Long service life

HP2 Long service life + Predictive maintenance

Carbon neutral

- Reduced exterior leakage
- Energy saving coil option (0.1 W)
- Reclaimed resin used

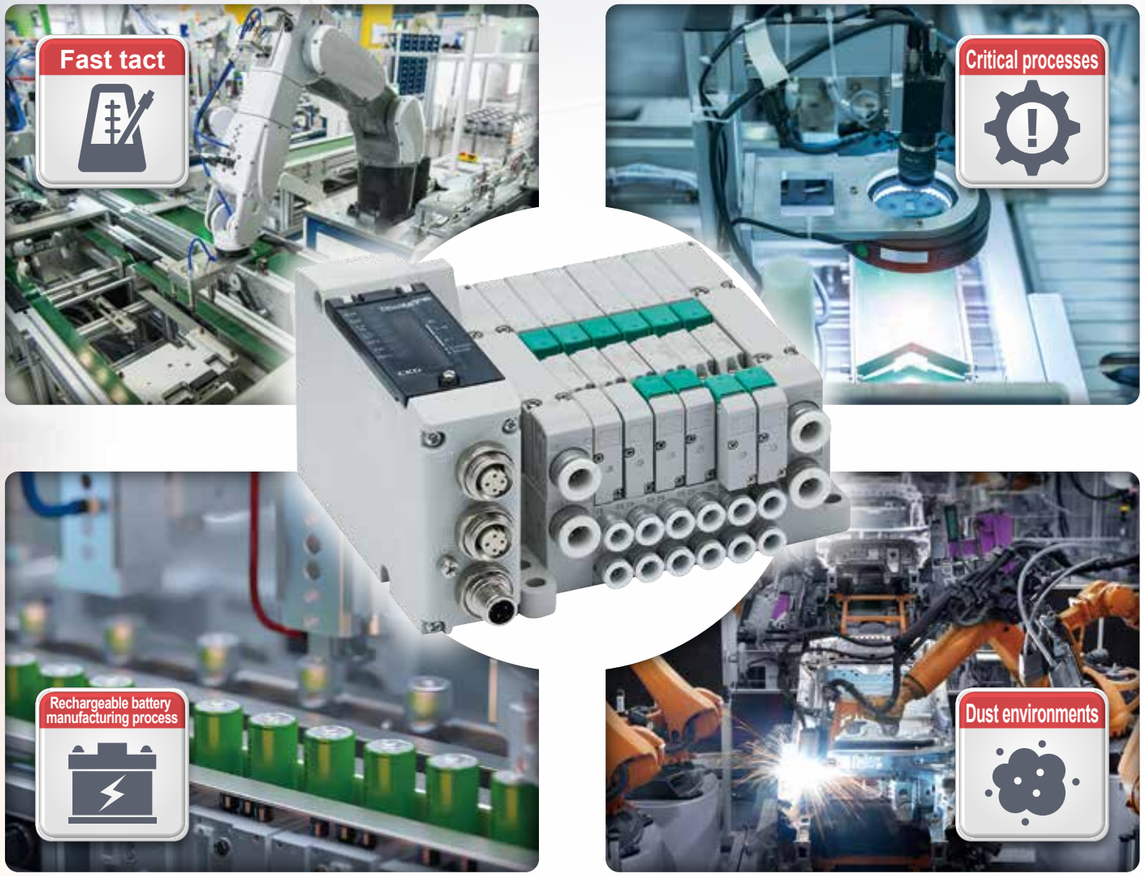
Plug-in valve

Easy to use

- Plug-in structure
- IP65/67
- Improved maintainability (built-in gasket)

High reliability

- Stable operation even with ultra dry air
- High durability of 120 million operations or more (twice that of conventional models)
- No unexplained stoppages



Plugs into various devices

Carbon neutrality and IoT contribute to the visualization of equipment and the elimination of control panels. Waterproof, robust, high-performance, and remote I/O-compatible FA system are key parts of the global model.

Pilot operated 3, 5-port solenoid valve, plug-in block manifold

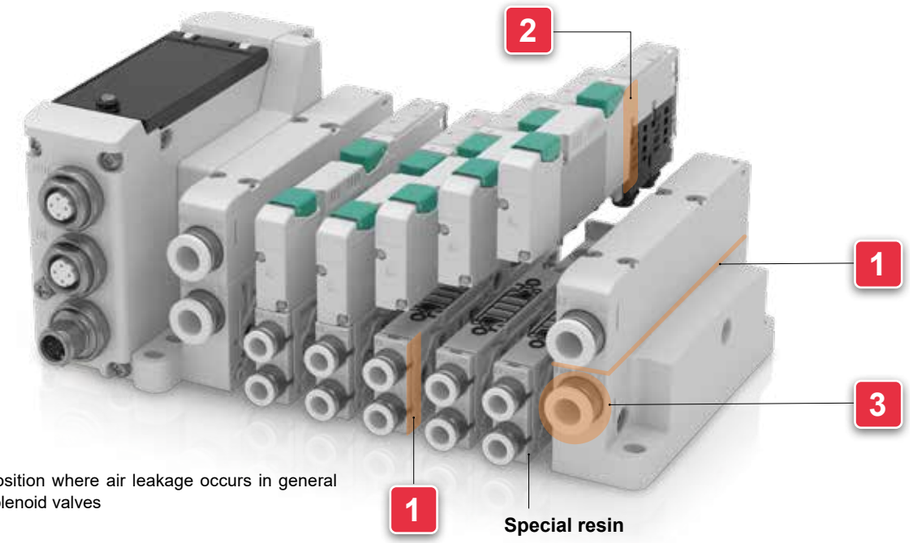
TVG Series

Carbon neutral

Reduces air leakage

Thoroughly improved valve parts that were prone to air leakage.
This plug-in valve is the culmination of CKD's commitment to sustained energy savings even with long-term use.

	Air leakage cause	Commitment to TVG
1	The deterioration of rigidity of resin materials due to moisture in the atmosphere, including during water adhesion, transportation, and storage.	Sealing design to withstand aging and special resin material to reduce air leakage.
2	Coil heating and changes in the ambient temperature cause repeated thermal stress, reducing the rigidity of resin materials.	Coil temperature rise is reduced. Air leakage is reduced with a special resin material and sealing design resistant to aging.
3	Wear of the spool packing causes supply air to run into the exhaust port.	Spool packing and special treatment on the body interior reduce wear.



Position where air leakage occurs in general solenoid valves

Coil performance improved

Continuous energizing possible (low exoergic/energy circuit)

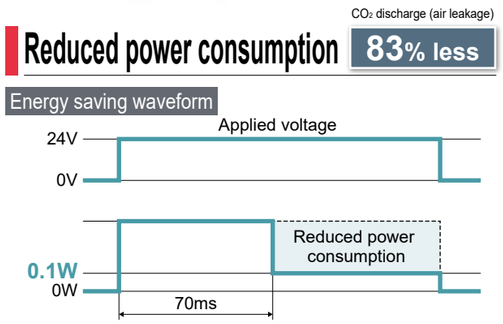
Uses a new coil actuator.

Power consumption

0.1 W (With low exoergic/energy circuit)
0.4 W (Standard products)

Reduced power consumption

CO_2 discharge (air leakage)
83% less



Uses materials with reduced environmental load

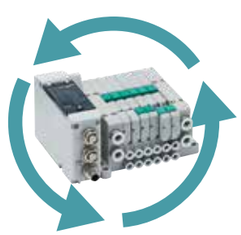
Biomass plastic

Protective cover*1 is made of plant-derived biomass plastic.

*1. The protective cover cannot be closed when manual operation is enabled, making it ideal for preventing forgotten manual operation.

Recycled material resin

The use of recycled resin contributes to reducing the environmental load



High reliability

Strives for stable operation

CO_2 discharge (air leakage)
99.8% less
120 million operation cycles

The TVG Series has been developed to optimize the sliding parts and achieves durability of 120 million cycles or more*. Stable operation due to low friction supports the reliable operation of the actuator, realizing stable operation of equipment and reduction in quality fluctuations.

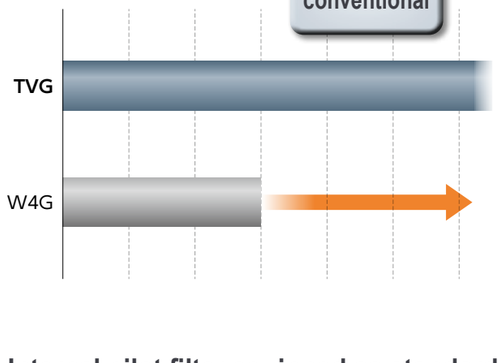
Low friction/Long service life

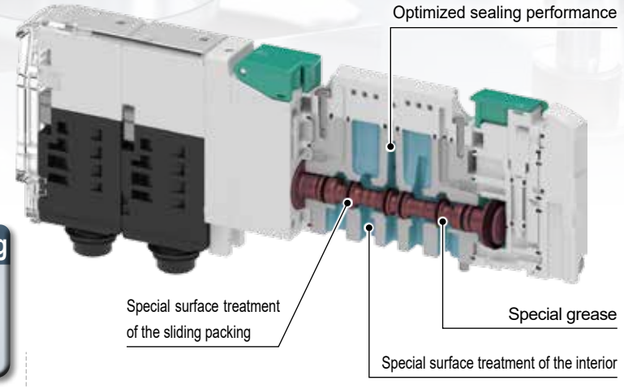
The superb sliding mechanism of the main valve realizes low friction and long service life. The elastic seal withstands 120 million cycles. Achieves both long service life and low air leakage.

Durability count of 120 million operations or more*

*Subject to CKD prescribed conditions.

Elastic sealing
2x conventional





Improved responsivity after startup

Smooth start even after time off. Effective for Monday morning troubles and unexplained stoppages as well.

Special grease used

Lubrication effect continues even with ultra dry air.

Internal pilot filter equipped as standard

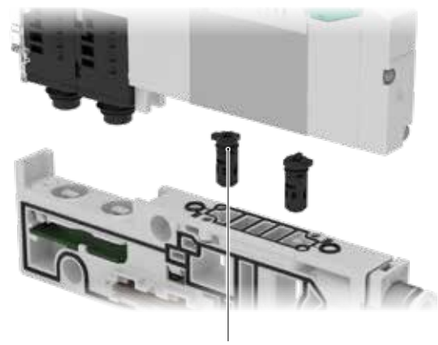
Improved operation stability.

Prevents problems with foreign matter

Port P (air supply) equipped with filter as standard.

Exhaust check valve (option) PAT.P

Retrofitting is possible even after installation.



The outer O-ring prevents small amounts of air from entering. Prevents compact actuators from malfunctioning.

Also compatible with global standards

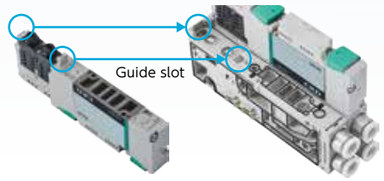
CE UKCA cULus RoHS

Easy to use

Plug-in valve with excellent workability

5 Positioning support as standard PAT.P

A "positioning support" that allows anyone to easily position the valve and base is provided as standard.



6 Easy-to-assemble plug-in connection

PAT.P

Actuator additions are wired complete by plug-ins.

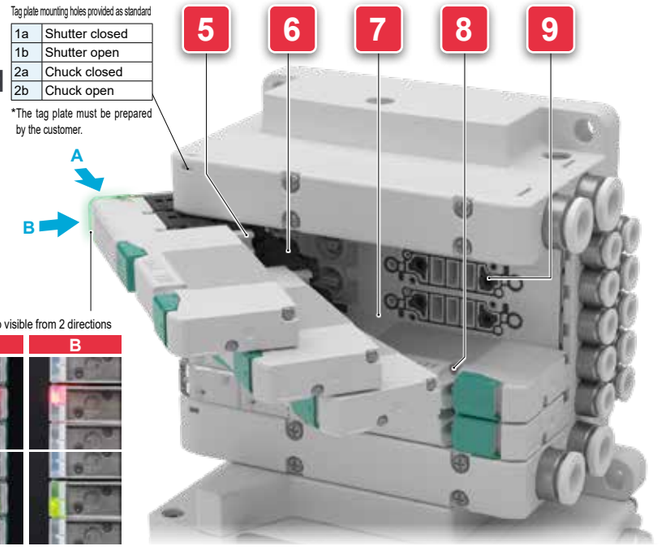
7 Connections that make it easy to adjust the number of stations

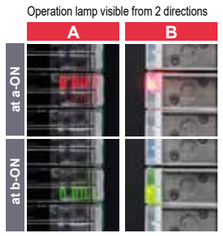
Internal wiring is completed at the same time as the manifold assembly.

8 Screw dropout prevention as standard

9 No parts dropped out

Gasket is built into the base.





Improved environmental performance

IP65/IP67 (dust/water-jet proof) for tough use

IP6*: No inflow of dust
IP*5: No harmful effects by water jets from any direction
IP*7: Prevents water from entering in amounts that would cause harmful effects even if temporarily submerged in water for a specified pressure and time

*TVG can be used in both IP67 and 65 environments. Refer to page 160 for IP performance.

Prevention of coil corrosion

Molded coil specification that is resistant to corrosion. Prevents water from adhering during use and rust due to moisture during transportation and storage.

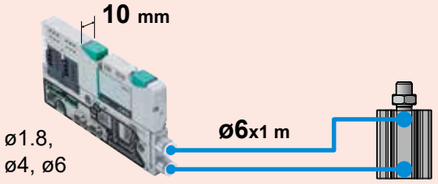
P4 Series for rechargeable battery manufacturing equipment

Restricted specifications for materials and surface treatments inappropriate for rechargeable battery manufacturing processes.

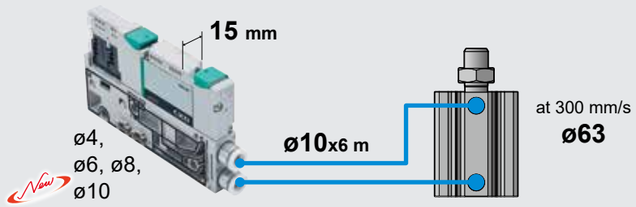
Valve width of 10mm, 15mm are supported

Our first 10 mm wide plug-in valve!

TVG1



TVG2

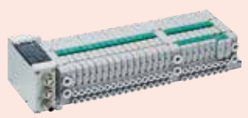


One Point!

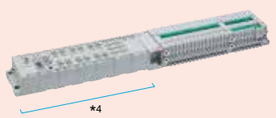
With ø10 fittings, the cylinder can be accelerated even with long-distance piping!

The speed of an air cylinder will decrease if the air piping is long or thin. For applications with long-distance piping where you want the air cylinder to operate at high speed, we recommend using a ø10 fitting, which is one size larger.

Compatible with various communications

Output only	Solenoid valve size	Supported communication	Max. number of points	Max. number of solenoid valves
	TVG1, TVG2	EtherNet/IP*1 DeviceNet, EtherCAT*1, CC-Link IE TSN, CC-Link IE Field*1, CC-Link IE Field Basic*1, CC-LINK, PROFINET*1, IO-Link*1, IO-Link Wireless*1	Solenoid: 32 points	TVG1:24 stations TVG2:24 stations

*1. Solenoid valve ON count function.

With remote I/O	Solenoid valve size	Supported communication	Max. number of points	Max. number of solenoid valves
	TVG1, TVG2	EtherNet/IP, EtherCAT, IO-Link*2 PROFINET	Solenoid: 32 points I/O:4096-point*3	TVG1:24 stations TVG2:24 stations

*2. As a IO-Link master. Solenoid valve communication is EtherNet/IP and EtherCAT.
*3. Solenoid points 32 are included in I/O point count 4096.
*4. Remote I/O must be prepared separately. Refer to Remote I/O RT Series (CC-1557AA) for details.

Easy to use (spacer option)

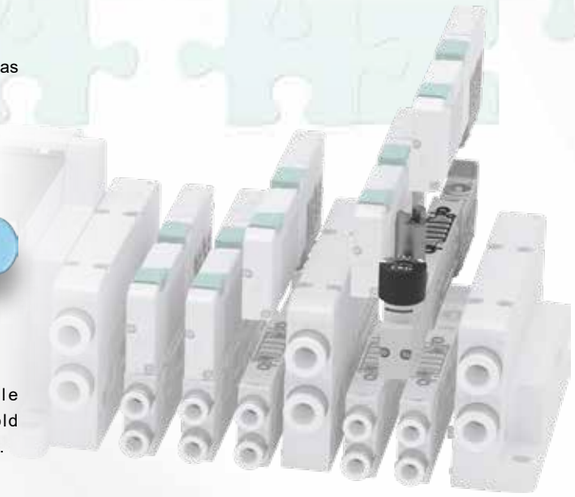
Recommended for situations like these

A Spacer with a Plug-in Structure

We want to handle it by making changes on the valve side.

We want to stock the valves as individual components.

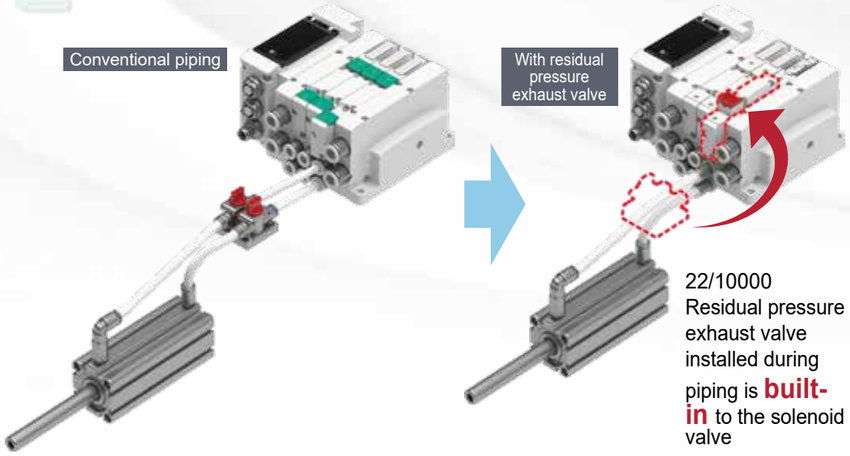
We want to assemble them once the manifold specifications are finalized.



Option

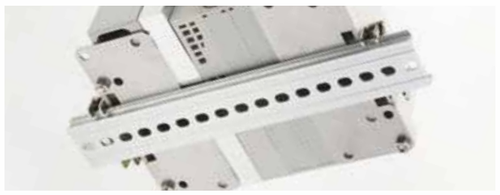
With residual pressure exhaust valve

It is possible to release the residual pressure from ports A and B without dropping the supply pressure.



22/10000 Residual pressure exhaust valve installed during piping is **built-in** to the solenoid valve

DIN rail mount



TAG holder

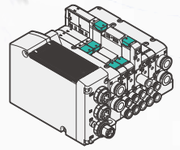
With spacer　　Without spacer

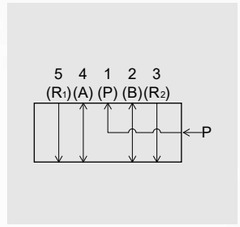
*The same TAG holder with or without spacer

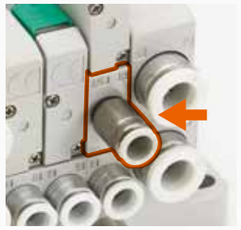
Spacer

Air supply spacer

Air can be supplied at different pressures for each valve. Ideal for adjusting the thrust of cylinders by increasing or decreasing the pressure of individual valves.

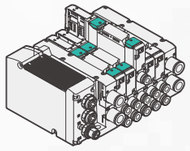


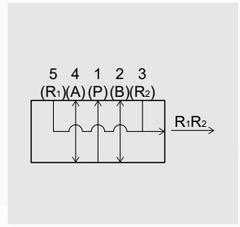




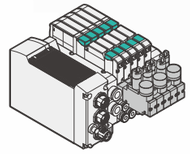
Exhaust spacer

Individual exhaust prevents misoperation of the single acting cylinder to prevent injury to persons and damage to components.





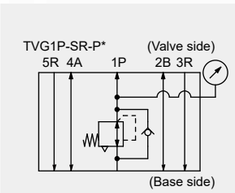
Spacer regulator



Pressure reduction is possible in units of 1 station of valve. P, A, and B can be each reduced in pressure by selecting the model No., enabling detailed cylinder control, etc.

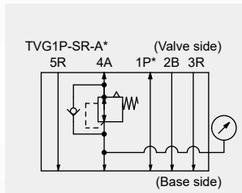
P regulator

Depressurizes both A and B for only one station.



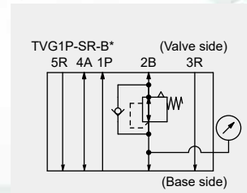
A regulator

Pressure is reduced only for the A side supply pressure of the cylinder connected to the valve.



B regulator

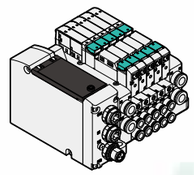
Pressure is reduced only for the B side supply pressure of the cylinder connected to the valve.

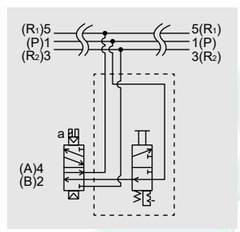


Spacer with in-stop valve

New

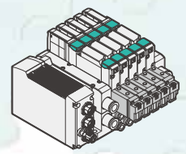
Air can be stopped for each valve. Valves can be replaced individually without stopping production line operation.

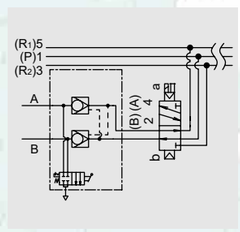


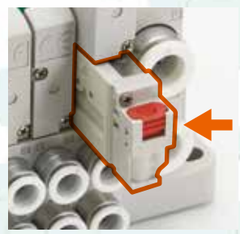


Spacer Pilot Check Valve

Ideal for cylinder position locking and braking over long periods.







Application (IO-Link Wireless)

Industry's first

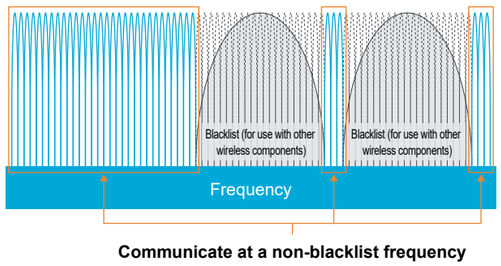
Open network IO-Link Wireless compatible solenoid valve*1

Uninterrupted wireless, usable for control. One billionth error rate. *2 Enables wireless connection of solenoid valve with PLC of various communications via IO-Link Wireless master.

Item	Wireless LAN	Bluetooth	ZigBee	IO-Link Wireless
Standards	IEEE802.11b	IEEE802.15.1	IEEE802.15.4	**IEEE802.15.1**
Frequency	2.4 GHz	2.4 GHz	2.4 GHz	**2.4 GHz**
Communication distance	Up to 100 m	Up to 10 m	Up to 100 m	**Up to 20 m**
Transmission bit rate	11 Mbps	1 Mbps	250 kbps	**21 kbps**
Connection nodes	32	7	128	**40**
Delay time	50 ms	10 to 30 ms	100 ms	**5 ms**
Reliability	Low	Low	Medium	**High**

Blacklist function

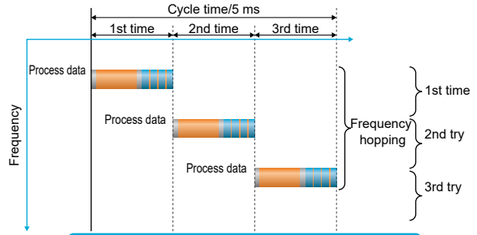
Avoids frequencies used in other wireless components. Coexistence with other wireless components is made possible.



Communicate at a non-blacklist frequency

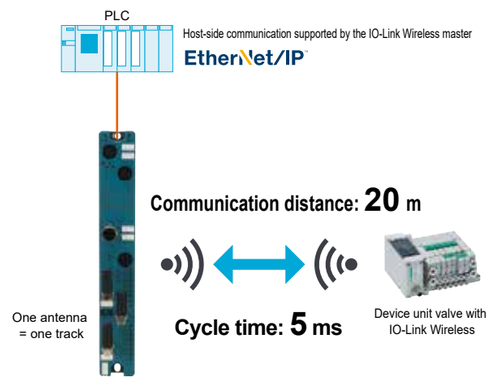
Frequency hopping function

Retries are executed 3 times in one communication cycle by switching frequency bands.



Uninterrupted, low latency

IO-Link Wireless system configuration example



It can also be purchased from CKD. Refer to page 55 for details.

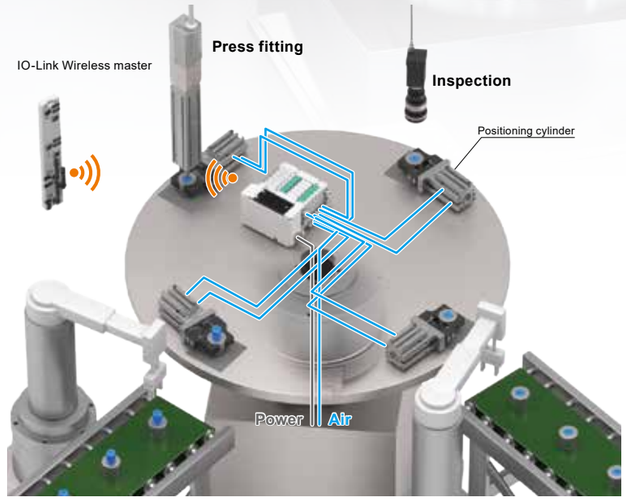
Solenoid valve lineup with IO-Link Wireless device unit

Solenoid valve appearance	IO-Link master (1 track) number of connected units per		Cycle Time
	32 pts Output	1 to 6 units	5 ms
		7 to 8 units	10 ms

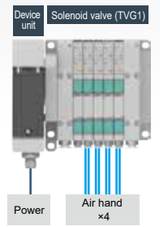
*1. June 2023, CKD research. CKD IO-Link Wireless component compatible regions: Japan and EU, USA.
*2. Blacklist and frequency hopping functions provide wired-like reliability. Wireless quality for use in control.

Assembly / Inspection (rotating table)

The solenoid valve manifold can be installed on the rotary table because the signal line is wireless. Equipment can be designed to improve workpiece positioning accuracy and accommodate a wide variety of workpieces.



Solenoid valve configuration

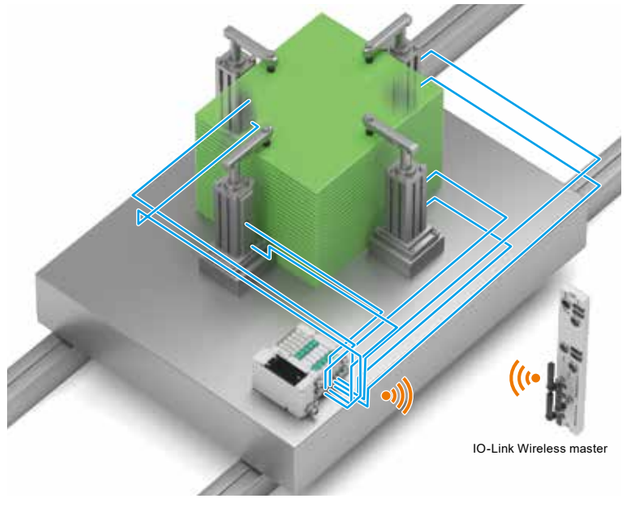


Component configuration

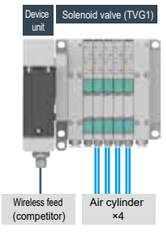
Air hand

Pallet transport

The solenoid valve for cylinder operation in the pallet is made wireless. By combining with a wireless power feed component, it is possible to hold a workpiece for a short time with air sealing even during travel.



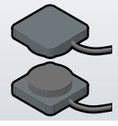
Solenoid valve configuration



Component configuration

Rotary clamp cylinder

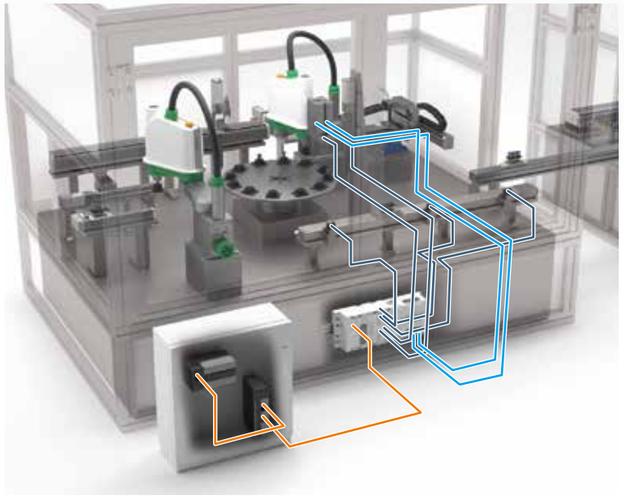
Wireless feed (competitors)



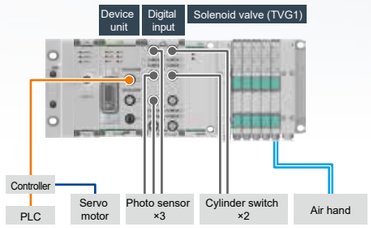
Application

Conveying equipment

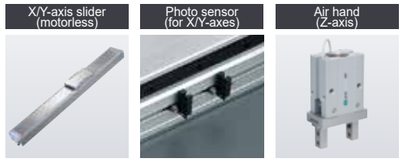
Air piping and electrical wiring can be consolidated in mixed equipment with servomotor-driven actuators and air hands.



Remote I/O configuration



Component configuration

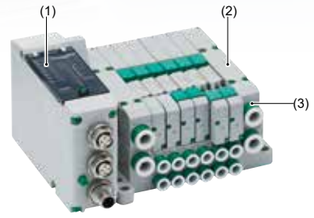


Rechargeable battery manufacturing process

Supports the rechargeable battery manufacturing process from electrode manufacturing to packaging. P4 option compatible with material restrictions and ultra dry air with dew point -80°C available. The long service life of the non-volatile special grease contributes to the stable operation of equipment.

Rechargeable battery option: P4

(1) Electric circuit unit IP65/67
(2) Flow path part Material restrictions
(3) SUS fitting

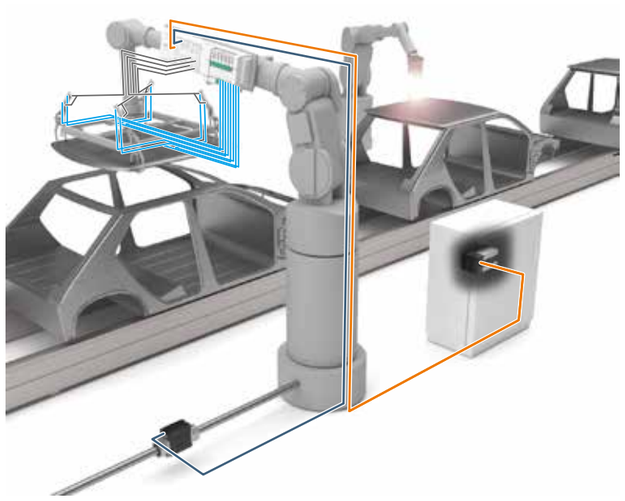


Stable operation even at -80°C dew point is realized by special grease adopted as standard.

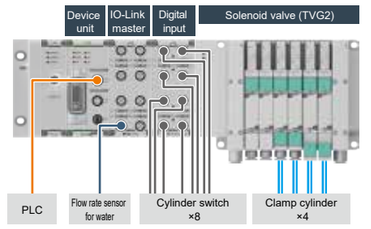
Refer to Rechargeable Battery Compatible Components P4* Series (CC-1226A) for details.

Auto body welding

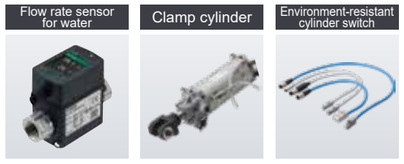
Contributes to reduced wiring of solenoid valves for cylinder drive and cylinder switch input. Only one Ethernet cable is required to complete wiring from the PLC (Programmable Logic Controller), contributing to reduction of installation space and improvement of wiring layout for devices including IO-Link devices.



Remote I/O configuration

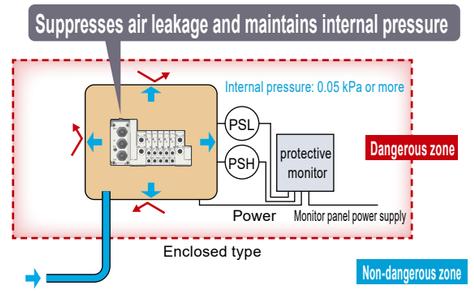


Component configuration



Internal pressure explosion-proof panel

Ideal for applications where solenoid valves are installed in internal explosion-proof control panels. Since there is little air leakage, the influence of pressure control inside the panel is minimized, contributing to stable operation of the equipment.



Supports continuous energization

Energy saving coil (0.1 W) is available as an option, and it supports continuous energization, which is often required for air-operated control.

Special resin

The special resin adopted as standard suppresses secular change and air leakage from the valve for long periods.

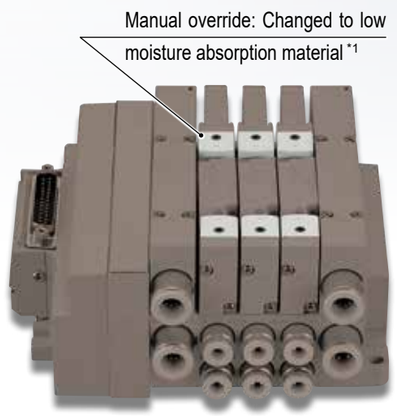
Explosion-proof model certification has not been obtained for discrete solenoid valves. For internal pressure and explosion-proof use, the customer must apply for and obtain a model certification. Observe JNIOSH-TR-46-3 and other standards when performing installation.

Special Specification Product

Compatible with low moisture absorption materials for low dew point environments

Standard Product

Special Specification Product



Features

- Materials with total part moisture absorption rate of 0.25% or less are used
- Ideal for installing solenoid valves in ultra-dry environments

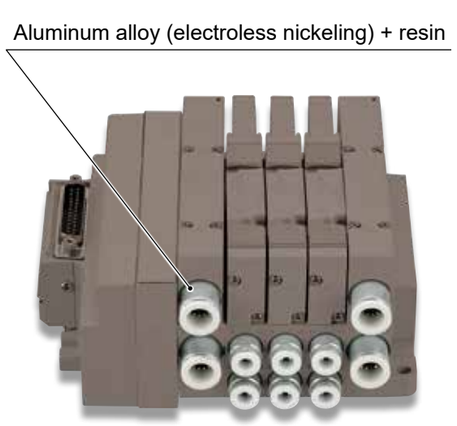
Application

- Rechargeable battery manufacturing

*1. Low moisture absorption material is available only for non-locking, tool operation, without cover (M3).

Fittings All stainless steel tube compatible

Standard Product



Special Specification Product

Features

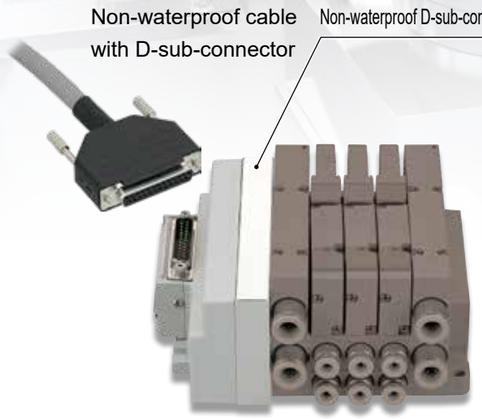
- Improved water resistance
- SUS316L (packing FKM)

Application

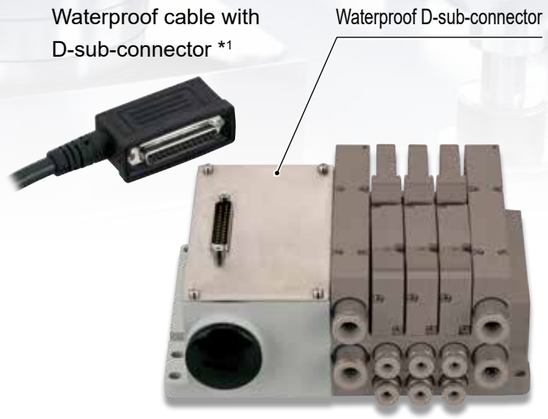
- Rechargeable battery manufacturing
- Food processing machinery

D-sub-connector waterproof specification

Standard Product



Special Specification Product



*1. CKD does not sell these products.

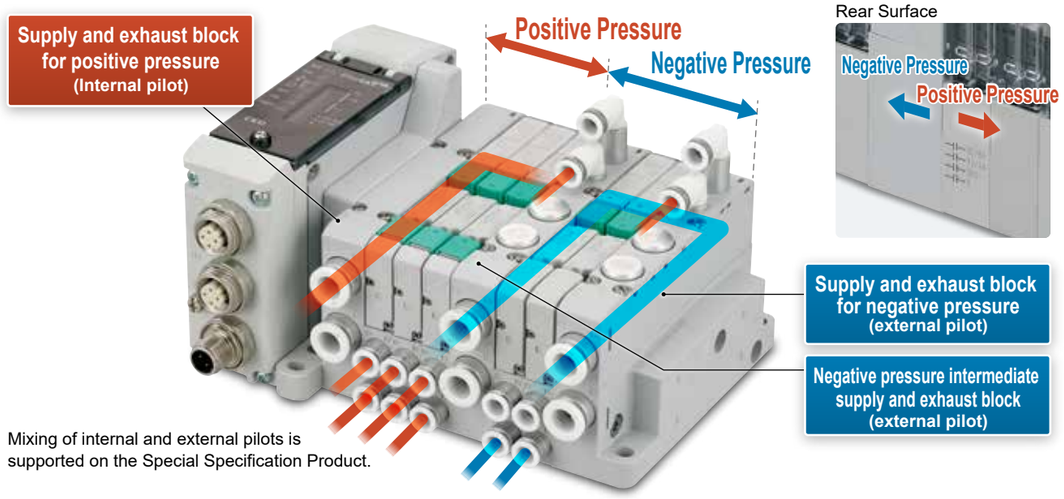
Features

- IP65/IP67 compatible
- 25-pin (max. solenoid number of points: 24)

Application

- Automobile related devices
- Machine tools
- Food processing machinery

Positive pressure/negative pressure mixed



Mixing of internal and external pilots is supported on the Special Specification Product.

Features

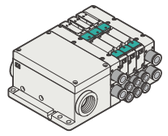
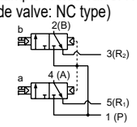
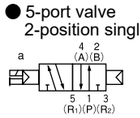
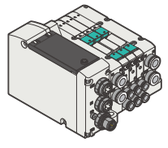
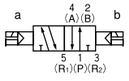
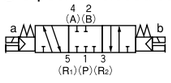
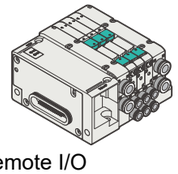
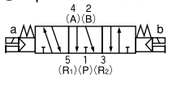
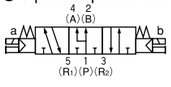
- One communication device unit can be used for both positive and negative pressures
- Additional air/vacuum flow rate supply is possible by adding intermediate supply and exhaust blocks
- Vacuum suction/transport of workpieces is supported with a single manifold

[Negative pressure] Vacuum suction [Positive pressure] Air cylinder control

Application

- Automobile related devices
- Food processing machinery
- Electronic parts

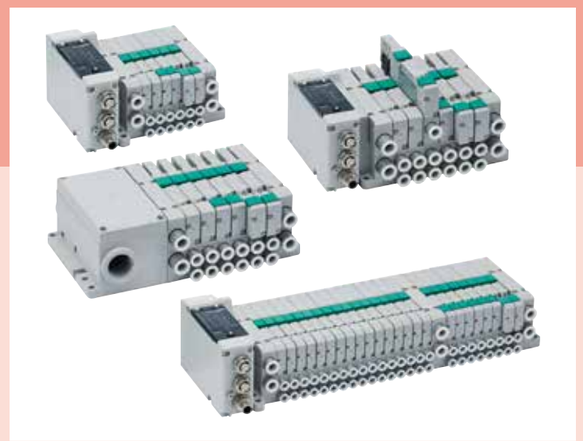
System Table TVG1 / TVG2 Series

Series external appearance		Equipped Valve Model No.	Position Number of solenoid valves Circuit Diagram Symbol	Flow Characteristics ($dm^3/(s \cdot bar)$)	Cylinder bore size (ø) *1	Switching position class: 2-position Single	2-position Double	3-position Closed center	3-position Exhaust center	3-position Pressure center	Two 3-port valves integrated	Mix	A/B Piping port (mm) Push-in fitting ø1.8	ø4	ø6	ø8	ø10	Push-in fitting L type (upward, downward) ø1.8	ø4	ø6	ø8	A/B Piping port (inch) Push-in fitting ø1/8"	ø5/32"	ø1/4"	ø5/16"	Electrical connections: Reduced wiring connection Common terminal block	Multi-connector	D-sub Connector	Serial transmission OPP8	RT	Voltage	Spacer: Supply, exhaust	Spacer Pilot Check Valve (Pilot check valve)	Regulator	In-stop valve spacer	Compatible with rechargeable battery manufacturing processes	Page Listed
																									DeviceNet CC-LINK EtherCAT EtherNet/IP PROFINET CC-Link IE Field CC-Link IE TSN IO-Link IO-Link Wireless	EtherNet/IP EtherCAT PROFINET OPC UA										P4
Reduced wiring manifolds / Base piping	Reduced wiring 	3-port	TVG1	● Two 3-port valves integrated Example A side valve: NC, B side valve: NC type) 	0.56 to 1.1	up to ø63						●	●	●	●			●	●	●		●	●			●	●	●			24 VDC	●	●	●	●	●	4
			TVG2		1.8 to 2.2	up to ø100						●		●	●	●	●		●	●	●			●	●	●	●	●	●				●	●	●	●	●	
		5-port	TVG1		0.59 to 1.3	up to ø63	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●			●	●	●				●	●	●	●	●	
			TVG2	● 5-port valve 2-position single 	1.8 to 2.9	up to ø100	●	●	●	●	●		●		●	●	●	●		●	●	●			●	●	●	●	●	●				●	●	●	●	●	
	Serial transmission 	3-port	TVG1	● 2-position double 	0.56 to 1.1	up to ø63						●	●	●			●	●	●		●	●						●		24 VDC	●	●	●	●	●	4
			TVG2		1.8 to 2.2	up to ø100						●		●	●	●	●		●	●	●			●	●	●	●	●	●				●	●	●	●	●	
		5-port	TVG1		0.59 to 1.3	up to ø63	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●					●				●	●	●	●	●	
			TVG2	● 3-position closed center 	1.8 to 2.9	up to ø100	●	●	●	●	●		●		●	●	●	●		●	●	●			●	●	●	●	●	●				●	●	●	●	●	
	With interface for Remote I/O connection  Remote I/O (RT Series) It is required separately.	3-port	TVG1	● 3-position exhaust center 	0.56 to 1.1	up to ø63						●	●	●			●	●	●		●	●							●	24 VDC	●	●	●			60
			TVG2		1.8 to 2.2	up to ø100						●		●	●	●	●		●	●	●			●	●	●	●	●	●				●	●	●			
		5-port	TVG1	● 3-position pressure center 	0.59 to 1.3	up to ø63	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●						●			●	●	●			
			TVG2		1.8 to 2.9	up to ø100	●	●	●	●	●		●		●	●	●	●		●	●	●			●	●	●	●	●	●				●	●	●			

*1: Refer to page 141 for details.

TVG

3, 5-port pilot operated valve, plug-in block manifold



CONTENTS

How to order solenoid valve manifold with reduced wiring/serial transmission device unit

The following 3 ordering methods are available.

Ordering method	Manifold specifications sheet	Customer assembly processes	Product delivery date
A Manifold assembly	Required	☆	○
B Easy assembly	Not required	◎	◎
C Discrete block	Not required	○	☆

☆: Excellent, ◎: Very good, ○: Good

Applicable solenoid valve

Reduced wiring

Serial transmission (output only)

A Manifold assembly

The units will be delivered with the specifications specified in the manifold specifications sheet.
Can be ordered with model No. starting with TVG□M and a manifold specifications sheet.

TVG□M

□: Valve size

Page 9

+

Manifold specifications sheet

Page 117

B Easy assembly

The single solenoid valve and assembled manifold base will be delivered separately. The following parts model No. can be ordered. The customer is required to assemble a single solenoid valve and a manifold base.

Single solenoid valve (For mounting base)
Specs not required
TVG□-
□: Valve size

Page 17

+

Assembled Manifold Base
Specs not required
TVG□B-
□: Valve size

Page 13

+

Spacer
Specs not required
TVG□P-
□: Valve size

Page 19

+

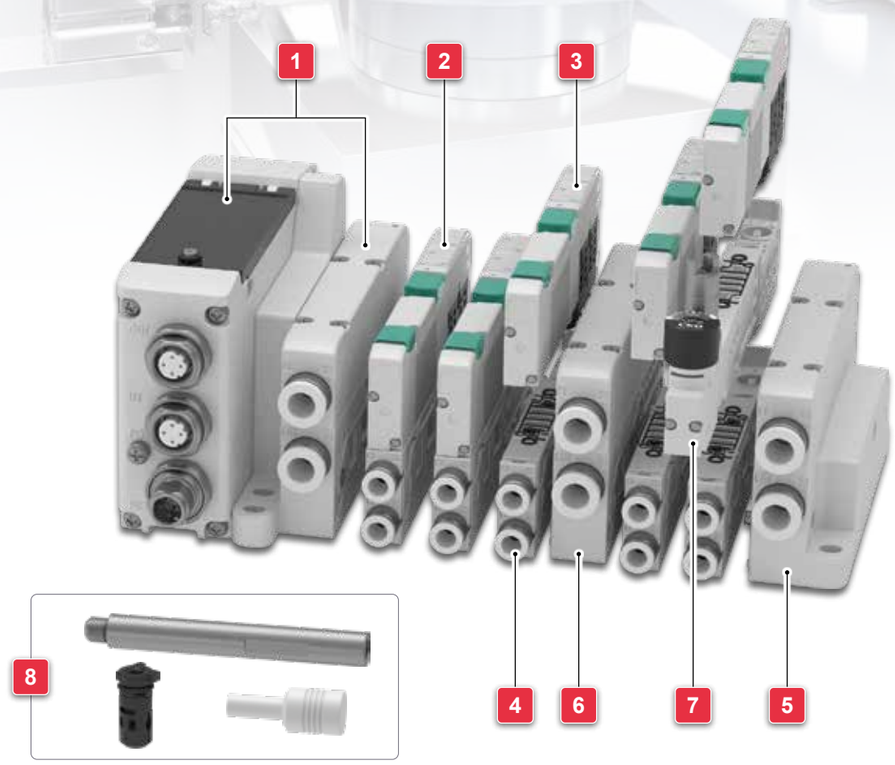
Exhaust malfunction Prevention valve
Specs not required
TVG□P-
□: Valve size

Page 54

*1. The manifold base is limited to options that can be manufactured without the need for specifications, such as double wiring and no malfunction prevention valve assembly.

C Discrete block

Each part is delivered separately. The customer must assemble the manifold by combining the parts. You can order the parts below with their model Nos.



No.	Name	Head model No.	Listed page
1	Wiring supply and exhaust block	TVG□P- □: Valve size	P. 39
2	Valve block with solenoid valve		P. 41
3	Solenoid valve discrete (for base mounting)		P. 17
4	Valve block		P. 45
5	End supply and exhaust block		P. 50
6	Intermediate supply and exhaust block		P. 51
7	Spacer		P. 19
8	Tie rod, silencer, exhaust check valve		P. 49, 54
	Other related parts		P. 53

Plug-in Block Manifold
Pilot Operated 3, 5-Port Valve

TVG1 / TVG2 Series

Manifold common specifications

Item		Content
Manifold		Block manifolds
Mounting Method		Direct mounting
Air supply and exhaust method		Common supply/common exhaust (With internal exhaust check valve)
Pilot exhaust method Internal pilot (*5)		Main valve/pilot valve common exhaust (Pilot exhaust check valve built-in)
Piping direction		Side direction of base
Valve Type and Operation Method		Pilot operated soft spool valve
Operating Fluid		Compressed Air
Max. working pressure MPa		0.7
Internal pilot Min. working pressure MPa	2-position double	0.1 (*7)
	2-position single 3-position	0.2
	3-port valve Two valves integrated	0.2
Min. working pressure of external pilot kPa		-100 (Pilot pressure at 0.2MPa or more)
Proof Pressure MPa		1.05
Ambient Temperature °C		−5 to 55 (no freezing)
Fluid temperature °C		5 to 55
Manual Override		Non-locking/locking common (standard)
Lubrication (*1)		Not required
Degree of protection (*2) (*8)		IP65, IP67
Vibration resistance m/s² (*9)		50 or less
Shock resistance m/s²		≤ 300
Atmosphere		Cannot be used in corrosive gas environments

Electrical specifications

Item		Reduced wiring connection EA1□, FA1□, GA1□	Serial transmission JA□□, JB□□
Rated Voltage (V)		24 VDC	24 VDC
Voltage fluctuation range (*3)		±10%	+10%, -5%
Holding current A	Standard	0.017	
	With low exoergic/ With low exoergic	0.005	
Power Consumption W	Standard	0.4	
	With low exoergic/ With low exoergic	0.1	
Thermal class		B	
Surge suppressor (*4)		Zener diode	
Indicator		LED	

*1: Use turbine oil Class 1 ISO VG32 for lubrication. Excessive or intermittent lubrication results in unstable operation.
*2: Tested according to the test method for IP65 and IP67 (IEC 60529: 2001) standards. Refer to page 160 for details.
*3: As the voltage drop occurs depending on the internal circuit of theserial transmission, be careful of the voltage fluctuation range.
*4: If low exoergic/energy circuit or surgeless types are selected then there will be a diode.
*5:The pilot exhaust method differs with the supply and exhaust block specification. Refer to page 52 for details.
*6: When using at low vacuum, select the external pilot. Refer to page 162 for details.
*7: 0.2MPa for low exoergic/energy circuit.
*8: The degree of protection of the D-sub-connector (GA1□) is dust-proof IP40 or equivalent. Avoid water drops or oil, etc., during use.
*9: For DIN rail mount vibration resistance, keep the vibration applied to the manifold to 20m/s² or less for 2 to 12 stations, and to 10m/s² or less for 13 to 16 stations.

Individual specifications

Item			TVG1 Common terminal block EA1□	TVG1 Multi-connector FA1□	TVG1 D-sub Connector GA1□	TVG1 Serial transmission JA□□, JB□□	TVG2 Common terminal block EA1□	TVG2 Multi-connector FA1□	TVG2 D-sub Connector GA1□	TVG2 Serial transmission JA□□, JB□□
Max. station No.	Standard wiring (double wiring)		10 stations	8 stations	12 stations	16 stations	10 stations	8 stations	12 stations	16 stations
	Single solenoid, Double solenoid layout specification (Single wiring)		20 stations	16 stations	24 stations	24 stations	20 stations	16 stations	24 stations	24 stations
Max. number of solenoids			20 points	16 points	24 points	32 points	20 points	16 points	24 points	32 points
Connection Port Size	Metric fitting	Port A/B	Push-in fitting ø1.8, ø4, ø6				Push-in fitting ø4, ø6, ø8, ø10			
		P/R Port	Push-in fitting ø6, ø8				Push-in fitting ø8, ø10			
	Inch fitting	Port A/B	Push-in fitting ø1/8", ø5/32"				Push-in fitting ø1/4", ø5/16"			
		P/R Port	Push-in fitting ø5/16"				Push-in fitting ø3/8"			

Performance/characteristics by model

Item			TVG1 at ON	TVG1 at OFF	TVG2 at ON	TVG2 at OFF
Response time ms	Two 3-port valves integrated		15	25	20	37
	2-position	Single	15	20	22	24
		Double	15	15	26	26
	3-position		20	30	25	35

The response times are values with supply pressure of 0.5 MPa at 20°C and without lubrication. They depend on the pressure and the lubricant quality.

Flow Characteristics

Model No.	Switching position class		P ➡ A/B C [dm³/(s·bar)]	P ➡ A/B b	P ➡ A/B Q[L/min(ANR)]	A/B ➡ R C [dm³/(s·bar)]		A/B ➡ R b		A/B ➡ R Q[L/min(ANR)]	
TVG1	Two 3-port valves integrated		0.77	0.37	205	1.1	(0.56)	0.34	(0.37)	287	(149)
	2-position		1.0	0.29	253	1.2	(0.59)	0.36	(0.41)	317	(162)
	3-position	Closed center	0.96	0.33	249	1.0	–	0.35	–	263	–
		Exhaust center	0.96	0.32	247	1.3	(0.60)	0.38	(0.40)	349	(163)
		Pressure center	1.1	0.35	289	1.0	–	0.36	–	265	–
TVG2	Two 3-port valves integrated		1.7	0.44	476	2.2	(1.8)	0.43	(0.20)	612	(431)
	2-position		2.4	0.32	618	2.8	(2.0)	0.34	(0.19)	731	(476)
	3-position	Closed center	2.2	0.35	578	2.5	–	0.38	–	670	–
		Exhaust center	2.2	0.32	567	2.9	(2.1)	0.40	(0.21)	789	(506)
		Pressure center	2.6	0.34	678	2.5	–	0.37	–	666	–

*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 × C.
*2: Values in ( ) are with the exhaust check valve.

Reduced wiring specifications

Item	EA1A	EA1B	FA1A	FA1B	GA1A	GA1B
Type	Common terminal block M3 thread		Multi-connector		D-sub Connector	
Connection Connector	-		HIROSE ELECTRIC CO. LTD. RM21WTP-20S 20-pin		D-sub-connector (female) 25-pin	
Output Format	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)

Serial Transmission Device Unit specifications (Refer to page 152 for the PLC compatibility table.)

Item		JA1C	JA1D	JA2C	JA2D	JA3C	JA3D	JA4C	JA4D	JA5C	JA5D	JA6C	JA6D
Communication protocol		DeviceNet		CC-Link Ver.1.10		EtherCAT		EtherNet/IP		CC-Link IEF Basic		PROFINET	
Power Supply Voltage	Unit side	11 to 25 VDC*		24 VDC ±10%									
	Valve side	24 VDC +10%, -5%											
Current Consumption	Unit side	50 mA or less (all points ON: 24 VDC)		90 mA or less (all points ON: 24 VDC)									
	Valve side	15 mA or less (excluding load current)											
Number of Output Points		32 points											
Occupied number		4bytes		1 station									
Operation Indicator		LED (power supply and communication status)											
Output Format		NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)

* Indicates the range of voltage communication power supply.

Item		JA7C	JA7D	JA8C	JA8D	JA9C	JA9D	JA9G	JA9H	JB1C	JB1D
Communication protocol		CC-Link IE Field		CC-Link IE TSN		IO-Link				IO-Link Wireless	
Power Supply Voltage	Unit side	24 VDC ±10%				18 to 30 VDC				24 VDC ±10%	
	Valve side	24VDC +10%, -5%									
Current Consumption	Unit side	100 mA or less (all points ON: 24 VDC)				50 mA or less (all points ON: 24 VDC)				35 mA or less (All points ON: 24 VDC)	
	Valve side	15 mA or less (excluding load current)									
Number of Output Points		32 points									
Occupied number		1 station									
Operation Indicator		LED (power supply and communication status)									
Output Format		NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)	NPN: (Plus common)	PNP: (Minus common)

model No. Notation Method

Manifold with solenoid valve

10 mm width (valve width)

Option

TVG1M - 1 B 06CS 3 JA4C - 6 U - HP1

Model No.

❷ Piping direction

❹ Voltage

❻ Station No.

❽ Base internal wiring system

❿ Electric circuit specifications

⓬ Ozone/ Coolant proof

⓮ With/Without spacer

⓰ Port A/B Filter

❶ Switching position class

❸ Connection Port Size

❺ Electrical connections

❼ Port P/R position

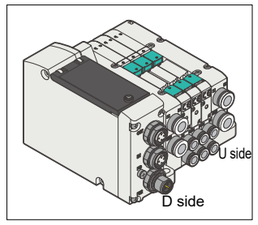
❾ Pilot operated

⓫ Manual Override

⓭ Residual pressure exhaust valve

⓯ Exhaust check valve

⓱ Mount type



❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
X	Mix manifold	
A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
B	Two valves integrated *1	A valve side: Normally open/B valve side: Normally Open
C		A valve side: Normally closed/B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions is the same as the 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code	
Push-in	ø1.8	0ACS	*4
	ø4	04CS	
	ø6	06CS	
Push-in L-type upward *2	ø1.8	0ACU	*4
	ø4	04CU	
	ø6	06CU	
Push-in L type downward	ø1.8	0ACD	*4
	ø4	04CD	
	ø6	06CD	
Push-in	Mix	99CX	*3

Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø1.8	Plug	0ACA	*4
	ø4		04CA	
	ø6		06CA	
	Plug	ø1.8	0ACF	*4
		ø4	04CF	
		ø6	06CF	
Push-in L-type upward *2	ø1.8	Plug	0ACB	*4
	ø4		04CB	
	ø6		06CB	
	Plug	ø1.8	0ACG	*4
		ø4	04CG	
		ø6	06CG	
Push-in L type downward	ø1.8	Plug	0ACC	*4
	ø4		04CC	
	ø6		06CC	
	Plug	ø1.8	0ACH	*4
		ø4	04CH	
		ø6	06CH	

• Inch fitting

Fitting	Port A/B	Code	
Push-in	ø1/8"	03LS	
	ø5/32"	04LS	
Push-in L-type upward *2	ø1/8"	C3LU	*5
	ø5/32"	04LU	*5
Push-in	Mix	99LX	*3

Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø1/8"	Plug	03LA	
	ø5/32"		04LA	
	Plug	ø1/8"	03LF	
		ø5/32"	04LF	
Push-in L-type upward *2	ø1/8"	Plug	03LB	*5
	ø5/32"		04LB	*5
	Plug	ø1/8"	03LG	*5
		ø5/32"	04LG	*5

❹ Voltage

Code	Content
3	24 VDC

❺ Electrical connections

• Reduced wiring connection

Content	Output Format	Code	
Common terminal block (M3 thread)	NPN	EA1A	
	PNP	EA1B	
Multi-connector	NPN	FA1A	
	PNP	FA1B	
D-sub Connector	NPN	GA1A	
	PNP	GA1B	

• Serial transmission

Communication protocol		Output Format	# of Output Points	Code	
DeviceNet		NPN	32 points	JA1C	
		PNP		JA1D	
CC-LINK		NPN		JA2C	
		PNP		JA2D	
EtherCAT		NPN		JA3C	
		PNP		JA3D	
EtherNet/IP		NPN		JA4C	
		PNP		JA4D	
CC-Link IEF Basic		NPN		JA5C	
		PNP		JA5D	
PROFINET		NPN		JA6C	
		PNP		JA6D	
CC-Link IE Field		NPN		JA7C	
		PNP		JA7D	
CC-Link IE TSN		NPN		JA8C	
		PNP		JA8D	
IO-Link	Class A	NPN		JA9C	
		PNP		JA9D	
	Class B	NPN		JA9G	
		PNP		JA9H	
IO-Link Wireless		NPN		JB1C	
		PNP		JB1D	

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: Port size mixtures of ports 4(A) and 2(B) are not available.
*4: The compatible ø for tube 1.8 push-in fitting is "UP-9402- * *".
*5: Custom Product.

How to order (manifold with solenoid valve)

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - P4

❻ Station No.

Code	Content	
02	2 stations	
L	L	*1, *2
24	24 stations	

*1: Differs depending on the reduced wiring specifications. Refer to the individual specifications (on page 7).
*2: ❼For mount "R" (DIN rail), the max. station No. is 16.

❼ Port P/R position

* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U side, D side	
T *1	U side, D side, With intermediate supply and exhaust block	

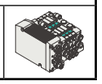
*1: Specify the specifications of the intermediate supply and exhaust block in the manifold specifications sheet.

❽ Base internal wiring system*1

Code	Content
Blank	(double wiring)
S	Single solenoid, Double solenoid layout specification

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated. Refer to page 157 for details.

❾ Pilot operated

Code	Content	
Blank	Internal pilot	
K	External pilot	

❿ Electrical circuit specification

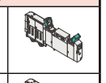
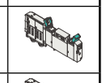
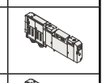
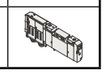
* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1:Combination of "E2" and PNP specifications is Custom Product.

⓫ Multiple manual override

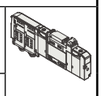
* cannot be selected.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, without cover	
M3	Non-locking, tool operation, without cover	

⓬ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (Main valve fluorine specification)

⓭ Residual pressure exhaust valve

Code	Content	
Blank	Without residual pressure exhaust valve	
Y1 *1, *2	With non-locking residual pressure exhaust valve	
Y2 *1, *2	With locking residual pressure exhaust valve	

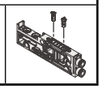
*1: ❶Solenoid position "3" and "4" only are supported.
*2: ⓫Only the manual override "M2" and "M3" are supported.

⓮ With/Without spacer

Code	Content
Blank	Without spacer
Z	With spacer (Type and location are specified in the MF specifications sheet)

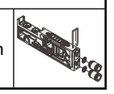
*1: Specify the spacer type and mounting position in the manifold specifications sheet. Stacking of spacers is not possible. Combination with the blanking plate is not supported. Cannot be selected together with L-type push-in fitting (upward).

⓯ Exhaust check valve

Code	Content	
Blank	None	
H *1	With exhaust check valve	

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve. Specify the number of stations to install in the manifold specifications sheet.

⓰ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

⓱ Mount type

Code	Content
Blank	Direct mount
R	DIN rail mount

model No. Notation Method

Manifold with solenoid valve

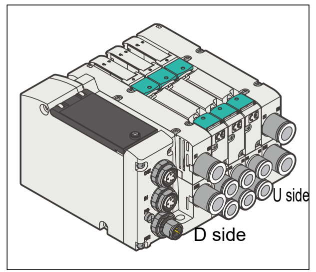
15 mm width (valve width)

Option

TVG2M - 2 B 06CS 3 JA4C - 05 B ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ -HP1

Model No. ❷ Piping direction ❹ Voltage ❻ Station No. ❽ Base internal wiring system ❿ Electric circuit specifications ⓬ Ozone/ Coolant proof ⓮ Valve mounting screw ⓰ Exhaust check valve ⓲ Mount type

❶ Switching position class ❸ Connection Port Size ❺ Electrical connections ❼ Port P/R position ❾ Pilot operated ⓫ Manual Override ⓭ Residual pressure exhaust valve ⓯ With/Without spacer ⓱ Port A/B filter



❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
X	Mix manifold	
A	3-port valve Two valves integrated *1	A valve side: Normally closed/B valve side: Normally Closed
B		A valve side: Normally open/B valve side: Normally Open
C		A valve side: Normally closed/B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions is the same as the 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• Metric fitting

Fitting	Port A/B		Code	
Push-in	ø4		04CS	
	ø6		06CS	
	ø8		08CS	
	ø10		10CS	
Push-in L-type upward *2	ø6		06CU	
	ø8		08CU	
Push-in L type downward	ø6		06CD	
	ø8		08CD	
Push-in	Mix		99CX	*3
Fitting	Single side plug specifications *1 Port A	Port B	Code	
Push-in	ø4	Plug	04CA	
	ø6		06CA	
	ø8		08CA	
	ø10		10CA	
	Plug	ø4	04CF	
		ø6	06CF	
		ø8	08CF	
		ø10	10CF	
Push-in L-type upward *2	ø6	Plug	06CB	
	ø8		08CB	
	Plug	ø6	06CG	
		ø8	08CG	
Push-in L type downward	ø6	Plug	06CC	
	ø8		08CC	
	Plug	ø6	06CH	
		ø8	08CH	

• Inch fitting

Fitting	Port A/B		Code	
Push-in	ø1/4"		06LS	
	ø5/16"		08LS	
Push-in L-type upward *2	ø1/4"		06LU	*4
	ø5/16"		08LU	*4
Push-in	Mix *3		99LX	*3
Fitting	Single side plug specifications *1 Port A	Port B	Code	
Push-in	ø1/4"	Plug	06LA	
	ø5/16"		08LA	
	Plug	ø1/4"	06LF	
		ø5/16"	08LF	
Push-in L-type upward *2	ø1/4"	Plug	06LB	*4
	ø5/16"		08LB	*4
	Plug	ø1/4"	06LG	*4
		ø5/16"	08LG	*4

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: Port size mixtures of ports 4(A) and 2(B) are not available.
*4: Custom Product.

❹ Voltage

Code	Content
3	24 VDC

❺ Electrical connections

• Reduced wiring connection

Content	Output Format	Code
Common terminal block (M3 thread)	NPN	EA1A
	PNP	EA1B
Multi-connector	NPN	FA1A
	PNP	FA1B
D-sub Connector	NPN	GA1A
	PNP	GA1B

• Serial transmission

Communication protocol		Output Format	Number of Output Points	Code
DeviceNet		NPN	32 points	JA1C
		PNP		JA1D
CC-LINK		NPN		JA2C
		PNP		JA2D
EtherCAT		NPN		JA3C
		PNP		JA3D
EtherNet/IP		NPN		JA4C
		PNP		JA4D
CC-Link IEF Basic		NPN		JA5C
		PNP		JA5D
PROFINET		NPN		JA6C
		PNP		JA6D
CC-Link IE Field		NPN		JA7C
		PNP		JA7D
CC-Link IE TSN		NPN		JA8C
		PNP		JA8D
IO-Link	Class A	NPN		JA9C
		PNP		JA9D
	Class B	NPN		JA9G
		PNP		JA9H
IO-Link Wireless		NPN		JB1C
		PNP		JB1D

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✻✻ - ✻✻ - ✻✻ - P4

❻ Station No.

Code	Content	
02	2 stations	
to	to	
24	24 stations	*1, *2

*1: Differs depending on the reduced wiring specifications. Refer to the individual specifications (on page 7).
*2: ⓲For mount "R" (DIN rail), the max. station No. is 16.

❼ Port P/R position

* Multiple selection is not possible.

Code	Content
U	U side
D	D side
B	U side, D side
T *1	U side, D side, With intermediate supply and exhaust block

*1: Specify the specifications of the intermediate supply and exhaust block in the manifold specifications sheet.

❽ Base internal wiring system*1

Code	Content
Blank	(double wiring)
S	Single solenoid, Double solenoid layout specification

*1:Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.

❾ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

❿ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1:Combination of "E2" and PNP specifications is Custom Product.

⓫ Manual device

* Multiple selections are not possible.

Code	Content
Blank	With locking, non-locking common, misoperation prevention cover
M1	Non-locking, with misoperation prevention cover
M2	Locking/non-locking common, tool operation, without cover
M3	Non-locking, tool operation, without cover

⓬ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

⓭ Residual pressure exhaust valve

Code	Content
Blank	Without residual pressure exhaust valve
Y1 *1, *2	With non-locking residual pressure exhaust valve
Y2 *1, *2	With locking residual pressure exhaust valve

*1: ❶Solenoid position "3" and "4" only are supported.
*2: Only the ⓫manual override "M2" and "M3" are supported.

⓮ Valve mounting screw

Code	Content
Blank	Pan head machine screw with Phillips head/flathead
J	Hexagon Socket Head Cap Screw

*1: ⓯With/without spacer "Z" cannot be selected with "J".

⓯ With/Without spacer

Code	Content
Blank	Without spacer
Z	With spacer (Type and location are specified in the MF specifications sheet)

*1: Specify the spacer type and mounting position in the manifold specifications sheet. Stacking of spacers is not possible. Combination with the blanking plate is not supported. Cannot be selected together with L-type push-in fitting (upward).

⓰ Exhaust check valve

Code	Content
Blank	None
H	With exhaust check valve

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve.
*2: Specify the number of stations to install in the manifold specifications sheet.

⓱ Port A/B filter

Code	Content
Blank	None
F	Port A/B filter built in

*1: A filter is built into port P.

⓲ Mount type

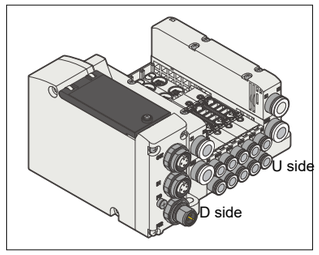
Code	Content
Blank	Direct mount
R	DIN rail mount

model No. Notation Method

Manifold base only * Solenoid valve is not included.

10 mm Width (Valve width)	Model No.	❷ Connection Port Size	❹ Electrical connections	❻ Port P/R position	❽ Pilot operated	❿ Port A/B filter	
TVG1B -	B	06CS	3	JA4C -	06	U	X
	❶ Piping direction		❸ Voltage	❺ Station No.	❼ Exhaust method	❾ Electric circuit specifications	⓫ Mount type

Option



❷ Port size (port A/B)

• Metric fitting

Fitting		Port A/B	Code	
Push-in		ø1.8	0ACS	*2
		ø4	04CS	
		ø6	06CS	
Push-in L-type upward	*1	ø1.8	0ACU	*2
		ø4	04CU	
		ø6	06CU	
Push-in L type downward		ø1.8	0ACD	*2
		ø4	04CD	
		ø6	06CD	

• Inch fitting

Fitting		Port A/B	Code	
Push-in		ø1/8"	03LS	
		ø5/32"	04LS	
Push-in L-type upward	*1	ø1/8"	C3LU	*3
		ø5/32"	04LU	*3

*1: 3-position is not available for L-type upward push-in fittings.
*2: The compatible tubing for ø1.8 One-touch Fitting is "UP-9402-**".
*3: Custom Product.

❶ Piping direction

Code	Content
B	Side piping

❸ Voltage

Code	Content
3	24 VDC

❹ Electrical connections

• Reduced wiring connection

Content	Output Format	Code	
Common terminal block (M3 thread)	NPN	EA1A	
	PNP	EA1B	
Multi-connector	NPN	FA1A	
	PNP	FA1B	
D-sub Connector	NPN	GA1A	
	PNP	GA1B	

• Serial transmission

Communication protocol		Output Format	Number of points	Code	
DeviceNet		NPN	32 points Output	JA1C	
		PNP		JA1D	
CC-LINK		NPN		JA2C	
		PNP		JA2D	
EtherCAT		NPN		JA3C	
		PNP		JA3D	
EtherNet/IP		NPN		JA4C	
		PNP		JA4D	
CC-Link IEF Basic		NPN		JA5C	
		PNP		JA5D	
PROFINET		NPN		JA6C	
		PNP		JA6D	
CC-Link IE Field		NPN		JA7C	
		PNP		JA7D	
CC-Link IE TSN		NPN		JA8C	
		PNP		JA8D	
IO-Link	ClassA	NPN		JA9C	
		PNP		JA9D	
	ClassB	NPN		JA9G	
		PNP		JA9H	
IO-Link Wireless		NPN		JB1C	
		PNP		JB1D	

How to order (manifold base only)

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - **P4**

• If an exhaust check valve is necessary, refer to page 54.

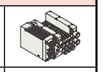
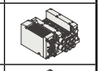
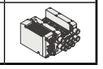
❺ Station No.

Code	Content	
02	2 stations	
to	to	
16	16 stations	*2

*1: The wiring inside the base is all for double solenoid regardless of the type of valve used. The blank number for one solenoid is generated in the section where a single solenoid is mounted.
*2: Differs depending on the reduced wiring specifications. Refer to the individual specifications (on page 7).

❻ Port P/R position

(TVG1B: ø 8)
* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U, D both sides	

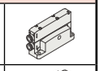
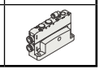
*1: The port P/R tube has the same direction as the port A/B tube.
*2: A filter is built into port P.

❼ Exhaust method

Code	Content		
Blank	Centralized Exhaust (port R is a push-in fitting)		
X	Silencer integrated (port R is a plug, exhaust is released to atmosphere)		*1

*1: ❻A silencer is integrated at the position selected with port P/R position.

❽ Pilot operated

Code	Content	
Blank	Internal pilot	
K	External pilot	

❾ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❿ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

⓫ Mount type

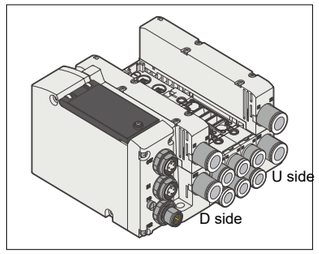
Code	Content	
Blank	Direct mount	
R	DIN rail mount	*1

*1: A DIN rail with standard length is attached. For how to calculate the standard length, refer to page 118.

model No. Notation Method

Manifold base only * Solenoid valve is not included.

15 mm Width (Valve width)							Option				
TVG2B -	B	08CS	3	JA4C -	05	B					
Model No.	❶ Piping direction	❷ Connection Port Size	❸ Voltage	❹ Electrical connections	❺ Station No.	❻ Port P/R position	❼ Exhaust method	❽ Pilot operated	❾ Electric circuit specifications	❿ Port A/B filter	⓫ Mount type



❷ Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code	
Push-in	ø4	04CS	
	ø6	06CS	
	ø8	08CS	
	ø10	10CS	
Push-in L-type upward *1	ø6	06CU	
	ø8	08CU	
Push-in L type downward	ø6	06CD	
	ø8	08CD	

• Inch fitting

Fitting	Port A/B	Code	
Push-in	ø1/4"	06LS	
	ø5/16"	08LS	
Push-in L-type upward *1	ø1/4"	06LU	*2
	ø5/16"	08LU	*2

*1: 3-position is not available for L-type upward push-in fittings.
*2: Custom Product.

❶ Piping direction

Code	Content
B	Side piping

❸ Voltage

Code	Content
3	24 VDC

❹ Electrical connections

• Reduced wiring connection

Content	Output Format	Code	
Common terminal block (M3 thread)	NPN	EA1A	
	PNP	EA1B	
Multi-connector	NPN	FA1A	
	PNP	FA1B	
D-sub Connector	NPN	GA1A	
	PNP	GA1B	

• Serial transmission

Communication protocol		Output Format	Number of points	Code	
DeviceNet		NPN	32 point output	JA1C	
		PNP		JA1D	
CC-LINK		NPN		JA2C	
		PNP		JA2D	
EtherCAT		NPN		JA3C	
		PNP		JA3D	
EtherNet/IP		NPN		JA4C	
		PNP		JA4D	
CC-Link IEF Basic		NPN		JA5C	
		PNP		JA5D	
PROFINET		NPN		JA6C	
		PNP		JA6D	
CC-Link IE Field		NPN		JA7C	
		PNP		JA7D	
CC-Link IE TSN		NPN		JA8C	
		PNP		JA8D	
IO-Link	ClassA	NPN		JA9C	
		PNP		JA9D	
	ClassB	NPN		JA9G	
		PNP		JA9H	
IO-Link Wireless		NPN		JB1C	
		PNP		JB1D	

How to order (manifold base only)

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - **P4**

• If an exhaust check valve is necessary, refer to page 54.

❺ Station No.

Code	Content	
02	2 stations	
to	to	
*2 16	16 stations	

*1: The wiring inside the base is all for double solenoid regardless of the type of valve used. The blank number for one solenoid is generated in the section where a single solenoid is mounted.
*2: Differs depending on the reduced wiring specifications. Refer to the individual specifications (on page 7).

❻ Port P/R position

(TVG2B: ø 10)
* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U, D both sides	

*1: The Port P/R tube has the same direction as the Port A/B tube.
*2: A filter is built into port P.

❼ Exhaust method

Code	Content	
Blank	Centralized Exhaust (port R is a push-in fitting)	
*1 X	Silencer integrated (port R is a plug, exhaust is released to atmosphere)	

*1: ❻The silencer is built into the unit at the location selected with port P/R position.

❽ Pilot operated

Code	Content	
Blank	Internal pilot	
K	External pilot	

❾ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❿ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

⓫ Mount type

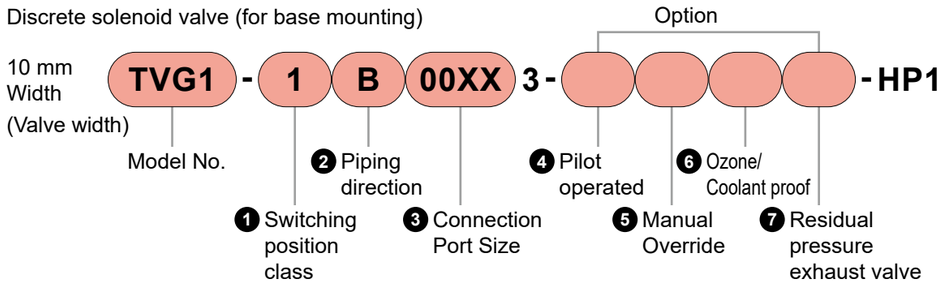
Code	Content
Blank	Direct mount
*1 R	DIN rail mount

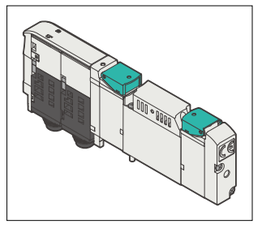
*1: A DIN rail with standard length is attached. For how to calculate the standard length, refer to page 118.

TVG1 Series

model No. Notation Method

Discrete solenoid valve (for base mounting)





Attached Parts
- The valve mounting screws are included.
- The gasket is attached to the manifold base.

❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve Two valves integrated	A valve side: Normally Closed B valve side: Normally Closed
*1 B		A valve side: Normally Open B valve side: Normally Open
*1 C		A valve side: Normally Closed B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Connection Port Size

Code	Content
00XX	Discrete solenoid valve for base

❹ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

❺ Manual device * Multiple selections are not possible.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, Without cover	
M3	Non-locking, tool operation, without cover	

❻ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

❼ Residual pressure exhaust valve

Code	Content	
Blank	Without residual pressure exhaust valve	
*1, *2 Y1	With non-locking residual pressure exhaust valve	
*1, *2 Y2	With locking residual pressure exhaust valve	

*1: ❶Solenoid position "3" and "4" only are supported.
*2: ❺Only the manual override "M2" and "M3" are supported.

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

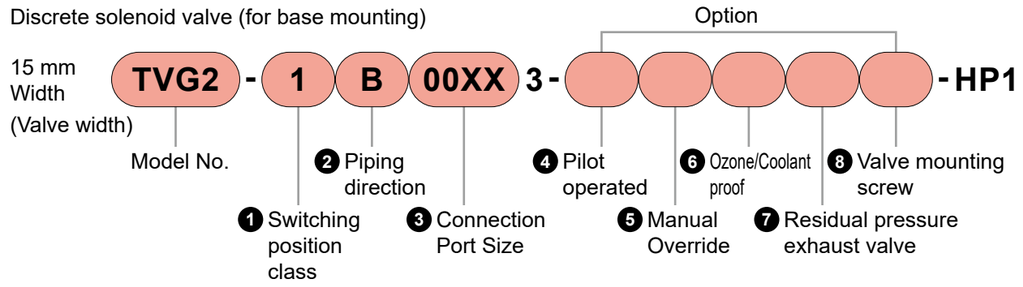
✱✱ - ✱✱ - ✱✱ - P4

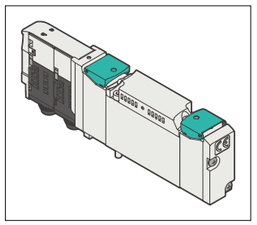
TVG2 Series

How to order (solenoid valve single unit)

model No. Notation Method

Discrete solenoid valve (for base mounting)





Attached Parts
- The valve mounting screws are included.
- The gasket is attached to the manifold base.

❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve Two valves integrated	A valve side: Normally Closed B valve side: Normally Closed
*1 B		A valve side: Normally Open B valve side: Normally Open
*1 C		A valve side: Normally Closed B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

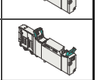
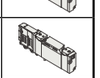
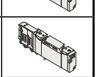
❸ Connection Port Size

Code	Content
00XX	Discrete solenoid valve for base

❹ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

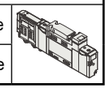
❺ Manual device * Multiple selections are not possible.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, without cover	
M3	Non-locking, tool operation, without cover	

❻ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

❼ Residual pressure exhaust valve

Code	Content	
Blank	Without residual pressure exhaust valve	
*1, *2 Y1	With non-locking residual pressure exhaust valve	
*1, *2 Y2	With locking residual pressure exhaust valve	

*1: ❶Solenoid position "3" and "4" only are supported.
*2: ❺Only the manual override "M2" and "M3" are supported.

❽ Valve mounting screw

Code	Content
Blank	Pan head machine screw with Phillips head/flathead
J	Hexagon Socket Head Cap Screw

Attached Parts

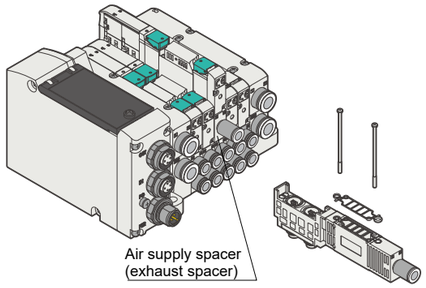
Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - P4

• If an exhaust check valve is necessary, refer to page 54.

Air supply spacer/exhaust spacer



Specifications

● Air supply spacer

Model No.	Weight g
TVG1P-P-□	31

● Exhaust spacer

Model No.	Weight g
TVG1P-R-□	31

Discrete model No.

● Air supply spacer

TVG1P – P – 04CS

❶ Connection Port Size

❶ Connection Port Size

Code	Bore size	Content
04CS	ø4	ø4 Push-in fitting
06CS	ø6	ø6 Push-in fitting

● Exhaust spacer

TVG1P – R – 04CS

❶ Connection Port Size

❶ Connection Port Size

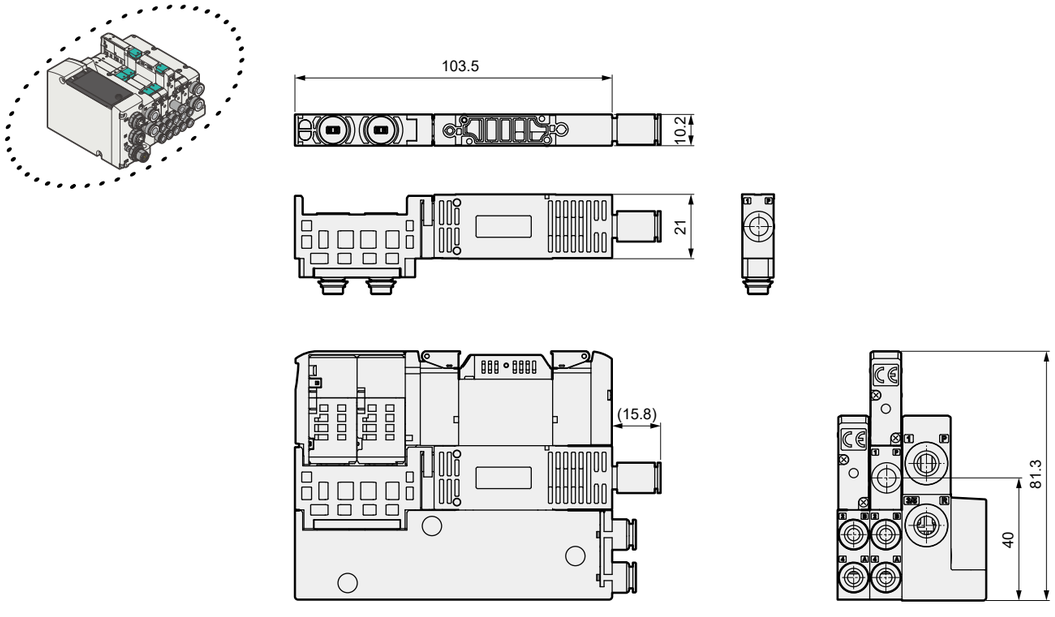
Code	Bore size	Content
04CS	ø4	ø4 Push-in fitting
06CS	ø6	ø6 Push-in fitting

Notes for model No. Selection

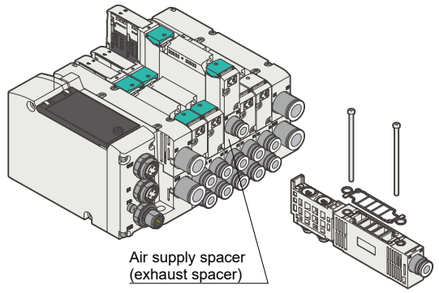
*1: Specify the positions and quantity of spacers for manifold in the manifold specifications sheet (**Refer to pages 119 to 126 Please provide instructions.**
*2: Stacking of spacers is not possible.
*3: A spacer cannot be combined with a blanking plate.
*4: A spacer mounting screw and gasket are included.
*5: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.

External Dimension Drawings

● Air supply spacer/exhaust spacer



Air supply spacer/exhaust spacer



Specifications

● Air supply spacer

Model No.	Weight g
TVG2P-P-□	56

● Exhaust spacer

Model No.	Weight g
TVG2P-R-□	56

Discrete model No.

● Air supply spacer

TVG2P – P – 06CS

❶ Connection Port Size

❶ Connection Port Size

Code	Bore size	Content
06CS	ø6	ø6 Push-in fitting
08CS	ø8	ø8 Push-in fitting
10CS	ø10	ø10 Push-in fitting

● Exhaust spacer

TVG2P – R – 06CS

❶ Connection Port Size

❶ Connection Port Size

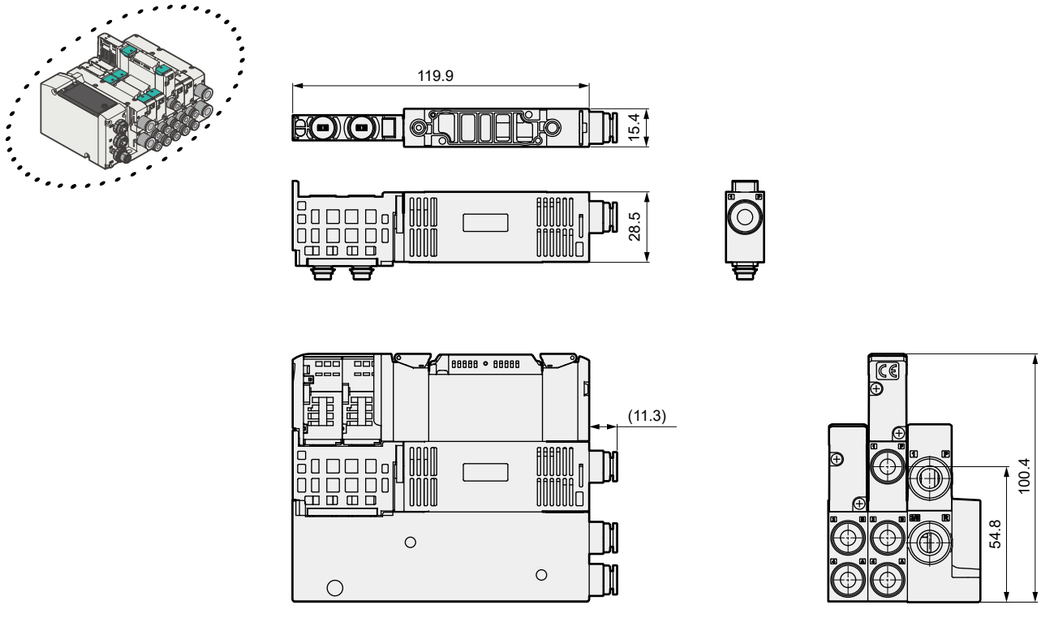
Code	Bore size	Content
06CS	ø6	ø6 Push-in fitting
08CS	ø8	ø8 Push-in fitting
10CS	ø10	ø10 Push-in fitting

Notes for model No. Selection

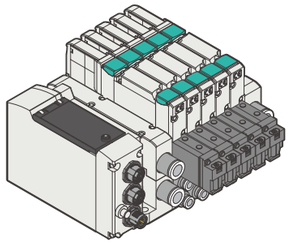
*1: Specify the positions and quantity of spacers for manifold in the manifold specifications sheet (**Refer to pages 119 to 126.**
*2: Stacking of spacers is not possible.
*3: A spacer cannot be combined with a blanking plate.
*4: A spacer mounting screw and gasket are included.
*5: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.

External Dimension Drawings

● Air supply spacer/exhaust spacer



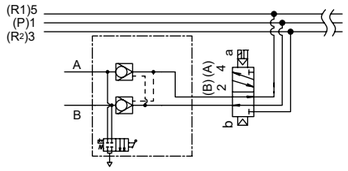
Spacer Pilot Check Valve (spacer pilot check valve)



Specifications

Item		TVG1P-PC-□	TVG2P-PC-□
Operating Fluid		Compressed Air	
Maximum Operating Pressure	MPa	0.7	
Min. working pressure	MPa	0.2	
Proof Pressure	MPa	1.05	
Ambient Temperature	°C	−5 to 55 (no freezing)	
Working fluid temperature	°C	5 to 55	
Atmosphere		Cannot be used in corrosive gas environment.	
Weight	g	34	73

Circuit Diagram Symbol



*: Please note that if you use cylinders with a large bore (guideline ø50 or more) in a state with almost no throttling on the exhaust side (e.g., without a speed controller or silencer), this may lead to a decrease in intermediate stop accuracy and intermediate stop failure.

Discrete model No.

TVG1 P − PC − M

❶ Model No. Spacer Pilot Check Valve

❷ Residual pressure exhaust function

❶ Model No.

Code	Content
TVG1	10 mm width (valve width)
TVG2	15 mm width (valve width)

❷ Residual pressure exhaust function

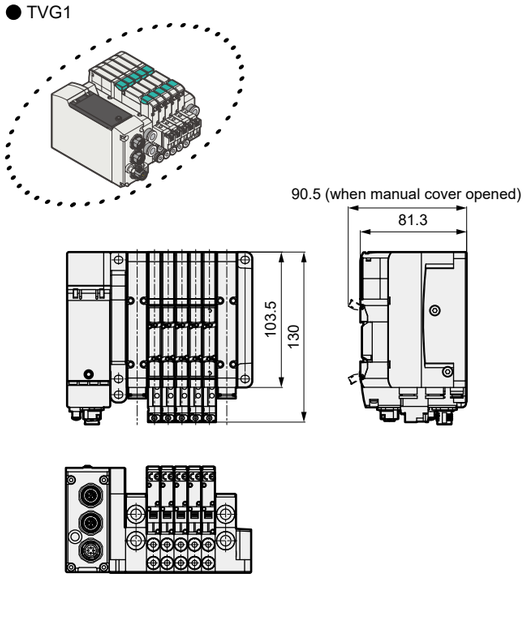
Code	Content
M	Manual override of non-locking
M1	Locking manual device
Blank	Without residual pressure exhaust function

Notes for model No. Selection

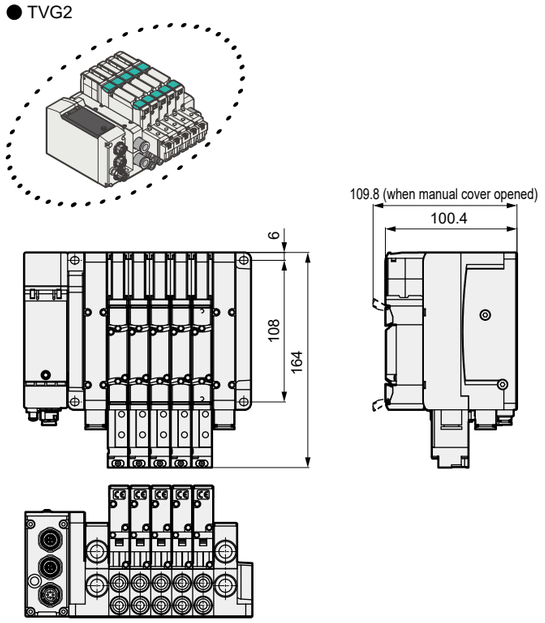
*1: Specify the spacer mounting position and residual pressure exhaust function selection in manifold specifications sheet.
*2: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.
*3: Stacking of spacers is not possible.
*4: A spacer cannot be combined with a blanking plate.
*5: A spacer mounting screw and gasket are included.

External Dimension Drawings

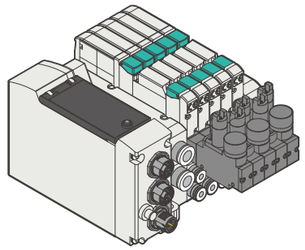
● TVG1



● TVG2



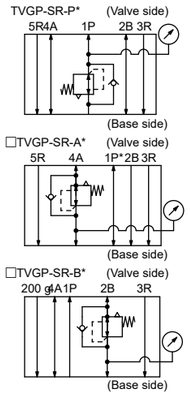
Spacer regulator



Specifications

Item		TVG1P-SR-□	TVG2P-SR-□
Pressure reduction port		P / A / B	
Operating Fluid		Compressed Air	
Maximum Operating Pressure	MPa	0.7	
Min. working pressure	MPa	0.1	
Proof Pressure	MPa	1.05	
Ambient Temperature	°C	−5 to 55 (no freezing)	
Working fluid temperature	°C	5 to 55	
Atmosphere		Cannot be used in corrosive gas environment.	
Weight	g	48	110

Circuit Diagram Symbol



Discrete model No.

TVG1 P − SR − P − G0

❶ Model No. Spacer regulator

❷ Pressure reduction specification

❸ Pressure Gauge

❷ Pressure reduction specification

Code	Content
P	P port pressure reduction
A	A port pressure reduction
B	B port pressure reduction

❸ Pressure Gauge

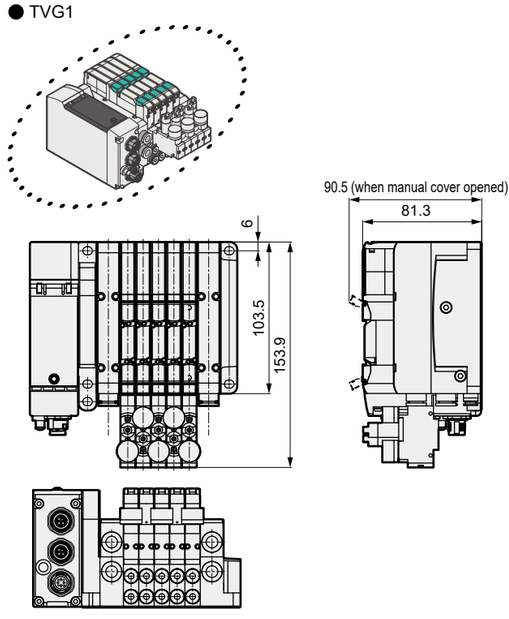
Code	Content	❶ Model No. TVG1	❶ Model No. TVG2
G0	Without Pressure Gauge	●	●
G1	With pressure gauge for odd numbers	●	
G2	With pressure gauge for even stations	●	
G3	Odd/even stations with common pressure gauge		●

Notes for model No. Selection

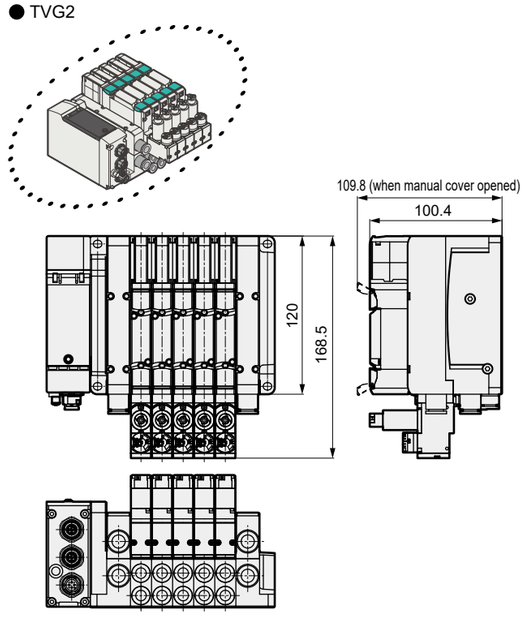
*1: Specify the spacer positions in the manifold specifications sheet.
*2: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.
*3: Stacking of spacers is not possible.
*4: A spacer cannot be combined with a blanking plate.
*5: A spacer mounting screw and gasket are included.

External Dimension Drawings

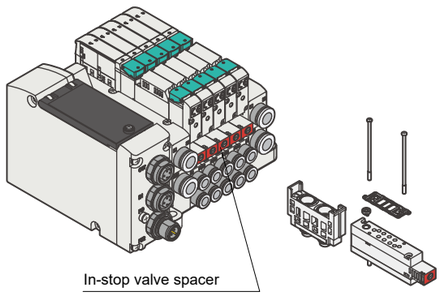
● TVG1



● TVG2



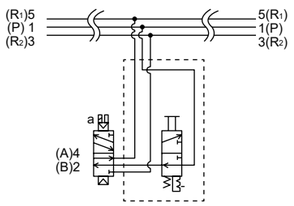
In-stop valve spacer



Specifications

Item		TVG1P-IS	TVG2P-IS
Operating Fluid		Compressed Air	
Maximum Operating Pressure	MPa	0.7	
Min. working pressure	MPa	0.1	
Proof Pressure	MPa	1.05	
Ambient Temperature	°C	−5 to 55 (no freezing)	
Working fluid temperature	°C	5 to 55	
Atmosphere		Cannot be used in corrosive gas environment.	
Weight	g	35	71

Circuit Diagram Symbol



Discrete model No.

TVG1 P − IS

❶ Model No. In-stop valve spacer

❶ Model No.

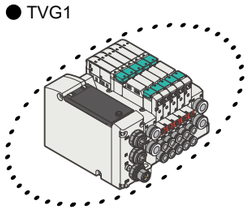
Code	Content
TVG1	10 mm width (valve width)
TVG2	15 mm width (valve width)

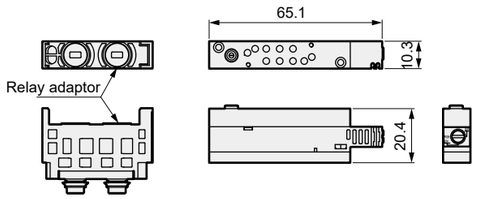
⚠ Notes for model No. Selection

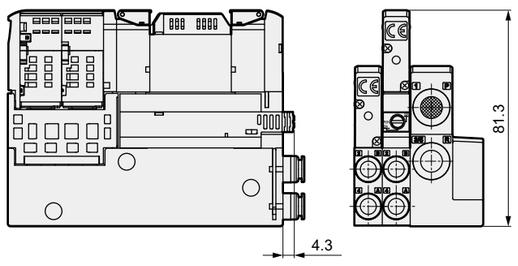
*1: Specify the spacer positions in the manifold specifications sheet.
*2: If the A/B port fitting is elbow type facing upward, a spacer cannot be selected.
*3: Stacking of spacers is not possible.
*4: A spacer cannot be combined with a blanking plate.
*5: Not compatible in combination with external pilot (K).

External Dimension Drawings

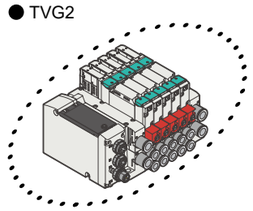
● TVG1

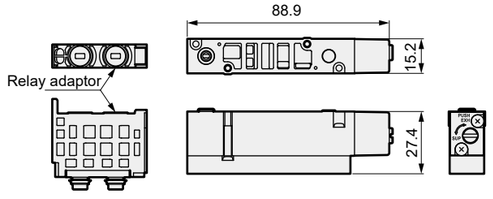


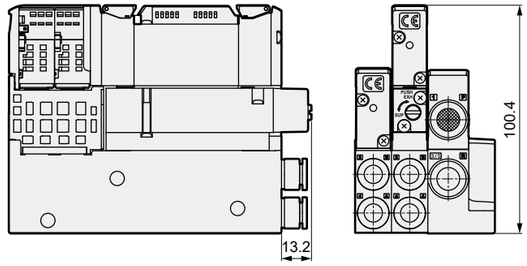




● TVG2



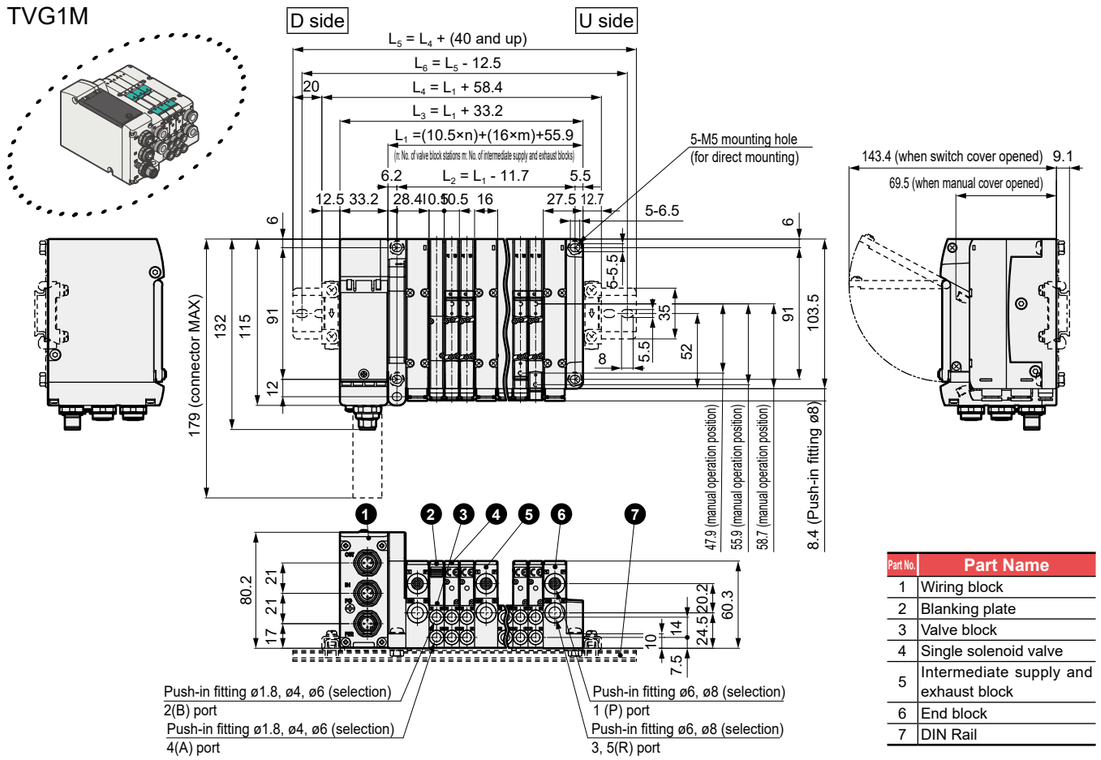




MEMO

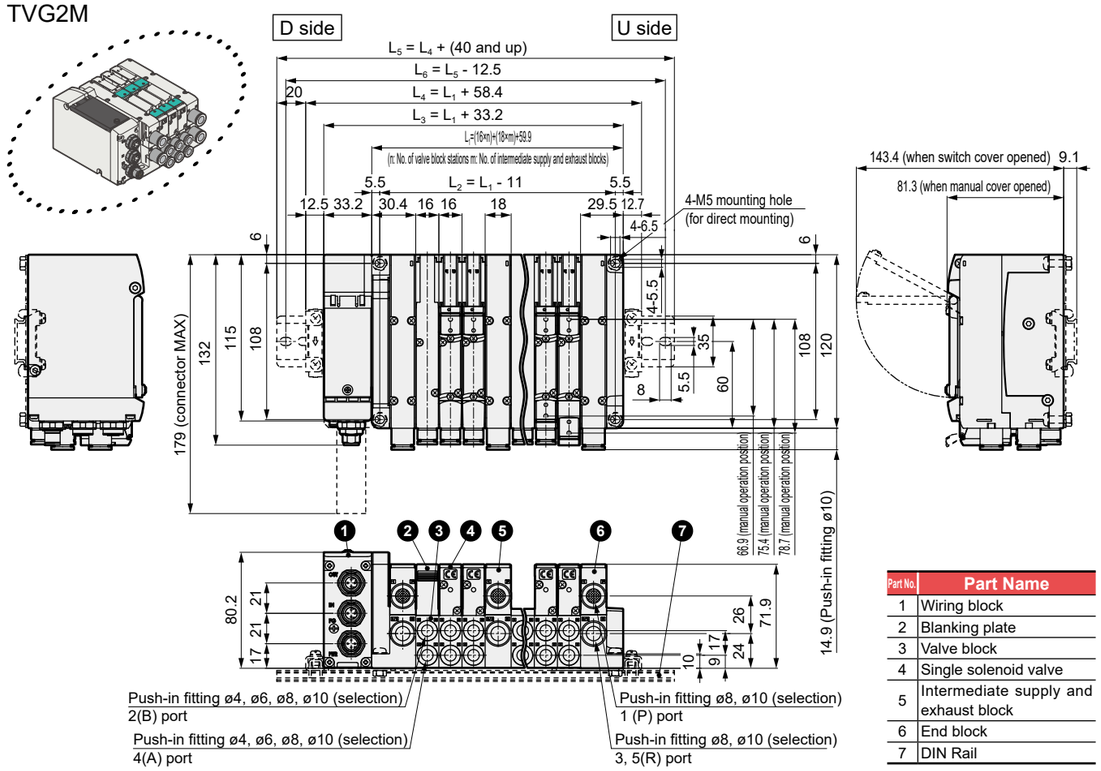
Dimensions diagram (Serial Transmission Device Unit JA□ JB□)

TVG1M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

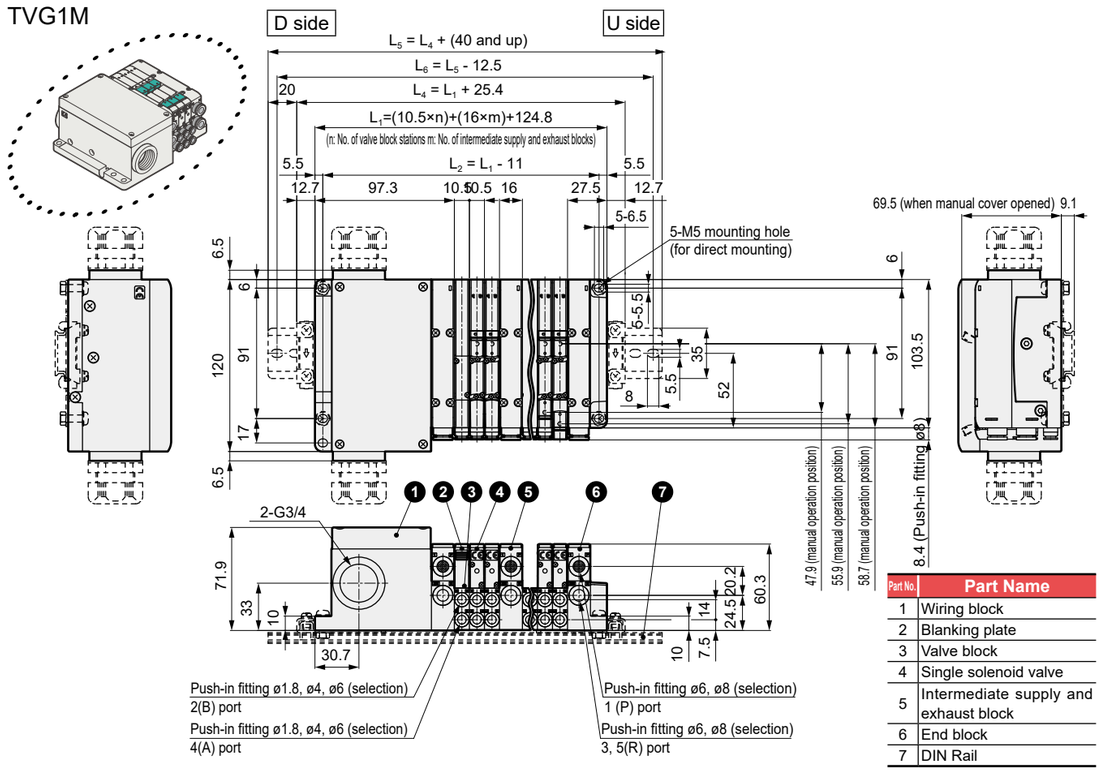
TVG2M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

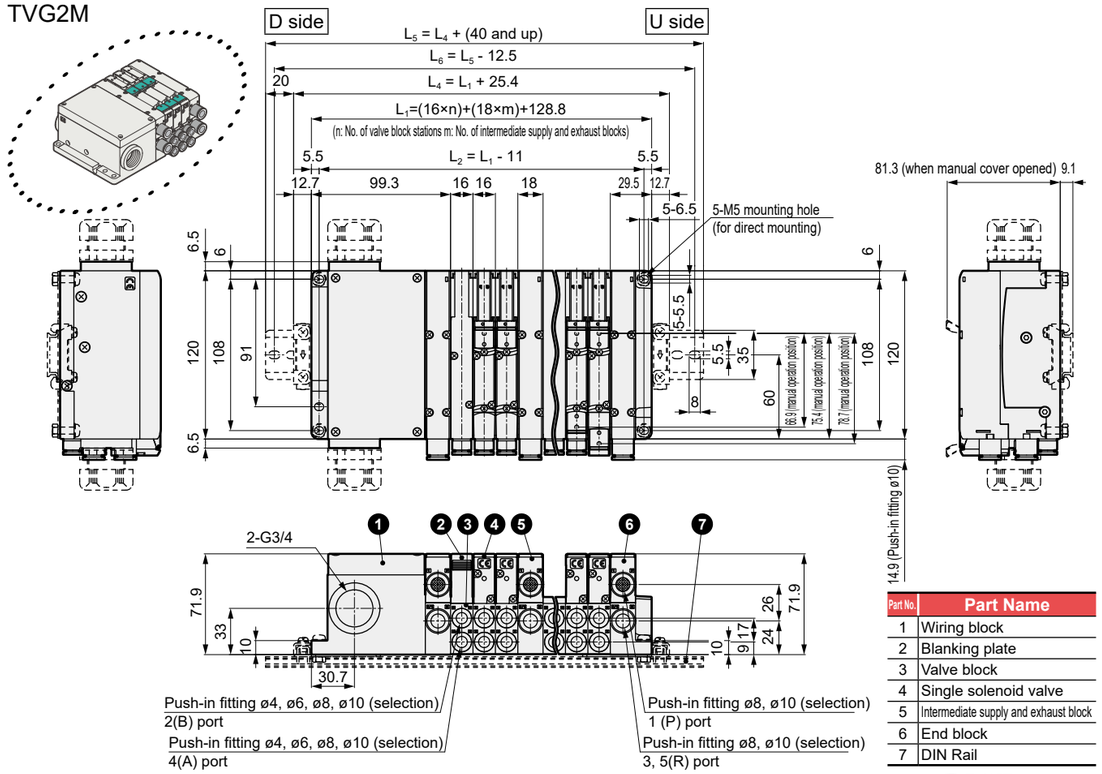
Dimensions diagram (common terminal block EA1□)

TVG1M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

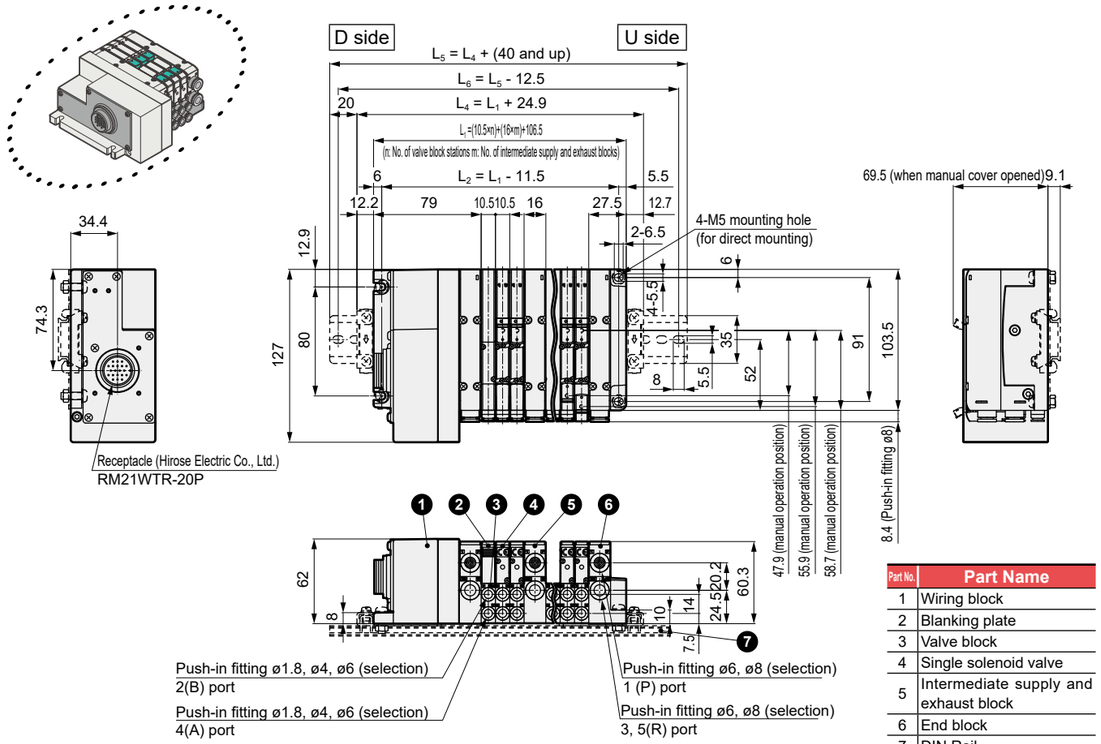
TVG2M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

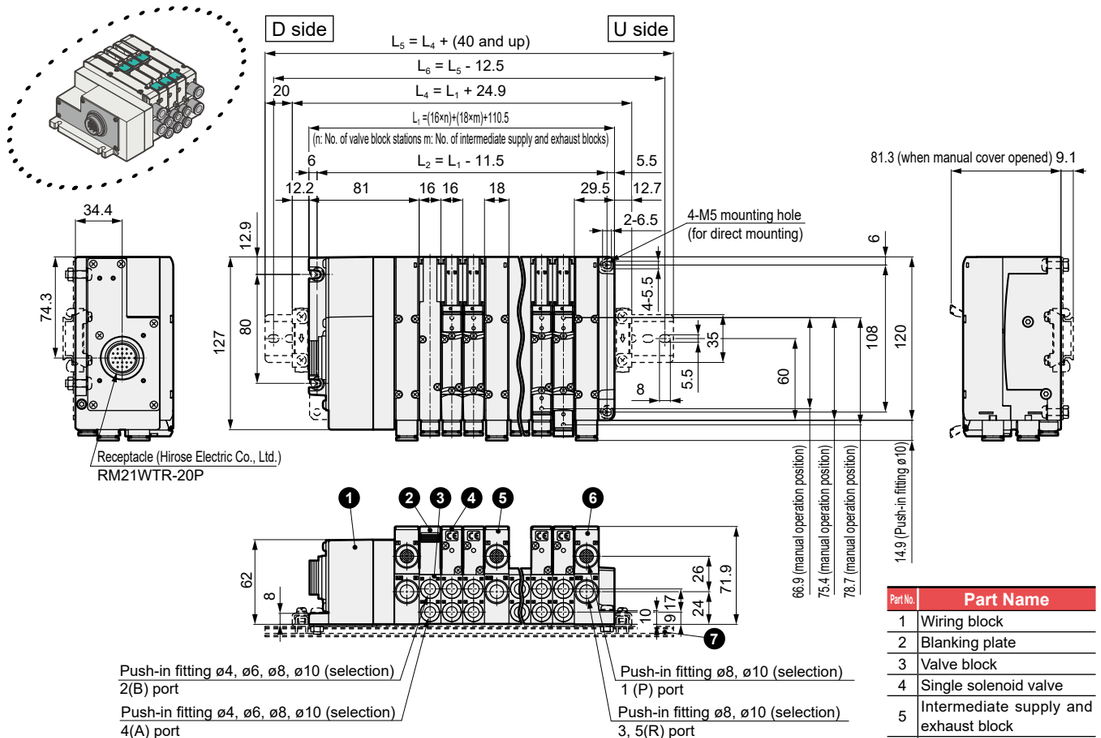
Dimensions diagram (multi-connector FA1□)

TVG1M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

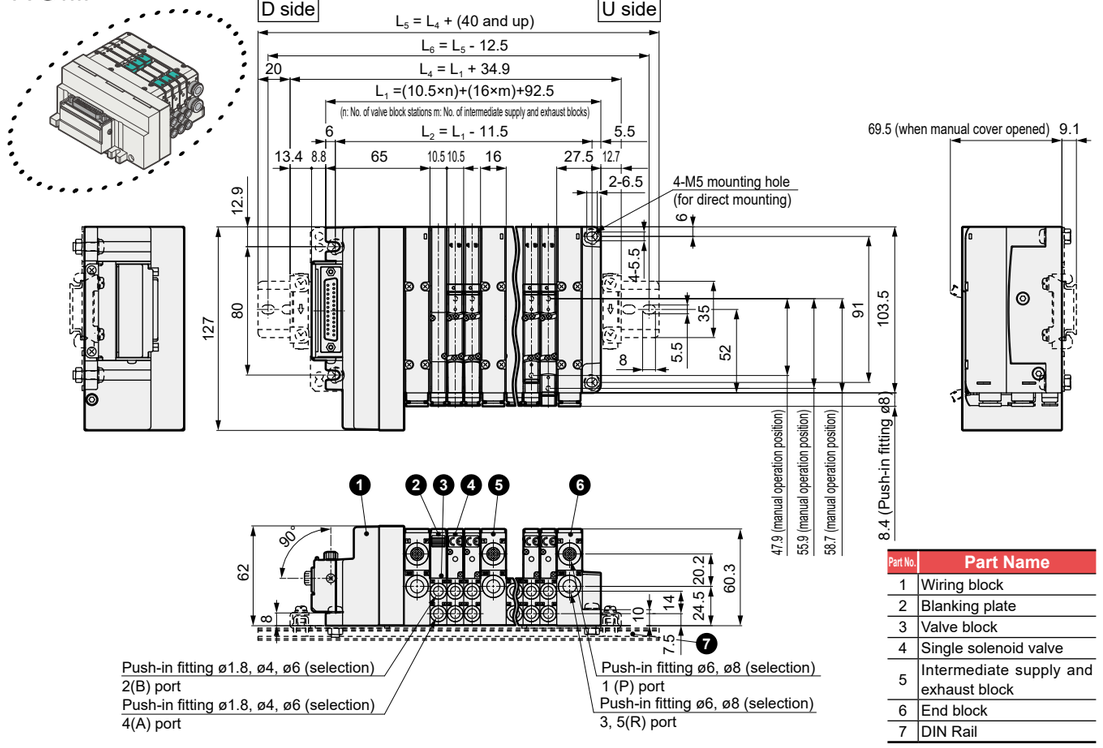
TVG2M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

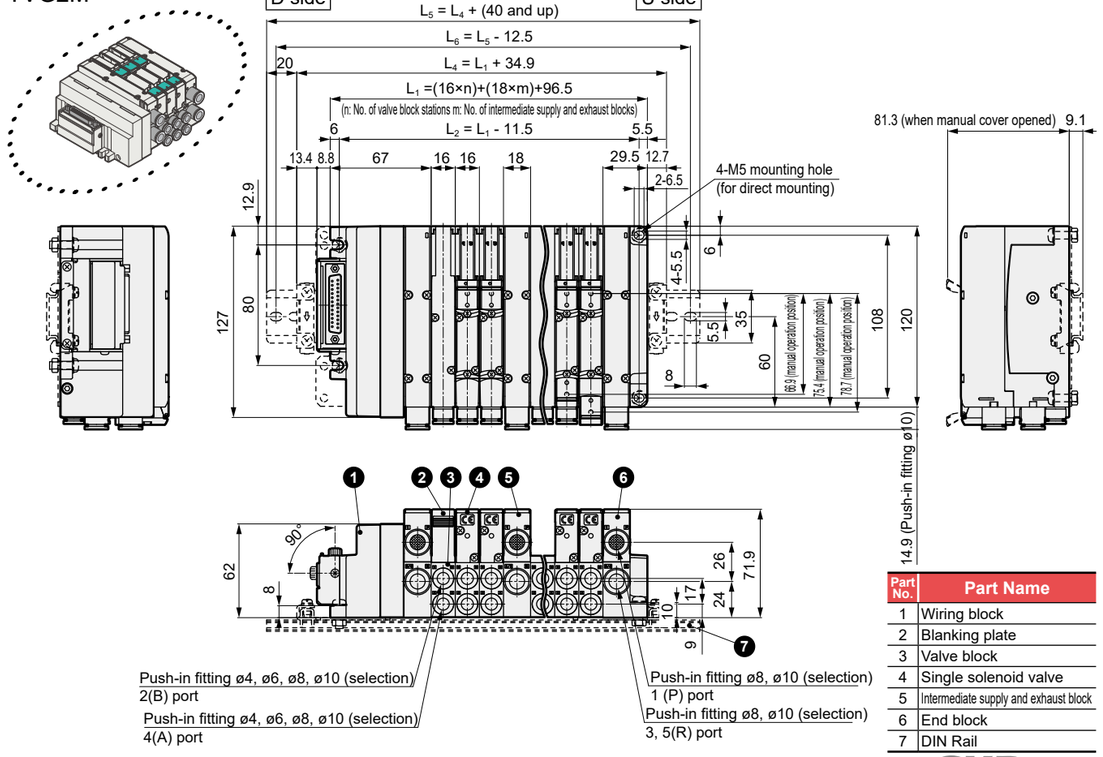
Dimensions diagram (D-sub-connector GA1□)

TVG1M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

TVG2M



Part No.	Part Name
1	Wiring block
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block
7	DIN Rail

External Dimension Drawings

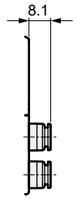
TVG1M

●Fitting straight

●ø1.8 (0ACS)

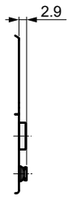
●ø4 (04CS)

●ø6 (06CS)

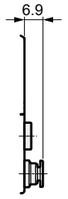


●Fitting straight, single plug

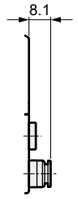
●ø1.8 (0ACA)



●ø4 (04CA)

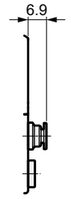


●ø6 06CA

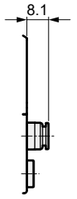


●ø1.8 (0ACF)

●ø4 (04CF)

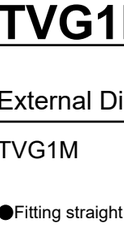


●ø6 (06CF)

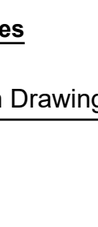


●L fitting (upward)

●ø1.8 (0ACU)



●ø4 (04CU)



●ø6 (06 CU)

●L fitting (downward)

●ø1.8 (0ACD)

●ø4 (04CD)

●ø6 06CD

●L fitting (upward), single plug

●ø1.8 (0ACB)

●ø4 (04CB)

●ø6 (06CB)

●ø1.8 (0ACG)

●ø4 (04CG)

●ø6 (06CG)

●L fitting (downward), single plug

●ø1.8 (0ACC)

●ø4 (04CC)

●ø6 (06CC)

●ø1.8 (0ACH)

●ø4 (04CH)

●ø6 (06CH)

External Dimension Drawings

TVG1M

●Fitting straight

●ø1/8" (03LS)

●ø5/32" (04LS)

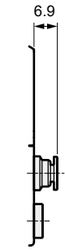
●Fitting straight, single plug

●ø1/8" (03LA)

●ø5/32" (04LA)

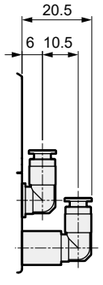
●ø1/8" (03LF)

●ø5/32" (04LF)

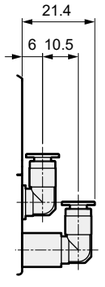


●L fitting (upward)

●ø1/8" (03LU)

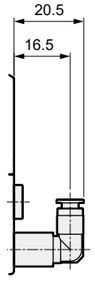


●ø5/32" (04LU)

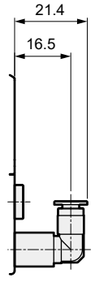


●L fitting (upward), single plug

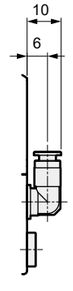
●ø1/8" (03LB)



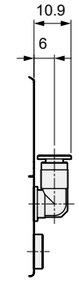
●ø5/32" (04LB)



●ø1/8" (03LG)



●ø5/32" (04LG)

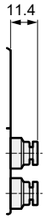


External Dimension Drawings

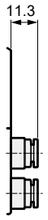
TVG2M

●Fitting straight

●ø4 (04CS)

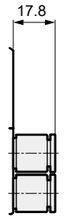


●ø6 (06CS)



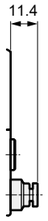
●ø8 (08CS)

●ø10 (10CS)

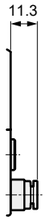


●Fitting straight, single plug

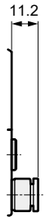
●ø4 (04CA)



●ø6 06CA



●ø8 08CA

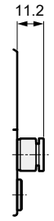


●ø10 (10CA)

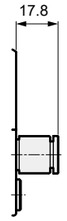
●ø4 (04CF)

●ø6 (06CF)

●ø8 (08CF)

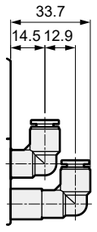


●ø10 (10CF)

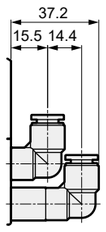


●L fitting (upward)

●ø6 (06 CU)

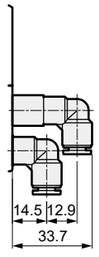


●ø8 (08CU)

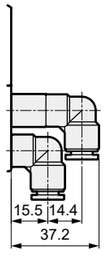


●L fitting (downward)

●ø6 06CD



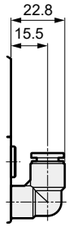
●ø8 08CD



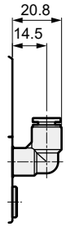
●L fitting (upward), single plug

●ø6 (06CB)

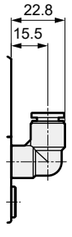
●ø8 (08CB)



●ø6 (06CG)

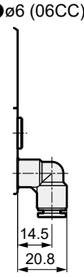


●ø8 (08CG)

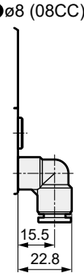


●L fitting (downward), single plug

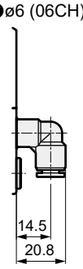
●ø6 (06CC)



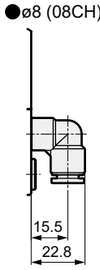
●ø8 (08CC)



●ø6 (06CH)



●ø8 (08CH)



External Dimension Drawings

TVG2M

●Fitting straight

●ø1/4" (06LS)

●ø5/16" (08LS)

●Fitting straight, single plug

●06LA ø1/4"

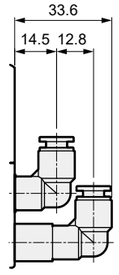
●ø5/16" (08LA)

●ø1/4" (06LF)

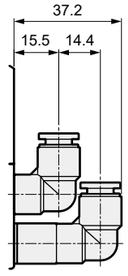
●ø5/16" (08LF)

●L fitting (upward)

●06LU ø1/4"

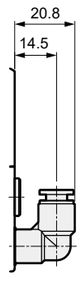


●ø5/16" (08LU)

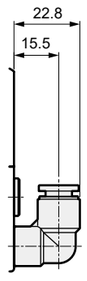


●L fitting (upward), single plug

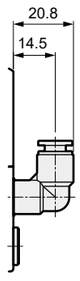
●ø1/4" (06LB)



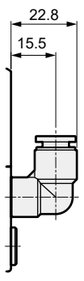
●ø5/16" (08LB)



●ø1/4" (06LG)



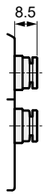
●ø5/16" (08LG)



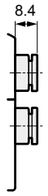
External Dimension Drawings

TVG1M Supply and exhaust block

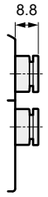
●Fitting straight
●ø6 (06CS)



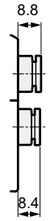
●ø8 (08CS)



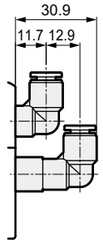
●Fitting straight
●ø5/16" (08LS)



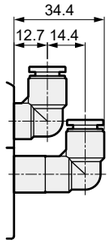
●Port P: ø5/16" (08XS)
Port R: ø8



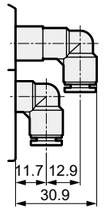
●L fitting (upward)
●ø6 (06 CU)



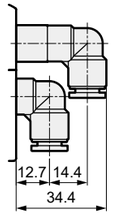
●ø8 (08CU)



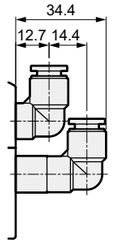
●L fitting (downward)
●ø6 06CD



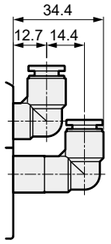
●ø8 08CD



●L fitting (upward)
●ø5/16" (08LU)



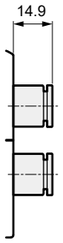
●Port P: ø5/16" (08XU)
Port R: ø8



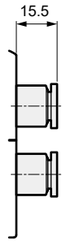
TVG2M Supply and exhaust block

●Fitting straight
●ø8 (08CS)

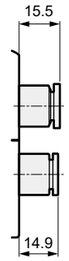
●ø10 (10CS)



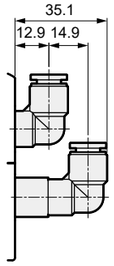
●Fitting straight
●ø3/8" (10LS)



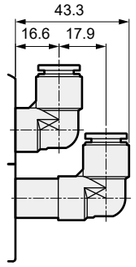
●Port P: ø3/8" (10XS)
Port R: ø10



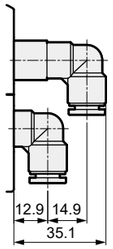
●L fitting (upward)
●ø8 (08CU)



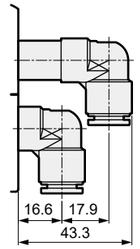
●ø10 (10 CU)



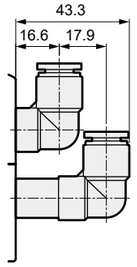
●L fitting (downward)
●ø08 (08CD)



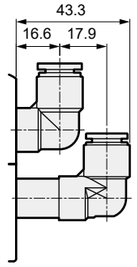
●ø10 (10CD)



●L fitting (upward)
●ø3/8" (10LU)



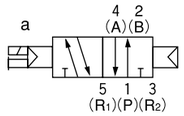
●Port P: ø3/8" (10XU)
Port R: ø10

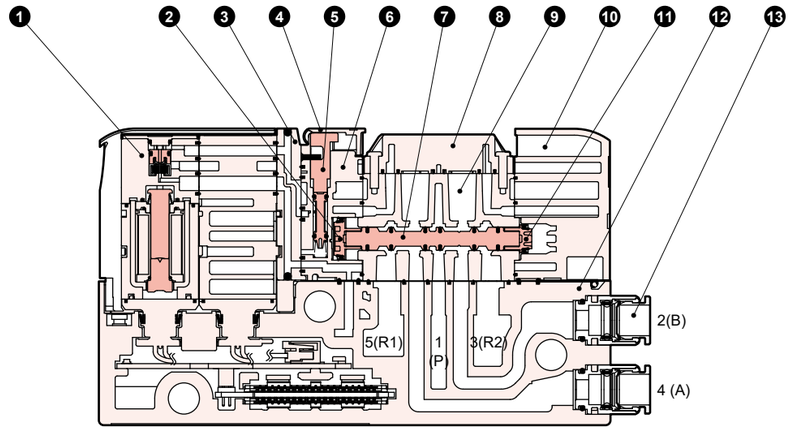


MEMO

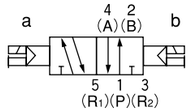
Internal Structure Diagram/Materials

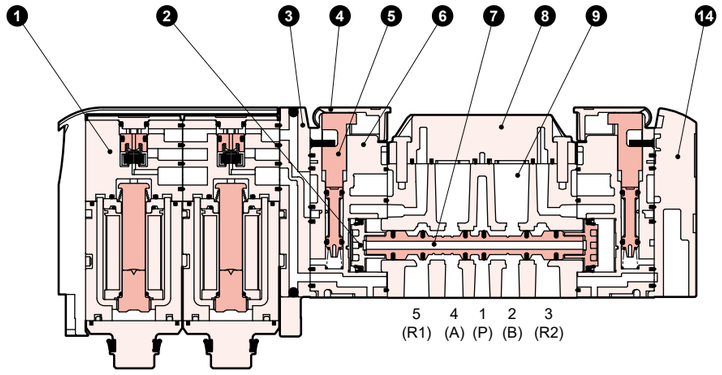
2-position single





● 2-position double





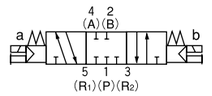
Main parts list

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Coil assembly	–	8	Plate	Resin
2	Piston D assembly	–	9	Body	Aluminum alloy die-cast
3	Pilot plate	Resin	10	Piston chamber S	Resin
4	Manual protection cover	Resin	11	Piston S assembly	–
5	Manual Override	Resin	12	Valve block	Resin
6	Piston chamber	Resin	13	Cartridge push-in fitting	–
7	Spool assembly	–	14	Cap	Resin

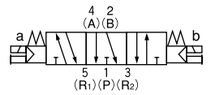
Internal Structure Diagram/Materials

3-position

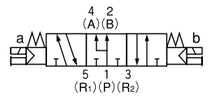
Closed center

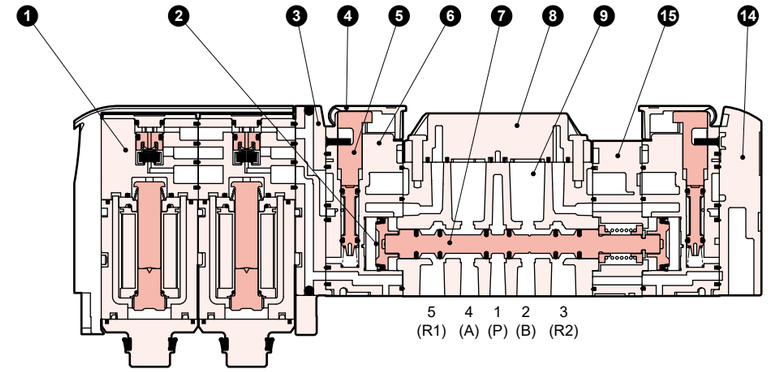


Exhaust center



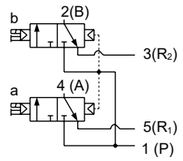
Pressure center

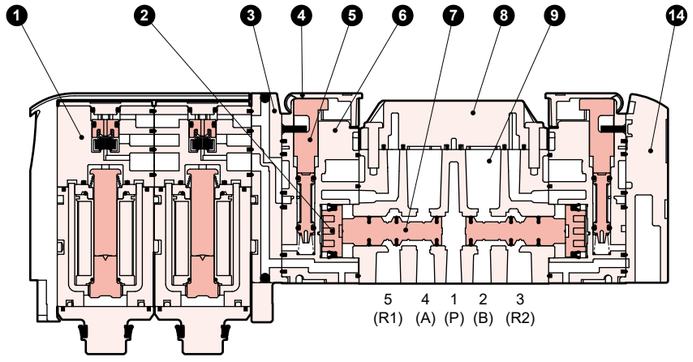




● Two 3-port valves integrated

A side valve: NC type B side valve: NC type



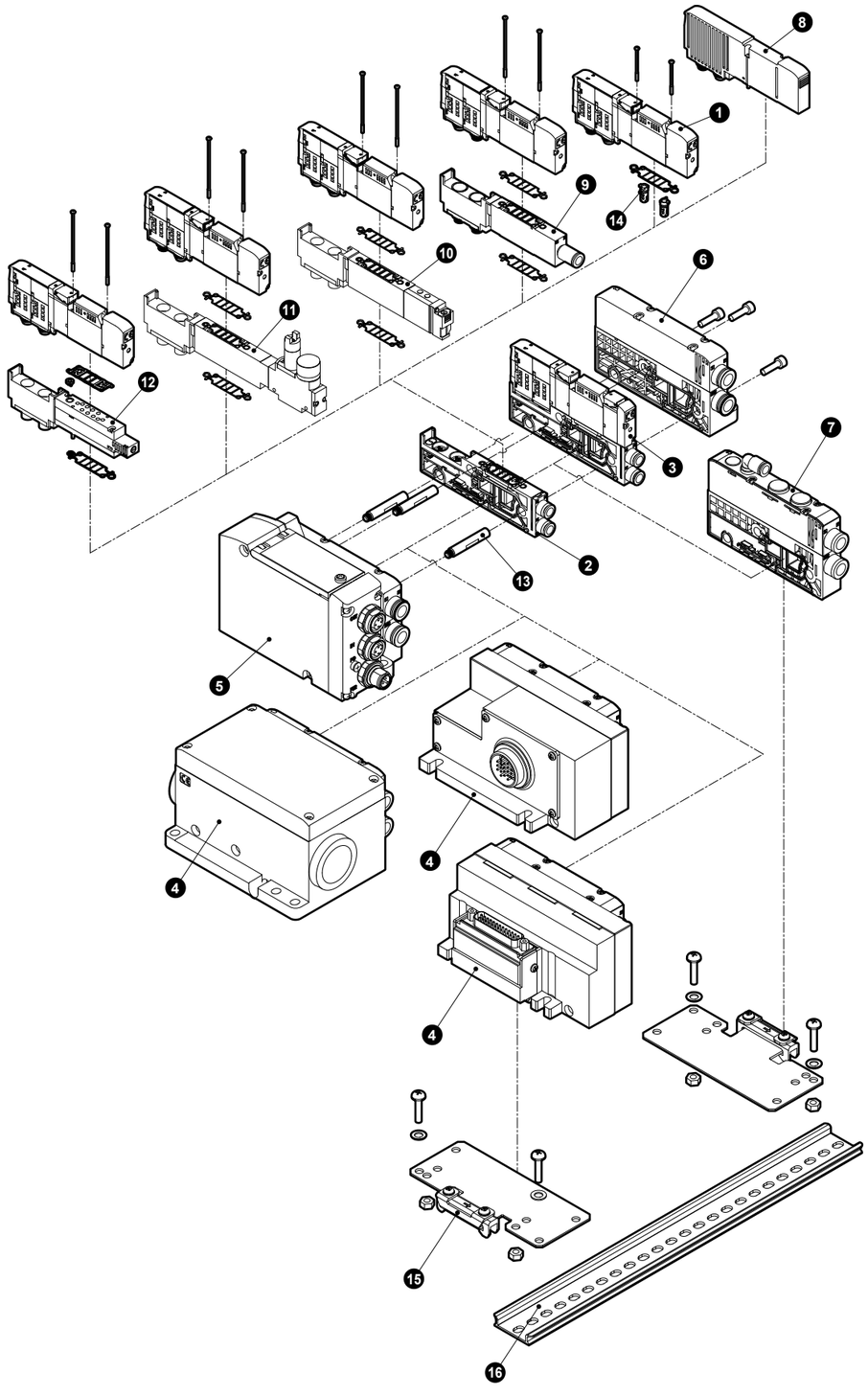


Main parts list

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Coil assembly	–	9	Body	Aluminum alloy die-cast
2	Piston D assembly	–	10	Piston chamber S	Resin
3	Pilot plate	Resin	11	Piston S assembly	–
4	Manual protection cover	Resin	12	Valve block	Resin
5	Manual Override	Resin	13	Cartridge push-in fitting	–
6	Piston chamber	Resin	14	Cap	Resin
7	Spool assembly	–	15	Body block	Resin
8	Plate	Resin			

Block manifolds Configurations

As it can be freely assembled, it is easy to change the number of stations, perform maintenance, etc.



Part No.	Part Name	Model No. (Example)	Remarks	Page Listed
1	Discrete solenoid valve (for base mounting)	TVG1-1B00XX3-HP1	A wide range of solenoid valves is available. It is also possible to have solenoid valves of different solenoid positions mixed in the same manifold.	P. 17
2	Valve block	TVG1P-VB-06CS3	The block on which the solenoid valve is based. Mount according to the required number of stations of solenoid valves. However, the number of stations depends on the wiring method. (Refer to pages 7 and 63.) As option is selected, it is also possible to partition the flow path in the manifold.	P. 45
3	Valve block with solenoid valve	TVG1P-1B06CS3-HP1	–	P. 41
4	Wiring block (common terminal block) Multi-connector D-sub Connector	TVG1P-TB-08CS-EA1	These blocks provide electrical wiring to the manifold and provide the air and exhaust functions.	P. 39
5	Wiring block (serial transmission)	TVG1P-TB-08CS-JA1C		P. 39
6	End block	TVG1P-EB-08CS	Block that provides air supply and exhaust to the manifold. Mount the block on the opposite side of the wiring block.	P. 50
7	Intermediate supply and exhaust block	TVG1P-QB-08CS	Block that provides air supply and exhaust to the manifold. Use this when the number of valve stations increases, or when the supply flow rate shortage is a concern.	P. 51
8	Blanking plate	TVG1P-BP	Assembled with a spare valve block for use if a solenoid valve will be added later.	P. 54
9	Air supply spacer	TVG1P-P-06CS	Use this when supplying different pressures for each station.	P. 19
	(exhaust spacer)	TVG1P-R-06CS	Used for individual exhaust. Use this product to prevent misoperation due to increased exhaust capacity and exhaust lead-in.	P. 19
10	Spacer Pilot Check Valve	TVG1P-PC-	Use this to stop the cylinder midway and to prevent it from falling.	P. 21
11	Spacer regulator	TVG1P-SR-P-G1	Pressure can be adjusted individually for each station. Port P, A and B pressure reduction types are available.	P. 22
12	In-stop valve spacer	TVG1P-IS	The air supply can be shut off individually for each station.	P. 23
13	Tie rod	TVG1P-TR-05	TVG1 is available in sets of 3, and TVG2 is available in sets of 2.	P. 49
14	Check valve	TVG1P-CHECK-VALVE	Prevents cylinder malfunction (popping out phenomenon) caused by exhaust air lead-in.	P. 54
15	DIN rail mounting bracket kit	TVG1P-D	A direct mount manifold can be modified to DIN rail mount manifold.	P. 53
16	DIN Rail	N4GR-BAA200	For how to calculate the standard length, refer to page 118.	P. 53

Weight

TVG1

Part Name	Model No.	Weight (g)
Discrete solenoid valve (for base mounting)	TVG1-1B00XX3-HP1	55
	TVG1-2B00XX3-HP1	62
	TVG1-3/4/5B00XX3-HP1	65
	TVG1-A/B/CB00XX3-HP1	63
Blanking plate	TVG1P-BP	40
End block	TVG1P-EB-08CS	159
Valve block	TVG1P-VB-06CS3	31
Wiring block	TVG1P-TB-08CS-E ✳	518
	TVG1P-TB-08CS-F ✳	850
	TVG1P-TB-08CS-G ✳	707
	TVG1P-TB-08CS-J ✳	456
	TVG1P-TB-08CS-K ✳	280

TVG2

Part Name	Model No.	Weight (g)
Discrete solenoid valve (for base mounting)	TVG2-1B00XX3-HP1	94
	TVG2-2B00XX3-HP1	101
	TVG2-3/4/5B00XX3-HP1	110
	TVG2-A/B/CB00XX3-HP1	101
Blanking plate	TVG2P-BP	68
End block	TVG2P-EB-10CS	224
Valve block	TVG2P-VB-08CS3	66
Wiring block	TVG2P-TB-10CS-E ✳	580
	TVG2P-TB-10CS-F ✳	912
	TVG2P-TB-10CS-G ✳	769
	TVG2P-TB-10CS-J ✳	529
	TVG2P-TB-10CS-K ✳	356

Parts list

TVG1

Part Name		Model No.
ø1.8 Push-in fitting		4G1R-JOINT-C18
ø4 Push-in fitting		4G1R-JOINT-C4
ø6 Push-in fitting		4G1R-JOINT-C6
ø1.8 push-in L-fitting		4G1R-JOINT-CL18,CLL18
ø4push-in L fitting		4G1R-JOINT-CL4,CLL4
ø6 push-in L-fitting		4G1R-JOINT-CL6,CLL6
ø1/8" push-in fitting		4G1R-JOINT-C3N
ø5/32" push-in fitting		4G1R-JOINT-C4N
ø1/8" push-in L-fitting	*1	4G1R-JOINT-CL3N,CLL3N
ø5/32" L type push-in fitting	*1	4G1R-JOINT-CL4N,CLL4N
Plug Cartridge		4G1R-JOINT-CPG

*1: Custom Product.

TVG2

Part Name		Model No.
ø4 Push-in fitting		4G2R-JOINT-C4
ø6 Push-in fitting		4G2R-JOINT-C6
ø8 Push-in fitting		4G2R-JOINT-C8
ø10 Push-in fitting		TVG2P-JOINT-C10
ø6 push-in L-fitting		4G2R-JOINT-CL6,CLL6
ø8 push-in L fitting		4G2R-JOINT-CL8,CLL8
ø1/4" push-in fitting		4G2R-JOINT-C6N
ø5/16" push-in fitting		4G2R-JOINT-C8N
ø1/4" L type push-in fitting	*1	4G2R-JOINT-CL6N,CLL6N
ø5/16" push-in L-fitting	*1	4G2R-JOINT-CL8N,CLL8N
Plug Cartridge		4G2R-JOINT-CPG

*1: Custom Product.

Model No. Notation Method

Wiring block

10 mm Width	TVG1P	- T	B	-	08CS	-		JA4C
15 mm Width	TVG2P	- T	B	-	10CS	-		JA4C
(Valve width)	❶ Model No.		❷ Piping direction		❸ Connection Port Size		❹ Exhaust method / ❺ Pilot operated	❻ Electrical connections

Attached Parts

The tie rod fixing nut is built into the wiring block.

Rechargeable Battery Compatible Specification

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - P4

For details, please refer to P. 90.

❸ Connection Port Size

●: Standard compliance
○: Custom Product

Fitting	Port P/R	Code	❶ Model No. TVG1P	TVG2P
Metric fitting				
Push-in	ø6	06CS	●	
	ø8	08CS	●	●
	ø10	10CS		●
Push-in L-type upward	ø6	06CU	●	
	ø8	08CU	●	●
	ø10	10CU		●
Push-in L type downward	ø6	06CD	●	
	ø8	08CD	●	●
	ø10	10CD		●
*1 **Inch fitting**				
Push-in	ø5/16"	08LS	●	
	ø3/8"	10LS		●
Push-in L-type upward	ø5/16"	08LU	○	
	ø3/8"	10LU		○
*3 **Port P: Fittings Inch, port R: Metric fitting**				
Push-in	ø5/16" / ø8	08XS	●	
	ø3/8" / ø10	10XS		●
Push-in L-type upward	ø5/16" / ø8	08XU	○	
	ø3/8" / ø10	10XU		○
Plug				
Plug		00XX	●	●

*1: Select 08XS, 10XS, 08XU or 10XU when using a silencer with inch Fittings specifications. Fittings Port R and PR (for KZ) are metric.
*2: ❺Pilot, K, KZ and 00XX cannot be selected together.
*3: Cannot be selected together with exhaust method X.

❷ Piping direction

Code	Content
B	Side piping

❹ Exhaust method

Code	Content
No Symbol	Centralized Exhaust (port R is a push-in fitting)
*1 X	Exhaust is open to atmosphere, with built-in silencer (Port R is sealed.)

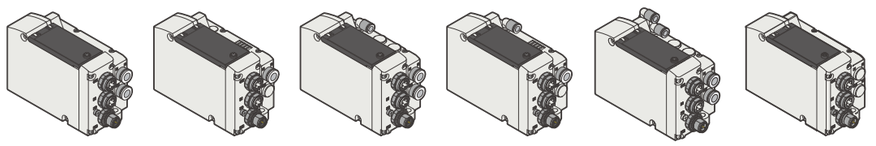
*1: ❸X is not available for port size "00XX", "□□X□".
*2: X is not available for pilot KZ.

❺ Pilot operated

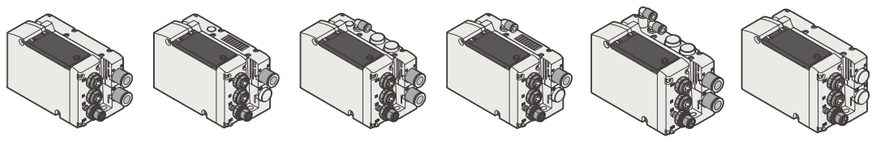
Code	Content
No Code	Internal pilot
*1, *2 K	External pilot
*1, *2 KZ	External pilot (PA/PR separated)

*1: Cannot be selected for❸port size "00XX".
*2: The external pilot port is an ø6 One-touch Fitting, and in the case of □□L□, it will be an ø5/32 inch fitting.

● TVG1P-TB-08CS ● TVG1P-TB-08CS-X ● TVG1P-TB-08CS-K ● TVG1P-TB-08CS-XK ● TVG1P-TB-08CS-KZ ● TVG1P-TB-00XX



● TVG2P-TB-10CS ● TVG2P-TB-10CS-X ● TVG2P-TB-10CS-K ● TVG2P-TB-10CS-XK ● TVG2P-TB-10CS-KZ ● TVG2P-TB-00XX



❻ Electrical connections

• Reduced wiring connection

Content	Code
Common terminal block (M3 thread)	EA1
Multi-connector	FA1
D-sub Connector	GA1

*1:NPN or PNP can be used.

• Serial transmission

Communication protocol		Output Format	Number of points	Code
DeviceNet		NPN	32 points Output	JA1C
		PNP		JA1D
CC-Link Ver.1.10		NPN		JA2C
		PNP		JA2D
EtherCAT		NPN		JA3C
		PNP		JA3D
EtherNet/IP		NPN		JA4C
		PNP		JA4D
CC-Link IEF Basic		NPN		JA5C
		PNP		JA5D
PROFINET		NPN		JA6C
		PNP		JA6D
CC-Link IE Field		NPN		JA7C
		PNP		JA7D
CC-Link IE TSN		NPN		JA8C
		PNP		JA8D
IO-Link	ClassA	NPN		JA9C
		PNP		JA9D
	ClassB	NPN		JA9G
		PNP		JA9H
IO-Link Wireless		NPN		JB1C
		PNP		JB1D

How to order (Serial Transmission Device Unit)

Model No. Notation Method

Serial transmission device unit

	OPP8	- A	2EC
	Model No.		❶ Serial transmission

❶ Serial transmission

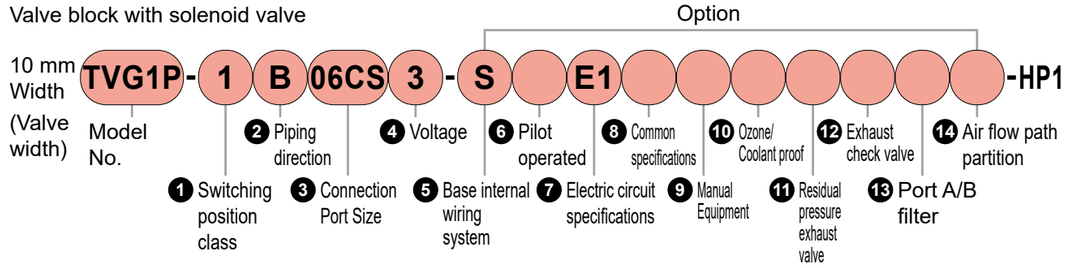
Communication protocol		Output Format	Number of points	Code	
DeviceNet		NPN	32 points Output	2D	
		PNP		2D-P	
CC-LINK		NPN		2G	
		PNP		2G-P	
EtherCAT		NPN		2EC	
		PNP		2EC-P	
EtherNet/IP		NPN		2EN	
		PNP		2EN-P	
CC-Link IEF Basic		NPN		2EB	
		PNP		2EB-P	
PROFINET		NPN		2EP	
		PNP		2EP-P	
CC-Link IE Field		NPN		2EF	
		PNP		2EF-P	
CC-Link IE TSN		NPN		2TG	
		PNP		2TG-P	
IO-Link	ClassA	NPN		2KC-A	
		PNP		2KC-PA	
	ClassB	NPN		2KC-B	
		PNP		2KC-PB	
IO-Link Wireless		NPN		2WK	
		PNP		2WK-P	

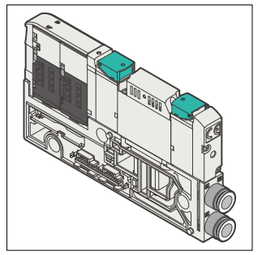
Attached Parts

- OPP fixing bolts 2pcs.
- Drip-proof gasket 1pc.

Model No. Notation Method

Valve block with solenoid valve





1 Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
*1 B	Two valves integrated	A valve side: Normally open/B valve side: Normally Open
*1 C		A valve side: Normally closed/B valve side: Normally Open
*2 Z	With blanking plate	

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.
*2: "-HP1" is not included in the model No. when Z is selected.

2 Piping direction

Code	Content
B	Side piping

3 Port size (port A/B)

• Metric fitting

Fitting	Port A/B		Code	
Push-in	ø1.8		0ACS	*3
	ø4		04CS	
	ø6		06CS	
Push-in L-type upward *2	ø1.8		0ACU	*3
	ø4		04CU	
	ø6		06CU	
Push-in L type downward	ø1.8		0ACD	*3
	ø4		04CD	
	ø6		06CD	
Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø1.8	Plug	0ACA	*3
	ø4		04CA	
	ø6		06CA	
	Plug	ø1.8	0ACF	*3
		ø4	04CF	
		ø6	06CF	
Push-in L-type upward *2	ø1.8	Plug	0ACB	*3
	ø4		04CB	
	ø6		06CB	
	Plug	ø1.8	0ACG	*3
		ø4	04CG	
		ø6	06CG	
Push-in L type downward	ø1.8	Plug	0ACC	*3
	ø4		04CC	
	ø6		06CC	
	Plug	ø1.8	0ACH	*3
		ø4	04CH	
		ø6	06CH	

• Inch fitting

Fitting	Port A/B		Code	
Push-in	ø1/8"		03LS	
	ø5/32"		04LS	
Push-in L-type upward *2	ø1/8"		C3LU	*4
	ø5/32"		04LU	*4
Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø1/8"	Plug	03LA	
	ø5/32"		04LA	
	Plug	ø1/8"	03LF	
		ø5/32"	04LF	
Push-in L-type upward *2	ø1/8"	Plug	03LB	*4
	ø5/32"		04LB	*4
	Plug	ø1/8"	03LG	*4
		ø5/32"	04LG	*4

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: The compatible tubing for ø1.8 One-touch Fitting is "UP-9402-**".
*4: Custom Product.

4 Voltage

Code	Content
3	24 VDC

How to order (valve block with solenoid valve)

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - P4

• Tie rod is not included, so order separately.
Refer to page 49 for details. The gasket between blocks is included.

5 Base internal wiring system *1

Code	Content
Blank	(double wiring)
S	Single solenoid, Dedicated wiring

*1:Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated. S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two 3-port valves integrated type and 3-position.

6 Pilot operated *1

Code	Content
Blank	Internal pilot
K	External pilot

*1:❶Solenoid position "Z" cannot be selected.

7 Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

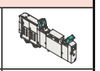
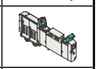
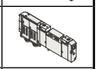
*1: The combination of "E2" and PNP specifications is Custom Product.

8 Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

9 Manual Override *1

Code	Content	
Blank	Locking/non-locking common, With misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, Tool operated, without cover	
M3	Non-locking, tool operation	

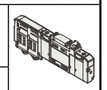
*1:❶Solenoid position "Z" cannot be selected.

10 Ozone/Coolant proof *1

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (Main valve fluorine specification)

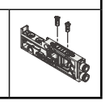
*1: ❶Solenoid position "Z" cannot be selected.

11 Residual pressure exhaust valve

Code	Content	
Blank	Without residual pressure exhaust valve	
*1, *2 Y1	Non-locking With residual pressure exhaust valve	
*1, *2 Y2	Locking With residual pressure exhaust valve	

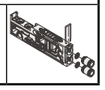
*1: ❶Solenoid position "3" and "4" only are supported.
*2: ❾Only the manual override "M2" and "M3" are supported.

12 Exhaust check valve

Code	Content	
Blank	None	
*1 H	Exhaust malfunction With prevention valve	

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve.

13 Port A/B filter

Code	Content	
Blank	None	
F	Port A/B Filter integrated	

*1: A filter is built into port P.

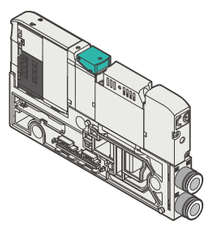
14 Air flow path partition

See P. 46 for details.

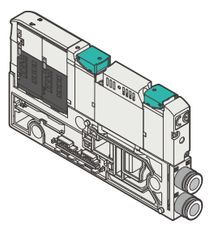
Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

*1: The right flow path is cut off when port A/B is facing forward.

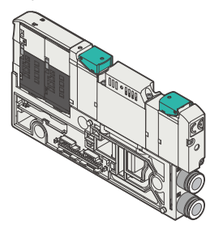
● 2-position single



● 2-position double
Two 3-port valves integrated

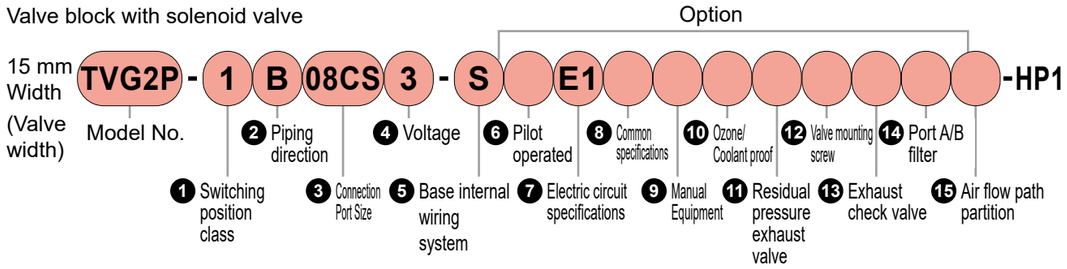


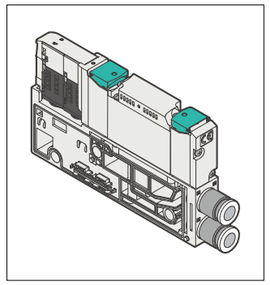
● 3-position exhaust center
3-position pressure center
3-position closed center



Model No. Notation Method

Valve block with solenoid valve





❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
*1 B	Two valves	A valve side: Normally open/B valve side: Normally Open
*1 C	integrated	A valve side: Normally closed/B valve side: Normally Open
*2 Z	With blanking plate	

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.
*2: "-HP1" is not included in the model No. when Z is selected.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• Metric fitting

Fitting	Port A/B		Code
Push-in	ø4		04CS
	ø6		06CS
	ø8		08CS
	ø10		10CS
Push-in L-type upward *2	ø6		06CU
	ø8		08CU
Push-in L type downward	ø6		06CD
	ø8		08CD
Fitting	Single side plug specifications		Code
	Port A	Port B	
Push-in	ø4	Plug	04CA
	ø6		06CA
	ø8		08CA
	ø10		10CA
	Plug	ø4	04CF
		ø6	06CF
		ø8	08CF
		ø10	10CF
Push-in L-type upward *2	ø6	Plug	06CB
	ø8		08CB
	Plug	ø6	06CG
		ø8	08CG
Push-in L type downward	ø6	Plug	06CC
	ø8		08CC
	Plug	ø6	06CH
		ø8	08CH

• Inch fitting

Fitting	Port A/B		Code	
Push-in	ø1/4"		06LS	
	ø5/16"		08LS	
Push-in L-type upward *2	ø1/4"		06LU	*3
	ø5/16"		08LU	*3
Fitting	Single side plug specifications		Code	
	Port A	Port B		
Push-in	ø1/4"	Plug	06LA	
	ø5/16"		08LA	
	Plug	ø1/4"	06LF	
		ø5/16"	08LF	
Push-in L-type upward *2	ø1/4"	Plug	06LB	*3
	ø5/16"		08LB	*3
	Plug	ø1/4"	06LG	*3
		ø5/16"	08LG	*3

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: Custom Product.

❹ Voltage

Code	Content
3	24 VDC

❺ Base internal wiring system *1

Code	Content
No Code	(double wiring)
S	Single solenoid dedicated wiring

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.
S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two 3-port valves integrated type and 3-position.

How to order (valve block with solenoid valve)

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - **P4**

• Tie rod is not included, so order separately.
Refer to page 49 for details. The gasket between blocks is included.

❻ Pilot operated *1

Code	Content
Blank	Internal pilot
K	External pilot

*1: ❶Solenoid position "Z" cannot be selected.

❼ Electrical circuit specification *

Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❽ Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

❾ Manual Override *1

Code	Content	
Blank	Locking/non-locking common, With misoperation prevention cover	
M1	Non-locking, With misoperation prevention cover	
M2	Locking/non-locking common, Tool operated, without cover	
M3	Non-locking, tool operation, Without cover	

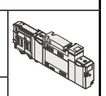
*1: ❶Solenoid position "Z" cannot be selected.

❿ Ozone/Coolant proof *1

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (Main valve fluorine specification)

*1: ❶Solenoid position "Z" cannot be selected.

⓫ Residual pressure exhaust valve

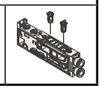
Code	Content	
Blank	Without residual pressure exhaust valve	
*1, *2 Y1	Non-locking With residual pressure exhaust valve	
*1, *2 Y2	Locking With residual pressure exhaust valve	

*1: ❶Solenoid position "3" and "4" only are supported.
*2: ❾Only the manual override "M2" and "M3" are supported.

⓬ Valve mounting screw

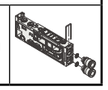
Code	Content
Blank	With plus/minus Pan head machine screw
J	Hexagon Socket Head Cap Screw

⓭ Exhaust check valve

Code	Content	
Blank	None	
H	With exhaust check valve	

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve.

⓮ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

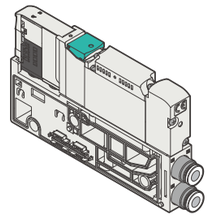
⓯ Air flow path partition

For details P. 48 details.

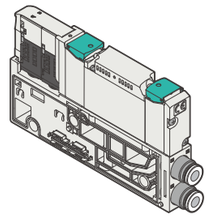
Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

*1: The right flow path is cut off when port A/B is facing forward.

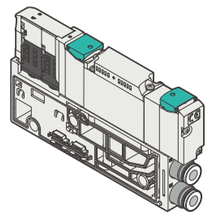
2-position single



● 2-position double
Two 3-port valves integrated



● 3-position exhaust center
3-position pressure center
3-position closed center



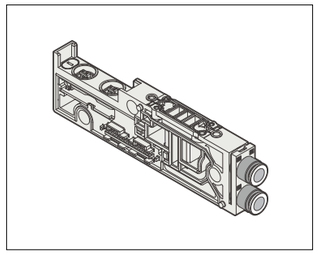
Model No. Notation Method

Valve block

10 mm Width (Valve width)

TVG1P - V **B** - **06CS** **3** - [Option] [Option] [Option] [Option] [Option]

- TVG1P: Model No.
- B: ❶ Piping direction
- 06CS: ❷ Connection Port Size
- 3: ❸ Voltage
- Option: ❹ Base internal wiring system / ❺ Electric circuit specifications / ❻ Common specifications / ❼ Port A/B filter / ❽ Air flow path partition



❶ Piping direction

Code	Content
B	Side piping

❷ Port size (port A/B)

• Metric fitting

Fitting	Port A/B		Code	
Push-in	ø1.8		0ACS	*3
	ø4		04CS	
	ø6		06CS	
Push-in L-type upward *2	ø1.8		0ACU	*3
	ø4		04CU	
	ø6		06CU	
Push-in L type downward	ø1.8		0ACD	*3
	ø4		04CD	
	ø6		06CD	
Fitting	Single side plug specifications		Code	
	Port A	Port B		
Push-in	ø1.8	Plug	0ACA	*3
	ø4		04CA	
	ø6		06CA	
	Plug	ø1.8	0ACF	*3
		ø4	04CF	
		ø6	06CF	
Push-in L-type upward *2	ø1.8	Plug	0ACB	*3
	ø4		04CB	
	ø6		06CB	
	Plug	ø1.8	0ACG	*3
		ø4	04CG	
		ø6	06CG	
Push-in L type downward	ø1.8	Plug	0ACC	*3
	ø4		04CC	
	ø6		06CC	
	Plug	ø1.8	0ACH	*3
		ø4	04CH	
		ø6	06CH	

• Inch fitting

Fitting	Port A/B		Code	
Push-in	ø1/8"		03LS	
	ø5/32"		04LS	
Push-in L-type upward *2	ø1/8"		C3LU	*4
	ø5/32"		04LU	*4
Fitting	Single side plug specifications		Code	
	Port A	Port B		
Push-in	ø1/8"	Plug	03LA	
	ø5/32"		04LA	
	Plug	ø1/8"	03LF	
		ø5/32"	04LF	
Push-in L-type upward *2	ø1/8"	Plug	03LB	*4
	ø5/32"		04LB	*4
	Plug	ø1/8"	03LG	*4
		ø5/32"	04LG	*4

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: The compatible tubing for ø1.8 One-touch Fitting is "UP-9402-**".
*4: Custom Product.

❸ Voltage

Code	Content
3	24 VDC

❹ Base internal wiring system *1

Code	Content
Blank	(double wiring)
S	Single solenoid dedicated wiring

*1:Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.
S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two 3-port valves integrated type and 3-position.

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - **P4**

• Tie rod is not included, so order separately.
Refer to page 49 for details. The gasket between blocks is included.

❺ Electrical circuit specification

*Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

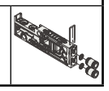
*1: The combination of "E2" and PNP specifications is Custom Product.

❻ Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

❼ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

❽ Air flow path partition

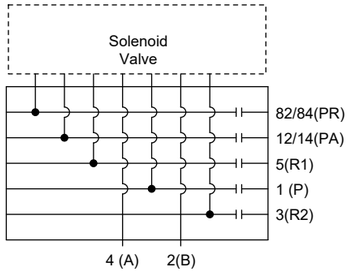
Refer to the following for details.

Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

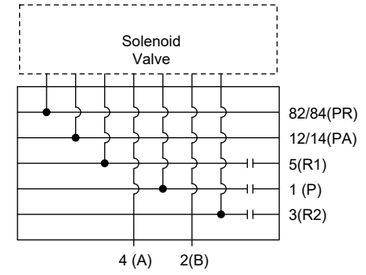
*1: The right flow path is cut off when port A/B is facing forward.

Air flow path partition

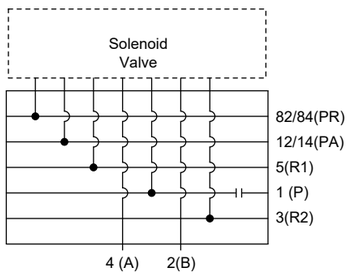
● Discrete valve block circuit diagram (T)



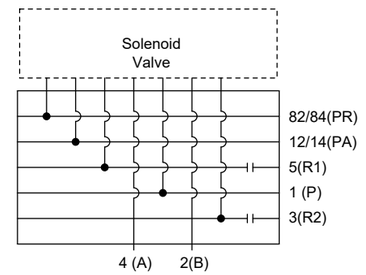
● Discrete valve block circuit diagram (U)



● Discrete valve block circuit diagram (V)



● Discrete valve block circuit diagram (W)



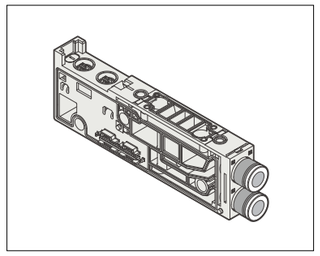
Model No. Notation Method

Valve block

15 mm Width (Valve width)

TVG2P - V B - 06CS 3 - [ ][ ][ ][ ][ ] (Option)

- TVG2P: Model No.
- B: ❶ Piping direction
- 06CS: ❷ Connection Port Size
- 3: ❸ Voltage
- [ ]: ❹ Base internal wiring system
- [ ]: ❺ Electric circuit specifications
- [ ]: ❻ Common specifications
- [ ]: ❼ Port A/B filter
- [ ]: ❽ Air flow path partition



❶ Piping direction

Code	Content
B	Side piping

❷ Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code
Push-in	ø4	04CS
	ø6	06CS
	ø8	08CS
	ø10	10CS
Push-in L-type upward *2	ø6	06CU
	ø8	08CU
Push-in L type downward	ø6	06CD
	ø8	08CD

Fitting	Single side plug specifications		Code
	Port A	Port B	
Push-in	ø4	Plug	04CA
	ø6		06CA
	ø8		08CA
	ø10		10CA
	Plug	ø4	04CF
		ø6	06CF
		ø8	08CF
		ø10	10CF
Push-in L-type upward *2	ø6	Plug	06CB
	ø8		08CB
	Plug	ø6	06CG
		ø8	08CG
Push-in L type downward	ø6	Plug	06CC
	ø8		08CC
	Plug	ø6	06CH
		ø8	08CH

• Inch fitting

Fitting	Port A/B	Code	
Push-in	ø1/4"	06LS	
	ø5/16"	08LS	
Push-in L-type upward *2	ø1/4"	06LU	*3
	ø5/16"	08LU	*3

Fitting	Single side plug specifications		Code	
	Port A	Port B		
Push-in	ø1/4"	Plug	06LA	
	ø5/16"		08LA	
	Plug	ø1/4"	06LF	
		ø5/16"	08LF	
Push-in L-type upward *2	ø1/4"	Plug	06LB	*3
	ø5/16"		08LB	*3
	Plug	ø1/4"	06LG	*3
		ø5/16"	08LG	*3

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: Custom Product.

❸ Voltage

Code	Content
3	24 VDC

❹ Base internal wiring system *1

Code	Content
No Code	(double wiring)
S	Single solenoid dedicated wiring

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.
S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two 3-port valves integrated type and 3-position.

Rechargeable Battery Compatible Specification For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - **P4**

• Tie rod is not included, so order separately.
Refer to page 49 for details. The gasket between blocks is included.

❺ Electrical circuit specification *

Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

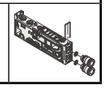
*1: The combination of "E2" and PNP specifications is Custom Product.

❻ Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

❼ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

❽ Air flow path partition

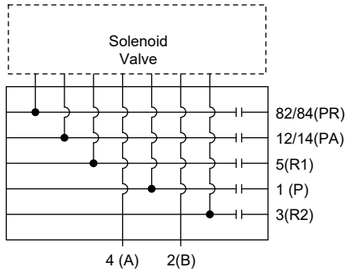
Refer to the bottom for details.

Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

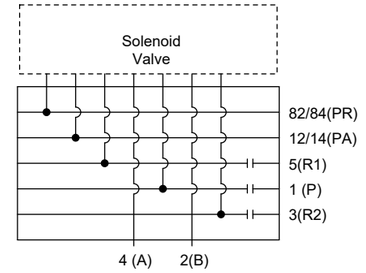
*1: The right flow path is cut off when port A/B is facing forward.

Air flow path partition

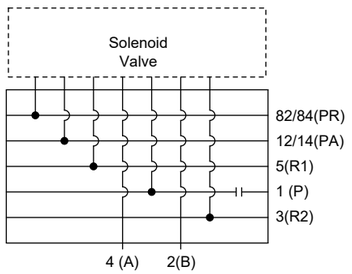
● Discrete valve block circuit diagram (T)



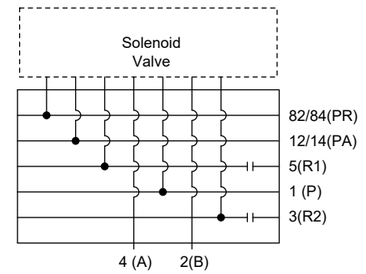
● Discrete valve block circuit diagram (U)



● Discrete valve block circuit diagram (V)



● Discrete valve block circuit diagram (W)



Model No. Notation Method

Tie rod

●For valve block

10 mm width **TVG1P - TR - 02**

15 mm width **TVG2P - TR - 02**

❶ Model No. ❷ Station No.

●For intermediate supply and exhaust block

10 mm width **TVG1P-TR-Q**

15 mm width **TVG2P-TR-Q**

●For valve block expansion

10 mm width **TVG1P-TR-01**

15 mm width **TVG2P-TR-01**

*1: TVG1P is a 3-piece set and TVG2P is a 2-piece set.

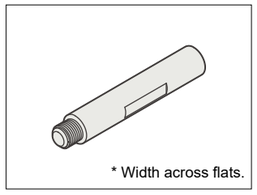
❷ Station No.

Code	Content
02	For 2 stations
03	For 3 stations
04	For 4 stations
05	For 5 stations
06	For 6 stations
07	For 7 stations
08	For 8 stations
09	For 9 stations
10	For 10 stations
11	For 11 stations
12	For 12 stations
13	For 13 stations

Code	Content
14	For 14 stations
15	For 15 stations
16	For 16 stations
17	For 17 stations
18	For 18 stations
19	For 19 stations
20	For 20 stations
21	For 21 stations
22	For 22 stations
23	For 23 stations
24	For 24 stations

Regarding expansion

- Manifold can expand by 3 stations with 2 to 17 stations. Up to three stations can be expanded in total: valve block and intermediate supply and exhaust block. When increasing 18 or more stations of manifolds, use a tie rod that matches the station No. after the increase.
- Fix the tie rod for station expansion/tie rod for intermediate supply and exhaust onto the wiring block. If installed on the end block side, it may not be able to be assembled correctly.



* Width across flats.

Model No. Notation Method

End block (U side)

A hexagon socket head cap screw for tie rod tightening and a gasket between the block are included.

10 mm Width **TVG1P - E B - 08CS -** ( ) ( )

15 mm Width **TVG2P - E B - 10CS -** ( ) ( )

(Valve width) ❶ Model No. ❷ Piping direction ❸ Connection Port Size ❹ Exhaust method ❺ Pilot Type

Rechargeable Battery Compatible Specification

For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - **P4**

❸ Connection Port Size

●: Standard compliance ○: Custom Product

Fitting	Port P/R	Code	❶ Model No. TVG1P	TVG2P
Metric fitting				
Push-in	ø6	06CS	●	
	ø8	08CS	●	●
	ø10	10CS		●
Push-in L-type upward	ø6	06CU	●	
	ø8	08CU	●	●
	ø10	10CU		●
Push-in L type downward	ø6	06CD	●	
	ø8	08CD	●	●
	ø10	10CD		●
*1 **Inch fitting**				
Push-in	ø5/16"	08LS	●	
	ø3/8"	10LS		●
Push-in L-type upward	ø5/16"	08LU	○	
	ø3/8"	10LU		○

*3 **Port P: Fittings Inch, port R: Metric fitting**					
Push-in	ø5/16"	ø8	08XS	●	
	ø3/8"	ø10	10XS		●
Push-in L-type upward	ø5/16"	ø8	08XU	○	
	ø3/8"	ø10	10XU		○
Plug					
Plug			00XX	●	●

*1: Select 08XS, 10XS, 08XU or 10XU when using a silencer with inch Fittings specifications. Fittings Port R and PR (for KZ) are metric.
*2: ❺Pilot, K, KZ and 00XX cannot be selected together.
*3: Cannot be selected together with exhaust method X.

❷ Piping direction

Code	Content
B	Side piping

❹ Exhaust method

Code	Content
Blank	Centralized Exhaust (port R is a push-in fitting)
*1 X	Exhaust is open to atmosphere, with built-in silencer (Port R is sealed.)

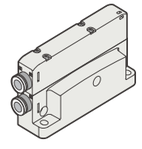
*1: For ❸port size "00XX" and "□□X□", X cannot be selected.
*2: X is not available for pilot KZ.

❺ Pilot operated

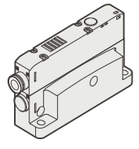
Code	Content
Blank	Internal pilot
*1, *2 K	External pilot
*1, *2 KZ	External pilot (PA/PR separated)

*1: ❸Cannot be selected for port size "00XX".
*2: The external pilot port is an ø6 One-touch Fitting, and in the case of □□L□, it will be an ø5/32 inch fitting.

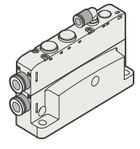
● TVG1P-EB-08CS



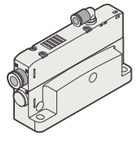
● TVG1P-EB-08CS-X



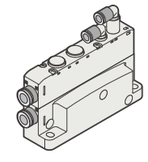
● TVG1P-EB-08CS-K



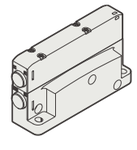
● TVG1P-EB-08CS-XK



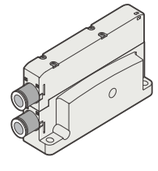
● TVG1P-EB-08CS-KZ



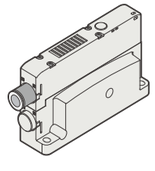
● TVG1P-EB-00XX



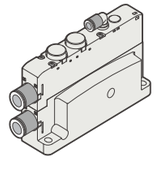
● TVG2P-EB-10CS



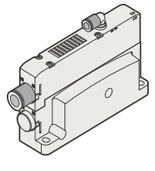
● TVG2P-EB-10CS-X



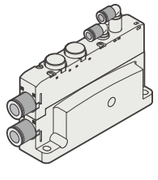
● TVG2P-EB-10CS-K



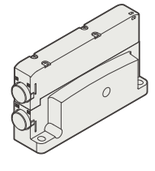
● TVG2P-EB-10CS-XK



● TVG2P-EB-10CS-KZ



● TVG2P-EB-00XX



Model No. Notation Method

Intermediate supply and exhaust block

The intermediate supply and exhaust block can be installed between the valve block and the valve block. These blocks cannot be adjacent to each other. In addition, this block cannot be adjacent to an end block or wiring block. The electrical internal wiring and the P.R.PA.PR port connect to the adjacent blocks.

10 mm Width: **TVG1P - Q B - 08CS -** ❶ ❺
15 mm Width: **TVG2P - Q B - 10CS -** ❹ ❺
(Valve width)

❶ Model No. ❷ Piping direction ❸ Connection Port Size ❹ Exhaust method ❺ Pilot operated

Rechargeable Battery Compatible Specification

For details, please refer to P. 90.

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

✱✱ - ✱✱ - ✱✱ - **P4**

❸ Connection Port Size

●: Standard compliance
○: Custom Product

Fitting	Port P/R	Code	❶ Model No. TVG1P	TVG2P
Metric fitting				
Push-in	ø6	06CS	●	
	ø8	08CS	●	●
	ø10	10CS		●
Push-in L-type upward	ø6	06CU	●	
	ø8	08CU	●	●
	ø10	10CU		●
Push-in L type downward	ø6	06CD	●	
	ø8	08CD	●	●
	ø10	10CD		●
*1 **Inch fitting**				
Push-in	ø5/16"	08LS	●	
	ø3/8"	10LS		●
Push-in L-type upward	ø5/16"	08LU	○	
	ø3/8"	10LU		○

*3 **Port P: Fittings Inch, port R: Metric fitting**					
Fitting	P Port	R Port	Code		
Push-in	ø5/16"	ø8	08XS	●	
	ø3/8"	ø10	10XS		●
Push-in L-type upward	ø5/16"	ø8	08XU	○	
	ø3/8"	ø10	10XU		○

*1 : Select 08XS, 10XS, 08XU or 10XU when using a silencer with the inch Fittings specifications. Fittings Port R and PR (for KZ) are metric.
*2: Port P has a filter built in to prevent foreign matter from entering.
*3: Cannot be selected together with exhaust method X.

❷ Piping direction

Code	Content
B	Side piping

❹ Exhaust method

Code	Content
Blank	Centralized Exhaust (port R is a push-in fitting)
*1, *2 X	Exhaust is open to atmosphere, with built-in silencer (Port R is sealed.)

*1: ❸X is not available for port size "□□X□".
*2: X is not available for pilot Z and KZ.

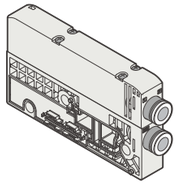
❺ Pilot operated

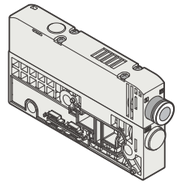
Code	Content
Blank	Internal pilot
*1 K	External pilot
*1 Z	Multi-pressure circuit
*1 KZ	External pilot (PA/PR separated)

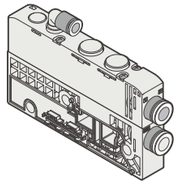
*1:If the ø6 push-in fitting and the ✱ ✱ L ✱ are used for the external pilot port, the øFittings is 5/32". Z cannot be used independently. Be sure to use with another type, blank, K or KZ.

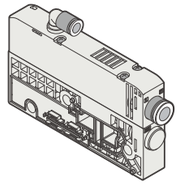
Attached Parts

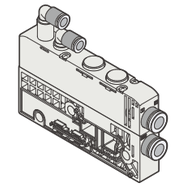
Manifold gasket: 1 pcs
Tie rod is not included, so order separately. Refer to page 49 for details. The gasket between blocks is included.

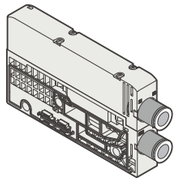
● TVG1P-QB-08CS


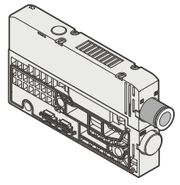
● TVG1P-QB-08CS-X


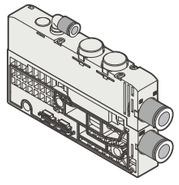
● TVG1P-QB-08CS-K


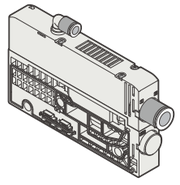
● TVG1P-QB-08CS-XK


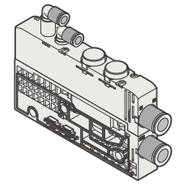
● TVG1P-QB-08CS-KZ


● TVG2P-QB-10CS


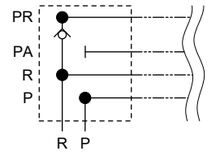
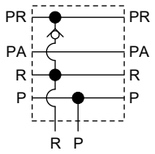
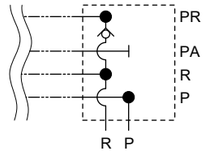
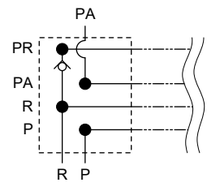
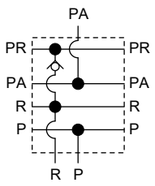
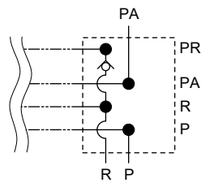
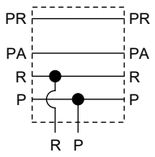
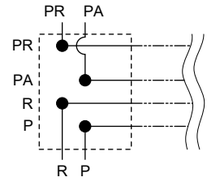
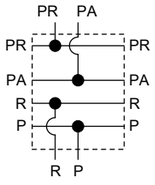
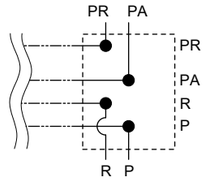
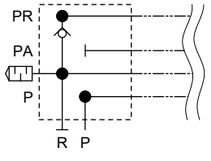
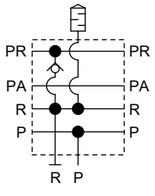
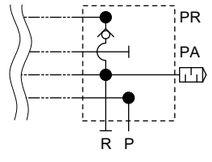
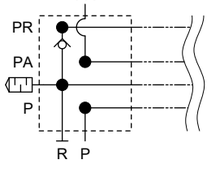
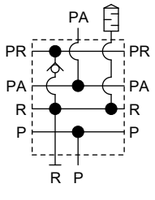
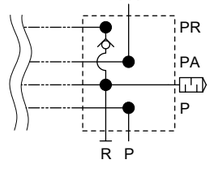
● TVG2P-QB-10CS-X


● TVG2P-QB-10CS-K


● TVG2P-QB-10CS-XK


● TVG2P-QB-10CS-KZ


Specification list of supply and exhaust block

Exhaust method	Pilot operated	D side Wiring/supply and exhaust block	Intermediate supply and exhaust block	U side End supply and exhaust block
Blank Centralized Exhaust	Blank Internal pilot			
Blank Centralized Exhaust	K External pilot			
Blank Centralized Exhaust	Z Multi-pressure circuit			
Blank Centralized Exhaust	KZ External pilot (PA/PR separated)			
X Atmospheric Release (Silencer integrated)	Blank Internal pilot			
X Atmospheric Release (Silencer integrated)	K External pilot			

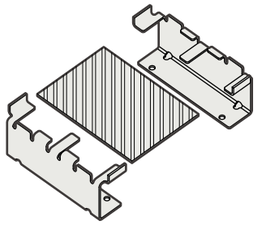
* The check valve between PR and R is for malfunction prevention. This product cannot be used for other applications.

Related products Tag plate (tag holder, tag plate), DIN rail, DIN rail mounting bracket kit

Tag plate Included with manifold with solenoid valve at shipment.
When necessary, indicate a ○ mark in the tag plate field on the manifold specifications sheet on pages 119 to 138.

Tag holder

TVG□P-TAG-HOLDER
- Size
  - 1
  - 2



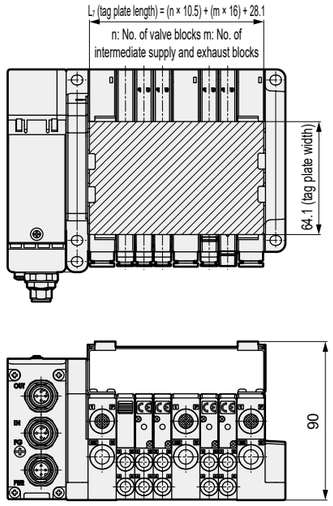
Tag plate

TVGP-TAG-PLATE-B-□
- Length (mm)
  - 200
  - 300
  - 400

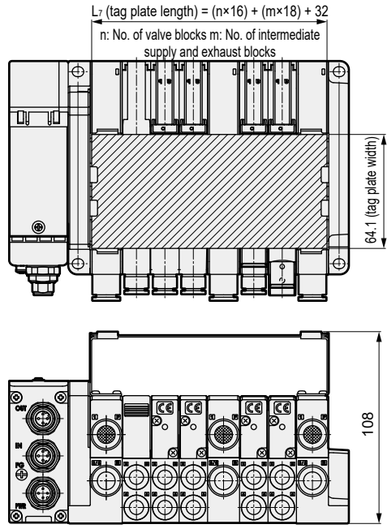
*1: Tag plate cannot be attached for the exhaust method "X".
*2: Tag plates cannot be attached for the pilot operated K and KZ types.
*3: Tag plate cannot be attached for the combination of spacer and residual pressure exhaust valve.
*4: When purchasing the plate as a single unit, cut it to the product length.

External Dimension Drawings

● TVG1

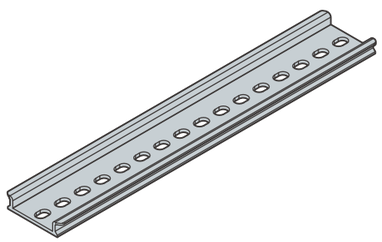


● TVG2



DIN Rail

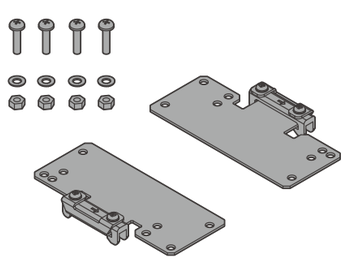
N4GR-BAA□
- Length



*1: Set the DIN rail length by referring to the formula on page 118.

DIN rail mounting bracket kit

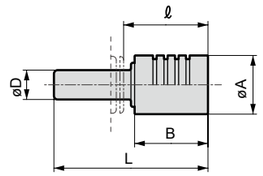
TVG□P-D
- Size
  - 1
  - 2



*Kit Contents: 2 mounting brackets and 4 mounting screws.

Related products Silencer, blanking plate kit, exhaust check valve, cable clamp, waterproof cap, waterproof plug

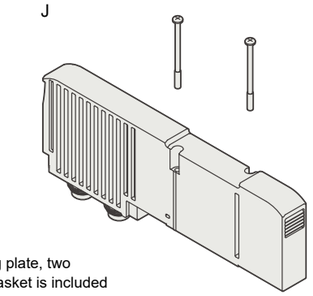
Silencer



Model No.	D	B	L	ℓ	A
SLW-H6	ø6	20	41	23.5	16
SLW-H8	ø8	20	42	23	16
SLW-H10	ø10	27	53	31.5	20

Blanking plate kit

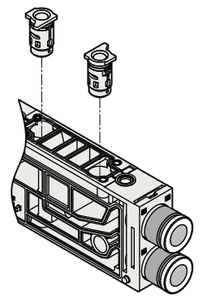
TVG□P-BP-□-□
- Size
  - 1
  - 2
- Valve mounting screw
  - Blank
  - J
- Compatible with rechargeable battery manufacturing processes
  - Blank
  - P4



* Kit Contents: Blanking plate, two mounting screws. A gasket is included with the valve block.

Exhaust check valve

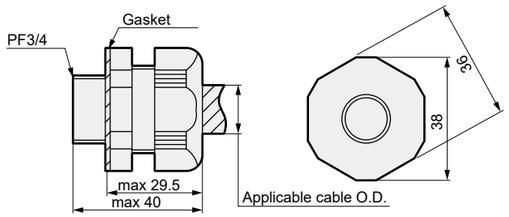
TVG1P-CHECK-VALVE
TVG2P-CHECK-VALVE
2 pieces/set



Parts kit for EA1 wiring block

● Cable clamp

Model No.	Applicable cable O.D.	Content
TVGP-SCL-18A	ø14.5 to 16.5	Used to protect cables from dust and jetting water.
TVGP-SCL-18B	ø16.5 to 18.5	

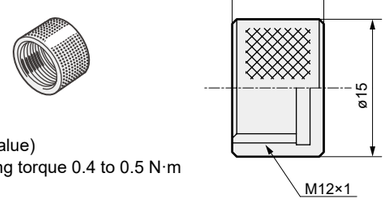


(reference value)
Body tightening torque 4.0 to 4.5 N·m
Cable clamp tightening torque 3.0 to 3.5 N·m

Parts for serial transmission device unit

● Water-proof cap

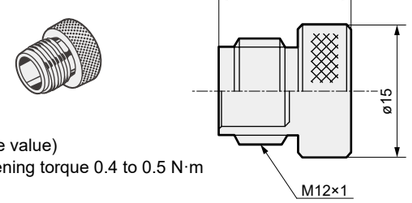
Model No.	Content
TVGP-XSZ-11	Provides water jet proof protection of unused signal connectors.



(reference value)
Tightening torque 0.4 to 0.5 N·m

● Water-proof plug

Model No.	Content
TVGP-XSZ-12	Provides water jet proof protection of unused signal connectors.



(reference value)
Tightening torque 0.4 to 0.5 N·m

Serial Transmission Device Unit cable

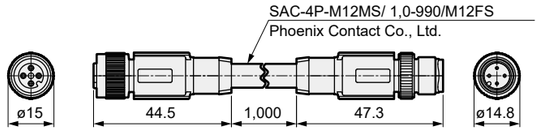
● Communication cable

For CC-Link

[Cable with two-sided connector (M12 socket - M12 plug, 1 m)]

TVGP - CABLE - G - M12M12 - 1

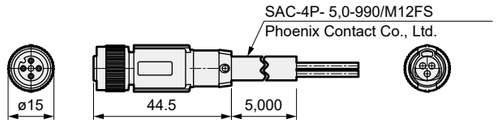
Signal name	Functions	Connector 1 M12, 4 poles Socket, A-cord Pin No.	Connector 2 M12, 4 poles Plug, A cord Pin No.
SLD	Ground wire (shield)	1	1
DB	Differential signal B (reversal)	2	2
DG	Signal ground	3	3
DA	Differential signal A (non-reversed)	4	4



[IN cable with one-sided connector (M12 socket - loose wire, 5 m)]

TVGP - CABLE - G - M12FS - 5

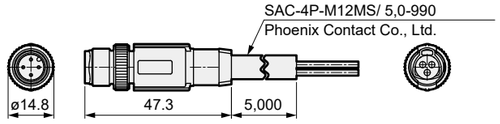
Signal name	Functions	Connector 1 M12, 4 poles Socket, A-cord Pin No.	Cable 5 m Insulator color
SLD	Ground wire (shield)	1	–
DB	Differential signal B (reversal)	2	White
DG	Signal ground	3	Yellow
DA	Differential signal A (non-reversed)	4	Blue



[For cable with one-sided connector OUT (M12 plug - loose wire, 5 m)]

TVGP - CABLE - G - M12MS - 5

Signal name	Functions	Connector 1 M12, 4 poles Plug, A cord Pin No.	Cable 5 m Insulator color
SLD	Ground wire (shield)	1	–
DB	Differential signal B (reversal)	2	White
DG	Signal ground	3	Yellow
DA	Differential signal A (non-reversed)	4	Blue

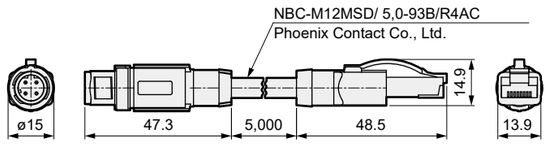


For EtherCAT, EtherNet/IP, PROFINET, CC-Link IEF Basic

[Cable with two-sided connector (M12 plug - RJ45 plug, 5 m)]

TVGP - CABLE - M12R4 - 5

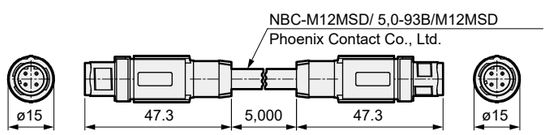
Signal name	Functions	Connector 1 M12, 4 poles Plug, D cord Pin No.	Connector 2 RJ45 Plug Pin No.
TD+	Transmitted data, positive	1	1
RD+	Received data, positive	2	3
TD-	Transmitted data, negative	3	2
RD−	Received data, negative	4	6



[Cable with two-sided connector (M12 plug - M12 plug, 5 m)]

TVGP - CABLE - M12M12 - 5

Signal name	Functions	Connector 1 M12, 4 poles Plug, D cord Pin No.	Connector 2 M12, 4 poles Plug, D cord Pin No.
TD+	Transmitted data, positive	1	1
RD+	Received data, positive	2	2
TD-	Transmitted data, negative	3	3
RD−	Received data, negative	4	4

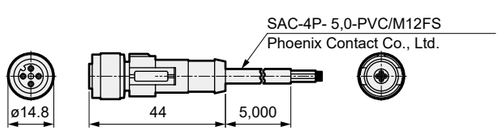


● Power supply cable

[Cable with one-sided connector (M12 socket - loose wire, 5 m)]

TVGP - CABLE - M12SAC - 5

Signal name	Functions	Connector 1 M12, 4 poles Socket, A-cord Pin No.	Cable 5 m Insulator color
Unit power	+ side: 24 V	1	Brown
Valve power supply	+ side: 24 V	2	White
Unit power	−side: 0 V	3	Blue
Valve power supply	−side: 0 V	4	Black



Parts for multi-connector

● Multi-connector (wiring method FA1) cable

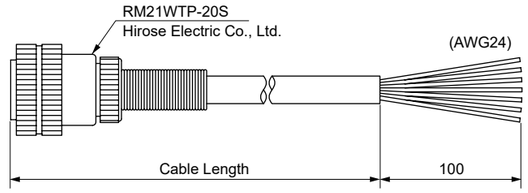
[Cable with connector]

TVGP - RMC - 3

❶ Cable Length

❶ Cable Length

Code	Content
1	1 m
3	3 m
5	5 m



Terminal No. and cores

Terminal No.		1	2	3	4	5	6	7	8	9	10
Core identification	Wire color	White	Brown	Green	Yellow	Gray	Pink	Blue	Red	Black	Purple
	Mark tube No.	1	2	3	4	5	6	7	8	9	10
Terminal No.		**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Core identification	Wire color	Gray/pink	Red/blue	White/green	Brown/green	White/yellow	Yellow/brown	White/gray	Gray/brown	(None)	(None)
	Mark tube No.	11	12	13	14	15	16	17	18	(None)	(None)

[Connector only]

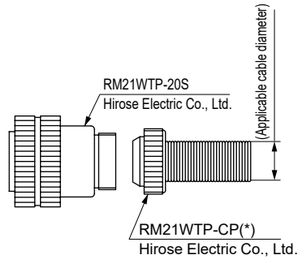
TVGP - RM21WTP - 10

❶ Applicable cable diameter

❶ Applicable cable diameter

Code	Content
8	ø8
10	ø10
12	ø12

*: Clamping force and waterproof performance of applicable cables may differ depending on their types. Therefore, check before use.



* For details on the Serial Transmission Device Unit and the I/O block connector, **Refer to pages 153 to 156.**

Block manifold; related products

Part for D-sub-connector

● Cable with D-sub-connector

Model No. Notation Method

Cable with D-sub-connector model No.

TVGP - CABLE - D 0 ❶ - ❷

❶ User interface

❷ Cable Length

❶ User interface

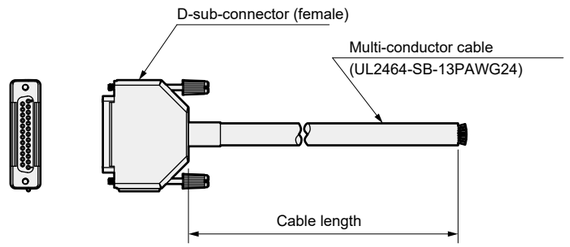
Code	Content	Model No. TVGP
0	Cut only	●
1	With round terminal for M3.5 screw	●

❷ Cable Length

Code	Content	Model No. TVGP
1	1 m	●
3	3 m	●
5	5 m	●

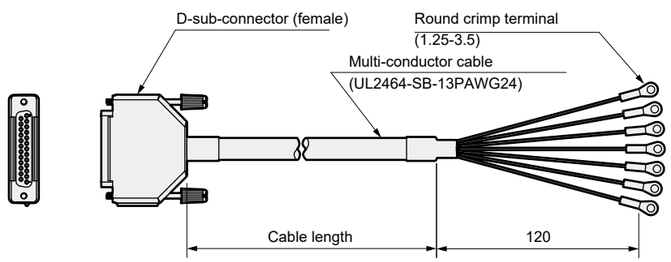
D-sub-connector terminal No. and conductor

TVGP-CABLE-D00-❷



D-sub-connector terminal No.		1	2	3	4	5	6	7	8	9	10	11	12	13
Core identification	Insulator color	Black	Yellow/ green	Brown	Brown/black	Red	Red/black	Orange	Orange/ black	Yellow	Yellow/ black	Green	Green/black	Blue
D-sub-connector terminal No.		14	15	16	17	18	19	20	21	22	23	24	25	–
Core identification	Insulator color	Blue/black	Purple	Purple/ black	Gray	Gray/black	White	White/black	Pink	Pink/black	Yellow-green	Yellow-green/ black	Water	Water/ black

TVGP-CABLE-D01-❷

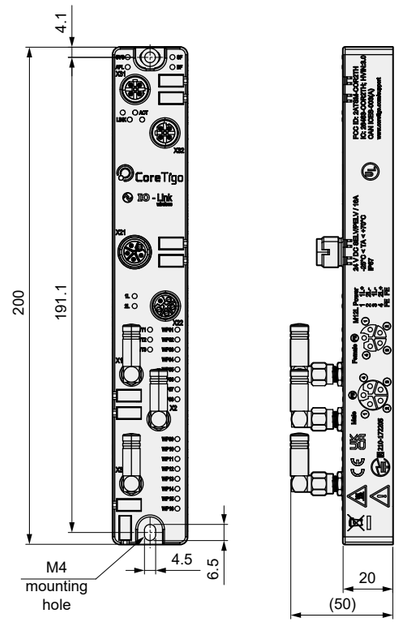


D-sub-connector terminal No.		1	2	3	4	5	6	7	8	9	10	11	12	13
Core identification	Insulator color	Black	Yellow/green	Brown	Brown/black	Red	Red/black	Orange	Orange/black	Yellow	Yellow/black	Green	Green/black	Blue
Mark tube No.		1	2	3	4	5	6	7	8	9	10	11	12	13
D-sub-connector terminal No.		14	15	16	17	18	19	20	21	22	23	24	25	–
Core identification	Insulator color	Blue/ black	Purple	Purple/ black	Gray	Gray/ black	White	White/ black	Pink	Pink/ black	Yellow-green	Yellow-green/black	Water	Water/ black
Mark tube No.		14	15	16	17	18	19	20	21	22	23	24	25	–

* Up to 24 points can be used. Cut the wires for surplus points before use.

IO-Link master

TIGOMASTER2TH-EIP



Supply source: Toho Technology Co., Ltd.

Specifications

Item	Content
Frequency	2401 MHz to 2480 MHz(80ch)
Transmission output	10 dBm MAX
Modulation method	GFSK
Compliant standards	FCC,CE Ordinance for Enforcement of the Radio Act, Article 2, Item 19
Cycle time	Min. 5 ms
Communication distance	Max. 20 m
Power Supply Voltage	18 to 31.2 VDC
Current Consumption	0.2 A
Mounting Method	Screw nominal M4 (torque 1.2 N·m)
Power cable specifications	M12 L code
Communication cable specifications	M12 D code
Communication I/ F *1	EtherNet/IP
Operating Temperature Range	−25 to 55 °C
Protection Structure	IP67

*1: EtherCAT and PROFINET are Special Specification Products.

Cable specifications

Content	Model No.	Specifications
Power supply cable	TIGOCABLEPOW-15	Length 1.5 m, one side M12 female, L-cord, one side rose
Communication cable	TIGOCABLENET-1	Length 1.0 m, one side M12, D cord, one side RJ45

TVG

3, 5-port pilot operated valve, plug-in block manifold

connection

∗Remote I/O requires separate ordering.

CONTENTS

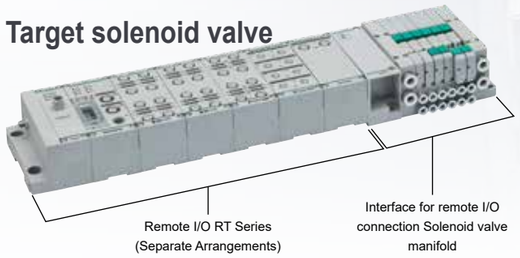
Remote I/O (RT Series) and solenoid valve (TVG Series) must be ordered separately. The customer is asked to assemble the RT and TVG.

The following 3 types of ordering methods are available.

Ordering method	Manifold specifications sheet	Customer assembly processes	Product delivery date
A Manifold assembly	Required	☆	○
B Easy assembly	Not required	◎	◎
C Discrete block	Not required	○	☆

☆: Excellent, ◎: Very good, ○: Good

Target solenoid valve



A Manifold assembly

The units will be delivered with the specifications specified in the manifold specifications sheet. Can be ordered with model No. starting with TVG□M and a manifold specifications sheet.

Remote I/O
Specifications not required
RT Series
(Separate order)

Remote I/O RT Series
(CC-1557AA)

+

Manifold with solenoid valve (for remote I/O connection)
Specifications required

Page 65

+

Manifold specifications sheet

Page 117

*1. The manifold base is only available with a valve interface.
*2. The device unit is a remote I/O (RT Series) device unit.
*3. Select the remote I/O in a separate catalog (RT Series).
*4. The remote I/O and manifold with solenoid valve must be assembled by the customer. Refer to "Remote I/O RT Series (CC-1557AA)" for how to assemble.

B Easy assembly

The single solenoid valve and assembled manifold base will be delivered separately. The following parts can be ordered with their model Nos. The customer is required to assemble the single solenoid valve and manifold base.

Remote I/O
Specs. not required
RT Series
(Separate catalog)

Remote I/O RT Series (CC-1557AA)

+

Discrete solenoid valve (for base mounting)
Specs. not required
TVG□-
□: Valve size

Page 73

+

Manifold base
Specs. not required
TVG□B-
□: Valve size

Page 69

+

Spacer
Specs. not required
TVG□P-
□: Valve size

Page 75

+

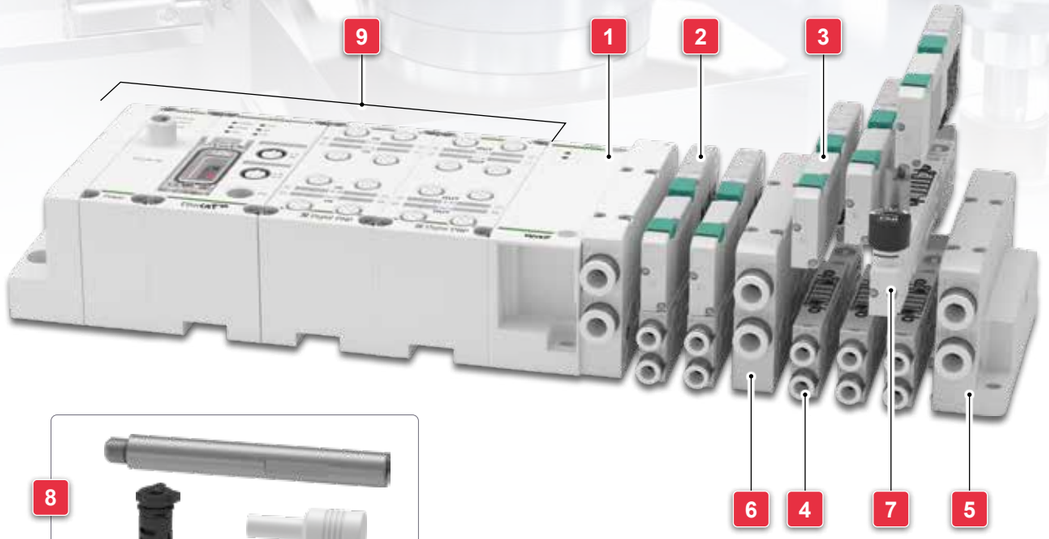
Exhaust check valve
Specs. not required
TVG□P-
□: Valve size

Page 54

*1. The manifold is limited to options that can be manufactured without a specification sheet, such as double wiring and no malfunction prevention valve assembly.
Note: This catalog lists TVGs. Alone, the solenoid valve section does not work, so please assemble the remote I/O and solenoid valve.

C Discrete block

Each part is delivered separately. The customer must assemble the manifold by combining the parts. You can order the parts below with their model Nos.



No.	Name	Head model No.	Listed page
1	Valve interface (supply and exhaust air)	TVG□P- □: Valve size	P. 88
2	Valve block with solenoid valve		P. 41
3	Discrete solenoid valve (for base mounting)		P. 73
4	Valve block		P. 45
5	End supply and exhaust block		P. 50
6	Intermediate supply and exhaust block		P. 51
7	Spacer		P. 75
8	Tie rod, silencer, exhaust check valve		P. 49, 54
	Other related parts		P. 53
9	Device unit	RT	Remote I/O RT Series (CC-1557AA)
	Power supply unit		
	I/O unit		
	End unit (without supply and exhaust)		

* Remote I/O requires separate ordering.

Plug-in Block Manifolds (for connection)
Pilot Operated 3, 5-Port Valve

TVG1 / TVG2 Series

Manifold common specifications

Item		Content
Manifold		Block manifolds
Mounting Method		Direct mounting
Air supply and exhaust method		Common supply/common exhaust (With internal exhaust check valve)
Pilot exhaust method Internal pilot	(*5)	Main valve/pilot valve common exhaust (Pilot exhaust check valve built-in)
Piping direction		Side direction of base
Valve Type and Operation Method		Pilot operated soft spool valve
Operating Fluid		Compressed Air
Max. working pressure	MPa	0.7
Internal pilot min. working pressure MPa	2-position double	0.1 (*6)
	2-position single / 3-position	0.2
	3-port valve Two valves integrated	0.2
Min. working pressure of external pilot	kPa	-100 (Pilot pressure at 0.2 MPa or more)
Proof Pressure	MPa	1.05
Ambient Temperature	°C	−5 to 55 (no freezing)
Fluid temperature	°C	5 to 55
Manual Override		Non-locking/locking common (standard)
Lubrication	(*1)	Not required
Degree of protection	*2	IP65, IP67
Vibration resistance m/s^2		50 or less
Shock resistance	m/s^2	≤ 300
Atmosphere		Cannot be used in corrosive gas environments

Electrical specifications

Item			KA1C	KA1D
Output Specification	Output Format		NPN	PNP
	Number of Output Points		32 points (4 bytes)	
	Response time ms		typ. ON delay 0.5 or less / OFF delay 1.0 or less	
	Forced output setting		Output settable regardless of process data.	
	Supply power V		24 VDC	
Electrical specifications	Internal consumption Current mA	For unit/input	≤ 15	
		For output	≤ 75	
	Operation Indicator		LED (for components status display, 2 pcs)	

*1: Use turbine oil Class 1 ISOVG32 for lubrication. Note that excessive or intermittent lubrication results in unstable operation.
*2: Tested according to the test method for IP65 (IEC 60529: 2001) standards. Refer to page 160 for details.
*3: If low exoergic/energy circuit or surgeless types are selected then there will be a diode.
*4: The pilot exhaust method differs with the supply and exhaust block used. Refer to page 52 for details.
*5: When using at low vacuum, select the external pilot. Refer to page 162 for details.
*6: 0.2 MPa for low exoergic/energy circuit.

Individual specifications

Item			TVG1 KA1□	TVG2 KA1□
Max. station No.	Standard wiring (Double wiring)		16 stations	16 stations
	Single solenoid, double solenoid layout specification (Single wiring)		24 stations	24 stations
Max. number of solenoids			32 points	32 points
Connection Port Size	Metric fitting	Port A/B	Push-in fitting ø1.8, ø4, ø6	Push-in fitting ø4, ø6, ø8, ø10
		P/R Port	Push-in fitting ø6, ø8	Push-in fitting ø8, ø10
	Inch fitting	Port A/B	Push-in fitting ø1/8", ø5/32"	Push-in fitting ø1/4", ø5/16"
		P/R Port	Push-in fitting ø5/16"	Push-in fitting ø3/8"

Performance/characteristics by model

Item	Switching position class		TVG1 at ON	TVG1 at OFF	TVG2 at ON	TVG2 at OFF
Response time ms	Two 3-port valves integrated		15	25	20	37
	2-position	Single	15	20	22	24
		Double	15	15	26	26
	3-position		20	30	25	35

The response times are values with supply pressure of 0.5 MPa at 20°C and without lubrication. They depend on the pressure and the lubricant quality.

Flow Characteristics

Model No.	Switching position class		P ➡ A/B C [dm^3/(s·bar)]	P ➡ A/B b	P ➡ A/B Q [L/min (ANR)]	A/B ➡ R C [dm^3/(s·bar)]		A/B ➡ R b		A/B ➡ R Q[L/min (ANR)]	
TVG1	Two 3-port valves integrated		0.77	0.37	205	1.0	(0.56)	0.34	(0.37)	287	(149)
	2-position		1.0	0.29	253	1.1	(0.59)	0.36	(0.41)	317	(162)
	3-position	Closed center	0.96	0.33	249	1.0	–	0.35	–	263	–
		Exhaust center	0.96	0.32	247	1.2	(0.60)	0.38	(0.40)	349	(163)
		Pressure center	1.1	0.35	289	1.0	–	0.36	–	265	–
TVG2	Two 3-port valves integrated		1.7	0.44	476	2.2	(1.8)	0.43	(0.20)	612	(431)
	2-position		2.4	0.32	618	2.5	(2.0)	0.34	(0.19)	731	(476)
	3-position	Closed center	2.2	0.35	578	2.3	–	0.38	–	670	–
		Exhaust center	2.2	0.32	567	2.5	(2.1)	0.40	(0.21)	789	(506)
		Pressure center	2.6	0.34	678	2.3	–	0.37	–	666	–

*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 × C.
*2: Values in ( ) are with the exhaust check valve.

Model No. Notation Method

Manifold with solenoid valve (for connection)

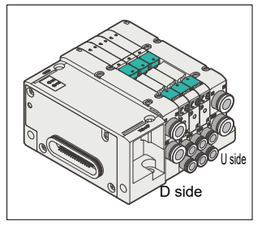
10 mm width (valve width)

Option

TVG1M - 1 B 06CS 3 KA1C - 06 U [ ][ ][ ][ ][ ][ ][ ][ ] -HP1

Model No.	❷ Piping direction	❹ Voltage	❻ Station No.	❽ Base internal wiring system	❿ Electric circuit specifications	⓬ Ozone/ Coolant proof	⓮ With/Without spacer	⓰ Port A/B filter

❶ Switching position class	❸ Connection Port Size	❺ Electrical connections	❼ Port P/R position	❾ Pilot operated	⓫ Manual Equipment	⓭ Residual pressure exhaust valve	⓯ Exhaust check valve



❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
X	Mix manifold	
A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
B	Two valves integrated *1	A valve side: Normally open/B valve side: Normally Open
C		A valve side: Normally closed/B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions is the same as the 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code	
Push-in	ø1.8	0ACS	*4
	ø4	04CS	
	ø6	06CS	
Push-in L-type upward *2	ø1.8	0ACU	*4
	ø4	04CU	
	ø6	06CU	
Push-in L type downward	ø1.8	0ACD	*4
	ø4	04CD	
	ø6	06CD	
Push-in	Mix	99CX	*3

Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø1.8	Plug	0ACA	*4
	ø4		04CA	
	ø6		06CA	
	Plug	ø1.8	0ACF	*4
		ø4	04CF	
		ø6	06CF	
Push-in L-type upward *2	ø1.8	Plug	0ACB	*4
	ø4		04CB	
	ø6		06CB	
	Plug	ø1.8	0ACG	*4
		ø4	04CG	
		ø6	06CG	
Push-in L type downward	ø1.8	Plug	0ACC	*4
	ø4		04CC	
	ø6		06CC	
	Plug	ø1.8	0ACH	*4
		ø4	04CH	
		ø6	06CH	

• Inch fitting

Fitting	Port A/B	Code	
Push-in	ø1/8"	03LS	
	ø5/32"	04LS	
Push-in L-type upward *2	ø1/8"	C3LU	*5
	ø5/32"	04LU	*5
Push-in	Mix	99LX	*3

Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø1/8"	Plug	03LA	
	ø5/32"		04LA	
	Plug	ø1/8"	03LF	
		ø5/32"	04LF	
Push-in L-type upward *2	ø1/8"	Plug	03LB	*5
	ø5/32"		04LB	*5
	Plug	ø1/8"	03LG	*5
		ø5/32"	04LG	*5

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: Port size mixtures of ports 4(A) and 2(B) are not available.
*4: The compatible ø for tube 1.8 push-in fitting is "UP-9402- * *".
*5: Custom Product.

❹ Voltage

Code	Content
3	24 VDC

❺ Electrical connections

Content	Output Format	Number of points	Code
RT Series connection Interface	NPN	32 points Output	KA1C
	PNP		KA1D

❻ Station No.

Code	Content
02	2 stations
to	to
24	24 stations

How to order (manifold with solenoid valve for connection)

• What Refer to Series (Catalog No.CC-1557A) for the RT Series ().
• If an exhaust check valve is necessary, refer to page 54.

❼ Port P/R position * Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U side, D side	
*1 T	With U side, D side, intermediate supply and exhaust block	

*1: Specify the specifications of the intermediate supply and exhaust block in the manifold specifications sheet.

❽ Base internal wiring system *1

Code	Content
No Code	(Double wiring)
S	Single solenoid, double solenoid layout specification

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.

❾ Pilot operated

Code	Content	
No Code	Internal pilot	
K	External pilot	

❿ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
No Code	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

⓫ Manual device

* Multiple selections are not possible.

Code	Content	
No Code	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, Tool operated, without cover	
M3	Non-locking, tool operation, without cover	

⓬ Ozone/Coolant proof

Code	Content
No Code	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

⓭ Residual pressure exhaust valve

Code	Content	
No Code	Without residual pressure exhaust valve	
*1, *2 Y1	With non-locking residual pressure exhaust valve	
*1, *2 Y2	With locking residual pressure exhaust valve	

*1: ❶Solenoid position "3" and "4" only are supported.
*2: ⓫Only the manual override "M2" and "M3" are supported.

⓮ With/Without spacer

Code	Content
No Code	Without spacer
Z	With spacer (type and location specified in MF specifications sheet)

*1: Specify the spacer type and mounting position in the manifold specifications sheet. Stacking of spacers is not possible. Combination with the blanking plate is not supported. Cannot be selected together with L-type push-in fitting (upward).

⓯ Exhaust check valve

Code	Content	
No Code	None	
H	With exhaust check valve	

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve. Specify the number of stations to install in the manifold specifications sheet.

⓰ Port A/B filter

Code	Content	
No Code	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

Model No. Notation Method

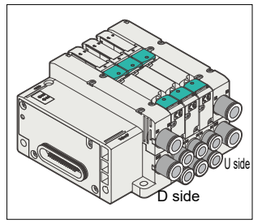
Manifold with solenoid valve (for connection)

15 mm width (valve width)

Option

TVG2M- 2 B 06CS 3 KA1C- 05 B -HP1

Model No.
❷ Piping direction
❹ Voltage
❻ Station No.
❽ Base internal wiring system
❿ Electric circuit specifications
⓬ Ozone/ Coolant proof
⓮ Valve mounting screw
⓰ Exhaust check valve
❶ Switching position class
❸ Connection Port Size
❺ Electrical connections
❼ P/R Port Position
❾ Pilot operated
⓫ Manual Override
⓭ Residual pressure exhaust valve
⓯ With/ Without spacer
⓱ Port A/B filter



❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
X	Mix manifold	
A	3-port valve Two valves integrated *1	A valve side: Normally closed/B valve side: Normally Closed
B		A valve side: Normally open/B valve side: Normally Open
C		A valve side: Normally closed/B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions is the same as the 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• Metric fitting

Fitting	Port A/B		Code	
Push-in	ø4		04CS	
	ø6		06CS	
	ø8		08CS	
	ø10		10CS	
Push-in L-type upward *2	ø6		06CU	
	ø8		08CU	
Push-in L type downward	ø6		06CD	
	ø8		08CD	
Push-in	Mix		99CX	*3
Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø4	Plug	04CA	
	ø6		06CA	
	ø8		08CA	
	ø10		10CA	
	Plug	ø4	04CF	
		ø6	06CF	
		ø8	08CF	
		ø10	10CF	
Push-in L-type upward *2	ø6	Plug	06CB	
	ø8		08CB	
	Plug	ø6	06CG	
		ø8	08CG	
Push-in L type downward	ø6	Plug	06CC	
	ø8		08CC	
	Plug	ø6	06CH	
		ø8	08CH	

• Inch fitting

Fitting	Port A/B		Code	
Push-in	ø1/4"		06LS	
	ø5/16"		08LS	
Push-in L-type upward *2	ø1/4"		06LU	*4
	ø5/16"		08LU	*4
Push-in	Mix		99LX	*3
Fitting	Single side plug specifications *1		Code	
	Port A	Port B		
Push-in	ø1/4"	Plug	06LA	
	ø5/16"		08LA	
	Plug	ø1/4"	06LF	
		ø5/16"	08LF	
Push-in L-type upward *2	ø1/4"	Plug	06LB	*4
	ø5/16"		08LB	*4
	Plug	ø1/4"	06LG	*4
		ø5/16"	08LG	*4

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.
*2: 3-position is not available for L-type upward push-in fittings.
*3: Port size mixtures of ports 4(A) and 2(B) are not available.
*4: Custom Product.

❹ Voltage

Code	Content
3	24 VDC

❺ Electrical connections

Content	Output Format	# of points	Code
RT Series interface	NPN	32 points Output	KA1C
	PNP		KA1D

❻ Station No.

Code	Content
02	2 stations
to	to
24	24 stations

How to order (manifold with solenoid valve for connection)

- For RT Series (), Series refer to "Pneumatic Valves" (Catalog No.CC-1557AA).
- If an exhaust check valve is necessary, refer to page 54.

❼ Port P/R position * Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U side, D side	
*1 T	With U side, D side, intermediate supply and exhaust block	

*1: Specify the specifications of the intermediate supply and exhaust block in the manifold specifications sheet.

❽ Base internal wiring system *1

Code	Content
Blank	(double wiring)
S	Single solenoid, double solenoid layout specification

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.

❾ Pilot operated

Code	Content	
Blank	Internal pilot	
K	External pilot	

❿ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

⓫ Manual device * Multiple selections are not possible.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, Tool operated, without cover	
M3	Non-locking, tool operation, without cover	

⓬ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

⓭ Residual pressure exhaust valve

Code	Content	
Blank	Without residual pressure exhaust valve	
*1, *2 Y1	With non-locking residual pressure exhaust valve	
*1, *2 Y2	With locking residual pressure exhaust valve	

*1: ❶Solenoid position "3" and "4" only are supported.
*2: ⓫Only the manual override "M2" and "M3" are supported.

⓮ Valve mounting screw

Code	Content
Blank	Pan head machine screw with Phillips head/flathead
J	Hexagon Socket Head Cap Screw

*1: ⓯With/without spacer "Z" cannot be selected with "J".

⓯ With/Without spacer

Code	Content
Blank	Without spacer
Z	With spacer (type and location specified in MF specifications sheet)

*1: Specify the spacer type and mounting position in the manifold specifications sheet. Stacking of spacers is not possible. Combination with the blanking plate is not supported. Cannot be selected together with L-type push-in fitting (upward).

⓰ Exhaust check valve

Code	Content	
Blank	None	
H	With exhaust check valve	

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve. Specify the number of stations to install in the manifold specifications sheet.

⓱ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

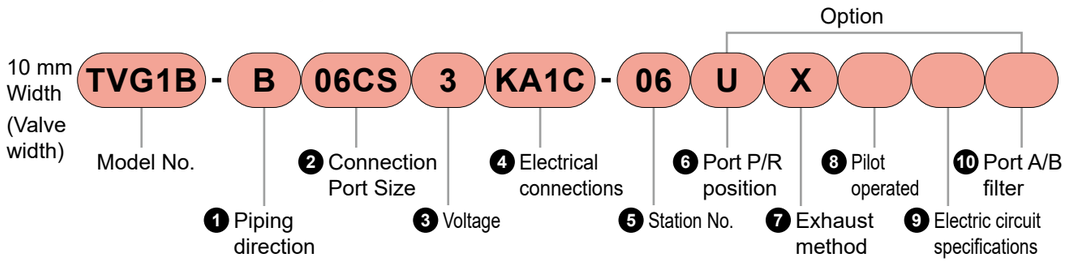
*1: A filter is built into port P.

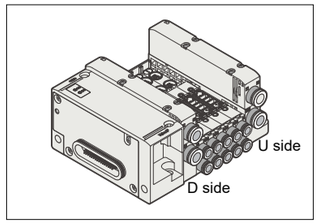
How to order (connection manifold base only)

- For the RT Series, please refer to the Remote I/O RT Series (Catalog No.CC-1557AA).

Model No. Notation Method

Manifold base for connection only. * Solenoid valve is not included.





1 Piping direction

Code	Content
B	Side piping

2 Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code	
Push-in	ø1.8	0ACS	*2
	ø4	04CS	
	ø6	06CS	
Push-in L-type upward *1	ø1.8	0ACU	*2
	ø4	04CU	
	ø6	06CU	
Push-in L type downward	ø1.8	0ACD	*2
	ø4	04CD	
	ø6	06CD	

• Inch fitting

Fitting	Port A/B	Code	
Push-in	ø1/8"	03LS	
	ø5/32"	04LS	
Push-in L-type upward *1	ø1/8"	C3LU	*3
	ø5/32"	04LU	*3

*1: 3-position is not available for L-type upward push-in fittings.
*2: Custom Product.

3 Voltage

Code	Content
3	24 VDC

4 Electrical connections

Content	Output Format	Number of points	Code
RT Series interface	NPN	32 point output	KA1C
	PNP		KA1D

5 Station No.

Code	Content
02	2 stations
to	to
16	16 stations

*1: The wiring inside the base is all for double solenoid regardless of the type of valve used. The blank number for one solenoid is generated in the section where a single solenoid is mounted.

6 Port P/R position

(TVG1B: ø 8)
* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U, D both sides	

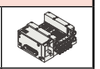
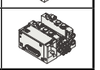
*1: The Port P/R tube has the same direction as the Port A/B tube.
*2: A port P filter is integrated.

7 Exhaust method

Code	Content	
Blank	Centralized Exhaust (port R is a push-in fitting)	
*1 X	Silencer integrated (port R is a plug, exhaust is released to atmosphere)	

*1: 6 A silencer is integrated at the position selected with port P/R position.

8 Pilot operated

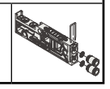
Code	Content	
Blank	Internal pilot	
K	External pilot	

9 Electrical circuit specification * Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low dust generation/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

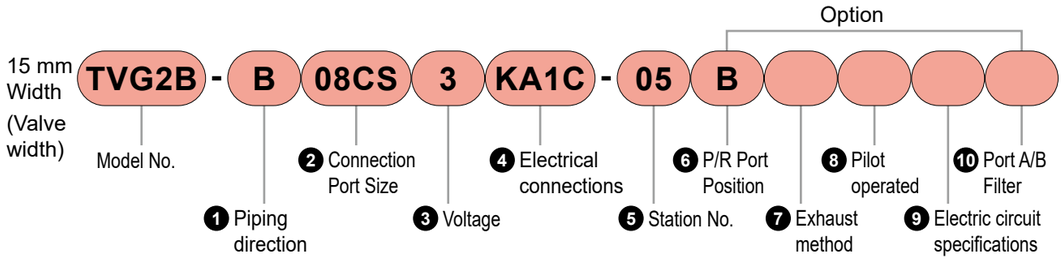
10 Port A/B filter

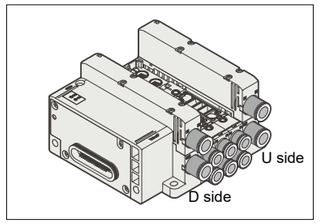
Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

Model No. Notation Method

Manifold base for connection only. * Solenoid valve is not included.





❷ Port size (port A/B)

• Metric fitting

Fitting		Port A/B	Code
Push-in		ø4	04CS
		ø6	06CS
		ø8	08CS
		ø10	10CS
Push-in L-type upward	*1	ø6	06CU
		ø8	08CU
Push-in L type downward		ø6	06CD
		ø8	08CD

• Inch fitting

Fitting		Port A/B	Code	
Push-in		ø1/4"	06LS	
		ø5/16"	08LS	
Push-in L-type upward		ø1/4"	06LU	*2
	*1	ø5/16"	08LU	*2

*1: 3-position is not available for L-type upward push-in fittings.
*2: Custom Product.

❸ Voltage

Code	Content
3	24 VDC

❹ Electrical connections

Content	Output Format	Number of points	Code
RT Series interface	NPN	32 points Output	KA1C
	PNP		KA1D

❺ Station No.

Code	Content
02	2 stations
to	to
16	16 stations

*1: The wiring inside the base is all for double solenoid regardless of the type of valve used. The blank number for one solenoid is generated in the section where a single solenoid is mounted.

❻ Port P/R position

(TVG2B: ø10)
* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U, D both sides	

*1: The port P/R tube has the same direction as the port A/B tube.
*2: A port P filter is integrated.

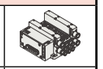
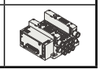
How to order (connection manifold base only)

• For the RT Series, please refer to the Remote I/O RT Series (Catalog No.CC-1557AA).

❶ Piping direction

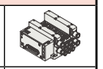
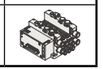
Code	Content
B	Side piping

❼ Exhaust method

Code	Content	
Blank	Centralized Exhaust (port R is a push-in fitting)	
*1 X	Silencer integrated (port R is a plug, exhaust is released to atmosphere)	

*1: ❻A silencer is integrated at the position selected with port P/R position.

❽ Pilot operated

Code	Content	
Blank	Internal pilot	
K	External pilot	

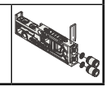
❾ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low dust generation/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❿ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

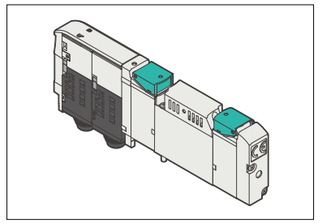
Model No. Notation Method

Discrete solenoid valve (for base mounting)

10 mm Width (Valve width)

TVG1 - 1 B 00XX 3 - (Option) - HP1

- TVG1: Model No.
- 1: ❶ Switching position class
- B: ❷ Piping direction
- 00XX: ❸ Connection Port Size
- Option: ❹ Pilot operated, ❺ Manual Override, ❻ Ozone/Coolant proof, ❼ Residual pressure exhaust valve
- HP1



Attached Parts
- The valve mounting screws are included.
- The gasket is attached to the manifold base.

❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve Two valves integrated	A valve side: Normally Closed B valve side: Normally Closed
*1 B		A valve side: Normally Open B valve side: Normally Open
*1 C		A valve side: Normally Closed B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Connection Port Size

Code	Content
00XX	Discrete solenoid valve for base

❹ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

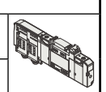
❺ Manual device * Multiple selections are not possible.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, Without cover	
M3	Non-locking, tool operation, without cover	

❻ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

❼ Residual pressure exhaust valve

Code	Content	
Blank	Without residual pressure exhaust valve	
*1, *2 Y1	With non-locking residual pressure exhaust valve	
*1, *2 Y2	With locking residual pressure exhaust valve	

*1: ❶Solenoid position "3" and "4" only are supported.
*2: ❺Only the manual override "M2" and "M3" are supported.

- Refer to Series (Catalog No.CC-1557AA) for the RT Series ().
- If an exhaust check valve is necessary, refer to page 54.

How to order (solenoid valve single unit)

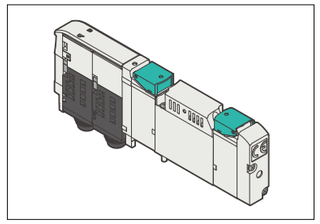
Model No. Notation Method

Discrete solenoid valve (for base mounting)

15 mm Width (Valve width)

TVG2 - 1 B 00XX 3 - (Option) - HP1

- TVG2: Model No.
- 1: ❶ Switching position class
- B: ❷ Piping direction
- 00XX: ❸ Connection Port Size
- Option: ❹ Pilot operated, ❺ Manual Override, ❻ Ozone/Coolant proof, ❼ Residual pressure exhaust valve, ❽ Valve mounting Thread
- HP1



Attached Parts
- The valve mounting screws are included.
- The gasket is attached to the manifold base.

❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve Two valves integrated	A valve side: Normally Closed B valve side: Normally Closed
*1 B		A valve side: Normally Open B valve side: Normally Open
*1 C		A valve side: Normally Closed B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

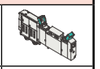
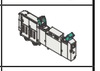
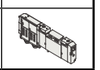
❸ Connection Port Size

Code	Content
00XX	Discrete solenoid valve for base

❹ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

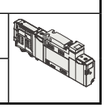
❺ Manual device * Multiple selections are not possible.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, Without cover	
M3	Non-locking, tool operation, without cover	

❻ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

❼ Residual pressure exhaust valve

Code	Content	
Blank	Without residual pressure exhaust valve	
*1, *2 Y1	With non-locking residual pressure exhaust valve	
*1, *2 Y2	With locking residual pressure exhaust valve	

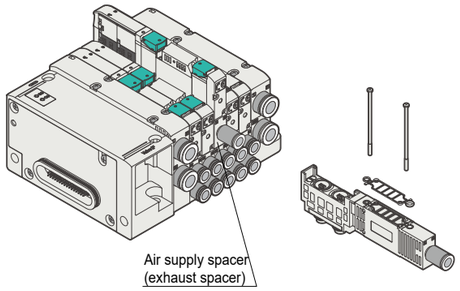
*1: ❶Solenoid position "3" and "4" only are supported.
*2: ❺Only the manual override "M2" and "M3" are supported.

❽ Valve mounting screw

Code	Content
Blank	Pan head machine screw with Phillips head/flathead
J	Hexagon Socket Head Cap Screw

- Refer to Series (Catalog No.CC-1557AA) for the RT Series ().
- If an exhaust check valve is necessary, refer to page 54.

Air supply spacer/exhaust spacer



Specifications

● Air supply spacer

Model No.	Weight g
TVG1P-P-□	31

● Exhaust spacer

Model No.	Weight g
TVG1P-R-□	31

Discrete model No.

● Air supply spacer

TVG1P – P – 04CS

❶ Connection Port Size

❶ Connection Port Size

Code	Bore size	Content
04CS	ø4	ø4 Push-in fitting
06CS	ø6	ø6 Push-in fitting

● Exhaust spacer

TVG1P – R – 04CS

❶ Connection Port Size

❶ Connection Port Size

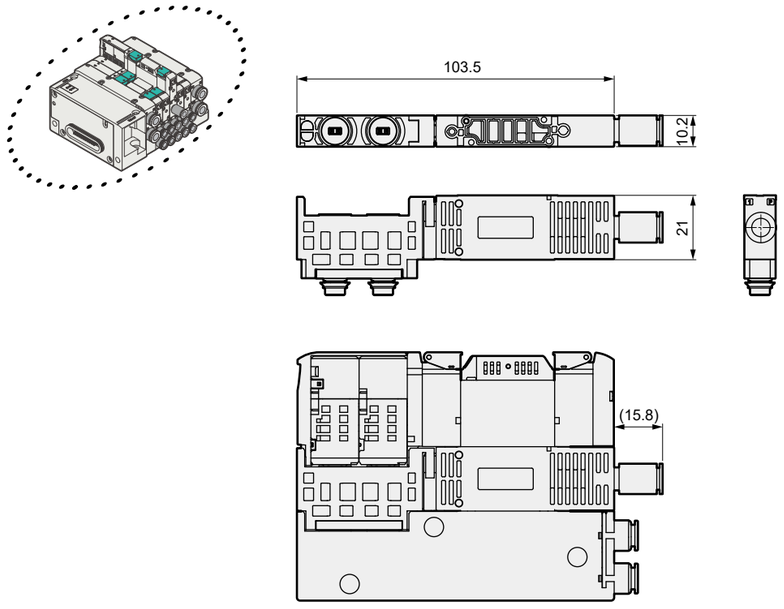
Code	Bore size	Content
04CS	ø4	ø4 Push-in fitting
06CS	ø6	ø6 Push-in fitting

⚠ Notes for model No. Selection

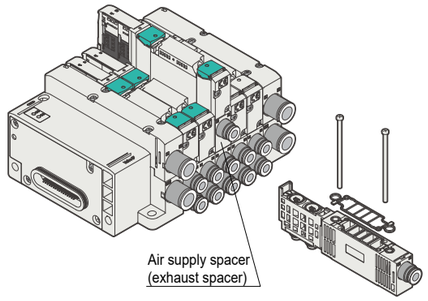
*1: Specify the positions and quantity of spacers for manifold in the manifold specifications sheet (**Refer to pages 127 to 130. Please provide instructions.**
*2: Stacking of spacers is not possible.
*3: A spacer cannot be combined with a blanking plate.
*4: A spacer mounting screw and gasket are included.
*5: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.

External Dimension Drawings

● Air supply spacer/exhaust spacer



Air supply spacer/exhaust spacer



Specifications

● Air supply spacer

Model No.	Weight g
TVG2P-P-□	56

● Exhaust spacer

Model No.	Weight g
TVG2P-R-□	56

Discrete model No.

● Air supply spacer

TVG2P – P – 06CS

❶ Connection Port Size

❶ Connection Port Size

Code	Bore size	Content
06CS	ø6	ø6 Push-in fitting
08CS	ø8	ø8 Push-in fitting
10CS	ø10	ø10 Push-in fitting

● Exhaust spacer

TVG2P – R – 06CS

❶ Connection Port Size

❶ Connection Port Size

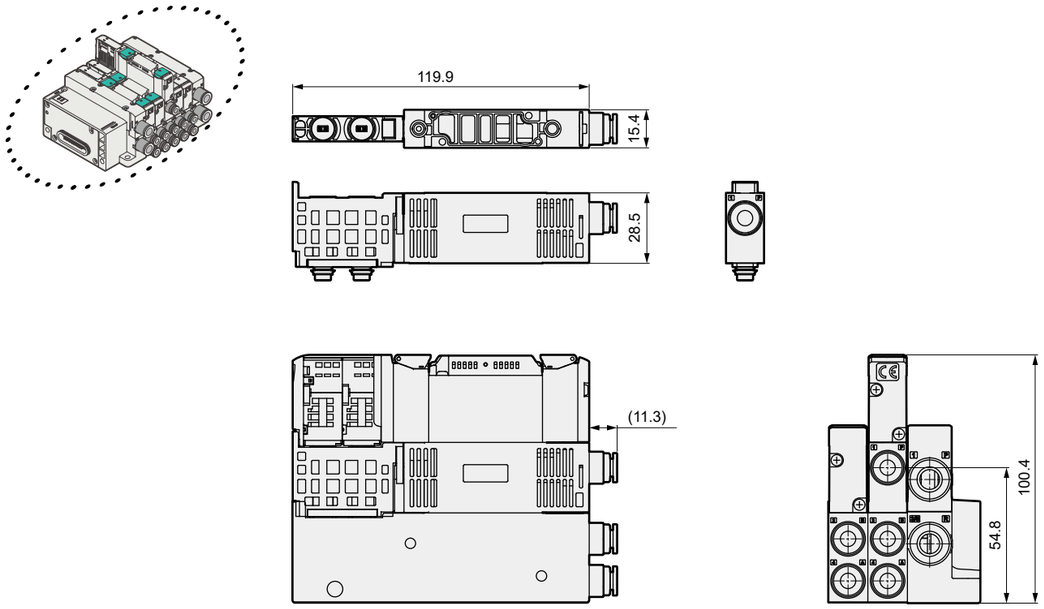
Code	Bore size	Content
06CS	ø6	ø6 Push-in fitting
08CS	ø8	ø8 Push-in fitting
10CS	ø10	ø10 Push-in fitting

⚠ Notes for model No. Selection

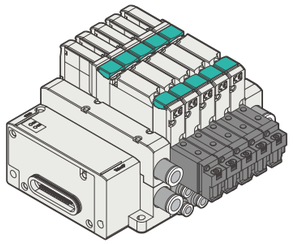
*1: Specify the positions and quantity of spacers for manifold in the manifold specifications sheet (**Refer to pages 127 to 130. Please provide instructions.**
*2: Stacking of spacers is not possible.
*3: A spacer cannot be combined with a blanking plate.
*4: A spacer mounting screw and gasket are included.
*5: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.

External Dimension Drawings

● Air supply spacer/exhaust spacer



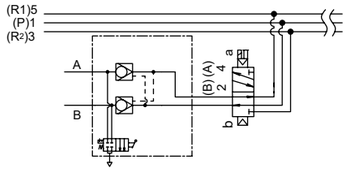
Perfect spacer (spacer pilot check valve)



Specifications

Item		TVG1P-PC-□	TVG2P-PC-□
Operating Fluid		Compressed Air	
Maximum Operating Pressure	MPa	0.7	
Min. working pressure	MPa	0.2	
Proof Pressure	MPa	1.05	
Ambient Temperature	°C	−5 to 55 (no freezing)	
Working fluid temperature	°C	5 to 55	
Atmosphere		Cannot be used in corrosive gas environment.	
Weight	g	34	73

Circuit Diagram Symbol



Note: Please note that if you use cylinders with a large bore (guideline ø50 or more) in a state with almost no throttling on the exhaust side (e.g., without a speed controller or silencer), this may lead to a decrease in intermediate stop accuracy and intermediate stop failure.

Discrete model No.

TVG1 P − PC − M

1 Model No. Perfect Spacer

2 Residual pressure exhaust function

1 Model No.

Code	Content
TVG1	10 mm width (valve width)
TVG2	15 mm width (valve width)

2 Residual pressure exhaust function

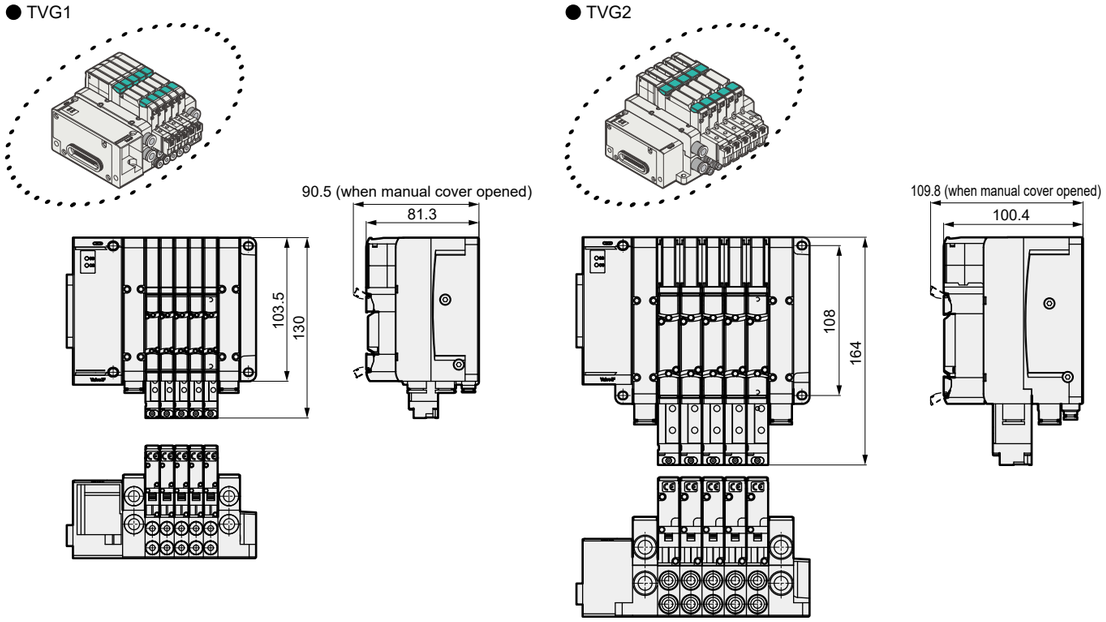
Code	Content
M	Manual override of non-locking
M1	Locking manual device
Blank	Without residual pressure exhaust function

Notes for model No. Selection

Note 1: Please specify the spacer mounting position and the selection of the residual pressure release function in the manifold specifications.
Note 2: If the A/B port fittings are the upward-facing elbow type, a spacer cannot be selected.
Note 3: Stacking multiple spacers is not supported.
Note 4: A spacer and a blanking plate cannot be combined.
Note 5: Spacer mounting screws and a gasket are included.

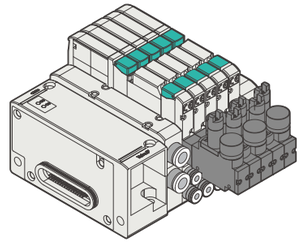
External Dimension Drawings

● TVG1



● TVG2

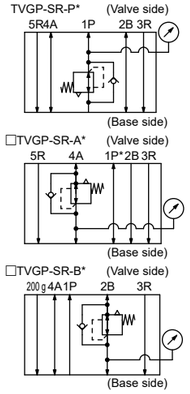
Spacer regulator



Specifications

Item		TVG1P-SR-□	TVG2P-SR-□
Pressure reduction port		P / A / B	
Operating Fluid		Compressed Air	
Maximum Operating Pressure	MPa	0.7	
Min. working pressure	MPa	0.1	
Proof Pressure	MPa	1.05	
Ambient Temperature	°C	−5 to 55 (no freezing)	
Working fluid temperature	°C	5 to 55	
Atmosphere		Cannot be used in corrosive gas environment.	
Weight	g	48	110

Circuit Diagram Symbol



Discrete model No.

TVG1 P − SR − P − G0

1 Model No. Spacer Regulator

2 Pressure reduction specification

3 Pressure Gauge

2 Pressure reduction specification

Code	Content
P	P port pressure reduction
A	A port pressure reduction
B	B port pressure reduction

3 Pressure Gauge

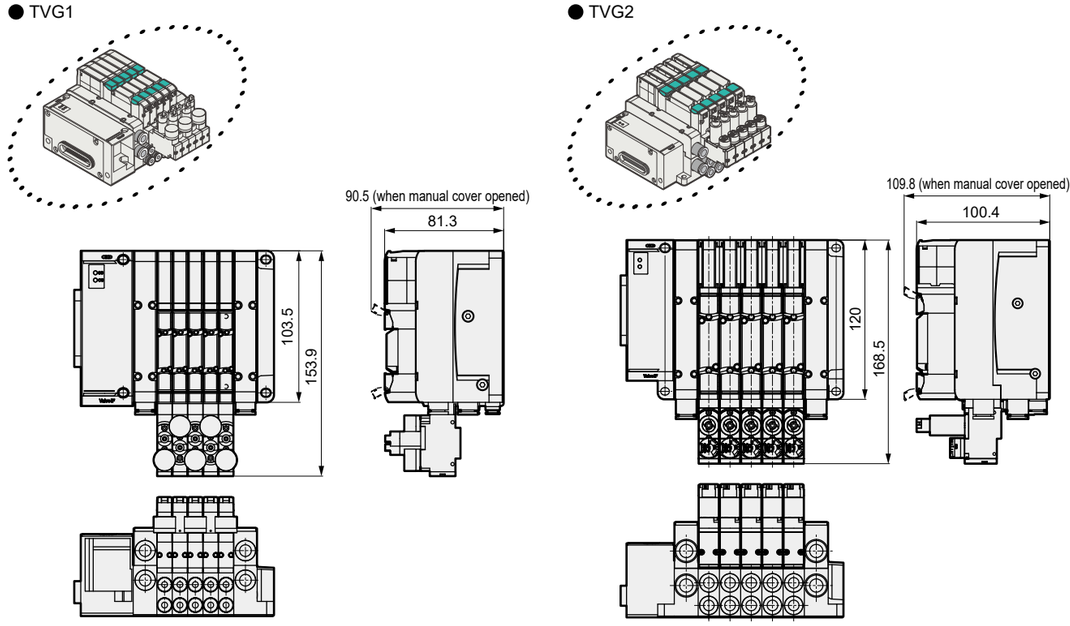
Code	Content	1 Model No. TVG1	TVG2
G0	Without Pressure Gauge	●	●
G1	With pressure gauge for odd numbers	●	
G2	With pressure gauge for even stations	●	
G3	Odd/even stations with common pressure gauge		●

Notes for model No. Selection

*1: Specify the spacer positions in the manifold specifications sheet.
*2: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.
*3: Stacking of spacers is not possible.
*4: A spacer cannot be combined with a blanking plate.
*5: A spacer mounting screw and gasket are included.

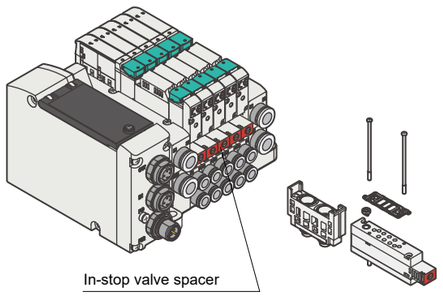
External Dimension Drawings

● TVG1



● TVG2

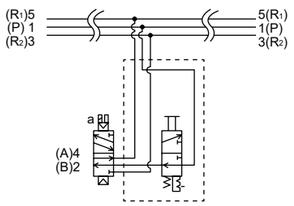
In-stop valve spacer



Specifications

Item		TVG1P-IS	TVG2P-IS
Operating Fluid		Compressed Air	
Maximum Operating Pressure	MPa	0.7	
Min. working pressure	MPa	0.1	
Proof Pressure	MPa	1.05	
Ambient Temperature	°C	−5 to 55 (no freezing)	
Working fluid temperature	°C	5 to 55	
Atmosphere		Cannot be used in corrosive gas environment.	
Weight	g	35	71

Circuit Diagram Symbol



Discrete model No.

TVG1 P − IS

❶ Model No. In-stop valve spacer

❶ Model No.

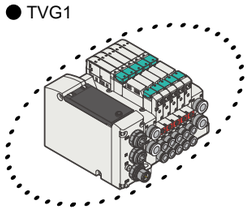
Code	Content
TVG1	10 mm width (valve width)
TVG2	15 mm width (valve width)

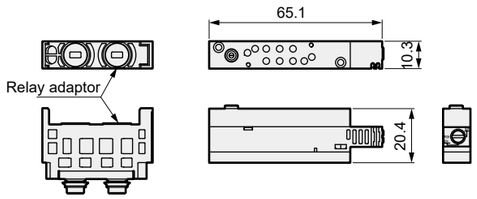
⚠ Notes for model No. Selection

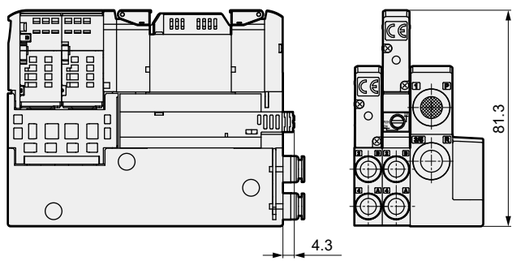
*1: Specify the spacer positions in the manifold specifications sheet.
*2: If the A/B port fitting is elbow type facing upward, a spacer cannot be selected.
*3: Stacking of spacers is not possible.
*4: A spacer cannot be combined with a blanking plate.
*5: Not compatible in combination with external pilot (K).

External Dimension Drawings

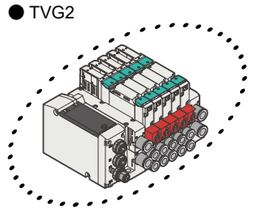
● TVG1

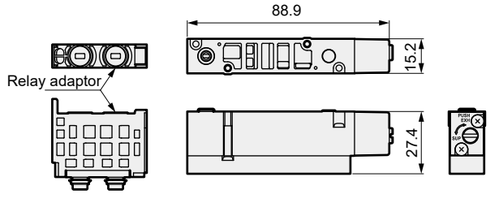


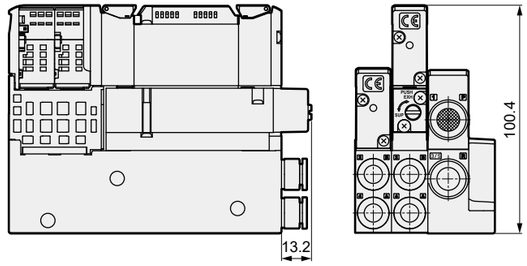




● TVG2



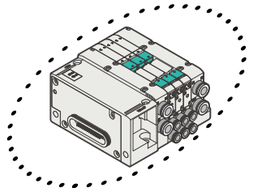


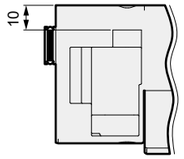


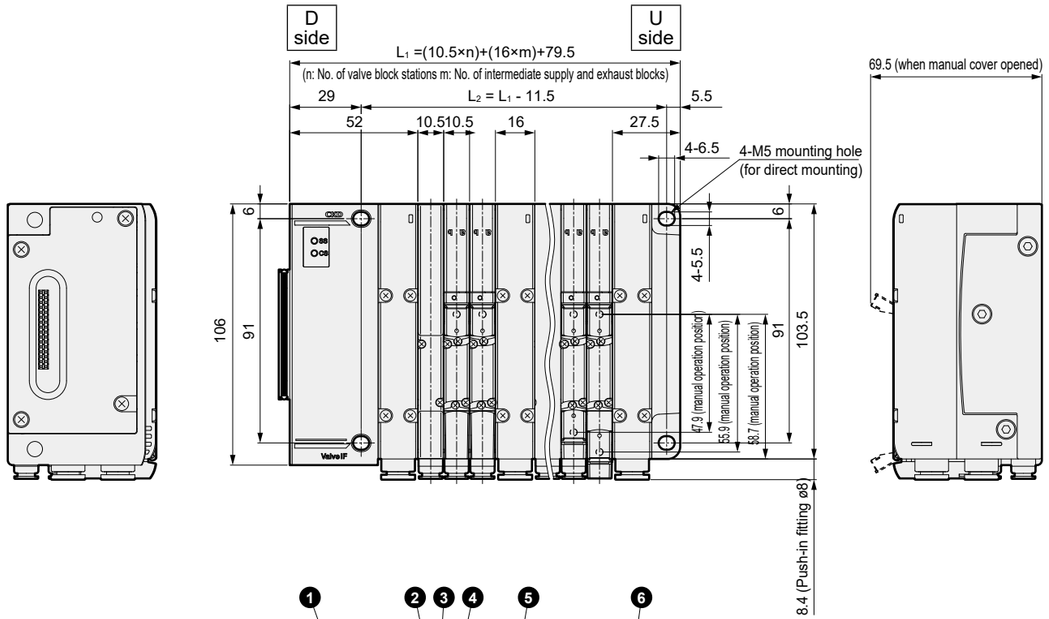
MEMO

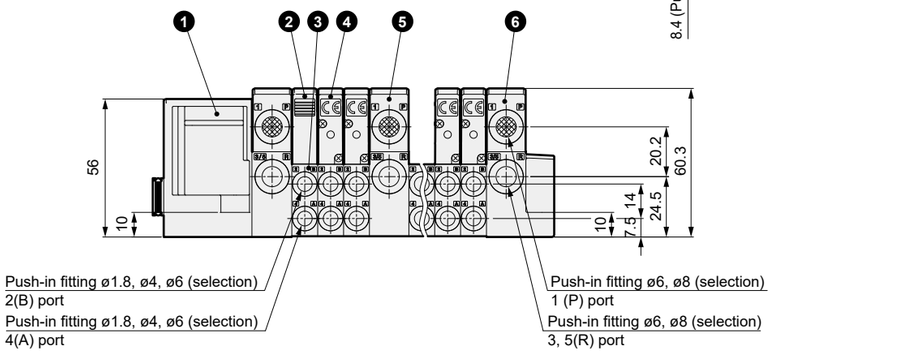
External Dimension Drawings

TVG1M for connection







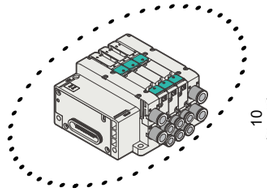


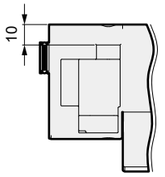
Part No.	Part Name
1	Valve interface
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block

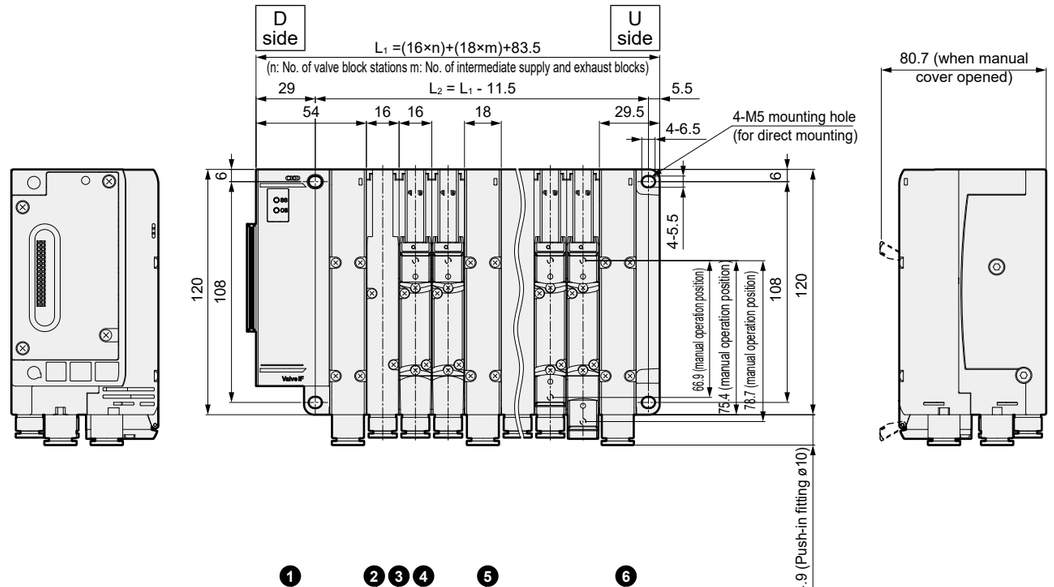
*Two tie rods to connect the valve interface to the RT Series are included.

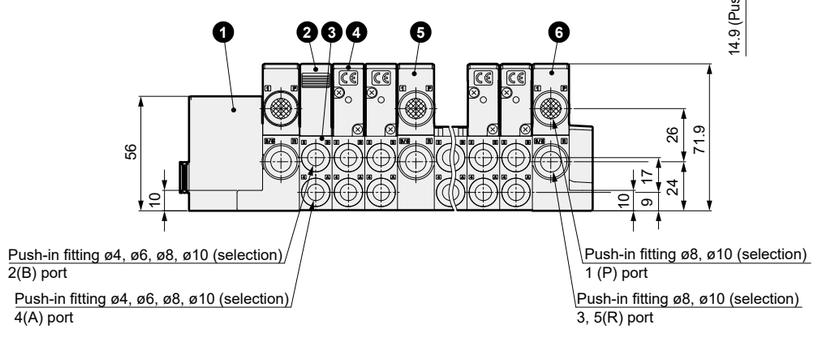
External Dimension Drawings

TVG2M for connection









Part No.	Part Name
1	Valve interface
2	Blanking plate
3	Valve block
4	Single solenoid valve
5	Intermediate supply and exhaust block
6	End block

*Two tie rods to connect the valve interface to the RT Series are included.

External Dimension Drawings

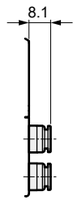
TVG1M

●Fitting straight

●ø1.8 (0ACS)

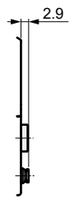
●ø4 (04CS)

●ø6 (06CS)

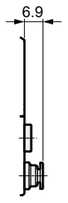


●Fitting straight, single plug

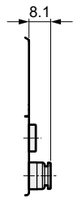
●ø1.8 (0ACA)



●ø4 (04CA)

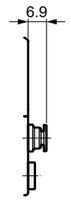


●ø6 06CA

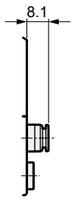


●ø1.8 (0ACF)

●ø4 (04CF)

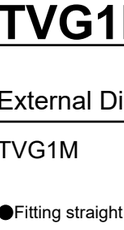


●ø6 (06CF)

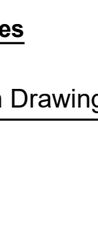


●L fitting (upward)

●ø1.8 (0ACU)



●ø4 (04CU)



●ø6 (06 CU)

●L fitting (downward)

●ø1.8 (0ACD)

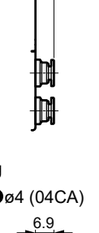
●ø4 (04CD)

●ø6 06CD

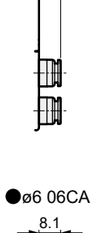
●L fitting (upward), single plug

●ø1.8 (0ACB)

●ø4 (04CB)



●ø6 (06CB)



●ø1.8 (0ACG)

●ø4 (04CG)

●ø6 (06CG)

●L fitting (downward), single plug

●ø1.8 (0ACC)

●ø4 (04CC)

●ø6 (06CC)

●ø1.8 (0ACH)

●ø4 (04CH)

●ø6 (06CH)

External Dimension Drawings

TVG1M

●Fitting straight

●ø1/8" (03LS)

●ø5/32" (04LS)

●Fitting straight, single plug

●ø1/8" (03LA)

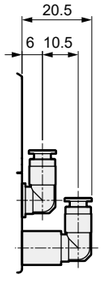
●ø5/32" (04LA)

●ø1/8" (03LF)

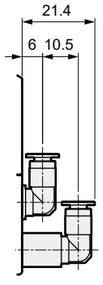
●ø5/32" (04LF)

●L fitting (upward)

●ø1/8" (03LU)

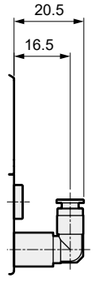


●ø5/32" (04LU)

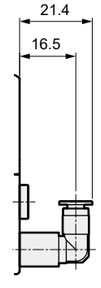


●L fitting (upward), single plug

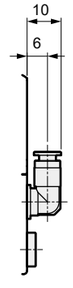
●ø1/8" (03LB)



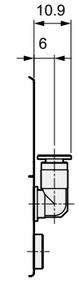
●ø5/32" (04LB)



●ø1/8" (03LG)



●ø5/32" (04LG)

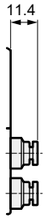


External Dimension Drawings

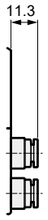
TVG2M

●Fitting straight

●ø4 (04CS)

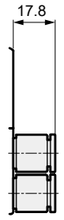


●ø6 (06CS)



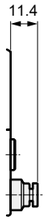
●ø8 (08CS)

●ø10 (10CS)

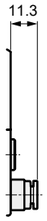


●Fitting straight, single plug

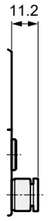
●ø4 (04CA)



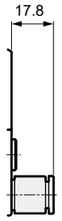
●ø6 06CA



●ø8 08CA



●ø10 (10CA)

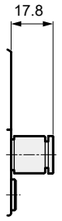


●ø4 (04CF)

●ø6 (06CF)

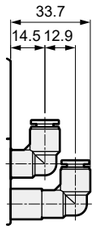
●ø8 (08CF)

●ø10 (10CF)

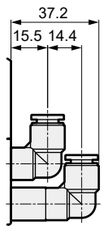


●L fitting (upward)

●ø6 (06 CU)

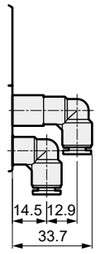


●ø8 (08CU)

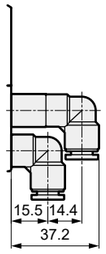


●L fitting (downward)

●ø6 06CD



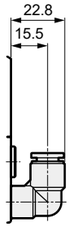
●ø8 08CD



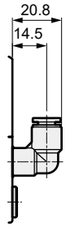
●L fitting (upward), single plug

●ø6 (06CB)

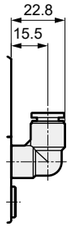
●ø8 (08CB)



●ø6 (06CG)

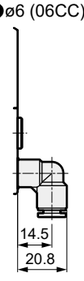


●ø8 (08CG)

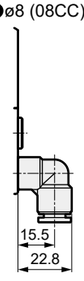


●L fitting (downward), single plug

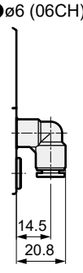
●ø6 (06CC)



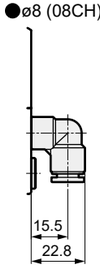
●ø8 (08CC)



●ø6 (06CH)



●ø8 (08CH)



External Dimension Drawings

TVG2M

●Fitting straight

●ø1/4" (06LS)

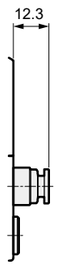
●ø5/16" (08LS)

●Fitting straight, single plug

●06LA ø1/4"

●ø5/16" (08LA)

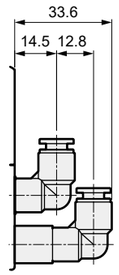
●ø1/4" (06LF)



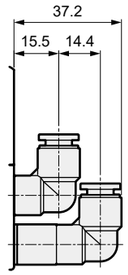
●ø5/16" (08LF)

●L fitting (upward)

●06LU ø1/4"

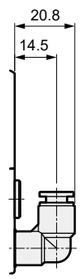


●ø5/16" (08LU)



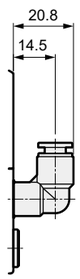
●L fitting (upward), single plug

●ø1/4" (06LB)

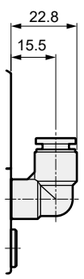


●ø5/16" (08LB)

●ø1/4" (06LG)



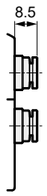
●ø5/16" (08LG)



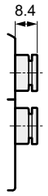
External Dimension Drawings

TVG1M Supply and exhaust block

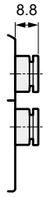
●Fitting straight
●ø6 (06CS)



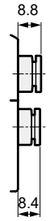
●ø8 (08CS)



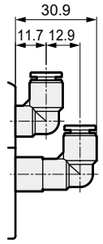
●Fitting straight
●ø5/16" (08LS)



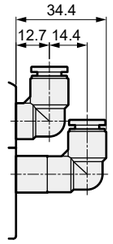
●Port P: ø5/16" (08XS)
Port R: ø8



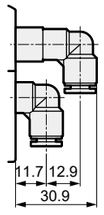
●L fitting (upward)
●ø6 (06 CU)



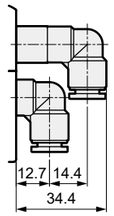
●ø8 (08CU)



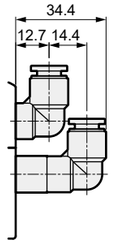
●L fitting (downward)
●ø6 06CD



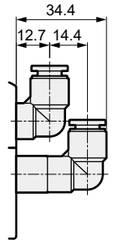
●ø8 08CD



●L fitting (upward)
●ø5/16" (08LU)



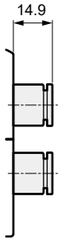
●Port P: ø5/16" (08XU)
Port R: ø8



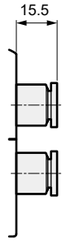
TVG2M Supply and exhaust block

●Fitting straight
●ø8 (08CS)

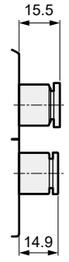
●ø10 (10CS)



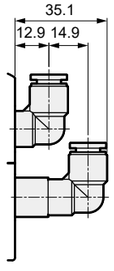
●Fitting straight
●ø3/8" (10LS)



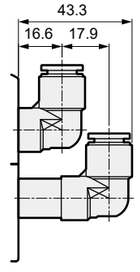
●Port P: ø3/8" (10XS)
Port R: ø10



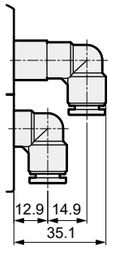
●L fitting (upward)
●ø8 (08CU)



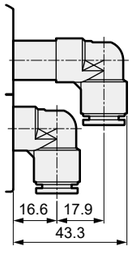
●ø10 (10 CU)



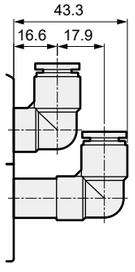
●L fitting (downward)
●ø08 (08CD)



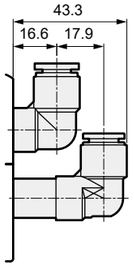
●ø10 (10CD)



●L fitting (upward)
●ø3/8" (10LU)



●Port P: ø3/8" (10XU)
Port R: ø10



How to order (valve interface (supply and exhaust air))

Model No. Notation Method

Valve interface (supply and exhaust air)

10 mm Width	TVG1P	- T	B	-	08CS	-		KA1C
15 mm Width	TVG2P	- T	B	-	10CS	-		KA1C
(Valve width)	❶ Model No.		❷ Piping direction		❸ Connection Port Size		❹ Exhaust method / ❺ Pilot operated	❻ Electrical connections

Attached Parts
- The nut for fixing tie rod is built into the valve interface.
- Comes with two tie rods that fasten the valve interface to the RT Series.

❸ Connection Port Size

●: Standard compliance
○: Custom Product

			❶ Model No. TVG1P	❶ Model No. TVG2P
Metric fitting				
Fitting	**Port P/R**	**Code**		
Push-in	ø6	06CS	●	
	ø8	08CS	●	●
	ø10	10CS		●
Push-in L-type upward	ø6	06CU	●	
	ø8	08CU	●	●
	ø10	10CU		●
Push-in L type downward	ø6	06CD	●	
	ø8	08CD	●	●
	ø10	10CD		●
*1 **Inch fitting**				
Fitting	**Port P/R**	**Code**		
Push-in	ø5/16"	08LS	●	
	ø3/8"	10LS		●
Push-in L-type upward	ø5/16"	08LU	○	
	ø3/8"	10LU		○
*3 **Port P: Fittings Inch, port R: Metric fitting**				
Fitting	**P Port**	**R Port**	**Code**	
Push-in	ø5/16"	ø8	08XS	●	
	ø3/8"	ø10	10XS		●
Push-in L-type upward	ø5/16"	ø8	08XU	○	
	ø3/8"	ø10	10XU		○
Plug				
Port P/R			**Code**	
Plug			00XX	●	●

*1: Select 08XS, 10XS, 08XU or 10XU when using a silencer with inch Fittings specifications. Fittings Port R and PR (for KZ) are metric.
*2: ❺Pilot, K, KZ and 00XX cannot be selected together.
*3: Cannot be selected together with exhaust method X.

❷ Piping direction

Code	Content
B	Side piping

❹ Exhaust method

	Code	Content
	Blank	Centralized Exhaust (port R is a push-in fitting)
*1	X	Exhaust is open to atmosphere, with built-in silencer (Port R is sealed.)

*1: ❸X is not available for port size "00XX".
*2: X is not available for pilot KZ.

❺ Pilot operated

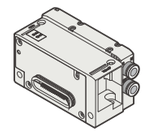
	Code	Content
	Blank	Internal pilot
*1, *2	K	External pilot
*1, *2	KZ	External pilot (PA/PR separated)

*1: ❸Cannot be selected for port size "00XX" and "□□X□".
*2: The external pilot port is an ø6 One-touch Fitting, and in the case of □□L□, it will be an ø5/32 inch fitting.

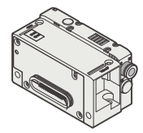
❻ Electrical connections

Content		Code
Valve interface	NPN	KA1C
	PNP	KA1D

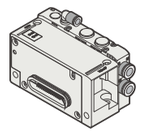
● TVG1P-TB-08CS



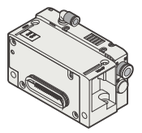
● TVG1P-TB-08CS-X



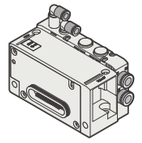
● TVG1P-TB-08CS-K



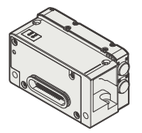
● TVG1P-TB-08CS-XK



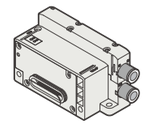
● TVG1P-TB-08CS-KZ



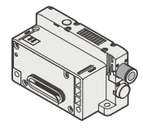
● TVG1P-TB-00XX



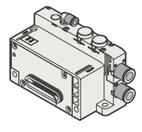
● TVG2P-TB-10CS



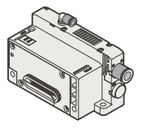
● TVG2P-TB-10CS-X



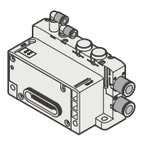
● TVG2P-TB-10CS-K



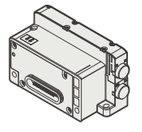
● TVG2P-TB-10CS-XK



● TVG2P-TB-10CS-KZ



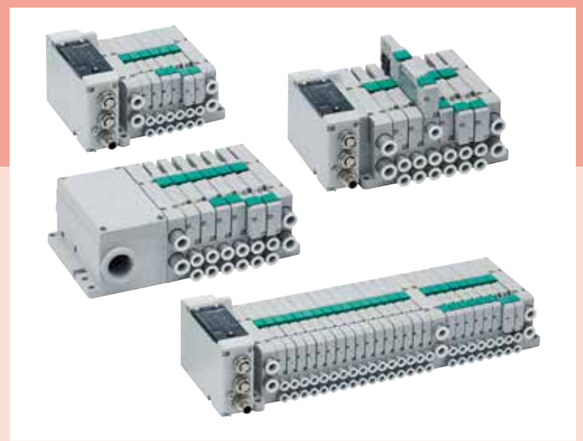
● TVG2P-TB-00XX



TVG

3, 5-port pilot operated valve, plug-in block manifold

Specifications for rechargeable battery manufacturing processes



CONTENTS

Model No. Notation Method

Manifold * with solenoid valve P4 Series has limited materials for air flow path/sliding part.

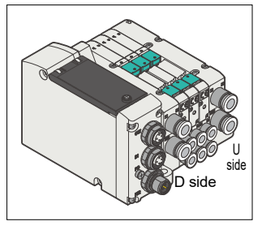
10 mm width (valve width)

Option

TVG1M - 1 B 06CS 3 JA4C - 06 U -P4-HP1

Model No.

1 Switching position class
2 Piping direction
3 Connection Port Size
4 Voltage
5 Electrical connections
6 Station No.
7 Port P/R position
8 Base internal wiring system
9 Pilot operated
10 Electric circuit specifications
11 Manual Override
12 Ozone/ Coolant proof
13 Spacer Yes/No
14 Exhaust check valve
15 Port A/B filter
16 Mount type



1 Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
X	Mix manifold	
A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
B	Two valves	A valve side: Normally open/B valve side: Normally Open
C	integrated *1	A valve side: Normally closed/B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions is the same as the 2-position double.

2 Piping direction

Code	Content
B	Side piping

3 Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code
Push-in fitting	ø4	04CS
	ø6	06CS
	Mix	99CX

*1

Fitting	Single side plug specifications		Code
	Port A	Port B	
Push-in fitting	ø4	Plug	04CA
	ø6		06CA
	Plug	ø4	04CF
		ø6	06CF

*1: Port size mixtures of ports 4(A) and 2(B) are not available.
*2: Ports A and B are available with one-sided plug specifications for 2-position single only.

4 Voltage

Code	Content
3	24 VDC

5 Electrical connections

• Reduced wiring connection

Communication protocol	Output Format	Code
Common terminal block (M3 thread)	NPN	EA1A
	PNP	EA1B
Multi-connector	NPN	FA1A
	PNP	FA1B
D-sub Connector	NPN	GA1A
	PNP	GA1B

• Serial transmission

Communication protocol		Output Format	Number of Output Points	Code
DeviceNet		NPN	32 points	JA1C
		PNP		JA1D
CC-LINK		NPN		JA2C
		PNP		JA2D
EtherCAT		NPN		JA3C
		PNP		JA3D
EtherNet/IP		NPN		JA4C
		PNP		JA4D
CC-Link IEF Basic		NPN		JA5C
		PNP		JA5D
PROFINET		NPN		JA6C
		PNP		JA6D
CC-Link IE Field		NPN		JA7C
		PNP		JA7D
CC-Link IE TSN		NPN		JA8C
		PNP		JA8D
IO-Link	Class A	NPN		JA9C
		PNP		JA9D
	Class B	NPN		JA9G
		PNP		JA9H
IO-Link Wireless		NPN		JB1C
		PNP		JB1D

6 Station No.

*1, *2

Code	Content
02	2 stations
to	to
24	24 stations

*1: Differs depending on the reduced wiring specifications. Refer to the individual specifications (on page 7).
*2: 16For mount "R" (DIN rail), the max. station No. is 16.

How to order (manifold with solenoid valve)

• If an exhaust check valve is necessary, refer to page 54.

7 Port P/R position

* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U side, D side	
T	U side, D side, With intermediate supply and exhaust block	

*1: Specify the specifications of the intermediate supply and exhaust block in the manifold specifications sheet.
*2: The atmosphere release (internal silencer) type does not support P4 specifications.

8 Base internal wiring system*1

Code	Content
Blank	(Double wiring)
S	Single solenoid, Double solenoid layout specification

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.

9 Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

10 Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1:Combination of "E2" and PNP specifications is Custom Product.

11 Manual device * Multiple selections are not possible.

Code	Content	
Blank	Locking/non-locking common, With misoperation prevention cover	
M1	Non-locking, With misoperation prevention cover	
M2	Locking/non-locking common, Tool operated, without cover	
M3	Non-locking, Tool operated, without cover	

12 Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (Main valve fluorine specification)

13 With/Without spacer

Code	Content
Blank	Without spacer
Z	With spacer (Type and location are specified in the MF specifications sheet)

*1: Specify the spacer type and mounting position in the manifold specifications sheet. Stacking of spacers is not possible. Combination with the blanking plate is not supported. The spacer Regulators does not support P4 specifications.

14 Exhaust check valve

Code	Content	
Blank	None	
H	With exhaust check valve	

*1

*1: 1Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve. Specify the number of stations to install in the manifold specifications sheet.

15 Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

16 Mount type

Code	Content
Blank	Direct mount
R	DIN rail mount

Model No. Notation Method

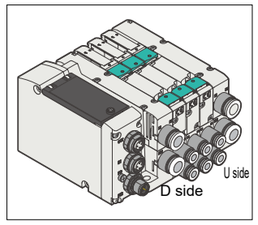
Manifold * with solenoid valve P4 Series has limited materials for air flow path/sliding part.

15 mm width (valve width)

Option

TVG2M - 2 B 06CS 3 JA4C - 05 B [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] -P4-HP1

- TVG2M: Model No.
- 2: ❷ Piping direction
- B: ❸ Connection Port Size
- 06CS: ❺ Electrical connections
- 3: ❹ Voltage
- JA4C: ❼ Port P/R position
- 05: ❻ Station No.
- B: ❽ Base internal wiring system
- [ ]: ❾ Pilot operated
- [ ]: ❿ Electric circuit specifications
- [ ]: ⓫ Manual Override
- [ ]: ⓬ Ozone/Coolant proof
- [ ]: ⓭ Valve mounting Thread
- [ ]: ⓮ Spacer with/without
- [ ]: ⓯ Exhaust check valve
- [ ]: ⓰ Port A/B filter
- -P4-HP1: ⓱ Mount type



❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
X	Mix manifold	
A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
B	Two valves integrated *1	A valve side: Normally open/B valve side: Normally Open
C		A valve side: Normally closed/B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions is the same as the 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code	
Push-in fitting	ø4	04CS	
	ø6	06CS	
	ø8	08CS	
	Mix	99CX	*1

Fitting	Single side plug specifications		Code
	Port A	Port B	
Push-in fitting	ø4	Plug	04CA
	ø6		06CA
	ø8		08CA
Push-in fitting	Plug	ø4	04CF
		ø6	06CF
		ø8	08CF

*1: Port size mixtures of ports 4(A) and 2(B) are not available.
*2: Ports A and B are available with one-sided plug specifications for 2-position single only.

❹ Voltage

Code	Content
3	24 VDC

❺ Electrical connections

• Reduced wiring connection

Communication protocol	Output Format	Code	
Common terminal block (M3 thread)	NPN	EA1A	
	PNP	EA1B	
Multi-connector	NPN	FA1A	
	PNP	FA1B	
D-sub Connector	NPN	GA1A	
	PNP	GA1B	

• Serial transmission

Communication protocol		Output Format	Number of Output Points	Code	
DeviceNet		NPN	32 points	JA1C	
		PNP		JA1D	
CC-LINK		NPN		JA2C	
		PNP		JA2D	
EtherCAT		NPN		JA3C	
		PNP		JA3D	
EtherNet/IP		NPN		JA4C	
		PNP		JA4D	
CC-Link IEF Basic		NPN		JA5C	
		PNP		JA5D	
PROFINET		NPN		JA6C	
		PNP		JA6D	
CC-Link IE Field		NPN		JA7C	
		PNP		JA7D	
CC-Link IE TSN		NPN		JA8C	
		PNP		JA8D	
IO-Link	Class A	NPN		JA9C	
		PNP		JA9D	
	Class B	NPN		JA9G	
		PNP		JA9H	
IO-Link Wireless		NPN		JB1C	
		PNP		JB1D	

❻ Station No.

Code	Content
02	2 stations
to	to
24	24 stations

*1, *2

*1: Differs depending on the reduced wiring specifications. Refer to the individual specifications (on page 7).
*2: ⓱For mount "R" (DIN rail), the max. station No. is 16.

❼ Port P/R position

* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U side, D side	
T	U side, D side, With intermediate supply and exhaust block	

*1: Specify the specifications of the intermediate supply and exhaust block in the manifold specifications sheet.
*2: The atmosphere release (internal silencer) type does not support P4 specifications.

❽ Base internal wiring system*1

Code	Content
Blank	(Double wiring)
S	Single solenoid, Double solenoid layout specification

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.

❾ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

❿ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: Combination of "E2" and PNP specifications is Custom Product.

⓫ Manual device * Multiple selections are not possible.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, without cover	
M3	Non-locking, tool operation, without cover	

⓬ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (Main valve fluorine specification)

⓭ Valve mounting screw

Code	Content
Blank	Pan head machine screw with Phillips head/flathead
J	Hexagon Socket Head Cap Screw

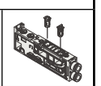
*1: ⓮With/without spacer "Z" cannot be selected with "J".

⓮ With/Without spacer

Code	Content
Blank	Without spacer
Z	With spacer (Type and location are specified in the MF specifications sheet)

*1: Specify the spacer type and mounting position in the manifold specifications sheet. Stacking of spacers is not possible. Combination with the blanking plate is not supported. Cannot be selected together with L-type push-in fitting (upward). The spacer Regulators does not support P4 specifications.

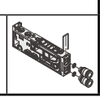
⓯ Exhaust check valve

Code	Content	
Blank	None	
H	With exhaust check valve	

*1

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve. Specify the number of stations to install in the manifold specifications sheet.

⓰ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

⓰ Mount type

Code	Content
Blank	Direct mount
R	DIN rail mount

• If an exhaust check valve is necessary, refer to page 54.

Model No. Notation Method

* The P4 Series has limited materials for the air flow paths and sliding parts.
* Solenoid valve is not included.

Manifold base only

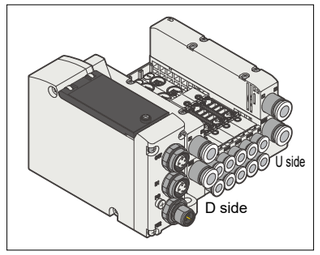
Option

10 mm Width (Valve width)

TVG1B - B 06CS 3 JA4C - 06 U - P4

Model No. | ❷ Connection Port Size | ❹ Electrical connections | ❻ Port P/R position | ❽ Electric circuit specifications | ❿ Mount type

❶ Piping direction | ❸ Voltage | ❺ Station No. | ❼ Pilot operated | ❾ Port A/B Filter



❷ Port size (port A/B)

• Metric fitting

Fitting	Port A/B		Code
Push-in fitting	ø4		04CS
	ø6		06CS
Fitting	Single side plug specifications		Code
	Port A	Port B	
Push-in fitting	ø4	Plug	04CA
	ø6		06CA
	Plug	ø4	04CF
		ø6	06CF

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.

❹ Voltage

Code	Content
3	24 VDC

❶ Piping direction

Code	Content
B	Side piping

❸ Electrical connections

• Reduced wiring connection

Communication protocol	Output Format	Code	
Common terminal block (M3 thread)	NPN	EA1A	
	PNP	EA1B	
Multi-connector	NPN	FA1A	
	PNP	FA1B	
D-sub Connector	NPN	GA1A	
	PNP	GA1B	

• Serial transmission

Communication protocol		Output Format	Number of points	Code	
DeviceNet		NPN	32 points Output	JA1C	
		PNP		JA1D	
CC-LINK		NPN		JA2C	
		PNP		JA2D	
EtherCAT		NPN		JA3C	
		PNP		JA3D	
EtherNet/IP		NPN		JA4C	
		PNP		JA4D	
CC-Link IEF Basic		NPN		JA5C	
		PNP		JA5D	
PROFINET		NPN		JA6C	
		PNP		JA6D	
CC-Link IE Field		NPN		JA7C	
		PNP		JA7D	
CC-Link IE TSN		NPN		JA8C	
		PNP		JA8D	
IO-Link	ClassA	NPN		JA9C	
		PNP		JA9D	
	ClassB	NPN		JA9G	
		PNP		JA9H	
IO-Link Wireless		NPN		JB1C	
		PNP		JB1D	

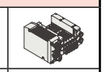
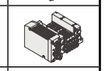
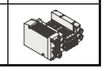
❺ Station No.

Code	Content
02	2 stations
to	to
16	16 stations

*1: The wiring inside the base is all for double solenoid regardless of the type of valve used. The blank number for one solenoid is generated in the section where a single solenoid is mounted.

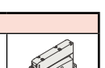
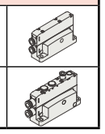
❻ Port P/R position (TVG1B: ø8)

* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U, D both sides	

*1: The Port P/R tube has the same direction as the Port A/B tube.

❼ Pilot operated

Code	Content	
Blank	Internal pilot	
K	External pilot	

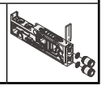
❽ Electrical circuit specification *

Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❾ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

❿ Mount type

Code	Content
Blank	Direct mount
*1 R	DIN rail mount

*1: A DIN rail with standard length is attached. For how to calculate the standard length, refer to page 118.

Model No. Notation Method

* The P4 Series has limited materials for the air flow paths and sliding parts.
* Solenoid valve is not included.

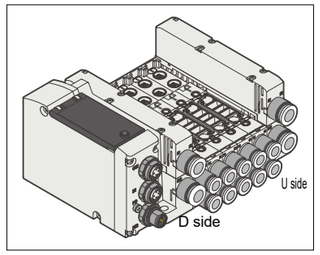
Manifold base only

15 mm Width (Valve width)

TVG2B - B - 08CS - 3 - JA4C - 05 - B - - - - - P4

Option

Model No.	❷ Connection Port Size	❹ Electrical connections	❻ Port P/R position	❽ Electric circuit specifications	❿ Mount type
❶ Piping direction	❸ Voltage	❺ Station No.	❼ Pilot operated	❾ Port A/B Filter	



❶ Piping direction

Code	Content
B	Side piping

❷ Port size (port A/B)

• Metric fitting

Fitting	Port A/B		Code
Push-in fitting	ø4		04CS
	ø6		06CS
	ø8		08CS
Fitting	Single side plug specifications		Code
	Port A	Port B	
Push-in fitting	ø4	Plug	04CA
	ø6		06CA
	ø8		08CA
	Plug	ø4	04CF
		ø6	06CF
		ø8	08CF

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.

❸ Electrical connections

• Reduced wiring connection

Communication protocol	Output Format	Code	
Common terminal block (M3 thread)	NPN	EA1A	
	PNP	EA1B	
Multi-connector	NPN	FA1A	
	PNP	FA1B	
D-sub Connector	NPN	GA1A	
	PNP	GA1B	

• Serial transmission

Communication protocol		Output Format	Number of points	Code	
DeviceNet		NPN	32 points Output	JA1C	
		PNP		JA1D	
CC-LINK		NPN		JA2C	
		PNP		JA2D	
EtherCAT		NPN		JA3C	
		PNP		JA3D	
EtherNet/IP		NPN		JA4C	
		PNP		JA4D	
CC-Link IEF Basic		NPN		JA5C	
		PNP		JA5D	
PROFINET		NPN		JA6C	
		PNP		JA6D	
CC-Link IE Field		NPN		JA7C	
		PNP		JA7D	
CC-Link IE TSN		NPN		JA8C	
		PNP		JA8D	
IO-Link	ClassA	NPN		JA9C	
		PNP		JA9D	
	ClassB	NPN		JA9G	
		PNP		JA9H	
IO-Link Wireless		NPN		JB1C	
		PNP		JB1D	

❹ Voltage

Code	Content
3	24 VDC

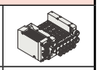
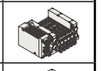
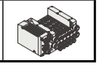
❺ Station No.

Code	Content
02	2 stations
to	to
16	16 stations

*1: The wiring inside the base is all for double solenoid regardless of the type of valve used. The blank number for one solenoid is generated in the section where a single solenoid is mounted.

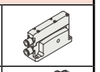
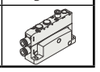
❻ Port P/R position (TVG2B ø10)

* Multiple selection is not possible.

Code	Content	
U	U side	
D	D side	
B	U, D both sides	

*1: The Port P/R tube has the same direction as the Port A/B tube.
*2: A filter is built into port P.

❼ Pilot operated

Code	Content	
Blank	Internal pilot	
K	External pilot	

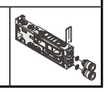
❽ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❾ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

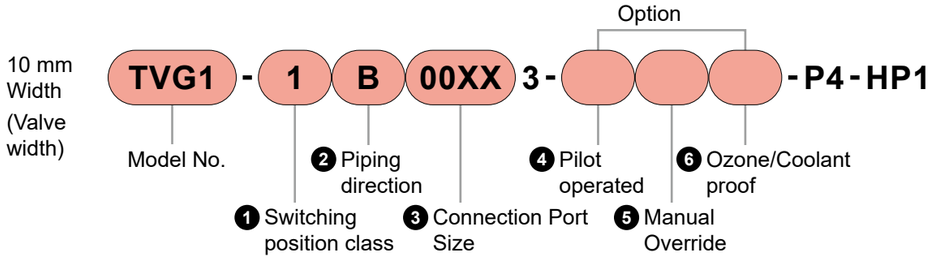
❿ Mount type

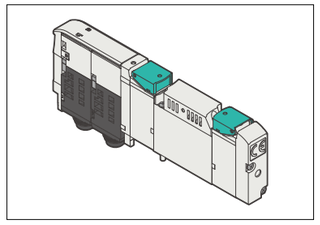
Code	Content
Blank	Direct mount
R	DIN rail mount

*1: A DIN rail with standard length is attached. For how to calculate the standard length, refer to page 118.

Model No. Notation Method

Discrete solenoid valve (for base mounting) The P4 Series * has limited materials for the air flow path and sliding part.





Attached Parts
- The valve mounting screws are included.
- The gasket is attached to the manifold base.

❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve Two valves integrated	A valve side: Normally Closed B valve side: Normally Closed
*1 B		A valve side: Normally Open B valve side: Normally Open
*1 C		A valve side: Normally Closed B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Connection Port Size

Code	Content
00XX	Discrete solenoid valve for base

❹ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

❺ Manual device * Multiple selections are not possible.

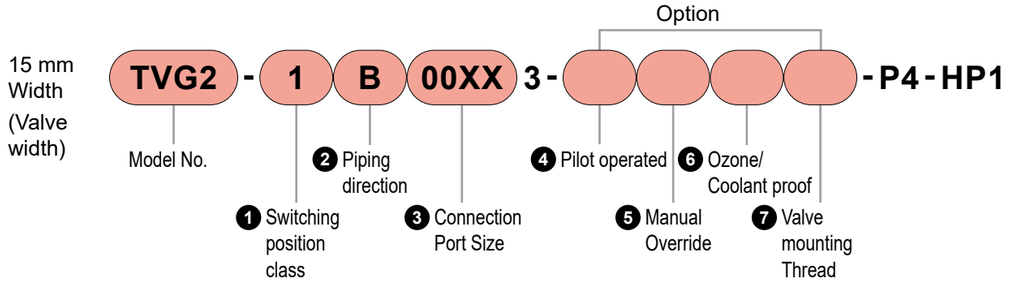
Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, Without cover	
M3	Non-locking, tool operation, without cover	

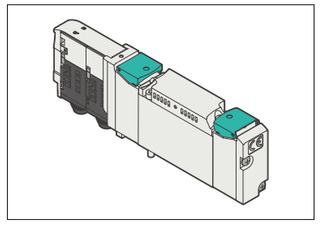
❻ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

Model No. Notation Method

Discrete solenoid valve (for base mounting) * The P4 Series has limited materials for the air flow path and sliding part.





Attached Parts
- The valve mounting screws are included.
- The gasket is attached to the manifold base.

❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve Two valves integrated	A valve side: Normally Closed B valve side: Normally Closed
*1 B		A valve side: Normally Open B valve side: Normally Open
*1 C		A valve side: Normally Closed B valve side: Normally Open

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

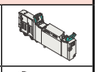
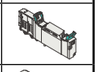
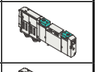
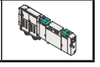
❸ Connection Port Size

Code	Content
00XX	Discrete solenoid valve for base

❹ Pilot operated

Code	Content
Blank	Internal pilot
K	External pilot

❺ Manual device * Multiple selections are not possible.

Code	Content	
Blank	With locking, non-locking common, misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, tool operation, Without cover	
M3	Non-locking, tool operation, without cover	

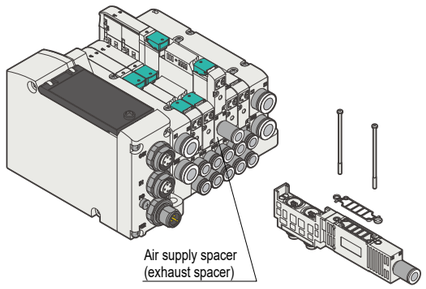
❻ Ozone/Coolant proof

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

❼ Valve mounting screw

Code	Content
Blank	Pan head machine screw with Phillips head/flathead
J	Hexagon Socket Head Cap Screw

Air supply spacer/exhaust spacer



Specifications

● Air supply spacer

Model No.	Weight g
TVG1P-P-□	33

● Exhaust spacer

Model No.	Weight g
TVG1P-R-□	33

Discrete model No.

● Air supply spacer

TVG1P – P – 04CS – P4

❶ Connection Port Size

❶ Connection Port Size

Code	Bore size	Content
04CS	ø4	ø4 Push-in fitting

● Exhaust spacer

TVG1P – R – 04CS – P4

❶ Connection Port Size

❶ Connection Port Size

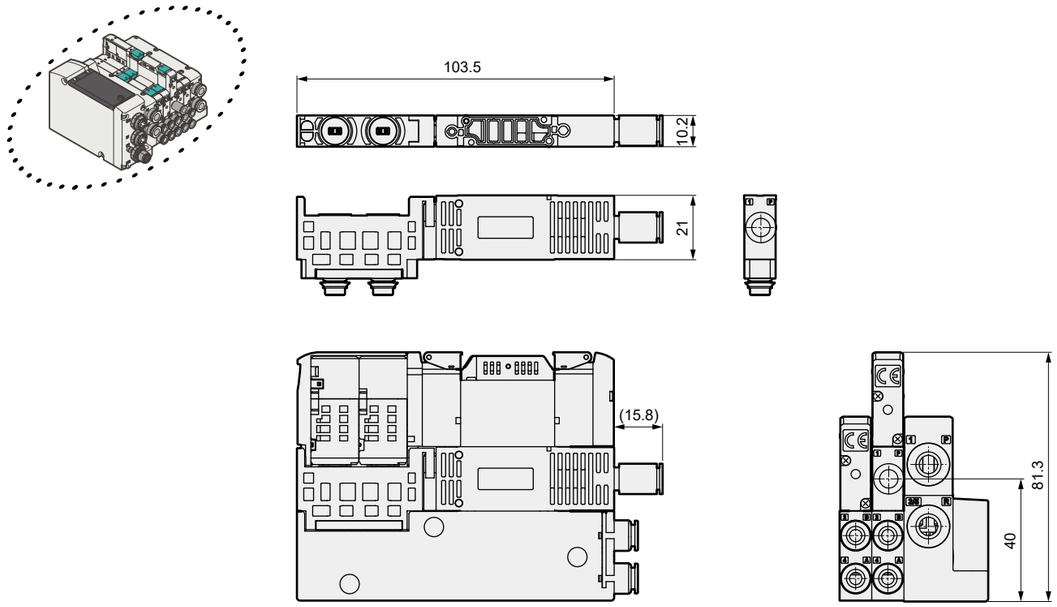
Code	Bore size	Content
04CS	ø4	ø4 Push-in fitting

⚠ Notes for model No. Selection

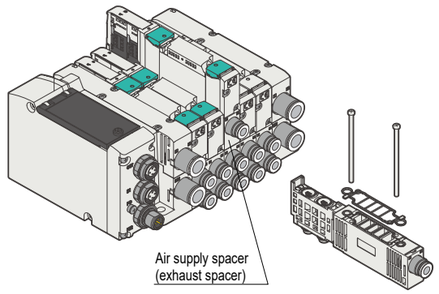
*1: Specify the positions and quantity of spacers for manifold in the manifold specifications sheet (**Refer to pages 131 to 138. Please provide instructions.**
*2: Stacking of spacers is not possible.
*3: A spacer cannot be combined with a blanking plate.
*4: A spacer mounting screw and gasket are included.
*5: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.

External Dimension Drawings

● Air supply spacer/exhaust spacer



Air supply spacer/exhaust spacer



Specifications

● Air supply spacer

Model No.	Weight g
TVG2P-P-□	66

● Exhaust spacer

Model No.	Weight g
TVG2P-R-□	66

Discrete model No.

● Air supply spacer

TVG2P – P – 06CS – P4

❶ Connection Port Size

❶ Connection Port Size

Code	Bore size	Content
06CS	ø6	ø6 Push-in fitting
08CS	ø8	ø8 Push-in fitting

● Exhaust spacer

TVG2P – R – 06CS – P4

❶ Connection Port Size

❶ Connection Port Size

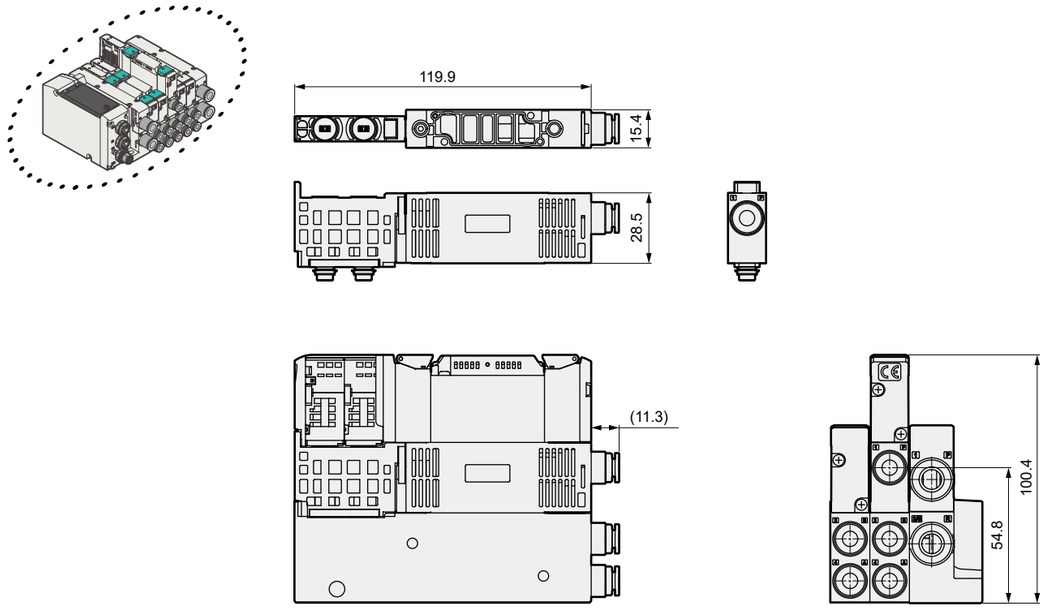
Code	Bore size	Content
06CS	ø6	ø6 Push-in fitting
08CS	ø8	ø8 Push-in fitting

⚠ Notes for model No. Selection

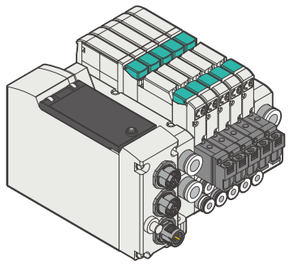
*1: Specify the positions and quantity of spacers for manifold in the manifold specifications sheet (**Refer to pages 131 to 138. Please provide instructions.**
*2: Stacking of spacers is not possible.
*3: A spacer cannot be combined with a blanking plate.
*4: A spacer mounting screw and gasket are included.
*5: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.

External Dimension Drawings

● Air supply spacer/exhaust spacer



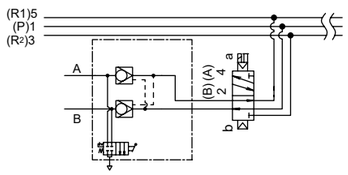
Spacer Pilot Check Valve



Specifications

Item		TVG1P-PC-P4
Operating Fluid		Compressed Air
Maximum Operating Pressure	MPa	0.7
Min. working pressure	MPa	0.2
Proof Pressure	MPa	1.05
Ambient Temperature	°C	−5 to 55 (no freezing)
Working fluid temperature	°C	5 to 55
Atmosphere		Cannot be used in corrosive gas environment.
Weight	g	34

Circuit Diagram Symbol



Discrete model No.

TVG1P − PC − P4

Spacer Pilot Check Valve

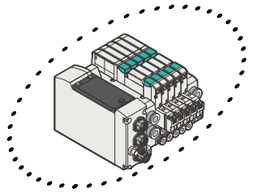
*** Residual pressure release function is not available.**

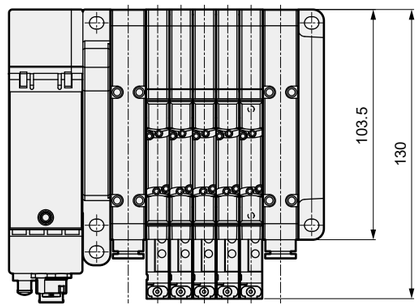
Note) Please note that if you use cylinders with a large bore (guideline ø50 or more) in a state with almost no throttling on the exhaust side (e.g., without a speed controller or silencer), this may lead to a decrease in intermediate stop accuracy and intermediate stop failure.

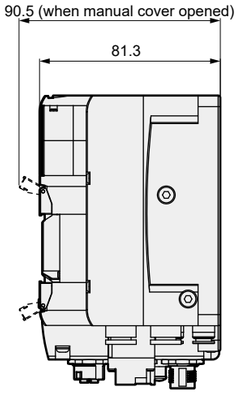
Notes for model No. Selection

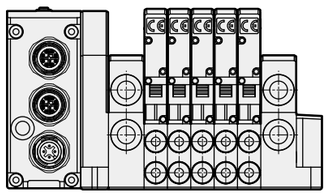
*1: Specify the spacer positions in the manifold specifications sheet.
*2: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.
*3: Stacking of spacers is not possible.
*4: A spacer cannot be combined with a blanking plate.
*5: A spacer mounting screw and gasket are included.

External Dimension Drawings

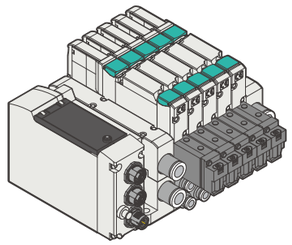








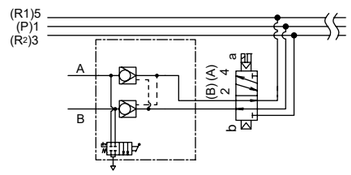
Spacer Pilot Check Valve



Specifications

Item		TVG2P-PC-P4
Operating Fluid		Compressed Air
Maximum Operating Pressure	MPa	0.7
Min. working pressure	MPa	0.2
Proof Pressure	MPa	1.05
Ambient Temperature	°C	−5 to 55 (no freezing)
Working fluid temperature	°C	5 to 55
Atmosphere		Cannot be used in corrosive gas environment.
Weight	g	73

Circuit Diagram Symbol



Discrete model No.

TVG2P − PC − P4

Spacer Pilot Check Valve

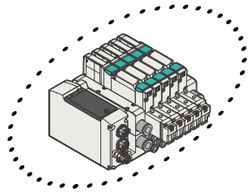
*** Residual pressure release function is not available.**

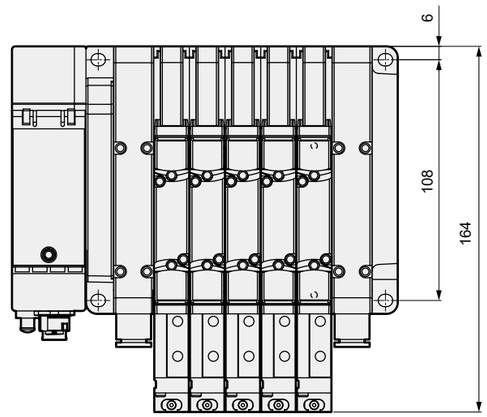
Note) Please note that if you use cylinders with a large bore (guideline ø50 or more) in a state with almost no throttling on the exhaust side (e.g., without a speed controller or silencer), this may lead to a decrease in intermediate stop accuracy and intermediate stop failure.

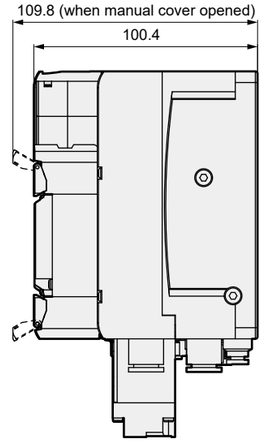
Notes for model No. Selection

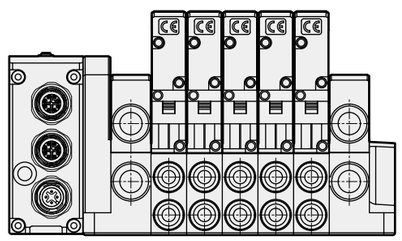
*1: Specify the spacer positions in the manifold specifications sheet.
*2: If the port A/B Fittings is elbow (upward), a spacer cannot be selected.
*3: Stacking of spacers is not possible.
*4: A spacer cannot be combined with a blanking plate.
*5: A spacer mounting screw and gasket are included.

External Dimension Drawings









Model No. Notation Method (Wiring block/Serial Transmission Device Unit)

Model No. Notation Method

Wiring block

10 mm Width	TVG1P	- T	B	-	08CS	-		JA4C	- P4
15 mm Width (Valve width)	TVG2P	- T	B	-	10CS	-		JA4C	- P4
		❶ Model No.	❷ Piping direction		❸ Connection Port Size		❹ Pilot operated	❺ Electrical connections	

Attached Parts
The tie rod fixing nut is built into the wiring block.

❷ Piping direction

Code	Content
B	Side piping

❸ Connection Port Size

		❶ Model No. TVG1P	❶ Model No. TVG2P
Metric fitting			
06CS	ø6 Push-in fitting	●	
08CS	ø8 Push-in fitting	●	●
10CS	ø10 Push-in fitting		●
Plug			
00XX	Port P, R plug	●	●

❹ Pilot operated

	Code	Content
	Blank	Internal pilot
*1, *2	K	External pilot
*1, *2	KZ	External pilot (PA/PR separated)

*1: ❸Cannot be selected for port size "00XX".
*2: The external pilot port is a ø6-push-in fitting.

❺ Electrical connections

• Reduced wiring connection

Content	Code
Common terminal block (M3 thread)	EA1
Multi-connector	FA1
D-sub Connector	GA1

* Both NPN and PNP can be used.

• Serial transmission

Communication protocol		Output Format	Number of points	Code
DeviceNet		NPN	32 points Output	JA1C
		PNP		JA1D
CC-LINK		NPN		JA2C
		PNP		JA2D
EtherCAT		NPN		JA3C
		PNP		JA3D
EtherNet/IP		NPN		JA4C
		PNP		JA4D
CC-Link IEF Basic		NPN		JA5C
		PNP		JA5D
PROFINET		NPN		JA6C
		PNP		JA6D
CC-Link IE Field		NPN		JA7C
		PNP		JA7D
CC-Link IE TSN		NPN		JA8C
		PNP		JA8D
IO-Link	ClassA	NPN		JA9C
		PNP		JA9D
	ClassB	NPN		JA9G
		PNP		JA9H
IO-Link Wireless		NPN		JB1C
		PNP		JB1D

Model No. Notation Method

Serial transmission device unit

OPP8	- A	2EC	- P4	
Model No.		❶ Serial transmission		

Attached Parts
- OPP fixing bolts 2pcs.
- Drip-proof gasket 1pc.

❶ Serial transmission

Communication protocol		Output Format	Number of points	Code	
DeviceNet		NPN	32 points Output	2D	
		PNP		2D-P	
CC-LINK		NPN		2G	
		PNP		2G-P	
EtherCAT		NPN		2EC	
		PNP		2EC-P	
EtherNet/IP		NPN		2EN	
		PNP		2EN-P	
CC-Link IEF Basic		NPN		2EB	
		PNP		2EB-P	
PROFINET		NPN		2EP	
		PNP		2EP-P	
CC-Link IE Field		NPN		2EF	
		PNP		2EF-P	
CC-Link IE TSN		NPN		2TG	
		PNP		2TG-P	
IO-Link	ClassA	NPN		2KC-A	
		PNP		2KC-PA	
	ClassB	NPN		2KC-B	
		PNP		2KC-PB	
IO-Link Wireless		NPN		2WK	
		PNP		2WK-P	

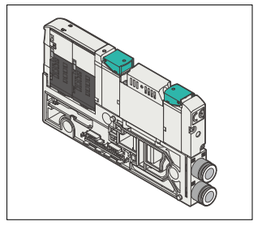
MEMO

Model No. Notation Method

Valve block with solenoid valve

10 mm Width (Valve width) — TVG1P - 1 B 06CS 3 - S [Option] E1 [Option] -P4 -HP1

- Model No.
- ❷ Piping direction
- ❹ Voltage
- ❻ Pilot operated
- ❽ Common specifications
- ❿ Ozone/Coolant proof
- ⓬ Port A/B filter
- ❶ Switching position class
- ❸ Connection Port Size
- ❺ Base internal wiring system
- ❼ Electric circuit specifications
- ❾ Manual Override
- ⓫ Exhaust check valve
- ⓭ Air flow path Partition



❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
*1 B	Two valves	A valve side: Normally open/B valve side: Normally Open
*1 C	integrated	A valve side: Normally closed/B valve side: Normally Open
Z	With blanking plate	

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• **Metric fitting**

Fitting	Port A/B	Code
Push-in fitting	ø4	04CS
	ø6	06CS

Fitting	Single side plug specifications *1		Code
	Port A	Port B	
Push-in fitting	ø4	Plug	04CA
	ø6		06CA
	Plug	ø4	04CF
		ø6	06CF

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.

❹ Voltage

Code	Content
3	24 VDC

❺ Base internal wiring system *1

Code	Content
Blank	(double wiring)
S	Single solenoid dedicated wiring

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.
S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two 3-port valves integrated type and 3-position.

❻ Pilot operated *1

Code	Content
Blank	Internal pilot
K	External pilot

*1: ❶Solenoid position "Z" cannot be selected.

❼ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❽ Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

❾ Manual Override *1

Code	Content	
Blank	Locking/non-locking common, With misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, Tool operated, without cover	
M3	Non-locking, tool operation, without cover	

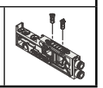
*1: ❶Solenoid position "Z" cannot be selected.

❿ Ozone/Coolant proof *1

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

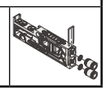
*1: ❶Solenoid position "Z" cannot be selected.

⓫ Exhaust check valve

Code	Content	
Blank	None	
*1 H	With exhaust check valve	

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve.

⓬ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

⓭ Air flow path partition

See P. 46 for details.

Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

*1:A/B port faces forward and cuts off the right flow path.

Model No. Notation Method

Valve block with solenoid valve

15 mm Width (Valve width)

TVG2P - 2 B 08CS 3 - S E1 -P4 -HP1 (Option)

Model No.

❷ Piping direction

❹ Voltage

❻ Pilot operated

❽ Common specifications

❿ Ozone/Coolant proof

⓬ Exhaust check valve

⓮ Air flow path Partition

❶ Switching position class

❸ Connection Port Size

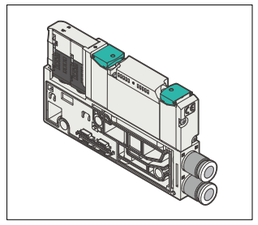
❺ Base internal wiring system

❼ Electric circuit specifications

❾ Manual Override

⓫ Valve mounting Thread

⓭ Port A/B filter



❶ Switching position class

Code	Content	
1	2-position single	
2	2-position double	
3	3-position closed center	
4	3-position exhaust center	
5	3-position pressure center	
*1 A	3-port valve	A valve side: Normally closed/B valve side: Normally Closed
*1 B	Two valves	A valve side: Normally open/B valve side: Normally Open
*1 C	integrated	A valve side: Normally closed/B valve side: Normally Open
Z	With blanking plate	

*1: Only compatible with internal pilot. Dimensions of the Dimensions diagram are the same as those of 2-position double.

❷ Piping direction

Code	Content
B	Side piping

❸ Port size (port A/B)

• Metric fitting

Fitting	Port A/B	Code
Push-in fitting	ø4	04CS
	ø6	06CS
	ø8	08CS

Fitting	Single side plug specifications *1		Code
	Port A	Port B	
Push-in fitting	ø4	Plug	04CA
	ø6		06CA
	ø8		08CA
	Plug	ø4	04CF
		ø6	06CF
		ø8	08CF

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.

❹ Voltage

Code	Content
3	24 VDC

❺ Base internal wiring system *1

Code	Content
Blank	(double wiring)
S	Single solenoid, Dedicated wiring

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.
S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two 3-port valves integrated type and 3-position.

❻ Pilot operated *1

Code	Content
Blank	Internal pilot
K	External pilot

*1: ❶Solenoid position "Z" cannot be selected.

❼ Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

*1: The combination of "E2" and PNP specifications is Custom Product.

❽ Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

❾ Manual Override *1

Code	Content	
Blank	Locking/non-locking common, With misoperation prevention cover	
M1	Non-locking, with misoperation prevention cover	
M2	Locking/non-locking common, Tool operated, without cover	
M3	Non-locking, tool operation, without cover	

*1: ❶Solenoid position "Z" cannot be selected.

❿ Ozone/Coolant proof *1

Code	Content
Blank	Standard specifications
A	Ozone/Coolant proof (main valve fluorine specification)

*1: ❶Solenoid position "Z" cannot be selected.

⓫ Valve mounting screw

Code	Content
Blank	Pan head machine screw with Phillips head/flathead
J	Hexagon Socket Head Cap Screw

⓬ Exhaust check valve

Code	Content	
Blank	None	
*1 H	With exhaust check valve	

*1: ❶Solenoid positions "3" and "5" cannot be selected. Refer to page 163 for details on the type with exhaust check valve.

⓭ Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

⓮ Air flow path partition

For details P. 48 details.

Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

*1: A/B port faces forward and cuts off the right flow path.

Model No. Notation Method

Valve block

10 mm Width (Valve width)

TVG1P - V **B** - **06CS** **3** - [ ][ ][ ][ ][ ] - P4

Option

Model No. TVG1P

1 Piping direction: B

2 Connection Port Size: 06CS

3 Voltage: 3

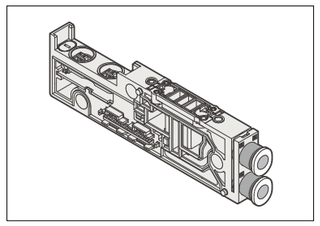
4 Base internal wiring system

5 Electric circuit specifications

6 Common specifications

7 Port A/B filter

8 Air flow path Partition



・Tie rod is not included, so order separately. Refer to page 49 for details. The gasket between blocks is included.

1 Piping direction

Code	Content
B	Side piping

2 Port size (port A/B)

• **Metric fitting**

Fitting	Port A/B	Code
Push-in fitting	ø4	04CS
	ø6	06CS

Fitting	Single side plug specifications *1		Code
	Port A	Port B	
Push-in fitting	ø4	Plug	04CA
	ø6		06CA
	Plug	ø4	04CF
		ø6	06CF

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.

3 Voltage

Code	Content
3	24 VDC

4 Base internal wiring system *1

Code	Content
Blank	(double wiring)
S	Single solenoid dedicated wiring

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.
S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two 3-port valves integrated type and 3-position.

5 Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

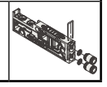
*1: The combination of "E2" and PNP specifications is Custom Product.

6 Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

7 Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

8 Air flow path partition

See P. 46 for details.

Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

Model No. Notation Method

Valve block

15 mm Width (Valve width)

TVG2P - V **B** - **06CS** **3** - [ ][ ][ ][ ][ ] - P4

Option

Model No. TVG2P

1 Piping direction: B

2 Connection Port Size: 06CS

3 Voltage: 3

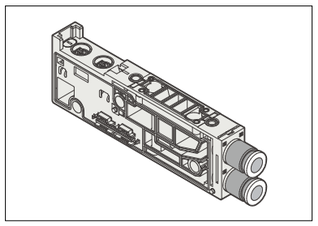
4 Base internal wiring system

5 Electric circuit specifications

6 Common specifications

7 Port A/B filter

8 Air flow path Partition



・Tie rod is not included, so order separately. Refer to page 49 for details. The gasket between blocks is included.

1 Piping direction

Code	Content
B	Side piping

2 Port size (port A/B)

• **Metric fitting**

Fitting	Port A/B	Code
Push-in fitting	ø6	06CS
	ø8	08CS

Fitting	Single side plug specifications *1		Code
	Port A	Port B	
Push-in fitting	ø6	Plug	06CA
	ø8		08CA
	Plug	ø6	06CF
		ø8	08CF

*1: Ports A and B are available with one-sided plug specifications for 2-position single only.

3 Voltage

Code	Content
3	24 VDC

4 Base internal wiring system *1

Code	Content
Blank	(double wiring)
S	Single solenoid dedicated wiring

*1: Blank = Double solenoid wiring regardless of the type of valve used. If a single solenoid is mounted, an empty number for one solenoid will be generated.
S = Dedicated for single solenoid. Cannot be selected with 2-position double solenoid, two
3-port valves integrated type and 3-position.

5 Electrical circuit specification

* Multiple selection is not possible.

Code	Content
Blank	With surge suppressor and indicator lamp
E1	Low exoergic/energy saving circuit (surgeless specifications)
E2	Surgeless

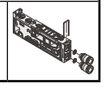
*1: The combination of "E2" and PNP specifications is Custom Product.

6 Common specifications

Code	Content
Blank	NPN/plus common specifications
P	PNP/minus common specifications

*1: Multiple selection is not possible.
*2: Select the same polarity as that of the wiring block.

7 Port A/B filter

Code	Content	
Blank	None	
F	Port A/B filter built in	

*1: A filter is built into port P.

8 Air flow path partition

See P. 48 for details.

Code	Content
Blank	None
T	P/R/PA/PR blocked
U	P/R blocked, PA/PR through
V	P blocked, R/PA/PR through
W	R blocked, P/PA/PR through

Model No. Notation Method

Tie rod

●For valve block

10 mm width **TVG1P - TR - 02**

15 mm width **TVG2P - TR - 02**

❶ Model No. ❷ Station No.

●For intermediate supply and exhaust block

10 mm width **TVG1P-TR-Q**

15 mm width **TVG2P-TR-Q**

●For valve block expansion

10 mm width **TVG1P-TR-01**

15 mm width **TVG2P-TR-01**

❷ Station No.

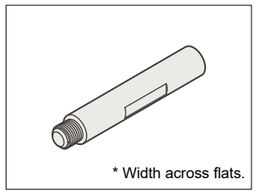
Code	Content
02	For 2 stations
03	For 3 stations
04	For 4 stations
05	For 5 stations
06	For 6 stations
07	For 7 stations
08	For 8 stations
09	For 9 stations
10	For 10 stations
11	For 11 stations
12	For 12 stations
13	For 13 stations

Code	Content
14	For 14 stations
15	For 15 stations
16	For 16 stations
17	For 17 stations
18	For 18 stations
19	For 19 stations
20	For 20 stations
21	For 21 stations
22	For 22 stations
23	For 23 stations
24	For 24 stations

*1: TVG1P is a 3-piece set and TVG2P is a 2-piece set.

Regarding expansion

- Manifold can expand by 3 stations with 2 to 17 stations. Up to three stations can be expanded in total: valve block and intermediate supply and exhaust block. When increasing 18 or more stations of manifolds, use a tie rod that matches the station No. after the increase.
- Fix the tie rod for station expansion/tie rod for intermediate supply and exhaust onto the wiring block. If installed on the end block side, it may not be able to be assembled correctly.



* Width across flats.

Model No. Notation Method

End block (U side)

A hexagon socket head cap screw for tie rod tightening and a gasket between the block are included.

10 mm Width **TVG1P - E B - 08CS - - P4**

15 mm Width **TVG2P - E B - 10CS - - P4**

(Valve width)

❶ Model No. ❷ Piping direction ❸ Connection Port Size ❹ Pilot operated

❷ Piping direction

Code	Content
B	Side piping

❹ Pilot operated

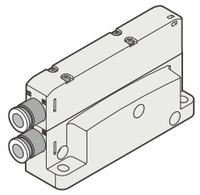
	Code	Content
	Blank	Internal pilot
*1, *2	K	External pilot
*1, *2	KZ	External pilot (PA/PR separated)

*1: ❸Cannot be selected for port size "00XX".
*2: The external pilot port is a ø6-push-in fitting.

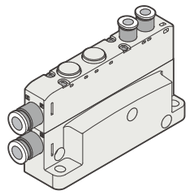
❸ Connection Port Size

Code	Content	❶ Model No. TVG1P	❶ Model No. TVG2P
Metric fitting			
06CS	ø6 Push-in fitting	●	
08CS	ø8 Push-in fitting	●	●
10CS	ø10 Push-in fitting		●
Plug			
00XX	Port P, R plug	●	●

● TVG1P-EB-08CS-P4



● TVG1P-EB-08CS-KZ-P4



Model No. Notation Method

Intermediate supply and exhaust block

The intermediate supply and exhaust block can be installed between the valve block and the valve block.
These blocks cannot be adjacent to each other. In addition, this block cannot be adjacent to an end block or wiring block.
The electrical internal wiring and the P.R.PA.PR port connect to the adjacent blocks.

10 mm Width: **TVG1P - Q B - 08CS - ( ) - P4**

16 mm Width: **TVG2P - Q B - 10CS - ( ) - P4**

(Valve width)

❶ Model No. ❷ Piping direction ❸ Connection Port Size ❹ Pilot operated

❷ **Piping direction**

Code	Content
B	Side piping

❸ **Connection Port Size**

Code	Content	❶ Model No. TVG1P	❶ Model No. TVG2P
Metric fitting			
06CS	ø6 Push-in fitting	●	
08CS	ø8 Push-in fitting	●	●
10CS	ø10 Push-in fitting		●

*1: A filter is built into port P to prevent foreign matter from entering.

❹ **Pilot operated**

	Code	Content
	Blank	Internal pilot
*1, *2	K	External pilot
	Z	Multi-pressure circuit
*1, *2	KZ	External pilot (PA/PR separated)

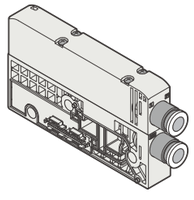
*1: ❸Cannot be selected for port size "00XX".
*2: The external pilot port is a ø6-push-in fitting.
*3: Z cannot be used independently. Be sure to use with another type, blank, K and KZ.

Attached Parts

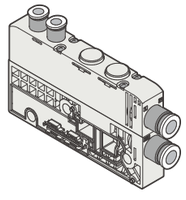
Manifold gasket: 1 pcs

Tie rod is not included, so order separately.
Refer to page 113 for details. The gasket between blocks is included.

● TVG1P-QB-08CS-P4



● TVG1P-QB-08CS-KZ-P4



MEMO

How to fill out manifold specifications sheet

● Manifold model No. (example)

TVG1M- X B 99CX 3 JA3C - 06 BH -HP1

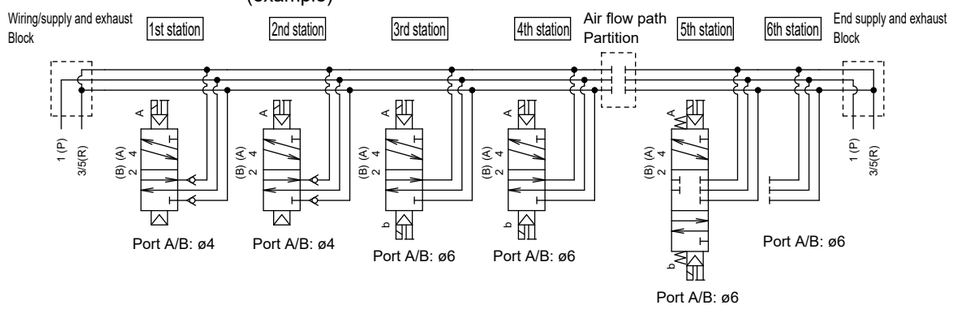
❶ Switching position class ❸ Connection Port Size ❹ Voltage ❺ Reduced wiring connection ❻ Station No. ❼ Option

Page	Code	Model No.	Installation positi 1	2	3	4	5	6	7	8	9	10	11	12	13	14	33	34	35	36	37	38	39	40	Qty. used
P. 39	[D side] Wiring block *1	TVG1P-TB-08CS-JA3C	○																						1
P. 41	Valve block with solenoid valve	TVG1P-1B04CS3-H-HP1		○	○																				2
		TVG1P-2B06CS3-HP1				○																			1
		TVG1P-2B06CS3-T-HP1					○																		1
		TVG1P-3B06CS3-HP1						○																	1
		TVG1P																							
		TVG1P																							
P. 41	With blanking plate Valve block Spacer cannot be selected.	TVG1P-ZB06CS3							○																1
19 to 22 Page	Spacer Only one type can be selected for one station.	TVG1P																							
P. 51	Intermediate supply and exhaust block	TVG1P-QB-																							
P. 50	[U side] End block *1	TVG1P-EB-08CS								○															1

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

- Complete from the left end, with the piping port facing forward.
  (Write the block model numbers and positions you determined referring to the block configurations (pages 37 to 38).)
- Write the total number of blocks specified in the quantity field in the table far right.
- Indicate for the○required attached parts.
- As there are manifold specifications sheets for each model No., fill in the form for the corresponding specifications.

Reference circuit diagram — Simplified circuit diagram of manifold model No. (example)



● Mounting rail length (L_5) of DIN rail mount

①Determine the rail length using the calculation method shown below.
The obtained length is standard.
②For standard length, length (L_5) is not required on the specifications sheet.
If you need a length other than the standard length, please enter it.

● How to determine the length of the mounting rail

Manifold length (L_4) = (A × Valve Block Quantity) + (B × Intermediate supply and exhaust Block Quantity) + C + D

Mounting rail length (L_5) = $L_{5'}$ × 12.5 A, B, C, and D indicate the length (width) of each block.

$$L_5 \quad \frac{L_4 + 40}{12.5} \rightarrow \text{round up to integer}$$

Rail mounting pitch (L_6) = L5-12.5

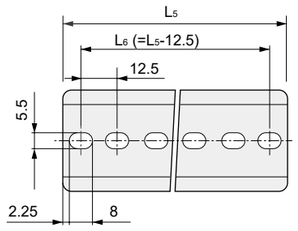
Block length (width) dimensions table (mm)

			TVG1	TVG2
A	Valve block		10.5	16
B	Intermediate supply and exhaust block		16	18
C	Wiring block	EA1□	110	112
		FA1□	91.2	93.2
		GA1□	87.2	89.2
		J□□□	74.1	76.1
D	End block		40.2	42.2

● Mounting rail length quick reference table

L_4 Manifold Length	≤ 47.5	47.5 Over to 60 or less	60 to 72.5	72.5 to 85	85 to 97.5	97.5 to 110	110 to 122.5	122.5 to 135	135 to 147.5	147.5 to 160	160 to 172.5	172.5 to 185	185 to 197.5	197.5 to 210	210 to 222.5	222.5 to 235	235 to 247.5	247.5 to 260	260 to 272.5	272.5 to 285	285 to 297.5	297.5 to 310	310 to 322.5	322.5 to 335	335 to 347.5	347.5 to 360
L_5 Rail Length	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375	387.5	400
Pitch L_6	75	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375	387.5

*1: L1 exceeds this table, calculate the length by referring to "How to calculate the length of the mounting rail".



TVG Reduced wiring with Serial Transmission Device Unit
TVG With interface for Remote I/O connection
TVG -P4 Compatible with rechargeable battery manufacturing process
Manifold Specification Sheet
Technical Data
Precautions for Use

TVG1M (reduced wiring) block manifold specifications sheet

● Contact Person	● Quantity Set	● Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue
Company Name
Contact
Order No.

Model No.

TVG1M-□B□□□-□-HP1

❶ Switching position class ❸ Connection Port Size ❹ Voltage ❺ Reduced wiring connection ❻ Station No. ❼ Option

When filling in this field, select the model No. from Block configurations (pages 37 to 38).

Installation position

Page	Code	Model No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 39	[D side] Wiring block *1	TVG1P-TB-□-□																																								
P. 41	Valve block with solenoid valve	TVG1P-□B□-□-HP1																																								
		TVG1P-□B□-□-HP1																																								
		TVG1P-□B□-□-HP1																																								
		TVG1P-□B□-□-HP1																																								
		TVG1P-□B□-□-HP1																																								
		TVG1P-□B□-□-HP1																																								
		TVG1P-□B□-□-HP1																																								
		TVG1P-□B□-□-HP1																																								
P. 41	Valve block with blanking plate Spacer cannot be selected.	TVG1P-ZB□																																								
		TVG1P-ZB□																																								
		TVG1P-ZB□																																								
P. 19 to 23	Spacer Only one type can be selected for one station	TVG1P-P-□																																								
		TVG1P-R-□																																								
		TVG1P-PC-□																																								
		TVG1P-SR-□																																								
		TVG1P-IS																																								
P. 51	Intermediate supply and exhaust block	TVG1P-Q□-□-□																																								
		TVG1P-Q□-□-□																																								
P. 50	[U side] End block *1	TVG1P-E□-□-□																																								

*1:KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = □ * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	PG-P2-B		GWP 4-B		SLW-H6		
	GWP 6-B		GWP 8-B		SLW-H8		

Please specify the required number.

Cable clamp for common terminal block		Cable with multi-connector		Multi-connector only		Cable with D-sub-connector		Tube remover
TVGP-SCL-18A		TVGP-RMC-□		TVGP-RM21WTP-□		TVGP-CABLE-D0-□-□		
TVGP-SCL-18B								

TVG Reduced wiring with Serial Transmission Device Unit
TVG With interface for Remote I/O connection
TVG -P4 Compatible with rechargeable battery manufacturing process
Manifold Specification Sheet
Technical Data
Precautions for Use

TVG1M (Serial Transmission Device Unit) block manifold specifications sheet

Contact Person	Quantity Set	Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue

Company Name

Contact

Order No.

Model No.

TVG1M-□ B □ 3 □ - □ -HP1

❶ Switching position class ❸ Connection Port Size ❺ Serial transmission ❻ Station No. ❼ Option

When filling in this field, select the model No. from Block configurations (pages 37 to 38).

Installation position

Page	Code	Model No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 39	[D side] Wiring block *1	TVG1P-TB-□-□																																									
P. 41	Valve block with solenoid valve	TVG1P-□B□-□-HP1																																									
		TVG1P-□B□-□-HP1																																									
		TVG1P-□B□-□-HP1																																									
		TVG1P-□B□-□-HP1																																									
		TVG1P-□B□-□-HP1																																									
		TVG1P-□B□-□-HP1																																									
		TVG1P-□B□-□-HP1																																									
		TVG1P-□B□-□-HP1																																									
P. 41	Valve block with blanking plate Spacer cannot be selected.	TVG1P-ZB□																																									
		TVG1P-ZB□																																									
		TVG1P-ZB□																																									
P. 19 to 23	Spacer Only one type can be selected for one station	TVG1P-P-□																																									
		TVG1P-R-□																																									
		TVG1P-PC-□																																									
		TVG1P-SR-□																																									
		TVG1P-IS																																									
P. 51	Intermediate supply and exhaust block	TVG1P-Q□-□-□																																									
		TVG1P-Q□-□-□																																									
P. 50	[U side] End block *1	TVG1P-E□-□-□																																									

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = □ * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	PG-P2-B		GWP 4-B		SLW-H6		
	GWP 6-B		GWP 8-B		SLW-H8		

Please specify the required number.

Water-proof cap		Water-proof plug		Tube remover
TVGP-XSZ-11		TVGP-XSZ-12		

TVG2M (reduced wiring) block manifold specifications sheet

● Contact Person	● Quantity Set	● Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue
Company Name
Contact
Order No.

Model No.

TVG2M [ ] **B** [ ] [ ] [ ] **-** [ ] **-HP1**

❶ Switching position class ❸ Connection Port Size ❹ Voltage ❺ Reduced wiring connection ❻ Station No. ❼ Option

When filling in this field, select the model No. fr nfigurations (pages 37 to 38).

Page	Code	Model No.	Installation position 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 39	[D side] Wiring block *1	TVG2P-TB-[ ]-[ ]																																								
P. 43	Valve block with solenoid valve	TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
P. 43	Valve block with blanking plate Spacer cannot be selected.	TVG2P-ZB[ ]																																								
		TVG2P-ZB[ ]																																								
		TVG2P-ZB[ ]																																								
P. 19 to 23	Spacer Only one type can be selected for one station	TVG2P-P-[ ]																																								
		TVG2P-R-[ ]																																								
		TVG2P-PC-[ ]																																								
		TVG2P-SR-[ ]																																								
		TVG2P-IS																																								
P. 51	Intermediate supply and exhaust block	TVG2P-Q[ ]-[ ]-[ ]																																								
		TVG2P-Q[ ]-[ ]-[ ]																																								
P. 50	[U side] End block *1	TVG2P-E[ ]-[ ]-[ ]																																								

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = [ ] * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	GWP 4-B		GWP 6-B		SLW-H8		
	GWP 8-B		GWP 10-B		SLW-H10		

Please specify the required number.

Cable clamp for common terminal block		Cable with multi-connector		Multi-connector only		Cable with D-sub-connector	
TVGP-SCL-18A		TVGP-RMC-[ ]		TVGP-RM21WTP-[ ]		TVGP-CABLE-D0-[ ]-[ ]	
TVGP-SCL-18B							

TVG2M (Serial Transmission Device Unit) block manifold specifications sheet

Contact Person	Quantity Set	Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue
Company Name
Contact
Order No.

Model No.

TVG2M ☐ B ☐ 3 ☐ - ☐ -HP1

❶ Switching position class ❸ Connection Port Size ❺ Serial transmission ❻ Station No. ❼ Option

When filling in this field, select the model No. from Block configurations (pages 37 to 38).

			Installation position																																						
Page	Code	Model No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 39	[D side] Wiring block *1	TVG2P-TB-☐-☐																																										
P. 43	Valve block with solenoid valve	TVG2P-☐B☐-☐-HP1																																										
		TVG2P-☐B☐-☐-HP1																																										
		TVG2P-☐B☐-☐-HP1																																										
		TVG2P-☐B☐-☐-HP1																																										
		TVG2P-☐B☐-☐-HP1																																										
		TVG2P-☐B☐-☐-HP1																																										
		TVG2P-☐B☐-☐-HP1																																										
		TVG2P-☐B☐-☐-HP1																																										
P. 43	Valve block with blanking plate Spacer cannot be selected.	TVG2P-ZB☐																																										
		TVG2P-ZB☐																																										
		TVG2P-ZB☐																																										
P. 19 to 23	Spacer Only one type can be selected for one station	TVG2P-P-☐																																										
		TVG2P-R-☐																																										
		TVG2P-PC-☐																																										
		TVG2P-SR-☐																																										
		TVG2P-IS																																										
P. 51	Intermediate supply and exhaust block	TVG2P-Q☐-☐-☐																																										
		TVG2P-Q☐-☐-☐																																										
P. 50	[U side] End block *1	TVG2P-E☐-☐-☐																																										

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = ☐ * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	GWP 4-B		GWP 6-B		SLW-H8		
	GWP 8-B		GWP 10-B		SLW-H10		

Please specify the required number.

Water-proof cap		Water-proof plug	
TVGP-XSZ-11		TVGP-XSZ-12	

TVG1M (for connection) block manifold specifications sheet

Contact Person | Quantity Set | Delivery Date (Month/Day)

Voucher No. | Order Received No.

Date of Issue

Company Name

Contact

Order No.

Model No.

TVG1M-□ B □ □ - □ -HP1

❶ Switching position class ❸ Connection Port Size ❺ Electrical connections ❻ Station No. ❼ Option

When filling in this field, select the model No. from Block configurations (pages 37 to 38).

Page	Code	Model No.	Installation position																																						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 88	[D side] Valve interface (with supply and exhaust block) *1	TVG1P-TB-□-□																																							
P. 41	Valve block with solenoid valve	TVG1P-□B□-□-HP1																																							
		TVG1P-□B□-□-HP1																																							
		TVG1P-□B□-□-HP1																																							
		TVG1P-□B□-□-HP1																																							
		TVG1P-□B□-□-HP1																																							
		TVG1P-□B□-□-HP1																																							
		TVG1P-□B□-□-HP1																																							
		TVG1P-□B□-□-HP1																																							
P. 41	Valve block with blanking plate Spacer cannot be selected.	TVG1P-ZB□																																							
		TVG1P-ZB□																																							
		TVG1P-ZB□																																							
P. 75 to 79	Spacer Only one type can be selected for one station	TVG1P-P-□																																							
		TVG1P-R-□																																							
		TVG1P-PC-□																																							
		TVG1P-SR-□																																							
		TVG1P-IS																																							
P. 51	Intermediate supply and exhaust block	TVG1P-Q□-□-□																																							
		TVG1P-Q□-□-□																																							
P. 50	[U side] End block *1	TVG1P-E□-□-□																																							

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

Attached Parts	Blank Plug				Silencer		Tag plate (included)	Tube remover
	PG-P2-B		GWP 4-B		SLW-H6			
	GWP 6-B		GWP 8-B		SLW-H8			

Please specify the required number.

TVG2M (for connection) block manifold specifications sheet

Contact Person	Quantity Set	Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue

Company Name

Contact

Order No.

Model No.

TVG2M [ ] **B** [ ] [ ] **-** [ ] **-HP1**

❶ Switching position class ❸ Connection Port Size ❺ Electrical connections ❻ Station No. ❼ Option

When filling in this field, select the model No. from Block configurations (pages 37 to 38).

			Installation position																																						
Page	Code	Model No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 88	[D side] Valve interface (with supply and exhaust block) *1	TVG2P-TB-[ ]-[ ]																																								
P. 43	Valve block with solenoid valve	TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-HP1																																								
P. 43	Valve block with blanking plate Spacer cannot be selected.	TVG2P-ZB[ ]																																								
		TVG2P-ZB[ ]																																								
		TVG2P-ZB[ ]																																								
P. 75 to 79	Spacer Only one type can be selected for one station	TVG2P-P-[ ]																																								
		TVG2P-R-[ ]																																								
		TVG2P-PC-[ ]																																								
		TVG2P-SR-[ ]																																								
		TVG2P-IS																																								
P. 51	Intermediate supply and exhaust block	TVG2P-Q[ ]-[ ]-[ ]																																								
		TVG2P-Q[ ]-[ ]-[ ]																																								
P. 50	[U side] End block *1	TVG2P-E[ ]-[ ]-[ ]																																								

*1:KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

	Blank Plug				Silencer		Tag plate (included)
Attached Parts	GWP 4-B		GWP 6-B		SLW-H8		
	GWP 8-B		GWP 10-B		SLW-H10		

Please specify the required number.

TVG1M (reduced wiring) block manifold specifications sheet

Contact Person	Quantity Set	Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue
Company Name
Contact
Order No.

Model No.

TVG1M-[ ] B [ ][ ][ ] - [ ] -P4 -HP1

1 Switching position class / 3 Connection Port Size / 4 Voltage / 5 Reduced wiring connection / 6 Station No. / 7 Option

When filling in this field, select the model No. configurations (pages 37 to 38).

			Installation position																																						
Page	Code	Model No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 105	[D side] Wiring block *1	TVG1P-TB-[ ]-[ ]-P4																																							
P. 107	Valve block with solenoid valve	TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
P. 107	Valve block with blanking plate Spacer cannot be selected.	TVG1P-ZB[ ]-P4																																							
		TVG1P-ZB[ ]-P4																																							
		TVG1P-ZB[ ]-P4																																							
P. 101 to 104	*spacer Regulators cannot be selected. Spacer Only one type can be selected for one station.	TVG1P-P-[ ]-P4																																							
		TVG1P-R-[ ]-P4																																							
		TVG1P-PC-[ ]-P4																																							
P. 115	Intermediate supply and exhaust block	TVG1P-Q[ ]-[ ]-[ ]-P4																																							
		TVG1P-Q[ ]-[ ]-[ ]-P4																																							
P. 114	[U side] End block *1	TVG1P-E[ ]-[ ]-[ ]-P4																																							

*1:KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = [ ] * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	PG-P2-B		GWP 4-B		SLW-H6		
	GWP 6-B		GWP 8-B		SLW-H8		

Please specify the required number.

Cable clamp for common terminal block		Cable with multi-connector		Multi-connector only		Cable with D-sub-connector		Tube remover
TVGP-SCL-18A		TVGP-RMC-[ ]		TVGP-RM21WTP-[ ]		TVGP-CABLE-D0-[ ]-[ ]		
TVGP-SCL-18B								

TVG1M (Serial Transmission Device Unit) block manifold specifications sheet

Contact Person	Quantity Set	Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue
Company Name
Contact
Order No.

Model No.

TVG1M-[ ]B[ ]3[ ]-[ ]-P4-HP1

❶ Switching position class ❸ Connection Port Size ❺ Serial transmission ❻ Station No. ❼ Option

When filling in this field, select the model No. from Block configurations (pages 37 to 38).

Page	Code	Model No.	Installation position																																							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 105	[D side] Wiring block *1	TVG1P-TB-[ ]-[ ]-P4																																							
P. 107	Valve block with solenoid valve	TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
		TVG1P-[ ]B[ ]-[ ]-P4-HP1																																							
P. 107	Valve block with blanking plate Spacer cannot be selected.	TVG1P-ZB[ ]-P4																																							
		TVG1P-ZB[ ]-P4																																							
		TVG1P-ZB[ ]-P4																																							
P. 101 to 104	* Spacer Regulators cannot be selected. Spacer Only one type can be selected for one station.	TVG1P-P-[ ]-P4																																							
		TVG1P-R-[ ]-P4																																							
		TVG1P-PC-[ ]-P4																																							
P. 115	Intermediate supply and exhaust block	TVG1P-Q[ ]-[ ]-[ ]-P4																																							
		TVG1P-Q[ ]-[ ]-[ ]-P4																																							
P. 114	[U side] End block *1	TVG1P-E[ ]-[ ]-[ ]-P4																																							

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = [ ] * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	PG-P2-B		GWP 4-B		SLW-H6		
	GWP 6-B		GWP 8-B		SLW-H8		

Please specify the required number.

Water-proof cap		Water-proof plug		Tube remover
TVGP-XSZ-11		TVGP-XSZ-12		

TVG2M (reduced wiring) block manifold specifications sheet

Contact Person	Quantity Set	Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue
Company Name
Contact
Order No.

Model No.

TVG2M □ **B** □ □ □ **-** □ **-P4 -HP1**

❶ Switching position class ❸ Connection Port Size ❹ Voltage ❺ Reduced wiring connection ❻ Station No. ❼ Option

When filling in this field, select the model No. configurations (pages 37 to 38).

Page	Code	Model No.	Installation position																																							Qty. used
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
P. 105	[D side] Wiring block *1	TVG2P-TB-□-□-P4																																									
P. 109	Valve block with solenoid valve	TVG2P-□B□-□-P4-HP1																																									
		TVG2P-□B□-□-P4-HP1																																									
		TVG2P-□B□-□-P4-HP1																																									
		TVG2P-□B□-□-P4-HP1																																									
		TVG2P-□B□-□-P4-HP1																																									
		TVG2P-□B□-□-P4-HP1																																									
		TVG2P-□B□-□-P4-HP1																																									
		TVG2P-□B□-□-P4-HP1																																									
P. 109	Valve block with blanking plate Spacer cannot be selected.	TVG2P-ZB□-P4																																									
		TVG2P-ZB□-P4																																									
		TVG2P-ZB□-P4																																									
P. 101 to 104	* spacer Regulators cannot be selected. Spacer Only one type can be selected for one station.	TVG2P-P-□-P4																																									
		TVG2P-R-□-P4																																									
		TVG2P-PC-□-P4																																									
P. 115	Intermediate supply and exhaust block	TVG2P-Q□-□-□-P4																																									
		TVG2P-Q□-□-□-P4																																									
P. 114	[U side] End block *1	TVG2P-E□-□-□-P4																																									

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = □ * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	GWP 4-B		GWP 6-B		SLW-H8		
	GWP 8-B		GWP 10-B		SLW-H10		

Please specify the required number.

Cable clamp for common terminal block		Cable with multi-connector		Multi-connector only		Cable with D-sub-connector	
TVGP-SCL-18A		TVGP-RMC-□		TVGP-RM21WTP-□		TVGP-CABLE-D0-□-□	
TVGP-SCL-18B							

TVG2M (Serial Transmission Device Unit) block manifold specifications sheet

Contact Person	Quantity Set	Delivery Date (Month/Day)
Voucher No.		Order Received No.

Date of Issue
Company Name
Contact
Order No.

Model No.

TVG2M [ ] B [ ] 3 [ ] - [ ] -P4 -HP1

❶ Switching position class ❸ Connection Port Size ❺ Serial transmission ❻ Station No. ❼ Option

When filling in this field, select the model No. from Block configurations (pages 37 to 38).

Installation position

Page	Code	Model No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Qty. used
P. 105	[D side] Wiring block *1	TVG2P-TB-[ ]-[ ]-P4																																								
P. 109	Valve block with solenoid valve	TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
		TVG2P-[ ]B[ ]-[ ]-P4-HP1																																								
P. 109	Valve block with blanking plate Spacer cannot be selected.	TVG2P-ZB[ ]-P4																																								
		TVG2P-ZB[ ]-P4																																								
		TVG2P-ZB[ ]-P4																																								
P. 101 to 104	*Spacer type Regulators cannot be selected. Spacer Only one type can be selected for one station.	TVG2P-P-[ ]-P4																																								
		TVG2P-R-[ ]-P4																																								
		TVG2P-PC-[ ]-P4																																								
P. 115	Intermediate supply and exhaust block	TVG2P-Q[ ]-[ ]-[ ]-P4																																								
		TVG2P-Q[ ]-[ ]-[ ]-P4																																								
P. 114	[U side] End block *1	TVG2P-E[ ]-[ ]-[ ]-P4																																								

*1: KZ is selected, select KZ for both U and D sides. Select Z or KZ for intermediate supply and exhaust block.

P. 53	Mounting rail	L_5 = [ ] * Write an integer multiple of 12.5. (How to determine the length: page 118)

Attached Parts	Blank Plug				Silencer		Tag plate (included)
	GWP 4-B		GWP 6-B		SLW-H8		
	GWP 8-B		GWP 10-B		SLW-H10		

Please specify the required number.

Water-proof cap		Water-proof plug	
TVGP-XSZ-11		TVGP-XSZ-12	

Standard system table

1. Common exhaust

Series	Solenoid valve port size	System No.	Speed Controller	Cylinder piping Pipe length 1 m	Common exhaust piping	Composite effective sectional area (mm²)
TVG1	C4	A1	SC3W-M5-4	ø4 x ø2.5	ø8 × ø6×3m	1.0
	C6	A2	SC3W-6-6	ø6 x ø4	ø8 × ø6×3m	2.7
	C6	A3	SC1-8	ø6 x ø4	ø8 × ø6×3m	3.8
TVG2	C6	B1	SC1-8	ø6 x ø4	ø10× ø7.5×3m	4.9
	C8	B2	SC1-8	ø8 x ø6	ø10× ø7.5×3m	7.5
	C10	B3	SC1-10	ø10 x ø7.5	ø10× ø7.5×3m	9.3

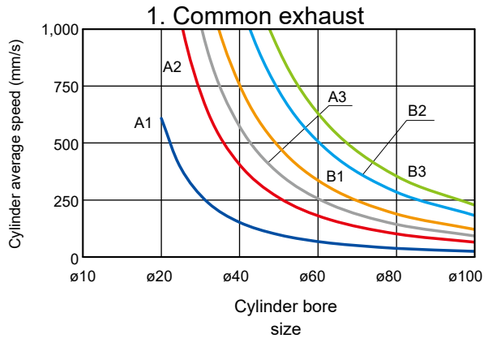
2. Atmospheric release exhaust (silencer integrated)

Series	Solenoid valve port size	System No.	Speed Controller	Cylinder piping Pipe length 1 m	End supply and exhaust block	Composite effective sectional area (mm²)
TVG1	T1 2	T1 2	SC3W-M5-4	ø4 x ø2.5	TVG1P-EB-08CS-X	1.0
	C6	A5	SC3W-6-6	ø6 x ø4		2.8
	C6	A6	SC1-8	ø6 x ø4		4.1
TVG2	C6	B4	SC1-8	ø6 x ø4	TVG2P-EB-10CS-X	5.1
	C8	B5	SC1-8	ø8 x ø6		8.2
	C10	T1 2	SC1-10	ø10 x ø7.5		10.8

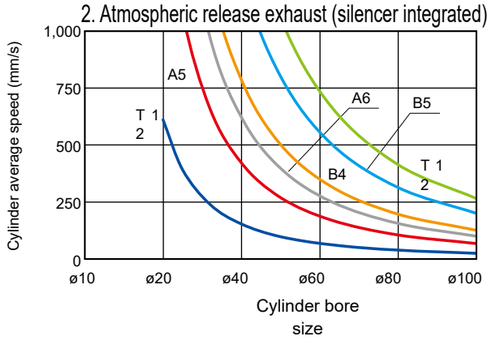
3. Exhaust with silencer

Series	Solenoid valve port size	System No.	Speed Controller	Cylinder piping Pipe length 1 m	Silencer	Composite effective sectional area (mm²)
TVG1	C4	A7	SC3W-M5-4	ø4 x ø2.5	SLW-H8	1.0
	C6	A8	SC3W-6-6	ø6 x ø4		2.6
	C6	A9	SC1-8	ø6 x ø4		3.7
TVG2	C6	B7	SC1-8	ø6 x ø4	SLW-H10	4.9
	C8	B8	SC1-8	ø8 x ø6		7.4
	C10	B9	SC1-10	ø10 x ø7.5		9.2

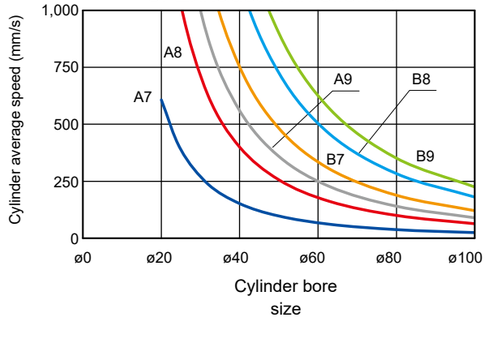
1. Common exhaust



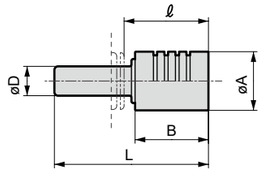
2. Atmospheric release exhaust (silencer integrated)



3. Exhaust with silencer



●Silencer



Model No.	D	L	A	B	ℓ
SLW-H8	ø8	42	16	20	23
SLW-H10	ø10	53	20	27	31.5

Device selection guide is used to select the optimum model at a glance.

● Fluid control components selection

Whether the cylinder bore size and cylinder being used are driven with relative high or low speed is determined as a condition. Using the table shown below as a reference, select the theoretical reference speed of the cylinder.

Degree of cylinder speed	Theoretical reference speed (mm/s)
Low speed	250
Medium speed	500
High speed	750
Ultra high speed	1,000

Components selection guide 1 table (P. 141) Select the equivalent bore size of cylinder tube and the proper standard system No. corresponding to theoretical reference speed.

● Theoretical reference speed: Indicates the degree of cylinder speed, expressed as the following formula. (This value matches speed with no load. When load is applied, speed drops considerably.)

$$vo=1920\times\frac{S}{A}=2445\times\frac{S}{D^2} \quad \text{——————} \quad (1)$$

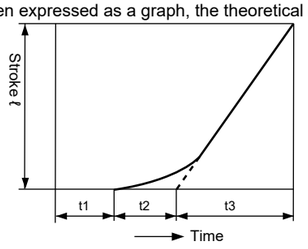
vo: Theoretical reference speed (mm/s)

(A) Cylinder sectional area (cm^2)

S: Composite effective cross-sectional area of circuit (exhaust air side) (mm^2)

D: Cylinder bore size (cm)

When expressed as a graph, the theoretical reference speed is the speed within the range where the cylinder moves at a uniform speed:



$$vo=\frac{\ell}{t3}\ (mm/s)$$

t1: Time until movement starts

t2: Time of primary delay

t3: Operating time with constant velocity

ℓ Stroke

● Note: t1 and t2 differ depending on load. Can be effectively ignored with no load.

● Required flow rate: Instantaneous flow rate for operating a cylinder with velocity vo, expressed with the following formula. Values in the table are when P = 0.5 MPa. The required flow rate is a value necessary to select clean air system components.

$$Q=\frac{Avo\ (P+0.101)\times 60}{0.101\times 104} \quad \text{——————} \quad (2)$$

Q: Required flow rate (ℓ/min) (ANR)

P: Supply Pressure (MPa)

● Required effective sectional area: Composite effective cross-sectional area for the exhaust circuit required for moving the cylinder at speed vo. (Composite effective cross-sectional area of solenoid valve, speed controller, silencer or piping) The ratio of the effective cross-sectional area S and sonic conductance C is S≈5.0×C.

● Proper standard system: The most appropriate combination of solenoid valve, speed controller, silencer and bore size for operating a cylinder with velocity vo. The combination in the table is for a pipe length of 1 m.

Expressed as follows using practical units.

$\frac{P_2+0.1}{P_1+0.1}$ When ≤ b, Choked flow

$$Q=600\times C(P_1+0.1)\sqrt{\frac{293}{273+t}} \quad .....(1)$$

$\frac{P_2+0.1}{P_1+0.1}$ When > b, subsonic flow

$$Q=600\times C\ (P_1+0.1)\sqrt{1-\left(\frac{\frac{P_2+0.1}{P_1+0.1}-b}{1-b}\right)^2}\sqrt{\frac{293}{273+t}} \quad .....(2)$$

Q: Air flow rate [dm^3/min(ANR)], SI unit dm^3 (cubic decimeter) can also be expressed with ℓ (liter). 1 dm^3 = 1 ℓ

C: Sonic conductance [dm^3/(s/bar)]

b: Critical pressure ratio [−]

P1: Upstream pressure [MPa]

P2: Downstream pressure [MPa]

t: Temperature [°C]

When calculating using the effective area S, substitute the value C obtained from C = S/5 into the above formula.

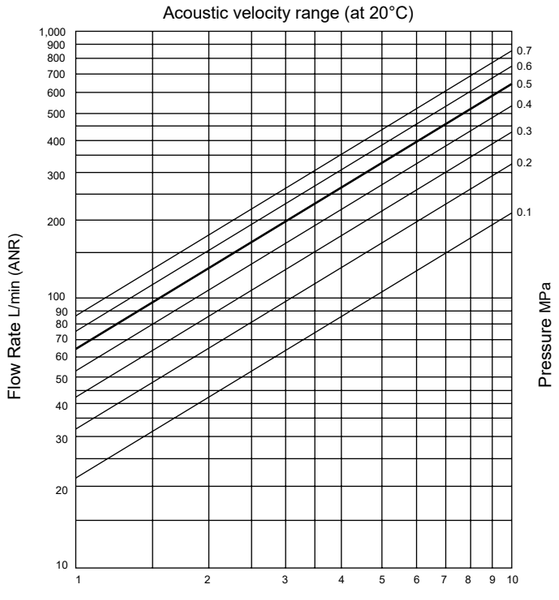
For subsonic flow, substitute b = 0.5 into formula (2).

TVG Series [Components Selection Guide]

Cylinder Bore size (mm)	Theoretical reference Speed (mm/s)	Required flow rate (L/min)(ANR)	Required effective Cross-sectional area (mm^2)	Proper standard system No.		
				1. Common exhaust	2. Atmospheric release exhaust	3. Exhaust with silencer
ø6	(500)	–	(0.1)	A1	A4	A7
ø10	500	–	(0.2)	A1	A4	A7
ø16	(500)	–	(0.5)	A1	A4	A7
ø20	250	28	0.4	A1	A4	A7
	500	56	0.8	A1	A4	A7
	750	84	1.2	A2	A5	A8
	1,000	110	1.6	A2	A5	A8
ø25	250	44	0.6	A1	A4	A7
	500	88	1.3	A2	A5	A8
	750	130	1.9	A2	A5	A8
	1,000	180	2.6	A2	A5	A8
ø32	250	72	1.0	A2	A5	A8
	500	140	2.1	A2	A5	A8
	750	220	3.1	A3	A6	A9
	1,000	290	4.2	B1	B4	B7
ø40	250	110	1.6	A2	A5	A8
	500	220	3.3	A3	A6	A9
	750	340	4.9	B1	B4	B7
	1,000	450	6.5	B2	B5	B8
ø50	250	180	2.6	A2	A5	A8
	500	350	5.1	B2	B4	B8
	750	530	7.7	B3	B5	B9
	1,000	700	10.2	–	B6	–
ø63	250	280	4.1	B1	A6	B7
	500	560	8.1	B3	B5	B9
	750	830	12.2	–	–	–
	1,000	1.100	16.2	–	–	–
ø80	250	450	6.5	B2	B5	B8
	500	900	13.1	–	–	–
	750	1,300	19.6	–	–	–
	1,000	1,800	26.2	–	–	–
ø100	250	700	10.2	–	B6	–
	500	1,400	20.5	–	–	–
	750	2,100	30.7	–	–	–
	1,000	2,800	40.9	–	–	–

* Please see **P. 139** for the System No..

[Effective Area]



(When the value of effective cross-sectional area is ×10^{-1} or ×10 n, multiply the value of flow rate by the same value.)

[Clean air system components]

[Clean air system components]

Part name	Model No.	Connection Port Size	Max. Flow Rate (ℓ/min atmospheric pressure conversion)
F.R.L. kit	**C1000-6-W**	Rc1/8	450
	C1000-8-W	Rc1/4	630
	C3000-8-W	Rc1/4	1,280
	C3000-10-W	Rc3/8	1,750
	C4000-8-W	Rc1/4	1,430
	C4000-10-W	Rc3/8	2,400
	C4000-15-W	Rc1/2	3,000
F.R. unit	**W1000-6-W**	Rc1/8	830
	W1000-8-W	Rc1/4	1,150
	W3000-8-W	Rc1/4	2,150
	W3000-10-W	Rc3/8	2,430
	W4000-8-W	Rc1/4	2,500
	W4000-10-W	Rc3/8	4,350
	W4000-15-W	Rc1/2	4,750
Air filter (F)	**F1000-6-W**	Rc1/8	460
	F1000-8-W	Rc1/4	610
	F3000-8-W	Rc1/4	1,230
	F3000-10-W	Rc3/8	1,500
	F4000-8-W	Rc1/4	1,320
	F4000-10-W	Rc3/8	2,140
	F4000-15-W	Rc1/2	3,000
Regulator (R)	**R1000-6-W**	Rc1/8	770
	R1000-8-W	Rc1/4	1,350
	R3000-8-W	Rc1/4	2,000
	R3000-10-W	Rc3/8	2,600
	R4000-8-W	Rc1/4	2,500
	R4000-10-W	Rc3/8	4,400
	R4000-15-W	Rc1/2	5,000
Lubricator (L)	**L1000-6-W**	Rc1/8	550
	L1000-8-W	Rc1/4	700
	L3000-8-W	Rc1/4	1,100
	L3000-10-W	Rc3/8	2,250
	L4000-8-W	Rc1/4	1,000
	L4000-10-W	Rc3/8	1,700
	L4000-15-W	Rc1/2	2,700

Note) Max. flow rate: For F.R.L., FR and R, flow rate at 0.7 MPa primary pressure, 0.5 MPa set pressure, 0.1 MPa pressure drop. For air filter, flow rate at 0.7 MPa primary pressure, 0.02 MPa pressure drop. For lubricator, flow rate at 0.5 MPa primary pressure, 0.03 MPa pressure.

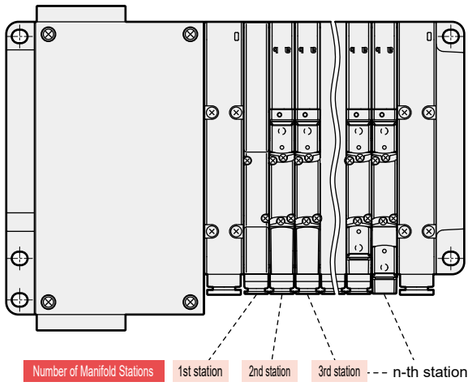
MEMO

Common terminal block (wiring method EA1A, EA1B)

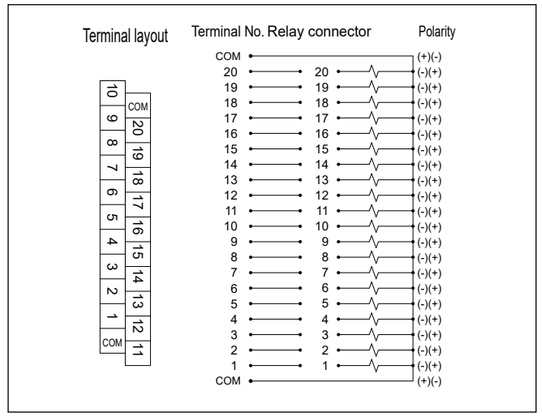
Notes on wiring

[Precautions for common terminal box (EA1*)]

①With the common terminal box, the common wiring is internal processed beforehand. When using the independent contact PLC output unit, wire the common wires at the contact section.
②Check the correspondence of the number of stations with solenoid positions to prevent incorrect wiring. (Refer to the table below.)
③Note that the correspondence will not function if the number of solenoid stations exceeds 20.
④The manifold station numbers are set in order from left with the piping port facing forward.
⑤A voltage drop may occur due to simultaneous energizing or cable length. Confirm that the voltage drop for the solenoid is within 10% of the rated voltage.



Wiring method Internal wiring of EA1 * (up to 20 solenoid stations)



Terminal array of wiring method EA1* (example)

*1: Valve No. 1a, 1b, 2a, 2b...The numbers in indicate the 1st and 2nd stations, and the letters a and b indicate the a side solenoid and the b side solenoid. The manifold's max. station number differs depending on the model. Check the specifications of each model.
*2: When using a single solenoid with standard wiring (double wiring), applying power to the (empty) part of the table below will light up the operation lamp. However, this is not an abnormality.

Terminal No.

	COM	20	19	18	17	16	15	14	13	12	11
10	9	8	7	6	5	4	3	2	1	COM	

[Standard wiring (double wiring)]

● For single solenoid valve

(MF station No. max. 10 stations)

Terminal block No.	COM	20	19	18	17	16	15	14	13	12	11
Valve No.	COM	(Blank)	10a	(Blank)	9a	(Blank)	8a	(Blank)	7a	(Blank)	6a
Terminal block No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**COM**
Valve No.	(Blank)	5a	(Blank)	4a	(Blank)	3a	(Blank)	2a	(Blank)	1a	COM

● For double solenoid valve

(MF station No. max. 10 stations)

Terminal block No.	COM	20	19	18	17	16	15	14	13	12	11
Valve No.	COM	10b	10a	9b	9a	8b	8a	7b	7a	6b	6a
Terminal block No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**COM**
Valve No.	5b	5a	4b	4a	3b	3a	2b	2a	1b	1a	COM

● For mixed use (single/double mixture)

(Number of solenoid valves up to 20 points)

Terminal block No.	COM	20	19	18	17	16	15	14	13	12	11
Valve No.	COM	10b	10a	9b	9a	8b	8a	7b	7a	(Blank)	6a
Terminal block No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**COM**
Valve No.	5b	5a	4b	4a	(Blank)	3a	(Blank)	2a	(Blank)	1a	COM

[Single solenoid, double solenoid layout specification]

(MF station No. max. 20 stations)

Terminal block No.	COM	20	19	18	17	16	15	14	13	12	11
Valve No.	COM	20a	19a	18a	17a	16a	15a	14a	13a	12a	11a
Terminal block No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**COM**
Valve No.	10a	9a	8a	7a	6a	5a	4a	3a	2a	1a	COM

(MF station No. max. 10 stations)

Terminal block No.	COM	20	19	18	17	16	15	14	13	12	11
Valve No.	COM	10b	10a	9b	9a	8b	8a	7b	7a	6b	6a
Terminal block No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**COM**
Valve No.	5b	5a	4b	4a	3b	3a	2b	2a	1b	1a	COM

(Number of solenoid valves up to 20 points)

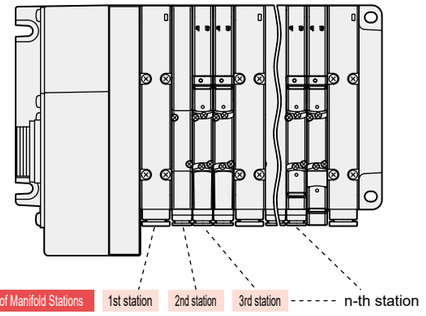
Terminal block No.	COM	20	19	18	17	16	15	14	13	12	11
Valve No.	COM	(Blank)	(Blank)	(Blank)	(Blank)	10b	10a	9b	9a	8b	8a
Terminal block No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**COM**
Valve No.	7b	7a	6a	5b	5a	4b	4a	3a	2a	1a	COM

Multi-connector (wiring method FA1A, FA1B)

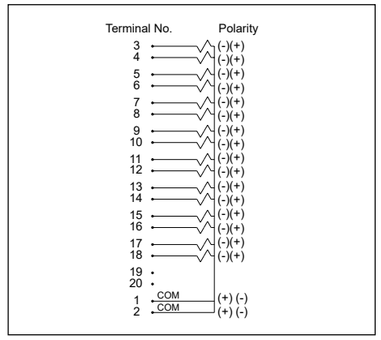
Notes on wiring

[Precautions for multi-connector (FA1 *)]

①With the common terminal box, the common wiring is internal processed beforehand. When using the independent contact PLC output unit, wire the common wires at the contact section.
②Check the correspondence of the number of stations with solenoid positions to prevent incorrect wiring. (Refer to the table below.)
③Note that the correspondence will not function if the number of solenoid stations exceeds 16.
④The manifold station numbers are set in order from left with the piping port facing forward.
⑤A voltage drop may occur due to simultaneous energizing or cable length. Confirm that the voltage drop for the solenoid is within 10% of the rated voltage.



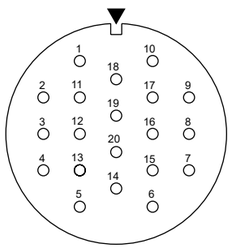
Internal wiring of FA1* (up to 16 solenoid stations)



Terminal array of wiring method FA1 * (example)

*1: Valve No. 1a, 1b, 2a, 2b...The numbers in indicate the 1st and 2nd stations, and the letters a and b indicate the a side solenoid and the b side solenoid. The manifold's max. station number differs depending on the model. Check the specifications of each model.
*2: When using a single solenoid with standard wiring (double wiring), applying power to the (empty) part of the table below will light up the operation lamp. However, this is not an abnormality.

Terminal No.



[Standard wiring (double wiring)]

● For single solenoid valve

(MF station No. max. 8 stations)

Terminal No.	20	19	18	17	16	15	14	13	12	11
Valve No.	(None)	(None)	(Blank)	8a	(Blank)	7a	(Blank)	6a	(Blank)	5a
Terminal No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Valve No.	(Blank)	4a	(Blank)	3a	(Blank)	2a	(Blank)	1a	COM	COM

● For double solenoid valve

(MF station No. max. 8 stations)

Terminal No.	20	19	18	17	16	15	14	13	12	11
Valve No.	(None)	(None)	8b	8a	7b	7a	6b	6a	5b	5a
Terminal No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Valve No.	4b	4a	3b	3a	2b	2a	1b	1a	COM	COM

● For mixed use (single/double mixture)

(Number of solenoid valves up to 16 points)

Terminal No.	20	19	18	17	16	15	14	13	12	11
Valve No.	(None)	(None)	8b	8a	(Blank)	7a	6b	6a	5b	5a
Terminal No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Valve No.	4b	4a	(Blank)	3a	2b	2a	(Blank)	1a	COM	COM

[Single solenoid, double solenoid layout specification]

(MF station No. max. 16 stations)

Terminal No.	20	19	18	17	16	15	14	13	12	11
Valve No.	(None)	(None)	16a	15a	14a	13a	12a	11a	10a	9a
Terminal No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Valve No.	8a	7a	6a	5a	4a	3a	2a	1a	COM	COM

(MF station No. max. 8 stations)

Terminal No.	20	19	18	17	16	15	14	13	12	11
Valve No.	(None)	(None)	8b	8a	7b	7a	6b	6a	5b	5a
Terminal No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Valve No.	4b	4a	3b	3a	2b	2a	1b	1a	COM	COM

(Number of solenoid valves up to 16 points)

Terminal No.	20	19	18	17	16	15	14	13	12	11
Valve No.	(None)	(None)	10b	10a	9b	9a	8b	8a	7b	7a
Terminal No.	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Valve No.	6a	5b	5a	4b	4a	3a	2a	1a	COM	COM

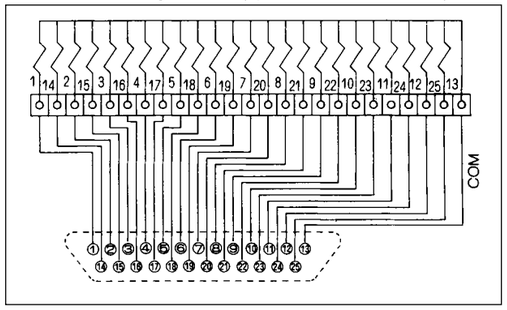
D-sub-connector (wiring method GA1A, GA1B)

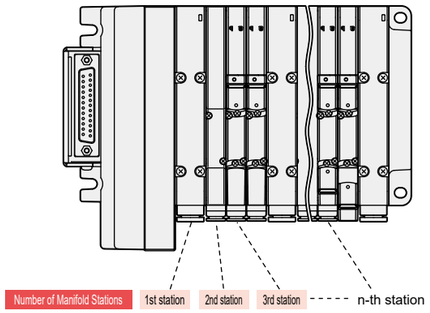
Notes on wiring

[GA1* connector]
The connector used for GA1* wiring, called a D-sub-connector, is used widely for FA and OA components components. 25P in particular is also an RS-232-C Standards designated connector, used for personal computer communication. The manifold station numbers are set in order from left with the piping port facing forward.

[Precautions for connector GA1*]
①Signal arrays of the PLC output unit must match signal arrays on the valve side.
②The working power is 24 VDC dedicated.
③A voltage drop may occur due to simultaneous energizing or cable length. Confirm that the voltage drop for the solenoid is within 10% of the rated voltage.

Internal wiring of GA1 * (up to 24 solenoid stations)

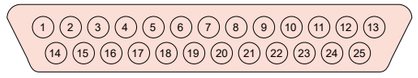




GA1 * connector pin array (example)

*1:The numbers on valves No. 1a, 1b, 2a, 2b ... indicate the 1st and 2nd stations, and alphabets "a" and "b" indicate the "a" side and "b" side solenoids. The manifold's max. station number differs depending on the model. Check the specifications of each model.
*2: When using a single solenoid with standard wiring (double wiring), applying power to the (empty) part of the table below will light up the operation lamp. However, this is not an abnormality.

Connector pin No.



[Standard wiring (double wiring)]

● For single solenoid valve

(MF station No. max. 12 stations)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	

(MF station No. max. 24 stations)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	3a	5a	7a	9a	11a	13a	15a	17a	19a	21a	23a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	2a	4a	6a	8a	10a	12a	14a	16a	18a	20a	22a	24a	

● For double solenoid valve

(MF station No. max. 12 stations)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	

(MF station No. max. 12 stations)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	

● For mixed use (single/double mixture)

(Number of solenoid valves up to 24 points)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	(Blank)	(Blank)	3b	4b	(Blank)	(Blank)	7b	(Blank)	(Blank)	(Blank)	11b	12b	

(Number of solenoid valves up to 24 points)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	3a	4a	5a	7a	8a	10a	11b	12b	14a	15b	17a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	2a	3b	4b	6a	7b	9a	11a	12a	13a	15a	16a	17b	

[Single solenoid, double solenoid layout specification]

(MF station No. max. 24 stations)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	3a	5a	7a	9a	11a	13a	15a	17a	19a	21a	23a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	2a	4a	6a	8a	10a	12a	14a	16a	18a	20a	22a	24a	

(MF station No. max. 12 stations)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	

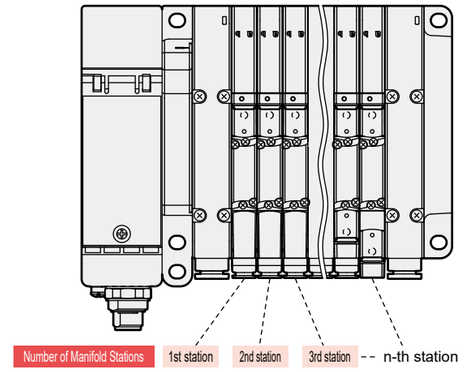
(Number of solenoid valves up to 24 points)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve No.	1a	3a	4a	5a	7a	8a	10a	11b	12b	14a	15b	17a	COM
Pin No.	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
Valve No.	2a	3b	4b	6a	7b	9a	11a	12a	13a	15a	16a	17b	

Serial transmission: Wiring Method

J** serial transmission

- The device unit's output No. differs with the manufacturer. The internal connector pin No. and the manifold solenoid correspond as shown below.
- The manifold station numbers are set in order from left with the piping port facing forward regardless of the wiring block position.
- Internal connectors are wired in order, so there may be some blank numbers depending on the number of stations. These blank outputs cannot be used to drive other than the solenoid manifolds in use.
- The working power is 24 VDC dedicated.
- Securely fix the attached connector with fixing screws. (Proper tightening torque 0.3 N·m)



Valve No. Arrangement Corresponding to Solenoid Output No. for Wiring Method J□□ (Example)

*: Valve No.1a, 1b, 2a, 2b,...The numbers in indicate the 1st and 2nd stations, and the letters a and b indicate the a side solenoid and the b side solenoid. The manifold's max. station number differs depending on the model. Check the specifications of each model.

[Standard wiring (double wiring)]

● For single solenoid valve

Solenoid Output No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valve No.	1a	(Blank)	2a	(Blank)	3a	(Blank)	4a	(Blank)	5a	(Blank)	6a	(Blank)	7a	(Blank)	8a	(Blank)
Solenoid Output No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Valve No.	9a	(Blank)	10a	(Blank)	11a	(Blank)	12a	(Blank)	13a	(Blank)	14a	(Blank)	15a	(Blank)	16a	(Blank)

● For double solenoid valve

Solenoid Output No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valve No.	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b
Solenoid Output No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Valve No.	9a	9b	10a	10b	11a	11b	12a	12b	13a	13b	14a	14b	15a	15b	16a	16b

● For mixed use (single/double mixture)

Solenoid Output No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valve No.	1a	(Blank)	2a	(Blank)	3a	3b	4a	4b	5a	(Blank)	6a	(Blank)	7a	7b	8a	(Blank)
Solenoid Output No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Valve No.	9a	(Blank)	10a	10b	11a	11b	12a	(Blank)	13a	(Blank)	14a	14b	15a	15b	16a	(Blank)

* Do not use (Blank).

[Single/double mixed wiring]

Solenoid Output No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a	14a	15a	16a
Solenoid Output No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Valve No.	17a	18a	19a	20a	21a	22a	23a	24a	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)	(Blank)

Solenoid Output No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valve No.	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b	6a	6b	7a	7b	8a	8b
Solenoid Output No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Valve No.	9a	9b	10a	10b	11a	11b	12a	12b	13a	13b	14a	14b	15a	15b	16a	16b

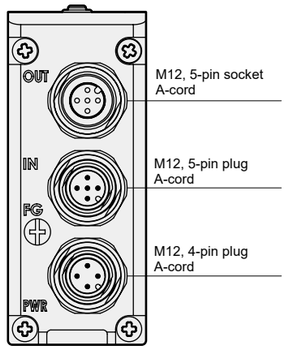
Solenoid Output No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valve No.	1a	(Blank)	2a	(Blank)	3a	3b	4a	4b	5a	(Blank)	6a	(Blank)	7a	7b	8a	(Blank)
Solenoid Output No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Valve No.	9a	(Blank)	10a	10b	11a	11b	12a	(Blank)	13a	(Blank)	14a	14b	15a	15b	16a	(Blank)

Solenoid Output No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valve No.	1a	2a	3a	3b	4a	4b	5a	6a	7a	7b	8a	9a	10a	10b	11a	11b
Solenoid Output No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Valve No.	12a	13a	14a	14b	15a	15b	16a	17a	18a	18b	19a	20a	21a	21b	22a	22b

JA1* DeviceNet

MS ☐
NS ☐
PW ☐
PW(V) ☐

LED name	Indicator description
MS	Status of the device unit body related to DeviceNet is indicated by the LED color (green/red) and state (ON/blinking)
NS	Status of the network related to DeviceNet is indicated by the LED color (green/red) and state (ON/blinking)
PW	Lights when communication power is ON. Green lamp is ON when normal
PW(V)	Lights when valve power is ON. Green lamp is ON when normal (Cannot be monitored when the communication power is not turned ON)



Communication connector pin array

Port	Pin	Signal name	Functions
IN OUT	1	Drain	Shield terminal
	2	V+	Communication power supply (+)
	3	V-	Communication power supply (-)
	4	CAN_H	Communication terminal (H)
	5	CAN_L	Communication terminal (L)

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

● Wiring of communication line

Please purchase communication cables or connectors that are compatible with the specifications of this product.
For wiring method, refer to the following communication connector pin array and communication cable wiring example.

Connector with cable for both sides : Type DCA1-5CN**W1 (socket/plug) OMRON Corporation
IN connector with cable for one side : Type DCA1-5CN**F1 (socket) OMRON Corporation
For OUT : Type DCA1-5CN**H1 (plug) OMRON Corporation

● Wiring to the power supply socket

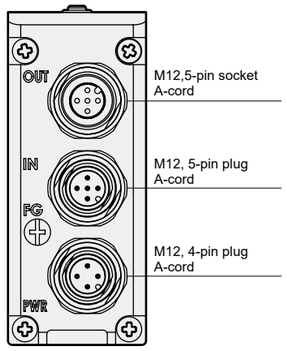
Please purchase power cables or connectors that are compatible with the specifications of this product.

Recommended M12-loose wire type power cable : Type XS2F-D421-☐8☐-☐ straight OMRON
Recommended communication plug and power cable : Part No. 2103 212 2305 Assembly M12 connector Manufactured by HARTING
Electric wire size: AWG22-18, Applicable cable diameter: ø6-8
*☐differs depending on the cable specifications

JA2* CC-LINK Ver1.10

RUN ☐
ERR ☐
PW ☐
PW (V) ☐

LED name	Indicator description
L RUN	Show data link status
L ERR	Displays data link error status
PW	Lights when unit power is ON.
PW(V)	Lights when valve power is ON. (Cannot be monitored when the unit power is not turned ON)



Communication connector pin array

Port	Pin	Signal name	Wire insulation color/others
IN OUT	1	SLD	Ground wire (shield)
	2	DB	White
	3	DG	Yellow
	4	DA	Blue
	5	No.	Vacant

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

● Wiring of communication line

Please purchase communication cables or connectors that are compatible with the specifications of this product.
For wiring method, refer to the following communication connector pin array and communication cable wiring example. (☐differs with cable length.)

Connector with cable for both sides : SAC-4P-M12MS/☐☐☐☐☐☐-990/M12FS (socket/plug) FENIX CONTACT CO., LTD.
TVGP-CABLE-G-M12M12-1 (socket/plug) CKD (refer to page 55)
IN connector with cable forone side : SAC-4P-☐☐☐☐☐☐-990/M12FS (socket) Manufactured by PHOENIX CONTACT CO., LTD.
(Specify a 5-pole M12 connector for the IN socket.)
TVGP-CABLE-G-M12FS-5 (socket) CKD Corporation (Refer to page 55)
For OUT: SAC-4P-M12MS/☐☐☐☐☐☐-990 (plug) Manufactured by FENIX CONTACT Co., Ltd.
TVGP-CABLE-G-M12MS-5 (plug) CKD Co., Ltd. (refer to page 55)

* terminating resistor can be set from switch above the product. Connect the following terminating resistor to the OUT side if not using switches.
Terminating resistor M12 connector : SAC-4P-M12MS CCL TR Manufactured by Phoenix Contact Co., Ltd.

● Wiring to the power supply socket

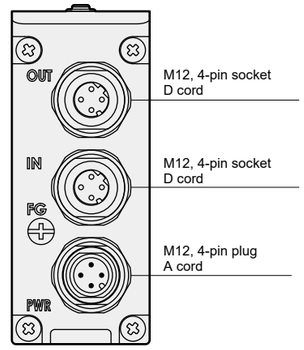
Please purchase power cables or connectors that are compatible with the specifications of this product.

Recommended M12-loose wire type power cable : Type XS2F-D421-☐8☐-☐ Straight OMRON
TVGP-CABLE-M12SAC-5 CKD Corporation (Refer to page 55)
Recommended communication plug and power cable: Part No. 2103 212 2305 Assembly M12 connector Manufactured by HARTING
Electric wire size: AWG22-18, Applicable cable diameter: ø6-8
*☐Differs depending on the cable specifications

JA3* EtherCAT

RUN ☐
ERR ☐
L/A IN ☐
L/A OUT ☐
INFO ☐
PW ☐
PW (V) ☐

LED name	Indicator description
RUN	Communication status of EtherCAT is indicated by the LED (green) is indicated by the ON state (OFF/ON/blinking) (Green lamp is ON during normal communication)
ERR	Abnormal status of EtherCAT is indicated by the LED (red) is indicated by the ON state (OFF/ON/ blinking) (Lamp is OFF during normal communication)
L/A IN	Status of the Ethernet port (IN side) is Indicated by the LED (green) state (OFF/ON/blinking)
L/A OUT	Status of the Ethernet port (OUT side) is Indicated by the LED (green) state (OFF/ON/ blinking)
INFO	Error status of the device unit is indicated by the LED (red) (OFF during normal communication)
PW	Lights when unit power is ON. Green lamp is ON when normal
PW(V)	Lights when valve power is ON. Green lamp is ON when normal (When the unit power is not turned ON, cannot be monitored)



Communication connector pin array

M12 pins		Signal name	Functions
IN OUT	1	TD+	Transmitted data, positive
	2	RD+	Received data, positive
	3	TD-	Transmitted data, negative
	4	RD−	Received data, negative

Power supply connector pin array

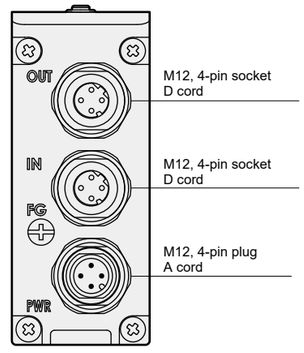
M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

- The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
- Connect the EtherCAT cable from the previous station to the communication connector (IN).
- Prepare a connector to be used on the wiring end.
- Refer to page 153 for details on connectors and power supplies.

JA4* EtherNet/IP

MS ☐
NS ☐
L/A IN ☐
L/A OUT ☐
ST ☐
PW(V) ☐

LED name	Indicator description
MS	Status of the device unit body related to EtherNet/IP is indicated by the LED color (green/red) and state (ON/blinking)
NS	Status of the network related to EtherNet/IP is indicated by the LED color (green/red) and state (ON/blinking)
L/A IN	Status of the Ethernet port (IN side) is is indicated by the LED color (green/yellow)
L/A OUT	Status of the Ethernet port (OUT side) is is indicated by the LED color (green/yellow)
ST	Status of the device unit body is indicated by the LED color (green/yellow) and blinking/ON status
PW(V)	Indicates the power status of the valve power supply. Lit in green when powered ON (When the unit power is not turned ON cannot be monitored)



Communication connector pin array

Port	Pin	Signal name	Functions
IN OUT	1	TD+	Transmitted data, positive
	2	RD+	Received data, positive
	3	TD-	Transmitted data, negative
	4	RD−	Received data, negative

Power supply connector pin array

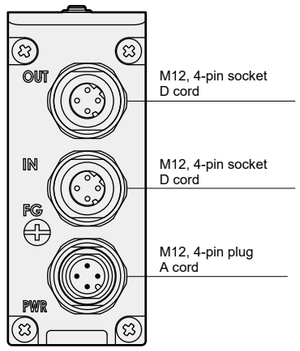
M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

- The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
- Connect the communication cable to IN or OUT.
- Prepare a connector to be used on the wiring end.
- * Refer to page 153 for details on connector and power supply.

JA5* CC-Link IEF Basic

RUN ☐
ERR ☐
L/A IN ☐
L/A OUT ☐
INFO ☐
PW ☐
PW (V) ☐

LED name	Indicator description
RUN	Connection status of CC-Link IEF Basic is indicated by the LED state (ON/blinking)
ERR	Abnormal connection status of CC-Link IEF Basic is indicated by the LED state (ON/blinking)
L/A IN	Status of the Ethernet port (IN side) is indicated by the LED state (ON/blinking)
L/A OUT	Status of the Ethernet port (OUT side) is indicated by the LED state (ON/blinking)
INFO	Status of the device unit body is indicated by the LED state (ON/blinking)
PW	Indicates the power status of the unit power supply. Lit in green when powered ON
PW(V)	Indicates the power status of the valve power supply. Green lamp ON when power turned ON (Cannot be monitored when unit power supply is OFF)



Communication connector pin array

Port	Pin	Signal name	Functions
IN OUT	1	TD+	Transmitted data, positive
	2	RD+	Received data, positive
	3	TD-	Transmitted data, negative
	4	RD−	Received data, negative

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

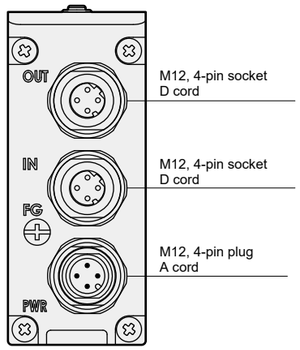
- The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
- Connect the communication cable to IN or OUT.
- Prepare a connector to be used on the wiring end.

* Refer to page 153 for details on connector and power supply.

JA6* PROFINET

RUN ☐
ERR ☐
L/A IN ☐
L/A OUT ☐
INFO ☐
PW ☐
PW (V) ☐

LED name	Indicator description
RUN	Connection status of PROFINET is indicated by the LED state (ON/blinking)
ERR	Abnormal connection status of PROFINET is indicated by the LED state (ON/blinking)
L/A IN	Status of the Ethernet port (IN side) is indicated by the LED state (ON/blinking)
L/A OUT	Status of the Ethernet port (OUT side) is indicated by the LED state (ON/blinking)
INFO	Status of the device unit body is indicated by the LED state (ON/blinking)
PW	Indicates the power status of the unit power supply. Lit in green when powered ON
PW(V)	Indicates the power status of the valve power supply. Green lamp ON when power turned ON (Cannot be monitored when unit power supply is OFF)



Communication connector pin array

Port	Pin	Signal name	Functions
IN OUT	1	TD+	Transmitted data, positive
	2	RD+	Received data, positive
	3	TD-	Transmitted data, negative
	4	RD−	Received data, negative

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

- The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
- Connect the communication cable to IN or OUT.
- Prepare a connector to be used on the wiring end.

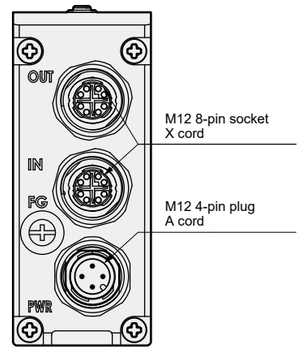
* Refer to page 153 for details on connector and power supply.

JA7* CC-Link IE Field

CC-Link IE Field

L ERR ☐
D Link ☐
RUN/ERR ☐
INFO ☐
L/A OUT ☐
L/A IN ☐
PW ☐
PW(V) ☐

LED name	Indicator description
L ERR	Communication port abnormal status of CC-Link IE Field is indicated by the LED (red) state (Lamp is OFF during normal communication)
D Link	Data link communication status of CC-Link IE Field is indicated by the LED (green) state (ON during normal communication)
RUN/ ERR	RUN: Product operation status is indicated by the LED (green) state ERR: Abnormal product operation status is indicated by the LED (red) state
INFO	Status of notification from device unit is indicated by the LED (red) state (OFF during normal communication)
L/A OUT (P1)	Status of the Ethernet port (OUT side) is indicated by the LED (green) state (OFF/blinking/blinking)
L/A IN (P2)	Status of the Ethernet port (IN side) is indicated by the LED (green) state (OFF/blinking/blinking)
PW	Lights when unit power is ON (Green lamp is ON when normal)
PW(V)	Lights when valve power is ON (Green lamp is ON when normal) *Cannot be monitored when the unit power is not turned ON.



Communication connector pin array

M12 8-pin		Signal name	Functions
IN OUT	1	BI_DA+	Transmit/receive data, positive
	2	BI_DA-	Transmit/receive data, negative
	3	BI_DB+	Transmit/receive data, positive
	4	BI_DC+	Transmit/receive data, positive
	5	BI_DC-	Transmit/receive data, negative
	6	BI_DB-	Transmit/receive data, negative
	7	BI_DD+	Transmit/receive data, positive
	8	BI_DD-	Transmit/receive data, negative

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

- The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
- Connect the communication cable to IN or OUT.
- Prepare a connector to be used on the wiring end.

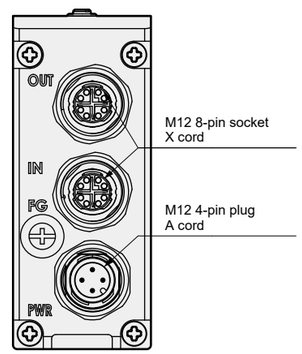
* Refer to page 154 for details on connector and power supply.

JA8* CC-Link IE TSN

CC-Link IE TSN

D Link ☐
RUN/ERR ☐
INFO ☐
L/A OUT ☐
L/A IN ☐
PW ☐
PW(V) ☐

LED name	Indicator description
D Link	Data link communication status of CC-Link IE TSN is indicated by the LED (green) state (ON during normal communication)
RUN/ ERR	RUN: Product operation status is indicated by the LED (green) state ERR: Abnormal product operation status is indicated by the LED (red) state
INFO	Status of notification from device unit is indicated by the LED (red) state (OFF during normal communication)
L/A OUT (P1)	Status of the Ethernet port (OUT side) is indicated by the LED (green) state (OFF/blinking/blinking)
L/A IN (P2)	Status of the Ethernet port (IN side) is indicated by the LED (green) state (OFF/blinking/blinking)
PW	Lights when unit power is ON (Green lamp is ON when normal)
PW(V)	Lights when valve power is ON (Green lamp is ON when normal) *Cannot be monitored when the unit power is not turned ON.



Communication connector pin array

M12 8-pin		Signal name	Functions
IN OUT	1	BI_DA+	Transmit/receive data, positive
	2	BI_DA-	Transmit/receive data, negative
	3	BI_DB+	Transmit/receive data, positive
	4	BI_DC+	Transmit/receive data, positive
	5	BI_DC-	Transmit/receive data, negative
	6	BI_DB-	Transmit/receive data, negative
	7	BI_DD+	Transmit/receive data, positive
	8	BI_DD-	Transmit/receive data, negative

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

- The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
- Connect the communication cable to IN or OUT.
- Prepare a connector to be used on the wiring end.

Refer to page 154 for details on * connector and power supply.

Model No. / LED display / Wiring method

JA9* IO-Link

LED display

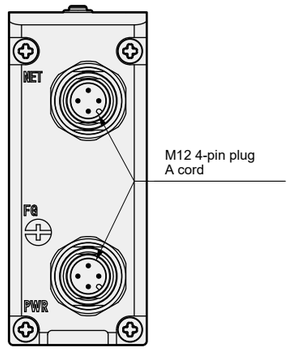
IO-Link Class A, Class B

PW(V) ☐
COM ☐
ST ☐
INFO ☐

LED name	Indicator description
PW(V)	Lights when valve power is ON. (Green lamp is ON when normal) *Cannot be monitored when the unit power is not turned ON.
COM	Unit power supply status and IO-Link communication status are indicated by the LED (green) Unit power supply OFF: OFF Unit power supply ON (IO-Link communication not implemented): ON Unit power supply ON (IO-Link in communication): Blinking
ST	Device unit status is indicated by the LED (red) Operating normally: OFF Maintenance Required: Blinking Hardware error (disconnection/memory error): ON
INFO	OFF (not used)

Wiring method

IO-Link Class A



M12 4-pin plug
A cord

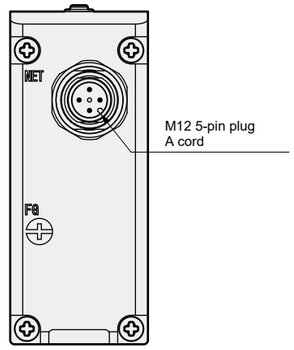
Communication connector pin array

M12 4-pin		Signal name	Functions
NET	1	L+	Unit power supply (+ side: 24 V
	2	NC	Vacant
	3	L4	Unit power supply (- side: 0 V)
	4	C/Q	IO-Link signal

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	NC	Vacant
	2	P24	Valve power supply 24 V
	3	NC	Vacant
	4	N24	Valve power supply 0 V

IO-Link Class B



M12 5-pin plug
A cord

Communication connector pin array

M12 5-pin		Signal name	Functions
NET	1	L+	Unit power supply (+ side: 24 V
	2	P24	Valve power supply (+ side: 24 V)
	3	L4	Unit power supply (- side: 0 V)
	4	C/Q	IO-Link signal
	5	N24	Valve power supply (- side: 0 V)

• The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
• Prepare a connector to be used on the wiring end.
* Refer to page 155 for details on connector and power supply.

JB1* IO-Link Wireless

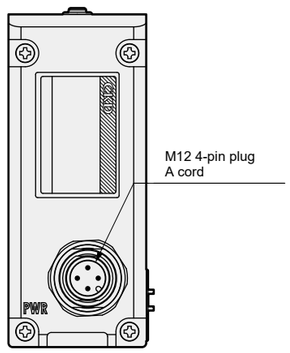
LED display

IO-Link Wireless

PW ☐
PW(V) ☐
LINK ☐
ST ☐
LQ ☐

LED name	Indicator description
PW	Lights when unit power is ON (Green lamp is ON when normal)
PW(V)	Lights when valve power is ON. (Green lamp is ON when normal) *Cannot be monitored when the unit power is not turned ON.
LINK	Communication status is indicated by the LED (green) (Power supply OFF: When OFF, power supply ON: ON, Normal communication: Blinking)
ST	Status of this product is indicated by the LED (red) state Normal operation: OFF Hardware error: ON When maintenance is required: Blinking
LQ	Communication quality is indicated by the ON status Communication quality "good": Green lit Communication quality "normal": Orange lit Communication error: Red lit

Wiring method



M12 4-pin plug
A cord

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

• The unit power supply and the valve power supply are separate power supplies. Supply power from the power supply connector (24 VDC).
• Prepare a connector to be used on the wiring end.
* Refer to page 156 for details on connector and power supply.

PLC compatibility table

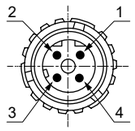
Model No.	Communication protocol		Recommended PLC model No. * 1	
	Association	Network name	Manufacturer	Host unit model No.
JA1*	ODVA	DeviceNet	OMRON Corporation	CJ1W-DRM21
JA2*	CC-Link Partner Association (CLPA)	CC-Link ver. 1.10	Mitsubishi Electric Corporation	RJ61BT11
JA3*	EtherCAT Technology Group (ETG)	EtherCAT	Connected to EtherCAT-compatible master	
			OMRON Corporation	NJ Series NX Series
JA4*	ODVA	EtherNet/IP	Connected to EtherNet/IP-compatible master	
			Rockwell Automation Co., Ltd.	ControlLogix5570
			OMRON Corporation	NJ Series NX Series
JA5*	CC-Link Partner Association (CLPA)	CC-Link IEF Basic	Connected to CC-Link IEF Basic-compatible master	
			Mitsubishi Electric Corporation	R Series CPU unit
JA6*	PROFIBUS & PROFINET International(PI)	PROFINET	Connected to PROFINET-compatible master	
			Mitsubishi Electric Corporation	RJ71PN92
			SIEMENS Corporation	S7-1200 S7-1500
JA7*	CC-Link Partner Association (CLPA)	CC-Link IE Field	Connected to CC-Link IE Field-compatible master	
			Mitsubishi Electric Corporation	RJ71GF11-T2
JA8*	CC-Link Partner Association (CLPA)	CC-Link IE TSN	Connected to CC-Link IE TSN-compatible master	
			Mitsubishi Electric Corporation	RJ71GN11-T2
JA9*	IO-Link Community	IO-Link	Connected to IO-Link-compatible master	
			OMRON Corporation	Contact the manufacturer
			Mitsubishi Electric Corporation	Contact the manufacturer
			Ballough Co., Ltd.	Contact the manufacturer
			Turk Japan Co., Ltd.	Contact the manufacturer
JB1*	IO-Link Community	IO-Link Wireless	Connected to IO-Link Wireless-compatible master CKD IO-Link Wireless components compatible Region: Japan, EU, USA	
			Core Tigo Technolody	Contact Toho Technology Co., Ltd.

*1 This is as of June 2023. For details, contact the PLC manufacturer.

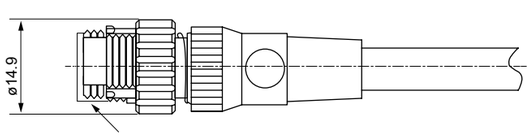
Water-proof connector

For EtherCAT, EtherNet/IP, PROFINET, CC-Link IEF Basic

● Connectors for EtherCAT, EtherNet/IP, PROFINET, CC-Link IEFBasic



(Plug)



Pin No.	Signal name	Functions
1	TD+	Transmitted data, positive
2	RD +	Received data, positive
3	TD-	Transmitted data, negative
4	RD−	Received data, negative

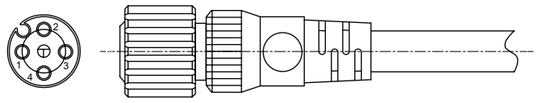
For wiring method, refer to the following communication connector pin array and communication cable wiring example.
Use CAT5 or higher for communication cable lines.

Recommended M12-RJ45 communication cable with connector
- TVGP-CABLE-M12R4-5 Straight CKD *Refer to P. 55 for details.
- Type XS5W-T421-□MC-K Straight OMRON
- Part No. 0945 700 50□□ Straight Manufactured by HARTING

Recommended M12-M12 communication cable with connector
- Refer to page 55 for TVGP-CABLE-M12M12-5 Straight CKD *Refer to P. 55 for details.

Recommended communication plug and cable
- Part No. 0945 600 01□□ Cable single unit Manufactured by HARTING
- Part No. 2103 281 1405 Assembly M12 connector Manufactured by HARTING

● Connector for power supply



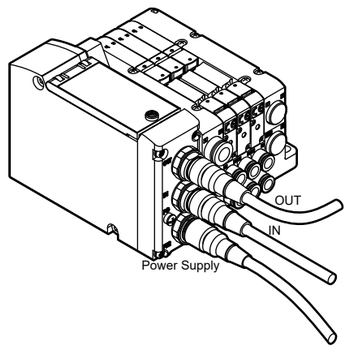
Pin No.	Signal name	Functions
1	Unit power	+ side: 24 V
2	Valve power supply	+ side: 24 V
3	Unit power	- side: 0 V
4	Valve power supply	- side: 0 V

Recommended M12-loose wire power cable
- Type XS2F-D421-□8□-□ Straight OMRON
- Refer to page 55 for TVGP-CABLE-M12SAC-5 Straight CKD *Refer to P. 55 for details.

Recommended communication plug and power cable
- Part No. 2103 212 2305 Assembly M12 connector Manufactured by HARTING
- Electric wire size: AWG22-18, Applicable cable diameter: ø6-8

*□differs depending on the cable specifications.

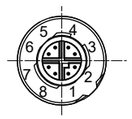
Connection method



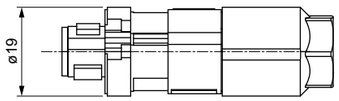
Water-proof connector

For CC-Link IE Field, CC-Link IE TSN

● Connector for CC-Link IE Field, CC-Link IE TSN



Plug



M12×1

Communication connector pin array

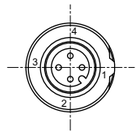
M12 8-pin		Signal name	Functions
IN OUT	1	BI_DA+	Transmit/receive data, positive
	2	BI_DA-	Transmit/receive data, negative
	3	BI_DB+	Transmit/receive data, positive
	4	BI_DC+	Transmit/receive data, positive
	5	BI_DC-	Transmit/receive data, negative
	6	BI_DB-	Transmit/receive data, negative
	7	BI_DD+	Transmit/receive data, positive
	8	BI_DD-	Transmit/receive data, negative

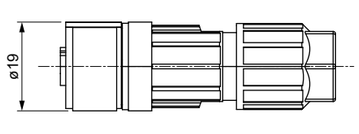
For wiring method, refer to the following communication connector pin array and communication cable wiring example.
Use CAT5 or higher for communication cable lines.

Recommended M12-RJ45 communication cable with connector
- SC-E5EW-□ Mitsubishi Electric System Services

Supports recommended communication plug (assembly) * SPEEDCON mating method
- 1411043 (SACC-MSX-8Q0) Phoenix Contact

● Connector for power supply





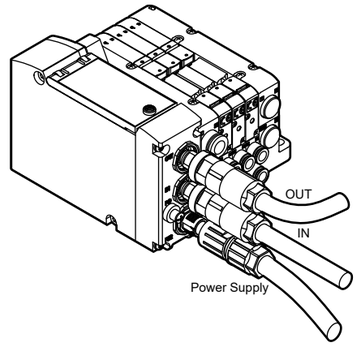
Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

Recommended M12-loose wire type power cable
- XS2F-D421-□8□-□ straight OMRON

Supports recommended communication plug (assembly) * SPEEDCON mating method
- 1424655 (SACC-M12FS-4PL M) Phoenix Contact

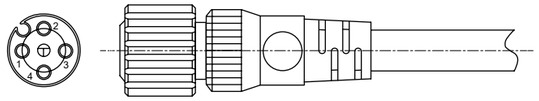
Connection method



Water-proof connector

For IO-Link

● Connector for IO-Link ClassA (NET, PWR)



Communication connector pin array

M12 4-pin		Signal name	Functions
NET	1	L+	Unit power 24 V
	2	NC	Vacant
	3	L4	Unit power 0 V
	4	C/Q	IO-Link signal

Power supply connector pin array

M12 4-pin		Signal name	Functions
PWR	1	NC	Vacant
	2	P24	Valve power supply 24 V
	3	NC	Vacant
	4	N24	Valve power supply 0 V

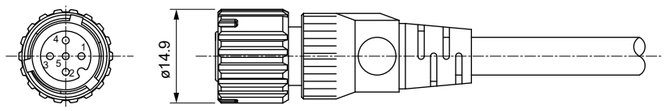
For wiring method, refer to the following communication connector pin array and communication cable wiring example. Use CAT5 or higher for communication cable lines.

Recommended M12-loose wire power cable
- Type XS2F-D421-□8□-□ Straight OMRON

Recommended M12 connector and power cable
- No. 2103 212 2305 Assembly M12 connector Manufactured by HARTING
- Electric wire size: AWG22-18, Applicable cable diameter: ø6-8

*□Differs depending on the cable specifications.

● Connector for IO-Link ClassB (NET)



Communication connector pin array

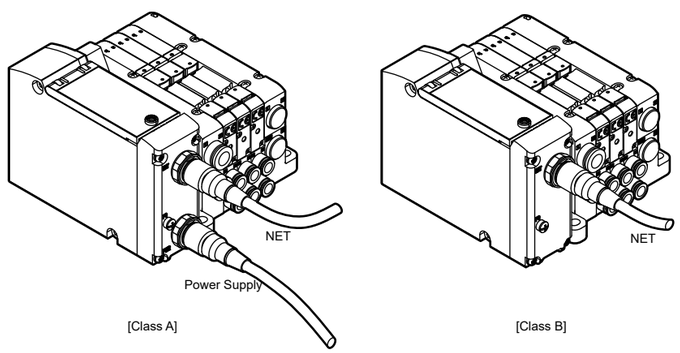
M12 5-pin		Signal name	Functions
NET	1	L+	Unit power supply (+ side: 24 V
	2	P24	Valve power supply (+ side: 24 V
	3	L4	Unit power supply (- side: 0 V)
	4	C/Q	IO-Link signal
	5	N24	Valve power supply (- side: 0 V)

Recommended M12-loose wire type power cable
- XS2F-D521-□8□-□ straight OMRON

Recommended M12 connector and power cable
- Part No. 2103 272 2505 Assembly M12 connector Manufactured by HARTING
- Electric wire size: AWG22-18, Applicable cable diameter: ø6-8

*□Differs depending on the cable specifications.

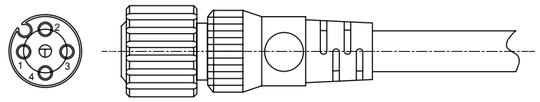
Connection method



Water-proof connector

For IO-Link Wireless

● Connector for power supply



Power supply connector pin array

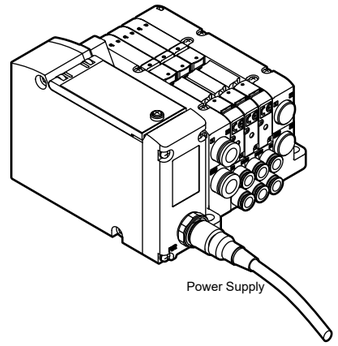
M12 4-pin		Signal name	Functions
PWR	1	Unit power	+ side: 24 V
	2	Valve power supply	+ side: 24 V
	3	Unit power	−side: 0 V
	4	Valve power supply	−side: 0 V

Recommended M12-loose wire power cable
- Type XS2F-D421-□8□-□ Straight OMRON

Recommended communication plug and power cable
- No. 2103 212 2305 Assembly M12 connector Manufactured by HARTING
- Electric wire size: AWG22-18, Applicable cable diameter: ø6-8

*□Differs depending on the cable specifications.

Connection method



Wiring structure between wiring block and valve block

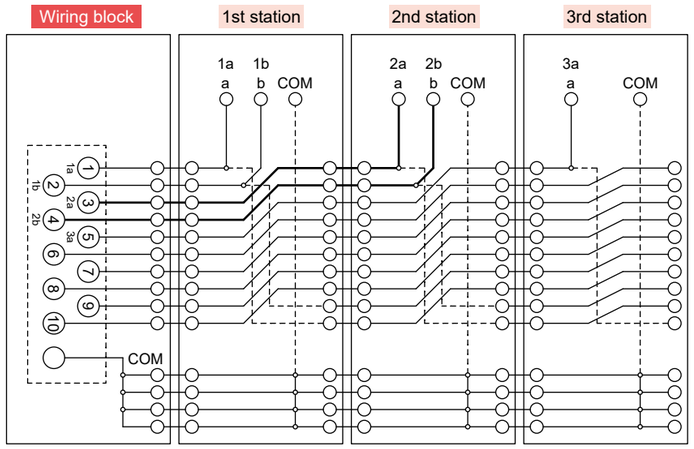
A part called a dedicated wiring connector is built into the valve block and intermediate supply and exhaust block, etc., This structure enables the wiring to be completed simultaneously with the disassembly and assembly of the block manifold. Special wiring work is not required during disassembly and assembly. There is regularity to the wiring block terminal block numbers and solenoid output numbers and wired valves. Refer to the section on the wiring method of each wiring block, and connect the wires between the valves and control equipment. Take special care when increasing or decreasing the number of valve blocks. In addition, an example of the wiring circuit when expanding stations is shown below.

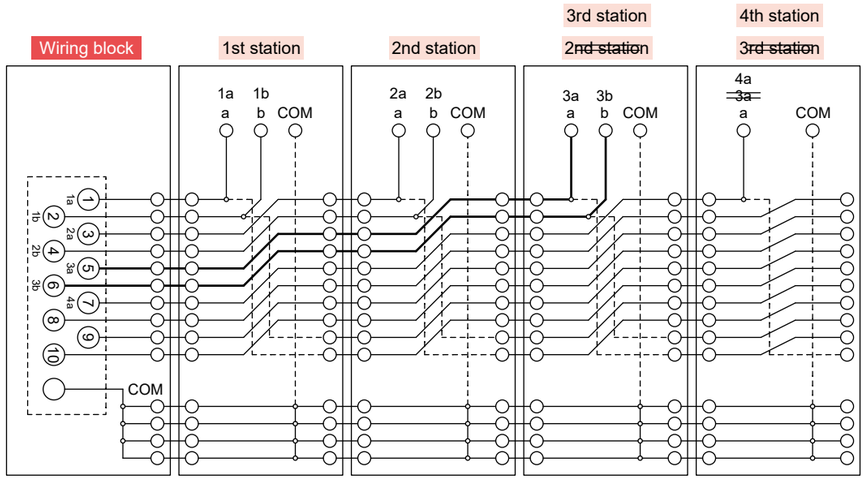
Example of wiring circuit

The diagram below shows the wiring circuit for TVG and differs from the actual specifications.

Standard wiring (double wiring)

When one station of a valve block has been expanded between the 2nd and 3rd station, the output that had been assigned to terminal block No.5 and No.6 of the wiring block will automatically shift for two solenoids and be assigned to terminal block No.7 and No.8.



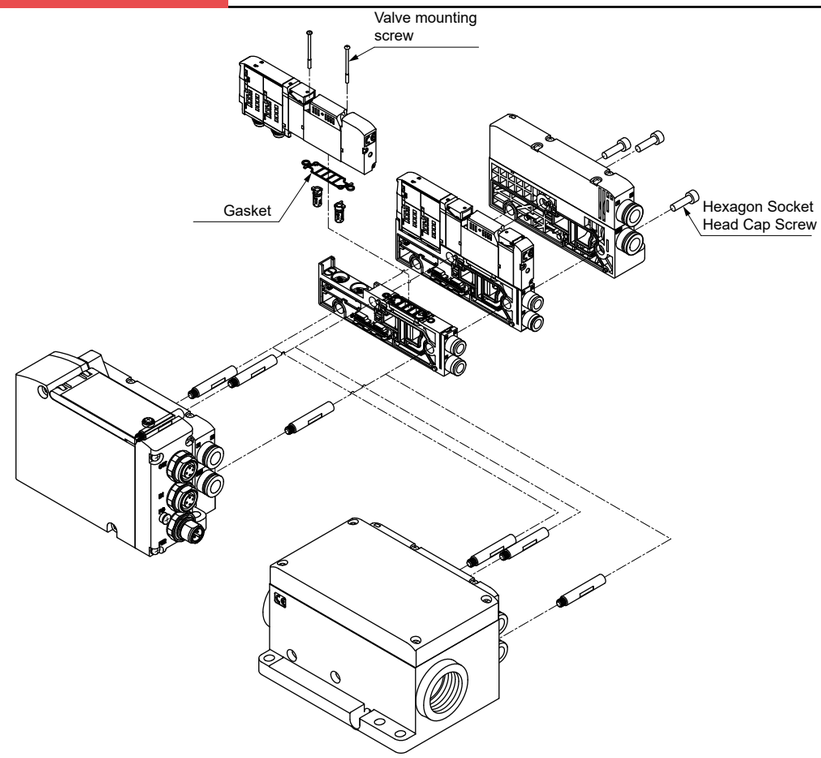


*For standard wiring (double wiring) When all points of the single solenoid valve are ON by a communication device unit, etc., the b side lamp lights because the operation lamp is built into the manifold base. However, this is not an error.

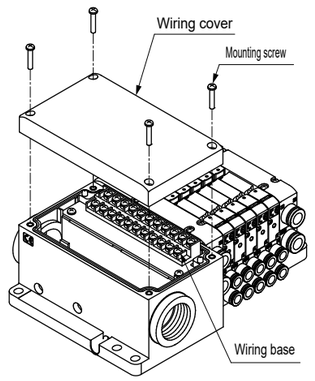
Single/Double mixed wiring

Similar to double wiring, the terminal block numbers will shift assignments. However, how they shift will depend on the solenoid valve. With types having one solenoid valve (2-position single), they shift for one valve position. With types having two solenoid valves (2-position double / 3-position), they shift for two valve positions.

Exploded view of block manifold



Removing the wiring cover



Increasing the valve blocks

①Remove the hexagon socket head cap screw.
②Remove all valve blocks and remove tie rods.
③Install a tie rod for the expansion stations to the wiring block. Be sure to install tie * to increase the number of stations on the wiring block. Install the original tie rod on the right side of the tie rod for the units being increased.
④Confirm that the gasket is flat in the groove and mount the valve block.
⑤Press so that there is no gap between blocks, and fasten with the hexagon socket head cap screw. Tightening Torque 1.1 to 1.3 N·m)

* Be sure to mount the tie rod before mounting the valve block.
* Take special care to prevent the gasket from getting caught in between blocks.

Replacing valves

Removing method

①Loosen the mounting screws (2-positions).
②Remove the valve from the valve block.

Installation method

Follow the removal procedure in reverse. Refer to the table below for the recommended tightening torque for the mounting screws.

Recommended tightening torque for the valve mounting screw

Model	Thread Size	Proper tightening torque (N·m)
TVG1	M1.7	0.19 to 0.21
TVG2	M2.5	0.35 to 0.40

Safety Precautions

Be sure to read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.
It is important to select, use, handle and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience.

2 Use this product in accordance with specifications.
This product must be used within its stated specifications. In addition, never modify or additionally machine this product.
This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.
(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)
❶ Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
❷ Use for applications where life or assets could be significantly affected, and special safety measures are required.

3 Observe organization standards and regulations, etc., related to the safety of device design and control, etc.
ISO4414, JIS B 8370 (Pneumatics fluid power - General rules and safety requirements for systems and their components)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.
❶ Inspect and service the machine and devices after confirming safety of all systems related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility.Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions in the following pages to prevent accidents.

■ The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, and when there is a high degree of emergency to a warning.

WARNING: If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.

CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation.
Every item provides important information and must be observed.

Warranty

1 Warranty period
The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage
If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.
However, following failures are excluded from this warranty:
1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
3) Failure not caused by the product.
4) Failure caused by use not intended for the product.
5) Failure caused by modifications/alterations or repairs not carried out by CKD.
6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
7) Failure caused by acts of nature and disasters beyond control of CKD.
The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.
Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check
The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use.
Refer to "Pneumatic Valves (No. CB-023SAA)" for general precautions on valves.

Individual Precautions: Plug-in valve TVG Series

Design / Selection

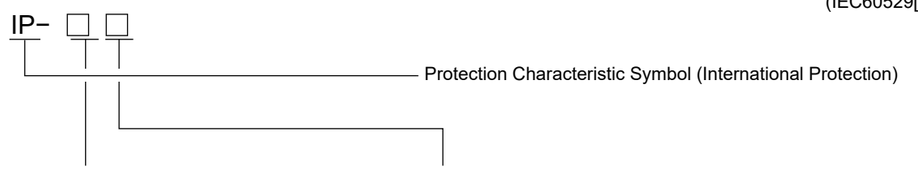
1. Operating Environment

Caution

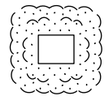
Avoid use in conditions where water, cutting oil, or dust directly contacts the valve.
Note that even IP67-compliant products cannot be used under water.
With the type with built-in silencer, make sure that water does not come directly to the exhaust port.
IP65 and IP67 use the following standard test method.
■IEC(Intemational Electrotechnical Commission: IEC60529:2001)
■JIS C 0920:2003

Description of protection characteristic codes and test methods for IP65 and IP67

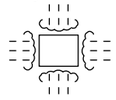
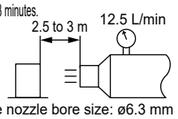
■IEC(Intemational Electrotechnical Commission: International Electrotechnical Commission standards (IEC60529[IEC60529:2001])



First Characteristic Numeral (Degree of protection against external solid objects)

Grade	Degree of Protection	
6	Dust-tight type 	No inflow of dust.

2nd characteristic No. (degree of protection for water entry)

Grade	Degree of Protection		Overview of test method (fresh water is used)
5	Protection against water jets 	Does not cause harmful effects from water jetted by a nozzle from any direction.	Using the test apparatus shown below, spray water from all directions onto the product under test (enclosure) for 1 minute per 1 m² of surface area for a total of at least 3 minutes.  Water discharge nozzle bore size: ø6.3 mm
7	Protection against immer-sion in water 	When the exterior is temporarily sub-merged in water at a specified pressure and time, there is no entry of water that could cause harmful effects.	Soak in 1 m of water for 30 minutes.

2. Serial transmission device unit

Caution

■When a communication error state occurs, the device station will be in the following state.
①All input signals are OFF.
②All output signals are OFF. (However, if the device unit has an output mode setting switch, it enters the set status.)

3. Surge suppressor

Caution

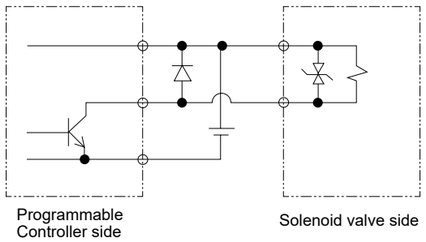
■ The surge suppressor included with the solenoid valve aims to protect the output contact for driving the solenoid valve. There is no protection for other peripheral devices, and those devices may be damaged or malfunction by a surge. The suppressor absorbs a surge voltage generated by other devices, and burns itself out protecting the output contact. The following points must be taken into consideration.

①The surge suppressor functions to limit solenoid valve surge voltage, which can reach several hundred volts, to a low voltage level that the output contact can withstand. Depending on the output circuit used, this may be insufficient and could result in damage or malfunction. Confirm in advance whether the surge suppressor is suitable for the withstand voltage of both the solenoid valve in use and the output device, circuit structure and the degree of return delay time. When necessary, provide other surge countermeasures. The solenoid valve with surge suppressor can suppress the inverse voltage surge that may occur when the solenoid valve is OFF to the level in the table below.

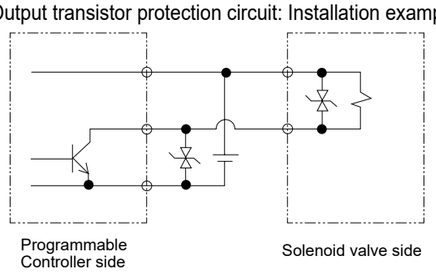
Specification voltage	Inverse voltage when OFF
24 VDC	Approx. 47 V

②When the output unit is NPN type, the output transistor may be subject to a surge voltage equivalent to the voltage + power supply voltage shown in the above table. Please provide a contact protection circuit.

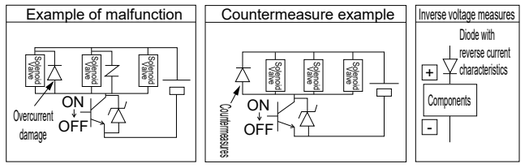
[Output transistor protection circuit: Installation example 1]



[Output transistor protection circuit: Installation example 2]



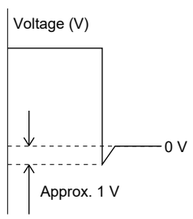
③If another device or solenoid valve is connected in parallel to the solenoid valve, the inverse voltage surge generated when the solenoid valve is OFF would apply to those devices. Even in the case of a solenoid valve with 24VDC surge suppressor, a surge voltage may reach negative tens of volts for some models. This inverse voltage may cause damage or malfunction to other parallel connected components. A components that is susceptible to inverse polarity voltages (example: Avoid parallel connection with the LED indicator lamp. When driving several solenoid valves in parallel, the surge from other solenoid valves may enter the surge suppressor of one solenoid valve, and it may burn depending on the current value. When driving several solenoid valves with surge suppressors in parallel, surge current could concentrate at the surge suppressor with the lowest voltage limit and cause similar burning. Even if the solenoid valve is the same, the surge suppressor's voltage limit can be inconsistent, and in the worst case, could result in burning. Avoid driving multiple solenoid valves in parallel.



④The surge suppressor incorporated in the solenoid valve will often be short-circuited if it is damaged by an overvoltage or overcurrent from other solenoid valves. Where there is a failed surge suppressor, if a large current flows when the output is ON, in the worst case scenario, the output circuit or solenoid valve could be damaged or ignited. Do not continue energizing the solenoid valve if the surge suppressor becomes faulty. Additionally, to prevent large currents from continuing to flow, connect an overcurrent protection circuit to the power supply and drive circuit, or use a power supply with overcurrent protection.

4. Surgeless type

■ Surgeless type reduces the solenoid valve surge voltage up to 1 V approx. by the built-in diode. In addition, there is no polarity.



■ The built-in diode of the surgeless type may be damaged by an open/close surge such as a reed relay or switch. Provide measures for open/close surges, such as proximity relay or surge absorber.

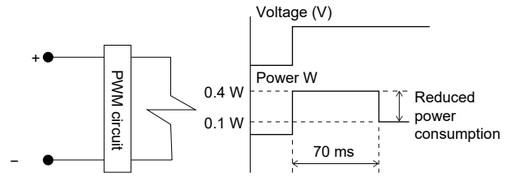
5. Low exoergic/energy saving circuit

■ The Low exoergic/energy saving circuit includes a PWM circuit in the solenoid valve, which is designed to reduce the current value when the coil is held with suction.

Power consumption is reduced to 1/4 compared to Standard Products.

[Specifications for Low exoergic/energy saving circuit]

Item		Current A	Power consumption W
During Startup	24 VDC	0.017	0.4
During Holding	24 VDC	0.008	0.1



Caution

■ Do not use this valve in an environment where vibration and impact exceed the specified range. This may result in valve malfunction.

■ The energized state cannot be maintained if power is cut off instantaneously for 30 ms or less on the power source driving the solenoid valve. If any disturbance has caused up to 30 ms instantaneous power cut-off of the solenoid valve after being continuously energized, cut the power OFF for 50 ms or more before switching the solenoid valve ON again.

■ Do not use this product by gradually raising the voltage. The valve will not operate.

■ With the type with low exoergic/energy circuit, the built-in diode may be damaged by the open/close surge of the reed relay or switch. Provide measures for open/close surges, such as proximity relay or surge absorber.

6. When using the product in combination with low friction cylinders

■ Malfunctions could occur because of the exhaust pressure. Contact CKD.

7. When using the product at vacuum

■ Select the external pilot. Supply compressed air of 0.2 to 0.7 MPa to the external pilot port (port PA) and connect negative pressure to the supply port (port P) before use.

■ Use under low vacuum conditions.

8. Connecting vacuum generating components (ex. blower) to the exhaust port

■ Check that differential pressure between exhaust port and supply port is 0.7 MPa or less. If the differential pressure is large, it may cause malfunction.

■ Use the external pilot PA/PR separated (kZ).

■ Do not connect port PR to a vacuum generating components such as a blower.

9. Degree of protection IP65 and IP67

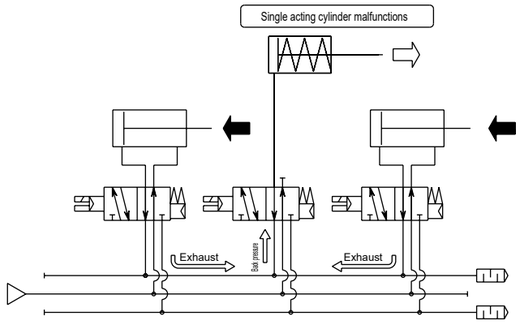
■ The TVG Series supports IP65 and IP67 as standard, and is protected from dust and water, but cannot be used immersed in water. Countermeasures such as a protective cover for the unit should also be taken if using in environments where it will be constantly exposed to dust or water.

Exhaust check valve

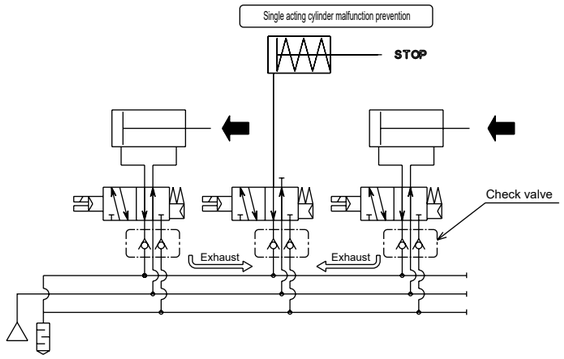
Caution: The exhaust check valve is a check valve. Note that if the cylinder rod is manually operated directly without pressurization, the check valve opens and the cylinder rod does not move. Check valve blocks back pressure from adjacent air components, etc. The structure does not permit continuous pressure holding, so do not use for purposes other than blocking back pressure.

Generally, the double acting cylinder connected at the manifold to single acting cylinders or exhaust center valves may malfunction when adversely affected by the exhaust pressure led in by operation of other cylinders. For the manifold of TVG Series, the "exhaust check valve" integrated to prevent this malfunction can be selected, except for closed center valves and pressure center valves. However, with components that are affected by a small amount of leakage or pressure of low friction cylinders, etc., the functions may not operate properly.

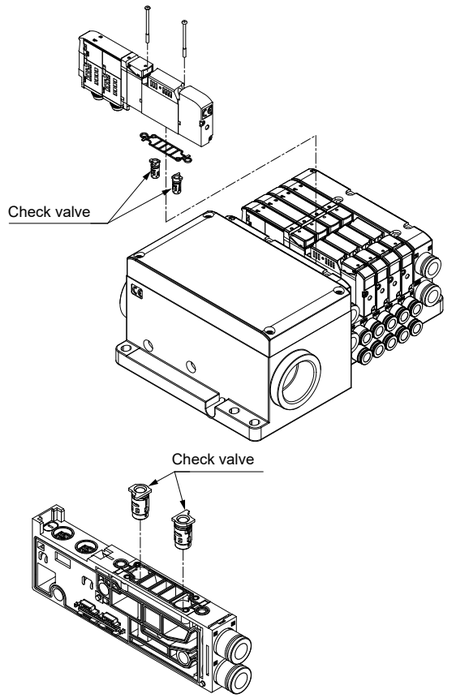
Example of pneumatic pressure system that may malfunction



TVG Series pneumatic pressure system



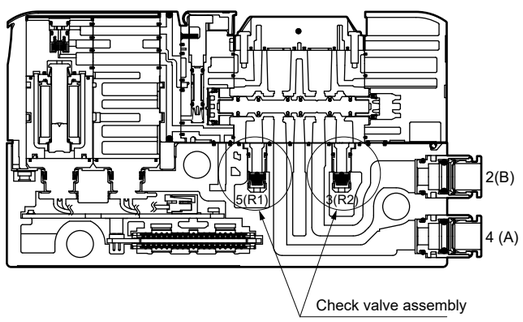
Internal Structure Diagram



Check valve equipped standard specifications

Model No.	Flow path switching	Option (H) selection
TVG*-1	2-position single	Yes
TVG*-2	2-position double	Yes
TVG*-3	3-position closed center	None
TVG*-4	3-position exhaust center	Yes
TVG*-5	3-position pressure center	None
TVG*-A	A valve side: Normally Closed B valve side: Normally Closed	Yes
TVG*-B	A valve side: Normally Open B valve side: Normally Open	Yes
TVG*-C	A valve side: Normally Closed B valve side: Normally Open	Yes

Because the 3-position closed center and pressure center are not adversely affected by the exhaust pressure led in from other cylinders at the neutral position, check valves are not required.



For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals .

MEMO

MEMO

Related Products

Remote I/O RT Series

Catalog No.CC-1557AA

- Modular waterproof compatible with digital I/O, analog I/O and IO-Link master.
- Max. device unit control points: 512 bytes (4096 points).
- Max. connection units 18 (including device unit units).

IO-Link Wireless input unit WD Series

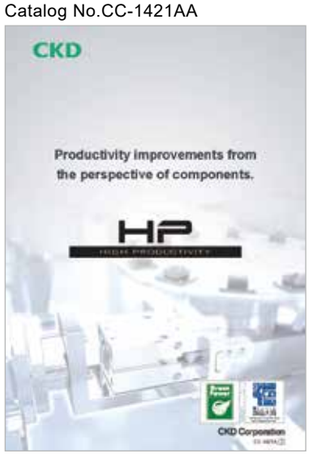
Catalog No.CC-1629AA

IO-Link Wireless compatible wireless input unit

- Error rate: 1/1 billion
  Supports wired-like, uninterrupted IO-Link Wireless
- Digital input 16 point input
- Enables wireless wiring of ON/OFF switches, including cylinder switches
- Lightweight and compact business card size that is easy to install in movable parts such as Robot End-of-Arms

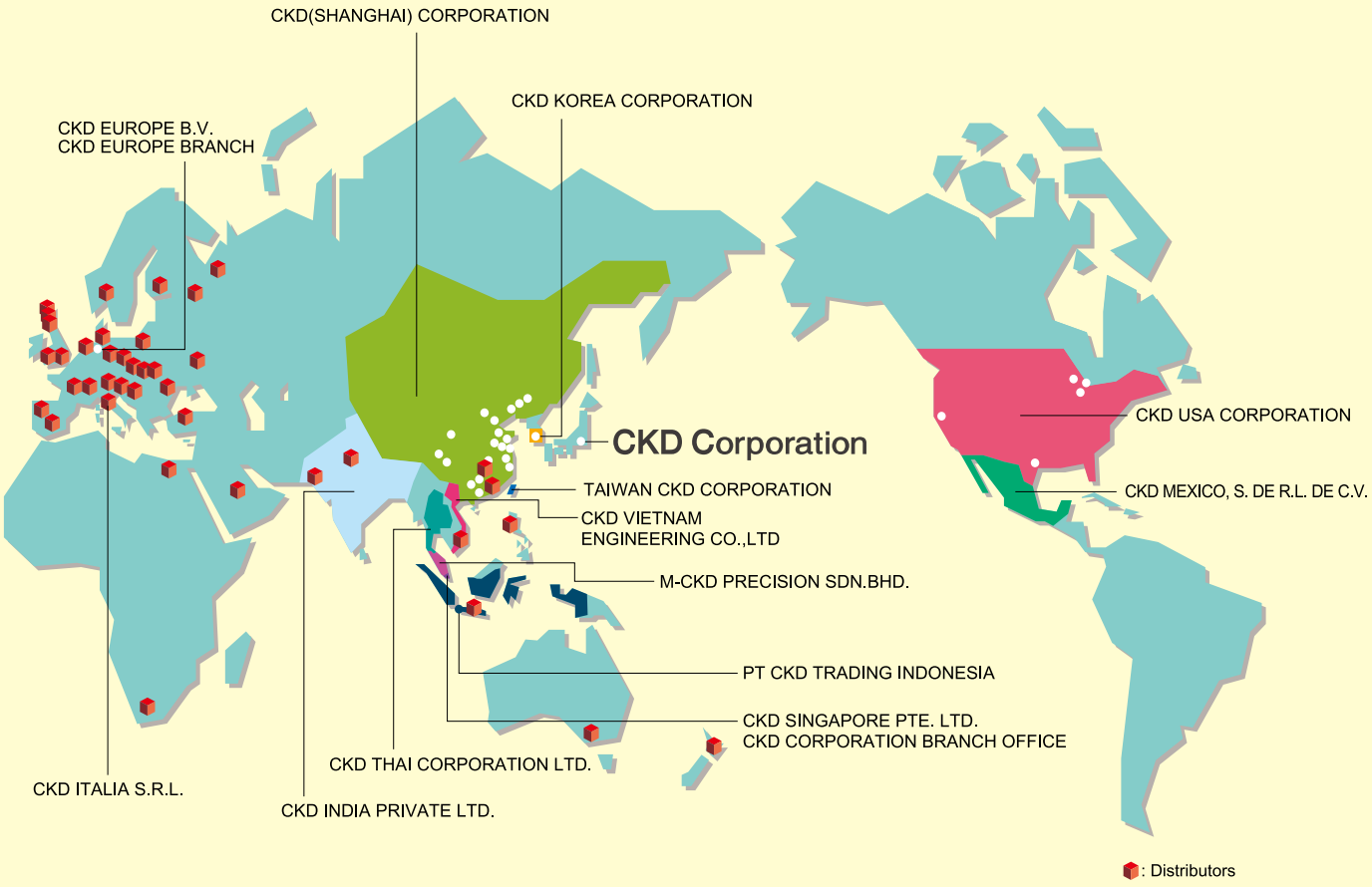
HP Series General Catalog

Catalog No.CC-1421AA



- Actuator for high frequency use (HP1)
  Optimized sliding technology for longer service life with the same dimensions as conventional products (more than 4-fold compared to conventional products)
- Actuator for dusty environments (G-HP1)
  Equipped with a strong scraper and lube keeper for improved durability in dusty environments (4 times more durable than conventional models)
- Actuator with length measuring function (HP2)
  Integrated high-precision position detection sensor for predictive maintenance
- Long service life cylinder Compatible with rechargeable batteries (P4-HP1)
  Extended service life of P4 Series, which has track records in the rechargeable battery manufacturing process (durability count of 10 million cycles or more)
- Environment-resistant cylinder For food manufacturing processes (FP1-G-HP1)
  Long service life in dusty environments in food manufacturing processes (durability count of 5 million cycles or more)

WORLD-NETWORK



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