CKD

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G108-7188

Handling Instructions

TVG series

Thank you for purchasing CKD product.
Please review the precautions in this Instructions thoroughly for safe operation of this equipment.
For further information, refer to the instruction manual and product catalog.

CAUTION!! Do not remove the solenoid valve's packing until just before piping.

Foreign matter could enter the solenoid valve from the piping port and could lead to faults or malfunctions.

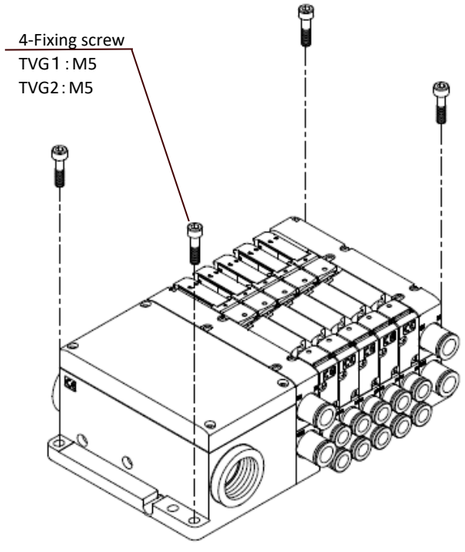
⚠ WARNING

■Do not step on or place objects on the product. Failure to follow this warning may cause falling accident, falling of the product, bodily injury due to fall, malfunction due to breakage of the product, etc.
■Before inspecting, checking or adjusting the product, turn off power supply and shut down compressed air line and verify zero residual pressure.

Installation

⚠ WARNING

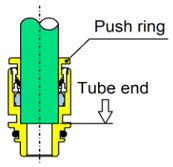
■Do not support valves with piping when installing valves.Install and fix the valve body.
■Be sure to tighten the screws with appropriate torque.
Also, when using 10 or more stations, use flat washers as well. Otherwise, air leakage, falling of product, damage to screws, etc. may occur.
■Avoid washing with water or solvents or painting.
Resin parts could be damaged.
The paint could block the pilot exhaust port and cause malfunction
■Do not restrict the valve's exhaust port (including pilot exhaust port) to less than the piping connection port size.
A breathing action is generated by valve operation at the valve's exhaust port, and foreign matter from around the exhaust port could be sucked in. If the exhaust port is installed facing upward, foreign matter could enter.
Install a silencer or pipe the exhaust port so it faces downward.



Piping

⚠ CAUTION

■Always flush just before piping pneumatic component.
Any foreign matter that has entered during piping must be removed so it does not enter the pneumatic component.
■Check the location of piping port by referring to product indication, etc. Wrong piping will cause malfunctioning of actuator.
■Do not throttle the supply port. Otherwise, supply pressure drops during operation and causes the device to malfunction.
■Securely insert the tube to the tube end, and make sure that the tube cannot be pulled off.
■Cut the tube at right angles using a dedicated cutting tool.
■The bending angle of piping must be larger than the minimum bend radius of the tube.



Minimum bend radius of tubing

Tube diameter mm	Minimum bending radius mm	
	Nylon	Urethane
φ4	10	10
φ6	20	20
φ8	30	30
φ10	40	40

Lubrication

⚠ CAUTION

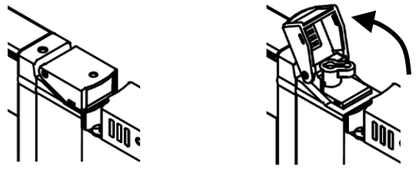
■This product is basically an oilless type, requiring no lubrication. However, it can accept class 1 turbine oil (additive-free), ISO VG32.
■Once the oil is applied to the product, continuous application is required. Loss of oil means loss of lubricant, causing malfunctioning.

Manual override

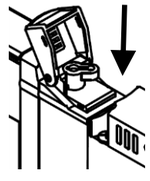
⚠ WARNING

■Do not operate manual override by excessive force. manual override is damaged.
■Even if the manual override is operated, the main valve does not switchover until air is supplied to the supply port on the internal pilot type, or to the external pilot supply port on the external pilot type.
■When conducting manual operations, make sure that there are no people near the moving cylinder.

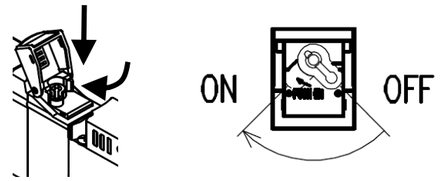
■Opening and closing the manual protective cover
Do not excessively force the manual protective cover when opening and closing it. Excessive force could cause faults. (Less than 5N))。
The M2 and M3 options do not have a manual protective cover.



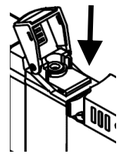
■How to both locking and non-locking, operation with manual protective cover
●How to operate manual override
For non-locking manual override Push it to arrow direction until it stops.Manual override is unlocked when released.



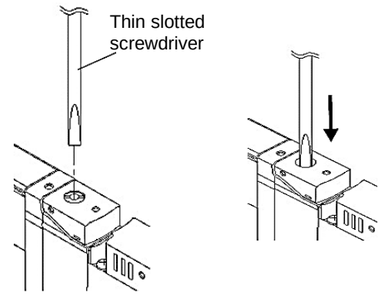
●push lock operation
For locking manual override Push manual override and turn 90˚ in the direction of the arrow.Manual override is not unlocked even when released.



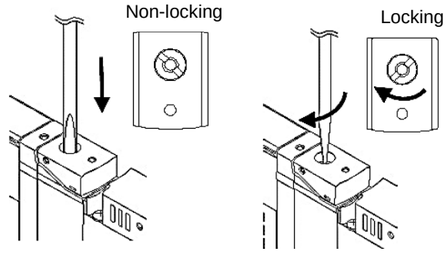
■How to both non-locking, operation with manual protective cover
For non-locking manual override Push it to arrow direction until it stops.Manual override is unlocked when released.



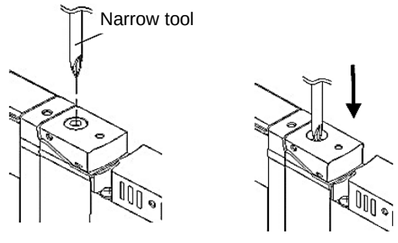
■How to both locking and non-locking, Tool operation type（Option M2）
●Push non-locking operation
Push the center of the manual override straight in the direction of the arrow with a fine tip screwdriver.Manual override is unlocked when released.



●Push lock operation
Insert the tip of a flathead screwdriver with a thin tip into the groove of the operation shaft and press And turn 90˚ in the direction of the arrow.Manual override is not unlocked even when released.



■Non-locking type, tool operation type（Option M3）
Push the center of the manual override straight in the direction of the arrow with a fine tip screwdriver.Manual override is unlocked when released.



Vacuum

Select an external pilot type.
Supply compressed air of 0.2 to 0.7 MPa to the external pilot port (PA port) and connect vacuum pressure to the supply port (P port).
Use it under low vacuum conditions.

Protection structure

The TVG series conforms to IP65/IP67 protection structure and is protected against dust and water, but cannot be used underwater. Also, take measures such as using a protective cover when using the product in an environment where it is constantly exposed to dust or water.

Connecting electric wire

General precautions on electric wire connection

⚠ WARNING

■Turn power OFF before attempting wiring work. There is a risk of electric shock.

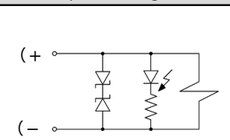
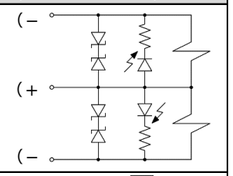
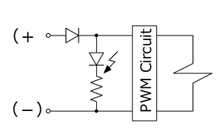
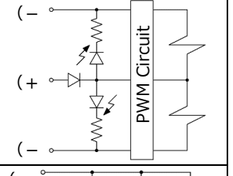
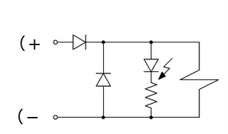
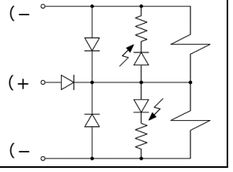
⚠ WARNING

■Install wiring before check the working voltage.
■The voltage will drop by simultaneous energizing and by the length of the cable. Check that the solenoid voltage drop is within 10% of the rated voltage.

Energization for a long time

■If energizing for a long time,pleaese use low heat and energy saving type.
■Valve perfomance deterioration may be accelerated if valves other than the low heat/power-saving type are continuously energizing for long
periods of time. Similar caution is required in the following use.
・During intermittent energizing, it takes longer than non-energizing.
・During intermittent energizing, one energizing session exceeds 30 min.
Consider heat disspation when installing.
Consult with CKD if energizing for a long time.

Schematic diagram of circuit inside the solenoid valve.

	2position Single	2position Double、3-position
Standard		
Option E1 (NPN)		
Option E2 (NPN)		

The energization to the solenoid valve has polarity.
Incorrect wiring will cause malfunction.

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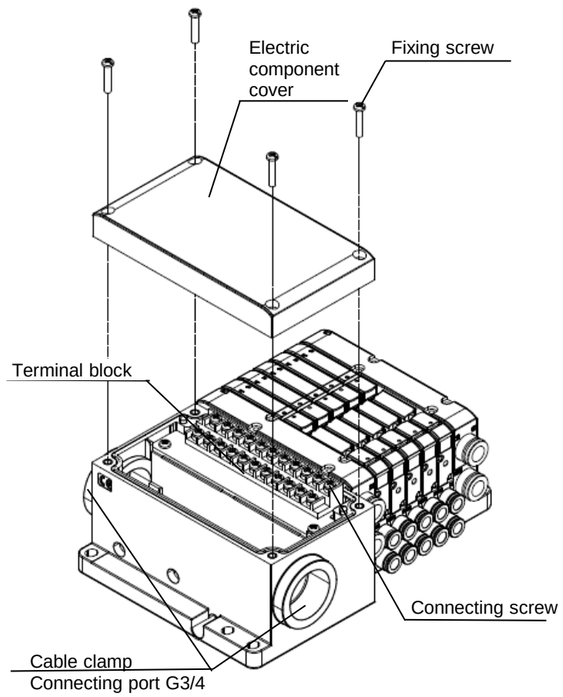
Common terminal block type（EA1A/EA1B）

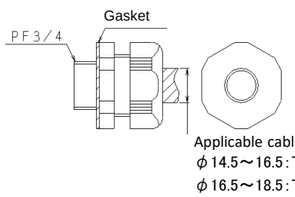
■Use Y terminal or round terminal for connection. For solderless terminal, use those for M3 with width less than 6.2. Connecting the lead wire directly will cause solenoid valve malfunction due to disconnection and contact failure.
■As common wiring is pretreated internally for common terminal block type, the manifold power supply must be standardized. For independent contact type PC output unit, install common wiring at the contact point.

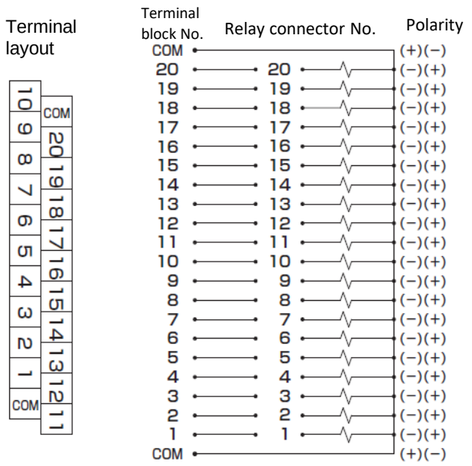
(1)Remove the electric component cover.
(2)Insert the wiring through the cable clamp connection port and fix it to the terminal block to the tightening torque of 0.6 N•m, taking care to prevent improper wiring.
(3)Fix the electric component cover, using mounting screw, to the tightening torque of 0.6 N•m.



⚠ CAUTION

■**Please observe the following to obtain protective construction IP65/IP67.**
If IP65/IP67 performance is required, connect cable clamp, etc. to the cover to secure protection. At that time, please be careful of the tightening torque. (Parts kit for electric component block EA1: the main body benchmark tightening torque for TVGP-SCL-18A and TVGP-SCL-18B is 4.0 to 4.5 N•m and cable clamp tightening torque is 3.0 to 3.5 N•m.)





The connector pin No. and valve No.

■Setting the connector pin No.
The numbers in the aforementioned internal circuit diagram are connector pin numbers (terminal block No. and receptacle terminal No.). These have been set originally by CKD for convenience sake.
■Setting the valve No.
•Set the manifold station numbers in order from left with the piping port to your side.
•The numbers indicating valve No. 1a, 2a--- indicate first station, second station ---. Alphabetical characters a and b indicate a side solenoid and b side solenoid respectively.The manifold's max. station number differs depending on the model. Check the specifications of each model.
•When using a single solenoid with standard wiring
When the blank part in the table below is energized, the operation lamp lights up, but It's not abnormal.

<Standard wiring>

●For single solenoid valve

(Maximum of 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

(Maximum of 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)

(Maximum of 20 solenoids)

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

<Designation of Single Solenoid and Double Solenoid Arrangement>

●For single solenoid valve

(Maximum of 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

●For double solenoid valve

(Maximum of 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

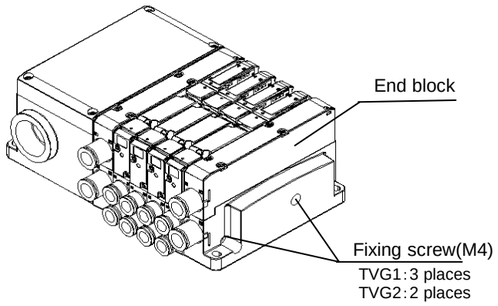
●For mixed use (single/double mixture)

(Maximum of 20 solenoids)

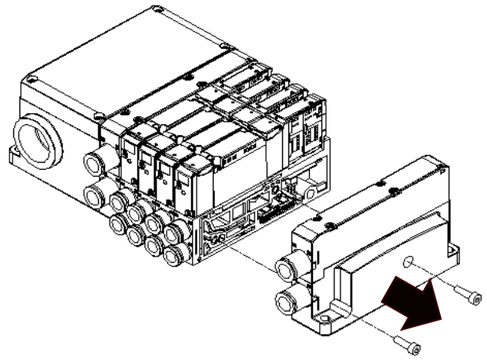
Terminal block No.	COM	20	19	18	17	16	15	14	13	12	11
Valve No.	COM	Blank	Blank	Blank	Blank	10b	10a	9b	9a	8b	8a
Terminal block No.	10	9	8	7	6	5	4	3	2	1	COM
Valve No.	7b	7a	6a	5b	5a	4b	4a	3a	2a	1a	COM

Additional installation of a valve

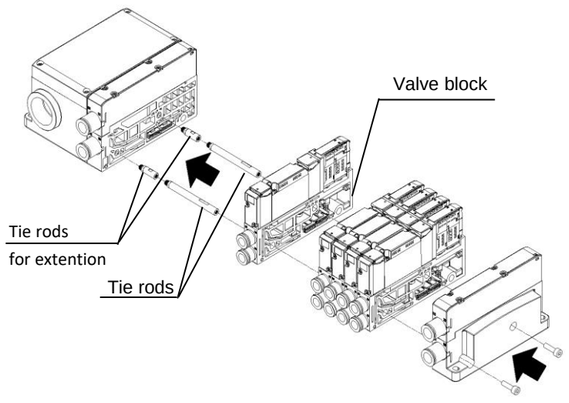
①Remove the End block fixing screw.



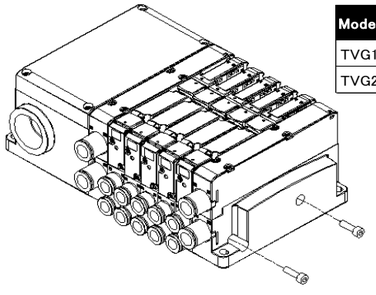
②Remove the End block.



③Add valve blocks and tie rods.
Attach the tie rod for additional stations to the wiring block.
Install the gasket so that it will not fall off or get caught.



④Tighten the fixing screw.



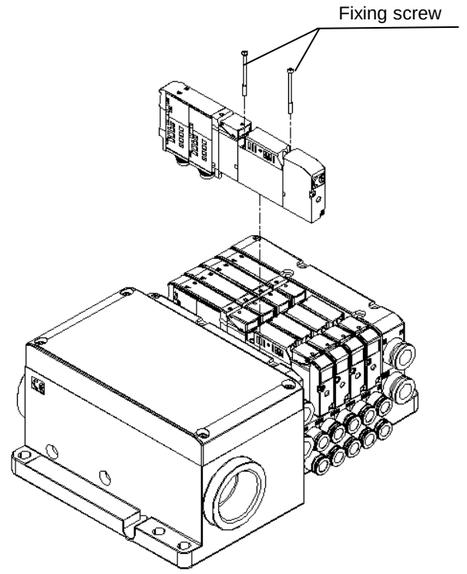
Model	Size	Tightening torque(N•m)
TVG1	M4	1.2
TVG2	M4	1.2

Valve replacement

⚠ CAUTION

■Check if the gasket has fallen off and tighten it with the appropriate torque.
■The inside of the gasket is the air flow path and electrical wiring. Be careful not to allow foreign matter such as dust or liquid to get inside.It may cause air leakage, malfunction, short circuit, etc.

Model	Size	Tightening torque(N•m)
TVG1	M1.7	0.19～0.21
TVG2	M2.5	0.35～0.40

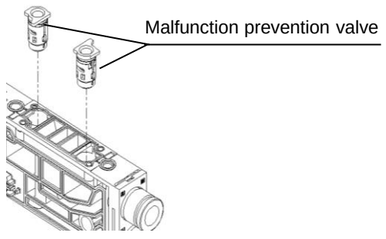


Malfunction prevention valve

⚠ CAUTION

■Check if the gasket has fallen off and tighten it with the appropriate torque.
■The inside of the gasket is the air flow path and electrical wiring. Be careful not to allow foreign matter such as dust or liquid to get inside.It may cause air leakage, malfunction, short circuit, etc.

Insert it in the position shown below. Insert it all the way to the end.



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