CKD

D3-140130-A 5 2017.12.05

Handling Instructions

W4G4 series

Thank you for purchasing CKD product.
Please review the precautions in this Instructions thoroughly for safe operation of this equipment.

Keep this document in a safe location so that it is easily referenced as necessary.
For further information, refer to the instruction manual and product catalog.

CAUTION!! Do not unpack solenoid valve until the piping is ready for connection.

Foreign materials entering through piping port will cause failure and malfunction.

⚠ 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.

Piping and installation

⚠ WARNING

- Do not use water or solvent for cleaning and painting. Plastics broken by the solvent and coating materials will clog the port, causing malfunction.
- Check the location of piping port by referring to product indication, etc. Wrong piping will cause malfunctioning of actuator.
- Screws used to fasten pipe joints must be tightened with a correct torque. Otherwise, air will leak or screws will be damaged.

Tightening torque

Connecting screw	Tightening torque N·m	Connecting screw	Tightening torque N·m
M3	0.3～0.6	Rc3/8	13～15
M5	1.0～1.5	Rc1/2	16～18
Rc1/8	3～5	Rc3/4	19～40
Rc1/4	6～8	Rc 1	41～70

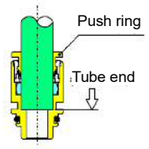
⚠ CAUTION

- **Do not throttle the supply port.** Otherwise, supply pressure drops during operation and causes the device to malfunction.

- Before connecting the piping to the valve, thoroughly clean the inside of piping by air blowing (flushing) or by washing to clear off chips, cutting lubricant, dust and foreign objects. Do not mount the solenoid valve by supporting it with piping. Secure the valve with dedicated supporting member.
- When wrapping a seal tape, start wrapping 2 mm from the tip of the screw, in the direction of screw. If the tape protrudes from the screw section, it will be cut as the piping is screwed, leaving shreds inside valve. These chips or shreds will result in failure.
- Prevent entrainment of foreign materials from exhaust port by facing down the port or by using a silencer.

Push-in joint

- Insert the tube to the tube end. Verify positive engagement of the tube by gently pulling it with a force of approx. 20 N. If the tube is not inserted to the bottom, it may become loose, causing air leakage.
- With the dedicated cutter, cut the cable at a right angle.
- 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
ϕ12	55	50

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

- Be sure the area near cylinder is cleared of all unauthorized personnel before operating the cylinder.
- Never attempt to start normal operation before performing unlocking operation. Possible consequences: malfunction
- Stop the use of the product if the product is broken.

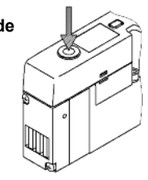
⚠ CAUTION

Do not press the manual override with a tool with sharp end, or the rubber cover could be broken.
(Use a Philips screwdriver not less than tip size #2.)

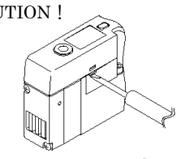
- W4G4 series is a pilot operated solenoid valve. Even if the manual override is operated, the main valve does not switchover until air is supplied to the supply port (or to the external pilot supply port if the external pilot type).

Unlock manual override (Standard)

① Push shaft to ON, release it to OFF.



CAUTION !

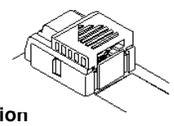


Do not insert any tool into the slit part of the cover to prevent the product from brekinng

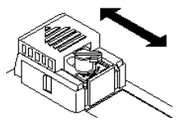
Non-locked and locked types commonly use manual override

■Never forcibly open/close the manual protection cover. Otherwise, it will be damaged.（less than 5N）

Sliding type ·Close

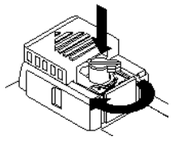


Sliding type ·Open



Operation

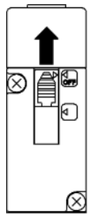
- Push to unlock
  Push the manual button.
- Push to lock
  While pressing the manual button to the bottom, rotate it clockwise 90 degrees.



- Be sure to press the manual button before rotating it. Otherwise, the manual override may be damaged.
- Note that the protection cover cannot be closed until the locking mechanism is disabled.

Manual override with OFF function (Option)

This can switch main valve even if energized since supply of pilot air at energized is stopped forcibly. When using OFF function, for 2 position single and 3 position ABR connection PAB, care must be taken since a cylinder is activated immediately.



Destination of output port

Operator position			OFF function (manual on energized side)		manual on de-energized side
			Non-operation	Operation	Operation
2-position	Single	**a side solenoid energized**	4(A)	→ 2(B)	-
	Double	**a side solenoid energized**	4(A)	4(A) →	2(B)
		b side solenoid energized	2(B)	2(B) →	4(A)
3-position	All port block	**a side solenoid energized**	4(A)	4(A) →	2(B)
		b side solenoid energized	2(B)	2(B) →	4(A)
	ABR connection	**a side solenoid energized**	4(A)	- →	2(B)
		b side solenoid energized	2(B)	- →	4(A)
	PAB connection	**a side solenoid energized**	4(A)	4(A)/2(B) →	2(B)
		b side solenoid energized	2(B)	4(A)/2(B) →	4(A)

* Manual operation on de-energized side: push to unlock

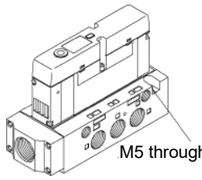
OFF function use : Slide the lever to the arrow direction until it stops. The manual override is not unlocked.
Normal use : Return the switch to former position and use it.

Installation

⚠ WARNING

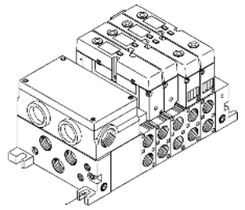
Tighten screw with appropriate torque. If not, air leakage, falling of product, or damage to screw may occur.

Individual subplate
Tighten mounting screw through the through-hole (2 holes).



M5 through-hole

Manifold
Tighten mounting screw through mounting hole (4 holes).



M8 through-hole

Wiring method

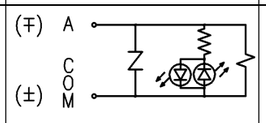
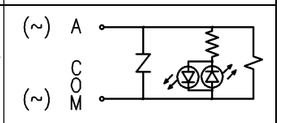
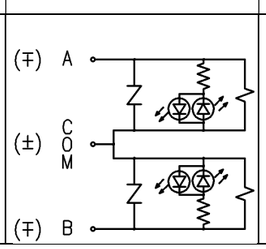
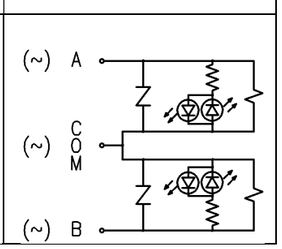
⚠ WARNING

- Be sure to turn off power before attempting wiring work.
  Never touch a current carrying terminal block or never bring bare hand close to it. Electrical shock may occur.

⚠ CAUTION

- Identify the voltage of available source
- Simultaneous feeding of many loads causes voltage drop, in proportion to cable length. Make sure that the voltage drop across solenoid is 10% or less the rated voltage.

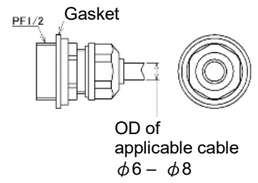
Solenoid valve internal circuit diagram

	DC	AC
Single		
Double		

Individual subplate (screw terminal type)

⚠ CAUTION

- **To achieve protective construction IP65, heed these precautions:**
  Connect protective cable clamp to the cover. Apply appropriate tightening torque.
  (Screw terminal type parts kit:
  For W4G-OA-W1608C1, typical tightening torque is 2.0-2.4 N·m and cable clamp tightening torque is 0.5-0.7 N·m.)



⚠ WARNING

- **There is possibility that the wire covering is damaged when internal wiring narrows between interior side of terminal stand and subplate.There is possibility of getting an electric shock.**

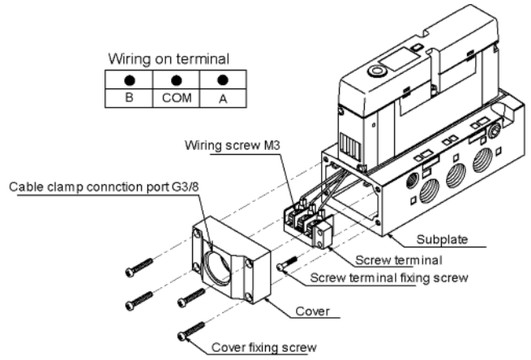
- For wiring, use Y or ring terminal. Use crimp terminal of M3, up to 6.2 wide. Direct connection of lead wire will result in breakage or contact failure, causing solenoid valve to malfunction.

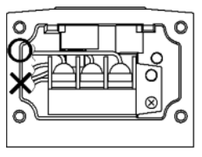
(1) Remove the cover and screw terminal from subplate.

(2) Pass the wires through connection port of the cable clamp and secure at the correct terminals with tightening torque of 0.6 N·m.

(3) Secure the screw terminal to subplate with the screw terminal fixing screw with tightening torque of 0.6 N·m.

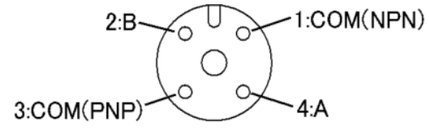
Secure the cover to subplate with the cover mounting screw with tightening torque of 0.6 N·m.





Individual subplate (I/O connector type)

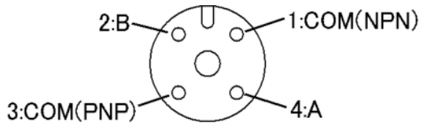
- Internal connections are prewired.
- Connect appropriate cable to I/O connector and secure the conductors with appropriate torque.



Pinout diagram

Individual wiring manifold (I/O connector type)

■ Internal connections are prewired.
■ Connect appropriate cable to I/O connector and secure the conductors with appropriate torque.

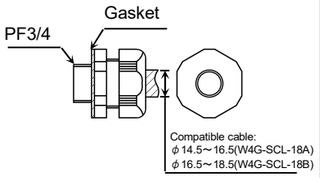


Pinout diagram

ne end port type [T10]

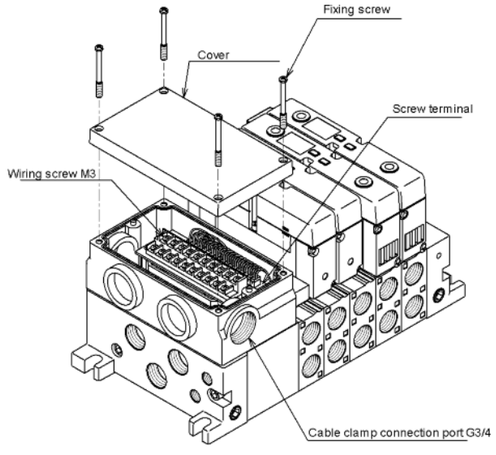
⚠ CAUTION

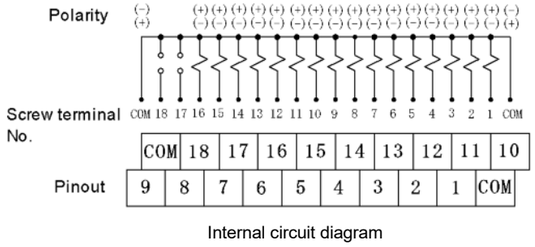
■ **To achieve protective construction IP65, heed these precautions:**
Connect protective cable clamp to the cover. Apply appropriate tightening torque.
(Electric block T10 parts kit:
For W4G-SCL-18A and W4G-SCL-18B, typical tightening torque is 4.0-4.5 N·m and cable clamp tightening torque is 3.0-3.5 N·m.)



■ For wiring, use Y or ring terminal. Use crimp terminal of M3, up to 6.2 wide. Direct connection of lead wire will result in breakage or contact failure, causing solenoid valve to malfunction.
■ On the one end port type, internal common line is prewired. Integration of the manifold power supply is required. For independent contact PLC output unit, wire contacts to common line.

(1) Remove cover.
(2) Pass the wires through connection port of the cable clamp and secure at the correct terminals with tightening torque of 0.6 N·m.
(3) Install the electric component cover and secure it with fixing screw with tightening torque of 0.6 N·m.

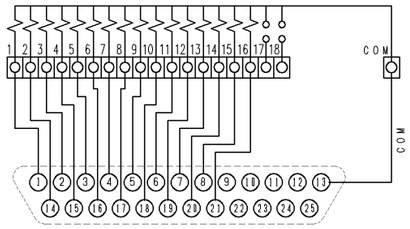




Internal circuit diagram

D-sub connector type [T30]

■Align signal arrangement of PLC output unit with that of valve.

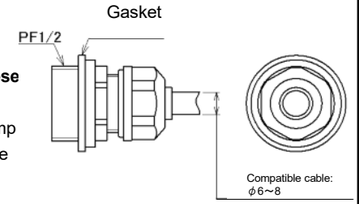


Internal circuit diagram

Serial transmission type [T6*]

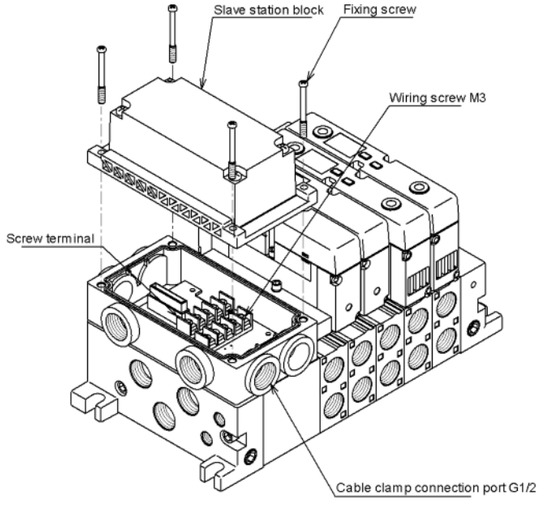
⚠ CAUTION

■ **To achieve protective construction IP65, heed these precautions:**
Connect protective cable clamp to the cover. Apply appropriate tightening torque.
(Electric block T10 parts kit:
For W4G-OA-W1608C1 typical tightening torque is 2.0-2.4 N·m and cable clamp tightening torque is 0.5-0.7 N·m.)



■ For wiring, use Y or ring terminal. Use crimp terminal of M3, up to 6.0 wide. Direct connection of lead wire will result in breakage or contact failure, causing solenoid valve to malfunction.

(1) Remove slave station block.
(2) Pass the wires through connection port of the cable clamp and secure at the correct terminals with tightening torque of 0.6 N·m.
(3) Install the slave station block and secure it with fixing screw with tightening torque of 0.6 N·m.



Wiring method to the screw terminal is defferent depending on the serial transmission method.
Refer to the handling instructions and catalogs prepared separately.

Wiring between Wiring-block and valve block (Reduced wiring of DC)

⚠ CAUTION

■ When increasing the number of manifold, do not exceed the maximum link number. Increasing the number of manifold, exceeding the range of specification, may cause unintentional operation of valve block causing malfunctioning of the device.

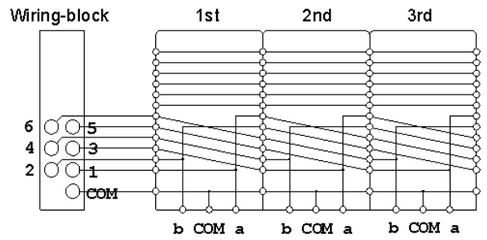
■ In case of DC ,valve block and wiring-block are provided with internal wiring connectors which perform wiring connections upon disassembling/assembling of block manifold, requiring no special wiring. The figure below shows wiring diagram.

Wiring diagram

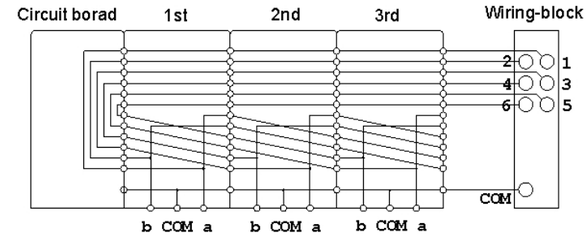
The figure right shows W4G4 wiring diagram which does not correspond to actual specification.

The diagram shows an example where:
1st -3rd link = double solenoid

Wiring-block in left side



Wiring-block in right side

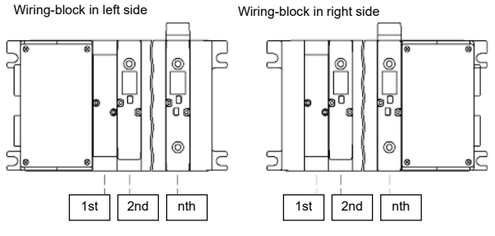


Setting connector pin number (Reduced wiring)

Numbers in the wiring diagrams above represent pin numbers on connector (screw terminal, receptacle) assigned by CKD for reference.

Setting valve numbers

- Assign manifold numbers in ascending order starting with leftmost one, with piping port viewed at the front.
- Valve Nos. 1, 2,,,, represent 1st, 2nd,,,, and a, b,,,, represent solenoid a, solenoid b, etc.



The tables below describe the **standard wiring (ascending order)** and optional (W) (**double wiring**). For other wiring methods, refer to individual wiring specification(s).
The maximum number of manifolds depends on the model. Refer to the specification of that model.

Standard wiring

Wiring is conducted in the order shown in the table below, with no connector pin number unused.

T10(example)

Screw terminal No.	COM	18	17	16	15	14	13	12	11	10
When single solenoid only	COM	(Unused)	(Unused)	16a	15a	14a	13a	12a	11a	10a
When double solenoid only	COM	9b	9a	8b	8a	7b	7a	6b	6a	5b
When single and double mixed	COM	(Unused)	(Unused)	(Unused)	(Unused)	9b	9a	8b	8a	7b

Screw terminal No.	9	8	7	6	5	4	3	2	1	COM
When single solenoid only	9a	8a	7a	6a	5a	4a	3a	2a	1a	COM
When double solenoid only	5a	4b	4a	3b	3a	2b	2a	1b	1a	COM
When single and double mixed	7a	6a	5b	5a	4b	4a	3a	2a	1a	COM

T30(example)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
When single solenoid only	1a	3a	5a	7a	9a	11a	13a	15a	(Unused)	(Unused)	(Unused)	(Unused)	COM
When double solenoid only	1a	2a	3a	4a	5a	6a	7a	8a	(Unused)	(Unused)	(Unused)	(Unused)	COM
When single and double mixed	1a	3a	4a	5a	7a	8a	10a	11b	(Unused)	(Unused)	(Unused)	(Unused)	COM

Pin No.	14	15	16	17	18	19	20	21	22	23	24	25
When single solenoid only	2a	4a	6a	8a	10a	12a	14a	16a	(Unused)	(Unused)	(Unused)	(Unused)
When double solenoid only	1b	2b	3b	4b	5b	6b	7b	8b	(Unused)	(Unused)	(Unused)	(Unused)
When single and double mixed	2a	3b	4b	6a	7b	9a	11a	12a	(Unused)	(Unused)	(Unused)	(Unused)

Double wiring (option symbol W)

Double wiring corresponds to the wiring of double solenoid regardless of operator position of solenoid valves installed. Therefore, if all solenoids are double type and they use all control points. the wringing is compatible with standard wiring. If single solenoids are used, connector pins for b solenoid are not used.

T10(example)

Screw terminal No.	COM	18	17	16	15	14	13	12	11	10
When single solenoid only	COM	(Unused)	(Unused)	(Unused)	8a	(Unused)	7a	(Unused)	6a	(Unused)
When double solenoid only	COM	9b	9a	8b	8a	7b	7a	6b	6a	5b
When single and double mixed	COM	(Unused)	(Unused)	8b	8a	7b	7a	(Unused)	6a	5b

Screw terminal No.	9	8	7	6	5	4	3	2	1	COM
When single solenoid only	5a	(Unused)	4a	(Unused)	3a	(Unused)	2a	(Unused)	1a	COM
When double solenoid only	5a	4b	4a	3b	3a	2b	2a	1b	1a	COM
When single and double mixed	5a	4b	4a	(Unused)	3a	(Unused)	2a	(Unused)	1a	COM

T30(example)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
When single solenoid only	1a	2a	3a	4a	5a	6a	7a	8a	(Unused)	(Unused)	(Unused)	(Unused)	COM
When double solenoid only	1a	2a	3a	4a	5a	6a	7a	8a	(Unused)	(Unused)	(Unused)	(Unused)	COM
When single and double mixed	1a	2a	3a	4a	5a	6a	7a	8a	(Unused)	(Unused)	(Unused)	(Unused)	COM

Pin No.	14	15	16	17	18	19	20	21	22	23	24	25
When single solenoid only	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)
When double solenoid only	1b	2b	3b	4b	5b	6b	7b	8b	(Unused)	(Unused)	(Unused)	(Unused)
When single and double mixed	(Unused)	(Unused)	3b	4b	(Unused)	(Unused)	7b	(Unused)	(Unused)	(Unused)	(Unused)	(Unused)

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