

Handling Precautions

IO-Link Wireless compatible

Serial Transmission Device

TVG series JB1*

(OPP8-A2WK / OPP8-A2WK-P)

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

Incorrect usage may result in malfunction and dangers.

Keep this Instruction in a safe and convenient place for future reference.

For further information, refer to the instruction manual and product catalog.

CAUTION

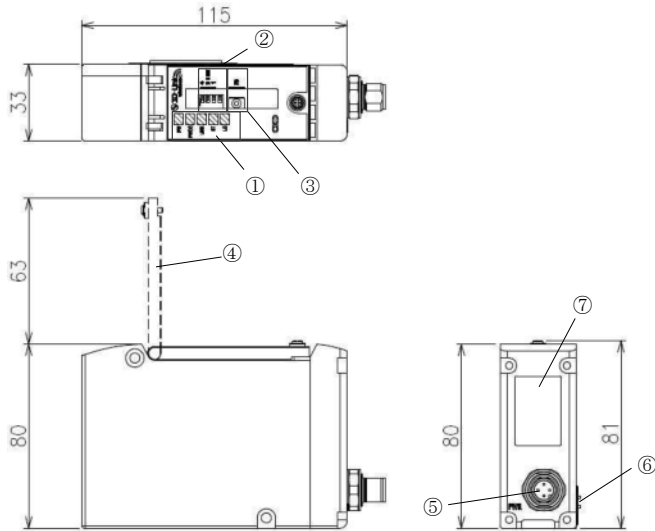
- Do not touch the live part with bare hands or the electrical wiring (bare live part), as an electric shock may occur.
- Read the instruction manual of the communication system before using the product.
- This product is DC dedicated. Use the product within the specified power voltage.
- This product complies with the Radio Laws of Japan, Europe, and the United States. Contact CKD for use in other countries.
- Do not install the product where it is surrounded by radio wave obstacles such as metal.

1. Device specifications : Always operate the device within its specifications.

Item	Specifications	
Model No.	OPP8-A2WK	OPP8-A2WK-P
Unit power voltage	21.6 VDC to 26.4 VDC (24 VDC±10%)	
Unit power current consumption	35 mA or less (all points ON at 24 VDC)	
Valve power voltage	22.8 VDC to 26.4 VDC (24 VDC±10%, -5%)	
Valve power current consumption	10 mA or less (with all points OFF) / 15 mA or less (with all points ON at no load)	
Output type	+COM (NPN)	-COM (PNP)
Number of output points	32 points	
Insulation resistance	Between external terminals and the case: 30 MΩ or more with 500 VDC	
Withstand voltage	Between external terminals and the case: 500 VAC for one minute	
Shock resistance	294.0 m/s ² for 3 times in 3 directions	
Storage temperature	-20°C to 70°C	
Storage humidity	30% to 85% RH (no dew condensation)	
Ambient temperature	-5°C to 55°C	
Ambient humidity	30% to 85% RH (no dew condensation)	
Ambient atmosphere	No corrosive gas	
Communication protocol	IO-Link Wireless	
Communication cycle time	5ms or more	
Communication distances	10 m	
Degree of protection	IP65 / IP67 ^{Note}	
Output insulation	Photo coupler insulation	
Leakage current	0.1 mA or less	
Residual voltage	0.5 V or less	
Fuse	Valve power: 24 V, 3 A/ Unit power: 24 V, 2 A (both fuses are non-replaceable)	
Operation indicator	LED (communication status, unit power and valve power status)	

Note: The product cannot be used underwater.

2. External dimensions (OPP8-A-WK)

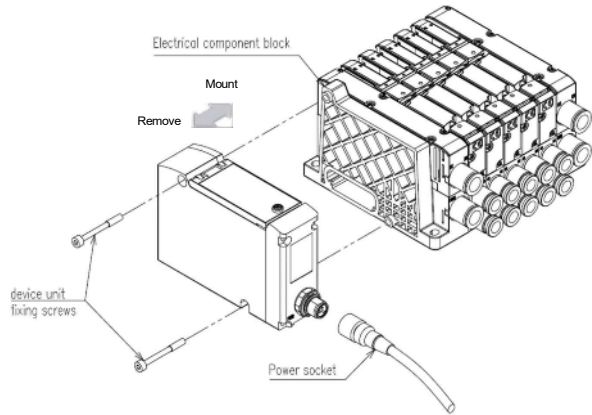


- LED
Indicates the status of the product and network with PW, PW(V), LINK, ST and LQ.
- Setting switches
Set output status in the event of a communication error by DIP switches.
- Pairing button
Performs pairing with the master unit and restarting the product by a momentary push button.
- Cover
Protects the LEDs, switches, and button.
- Unit/valve power plug (M12×1 port [PWR] A-cord: 4pins)
Connects unit/valve power socket.
- Valve connector
Connects the product to the valve.
- Unique ID (UID)
The number for the master to identify the product.

5. Maintenance

5.1 Mounting the product

- Set the switches of the product.
- Connect the power connector with the power (for the unit/valve) turned off.
The system may start operating suddenly if it is connected while the power is turned on.
Be careful of the surroundings and secure safety before performing work.
- Assemble the product to the electrical component block and screw it with the device fixing screws.
- After confirming safety, turn on each power supply.



5.2 Removing the product

- After confirming safety, stop network communication as necessary and turn off all peripheral equipment.
- After confirming safety, turn off the unit power and valve power as necessary.
- Unscrew the device fixing screws and slowly remove the product from the electrical component block.

CAUTION

- Do not remove the product by pulling the cable or connector that may cause cable disconnection or damage.
- An electric shock may occur by touching the electrical wiring connection (bare live part).

6. Settings by IODD files

6.1 Registering the device

The IODD file describes the communication specifications of the device. Registering the IODD file may be necessary for connecting the device to the master unit. Refer to the instruction manual issued by the master unit manufacturer for registering the IODD file. Use the latest IODD file for suitable network configuration.

Item	IODD file name
OPP8-A2WK	CKD-OPP8_A2WK-yyyyymmdd-IODD1.1
OPP8-A2WK-P	CKD-OPP8_A2WK_P-yyyyymmdd-IODD1.1

Note: Described as "yyyyymmdd-IODD1.1" at the end of each IODD file name, where indicate yyyy as the year (4 digits of the Western year), mm as the month, and dd as the day.

6.2 Output mapping

There is process data communication for the communication between the master and the product(device). This product is an output device that receives Process Data Out from the master unit and outputs to the valve. Refer to the following table for output mapping to the valve and Process Data Out.

Note: There is no Process Data IN for the product.

The process data can be changed between little-endian and big-endian by setting "Process Data Endian (Index=0x00EA)".

0: Little-endian (Initial value)

1: Big-endian

Refer to the instruction manual for detail.

Process Data Out mapping (32-point output)

Number of output points		Process Data Out							
		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
32 points	Octet 0	07	06	05	04	03	02	01	00
	Octet 1	15	14	13	12	11	10	09	08
	Octet 2	23	22	21	20	19	18	17	16
	Octet 3	31	30	29	28	27	26	25	24

Big-endian

Number of output points		Process Data Out							
		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
32 points	Octet 0	31	30	29	28	27	26	25	24
	Octet 1	23	22	21	20	19	18	17	16
	Octet 2	15	14	13	12	11	10	09	08
	Octet 3	07	06	05	04	03	02	01	00

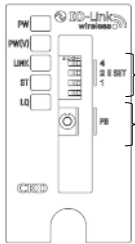
Note: With the standard wiring of the double solenoid valve, the a-side solenoid close to the product is assigned Octet3_bit0 data 00, and the b-side solenoid is assigned Octet3_bit1 data 01 in order.

3. LEDs and switches/button

3.1 LED indicators

These LEDs indicate the status of network and the device. Refer to the following table for the description of LED indicators.

Item	Indication
PW	Indicates the unit power status with the LED (green) lighting. (Power OFF: lights off, Power ON: lights on)
PW(V)	Indicates the valve power status with the LED (green) lighting. (Power OFF: lights off, Power ON: lights on) Note: This indicator is disable when the unit power is OFF.
LINK	Indicates the communication status with the LED (green) lighting. (Power OFF: lights off, Power ON: lights on, Normal communication: blinking)
ST	Indicates the product status with the LED (red) lighting. (Normal operation: lights off, Hardware error: lights on, Need maintenance: blinking)
LQ	Indicates the communication quality with the LED (3 colors) lighting. ("Good" quality: green on, "Normal" quality: orange on, "Abnormal" quality: red on)



3.2 Switches and button

3.2.1 Setting switches (DIP switches)

Set the product's output status in the event of a communication error.

The setting is read into memory at power-up. Refer to the following table for the settings of each switch.

No	E SET			Settings
	4	2	1	
①	OFF	OFF	OFF	All points OFF
		OFF	ON	Final output data
		ON	OFF	All points ON
	ON	-	-	The value of Process Data Out last received. Value set in Value Setting Communication Error.

Pairing button (momentary push button)

Performs pairing with the master unit and restarting the product by a momentary push button.

Refer to the table below for the operation depending on the pressing time of the pairing button.

(The time from pressing to releasing the button is defined as pressing time.)

No	Pressing time [s]	Operation
②	0 < ≤ 3	No action
	3 < ≤ 10	Requests pairing to the master unit
	10 < ≤ 30	No action
	30 <	Restarts the product

CAUTION

- Set the DIP switches while the unit power is turned off.
- Keep the cover of the product closed except when setting the switches. The cover may get damaged or foreign matters may enter the internal circuit and cause unexpected failure.
- The setting switch is very precise and may be damaged in case of rough handling. The internal circuit board can be easily damaged.

4. Wiring

Function description and connection of the terminal are as following.

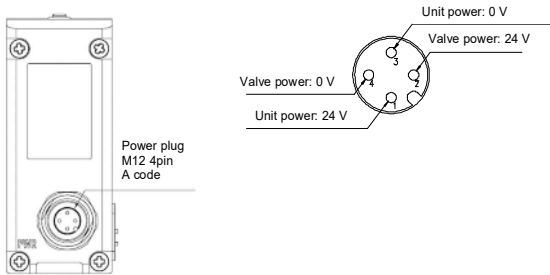
CAUTION

- Check the working voltage and polarity before wiring and energizing.
- Select the power cable by calculating the current consumption.
- If power is supplied to more than one produce(device) from one power supply, consider the voltage drop due to cables when selecting and wiring the cables.
- Install a terminal block if multi-drop wiring of the power cables is needed.
- Since the product has no resistance to lightning surges, take measures against surges on the equipment side. For AC power model, use it in an installation category II environment.

4.1 Wiring

Follow the steps below to connect the power cables to the product.

- Refer to the figure below and wire the unit/valve cables to the correct terminals of the power connector (24 V to 24 V, 0 V to 0 V).
- Connect the wired unit/valve power connector to the power plug of the product.



Recommended M12 connector (socket): loose wire type power cable

XS2F-D421-0.8-0 Straight type

Note: differs depending on the cable specifications.

Mfd by Omron Corporation

Recommended assembly type M12 connector and power cable

1424655 (SACC-M12FS-4PL M): Assembly type M12 connector

Cable size : AWG26 to 18, compatible outside diameter of cable : 4 to 8 dia.

Mfd by Phoenix Contact

PRECAUTIONS

- This product has received Radio Equipment Type Approval as a wireless equipment based on the Radio Act (Radio law in Japan).
- Do not disassemble or modify. Disassembly and modification are prohibited by the radio law.
- Review the operating environment when the communication is unstable.
- To correspond with the requirements of the relevant EC Directive, use AC/DC adapter (e.g., switching power supplies) complying with EMC standards for the unit and valve power supplies.
- The system or solenoid valve (cylinder) may operate suddenly when powering on and off. Be careful of the surroundings and secure safety before starting.
- For the communication delay time, refer to the instruction manual of the master unit. Transmission delay as a system varies depending on the PLC scan time and other devices connected to the same network.
- For the Response time of the solenoid valve, check the solenoid valve specifications.
- The solenoid valve response (OFF) time is delayed by approximately 20 msec due to the surge absorbing circuit integrated in the product.
- Wire the power cable properly within its specifications to avoid any incorrect wiring.
- Do not apply tension or impact to the power cable.
- Make sure that cables and connectors are securely connected before turning on the power.
- Do not drop or apply excessive vibrations or shocks to the product as the part inside are made precisely.
- Do not attach or detach the connector while the power is turned on as that may cause failure or malfunction.
- Mold and rust may develop on the product if it is exposed to high humidity during transportation. Include moisture absorbers and tightly seal the package.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
 - This device may not cause harmful interference, and
 - this device must accept any interference received, including interference that may cause undesired operation.

- For inquiries regarding this product, please contact the following or the nearest sales office.

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Please check global distributors with our catalog or the website below.

<https://www.ckd.co.jp/en/>