CKD

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Handling Precautions

IO-Link compatible Serial Transmission Device

TVG Series JA9*

(OPP8-A2KC-*/ OPP8-A2KC-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

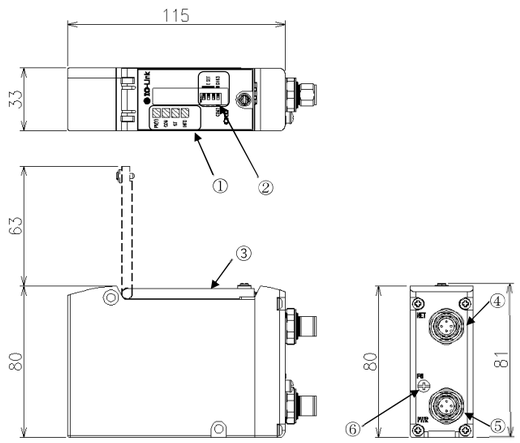
- Do not touch the live part with bare hands or the electrical wiring (bare live part), as an electric shock may occur.
- Read the instruction manual of the communication system before using the product.
- This product is DC dedicated. Use the product within the specified power voltage.

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

Item	Specifications	
Model	OPP8-A2KC-A OPP8-A2KC-B	OPP8-A2KC-PA OPP8-A2KC-PB
Device power voltage	18 VDC to 30 VDC	
Device power current consumption	50 mA or less (at 24.0 VDC with all points ON)	
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	NPN output (+COM)	PNP output (-COM)
Number of output point	32 points	
Insulation resistance	Between external terminals and the case: 30 MΩ or more with 500 VDC	
Withstand voltage	Between external terminals and case: 500 VAC for 1 minute	
Shock resistance	294.0 m/s² for 3 times in 3 directions	
Storage ambient temperature	-20℃ to 70℃	
Storage humidity	30 to 85%RH (no dew condensation)	
Ambient temperature	-5℃ to 55℃	
Ambient humidity	30 to 85%RH (no dew condensation)	
Atmosphere	No corrosive gas	
Communication protocol	IO-Link V1.1	
Baud rate	Set by switch	
Output insulation	Photo coupler insulation	
Leakage current/ Residual voltage	0.1 mA or less/ 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)	

Note: Status can be monitored when the unit power is supplied within specified voltage.

2.External dimensions (OPP8-A2KC-*A)

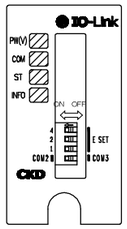


① LED
Indicate the status of the device and network with PW(V), COM, ST, and INFO.
② Setting switch
Set the operation at communication error and baud rate by slide switches.
③ Cover
Protects the LEDs and switches.
④ Network connector (M12 x 1 port, A-code)
Class A (4 pins): connects the cables for unit power and IO-Link communication.
Class B (5 pins): connects the cables for unit/valve power and IO-Link communication.
⑤ Valve power connector (M12 x 1 port , A code: 4 pin (Class A only))
Connects the valve power cables (24 V).
⑥ FG Terminal
Connects FG(frame grounding) to the terminal.

3. LED indicators and switch settings

3.1 LED indicators

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



LED	Indication
PW(V)	Indicates the valve power status. (Green on when the valve power is ON.) Note: This indicator is disabled when the unit power is off.
COM	Indicates the status of the unit power and IO-Link communication. Unit power is ON, IO-Link communication has not started (green on) Unit power is ON, IO-Link communication is on (green blinking)
ST	Indicates the device status. Need maintenance (Red blinking) Hardware is in abnormal condition (Red on) Normal condition (Off)
INFO	Off (not used)

3.2 Switch settings

Set the output status when a communication error occurs and baud rate of the device.
The setting is read into memory at power-up.
Refer to the following table for the settings of each switch.

① Output settings at communication error

E SET			Mode	Valve operation at communication error
4	2	1		
OFF	OFF	OFF	Hardware mode	All points OFF
	OFF	ON		Final output data
	ON	OFF		All points ON
	ON	ON		The value of Process Data Out last received
ON	-	-	Software mode	The value set by IO-Link communication

Note: Since IO-Link is a one-to-one communication between the master and device unit, there is no switch for address setting.

② Baud rate setting

COM	Mode
OFF	COM3
ON	COM2

Note: The slide switch is in [ON] position when it is turned to the left in the above figure.

⚠ CAUTION

- Set switches with the device power turned off.
- Keep the cover of the device closed except when setting the switches. The cover may get damaged or foreign matters may enter inside 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.
- If power is supplied to more than one device from one power supply, consider the voltage drop due to cables when selecting and wiring the cables.
- Since the device has no resistance to lightning surges, take measures against the surges on the device side. For AC power model, use it in an installation category II environment.

Wiring the network cable to the network plug enables the plug to connect to the network connector on the device.
Network plug is not supplied with the product. Separately purchase a network connector that satisfies the specifications.

Unit power

This electrical power is for operating the device. Power between 18 VDC to 30 VDC is supplied from the master unit.

Valve power

This electrical power is for operating the solenoid valve. Use 22.8 VDC to 26.4 VDC power with the least noise.

Recommended M12 assembly type connector

Class A

Port	Part name	Model No.	Manufacturer
NET, PWR	M12 assembly type connector (4pin female)	21 03 212 2305	HARTING Co., Ltd.

Class B

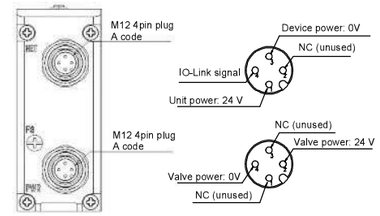
Port	Part name	Model No.	Manufacturer
NET	M12 assembly type connector (5pin female)	21 03 272 2505	HARTING Co., Ltd.

Follow the steps below to connect the network cable to the network connector.

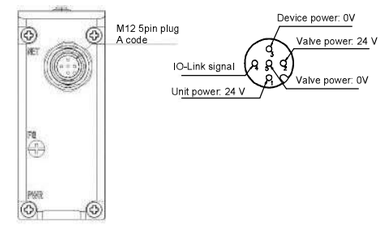
<Network cable>

(1) After confirming safety, stop network communication and turn off all peripheral equipment.
(2) Refer to the following figure to wire the cable to the M12 connector.

Class A



Class B



⚠ CAUTION

- Check the polarity of this product and the cable terminal before connecting.
- Select the power cable by calculating the current consumption.
- Provide sufficient bending radius for the network cable and do not bend it forcibly.
- Wire the network cable away from the power cable and high-voltage wire.

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 IODD file suitable to the product for proper network configuration.
Download the IODD file from the CKD website. (https://www.ckd.co.jp/kiki/en/).

6.2 I/O mapping

There is process data communication for the communication between the master and the device unit (this product). This product generally is a device that controls the valve using Process Data OUT communication. Refer to the following table for the Process Data OUT output mapping.

Process Data OUT mapping (32-point output)

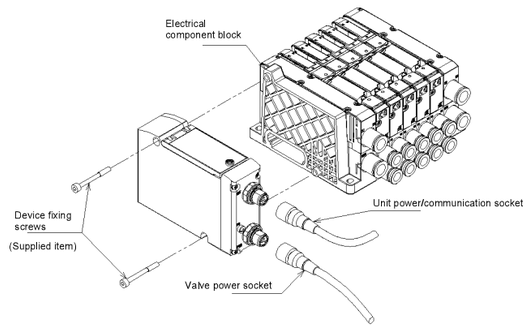
Number of output point		Process Data OUT (bit)							
		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
32 points	Octet 3	07	06	05	04	03	02	01	00
	Octet 2	15	14	13	12	11	10	09	08
	Octet 1	23	22	21	20	19	18	17	16
	Octet 0	31	30	29	28	27	26	25	24

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.

5. Maintenance

5.1 Mounting the product (device)

(1) Set the switches of the product.
(2) Connect the IO-Link plug with the power (for the master unit and valve) turned off.
The system may start operating suddenly if the plug is connected while the power is turned on.
Be careful of the surroundings and secure safety before connecting the connectors.
Reference tightening torque: 0.4 N·m (Since it varies depending on the plug, consult the plug manufacturer.)
(3) Hold the product and insert it slowly.
(4) Check that the product and device electrical component block are properly connected and tighten the device fixing screws firmly.
(Appropriate tightening torque: 0.5 N·m)
(5) Confirm safety and turn on each power.



5.2 Removing the product (device)

(1) After confirming safety, stop network communication as necessary and turn off all peripheral equipment.
(2) After confirming safety, turn off the power for the master unit and valve as necessary.
(3) Loosen the device fixing screws.
(4) Hold and pull out the product slowly.
(5) Remove the unit power/communication socket and valve power socket.

⚠ CAUTION

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

PRECAUTIONS

- 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 valve and unit 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 performing work.
- For the delay time, refer to the instruction manual for the master unit.
Transmission delay as a system varies depending on the PLC scan time and other devices connected to the same network.
- Check the solenoid valve specifications since the response delay of the valve varies depending on the model.
- Solenoid valve OFF time is delayed by approximately 20 msec due to the surge absorbing circuit integrated in the device.
- Wire the power cable and network cable properly within its specifications to avoid any incorrect wiring.
- Do not apply tension or impact to the power cable or network cable.
- Make sure that cables and connectors are securely connected before turning on the power.
- Do not disassemble, modify, or repair the product as that may cause failure or malfunction.
- 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 ON as that may cause a 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.

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

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