CKD

G108-1235-A 2023.09.08

Handling Precautions

CC-Link IE Field Compatible Serial Transmission Device TVG series JA7* (OPP8-A2EF / OPP8-A2EF-P)

Thank you for purchasing CKD product.
Please review the precautions in this handling instructions 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.

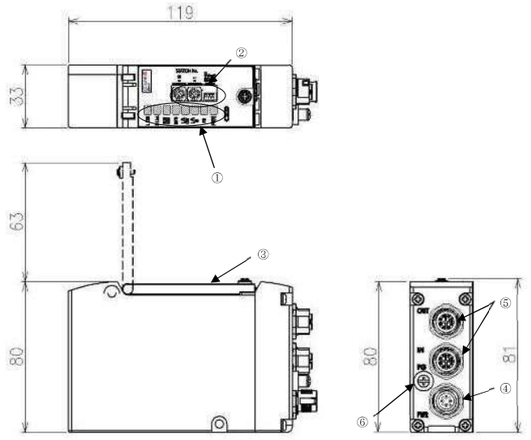
⚠ CAUTION

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

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

Item	Specifications	
Model	OPP8-A2EF	OPP8-A2EF-P
Device power voltage	21.6 VDC to 26.4 VDC (24VDC±10%)	
Device power current consumption	100 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	+COM(NPN)	-COM(PNP)
Number of input/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 the case: 500 VAC for one minute	
Shock resistance	294.0 m/s² for 3 times in 3 directions	
Storage ambient temperature	-20℃ to 70℃	
Storage ambient 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	CC-Link IE Field	
Output insulation	Photo coupler insulation	
Leakage current	0.1 mA or less	
Residual voltage	0.5 V or less	
Fuse	Valve power: 24V, 3A/ Device power: 24V, 2A (both fuses are non-replaceable)	
Operation indicator	LED (communication status, device power and valve power statuses)	

2.Dimensional outline drawing



① LED
L ERR, D Link, RUN/ERR, INFO, LINK/ACT OUT, LINK/ACT IN, PW, PW (V)
Indicate device status and network status by LEDs.

② Switches
Set the station number of the device by rotary switches.
Set the operation at communication error, network number, and Fast Link-up function by slide switches.

③ Cover
Protects the LEDs and switches.

④ Device/valve power plug (M12Ï 1 port【PWR】 A-cord)
Connects the device/valve power socket.

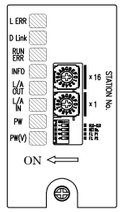
⑤ Network connector socket (M12Ï 2 ports【IN, OUT】X-cord)
Transmits CC-Link IE Field communication to the next device or receives it from the previous device.
Note: There is no difference in the function between input (IN) and output (OUT) ports which only named to distinguish each port. (Except when the fast link up function is enabled)

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
L ERR	Indicates the error status of CC-Link IE Field network port with the LED (red) lighting (Lights off at normal communication)
D Link	Indicates the communication status of CC-Link IE Field data link with the LED (green) lighting (Lights on at normal communication)
RUN /ERR	RUN: Indicates the operating status of the product with the LED (green) lighting ERR: Indicates the error status of the product operation with the LED (red) lighting
INFO	Indicates the notification status from the device with the LED (red) lighting (Lights off at normal communication)
L/A OUT (P1)	Indicates the status of the Ethernet port (OUT side) with the LED (green) lighting (light off, blinking, rapid flashing)
L/A IN (P2)	Indicates the status of the Ethernet port (IN side) with the LED (green) lighting (light off, blinking, rapid flashing)
PW	Lights when the device power is on (Green on).
PW(V)	Lights when the valve power is on (Green on) Note: This indicator is disable when the device power is off.

3.2 Switch settings

Set the station number, network number, output status at communication error, and fast link-up function.
The station number, network number, and fast link-up function settings are read into the device when the power is on.
Refer to the following table for the settings of each switch.

Part name		Settings	Setting specification range
STATION No.	Station number setting switch (I 16)	Sets the station number of the device. Note: No duplicate setting.	1 to 120
	Station number setting switch (I 1)		
HLD-CLR	Switch for output setting at communication error	Sets the output status when a communication error occurs. ON: Hold mode OFF: Clear mode	ON or OFF
NET No.	Network number setting switch	Sets the network number. ON: Network number is 1 OFF: Software setting (Refer to the instruction manual for details.)	ON or OFF
F.L P1	Switch for fast link-up function (OUT) setting.	Sets the fast Link-up function (OUT). ON: Enable OFF: Disable	ON or OFF
F.L P2	Switch for fast link-up function (IN) setting.	Sets the fast Link-up function (IN) ON: Enable OFF: Disable	ON or OFF

⚠ CAUTION

- Set switches while the unit power is 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.

4. Wiring

Function description and connection of the terminals are as following.

⚠ CAUTION

- Check the working voltage and polarity before wiring and energizing.
- If power is supplied to more than one device (remote station) 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.

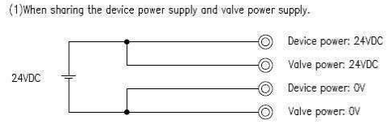
4.1 Communication distance and wiring

Although the CC-Link IE Field network uses a standard Ethernet cable and has flexible wiring methods, there are limits depending on the wiring material, devices, master, hub, etc. Always understand their specifications thoroughly before wiring.
(For further information, refer to the instruction manuals provided by the master unit manufacturer and CLPA (CC-Link Partner Association).

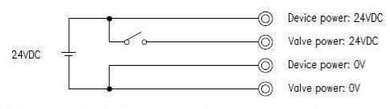
4.2 Connecting and wiring to the device/Valve power plug

It has separate power supplies for the device/valve power.
Each power supply is connected by an M12 connector (socket). The following figures 1 to 3 are examples of the wiring for the power plug.
Note: Power connector is not supplied with the product. Separately purchase a power connector that satisfies the specifications.

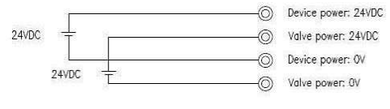
(1)When sharing the device power supply and valve power supply.



(2)When turning ON/OFF the valve power supply only.



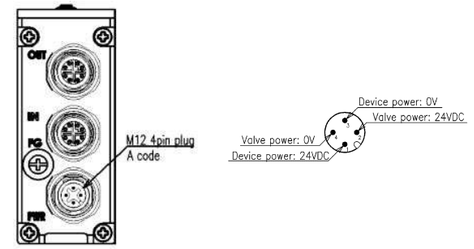
(3)When separating the device power supply and valve power supply.



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

Power cable

After confirming safety, stop network communication and power off all peripheral equipment.
Refer to the figure below and wire to the M12 connector.



<Recommended cable with connector (M12 socket) >
XS2F-D421-□8□-□ straight socket with open ends Mfd by OMRON
* □ differs depending on the cable specifications.

<Recommended cable and M12 socket>
1424655(SACC-M12FS-4PL M) M12 Assembly connector Mfd by PHOENIX CONTACT
Wire size: AWG18 to 26, applicable diameter: φ4 to 8.

⚠ CAUTION

- Check the polarity of this product and the cable terminal before connecting.
- Calculate the current consumption before selecting the appropriate power cable.

4.3 Connecting and wiring to the network connector socket (M12 connector:X-code)

Network plug is not supplied with the product. Separately purchase a network plug that satisfies the specifications.
By wiring the network cable to a network plug, the plug can be connected to the network connector socket on the device.

Recommended cable with plug [Cat.5e]
SC-E5EW-□ straight connection Mfd by MITSUBISHI
* □ differs depending on the cable specifications.

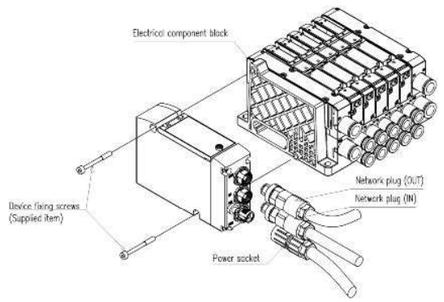
Recommended M12 assembly connector
1411043(SACC-MSX-8QO) M12 data connector Mfd by PHOENIX CONTACT
* Compatible with the rapid interlock system: SPEEDCON

5.2 Removing the product (device)

(1) After confirming safety, turn off the device power and valve power as necessary.
(Note that following stations next to this device stop communication.)
(2) Unscrew the device fixing screws and slowly remove the device from the electrical component block.

⚠ CAUTION

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



6. Settings by CSP+ system profile

For the CC-Link IE Field device to join the network, it is necessary to register the device to the network using the CSP+ file which describes the communication specification of the device.
Refer to the instruction manual of the master unit manufacturer for registering the CSP+ file.
Also, use the latest CSP+ file for proper network configuration.

6.1 Registering the device

Check the specifications (model name) of the device before registering, as both the device and CSP+ file need to be matched. Refer to the following table for the device specifications and CSP+ file.

Specifications and model names in the CSP+ file

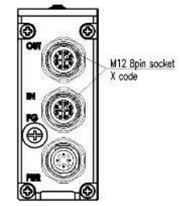
Item	Specifications	
Model	OPP8-A2EF	OPP8-A2EF-P
Module name	OPP8-2EF	OPP8-2EF-P
Output type	+COM (NPN)	-COM (PNP)
Number of output points	32 points	
CSP+ profile name	0x0104_OPP8-2EF_1.0_en	0x0104_OPP8-2EF-P_1.0_en

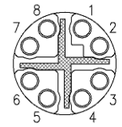
6.2 I/O mapping

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

Network cable

After confirming safety, stop network communication and turn off all peripheral equipment.
Refer to the figure below and connect the CC-Link IE Field compliant cable to M12 connector.
Note: There is no difference in the function between input (IN) and output (OUT) ports which only named to distinguish each port. (Except when the fast link up function is enabled)
Note: When the previous device is OFF, network of this device turns OFF.





Port	Pin	Signal	Function
IN / OUT	1	BI_DA+	Sent/received data, plus
	2	BI_DA-	Sent/received data, minus
	3	BI_DB+	Sent/received data, plus
	4	BI_DB-	Sent/received data, minus
	5	BI_DD+	Sent/received data, plus
	6	BI_DD-	Sent/received data, minus
	7	BI_DC-	Sent/received data, minus
	8	BI_DC+	Sent/received data, plus

⚠ CAUTION

- Use a dedicated network cable that complies with CC-Link IE Field specifications.
- Provide enough bending radius for the network cable and do not bend it forcibly.
- Separate the network cable from the power cable and high-voltage wire.

5. Maintenance

5.1 Mounting the product (device)

(1) Set the switches and the station number of this product.
(2) Turn off the power (for device/valve) and connect the network plug and power socket.
The system may operate suddenly if the connectors are connected while the power is turned on.
Be careful of the surroundings and secure safety before performing work.
(3) Assemble this product to the electrical component block and screw it with the device fixing screws.
(4) Confirm safety and turn on each power.

There are two types of I/O data: RY (remote output) data sent from the master unit to the remote station(this product) and RX (remote input) data sent from the remote station to the master unit.
This product is an output device that receives remote output data from the master unit and output to the valve.
Refer to the following table for RY mapping
(There is no remote input for the product).

RY mapping

Number of I/O points		Bit															
	RY	RY□0	RY□1	RY□2	RY□3	RY□4	RY□5	RY□6	RY□7	RY□8	RY□9	RY□A	RY□B	RY□C	RY□D	RY□E	RY□F
32-point outputs	4 bytes	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

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

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 device 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.
- For the Responce time of the solenoid valve, check the solenoid valve specifications.
- 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.

CKD Corporation

Head Office and Plant
250, Ouji 2-chome, Komaki, Aichi, 485-8551, Japan
Phone: +81-(0)568-77-1111 /Fax: +81-(0)568-75-1123
Overseas Sales Administration Department
250, Ouji 2-chome, Komaki, Aichi, 485-8551, Japan
Phone: +81-(0)568-74-1338 /Fax: +81-(0)568-77-3461
Please check global distributers with our catalog or the website below.
https://www.ckd.co.jp/en/