

Handling Precautions
PROFINET Compatible
Serial Transmission Device
TVG series JAG*
(OPP8-A2EP / OPP8-A2EP-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.

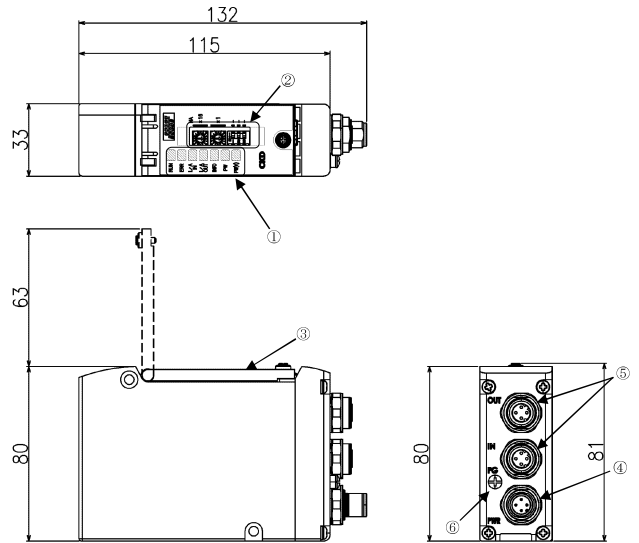
CAUTION

- Do not touch the live part with bare hands or the electrical wiring (bare live part), as an electric shock may occur.
- 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-A2EP	OPP8-A2EP-P
Unit power voltage	21.6 VDC to 26.4 VDC (24VDC+10%)	
Unit power current consumption	90 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 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	PROFINET IO	
Transmission rate (Baud rate)	Supports 100Mbps / Full Duplex only	
Output insulation	Photo coupler insulation	
Leakage current	0.1 mA or less	
Residual voltage	0.5 V or less	
Fuse	Valve power: 24V, 3A / Unit power: 24V, 2A (both fuses are non-replaceable)	
Operation indicator	LED (communication status, unit power and valve power status)	

2. Dimensional outline drawing



- LED
Indicate the status of the device and network with RUN, ERR, U/A IN, U/A OUT, INFO, PW, and PW(V).
- Setting switches
Set the device name by rotary switches. DIP switches are not used.
- Cover
Protects the LEDs and switches.
- Unit/valve power plug (M12I 1 port [PWR] A-cord: 4pins)
Connects unit/valve power socket.
- Network connector socket (M12I 2 ports [IN, OUT] D-cord: 4 pins)
Transmits PROFINET communication to the next device or receives it from the previous device.
- 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	Function	Status	
RUN	Indicates device's communication status	Off Green on Green blinking Green triple flash	No communication In communication Preparing for communication In forced output setting
ERR	Indicates the device errors	Off Red blinking Red double flash	Normal condition Cyclic data receive timeout Preparing for communication
U/A IN	Indicates the status of Ethernet port IN side	Off Green on Green blinking	No link and no data transfer Link detected but no data transfer Link detected and data transferring
U/A OUT	Indicates the status of Ethernet port OUT side	Off Green on Green blinking	No link and no data transfer Link detected but no data transfer Link detected and data transferring
INFO	Indicates the device status	Off Red on Red blinking Red slow blinking Red triple flash Other than the above	Normal condition EEPROM error FLASH LED test signal received Switch operation detected Maintenance notice Internal circuit board error
PW	Unit power status	Off Green on	Unit power OFF Unit power ON
PW(V)	Valve power status Note: This indicator is disabled when the unit power is off.	Off Green on	Valve power OFF Valve power ON

3.2 Switch settings

Set the device name of the product. The setting is read into memory at power-up.
Refer to the following table for the switch settings.
Note: Each PROFINET device needs to have a different device name.
Refer to the instruction manual issued by the controller unit manufacturer when setting the device name by the controller unit.

Switch	Settings	Setting specification range
NA x16 x1 NA x16 x1	Device name setting switch Set the device name of the device. The device name will be "OPP8"-setting value". When setting to "00", it operates with the device name set by the controller unit.	01 to FF

Note: DIP switches have no function.

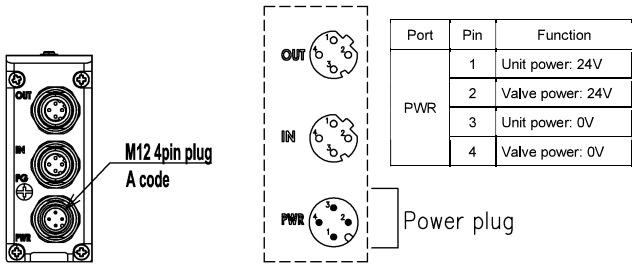
CAUTION

- Set switches while the unit power is turned off.
- Keep the cover of serial transmission 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.

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

<Power cable>

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



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

XS2F-D421-□8□□□□ Straight type Mfd by Omron Corporation
Note: □ differs depending on the cable specifications.

Recommended assembly type M12 connector and power cable

21 03 212 2305 M12 Assembly type connector Mfd by HARTING
Cable size : AWG22 to 18, outside diameter of compatible cable : 6 to 8 dia.

CAUTION

- Check the polarity of the device and the cable terminal before connecting.
- Select the power cable by calculating the current consumption.

4.3 Connecting and wiring to the network connector socket (M12 connector)

Network plug is not supplied with the product. Separately purchase a network plug that satisfies the specifications.

Wiring the network cable to a network plug enables the plug to connect to the network connector socket on the device.

Recommended M12 network cable with RJ45 connector [Cat.5e]

XS5W-T421-□MC-K Straight type Mfd by Omron Corporation
09 45 700 50□□□□ Straight type Mfd by HARTING

Note: □ differs depending on the cable specifications.

Recommended assembly type connector

21 03 281 140 Assembly type M12 connector Mfd by HARTING
09 45 151 1100 Assembly type RJ45 connector Mfd by HARTING

Recommended cable [Cat.5e]

09 45 600 01□□□□ Industrial Ethernet cable Mfd by HARTING

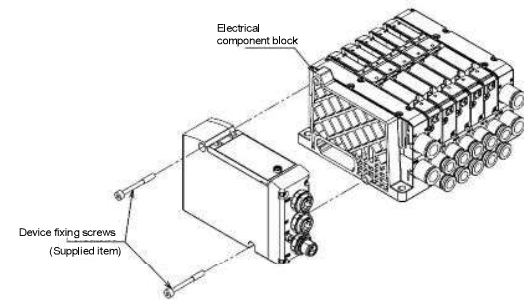
Note: □ differs depending on the cable specifications.

5.2 Removing the product (device)

- 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.
(Note that communication will stop after the next station of the product.)
- Remove the device fixing screws and pull out the device slowly from the electrical component block.

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).



6. Settings by GSDML files

In order for the PROFINET device to join the network, it is necessary to register the device to the network using the GSDML file which describes the communication specification of the device. Refer to the instruction manual issued by the controller unit manufacturer for registering the GSDML profile. Use the latest GSDML file for suitable network configuration.
GSDML file name: GSDML-V2.42-CKD-OPP7_OPP8-20230427

6.1 Registering the device

Before registering, check the device name of the device to be used, as both the device and GSDML file need to be matched.

Specifications and model names in the GSDML file

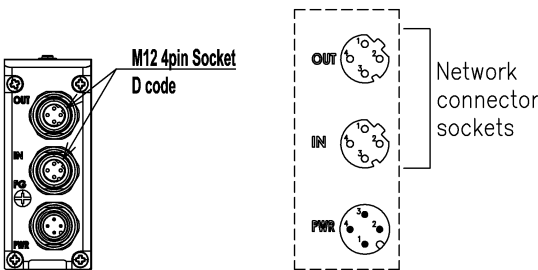
Item	Specifications	
Model	OPP8-A2EP	OPP8-A2EP-P
Output type	+COM (NPN)	-COM (PNP)
Number of output points	32 points	32 points
GSDML file	Head Module name	OPP8
	Module name	-2EP

Note: There is no distinction between model names in the GSDML file for +COM and -COM.

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 following figure and wire the PROFINET-compliant cable to the M12 plug (PROFINET compliant).
- Note: The communication of the product may stop when the previous device stops.



Port	Pin	Signal	Function
IN/OUT	1	TD+	Transmission data, plus
	2	RD+	Reception data, plus
	3	TD-	Transmission data, minus
	4	RD-	Reception data, minus

CAUTION

- Use a dedicated network cable that complies with PROFINET specifications.
- Provide sufficient bending radius for the network cable and do not bend it forcibly.
- Separate the network cable from power lines and high-voltage lines.

5. Maintenance

5.1 Mounting the product (device)

- Conduct the switch settings of the product.
- Turn off the power (for unit/valve) and connect the network plug and power socket. The system may start operating suddenly if they are 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.

6.2 I/O mapping

There are two types of data: the output data sent from the controller unit to a device (this product) and the input data sent from the device to the controller unit. The product is an output device that receives output data from the controller unit and outputs it to the valve. Refer to the following table for mapping of output data.

Mapping of output data

* Allocation example when Q address (output) and I address (input) are set to 2 on a PLC manufactured by Siemens AG

I/O points		Bit																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
32 points output		QB2.0	QB2.1	QB2.2	QB2.3	QB2.4	QB2.5	QB2.6	QB2.7	QB3.0	QB3.1	QB3.2	QB3.3	QB3.4	QB3.5	QB3.6	QB3.7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

Note: With the standard wiring of the double solenoid valve, the A-solenoid close to the product is assigned output data 00, and the B-solenoid is assigned output 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 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 performing work.
- For the delay time, refer to the instruction manual of the controller 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.
- 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.
- 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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Please check global distributors with our catalog or the website below.
<https://www.ckd.co.jp/en/>