ACTIVAL+™
Standalone Model (JIS 20K / SCPH2)

■ General

ACTIVAL +™ Model FVY513EJ/FVY514EJ is a series of motorized two-way valves with flanged-end connection. Rotary valve and actuator are integrated in a single unit.

Valve size ranges from DN15 (1/2") to DN80 (3"), and valve body rating corresponds to JIS 20K.

In combination with the functions of a control valve, Model FVY513EJ/FVY514EJ measures and controls flow. Model FVY513EJ/FVY514EJ thus enables to control temperature for air conditioning by controlling chilled/hot water volume and to measure chilled/hot water flow.

For such a high functionality, compact size and simple installation of Model FVY513EJ/FVY514EJ are incomparable.

2 kinds of control signals are available to operate the Model FVY513EJ/FVY514EJ.

- 4-20 mA DC input:
  Provides proportional control in combination with a DDC controller. (e.g., Infilex™ GC Model WY5111, Model R35/R36)
- 2-10 V DC input:
  Provides proportional control in combination with a DDC controller. (e.g., Infilex™ AC Model WY5117)

Flow data stored in Model FVY513EJ/FVY514EJ is retrieved via RS-485 communication (Modbus protocol). The retrieved flow data is effective for energy-saving facility operation.

* JIS: Japanese Industrial Standards
* DDC: Direct Digital Control

■ Features

- Compact and lightweight:
  Rotary valve actualizes small body and light weight.
- Valve and actuator integrated in a single unit.
- Model FVY513EJ/FVY514EJ holds flow data effective for maintenance and energy-saving facility operation. The data is retrieved via RS-485 communication (Modbus protocol).
- Valve for chilled/hot water control applicable to large Cv value, high rangeability, and low leakage.
- Durable actuator with low power consumption.
- Flow rate control/position control operation selectable:
  For flow rate control, flow characteristic is selectable (equal percentage or linear). For position control, flow characteristic is equal percentage.
- In combination with the optional Display Panel (Model QY5010S1000) and the insertion-type pipe temperature sensor (Model TY7830) or the temperature sensor for pipe surface (Model TY7820), pressure, temperature, and flow can be displayed on the Display Panel.

IMPORTANT:
Do not use the data measured by this product for charging or dealing purposes.

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Safety Instructions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual nearby for quick reference.

Restrictions on Use

This product was developed, designed, and manufactured for general air conditioning use.

Do not use the product in a situation where human life may be at risk or for nuclear applications in radiation-controlled areas. If you wish to use the product in a radiation-controlled area, please contact Azbil Corporation.

Particularly when the product is used in applications like the following where safety is especially required, implementation of fail-safe design, redundant design, regular maintenance, etc., should receive appropriate consideration so that the product can be used safely and reliably.

- Safety devices for protecting the human body
- Start/stop control devices for transportation machines
- Aeronautical/aerospace machines

For system design, application design, instructions for use, or product applications, please contact Azbil Corporation. Azbil Corporation bears no responsibility for any result, or lack of result, deriving from the customer's use of the product.

Recommended Design Life
(Recommended Period of Use)

It is recommended that this product be used within its design life. The design life is the period during which you can use the product safely and reliably based on the design specifications. If the product is used beyond this period, its failure ratio may increase due to time-related deterioration of parts, etc. The design life during which the product can operate reliably with the lowest failure ratio and least deterioration over time is estimated scientifically based on acceleration tests, endurance tests, etc., taking into consideration the operating environment, conditions, and frequency of use as basic parameters.

The design life of this product is 10 years.

The design life specified for this product assumes that maintenance, such as replacement of the limited-life parts, is carried out properly. Refer to the section on maintenance in this manual.

■ Warnings and Cautions

⚠ WARNING	Alerts users that improper handling may cause death or serious injury.
⚠ CAUTION	Alerts users that improper handling may cause minor injury or material loss.

■ Symbols

	Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside ⃠ graphically indicates the prohibited action. (For example, the sign on the left notifies that disassembly is prohibited.)
	Instructs users to carry out a specific obligatory action to prevent possible danger. The symbol inside ● graphically indicates the actual action to be carried out. (For example, the sign on the left indicates general instructions.)

⚠ WARNING	
	When handling or transporting any heavy product (more than 18 kg), carefully move the product with a hand truck or the like, or with 2 or more people. Careless lifting or accidental dropping of the product may result in injury or product damage.

⚠ CAUTION	
	Provide a circuit protector (e.g., a fuse or circuit breaker) for the power source. Failure to do so may cause a short circuit leading to fire or device failure.
	Do not freeze this product. Doing so may damage the valve body and cause leakage.
	When piping this product, be sure there is no foreign matter in the pipes. If foreign matter remains in the pipes, the product may break down.
	Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
	When installing this product, hold it in the proper position and securely fasten it to the pipes. Excessive tightening or improper installation position may damage the valve.
	After installation, make sure no fluid leaks from the valve-pipe connections. Improper piping may cause fluid leakage outside of the valve.
	Do not put a load or weight on this product. Doing so may damage the product.
	Installation and wiring of the actuator must be performed by personnel qualified to do instrumentation and electrical work. Mistakes in installation or wiring may cause fire or electric shock.
	Before wiring, setting, maintenance, or replacement, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.

⚠ CAUTION	
	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
	For wiring, strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.
	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may cause short circuit leading to fire or device failure.
	Tighten the terminal screws with the specified torque. Insufficient tightening of the terminal screws may cause fire or overheating.
	After wiring, setting, engineering, maintenance, or replacement work, be sure to reattach the cover. Failure to do so may result in electric shock.
	Do not carelessly touch this product when it is used to control hot water. Doing so may result in burns, because the product reaches a high temperature.

IMPORTANT:

- This product is applicable only to chilled/hot water control. If the product is used to control any other medium such as brine or air, flow rate cannot be measured or controlled.
- Install the valve so that the flow direction of process fluid agrees with the arrow indicated on the valve body. If the flow direction is opposite to the arrow, correct measurement and control of flow is not assured.
- Do not loosen the yoke fixing screws or the actuator fixing screws. Loose fixing screws lower flow rate measuring accuracy. Note that the actuator mounting position onto the valve cannot be changed.
- Flow rate measuring accuracy in the subsection **Measuring range and accuracy** shown later is for the valve sensor measuring 7 to 17 °C and 45 to 65 °C ranges, 0.2 to 1.8 MPa pipe pressure, and 0.03 to 0.3 MPa differential pressure. Without these ranges, the flow rate measuring accuracy may lower.
- To keep flow rate measuring accuracy, control the quality of process fluid (water), and do not allow rust or foreign object inside the valve. Rust or foreign object inside the valve lowers flow rate measuring accuracy.
- Thermally insulate the valve, and do not allow the process fluid to freeze. Frozen process fluid around the valve sensor may damage the valve sensor and cause error output.

■ Model Numbers

Model FVY513EJ/FVY514EJ is the model for the valve and actuator integrated into a single unit.
The model number label is attached to the yoke.

Base model number	Actuator control signal	Valve rating/ material	Actuator type	—	Valve size/Cv value	Description
FVY51						Flow Measurement and Control Valve
	3					4-20 mA DC input, pulse output, RS-485 communication (Modbus protocol)
	4					2-10 V DC input, pulse output, RS-485 communication (Modbus protocol)
		E				JIS 20K / SCPH2
			J			IEC IP54 protected and standard torque type actuator with terminal block
				00		Fixed
					12	DN15 (1/2”) / 2.5 in Cv value
					13	DN15 (1/2”) / 6.0 in Cv value
					21	DN25 (1”) / 10 in Cv value
					22	DN25 (1”) / 16 in Cv value
					41	DN40 ($1^1/_2$”) / 25 in Cv value
					42	DN40 ($1^1/_2$”) / 40 in Cv value
					51	DN50 (2”) / 65 in Cv value
					61	DN65 ($2^1/_2$”) / 95 in Cv value
					81	DN80 (3”) / 125 in Cv value

● Options

Separately order the following optional parts if needed.

Item		Specification	Note
Seal connector	Part No. 83104346-003	ϕ7 mm to ϕ9 mm	Seal connector is necessary for IEC IP54 protection.
	Part No. 83104346-004	ϕ9 mm to ϕ11 mm	
	Part No. 83104346-005	ϕ11 mm to ϕ13 mm	
	Part No. 83104098-001 (for Insertion-type pipe temperature sensor)	ϕ4 mm to ϕ6 mm	
Seal connector for the cable gland	Part No. 83104346-012	ϕ6 mm to ϕ8 mm	Seal connector for SAnet cable gland with three ports is necessary for IEC IP54 protection.
	Part No. 83104346-013	ϕ7 mm to ϕ9 mm	
	Part No. 83104346-014	ϕ9 mm to ϕ11 mm	
	Part No. 83104346-015	ϕ11 mm to ϕ13 mm	
Display Panel Model QY5010S1000*		Data displaying device for Model FVY513EJ/FVY514EJ series	For the specifications of Display Panel, refer to **AB-7043 Specifications/ Instructions of Display Panel**.
Temperature sensor for pipe surface (Pipe sensor)	Model TY7820Z0P01	Total length: 1.5 m	For the specifications of the pipe sensor, refer to **AB-6923 Specifications/ Instructions of Temperature Sensor for Pipe Surface**.
	Model TY7820Z0P05	Total length: 5 m	
	Model TY7820Z0P10	Total length: 10 m	
	Model TY7820Z0P30	Total length: 30 m	
Insertion-type pipe temperature sensor Model TY783		For the specifications of the insertion type pipe temperature sensor, refer to **AB-5429 Specifications/Instructions of Pipe Temperature Sensor**.	
Outdoor cover Part No. DY3001A1017		Required when the product is installed outdoors.	
Cable gland with three ports Part No. DY7000A1000		Do not use it outdoors. For the specifications of the cable gland with three ports, refer to **AS-923E Specifications of Cable Gland with Three Ports**.	
RS-485/analog output signal converter Model RYY792C3001		Signal converter from RS-485 to 4-20 mA DC (Two channels of analog output per one converter)	For the specifications of RS-485/analog output signal converter, refer to **AB-7045 Specifications/Instructions of RS-485/ Analog Output Signal Converter**.

Note:

* Order Display Panel (Model QY5010S1000) and connect it to Model FVY513EJ/FVY514EJ. Display Panel is required to set the product.

■ Specifications

For weight, refer to the table shown in the section **Dimensions**.

● Valve and actuator (as a single unit) specifications

Item		Specification	
Environmental conditions	Rated operating conditions	Ambient temperature	-20 °C to 50 °C (Do not allow the process fluid to freeze.)
		Ambient humidity	5 %RH to 95 %RH
		Vibration	4.9 m/s^2 (10 Hz to 150 Hz)
		Shock	4.9 m/s^2
	Transport/storage conditions (in package)	Ambient temperature	-20 °C to 70 °C
		Ambient humidity	5 %RH to 95 %RH
		Vibration	19.6 m/s^2 (10 Hz to 150 Hz)
Installation locations		Indoor / outdoor (Optional outdoor cover must be used) Note: Salt air, corrosive gas, flammable gas, and organic solvent must be avoided.	
Mounting position		Refer to ■ “Installation,” ● “Mounting position.”	
Manual operation		Available. Refer to the subsection **Manually opening/closing valve.**	
Factory preset position		100 % (fully open)	

● Valve specifications

Item		Specification			
Model		Two-way valve with flanged-end connection			
Body pressure rating		JIS 20K (Max. working pressure: 2.0 MPa)			
End connection		JIS 20K flanged-end, raised flange			
Size, Cv, Close-off rating		Model number	Nominal size	Cv	Close-off ratings
		FVY513EJ0012 / FVY514EJ0012	DN15 (1/2”)	2.5	1.0 MPa
		FVY513EJ0013 / FVY514EJ0013	DN15 (1/2”)	6.0	1.0 MPa
		FVY513EJ0021 / FVY514EJ0021	DN25 (1”)	10	1.0 MPa
		FVY513EJ0022 / FVY514EJ0022	DN25 (1”)	16	1.0 MPa
		FVY513EJ0041 / FVY514EJ0041	DN40 ($1^1/_2$”)	25	1.0 MPa
		FVY513EJ0042 / FVY514EJ0042	DN40 ($1^1/_2$”)	40	1.0 MPa
		FVY513EJ0051 / FVY514EJ0051	DN50 (2”)	65	1.0 MPa
		FVY513EJ0061 / FVY514EJ0061	DN65 ($2^1/_2$”)	95	1.0 MPa
		FVY513EJ0081 / FVY514EJ0081	DN80 (3”)	125	1.0 MPa
Applicable fluid		Chilled/hot water			
Allowable fluid temperature		0 °C to 80 °C (Non-freezing) * Frozen process fluid around the valve sensor may damage the valve sensor or may cause output error.			
Flow characteristic		Equal percentage For flow rate control, flow characteristic is selectable between equal percentage and linear.			
Rangeability		100 : 1			
Seat leakage		0.01 % of rated Cv value (0.0006 Cv or less for DN15 model)			
Materials	Body	Cast carbon steel (equivalent to JIS SCPH2)			
	Plug, stem	Stainless steel			
	Seat ring, gland packing	Heat-resistant PTFE			
	Gasket	Expandable graphite sheet			
Paint		Gray (equivalent to M5B 4/1)			
Actuator to be combined		Integrated with the valve			

● Actuator specifications

Item		Specification
Power supply		24 V AC ± 15 %, 50 Hz/60 Hz
Applicable valve type		DN15 to DN80, standard torque
Power consumption		8 VA
Timing		63 ± 5 sec (50 Hz) / 53 ± 5 sec (60 Hz)
Control signal	Model FVY513EJ	4-20 mA DC input (Input impedance: 300 Ω or less)
	Model FVY514EJ	2-10 V DC input (Input impedance: 500 kΩ or more)
DI*1 (Cooling/heating switch signal)	Input type	Potential free (dry) contact input
	Voltage, current	12 V DC, 5 mA
Pulse output*2 (Totalized energy output Totalized flow output)	Output type	Open collector output
	Contact rating	30 V DC, Max. 60 mA
	Pulse rate*3	3.4 Hz or lower
Temperature sensor input*4		Pt100 RTD, 3-wire
Communication (Modbus protocol)*5	Transmission system	RS-485
	Transmission speed	4800 bps
	Connection	Multi-drop (1 to 31 max.)
	Transmission distance	Max. 500 m
Communication (Display Panel)	Transmission system	AP-bus (RS-485 communication)
	Transmission speed	4800 bps
	Transmission distance	Max. 50 m
Materials	Case	Die cast aluminum
	Top cover, terminal cover	Polycarbonate resin
	Yoke	Steel plate
Surface finishing	Case	None
	Yoke	Electro-galvanized (Bright chromate finish)
Valve position indication		Pointer of the actuator shows the position (0 % to 100 %). Position and flow can be indicated on the optional Display Panel.
Terminals connection	Power, control signal, DI, pulse output	M3.5 screw terminal connection
	Temperature sensor (Pt100 input)	6-pin (3-pin × 2) connector
	RS-485 communication	6-pin (3-pin × 2) connector
	Display Panel	4-pin connector
Enclosure rating		IEC IP54 (dust-proof and splash-proof)
Operation status indicator LED		1 red LED
	Status	LED indication
	Normal	Repetition of 1-second ON → 1-second OFF.
	Major alarm	Continuous ON.
	Minor alarm	Repetition of 1-second ON → 0.25-second OFF → 0.25-second ON → 0.25-second OFF.
	Communication error (and minor alarm)	Repetition of 0.25-second ON → 0.25-second OFF

Notes:

*1 Heating and cooling modes are switched over by DI (open/closed contact). Heating and cooling modes are also switched over with the Display Panel (Model QY5010S1000). Refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model** for details.

*2 Totalized energy or totalized flow rate for the pulse output is selectable with the Display Panel (Model QY5010S1000). Refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model** for details.

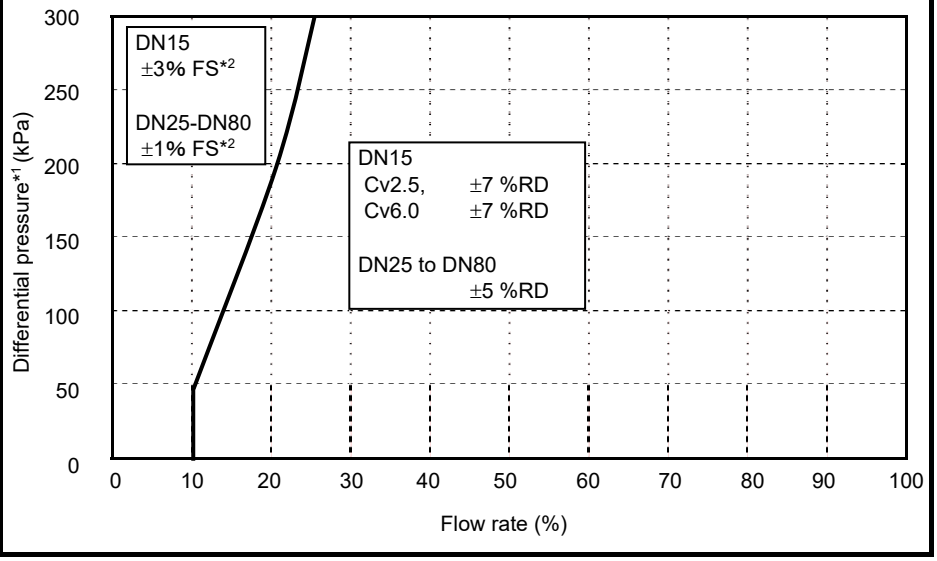
*3 Pulse rate is set with the Display Panel (Model QY5010S1000). Refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model** for details.

*4 In combination with 2 temperature sensors (Pt100 RTD, 3-wired), the product is applicable to simplified energy calculation. Refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model** for details.

*5 Flow measuring data and device data are output in Modbus protocol via RS-485 communication. Besides, in combination with the RS-485/analog output signal converter (Model RYY792C3001), flow measuring data is converted in 4-20 mA DC output signal. Refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model** for details.

● Measuring range and accuracy

(1/2)

Item		Specification			
Flow rate measuring	Setting range	Model number	Nominal size	Cv value	Max. set flow rate
		FVY513EJ0012 / FVY514EJ0012	DN15 (1/2”)	2.5	25 l/min
		FVY513EJ0013 / FVY514EJ0013	DN15 (1/2”)	6.0	60 l/min
		FVY513EJ0021 / FVY514EJ0021	DN25 (1”)	10	100 l/min
		FVY513EJ0022 / FVY514EJ0022	DN25 (1”)	16	160 l/min
		FVY513EJ0041 / FVY514EJ0041	DN40 ($1^1/_2$”)	25	250 l/min
		FVY513EJ0042 / FVY514EJ0042	DN40 ($1^1/_2$”)	40	400 l/min
		FVY513EJ0051 / FVY514EJ0051	DN50 (2”)	65	650 l/min
		FVY513EJ0061 / FVY514EJ0061	DN65 ($2^1/_2$”)	95	950 l/min
		FVY513EJ0081 / FVY514EJ0081	DN80 (3”)	125	1250 l/min
	Measuring accuracy (Factory preset)				

Notes:

*1 The flow measurement accuracy figures assume a temperature range of 7–17 °C or 45–65 °C, internal pipe pressure of 0.1–0.8 MPa, and differential pressure of 0.03–0.3 MPa.
If the actual conditions differ, accuracy may be less.
Differential pressure is the difference between valve inlet pressure and valve outlet pressure as measured inside the valve.

*2 Flow rate measuring accuracy above may change depending on the conditions including valve positions, differential pressure, etc.

(2/2)

Item			Specification				
Valve sensor	Pressure measuring	Measuring range	0 MPa to 2.0 MPa*3				
		Accuracy of the displayed pressure	± 0.5 %FS (factory preset)*4				
	Temperature measuring	Measuring range	0 °C to 80 °C				
		Accuracy	± 1.0 °C (factory preset)*5 (within 0 °C to 80 °C measuring range, at -25 °C to 40 °C temperature difference between measuring temperature and ambient temperature)				
Pt100 input	Temperature measuring	Accuracy*6	Conversion accuracy: ± 0.4 °C (at 0 °C to 50 °C ambient temperature) ± 0.6 °C (at -20 °C to 0 °C ambient temperature) Error due to wiring length: ± 0.15 °C (15 ± 15 m) in the 0 to 80 °C measuring range				
Energy calculation*7 (with two temperature sensors (Pt100 input) connected)		Accuracy	Temperature difference b/w supply and return water	Flow rate measuring accuracy*8			
				± 5 %RD	± 7 %RD	± 1 %FS	± 3 %FS
			ΔT = 5 °C	± 25 %RD	± 27 %RD	± 21 %FS	± 23 %FS
			ΔT = 10 °C	± 15 %RD	± 17 %RD	± 11 %FS	± 13 %FS
			ΔT = 15 °C	± 12 %RD	± 14 %RD	± 8 %FS	± 10 %FS

Notes:
*3 When you test the withstand pressure of the valve sensor, up to 3.4 MPa pressure can be applied to the valve sensor.
*4 Accuracy of the displayed pressure was calibrated with the conditions, temperature of fluid: 7 °C to 65 °C, barometric pressure: 99 kPa. If the actual conditions are out of the estimated ones, the accuracy may degrade.
(This specification is applied for the products manufactured on Dec. 1, 2016 or later (date code: 1648).)
*5 For accurate measuring of flow temperature, thermal insulation is required. Refer to the subsection **Heat insulation** for applying thermal insulation.
*6 Overall accuracy is calculated based on the sensing accuracy of the temperature sensors connected, the conversion accuracy, and the error due to wiring length.
*7 Energy calculation accuracy is calculated from the flow rate measuring accuracy at 1 °C measuring error of the temperature difference.
*8 The flow rate measuring accuracy in the table corresponds to the data shown in the above flow rate measuring accuracy graph.

■ Data in Model FVY513EJ/FVY514EJ

Data type	Description
Flow data	Following items are displayed on Display Panel (Model QY5010S1000): Actual flow rate, supply water temperature, return water temperature, valve inlet pressure, valve outlet pressure, actual flow rate (% in bar graph), actual valve position (% in bar graph)
	Following items are output in analog signal using RS-485/analog output signal converter (Model RYY792C3001): Control setting value, actual valve position, actual flow rate, set flow rate, supply water temperature, return water temperature, valve inlet pressure, valve outlet pressure, instantaneous energy
	Following items are retrieved via RS-485 communication (Modbus protocol): Control setting value, actual valve position, actual flow rate, set flow rate, supply water temperature, return water temperature, valve inlet pressure, valve outlet pressure, instantaneous energy, totalized flow rate, totalized energy, cool/heat status, point status*1
Device data	Following items are retrieved via RS-485 communication (Modbus protocol): Model number, date of manufacture, version of hardware, version of software, serial number, power-ON time, operating time, operating level, number of operations, number of reverse, range, device status*2

IMPORTANT:
Do not use the data measured by this product for charging or dealing purposes.

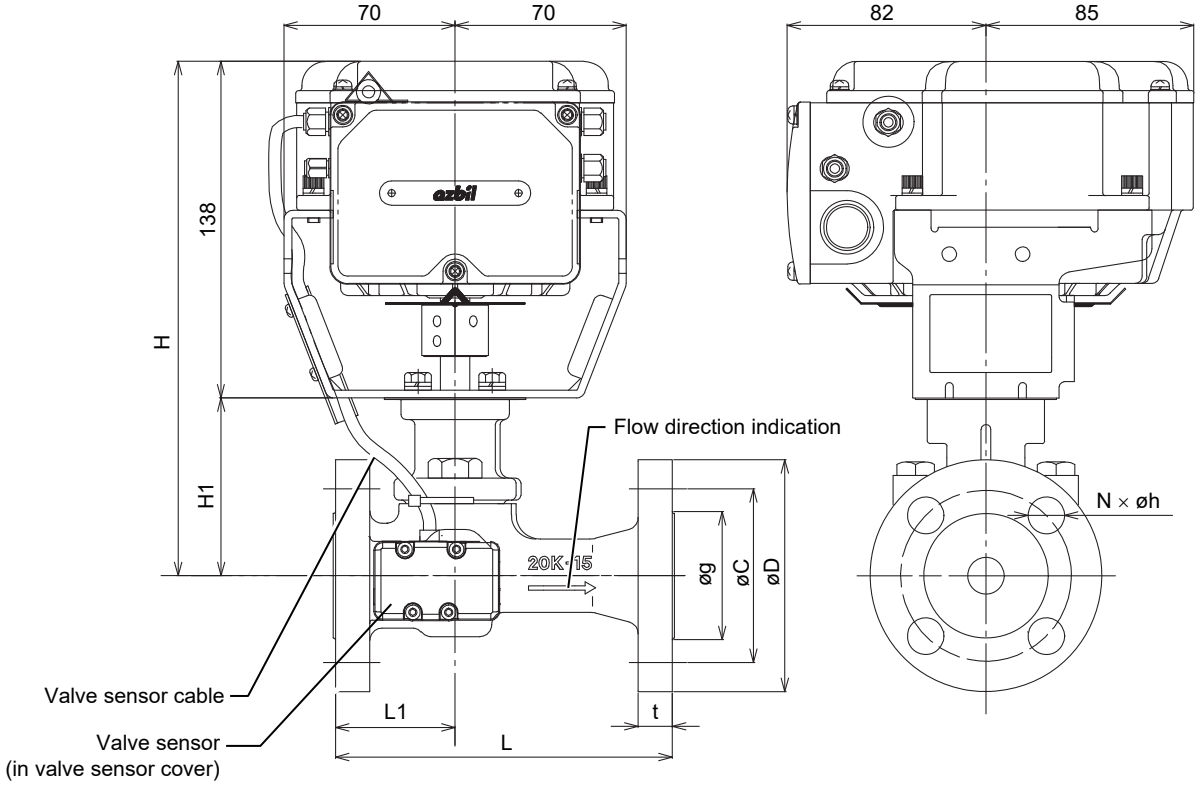
Notes:
*1 Point status indicates an error of analog data. Refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model** for details.
*2 Device status indicates the status of this product. Refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model** for details.

■ Wire Specifications

Item		Specification	Length*1	Connection
Power		JIS CVV, JIS IV 0.75 mm^2, 1.25 mm^2, 2.0 mm^2	—	M3.5 screw connection
Control signal, DI (Cooling/heating switch signal), pulse output		JIS CVV, JIS IV, KPEV®*3, JCS*2 CVV-S 0.75 mm^2, 1.25 mm^2	50 m	M3.5 screw connection
Display Panel		JIS VCTF (0.3 mm^2 × 4-core) ϕ4.5 mm to ϕ6.0 mm	50 m	4-pin connector
Temperature sensor (Pt100 input)	Temperature sensor for pipe surface (Pipe sensor)	3-core cable assembled with the sensor	30 m	6-pin (3-pin × 2) connector
	Insertion-type pipe temperature sensor	JIS VCTF (0.3 mm^2 × 3-core)	30 m	
RS-485 communication		KPEV®-S*3 2P, JCS IPEV-S 2P 0.9 mm^2	500 m*4	6-pin (3-pin × 2) connector

Notes:
*1 Total length of the product - relay terminal block wiring and the relay terminal block - load (device in connection).
*2 JCS: Japanese Electric Wire and Cable Makes' Association
*3 KPEV: Wire standard provided by Furukawa Electric Co., Ltd.
*4 Max. wiring length is 100 m for the product with the RS-485/analog output signal converter (Model RYY792C3001).

■ Dimensions



Model number	Valve size (DN)	H (mm)	H1 (mm)	L (mm)	L1 (mm)	t (mm)	øC (mm)	øD (mm)	øg (mm)	øh (mm)	N	Weight (kg)
FVY51XEJ001X	15	213	75	140	50	14	70	95	51	15	4	5.2
FVY51XEJ002X	25	228	90	165	60	16	90	125	67	19	4	7.4
FVY51XEJ004X	40	241	103	190	82.5	18	105	140	81	19	4	10.5
FVY51XEJ0051	50	245	107	216	115	18	120	155	96	19	8	12
FVY51XEJ0061	65	262	124	241	120.5	20	140	175	116	19	8	17
FVY51XEJ0081	80	263	125	283	123	22	160	200	132	23	8	22

Figure 1. Dimensions (mm)

■ Parts Indication

● Valve details

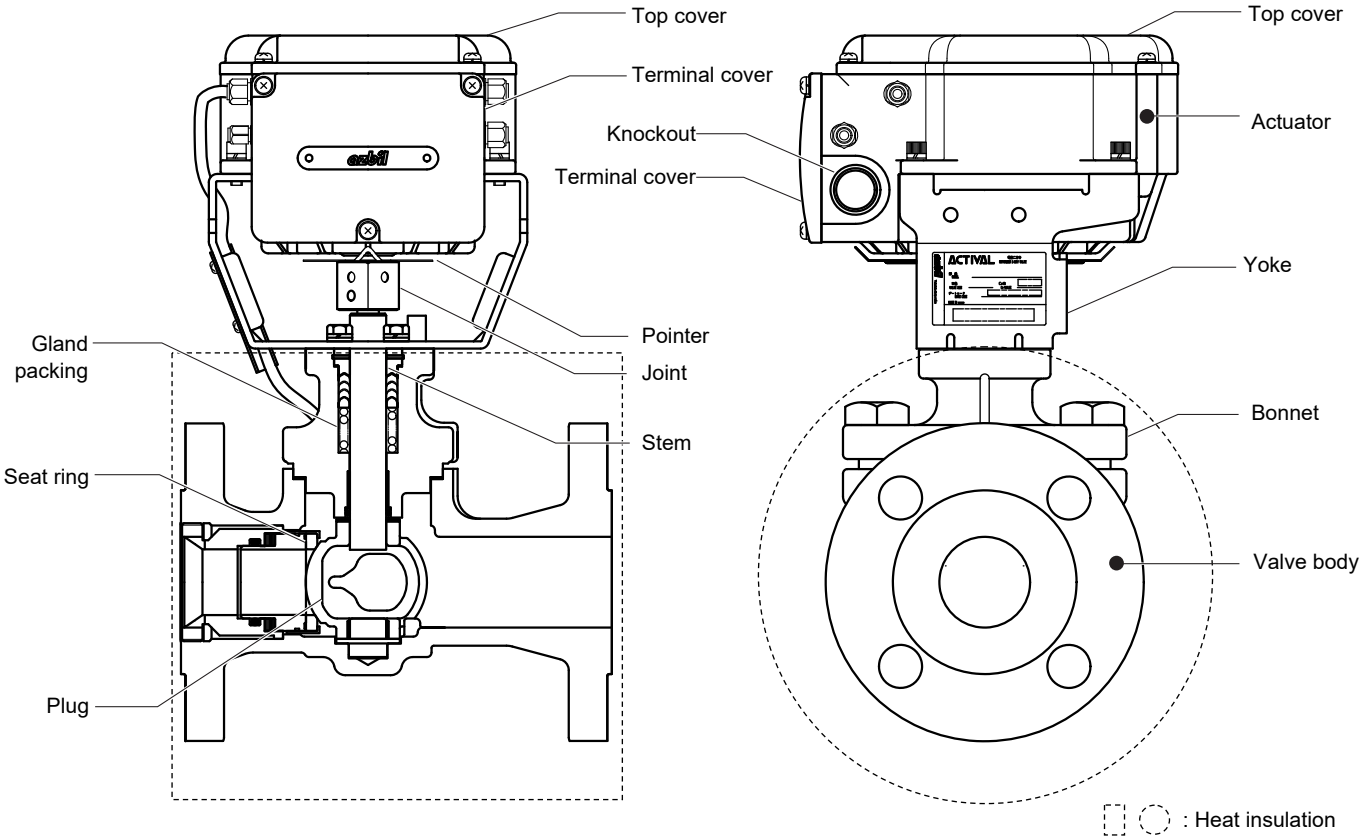


Figure 2. Parts Indication: Valve details

● Actuator details (Connectors, ports, terminals and LED)

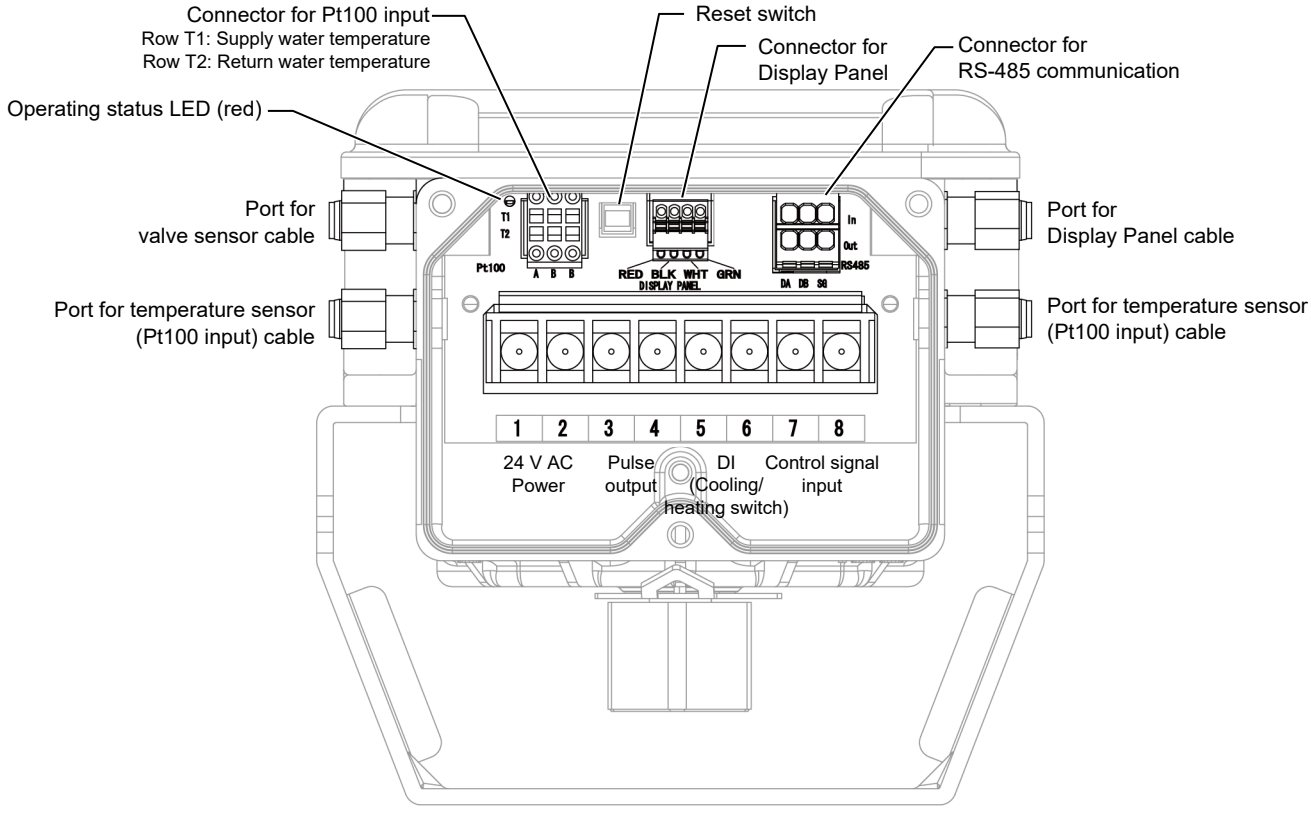


Figure 3. Parts Indication: Actuator details

■ Installation

⚠ WARNING
When handling or transporting any heavy product (more than 18 kg), carefully move the product with a hand truck or the like, or with 2 or more people. Careless lifting or accidental dropping of the product may result in injury or product damage.

⚠ CAUTION
Install and use this product according to the specifications stated in this manual. Failure to do so may cause device failure.
Do not put a load or weight on this product. Doing so may damage the product.
Installation and wiring of the actuator must be performed by personnel qualified to do instrumentation and electrical work. Mistakes in installation or wiring may cause fire or electric shock.

● Notes for installation

Observe the following cautions in order to avoid failure of this product.

- Do not subject this product to shock or impact.
- Do not leave any foreign substances in the pipes of this product.
  Observe the following instructions to remove foreign substances.
  - Provide a strainer on the inflow side of the valve.
    For chilled/hot water: 40 or more meshes
  - If the strainer cannot be installed just before the inlet of each valve, install it on the pipe diverting sections for each piping system.
  - Install the bypass pipes for this product and install the gate valves at the inflow, outflow, and bypass side.
- Do not install this product nearby a steam coil or a hot-water coil.
  High temperature radiation may cause device failure of the actuator.
- Avoid connecting the product to pipes where water hammer may occur or slag, etc. easily collects.

Observe the following cautions in order to measure flow precisely.

- Install straight pipes, minimum length is 2 times of valve diameter (d), on the inflow and outflow sides of the valve.
- If flange gaskets are installed for connecting to the pipes, do not use the rubber gaskets or the gaskets that go inside the pipes.
- Install the product to pipes so that they are electrically connected at the same potential.
  If the valve and the pipe are electrically isolated, noise will be generated, causing incorrect measurement and control of flow.

In addition, observe the following cautions.

- Place a drain pan under the valve.
- Install the product where maintenance or replacement can be done easily.
  Refer to ■ “Maintenance Space.”
- When installing the product in the ceiling, make a trapdoor within 50 cm around the valve.

● **Mounting position**

- Install the valve so that fluid flows in the direction pointed by the arrow on the valve body, and keep the valve orientation as described below.
  Orientation of the actuator cannot be changed.
- The product can be mounted with any position from upright to sideways (max. 90-degree inclination) and flow direction is from bottom to top.
- If the product is installed inclining from the upright position, the valve sensor should be placed upper side.

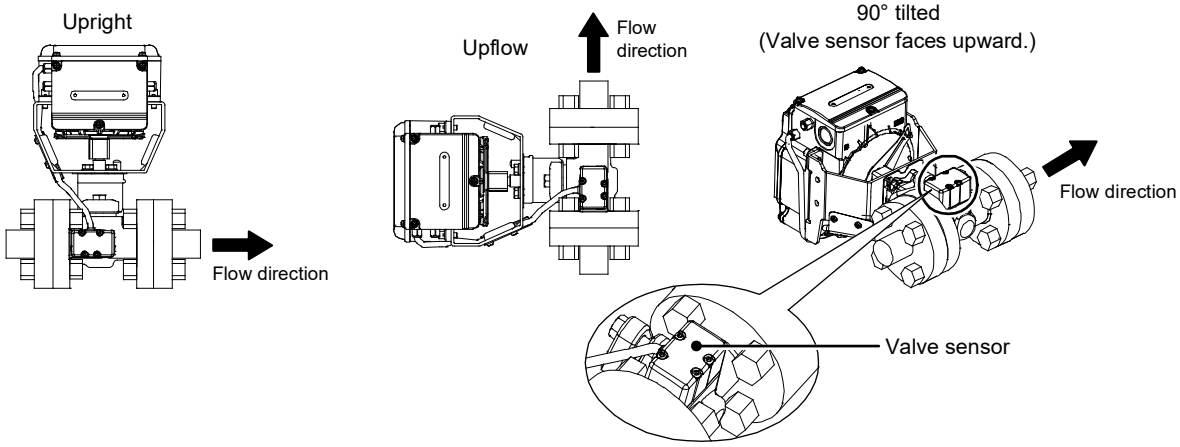


Figure 4. Correct mounting orientations

- If the product is installed outdoors, place it in upright position.

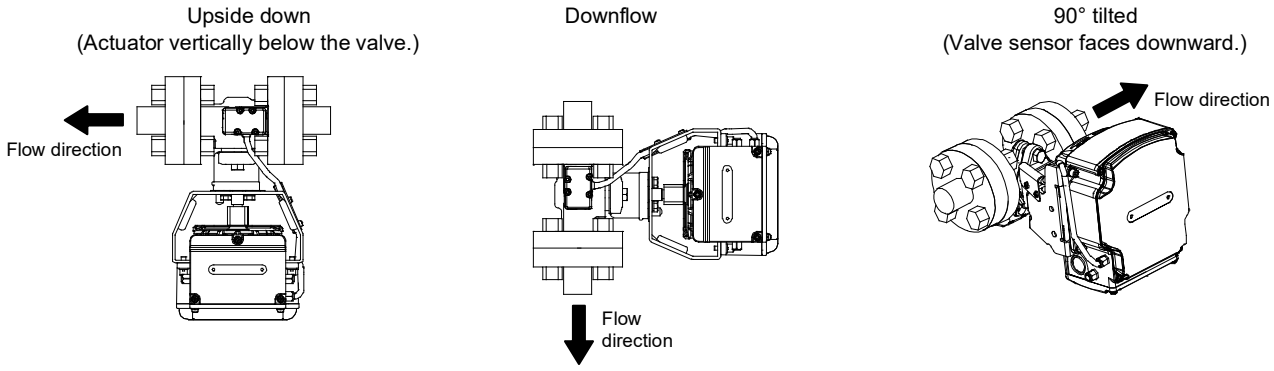


Figure 5. Incorrect mounting orientations

● **Piping**

⚠ WARNING
When handling or transporting any heavy product (more than 18 kg), carefully move the product with a hand truck or the like, or with 2 or more people. Careless lifting or accidental dropping of the product may result in injury or product damage.

⚠ CAUTION
Do not freeze this product. Doing so may damage the valve body and cause leakage.
When piping this product, be sure there is no foreign matter in the pipes. If foreign matter remains in the pipes, the product may break down.
Install and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
When installing this product, hold it in the proper position and securely fasten it to the pipes. Excessive tightening or improper installation position may damage the valve.

IMPORTANT:
Do not apply excessive force on the valve sensor and its cable during piping or applying heat insulation. Doing so may cause device failure.

1) Check the Model number, printed on the label affixed on the yoke, of this product
2) Install the valve so that fluid flows in the direction pointed by the arrow on the valve body.
   Refer to ● "Mounting position."

- Do not apply too much sealing material, such as solidifying liquid and tape, to the pipe connection sections.
- Do not allow chippings, sealing material, etc. to enter the pipes.

  The foreign substances, such as chippings, seal material, may be caught in, resulting damages on the sheet and the valve may not be fully closed.

3) Fully open the valve and flush it out with the maximum flow rate.
   When fluid flows for the first time, it is to clean out the foreign substances and refuse in the pipes.
   The valve is set to fully open when it is shipped from the factory.

⚠ CAUTION	
❗	After installation, make sure no fluid leaks from the valve-pipe connections. Improper piping may cause fluid leakage outside of the valve.
⃠	Do not put a load or weight on this product. Doing so may damage the product.

● Heat insulating

- Apply heat insulation as illustrated by [ ] in Fig. 6.
- If the yoke and/or the actuator are covered with insulation material, the point cannot be checked or may be distorted.
- If the heat insulation is inappropriate, accuracy of flow rate measurement and temperature measurement may degrade.
- When cutting the insulation material that covers the valve, be sure not to damage the valve sensor cable.

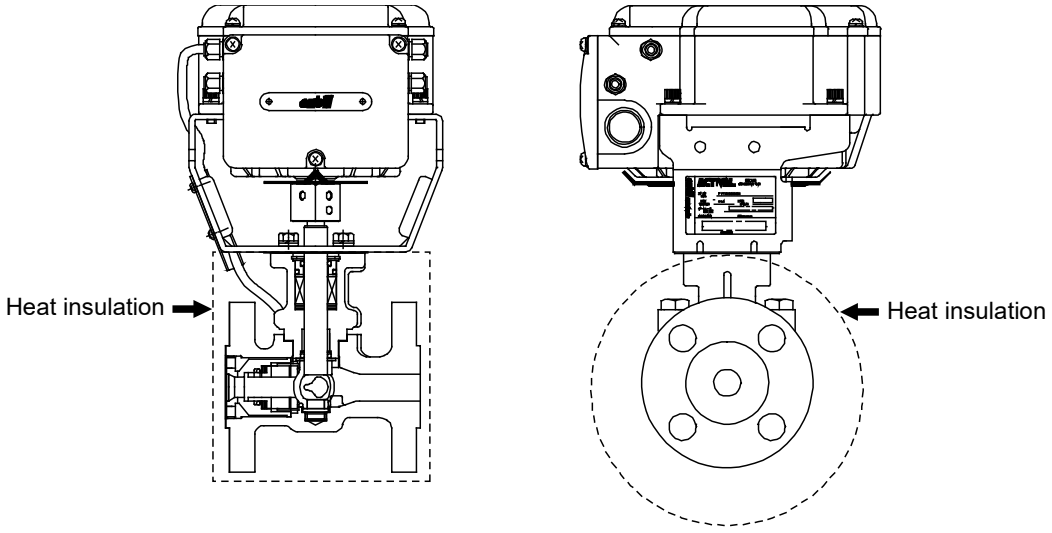


Figure 6. Heat insulating

● Factory preset position

The actuator shaft is positioned at 100 % for shipment.
The shaft is thus completely turned clockwise, and the pointer points at “100.”

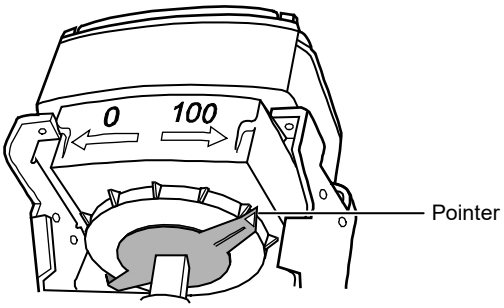


Figure 7. Pointer position for shipment

● Manually opening/closing valve

IMPORTANT:
- Before opening or closing the valve manually, turn off the power.
  If the valve is manually opened or closed while the power 24 V AC active, the actuator may break down.
- Do not manually open or close the valve more than 100 % or less than 0 % scale.

1) Turn off the power.
2) Hold the joint using a wrench, etc., gently turn the wrench to the desired position, open or close.

   Note: If the valve is subject to shock, the actuator may break down.

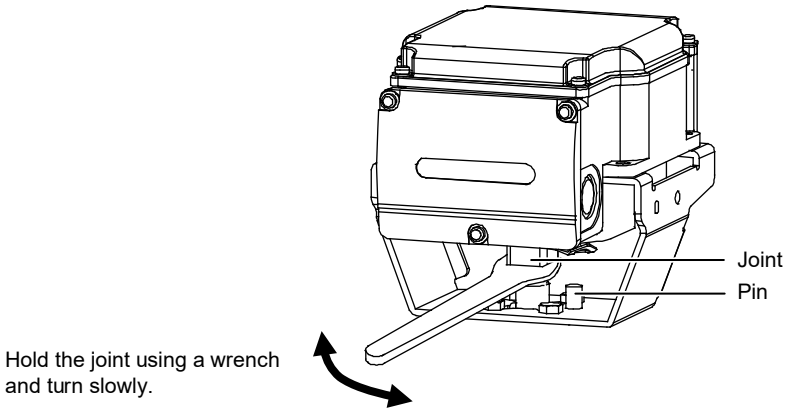


Figure 8. Manually opening/closing valve

■ Wiring

⚠ CAUTION	
❗	Provide a circuit protector (e.g., a fuse or circuit breaker) for the power source. Failure to do so may cause a short circuit leading to fire or device failure.
❗	Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
❗	Installation and wiring of the actuator must be performed by personnel qualified to do instrumentation and electrical work. Mistakes in installation or wiring may cause fire or electric shock.
❗	Before wiring, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
❗	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
❗	For wiring, strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.
❗	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may cause short circuit leading to fire or device failure.
❗	Tighten the terminal screws with the specified torque. Insufficient tightening of the terminal screws may cause fire or overheating.

IMPORTANT:

- The product is designed for 24 V AC power supply voltage.
  Do not apply any other power voltage (e.g., 100 V AC, 200 V AC) to the product.
- Do not leave any refuse including metal chips inside the actuator after cutting a knockout and after connecting the wires.

● Wiring procedure

1) To lead the wires into the terminals, open a knockout for a wiring port. Two knockouts are provided on the bilateral sides of the actuator terminals. Select a knockout according to the conduit mounting direction, and open the hole by lightly knocking the knockout using a screwdriver.

2) Unscrew the 3 setscrews (M4 × 10) of the terminal cover and remove the terminal cover, as shown in Fig. 10.

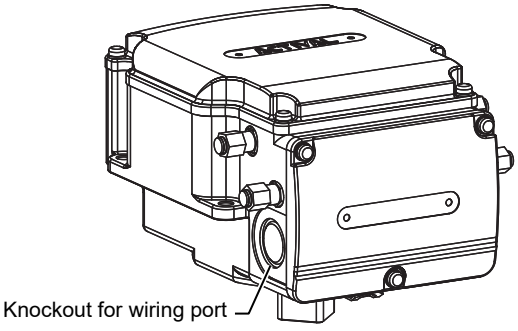


Figure 9. Knockout for wiring port

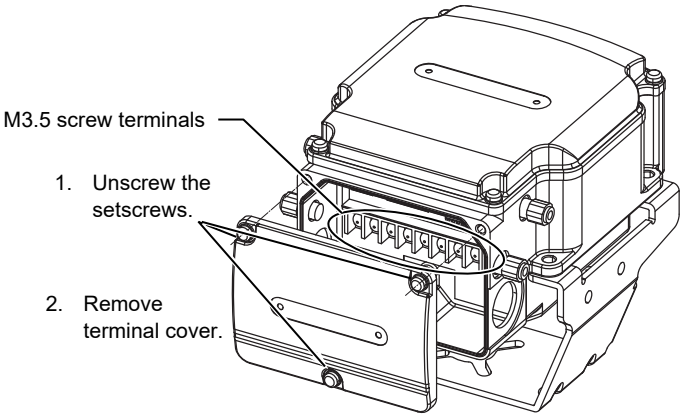
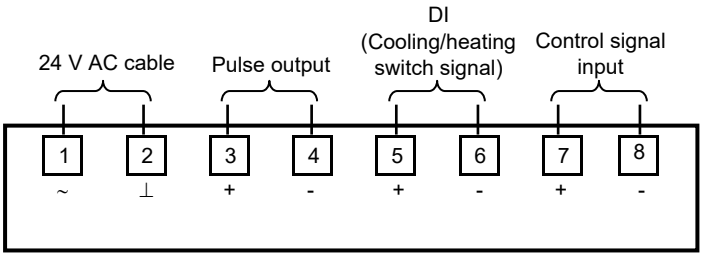


Figure 10. Terminal cover removal

3) Refer to Figs. 3 and 10 and correctly connect the wires to the M3.5 screw terminals. Note that the wires of the temperature sensor, Display Panel, and RS-485 communication lines are connected to the connectors.



Actuator of Model FVY513EJ/FVY514EJ

Figure 11. Terminals arrangement

4) Separate the power supply line from the signal lines. Do not lead the power supply line through the wiring port (knockout) for the signal lines since the power supply line may generate noise causing operation error and failure.

5) Connect the wires of each line. After connecting the wires, lightly pull them from the wiring ports so that minimum wire slack remains inside the actuator. Too long wire slack inside the actuator may block the terminal cover to close or may hold down the reset switch and interrupt the operation. See Fig. 3 for the location of the reset switch.

6) Tighten the seal connectors of the wiring ports. On the wiring ports for Display Panel cable and temperature sensor (Pt100 input) cable, tighten the seal connectors until the clearance between the wiring port and the seal connector becomes narrower than 1 mm.
Cable may get twisted as you tighten the seal connector. In such a case, loosen and remove the seal connector and untwist the cable, then re-tighten the seal connector.

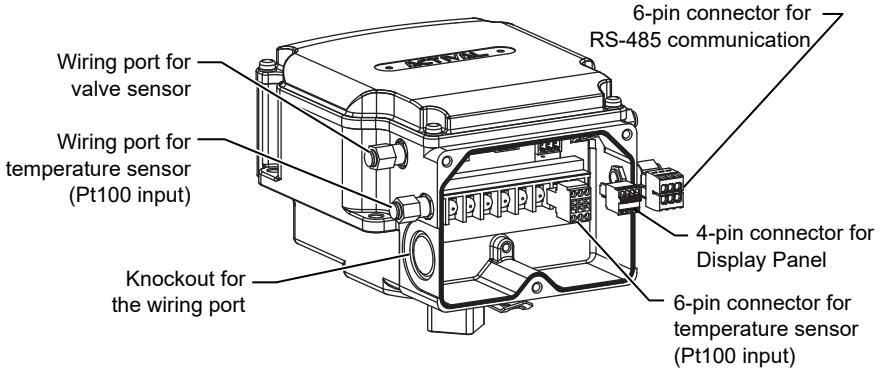


Figure 12. Connectors for the temperature sensor, Display Panel, and RS-485 communication

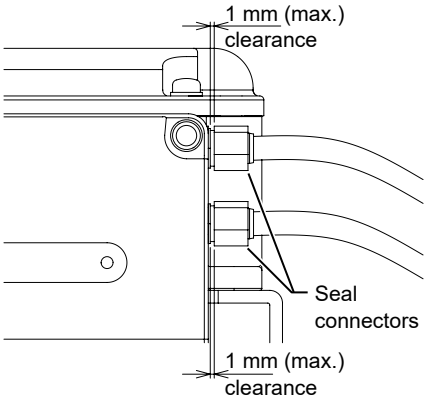


Figure 13. Clearance for seal connector connection

● **Wires connection of the temperature sensor (Pt100 input)**

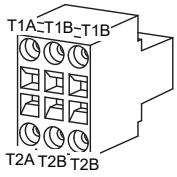


Figure 14. 6-pin connector for temperature sensor (Pt100 input)

Terminal	Wire color*		Description
	Temperature sensor for pipe surface	Insertion-type pipe temperature sensor	
T1A	Red	Red	Pt100 A (supply water temperature)
T1B	White	Black	Pt100 B (supply water temperature)
T1B	White	White	Pt100 B (supply water temperature)
T2A	Red	Red	Pt100 A (return water temperature)
T2B	White	Black	Pt100 B (return water temperature)
T2B	White	White	Pt100 B (return water temperature)

Note: * Wire color of the insertion-type pipe temperature sensor shown in the above table is the wire colors of the recommended cable.

1) Pass the 3-core cable of the temperature sensor (Temperature sensor for pipe surface/Insertion-type pipe temperature sensor) through the actuator port for the temperature sensor (Pt100 input). (See Fig. 3 for the location of the port.) Use JIS VTCF 0.3 mm^2 × 3 cores cable or equivalent for the insertion-type pipe temperature sensor.

2) Strip the wire sheath. Strip length is 7 mm. (See Fig. 15.)

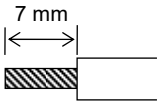


Figure 15. Wire sheath strip length

3) Unplug the 6-pin connector for temperature sensor (Pt100 input) from the actuator socket, and connect the sheath stripped wires (3-core cable of the temperature sensor (Pt100 input)) to the connector.
Insert a slotted screwdriver (with 2.5 × 0.4 mm blade tip) into a square hole of the connector for clamp release. The screwdriver successfully releasing the clamp remains the inserted position. Insert the stripped wire into a circular hole (terminal), and then pull out the screwdriver. Make sure that all the wires are completely connected by lightly pulling the wires.

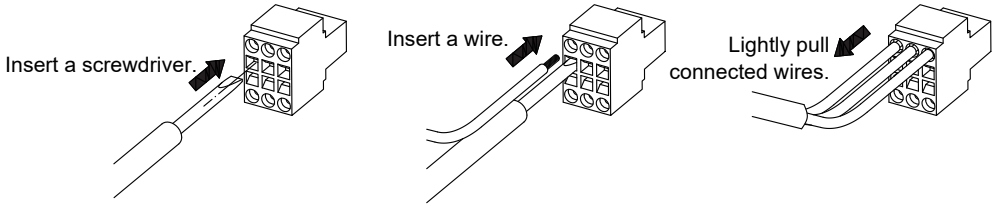
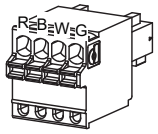


Figure 16. Wires connection to the 6-pin connector for the temperature sensor

4) Plug the connector into the actuator socket.

Note:
Completely plug the connector into the actuator socket. Incompletely plugged connector might become unplugged due to vibration.

● **Wires connection of Display Panel**



R: RED
B: BLK
W: WHT
G: GRN

Figure 17. 4-pin connector for Display Panel

Terminal	Wire color*	Description
RED	Red	12 V DC
BLK	Black	0 V
WHT	White	AP-bus (+)
GRN	Green	AP-bus (-)

Note: * Wire color of the Display Panel shown in the above table is the wire colors of the recommended cable.

1) Pass the 4-core cable of Display Panel through the actuator port for Display Panel. (See Fig. 3 for the location of the port.)

2) Strip the wire sheath. Strip length is 8 mm. (See Fig. 15.)

3) Unplug the 4-pin connector for Display Panel from the actuator socket, and connect the sheath stripped wires to the connector. Hold down a clamp release button using a slotted screwdriver, insert the stripped wire into a terminal, and then release the button. Make sure that all the wires are completely connected by lightly pulling out the wires.

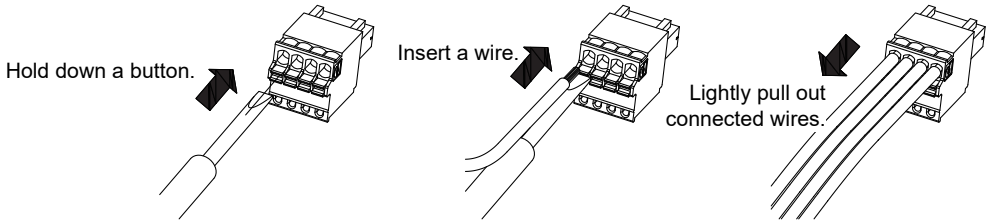


Figure 18. Wires connection to the 4-pin connector for Display Panel

4) Plug the connector into the actuator socket.

Note:
Completely plug the connector into the actuator socket. Incompletely plugged connector might become unplugged due to vibration.

● **Wires connection of RS-485 communication**

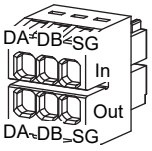


Figure 19. 6-pin connector for RS-485 communication

Terminal	Description
In DA	DA
In DB	DB
In SG	SG
Out DA	DA
Out DB	DB
Out SG	SG

1) Pass the cable of RS-485 communication through the actuator wiring port (knockout).

2) Strip the wire sheath. Strip length is 7 mm.

3) Unplug the 6-pin connector for RS-485 communication from the actuator socket, and connect the sheath stripped wires to the connector. Insert a slotted screwdriver (with 2.5 × 0.4 mm blade tip) into a pocket on the top/bottom of the connector for clamp release. The screwdriver successfully releasing the clamp remains the inserted position. Insert the stripped wire into a terminal, and then pull out the screwdriver. Make sure that all the wires are completely connected by lightly pulling out the wires.

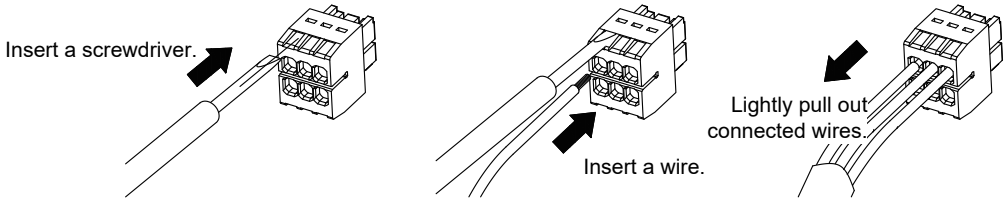


Figure 20. Wires connection to the 6-pin connector for RS-485 communication

4) Plug the connector into the actuator socket.

Note:
Completely plug the connector into the actuator socket. Incompletely plugged connector might become unplugged due to vibration.

● **Wires connection of control signal, DI (Cooling/heating switch signal), pulse output**

1) Pass the cable of control signal/DI/pulse output through a wiring port on the other side of the port for power supply cable.
2) Use 4- or 6-core cable for connecting the multiple signal lines.

⚠ CAUTION
After wiring, be sure to reattach the cover. Failure to do so may result in electric shock.

● **Precautions for connection**

1. RS-485 communication (See Figs. 26 and 27.):
   - Pass the cable of RS-485 communication through a wiring port (knockout) on the other side of the wiring port for power supply cable. Attach the optional cable gland with three ports (Model DY7000A1000) to the wiring port to share the wiring port with signal lines.
   - Connect the wires of RS-485 communication cable to the connector unplugged from the actuator socket. After connecting the wires to the connector, plug the connector into the socket.
   - Do not use terminators.
   - Do not connect between the terminals DA and DB.
   - Single-point ground is required for one side of the shielded cable.
   - Connect SG wire for stable communication link.
   - To daisy-chain the communication line, connect the wires of the receiving line to the terminals In DA, In DB, and In SG. Connect the wires of the sending line to the terminals Out DA, Out DB, and Out SG.
2. Pulse output (See Figs. 28 and 29.):
   - Apply 30 V DC or lower voltage (on '**+V**' shown in Fig. 28).
   - Do not directly connect the DC power to the pulse output terminal.
   - To use a magnetic counter with a relay coil, refer to Fig. 30 and connect a protection diode to the input of the magnetic counter.
3. Temperature sensor for pipe surface:
   Since the 3-core cable of the temperature sensor for pipe surface has small diameter, the seal connector pre-assembled with the product is not enough to ensure the IEC IP54 protection. Caulk the seal connector or apply the tape to seal the connector.
4. Insertion-type pipe temperature sensor:
   Use the seal connector Part No. 83104098-001 for the cable of the insertion-type pipe temperature sensor (JIS VTCF 0.3 mm^2 × 3 cores or equivalent.)

5. Internal isolation:
   Only the pulse output and the RS-485 communication are internally isolated. Isolator therefore is required to connect a non-isolated device to the control signal input and DI (Cooling/heating switch signal) of the product.

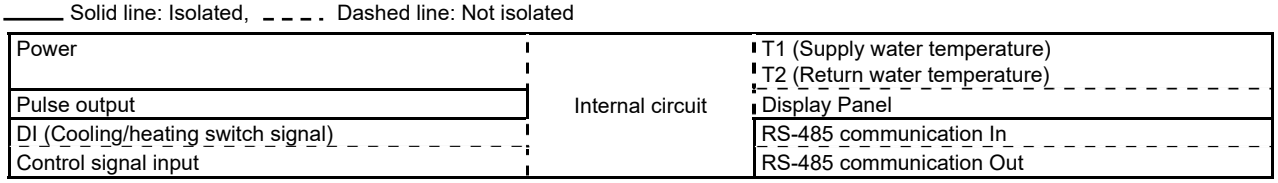


Figure 21. Internal isolation

6. Single transformer with two products (See Fig. 22.):
   Connect the lines from the terminal 1 of each product to the transformer with the same polarity. Connect the lines from the terminal 2 of each product the same way. If the terminals (of the product and the transformer) with different polarities are connected, the products may get damaged.

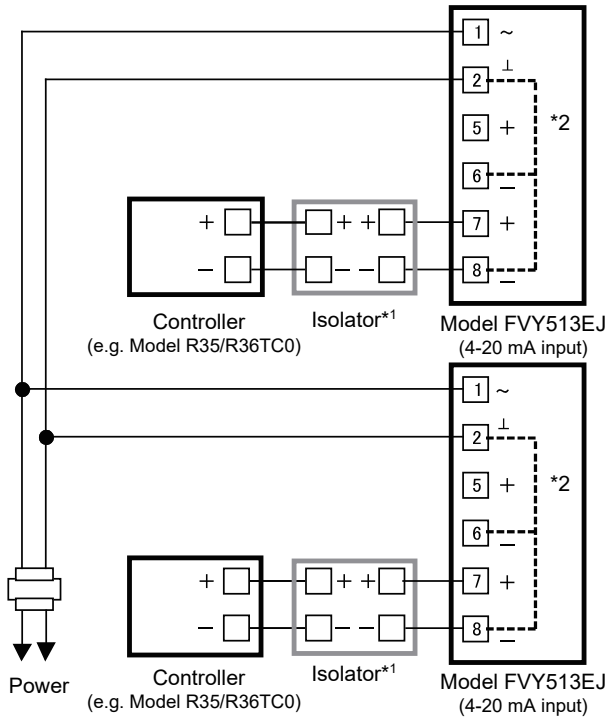
7. Single controller with multiple 4-20 mA input type products (See Figs. 23 and 24.):
   4-20 mA control signal input is not isolated from the power, and the 4-20 mA input impedance is 282 Ω. For connecting a controller, the relations among the input impedance of this product, the output load resistance of the controller, and the output load resistance and input impedance of an isolator (if necessary) must meet the following formula.
   Applicable load resistance > Total input impedance

   To operate the two products with a single controller for example, refer to Fig. 23 for the two products powered by a single transformer, and refer to Fig. 24 for the two products separately powered by the two transformers. To connect a single transformer, be sure to connect an isolator to the 4-20 mA input terminal of the second product. The products will malfunction without the isolator.

8. Single controller with multiple 2-10 V input type products (See Fig. 25.):
   2-10 V control signal input is not isolated from the power.

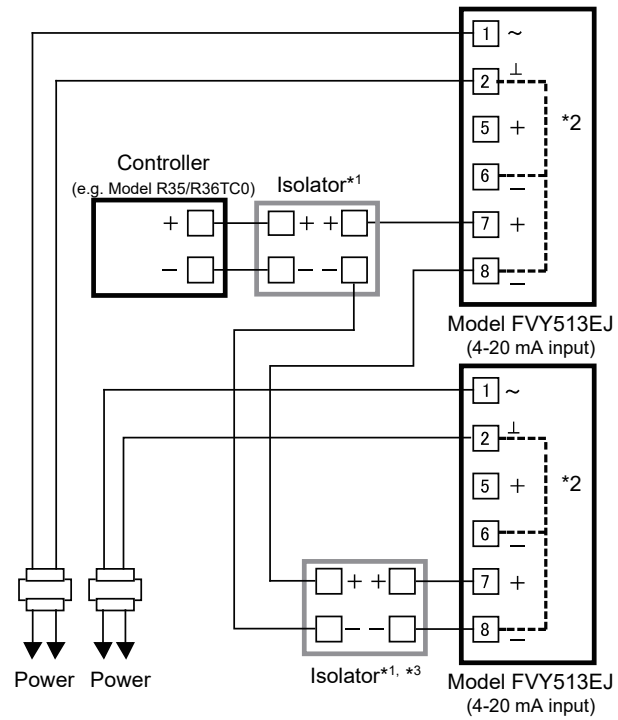
   To operate the two products with a single controller for example, the two products must be powered by a single transformer.

● Connection examples



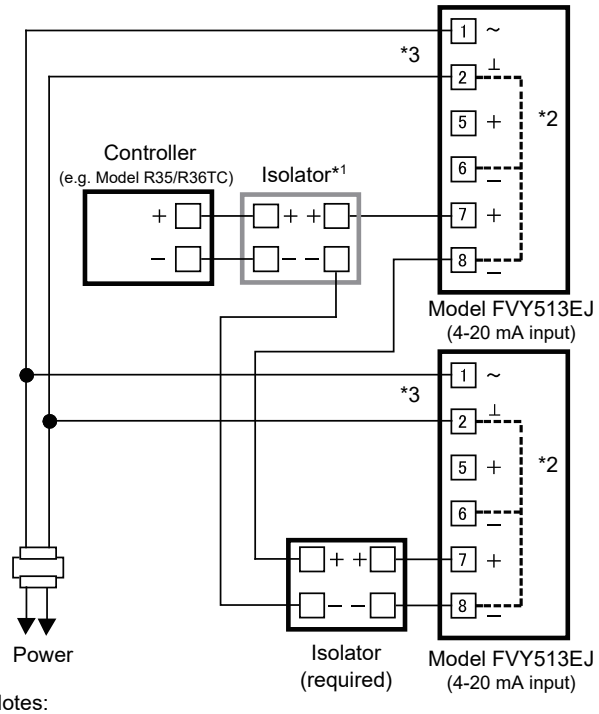
Notes:
*1 Provide an isolator for the controller not internally isolated.
*2 Terminals 2, 6, and 8 of the product are internally connected.

Figure 22. Connection example: Two Model FVY513EJ with a single transformer



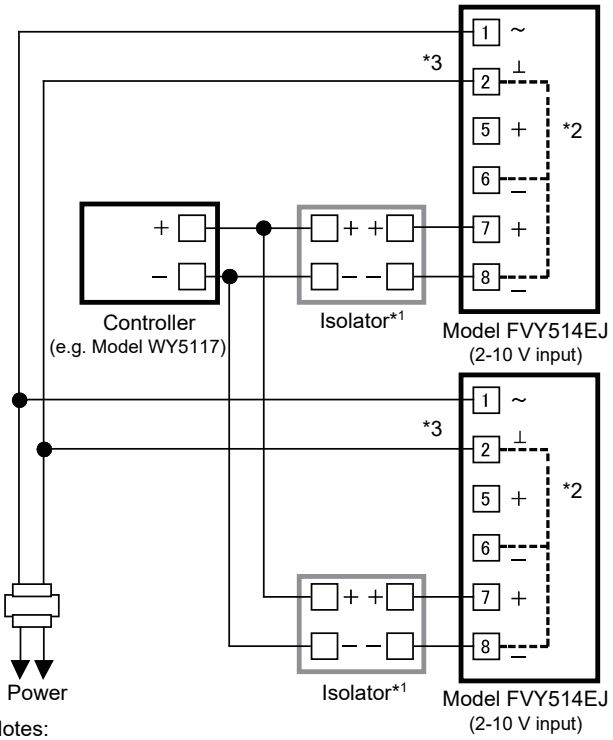
Notes:
*1 Provide an isolator for the controller not internally isolated.
*2 Terminals 2, 6, and 8 of the product are internally connected.
*3 - No isolator provided for the 4-20 mA input of the first product
- Less than 600 Ω applicable load resistance of the controller
Provide an isolator for the second product if both of the above conditions fit your connection.

Figure 23. Connection example: Two Model FVY513EJ with a single controller and two transformers for each Model FVY513EJ



Notes:
*1 Provide an isolator for the controller not internally isolated.
*2 Terminals 2, 6, and 8 of the product are internally connected.
*3 Refer to **6. Single transformer with two products** in the **Precautions for connection** section.

Figure 24. Connection example: Two Model FVY513EJ with a single controller and a single transformer



Notes:
*1 Provide an isolator for the controller not internally isolated.
*2 Terminals 2, 6, and 8 of the product are internally connected.
*3 Refer to **6. Single transformer with two products** in the **Precautions for connection** section.

Figure 25. Connection example: Two Model FVY514EJ with a single controller

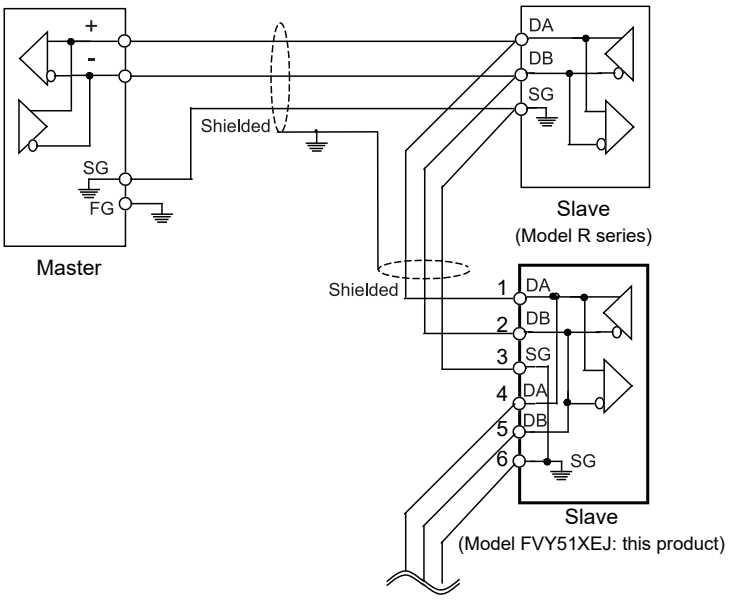
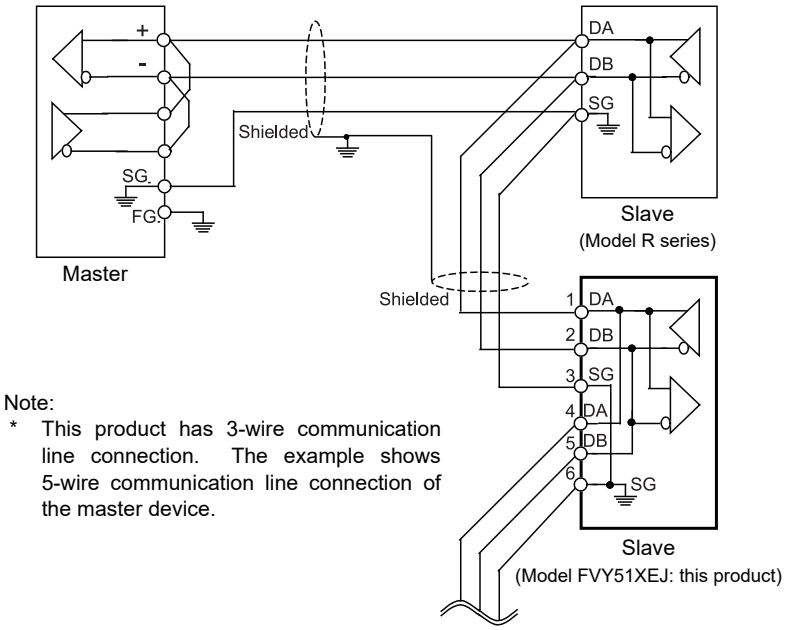


Figure 26. Connection example: 3-wire RS-485 communication



Note:
* This product has 3-wire communication line connection. The example shows 5-wire communication line connection of the master device.

Figure 27. Connection example: 5-wire RS-485 communication

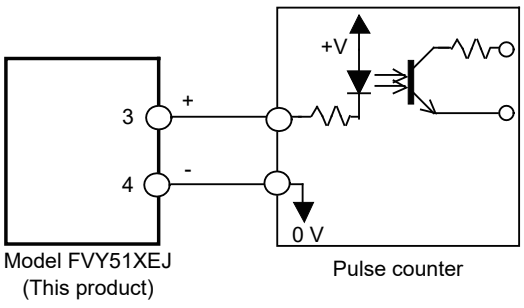


Figure 28. Connection example: Totalizing pulse output (open collector output)

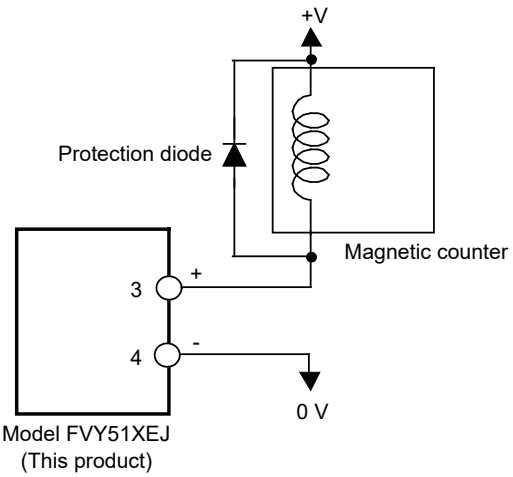


Figure 29. Connection example: Magnetic counter with relay coil

■ Cable Gland with Three Ports

Cable gland with three ports (Model DY7000A1000) is recommended to attach to a wiring port (knockout) of this product when RS-485 communication line and signal line are passed through the same wiring port. The cable gland with three ports is applicable to cables for small power. (Small power: 60 V or lower input voltage)

⚠ CAUTION

Tighten the terminal screws with the specified torque. Insufficient tightening of the terminal screws may cause fire or overheating.

IMPORTANT:

Carefully attach the cable gland with three ports so that O-rings do not fall from the cable gland. Without O-rings, water-proof protection is not assured.

● Removing the cover from the base

Remove the cover from the base by releasing the 3 latches. Follow the below procedure to release the latches.

IMPORTANT:

When you remove the cover from the base, it is fairly difficult to release the last latch. To easily release all the latches, start with the one which cannot be visibly checked.

1) Press the upper part of one of the male latches ('1' in the figure below.)

2) Press up the lower part of the one of the male latches ('2' in the figure below) toward the direction '3' while pressing '1' to release the latch.

Note:
* Do not use a tool such as a screwdriver since a tool may damage a latch.

3) Perform 1) and 2) to release the other 2 latches.

4) Lift and remove the cover from the base.

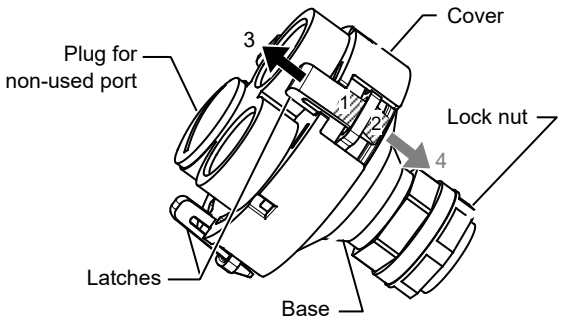


Figure 30. Cover removal from the base

● Attaching the cover to the base

Attach the cover to the base and fix them by locking the 3 latches.

1) Attach the cover to the base by simultaneously inserting the 3 male latches of the cover to the 3 female latches of the base. Equally press the force on each latch to the direction '4' in Fig. 30.

2) Keep pressing the force on each latch until they click.

3) Check that all of the latches are completely locked. If the latches are not completely locked yet, press the force on the latches to the direction '4' in Fig. 30 so that the latches are completely locked.

● **Connecting the cable gland with three ports**

Refer to the below table and tighten each part of the cable gland to connect it onto a wiring port (knockout) of this product.

Part of cable gland with three ports	Fastening torque
Lock nut of the base	1.8 N·m ± 10 %
Seal connector for wiring port of the cover	1.8 N·m ± 10 %
Plug for non-used port	1.7 N·m ± 10 %
Cap of the seal connector	1.0 N·m ± 20 %

1) Remove the terminal cover of the product.

2) Open a knockout for wiring port of the product. Remove the lock nut screwed on the base of the cable gland, and connect the base onto the wiring port with the lock nut.

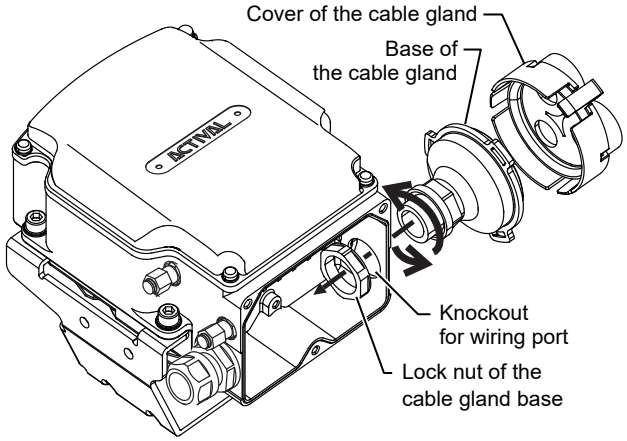


Figure 31. Connecting the base of the cable gland onto the wiring port

3) Connect the seal connectors (optional) to the cover of the cable gland.

IMPORTANT:
When tightening a seal connector to the cover, be sure not to press excessive force on the latches.

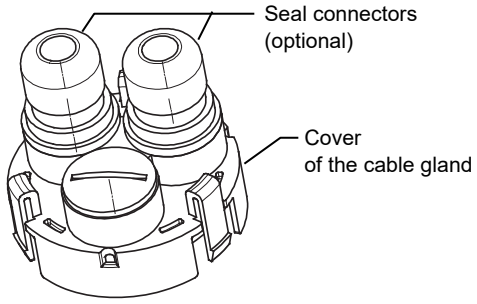


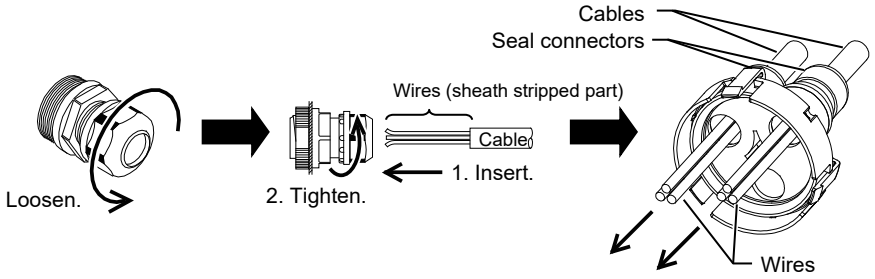
Figure 32. Connecting the seal connectors onto the cover of the cable gland

4) Strip the cable sheath long enough for connecting to the terminals of the product.

IMPORTANT:
Be sure not to scratch the insulated wires.

- Adjust (cut) the wires (sheath stripped part of cables) in accordance with distance from the cable gland and each terminal/connector.
- Sheath strip length is 170 mm or longer. Change the strip length of the cables in accordance with distance from the cable gland to each terminal/connector to facilitate connecting wires.

5) Loosen the cap of a seal connector. Let the wires through the seal connector so that the end of the sheath comes to inner side of the cover. Then, tighten the cap of the seal connector to fix the cable.



Pass through the wires until the end of e sheath comes to inner side of the cover.

Figure 33. Wires through the seal connector

6) Lead the wires (sheath stripped part of cables) through the wiring port (where the base of the cable gland is attached) of the product. Then, attach the cover of the cable gland to the base.

IMPORTANT:

Carefully attach the cable gland so that O-rings do not fall from the cable gland. Without the O-rings, water-proof protection is not assured.

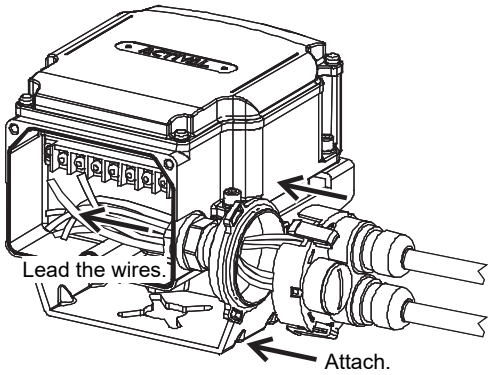


Figure 34. Attaching the cover to the base

7) Process the wire ends and connect them to the terminals/connectors.

IMPORTANT:

- If a terminal lug without insulation sleeve is crimped on a wire end, use a tube marker for safety.
- During wire termination, do not allow any foreign objects including chips and stripped insulation to get inside the product.

Before stripping wire insulation of the wire ends, cut too long wires to adjust the length of the wires inside the actuator. Too long wires left inside the actuator may press the board.

8) Attach the terminal cover of the actuator.

9) Arrange the cables connected from the product by fixing them to the cable duct.
When replacing the product, terminal lugs crimped on the wire ends may be cut off, and new terminal lugs will be re-crimped on the wire ends. Keep the margins therefore to arrange the cables.

IMPORTANT:

Do not put heavy load on the joint of the cable gland with the product.

⚠ CAUTION

After wiring, be sure to reattach the cover. Failure to do so may result in electric shock.

● **Detaching the cable gland with three ports**

1) Disconnect the cables (wires) connected to the terminals/connectors of the product.

2) Release the 3 latches that assemble the cover and base of the cable gland.
   - If the cable fixing position near the product disturbs removal of the cover from the base, unfix the cable position (untie the cable tie).
   - Thick cables and multiple cables may not be pulled out of the product wiring port. In such a case, cut out the terminal lugs crimped on the wires (cables) and pull them out.

3) Detach the base of the cable gland from the wiring port of the product.

IMPORTANT:
Carefully handle the O-rings attached to the cable gland. Check that the cable gland has 3 O-rings and be sure to keep these since these are required to re-attach the cable gland.

● **To keep IP54 protection (dust-proof and splash-proof),**

Use a water-proof connector for the product in a high-humidity environment or outdoor location.

- Be sure to completely close the terminal cover and the top cover.
- Waterproof the knockout hole.
  - For cable connection, use a water-proof connector.
    In accordance with the diameter of the cable used, select a suitable waterproof connector from ■ “Model Numbers,” ● “Options.”
  - For conduit connection, use a water-proof plica tube or the like.

■ Maintenance

⚠ CAUTION	
	Do not put a load or weight on this product. Doing so may damage the product.
	Before doing maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
	After maintenance, be sure to reattach the cover. Failure to do so may result in electric shock.
	Do not carelessly touch this product when it is used to control hot water. Doing so may result in burns, because the product reaches a high temperature.

- Inspect the product according to Table 1.
- Be sure to check the flow measuring accuracy according to **Flow rate measuring accuracy** in Table 1. Flow rate measuring accuracy is very essential for this product used for energy management, energy-saving application, etc. (To inspect flow rate measuring accuracy, optional Display Panel is required.)
- Manually open/close the product at least once a month if it is left in inactive state for a long period.
- Visually inspect the fluid leakage of the valve and the actuator operations every six months. If any of the problems described in **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model (Chapter 4. Troubleshooting)** are found, take corresponding actions shown in that manual.
  If your problem is not solved by the corresponding action, please contact our salesperson/serviceperson.

IMPORTANT:
Do not wipe the cover by various chemicals and organic solvents.
Do not disassemble the product. Doing so may cause device failure.

Table 1. Inspection items and details

Inspection item	Inspection interval	Inspection detail
Visual inspection	Semiannual	• Fluid leakage from the gland and the flange face • Loosened bolts • Valve and actuator damages
Operating status	Semiannual	• Unstable open/close operation • Abnormal noise and vibration • Abnormal differential pressure across valve (Pvin-Pvout) in fully closed/open position.
Routine inspection	Any time	• Fluid leakage to the outside • Abnormal noise and vibration • Unstable open/close operation • Valve hunting
Flow rate measuring accuracy*1	Any time (annual)	• Measuring accuracy of differential pressure across valve: Measure the valve inlet pressure and outlet pressure when they are equal and check the values measured by the valve sensor. If difference of the values is ± 3 kPa, flow rate measuring accuracy satisfies the factory preset accuracy. Situation of inlet pressure equal to outlet pressure → No flow across the valve in open position e.g, when supply pump is OFF, or when hand valves on the inflow and/or outflow sides of the valve are/is fully closed. • Valve position detecting accuracy: Select the position control*2, and check the position of the actuator pointer when 50 % position signal is input. If the pointer points out of 1 cm range from the 50 % scale (the center of the lower setscrew of the terminal cover), product replacement is required. See Fig. 35.

Notes:
∗1 Simplified inspection of flow rate measuring accuracy is illustrated above. For accurate inspection, a reference flow meter is required. Note that you cannot field-calibrate or field-adjust flow rate measuring accuracy.
∗2 To select the position control, refer to **AB-7044 Instruction Manual of ACTIVAL +™ Standalone Model**.

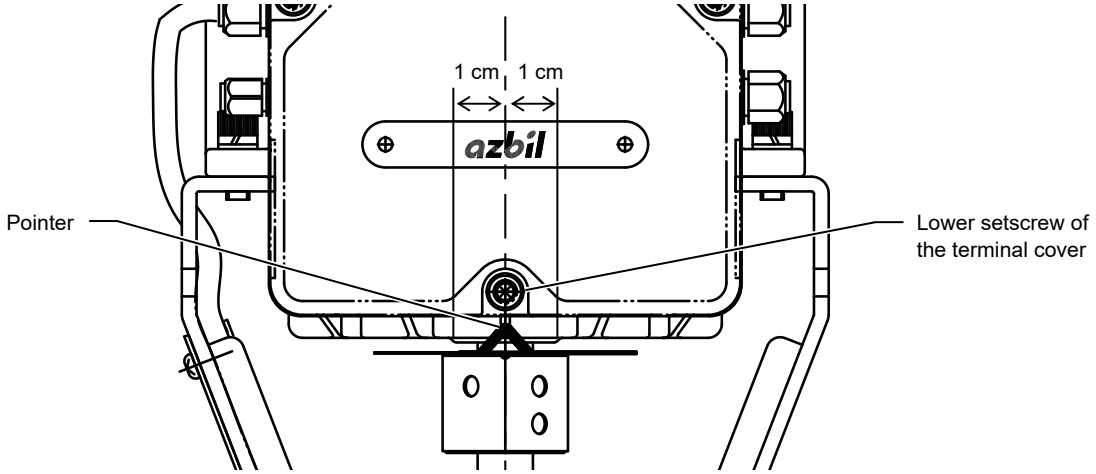


Figure 35. Check of the valve position detecting accuracy

■ Disposal

⚠ WARNING
When handling or transporting any heavy product (more than 18 kg), carefully move the product with a hand truck or the like, or with 2 or more people. Careless lifting or accidental dropping of the product may result in injury or product damage.

Dispose of this product as industrial waste in accordance with your local regulations.
Do not reuse all or any part of the product.

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This product complies with the following harmonised standards of the Electromagnetic Compatibility Directive (EMCD).
EMCD: EN 61000-6-2
EN 61000-6-4

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Specifications are subject to change without notice.