Infilex™ VC
Variable Air Volume Controller with Actuator for BACnet MS/TP Communication

General

Infilex VC Model WY5706C is a VAV controller with an actuator that communicates via BACnet MS/TP. Infilex VC provides high-performance DDC of VAV unit in a building air-conditioning system. Thus, Infilex VC, networked even within a complicated HVAC system, controls VAV unit.
Besides, Infilex VC offers building owners and operators the flexible and enhanced controls of temperature and VAV for various VAV units.
Infilex VC sends unique energy-saving information to its networked BACnet zone controller, enhancing overall controllability of a building management system.

DDC: Direct digital control
HVAC: Heating, ventilation, and air conditioning
VAV: Variable air volume
MS/TP: Master-Slave/Token-Passing

Features

- BACnet® VAV controller:
  Infilex VC Model WY5706C is integrated in the BACnet MS/TP network.
- Economical efficiency:
  - Temperature and air-volume are controlled by a single controller.
  - VAV controller that resides on an actuator offers great value.
- Wide range of application:
  Most of the major VAV types for industry are preconfigured in the controller.
- Unique energy conservation control:
  - VAV damper opens wide to minimize the fan power consumed by static pressure.
  - Network with a zone controller allows supply air temperature to be modified at an optimum level.
- Advanced building management integrated into BMS:
  Our digital user terminal Neopanel enables users and operators to modify the preset setting of temperature and operating schedule (to extend) and offers flexibility of temperature control and schedule control.
- BTL certified product:
  Infilex VC Model WY5706C is a BACnet® Application Specific Controller (B-ASC).
- CE Marking certified product:
  Infilex VC Model WY5706C conforms to all the applicable standards of CE Marking.

BTL: BACnet Testing Laboratory

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

As an electromagnetic wave equipment for office use (Class A), this equipment is intended to use in other than home area. Sellers or users need to take note of this.
This product is targeted for general air conditioning. Do not use this product in a situation where human life may be affected. If this product is used in a clean room or a place where reliability or control accuracy is particularly required, please contact our sales representative. Azbil Corporation will not bear any responsibility for the results produced by the operators.

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.

Signs

	Alerts users possible hazardous conditions caused by erroneous operation or erroneous use. The symbol inside △ indicates the specific type of danger. (For example, the sign on the left warns of the risk of electric shock.)
	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	
	Before wiring and maintenance, be sure to turn off the power to the product. Failure to do so might cause electric shock.
	To control a VAV unit with electric heater, be sure to provide a circuit to prevent temperature rise. Failure to do so might cause fire or overheating.
	To control a VAV unit with electric heater, configure the system so that air conditioning unit will not stop when the VAV unit is turned off. This allows the electric heater to cool down after it is turned off. Failure to do so might cause fire or device damage.

⚠ CAUTION	(1/2)
	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
	Install and use the product in a location that meets the operating conditions (temperature, humidity, power, vibration, shock, mounting direction, atmospheric condition, etc.) as listed in the specifications. Failure to do so might cause fire or device failure.
	All wiring must comply with applicable codes and ordinances.
	Make sure all the wires are tightly connected to the corresponding terminals. Failure to do so might cause device failure or overheating.
	For wiring, strip each wire insulation as specified in this manual. If the strip length is longer than the specified, the stripped part of the wires will be exposed, causing electric shock or short circuit between adjacent terminals. If it is shorter, the stripped part will not contact the connector.
	If more than the rated power voltage is applied to the product, replace the product with new one for your safety. Failure to do so might cause device failure or overheating.
	Be sure to provide a circuit breaker for the power to the product as the product does not have a power switch.
	Do not test the withstand voltage of the product. Doing so might cause accident or device failure.

⚠ CAUTION (2/2)	
	Do not disassemble the product. Doing so might cause electric shock or device failure.
	Do not touch the moving parts of the product. Doing so might cause injury.
	Do not incinerate the product for waste disposal. The cover will generate toxic gas when being incinerated. Do not reuse all or part of this product after disposal of the product.
	Dispose of the product as industrial waste in accordance with your local regulations. Do not reuse all or part of this product.

System Configuration

Infilex VC integrated into our building management system (BMS): savic-net™ G5

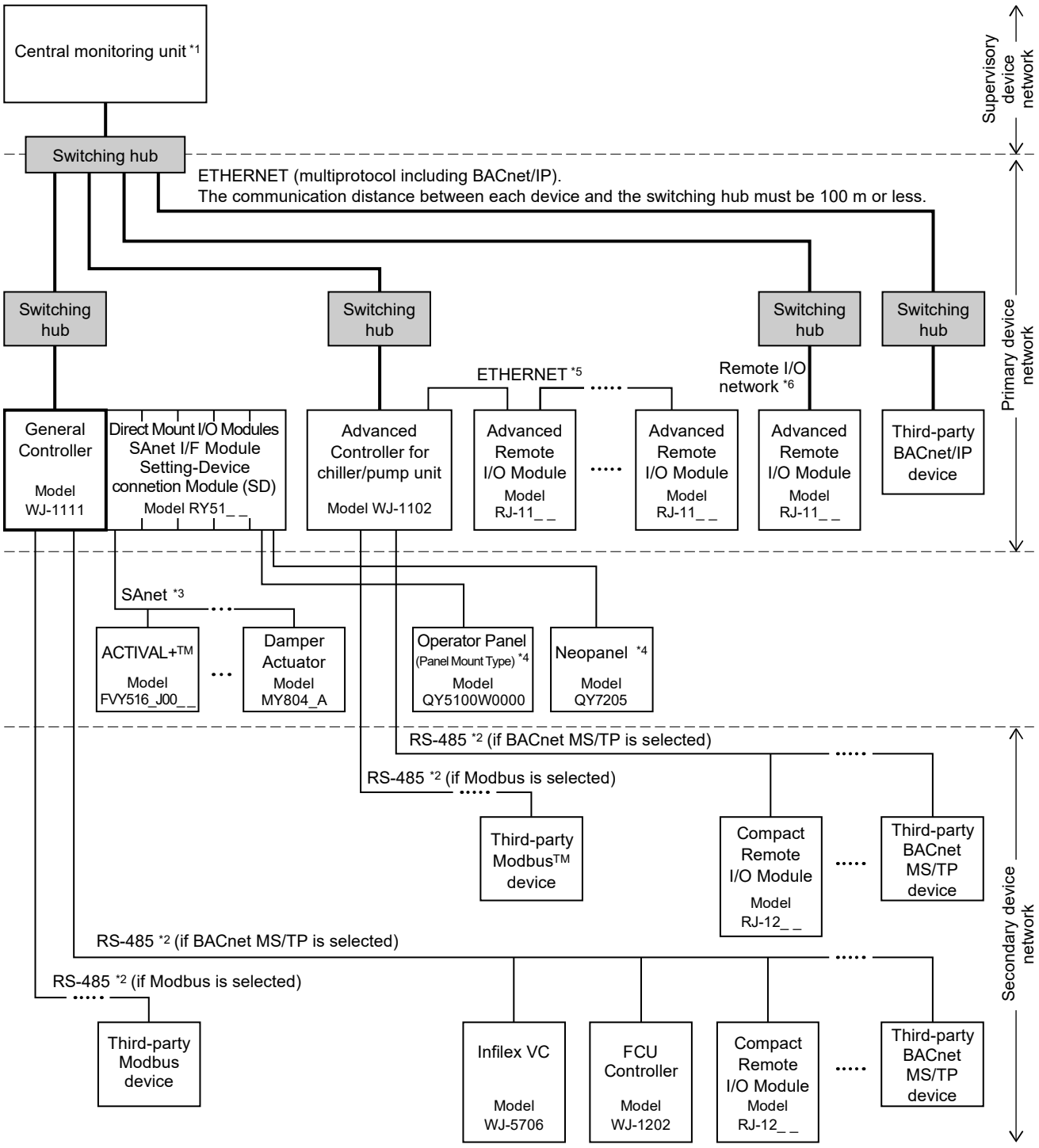


Figure 1. System configuration example: Infilex VC integrated into *savic-net G5* BMS

Notes:

*1 The system can be connected to Azbil Supervisory Controller (Model BH-101G0W0000) or a third-party central monitoring unit for BACnet/IP communications.

*2 The General Controller and Advanced Controller have two RS-485 communication channels.
For each channel, communication protocol can be selected from BACnet MS/TP, Modbus™ RTU, or Modbus ASCII.
- The number of devices that can be connected for BACnet MS/TP
  If only the Azbil devices are connected:
  50 devices/channel (VAV/FCU controllers, Compact Remote I/O Modules, etc.)
  The maximum number of the secondary devices that can be connected to one General Controller is 70 , or 50 which is the sum of Azbil VAV and FCU Controllers. The Advanced Controller has no restrictions.
  If only the third-party devices are connected:
  31 devices/channel (when transmission speed is 76.8 kbps, 30 objects/device)
- The number of devices that can be connected for Modbus
  31 devices/channel (when transmission speed is 76.8 kbps, 30 objects/device)

If the transmission speed and the number of objects are different among the third-party devices, or if the Azbil devices and third-party devices coexist on the same channel, the number of connected devices will vary. For details, please contact one of Azbil salespersons.

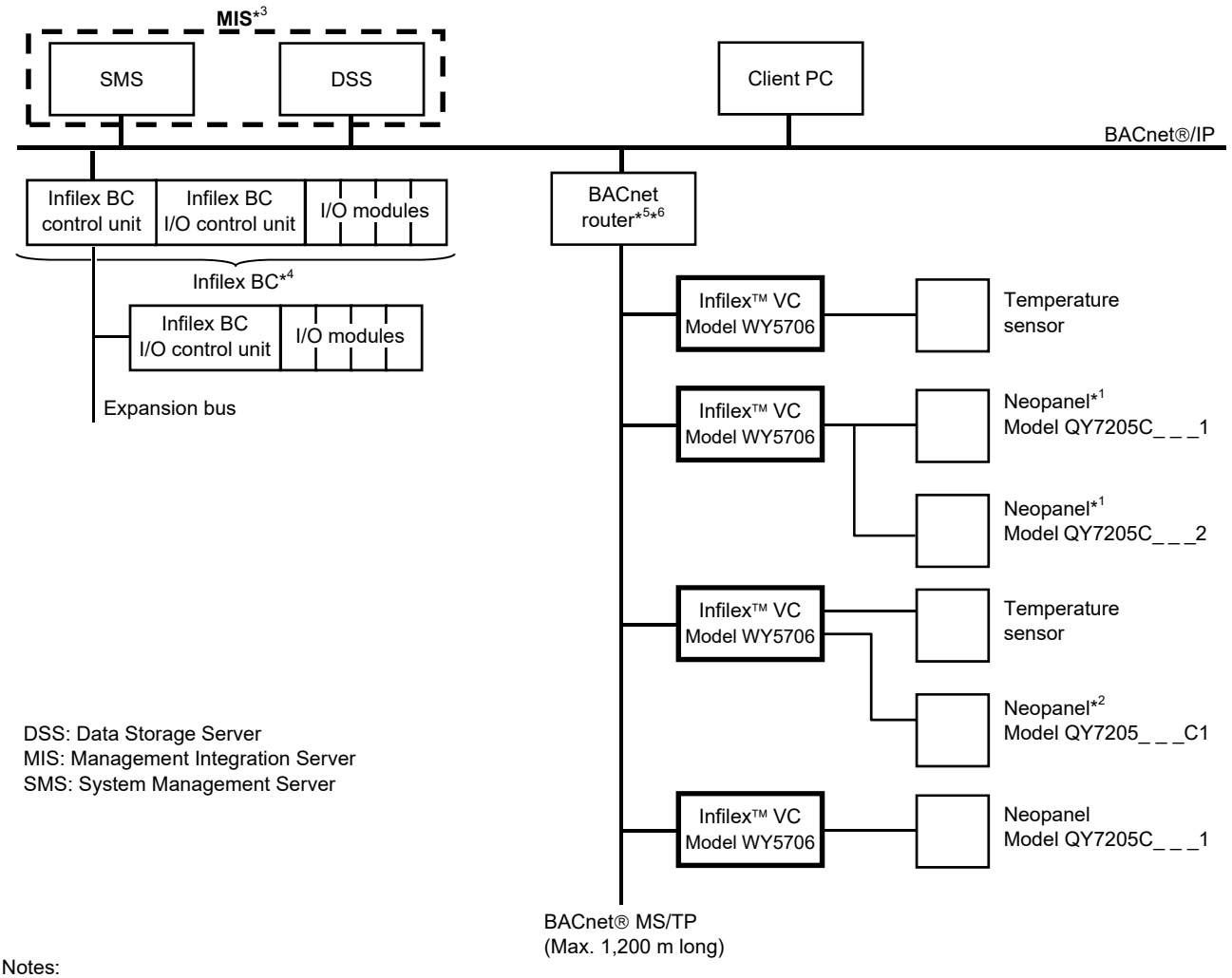
*3 By connecting the SAnet Interface Module, it is possible to connect the Intelligent Component Series devices.
For restrictions on the SAnet communication line, refer to AB-6713, *Intelligent Component Series for SAnet Communication: Installation Manual*.

*4 By connecting the Setting-Device connection Module (SD), the Operator Panel (Panel Mount Type), Neopanel, or Neoplate can be connected.
AB-7530, *Operator* Panel *(Panel Mount Type), Operator Panel (Integral Type), Specifications/Instructions.*

*5 A network that connects the Advanced Controller and Advanced Remote I/O Modules under its control is referred to as a local I/O network.
A switching hub is not required for the local I/O network since a daisy chain Ethernet is used between the Advanced Controller and the Advanced Remote I/O Modules under its control, as well as between the Advanced Remote I/O Modules and the I/O modules for the Advanced Controller.

*6 A network that connects the Advanced Controller and Advanced Remote I/O Modules through a host network is referred to as a remote I/O network.
A switching hub is required to connect the Advanced Remote I/O Modules to the remote I/O network.
The maximum number of the Advanced Remote I/O Modules connected to this network is 3 per Advanced Controller.

Infilex VC integrated into our building management system (BMS): *savic-net™ FX*



Notes:

*1 Up to two Neopanel can be connected to one Infilex VC.
For two Neopanel connection, provide Model QY7205C_ _ _1 for the address 1 and Model QY7205C_ _ _2 for the address 2 and connect to Infilex VC via modular branch unit (Part No. DY7203A0000).

*2 Neopanel and a temperature sensor can be connected to the same Infilex VC.

Notes for savic-net FX BMS:

*3 MIS may be used instead of SMS and DSS for your savic-net FX system. Note that MIS cannot coexist with SMS or DSS in the same system.

*4 Maximum of 75 MS/TP devices including Infilex VC (not including the BACnet router) can be connected to one Infilex BC.

*5 Use LOYTEC L-IP(TM) BACnet router Model LIP-ME201 and set the baud rate of the router to 76800 bps for Infilex VC integrated in savic-net FX.

*6 Maximum of 31 Infilex VC are connectable to one MS/TP network segment of the LOYTEC L-IP(TM) BACnet router Model LIP-ME201 at the baud rate 76800 bps. Do not connect any devices except Infilex VC on this MS/TP network segment (where Infilex VC is connected).

Figure 2. System configuration example: Infilex VC integrated into *savic-net FX* BMS

Model Numbers

Base model number	Power	—	Actuator	Airflow sensor DO output	Pt input type	Description
WY5706						Infilex VC for BACnet MS/TP communication
	C					24 V AC
		5				Fixed.
			1			5 N·m torque
			2			10 N·m torque
			(Note 1)	0		Airflow pulse input, DO: 0 pt.
				1		With internal airflow sensor, DO: 0 pt.
			(Note 2)	2		Airflow pulse input DO: 3 pts. (2 pts. for reheat control, 1 pt. for fan control)
				3		With internal airflow sensor, DO: 3 pts. (2 pts. for reheat control, 1 pt. for fan control)
					0	Pt100 input
				(Note 3)	K	Pt1000 input

Note 1: Only model WY5706C510K is available.
Note 2: Only model WY5706C512K is available.
Note 3: Only model WY5706C510K and WY5706C512K are available.

Part Numbers of Optional Parts and Tools

Item	Part number
Universal bracket	12595-00001
Modular branch unit	DY7203A0000
Modular relay units (5 pieces/set)	DY7202A0000
Adapters for connecting to a Pt100 temperature sensor (10 pieces/set)	DY7204A0003
Adapters for connecting to a user terminal (10 pieces/set)	DY7204A0008
Modular plugs (100 pieces/set)	DY7207A0100
Modular crimper	DY7205A0002
Modular cable tester	DY7206A0000
Connector cable for two terminals (short cable model)	DY7221A
Terminators (10 pieces/set)	83172137-001

Note:
* For details of the optional parts and tools shown above, see the **Optional Parts** and **Optional Tools** sections.

Specifications

Basic specifications

Item		Specification		
Power supply		24 V AC ± 15 % (50 Hz/60 Hz)		
Power consumption		5 N·m: 8 VA / 10 N·m: 9.5 VA		
Rated torque		5 N·m / 10 N·m		
Operating range		To 95°		
Operating time (for 95° operating angle)		Operation mode	5 N·m torque type	10 N·m torque type
		Forced open/close	150 seconds	150 seconds
		Synchronisation (An operation mode to synchronise the actuator position with the damper position.)	75 seconds	86 seconds
		Automatic control (with variable speed)	120 to 300 seconds	120 to 300 seconds
Attachable damper shaft		5 N·m torque type		10 N·m torque type
	Thickness	Φ6 mm toΦ20 mm (circular cross section)		Φ8 mm toΦ26.7 mm (circular cross section)
		4.5 mm square to 14 mm square (square cross section)		5.7 mm square to 18.8 mm square (square cross section)
	Length	37 mm or longer		40 mm or longer
Operating environmental conditions		Temperature	0 °C to 50 °C	
		Humidity	10 %RH to 90 %RH (Non-condensing)	
		Vibration	Max. 3.2 m/s² (10 Hz to 150 Hz)	
Transport/storage conditions		Temperature	-20 °C to 60 °C	
		Humidity	5 %RH to 95 %RH (Non-condensing)	
		Vibration	Max. 9.8 m/s² (10 Hz to 150 Hz)	
Enclosure rating		Equivalent to IEC IP30: Dust-proof (in wired, covered, and plugged state)		
Sound power level		35 dB or lower		
Installation		In VAV control box		
Address setting		Rotary switch × 2		
Materials		Back plate: Zinc plated steel Clamps and screws : Zinc plated steel Housing: PC-ABS Cover of air flow sensor: Thermoplastic elastomer Cover of nonuse connector (for setting): Thermoplastic elastomer Universal bracket: Zinc plated steel		
Weight		5 N·m torque type: 500 g 10 N·m torque type: 800 g		

IEC: International Electrotechnical Commission
PC-ABS: Polycarbonate acrylonitrile butadiene styrene
VAV: Variable air volume

Input/output specifications

Unit to be connected	Input/output description		Input/output specification	Connection type	Wire/tube specification
VAV unit	Air flow signal input	Air flow pulse	Voltage pulse input Voltage: 5 V DC ± 20 % for high level 0 V DC to 0.5 V DC for low level Current: Max. 10 mA Pulse width: 450 μs or more for high level 450 μs or more for low level Frequency: Max. 1000 Hz + 10 % or less 100 Hz or higher for full span Current restriction resistance: 470 Ω	Terminal connection: Push-in terminal block	2.0 mm^2 to 2.5 mm^2 Max. 5 m
		Direct air flow sensor	Differential pressure input sensor Differential pressure sensing range: ΔP = 0 Pa to 250 Pa Temperature characteristics: ± 0.5 % of full span °C (0 °C to 50 °C, 1013 hPa)	Tube connection	Length: Max. 1m at each port Inner diameter (flexible tube): 5.0 mm to 6.0 mm Inner diameter (inflexible tube): 5.5 mm to 6.5 mm Outer diameter: Max. 10.0 mm Material: PVC, silicon rubber (e.g., TYGON® Model R-3603)
	Heater and fan		Dry contact 30 V AC, 0.8 A or 30 V DC, 0.5 A	Terminal connection: Push-in terminal block	2.0 mm^2 to 2.5 mm^2 Max. 5 m
Temperature sensor	Pt100 input		Pt100 temperature sensor Input temperature range: 0 °C to 50 °C	Connector connection*1	LAN cable*2 Max. 50 m
	Pt1000 input		Pt1000 temperature sensor Input temperature range: 0 °C to 50 °C	Connector connection*3	1.25 mm^2 to 2.5 mm^2 + connector cable (Model DY7221A) Max. 50 m
User terminal	Temperature setting Air conditioning ON/OFF		Serial voltage transmission Transmission speed: 100 bps	Connector connection*1	LAN cable*2 Max. 50 m
Communication line	BACnet MS/TP		RS-485, 3-wire Baud rate (auto-detecting): 9.6 kbps/19.2 kbps/38.4 kbps/76.8 kbps Terminating resistor: External Unit load: 1/8	Terminal connection: Screw terminal block	22 AWG or 24 AWG 2 pairs of shielded twisted- pair cable / 1 pair of shielded twisted- pair and one conductor cable*4 Max. 1200 m*5
Power supply	—		Power supply voltage: 24 V AC ± 15 %	Terminal connection: Push-in terminal block	2.0 mm^2 to 2.5 mm^2

Notes:

*1 For connector connection, use Bel Stewart Connector's Plug: Model SS-37000-002.
This plug is also available at Azbil Corporation. (Part No. DY7207A0100, 100 pieces/set)

*2 LAN cable compliant with EIA/TIA-568 Category 3 or over (⌀0.5 mm × 4 pairs) is required.
For *1 and *2, the connector cable (regular cable: Part No. DY7210, short cable: Part No. DY7220) are available at Azbil Corporation.

*3 Use the short connector cable for two terminals (Part No. DY7221A). Other cables are not acceptable.

*4 Recommended cable: Belden's Model 3106A/3107A/9842

*5 The maximum wiring length is only for the cable that meets the following specifications:
- Characteristic impedance: 100–130 Ω
- Line capacity: 100 pF/m or less
- Conductor-shield capacity: 200 pF/m or less

Cable size conversion

AWG	13	14	16	22	24	26
Area (mm^2)	2.6240	2.0809	1.3087	0.3255	0.2047	0.1288

Dimensions

5 N·m torque type

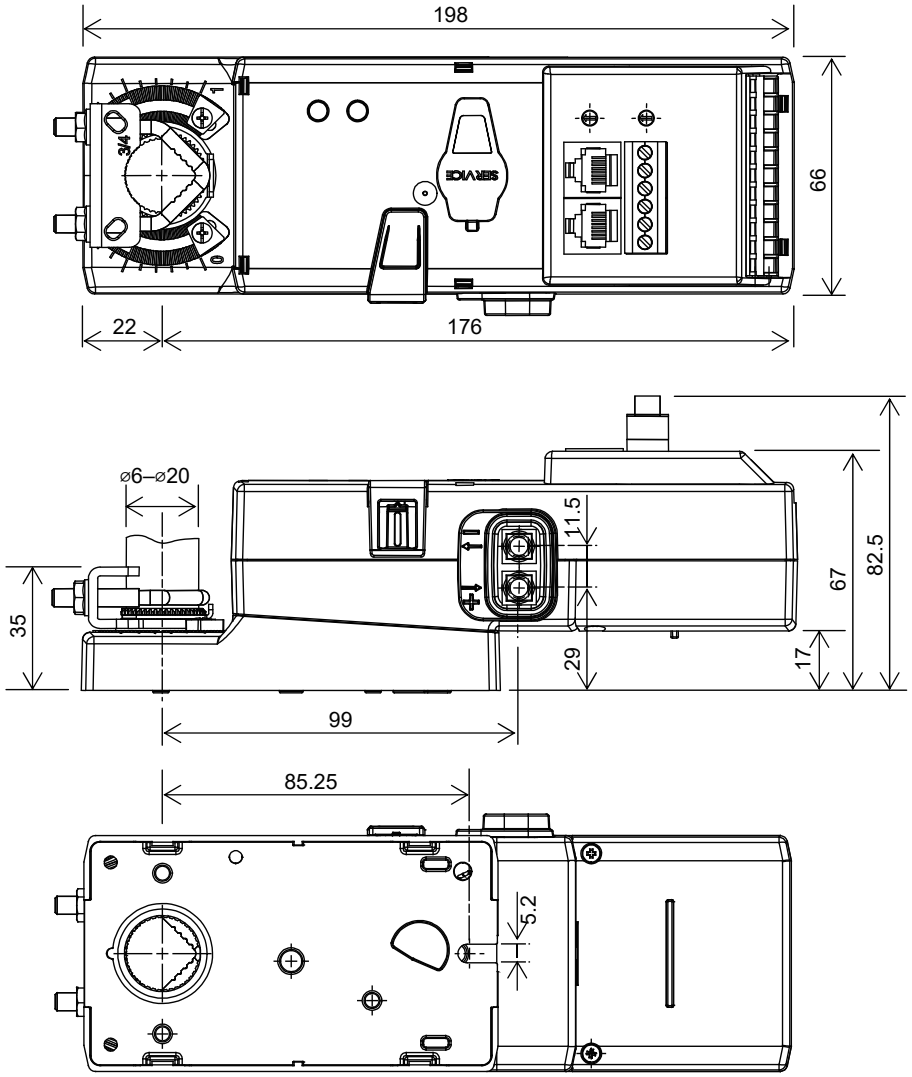


Figure 3. Dimensions: 5 N·m torque type (mm)

10 N·m torque type

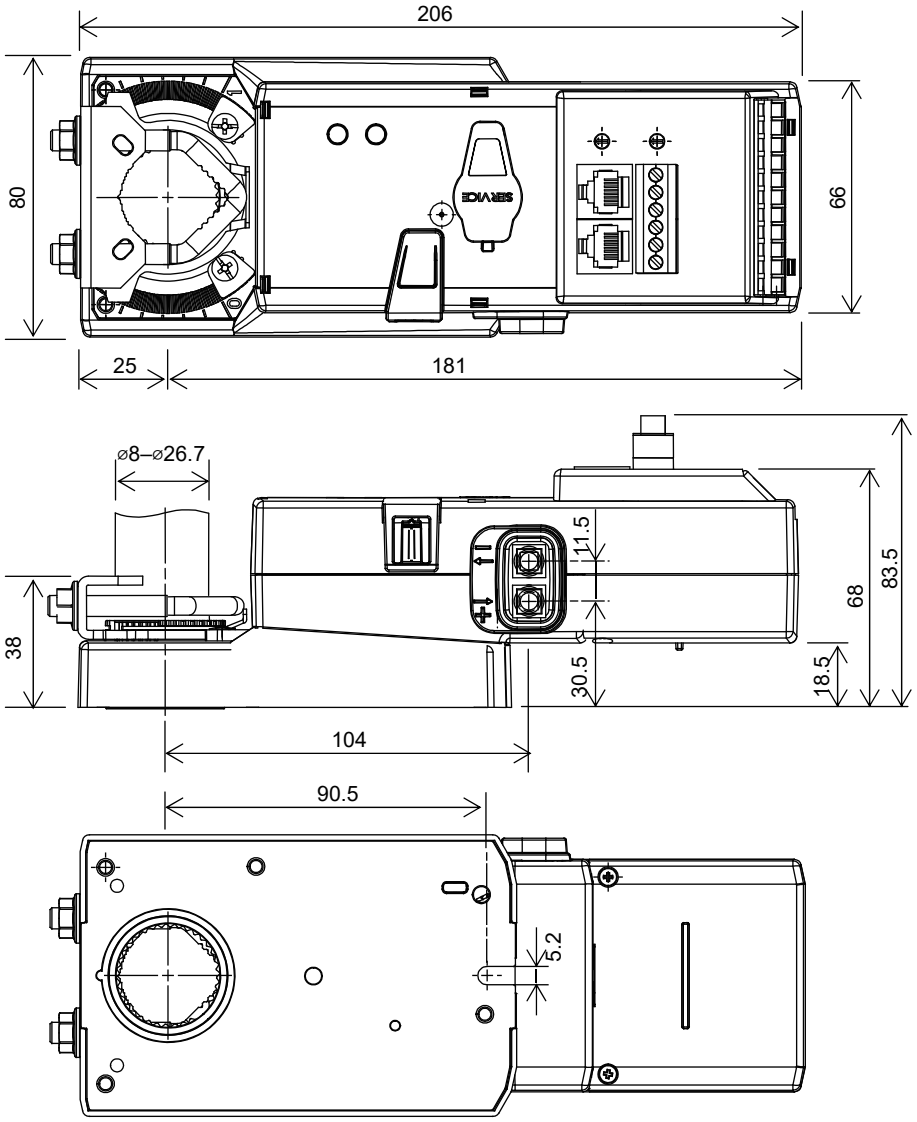


Figure 4. Dimensions: 10 N·m torque type (mm)

Universal bracket (requiring separate order)

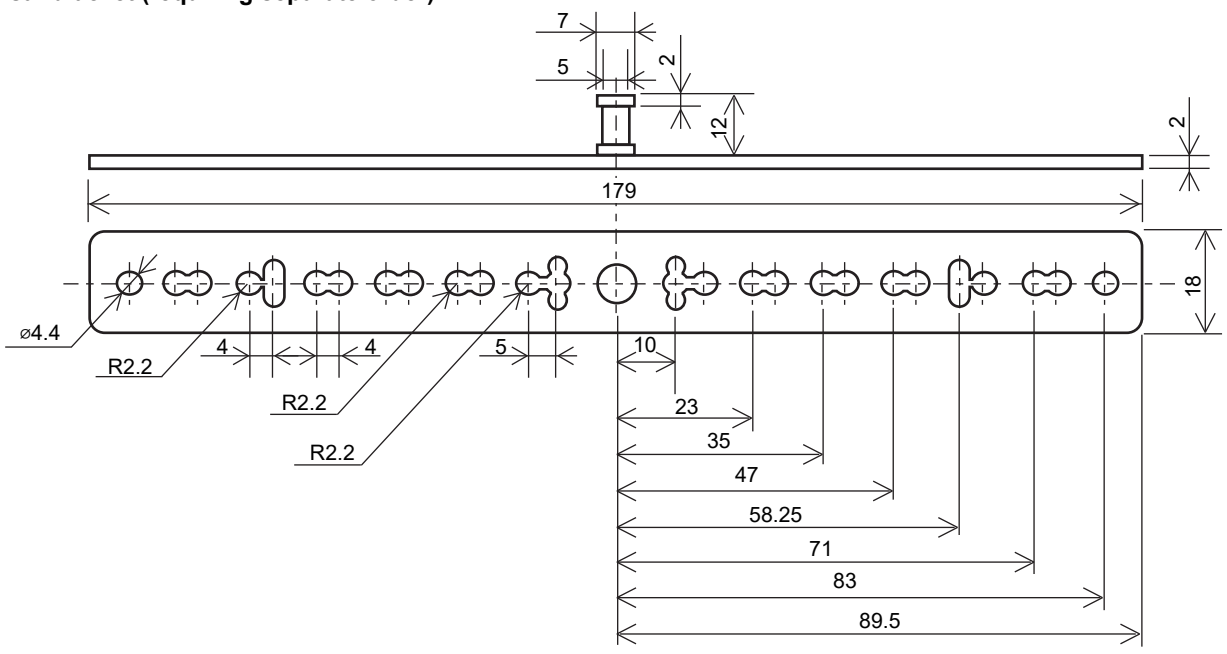


Figure 5. Dimensions: Universal bracket (mm)

Parts Identification

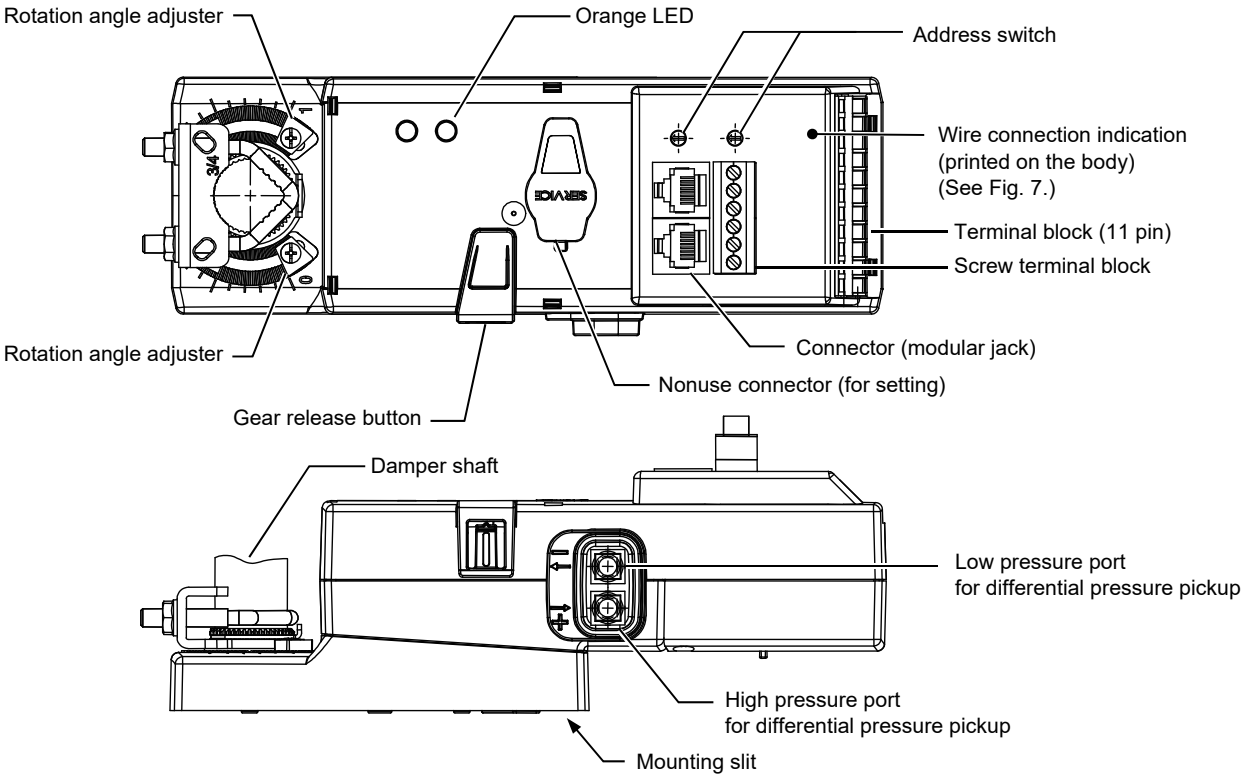


Figure 6. Parts identification

Wire Connection Indication

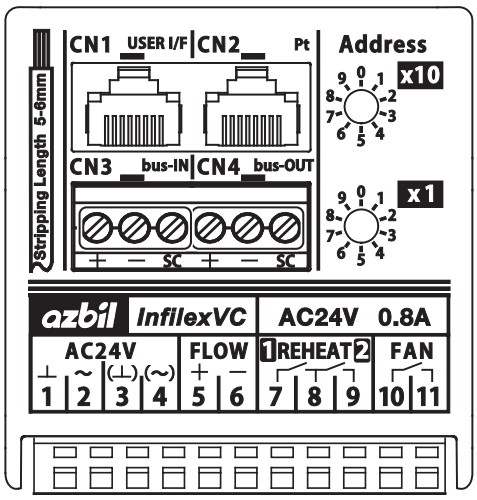
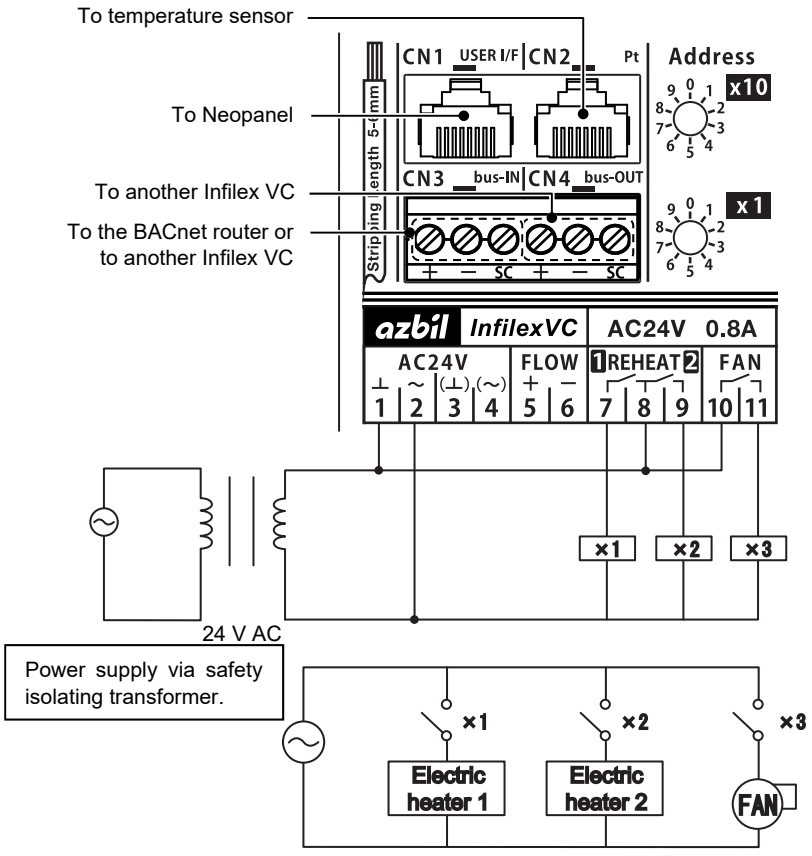


Figure 7. Wire connection indication printed on Model WY5706C5_3_

Wire Connection Examples

Electric heater connection

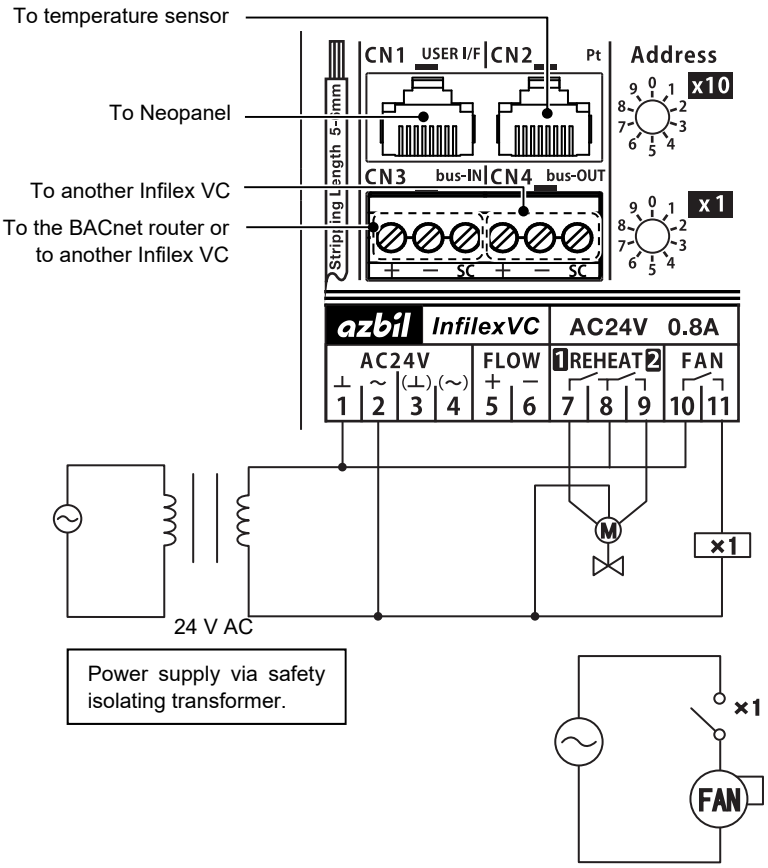


Notes:

* For wiring to CN1 and CN2 connectors, refer to the following sections.
  - **Wiring to user terminal / Pt100 temperature sensor**
  - **Wiring to Pt1000 temperature sensor**
* For wiring to CN3 and CN4 terminals, refer to the following sections.
  - **BACnet MS/TP network wiring**
* Operate electric heater and fan by a relay with 24 V AC operating voltage.
* When an electric heater is connected, additionally provide a circuit to prevent temperature rise.

Figure 8. Connection example for two-step electric heater + fan output control (Model WY5706C5_3_)

Floating control valve connection

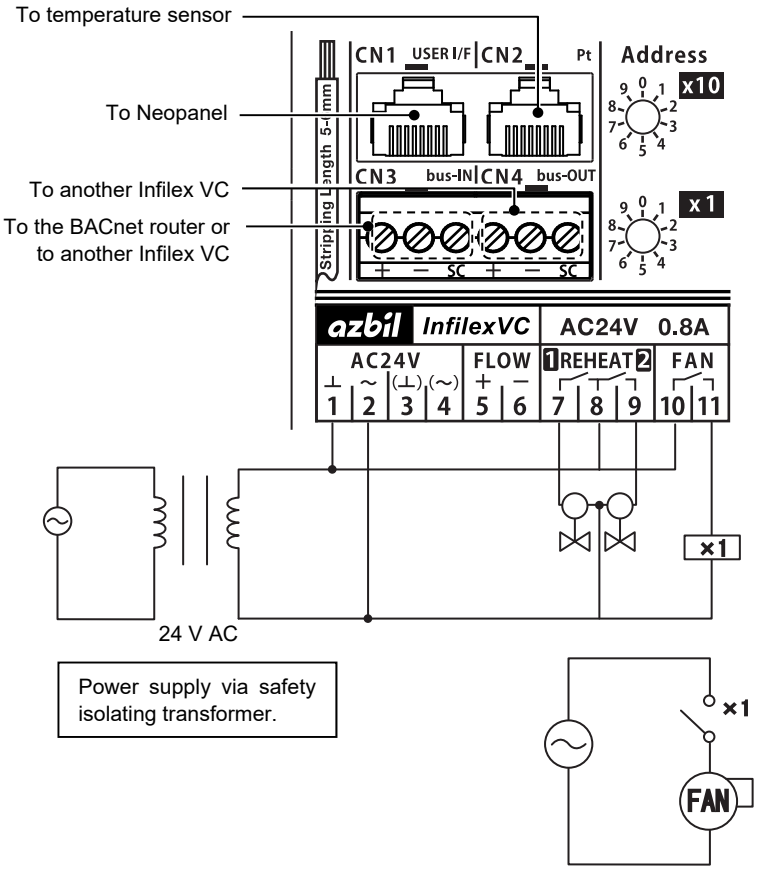


Notes:

* For wiring to CN1 and CN2 connectors, refer to the following sections.
  - **Wiring to user terminal / Pt100 temperature sensor**
  - **Wiring to Pt1000 temperature sensor**
* For wiring to CN3 and CN4 terminals, refer to the following sections.
  - **BACnet MS/TP network wiring**
* Operate fan by a relay with 24 V AC operating voltage.
* Rated voltage of reheat output is 30 V AC. If the voltage of reheat output exceeds 30 V AC, operate reheat valve by a relay.
* For accurate control of Infilex VC installed in a 24-hour system, floating valves are automatically closed when they are kept unclosed for 48 hours.

Figure 9. Wiring example for floating control (Model WY5706C5_3_)

Two-step control valve connection



Notes:

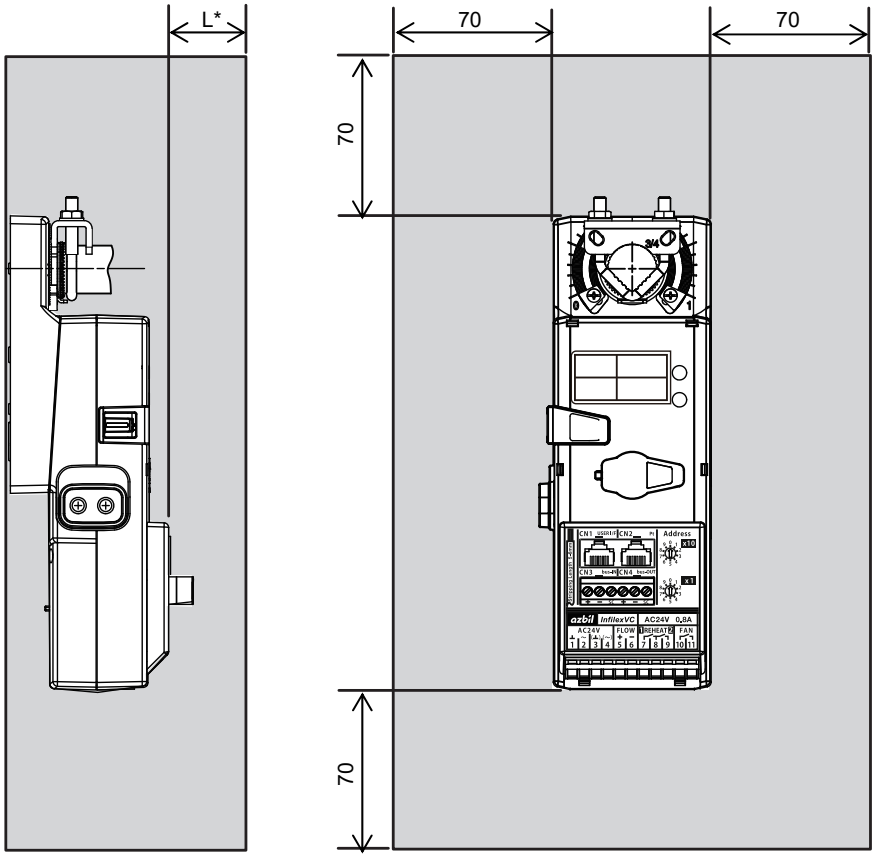
* For wiring to CN1 and CN2 connectors, refer to the following sections.
  - **Wiring to user terminal / Pt100 temperature sensor**
  - **Wiring to Pt1000 temperature sensor**
* For wiring to CN3 and CN4 terminals, refer to the following sections.
  - **BACnet MS/TP network wiring**
* Operate fan by a relay with 24 V AC operating voltage.
* Rated voltage of reheat output is 30 V AC. If the voltage of reheat output exceeds 30 V AC, operate reheat valve by a relay.
* For ON/OFF valve, use a valve with automatic return or spring return function.

Figure 10. Wiring example for two-step control (Model WY5706C5_3_)

Installation

Installation precautions

- Before installation, be sure to turn off the power to the product.
- Leave the maintenance clearance as shown in the figure below.



Note:
* Dimension L must be larger than [size Φ of the modular cables to be connected x 4] for the bend radius.
(e.g., Dimension L for ⌀6 mm modular cable is larger than 24 mm for bend radius.)

Figure 11. Maintenance clearance (mm)

Installation procedure

1) Fully close the VAV damper shaft.

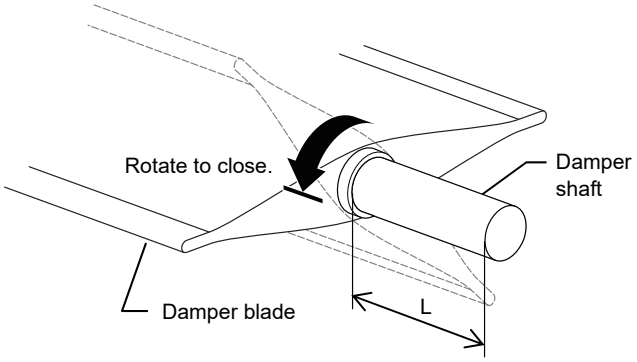


Figure 12. Damper shaft

Actuator torque type	L: Minimum length of the shaft (mm)	Diameter of the shaft (mm)	
		○	□
5 N·m	37	6 to 20	4.5 to 14
10 N·m	40	8 to 26.7	5.7 to 18.8

2) Fully close the actuator of this product, and mount it to the damper shaft. Finger-tighten the fastening nuts of the shaft clamp to temporarily fix the actuator.

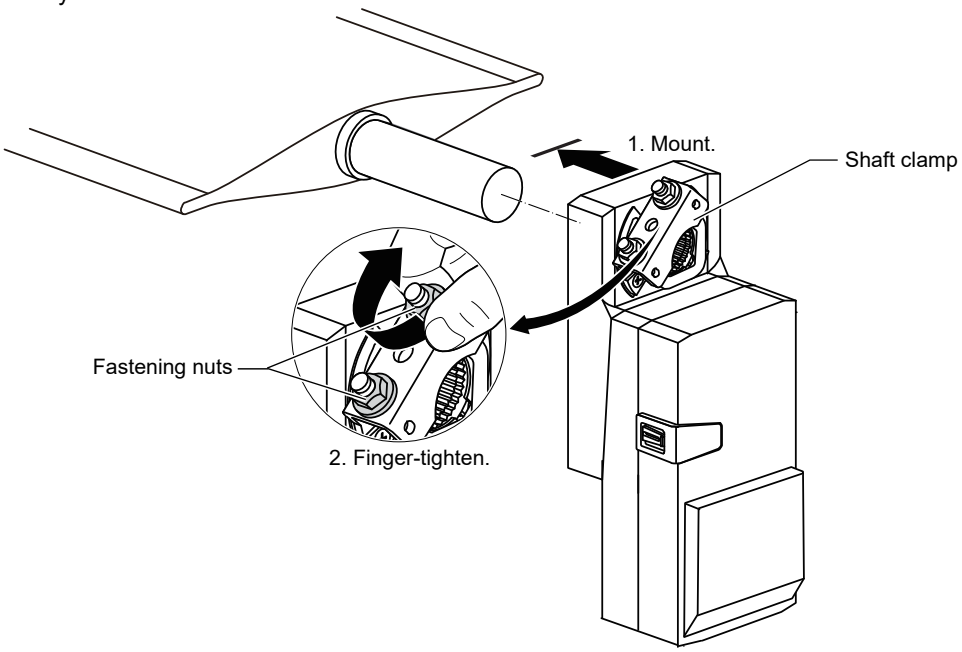
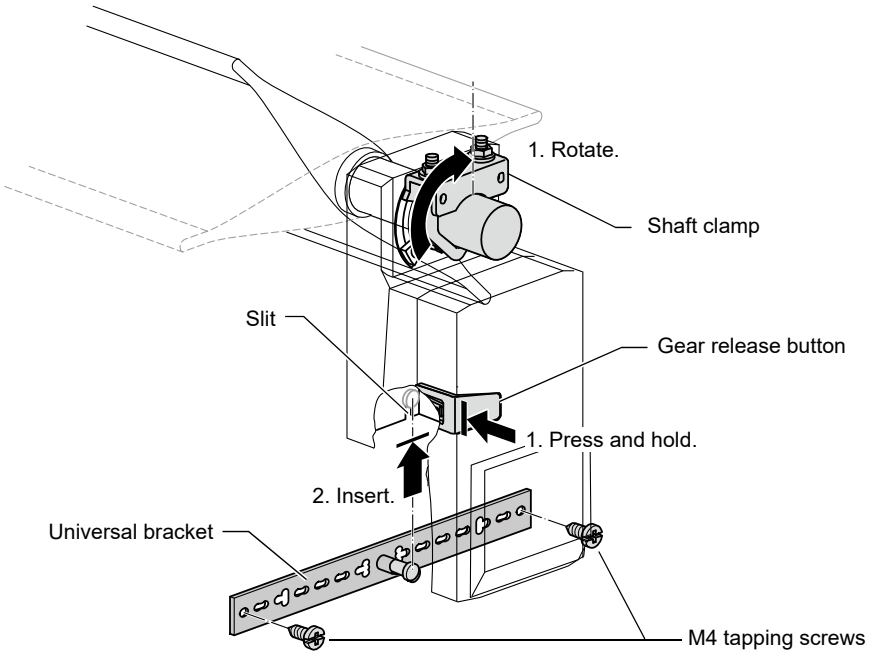


Figure 13. Temporal installation of the actuator body

3) While pressing the gear release button, manually rotate the shaft clamp until it is in the upright position. Then, insert the universal bracket (protruding part) into the slit of this product and fix the bracket with the two M4 tapping screws.

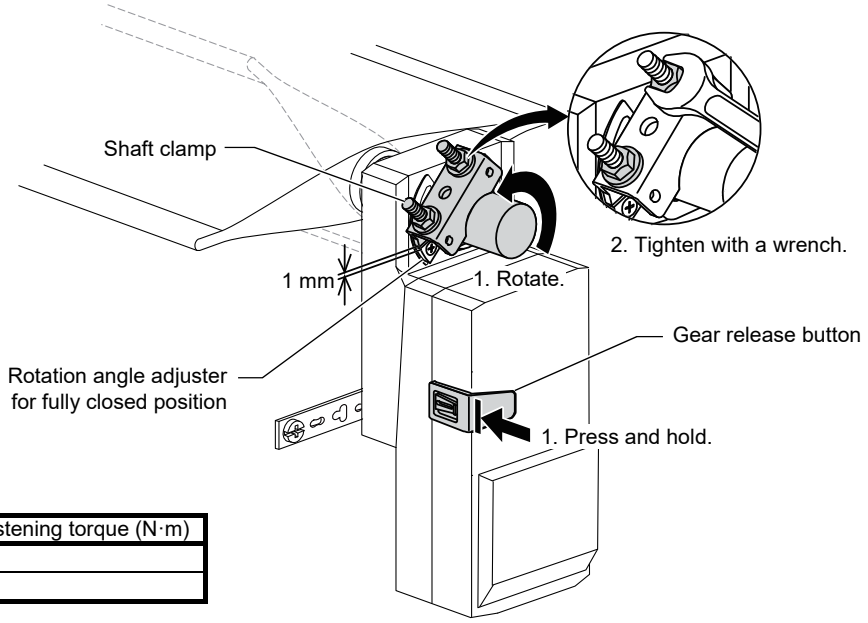


Note:

* The universal bracket, required for the installation of this product, is commercially available. The universal bracket is also available at Azbil Corporation (Universal bracket: Part No. 12595-00001). Be sure to separately order if necessary.

Figure 14. Attaching the universal bracket

4) Manually rotate the shaft clamp back to the fully closed position while pressing the gear release button. At this time, be sure to leave a clearance (approx. 1 mm) between the shaft clamp and the rotation angle adjuster (mechanical stopper) for the fully closed position. This will allow the actuator to shut off the damper. Using a wrench, tighten the fastening nuts of the shaft clamp to completely fix this product. See the following table for the nut fastening torque.



Actuator torque type	Nut fastening torque (N·m)
5 N·m	5 to 6
10 N·m	8 to 9

Figure 15. Complete installation of the actuator body

5) Manually rotate the shaft clamp until the damper fully opens while pressing the gear release button. Then, set the rotation angle adjuster for the fully open position.

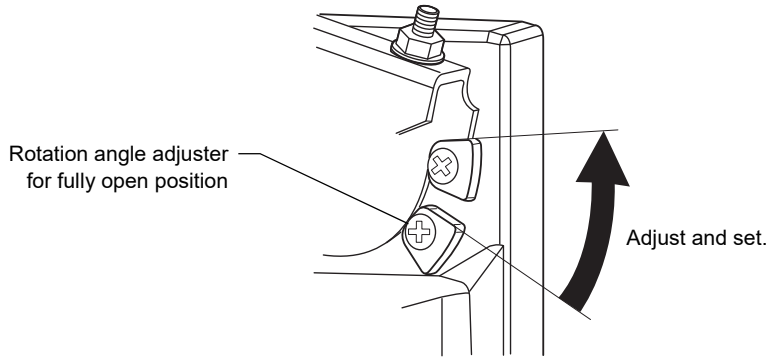
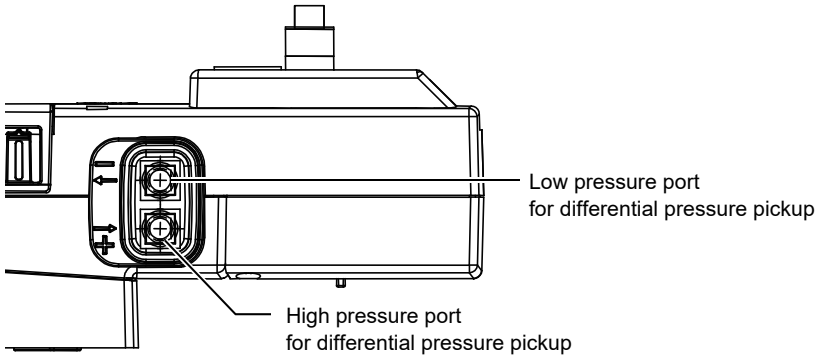


Figure 16. Setting the operating angle for the fully open position

Connection of the tubes to the air flow sensor

For differential pressure pickup, connect the total pressure measuring port of the VAV unit to the high pressure port (indicated with "+") of this product with a tube. Also connect the static pressure measuring port of the VAV unit to the low pressure port (indicated with "-") of this product with a tube.



Required specification of the air flow sensor tube

Type	Length	Inner diameter	Outer diameter	Material
Flexible tube	Max. 1 m	5 mm to 6 mm	Max. 10 mm	PVC, silicon rubber
Inflexible tube		5.5 mm to 6.5 mm		

PVC: Polyvinyl chloride

Notes:

* Use the tube as specified in the above table.
* If the tube of the differential pressure pickup (of the VAV unit) does not meet the required specification shown in the above table, use a joint to meet the specification.
* Total tube length must be 1 m max. even if two tubes with different diameters are connected by the joint.

Figure 17. High and low pressure ports for differential pressure pickup (Model WY5706C5_1_ and Model WY5706C5_3_)

Wiring

Push-in terminal connection

Wires of power supply and DO (digital output) are connected to the push-in terminal block. Follow the procedure below for the wiring connections.

1) Strip the 5-6 mm insulation of the wire end. (If the insulation stripped part is longer than the specified, it will be exposed causing electric shock or short-circuit between adjacent terminals. If it is shorter, the wire may not contact the terminal.)

2) Make sure that any wire fiber is unbound from the wire end.

3) Insert a slotted screwdriver into a smaller square hole (for clamp release) on the terminal block located on the front surface.

   To insert the screwdriver to the deep end (approx. 10 mm deep), push and tilt it (towards the front surface of Infilex VC main unit) along the curving surface inside the square hole.

   When the screwdriver is inserted to the deep end, the clamp is completely released.

   Notes:
   * A slotted screwdriver with the blade 3.5 mm wide and 0.5 mm thick (straight type) is acceptable. A screwdriver with the blade tip narrower than the shaft may not be acceptable.
   * Appropriate screwdriver (an example):
     Model 9900 (3 mm wide x 100 mm long) or Model 910 (3 mm wide x 75 mm long) manufactured by Vessel Co., Inc.
   * Since the terminal block has the inclined surface, required clearance for maintenance varies depending on the length of the screwdriver to be used.

4) Insert the wire end into a larger square hole. When the wire end is fully inserted, remove the screwdriver.

5) Gently pull out the wire to make sure it is completely held by the clamp.

Wiring of user terminal / Pt100 temperature sensor to Infilex VC

User terminal and Pt100 temperature sensor are wired to Infilex VC with modular connection. For correctly crimping modular plugs on a LAN cable, refer to the following.

Modular connector connection

Modular connector is composed of a modular plug (male) and a modular jack (female). Modular jacks are provided on Infilex VC, and modular plugs will be crimped on LAN cables as required. Refer to the following procedure for crimping the modular plugs on the LAN cables and connecting them to the modular jacks.

Note:
* For modular plugs, refer to **Note *1** of the **Input/output specifications** section.

Procedure for modular connector connection

1) Strip the outer sheath of a LAN cable end. Be sure not to scratch or peel off any wire insulation when stripping the sheath.

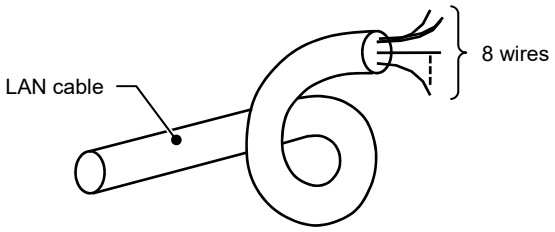


Figure 18. Stripping the sheath

Make sure there are eight wires inside the sheath.

2) Align the eight wires in the order specified by the LAN cable manufacturer.
An alignment example of the LAN cable wires is shown in the table below.

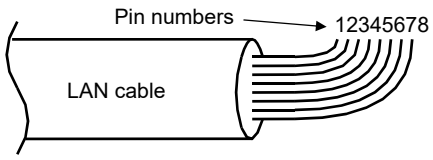


Figure 19. Alignment of the wires

Modular plug pin number	Wire alignment	Wire color code
1	Line 2 of pair 2	White and orange
2	Line 1 of pair 2	Orange
3	Line 2 of pair 3	White and Green
4	Line 1 of pair 1	Blue
5	Line 2 of pair 1	White and blue
6	Line 1 of pair 3	Green
7	Line 2 of pair 4	Brown and white
8	Line 1 of pair 4	Brown

Note:
* Wire colors shown above may not agree with your LAN cable specification. Ask your LAN cable manufacturer for the latest specification.

3) Insert the aligned wires into a modular plug.

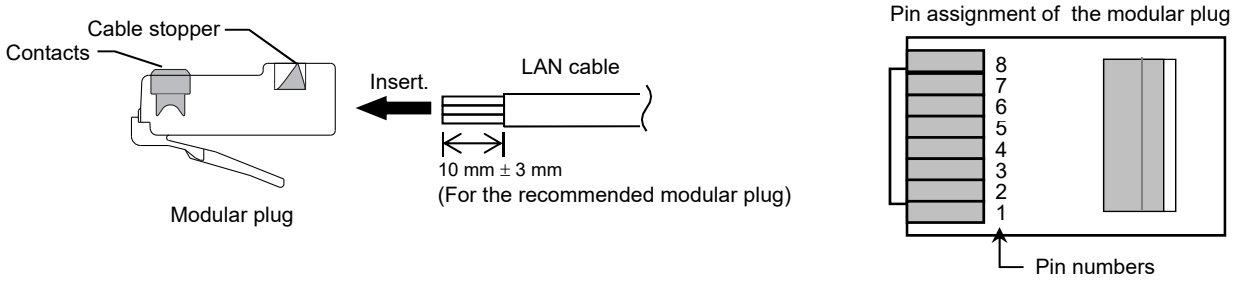


Figure 20. LAN cable insertion into a modular plug

Pin assignment of the modular plug in Fig. 20 is the image when the contacts and the cable stopper of the modular plug are viewed from above.

Before inserting the wires into the modular plug, even out the length using a nipper. Note that the modular plug may not be crimped on wires if the wires without the outer sheath are too long.

4) Crimp the modular plug using a crimper. Insert the wires into the modular plug so that the contacts of the modular plug stick into the wires after crimping. Crimped modular plug is secured on the LAN cable by the cable stopper of the modular plug. Check the contacts and the cable stopper when crimping the modular plug.

5) Follow 1) to 4) for the other end of the LAN cable.

6) Check continuity of the LAN cable. Modular cable tester (Part No. DY7206A0000) facilitates the continuity check. At the same time, make sure that the wires are aligned in the specified order, the modular plug contacts stick into the wires, and that there is no cable damage or disconnection.

7) Connect the modular plugs to the modular jacks.
After successfully finishing the continuity check, insert a modular plug of the LAN cable into the modular jack of Infilex VC and the other modular plug into the modular jack provided for connecting to the user terminal/Pt100 temperature sensor. Insert a modular plug until it clicks and gently pull the cable to check complete connection.

Wiring of Pt1000 temperature sensor to Infilex VC

Pt1000 temperature sensor is also wired to Infilex VC with modular connection, and the short connector cable for two terminals Part No. DY7221A is required for wiring. Refer to the following for details.

1) Connect the modular plug of Part No. DY7221A to the connector CN2 of Infilex VC.

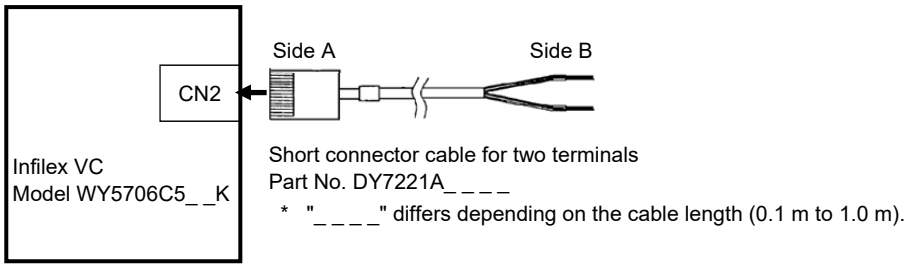
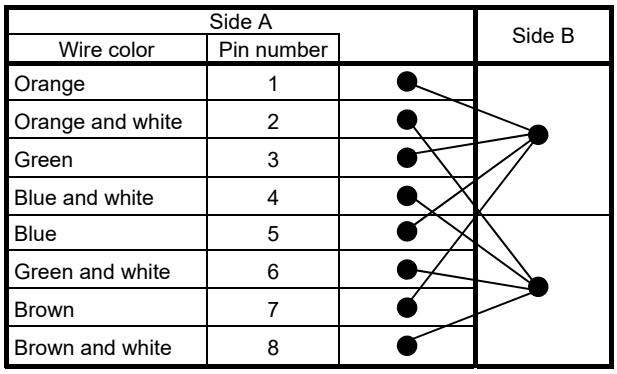


Figure 21. Connection of the connector cable for two terminals to Infilex VC

See the following for the pin assignment of the connector cable for two terminals Part No. DY7221A (between sides A and B).



2) Splice the two wires (side B) of Part No. DY7221A and the wires from the Pt1000 temperature sensor with insulation sleeves.

Note:

* The Pt1000 temperature sensor is a two-wire sensor. Because wire resistance causes measuring error, longer cable, which has larger wire resistance, will cause greater measuring error. Use Part No. DY7221A (0.1–1.0 m long), and extend the sensor cable (1.25–2.5 mm^2 size) if needed.

BACnet MS/TP network wiring

Daisy-chain Infilex VC as follows. Be sure to terminate the both ends of the BACnet MS/TP network with 120 Ω terminators. The maximum wiring length of one network segment is 1200 m. Use the cable explained in the **Input/output specifications** section.

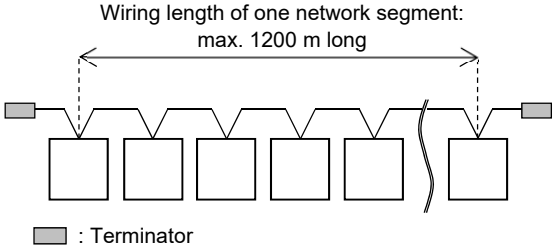


Figure 22. Wiring length of BACnet MS/TP network segment

Wiring procedure

1) Strip the cable sheath.

2) Strip 6 mm of the wire insulation.

3) Connect the stripped wires to the screw terminals of Infilex VC.
See the following for the pin assignment of the BACnet MS/TP terminals of Infilex VC.

Indication on Infilex VC	Descriptions
+	BACnet MS/TP non-inverting
-	BACnet MS/TP inverting
SC	Signal common

Use the following cables for wiring the BACnet MS/TP network.

- Twisted pair cable (two pairs)
  Use one twisted pair for the data communication line (+ and -).
  Use a wire of the other twisted pair for the signal common line. Cut off the other wire of this twisted pair.

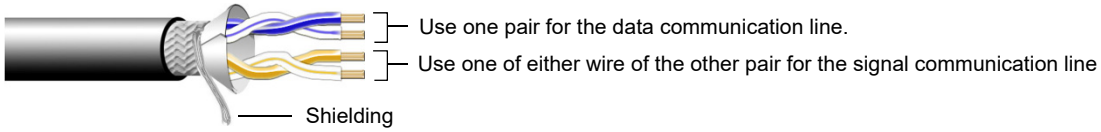


Figure 23. Two twisted pair cables for BACnet MS/TP network

- Twisted pair cable (one pair and one conductor)
  Use one twisted pair cable for the data communication line (+ and -).
  Use the conductor for the signal common line.

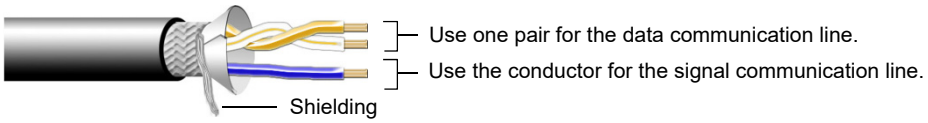
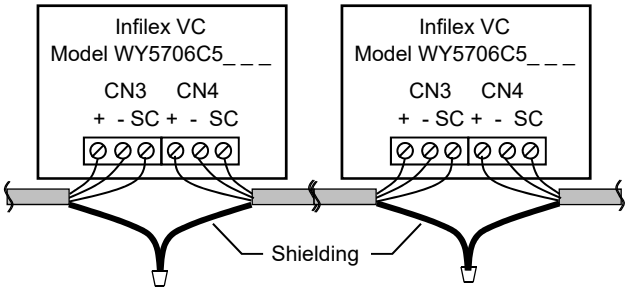


Figure 24. One twisted pair and one conductor cable for BACnet MS/TP network

4) Splice the shielding.
Do not connect the shielding to Infilex VC. Splice the shielding with a twist-on wire connector, as shown in the figure below.
Cut off the shielding of the cable connected from the terminal Infilex VC.
Single-point ground is required for Infilex VC and the devices inside the control panel such as the BACnet router.

Note:
* Do not let the shielding touch any other wires or any metal objects. Failure to do so might cause short circuit. Short circuit will disconnect the communication line, and the LED of Infilex VC will indicate BACnet MS/TP error. (See the **LED Indication** section.)



Splice the shielding with twist-on wire connectors.

Figure 25. Splice of the shielding with twist-on wire connectors

Terminator connection

Connect the terminator that meets the following specifications to Infilex VC at the both ends of the BACnet MS/TP network (bus topology).

Required specifications of the terminator
- Resistance: 120 Ω ±5 %
- Rated power consumption: 1/2 W or over

Connect the terminator to unused + and - screw terminals (of CN3 or CN4) of Infilex VC at the end of the network.

Note:
* Do not let the terminator to touch any other wires or any metal objects. Failure to do so might cause short circuit. Short circuit will disconnect the communication line, and the LED of Infilex VC will indicate BACnet MS/TP error. (See the **LED Indication** section.)

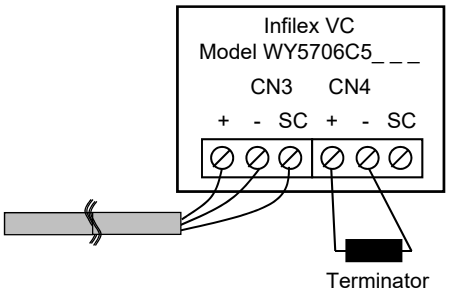


Figure 26. Terminator connection to Infilex VC

For the BACnet router at the end of the network, the following are required:

- The shielding of the network cable must be single-point grounded.
- Connect the terminator to the + and - terminals of the BACnet router.

Software Details

(1/2)

Item	Function	Description	Remark
Operation	VAV ON/OFF	Turns on/ off the variable air volume (VAV) unit by operating the BMS client PC or the user terminal.	- Each Infilex VC can individually turn on/off the VAV unit. - The latest user terminal/BMS client PC operation is effective. - VAV ON/OFF function using the user terminal can be disabled by the BMS client PC. - Once *VAV ON/OFF* function is set, you can not turn on the *Setback* function with the user terminal. (The user terminal allows you to operate either *VAV ON/OFF* or *VAV ON/Setback ON*.)
	Setback	Adds/Subtracts the setback value to/from the set temperature. Switches to the setback operation by operating the BMS client PC or the user terminal. The setback value is preset at Infilex VC.	- Each Infilex VC can individually change the set temperature for the *setback* operation. - The latest user terminal/BMS client PC operation is effective. - Setback function using the user terminal can be disabled by the BMS client PC. - Once *Setback* function is set, you can not turn off the VAV unit with the user terminal. (The user terminal allows you to operate either *VAV ON/Setback ON* or *VAV ON/OFF*.)
	Temperature setting	Changes the set temperature by operating the BMS client PC or the user terminal.	- The latest user terminal/BMS client PC operation is effective. - High/low limit of the setpoint is set by the BMS client PC. - Dual setting is available*2.
	VAV interlocking with air conditioning unit*1	Interlocks the ON/OFF operation of the VAV units with the ON/OFF status of the air conditioning unit in the same AHU group.	- One Infilex BC controls up to four AHU groups. - Do not operate *VAV ON/OFF* with the user terminal when you set the *VAV interlocking with air conditioning unit* function. - Do not set the *air conditioning unit interlocking with VAV* function when you set the *VAV interlocking with air conditioning unit* function.
	Air conditioning unit interlocking with VAV*1	Interlocks the ON/OFF operations of the air conditioning unit with the ON/OFF status of the VAV units in the same AHU group.	- One Infilex BC controls up to four groups. - Do not set the *VAV interlocking with air conditioning unit* function when you set the *air conditioning unit interlocking with VAV* function.

AHU: Air handling unit
BMS: Building management system
VAV: Variable air volume

Notes:
*1 These functions are enabled by Infilex VC being combined with Infilex BC and other controllers integrated in our BMS.
*2 Dual setting is the method to have cooling setting and heating setting separately.

(2/2)

Item	Function	Description	Remark
Control	Temperature control	Controls VAV damper to meet the actual (measured) temperature with the set temperature.	Each Infilex VC can individually controls the VAV damper.
	Fan speed control*1	Detects over/short static pressure of the VAV unit and optimally controls the revolution speed of the supply air fan to minimize the fan power.	One Infilex BC controls up to four groups.
	Optimum temperature control of supply air*1	Controls the supply air temperature of the air conditioning unit at the optimum level to provide comfort and to save energy.	One Infilex BC controls up to four groups.
	Mixing loss control*1	Sets the difference between the set temperature of the perimeter zone air conditioning unit and the interior zone air conditioning unit that are interlocked. This prevents the mixing loss.	- One (group of) Infilex VC interlocks with another (group of) Infilex VC. - Slave-Infilex VC cannot interlock with a different Infilex VC. - Do not operate the slave-Infilex VC with the user terminal.
	Parallel operation of multiple VAV*1	Concurrently turns on/off the multiple VAV units or changes fan speed of the multiple VAV units (supply air VAV unit and return air VAV unit).	One-to-one Infilex VC or one-to-multiple Infilex VC are interlocked.
	Fan powered control	Turns on/off the fan of the VAV unit with fan to maintain enough airflow.	Fan output corresponds with heating/ cooling conditions and each fan type. - Series fan: Fan is ON when VAV unit is ON. - Parallel fan (for temperature): Fan is ON when VAV unit is ON in heating mode. - Parallel fan (for air volume): Fan is ON when VAV unit is ON in heating mode with low airflow.
	Reheat control*1	Enables the heating mode by electric heater or hot water valve.	- Electric heater and ON/OFF valve allow up to two-step control. Floating valve allows single-step control. - Reheat control is forcibly performed by operating the BMS client PC (manual override function).
Monitoring (with the BMS client PC)	Individual monitoring*1	Monitors and controls the point data (measuring, setting, operation, and control data) of Infilex VC from the BMS client PC. The following are examples of the point data for individual monitoring: VAV ON/OFF, VAV failure, room temperature, cool setting/main setting, heat setting, heat high limit/set high limit, cool low limit/set low limit, setback, re-heater output, fan output, measured air volume, max. air volume, damper position (Not all of the items above are required to monitor or control with the client PC.)	
	Point group monitoring*1	Forms a group of multiple Infilex VC having the same point data (measuring, setting, operation, and control data), monitors and controls grouped Infilex VC in combination with Infilex BC. Multiple Infilex VC are formed in a group per one of the following point data: VAV ON/OFF, VAV failure, room temperature*3, cool setting/main setting, heat setting, heat high limit/set high limit, cool low limit/set low limit, setback	One Infilex VC belonging to a group for a certain point data (point group monitoring) can be individually monitored or controlled for a different point data (individual monitoring). (e.g. VAV ON/OFF for group monitoring and room temperature for individual monitoring).
	Batch operation*1	Forcibly sets the airflow of all the VAV units (that are included in each air conditioning unit group) at the maximum or minimum volume by operating the BMS client PC.	- One Infilex BC controls up to four groups. - Batch operation is enabled with Infilex BC as well as with the BMS client PC.

BMS: Building management system
VAV: Variable air volume

Notes:
*1 These functions are enabled by Infilex VC being combined with Infilex BC and other controllers integrated in our BMS.
*3 Room temperature for point group monitoring is either the average value in a group or the representative value of a group.

LED Indication

After the power is applied to Infilex VC, check that the status indicator LED blinks in approx. 10 seconds. If it stays ON, Infilex VC is in abnormal status. The LED is ON for several seconds immediately after the power is applied to Infilex VC, but this does not indicate error.
For the description of LED indications, refer to Fig. 28.

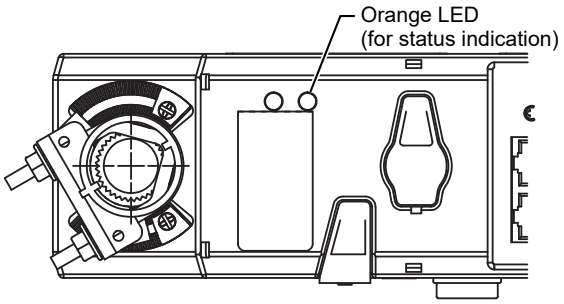


Figure 27. LED location

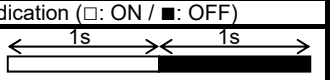
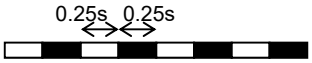
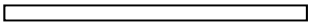
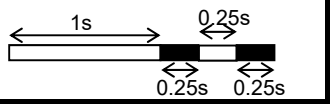
Status	LED indication (□: ON / ■: OFF)
Normal	Normal 
Power OFF	Power Off 
BACnet MS/TP error	BACnet MS/TP Error 
Initializing / Error	Error 1 
Minor error	Error 2 

Figure 28. Description of LED indication

IMPORTANT:
Do not press the LED button. Operation of Infilex VC will be stopped, and the automatic operation mode will switch to the adaption mode. (Infilex VC will fully close and open the VAV damper.)

Setting

The following settings must be performed by a technical engineer.

- Address setting
  Two address setting switches are located on the front surface of Infilex VC. The switch with "X10" indicates tens of the address, and the switch with "X1" indicates ones of the address.
  For setting the address, use the slotted screwdriver used for the wiring connection. (See the **Push-in terminal connection** section.)
- Parameter setting
  Infilex VC parameters are set in response to the size and type of VAV unit, room characteristics, and applications.
  For setting the parameters, our engineering tool (PC-MMI for BACnet) is required.

To Connect Two User Terminals

Up to two digital user terminals (Neopanel Model QY7205) can be connected to one Infilex VC.

To connect the two user terminals, the following are required.

- Modular branch unit (Model DY7203A0000)
  See the **Optional Parts** section for details.
- Neopanel with address 1 and with address 2
  (Note that two Neopanel with address 1 connected to the Infilex VC will not work.)

For two Neopanel connection, provide Model QY7205C_ _ _1 for the address 1 and Model QY7205C_ _ _2 for the address 2. Address number is indicated on the shipping carton and on the label attached to the inside surface of the Neopanel main unit (with the base cover removed).

Notes:
* The latest VAV unit ON/OFF operation or temperature setting operation with a Neopanel or with the BMS client PC is effective.
* Neopanel with address 2 (Model QY7205C_ _ _2) does not have the temperature measuring function.

Optional Parts

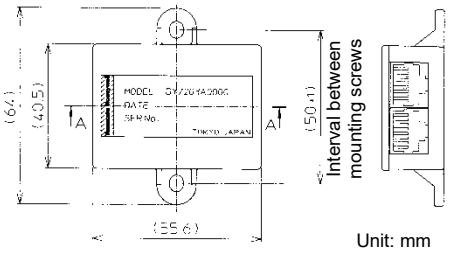


Figure 29. Modular branch unit: Part No. DY7203A0000

Modular branch unit (See Fig. 29):
Used to branch out the communication line for two user terminals to be connected.

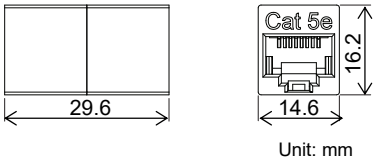


Figure 30. Modular relay unit: Part No. DY7202A0000

Modular relay unit (See Fig. 30):
Used to extend the communication line by connecting to another communication line.

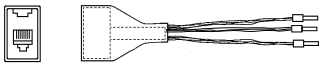


Figure 31. Adapter for connecting to a Pt100 temperature sensor: Part No. DY7204A0003

Adapter for connecting to a Pt100 temperature sensor (See Fig. 31):
Used to connect a Pt100 temperature sensor to Infilex VC with a modular connector.

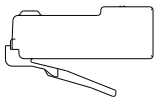


Figure 32. Modular plug: Part No. DY7207A0100

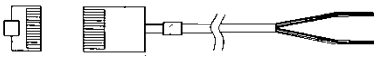


Figure 33. Connector cable for two terminals: Part No. DY7221A

Connector cable for two terminals (See Fig. 33):
Used to connect a Pt1000 temperature sensor to Infilex VC with a modular connector.

Precautions for use

- Modular branch unit, modular relay unit, adapter for connecting to a Pt100 temperature sensor, and connector cable for two terminals must be used in an outlet box or inside a panel.
- For the modular connector connection, be sure to insert the modular plugs into the modular jacks until they click. Then, lightly pull out the cables to make sure they are completely connected.

Optional Tools

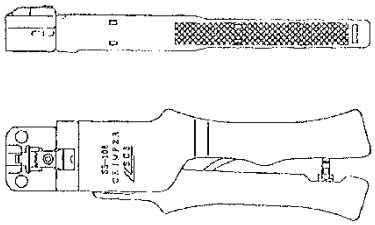


Figure 34. Modular crimper: Part No. DY7205A0002

Modular crimper (See Fig. 34.):
Used to crimp a modular plug on a LAN cable.

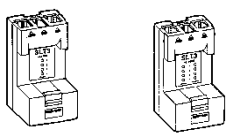


Figure 35. Modular cable tester: Part No. DY7206A0000

Modular cable tester (See Fig. 35.):
Used to check continuity of a LAN cable with modular plugs crimped on.

This blank page was added for page layout purposes.

This blank page was added for page layout purposes.

This blank page was added for page layout purposes.

This product complies with the essential requirements of the Electromagnetic Compatibility Directive (EMCD) and the Restriction of Hazardous Substances Directive (RoHSD).

EMCD: EN 61000-6-2
EN 61000-6-3

Infilex, PARAMATRIX, and savic-net are trademarks of Azbil Corporation in Japan or in other countries.
BACnet is a registered trademark of ASHRAE.
Modbus is a trademark and the property of Schneider Electric SE, its subsidiaries and affiliated companies.
TYGON is a trademark of Saint-Gobain Performance Plastics Corporation.

Specifications are subject to change without notice.

Azbil Corporation
Building Systems Company

https://www.azbil.com/