

Inflex™ AC AHU Controller Model WY5317C

General

Inflex AC (Inflex: named for “Infinity” and “Flexible”) Model WY5317C is a DDC (direct digital control) controller for AHU (air handling unit). It can be placed in a small place such as an AHU control panel.

Inflex AC is equipped with inputs and outputs suitable for AHU control, and its software can be freely edited in response to the applications.

In terms of operation, Inflex AC can be operated with a user terminal (Neopanel™ / Neoplate) or Operator Panel to correspond with various situations. Besides, it performs advanced control and management by communicating with BMS (building management system) savic-net™ FX via LonTalk® protocol. Inflex AC integrated into BMS enables autonomous control since Inflex AC itself has the time scheduling function.



Features

- Compact design:
Small size body can be fit into a control panel of a compact AHU unit.
- Various input/output (I/O) configurations:
Model number changes depending on the number of its I/O points, which allows external cooling control, humidification, and other AHU controls.
- User interface module (Operator Panel):
Operator Panel (panel mount type/integral type) connected to Inflex AC allows you, without changing the settings from the BMS center unit, to change the Inflex AC settings.
- Remote control with a user terminal:
Neopanel™ or Neoplate is connectable, so that a user at a remote location can perform ON/OFF operation and change temperature setting.
- Autonomous distributed control:
Even if a trouble occurs in the BMS center unit, the backup operation is performed individually to distribute potential risks caused by malfunction of the system.
- I/O module:
To Model WY5317C0400, one I/O module can be added so that the number of I/O points is increased.
- Cooperation with BMS:
To perform advanced control and management, Inflex AC can directly communicate with the BMS center unit (savic-net™ FX client PC).
- Installation:
Quick-fit screwless (clamp) terminal blocks are used for the I/O terminal block, ensuring the labor saving of the wiring work.
Additionally, a desired mounting method can be selected from two kinds of mounting methods, DIN rail mounting and screw mounting.
- CE Marking certified product:
Inflex AC conforms to all the applicable standards of CE Marking (Class A).









Safety Instructions

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
















Usage Restrictions

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 Azbil Corporation's sales representative. Azbil Corporation will not bear any responsibility for the results produced by the operators.

WARNING

-  • DANGER: To prevent the risk of severe or fatal electrical shock, always disconnect power source and product power supply before performing any wiring.
-  • Be sure to ground with 100 Ω or lower ground resistance. Improper grounding may cause electrical shock or equipment damages.
-  • Do not detach the terminal cover at any time except when wiring. After wiring, be sure to attach the terminal cover. Before attaching/detaching the terminal cover, make sure that the wires are not current-carrying to prevent electrical shock.
-  • Disconnect power before the product replacement to prevent electrical shock.
-  • Wire strip length to be connected to the quick-fit screwless terminal block must be 8 mm. If the strip length is longer than 8 mm, the conductor will be exposed, causing electrical shock or short circuit between adjacent terminals. If it is shorter, the conductor will not contact the connector.
-  • Do not disassemble the product. Disassembly may result in electrical shock or equipment damage.

CAUTION

-  • Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
-  • Installation must be carried out according to the operating conditions (power, temperature, humidity, vibration, shock, installation position, atmospheric condition, etc) specified in this manual to prevent equipment damages.
-  • All wiring must comply with local codes of indoor wiring and electric installation rules.
-  • Install a circuit breaker or circuit protector in the power supply circuit that supplies the power to the product.
-  • Use crimp terminal lugs with insulation for electric wires connected to the screw terminals.
-  • Connect cables to the power source with terminals or the like for permanent connection.
-  • Make sure all the wires are tightly connected to prevent heat generation or equipment damages.
-  • If more than the rated power supply voltage is applied, product replacement is required for safety.
-  • Install this product in a location out of reach of unauthorized people. (e.g. Inside of the control panel cabinet)
-  • Lightning protection based on the regional characteristics and the building structure is needed to minimize equipment damages.
-  • Noise protection is necessary when the product is installed in a location close to many noise sources.
-  • Do not block the vent holes of the product to prevent equipment damages. Remove protective sheet after installation and wiring.
-  • After mounting the product on DIN rail, make sure that the holding parts of all the modules are properly fixed with their whole parts lifted. The product may drop from the DIN rail and be damaged due to improper mounting.
-  • Dispose of the lithium battery in accordance with your local regulations.
-  • Dispose of this product in accordance with your local regulations. Do not reuse all or a part of this product.

Trademark information:

Inflex, Neopanel, PARAMATRIX and savic-net are trademarks or registered trademarks of Azbil Corporation in Japan or in other countries.

BACnet is a registered trademark of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

CompactFlash is a U.S. registered trademark of SanDisk Corporation.

KPEV is a registered trademark of Furukawa Electric Co., Ltd.

LonTalk is a trademark of Echelon Corporation registered in the United States and other countries.

System Configurations

Inflex AC integrated into BMS: savic-net™ FX

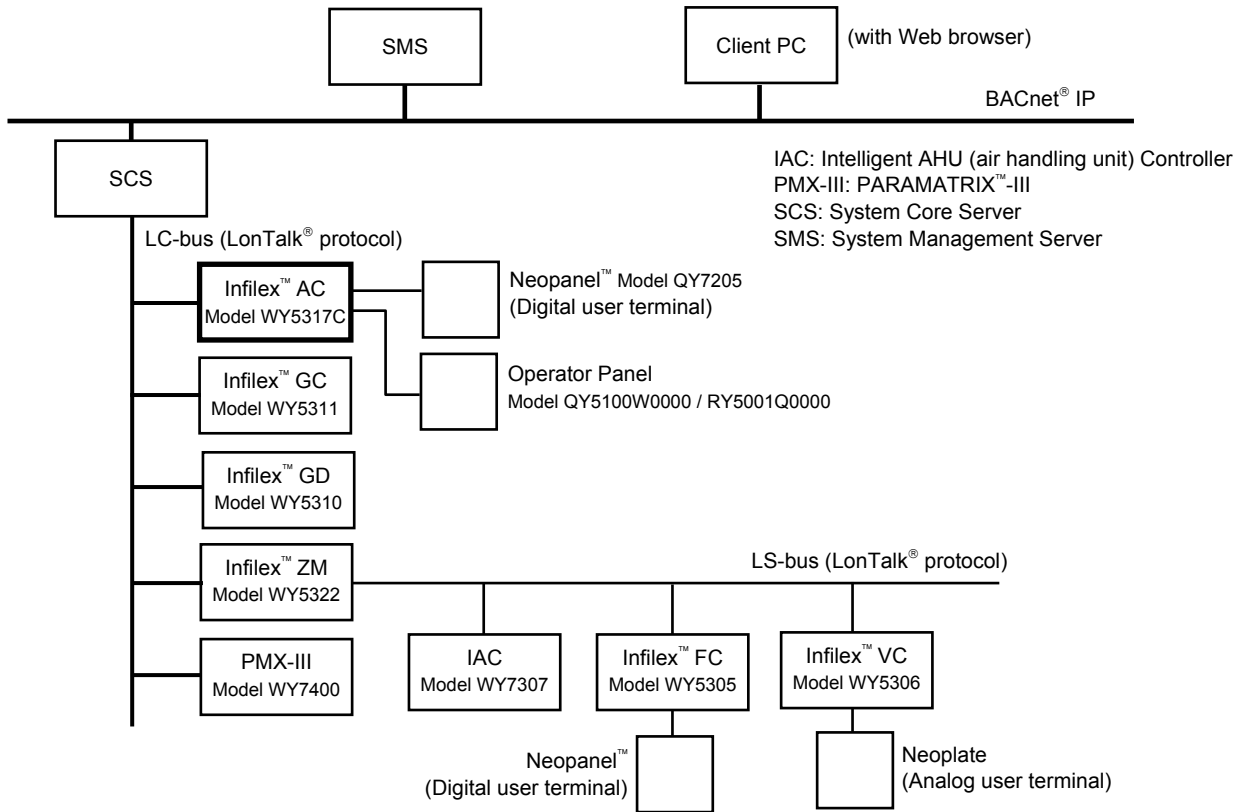


Figure 1. System configuration example of BMS-integrated Inflex AC

Notes:

- * On 1 channel of LC-bus (2 lines for 1 channel), max. 50 remote units (also called 'controllers') can be connected. For Inflex ZM, however, max. 10 units can be connected on LC-bus (5 units per 1 line, 2 lines for 1 channel).
- * Max. wiring length of LC-bus (2 lines for 1 channel) is 900 m.
- * On LS-bus, max. 50 remote units (also called 'sub-controllers') can be connected.
- * Max. wiring length of LS-bus is 900 m.

Standalone Inflex AC

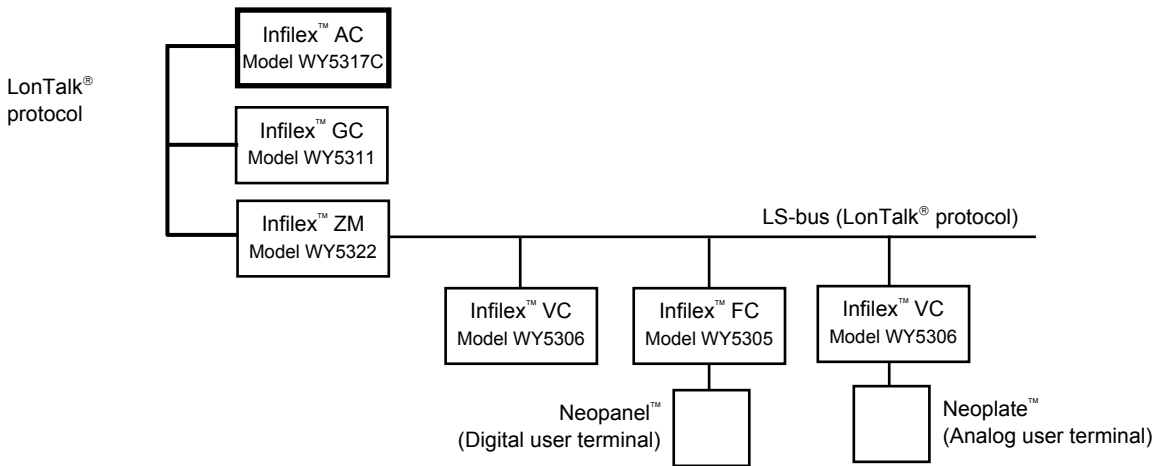


Figure 2. System configuration example of standalone Inflex AC

Notes:

- * On LS-bus, max. 50 remote units (sub-controllers) can be connected.
- * Max. wiring length of LS-bus is 900 m.

Model Numbers

Model number				Description
WY5317				Base model number
	C			24 V AC power
		0		Fixed
			1	Temperature input: 2 pts., voltage input: 2 pts., digital input: 4 pts., voltage output: 2 pts., relay output: 3 pts. 1 user interface module can be combined. (e.g., for basic AHU control: chilled/hot water valve + humidification (proportional))
			2	Temperature input: 2 pts., voltage input: 2 pts., digital input: 4 pts., voltage output: 3 pts., relay output: 4 pts. 1 user interface module can be combined. (e.g., for proportional humidifying control: chilled water valve + hot water valve + humidification (proportional))
			3	Temperature input: 2 pts., voltage input: 2 pts., digital input: 6 pts., voltage output: 5 pts., relay output: 5 pts. 1 user interface module can be combined. (e.g., for outdoor air cooling control: the same as Model WY5317C02 + inverter fan speed control)
			4	Temperature input: 2 pts., voltage input: 2 pts., digital input: 8 pts., voltage output: 6 pts., relay output: 6 pts. 1 user interface module and/or 1 I/O module can be combined. (e.g., for proportional humidifying control + outdoor air cooling control: the same as Model WY 5317C03 + outdoor air cooling control)
			00	Fixed

Notes:

- * For I/O modules and user interface modules (UT module and Operator Panel) to be combined with Inflex AC Model WY5317C0400, separate order is required.
- * Regarding I/O modules and user interface modules to be combined with Model WY5317C, refer to AB-6527 Specifications/Instructions of Model RY50XX.

Parts for Installation

For details regarding Inflex AC installation, refer to Installation manual of the Inflex series controllers

Part number	Description
83165861-001	Screw tab
83104567-001	DIN rail mounting bracket

Note:

For mounting Inflex AC, either the screw tab (for screw mounting) or the DIN rail mounting bracket (for DIN rail mounting) is required. Be sure to separately order depending on your mounting type.

Specifications

Basic specifications

Item		Specification			
Power supply		Rated voltage	24 V AC, 50 Hz/60 Hz		
		Allowable voltage range	20.4 V AC to 27.6 V AC, 50 Hz/60 Hz		
		Power shutdown detection	19.2 V AC or less		
		Power consumption	15 VA		
Environmental conditions		Rated operating conditions			
		Ambient temperature	0 °C to 50 °C		
		Ambient humidity	10 %RH to 90 %RH (non-condensing)		
		Altitude	2000 m or lower		
		Vibration	Max. 5.9 m/s ² at 10 Hz to 150 Hz		
		Transport/storage conditions		Ambient temperature	-20 °C to 60 °C
		Ambient humidity	5 %RH to 95 %RH (non-condensing)		
Vibration for storage	Max. 5.9 m/s ² at 10 Hz to 150 Hz				
Vibration for transport	Max. 9.8 m/s ² at 10 Hz to 150 Hz				
LED indication		Operation			
		Repetition of 1-second ON and 1-second OFF	Data being transmitting		
		Repetition of 0.25-second ON and 0.25-second OFF	LC-bus error		
		ON	Major failure or initializing		
		Repetition of 1-second ON, 0.25-second OFF, 0.25-second ON, and 0.25-second OFF	Minor failure		
		Repetition of 0.25-second ON, 0.25-second OFF, 0.25-second ON, and 1.25-second OFF	Engineering mode		
		OFF	Power OFF		
LonTalk service	Operation in accordance with the LonTalk specifications.				
Input		Digital input			
		Current	Typ. 5 mA		
		Voltage	Typ. 24 V DC		
		Connectable output	Potential free contact		
		Temperature input		Input signal	RTD Pt 100 Ω / 0 °C
		Measuring range	-20 °C to 80 °C		
		Voltage input		Input voltage range	1 V to 5 V
Input impedance	500 kΩ				
Output		Relay output (normally open (N.O.) contact)			
		Output method	Relay output N.O. contact (N.O. contacts share the same common line.)		
		Contact rating	Max. 24 V AC, 0.5 A (inductive load: cos φ 0.4 or more) Max. 24 V DC, 0.5 A		
		Min. applicable load	5 V, 10 mA		
		Relay output (normally open/normally close (N.O./N.C.) contact)		Output method	Relay output N.O./N.C. contact (N.O./N.C. contacts use a different common line from N.O. contacts.)
		Contact rating	Max. 24 V AC, 0.5 A (inductive load: cos φ 0.4 or more) Max. 24 V DC, 0.5 A		
		Min. applicable load	5 V, 10 mA		
Voltage output		Output voltage range	2 V to 10 V / 0 V to 10 V		
Min. load resistance	10 kΩ or higher				
Power failure backup		RAM, RTC*	Lithium battery backup		
		Data file	Non-volatile memory (flash memory) backup		
Communications		LC-bus			
		Transmission system	LonTalk protocol (TP/FT-10, transceiver)		
		Transmission speed	78 kbps		
		Transmission distance	900 m (for bus topology connection)		
Remote units	Max. 50 remote units connectable				
Weight		500 g			
Material (housing), color		Modified PPE, light gray			
Terminal block		Power supply, ground	M3 screw terminals		
		Inputs/outputs	Quick-fit screwless terminal blocks		
		LC-bus communication	Modular connectors		

Note:

* RTC: Real Time Clock. RTC is backed up by a lithium battery to ensure accurate clocking while the power is OFF

Wiring specifications

Item	Wiring	Wiring length	Condition
Power supply	JIS IV2.0 mm ² or JIS CVV 2.0 mm ² or greater	—	—
Ground	JIS IV 2.0 mm ² or JIS CVV 2.0 mm ² or greater	—	Ground resistance: 100 Ω or lower
Digital input	JIS IV, JIS CVV, or KPEV [®] 0.9 mm ² , 1.25 mm ²	50 m	—
Relay output	JIS IV, JIS CVV, or KPEV [®] 1.25 mm ²	50 m	30 V AC/DC or less
Temperature input	JIS IV, JIS CVV, or KPEV [®] 1.25 mm ²	50 m	—
Voltage input	JIS IV, JIS CVV, or KPEV [®] 0.9 mm ² , 1.25 mm ²	50 m	—
Voltage output	JCS* CVV-S 1.25 mm ²	20 m	Inverter output
	JIS IV, JIS CVV, or KPEV [®] 1.25 mm ²	10 m	Valve/damper (to be connected for the system common*) *See Notes.
	JIS IV, JIS CVV, or KPEV [®] 2.0 mm ² (from the relay terminal block)	20 m	
	JIS IV, JIS CVV, or KPEV [®] 1.25 mm ²	20 m	Valve/damper
LC-bus	EIA/TIA-568 category 5 or over (φ0.5 × 4 poles)	900 m	For bus network topology

Notes

- * M3 screw terminal block is provided for wiring of power supply and ground. Crimp terminals therefore are required for the cable ends.
- * Quick-fit screwless terminal blocks are provided for the wiring of communication and I/O. The wires can be connected only by stripping the sheath. (Sheath stripped length: 8 mm, pin terminal cannot be used.)
- * Organize the cables with cable binding bands so as not to hide LED, battery holder, or tag.
- * JIS: Japanese Industrial Standards
- * KPEV is a wiring standard provided by Furukawa Electric Co., Ltd.
- * JCS: Japanese Electric Wire and Cable Makers' Association
- * System common: Ground line (L) is used as a common line for signal (-) transmission. Actuator/damper thus has to have mutual ground as the connected Inflex AC.

When the valve/damper is connected for the system common, the valve/damper operating current flows through the common line. Hence, the specification is as shown above. For a 20-m-long IV 1.25 mm² cable, use 4 wires for connections to prevent the operating current from flowing through the common line.

Specifications of I/O modules, user interface modules, and Operator Panel

For the specifications of I/O modules and user interface modules, refer to Specifications/Instructions of Model RY50XX (AB-6527). For the specifications of Operator Panel (integral type / panel mount type), refer to Specifications/Instructions of Model RY5001Q/QY5100W (AB-6546).

CE Marking Conformity

This product must be installed in a panel cabinet.

This product complies with the following Electromagnetic Compatibility (EMC).

EMC: EN61326-1 Class A, Table 2 (For use in an industrial electromagnetic environment)

Input/Output Terminal Arrangement

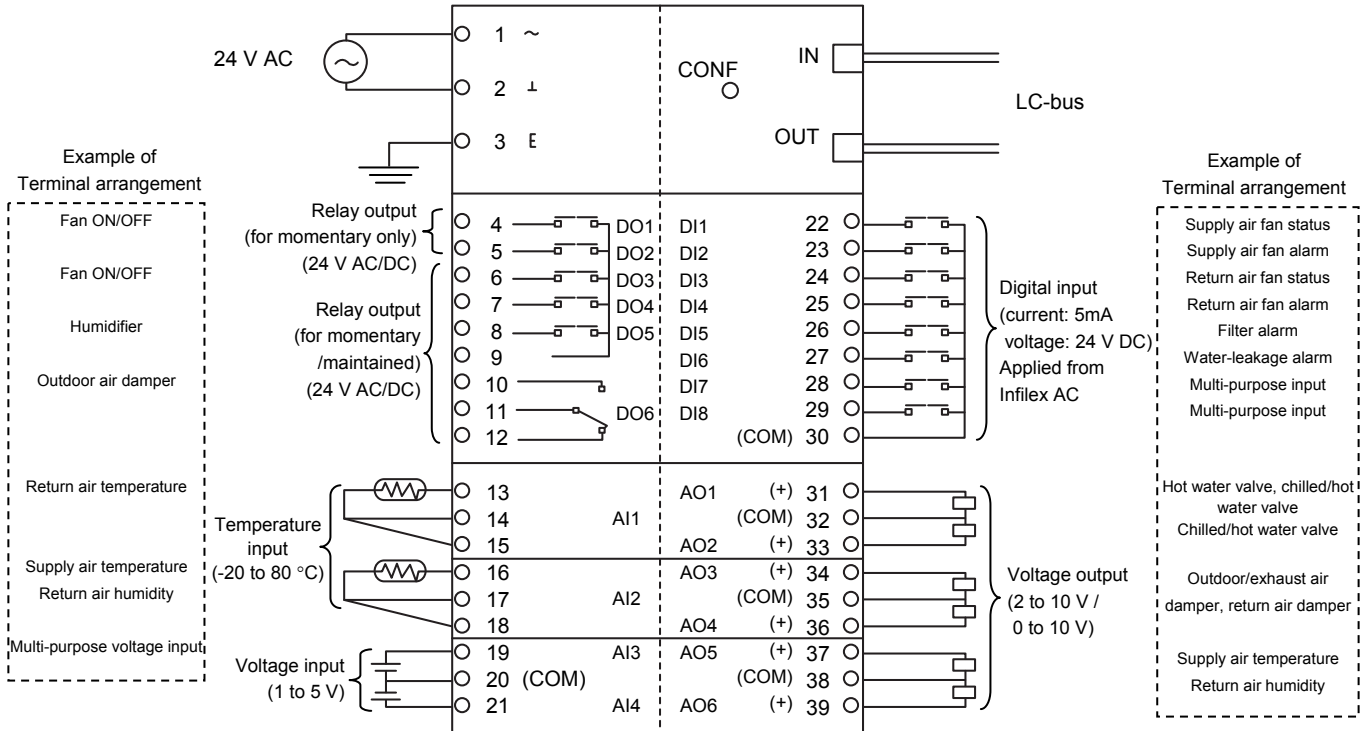


Figure 3. Example of input/output terminal arrangement

Note:

Fig. 3 shows an application example. Other applications that satisfy input/output specifications are applicable as well. For applicable inputs and outputs of each Infilex AC model, refer to Table 1.

Table 1. Applicable inputs/outputs for each model number

Model number	AI1 to AI4	AO1, AO2	AO3	AO4	AO5	AO6	DI1 to DI4	DI5, DI6	DI7, DI8	DO1, DO2	DO3	DO4	DO5	DO6
WY5317C0100	✓	✓					✓			✓				✓
WY5317C0200	✓	✓	✓				✓			✓	✓			✓
WY5317C0300	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓		✓
WY5317C0400*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

*** Note:**

An I/O module can be added to Model WY5317C0400. For the applicable I/O module, refer to AB-6527 Specifications/Instructions of Model RY50XX.

Dimensions

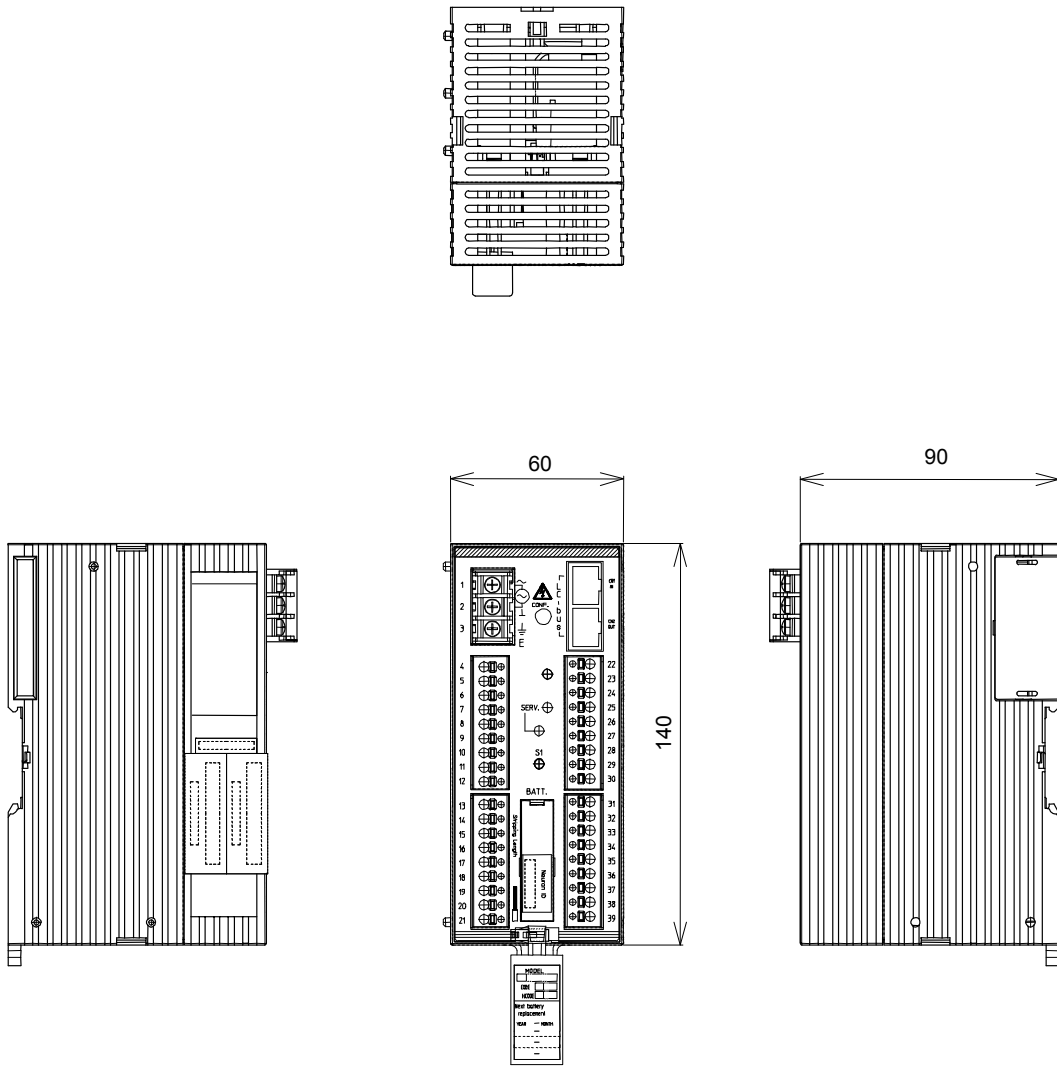


Figure 4. Dimensions (mm)

Parts Identification

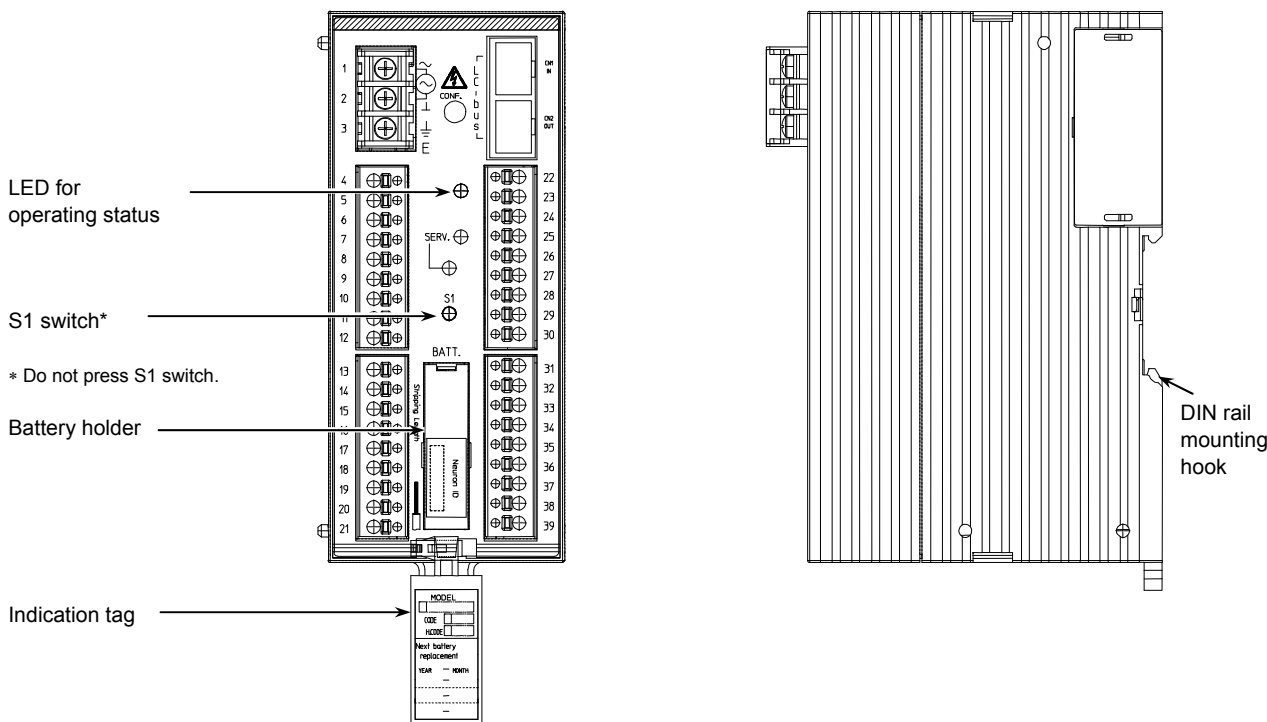


Figure 5. Parts identification

Table 2. Indication and operation of operating status LED

LED indication	LED operation
Data transmitting	Repetition of 1-second ON and 1-second OFF
LC-bus error	Repetition of 0.25-second ON and 0.25-second OFF
Major alarm / initializing	ON
Minor alarm	Repetition of 1-second ON, 0.25-second OFF, 0.25-second ON, and 0.25-second OFF.
Engineering mode	Repetition of 0.25-second ON, 0.25-second OFF, 0.25-second ON, and 1.25-second OFF.
Power OFF	OFF

Connection of Data Setter for LonTalk Protocol

Connect the CompactFlash® memory type Data Setter (Model QY5111B) for LonTalk protocol to LC-bus port of Inflex AC with the Data Setter adaptor (Part No. DY5301S0000) or to CONF. port of Inflex AC with the conversion cable Part No. 83166788-001 (1 cable) / 83166788-010 (10 cables) and Data Setter adaptor Part No. DY5301S0000.

For details of Data Setter adaptor Part No. DY5301S0000, refer to its Specifications manual.

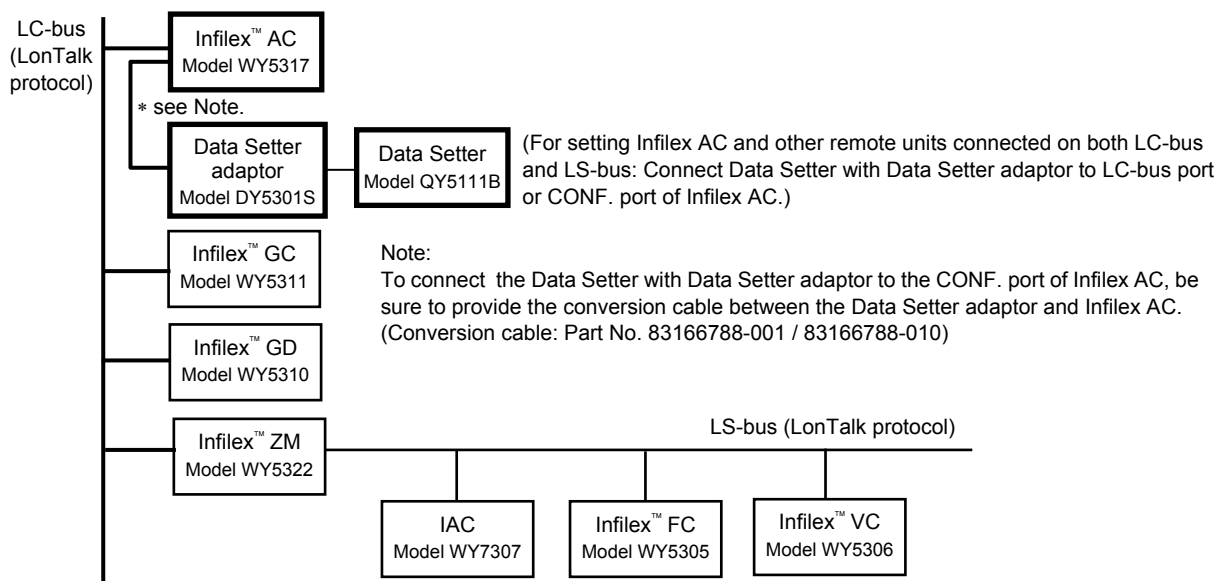


Figure 6. Connection example of Data Setter with Data setter adaptor to LC-bus port/CONF. port of Inflex AC

Maintenance (Lithium Battery Replacement)

Replace the lithium battery for backup (Part No. 83104934-001) for every 5 years.

- IMPORTANT:**
- Since the remaining battery capacity cannot be checked by measuring the terminal voltage, be sure to replace the battery every 5 years.
 - Only authorized service personnel is allowed to replace the battery.
 - Do not touch the power supply unit when replacing the battery.
 - Replace the lithium battery every 5 years if the product is always in use (in ON state).
 - Replace the lithium battery with the power ON.
 - If the product has never or hardly been operated (in OFF state) for a year, replace the lithium battery before the product operation.

Battery replacement

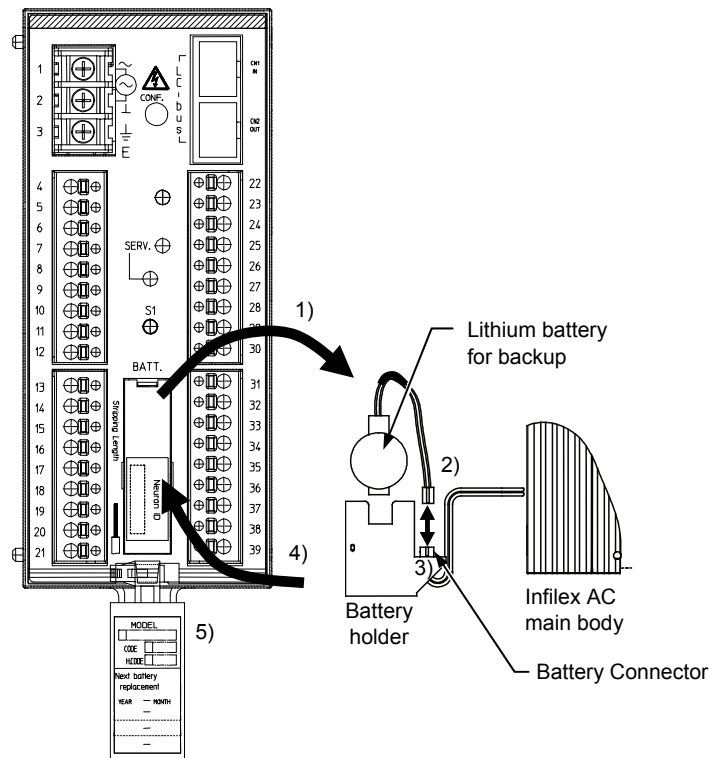


Figure 7. Battery replacement

- 1) Pull out the battery holder using a slotted screwdriver.
- 2) Disconnect the battery connector and detach the lithium battery from the battery holder.
- 3) Place a new lithium battery in the battery holder and connect the battery connector to it.
- 4) Insert the battery holder into the main body.
- 5) Fill in the date for next replacement (5 years after the replacement) on the indication tag using an oil-based pen.

Precautions for Use

- Do not mount the product under the conditions of high temperature and humidity.
- Be sure not to drop the product.
- Be sure to shut down the power (disconnect the wiring between the power supply and the product power terminals) for the wire replacement.
- Before turning on the power, make sure that wires are correctly connected.
- Do not connect wires to vacant terminals.
- Several tens of seconds are required for the product normal operation after the power is turned on. During this time, the LED on the front lights up temporarily, but this does not indicate an error.
- Be sure to use a small-power circuit to turn on/off the fan.
- Be sure to use a shielded wire for the signals output to the inverter.
- Leave at least 35 mm clearance between the top/bottom surfaces of the product and other devices.
- Peel off the protective sheet on the top surface of the product before turning on the power (see Fig. 8).

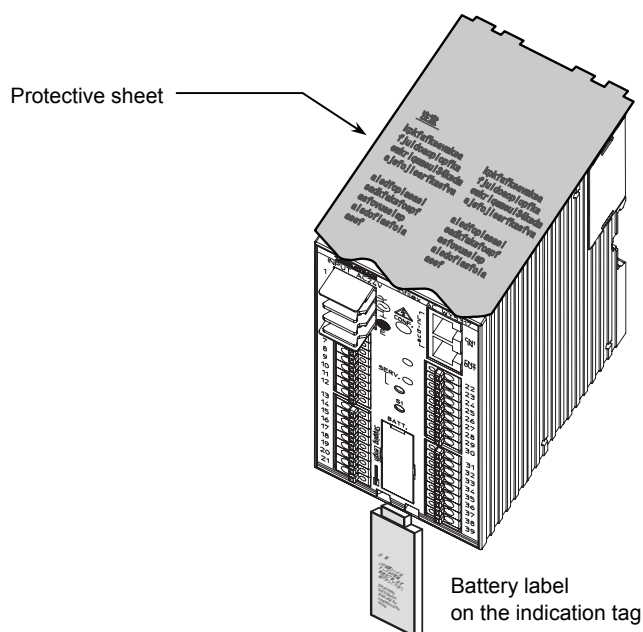


Figure 8. Battery label and protective sheet

azbil

Specifications are subject to change without notice.

Azbil Corporation
Building Systems Company

<http://www.azbil.com/>