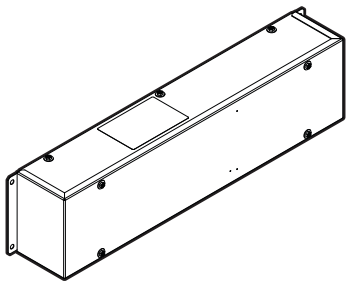
Installation manual

Communication box



BRR9B1V1

Table of contents

1 About the documentation

1.1 About this document

The term "indoor unit" here applies to indoor unit for air conditioning.

WARNING

Make sure installation, servicing, maintenance, repair and applied materials follow the instructions from Daikin (including all documents listed in “Documentation set”) and, in addition, comply with applicable legislation and are performed by qualified persons only. In Europe and areas where IEC standards apply, EN/IEC 60335-2-40 is the applicable standard.

Target audience

Authorised installers

Documentation set

This document is part of a documentation set. The complete set consists of:

- **Installation manual:**
  - Installation instructions, configuration, …
  - Format: Paper (supplied in the kit) + digital files on https://www.daikin.eu. Use the search function to find your model.

Latest revisions of the supplied documentation may be available on the regional Daikin website or via your dealer.

The original instructions are written in English. All other languages are translations of the original instructions.

Technical engineering data

- A **subset** of the latest technical data is available on the regional Daikin website (publicly accessible).
- The **full set** of latest technical data is available on the Daikin Business Portal (authentication required).

2 General safety precautions

2.1 About the documentation

- The original instructions are written in English. All other languages are translations of the original instructions.
- The precautions described in this document cover very important topics, follow them carefully.
- The installation of the system, and all activities described in the installation manual and in the installer reference guide MUST be performed by an authorised installer.

2.1.1 Meaning of warnings and symbols

DANGER

Indicates a situation that results in death or serious injury.

DANGER: RISK OF ELECTROCUTION

Indicates a situation that could result in electrocution.

DANGER: RISK OF BURNING/SCALDING

Indicates a situation that could result in burning/scalding because of extreme hot or cold temperatures.

DANGER: RISK OF EXPLOSION

Indicates a situation that could result in explosion.

WARNING

Indicates a situation that could result in death or serious injury.

WARNING: FLAMMABLE MATERIAL

CAUTION

Indicates a situation that could result in minor or moderate injury.

NOTICE

Indicates a situation that could result in equipment or property damage.

INFORMATION

Indicates useful tips or additional information.

Symbols used on the unit:

Symbol	Explanation
	Before installation, read the installation and operation manual, and the wiring instruction sheet.
	Before performing maintenance and service tasks, read the service manual.
	For more information, see the installer and user reference guide.
	The unit contains rotating parts. Be careful when servicing or inspecting the unit.

Symbols used in the documentation:

Symbol	Explanation
	Indicates a figure title or a reference to it. **Example:** "▲ 1–3 Figure title" means "Figure 3 in chapter 1".
	Indicates a table title or a reference to it. **Example:** "▦ 1–3 Table title" means "Table 3 in chapter 1".

2.2 For the installer

2.2.1 General

If you are NOT sure how to install or operate the unit, contact your dealer.

DANGER: RISK OF BURNING/SCALDING

- Do NOT touch the refrigerant piping, water piping or internal parts during and immediately after operation. It could be too hot or too cold. Give it time to return to normal temperature. If you MUST touch it, wear protective gloves.
- Do NOT touch any accidental leaking refrigerant.

WARNING

Improper installation or attachment of equipment or accessories could result in electrical shock, short-circuit, leaks, fire or other damage to the equipment. ONLY use accessories, optional equipment and spare parts made or approved by Daikin unless otherwise specified.

WARNING

Make sure installation, testing and applied materials comply with applicable legislation (on top of the instructions described in the Daikin documentation).

WARNING

Tear apart and throw away plastic packaging bags so that nobody, especially NOT children, can play with them. **Possible consequence:** suffocation.

WARNING

Provide adequate measures to prevent that the unit can be used as a shelter by small animals. Small animals that make contact with electrical parts can cause malfunctions, smoke or fire.

CAUTION

Wear adequate personal protective equipment (protective gloves, safety glasses,...) when installing, maintaining or servicing the system.

CAUTION

Do NOT touch the air inlet or aluminium fins of the unit.

CAUTION

- Do NOT place any objects or equipment on top of the unit.
- Do NOT sit, climb or stand on the unit.

In accordance with the applicable legislation, it might be necessary to provide a logbook with the product containing at least: information on maintenance, repair work, results of tests, stand-by periods,...

Also, at least, following information MUST be provided at an accessible place at the product:

- Instructions for shutting down the system in case of an emergency
- Name and address of fire department, police and hospital
- Name, address and day and night telephone numbers for obtaining service

In Europe, EN378 provides the necessary guidance for this logbook.

2.2.2 Installation site

- Provide sufficient space around the unit for servicing and air circulation.
- Make sure the installation site withstands the weight and vibration of the unit.
- Make sure the area is well ventilated. Do NOT block any ventilation openings.
- Make sure the unit is level.

Do NOT install the unit in the following places:

- In potentially explosive atmospheres.
- In places where there is machinery that emits electromagnetic waves. Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
- In places where there is a risk of fire due to the leakage of flammable gases (example: thinner or gasoline), carbon fibre, ignitable dust.
- In places where corrosive gas (example: sulphurous acid gas) is produced. Corrosion of copper pipes or soldered parts may cause the refrigerant to leak.

2.2.3 Electrical

DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 10 minutes, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage MUST be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram.
- Do NOT touch electrical components with wet hands.
- Do NOT leave the unit unattended when the service cover is removed.

WARNING

If NOT factory installed, a main switch or other means for disconnection, having a contact separation in all poles providing full disconnection under overvoltage category III condition, MUST be installed in the fixed wiring.

WARNING

- ONLY use copper wires.
- Make sure the field wiring complies with the applicable legislation.
- All field wiring MUST be performed in accordance with the wiring diagram supplied with the product.
- NEVER squeeze bundled cables and make sure they do NOT come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- Make sure to install earth wiring. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Make sure to use a dedicated power circuit. NEVER use a power supply shared by another appliance.
- Make sure to install the required fuses or circuit breakers.
- Make sure to install an earth leakage protector. Failure to do so may cause electrical shock or fire.
- When installing the earth leakage protector, make sure it is compatible with the inverter (resistant to high frequency electric noise) to avoid unnecessary opening of the earth leakage protector.

WARNING

- After finishing the electrical work, confirm that each electrical component and terminal inside the electrical components box is connected securely.
- Make sure all covers are closed before starting up the unit.

CAUTION

- When connecting the power supply: connect the earth cable first, before making the current-carrying connections.
- When disconnecting the power supply: disconnect the current-carrying cables first, before separating the earth connection.
- The length of the conductors between the power supply stress relief and the terminal block itself MUST be as such that the current-carrying wires are tautened before the earth wire is in case the power supply is pulled loose from the stress relief.

NOTICE

Precautions when laying power wiring:

- Do NOT connect wiring of different thicknesses to the power terminal block (slack in the power wiring may cause abnormal heat).
- When connecting wiring which is the same thickness, do as shown in the figure above.
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will damage the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them.

Install power cables at least 1 meter away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 meter may NOT be sufficient.

NOTICE

ONLY applicable if the power supply is three-phase, and the compressor has an ON/OFF starting method.

If there exists the possibility of reversed phase after a momentary black out and the power goes ON and OFF while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase can break the compressor and other parts.

3 Specific installer safety instructions

Always observe the following safety instructions and regulations.

WARNING

Installation shall be done by an installer, the choice of materials and installation shall comply with the applicable legislation. In Europe, EN378 is the applicable standard.

WARNING

Provide adequate measures to prevent that the unit can be used as a shelter by small animals. Small animals that make contact with electrical parts can cause malfunctions, smoke or fire.

WARNING

- Make sure the electrical wiring does NOT obstruct correct reattachment of the communication box cover. Incorrect reattachment of the communication box cover might result in electrical shocks, fire, or terminal overheating.
- Do NOT connect the power supply wires to the terminal block for the transmission wiring. Incorrect connection is very dangerous, results in damage, and possible burnout of the electrical components.
- Do NOT use stranded wires with a solder finish applied. A loose wire or other abnormalities might cause abnormal heating.

WARNING

- When opening the front plate of an outdoor unit during operation, be careful of a rotating fan. The fan continues rotating for a while even after the operation is stopped.
- Before turning ON the power supply, make sure that the operation switch of the outdoor unit is turned OFF. You can check this via the inspection hole of the electrical component box (middle) of the outdoor unit.
- After turning ON the power supply, operate the push buttons and check the LED indication via the inspection hole of the electrical component box (middle) of the outdoor unit. Operating with the cover open might cause an electrical shock.
- For more information on how to configure the monitoring system (field supply), see the manual of the supplier.

WARNING

- Do NOT turn ON the power when the communication box cover is open. An electrical shock might occur.
- Before turning ON the power, make sure that the communication box cover is closed.

CAUTION: Precautions when setting the slave address

- Do NOT set the same slave address for devices connected to the Modbus master device.
- Apart from the slave address set in the communication box, there are 2 other slave addresses that cannot be set. When the slave address on the PCB for the outdoor unit (A2P) is set to "A", slave addresses "A+1" and "A+2" CANNOT be set. Slave address "A" is used for the outdoor unit, "A+1" is used for the capacity up unit, and "A+2" may NOT be used.

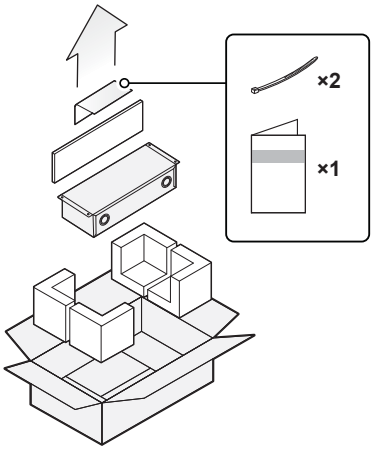
4 About the box

Keep the following in mind:

- At delivery, the unit MUST be checked for damage and completeness. Any damage or missing parts MUST be reported immediately to the claims agent of the carrier.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
- Prepare in advance the path along which you want to bring the unit to its final installation position.

4.1 Communication box

4.1.1 To remove the accessories from the communication box



a Installation manual
b Cable tie (2×)

5 About the communication box

INFORMATION

The modbus communication box is used for refrigeration units, e.g. LREN*, LRYEN10*, LRNUN* .

For the complete compatibility, refer to the service manual.

Communication box (BRR9B1V1)

Install the modbus communication box to fully integrate your system with building control automation networks and other monitoring systems.

NOTICE

ALWAYS check with the reference guide of the installed outdoor unit if the communication box is compatible with it. Do NOT connect the communication box to any other unit.

Also see: "8.1 About the PCBs" [▸ 20].

General names and product names

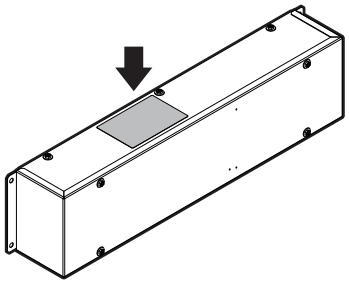
In this manual, we use the following names:

General name	Product name
Communication box	BRR9B1V1
Outdoor unit	Main outdoor unit. For example: LREN*, LRYEN10*
Capacity up unit	Additional outdoor unit for extra refrigeration capacity. For example: LRNUN*

5.1 Identification

5.1.1 Identification label: Communication box

Location



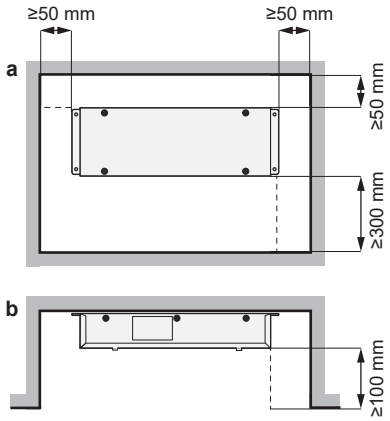
6 Unit installation

In this chapter

6.1 Preparing the installation site

6.1.1 Installation site requirements of the communication box

- Mind the following spacing installation guidelines:

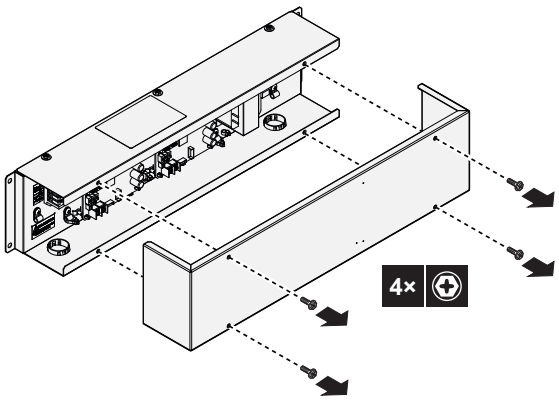


a Front view
b Top view

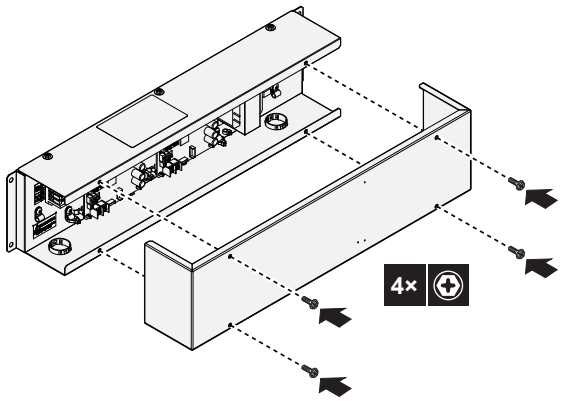
- The communication box is designed for indoor installation only and for ambient temperatures ranging from –5~35°C.

6.2 Opening and closing the unit

6.2.1 To open the communication box



6.2.2 To close the communication box



6.3 Installing the communication box

6.3.1 Precautions when installing the communication box

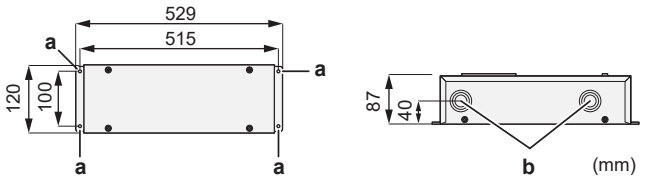
INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

6.3.2 To install the communication box

1 Drill 4 holes at the fixing points.



a Hole for a M5 self-tapping screw (4 fixing points)
b Wiring intake

2 Secure the communication box using 4 screws (field supply).

INFORMATION

Install the communication box on a sufficiently strong wall using fixing screws (field supply) suitable for the wall.

INFORMATION

- Make sure that the wiring intakes face downward.
- Make sure that dew or rainwater will not drop on the field wiring.
- Provide traps in front of the wiring intakes.

7 Electrical installation

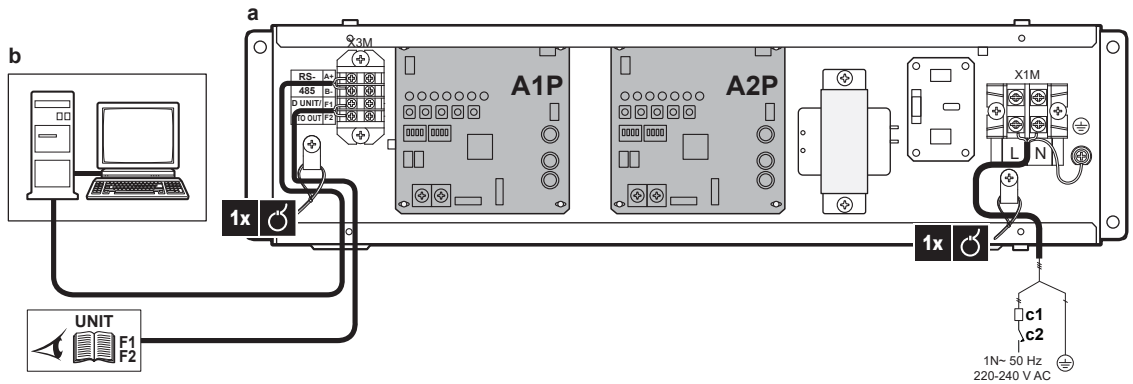
DANGER: RISK OF ELECTROCUTION

WARNING

ALWAYS use multicore cable for power supply cables.

In this chapter

7.1 Field wiring: Overview



a Communication box
b Monitoring system (field supply)
c1 Overcurrent fuse (field supply)
c2 Earth leakage circuit breaker (field supply)

Field wiring

Field wiring consists of:

- power supply (including earth),
- DIII transmission wiring between communication box and outdoor unit,
- RS-485 transmission wiring between communication box and monitoring system.

NOTICE

- Keep the power line and transmission line apart from each other. Transmission wiring and power supply wiring may cross, but may NOT run parallel.
- In order to avoid any electrical interference, the distance between both wirings should ALWAYS be at least 50 mm.

Transmission wiring

7–1 DIII weak current – Transmission wiring between each unit except monitoring system

Transmission wiring specification and limits[a]	
Only use harmonised wire providing double insulation and suitable for the applicable voltage. 2-cord cable. 0.75~1.25 mm².	
Maximum wiring length	1000 m
Total wiring length	≤2000 m

[a] If the total transmission wiring exceeds these limits, communication errors might occur.

7–2 RS-485 weak current – Transmission wiring between monitoring system and communication box

Transmission wiring specification and limits[a]	
Only use harmonised wire providing double insulation and suitable for the applicable voltage. 2-cord cable. 0.75~1.25 mm².	
Maximum wiring length	1200 m

[a] If the total transmission wiring exceeds these limits, communication errors might occur.

7.2 Guidelines when connecting the electrical wiring

7–3 Tightening torque for power supply

Item	Tightening torque (N•m)
Terminal block (X1M) (M4)	1.18~1.44
Earth terminal (M5)	3.02~4.08

7–4 Tightening torque for transmission wiring

Item	Tightening torque (N•m)
Communication box terminal block (X3M) (M3.5)	0.79~0.97
Outdoor unit terminal block (X1M (A1P)) (M3.5)	0.80~0.96

7.3 Specifications of standard wiring components

NOTICE

We recommend using solid (single-core) wires. If stranded wires are used, slightly twist the strands to consolidate the end of the conductor for either direct use in the terminal clamp or insertion in a round crimp-style terminal. Details are described in "Guidelines when connecting the electrical wiring" in the installer reference guide.

7–5 Power supply and earth wire

Component	Specification
Power supply wire	Must comply with the national wiring regulation. 3–core cable. Wire size based on the current, but not less than 2.0 mm²
Power supply wire – maximum wiring length	250 m
Earth wire	No less than 2 mm² (Ø1.6 mm)

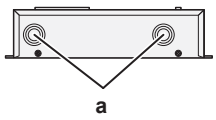
7.4 To connect the electrical wiring on the communication box

WARNING

- Make sure the electrical wiring does NOT obstruct correct reattachment of the communication box cover. Incorrect reattachment of the communication box cover might result in electrical shocks, fire, or terminal overheating.
- Do NOT connect the power supply wires to the terminal block for the transmission wiring. Incorrect connection is very dangerous, results in damage, and possible burnout of the electrical components.
- Do NOT use stranded wires with a solder finish applied. A loose wire or other abnormalities might cause abnormal heating.

See also illustration "7.1 Field wiring: Overview" [▸ 14].

1 Insert the wiring in the intake hole from the bottom of the communication box.

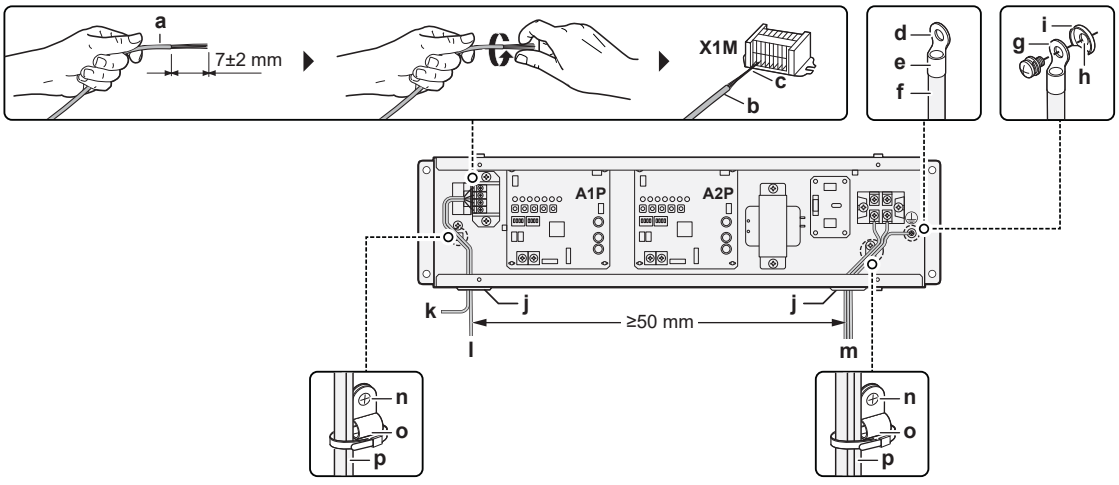


a Intake hole

2 Remove the sheath of the transmission cables.

3 Twist the transmission cables.

4 Connect the power supply to the terminal block (X1M) of the communication box.



a Sheath
b Twist together before connecting.

c Connect to X1M.
d Round crimp-style terminal
e Insulation sleeve
f Wire
g Round crimp-style terminal
h Cutout section
i Cup washer
j Wiring intake
k Transmission wiring (RS-485 weak current) to the monitoring system (mind polarity)
l Transmission wiring (DIII weak current) to outdoor unit (no polarity)
m Power wire and earth wire (copper)
n Cable clamp
o Cable tie
p Wiring

5 Connect the earth wire to the earth terminal.

6 Connect the transmission wiring as described in "7.5 To connect the transmission wiring" [▸ 17].

7.5 To connect the transmission wiring

7.5.1 Between communication box and outdoor unit

INFORMATION

- Mind the maximum length of the transmission wiring. Otherwise transmission errors might occur.
- Use sheathed vinyl cords or cables (2 cores).
- Use ONLY 2-core cables. Do NOT use cables with 3 or more cores, otherwise transmission errors might occur.

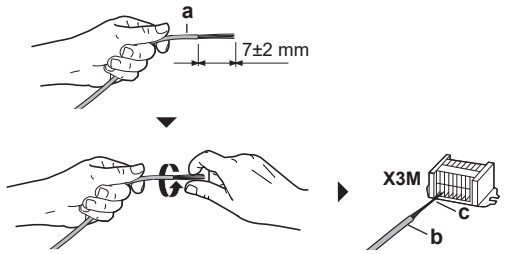
Prerequisite: Use DIII weak current wire.

Prerequisite: Cut the end portion of the transmission wiring that has to be connected. Strip insulation from the wire before connecting it to the terminal block (X3M).

Prerequisite: Twist the wires together before connecting the wires.

1 Connect F1 and F2 of the X3M (Class II construction) terminal block of the communication box to F1 and F2 (TO OUT/D UNIT) of the X1M (A1P) terminal block of the outdoor unit.

2 Connect F1 and F2 (TO OUT/D UNIT) of the X1M (A1P) terminal block of the outdoor unit to F1 and F2, respectively, of the terminal block of the capacity up unit.



7–1 Cut, twist, and connect the wire to the terminal block

a Sheath
b Twist together before connecting.
c Connect to X3M.

7.5.2 Between communication box and monitoring system

NOTICE

Mind the polarity of the transmission wiring.

See also illustration "7.1 Field wiring: Overview" [▸ 14].

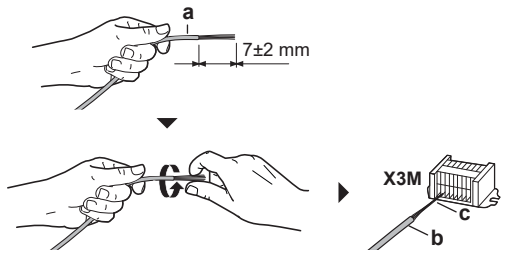
Prerequisite: Use RS-485 weak current wire.

Prerequisite: Cut the end portion of the transmission wiring that has to be connected. Strip insulation from the wire before connecting it to the terminal block (X3M).

Prerequisite: Use wires with the same diameter and twist the core wires together before connecting the wires.

1 Connect wires from A+ and B– of the terminal block of the communication box to the monitoring system.

2 Connect the wires to the X3M terminal block in the same way as "7.5.1 Between communication box and outdoor unit" [▸ 17].



7–2 Cut, twist, and connect the wire to the terminal block

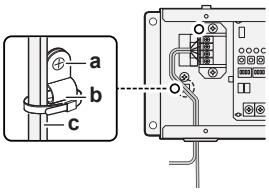
a Sheath
b Twist together before connecting.
c Connect to X3M.

7.6 To fix the wiring cables with cable ties

NOTICE

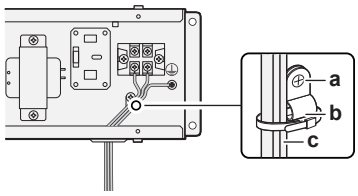
Transmission wiring is used for communication between the units. Do NOT fix the transmission wiring together with the power wiring or earth wire. Otherwise communication errors might occur.

1 Fix the transmission wires using a cable tie (delivered as accessory).



a Cable clamp
b Cable tie
c Wiring

2 Fix the power and earth wires using a cable tie (delivered as accessory).



a Cable clamp
b Cable tie
c Wiring

3 Cut off the excess part of the cable ties.

4 Seal all gaps to prevent small animals from entering the wiring intake (sealing material is field supply).

8 Configuration

DANGER: RISK OF ELECTROCUTION

INFORMATION

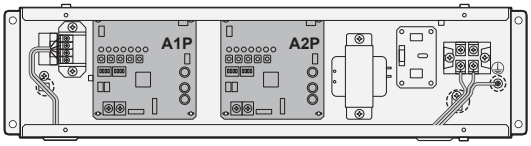
It is important that all information in this chapter is read sequentially by the installer and that the system is configured as applicable.

In this chapter

8.1 About the PCBs

The communication box is for connection to an outdoor unit only. Do NOT connect any other types of units.

The communication box contains 2 PCBs:



A1P PCB for communication with the indoor unit (air conditioning).
A2P PCB for communication with the outdoor unit and capacity up unit.

NOTICE

Communication settings (slave address, baud rate, parity and stop bits) MUST be made for A1P and A2P.

8.2 Setting the addresses of outdoor units and indoor units

The term "indoor unit" here applies to indoor unit for air conditioning.

WARNING

- When opening the front plate of an outdoor unit during operation, be careful of a rotating fan. The fan continues rotating for a while even after the operation is stopped.
- Before turning ON the power supply, make sure that the operation switch of the outdoor unit is turned OFF. You can check this via the inspection hole of the electrical component box (middle) of the outdoor unit.
- After turning ON the power supply, operate the push buttons and check the LED indication via the inspection hole of the electrical component box (middle) of the outdoor unit. Operating with the cover open might cause an electrical shock.
- For more information on how to configure the monitoring system (field supply), see the manual of the supplier.

About the effective address range

Set an address in accordance with the model to be connected to the communication box. The following table shows the numbers to which an address can be set.

Model	Effective address range
Outdoor unit	1-7
Capacity up unit	
Indoor unit (air conditioning)	1-00 – 4-15

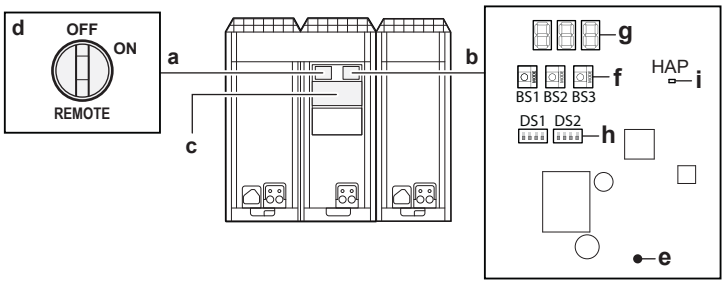
INFORMATION

The numbers in the table show the effective range of address setting. For the number of outdoor units that can communicate with 1 communication box, see the specifications.

- The address of an outdoor unit and capacity up unit needs to be different.
- Setting an address outside the effective range disables proper communication.
- After an address of the outdoor unit and capacity up unit is set or changed, reset the power supply of the communication box.

8.3 To set the addresses of the outdoor unit and capacity up unit

1. Open the left inspection hole cover.
2. Turn OFF the power supply.
3. Turn OFF the operation switch.



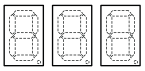
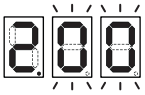
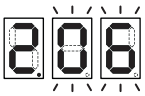
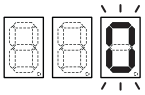
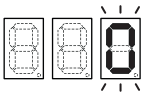
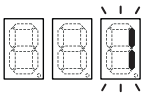
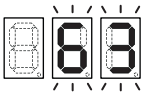
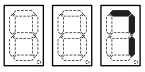
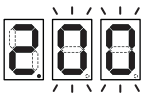
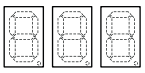
a Inspection hole (left)
b Inspection hole (right)
c Electrical component box
d Operation switch
e PCB (A1P)

f Push buttons (BS1~BS3)
g 7-segments display
h DIP switch
i HAP LED

4 Turn the power supply ON and leave the operation switch OFF.

5 Open the right inspection hole cover.

6 Set the addresses as described in the table below.

Procedure		7-segments display	Remarks
Initial indication			Show the initial indication in a normal condition.
Press and hold BS1 for 5 seconds.  BS1 BS2 BS3			Make sure that the left 7-segment is **2**.
Press BS2 6 times.  BS1 BS2 BS3			Check the number of button presses with the right 7-segment. (You see number 6 in the right 7-segment, this means that you pressed 6 times on BS2).
Press BS3 once.  BS1 BS2 BS3			This displays the Airnet address.
Press BS2 to select the desired setting.  BS1 BS2 BS3	No address set		0 is factory setting. If no setting has been made, communication cannot be established.
	Address 1		Displays the total number of button presses in the 7-segment (center and right).
	⋮	⋮	⋮
	Address 63		An address can be setup to 63. When BS2 is pressed after that, the setting will change to "Address not set".
Press BS3 once.  BS1 BS2 BS3			When the value is determined, the 7-segment display changes from blinking to lit.
Press BS3 once.  BS1 BS2 BS3			—
Press BS1 once.  BS1 BS2 BS3			Returns to the initial indication.

8.4 To set the addresses of the indoor units

The term "indoor unit" here applies to indoor unit for air conditioning.

Refer to the installation manual of the controller.

8.5 Configuring the communication box

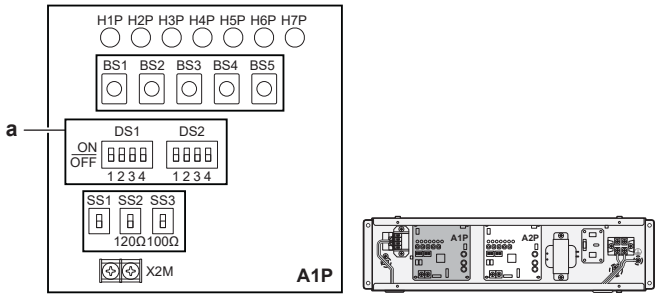
WARNING

- Do NOT turn ON the power when the communication box cover is open. An electrical shock might occur.
- Before turning ON the power, make sure that the communication box cover is closed.

8.5.1 To configure the communication box PCB for the indoor units

The term "indoor unit" here applies to indoor unit for air conditioning.

Overview of buttons, switches, and other parts



a DIP switches (DS1, DS2)

You can configure 3 different settings on PCB A1P:

- RS-485 Modbus baud rate
- Modbus communication parity/stop bit
- Modbus slave address setting

RS-485 Modbus baud rate setting

Setting	
DS1 pin 2: OFF	9600 bps
DS1 pin 2: ON	19200 bps

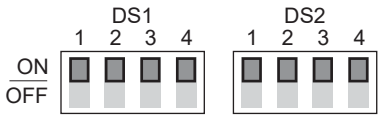
Modbus communication parity/stop bit

Setting	
DS1 pin 3: OFF, pin 4: OFF	Even 1 stop bit
DS1 pin 3: OFF, pin 4: ON	Odd 1 stop bit
DS1 pin 3: ON, pin 4: OFF	None 2 stop bits
DS1 pin 3: ON, pin 4: ON	None 1 stop bit

Modbus slave address setting

Setting	
DS2 pin 1/2/3/4	When Modbus address is set (e.g. 1, ..., 15), then Modbus RS-485 is enabled.
OFF/OFF/OFF/OFF	No Modbus address is set, this means no Modbus RS-485 communication.

Setting	
OFF/OFF/OFF/ON	Address 1
OFF/OFF/ON/OFF	Address 2
...	...
ON/ON/ON/ON	Address 15



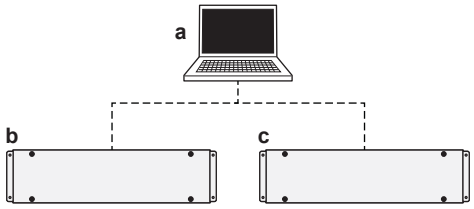
DS1 Switch 2 = baud rate.
DS1 Switch 3+4 = parity stop bits.
DS2 Switch 1~4 = Modbus slave address.

INFORMATION

For more information, see the design guide of Modbus Interface DIII (EKMBDX*).

CAUTION: Precautions when setting the slave address

- Do NOT set the same slave address for devices connected to the Modbus master device.
- Apart from the slave address set in the communication box, there are 2 other slave addresses that cannot be set. When the slave address on the PCB for the outdoor unit (A2P) is set to "A", slave addresses "A+1" and "A+2" CANNOT be set. Slave address "A" is used for the outdoor unit, "A+1" is used for the capacity up unit, and "A+2" may NOT be used.



a Modbus master device
b Communication box 1
c Communication box 2

8–1 Settings for slave address for communication box 1

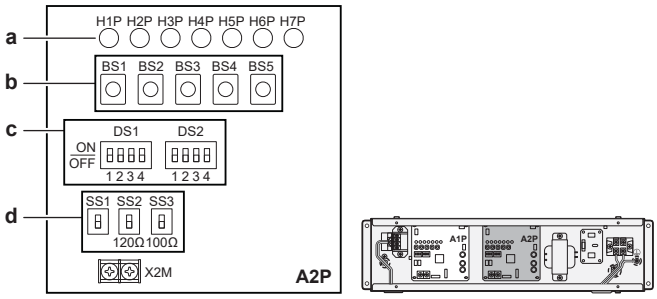
PCB	A1P	A2P		
Address set	1	2		
Unit/system	Indoor	Outdoor	Capacity up unit	Reserved address
Valid slave address	1	2	3	4

8–2 Settings for slave address for communication box 2

PCB	A1P	A2P		
Address set	8	5		
Unit/system	Indoor	Outdoor	Capacity up unit	Reserved address
Valid slave address	8	5	6	7

8.5.2 To configure the communication box PCB for the outdoor unit and capacity up unit

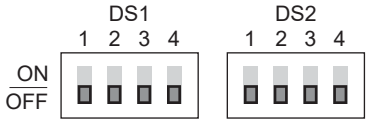
Overview of buttons, switches, and other parts



a LEDs
b Push buttons (BS1~BS5)
c DIP switches (DS1, DS2)
d Switches to set the terminating resistance (SS1~SS3)

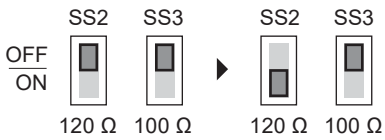
1 Set the slave address using the DIP switches (DS1, DS2) on PCB A2P of the communication box.

> **INFORMATION**
>
> Make sure to set the slave address before you turn the power ON. The setting is invalid when the setting was done after power ON.

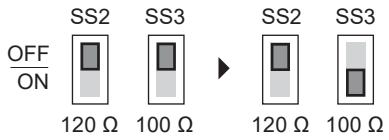


Slave address	DS1				DS2				Remarks
	1	2	3	4	1	2	3	4	
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Default value
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	—
2	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	
3	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	
...									
26	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	
...									
245	ON	ON	ON	ON	OFF	ON	OFF	ON	Maximum effective address

2 If needed, set the terminating resistance. You can set this setting with 2 slide switches (SS2, SS3). If both switches are "OFF" (default setting), the terminating resistance is 0 Ω.



8–1 Example of slide switch settings when resistance is 120 Ω



8–2 Example of slide switch settings when resistance is 100 Ω

3 Check all transmission wiring (DIII weak current).

4 Check all transmission wiring (RS-485 weak current) from the monitoring system to the communication box.

5 Close the communication box cover when you turn ON the power supply.

6 Set the parity using the push buttons (BS1~BS5) on the A2P PCB of the communication box. The table below shows the setting method. Set the parity as specified by the monitoring system.

Procedure		LED indication[a]							Remarks
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Initial indication		●	●	●	●	●	○	○	Shows the initial indication in normal conditions.
Press and hold BS1 for 5 seconds.		○	●	●	●	●	●	●	Make sure that the H1P LED has turned ON.
Press BS2 2 times.		○	●	●	●	●	○	●	Check the pressing count against the LED indication.
Press BS3 once.		○	●	●	●	●	●	◐	Indicates the last setting status.
Press BS2 to select the desired setting.	None	○	●	●	●	●	●	◐	Factory setting
	Odd	○	●	●	●	●	◐	●	—
	Even	○	●	●	●	◐	●	●	
Press BS3 once.		○	●	●	●	●	●	○	The LED indication will change from flashing to ON.
Press BS3 once.		○	●	●	●	●	●	●	—
Press BS1 once.		○	●	●	●	●	○	○	Returns to the initial indication

[a] ● = OFF, ○ = ON, and ◐ = flashing.

7 Set the baud rate setting using the push buttons (BS1~BS5) on PCB A2P of the communication box. The following table shows the setting method. Set the baud rate as specified by the monitoring system.

Procedure		LED indication[a]							Remarks
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Initial indication		●	●	●	●	●	○	○	Shows the initial indication in normal conditions.
Press and hold BS1 for 5 seconds.		○	●	●	●	●	●	●	Make sure that the H1P LED has turned ON.
Press BS2 once.		○	●	●	●	●	●	○	Check the pressing count against the LED indication.
Press BS3 once.		○	●	●	●	●	●	◐	Indicates the last setting status.
Press BS2 to select the desired setting.	9600 bps	○	●	●	●	●	●	◐	Factory setting
	19200 bps	○	●	●	●	●	◐	●	—

Procedure	LED indication[a]							Remarks
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Press BS3 once.	○	●	●	●	●	●	○	The LED indication will change from flashing to ON.
Press BS3 once.	○	●	●	●	●	●	●	—
Press BS1 once.	○	●	●	●	●	○	○	Returns to the initial indication

[a] ● = OFF, ○ = ON, and ◐ = flashing.

8 Set the stop bit settings using the push buttons (BS1~BS5) on PCB A2P of the communication box. The following table shows the setting method. Set the stop bit settings as specified on the monitoring system.

Procedure		LED indication[a]							Remarks
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Initial indication		●	●	●	●	●	◐	◐	Shows the initial indication in normal conditions.
Press and hold BS1 for 5 seconds.		○	●	●	●	●	●	●	Make sure that the H1P LED has turned ON.
Press BS2 6 times.		○	●	●	●	○	○	●	Check the pressing count against the LED indication.
Press BS3 once.		○	●	●	●	●	●	◐	Indicates the last setting status.
Press BS2 to select the desired setting.	Auto	○	●	●	●	●	●	◐	LED indication is the desired setting.
	1 stop bit	○	●	●	●	●	◐	●	
	2 stop bits	○	●	●	●	◐	●	●	
Press BS3 once.		○	●	●	●	●	●	○	The LED indication will change from flashing to ON.
Press BS3 once.		○	●	●	●	●	●	●	—
Press BS1 once.		○	●	●	●	●	◐	◐	Returns to the initial indication

[a] ● = OFF, ○ = ON, and ◐ = flashing.

9 After the settings are set, reset the power supply of the communication box.

INFORMATION

The power supply must be reset before the settings of parity, baud rate, and stop bits become effective.

9 Commissioning

INFORMATION

For more information on how to do a test run of each unit, see the installation manual or installer reference guide of each unit.

☐	**Are the LEDs (H1P~H4P) on the PCB (A1P) flashing?** ▪ H1P: DIII connection (send). ▪ H2P: DIII connection (receive). ▪ H3P: RS-485 connection (send). ▪ H4P: RS-485 connection (receive).
☐	**Are the LEDs (H6P, H7P) on the PCB (A2P) ON?** If the LEDs are still flashing, communication is not established. ▪ H6P ON: RS-485 communication is established. ▪ H7P ON: DIII communication of 1 or more units is established.
☐	**Can the operation data of each address be monitored on the monitoring system?** Make sure that the power supply to each unit is turned ON.
☐	**Check that the address set on each unit corresponds with the address displayed on the monitoring system.** Make sure that the power supply to each unit is turned ON.

Result: If there are no problems with the operation data and the remote settings, the H2P LED will be OFF and the H6P and H7P LEDs will be ON. The test run is then complete for A2P.

INFORMATION

- Confirmation of an error takes about 12 minutes.
- If there is no communication from the monitoring system (e.g. monitoring system is turned OFF, incorrect polarity or disconnection), a communication error occurs on the RS-485 side.

What to do in case of a communication error?

- The operation data cannot be checked on the monitoring system.
- Check all items in "10 Troubleshooting" [▸ 29] and correct any problem.
- "▦ 10–1 Operation procedure step 1" [▸ 30] describes how you can check some errors.

10 Troubleshooting

In this chapter

10.1 Troubleshooting for PCB for indoor unit communication

The term "indoor unit" here applies to indoor unit for air conditioning.

What to check?	How to check?	Solution
No Modbus communication	Incorrect Modbus address setting was present at power ON on the Modbus interface DIII.	During power OFF, set DS2 on A1P to the required Modbus address. See "8.4 To set the addresses of the indoor units" [▸ 22]. The ON/OFF status of the DIP switch is detected only at the time of power ON of the PCB.
	No Modbus address is set (=DS2: OFF/OFF/OFF/OFF).	Set DS2 on A1P to the required Modbus address. See "8.4 To set the addresses of the indoor units" [▸ 22].

10.2 Troubleshooting for PCB for outdoor unit and capacity up unit communication

What to check?	How to check?	Solution
Address setting of each unit	Data of each address can be checked on the monitoring system.	Set the addresses of the outdoor unit and capacity up unit again. See "8 Configuration" [▸ 20].
Slave address setting	DIP switches (DS1, DS2) of the communication box PCB (A2P).	Set the slave address correctly. See "8.5.2 To configure the communication box PCB for the outdoor unit and capacity up unit" [▸ 25].
Parity setting	Parity setting on the monitoring system against the parity setting on the communication box.	Set the parity setting correctly. See "8.5.2 To configure the communication box PCB for the outdoor unit and capacity up unit" [▸ 25].
Stop bit setting	Stop bit setting on the monitoring system against the stop bit setting on the communication box.	Set the stop bit setting correctly. See "8.5.2 To configure the communication box PCB for the outdoor unit and capacity up unit" [▸ 25].

What to check?	How to check?	Solution
Baud rate setting	Baud rate setting on the monitoring system against the baud rate setting on the communication box.	Set the baud rate setting correctly. See "8.5.2 To configure the communication box PCB for the outdoor unit and capacity up unit" [▶ 25].
DIII weak current transmission wiring	Data of each address on the monitoring system.	Check the wiring of the unit with data that cannot be checked and correct the wiring.
	H2P is ON and H7P is flashing on the communication box. Follow the instructions in "▦ 10–1 Operation procedure step 1" [▶ 30] to diagnose the communication box.	Communication cannot be established with any of the outdoor units. Check the transmission wiring (DIII weak current) and address settings.
RS-485 weak current transmission wiring	Make sure that the field settings are made correctly, check whether the data can be checked on the monitoring system.	Check RS-485 weak current transmission wiring and correct it (e.g. disconnection, incorrect polarity).
Refrigerator connection other than an outdoor unit and capacity up unit	H2P is ON on the communication box. Follow the instructions in "▦ 10–2 Operation procedure step 2" [▶ 31] to diagnose the communication box.	Disconnect the non-CO_2 refrigerator.
PCB error	H2P is ON on the communication box. Follow the instructions in "▦ 10–1 Operation procedure step 1" [▶ 30] to diagnose the communication box.	Replace PCB (A2P).
	No LED is ON on PCB (A2P).	
	Check conditions of all units: indoor unit (air conditioning), outdoor unit and capacity up unit.	

▦ 10–1 Operation procedure step 1

Procedure	LED indication[a]							Remarks
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Initial indication[b]	●	○	●	●	●	◐	◐	H6P flashing: RS-485 communication error H7P flashing: DIII communication error (if communication is not established with any of the indoor units (air conditioning)).
Press BS1 once.	◐	●	●	●	●	●	●	—
Press BS2 twice.	◐	●	●	●	●	○	●	

Procedure		LED indication[a]							Remarks
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Press BS3 once (error check).[c]	DIII side communication error	◐	◐	●	●	●	●	●	Communication error of all outdoor units.[d]
	RS-485 communication error	◐	●	◐	●	●	●	●	Communication error on the RS-485 side. An error is detected even when the polarity is correct. Check the address settings and the RS-485 wiring.[d]
	Board error	◐	●	●	◐	●	●	●	Error of the PCB (A2P) of the communication box. Replace the PCB.
	Duplicate outdoor unit addresses	◐	●	●	●	◐	●	●	Duplicate outdoor unit addresses. Check the address settings and DIII wiring.
	Outdoor unit address not set	◐	●	●	●	●	◐	●	The address of an outdoor unit is not set. Check the address setting and DIII wiring.
	Slave address setting error	◐	●	●	●	●	●	◐	Slave address setting error. Check the slave address setting and wiring.
Press BS1 once.		●	○	●	●	●	◐	◐	In normal conditions, H2P is OFF, and H6P and H7P are ON.

[a] ● = OFF, ○ = ON, and ◐ = flashing.
[b] The initial indication in the table shows the indication when an error is detected. If there are no communication errors, the H2P LED is OFF and the H6P and H7P LEDs are ON.
[c] When multiple errors are detected, multiple LEDs (H2P to H7P) are flashing.
[d] For both DIII side and RS-485 side, if a communication error occurs after the communication is confirmed, an error is generated. If the communication has not been confirmed, errors are not detected.

10–2 Operation procedure step 2

Procedure		LED indication[a]							Remarks
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Initial indication[b]		●	○	●	●	●	◐	◐	H6P flashing: RS-485 communication error. H7P flashing: DIII communication error (if communication is not established with any of the indoor units (air conditioning)).
Press BS1 once.		◐	●	●	●	●	●	●	—
Press BS2 3 times.		◐	●	●	●	●	○	○	
Press BS3 once (error check).	Reserve	◐	◐	●	●	●	●	●	
	Reserve	◐	●	◐	●	●	●	●	
	Different refrigerator	◐	●	●	◐	●	●	●	A non-CO_2 refrigerator is connected.
Press BS1 once.		●	○	●	●	●	◐	◐	In normal conditions, H2P turns OFF, and H6P and H7P turn ON.

(a) ● = OFF, ○ = ON, and ◐ = flashing.

(b) The initial indication in the table shows the indication when an error is detected. If there are no communication errors, the H2P LED is OFF and the H6P and H7P LEDs are ON.

11 Technical data

11.1 Wiring diagram: Communication box

A1P	PCB (communication with indoor unit for air conditioning)
A2P	PCB (communication with outdoor unit and capacity up unit)
A3P	PCB
BS1~BS5	Push buttons (see Note 1)
DS1, DS2	DIP switches (see Note 1)
F1S	Varistor
F1U	Fuse (T, 3.15 A, 250 V)
H1P~H7P	LED
HAP	LED
SS1~SS3	Switches to set the terminating resistance (see Note 1)
T1R	Transformer (220~240 V/22 V)
X3A~X11A	Connectors
X1M~X3M	Terminal strips
⊏▪▪▪⊐	Field wiring
□□□□	Terminal strip
⌀⌀	Connector
⏚	Protective earth
BLK	Black
ORG	Orange
WHT	White
YLW	Yellow
HIGH VOLTAGE	High voltage
LOW VOLTAGE	Low voltage
MONITORING SYSTEM	Monitoring system
OUTDOOR UNIT	Outdoor unit
POWER SUPPLY	Power supply
SWITCH BOX	Switch box

Note 1

Communication settings can be changed using the push buttons. For information on how to do this, see the installation manual of the outdoor unit and the capacity up unit.

12 Glossary

Dealer
Sales distributor for the product.

Authorised installer
Technical skilled person who is qualified to install the product.

User
Person who is owner of the product and/or operates the product.

Applicable legislation
All international, European, national and local directives, laws, regulations and/or codes that are relevant and applicable for a certain product or domain.

Service company
Qualified company which can perform or coordinate the required service to the product.

Installation manual
Instruction manual specified for a certain product or application, explaining how to install, configure and maintain it.

Operation manual
Instruction manual specified for a certain product or application, explaining how to operate it.

Maintenance instructions
Instruction manual specified for a certain product or application, which explains (if relevant) how to install, configure, operate and/or maintain the product or application.

Accessories
Labels, manuals, information sheets and equipment that are delivered with the product and that need to be installed according to the instructions in the accompanying documentation.

Optional equipment
Equipment made or approved by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

Field supply
Equipment NOT made by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

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4P617761-1D 2023.02