

EnzAir CCU

EnzAir CCU — Installation & Wiring Manual

Part No. 728E3773 | ECCU_RS485 | Revision 4.0 | March 2026

1. Safety Notices

⚠ WARNING: This unit contains 230Vac mains voltage. Installation must only be carried out by a competent person familiar with low-voltage electrical installations.

⚠ WARNING: Isolate and lock off the compressor mains supply before installing or wiring this unit.

i The 230Vac circuit is protected by a 2A slow-blow fuse fitted in the onboard fuse holder (F1).

i All screened cable shields must be earthed correctly at the PCB end only — see Section 4.

⚠ WARNING: The 230Vac mains supply feeding this unit must be correctly earthed with full CPC (Circuit Protective Conductor) continuity back to the distribution board. The integrity of the earth path must be verified before the unit is energised.

⚠ WARNING: The metal enclosure or cabinet in which this PCB is installed must be bonded to earth. The enclosure earth must be connected to the same earth bar or terminal as the CCU earth conductors. This is essential for safe operation and compliance with BS 7671 wiring regulations.

2. Unit Overview

The EnzAir CCU is a microcontroller-based PCB that monitors the compressor operating conditions via the RS485 communication port with the Variable Speed Drive (VSD) and controls a solenoid valve via a relay output. The unit mounts inside the compressor control panel and connects to the VSD, mains supply, and optional pressure/temperature sensors.

Two firmware modes are available, selected by the onboard DIP switch (SW2):

- Position 1 — RS485 Mode: reads pressure and temperature data directly from the VSD over RS485.
- Position 2 — Sensor Mode: reads a 4-20mA pressure transducer and PT100 temperature sensor wired directly to the CCU.

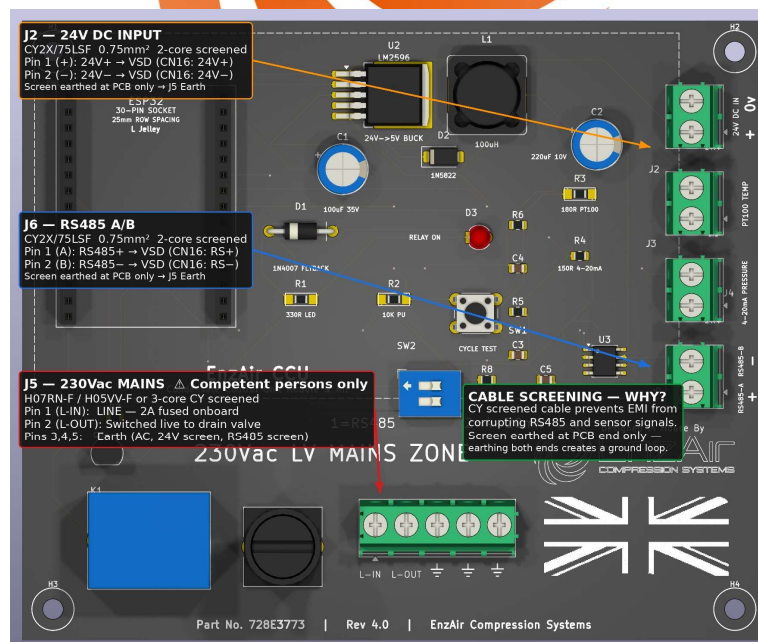


Figure 1 — EnzAir CCU PCB wiring connections

3. Terminal Connections Summary

Terminal	Label	Cable	Size	Connection	Notes
J2	24V DC	CY2X/75LSF	0.75mm ²	VSD CN16: 24V DC+ / 24V DC–	Screen earthed at PCB only
J6	RS485	CY2X/75LSF	0.75mm ²	VSD CN16: RS+ / RS–	Screen earthed at PCB only
J5	230Vac	H07RN-F, H05VV-F or 3-core CY	Min 0.75mm ²	L-IN: LINE (fused 2A) L-OUT: Switched live → drain valve Pins 3–5: Earth	⚠ 230Vac — competent persons only

4. Cable Screening & Earthing

All signal cables (24V DC supply and RS485 communication) must use CY or SY screened cable. The cable screen protects the signal conductors from electromagnetic interference (EMI) generated by the VSD inverter drive, motor cables, and other switching equipment within the compressor panel. Without correct screening, EMI can corrupt the RS485 data stream and cause erratic or unreliable operation.

⚠ WARNING: The cable screen must be earthed at the PCB end only. Earthing at both ends creates a ground loop which can make EMI worse rather than better. The VSD end of the screen must be left unconnected and insulated.

The three Earth terminals on J5 (Pins 3, 4, and 5) are provided for the following screen connections:

- Pin 3 (PE-AC): Earth for the 230Vac supply cable
- Pin 4 (PE-24V): Earth screen termination for the 24V DC supply cable
- Pin 5 (PE-RS): Earth screen termination for the RS485 cable

5. 24V DC Supply Connection (J2)

The CCU requires a 24V DC supply from the VSD or compressor control board, typically available on the VSD terminal block labelled CN16, see section 8 figure 2.

Cable Specification

- Type: CY2X/75LSF or equivalent 2-core SY/CY screened cable
- Cross section: 0.75mm² per conductor

Terminal Connections

J2 Pin	Polarity	VSD Terminal
Pin 1	24V DC+ (positive)	CN16: 24V DC+
Pin 2	24V DC– (negative)	CN16: 24V DC–

i Polarity is important — reversing 24V connections will damage the unit. Pin 1 (+) is clearly marked on the PCB silkscreen.

6. RS485 Communication Connection (J6)

The CCU connects to the VSD RS485 port as a passive sniffer — it listens to the RS485 bus between the VSD and HMI panel without transmitting. The HMI and VSD operate completely normally and are unaware of the CCU's presence on the bus.

Cable Specification

- Type: CY2X/75LSF or equivalent 2-core SY/CY screened cable

- Cross section: 0.75mm² per conductor

Terminal Connections

J6 Pin	Signal	VSD Terminal
Pin 1	RS485-A (RS485+)	CN16: RS+ (A)
Pin 2	RS485-B (RS485-)	CN16: RS- (B)

i If RS485 communication is not established, try swapping Pin 1 and Pin 2 — some VSD manufacturers label A/B in reverse.

i SW2 must be set to position 1 (RS485 mode) for RS485 operation. Change position and power cycle to switch modes.

7. 230Vac Mains Connection (J5)

⚠ WARNING: This section involves 230Vac mains voltage. This work must only be carried out by a competent person. Isolate and lock off the supply before making any connections.

J5 is a 5-way terminal block providing the 230Vac mains connections. Pin 1 (L-IN) is the incoming live feed, which passes through the onboard 2A slow-blow fuse (F1) before reaching the relay. When the relay energises, the switched live appears on Pin 2 (L-OUT) and feeds the condensate drain valve solenoid.

The neutral conductor is not wired to the PCB directly. It must be terminated into a 2-way Wago connector alongside the neutral of the drain valve, providing the return path for the valve circuit. This keeps the neutral connection off the PCB, reduces the number of connections on J5, and minimises EMI coupling into the low-voltage circuits on the board.

Cable Specification

- Preferred: 3-core CY screened — provides additional EMI screening for the mains feed
- Alternative: H07RN-F (rubber sheathed) or H05VV-F (PVC sheathed)
- Minimum cross section: 0.75mm² — 1.0mm² recommended

Terminal Assignments

J5 Pin	Label	Connection
Pin 1	L-IN	LINE in — passes through onboard 2A slow-blow fuse F1
Pin 2	L-OUT	Switched live output — feeds condensate drain valve solenoid
Pin 3	Earth	Earth — 230Vac supply cable earth conductor
Pin 4	Earth	Earth — 24V DC supply cable screen termination (PCB end only)
Pin 5	Earth	Earth — RS485 cable screen termination (PCB end only)
Neutral	(Wago)	Neutral — NOT wired to PCB. Connect into 2-way Wago with drain valve neutral return.

⚠ WARNING: Pin 1 (L-IN) is the fused live conductor. Ensure this is connected to the LINE conductor — not neutral. The PCB silkscreen clearly labels L-IN.

8. VSD Wiring Reference

The photograph below shows a typical VSD terminal block (CN16) with 24V DC and RS485 connections wired. Use this as a reference for identifying the correct terminals on the compressor VSD.

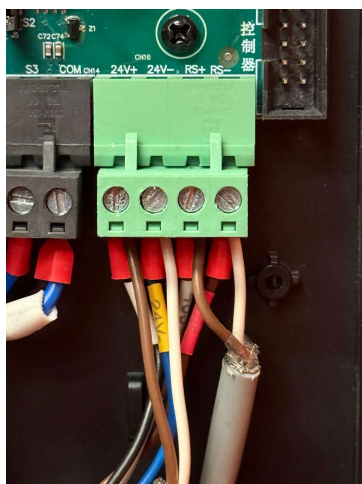


Figure 2 — Typical VSD CN16 terminal block: 24V+, 24V-, RS+, RS-

9. Firmware Mode Selection (SW2)

SW2	Mode	Sensors Used
Position 1	RS485 Mode	RS485 data from VSD (pressure & temperature)
Position 2	Sensor Mode	4-20mA pressure transducer (J4) + PT100 temperature sensor (J3)

i The DIP switch is read at power-on. Change the switch position and power cycle the unit to switch between modes.

10. Technical Specification

Parameter	Value
Supply voltage	24V DC
Supply current	< 200mA
Mains input	230Vac 50Hz
Mains fuse	2A slow-blow 5×20mm (F1 — onboard)
Relay output	SPDT 10A 250Vac — switches drain valve
RS485	9600 baud Modbus RTU — passive sniffer (no transmission)
Operating temperature	0°C to +60°C
PCB dimensions	120 × 100mm
Part number	728E3773-RS2