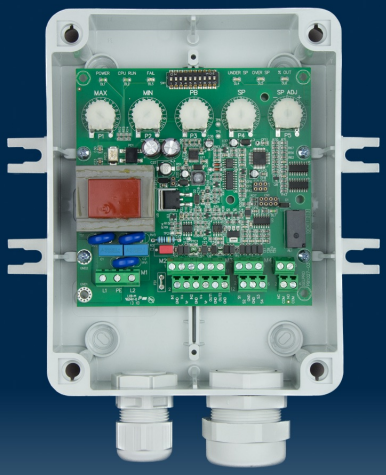
ECB

Compact configurable digital Master & Slave controller for single-phase and three-phase EC fan motors



EC fans

Master & Slave

ECB is a **compact and configurable digital controller** designed for **proportional or PI control** of single-phase and three-phase EC motors in HVAC/R systems, such as remote condensers, dry coolers and high-efficiency cooling units. It supports a **24 Vac, 230 Vac or 400 Vac (±10%)** power supply, with automatic **50/60 Hz** frequency selection.

The **two independent analog outputs**, one for voltage signals **0-10 Vdc** and one for current signals **4-20 mA**, allow direct control of up to **30 EC motors per output**, providing flexible management even in large systems. The outputs are protected against short circuits, ensuring operational safety.

In master mode, ECB features **two programmable analog inputs**, compatible with **4-20 mA, 0-10 Vdc, 0-5 Vdc** signals or **10 kΩ @ 25 °C NTC probes**. In slave mode, it accepts **0-20 mA, 4-20 mA and 0-10 Vdc** analog signals. The two inputs operate in parallel, with **automatic selection of the higher value**.

Control can be set to **direct or reverse proportional mode**, or the **PI algorithm** can be enabled for more advanced control. Thanks to an optional plug, a **second setpoint** can also be enabled and selected via an on-off input.

Configuration is simple and intuitive: the inputs are set using **DIP switches**, while the **setpoint** is adjusted using two **13-position digital selector switches**, SP for the operating point and SP Adj for fine adjustment. This solution makes the selected value **clear, repeatable and protected against unintentional adjustments**, with a total of **169 selectable operating points**. During calibration, the Under SP and Over SP LEDs indicate the position of the measured value in relation to the setpoint, increasing their flashing frequency as the measured value approaches the selected value.

ECB offers **four digital inputs** for remote Start/Stop, setpoint changeover, reverse operation and activation of the night limit or a fixed speed. It also features **seven status LEDs** for immediate diagnostics of the power supply status, microprocessor activity, alarms and output control signal level.

The **Unlock/Antilock** function is also available: in line with the recommendations of leading EC fan manufacturers, it forces the fans to rotate at **40% speed for 1.5 minutes** if they remain stopped for **2.5 consecutive hours**. ECB is equipped with an **alarm relay** and is available in **IP55 or IP00** versions

Supply voltage

Available options:

24 Vac ± 10% | 230 Vac ± 10% | 400 Vac ± 10%

50/60 Hz:

Automatic

Control output signal

0-10V | 1-10V | 4-20mA

Two **control outputs**, configurable as **0(1)–10 Vdc** or **4–20 mA**, **independent** and **short-circuit protected**, allow direct control of up to **30 EC fans**.

Inputs

2 Inputs
For sensors and control signals

The controller features two **programmable analog inputs**, compatible with **4–20 mA**, **0–10 Vdc**, **0–5 Vdc** or **10 kΩ NTC** probes (25 °C, 10/60 °C) in **master mode**. In **slave mode**, ECB accepts **0–20 mA**, **4–20 mA** and **0–10 Vdc**. In both cases, the two inputs work **in parallel** with **automatic high-signal selection**.

- 0-20 mA
- 4-20 mA
- 0-5 V
- 0-10 V
- NTC +10/+60°C

Control system

- Proportional Master
- Proportional Slave
- Master PI

The integrated software is designed for the dynamic management of **fan-assisted heat exchangers** and supports both **proportional control**—**direct** or **reverse**—and **PI control** with the **IES (Intelligent Energy Saving)** algorithm, for optimised control of environmental parameters and **energy performance**.

Setpoint

1 Setpoint
Optional 2nd

The inputs are configured using **DIP switches**. The **setpoint (SP)** is set using two **13-position digital selector switches** — SP (operating point) and SP Adj (fine adjustment) — ensuring an **unambiguous set value**, for a total of **169 selectable operating points**. A **second setpoint** can also be enabled via an optional plug and selected through an on-off input, providing **two distinct control levels** according to operating requirements.

Operating parameters

- Setpoint
- Proportional band
- Min cut-off
- Min speed limit
- Max speed limit

Digital outputs

1 Output
Relay output

The device integrates an **alarm relay** (**RL1**) with a **changeover contact** for signalling possible **operating anomalies**.

Digital inputs

4 Inputs
On/Off contacts

Four digital inputs are provided for on/off control of the operating modes, including the ability to set a fixed speed (absolute-priority safety bypass, even in case of faults), night limit, maximum and minimum speed limits, setpoint change and remote Start/Stop.

- Remote Start/Stop
- Night speed limit
- Heat pump
- Direct/Reverse mode
- Setpoint 1/2 switch

Options

Optional 2nd setpoint plug

Technical specifications

Control input types	4–20 mA transducer, 0–5 Vdc transducer, 0–10 Vdc transducer, NTC probe (+10/+60 °C)
Interface	Analogue
Electrical protections	• Control input protection • Mains overvoltage protection
Protection ratings	IP00 Din-rail IP55
Applicable earthing systems	Full compliance with international earthing standards IT / TT / TN
Operating temperature	-20°C / 50°C
Weight (kg)	1 kg
Dimensions (H×W×D) (mm)	203x199x85

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