LSCONTROL

CO_2-regulator / ES 899

Combined CO_2 and temperature regulator for duct mounting

Controls a fan unit according to temperature and CO_2 level.

ES 899 is a CO_2 and temperature regulator for a wide range of applications. It has two independent 0-10V output signals. A linear output based on current CO_2 level, and a regulation output designed for control of e.g. a damper or EC-motor.
The regulator also has integrated RS485 Modbus communication.

Description:

ES 899 measures CO_2 and temperature levels and controls a fan unit or a damper according to the set points.
It also can be used as independent CO_2 sensor with a linear 0-10V output voltage or as ON/OFF controller with an optional external 0-10V set point relay unit.

The CO_2 sensor uses the widely used ABC algorithm, which ensures long life without calibration. Only the room cannot be used constantly, but must regularly get sufficient airflow to lower the CO_2 to fresh air level.

The required CO_2 and temperature levels are adjusted on the *CO_2* and *°C* knobs.
The speed of the regulator loop is adjustable on the *Air Change Rate* knob.

The light indicates if the CO_2 or the temperature levels in the room have exceeded set levels. The light flashes if the CO_2 level exceeds 50ppm or the temperature exceeds the set point with 1°C. The indicator light will turn into constant light when the level is back to normal.

CO_2 linear output:

The voltage varies linearly with the CO_2 level between 0 and 10V corresponding to 0 and 2000 ppm.

Regulation output:

If the CO_2 level is above the CO_2 set point or the temperature above the temperature set point, the output signal will increase.
If the temperature knob is set to OFF the temperature regulator function is disabled.

To meet requirements from different types of ventilation systems, the speed of the regulator loop can be adjusted with the knob *Air-Change-Rate*. Voltage output range can be selected to 0-10V or 2-10V with a jumper.

Test feature:

It is possible to force the output voltage to 10V by turning the 3 knobs fully clockwise.
The indicator is flashing red while in test function.

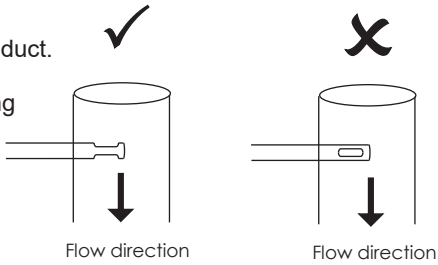
Adjustment:

The *Air-Change-Rate* knob adjusts how fast the output voltage increase from 0 to 10V when the CO_2 or temperature set point is exceeded. Turning clockwise will increase the speed of the regulation.
The *°C* potentiometer set the desired temperature. If you turn the control to OFF, the temperature regulation will be disabled.
The *CO_2* knob set the desired CO_2 level.
When adjustments are completed, the front cover can be mounted to cover the knobs.
Jumper DP4 selects the output voltage range to 0-10V (default) or 2-10V. When DP4 (No jumper placed) the output is 0-10V (default). IF DP4 is closed (jumper in place) the output is 2-10V. NC is place holder for jumper. If jumper is missing entirely the output is 0-10V.

Mounting:

The sensor is to be mounted on the ventilation duct. A 20mm hole is to be drilled for the sensor. Attach the bracket to the duct, using self-tapping screws.

NB! Be sure to place the sensor correctly in relation to the flow direction. (see drawing). Incorrect mounting may result in faulty CO_2 readings.



IMPORTANT:

Cable transfer (glands / clamps) must fit tightly around cables/wires as leaks will result in less accurate CO_2 measurements.

MODBUS

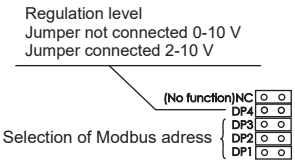
ModBus connection is placed under the cover, see drawing on next page.

Important: ModBus must be installed in accordance with the MOD-BUS standard. A termination resistor must be installed if required by the standard.

Jumper DP1, DP2 og DP3 are Node-ID selection for ES 899 MOD-BUS.

Node-ID-jumper (1=Jumper on, 0=No jumper):

DP1	DP2	DP3	Node-ID
1	1	0	2
1	0	1	3
1	0	0	4
0	1	1	5
0	1	0	102
0	0	1	103
0	0	0	104

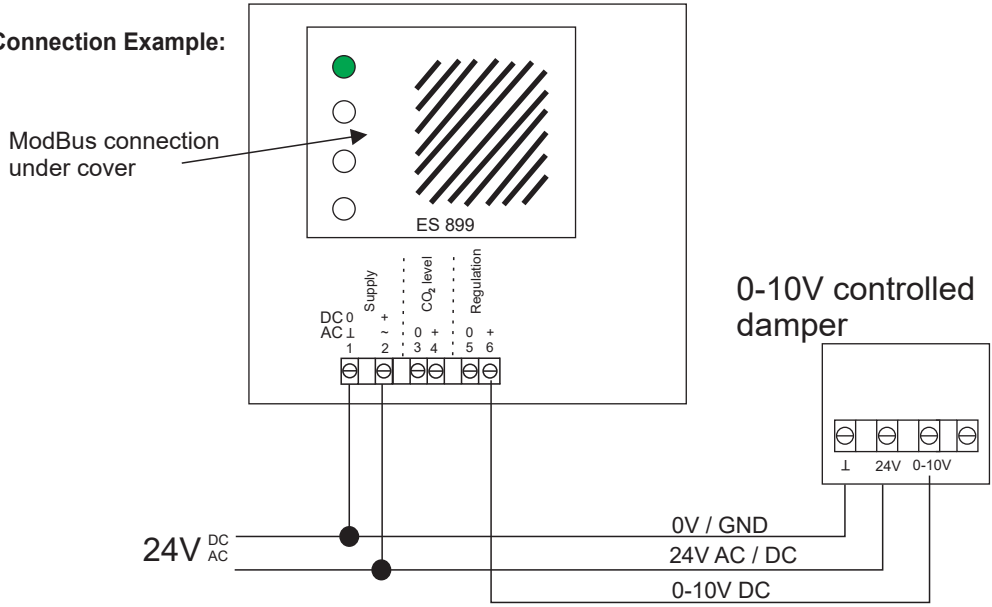


Available data:

Register adresse	Description
3x0000	CO_2 Level(0-2000)
3x0001	Temperature(-40 +460 = 0-50°)
3x0002	Regulation output (0-255 = 0-10V)
4x0000	Air-Change-Rate set point (0-200 = slow-fast)
4x0001	Temperatur set point (170-270 =17-27°)
4x0002	CO_2 set point (500-1500)

If PLC-adressing is selected, 1 is added to the adresses above.

Connection Example:



Technical data:

Supply voltage:	DC: 24V ±10% 3VA
	AC: 24V ±10% 6,4VA
Measuring range CO_2:	0 - 2000 ppm
Accuracy CO_2:	±50ppm ved 500 ppm
Measuring range temperature:	0 - 50°C
Accuracy temperatur:	±0,5°C
CO_2 proportional output:	0-10V, 15mA
Regulation output:	PID based
	0-10V / 2-10V, 15mA
Rs485 / MOD-BUS:	RTU, 19200 Baud, even parity, 1 stop bit
Operating temperature:	20 - 50°C
Enclosure:	IP 54 (box)
Dimensions (HxWxD):	Box: 120x122x55 mm - 120x122x171 (incl. sensor tube)

Maintenance free in households and office environments.

The product complies with the following standard

EN 60730-1

Date:	17/09-2026
Drawing:	950-206650 CO2Sensor_ES899_UK
Drawn by:	UP/AH/JEH/DC/df
Rev.:	3.2
Manufactured by:	LS Control A/S
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