L02B--/L22E-- INSTRUCTIONS FOR USE

Thank you for having chosen a Fantini Cosmi product. Before installing the instrument, please read these instructions carefully to ensure maximum performance and safety.

DESCRIPTION

Fig.1 — Front panel

Setpoint button.

Decrease button.

Increase button.

Exit / Stand-by button.

INDICATIONS

OUT1 Thermostat output

INSTALLATION

- Insert the controller through a hole measuring 71x29 mm.
- Make sure that electrical connections comply with the paragraph "wiring diagrams". To reduce the effects of electromagnetic disturbance, keep the sensor and signal cables well separate from the power wires.
- Fix the controller to the panel by means of the suitable clips, by pressingly gently; if fitted, check that the rubber gasket adheres to the panel perfectly, in order to prevent debris and moisture infiltration to the back of the instrument.
- Place the probe T1 inside the room in a point that truly represents the temperature of the stored product.

OPERATION

DISPLAY

During normal operation, the display shows either the temperature measured or one of the following indications:

OFF	Controller in stand-by	E1	In tuning: timeout1 error
OR	Probe T1 overrange or failure	E2	In tuning: timeout2 error
TUN / 5.4	Controller in autotuning	E3	In tuning: overrange error

SETPOINT (display and modification of desired temperature value)

- press button for at least half second, to display the setpoint value.
- By keeping button pressed, use button or to set the desired value (adjustment is within the minimum SPL and the maximum SPH limit).
- When button is released, the new value is stored.

STAND-BY

Button when pressed for 3 seconds, allows the controller to be put on a standby or output control to be resumed (with SB =YES only).

CONTROLLER AUTOTUNING IN PID MODE

Before starting

- Adjust the setpoint 1SP to the desired value.
- Set 1Y =PID.
- Make sure that the 1PB value matches the desired control mode (1PB <0 for heating; 1PB >0 for refrigeration).

Start autotuning

- Keep buttons + pressed for 3 seconds. 1CT blinks on the display.
- With + or set the cycle time in order to define the dynamic of the process to be controlled.
- To start autotuning press + or wait for 30 seconds. To abort the autotuning function, press .

During autotuning

- During the entire autotuning phase, the display alternates TUN with the actual temperature measured.
- In case of power failure, when power is resumed, after the initial autotest phase, the controller resumes the autotuning function.
- To abort the autotuning, without modifying the previous control parameters, keep button pressed for 3 seconds.
- After the autotuning has taken place successfully, the controller updates the control parameters and start to control.

Errors

- If the autotuning function failed, the display shows an error code:
- E1 timeout1 error: the controller could not bring the temperature within the proportional band. Increase 1SP in case of heating control, vice versa, decrease 1SP in case of refrigerating control and re-start the process.
- E2 timeout2 error: the autotuning has not ended within the maximum time allowed (1000 cycle times). Re-start the autotuning process and set a longer cycle time 1CT .
- E3 temperature overrange: check that the error was not caused by a probe malfunction, then decrease 1SP in case of heating control, vice versa increase 1SP in case of refrigerating control and then re-start the process.
- To eliminate the error indication and return to the normal mode, press button .

Control improvement

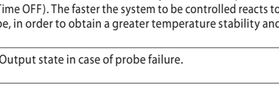
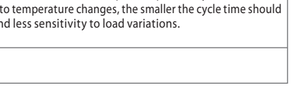
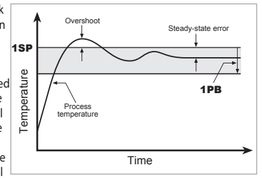
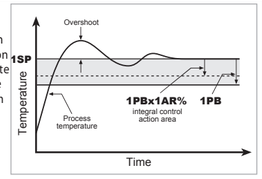
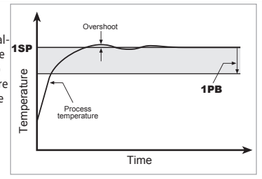
- To reduce overshoot, reduce the integral action reset 1AR .
- To increase the response speed of the system, reduce the proportional band 1PB . Caution: doing this makes the system less stable.
- To reduce swings in steady-state temperature, increase the integral action time 1IT ; system stability is thus increased, although its response speed is decreased.
- To increase the speed of response to the variations in temperature, increase the derivative action time 1DT . Caution: a high value makes the system sensitive to small variations and it may be a source of instability.

RECALIBRATION

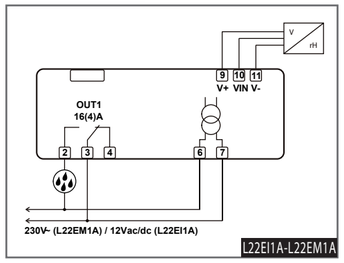
- Have a precision reference thermometer or a calibrator to hand.
- Ensure that OS1 =0 and SIM =0.
- Switch the controller off then on again.
- During the auto-test phase, press buttons + , and keep them pressed till the controller shows 0AD .
- With buttons and select 0AD or SAD : 0AD allows a calibration of 0, inserting a constant correction over the whole scale of measurement. SAD allows a calibration of the top part of the measurement scale with a proportional correction between the calibration point and 0.
- Press to display the value and then use + or to make the read value coincide with the value measured by the reference instrument.
- Exit from calibration by pressing button .

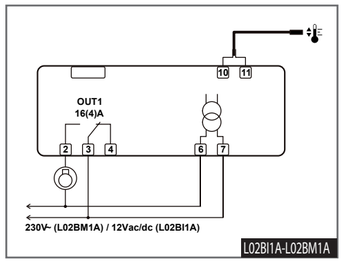
CONFIGURATION PARAMETERS

- Setup menu is accessed by pressing buttons + for 5 seconds.
- With button or select the parameter to be modified.
- Press button to display the value.
- By keeping button pressed, use button or to set the desired value.
- When button is released, the newly programmed value is stored and the following parameter is displayed.
- To exit from the setup, press button or wait for 30 seconds.

PAR	RANGE	DESCRIPTION
SCL	1°C; 2°C; °F	Readout scale. 1°C : measuring range -40/-19.9 … 99.9/105°C for L02B-- 0.0 … 100 %r.H. for L22E-- 2°C : measuring range -40 … 105°C for L02B-- 0.0 … 100 %r.H. for L22E-- °F : measuring range -40 … 221°F for L02B-- Caution: upon changing the SCL value, it is then absolutely necessary to re-configure the parameters relevant to the absolute and relative temperatures (SPL, SPH, 1SP, 1HY, etc..).
SPL	-50..SPH	Minimum limit for 1SP setting
SPH	SPL.150°	Maximum limit for 1SP setting
1SP	SPL... SPH	Setpoint (value to be maintained in the room).
1Y	HY / PID	Control mode. With 1Y=HY you select control with hysteresis: parameters 1HY and 1CT are used. With 1Y=PID you select a Proportional-Integral-Derivative control mode: parameters 1PB, 1IT, 1DT, 1AR, 1CT will be used.
1HY	-19.9…19.9°C -19.9..19.9%r.H	Thermostat differential [control with hysteresis]. Set 1HY on a value greater than zero to make the output work in refrigerating mode, vice versa set on a value lower than zero to make the output work in heating mode. With 1HY=0 the output is always off.  Fig. 1a. ON/OFF refrigerating control (1Y=HY, 1HY>0)  Fig. 1b. ON/OFF heating control (1Y=HY, 1HY<0)
1PB	-19.9…19.9°C -19.9..19.9%r.H	Proportional band [PID control]. Set 1PB on a value greater than zero to make the output work in refrigerating mode, vice versa set on a value lower than zero to make the output work in heating mode. With 1PB=0 the output is always off. With a proportional controller, the temperature is controlled by varying the time of activation of the output. The nearer the temperature to set point, the less time of activation. A small proportional band increases the promptness of response of the system to temperature variations, but tends to make it less stable. A purely proportional control stabilises the temperature within the proportional band but does not cancel the deviation from the set point. 
1IT	0…999s	Integral action time [PID control]. The steady-state error is cancelled by inserting an integral action into the control system. The integral action time, determines the speed with which the steady-state temperature is achieved, but a high speed (1IT low) may be the cause of overshoot and instability in the response. With 1IT=0 the integral control is disabled. 
1DT	0…999s	Derivative action time [PID control]. Response overshoot in a system controlled by a Proportional-Derivative controller may be reduced by inserting a derivative action in the control. A high derivative action (1DT high) makes the system very sensitive to small temperature variations and causes instability. With1DT=0 the derivative control is disabled. 
1AR	0…100%	Reset of integral action time referred to 1PB [PID control]. Decreasing the parameter1AR reduces the integral control action zone, and consequently the overshoot (see figure on paragraph1IT).
1CT	0…255s	Cycle time. In the ON/OFF control (1Y=HY), after the output has switched on or off, it will remain in the new state for a minimum time of1CT seconds, regardless of the temperature value. In the PID control (1Y=PID), the cycle time is the period of time in which the output completes a cycle (Time ON + Time OFF). The faster the system to be controlled reacts to temperature changes, the smaller the cycle time should be, in order to obtain a greater temperature stability and less sensitivity to load variations.
1PF	ON / OFF	Output state in case of probe failure.
BAU	NON / SBY	With BAU=SBY, the stand-by button is enabled.
SIM	0...100	Display slowdown.
OS1	-12.5..12.5°C	Probe T1 offset.
ADR	1...255	address for PC communication. (function not available)

WIRING DIAGRAMS





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TECHNICAL DATA

Power supply

L02BI1A/L22EI1A 12Vac/dc±10%, 3W
L02BM1A/L22EM1A 230Vac±10%, 50/60Hz, 3W

Relay outputs

OUT1 16(4)A 240Vac

Inputs

L22E--: 0-1V (LS160A)
L02B--: NTC 10K (LS130)

Measuring Range

L22E--: 0…100% U.R.
L02B--: -40…105°C

Measuring accuracy

L22E…: <±0.7%r.H. in the measuring range
L02B…: <±0.3°C -40…100°C; ±1°C out of that range

Operating conditions

-10 … +50°C; 15…80% r.H.

CE (Reference Norms)

EN60730-1; EN60730-2-9;
EN55022 (Class B);
EN50082-1

Front protection

IP55