APPLICATION FAST SET

Operation Manual

Controller

Series L-300

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1 Safety information

Before putting the unit into operation, the safety information, the instructions for installation and the operating manual that is supplied with the unit must be read and observed.

Please read the safety information carefully and comply with the items stated. This is a matter of safety for personnel and equipment. The unit is designed as a simple temperature controller for electrical heating systems. Improper application, installation, configuration or operation of a system or that which goes against the machine's intended purpose may cause severe personal injuries and extensive property damage!

***Important:** This unit is not a safety temperature limiter according to DIN EN 60730-1*

The unit must not be installed in potentially explosive atmospheres. If a process function originating from an explosion-risk area is to be processed by the unit installed outside the explosion-risk area, all supply lines of the unit leading into the explosion-risk area must be guided via safety barriers!

The prerequisite for error-free and safe operation of the unit is its careful transport and storage, as well as correct assembly and installation. This device may only be installed by qualified persons who are familiar with installation, commissioning and maintenance of comparable devices and with the system in which the device will be applied and who have appropriate knowledge in the field of instrumentation and control. Operating staff of the system in which the device is to be used must be instructed on operation and control of the unit by qualified persons.

Please observe and comply with:

- The contents of the present manual for installation and operation of the unit, in particular the information on installation, taking into operation, any notes in bold print and adjustment of the device to suit the overall system.
- Any and all safety information attached to the unit
- Any and all relevant safety regulations for installation and operation of electrical systems
- The keeping of this manual in a safe place for future use

The regulations stated in the present manual are applicable and valid in all EU countries. For use of the device outside of an EU country, the relevant national rules and regulations must be considered.

This device has been produced and tested in accordance with DIN EN 61010 Part 1, “Safety requirements for electrical equipment for measurement, control, and laboratory use”, and has left our company in an error-free condition in terms of its safety and functionality.

***Important:** The sensor cable is connected to mains voltage.*

1.1 Place of application of the unit

The unit is designed as a temperature controller for flexible application in electrical heating systems. The place of operation or installation of the temperature controller must not be close to motors,

transformers, circuit breakers or other inductive loads, it must be shock-free and vibration-free. The ambient temperature at the place of installation must be between −20 °C and 45 °C. Aggressive gases and vapors may damage the unit.

1.2 Instructions for installation

Please read the installation instructions carefully and comply with all conditions mentioned here during installation of the unit. In case of non-compliance with the Instructions for installation, faults or malfunctions may occur, or the unit may fail to comply with the required EMC guidelines and the conditions for CE-conformity will not be fulfilled.

Before connection of the unit and before putting it into operation, please ensure that the operating voltage and the conditions for the operating voltage required by the unit correspond to the conditions on site (cf. name plate and technical specifications). If required, take any appropriate measures.

Please make sure that the control and load voltage on site are switched off and secured against accidental reactivation during installation of the device. The electrical connections must be made on the basis of the relevant national rules and regulations. The supply lines for the device must be laid such that they are free from any tensile loads and are not exposed to risks of shearing or crushing under any circumstances.

The mains connection and the connections for the loads must each be provided by suitable cables with a cross-section of a minimum of 1.0mm².

For sensor lines and signal lines, it is highly recommended to use shielded cables (especially if lines are long and running along potential sources of interference); for thermocouples, shielded compensation lines should be used likewise. Sensor lines and signal lines must be installed such that they are spatially separated from the load and control lines (high-voltage lines). If signs of incorrect switching behavior are detected the circuit must be put out of service until remedial action.

For intermediate clamping of compensation lines for thermocouples, no regular terminals may be used, since this would result in generation of additional thermocouples that may falsify the measuring results.

Connect the shield of the sensor lines and the signal lines with the signal ground as close to the unit as possible and lay a line with a diameter of minimum 1.0 mm² from this point to the PE bus bar along the shortest possible route.

The controller is not suitable to switch inductive loads such as contactors, valves, motors, transformers etc.

The load circuit is fused against excess current by means of an internal safety fuse with 10 A.

The present manual does not contain all notes for regulations, standards, etc. that must be observed and complied with during working with the unit in connection with systems and plants. Any such regulations, standards etc. shall be complied with and observed by the operator of the unit with regard to specific requirements of the respective system or plant.

2 General information

The L-330 is a compact FAT Temperature Controller. FAT stands for Fast-Adaptive-Tuning. A novel algorithm permanently adjusts the control parameters to the control process. The common adjustment of PID controllers or the execution of an auto tuning procedure is obsolete.
The setpoint is either set at the factory at the customer's request or can be set using the IR-Control Unit “ZF-310”. A color LED shows the various operating states and, if applicable, error states. The electronic is protected against overcurrent and thermal overload.

3 Start-up and adjustment of controller

Controller with factory setpoint
If the controller is ordered with a fixed setpoint ex works, it is ready for use.

Controller with user adjustable setpoint
If the controller is ordered with an adjustable setpoint ex works, the correct setpoint must be set with the IR-Control Unit before use. The setpoint can only be set within the limits specified ex works.

4 Color LED

4.1 Status LED

Starting procedure:

After connecting to power supply, the controller starts with a self-test: LED is white.
After Self-test successfully completed, the LED is shortly green and then controller starts heating.
If a failure is detected an error signal will show up: see 4.2 Fault detection.

Heat-up phase:

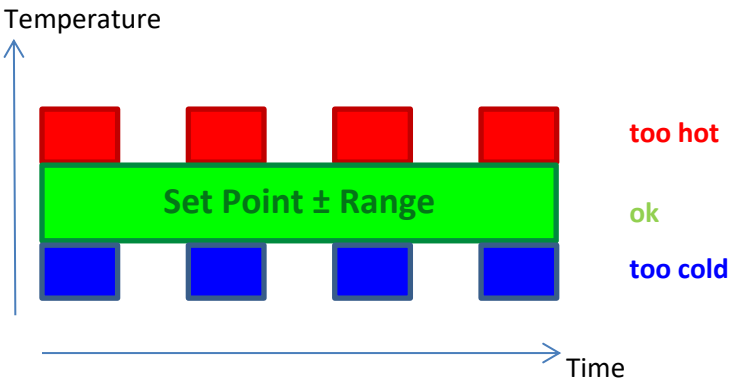
Usually, after startup, the temperature is below the set point and the signal LED flashes slowly (1 Hz) blue. This means set point is not reached yet.

Set-point temperature reached:

The Controller works at set-point temperature inside the good range: green LED permanent on

Temperature monitor:

The LED remains green at set-point temperature in-between the band of tolerance. Above and below this temperature range the LED starts to blink with a frequency of 1 Hz. Blue signals too low and red too high temperatures. The standard ex works setting for the range is ±3 K:



4.2 Fault detection

From start and during operation the controller is permanently checking the following Failure:

1. PCB temperature
2. power supply
3. sensor break

Signal LED on failure

If any failure occurs the controller stops heating (stand-by) and the Signal LED starts fast blinking with a frequency of 4 Hz:

1. Device failure: 4 Hz
   If the controller overheats due to overload or too high ambient temperature, the controller switches off for protection. After the controller has cooled down, it returns to normal operation.

2. Sensor failure: 4 Hz
   The measuring signal is outside the measuring range and cannot be evaluated. If the sensor is briefly interrupted, the display flashes for at least 10 seconds. After that the controller returns to normal operation.

5 Controller On / Off

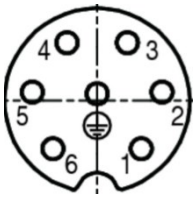
The controller switches automatically on with the power supply connected.

6 Troubleshooting

Error:	Actions:
LED stays off	• Check the power supply • Briefly interrupt the power supply • If the error persists, please contact the service
LED fast flashing yellow → sensor failure	• Check connector and cable for correct contact • Check sensor element for function • Replace sensor
LED fast flashing red → switch-off due to over-temperature	• Place the controller in a cooler place • Improve the air circulation on the controller • If possible, reduce the load on the controller

Service mail: info@purcraft.de

7 Standard plug arrangement

Standard plug arrangement		
1	Line	**Connector front view**
2	Neutral lead	
3	Not connected	
4	Not connected	
5	RTD Sensor / (+) K Thermocouple	
6	RTD Sensor / (-) K Thermocouple	
PE	Protective earth connection	

8 Repair and maintenance

If the controller is damaged, please return the controller to us with an error description.

Maintenance intervals and Maintenance directives according to DGVU Rule 3 apply.

If the device is dirty, turn power off, and clean it with a damp cloth. Heavy dirt may be cleaned with a non-abrasive, solvent-free cleaning agent.

9 Disassembly and disposal

Do not open the device. Opening the device irreparably destroys it!

Electronic devices are recyclables and do not belong in the household waste! Dispose of the product at the end of its service life in accordance with applicable legislation.