Microprocessor-based Controller type ER 3000 for Electronic Temperature Control

Characteristics

- PI-PID cascade controller
- Easy operation
- For cooling systems in maritime installations
- Manual- / automatic changeover
- Robust self-optimization
- Alarm indicating at deviation from set point, positive or negative
- User-defined operation level
- 2- or 3-positional output for controlling the actuator

Applications

The ER 3000 controller is used for constant temperature control. It is specially designed for large engine jacket cooling water systems where conventional single loop controllers cannot maintain a constant and precise temperature.

Design

The ER 3000 controller is designed for panel mounting.
For easy start-up it has optimization for automatic determination of favourable control parameters. The optimization starts when changing the set point or when switching over from manual mode to automatic control. The optimization can be disregarded.
For easy operation it has four keys - two for scrolling or changing values, an enter key and a key for choosing manual or automatic control. Two digital displays show the process variable and the set point. 7 LEDs indicate alarm, actuator opens, actuator closes, slave control, setpoint raising / lowering and manual mode.
The controller can be switched from auto mode to manual mode. In manual mode the actuator can be opened, closed or stopped in a certain position.
Three different alarm settings are possible:

A: Alarm at a deviation from the set point SP
B: Alarm at a fixed limit value
C: Alarm at leaving a band around the set point SP

The 3 alarm settings include alarm in case of sensor fault.
It can operate either as a three position or as a two position controller and has adjustable proportional band, integral action time and derivative action time.

Function

The controller operates with two sensor inputs. One Pt 100 sensor is placed at the outlet from the engine and one Pt 100 sensor with a built-in 4-20 mA transmitter is placed at the inlet to the engine. The measured values of the controlled variables are compared with the set point value and adjusted via a PI or a PID control structure.
When used for large engine jacket cooling water systems the controller must be set up as a cascade controller
The cascade controller has two process variables - master and slave.
The cascade controller compares the measured master value (outlet from the engine) with its setpoint and adjusts the setpoint of the slave variable (inlet to the engine) if neccesary.

Technical Data

Line voltage
230 V AC
115 V AC*
24 V AC*
} -15 % / +10 %, 50 / 60 Hz
*- optional (please specify)

Power consumption approx. 7 VA

Weight approx. 1 kg

Permissible ambient temperature
- Operation 0 to 50ºC
- Transport and storage -25 to + 65ºC

Degree of protection
Front IP 65 according to DIN 40050
Terminals: IP00

Design
For control panel installation
96 x 96 x 135 mm (W x H x D)
panel cut out 92 x 92 mm

Installation position arbitrary

DI - feed voltage and measuring transducer feed voltage
24 V DC, Imax. = 60 mA

Analog inputs
Pt100, 2.4 = 0°C to 300°C
or 2.2 = 0°C to 400°C
or 2.50 = -50°C to 250°C
Connection in three - wire system
0/4 to 20 mA, input resistance = 50 Ohm
0/2 to 10 V, input resistance = 100 KOhm

Measuring accuracy
0.1% of the measuring range

Digital inputs
high active, Ri = 1 k W;
0V DC = low
15 V to 24 V DC = high
Analog output for process variable
0 to +10 V corresponds with
0 to 300°C (2.4) or 0 to 400°C (2.2)
or -50°C to 250°C (2,50), $I_{max.}$ = 2 mA

Displays
Two 4 - digit 7 segment displays, LED, red,
character height = 13 mm

Alarms
Alarm type A, B, C;
working contact normally closed circuit principle

Relay
Switching capacity: 250 V AC / 3 A
Spark quenching element

Data protection
Semi - conductor memory

Subject to changes without notice.

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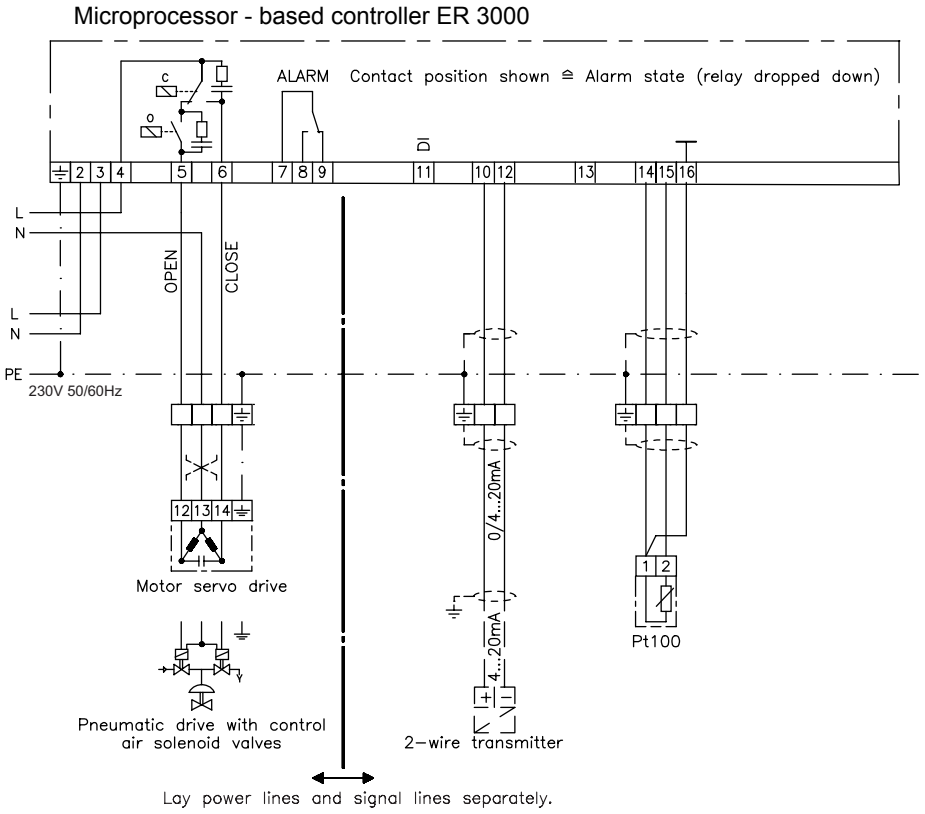
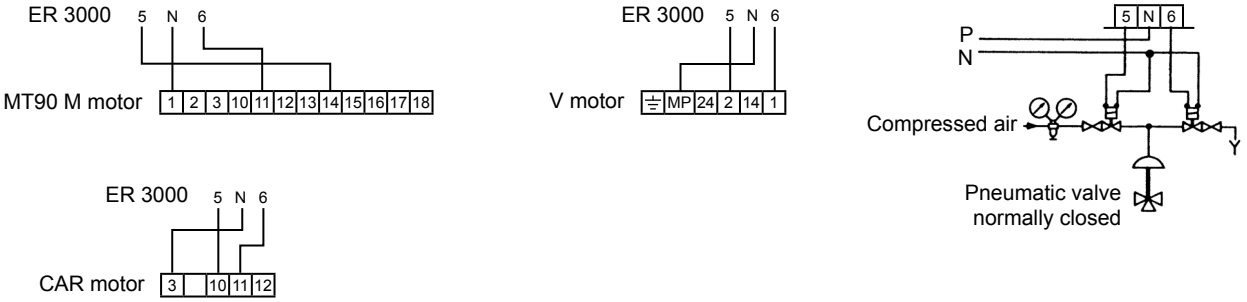
Wiring diagram

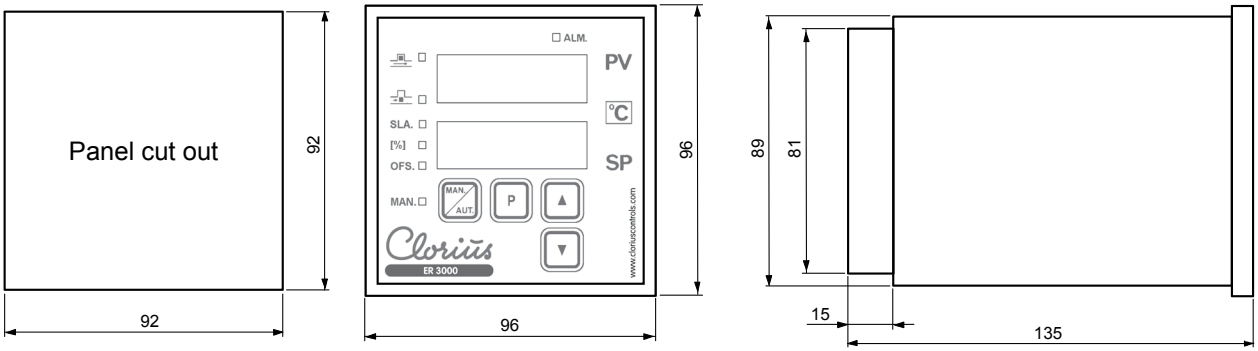


Electrical Connections - Optional external units



Cooling: Remember to set controller into cooling mode.

Dimensions in mm



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