# Manual

**for**

# the EDC 48 series


## 1. Introduction

The EDC-48 series is a modular constructed product which can be applied for nearly 1000 configurations.

As it is not practically possible to develop specific manuals for every single, this manual contains passages without relation to your model of the EDC-48. These passages can be left out or they can be read as example of the versatility of the EDC-48 series.

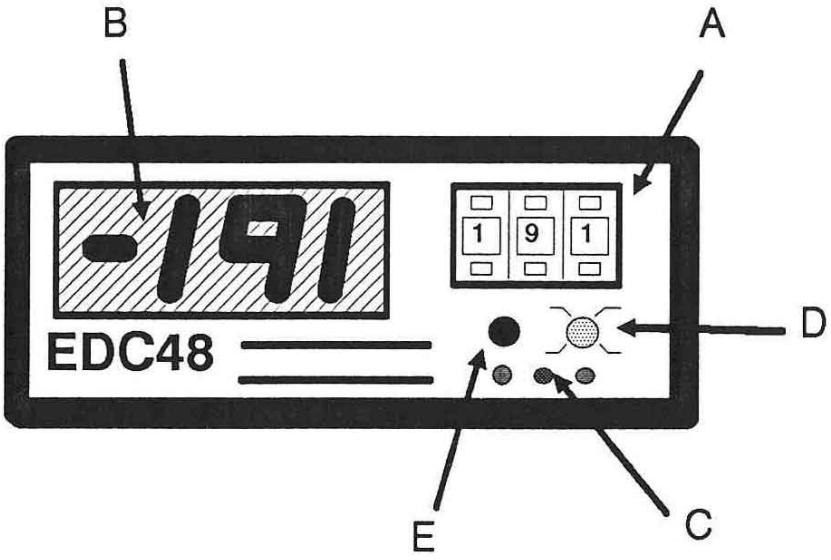
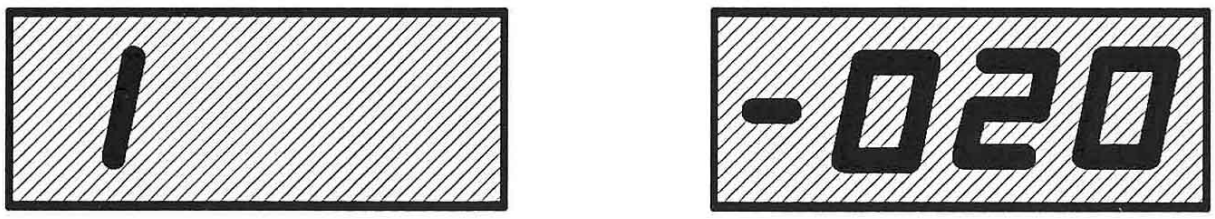



Fig. 1 Front controls

## 2. The Set-Point (fig. 1 a)

The EDC 48 is supplied with digital adjustment of the set-point (temperature, voltage etc.). To change the set-point tip the pawl above or below the digit which must be changed and press. Using the upper-pawl the digit is increased. The lower-pawl is for decreasing the digit.

In controllers with a decimal point switched on in the display (for example 199.9), a decimal point in the set-point switch is implied at the same position.




a b

Fig.2 Display overflow (a) and thermoelement fracture (b)

## 3. The Display (fig. 1 b)

The display shows the actual process variable. If the process variable exceeds 1999 overflow indicating a "one" in the extreme left of the display with the three other switched off. Using thermoelements this function indicates element fracture.

# 4. The Functional Meter (fig. 1 c)

The functional meter consists of 3 light-emitting diodes, two in red and a green one. The green is switched on when outputs (for example the heat) are activated. The red light-emitting diode to the left emits light, if the process variable (for example the temperature) is more than 10% under the adjusted set-point. The light-emitting diode to the right emits light, if the process variable is more than about 10% over the set-point. In that way the three light-emitting diodes in the functional meter give a quick general view of the controlling conditions.

# 5. The Alarm (fig. 1 d)

Exeeding a certain value between the set-point and the process variable the alarm relay is activated.

You adjust the alarm with a little screwdriver. The screwdriver is going to be carefully placed in the notch of the alarm adjustment. Turn the screwdriver fully "clockwise". The end of the notch, which is now pointing at “12”, can be turned to the wished alarm point. When the notch is pointing at +12 and the process variable is 12% (of the measuring range) over the set-point, the alarm relay is switching on. When the notch is pointing at -12 and the process variable is 12% under the set-point, the alarm relay is already switching on. The yellow light-emitting diod emits light, when the alarm is activated.

This can for example be a signal for other devices knowing that the process variable is all right, start of processtimer or coupling and uncoupling of extra cooling water etc.

The manufacturer can change the alarm function switching on the alarm relay to be on in OK situations and switched off by alarm. This can be useful, R you wish the alarm to start during current drop-out.

# 6. Control output

## *On/off*

If the controller is supplied with an on off control system, this is going to work after the following principle: When the process variable is greater than the set-point, the output is switched off. Switched off the output, the process variable must be more than 0,5% under the set-point, before the output again activated. This phenomenon is called "hysteresis" and secures the output against too many activations.

## *PD*

If the controller is supplied with a PD control system, this is going to work after the following principle. When the process variable is much lesser then the set-point,. the output is activated. When the process variable is much greater than the set-point, the output is switched off. In a range around the set-point called the “XP band" or "the proportional band" the output is giving a power off which is proportional with the deviation from the set-point.

By controllers with relay or output for solid state relay, the output power is variated by On / off control. When the process variable and the ratio set-point are alike, is the on/off time ratio 1.

By continuous controllers is the output signal regulates, for example 4-20 mA, proportional with the deviation. When the process variable and the set-point are alike, the output signal shows 12 mA.

The width of the XP band is set for how much the controller indicates an eventual diviation. For that reason a narrow XP band will give a powerful counter control and therefore the most precise control. Unfortunately various time delays may cause self-exited oscilation, if the XP band is made too small. For that reason the XP band must be adjusted to as narrow a value as possible without arising self-excited oscillator.

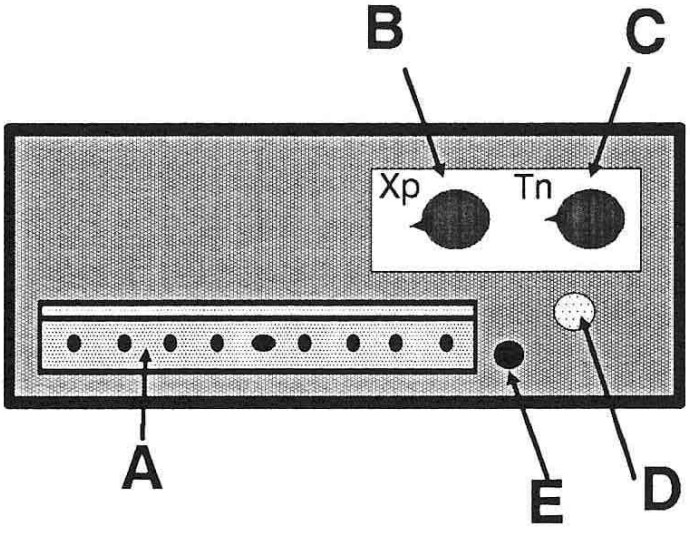



Fig.3 EDC-48 Rearview

## *PID*

If the controller is supplied with a PID control system, this will work as described in the control output PD section, but with addition of an intergral function.

The intergral function provides that a deviation arised in consequence of the width of XP band will be corrected slowly. You adjust the velocity of the adjustment with the button signed Tn. The adjustment depends on inertia in the system you are adjusting. The greater inertia the greater Tn.

# 7. Control Outputs

The controller is supplied with one or more output functions:

1 solid state (TH) output for 2-point adjustments, on / off, PD, PID.
1 relay output (T) for 2-point adjustments; on / off, PD, PID.
2 solid state (2TH) outputs for 3-point adjustments, PID.
2 relay outputs (2T) for 3-point adjustments, PID

Continuous working output; 4-20 mA invers or direct PD, PID function.

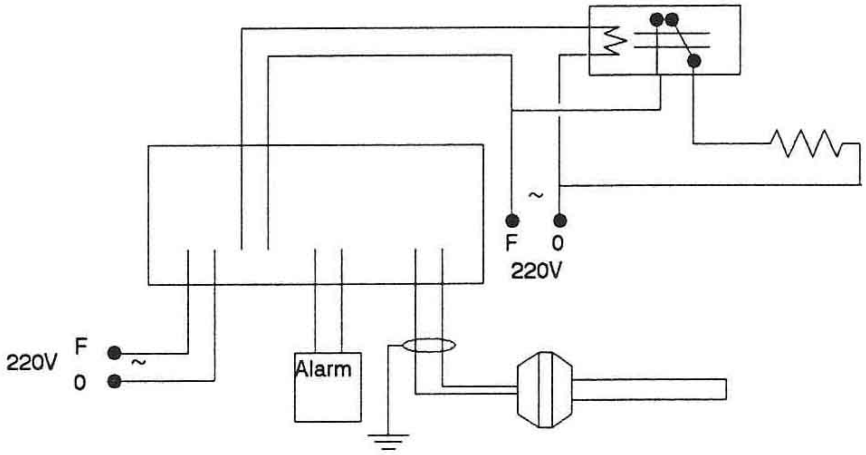



Fig.4 Typical connection of EDC-48 with T output

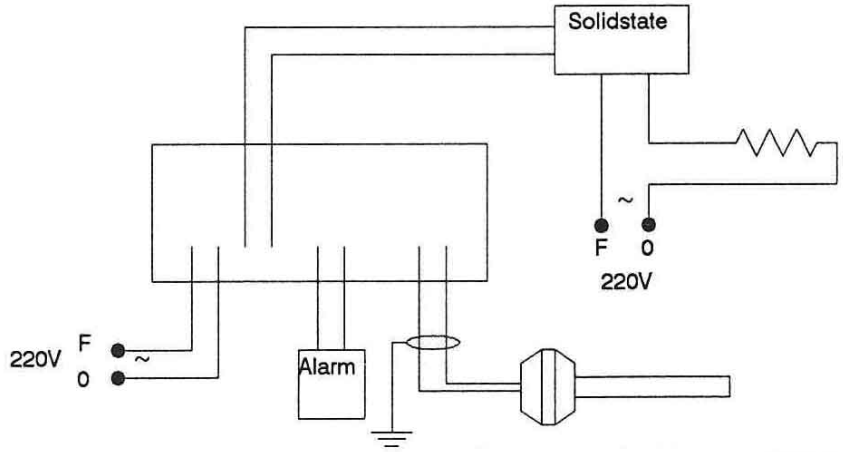



Fig.5 Typical connection of EDC-48 with 2TH output

# 8. Outputloads

Relay outputs must maximal be loaded with 5A / 220 V ac.

TH outputs are formed of 24 V in series with 660Ohm and are used as control signal for "solid state" relays. Continuous outputs are formed of 24 V in series with 100Ohm and a current adjustment circuit.

# 9. Alarm Output

The controller is supplied with either relay or solid state alarm output (TH).

The alarm is supplied with hysteresis in order to protect relay and connected equipment. Maximum relay output is 5A 220V ac. TH output is made of 24 V in series with 660Ohm.

# 10. Input Signals

The controller is supplied with an input circuit for one of the following signals.

## *Thermocouples*

NiCr-Ni, Fe-CuNi, PtRh-Pt
By inputs of thermocouples Fe-CuNi, PtRh-Pt, or NiCr-Ni the sensor must be connected with the right type of compensation wire. If you for example try to extend the sensor cable with a regular copper wire, the result will be erroneous. The sensor and wire must be screened types with the screen earthed.

## *Resistor Elements Pt 100*

3-wire System
By resistor elements the sensor is connected through the 3-wire principle. This will make sure that the resistance in the cable does not influence the accuracy of measuring. In order that the 3-wire system may work correct, it is very important that the 3 wires are alike and have equal length. All 3 wires must connect sensor and controller.

2-wire System
If it is necessary to use a 2-wire sensor, you can "cheat,' by connecting pin 11 and 12. Connect afterwards the two wires of the sensor to pin 10 or 11. Fine adjustment may be done through the little aperture on the rear of the controller. Adjust the reading with a little screwdriver (located at the thermometer).

Screened Resistor Element
Sensor cable must be a screened type. The screen must be earthed.

## *Voltage and Current Inputs*

0-2V, 0-20V, 0-2OmA, 4-2OmA
By voltage and current inputs connections must be done with a screened cable. The screen must be earthed.

Usually the controller will be calibrated according to the client's specfications. On the rear of the controller a fine adjustment of "Gain" can be done. By connection of an input signal fine adjustment of the reading can take place using a screwdriver.

# 11.Installation

The controller is mounted from the front in a rectangular gap as shown in Fig. 1. Through mounting it is important not to expose the controller to heat from other installations as furnaces etc..

The controller is fastened with the supplied parts.

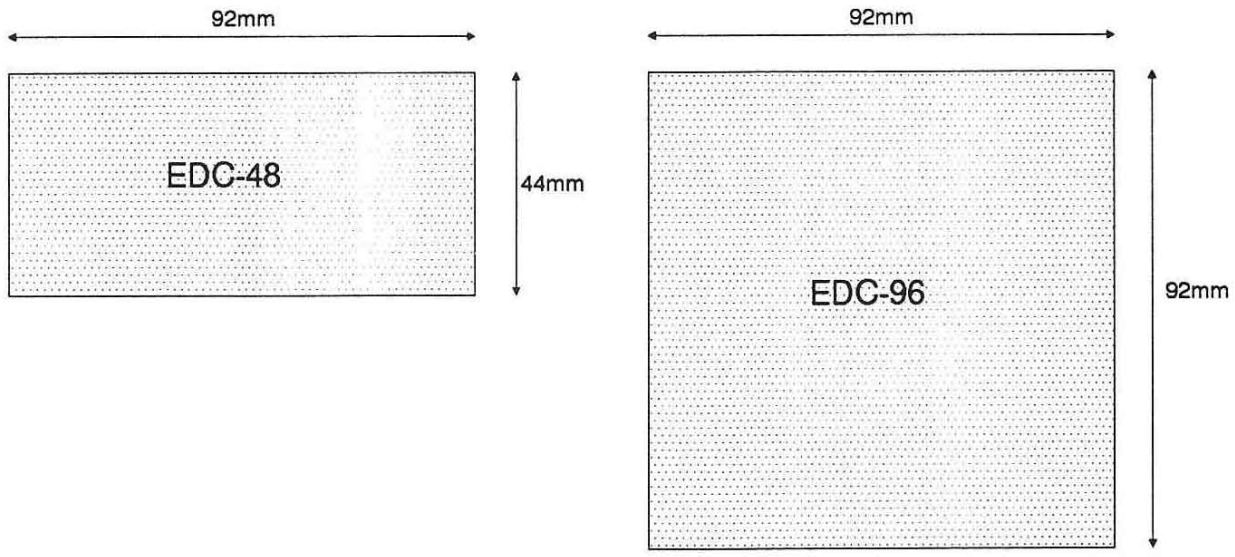



Fig.6 Panel cut-out

# 12.Technical Data

Cabinet: Following DIN standard 43700.
Material: Noryl
Dimensions (HxWxD): 96x48x130 mm.
Weigth: appr. 400g.

Mains connection:
220VAC, 110VAC, 24VAC
consumption: Approx. 2 VA

Connection: Multipoleplug.

Display: 14 mm red digits
Reading from -1 999 to + 1999

Input signal: Resistor elements
Pt100 -50°C - + 199.9°C
Pt100 -50°C - + 600°C

Thermoelements
Fe-CuNi -200°C - + 199.9°C
Fe-CuNi -30°C - + 600°C
NiCr-Ni -30°C - + 1200°C
PtRh-Pt(l 0%) -30°C + 1600°C
PtRh-Pt(l 3%) -30°C + 1600°C

Voltage
0 – 199.9V
0 – 19.00V

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