Nokeval

www.nokeval.com
sales@nokeval.com

Yrittäjäkatu 12
FIN-37100 Nokia

Tel.   358-3-342 4800
Fax.   358-3-342 2066

Panelmeters 440SC and 441SC

- **Model 440 with 14,5 mm display**
- **Model 441 with 25 mm display**
- **2 input channels, freely selectable**
- **Processor based**
- **Pt100-inputs, thermocouples, 0/4..20 mA, 0..10V, potentiometers and 20...1000 mV**
- **Input and output programmable on front panel**
- **Invidual settings of channels**
- **Galvanic isolated output 0/4..20 mA, 0..10 V**
- **2 alarms as a standard**
- **Math functions between channels**
- **Accuracy 0.05..0.1 %**

Indicators 440 and 441 have two separate input channels. You may set to both channels functions like square root, logarithm, subtraction, sum, etc. The channel, showing the calculation, may also have its own functions. You can freeze the automatic scanning or use only one channel. Many applications may be realized without separate transmitters e.g. differential temperature measurement or temperature compensation in flow metering.

Four digit display (-999...+9999) has a resolution 1/32000. Smallest range (20 mV) has resolution of 0.7 µV. Floating decimal point widens display range within resolution limits. All settings are stored in non volatile EEPROM.
Model 440 has 14,5 mm digit height and case 48 x 96 mm and model 441 respectively 25 mm digit height and case 72 x 144 mm.
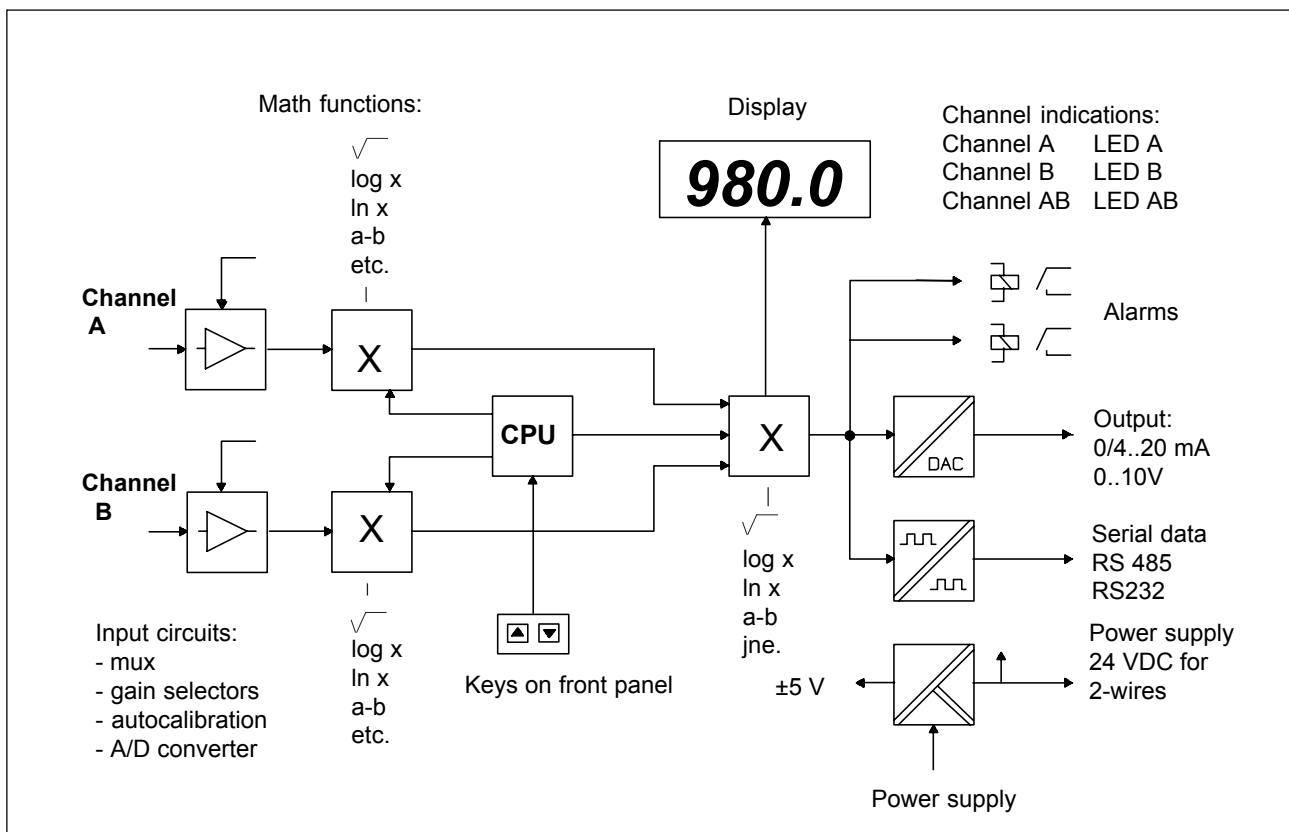
Technical specificatios

Input channels:
2 separate, differential input channels. 2-, 3-, or 4- wire connection, depending on sensor.

RTD- sensor Pt100:
Range   -200...700 °C
Resolution   0.1 or 1 °C
Accuracy 4-wire 0.05 % or 0.1 °C
Accuracy 3-wire 0.05 % or 0.2 °C
Differencies between channels max. ±1 °C.
Line resistor effect 0.005%/Ω (3-wire).
Temperature drift negligible.

Thermocouples:
K   -100...1250 °C
J, J/DIN   -100...+900 °C
T   -50...+350 °C
E   -50...+350 °C
R,S   0...+1700 °C
Accuracy 1 °C ± 1 digit, S,R: 2 °C ±1 digit
Sensor wires have no effect below 1000 Ω. Cold junction effect below 0.05 °C/°C.

Input signal 0/4...20 mA:
Scaleable range -999...+9999.
Floating decimal point 0.001...9999.
Input resistance 50 Ω.
Accuracy 0.05 % of range.

Voltage inputs:
Scaleable ranges:
0-1, 0-5, 1-5, 0-10 VDC
on range -999...9999.
Input resistance 1 MΩ.

Voltage ranges: 20, 50, 500, 1000 mV.
Input resistance 1MΩ, ranges 500 and 1000 mV. Input resistance 10 kΩ, ranges 20 and 50 mV.
Floating decimal point.
Accuracy 0.05% of range

Potentiometer inputs:
Potentiometers 25...1000 Ω as standard, 1..10 kΩ as factory calibrated. 440 can be teached to remember min/max. position of potentiometer and save it in memory. Setting via instrument front buttons. you can scale display to desired range, not depending on teaching function. Factory calibration to desired pot. value.

Mathematical functions:
You can set separate functions to channel 1 and 2. The third channel displays the calculation between input channels 1 and 2, e.g. difference, sum, average, square root etc., according to a separate table. All 3 channels may have output signal. However, only 1 output signal at a time.

Output signals:
Ranges: 0..20 , 4...20 mA, 0..5. 1...5, 0..10 VDC.
Output signal is scaleble over whole display range. Each channel may have different value. Configuration via instrument front.
Accuracy 0.05% of display.
The output signal is isolated.
Max load 600 Ω.

Alarms:
2 alarm levels to be set to any channel and if desired, to steer 1 or 2 relays.
2 relay outputs, 240 VAC, 2 A, closing or opening contact to be set K1 or K2 alarm.
Freely selectable hysteresis.
Programmable or automatic reset (on/off function)

Serial port
RS232 or RS485 serial port on a separate card. Severtal indicators may be connected to the same serial cable. You can not use serial port simultaneously with analog card.

General information
2 freely programmable input channels.
4 digit, red, LED display: model 440 14,5 mm and model 441 25 mm.
Configuration via push buttons on instrument front.
Case 48 x 96 x145 mm and 72 x 144 x 145.
Operating temperature -5...+50 °C
Storage temperature -40...+70 °C
Removable connectors, max. 2.5 mm^2
Line voltage 230 or 110 VAC, 50/60 Hz or 24 VDC.
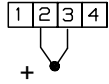Weight   440 model 500 g
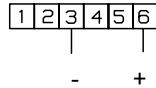   441 model 600 g

Application example
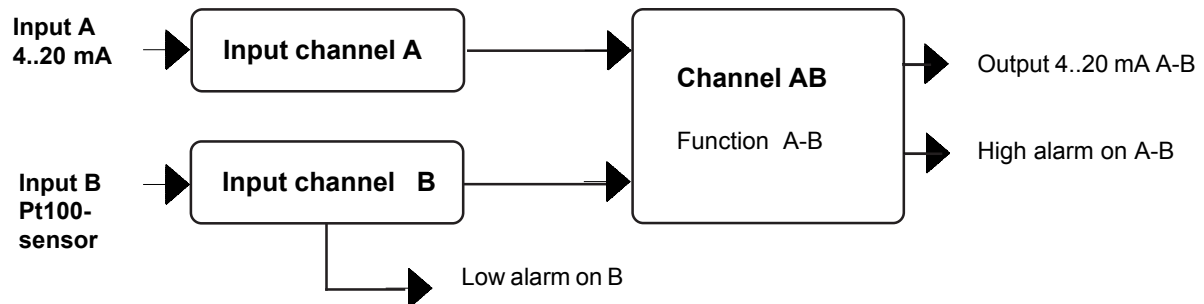
Subtracton A-B is calculated to channel AB. Output signal is set to channel AB and alarms to channel B (temperature) and channel AB (subtraction A-B)
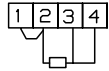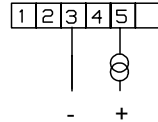
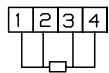# Connections:

Channel B

Thermocouple and mV-input:

| 1 | 2 | 3 | 4 |

+

Input: 0/1..5/10VDC:

| 1 | 2 | 3 | 4 | 5 | 6 |

-    +

Pt100 3-wire.

| 1 | 2 | 3 | 4 |

Current 0/4..20 mA:

| 1 | 2 | 3 | 4 | 5 |

-    +

Pt100 4-wire.

| 1 | 2 | 3 | 4 |

Potentiometer:

| 1 | 2 | 3 | 4 |

+

Pt100 2-wire.

| 1 | 2 | 3 | 4 |

Output (V)
0/1...5/10 V
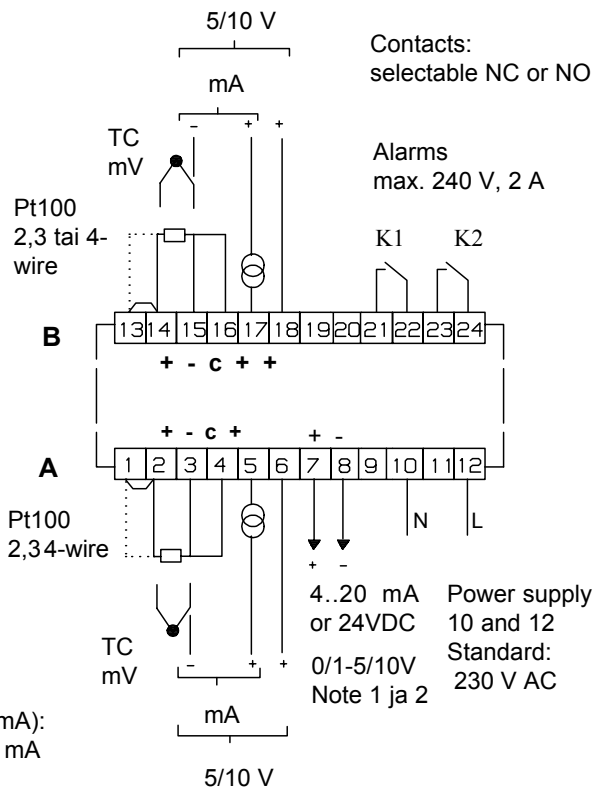
| 19 | 7 | 8 |

+ -

Output (mA):
(0) 4..20 mA

| 7 | 8 |

+ -
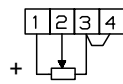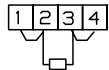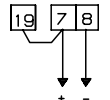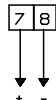
Connections for channel B as channel A.

Power supply:
Standard 230 VAC
Others 110, 24 V AC or
24 VDC, connectors:
12(+) ja 10 (-).

5/10 V

mA

TC mV

Contacts:
selectable NC or NO

Alarms
max. 240 V, 2 A

Pt100
2,3 tai 4-wire

K1   K2

B

| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

+ - c + +

+ - c +   + -

A

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

N   L

Pt100
2,3 4-wire

TC mV

mA

5/10 V

Channel A

4..20 mA
or 24VDC

0/1-5/10V
Note 1 ja 2

Power supply
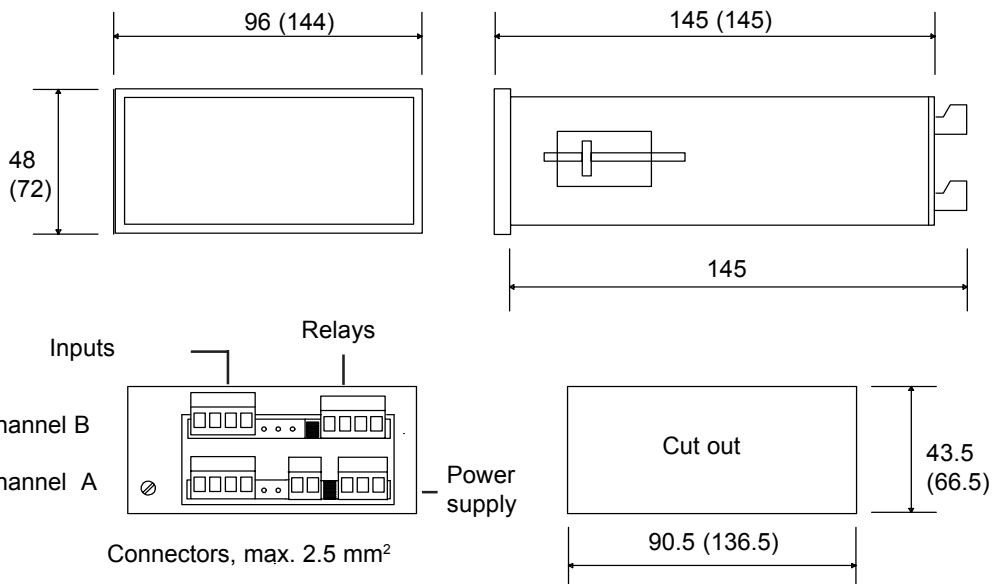10 and 12
Standard:
230 V AC

Note 1.
Output 0/1..5/10 : Connect jumper to connectors 7 and 19.

Note 2.
Power supply 24 DC (non-regulated)
for 2- wire transmitters from output connectors (7+, 8 -) if outputcard not used.

Dimensions:

Models 440 and (441 in brackets)

96 (144)

145 (145)

48 (72)

145

Inputs   Relays

Channel B

Channel A

Power supply

Connectors, max. 2.5 mm²

Cut out

43.5 (66.5)

90.5 (136.5)

Inputs:

Both channels accept different input f.ex. channel A may have Pt100 sensor and channel B thermocouple K. Small mV ranges are 20, 50, 500, 1000 mV and scaleable current ranges 0/4..20 mA, 01..5/10 V and 0..1V. You can teach on site indicator to remember real path of potentiometer. Scaling is affected by front panel keys. Various sensor types are stored in memory and are freely programmable.

Alarms:

You can set two separate alarm levels to each channel by front panel keys. Meter has two relay alarms which may be set to each channel or also to math function channel. relays can control direct line voltage (230 VAC) devices.
You can program low or high alarm. Reset function is also available. By alarms you may realize special functions like comparing which channel is larger and giving relay information about relation of inputs.

Output signal

Standard output card is 0..20 mA or 4..20 mA and 0..5 V , 1..5 V and 0..10 V as option. either input channel or function channel can get output signal which is galvanic isolated from input signal. In many applications meter replaces transmitters by using output card. If output card is not used, you can get 24 VDC supply for 2-wire transmitters. You may customize output signal f.ex. by adjusting recorder scale by front panel keys
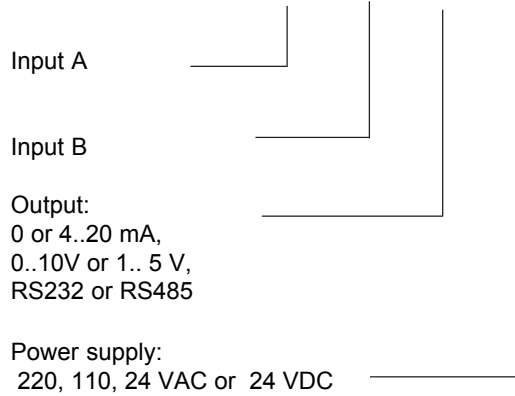
Serial output RS232 or RS485

Serial output is alternative for analog output. Meters can be connected parellel to serial cable and their content are to be read. You send first address and thereafter meters answer by giving number of channel in question. Serial output is galvanic isolated.

How to order:

Model 440	Digit size 14.5 mm
Model 441	Digit size 25 mm

Code   **440SC** - **A** xx -**B** xx - **L** xx - **P** xx
or   **441SC** - **A** xx -**B** xx - **L** xx - **P** xx

Input A

Input B

Output:
0 or 4..20 mA,
0..10V or 1.. 5 V,
RS232 or RS485

Power supply:
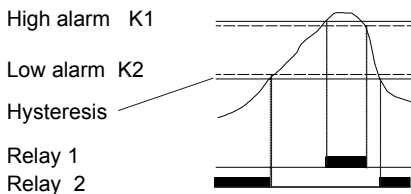 220, 110, 24 VAC or 24 VDC

For example of order:

Model 440
Channel A Pt100
Channel B 4..20 mA, range 0..100.0
Output 4..20 mA. range 0..50.0
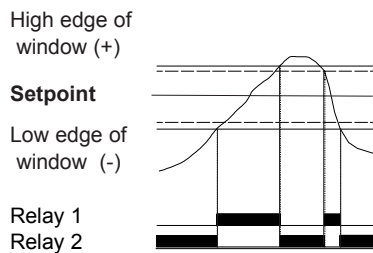Power supply 230 VAC

Code   440SC - APt100- B4/20 - LB4/20 - P230
         - Range   B 0..100.0
         - Output range 0...50.0 for channel B.

Sensors and ranges are changeable by front keys, also output range is output card is ordered. Settings are made according to order.

Two examples of 14 different alarm functions

High alarm   K1
Low alarm K2
Hysteresis
Relay 1
Relay 2

High and low alarm action

High edge of window (+)
Setpoint
Low edge of window (-)
Relay 1
Relay 2

Window comparator

250702