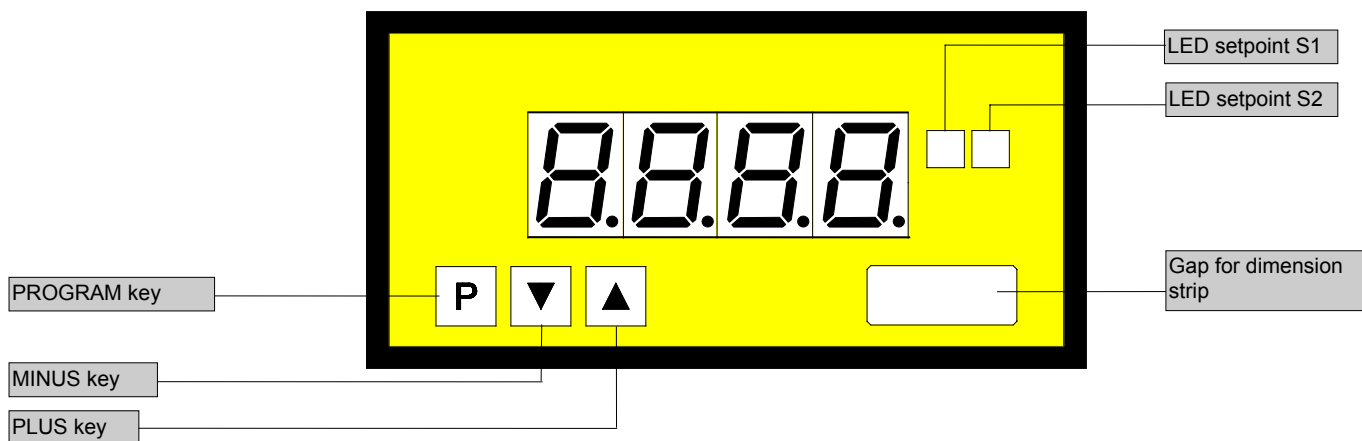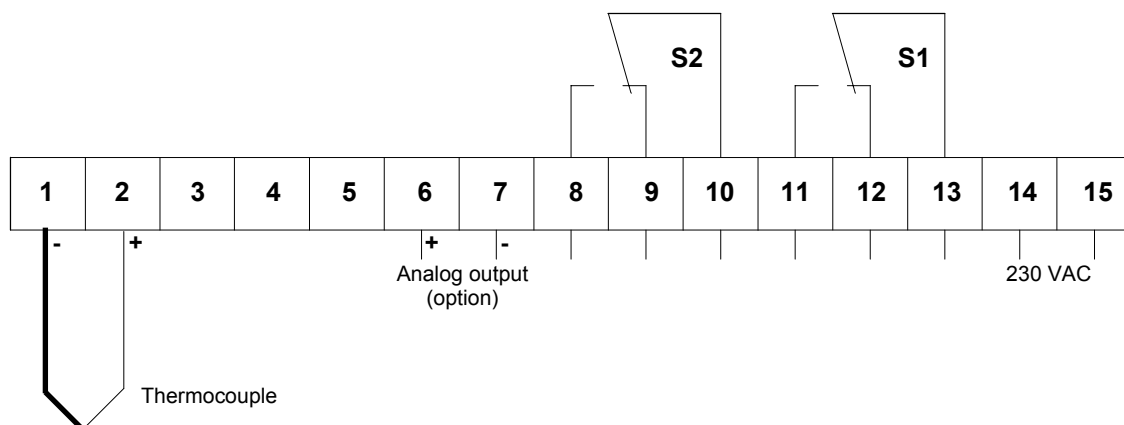# Temperature metering thermocouple

- Microprocessor based technology
- Standard: 2 setpoints, min/max memory
- Mounting into panels with thickness up to 50 mm - optional analogue output

96x48

`8888`

LED setpoint S1

LED setpoint S2

Gap for dimension strip

PROGRAM key

MINUS key

PLUS key

ORDER NUMBER OF TYPE
PTE 4.40x.1522B

S2   S1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
-	+				+	-								

Analog output
(option)

230 VAC

Thermocouple

Power supply 115 VAC
(connection via terminal 14 and 15)

PTE 4.40x.1422B

Power supply 24 VDC
- galv. insulated - (15= plus, 14= minus)

PTE 4.40x.1722B

PTE 4.4x**L**.1xx2B	FeCuNi (DIN)	-100 to + 900°C
PTE 4.4x**J**.1xx2B	FeCuNI (americ.)	-200 to + 1200°C
PTE 4.4x**K**.1xx2B	NiCrNi	-250 to + 1350°C

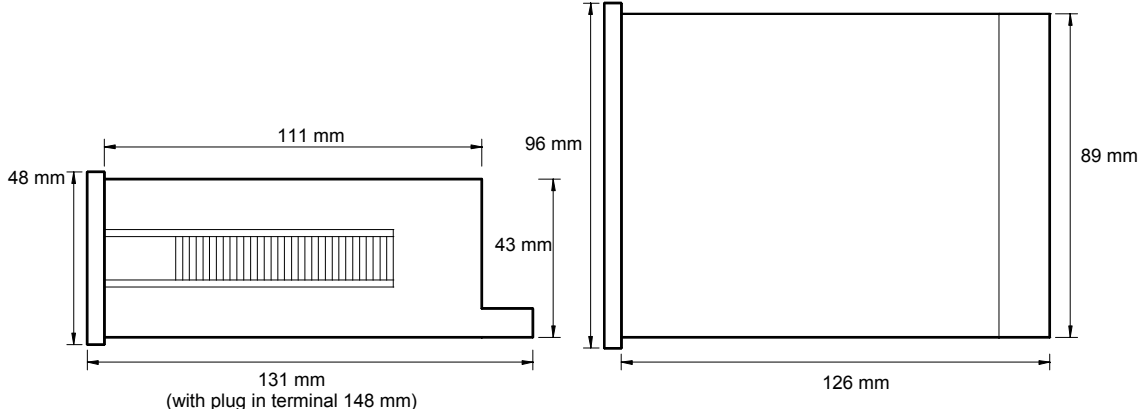Type „X" includes all above thermocouples.

Options
- Green LED
- Protection IP54
- Protection IP65
- Analog output 0-10 VDC (12 bit)
- Analog output 0-20 mA/load 500 Ω (12 bit)
- Analog output 4-20 mA/load 500 Ω (12 bit)
- Analog output 0-10 VDC (12 bit)   *(supply voltage 24 VDC galvanically insulated)*
- Analog output 0-20 mA/load 500 Ω (12 bit)   *(supply voltage 24 VDC galvanically insulated)*
- Analog output 4-20 mA/load 500 Ω (12 bit)   *(supply voltage 24 VDC galvanically insulated)*
- Other power supplies on demand

Technical data

Dimensions	Housing	96 x 48 x 134 mm, including screw terminal
	Assembly cut out	$92.0^{+0.8}$ x $45.0^{+0.6}$ mm
	Fastening	special quick plastic clamp proper to fix in wall thickness up to 50 mm
	Housing material	PC/ABS-plastic blend, colour black, UL94V-0
	Protective system	at the front IP40
		connection IP00
	Weight	approx. 0.450 kg
	Connection	at the rear side via screw terminals up to 2.5 mm^2
Input	L Fe-CuNi (DIN)	-100 up to + 900°C
	J Fe-CuNi (americ.)	-200 up to + 1200°C
	K NiCr-Ni	-250 up to + 1350°C
Output	Relay output	charge 230 VAC/5 A – 30 VDC/2 A, with ohm resistive burden
	Switching cycles	$0.5 * 10^5$ at max. contact rating
		$5 * 10^6$ mechanically
		Separation appropriate to DIN EN 50178/ Specification appropriate to DIN EN60255
	Analogue output	0-10 VDC (12 bit)
		0-20 mA (12 bit) - load 500 Ohm
		4-20 mA (12 bit) - load 500 Ohm
Accuracy	Resolution	1°C
	Measuring fault	1°C, +/-1 Digit
	Temp. drift	100 ppm/K
	Measuring principle	voltage/frequency converter
Power unit	Supply voltage	230/115 VAC +/- 10 % (50-60 Hz), 24 VDC +/-10 % galvanic insulated
	Power consumption	approx. 5 VA
Indication	Display	LED with 7 segments, 14 mm high, red
		4-digit = display 9999
	Overflow	indication of 4 transversal bars
	Indication time	from 0.2 up to 10.0 seconds adjustable
Ambient conditions	Working temperature	0 up to + 60°C
	Storing temperature	-20 up to + 80°C

The analogue output is galvanic insulated from the measuring input!

Housing:

111 mm

48 mm

131 mm
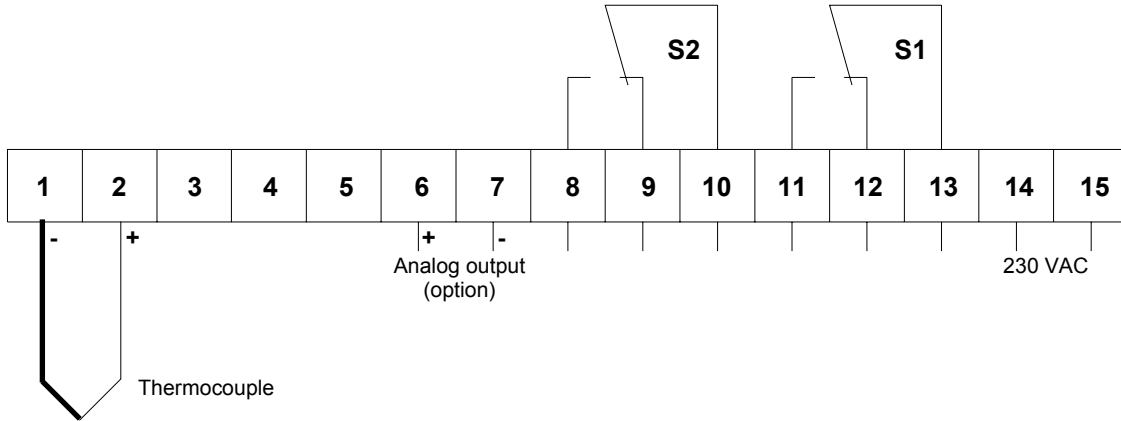(with plug in terminal 148 mm)

96 mm

43 mm

89 mm

126 mm

CE-sign
For unlimited use of the instrument within the directives for electromagnetic compatibility 89/336/EC measuring wires have to be used with shielded cable and cable's shield connected to earth ground at one end only.

Connection diagram, programming, remarks

Thermocouple

Analog output (option)

230 VAC

Setting

1. Connect the instrument according to the wiring diagram.
2. After power on, the instrument runs into a lamp test and returns back to the standard mode.
3. Pressing the **P**-key enters the program mode with indication of **P2** in the display.
4. Pressing the **P**-key and ▲-key simultaneously steps through the different program numbers.
5. Pressing ▲ or ▼-key shows the current values.
6. To change values use ▲ or ▼-key.
7. The remaining values will be memorized automatically 7 seconds after the last touch of key with leaving program mode.

Additional key-functions in standard mode for indication of min/max values.

Simultaneously pressing of ▼ and ▲ key deletes and actualizes min/max-memory.
▲ key enters max-memory.
▼ key enters min-memory.

Instructions

After power on the instrument with his inbuilt microcontroller starts with an initialprogram activating lamp test and readout of memorized parameters in an EEPROM.

The following diagrams are showing the switching operation of PTE4 relay contacts. The hysteresis is free programmable.
There are two kinds of operation:

Example: operation current

Example: quiescent current
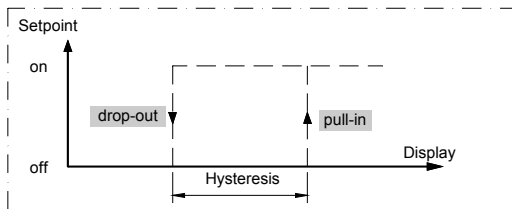
Operation current means that the relay will be pulled in if reaching the adjusted setpoint.
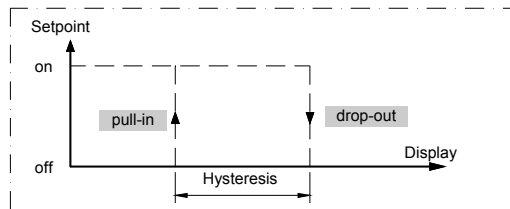
Quiescent current means that the relay will be dropped out if reaching the adjusted setpoint.

Operation, setting instructions

Subject to technical alteration – status 05/2006 - PTE4TX1GB

Program table 1

Program Number (PN)	Function	Remark	Display	Basic parameter after reset
2	Sensor and line balancing	Temperature is displayed	0 to +/-20	0
3	Selection of thermocouples	**L** Fe-CuNi (DIN) **J** Fe-CuNi (americ.) **K** NiCr-Ni	1 (°C) – 11 (°F) 2 (°C) – 12 (°F) 3 (°C) – 13 (°F)	2
4	Input of display time	Display time = measuring time Method of measurement integrating	0.2 to 10.0 seconds	1.0
5	Input of final value for analog output	Option	-999 to +9999	500
6	Input of offset for analog output	Option	-999 to +9999	0

Program table 2
(setpoints)

S1 PN	S2 PN	Function	Display	Basic parameter after reset
61	66	Setpoint	-999 to +9999	100/150
62	67	Hysteresis	0 to +9999	1/1
63	68	Quiescent current	0	-
		Operating current	1	1/1

Example for programming

Temerature sensor: Thermocouple **L** (FeCuNi)
Connection: 2-wire
Display: -100 to +900°C (ex works)
Display time: 2.0 seconds
Setpoints: S1 ==> 60 and quiescent current
relay pull in = 58 ==> hysteresis 2
S2 ==> 150 and operating current
relay drop out = 80 ==> hysteresis 70

Analog output: 0 V output ==> display 0 ==> 0°C
10 V output ==> display 600 ==> 600°C
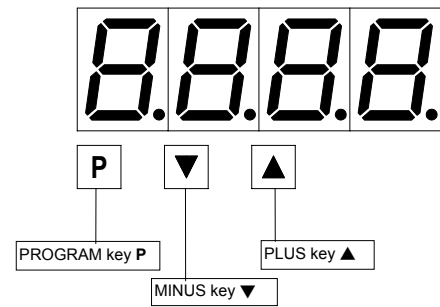
The basic adjustments concerning to the following program example are the ground parameters after a total reset occuring through a power on with pressing **P**-key (see previous page).

Program advices:
Pressing the **P**-key enters **always** the program mode with program number **2**. The **P2** begins to blink in change with the current value after 3 seconds. After further 4 seconds the system leaves the program mode and goes to the standard mode. In program mode pressing ▼ or ▲ -key selects the current values which are free scalable with both of the keys. All the other parameters will be memorized automatically after leaving program mode.
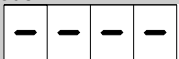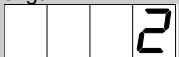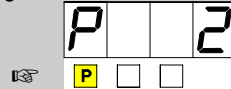
Programming.
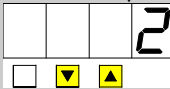Switch power on!

Lamp test

Standard mode

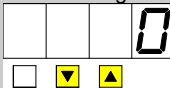Set thermocouple simulator to 0°C. The indication value depends of the used cable length.
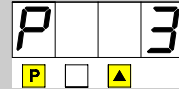
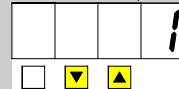To program number 2 with **P**.

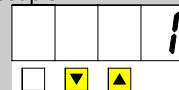To memorized value with ▼ or ▲.

Sensor and line balancing

To program number 3 with **P** and ▲.

To memorized value with ▼ or ▲.

Set thermocouple **L**.
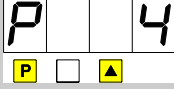
Example for programming

To program number 4 with **P** and ▲.

```
P    4
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
   1.0
```
[ ] [▼] [▲]

Set display time.

```
   2.0
```
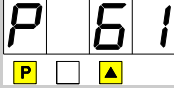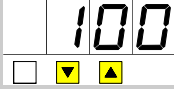[ ] [▼] [▲]
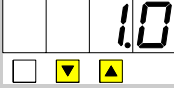
The following programming steps are necessary for the setpoints programming of S1 and S2 only.
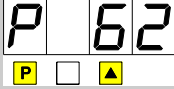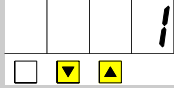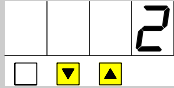
To program number 61 with **P** and ▲.

```
P   61
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
  100
```
[ ] [▼] [▲]

Set free scalable value for setpoint S1.

```
   60
```
[ ] [▼] [▲]
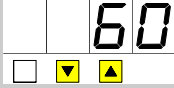
To program number 62 with **P** and ▲.

```
P   62
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
    1
```
[ ] [▼] [▲]

Set hysteresis for S1.

```
    2
```
[ ] [▼] [▲]

To program number 63 with **P** and ▲.

```
P   63
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
    1
```
[ ] [▼] [▲]
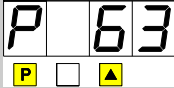
Set quiescent current.

```
    0
```
[ ] [▼] [▲]
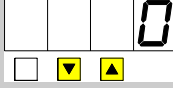
To program number 66 with **P** and ▲.

```
P   66
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
  150
```
[ ] [▼] [▲]

Set free scalable value for setpoint S2.

```
  150
```
[ ] [▼] [▲]

To program number 67 with **P** and ▲.

```
P   67
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
    1
```
[ ] [▼] [▲]

Set hysteresis for S2.

```
   70
```
[ ] [▼] [▲]
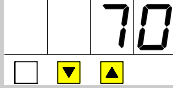
To program number 68 with **P** and ▲.

```
P   68
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
    1
```
[ ] [▼] [▲]

Set operating current.
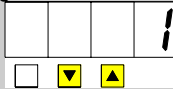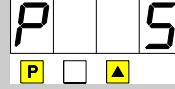
```
    1
```
[ ] [▼] [▲]

Programming finished.
All programmed values are memorized after 7 seconds. Jumps back into standard mode automatically.

The program numbers 5 and 6 are available with option analogue output only.
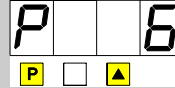
To program number 5 with **P** and ▲.

```
P    5
```
[P] [ ] [▲]
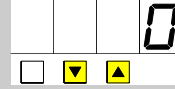
To memorized value with▼ or ▲.

```
  500
```
[ ] [▼] [▲]

Set free scalable final indication value for analog output.

```
  600
```
[ ] [▼] [▲]

To program number 6 with **P** and ▲.

```
P    6
```
[P] [ ] [▲]

To memorized value with▼ or ▲.

```
    0
```
[ ] [▼] [▲]

Programming finished.
All programmed values are memorized after 7 seconds. Jumps back into standard mode automatically.

Setting possibilities of the jumper field on the rear side.

Jumper *terminal*

Programming free | 1 | 2 | 3 |

Programming blocked | 1 | 2 | 3 |

Programming limited (PN61-68 free) | 1 | 2 | 3 |