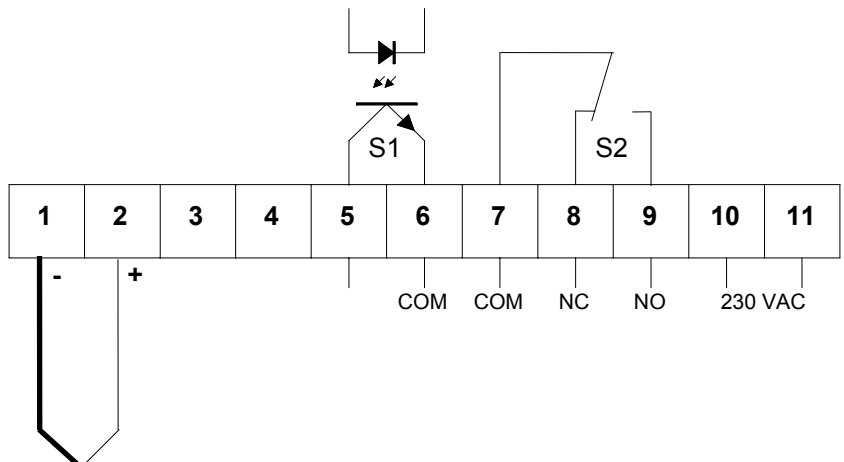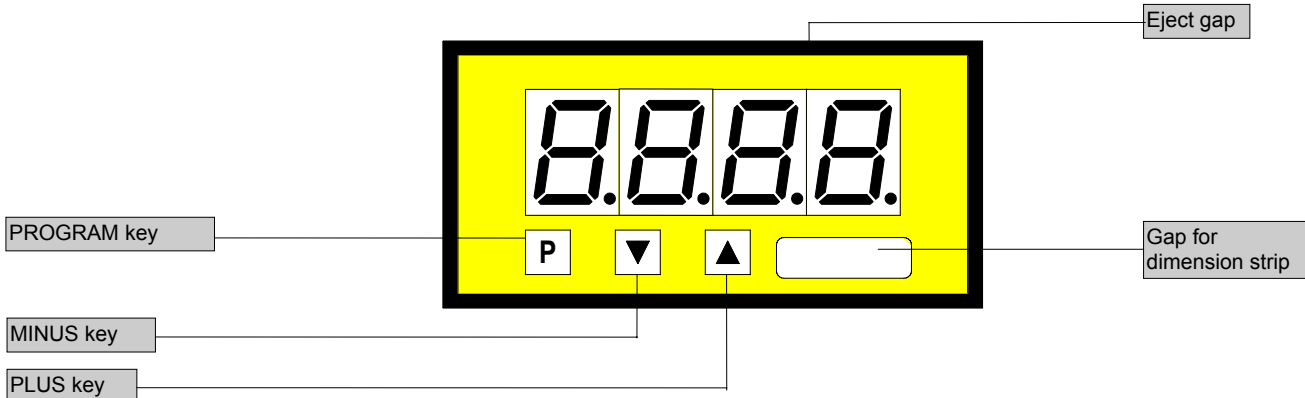# Temperature metering thermocouple

**- microprocessor based technology**
**- standard: 2 setpoints, min/max memory - optional analogue output**
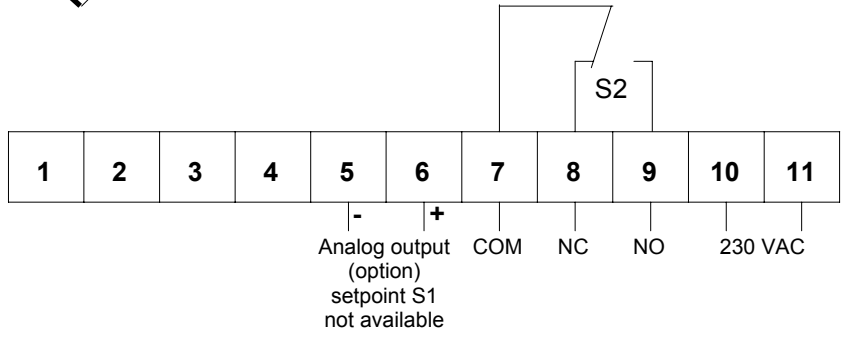**- mounting into panels with thickness up to 50 mm**

72x36

8888

Eject gap

PROGRAM key

P ▼ ▲

Gap for
dimension strip

MINUS key

PLUS key

S1        S2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|----|----|
| - | + | | | | | COM | COM | NC | NO | 230 VAC |

ORDER NUMBER OF TYPE
**PTE 4.40x.6522B**

**PTE 4.40x.6422B**
Power supply 115 VAC
(connection via terminal 10 and 11)

S2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|----|----|
| | | | | - | + | COM | NC | NO | 230 VAC | |

Analog output
(option)
setpoint S1
not available

**PTE 4.40x.6722B**
Power supply 24 VDC
**galv. insulated** (11= plus, 10= minus)

| | | |
|---|---|---|
| PTE 4.4x**L**.6xx2B | FeCuNi (DIN) | -100 up to + 900°C |
| PTE 4.4x**J**.6xx2B | FeCuNI (americ.) | -200 up to + 1200°C |
| PTE 4.4x**K**.6xx2B | NiCrNi | -250 up 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)
● Tenalog output 0-10 VDC (12 bit)        *(supply voltage 24 VDC galv. insulated)*
● Analog output 0-20 mA/load 500 Ω (12 bit) *(supply voltage 24 VDC galv. insulated)*
● Analog output 4-20 mA/load 500 Ω (12 bit) *(supply voltage 24 VDC galv. insulated)*
**With analog output setpoint S1 is not available!**
● Dimension strip selectable (max. 7 characters)
● Other power supplies on demand

# Technical data

| | | |
|---|---|---|
| **Dimensions** | Housing | 72 x 36 x 97 mm, including screw terminal |
| | Assembly cut out | $68.0^{+0.7}$ x $33.0^{+0.6}$ mm |
| | Fastening | special quick plastic clamp proper to fix in wall thickness up to 50 mm |
| | Housing material | PC/ABS blend, colour black, UL94V-0 |
| | Protective system | at the front IP40 |
| | | connection IP00 |
| | Weight | approx. 0.190 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 240 VAC/0.25 A – 24 VDC/1 A, with ohm resistive burden |
| | Switching cycles | $2 * 10^5$ at max. contact rating |
| | | $10 * 10^6$ mechanically |
| | Open collector | supply by customers ($U_B$=5-40 V/$I_{max}$=100 mA) |
| | Analogue output | 0-10 VDC (12 bit) |
| | | 0-20 mA (12 bit) - load 500 Ohm    } The analogue output is galvanic insulated from the measuring input! |
| | | 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** | Power supply | 230/115 VAC +/- 10 % (50-60 Hz), 24 VDC +/-10 % galvanic insulated |
| | Power consumption | approx. 3 VA |
| **Indication** | Display | LED with 7 segments, 14 mm high, red |
| | | 4-digit = indication 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 |

**Housing:**



77 mm

72 mm

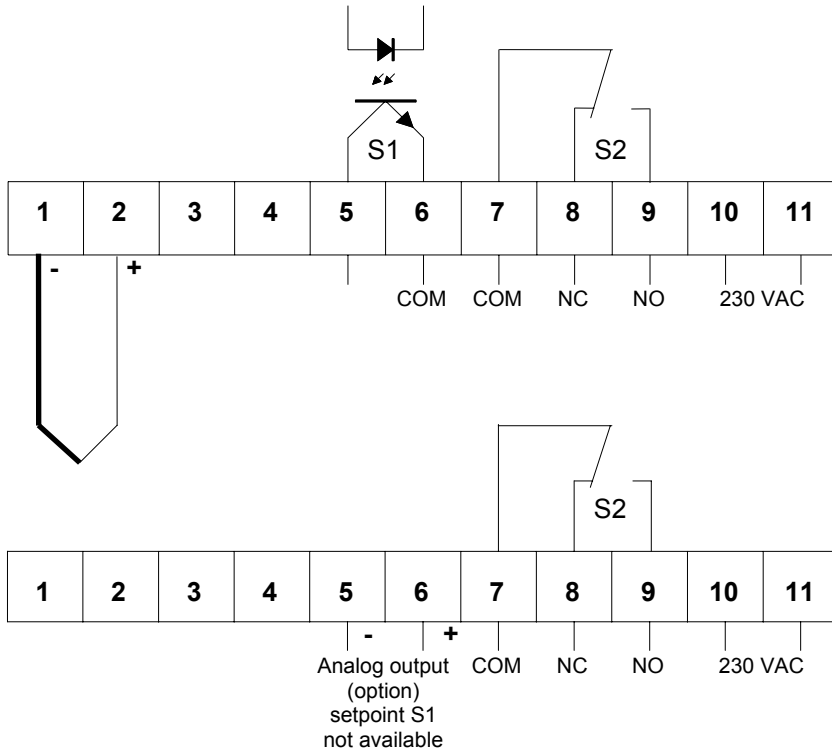65 mm

36 mm

32 mm

97 mm
(with plug in terminal 115 mm)

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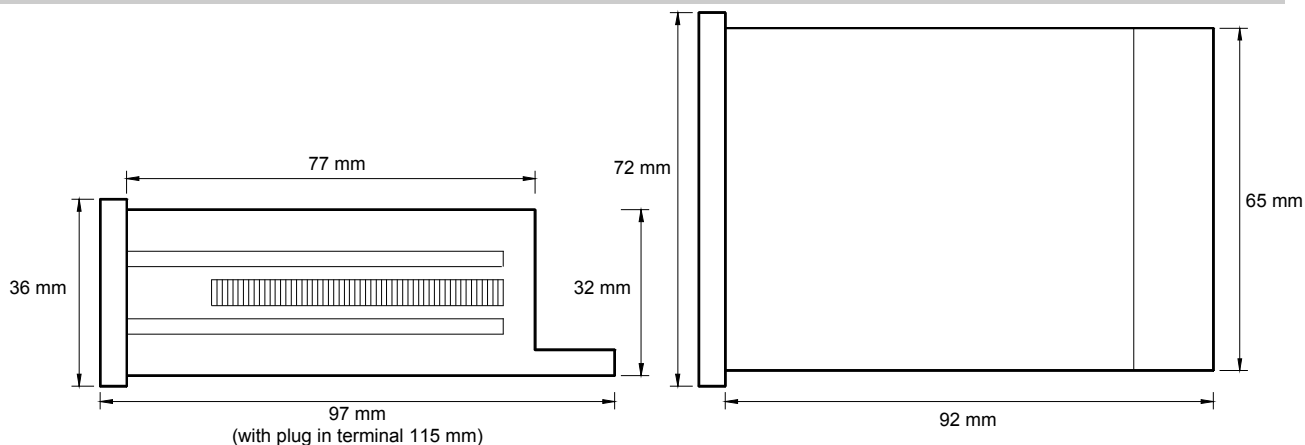
**CE-sign**
For unlimited use of the instrument within the directives for electromagnetic compatibility 89/336/EC measuring wires have to be used with shielded cable and cable's shield connected to earth ground at one end only.

# Connection diagram, programming, remarks



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

S1     S2

-   +        COM   COM   NC   NO   230 VAC

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

S2

-   +        COM   NC   NO   230 VAC

Analog output
(option)
setpoint S1
not available

## Setting

1. Connect the instrument according to the wiring diagram.
2. After power on, the instrument runs into a lamptest and returns back to the standard mode.
3. Pressing the **P**-key enters the program mode with indication of **P2** on 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 PVE4 relay contacts. The hysteresis is free programmable.
There are two kinds of operation:

**Example: operation current**
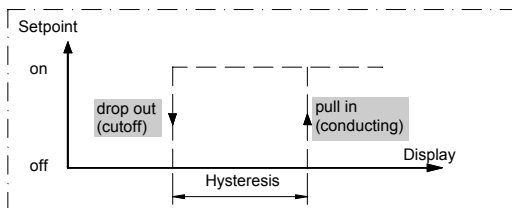


**Example: quiescent current**
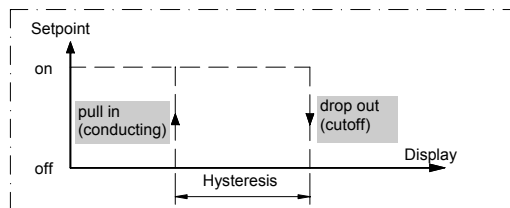


Operation current means that the open collector will be pulled in (conducting) if reaching the adjusted setpoint.

Quiescent current means that the open collector will be dropped out (cutoff) if reaching the adjusted setpoint.

# Operation, setting instructions

subject to technical alteration – status 05/2006 - PTE4TX6GB.DOC

## 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)<br>**J** Fe-CuNi (americ.)<br>**K** NiCr-Ni | 1 (°C) – 11 (°F)<br>2 (°C) – 12 (°F)<br>3 (°C) – 13 (°F) | 2 |
| 4 | Input of display time | Display time = measuring time<br>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 | S2 | Function | Display | Basic parameter after reset |
|---|---|---|---|---|
| PN | PN | | | |
| 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

**Temperature 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
open collector conducting = 58 ==> hysteresis 2
S2 ==> 150 and operating current
relay cut off = 80 ==> hysteresis 70

**Analog output:** 0 V output ==> display 0 ==> 0°C
(no setpoint S1) 10 V output ==> display 600 ==> 600°C

PROGRAM key **P**     PLUS key ▲     MINUS key ▼

---
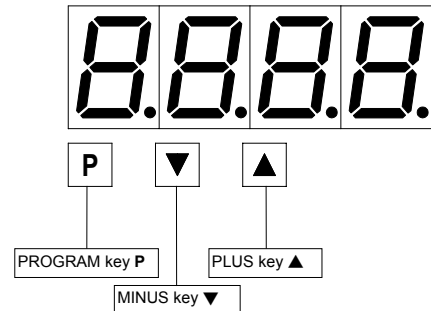
The basic adjustments concerning to the following program example are the ground parameters after a total reset occuring through a power on with pressing **P**-key (see previous page).

**Program advices:**
Pressing the **P**-key enters **always** the program mode with program number **2**. The **P2** starts 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 the keys. All the other parameters will be memorized automatically after leaving program mode.
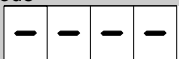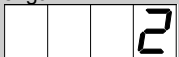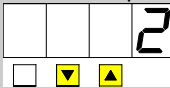
**Programming**
Switch power on!

Lamp test
`8.8.8.8`

Standard mode
`– – – –`

Set thermocouple simulator to 0°C.
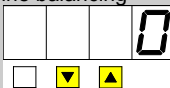The indication value depends of the used cable length.
`2`

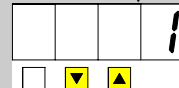To program number 2 with **P.**
☞ `P   2`  [P]

To memorized value with ▼ or ▲.
`2`  [▼][▲]

Sensor and line balancing
`0`  [▼][▲]

To program number 3 with **P** and ▲.
`P   3`  [P][▲]

To memorized value with ▼ or ▲.
`1`  [▼][▲]

Set thermocouple **L.**
`1`  [▼][▲]
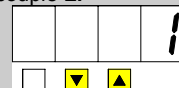
# Example for programming

To program number 4 with **P** and ▲.

```
P    4
[P]  [ ]  [▲]
```

To memorized value with ▼ or ▲.

```
     1.0
[ ]  [▼]  [▲]
```

Set display time.

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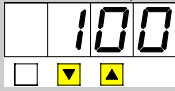
---------------------------------------------------------
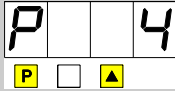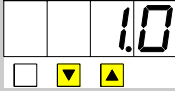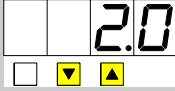
**The following programming steps are neccessary for the switching point programming of S1 and S2 only.**
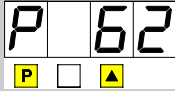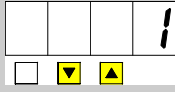
To program number 61 with **P** and ▲.

```
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
[ ]  [▼]  [▲]
```
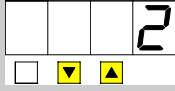
To program number 63 with **P** and ▲.

```
P    63
[P]  [ ]  [▲]
```

To memorized value with ▼ or ▲.

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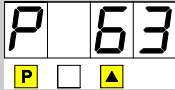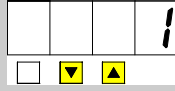
Set quiescent current.

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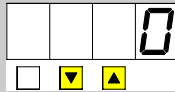
To program number 66 with **P** and ▲.

```
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
[ ]  [▼]  [▲]
```
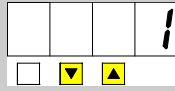
Set hysteresis for S2.

```
     70
[ ]  [▼]  [▲]
```

To program number 68 with **P** and ▲.

```
P    68
[P]  [ ]  [▲]
```

To memorized value with ▼ or ▲.

```
     1
[ ]  [▼]  [▲]
```
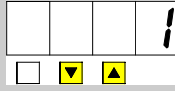
Set operating current.
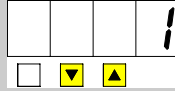
```
     1
[ ]  [▼]  [▲]
```
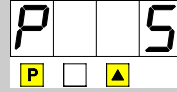
**Programming finished.**
All programmed values are memorized after 7 seconds. Jumps back into standard mode automatically.

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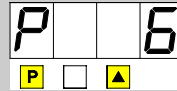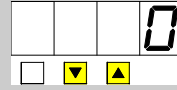
To program number 5 with **P** and ▲.

```
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 |