

PROGRAMMABLE TRANSDUCER OF TEMPERATURE AND STANDARD SIGNALS P11T



APPLICATION

The P11T transducer is destined to the conversion of temperature, resistance, voltage from the shunt and standard signals into a d.c. current and voltage standard signal.

The output signal is galvanically isolated from the input signal and the supply.

The P11T transducer is offered in two basic versions:

- P11T-1, with programmed parameters by the producer acc. the ordered version.
- P11T-2, with programmed parameters by the producer acc. the ordered version and with the possibility to change the parameters by the user by means of a computer through the PD11 programmer.

The PD11 programmer is a universal device serving to programme all the P11 and P12 series.

The P11T-2 transducer realises also following functions:

- conversion of the measured value into an optional output signal on the base of the individual linear characteristic.
- switching on or off the automatic compensation. Possibility to introduce a manual correction.
- storage of maximal and minimal values.
- programming of the measurement averaging time.
- blocking of the parameter introduction by means of a password.

Using the PD11 programmer, one can read out in any time from the P11T-2 transducer:

- the measured value,
- the maximal and minimal value, the signal on the analogue output in percentage of the range

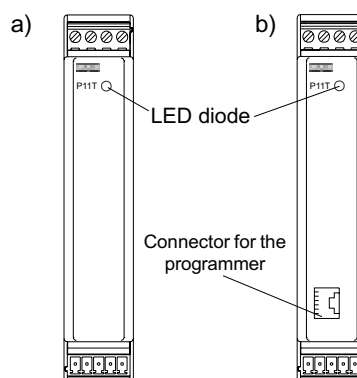


Fig.1 View of the P11T transducer

- a) P11T-1
- b) P11T-2

INSTALLATION

The P11T transducer is designed to be installed on a 35 mm DIN rail acc. EN 60715. On the external side of the transducer there are screw or self-locking terminal strips enabling the connection of 2.5 mm² external leads (supply and output) and up to 1.5 mm² leads (input). The lighted diode situated on the upper front of the transducer signals the connection of this transducer to the mains.

EXTERNAL AND ASSEMBLY DIMENSIONS

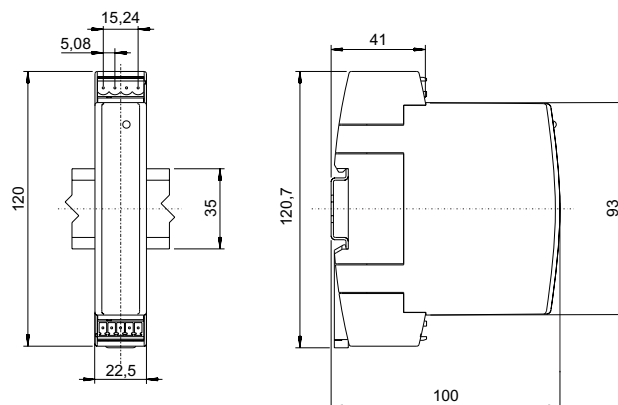


Fig.2 Overall dimensions and fixing way of the P11T transducer

DIAGRAMS OF EXTERNAL CONNECTIONS

The P11T transducer has two sockets of terminal strips and two connectors are included, a screw plug or a self-locking plug depending on the chosen type by the user in the order code.

The fig.4 shows the connection way of external signals.

The P11T-1 transducer works with programmed parameters acc. the ordering code and there is no possibility to change these parameters.

In case of P11T-2 transducers there is the possibility to change these parameters by means of a PD11 programmer and a computer (see fig.3).

CHANGE OF PARAMETERS IN THE P11T-2 TRANSDUCER

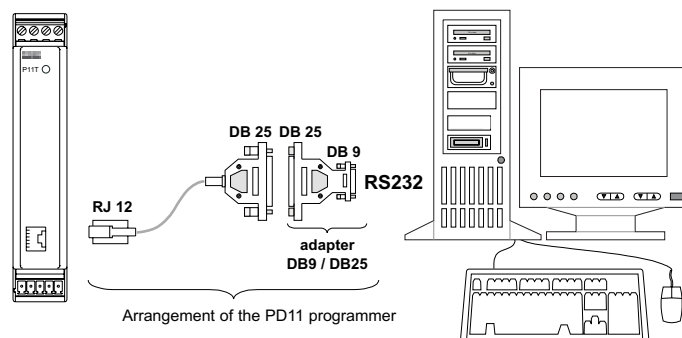


Fig.3 Connection way of the P11T-2 transducer with a computer.

The programming of parameters is possible after the introduction of the correct password.

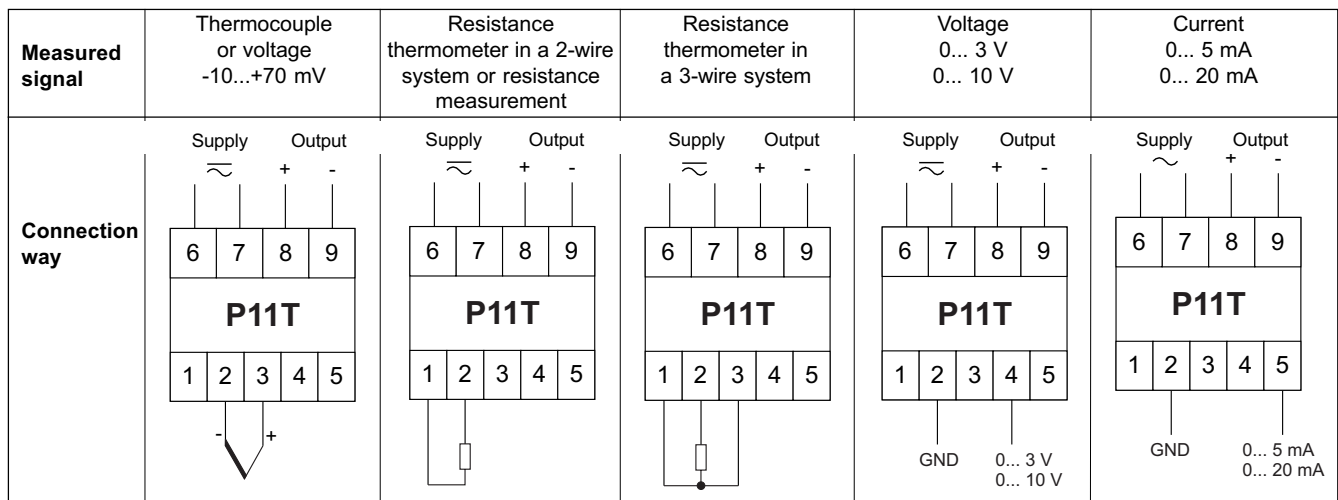


Fig.4 Description of terminal strips of the P11T transducers.

TECHNICAL DATA

Basic parameters:

- input signals:

Input type	Full range	Minimal sub-range with preservation of class		
		automatic compensation switched off	automatic compensation switched on	
Pt100	(-200...+850)°C	260°C	530°C	
Pt500	(-200...+850)°C	260°C		
Pt1000	(-200...+850)°C	260°C		
Cu100	(-50...+180)°C	120°C	(-50...+180)°C	
Ni100	(-60...+180)°C	120°C	(-60...+180)°C	
J (Fe-CuNi)	(-100...+1200)°C	330°C	650°C	
K (NiCr-NiAl)	(-100...+1370)°C	370°C	740°C	
N (NiCrSi-NiSi)	(-100...+1300)°C	350°C	700°C	
E (NiCr-CuNi)	(-100...+900)°C	250°C	500°C	
R (PtRh13-Pt)	(0...+1760)°C	880°C	(0...+1760)°C	
S (PtRh10-Pt)	(0...+1760)°C	880°C	(0...+1760)°C	
T (Cu-CuNi)	(-50...+400)°C	250°C	(-50...+400)°C	
resistance	(0... 400) Ω	100 Ω	200 Ω	
resistance	(0... 4000) Ω	1000 Ω		
voltage	(-10... 70) mV	20 mV		input resistance >9 MΩ
voltage	(0...3) V	0.75 V		input resistance >1 MΩ
voltage	(0...10) V	2.5 V		input resistance >1 MΩ
current	(0...5) mA	1.25 mA		input resistance < 4 Ω
current	(0...20) mA	5 mA		input resistance < 4 Ω

thermocouple characteristics acc. EN-60584-1
resistance thermometer characteristics acc. EN 60751+A2

- analogue output galvanically isolated with a resolution 0.01% of the range

- current programmable 0/4...20 mA load resistance ≤ 500 Ω
- voltage programmable 0...10 V load resistance ≥ 500 Ω
- current programmable 0...5 mA load resistance ≤ 2000 Ω

- accuracy class
0.2
0.3 for Cu100 and Ni100;
minimal subrange in P11T-2:
4 times smaller than the full range

- additional error from the ambient temperature change

± (0.1% of the range/10 K)
± (0.2% of the range/10 K)
for resistance thermometers and thermocouples of T type.

- conversion time:

- P11T-1
- P11T-2

< 200 ms
min 200 ms (averaging time
min 100 ms + output
response time 100 ms)

- power input

≤ 3 VA

- current intensity flowing through the resistance thermometer

< 0.17 mA

- resistance of leads connecting the resistance thermometer with the transducer < 20 Ω/1 lead
- preheating time of the transducer 10 min.

Nominal operating conditions:

- supply voltage depending on the execution code 85...230...253 V a.c./d.c.
20...24...50 V a.c./d.c.
- frequency of the supply a.c. voltage 40...50...440 Hz
- ambient temperature -25...23...55°C
- storage temperature -25°C ...+85°C
- relative humidity < 95% (condensation inadmissible)
- working position assembling on a 35 mm DIN rail

Sustained overload:

- thermocouples, resistance thermometers 1%
- measurement of voltage, current and resistance 20%

Short duration overload (3 sec):

- inputs of sensors and voltage 30 V
- current input 10 In

Ensured protection degree:

- by the housing IP 40
- from the terminal side IP 20

Dimensions 22.5 x 120 x 100 mm

Weight 125 g

Fixing on a 35 mm DIN rail

Electromagnetic compatibility:

- immunity EN 61000-6-2
- emission EN 61000-6-4

Security requirements acc. EN 61010-1

- installation category III
- pollution level 2
- maximal working voltage in relation to earth:
 - supply 300 V a.c.
 - input 50 V a.c.
 - output 50 V a.c.

ORDERING CODES

Ordering codes of the P11T transducer

TRANSUCER	P11T-	X	XX	X	X	X	XX	X
Kind of transducer:								
programmed by the producer			1					
programmable*			2					
Input signal								
Pt100 (-200...+850)°C							00	
Pt500 (-200...+850)°C							01	
Pt1000 (-200...+850)°C							02	
Cu100 (-50...+180)°C							03	
Ni100 (-60...+180)°C							04	
Thermocouple J - (Fe-CuNi) (-100...+1200)°C							05	
Thermocouple K - (NiCr-NiAl) (-100...+1370)°C							06	
Thermocouple N - (NiCrSi-NiSi) (-100...+1300)°C							07	
Thermocouple E - (NiCr-CuNi) (-100...+900)°C							08	
Thermocouple R - (PtRh13-Pt) (0...+1760)°C							09	
Thermocouple S - (PtRh10-Pt) (0...+1760)°C							10	
Thermocouple T - (CuCu-Ni) (-50...+400)°C							11	
Measurement of resistance up to 400 Ω (0...+400) Ω							12	
Measurement of resistance up to 4 kΩ (0...+4000) Ω							13	
Measurement of voltage -10...70 mV (-10...+70) mV							14	
Measurement of voltage 0...3 V (0...3) V							15	
Measurement of voltage 0...10 V (0...10) V							16	
Measurement of current 0...5 mA (0...5) mA							17	
Measurement of current 0...20 mA (0...20) mA							18	
Custom-made version:								
Pt100 (0... + 100)°C							19	
Pt100 (0... + 250)°C							20	
Measurement of current 0...50 mA (0... 50) mA							21	
Measurement of current 0...80 mA (0... 80) mA							22	
Pt250 (0... + 100)°C							23	
Measurement of voltage -12...150 mV (- 12... +150) mV ...							24	
on order**							XX	
Output signal:								
voltage, 0... 10 V							1	
current, 0... 20 mA							2	
current, 4... 20 mA							3	
current, 0... 5 mA							4	
on order**							9	
Supply:								
85... 253 V a.c./d.c.							1	
20... 50 V a.c./ d.c.							2	
Kind of terminals:								
socket - screw plug							0	
socket - self-locking plug							1	
Version:								
standard							00	
custom-made**							XX	
Acceptance tests:								
without a quality inspection certificate							0	
with a quality inspection certificate							1	
acc. user's agreement***							X	

* The programmable transducer has a universal input. When ordering one must give the code of the output signal which will be to programmed.

** After agreeing by the producer

*** The producer will establish the version code number

Coding example:

The **P11T-1-00-1-1-0-00-0** code means: the version of a P11T transducer programmed by the producer without the possibility to re-programme it by the user, with an input signal: PT100 resistance thermometer, voltage output signal: 0 -10 V, supply voltage: 85...253 V a.c./d.c., with a socket-screw plug, standard version, without a quality inspection certificate.

- **Ensured protection degree:**
 - through the case IP 40
- **Dimensions** 45 x 120 x 100 mm
- **Mass** < 300 g
- **Fixing** on a 35 mm DIN rail
- **Power consumption** < 5 VA
- **Supply decay immunity**
 - storage of all energy counter states
 - storage of all programming parameters
 - storage of all minimal and maximal values

- **Electromagnetic compatibility:**
 - immunity EN 61000-6-2
 - emission EN 61000-6-4

■ **Security requirements acc. EN 61010-1**

- standard:**
- installation category III
 - pollution level 2
 - phase-to-earth maximal working voltage:
 - input 600 V a.c.
 - supply 300 V a.c.
 - reals 300 V a.c.
 - analog output 50 V a.c.
 - RS-485 50 V a.c.

ORDERING CODES

Ordering codes of the P12P transducer

PROGRAMMABLE TRANSDUCER P12P	X	X	XX	X	X	X	XX	X
Kind of transducer:								
without a display	1							
with a display	2							
Input range:								
100 V 1 A	1							
100 V 5 A	2							
400 V 1 A	3							
400 V 5 A	4							
Custom-made version:								
600 V 5 A	5							
on order**	X							
Programmed converted parameter*:								
voltage	00							
current	01							
frequency	02							
active power	03							
reactive power	04							
apparent power	05							
3-phase active power	06							
3-phase reactive power	07							
3-phase apparent power	08							
cosφ	09							
tgφ	10							
φ	11							
active energy	12							
reactive energy	13							
apparent energy	14							
3-phase active energy	15							
3-phase reactive energy	16							
3-phase apparent energy	17							
on order**	XX							
Output signal:								
voltage 0... 10 V	1							
current 0...20 mA	2							
current 4...20 mA	3							
current 0...5 mA	4							
on order**	X							
Supply:								
85...253 V d.c. or a.c. (40...400 Hz)	1							
20...50 V d.c. or a.c. (40...400 Hz)	2							
Kind of terminals:								
socket - screw plug	0							
on order***	X							
Version:								
standard	00							
custom-made**	XX							
Acceptance tests:								
without a quality inspection certificate	0							
with a quality inspection certificate	1							
acc user's agreement**	X							

The transducer maintains its class index up to a four-fold decrease of the input signal of the basic range. In the P12P-1 transducer, besides the basic range, one must give the required sub-range.

In case when the given sub-range is lower than the basic range divided by four, one must specify the input signal in the order as XX.

Coding examples

1. Transducer with a basic range

P12P- 2 - 1 - 03 - 3 - 1 - 0 - 00 - 0 means:

- 2 - version of a P12P transducer with a display
- 1 - input range: 100 V, 1 A
- 03 - programmed by the manufacturer to convert active power
- 3 - current output signal: 4...20 mA
- 1 - supply voltage: 85...253 V a.c./d.c.
- 0 - socket - screw-plug terminals
- 00 - standard version
- 0 - without an extra quality inspection certificate.

2. Transducer with a measuring sub-range

P12P-1- 2 - 00 - 2 - 1 - 0 - 00 - 0 sub-range 0...50 V code means:

- 1 - version of a P12P transducer without a display
- 2 - input range: 100 V, 5 A
- 00 - programmed by the manufacturer to convert the 0...50 V range
- 2 - current output signal: 0...20 mA
- 1 - supply voltage: 85...253 V a.c./d.c.
- 0 - socket - screw-plug terminals
- 00 - standard version
- 0 - without an extra quality inspection certificate.

* The modification of the converted parameter is possible from the keyboard (P12P-2) through PD11 or RS-485. When ordering, one must give the code of converted parameter which is to be programmed.

** The version must be agreed with the producer

*** Possible version with self-locking terminals