APPLICATION

The devices are designed for remote measurement of physical quantities. The input signal may be direct voltage or current or change of resistance.
The indication device can be completed with the following accessories:

- analogue unified output
- analogue unified output with galvanic separation
- signalling of two adjustable limits, output – open collectors
- signalling of two adjustable limits, output - relay contacts
- input for connection of programme transmitter of required value

DESCRIPTION

Circuits of the device are located on two to five boards of printed circuits. On the mother board of the indicating device, there are circuits of source, input amplifier, A/D converter and connecting terminal board. The display board is soldered vertically to the mother board. Boards of other accessories, i.e. limit signalling, analogue output, galvanic separation, input of programme transmitter are soldered vertically to the mother board. The board of relay outputs is located in parallel to the mother board and the terminal board of relay outputs is located on it. The set of printed circuits is inserted into a metal box of the device and the terminal board is on the rear side of it. As for the device provided with signalling of limit values, on the front side there are two push-buttons, potentiometers for their adjustment and diodes indicating that they have been exceeded. The device has no melting fuse. It is protected against overload by non-destructive thermally dependent limiter in the circuit of primary wiring of the transformer.

TECHNICAL DATA

The device is designed pursuant to ČSN EN 61010-1 as an electrical equipment of protection class I for the application in networks with category of overvoltage in installation III and pollution grade 2. The internal source for power supply of circuits of input signals corresponds to Article 6.3 of the standard.
The device has internal protection by means of reversible thermal fuse in the primary circuit of the transformer and, therefore, it does not have to be secured with an external fuse.
The device is designed for embedding or for connection on the wall.

Electric strength:
of mains circuit against protective terminal: AC 2200 V.
of input and output circuits against mains circuit: AC 4000 V
of input and output circuits against protective terminal: AC 500 V
of circuit of contacts of signalling relays against protective terminal: AC 2200 V.
of circuits of contacts of signalling relays against mains circuit: AC 4000 V.
of circuits of contacts of signalling relays against input and output circuits: AC 4000 V.
of circuits of contacts of one signalling relay against contacts of other relays: AC 2000 V.
between contacts of the same signalling relay that can be disconnected AC 1000 V

Electric isolation resistance: min. 20 MΩ

Power supply:

Type of supply mains:	1 / N / PE AC 230 V, 50 Hz
Tolerance of supply voltage:	±10 %
Tolerance of mains frequency:	48 to 62 Hz
Coefficient of upper harmonics:	max. 10 %

Electric power input: max. 10 VA
Ingress protection: pursuant to ČSN EN 60529: box IP 42
terminals IP 20
Weight: 0.5 kg
Used materials:

- Device box is made of steel metal sheet and is painted
- The front consist of self-sealing plastic foil

OPERATION CONDITIONS

The device is designed for the environment defined by the group of parameters and their severity grades IE 35 pursuant to ČSN EN 60721-3-3, but the level of vibrations may only reach the amplitude of 0.35 mm.

Ambient temperature: 0 to 50 °C
Relative ambient humidity:
10 to 95 with upper limit of water content 29g H_2O/kg of dry air without condensation
Atmospheric pressure: 86 to 106 kPa
Vibrations:

Frequency range [Hz]	10 to 55
Drift amplitude [mm]	0.35

Heating period: 20 minutes
Type of operation: continuous
Operation position: horizontal

METROLOGICAL DATA

Input signals:
1. Voltage DC

Maximum range	0 to ± 10 V
Minimum range	0 to 10 mV
Input resistance	min 20 kΩ
Suppression of start	max. 200% of measurement range
Limits of permitted basic error	0.2% ± 2 digits

The error is related to nominal range of indicated signal.
2. Current DC

Maximum range	0 to 20 mA
Minimum range	0 to 50 µA
Input resistance	to 5 mA max. 100 Ω
over 5 mA incl.	voltage drop ≤ 100 mV
Suppression of start	max. 200% of measurement range
Limits of permitted basic error	0.2% ± 2 digits

The error is related to nominal range of indicated signal.
3. Signals from thermocouples

Signal	Basic measuring range	Limits of permitted basic error
thermo-couple J	0 to 900°C	0.4%
thermo-couple K	0 to 1200°C	0.4%
thermo-couple S	0 to 1600°C	0.4%
thermo-couple B	300 to 1800°C	0.4% for 600 to 1800°C 0.8% for 300 to 1600°C

The error is related to basic measuring range.
Compensation of comparison ends of thermocouple:

- Internal: accuracy ± 0.2 % of basic measuring range
- External: selectable by by-pass coupler inside the device 20, 50°C

4. Signals form resistance thermometers Pt100

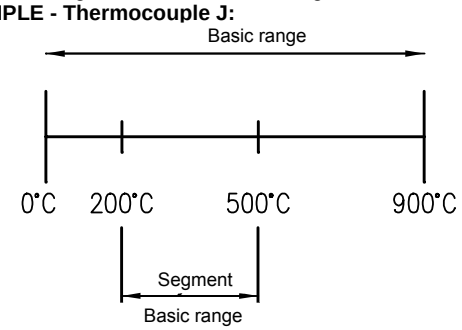
Signal	Basic measuring range	Limits of permitted basic error
Resistance	-199.9 to 199.9°C	0.1% + 2 digits
	-200 to 600°C	0.2% + 2 digits

The error is related to basic measuring range.
Long-term drift for 240 hours: max. 0.2 % ± 2 digits
Additional errors:

- 0.1 % in case of ambient temperature change per each 10 °C
- 0.1 % within the whole operation range of supply voltage
- Impact of interfering signals: max.1%
  - For serial ones in case of interfering signal 1 x range, but max. 5 V a 50 Hz
  - For parallel ones, in case of interfering signal 500 x range, but max. 10V and 50Hz

The impact of other influencing quantities in the operation field has no metrological significance.
Frequency of measurement: 2.5× sec
Signalling of exceeding limit values:
- Number of adjustable limits: 2
- The adjustment value of lower limit can be entered with the use of the external voltage input provided with a selectable divider 3.5x or 15x (data on the display when pressing the push-button of lower limit – it is the value of the lower limit – is equal to voltage on the external input divided by the selected division ratio)
- Input resistance of external input for divider: 3.5 x 7 kΩ
  15 x 30 kΩ
- Range of limit adjustability:
  - Range of limit adjustability is equal either with the whole basic range of measurement of the relevant sensing unit or with a certain segment of this range.

EXAMPLE - Thermocouple J:



Hysteresis of limit signalling: typical value 0.4% of limit adjustability range
Output signals:
1. Relay
- 1x switch-over relay contact 230V, 5A for each limit. Possibility of selection of idle conditions of relay in a follow-up to exceeding the pre-set limit in both directions. Relay contacts can be used either in circuits of mains voltage or in circuits of safe voltage, always both relays in the same category of circuits. Values of surface paths correspond to ČSN 33 0420.

2. Open collectors:
- Parameters of output transistors are:
  Uce max. = 30 V, Ic max. = 150 mA.
- Possibility of selection of active conditions of transistor in follow-up to exceeding the adjusted limit in both directions.

Analogue output:
The whole range of the analogue output signal is assigned either to the whole basic range of measurement of the relevant sensing unit or to a certain segment of this range.
Selectable analogue output:

1. Unified voltage:	0 - 10 V
Limits of permitted basic error:	0.4 %
Load resistance:	min 2.4 kΩ
2. Selectable unified current:	0 - 20 mA, 4 - 20 mA
Limits of permitted basic error:	0.4 %
Load resistance:	max. 500 Ω

The errors are related to the display range (segment).
Output signals can be inverted (the initial output value is e.g. for voltage output 10V, the end value is 0V).
Analogue output with galvanic separation:
The whole range of the analogue output signal is assigned either to the whole basic range of measurement of the relevant sensing unit or to a certain segment of this range.
Selectable analogue output:

1. Unified voltage:	0 - 10 V
Limits of permitted basic error:	0.4 %
Load resistance:	min 2.4 kΩ
2. Selectable unified current:	0 - 20 mA, 4 - 20 mA
Limits of permitted basic error:	0.4 %
Load resistance:	max. 500 Ω

The errors are related to the displayed range (segment).
Electric strength of galvanic separation: 100 V
Output signals can be inverted.

ELECTROMAGNETIC COMPATIBILITY (EMC)

Limit values of interfering voltage, pursuant to ČSN EN 55011:
class B, group 1
Electrostatic discharges, pursuant to ČSN EN 61000-4-2:
level 3, functional criterion 1
External electromagnetic field, pursuant to ČSN EN 61000-4-3:
level 2, functional criterion 2
Fast transient phenomena, pursuant to ČSN EN 61000-4-4:
level 2, functional criterion 2
Magnetic fields of mains frequency, pursuant to ČSN EN 61000-4-8:
level 5, functional criterion 1

DESIGNATION

Data on the product:
- Trade mark
- Made in Czech Republic
- Product number
- Manufacturing number
- Type and size of supply mains
- Maximum power input
- Ingress protection grade
- CE mark

DELIVERY

The device is pre-set and adjusted in the manufacturing plant pursuant to Figures 5, 7, 8 and 9.
Unless agreed otherwise with the customer, each delivery includes
- Delivery note
- Products pursuant to the purchase order
- The following is delivered with each device
  - Resistor Rj 20 Ω for resistance input signals
  - 2 pcs of connecting yokes for installation into panel
  - At a special request 2 pcs of installation braces for installation on the wall
  - Accompanying technical documentation in Czech in the following range:
    - Product quality and completeness certificate (it declares compliance with Technical conditions and also serves as the Warranty Certificate)
    - Installation, operation and maintenance manual

If it is established in the purchase contract or agreed otherwise, the following documentation can be also delivered with the product
- EC Declaration of Conformity
- Other documents

RELIABILITY

Reliability on conditions pursuant to ČSN 18 0023:
Informative value of mean time between failures is 16,000 hours. Mean life is 5 years.

PACKING

The devices are delivered in a transport package ensuring protection against the following mechanical effects:
- Vibrations: frequency 10 to 55 Hz
  shift / acceleration 0.35 mm / 49 m/s2
- Impulses: pulse amplitude 98 m/s2
  pulse length period 16 ms

Both sensors and accessories are packed pursuant to controlled packing regulations.
The devices are delivered in a packing ensuring resistance to the impact of thermal effects pursuant to ČSN EN 60654-1 and mechanical effects pursuant to ČSN IEC 654-3.

TRANSPORT

The devices may be transported on conditions corresponding to the set of combinations of classes IE 21 pursuant to ČSN EN 60721-3-2.

STORAGE

The devices may be stored on conditions corresponding to the set of combinations of classes IE 11 pursuant to ČSN EN 60721-3-1 at ambient temperature 0 ÷ 55 °C and relative air humidity to 95% and max. content of 29g H_20/kg of dry air.
The storage life is max. 12 months. After this period, the product shall be subjected to piece test.

ORDERING

The purchase order shall specify

- Name
- Product ordering number
- Number of pieces

PURCHASE ORDER EXAMPLE
ZEPAX 02
Relay output 0-150°C Pt100
502 040 119
Installation braces
999 502 001
2 pcs

1. TABLE OF DESIGNS

SPECIFICATION							ORDERING NUMBER			
							502	xx	xx	xx
	Indication	Analogue output	Galvanic separation	Output open collector	Output relay	Output PGV				
Design	•							00	*	**
	•	•						01		
	•	•	•					02		
	•			•		•		03		
	•				•	•		04		
	•	•		•				05		

* Pursuant to Table 2.
** Pursuant to Table 3 and 6.
For installation on the wall, braces are delivered at a special request - refer to Figure 3 (2 pcs shall be ordered).

2. TABLE OF SIGNALS

502 xx				xx
Natural signals from resistance sensing units	Pt 100, W100 = 1.3850 (ČSN IEC 751)			01
Natural signals from thermoelectric thermometers pursuant to ČSN EN 60584-1	Thermocouple Fe - CuNi designation "J"	Internal compensation		08
		External compensation 20°C		09
		External compensation 50°C		10
	Thermocouple NiCr - NiAl designation. "K"	Internal compensation		16
		External compensation 20°C		17
		External compensation 50°C		18
	Thermocouple PtRh 10 - Pt designation "S"	Internal compensation		20
		External compensation 20°C		21
		External compensation 50°C		22
	Thermocouple PtRh 30 - PtRh 6 designation "B"	Without compensation		24
Signals from converters with unified output	Converters for temperature sensing units Pt100, Pt500,Pt1000, Ni100, Ni200, Ni500, Ni1000 and converters with compensation of comparison ends for thermocouples Fe-CuNi, Fe-ko, NiCr-NiAl, PtRh10-Pt, PtRh30-PtRh6	Linearized output signal	0 - 20mA	28
			4 - 20mA	29
			0 - 10 V	30
	Pressure sensors or other converters with linearized output		0 - 20mA	52
			4 - 20mA	53
			0 - 5mA	54
			0 - 10 V	55
Other signals	Direct connection to resistance transmitter 5 - 105 Ω, three-wire connection			56
	Other signals within limits of possibilities of the device 1)			58

1) - Only on the basis of an agreement with the manufacturer

3. TABLE OF RANGES FOR TEMPERATURE MEASUREMENT

502 xx xx			xx	502 xx xx			xx	502 xx xx			xx
-200	to	-100 °C	01	0	to	150 °C	19	100	to	400 °C	37
-200	to	+50 °C	02	0	to	200 °C	20	200	to	400 °C	38
-100	to	0 °C	03	0	to	250 °C	21	200	to	600 °C	39
-100	to	+50 °C	04	0	to	300 °C	22	300	to	600 °C	40
-100	to	+100 °C	05	0	to	400 °C	23	300	to	900 °C	41
-50	to	0 °C	06	0	to	500 °C	24	300	to	1200 °C	42
-50	to	+50 °C	07	0	to	600 °C	25	300	to	1600 °C	43
-50	to	+150 °C	08	0	to	800 °C	26	400	to	600 °C	44
-30	to	+50 °C	09	0	to	900 °C	27	400	to	800 °C	45
-25	to	+25 °C	10	0	to	1000 °C	28	400	to	1200 °C	46
-25	to	0 °C	11	0	to	1200 °C	29	500	to	1000 °C	47
-20	to	+70 °C	12	0	to	1400 °C	30	600	to	1200 °C	48
0	to	25 °C	13	0	to	1600 °C	31	600	to	1600 °C	49
0	to	40 °C	14	15	to	40 °C	32	600	to	1800 °C	50
0	to	50 °C	15	50	to	100 °C	33	800	to	1200 °C	51
0	to	60 °C	16	50	to	150 °C	34	800	to	1400 °C	52
0	to	80 °C	17	100	to	200 °C	35	800	to	1600 °C	53
0	to	100 °C	18	100	to	300 °C	36	1000	to	1600 °C	54

4. TABLE OF OTHER RANGES FOR TEMPERATURE MEASUREMENT

502 xx xx	xx
Discretionary converter with unified output, linear dependence - range and unit to be specified 1)	70
Position of servo drive, signal from resistance transmitter 5 – 105 Ω, three-wire connection, linear dependence 0 - 100 %	91
DC ranges within limits of possibilities of the device, scale in μA, mA, mV or V	98

[1]) Recommended ranges in Table 5.

5. SELECTION OF RANGES FOR DISCRETIONARY CONVERTERS WITH LINEAR UNIFIED OUTPUT

502 xx xx			70	502 xx xx			70	502 xx xx			70
.000	to	.500		0.00	to	15.00		6.00	to	10.00	
.000	to	1.000		0.00	to	16.00		6.30	to	16.00	
0.00	to	1.00		00.0	to	20.0		10.0	to	25.0	
0.00	to	1.500		00.0	to	30.0		15.0	to	30.0	
0.00	to	1.6		00.0	to	63.0		16.0	to	40.0	
0.00	to	2.50		00.0	to	160.0		25.0	to	35.0	
0.00	to	3.00		000	to	630		25.0	to	63.0	
0.00	to	4.00		1.00	to	2.50		40.0	to	100.0	
0.00	to	5.00		1.60	to	4.00		63.0	to	160.0	
0.00	to	6.30		2.50	to	6.30		70.0	to	80.0	
0.00	to	10.00		4.00	to	10.00		96.5	to	99.5	
0.00	to	12.00		5.00	to	15.00		100	to	250	

Warning:
The selection of ranges specified in this table also includes the ranges specified in Table 3 unless they are used for temperature measurement.
They shall be ordered with the number 502 xx 70, too. The ranges and units of measure shall be specified.

6. TABLE OF COMBINATIONS OF TEMPERATURE SENSORS AND MEASURING RANGES - NATURAL SIGNALS

Natural signals pursuant to Table 8.2 - Technical requirements											Range [1])
01	08	09	10	16	17	18	20	21	22	24	
•											01
•											02
•											03
•											04
•											05
•											06
•											07
•											08
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•											10
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•											19
•	•	•	•								20
•											21
•	•	•	•								22
•	•	•	•								23
•											24
•	•	•	•	•	•	•					25
•	•	•	•	•	•	•					26
				•	•	•					27

Natural signals pursuant to Table 8.2 - Technical requirements											Range [1])
01	08	09	10	16	17	18	20	21	22	24	
				•	•	•	•	•	•		28
				•	•	•	•	•	•		29
							•	•	•		30
							•	•	•		31
•											32
•											33
•											34
•											35
•											36
•											37
•											38
•											39
•	•	•	•	•	•	•					40
				•	•	•					41
				•	•	•					42
										•	43
•	•	•	•	•	•	•					44
•	•	•	•	•	•	•					45
				•	•	•					46
				•	•	•					47
				•	•	•					48
							•	•	•		49
										•	50
				•	•	•					51
							•	•	•		52
							•	•	•		53
							•	•	•		54

[1]) Pursuant to Table 3.

INSTALLATION AND CONNECTION

Interconnecting fields for the selection pursuant to the following articles are permitted after sliding the device from the box. After it has been screwed in again, it is necessary to check conducting connection of protective terminals and the box, which is ensured with a fan-shaped washer on connecting screws. The value of transient resistance between the protective terminal and the box close to the connecting screw shall be below 0.5 Ω.

The device is installed into the panel by means of two installation yokes pursuant to figure 2. The installation into the panel enables both vertical and horizontal tight installation of the device.

The device is installed on the wall by means of two braces pursuant to figure 3, which are delivered at a special request after an agreement with the manufacturer.

Drawings of connection of inputs and outputs are provided in figures 4 to 9.

Connection of input signal:

The sensor (input signal) is connected with a two, three or four-core cable with total isolation resistance of at least 6 MΩ.

Resistance value of the circuit of voltage input signal:

- up to 1 V, it may be max. 50 Ω
- over 1 V, it may be max. 20 Ω

Resistance value of the circuit of the thermoelectric temperature sensor may be max. 20 Ω.

If external compensation is used, selection of temperature of 20°C or 50°C is made with a by-passing coupler inside the device pursuant to figure 5.

The interconnecting piece is pre-set from the manufacturing plant in the position for external compensation of 50°C.

In case of two-wire connection of resistance temperature sensors, resistor Rj shall be adjusted to the value of resistance of the sensor (i.e. value of both wires, including resistance of internal wiring of the sensor) and connected between terminals 3 and 4. The maximum value of resistance of the circuit may be 20 Ω.

In case of three-wire connection of resistance temperature sensors with internal two-wire connection, resistor Rj shall be adjusted to the value of resistance of the internal wiring of the sensor. The value of resistance of individual connecting wires to terminals shall be equal and may be max. 20 Ω , including resistor Rj.

In case of three-wire connection of resistance temperature sensors with internal four-wire (three-wire) connection, the value of resistance of individual connecting wires shall be equal and may be max. 20Ω. Wiring resistance is not compensated.

In case of four-wire connection of resistance temperature sensors with an auxiliary loop, the values of resistance of individual connecting wires shall be equal and may be max. 20 Ω.

For the connection of the device to the supply mains, isolated wires shall be used that are dimensioned pursuant to ČSN 33 2000-4-43. The installation of the device shall include a switch or a circuit breaker enabling disconnection from supply mains.

In case of connecting a resistance transmitter, the value of resistance of individual connecting wires shall be equal and may be max. 20 Ω.

For the connection of the device to the supply mains, isolated copper wires shall be used that are dimensioned pursuant to ČSN 33 2000-4-43.

The installation of the device shall include a switch or a circuit breaker enabling disconnection from supply mains.

COMMISSIONING

The equipment may only be used in the way for which it is designed by the manufacturer.

In case of devices equipped with signalling limit values, the switching points are adjusted by turning the relevant potentiometer with concurrent pressing the relevant push-button pursuant to figure 1.

When the push-button is pressed, the value of the switching point being adjusted is displayed on the display.

After sliding the module of the device from the device box, it is possible to use by-passing couplers to select active statuses of the relays or output transistors in a follow-up to exceeding the switching point in both directions; refer to figure 7.

If external signal from programme transmitter is used for the adjustment of the switching point of the lower limit, the following procedure shall be used:

- On the board of the input external signal, the interconnecting pieces are placed in positions pursuant to figure 9.
- The potentiometer of adjustment of lower limit is adjusted to the bottom stop. Voltage output of programme transmitter is connected to the input of the external signal ZEPAX 02.
- On the programme transmitter, select the voltage output, range 0 to 10 V, manual control mode. Further adjustment is realized with pressed push-button of lower limit on ZEPAX 02.
- With push-buttons of manual control of the programme transmitter, adjust the start value of the signalling range on the display of ZEPAX 02, read the value of voltage on the display of the programme transmitter - U1. With push-buttons of manual control of the programme transmitter, adjust the end value of the signalling range on the display of ZEPAX 02, read the value of voltage on the display of the programme transmitter - U2. When creating the course generated by the programme transmitter, follow the applicable manual and, when adjusting the output signal, select the voltage with range, start value of the range will equal the value U1 and end value of the range will equal the value U2. The range of indication on the display is selected as equal with the signalling range of ZEPAX 02.

In case of devices equipped with analogue output, either voltage or current output can be selected with by-passing couplers after sliding the module of the device from the device box.

Current output can be selected either 0 to 20 mA or 4 to 20 mA. By-passing couplers can be used to invert the signal. The positions of by-passing couplers are specified in figure 9.

After the connection of supply voltage and the settlement period, the device is prepared for operation.

OPERATION AND MAINTENANCE

The device does not require any operation and maintenance.

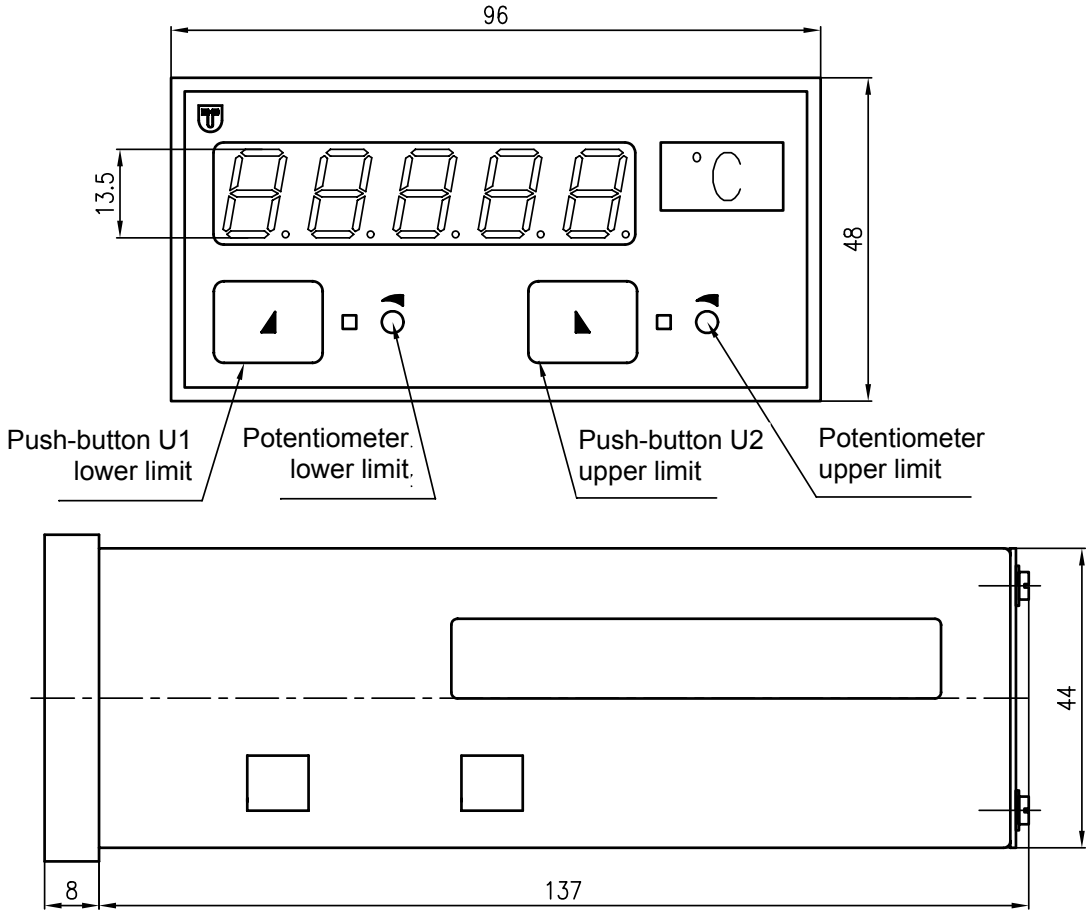
SPARE PARTS

The design of the device does not require any delivery of spare parts.

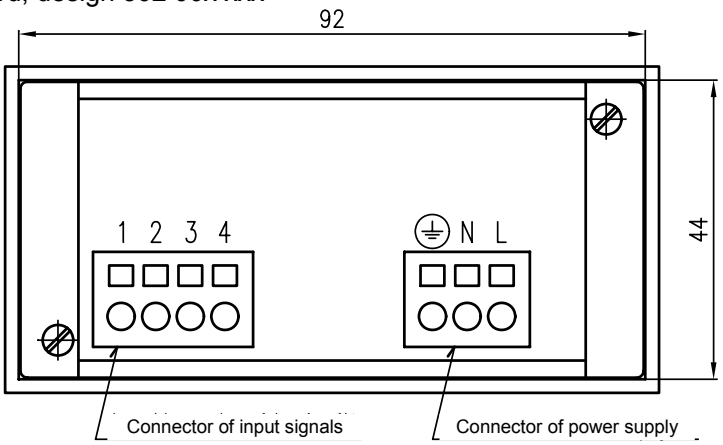
REPAIRS

The devices shall be repaired by the manufacturer. They shall be sent for repair in the original package without accessories.

Figure 1 Dimensional drawing and description of elements of indicating device, drawings of terminal boards



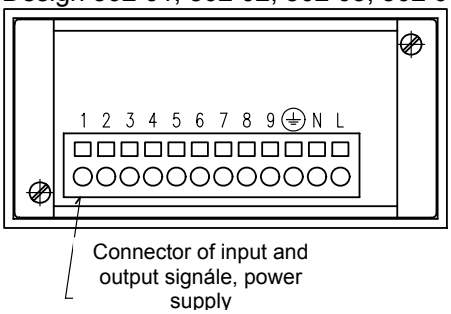
View of terminal board, design 502 00x xxx



Type of terminals: screw-less WAGO 0.08 - 2.5mm^2

DRAWINGS OF TERMINAL BOARDS:

Design 502 01, 502 02, 502 03, 502 04



Design 502 04 with relay outputs

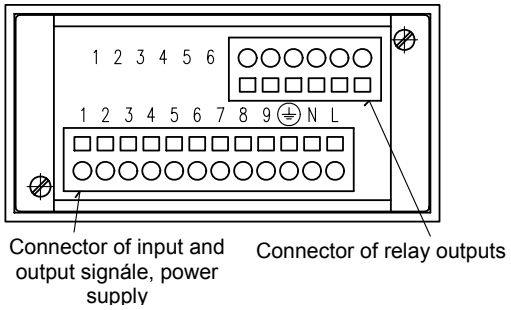
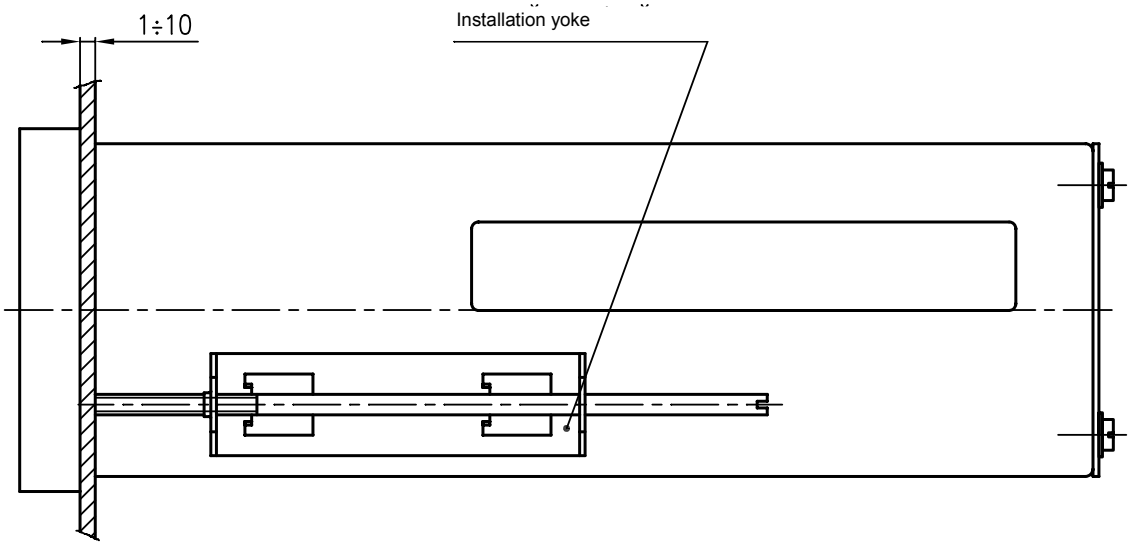


Figure 2 Drawing of device installation into panel



CUT-OUTS OF HOLES INTO PANEL

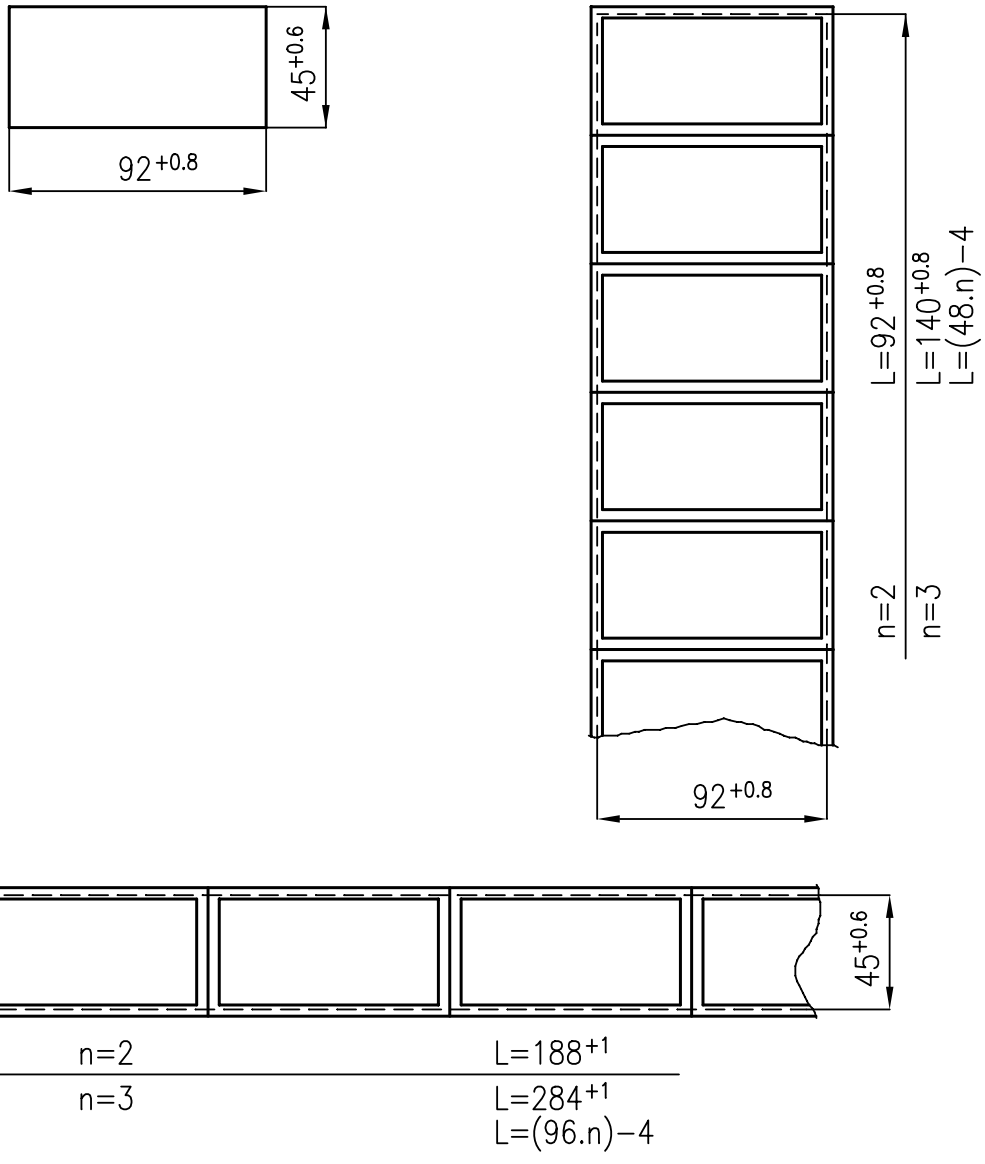


Figure 3 Drawing of installation of indicating device on the wall (at special request)

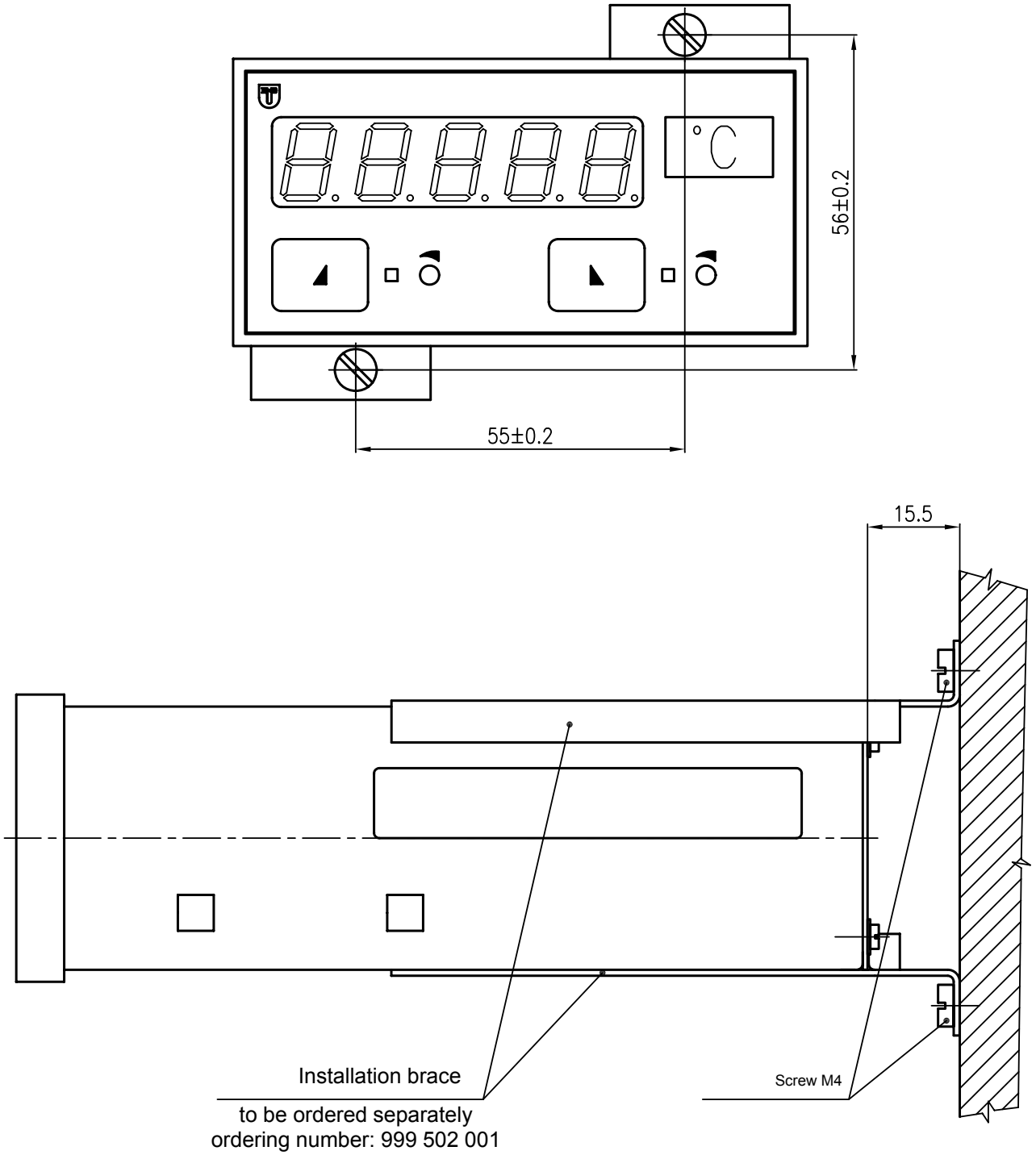
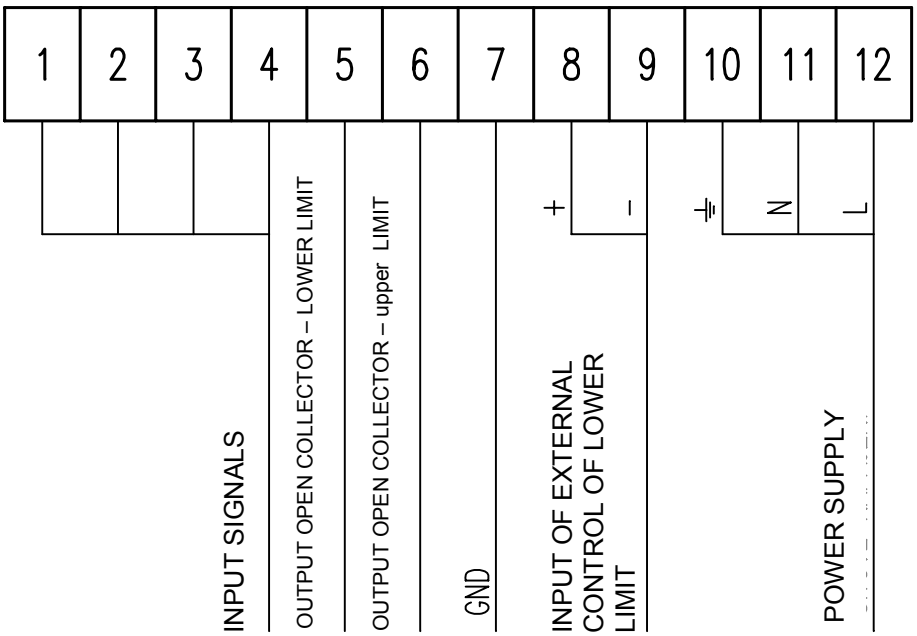


Figure 4 Connection of input and output signals

Design with limit signalling



Design with limit signalling and with analogue output
Design with analogue output only has vacant terminals 5, 6, 7

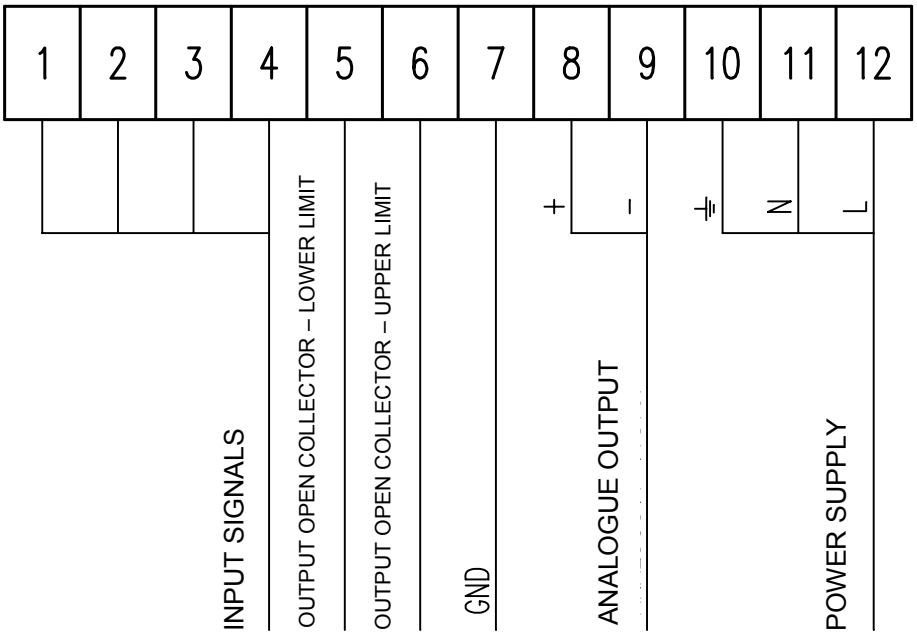
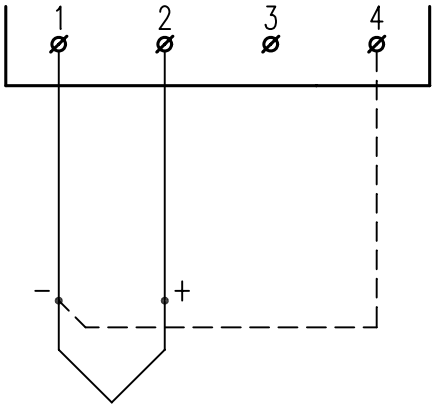


Figure 5 Connection of voltage or current input signals

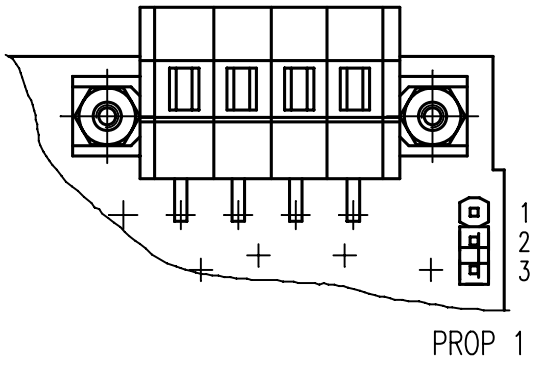
THERMOELECTRIC COUPLES

Connection of + pole:
terminal 2
Connection of - pole:
terminal 1 - for internal compensation
terminal 4 - for external compensation 20°C, 50°C

Terminal 3 cannot be used for external connection



TYPE OF SELECTION OF EXTERNAL COMPENSATION



External compensation 20°C: PROP 1 in positions 1-2
External compensation 50°C: PROP 1 in positions 2-3

The interconnecting piece is accessible after sliding the device from the box.

The device is delivered from the manufacturing plant with the interconnecting piece in the position for external compensation 50°C.

VOLTAGE OR CURRENT SIGNAL

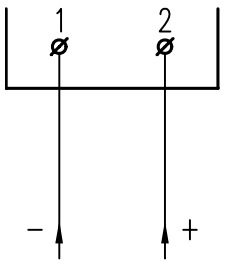
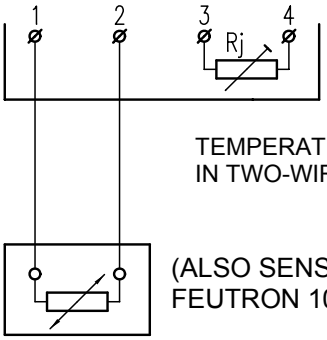


Figure 6 Connection of resistance input signals

CONNECTION OF TEMPERATURE SENSORS

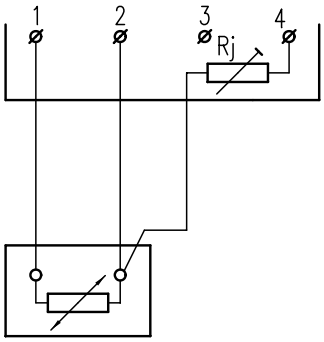
Two-wire connection



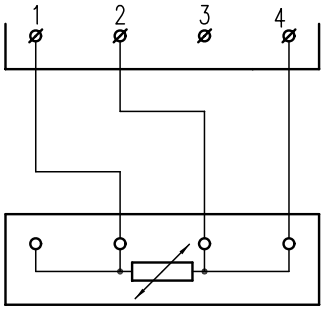
TEMPERATURE SENSORS
IN TWO-WIRE CONNECTION

(ALSO SENSING UNIT
FEUTRON 1041)

Three-wire connection

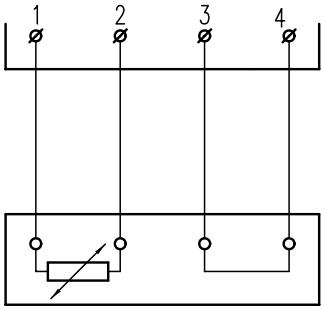


Three-wire connection



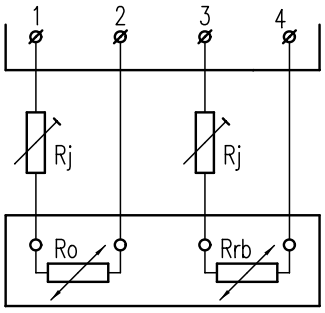
TEMPERATURE SENSOR IN
FOUR-WIRE CONNECTION

Four-wire connection



TEMPERATURE SENSOR IN
CONNECTION WITH A LOOP

CONNECTION OF RELATIVE HUMIDITY METER



Ro - SENSING UNIT FEUTRON 1014
Rrb - SENSING UNIT FEUTRON 1041

THREE-WIRE CONNECTION
OF RESISTANCE TRANSMITTER

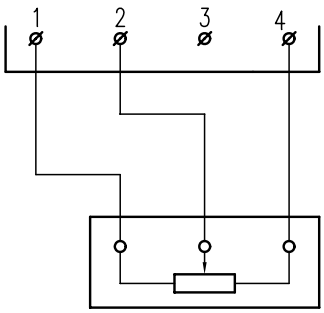


Figure 7 Connection and selection of function of relay outputs

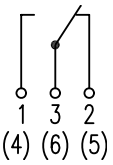
POSITION OF LIMITS AND MEASURED QUANTITIES

LOWER LIMIT, UPPER LIMIT

Př. (RL–MD MEZ DOLNÍ, RL–MH MEZ HORNÍ)			10–12	15–17	10–11	15–16	10–12	15–16	10–11	15–17
1)	LED MD	LED MH	RL–MD [1–3–2]	RL–MH [4–6–5]	RL–MD [1–3–2]	RL–MH [4–6–5]	RL–MD [1–3–2]	RL–MH [4–6–5]	RL–MD [1–3–2]	RL–MH [4–6–5]
S1 S2 0% 100%	ON	OFF	o–o o	o o–o	o o–o	o–o o	o–o o	o–o o	o o–o	o o–o
S1 S2 0% 100%	OFF	OFF	o o–o	o o–o	o–o o	o–o o	o o–o	o–o o	o–o o	o o–o
S1 S2 0% 100%	OFF	ON	o o–o	o–o o	o–o o	o o–o	o o–o	o o–o	o–o o	o–o o
2) 0% 100%	OFF	OFF	o o–o	o o–o	o o–o	o o–o	o o–o	o o–o	o o–o	o o–o

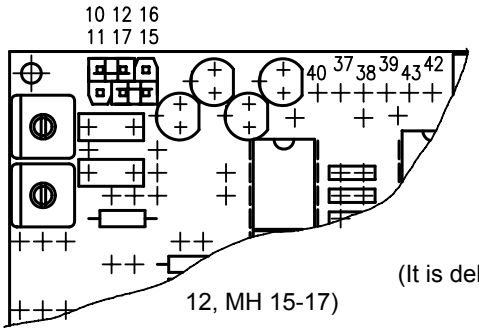
1) POSITION OF RELAY CONTACTS
2) WITHOUT POWER SUPPLY

RL (idle position)



Numbers of terminals on connector of relay outputs

INTERCONNECTING PIECES ON LIMIT SIGNALLING BOARD

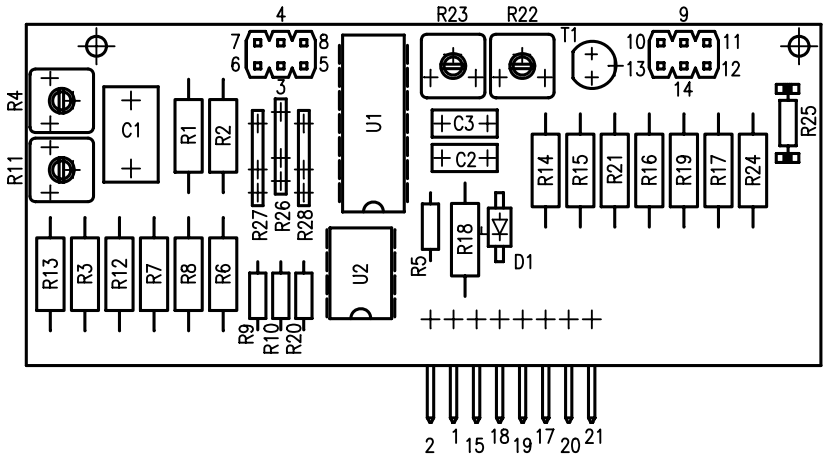


Limit exceeded downwards

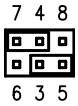
active status (relay ON)	10-12 for RL-MD 15-16 for RL-MH
passive status (idle relay)	10-11 for RL-MD 15-17 for RL-MH

(It is delivered from the plant with interconnecting pieces in positions MD 10-

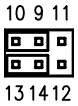
Figure 8 Selection of analogue output



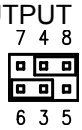
NON-INVERTED OUTPUT
(pre-set at the manufacturing plant)



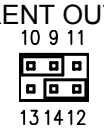
VOLTAGE OUTPUT



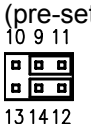
INVERTED OUTPUT



CURRENT OUTPUT 0 to 20 mA



CURRENT OUTPUT 4 to 20 mA
(pre-set at the manufacturing plant)



BOARD OF GALVANIC SEPARATION

With respect to the design with galvanic separation, the selection of voltage or current output is realized on the board of galvanic separation.

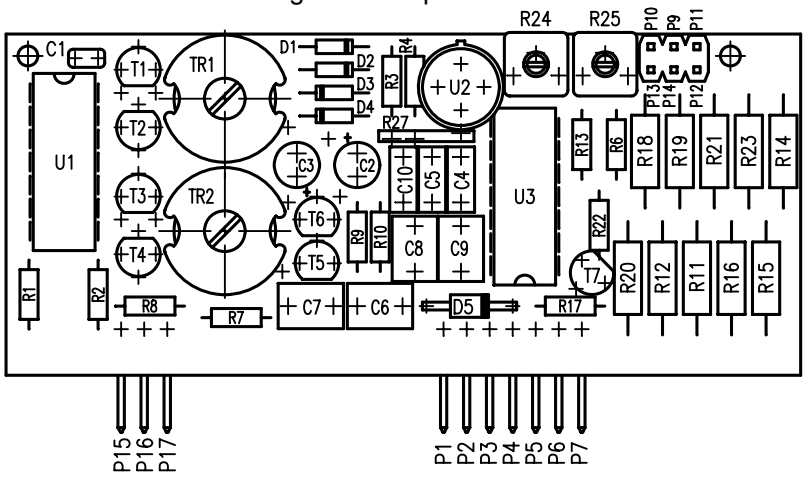
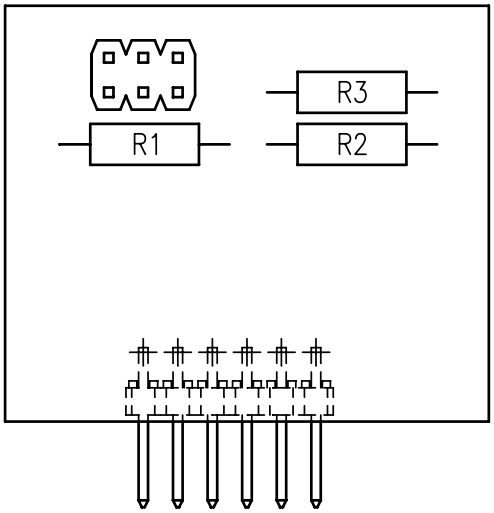
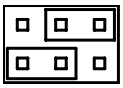


Figure 9 Selection of external input

ADJUSTMENT OF LOWER SIGNALLING LIMIT

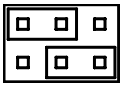
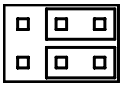


POSITION OF INTERCONNECTING PIECES IN INTERNAL CONTROL OF LOWER LIMIT



Signalling of lower limit is derived from signal of lower limit adjustment potentiometer ZEPAX 02 (pre-set at the manufacturing plant).

POSITION OF INTERCONNECTING PIECES IN EXTERNAL CONTROL OF LOWER LIMIT
Signalling of lower limit is derived from external signal (signal from programme transmitter) that is connected to input terminals of the external control of lower limit.

Input divider is pre-set to value 3.5.	Input divider is pre-set to value 15.
	
0 to 100	0 to 300
0 to 150	0 to 400
0 to 200	0 to 600
0 to 800	100 to 300
0 to 900	200 to 400
0 to 1200	200 to 600
0 to 1400	300 to 600
0 to 1600	400 to 800
600 to 1600	-20 to 25
300 to 1600	0 to 50
600 to 1800	0 to 250
50 to 150	15 to 40
100 to 200	50 to 100
-200 to 50	100 to 300
-100 to 0	100 to 400
-100 to 100	400 to 600
-50 to 50	

April 2006

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