

Fig.1 The RI3P module.

### ZASTOSOWANIE

The relay module used to work with controllers as an executive element, activating three-point controlled peripheral equipment.

### DESCRIPTION

The RI3P and the RI3PT are two relays modules, changing the analog signal (0 - 10V) from the controller to the three-point voltage-free output pulses. The pulse duration is  $1/17$  transition time  $T_p$  (the time needed to completely close the valve).

The module works in two modes:

- **starting mode** - the **ST** LED is blinking.

After power on, the pulse length  $T_p$  is generated, shorting contact S2. This has led to the complete closure of the valve in order to synchronize the controller-valve connection.

Then, the input voltage is measured, calculated the amount exceeded thresholds and, if necessary pulse is generated shorting contact S1 - which is the sum of the individual voltage thresholds. The system goes into operation mode.

- **in the operation mode** - the **ST** LED lights with continuous signal.

For the rising voltages between 1V - 9V, the thresholds at 0.5V pulse is generated with a length of  $1/17 T_p$  shorting contact S1. Above 9.6V voltage contact S1 is permanently closed.

For decreasing voltages from 8,75V - 0,75V, the thresholds at 0.5V pulse is generated with a length of  $1/17 T_p$  shorting contact S2. Below 0.4V voltage contact S2 is still closed.

The 0,1V hysteresis circuit prevents contacts from "flickering" in switching points. To ensure correct operation, the signal from the controller should be integrating, so that the transition time from 0V to 10V was greater than or equal to the  $T_p$  time. The RI3P has electromechanical relays with normally open contacts. The RI3PT has a MOSFET solid state relays. Auxiliary connectors 4 and 5 are shorted together. LEDs indicate output states.

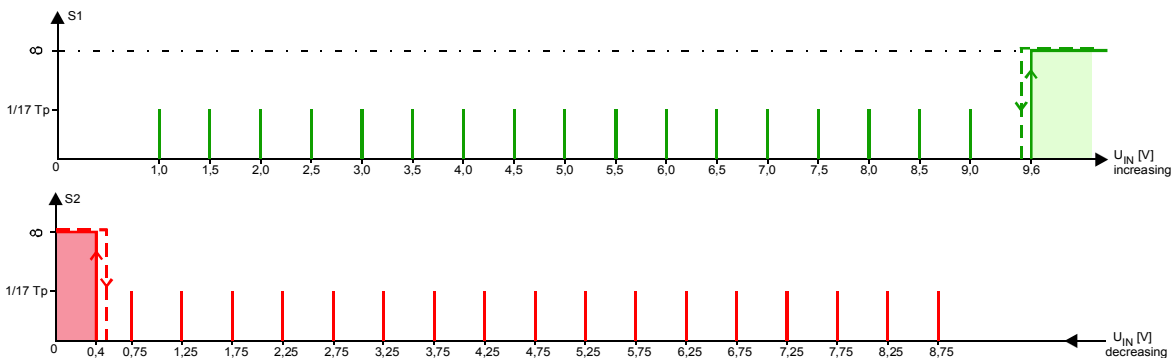


Fig.2 Switching diagram.

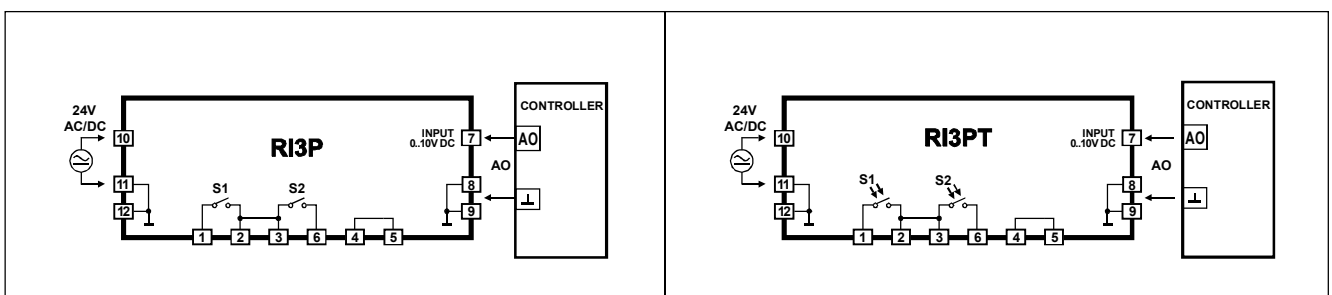


Fig.3 Connections of the RI3P and the RI3PT.

# RI3P, RI3PT

For rising voltages			For decreasing voltages		
U <sub>IN</sub>	S1	S2	U <sub>IN</sub>	S1	S2
0	○	● ∞	10,0	● ∞	○
0,5	○	● ∞	9,5	● ∞	○
1,0	● 1/17 Tp	○	8,75	○	● 1/17 Tp
1,5	● 1/17 Tp	○	8,25	○	● 1/17 Tp
2,0	● 1/17 Tp	○	7,75	○	● 1/17 Tp
2,5	● 1/17 Tp	○	7,25	○	● 1/17 Tp
3,0	● 1/17 Tp	○	6,75	○	● 1/17 Tp
3,5	● 1/17 Tp	○	6,25	○	● 1/17 Tp
4,0	● 1/17 Tp	○	5,75	○	● 1/17 Tp
4,5	● 1/17 Tp	○	5,25	○	● 1/17 Tp
5,0	● 1/17 Tp	○	4,75	○	● 1/17 Tp
5,5	● 1/17 Tp	○	4,25	○	● 1/17 Tp
6,0	● 1/17 Tp	○	3,75	○	● 1/17 Tp
6,5	● 1/17 Tp	○	3,25	○	● 1/17 Tp
7,0	● 1/17 Tp	○	2,75	○	● 1/17 Tp
7,5	● 1/17 Tp	○	2,25	○	● 1/17 Tp
8,0	● 1/17 Tp	○	1,75	○	● 1/17 Tp
8,5	● 1/17 Tp	○	1,25	○	● 1/17 Tp
9,0	● 1/17 Tp	○	0,75	○	● 1/17 Tp
9,6	● ∞	○	0,4	○	● ∞
10,0	● ∞	○	0	○	● ∞

**ATTENTION:**  
When placing an order,  
please specify the  
transition time Tp.

- - opened contacts,  
the LED is on
- - closed contacts,  
the LED is off

Fig.4 Switching table.

## TECHNICAL DATA

Module name	RI3P	RI3PT
Power supply	24 V AC/DC ± 10%	
Max. current consumption	35 mA for 24 V AC / DC	22 mA for 24 V AC / DC
Input resistance	100kΩ	
Input voltage	0 - 10V	
Sensitivity	10mV	
Input signal settling time	400ms	
Type of relay	Electromechanical	Solid state MOSFET
Contact switching capacity alternating current cosφ=1 direct current	400V, 8A [2000VA] 32V, 8A	270V, 130mA 400V, 130mA
Contact resistance	100mΩ	30Ω
Protection class of the case	IP-40	
Compliance with EU standards	2004/108/WE	
Ambient temperature range	-10...+55°C	
Diameter of terminals	2,5 mm <sup>2</sup>	
Protections	against reverse polarisation	
Mounting	DIN-35 rail	
Dimensions (L x W x H)	90mm x 17,5mm x 56mm	
Weight	95 g	90 g

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