Digital Proportional Amplifier

RT-MRPD2

Series: 1X

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Features

–Suitable for the control of proportional directional valves with electrical position feedback

–Powerful 32-bit processor

–Command value input 0 ~ + 10 V or 4 ~ 20 mA

–Two pulsed current output stages

–Adjustment range of ramp time 0.05~5 s

–+10V regulated voltage, used for external potentiometer control

–One configurable digital input/ output, used for the customers' special requirement, defaults to be amplifier enable input

–Fault diagnosis function, power supply voltage, coil short circuit, open circuit or other abnormal conditions prompted

–Polarity protection for the voltage supply

–35mm rail mounting

Any question, please don't hesitate to contact us!

Odering code

RT- MRPD2 - 1X / M / *

Proportional amplifier

Suitable for the control of proportional directional valves with electrical position feedback

Design number =1X

10 ~ 19: Technical data and terminal function remain unchanged

Configuration instructions of terminal "I/O[1)]

E = Enable

M = Modem with displacement transducer

D1 = Modem without displacement transducer

D2 = Modem without displacement transducer

D3 = Modem without displacement transducer

1) "/E" is the default setting if no special requirements are needed; please apply textual description if need to configure into other functions.

2) To type D*, the modem module is in the displacement transducer; for the specific output signal of the displacement transducer, see "Technical data" in the next section.
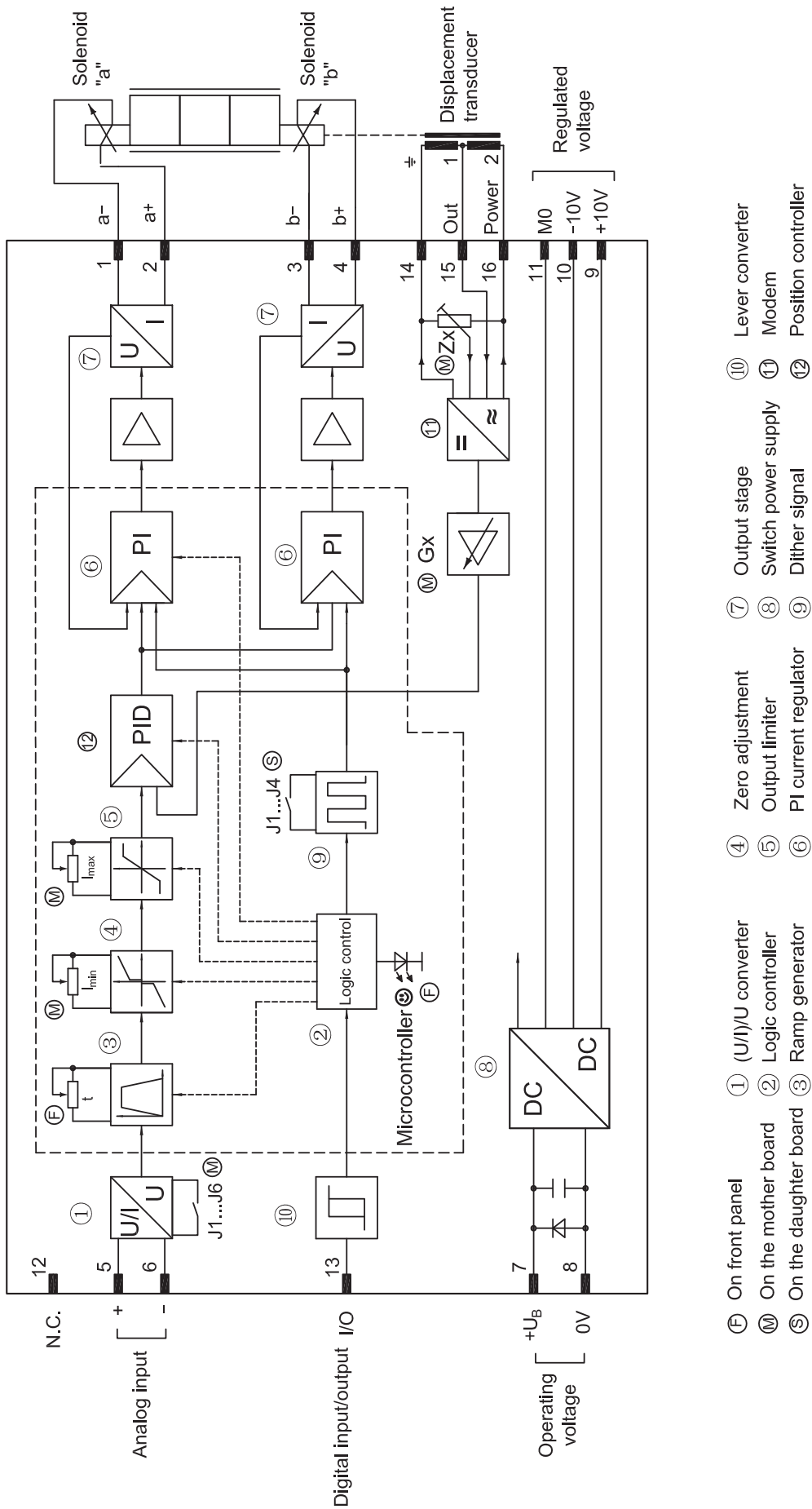
Pin assignment

Terminal		Function description
1	a–	Solenoid "a" coils
2	a+	
3	b–	Solenoid "b" coils
4	b+	
5	+	Analog input：
6	–	Voltage:–10V ~ 0 ~ +10V Current: 4 ~ 20mA ， 4 mA ≡ -100%，12 mA ≡ 0%，20 mA ≡ +100%
7	+U_B	Operating voltage
8	0V	24VDC
9	−10V	Regulated voltage output, the reference point is M0
10	+10V	
11	M0	Measuring reference point
12	N.C.	Reserve
13	I/O	Digital input/ output：10 V < U < U_B, valid；U < 10 , invalid, see detail in the upper section "Technical data"
14	⏚	Displacement transducer
15	Out	
16	Power	

Technical data (For applications beyond these parameters, please consult us!)

Dimensions (L × W × H)		$100 \times 23 \times 114$ mm
Operating voltage	U_B	24 VDC
Operating range		
－Upper limit value	$U_B(t)_{max}$	30 V
－Lower limit value	$U_B(t)_{min}$	10 V
Non-driving current consumption	I_{cmax}	60 mA
Ramp time		0.05 ~ 5 s, adjustable
Analog inputs：		
－Input voltage level	U	-10 V ~ 0 ~ +10 V
● Input resistance level	R_e	100 kΩ
● Resolution		< 10mV
－Input current level	I	4 ~ 20 mA, 4 mA corresponding -100%, 12 mA corresponding 0%, 20 mA corresponding +100%
● Input resistance	R_e	200Ω
Digital input/ output：	U	Configuration depending on customers' requirements, $10 V < U < U_B$，valid；U < 10 V, invalid；amplifier enable as the default configuration if no special requirements
Outputs:		
－Output stage		
● Maximal drive current	I_{max}	2.5 ± 20 %
－Driving of displacement transducer		
● RT- MRPD2 - 1X / M type		
Driving frequency	Hz	1.5 ~ 6 kHz ± 20 %
Voltage amplitude	U	5 V，10 mA
● RT- MRPD2 - 1X / D* type		
Power supply voltage	U	24 VDC，I_{max} = 50 mA
Transducer output voltage range	U	To type D1, 3 ~ 7.5 ~ 12 VDC, the middle position 7.5 VDC To type D2, 0 ~ 2.5 ~ 5 VDC, the middle position 2.5 VDC To type D3, 4 ~ 12 ~ 20 mA, the middle position 12 mA
－Regulated voltage	U	±10 V, reference point is M0,I_{max} = 15 mA
Type of connection		Connection terminal (inserted type)
Permissible operating temperature range		-25 ~ 70 ℃
Storage temperature range		-25 ~ 85 ℃
Weight	m	0.30 kg

Block circuit diagram

Display/ setting elements
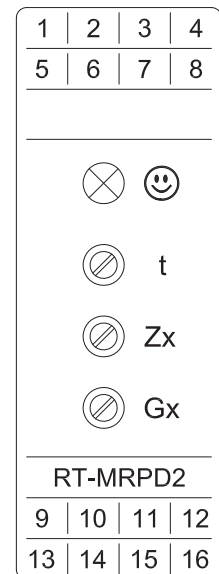
LED and potentiometers on the front panel

States and meanings of light "☺"

No.	States of light "☺"	Meanings
1	Green always	In working order
2	Light off	No or lack of power supply of amplifier
3	Red flashes every 1s	Electromagnet cable fracture
4	Red flashes every 0.2s	Electromagnet cable short circuit

"t" —Ramp time, clockwise increases, counterclockwise decreases

"Zx" —Zero point of the displacement transducer

"Gx" —Amplitude of the displacement transducer

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┌────┬────┬────┬────┐
│ 1  │ 2  │ 3  │ 4  │
├────┼────┼────┼────┤
│ 5  │ 6  │ 7  │ 8  │
└────┴────┴────┴────┘

    ⊗    ☺

    ⊘    t

    ⊘    Zx

    ⊘    Gx

   RT-MRPD2
┌────┬────┬────┬────┐
│ 9  │ 10 │ 11 │ 12 │
├────┼────┼────┼────┤
│ 13 │ 14 │ 15 │ 16 │
└────┴────┴────┴────┘
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Meanings of potentiometer and dial swith on the printed circuit board

State of "J1, J2, J3, J4"	Analog input form of terminal 5, 6
ON, ON, ON, ON	Voltage mode 0 ~ +10 V
OFF, OFF, OFF, OFF	Current mode 4 ~ 20 mA
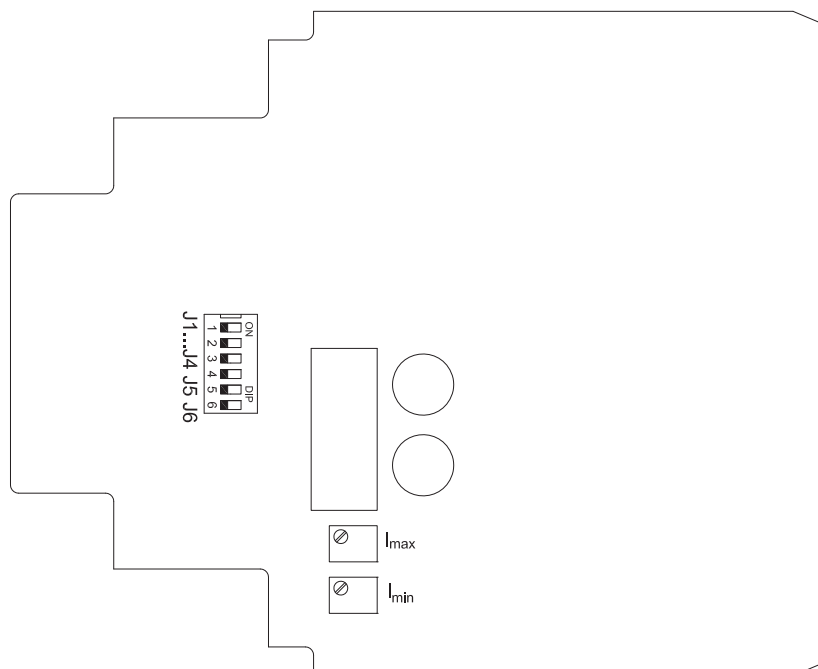
Note:

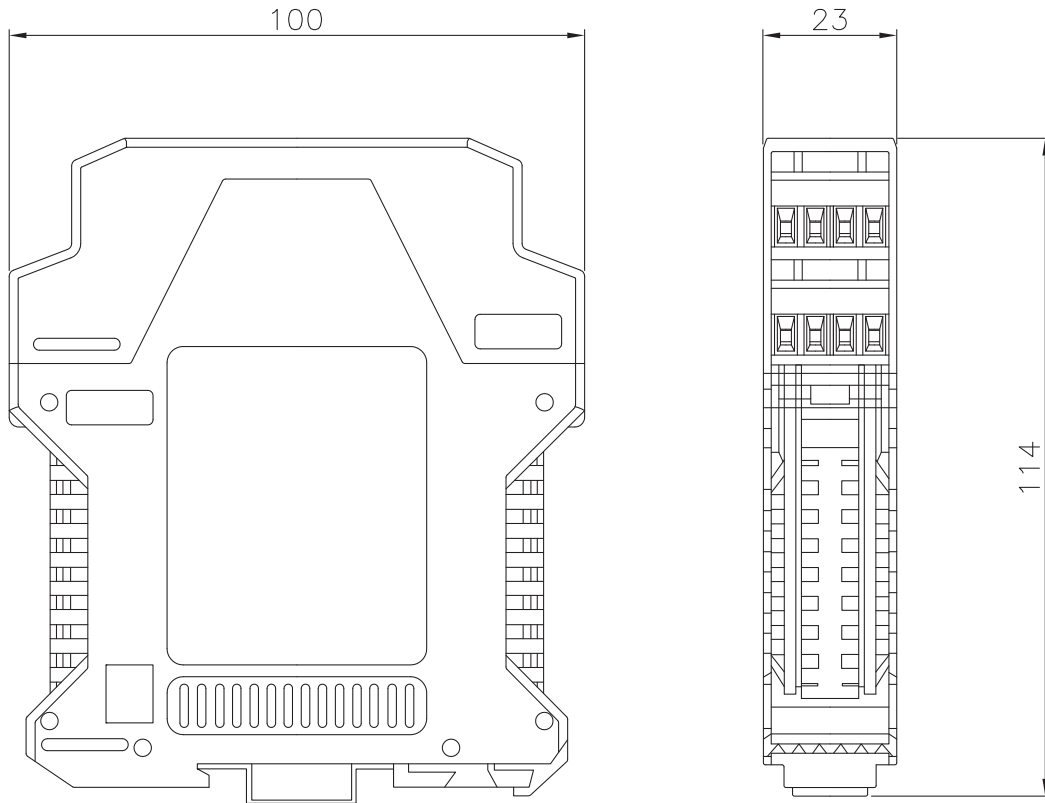**1. The potentiometers and other jumpers on the printed circuit board has been adjusted at the factory, if you change settings of these potentiometers and jumpers, the warranty will become void！**

2. Dial swith J5 and J6 on the printed circuit board are invalid.

Unit dimensions (in mm)

Project / maintenance instructions / additional information

– The amplifier card may only be unplugged or plugged in when switched off!

– Do not use plugs with free wheel diodes or LED displays when connecting the solenoids!

– Measurements at the card may only be carried out with instruments $R_i > 100$ kΩ!

– For switching the command values, use relays with gold contacts (small voltages, small currents)!

–When using external control, the control voltage may have a residual ripple factor of a maximum of 10%!

– Always shield command value cables; connect the shield to 0 V operating voltage on the card side, and leave the other
 side open (danger of earth loops)!

 Recommendation: Also shield solenoid lines!

   For solenoid cable lengths up to 50 m, use cable type LiYCY 1.5 mm^2.

   For greater lengths, please consult us!

– The distance to aerial, radio sources and radar equipment must be at least 1 m!

– Do not lay solenoid and signal lines near power cables!

– Because of the loading current of the smoothing capacitor on the card, pilot fuses must be of the slow-blowing type!

– **Warning:** When using the **differential input, both inputs** must always be switched on or off **simultaneously**!

– Electrical signals generated via control electronics must not be used for switching safety-relevant machine
  functions. (See also the European standard "Safety requirements for fluid power systems and components –
  Hydraulics", prEN 982)