

## Digital Proportional Amplifier

**RT-MRPD1**

**Series: 1X**



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### Features

- Suitable for the control of one-solenoid proportional valves with electrical position feedback
- Powerful 32-bit processor
- Command value input 0 ~ + 10 V or 4 ~ 20 mA
- One pulsed current output stage
- 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

## Odering code

RT- MRPD1 - 1X / M / \*

### Proportional amplifier

Suitable for the control of one-solenoid proportional valves with electrical position feedback

Design number

=1X

10 ~ 19: Technical data and terminal function remain unchanged


Configuration instructions of terminal "I/O"<sup>1)</sup>

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.

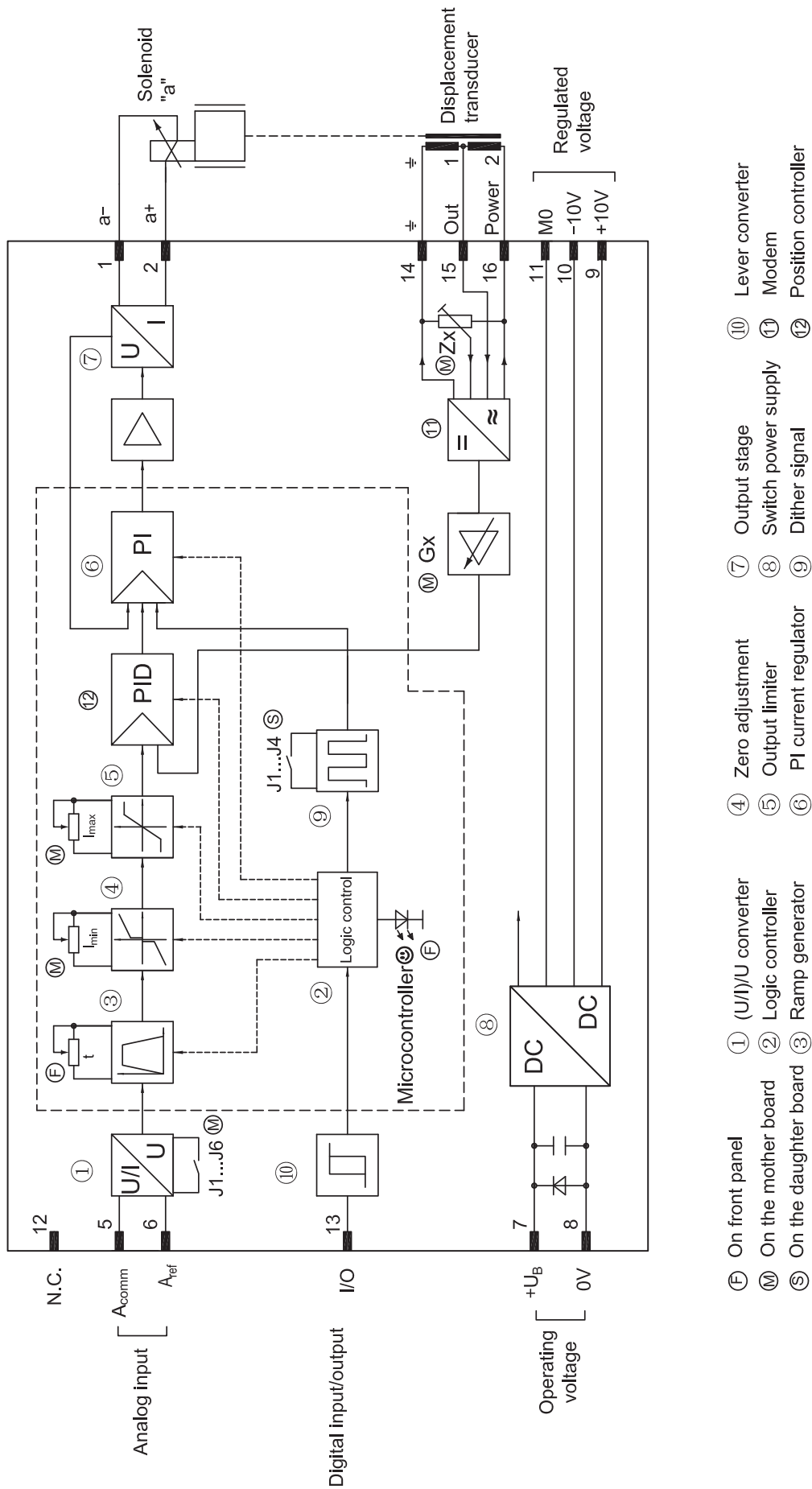
## Pin assignment

Terminal	Function description
1 a-	Solenoid coils
2 a+	
3 N.C.	Reserve
4 N.C.	
5 A <sub>comm</sub>	Analog input: Voltage: 0 ~ +10V Current: 4 ~ 20mA, 4 mA ≡ 0%, 20 mA ≡ +100%
6 A <sub>ref</sub>	
7 +U <sub>B</sub>	Operating voltage 24VDC
8 0V	
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 <sub>B</sub> , 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)		100×23×114 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
• Input resistance	$R_e$	corresponding 0%, 20 mA corresponding +100% 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- MRPD1 - 1X / M type		
Driving frequency	Hz	1.5 ~ 6 kHz ± 20 %
Voltage amplitude	$U$	5 V, 10 mA
• RT- MRPD1 - 1X / D* type		
Power supply voltage	$U$	24 VDC, $I_{max} = 50$ mA
Transducer output voltage range	$U$	To type D1, 3 ~ 7.5 VDC To type D2, 0 ~ 2.5 VDC To type D3, 4 ~ 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 °C
Storage temperature range		-25 ~ 85 °C
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

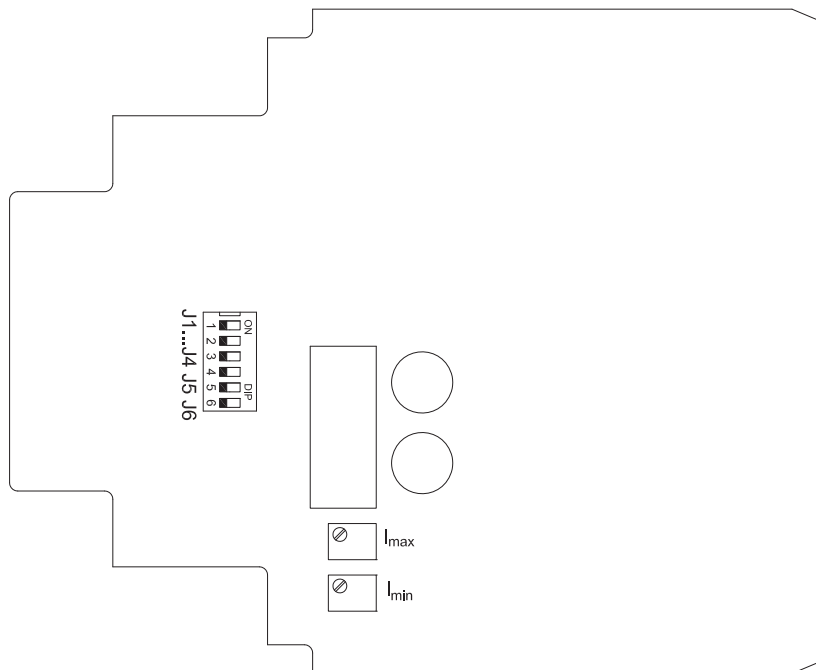
“Zx” — Zero point of the displacement transducer

“Gx” — Amplitude of the displacement transducer

1	2	3	4
5	6	7	8
RT-MRPD1			
9	10	11	12
13	14	15	16

Meanings of potentiometer and dial switch 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



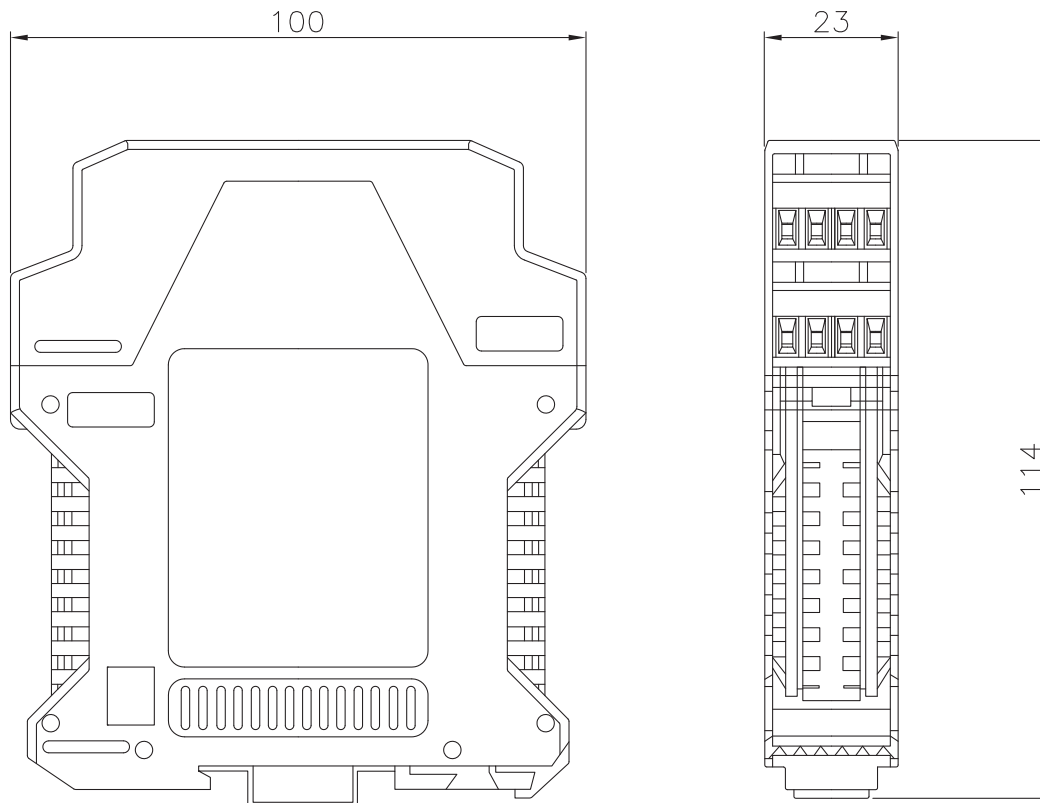
**Note:**

- 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)**

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## Project / maintenance instructions / additional information

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- 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  $R_i > 100 \text{ k}\Omega$ !
- 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<sup>2</sup>.

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)