

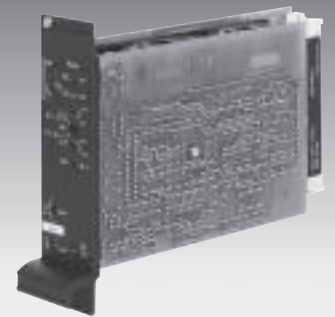
# Electric amplifier for proportional cartridge throttle valves

RE 30053/09.05

1/8

Type VT-VRPA1-527-2X/V0/RTS-2/2V

Unit series 2X



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## Features

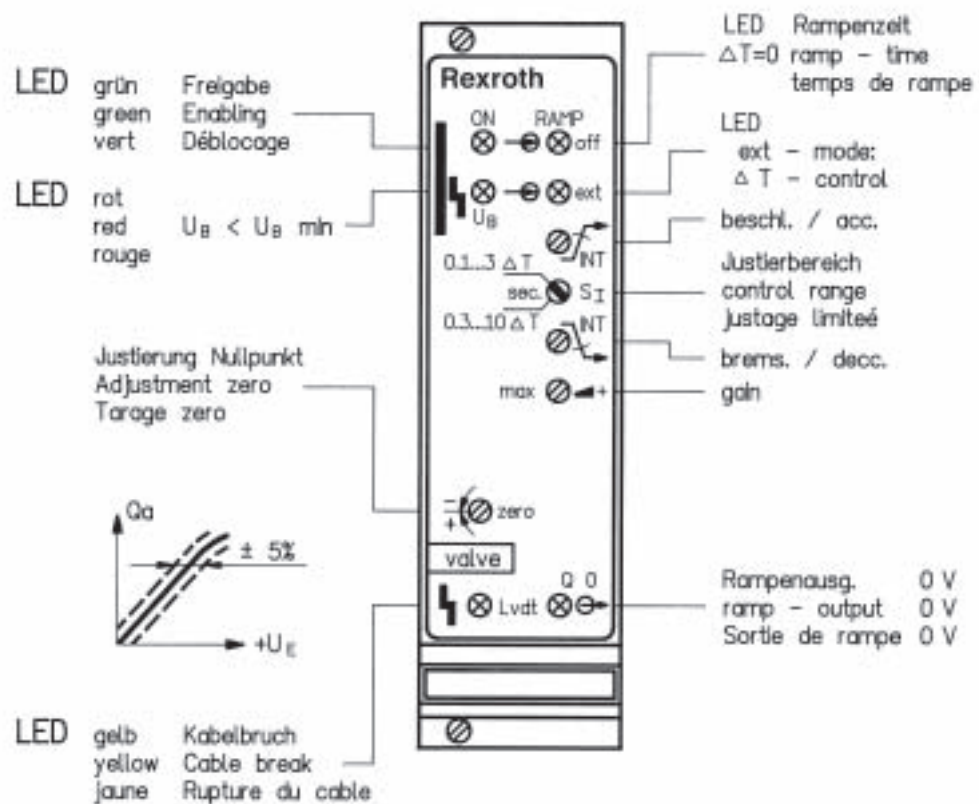
- Analog amplifier in Europe card format for installation in 19" rack
- Closed-loop controlled output stage
- Enabling input
- Outputs short-circuit-proof
- Adjustment possibilities – valve zero
- Open-circuit detection for feedback signal cable
- Closed-loop position control with PID action
- Ramp function:
  - External voltage-controlled ramp adjustment via differential inputs
  - Ramp function can be shut down

### Testing and service equipment

- Test box type VT-PE-TB2, see RE 30064
- Test adapter type VT-PA-3, see RE 30070



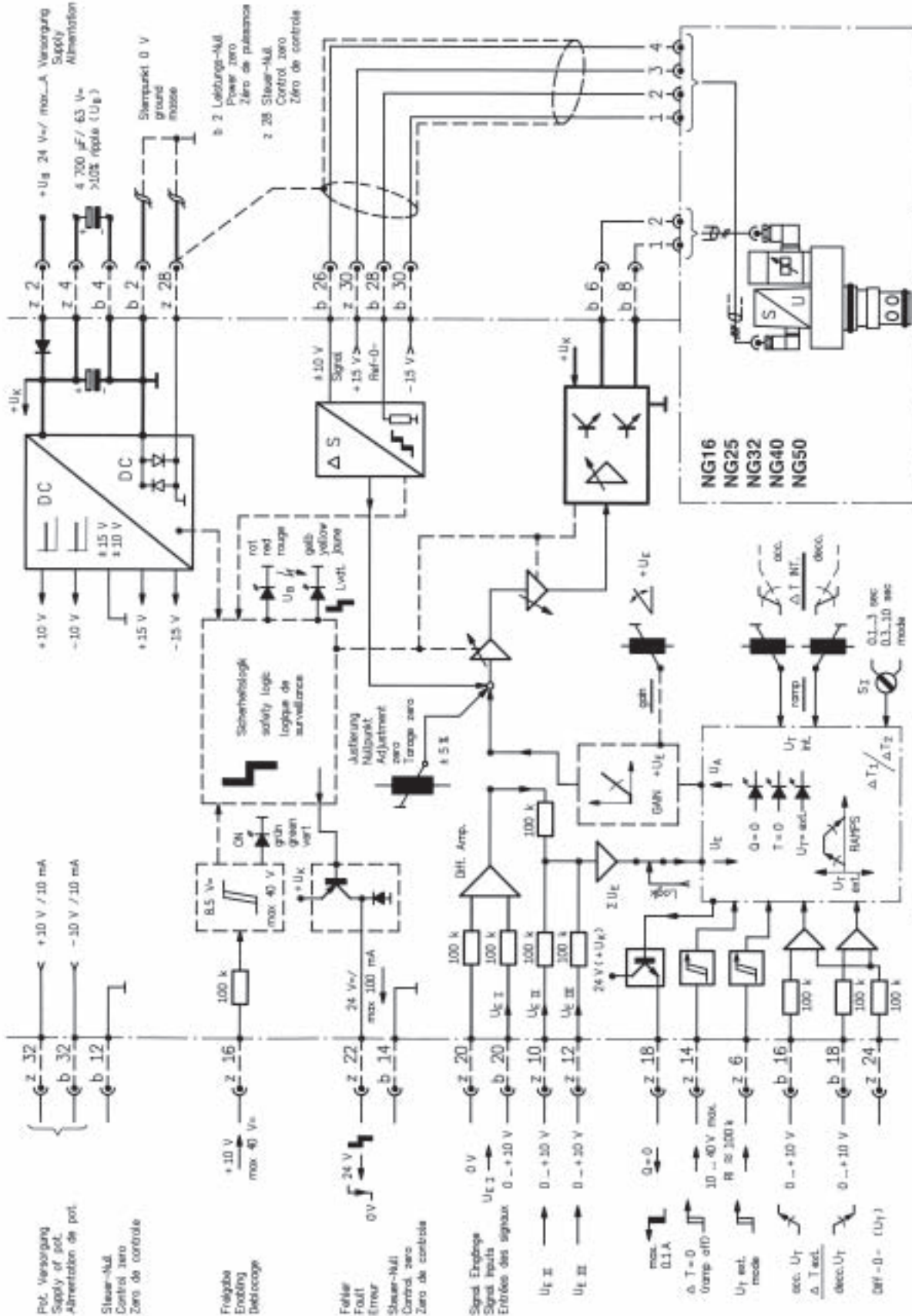
## Front panel



## Function

- Three setpoint inputs
  - $U_{E1}$  differential input ( $b20 = 0 \dots \pm 10 \text{ V}$   $z20 = 0 \text{ V}$ )
  - $U_{E11}$  } relative to control zero ( $z10$ )
  - $U_{E11}$  } cumulative effect ( $z12$ )
- Selection of internal and external ramp time adjustment via control input  $U_{\text{ext}}$  ( $z6$ )  
LED display on front panel
- Ramp rise time can be set to
  - $\Delta T$  0.1...3 s
  - $\Delta T$  0.3...10 s, using the switch on the front panel
- Ramp function switched on and off via the "Ramp off" control input ( $z14$ )  
LED display on front panel indicates the operating mode
- Internal ramp time adjustment using potentiometer on the front panel  
Accelerate - Decelerate
- External ramp time adjustment using voltage-controlled differential inputs  $U_T$   
Accelerate ( $b16$ ) - Decelerate ( $b18$ )
- Signal output "ramp completed" on  $U_E = 0$  ( $z18$ , open collector output to  $+U_A$ )  
LED display on front panel
- Adjustment: sensitivity  
 $Q_a$  - limited in the range 100...50%  $Q_{\text{max}}$

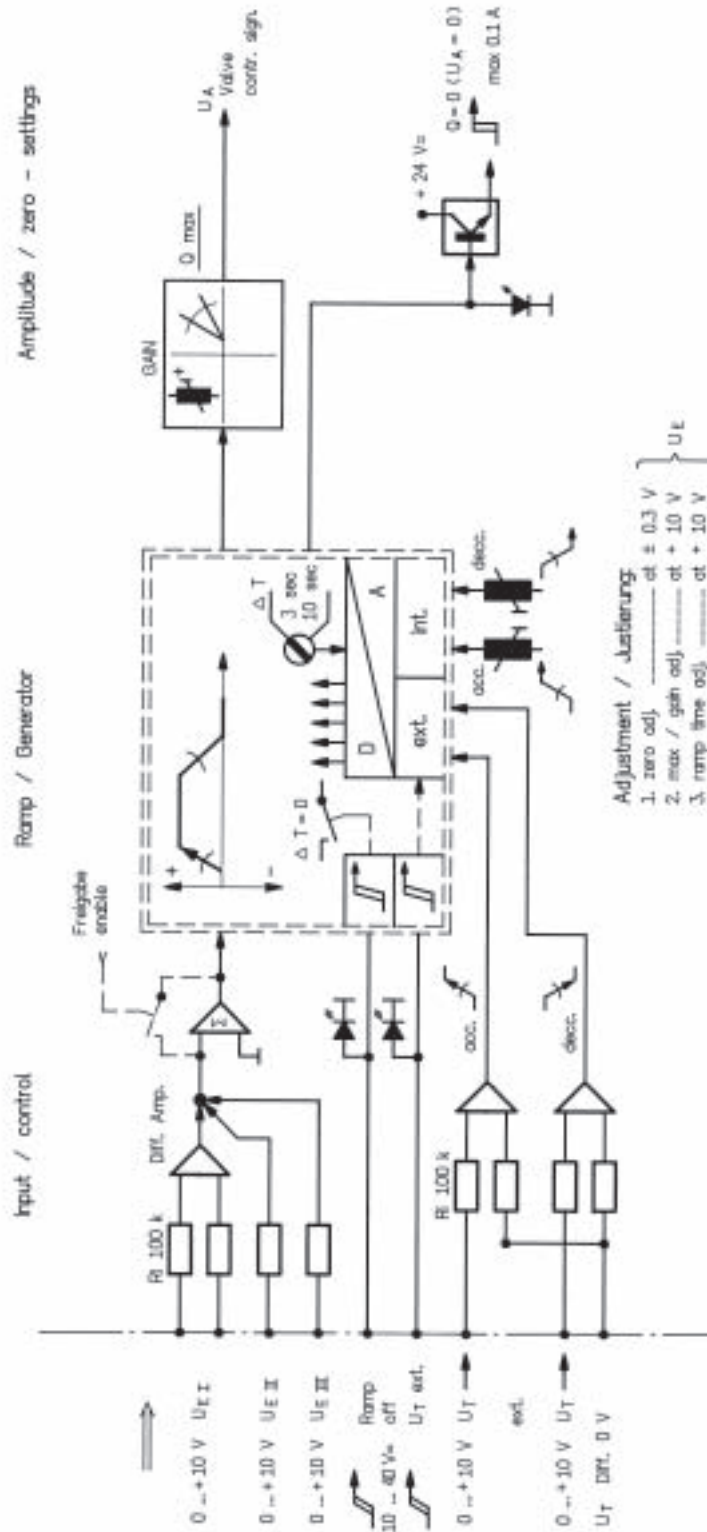
Circuit diagram with pin assignment



See functional diagram of ramp control on page 5

### Circuit diagram with pim assignment

#### Functionl diagram of ramp control



## Technical data

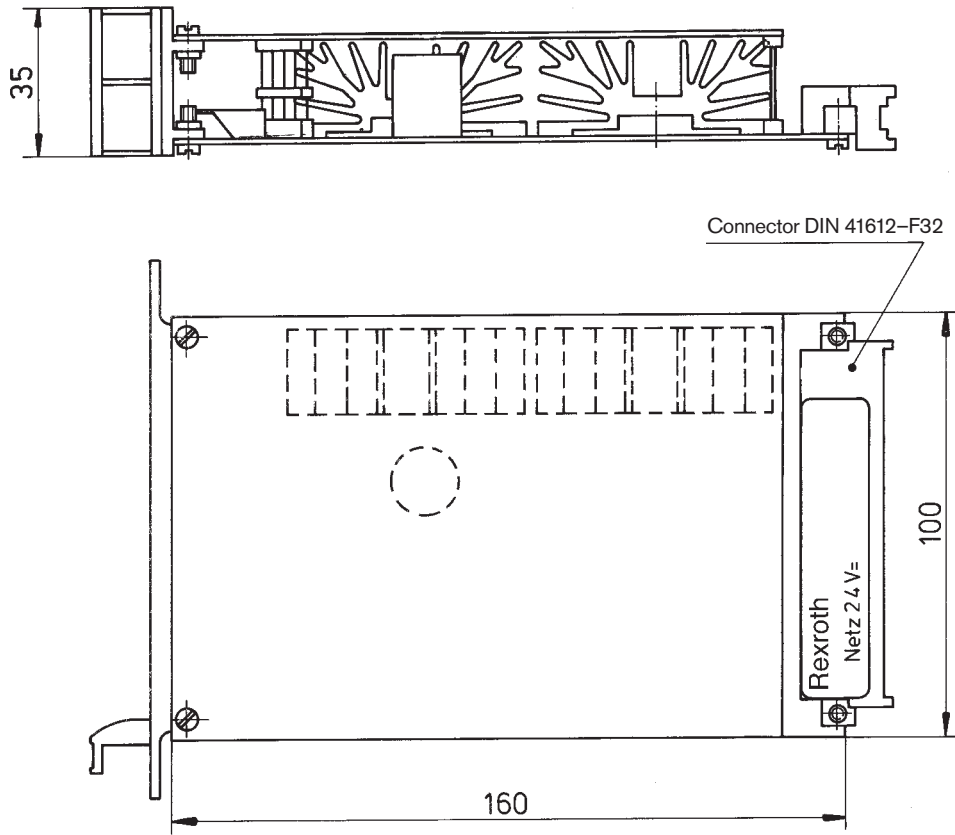
Characteristic values		
P.C.B. format	mm	(100 x 160 x approx. 35) / (W x L x H) Europe card format with front panel (7 modular spacings)
Plug connector		DIN 41612-F32
Ambient temperature	°C	0...+70, storage temperature min. -20, max. +70
Power supply $U_B$ at $z_2 - b_2$		Nominal 24 V DC Battery voltage 21 ... 40 V, rectified AC voltage $U_{\text{eff}} = 21...28$ V (single-phase, full-wave rectification)
Smoothing capacitor, separately to b4, z4		4700 $\mu\text{F}/63$ V DC, only required if $U_B$ ripple > 10 %
Max. valve solenoid	A/VA	<b>2.7/40</b>
Current rating	A	1.5 The current rating may rise on min. $U_B$ and if cable to control solenoid is extremely long
Power consumption (typical)	W	37
Input signal (setpoint)		b20: 0...+10 V } Differential z20: 0 V } amplifier ( $R_i = 100$ k $\Omega$ )
Signal source		Potentiometer 10 k $\Omega$ Supply +10 V from z32 (10 mA) or external signal source
Output stage enable		At z16, $U = 8.5...40$ V, $R_i = 100$ k $\Omega$ , LED (green) on front panel lights up
Position transducer	Power supply	b30: -15 V (25 mA) z30: +15 V (35 mA)
	Feedback signal	b26: 0...-10 V, $R_L > 10$ k $\Omega$
	Feedback reference	b28
Solenoid output b6 - b8	A	Clocked current regulator $I_{\text{max}} = 2.7$
Length of cables between amplifier and valve		Solenoid cable: up to 20 m 1.5 mm <sup>2</sup> 20 to 60 m 2.5mm <sup>2</sup> Position transducer: 4 x 0.5 mm <sup>2</sup> (shielded)
Special features		Open-circuit protection for feedback signal cable Closed-loop position control with PID action Clocked output stage Rapid energizing and de-energizing for fast response times Short-circuit-proof outputs
Adjustment		Zero via trimming potentiometer $\pm 5\%$
LED displays		Green: Enable Yellow: Feedback signal open circuit Red: Under-voltage ( $U_B$ too low)
Fault signal - Feedback signal open circuit - $U_B$ too low - $\pm 15$ V stabilization		z22: Open collector output to $+U_K$ max. 100 mA, no fault: $+U_K$

### Note

Connect power zero b2 and control zero b12, b14 or z28 separately to central ground (neutral point).

**Unit dimensions** (nominal dimensions in mm)

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## Notes

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