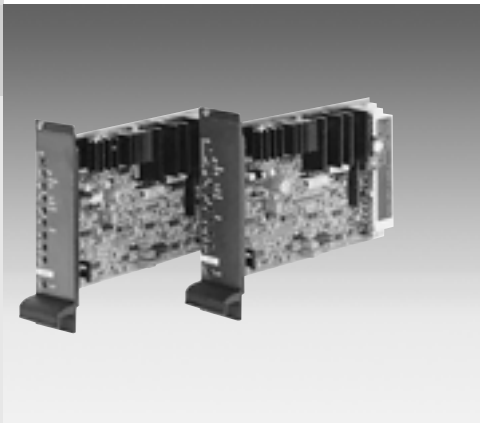
Electric amplifiers

RE 30048/01.09
Replaces: 11.02

Type VT-VRPA2



Unit series 1X

List of contents

Features

- Suitable for actuating directly operated servo solenoid valves (type 4WRP, series 1X)
- Analog amplifiers in Eurocard format for installation in 19″ rack
- Ramp generator can be deactivated
- Deadband compensation
- Output stage with closed-loop control
- Enabling input
- Inputs and outputs (partially) short-circuit-proof
- External ramp deactivation
- Adjustment possibilities
  - Valve zero
  - Sensitivity
  - Ramp times
- Open-circuit detection for feedback signal cable
- Closed-loop position control with PID action

Testing and service equipment

- Test box type VT-PE-TB1, see RE 30063
- Test adapter type VT-PA-3, see RE 30070

Ordering data

VT – V | R | P | A | 2 – –1X/V0/RTP

Hydraulic component
For valves with electrical feedback **= R**

Valve type
Servo solenoid valve **= P**

Actuation
Analog **= A**

Output stage
Two output stages per valve **= 2**

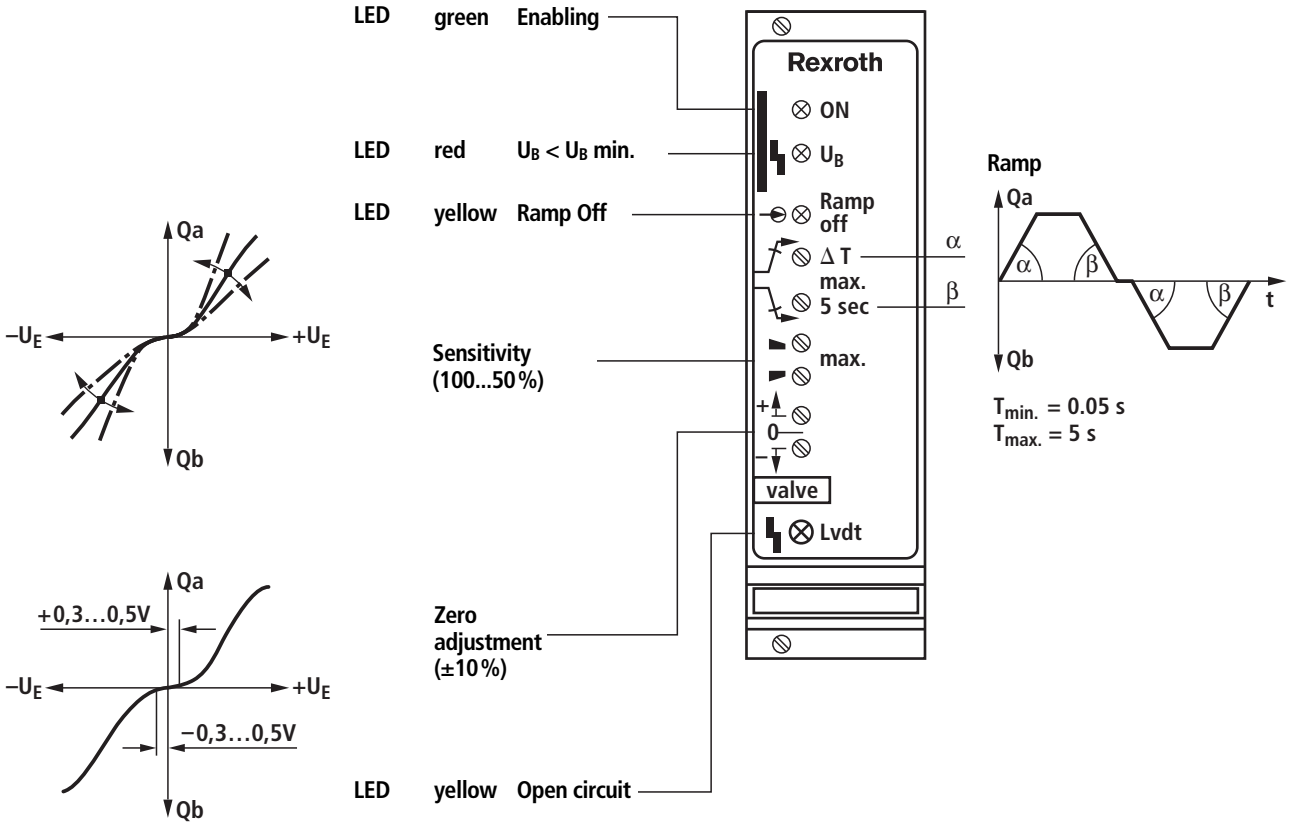
Option
RTP = Ramp function manually adjustable

Customer version
V0 = Catalogue version

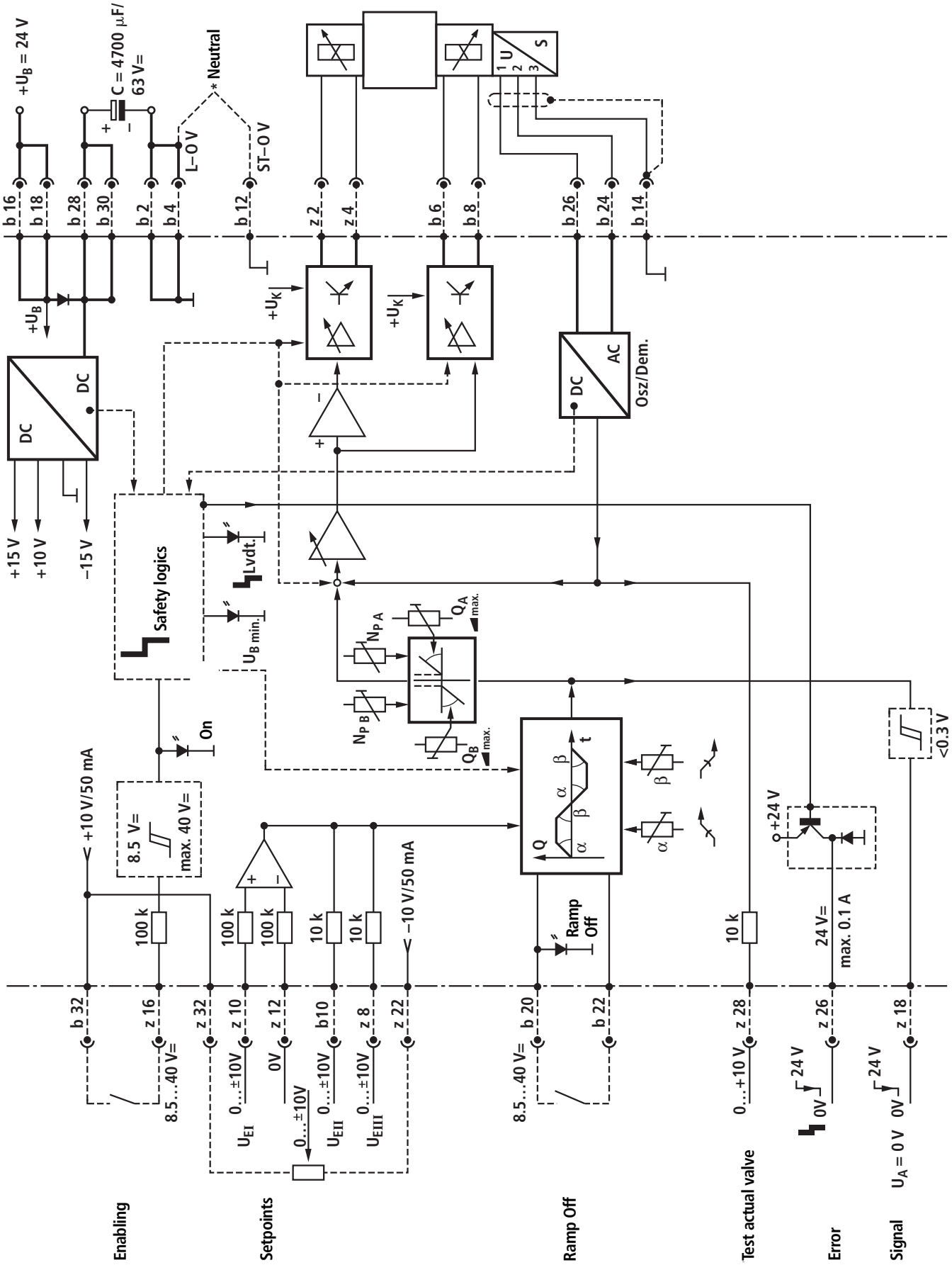
Unit series
1X = Unit series 10 to 19

Serial numbers for types
527 = NG6
537 = NG10

Front panel



Block diagram with pin assignment



Technical data

P.C.B. format	mm	(100 x 160 x approx. 35) / (W x L x H) Europe format with front panel (7 modular spacings)	
Plug connector		DIN 41612 – F32	
Ambient temperature	°C	0...+70, storage temperature min. –20; max. +70	
Weight	kg	0,25	
Power supply U_B to b 16/b 18 and b 2/b 4		24 V DC nominal, Battery voltage 21…40 V, Rectified AC voltage U_{eff} = 21…28 V (single-phase, full-wave rectification)	
Smoothing capacitor, separately to b 28/b 30 – b 2/b 4		4,700 μF/63 V DC, only required if U_B ripple >10 %	
Solenoid	A/VA	**2.7/25 (NG6)**	**3.7/50 (NG10)**
Current rating	A	1.5	2.5
		The current rating can rise at min. U_B and long cable length to control solenoid	
Power consumption (typical)	W	35	60
Input signal (setpoint)	V	0...±10 supply from b 10, z 8, z 10, z 12, z 14/b 14 cumulative (Ri = 10 kΩ)	
Signal source		Potentiometer 1 kΩ, +10 V supply from b 32 (50 mA), –10 V from z 22 (50 mA) or external signal source	
Actual-value feedback		Oscil. b 26	Meas. tap z 28 [1]
	0 811 405 119	10.2 V_{eff} / 7.8 kHz	0...±10 V=
	0 811 405 120	10.2 V_{eff} / 7.8 kHz	0...±10 V=
Output stage enable		To z 16, U = 8.5...40 V, R_i = 100 kΩ, LED (green) on front panel lights up	
Ramp OFF		To b 20, U = 8.5...40 V	
Solenoid output		Output stage to solenoid Signal to position sensor Potentiometer power supply	
Length of amplifier to valve cables		Solenoid cable: up to 20 m 1.5 mm² 20 to 50 m 2.5 mm² Position transducer: max. 50 m at 100 pF/m Supply and capacitor 1.5 mm²	
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 Ramps with quadrant recognition Deadband compensation in valve centre position Ramps can be deactivated	
Adjustment via trimming potentiometer		1. Zero N_{PA} and N_{PB} 2. Sensitivity Q_A and Q_B 3. Ramps for acceleration and deceleration t = 0.05...5 s	
LED displays		Green: Enable ON Red: $U_B < U_B$ min. (approx. 21 V) Yellow: Ramp OFF Yellow: Feedback signal open circuit	
Fault signal – Feedback signal open circuit – U_B too low – ±15 V stabilization		z 22: Open collector output to +U_K max. 100 mA; no fault: +U_K	

Note
Connect power zero b 2 and control zero b 12 separately to central ground (neutral point).

[1] Values for potentiometer in end position (cw) and for “zero potentiometer“ in centre position.

Additional information

Information for using ramps

Ramp ON if b 20 is open.

Ramp OFF if b 20 is linked to b 22 or U = 8.5 ... 40 V at b 20.

Ramp OFF, Enable OFF or **Open circuit** interrupts a ramp in progress. There is an abrupt transition to the final signal value.

Quadrant recognition A

Travel through the centre position leaves the direction of motion of the valve spool unchanged but not that of the cylinder. In order to ensure that the acceleration values for both directions of motion remain the same when the valve crosses from one quadrant to another, the ramp is switched over by the process of quadrant recognition.

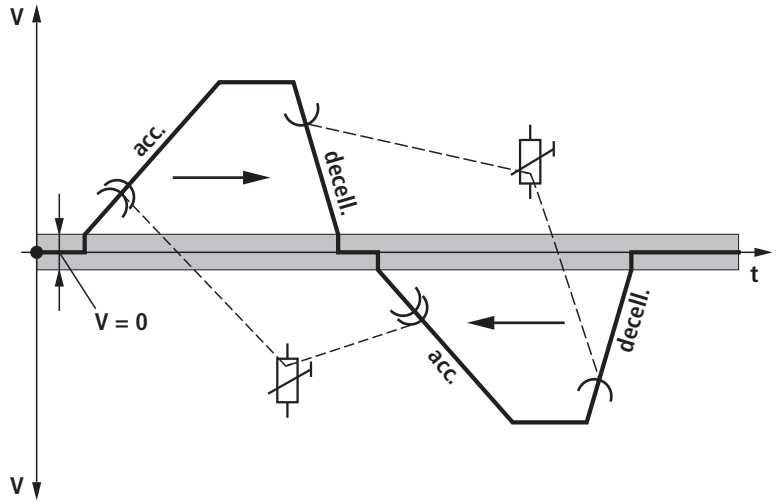
Deadband compensation in valve centre position B

The positive overlap of ±20 % of the spool stroke is bypassed by means of an electronic compensation circuit in the ±15 % range of the spool stroke.

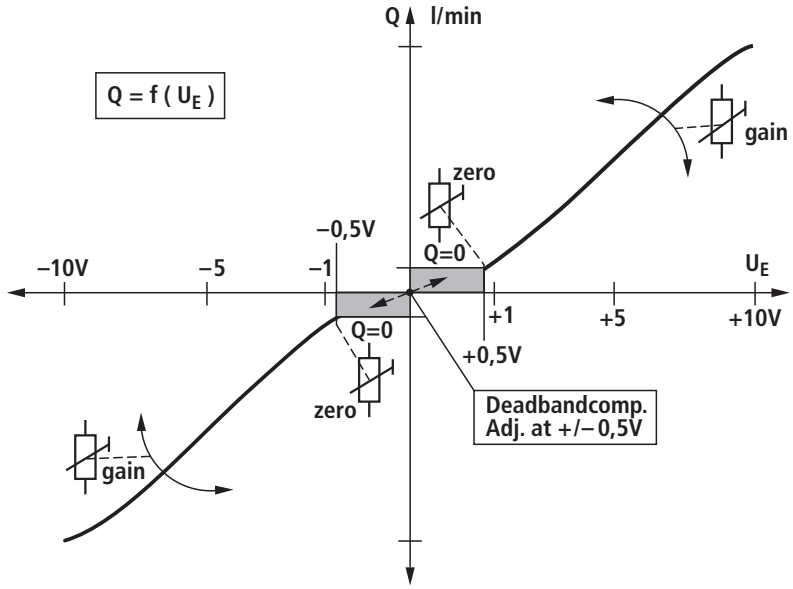
Zero compensation

A low setpoint (U_E = 0.3 ... 0.5 V) must be entered for zero compensation, in order to ensure exit from the deadband.

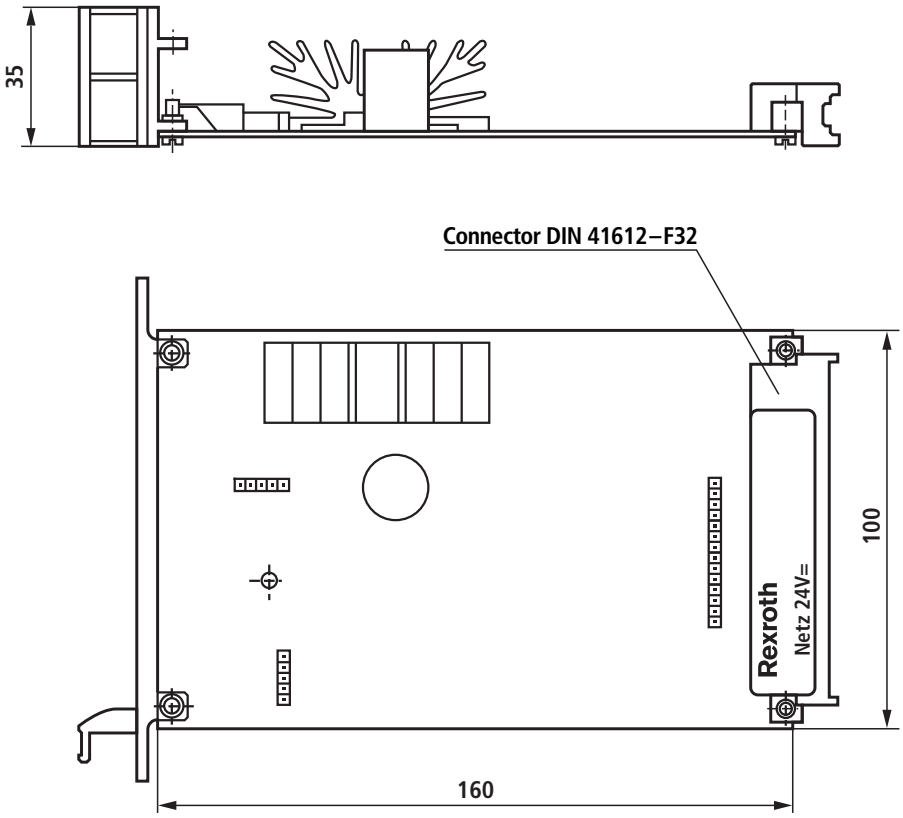
A



B



Unit dimensions (nominal dimensions in mm)



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