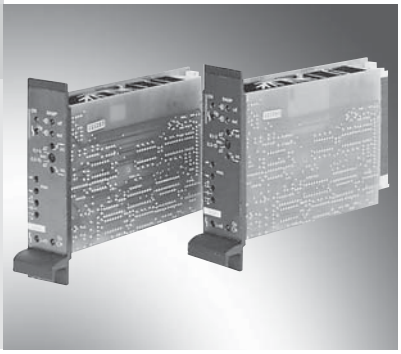
Electric amplifiers

RE 30047/03.12 1/6
Replaces: 11.02

Type VT-VRPA2-5...-1X/V0/RTS

Component series 1X



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Features

- Suitable for controlling direct operated high-response valves with positive overlap
- Amplifier with additional electronics (daughter card)
- Analog amplifiers in Europe format for installation in 19" racks
- Adjustment possibilities
  - Zero point valve
  - Sensitivity
  - Ramp times
- Controlled output stage
- Enable input
- Ramp generator that can be switched off
- Compensation step
- Inputs and outputs short-circuit-proof
- External ramp switch-off
- External voltage-controlled ramp setting via differential inputs
- Cable break detection for actual value cable
- Position control with PID behavior

Notice:

The photo shows an example configuration.
The delivered product differs from the figure.

Ordering code, accessories

VT-	V	R	P	A	2 –	–1X/V0/RTS

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

Valve type
High-response valve = **P**

Control
Analog = **A**

Output stage
2 output stages per high-response valve = **2**

Option
RTS = Ramp function set via signal

Customer version
V0 = Catalog version

1X = Component series 10 to 19
(10 to 19: Unchanged technical data and pin assignment)

Serial number for types
527 = Size 6
537 = Size 10

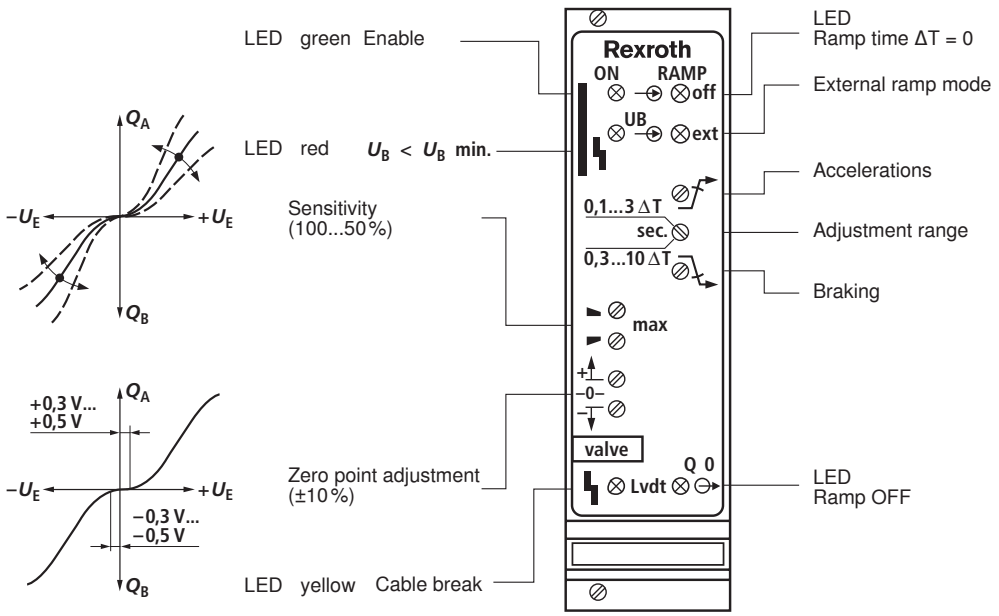
Preferred types

Amplifier type	Material number	For high-response valves with electric position feedback and inflected characteristic curve
VT-VRPA2-527-10/V0/RTS	0811405137	4WRP 6...S-1X...
VT-VRPA2-537-10/V0/RTS	0811405138	4WRP 10...S-1X...

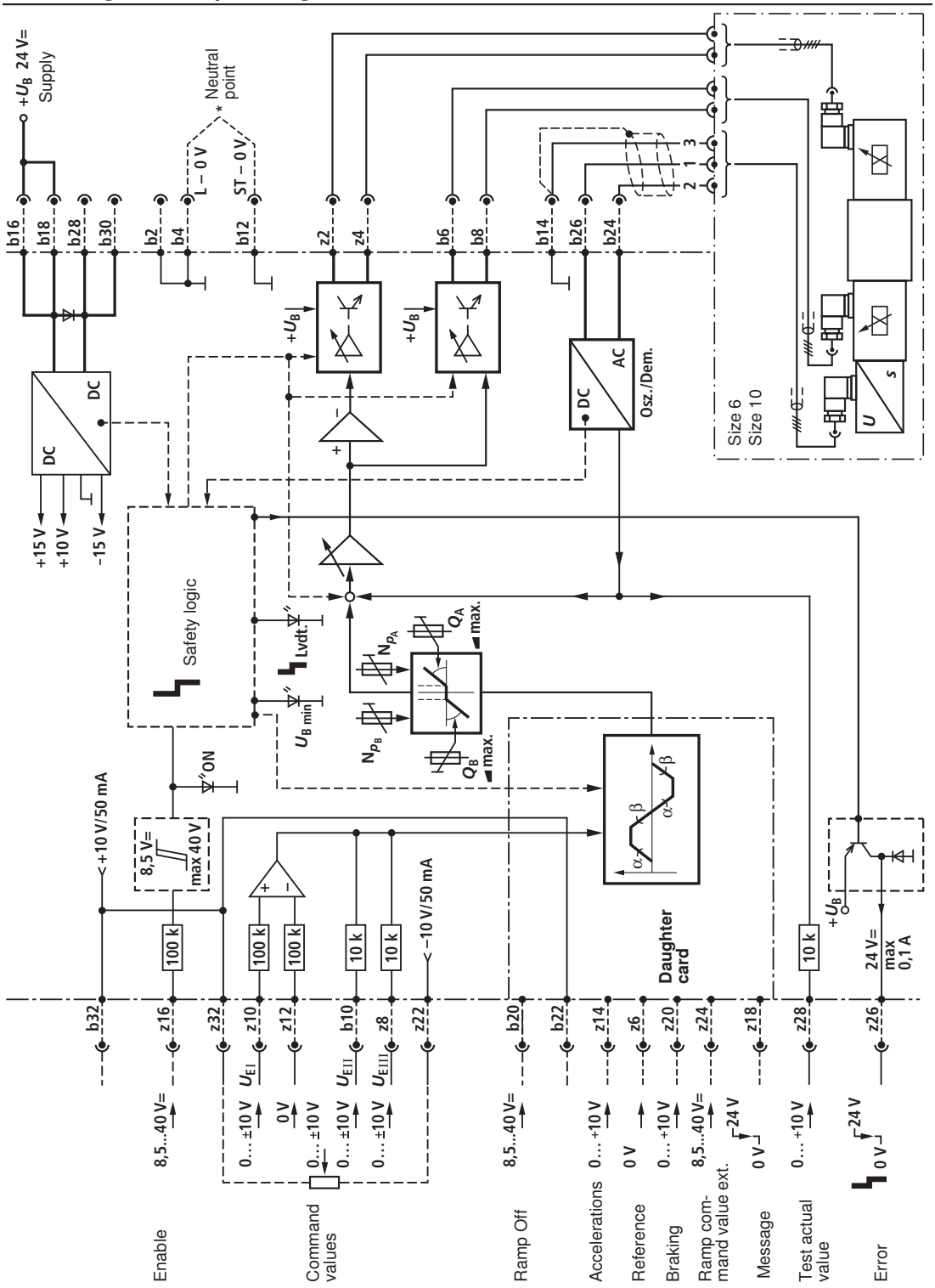
Suitable card holder:

– Open card holder VT 3002-1-2X/32F
(see data sheet 29928).
Only for control cabinet installation!

Front plate



Block diagram with pin assignment



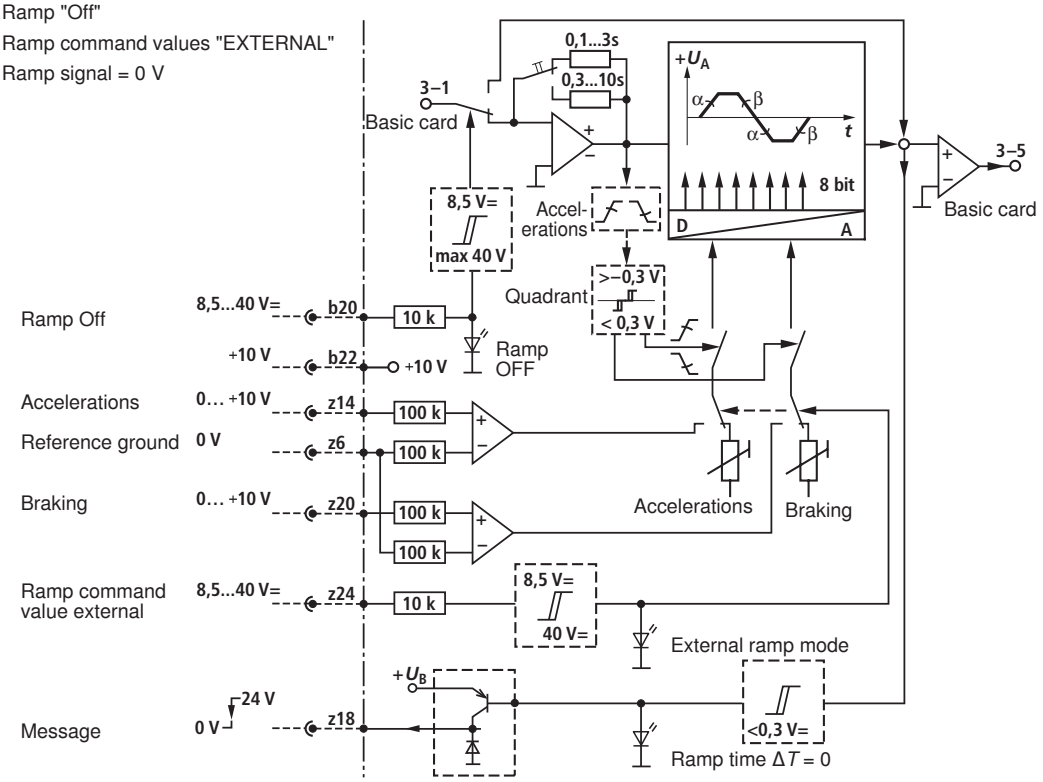
Block diagram with pin assignment daughter card

Operating range: Ramp generator

– Internal/external specification 0...+10 V for the ramp time

Logic signals

– Ramp "Off"
– Ramp command values "EXTERNAL"
– Ramp signal = 0 V



Additional information

Information for the use of ramps

1. Quadrant recognition
   There is automatic quadrant recognition of the ramps for positive and negative valve command values.

2. Switch-over INTERNAL/EXTERNAL ramp command value specification
   – Switch-over is effected by means of voltage signal at z24 to external specification
   – This renders the setting potentiometers ineffective
   – "EXTERNAL" state is displayed by LED.

3. INTERNAL ramp setting
   – Set potentiometer to desired ramp behavior
   – Prerequisite: No command at z24 and/or b20.

4. EXTERNAL ramp setting
   – Voltage specification at z14 and z20 (joint reference point z6)
   – Max. resolution: 75 mV
   Prerequisite: Command at z24 and no command at b20.

5. Ramp time range
   – You can set 2 ramp time ranges (front plate selector). They are valid for internal and external command value specification.

6. Ramp OFF
   – Ramp switch-off by means of command at b20
   – If the ramp has already been started, transition to the signal end value is effected by means of a step
   – "Ramp Off" state is displayed by LED.

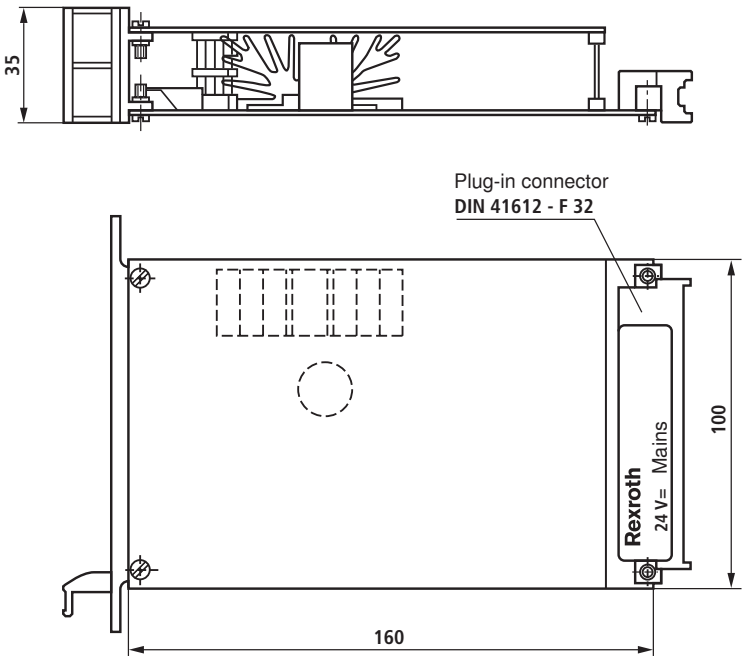
7. Ramp time $\Delta T = 0$
   – If the ramp output voltage $U_A = 0$ V, the signal output z18 is switched to 24 V
   – The state is also displayed by an LED
   – If the ramp function is switched off, there is no message.

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

Supply voltage U_B at b16 – b2		Nominal 24 V = Battery voltage 21...40 V, Rectified alternating voltage U_{eff} = 21...28 V (one-phase, full-wave rectifier)	
Smoothing capacitor, separately at b16 – b2		Recommendation: Capacitor module VT 11110 (see data sheet 30750) (only necessary if the ripple of U_B > 10 %)	
Valve solenoid, max.	A/VA	**2.5/25 (size 6)**	**3.7/50 (size 10)**
Current consumption, max.	A	1.5	2.5
		The current consumption may increase with min. U_B and extreme cable length to the control solenoid	
Solenoid output b6 – b8/z2 – z4	A	Rectangular voltage, pulse-modulated $I_{max.}$ = 2.7	$I_{max.}$ = 3.7
Power consumption (typical)	W	35	60
Input signal (command value)		0...±10 V optionally at b10, z8, z10, z12, z14/b14 summing (R_i = 100 kΩ)	
Signal source		Potentiometer 1 kΩ Supply ±10 V from b32 (50 mA) – 10 V from z22 (50 mA) or external signal source	
Actual value feedback		Osci b26	Test point z28[1)]
	0811405137	10.2 V_{eff}/7.8 kHz	0...±10 V =
	0811405138	10.2 V_{eff}/7.8 kHz	0...±10 V =
Enable output stage		At z16, U = 8.5...40 V, R_i = 100 kΩ, LED (green) on front plate lights up	
Ramp internal/external		At z24, U = 8.5...40 V external ramp command values	
Ramp OFF		At b20 U = 8.5...40 V	
Cable lengths between amplifier and valve		Solenoid cable: to 20 m 1.5 mm² 20 to 50 m 2.5 mm² Position transducer: Max. 50 m with 100 pF/M Supply and capacitor 1.5 mm²	
Short-circuit-proof outputs		Output stage to the solenoid, signal to the positional transducer, Supply voltage for potentiometer	
Special features		Cable break protection for actual value cable, Position control with PID behavior, Pulsed output stage, Fast energization and fast deletion for short actuating times, Ramps with quadrant recognition, Compensation of the dead zone in central valve position, Ramps that can be switched off, Ramp command values can be specified internally (potentiometers) or externally (voltage)	
Adjustment via trimming potentiometer		1. Zero point N_{PA} and N_{PB} 2. Sensitivity Q_A and Q_B 3. Ramps for acceleration and braking, depending on setting 0.1...3 sec and/or 0.3...10 sec 4. Switch-over ramp setting range	
LED displays		green: Enable ON / ramp external yellow: Cable break actual value / ramp OFF / Q_0 = 0 V red: $U_B > U_{B\,min.}$ (approx. 21 V)	
Error message – Cable break actual value – U_B too low – ±15 V stabilization		Switching output No error: +24 V (max. 100 mA) Error 0 V	
Circuit board format	mm	(100 x 160 x approx. 35) / (W x L x H) Europe format with front plate 7 TE	
Plug-in connection		Connector DIN 41612 – F32	
Ambient temperature	°C	0...+70	
Storage temperature range	°C	–20...+70	
Weight	*m*	0.43 kg	
Notice: Power zero b2 and control zero b12 must be separately led to the central ground (neutral point).			

[1)] Values for potentiometer in end position (cw) and for "zero potentiometer" in central position.

Unit dimensions (dimensions in mm)



Project planning / maintenance instructions / additional information

- The amplifier card may only be unplugged and plugged when de-energized.
- The distance to aerial lines, radios and radar systems must be sufficient (> 1 m).
- Do not lay solenoid and signal lines near power cables.
- For signal lines and solenoid conductors, we recommend using shielded cables.
  The cable shield must be connected to the control cabinet extensively and as short as possible.
- The valve solenoid must not be connected to free-wheeling diodes or other protective circuits.
- The cable lengths and cross-sections specified on page 5 must be complied with.