

Electric Drives
and Controls

Hydraulics

Linear Motion and
Assembly Technologies

Pneumatics

Service

Rexroth
Bosch Group

Electric amplifiers

RE 30046/03.12
Replaces: 11.02

1/6

Type VT-VRRA1-5...-2X/V0/KV-AGC

Component series 2X

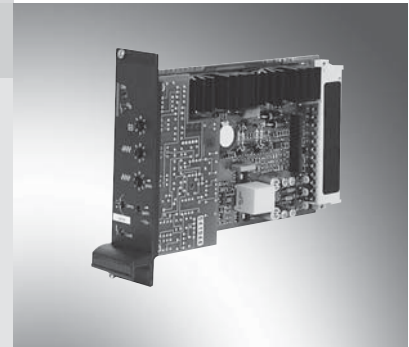


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Features

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Notice:

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

Ordering code, accessories

VT-	V	R	R	A	1	-	-2X/V0/KV-AGC	
Hydraulic component For valves with electric feedback		= R						Option
Valve type High-response valve		= R						KV-AGC = Function for variable inflection Small signal amplification Area adjustment
Control Analog		= A						Customer version Catalog version
							V0 =	Component series 20 to 29 (20 to 29: Unchanged technical data and pin assignment)
							2X =	Serial number for types 527 = Size 6 537 = Size 10

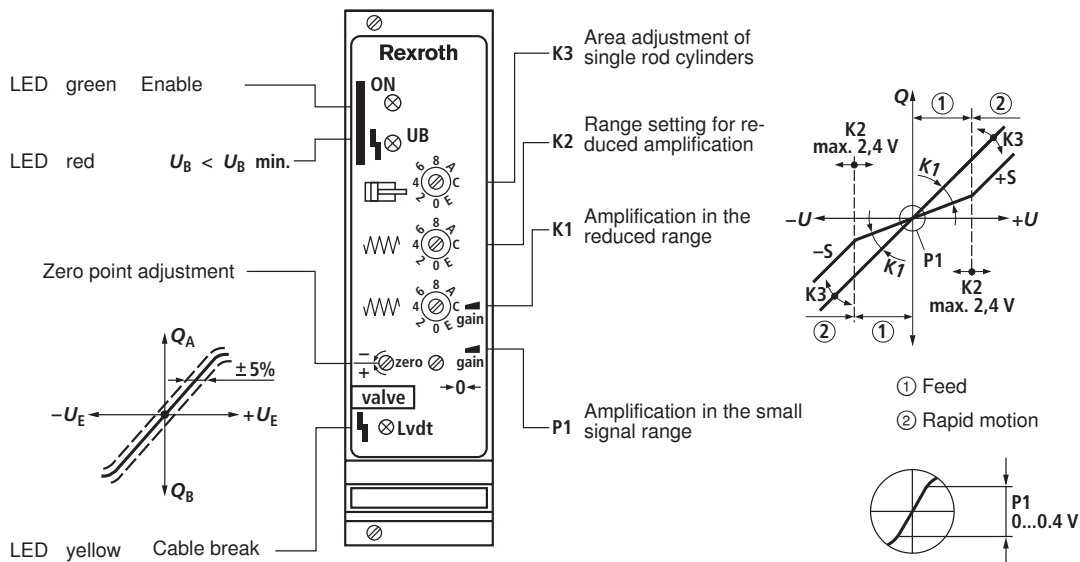
Preferred types

Amplifier type	Material number	For high-response valves with electric position feedback and linear characteristic curve
VT-VRRA1-527-20/V0/KV-AGC	0811405069	4WRPH 6...P-2X...
VT-VRRA1-537-20/V0/KV-AGC	0811405070	4WRPH 10...P-2X...

Suitable card holder:

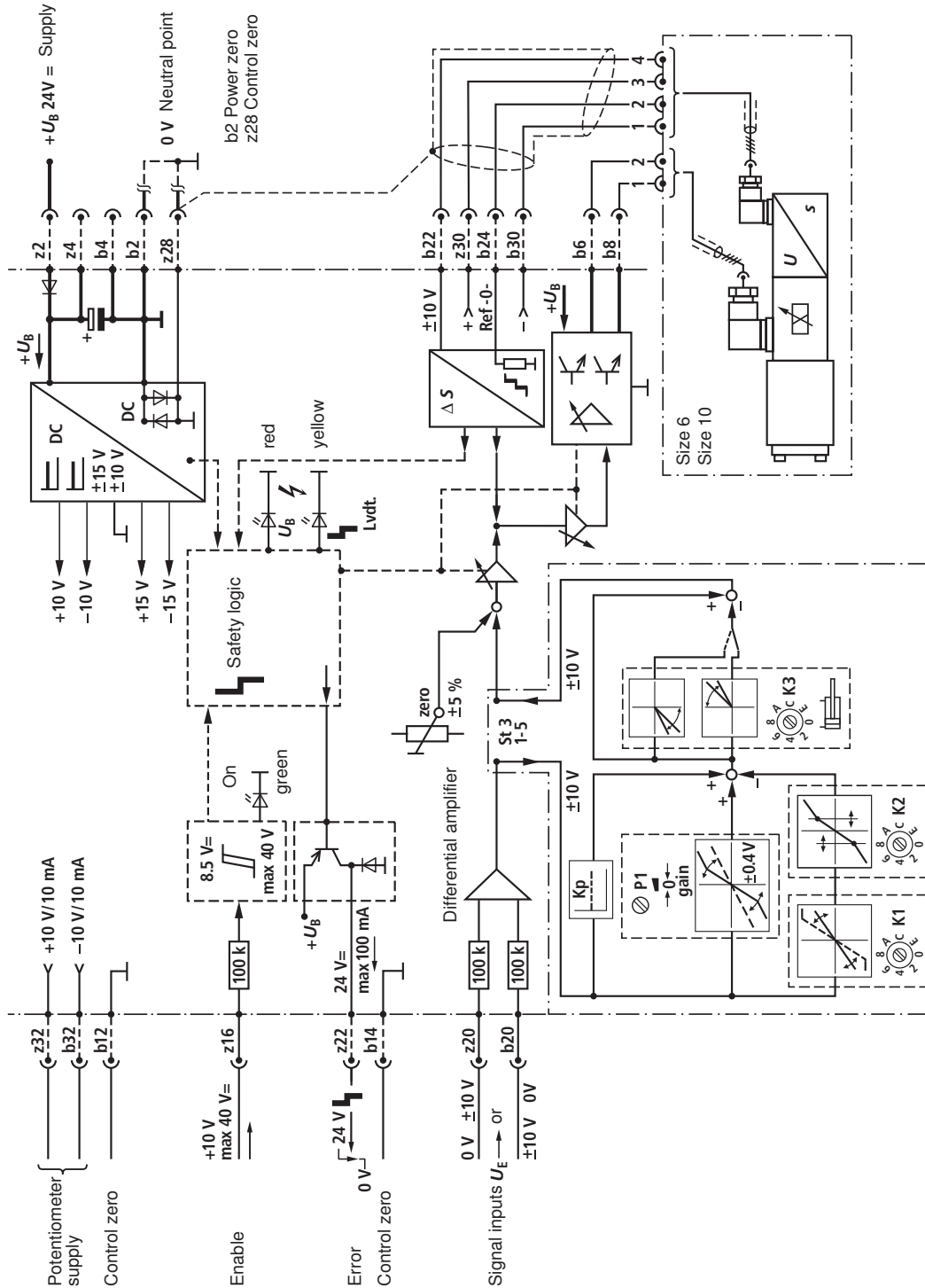
- Open card holder VT 3002-1-2X/32F (see data sheet 29928).
Only for control cabinet installation!

Front plate



Position	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Amplification K3	1:1	1.06:1	1.15:1	1.23:1	1.33:1	1.44:1	1.56:1	1.70:1	0.733	0.7	0.666	0.633	0.6	0.566	0.533	0.5
Area ratio	1	0.97	0.934	0.9	0.867	0.834	0.8	0.766	1.86:1	2.04:1	2.23:1	2.50:1	2.77:1	3.12:1	3.52:1	4:1

Block diagram with pin assignment



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

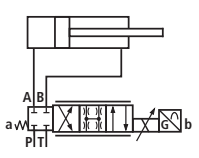
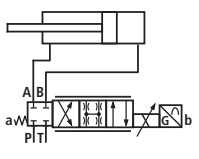
Supply voltage U_B at z2 – b2		Nominal 24 V = Battery voltage 21...40 V, Rectified alternating voltage $U_{\text{eff}} = 21...28$ V (one-phase, full-wave rectifier)	
Smoothing capacitor, separately at z2 – b2		Recommendation: Capacitor module VT 11110 (see data sheet 30750) (only necessary if the ripple of $U_B > 10\%$)	
Valve solenoid, max.	A/VA	2.7/40 (size 6)	3.7/60 (size 10)
Current consumption, max.	A	1.7	2.7
		The current consumption may increase with min. U_B and extreme cable length to the control solenoid	
Power consumption (typical)	W	37	55
Input signal (command value)		b20: 0...±10 V } z20: 0...±10 V } Differential amplifier ($R_i = 100$ kΩ)	
Signal source		Potentiometer 10 kΩ Supply with ±10 V from b32, z32 (10 mA) or external signal source	
Enable output stage		At z16, $U = 8.5...40$ V, $R_i = 100$ kΩ, LED (green) on front plate lights up	
Position transducer Supply		b30: -15 V z30: +15 V	
	Actual value signal	b22: 0...±10 V, $R_i = 20$ kΩ	
	Actual value reference	b24	
Solenoid output b6 – b8	I_{max}	2.7 A	3.7 A
Cable lengths between amplifier and valve		Solenoid cable: to 20 m 1.5 mm ² 20 to 60 m 2.5 mm ² Position transducer: 4 x 0.5 mm ² (shielded)	
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, Short-circuit-proof outputs	
Adjustment		Zero point via trimming potentiometer ±5 % Area adjustment of single-rod cylinders (K3) Amplification in the small signal range (P1) Variable adjustment of the loop gain in the feed speed range (K1) Range setting of feed speed range (K2)	
LED displays		green: Enable yellow: Cable break actual value red: Undervoltage (U_B too low)	
Error message – Cable break actual value – U_B too low – ±15 V stabilization		z22: Open collector output to + U_B Max. 100 mA; no error: + U_B	
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	0.40 kg	

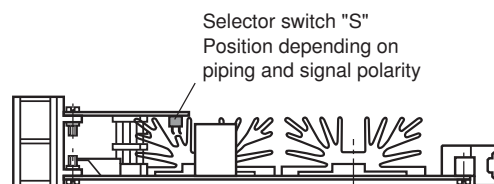
Notice:

Power zero b2 and control zero b12 or b14 or z28 must be separately led to the central ground (neutral point).

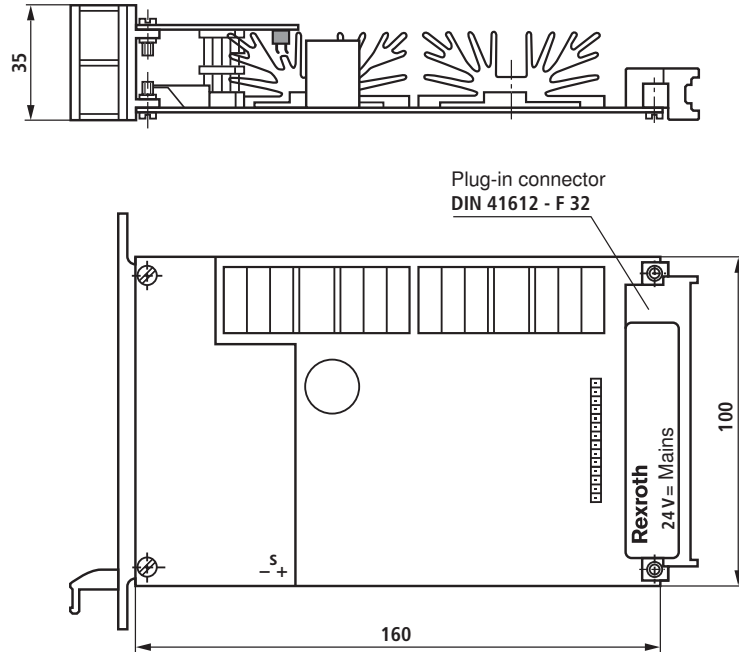
Commissioning

- Setting the electric and hydraulic zero point using the „zero“ potentiometer.
With closed control loop, the following error displayed by the CNC is then controlled to 0.
- Setting of the range of minimum valve modulation by means of the rotary encoding switch K2.
- Reduction of the amplification by means of the rotary encoding switch K1 so that the drive stabilizes in the area of minimum valve modulation.
- Carry out point 2 and 3 in several steps, if necessary.
- Adjust different forward and backward speeds (area adjustment of single rod cylinders) using switch S and rotary encoding switch K3.
- Adjust the optimization of the amplification in the small signal range by means of P1 (complete reduction of the following error).

Valve ← → Cylinder	Selector switch
	"S" -
	"S" +



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 4 must be complied with.

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