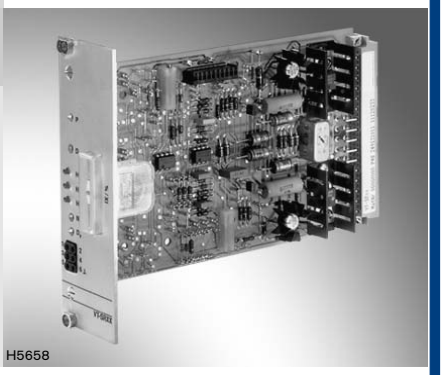
Analogue amplifier

RE 29980/09.05 1/6
Replaces: 02.03

Type VT-SR2

Series 1X


H5658

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Features

- Suitable for controlling single and two-stage servo-valves without electrical position feedback (types 4WS2EM 6, 4WS2EM 10., 4WS2EM 16., 4WS2EB 10., 4DS1EO 2 and 3DS2EH 10)
- Regulator for valve current
- Dither signal generator
- Push-pull output stage
- Enable circuit with relay
- Measuring instrument for displaying servo-valve current
- Reverse polarity protection for voltage supply
- Optional extensions:
  - PID-controller[1)] with controller changeover
  - Relay with potential-free changeover contact (28 V / 2 A)
  - Voltage regulator ±15 V for supplying the closed-loop control electronics

[1)] The D-components act on the actual value only.

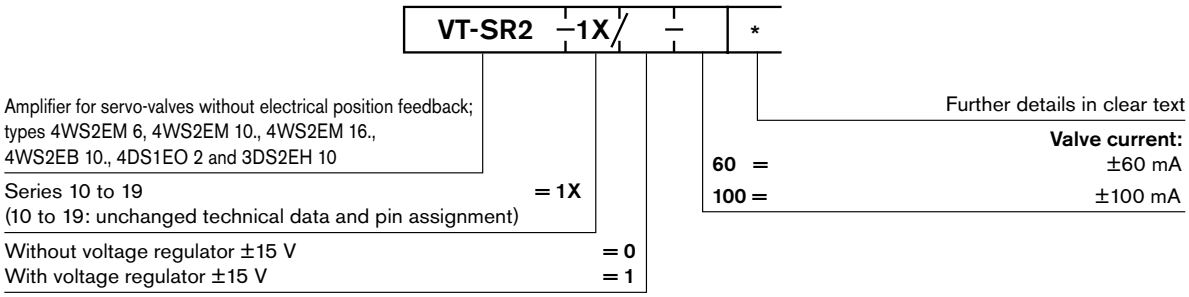
Suitable Card holders:

- Type VT 3002-2X/32, see RE 29928
  Single card holder, without power supply unit

Suitable Power supply unit:

- Type VT-NE31-1X, see RE 29929
  Compact power supply unit 115/230 VAC → ±24 VDC, 7 VA

Ordering code



Functional description

VT-SR2 amplifiers operate with a push-pull output stage with bipolar transistors. The output of this output stage can be activated or deactivated using an enable circuit (relay K2). The enable is indicated by lighting up of the LED “H2“ on the front panel. The switching voltage of all relays is set to either 0 V or $+U_O$ (factory setting $+U_o$) by means of jumpers J12 and J13.

The output stage consists of an I-controller with connected dither signal generator. The amplitude of the dither signal can be adjusted using R7. The input stage (current command value) is controlled by a PD-controller. The actual current value fed back is indicated on an instrument on the front panel.

The position command value is fed to the PD-controller, with the D-component acting **only** on input 3.

The valve zero point can be adjusted from the front panel using R3 (“NP”).

The required symmetric operating voltage $\pm U_O$ is protected against reverse polarity. For the version **without voltage regulator**, an **additional stabilised auxiliary voltage** ($\pm U_M$) must be provided to supply the controller electronics. The auxiliary voltage connection is protected against reverse polarity up to a maximum current of 1 A.

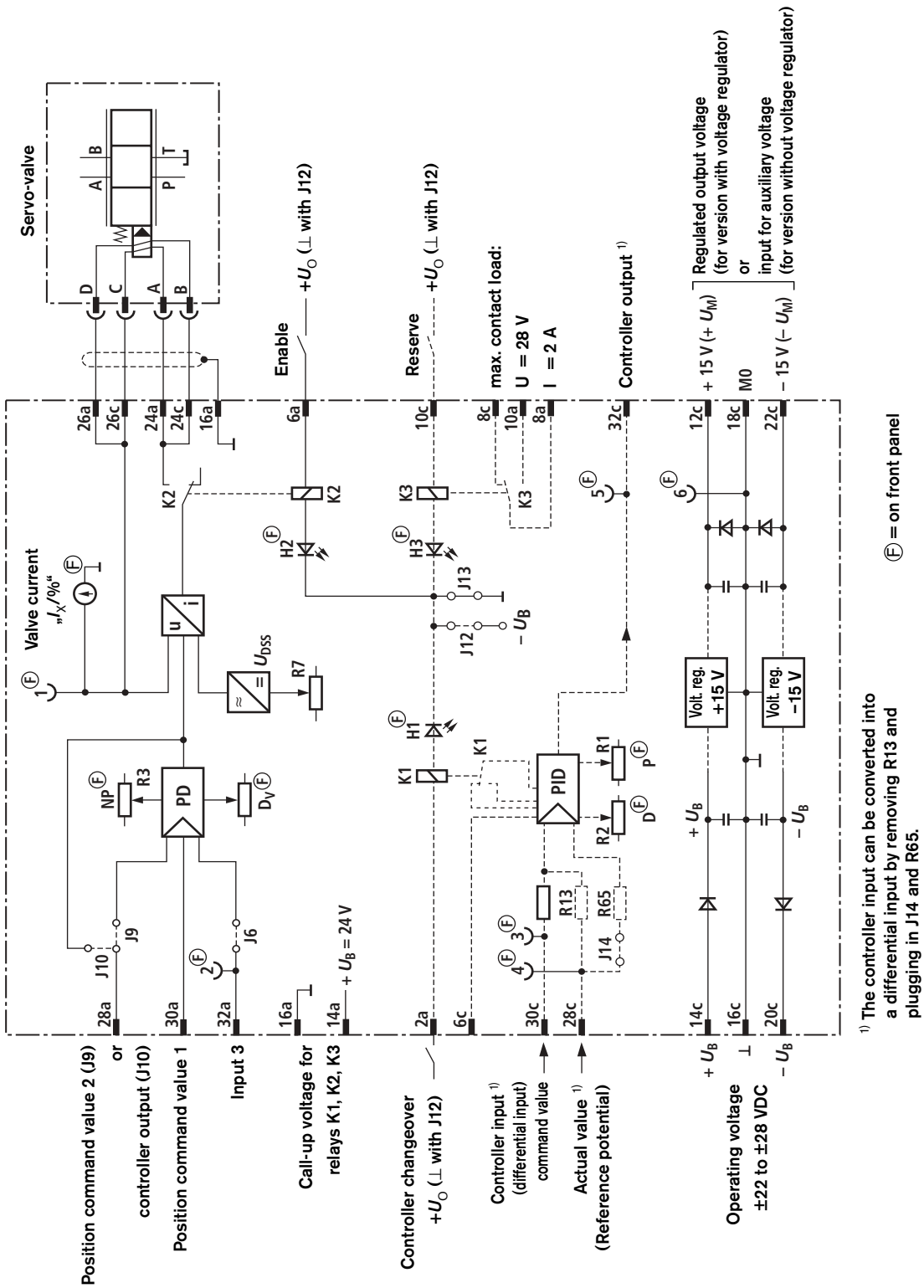
Optionally, the amplifier can be fitted with a PID-controller (D-component acts **only** on the actual value), with the PI-component being able to be changed over, and a reserve relay with potential-free changeover contact. This controller can be used to superimpose a further closed control loop (e.g. for drive control). The P- and D-component can be adjusted on the front panel. The control state of the controller is signalled by LED “H1”, that of the relay by LED “H3” (LEDs light up when relays are picked up). The PID-controller configuration is customised and must therefore be indicated in clear text on the order. When dispatched, a special type designation is assigned to the amplifier. The reserve relay may be loaded up to 28 V and 2 A.

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

Operating voltages					
With voltage regulator		U_B	±24 VDC		
– Upper limit value		$u_O(t)_{max}$	±28 VDC		
– Lower limit value		$u_O(t)_{min}$	±22 VDC		
Without voltage regulator (operating and auxiliary voltage)	U_O	U_M	±24 VDC	±15.0 VDC	
– Upper limit values	$u_O(t)_{max}$	$u_M(t)_{max}$	±28 VDC	±15.2 VDC	
– Lower limit values	$u_O(t)_{min}$	$u_M(t)_{min}$	±22 VDC	±14.8 VDC	
Power consumption (without valve) at U_O = ±24 V [1]		I	<150 mA		
Inputs					
– Command value 1 (main spool position)		U_e	0 to ±10 V (R_i = 50 kΩ)		
– Command value 2 (main spool position) with J9		U_e	0 to ±10 V (R_i = 50 kΩ)		
– Enable		U_e	+24 V with J13	0 V with J12	(R_i = 700 Ω, relay circuit)
– Changeover of controller		U_e	+24 V with J13	0 V with J12	(R_i = 700 Ω, relay circuit)
– Reserve relay		U_e	+24 V with J13	0 V with J12	(R_i = 700 Ω, relay circuit)
Outputs					
– Regulated output voltage [1]		U_M	±15 V ±2 %, 150 mA		
– Valve current		I_{max}	±60 mA / ±100 mA		
– Valve current command value (with J10)		U_a	−10 V ≙ +60 mA / +100 mA (measurement output)		
– Relay call-up voltage		U	+24 V (+U_O)		
Dither signal		f	340 Hz ±5 % (I_{SS} = 3 mA)		
Relay data					
– Nominal voltage		U	+26 V		
– Response voltage		U	>13 V		
– Release voltage		U	1.3 V to 6.5 V		
– Switching time		t	<4 ms		
– Coil resistance (at 25 °C)		R	700 Ω		
Type of connection			32-pin male connector, DIN 41612, form D		
Card dimensions			Euro-card 100 x 160 mm, DIN 41494		
Front panel dimensions					
– Height			3 HE (128.4 mm)		
– Width soldering side			1 TE (5.08 mm)		
– Width component side			7 TE		
Permissible ambient temperature range		ϑ	0 to +50 °C		
Storage temperature range		ϑ	−20 to +70 °C		
Weight		m	0.2 kg		

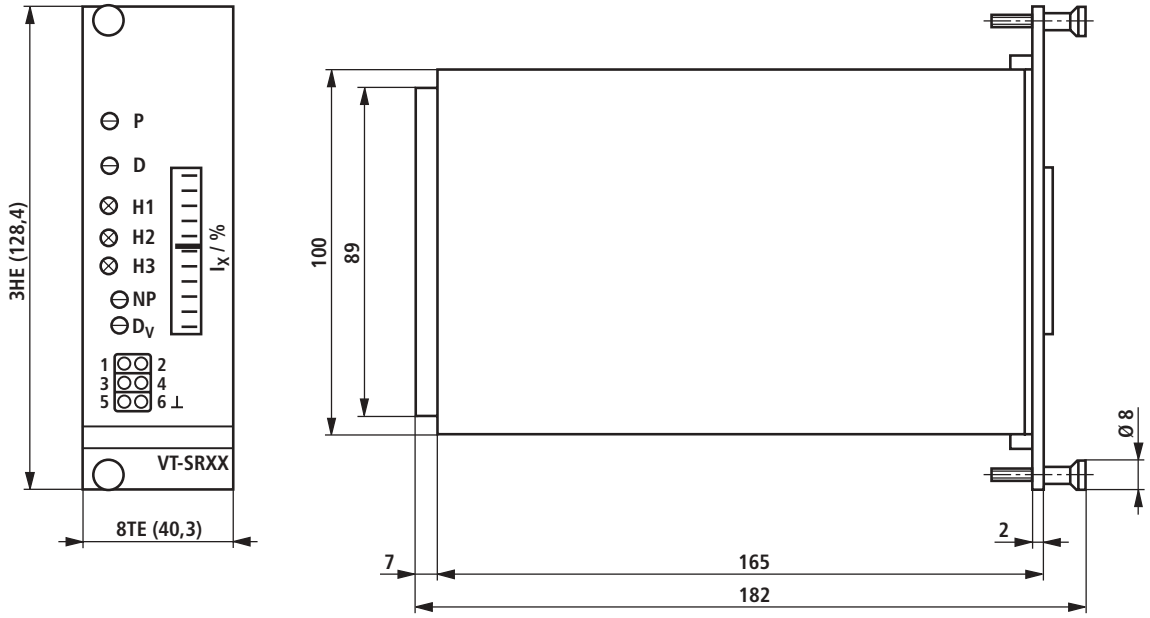
[1] Only for version **with** voltage regulator

Block circuit diagram / pin assignment



Unit dimensions

(Dimensions in mm)



Engineering / maintenance notes / supplementary information

- The amplifier may only be plugged or unplugged when disconnected from the power supply!
- Command values may only be switched via relays with gold-plated contacts (small voltages, small currents)!
- For switching card relays (enable, controller changeover, reserve) use only contacts with a load-carrying capacity of ca. 40 V, 50 mA.
- Always shield command value and actual value cables; leave one end of shield open and connect the card-sided end to the ground (⊥)!
- Do not lay signal cables near power cables!
- Recommendation: Also shield solenoid cables!
  For solenoid cable lengths up to 50 m, use cable type LiYCY 1.5 mm^2.
  For greater lengths, please consult us!