Analog amplifier

RE 30211/06.11 1/6
Replaces: 12.10

Type VT-SR11

Component series 1X

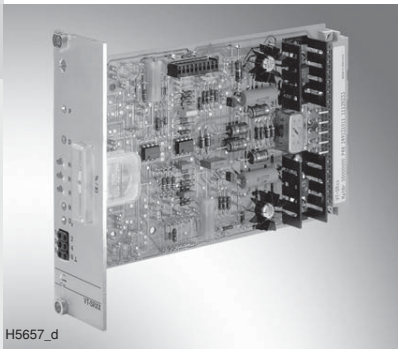
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Table of contents

Contents	Page
Features	1
Ordering code	2
Functional description	2
Block diagram/Pinout	3
Technical data	4
Unit dimensions	5
Project planning/Maintenance instructions/ Additional information	5

Features

- Suitable for actuation of control valves with servo-valve pilot control and electric position feedback (type 4WRD)
- Controller for valve flow, controller for main spool position
- Dither signal generator and push-pull output stage
- Oscillator/demodulator
- Release circuit with relay
- Measuring instrument fro display of servo valve flow
- Reverse polarity protection for the voltage supply

Optional extensions:

- PID controller [1] with controller change-over
- Relay with potential-free changeover contact (28 V/0.5 A)
- Voltage regulator ±15 V for supply of controller and position transducer electronics

[1] The D share of the controller only affects the actual value (velocity feedback).

Ordering code

**VT-SR11 –1X / / / *

Amplifier for type 4WRD control valves, component series 5X, with servo valve pilot control and electric position feedback

Component series 10 to 19 (10 to 19: unchanged technical data and pinout) **= 1X**

Without voltage regulator ±15V **= 0**

With voltage regulator ±15V **= 1**

Further details in the plain text [1)]

Type designation of the valve e.g. 4WRD10-5X

No code = Standard

V002 = For 4WRD...XN valves

[1)] E.g. with/without PID controller, with/without backup relay K3
The controller characteristics for the additional PID controller need to be specified.

Accessories

Card holder

– Type VT 3002-2X/32, see data sheet 29928 single card holder without mains adapter

Functional description

The amplifier VT-SR11 operates with a push-pull output stage with bipolar transistors. The output of this output stage can be connected or disconnected by means of a release circuit (relay K2). The release is indicated by the LED "H2" on the front panel being illuminated. The switching voltage of all relays is defined by means of the jumpers J12 and J13 to either 0 V or $+U_B$ (factory setting $+U_B$).

The output level consists of an I controller with connected dither signal generator. The amplitude of the dither signal is set by means of R7. The actuation of the pre-stage (current command value) is made via a PD controller. The current actual value returned is at the same time displayed by the instrument on the front panel.

The oscillator/demodulator serves for sensing of the spool position. It is designed as pluggable board the parameters of which are adapted to the respective valve type.

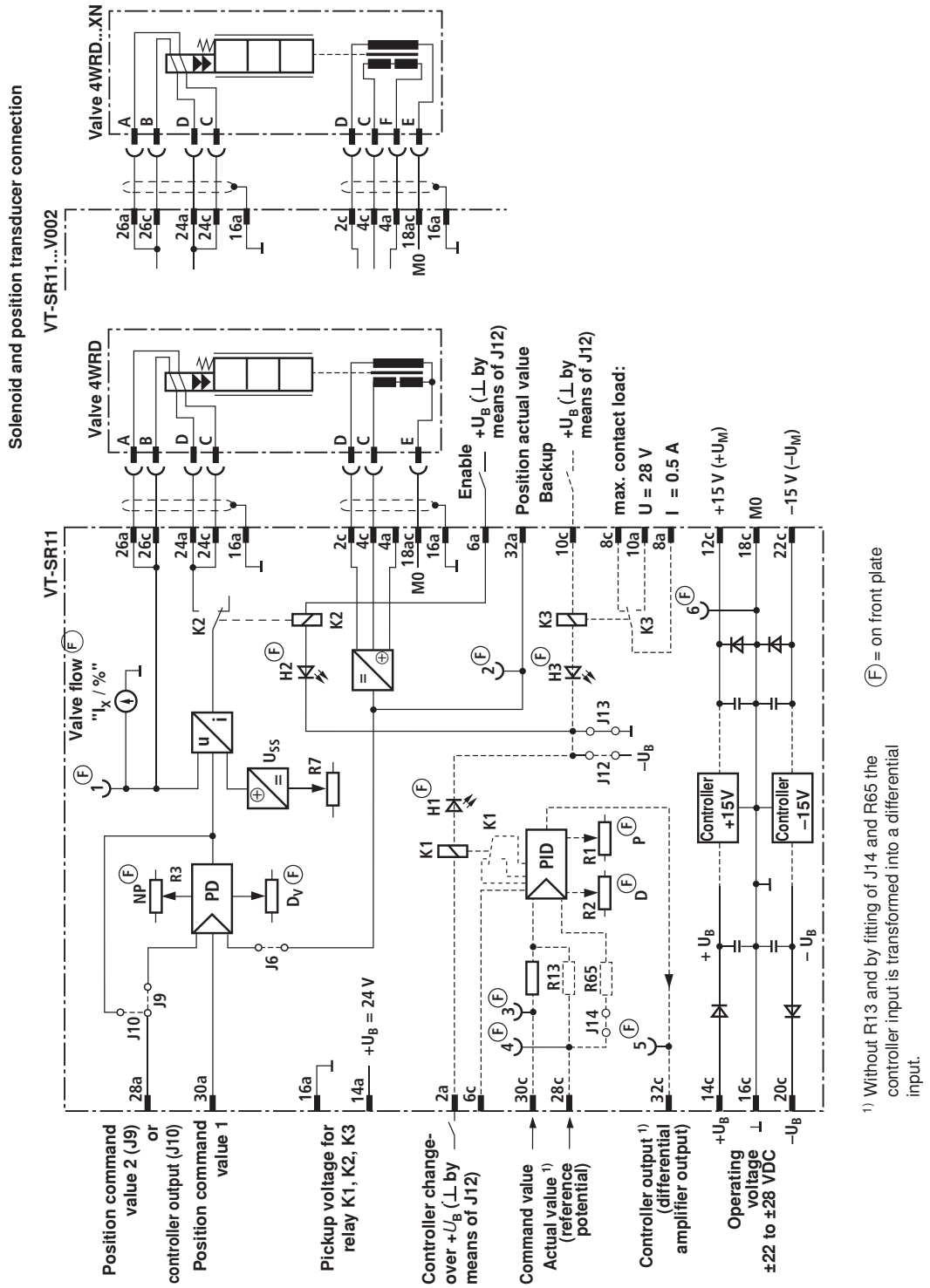
The PD controller is supplied the position command value and the position actual value with the D share of the controller **only** affecting the actual value (velocity feedback).

The zero point can be set via R3 ("NP") from the front panel.

The required symmetric operating voltage $\pm U_B$ is protected against reverse polarity. If the board does not have any voltage regulators for supply of the controller and position transducer electronics, an additional stabilized auxiliary voltage $\pm U_M$ has to be provided. The auxiliary voltage port is protected against reverse polarity up to a maximum current of 1 A.

As an option, the amplifier can be equipped with a PID controller (D share **only** affects the actual value) with selectable PI share and a backup relay with potential-free changeover contact. This controller can be used to superimpose a further control circuit (e.g. for drive control). The P and D share can be set at the front panel. The controller switching status is indicated by the LED "H1", the relay at LED "H3" (LEDs illuminated if relays are applied). The PID controller fitting is customer specific and therefore has to specified in the order in the plain text. These amplifiers receive a special type designation upon delivery. The backup relay is loadable up to 28 V and 0.5 A.

Block diagram/Pinout

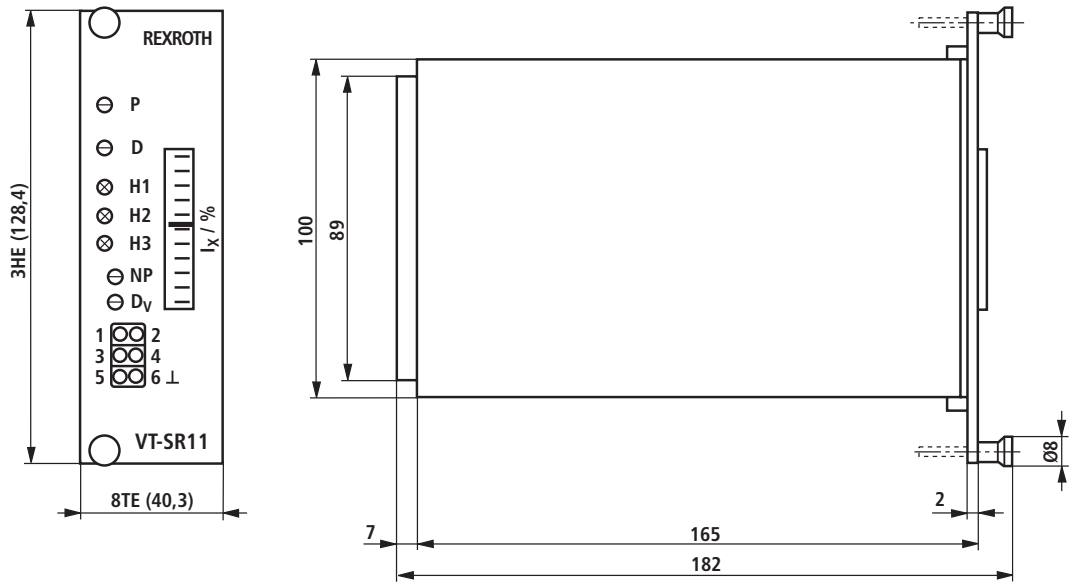


Technical Data (For applications outside these parameters, please consult us!)

Operating voltages		
with voltage regulator	U_B	±24 VDC
upper limit value	$u_B(t)_{max}$	±28 VDC
lower limit value	$u_B(t)_{min}$	±22 VDC
without voltage regulator	U_B; U_M	±24 VDC; ±15.0 VDC
upper limit values	$u_B(t)_{max}$; $u_M(t)_{max}$	±28 VDC; ±15.2 VDC
lower limit values	$u_B(t)_{min}$; $u_M(t)_{min}$	±22 VDC; ±14.8 VDC
Current consumption (without valve) for U_B= ±24 V [1]	I	< 150 mA
Inputs		
Command value 1 (main spool position)	U_e	0 to ±10 V (R_e = 50 kΩ)
Command value 2 (main spool position) by means of J9	U_e	0 to ±10 V (R_e = 50 kΩ)
Actual value (main spool position)	U_e	0 to ±10V (R_e = 50 kΩ)
Enable	U_e	+24 V with J13; 0 V with J12 (R_e = 700 Ω; relay circuit)
Controller change-over	U_e	+24 V with J13; 0 V with J12 (R_e = 700 Ω; relay circuit)
Backup relay	U_e	+24 V with J13; 0 V with J12 (R_e = 700 Ω; relay circuit)
Outputs		
controlled output voltage [1]	U_M	±15 V ±2 %; 150 mA
Valve flow	I_{max}	±60 mA
Valve flow command value (by means of J10)	U_a	–10 V ≙ +100 mA (measuring output)
Relay pickup voltage	U	+24 V (+U_B)
Dither signal	f	470 Hz ±5 %
Oscillator frequency	f	5 kHz
Relay data		
Nominal voltage	U	+26 V
Response voltage	U	> 13 V
Step-back voltage	U	1.3 V to 6.5 V
Switching time	t	< 4 ms
Coil resistance (for 25°C)	R	700 Ω
Contact load	A	0.5
Type of connection		32-pole male multipoint connector, DIN 41612, design D
Card dimensions		Euro board 100 x 160 mm; DIN 41494
Front plate dimensions		
Height		3 HE (128.4mm)
Broad soldering side		1TE (5.08mm)
Broad component side		7 TE
admissible ambient temperature range	ϑ	0 to +50 °C
Storage temperature range	ϑ	–20 to +70 °C
Weight	m	0.3 kg

[1] For design **with** voltage regulator

Unit dimensions



Project Planning/Maintenance Instructions/Additional Information

- The amplifier card may only be unplugged and plugged when de-energized!
- Command values may only be switched via relays with gold contacts (low voltage, low currents)!
- Card relays may only be switched (enable, controller change-over, reserve) using contacts with a load capacity of approx. 40 V; 50 mA.
- Always shield command and actual value lines; Connect shielding to ground (⊥) on the card-side, open at one side!
- Do not lay signal lines close to power cables!
- **Recommendation** 1. Do also shield solenoid lines (one-sided to ⊥)!
  2. Up to 50 m length, use cable type LiYCY 1.5 mm^2, for higher lengths please ask!

Note Electric signals taken out via control electronics (e.g. actual value) must not be used for switching of safety-relevant machine functions! (See also the European standard "Safety requirements for fluid power systems and their components - Hydraulics", EN 982.)

Note for V002 version

The project planning information in data sheet 29094-XN-B2 must be complied with.

Notes