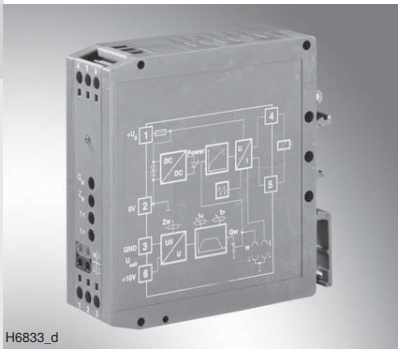
Analog amplifier module

RE 30224/12.10 1/6
Replaces: –.–

Type VT-MSPA1-30, VT-MSPA1-150

Component series 1X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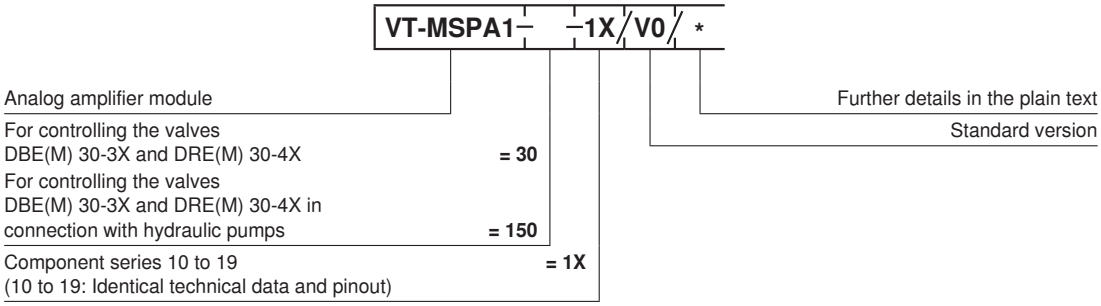
Features

- Suitable for controlling direct operated proportional pressure valves:
  - DBE(M) 30-3X
  - DRE(M) 30-4X
- Inverse-polarity protection of the operating voltage
- Differential input for command value voltage +10 V
- Ramp generator up and down can be set separately
- Zero point potentiometer
- 1 command value attenuator
- Characteristic curve generator
- Synchronized power output stage
- Output short-circuit-proof
- LED display: • Ready for operation (green)
- Measuring sockets for: • Pressure command value
  • Actual current value
- Dither generator with fixed frequency

Ordering code



Functional description

Analog amplifier for controlling pressure valves without electric return. The modular design allows for simple top hat rail assembly as is usual in control cabinets.

Command value input: 4

The module amplifier is controlled by means of a standard command value signal 0 to +10 V. By means of the zero point trimmer (Zw) (6), a zero point offset can be corrected.

Ramp generator: 5

In the ramp generator (5), the actuating variable rise is limited. Using the trimmer "t <" (7), the time for the increasing command value signal is set and using trimmer "t >" (8), the time for the decreasing command value voltage is set. The adjustable time is contained in the technical data.

Characteristic curve generator: 10

Using the trimmer "Gw" (9), the rated current for the solenoid is set. In the characteristic curve generator (10), the command value signal is changed so that a linear command value current characteristic curve results.

Clock generator: 12

In the clock generator (12), a fixed frequency for the output stage is generated.

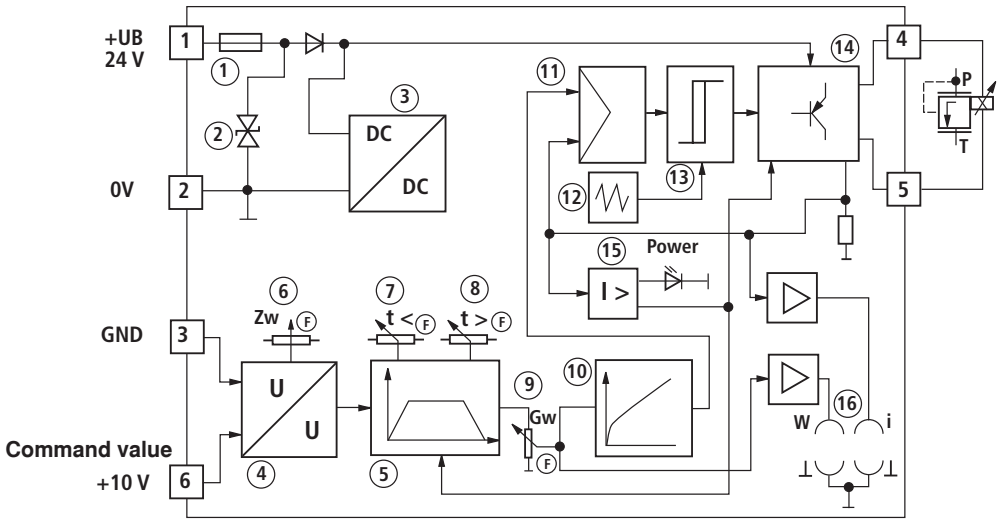
Power output stage: 11-14

Using the actuating variable coming from the characteristic curve generator (10) and the clock frequency, the power output stage generates a PWM signal that is fed into the solenoid. The solenoid current is recorded and in the current controller (11) compared with the actuating variable and the difference is compensated.

Fault recognition: 15

Monitors the solenoid lines with regard to cable break and short circuit as well as overcurrent of the output stage. If there is an error, the green Ready for operation display goes out.

Block diagram



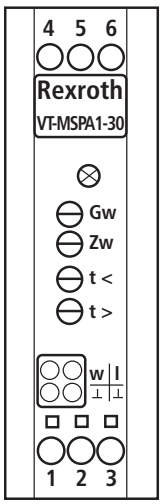
1	Fuse	**7**	Potentiometer ramp up	**13**	Schmitt trigger
2	Suppressor diode	**8**	Potentiometer ramp down	**14**	Output stage
3	Power supply	**9**	Potentiometer I_{max}	**15**	Fault recognition
4	Command value input	**10**	Characteristic curve generator	**16**	Measuring socket
5	Ramp generator	**11**	Current controller		
6	Potentiometer zero point	**12**	Clock generator	(F)	On front side

Terminal assignment / device view

Terminal assignment

Terminal	
1	$+U_B$
2	Ground
3	$-U_{command}$
4	Solenoid +
5	Solenoid –
6	$+U_{command}$

Device view



Potentiometer:
"Gw" Pressure command value
"Zw" Zero point
"t <" Ramp time up
"t >" Ramp time down

Sockets:
"w" Pressure command value
"I" Actual current value
"⊥" Measurement null

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

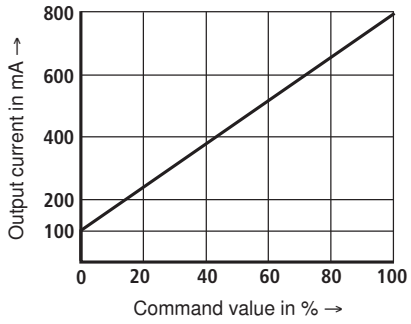
		VT-MSPA1-30	VT-MSPA1-150
Operating voltage	U_B	24 VDC +40 % –10 %	
Operating range:			
– Upper limit value	$u_B(t)_{max}$	35 V	
– Lower limit value	$u_B(t)_{min}$	21 V	
Power consumption	P_{max}	< 25 VA	
Current consumption	I_{max}	< 1 A	
Fuse	I_s	Electronic overload protection and SMD fuse (soldered in)	
Inputs			
– Command value (differential input)	$U_{command}$	0 to +10 V; R_e = 100 kΩ	
Outputs			
– Bias current (factory setting)	I_V	100 mA	200 mA
– Solenoid current / resistance	I_{max}	800 mA; R_{20} = 19.5 Ω	700 mA; R_{20} = 19.5 Ω
– Frequency	f	200 Hz	100 Hz ±10 %
Setting ranges			
GW: Solenoid current	I	100 mA…800 mA	200 mA…700 mA
ZW: Zero point		±25 %	±25 %
t >: / t <: Ramp	t	60 ms…5 s	60 ms…5 s
Measuring sockets			
– Command value "w"	U	0 to 10 V	
– Actual current value "I"	U	1 mV ≙ 1 mA solenoid current	
Type of connection		6 screw terminals	
Mounting type		Top hat rail TH 35-7.5 according to EN 60715	
Protection class according to EN 60529		IP 20	
Dimensions (W x H x D)		25 x 79 x 85.5 mm	
Admissible operating temperature range	ϑ	0 to +50 °C	
Storage temperature range	ϑ	–25 to +85 °C	
Weight	m	0.15 kg	

Important:

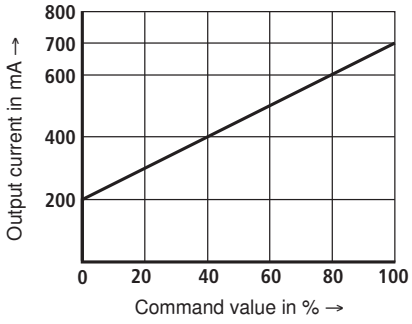
Information on the **environment simulation testing** for the areas EMC (electromagnetic compatibility), climate and mechanical load see 30223-U (declaration on environmental compatibility).

Output characteristic curve

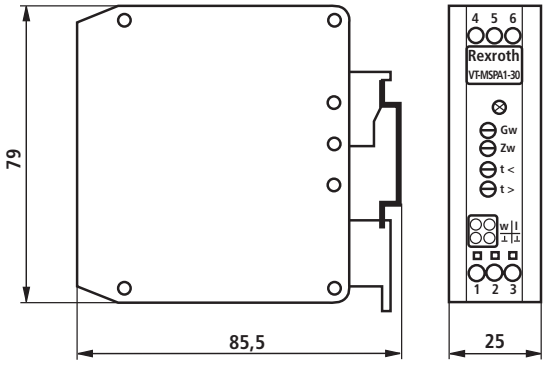
VT-MSPA1-30



VT-MSPA1-150



Unit dimensions (dimensions in mm)



Project planning / maintenance instructions / additional information

- The amplifier module may only be wired when de-energized!
- The distance to radios must be sufficient (>> 1 m)!
- Screen command value lines, do not lay them close to power cables, screen solenoid lines!
- Do not use **free-wheeling diodes** in the solenoid lines!
- With a strongly fluctuating operating voltage, it may in the individual case be necessary to use an external smoothing capacitor with a capacity of at least 2200 μF.

  Recommendation: Capacitor module VT 11110 (see RE 30750); sufficient for up to 3 amplifier modules.