

# Analog amplifier module

**RE 30218/04.12**  
 Replaces: 02.11

1/6

## Type VT 11118

Component Series 1X



HD20489\_d

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### Note:

When using VT 11118 as substitute for VT 11011, VT 11012, VT 11013, VT 11090 or VT 11114, observe the configuration and adjustment notes given in supplementary information 30218-Z.

## Features

- Suitable for controlling direct operated proportional directional valves (type 4WRA, Component Series 1X only), pilot operated proportional directional valves (type .WRZ, from Component Series 5X) and proportional pressure reducing valves (type 3DREP 6) without electrical position feedback
- Selection of the valve type by means of change-over switch at the front
- Differential input for command value voltage  $\pm 10$  V
- Enable inputs
- Polarity effect of command value voltage can be controlled via enable inputs
- Adjustable ramp generator
- 2 command value attenuators
- 2 output stages with fixed-frequency clocking
- DC/DC converter (L0 = M0)
- Reverse polarity protection for operating voltage
- Short-circuit-proof outputs
- LEDs: “power” – internal supply voltage (green)  
           “H1” – Enable logic mode 1 (yellow)  
           “H2” – Enable logic mode 2 (yellow)

## Ordering code

VT 11118 -1X/ \*

Amplifier module for direct operated proportional directional valves (type 4WRA, Component Series 1X only), pilot operated proportional directional valves (type .WRZ, from Component Series 5X) and proportional pressure reducing valves (type 3DREP 6)

Component Series 10 to 19  
(10 to 19: unchanged technical data and pin assignment)

= 6

Further Details in clear text

## Functional description

The amplifier module is to be snapped onto top hat rail according to EN 60715. The electrical connection is by means of screw terminals. The module is operated using 24 V DC. A power supply unit [1] provides internally required positive and negative supply voltages. As soon as the power supply unit is in operation, the green LED ("power") lights up.

One of the two solenoids ("a" or "b") of the valve is controlled by applying a command value voltage to the differential input and a positive enable voltage to one of the enable inputs. The solenoid current depends on the amount of the command value (see output characteristic curves) and on the position of the selector switch [13] for the valve type. Which of the two solenoids is controlled depends on the polarity of the command value and the activation of the enable inputs (see function table).

The solenoid current (actual value) is measured and compared with the externally provided command value; any differ-

ences caused e.g. by changes in temperature of the solenoid or changes in the supply voltage are corrected. Potentiometers "GW1" and "GW2" are used to set the maximum current of the solenoids and thus the maximum valve opening. Which of the potentiometers is activated by the enable inputs is indicated by the yellow LED. Potentiometer "S" (jump height) can be used to compensate for tolerances of valve overlap. However, care must be taken that the nominal voltage of the solenoids is not exceeded.

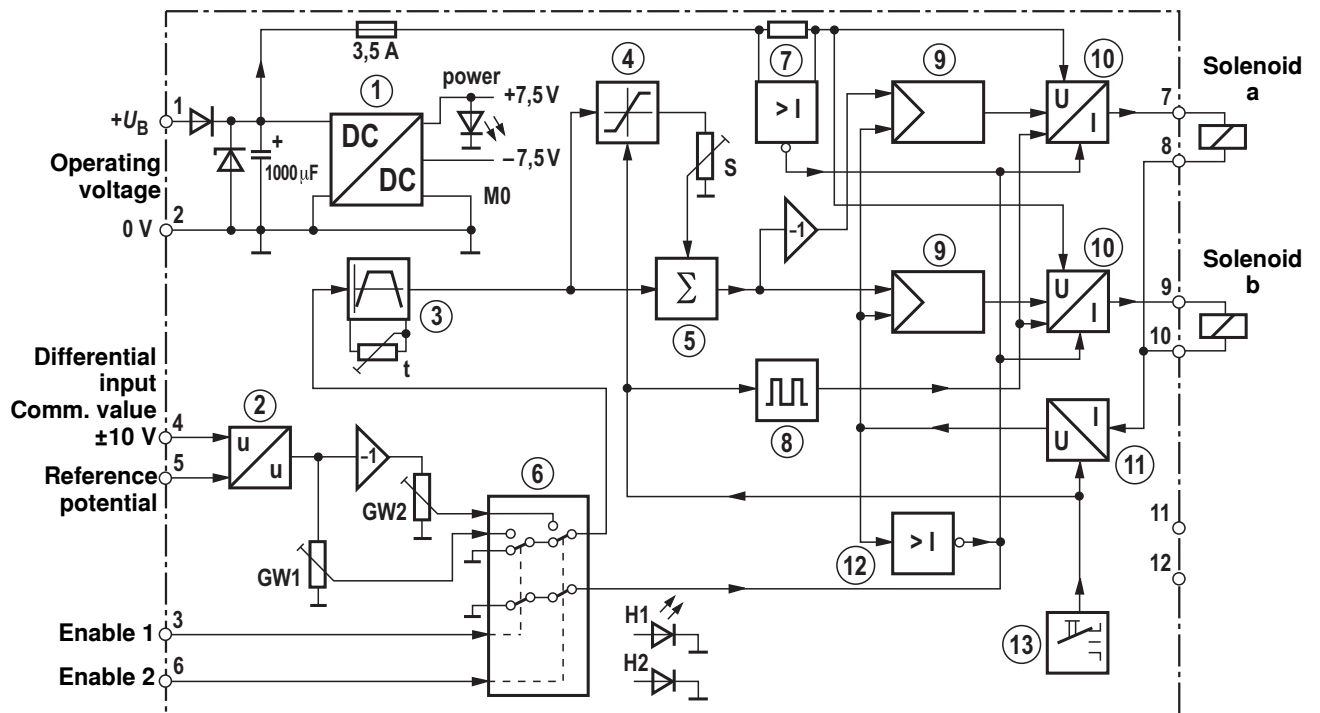
The amplifier module comprises a ramp generator [3]; the associated potentiometer "t" can be used to adjust the rise and fall time of the solenoid current.

The presettings for the valve type to be controlled can be selected at the front of the module.

### Function table of enable inputs and solenoid control

Enable inputs		Command value voltage $U_{Comm}$	Active solenoid	Active LED	Mode
Enable 1, $U_{F1}$ active	Enable 2, $U_{F1}$ active				
Yes	No	> 0 V < 0 V	b a	H1	1
No	Yes	> 0 V < 0 V	a b	H2	2
Yes	Yes	> 0 V < 0 V	a b	H2	2
No	No	> 0 V < 0 V	- -	-	-

## Block circuit diagram / Pin assignment



- |    |  |     |   |
|----|--|-----|---|
| 1  | Power supply                                     | 11  | Solenoid current measurement                |
| 2  | Differential amplifier                           | 12  | Overcurrent detector                        |
| 3  | Ramp generator                                   | 13  | Valve type selector switch                  |
| 4  | Step function generator                          | GW1 | Command value attenuator 1                  |
| 5  | Summator   | GW2 | Command value attenuator 2                  |
| 6  | Command value changeover and output stage enable | t   | Ramp time setting                           |
| 7  | Short-circuit detector                           | S   | Jump height at $U_{Comm} = \pm 10\text{ V}$ |
| 8  | Clock-pulse generator                            | H1  | Enable logic mode 1                         |
| 9  | Current regulator                                | H2  | Enable logic mode 2                         |
| 10 | Output stage                                     |     |   |

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

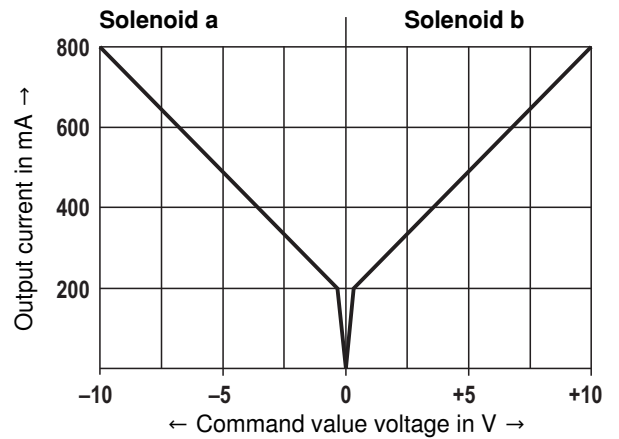
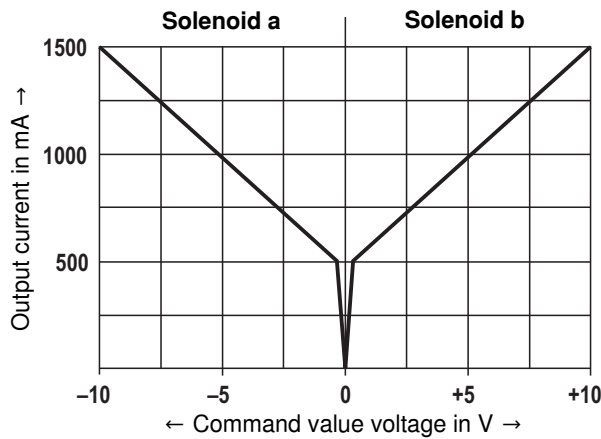
Operating voltage	$U_O$	24 VDC + 40% (- 10%)
Operating range		
Upper limit value	$u_O(t)_{\max}$	35 V
Lower limit value		
for 4WRA (Component Series 1X), .WRZ (Component Series 7X), 3DREP 6, (Component Series 2X)	$u_O(t)_{\min}$	21 V
for .WRZ (Component Series 5X and 6X) and 3DREP 6 (Component Series 1X)	$u_O(t)_{\min}$	24 V
Power consumption	$P_S$	approx. 30 VA
Current consumption	$I$	< 1,3 A
Fuse	$I_S$	3,5 A F (soldered in)
Inputs		
Command value (differential input)	$U_{Soll}$	0 to $\pm 10$ V; $R_e > 50$ k $\Omega$
Enable		
active	$U_{F1}; U_{F2}$	$10$ V < $U_F$ < $35$ V; $R_i > 3$ k $\Omega$
not active	$U_{F1}; U_{F2}$	< $8$ V
Adjustment ranges		
Jump height		0 to approx. 50 % of $I_{\max}$
Ramp time		approx. 50 ms to approx. 5 s
Outputs		
Solenoid current/resistance		
for 4WRA 6 (Component Series 1X)	$I_{\max}$	1,75 A; $R_{(20)} = 5,4$ $\Omega$
for 4WRA 10 (Component Series 1X)	$I_{\max}$	1,75 A; $R_{(20)} = 10$ $\Omega$
for .WRZ (Component Series 5X and 6X) and 3DREP 6 (Component Series 1X)	$I_{\max}$	1 A; $R_{(20)} = 19,5$ $\Omega$
for .WRZ (Component Series 7X) and 3DREP 6 (Component Series 2X)	$I_{\max}$	1,75 A; $R_{(20)} = 4,8$ $\Omega$
Clock-pulse frequency of the output stage		
for 4WRA 6 (Component Series 1X), .WRZ (Component Series 5X to 7X), 3DREP 6 (Component Series 2X)	$f$	175 Hz $\pm$ 10 %
for 4WRA 10 (Component Series 1X) and 3DREP 6 (Component Series 1X)	$f$	100 Hz $\pm$ 10 %
Type of connection		12 screw terminals
Type of mounting		Top hat rail TH 35-7.5 to EN 60715
Type of protection to EN 60529		IP 20
Dimensions (W x H x D)		40 x 79 x 85,5 mm
Operating temperature range	$\vartheta$	0 to +50 °C
Storage temperature range	$\vartheta$	- 25 to +85 °C
Weight	$m$	0,14 kg

**Output characteristic curves** (valid at enable voltage  $U_{F1} > 10\text{ V}$ )

- Switch position 1 for valves**  
 – 4WRA 6 (Component Series 1X),  
 – .WRZ (Component Series 7X)  
 – 3DREP 6 (Component Series 2X)

- Switch position 2 for valves**  
 – 4WRA10 (Component Series 1X)

- Switch position 3 for valves**  
 – .WRZ (Component Series 5X und 6X)  
 – 3DREP 6 (Component Series 1X)

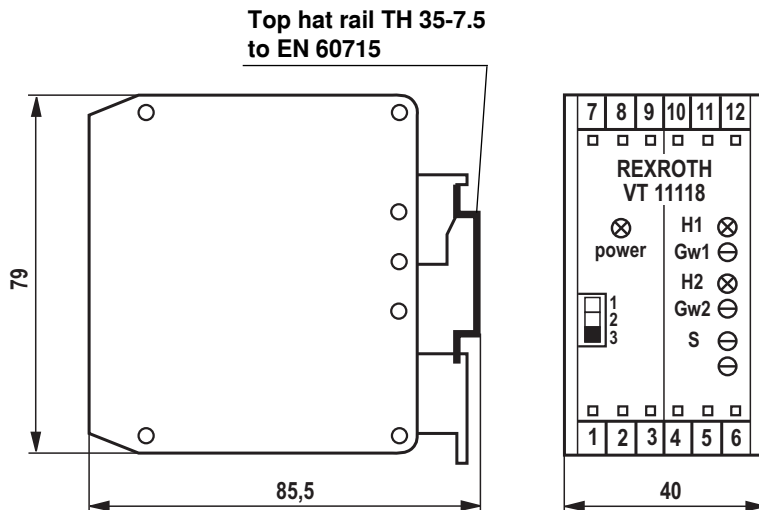


**Terminal assignment**

Operating voltage	$+U_O$	<b>1</b>	<b>7</b>	Solenoid a
	0 V	<b>2</b>	<b>8</b>	
Enable 1	$+U_{F1}$	<b>3</b>	<b>9</b>	Solenoid b
Differential input	$\pm U_{Comm}$	<b>4</b>	<b>10</b>	
	Reference-potential	<b>5</b>	<b>11</b>	
Enable 2	$+U_{F2}$	<b>6</b>	<b>12</b>	

<sup>1)</sup> These terminals must not be used!

## Unit dimensions (Dimensions in mm)



### Potentiometer:

Gw1	$I_{\max}$ at Mode 1
Gw2	$I_{\max}$ at Mode 2
S	jump height
t	ramp time

### LED-lamps:

power	operating voltage ON
H1	Enable logic mode 1
H2	Enable logic mode 2

### Switch positions:

- 1 for valves 4WRA6 (Component Series 1X), .WRZ (Component Series 7X) and 3DREP 6 (Component Series 2X)
- 2 for valves 4WRA10 (Component Series 1X)
- 3 for valves .WRZ (Component Series 5X and 6X) and 3DREP 6 (Component Series 1X)

## Engineering / maintenance notes / supplementary information

- The amplifier module may only be wired when disconnected from the power supply.
- Ensure a sufficient distance to radio sources ( $\gg 1$  m).
- Shield solenoid cables, never lay solenoid cables near power cables; shield solenoid cables in pairs.
- Do not use free-wheeling diodes in solenoid cables.
- In the case of heavy fluctuations in the operating voltage, it may be required to use an external smoothing capacitor having a capacitance of at least 2200  $\mu\text{F}$ .  
Recommended: Capacitor module VT 11110 (see data sheet 30750); sufficient for up to 3 amplifier modules

## Notes

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