Proportional valve amplifier AMP08

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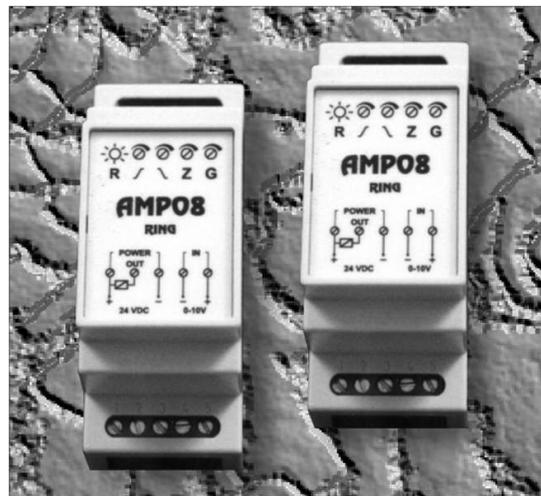
AMP08 is amplifier for control of hydraulic proportional valves with one solenoid without feedback for the position of valve spool. By using of microprocessor the current is adjusted proportional to the input reference.

Output voltage is pulsed at a frequency of 200 Hz, as a duty cycle depends on the input reference. The output current (current through the valve) is measured and regulated by changing the duty cycle of the output voltage. The output control element of the AMP08 is protected against short circuit and overheating.

There are four trimmers:

- duration of the leading edge - sets the rise time of the current from zero to assignment with increasing the input signal;

- duration of the trailing edge - sets the time to reduce the current from the assignment to 0 upon dropping the input signal.

These two trimmers allow smooth achievement of task, which reduces shock and vibration in the final mechanical system. The change range of fronts is from 60ms to 5s. Factory setting is set to minimum.

- null adjustment - sets current at minimum input reference. The regulation is from 10% to 50% of rated output current.

- gain adjustment - sets current at maximum input reference. The regulating area is from 0.5 to 1.

These two trimmers allow combining the characteristic of the amplifier with that of the valve. The output of the amplifier is given by:

$y = G.x + Z$, where

y is the output as a percentage;

x - input reference as a percentage;

G - reference of trimmer for gain

Z - reference of trimmer for zero

There is an LED showing the current value of trimmer, which is set at the moment.

The input signal is an analog between 0 and 10 VDC. The assignment is filtered digitally.

AMP08 can be used to control valves with power up to 60W. The device is mounted on DIN rail.

Technical specifications

Power supply	10..30 VDC 10..21 VAC rectified with peaks 2 VACmax
Output current	2,5 A max
Reference	0 … +10 VDC
Input impedance	20 кОм
Cable to valve	1,5 mm^2 20 m max
Ramp time	0.06 ... 5 s
Zero adjust	from 10% to 50%
Gain adjust	from 0.5 to 1
Output voltage	PWM 200 Hz
Control algorithm	integral
Dimensions (w x h x d)	34 x 86 x 58 mm
DIN rail	35 mm
Working temperature	0 ℃ … +50℃
Storage temperature	min. −20 ℃; max. +70 ℃

Wiring diagram and pin assignment
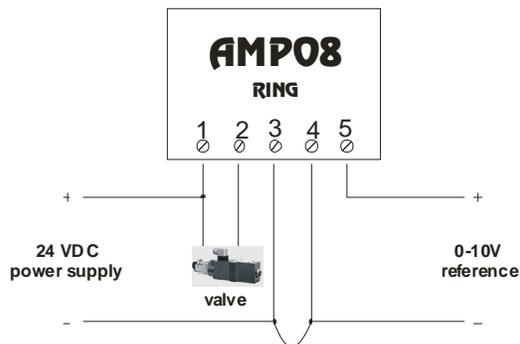
Trimmer's adjustment

In most cases there is no need to adjust the trimmers. When necessary, adjustments must be made in the following sequence (the example is for pressure valve):

1. To the input is fed 0.3 V. With trimmer zero (denoted by Z) is set outlet pressure of the valve to be on the required minimum.

2. Submitted 10 V reference. With trimmer gain (denoted by G) adjusts the valve outlet pressure to a maximum value.

3. Adjust the speed of rise (with trimmer marked ⌐) and the rate of decline (with trimmer marked ⌐) of the output signal. Time is measured by entrance to input a single pulse (transition from 0 to 10 V).