

# PVA - 1.6

## Proportional Valve Power Amplifier

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### 1. Introduction

The amplifier PVA – 1.6 provides an appropriate tool in order to control proportional valves for hydraulic systems with a nominal current up to 3 A. The plastic housing allows a straightforward installation onto mounting rails of type DIN 46277/1 and DIN 462277/3. Furthermore, the screwing terminals, arranged at the side walls of the housing, allow easy wiring without additional socket. The supply voltage  $V_s$  ranges from 12 to 36 VDC and the control inputs are available in voltage or current configuration. Using the internal 10 VDC reference voltage  $V_{ref}$  for the generation of the control signals  $V_c$  allows an easy realisation of a complete control system with only a few external elements (Figure 5 and 6). The power output stage can be switched on or off using the enable input. Moreover, an integrated slope function restricts the change in output current  $I_o$  per time. The up- and down slopes  $S$  are individually adjustable and variable in a wide range using 2 exponential potentiometers. A dither signal is superposed onto the output current  $I_o$ . Its frequency  $\nu$  as well the other parameters can be adjusted by potentiometers accessible from the front cover. Figure 4 displays a block diagram of the PVA – 1.6 amplifier.



Figure 1: Front view of PVA – 1.6

## 2. Electrical and Mechanical Data

### 2.1. Electrical data and terminal assignment

Table 1: Electrical Data



Description	Value
Power supply $V_s$	12 – 36 VDC
Reference voltage $V_{ref}$	+ 10 V
Control signals $V_c$ <sup>1)</sup>	0 – 10 VDC <sup>2)</sup>
	0 – 20 mA
	4 -20 mA
Maximal output current $I_{max}$	$\leq 3$ A
Enable input	$U_E < 1$ V $\rightarrow$ current off
	$U_E > 4$ V $\rightarrow$ current on
Dither frequency $\nu$	100 – 500 Hz
Minimale output current $I_{min}$	0 ... 500 mA
Output current as a function of $V_c$	$I = I_{min} + \left( 60 \frac{mA}{V} \dots 180 \frac{mA}{V} \right) V_c$
Slope function $S = \frac{I_{max} - I_{min}}{\Delta t}$	$80 \frac{mA}{s} \dots 16 \frac{A}{s}$

<sup>1)</sup> The control inputs are available in the indicated configurations

<sup>2)</sup> Differential input

Table 2: Terminal Assignment

Description	Terminal
+ $V_s$	D
GND (power)	F
+ 10 V	K
GND (signal)	M
Ground	E
Enable	J
+ $V_c$	H
- $V_c$	G
+ Output	C
- Output	A

The terminal assignment is schematically displayed in Figure 4.

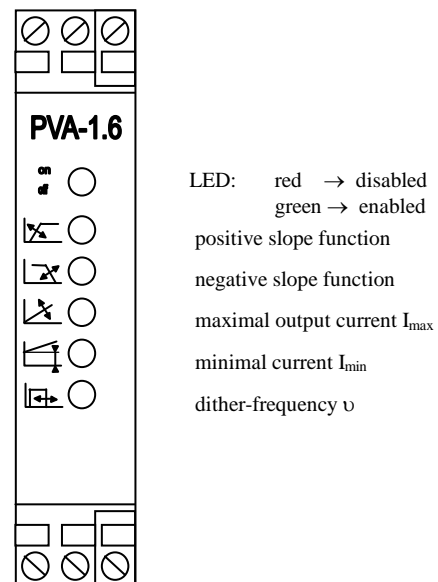
### 2.2. Front cover

The provided aluminium front cover contains an oil-resistant silk screen printing. The parameters are adjustable with the potentiometers accessible from the front side of the module using a suitable screw driver. While the output stage is enabled the LED mounted in the front cover lights up green otherwise red-coloured. Figure 2 shows a drawing of the front cover.

### 2.3. Parameters

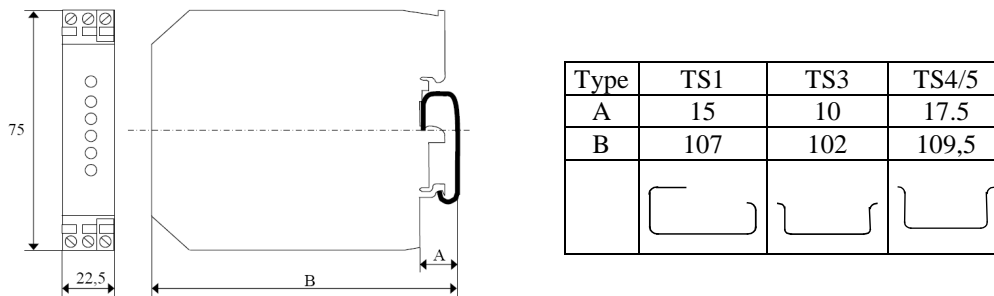
The adjustable parameters are listed below.

- positive/negative slope  $S$  of the current limiting function
- maximal/minimal output current  $I_o$
- dither-frequency  $\nu$



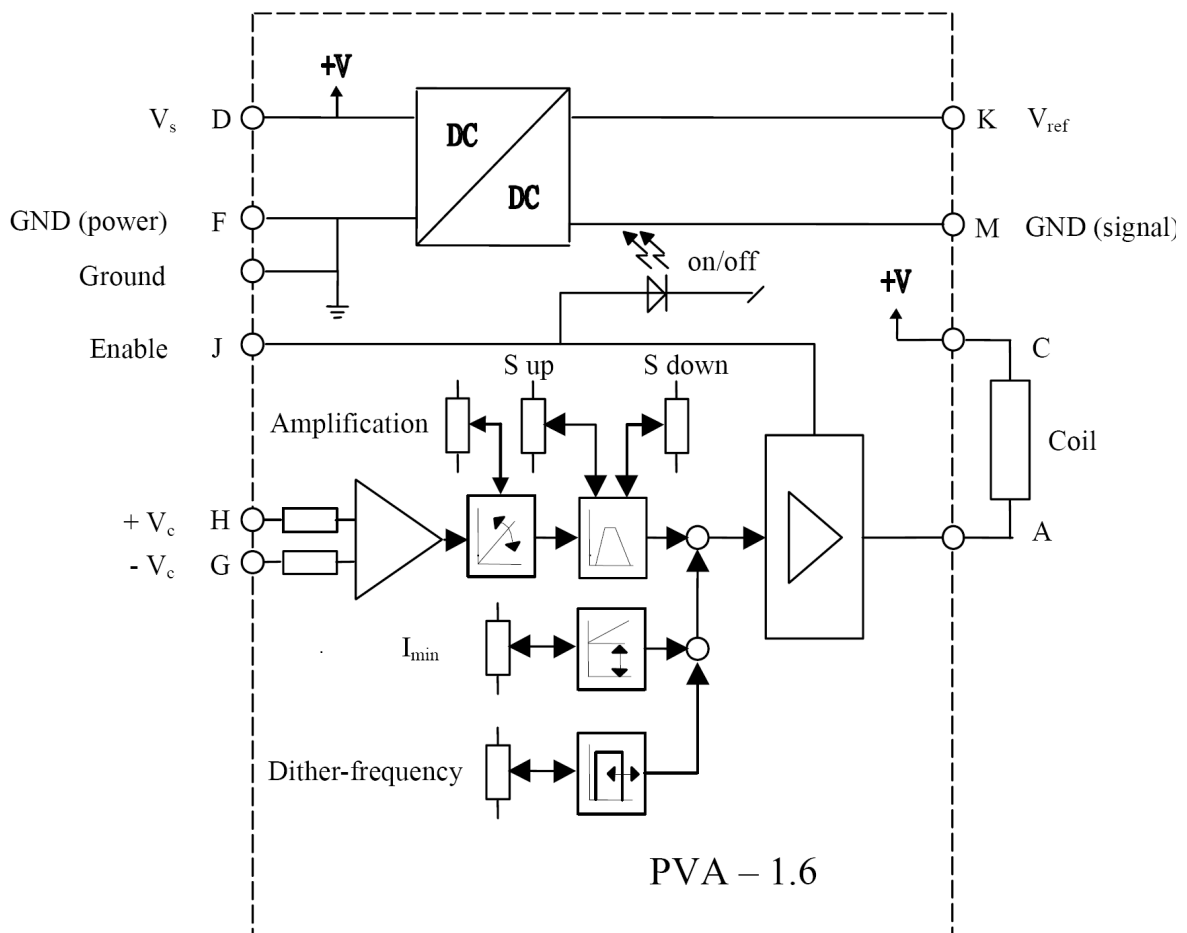
**Figure 2:** PVA – 1.6 schematic front view showing red/green coloured LED and potentiometer arrangement.

## 2.4. Mechanical dimensions



**Figure 3:** Mechanical dimensions. The module can be directly mounted onto different mounting rails corresponding to DIN 46277/1 and DIN 46277/3.

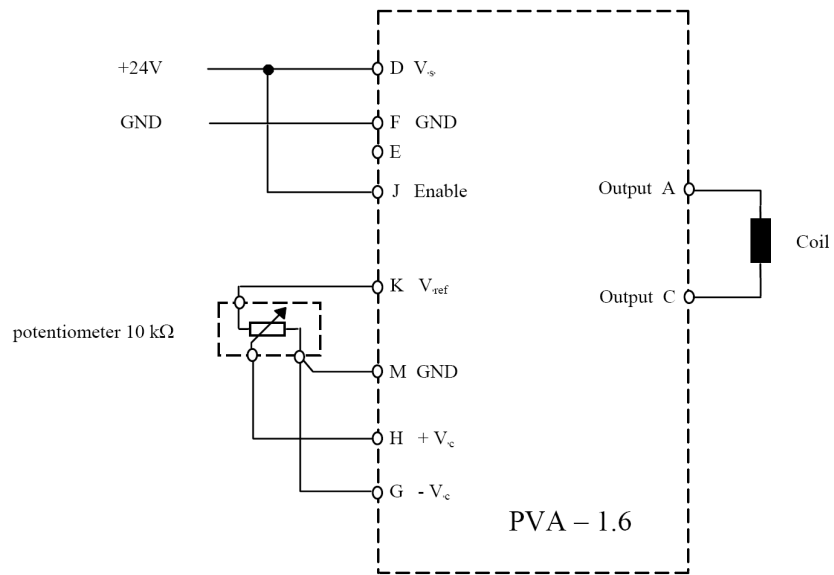
## 3. Block-Diagram



**Figure 4:** Block-diagram of PVA – 1.6 amplifier unit

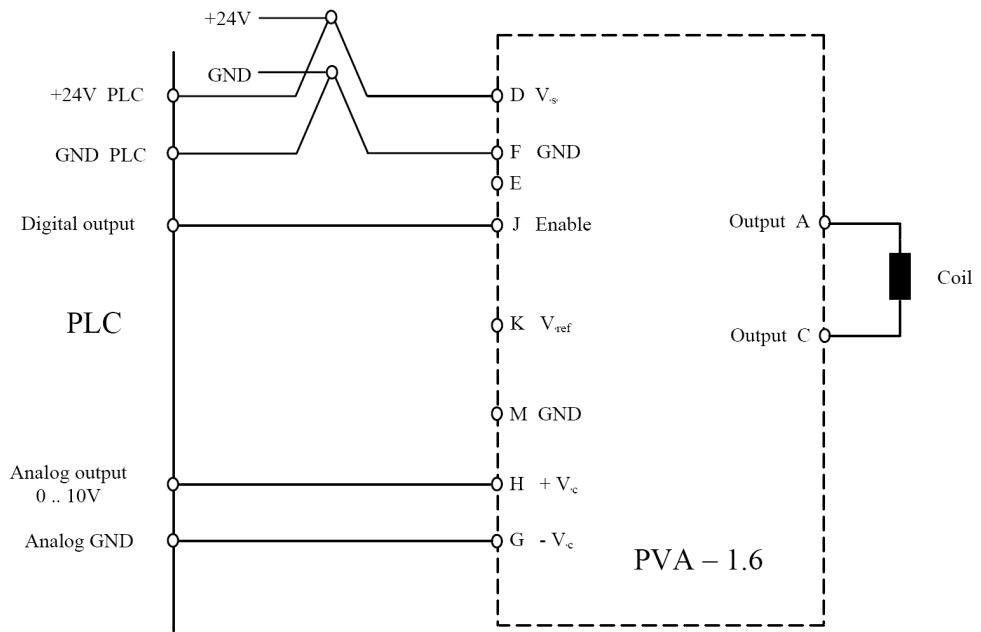
## 4. Typical Applications

a) Using the internal reference voltage  $V_{ref}$



**Figure 5:** Example using internal 10 V reference voltage

b) Using a programmable logic controller (PLC)



**Figure 6:** Example using programmable logic controller (PLC)