ETB
Sensortechnik GmbH

ESV - 24

Servo-Valve Controller

1. Summary

The servo-valve controller ESV – 24 provides an entire driver unit adapted for controlling servo-valves with nominal currents up to 100 mA. A snap-fit suitable for DIN 46277/1 or DIN 46277/3 mounting rails, allowing easy installation, is included in the plastic housing. As the electrical terminals are arranged at the side-walls of the unit the contact wires can directly be screwed onto the housing and, therefore, no additional clamps are required.
The adjustment of the following parameters can be carried out using the potentiometers accessible through the front-panel (Figure 1): amplification v, offset-current I_{offset}, step-function (lower current limit $I_{min,}$ see figure 3), dither-amplitude A_D, and dither-frequency υ_D. The output-current I_O can be controlled applying a voltage V_s ranging from -10 V to +10 V, thus, allowing full two quadrant operation (Figure 3). The upper limit of I_O is restricted to a value of ± 110 mA. Additionally, using the enable input the output-current I_O can directly be switched on and off. The supply-voltage V_p lies in the range from 18 to 36 VDC. Moreover, the internally generated reference voltages V_{ref} -10 and +10 VDC are externally available in order to realise an entire set-up using only a few additional components. Using the voltage signal V_m provided by the control-unit the output current I_O can directly be measured at the corresponding terminal.

Figure 1: Front-view of the ESV – 24 servo-valve controller.

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2. Electrical and mechanical specifications

2.1. Electrical data and terminal assignment

Electrical data and terminal assignment are specified in tables 1 and 2, respectively. Additionally, the terminal assignment is schematically depicted in the block diagram (Figure 5).

Table 1: Electrical Data

Description	Value
Power Supply V_P	18 – 36 VDC
Maximal power consumption	4 W
Control voltage V_s	-10 ... 10 VDC
Output current I_O	-110 ... 110 mA
Enable V_e	$V_e <$ 11 V $\rightarrow$ I_O off $V_e >$ 11 V $\rightarrow$ I_O on
Dither-frequency υ	0.5 – 2 kHz
Step-function I_{min}	0 ... 10 mA
Amplification v	$v = 1...15 \frac{mA}{V}$
Dither amplitude A_D	0 ... 20 mA
Current measuring signal V_m	$I_{Out} = V_m * 1\frac{A}{V}$

Table 2: Terminal assignment

Description	Value
$+V_p$	M
Ground	L
+ 10 V	B
- 10 V	F
Enable	J
+ Control voltage V_s	G
- Control voltage V_s	H
+ Output	A
- Output	C
Test terminal $+V_m$	E
Test terminal $-V_m$	D

2.2.Front panel

The aluminium front panel garnished with an oil resistant silkscreen printing is glued onto the plastic housing. Furthermore, the potentiometers for parameter adjustments are accessible from the front panel, therefore, the parameters can easily be adjusted using a suitable screwdriver. The 5 following parameters can be adjusted:

- Amplification v
- Dither amplitude A_D
- Dither frequency υ
- Offset-current I_{offset}
- Step-function I_{min}

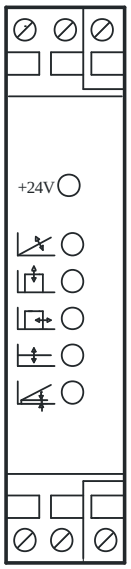


Figure 2: Front view with parameter adjustments

2.3. Step-function

Possible retardations due to a delayed response of the valve at zero-crossing of the control voltage V_s can be compensated using the adjustable step-function. Figure 3 shows the output-current I_O as a function of the control voltage V_s.

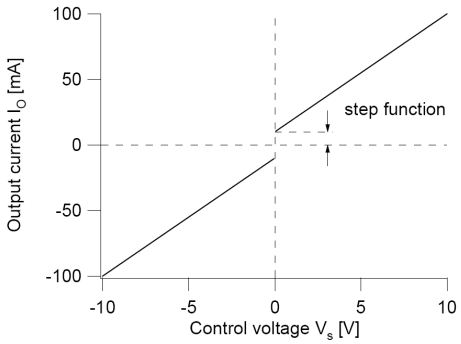
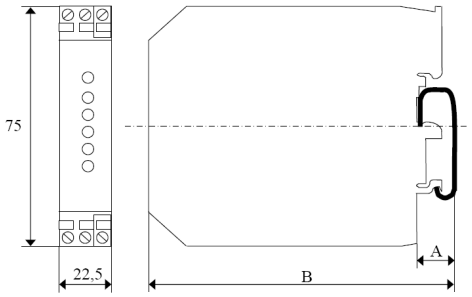


Figure 3: The output current I_O jumps to the corresponding adjustable value I_{min} at zero-crossing of the control voltage V_s.

2.4. Mechanical dimensions



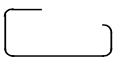
Typ	TS1	TS3	TS4/5
A	15	10	17.5
B	107	102	109,5
			

Figure 4: Mechanical dimensions of the plastic housing. The controller-unit contains snap-fits suitable for mounting rails of type DIN 46277/1 and DIN 462277/3.

3. Block diagram

Mode of operation and terminal assignments are schematically depicted in the block diagram figure 5.

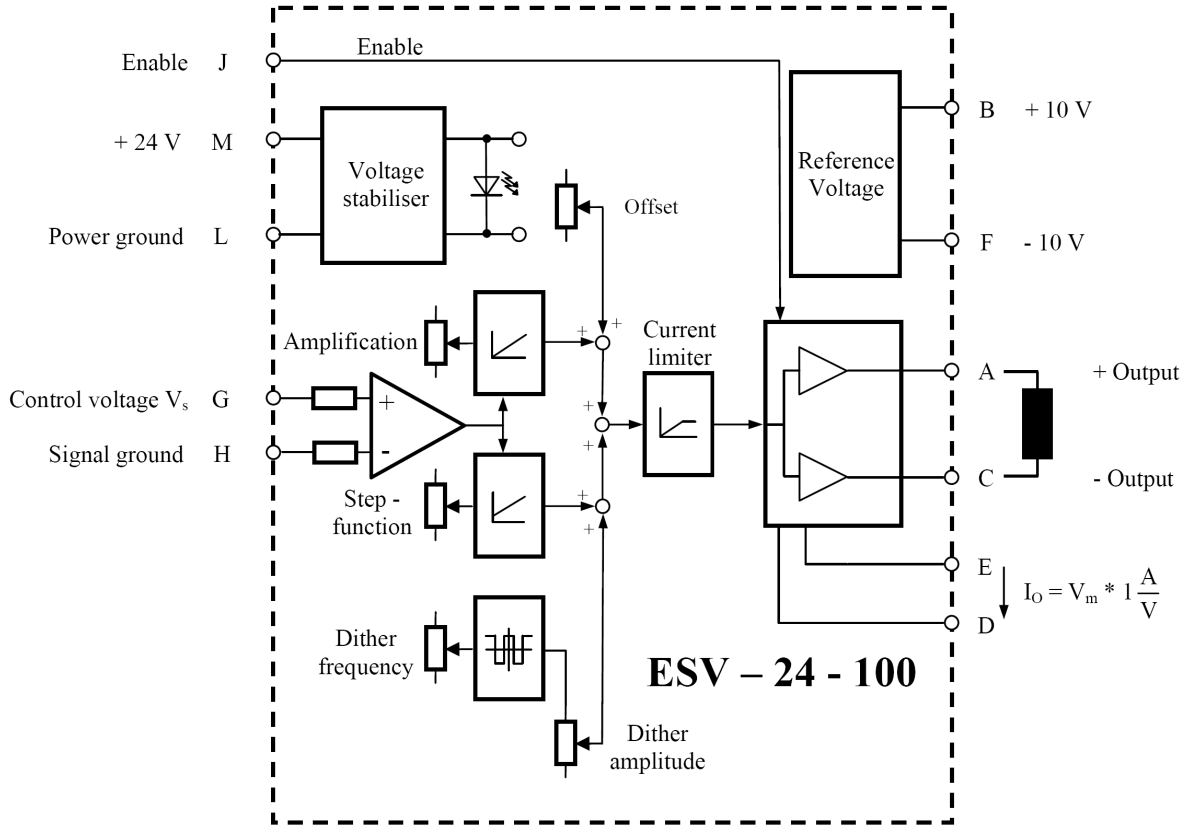


Figure 5: Block diagram of the ESV - 24 controller unit

4. Typical Applications

a) Using the internal reference voltages V_{ref}

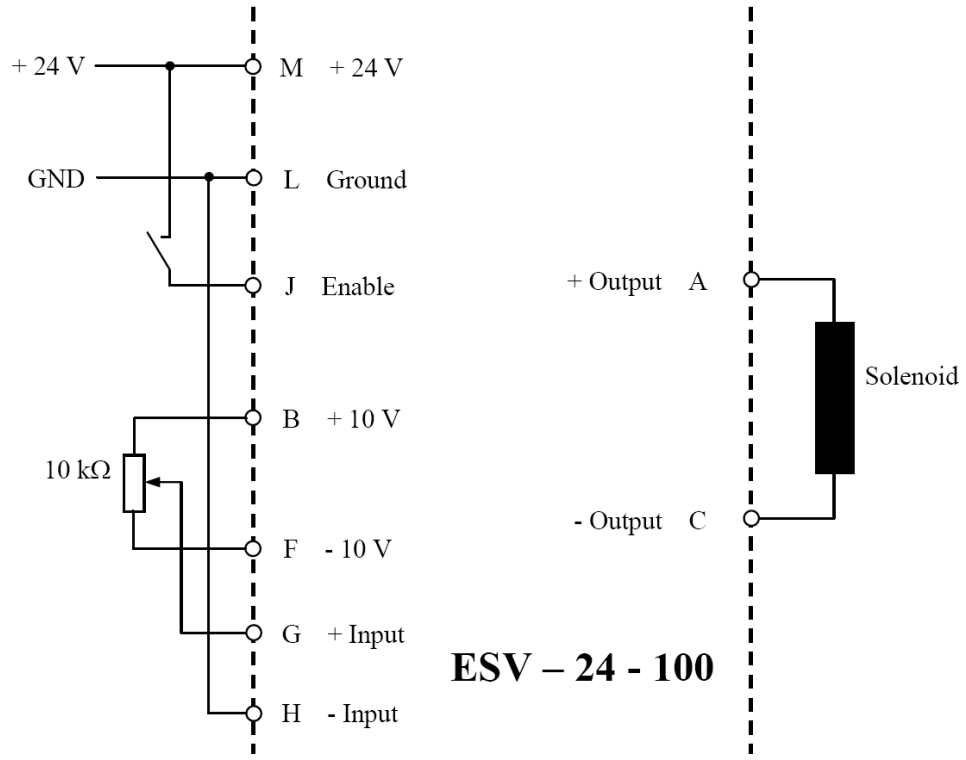


Figure 6: Example using the internal reference voltages V_{ref}.

b) Using a programmable logic controller (PLC)

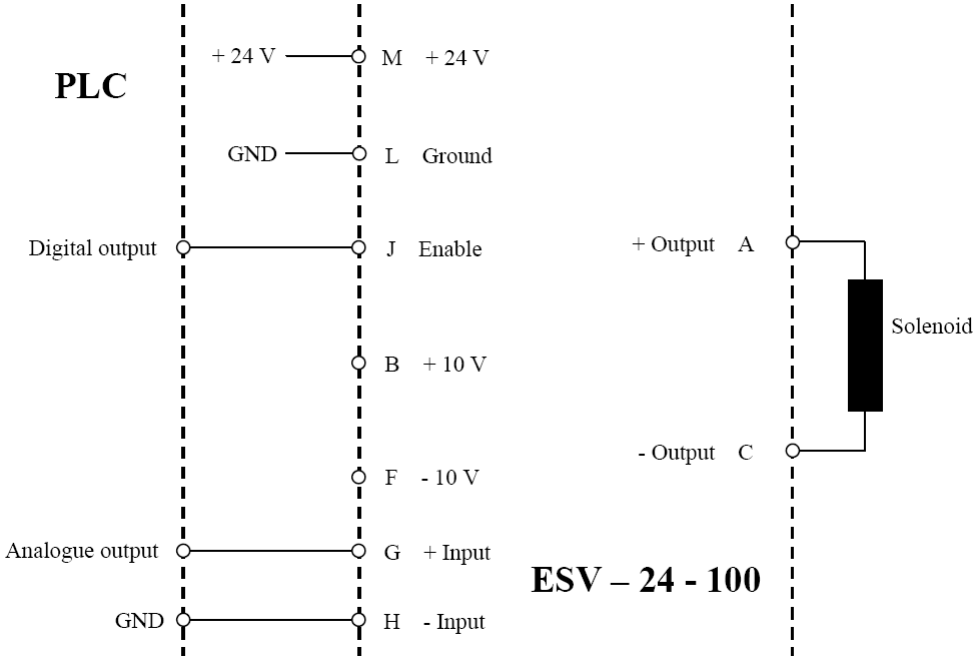


Figure 7: Example using a PLC