Digital control with signal processing unit (DSP)

Type :   HE 302 ... (DSP-version)

description

The digital axle controller was developed for electrical hydraulic systems with servo valves. In the past one always had to resort to the available CNC controllers when installing a digital controller. These controllers, however, were developed primarily for electric systems and are tuned to the static and dynamic functioning of electric systems. Servo valves function quite differently from electric systems, however, and only achieved an unsatisfactory resolution of the closed loop. The DSP controller has been perfected in its static and dynamic functioning to adapt to Schneider Servo valves. The TI TMS 320 with 80 MHz and 16 bit permits a scan time of <100µs for a complete calculation operation with a PID algorithm. With this, dynamic control patterns are also possible, comparable with an analogue controller. Added advantages are the digital parametric and the stability of a digital controller.

An example is the application with punch and nippling machines with high dynamic position control and pressure limiting.

The controller is optimized by a RS 232 interface.

The software can be set to the following:
1. Reference functions: ramps (sinus/ polynomial as options)
2. Position references values
3. Speed values
4. Controller parametric up to adaptive and subordinated regulation systems.

Technical data

1. Supply:
24 V DC (18V ... 28 V) 0,8 A

2. Outputs:
<u>analogue, for servo valve</u>
PWM amplifier useable for all Schneider servo valve z. B. :0 ... 650 mA

<u>digital to PLC interface</u>
6 x digital 24V/ 500mA with high side switch and LED indication

3. Inputs:
<u>analogue, for cylinder position</u>
inductive position transducer in Differential-connection z.B. Scheavitz HR1000
alternate
analogue position transducer with an output 0 ... +10V or 4 ... 20mA

<u>digital from PLC interface</u>
6 x digital 24V opto coupler and with LED indication
1 x digital 24V switching against GND with LED indication

4. technical details
This is an adaptive, highly dynamic hydraulic position controller with PWM amplifier and current control for servo valve. All related parameter are set by software with RS232 connection.
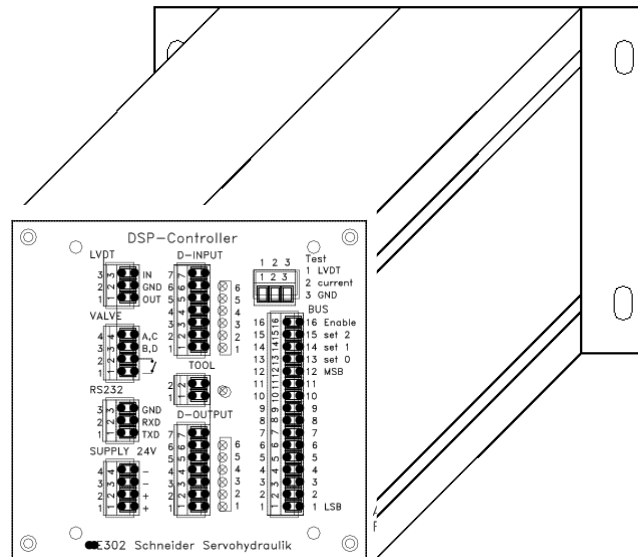
5. dimensions

breadth:	150 mm
high:	105 mm
deep:	185 mm
	210 mm with connection on front side
mounting holes	66 x 136 mm for 4 x max. M5
mass:	500g

6. environment

IP 40, for mounting in an electrical cabinet or junction box
temperature range : –20C° to +60 C°

7. view

8. description software parameter

(see separate file)

9. Connection diagram

X1	**supply**	4 pol. plug connector	1 / 2 =		+ 24 V DC
			3 / 4 =		supply ground, GND
X2	RS 232	3 pol. plug connector	1 =	TXD	to pin 2 on RS232 9pin D-SUB female
			2 =	RXD	to pin 3
			3 =	Ground	to pin 5
X3	valve	4 pol. plug connector	1 =	switch	
			2 =	switch	
			3 =	servo valve (B,D)	
			4 =	servo valve (A,C)	
X4	LVDT	3 pol. plug connector	1 =	Out	#3 Prim. Coil (yellow/white)
			2 =	GND	#1/4 Prim/sec. coil (yellow/red / black)
			3 =	In #5 sec. coil (red)	
X5	D-Output	7 pol. plug connector	1 =	PMH	OT
			2 =	PAT	MT
			3 =	PMB	UT
			4 =	P-fin	cycle finished
			5 =	tool in	
			6 =	test 1 = ok / 0 = fault	
			7 =	supply ground, GND	
X6	tool	2 pol. plug connector	1 =	to tool switch	
			2 =	supply ground, GND	
X7	D-Input	7 pol. plug connector	1 =	(start signal)	
			2 =	PMB	(drive to UT)
			3 =	PAT	(drive to MT)
			4 =	PMH	(drive to OT)
			5 =	tool simulation	
			6 =	punching = 0 forming (stamp) =1	
			7 =	external Ground	
X8	bus interface	16 pol. plug connector	1 =	digital Input 0 LSB (12 bit digital value)	
			2 =	digital Input 1 (12 bit digital value)	
			3 =	digital Input 2 (12 bit digital value)	
			4 =	digital Input 3 (12 bit digital value)	
			5 =	digital Input 4 (12 bit digital value)	
			6 =	digital Input 5 (12 bit digital value)	
			7 =	digital Input 6 (12 bit digital value)	
			8 =	digital Input 7 (12 bit digital value)	
			9 =	digital Input 8 (12 bit digital value)	
			10 =	digital Input 9 (12 bit digital value)	
			11 =	digital Input 10 (12 bit digital value)	
			12 =	digital Input 11 (12 bit digital value)	
			13 =	digital Input 12 (set signal 1)	
			14 =	digital Input 13 (set signal 2)	
			15 =	digital Input 14 (set signal 3)	
			16 =	digital Input 15 (enable signal)	
X9	Test plug	3 pol. plug connector	1 =	GND	
			2 =	servo valve current	
			3 =	cylinder LVDT signal	
				-4,5 –5Volt on top to about –4,5 or 5V on bottom	