

# Digital Controller RE 4 for Hauhinco Proportional Valves

## Features

- Electronic amplifier with integrated PID-Controller for solenoid-operated hydraulic valves
- Operating mode Pressure and Position control
- Suitable for all Hauhinco Valves
- Exchangeability of RE1, RE2 and RE3 is given
- Control and Diagnosis over software
- Automatic calibration between controller and hydraulic valve
- Communication between PC/Laptop and Controller by USB-port



## Functional description

The Controller has been specifically designed for Hauhinco Control Valves and forms a closed loop circuit with hydraulic valve.

The demand values for the pressure at the working connection or the position of the setting piston are transmitted by the user by scaled voltage (0-10V) and electricity (4-20 mA) to the controller. Through the controller the demand value and the current value are compared and the valve is being calibrated until the offset is minimized. The control parameters can be altered in many areas within the control software. Further functions as for example a ramp function are also implemented.

Depending on the used valve type (3/2 or 2/2 way valve) one or two valves can be controlled per one controller. The master/slave configuration of the controller allows an expansion to up to four 3/2 way valves or eight 2/2 way valves that are controlled by the master controller. The previous control cards RE1, RE2 und RE3 can be replaced with the RE4.

## Technical information

- Mechanical mounting on a standardized top hat rail according to DIN 50 022
- Digital PID-Controller
- Controller sampling rate 1 ms
- Control deviation monitoring
- Up to 8 demand values can be stored on the Controller and selected digitally
- Demand value correction for the analog signal
- Automatic actual value correction for the analog signal
- Broken wire detection for analog power inputs
- Broken wire detection for power outputs
- Short circuit detection for power outputs
- Adaption to Hauhinco valve construction sizes
- Visualization of the control variables in test mode
- Automatic adaption of the overlap compensation for all Hauhinco Valve construction sizes
- Analog output of internal control parameters
- To optimize the control procedures, manual correction of single parameters are possible
- Controller is configurable as Master/Slave, parallel valve groups can controlled
- The initial valve position can be defined, for example „NC“ or „NO“
- The operating and diagnostic software is designed for WIN32 compatible operating systems (e.g. Windows® Vista, Windows® 7, 8, 10 etc.)

# Technical data

Digital Controller RE 4	
Supply voltage (U <sub>b</sub> )	12... 30 VDC (incl. ripple))
Power requirement max.	60W (depending on solenoid)
External protection	3A medium time lag
Digital inputs	4
Low level	OFF : < 2 V
High level	ON : > 10 V
Input resistance	25 kOhm
Digital outputs	2
Low level	OFF : < 2 V
High level	ON : > max. U <sub>b</sub>
Maximum output current	50 mA
Analogue inputs	3
Signal	0... 10 V; min. 25 kOhm 4... 20 mA; 240 Ohm
Signal resolution	0,003 % incl. Oversampling
Analogue outputs	2
Signal	0... 10 V 10 mA (max. load)
Signal resolution	0,006 %
PWM outputs	2
Nominal current	500... 2600 mA, broken wire monitored and short circuit proof
Frequency	61... 2604 Hz, adjustable in steps
Dither frequency	60... 400 Hz
Dither amplitude	0... 30 %
Sample time	
PID controller	1 ms
Current controller	0,125 ms
Ramp function	
Up	0... 60000 ms
Down	0... 60000 ms
Standby current for pre-magnetisation	0... 60 (max. current)%
Serial interface	USB in RS 232C Emulation (9600... 57600 Baud, 1 Stop bit, no parity, Echo Mode)
Housing	Snap-on module to EN 50022 PA 6.6 polyamide Flammability class V0 (UL94)
Protection class	IP20
Temperature range	-20... 60°C
Storage temperature	-20... 70°C
Humidity	< 95% (non-condensing)
Weight	0,250 kg
Connections	USB Type B 8 x 4 pole terminal blocks PE: via the DIN mounting rail
EMC	EN 61000-6-2: 8/2005 EN 61000-6-4: 6/2007 + A1:2011

# Modification measures

An adaption is necessary when older Controllers are being replaced.  
Please see the following overview for the necessary adaptations:

MR1 / Controller RE 4.01		
Version	Connections at the controller	RE 4.01
RE 1.19		
RE 2.01		
2	z 24 V + Supply Voltage Controller	3
	b 24 V + Supply Voltage Controller	3
	d 24 V + Supply Voltage Controller	3
4	z GND Demand Value	1
	b Demand value 0-10 V	13
	d Demand Value 4-20 mA	13
6	z GND Actual Value 1	11
	b Actual Value 1, 0-10 V	14
	d Actual Value 1, 4-20 mA	14
8	z	
	b	
	d	
10	z	
	b	
	d Digital Input No. 9 / constant demand value 2	6
12	z Digital Input No. 8 / valve lock	8
	b Digital Input No. 7 / constant demand value 1	5
	d Digital Input No. 6 / constant demand value 0 (RE2.01 analog/digital demand value)	-
14	z Digital Input No. 5 / constant demand value 3	7
	b Digital Output No. 4 / I-Amount Reset	-
	d Digital Output No. 3 / 2 ramp pairs	-
16	z Digital Input No. 2 / Delete ramp	-
	b Digital Output No. 1 / Actual Value Comparator	-
	d Digital Output No. 2 / Failure	1
18	z Proportional solenoid Y1 GND	19
	b Analog 0 Output	16
	d Analog 1 Output	-
20	z + 12 Volt	-
	b + 12 Volt	-
	d + 12 Volt	-
22	z GND Analog Output	12
	b GND	-
	d GND	-
24	z -12 Volt	-
	b -12 Volt	-
	d -12 Volt	-
26	z + 10 Volt Reference	-
	b S/W Solenoid Y3 GND	-
	d S/W Solenoid Y3 +	-
28	z + 24 Volt Supply Solenoid Valves	22
	b S/W Solenoid Y4 GND (not applicable by RE2.01)	-
	d Proportional Solenoid Y2 GND	20
30	z Proportional Solenoid Y2 +	18
	b Proportional Solenoid Y1 +	17
	d S/W Solenoid Y4 + (not applicable by RE2.01)	-
30	z GND	4/24
	b GND	4/24
	d GND	4/24
	- Output deviation	2
	- Input from Slave-Signal to Master 0-10 Volt	10
	- Input from Slave-Signal to Master 0 Volt	9
	- Master Output Slave-Signal for Slave 0-10 Volt	15
	- Master Output Slave-Signal for Slave 0 Volt	11