



Bulletin HY11-3211-M1/UK

Installation Manual Series PW*404

Electronic Module



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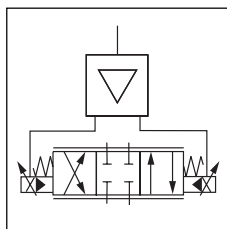
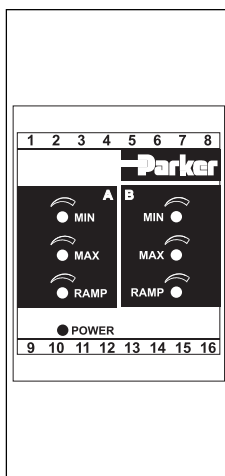
Electronic module for the control of proportional directional control valves without position sensor. The movement profile of the valve spool is given by externally supplied command signals and internal limiting and ramp potentiometers. In this case the command signals may be generated from a PLC. The module provides also a "Soft Shift" function. This means replacement of an On/off-valve by a proportional valve without modification of the wiring installation.

Design Features

- Differential command input for voltage or current signals.
- Ramp generator
- Flow offset adjustment (MIN) for deadband compensation
- Maximum adjustment (MAX) to maintain the operation range to the command signal range
- Soft Shift function
- PWM constant current control of the valve solenoids
- Snap-on module fits on EN 50022 rail
- Disconnectable terminals
- EMC-conformity

Note

The solenoid designations (A-B) shown in this information brochure are exemplary as for using of direct operated valves. By connecting of pilot operated valves variations may occur.



There is a linear relationship between the solenoid current and the input signal. The solenoid current is stabilized against voltage fluctuations as well as temperature dependent resistance variations of the solenoid coils. Because of the effect of load on the position of the valve spool, the spool position may vary and there is a limited relationship between the command signal and the valve flow.

Ordering Code


Code	Current
18	1.8A
25	2.5A
35	3.5A

PW — **Max.-Current**
Packaged Module DC Valves

A — **404**
Module Type Amplifier, adjustable MIN./MAX.-limiting, Up/Down-ramps

Design Series

Technical Data

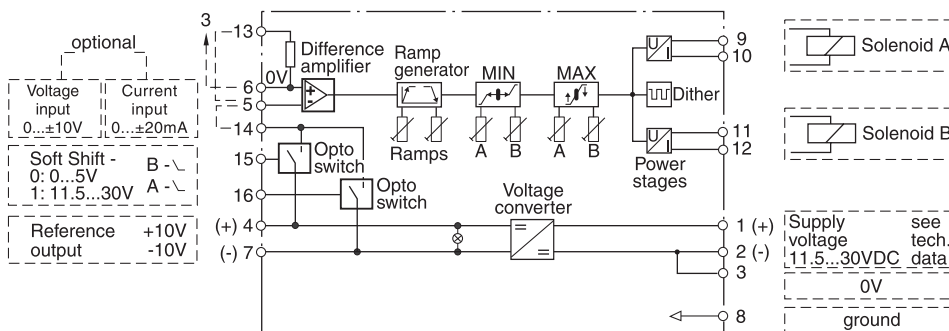
Supply voltage range *	11.5...30VDC	
Supply voltage ripple	max. 5%	
Current consumption	max. 3.5A	
Input signal range		
Input voltage	0...±10V / 100kOhm	
Input current	0...±20mA / 500Ohm	
Reference output	±10V +5% / max. 10mA	
Soft Shift inputs		
0	0...5VDC	
1	11.5...30VDC / max. 15mA	
Output current max.	see ordering code	
Adjustment range ramp time	0...3sec.	
Ambient temperature range	-20...+60°C	
Connection	Screw-in terminals, plug-in type AWG 24...13	
Installation cross sections min.	Voltage supply + solenoid: AWG16. Other connections: AWG20	
Cable length	max. 50m	
Pre-fuse	6.3A, medium-lag, DIN 41571	

* see compatibility table

EMC

EN 50081-2	EN 55011						
EN 50082-2	ENV 50140	EN 61000-4-4	ENV 50204	EN 61000-4-5	EN 61000-4-2	EN 61000-4-6	

Block Diagram



MIN/MAX-Setup

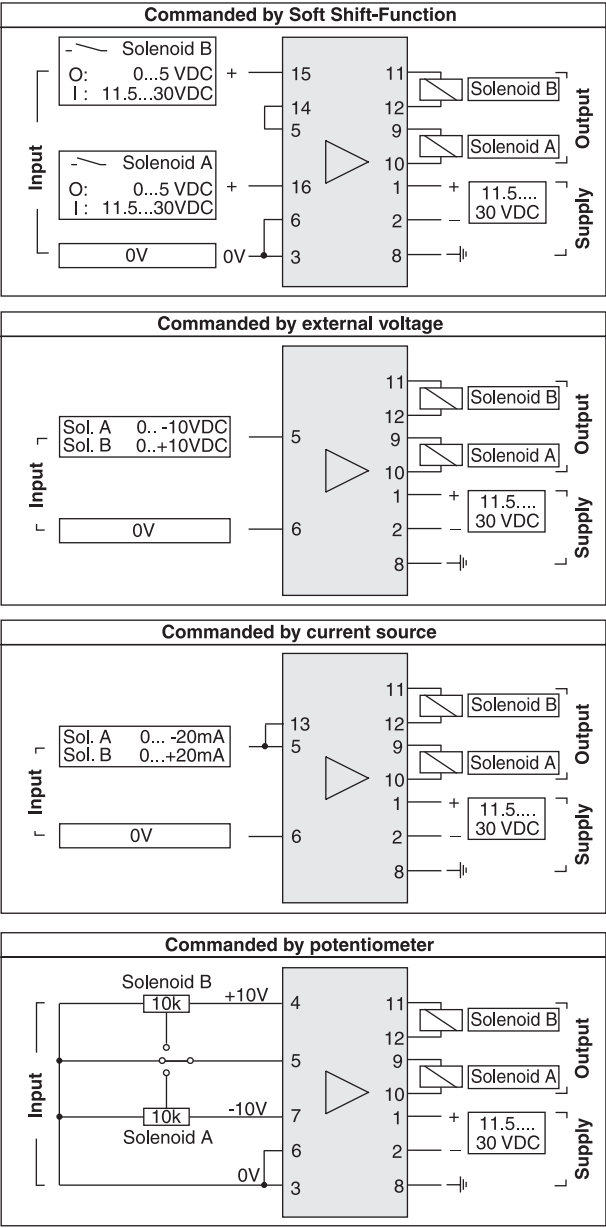
With the Minimum-adjustments the deadband of the valve spool can be compensated individually for both directions. The Maximum-adjustment feature adapts the full command signal range to the defined actual working range of the valve.

Set-up procedure:

- 1) Feed in a signal of +200mV (resp. + 0.4mA) into input 5/6.
- 2) Adjust offset for corresponding valve side by trimpot "MIN B".

- 3) Feed in a signal of +10V (resp. +20mA) into input 5/6.
- 4) Adjust the required spool stroke for corresponding valve side by trimpot "MAX B".
- 5) Repeat that procedure for opposite valve side. Feed in negative command signals and adjust by trimpots "MIN A" and "MAX A".
- 6) Take into account that MIN has to be adjusted before MAX.

Wiring Examples



Compatibility Table

Valve Type	Solenoid voltage	Module Type	Voltage range supply
D1FW	K (12VDC) M (9VDC) L (6VDC)	PW18_ PW25_ PW35_	17.5...30 VDC 14.5...30 VDC 11.5...30 VDC
D3FW	K (12VDC) M (9VDC)	PW25_ PW35_	17.5...30 VDC 14.5...30 VDC
D*1FW	L (6VDC)	PW25_	11.5...30 VDC
RLL/WLL (NG06)	G09 (9VDC)	PW25_	11.5...30 VDC
RLL/WLL (NG10)	G09 (9VDC)	PW35_	14.5...30 VDC

Relationship of Ramp Function

A simple ramp function is provided to maintain a smooth movement of the solenoid coils. The time is adjustable from 0...3 sec.

Potentiometer	Controls command polarity	
Ramp A	- On	- Off
Ramp B	+ On	+ Off

Relationship of Soft Shift Function

A signal at one of the two Soft Shift inputs energizes the corresponding solenoid. Only 1 input is allowed to be energized once.

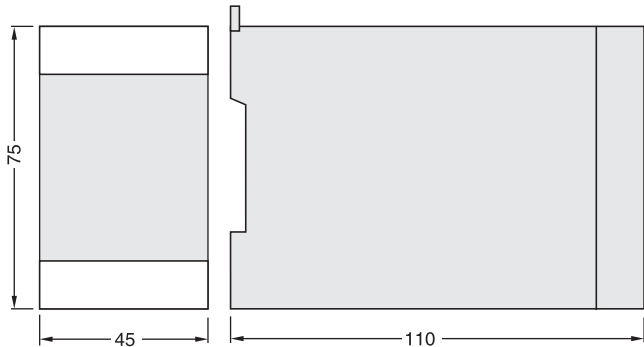
Signal	Controls solenoid at
I at 15	Terminals 11 - 12
I at 16	Terminals 9 - 10

Relationship of Polarity

The command signal input provides differential input, this permits free polarity selection.

Polarity	Controls solenoid at
+ at 5 - at 6	Terminals 11 - 12
- at 5 + at 6	Terminals 9 - 10

Dimensions



Installation guide to electronic modules to provision of electromagnetic compatibility

Power Supply

The utilized power supply has to comply with the EMC-standards (CE-sign, certificate of conformity).

Relais and solenoids operating from the same supply circuit as the valve electronics have to be fitted by surge protection elements.

Wiring Cable

The wires between the installation site of the module and the peripheral units, as power supply, valve solenoids, position transducer, command signal source have to be shielded. The following wire sizes must be reached: power supply AWG 16, other connections AWG 20. The capacity should not exceed a value of approx. 130 pF/m (wire/wire). The maximum cable length is 50 m. No power current lines may be placed within the wired shielded cables to the electronic module. The cable shield has to be connected to ground at both ends (see also chapter "Grounding"). Please be aware of Ground-loops.

Installation

The module has to be mounted within a conductive, shielded enclosure. Usable is i.e. an EMC-approved control cabinet. A perfect grounding of the enclosure is mandatory (see also chapter "Grounding").

Grounding

The mounting plate of the valve has to be connected to the grounded metal machine frame. The cable shields must be tied to ground at the control cabinet. A low-ohmic potential compensation wire has to be provided between the control cabinet and the machine frame (cable wire >AWG 7 cross section) to prevent ground loops.