Janus
CONTROL VALVE

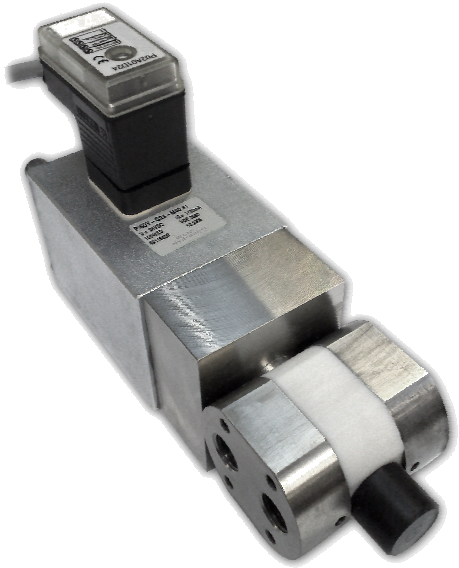
PROPORTIONAL CONTROL VALVE

The Water Hydraulics Co. Ltd.

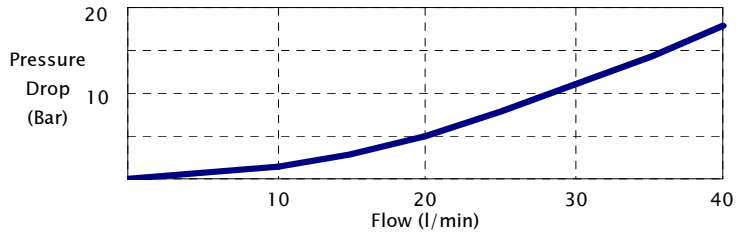
A patented range of direct acting valves that can electronically control directional flow and pressure of corrosive fluids in hydraulic systems. Designed specifically for fluids with low viscosity the valves offer high accuracy with both open and closed loop control available.

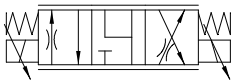
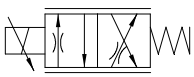
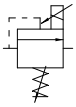
SPECIFICATION	
Max Inlet Pressure	200 bar
Operating Pressure Range	1 to 160 bar
Flow Range	0-30 L/min
Flow Characteristics	Cv Rate 0.62 Kv Rate 0.75
Feed Gallery Diameter	6mm
Porting	1/4" BSP (Parallel) & Manifold
Construction Materials	316 Stainless Steel, Ceramic & Polymer
Solenoid Operation	24V DC
Electrical Connections	Spade or Hirschmann

Controllers:
The proportional coil can be driven by several designs of amplifier in open loop or control loop functions. With both 10 and 16 bit control available a wide choice of interfaces ensure application compatibility and accuracy. See data sheet for more information.



Flow Characteristics



ORDERING CODES	STANDARD BUILD	MANIFOLD MOUNT
 4/3 Valve Centre Position Closed P AB&T connected	223BNSW	2M23BNSW
 4/2 Valve Centre Position Closed P AB&T connected	224BNSW	2M24BNSW
 Pressure Control	225BNSW	2M25BNSW

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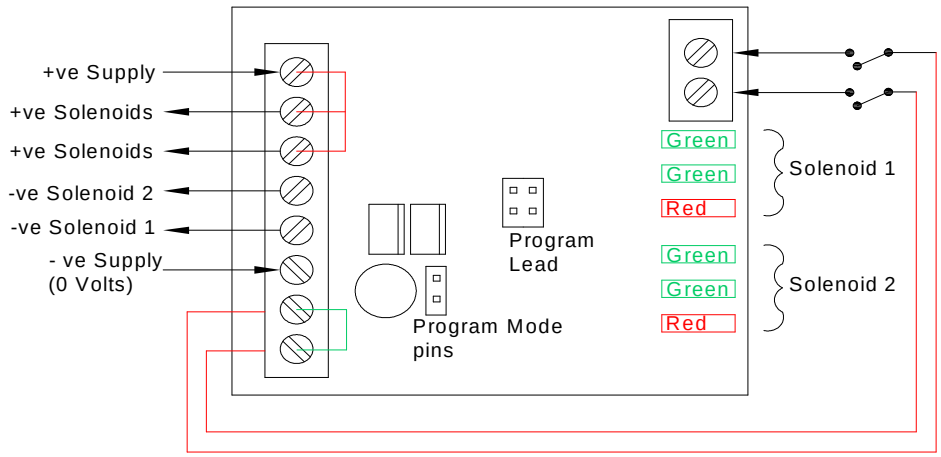
The valves are supplied with a 12V DC coil. The PCB will control the duration of supply to ensure that the maximum temperature of the coil is not exceeded. The solenoid should not be switched on/off continuously with a duty cycle shorter than 1 second.

Power supply.

A power supply capable of supplying a regulated 24V DC (supply) at 5 amps is required to the board at all times. The schematic below shows that the signal supply can be taken from the last 2 terminals of the board – alternatively the signal can be supplied directly from a PLC (6mA if the output from the PLC is 24V or 1mA if the output is 5V).



To energise Solenoid 1 apply 5-24V with respect to 0 V supply

To energise Solenoid 2 apply 5-24V with respect to 0 V supply

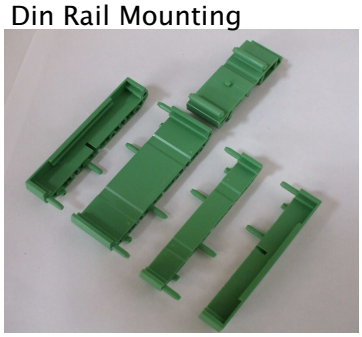
The signal supply can be taken from the last 2 terminals of the card as shown, or can be supplied directly from the output of a PLC

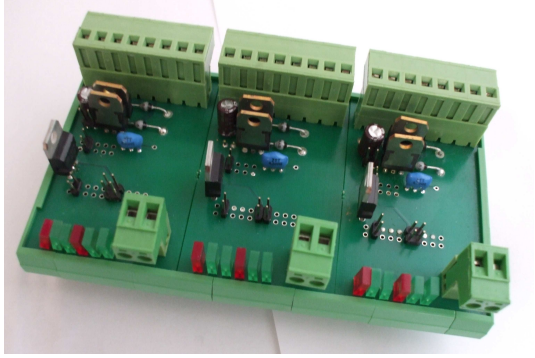
With the connections made as shown, by supplying a 5–24V signal to the input a sequence will commence. The solenoid will be supplied with an initial 24V supply for 100ms. The average voltage that the solenoid will then see is 15V for a further 2 seconds. A further reduction to 10V is then made to reduce the temperature generated in the solenoid under hold conditions. This will also reduce the power consumption of the system. The sequence is illustrated by the LED's, the red is the holding condition.

Note that once energised the card will remain in the holding condition with a signal voltage of only 1.3V, therefore care should be taken when routing the signal cables so as to avoid interference which may induce voltages high enough to trigger the signal.

The board can be supplied as a DIN rail mounted card or in an enclosure with fly leads for solenoid connection. A combination of the mounting modules (shown on page 2) allow the card to be mounted singularly, or in multiples to a DIN rail.

Din Rail Mounting





See following page for ordering codes

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ORDERING CODES		
No of Cards to be Mounted:	**Part Number:**	**Dimensions:**
Actuation Card Only	004-010	H 38mm L 78mm W 42mm
1 Card including Din Rail Mounting	004-104	H 50mm L 80mm W 45mm
2 Cards including Din Rail Mounting	004-105	H 50mm L 80mm W 90mm
3 Cards including Din Rail Mounting	004-106	H 50mm L 80mm W 136mm
Din Rail Mounting:	**Part Number:**	**Dimensions:**
Mounting Only (1 Card)	004-101	H 50mm L 80mm W 45mm
Mounting Only (2 Cards)	004-102	H 50mm L 80mm W 90mm
Mounting Only (3 Cards)	004-103	H 50mm L 80mm W 136mm

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CONTROL VALVE

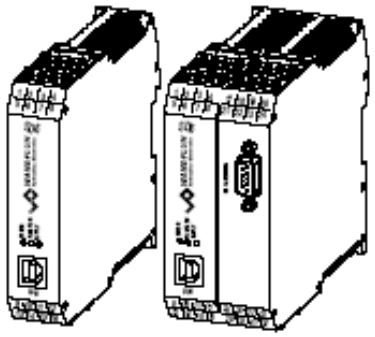
PROPORTIONAL CONTROLLER

The Water Hydraulics Co. Ltd.

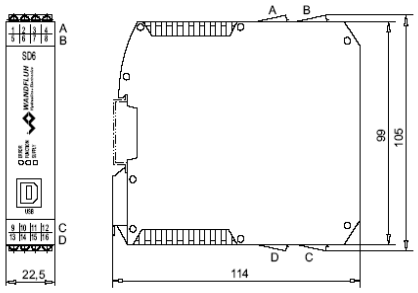
DESCRIPTION

Digital controller module for top-hat rail installation for driving proportional valves with two solenoids. The controller serves to control a predefined pressure, volume flow or a position. The parameterisation takes place by means of the menu-controlled parameterisation and diagnostics software «PASO» of Wandfluh (USB-interface). The module is available as a basic controller and as an enhanced controller.

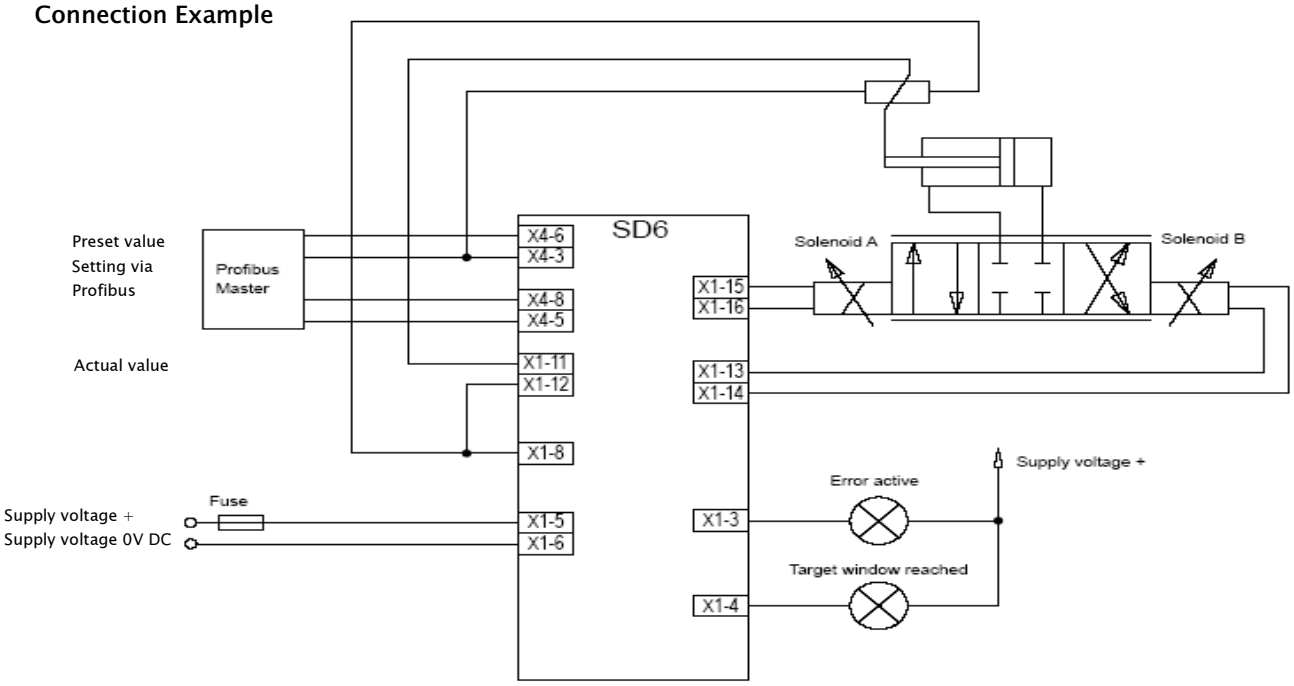
GENERAL SPECIFICATIONS	
Execution	Module for electrical control cubicle, housing made of plastic.
Dimensions	Digital controller module Basic: • 105 x 114 x 22.5 mm (see dimensions) Digital controller module Basic with Profibus DP: • 105 x 114 x 45 mm (see dimensions) Digital controller module Enhanced: • 105 x 114 x 45 mm (see dimensions).
Installations	For 35mm dome rail acc. To EN 60715.
Weight	Digital controller module Basic / with Profibus: • 130g/220g Digital controller module Enhanced / with Profibus: • 220g/240g
Connections	Screw terminals, max. cable cross sections 2.5 mm2
Working temperature	-20...+60°C



Dimensions



Connection Example



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FUNCTION

The set-point position is predefined externally (e.g. with a potentiometer). In case of the enhanced controller, it is additionally possible to predefine the set-point position by means of freely adjustable travel profiles. As actual value transmitters, it is possible to connect analogue (in case of the enhanced controller also digital) measuring systems directly to the controller module. The basic controller has a 10-bit, the enhanced controller a 16-bit resolution.

APPLICATIONS

As a snap-on module, the electronics card is mainly used in the industrial field. The module can be installed on top-hat rails. Thanks to several digital inputs and outputs, it is possible to connect the controller module to a super-ordinate machine control system. With the enhanced controller, valves with integrated amplifier can be driven.

ELECTRICAL SPECIFICATIONS

Protection class	IP 30 acc. to EN 60 529
Supply voltage	24 VDC or 12 VDC
Voltage range	24 VDC: 21...30 V 12 VDC: 10.5...15 V
Ripple on supply vol.	<10%
Fuse	Slow
Current consumption	No-load current—approx 40 mA Maximum current consumption • no-load current + 1.8 A per solenoid (with 24 VDC) • no-load current + 2.3 A per solenoid (with 12 VDC).
Preset and actual	Selectable with software
Value signal	Diff. inputs not galvanically separated, for earth potential differences up to 1.5 V 4...+20 mA/0...+20 mA 0...+10 V -10... +10 V
Input resistance	Voltage input > 18 kΩ Load for current input = 250Ω
Stabilised output voltage	10 VDC (with version 24 VDC) 8 VDC (with version 12 VDC) Max. load 30 mA

Solenoid current	Minimal current I min • Adjustable 0...950 mA • Factory-preset 150 mA Maximal current I max • Adjustable I min...1.8 A (with 24 VDC) 2.3 A (with 12 VDC). • Factory-preset 700 mA
Dither	Frequency adjustable 20...500 Hz Factory-preset 100 Hz Amplitude adjustable 0...400 mA Factory-preset 100 mA
Temperature drift	<1% at ΔT = 40°C
Digital inpits	Switching threshold high 6...30 VDC Switching threshold low 0...1 VDC Signal active at 6...30 VDC (active high)
Digital outputs	Low-slide-switch: • U max = 40 VDC • I max = 700 mA
Serial interface	USB (receptacle type B) To set parameters with «PASO»
EMV	Immunity • EN 61 000-6-2 Emission • EN 61 000-6-4

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CONTROL VALVE

PROPORTIONAL AMPLIFIER

The Water Hydraulics Co. Ltd.

DESCRIPTION

Proportional amplifier for direct mounting onto the proportional coil. P in layout according to DIN 43650, Type A (ISO 4400) . Protection class of the plug amplifier is IP65, mounted according to DIN 40050. The connector cable is already mounted in the plug.

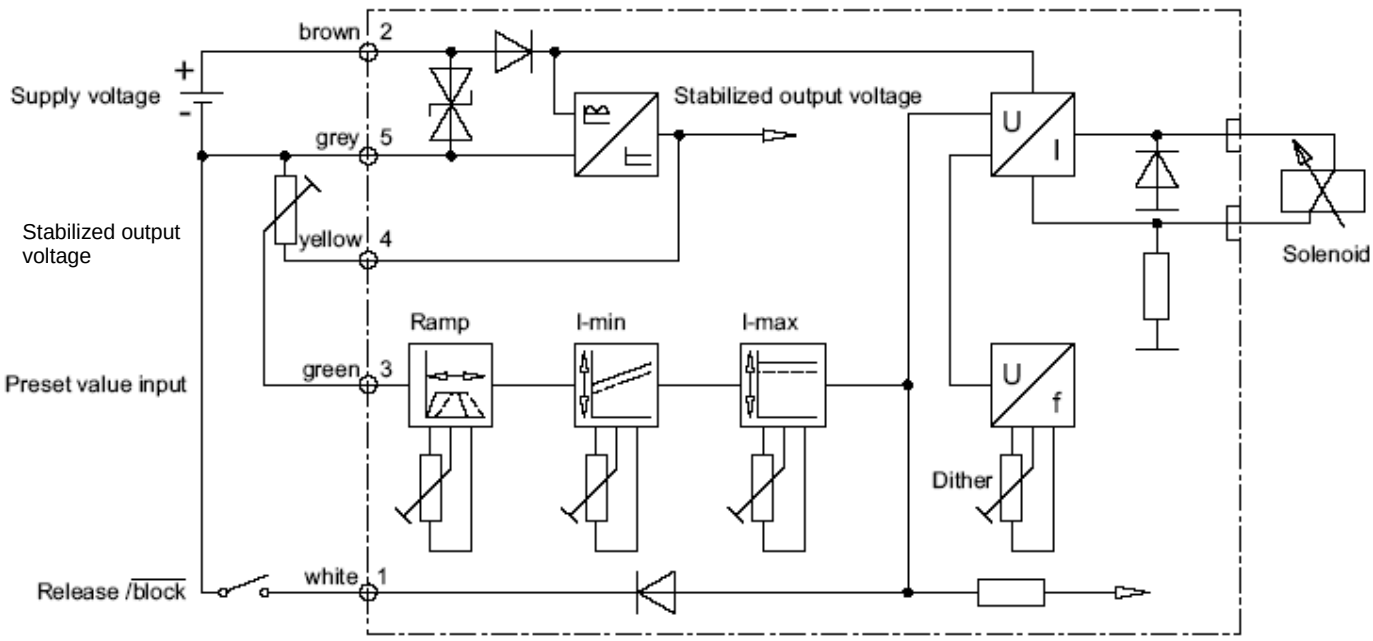
GENERAL SPECIFICATIONS	
Plug Housing	Polyamide
Plug	Polycarbonate
Weight	160g
Connections	Mounted cable, length 1.5m (on request, cable length 5m/10m)
Ambient Temperature	See curve max. ambient temp.

FUNCTION

The proportional amplifier has a clock-pulsed final stage. The clock frequency acts as dither and can be steplessly adjusted. Minimum and maximum solenoid current can be adjusted separately. Furthermore, a linear ramp is integrated. By means of the input release/block, the function can be blocked. A stabilized output voltage is available for supplying external preset value transmitters.

APPLICATIONS

The amplifier is suitable for different applications because of its splash water proof design. The ease of connection allows to put it into operation without help of special tools. All settings are easily adjustable. The plug can be rotated by 180°.



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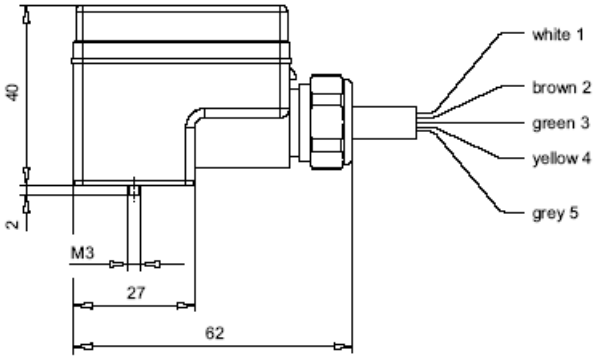
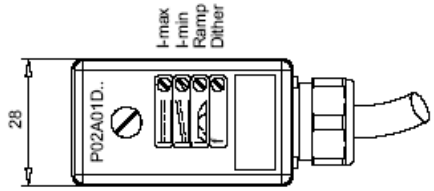
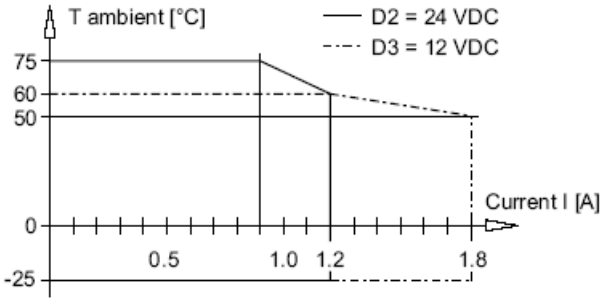
DIMENSIONS





MAX. AMBIENT TEMPERATURE CURVE



If mounted on the solenoid ☐60 / 12V the current has to be limited to 1.8 A, otherwise the proportional-amplifier could be overloaded.

ADDITIONAL INFORMATIONS

	Wandfluh-Documentation	
Proportional directional control valves	register	1.10
Proportional pressure control valves	register	2.3
Proportional flow control valves	register	2.6

ELECTRICAL SPECIFICATIONS

Supply voltage	24 VDC tolerance: 22...36 VDC 12 VDC tolerance: 11...18 VDC
Preset value input	0...+10 VDC (0...+8 VDC)
Input resistance	≥ 100 KOhm
Stabilized output voltage	24 V-version: 10 VDC. max. load 2 mA 12 V-version: 8 VDC. max. load 2 mA
Dither	frequency adjustable 60...250 Hz
Works setting	200 Hz
No load-power	24 VDC: 0.3 W 12 VDC: 0.2 W
Solenoid current	**for 24 Volt solenoid**: min. current I min adjustable 30..400 mA works setting 150 mA max. current I max adjustable Imin..1200 mA works setting 700 mA **for 12 Volt solenoid**: min. current I min adjustable 80..800 mA works setting 300 mA max. current I max adjustable Imin..1800 mA works setting 1200 Ma
Ramp	1 ramp up/down adjustable with same potentiometer.
Ramp time	0.25...6 seconds
EMC	Immunity: EN 61 000-6-2 Emission: EN 61 000-6-4

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