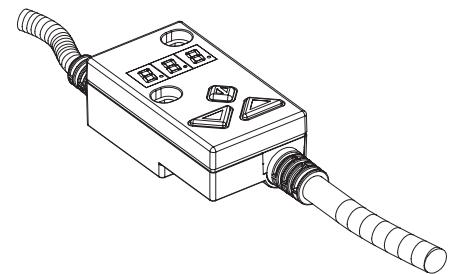


Digital amplifier electronics PD2

- For 1 proportional or switching solenoid
- With cable outlet for free choice of the connecting plug
- Protection class IP 67
- Interface:
 - analogue
 - CANopen/J1939
- 1 analogue input
- 1 digital input
- Adjustable with push-buttons and display directly on the device or via PC



DESCRIPTION

Amplifier with cable outlet for free choice of the connecting plug such as DIN EN 175301-803/ISO 4400, AMP Junior Timer or Deutsch DT04-2P. Protection class is IP67. The connecting and solenoid cable are firmly mounted in the device. The voltage range enables the driving of 12 VDC and 24VDC devices. The amplifier is also available mounted directly on the solenoid.

FUNCTION

The electronics has a Pulse-Width-Modulated current output. The solenoid output can also be parameterised for switching solenoids. The parameterisation is carried out directly on the device by means of push-buttons and display, or by means of the parameterisation and diagnostics software "PASO" of Wandfluh.

APPLICATION

Due to its water spray resistant execution, the amplifier is suitable for most diverse applications. Easy connecting enables assembly and commissioning with conventional tools. All settings can be carried out easily and quickly.

TYPE CODE

P	D2	3	0	1	D8	0	-	A	<input type="checkbox"/>	<input type="checkbox"/>	#	<input type="checkbox"/>
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Connector												
Digital												
Adjustable with Push-buttons / display and PASO												
Basic amplifier												
1-solenoid execution												
Supply voltage	8...32 VDC											
Analogue input	Voltage / Current (not for fieldbus)											
10-bit resolution												
Option fieldbus:												
• without fieldbus	<input type="checkbox"/>											
• with CANopen	<input type="checkbox"/>											
• with J1939	<input type="checkbox"/>	(on request)										
Connection cable length												
• 1,5 m	<input type="checkbox"/>											
• 7,5 m	<input type="checkbox"/>	(not for fieldbus)										
Design index (subject to change)												

GENERAL SPECIFICATIONS

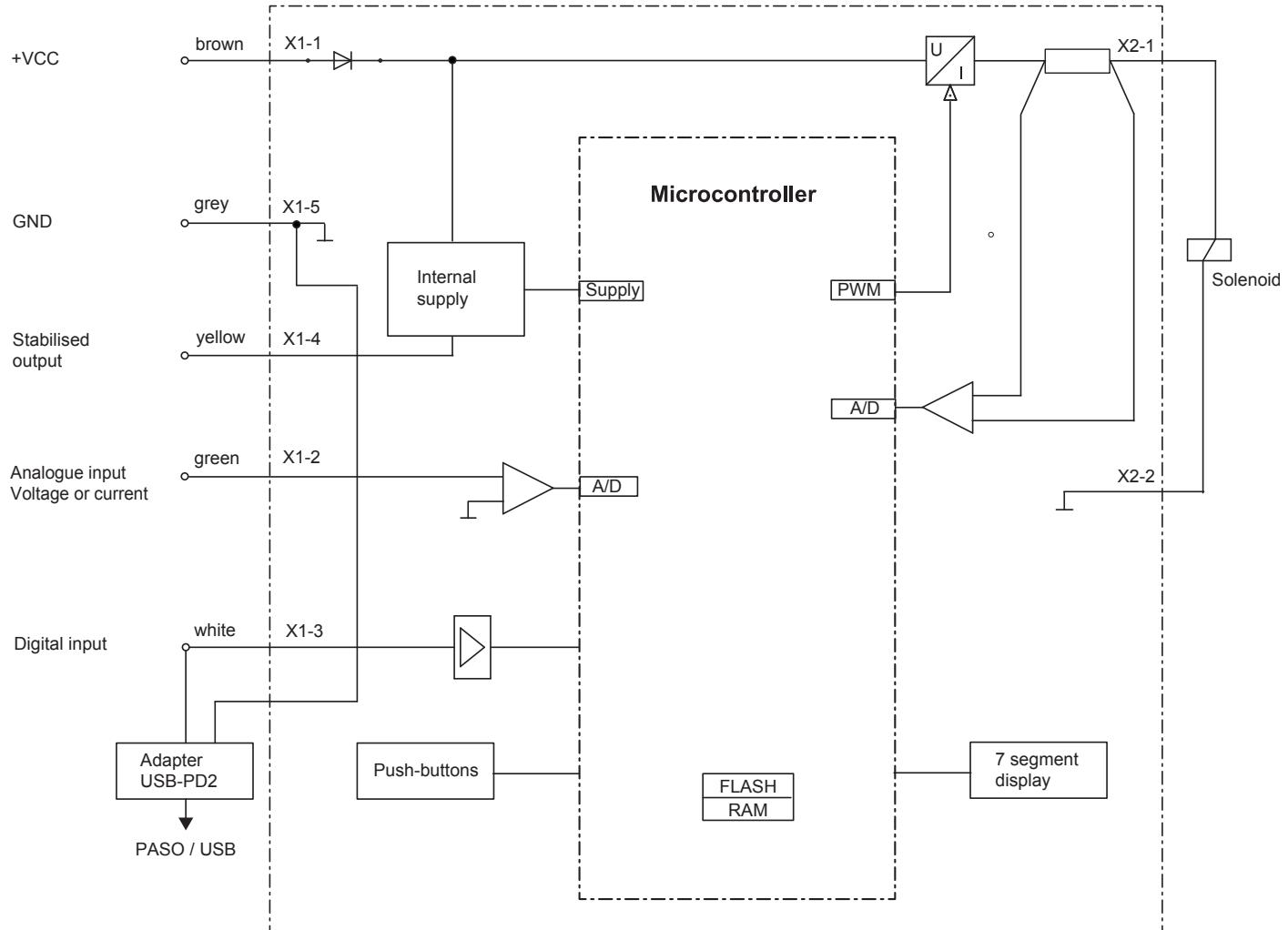
Execution	With cable outlet for free choice of the connecting plug
Connections	Connection cable 5 x 0,34 mm ² , Exterior coating PVC length = 1,5 m or 7,5 m
	Solenoid cable 2 x 0,34 mm ² , Exterior coating PVC length = 0,5 m
	USB interface via connection «Digital input» requires the Wandfluh USB adapter PD2
Dimensions	See drawing page 2
Ambient temperature	-40...+85 °C

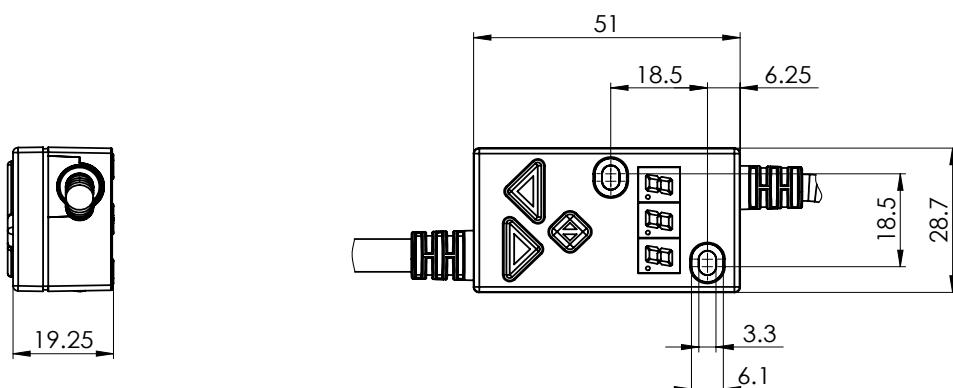
Amplifier with analogue interface

ELECTRICAL SPECIFICATIONS

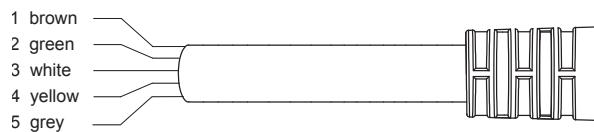
Protection class	IP 67 acc. to EN 60 529	Dither	Frequency adjustable 4...500 Hz
Supply voltage	8...32 V	Factory setting 80 Hz	Factory setting 180 mA
Residual ripple	< +/- 5 %	Level adjustable 0...400 mA	< 1 % at $\Delta T = 40^\circ\text{C}$
Fuse	low	Digital inputs	1 input high-active, no pull-up/down
No-load current	approx. 20 mA	Temperature drift	Switching threshold high 6...32 VDC
Max. current consumption	No-load current + 2,5 A per solenoid	Digital inputs	Switching threshold low 0...1 VDC
Analogue input	1 input non-differential Voltage / current (switchable by means of parameter) 0...+/- 10V or 0/4...20mA	USB interface	Usable as frequency input (frequency 5...5000 Hz) and as PWM input (automatic frequency recognition)
Resolution	10-Bit	EMV	Via digital input
Input resistance	Voltage input >100 k Ω (Input current < 5 mA)	Immunity	Requires the Wandfluh USB adapter
Stabilised output voltage	Load for current input = 124 Ω 5 VDC max. load 20 mA	Emission	EN 61 000-6-2 EN 61 000-6-4
<i>Solenoid current:</i>			
• Minimal current I_{\min}	Adjustable 0... I_{\max} mA Factory setting 150 mA		
• Maximal current I_{\max}	Adjustable $I_{\min}\dots 2450$ mA Factory setting 700 mA		

BLOCK DIAGRAM



DIMENSIONS

CONNECTOR ASSIGNMENT

Connection cable (X1)



- 1 = + VCC
- 2 = Command value
- 3 = Dig Inp
- 4 = Stab out
- 5 = GND

START-UP

Information regarding installation and commissioning are contained in the information leaflet supplied with the amplifier electronics and in the operating instructions.

Additional information can be found on our website:
www.wandfluh.com

Free-of-charge download:

- «PASO-PD2» Parameterisation software
- Operating instruction (*.pdf)

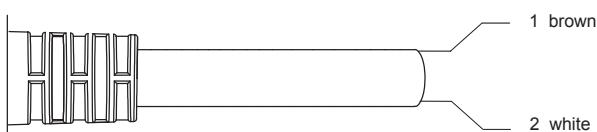
PARAMETER SETTINGS

The PD2 electronics have push-buttons and a 7 segment display which enable setting the most important parameters. In addition, the digital input can be used as a communication interface, through which, by means of the parameterisation software "PASO-PD2", the complete parameterisation and diagnostics can be carried out. For this, the Wandfluh USB-PD2 adapter is required. (not included in the delivery)

Attention: During the communication, the digital input cannot be used.

FUNCTION DESCRIPTION

Solenoid cable (X2)



- 1 = Solenoid +
- 2 = Solenoid -

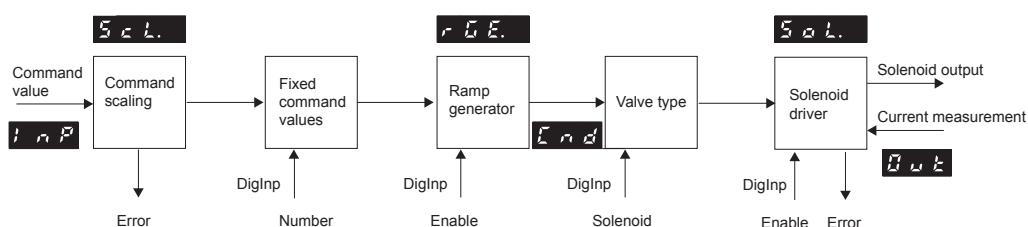
ADDITIONAL INFORMATION

Wandfluh electronics general	Wandfluh documentation-register	1.13
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Proportional spool valve	register	1.10
Proportional pressure valves	register	2.3
Proportional flow control valves	register	2.6

ACCESSORIES

USB-adapter PD2 incl. USB-cable, type A-B 1.8 m (for parameterisation via PASO)	Article no. 726.9900
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PD2-AMPLIFIER WITH ANALOGUE INTERFACE

Command value scaling

The command value can be applied as a voltage, current, digital, frequency or PWM signal. The scaling takes place via the parameter „Interface“. Furthermore, the command value can be monitored for a cable break. A dead band can also be set.

Fixed command value

There is 1 fixed command value available, which can be selected via the digital input. This function has to be configured before in PASO.

Ramp generator

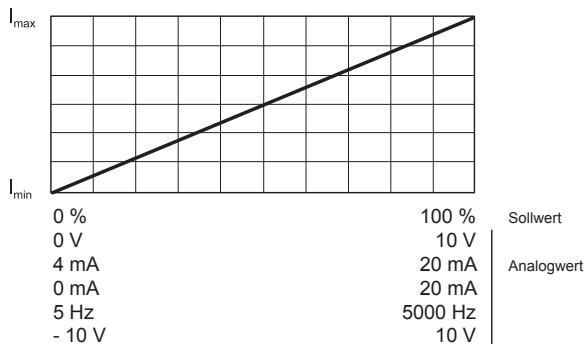
Two linear ramps for up and down are available which can be adjusted separately.

Valve type

Adjustment possibilities: switching solenoid or proportional solenoid.

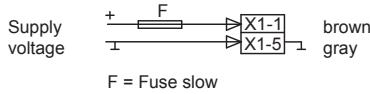
Mode of operation „Command value unipolar/bipolar (1-Sol)

Dependent on a command value signal (voltage, current, digital, frequency or PWM), the solenoid is driven (e.g. 0...10V correspond to 0...100 % command value, 0...+100 % command value correspond to Imin...Imax solenoid driver)

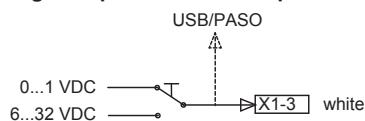


CONNECTION EXAMPLES

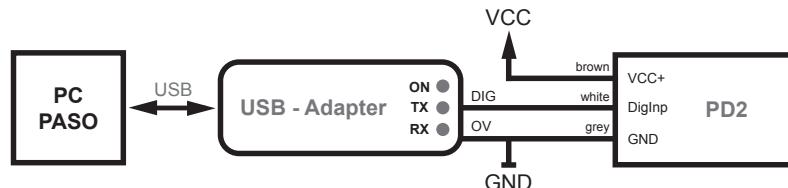
Supply voltage



Digital input as function input



Digital input as USB interface



Signal recording

Furthermore, the „PD2“ amplifier electronics have a signal recording function. This, by means of PASO, enables the recording of various system signals, such as command value, solenoid current, etc., which can be represented on a common time axis.

Solenoid driver

A Pulse-Width-Modulated current output is available. A dither signal is superimposed, whereby the dither frequency and the dither level are separately adjustable. The minimum (Imin) and maximum (Imax) current can be adjusted. The solenoid output can also be configurated as switching solenoid output. In this case, a power reduction can be adjusted.

Optimisation of characteristic curve

An adjustable characteristic curve „Command value input – solenoid current output“ enables an optimised (e.g. linearised) characteristic of the hydraulic system.

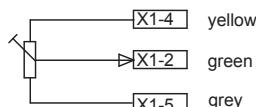
Channel enabling

As per factory setting, the device is enabled („on“). This „enable channel“ can be set to „on“, „off“ or „external“ (digital input) via PASO or via menu item.

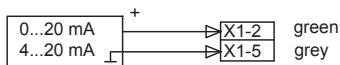
Hints:

Digital input: if not wired, the state of the digital input is not defined
 Analogue input: if not wired, the voltage input will read 1.11 V constantly.

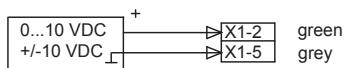
Analogue input with potentiometer



Analogue input current with external current source



Analogue input voltage with external voltage source

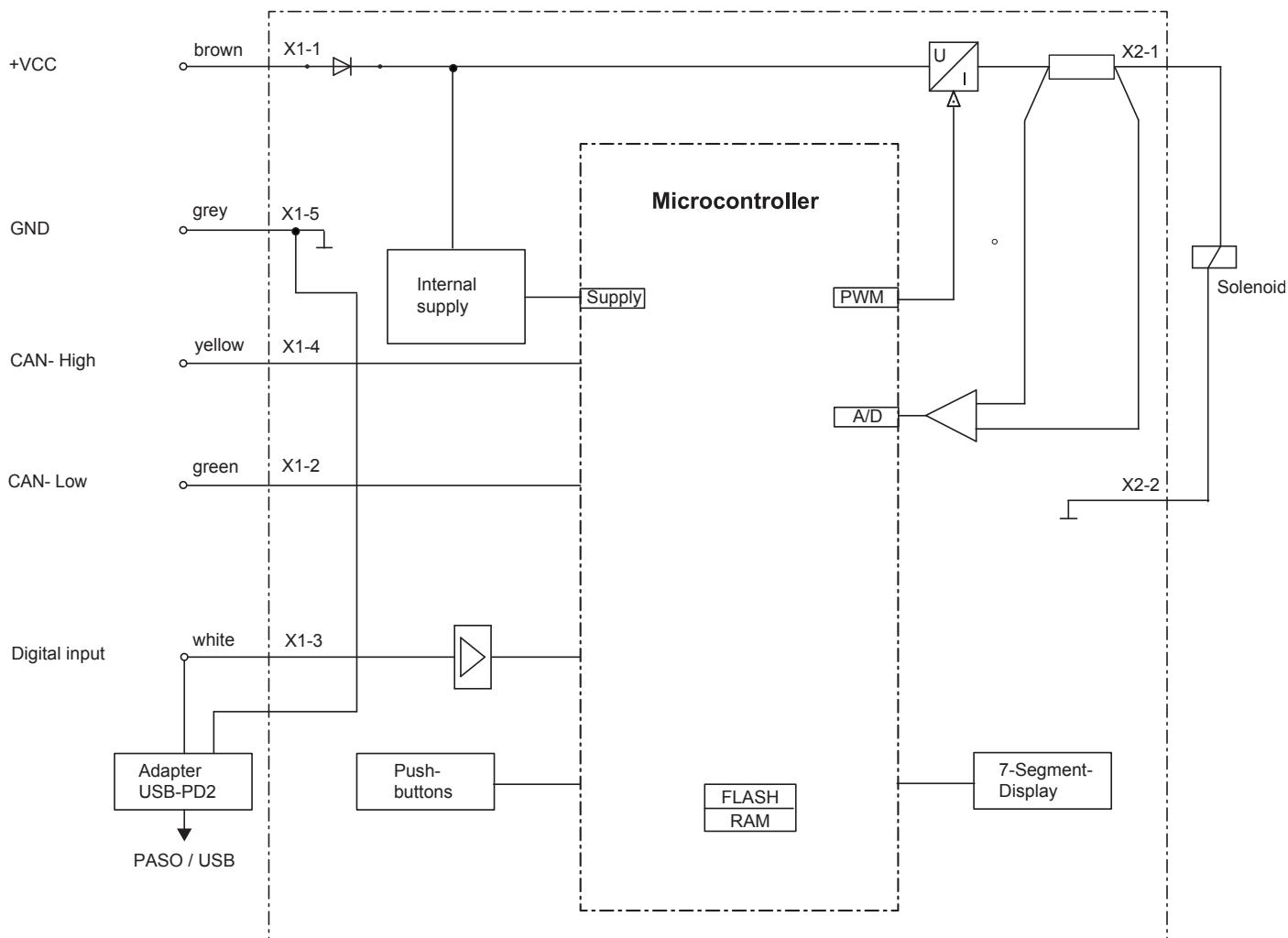


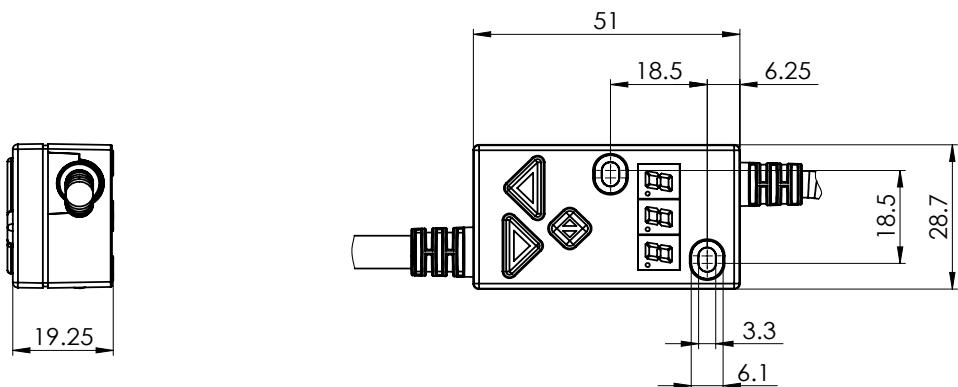
Amplifier with CANopen interface

ELECTRICAL SPECIFICATIONS

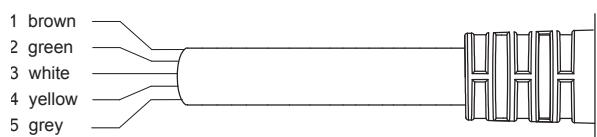
Protection class	IP 67 acc. to EN 60 529	Temperature drift	<1 % at $\Delta T = 40^\circ\text{C}$
Supply voltage	8...32 V	Digital inputs	1 input high-active, no pull-up/down
Residual ripple	< +/-5 %		Switching threshold high 6...32 VDC
Fuse	low		Switching threshold low 0...1 VDC
No-load current	approx. 20 mA		Usable as frequency input
Max. current consumption	No-load current + 2,5 A per solenoid		(frequency 5...5000 Hz) and as PWM input (automatic frequency recognition)
Solenoid current:		USB interface	Via digital input
• Minimal current I_{\min}	Adjustable 0... I_{\max} mA Factory setting 150 mA	EMV	Requires the Wandfluh USB adapter
• Maximal current I_{\max}	Adjustable I_{\min} ...2450 mA Factory setting 700 mA	Immunity	EN 61 000-6-2
Dither	Frequency adjustable 4...500Hz Factory setting 80Hz Level adjustable 0...400 mA Factory setting 180mA	Emission	EN 61 000-6-4

BLOCK DIAGRAM



DIMENSIONS

CONNECTOR ASSIGNMENT

Connection cable (X1)



- 1 = + VCC
- 2 = CAN-Low
- 3 = Dig Inp
- 4 = CAN-High
- 5 = GND

START-UP

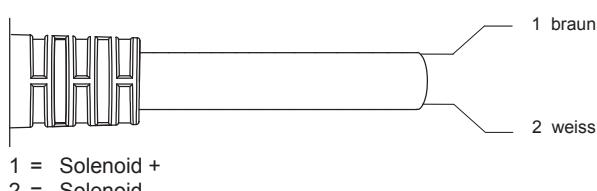
Information regarding installation and commissioning are contained in the information leaflet supplied with the amplifier electronics and in the operating instructions.

Additional information can be found on our website:
www.wandfluh.com

Free-of-charge download:

- «PASO-PD2» Parameterisation software
- Operating instruction (*.pdf)

Solenoid cable (X2)



- 1 = Solenoid +
- 2 = Solenoid -

ADDITIONAL INFORMATION

Wandfluh electronics general

Wandfluh documentation-register 1.13

Proportional spool valve

register 1.10

Proportional pressure valves

register 2.3

Proportional flow control valves

register 2.6

ACCESSORIES

USB-adapter PD2

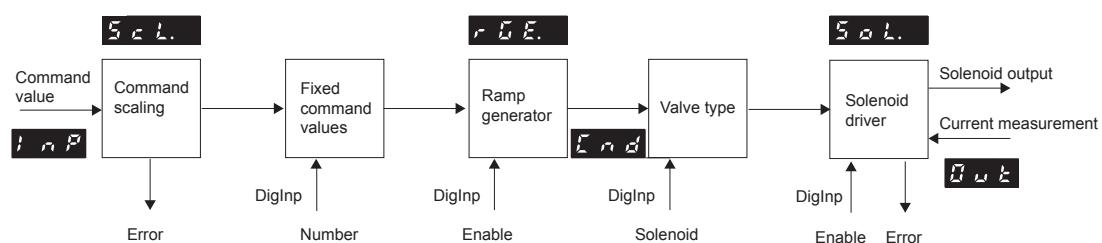
Article no. 726.9900

 incl. USB-cable, type A-B, 1,8 m
 (for parameterisation via PASO)

PARAMETER SETTINGS

The PD2 electronics have push-buttons and a 7 segment display which enable setting the most important parameters. In addition, the digital input can be used as a communication interface, through which, by means of the parameterisation software „PASO-PD2“, the complete parameterisation and diagnostics can be carried out. For this, the Wandfluh USB-PD2 adapter is required. (not included in the delivery)

Attention: During the communication, the digital input cannot be used.

FUNCTION DESCRIPTION


PD2-AMPLIFIER WITH CANopen INTERFACE

Command value scaling

The command value can be applied as a CAN-bus-, digital, frequency or PWM signal. The scaling takes place via the parameter „Interface“. Furthermore, the command value can be monitored for a cable break. A dead band can also be set.

Fixed command value

There is 1 fixed command value available, which can be selected via the digital input. This function has to be configurated before in PASO.

Ramp generator

Two linear ramps for up and down are available which can be adjusted separately.

Valve type

Adjustment possibilities: switching solenoid or proportional solenoid.

Mode of operation „Command value unipolar/bipolar (1-Sol)

Dependent on a command value signal (CAN-bus, digital, frequency or PWM), the solenoid is driven (e.g. 0....16383 CAN-command correspond to 0....100 % command value, 0....+100 % command value correspond to Imin....Imax solenoid driver)

Signal recording

Furthermore, the „PD2“ amplifier electronics have a signal recording function. This, by means of PASO, enables the recording of various system signals, such as command value, solenoid current, etc., which can be represented on a common time axis.

Solenoid driver

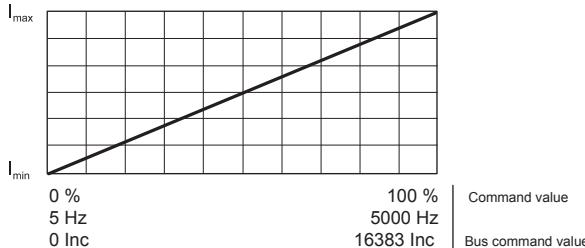
A Pulse-Width-Modulated current output is available. A dither signal is superimposed, whereby the dither frequency and the dither level are separately adjustable. The minimum (Imin) and maximum (Imax) current can be adjusted. The solenoid output can also be configurated as switching solenoid output. In this case, a power reduction can be adjusted.

Optimisation of characteristic curve

An adjustable characteristic curve „Command value input – solenoid current output“ enables an optimised (e.g. linearised) characteristic of the hydraulic system.

Channel enabling

As per factory setting, the device can be enabled via CAN-bus. This „enable channel“ can be set to „bus“, „on“, „off“ or „external“ (digital input) via PASO or via menu item.

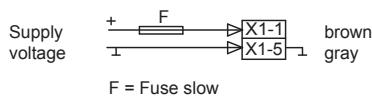


Hint:

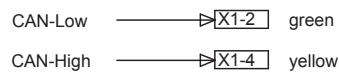
Digital input: if not wired, the state of the digital input is not defined

CONNECTION EXAMPLES

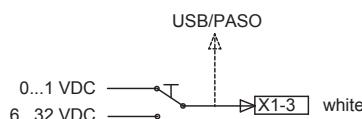
Supply voltage



CAN connection



Digital input as function input



Digital input as USB interface

