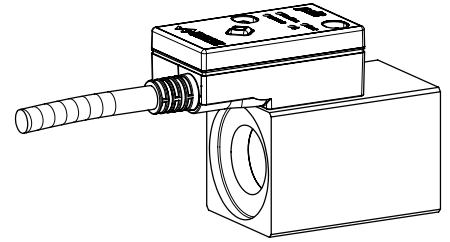## Solenoid coil acc. to VDE 0580
- **With integrated amplifier electronics PD3**
- **Protection class IP 67**
- **Interface:** - IO-Link (with Master Typ B)
  - Analogue
- **Adjustable via Bluetooth by means of the Wandfluh App**

DESCRIPTION

Solenoid coil with integrated amplifier electronics. Protection class is IP67. The electronics are fix mounted on the solenoid coil. The construction corresponds to standard VDE 0580. The steel housing is zinc nickel coated.

FUNCTION

The electronics has a Pulse-Width-Modulated current output. The solenoid output can also be parameterised for switching solenoids. The parameterisation is made via Bluetooth by means of the Wandfluh App.

APPLICATION

Due to its water spray resistant execution, the solenoid coil is suitable for most diverse applications.

It can be used on all proprtional valves with 19 mm, 23 mm resp. 31 mm armature tube diameters.

Easy connecting enables assembly and commissioning with conventional tools. All settings can be carried out easily and quickly.

TYPE CODE

$$\text{M T} \square - \text{P 1} - \square - \boxed{} \# \square$$

Metal housing square

Integrated amplifier electronics PD3

Coil execution
Square 35 mm	S35/19x50	Square 60 mm	S60/31x72
Square 45 mm	S45/23x50	Square 60 mm	A60/31x72 *

Connection cable
away from the solenoid

1-solenoid execution

Nominal voltage U_N 12 VDC   12
                         24 VDC   24

IO-Link   I1
Analogue input   voltage / current (0...5 V factory preset)   A1

Design index (subject to change)

* only for proportional spool valve NG10

GENERAL SPECIFICATIONS

Connections	Connection cable	with M12 connector (male) 5 pole length = 1,5 m

Dimensions   See drawing on page 3
Ambient temperature   -20...+85 °C (Derating, see Operating Instructions PD3)
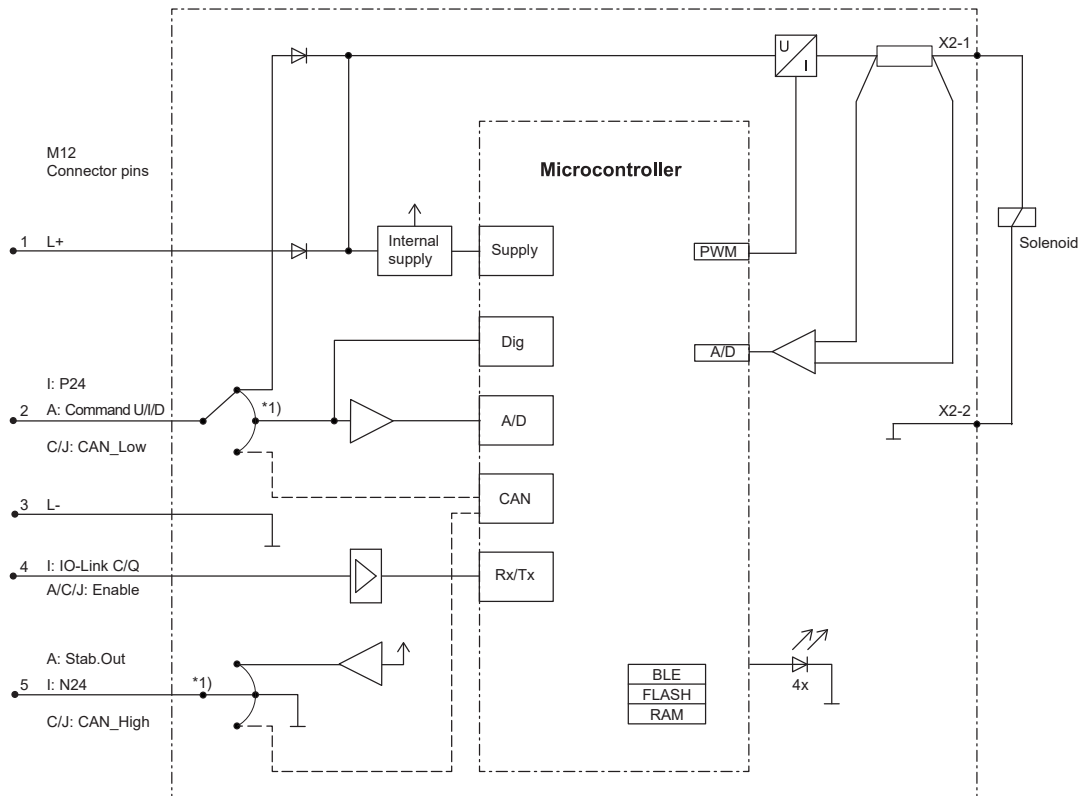
SAFE OPERATION

Caution: To avoid overheating the coil may only be energised when mounted on an armature tube and valve.

Note: For maximum power development the coil has to be installed in its preferred direction. A reversed installation can lead to lower hydraulic values.
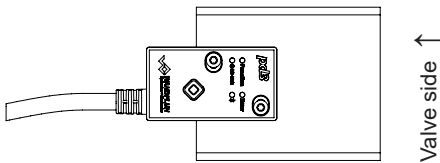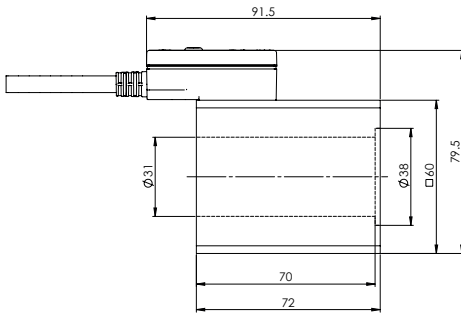
Amplifier with analogue interface

ELECTRICAL SPECIFICATIONS

Protection class	IP67 acc. to EN 60 529	Dither	Frequency adjustable 4…500 Hz
Supply voltage	IO-Link: 24 V (18..30V), analogue: 8..32V		Factory setting 80 Hz
Residual ripple	< 1.3 Vpp		Level adjustable 0…400 mA
Fuse	Low		Factory setting 180 mA
No-load current	Approx. 30 mA	Temperature drift	<1 % bei $\Delta T = 40\,°C$
Max. current consumption	No-load current + 2,5 A per solenoid	Enable input	1 input high-active
			Switching threshold high 1/2 VCC +2V
Command value input	1 input non-differential		Switching threshold low 1/2 VCC -2V
	Voltage / current (switchable by means of parameter)	IO-Link interface	Data line C/Q, COM2 = 38,4 kBaud
	0...+ 10V or 0/4...20mA		Use master type B
	Usable as frequency input	Bluetooth	Low Energy with access protection
	(frequency 5...5000 Hz) or as PWM input		Contains FCC ID: QOQ11
	(automatic frequency detection) or digital	Fieldbus (option)	CANopen (on request)
	dig. switching threshold high >3V		J1939 (on request)
	dig. switching threshold low <0.8V	LEDs	Function green
Resolution	12-bit		Bluetooth blue
Input resistance	Voltage input >100 kΩ		IO-Link green
	Load for current input = 124 Ω		Error red
Stabilised output voltage	5 VDC	Supply solenoid	with IO-Link
	max. load 20 mA		galvanically separated via P24/N24
Solenoid current:		EMV	2014/53/EU (Radio Equipment Directive)
• Minimal current I_{min}	Adjustable 0…I_{max} mA		ETSI EN 300 328
	Factory setting 50 mA		47 CFR, Part 15 / ICES-003
• Maximal current I_{max}	Adjustable I_{min} ...2500 mA		ETSI EN 301 489-1 / 301 489-17
	MTS35/19x50-..-12, Factory setting 1360 mA	Immunity	EN 61 000-6-2
	MTS35/19x50-..-24, Factory setting 680 mA	Emission	EN 61 000-6-4
	MTS45/23x50-..-12, Factory setting 1490 mA		
	MTS45/23x50-..-24, Factory setting 780 mA		
	MTS60/31x72-..-12, Factory setting 2290 mA		
	MTA60/31x72-..-12, Factory setting 2290 mA		
	MTS60/31x72-..-24, Factory setting 1140 mA		
	MTA60/31x72-..-24, Factory setting 1140 mA		

BLOCK DIAGRAM

*1) fix selection according to type code

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Postfach Fax +41 33 672 72 12 Internet: www.wandfluh.com *Data subject to change* **1.1-332E** 2/4
CH-3714 Frutigen Edition 21 01

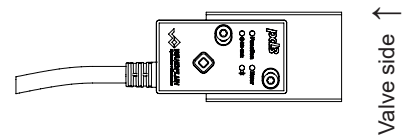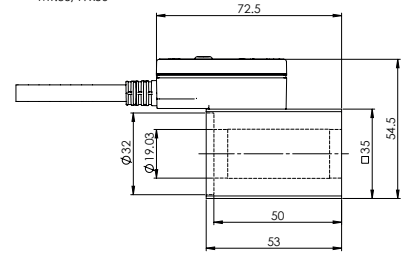## DIMENSIONS

MT.60/31x72

MT.45/23x50

MT.35/19x50

Valve side
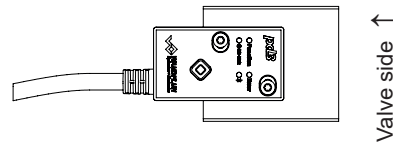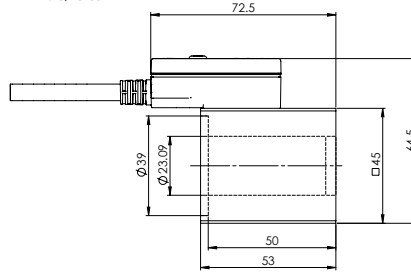
CONNECTOR ASSIGNMENT

Valve connection cable (X1)
With mounted M12 connector
5 pole male A coded
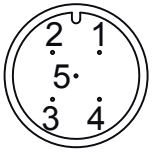
		Typ analogue	**Typ I/O-Link**
1	(brown)	Supply voltage VCC +	L+ supply voltage +
2	(green)	Command value signal	P24/2L+ additional supply +
3	(grey)	Supply 0 VDC/GND	L-supply 0 VDC/GND
4	(white)	Digital input	C/Q
5	(yellow)	Stabilised output voltage*	N24/2L-additional supply 0 VDC

*Caution: Some M12 distributor boxes have the earth connection on pin 5 → Short-circuit hazard!

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:
• Operating instruction (*.pdf)
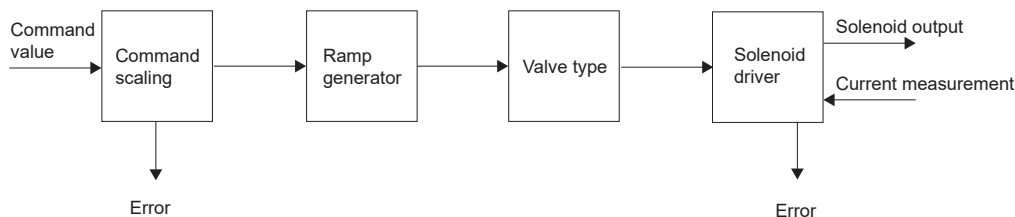• Wandfluh App for Android (Google Play) and iOS (App Store)

ADDITIONAL INFORMATION

	Wandfluh documentation	
Wandfluh electronics general	register	1.13
Digital amplifier electronics PD3	register	1.13-66
Proportional spool valves	register	1.10
Proportional pressure valves	register	2.3
Proportional flow control valves	register	2.6

ADJUSTMENTS

The PD3 electronics has a Bluetooth interface. Via the Wandfluh App, the PD3 functions can be analysed and all parameters set.

FUNCTION DESCRIPTION

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Postfach   Fax +41 33 672 72 12   Internet: www.wandfluh.com   *Data subject to change*   **1.1-332E** 3/4
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PD3-AMPLIFIER

Command value scaling
Type IO-Link: The command value can only be specified via IO-Link.
Type analogue: The command value can be specified as a voltage, current, digital, frequency or PWM signal.

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 (IO-Link, voltage, current, digital, frequency or PWM), the solenoid is controlled (e.g. 0….10V correspond to 0….100 % command value, which again corresponds to Imin….Imax solenoid driver).
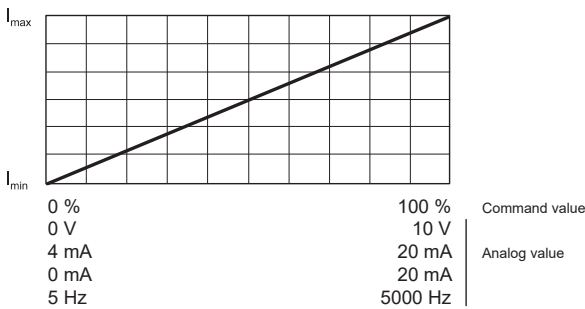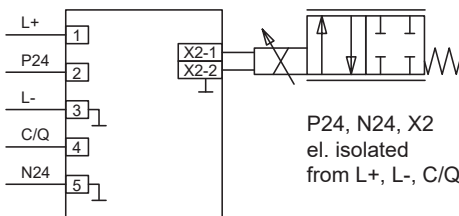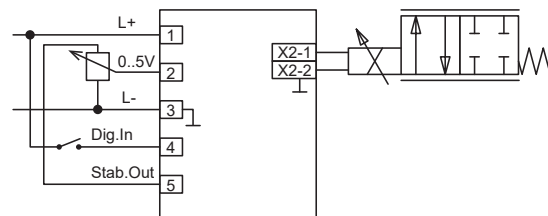
Solenoid driver
A Pulse-Width-Modulated current output is available. A dither signal is superimposed, whereby the dither frequency and the dither level are separately adjustable. The minimum (Imin) and maximum (Imax) current can be adjusted. The solenoid output can also be configured as switching solenoid output. In this case, a power reduction can be adjusted.

Channel enabling
Enable can be configured by means of the App:
• on
• off
• external (enable input with type analogue)
• bus (with type IO-Link)

0 %	100 %	Command value
0 V	10 V	
4 mA	20 mA	Analog value
0 mA	20 mA	
5 Hz	5000 Hz	

CONNECTION EXAMPLES

Connection example IO-Link

P24, N24, X2
el. isolated
from L+, L-, C/Q

Connection example analogue with stabilised output

WANDFLUH APP