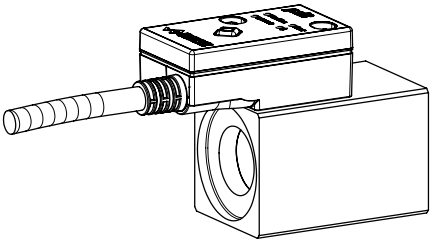
Solenoid coil acc. to VDE 0580
- **With integrated amplifier electronics PD3**
- **Protection class IP 67**
- **Interface: - IO-Link (with Master Typ B)**
  - Analogue
- **Adjustable via Bluetooth by means of the Wandfluh App**



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

M T ☐ - P 1 - ☐ - ☐ # ☐

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.

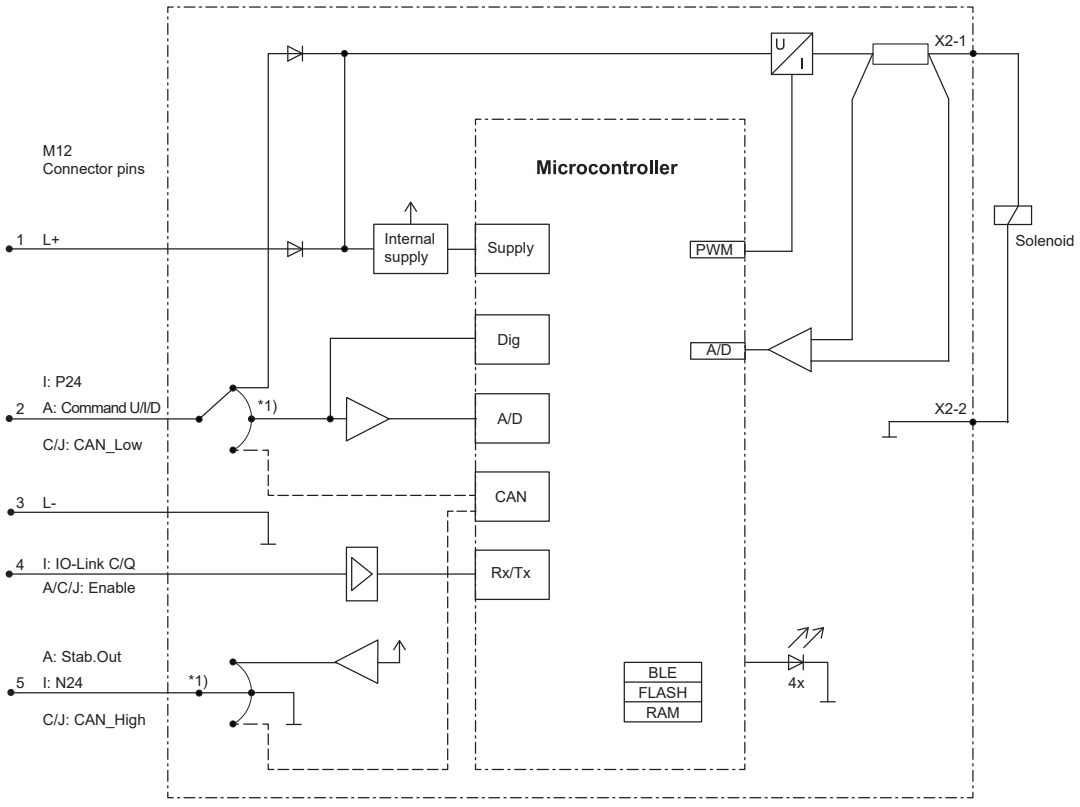
Amplifier with analogue interface

ELECTRICAL SPECIFICATIONS

Protection class	IP 67 acc. to EN 60 529
Supply voltage	IO-Link: 24 V (18..30V), analogue: 8..32V
Residual ripple	< 1.3 Vpp
Fuse	Low
No-load current	Approx. 30 mA
Max. current consumption	No-load current + 2,5 A per solenoid
Command value input	1 input non-differential Voltage / current (switchable by means of parameter) 0...+ 10V or 0/4...20mA Usable as frequency input (frequency 5...5000 Hz) or as PWM input (automatic frequency detection) or digital dig. switching threshold high >3V dig. switching threshold low <0.8V
Resolution	12-bit
Input resistance	Voltage input >100 kΩ Load for current input = 124 Ω
Stabilised output voltage	5 VDC max. load 20 mA
Solenoid current:	
• Minimal current I_{min}	Adjustable 0…I_{max} mA Factory setting 50 mA
• Maximal current I_{max}	Adjustable I_{min} ...2500 mA MTS35/19x50-..-12, Factory setting 1360 mA MTS35/19x50-..-24, Factory setting 680 mA 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

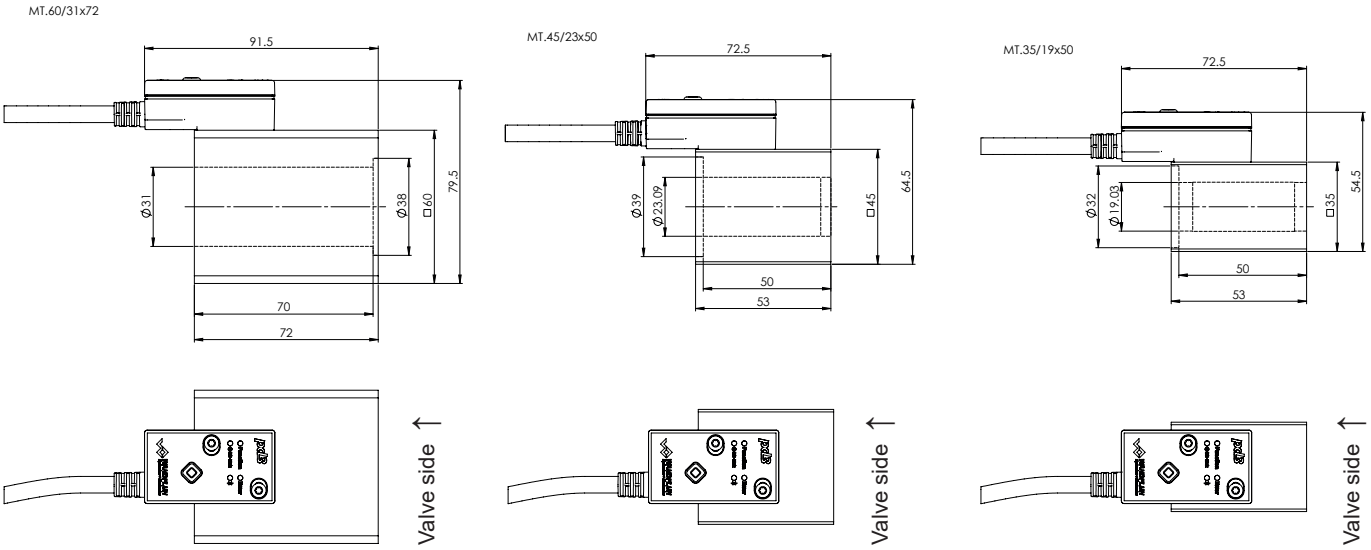
Dither	Frequency adjustable 4…500 Hz Factory setting 80 Hz Level adjustable 0…400 mA Factory setting 180 mA
Temperature drift	<1 % bei ΔT = 40 °C
Enable input	1 input high-active Switching threshold high 1/2 VCC +2V Switching threshold low 1/2 VCC -2V
Ramps	Adjustable 0…500 s
IO-Link interface	Data line C/Q, COM2 = 38,4 kBaud Use master type B
Bluetooth	Low Energy with access protection Contains FCC ID: QOQ11
Fieldbus (option)	CANopen (on request) J1939 (on request)
LEDs	Function green Bluetooth blue IO-Link green Error red
Supply solenoid	with IO-Link galvanically separated via P24/N24
EMV	2014/53/EU (Radio Equipment Directive) ETSI EN 300 328 47 CFR, Part 15 / ICES-003 ETSI EN 301 489-1 / 301 489-17
Immunity	EN 61 000-6-2
Emission	EN 61 000-6-4

BLOCK DIAGRAM



*1) fix selection according to type code

DIMENSIONS



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)

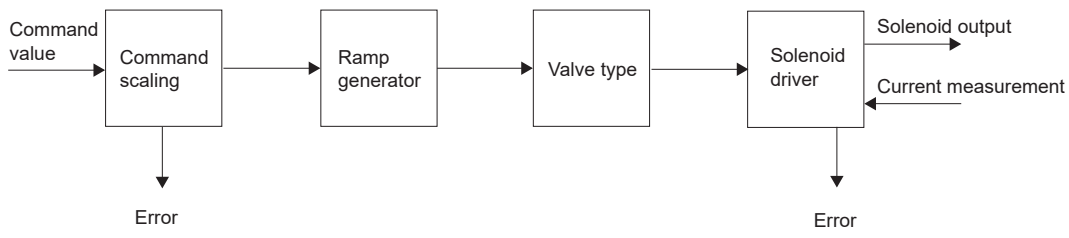
ADDITIONAL INFORMATION

	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



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.

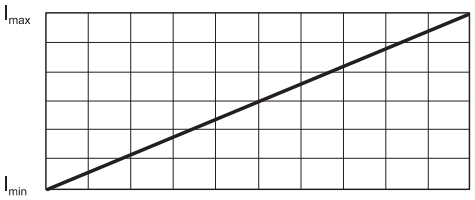
Ramp generator
Two linear ramps for up and down are available which can be adjusted separately.

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 configurated as switching solenoid output. In this case, a power reduction can be adjusted.

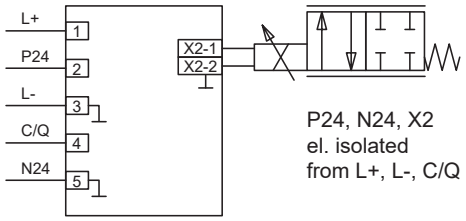
Channel enabling
Enable can be configurated by means of the App:
• on
• off
• external (enable input with type analogue)
• bus (with type IO-Link)



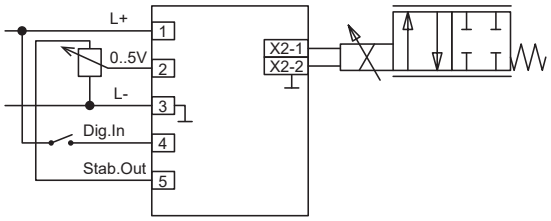
0 %	100 %	Command value
0 V	10 V	Analog value
4 mA	20 mA	
0 mA	20 mA	
5 Hz	5000 Hz	

CONNECTION EXAMPLES

Connection example IO-Link



Connection example analogue with stabilised output



WANDFLUH APP

Download on the App Store

ANDROID APP ON Google play