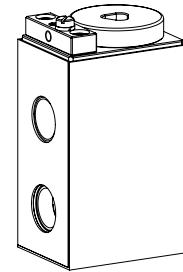


**Solenoid coil MKY45/18x60**  
**For explosion-hazard zones**  
**Protection class IP65/66/67**  
**Surface AISI 316L**  
**Optional with integrated amplifier electronics**

**Ex db IIC T6, T4 Gb**  
**Ex tb IIIC T80°C, T130°C Db**  
**Ex db I Mb**

 **II 2 G Ex db IIC T6, T4**  
 **II 2 D Ex tb IIIC T80°C, T130°C**  
 **I M2 Ex db I Mb**



#### DESCRIPTION

##### For explosion-hazard zones

Solenoid coil for explosion-hazard zones. The flameproof enclosures prevents an explosion in the interior from getting outside. The design prevents a surface temperature capable of igniting. The steel housing is AISI 316L. Optional with integrated amplifier electronics.

#### FUNCTION

In combination with an armature tube, the function of a switching solenoid or of a proportional solenoid results. Solenoid coils in AC - construction have an integrated rectifier. All cable threaded joints certified for this explosion protection class with a protection class of at least IP65 can be used. The optional amplifier electronics have an analogue interface and can be adjusted by means of push-buttons and 7 segment display or by means of the parameterisation software PASO.

#### APPLICATION

The solenoid coil is suitable for use in all explosion-hazard zones, open cast and also in mines.

This signifies, that the coils are certified for applications in zones with explosion-hazard gas, steam, vapour, air and dust mixtures of the zones 1/21 and 2/22.

Valves for explosion-hazard zones are utilised in:

- the shipping- and offshore industrie
- the oil- and gas industries
- the chemical industry
- wood processing
- grain mills
- the mining application

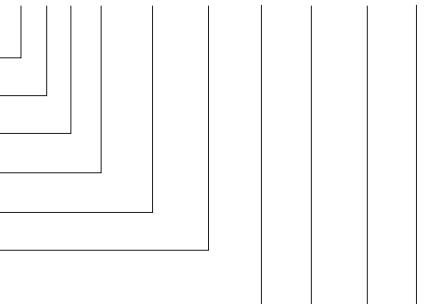
#### CERTIFICATES

in accordance with	Surface gas and dust				Mining
	Standard -25 °C to...	M224 -40 °C to...	M238 -60 °C to...	Amplifie M248	
ATEX / UKEX	x	x	x	x	x
IECEx	x	x	x	x	x
EAC (GOST Ex)	x	x	x	x	x
CCC	x	x	x	x	x

#### TYPE CODE

M K Y 45 / 18 x 60 -  /  - K9 -  #

Mobile execution, metal housing



Terminal box without cable

Explosion proof version Ex d

Housing width 45 mm

Internal coil diameter 18 mm

Coil length 60 mm

Nominal voltage U <sub>N</sub>	12 VDC <input type="checkbox" value="G 12"/>	115 VAC <input type="checkbox" value="R 115"/>
	24 VDC <input type="checkbox" value="G 24"/>	230 VAC <input type="checkbox" value="R 230"/>

Nominal power P<sub>N</sub> 6 W  9 W  15 W  21 W

#### Surface

Temperature range	-25°C to ... -40°C to ... -60°C to ...	<input type="checkbox" value="M224"/> <input type="checkbox" value="M238"/> <input type="checkbox" value="M248"/>
Function	Amplifie	<input type="checkbox" value="M248"/> only G12 or G24 / up to max. L15 not for M224 and M238
	Freewheel diode	<input type="checkbox" value="M256"/> do not use for proportional functions
	Bipolar protecting diode	<input type="checkbox" value="M264"/> only G24
	Power reduction	<input type="checkbox" value="M272"/> only L6

Design-Index (Subject to change)

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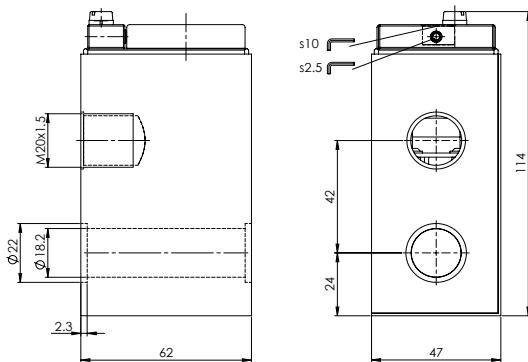
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Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

**DIMENSIONS**

without amplifier electronic


**CHARACTERISTICS**

Coil winding isolation class H

Protection class

acc. to EN 60529 IP65/66/67, with corresponding cable gland and correct installation

Relative duty factor 100 % DF, combined with armature tube and valve

Reference temperature

**Execution L6 / L9:**

-25...+40 °C (operation as T1...T6/T80 °C)  
-25...+90 °C (operation as T1...T4/T130 °C)

**Execution L15:**

Temperature range „-25° to ...“  
-25...+70 °C (operation as T1...T4/T130 °C)  
Temperature range „-40° to ...“  
-40...+70 °C (operation as T1...T4/T130 °C)  
Temperature range „-60° to ...“  
-60...+70 °C (operation as T1...T4/T130 °C)

**Execution L 21:**

-25...+60 °C (operation as T1...T4/T130 °C)  
Steel housing AISI 316L  
max. 95 % (not dew-forming)  
Salt spray test in accordance with EN ISO 9227 > = 2000 hours

Housing

Relative humidity factor  
Corrosion protection

Maximum operating voltage

Nominal voltage +10%  
in acc. with name plate ±2%

Nominal frequency  
Standard nominal voltages

U<sub>N</sub> = 12 VDC  
U<sub>N</sub> = 24 VDC  
U<sub>N</sub> = 115 VAC  
U<sub>N</sub> = 230 VAC

Other nominal voltages in the ranges of 12–230 VDC and 24–230 VAC on request

Standard nominal powers

P<sub>N</sub> = 6 W with M272 P<sub>R</sub> = 3,8 W  
P<sub>N</sub> = 9 W  
P<sub>N</sub> = 15 W  
P<sub>N</sub> = 21 W

**12 VDC**

	6	9	15	21
Nominal power (W)	24,75	16,5	9,9	7,1
Nominal resistance (Ω)	1000	1600	2500	4000
Recommended rated current for fuse inserts (mA)				
Limiting current (mA)	400	610	960	1230
(Proportional function)				

**24 VDC**

	6	9	15	21
Nominal power (W)	98,5	64	38,5	27,5
Nominal resistance (Ω)	400	800	1250	2000
Recommended rated current for fuse inserts (mA)				
Limiting current (mA)	200	300	450	600
(Proportional function)				

**115 VAC**

	6	9	15	21
Nominal power (W)	1840	1180	700	500
Nominal resistance (Ω)	100	200	315	400
Recommended rated current for fuse inserts (mA)				

**230 VAC**

	6	9	15	21
Nominal power (W)	7280	4750	2850	2050
Nominal resistance (Ω)	100	100	160	200
Recommended rated current for fuse inserts (mA)				

M272 reduces the nominal power (P<sub>N</sub>) after 500ms to a reduced power (P<sub>R</sub>)

**OPERATION SECURITY**

The solenoid coil must only be put into operation, if the requirements of the operating instructions supplied are observed to their full extent.

In case of non-observance, no liability can be assumed.



A corresponding fuse in accordance with its design current has to be connected in series as short-circuit protection for every solenoid coil.

**INSTALLATION**

For stack assembly please observe the remarks in the operating instructions.

## With amplifier electronics and with analogue interface

### Digital amplifier electronics to MKY...M248

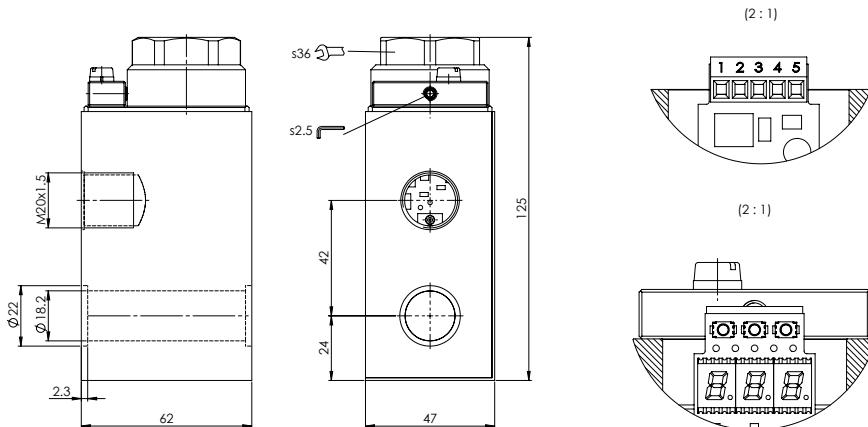
- Electronics integrated in solenoid housing
- For proportional or switching valves
- Screw terminals for simple assembly
- 1 analogue input
- 1 digital input
- Adjustable with push-buttons and display directly on the device or via PC

### ELECTRICAL SPECIFICATIONS

Supply voltage	G12: 12 V +10%, G24: 24 V +10%	G24/L9 Adjustable $I_{min} \dots 510$ mA
Residual ripple	< +/-5%	Factory setting 300 mA
Fuse	low	G12/L9 Adjustable $I_{min} \dots 685$ mA
No-load current	approx. 20 mA	Factory setting 610 mA
Max. current consumption	No-load current + limiting current of the solenoid	Frequency adjustable 4...500 Hz
Analogue input	1 input non-differential Voltage / current (switchable by means of parameter) 0...+/- 10V or 0/4...20mA	Factory setting 80 Hz
Resolution	10-Bit	Level adjustable 0...400 mA
Input resistance	Voltage input >100 k $\Omega$ (Input current < 5 mA)	Factory setting 150 mA
Stabilised output voltage	Load for current input = 124 $\Omega$ 5 VDC max. load 20 mA	<1 % at $\Delta T = 40$ °C
Solenoid current:		1 input high-active, no pull-up/down
• Minimal current $I_{min}$	Adjustable 0... $I_{max}$ mA Factory setting 30 mA	Switching threshold high 6...32 VDC
• Maximal current $I_{max}$	G24/L15 Adjustable $I_{min} \dots 510$ mA Factory setting 450 mA G12/L15 Adjustable $I_{min} \dots 1020$ mA Factory setting 960 mA	Switching threshold low 0...1 VDC
		Usable as frequency input (frequency 5...5000 Hz) and as PWM input (automatic frequency recognition)
		Via digital input
		Requires the Wandfluh USB adapter PD2
		EN 61 000-6-2
		EN 61 000-6-4

### DIMENSIONS

with amplifier electronic

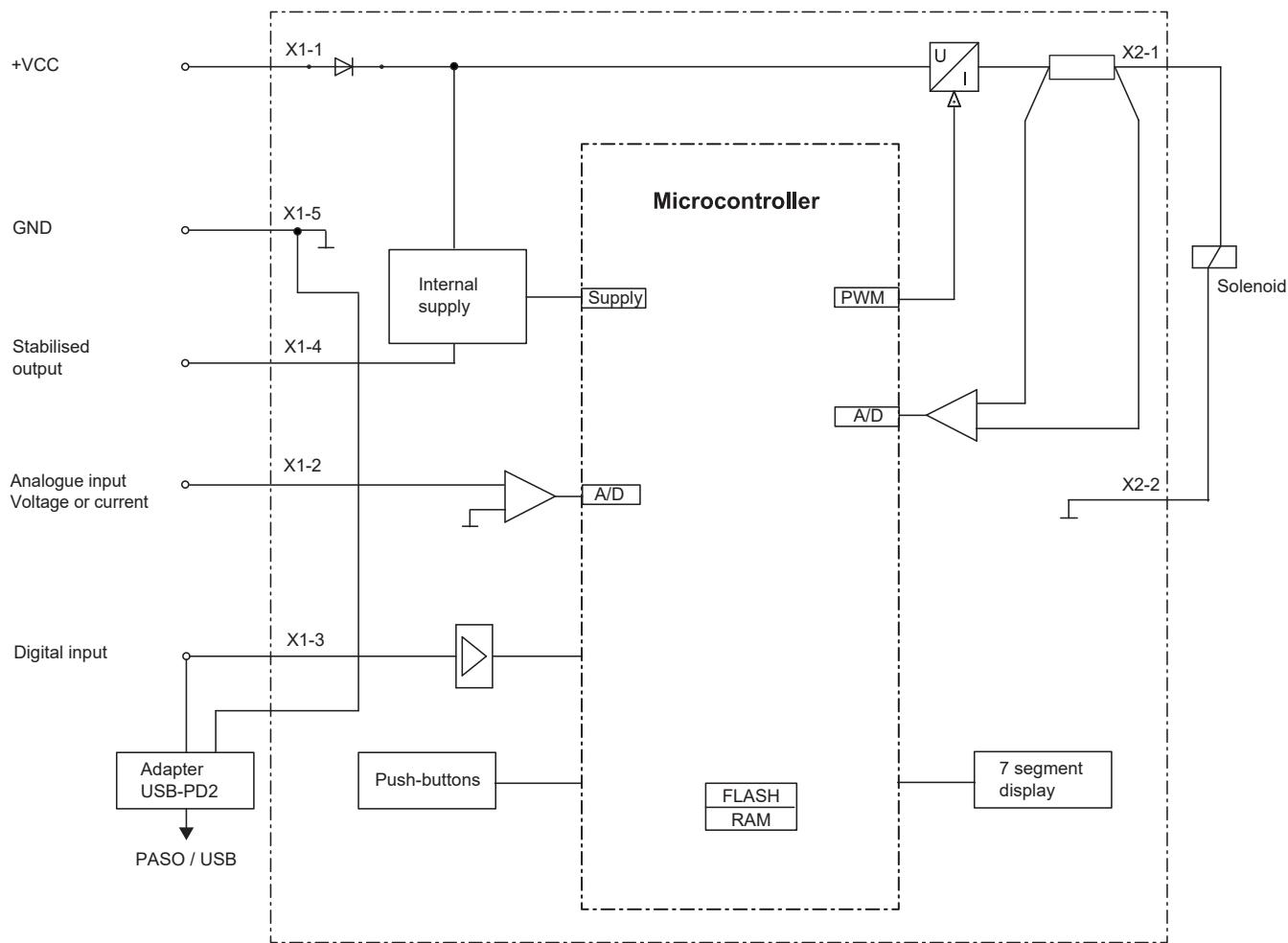


### CONNECTOR ASSIGNMENT (X1)

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

### GENERAL SPECIFICATIONS

- Execution
- Connections
- Screw terminal
- USB interface
- Electronics board built-in directly in solenoid housing
- 5-pole, max. 1.0 mm<sup>2</sup>  
via connection «Digital Input»,  
requires an additional Wandfluh adapter PD2

**BLOCK DIAGRAM**

**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**

Proportional spool valve	Wandfluh documentation register	1.10
Proportional pressure valves	register	2.3
Proportional flow control valves	register	2.6

Free-of-charge download:

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

**ACCESSORIES**

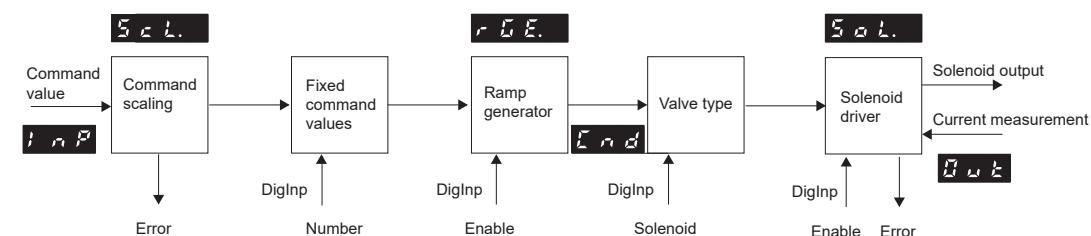
USB adapter PD2  
incl. USB cable, 1,8 m  
(for parameterisation via PASO)

Article no. 726.9900

**PARAMETER SETTINGS**

The MKY electronics have push-buttons and a 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.

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

**FUNCTION DESCRIPTION**


**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 configurated before in ASO.

**Ramp generator**

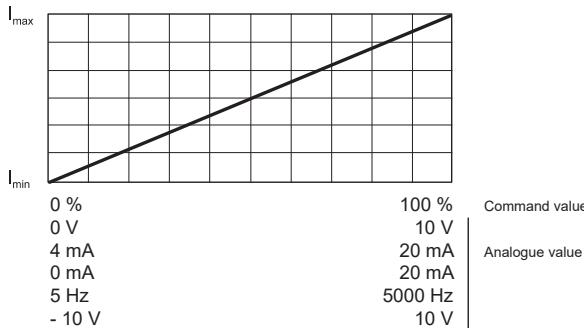
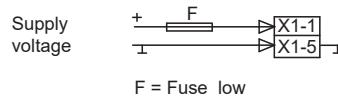
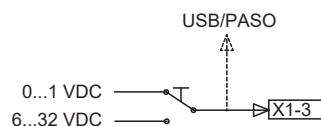
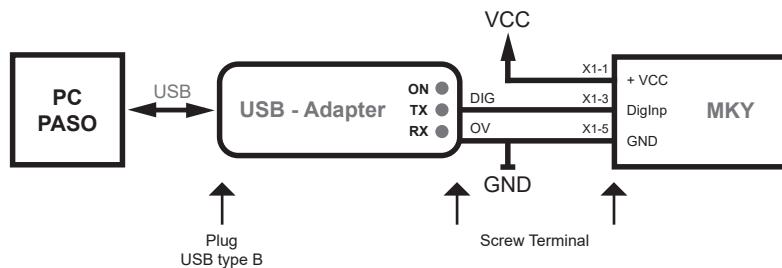
Two linear ramps for up and down are available which can be adjusted separately.

**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**

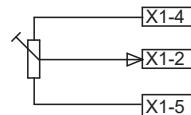
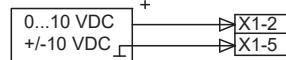
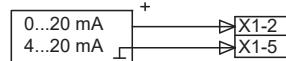
A Pulse-Width-Modulated current output is available. A dither signal is superimposed, whereby the dither frequency and the dither level are separately adjustable. The minimum (Imin) and maximum (Imax) current can be adjusted. The solenoid output can also be configurated as switching solenoid output.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

The device is enabled as per factory setting. Via PASO or menu item, the digital input can be configurated for enabling.

**Analogue input with potentiometer****Analogue input voltage with external voltage source****Analogue input current with external current source**

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