

**Proportional-amplifier**

- Plug amplifier for direct assembly on the valve
- Protection class IP65
- 24 and 12 VDC supply voltage
- Housing-types for solenoids from □ 29

**P02**  
 DIN 43 650  
 ISO 4400

**DESCRIPTION**

Proportional amplifier for direct assembly on the valve. Pin layout according to DIN 43650, Type A (ISO 4400) for solenoids from □ 29 or larger. Protection class of the plug amplifier is IP65, mounted according to DIN 40050. The connector cable is already mounted in the plug.

**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 pre-set value transmitters.

**APPLICATIONS**

The amplifier is suitable for different applications because of its splash water proof design. The easyness 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°.

**CONTENTS**

GENERAL SPECIFICATIONS.....	1
ELECTRICAL SPECIFICATIONS.....	1
BLOCK DIAGRAM.....	2
DIMENSIONS.....	2
MAX. AMBIENT TEMPERATURE .....	2
ADDITIONAL INFORMATIONS.....	2
START-UP .....	3

**TYPE CODE**

Plug	P	02	A	0	1	□	□	#	□
Type number									
Housing A for solenoids □ 29 or larger									
with cable connection									
1-solenoid version									
Supply voltage									
24 VDC	24 V proportional solenoid	D2							
12 VDC	12 V proportional solenoid	D3							
Preset value input 0...+ 8 VDC (only for 12 VDC)	3								
Preset value input 0...+ 10 VDC (only for 24 VDC)	4								
Design-Index (Subject to change)									

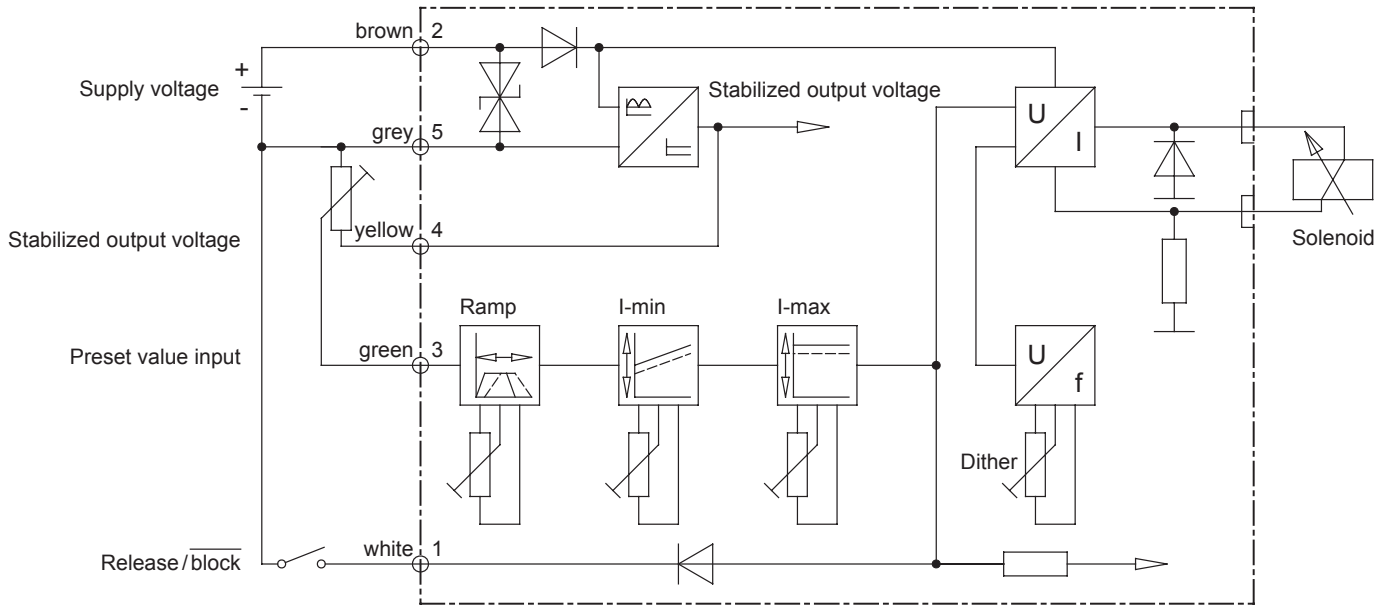
**GENERAL SPECIFICATIONS**

Plug housing	polyamide
Plug	polycarbonate
Weight	160 g
Connections	mounted cable, length 1,5 m (on request, cable length 5 m/10 m)
Ambient temperature	see curve max. ambient temp.

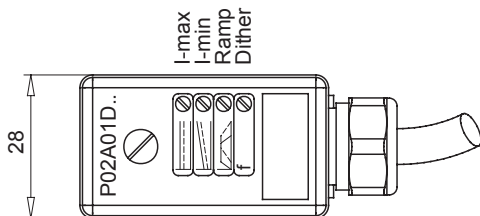
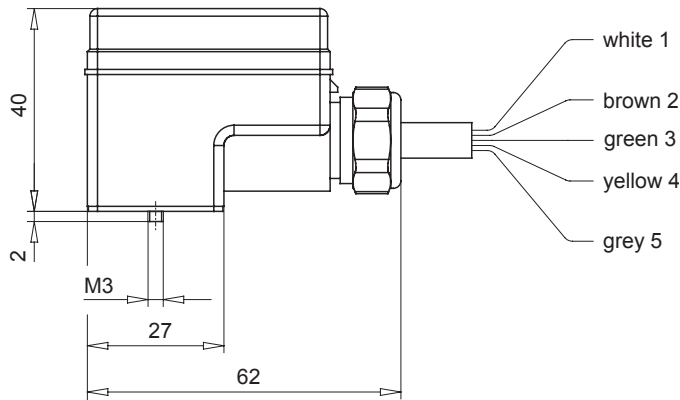
**ELECTRICAL SPECIFICATIONS**

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 kΩ	
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	<b>for 24 Volt solenoid</b>	
	min. current I <sub>min</sub> adjustable	30..400 mA
	works setting	150 mA
	max. current I <sub>max</sub> adjustable	I <sub>min</sub> ..1200 mA
	works setting	700 mA
	<b>for 12 Volt solenoid</b>	
	min. current I <sub>min</sub> adjustable	80..800 mA
	works setting	300 mA
	max. current I <sub>max</sub> adjustable	I <sub>min</sub> ..1800 mA
	works setting	1200 mA
Ramp	1 ramp up/down adjustable with same potentiometer.	
Ramp time	0,25..6 s.	
EMC		
Immunity	EN 61 000-6-2	
Emission	EN 61 000-6-4	

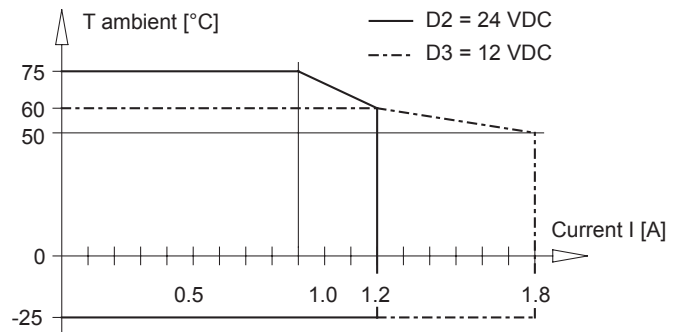
**BLOCK DIAGRAM**



**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 INFORMATION**

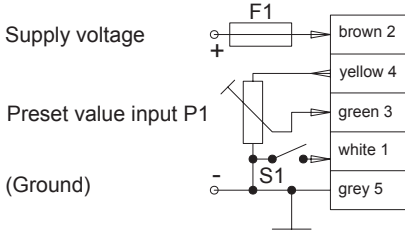
	Wandfluh-Dokumentation register
Proportional directional control valves	1.10
Proportional pressure control valves	2.3
Proportional flow control valves	2.6

**START-UP**

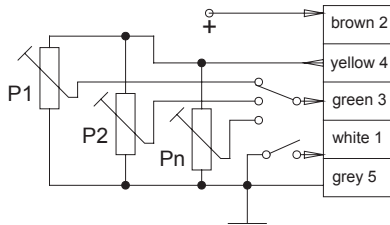
This data sheet is enclosed with each proportional-amplifier.

**Connection examples**

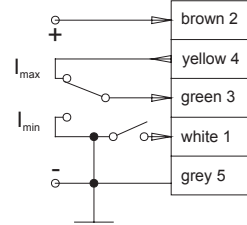
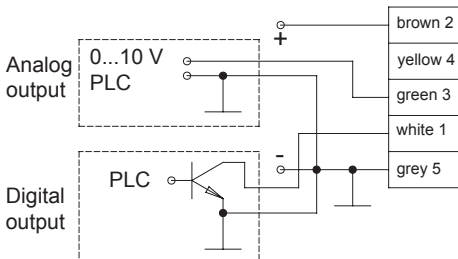
Connection with external preset value potentiometer


 F1: 24 V = 1,6 A quick-break  
 12 V = 2,5 A quick-break  
 P1 = 10 k $\Omega$   
 S1 = release/block

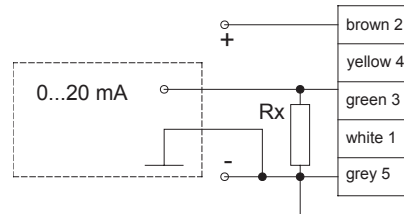
Connection with n preset value potentiometers


 $P1 - Pn = 50 \text{ k}\Omega$ 

Connection with preset value switch


 Connection with external power source release/block  
 with PLC, PC or NC


Connection with external current source


 $Rx = 470 \Omega / 0,5 \text{ W}$  for 24 VDC  
 $Rx = 390 \Omega / 0,5 \text{ W}$  for 12 VDC

**Connection instructions**
**Supply voltage (brown, grey)**

The connection has to be done as shown above:

- + pole = brown
- pole = grey (Ground)

**Stabilized output voltage (yellow)**

 The output can be used for supplying an external preset input. The maximum load is 2 mA.  
 (R preset input  $\geq 5 \text{ k}\Omega$ )

**Preset value input (green)**

The analog preset value signal 0...+10 VDC (0...+8 VDC/12 V-version) has to be connected here.

**Release/block (white)**

If the line is not connected, the proportional amplifier is released. If the line is connected to ground, the amplifier is blocked.

**Mounting**

With a screw driver the bottom of the amplifier can be lifted-off and turned by 180°.

**Setting instructions**
**Minimum current  $I_{\min}$** 

 Adjust the external preset value to 0%. Adjust the solenoid current with the potentiometer  $I_{\min}$  to a value which results in the desired minimum output of the consumer.

**Maximum current  $I_{\max}$** 

 Adjust the external preset value to 100%. Adjust the solenoid current with the potentiometer  $I_{\max}$  to a value which results in the desired maximum output of the consumer.

**Dither**

With the potentiometer Dither, adjust the frequency of the modulated solenoid current to the value which results in the desired sensitivity of the consumers.

- Turning the potentiometer to the right: Higher frequency.
- Turning the potentiometer to the left: Lower frequency.

**Ramp**

There is a common potentiometer mounted for the «ramping up/ramping down» functions.

- Turning the potentiometer to the right: Long ramping time.
- Turning the potentiometer to the left: Short ramping time.