

Operating Manual

Motorised Proportional Flow Valve P820



Description Motorised proportional flow valve for compressed air, hot water, oil, and also soiled liquids. With a choice of compact drives with low power consumption, for liquids up to 40 mm³/s (cST).

Principle Throttle setting by wear-resistant control drives made of oxide-ceramic.
Throttle setting with overlap but not gas-tight.

Drive DC, synchronous or stepping motor with standard voltage of 24V DC or AC $\pm 10\%$ and IP54.
All motors fulfil standards EN50.081-1, EN50.082-2 and 89/336/EEC.

Stepper motor (38) Bipolar, by means of SAA1042A (Motorola) with drop resistance of 44 W per phase at a driver (full-step) operating voltage of 24V $\pm 5\%$.

DC motor (15 / 24) Motor with feedback potentiometer for servo-amplifier.
2028 steps for 90° control disc turn, max 200 Hz
Resistor 1kW $\pm 20\%$, control e.g. by servo-amplifier.
Only part of potentiometer range is used.

DC motor (50 / 51) With integrated position controller. Setpoint input using jumpers: 0 ... 10V, 0/4 ... 20 mA
Input resistance: 200 kW with voltage signal, 500 W with current signal, Voltage for poti: 12V, 10 mA

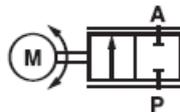
Temperature -10 °C to 90 °C / 14 °F to 190 °F fluid medium 0 °C to 40 °C / 32 °F to 100 °F ambient

Protection class IP 54

Materials Housing: brass Elastomer:
NBR Control discs: oxide-ceramic



Throttle setting with overlap (not gastight)



Characteristic data Valves

Type ¹⁾	Dimension table	Nominal diameter (mm)	Port size	Operating pressure *		kvs-Value (Basis m ³ /h)	weight total (kg)
				min.	max (bar)		
P825- ...	-	15	cartridge	-0.9	10	1.1	0.7
P822- ...	01	15	G 1/2	-0.9	10	1.1	0.9
P823- ...	02	20	G 3/4	-0.9	6 ²⁾	4.4	1.6
P824- ...	02	20	G 1	-0.9	6 ²⁾	4.4	1.6

1) See motor drives for motor Cat no and power supply

2) Operating pressure increases to 10 bar for P824- und P851

Motor drives

Motor type	Standard voltage Tolerance $\pm 10\%$ [V]	Frequency [Hz]	Power consumption [W]	Protection class	Torque [Ncm]	Operating time ¹⁾ trough 90 °	Wiring diagram	Type-No
DC motor	24	-	1.5	IP54	120	10-14s	01	P82.-15
DC motor	24	-	1.5	IP54	120	10-16s	02	P82.-50
Synchronous motor	24	50	3.0	IP54	120	10s	04	P82.-36
Stepping motor	24	²⁾	5.0	IP54	120	10s	05	P82.-38
DC motor	24	-	2.0	IP54	200	13s	01	P82.-24 ³⁾
DC motor	24	-	2.5	IP54	200	13-16s	02	P82.-51 ³⁾

1) Operating time depends on operating pressure

2) Nominal stepping frequency 200 Hz

3) Only in conjunction with G 3/4 and G 1

Limit switch service life >100,000 cycles

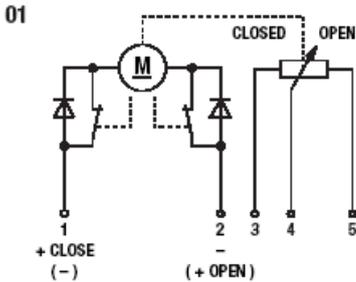
Motorised Proportional Flow Valve P820

Further technical data for DC motor P82.-15 and P82.-24

Motor with feedback potentiometer for servo-amplifier
Feedback potentiometer

Resistor: 1 k Ohm
Resistor tolerance: $\pm 20\%$
Max wiper current: 1mA
Power rating: 0.1 W

Only part of the potentiometer's range is used.



DC motor

Wiring:

+ to 1 Direction of operation: CLOSE
- to 2
+ to 2 Direction of operation: OPEN
- to 1

Cutoff at limits provided by microswitches

Resistance between 3 and 4:

minimum value – valve closed

maximum value – valve opened

Further technical data for DC motors P82.-50 and P82.-51

Drives with integrated position controller

The set point input can be set to the required signal range with the 2 jumpers.

Power supply residual ripple:

max 1.2 Vpp

Set point input:

0 – 10 V J1, J2 not inserted
0 – 20 mA J1 inserted, J2 not inserted
4 – 20 mA J1, J2 inserted

Input signal ripple:

max 40 mVpp with voltage signal

max 0.08 App with current signal

Input resistance:

200 k Ohm with voltage signal

500 Ohm with current signal

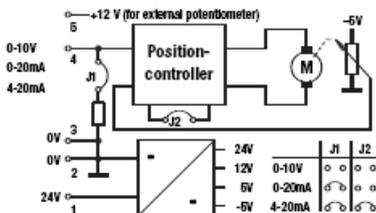
Auxiliary voltage for external potentiometer:

12 V $\pm 3\%$

max 10 mA

IMPORTANT! Brief interruptions in the power supply e. g. caused, by it being switched by an electromechanical relay, can cause the electronics to malfunction.

02



DC motor

Wiring :

1 and 2 Power supply
3 and 4 Input control voltage
5 Output/auxiliary

Further technical data for stepper motor P82.-38

Control:

bipolar, by means of SAA 1042 A (Motorola)

stepper motor driver or equivalent with drop resistance of 44 W per phase at a driver (full-step) operating voltage of 24 V $\pm 5\%$, or by means

of a constant current driver set to 0.4A.

Resistance per phase:

9 Ohm

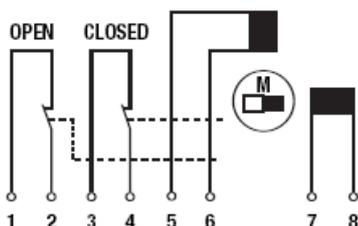
Inductance per phase:

12 mH

Steps for opening angle of 90°:

2028

05



Stepper motor

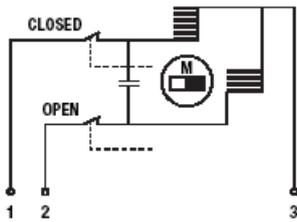
Wiring:

1 Motor frame (possibly for screening)
2 Reference potential for contacts
3 Limit feedback signal (OPEN)contact opened at limit
4 Limit feedback signal (CLOSED)contact opened at limit
5 and 6 Connections for phase 1
7 and 8 Connections for phase 2

Motorised Proportional Flow Valve P820

Further technical data for DC motors P82.-38

04



Synchronous motor

Wiring:

AC to 1 and 3

Direction of operation: CLOSE

2 unused

AC to 2 and 3

Direction of operation: OPEN

1 unused

Cutoff at limits provided by microswitches

Notes on choice of motor

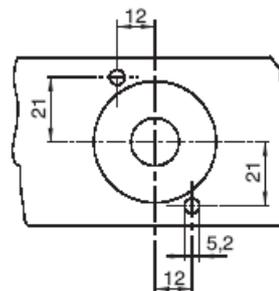
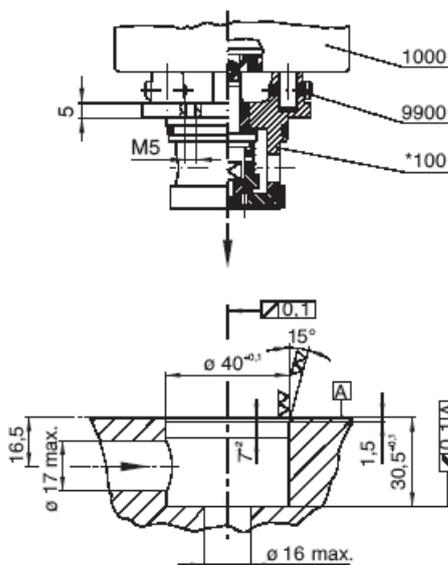
The mechanical contacts of DC motors make them unsuitable for control functions involving a large number of small adjustments. The AC synchronous motors last longer thanks to their absence of contacts. A stepper motor has to be used where frequent and/or fine adjustment is required.

The following table shows the characteristics of the components used.

	Motor life (running time)	Recommended pulse duration	Recommended interval without current during reversal in direction of rotation
DC motor P82.-15	500 h	> 100 msec	600 msec
DC motor P82.-24	500 h	> 100 msec	250 msec
DC motor P82.-50 u. P82.-51	500 h	-	-
Synchronous motor P82.-36	1000 h	> 100 msec	40 msec
Stepping motor P82.-38	1000 h	Stepping frequency 200 Hz	-

Since under the rated torque of 120/200 Ncm the life of the gearing is consistently around 1000 hours, the life of the drive is determined by the motor.

Sectional dimension diagrams



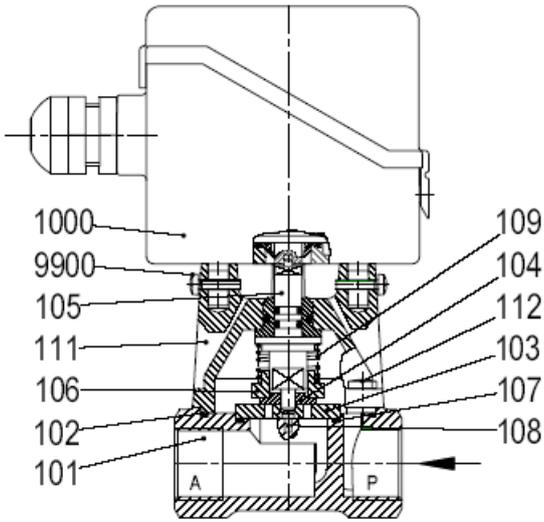
*100 Valve cartridge
1000 Motor drive
9900 Cheese-head screw

* These parts form a complete wearing unit.

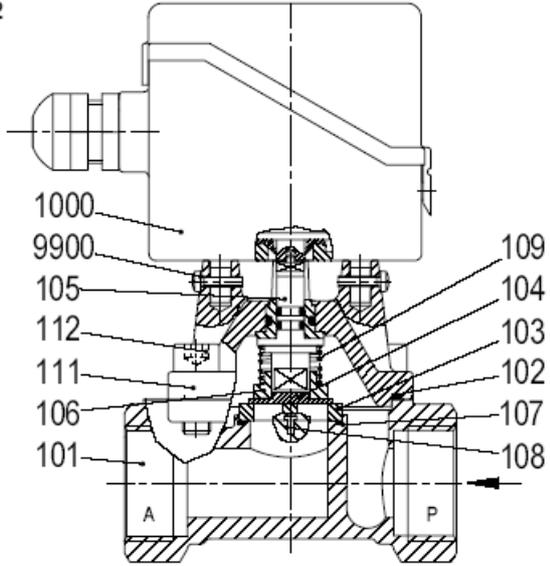
Motorised Proportional Flow Valve P820

Sectional diagrams

01



02

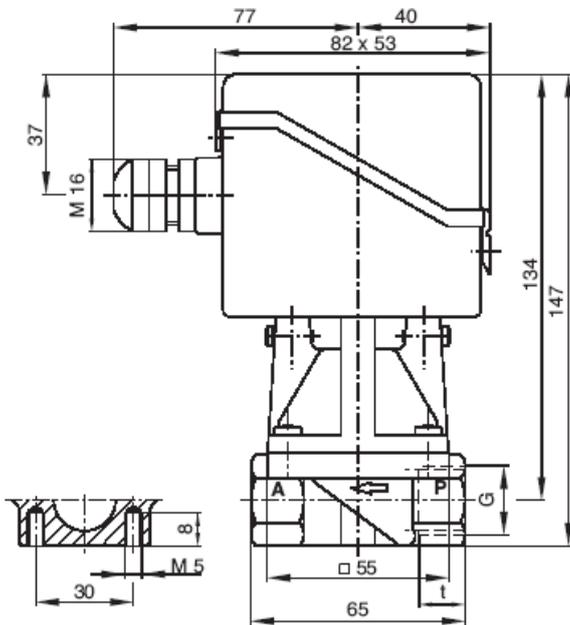


- 101 Valve body
- 102 O-ring *
- 103 Disc
- 104 Disc
- 105 Valve spindle *
- 106 Holder
- 107 O-ring *
- 108 Pin
- 109 Compression spring *
- 111 Body cover

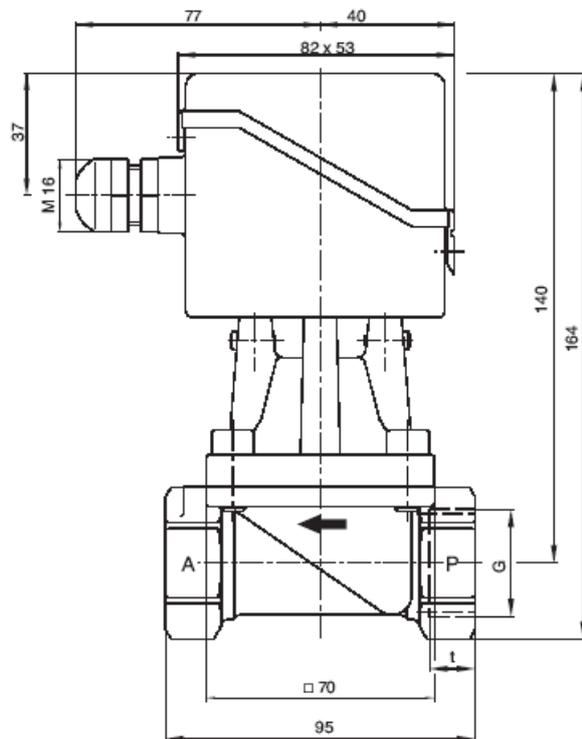
- 112 G 1/2 flat head screw
- 112 Allen screw for G 3/4 and G1
- 1000 Motor drive
- 9900 Fillister-head screw

Dimension diagrams

01



02



Dimension table	Dimension diagram	G	t
01	01	G 1/2	14.0
02	02	G 3/4	12.5
02	02	G 1	14.0