

Proportional Throttle Cartridges, Size 10

$Q_{\max} = 140 \text{ l/min}$, $p_{\max} = 250 \text{ bar}$, $Q_N = 55 \text{ l/min}$ at $\Delta p 10 \text{ bar}$

Two-Stage, with Seat-Valve Shut-Off

Series MVRPSBB-HG...



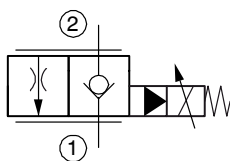
- Normally closed
- Seat-valve shut-off from 2 → 1
- Compact construction for cavity type DH to ISO 7789-27-01-0-07
- More reliable operation over the whole pressure and flow range (high pressure differences)
- Low headloss
- All exposed parts with zinc-nickel plating
- High pressure wet-armature solenoids
- The slip-on coil can be rotated, and it can be replaced without opening the hydraulic envelope
- Various plug-connector systems and voltages are available
- Can be fitted in a line-mounting body

1 Description

Series MVRPSB... two-stage proportional throttle cartridges are size 10, high performance screw-in valves with an M27 x 2 mounting thread. Both the main and pilot stages are designed on the poppet/seat principle and the 2 → 1 flow path is therefore virtually leak-free. With these proportional throttle cartridges, the flow rate from 2 → 1 is dependent on the control current, and it can be varied continuously and set at any desired level. When used with a pressure compensator, these cartridges are particularly suitable for precise and load-compensated lifting and lowering mo-

vements, but they can also be used on their own for reliable operation in mobile and industrial applications with large pressure differences. All external parts of the cartridge are zinc-nickel plated to DIN 50 979 and are thus suitable for use in the harshest operating environments. The slip-on coils can be replaced without opening the hydraulic envelope and can be positioned at any angle through 360°. If you intend to manufacture your own cavities or are designing a line-mounting installation, please refer to the section "Related data sheets".

2 Symbol



3 Technical data

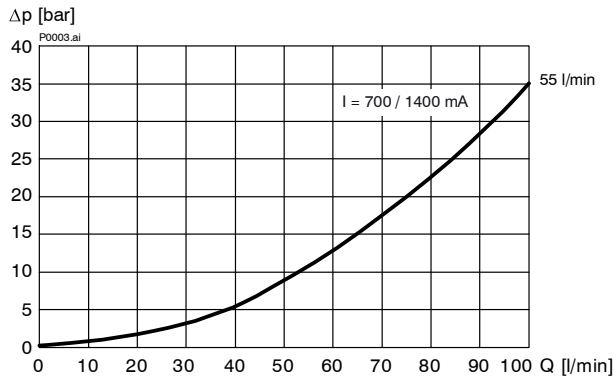
General characteristics	Description, value, unit
Designation	proportional-throttle cartridge
Design	seat-valve shut-off, two stage
Mounting method	screw-in cartridge M27 x 2
Tightening torque	100 Nm ± 10 %
Size	nominal size 10 mm, cavity type DH
Weight	0.56 kg
Mounting attitude	unrestricted (preferably vertical, coil down)
Ambient temperature range	-25 °C ... +50 °C

Hydraulic characteristics	Description, value, unit
Maximum operating pressure	250 bar
Maximum flow rate	140 l/min
Nominal flow rate	55 l/min at $\Delta p = 10$ bar
	< 0,2 cm ³ /min (max. 5 drops/min) with oil viscosity 33 mm ² /s (cSt)
Flow direction	2 → 1 throttle function, see symbols 1 → 2 free flow
Hydraulic fluid	HL and HLP mineral oil to DIN 51 524; for other fluids, please contact BUCHER
Hydraulic fluid temperature range	-25 °C ... +70 °C
Viscosity range	15...380 mm ² /s (cSt), recommended 20...130 mm ² /s (cSt)
Minimum fluid cleanliness Cleanliness class to ISO 4406 : 1999	class 18/16/13

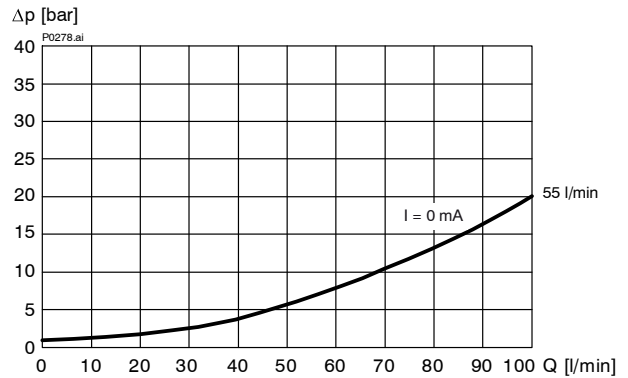
Electrical characteristics	Description, value, unit
Supply voltage	12 V DC, 24 V DC
Control current	12 V = 0...1400 mA, 24 V = 0...750 mA
Coil resistance R - cold value at 20 °C - max. warm value	12 V = 5.8 Ω / 24 V = 20.9 Ω 12 V = 8.6 Ω / 24 V = 32 Ω
Recommended PWM frequency (dither)	200 Hz
Hysteresis with PWM	2...4 % I _N
Reversal error with PWM	2...4 % I _N
Sensitivity with PWM	< 1 % I _N
Reproducibility with PWM	< 2 % p _N
Switching time	see performance graph
Relative duty cycle	100 %
Protection class to ISO 20 653 / EN 60 529	IP 65 / IP 67 / IP 69K, see "Ordering code" (with appropriate mating connector and proper fitting and sealing)
Electrical connection	3-pin square plug to ISO 4400 / DIN 43 650 (standard) for other connectors, see "Ordering code"

4 Performance graphs

$\Delta p = f(Q)$ Pressure drop - Flow rate characteristic [2 → 1]



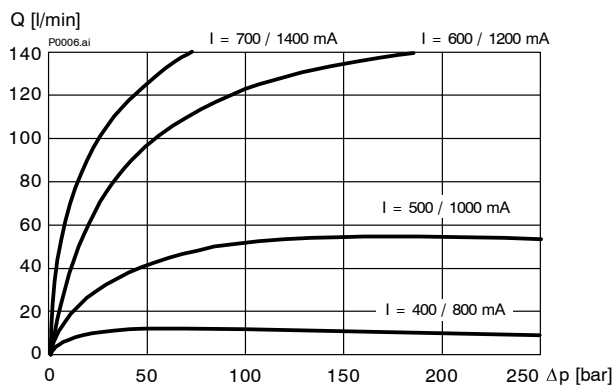
$\Delta p = f(Q)$ Pressure drop - Flow rate characteristic [1 → 2]



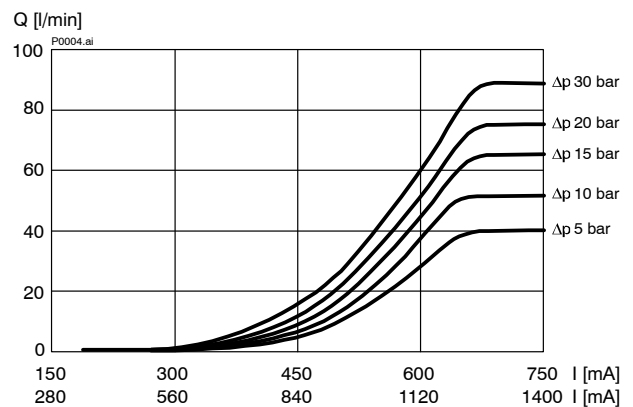
Attention:

where there are large pressure differences in the flow direction 1 → 2, the main stage poppet will become damaged.

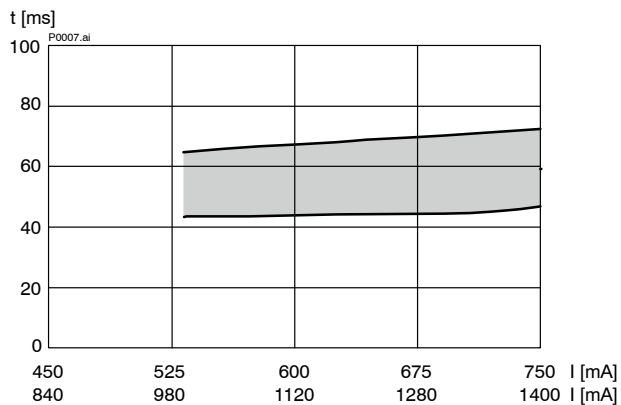
$Q = f(\Delta p; I)$ Flow rate adjustment characteristic



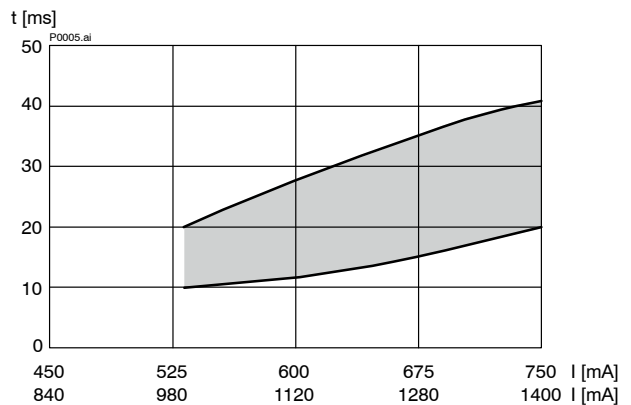
$Q = f(I; \Delta p)$ Flow rate adjustment characteristic



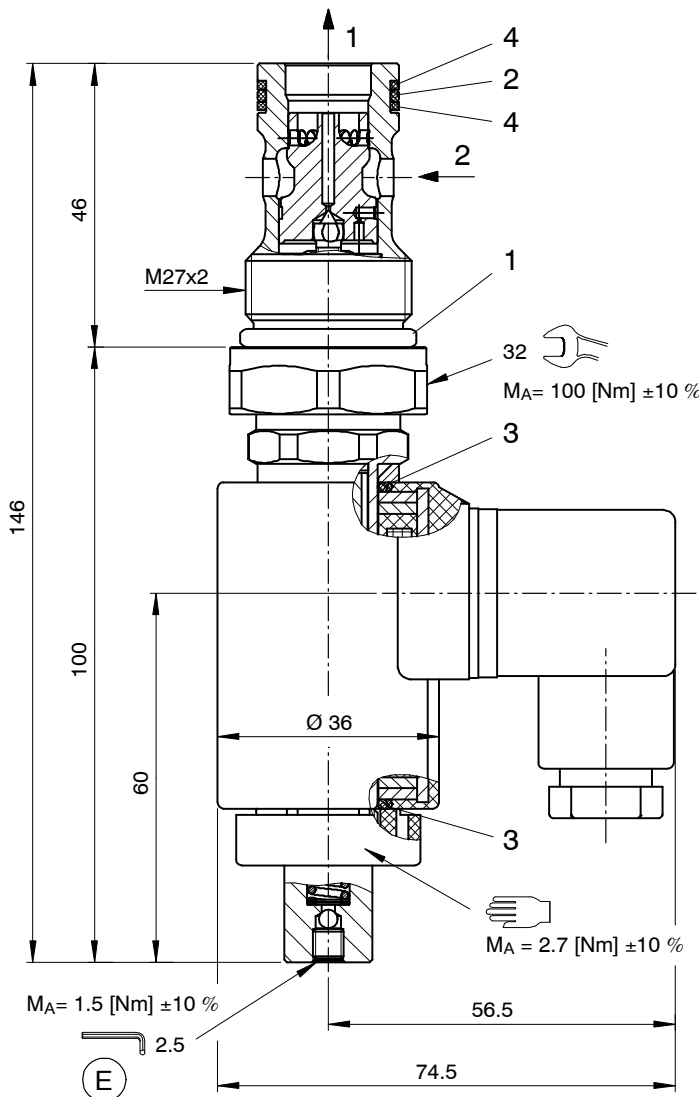
$t = f(I; \Delta p)$ Switching time characteristic Opening at $\Delta p = 10 \dots 50$ bar



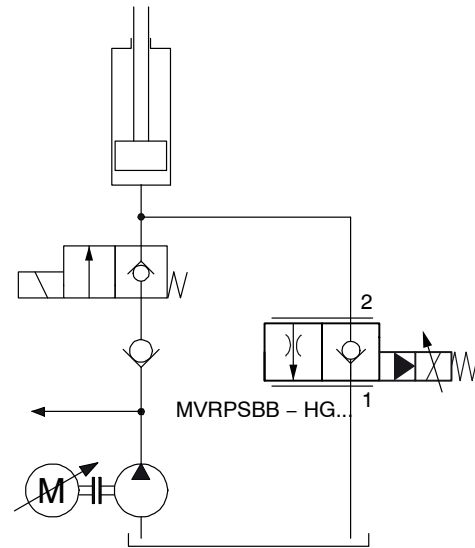
$t = f(I; \Delta p)$ Switching time characteristic Closing at $\Delta p = 10 \dots 50$ bar



5 Dimensions & sectional view



6 Application examples



7 Installation information



Important:

When fitting the cartridges, note the mounting attitude (preferably vertical, with coil down → automatic air bleed) and use the specified tightening torque. For the initial start-up, we recommend using the air-bleed screw (item E) to bleed air from the cartridges. No adjustments are necessary, since the cartridges are set in the factory.



ATTENTION!

Only qualified personnel with mechanical skills may carry out any maintenance work. Generally, the only work that should ever be undertaken is to check, and possibly replace, the seals. When changing seals, oil or grease the new seals thoroughly before fitting them.

Seal kit NBR no. DS-368-N ¹⁾

Item	Qty.	Description
1	1	O-ring no. 119 $\varnothing 23.47 \times 2.62$ N90
2	1	O-ring no. 018 $\varnothing 18.77 \times 1.78$ N90
3	2	O-ring $\varnothing 16.00 \times 2.00$ FKM
4	2	Backup ring $\varnothing 18.00 \times 1.40 \times 1.40$ FI0751



IMPORTANT!

¹⁾ Seal kit with FKM (Viton) seals, no. DS-368-V

8 Ordering code

	MV	R	P	S	B	B	-	H	G	-	10	-	55	-	1	24	D	-	
M V	=	throttle valve, two-stage																	
R	=	proportional-solenoid operated																	
P	=	cartridge design																	
S	=	seat-valve design																	
B	=	pressurised oil enters at 2																	
A ... Q	=	standard model - see relevant data sheets																	
Z ... R	=	special features - please consult BUCHER																	
H	=	cavity type DH																	
G	=	normally closed																	
10	=	nominal size 10 mm																	
55	=	nominal flow rate 55 l/min at $\Delta p = 10$ bar																	
(blank)	=	NBR (Nitrile) seals (standard)																	
V	=	FKM (Viton) seals (special seals - please contact BUCHER)																	
1 ... 9	=	design stage (omit when ordering new units)																	
...	=	voltage e.g. 24 (24 V)																	
D	=	current DC																	
(blank)	=	ISO 4400 / DIN 43 650 mating plug (standard, IP 65)																	
M100	=	without mating DIN plug																	
C	=	Kostal plug connection (IP 65)																	
JT	=	Junior Timer radial plug connection (with protection diode, IP65)																	
IT	=	Junior Timer axial plug connection (with protection diode, IP65)																	
D	=	Deutsch plug connection DT04-2P (IP 67/69K)																	
DT	=	Deutsch plug connection DT04-2P (with protection diode, IP 67/69K)																	
S	=	AMP Superseal 1.5 (IP 67) / Metri-Pack 150 (IP 65)																	
F	=	flying leads (500 mm)																	

} mating plug not supplied

9 Related data sheets

Reference	(Old no.)	Description
400-P-040011	(i-32)	The form-tool hire programme
400-P-060171		Cavity type DH to ISO 7789-27-01-0-07
400-P-120110	(W-2.141)	Coils for screw-in cartridge valves
400-P-510101		Amplifier unit for proportional valves (1-channel) PBS - 3A
400-P-511101		Amplifier card for proportional valves (1-channel) SAN-535...
400-P-740161		Line-mounting body, type GCDHA (G 3/4")

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