

# Proportional Throttle Cartridges, Size 5 / SAE 08

$Q_{\max} = 50 \text{ l/min (13 gpm)}$ ,  $p_{\max} = 250 \text{ bar (3600 psi)}$

Two-Stage, with Seat-Valve Shut-Off

Series MVRPSBA-...



- De-energised closed
- Seat-valve shut-off in flow direction (see symbol)
- $Q_N = 20 \text{ l/min (5.3 gpm)}$  at  $\Delta p 10 \text{ bar (140 psi)}$
- Compact construction for cavity types:  
AL or C0820 – 3/4-16 UNF
- Reliable operation over the whole pressure and flow range (even at 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

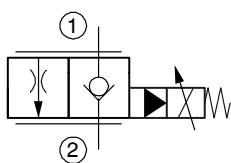
## 1 Description

Series MVRPSBA-... two-stage proportional throttle cartridges are size 5 / SAE 08, high performance screw-in valves with a 3/4-16 UNF mounting thread. The main and pilot stages are designed on the poppet/seat principle and are therefore virtually leak-free in the flow direction (see symbol). With these proportional throttle cartridges, the flow rate is dependent on the electrical control current, and it can be varied continuously and responsively. When used with a pressure compensator, these cartridges are particularly suitable for precise and load-compensated lifting and

lowering movements, 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".

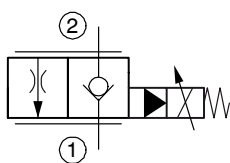
## 2 Symbol

Cavity type AL



MVRPSBA-LG... (size 5)

Cavity type C0820



MVRPSBA-2G... (SAE08)

## 3 Technical data

General characteristics	Description, value, unit
Designation	proportional-throttle cartridge
Design	seat-valve shut-off, two stage
Mounting method	screw-in cartridge 3/4-16 UNF
Tightening torque	40 Nm $\pm$ 10 % (30 ft-lbs $\pm$ 10 %)

General characteristics	Description, value, unit
Size	nominal size 5 for cavity type AL size SAE 08 for cavity type C0820
Weight	0.40 kg (0.9 lbs)
Mounting attitude	unrestricted (preferably vertical, coil down)
Ambient temperature range	-25 °C ... +50 °C (-13 °F ... +122 °F)

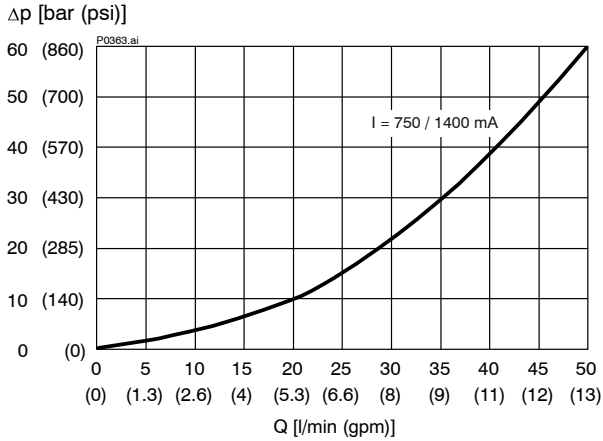
Hydraulic characteristics	Description, value, unit
Maximum operating pressure	250 bar (3600 psi)
Maximum flow rate	50 l/min (13 gpm)
Nominal flow rate	20 l/min at $\Delta p = 10$ bar (5.3 gpm at $\Delta p = 140$ psi)
Leakage flow rate	< 0,2 cm <sup>3</sup> /min (max. 5 drops/min) with oil viscosity 33 mm <sup>2</sup> /s (cSt)
Flow direction	see symbol
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 (-13 °F ... +158 °F)
Viscosity range	15...380 mm <sup>2</sup> /s (cSt), recommended 20...130 mm <sup>2</sup> /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...760 mA
Coil resistance R - cold value at 20 °C - max. warm value	12 V = 5.8 $\Omega$ / 24 V = 20.9 $\Omega$ 12 V = 9.1 $\Omega$ / 24 V = 32.7 $\Omega$
Recommended PWM frequency (dither)	200 Hz
Hysteresis with PWM	3...6 % I <sub>N</sub>
Reversal error with PWM	3...6 % I <sub>N</sub>
Sensitivity with PWM	< 2 % I <sub>N</sub>
Reproducibility with PWM	< 3 % p <sub>N</sub>
Switching time	see performance graphs
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"

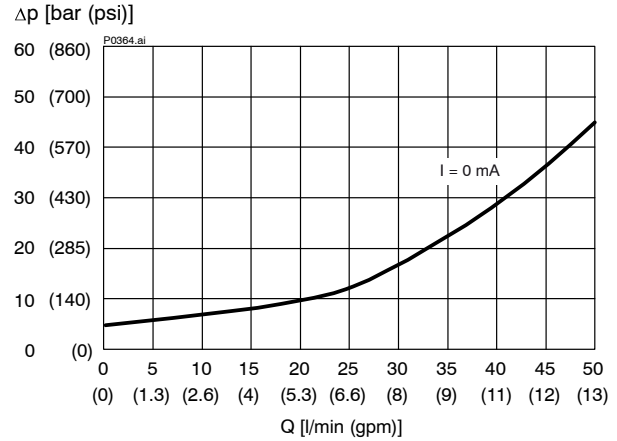
## 4 Performance graphs

measured with oil viscosity 33 mm<sup>2</sup>/s (cSt) – for cavity type AL and C0820

$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic  
"energized"



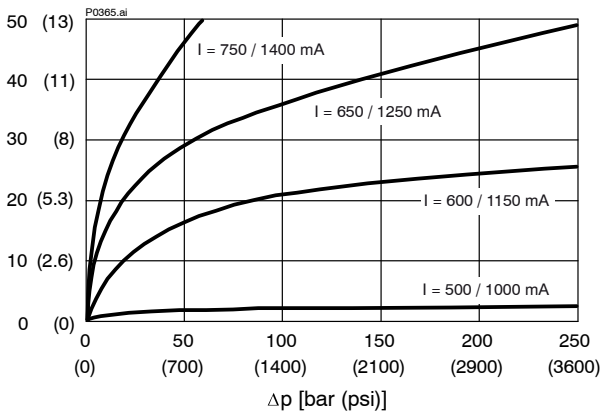
$\Delta p = f(Q)$  Pressure drop - Flow rate characteristic  
"de-energized - through check valve"



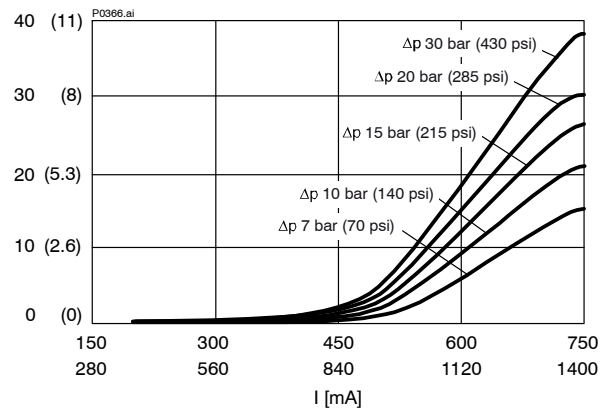
**Attention:**

When flow passes through the check valve and there is a large pressure difference, the poppet in the main stage can be damaged.

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

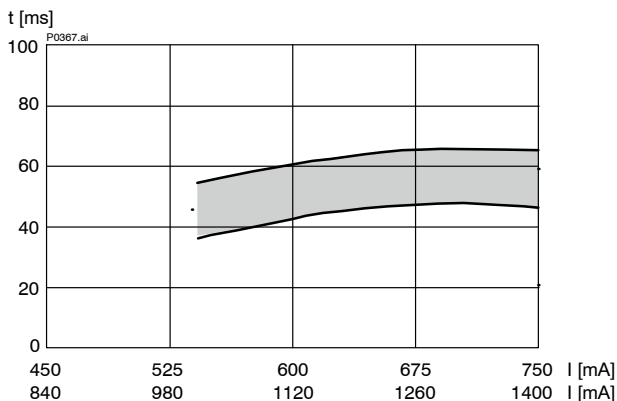


$Q = f(I; \Delta p)$  Flow rate adjustment characteristic

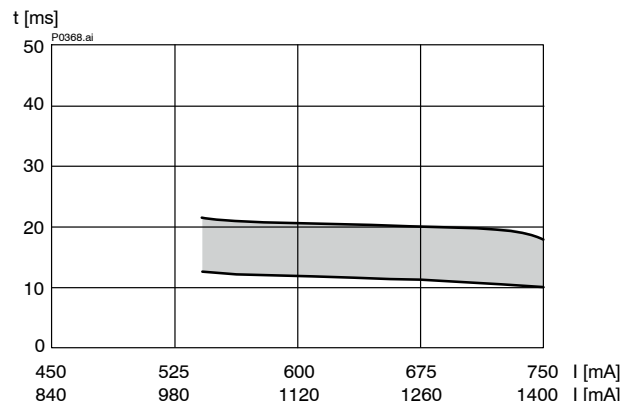


Switching time measured up to 80 % change in the pressure difference. Electrical operation with DC power supply.

$t = f(I; \Delta p)$  Switching time characteristic Opening at  $\Delta p = 10 \dots 50$  bar (140 ... 700 psi)



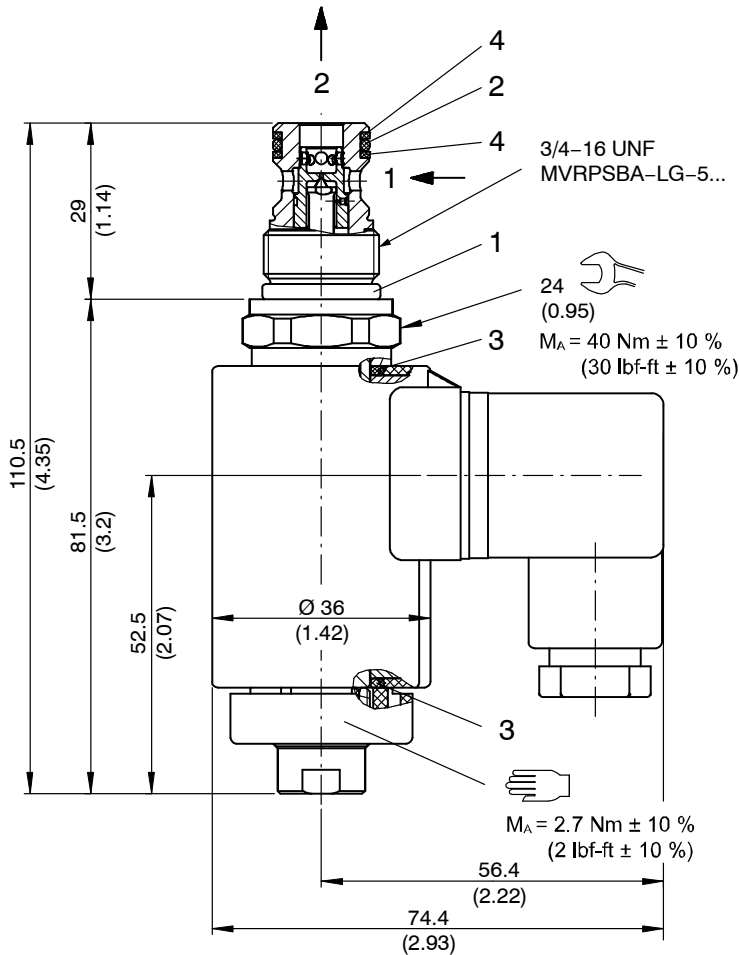
$t = f(I; \Delta p)$  Switching time characteristic Closing at  $\Delta p = 10 \dots 50$  bar (140 ... 700 psi)



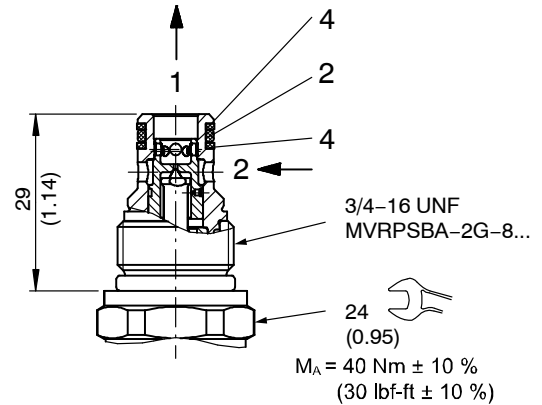
## 5 Dimensions & sectional view

Dimensions in millimeters (inches)

### 5.1 Insertion in cavity type "AL"



### 5.2 Insertion in cavity type "C0820"



## 6 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. 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-447-N (cavity type AL) <sup>1)</sup>

Item	Qty.	Description
1	1	O-ring no. 017 $\varnothing$ 17.17 x 1.78 N90
2	1	O-ring no. 014 $\varnothing$ 12.42 x 1.78 N90
3	2	O-ring $\varnothing$ 16.00 x 2.00 FKM
4	2	Backup ring $\varnothing$ 10.70 x 1.45 x 1.00 FI0751

### Seal kit NBR no. DS-448-N (cavity type C0820) <sup>2)</sup>

Item	Qty.	Description
1	1	O-ring no. 017 $\varnothing$ 17.17 x 1.78 N90
2	1	O-ring no. 012 $\varnothing$ 9.25 x 1.78 N90
3	2	O-ring $\varnothing$ 16.00 x 2.00 FKM
4	2	Backup ring $\varnothing$ 7.80 x 1.45 x 1.00 FI0751



### IMPORTANT!

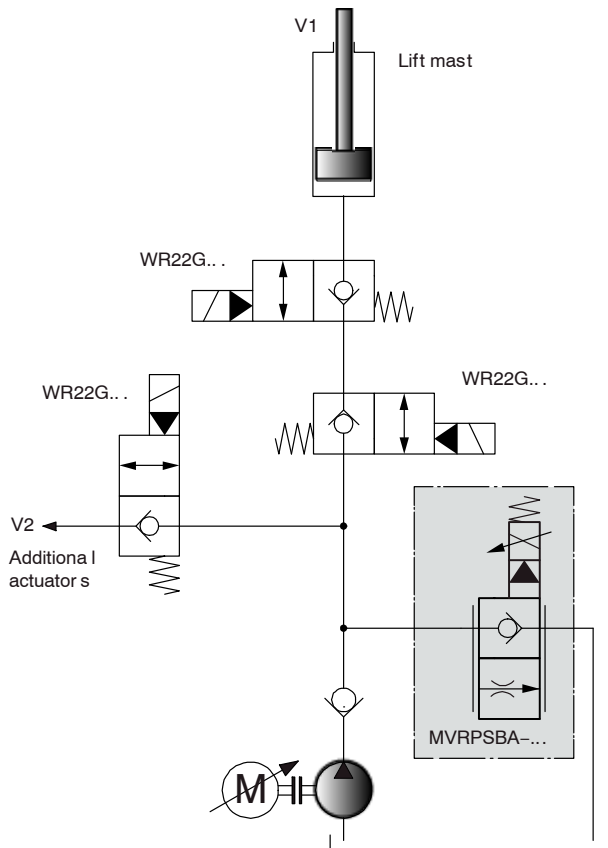
1) Seal kit with FKM (Viton) seals, no. DS-447-V



### IMPORTANT!

2) Seal kit with FKM (Viton) seals, no. DS-448-V

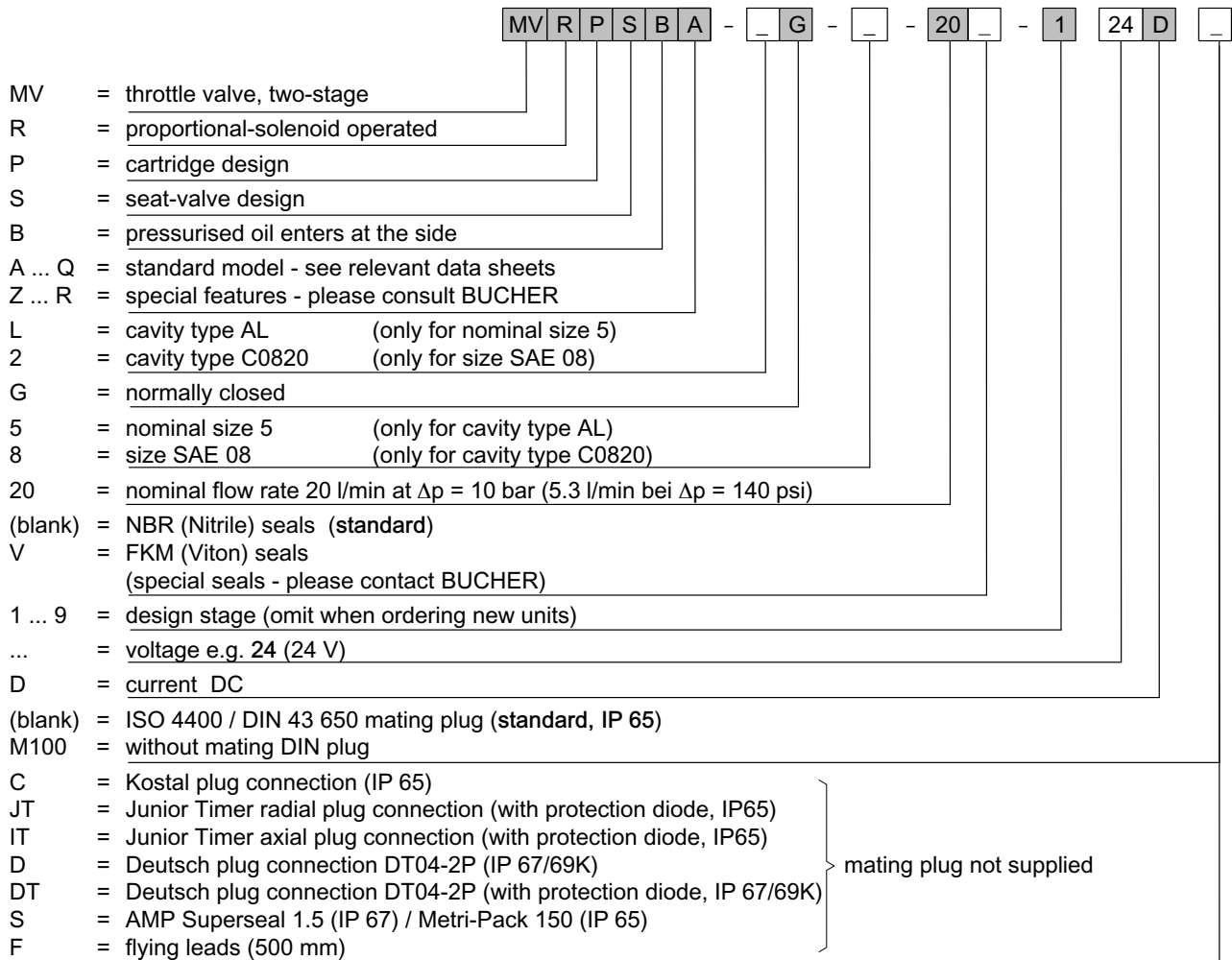
## 7 Application examples



### Potential applications

- Lifting and lowering movements on industrial trucks
- In agricultural machines, e.g. proportional scraper-floor controls in self-loading trailers
- In all applications where a load-independent function is required, in combination with our in-line or bypass pressure compensators

### 8 Ordering code



### 9 Related data sheets

Reference	(Old no.)	Description
400-P-040011	(i-32)	The form-tool hire programme
400-P-040171		Cavity type AL
520-P-000110		Cavity type C0820
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-720101		Line-mounting body, type GALA (G 3/8")
520-P-000111		Line-mounting body, size SAE 08 (G 3/8")

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