



Remote Controls

BMV

Brake Modulating Valve

Catalogue HY17-8450/UK
September 2005



Catalogue layout

This catalogue has been designed to give a brief overview of the Brake Modulating Valve, and to make it easy for you to study and choose from the different options available, so that we may customize your valve in accordance with your wishes.

In addition to general information and basic technical data, the brochure therefore contains descriptions of the standard options available for the valve.

Early consultation with Parker Hannifin saves time and money

Our experienced engineers have in-depth knowledge of the different types of hydraulic system and the ways in which they work. They are at your disposal to offer qualified advice on the best system for the desired combination of functions, control

characteristics and economic demands. By consulting Parker early in the project planning stage, you are assured of a comprehensive hydraulic system that gives your machine the best possible operating and control characteristics.

Conversion factors

1 kg	= 2.2046 lb
1 N	= 0.22481 lbf
1 bar	= 14.504 psi
1 l	= 0.21997 UK gallon
1 l	= 0.26417 US gallon
1 cm ³	= 0.061024 in ³
1 m	= 3.2808 feet
1 mm	= 0.03937 in
9/5 °C + 32	= °F

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The BMV are typically used in hydraulically actuated single and dual circuit mobile and industrial braking systems where precise pressure modulation is required. These valves are of closed centre type and can be used in open centre, closed centre and load sense hydraulic systems. The high flow capability of the valves permit use with wet brakes which typically require more flow for actuation/brake release. Lower flow competitive valves often suffer from slow braking response because of their inability to deliver/release the volume needed to actuate/release the brakes. Use of the Parker modulating valve can therefore reduce mechanical drag and power loss by allowing the wet brake disc to be further apart when not applied. The valve can be specified to have gauge ports, for pressure switches, and bleed screws for removing trapped air pockets. A wide range of actuating forces can be specified, including stage modulating springs for more progressive feel. Alternatively there is an option that increases hydraulic reaction to provide a "natural" pedal feel.

Freedom in machine design

Good machine design is heavily dependent on the availability of flexible components and systems that can be combined in different ways to give optimum operating and control characteristics. Parker Hannifin control systems give you the freedom to design your machines the way you want them, since they themselves are designed to enable components such as directional valves and other control devices to be located ideally on the machine. This gives advantages in production too, since it greatly facilitates the building of machine subassemblies at different sites prior to collation for final assembly.

Safety

In spite of the sophistication of the final functions it may serve, the BMV is of robust and simple construction with predictable control characteristics and great dependability. This does much to improve the operational safety of the machine.

Essential characteristics

- Wide range of control pressure characteristics.
- Small dimensions enable simple, compact installation.
- Low hysteresis gives consistent machine function response to valve actuation.
- Quality materials and great precision in manufacturing, assembly and testing assure you of a quality product with low internal leakage and long service life.
- The valve is delivered pre set from factory.
- Low pressure drop gives minimum of lag.

Ordering Code

BMV

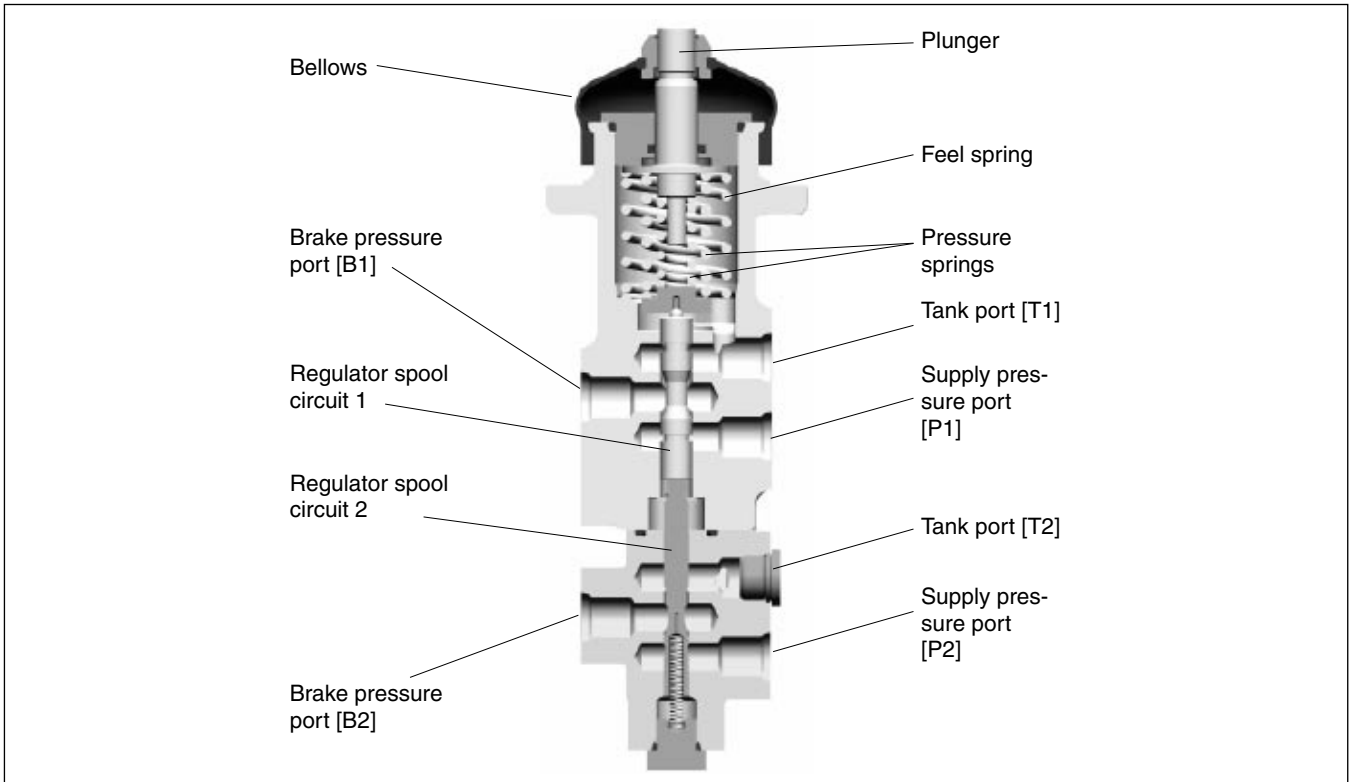
BMV	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Valve function	Supply, Brake pressure and Tank ports	Gauge ports	Remote bleed port	Plunger config	Pedal angle setting	Valve orientation	Max. Brake pressure	Target force	Target pressure stage point	Target stroke point												
Code Valve function		Code Supply, Brake pressure and Tank ports		Code Gauge port		Code Remote bleed port		Code Plunger config.		Code Pedal incline angle setting		Code Max. brake pressure in bar		Code Valve orientation description									
S Single circuit D Dual circuit		U 9/16-18 UNF-2B SAE O-ring M M16x1.5		/ No Y Yes		/ No Y Yes		P Plain end for pedal C Ø15x14 deep cup M M10 x 28 long male thread U 3/8"-24 UNF x 28 long male thread		/ No pedal 25 Pedal mounted at 25° 30 Pedal mounted at 30° 35 Pedal mounted at 35° 40 Pedal mounted at 40° 45 Pedal mounted at 45° 50 Pedal mounted at 50° (Standard)		030 30 035 35 040 40 045 45 050 50 055 55 060 60 065 65 070 70 075 75 080 80 085 85 090 90 095 95 100 100 105 105 110 110 115 115 120 120 125 125 130 130 135 135 140 140 145 145 150 150 155 155 160 160		/ No pedal B Brake port facing back of pedal F Brake port facing front of pedal L Brake port facing left of pedal R Brake port facing right of pedal									

See pages 7- 9 for more information about the different options available.

How to order your valve

Each valve is unique for the customer. Choose the option you require and enter the corresponding code into the boxes in the ordering code above. Then give your ordering code to your

Parker Hannifin representative. For more information about the different options available, please see pages 7 to 9.



General

The data given is applicable at an oil temperature of 40 °C (104 °F) and the viscosity of 32 mm²/s (cSt) using mineral base oil according to DIN 51524. The valve housing is painted in black, non-sand primer undercoat based on alcyd resin.

Pressures

Supply pressure (pump pressure) max. 250 bar (3045 psi)
 Pressure regulated up to max. 160 bar (2320 psi)

Flow rate

Control Flow max. 20 l/min (5 USgpm)

Hydraulic fluids

Best performance is obtained using mineral-base oil of high quality and cleanness in the hydraulic system. HLP hydraulic fluids (DIN 51524), automatic gearbox oil type A and API CD engine oils can be used.

Viscosity range 10-380 mm²/s (cSt)

Performance efficiency will be reduced if outside the ideal values. These extreme conditions must be evaluated by the user to establish suitability of the products performance.

Filtration

Filtration should be arranged so that the Target Contamination Class 17/14/12 according to ISO 4406 is not exceeded.

Temperature

Min. oil temperature -20 °C (-4 °F)
 Max. oil temperature +80 °C (176 °F)

Product operating limits are broadly within the above range, but satisfactory operation within the specification may not be accomplished. Leakage and response will be affected when used at temperature extremes and it is up to the user to determine acceptability at these levels.

Pedal forces

Actuated force on the plunger is typical 900 to 1300 N.

Connection style

Two different types of connection styles are available:
 UNF according to SAE J1926/1 (U version)
 Metric ISO thread for flat seal (M version)

Weight

The weight of the unit varies with its configuration. A few examples are given below.

Single circuit BMV (without pedal)	approx. 2,2 kg
Dual circuit BMV (without pedal)	approx. 3,1 kg
Pedal	approx. 1,8 kg



Warning

If the filtration demands are not met, the valve spool can jam, with the result that the valve remains unactuated.

Technical Information

Valve Function

The valve can be chosen in either single or dual circuit.

- S** Single circuit
- D** Dual circuit

Connections for supply, brake pressure and tank ports

- U** Connections with 9/16" UNF thread for O-ring
- M** Connections with M16 x 1.5 thread for bonded seal

Gauge ports

- /** No gauge ports
- Y** Gauge ports

The thread for the gauge port depends on your choice of connections for supply, brake pressure and tank ports above.

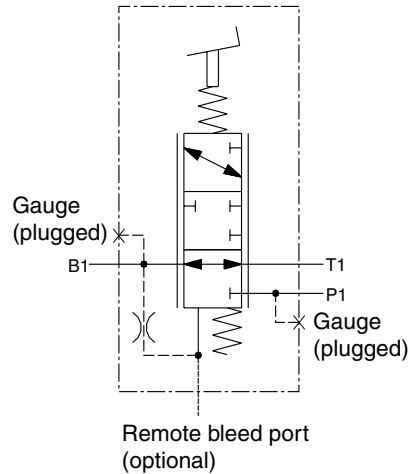
- For U it will be 7/16 "UNF thread for O-ring
- For M it will be M12 x 1.5 thread for bonded seal

Remote bleed port

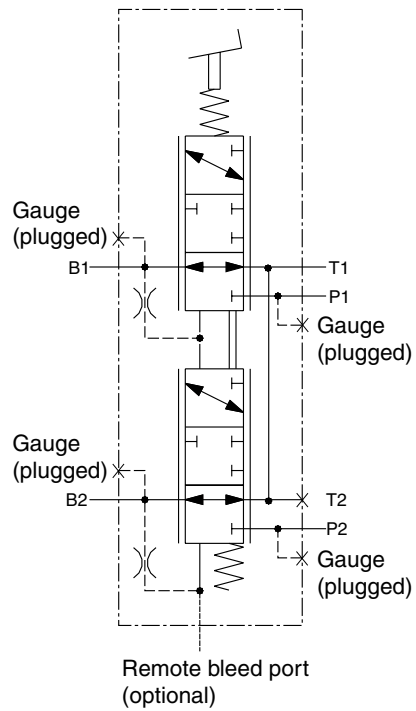
- /** No bleed port
- Y** Bleed port

The thread for the remote bleed port depends on your choice of connections for supply, brake pressure and tank ports above.

- For U it will be 7/16 "UNF thread for O-ring
- For M it will be M12 x 1.0 thread for bonded seal



BMV single circuit

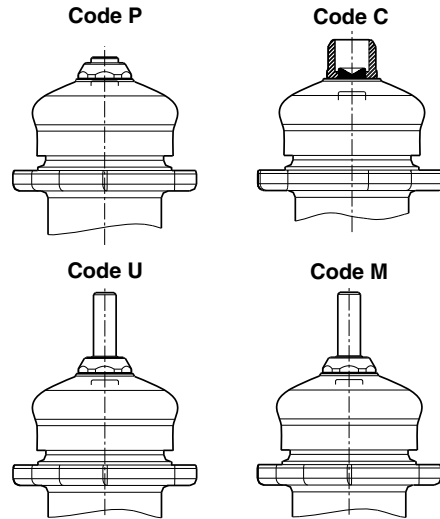


BMV dual circuit

Plunger configuration

There are four different plungers that can be mounted on the valve, see dimensional drawings on page 10.

- P** Plain end (for pedal)
- C** Ø15 x 14 deep cut
- U** 3/8" – 24 UNF x 28 long male tread
- M** M10 x 28 long male thread

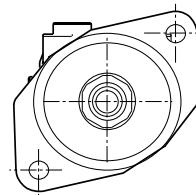


Pedal incline angle

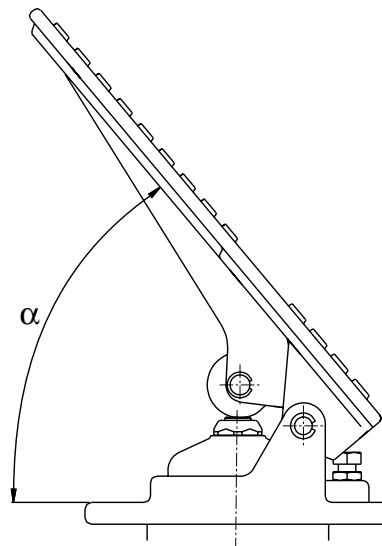
When no pedal is chosen the valve will be delivered with a spigot.

If a pedal is chosen, the incline angle α must be set. The different options that are available you can see below.

- / No Pedal
- Pedal mounted at incline angel:
- 25** 25°
- 30** 30°
- 35** 35°
- 40** 40°
- 45** 45°
- 50** 50°



Spigot



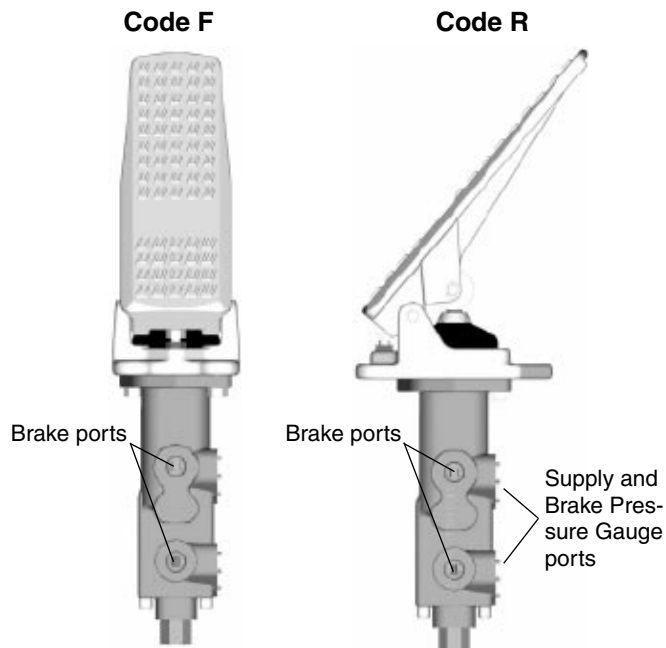
Pedal incline angle α is fixed and can not be changed

Technical Information

Valve orientation

The valve can be mounted either vertically or horizontally on the machine. The different options on how the valve and the pedal are mounted together you can find in the list below.

- / No pedal
- B** Brake port facing back of pedal
- F** Brake port facing front of pedal
- L** Brake port facing left of pedal
- R** Brake port facing right of pedal



Maximum brake pressure

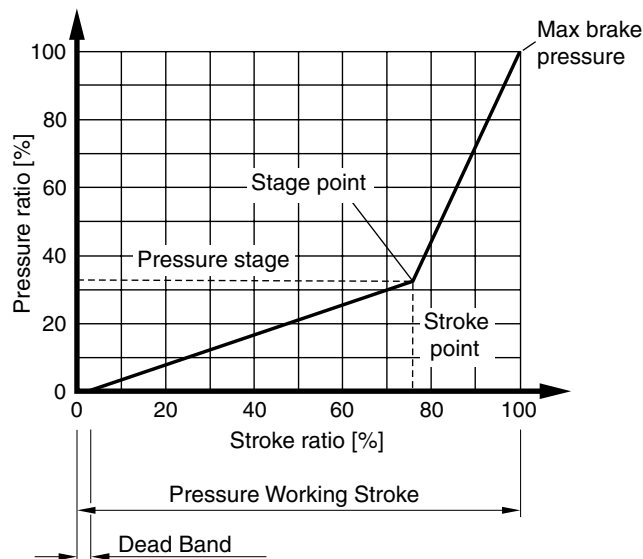
Maximum brake pressure can be obtained in a great number of versions.

30-160 Standard pressure in bar for maximum brake pressure: Between 30 and 160 bar in 5 bar increment.

Target force

Typical operating force on the plunger is in the range of 900 N up to 1300 N at the maximum brake pressure.

When a chosen target force can not be met we will take the nearest force available. This will be done when the specification is done.



Target stage point

A staged pressure characteristic can be ordered. When the chosen stage point can not be met we will take the nearest stage point available.

Target pressure stage point

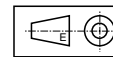
- / Straight characteristics
- XX** Enter required pressure in % for stage point of maximum brake pressure.

Target stroke point

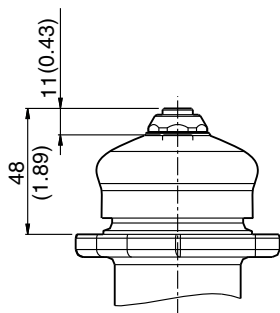
- / Straight characteristics
- XX** Enter required stroke of the plunger for the stage point in % of working stroke.

Plungers

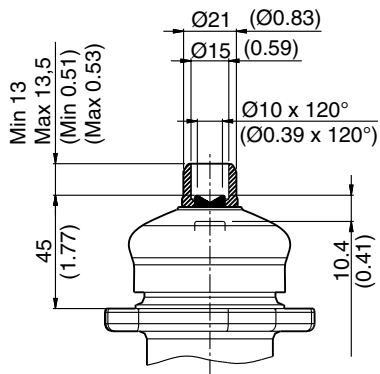
(Inch)



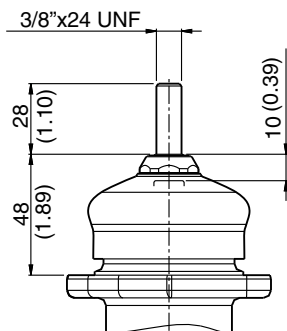
Code P



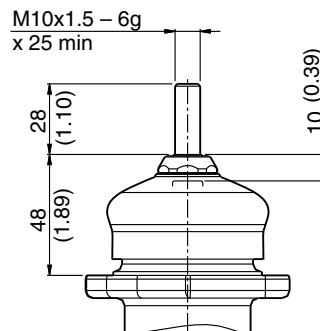
Code C



Code U

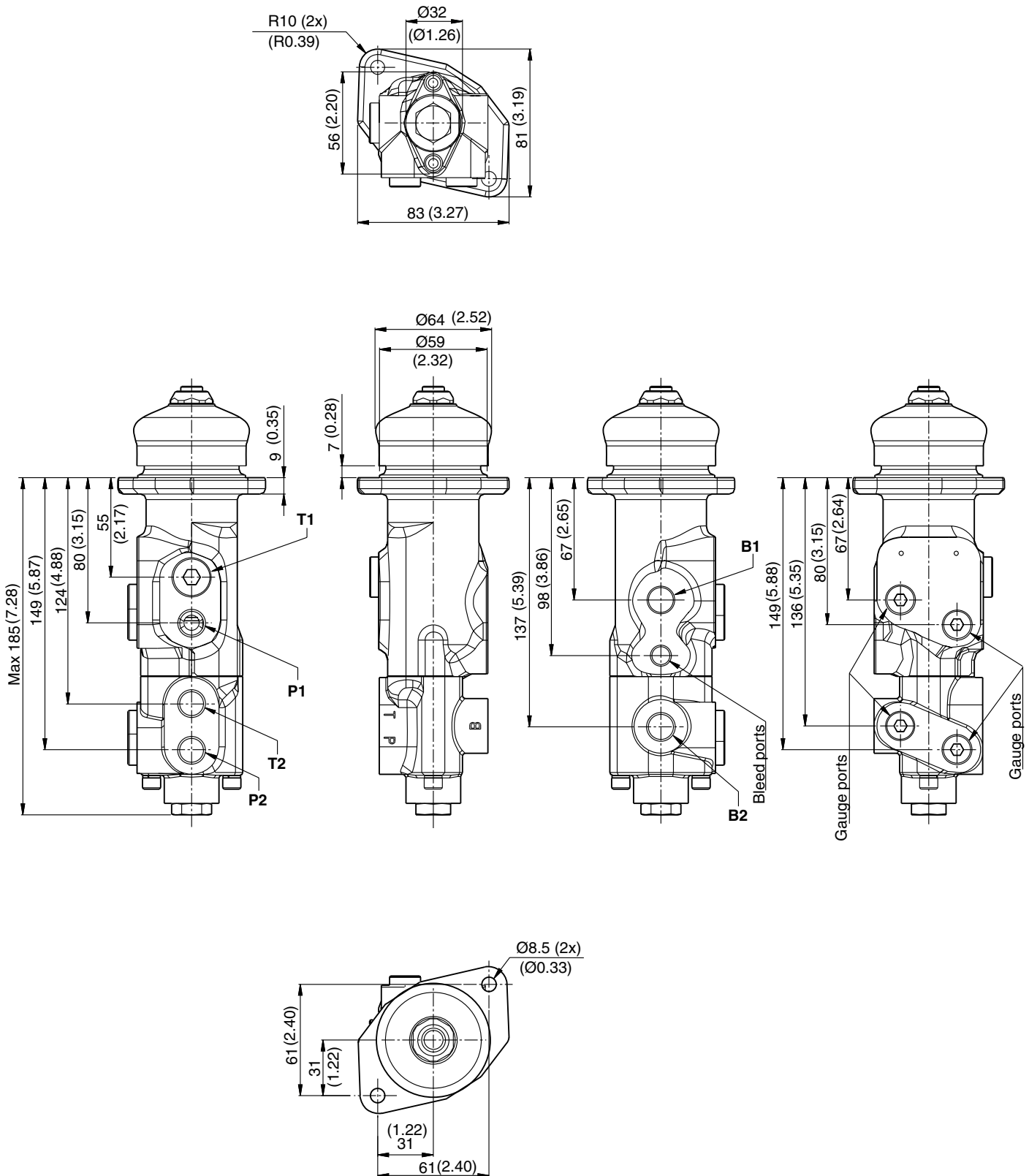
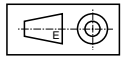


Code M



Dual circuit

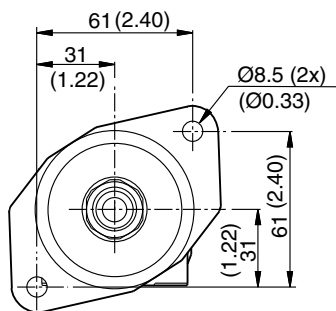
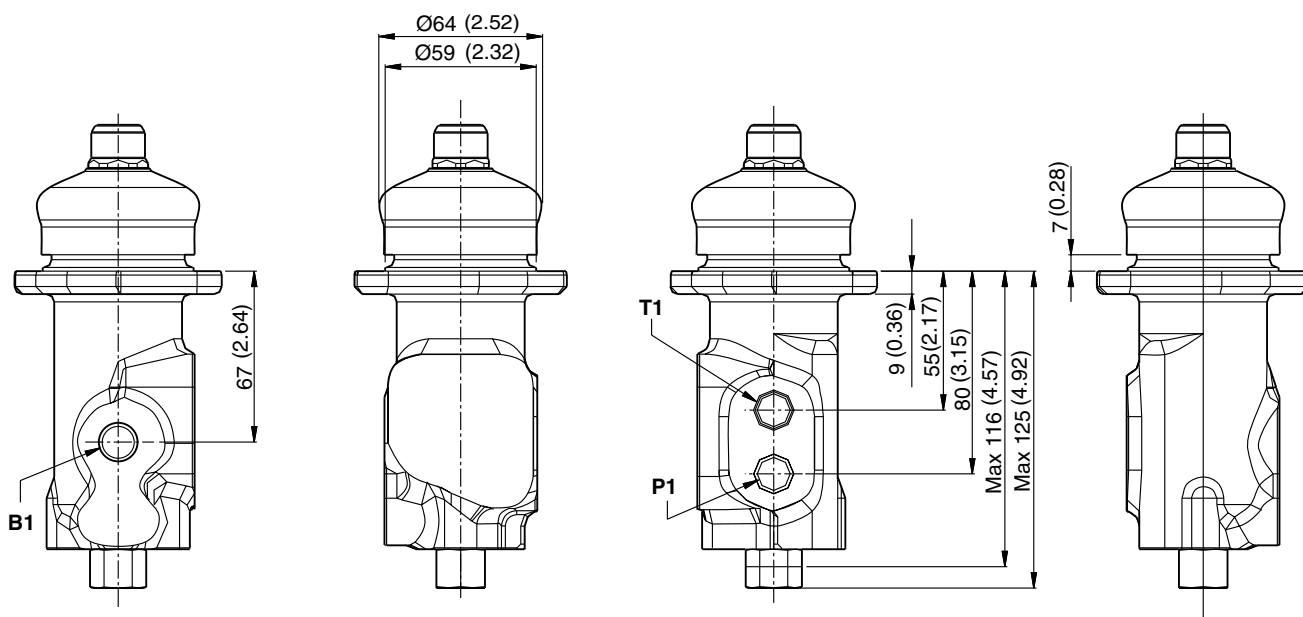
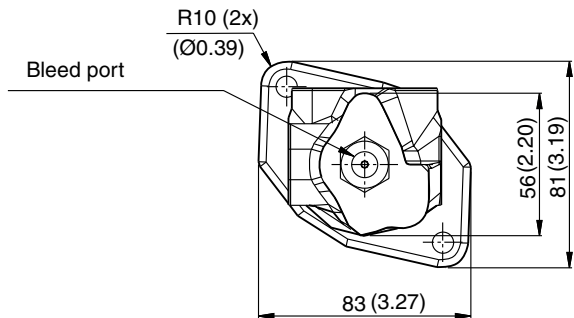
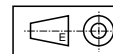
(Inch)



(Spygot no pedal. For pedal see page 13)

Single circuit

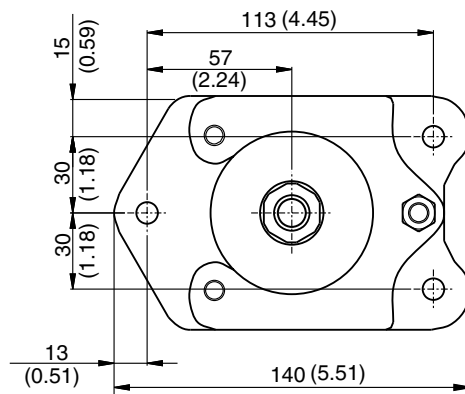
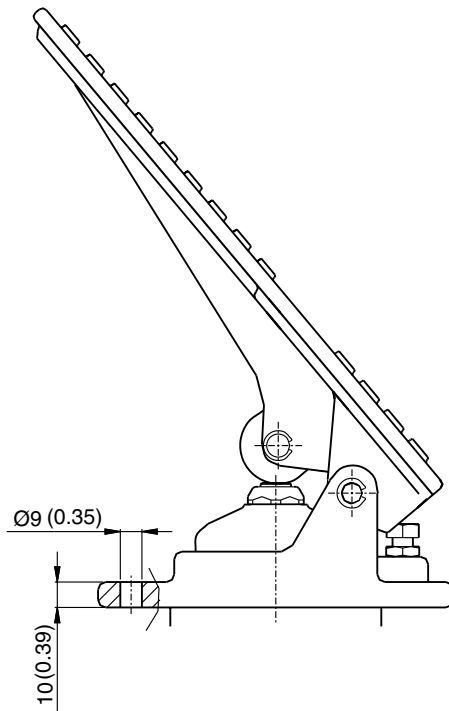
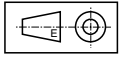
(Inch)



(Spygot no pedal. For pedal see page 13)

Pedal

(Inch)



**WARNING**

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