



BM40

LENGTH	1 millimetre (mm) = 0.0394 inch	1 inch = 25.4 millimetre (mm)
PRESSURE	1 bar (gage) = 14.493 pounds per square inch (PSI)	1 pound per square inch (PSI) = 0.069 bar (gage)
VACUUM	0.1 bar (a value less than 1.0) = 2.94 inches of mercury (in Hg) at 15.6 degrees Celsius (°C)	1 inch of mercury (in Hg) = 0.034 bar (a value less than 1.0 at 60° degrees Fahrenheit 1(°F)
FLOW	1 litre per minute (l/min) = 0.264 gallons per minute (GPM) 1 cubic centimetre per minute (cc/min) = 0.000264 gallons per minute (GPM)	1 gallon per minute (GPM) = 3.785 litres per minute (l/min) 1 gallon per minute (GPM) = 3785 cubic centimetres per minute (cc/min)
FORCE	1 Newton (N) = 0.225 pound _f (lbr _f)	1 pound _f (lbr _f) = 4.44 Newton (N)
MASS	1 kilogram (kg) = 2.20 pound _m (lbr _m)	1 pound _m (lbr _m) = 0.455 kilogram (Kg)
TIME	second (s)	second (s)
VOLUME	1 litre (l) = 0.264 US gallon (gal) 1 cubic centimetre (cc) = 0.000264 US gallons (gal)	1 US gallon (gal) = 3.785 litre (l) 1 US gallon (gal) = 3785 cubic centimetres (cc)
TEMPERATURE	°F = (1.8 • °C) + 32°	°C = 0.556 (°F - 32°)
TORQUE	1 Newton metre (N • m) or joule = 8.8 pound _f inches (lbr - in.)	1 pound _f inch (lbr - in.) = 0.1136 Newton metre (N • m) or joule
POWER	1 kilowatt (kW) = 1.34 horsepower (HP)	1 horsepower (HP) = 0.746 kilowatt (kW)
SHAFT SPEED	revolutions per minute (rev/min)	revolutions per minute (RPM)
FREQUENCY	1 Hertz (Hz) = 1 cycle per second (cps)	1 cycle per second (cps) = 1 Hertz (Hz)
DISPLACEMENT	1 cubic centimetre per revolution (cc/rev) = 0.061 cubic inches per revolution (cu. in./rev.)	1 cubic inch per revolution (cu. in./rev.) = 16.4 cubic centimetres per revolution (cc/rev)
VELOCITY	1 metre per second (m/s) = 3.28 feet per second (fps)	1 foot per second (fps) = 0.305 metre per second (m/s)

NOTE: 1 cubic (cc) = 1 millilitre (ml) = 0.001 litre (l)

GENERAL INDICATIONS	4
DESIGNATION SAMPLE	5
TECHNICAL CHARACTERISTICS: WEIGHT, DIMENSIONS, THREADS, INTERNAL LEAKAGE	6
RELIEF VALVES	8
INLET PLUGS	10
ACTUATORS	11
SPOOLS	15
SPOOL CONTROLS	21
OUTLET PLUGS	30

This booklet is meant to be a technical deepening on directional control valves of the BM40 series. Choice, use, maintenance and warranty conditions of all BLB products are described in the 2006 BLB general catalogue.

The monoblock valves of the BM40 series are characterized by a single body having following features:

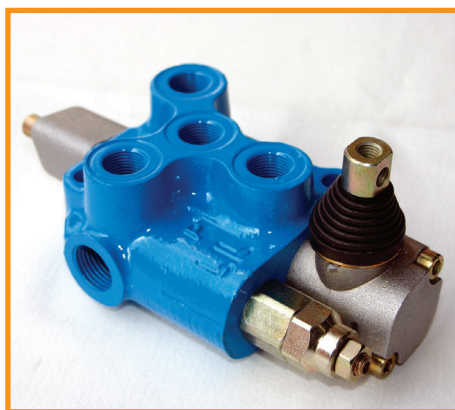
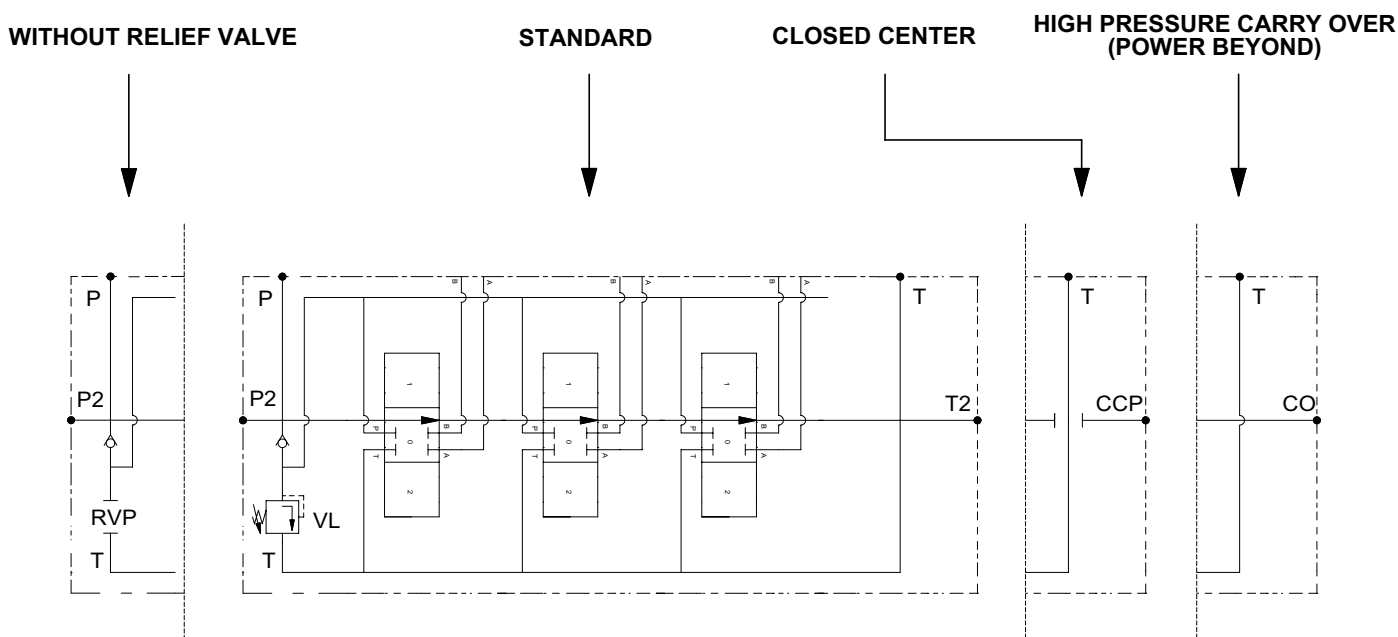
- **Low production costs**
- **Sound construction**
- **Compact size**
- **Reduced weight**

Monoblock valves are generally used when no auxiliary valves are needed and the inside circuits are not too complicated.

Furthermore, the absence of tie rods and intermediate seals allow monoblock valves to provide:

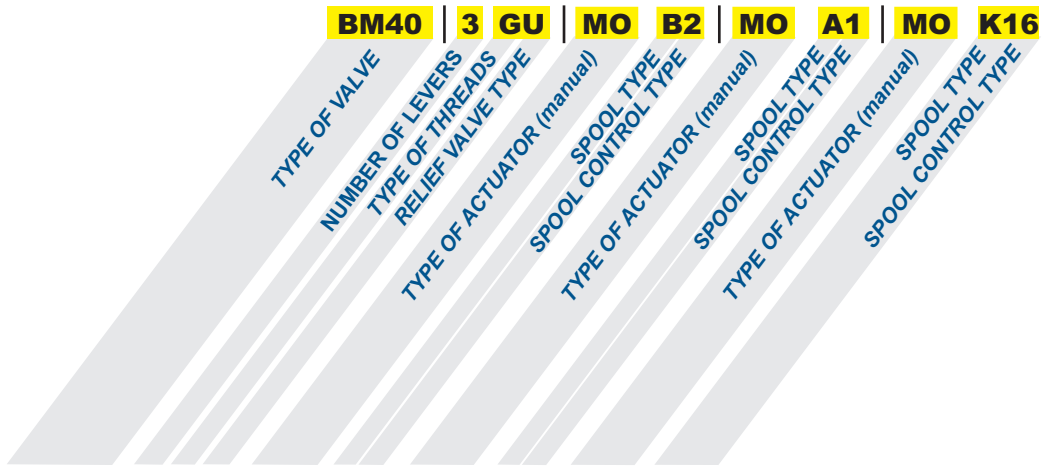
- **Improved dependability**
- **Sturdy valves body for fewer leak points**
- **Lower maintenance**

Above characteristics suggest that monoblock valves are ideal for use in mobile machines applications.

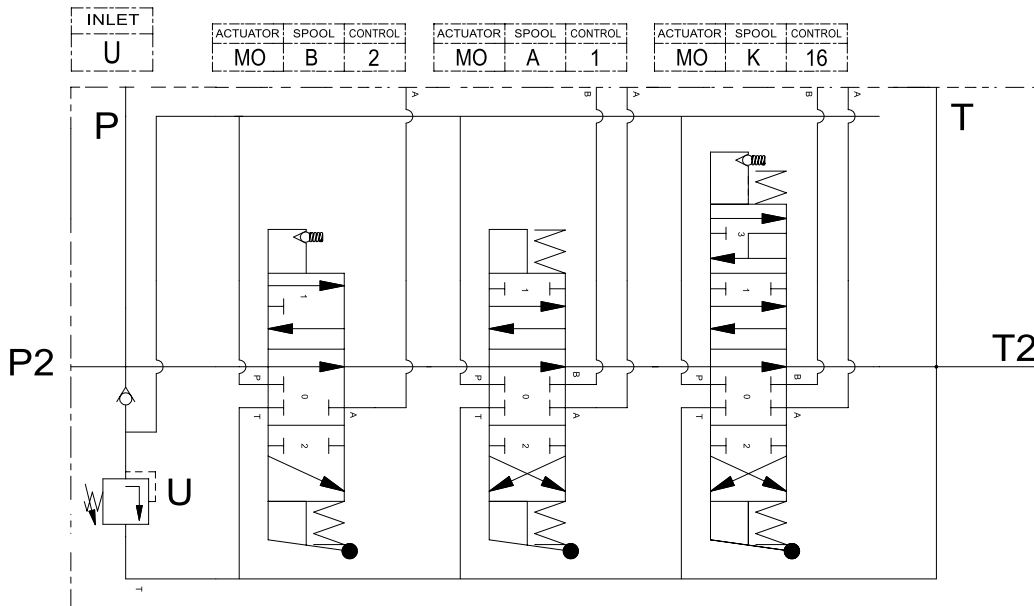


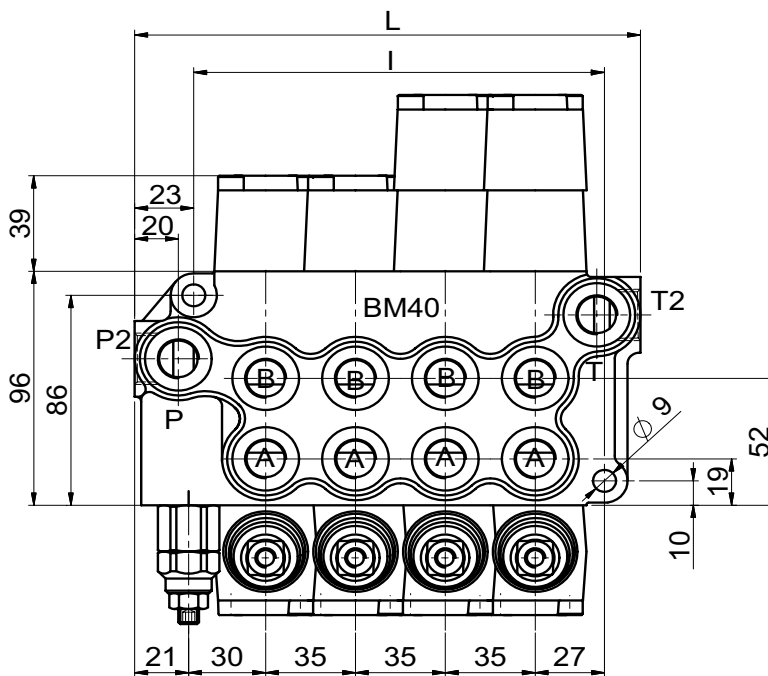
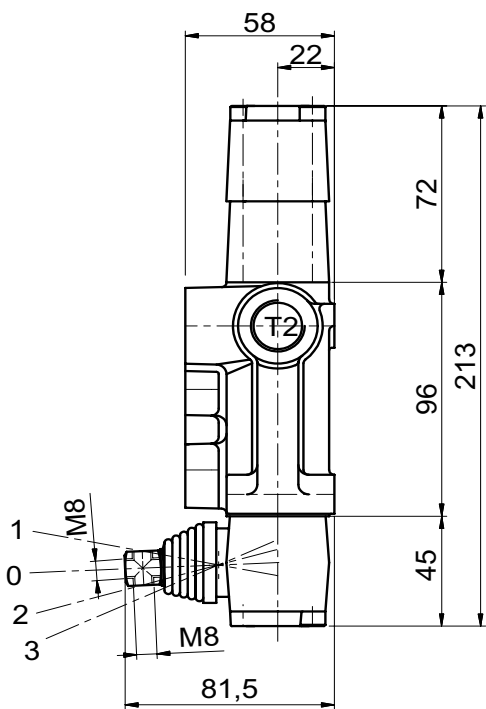
BM40

DESIGNATION SAMPLE

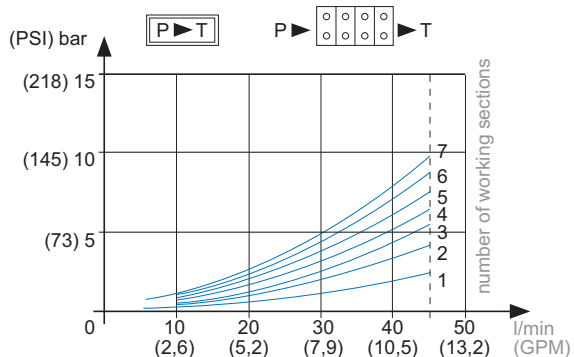


 Mandatory field
 Optional field



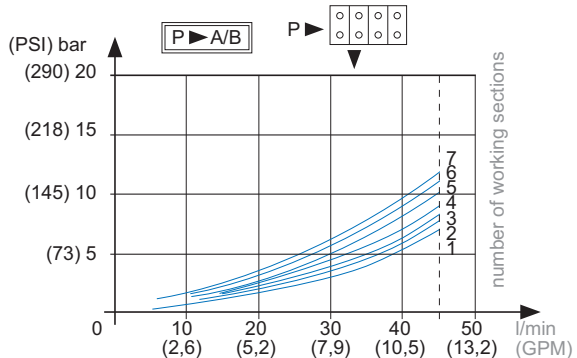


P ▶ T - oil temperature 50 °C - viscosity 32 mm²/s

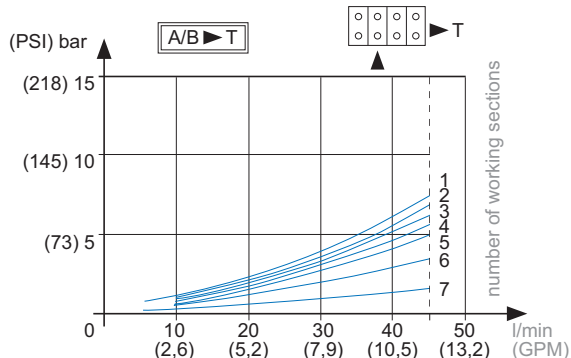


INTERNAL OIL LEAKAGE	
From A B to T	4 ÷ 8 cc/min
TESTING CONDITIONS	
Pressure	100 bar
Oil temperature	40 °C
Oil viscosity	32 mm ² /s

P ▶ A/B - oil temperature 50 °C - viscosity 32 mm²/s



A/B ▶ T - oil temperature 50 °C - viscosity 32 mm²/s

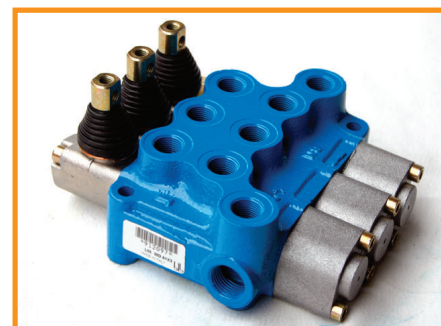
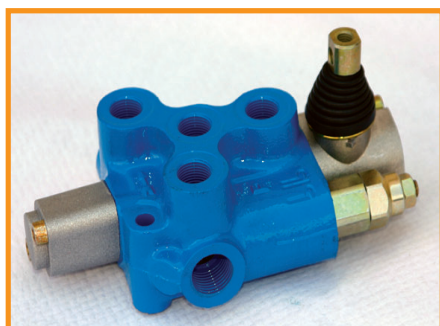


TECHNICAL CHARACTERISTICS

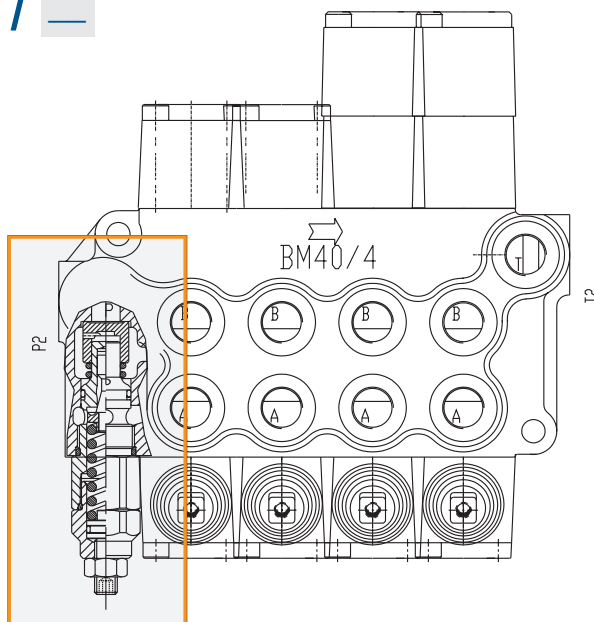
NUMBER OF SECTIONS	L		I		Kg	Pound
	(mm)	(in)	(mm)	(in)		
BM40/1	90	3.54	55	2.17	2.5	5.51
BM40/2	125	4.92	90	3.54	3.7	8.16
BM40/3	160	6.29	125	4.92	5.0	11.02
BM40/4	195	7.68	160	6.29	6.2	13.67
BM40/5	230	9.06	195	7.68	7.4	16.31
BM40/6	265	10.43	230	9.06	8.6	18.96
BM40/7	300	11.81	265	10.43	9.8	21.60

TECHNICAL CHARACTERISTICS		
NOMINAL FLOW	35 l/min	9 GPM
MAX FLOW	45 l/min	12 GPM
NOMINAL PRESSURE	250 bar	3600 PSI
MAX PRESSURE ON PORTS	320 bar	4700 PSI
MAX PRESSURE ON TANK-LINE	80 bar	1100 PSI

STANDARD THREADS					
	A - B	P	T	P2	T2
G (BSP)	3/8"	3/8"	3/8"	1/2"	1/2"
F (UNF)	3/4" - 16	3/4" - 16	3/4" - 16	7/8" - 14	7/8" - 14



BM _ / _ _ () _ / _ _ _ / _

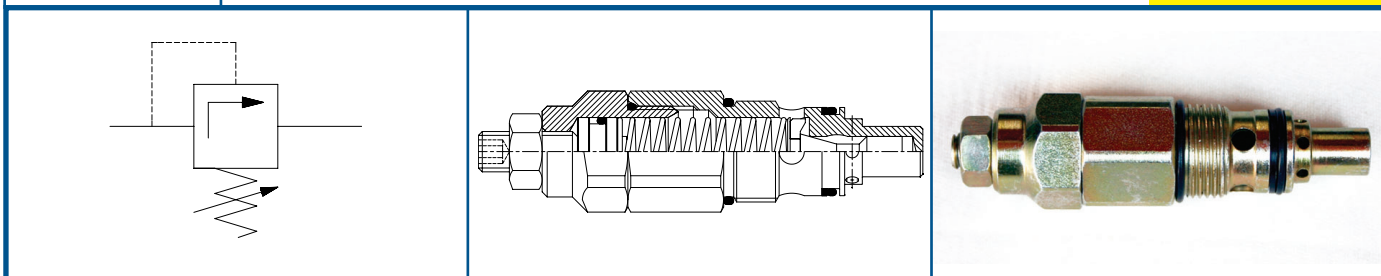


RELIEF VALVE X

PRESSURE RANGE 30 ÷ 90 bar

STANDARD RELIEF SETTING 70 bar

COD. 803009



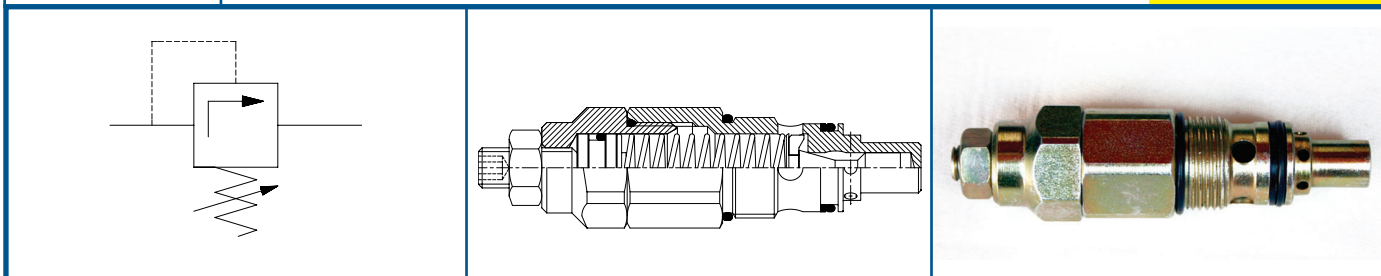
Low pressure adjustable relief valve. Allows the external adjustment of the relief valve pressure between 30 to 90 bar. The pressure rating is based on a pre-set flow of 8 l/min.

RELIEF VALVE U

PRESSURE RANGE 80 ÷ 230 bar

STANDARD RELIEF SETTING 140 bar

COD. 803002



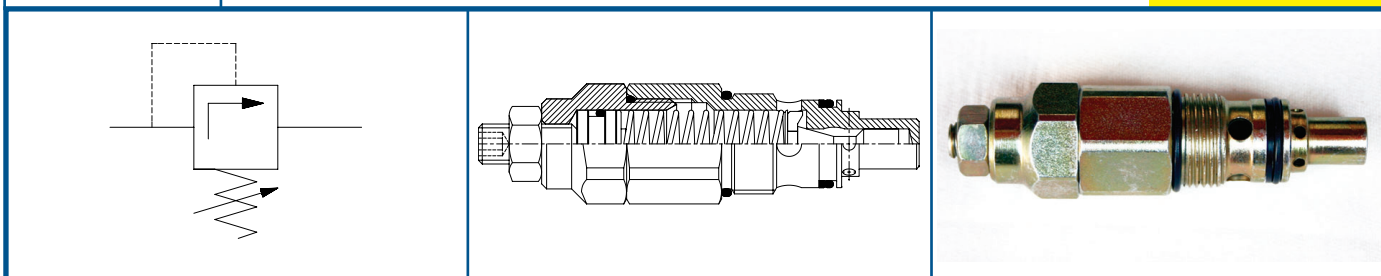
High pressure adjustable relief valve. Allows the external adjustment of the relief valve pressure between 80 to 230 bar. The pressure rating is based on a pre-set flow of 8 l/min.

RELIEF VALVE K

PRESSURE RANGE 150 ÷ 300 bar

STANDARD RELIEF SETTING 200 bar

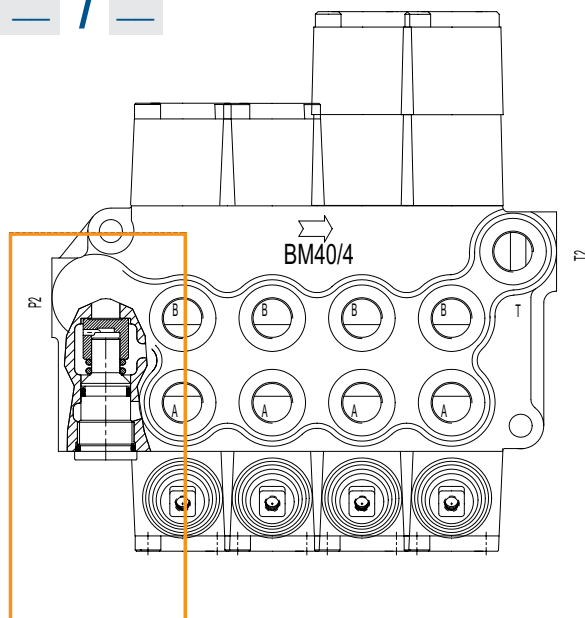
COD. 803010



Very high pressure adjustable relief valve. Allows the external adjustment of the relief valve pressure between 150 to 300 bar. The pressure rating is based on a pre-set flow of 8 l/min.

RELIEF VALVES

BM __ / __ __ () __ / __ __ __ / __



RELIEF VALVE LOCK KIT PB	COD. 020027	

Prevents users from altering the factory pre-set relief valve.

RELIEF VALVE PLUG RVP	COD. 832010	

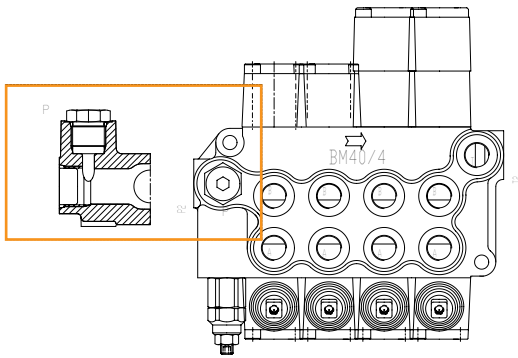
Replaces the relief valve in closed center systems where the relief valve is not required.

KIT VNR	COD. 560189	

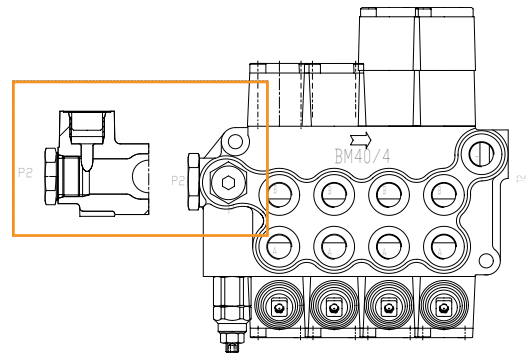
Standard on all Bib monoblock valves. Each valve has only one load check. The load check prevents the fall of a cylinder as the spool is shifted. It also prevents the backflow of oil from the work port to the inlet.

BM _ / _ _ _ () _ / _ _ _ / _

P



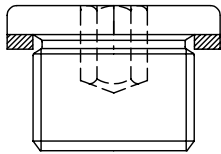
P2



INLET PLUG P

3/8" BSP

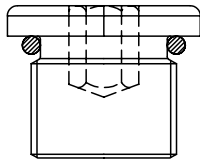
COD. 015008



INLET PLUG P

3/4" - 16 UNF

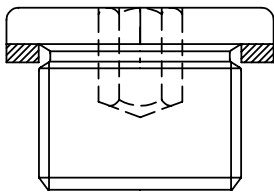
COD. 560333



INLET PLUG P2

1/2" BSP

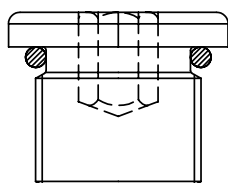
COD. 015007



INLET PLUG P2

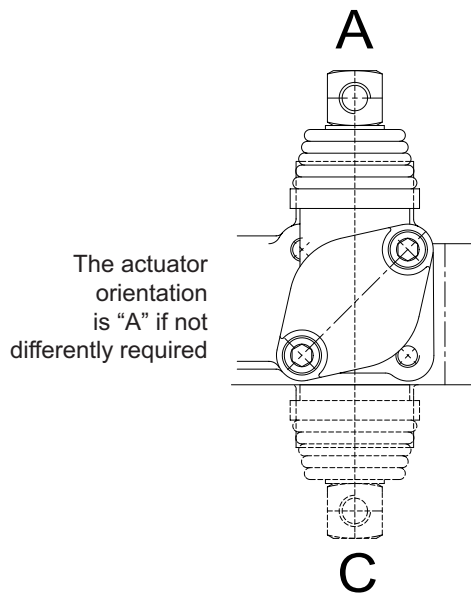
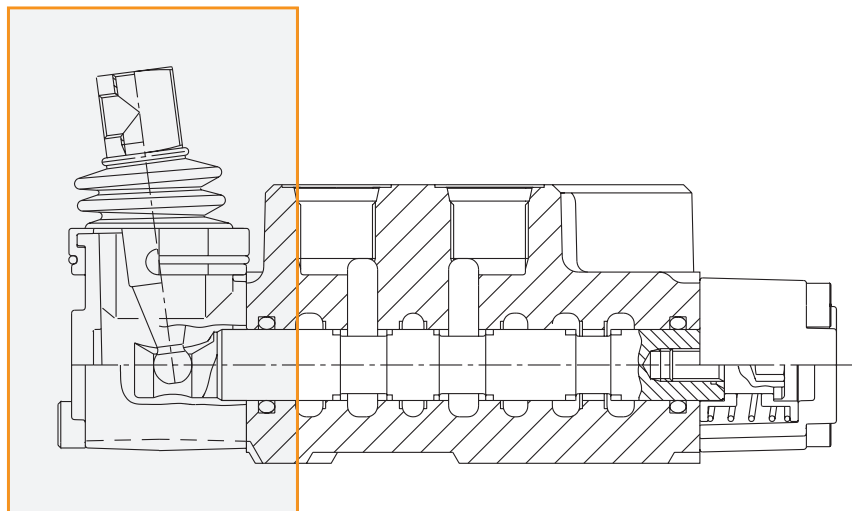
7/8" - 14 UNF

COD. 560094



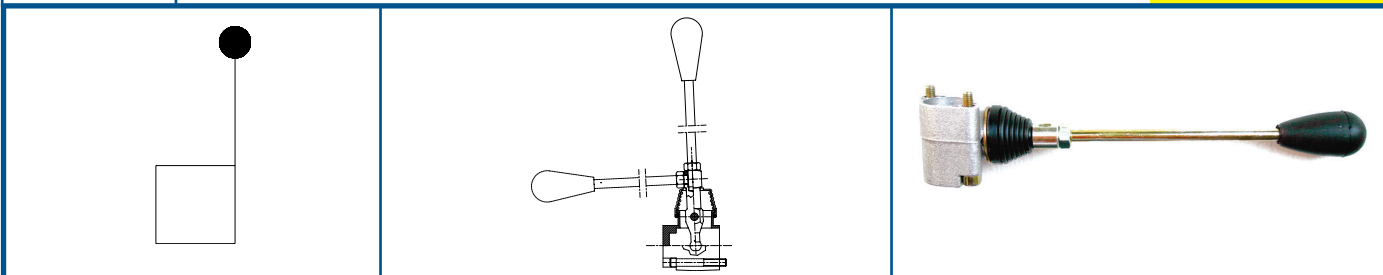
ACTUATORS

BM _ / _ _ _ () _ / _ _ _ / _



MANUAL MO

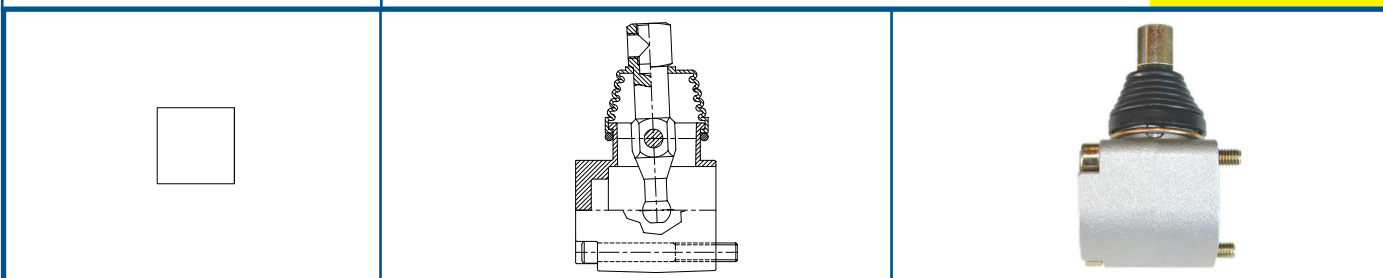
COD. 801001



Manual lever control for manual operation. Features 2 angles 90° - 180°.

MANUAL WITHOUT LEVER MW

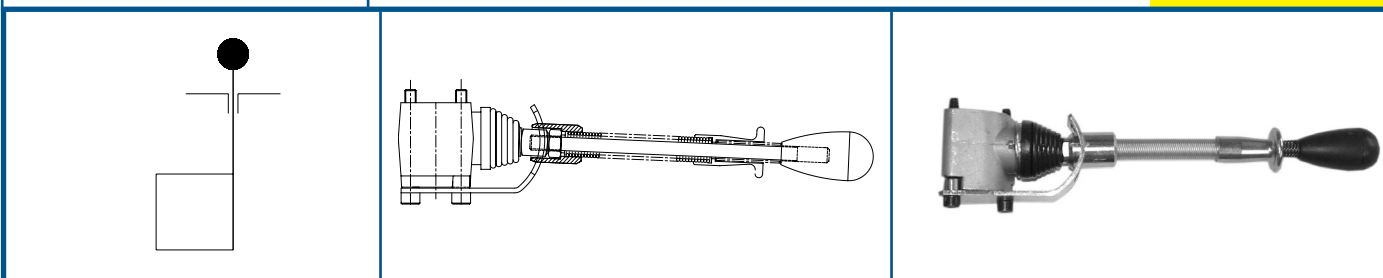
COD. 801035



Manual control without lever handle.

SAFETY MANUAL LEVER MX

COD. 801175

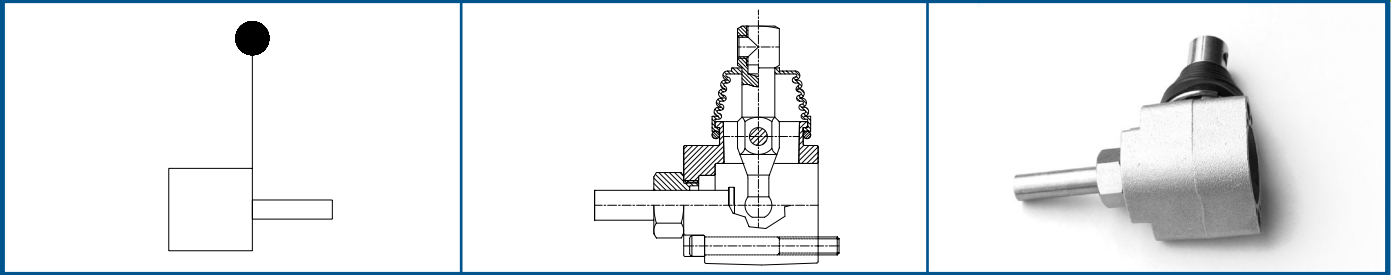


Manual control with safety lever system. Allows the operation of the lever only after the lock system is released.

BM __ / __ __ __ () __ / __ __ __ / __

MANUAL WITH CAM MC

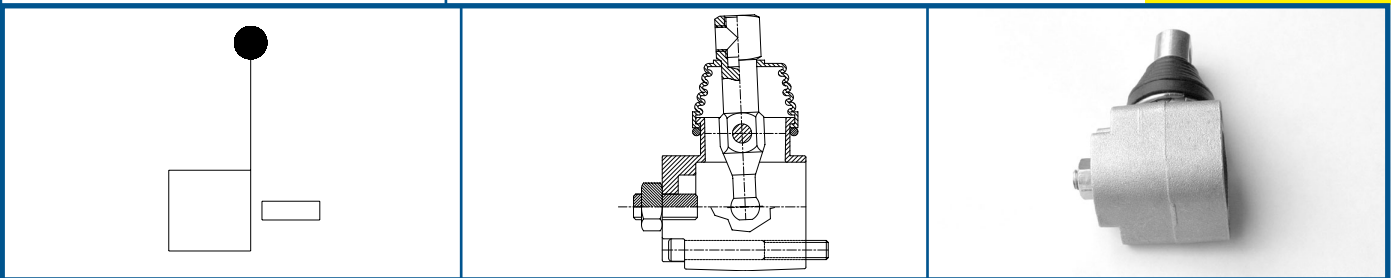
COD. 801065



Manual lever control with cam.

MANUAL WITH LIMITING DEVICE ML

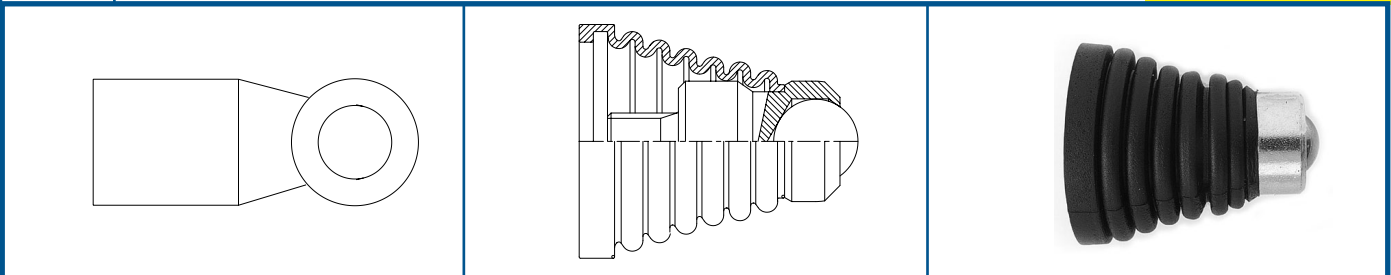
COD. 801162



Manual lever control with limiter of the spool movement.

CAM DO

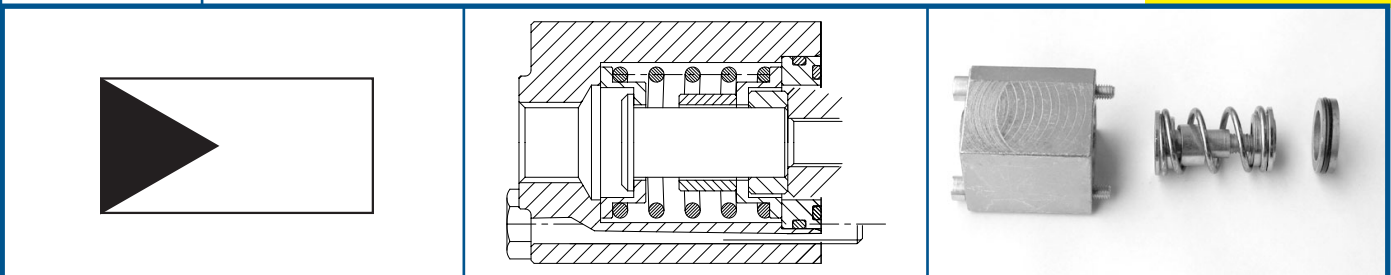
COD. 801044



Cam actuator.

HYDRAULIC HO

COD. 560644



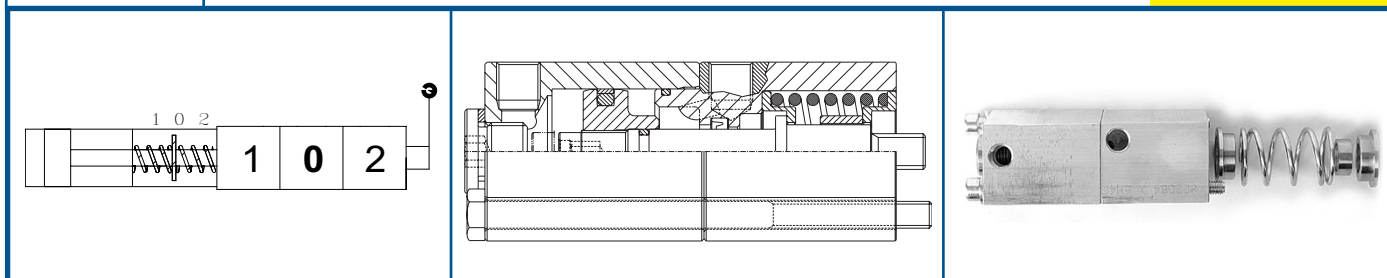
Hydraulic actuator for remote control.

ACTUATORS

BM __ / __ __ __ () __ / __ __ __ / __

PNEUMATIC 1P

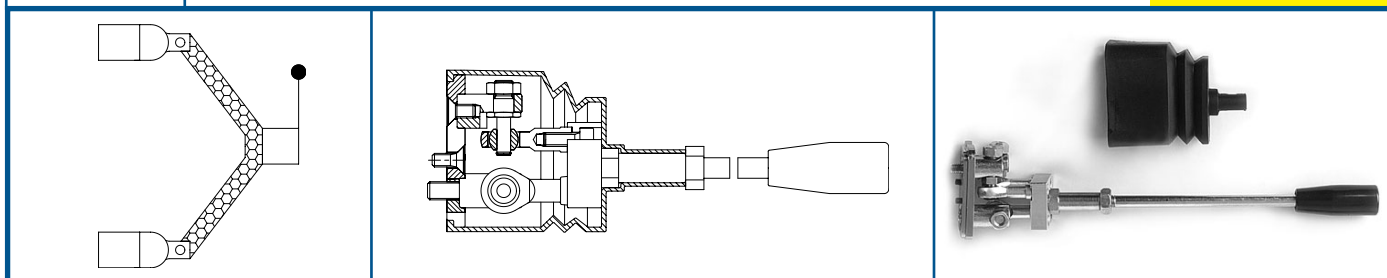
COD. 802064



Pneumatic actuator for remote control mounted on the spool control side. It can be combined with other manual actuators.

JOYSTICK JS

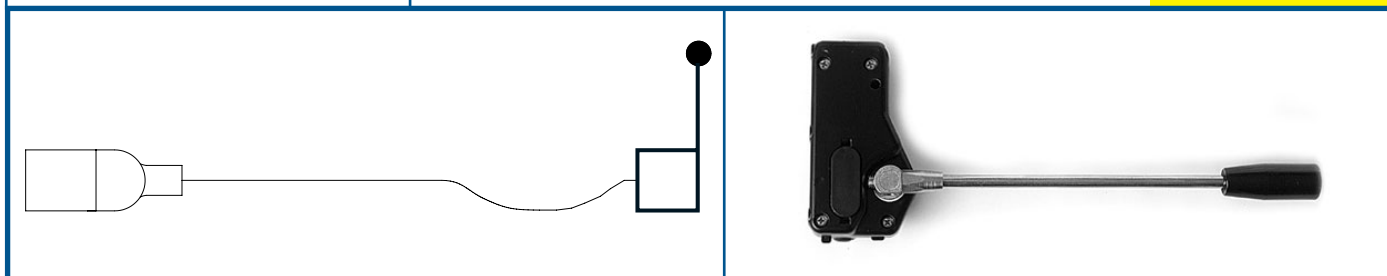
COD. 801120



Operates two spools with one lever handle. Two spools can be operated independently or simultaneously, depending on the movement of the handle. Joystick requires to be assembled with spools AS, BS, DS or KS.

MANUAL REMOTE CONTROL FO

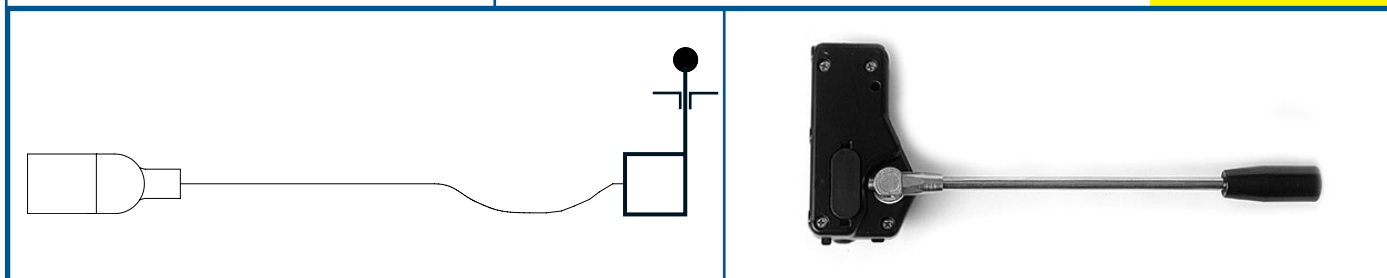
COD. 023040



Manual lever control for manual remote operation.

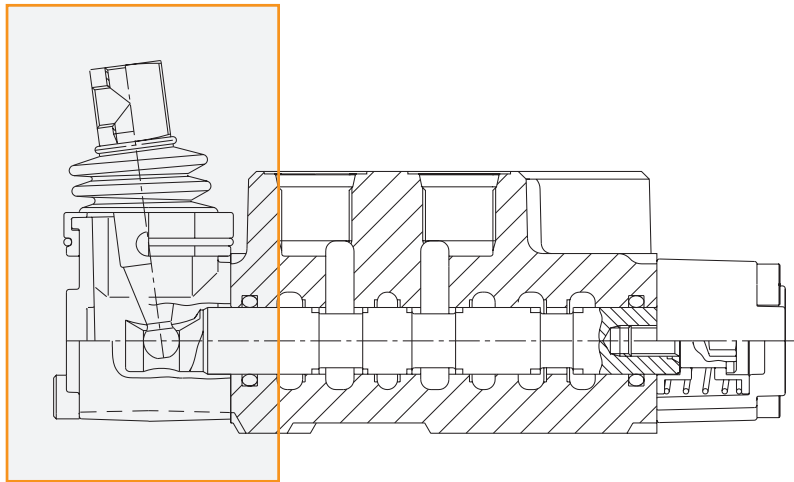
SAFETY MANUAL REMOTE CONTROL FA

COD. 023047



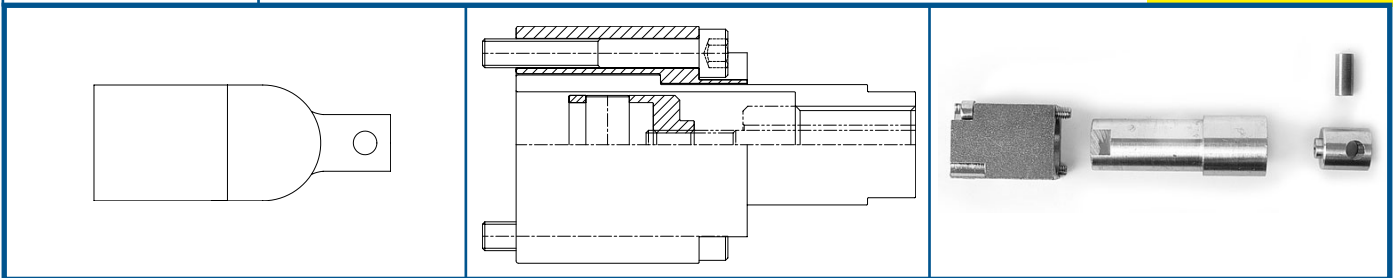
Manual lever control with safety system for manual remote operation. Allows the operation of the lever only after the lock system is released.

BM _ / _ _ _ () _ / _ _ _ / _



CABLE ADAPTER FL

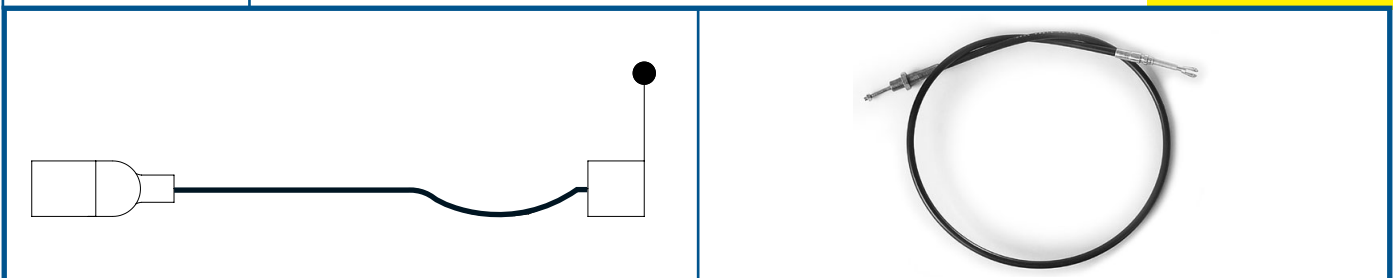
COD. 801023



Cable adapter for cable control. No hand lever is provided.

CABLE TYPE CA2.0

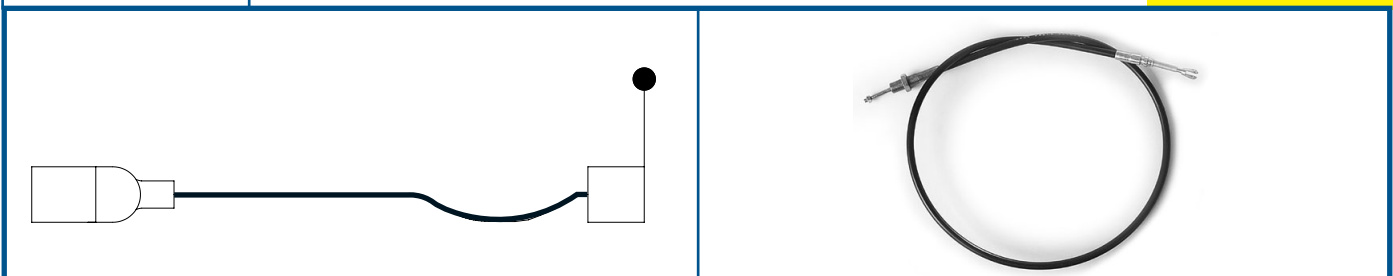
COD. 023043



Cable 2.0 mt. long.

CABLE TYPE CA2.5

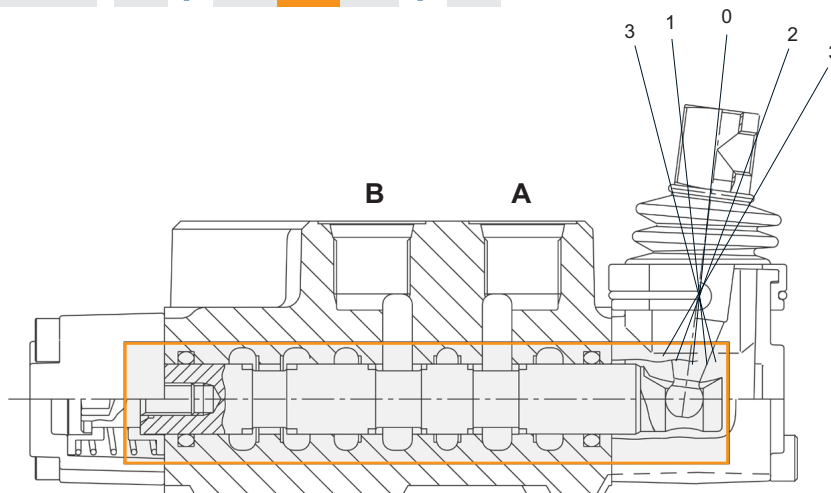
COD. 023044



Cable 2.5 mt. long.

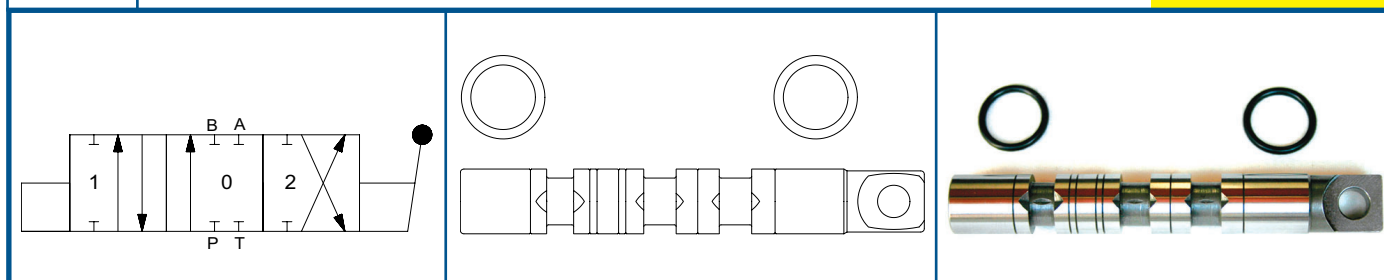
SPOOLS

BM / () / /



SPOOL A

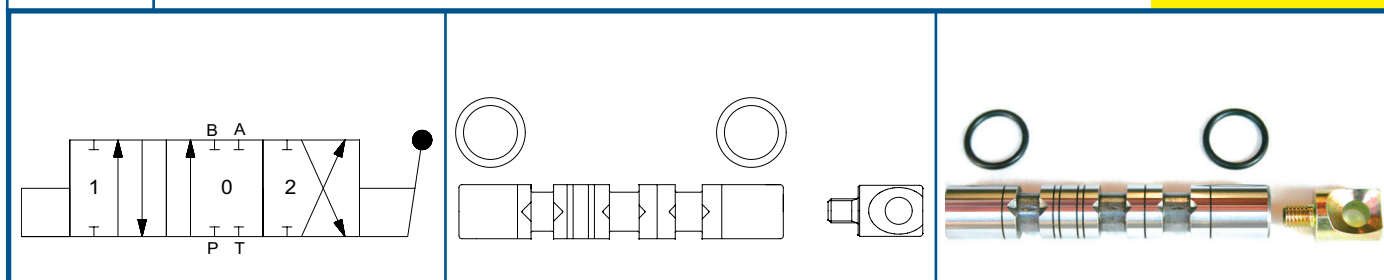
COD. 560096



4-WAY / 3-POSITION SPOOL. Provides control of double-acting cylinders or bi-directional hydraulic motors. In position 0 work ports are blocked.

SPOOL AS

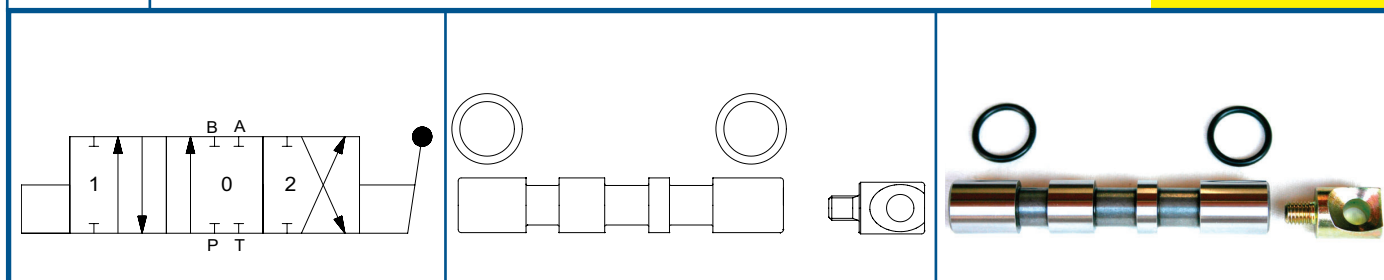
COD. 560111



4-WAY / 3-POSITION SPOOL. Same features as spool A but with threaded spool end. Required to assembly the joystick (JS) or for special applications.

SPOOL SP

COD. 560109

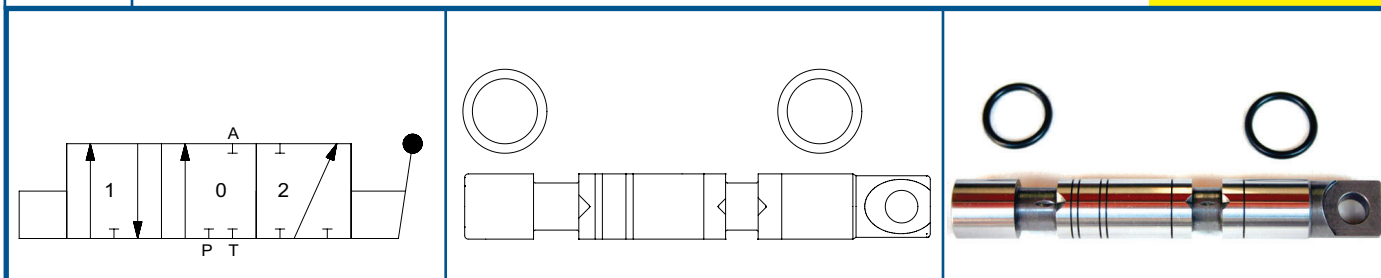


4-WAY / 3-POSITION SPOOL. Same features as spool AS but without metering. Required for special applications (i.e. woodsplitter).

BM __ / __ __ __ () __ / __ — __ / __

SPOOL B

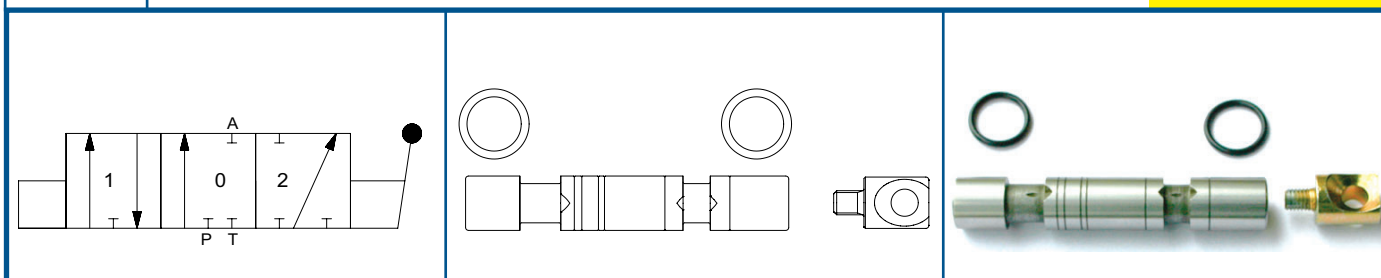
COD. 560097



3-WAY / 3-POSITION SPOOL. Provides control of single-acting cylinders or start and stop of uni-directional hydraulic motors. In position 0 work port is blocked. B port is plugged.

SPOOL BS

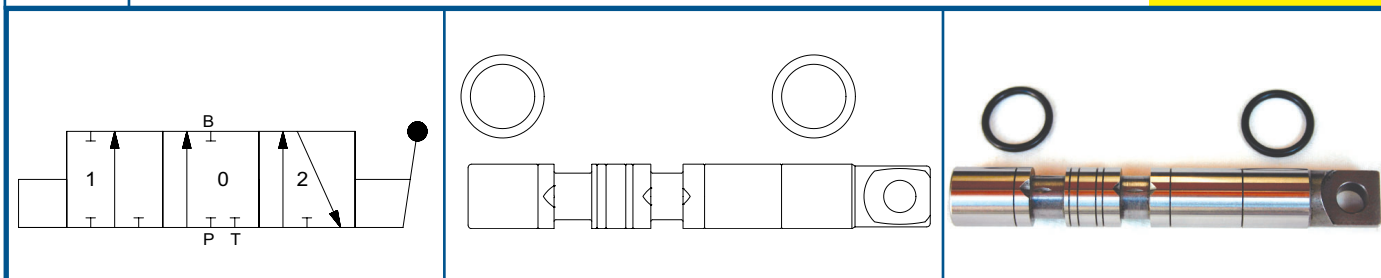
COD. 560112



3-WAY / 3-POSITION SPOOL. Same features as spool B but with threaded spool end. Required to assembly the joystick (JS) or for special applications.

SPOOL C

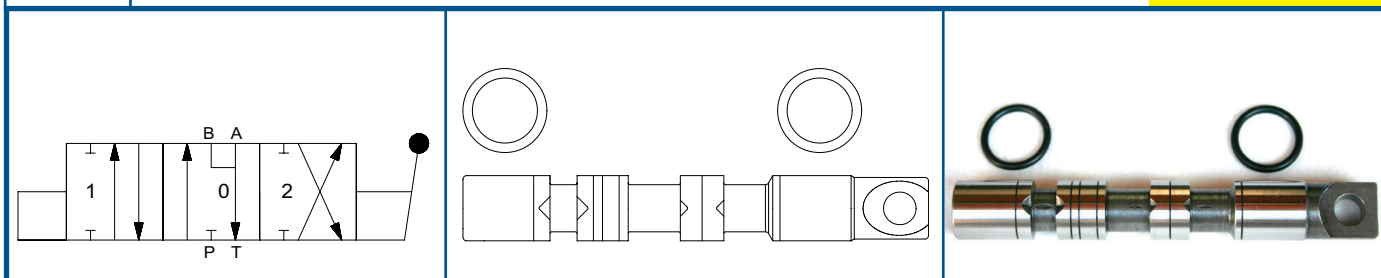
COD. 560098



3-WAY / 3-POSITION SPOOL. Provides control of single-acting cylinders or start and stop of uni-directional hydraulic motors. In position 0 work port is blocked. A port is plugged.

SPOOL D

COD. 560099



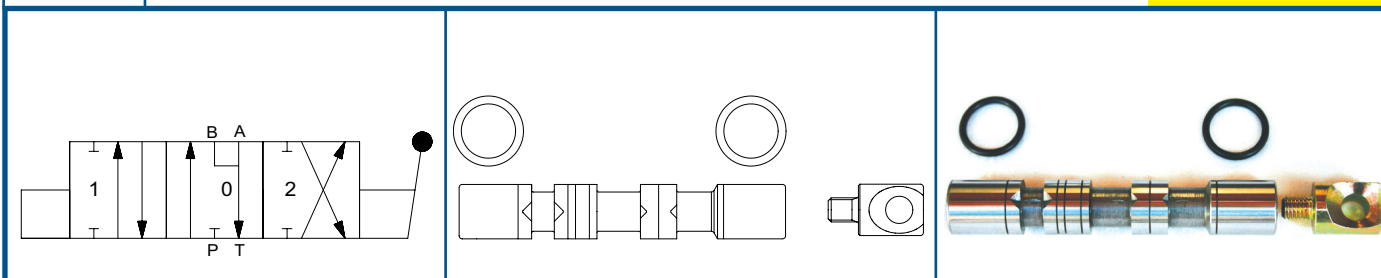
4-WAY / 3-POSITION SPOOL, OPEN CENTER (MOTOR SPOOL). Provides control of double acting cylinders or bi-directional hydraulic motors. Allows a cylinder to float or a motor to wheel free when the spool is in position 0. Work ports are open to the tank port when the spool is in position 0.

SPOOLS

BM / () / /

SPOOL DS

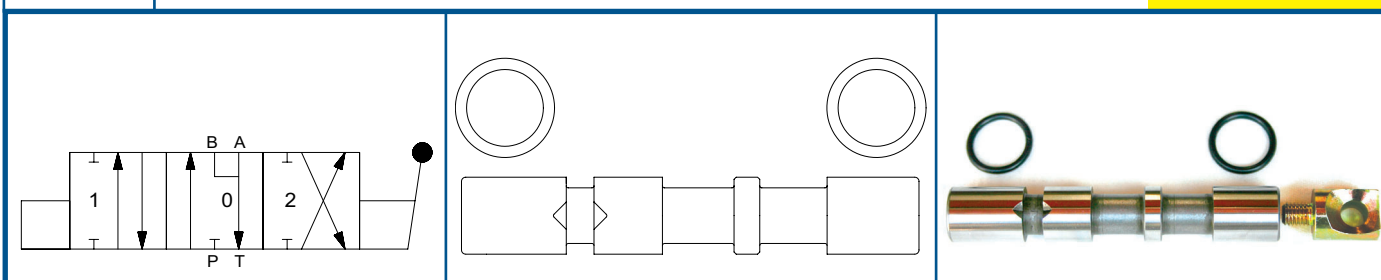
COD. 560114



4-WAY / 3-POSITION SPOOL, OPEN CENTER (MOTOR SPOOL). Same features of spool D but with threaded spool end. Required to assemble the joystick (JS) or for special applications.

SPOOL INS

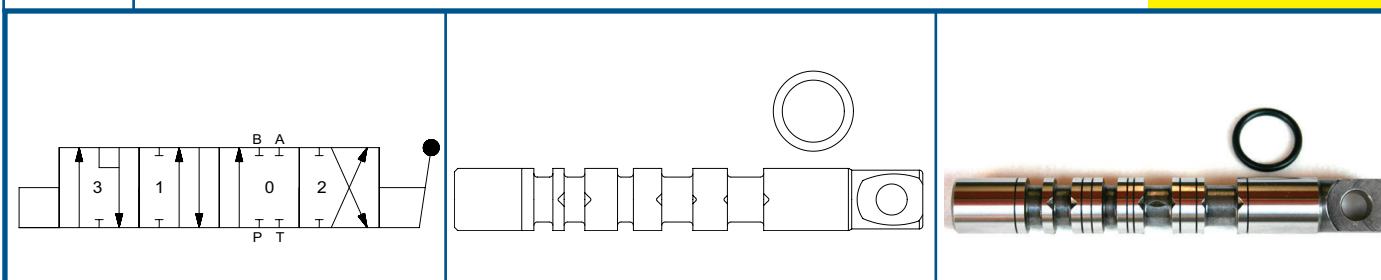
COD. 560110



4-WAY / 3-POSITION SPOOL, OPEN CENTER (MOTOR SPOOL). Same features as spool DS but without metering. Required for special applications.

SPOOL K

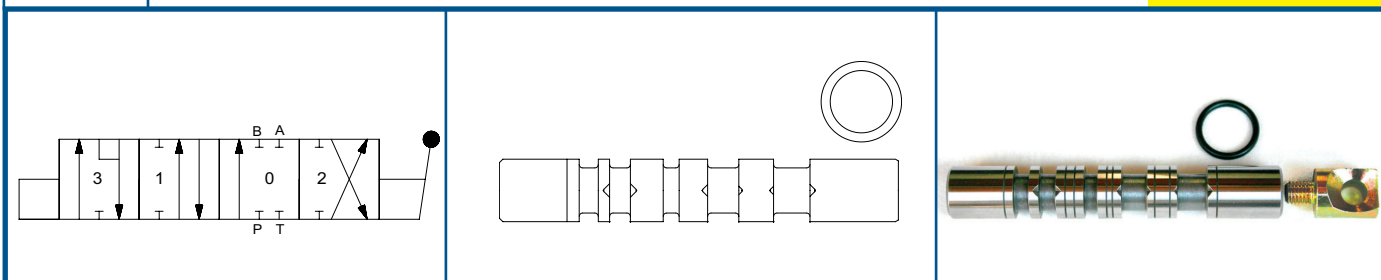
COD. 560102



4-WAY / 4-POSITION, FLOATING SPOOL. Same features as spool A with the addition of a fourth floating position. The floating position allows a cylinder to float or a motor to wheel free when the spool is in position 3. To be combined only with spool controls 16 or 54. Special machining on the body is required.

SPOOL KS

COD. 560421

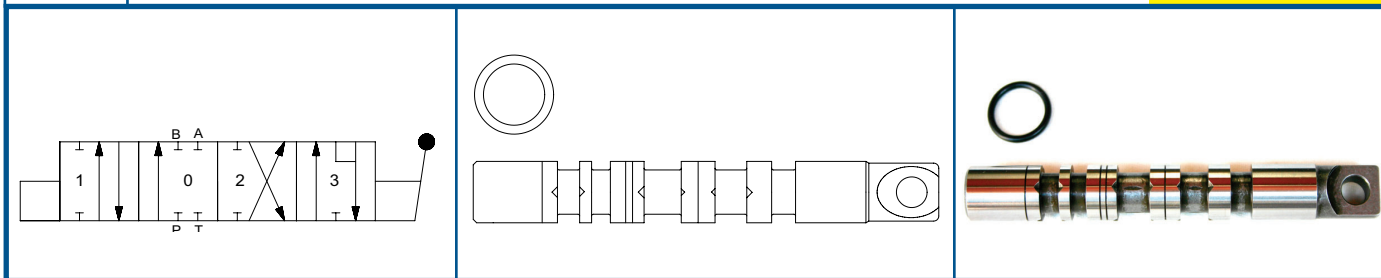


4-WAY / 4-POSITION, FLOATING SPOOL. Same features as spool K but with threaded spool end. Required to assemble the joystick (JS) or for special applications. To be combined only with spool controls 16 or 54. Special machining on the body is required.

BM __ / __ __ __ () __ / __ **—** __ / __

SPOOL L

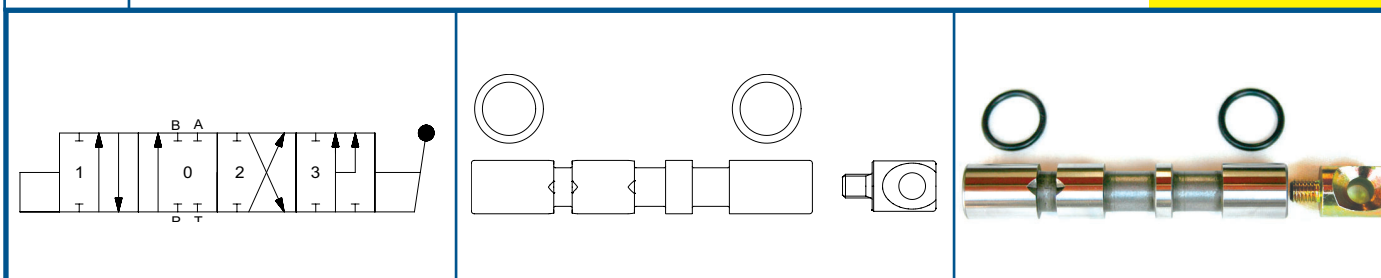
COD. 560103



4-WAY / 4-POSITION, FLOATING SPOOL. Same features as spool A with the addition of a fourth floating position. The floating position allows a cylinder to float or a motor to wheel free when the spool is in position 3. To be combined only with spool controls 12, 13 or 53. Special machining on the body is required.

SPOOL Z

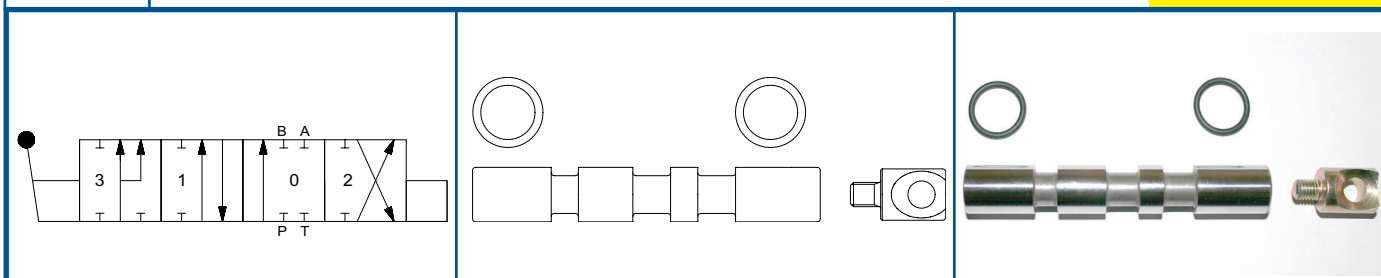
COD. 560108



4-WAY / 4-POSITION REGENERATIVE SPOOL. Same features as spool A with the addition of a fourth regenerative circuit in position 3. The regenerative circuit allows the cylinder to increase its speed, in one way only, adding the oil returning from the rod chamber of the cylinder to the pump flow. To be combined only with spool controls 14, 42, 43 or 44. Special machining on the body is required.

SPOOL WS

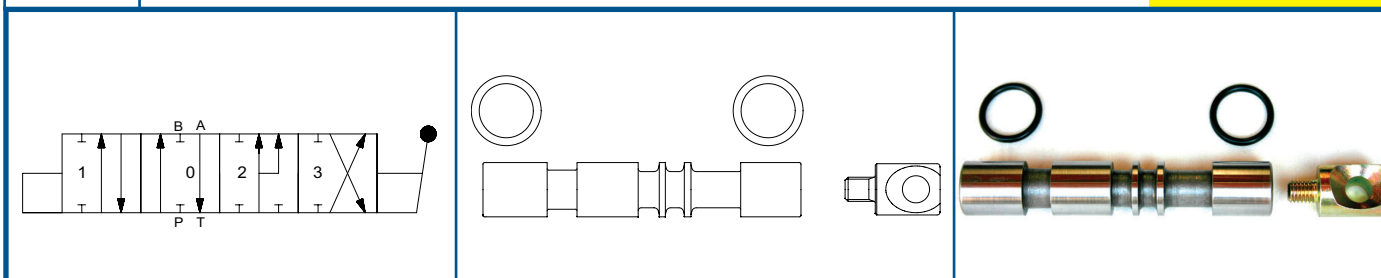
COD. 560772



4-WAY / 4-POSITION REGENERATIVE SPOOL. Same features as spool Z but with threaded spool end. To be combined only with spool controls 42 or 43. Special machining on the body is required.

SPOOL ZI

COD. 560645



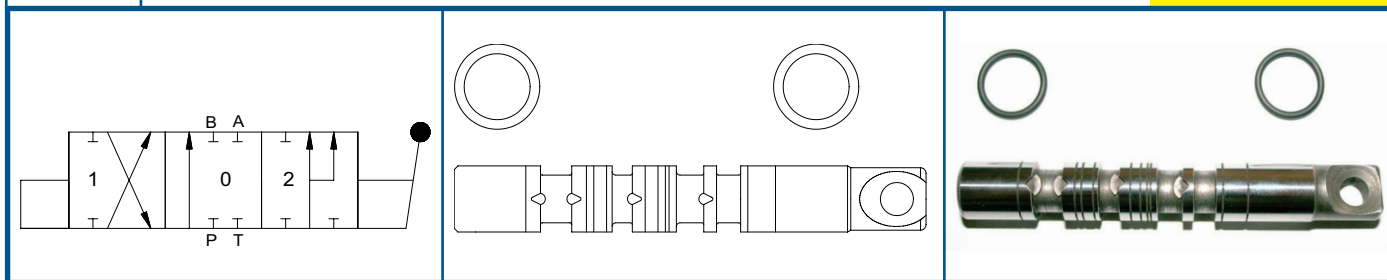
4-WAY / 4-POSITION REGENERATIVE SPOOL. Same features as spool Z. The fourth regenerative circuit is in position 2. To be combined only with spool control 17. Special machining on the body is required.

SPOOLS

BM __ / __ __ __ () __ / __ **—** __ / __

SPOOL R

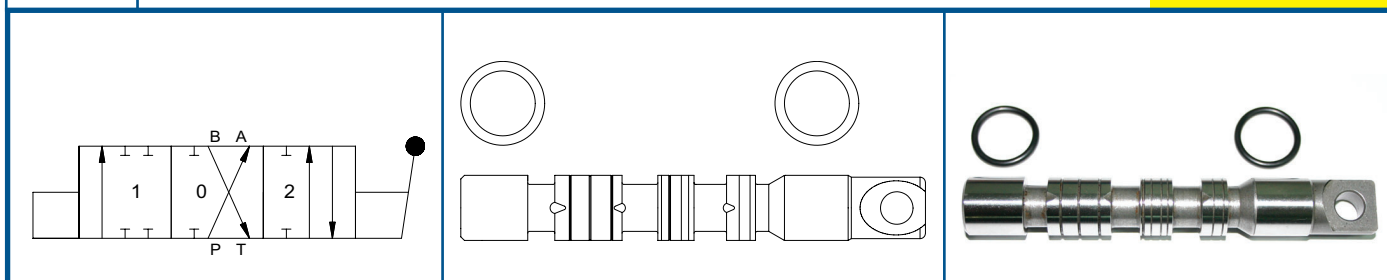
COD. 560228



4-WAY / 3-POSITION REGENERATIVE SPOOL. Provides control of double-acting cylinders or bi-directional hydraulic motors. The regenerative circuit is in position 2. The regenerative circuit allows the cylinder to increase its speed, in one way only, adding the oil returning from the rod chamber of the cylinder to the pump flow. Special machining on the body is required.

SPOOL Y

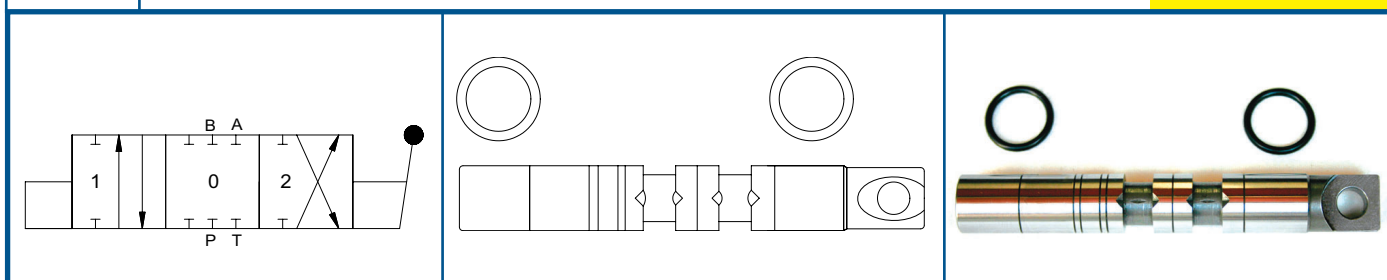
COD. 560107



4-WAY / 3-POSITION SPOOL. Provides control of bi-directional motors. Required when the sequence of the stop and go of the motor is different than usual. The neutral position is in position 1.

SPOOL M

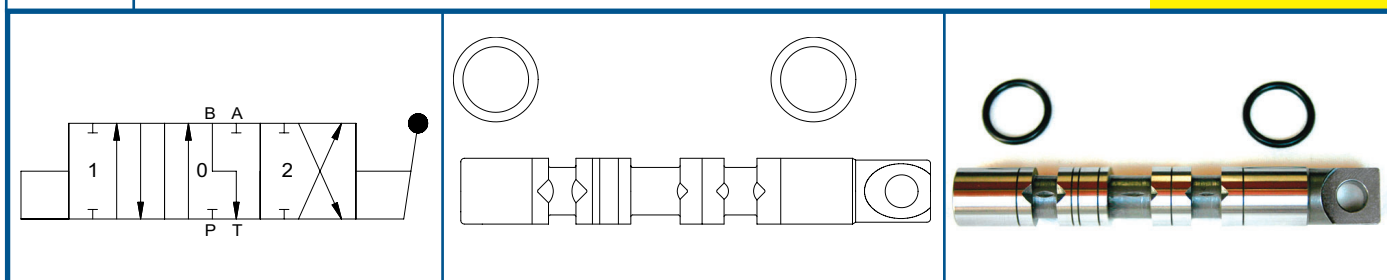
COD. 560104



4-WAY / 3-POSITION SPOOL. Same features as spool A to be used in a closed center system.

SPOOL E

COD. 560100

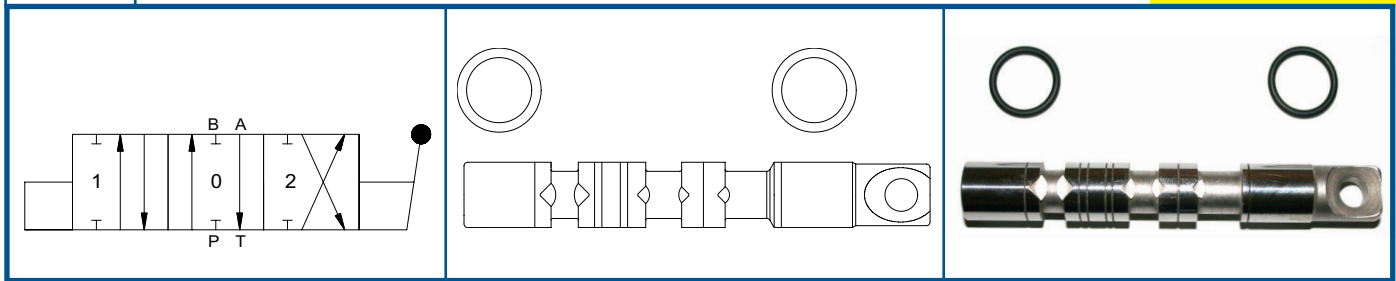


4-WAY / 3-POSITION SPOOL. Same features as spool A. In position 0 B port is connected to the tank. Required for special applications.

BM _ / _ _ _ () _ / _ _ / _

SPOOL F

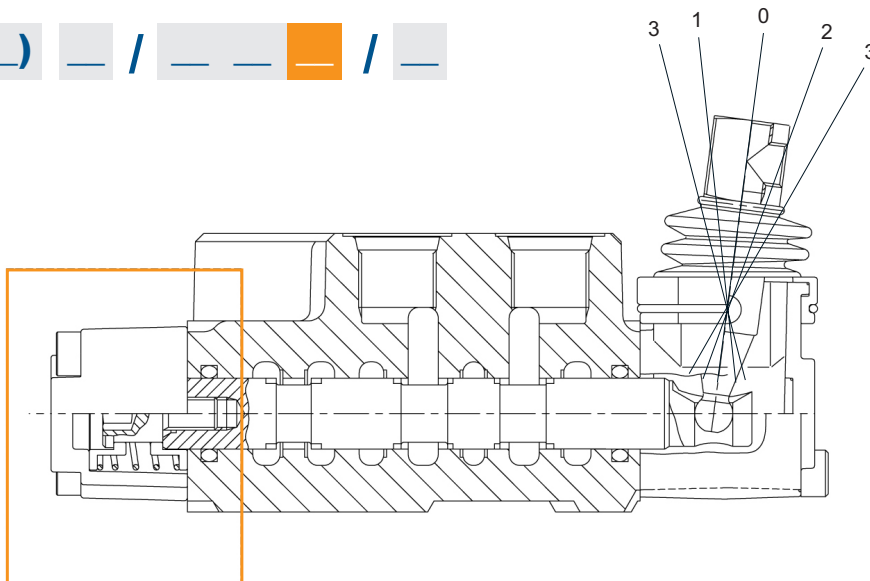
COD. 560101



4-WAY / 3-POSITION SPOOL. Same features as spool A. In position 0 A port is connected to the tank. Required for special applications.

SPOOL CONTROLS

BM / () / /



SPOOL CONTROL 1	3 POSITIONS	COD. 802001

The spool returns to position 0 when the handle is released.

SPOOL CONTROL 2	3 POSITIONS	COD. 802002

The spool is detented in position 1 and returns to 0 from position 2 when the handle is released.

SPOOL CONTROL 3	3 POSITIONS	COD. 802003

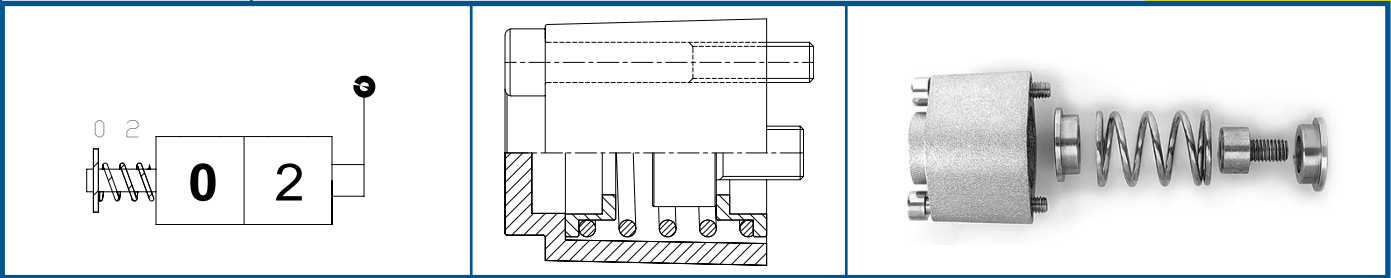
The spool is detented in position 2 and returns to 0 from position 1 when the handle is released.

BM _ / _ _ _ () _ / _ _ _ / _

SPOOL CONTROL 4

2 POSITIONS

COD. 802004

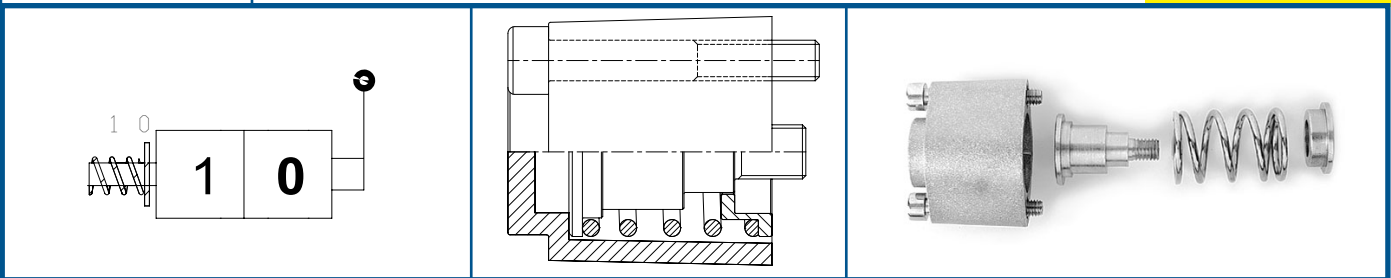


The spool returns to position 0 when the handle is released.

SPOOL CONTROL 5

2 POSITIONS

COD. 802005

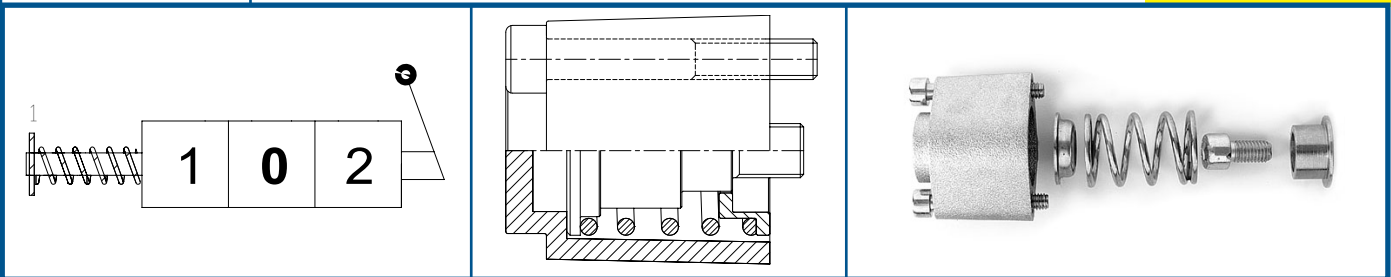


The spool returns to position 0 when the handle is released.

SPOOL CONTROL 6

3 POSITIONS

COD. 802006

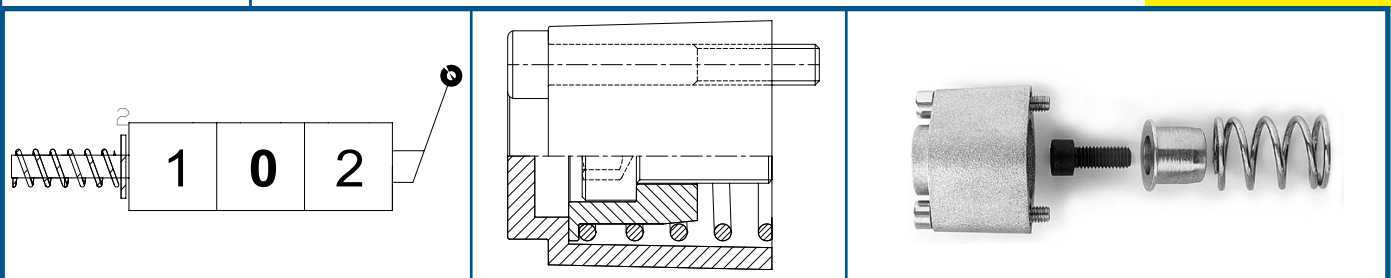


The spool returns to position 1 when the handle is released.

SPOOL CONTROL 7

3 POSITIONS

COD. 802007



The spool returns to position 2 when the handle is released.

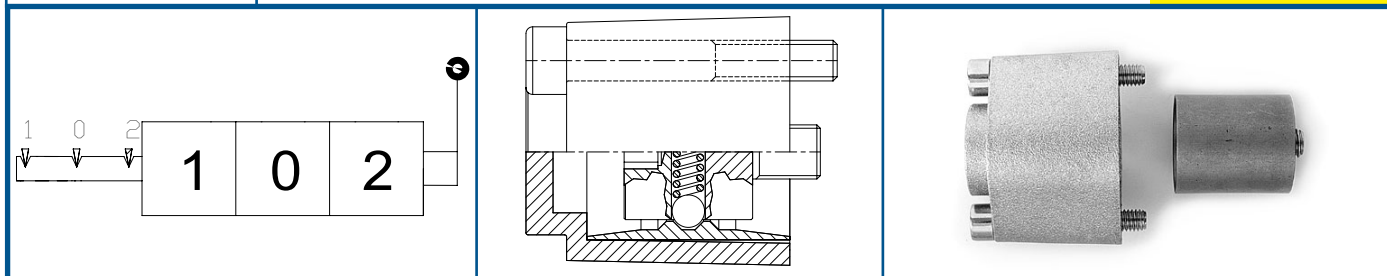
SPOOL CONTROLS

BM / () / /

SPOOL CONTROL 8

3 POSITIONS

COD. 802008

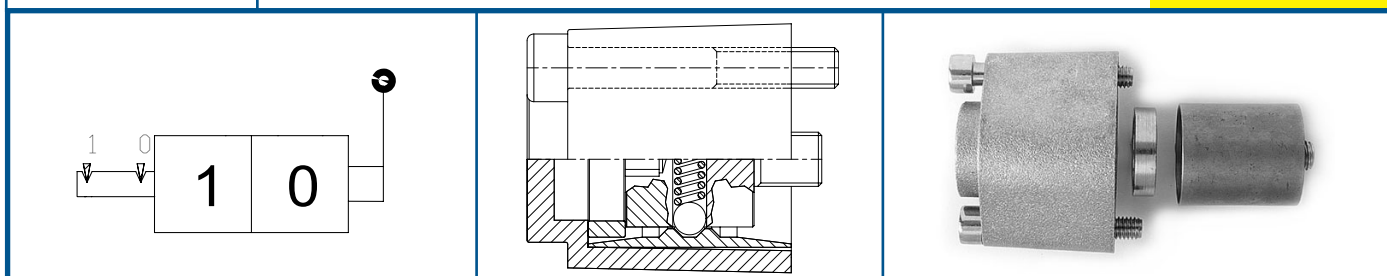


The spool is detented in all three positions.

SPOOL CONTROL 9

2 POSITIONS

COD. 802009

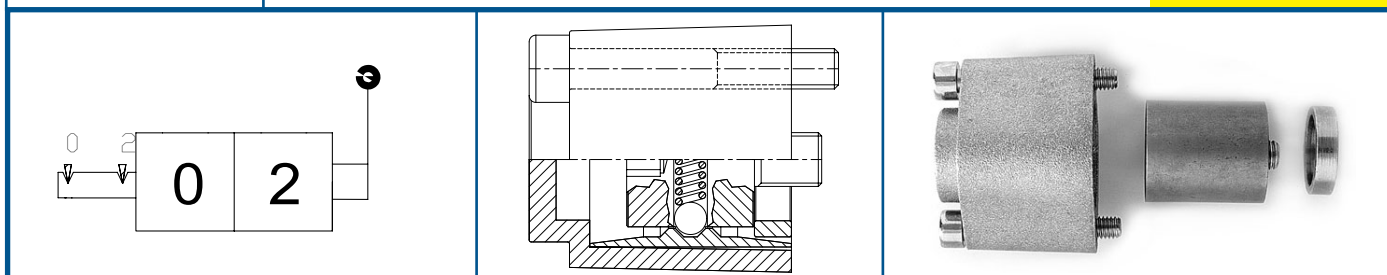


The spool is detented in both positions.

SPOOL CONTROL 10

2 POSITIONS

COD. 802010

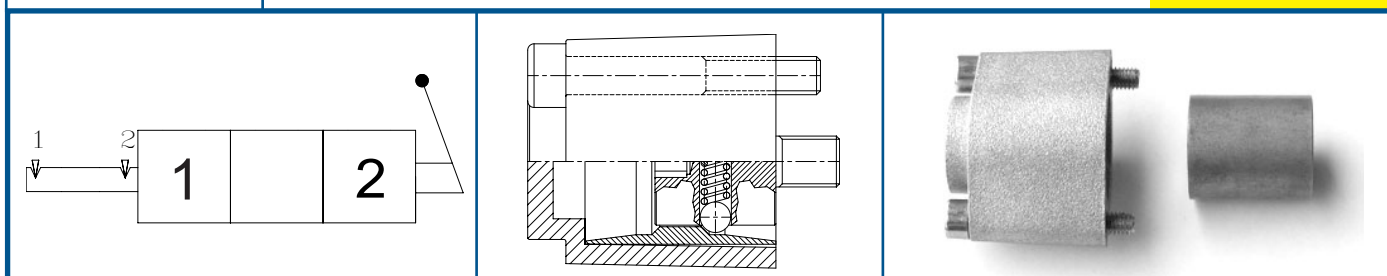


The spool is detented in both positions.

SPOOL CONTROL 11

2 POSITIONS

COD. 802011



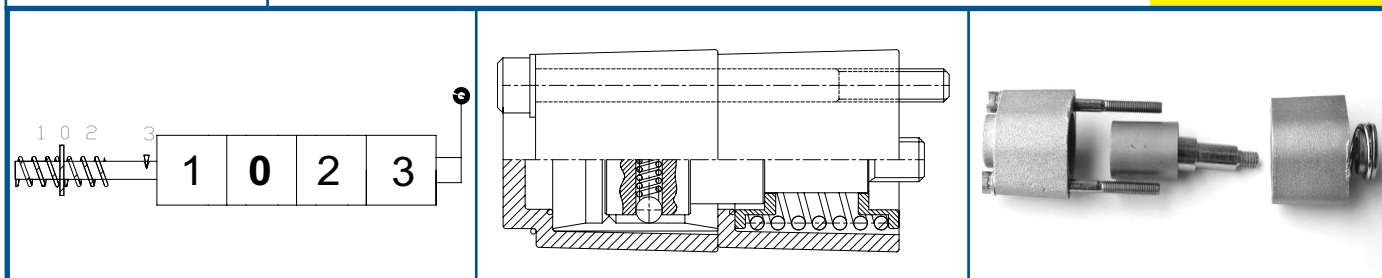
The spool is detented in both positions. The neutral position is absent.

BM _ / _ _ _ () _ / _ _ _ / _

SPOOL CONTROL 12

4 POSITIONS

COD. 802012

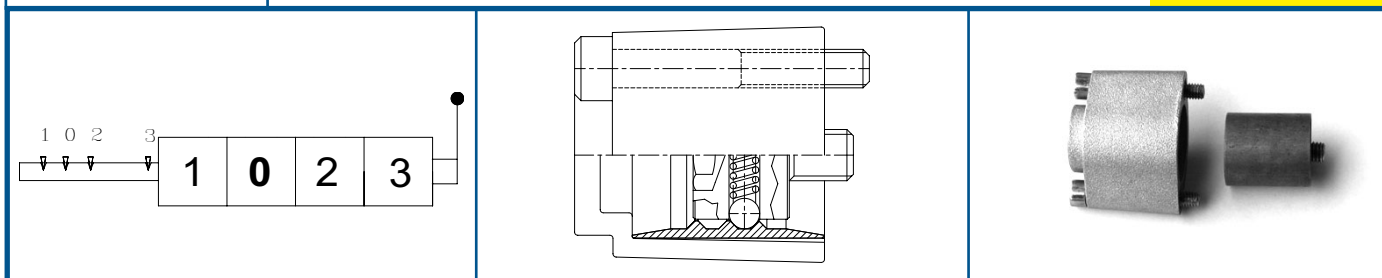


The spool returns to 0 from positions 1 and 2 when the handle is released. Position 3 is detented. To be combined only with spool L.

SPOOL CONTROL 13

4 POSITIONS

COD. 802013

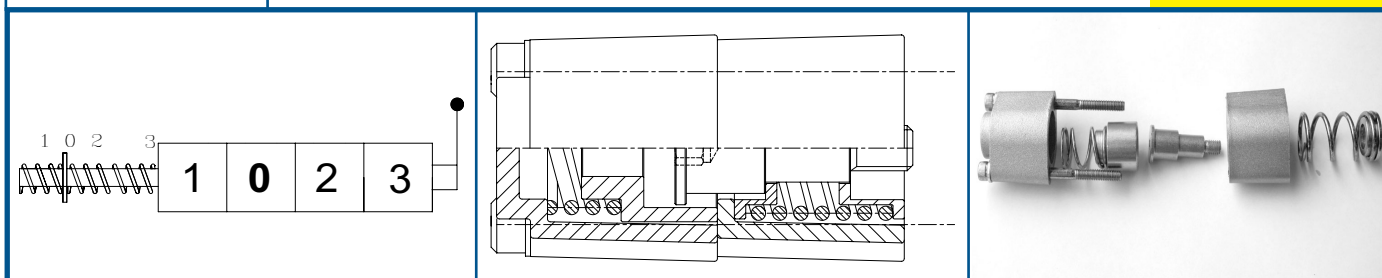


The spool is detented in all positions. To be combined only with spool L.

SPOOL CONTROL 14

4 POSITIONS

COD. 802045

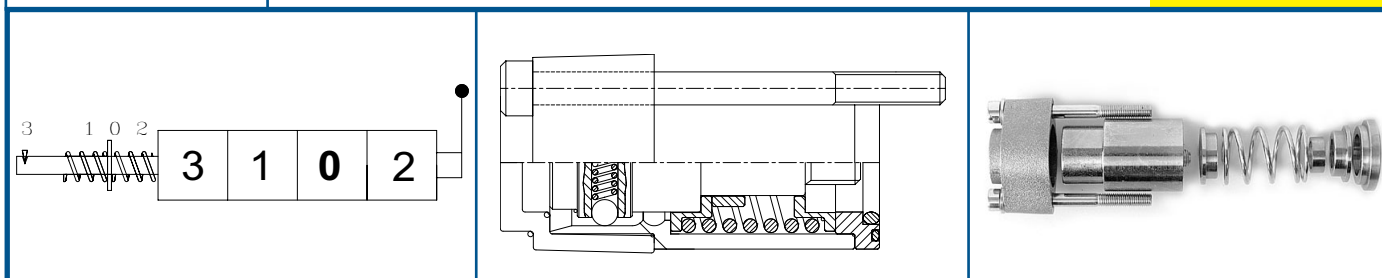


The spool returns to position 0 when the handle is released. To be combined only with spool Z.

SPOOL CONTROL 16

4 POSITIONS

COD. 802099



The spool returns to 0 from positions 1 and 2 when the handle is released. Position 3 is detented. To be combined only with spool K.

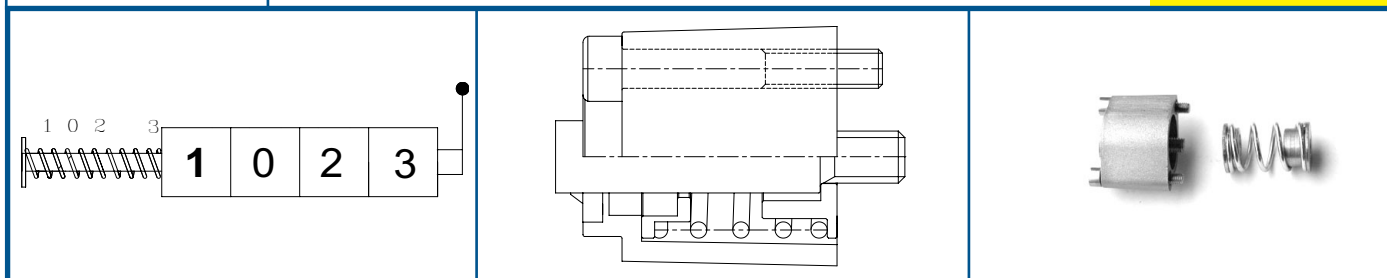
SPOOL CONTROLS

BM / () / /

SPOOL CONTROL 17

4 POSITIONS

COD. 802128

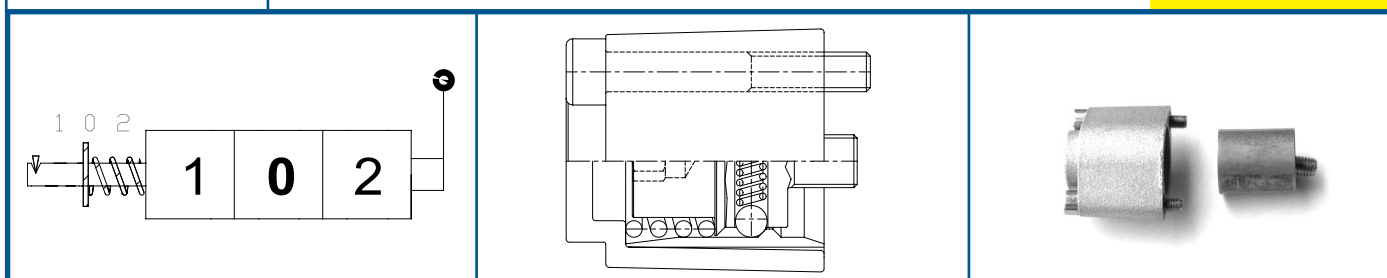


The spool returns to position 1 when the handle is released. To be combined only with spool ZI.

SPOOL CONTROL 28

3 POSITIONS

COD. 802039

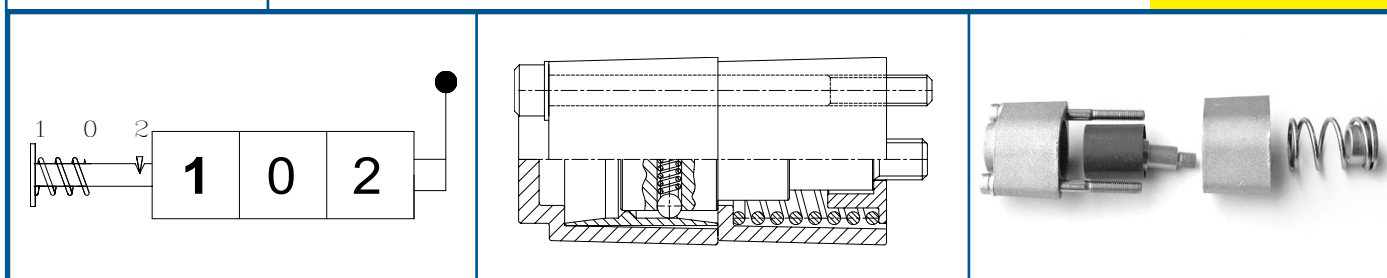


The spool is detented in position 1 and returns to 0 from position 2 when the handle is released.

SPOOL CONTROL 40

3 POSITIONS

COD. 802055

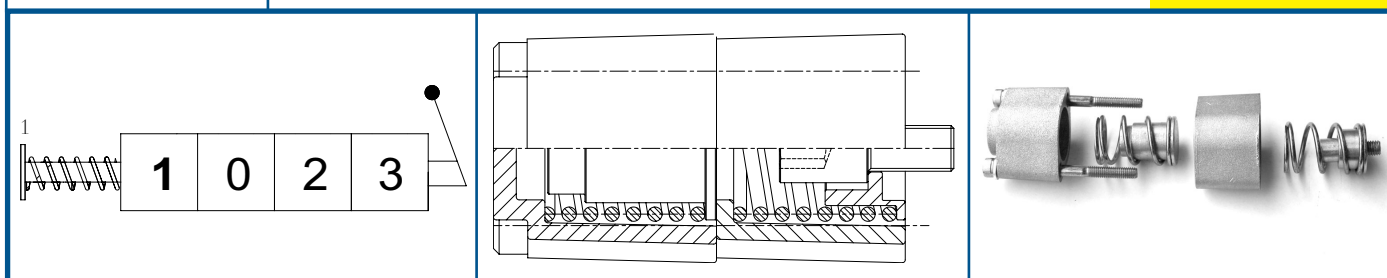


The spool is detented in position 2 and returns to position 1 from position 0 when the handle is released.

SPOOL CONTROL 42

4 POSITIONS

COD. 802056



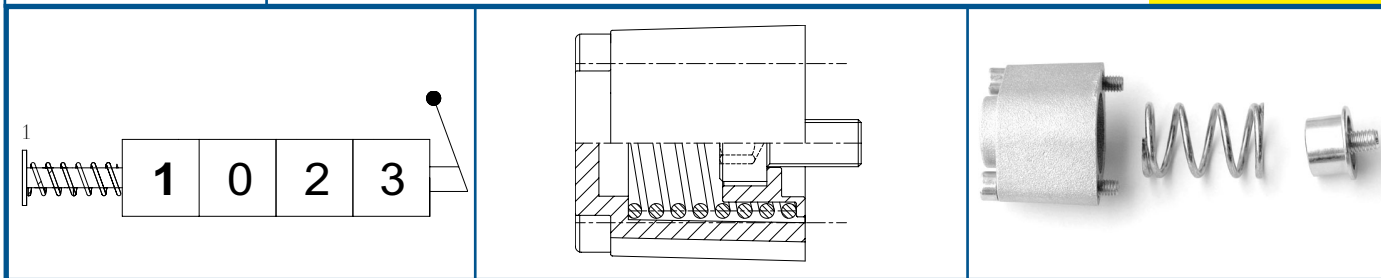
The spool returns to position 1 when the lever is released. To be combined only with spool Z or WS.

BM _ / _ _ _ () _ / _ _ _ / _

SPOOL CONTROL 43

4 POSITIONS

COD. 802129

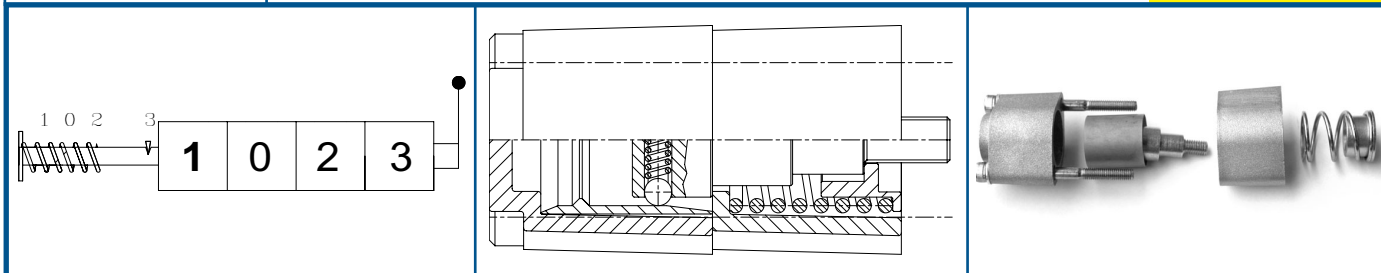


The spool returns to position 1 when the lever is released. To be combined only with spool Z or WS.

SPOOL CONTROL 44

4 POSITIONS

COD. 802084

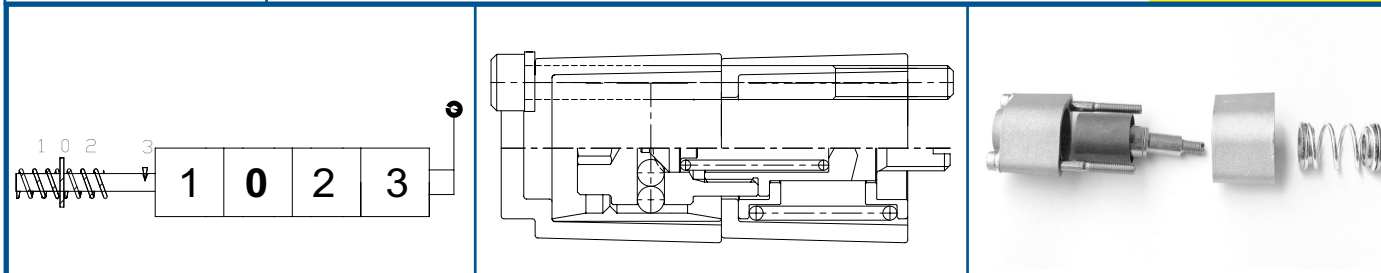


The spool is detented in pos 3 and returns to 1 from positions 2 and 0. To be combined only with spool Z.

SPOOL CONTROL 53

4 POSITIONS

COD. 802192

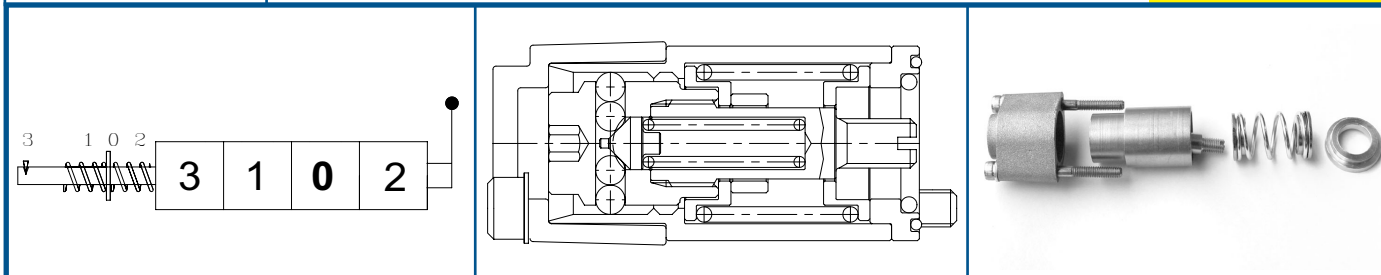


The spool returns to 0 from positions 1 and 2 when the handle is released. Position 3 is detented. To be combined only with spool L.

SPOOL CONTROL 54

4 POSITIONS

COD. 802193



The spool returns to 0 from positions 1 and 2 when the handle is released. Position 3 is detented. To be combined only with spool K.

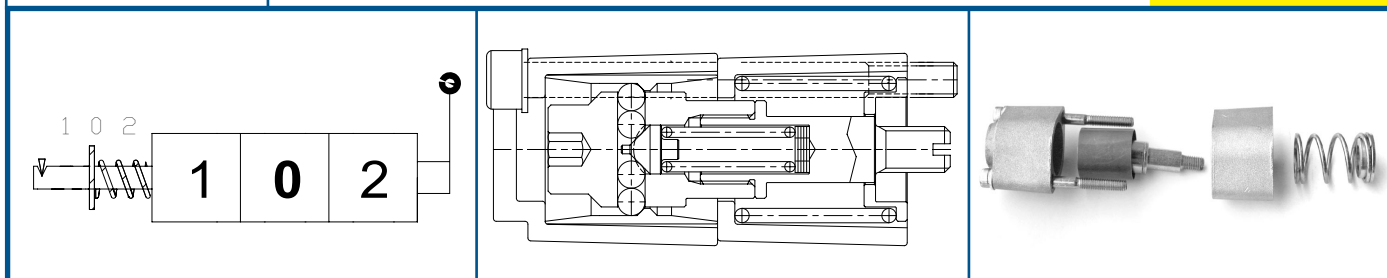
SPOOL CONTROLS

BM __ / __ __ __ () __ / __ __ **—** / —

SPOOL CONTROL 58

3 POSITIONS

COD. 802226

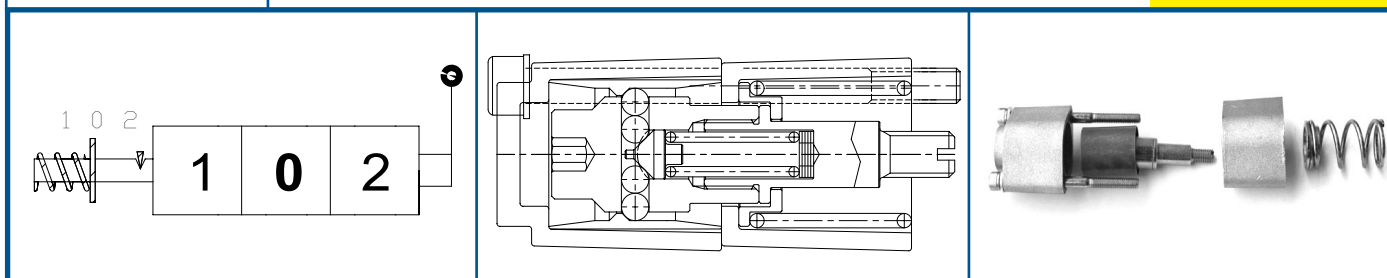


The spool is detented in position 1 and returns to 0 from position 2 when the handle is released.

SPOOL CONTROL 59

3 POSITIONS

COD. 802227

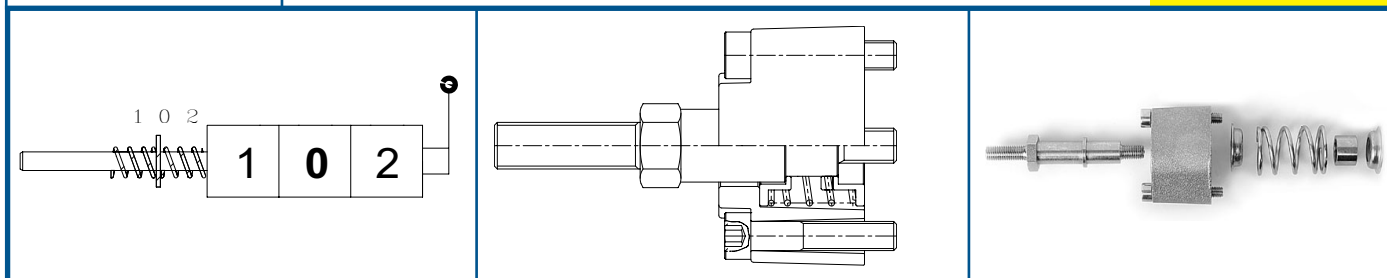


The spool is detented in position 2 and returns to 0 from position 1 when the handle is released.

SPOOL CONTROL 1DC

3 POSITIONS

COD. 802076

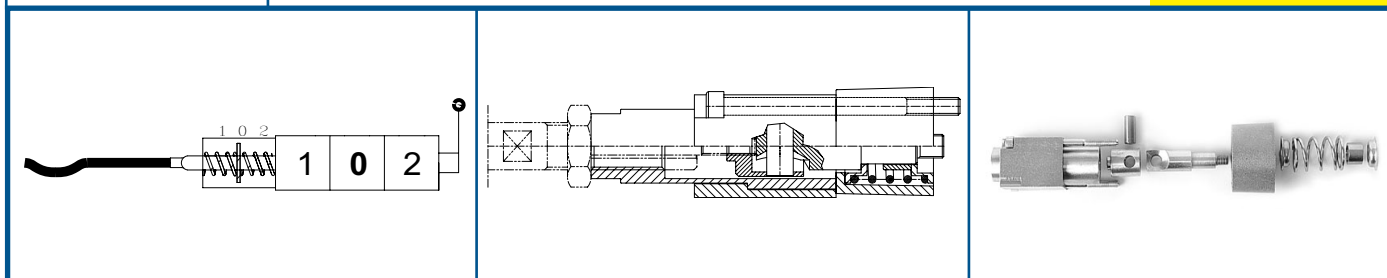


Same features as spool control 1 with the addition of a threaded pin which allows to operate the spool also from the side opposite to the manual control.

SPOOL CONTROL 1F

3 POSITIONS

COD. 802070



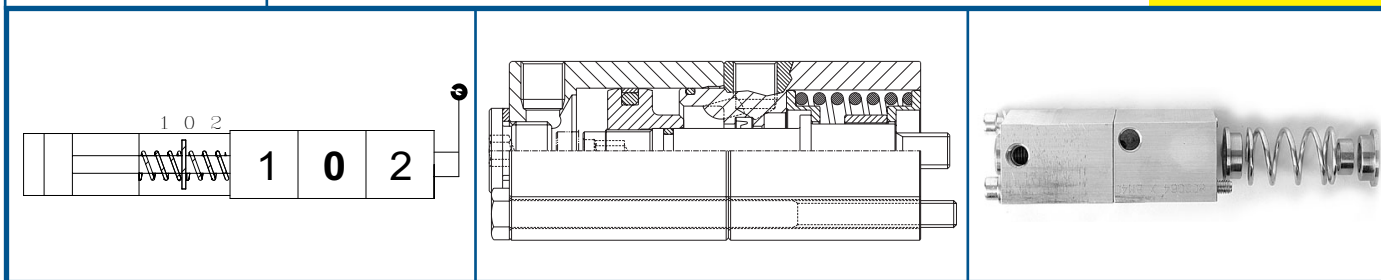
Same features as spool control 1 with the addition of the connection kit to cable remote control. To be assembled with manual remote control FO-FA and cable CA.

BM _ / _ _ _ () _ / _ _ _ **—** / _

SPOOL CONTROL 1P

3 POSITIONS

COD. 802064

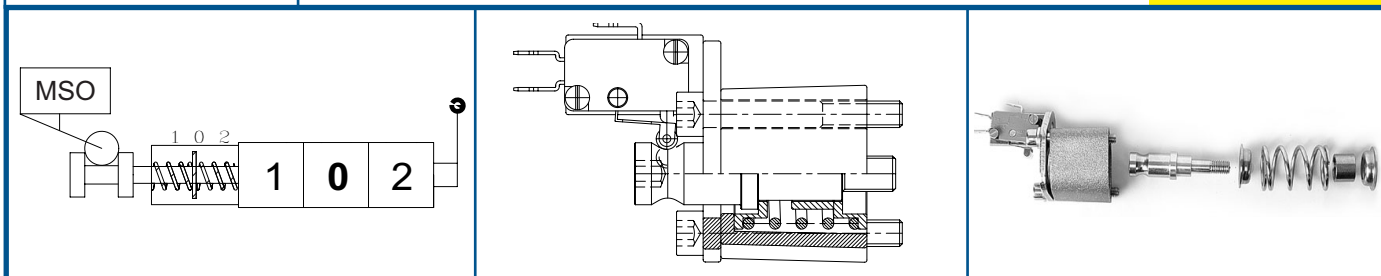


Same features as spool control 1 with the addition of the pneumatic remote control.

SPOOL CONTROL 1MS0

3 POSITIONS

COD. 802053

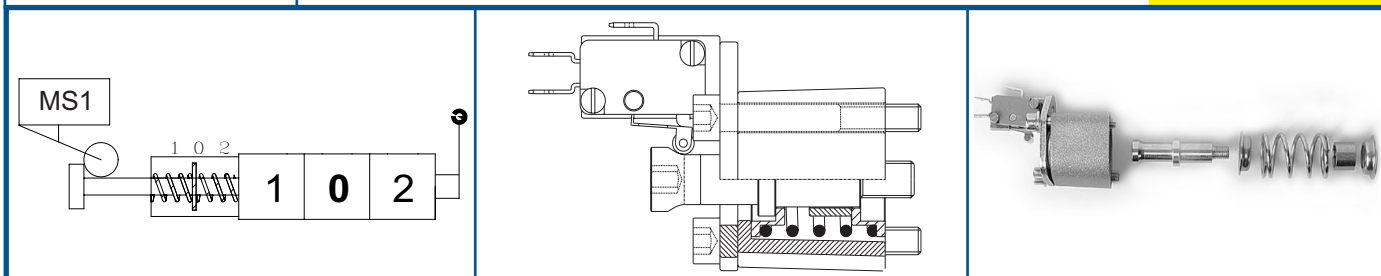


Same features as spool control 1 with the addition of a microswitch operating in positions 1 and 2.

SPOOL CONTROL 1MS1

3 POSITIONS

COD. 802093

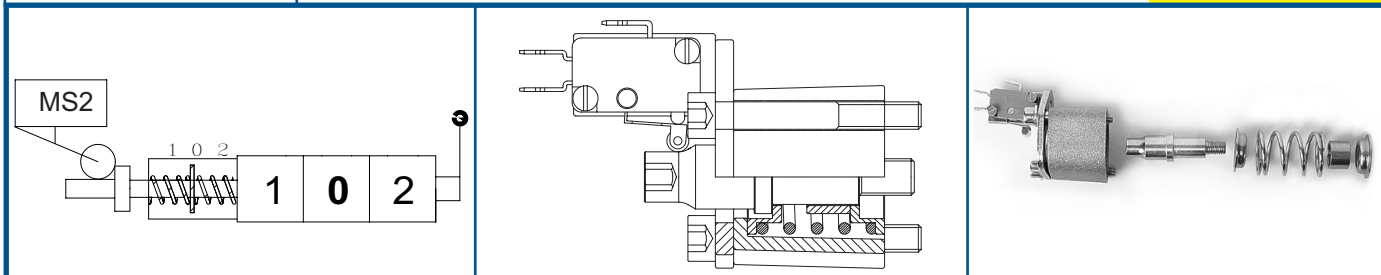


Same features as spool control 1 with the addition of a microswitch operating in position 1.

SPOOL CONTROL 1MS2

3 POSITIONS

COD. 802054



Same features as spool control 1 with the addition of a microswitch operating in position 2.

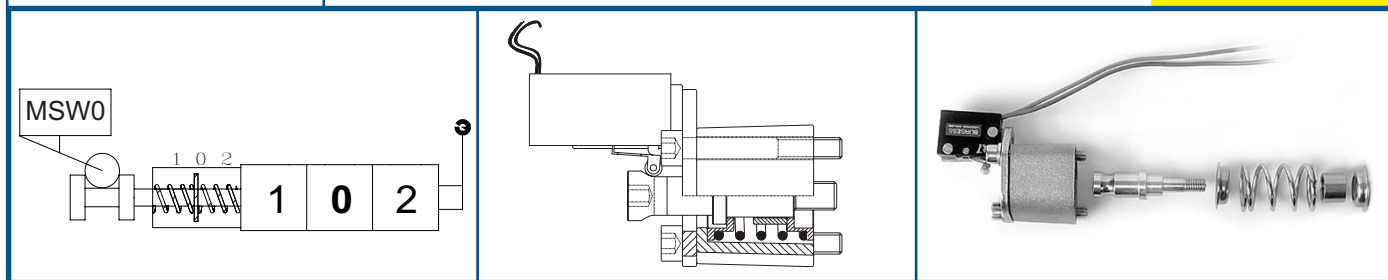
SPOOL CONTROLS

BM / () / /

SPOOL CONTROL 1MSW0

3 POSITIONS

COD. 802176

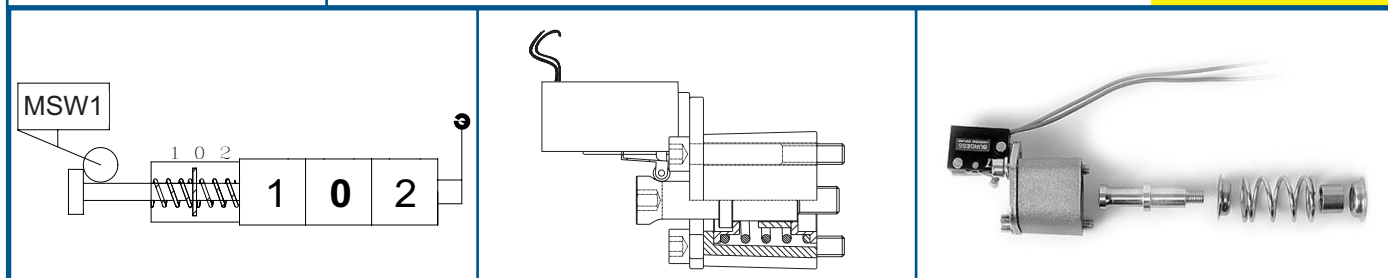


Same features as spool control 1 with the addition of a waterproof microswitch operating in positions 1 and 2.

SPOOL CONTROL 1MSW1

3 POSITIONS

COD. 802177

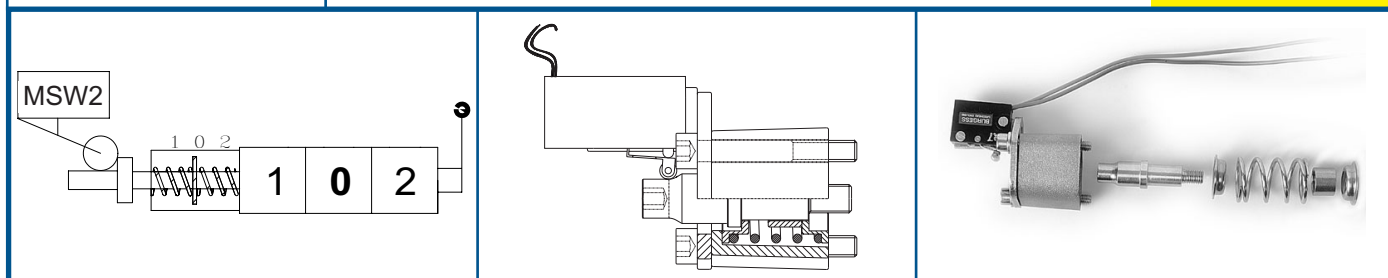


Same features as spool control 1 with the addition of a waterproof microswitch operating in position 1.

SPOOL CONTROL 1MSW2

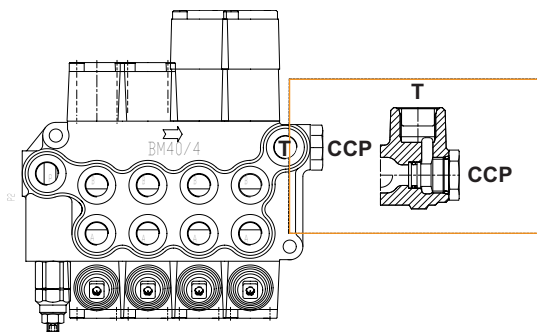
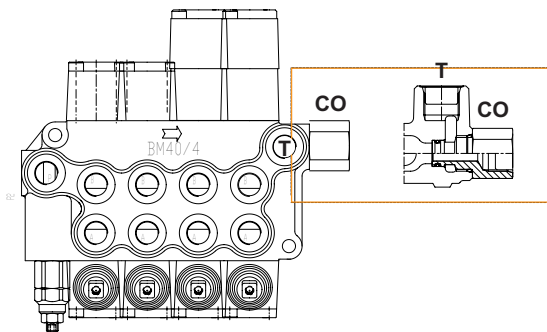
3 POSITIONS

COD. 802178



Same features as spool control 1 with the addition of a waterproof microswitch operating in position 2.

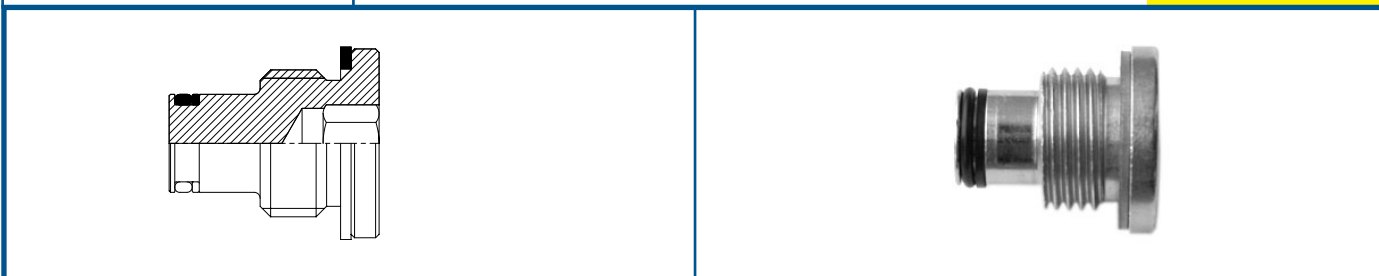
BM _ / _ _ _ () _ / _ _ _ / _



CLOSED CENTER PLUG CCP

1/2" BSP

COD. 832007

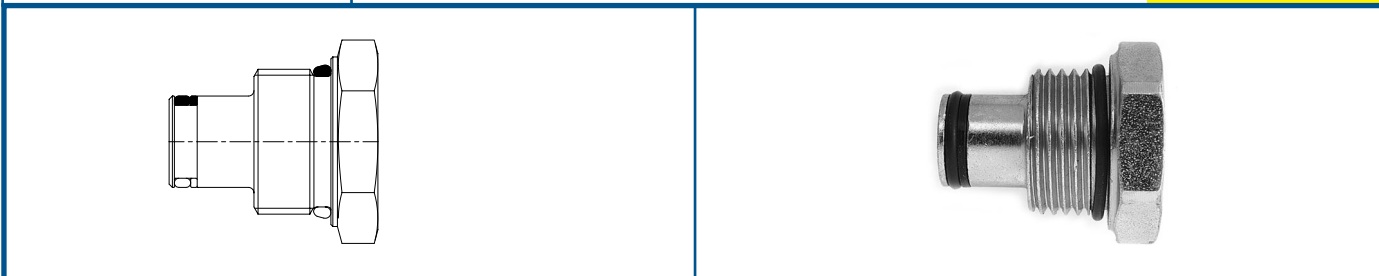


Turns an open center circuit into a closed center one. BSP threaded.

CLOSED CENTER PLUG CCP

7/8" - 14 UNF

COD. 832008

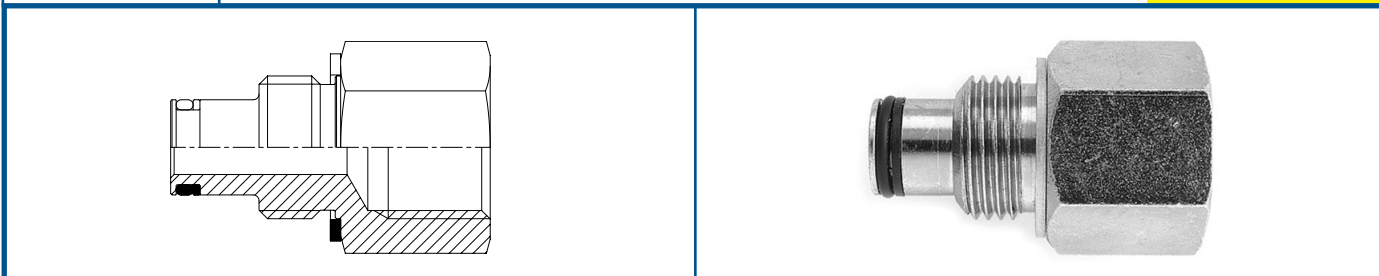


Turns an open center circuit into a closed center one. UNF threaded.

CARRY OVER CO

1/2" BSP

COD. 832004

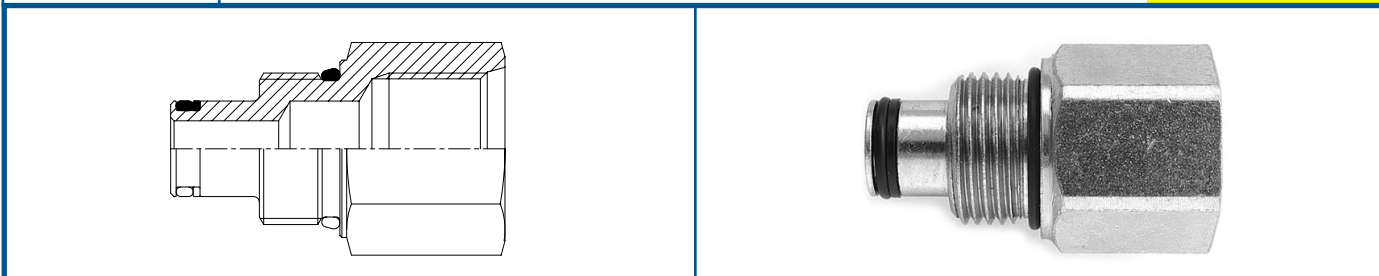


Allows the installation of another valve downstream from the first. Assembled on T2 port of a valve. BSP threaded.

CARRY OVER CO

7/8" - 14 UNF

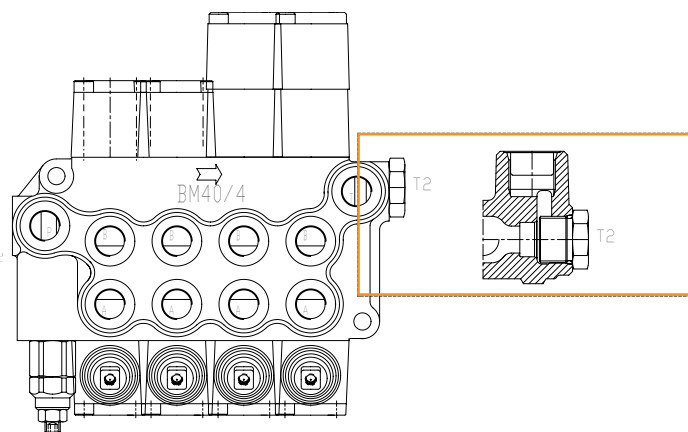
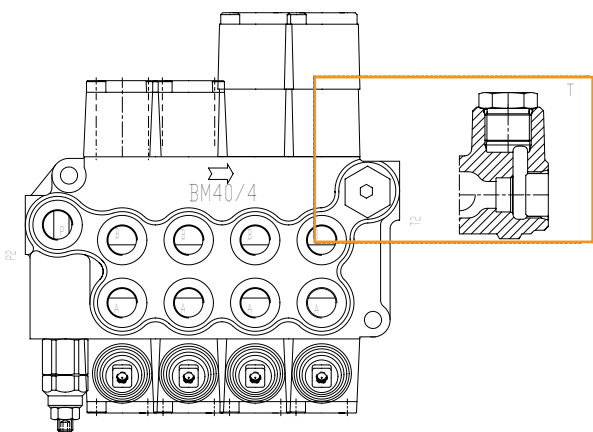
COD. 832006



Allows the installation of another valve downstream from the first. Assembled on T2 port of a valve. UNF threaded.

OUTLET PLUGS

BM / () / /

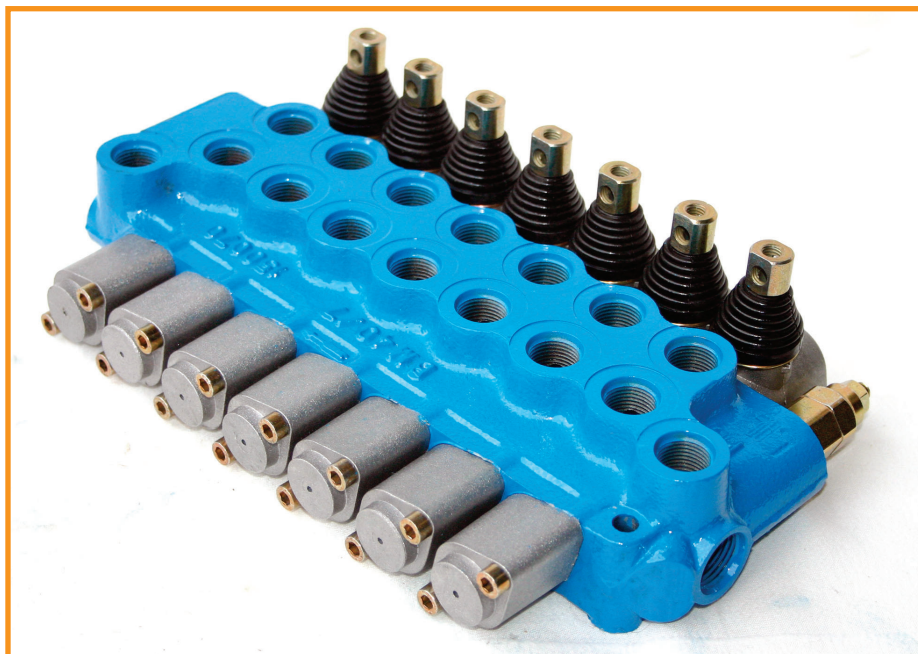


OUTLET PLUG T	3/8" BSP	COD. 015008

OUTLET PLUG T	3/4" - 16 UNF	COD. 560333

OUTLET PLUG T2	1/2" BSP	COD. 015007

OUTLET PLUG T2	7/8" - 14 UNF	COD. 560094



BLB srl
via Natta 1 - 36040 Brendola (VI) ITALY
phone +39 0444 401141 fax +39 0444 401086
www.blbhydraulic.com e-mail: blb@blbhydraulic.com