hydraulic

BM20

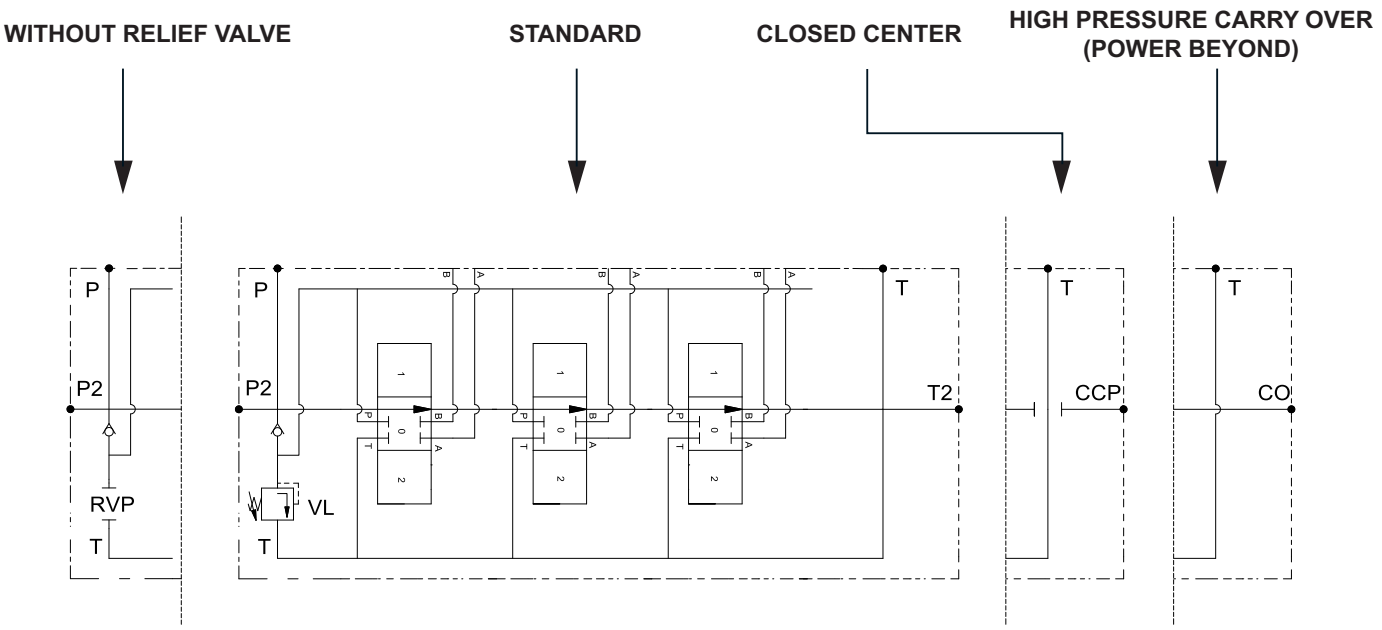
MONOBLOCK VALVES

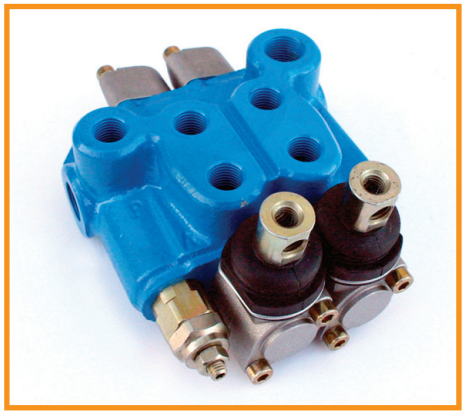
LENGHT	1 millimetre (mm) = 0.0394 inch	1 inch = 25.4 millimetre (mm)
PRESSURE	1 bar (gage) = 14.493 pounds per square inch (PSI)	1 pound per square inch (PSI) = 0.069 bar (gage)
VACUUM	0.1 bar (a value less than 1.0) = 2.94 inches of mercury (in Hg) at 15.6 degrees Celsius (°C)	1 inch of mercury (in 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 $pound_f$ (lb_f)	1 $pound_f$ (lb_f) = 4.44 Newton (N)
MASS	1 kilogram (kg) = 2.20 $pound_m$ (lb_m)	1 $pound_m$ (lb_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	°C = 0.556 (°F - 32°)	°F = (1.8 • °C) + 32°
TORQUE	1 Newton metre (N • m) or joule = 8.8 $pound_f$ inches (lb_f - in.)	1 $pound_f$ inch (lb_f - 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)

This booklet is meant to be a technical deepening on directional control valves of the BM20 series.
Choice, use, maintenance and warranty conditions of all BLB products are described in the 2009 BLB general catalogue.

The monoblock valves of the BM20 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.





BM20

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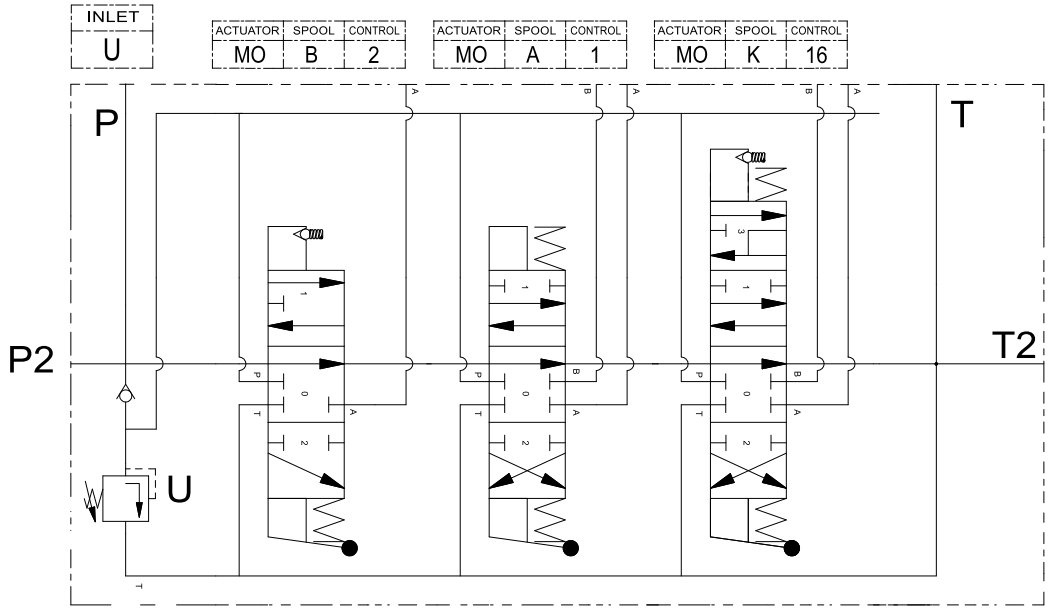
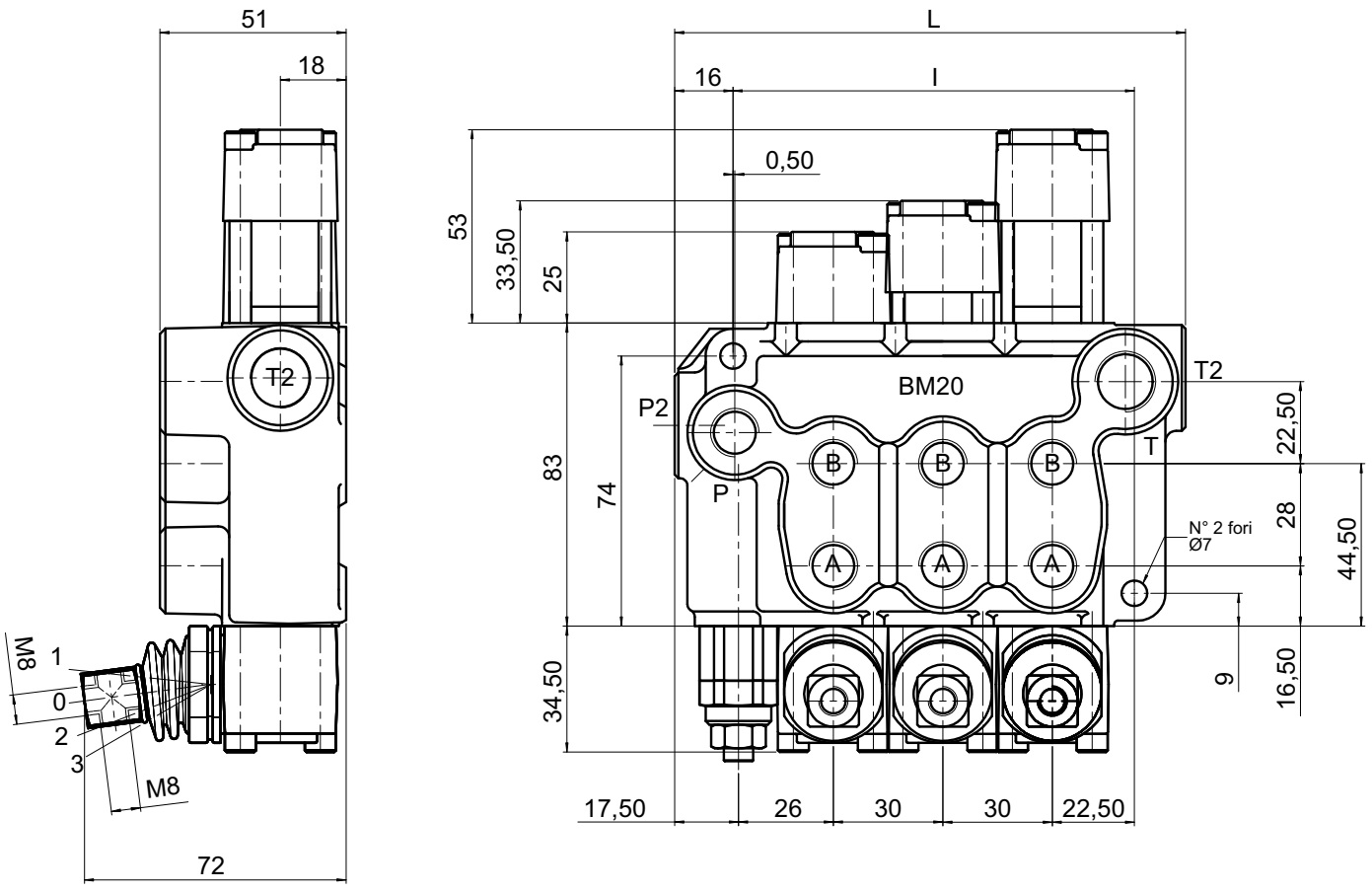
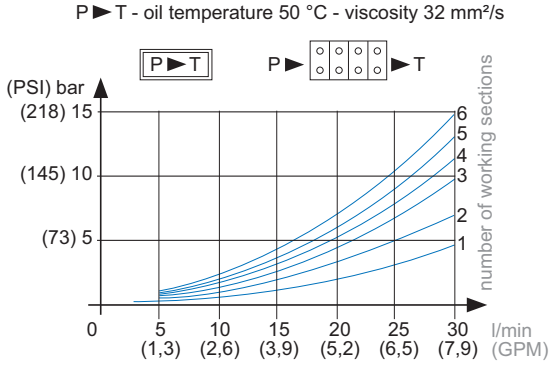
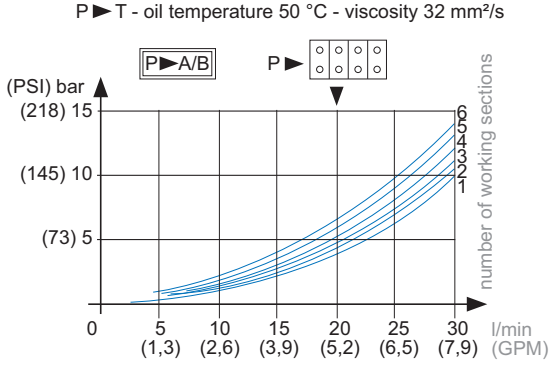
Mandatory field Optional field

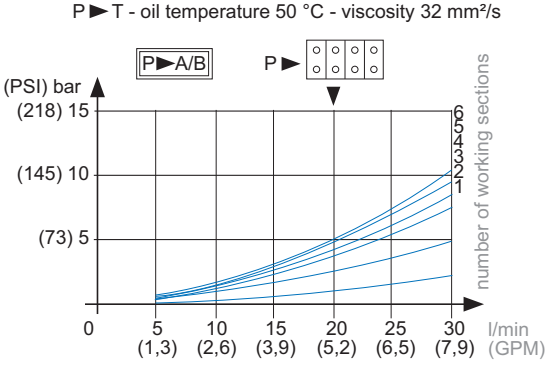






INTERNAL OIL LEAKAGE	
From A B to T	3 ÷ 6 cc/min
TESTING CONDITIONS	
Pressure	100 bar
Oil temperature	40 °C
Oil viscosity	32 mm²/s

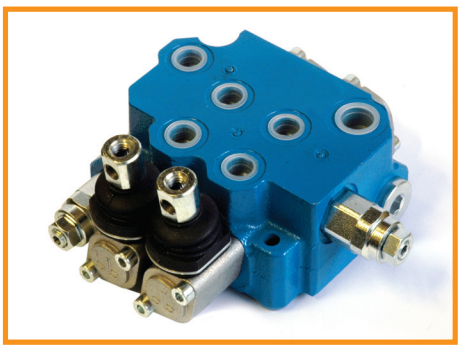


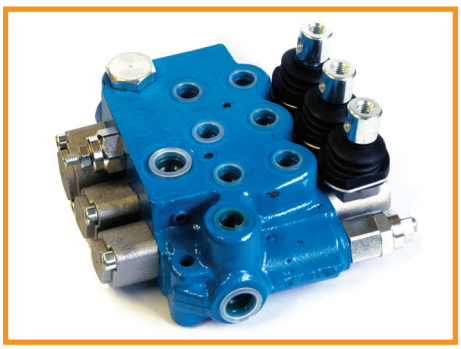


NUMBER OF SECTIONS	L		I		Kg	Pound
	(mm)	(inch)	(mm)	(inch)		
BM20/1	76	2.99	50	1.96	1.5	3.3
BM20/2	106	4.17	80	3.14	2.3	5.06
BM20/3	136	5.35	110	4.33	3.1	6.82
BM20/4	166	6.53	140	5.51	3.9	8.585
BM20/5	196	7.71	170	6.69	4.7	10.34
BM20/6	226	8.89	200	7.87	5.5	12.1

TECHNICAL CHARACTERISTICS		
NOMINAL FLOW	17 l/min	4.5 GPM
MAX FLOW	25 l/min	6.6 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)	1/4”	1/4”	3/8”	3/8”	3/8”
F (UNF)	9/16” - 18	9/16” - 18	9/16” - 18	3/4” - 16	3/4” - 16





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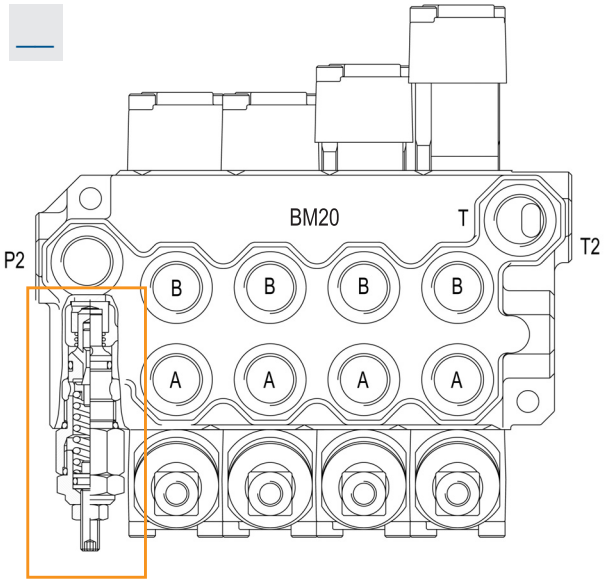
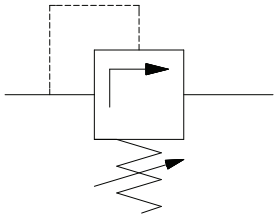
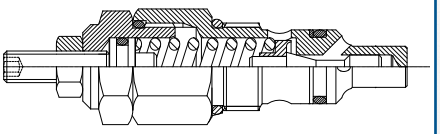


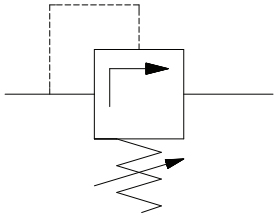
RELIEF VALVE X — PRESSURE RANGE 30 ÷ 90 bar STANDARD RELIEF SETTING 70 bar — COD. 803096

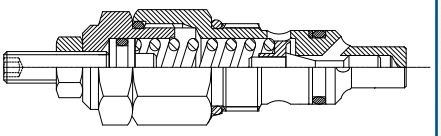




Low pressure adjustable relief valve. Allows the external adjustament of the relief valve pressure from 30 to 90 bar. The pressure rating is based on a pre-set flow of 8 l/min.

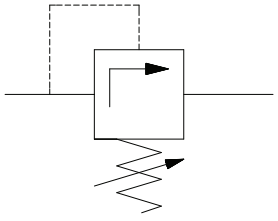
RELIEF VALVE U — PRESSURE RANGE 80 ÷ 230 bar STANDARD RELIEF SETTING 140 bar — COD. 803097

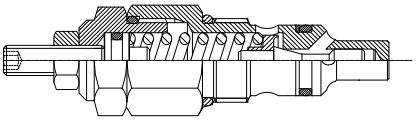




High pressure adjustable relief valve. Allows the external adjustament of the relief valve pressure from 80 to 230 bar. The pressure rating is based on a pre-set flow of 8 l/min.

RELIEF VALVE K — PRESSURE RANGE 150 ÷ 300 bar STANDARD RELIEF SETTING 200 bar — COD. 803098





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

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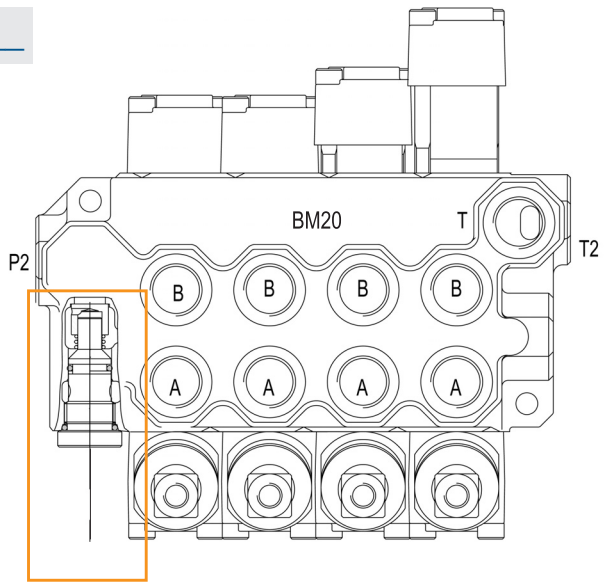
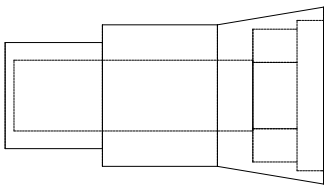
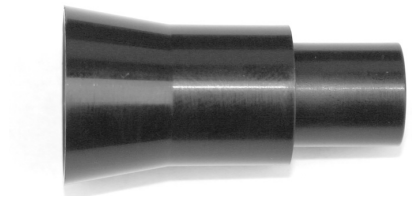
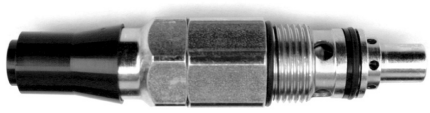
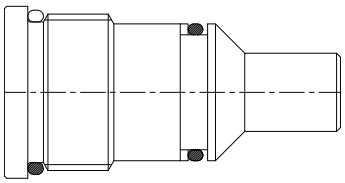
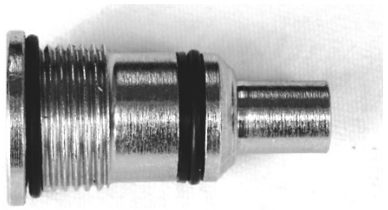


RELIEF VALVE LOCK KIT PB — COD. 560926

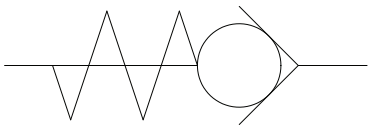
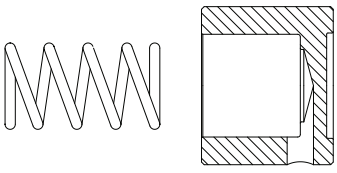
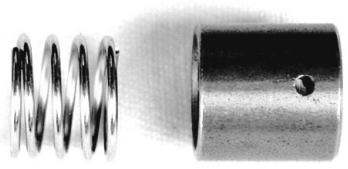
Prevents users from altering the factory relief valve setting.

RELIEF VALVE PLUG RVP — COD. 832018

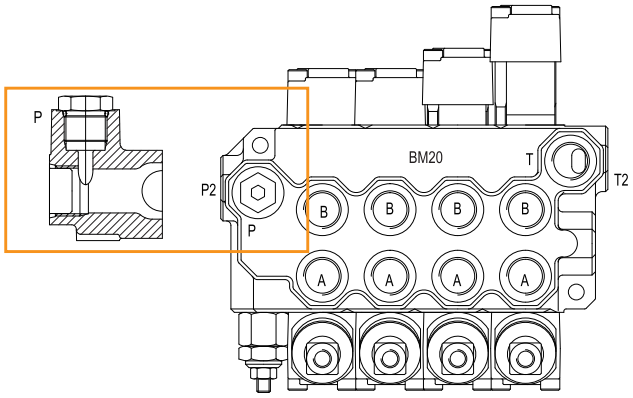
Replaces the relief valve in closed center systems where the relief valve is not required.

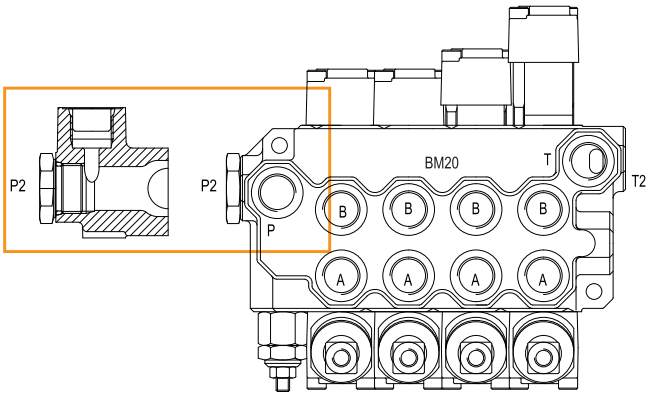
RELIEF VALVE K — COD.560161

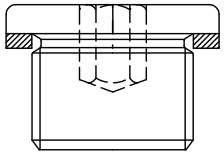
Standard on all Blb monoblock valves. Each valve has only one load check. The load check prevents the fall of a cylinder as the spool is shifted. It also prevents the backflow of oil from the work port to the inlet.

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

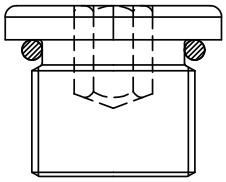




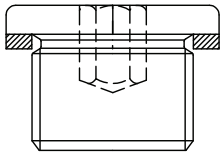
INLET PLUG P — 1/4" BSP — COD. 015009



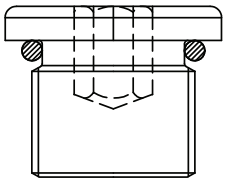
INLET PLUG P — 9/16" - 18 UNF — COD. 015002



INLET PLUG P2 — 3/8" BSP — COD. 015008



INLET PLUG P2 — 3/4" - 16 UNF — COD. 015003



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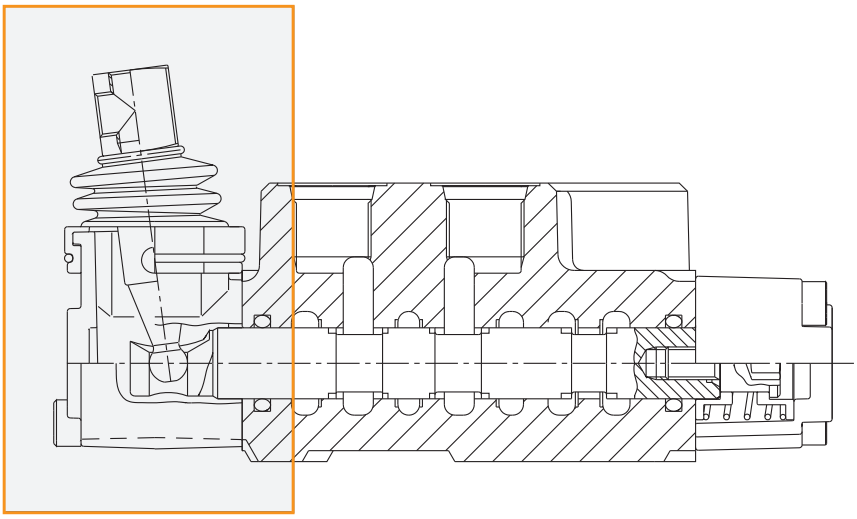
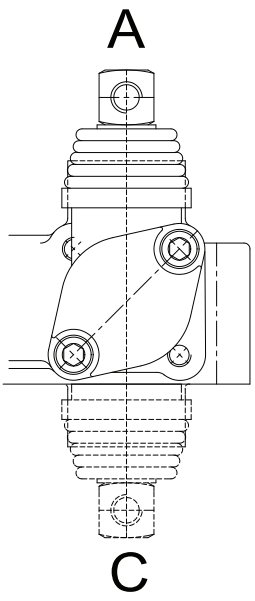
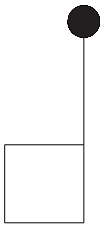


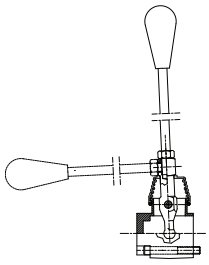


The actuator orientation is “A” if not differently required

MANUAL MO

COD. 801017

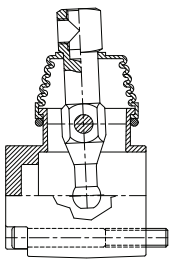




Manual lever control for manual operation. Features 2 angles 90° - 180°.

MANUAL WITHOUT LEVER MW

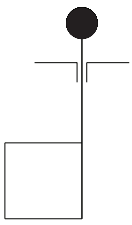
COD. 801025

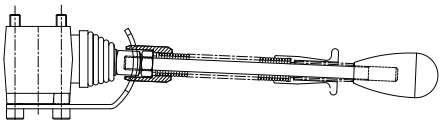


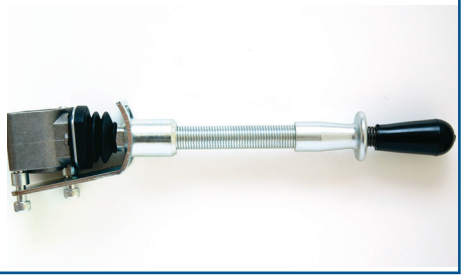
Manual control without lever handle.

SAFETY MANUAL LEVER K

COD. 801174







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

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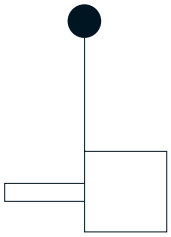
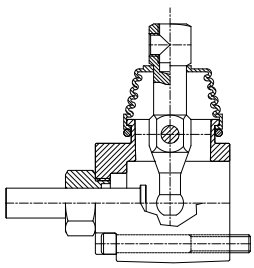
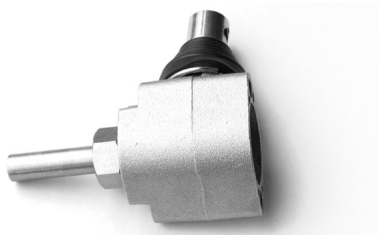
MANUAL WITH CAM MC

COD. 801029



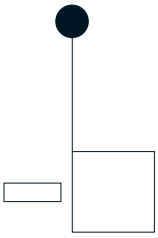


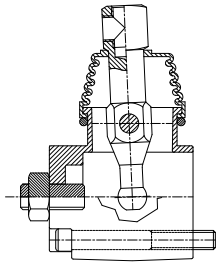


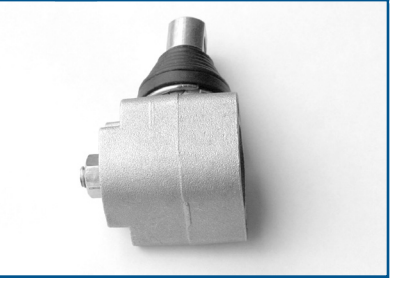
Manual lever control with cam.

MANUAL WITH LIMITING DEVICE ML

COD. 801167



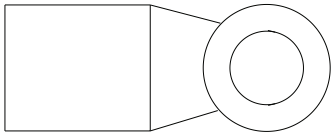


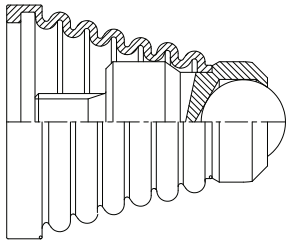


Manual lever control with limiter of the spool movement.

CAM DO

COD. 801155

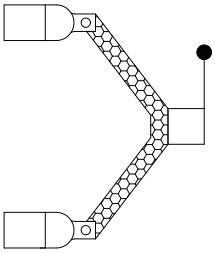


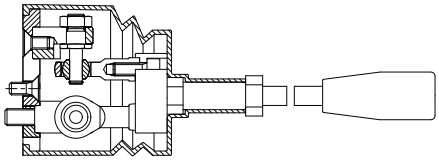


Cam actuator.

JOYSTICK JS

COD. 801143

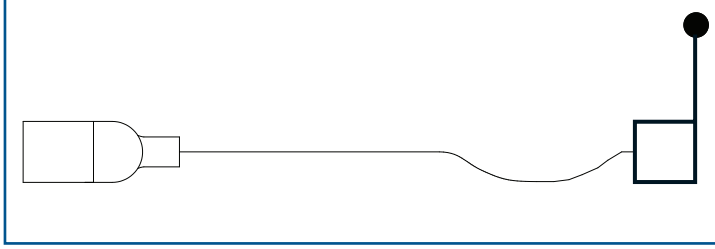


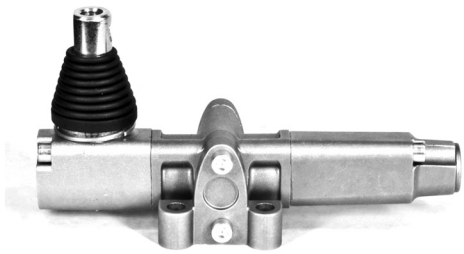


Operates two spools with one lever handle. Two spools can be operated indipendently or simultaneously, depending on the movement of the handle. Joystick requires to be assembled with spools AS, BS, DS or KS.

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

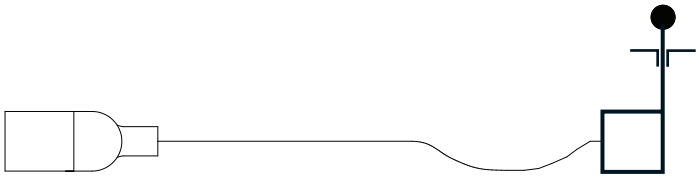
MANUAL REMOTE CONTROL FO — COD. 801233

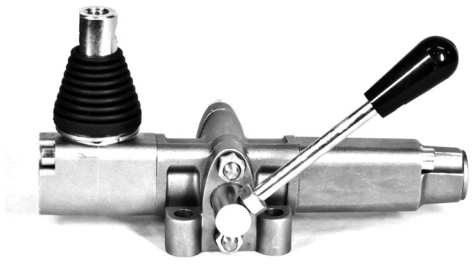




Manual lever control for manual remote operation.

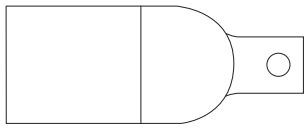
SAFETY MANUAL REMOTE CONTROL FA — COD. 801235

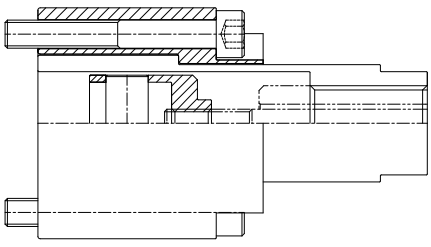


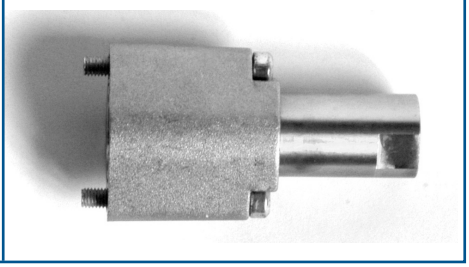


Manual lever control with safety system for manual remote operation. Allows the operation of the lever only after the lock system is released.

CABLE ADAPTER FL — COD. 801022



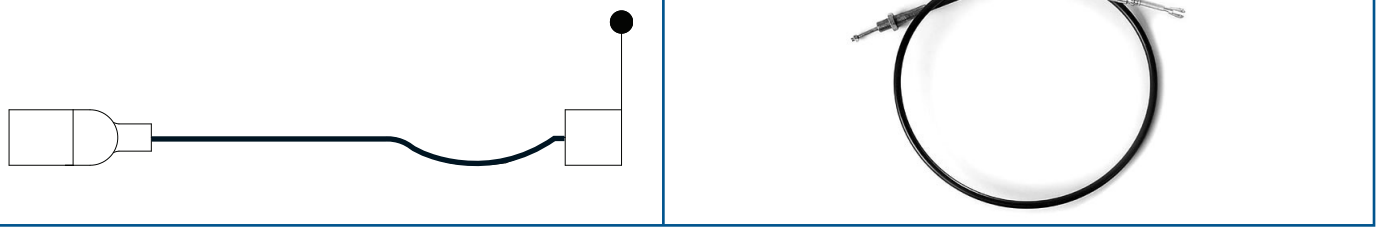




Cable adapter for cable control. No hand lever is provided.

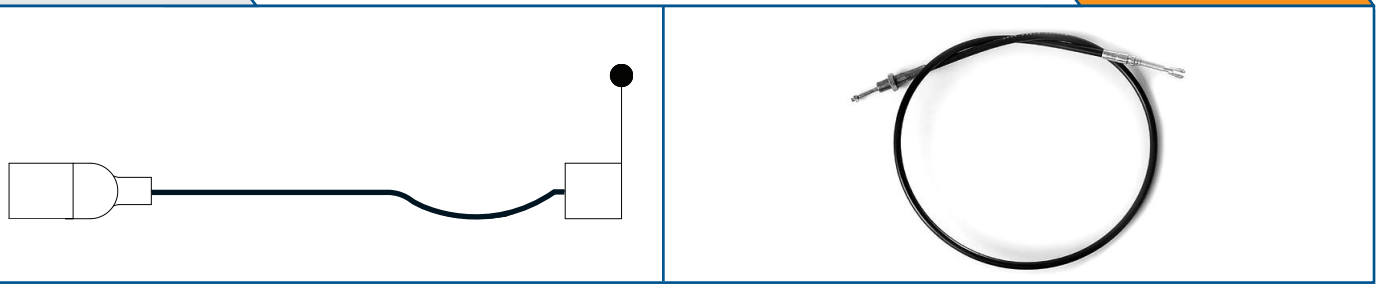
BM __ / __ __ __ (_) __ / __ __ __ / __

CABLE TYPE CA1.5 **COD. 023088**



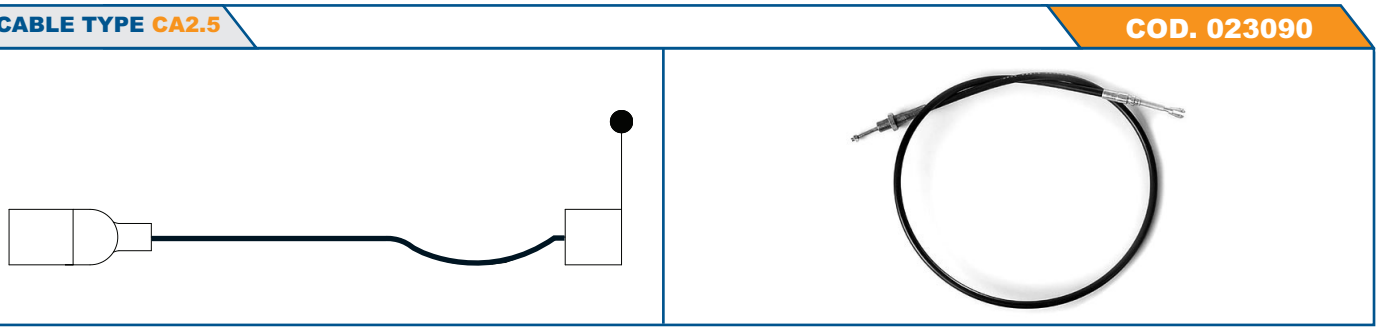
Cable 1.5 mt. long.

CABLE TYPE CA2.0 **COD. 023089**



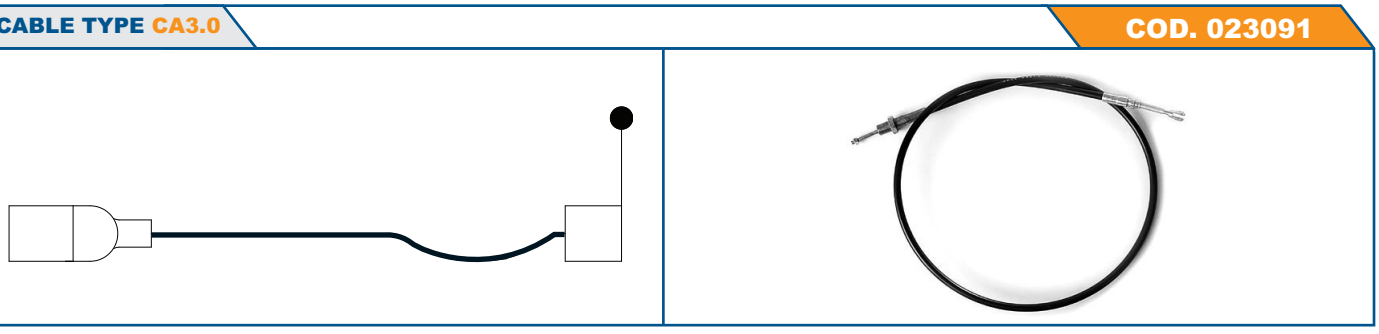
Cable 2.0 mt. long.

CABLE TYPE CA2.5 **COD. 023090**



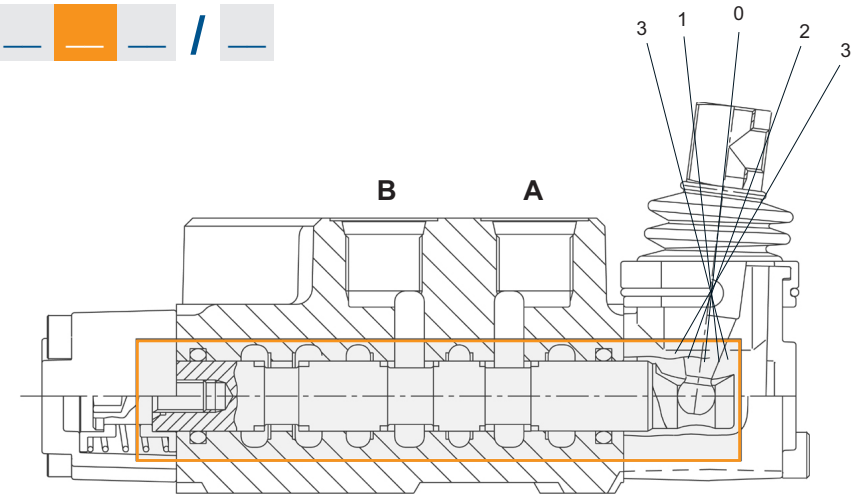
Cable 2.5 mt. long.

CABLE TYPE CA3.0 **COD. 023091**

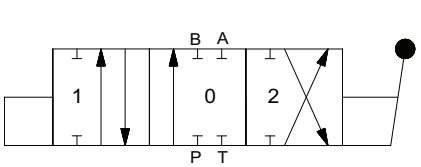


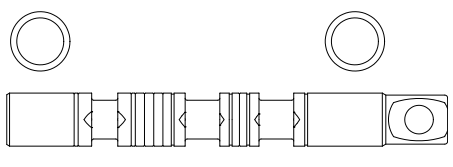
Cable 3.0 mt. long.

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



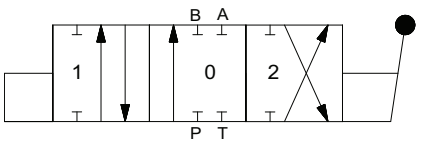
SPOOL A — COD. 560075

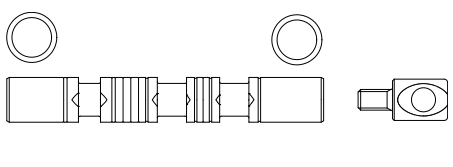




4-WAY / 3-POSITION SPOOL. Provides control of double-acting cylinders or bi-directional hydraulic motors. In position 0 work ports are blocked.

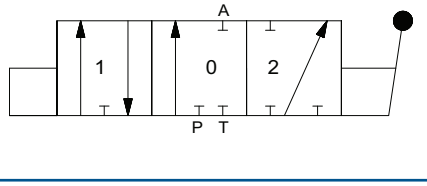
SPOOL A DX — COD. 560085

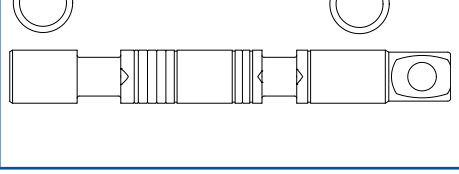




4-WAY / 3-POSITION SPOOL. Same features as spool A but with threaded spool end. Required to assembly the joystick (JS) or for special applications.

SPOOL B — COD. 560076

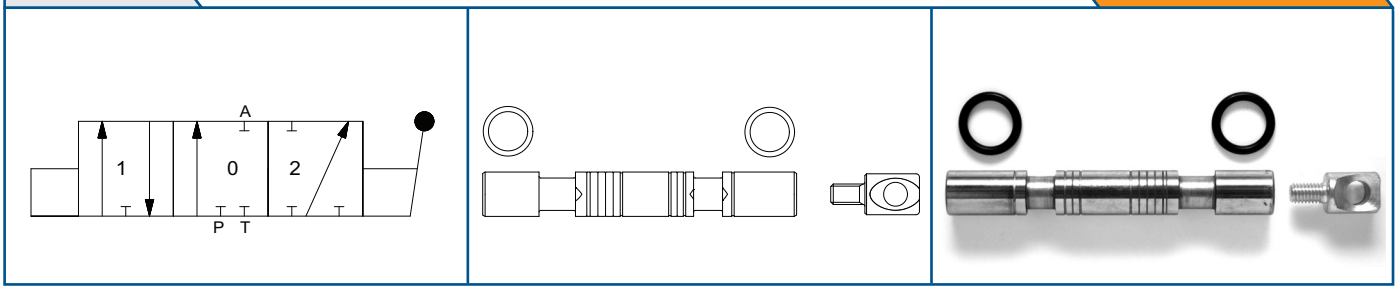




3-WAY / 3-POSITION SPOOL. Provides control of single-acting cylinders or start and stop of uni-directional hydraulic motors. In position 0 work port is blocked. B port is plugged.

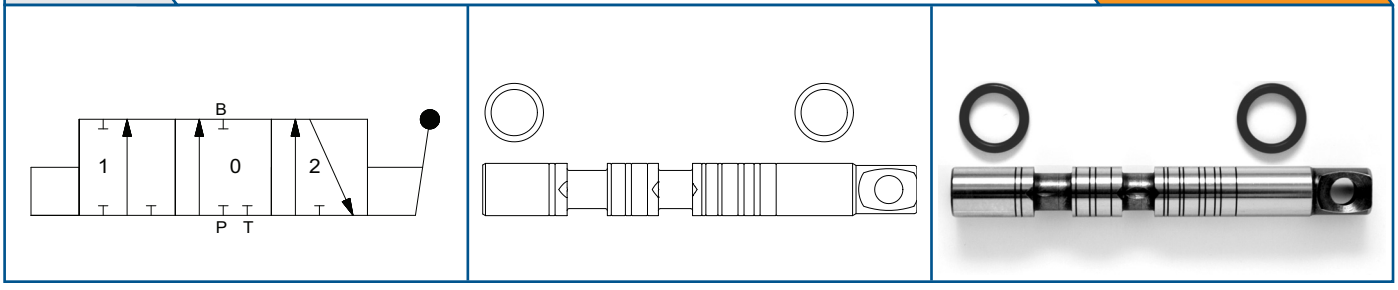
BM __ / __ __ __ (_) __ / __ __ __ / __

SPOOL B DX — COD. 560086



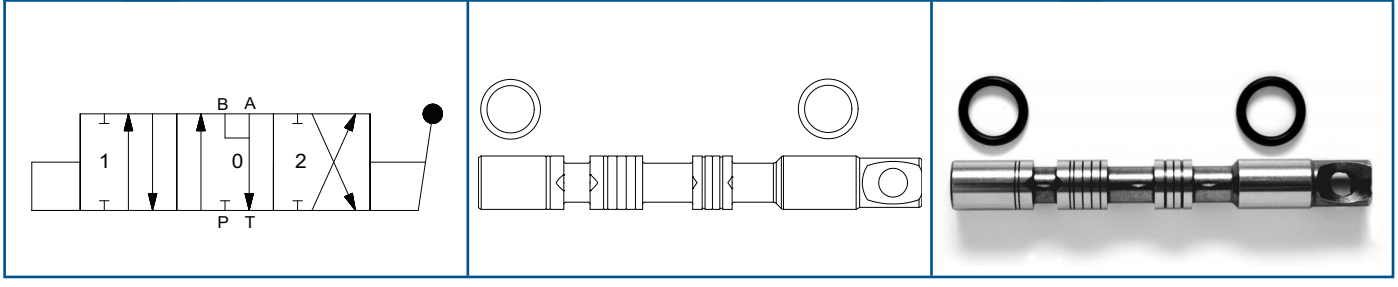
3-WAY / 3-POSITION SPOOL. Same features as spool B but with threaded spool end. Required to assembly the joystick (JS) or for special applications.

SPOOL C — COD. 560077



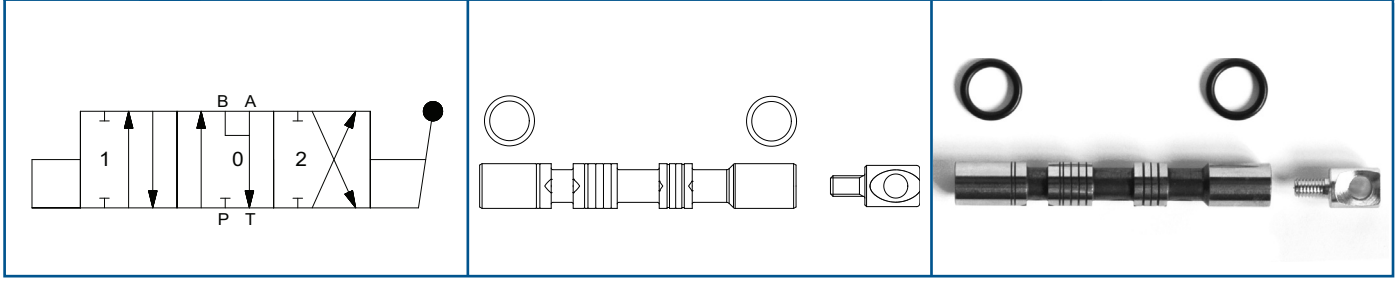
3-WAY / 3-POSITION SPOOL. Provides control of single-acting cylinders or start and stop of uni-directional hydraulic motors. In position 0 work port is blocked. A port is plugged.

SPOOL D — COD. 560078



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.

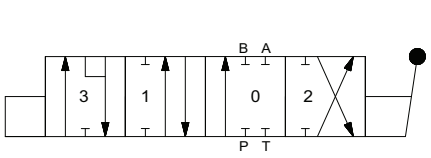
SPOOL D DX — COD. 560087

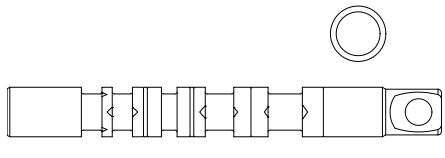
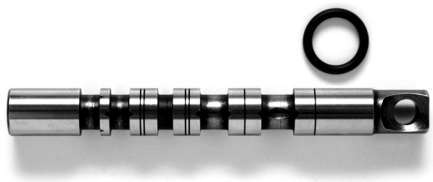


4-WAY / 3-POSITION SPOOL, OPEN CENTER (MOTOR SPOOL). Same features of spool D but with threaded spool end. Required to assembly the joystick (JS) or for special applications.

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

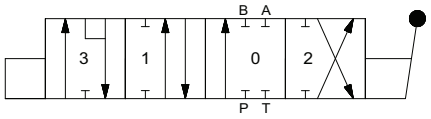
SPOOL K — COD. 560081

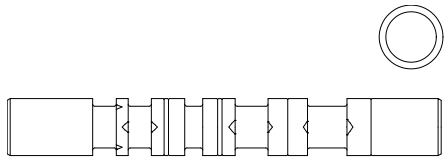
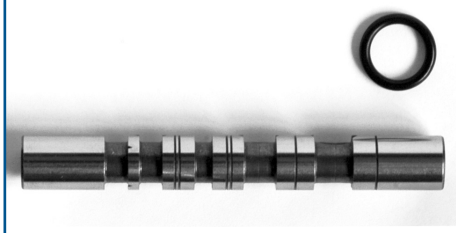


4-WAY / 4-POSITION, FLOATING SPOOL. Same features as spool A with the addition of a fourth floating position. The floating position allows a cylinder to float or a motor to wheel free when the spool is in position 3. To be combined only with spool controls 16 or 54. Special machining on the body is required.

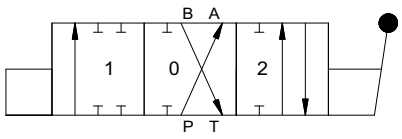
SPOOL KS — COD. 560420

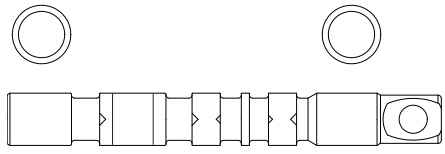
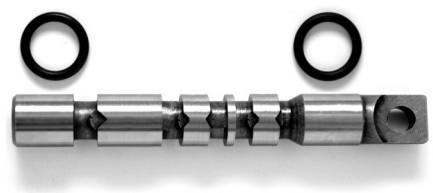


4-WAY / 4-POSITION, FLOATING SPOOL. Same features as spool K but with threaded spool end. Required to assembly the joystick (JS) or for special applications. To be combined only with spool controls 16 or 54. Special maching on the body is required.

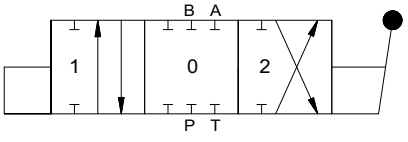
SPOOL Y — COD. 560084

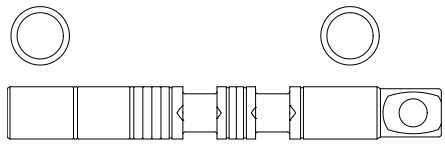


4-WAY / 3-POSITION SPOOL. Provides control of bi-directional motors. Required when the sequence of the stop an go of the motor is different than usual. The neutral position is in position 1.

SPOOL M — COD. 560082

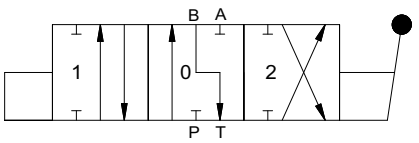


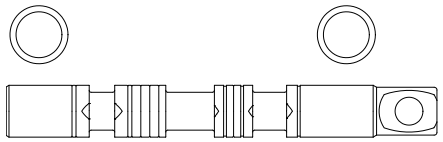



4-WAY / 3-POSITION SPOOL. Same features as spool A to be used in a closed center system.

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

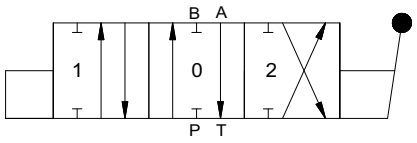
SPOOL E — COD. 560079

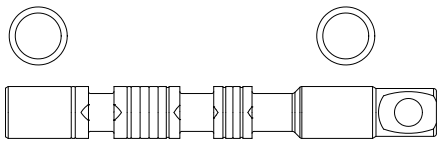


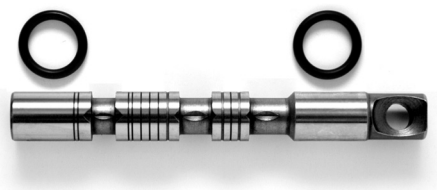


4-WAY / 3-POSITION SPOOL. Same features as spool A. In position 0 B port is connected to the tank.

SPOOL F — COD. 560080







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

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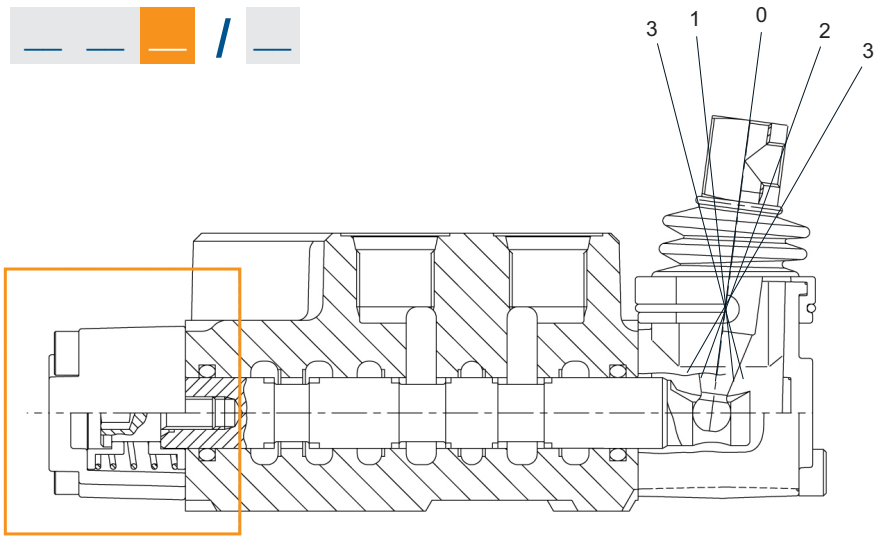
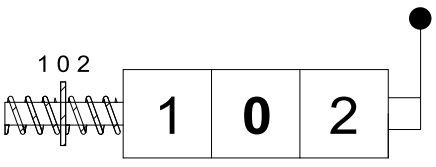
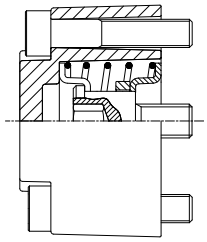
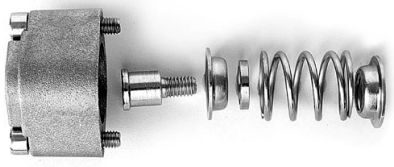


SPOOL CONTROL 1 — 3 POSITIONS — COD. 802049

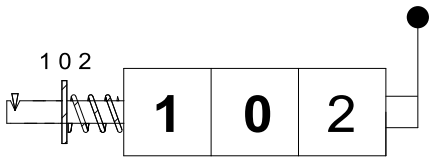


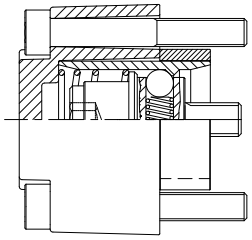


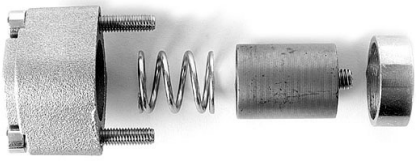


The spool returns to position 0 when the handle is released.

SPOOL CONTROL 2 — 3 POSITIONS — COD. 802051

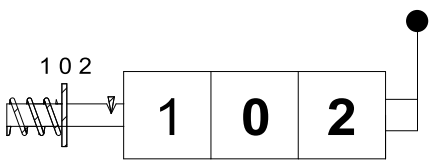


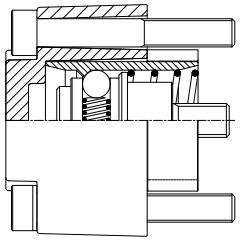


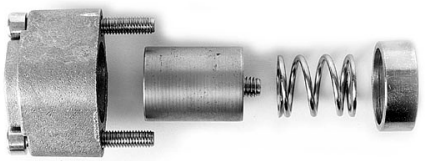


The spool is detented in position 1 and returns to 0 from position 2 when the handle is released.

SPOOL CONTROL 3 — 3 POSITIONS — COD. 802052







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

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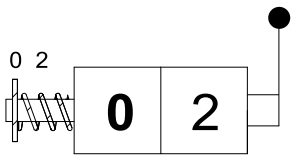
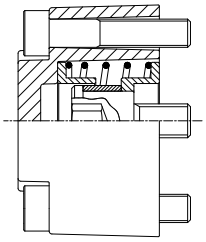
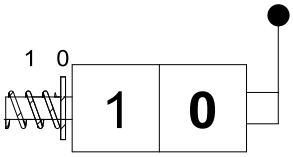
SPOOL CONTROL 4 — 2 POSITIONS — COD. 802057

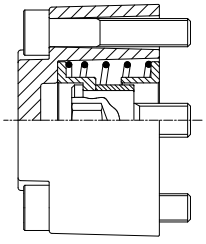


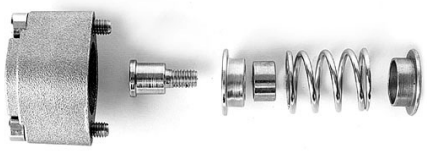


The spool returns to position 0 when the handle is released.

SPOOL CONTROL 5 — 2 POSITIONS — COD. 802058

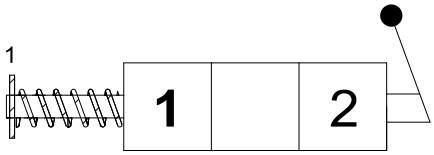


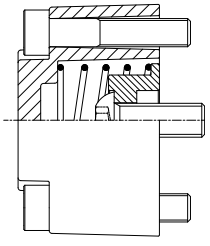


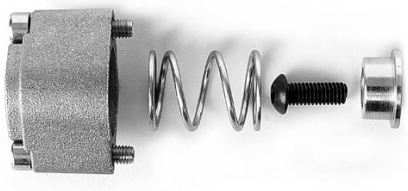


The spool returns to position 0 when the handle is released.

SPOOL CONTROL 6 — 3 POSITIONS — COD. 802059

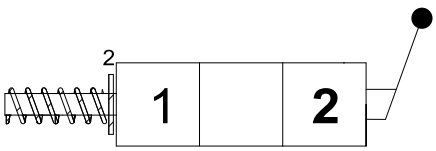


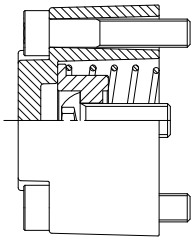


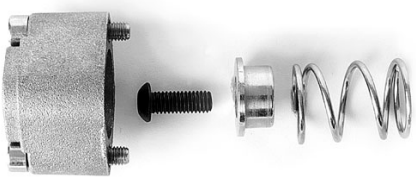


The spool returns to position 1 when the handle is released.

SPOOL CONTROL 7 — 3 POSITIONS — COD. 802060







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

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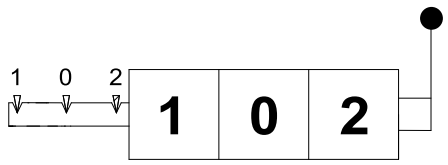
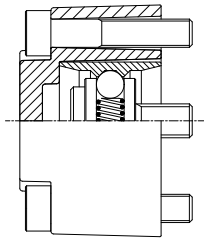
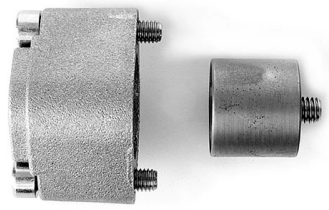
SPOOL CONTROL 8 — 3 POSITIONS — COD. 802050

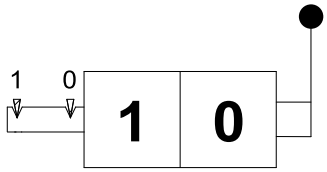


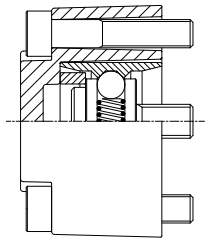


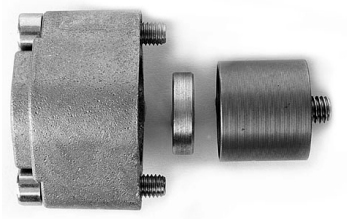


The spool is detented in all three positions.

SPOOL CONTROL 9 — 2 POSITIONS — COD. 802085

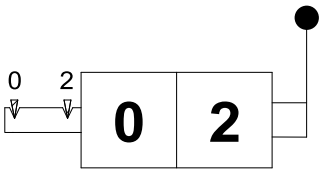


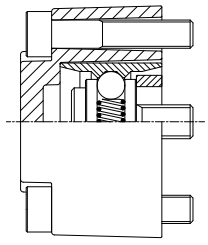


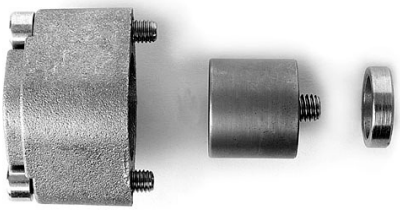


The spool is detented in both positions.

SPOOL CONTROL 10 — 2 POSITIONS — COD. 802086

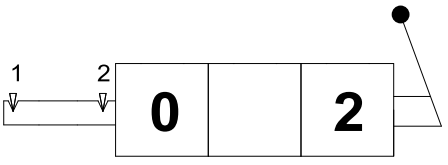


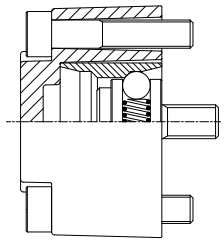


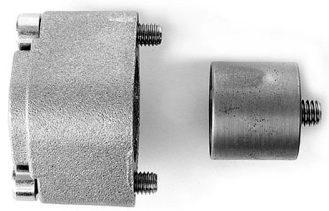


The spool is detented in both positions.

SPOOL CONTROL 11 — 2 POSITIONS — COD. 802089







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

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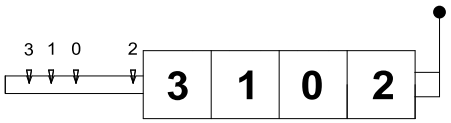
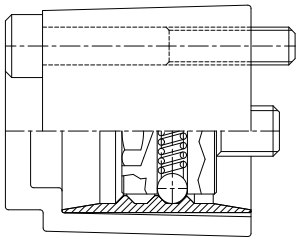
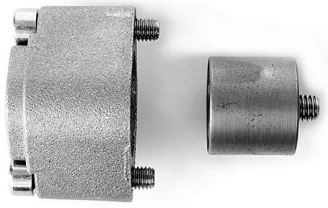
SPOOL CONTROL 13 — 4 POSITIONS — COD. 802082

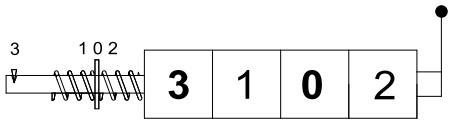


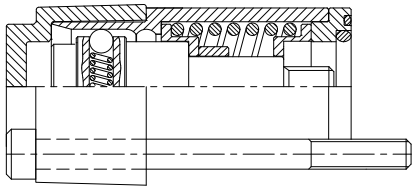


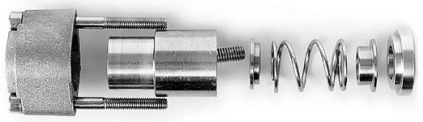


The spool is detented in all positions. To be combined only with spool L.

SPOOL CONTROL 16 — 4 POSITIONS — COD. 802061

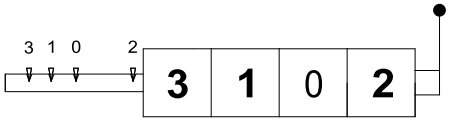


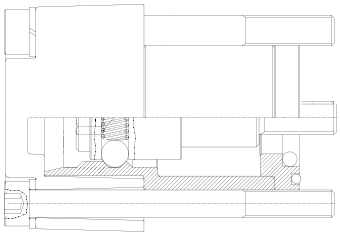


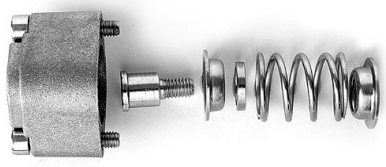


The spool returns to 0 from positions 1 and 2 when the handle is released. Position 3 is detented. To be combined only with spool K.

SPOOL CONTROL 31 — 3 POSITIONS — COD. 802229

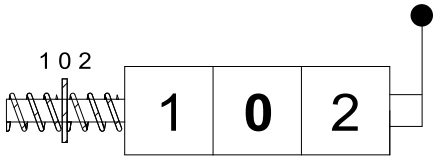


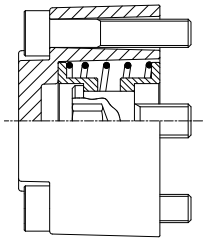


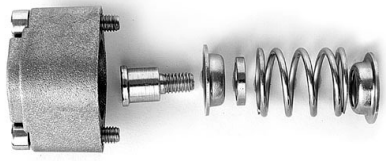


The spool returns to positions 0 when the handle is released. To be combined only with spool C.

SPOOL CONTROL 55 — 3 POSITIONS — COD. 802101







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

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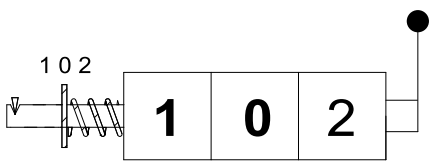
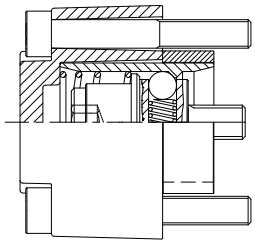
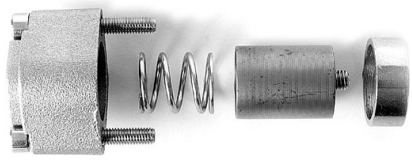
SPOOL CONTROL 56 — 3 POSITIONS — COD. 802111

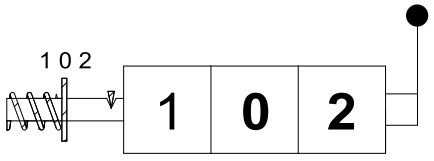


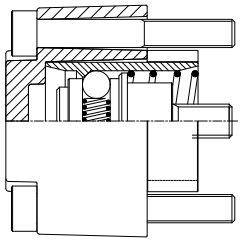


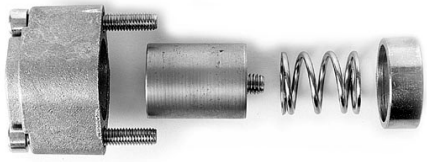


The spool is detented in positions 1 and returns to 0 from position 2 when the handle is released. To be combined only with spool C.

SPOOL CONTROL 57 — 3 POSITIONS — COD. 802110

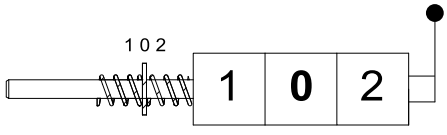


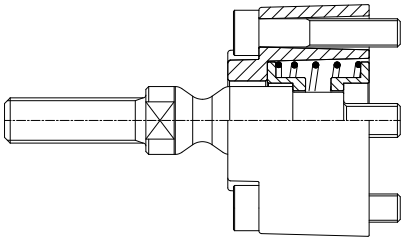


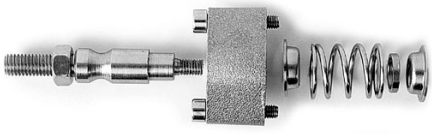


The spool is detented in positions 2 and returns to 0 from position 1 when the handle is released. To be combined only with spool C.

SPOOL CONTROL 1DC — 3 POSITIONS — COD. 802109

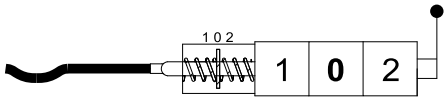


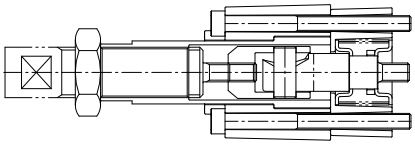




Same features as spool control 1 with the addition of a threaded pin which allows to operate the spool also from the side opposite to the manual control.

SPOOL CONTROL 1F — 3 POSITIONS — COD. 802132





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.

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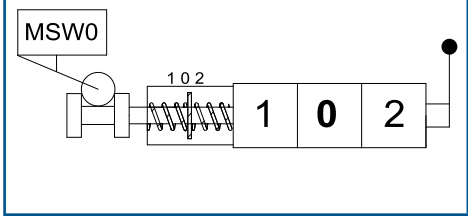
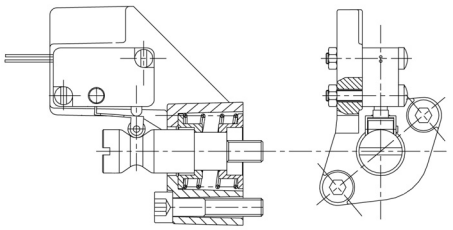
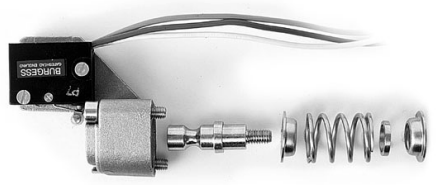
SPOOL CONTROL 1MSW0 — 3 POSITIONS — COD. 802173

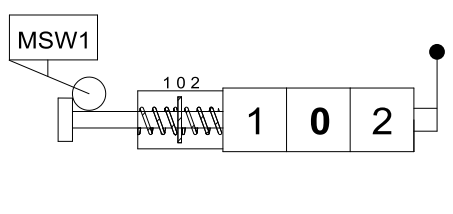


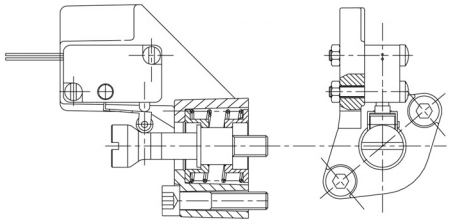


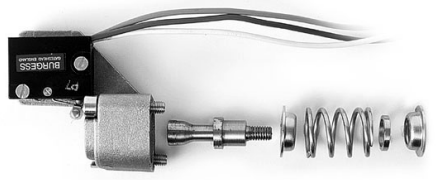


Same features as spool control 1 with the addition of a waterproof microswitch operating in positions 1 and 2.

SPOOL CONTROL 1MSW1 — 3 POSITIONS — COD. 802174

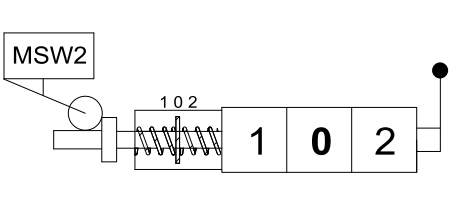


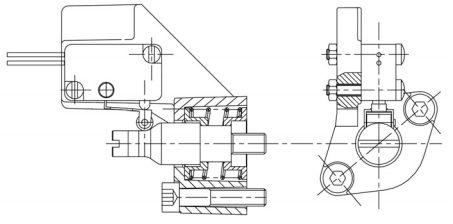


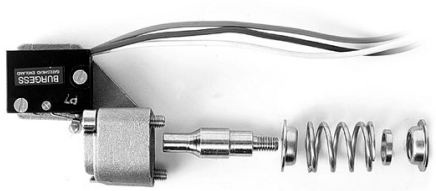


Same features as spool control 1 with the addition of a waterproof microswitch operating in position 1.

SPOOL CONTROL 1MSW2 — 3 POSITIONS — COD. 802175







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

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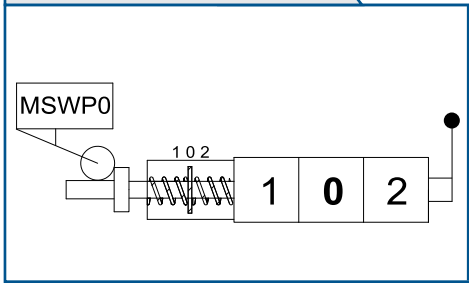
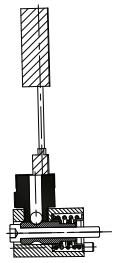
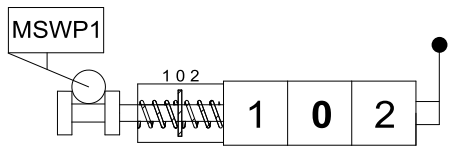
SPOOL CONTROL 1MSWP0 — 3 POSITIONS — COD. 802341

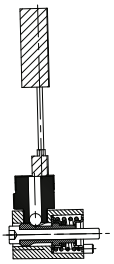




Same features as spool control 1 with the addition of a protected microswitch operating in position 1 and 2.

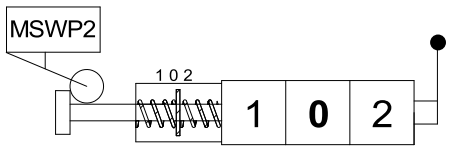
SPOOL CONTROL 1MSWP1 — 3 POSITIONS — COD. 802345

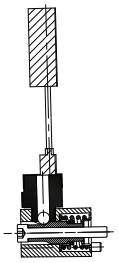




Same features as spool control 1 with the addition of a protected microswitch operating in position 1.

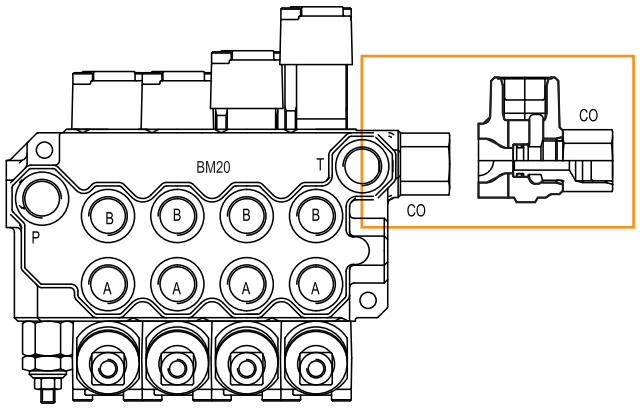
SPOOL CONTROL 1MSWP2 — 3 POSITIONS — COD. 802346

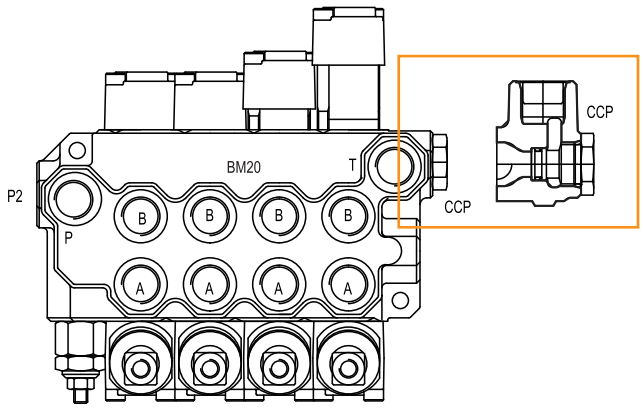




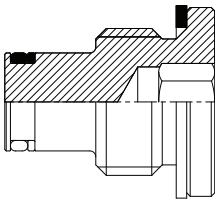
Same features as spool control 1 with the addition of a protected microswitch operating in position 2.

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



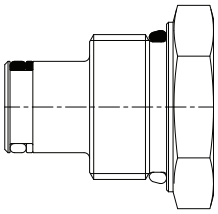


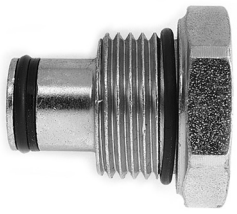
CLOSED CENTER PLUG CCP — 3/8" BSP — COD. 832017



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

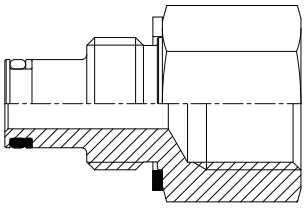
CLOSED CENTER PLUG CCP — 3/4" - 16 UNF — COD. 832033

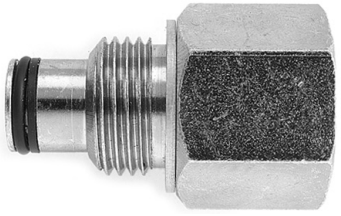




Turns an open center circuit into a closed center one. UNF threaded.

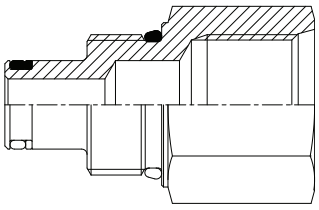
CLOSED CENTER PLUG CO — 3/8" BSP — COD. 832019

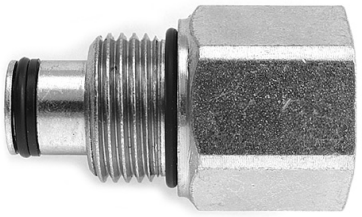




Allows the installation of another valve downstream from the first. Assembled on T2 port of a valve. BSP threaded.

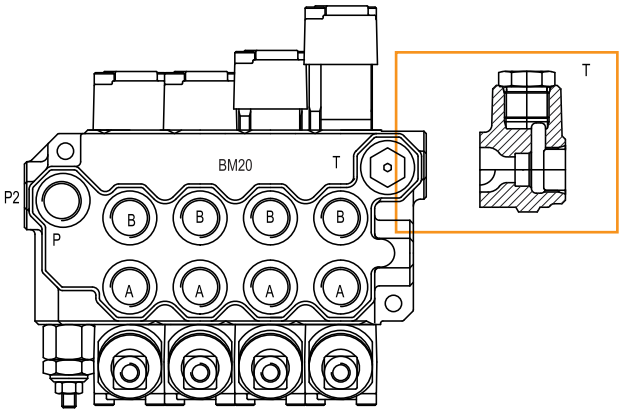
CLOSED CENTER PLUG CO — 3/4" - 16 UNF — COD. 832032

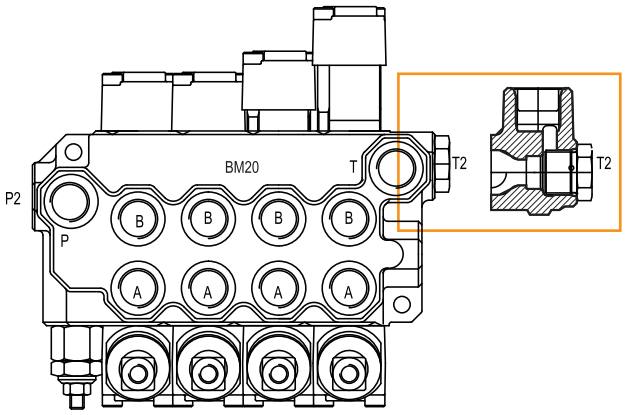




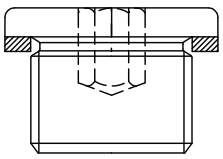
Allows the installation of another valve downstream from the first. Assembled on T2 port of a valve. UNF threaded.

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

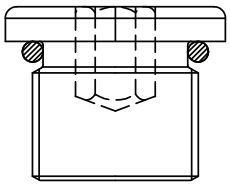




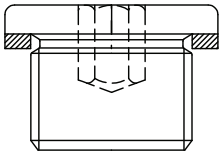
OUTLET PLUG T	3/8" BSP	COD. 015008



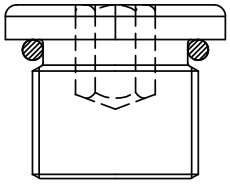
OUTLET PLUG T	3/4" - 16 UNF	COD. 015003

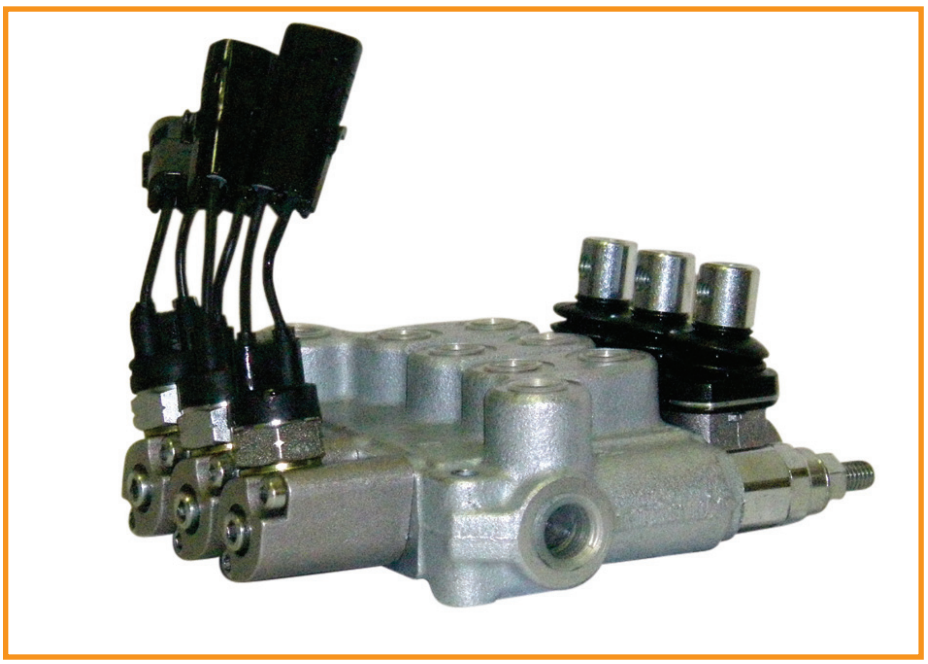


OUTLET PLUG T2	3/8" BSP	COD. 015008



OUTLET PLUG T2	3/4" - 16 UNF	COD. 015003





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