

**ELECTRIC PROPORTIONAL
PROPORTIONAL CONTROL**

BC60
HE - HO

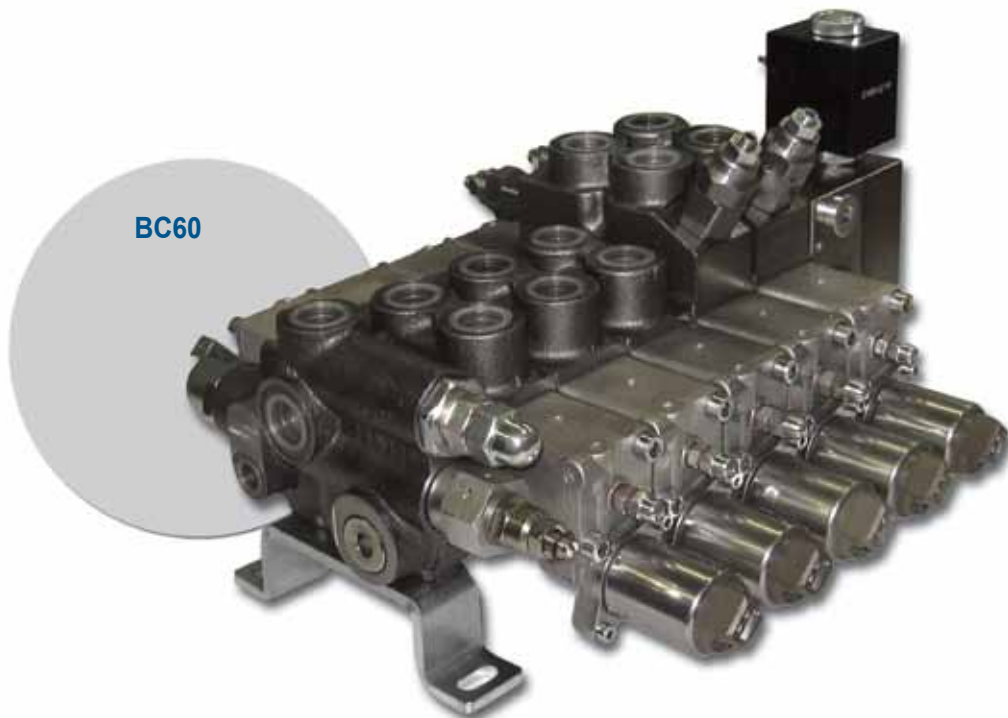
SECTIONAL VALVE WITH ELECTRIC PROPORTIONAL
AND HYDRAULIC PROPORTIONAL CONTROL



**ELECTRIC
PROPORTIONAL
JOYSTICK**



**CONNECTION
WIRES**



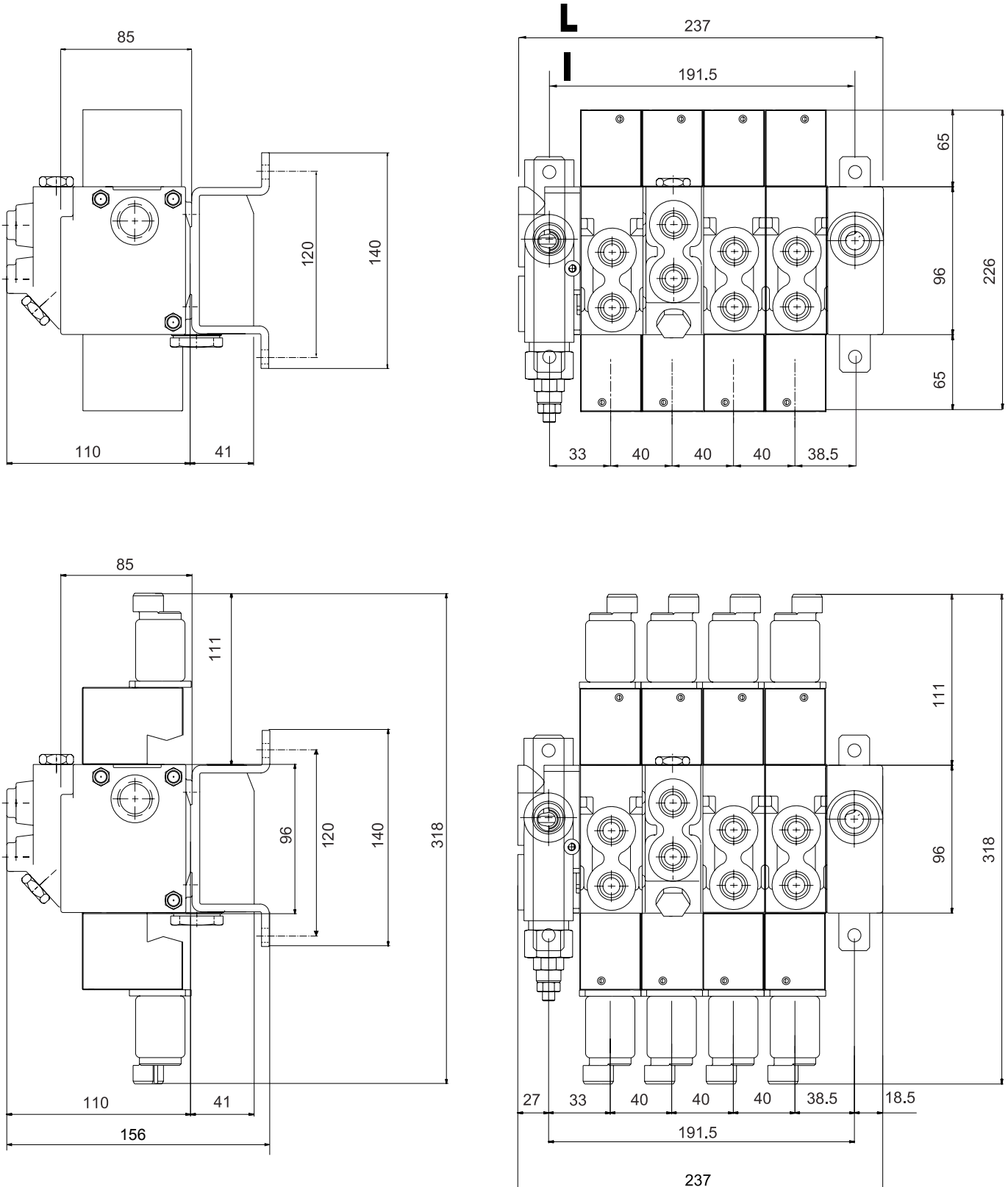
BC60

| | |
|--|----|
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This booklet is meant to be a technical deepening on the **BC60** directional control valve. Choice, use, maintenance and warranty conditions of all BLB products are described in the BLB General Catalog.

The **BC60** sectional valve has been designed for the remote proportional actuation of systems with fix displacement pumps. However, the installation of an auxiliary electro-valve (**LSK**) allows the utilization of the **BC60** valve in systems with variable displacement pumps (**LS**).

The actuation of the **BC60** valve can be electric proportional (**HE**), hydraulic proportional (**HO**) or the combination of the two.



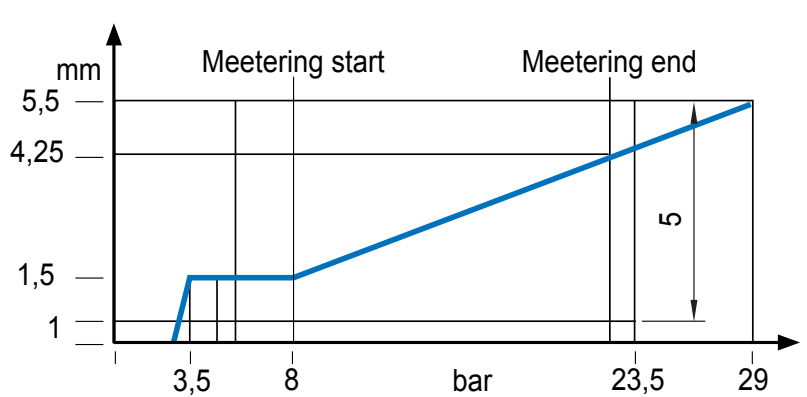
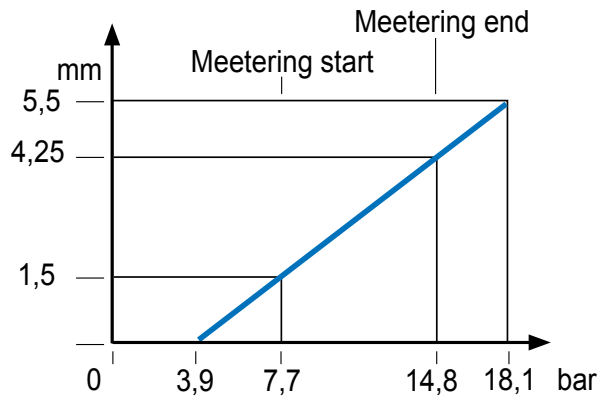
| TECHNICAL CHARACTERISTICS | | |
|----------------------------|----------|----------|
| NOMINAL FLOW | 60 l/min | 16 GPM |
| MAX FLOW | 70 l/min | 18 GPM |
| NOMINAL PRESSURE | 300 bar | 3600 PSI |
| MAX PRESSURE ON PORTS | 320 bar | 4700 PSI |
| MAX PRESSURE ON TANK-LINE | 15 bar | 220 PSI |
| MAX SERVO PRESSURE SETTING | 30 bar | 440 PSI |

| 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 |

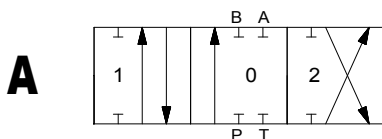
| STANDARD THREADS | | | | | |
|------------------|---------|---------|---------|---------|---------|
| | A - B | P | T | P2 | T2 |
| G (BSP) | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" |
| F (UNF) | 7/8"-14 | 7/8 -14 | 7/8"-14 | 7/8"-14 | 7/8"-14 |

| NUMBER OF SECTIONS | L | | I | |
|--------------------|------|--------|-------|--------|
| | (mm) | (inch) | (mm) | (inch) |
| BC60/1 | 117 | 4,6 | 71,5 | 2,81 |
| BC60/2 | 157 | 6,18 | 111,5 | 4,54 |
| BC60/3 | 197 | 7,75 | 151,5 | 5,96 |
| BC60/4 | 237 | 9,33 | 191,5 | 7,53 |
| ... | ... | ... | ... | ... |

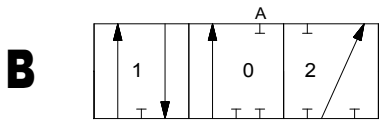
ACTUATORS



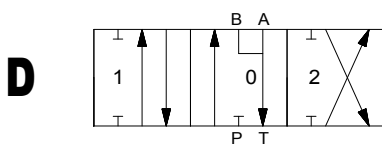
SPOOL TYPES



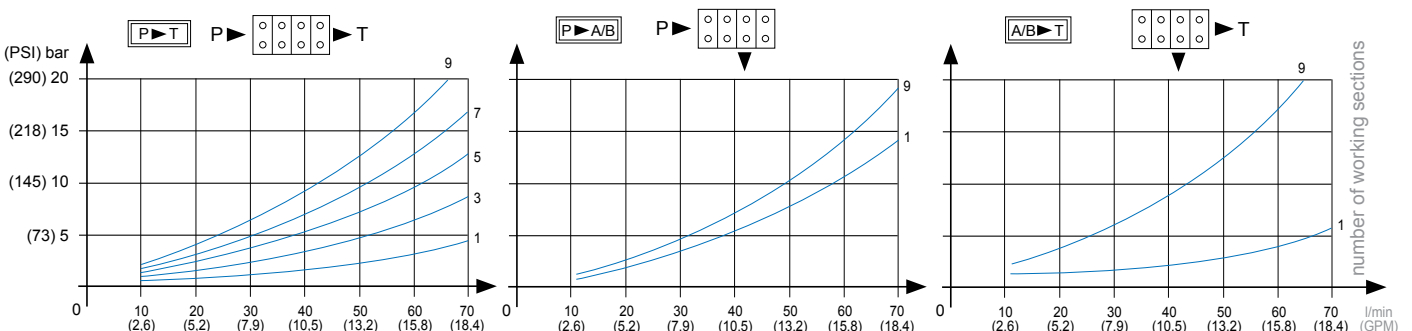
4-WAY / 3-POSITION SPOOL. Provides control of double-acting cylinders or bi-directional hydraulic motors. In position 0 work ports are blocked.



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.



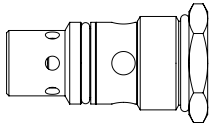
4-WAY / 3-POSITION SPOOL, OPEN CENTER (MOTOR SPOOL). Provides control of double acting cylinders or bi-directional hydraulic motors. Allows a cylinder to float or a motor to wheel free when the spool is in position 0. Work ports are open to the tank port when the spool is in position 0.



The BC60 sectional valve has the following features:

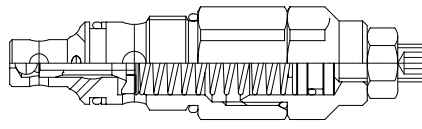
- Possibility to have auxiliary valves on ports: antishock valves (VL), anticavitation valves (VC) and combined antishock and anticavitation valves (VLC);
- Check valves on each section;
- Priority flow control sections (RFS, RFP)
- Elements with integrated pressure compensated flow control (CF, FCV).

Thanks to its high versatility and modular structure, the BC60 valve can be used in simple and complex hydraulic systems, fulfilling the most advanced requirements of the modern mobile machines.



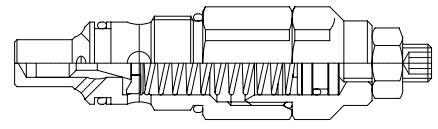
VC

ANTICAVITATION VALVE



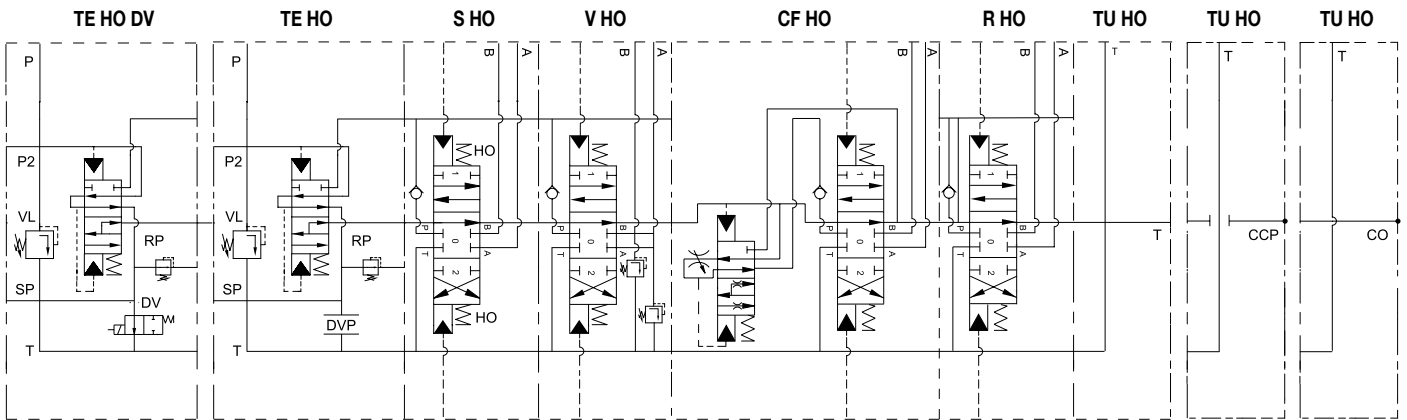
VLC

COMBINED ANTISHOCK AND ANTICAVITATION VALVE



VL

ANTISHOCK VALVE



INLET WITH DUMP VALVE

STANDARD INLET

STANDARD ELEMENT

ELEMENT ACCEPTING VALVES ON PORTS

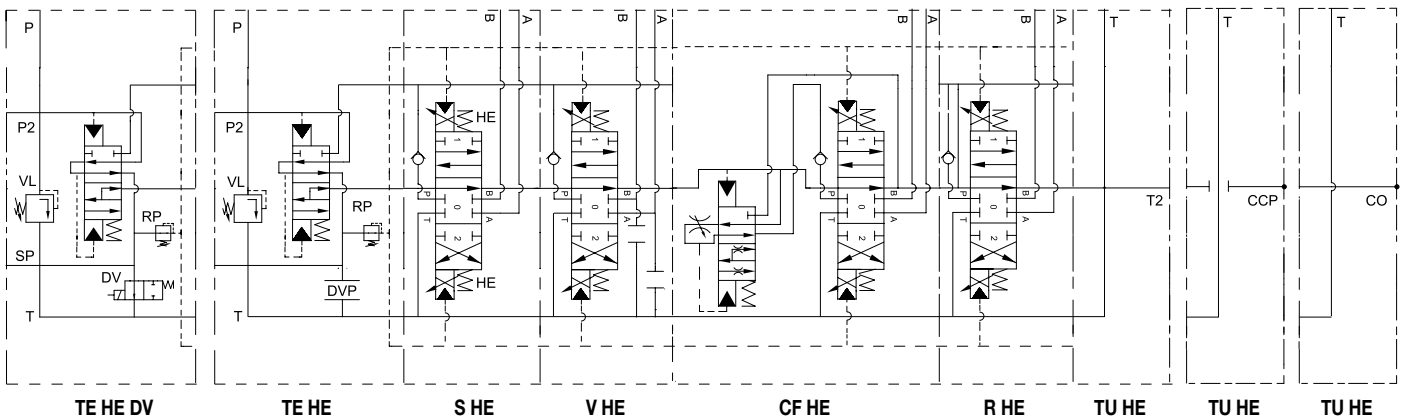
FLOW CONTROL ELEMENT

RECUPERATION ELEMENT

STANDARD OUTLET OPEN CENTER

STANDARD OUTLET WITH CLOSE CENTER PLUG

STANDARD OUTLET WITH CARRY OVER ADAPTOR



TE HE DV

TE HE

S HE

V HE

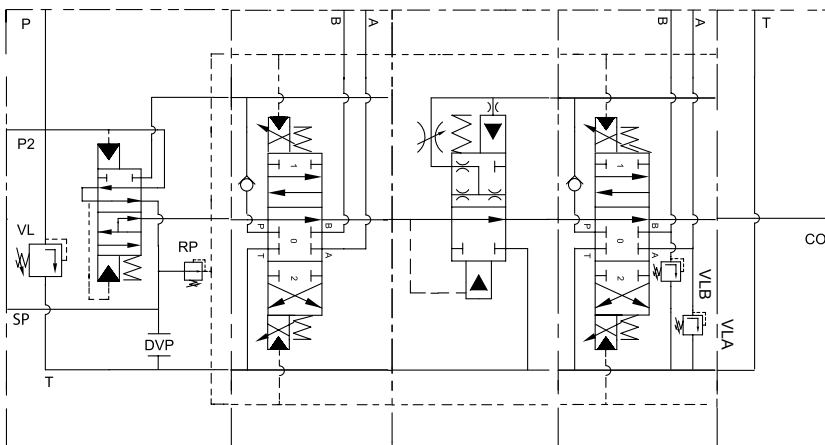
CF HE

R HE

TU HE

TU HE

TU HE



BC60 / 3 12 DV HE GK / S HE A / RFSHE / V HE A(VLAB) / CO

TYPE OF VALVE

NUMBER OF ELEMENTS

VOLTAGE
12 volt DC
24 volt DC

DV Dump valve

HE Proportional electric hydraulic
HO Proportional hydraulic

TYPE OF THREADS
G British standard parallel
F American standard UNF

TYPE OF INLET RELIEF VALVE
U 90÷250 bar
K 150÷300 bar

TYPE OF ELEMENT
S Standard element
V Element accepting valves on ports
P Priority element
PV Priority element accepting valves on ports
R Recuperation element
RV Recuperation element accepting valves on ports
CF Element with compensated priority flow control
CFV Element with compensated priority flow control accepting valves on ports

TYPE OF ACTUATOR
HE Proportional electric hydraulic
HO Proportional hydraulic

PRIORITY FLOW CONTROL ELEMENT
RFSHE Exceeding flow to the tank
RFPHE Exceeding flow recuperated
RFSHO Exceeding flow to the tank
RFPHO Exceeding flow recuperated

SPOOL TYPE
A Double acting
B Single acting
D Motor spool

TYPE OF ELEMENT
S Standard element
V Element accepting valves on ports
P Priority element
PV Priority element accepting valves on ports
R Recuperation element
RV Recuperation element accepting valves on ports
CF Element with compensated priority flow control
CFV Element with compensated priority flow control accepting valves on ports

OUTLET OPTIONS
CO Carry over
CCP Close center plug

AUXILIARY VALVES ON PORTS
VL Main relief valve
VC Anticavitation
VLC Combined anticavitation - Antishock valve

SPOOL TYPE
A Double acting
B Single acting
D Motor spool

TYPE OF ACTUATOR
HE Proportional electric hydraulic
HO Proportional hydraulic

LEGEND

A Port
B Port
P Pump connection
P2 Pump connection
SP Servo pressure

RP Pressure reducing valve
RVP Relief valve plug
DV Dump valve
DVP Dump valve plug
VL Main relief valve

VLAB Antishock valves
VLC Antishock and anticavitation valve
VC Anticavitation valve
HO Hydraulic proportional actuator
HE Electric proportional actuator

T Tank connection
T2 Tank connection
CCP Close center plug
CO Carry over

MANDATORY FIELD
OPTIONAL FIELD



INLET

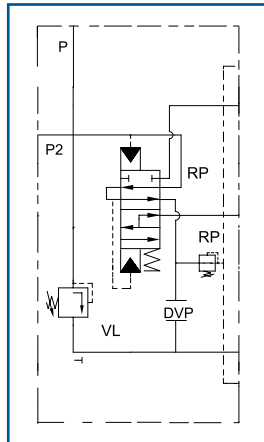


TE HE

2 kg

TE HE inlet elements feature a pressure compensated flow divider and a pressure reducer valve (RP) set at 25/30 bar. These two devices are used to generate an auxiliary pressure, needed to operate the spools through electric or hydraulic proportional actuators. The auxiliary pressure can be taken out of the inlet and connected to other users.

| | |
|---------------------|--------|
| BC60TE HE GU | 805143 |
| BC60TE HE GK | 805019 |
| BC60TE HE FU | 805145 |
| BC60TE HE FK | 805111 |

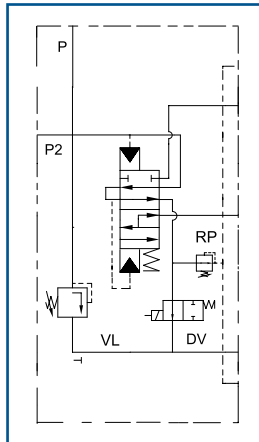


INLET WITH DUMP VALVE



TE HE DV

2,3 kg



| | |
|---------------------------|--------|
| BC60TE 12 HE DV GU | 805147 |
| BC60TE 12 HE DV GK | 805148 |
| BC60TE 12 HE DV FU | 805150 |
| BC60TE 12 HE DV FK | 805151 |
| BC60TE 24 HE DV GU | 805153 |
| BC60TE 24 HE DV GK | 805126 |
| BC60TE 24 HE DV FU | 805155 |
| BC60TE 24 HE DV FK | 805129 |

DV dump valve prevents the unwanted or accidental use of the directional control valve, connecting the auxiliary pressure to tank.

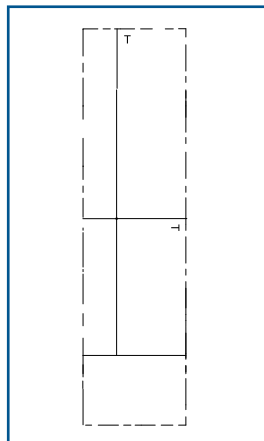
OUTLET



TU HE

1,7 kg

| | |
|--------------------|--------|
| BC60TU HE G | 805091 |
| BC60TU HE F | 805114 |



OUTLET WITH ANTISHOCK VALVE VL



TU HE VL

1,9 kg

| | |
|----------------------|--------|
| BC60TU HEVL G | 805137 |
| BC60TU HEVL F | 805138 |

The VL valve preserves the system from accidental pressure peaks in the tank line. VL setting is 100 bar.

STANDARD ELEMENT



S HE

2,7 kg

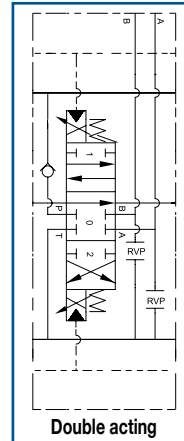
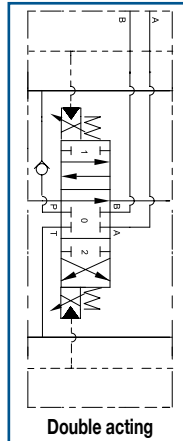
**STANDARD ELEMENT
ACCEPTING
VALVES
ON PORTS**



V HE

3,3 kg

| | |
|--------------------------|--------|
| BC60S 12 G /HE A/ | 807597 |
| BC60S 24 G /HE A/ | 807594 |
| BC60S 12 F /HE A/ | 807655 |
| BC60S 24 F /HE A/ | 807656 |

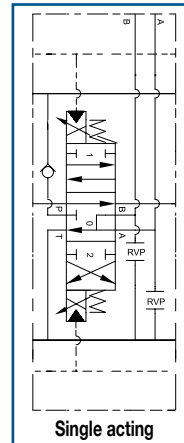
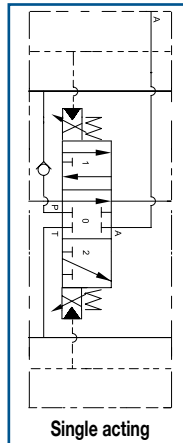


| | |
|--------------------------------|--------|
| BC60V 12 G /HE A RVPAB/ | 807661 |
| BC60V 24 G /HE A RVPAB/ | 807595 |
| BC60V 12 F /HE A RVPAB/ | 807662 |
| BC60V 24 F /HE A RVPAB/ | 807663 |

| | |
|-------------------------------|--------|
| BC60V 12 G /HE A VLAB/ | 807840 |
| BC60V 24 G /HE A VLAB/ | 807596 |
| BC60V 12 F /HE A VLAB/ | 807841 |
| BC60V 24 F /HE A VLAB/ | 807842 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

| | |
|--------------------------|--------|
| BC60S 12 G /HE B/ | 807651 |
| BC60S 24 G /HE B/ | 807653 |
| BC60S 12 F /HE B/ | 807657 |
| BC60S 24 F /HE B/ | 807658 |

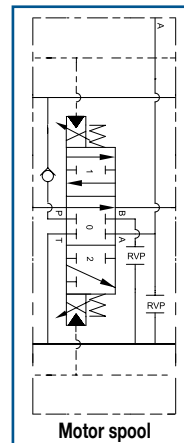
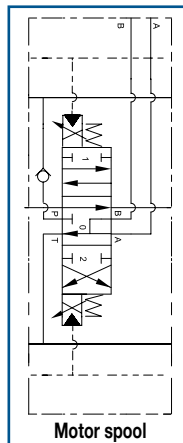


| | |
|--------------------------------|--------|
| BC60V 12 G /HE B RVPAB/ | 807664 |
| BC60V 24 G /HE B RVPAB/ | 807665 |
| BC60V 12 F /HE B RVPAB/ | 807666 |
| BC60V 24 F /HE B RVPAB/ | 807667 |

| | |
|------------------------------|--------|
| BC60V HE 12 G B VLAB/ | 807843 |
| BC60V HE 24 G B VLAB/ | 807844 |
| BC60V HE 12 F B VLAB/ | 807845 |
| BC60V HE 24 F B VLAB/ | 807846 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

| | |
|--------------------------|--------|
| BC60S 12 G /HE D/ | 807652 |
| BC60S 24 G /HE D/ | 807654 |
| BC60S 12 F /HE D/ | 807659 |
| BC60S 24 F /HE D/ | 807660 |



| | |
|--------------------------------|--------|
| BC60V 12 G /HE D RVPAB/ | 807668 |
| BC60V 24 G /HE D RVPAB/ | 807669 |
| BC60V 12 F /HE D RVPAB/ | 807670 |
| BC60V 24 F /HE D RVPAB/ | 807671 |

| | |
|-------------------------------|--------|
| BC60V 12 G /HE D VLAB/ | 807847 |
| BC60V 24 G /HE D VLAB/ | 807848 |
| BC60V 12 F /HE D VLAB/ | 807849 |
| BC60V 24 F /HE D VLAB/ | 807850 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

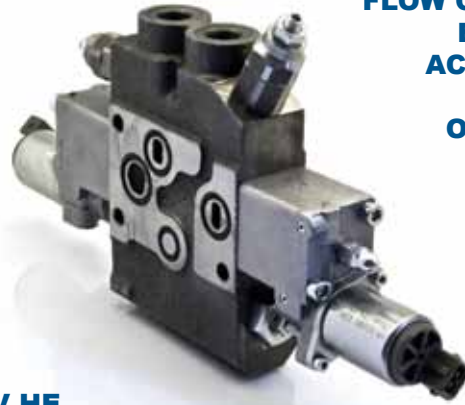
FLOW CONTROL ELEMENT



CF HE

kg 3,9

FLOW CONTROL ELEMENT ACCEPTING VALVES ON PORTS



CFV HE

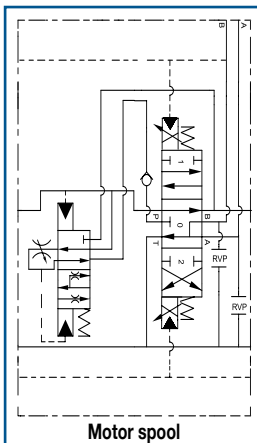
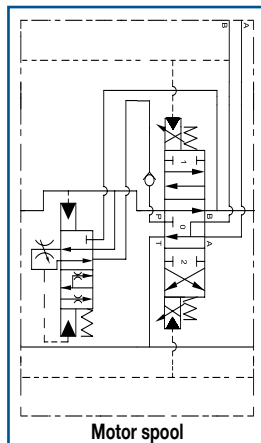
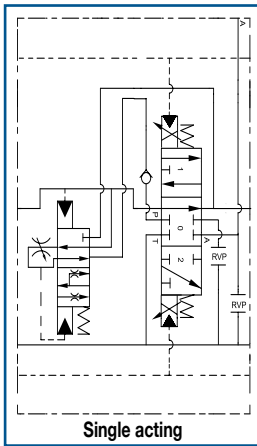
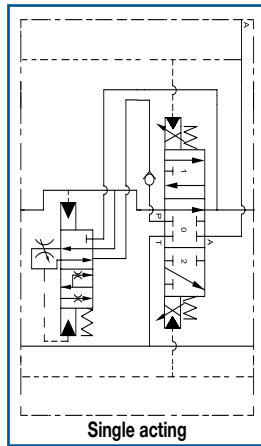
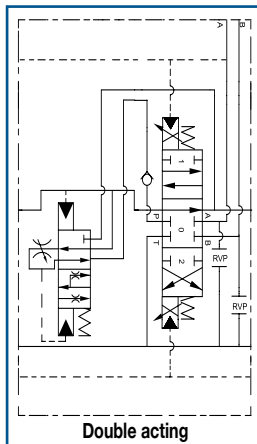
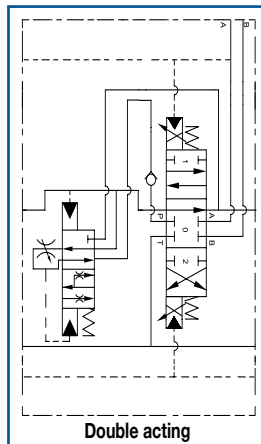
kg 4,5

CF and CFV elements integrate a pressure compensated flow control that allows the external regulation of the flow inside the elements themselves and recuperates the exceeding flow (EF) for the following elements.

| | |
|---------------------------|--------|
| BC60CF 12 G /HE A/ | 807718 |
| BC60CF 24 G /HE A/ | 807719 |
| BC60CF 12 F /HE A/ | 807720 |
| BC60CF 24 F /HE A/ | 807721 |

| | |
|---------------------------|--------|
| BC60CF 12 G /HE B/ | 807722 |
| BC60CF 24 G /HE B/ | 807723 |
| BC60CF 12 F /HE B/ | 807724 |
| BC60CF 24 F /HE B/ | 807725 |

| | |
|---------------------------|--------|
| BC60CF 12 G /HE D/ | 807726 |
| BC60CF 24 G /HE D/ | 807727 |
| BC60CF 12 F /HE D/ | 807728 |
| BC60CF 24 F /HE D/ | 807729 |



| | |
|----------------------------------|--------|
| BC60CFV 12 G /HE A RVPAB/ | 807730 |
| BC60CFV 24 G /HE A RVPAB/ | 807731 |
| BC60CFV 12 F /HE A RVPAB/ | 807732 |
| BC60CFV 24 F /HE A RVPAB/ | 807733 |

| | |
|---------------------------------|--------|
| BC60CFV 12 G /HE A VLAB/ | 807851 |
| BC60CFV 24 G /HE A VLAB/ | 807852 |
| BC60CFV 12 F /HE A VLAB/ | 807853 |
| BC60CFV 24 F /HE A VLAB/ | 807854 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

| | |
|----------------------------------|--------|
| BC60CFV 12 G /HE B RVPAB/ | 807734 |
| BC60CFV 24 G /HE B RVPAB/ | 807735 |
| BC60CFV 12 F /HE B RVPAB/ | 807736 |
| BC60CFV 24 F /HE B RVPAB/ | 807737 |

| | |
|---------------------------------|--------|
| BC60CFV 12 G /HE B VLAB/ | 807855 |
| BC60CFV 24 G /HE B VLAB/ | 807856 |
| BC60CFV 12 F /HE B VLAB/ | 807857 |
| BC60CFV 24 F /HE B VLAB/ | 807858 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

| | |
|----------------------------------|--------|
| BC60CFV 12 G /HE D RVPAB/ | 807738 |
| BC60CFV 24 G /HE D RVPAB/ | 807739 |
| BC60CFV 12 F /HE D RVPAB/ | 807740 |
| BC60CFV 24 F /HE D RVPAB/ | 807741 |

| | |
|---------------------------------|--------|
| BC60CFV 12 G /HE D VLAB/ | 807859 |
| BC60CFV 24 G /HE D VLAB/ | 807860 |
| BC60CFV 12 F /HE D VLAB/ | 807861 |
| BC60CFV 24 F /HE D VLAB/ | 807862 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

NOTE: After a **CF** or **CFV** the first element must be a **R** type

VERTICAL



RFS HE

2 kg

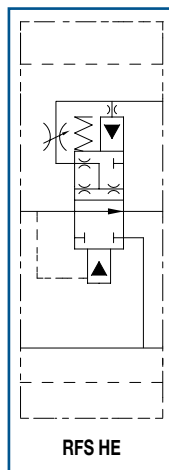
HORIZONTAL



RFSO HE

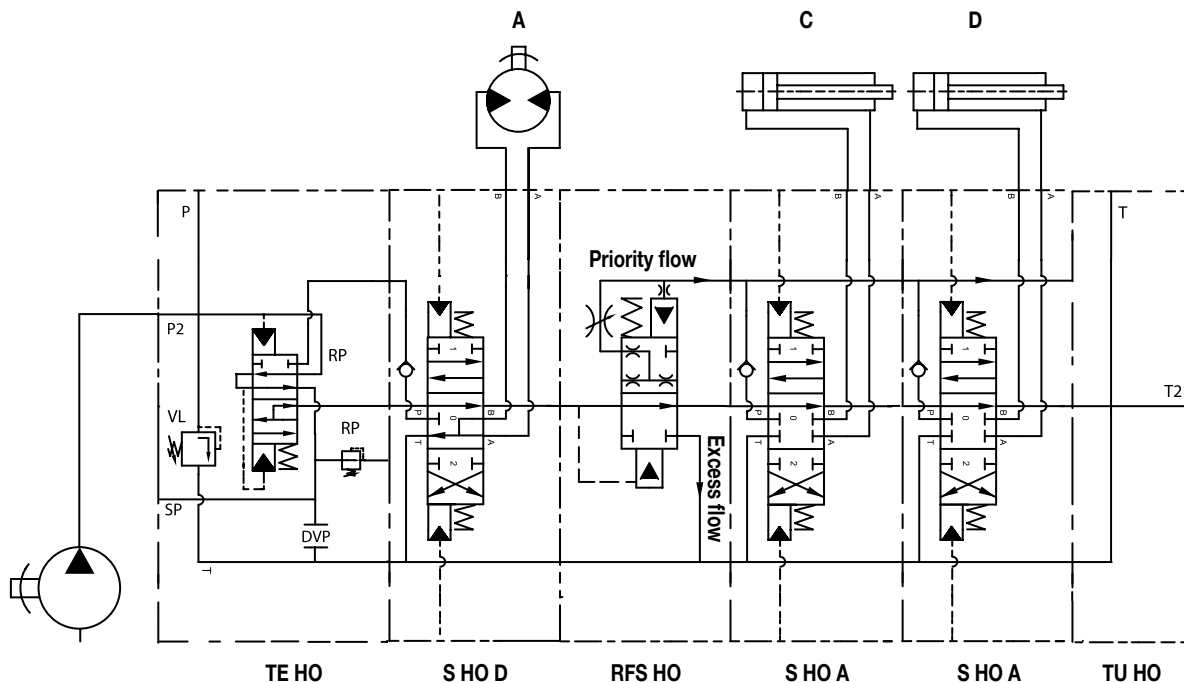
2 kg

The pressure compensated flow control section **RFS**, divides the flow in two channels: the priority flow (**PF**) channel, adjustable with the external knob, and the exceeding flow (**EF**) channel that goes to tank. Elements preceding **RFS** sections receive the full pump flow whereas the elements following **RFS** sections receive just the flow requested and settled. In order to prevent undesired heating in the system, the **RFS** section works only when one or more of the following sections are operated. The **RFS** section can be combined with all standard elements.



RFS HE

| | |
|---------------------|--------|
| BC60 RFS HE | 835011 |
| BC60 RFSO HE | 835010 |



EXAMPLE The motor (A) is fed by the whole flow of the pump. The cylinders (C, D) downstream the flow control element (RFS) are fed only by the priority flow (PF) which is adjustable through the flow control knob on the element. The excess flow goes to tank.

VERTICAL



RFP HE

2 kg

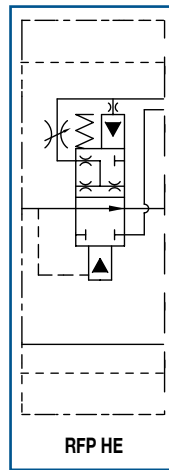
HORIZONTAL



RFPO HE

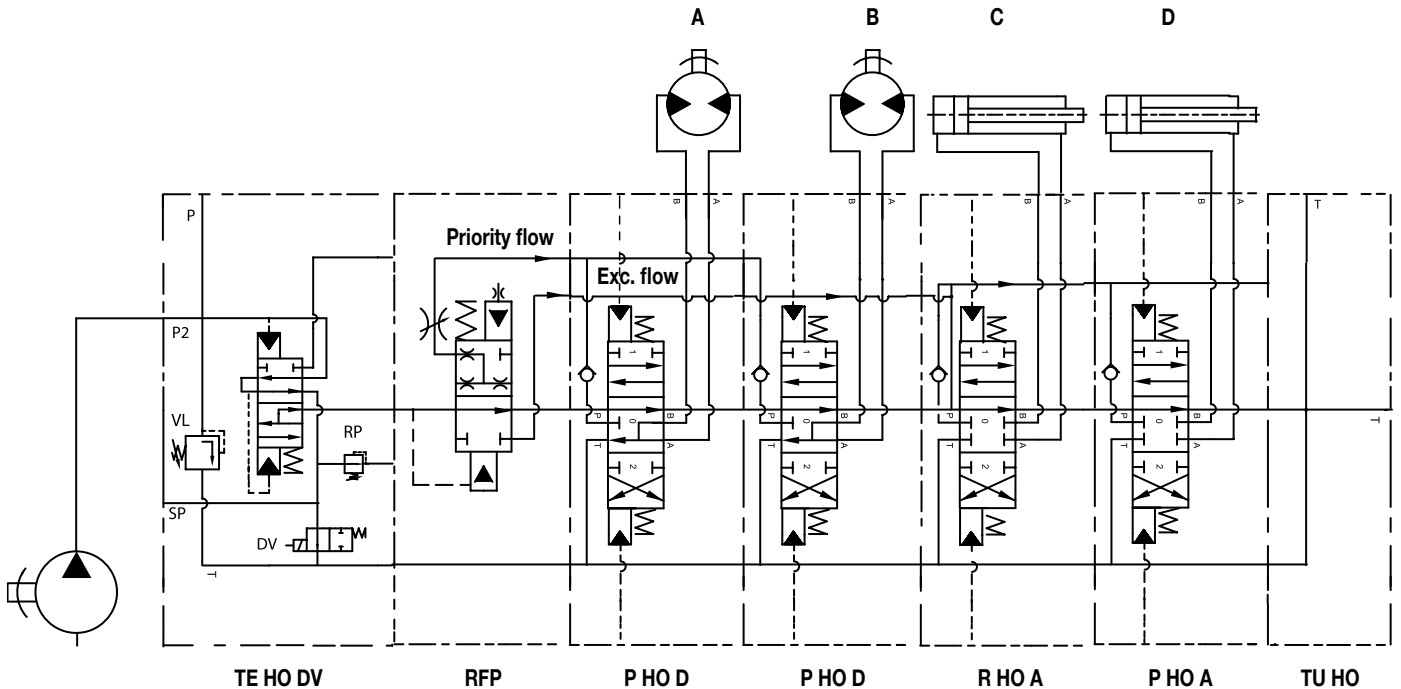
2 kg

The pressure compensated flow control section **RFP**, divides the flow in two channels: the first channel receives the priority flow (**PF**) (adjustable with the external knob) and feeds one or more Priority elements (**P**, **PV**); the second channel receives the exceeding flow (**EF**) and feeds one or more Recuperation elements (**R**, **RV**) which follow the priority ones. **RFP** sections, have to be followed by one or more priority elements (**P**, **PV**); Priority elements have to be followed by one or more Recuperation elements (**R**, **RV**). In order to prevent undesired heating in the system the **RFP** section works only when one or more of the Priority sections are operated. The installation of an **RFP** section, allows the contemporaneous operation of one Priority element and one Recuperation element which will work at different flows and pressures without interfering one with the other. When no Priority section is operated, the Recuperation elements get the full pump flow.



RFP HE

| | |
|--------------|--------|
| BC60 HE RFP | 835121 |
| BC60 HE RFPO | 835120 |



EXAMPLE The motors (A, B) are fed by the priority flow (PF) which is adjustable through the flow control knob on the element. The cylinders (C, D) are fed by the whole flow of the pump when singly actuated. When a cylinder and a motor are simultaneously actuated, the motor is fed by the priority flow (PF) and the cylinder by the exceeding flow (EF). If a cylinder is actuated while a motor is in work, this last will not vary its rotation speed.

PRIORITY ELEMENT



P HE

2,7 kg

PRIORITY ELEMENT ACCEPTING VALVES ON PORTS

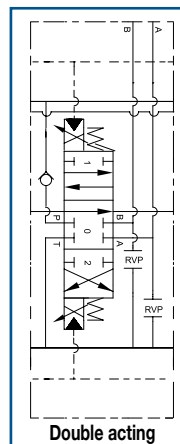
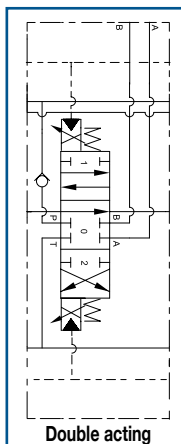


PV HE

3,3 kg

P elements use the priority flow regulated by the RFP sections. They have to be installed after an RFP section.

| | |
|--------------------------|--------|
| BC60P 12 G /HE A/ | 807672 |
| BC60P 24 G /HE A/ | 807673 |
| BC60P 12 F /HE A/ | 807674 |
| BC60P 24 F /HE A/ | 807675 |

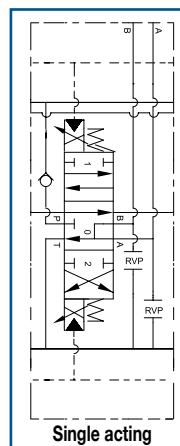
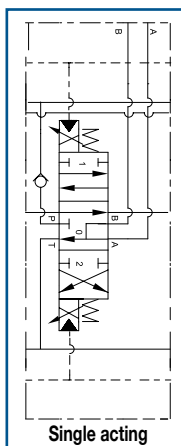


| | |
|---------------------------------|--------|
| BC60PV 12 G /HE A RVPAB/ | 807684 |
| BC60PV 24 G /HE A RVPAB/ | 807685 |
| BC60PV 12 F /HE A RVPAB/ | 807686 |
| BC60PV 24 F /HE A RVPAB/ | 807687 |

| | |
|--------------------------------|--------|
| BC60PV 12 G /HE A VLAB/ | 807863 |
| BC60PV 24 G /HE A VLAB/ | 807864 |
| BC60PV 12 F /HE A VLAB/ | 807865 |
| BC60PV 24 F /HE A VLAB/ | 807866 |

VL valves on ports A and B are type U.
Standard setting 140 bar.

| | |
|--------------------------|--------|
| BC60P 12 G /HE B/ | 807676 |
| BC60P 24 G /HE B/ | 807677 |
| BC60P 12 F /HE B/ | 807678 |
| BC60P 24 F /HE B/ | 807679 |

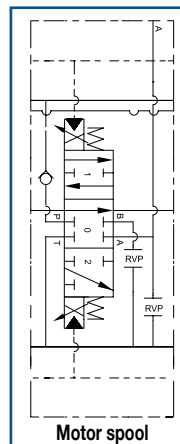
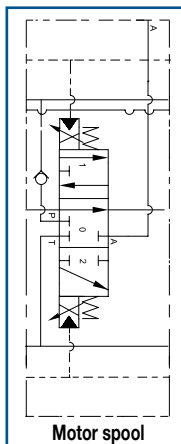


| | |
|---------------------------------|--------|
| BC60PV 12 G /HE B RVPAB/ | 807688 |
| BC60PV 24 G /HE B RVPAB/ | 807689 |
| BC60PV 12 F /HE B RVPAB/ | 807690 |
| BC60PV 24 F /HE B RVPAB/ | 807691 |

| | |
|--------------------------------|--------|
| BC60PV 12 G /HE B VLAB/ | 807867 |
| BC60PV 24 G /HE B VLAB/ | 807868 |
| BC60PV 12 F /HE B VLAB/ | 807869 |
| BC60PV 24 F /HE B VLAB/ | 807870 |

VL valves on ports A and B are type U.
Standard setting 140 bar.

| | |
|--------------------------|--------|
| BC60P 12 G /HE D/ | 807603 |
| BC60P 24 G /HE D/ | 807681 |
| BC60P 12 F /HE D/ | 807682 |
| BC60P 24 F /HE D/ | 807683 |



| | |
|---------------------------------|--------|
| BC60PV 12 G /HE D RVPAB/ | 807692 |
| BC60PV 24 G /HE D RVPAB/ | 807693 |
| BC60PV 12 F /HE D RVPAB/ | 807694 |
| BC60PV 24 F /HE D RVPAB/ | 807695 |

| | |
|--------------------------------|--------|
| BC60PV 12 G /HE D VLAB/ | 807871 |
| BC60PV 24 G /HE D VLAB/ | 807872 |
| BC60PV 12 F /HE D VLAB/ | 807873 |
| BC60PV 24 F /HE D VLAB/ | 807874 |

VL valves on ports A and B are type U.
Standard setting 140 bar.

RECUPERATION ELEMENT

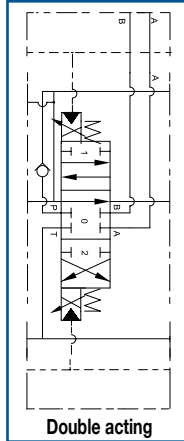


R HE

2,7 kg

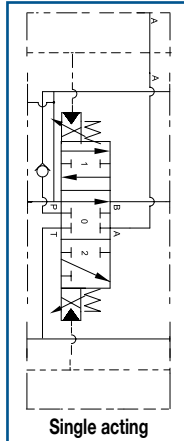
R elements use the exceeding flow coming from an RFP section. They have to be installed only after one or more P elements.

| | |
|-------------------|--------|
| BC60R 12 G /HE A/ | 807605 |
| BC60R 24 G /HE A/ | 807680 |
| BC60R 12 F /HE A/ | 807696 |
| BC60R 24 F /HE A/ | 807697 |



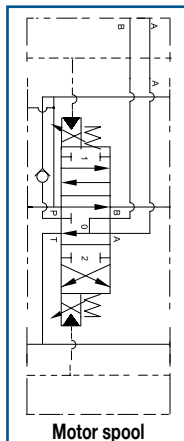
Double acting

| | |
|-------------------|--------|
| BC60R 12 G /HE B/ | 807698 |
| BC60R 24 G /HE B/ | 807699 |
| BC60R 12 F /HE B/ | 807700 |
| BC60R 24 F /HE B/ | 807701 |



Single acting

| | |
|-------------------|--------|
| BC60R 12 G /HE D/ | 807702 |
| BC60R 24 G /HE D/ | 807703 |
| BC60R 12 F /HE D/ | 807704 |
| BC60R 24 F /HE D/ | 807705 |



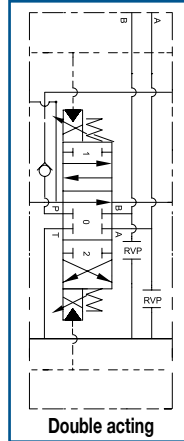
Motor spool

RECUPERATION ELEMENT ACCEPTING VALVES ON PORTS



RV HE

3,3 kg



Double acting

| | |
|--------------------------|--------|
| BC60RV 12 G /HE A RVPAB/ | 807706 |
| BC60RV 24 G /HE A RVPAB/ | 807707 |
| BC60RV 12 F /HE A RVPAB/ | 807708 |
| BC60RV 24 F /HE A RVPAB/ | 807709 |

| | |
|-------------------------|--------|
| BC60RV 12 G /HE A VLAB/ | 807875 |
| BC60RV 24 G /HE A VLAB/ | 807876 |
| BC60RV 12 F /HE A VLAB/ | 807877 |
| BC60RV 24 F /HE A VLAB/ | 807878 |

VL valves on ports A and B are type U. Standard setting 140 bar.

| | |
|--------------------------|--------|
| BC60RV 12 G /HE B RVPAB/ | 807710 |
| BC60RV 24 G /HE B RVPAB/ | 807711 |
| BC60RV 12 F /HE B RVPAB/ | 807712 |
| BC60RV 24 F /HE B RVPAB/ | 807713 |

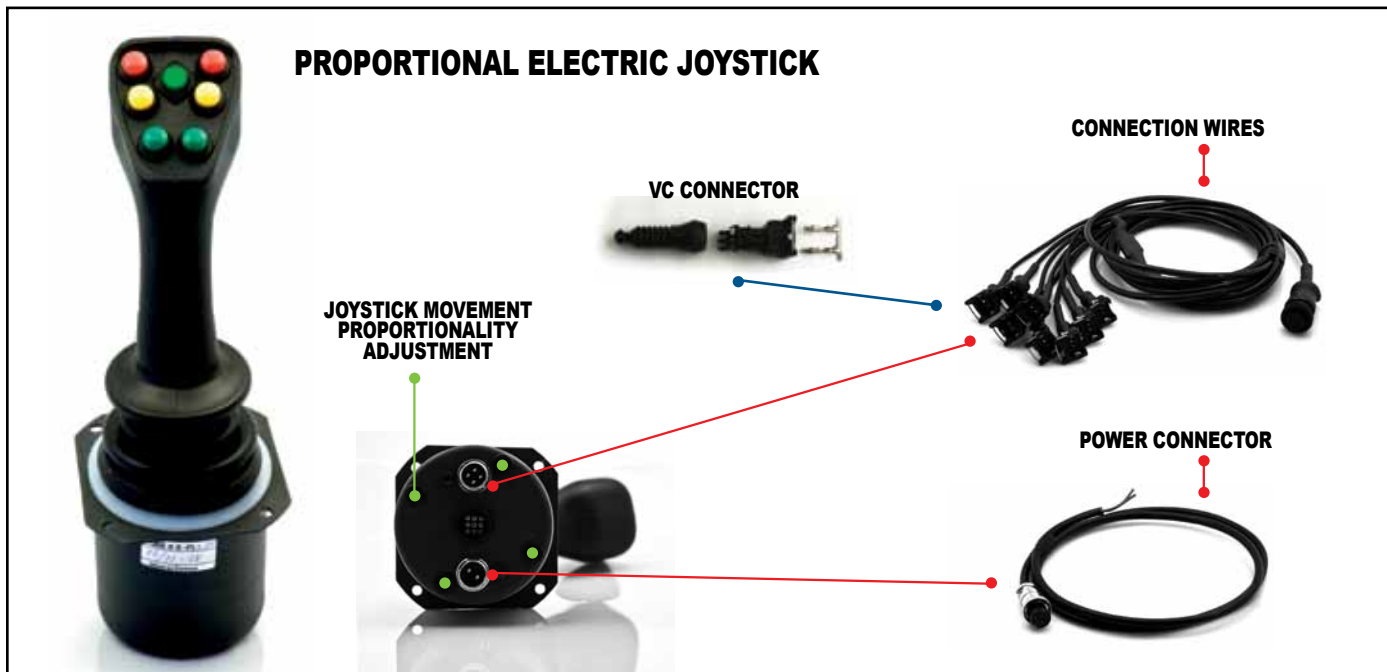
| | |
|-------------------------|--------|
| BC60RV 12 G /HE B VLAB/ | 807879 |
| BC60RV 24 G /HE B VLAB/ | 807880 |
| BC60RV 12 F /HE B VLAB/ | 807881 |
| BC60RV 24 F /HE B VLAB | 807882 |

VL valves on ports A and B are type U. Standard setting 140 bar.

| | |
|--------------------------|--------|
| BC60RV 12 G /HE D RVPAB/ | 807714 |
| BC60RV 24 G /HE D RVPAB/ | 807715 |
| BC60RV 12 F /HE D RVPAB/ | 807716 |
| BC60RV 24 F /HE D RVPAB/ | 807717 |

| | |
|-------------------------|--------|
| BC60RV 12 G /HE D VLAB/ | 807883 |
| BC60RV 24 G /HE D VLAB/ | 807884 |
| BC60RV 12 F /HE D VLAB/ | 807885 |
| BC60RV 24 F /HE D VLAB/ | 807886 |

VL valves on ports A and B are type U. Standard setting 140 bar.



ELECTRIC PROPORTIONAL JOYSTICK WITH 1 AXIS AND MICROSWITCHES

Electric proportional joystick complete with electronic card. Monoaxis version for the control of one proportional element in the BC60 valve. On request, extra microswitches will be available for the operation of further elements (up to 10 switches).

| | |
|----------------|--------|
| JMPE2S | 023081 |
| JMPE4S | 023082 |
| JMPE6S | 023083 |
| JMPE8S | 023084 |
| JMPE10S | 023085 |



ELECTRIC PROPORTIONAL JOYSTICK WITH 2 AXES AND MICROSWITCHES

Electric proportional joystick complete with electronic card. Biaxes version for the control of two proportional elements in the BC60 valve. On request, extra microswitches will be available for the operation of further elements (up to 10 switches).

| | |
|----------------|--------|
| JSPE2S | 023076 |
| JSPE4S | 023077 |
| JSPE6S | 023078 |
| JSPE8S | 023079 |
| JSPE10S | 023080 |



VCC CONNECTION WIRES

Electric wires to connect the joystick to the valve. Standard length 4.50 meters.

| | |
|-----------------|--------|
| VCC E2S | 025099 |
| VCC E4S | 025100 |
| VCC E6S | 025101 |
| VCC E8S | 025102 |
| VCC E10S | 025103 |



PC POWER CONNECTOR

Connects the joystick to the power source. Standard length 4.50 meters.

| | |
|-----------|--------|
| PC | 025104 |
|-----------|--------|



VC CONNECTOR

Valve connector that allows kinds of wiring different from the usual.

| | |
|-----------|--------|
| VC | 560883 |
|-----------|--------|

INLET

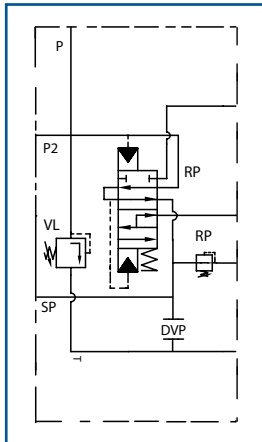


TE HO

2 kg

TE HE inlet elements feature a pressure compensated flow divider and a pressure reducer valve (RP) set at 25/30 bar. These two devices are used to generate an auxiliary pressure, needed to operate the spools through electric or hydraulic proportional actuators. The auxiliary pressure can be taken out of the inlet and connected to other users.

| | |
|---------------------|--------|
| BC60TE HO GU | 805166 |
| BC60TE HO GK | 805008 |
| BC60TE HO FU | 805168 |
| BC60TE HO FK | 805112 |

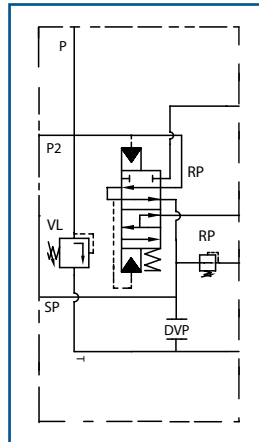


INLET WITH DUMP VALVE



TE HO DV

2,3 kg



| | |
|---------------------------|--------|
| BC60TE 12 HO DV GU | 805170 |
| BC60TE 12 HO DV GK | 805171 |
| BC60TE 12 HO DV FU | 805173 |
| BC60TE 12 HO DV FK | 805174 |
| BC60TE 24 HO DV GU | 805176 |
| BC60TE 24 HO DV GK | 805127 |
| BC60TE 24 HO DV FU | 805178 |
| BC60TE 24 HO DV FK | 805130 |

DV dump valve prevents the unwanted or accidental use of the directional control valve, connecting the auxiliary pressure to tank.

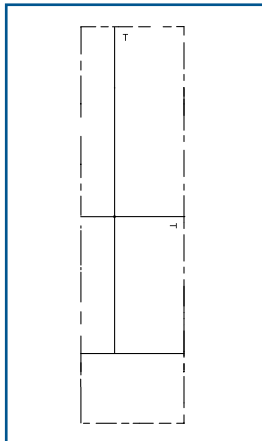
OUTLET



TU HO

1,7 kg

| | |
|--------------------|--------|
| BC60TU HO G | 805012 |
| BC60TU HO F | 805113 |



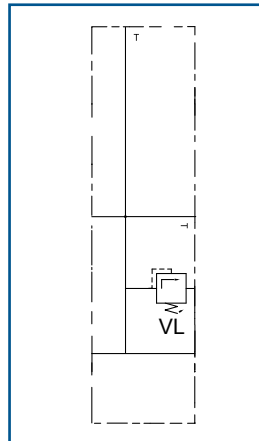
OUTLET WITH VL



TU HO VL

1,9 kg

| | |
|-----------------------|--------|
| BC60TU HO VL G | 805137 |
| BC60TU HE VL F | 805138 |



The VL valve preserves the system from accidental pressure peaks in the tank line. VL setting is 100 bar.

STANDARD ELEMENT



S HO

3,5 kg

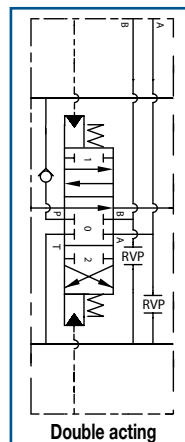
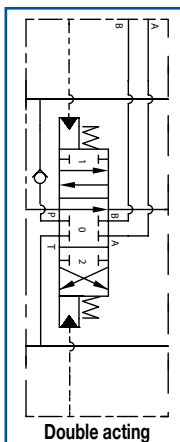
STANDARD ELEMENT ACCEPTING VALVES ON PORTS



V HO

4,1 kg

| | |
|----------------|--------|
| BC60S G /HO A/ | 806279 |
| BC60S F /HO A/ | 806853 |

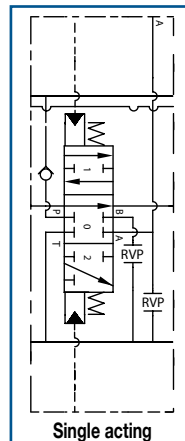
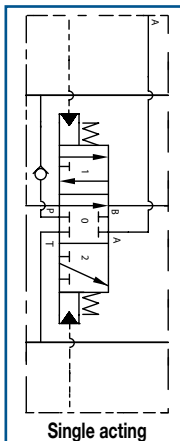


| | |
|----------------------|--------|
| BC60V G /HO A RVPAB/ | 806803 |
| BC60V F /HO A RVPAB/ | 806855 |

| | |
|----------------------|--------|
| BC60V G /HO A/ VLAB/ | 806887 |
| BC60V F /HO A/ VLAB/ | 806893 |

VL valves on ports A and B are type U.
Standard setting 140 bar.

| | |
|----------------|--------|
| BC60S G /HO B/ | 806888 |
| BC60S F /HO B/ | 806891 |

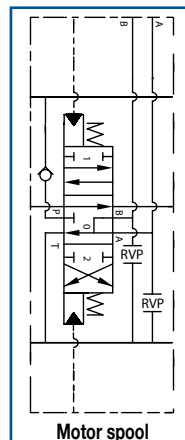
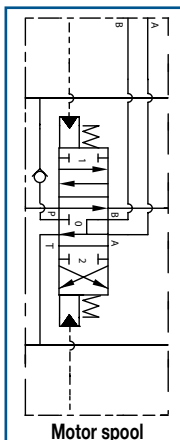


| | |
|----------------------|--------|
| BC60V G /HO B RVPAB/ | 806894 |
| BC60V F /HO B RVPAB/ | 806897 |

| | |
|---------------------|--------|
| BC60V G /HO B VLAB/ | 806896 |
| BC60V F /HO B VLAB/ | 806983 |

VL valves on ports A and B are type U.
Standard setting 140 bar.

| | |
|----------------|--------|
| BC60S G /HO D/ | 806889 |
| BC60S F /HO D/ | 806892 |



| | |
|----------------------|--------|
| BC60V G /HO D RVPAB/ | 806895 |
| BC60V F /HO D RVPAB/ | 806898 |

| | |
|---------------------|--------|
| BC60V G /HO D VLAB/ | 806984 |
| BC60V F /HO D VLAB/ | 806985 |

VL valves on ports A and B are type U.
Standard setting 140 bar.

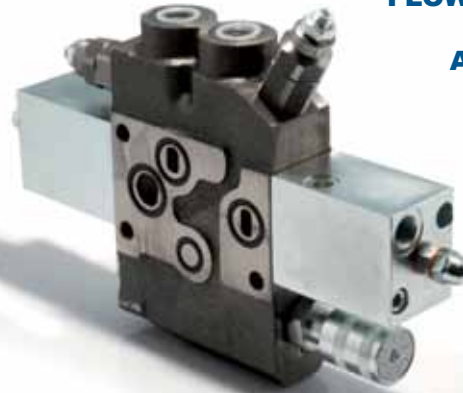
FLOW CONTROL ELEMENT



CF HO

4,6 kg

FLOW CONTROL ELEMENT ACCEPTING VALVES ON PORTS



CFV HO

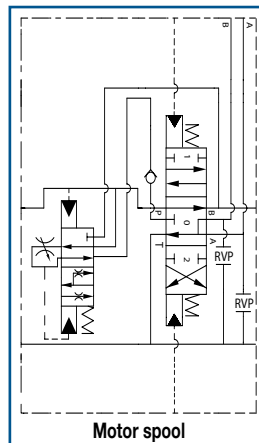
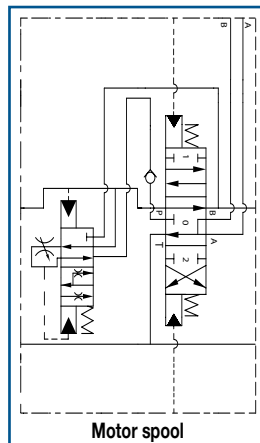
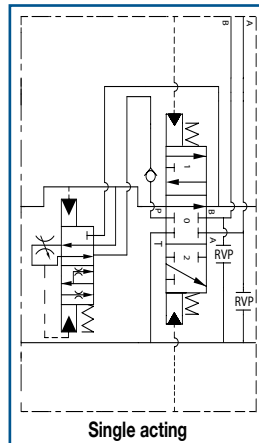
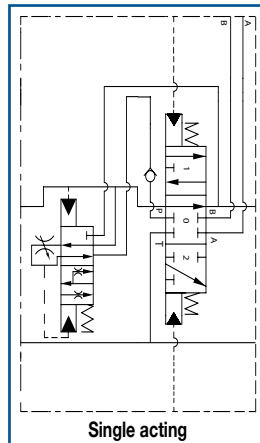
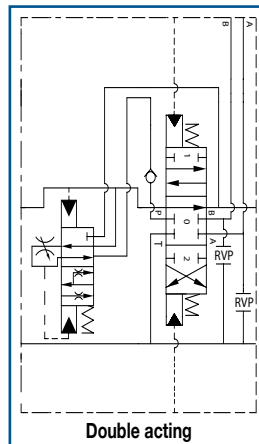
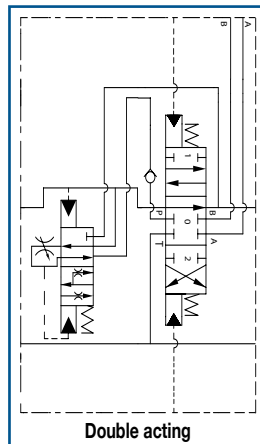
5,2 kg

CF and CFV elements integrate a pressure compensated flow control that allows the external regulation of the flow inside the elements themselves and recuperates the exceeding flow (EF) for the following elements.

| | |
|------------------------|--------|
| BC60CF G /HO A/ | 806923 |
| BC60CF F /HO A/ | 806926 |

| | |
|------------------------|--------|
| BC60CF G /HO B/ | 806924 |
| BC60CF F /HO B/ | 806927 |

| | |
|------------------------|--------|
| BC60CF G /HO D/ | 806925 |
| BC60CF F /HO D/ | 806928 |



| | |
|-------------------------------|--------|
| BC60CFV G /HO A RVPAB/ | 806929 |
| BC60CFV F /HO A RVPAB/ | 806932 |

| | |
|------------------------------|--------|
| BC60CFV G /HO A VLAB/ | 809001 |
| BC60CFV F /HO A VLAB/ | 809002 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

| | |
|-------------------------------|--------|
| BC60CFV G /HO B RVPAB/ | 806930 |
| BC60CFV F /HO B RVPAB/ | 806933 |

| | |
|------------------------------|--------|
| BC60CFV G /HO B VLAB/ | 809003 |
| BC60CFV F /HO B VLAB/ | 809004 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

| | |
|-------------------------------|--------|
| BC60CFV G /HO D RVPAB/ | 806931 |
| BC60CFV F /HO D RVPAB/ | 806934 |

| | |
|------------------------------|--------|
| BC60CFV G /HO D VLAB/ | 809005 |
| BC60CFV F /HO D VLAB/ | 809006 |

VL valves on ports **A** and **B** are type **U**.
Standard setting 140 bar.

NOTE: After a **CF - CVF** the first element must be a **R** type

VERTICAL



RFS HO

2 kg

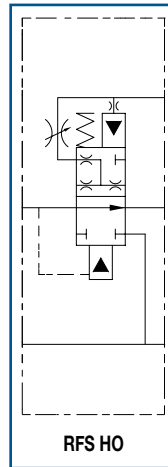
HORIZONTAL



RFSO HO

2 kg

The pressure compensated flow control section **RFS**, divides the flow in two channels: the priority flow (**PF**) channel, adjustable with the external knob, and the exceeding flow (**EF**) channel that goes to tank. Elements preceding **RFS** sections receive the full pump flow whereas the elements following **RFS** sections receive just the flow requested and settled. In order to prevent undesired heating in the system, the **RFS** section works only when one or more of the following sections are operated. The **RFS** section can be combined with all standard elements.



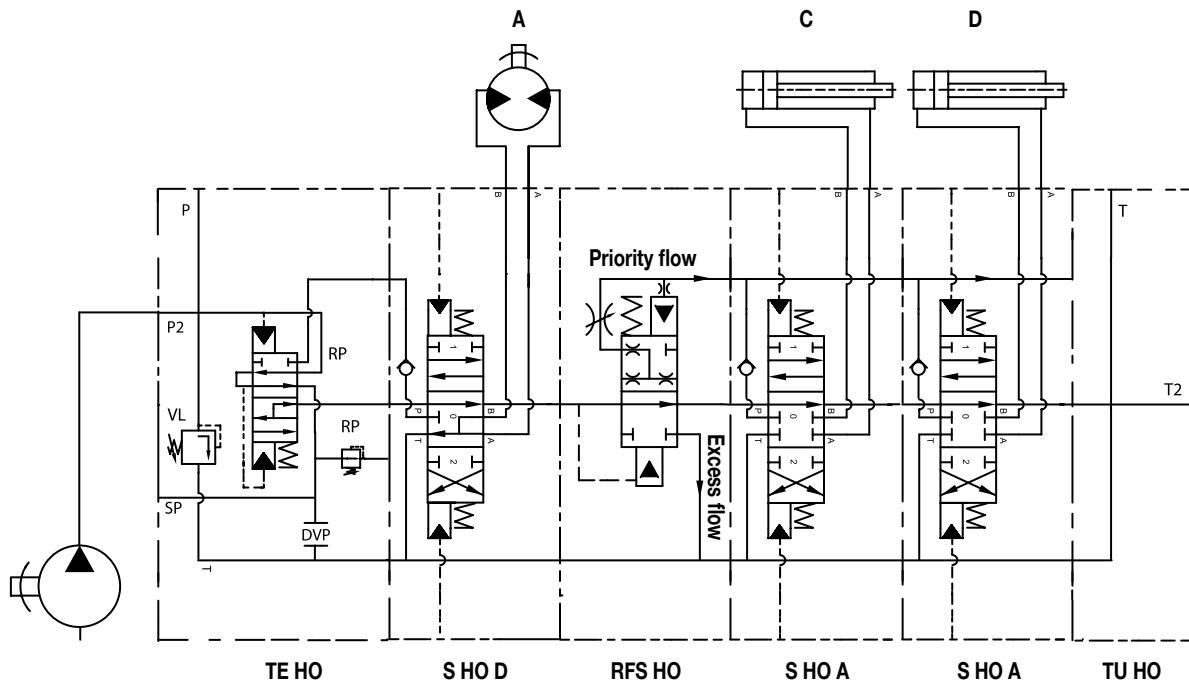
RFS HO

BC60 HO RFS

835001

BC60 HO RFSO

835006



EXAMPLE The motor (A) is fed by the whole flow of the pump. The cylinders (C, D) downstream the flow control element (RFS) are fed only by the priority flow (PF) which is adjustable through the flow control knob on the element. The excess flow go to the tank.



VERTICAL



RFP HO

2 kg

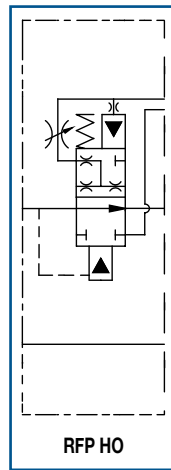
HORIZONTAL



RFPO HO

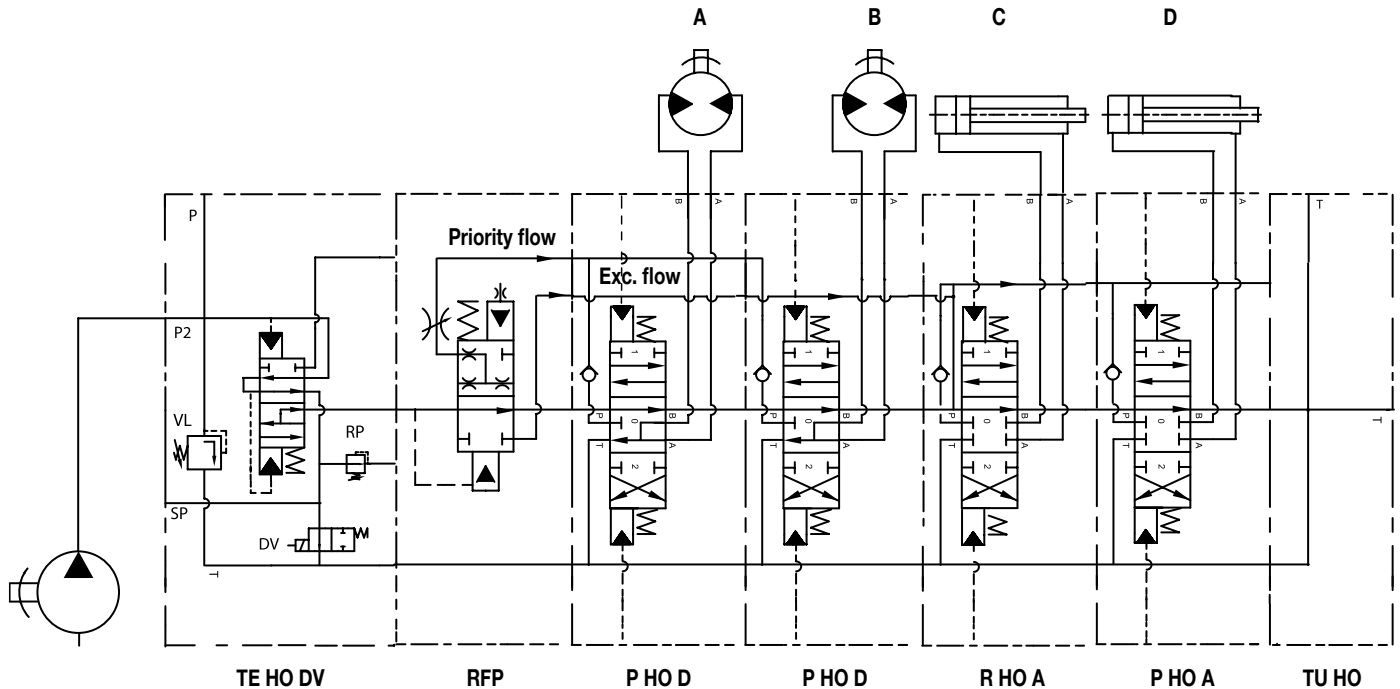
2 kg

The pressure compensated flow control section **RFP**, divides the flow in two channels: the first channel receives the priority flow (**PF**) (adjustable with the external knob) and feeds one or more Priority elements (**P**, **PV**); the second channel receives the exceeding flow (**EF**) and feeds one or more Recuperation elements (**R**, **RV**) which follow the priority ones. **RFP** sections, have to be followed by one or more priority elements (**P**, **PV**); Priority elements have to be followed by one or more Recuperation elements (**R**, **RV**). In order to prevent undesired heating in the system the **RFP** section works only when one or more of the Priority sections are operated. The installation of an **RFP** section, allows the contemporaneous operation of one Priority element and one Recuperation element which will work at different flows and pressures without interfering one with the other. When no Priority section is operated, the Recuperation elements get the full pump flow.



RFP HO

| | |
|--------------|--------|
| BC60 HO RFP | 835004 |
| BC60 HO RFPO | 835002 |



EXAMPLE The motors (A, B) are fed by the priority flow (PF) which is adjustable through the flow control knob on the element. The cylinders (C, D) are fed by the whole flow of the pump when singly actuated. When a cylinder and a motor are simultaneously actuated, the motor is fed by the priority flow (PF) and the cylinder by the exceeding flow (EF). If a cylinder is actuated while a motor is in work, this last will not vary its rotation speed.

PRIORITY ELEMENT



P HO

3,5 kg

PRIORITY ELEMENT ACCEPTING VALVES ON PORTS

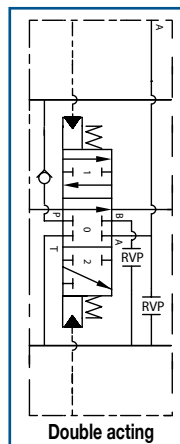
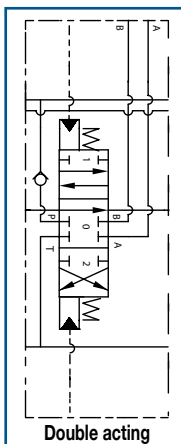


PV HO

4,1 kg

P elements use the priority flow regulated by the RFP sections. They have to be installed after an RFP section.

| | |
|-----------------------|--------|
| BC60P G /HO A/ | 806899 |
| BC60P F /HO A/ | 806902 |

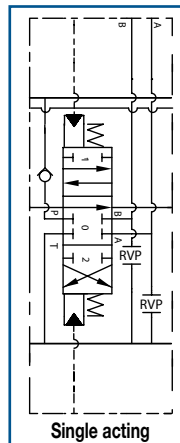
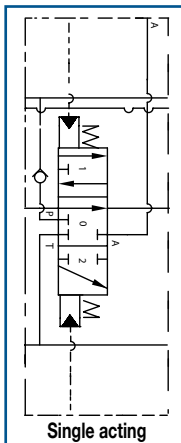


| | |
|------------------------------|--------|
| BC60PV G /HO A RVPAB/ | 806905 |
| BC60PV F /HO A RVPAB/ | 806908 |

| | |
|-----------------------------|--------|
| BC60PV G /HO A VLAB/ | 806986 |
| BC60PV F /HO A VLAB/ | 806987 |

VL valves on ports A and B are type U. Standard setting 140 bar.

| | |
|-----------------------|--------|
| BC60P G /HO B/ | 806900 |
| BC60P F /HO B/ | 806903 |

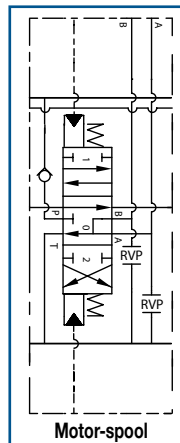
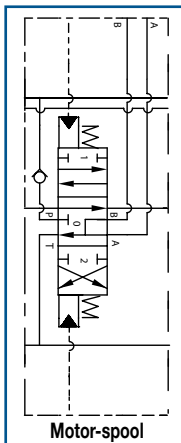


| | |
|------------------------------|--------|
| BC60PV G /HO B RVPAB/ | 806906 |
| BC60PV F /HO B RVPAB/ | 806909 |

| | |
|-----------------------------|--------|
| BC60PV G /HO B VLAB/ | 806988 |
| BC60PV F /HO B VLAB/ | 806989 |

VL valves on ports A and B are type U. Standard setting 140 bar.

| | |
|-----------------------|--------|
| BC60P G /HO D/ | 806901 |
| BC60P F /HO D/ | 806904 |



| | |
|------------------------------|--------|
| BC60PV G /HO D RVPAB/ | 806907 |
| BC60PV F /HO D RVPAB/ | 806910 |

| | |
|-----------------------------|--------|
| BC60PV G /HO D VLAB/ | 806990 |
| BC60PV F /HO D VLAB/ | 806991 |

VL valves on ports A and B are type U. Standard setting 140 bar.

RECUPERATION ELEMENT

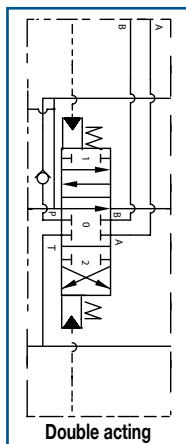


R HO

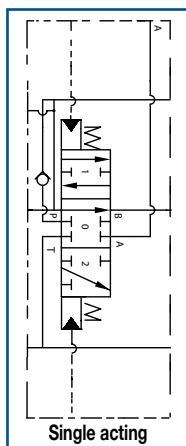
3,5 kg

R elements use the exceeding flow coming from an RFP section. They have to be installed only after one or more P elements.

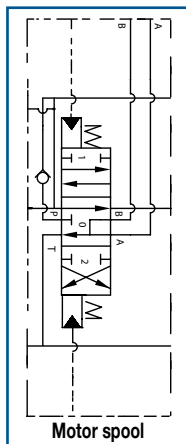
| | |
|----------------|--------|
| BC60R G /HO A/ | 806911 |
| BC60R F /HO A/ | 806914 |



| | |
|----------------|--------|
| BC60R G /HO B/ | 806912 |
| BC60R F /HO B/ | 806915 |



| | |
|----------------|-------------|
| BC60R G /HO D/ | COD. 806913 |
| BC60R F /HO D/ | COD. 806916 |



RECUPERATION ELEMENT ACCEPTING VALVES ON PORTS



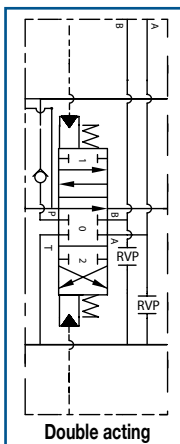
RV HO

4,1 kg

| | |
|-----------------------|--------|
| BC60RV G /HO A RVPAB/ | 806917 |
| BC60RV F /HO A RVPAB/ | 806920 |

| | |
|----------------------|--------|
| BC60RV G /HO A VLAB/ | 806992 |
| BC60RV F /HO A VLAB/ | 806993 |

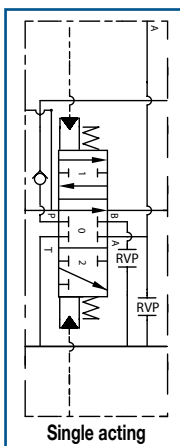
VL valves on ports A and B are type U. Standard setting 140 bar.



| | |
|-----------------------|--------|
| BC60RV G /HO B RVPAB/ | 806918 |
| BC60RV F /HO B RVPAB/ | 806921 |

| | |
|----------------------|--------|
| BC60RV G /HO B VLAB/ | 806994 |
| BC60RV F /HO B VLAB/ | 806995 |

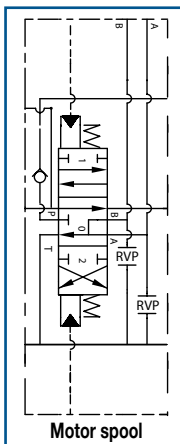
VL valves on ports A and B are type U. Standard setting 140 bar.



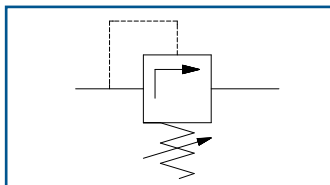
| | |
|-----------------------|--------|
| BC60RV G /HO D RVPAB/ | 806919 |
| BC60RV F /HO D RVPAB/ | 806922 |

| | |
|----------------------|--------|
| BC60RV G /HO D VLAB/ | 806996 |
| BC60RV F /HO D VLAB/ | 806997 |

VL valves on ports A and B are type U. Standard setting 140 bar.

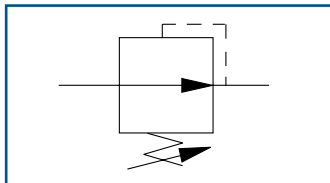


VL INLET RELIEF VALVE Adjustable main relief valve. Allows the external adjustment of the relief valve pressure. The pressure rating is based on a pre-set flow of 8 l/min.



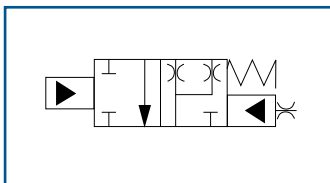
| | |
|------------|--------|
| VLU | 030916 |
| VLK | 030908 |

RP PRESSURE REDUCING VALVE Reduces the auxiliary pressure to 25/30 bar



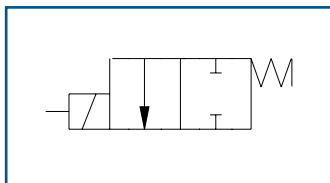
| | |
|-----------|--------|
| RP | 803116 |
|-----------|--------|

TE HE - TE HO COMPENSATOR KIT



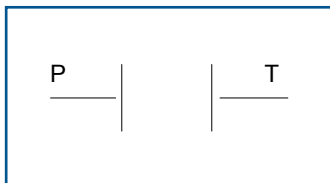
| | |
|--------------------|--------|
| COMPENSATOR | 560944 |
|--------------------|--------|

DV DUMP VALVE prevents the unwanted or accidental use of the directional control valve, connecting the auxiliary pressure to tank.



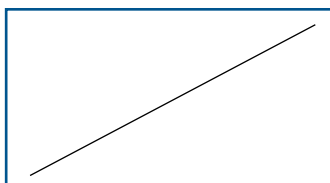
| | |
|--------------|--------|
| DV 12 | 025098 |
| DV 24 | 025094 |

DVP DUMP VALVES PLUG Replaces the dump valve where not required.



| | |
|------------|--------|
| DVP | 015024 |
|------------|--------|

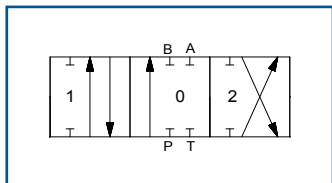
BRACKETS KIT



| | |
|-----------------|--------|
| BRACKETS | 560893 |
|-----------------|--------|

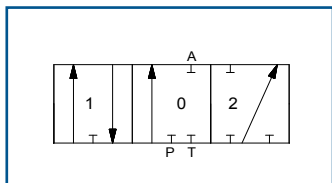


SPOOL A - AL 4-WAY / 3-POSITION SPOOL. Provides control of double-acting cylinders or bi-directional hydraulic motors. In position 0 work ports are blocked. For a good metering, use spool AL when the flow is lower than 30 l/min.



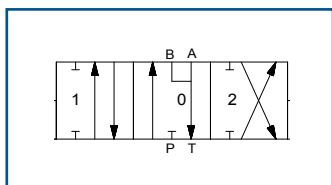
| | |
|-----------------|--------|
| SPOOL A | 201088 |
| SPOOL AL | 201295 |

SPOOL B - BL 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. For a good metering, use spool BL when the flow is lower than 30 l/min.



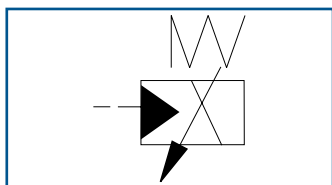
| | |
|-----------------|--------|
| SPOOL B | 201089 |
| SPOOL BL | 201300 |

SPOOL D - DL 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. For a good metering, use spool DL when the flow is lower than 30 l/min.



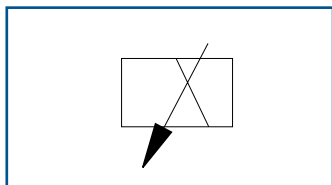
| | |
|-----------------|--------|
| SPOOL D | 201090 |
| SPOOL DL | 201301 |

HE ACTUATOR Complete with spool control and proportional pressure reducing valve.



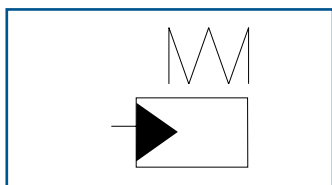
| | |
|--------------|--------|
| HE 12 | 801222 |
| HE 24 | 801223 |

TM PROPORTIONAL VALVE Pressure reducing electric proportional valve.



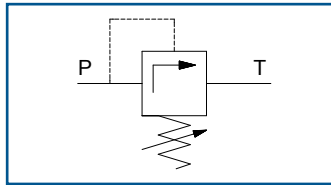
| | |
|--------------|--------|
| TM 12 | 025807 |
| TM 24 | 025808 |

HO ACTUATOR Complete with spool control



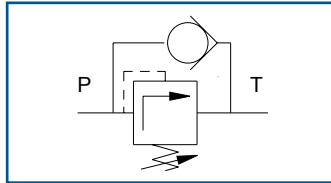
| | |
|-----------|--------|
| HO | 801207 |
|-----------|--------|

VL PORTS RELIEF VALVE Adjustable ports relief valve. Allows the external adjustment of the relief valve pressure. The pressure rating is based on a pre-set flow of 8 l/min.



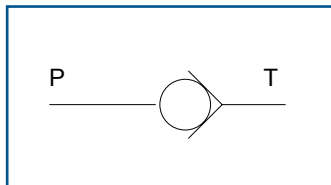
| | |
|-------------|--------|
| VL X | 803060 |
| VL U | 803061 |
| VL K | 803062 |

VLC PORTS ANTISHOCK ANTICAVITATION VALVE Combined ports relief and anticavitation valve. Allows the external adjustment of the relief valve pressure. The pressure rating is based on a pre-set flow of 8 l/min.



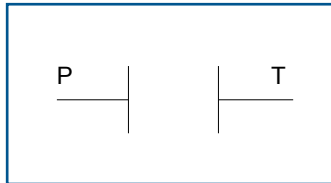
| | |
|--------------|--------|
| VLC X | 803119 |
| VLC U | 803083 |
| VLC K | 803084 |

VC PORTS ANTICAVITATION VALVE



| | |
|-----------|--------|
| VC | 803037 |
|-----------|--------|

RVP RELIEF VALVE PLUG Replaces the relief valve in close center systems where the relief valve is not required.



| | |
|------------|--------|
| RVP | 832010 |
|------------|--------|

PB RELIEF VALVE LOCK KIT Prevents users from altering the factory relief valve setting.



| | |
|-----------|--------|
| PB | 560926 |
|-----------|--------|

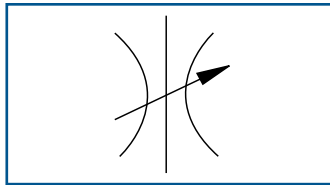
TIE RODS KIT



| | |
|---------------|--------|
| BC60/1 | 560812 |
| BC60/2 | 560813 |
| BC60/3 | 560814 |
| BC60/4 | 560815 |
| BC60/5 | 560816 |

| | |
|----------------|--------|
| BC60/6 | 560817 |
| BC60/7 | 560818 |
| BC60/8 | 560819 |
| BC60/9 | 560820 |
| BC60/10 | 560821 |

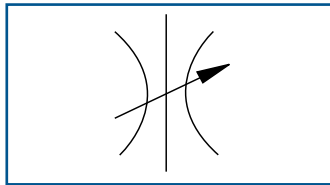
HORIZONTAL FLOW CONTROL KIT



FLOW CONTROL 560475

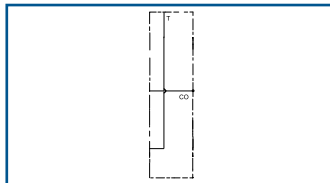


VERTICAL FLOW CONTROL KIT



FLOW CONTROL 560437

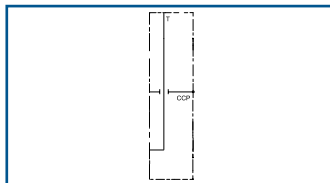
CO CARRY OVER Allows the installation of another valve downstream from the first. To be assembled on T2 port of the valve.



CO G (1/2" BSP) 832004
CO F (7/8"-14 UNF) 832006



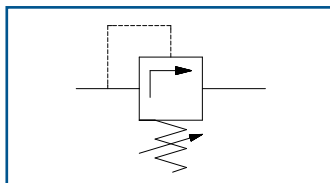
CCP CLOSE CENTER PLUG Turns an open center circuit into a close center one.



CCP G (1/2" CCP BSP) 832007
CCP F (7/8"-14 UNF) 832008

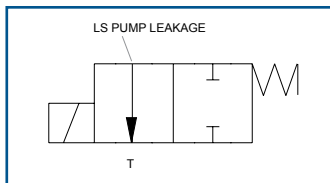


VL OUTLET RELIEF VALVE High pressure adjustable relief valve. Allows the external adjustment of the relief valve pressure from 80 to 230 bar. The pressure rating is based on a pre-set flow of 8 l/min.



VLU 803034

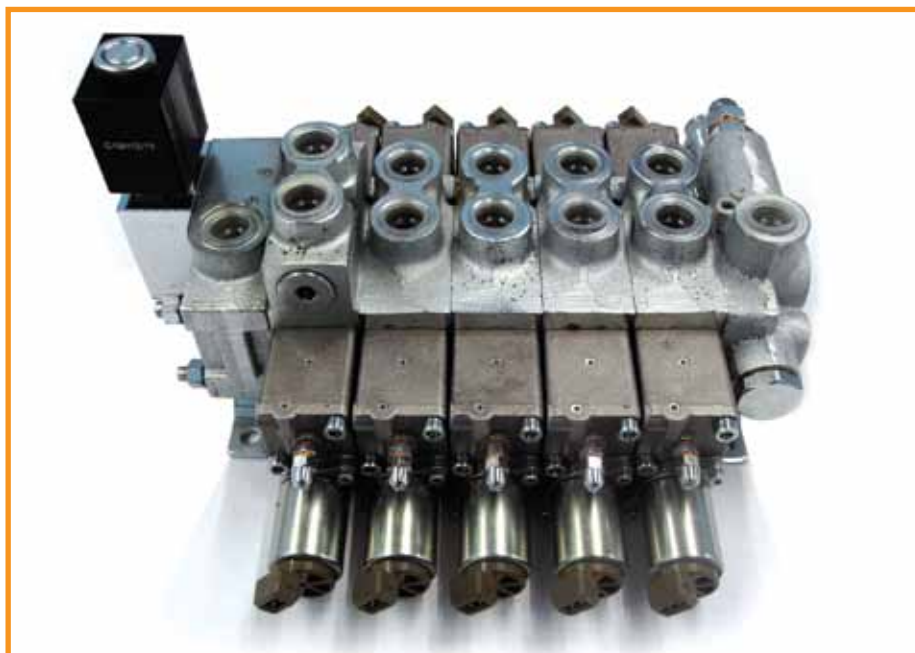
LSK VALVE Allows the utilization of the BC60 valve in systems with variable displacement pumps (LS)



LSK 12 G 030918
LSK 12 F 030920
LSK 24 G 030922
LSK 24 F 030924

| | | |
|---------------------|---|---|
| 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 (lbf) | 1 pound _f (lbf) = 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 (lbf - in.) | 1 pound _f inch (lbf - 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)



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