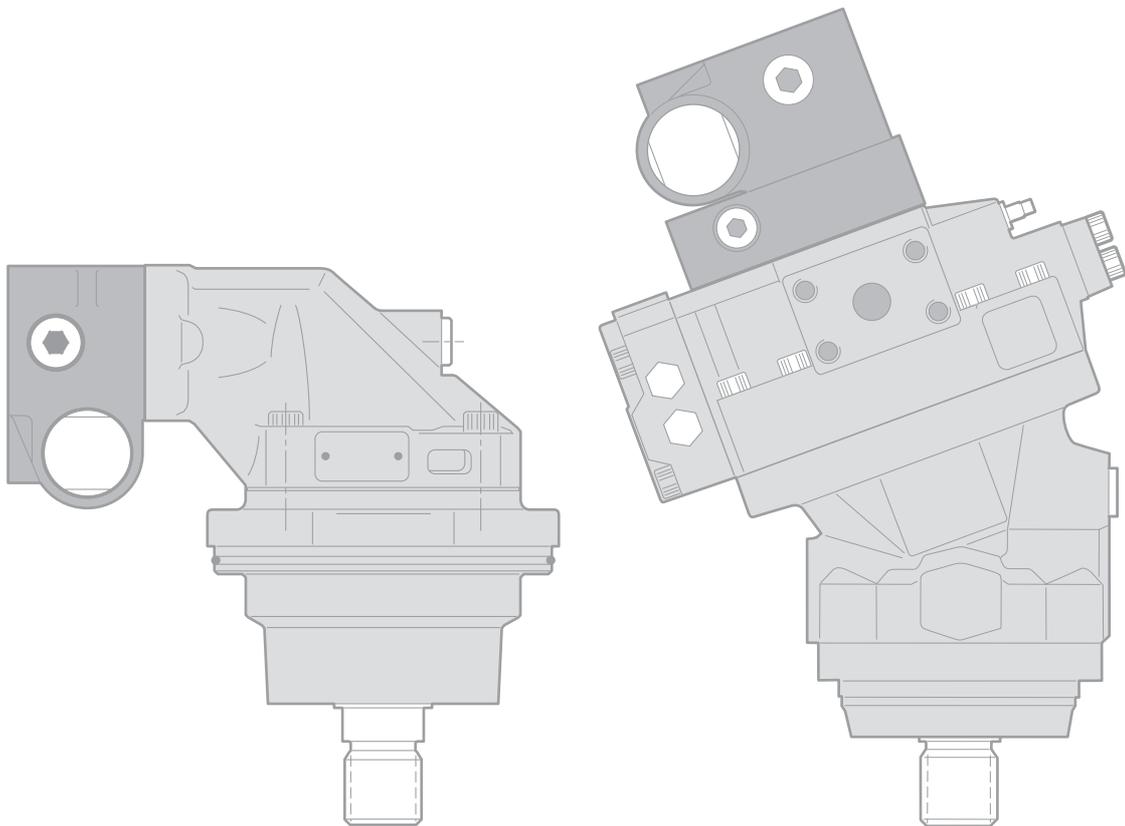




# **Mobile motor/pump accessories**

*Catalogue HY17- 8258/UK  
November 2004*



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 **WARNING**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure, and review the information concerning the product or system in the current product catalogue. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**Offer of Sale**

Please contact your Parker representation for a detailed "Offer of Sale".

**Suction fittings**

To minimize the risk for cavitation when operating the F12 as a pump, we recommend using our suction fittings; all take 2" hoses.

Part no.	SAE size	For	Max speed [rpm] <sup>1)</sup>	L [mm]
379 4070	3/4"	F12-30	2850 <sup>2)</sup>	100
		F12-40	2650 <sup>2)</sup>	
		F12-60	2000 <sup>3)</sup>	
370 4095	1"	F12-80	1500 <sup>3)</sup>	100
370 3916	1 1/4"	F12-110	1100 <sup>3)</sup>	102

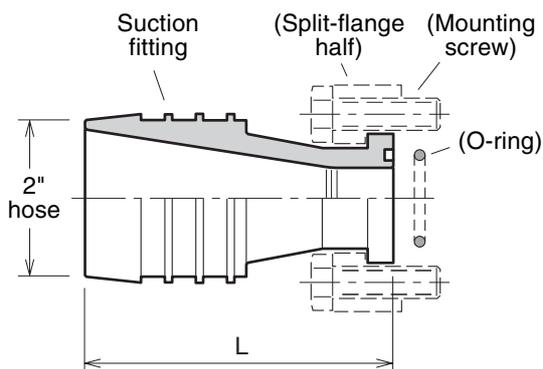
NOTE: 1) Shaft speeds shown are theoretical and may have to be decreased because of long hoses and/or other unfavourable inlet conditions.

2) Selfpriming speed

3) Below selfpriming speed

The suction fittings are designed for use with standard SAE or metric split-flange halves as shown. O-ring and mounting screw sizes are listed below (O-ring material is NBR, nitrile rubber).

SAE size	O-ring dimension	Screw size	
		SAE	Metric
3/4"	30.0x3.53	3/8"-16x1.50	M10x35
1"	32.9x3.53	7/16"-14x1.50	M12x40
1 1/4"	37.7x3.53	1/2"-13x1.75	M14x45



**Suction fitting kits**

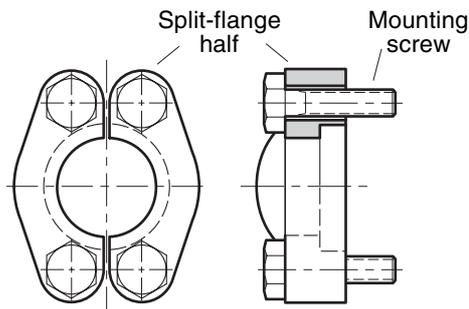
Suction fitting kits are available for the F12 ISO and Cartridge versions. A kit consists of a suction fitting (shown above), two split-flange halves, an O-ring and four mounting screws.

Part no.	SAE size	For	Screw size
379 4421	3/4"	F12-30/-40/-60	M10x35
370 4098	1"	F12-80	M12x40
370 3926	1 1/4"	F12-110	M14x45

**Split-flange kits**

Separate metric split-flange kits, consisting of two split-flange halves and four mounting screws for use on the F12 ISO and cartridge versions, are also available.

Part no.	SAE size	For	Screw size
379 4405	3/4"	F12-30/-40/-60	M10x35
370 4329	1"	F12-80	M12x40
370 4330	1 1/4"	F12-110	M14x45



**Drain fittings**

Please refer to: 'Parker Fluid Connectors Catalog 4300 (EO fittings)'.

**Integrated flushing valve (F12-30, -40, -60, -80)**

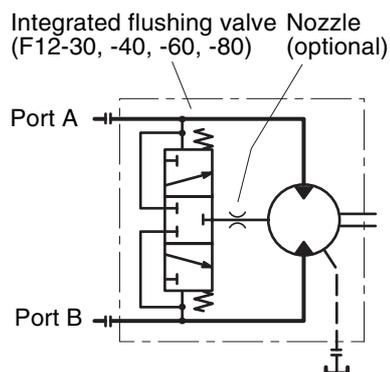
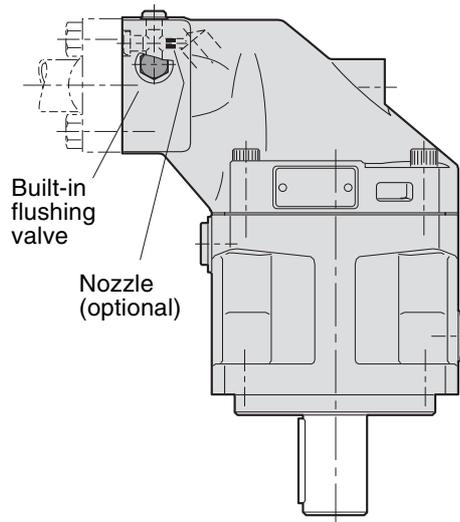
**General information**

The integrated flushing valve supplies the motor with a cooling flow through the case which may be required when operating at high speeds and power levels.

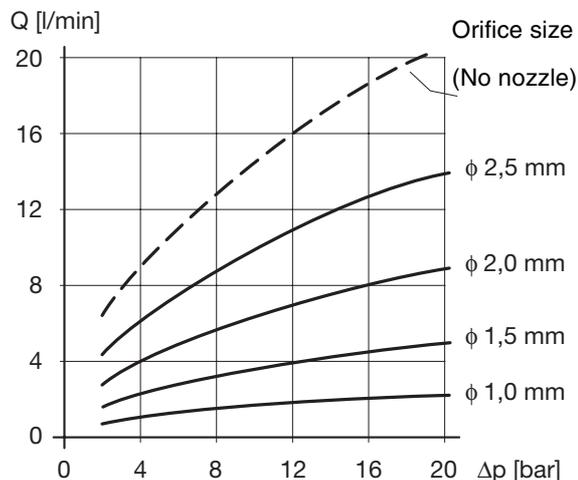
In a closed loop hydrostatic transmission the flushing valve provides that cool fluid from the charge circuit is constantly added to the main circuit.

The flushing valve consists of a 'three-position', three-way spool valve which connects the low pressure side of the main hydraulic circuit with the motor case. The valve opens at a pressure differential between port A and port B of about 14 bar.

In order to limit the flow, a nozzle with a suitable orifice is available from Parker Hannifin (Mobile Controls Div.); refer to the table below right. The diagram to the right shows flow versus differential pressure at selected orifice sizes.



Hydraulic schematic.



Flow versus pressure differential (port A or B to tank).

**Ordering code**

Example: F12 - 80 - MF - IH - K - 000 - **L01** - 0

Standard F12 ordering code  
(for F12-30, -40, -60, -80)

Nozzle designation  
**L01** (refer to the table)

**NOTE:** FV13 flushing valve block for F12-110 shown on next page.

**Restrictor nozzles**

The following table shows currently available nozzles and the corresponding F12 ordering code designation (F12-30/-40/-60: M5x0.8 thread; F12-80: M10x1.0).

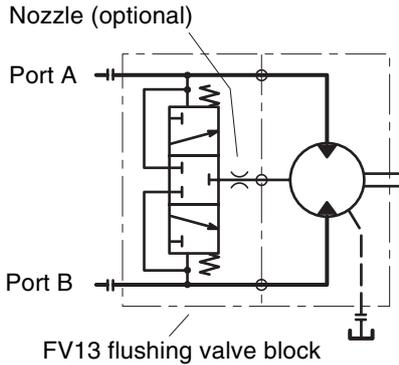
Designation	Orifice size [mm]	Part no. for F12-30/-40/-60	Part no. for F12-80
<b>L01</b> (std.)	1.3	370 4595	379 4413
L02	0.8	370 4590	379 3326
L03	1.0	370 4592	379 4410
L04	1.2	370 4594	379 4412
L05	1.5	370 4597	379 4415
L06	1.7	370 5821	379 4417
L07	2.0	370 5824	379 4420
L08	1.6	370 4597	379 4416
L09	1.4	370 4596	379 4414
L10	2.5	3783025	3783029

**NOTE:** L00 - no nozzle.

**General information (for F12-110)**

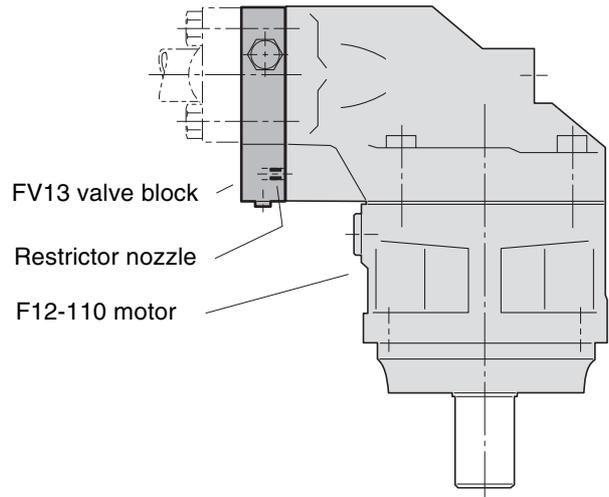
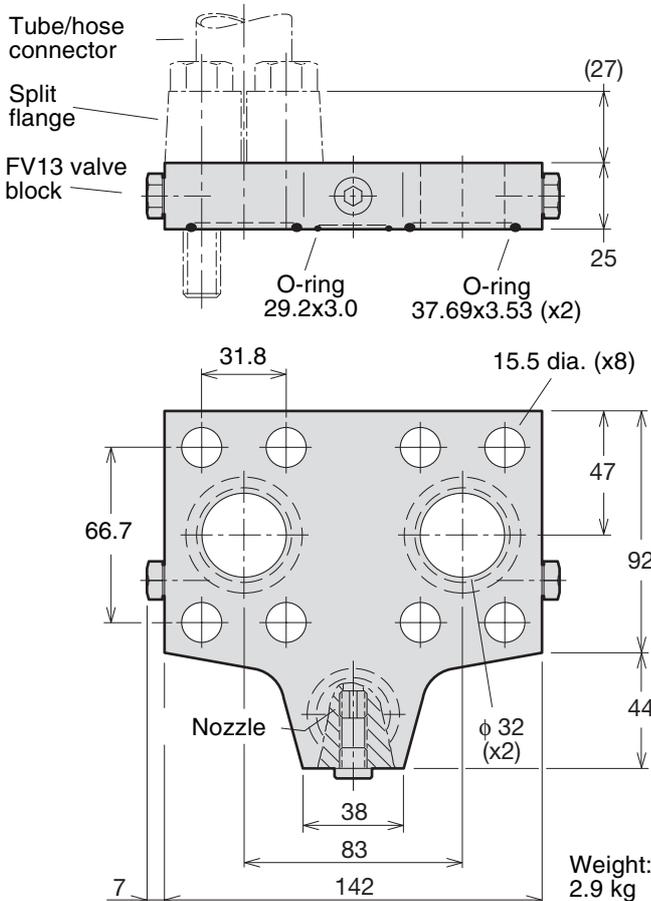
The FV13 for the F12-110 motor has the same function as the integrated flushing valve for the other F12 frame sizes. The valve block mounts between the motor port flange and the split-flange tube/hose connectors utilizing 'long' mounting screws (screw size M14x75 or 1/2"-13 UNC based on split-flange height as shown below).

The FV13 flushing valve kit contains the required O-rings (shown below) but no screws, split-flanges or tube/hose connectors.



Hydraulic schematic.

**FV13 installation**



**FV13 ordering code**

Example: **FV 1 3 - H - A - L01**

Valve function **FV** Flushing valve  
 Version **1** Factory assigned  
 Size (SAE 6000 psi) **3** 1 1/4" (for F12-110)  
 Nozzle **L01** (table below)  
 Techn. status **A** Factory assigned  
 Seals **H** Nitrile rubber

**FV13 restrictor nozzles**

When required, a nozzle is utilized to restrict the flow through the F12-110 motor case. The nozzle installs in the drilled and tapped (M10x1.0) drain line located in the valve block as shown to the left. The diagram on page 1 shows flushing flow versus differential pressure for selected orifice sizes.

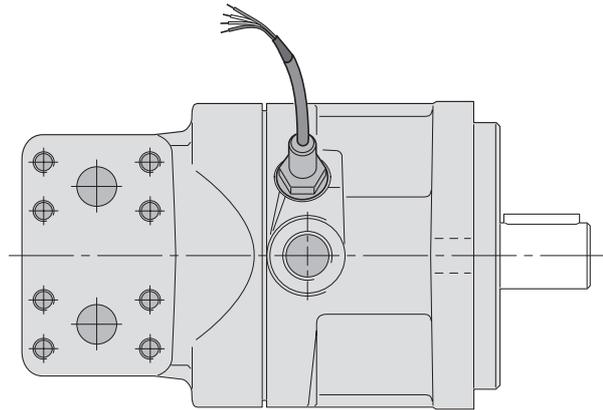
The following table lists currently available nozzles and the corresponding FV13 ordering code designation.

Designation	Orifice size [mm]	Part number
<b>L01</b> (std.)	1.3	379 4413
L02	0.8	379 3326
L03	1.0	379 4410
L04	1.2	379 4412
L05	1.5	379 4415
L06	1.7	379 4417
L07	2.0	379 4420
L08	1.6	379 4416
L09	1.4	379 4414

NOTE: L00 - no nozzle

**General information**

- A speed sensor kit is available for series F11-14 and F11-19, for series F12 and the I and S versions of series V12 and V14.
- The sensor consists of a ferrostat differential (Hall-effect) speed sensor and a seal nut. The sensor installs in a threaded hole in the F12 or V12 bearing housing, and in the F11 barrel housing.
- The speed sensor is directed towards the teeth of the F12 ring gear or, on the V12/V14, towards depressions in the shaft head, on F11 towards the piston.
- The sensor output is a square wave signal within a frequency range of 5 Hz to 20 kHz.
- The sensor withstands high as well as low temperatures and is highly moisture protected (IP68).



*Speed sensor (installed on an F12-60).*

Frame size	No. of pulses/rev	Min rpm
F11-14, -19 (I and S)	5	~60
F12 (all sizes)	35	~9
V12/V14 (I and S)	36	~8

*Pulses per shaft rev and min rpm.*

**Technical data**

Power supply	12-32 VDC (protected against false polarity)
Current consumption	Max 20 mA (without load)
Signal output	Square wave voltage (short circuit proof ; protected against false polarity)
Frequency	Min 5 Hz max 20 kHz
Insulation	Housing and electronics galvanically separated
Operating temperature	-40 to +125 °C [-40 to +255 °F]
Sensor head pressure	Max 25 bar [360 psi]
Protection class	IP68 (DIN 40050)
Weight (incl. cable)	0.15 kg [0.33 lb]
Sensing distance	0.2 to 2.5 mm; 1.0 recom. [0.01 to 0.10 in; 0.04 recom.]
Transistor	NPN

**Cable**

Material	Teflon insulation
Length	5 m [16.4 ft]
No. of wires	3 (plus screen; white wire)
Wire area	4 x 0.24 mm <sup>2</sup> [AWG 24]
Screen	Stranded metal net (insulated from housing)

**NOTE:** Screen must be connected to 0 V (zero volt) power supply. The additional, brown wire is not used, it is cut off and sealed

Bending radius Min 60 mm [2.5 in]

**Connection**

Sensor wires are susceptible to radiated noise. Therefore, the following should be noted:

- Uninterrupted screened 3 wire cable must be used and the screen only connected to the appropriate instrument screen input terminal or 0V. Connections to power earth are not advisable.
- The sensor wires must be installed as far away as possible from electrical machines and must not run in parallel with power cables in the vicinity.

The maximum cable length that can be utilized is dependent on sensor voltage, how the cable is installed, and cable capacitance and inductance.

It is, however, always advantageous to keep the distance as short as possible.

The sensor cable supplied can be lengthened via a terminal box located in an IP20 protected connection area (per DIN 40050).

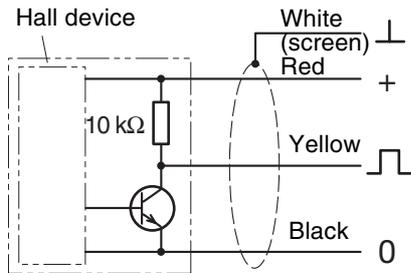
Contact Parker Hannifin, Mobile Controls Division for recommendations.

**Installation**

**Installation information**

As the sensor has a built-in differential Hall-effect device, the sensor housing must be aligned according to the drawing below. If it is not, the sensor may not function properly and noise immunity decreases.

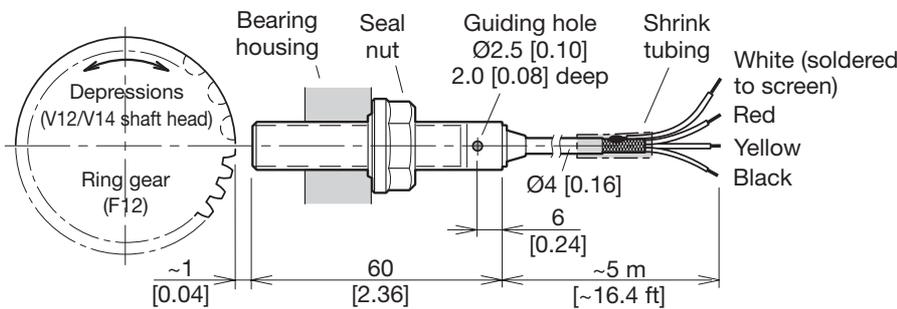
The sensor is non-sensitive to oil and the stain-less steel housing stands arduous environment conditions.



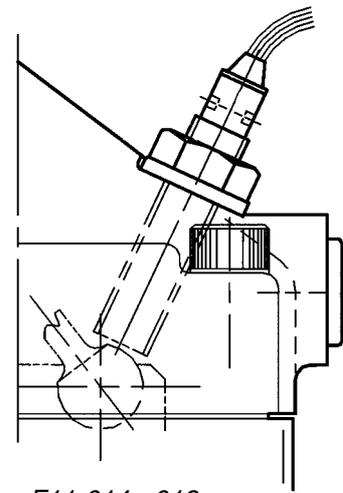
Speed sensor schematic.

**Installation procedure**

- Install the sensor in the threaded hole (M12x1) of the **F12/V12/V14** bearing housing; turn the sensor until its head just touches the ring gear teeth (F12) or the shaft head (V12/V14); refer to the installation drawing below.
- On **F11** the **pistons positions must be known** before mounting the sensor. Install the sensor in the threaded hole (M12\*1) of the F11 barrel housing; turn the sensor until its head just touches the piston.
- When mounting the sensor in the threaded hole be sure that you also rotate the cable so the cable not get twisted.
- Back off the sensor one turn (counter clockw.).
- If required, back it off further until the sensor guiding hole centerline is parallel to the F12/V12/V14 shaft centerline (either as shown or 180° opposite).
- Tighten the seal nut; max 12 Nm (100 lb in). Be sure that the position of the guiding hole centerline still is correct.
- Connect the electrical wires as shown in the schematic. Please note the instructions on page 1 regarding screening.
- Brown cable shall not be used.



Speed sensor installation, F11, V12, V14.



F11-014, -019.

**Ordering information**

- F11 - 014 - H B - C V - K - 000 - 000 - **S**
- F12 - 080 - M F - I H - K - 000 - L01 - **S**
- V12 - 080 - M S - S H - S - 000 - D - **S** - ...
- V14 - 110 - I H D - E P H 3 N - N 000 - **S** - ...
- S** - Speed sensor
- P** - Prepared for speed sensor

- Separate speed sensor:  
 Order kit P/N 379 9424 (sensor and seal nut).

**NOTE:** - The speed sensor is not installed in the motor during transportation.

**General information**

In an open circuit, hydraulic propulsion system, there is a risk of cavitation when the vehicle is going downhill or is being braked. Cavitation occurs when the speed of the motor corresponds to a higher flow than what is available. This condition may lead to a complete loss of the hydraulic braking torque and also to motor deterioration.

When installed correctly, the BT brake valve prevents cavitation by throttling the return line from the motor as soon as the differential pressure between the inlet and return lines decreases to a specific value.

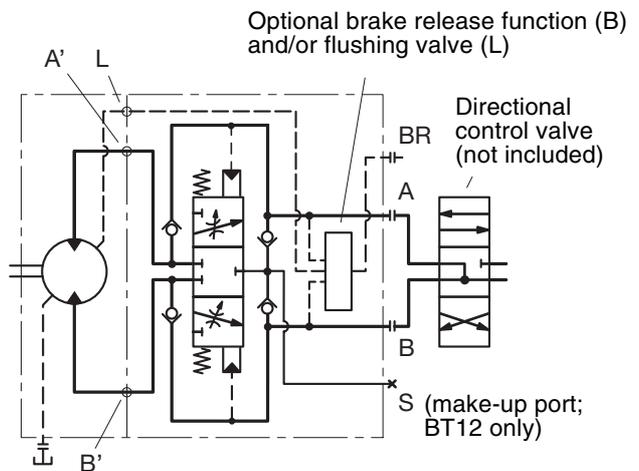
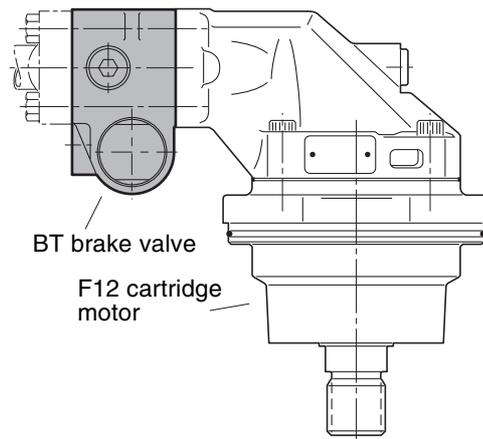
The BT brake valve consists mainly of a spool valve. The position of the spool is determined by the differential pressure. When the differential pressure decreases and approaches 35 bar (500 psi), the spool begins to close the port connected to the return line. It leads to pressure build-up on the return side of the motor, which gives a braking torque.

The BT brake valve makes sure the speed of the motor is in balance with the supplied flow. The special check valve arrangement on the pump side of the brake valve gives extra protection against cavitation. If the supply pressure drops below the return line pressure, fluid is fed directly back to the motor inlet.

The BT brake valve is very compact and installs between the F12 or T12 port flange and the main line split-flanges.

**NOTE:** - Before designing a system with a BT brake valve, Product Support (Pumps & Motors) should be contacted.

- When utilizing the flushing valve (L) and/or the brake release function (B), make sure the F12 is ordered with the third drain connection. On the T12, the third drain line plug must be removed before installing the BT valve.



Hydraulic schematic (F12 motor with BT brake valve).

**IMPORTANT**

When ordering, a filled-in 'BT brake valve specification form' (MI 119) must be attached.

**Ordering code**

Example:

Valve function **BT** Brake valve (for track drives)

Version **2** Issued by Parker Hydraulics

Main ports (SAE 6000 psi) **1** 3/4" (for F12-30/-40/-60, T12-60)  
**2** 1" (for F12-80, T12-80, V12-110)

Spool configuration **11** Standard

Valve damping, etc. **14** Standard

**BT 2 1 - 11 14 - L B V5 - A N**

Seals

**N** Nitrile

**V** FPM (optional)

Spring cover location

**A** At port A (as shown on page 3)

**B** At port B

Optional functions

**L** Flushing valve

**B** Brake release function

**V5** Check valve (5 bar spring)

**Brake valve**

The diagrams to the right show the pressure drop, motor to return line (refer to the schematic on page 1) when the brake valve spool is completely open.

To keep the brake valve completely open, the pressure differential between ports A and B must be at least 35 bar (500 psi).

If this differential tends to decrease, i.e. when the vehicle is going downhill or whenever the driver decides to decrease the speed, the valve closes sufficiently to maintain the speed or slow down the vehicle, and the  $\Delta p$  will be higher than shown in the diagrams.

**Cold-start function**

It is well known that, due to high viscosity when operating in the low temperature range, the response time of the brake valve of e.g. the left hand motor in a propel drive can be different from that of the brake valve of the right hand motor.

This means that one of the brake valves opens before the other which, in turn, means that the machine doesn't start to move in a straight forward direction.

To correct this situation, the BT valve is supplied with a cold start function which makes the brake valves open simultaneously when starting; the machine will then go straight forward independent of oil viscosity.

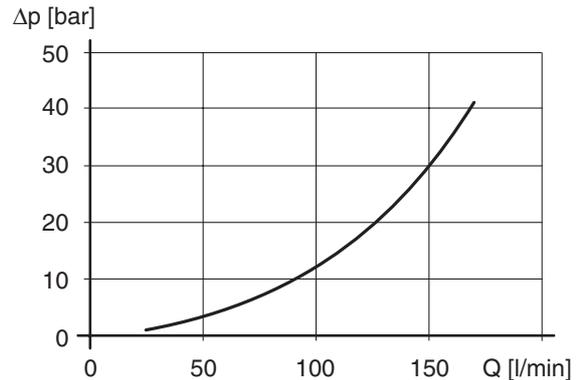
**Check valves**

The check valve characteristics for series BT are shown in the diagram below right.

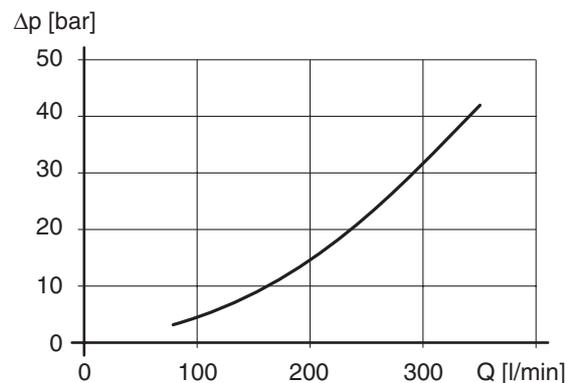
**Brake release function**

The BT brake valve can be ordered with a brake release function. If, for example, an F12 motor with BT valve is installed on a planetary gearbox, the BR port is connected to the brake release port. When the motor is started, the BR port is pressurized and the gearbox disc brake is automatically released.

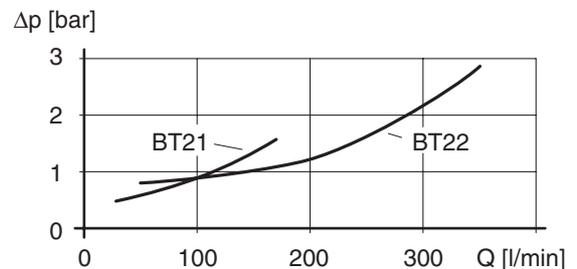
The bottom right diagram illustrates the BT brake release characteristic (port BR pressure vs.  $\Delta p$  between the main ports) at 10 bar (150 psi) return line pressure.



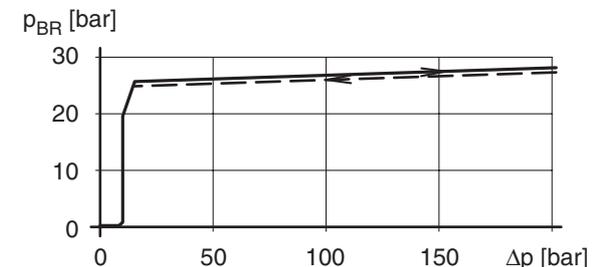
BT21 brake valve characteristic (A' to A; B' to B).



BT22 brake valve characteristic (A' to A; B' to B).



BT check valve characteristic (A to A'; B to B').



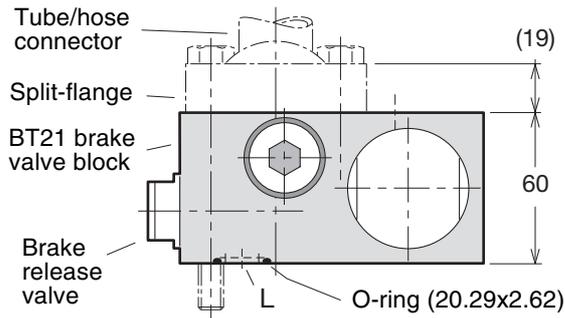
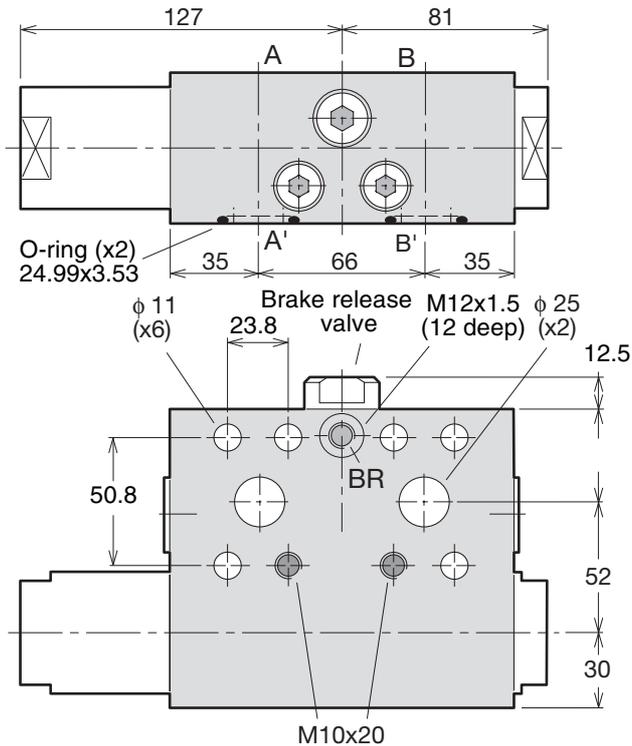
BT brake release valve characteristic.

**IMPORTANT**

The vehicle must be provided with a mechanical braking system which is independent of the **open loop type** hydrostatic transmission.

(continued on page 10)

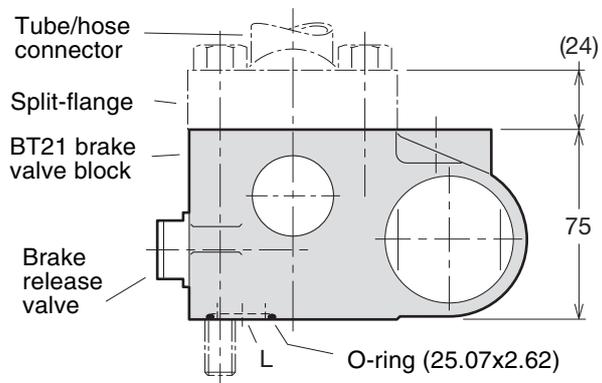
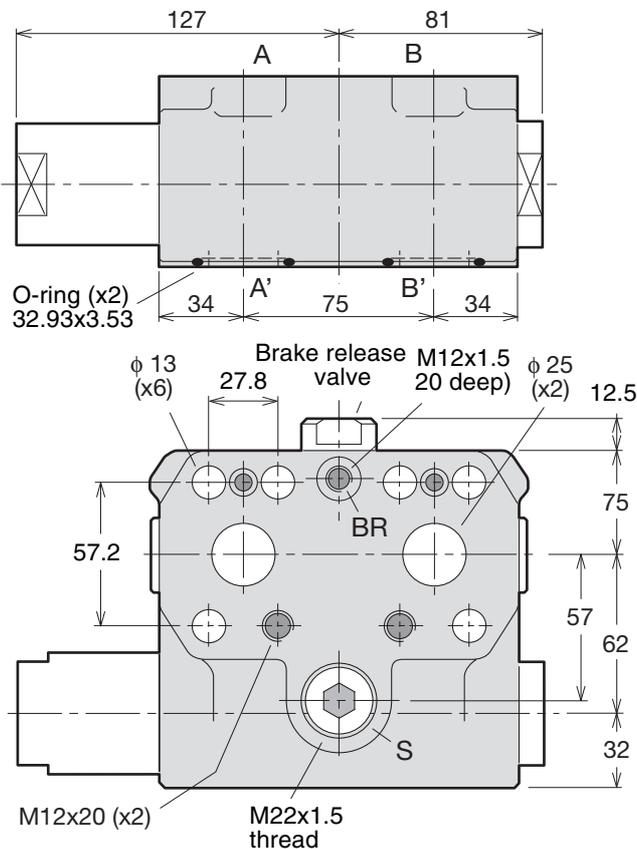
**BT21 installation**



**Installation information**

- 1) The BT21 brake valve block flange mounts between the motor main port flange and the split-flange tube/hose connections utilizing six M10x100 and two M10x40 screws (with 19 mm split-flanges as shown).  
 O-rings are provided (but no screws, split-flanges or tube/hose connectors).  
 When utilized, make sure port **L** connects with the corresponding port on the motor.
- 2) When factory mounted, the BT21 brake valve block is attached to the motor with two M10x75 screws.

**BT22 installation**

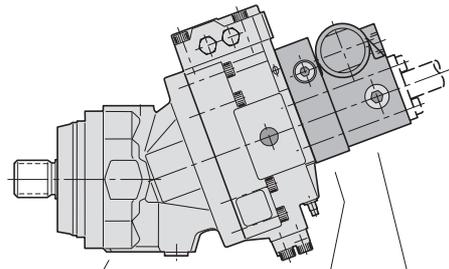


**Installation information**

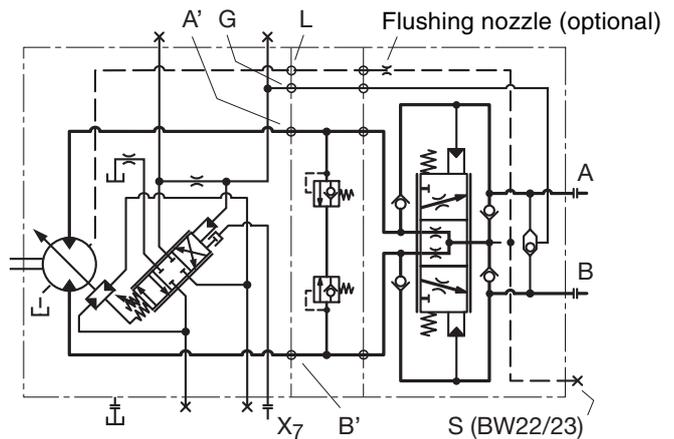
- 1) The BT22 brake valve block flange mounts between the motor main port flange and the split-flange tube/hose connections utilizing six M12x120 and two M12x40 screws (with 24 mm split-flanges as shown).  
 O-rings are provided (but no screws, split-flanges or tube/hose connectors).  
 When utilized, make sure port **L** connects with the corresponding port on the motor end cap.
- 2) When factory mounted, the BT22 brake valve block is attached to the motor with two M12x90 screws.

**General information**

- The BW2/SX2 brake/relief valve consists of two separate valve blocks, one containing the brake valve and the other pressure relief valves.
- The BW2 valve provides smooth braking on all V12 wheel driven vehicles and reduces the risk of motor cavitation when braking or coasting. Cavitation occurs when the speed of the motor corresponds to a higher flow than available. This, in turn, may lead to complete loss of hydraulic braking torque and motor deterioration.
- The BW2 also contains a brake defeat function, consisting of a shuttle valve. This function prevents the V12 motor from increasing its displacement when the vehicle is going downhill. Without this function, too hard braking and engine over-speed could be experienced.
- The brake valve spool is controlled by the differential pressure (supply pressure less return pressure). When the differential pressure drops below 35 bar the valve spool begins to close. This leads to pressure build-up on the return side of the motor, which in turn produces a braking torque.
- The BW2 brake valve makes sure the speed of the motor is in balance with the supplied flow. The valve characteristic and the residual area ensures smooth braking of the vehicle.



V12 motor (AC, AE or AH control) SX2 relief valve block BW2 brake valve block



(continued on page 12) Hydraulic schematic (V12 with AH control).

**BW2/SX2 ordering code**

Example:

**BW 2 1 - 15 15 - G L V5 - A N / SX 2 1 - 350/350 - G L - N**

Valve function **BW** Brake valve (for wheel drives)

Version **2** Issued by VOAC

Main ports (SAE 6000 psi)  
**1** 3/4" (for V12-60 and -80)  
**2** 1" (for V12-110)  
**3** 1" (for V12-160)

Spool configuration **15** Standard

Valve damping **15** Standard

Optional functions  
**G** Brake defeat valve  
**L** Flushing valve (and two digits for orifice size)  
**V5** Check valve (5 bar spring)

Spring cover location  
**A** At port A (as shown on pages 3 and 4)  
**B** At port B

Seals  
**N** Nitrile  
**V** FPM (optional)

Seals  
**N** Nitrile  
**V** Viton (optional)

Ports  
**G** Brake defeat  
**L** Flushing (optional)

Pressure settings (A/B ports) [bar]  
**280, 300, 350, 380, 400 or 420**

Main ports (SAE 6000 psi)  
**1** 3/4" (V12-60/-80)  
**2** 1" (V12-110)  
**3** 1 1/4" (V12-160)

Version  
**2** Issued by Mobile Controls Div.

Valve function  
**SX** Relief valve

**NOTE:**

- The V12 motor must be ordered with a special end cap designated **TX** (e. g. V12-110-**TX**-IH-C- ... -AH).
- Each valve block has its own name plate with the corresponding ordering code.

(continued on page 12)

(Continued from page 11)

Additional protection against cavitation can be obtained by pressurizing port S on the BW2 valve block (refer to the schematic on page 1).

The pressure reliefs in the SX2 valve block protect the V12 motor against pressure peaks and provides sufficient braking torque to stop the vehicle in a steep downhill, should the need arise.

**NOTE:** Before designing a system with the BW2/SX2 brake/relief valve, Parker Hydraulics (Mobile Controls Div.) should be consulted.

**BW 2 characteristics**

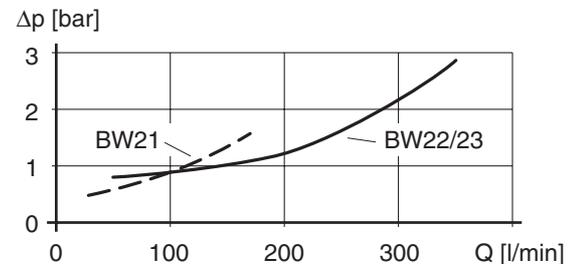
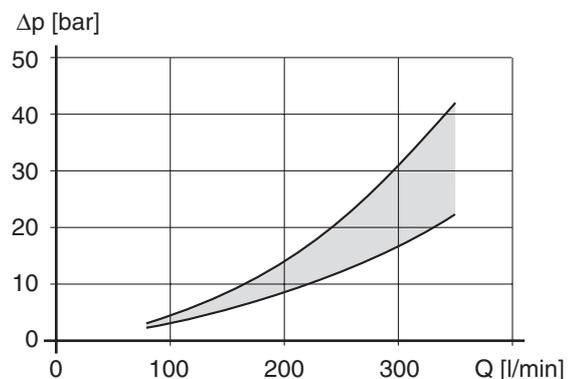
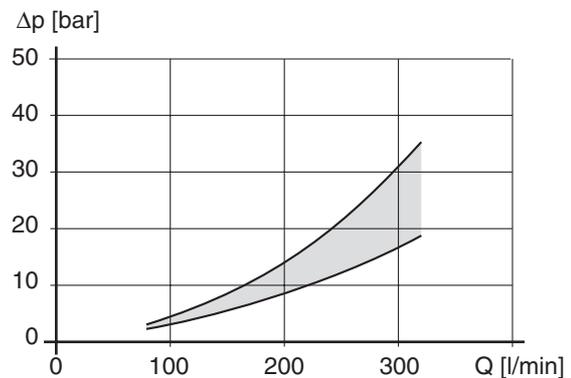
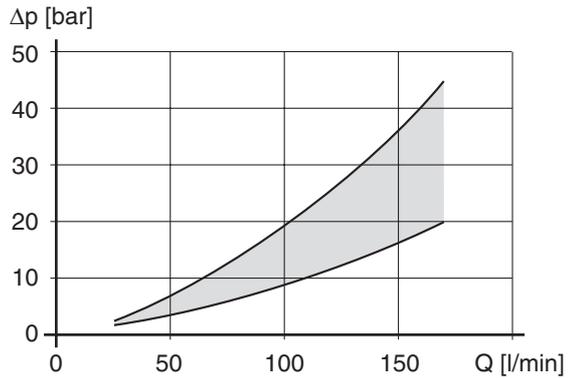
The upper three diagrams to the right show the pressure drop, motor to return line (refer to the schematic on page 1), for the BW2 frame sizes when the brake valve is completely open.

To keep the brake valve completely open, the pressure differential between ports A and B must be at least 35 bar (500 psi).

If this differential tends to decrease, i.e. when the vehicle is going downhill or when the driver decides to decrease the speed, the valve closes sufficiently to maintain or slow down the speed, and the  $\Delta p$  will be higher than what is shown in the diagrams.

To give the vehicle the desired braking performance, Parker Hydraulics (Mobile Controls Div.) will assist in optimizing the brake valve characteristic (within the shaded areas shown) as well as giving the valve a suitable response time for a forceful but smooth vehicle braking.

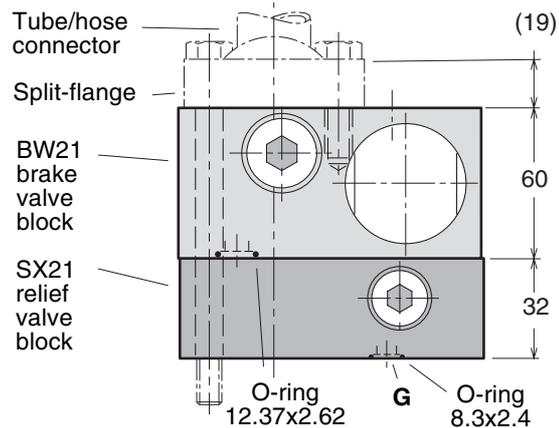
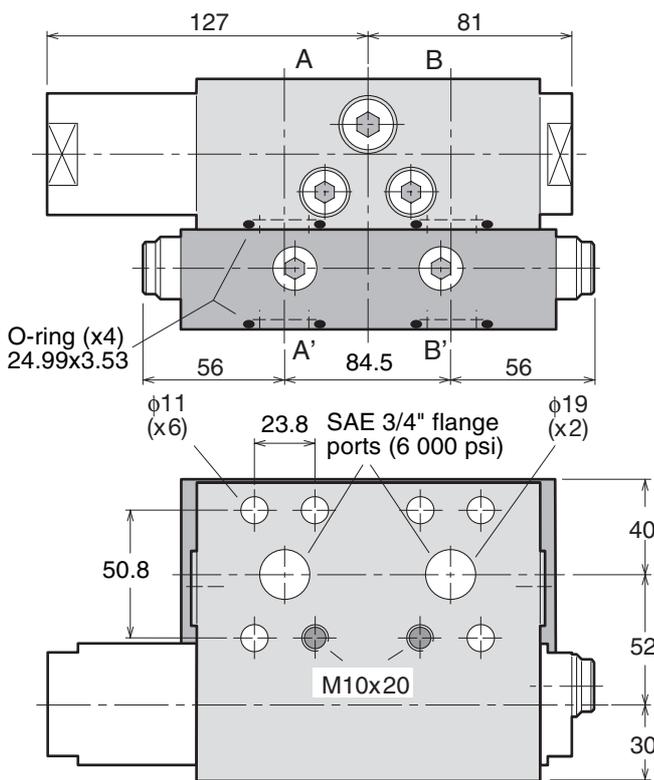
The check valve characteristics of the BW2 are shown in the bottom diagram.



**IMPORTANT**  
 The vehicle must be provided with a mechanical braking system which is independent of the **open loop type** hydrostatic transmission.

**BW21/SX21 installation**

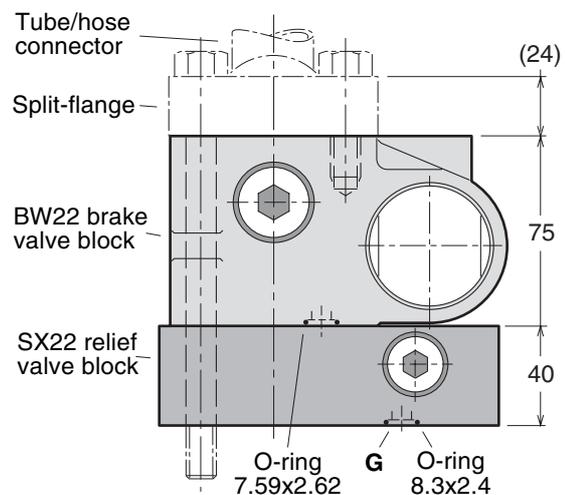
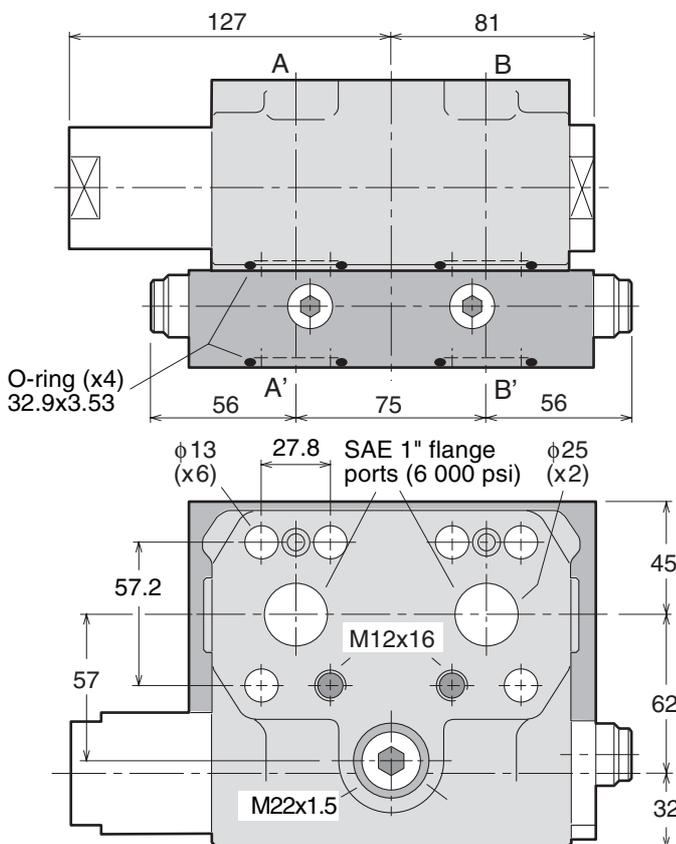
**Mobile motor/pump accessories**



**Installation information**

- 1) The BW21/SX21 brake/relief valve blocks sandwich mount between the split-flange tube/hose connections and the V12-060/-080 motor utilizing six M10x140 and two M10x40 screws (with 19 mm split-flanges). O-rings are provided (but no screws, split-flanges or tube/hose connectors). Make sure port G connects with the corresponding port on the motor end cap.
- 2) When factory mounted, the BW21/SX21 brake/relief valve blocks are attached to the V12-060/-080 motor with two M10x110 screws.

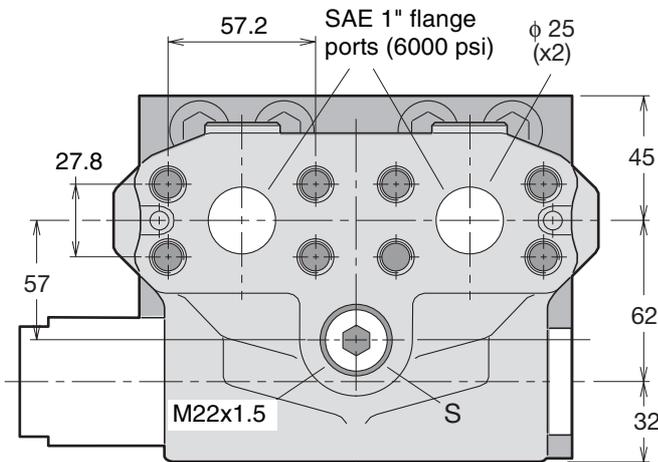
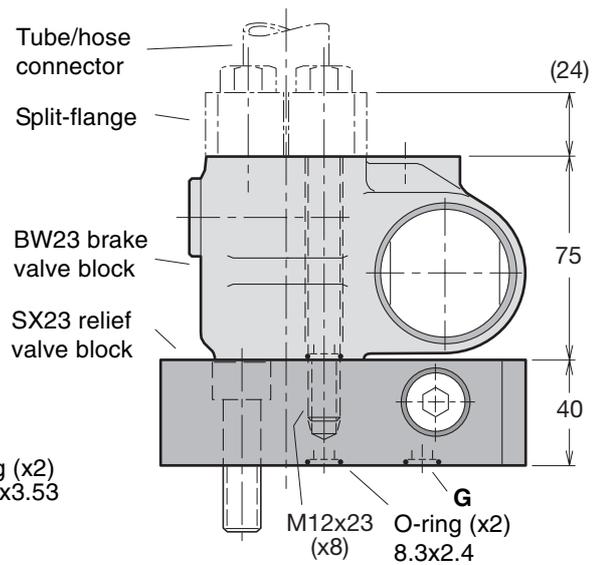
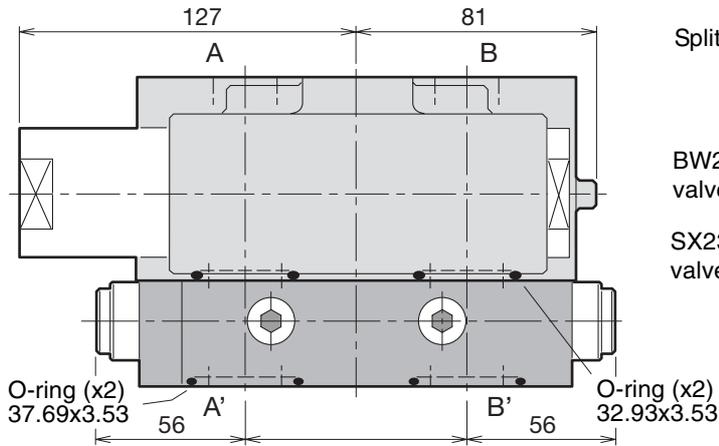
**BW22/SX22 installation**



**Installation information**

- 1) The BW22/SX22 brake/relief valve blocks sandwich mount between the split-flange tube/hose connections and the V12-110 motor utilizing six M12x160 and two M12x40 screws (with 24 mm split-flanges). O-rings are provided (but no screws, split-flanges or tube/hose connectors). Make sure port G connects with the corresponding port on the motor end cap.
- 2) When factory mounted, the BW22/SX22 brake/relief valve blocks are attached to the V12-110 motor with two M12x130 screws.

(Continued on page 14)



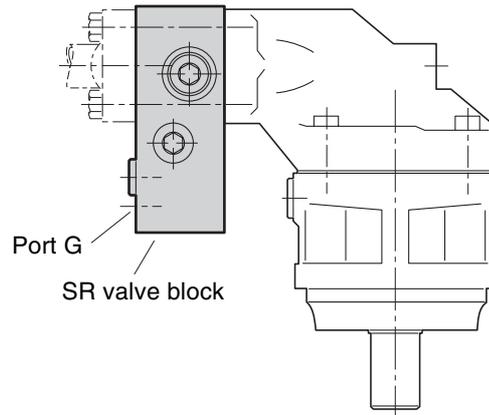
### Installation information

- 1) Install the relief valve block on the V12-160 motor; M14x50 mounting screws and O-rings are included. Make sure port G connects with the corresponding port on the motor end cap.
- 2) The brake valve block sandwich mounts between the split-flange tube/hose connections and the relief valve block utilizing eight M12x120 screws (with 24 mm split-flanges).  
 O-rings are provided (but no screws, split-flanges or tube/hose connectors).
- 3) When factory mounted on the V12-160 motor, the BW23 brake valve block is attached to the SX23 relief valve block with two M12x90 screws.

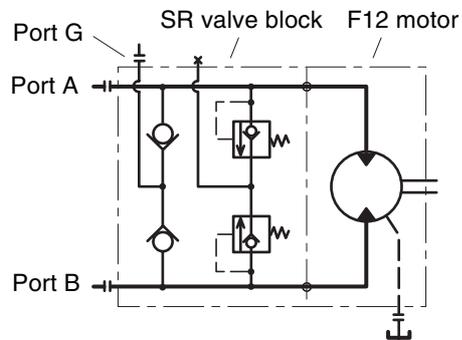
**General information**

- The SR pressure relief/make-up valve block for series F12 and V12 motors is designed to protect the motor and the main hydraulic lines from short duration pressure spikes. The valve block also provides an excellent make-up function.
- The valve block installes directly on the motor port flange, and is available in three sizes:
  - a) 3/4" for F12-30/-40/-60, T12-60 and V12-60/-80
  - b) 1" for F12-80, T12-80 and V12-110
  - c) 1 1/4" for F12-110 and V12-160.
- The SR valve block consists of a housing containing two high pressure relief cartridges and two separate check valves for make-up. Cartridges are available in non-adjustable pressure settings between 280 and 420 bar (4000 and 6000 psi respectively).
- A make-up port (G) is also provided. In certain operating conditions, the motor (when operating as a pump) may cavitate because of insufficient inlet pressure. To prevent this, the G port should be pressurized. Contact Parker Hannifin (Mobile Controls Division) for further information.
- The pressure drop through the main ports (A-A' or B-B') is low. As an example, the pressure drop on size 1 (3/4") is 0.45 bar (6.5 psi) at 175 l/min, and on size 2 (1") 0.7 bar (10 psi) at 250 l/min.

**NOTE:** The valve block includes main port O-rings (facing the motor) but no mounting screws.



SR valve block location.



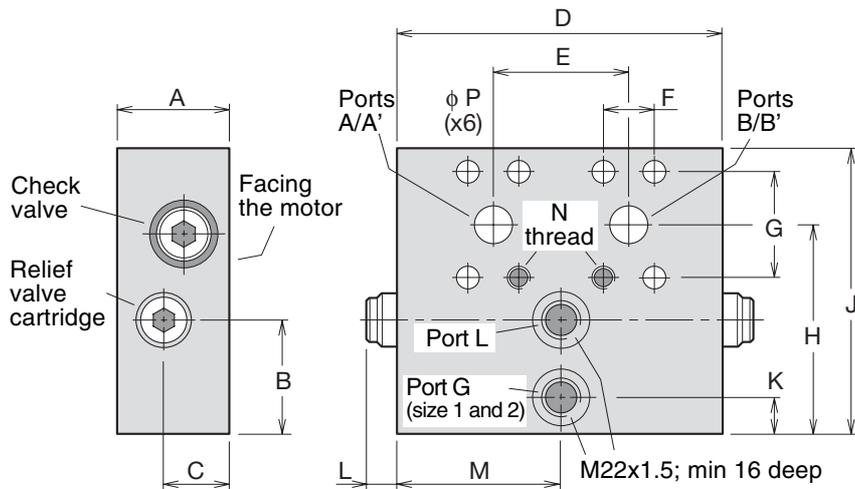
SR valve block schematic.

**Ordering code**

Example: **SR 1 2 - 350/350 - 00 - H F - A**

<p>Valve function <b>SR</b> Pressure relief/ make-up valve block</p> <p>Version <b>1</b> Factory assigned</p> <p>Port size (SAE 6000 psi) <b>1</b> 3/4" (F12-30, -40, -60, and V12-60, -80) <b>2</b> 1" (F12-80 and V12-110) <b>3</b> 1 1/4" (F12-110, V12-160)</p> <p>Pressure setting (A/B ports) [bar] <b>280, 300, 330, 350, 380, 400 or 420</b> (<sup>3</sup>4000, 4350, 4800, 5000, 5800 or 6100 psi)</p>	<p><b>350/350</b></p> <p><b>00</b></p> <p><b>H</b></p> <p><b>F</b></p> <p><b>A</b></p>	<p>Techn. status <b>A</b> Factory assigned</p> <p>Threads (port G) <b>F</b> Metric</p> <p>Seals <b>H</b> Nitrile rubber</p> <p>Serial number <b>00</b> Factory assigned</p>
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(continued on page 16)



Dim. [mm]	Size 1 (3/4")	Size 2 (1")	Size 3 (1 1/4")
A	55	57	57
B	55	55	25
C	32	32	26
D	157	160	160
E	66	75	83
F	23.8	27.8	31.8
G	50.8	57.15	66.7
H	103	109	88
J	140	150	135
K	18	18	-
L	16	16	16
M	78.5	80	-
N	M10 x18	M12 x20	M14 x23
P	11	13	15.5

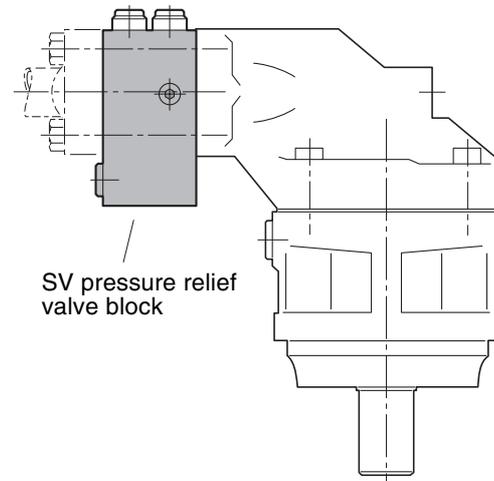
Weight [kg]	Size 1 (3/4")	Size 2 (1")	Size 3 (1 1/4")
	7.4	9.1	8.5

## SV pressure relief valve

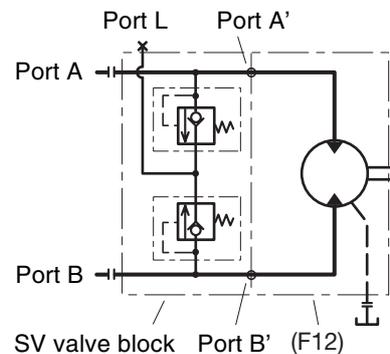
### General information

- The SV pressure relief valve block for series F12 and V12 motors is designed to protect the motor and adjacent hydraulic components from short duration pressure peaks.
- It installes directly on the motor port flange and is available in three sizes:
  - '1': 3/4" for F12-30/-40/-60, T12-60 and V12-60/-80
  - '2': 1" for F12-80, T12-80 and V12-110
  - '3': 1 1/4" for F12-110 and V12-160
- The valve block consists of a housing containing two high pressure relief cartridges with anti-cavitation function. Cartridges are available in non-adjustable pressure settings between 280 and 420 bar.
- A make-up/drain port, L, is also provided. In certain operating conditions the motor may cavitate because of in-sufficient inlet pressure. To prevent this, the L port can be pressurized. When there is a risk of overheating, the L port can also be utilized to take out part of the flow for cooling. Contact Parker Hannifin (Mobile Controls Division) for further information.
- The pressure drop through the main ports (A-A' or B-B') is low. As an example, the pressure drop on size 1 (3/4") is 0.45 bar (6,5 psi) at 175 l/min (45 gpm), and on size 2 (1") 0.7 bar (10 psi) at 250 l/min (65 gpm).

- NOTE:**
- The valve block includes main port O-rings (facing the motor) but no mounting screws.
  - The valve blocks can be used on all versions of series F12 as well as V12 and T12 motors.



SV valve block installed on an F12 motor.



Hydraulic schematic.

**Ordering code**

Example: **SV 1 2 - 350/350 - 00 - H F - A**

Valve function — **SV** Pressure relief valve

Version — **1** Factory assigned

Port size (SAE 6000 psi) — **1** 3/4" (F12-30/-40/-60, T12-60, V12-60/-80)  
**2** 1" (F12-80, T12-80, V12-110)  
**3** 1 1/4" (F12-110, V12-160)

Pressure setting (A/B ports) [bar] — **280, 300, 330, 350, 380, 400 or 420**  
(<sup>3</sup>4 000, 4 350, 4 800, 5 000, 5 800 or 6 100 psi)

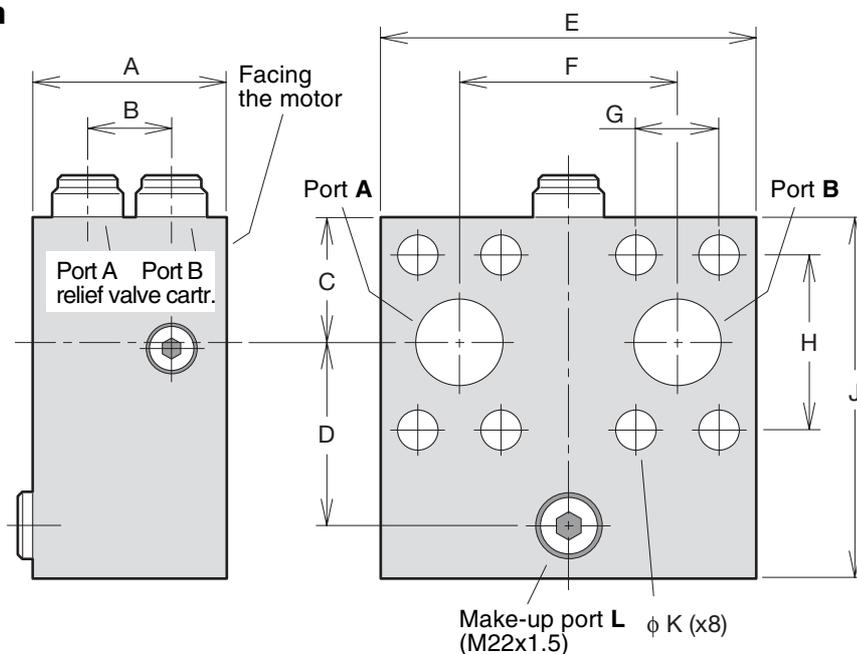
Techn. status — **A** Factory assigned

Threads (port L) — **F** Metric

Seals — **H** Nitrile rubber

Serial number — **00** Factory assigned

**Installation**



Dim. [mm]	SV11	SV12	SV13
A	71	73	73
B	31	31	31
C	36	41	47
D	47	51	68
E	130	127	142
F	66	75	83
G	23.8	27.8	31.8
H	50.8	57.2	66.7
J	99	109	135
K	11	13	15.5
Weight [kg]	4.2	5.0	6.7

The SP, super shockless, pressure relief/make-up valve block for series F12 motors is designed mainly for protection of the swing function of an excavator. It features a very 'soft' relief characteristic with very little overshoot and an excellent make-up function.

The pressure/time diagram to the right is a recording of an actual start-brake sequence of an excavator swing function. In the left part ('Start'), port A is pressurized and the swing is accelerating; the pump pressure is limited by the relief valve setting.

In the right part ('Brake'), port B is pressurized (as determined by the relief valve setting), and the swing movement stops.

The valve block installes directly on the motor port flange, and is available in three sizes:

SP11 3/4" for F12-30/-40/-60

SP12 1" for F12-80

SP13 1 1/4" for F12-110

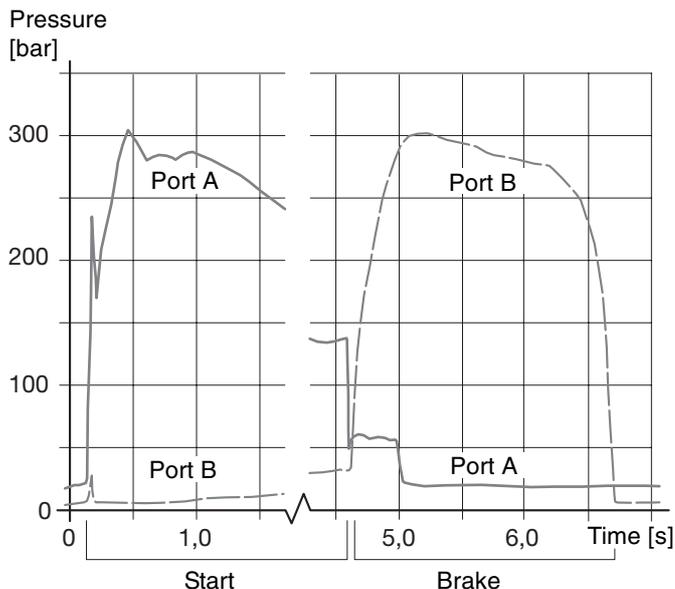
The SP valve consists of a valve block containing two high pressure relief cartridges and two separate check valves for make-up; refer to the split view below.

Cartridges are available in five non-adjustable pressure settings between 190 and 315 bar.

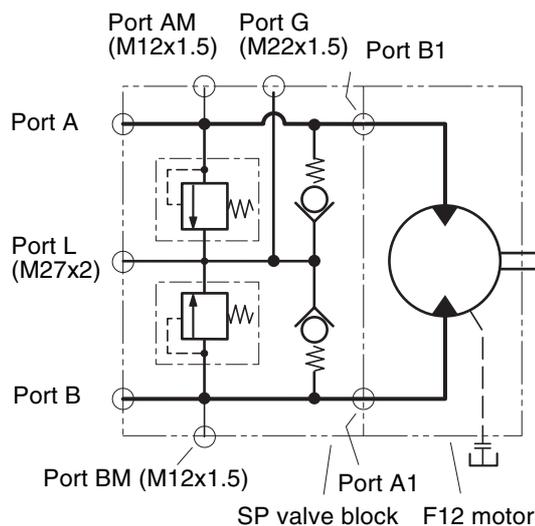
A make-up port (G) is also provided. In certain operating conditions, the motor (when operating as a pump) may cavitate because of insufficient inlet pressure. To prevent this, the G port should be pressurized.

Contact Parker Hannifin, Mobile Controls Division for further information.

**NOTE:** The valve block includes main port O-rings (facing the motor) but no mounting screws.



Pressure/time diagram (example).



SP/F12 schematic.

**Ordering code**

Example: **SP12 - 250/250 - 00 - H F - A**

Version

1 Factory assigned

Port size (SAE 6000 psi)

1 3/4" (F12-30, -40, -60)

2 1" (F12-80)

3 1 1/4" (F12-110)

Pressure setting

(A and B ports) [bar]

190, 220, 250, 285 or 315

Serial number

00 Factory assigned

Seals

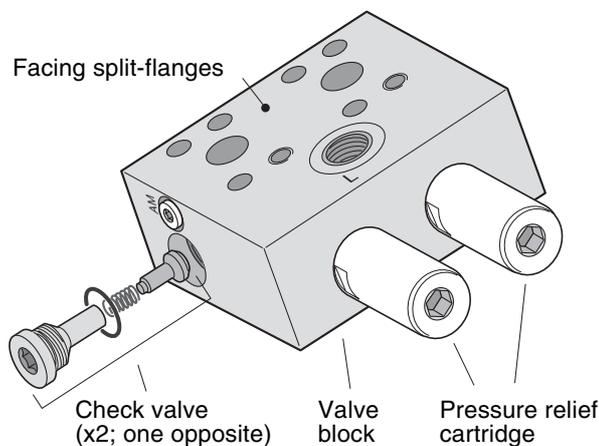
H Nitrile rubber

Threads (port G)

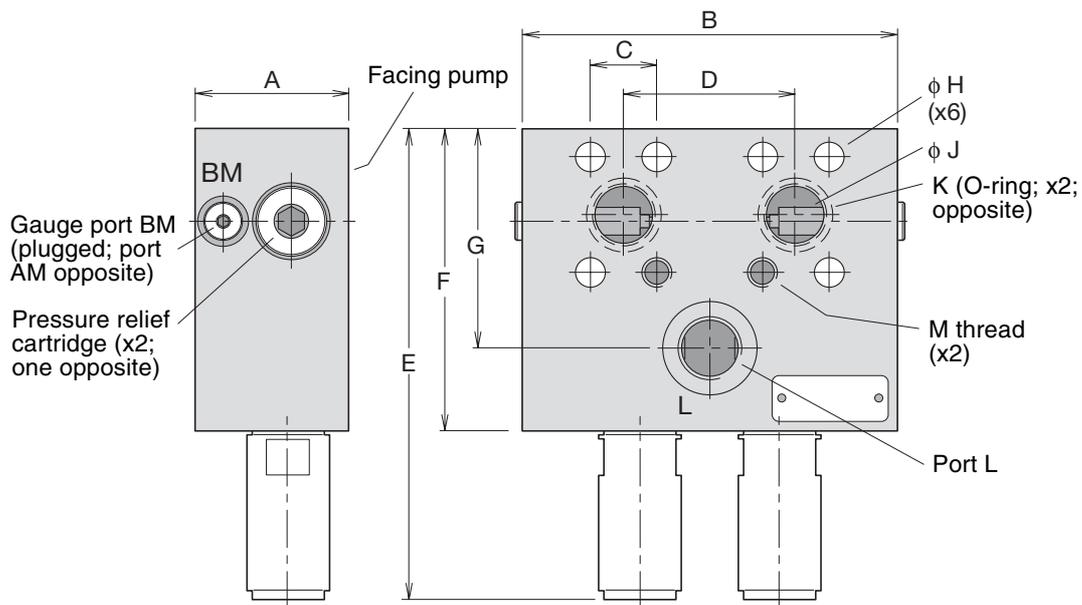
F Metric

Techn. status

A Factory assigned



SP valve components.



**Installation dimensions** (refer to the illustration)

Valve type	For F12-60	For F12-80	For F12-110
A	63	66	70
B	156	160	160
C	23.8	27.8	31.8
D	66	75	83
E	207	207	225
F	133	133	151
G	97	97	115
H	11	13	15
J	3/4"	12	1 1/4"
K	24.99x3.53 0686 371 810*	32.93x3.53 0663 918 801*	37.69x3.53 0663 919 101*
M	M10 (20 deep)	M12 (20 deep)	M14 (26 deep)

\* Spare part number

**Valve assembly part numbers**

For pump type	Pressure setting [bar] at 20 l/min <sup>1)</sup>				
	190	220	250	285	315
F12-60	376 6320	376 4631	376 3674		
	376 7157		376 3675		
F12-80	376 7161	376 6924	376 3677		
	376 7158		376 3678		
F12-110	376 7162	376 7163	376 3679		
	376 7159		376 7164		

1) Setting within ±10 bar

**Pressure relief cartridges**

Cartridge type	Pressure setting [bar] at 20 l/min <sup>1)</sup>				
	190	220	250	285	315
Spare part number	376 4610	376 4632	376 3825		
	376 7156		376 3824		

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