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HYDRAULICS INC

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**100% GENUINE
MADE IN SWEDEN**



**2025
DISTRIBUTOR
OF THE YEAR**



**SERIES F1
HYDRAULIC PUMP
& MOTOR**
Fixed Displacement



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INVENTORY STATUS

[CHECK PRICING](#)

Unit Availability	
Parts Availability	
Ability to Solve Problems	

FEATURES

- 45° bent-axis angle
- Optimal inlet port geometry in the end cap
- Single housing design
- Spherical pistons - high speeds
- Laminated piston rings - low leakage
- Positive synchronisation with timing gear
- Installation above the reservoir level possible
- Tolerates low temperatures and high temperature shocks
- Shaft end and mounting flange meet the ISO standard for all sizes

F1 Pump SAE

- Laminated piston rings - low leakage
- Positive synchronisation with timing gear
- Operating pressure up to 350 bar
- Installation above the reservoir level possible
- Tolerates low temperatures and high temperature shocks
- Shaft end and mounting flange meet the standard SAE-B
- 4 sizes -25 / -41 / -51 / -61 cm³/rev

F1 Motor ISO

- Laminated piston rings - low leakage
- Positive synchronisation with timing gear
- Operating pressure up to 250 bar
- Tolerates low temperatures and high temperature shocks
- Shaft end and mounting flange meet the ISO standard for all sizes
- Tolerates high acceleration

F1 Pump ISO

- High selfpriming speeds
- Operating pressures up to 400 bar
- High overall efficiency
- Low noise level
- Small installation dimensions
- Low weight

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SPECIFICATIONS

F1 ISO

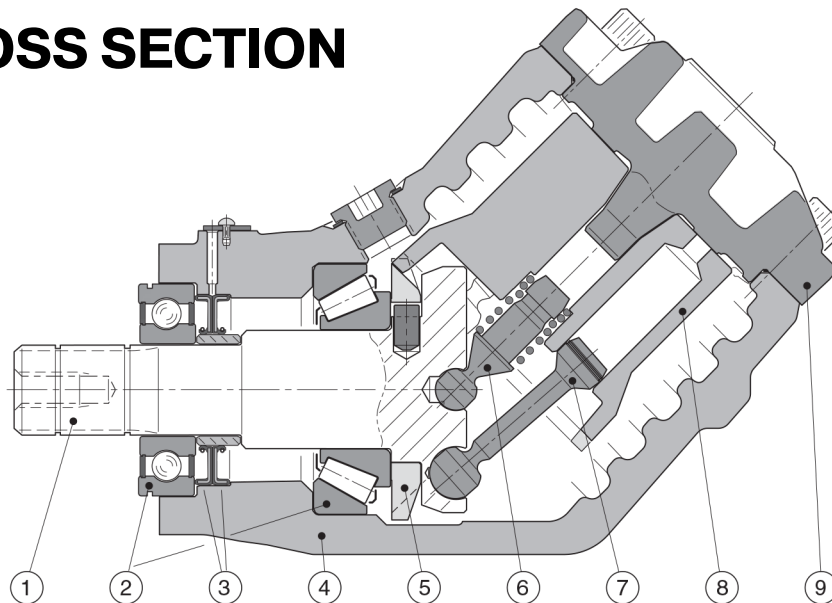
¹ Theoretical values.

² Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm²/s (cSt).

³ Max 6 seconds in any one minute.

Frame size F1-	25	41	51	61	81	101
Displacement [cm ³ /rev]	25.6	40.9	51.1	59.5	81.6	102.9
Max flow ¹⁾ [l/min]	78	104	125	143	180	216
Max operating pressure [bar]	400	400	400	400	400	400
Mass moment of inertia J [kgm ²]	0.00274	0.00266	0.00261	0.00257	0.00532	0.00524
Shaft speed [rpm]						
- short circuited pump (low press.)	3100	2700	2700	2700	2300	2300
- max selfpriming speed ²⁾	3050	2550	2450	2400	2200	2100
Torque ¹⁾ [Nm]	163	260	324	378	518	653
Max Input power ³⁾ [kW]	45	61	73	83	105	126
Weight [kg]	8.5	8.5	8.5	8.5	12.3	12.1

PUMP CROSS SECTION



1. Input shaft

2. Bearings

3. Shaft seals

4. Housing

5. Timing gear

6. Barrel support

7. Piston with piston ring

8. Cylinder barrel

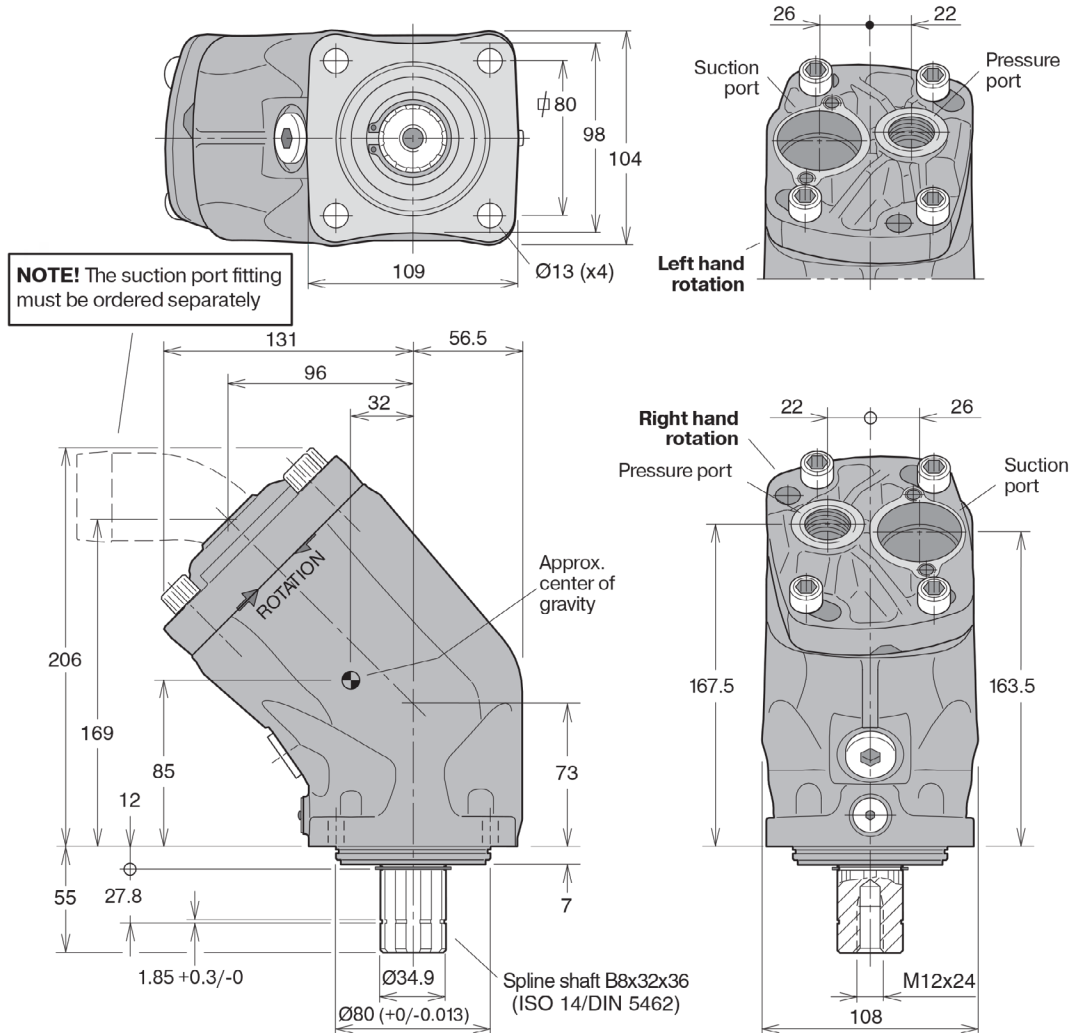
9. End cap

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F1-25, -41, -51 and -61 ISO



Ordering code

Example:

F1 frame size

25, 41, 51, 61, 81 or 101

Shaft rotation

R Right hand

L Left hand

F1-81-R

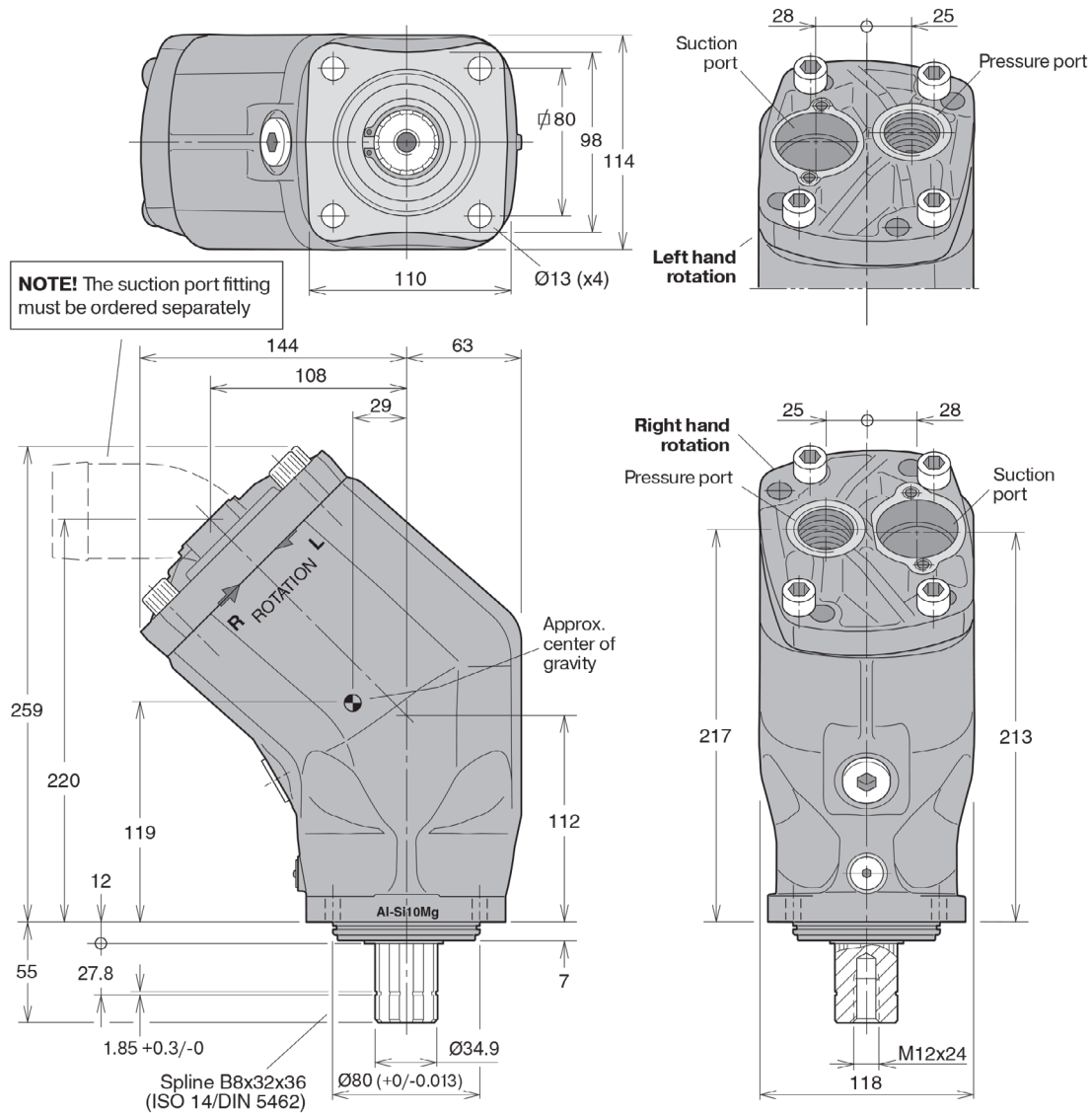
Standard versions

Designation	Ordering no.
F1-25-R	378 1024
F1-25-L	378 1025
F1-41-R	378 1040
F1-41-L	378 1041
F1-51-R	378 1050
F1-51-L	378 1051
F1-61-R	378 1060
F1-61-L	378 1061

NOTE: The pump **does not** include a suction fitting; it must be ordered separately.

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F1-81 and -101 ISO



Port size

F1 frame size	Pressure port ¹⁾
-25	3/4"
-41	3/4"
-51	3/4"
-61	3/4"
-81	1"
-101	1"

¹⁾ BSP thread (fitting not included)

Standard versions

Designation	Ordering no.
F1-81-R	378 1080
F1-81-L	378 1081
F1-101-R	378 1100
F1-101-L	378 1101

NOTE: The pump **does not** include a suction fitting; it must be ordered separately.

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F1-12 ISO with BSP port treads

Specifications

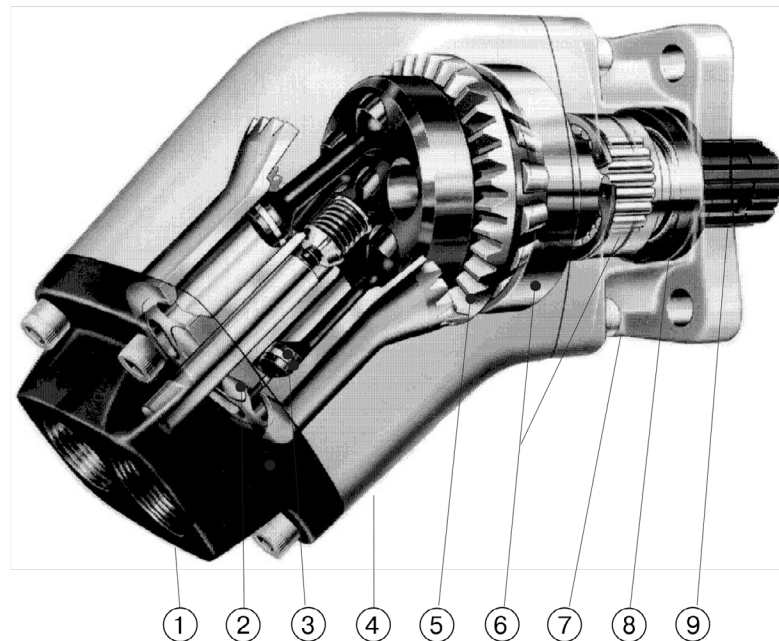
Frame size F1-	12
Displacement [cm ³ /rev]	12
Max flow ¹⁾ [l/min]	28
Max operating pressure [bar]	350
Shaft speed [rpm]	
- short circuited pump (low press.)	3100
- max selfpriming speed	2300
Torque ¹⁾ [Nm]	67
Max input power [kW]	16
Weight [kg]	6.7

¹⁾ Theoretical values

NOTE:

For noise level information, contact Parker Hannifin

Pump cross section



1 End cap

2 Cylinder barrel

3 Piston with piston ring

4 Barrel housing

5 Timing gear

6 Roller bearings

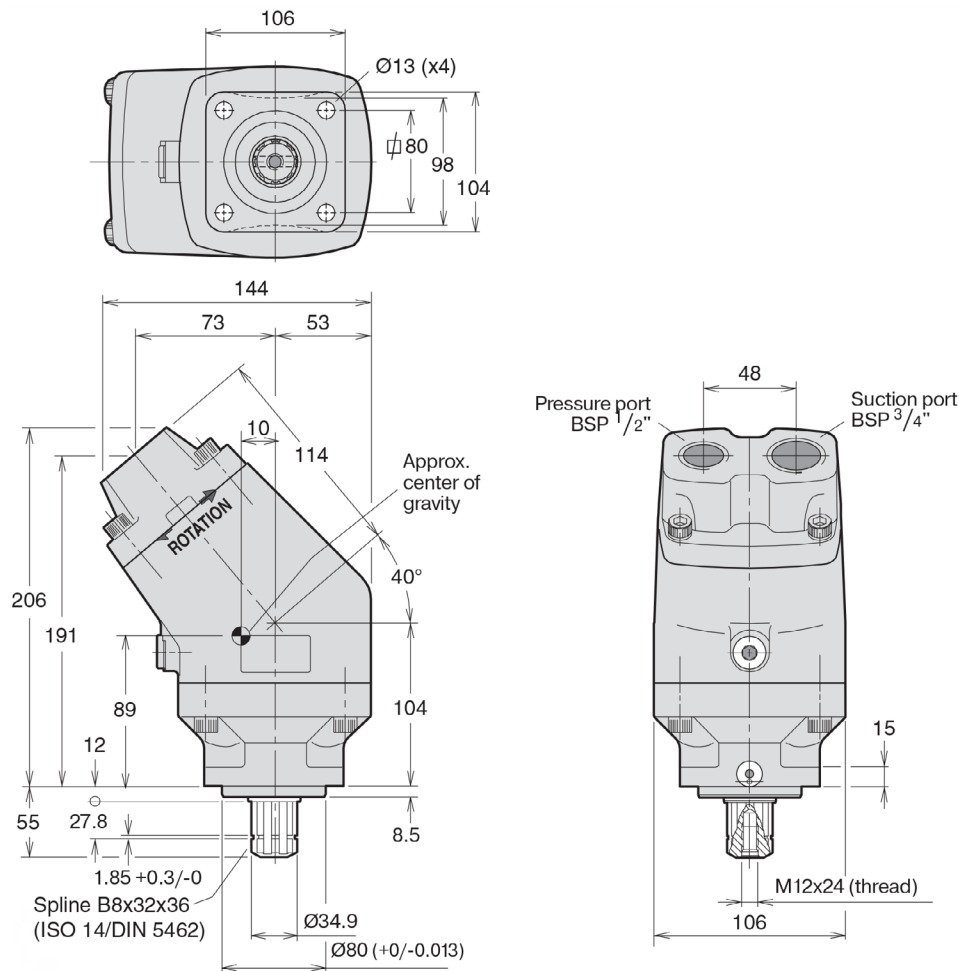
7 Bearing housing with flange

8 Shaft seals

9 Input shaft

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F1-12 with BSP port treads



Ordering code

Example:

F1 - 12 - R

F1 frame size **12**

Shaft rotation
R Right hand
L Left hand

Standard versions

Designation	Ordering no.
F1-12-R	378 2212
F1-12-L	378 2211

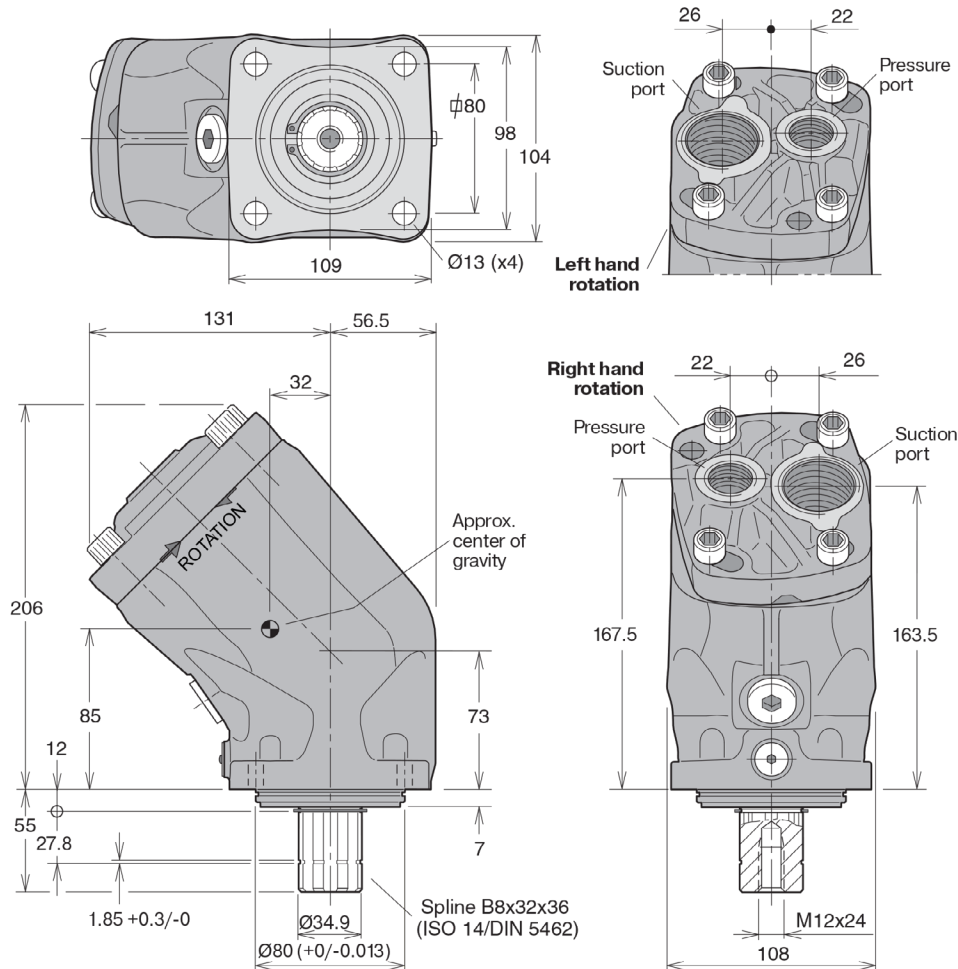
NOTE: The pump **does not** include a suction fitting; it must be ordered separately.

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F1-25, -41, -51 and -61 with BSP port treads



Port size (all ports are BSP)

F1 frame size	Pressure port ¹⁾	Suction port
-25	3/4"	1"
-41	3/4"	1"
-51	3/4"	1"
-61	3/4"	1"

Ordering code

Example: **F1- 61 - RB**

F1 frame size **25, 41, 51, 61, 81 or 101**

Shaft rotation/port threads

RB Right hand/BSP

LB Left hand/BSP

Standard versions

Designation	Ordering no.
F1-25-RB	378 4024
F1-25-LB	378 4025
F1-41-RB	378 4040
F1-41-LB	378 4041
F1-51-RB	378 4050
F1-51-LB	378 4051
F1-61-RB	378 4060
F1-61-LB	378 4061

NOTE: The pump **does not** include a suction fitting; it must be ordered separately.

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SPECIFICATIONS

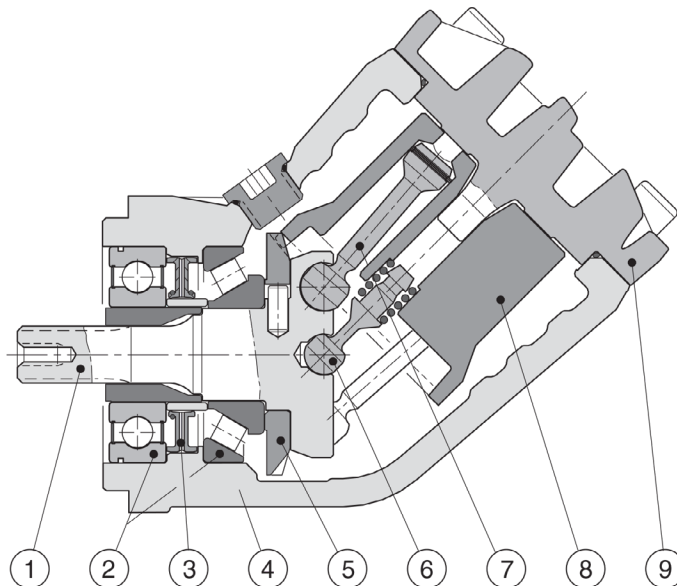
F1 SAE

¹ Theoretical values.

² Valid at an inlet pressure of 1.0 bar/15 psi (abs.) when operating on mineral oil at a viscosity of 30 mm²/s (cSt)/150 SUS.

Frame size F1-	25	41	51	61
Displacement [cm ³ /rev]	25.6	40.9	51.1	59.5
[cu in/rev]	1.56	2.50	3.12	3.63
Max flow ¹⁾ [l/min]	78	104	125	143
[gpm]	20.6	27.5	33.0	37.8
Max operating pressure [bar]	350	350	350	350
[psi]	5800	5800	5800	5800
Shaft speed [rpm]				
- short circuited pump (low press.)	3100	2700	2700	2700
- max selfpriming speed ²⁾	3050	2550	2450	2400
Torque ¹⁾				
at 350 bar [Nm]	142	227	284	331
at 5000 psi [lbf ft]	105	168	210	244
Input power				
[kW]	45	61	73	83
[hp]	60	82	98	111
Weight [kg]	8.5	8.5	8.5	8.5
[lbs]	18.7	18.7	18.7	18.7

PUMP CROSS SECTION



1. Input shaft
2. Bearings
3. Shaft seal
4. Housing
5. Timing gear
6. Barrel support
7. Piston with piston ring
8. Cylinder barrel
9. End cap

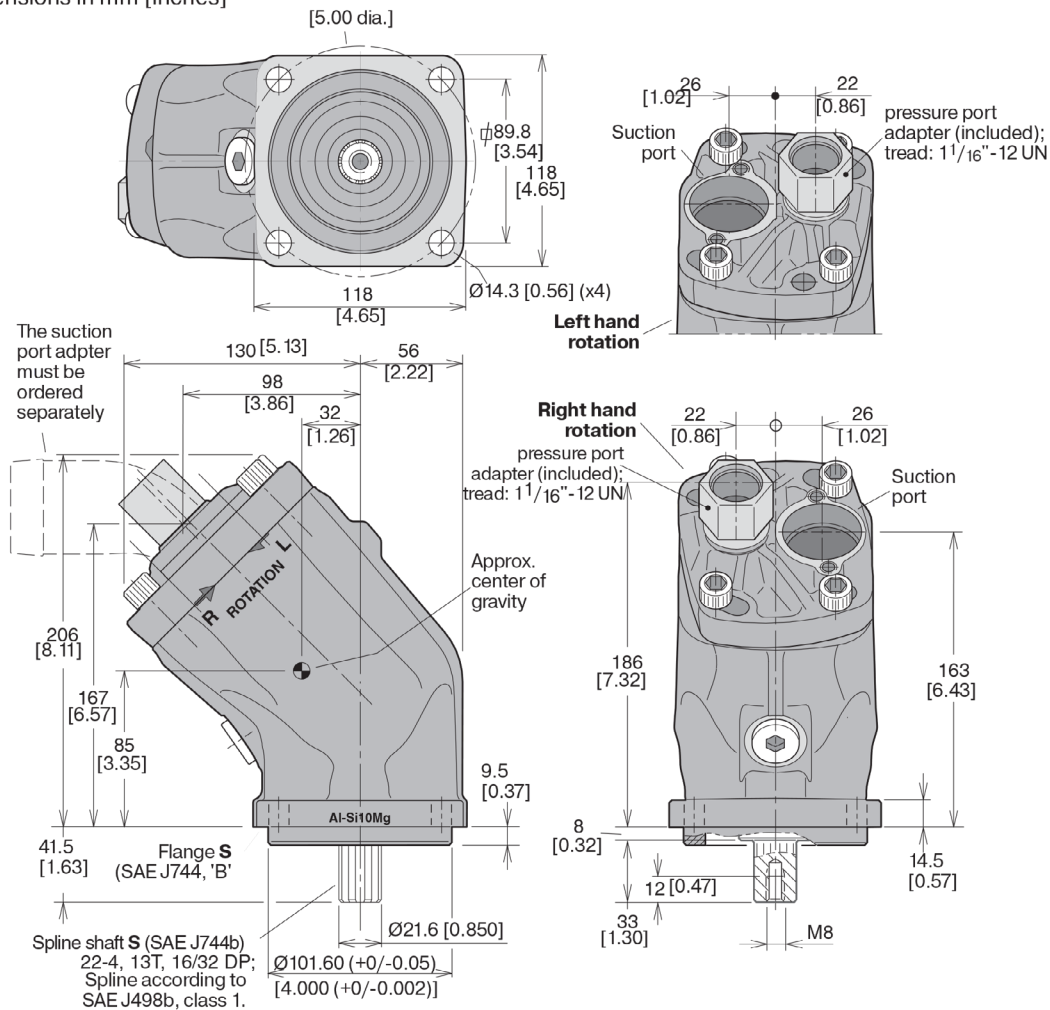
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Installation dimensions, F1-25, -41, -51 and -61 (SAE)

Dimensions in mm [inches]



Ordering code (SAE)

Example: **F1-61-RU-SV-S**

F1 frame size
25, 41, 51 or 61

Shaft rotation
R Right hand
L Left hand

Main port
U SAE O-ring, UN threads

Shaft end
S SAE spline "B" spline

Shaft seal
V FPM

Mounting flange
S SAE "B"

Port size

F1 frame size	Pressure port ¹⁾
-25	1 1/16" - 12 UN
-41	1 1/16" - 12 UN
-51	1 1/16" - 12 UN
-61	1 1/16" - 12 UN

Standard SAE versions

Designation	Ordering no.
F1-25-RU	378 1424
F1-25-LU	378 1425
F1-41-RU	378 1440
F1-41-LU	378 1441
F1-51-RU	378 1450
F1-51-LU	378 1451
F1-61-RU	378 1460
F1-61-LU	378 1461

¹⁾ BSP-to-SAE adapter (included)

NOTE: The pump **does not** include a suction fitting; it must be ordered separately.

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SPECIFICATIONS

F1 MOTOR

¹ Max 6 seconds in any one minute.

Motor frame size F1-	25-M	41-M	51-M	61-M	81-M	101-M	121-M
Displacement [cm ³ /rev]	25.6	40.9	51.1	59.5	81.6	102.9	118.5
Max operating pressure [bar]							
continuous	250	250	250	250	250	250	250
intermittent ¹⁾	350	350	350	350	350	350	350
Max Shaft speed [rpm]							
- continuous	2 300	2 000	1 800	1 700	1 500	1 400	1300
- intermittent	3 000	2 700	2 400	2 200	2 000	1 800	1700
Torque (theor.) [Nm]							
at 200 bar	81	130	162	189	259	327	376
at 350 bar	142	227	284	331	453	572	658
Max output power [kW]	45	64	72	76	95	108	117
Weight [kg]	8.5	8.5	8.5	8.5	12.5	12.5	12.5

Ordering code

Example: **F1 - 81 - M**
 F1 Motor frame size
25, 41, 51, 61, 81, 101 or 121

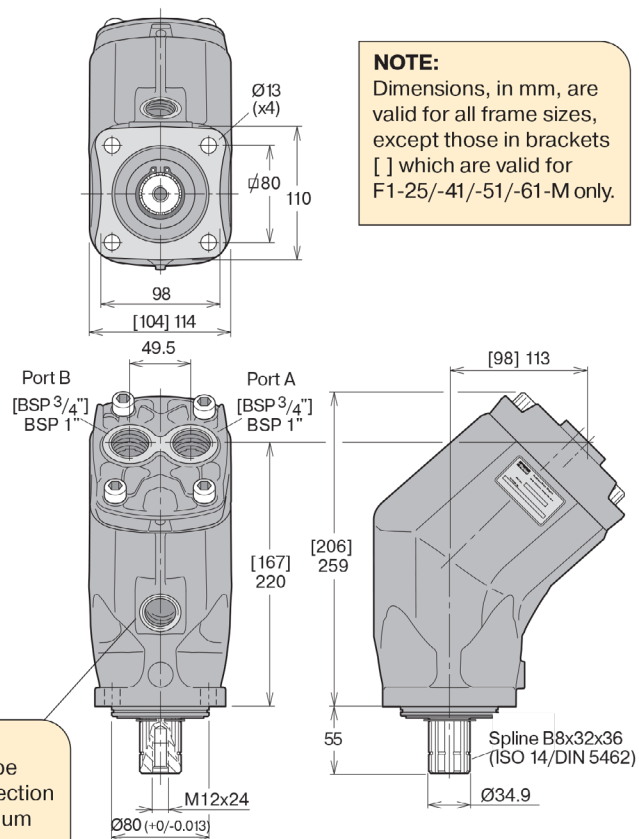
Port size

F1 motor frame size	Port size
F1-25/41/51/61	3/4"
-81/101/121	1"

Standard versions

Designation	Ordering no.
F1-25-M	378 1724
F1-41-M	378 1740
F1-51-M	378 1750
F1-61-M	378 1760
F1-81-M	378 1780
F1-101-M	378 1800
F1-121-M	378 4120

Installation dimensions



Note:
 Drain line must be mounted. Connection BSP 1/2". Maximum drain line pressure is 5 bar.

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Suction fittings for series F1, F2, F3, F4 and T1 pumps also VP1-095, -110 and -130

NOTE: A suction fitting must be ordered separately (not included with the pump).

Suctions fittings for VP1-045/075 see page 57. 'Straight' suction fittings for F1, T1, F2, F3, F4, VP1-095/-110/-130

Ordering no.	A mm	B mm	ØC dia. mm (in.)
378 0635 ¹⁾	0	85	38 (1½")
378 0636 ²⁾	17	136	50 (2")
378 0637 ³⁾	25	145	63 (2½")
378 3523 ³⁾	32	174	75 (3")

45° suction fittings for F1, T1, F2, F3, F4 VP1-095/-110/-130

Ordering no.	A mm	B mm	ØC dia. mm (in.)
378 1234 ¹⁾	60	104	32 (1¼")
378 0633 ¹⁾	60	104	38 (1½")
378 0364 ²⁾	67	110	50 (2")
378 0634 ³⁾	75	117	63 (2½")
378 3367 ³⁾	95	138	75 (3")
378 1062	67	110	40
378 0975	67	110	45

90° suction fittings for F1, T1, F2, F3, F4 VP1-095/-110/-130

Ordering no.	A mm	B mm	ØC dia. mm (in.)
378 0978 ¹⁾	126	83	38 (1½")
378 0979 ²⁾	135	83	50 (2")
378 1980 ³⁾	147	83	63 (2½")
378 0976	135	83	45
378 8690 ³⁾	185	83	75 (3")

145° suction fitting for F1, T1, F2, F3, F4 VP1-095/-110/-130

Ordering no.	A mm	B mm	ØC dia. mm (in.)
378 1867	165	73	50 (2")

¹⁾ Recommended for frame size F1-25.

²⁾ Recommended for frame size F1-41,-51,-61,-81, -101.

³⁾ (3 clamps and 3 screws)

Spare parts

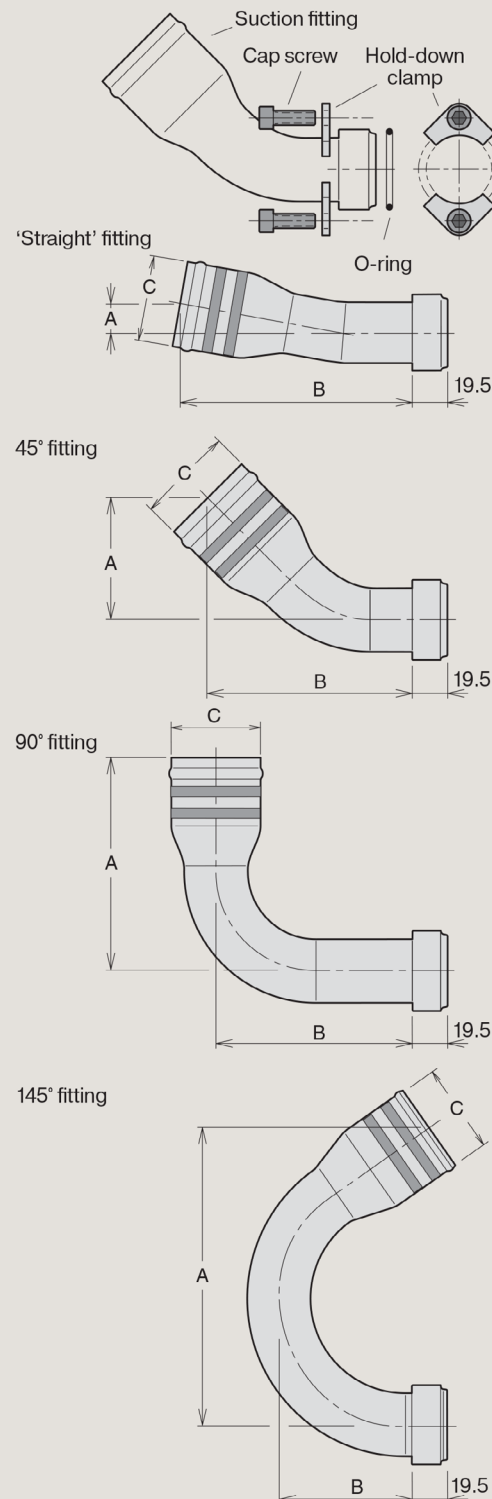
Additional Hold-down-clamp kit consists of:
hold-down-clamp cap screw and O-ring

Ordering no. 378 1321

Additional Hold-down-clamp kit for mounting on BPV

Ordering no. 378 2439

A 'suction fitting' consists of a straight, 45°, 90° or 135° suction fitting, clamps, cap screws and O-ring.



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Suitable suction fittings for F1 and VP1-045/-060/-075 with BSP port treads

NOTE: A suction fitting must be ordered separately (not included with the pump).

45° suction fittings

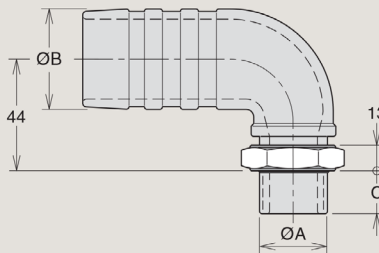
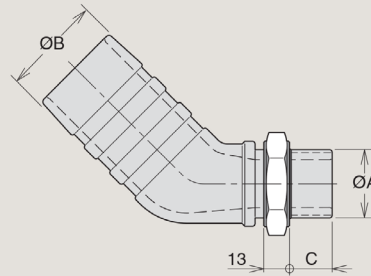
Ordering no.	ØA	ØB inch	C mm
00509035016	BSP 1" ¹⁾	2"	18
00509035116	BSP 1 1/4"	2"	18
00509021916	BSP 1 1/4"	2 1/2"	18

¹⁾ Not for VP1-045/-060/-075

90° suction fittings

Ordering no.	ØA	ØB inch	C mm
00509034516	BSP 1" ¹⁾	2"	18
00509034616	BSP 1 1/4"	2"	18

¹⁾ Not for VP1-045/-060/-075

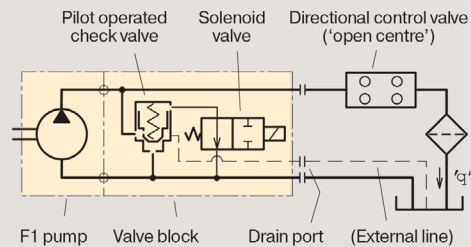


BPV-F1 and BPV-T1 bypass valve

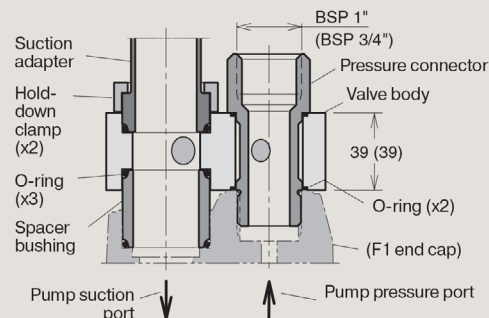
- The bypass valve is mainly utilised in applications where the F1 pump is driven from the crank-shaft through a cardan shaft, or when it is installed on an engine PTO.
- The BPV bypass valve should be disengaged during transportation when the pump is operating constantly and the engine is running at max rpm; the hydraulic system is not sized for the large flow that would otherwise go through it.
- The BPV valve substantially reduces the energy loss during transportation.
- The valve installs directly on top of the pump end cap with a pressure port 'banjo' fitting and an inlet port spacer bushing with two cap screws; refer to the illustration to the right.
- As the BPV valve is symmetrical, it can be 'turned 180°' to prevent interference with chassis components; it can be utilised for either left hand or right hand pumps.
- The valve function must only be activated or released (by means of the 24 VDC solenoid) at no-load (below 20 bar) system pressure.

IMPORTANT INFORMATION

- In order to secure a cooling flow through the system, a separate drain line **must** be connected from the BPV-F1 drain line fitting directly to tank; (shown in the Installation Information Bulletin MSG30-8227-INST/UK/DE) refer also to the schematic.
- The pressure connector must be tightened (to 50 Nm) before the suction fitting clamp screws are tightened.



Bypass valve schematic.



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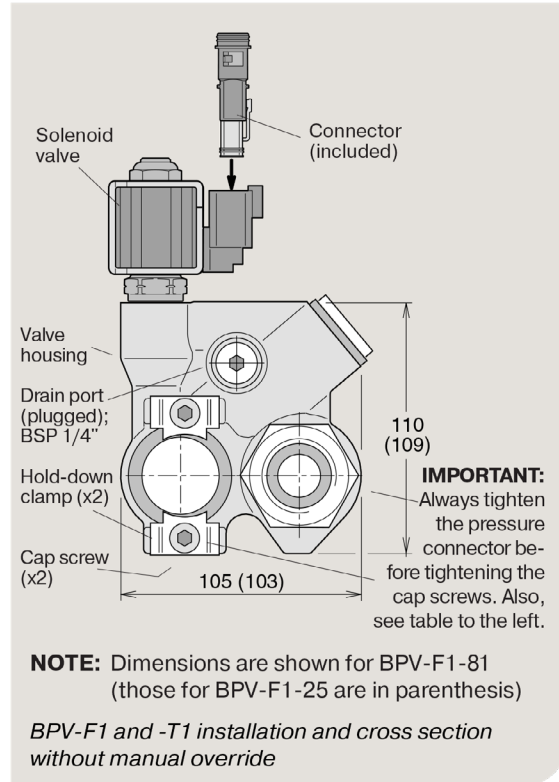
BPV-F1 and BPV-T1 Bypass valve Without manual override

Bypass valve, type	BPV-F1-25 to -101 and BPV-T1-81 and -121
Max pressure, continuous	350 bar
intermittent	400 bar
Solenoid voltage (option)	24 VDC, (12 VDC)
Power requirement	14 W
Operating mode	Activated solenoid: Check valve closed

Bypass valve	Voltage	Ordering number	For F1 and T1 size	Torque ¹⁾
BPV-F1, BPV-T1	24 VDC	378 7201	F1-25²⁾ , -41, -51, -61 and T1-81	50 Nm
	12 VDC	378 7202		
	24 VDC	378 7203	F1-81 , -101 and T1-121	100 Nm
	12 VDC	378 7204		
Drain fitting kit ²⁾ F1-025		378 1640	Contains a drain line fitting a bonded seal and nozzle.	
Drain fitting kit other F1, T1 and F2		378 3039	Contains a drain line fitting and a bonded seal. N.B. Included in the complete bypass valve.	

¹⁾ Torque pressure connector to:

²⁾ Drain fitting kit **378 1640** must be ordered separately for **F1-025**.



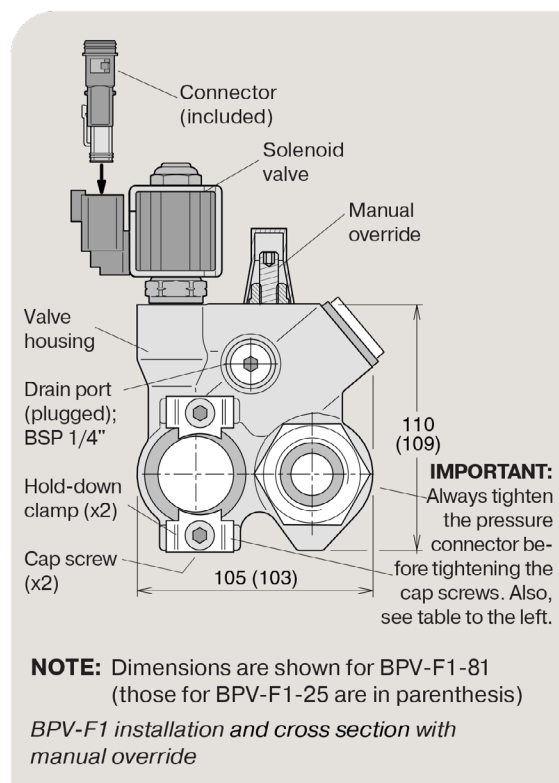
BPV-F1 and BPV-T1 Bypass valve With manual override

Bypass valve, type	BPV-F1-25 to -101 and BPV-T1-81 and -121
Max pressure, continuous	350 bar
intermittent	400 bar
Solenoid voltage	24 VDC
Power requirement	14 W
Operating mode	Activated solenoid: Check valve closed

Bypass valve	Voltage	Ordering number	For F1 and T1 size	Torque ¹⁾
BPV-F1, BPV-T1	24 VDC	378 4179	F1-25²⁾ , -41, -51, -61 and T1-81	50 Nm
	24 VDC	378 4180	F1-81 , -101 and T1-121	100 Nm
Drain fitting kit ²⁾ F1-025		378 1640	Contains a drain line fitting a bonded seal and nozzle.	
Drain fitting kit other F1, T1 and F2		378 3039	Contains a drain line fitting and a bonded seal. N.B. Included in the complete bypass valve.	

¹⁾ Torque pressure connector to:

²⁾ Drain fitting kit **378 1640** must be ordered separately for **F1-025**.

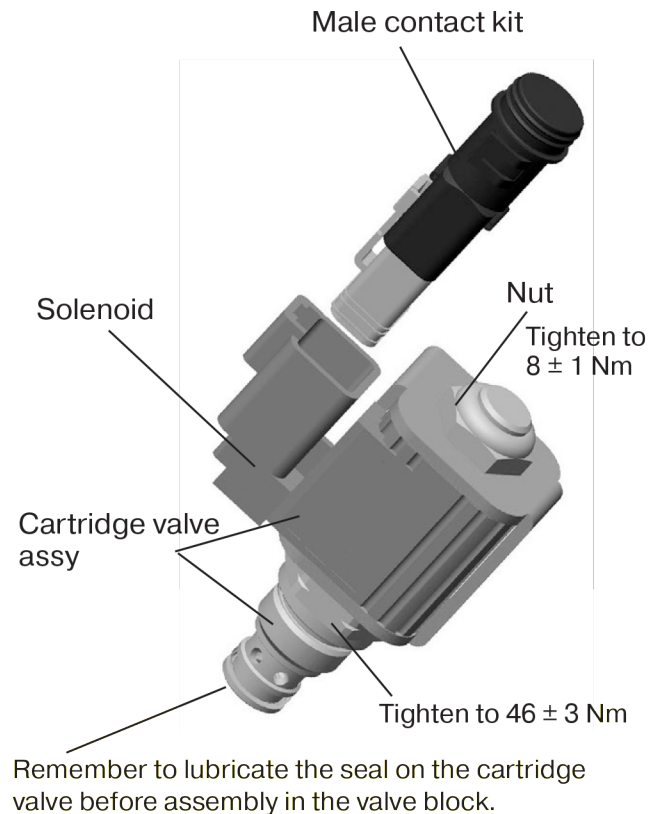
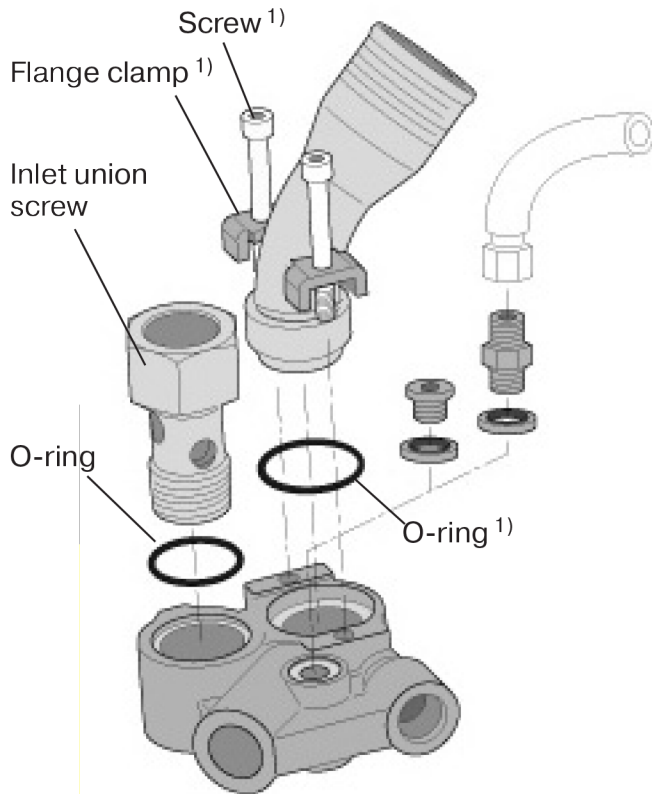


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BPV-F1, -T1, -F2, -F3 and -F4 Accessories / Spare Parts



Part No	Description	Remarks
3781480	Inlet union screw	F2 (all sizes)
3781082	Inlet union screw	F1-25, -41, -51, -61 and T1-81
3781094	Inlet union screw	F1-81, -101, T1-121, and F3-81, -101
3780641	O-ring kit	For F1, T1, F2, F3 and F4 (all sizes)
3782439	Hold-down clamp Suction fitting ¹⁾	For BPV F1, T1, F2, F3 and F4

Part No	Description	Remarks
3787496	Solenoid 24 V	Incl. new connector
3787497	Solenoid 12 V	Incl. new connector
3787494	Cartridge valve assy 24 V	Incl. new connector
3787495	Cartridge valve assy 12 V	Incl. new connector
3785948	Nut for cartridge valve	
3787488	Male contact kit	

¹⁾ Hold-down clamp for suction fitting on bypass valve for F1, T1, F2 and F3 (parts designated '1' in the split view).

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WARNING — USER RESPONSIBILITY

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- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.