



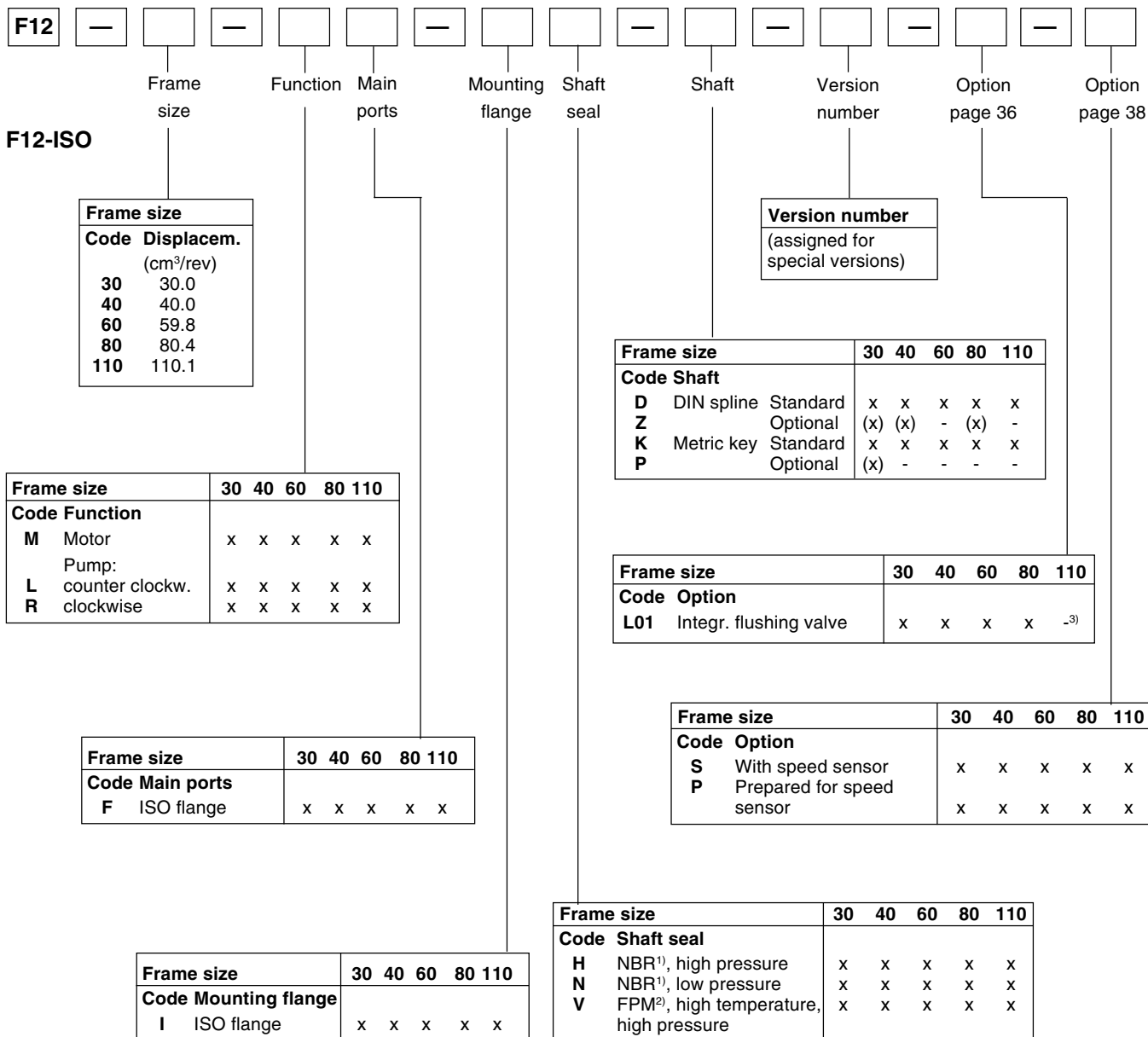
# **Hydraulic Pump Series F12**

*Fixed Displacement*

*Catalogue HY17-8249/US  
March 2004*



Ordering codes



x: Available      (x): Optional      —: Not available

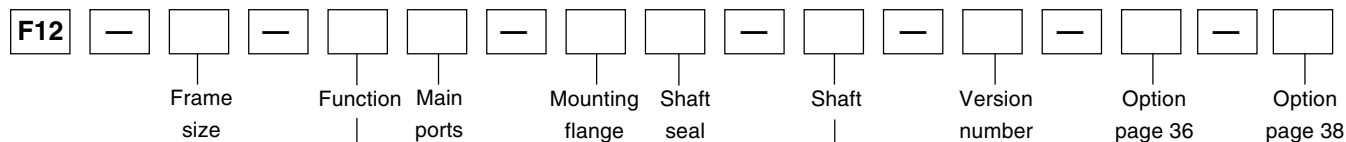
1) NBR - Nitrile rubber

2) FPM - Fluor rubber

3) F12-110: Accessory valve block (page 36)

**Ordering codes**

**Series F12**



**F12-Cartridge**

Frame size	
Code	Displacem. (cm <sup>3</sup> /rev)
30	30.0
40	40.0
60	59.8
80	80.4
110	110.1

**Version number**  
(assigned for special versions)

Frame size	30	40	60	80	110
<b>Code Shaft</b>					
C DIN spline Standard	x	x	x	x	x
K Metric key Standard	x	-	x	x	-
X " " Optional	-	(x)	-	-	-

Frame size	30	40	60	80	110
<b>Code Function</b>					
M Motor	x	x	x	x	x

Frame size	30	40	60	80	110
<b>Code Option</b>					
L01 Integr. flushing valve	x	x	x	x	- <sup>3)</sup>

Frame size	30	40	60	80	110
<b>Code Main ports</b>					
F ISO flange	x	x	x	x	x

Frame size	30	40	60	80	110
<b>Code Option</b>					
S With speed sensor	x	x	x	x	x
P Prepared for speed sensor	x	x	x	x	x

Frame size	30	40	60	80	110
<b>Code Mounting flange</b>					
C Cartridge	x	x	x	x	x

Frame size	30	40	60	80	110
<b>Code Shaft seal</b>					
H NBR <sup>1)</sup> , high pressure	x	x	x	x	x
N NBR <sup>1)</sup> , low pressure	x	x	x	x	x
V FPM <sup>2)</sup> high temperature, high pressure)	x	x	x	x	x

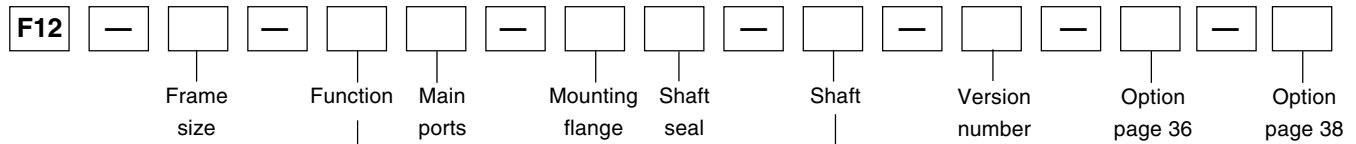
x: Available (x): Optional - : Not available

1) NBR - Nitrile rubber

2) FPM - Fluor rubber

3) F12-110: Accessory valve block (page 36)

Ordering codes



F12-SAE

Frame size	
Code	Displacem. (cm³/rev)
30	30.0
40	40.0
60	59.8
80	80.4
110	110.1

**Version number**  
(assigned for special versions)

Frame size		30	40	60	80	110
<b>Code Shaft</b>						
S	SAE spline Standard	x	x	x	x	x
U	" " Optional	-	-	-	(x)	-
T	SAE key Standard	x	x	x	x	x

Frame size		30	40	60	80	110
<b>Code Function</b>						
M	Motor	x	x	x	x	x
L	Pump: counter clockw.	x	x	x	x	x
R	clockwise	x	x	x	x	x

Frame size		30	40	60	80	110
<b>Code Option</b>						
L01	Integr. flushing valve	x	x	x	x	- <sup>3)</sup>

Frame size		30	40	60	80	110
<b>Code Main ports</b>						
S	SAE flange	x	x	x	x	x
U	SAE, UN threads	(x)	(x)	(x)	-	(x)

Frame size		30	40	60	80	110
<b>Code Option</b>						
S	With speed sensor	x	x	x	x	x
P	Prepared for speed sensor	x	x	x	x	x

Frame size		30	40	60	80	110
<b>Code Mounting flange</b>						
S	SAE 4 bolt	x	x	x	x	x
T	SAE 2 bolt	x	x	x	-	-

Frame size		30	40	60	80	110
<b>Code Shaft seal</b>						
H	NBR <sup>1)</sup> , high pressure	x	x	x	x	x
N	NBR <sup>1)</sup> , low pressure	x	x	x	x	x
V	FPM <sup>2)</sup> , high temperature, high pressure	x	x	x	x	x

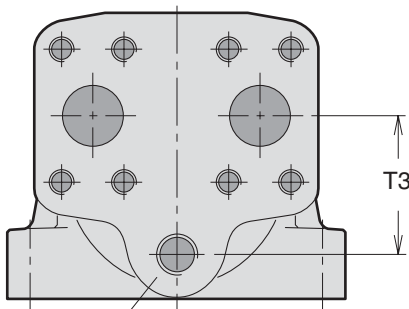
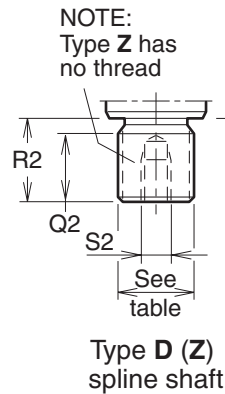
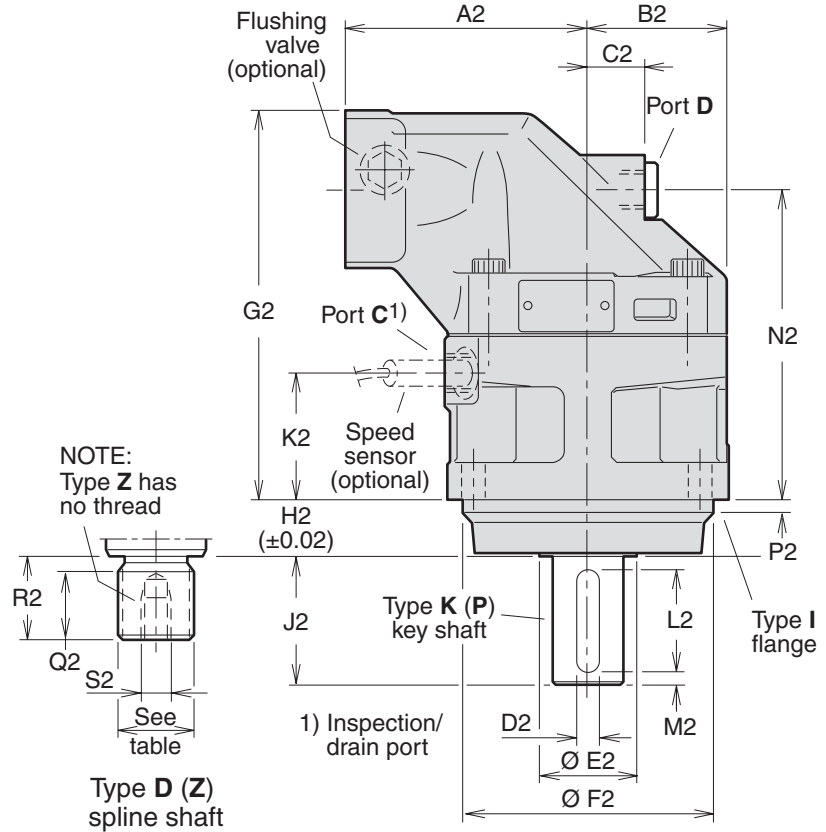
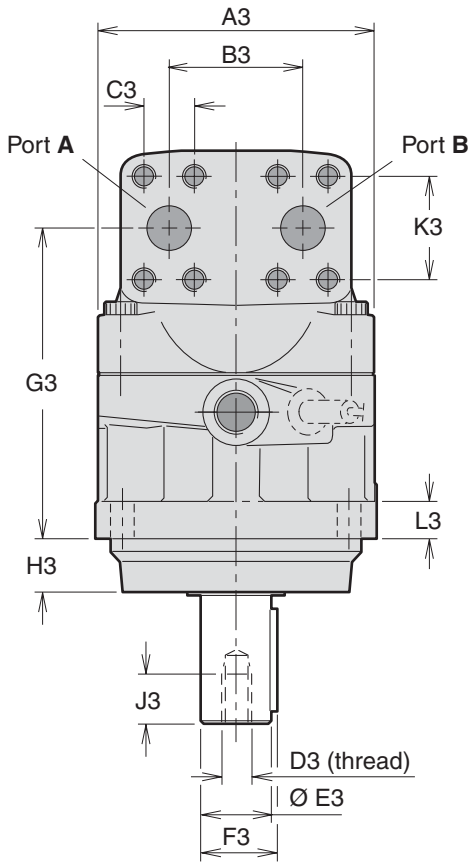
x: Available (x): Optional - : Not available

1) NBR - Nitrile rubber

2) FPM - Fluor rubber

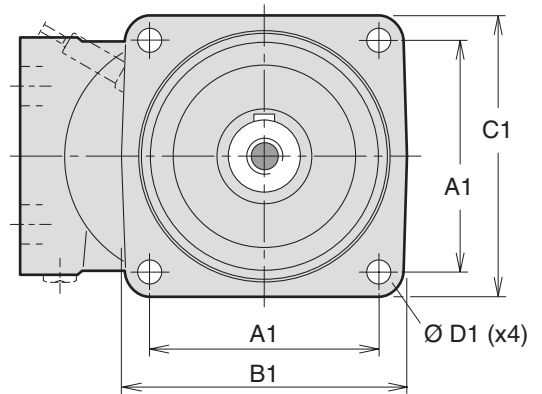
3) F12-110: Accessory valve block (page 36)

**F12-30, -40, -60, -80 and -110**  
 (ISO versions)



Port E (third drain port)  
 F12-110 barrel housing  
 (ISO/cartridge version)

Shown: F12-80



Type I mounting flange  
 (ISO 3019/2)

Dim.	F12-30	F12-40	F12-60	F12-80	F12-110
A1	3.48	4.46	4.46	5.01	5.57
B1	4.65	5.75	5.75	6.22	7.09
C1	4.65	5.59	5.67	6.10	7.09
D1	0.43	0.53	0.53	0.53	0.71
A2	3.94	4.33	4.92	5.32	5.71
B2	2.32	2.56	2.76	3.05	3.35
C2	0.98	1.02	0.87	1.26	1.50
D2	0.32	0.32	0.39	0.47	0.55
E2	1.30	1.65	1.65	2.05	2.26
F2	3.9370/ 3.9349	4.9213/ 4.9188	4.9213/ 4.9188	5.5118/ 5.5093	6.2992/ 6.2967
G2	6.77	6.81	7.48	8.50	9.09
H2	1.00	1.28	1.28	1.28	1.59
J2 <sup>1)</sup>	1.97	2.36	2.36	2.76	3.23
J2 <sup>2)</sup>	1.97	-	-	-	-
K2	2.16	2.05	2.13	2.76	2.61
L2	1.58	1.97	1.97	2.21	2.76
M2	0.20	0.20	0.20	0.28	0.24
N2	5.37	5.39	6.06	6.79	7.05
P2	0.32	0.32	0.32	0.32	0.32
Q2	1.10	1.10	1.30	1.42	1.61
R2 <sup>3)</sup>	1.38	1.38	1.61	1.77	1.97
R2 <sup>4)</sup>	1.69	1.38	-	1.61	-
S2* <sup>3)</sup>	M12 x24	M12 x24	M12 x28	M16 x36	M16 x36
A3	4.80	5.28	5.67	6.10	6.69
B3	2.60	2.60	2.60	2.95	3.29
C3	0.937	0.937	0.937	1.094	1.250
D3*	M12	M12	M12	M16	M16
E3	1.1817/ 1.1812	1.1817/ 1.1812	1.3787/ 1.3780	1.5755/ 1.5749	1.7724/ 1.7717
F3	1.30	1.30	1.50	1.69	1.91
G3	5.37	5.39	6.06	6.79	7.05
H3	0.93	1.20	1.20	1.20	1.52
J3	0.95	0.95	1.10	1.42	1.42
K3	2.000	2.000	2.000	2.250	2.626
L3	0.71	0.79	0.79	0.79	0.87
S3	0.63	0.63	0.63	1.02	-
T3	-	-	-	-	2.68

\* Metric thread

1) Key shaft type K

2) " " " P

3) Spline shaft type D

4) " " " Z.

Ports	F12-30	F12-40	F12-60	F12-80	F12-110
A, B size	3/4"	3/4"	3/4"	1"	1 1/4"
Screw thread <sup>1)</sup>	M10 (0.79)	M10 (0.79)	M10 (0.79)	M12 (0.79)	M14 (1.02)
C, D thread <sup>2)</sup>	M22 x1.5	M22 x1.5	M22 x1.5	M22 x1.5	M22 x1.5
E thread <sup>2)</sup>	-	-	-	-	M22 x1.5

A, B: ISO 6162

1) Metric thread (depth in inches)


2) Metric thread x pitch in mm.

**Spline shaft (DIN 5480; in mm)**

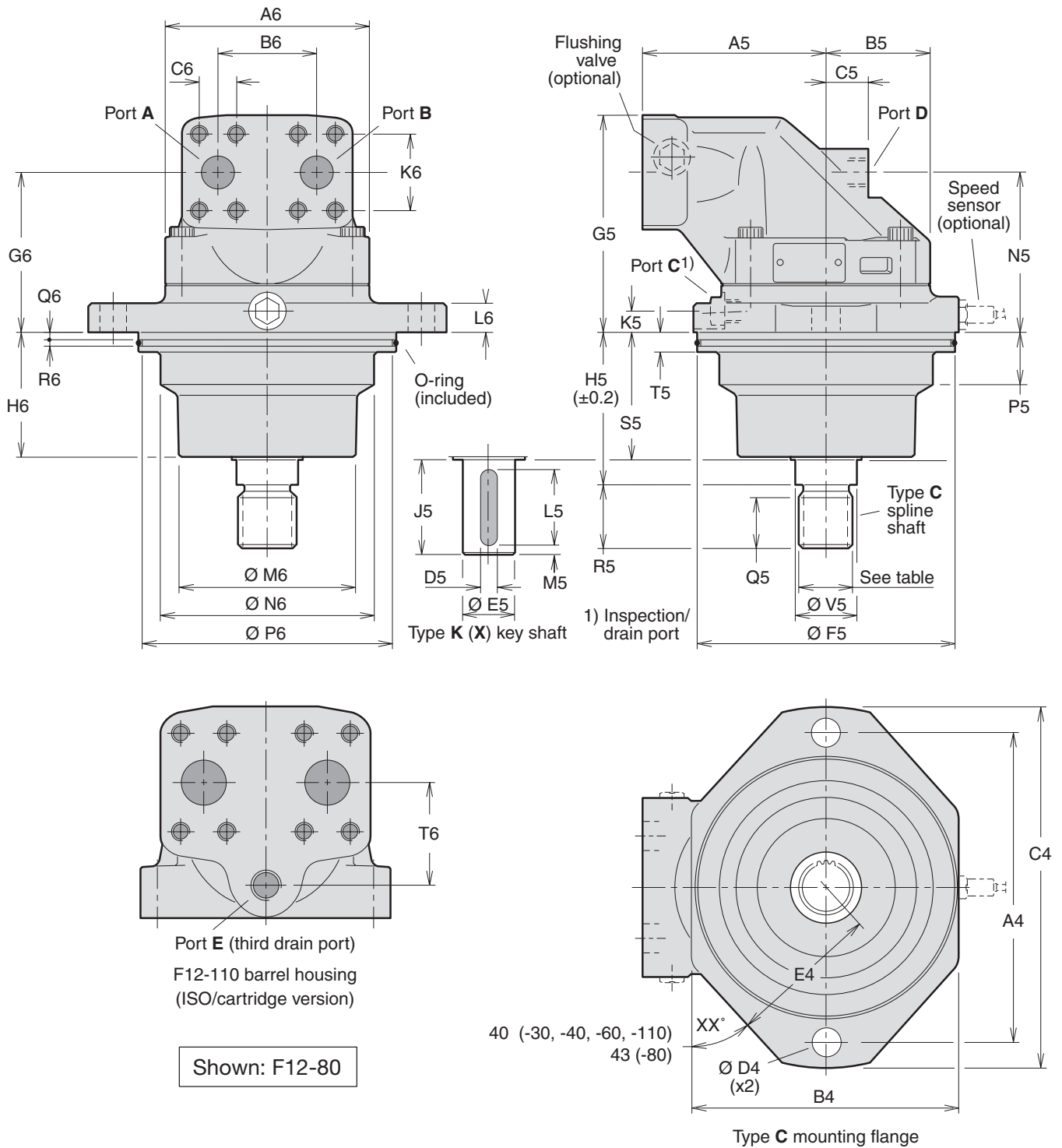
	Type D (standard)	Type Z (optional)
F12-30	W30x2x14x9g	W25x1.25x18x9g
-40	W32x2x14x9g	W30x2x14x9g
-60	W35x2x16x9g	W32x2x14x9g
-80	W40x2x18x9g	W35x2x16x9g
-110	W45x2x21x9g	-

**Metric key shaft (in mm)**

	Type K (standard)	Type P (optional)
F12-30	30 dia.	25 dia.
-40	30 dia.	-
-60	35 dia.	-
-80	40 dia.	-
-110	45 dia.	-

 = Max 5 100 psi (350 bar) operating pressure.

**F12-30, -40, -60, -80 and -110**  
 (Cartridge versions)



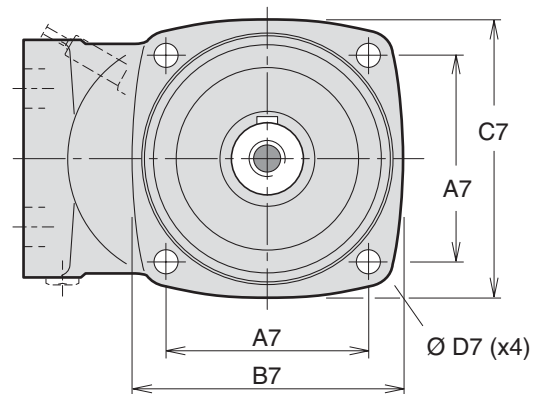
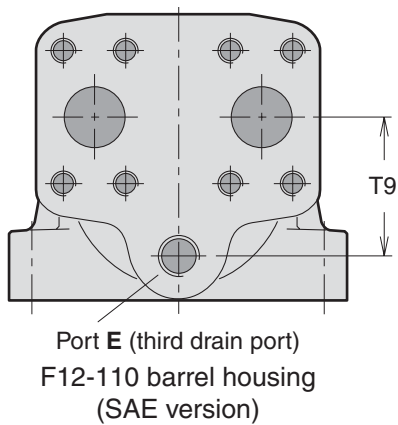
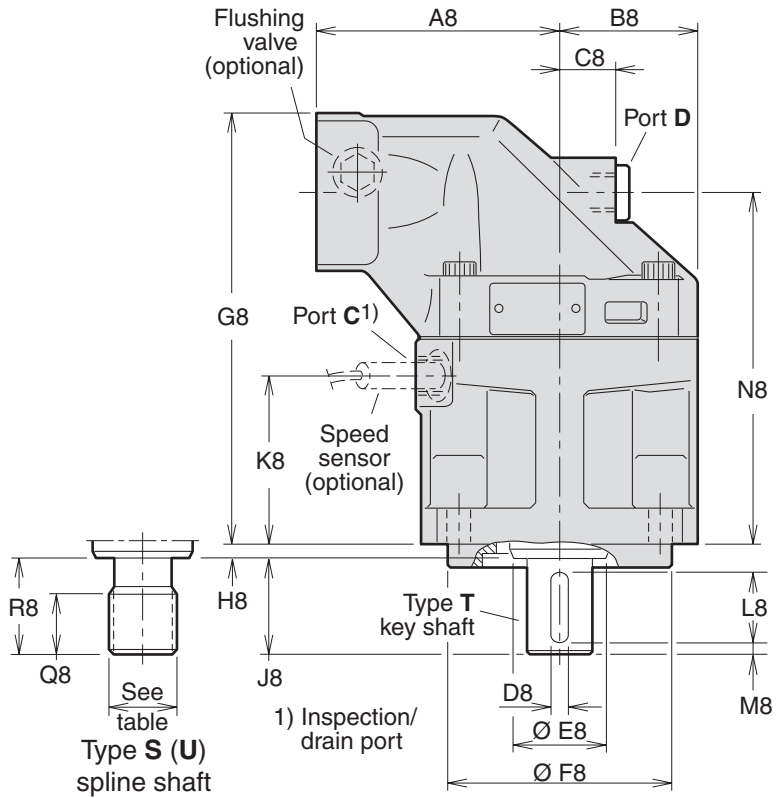
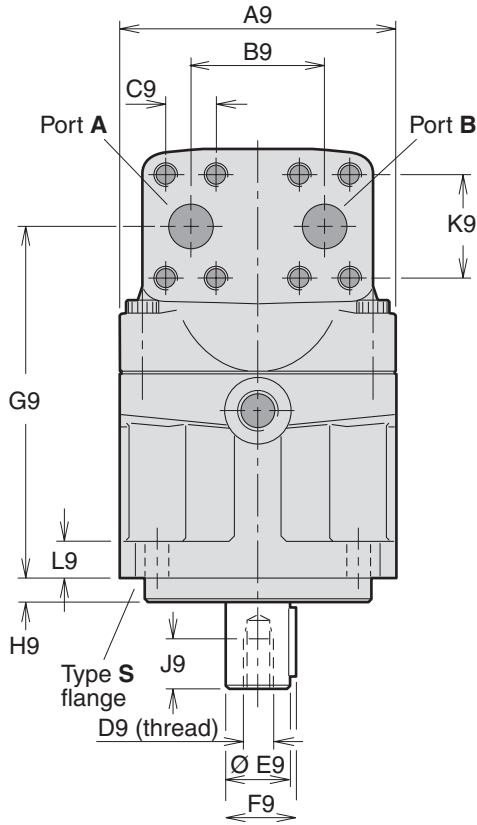
Shown: F12-80

Dim.	F12-30	F12-40	F12-60	F12-80	F12-110	Ports	F12-30	F12-40	F12-60	F12-80	F12-110
A4	6.30	7.87	7.87	8.82	9.84	A, B size	3/4"	3/4"	3/4"	1"	1 1/4"
B4	5.51	6.46	6.46	7.72	8.11	Screw thread <sup>3)</sup>	M10 (0.79)	M10 (0.79)	M10 (0.79)	M12 (0.87)	M14 (1.02)
C4	7.40	9.25	9.25	10.24	11.26	C thread <sup>4)</sup>	M14 x1.5	M14 x1.5	M14 x1.5	M14 x1.5	M14 x1.5
D4	0.55	0.71	0.71	0.87	0.87	D, E thread <sup>4)</sup>	M18 x1.5	M18 x1.5	M22 x1.5	M22 x1.5	M22 x1.5
E4	3.03	3.74	3.74	4.33	4.57	A, B: ISO 6162      3) Metric thread (depth in inches) 4) Metric thread x pitch in mm.					
A5	3.94	4.33	4.92	5.31	5.71	<b>Spline shaft</b> (DIN 5480; in mm) Type <b>C</b> (standard)					
B5	2.32	2.56	2.76	3.05	3.35	F12-30	W30x2x14x9g				
C5	0.98	1.02	0.87	1.26	1.50	-40	W30x2x14x9g				
D5	0.31	1) 2)	0.39	0.47	0.55	-60	W30x2x14x9g				
E5	1.1817/ 1.1812	1) 2)	1.3787/ 1.3780	1.5755/ 1.5749	1.7724/ 1.7717	-80	W40x2x18x9g				
F5	5.3150/ 5.3125	6.2992/ 6.2967	6.2992/ 6.2967	7.4803/ 7.4775	7.8740/ 7.8712	-110	W40x2x18x9g				
G5	5.00	5.24	5.75	6.18	6.89	<b>Metric key shaft</b> (in mm) Type <b>K</b> (std)    Type <b>X</b> (opt.)					
H5	3.50	3.63	3.63	4.35	4.83	F12-30	30 dia.		-		
J5	1.97	2.36	2.36	2.76	-	-40	-	35 dia.			
K5	0.55	0.63	0.59	0.59	0.59	-60	35 dia.		-		
L5	1.57	1.97	1.97	2.20	-	-80	40 dia.		-		
M5	0.20	0.20	0.20	0.28	-	-110	-		-		
N5	3.58	3.82	4.33	4.49	4.84	<b>O-ring dimensions</b> (in mm)					
P5	0.87	1.18	1.22	1.57	1.57	F12-30	127x4				
Q5	1.10	1.10	1.10	1.46	1.46	-40	150x4				
R5	1.38	1.38	1.38	1.77	1.77	-60	150x4				
S5	2.78	2.83	2.99	3.58	3.77	-80	180x4				
T5	0.59	0.59	0.59	0.59	0.59	-110	190x4				
V5	1.30	1.38	1.38	1.77	1.77						
A6	4.80	5.28	5.67	6.10	6.69						
B6	2.60	2.60	2.60	2.95	3.27						
C6	0.937	0.937	0.937	1.094	1.250						
G6	3.60	3.82	4.33	4.49	4.84						
H6	2.74	2.80	2.91	3.52	3.69						
K6	2.000	2.000	2.000	2.250	2.626						
L6	0.63	0.71	0.71	0.79	0.79						
M6	3.62	4.53	4.53	5.12	5.51						
N6	4.33	5.00	5.31	6.06	6.30						
P6	5.047	6.031	6.031	7.213	7.606						
Q6	0.20	0.20	0.20	0.20	0.20						
R6	0.20	0.20	0.20	0.20	0.20						
T6	-	-	-	-	2.68						

1) Key shaft type K: D5 - 0.31; E5 - 1.1817/1.1812  
 2) Key shaft type X: D5 - 0.39; E5 - 1.3787/1.3780



**F12-30, -40, -60, -80 and -110**  
 (SAE versions with 4 bolt flange)



Shown: F12-80 with 4 bolt flange

Type S (SAE 4 bolt) mounting flange

Dim.	F12-30	F12-40	F12-60	F12-80	F12-110
A7	3.54	4.51	4.51	4.51	6.36
B7	4.65	5.83	5.83	6.10	8.03
C7	4.65	5.67	5.67	6.10	7.87
D7	0.55	0.55	0.55	0.55	0.83
A8	3.94	4.33	4.92	5.31	5.71
B8	2.32	2.56	2.76	3.05	3.35
C8	0.98	1.02	0.87	1.26	1.50
D8	0.25	0.31	0.31	0.38	0.44
E8	1.30	1.65	1.65	2.05	2.26
F8	4.000/ 3.998	5.000/ 4.998	5.000/ 4.998	5.000/ 4.998	6.000/ 5.998
G8	7.46	7.76	8.43	9.45	10.39
H8	0.31	0.31	0.31	0.31	0.31
J8	1.50	1.89	1.89	2.13	2.64
K8	2.83	2.99	3.11	3.74	3.90
L8	1.25	1.50	1.50	1.75	2.13
M8	0.10	0.16	0.16	0.16	0.29
N8	6.04	6.34	7.02	7.76	8.35
Q8 <sup>1)</sup>	0.91	0.91	0.91	0.98	1.34
Q8 <sup>2)</sup>	-	-	-	0.91	-
R8 <sup>1)</sup>	1.30	1.89	1.89	2.13	2.63
R8 <sup>2)</sup>	-	-	-	1.88	-
A9	4.80	5.28	5.67	6.10	6.69
B9	2.60	2.60	2.60	2.95	3.27
C9	0.937	0.937	0.937	1.094	1.250
D9*	5/16"-24	3/8"-24	3/8"-24	1/2"-20	5/8"-18
E9	1.000/ 0.998	1.250/ 1.248	1.250/ 1.248	1.500/ 1.498	1.750/ 1.748
F9	1.11	1.39	1.39	1.67	1.94
G9	6.06	6.34	7.02	7.76	8.35
H9	0.38	0.50	0.50	0.50	0.50
J9	0.63	0.75	0.75	1.02	1.26
K9	2.000	2.000	2.000	2.250	2.626
L9	0.71	0.79	0.79	0.79	0.87
T9	-	-	-	-	2.68

\* UNF-2B thread

- 1) Spline shaft type **S**
- 2) " " " " **U**

**Main ports A and B, type U (optional)**

F12-110	1 5/8" - 12 UN
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O-ring ports according to SAE J514d

Ports	F12-30	F12-40	F12-60	F12-80	F12-110
A, B size	3/4"	3/4"	3/4"	1"	1 1/4"
Screw thread <sup>3)</sup>	3/8"-16 (0.87)	3/8"-16 (0.79)	3/8"-16 (0.87)	7/16"-14 (1.06)	1/2"-13 (0.98)
C thread	7/8"-14	7/8"-14	7/8"-14	7/8"-14	1 1/16"-12
D thread	3/4"-16	3/4"-16	7/8"-14	7/8"-14	1 1/16"-12
E thread	-	-	-	-	1 1/16"-12

A, B: ISO 6162; C, D, E: O-ring boss (SAE J514)

3) UN thread (depth in inches)

**Mounting flange (SAE J744)**

	<b>S (standard)</b>	<b>X (optional)</b>
F12-30	SAE 'B', 4 bolt	-
-40	SAE 'C', "	-
-60	SAE 'C', "	-
-80	SAE 'C', "	SAE 'D', 4 bolt
-110	SAE 'D', "	-

**Spline shaft (SAE J498b, class 1, flat root, side fit)**

	<b>S (standard)</b>	<b>U (opt.)</b>	<b>X (optional)</b>
F12-30	SAE 'B' 13T, 16/32 DP	-	-
-40	SAE 'C' 14T, 12/24 DP	-	-
-60	SAE 'C' 14T, 12/24 DP	-	-
-80	SAE 'C-C' 17T, 12/24 DP	SAE 'C' 14T, 12/24 DP	SAE 'D' 13T, 8/16 DP
-110	SAE 'D' 13T, 8/16 DP	-	-

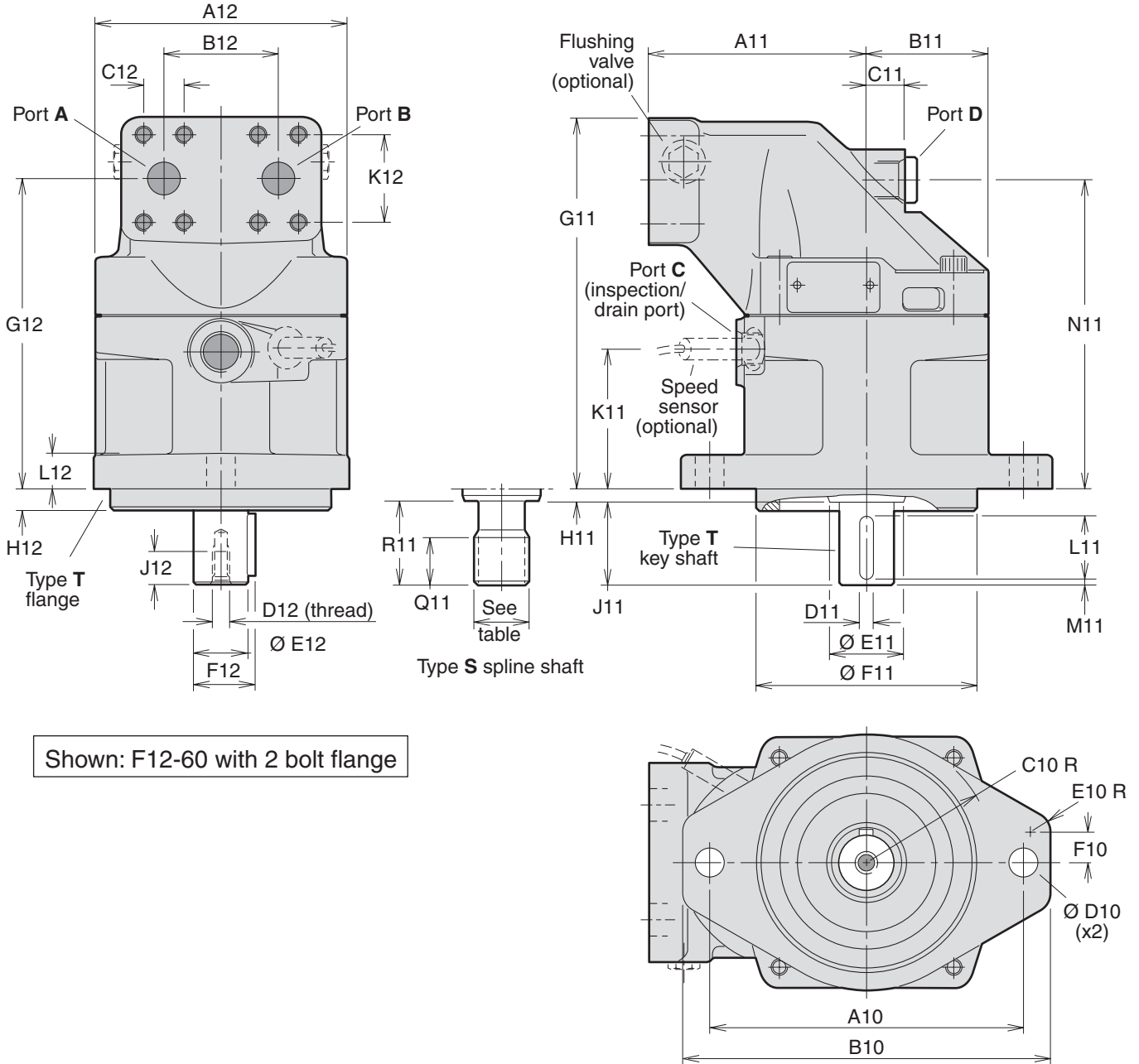
= Max 5100 psi (350 bar) operating pressure.

**Key shaft (SAE J744)**

	<b>T (standard)</b>	<b>X (optional)</b>
F12-30	SAE 'B-B' (1"/25.4 mm)	-
-40	SAE 'C' (1 1/4"/31.75 mm)	-
-60	SAE 'C' (1 1/4"/31.75 mm)	-
-80	SAE 'C-C' (1 1/2"/38.1 mm)	SAE 'D' (1 3/4"/44.45 mm)
-110	SAE 'D' (1 3/4"/44.45 mm)	-

**F12-30, -40, and -60**

(SAE versions with 2 bolt flange)



Dim.	F12-30	F12-40	F12-60
A10	5.75	7.13	7.13
B10	6.93	8.46	8.46
C10	2.48	2.91	2.91
D10	0.57	0.69	0.69
E10	0.39	0.63	0.63
F10	0.39	0.61	0.61
A11	3.94	4.33	4.92
B11	2.32	2.56	2.76
C11	0.98	1.02	0.87
D11	0.25	0.31	0.31
E11	1.30	1.65	1.65
F11	4.000/ 3.998	5.000/ 4.998	5.000/ 4.998
G11	7.46	7.76	8.43
H11	0.31	0.31	0.31
J11	1.50	1.89	1.89
K11	2.80	3.03	3.21
L11	1.25	1.50	1.50
M11	0.10	0.16	0.16
N11	6.06	6.34	7.03
Q11	1.02	1.06	1.06
R11	1.30	1.89	1.89
A12	4.80	5.28	5.67
B12	2.60	2.60	2.60
C12	0.937	0.937	0.937
D12*	5/16"-24	3/8"-24	3/8"-24
E12	1.000/ 0.998	1.250/ 1.248	1.250/ 1.248
F12	1.11	1.39	1.39
G12	6.06	6.34	7.03
H12	0.38	0.50	0.50
J12	0.63	0.75	0.75
K12	2.000	2.000	2.000
L12	0.71	0.79	0.79

\* UNF-2B thread

Ports	F12-30	F12-40	F12-60
A, B size	3/4"	3/4"	3/4"
Screw thread <sup>1)</sup>	3/8"-16 (0.87)	3/8"-16 (0.79)	3/8"-16 (0.87)
C thread	3/4"-16	3/4"-16	7/8"-14
D thread	3/4"-16	3/4"-16	7/8"-14


A, B (main ports): SAE J518c (6000 psi)  
C, D (drain ports): O-ring boss (SAE J514)

1) UN thread (depth in inches).

**Main ports A and B, type U (optional)**

F12-30	1 1/16" - 12 UN
-40	1 5/16" - 12 UN
-60	1 5/16" - 12 UN

O-ring ports according to SAE J514d

 = Max 350 bar operating pressure.

**Mounting flange (SAE J744)**

**Type T**

F12-30	SAE 'B', 2 bolt
-40	SAE 'C', 2 bolt
-60	SAE 'C', 2 bolt

**Spline shaft (SAE J498b, class 1, flat root, side fit)**

**Type S**

F12-30	SAE 'B' 13 T; 16/32 DP
-40	SAE 'C' 14 T; 12/24 DP
-60	SAE 'C' 14 T; 12/24 DP

**Key shaft (SAE J744)**

**Type T**

F12-30	1" dia. SAE 'B-B'
-40	1 1/4" dia. SAE 'C'
-60	1 1/4" dia. SAE 'C'

**F12 integrated flushing valve**

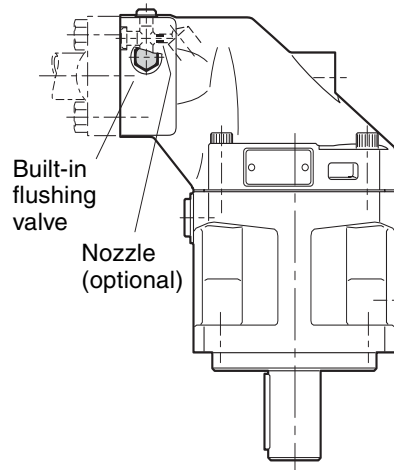
(F12-30, -40, -60 and -80)

Series F12 (except F12-110; refer to the FV13 flushing valve block below) is available with an integrated flushing valve which provides the rotating parts with an additional cooling flow, required when operating at high speeds and power levels.

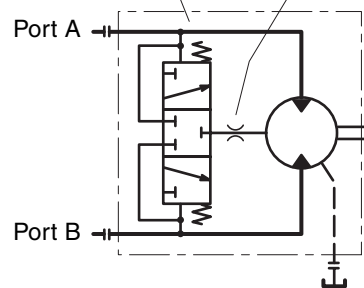
In a hydrostatic transmission, the valve also ensures that part of the main circuit fluid is being removed and replaced by cool, filtered fluid from the charge pump.

The flow is limited by a suitably sized nozzle that installes below a plug in the motor port flange.

**NOTE:** Ordering code, available nozzles and other information is provided in publication 'Mobile motor/pump accessories' (catalogue HY17-8258/UK).



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



**F12 accessory valve blocks**

**Type FV13 flushing valve (for F12-110)**

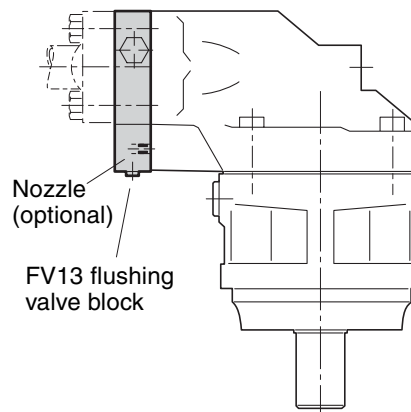
A separate flushing valve block is available for the F12-110. It has the same function as the integrated valve for the other F12 frame sizes (above).

The valve block mounts between the motor port flange and the split flanges as shown to the right.

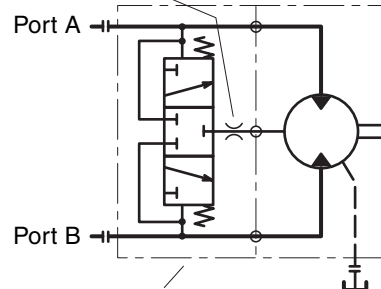
An optional nozzle can be installed in the valve block drain port.

Ordering code: FV13

**NOTE:** Additional information is available in publication 'Mobile motor/pump accessories' (catalogue HY17-8258/UK).



Nozzle (optional)



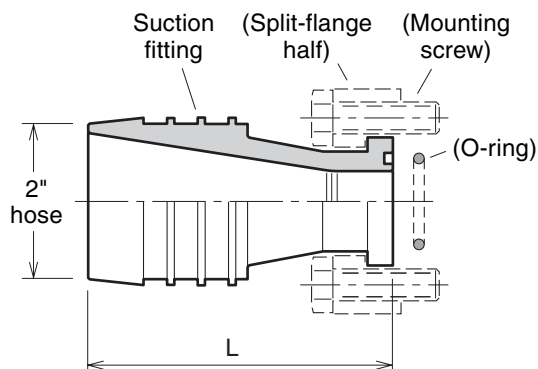
FV13 flushing valve block

### F12 main port suction fittings

#### 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	L [inch]
379 4070	3/4"	F12-30	3.94
		F12-40	
		F12-60	
370 4095	1"	F12-80	3.94
370 3916	1 1/4"	F12-110	4.02



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.

SAE size	O-ring dimension [mm]	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

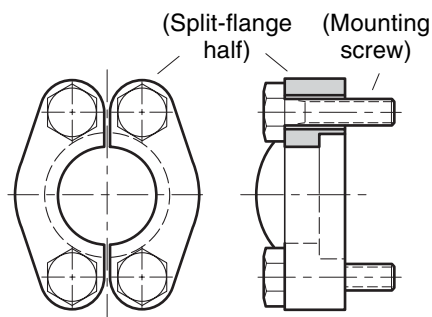
Suction fitting kits are available for the F12 ISO and Cartridge versions. A kit consists of a suction fitting (shown above), two split-flange halves, an O-ring and four mounting screws.

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



# Hydraulics Group Sales Offices

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## **North America**

### **USA, Canada**

100 Parker Drive  
Otsego, MI 49078  
USA  
Tel: +1 269-694-9411  
Fax: +1 269-694-4638

### **Mexico**

Via de Ferrocarril a Matamoros #730  
Apodaca, N.L.  
Mexico  
C.P. 6 6 6 0 0  
Tel: +52 81 56 6000  
Fax: +52 81 56 6076

## **Latin America**

### **Pan American Division**

7400 N.W. 19th Street  
Suite A  
Miami, FL 33126  
USA  
Tel: +305 470 8800  
Fax: +305 470 8808

### **Argentina**

Stephenson 2711  
(1667) Tortuguitas–Malvinas Argentinas  
Pcia. de Buenos Aires  
Argentina  
Tel: +54 11 4752 4129  
Fax: +54 11 4752 3704

### **Brazil**

Av. Lucas Nogueira Garcez  
2181 Jacarei, SP Brazil 12300-000  
Brazil  
Tel: +55 12 354 5100  
Fax: +55 12 354 5262

### **Chile**

Av. Americo Vespucio 2760-C,  
Conchali  
Santiago  
Chile  
Tel: +56 2 623 1216  
Fax: +56 2 623 1421

### **Venezuela**

Av. Principal de Boleita Norte con Calle Miraima,  
Edf. Draza, Planta Baja  
Caracas 1070  
Venezuela  
Tel: +58 212 238-5422  
Fax: +58 212 239-2272

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Catalogue HY17-8249/US  
2M 03/04 RT

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