eREADY PUMPS SERIES F1e/F12e

Fixed Displacement

Parker

eReady

Basic formulas for hydraulic motors

Flow (q)

$$q = \frac{D \times n}{1000 \times \eta_v} \text{ [l/min]}$$

Torque (M)

$$M = \frac{D \times \Delta p \times \eta_{hm}}{63} \text{ [Nm]}$$

Power (P)

$$P = \frac{q \times \Delta p \times \eta_t}{600} \text{ [kW]}$$

D – displacement [cm^3/rev]

n – shaft speed [rpm]

η_v – volumetric efficiency

Δp – differential pressure [bar] (between inlet and outlet)

η_{hm} – mechanical efficiency

η_t – overall efficiency ($\eta_t = \eta_v \times \eta_{hm}$)

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η_t – overall efficiency ($\eta_t = \eta_v \times \eta_{hm}$)

Conversion factors

1 kg	2.20 lb
1 N	0.225 lbf
1 Nm	0.738 lbf ft
1 bar	14.5 psi
1 l	0.264 US gallon
1 cm^3	0.061 cu in
1 mm	0.039 in
1°C	$^5/_9$(°F-32)
1 kW	1.34 hp

Conversion factors

1 lb	0.454 kg
1 lbf	4.448 N
1 lbf ft	1.356 Nm
1 psi	0.068948 bar
1 US gallon	3.785 l
1 cu in	16.387 cm^3
1 in	25.4 mm
1°F	9/5°C + 32
1 hp	0.7457 kW

Content

If you have questions about the products contained in this catalog, or their applications, please contact:
Parker Hannifin EMEA Sàrl European Headquarters
parker.com/msge

GENERAL INFORMATION

Series F12e

F12e is a bent-axis, fixed displacement motor/pump. Based on the proven, robust F12 series with low noise and high self priming speed. It can be used in numerous applications in both open and closed loop circuits. Making it an ideal choice for application where low noise and high pump speed is needed such as electrified applications The F12e series is available in sizes 60, 80, 90 cc/rev.

F12e Features

- Max intermittent pressure up to 500 bar and continuous operating pressure up to 450 bar
- Zero speed capability
- Lower noise operation
- Less pulsation
- SAE versions
- Lower overall weight
- Much more compact installation
- Same mounting flange installation dimensions for all sizes

Series F1e

Featuring a newly developed pump design that prioritizes efficiency while significantly reducing noise and pulsations. This innovative deisgn not only enhances performance but also contributes to a quieter operating envionment. The F1e series is available in sizes 61 and 81 cc/rev.

F1e Features

- Operating pressures up to 400 bar
- Zero speed capability
- Lower noise operation
- Less pulsations
- Small installation dimensions
- Low weight
- ISO versions
- Optimized for right rotation (Clockwise)

General Features

- The laminated piston ring offer s important advantages such as unbeatable efficiency and thermal shock resistance
- High allowable speeds and operating pressures means high output power
- The unique piston locking, timing gear and bearing set-up as well as the limited number of parts add up to a very robust design with long service life and, above all, proven reliability .
- The angles, 40° for F12e and 45° for F1e, between shaft and cylinder barrel allows for a very compact, lightweight pump.
- Small envelop size and a high power-to-weight ratio
- Increased self priming speed and low noise
- Heavy duty roller bearings permit substantial external axial and radial shaft loads
- Improvements in pressure pulsation and high speed capability is ensuring pressure and flow performance at the highest levels of system efficiency together with lower noise emissions.

F12e

SPECIFICATIONS

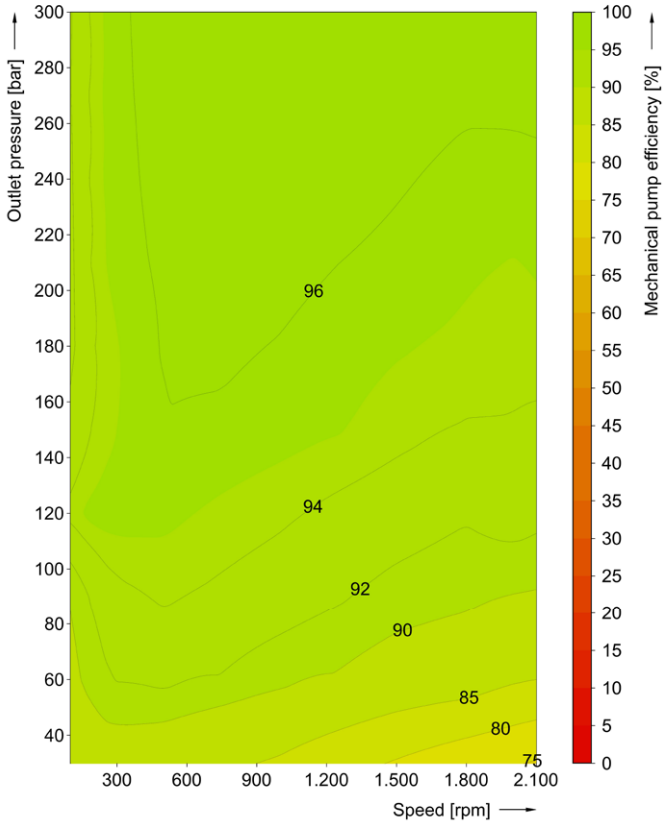
Frame size F12e	-060	-080	-090
Displacement [cm^3/rev]	59.8	80.4	93
Mounting Flange[1)]	SAE C	SAE C	SAE C
Spline	14T, $^{12}/_{24}$ DP	14T, $^{12}/_{24}$ DP	14T, $^{12}/_{24}$ DP
Operating pressure			
max intermittent[2)] [bar]	500	500	420
max continuous [bar]	450	450	350
Max pump selfpriming speed [3)]			
R function; max [rpm]	2800	2500	2500
Min continuous [rpm]	0	0	0
Noise reduction [4)]			
Reduced noise level [dbA]	<-6	<-6	<-6
Pressure pulsation	-40 %	-40 %	-40 %
Max input power [kW]	118	146	109
Mass moment of inertia			
($x10^{-3}$) [kg m^2]	5	8.4	8.4
Weight [kg]	20.2	26.1	26.1

1) Other interfaces avaiable, please contact Parker
2) Intermittent: max 6 seconds in any one minute
3) Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm^2/s (cSt)
4) Compared to standard to F12 series

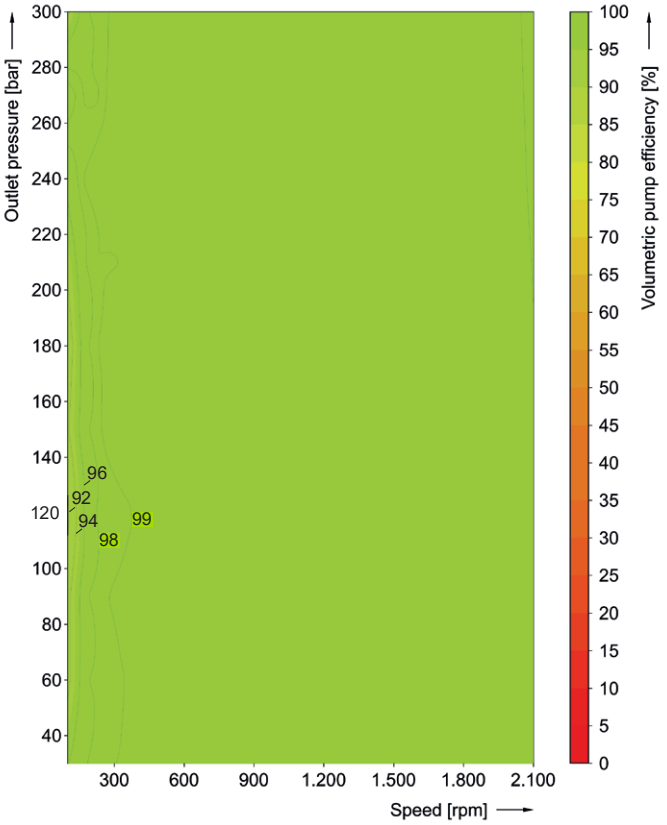
EFFICIENCY

Because of its high overall efficiency, driving a motor/pump from series F12e requires less fuel or electric power. Also it allows the use of a small reservoir and heat exchanger, which in turn reduce cost, weight, and installation size.

Mechanical efficiency of hydraulic unit F12e-080



Volumetric efficiency of hydraulic unit F12e-080

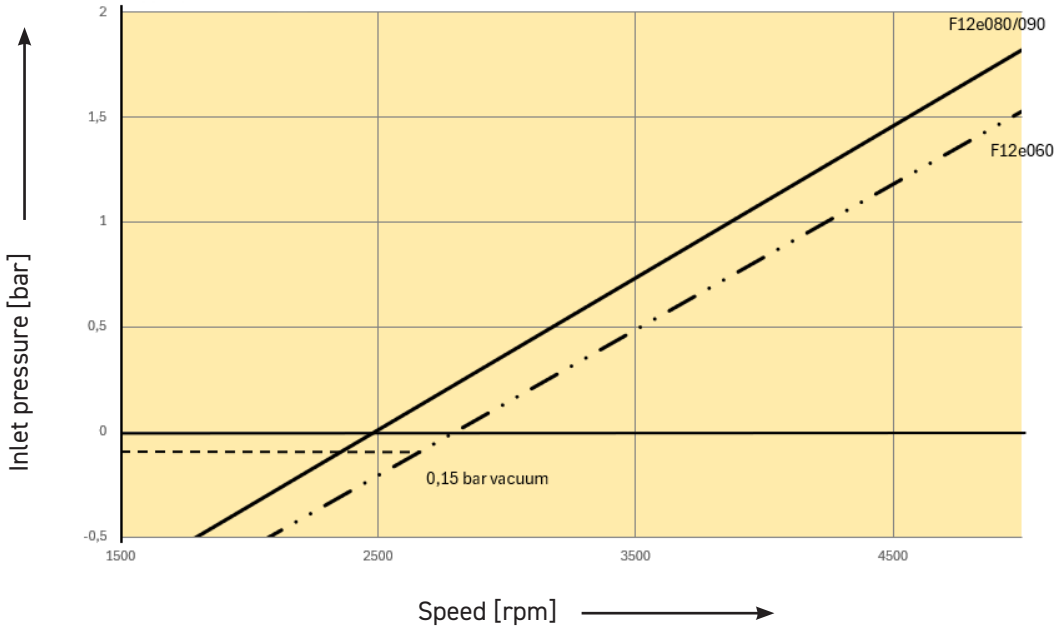


SELFPRIMING SPEED AND REQUIRED INLET PRESSURE

F12e

The F12e has to be pressurized when operating above the selfpriming speed. Increased noise and deteriorating performance may otherwise be experienced.
Diagram below shows minimum required inlet pressure with suction fittings.
Find more info about suction fittings and feederadapter at page 16 & 17.

F12e - SPS (Suction fitting)



For pressures above 3 bar, use suction adapter

ORDERING CODES

F12	E	060	–	R	H	–	S	V	–	S	–	000	–	0000	–	PT
		Frame size		Function	Main ports		Mounting flange	Shaft seal		Shaft		Version number		Option		Option

For options of F12, please see catalogue MSG30-8249/UK

Frame size	
Code	Displacem. (cm^3/rev)
060	59.8
080	80.4
090	93.0

Version number
(assigned for special versions)

Frame size		60	80	90
Code	Option			
0000	Standard	x	x	x
L130	Flushing valve 1.3 mm orifice	(x)	(x)	(x)
P__R [2])	Pressure relief valve clockwise rotation	(x)	-	-
P__L [2])	Pressure relief valve counter clockwise rotation	(x)	-	-

Frame size		60	80	90
Code	Function			
R	Pump, clockwise rotation	x	x	x

Frame size		60	80	90
Code	Main ports			
H	SPS optimized*	x	x	x

* Increased selfpriming speed allows higher rpm without pressurizing the inlet

Frame size		60	80	90
Code	Mounting flange			
S	SAE 4 bolt	x	x	x
R	SAE 4 bolt	-	x	x
T	SAE 2 bolt	x	-	-

Frame size		60	80	90
Code	Shaft*			
S	SAE Spline	x	(x)	(x)
U	SAE Spline	-	x	x

*drawings on pages X.
For other versions, contact Parker Hannifin.

Frame size		60	80	90
Code	Shaft seal			
V	FPM, high pressure, high temperature	x	x	x

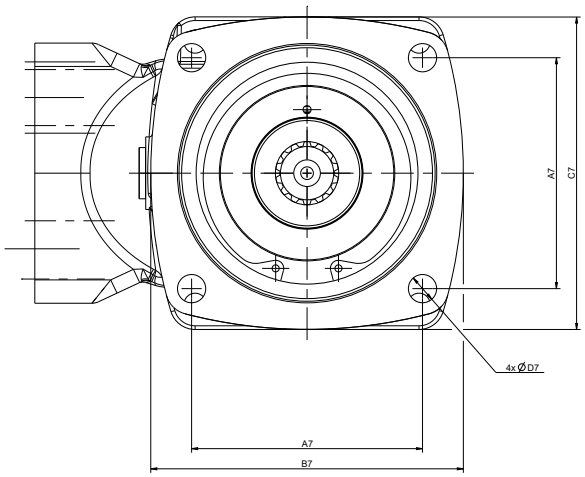
For other versions, contact Parker Hannifin.

Frame size		60	80	90
Code	Option			
P0	Standard, prepared for speed sensor	x	x	x
PT	Prepared for speed sensor and painted black	(x)	(x)	(x)

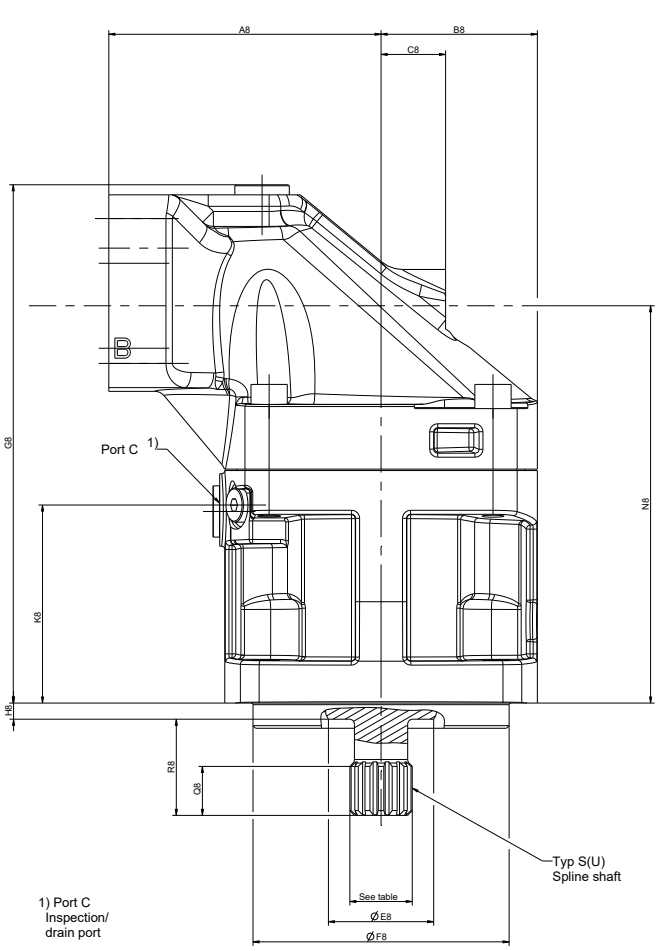
x: Available (x): Optional – : Not available

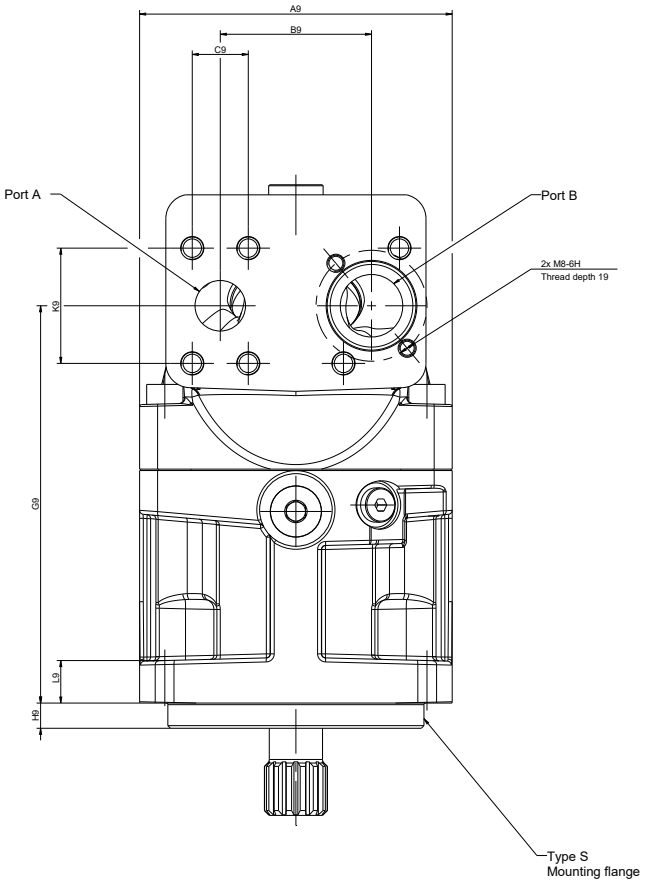
INSTALLATION DIMENSIONS

F12e-60, -80, -90 (SAE versions with 4 bolt flange)



Type S (SAE 4-bolt) mounting flange





NOTE: T he pump does not include a suction fitting; it must be ordered separately. See page 16.

Dim.	F12-60	F12-80 F12-90
A7	114.5	114.5
B7	148	155
C7	144	155
D7	14	14
A8	125	135
B8	70	77.5
C8	22	32
D8	7.94	9.53
E8	45	55
F8	127.00/ 126.94	127.00/ 126.94
G8	232.8	257.1
H8	8	8
J8	48	54
K8	79	95
L8	38.1	44.5
M8	4	4
N8	178.3	197.1
Q8[1)]	27	29
Q8[2)]	-	23
R8[1)]	48	54
R8[2)]	-	48
A9	144	155
B9	66	75
C9	23.8	27.8
D9*	3/8"-24	1/2"-20
E9	31.75/ 31.70	38.10/ 38.5
F9	35.3	42.3
G9	178.3	197.1
H9	12.7	12.7
J9	19	26
K9	50.8	57.2
L9	20	20
T9	-	-

* UNF-2B thread

[1)] Spline shaft type S
[2)] Spline shaft type U
[3)] Max operating pressure 350 bar

Ports	F12-60	F12-80 F12-90
A, B size	3/4"	1"
Screw thread**)	3/8"-16 x22	7/16"-14 x27
C thread	7/8"-14	7/8"-14
D thread	7/8"-14	7/8"-14
E thread	-	-

A, B: ISO 6162

**)UN thread x depth in mm.

Mounting flange (SAE J744)

	S (standard)	R (optional)
F12e60	SAE "C", 4 bolt	-
F12e80	SAE "C", 4 bolt	SAE "D", 4 bolt
F12e90	SAE "C", 4 bolt	SAE "D", 4 bolt

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

	S	U
F12e60	SAE 'C' 1 4T , 12/24 DP	-
F12e80	(x)	SAE 'C-C' 17T, 12/24 DP[3)]
F12e90	(x)	SAE 'C-C' 17T, 12/24 DP[3)]

	Main ports
Ports	Pressure port
F12e60	1 5/16" - 12 UN[3)]
F12e80	1 5/16" - 12 UN[3)]
F12e90	1 5/16" - 12 UN[3)]

F1e

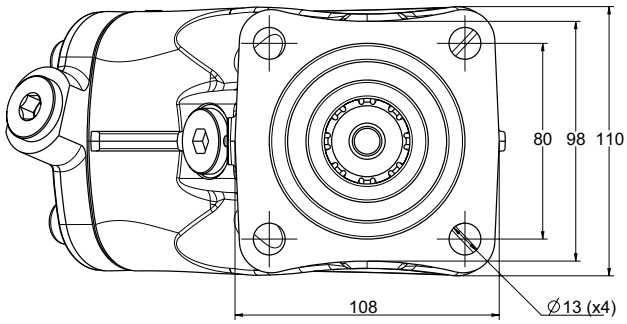
SPECIFICATIONS

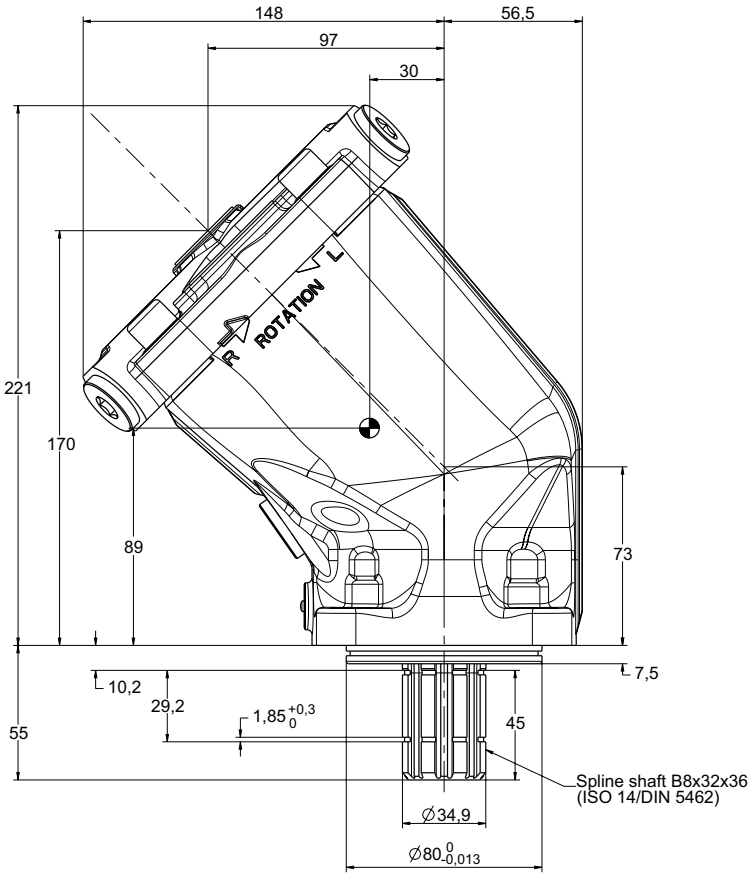
Frame size F1e	-061	-081
Displacement [cm^3/rev]	59.5	81.7
Interface [1)]		
Flange	ISO 7653	ISO 7653
Spline	B8x32x36 (ISO 14/DIN 5462)	B8x32x36 (ISO 14/DIN 5462)
Operating pressure		
max intermittent[2)] [bar]	400	400
max continuous [bar]	350	350
Max pump selfpriming speed [3)]		
R function; max [rpm]	2400	2200
Min continuous [rpm]	0	0
Noise reduction [4)]		
Reduced noise level [dbA]	<-6	<-6
Pressure pulsation	-40 %	-40 %
Max input power [2)][kW]	83	105
Mass moment of inertia		
($x10^{-3}$) [$kg\ m^2$]	2.57	5.32
Weight [kg]	9	13

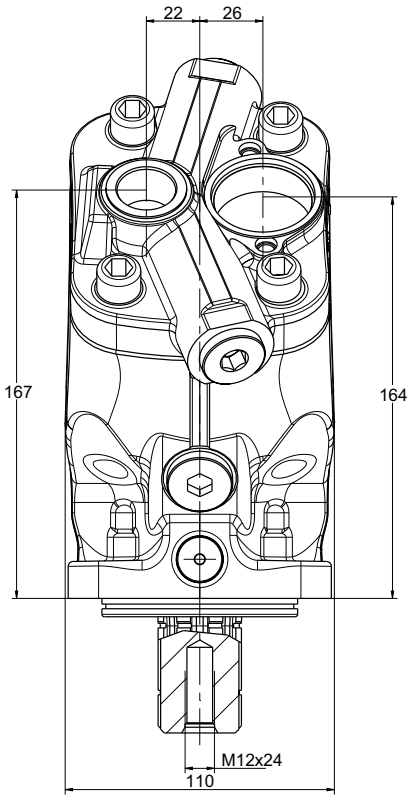
1) Other interfaces avaiable, please contact Parker
2) Intermittent: max 6 seconds in any one minute
3) Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm^2/s (cSt)
4) Compared to standard F1 series

INSTALLATION DIMENSIONS

F1e-61







ORDERING CODE

Example:
F1 frame size
61

Shaft rotation
R right hand

F1e61-R

Standard versions

Designation	Ordering no.
F1e61-R	3725206

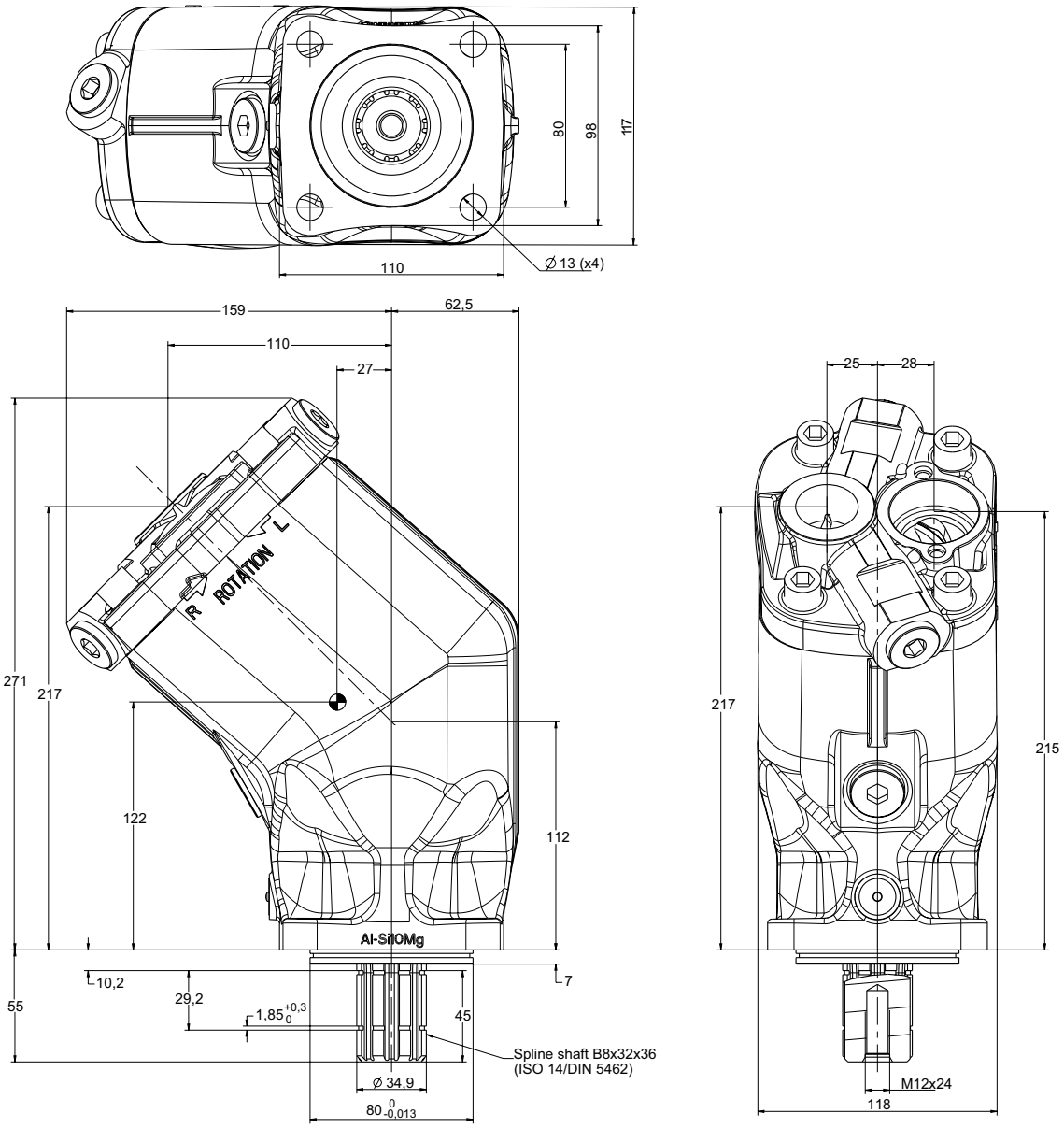
Port size

F1e frame size	Pressure port [1]
F1e61	¾ ''

[1] BSP thread (fitting not included)

NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See page 16.

F1e-81



Standard versions

Designation	Ordering no.
F1e81-R	3725207

Port size

F1e frame size	Pressure port [1]
F1e81	1 ''

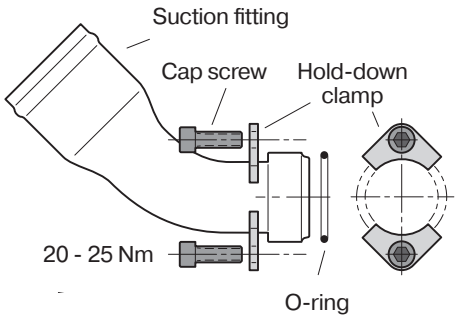
[1] BSP thread (fitting not included)

NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See page 16.

SUCTION FITTINGS FOR SERIES F1e AND F12e

NOTE: A suction fitting must be ordered sepa- rately (not included with the pump).**To choice the correct dimension of suction connection, see MSG30-8200/UK.**

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



'Straight' suction fittings for F1e and F12e

Ordering no.	A mm	B mm	ØC dia. mm (in.)
378 0635[1)]	0	85	38 ($1^1/_2$")
378 0636[2)]	17	136	50 (2")
378 0637[3)]	25	145	63 ($2^1/_2$")
378 3523[3)]	32	174	75 (3")

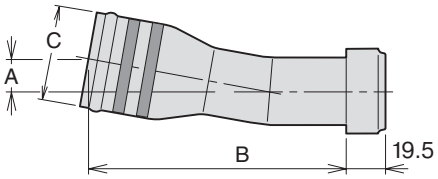
45° suction fittings for F1e and F12e

Ordering no.	A mm	B mm	ØC dia. mm (in.)
378 1234[1)]	60	104	32 ($1^1/_4$")
378 0633[1)]	60	104	38 ($1^1/_2$")
378 0364[2)]	67	110	50 (2")
378 0634[3)]	75	117	63 ($2^1/_2$")
378 3367[3)]	95	138	75 (3")
378 1062	67	110	40
378 0975	67	110	45

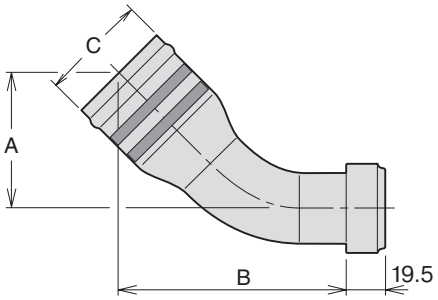
90° suction fittings for F1e and F12e

Ordering no.	A mm	B mm	ØC dia. mm (in.)
378 0978[1)]	126	83	38 ($1^1/_2$")
378 0979[2)]	135	83	50 (2")
378 1980[3)]	147	83	63 ($2^1/_2$")
378 0976	135	83	45
378 8690[3)]	185	83	75 (3")

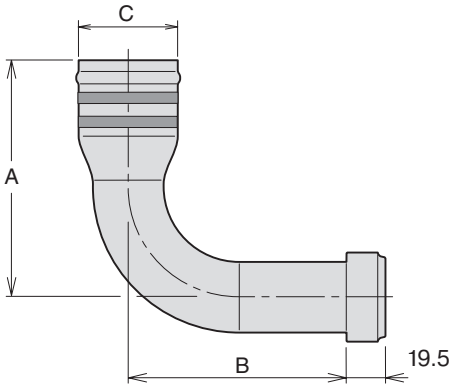
'Straight' fitting



45° fitting



90° fitting



Important installation info. Series F1e

Use the correct size suction fitting Flow.
Flow speed [m/s] at indicated line size [mm/in]

[l/min]	25 / 1"	32 / $1^1/_4$"	38 / $1^1/_2$"	51 / 2"	64 / $2^1/_2$"
25	*0.8*	*0.5*	*0.4*	*0.2*	*0.1*
50	1.7	*1.0*	*0.7*	*0.4*	*0.3*
75	2.5	1.6	1.1	*0.6*	*0.4*
100	3.4	2.1	1.5	*0.8*	*0.5*
150	5.1	3.1	2.2	1.3	*0.8*
200	-	4.1	2.9	1.6	1.1
250	-	5.3	3.7	2.1	1.3

Inlet (suction) line

Outlet (pressure) line

Max Q [l/min]		Min Ø	
Suction port Sauganschluss Orifice d'aspiration	60	38 mm	*($1^1/_2$")*
	120	50 mm	*(2")*
	150	63 mm	*($2^1/_2$")*
	185	75 mm	(3")

Spare parts

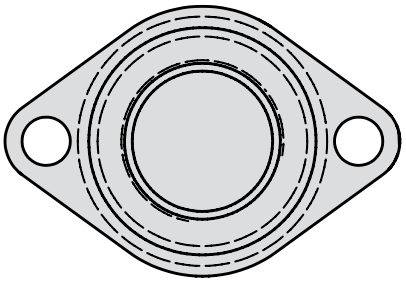
Additional Hold-down-clamp kit consists of:
hold-down-clamp cap screw and O-ring
Ordering no. 378 1321

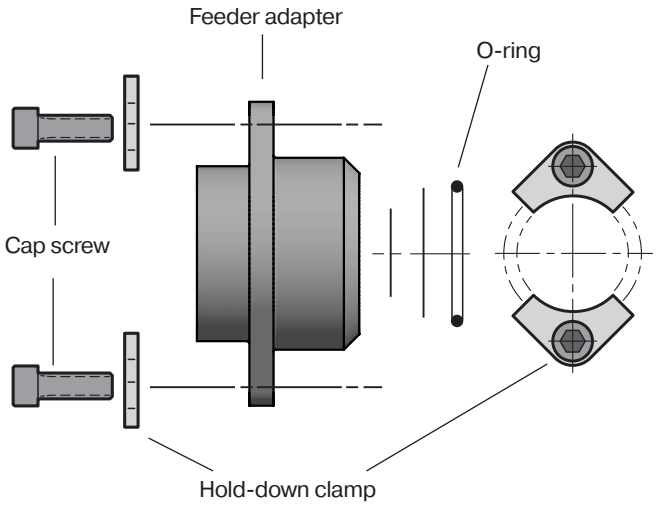
FEEDER ADAPTER FOR SERIES F12e

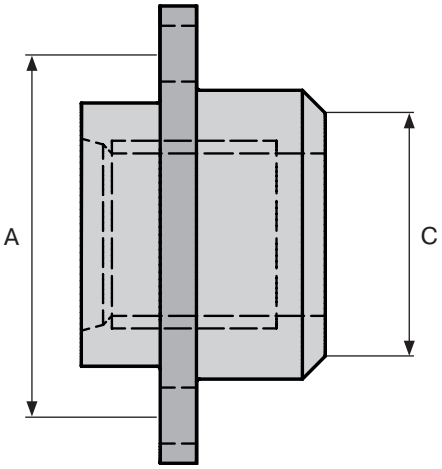
For boost pressure over 3 bar, use the following feeder adapter.

Feeder adapter for series F12e

Ordering no.	Dimensions		
	A mm	B mm	ØC dia. mm (in.)
3725261	55	37.1	40 ($1^1/_2$")

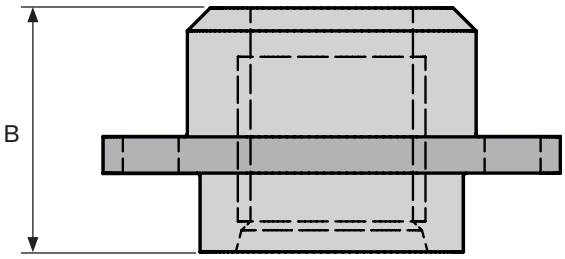






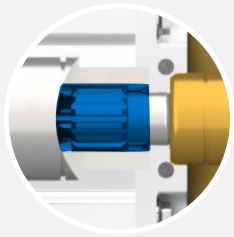
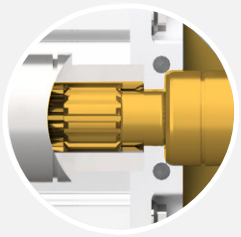
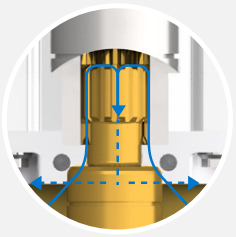
Spare parts

Additional Hold-down-clamp kit consists of:
hold-down-clamp cap screw and O-ring
Ordering no. 378 1 321



SPLINE LUBRICATION TECHNOLOGIES FOR ePUMPS

Within the direct connection approach, there are three primary lubrication types. The ultimate selection will depend on the application's needs.
Parker's Patent Pending Maintenance-free spline delivers the best solution when maintenance is to be avoided.
It will give the machine and its user the longest life without costly and bothersome maintenance. Refer to the chart below for a complete overview of each spline lubrication.

	GOOD	BETTER	BEST
	Greased Spline	Wet Spline	Parker's Maintenance-Free Spline (Patented)
DESCRIPTION	 A greased lube closed connection	 Oil-bath lubed open spline connection	 Oil flow created to actively lubricate the spline connection
MAINTENANCE	• Requires re-greasing • Maintenance interval dependent on the application and duty cycle	• Maintenance may be required • Frequency is dependent on application	• Maintenance-free
MOUNTING OPTIONS	Horizontal & Vertical	Horizontal	Horizontal & Vertical
LONGEVITY	★	★★	★★★

Case pressure required for spline lubrication technologies for ePumps

The service life of the shaft seal ring is affected by the can decrease with an increase in the frequency of pressure peaks.
Note, seal life can be shorter at unfavourable operating conditions (high temperature, low oil viscosity , contaminated oil).
The table below shows recommended case pressure as a function of shaft speed.
The case pressure must be equal to or greater than the speed of the motor and the case drain pressure and it external pressure on the shaft seal ring.

To secure correct case pressure and lubrication, a spring loaded check valve, 1– 3 bar, in the drain line (shown on next page) is recommended.

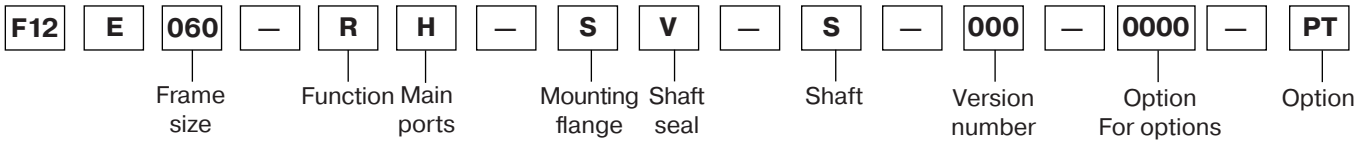
Note: Contact Parker Hannifin for information when operating at high speeds.

Viscosity

The ideal operating range is 15 to 30 mm2/s [cSt]. At operating temperature, the viscosity (of the drain fluid) should be kept above 8 mm²/s [cSt].

At start-up the viscosity should not exceed 1000 mm²/s [cSt].

How to order spline lubrication techonologies



Frame size		60	80	90
Code	Option			
0000	Standard	x	x	x
G00	Greased spline	(x)	(x)	(x)
W00	Wet spline	(x)	(x)	(x)
M00	Maintenance free spline	(x)	(x)	(x)

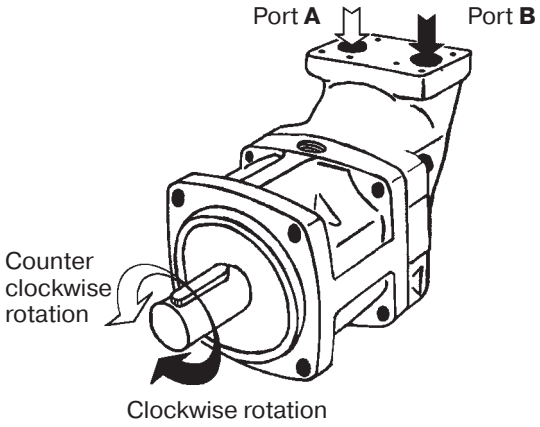
INSTALLATION INFORMATION

Direction of rotation

The ePump versions are uni-directional, allowing higher selfpriming speeds.

The illustration to the right shows direction of flow versus shaft rotation.

When the shaft turns clock-wise, port B is the inlet port and should be connected to tank.



Hydraulic fluids

Ratings and performance data for series F12e are based on operating with good quality , contamina-tion-free, petroleumbased fluids.

Hydraulic fluids type HLP (DIN 51524), automatic trans-mission fluids type A, or API CD engine oils can be used.

Fire resistant fluids (when used under modified operat-ing conditions) and synthetic fluids may also be suitable.

NOTE:
When operating the F12e above the selfpriming speed, the inlet must be sufficiently pr essurized. Increased noise and deteriorating perfor-mance may otherwise be experienced.

For further information refer to 'Selfpriming speed and required inlet pressure' on pages X, X and X.

Operating temperature

The following temperatures should not be exceeded (type **V** FPM shaft seals):

Main circuit 80 °C

Drain circuit: 15 °C.

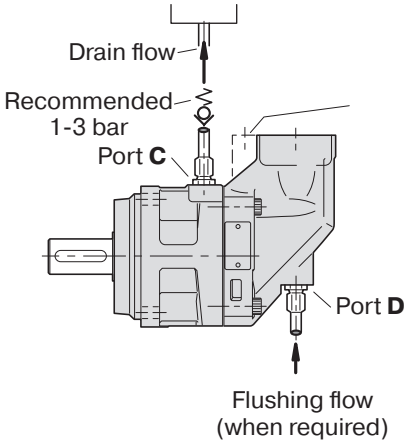
NBR shaft seals (type **N**) can be used to 90 °C drain fluid temperature.

NOTE: The temperature should be measured at the uti-lized drain port. Continuous operation may require case flushing in order to meet the viscosity and temperature limitations.

Case drain connections

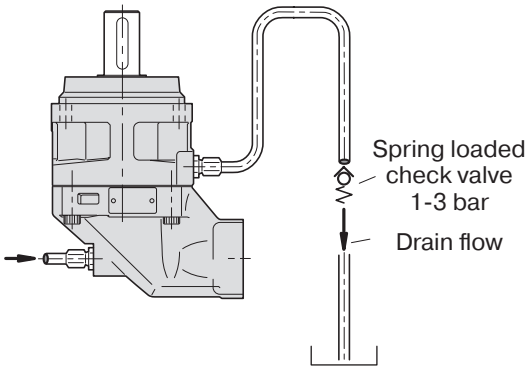
Series F10/F11/F12 have two drain ports, **C** and **D**, while F10-125, F12- 110 and -125 have an additional port, **E**.

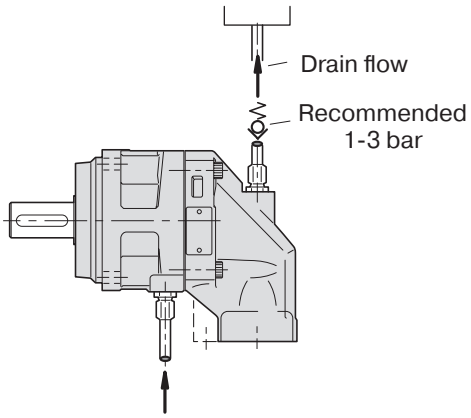
The uppermost drain port (such as port C in the illustration below) should always be utilized.

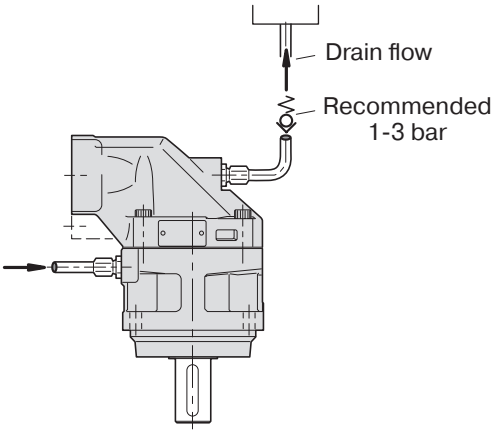


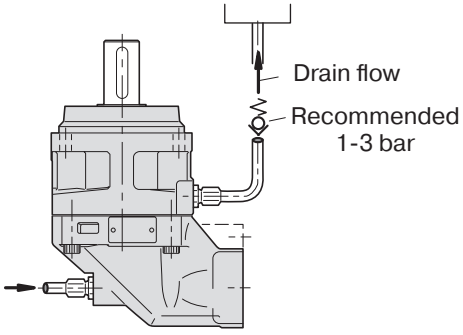
In mounting positions such as 'shaft up' (below) a spring loaded check valve should be installed in the drain line in order to insure a sufficiently high oil level in the case.

Preferably, the drain line should be connected directly to the reservoir.









Before start-up

Make sure the F12e case as well as the entire hydraulic system is filled with a r ecommended fluid.

The internal leakage, especially at low operating pressures, is not sufficient to provide lubrication at start-up.

NOTE:

- To avoid cavitation and obtain a low noise level as well as reduced heat generation, tubes, hoses and fittings must be adequately dimensioned.
- Preferably, the suction line flow speed should be 0.5 to 1 m/s, and pressure line flow speeds 3 to 5 m/s.

NOTES

Scan for Catalogue Boost Unit
Series BLA, MSG30-8224/UK

Scan for Catalogue Hydraulic
Saw Motor - Series F11/F12, MSG30-8245/UK

Scan for Manual Speed Sensor
Series F10/F11/F12 and V12/V14, Valid for
sensor 3785190, MSG30-8301-INST

Scan for Installation & Startup Manual
Series F10/F11/F12, MSG30-8205-INST/EU

Scan for Manual Speed Sensor
Series F10/F11/F12 and V12/V14,
Valid for sensor 3722480, MSG30-8304-INST

Scan for Manual Speed Sensor
Series F10/F11/F12 and V12/V14,
Valid for sensor 3783883, MSG30-8302-INST

Scan for Manual Speed Sensor
Series F10/F11/F12 and V12/V14,
Valid for sensor 3722481, MSG30-8303-INST

Scan for
Noise Installation Guideline

WARNING – USER RESPONSIBILITY

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

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