



Product Description



Flow volume: 310 - 2900 l/min

Max differential pressure: 16 bar

Applications: Circulation, lubrication and transfer

ALSO VALID FOR PUMP SERIES UCF Generation 5

1. Applications

1.1 Functionality

The ACF/UCF pumps are used for a number of different fluids:

Lubrication oil, fuel oil, vegetable oil, hydraulic oil and any non-aggressive fluid with sufficient lubricating properties.

If requested, the ACF/UCF pump may be certified according to any of following classification societies: DNV, BV, LRS, ABS, RS, GL, RINA, KR, NK, RMR or CCS.

Accuracy of performance according to VDMA 28284 group 2.

1.2 Applications

Typical applications are:

- Lubrication of diesel engines, gears, gas and steam turbines, hydro turbines and paper machines
- Main and prelube for diesel engines
- Circulation for cooling and filtration in large machineries and hydraulic systems
- Transformer oil for insulation in transformers
- Transfer onboard vessels, in power plants, oil factories, refineries, tank farms etc
- Filling of pressure chambers in hydraulic presses

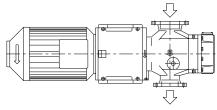
1.3 Installation

The pump is designed to be flange-mounted to its electric motor via a connecting frame and a flexible shaft coupling. By the connecting frame, the pump may be installed both horizontally and vertically. For vertical installations, a stand called TRIPOD can be supplied.

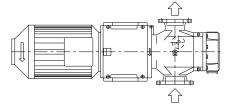
For pipe connections, standard for ACF series is DIN-type. For UCF, the standard is ANSI. Note that for UCF, a version for vertical installation with feet are available (version xxFx). See section Pump Model code

As standard the pump is delivered with the discharge side to the left when seen from the pump rear end (see below).

For more information about installation, see Installation and Start-up instruction for low pressure pumps.



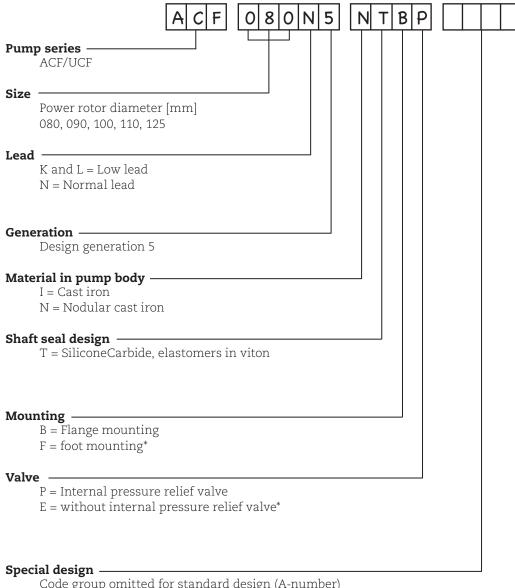
Mounting standard picture M93-0.



On request the pump can be delivered with opposite flow direction, M39-0.

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2. Pump model code



Code group omitted for standard design (A-number) and/or numbering code

Std - without flanges included

001 - flanges included

002 - with TRIPOD, without flanges

003 - with TRIPOD and flanges

*Only valid for UCF series

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3. Technical Data

3.1 Pressure Information

Pressure relief valve

The pump is equipped with an internal pressure relief valve with internal return, limiting the differential pressure across the pump and protecting the pump. Should the discharge line be blocked, the relief valve will open by the pressure. The valve is adjustable for different opening pressures.

The value of the pressure limit can be set at the factory and should be adjusted at installation (see Installation & Start-up instruction for low-pressure pumps).

The maximum pressure accumulation varies with pump size, speed and viscosity, but will normally not exceed 5 bar.

The valve has a maximum set pressure of 16 bar.

Inlet pressure

Minimum inlet pressure (suction capability) is dependent on fluid viscosity and rotation speed. It increases with decreasing viscosity and decreasing speed. Information about minimum inlet pressure for each individual duty case can be obtained from IMO AB or pump selection software WinPump.

Maximum inlet pressure is 7 bar.

Discharge pressure

Maximum discharge pressure is 16 bar.

Differential pressure

Maximum differential pressure is 16 bar but reduced at low viscosities according to table below

Viscosity [cSt] 1,4 2 6 10 >38 Max. diff. pressure [bar] 4,3 5 7,7 9,5 16

Refer to your IMO representative or use the pump selection software WinPump to determine the exact operating limits.

3.2 Driver information

Driver type

The pump is designed to be connected to an electrical motor via a flexible shaft coupling.

Under certain conditions, other types of drive can be permitted, e.g. gear or pully drives, which create radial loads onto the shaft end.

For radial load requirements, contact IMO AB.

Speed

The maximum speed is 1800 rpm. Maximum operating speed may be reduced depending on inlet conditions. Contact IMO or use the pump selection software WinPump to find a corresponding speed limit in order to avoid cavitation problems. For information about cavitation see section IMO Tuning.

Rotation

The pump is designed to operate in one rotational direction only, as standard clockwise when facing the shaft end. Pumps for CCW operation can be delivered on special request. For shorter periods of time, a few minutes for emptying a discharge line, the pump may be operated in reverse direction, provided the back pressure is limited to 3 bar.

3. Technical Data

3.3 Sound level

Typical pump sound levels refer to free field conditions at a distance of 1 m from the pump. Noise of driver excluded in the quoted figures. The sound levels are measured at a discharge pressure of 7 bar, speed 1450 rpm and viscosity 37 cSt.

Pump Size 080 090 100 110 125 Sound level dB[A] 73 74 75 76 77

3.4 Moment of Inertia

Size 080 090 100 110 125 [10⁻³ kgm²] 5,3 8,2 17,2 24,6 43,9

3.5 Fluid viscosity

1,4 - 5000 cSt.

3.6 Fluid temperature

Cast Iron version (Ixxx): -20 - +90 °C

Nodular Cast Iron version (Nxxx): -20 - +130 °C

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4. Design

4.1 Ball bearing

The pump is fitted with internal ball bearing which continuously is being greased by the handling media.

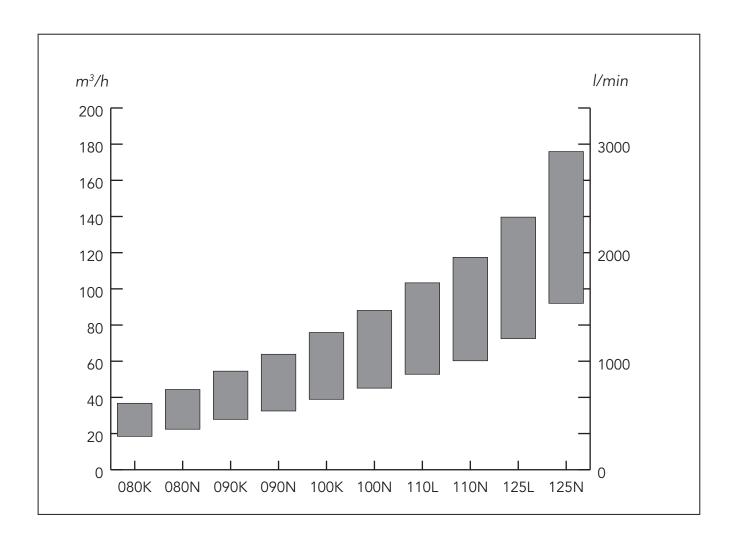
4.2 Material & design

Model	Material pump	Material rotor	Material idler	Material seal	Material Elastomers
ACF I/ UCF I	Grey cast iron	Structural steel, surface treated	Structural steel, surface treated	SiliconCarbide (SiC/SiC)	Viton
ACF N/ UCF N	Nodular (duc- tile) cast iron	Structural steel, surface treated	Structural steel, surface treated	SiliconCarbide (SiC/SiC)	Viton

For handling of fluids which may be aggresive to above materials, consult IMO AB.

5. Performance Guide

Typical performance values at 5 bar Flow calculated at 26 cSt, power at 260 cSt.

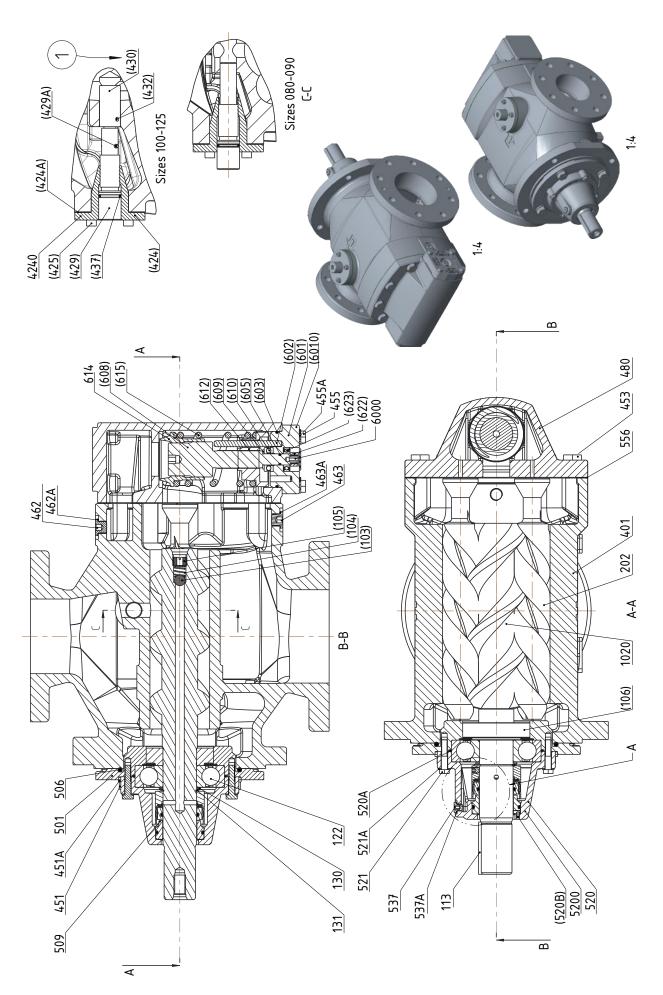


rpm	080K l/min	kW	080N l/min		090K l/min		090N l/min	kW
950	308	4,7	373	5,7	464	6,9	541	8,1
1150	384	5,9	465	7,1	575	8,6	672	10,2
1450	498	7,8	602	9,4	742	11,4	868	13,4
1750	612	9,8	739	11,8	908	14,3	1 064	16,8
	100K		100N		110L		110N	
rpm	l/min	kW	l/min	kW	l/min	kW	l/min	kW
950	649	9,5	752	11,1	880	9,5	1 004	11,1
1150	803	12,0	931	13,9	1 090	12,0	1 242	13,9
1450	1 034	15,8	1 200	18,4	1 406	15,8	1 600	18,4
1750	1 265	19,9	1 468	23,1	1 722	19,9	1 957	23,1
	125L		125N					
rpm	l/min	kW	l/min	kW				
950	1 208	9,5	1 533	11,1				
1150	1 488	12,0	1 883	13,9				
1450	1 908	15,8	2 407	18,4				
1750	2 328	19,9	2 932	23,1				

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6. Sectional view



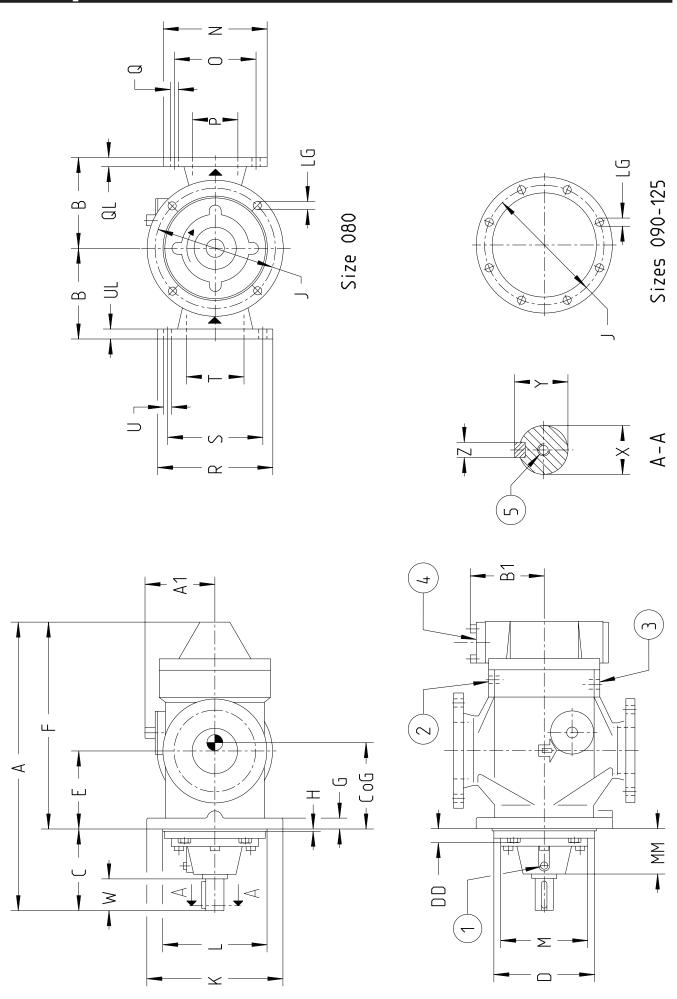
7. List of Components

ion			gnld	her					Complete valve element	alve cover				le		h. C	nut	٦	b0		b ^o
Pos No Denomination		lension pin	Deaeration plug		O-ring	Screw	Washer	Gasket	Complete va		Pin	O-ring	O-ring	Valve spindl	Washer	Ball bearing	Regulating nut	Valve piston	Valve spring	Nut	Ball Bearing
Pos N	, C C C C	(220B)	(537)	(537A)	520A	521	521A	256	0009	(6010)	(602)	(603)	(602)	(809)	(609)	(610)	(612)	(614)	(615)	(622)	(623)
Pos No Denominat	(Screw	Washer	Screw	Screw	Washer	Plug	Sealing washer	Plug	Sealing washer	Valve housing	Front cover	O-ring	Complete shaft seal	Stationary seat	Stationary seat O-ring	Seal ring	Seal ring carrier	Seal ring O-ring	Complete cover	Cover
Pos No	ŗ	45I	451A	453	455	455A	462	462A	463	463A	480	501	909	509	S1	S2	S4	S5	S6	5200	(520)
Pos No Denomination		Complete power rotor	Ball	Spring	Hole	Balancing piston	Key	Ball bearing	Support ring	Retaining ring	Idler rotor	Pump body	Complete tuning element		Gasket		Guiding screw	Tension pin	Piston	Tension pin	O-ring
Pos N	0	070I	(103)	(104)	(105)	(106)	113	122	130	131	202	401	4240	(424)	(424A)	(425)	(429)	(429A)	(430)	(432)	(437)

Notes: - Components with Pos No within parenthesis are parts of subassembly

Drawing remarks: (1) Applicable for sizes 100-125

8. Pump Dimensions



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8. Pump Dimensions

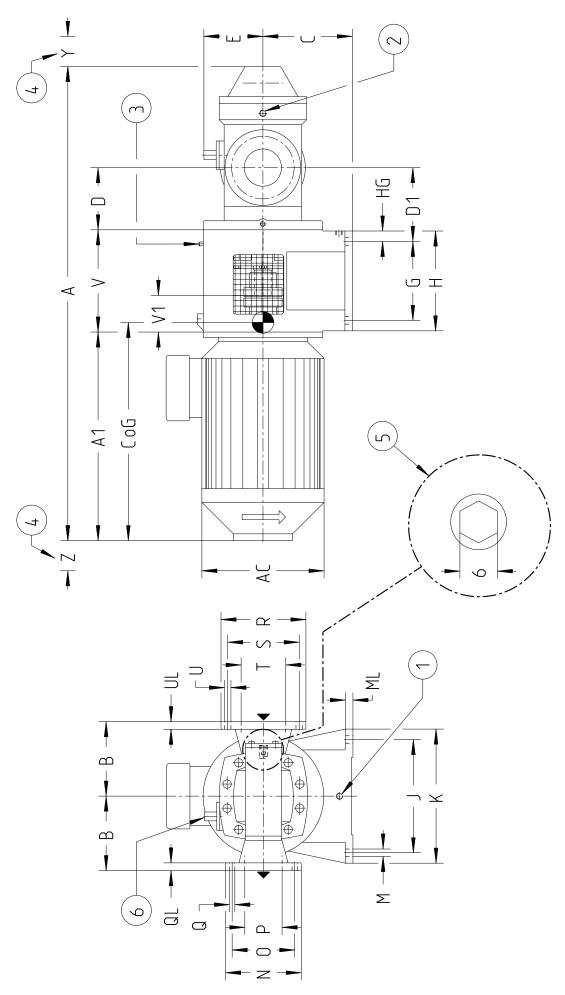
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Dimensions in mm
Dimension A1 is a maximal value
Weight is an approximate value
Counter flanges according to:

ACF = DIN2633/ND16 UCF = ASME B16.5 150#

Tolerances ISO h7 Tolerances ISO j6 1)

(4) Relief valve. Turn clockwise to increase opening pressure (5) 5/8" UNC. Depth 32 Drawing remarks:
(1) Deaeration plug
(2) Inlet gauge. ISO G3/8
(3) Outlet gauge. ISO G3/8



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9. Pump Unit dimensions

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	500	115 600	630	_	675	145 690	8	165 77	11	145 76	73	2 190	18E 7C		810	145 82	77	165 80	_	691	840	145 900	860	165 890	185 800
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Pump	Size		080	1							100												101		

Dimensions in mm
 Dimensions valid for standard motors from IMO AB
 Weight is an approximate value

(4) Space for dismantling
(5) Relief valve. Turn clockwise to increase opening pressure. Use hexagon head socket screw key= 6 mm
(6) Control for Tuning

Drawing remarks:
(1) Drain connection. ISO G1/2
(2) Outlet gauge ISO G3/8.
Other side: Inlet gauge ISO G3/8

(3) Deaeration plug

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10. Accessories

A bare shaft pump (Fig. 1) can be ordered with the accessories in fig. 2-7.



Fig. 1 Bare shaft pump



Fig. 2 Set of counter flanges



Fig. 3 Connecting frame



Fig. 4 Electric motor



Fig. 5 Shaft coupling



Fig. 6 Tripod



Fig. 7 Gauge panel

11. Maintenance and Service

Spare parts for these pumps are easily available from stock. For detailed information and know-how about service, see the Maintenance & Service Instruction for ACF5/UCF5 pumps or contact IMO AB.

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12. IMO AB Tuning

The tuning® valves, which are standard on the ACF/UCF series, make it possible to pump oil containing free air, with a minimum of disturbing vibration noise.

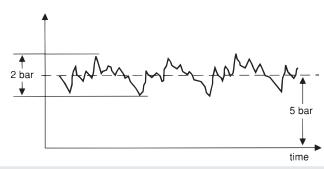
Low volume lube oil systems and additives that prolong deaeration time are the main reasons for having an excessive amount of free air in the oil. Free air is the main source of vibration and noise in pump systems as the air entrained oil is compressible and air bubbles expands and decreases in size very rapidly. By throttling the tuning® valve, the correct amount of fluid, depending on air content and pressure, is fed from the pressure side into the rotor bores.

The effect this has on the air bubbles is that they will gradually decrease in size rather than collapse when exposed to the full pressure on the discharge side.

12.1 Effect of tuning® Pressure fluctuations

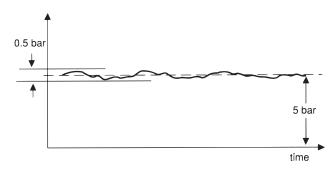
Without tuning

Pressure fluctuations are rapid and cover a wide band which produces a loud ratting noise.



With tuning

Pressure fluctuations are highly reduced in speed and magnitude leading to low noise level. Diagram refers to tests at 1800 rpm, delivery pressure 5 bar, inlet pressure -0,5 bar, viscosity 75 cSt and 6 % free air.



The two tuning® valves on the pump are easily adjusted individually (by turning the tuning spindles with an Allen key to a position where the noise level comes to a minimum) while the pump is working under normal operating conditions.

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