

# Operating instructions

FPOD, FPOG, FPOJ, FPON, FPOS 65 - ...

⟨Ex⟩ || 2G cT3



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#### **Proper use**



People and material may be put at risk in the event of any deviation from the intended form of application. The limits contained in these instructions may not be exceeded.

The vane pump is used to pump low-viscosity mineral oil products and non-corrosive and/or suspension-free liquids up to a viscosity of approx. 76 cSt (up to 500 cSt with positive actuation of the vanes). It is resistant against E 85, bio diesel and vegetable oil and is suitable for installation in zone 1 according CD 1999/92/EG.

Measures for explosion proofness:

These operating instructions describe the necessary measures for safe operation (e.g. prevention of excessive temperature, excessive run time of dry pumping).

If this can not be assured, additional measures shall be taken (e.g. deactivation by temperature switch, safeguarding the connected systems by flame arrestors).

Each modification of the vane pump and every alteration of the use, that was arranged at the sale, requires consultation with Alfons Haar.



Type code	FPO	СН	D	65	-	407	Ζ	R	X1	- P	A 1	.8
Vane type pump with connections on top for vertical installation position, integrated by-pass valve												
Usage												
w/o: Standard (for mineral oil, E 85, bio diesel,												
vegetable oil)												
ST: Stationary (housing material GGG 50)												
Shaft design (dimensional)												
D: Free cylindrical drive-shaft end with												
feather key on both side												
(special design)												
feather key and drive-shaft end for												
hydraulic pump HyZFS												
J: Shaft end for drive with hydraulic motor												
MZFS												
hydraulic motors MZES												
S: Shaft end with internal toothing for												
HyPOWER motor												
Nominal hore of suction and discharge side												
Norminal bore of succion and discharge side												
Theoretical volumetric flow									ア			
(Litres / 1000 rotations or cm <sup>3</sup> / rotations)					_							
Positive actuation of the vanes							N°					
w/o: without positive actuation												
Z: with positive actuation of 6 vanes						<b>)</b>						
Direction of rotation (as seen on drive-shaft)				$\bigcirc$	•							
R: Clockwise directional rotation			5	$\sim$								
			$\sim$									
Operation temperature range	·	$\mathbf{O}$	Ť									
V: -15 to +70°C (standard)												
X1: -32 to +70°C (low temperature)												
By-pass valve												
P: pneumatic												
M: mechanical												
Pump pressure (depending on pressure												
spring in the by-pass valve)												
pneumatic (e.g.):												
(PA) 1.8: By-pass valve with pressure spring 1.8 k	bar											
(PB) 3.0: By-pass valve with pressure spring 3.01	bar											
mechanical (fixed setting):												
(MC) 3.5: By-pass valve with pressure spring 3.5	bar											
(MC) 6.5: By-pass valve with pressure spring 1.8	bar											

(MC) 8.0: By-pass valve with pressure spring 8.0 bar

(MC) 10.0: By-pass valve with pressure spring 10.0 bar

\* Shaft design *G* replaces shaft design *C* 

\*\* Shaft design *N* only with positive actuation of the vanes

Technical data	Speed:	n <sub>max</sub> n <sub>min</sub>	= 1700 rpm = 500 rpm
	with pos. actuation of vanes:	n <sub>min</sub>	= < 500 rpm
	Viscosity: with pos. actuation:	$ u_{max}$ $ u_{max}$	<ul> <li>76 cSt</li> <li>500 cSt (higher viscosity on request)</li> </ul>
	Nominal pressure:	PN	= 10 bar
	Max. pressure difference (continuous operation)	Δр	= 10 bar
	Temperature range: (Temperatures up to -32 °C and with Alfons Haar)	t d in exce	= - 15 °C to + 70 °C ess of 70 °C in consultation
Application notes	Operating pressure (Pneumatio	:)	= 3 to 5 bar
Installation position:	The shaft of the pump is to be maximum permissible inclination The housing can be aligned to upright or horizontally.	positione n is 5°. suit; the	ed horizontally; the pump can be installed
Intake characteristic:	Because of their very good inta pumps are well suited for self-f tanks.	ke chara Iling veh	acteristics, vane-type nicles using underground
Residual drainage:	The special positive-displacement possible to empty the system p chamber volume level without of pump, e.g. when changing prod	ent char ractically using an ducts.	acteristics mean that it is y down to the measuring additional discharge
Pneum. control:	The pneumatic control on the c influence the pump pressure an (See: Bypass valve control)	overflow nd volum	valve can be used to netric flow.



#### Dimensions

FPOD 65- ... R / P ...







FPOJ 65- ... R (L) / MC ...

For other fitting positions: Lubricating nipple must face upwards! (unscrew cover, turn cover and fasten it again)



Journal on this side







### FPOS 65- ... R - P ... -0 with HyPOWER Motor 17 / 25 / 34



















### Net positive suction head



### Viscosity of the medium: 12 cSt



### Flow control

A compressed air control can be applied for continuous adjustment of the rate of flow.



Installation	
Preparation:	
	Remove all transport packaging.
	Check pump for signs of any external transportation damage.
Installation position:	
	Install pump stress-free in horizontal shaft bearing. Deviations of 5° to the horizontal are permissible.
	The pump can be installed upright, hanging or horizontally.
	In the event of horizontal installation the housing covers must be turned in the way that drainage bores are facing downwards.
	The housing cover opposite the drive should be accessible for service reasons.
Fastening:	
	If required the pump can be flexibly suspended on silent bearings at its base fastening to dampen noise and vibrations. For this purpose a complete set consisting of 4 rubber-bonded metal suspension elements is available. Set of elastic mounts (4 pcs.)
	For mounting in upright position the pump can be fixed with additional mounting angles (part no. 1153770).

Assembly at inaccessible positions:

Position pump lubricating points such that maintenance can be conducted without any risk.





Weld-on flange DN 80/65 in aluminium

Example for welding the weld-on flange DN 80/65 to the suction side and to the pressure side of the FPO... 65:



Weld-on flange DN 65 in stainless steel (1.4571) For special uses there is also a weld-on flange DN 65 in stainless steel deliverable, part no. 2194407.

Elbow DN 65-FL4-FL DIN 2633 for FPO 65





Prop shaft drive:	During installation and maintenance of the propeller shaft, the manufacturer's specifications are to be adhered to!
	Do not mount the propeller-shaft flange onto the pump shaft using hard impacts (use lubricant and plastic hammer).
	Use propeller shaft with linear compensation.
	The propeller shaft heads must be located on a single level (see Fig. 1). The propeller-shaft flange from the auxiliary drive and pump must be parallel (see Fig. 2).
	Linear compensation
	Fig. 1
	parallel
	Fig 2
	1 · g. 2 /
	A Z layout (see Fig. 2) should be strived for.
	Where possible angles $\alpha$ and $\beta$ should be equal.
	If, depending on the speed, no other values have been specified by the propeller shaft manufacturer for bending angles ( $\alpha$ or $\beta$ ), we would advise you not to exceed 10°
	The drive may not transmit any thrust to the pump drive shaft.
	If drive is provided by a vehicle engine then it must be ensured that the pump's drive is switched off when driving.

	Accessories:	
	Prop shaft flange with project	tion for centring
	4 holes, outside diameter 90 Bore ø24 x 50 mm Part no.: 1010634	mm
	6 holes, outside diameter 100 Bore ø24 x 50 mm Part no.: 1010642	0 mm
Prevention of		
impermissible heating up:		
Filled pump:	Extended operation (> 5min) discharge side should be avo of heat.	of the pu <mark>mp against the closed</mark> bided due to impermissible build-up
Attention when dry running:	<ul> <li>with the discharge closed, of</li> <li>with discharge open (Ø min running must not exceed 5 min</li> <li>Accessory:</li> </ul>	dry running must not exceed 1 minute . 6 mm) and without medium, dry minutes.
	Pneumatic temperature switc Fastening screw thread: M12 Switch-point: 70°C. Part no. 2072303	th TPV 1A 3/2 + 1.3-70 2 x 18 long,
		M12
		Schematic diagram
	Weight: 0.083 kg	AU 6 mm



Pressure monitoring: For adjustment and monitoring of the pump a manometer can be mounted on the pressure side. A measurement point is available on the suction side. Pressure gauge -1 to +9 bar part no. 1167100 Suction side Suction side Speed adjustment at hydraulic drive: To set the speed, the shaft covering on the side opposite the drive can be removed.

This cover has to be mounted again after the measurement in order to avoid any bearing drift.

Start-up	If this is not observed people and material will be put at risk! Pump operation without any product will lead to an impermissible build up of heat (see note on page 22).
Checking direction of rotation:	The drive's direction of rotation must match that of the pump.
Start-up:	
	Remove plugging for venting (connection "R").
	Check the installation in accordance with the operating instructions!
	Check the pipelines and all connections!
	Make sure that the pump speed does not exceed the maximum permissible speed.
	The bypass valve is to be relieved before switching on the pump. To this end, the applied air pressure should be reduced to zero and, once the pump has started, increased again.
	Make sure that a pump filter is installed.
Adjustment of pump pressure:	The maximum pump pressure is set using the pneumatic pressure in the overflow valve. To this end a manometer must be connected to the pump's pressure side. The manometer pressure is monitored to help gradually regulate the rate of delivery. This can be done either by closing off the fuel nozzle or by making a bend in the delivery hose.
	The air pressure on the overflow valve is gradually increased until the pressure-side manometer reaches the desired pump pressure.
	In doing so the maximum pump pressure of 10 bar may not be exceeded. The impermissible increase of the pneumatic pressure may be prevented.
Operation:	
	The pump may not run permanently against the closed

shut-off valve.



Maintenance	
Lubrication:	The vane-type pump is to be lubricated at the bearing positions.
Intervals:	Every 600 operating hours or 3 years, whatever happens earlier.
Lubricant:	For standard operations: Beacon EP2 (part no. 1000189). For low temperature operations (e.g. for type X1): Molyduval Aero 14 (part no. 2067578).
Procedure:	Apply lubrication to the lubricating points during pump is running (without load, min. 300 rpm) until the grease is discharged at the exit points. Danger - Be careful for running pumps!
Central lubrication:	This is permitted providing a suitable lubricant is used.
Troublochooting	

Iroubleshooting				
Fault:	Cause:	Remedy:		
No pump suction /	Protective filter clogged	Clean filter		
	Pump worn (high gap leakages)	Send pump to Service change vanes if necessary		
Drive motor stops at pressure- side shutoff	Bypass valve setting too high	Check setting of bypass valve and set if necessary		
Pump makes knocking noises	Delivery elements (vanes)	Send pump to Service		
	Sidicit Contraction of the second sec	Check pump`s protective filter for signs of damage		
Pump pressure too high	Bypass valve setting too high	Check setting of bypass valve and set if necessary		
Pump pressure too low or not available	essure too low or not Bypass valve setting too low or faulty			
	Speed too low	Increase speed (n <sub>max</sub> )		
No output	No venting	Remove plug for venting (connection "R")		