OPERATING MANUAL



# CENTRIFUGAL PUMPS FPE/FP...V Series



Model:

Model No.:

OPERATING MANUAL FPE



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## 1. Disassembly

#### 1.1 General



- Disconnect the pump from the power supply so that it is deenergised.
- If fitted, close the shut-off valve in the suction pipe and discharge pipe.
- Undo the suction/discharge connections and remove the pump from the system.



• In the case of dangerous pumping media, legal and works safety directions must be observed.



#### For highly polished surfaces: When tightening or untightening the impeller nut please use softer

material tool inlets (copper sheet) in order to prevent surface damage.

#### 1.2 Impeller and shaft seal

- Unscrew the cover and drain the pump, clean it, if necessary.
- Undo the impeller nut.
- Pull off the impeller from the shaft and remove the feather key.
- Carefully dismantle the shaft seal parts in accordance with the order-related documentation.

#### 1.3 Complete disassembly

- Undo the clamping screw resp. hex-screws between casing and lantern (only for 1051/2, 1151/2, 1231/2, 1251/2, 101/102-200, 101/102-250).
- · Pull off the casing.
- Undo the screws between the motor flange and clamping disc/ lantern.
- Pull off the clamping disc/lantern.
- Undo the screws of the shrink-fit ring.
- Release the tensioning rings from the clamping ring.
- Pull off the pump's hollow shaft from the motor shaft.
- Pull off the shrink-fit ring from the pump's hollow shaft.

## 2. Assembly

#### 2.1 General

Before assembling the pump, the following has to be done:

- The parts have to be cleaned.
- The sealing area has to be cleaned.
- All parts have to be checked for precision fit and, if necessary, reworked, with the exception of the sliding surfaces of the shaft seal.
- Worn parts have to be replaced.
- O-rings and gaskets always have to be replaced before assembly.

#### 2.1.1 Setting the gap

The gap size of the pump must be reset in accordance with Tab 1.







Pump Type	Axial gap					
	Impeller/ cover	Impeller/ casing				
711/712						
721/722						
741/742	0.5	mm				
3401/3402						
3521/3522						
3531/3532	0.5 mm 1.0 mm					
3541/3542						
3451/3552	1.0	<b>m</b> m				
3551/3552	1.0					
751/752						
1051/1052	0.7 mm	0.6 mm				
1151/1152	2.0	mm				
1231/1232						
1251/1252	1.0 mm	1.5 mm				
101/102-200	0 E mm	1.2 mm				
101/102-250	0.5 mm	1.2 mm				

Tab. 1: Gap sizes



## 2.1.2 Screw tightening torque

The screw tightening torque in the tables below must be complied with.

	M6	M8	M 10	M 12	M 16	M 20	
Nm	10	25	49	85	210	420	

Tab. 2: Class 8.8 steel screws

	M6	M8	M 10	M 12	M 16	M 20
Nm	7,3	17,5	35	60	144	281

Tab. 3: Stainless steel screws A2-70 and A4-70

#### 2.2 Pump assembly

- 1. Remove the feather key from the motor shaft.
- 2. Degrease the motor shaft and bore of the hollow shaft.
- Insert half feather key into the motor shaft (only for bigger motors above > 30 kW).
- Seal the motor shaft around the shaft shoulder with a sealing gel (e.g. Stucarit sealing gel 309).
- 5. Push the hollow shaft with shrink-fit ring onto the motor shaft up to the shaft shoulder.
- 6. Tighten the hexagon socket screws of the shrink-fit ring in diagonally opposite sequence (see Tab. 4).

Hexagon socket screw	Tightening torque
M 5	6 Nm
M 6	12 Nm

- Tab. 4: Tightening torque for the fastening screws of the shrinkfit ring
- 7. Check the hollow shaft for concentricity and align.
  Concentricity tolerance: max. 0,06 mm for motors below 30 kW max. 0,08 mm for motors above 30 kW



- 8. Screw the clamping disc/lantern to the motor flange.
- Insert the shaft seal housing or stationary ring with O-ring into the pump casing and secure (in accordance with the orderrelated documentation).
- 10. Screw pump casing and clamping disc/lantern together so as to be fingertight.
- 11. Fit the front seal set of the shaft seal. Cut the Nylon lock ring and put it into the prepared groove behind the thread of the shaft.
- 12. Insert the O-ring into the impeller nut. Push the impeller on to the pump shaft. Secure the impeller against twisting and tighten the impeller nut with 100 Nm.
- 13. Set the gap size of the cover, impeller and casing by shifting the pump casing within the clamped joint, resp. measure the gap size and adjust by fitting shims between casing and lantern (only for 1051/2, 1151/2, 1231/2, 1251/2, 101/102–200, 101/102–250) (see Tab. 1: Gap sizes).
- 14. Tighten the clamping screw with the following torque:
  M 10 with 45 Nm
  M 12 with 75 Nm or hex-screws with torque specified.
- 15. Place the cover with O-ring onto the casing and tighten.

#### 2.3 Pumps with double shaft seal

- 1. Remove the feather key from the motor shaft.
- 2. Degrease the motor shaft and bore of the hollow shaft.



For pumps in FPE execution radial gasket needs to be fitted onto a speedy – sleeve.

3. Use a piece of pipe (length between 120 to 150 mm) to push the sleeve onto the shaft. Inner diameter of pipe 23 mm (for 22 mm shaft), 36 mm (for 35 mm shaft).



For pumps in FPE execution with 22 mm shaft only: Sealing cover with radial gasket to be fitted to pump housing. Flushing pipes in vertical direction, then threaded pins to be fixed manually.

- Insert half feather key into the motor shaft (only for bigger motors above 30 kW).
- 5. Seal the motor shaft around the shaft shoulder with sealing gel (e.g. Stucarit sealing gel 309).
- 6. Push the hollow shaft with shrink-fit ring onto the motor shaft up the shaft shoulder.
- 7. Tighten the hexagon socket screws of the shrink-fit ring in diagonally opposite sequence (see Tab. 4).
- Check the hollow shaft for concentricity and align.
   Concentricity tolerance: max. 0,06 mm for motors below 30 kW max. 0,08 mm for motors above 30 kW





9. Screw the clamping disc/ lantern to the motor flange.

For pumps in FP...V execution only: Push rear mechanical seal unit onto the shaft (according to the order-related documentation).

- Insert the shaft seal housing or stationary ring with O-ring into the pump casing and secure (in accordance with the order-related documentation).
- 11. Screw pump casing and clamping disc/lantern together so as to be fingertight.
- 12. Flushing pipes to screw into the sealing cover to be sealed with sealing paste.
- 13. Fit the front seal set of the shaft seal. Cut the Nylon lock ring and put it into the prepared groove behind the thread of the shaft.
- 14. Insert the O-ring into the impeller nut. Push the impeller on to the pump shaft. Secure the impeller against twisting and tighten the impeller nut with 100 Nm.
- 15. Set the gap size of the cover, impeller and casing by shifting the pump casing within the clamped joint, resp. measure the gap size and adjust by fitting shims between casing and lantern (only for 1051/2, 1151/2, 1231/2, 1251/2, 101/102–200, 101/102–250) (see Tab. 1: Gap sizes).

- 16. Tighten the clamping screw with the following tightening torque:
  - M10 with 45 Nm
  - M 12 with 75 Nm or hex-screws with torque specified.
- 17. Place the cover with O-ring onto the casing and tighten.



Each time the impeller is assembled, a check must be made to ensure that it does not chafe at any point, and the Nylon lock ring has to be replaced.





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Scandinavia Fristam Pumper A/S Saeby

South/East Asia Fristam Pumpen (S.E.A.) Pte.Ltd. Singapore **Ukraine** Fristam Kiev Ltd. Kiev

USA/Canada Mexico South America Fristam Pumps, Inc. Middleton, WI





Kreiselpumpen FP / Centrifugal Pumps FP n=1450 min<sup>-1</sup>

zulässige Leistungsschwankungen ± 5% alle Angaben gelten für Wasser bei 20°C

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Kreiselpumpen FP / Centrifugal Pumps FP n=2900 min<sup>-1</sup>

zulässige Leistungsschwankungen ± 5% alle Angaben gelten für Wasser bei 20°C

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Bearb.







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Gepr.	Kreiselounge		Ausführung: B - ohne Verkleidung       Maße øg. g1.k und Motor-         Bewichte sind abhängig       gewichte sind abhängig         Kom Motorfabrikat.       vom Motorfabrikat.	Pumpe Gewindestutzen DIN 11851 Klemm- Motor Dimensions g. gl. k and pump Gewindestutzen DIN 11851 Scheibe P (kw) motor motor motor execution.	Type b1 n 40 50 65 80 100 40 50 65 80 100 kg Ausf. [ kg 3000 frame Øa1 e a o Øg g1 h k z b p kg	FPE       3452       141       33         85       95       112        182       245       240        24 <b>*</b> FPE       3542       115       33         89       99       99       99        216       182       200       220       130       305       380       365       380       366       30       318       403       208       70         FPE       3552       138       38         90       90       117        238       200       200       400       353       305       380       365       380       306       308       303       308       303       308       303       308       303       308       303       308       303	FPE 752       14.5       4.4         103       80         50 <b>**</b> 30.0       2001       400       319       305       380       360       208       318       4.03       208       378       4.03       208       378       4.03       208       378       305       380       360       378       4.03       208       378       305       380       360       378       4.03       208       360       378       4.03       208       378
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# Kreiselpumpe centrifugal pump

FP/FPE 700/3400/3500

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Auftrag

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