SPXFLOW

INSTRUCTION MANUAL
SE/EN/DE/FR/ES/IT

Flexible Impeller Pumps

F2P10-19 12/24 V DC, F3B-19 12/24 V DC, F3B-19 Oil Change 12/24 V DC,

F38B-19 12/24 V DC, F4B-19 12/24 V DC

IB-414 R09 (04/2018)

ORIGINAL INSTRUCTIONS/TRANSLATION OF ORIGINAL INSTRUCTIONS
READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT

Johnson Pump®

Self-priming, flexible impeller pump flange mounted to DC motor 12/24 V

Typical applications

Bilge pump, fresh water pump, deck washing, fuel oil transfer, fire pump, etc. F3B-19 Oil Change: Pump for permanent installation near the boat engine. To be used for the draining/filling of engine oil. Flow direction is easily changed with the integrated reversing switch.

Technical description				
	F2P10	F3B/F3B Oil Change	F38B	F4B
Body:				
PTMT, Termoplastic polyester	▪			
Brass		▪	▪	▪
Wearplates:				
AISI 316, stainless steel	▪			
Impeller:				
NBR (nitrile) rubber	▪	▪	▪	▪
Seal:				
Lipseal, NBR (nitrile) rubber	▪	▪	▪	▪
O-ring:				
NBR (nitrile) rubber	▪	▪	▪	▪
Connections:				
½" hose	▪			
R⅜" or ⅜"-18 NPTF		▪		
R½" or ½"-14 NPTF or 1" hose (Ø25 mm)			▪	▪
Liquid temperature:	Max +80°C. See page 12, "Temperature".			
Motor:	0,12 kW Total enclosed Reversible			
	12/24 V with built in thermal protection			
Shaft:	AISI 316, stainless steel			
Bearing:	Ball bearing			

The motor is ignition protected according to ISO 8846 (Small craft – Electrical devices - Protection against ignition of surrounding flammable gases).

Type designation

Type	Part No	Type	Part No
F2P10-19 ½" hose 12 V	10-24886-01	F3B-1907 Oil Change 12 V	10-24760-03
F2P10-19 ½" hose 24 V	10-24886-02	F3B-1907 Oil Change 24 V	10-24760-04
F3B-19 12 V	10-24516-01	F38B-1907 12 V	10-24727-03
F3B-19 24 V	10-24516-02	F38B-1907 24 V	10-24727-04
F3B-1907 12 V	10-24516-03	F4B-19 12 V	10-24689-01
F3B-1907 24 V	10-24516-04	F4B-19 24 V	10-24689-02
F3B-19 Oil Change 12 V	10-24760-01	F4B-1907 12 V	10-24689-03
F3B-19 Oil Change 24 V	10-24760-02	F4B-1907 24 V	10-24689-04

Pressure and capacity data

(based on water at 20°C and at full voltage of the motor, 12.0 / 24.0 V unless specified otherwise)

F2P10-19

				Amp draw	
Bar	**kPa**	**l/min**	**USGPM**	**12V**	**24V**
Continous duty					
0	0	15,0	4,0	5,6 A	4,0 A
0,1	10	14,5	3,8	5,7 A	4,0 A
0,2	20	14	3,7	5,8 A	4,1 A
0,3	30	13,5	3,6	5,9 A	4,1 A
0,6	60	11,0	2,9	6,1 A	4,2 A
Intermittent duty					
0,75	75	9,6	1,1	6,5 A	4,3 A
0,9	90	7,0	1,8	6,5 A	4,8 A
Fuse required				**10 A**	**8 A**

F38B-19

				Amp draw	
Bar	**kPa**	**l/min**	**USGPM**	**12V**	**24V**
Continous duty					
0	0	35	9,2	10,9 A	5,0 A
0,1	10	33,8	8,9	11,0 A	5,1 A
0,2	20	32,2	8,5	11,0 A	5,1 A
0,3	30	31	8,2	11,1 A	5,2 A
0,6	60	25,5	6,7	11,9 A	5,4 A
Intermittent duty					
0,9	90	15,3	4,0	13,6 A	6,0 A
1,2	120	2	0,5	15,8 A	7,1 A
Fuse required				**20 A**	**10 A**

F3B-19/F3B-19 Oil Change

				Amp draw	
Bar	**kPa**	**l/min**	**USGPM**	**12V**	**24V**
Continous duty					
0	0	21	5,5	8,4 A	4,0 A
0,1	10	20,5	5,4	8,5 A	4,0 A
0,2	20	20	5,3	8,6 A	4,1 A
0,3	30	19,5	8,2	8,8 A	4,1 A
0,6	60	17,8	5,2	9,0 A	4,2 A
Intermittent duty					
0,9	90	15,6	4,1	9,6 A	4,3 A
1,2	120	12	3,2	10,3 A	4,8 A
Oil 10W 40 (20° C)					
0	0	15,7	4,14	16,1 A	7,68 A
Warm oil increases the flow and decreases the power consumption					
Fuse required			**Water**	**15 A**	**8 A**
			Oil	**20 A**	**10 A**

F4B-19

				Amp draw	
Bar	**kPa**	**l/min**	**USGPM**	**12V**	**24V**
Continous duty					
0	0	48	12,7	12,2 A	6,5 A
0,1	10	45	11,9	12,3 A	6,7 A
0,2	20	44,5	11,7	12,2 A	6,8 A
0,3	30	41	10,8	13,1 A	7,1 A
0,6	60	34	9,0	14,9 A	7,5 A
Intermittent duty					
0,9	90	25	6,6	16,5 A	7,8 A
1,2	120	11	2,9	18,3 A	8,8 A
Fuse required				**25 A**	**15 A**

Installation and maintenance

Installation

General: Pump may be mounted in any position without loss of efficiency; however, it is suggested that the pump head be down if vertical mounting is desired. Mount motor as close as possible to power source to obtain full voltage.

The pump should be installed so that the motor is protected from rain or wash down.

When using a vac-on-switch, mount it on the connection on the inlet side of the pump. When using a pressure switch, mount it on the outlet side of the pump.

F3B-19 Oil Change: Locate the pump near the engine so the length of the hose to the engine can be kept as short as possible. To achieve best operation the pump should be installed at the same level as the maximum level of oil in the engine. Mount the provided ⅜" gate valve between the engine and the pump as a safeguard against accidental oil discharge during operation or draining. Use a reinforced oil hose that can withstand 120°C for connection between the pump and oil receptacle. Note! The hose between the motor and pump must use permanent connections.

Operation: F3B19-Oil Change: Before changing the oil, run the engine and let the temperature rise to 50°C to reduce the viscosity. This makes it easier to handle the oil. Turn off the engine. Open the gate valve between the motor and pump. Make sure the discharge hose is securely positioned in a waste oil receptacle. Note that the discharge hose may tend to move slightly during operation. Move the switch

in the flow direction to the receptacle. When the oil is drained (check with the dipstick of the engine) switch off the pump immediately by moving the integrated switch to its centre position. Change the oil receptacle to the container with new oil. Start the pump by pressing the switch in the flow direction to the motor. Use the dipstick of the engine to make sure the right amount of oil has been filled into the engine. Note! As soon as all oil has been drained from the engine, or when the container for refilling oil into the engine is empty, the pump must be stopped immediately. Otherwise there is a risk of dry running which will damage the impeller.

Wiring dimensions

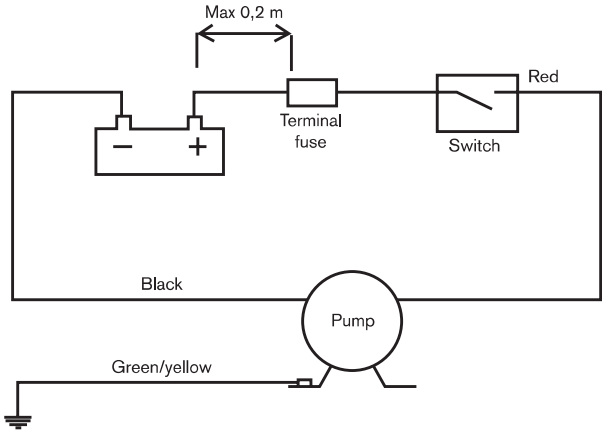
(based on 3% voltage drop)

Wire size	Max wire length in m*							
	F2P10-19		F3B-19 F3B-10 Oil Change		F38B-19		F4B-19	
	12V	24V	12V	24V	12V	24V	12V	24V
1,5 mm²	3,7 m	14,6 m	3,7 m	14,6 m				
2,5 mm²	6,1 m	24,4 m	6,1 m	24,4 m	2,7 m	11,0 m	2,7 m	11,0 m
4 mm²	9,8 m		9,8 m		4,4 m	17,6 m	4,4 m	17,6 m
6 mm²	14,6 m		14,6 m		6,6 m	26,3 m	6,6 m	26,3 m
10 mm²	24,4 m		24,4 m		17,6 m		17,6 m	
25 mm²					27,4 m		27,4 m	

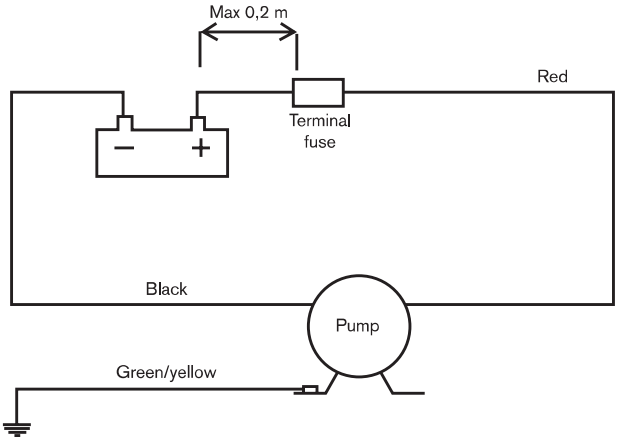
* The wire length is the total distance from the battery to the pump and back to the battery. It is recommended to use a relay to shorten the main leaders.

Wiring table

All DC pumps



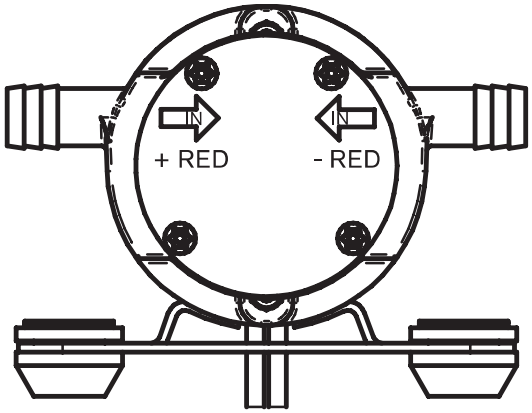
F3B-19 Oil Change



Electrical installation

F2P10-19

Connect power supply according to picture.



The pump must be installed according to ISO 10133 (Small craft - Electrical system - Extra low voltage DC installation for continuous current). Note: The fuse must be ignition protected.

The motor is equipped with built in thermal protection to prevent the motor from overheating. The protection is automatically restored when the motor is cooled. If the pump is connected with separate earth lead, this should be yellow/green and connected to the motor base. See the wiring table above for correct installation. Negative wire must be black.

Choose wire size in accordance with total wire length (see table above). The wire connections must be sealed with a marine sealant or sealed cable connectors. Other electrical devices, eg switch, circuit breaker, must be installed between the pump and the positive (+) lead on the battery (on the red wire). Note: Before installation with electrical control systems, check that equipment to be used is of sufficient rated capacity to accept ampere draw of motor. Low voltage will cause motor to overheat.

Self-priming
Pump is self-priming up to 3 m (for F4B 4 m). Intake lines must be air-tight to ensure selfpriming.

Note: Pump will prime when impeller is dry but suction lift up to 3 m (for F4B 4 m) is only obtainable when impeller is lubricated with liquid being pumped or Johnson Pump Impeller lubricant.

For permanent installations where suction lift exceeds 4 m, a foot valve should be used to assure priming on start up.

Continuous duty
For continuous duty 0,6 bar (60 kPa) maximum head is permissible. Normal working temperature of the motor may reach approx. +80°C (surface temperature) which may burn your skin.

Warning! Dry running
Do not run dry for more than 30 seconds. Lack of liquid will burn the impeller and damage the seals.

If the pump is used for fuel oil transfer it should be equipped with a vacuum switch. When the liquid has been evacuated the electric supply is automatically switched off.

Warning! Caution Explosion Hazard
Do not pump gasoline, solvents, thinners, highly concentrated or organic acids. If corrosive fluids must be handled, pump life will be pro-longed if flushed with water after each use or after each work day.

Warning! Caution. Explosion Hazard.
Never operate a motor which in any way has been manipulated and lost it's full enclosure.

Temperature
Max ambient temperature: +60°C. The life of the impeller depends on the temperature of liquid being pumped.

Temperatures between +5°C and +55°C give normal life. Higher or lower temperature will reduce the life.

When the pump is used as bilge pump
Max total head 6 m. The pump must be installed so that the motor is protected from splash from bilge water.

The pump must be fitted with a strainer or other means of preventing debris from entering the pump.

Freezing weather
Drain unit by loosening the endcover. Glycol based anti-freezes can be used but do not use petroleum based anti-freeze compounds.

Waste handling/material recycling
At the product's end of life please dispose of the product according to applicable law. Where applicable please disassemble the product and recycle the parts material.

Service instructions F2P10 (see page 42)

Disassembly

1. Back off the endcover screws (7) and remove the endcover (5) and O-ring (6).
2. Pull out the impeller (3) using a slip joint plier or other suitable implements.
3. Remove the wearplate (7).
4. Remove the nuts (8) holding the pump body to the motor and remove the pump body from the motor.
5. Remove the lip seal (4).
6. Do not disassemble the motor.

Assembly

1. Moisten the new lip seal with soapy water (5 % soap) and mount the seal with the lip facing towards the impeller.
2. Lubricate the motor shaft with Vaseline of the like.
3. Assemble the wearplate.
4. Lubricate inside the pump body where the impeller should be placed with Johnson Pump impeller lubricant 09-47086, glycerine or similar. Also lubricate the surface of the endcover.
5. Fit in the impeller with a rotating movement in the intended direction of the pump rotation.
6. Lubricate the O-ring with Johnson Pump impeller lubricant 09-47086, glycerine or similar. Position the O-ring and fasten the endcover.

Service instructions F3B-19 / F3B-19 Oil Change / F38B-19 / F4B-19 (see page 43-46)

Disassembly

1. Back off the endcover screws (7), remove the endcover (5) and O-ring (6).
2. Pull out the impeller (3) using a slip joint plier.
3. Back off and remove the nuts (8) and washers (9) holding the body. Separate the body from the motor.
4. Remove the lip seal (4).
5. Do not disassemble the motor.

Assembly

1. Moisten the new lip seal with soapy water (5% soft soap), mount the seal with the lip facing towards the impeller.
2. Lubricate the motor shaft with vaseline/ glycerin. Fit the body to the motor.
3. Lubricate inside the pump body where the impeller should be placed with Johnson Pump Impeller lubricant (09-47086), glycerine, liquid hand soap or similar. Also lubricate the surface of the endcover.
4. Fit the impeller with a rotating movement in the intended direction of the pump rotation.
5. Lubricate the O-ring with Johnson Pump Impeller lubricant (09-47086), glycerine, liquid hand soap or similar and fit it in its position and fasten the endcover.

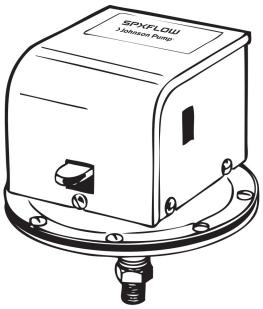
Impeller

The impeller is a very important security device and should be replaced every year with a Johnson Pump original impeller and Johnson Pump impeller lubricant 09-47086.

Accessories

Vacuum switch 09-45053

- For automatic shut off operation.
- To prevent pump damage.



The vacuum switch works with all selfpriming impeller pumps and should be used for e.g. bilge pumping/emptying of tanks to prevent the pump from running dry.

The vacuum switch automatically shuts the pump off when the bilge/tank is dry. With the switch fitted, you can start the pump by remote push button or manually by depressing lever on the switch.

Warning! The switch is not ignition protected.

Deckwash kit 09-46553

For convenient deckwash:

- pressure switch
- check valve
- triggel nozzle