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**FLO**

# Multi-Purpose Drainage Submersible Pumps



**Series FS 250**

**Series FS 237/337/437/355/455**

**Series FS 475/675/4110/6110**

[www.flofab.com](http://www.flofab.com)

Manufacturer of Pumps, Tanks, Heat Exchangers & Accessories  
for HVAC Market After-Sales Parts and Services

Submersible Pumps

**Series FS 250**

**Series FS 237/337/437/355/455**

**Series FS 475/675/4110/6110**

INSTALLATION, OPERATION and MAINTENANCE MANUAL

## 1. PRIOR TO OPERATION

- A. Be sure to provide adequate grounding and install the leakage breaker without fail. It is important that the pump be properly grounded and provided with leakage breaker to prevent the users from serious electric shock injury.
- B. Make sure the voltage of the power supply is identical to the one indicated on the nameplate (label) of the pump. Do not plug into other voltage or phase than what is the indicated on the pump nameplate.
- C. Do not have a "dry-run" in the air, it will damage the pump.
- D. Do not use the electrical cable to carry the pump. Do not lift or lower the pump by the cable, please carry with pump handle.
- E. Extension of power cable: If the power cable has to be extended, select the proper cable size within the allowable length. If cable is extended too far, a drop in voltage may occur, which will stop the running of the motor and damage the pump. To prevent any possible accident, do not use the pump in a pond, swimming pool or bath tub if there are people present.



## 2. CARE UNDER OPERATION

- A. The motor protection device is built-in to shut off the circuit automatically and to prevent the motor from burning out when the motor is over loaded due to the clogging by foreign particles or plug-in to wrong power source (Voltage, Frequency, etc.). Should the pump stop suddenly, check the piping, the pump itself and the connection of electrical cable to the power source. The motor protector automatically trips off in a few seconds if there is any abnormality. Resume the operation after clearing the trouble and leave the pump as is.
- B. Consult your FloFab dealer if you are unable to find the trouble. Unauthorized disassembly or assembly is prohibited as it will probably result in inferiority in performance or damage to the motor.

## 3. CARE AFTER OPERATION

You do not need to take any special care of your pump after operation, however note the following points:

- A. If freezing temperatures are expected, remove pump from water and store in a dry place.
- B. If pump is left in the water for a long period of time without running, pump may show signs of rusting and possibly accumulate floating matter which will shorten the life of your pump. In this case, let the pump run in clean water to remove floating matter from inside the pump. Thoroughly dry and store.

## 4. APPLICATIONS

### *Light, Rugged, Abrasion & Corrosion-Resistant*

- A. Newly designed double casing with circumferential flow system assures superior cooling and excellent durability for long continuous running.
- B. Abrasion and corrosion-resistant casings and impellers are suitable for sea water transfer, light chemical, and the food industry.
- C. Wastewater discharge for households, industries, and small municipalities.
- D. Construction sites and civil engineering projects including subways, tunnels and dams.
- E. Utilities: Telecommunications, power and generation plants.

## 5. TROUBLE-SHOOTING

To prevent serious accidents, disconnect the power supply before inspecting the pump

CONDITIONS OF DISORDER	REASONS	COUNTERMEASURE
<i>Pump fails to start.</i>	No power is supplied. (Power outage)	Contact power company or an electrical repair shop.
	Open circuit or poor connection of the cabtyre cable.	Check if there is an open circuit in the cabtyre cable or wiring.
	Impeller is obstructed.	Inspect the pump and remove the obstruction.
<i>Pump starts but stops immediately, causing the motor protector to actuate.</i>	Impeller is obstructed.	Inspect the pump and remove the obstruction.
	Voltage drop.	Correct the voltage to the rated voltage, or use an extension cable that meets the standard.
	A 50 Hz model is operated at 60 Hz.	Check the nameplate and replace the pump or impeller.
	The strainer is obstructed, and the pump was operated dry for a long period.	Remove the obstruction.
	Motor sounds abnormal or will not run.	Repair the motor or replace with a new motor.
	The pump is picking up too much sediment.	Place a concrete block under the pump to prevent pump from picking up sediment.
<i>The pump's head and pumping volume is lower.</i>	The impeller is worn.	Replace impeller.
	The hose appears to be clogged.	Minimize the number of bends in the hose. (in an area with a large amount of debris, use the pump in a meshed basket.)
	The strainer is obstructed or buried.	Remove the obstruction. Place a concrete block under the pump to prevent pump from picking up sediment.
	The motor rotates in reverse.	Interchange the power supply terminal connection.
<i>The pump generates noise or vibration.</i>	The bearing of the motor may be damaged.	Replace the bearing. Contact an authorized service center or the dealer where you purchased the equipment.

## 6. AFTER-CARE:

If you can not find out the reason for trouble, please consult an authorized dealer or an authorized service center.

## 7. TECHNICAL SPECIFICATIONS

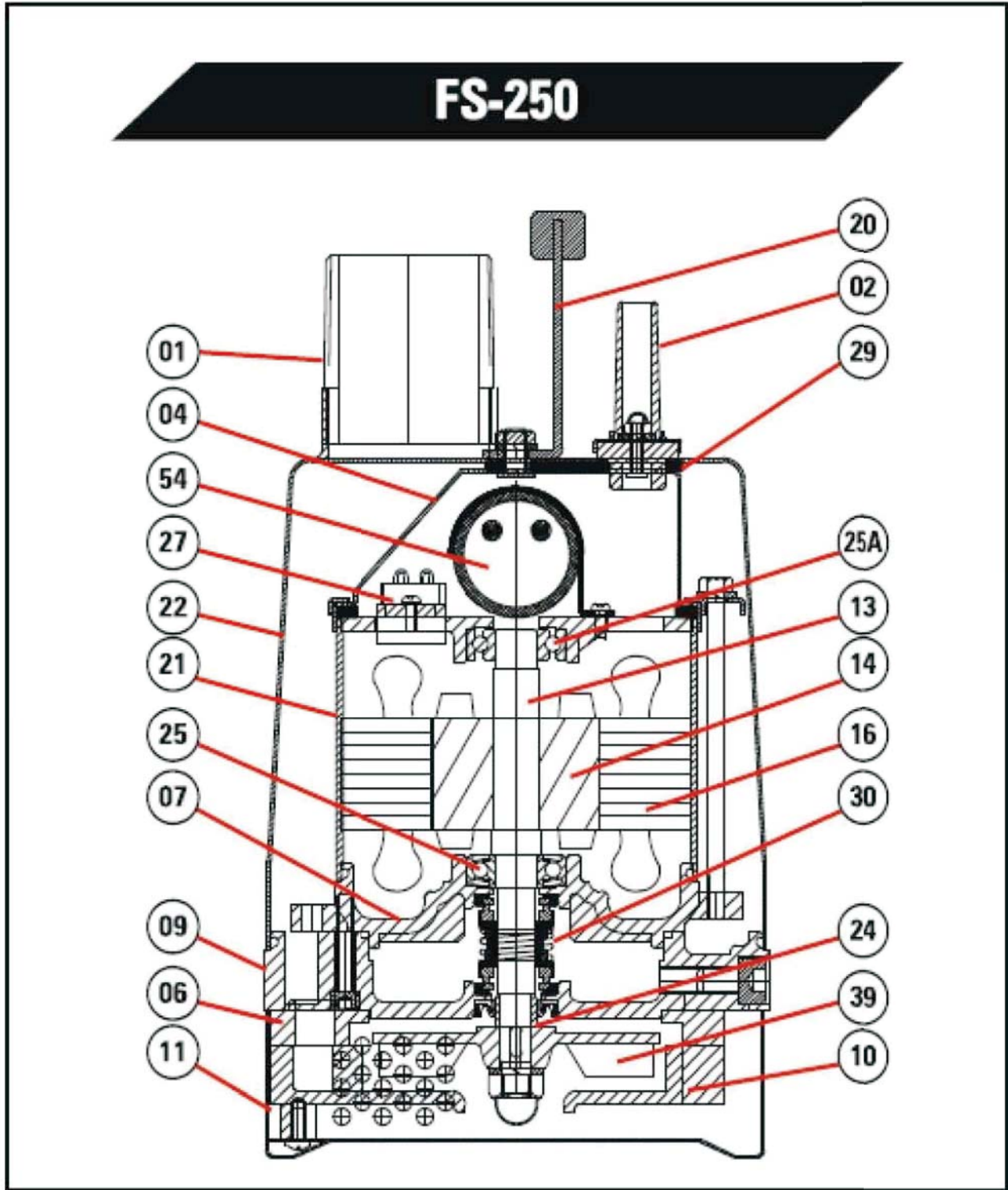
MODELS	DISCHARGE	SOLID
FS-250	1 1/2"	3/8"

### SPECIFICATIONS

MODELS	OUTLET		Elec. MOTOR			Voltage / Phase / HZ	Solid Pass		Weight	
	mm	in	Hp	Amp.			mm	in.	kg.	lbs
				Start	Run					
FS-250	40	1.5	1/3	14.5	3.50	110 Volts	6	0.24	12	2

# 8. PARTS BREAKDOWN

SEE CHART ON PAGE 5



## 8. PARTS BREAKDOWN

Reference Number	Part Description	FS250
1	Hose Tail	Cast Iron 200
2	Cable Gland	Fiber Plastic
4	Upper Cover	SUS304
04A	Motor Cover	
6	Pump Casing	Cast Iron 200
7	Bearing Block	
9	Seal Block	
10	Inlet Plate	Cast Iron 200
11	Strainer	SUS304
12	Bottom Plate	
13	Shaft	SUS410
14	Rotor	Silicon Steel
16	Stator	Silicon Steel
20	Handle/Hanger	Steel
21	Motor Frame	SUS304
22	Outer Case	SUS304
24	Shaft Sleeve	SUS304
25-25A	Bearing	
27	Protector	
28	O'ring	NBR
29	Gasket	NBR
30	Mechanical Seal	CE/CA+SIC/SIC
32	Cable	
34	C'ring	
39	Impeller	Ductile Iron 45
54	Capacitor	
60	Flange	ABS
76	Bearing block	Cast Iron 200
90	Rubber Liner	NBR

## 6. AFTER-CARE:

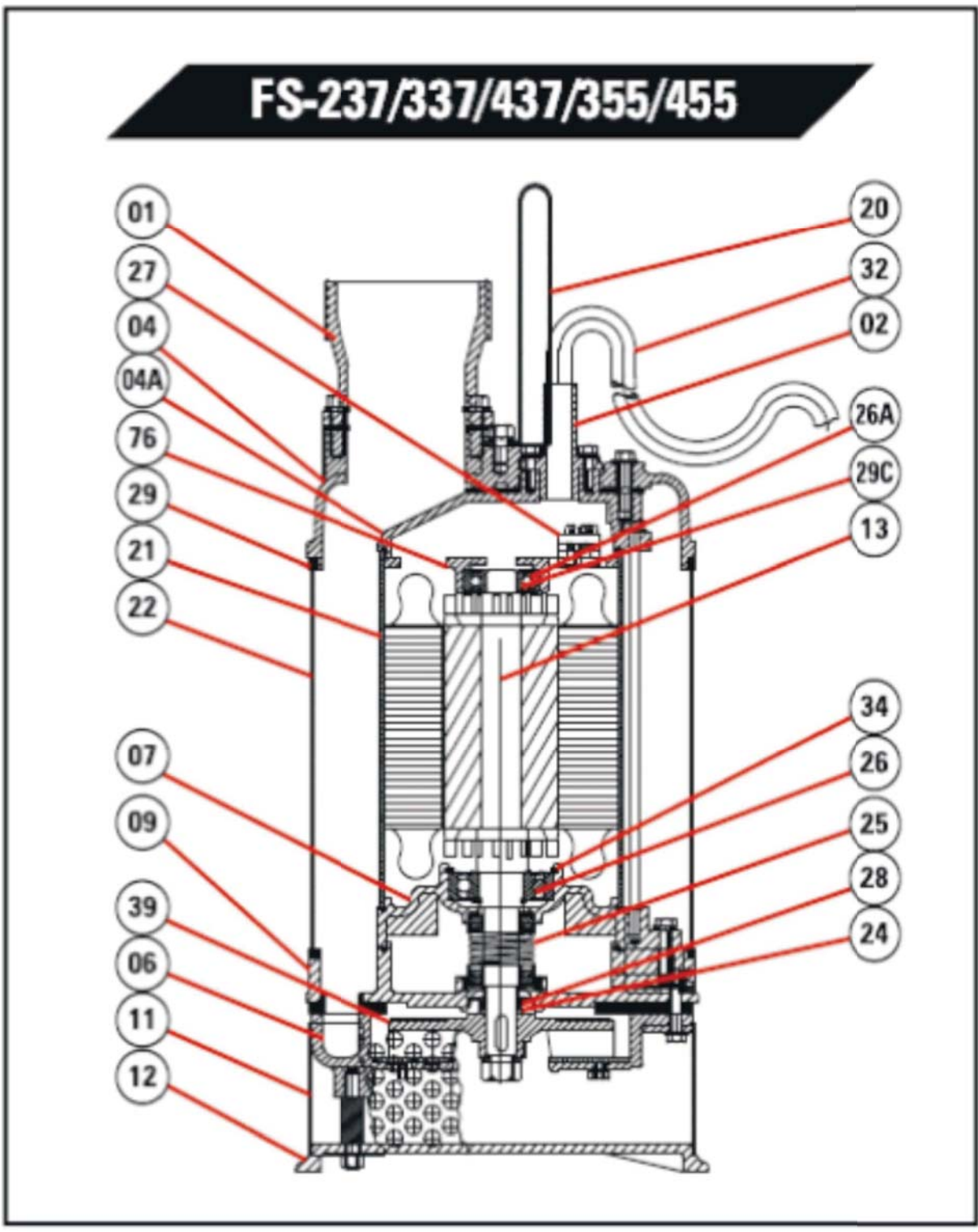
If you can not find out the reason for trouble, please consult an authorized dealer or an authorized service center.

## 7. TECHNICAL SPECIFICATIONS

### SPECIFICATIONS

MODELS	OUTLET		Elec. MOTOR			Voltage / Phase / HZ	Solid Pass		Weight	
	mm	in	Hp	Amp.			mm	in.	kg.	lbs
				Start	Run					
FS-237	50	2	5	74	15	220/3/60	11	0.4	58	127
FS-237	50	2	5	45.9	8.7	380/3/60	11	0.4	58	127
FS-237	50	2	5	37	7.5	460/3/60	11	0.4	58	127
FS-237	50	2	5			480/3/60	11	0.4	58	127
FS-237	50	2	5	30	5.7	575/3/60	11	0.4	58	127
FS-337	80	3	5	74	15	220/3/60	11	0.4	58	127
FS-337	80	3	5	45.9	8.7	380/3/60	11	0.4	58	127
FS-337	80	3	5	37	7.5	460/3/60	11	0.4	58	127
FS-337	80	3	5			480/3/60	11	0.4	58	127
FS-337	80	3	5	30	5.7	575/3/60	11	0.4	58	127
FS-437	100	4	5	74	15	220/3/60	11	0.4	58	127
FS-437	100	4	5	45.9	8.7	380/3/60	11	0.4	58	127
FS-437	100	4	5	37	7.5	460/3/60	11	0.4	58	127
FS-437	100	4	5			480/3/60	11	0.4	58	127
FS-437	100	4	5	30	5.7	575/3/60	11	0.4	58	127
FS-355	80	3	5.5	105.6	22.5	220/3/60	19	3/4	50	110
FS-355	80	3	5.5	56.8	15	380/3/60	19	3/4	50	110
FS-355	80	3	5.5	54	10.25	460/3/60	19	3/4	50	110
FS-355	80	3	5.5			480/3/60	19	3/4	50	110
FS-355	80	3	5.5	50	7.50	575/3/60	19	3/4	50	110
FS-455	100	4	5.5	105.6	22.5	220/3/60	19	3/4	50	110
FS-455	100	4	5.5	56.8	15	380/3/60	19	3/4	50	110
FS-455	100	4	5.5	54	10.25	460/3/60	19	3/4	50	110
FS-455	100	4	5.5			480/3/60	19	3/4	50	110
FS-455	100	4	5.5	50	7.50	575/3/60	19	3/4	50	110

# 8. PARTS BREAKDOWN





## 8. PARTS BREAKDOWN

Reference Number	Part Description	FS-237/337/437/355/455
1	Hose Tail	Cast Iron 200
2	Cable Gland	NBR
4	Upper Cover	SUS304
04A	Motor Cover	Cast Iron 200
6	Pump Casing	Ductile Iron 50
7	Bearing Block	Cast Iron 200
9	Seal Block	Cast Iron 200
10	Inlet Plate	Cast Iron 200
11	Strainer	SUS304
12	Bottom Plate	Ductile Iron 50
13	Shaft	SUS410
14	Rotor	Silicon Steel
16	Stator	Silicon Steel
20	Handle/Hanger	Steel
21	Motor Frame	Cast Iron 250
22	Outer Case	SUS304
24	Shaft Sleeve	SUS410
25-25A	Bearing	
27	Protector	
28	O'ring	NBR
29	Gasket	NBR
30	Mechanical Seal	CE/CA+SIC/SIC
32	Cable	
34	C'ring	SC40
39	Impeller	High Chrome Steel
54	Capacitor	
60	Flange	
76	Bearing block	Cast Iron 200
90	Rubber Liner	NBR

## 6. AFTER-CARE:

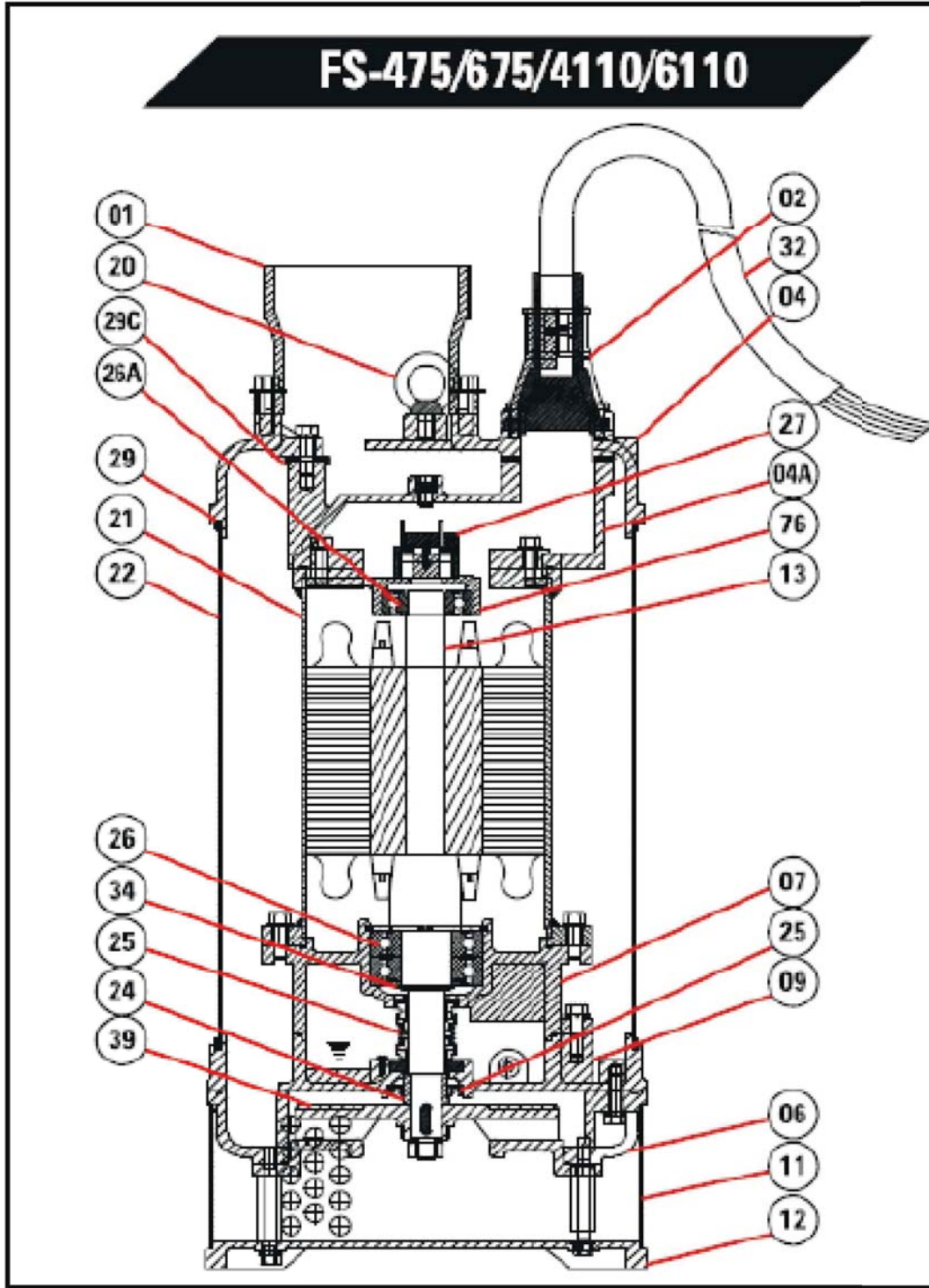
If you can not find out the reason for trouble, please consult an authorized dealer or an authorized service center.

## 7. TECHNICAL SPECIFICATIONS

### SPECIFICATIONS

Modèles	Sortie		Moteur élec.			Voltage / Phase / HZ	Passage des solides		Poids	
	mm	po	Hp	Amp.			mm	po.	kg.	lb
				Départ	Opération					
FS-475	100	4	10	113.5	30	220/3/60	15	0.6	128	282
FS-475	100	4	10	65	17.4	380/3/60	15	0.6	128	282
FS-475	100	4	10	74	15	460/3/60	15	0.6	128	282
FS-475	100	4	10			480/3/60	15	0.6	128	282
FS-475	100	4	10	60	11.5	575/3/60	15	0.6	128	282
FS-675	150	6	10	113.5	30	220/3/60	15	0.6	128	282
FS-675	150	6	10	65	17.4	380/3/60	15	0.6	128	282
FS-675	100	6	10	74	15	460/3/60	15	0.6	128	282
FS-675	100	6	10			480/3/60	15	0.6	128	282
FS-675	150	6	10	74	15	575/3/60	15	0.6	128	282
FS-4110	100	4	15	120	45	220/3/60	15	0.6	134	295
FS-4110	100	4	15	96	26.1	380/3/60	15	0.6	134	295
FS-4110	100	4	15	110	22.5	460/3/60	15	0.6	134	295
FS-4110	100	4	15			480/3/60	15	0.6	134	295
FS-4110	100	4	15	120	17.2	575/3/60	15	0.6	124	295
FS-6110	150	6	15	120	45	220/3/60	15	0.6	134	295
FS-6110	150	6	15	96	26.1	380/3/60	15	0.6	134	295
FS-6110	150	6	15	110	22.5	460/3/60	15	0.6	134	295
FS-6110	150	6	15			480/3/60	15	0.6	134	295
FS-6110	150	6	15	120	17.2	575/3/60	15	0.6	134	295

# 8. PARTS BREAKDOWN



## 8. PARTS BREAKDOWN

Reference Number	Part Description	FS-475/675 FS-4110/6110
1	Hose Tail	Cast Iron 200
2	Cable Gland	NBR
4	Upper Cover	SUS304
04A	Motor Cover	Cast Iron 200
6	Pump Casing	Ductile Iron 50
7	Bearing Block	Cast Iron 200
9	Seal Block	Cast Iron 200
10	Inlet Plate	Cast Iron 200
11	Strainer	SUS304
12	Bottom Plate	Ductile Iron 50
13	Shaft	SUS410
14	Rotor	Silicon Steel
16	Stator	Silicon Steel
20	Handle/Hanger	Steel
21	Motor Frame	Cast Iron 250
22	Outer Case	SUS304
24	Shaft Sleeve	SUS410
25-25A	Bearing	
27	Protector	
28	O'ring	NBR
29	Gasket	NBR
30	Mechanical Seal	CE/CA+SIC/SIC
32	Cable	
34	C'ring	SC40
39	Impeller	High Chrome Steel
54	Capacitor	
60	Flange	
76	Bearing block	Cast Iron 200
90	Rubber Liner	

## 9. Slide Rail Coupling

Notice to installing contractor: Instructions must remain with installation.

### GENERAL INFORMATION

These models are complete systems used in sewage or dewatering installations with side outlet flanged pumps. They can be used in basins of 10ft depth (for deeper depths, consult factory). The guide rail systems are particularly useful when the liquid level is above the pump discharge pump. The systems feature easy automatic engagement and disengagement for removing the pump for service or repair without draining the basin.

### GENERAL CONSTRUCTION

A flanged discharge elbow base is supplied with the rail system. The elbow base has casted mounting pins which supports the lower rail guides. The elbow base, mounting plate, as well as the upper guide rail bracket are made of durable class 30 cast iron that is epoxy coated. All models require the use of 1" schedule 40 (galvanized steel or stainless steel) pipe for guide rails. Pipe is furnished by the installer.

### LIFTING CABLE

The pump is equipped with lifting lugs that are an integral part of the motor housing or cover for lifting. A permanently attached chain or cable (purchased separately), should be used to aid in pump installation and removal. It is not necessary to use a separate pull chain on the mounting plate which is bolted to the pump discharge flange.

### UPPER GUIDE RAIL SUPPORT BRACKET

As mentioned above, all the rail systems utilize 1" standard pipe for the guide rails. The upper guide support rail bracket is to be mounted to the basin cover frame, as per the discretion of the installer.

### INSTALLING RAIL SYSTEM PARTS (Concrete Basin)

#### Discharge Elbow Base and Guide Rails:

1. Lower the elbow base into the basin.
2. Position the elbow base by dropping a plumb line from the center of the guide rail pins located on the upper guide rail bracket to the center of guide rail pins protruding from the elbow base. Level the elbow base flange in two directions 90° to each other. Mark the outline of the base and bolt holes/slots on the concrete basin floor.
3. Move the base aside to allow for installation of 1" mounting bolts (not included & method of installation to be determined by installer). Secure base with mounting bolts.
4. Cut the 1" pipe guide rails (supplied by others) to the proper length and install them between the pins of the upper guide rail bracket and the pins on the elbow base. It is recommended that the guide rails are to be 1" schedule 40, galvanized or stainless steel pipe.

## 9. Slide Rail Coupling

### **INSTALLING RAIL SYSTEM PARTS (Fiberglass Basin)**

#### **Discharge Elbow Base, Discharge Piping and Guide Rails:**

1. Determine proper length required for discharge piping.
2. Connect discharge piping to elbow base
3. Lower the discharge piping/elbow base assembly into the basin.
4. Position the elbow base by dropping a plumb line from the center of the guide rail pins located on the upper guide rail bracket to the center of guide rail pins protruding from the elbow base. Level the elbow base flange in two directions 90° to each other.
5. Cut the 1" pipe guide rails (supplied by others) to the proper length and install them between the pins of the upper guide rail bracket and the pins on the elbow base. It is recommended that the guide rails are to be 1" schedule 40, galvanized or stainless steel pipe.

### **ATTACHING MOUNTING PLATE TO PUMP**

1. Determine if mounting adapter flange (included) is required for proper assembly.
2. Position mounting plate against pump discharge flange or (if required) sandwich mounting adapter flange between mounting plate and pump discharge flange.
3. Secure mounting plate to pump with screws and washers. Tighten securely.

### **INSTALLING PUMP AND DISCONNECT**

Position pump so the guide rails are captured by the mounting plate. Slowly lower the pump down the guide rails to the base.

If the pump is supported from beneath with concrete blocks or extended legs on the pump base, make certain the mounting plate is sufficiently compressed for sealing. The cantilevered weight of the pump is required for compressing and sealing the machined faces between the mounting plate the elbow base.

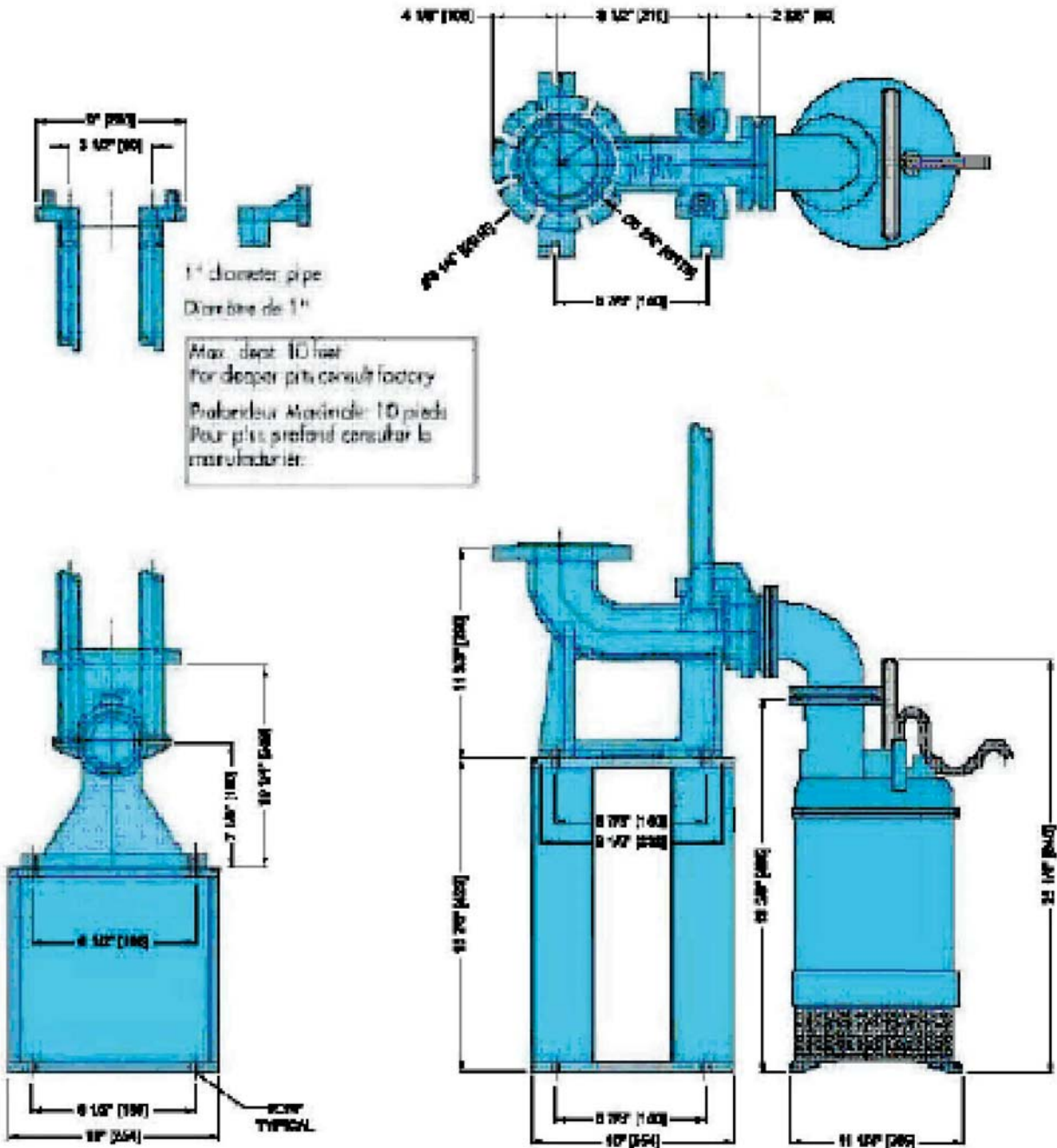
After lowering the pump down the guide rail, secure the upper end of the lifting cable where convenient, to prevent the cable from falling into the basin.

# 9. Slide Rail Coupling

FS - 3" Model BAFFS0300

FS - 4" Model BAFFS0400

SUBMITTAL DATA SHEET  
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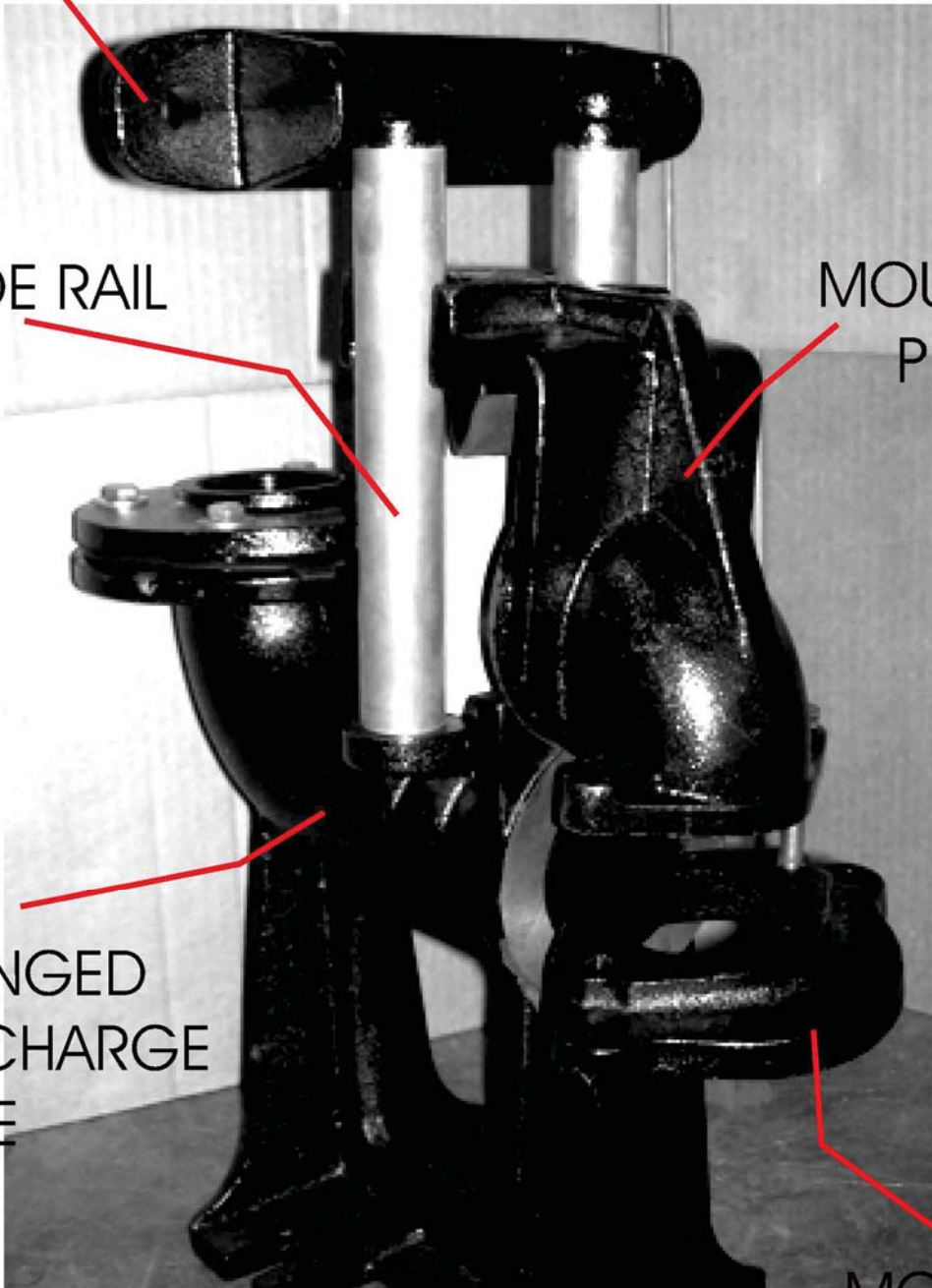
UPPER GUIDE RAIL BRACKET

GUIDE RAIL

MOUNTING  
PLATE

FLANGED  
DISCHARGE  
BASE

MOUNTING  
ADAPTER  
FLANGE  
(if required)





# 1A1 MODEL Cartridge Filter Housing



The 1A1 MODEL Cartridge Filter Housing is an all-metal, two-piece housing, featuring centerpost-type construction. The 1 A1 Model has a maximum operating temperature and pressure of 125 psig at 200°F. The 1A1 Model Cartridge Filter Housing has flow rates to up to 6 Gallons Per Minute (GPM).

## APPLICABLE FILTER CARTRIDGES

Micro-Klean— III (Series U30)

Betapure—

## DESIGN FEATURES

- All-metal, two-piece construction.
- Head and Sump Durable die-cast aluminum
- Mounting pads drilled to accept self-tapping screws provided with the optional mounting bracket.
- Centerpost-type design for easy cartridge changeout.

## Options

- Mounting bracket; order separately.

## STANDARD MODEL SPECIFICATIONS

Table 1 gives specifications for the 1A1 Model. Note that Maximum Operating Pressure is the rating for the housing only. Actual filter operating temperature depends on temperature capability of the filter cartridge used in the housing.

Operating Data	1A1 Model
Maximum Operating Pressure and Temperature	125 psi @ 200°F
Flow Rate (GPM)	See Table 2.
Materials of Construction	
Head and Sump	Die-Cast Aluminum
Centerpost	Stainless Steel
Head Gasket	Buna N & Cork
Cap-Nut Gasket	Fiber
Connection Sizes	3/8" NPTF
Cartridge Requirements	The model uses one filter cartridge. See "Cartridge Requirements" for more information.

TABLE 1 - SPECIFICATIONS

## CARTRIDGE REQUIREMENTS

The 1A1 Model Cartridge Filter Housing uses one Micro-Klean III Cartridge or one Betapure Cartridge Filter.

## FLOW RATES

Table 2 gives maximum flow rates in Gallons Per Minute (GPM) for the 1A1 Model Cartridge Filter Housings. Do not use Table 2 for filter sizing. Use the table as a guide only in establishing the housing flow rates. When you know the flow rate for a selected cartridge, then use the table to determine whether or not the housing is within the recommended flow rate. Remember to consider the amount of contaminant to be removed when selecting a filter.

Housing Model	Inlet / Outlet	FLOW (GPM)					
		Water	80 SSU	150 SSU	300 SSU	600 SSU	1000 SSU
1A1	3/8" NPTF	6	5	4.5	4	3.5	3

TABLE 2 - RECOMMENDED FLOW RATES

## BENEFITS

- Long Service Life
- Quick and Easy Cartridge Change-out
- Reduced Down Time for Filter Change-out
- Reduced Labor Cost
- Uses Standard Filters
- Economical
- Easily Mounted to Wall or Support Structure





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for HVAC Market After-Sales Parts and Services**

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FLORIDA, USA

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