

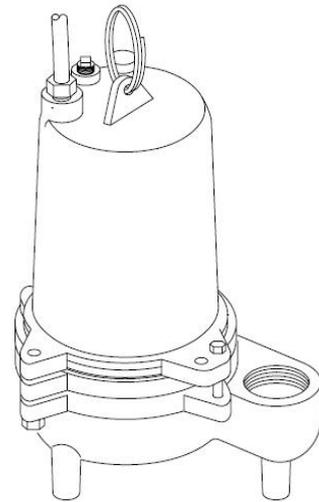
USER'S MANUAL FOR F&Q

SUBMERSIBLE SEWAGE PUMPS

CFW40 / CFW50 / CFW50V SERIES

Description

F&Q submersible sewage pumps are self-contained and recommended for use in a sump or basin. The sump or basin shall be vented in accordance with local plumbing codes. Designed to pump effluent or wastewater, non-explosive and noncorrosive liquids, and shall **NOT** be installed in locations classified as hazardous in accordance with the United States National Electrical Code (NEC), ANSI/NFPA 70. Never install the pump in a trench, ditch, or hole with a dirt bottom; the legs will sink into the dirt and the suction will become plugged.



Specifications

TEMPERATURE.....104°F (40°C) Continuous
IMPELLER..... CFW40/50: 2 Vane, open
CFW50V: 10 Vane, Vortex
SOLIDS HANDLING.....2" (51mm) spherical
PAINT..... Air dry enamel
SEAL..... Single mechanical, Silicon Carbide,
oil-filled reservoir, 300 series Stainless Steel Parts
CABLE ENTRY..... 20 ft. (6 m) quick disconnect cord,
with plug on 120 & 240 volt, 1 phase, pressure grommet for
sealing and strain relief.

UPPER BEARING.....Single row, ball design oil lubrication,
radial load
LOWER BEARING.....Single row, ball design, oil lubrication,
radial & thrust load
MOTOR..... NEMA L, torque curve, oil-filled,
squirrel cage induction, Class B insulation
SINGLE PHASE..... Permanent Split Capacitor (PSC)
Includes Thermal Overload Protection in motor
CONSTRUCTION MATERIAL..... Class 30 cast iron for motor
house, Seal Plate and impeller
OPTIONAL.... 20 ft float switch with piggy-back plug



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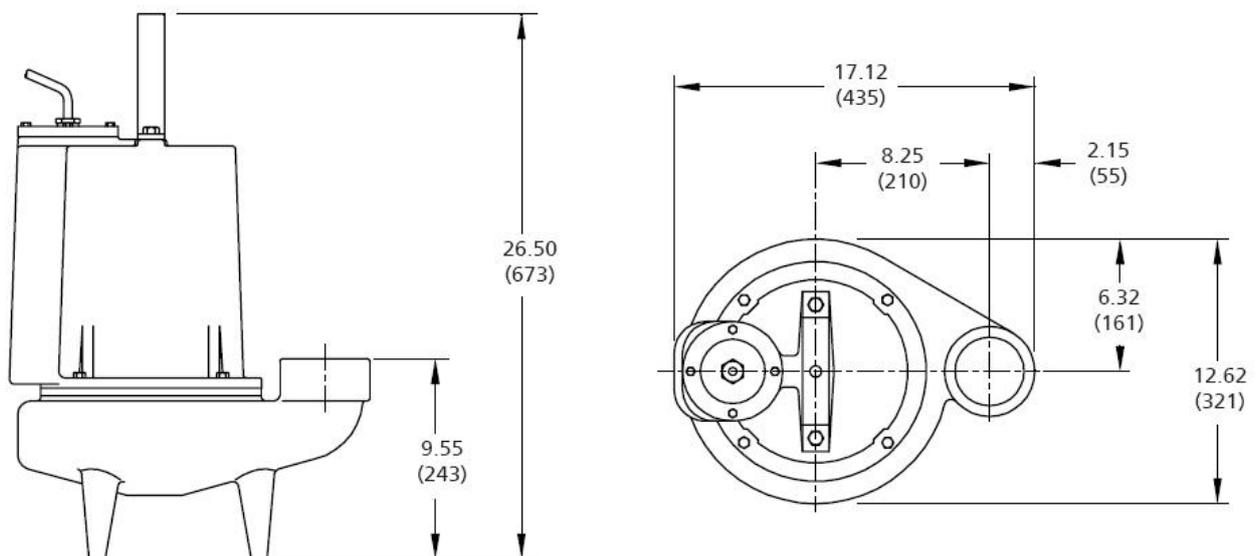
Motor & Electrical

Models	Hp	Volt/Ph	Hz	Rpm	NEMA Start Code	Full Load Amps	Locked Rotor Amps	Cord Size	Cord Type	Cord O.D. Inches (mm)
CFW40A	4/10	115/1	60	1750	C	12.0	19.0	14/3	SJTOW	0.375 (9.5)
CFW40M	4/10	115/1	60	1750	C	12.0	19.0	14/3	SJTOW	0.375 (9.5)
CFW50A	1/2	115/1	60	1750	A	12.0	26.0	14/3	SJTOW	0.375 (9.5)
CFW50M	1/2	115/1	60	1750	A	12.0	26.0	14/3	SJTOW	0.375 (9.5)
CFW50VA	1/2	115/1	60	1750	A	12.0	26.0	14/3	SJTOW	0.375 (9.5)
CFW50VM	1/2	115/1	60	1750	A	12.0	26.0	14/3	SJTOW	0.375 (9.5)
CFW502VA	1/2	230/1	60	1750	A	5.5	13.0	14/3	SJTOW	0.375 (9.5)
CFW502VM	1/2	230/1	60	1750	A	5.5	13.0	14/3	SJTOW	0.375 (9.5)

Performance

Models	Hp	Speed	Disch. NPT	Gal./Min @ Total Head in Feet						Shut off
				0 Ft	5 Ft	10 Ft	15 Ft	20 Ft	25 Ft	
CFW40A	4/10	1750	2" (51mm)	135	125	110	85	50	5	25.5
CFW40M	4/10	1750	2" (51mm)	135	125	110	85	50	5	25.5
CFW50A	1/2	1750	2" (51mm)	140	130	115	90	55		25
CFW50M	1/2	1750	2" (51mm)	140	130	115	90	55		25
CFW50VA	1/2	1750	2" (51mm)	130	120	95	65	23		23
CFW50VM	1/2	1750	2" (51mm)	130	120	95	65	23		23
CFW502VA	1/2	1750	2" (51mm)	130	120	95	65	23		23
CFW502VM	1/2	1750	2" (51mm)	130	120	95	65	23		23

Dimensions



General Safety Information

Please read this before installing or operating pump, this information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols:

NOTE: Indicates special instructions which are important but not related to hazards.

IMPORTANT: Indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

1. Most accidents can be avoided by using **COMMON SENSE**.

 **Do not wear loose clothing that may become entangled in the impeller or other moving parts. Always wear appropriate safety gear, such as safety glasses, when working on the pump or piping.**

 **Pumps build up heat and pressure during operation. Allow time for pumps to cool before handling or servicing.**

2. Only qualified personnel should install, operate, and repair pump.

 **Keep clear of suction and discharge openings. Do not insert fingers in pump with power connected.**

 **Do not pump Hazardous materials (flammable,**

caustic, etc.) unless the pump is specifically designed and designated to handle them.

3. Make sure lifting handles are securely fastened each time before lifting.

4. Do not lift pump by the power cord.

5. Do not exceed manufacturer's recommendation for maximum performance, as this could cause the motor to overheat.

6. Secure the pump in its operating position so it cannot tip over, fall, or slide.

7. Keep hands and feet away from impeller when power is connected.

 **Submersible pumps are not approved for use in swimming pools, recreational water installations, decorative fountains, or any installation where human contact with the pumped fluid is common.**

8. Operation against a closed discharge valve will cause premature bearing and seal failure on any pump.

 **To reduce risk of electrical shock, pump must be properly grounded in accordance with the United States National Electric Code (NEC), or the Canadian Electrical Code (CEC) and all applicable state, and local codes and ordinances.**

 **To reduce risk of electrical shock, always disconnect the pump from the**

power source before handling or servicing.

9. Any wiring of pumps should be performed by a qualified electrician.

 **Never operate a pump with a power cord that has frayed or brittle insulation.**

10. Cable should be protected at all times to avoid punctures, cuts, bruises, and abrasions – inspect frequently.

 **Never handle connected power cords with wet hands. Never operate a 120 volt pump with a plug-in type power cord without a ground fault circuit interrupter**

11. Do not remove cord and strain relief. Do not connect conduit to pump.

 **To reduce risk of electrical shock, all wiring and junction connections should be made per the United States National Electric Code (NEC), or the Canadian Electrical Code (CEC) and applicable state or province and local codes. Requirements may vary depending on usage and location. See wiring diagrams in manual.**

F&Q Pumps, Inc is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

Unpacking

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the carrier that delivered the pump. If the manual is removed from the packaging, do not lose or misplace.

Storage

Short Term - Pumps are manufactured for efficient performance following short inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

Long Term - For storage of six (6) months, to twenty-four (24) months, the units should be stored in a temperature controlled area, a roofed-over walled enclosure that provides protection from the elements (rain, snow, wind-blown dust, etc.), and whose temperature can be maintained between +40° F and +120° F. If extended high humidity is expected to be a problem, all exposed parts should be inspected before storage and all surfaces that have the paint scratched, damaged, or worn should be recoated with a water base, air dry enamel paint. All surfaces should then be sprayed with a rust-inhibiting oil. Pump should be stored in its original shipping container. On initial start up, rotate impeller by hand to assure seal and impeller rotate freely.

If it is required that the pump be

installed and tested before the long term storage begins, such installation will be allowed provided:

1. The pump is not installed under water for more than one (1) month.
2. Immediately upon satisfactory completion of the test, the pump is removed, thoroughly dried, repacked in the original shipping container, and placed in a temperature controlled storage area.

Installation

SUBMERGENCE

It is recommended that the pump be operated in the submerged condition and the sump liquid level should never be less than "A" dimension in Figure 1.

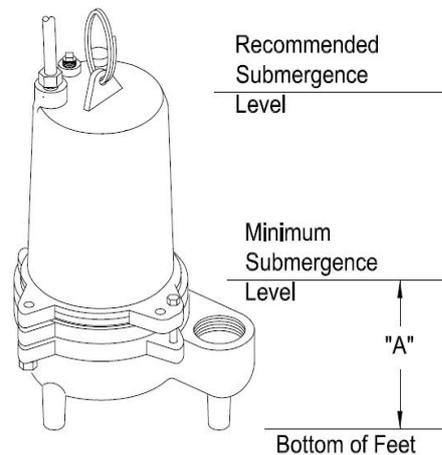


FIGURE 1

DISCHARGE

Discharge piping should be as short as possible. Both a check valve and a shut-off valve are recommended for each pump being used. The check valve is used to prevent backflow into the sump. Excessive backflow can cause flooding and/or damage to the pump.

The shut-off valve is used to stop

system flow during pump or check valve servicing.

LIQUID LEVEL CONTROL

Figure 2 shows a typical installation for any submersible pump using a level control mounted to the discharge piping with a piggy-back plug.

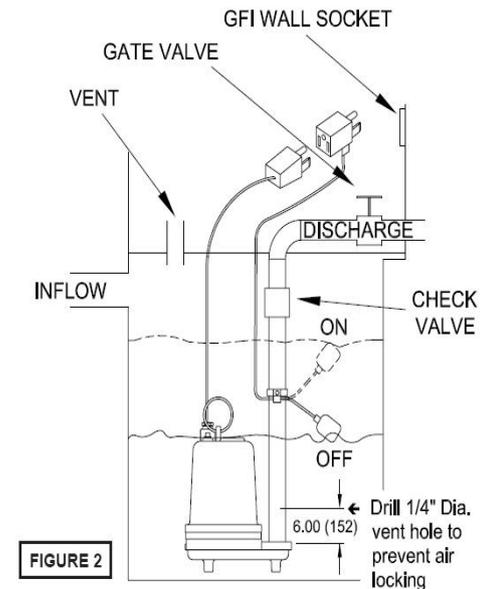


FIGURE 2

Figure 3 shows a typical connection for 1 phase 120V pumps with a piggy-back plug, for manual and automatic operations.

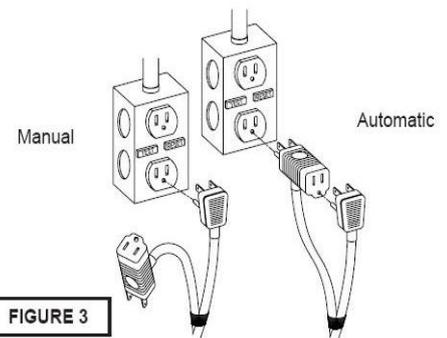


FIGURE 3

ELECTRICAL CONNECTIONS

An acceptable motor control switch shall be provided at the time of installation.

Power Cable - The cord assembly mounted to the pump must not be

modified in any way except for shortening to a specific application. Any splice between the pump and the control panel must be made in accordance with all applicable electric codes. It is recommended that a junction box, if used, be mounted outside the sump or be of at least NEMA 4 construction if located within the wet well. Do not use the power cable to lift pump.

NOTE: The white wire is **NOT** a neutral or ground lead, but a power carrying conductor.

⚠ CAUTION *Risk of*

electric shock. Do not remove cord and/or strain relief. Do not connect conduit to pump.

Wire Size

Consult a qualified electrician for proper wire size. See table on page 2 for electrical information.

Pre-operation

CHECK VOLTAGE AND PHASE

Before operating pump, check to make sure that the voltage and phase information stamped on the pump's identification plate matches the available power.

CHECK PUMP ROTATION

Before putting pump into service for the first time, the motor rotation must be checked. Improper motor rotation can result in poor pump performance and can damage the motor and/or pump. To check the rotation, suspend the pump freely, momentarily apply power and observe the "kickback." "Kickback" should always be in a counter clockwise direction as viewed from the top of the pump ("kickback" is always opposite to impeller rotation).

"Rotation" and "kickback" direction is noted on the pump motor housing.

IDENTIFICATION PLATE

Note the numbers on the pump's

identification plate and record at the end of the manual for future reference.

INSULATION TEST

Before the pump is put into service, an insulation (megger) test should be performed on it. The ohm values as well as the volts and amps should be recorded.

PUMP-DOWN TEST

After the pump has been properly wired and lowered into the basin, sump, or lift station, it is advisable to check the system by filling with liquid and allowing the pump to operate through it's pumping cycle. The time needed to empty the system, or pump down time, should be recorded.

Maintenance

As the motor is oil filled, no lubrication or other maintenance is required.

Troubleshooting Chart

⚠ CAUTION *Always disconnect the pump from the electrical power source before handling. If the system fails to operate properly, carefully read instructions and perform maintenance recommendations. If operating problems persist, the following chart may be of assistance in identifying and correcting them.*

NOTE: Not all problems and corrections will apply to each pump model.

Symptom	Possible Cause (s)	Corrective Action
Pump will not run	<p>1. Poor electrical connection, blown fuse, tripped breaker, or other interruption of power; improper power supply</p> <p>2. Switch will not activate pump or is defective</p>	<p>1. Check all electrical connections for security. Have electrician measure current in motor leads. If current is within $\pm 20\%$ of locked rotor Amps, impeller is probably locked. If current is 0, overload may be tripped. Remove power, allow pump to cool, then recheck current</p> <p>2. Disconnect level control. Set ohmmeter for a low range, such as 100 ohms full scale and connect to level control leads. Actuate level control manually and check to see that ohmmeter shows zero ohms for closed switch and full scale for open switch (Float Switch)</p>

Troubleshooting Chart (Continued)

Symptom	Possible Cause (s)	Corrective Action
Pump will not run	<ul style="list-style-type: none"> 3. Motor or switch inoperative 4. Float movement restricted 5. Defective motor 6. Insufficient liquid level 	<ul style="list-style-type: none"> 3. Go to manual operation of pump 4. Reposition pump or clean basin as required to provide adequate clearance for float 5. Check winding insulation (Megger Test) and winding resistance. If check is outside of range, dry and recheck. If still defective, replace per service instructions 6. Make sure liquid level is at least equal to suggested turn-on point
Pump hums but doesn't run	<ul style="list-style-type: none"> 1. Incorrect voltage 2. Impeller jammed or loose on shaft, worn, or damaged, impeller cavity or inlet plugged 	<ul style="list-style-type: none"> 1. Check all electrical connections for security 2. Check impeller for freedom of operation, security, and condition. Clean impeller cavity and inlet of any obstruction
Pump delivers insufficient capacity	<ul style="list-style-type: none"> 1. Incorrect voltage 2. Excessive inflow or pump not properly sized for application 3. Discharge restricted 4. Check valve stuck closed or installed backwards 5. Shut-off valve closed 6. Impeller jammed or loose on shaft, worn or damaged, impeller cavity or inlet plugged 7. Pump may be airlocked 8. Pump running backwards 	<ul style="list-style-type: none"> 1. Check all electrical connections for security. 2. Recheck all sizing calculations to determine proper pump size 3. Check discharge line for restrictions, including ice. If line passes through or into cold areas 4. Remove and examine check valve for proper installation and freedom of operation 5. Open valve 6. Check impeller for freedom of operation, security, and condition. Clean impeller cavity and inlet of any obstruction 7. Loosen union slightly to allow trapped air to escape. Verify that turn-off level of switch is set so that impeller cavity is always flooded. Clean vent hole 8. Check rotation. If power supply is three phase, reverse any two of three power supply leads to ensure proper impeller rotation
Pump operates noisily or vibrates excessively	<ul style="list-style-type: none"> 1. Worn bearings, motor shaft bent 2. Debris in impeller cavity or broken impeller 3. Pump running backwards 4. Piping attachments to building structure too rigid or too loose 	<ul style="list-style-type: none"> 1. Check winding insulation (Megger Test) and winding resistance. If check is outside of range, dry and recheck. If still defective, replace per service instructions 2. Check impeller for freedom of operation, security, and condition. Clean impeller cavity and inlet of any obstruction 3. Check rotation. If power supply is three phase, reverse any two of three power supply leads to ensure proper impeller rotation 4. Replace portion of discharge pipe with flexible connector