



Submersible Pump Quick Start Guide

Complete IOM available from sterlingpumps.com.au or contact Sterling Pumps on 03 5941 3400.

1) General Description:

This guide is relevant to the following 50HZ submersible pumps.

- Models W8 TO W215
- Models ST30 to ST375
- Models 150 to 450

2) Delivery and handling:

Pumps and motors should remain in the supplied packaging until ready for use.

Packaging and the pump unit should be inspected for damage on arrival.

Never lift the unit by the power cable.

DO NOT use any sharp tools to unpack the unit, there is a risk the cable may be cut.

Be gentle: bending or dropping the unit may cause misalignment and bearing damage.

3) Technical Data:

Unless noted on drawings or invoice, all pumps are fitted with an undrilled check valve.

Motors are designed for 415v +/-10% 50 hz supply.

Pump **must** be operated within the performance envelope printed on the pump curve. If in doubt, check with Sterling Pumps.

4) Motor:

Check liquid level. All Sterling motors are water filled. This level should be checked when the motor is in a vertical position *prior* to installation. Motor should be full to the filling plug with potable water (4" motors are permanently sealed and do not require this check).

Standard 4" to 10" - 2 pole motors are designed for liquid temperatures to 45deg C; all other standard motors are designed for 25deg C water.

5) Pump unit:

The pump is designed to operate between vertical, with discharge uppermost, and horizontal positions. It should *never* be operated beyond horizontal with check valve down. Special versions are available for this application.

If the pump and motor are supplied separately, ideally they should be coupled in vertical position, avoiding applying force to the pump or motor shafts. Once coupled, the shaft should be checked for free rotation and end play.

6) Electrical:

Detailed submersible cable joint procedure available on the Sterling web site, or from Sterling Pumps.

This work must be done by a suitably qualified person.

Joining materials available from Sterling Pumps on request.

7) Installation:

It is assumed that the installer is an experienced, suitably qualified tradesperson.

The following items should be checked:

- Condition of the well
- Condition of the water, more than 50g/m³ solids in suspension
- Liquid temperature not more than 45deg C, unless separate engineering sheet supplied
- Cable connection
- Pipework connections
- Unit must be connected to a proper earth
- Ensure power supply is disconnected prior to working with the unit
- Proper clamps and slings should be used as shown.
- Detailed lifting procedure available on the Sterling web site or by calling Sterling Pumps

8) Checking the direction of rotation:

The pump must not be started until the suction case is completely submerged in water. The direction of rotation should be checked, following procedure below, *every time* it is connected to a new installation.

- a) Start the pump and check the discharge flow and head produced by pump.
- b) Stop the pump and interchange 2 phases in the starter.
- c) Start the pump and again check the discharge flow and head produced by pump.
- d) Compare the results taken from a) and c). The connection that gives the largest volume of water and highest head is the correct connection.
- e) Unit rotation is CCW looking at the pump discharge.

9) Start Up:

When the pump has been correctly connected and is submerged in the liquid to be pumped, it should be started with the valve open approximately 1/3 from closed position.

Check the direction of rotation as described in section 8.

If there are impurities in the water the valve should be gradually opened until the water runs clearer.

The pump should not be stopped until the water is clear, otherwise the impurities may collect in the wear rings and check valve, preventing the unit from starting again.

As the valve is opened the draw down level of the water should be constantly checked to ensure the pump is always submerged. The dynamic water level should always be over the suction case of the pump.

If the pump is pumping a greater amount than the yield of the bore there is a risk of the pump drawing in air. This event can cause serious damage to the pump and submersible motor.

To prevent this occurring it is recommended that low level or low flow protection is fitted to the unit.

10) Operation:

Minimum flow rate - the pumped rate should never be so low that the motor cooling is compromised.

If the pump is to be operated outside its nominated range consult Sterling or your pump dealer.

Frequency of starts - pumps and motors should not be left idle for extended periods; it is recommended that the unit is started at least once every 15 days.

Maximum number of starts recommended is 15 per hour for 4", 6", 8" and 10" motors.

11) Storage:

If the pump and motor are not going to be installed and operated soon after arrival, store in a closed, clean, dry and well ventilated area with slow moderate temperature changes. Protect the pump and motor from moisture, heat, dust and foreign bodies. The unit should not be exposed to direct sunlight.

Storage temperature must be maintained between -20°C and +60°C

The motor shaft must be turned at least once a month.

If storage exceeds 1 year the unit should be dismantled and inspected.

12) Fault Finding:

Fault	Cause	Remedy
 Before removal/dismantling of the pump, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on. All rotating parts must have stopped moving.		
1	The pump/motor does not run.	
	a) The fuses are blown	Replace the blown fuses. If they blow again, the electric installation and the submersible drop cable should be checked.
	b) The ELCB or the voltage-operated ELCB has tripped out.	Cut in the circuit breaker.
	c) No electricity supply	Contact the electricity supply company.
	d) The motor starter overload has tripped out	Reset the motor starter overload (automatically or possibly manually). If it trips out again, check the voltage. Is the voltage OK? Then see items e) - h).
	e) Motor starter/contactor is defective.	Replace the motor starter/contactor.
	f) Starter device is defective.	Repair/replace the starter device.
	g) The control circuit has been interrupted or is defective.	Check the electric installation.
	h) The dry-running protection has cut off the electricity supply to the pump, due to low water level.	Check the water level. If it is OK, check the water level electrodes/level switch.
	i) The pump/submersible drop cable is defective.	Repair/replace the pump/cable.
2	The pump runs but gives no water.	
	a) The discharge valve is closed.	Open the valve.
	b) No water or too low water level in borehole.	See item 3 a).
	c) The non-return valve is stuck in it's shut position.	Pull out the pump and clean or replace the valve.
	d) The inlet strainer is choked up.	Pull out the pump and clean the strainer.
	e) The pump is defective.	Repair/replace the pump.
3	The pump runs at reduced capacity.	
	a) The drawdown is larger than anticipated.	Increase the installation depth of the pump, throttle the pump or replace it by a smaller model to obtain a smaller capacity.
	b) Wrong direction of rotation.	See section 8 "Checking the direction of rotation".
	c) The valves in the discharge pipe are partly closed/blocked.	Check and clean/replace the valves, if necessary.
	d) The discharge pipe is partly choked by impurities (ochre).	Clean/replace the discharge pipe.
	e) The non-return valve of the pump is partly blocked.	Pull out the pump and check/replace the valve.
	f) The pump and the riser pipe are partly choked by impurities (ochre).	Pull out the pump. Check and clean or replace the pump, if necessary. Clean the pipes.
	g) The pump is defective.	Repair/replace the pump.
	h) Leakage in the pipework.	Check and repair the pipework.
	i) The riser pipe is defective.	Replace the riser pipe.
4	Frequent starts and stops	
	a) The differential of the pressure switch between the start and stop pressures is too small.	Increase the differential. However, the stop pressure must not exceed the operating pressure of the pressure tank, and the start pressure should be high enough to ensure sufficient water supply.
	b) The water level electrodes or level switches in the reservoir have not been installed correctly.	Adjust the intervals of the electrodes/level switches to ensure suitable time between the cutting-in and cutting-out of the pump. See installation and operating instructions for the automatic devices used. If the intervals between the stop/start cannot be changed via the automatics, the pump capacity may be reduced by throttling the discharge valve.
	c) The non-return valve is leaking or stuck half open.	Pull out the pump and clean/replace the non-return valve.
	d) The volume of air in the pressure/diaphragm tank is too small.	Adjust the volume of air in the pressure/diaphragm tank in accordance with its installation and operating instructions.
	e) The pressure/diaphragm tank is too small.	Increase the capacity of the pressure/diaphragm tank by replacing or supplementing with another tank.
	f) The diaphragm of the diaphragm tank is defective.	Check the diaphragm tank.