

Installation, Operating, Maintenance and Safety Instructions for **CW332**

Pressurised water system for boats
24 volt d.c.



**To obtain the best performance from your
'Pressurised water system' please read these
instructions carefully.**

Failure to observe the recommended procedures
may result in early and severe damage, and may
invalidate the supplier's guarantee.



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1. CHECKING YOUR PUMP ON DELIVERY

Your pump left our works in perfect condition. We want it to reach you in the same condition, and to provide you with long and trouble-free service. On receiving your pump, please make the following preliminary checks:

1. check that the model number conforms to your order
2. check that the details on the plate of the electric motor correspond to your power supply.
3. check that no damage has occurred in transit. Check for loose nuts and bolts and for missing parts. Did you order accessories or spare parts? Are they all there?

Report immediately to your supplier any damage or missing or incorrect parts. Delay in notification may cause problems in dealing with claims under warranty.

2. SCOPE OF USE

The CW332 pressure system is intended for use in pressurised fresh water systems.

WARNING!

This pump is not intended for use with fuel oils or with petrol, gasoline, benzene or other light-fraction petroleum fuels or solvents, and it must not be used for this purpose. The electric motor is not explosion-proof or spark-protected, and is not suitable for use in areas where flammable vapours can occur.

3. INSTALLING THE PUMP

1. Locate the pump in a dry, well-ventilated space. Provide adequate access, so that maintenance work can be carried out without difficulty.
2. Secure the pump to a firm, horizontal base. Mounting on rubber pads can help to reduce vibration and transmitted noise.
3. The electrical installation should be carried out or supervised by a qualified electrician. With low-voltage d.c. units, it is particularly important to use adequately sized cable to minimise voltage drop. Refer to TABLE 1. If the pump is more than 6 metres from the battery, use a heavier grade of cable than that specified.

TABLE 1

D.C. CABLE SIZE and FUSE RATINGS for cable runs up to 6m

MODEL	24V d.c Conductor cross-sectional area per wire, mm ²	FUSE AMP
CW332	6	20

4. The CW332 pump is self-priming. Maximum recommended suction lift is indicated in TABLE 2.

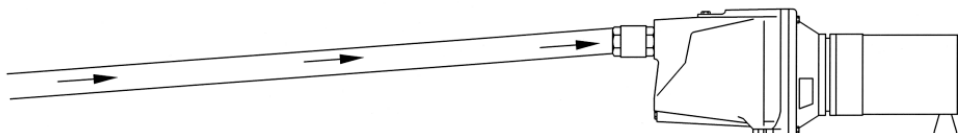
TABLE 2

MODEL	Maximum vertical suction lift (new pump)
CW332	3 metres (10 ft)

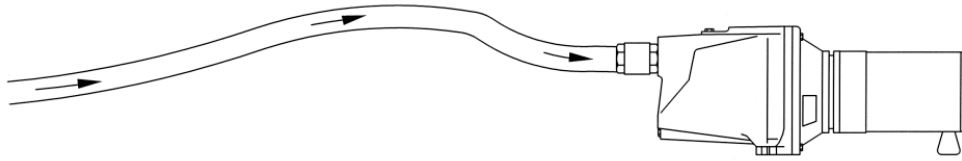
The suction lift is the vertical distance from the lowest level of the water source to the centre line of the pump inlet port. Do not exceed this recommended maximum. For optimum pump life and performance, keep the suction lift to a minimum.

5. The inlet line to the pump should be as short and straight as possible, with a bore at least as large as the nominal bore of the pump inlet port. Use rigid or reinforced pipe that will not deform or collapse under suction conditions. The inlet pipe should be angled below the horizontal, to prevent entrapment of air and loss of prime when running.

CORRECT



INCORRECT



If a long inlet line is unavoidable, it may be advantageous to increase the size of the pipe. Check with your pump supplier if in doubt.

Fit an **inlet strainer** to protect the pump from entry of solid material. The strainer should be of suitable material, with approximately 0.5mm mesh size and with an open area of at least 2½ times the cross-sectional area of the inlet pipework. The strainer should be inspected regularly and cleaned when necessary. Check the inlet line carefully for **air leaks**, which will stop the pump from priming itself.

6. The discharge line should preferably be of the same bore as the pump discharge port. Smaller pipework will limit the system flow rate. Pipework of reduced size may be used for branches to individual fittings.

4. FITTING THE ACCUMULATOR TANK

1. The accumulator tank should be teed off the pump discharge line and a convenient point within 2m of the pump.
2. The tank may be mounted in any orientation – see fitting instructions for this.
3. Check the gas pressure of the tank at the time of installation. It should be already set at 0.7 bar (10psi).

The pressure in the tank can be adjusted by means of the Schrader valve in the closed end. Any pressure adjustment is best done before installation of the tank, using a car-type pressure gauge to determine when the required pressure is reached, as follows:

- I. Depress the central pin of the Schrader valve with your finger, to release gas
- II. Release gas a little at a time, until the pressure is correct
- III. If you release too much gas by mistake, air may be pumped back in with a hand – or foot-pump.

WARNING

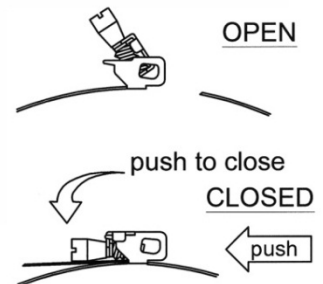
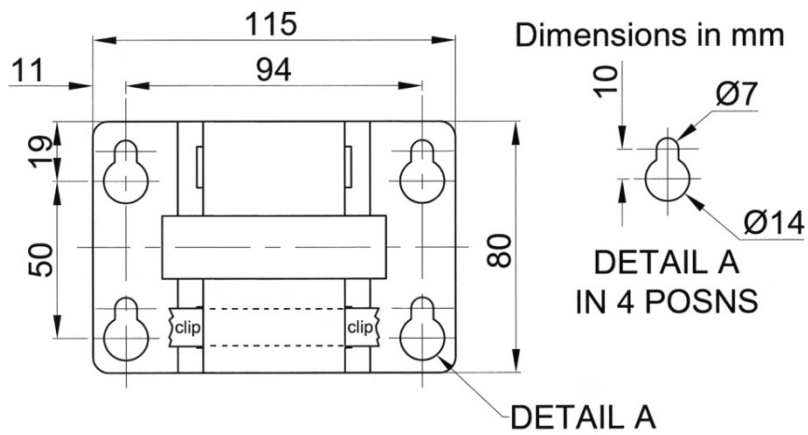
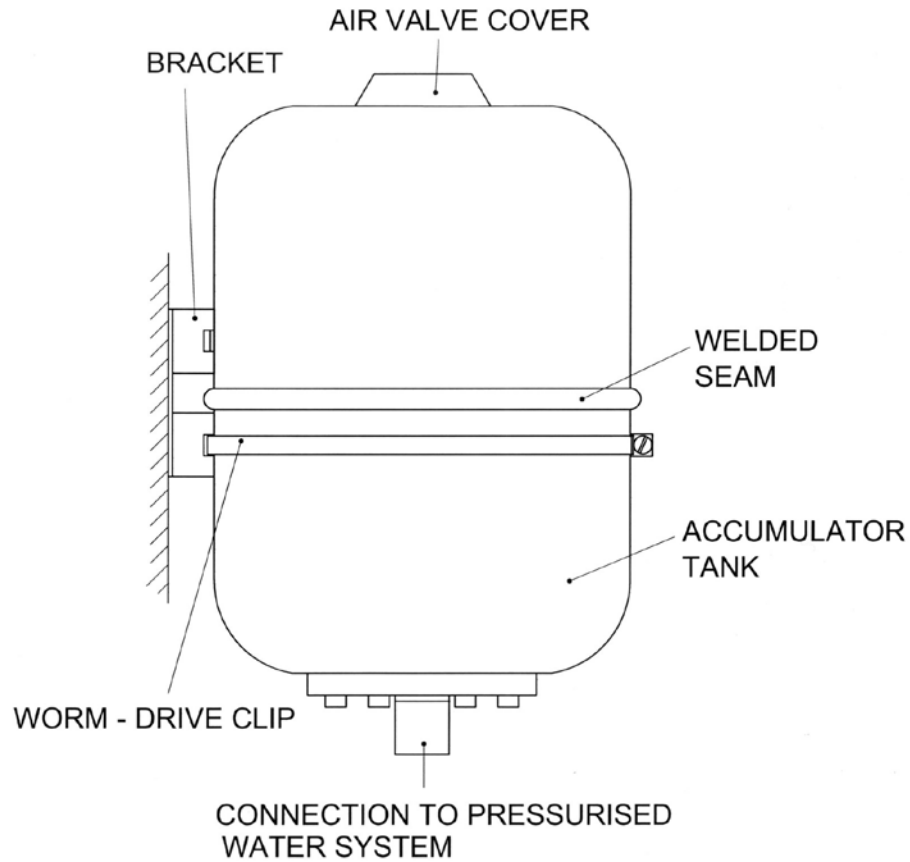
Make sure that there is adequate ventilation when setting or adjusting pressure in an accumulator tank. Nitrogen is non-toxic, but oxygen levels may be reduced in confined spaces.

If the tank pressure requires adjustment after installation, ensure first that the pump is switched off and that an outlet is open, so that there is no pressure in the system. Then regulate the pressure as indicated above.

Check the accumulator tank performance in this way every 6 months, and adjust the pressure if necessary.

Accumulator Tank Bracket Kit

Fitting instructions



Your accumulator tank may be up to half - full of water in normal operation. It needs to be secured in place firmly to prevent movement and possible damage to pipe work and fittings. The accumulator tank contains an internal membrane, and may be mounted vertically, horizontally or in any convenient position close to the pump. Make sure that you have access to the air valve and to the threaded pipe connection.

1. Locate the bracket on the firm surface. Check the final position of the accumulator tank, and then secure the bracket firmly in the place with suitable screws.
2. Check that the worm - drive fastener is in the 'open' position (see diagram). Pass the free end of the clip through the lower pair of holes in the bracket (vertical mounting) or through either pair (horizontal mounting). Only 1 clip is required to hold the accumulator tank securely in place; a second clip may be added but is not supplied with this kit.
3. Position the accumulator tank on the bracket and rotate the clip until the worm-drive fastener is in a convenient position to be tightened. Position the clip below the central welded seam of the accumulator tank.
4. Push the free end of the clip through the fastener as far as it will go. Close the worm - drive fastener (see diagram). Tighten the screw until the accumulator tank is firmly secured in place. Do not over - tighten. Trim off excess clip material. To avoid possible injury deburr cut edges with file.

5. CONNECTING THE ELECTRIC SUPPLY

1. Isolate the unit from the electric supply.
2. Connect the pump's power cable to the electric supply.
3. The unit is supplied with the motor pre-wired to its controls. Observe the correct polarity when connecting the motor lead to the power supply cable from the battery.
4. Connect the pump's power cable to the electric supply.
5. Check that a correctly rated fuse has been fitted in the power supply.

6. STARTING THE PUMP

1. Remove the filler plug on the top of the pump. Fill the pump body with water and replace the plug, ensuring that it is screwed fully home to make an air-tight seal.
2. Check that the wiring is complete and correct, that the motor terminal box cover is in place and that all enclosures containing live components have been secured. Turn on the power supply at the master switch.
3. The motor will rotate in the correct direction if it is connected with the polarity shown in its wiring diagram.

4. Check the water level in the supply tank, open taps and other outlets. Check that isolating valves in the inlet and discharge lines are fully open.
5. Switch on the pump. After a short time, water and air should start to flow from the open outlets. Allow a few seconds for the air to clear itself. If the pump has not primed itself and established a steady flow after about 20 seconds, stop the pump and investigate for air leaks in the inlet pipework. As soon as water flows smoothly from the taps, turn them off one by one. The pump should turn itself off within a few seconds of closing the last outlet. Your system is now ready for use.

ESSENTIAL PRECAUTIONS

- * *Do not run the pump dry. Running the pump for more than a short time with no water in it will damage the shaft seal. A timer, or a level control in the water supply tank, will protect the pump. Contact your pump supplier for advice if necessary.*
- * *Never restrict the inlet pipe while the pump is running. A restricted inlet line will give rise to low pressure with the risk of cavitation, loss of efficiency, vibration, noise and eventual damage to the pump.*
- * *If the pump is to be shut down for an extended period, switch off the electric supply and open outlets to depressurise the system. Drain the pipework, water storage heater (calorifier) and pump casing if there is any risk of frost damage.*
- * *Check regularly that the pump runs smoothly, delivers the required flow and pressure and does not leak. Investigate leaks, noisy running, or vibration immediately, to minimise the risk of damage or premature failure.*
- * *If the pump loses performance or fails to reach its cut-out pressure, remember to check the electric supply voltage, at the motor terminals, with the pump running, as well as the condition of the pump itself.*

7. Operating the pump

Provided the pump has been correctly installed and commissioned, it should operate automatically on demand. The cut-in and cut-out pressures, and the air pressure in the accumulator tank, have been pre-set before delivery.

The cut-in and cut-out pressures may be altered if required, by adjusting the settings in the pressure switch. Check with Cleghorn Waring that the pressure settings you propose are compatible with the unit.

WARNING

Before you alter the pressure settings, you are strongly advised to check that every component in the pressurised system is suitable for your intended maximum pressure. In particular, check the pressure rating of water storage heaters (calorifiers) and their pressure relief valves. Increased pressure may cause a relief valve to lift, resulting in a continuous loss of stored water.

8. Maintenance & Repair

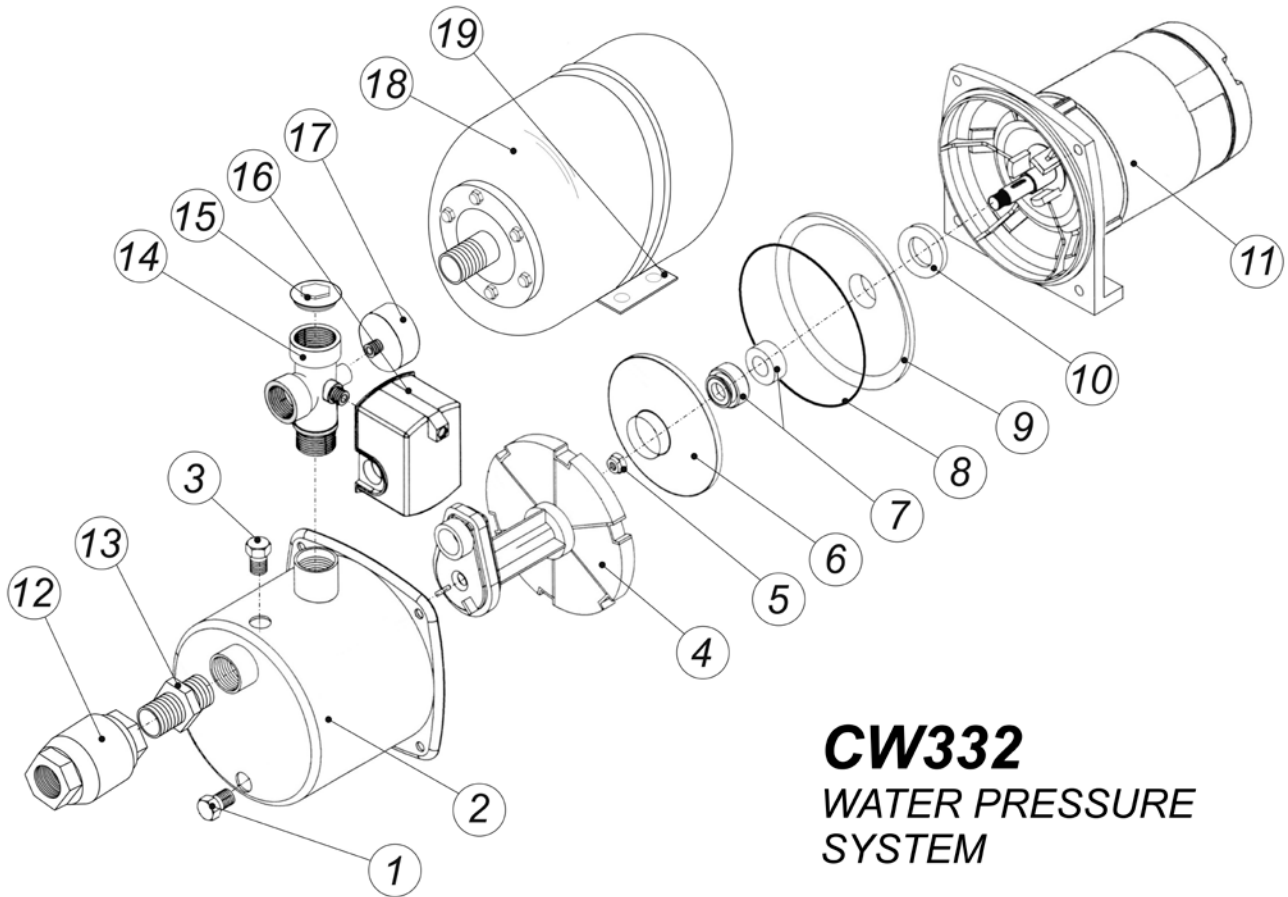
Your CW332 pump is designed to give long service with minimal attention. The shaft seal and the brushes in d.c. electric motors are wearing parts and may eventually need to be replaced.

9. Trouble Shooting

PROBLEM	POSSIBLE CAUSE	ACTION
Motor fails to start when switched on	<ul style="list-style-type: none"> - loose wiring - fuse blown - no power in pump circuit 	<ul style="list-style-type: none"> - check wiring - check cause, replace fuse - check power supply
Motor hums but does not run	<ul style="list-style-type: none"> - pump has jammed 	<ul style="list-style-type: none"> - disconnect power; turn motor fan by hand, or open pump and turn by hand; investigate cause
Motor runs but no water flows	<ul style="list-style-type: none"> - air leak in inlet line - pump is not primed - pump has lost prime - air lock in inlet line - no water supply - inlet or discharge line blocked - inlet valve closed - blocked jet or impeller in pump 	<ul style="list-style-type: none"> - check inlet line, port connections, drain plug, priming plug - prime pump, open outlets - open outlets to allow pump to re-prime on starting - possible inlet air leak. - alter pipework layout - check supply tank - check pipework - check inlet valve - open pump and check for blockages
Motor runs hot to touch; smell of burning	<ul style="list-style-type: none"> - motor overloading and not properly protected - cavitation due to blocked inlet line - cut-out pressure set too high, pump runs continuously - water supply has run out, pump running dry 	<ul style="list-style-type: none"> - check cause: thermal cut-out setting, motor condition, fuse rating - check inlet line - check cut-out pressure - refill tank check for pump damage.

Insufficient flow or pressure	<ul style="list-style-type: none"> - pump running in reverse - Inlet or discharge pipe blocked - air leak 	<ul style="list-style-type: none"> - check direction of pump rotation - check pipework, strainers - check pipework, strainers and pump connections
Pump will not reach cut-out pressure	<ul style="list-style-type: none"> - low voltage - water tanks empty - blocked or worn impeller - blocked orifice in pressure switch - pump unable to re-prime following loss of water supply - incorrect pressure switch settings - air leak 	<ul style="list-style-type: none"> - check voltage at pump, with pump running - check tanks - check condition of pump - check pressure switch - open all outlets and re-start pump - correct settings. - check pipework, strainers and pump connections
Pumps starts and stops rapidly	<ul style="list-style-type: none"> - incorrect pressure in accumulator tank - ruptured membrane in accumulator tank 	<ul style="list-style-type: none"> - check that pressure in accumulator tank is 0.25bar (4 psi) below pump cut-in pressure - check membrane
Water escapes from air valve of accumulator tank	<ul style="list-style-type: none"> - ruptured membrane in accumulator tank 	<ul style="list-style-type: none"> - check membrane

10. Spare Parts



CW332 WATER PRESSURE SYSTEM

REF No	DESCRIPTION
1	Drain plug
2	Pump body
3	Filler plug
4	Diffuser + Venturi
5	Impeller nut
6	Impeller
7	Mechanical Seal
8	'O' ring
9	Seal housing
10	Slinger
11	Motor
12	1" BSP non-return valve
13	1" BSP nipple
14	5 way adaptor
15	1" BSP plug
16	Pressure switch
17	Pressure gauge
18	8 litre accumulator tank
19	Accumulator tank fitting kit