



# **Econoboost VS Series**

Installation, Operation & Maintenance Manual

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## General Installation

### Site Location

During off loading and positioning of the unit, care must be taken not to lift with the pipework or any electrical equipment.

The unit location should be undercover, dry and freely ventilated. The panel is IP54 rated, the ABB ACH 580 inverters are IP55 rated but the unit should be positioned away from any water ingress. Protection from frost must be ensured. Reasonable access to all parts of the set and adequate service workspace must be provided.

The site base should be firm and level, in all directions, a concrete floor or slab is ideal, the base can be stainless to achieve a level platform if required.

All system pipework should be aligned and self-supporting preventing any strain on the unit connections.

Units supplied without manifold valves should have these fitted by the customer during installation together with unions or flanges to allow isolation and removal of the manifolds for service or repair of components is required.

### Cold Water Supply

The stored water should be clean and free from any foreign materials. There should be nothing suspended or dissolved to block or wear the pump internal components.

The water storage tank should provide the pump with a fully flooded suction (with the exception of self priming units) at all times irrespective of water level within the tank. We always recommend a low-level float switch is fitted to all water tanks as a pump protection device.

All self-priming sets should be fitted at the water source with a good quality foot valve complete with a stainless-steel strainer and all suction pipework runs should be sited to avoid any air pockets. Pipe sizing should be to suit the length of suction run and the pump net positive suction head requirements. Never reduce the size of the suction pipework below that of the booster set suction manifold.

## Electrical

### Note to Electrician

DO NOT PUT POWER TO THESE UNITS UNTIL THEY HAVE BEEN FILLED WITH WATER AND PRIMED. The pumps will start automatically on power being applied.

The supply should be brought to the set with suitable trunking or armoured cable, terminating in the final metre in a flexible conduit or flex to avoid any stress or fatigue.

All supply cables should be sized to accommodate any long run voltage drop, when checked at the unit the voltage should match that on the specification sheet or motor plate.

A neutral supply is required for all 240-volt sets (On 415 Volt sets check the wiring diagram)

It is recommended that an isolator be fitted locally to the unit, within 1.0 metre of the control panel.

Supply fuses to the unit should allow for all pumps running together. Fuses should be motor rated and MCB units, if fitted, should be rated for all pumps to run together.

All equipment should be earthed.

A competent electrician should perform all electrical work.

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## Start Up

### Priming

After flooding the suction line the pumps should be primed and vented. On vertical multistage type pumps these should have the individual vent plugs loosened to allow air purging and water flow to each priming point, this may have to be repeated if poor pump performance is experienced due to trapped air pockets.

On certain horizontal end suction pumps these too may have a vent plug, but if not fitted air should be allowed to evacuate via a suitable point of the discharge pipework, e.g. a drain cock, tap etc.

NEVER RUN ANY PUMPS EVEN TO CHECK ROTATION BEFORE COMPLETE PRIMING IS ACHIEVED.

Check all valves with the exception of the final discharge manifold valve are open. Leave the final valve open by approximately 20% to provide a resistance when filling an empty system,

If after powering up the unit, as per the following section of instructions, you find that **the pump(s) doesn't** run, please contact our service department. Note: If the system has been back filled and the pressure is above the booster requested pressure the pumps will not run.

To operate this pump set, turn on the power with the Control Panel main isolator on the door.

Switch on each pump using the off/auto selector switches on the panel door, this will then power up each inverter drive. After each drive has gone through its start up process, press the Auto button on each inverter, the pump should now run to achieve the set pressure.

To stop the pump, push the Off button on the inverters. (Note: The hand button on the inverter has been disabled).

When the unit is 1) First turned on or, 2) after it has been stopped by the low level float switch, the unit will go into the anti-surge pressure setting where it will run at a reduced pressure for 3 minutes to reduce hydraulic shock to the system, after the timed period the set will increase to the full programmed pressure.

After venting and starting the booster set, the final discharge valve should be left opened slightly to vent any pipework air and then closed again allowing the pump to fill the accumulator, finally switching off the pump via the Invertor. Open the main valve slowly again, filling the system and taking care not to overload the pump at this point and as the system pressure rises open the valve fully to leave the system operational. Open and close the valves slowly to prevent hydraulic shock to the pipework

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### ABB Controller (refer to diagram on following page)

The inverter takes a signal from the pipework transducer and varies the motor hertz output to vary speed and flow to suit demand.

When flow decreases one or more of the pumps will stop and the inverter will go into its sleep mode, when water is required again, the inverter will start up automatically to run the pump again.

NOTE: DURING SLEEP PERIODS THE INVERTER WILL DISPLAY AN ALARM. THIS IS NOT A FAULT BUT JUST INDICATES THAT THE INVERTER IS ASLEEP BUT READY TO START WHEN NEEDED.

On multiple pump units the inverters will operate the pumps as required, and will alternate the lead pump on a timed basis, based on the number of hours the pump has run for.

Full details of the ABB control can be obtained in the separate information manual produced by ABB Drives.

All units are wet tested and set before despatch.

DO NOT TRY TO ALTER THE FACTORY SETTINGS OF THE INVERTER, IF CHANGES NEED TO BE CARRIED OUT, THIS MUST BE PERFORMED BY A **STOKVIS** ENGINEER OR ABB (THE INVERTER MANUFACTURER) USING THE ABB SOFTWARE PROGRAM ON A LAPTOP OR COMPUTER.

### Extra Controls

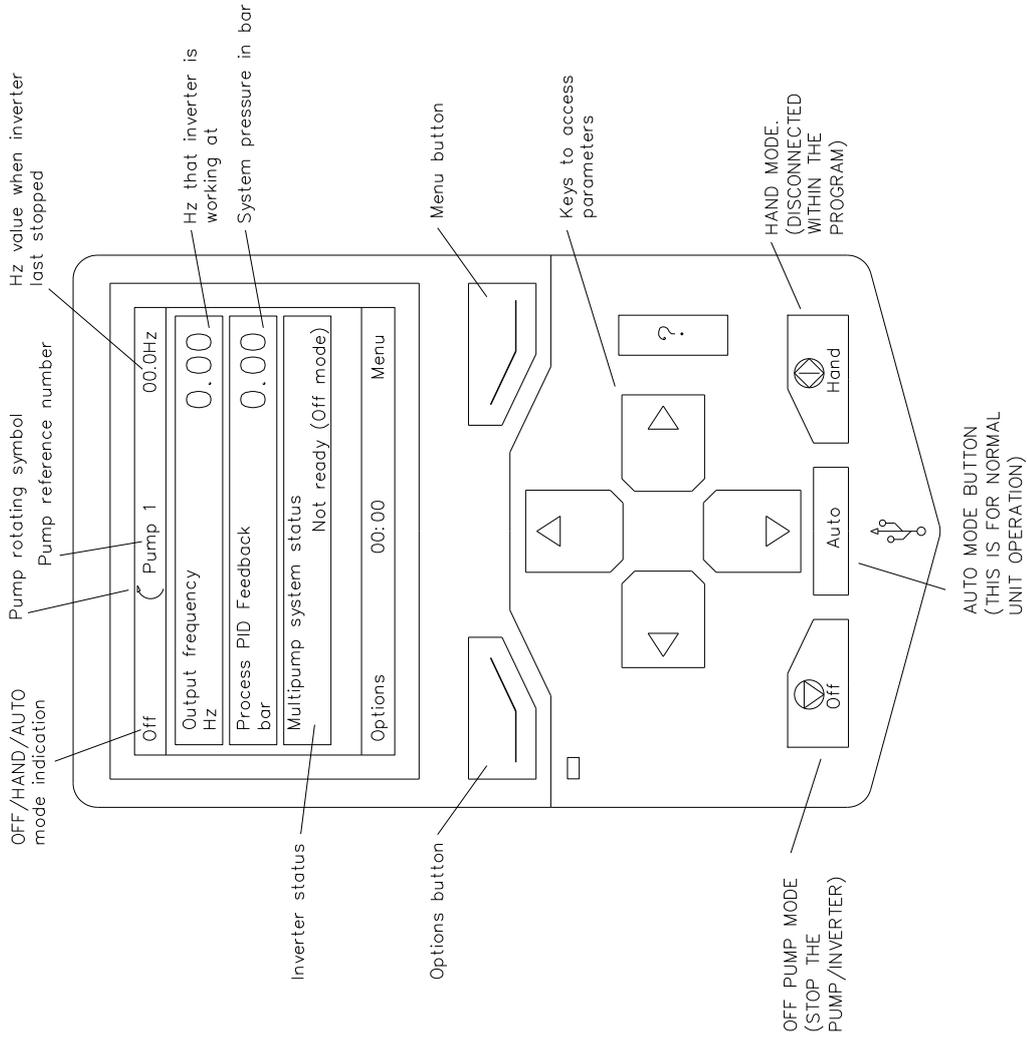
On units fitted with low level float switches (or float switches supplied loose) these should be wired to low water connections as shown in the panel wiring diagram. If two water tanks are used and two float switches these should be wired in series and into the panel connections. So which ever float drops first this will stop the pumps from running dry.

If requested at order, **we can** provide float switch connections located within a termination box.

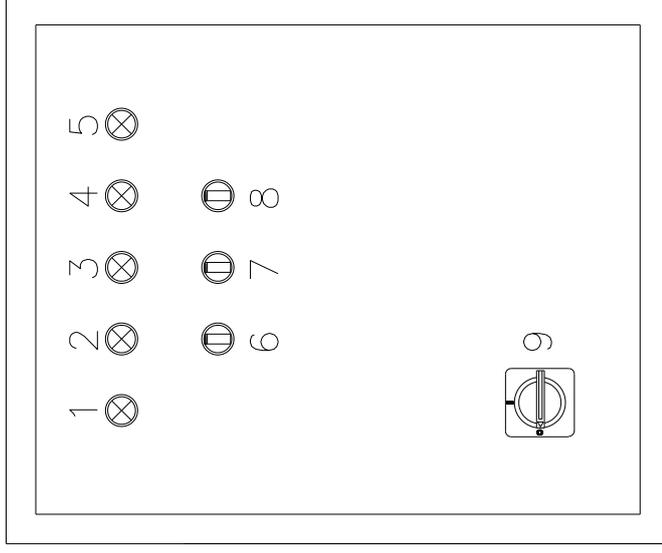
Should a low level condition occur this will stop all pumps until the water level rises and resets the switches. After this occurs the booster set will start again and operate at the anti-surge, lower pressure will be produced for a 3 minute period and then revert back to the normal operating pressure.

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# INVERTER KEYBOARD LAYOUT



# EXAMPLE OF CONTROL PANEL LAYOUT



- 1 = POWER ON
- 2 = PUMP 1 TRIPPED/ISOLATED
- 3 = PUMP 2 TRIPPED/ISOLATED
- 4 = PUMP 3 TRIPPED/ISOLATED
- 5 = LOW WATER LEVEL
- 6 = PUMP No.1 OFF/AUTO
- 7 = PUMP No.2 OFF/AUTO
- 8 = PUMP No.3 OFF/AUTO
- 9 = DOOR ISOLATOR

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## Commissioning

It is recommended that the customer has the unit commissioned after installation and before **being put into service**.

## Maintenance

Booster sets require regular maintenance, listed below are quarterly and yearly check schedules.

### 6 Monthly

The hydraulic accumulator should have its internal air charge checked and adjusted to the correct pressure using a foot pump or oil free compressor. See vessel label for pressure required. It must be stressed that this is only performed after switching off the unit and releasing all the pressure from the set or the vessel. After adjustments switch the unit back on again.

Failure to successfully re-inflate the air charge, or if water is found to be present at the Schrader valve would point to a ruptured vessel membrane, this would require immediate replacement of the vessel.

The whole unit should be observed for any leaks, particularly the pump shaft seals and the valve glands. If found please contact our service department for assistance.

The pump should be noted for any deviations to the smooth running and performance, again please contact our service department for any assistance required.

If the unit has not been operational for a long period the pump should be vented as described in the start up information. If not in use during the winter period and there is any chance of freezing, drain the pumps and pipework and cover with suitable frost protection covering. Ensure full venting before start up when put into service again.

### Yearly

All quarterly checks are to be performed.

The pump should have a full load current, and windings test to ascertain pump motor condition.

The ABB Inverter should be checked and adjustable is required.

The non-return valves should have a visual and audible inspection for general wear and sealing and to ensure there is no back flow of water through the valves

All electrical cables are to be checked for cuts or chaffing and to be replaced as necessary (After unit isolation).

It is recommended that all yearly checks are carried out by our engineers and service contracts are available on request.

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