



INVERTER BOOSTER O&M

The Booster Set has variable speed pumps and provides control on Duty, Standby or Assist pump application.

Operation and Functionality

The interlocked control panel door isolator when in the OFF position isolates the electrical supply to the isolator panel, it does not isolate the electrical supply to the isolator itself.

The HAND / OFF / AUTO parameter for each pump allows the pump to be manually switched ON and OFF independent of control and each other. In the AUTO control mode, the pumps are controlled by signals from a transducer via the inverter.

Please note: If operating any booster set pumps in the Hand position, there is a danger that if there is NO FLOW in the pipe work, damage to the mechanical seals and/or impellers of the pumps could occur. The Hand Position should only be used for testing the pumps or in an emergency situation.

If operating Hand position in an emergency situation, we recommend that a “spill back” pipe off the discharge manifold is installed to allow a permanent flow back to the cold water storage tank. This will prevent damage to the pumps.

The control sequence is as follows:

On power up the drive designated, as master will begin regulating the lead pump. If the loads on the lead pump falls below pre-set value the drive will go to sleep. It will stay in this condition until the system pressure falls below a pre-set value, at which point the drive will wake up and proceed to regulate the pump. When the demand requires the regulated pump to exceed 50 Hz the drive will send a command for NEXT START on the communication line. It will lock at nominal production and the next drive will start regulating. When the regulating drive detects over capacity, when running at minimum frequency and there are drives running at nominal production speed, then it will put itself to Stand-by mode and the drive running at nominal production speed will begin regulating. The drives on the booster will automatically change the lead drive to equalise wear on the pumps. The drive is counting time for auto-change event, only when it is running. The time to run before the auto-change occurs can be set to suit user requirements.

Installation

Do not attempt to start the pumps until the suction manifold has been vented via the probe assembly. Then vent each pump to be sure they are primed.

All installation pipe work should be in accordance with local water authority regulations.

If the booster set is sited close to living accommodation, it is advisable to install flexible pipe couplings on the suction and discharge pipe work to prevent vibration being transmitted through the pipe work.

Isolating valves should be fitted to both suction and discharge pipe work connected to the manifolds of the booster. The suction and discharge pipe work must be at least the same size as the booster manifolds; if smaller, this may reduce pump performance, increase velocity and noise. The suction and discharge pipe work must be supported in order not to put any strain on the pump connections.



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Installation cont...

Where the suction pressure is negative (suction lift) the suction pipe-isolating valve should be omitted. The suction pipe should be short and straight as possible. To keep friction losses to a minimum avoid unnecessary bends and fittings. When a pump set that is not self priming is to draw water from a level lower than the pump inlet port, a foot valve and strainer must be fitted to the end on the suction pipe, below the lowest possible water level (dynamic level). The pipe must slope downward, away from the pump, to avoid airlocks. If this is not possible and the suction pipe is installed so that parts of its length is higher than the pump inlet, then an air vent and priming plug must be fitted in the highest part of the pipe.

When water is supplied to the booster set from a storage tank, check that the tank size is adequate to meet the maximum demand of the booster set when all the pumps are running. Before the booster set is commissioned it is recommended that the system delivery pipe work connected to the discharge of the booster, be tested to 1.5 times the maximum pressure that the pump set is capable of producing.

Location

The booster set should be sited in a dry, well-ventilated, frost-free position but not subject to extremes of temperature. The booster set may be sited outside but must be protected from the elements by means of a suitable cover. Ensure that the pump and motor are clear of obstructions and that an adequate air supply reaches the pump motors and the control panel vents. The booster set should be positioned as close as possible to the source water supply. Ensure that the booster set is mounted on a flat surface and connection pipe work supported in order not to strain connections.

Frost Protection

Pump(s) that are not being used during periods of frost should be drained to avoid damage. Remove both the drain and vent plugs and allow the pump to drain. Do not replace the plugs until the pump(s) are to be used again.

Electrical Connection

A qualified electrician in accordance with the latest I.E.E regulations should carry out all electrical work.

If being installed with a supply incorporating a RCD earth leakage breaker, this should be of the DC. DRAIN TO EARTH TYPE 100ma.

The operating voltage and other electrical data is marked on the panel label. Make sure that the booster is suitable for the electrical supply on which it will be used. All electrical connections to the booster set must be made in accordance with the wiring diagrams supplied with the booster set.

Priming and Venting

All pumps must be vented and primed before starting since the mechanical seal faces are lubricated and cooled by the pumped liquid. On installations where there is a positive inlet pressure (flooded suction) the pumps must be vented by releasing the air vent screw, or plug until all the air has been expelled. On installations where there is a suction lift, the suction pipe must be filled with water and the pumps filled through the priming plug.

WARNING: Do not over tighten the airscrew or plug as this may lead to damage and leakage.



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Pressure Vessel Installation

If a pressure vessel is to be installed remote from the discharge manifold or riser, it should be connected within the following guidelines:

Vessel inlet connection 1"	1-4m from discharge manifold or riser	1" pipe work
Vessel inlet connection 1"	4-6m from discharge manifold or riser	1 ¼" pipe work
Vessel inlet connection 1 ¼"	1-2m from discharge manifold or riser	1 ¼" pipe work
Vessel inlet connection 1 ¼"	2-4m from discharge manifold or riser	1 ½" pipe work
Vessel inlet connection 1 ¼"	4-8m from discharge manifold or riser	2" pipe work

The pressure vessel needs to be pre-charged with air (0.3 – 0.5 Bar) below pump wake up level. Before checking the pre-charge the vessel will require to be isolated from the system and de-pressurised.

Maintenance

Whilst the booster set requires minimal maintenance, it should be inspected on a regular basis, as failure to the set could potentially cause personal injury and considerable damage to property. We would therefore recommend that an **ESPA Maintenance Contract** be taken out. It is essential that the following checks be carried out at intervals of not more than six months.

- Check and adjust vessel pressure
- There are no water leaks
- Pumps have adequate ventilation
- Pumps run quietly
- Pumps shafts are free to rotate
- Monitor set point pressure

The pressure vessel needs to be pre-charged with air (0.3 – 0.5 Bar) below pump wake up level. Before checking the pre-charge the vessel will require to be isolated from the system and de-pressurised.

Warranty

A manufacturers warranty of 1 year from commissioning date is valid on the booster set.

NOTE: A commission test report must be shown with any warranty claim.