

# ALLAN AQUA-SYSTEMS

## EQUIPMENT TYPE: AA-VPJ

### VARIABLE SPEED BOOSTER SET WITH SMALL CAPACITY JOCKEY PUMP

#### DATA SHEET No.: PCU600V/41

#### GENERAL DESCRIPTION

The unit is a fully automatic, self-contained packaged pumping set comprising inverter driven pumps, control panel, hydraulic accumulator, isolating and non-return valves, interconnecting copper pipework and single pressure transducer, all mounted on a common fabricated steel baseplate. The booster set is fully wired and tested at our factory prior to despatch and painted with one coat of primer and two top coats in standard Allan Aqua livery. All pump sets are arranged to operate on a jockey and multiple main support/standby basis with all pumps capable of running on an abnormally high demand. Duty rotation of the pumps is carried out automatically after each jockey pump operating cycle. Support pumps are automatically sequenced in and out according to the system demand. Site installation is limited to suction and delivery pipe connections along with a 415v/3ph/50Hz/N/E electrical supply and a suitable dry running protective device.

#### METHOD OF OPERATION

When there is no demand within the system, no pumps will be running and the system will be at rest. The hydraulic accumulator membrane will also be at its maximum pressure, pressurised by air between it and the steel shell of the vessel. When there is a small demand on the system, air pressure between the membrane and the shell forces water out of the accumulator and into the system, thereby satisfying such demands. When there is a larger demand that exceeds the stored capacity of the accumulator, the pressure in the system will start to drop. The jockey pump will start when the pressure drops below the nominal working head of the system and will continue to run on a variable speed basis until the system demand has been satisfied, at which point the pump will accelerate for a short time to refill the vessel and then stop. If the jockey pump fails to maintain the required system pressure main support pump(s) will automatically start and stop according to the system demand. The jockey pump runs on a fixed speed basis with the main support pump(s) operating on a variable speed basis until the demand has been satisfied sufficiently for the jockey pump to cope on its own, at which point the main support pump(s) will stop, leaving the jockey pump running.

Should the water level in the main water break tank drop to critical level as determined by the low level cut-out float switch mounted in the tank, the pumps will be stopped immediately and the HMI text display will indicate a low level and the fault LED will illuminate. The pumps will be prevented from restarting until the water level has returned to normal operating level. After an adjustable time delay the pumps' control circuit will be re-energised and the text message cleared. Should the water level in the mains water break tank rise to critical level as determined by the high level float switch mounted in the tank, the HMI text display will indicate a high level and the fault LED will illuminate. The pumps will continue to run. Once the water level returns to normal the text message will be cleared.

Visual LED indications are provided for 'power on' and 'fault' along with individual pump 'run' and 'fault' conditions. A common fault volt free change over contact is also provided.

The pumps are provided with selectable hand/off/auto controls within the pump controller. When operated in automatic mode, fully automatic control of the pumps is enabled, including jockey rotation and main support. When in manual mode, the pump(s) will run at a nominal preset speed and a higher than usual operating pressure may be experienced. Under normal operating conditions the pumps should be left in automatic.

#### EQUIPMENT DETAILS

##### PUMPS

The pumps would normally be WRAS approved for use on potable water applications and be of the vertical multi-stage in-line type with cast iron bodies, stainless steel shafts and impellers. Other pump configurations and materials of construction will be used if better suited to the application or upon request.

##### ELECTRIC MOTORS

Standard motors are of squirrel-cage, aluminium construction with totally enclosed fan cooling, class F insulation, IP55 protection and performance in line with the requirements of IEC34-1. All motors of 1.1kW and above are of the high efficiency type and are EFF1 compliant. Smaller motors are EFF2 compliant.

##### HYDRAULIC ACCUMULATOR

Large volume accumulators are not required on inverter systems. The vessel is of nominal size to reduce pressure surge and trigger pump starts. The accumulator will be adequately rated for the maximum working pressure of the system.

##### CONTROL PANEL

The control panel would be manufactured to the latest revision of the I.E.E. Wiring Regulations with a minimum overall protection rating of IP55. Control panels

would normally be fitted with the following equipment as standard:

- One - Mild steel enclosure, IP55 minimum;
- One - Door interlocked main isolator;
- One - ECA approved frequency converter and set of motor rated fuses per motor;
- One - Where necessary a suitably rated, fuse protected, thermostatically controlled cooling system will be fitted;
- One - Control circuit fuse;
- One - Allan Aqua-Systems Limited PCU600V pump controller complete with pump 'hand-off-auto' selection, break tank high and low level controls, text display, LED indicators and pressure transducer;
- One - Set of common fault, volt free change over contact terminals;
- One - Set of outgoing motor terminals;
- One - Set of control terminals;
- One - Set of earthing terminals.

Important Note: It is the responsibility of the installer to ensure all equipotential bonding of the complete installation complies with the requirements of the latest edition of the I.E.E. Wiring Regulations

##### PIPEWORK

Booster sets will be assembled using copper pipework and fittings to the relevant British Standards where applicable. Other pipework materials such as stainless steel, ABS, uPVC,

malleable iron or galvanised steel are available upon request. Prices will vary for alternative pipework materials. Standard pipework configuration comprises pump suction isolating valves, pump delivery check and isolating valves, accumulator isolating and drain valves and pressure transducer isolating valve.

##### TERMINAL CONNECTIONS

Common suction and delivery manifold connections will usually be terminated with BSPF connections up to 1.1/4" and suitably rated BS 4504 flanges above 32mm. Alternative terminations are available upon request.

##### PAINT FINISH

Booster sets will be sprayed with one coat of undercoat/primer and one/two coat of Allan Aqua-Systems Limited 'deep blue' hammer finish paint. Alternatively any BS 4800 semi-gloss paint colour is available as a cost option. Specialist paint finishes can also be incorporated, if required.

##### DRAWINGS

We regret that project specific drawings will only be issued upon receipt of written orders. Preliminary drawings of similar products may be available upon request. Preliminary drawings should not be used for detailed construction purposes.

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## OPTIONAL EXTRAS

The most popular additional items and optional extras for the Allan Aqua-Systems Limited booster sets are listed below. However, should you require something that is not listed please ask as the options available are almost limitless.

- ✦ Single phase power supply;
- ✦ Integrated or remote break tank assembly complete with steel main support table or baseplate and all necessary fittings to comply with the applicable Water Regulations;
- ✦ Flanged or screwed flexible connections;
- ✦ High and low level monitoring devices;
- ✦ Hour run meters, ammeters, voltmeters;
- ✦ Anti-vibration mountings;
- ✦ Thermostatically controlled anti-condensation heaters in individual motors, in the control panel or in both panel and pump motors;
- ✦ Phase monitoring devices;
- ✦ Lamp test facility;
- ✦ Audible alarm with mute push-button
- ✦ Remote monitoring via SMS or other communication methods;
- ✦ Individual volt free contacts for more detailed remote monitoring of the booster set;
- ✦ Remote BMS monitoring control panels;
- ✦ Mains water bypass valve assemblies;
- ✦ Pressure limiting valves;
- ✦ Pilot operated pressure modulating valves;
- ✦ Hot water service expansion vessels;
- ✦ Pressure relief valves;
- ✦ Automatic air vents;
- ✦ Commissioning, servicing and contract maintenance;
- ✦ Extended warranties (subject to maintenance);
- ✦ Delivery to site via Hi-Ab type vehicle;
- ✦ Dismantling of completed unit prior to delivery to site,
- ✦ Site re-assembly of dismantled pump sets.

## INSTALLATION NOTES

### PLANT ROOM

Pump sets must be located in a well-ventilated weatherproof building away from louvers and other air intake areas. The pump house floor should have a slight fall to a drain to avoid trapping any water that may result from draining, mechanical seal failure, condensation or other causes. Frost damage can occur to pumps and pipework, particularly in exposed or isolated pump houses. Where this possibility exists, or is likely to occur, adequate heating and/or pipework insulation should be provided.

### ACCESS

It is most important to allow adequate access to, and space around, the booster set to make maintenance and repair work easier. Ideally, the pump set will require 0.5m all round access with 1.0m in front of the control panel. Extra headroom and lifting equipment may be required to facilitate servicing on the larger pieces of equipment.

### MAINS' ELECTRICAL SUPPLY

The mains electrical supply should be adequately sized and suitably protected by either motor rated fuses or miniature circuit breakers. The protective device should be selected to provide sufficient discretion between the fuse link ratings of the incoming mains' and individual pump motor fuses (or equivalent fuse link rating). In all cases the protective device rating of the incoming mains' electrical supply should not exceed the rating of the main isolator fitted in the control panel.

### TEMPORARY MAINS' POWER SUPPLY

If the booster set has been commissioned using a temporary electrical supply it is imperative that the pumps' direction of rotation is checked after reconnection to the permanent mains supply. Allan Aqua-Systems Limited will not accept any responsibility for damage caused through incorrect pump rotation.

### DRY RUNNING PROTECTION

The control panel is supplied with a no-water protection facility to prevent pump damage caused by dry running. It is essential that a suitable protective device is installed according to the manufacturer's instructions and set at the correct height in relation to the pump suction take off point.

### STRAINERS

Where there is any possibility of foreign matter being drawn through the mains' or entering the suction pipe, suitable strainers should be fitted on the common suction manifold leading to the pumps or on the incoming mains' water supply. Care should be taken to ensure that the strainer does not limit the flow of water to the pumps causing them to run dry. Correct maintenance according to the manufacturer's instructions is essential.

### CHECK VALVES

Although each pump is usually fitted with a check valve, it is advisable to fit a fast acting, non-slam type non-return valve at the foot of each riser along with an isolating valve before and after the pump set.

### WATER SUPPLY BYLAWS

The booster must be installed according to any National or Local Water Authority requirements, particularly with regard to potable water installations, maintenance of water quality integrity and backflow prevention.

### NOISE AND VIBRATION

Booster sets can be the source of noise and vibration. The extent to which these are transmitted throughout the building is dependent upon the construction of the building and the manner in which the pump set has been installed.

Although fixing holes are provided, generally booster sets are not bolted down in order to minimise vibration transmission through the structure of the building. It is common practice to isolate the pump set from the pipework by using flexible connections on the terminal connections and from the building by fitting anti-vibration mounts to the baseplate. The pump set should be located away from noise sensitive areas or if this is not possible thought should be given to minimise the noise by means of acoustic attenuation.

### ELECTROMAGNETIC INTERFERENCE

The control panel complies with current legislation with regard to EMC and the Machinery Directive. It is the responsibility of the installer to ensure that the remainder of the installation complies with the applicable regulations and directives.

### GUARANTEE

All Allan Aqua-Systems limited booster sets are guaranteed for a period of 18 months from despatch, 12 months from commissioning or as otherwise extended to us by our suppliers, whichever is the soonest, against defective workmanship or materials in accordance with our conditions of sale.

### MAINTENANCE IN GUARANTEE PERIOD

It should be noted that during the guarantee period it is the responsibility of the user to ensure all necessary routine maintenance is carried out according to our requirements otherwise we reserve the right to withdraw any warranties and guarantees in place. Alternatively, our service department can carry out the routine maintenance checks for a negotiable annual fee.

### LIMITATIONS OF GUIDANCE NOTES

These notes are intended as a guide for the installers of our equipment and are based on the experience gained with a large number of booster sets installed under widely varying conditions. It must be appreciated that not all the suggestions are applicable for every piece of equipment or installation and alternative methods may be required.

### PRODUCT DEVELOPMENT

The details provided within this product specification data sheet are correct at time of issue but as Allan Aqua-Systems Limited is continually developing and improving the product range and specifications we reserve the right to make detailed changes or modifications without prior notice.