

## INSTALLATION AND OPERATING INSTRUCTIONS

### Series 6850 Hydropak HM SETS



**Please read all these notes carefully.**

#### **CE CONFORMITIES:**

For Declaration of Conformities see Armstrong

#### **PREFACE**

1. The microprocessor controlled sets are designed for ease of setting and operation. For details of the PCB controller and control panel see Installation, Operation and Maintenance Instructions for the Microstar 2000.
2. All packaged pump systems are pre-wired and fully tested, both hydraulically and electrically prior to despatch.
3. All parameter data has been entered into the controller in accordance with the system criteria. Once on-site connections have been made, and all pre-checks carried out the system is ready for commissioning.
4. If during commissioning system conditions are found to vary from those set out in the design criteria, the parameters can be easily changed. (See section on parameter set up in 2000 manual).

#### **INTRODUCTION**

1. This leaflet contains specific information regarding the safe installation and operation of Hydropak HM packaged sets. These instructions must be read and understood by any one responsible for the installation and maintenance of this equipment.
2. When a pump set leaves the factory, it will be set so that all pumps are in the 'AUTO' position on initial power up.
3. Prior to power being applied, it is essential that all precommissioning procedures are carried out in full.
4. Operation and maintenance instructions for the Microstar 2000 should be read in conjunction with - this instruction.
5. Operators and installers must familiarise themselves

with the operation and controls of the equipment.

#### **WARNING SYMBOLS**



Safety instruction where an electrical hazard is involved.



Safety instruction where non-compliance would affect safety.



Safety instruction relating to safe operation of the equipment. (ATTENTION)

#### **TEMPERATURE**

Where under normal operating conditions the limit of 68°C (restricted zone) for normal touch, or 80°C (unrestricted zone) for unintentional touch, may be experienced, steps shall be taken to minimise contact or warn operators/users that normal operating conditions will be exceeded.




#### **NOISE LEVELS**

Maximum sound pressure level of 70dB(A) @ 1 metre unless otherwise stated.

Motor kW	4.0	5.5	7.5	11	15	18.5	22
2 Pole	73	73	74	80	81	82	90

#### **INSTRUCTIONS FOR SAFE USE**

1. No installation of this equipment should take place until this O&M instruction has been studied and understood by the person responsible.
2. Handling, transportation and installation of this equipment shall only be undertaken with the proper use of lifting gear.
3. The set shall not be used for any purpose other than that for which it was designed and sized. 
4. **The set shall not be operated with the door open and the Door Interlocked Isolator overridden.**

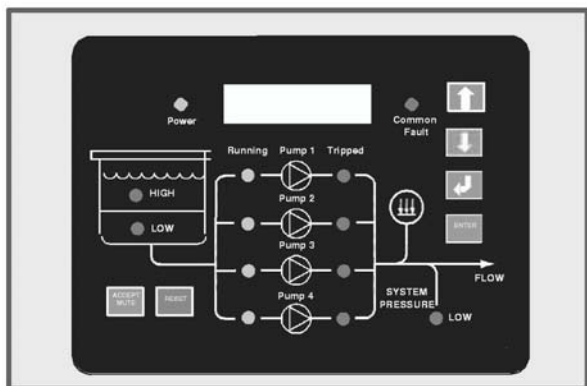
#### **STORAGE**

Store in a dry place. Protect against dirt, damage and frost.

#### **LIMITATIONS**

1. Maximum system working pressure: 10 or 15 bar.
2. Operating pressure:  
Nominal - as shown on pump name plates.  
Maximum - shut valve head of pumps supplied.
3. Electrical supplies: 3 phase, 50 Hz, 400volts.
4. Power supply fluctuation: +/- 10% maximum.
5. Humidity none condensing: 80% RH up to 31°C decreasing linearly to 50% RH at 40°C.
6. Ambient temperature: 5°C to 40°C.

## Microstar 2000



**Please read all these notes carefully.**

### **CE CONFORMITIES:**

For Declaration of Conformities see Armstrong

### **PREFACE**




1. The microprocessor controllers are designed for ease of setting and operation. Access to information and the setting parameters has been made quick and simple by dividing the main menu into four segments ALARMS, HOURS RUN, PUMP TEST and PARAMETER SETUP.
2. All packaged pump systems are pre-wired and fully tested, both hydraulically and electrically prior to dispatch.
3. All parameter data has been entered into the controller in accordance with the system criteria. Once on-site connections have been made, and all pre-checks carried out the system is ready to operate.
4. If during commissioning, system conditions are found to vary from those set out in the design criteria, the parameters can be easily changed. (See parameter set up).
5. The Microstar 2000 Controller Operating Instructions describe the ease of pump set-up operation and adjustment for Multi-pump packaged sets.

### **INTRODUCTION**


1. This leaflet contains specific information regarding the safe installation and operation of the Microstar 2000 controlled packaged sets. These instructions must be read and understood by any one responsible for the installation and maintenance of this equipment.
2. When a pump set leaves the factory, it will be set so all pumps are in the 'AUTO' position on initial power up.
3. Prior to power being applied, it is essential that all precommissioning procedures are carried out in full.
4. Operation and maintenance instructions for the Starpak HM 2000 should be read in conjunction with these Multi-pump Controller Operating Instructions.
5. Operators and installers must familiarise themselves with the operation and controls of the equipment.
6. The DIL switches (Dual -in-Line sub-miniature circuit board switches)[2], fitted to the motherboard, MUST NOT under any circumstances be changed from the

factory set positions. If changed the unit will malfunction and parameter settings will be lost.

### **WARNING SYMBOLS**

-  Safety instruction where an electrical hazard is involved.
-  Safety instruction where non-compliance would affect safety.
-  Safety instruction relating to safe operation of the equipment. (ATTENTION)

### **INSTRUCTIONS FOR SAFE USE**

1. No installation of this equipment should take place until this Installation, Operation and Maintenance instruction has been studied and understood by the person responsible.
2. Handling, transportation and installation of this equipment shall only be undertaken with the proper use of lifting gear.
3. The set shall not be used for any purpose other than that for which it was designed and sized.
4. **The set shall not be operated with the door open and the Door Interlocked Isolator overridden.** 

### **STORAGE**

1. Store in a dry place.
2. Protect against dirt, damage and frost.

### **LIMITATIONS**

1. Maximum system working pressure: 10 or 15bar.
2. Operating Pressure:  
Nominal : as shown on pump nameplates.  
Maximum: shut valve head of pumps fitted.
3. Electrical supplies: 3 phase, 50Hz, 400 volts.
4. Power supply fluctuation: +/- 10% maximum.
5. Humidity non condensing: 80% RH up to 31 °C decreasing linearly to 50 RH at 40°C.
6. Ambient temperature: 5°C to 40°C.

### **PROTECTION**

The set must be protected from the formation of condensation. If there is a likelihood of condensation forming on or in the control panel then an anti condensation heater should be fitted. Contact our Service Department for details.

## GENERAL NOTES

1. The Microstar 2000 can control two, three or four pumps operating on a duty stand-by or duty, support and stand-by arrangement.
2. Each unit is set up for a specific application, any change in the system conditions may necessitate a change in the settings.

## INSTALLATION

### Mechanical

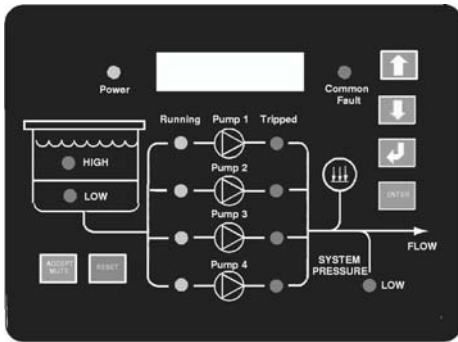
1. The controller is normally installed as part of the packaged pump set.
2. Site the set with sufficient space to the front and rear for maintenance purposes.

### Electrical

1. The power supply required is 400 volt +/- 10%, 3 phase, 50Hz to suit motors fitted.
2. The incoming supply should be connected to the door interlocked isolator from a local distribution board and if possible an ELCB unit.
3. Wire the set VFC and external control systems (see enclosed wiring diagram) from the terminals provided using the ferrite beads as instructed.
4. All incoming cable glands should be IP54 rated as a minimum.
5. **THE SET MUST BE EFFICIENTLY EARTHED.**



## OPERATION AND SETTING PROCEDURE













1. Switch disconnect switch to the 'ON' position. Display will show: UNIT STARTING.
2. After 5 seconds the display will show: BOOSTING.
3. After 5 seconds display will show: SYSTEM OFF and SYS PRESSURE 0.0BAR, unless the unit is in the remote inhibit mode. The display will then show: REMOTE OFF and SYS PRES 0.0BAR.



### **Note:**

In this position all parameters can be accessed with the exception of the pump 'Test' and pump 'Man/Auto' section. To access all parameters ensure unit is **not** in the inhibited mode.

### To access parameter set up







1. Press  once and the alarm status display will be shown. Press  once more and the pump 'Hours Run' screen will be displayed. Press  once more and the pump 'Test' screen will be displayed. Press  once more and the 'Parameter Set Up' screen will be displayed.
2. Press the 'Enter' button and display will show 'Pump 1, Select OFF'. Press 'Up' button to select 'Auto' or 'Down' button to select 'Manual'.  
**Note:** If pump 1 is selected to 'Manual', pump 2 will automatically be switched to the 'OFF' position and vice versa, only one pump can be operated at a time.
3. After a pump has been selected to 'Manual', care should be taken to ensure that when it is returned to the 'Auto' position, the opposite pump(s) parameters also has its parameters returned to the 'Auto' position. The 'Manual' position is for commissioning purposes only. Left in this position, the system could be over pressurised and the pumps become over heated. (Where possible the 'Pump Test' section should be used for commissioning purposes). All pumps should be left in the 'Auto' position for normal operation.
4. Press  once and the display will show 'Pump 2 Select OFF', proceed as for pump 1. Set all pumps to 'Auto'.
5. Press  once and the display will show 'Duty pump' cut-in pressure. Press 'Up' button to increase or 'Down' button to decrease figure. This is normally set at clients required system pressure.
6. Press  once and display will show 'Pump Cut Out' pressure. This is normally set at 0.3 bar below shut valve head, to change setting press 'Up' or 'Down' button.
7. Press  once more and display will show 'Low Pressure Alarm' operates at. This should be set at 1.0 bar below the duty pump cut-in pressure. To change settings press 'Up' or 'Down' button.
8. Press  once more and display will show 'Low Pressure Alarm' resets at, this should be set at 0.1 bar above the low pressure alarm operating point. To change settings press 'Up' or 'Down' button .
9. Press  once more to return to the system status display screen.

## To Access Logged Alarms






1. Press  once from the system status display screen and display will now show 'Alarm Status'.
2. To access logged alarms press 'Enter'. If no alarms exist the system status display screen will once again be displayed. If an alarm has been logged, the display will show which individual alarm has been activated. If more than one alarm is logged press  once to view each alarm.
3. Once all alarms have been viewed pressing the 'Scroll' button will automatically revert back to the status display screen.

**Note:** - Pressing the 'Reset' button will remove all alarms that are no longer active from the window and the memory.

## To Access Pump Hours Run

1. Press  once and 'Alarm Status' display will be shown.
2. Press  once more and the 'Pump Hours Run' screen will be displayed.
3. Press the 'Enter' button and 'Pump 1 Hours Run' will be displayed.
4. Press  once and 'Pump 2 Hours Run' will be displayed.
5. Press  once and 'Pump 3 Hours Run' will be displayed.
6. Press  once and 'Pump 4 Hours Run' will be displayed.
7. Press  once more and the system status screen will automatically be displayed again.

## To Access Pump Test

1. Press  once and the 'Alarm Status' display will be shown.
2. Press  once more and the 'Pump Hours Run' screen will be displayed.
3. Press  once more and the 'Pump Test' screen will be displayed.
4. Press the 'Enter Button' and the display will show 'Pump 1 Test Off'.
5. To turn pump on, press 'Up' button once and pump 1 will now run. After 30 seconds the pump will automatically turn off and display will revert to the standard front screen.
6. To turn pump off before the 30 seconds have elapsed press the 'Down' button and the pump will be switched off.
7. Press  once to move on to 'Pump 2 Test'. To operate press 'UP' or 'Down' buttons as for Pump 1.
8. Press  once more to return to the system status display screen.

## Parameter Presets

Access to this parameter is restricted to authorized service personnel only.

## Accept/Mute Button

In the event of an alarm occurring, the 'Accept/Mute' button can be operated to silence the external audible alarm (if fitted) and bring the flashing 'Common Fault LED' to a steady state. If a subsequent alarm operates, the audible alarm will be sounded again and 'Common Fault LED' will re-flash.

## Reset Button

Once the alarm has been accepted and is no longer active, the reset button can now be operated to clear the now steady 'Common Fault LED' and remove alarms that have been logged.

**Note:-** In the event of a danger warning level occurring in the break tank, pumps will have been locked out. Once the water level has been restored, the 'Reset' button must be operated before the pumps will operate again.

## SET MAINTENANCE

Ensure that the unit is isolated from all electrical supplies and pressure is released before any maintenance work is carried out.

## Pressure Transducer

Should an open circuit fault occur in the transducer circuitry, the digital display will read full scale i.e.(above 250 psi). This will cause the high pressure alarm to activate and stop further pump operation. Replace faulty transducer and/or cable.

## Fuses

Only two fuses are fitted and they are on the main processor board, one for the transformer and one for the external alarm bell. Both are 5 dia x 20 long glass tube 630mA to IEC 127-2 sheet 2. **Do not replace with larger fuses.**

## FAULT FINDING CHART

Fault	Possible Cause	Possible Remedy
The unit will not power up	<ol style="list-style-type: none"> <li>1. No power supply</li> <li>2. Control circuit breaker tripped</li> <li>3. External connection to the unit have not been made correctly</li> </ol>	<ol style="list-style-type: none"> <li>1. Restore power</li> <li>2. Investigate cause and reset</li> <li>3. Check wire connections have been made to the correct terminals in accordance with the appropriate wiring diagram</li> </ol>
Power light on but pumps will not run	<ol style="list-style-type: none"> <li>1. Pump selected to the 'Off' position</li> <li>2. System inhibited from remote source</li> <li>3. Incorrect pressure setting on pump control circuit</li> </ol>	<ol style="list-style-type: none"> <li>1. Set pumps to the 'Auto' position</li> <li>2. Switch the remote inhibits off</li> <li>3. Check the setting are in accordance with the data sheet</li> </ol>
Pumps will not alternate	<ol style="list-style-type: none"> <li>1. One of the pumps is switched to the 'Off' position</li> <li>2. Duty pump failed and locked out</li> </ol>	<ol style="list-style-type: none"> <li>1. Enter the parameter mode and set both pumps to 'Auto'</li> <li>2. Press 'Reset' button</li> </ol>
Pumps run but will not develop adequate pressure	<ol style="list-style-type: none"> <li>1. Break tank empty</li> <li>2. Air in pump housing</li> <li>3. Break in system pipework</li> </ol>	<ol style="list-style-type: none"> <li>1. Reinststate water supply to break tank</li> <li>2. Vent pumps to remove air</li> <li>3. Repair break in pipework</li> </ol>
Pumps switch on and off rapidly(bounce)	<ol style="list-style-type: none"> <li>1. Storage vessel has incorrect pre-charge</li> <li>2. Pump control pressure setting have been set with differential too small</li> <li>3. Air in control line to transducer</li> </ol>	<ol style="list-style-type: none"> <li>1. Check pre-charge of vessel is in accordance with data sheet</li> <li>2. Check pressure settings are in accordance with data sheet</li> <li>3. Evacuate all air from control line</li> </ol>

### PROTECTION

The set must be protected from the formation of condensation. If there is a likelihood of condensation forming on or in the control panel then an anticondensation heater should be fitted. Contact our Service Department for details.

### GENERAL NOTES


1. The sets comprise two, three or four pumps operating on a duty-standby or duty, support and stand-by arrangement.
2. Each unit is set-up for a specific application, any change in the system conditions may necessitate a change in the settings.

### INSTALLATION

#### Mechanical

1. The pump set is intended for use under flooded suction conditions, unless suction lift conditions were specifically included in the order, and should be positioned in such a way that its relationship to the storage tank ensures a positive suction head at full flow.
2. Site the set with sufficient space to the front and rear for maintenance purposes.
3. The set should be installed on a flat and even surface.

#### Electrical

1. The power supply required is 400 volt +/- 10%, 3 phase, 50Hz to suit motors fitted.
2. The incoming supply should be connected to the door interlocked isolator from a local distribution board and if possible an ELCB unit.
3. Wire the set VFC and external control systems (see enclosed wiring diagram) from the terminals provided using the ferrite beads as instructed.
4. All incoming cable glands should be IP54 rated as minimum.
5. The set **MUST BE EFFECTIVELY EARTHED.** 

## **OPERATION and SETTING PROCEDURES**

1. Open the water supply valve to the set, then the suction isolating valves on the pumps followed by the delivery isolating valves. The system supply valve should remain closed.
2. Fully vent all the pumps.
3. Switch disconnect switch to the 'ON' position. Display will show: UNIT STARTING.
4. After 5 seconds the display will show: BOOSTING.
5. After a further 5 seconds display will show: SYSTEM OFF and SYS PRESSURE 0.0BAR, unless the unit is in the remote inhibit mode. The display will then show: REMOTE OFF and SYS PRES 0.0BAR.
6. The first pump will start and pressurise the set.
7. Now crack open the system supply valve and allow the system to pressurise. Fully open the system supply valve. The set is now ready for operation.

## **SET MAINTENANCE**

1. Ensure that the unit is isolated from all electrical supplies and pressure is released before any maintenance work is carried out.
2. Approximately every six months a thorough examination of the installation should be conducted. The set and pump seals should be checked for leakage and motors for bearing noise.
3. Every 2 years the set storage vessel should be stripped down and all parts should be examined, the shell should be checked for any internal corrosion and be replaced if any is present.  
NOTE: this procedure should be written into your Written Scheme of Examination.
4. Motors are generally fitted with sealed for life bearings in which case they require no further attention. Where grease nipples are fitted follow the instructions on the lubrication plate.

Note: The use of spare parts not supplied by Armstrong will invalidate guarantee. The units must be installed and maintained in line with our Operating and Maintenance Manual during the warranty period. Failure to adhere to any of the above will invalidate all guarantees and product responsibility of Armstrong.

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