Techsys

Corporation

BARRACOUTA

PRESSURE OPERATION MANUAL

SINGLE OR DUPLEX
FIXED SPEED PUMP
CONTROL SYSTEMS

Version 1.8 Jul 2013
Made in Australia

INTRODUCTION

⚠️ **SAFETY WARNING – This control system contains dangerous voltages and should not be opened or connected by un-qualified personnel.**

BARRACOUTA Pump Controller

The BARRACOUTA pump control system is a fully integrated pump controller for one or two pumps of any type required to operate via pressure.
The unique electronic - hydraulic control allows each pump to operate at the maximum performance level.

The BARRACOUTA controls one or two pumps via pressure sensing as a standard option.

Easy access menu items and in-built pump and system protection allows simple adjustment for any pump application. Adjustable parameters include high pressure and low pressure alarms and delays, pump start rotation, control parameters, various timers and protection options.

System Status LCD display includes calculated flow (instantaneous and totalised flows), hour run per pump, number of starts meter for each pump, system starts for the last hour and fives time stamped fault logs.

System Protection includes adjustable high pressure shutdown settings and flow switch inputs with adjustable delay timers with the sole task of protecting the pumps.

BARRACOUTA also offers a complement of telemetry outputs for simple integration into central monitoring or control applications. Modbus is also included for BMS interface.

The BARRACOUTA Pump Control system is part of the Techsys Pump Control range. Pump Controllers are available in a range of options to suit particular applications and user requirements.

The mains isolator and control window are key lockable to prevent unauthorised access or tampering.

Additional manuals available for:-
• Level control

Version History

This manual covers the software applications for Version No. 25.13.01 or later.
Please contact Techsys Corporation to obtain any verification of the currency of this manual for your application.

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Reading suggestions for minimal set up.

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QUICKSTART - Accessing operator controls

(Optional alarm strobe light & buzzer shown)

Single phase control panel.
Motor circuit breaker –
Non-adjustable.

To open the clear cover and
access the operator controls
use the triangular key
provided – Turn clockwise to
open.

QUICKSTART -Operator controls

Lift cover to access controls.

Pump motor circuit breakers.
When in the OFF position a
small padlock can be inserted
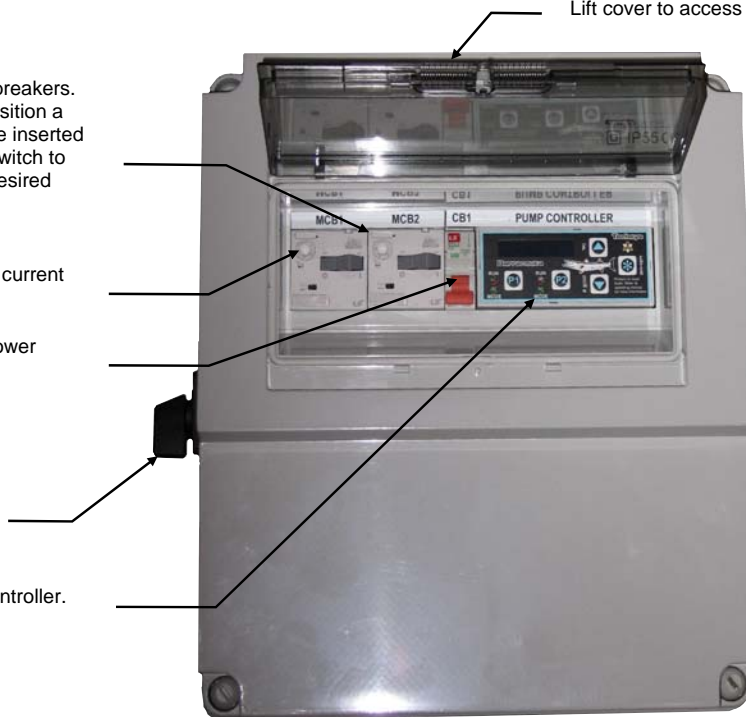through the rocker switch to
safely lock out the desired
pump.

Pump motor full load current
setting dial.

Barracouta control power
circuit breaker.

Mains power
isolator switch.

Barracouta pump controller.

QUICKSTART – Commissioning Mode

To make it quicker and easier to initially set up the Barracouta a "Commissioning Mode" has been included which will guide you through the each of the available options as you select different modes and settings. In most cases this will have already been completed prior to the system being dispatched. Commissioning mode can be re-done but any setting previously entered will be changed back to default values.

1.   To enter the Commissioning Mode, press and hold down the UP and DOWN keys and then turn on the power to the controller.

When Commissioning Mode is displayed release the both keys.

Commissioning Mode
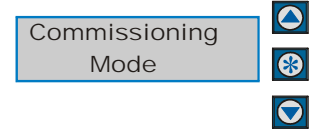
2.   The display should now show "Number of Pumps" flashing on the top line. Use the UP and DOWN keys to adjust the setting, the options are 1 or 2 pumps.

Press the ENTER " * " key when finished.

Number Of Pumps
2
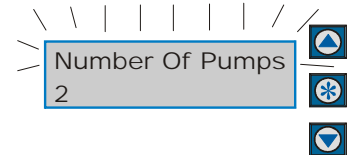
3.   The display should now show "Operating Mode" flashing on the top line. The options are Pressure, Temperature, Single Level and Multi- Level.

Operating Mode
Pressure
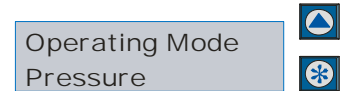
This manual is dedicated to "Pressure" mode only therefore only applicable option is – Pressure. The controller, however is capable of running in modes: Single Level, Multi Level, Air Pump 1 Level, Air Pump Multi-Lvl – please refer to the "Barracouta Level Control Manual" for further information on these modes.

Pressure – This mode requires the system to be fitted with a pressure transducer or pressure switches which feeds back to the controller to maintain a range of system pressures. For standard pressure systems a 25 Bar transducer will be included.

Use the up and down arrow keys to select "Pressure".

Press the ENTER " * " key when finished.

4.   The display should now show "Sensing Input" flashing on the top line. The options are Analogue, Reverse Analogue and Switched.
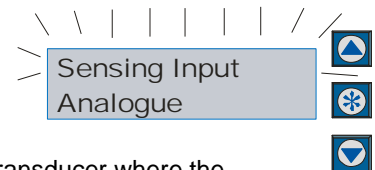
Sensing Input
Analogue

Analogue – This mode requires the system to be fitted with a pressure transducer where the output of the transducer increases as the system pressure rises.
Reverse Analogue – This mode requires the system to be fitted with a pressure transducer where the output of the transducer decreases as the system pressure rises.
Switched – This mode requires the system to be fitted one or more pressure switches adjusted to different pressure points. However, with only one pressure switch, many of the system protection modes will not be available.

Use the up and down arrow keys to select the desired option.

Press the ENTER " * " key when finished. If "Sensing Input" is set to "Switched" go to the END.

5.   With the operating mode set to "Pressure" mode and the Sensing Input was set "Analogue" the display should now show "Transducer Type" flashing on the top line.
The options are Custom, 0-5 Bar, 0-10 Bar and 0-25 Bar.

Transducer Type
0-5 Bar
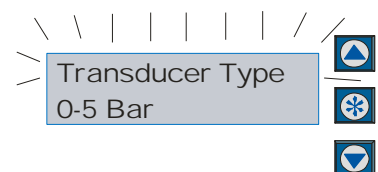
Custom – This mode requires calibration of the sensor to be completed manually. See sections on Transducer Zero and Adjust Pressure.

0-5 Bar – This pre-calibrates the controller to operate on a sensor with a full scale output of 5 Bar (equivalent to 500kPa or 72.5psi). Further scaling or adjustment can then be carried out if required. See sections on Transducer Zero and Adjust Pressure.

0-10 Bar – This pre-calibrates the controller to operate on a sensor with a full scale output of 10 Bar (equivalent to 1000kPa or 145psi). Further scaling or adjustment can then be carried out if required. See sections on Transducer Zero and Adjust Pressure.

0-25 Bar – This pre-calibrates the controller to operate on a sensor with a full scale output of 25 Bar (equivalent to 2500kPa or 362.5psi). Further scaling or adjustment can then be carried out if required. See sections on Transducer Zero and Adjust Pressure.

Use the up and down arrow keys to select the desired option.

Press the ENTER " * " key when finished

END

Commissioning Complete – These are the basic setting completed, there are other settings that may need to be adjusted, read items as indicated at the bottom of the Contents page.

If a mistake is made during the commissioning sequence the power can be turned off and the sequence restarted.

QUICKSTART - Moving Around & Editing Menu Items

Access Code

To move between the Main Menu screens press the UP or DOWN key.

| SETTINGS |
| Press * For Menu |
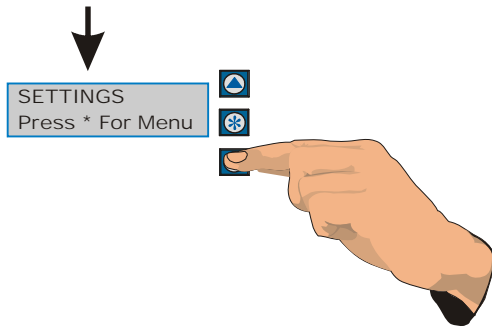
To access a sub menu press the ENTER " * " key. Access to the sub menus is controlled by an Access Code which can be entered prior to accessing the sub menu or if it has not been entered it will pop up allowing it to be entered prior to accessing any of the sub menu. If the Access Code is not entered correctly the system will disable entry into the Sub menus and the use of any pump select or enable keys.
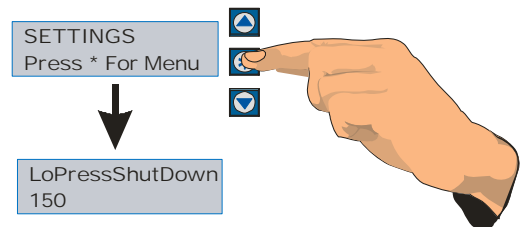
| SETTINGS |
| Press * For Menu |

| LoPressShutDown |
| 150 |

To scroll through the sub menu select the UP or DOWN keys

| LoPress_ShutDown |
| 150 |

When the menu to be edited is displayed, press the ENTER Key once, the top line of the display will then flash; this is to indicate that the data can now be edited.
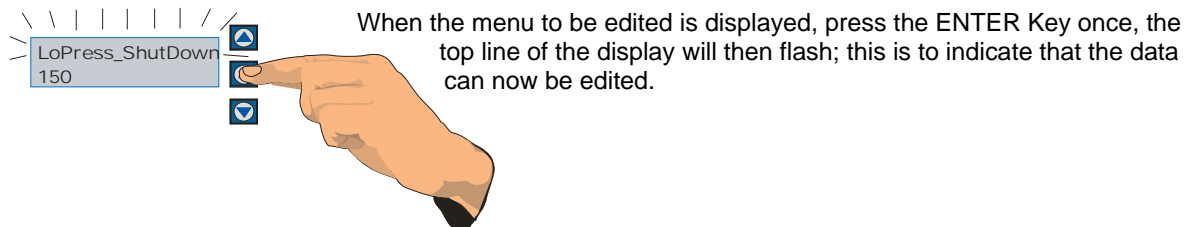
Now press the UP or DOWN key until the desired value is reached.

| LoPress_ShutDown |
| 150 |

| LoPress_ShutDown |
| 149 |

| LoPress_ShutDown |
| 140 |

Press the ENTER Key again to save the value selected.
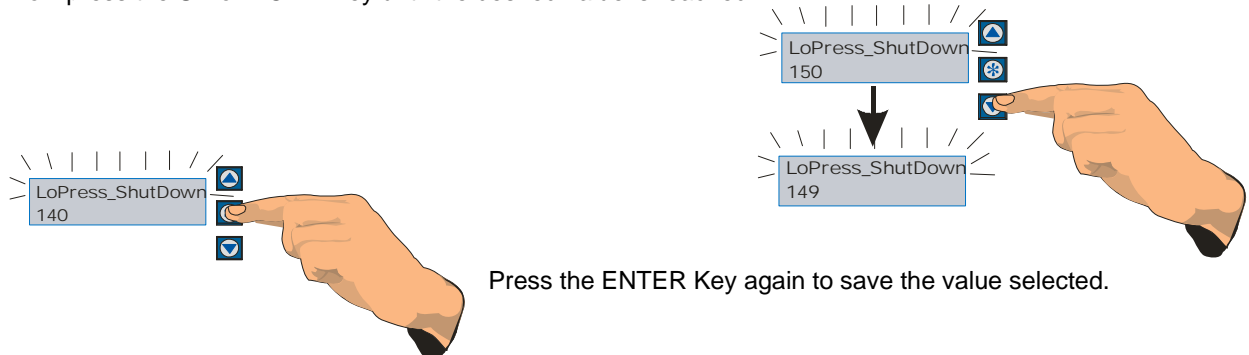
To move out of a submenu press the up or down key to scroll to the top or bottom of the submenu and the display will return to the main menu area.

Main Status Screen

Press UP or DOWN to navigate through the MAIN menu items.

Flow Rate /Min
0

Press * when on Flow Rate display to mute buzzer.

FAULT HISTORY
Press * For Menu

PUMP DATA LOG
Press * For Menu

Hour Run Pump 1
Hour Run Pump 2
Pump 1 Starts
Pump 2 Starts
Starts Last Hour
Analogue Input
Analogue Output
Digital Input State
Digital Output State
Curr & Max Retry
Temperature

Access Code
0

Settings
Press * For Menu

Lo Pressure Shutdown
Cut Out 1
Cut Out 2
Cut In 1
Cut In 2
Hi Pressure Shutdown

TIMING
Press * For Menu

Low Pressure Delay
High Pressure Delay
In Delay Timer
Out Delay Timer
Restart Delay
No Flow Timer
Input Delay Time
Min Pump Runtime
Start Time 1
Start Time 2
Start Time 3
Start Time 4

CONFIGURE
Press * For Menu

Set Time/Date
Transducer Zero
Adjust Scale
Averaging
Pump Flow Rate
Pump Rotation
Restarts
Excess Start Protection
Low Limit Action
High Limit Action
User Access Code
Modbus Baud Rate
Modbus Address

JOCKEY PUMP
Press * For Menu

Jockey Pump On/Off
JP Cut In
JP Cut Out
JP Run On Time
JP In Delay Time

OUTPUTS
Press * For Menu

Digital Output 1
Digital Output 2

INPUTS
Press * For Menu

Program Input 1
Program Input 2
Program Input 3
Program Input 4
Program Input 5
Program Input 6
Program Input 7
Program Input 8

These functions are the same for all menus with multiple items.

Press * to access menu items

Pressing UP at the top menu item will exit the menu

Fault 1
Fault 2
Fault 3
Fault 4
Fault 5

Press UP or DOWN to navigate through menu items.

Pressing DOWN at the bottom menu item will exit the menu

QUICKSTART - Pump Controller basic functions

The interface for BARRACOUTA Control Panel allows access for the operator to edit values throughout the menus.

Two line LCD Display (Currently showing system Pressure)

Pump ON/OFF/Manual Switch (Mode) (One for each pump)

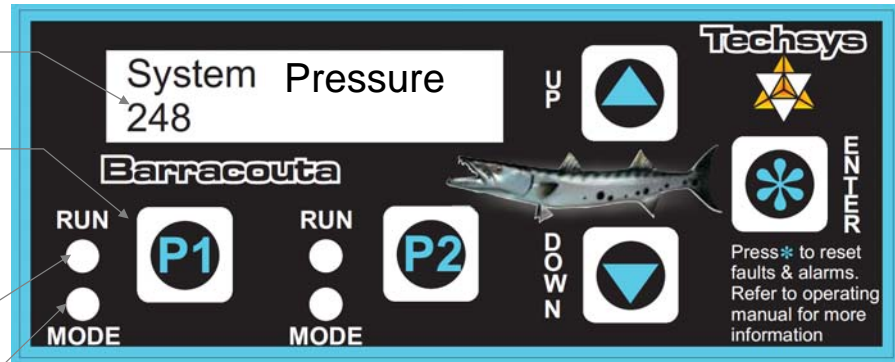**Pump RUN Indicator** (One for each pump)

MODE: ON/OFF Indicator (One for each pump)

System Pressure
248

Barracouta

RUN   P1   RUN   P2
MODE   MODE

UP

DOWN

ENTER

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Press ✳ to reset faults & alarms. Refer to operating manual for more information

To edit values and settings within menus
Press the ENTER (*) key when the desired menu is displayed. The top line will flash if the menu can be edited (some menus may be locked and unavailable). Use the UP and DOWN buttons to change the selection, then press ENTER (*) again to confirm the change.

Each pump is controlled by an individual "P" button. By default a valid Access Code is required to enable, or manually run a pump. Pumps can however be stopped and disabled without an Access Code. (Default is 21).

To enable a pump for operation
Press the "P" button and the associated mode indicator will light up. The selected pump is now available for operation in Automatic mode.

To disable a pump in Automatic Mode
Press the "P" button until the Pump MODE: ON/OFF indicator light turns off.

To operate a pump on Manual
Press and hold the "P" switch for 3 seconds to start a pump in "Manual".

The Pump MODE: ON/OFF light will be flashing and the RUN indicator will be on. To turn a manual pump off, press and release the "P" switch.
The RUN light turns off when the pump is disabled. To return it to Automatic press the "P" button again until the Mode indicator turns on.

MANUAL MODE PROTECTION
Pump protection settings apply to all pumps including those in manual mode.
The individual pump protection features can be adjusted or disabled but the Barracouta controller will maintain pump protection when required and will not allow pumps to run in manual mode.

Optional alarm/fault light and buzzer
If an alarm strobe light and buzzer are fitted an output will be set to Any Fault.
To reset the fault and turn off the alarm and buzzer the Enter key must be pressed.
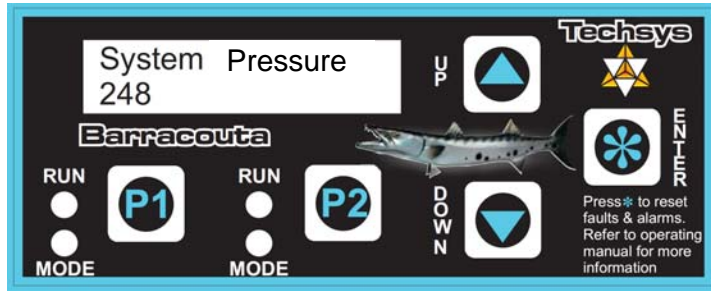
NB: By default all pumps will be off when system is powered up for the first time.

To edit menu data
Press the ENTER key to edit data in the required menu, the top line will flash if the current menu is an editable screen. Use the UP and DOWN buttons to change the selection, then press ENTER again to confirm the change.

QUICKSTART - ROTATION CHECK

The following procedures are the minimum required to start and operate the BARRACOUTA. If you are concerned regarding the commissioning of the unit please read the complete manual or call your closest Techsys Corporation dealer.
The following test confirms the operational directions of all pumps in both Manual and Automatic Modes

This is a most important procedure and should be completed prior to any other commissioning procedure.
Only Qualified Personnel should be allowed to complete this procedure as there is High Voltage wiring within the panel.

1.   Switch OFF all motor circuit breakers.

2.   Turn ON power to BARRACOUTA controller.

3.   Make sure all Pump Mode indicators are OFF, If not press "P1" and/or "P2" keys to turn pump off all pumps (All pumps should now be off)

4.   Adjust Overloads to to suit motor ratings. Switch ON all circuit breakers.

5.   Press "P1" to turn on Pump 1. The Running indicator should light up.

(If the message "Key Pad Locked" appears, The Access Code menu will then appear, increment the Access Code using the UP key until it is 21 and then press Enter. Now Press "P1" again)

Check Rotation against the pump manufacturers direction arrow.
After checking turn Pump1 to OFF by pressing "P1" again.

6.   Press "P2" to turn on Pump 2 (If fitted). The Running indicator should light up

Check Rotation against the pump manufacturers direction arrow.
After checking turn Pump1 to OFF by pressing "P2" again.

7.   If any of the pumps have the wrong direction of rotation change two of the wires on the wiring connected to the motor in question. This should only be done by qualified personnel.

• Re-check direction

8.   Rotation check complete.

*****IMPORTANT*****
Failure to follow this procedure will void Warranty and possibly cause failure of the pump.

Cancelling audible beeper.
If during commissioning you wish to cancel the BEEP heard on key strokes go to the "Flow-Rate" display and press *

QUICKSTART - Key settings

1.   Press the Up Key until the Message **Access Code** is displayed.

2.   Press the "Enter Key" once, the display should start to flash, now press the UP Key until the number 21 appears in the lower part of the screen, now press the Enter Key" again, the display should stop flashing. The correct Access code is now set. (The same sequence of key presses is used to adjust all settings on the BARRACOUTA)

3.   Then press the "DOWN Key" until **SETTINGS** screen is displayed.

4.   Press the "Enter Key" to access the **SETTINGS** Sub Menu.

5.   Press the "DOWN Key" Until the **Cut In Pressure** screen is reached.

6.   Adjust the **Cut In Pressure** by pressing the "Enter Key" once, the display should then start to flash, now press the "UP or DOWN Key" to alter the **Cut In Pressure.**

7.   Press the "Up or DOWN Key" Until the **Cut Out Pressure** screen is reached.

8.   Adjust the **Cut Out Pressure** by pressing the "Enter Key" once, the display should then start to flash, now press the "UP or DOWN Key" to alter the **Cut Out Pressure.**

9.   After the adjustments have been made, press the "DOWN Key" until the sub menu is exited and the "SETTINGS" main screen appears.

CALIBRATING PRESSURE TRANSDUCER (ONLY REQURIED IF FITTED WITH A NON-STANDARD
        TRANSDUCER)

1.   Disconnect pressure transducer from pressure source.

2.   Press the "DOWN Key" until you reach the Main Menu Marked **"CONFIGURE"**

3.   Enter the submenu by pressing the "Enter Key"

4.   Press the "DOWN Key" until the "Transducer Zero" screen is displayed.

5.   Adjust the value in the bottom screen until the reading is "0" – If the screen reads "Value Too Low", use the "UP" key to adjust the display to read zero (the key may need to be pressed a number of times or held down to achieve this).

6.   Press the "DOWN key" until you **reach "ADJUST PRESSURE".** (At this point the pressure transducer needs to be reading a known pressure eg. Pump is running in manual).

7.   Adjust the value in the "Adjust Pressure" screen until the guage pressure is the same as the screen pressure. NB: Screen keys may need to be hit multiple times or held to achieve this.

8.   The System is now Calibrated. Press the DOWN key until the main system pressure screen (Status Screen) returns.

System Operation

The operating constraints for the system are detailed below.

Pressure Mode

When the system pressure drops below the "cut in" point the controller will start a pump after the "cut in delay" timer has expired. If the pressure then rises above the "cut in" point, no further pumps are started. When the pressure rises above the "cut out" pressure the "cut out delay" timer is started. If the "cut out delay" timer expires and the pressure is still above the "cut out" point then the pump will be turned off, unless the pump minimum run time has not been achieved. In this case, the pump will remain on until the "minimum run" timer expires.

If one pump is running and the system pressure drops below the cut in pressure again for longer than the "cut in delay", the second pump will start.
After the pressure rises above the "cut out" point the first pump's cut out timer will start and when it expires it will turn off the first pump if the pump "minimum run time" has been achieved. The same will then occur for the second pump.
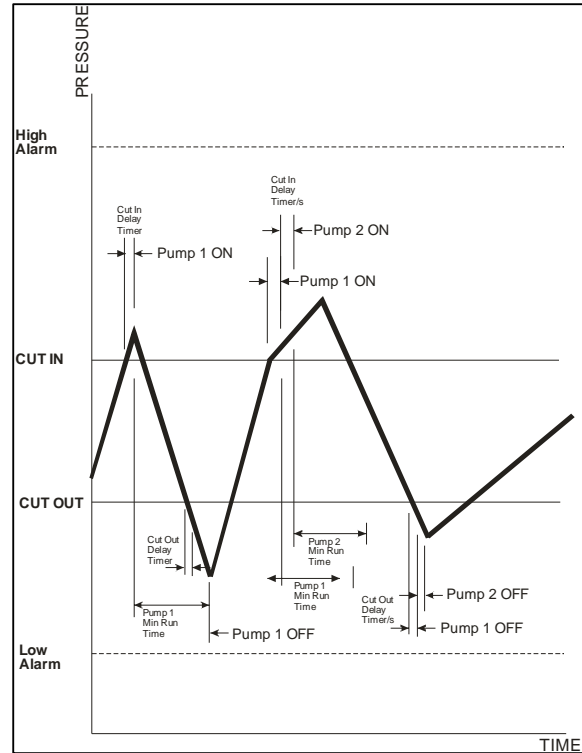
MENUS

The BARRACOUTA controller has numerous adjustment menus to allow the system to be tuned to suit each application. These are listed below and explained throughout this manual.
Menus throughout this manual show the complete range of options available. If a menu is not needed because the option is disabled then these screens will not appear. For example if only 1 pump is implemented, then screens with options for pump 2 will be hidden.

Main Menu		Units	Range	
System Pressure		number	0 - 9999	Current reading
Flow Rate /Min		number	0 - 9999	Calculated flow

NOTE- To MUTE the buzzer press the * screen when Flow Rate is displayed

Main Menu	Sub Menu	Units	Fault Messages	Initial record
FAULTS				
	F1	display	None Lo Press Shut,	None
	F2	display	Hi Press Shut, No Flow Shut,	None
	F3	display	# P1 - 2 Protection # P1 - 2 Fault	None
	F4	display	Power Off Power Glitch	None
	F5	display	Auto Reboot	None

P2 is only displayed if "Number of pumps" is set to 2

Main Menu	Sub Menu	Units	Range	Initial value
PUMP DATA LOG				
	Hours Run Pump 1	hours	0 - 65535	0
Note 1	Hours Run Pump 2	hours	0 - 65535	0
	Pump 1 Starts	number	0 - 65535	0
Note 1	Pump 2 Starts	number	0 - 65535	0
	Pump Starts Last Hr	number	0 - 65535	0
Note 2	Analogue Input	%	0.00 - 100.00	Current reading
Note 2	Analogue Output	%	0.00 - 100.00	Current reading
	Dig Input State	number	1 to 8 X for Active	Current reading
	Dig Output State	number	1 to 2 X for Active	Current reading
	Curr & Max Retry	number	0 to 21	Current reading
	Temperature	number	0 to 100C	Current reading

Note 1 - Only visible if "Number of pumps" is set to 2

Note 2 - "Analogue Input"& "Output" is only visible if the "Sensing Input" in CONFIGURE menu is set to "Analogue"

Main Menu		Units	Range	Initial setting
Access Code		number	0 - 250	21

Main Menu	Sub Menu	Units	Range	Initial setting
SETTINGS				
Note 1	LoPress Shutdown	seconds	0 - 9999	150
Note 2	LoPress Alarm	seconds	0 - 9999	150
Note 3	Low Limit	display	OFF	
	Cut In Pressure	unitless	0 - 9999	200
	Cut Out Pressure	unitless	0 - 9999	450
Note 4	HiPress Shutdown	seconds	0 - 9999	650
Note 5	HiPress Alarm	seconds	0 - 9999	650
Note 6	High Limit	display	OFF	
Note 7	Alt Cut In 2	unitless	0 - 9999	250
Note 7	Alt Cut Out 2	unitless	0 - 9999	500
Note 7	Alt Cut In 3	unitless	0 - 9999	300
Note 7	Alt Cut Out 3	unitless	0 - 9999	600
Note 8	Trip Point Low	unitless	0 - 9999	300
Note 8	Trip Point High	unitless	0 - 9999	400

General Note - No settings are displayed if system is programmed to operate in switched mode

Note 1 - LoPress Shutdown is displayed when "Low Limit Action" in CONFIGURE menu is set to "Shutdown"

Note 2 -LoPress Alarm is displayed when "Low Limit Action" in CONFIGURE menu is set to "Alarm"

Note 3 - Low Limit "OFF" is displayed when "Low Limit Action" in CONFIGURE menu is set to "OFF"

Note 4 -HiPress Shutdown is displayed when "HighLimit Action" in CONFIGURE menu is set to "Shutdown"

Note 5 -HiPress Alarm is displayed when "HighLimit Action" in CONFIGURE menu is set to "Alarm"

Note 6 -High Limit "OFF" is displayed when "High Limit Action" in CONFIGURE menu is set to "OFF"

Note 7 - Alternate Settings are displayed when input is programmed accordingly and only available in "Single Level" mode.

Note 8 - "Trip Point Low" & "High" are displayed when a "Digital Output" is set to "Trip Point"

Also the trip point function is not available if the "Sensing Input" is set to "Switched" mode in CONFIGURE menu.

Main Menu	Sub Menu	Units	Range	Initial setting
TIMING				
	Lo Press Delay	seconds	^ OFF, 0 - 250	120
	High Press Delay	seconds	^^ OFF, 0 - 250	4
	In Delay Timer	seconds	0 - 999	4
	Out Delay Timer	seconds	0 - 999	1
	Restart Delay	seconds	0 - 999	0
	No Flow Timer	seconds	0 - 250	0
	Input Delay Timer	seconds	0 - 999	5
Note 1	LoTrip Pnt Delay	seconds	0 - 999	0
Note 1	Hi Trip Pnt Delay	seconds	0 - 999	0
Note 2	Min Pump Runtime	seconds	0 - 240	60
Note 3	Max Pump Starts	per Hour	0 - 240	60
	Start Time 1	Hr:Min	OFF, 00:00 - 23:59	OFF
	Stop Time 1	Hr:Min	OFF, 00:00 - 23:59	OFF
	Start Time 2	Hr:Min	OFF, 00:00 - 23:59	OFF
	Stop Time 2	Hr:Min	OFF, 00:00 - 23:59	OFF
	Start Time 3	Hr:Min	OFF, 00:00 - 23:59	OFF
	Stop Time 3	Hr:Min	OFF, 00:00 - 23:59	OFF
	Start Time 4	Hr:Min	OFF, 00:00 - 23:59	OFF
	Stop Time 4	Hr:Min	OFF, 00:00 - 23:59	OFF

^ OFF is displayed in the "Lo Press Delay" screen when "Low Limit Action" in CONFIGURE menu is set to "OFF"

^^ OFF is displayed in the "Hi Press Delay" screen when "High Limit Action" CONFIGURE menu is set to "OFF"

Note 1 - Level Trip delays are only visible if an OUTPUT is set to "Level Trip"

Note 2 - "Min Pump Runtime" Is displayed when "Excess Start Prot" in CONFIGURE menu is set to "Minimum Run Time"

Note 3 - "Max Pump Starts" Is displayed when "Excess Start Prot" in CONFIGURE menu is set to "Max Starts PerHr"

Main Menu	Sub Menu	Units	Range or Options	Initial setting
CONFIGURE				
	Set Time/Date		Hr:Min Year Month Day	
Note 1	Transducer Zero	unitless	Set to 0 at Zero Pressure	
Note 1	Adjust Pressure	unitless	Set to equal current pressure	
Note 1	Averaging	number	0 - 50	5
Note 1	Scale An Output	number		1000
	Pump Flow Rate	per Min	1-9999 /Min	5
	Lead Pump	selection	Auto, Pump 1, Pump 2, Every 24 hours, Lowest hours	Auto
	High Press Restarts	selection	0 - 250	0
	Sensing Input	selection	Analogue, Switched	Analogue
	Exces_Start Prot	selection	Minimum Run Time, Max Starts PerHr	Minimum Run Time
	Low Limit Action	selection	OFF, Alarm, Shutdown, Pump Start	SHUTDOWN
	HighLimit Action	selection	OFF, Alarm, Shutdown, Pump Start	SHUTDOWN
	User Access Code	number	0 - 250	21
	Modbus BaudRate	number	2400 - 230400	9600
	Modbus Address	number	1 - 128	1
	Number of Duty	number	1 - 2	2

^ Pumps 2 is only visible if "Number of pumps" is set to 2

Note 1 - "Transducer Zero", "Adjust Pressure"," Averaging" & "Scale An Output" are hidden when in "Switched" mode

Main Menu	Sub Menu	Units	Range OR Option	Defaults
JOCKEY PUMP				
	Jockey Pump	selection	----Off----, ===On===	----Off----
Note 1	JP Cut In Press		0 - 9999	250
Note 1	JP Cut Out Press		0 - 9999	400
Note 1	JP Run On Time	seconds	0 - 999	2
Note 1	JP In Delay Time	seconds	0 - 999	0

Note 1 - JP Screens are only visible if "Jockey Pump" is set to " ===ON==="
AND "Sensing Input" in CONFIGURE menu is set to "Analogue"

Main Menu	Sub Menu	Units	Options	Defaults
OUTPUTS				
	Digital Output 1	selection	Shutdown Fault, Low Press Fault, High Press Fault, ^ Pump 1 - 2 Run, ^^ Pump 1 - 2 Fault, System Paused, Low Alarm, High Alarm, Any Alarm, Any Pump Shutdwn, Any Pump Running, # Trip Point Alternate Trip, Aux Output 1, Aux Output 2, No Flow Fault	Shutdown Fault
	Digital Output 2	selection		Any Pump Shutdwn
Note 1	Analogue Output	selection	System Pressure	System Pressure

^ Pump Run 2 is only visible if "Number of pumps" is set to 2

^^ Pump Fault 2 is only visible if "Number of pumps" is set to 2

Trip point function is not available if the "Sensing Input" is set to "Switched" mode in CONFIGURE menu.

Note 1 - "Analogue output" is only visible if the "Sensing Input" in CONFIGURE menu is set to "Analogue"

Main Menu	Sub Menu	Units	Options	Initial Setting

INPUTS

Main Menu	Sub Menu	Units	Options	Initial Setting
	Program Input 1	selection	Any of the following options can be selected on any input and used multiple times.	No Flow
	Program Input 2	selection		System Pause
	Program Input 3	selection		Not Selected
	Program Input 4	selection	Not Used	Not Selected
	Program Input 5	selection	^ Alt 2 Settings	Low Limit
	Program Input 6	selection	^ Alt 3 Settings	High Limit
Note 1	Program Input 7	selection	^^ Cut In,	P1 Prot(Pause)
Note 1	Program Input 8	selection	^^ Cut Out,	P2 Prot(Pause)
			# Cut In 1,	
			# Cut In 2,	
			# Cut Out 1,	
			# Cut Out 2,	
			Low Limit,	
			High Limit,	
			System Pause,	
			< P1-2 Prot(Pause)	
			< Pump1 - 2 Stop,	
			< Pump1 - 2 Manual Run,	
			Fire Mode,	
			Cycle Pumps,	
			Reset,	
			No Flow,	
			Aux Input 1, Aux Input 2,	
			< Pump1-2 Fault(Stop)	
			Schedule Bypass	

^ Alternate 2&3 pressure options are only available and visible if the "Sensing Input" in the CONFIGURE menu is set to "Analogue" mode.

< Pump 2 option is only visible if "Number of pumps" is set to 2.

Note 1 - Input function locked to pump protection.

SYSTEM STATUS

System Pressure

System Pressure		number	0 - 9999

The System Pressure is the direct measurement of the pressure in the system. It is read from the pressure transducer and is displayed on the Pressure Screen on the front of the panel.

System Pressure
XXXX

This is the default display screen; it will also display appropriate messages describing current conditions. These include in order of priority: Emergency Stop, Hi Press Shutdown, Lo Press Shutdown, No Flow Shutdown, Fault, Lo Flow Detected, and Pause Activated.

If the system is to be configured to run with a pressure switch/es this screen will show switched mode, pumps on standby or pumps running.

Switched Mode
Pump/s on StdBy

After 25 minutes from the last key press the BARRACOUTA will revert to this screen automatically.

Flow Rate

Flow Rate /Min		number	0 - 9999

The BARRACOUTA can display a calculated flow rate.

The Calculated flow rate uses information that is input into the Pump Flowrate screen to provide an estimation of the flow rate at any time. This calculation automatically compensates for the number of pumps operating - it is useful in determining the system capacity. This is a calculated flow and must be treated as such. The time base for this flow is in flow per *MINUTES* and is not adjustable.

Flow-Rate /Min
XXXXX*

FAULT HISTORY

FAULTS			
Fault 1	display	None Logged
		Lo Press Shut,
Fault 2	display	Hi Press Shut,
		No Flow Shutdown,
Fault 3	display	# P 1 - 2 Protection
		# P 1 - 2 Fault
Fault 4	display	Power Off
		Power Glitch
Fault 5	display	Auto Reboot

When a system fault is registered a "NEW FAULT" message will appear on the main screen. It will also be logged in the FAULT HISTORY menu. There is space for up to 5 faults to be logged which scroll down as new faults are received.

In the event of a new fault, which has been automatically reset, the default screen will display the message "New Fault". Go to the FAULT HISTORY to view this fault. Faults that are active will remain live on the screen until the ENTER Key is pressed to clear the fault.

** NEW FAULT **

Faults will appear in the Fault sub menu in the following format with the most recent fault being Fault 1.

```
Last Fault (No.1
Lo Press Shutdwn
```

Note: The FAULT HISTORY menu is clear when the system is first powered up. "P1 Fault" or "P2 Fault" signifies that the corresponding "Pump protect 1-2" input has been activated for the period of the input delay time.

```
Fault 2
No Flow Shutdown
```

"Auto Reboot" denotes that the BARRACOUTA has automatically restarted due to an internal reset, whereas "Power Failure" records that the BARRACOUTA has recovered from a power supply disconnection. A very short disconnection of power will record a "Power Glitch" message, typically around 0.1seconds.

The FAULT HISTORY menu is always visible regardless of whether the Access Code is correct.
To reset the complete FAULT HISTORY, press the ENTER key then DOWN and then ENTER again when at Fault 1. Individual Faults can be reset by completing the same action while displaying the Fault screen required to be reset.

PUMP DATA LOG

Main Menu	Sub Menu	Units	Range
PUMP DATA LOG			
	Hours Run Pump 1	hours	0 - 65535
	Hours Run Pump 2	hours	0 - 65535
	Pump Starts 1	number	0 - 65535
	Pump Starts 2	number	0 - 65535
	Pump Starts Last Hr	number	0 - 65535
	Analogue Input	%	0.00 - 100.00
	Analogue Output	%	0.00 - 100.00
	Digital Input State	number	1 to 8 X for Active
	Digital Output State	number	1 to 2 X for Active
	Curr & Max Retry	number	0 to 21
	Temperature	number	0 to 100C

Hours Run Pump 1-2

Each pump has an hour run meter to record the actual run time for each pump. The hour log will accumulate all of the operation time for each pump in both AUTOMATIC and MANUAL modes.
To reset the time press ENTER then DOWN and then ENTER again.

```
Hours Run Pump1
XXXXX
```

Pump 1-2 Starts

The BARRACOUTA registers the number of starts that each pump accumulates to assist in the tuning of the system. This number can assist in the selection of the Cut In and Cut Out Pressures and the run time settings. The starts do not increment when selected in MANUAL as this is considered to be an override function.
To reset press ENTER then DOWN and then ENTER again.

```
Pump Starts 1
XXXXX
```

Pump Starts Last Hour

This registers the numbers of starts that the *TOTAL SYSTEM* had over the past hour. This is the accumulation of all of the Starts for all of the pumps and is designed to assist in trouble shooting. The new number is accumulated over a 10-min period and is updated at 10-minute intervals. To get a true hourly reading the system must have been running for at least 1 hour. After the first hour the last 6 previous 10-minute readings are added together to get the Starts last hour reading.
To reset press ENTER then DOWN and then ENTER again.

```
Pump Starts Last
Hour   XXXXX
```

Analogue Input

This screen displays the actual Analogue Input reading in percentage.
It shows the actual possible full scale reading and is not zeroed or scaled to Pressure. It is used to determine input functionality. It will not be displayed if operating in switched mode.

```
Analogue Input
XXX.XX%
```

Analogue Output

This screen displays the actual Analogue Output reading in percentage. This output mimics the Analogue 1 Input and can be re-scaled in the configuration settings.
It will not be displayed if operating in switched mode.

```
Analogue Output
XXX.XX%
```

Dig Input State

This screen displays the state of the Digital inputs
X = energised
- = de-energised
See INPUTS for configurable options for this item.

```
Dig Input State
X- - X- - - - X
```

Dig Output State

This screen displays the state of the Digital outputs
X = energised
- = de-energised
See OUTPUTS for configurable options for this item.

```
Dig Output State
X - - -
```

Curr & Max Retry

The number under "Curr" is the current number of times the main processor has not been able to communicate with the analogue system. If it is not at Zero it indicates that the analogue system has been subject to noise and may have had to restart itself. If this number continues to increment up to 20, then resets to 0, and continues incrementing again it indicates a possible major malfunction with the analogue system

```
Curr & Max Retry
XXX        XXX
```

The number under "Max Retry" is the maximum number of times the main processor has not been able to communicate with the analogue circuitry. If it is at 20 there may have been a major disruption in the analogue system and was unable to restart its self and the main processor has more than likely forced it to restart.

Temperature

Displayed is the current temperature in degrees C, read via the temperature sensor on the circuit board.

```
Temperature
XXX degrees C
```

ACCESS CODE

Main Menu		Units	Range
Access Code		number	0 - 250

Press ENTER to edit the Access Code at this location. If correct this will then allow access to the "Sub Menus". Once the Access Code is input it will remain active for 25 minutes after the last key press. Standard security will then resume and access into the submenus will require re-entering of the Access Code.

```
Access Code
XXX
```

The system will then automatically lock the use of the keys which control the ON/OFF and AUTOMATIC and MANUAL Functions. This is designed to protect the system from tampering.

If a message KEPAD LOCKED appears on the screen enter the ACCESS CODE to allow access.

```
*KEY PAD LOCKED*
Enter Access Code
```

SETTINGS

Main Menu	Sub Menu	Units	Range
SETTINGS			
	LoPressure Shutdown	seconds	0 - 9999
	LoPressure Alarm	seconds	0 - 9999
	Low Limit	display	OFF
	Cut In Pressure	unitless	0 - 9999
	Cut Out Pressure	unitless	0 - 9999
	HiPressure Shutdown	seconds	0 - 9999
	HiPressure Alarm	seconds	0 - 9999
	High Limit	display	OFF
	Alt Cut In 2	unitless	0 - 9999
	Alt Cut Out 2	unitless	0 - 9999
	Alt Cut In 3	unitless	0 - 9999
	Alt Cut Out 3	unitless	0 - 9999
	Trip Point Low	unitless	0 - 9999
	Trip Point High	unitless	0 - 9999

Low Press Shutdown
Low Press Alarm
Low Limit

This is the alarm Pressure point for low Pressure. If any pump is running and the system falls below this Pressure and remains there for the period of the "LoPressure Delay" time the system will act according to the setting in the "Low Limit Action" Sub menu.

```
LoPress Shutdwn
XXXX
```

➢ If Low Limit Action is set to OFF, then no action is taken.
➢ If Low Limit Action is set to Alarm, then an alarm is only logged.

> If Low Limit Action is set to Shutdown, then a shutdown is initiated.

For alarm and shutdown actions, an output relay can be set to the appropriate mode to turn it on.

An alarm message will show on the main screen showing that there is a low Pressure shutdown fault. The fault will also be recorded in the FAULT HISTORY sub menu. To clear the fault and restart the system press the ENTER key.

LoPress Shutdwn

Note: All pumps will be shutdown including manual pumps.
If Low Limit Action is set to OFF the Low Limit and the Low Pressure Delay screens will then display ------OFF---- and can be not edited.

Cut In Pressure

The Cut In Pressure is the Pressure at which the system will restart or the next pump will start. This Pressure must be higher than the Low Pressure Shutdown. If the system is re-starting, then the restart timer (see timing menu) must have timed out before the first pump will start.

| Cut In Pressure |
| XXXX |

If there is a pump already running, then the Cut In timer (see timing menu) must have timed out before the next pump will start. Pumps may also be prevented from starting if the Max starts per hour setting has been exceeded. A message will appear on the status screen letting you know that it has occurred.

| PUMP/S REACHED |
| MAX Starts PerHr |

(This option is set in- Configuration -> Excess Run Protection)

Cut Out Pressure

The Cut Out Pressure is the Pressure at which the system will start to turn off pumps. This Pressure must be higher than the Cut In Pressure. The Cut Out timer (see timing menu) must have timed out before the next pump will be turned off. Pumps may also be prevented from stopping if the Minimum run time (see timing menu) for all pumps that are currently running, have not yet timed out.

| Cut Out Pressure |
| XXXX |

| Min Run Time ON |
| Pump Stop X Secs |

(This option is set in- Configuration -> Excess Run Protection)

High Pressure Shutdown

This is the alarm Pressure point for High Limit. If any pump is running and the system rises above this Pressure and remains there for the period of the "Hi Press Delay" time (see timing menu) the system will act according to the setting in the "High Limit Action" Sub menu.

| HiPress Shutdown |
| XXXX |

> If High Limit Action is set to OFF, then no action is taken.
> If High Limit Action is set to Alarm, then an alarm is only logged.
> If High Limit Action is set to Shutdown, then a shutdown is initiated.

For alarm and shutdown actions, an output relay can be set to the appropriate mode to turn it on.

If the High Limit Action is set to "Shutdown" then another option also becomes available; this is to automatically restart the system after a High Pressure shutdown. This is called "High Press Restarts" and is located in the Configuration menu. It can be set at any value between 0 and 250 to suit the application.

Note: All pumps will be shutdown including manual pumps.
If High Limit Action is set to OFF then the High Limit and the High Press Delay screens will then display ------OFF---- and cannot be altered.

Alt Cut In 2 / Alt Cut Out 2

In cases where the Cut In and Cut Out settings need to be changed via a remote control signal, activating the Alternate 2 settings will force the BARRACOUTA to operate on "Alt Cut In 2" & "Alt Cut Out 2" setting.

- Primary settings (Cut In - Cut Out)
- 2nd Settings (Alt Cut In 2 - Alt Cut Out 2)
- 3rd Settings (Alt Cut In 3 - Alt Cut Out 3)

In order to run the alternate settings program one of the inputs to Alt Setting 2 and activate the relevant input.
Alternate Cut Ins and Cut Out options are not available in Switched mode or Multi level operation. See Inputs for detailed description.

```
Alt Cut In 2
XXXX
```

```
Alt Cut Out 2
XXXX
```

Alt Cut In 3 / Alt Cut Out 3

In cases where the Cut In and Cut Out settings need to be changed via a remote control signal, activating the Alternate 3 settings will force the BARRACOUTA to operate on "Alt Cut In 3" & "Alt Cut Out 3" setting.

- Primary settings (Cut In - Cut Out)
- 2nd Settings (Alt Cut In 2 - Alt Cut Out 2)
- 3rd Settings (Alt Cut In 3 - Alt Cut Out 3)

In order to run the alternate settings program one of the inputs to Alt Setting 3 and activate the relevant input.
See Inputs for detailed description

NOTE: These settings will also limit the adjustment of the High Level and Low Level settings. If Alt Cut In & Alt Cut Out 2 or 3 are not used, adjust these settings to be close to the "standard" CUT OUT, this should prevent them from limiting adjustment to the High Level and Low Level settings.

```
Alt Cut In 3
XXXX
```

```
Alt Cut Out 3
XXXX
```

Trip Point Low

BARRACOUTA has the ability to energise an output relay based on specific system Pressure points. This can be useful for monitoring other functions through out the system that are not directly affected by the BARRACOUTA control. Trip Point High also has to be set, see below. See Output Relays section for more information on how to set this feature.

```
Trip Point Low
XXXX
```

Note: The "Trip Point Low" and "Trip Point High" screens will only appear if an output is set to "Trip Point" within the OUTPUTS menu.
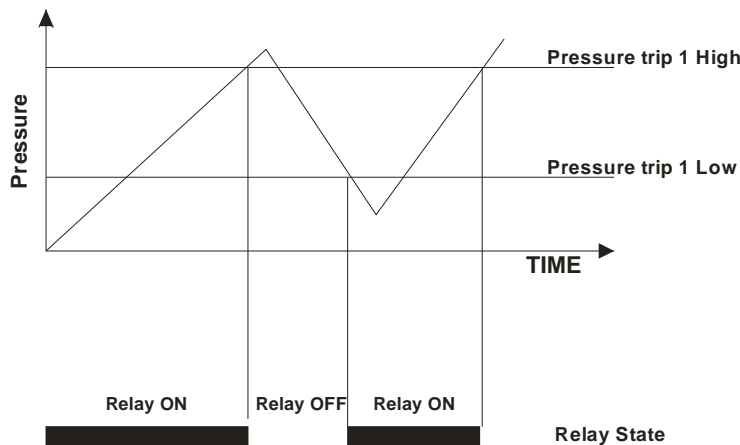
Trip Point High

The Trip Point High is related to the Trip Point low. If a single trip point is required set the High and Low trip points to the same value.
Note: The settings of Trip Point High must be greater or equal to Trip Point Low. The system constrains settings outside this range.

Note: The "Trip Point Low" and "Trip Point High" screens will only appear if an output is set to "Trip Point" within the OUTPUTS menu.

```
Trip Point High
XXXX
```

TIMING

Main Menu	Sub Menu	Units	Range
TIMING			
	Lo Press Delay	seconds	OFF, 0 - 250
	High Press Delay	seconds	OFF, 0 - 250
	In Delay Timer	seconds	0 - 999
	Out Delay Timer	seconds	0 - 999
	Restart Delay	seconds	0 - 999
	No Flow Timer	seconds	0 - 250
	Input Delay Timer	seconds	0 - 999
	Lo Trip Pnt Delay	seconds	0 - 999
	Hi Trip Pnt Delay	seconds	0 - 999
	Min Pump Runtime	seconds	0 - 240
	Max Pump Starts	per Hour	0 - 240
	Start Time 1	Hr:Min	OFF, 00:00 - 23:59
	Stop Time 1	Hr:Min	OFF, 00:00 - 23:59
	Start Time 2	Hr:Min	OFF, 00:00 - 23:59
	Stop Time 2	Hr:Min	OFF, 00:00 - 23:59
	Start Time 3	Hr:Min	OFF, 00:00 - 23:59
	Stop Time 3	Hr:Min	OFF, 00:00 - 23:59
	Start Time 4	Hr:Min	OFF, 00:00 - 23:59
	Stop Time 4	Hr:Min	OFF, 00:00 - 23:59

Low Pressure Shutdown Delay

Set this time to delay a Low Pressure Shutdown. It must time out before the system will shut down in Low Pressure mode. The range for this is "0-250 sec". If the Low Pressure shutdown needs to be turned OFF it can be done by accessing the "Low Limit Action" sub menu in the Configuration menu. If Low Limit Action is set to OFF the Low Limit and the Low Press Delay screens will then display ------OFF---- and can not then be altered. If OFF is selected then the system will ignore any low-Pressure shutdown events. Be sure that you fully understand the repercussions of this setting as the Shutdown settings are designed to protect both the pump and the system from damage.
The Low & High Pressure delay timers are independent of each other and can be set to suit individual needs.

```
LoPress Delay
XXX seconds
```

High Pressure Shutdown Delay

Set this time to delay the High Pressure Shutdown. It must time out before the system will shut down in High Pressure mode. The range for this is "0-250 sec". If the High Pressure shutdown needs to be turned OFF it can be done by accessing the "High Limit Action" sub menu in the Configuration menu. If High Limit Action is set to OFF the High Limit and the High Press Delay screens will then display ------OFF---- and can not be altered. If OFF is selected then the system will ignore any high-Level shutdown commands. Be sure that you fully understand the repercussions of this setting as the Shutdown settings are designed to protect both the pump and the system from damage.

```
HiPress Delay
XXX seconds
```

In Delay Timer

The IN DELAY TIMER is used to delay the starting of additional pumps. When the system Level drops below the Cut In Pressure the system starts the first pump according to the "restart" timer. Any additional pumps required will be started if the Pressure remains below the Cut IN Pressure after the In Delay Timer has timed out. This timer is designed to assist in the reduction of Short Cycling and allowing the system to stabilise before additional pumps are started.

```
In Delay Timer
XXX seconds
```

Out Delay Timer

When the pumps are called to turn off the delay for this is governed by the OUT DELAY TIMER. It delays the shutting down of additional pumps when the system Pressure is above the Cut In and pumps are attempting to shut down. Take care in setting this timer as the increase in Pressure due to this delay can cause Pressure spikes.

```
Out Delay Timer
XXX seconds
```

Restart Delay

When the system Pressure drops below the Cut In Pressure the first duty pump to start will be delayed by the RESTART DELAY

```
Restart Delay
XXX seconds
```

No Flow Timer

If a flow switch is fiited and connected to a programmable input which is programmed to "No Flow" and pumps are running there should be flow detected by the Flow Switch. If there is No flow the flow switch input is closed this timer delays a No Flow Shutdown by the given amount.

```
No Flow Prot Dly
XXX seconds
```

Input Delay Timer

The BARRACOUTA has the capacity to accept input signals for various processes. This timer sets the delay for reaction to those inputs. The specific inputs that are controlled by this timer are outlined in the "Programmable Input Options"

```
I/P Delay Timer
XXX seconds
```

Pressure Trip Low Delay

This setting delays the activation of the relevant Output relay if programmed for Pressure Trip.

```
Lo Trip Pnt Delay
XXX seconds
```

Pressure Trip High Delay

This setting delays the deactivation of the relevant Output relay if programmed for Pressure Trip.

Note: The screens "Pressure Trip Low Delay" and "Pressure Trip High Delay" are only visible if at least one output is set to "Trip point" in the OUTPUTS menu.

Hi Trip Pnt Delay
XXX seconds

Min Pump Runtime

This setting is used to prevent switchgear and pumps from failing due to excessive cycling. Each pump is prevented from stopping until its own Minimum run timer expires.

A message will appear on the status screen letting you know that it has occurred.

This method of protection should only be used if the reticulation system can withstand maximum pump head.

Min Pump Runtime
XXX seconds

Min Run Time ON
Pump Stop X Secs

Maximum Pump Starts

This setting is used to prevent switchgear and pumps from failing due to excessive cycling. Each pump is prevented from starting if the Max starts per hour setting has been exceeded.

A message will appear on the status screen letting you know that it has occurred.

Note: The "Min Pump Runtime" and "Max Pumps Starts" screens are visible according to the setting of "ExcessRun Prot'n" sub menu in the "Configuration" Menu.

Max Pump Starts
XXX per Hr

PUMP/S REACHED
MAX Starts PerHr

Integrated Start/Stop Function
This Barracouta has four adjustable start and stop times

Starts Time 1-4

Start Time 1-4 determines when the system will be active.

Start Time 1
HH:MM

Stop Time 1-4

Stop Time 1-4 determines when the system will be inactive.
The display will show how long before the system will again restart.

Stop Time 1
HH:MM

Note- The start and stop times can be set to overlap each other which is intentional for future development, Be mindful that overlapping times can unintentionally set the controller to start or stop when it was not intended.

SCHEDULE PAUSE
xHrs, xMin left

Correct multi start/stop time operation would be-
Start 1 06:00,
Stop 1 13:00
Start 2 17:00
Stop 2 02:00

This setting would turn off the system from 1pm to 5pm and 2am to 6am.
Setting times to overlap each other such as shown below cause Incorrect multi start/stop time operation.
Start 1 06:00
Stop 1 02:00
Start 2 17:00
Stop 2 13:00

This setting would never turn off the system.

CONFIGURE

Main Menu	Sub Menu	Units	Range or Options
CONFIGURE			
	Set Time/Date		Hr:Min Year Month Day
	Transducer Zero	unitless	Set to 0 at Zero Pressure
	Adjust Pressure	unitless	Set to equal current pressure
	Averaging	number	0 - 50
	Scale An Output	number	
	Pump Flow Rate	per Min	1-9999 /Min
	Lead Pump	selection	Auto, Pump 1, Pump 2, Every 24 Hours, Lowest Hours.
	High Pressure Restarts	selection	0 - 250
	Low Pressure Restarts	selection	0 - 250
	Sensing Input	selection	Analogue, Switched
	Exces_Start Prot	selection	Minimum Run Time, Max Starts PerHr
	Low Limit Action	selection	OFF, Alarm, Shutdown, Pump Start
	HighLimit Action	selection	OFF, Alarm, Shutdown, Pump Start
	User Access Code	number	0 - 250
	Modbus BaudRate	number	2400 - 230400
	Modbus Address	number	1 - 128

Set Time/Date

The time and date are required for correct operation on the independent
Start and Stop times and Fault History recording.

> **Set Time/Date**
> **08:51 2011 Oct**

Transducer Zero

The Transducer Zero adjusts the zero offset in the Pressure sensor. Remove
all Pressure in the system and then trim the display by pressing ENTER and
then the UP or DOWN keys to set the reading to "0". There are buffers in the
system so the transition to the new reading may take some time to
settle, wait at least 5 seconds before accepting the adjustment.

> **Transducer Zero**
> **XXXXX kPa**

If BARRACOUTA senses that the adjusted zero input is lower than can be
accepted, a message will come up on the screen stating "VALUE TOO
LOW". If this message appears, increase the setting slowly by pressing
ENTER and then UP, press ENTER again to confirm. Exit out of the menu to
store the value.
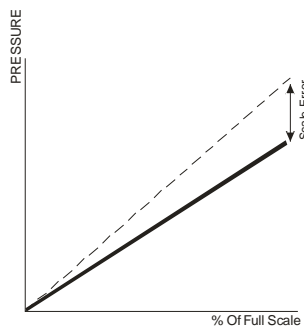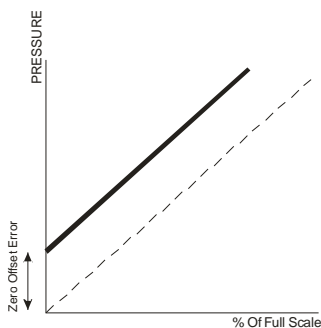
Note: This screen will not be displayed if the BARRACOUTA is running in switched mode.

Adjust Pressure

The calibration of the analogue sensor is achieved by adjusting the Pressure reading on this screen to match a reading from a Pressure gauge.

```
Adjust Pressure
XXXXX
```

Once the system Pressure has stabilised, press the ENTER key and then either UP or DOWN keys to match the reading on this screen to suit a Pressure gauge reading. Once the readings are matched the system Pressure is calibrated. Press ENTER again and then exit out of the menu to store the data.

There are buffers in the system so the transition to the new reading may take some time to settle, wait for 5 seconds before accepting the adjustment.

Note: This screen will not be displayed if the BARRACOUTA is running in switched mode

Averaging

To allow the system Pressure to be displayed without significant Pressure bouncing, the BARRACOUTA averages the readings taken.
To damp the Pressure Reading insert a high number.

```
Averaging
XX
```

Note: The "Transducer Zero", "Adjust Pressure" and " Averaging" screens are not visible if the "Sensing Input" sub menu in the "Configuration" Menu is set to Switched.

Scale An Output

This allows the analogue input to be re-scaled and sent to other devices.
1000 = 1:1 2000 = 2:1 (Output twice the input value)
Pump Flow Rate

```
Scale An Output
XXXX
```

This figure is the flow rate of the pump at a nominated Pressure. It is read from a manufacturers pump curve and input as a flow rate / minute. Any units can be used for this figure however the time units are fixed at MINUTES.
Each time the operating range of the controller is changed this figure should be modified to maintain a more accurate figure.

```
Pump Flow Rate
XXXX /min
```

Pump-Rotation

This menu allows BARRACOUTA to call on one pump to be the lead pump or to allow for a new pump to be the lead pump after each time all of the pumps have shutdown.

```
Lead Pump
Auto
```

Note: The lead pump is the name given to the first auto pump to start (if available). The options are Auto, Pump 1, Pump 2, Every 24 Hours and Lowest Hours. If a pump number is selected then that pump will always be the lead pump. If Auto is selected then the lead pump will cycle after system shutdowns or *PAUSE* events.

If set to "Every 24 Hours", once every 24 hours the system will shutdown all auto pumps (including jockey) and force a cycle of the lead pump. Selecting "Lowest Hours" will start the next available pump with the lowest hours according to the individual Hours Run meters as seen in PUMP DATA LOG. The aim of the setting is to get an even wear through all of your pumps.

Note: A forced rotation can also be activated by setting one of the programmable inputs to "Cycle Pumps" and closing the relevant input terminals- see Programmable Inputs.

High Pressure Restarts

This setting allows the operator to set the number of times that the system can shutdown and then automatically restart after a High Pressure Shutdown.
The range is from 0-250. Select 0 to make the system shut down immediately after the High Pressure delay timer trips. This is the safest setting and the default for the system. After each automatic restart the fault is logged in FAULT HISTORY and the message "New Fault" appears on the main screen.
The restart number is based on a 1 hour time period. i.e. if the Restarts number is 5 then the system will allow 5 restarts in the 1 hour time frame starting from the time of the first HiPressure Fault.

```
HiPressure
Restarts
```

Sensing Input

The BARRACOUTA can accommodate a variety of inputs. It is divided in to two categories.
• **Analogue-** Analogue sensors provide a signal to the controller which is proportional to the system pressure. Most sensors and transducers have an analogue output. Analogue is also divided in to two categories.
o **Standard Analogue-** This is where a Pressure rise will cause a rise in the output of the transducer.
o **Reverse Analogue-** This is where a Pressure rise will cause a fall in the output of the transducer. (These are very rare in Pressure control applications)
• **Switched-** These are signals which change instantaneously. Typical switched products are:
o Pressure switches.

```
Sensing Input
Analogue
```

Excess Run Protection

There are two options to prevent excessive pump cycling or starting.
• **Min Run Time** If this setting is used then each pump is prevented from stopping until it's own Minimum Run Timer times out. This method of protection should only be used if the reticulation system can withstand maximum pump head. A message will appear on the status screen letting you know that it has occurred.
• **Max Starts PerHr** If this setting is used then each pump from starting if the Max starts per hour setting has been exceeded. The down side of this is that if all pumps have exceeded the number of starts per hour then the reticulation pressure will fall to zero. A message will appear on the status screen letting you know.

```
ExcessRun Prot'n
Min Run Time
```

```
Min Run Time ON
Pump Stop X Secs
```

```
PUMP/S REACHED
MAX Starts PerHr
```

Low Limit Action

The Low limit action allows the user to select an appropriate action in the event of a sustained low level condition. There are four possible settings:
• **OFF** Completely turns OFF Low Pressure Protection. Be aware that if set to OFF there is no Low Pressure protection for the system.
• **Alarm** This setting turns OFF Low Pressure protection but will generate an alarm which can be used for telemetry . Be aware that if set to Alarm there would be no Low Pressure protection for the system
• **Shutdown** This setting turns ON Low Pressure protection and also generates a fault alarm which can be used for telemetry.

```
Low Limit Action
OFF
```

High Limit Action

The High limit action allows the user to select an appropriate action in the event of a sustained high pressure condition. There are four possible settings:

- **OFF** This setting completely turns OFF High Pressure Protection. Be aware that if set to OFF there would be no High Pressure protection for the system.
- **Alarm**   This setting turns OFF High Pressure protection but will generate an alarm which can be used for telemetry. Be aware that if set to Alarm there would be no High Pressure protection for the system
- **Shutdown** This setting turns ON High Pressure protection and also generates a fault alarm which can be used for telemetry.

```
HighLimit Action
OFF
```

User Access Code

The access code is used to limit access to the settings menus.
The user access code has the range "off, 0 – 250". Off will disable the access code and allow unlimited access. Once a number is selected then access to the settings screens or any other editable screen will require the inputting of this number to progress. To edit press enter and then up or down keys to edit the new number. Press enter again and exit the menu to store the changes.

```
Access Code
XXX
```

JOCKEY PUMP (JP)

Main Menu	Sub Menu	Units	Range OR Option
JOCKEY PUMP			
	Jockey Pump	selection	----Off----, ===On===
	JP Cut In Press		0 - 9999
	JP Cut Out Press		0 - 9999
	JP Run On Time	seconds	0 - 999
	JP In Delay Time	seconds	0 - 999

The Jockey pump is typically a smaller auxiliary pump that is outside the flow range of the main pumps. The jockey pump will turn on when there are no main pumps on and the pressure is below Jockey Cut In Pressure.

```
Jockey Pump
-----------Off-----------
```

To enable the jockey pump and allow viewing of the rest of the jockey pump's screens change to Jockey Pump ON.

```
Jockey Pump
=======On======
```

JP Cut In Pressure

The JP Cut In Pressure is the Pressure below which the pump defined as Jockey pump will restart.

```
JP Cut In Press
XXXX
```

JP Cut Out Level

The Set Point is the Pressure that the Jockey Pump will be turned off.

```
JP Cut Out Press
XXXX
```

JP Run On Time

The Jockey pump can be forced to run on after the main system has started by the time detailed in this screen.

```
JP Run On Time
XXX seconds
```

JP Restart Delay

When the Pressure drops below the JP Cut In Pressure and remains there the Jockey pump will start after this period. If the pressure continues to fall and the main pump is started the Jockey Pump turn off again after the JP run on time has expired.

JP Restart Delay
XXX seconds

OUTPUTS

Main Menu	Sub Menu	Units	Options
OUTPUTS			
	Digital Output 1	selection	Shutdown Fault,
	Digital Output 2	selection	Low Press Fault,
			High Press Fault,
			Pump 1 - 2 Run,
			Pump 1 - 2 Fault,
			System Paused,
			Low Alarm, High Alarm,
			Any Alarm,
			Any Pump Shutdwn,
			Any Pump Running,
			Trip Point
			Alternate Trip,
			Aux Output 1,
			Aux Output 2,
			No Flow Fault
	Analogue Output	selection	System Press

BARRACOUTA has two programmable outputs that can be used to communicate with external sources such as Telemetry or Building Management Systems (BMS). As each system requires different combinations of information all output relays are configurable in software. All outputs are Voltage Free – Change Over contact outputs and capable of 5 amps 240 VAC.

You can view which outputs are currently activated within the PUMP DATA LOG menu, under Digital Output State. The status of the analogue outputs is also available within this menu.

Digital Output Options

No.	Delay	Option
1	As per delay timer	Shutdown Fault,
2	As per delay timer	Lo Press Fault,
3	As per delay timer	Hi Press Fault,
4	Instantaneously	Pump 1 Run,
5	Instantaneously	Pump 2 Run,
6	As per delay timer	Pump 1 Fault,
7	As per delay timer	Pump 2 Fault,
8	Instantaneously	System Paused,
9	As per delay timer	Low Alarm,
10	As per delay timer	High Alarm,
11	As per delay timer	Any Alarm,
12	As per delay timer	Any Pump Shutdown,
13	Instantaneously	Any Pump Running,
14	As per delay timer	Trip Point
15	Instantaneously	Alternate Trip,
16	Instantaneously	Aux Output 1
17	Instantaneously	Aux Output 2
18	Instantaneously	No Flow Fault

- **Shutdown Fault**

This output is used to indicate that there has been an event that has shut down the system. This can be a High or Low-Pressure Shutdown, No Flow Shutdown.

- **Low Pressure Fault**

A shutdown based on a Low Pressure Shutdown.

- **High Pressure Fault**

A shutdown based on a High Pressure Shutdown.

- **Pump 1-2 Run**

Pump 1-2 running.

- **Pump 1-2 Shutdown**

Pump 1-2 shutdown on individual pump protection.

- **System Paused**

The "system pause" input is activated

- **Low Alarm**

If a Low Pressure circumstance has occurred then the output will turn on.

- **High Alarm**

If a High Pressure circumstance has occurred then the output will turn on.

- **Any Alarm**

If there are any Fault Re-starts active or general faults/alarms that do not cause a system shutdown, this output will activate.

- **Any Pump Shutdwn**

If any pump is shutdown this will then will activate the relay.

- **Any Pump Running**

Any pump running will activate the relay.

- **Trip Point**

When the system Pressure reaches the nominated Trip Point Low and High, this relay will energise or de-energise. See Pressure Trip in SETTINGS.

- **Alternate Trip**

Each time the system shuts down the energised state of the relay will change. E.g. If the relay on one cycle is closed during operation then the next cycle this relay will be open.
The relay will change on the following: - Low Pressure Shutdown, High Pressure Shutdown, No Flow Shutdown and Pause.

- **Aux Outputs 1 - 2**

Any output can be set to be an auxiliary output. Setting an output to become an auxiliary output allows the BARRACOUTA to use an input to turn on a Digital Output. To do this the input has to be set up to be an Auxiliary input. There are three auxiliary functions available.
Aux Input 1 operates Aux Output 1
Aux Input 2 operates Aux Output 2

- **Any Alarm**

If there are any Faults active that has caused a system or pump shutdown then this output will activate.

- **Alarm/Fault light and buzzer**

If an alarm strobe light and buzzer are fitted an output will be set as Any Fault. To reset the fault and turn off the alarm and buzzer the Enter key must be pressed.

- **RELAY RATINGS** The relays are rated at 5 amp 250VAC. Consideration of inrush current, inductive loads and cycling must be taken into account when applying current to these relays.

INPUTS

Main Menu	Sub Menu	Units	Options
INPUTS			
	Program Input 1	selection	Any of the following options
	Program Input 2	selection	can be selected on any
			input and used multiple
	Program Input 3	selection	times
	Program Input 4	selection	
	Program Input 5	selection	Not Used
	Program Input 6	selection	^ Alt 2 Settings
	Program Input 7	selection	^ Alt 3 Settings
	Program Input 8	selection	^^ Cut In,
			^^ Cut Out,
			# Cut In 1,
			# Cut In 2,
			# Cut Out 1,
			# Cut Out 2,
			Low Limit,
			High Limit,
			System Pause,
			< P1-2 Prot(Pause)
			< Pump 1 - 2 Stop,
			< Pump 1 - 2 Manual Run,
			Fire Mode,
			Cycle Pumps,
			Reset,
			No Flow,
			Aux 1, Aux 2,
			< Pump1-2 Fault(Stop)
			LoLevel Pause

There are 8 inputs with the BARRACOUTA that control the external sensing functions. They all require **VOLTAGE FREE** contacts and as such should **NOT HAVE ANY VOLTAGE APPLIED**. Inputs 7 and 8 are not programmable.

All inputs operate on a **CLOSED CONTACT** for registration. This contact needs to be made between the input common and the relevant input. There are eight terminals for the input Common to allow for multiple connections.

You can view which inputs are activated within the PUMP DATA LOG menu under the "Digital Input State" screens. See PUMP DATA LOG for more information.

PROGRAMMABLE INPUT OPTIONS

Not Used
When this is selected the input will not respond to any activation.

Any input can be selected for any of the above options and multiple inputs can have the same option.

Alt Setting 2 & 3

If an input is programmed as a means of selecting the Alternate Setting, then closing of the contact to either of these inputs will activate an alternate cut in and cut out. If two inputs are activated at the same time, then Alternate Setting 3 will be the selected option.

```
Program Input X
Alt 2 Setting
```

Low Limit

An input can be programmed to function as a switched low limit. Closing of the contact on this input will start the action programmed for the low limit action as set in the Configuration menu.

```
Program Input X
Low Limit
```

High Limit

An input can be programmed to function as a switched high limit. Closing of the contact on this input will start the action programmed for the high limit action as set in the Configuration menu.

```
Program Input X
High Limit
```

System Pause

An external switch/float/sensor can be used to PAUSE the system. When the system receives a PAUSE command on the input the system operation will be paused. The system turns off all running pumps and a message will be shown on the main screen.

```
Program Input X
System Pause
```

The Pause message will displayed when the input is active and if operating in analogue mode the current level will be displayed on the bottom line.

```
PAUSE ACTIVATED
```

After the PAUSE input has been deactivated the system will restart under normal operations. If the Auto-rotation is selected to FULL the lead pump will rotate.

Pump 1-2 Prot(Pause)

BARRACOUTA has inputs for each pump to allow for individual pump protection. In the event of a pump going into a fault condition the input for that pump should close. This will pause the pump after the time set by the Input Delay Timer. Inputs 7 and 8 are permanently configured for Pump 1 / Pump 2 Prot(Pause)

```
Program Input X
PumpX Protection
```

Note: The pump will become available again when the Input contact is opened. This protection is ideal for the following pump protection sensors:

- Temperature probes
- Thermal Overloads
- Moisture sensor for oil bath pump seals
- Any individual pump protection device.

Pump 1-2 Stop

Activation of this input will instantly stop the operation of the relevant
pump. This can be used as an Off Override switch in the system or if
the remote control of a pump is required.
Note: This input will override the relevant "Pump 1-6 Manual Run" input
if both are active.

| Program Input X |
| Pump X Stop |

Pump 1-2 Manual Run

.
Activation of this input will instantly start the relevant pump. All
automatic control of the pump is ceased at this stage.
This action can cause an alarm or shutdown condition. (See Manual
operation)

| Program Input X |
| PumpX Manual Run |

Fire Mode

The FIRE MODE allows the system to ignore all shutdown protection
features so the pump will continue running under all conditions.
The system will still operate as per normal turning on pumps when
below the Cut In setting and Turning off pumps when above the Cut Out
setting. The following protection features are disabled:

| Program Input X |
| Fire Mode |

- High Pressure Shutdown
- Low Pressure Shutdown
- System Pause
- No Flow
- Pump 1-2 Pump Protection
- Pump 1-2 Stop
- Pump 1-2 Pump Fault

***The operational consequences for activating Fire Mode are substantial
so be sure to understand the repercussions of activating this Input.***

It should only be used if the risk of the pump stopping is greater that letting it
run to destruction.

Hardware items such as circuit breakers, Thermal Overloads and any other
switchgear protection are not effected by this mode and will continue to
provide switchgear protection.

Cycle pumps

Activation of this input will shutdown and then cycle the pumps to the
next available pump as the lead pump. If pump 1 started first on the
last start-up, the toggling of this input will switch the lead pump to
pump 2 instantly on receipt of this signal.

| Program Input X |
| Cycle Pumps |

Reset

The reset input allows remote resetting of BARRACOUTA after a
shutdown fault. If BARRACOUTA has shutdown due to a fault - for any
reason - closing the reset contact will reset all current faults and restart
the system.

| Program Input X |
| Reset |

No Flow

An input can be set up to monitor a flow switch. If the system detects that there is a No Flow signal from an external flow switch and there are pumps running, then the BARRACOUTA will display the message "Low Flow Detected". If this input remains on for the period of the No flow delay timer, then the BARRACOUTA will shut down all pumps. This is optional and requires a flow switch to be connected into the input programmed for No Flow and will only operate if there is at least 1 pump selected to AUTO.
Once the No Flow Delay Timer has expired then the screen message changes to "No Flow Shutdown"

```
Program Input X
No Flow
```

```
Low Flow Detected
XXXXX
```

```
No Flow Shutdown
XXXXX
```

Aux Inputs 1- 3

Any input can be set to be an auxiliary input. Setting an input to become an auxiliary input allows the BARRACOUTA to use this input to turn on a Digital Output. To do this the output has to be set up to be an Auxiliary output. There are three auxiliary functions available.
Aux Input 1 operates Aux Output 1
Aux Input 2 operates Aux Output 2
Aux Input 3 operates Aux Output 3

```
Program Input X
Aux Input X
```
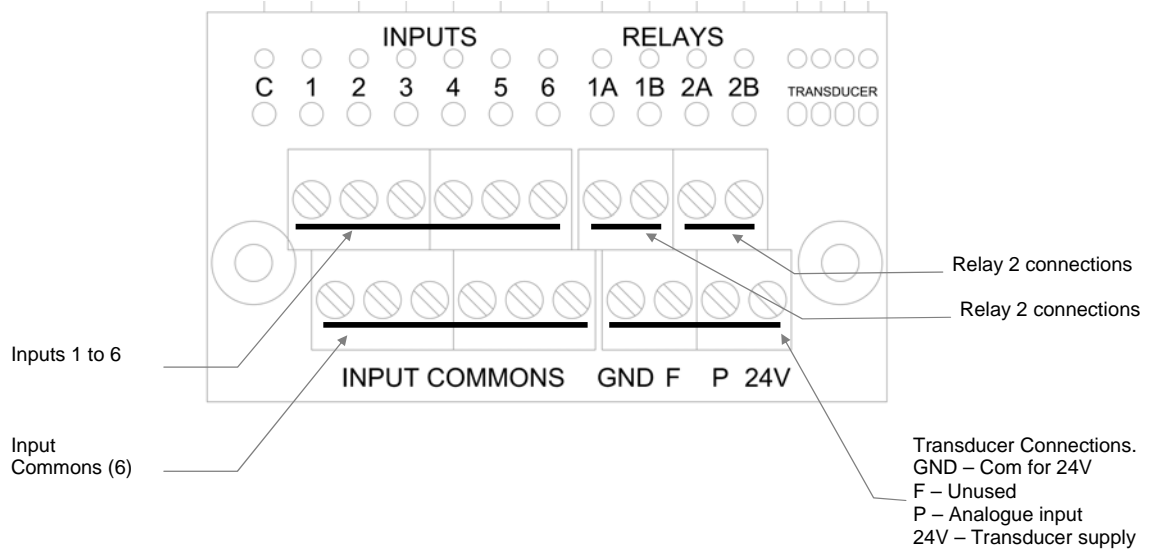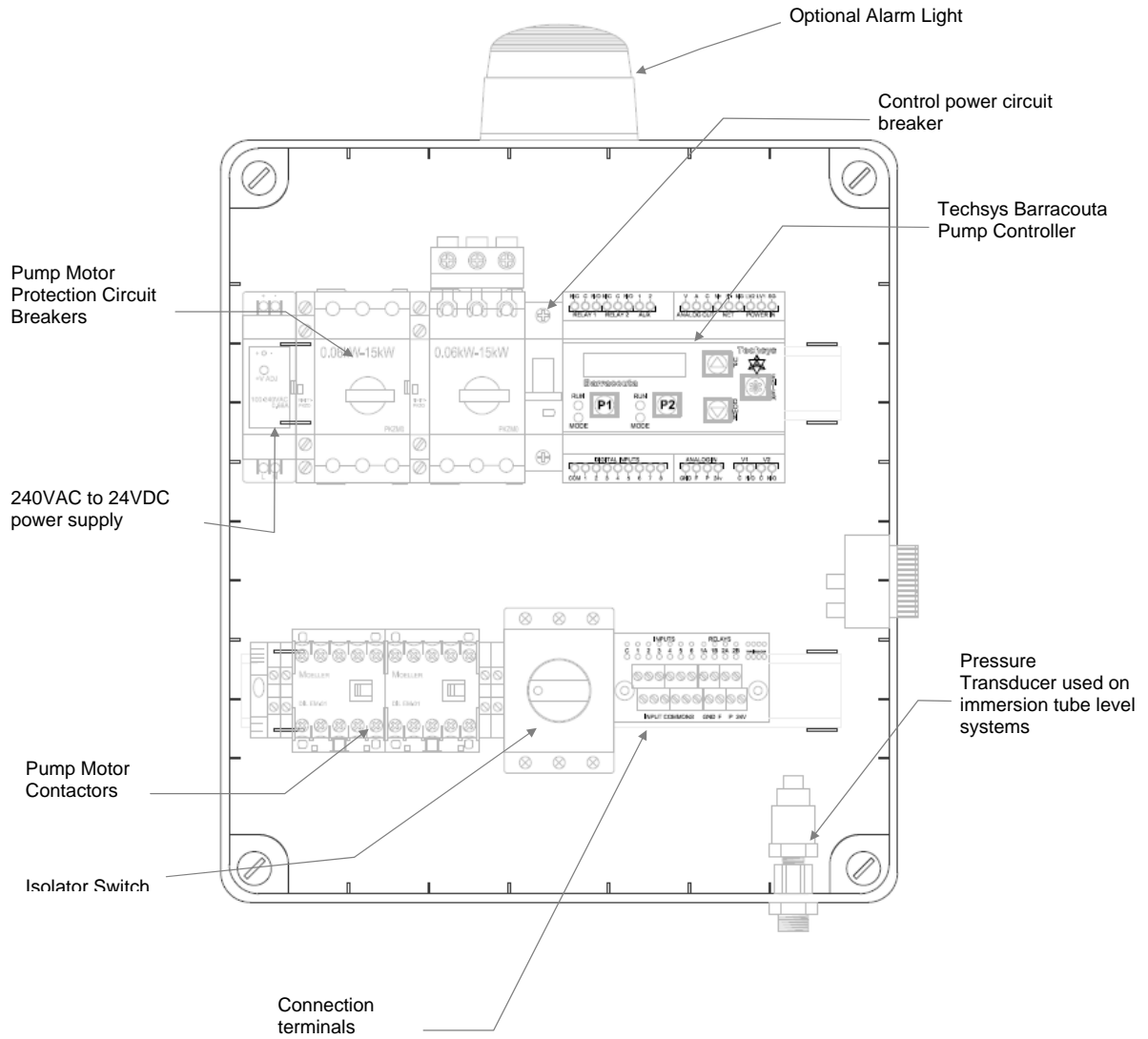
Pump 1-2 Fault(Stop)

BARRACOUTA has inputs for each pump to allow for individual pump fault detection. In the event of an individual pump input activating such as losing prime or flow for some reason. This will shut down the pump after the time set by the Pump Fault Delay Timer. The pump will be permanently disabled until reset by the operator or remotely via the reset input.
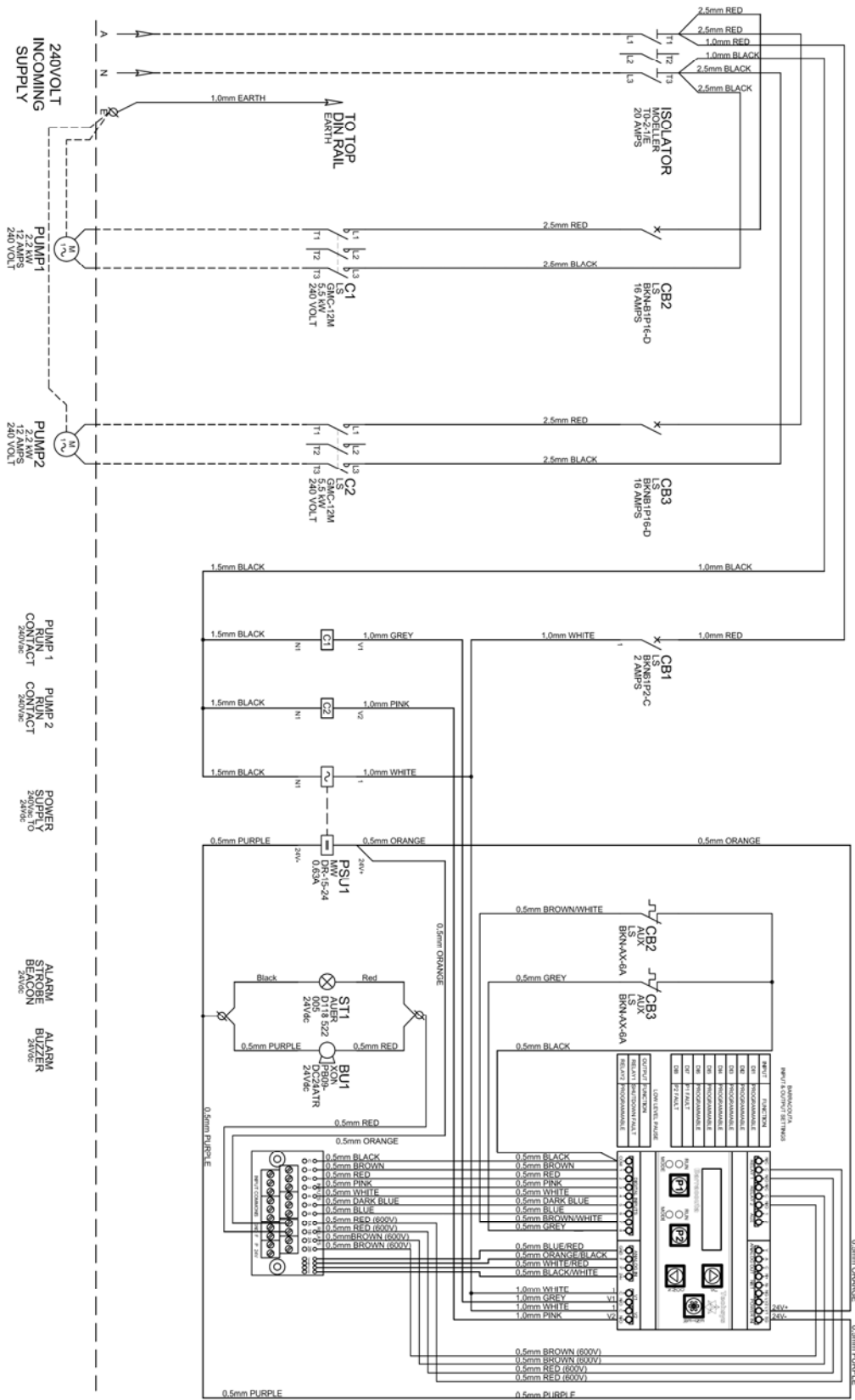This protection is ideal for the following pump protection sensors.
• Temperature probes
• Individual Loss of prime Level switches
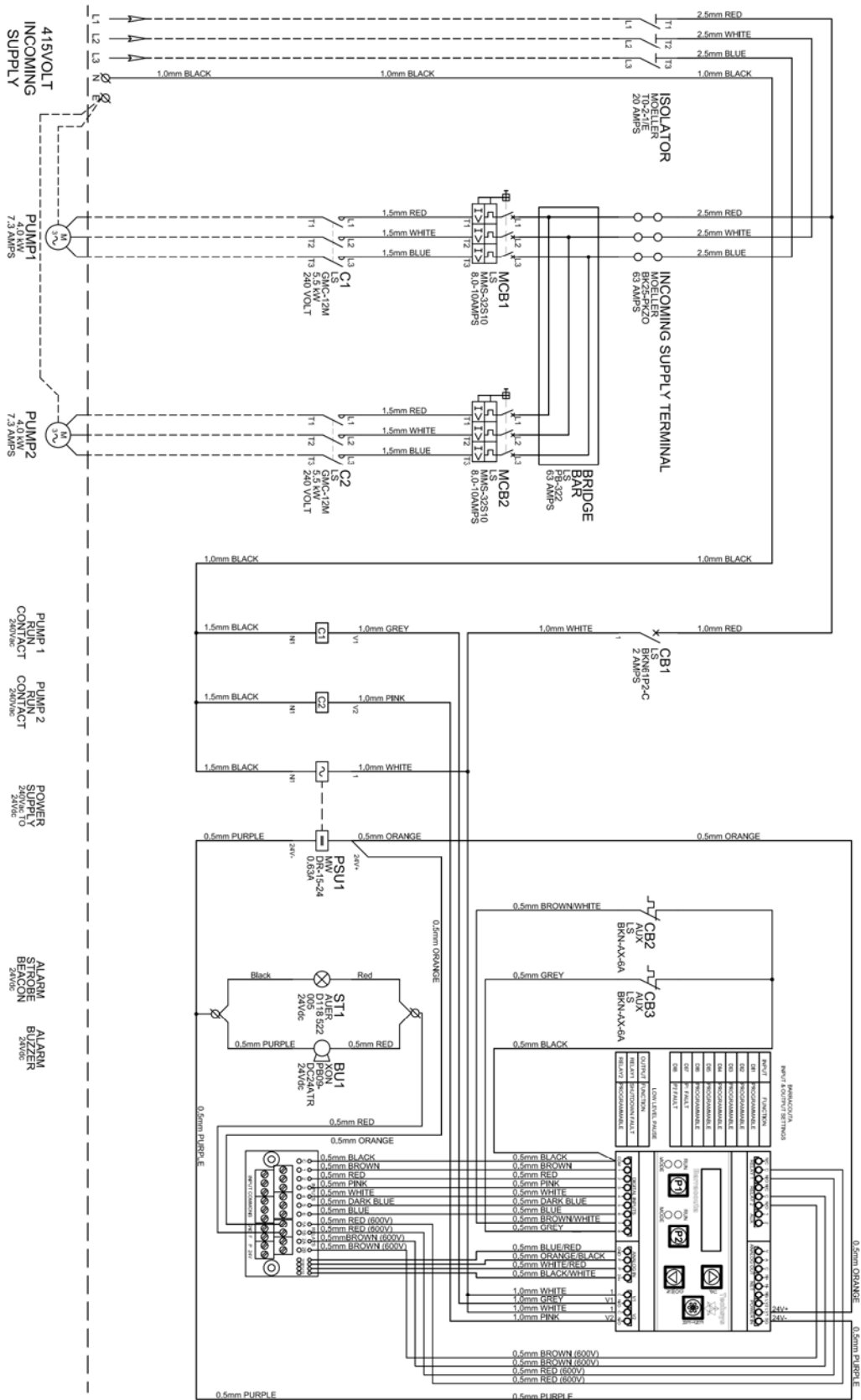• Any individual pump protection device.

```
Program Input X
PumpX Fault
```

Panel Layout

Optional Alarm Light

Control power circuit breaker

Techsys Barracouta Pump Controller

Pump Motor Protection Circuit Breakers

240VAC to 24VDC power supply

Pressure Transducer used on immersion tube level systems

Pump Motor Contactors

Isolator Switch

Connection terminals

INPUTS							RELAYS				
C	1	2	3	4	5	6	1A	1B	2A	2B	TRANSDUCER

INPUT COMMONS   GND F   P   24V

Relay 2 connections

Relay 2 connections

Inputs 1 to 6

Input Commons (6)

Transducer Connections.
GND – Com for 24V
F – Unused
P – Analogue input
24V – Transducer supply

WIRING DIAGRAMS

415VOLT INCOMING SUPPLY

L1 L2 L3
N
E

2.5mm RED
2.5mm WHITE
2.5mm BLUE
1.0mm BLACK

ISOLATOR
MOELLER
T0-2-1/E
20 AMPS

INCOMING SUPPLY TERMINAL

INCOMING
MOELLER
BK25-PKZ0
63 AMPS

2.5mm RED
2.5mm WHITE
2.5mm BLUE

PUMP1
4.0 kW
7.3 AMPS

1.5mm RED
1.5mm WHITE
1.5mm BLUE

C1
GMC-12M
5.5 kW
240 VOLT

MCB1
MMS-32S10
8.0-10AMPS

PUMP2
4.0 kW
7.3 AMPS

1.5mm RED
1.5mm WHITE
1.5mm BLUE

C2
GMC-12M
5.5 kW
240 VOLT

MCB2
MMS-32S10
8.0-10AMPS

BRIDGE BAR
LS
PB-322
63 AMPS

1.0mm BLACK
1.0mm BLACK

PUMP 1 RUN CONTACT 240Vac
1.5mm BLACK   C1   1.0mm GREY
PUMP 2 RUN CONTACT 240Vac
1.5mm BLACK   C2   1.0mm PINK
POWER SUPPLY 240Vac TO 24Vdc
1.5mm BLACK   1.0mm WHITE

1.0mm WHITE   CB1   1.0mm RED
LS
BKN61P2-C
2 AMPS

0.5mm PURPLE   0.5mm ORANGE   0.5mm ORANGE

PSU1
DW
DR-15-24
0.63A

ALARM STROBE BEACON 24Vdc
ST1
AUGER
D118 522
005
24Vdc
Black   Red
0.5mm PURPLE   0.5mm RED

ALARM BUZZER 24Vdc
BU1
XON
PB09-
DC24ATR
24Vdc

0.5mm BROWN/WHITE
CB2 AUX
LS
BKN-XX-6A
0.5mm GREY
CB3 AUX
LS
BKN-XX-6A
0.5mm BLACK

0.5mm ORANGE
0.5mm RED

0.5mm BLACK
0.5mm BROWN
0.5mm RED
0.5mm PINK
0.5mm WHITE
0.5mm DARK BLUE
0.5mm BLUE
0.5mm RED (600V)
0.5mm RED (600V)
0.5mmBROWN (600V)
0.5mm BROWN (600V)

0.5mm BLACK
0.5mm BROWN
0.5mm RED
0.5mm PINK
0.5mm WHITE
0.5mm DARK BLUE
0.5mm BLUE
0.5mm BROWN/WHITE
0.5mm GREY

0.5mm BLUE/RED
0.5mm ORANGE/BLACK
0.5mm WHITE/RED
0.5mm BLACK/WHITE

1.0mm WHITE
1.0mm GREY
1.0mm WHITE
1.0mm PINK

0.5mm BROWN (600V)
0.5mm BROWN (600V)
0.5mm RED (600V)
0.5mm RED (600V)

0.5mm PURPLE   0.5mm PURPLE

0.5mm ORANGE
0.5mm PURPLE
24V+
24V-

SPECIFICATIONS

Item	Description
Power supply	Control - 24 VDC- 20mA min 120mA max
External transducer power supply	24 VDC- 50mA max. Auto reset fuse protected
EMC/ EMI filtering	Designed to minimise conducted and radiated emissions.
Standard Transducer	N/A
Time based functions	±5% of real time
Output Relays	5 amp 250VAC changeover software configurable
Switched inputs	Voltage free - internal supply 24VDC - read threshold - 2mA
Operating temperature	0 to 50 degC
Enclosure	IP55
Contactors	Rated voltage - 690Vac Coil – 240VAC cycles mech. - 10×10^6 $\qquad$ elec. - 2×10^6 cycles/hr - 3600 auxiliary contacts - 1 x NO Standard - IEC947
Motor circuit breakers	Standard - IEC947 – Start current 10x FLC
Wiring	Standard - AS3000
Input supply Voltage - 3 phase	230 - 440V
Input supply tolerance - 3 phase	-20% + 10%
Input frequency range	48 to 62 Hz
Enclosure size	320W x 360H x 140D (mm)
Dimensions including light, buzzer & isolator.	360W x 410H x 140D (mm)

REMOVING FRONT COVER

Removing the front cover is necessary if the test mode is to be accessed.

Place a small screw driver in the slot on the left hand side of the front cover and lever up the cover.

The display, switches and LED indicators will then be exposed. The switch to the left hand side of the display is the test mode switch. To enter the test mode this switch must be pressed when powering up the system.
When the system shows "Test Mode", release the button.

Activating one of the inputs will display an "X" for the applicable input.

Pressing and holding "P1" will activate Pump 1 output and then

Relay 1 in a continuous sequence. .

Pressing and holding "P2" will activate Pump 2 output and then Relay 2 in a continuous sequence. .

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Can't enable pumps	• Screen Stated – "KEY PAD LOCKED" • One of the Inputs is set to Pump STOP.	• Input Access Code- typically 21 • Check Input LED's for activation. • Check Input Menu for Pump Stop setting.
Pump/s won't start	• Pump not enabled.(Turned OFF) • Motor circuit breaker tripped or off • Control circuit breaker tripped or off • Pressure above Cut In Pressure • System Pause Active	• Press pump mode switch for at least 1 second. • Reset circuit breaker. • Reset Circuit breaker • Increase cut-in pressure or remove pressure. • Allow the system Pressure to drop
Pump won't turn off	• Manual selected for that pump (Running LED flashing) • Pump Manual Run input active • Cut Out set too high	• Press pump mode switch once to turn OFF. • De-activate Manual Run input • Adjust Cut Out Pressure
No display screen	• Control circuit breaker tripped • High voltage or current has tripped the surge protection fuse	• Reset Circuit breaker • Turn off power, wait 20 seconds and re-apply power.
No Pressure or wrong Pressure displayed	• Incorrect Sensing Input selected • Calibration incorrect for sensor	• Change Sensing Input to suit sensor that is being used • Calibrate sensor (Refer to calibration section)
Pumps cycling excessively	• IN delay too low • Pause Input activating • Voltage being applied to the Inputs. • Cut In & Cut Out are incorrect. • No pressure tank fitted • Incorrect pressure tank charge pressure	• Extend IN Delay timer • Check Pause input • Make sure that the Inputs are Voltage Free • Adjust Cut In lower and/or Cut Out higher • Fit tank suitable for application • Charge tank with correct pressure for application
Pump shutting down on Pump Protection	• Pump Protection or Fault input is active. • Fault in protection sensor	• Determine cause of fault, reset fault. • Replace or adjust sensor
Controller powers on and off continuously	• Voltage being applied to the Inputs. • Excessive current being drawn from the external Level sensor	• Make sure that the Inputs are Voltage Free • Check external sensor current 100mA max.
System Displays "won't initialise" Loading Data message cycles continuously	• System needs to be initialised.	• Press the "Up and Down" Keys whilst powering up the system to initialise the program.
System Pressure not displaying	• Transducer not connected properly. • Transducer type is incorrect. • Analogue circuits not functional	• Check transducer connections. Refer to Analogue Input section. • Change from Switch Input to Analogue. • Ensure that a 4-2-mA transducer is connected correctly to the P analogue input
Pumps do not seem to operate	• Outputs or Inputs possibly defective.	• Use the "Test mode" function to visually test the Inputs and Outputs without the use of a meter.

INSTALLATION NOTES

General Installation information can be obtained from Techsys Corporation regarding the site-specific requirements however there are some "GOLDEN RULES" in site installation that should be followed.

Site Installation

- Standard BARRACOUTA requires a NEUTRAL
- Select the site most shaded and out of direct sunlight.
- NEVER allow direct exposure to the sun on to the display, it will cause permanent damage.
- Ensure there is sufficient air flow around the control panel to keep it cool.
- The earth connection needs to be close and not laid parallel with High Voltage cables

Inputs

- Use shielded wire for all analogue inputs
- Connect the shield to EARTH at the controller end.
- Never apply voltage to the Inputs.
- Never run wires for the inputs with motor or supply cables.
- Take care in running inputs for long distances. (15Mtr max)
- The inputs use a 24VDC signal as the carrier voltage- use compliant sensors.

Outputs

- 5 amp maximum switching load
- Check the programming on each output before trying to troubleshoot

Start-up

- CHECK ROTATION
- Calibrate transducer
- Input Level settings

Site Record

Main Menu	Sub Menu		Date	
		/ /	/ /	/ /
Set Point & Actual Level				
Flow Rate /Min				
FAULT HISTORY	Fault 1			
	Fault 2			
	Fault 3			
	Fault 4			
	Fault 5			

Main Menu	Sub Menu			
PUMP DATA LOG	Flow Total			
	Hours Run 1			
	Hours Run 2			
	Pump Starts 1			
	Pump Starts 2			
	Pump Starts Last Hr			
	Curr & max retry			
	Temperature			
Access Code	21			

Main Menu	Sub Menu			
SETTINGS	LoPressure			
	Cut In Pressure			
	Cut Out Pressure			
	HiPressure			
	Alt Cut In 2			
	Alt Cut Out 2			
	Alt Cut In 3			
	Alt Cut Out 3			
	Trip Point Low			
	Trip Point High			

Main Menu	Sub Menu			
TIMING	LoPressure Delay			
	HiPressure Delay			
	IN Delay Timer			
	OUT Delay Timer			
	Restart Delay			
	No Flow Timer			
	Input Delay Timer			
	Lo Press Trip Delay			
	Hi Press Trip Delay			
	Min Pump Runtime			
	Max Pump Start			
	Start Time 1			
	Stop Time 1			
	Start Time 2			
	Stop Time 2			
	Start Time 3			
	Stop Time 3			
	Start Time 4			
	Stop Time 4			

Main Menu	Sub Menu			
CONFIGURE	Operating Mode			
	Transducer Zero			
	Adjust Level			
	Averaging			
	Scale An Output			
	Pump Flow Rate			
	Auto Rotation			
	Hi Press Restart			
	Sensing Input			
	Cycle Protection			

Main Menu	Sub Menu		Date	
	Low Limit Action			
	High Limit Action			
	User Access Code			
	Modbus BaudRate			
	Modbus Address			

JOCKEY PUMP	Jockey Pump			
	JP Cut In Press			
	JP Cut Out Press			
	JP Run On Time			
	JP In Delay Time			

OUTPUTS	Digital Output 1			
	Digital Output 2			

INPUTS	Program Input 1			
	Program Input 2			
	Program Input 3			
	Program Input 4			
	Program Input 5			
	Program Input 6			
	Program Input 7			
	Program Input 8			

Commissioned by…………………………………………..Date……………………

Agent……………………………………………

Contact details…………………………………

Panel Serial Number ………………………………………….

INDEX

NOTES

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