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A-HC – ESD Valve Controller

USER SETUP & OPERATION MANUAL

Doc No. TECH-00xxx

Exclusively Supported in USA by:
VRG Controls, LLC
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Features

- Large backlit liquid crystal display
- 4-20mA Valve Feedback input
- 4-20mA Accumulator Pressure input
- 4-20mA calibrated output for Pressure
- MANUAL pump control mode
- Fault output – Relay contact
- Hydraulic pump drive
- Digital inputs for sensor switch monitoring
- Fault logging

Operating Description

The A-HC- provides manual control of the actuated valve position and pressure control in the accumulators by operation of the Red Horse pump units and system solenoid valves. It reads the positional feedback from the valve mounted Red Rover valve switchbox. The instrument outputs a 4-20mA signal (retransmitted output), proportional to the calibrated accumulator pressure.

On first power up the controller starts the accumulator charging cycle, starting the pump when the pressure is below the Pump Start Pressure (set at 170Bar), and runs the pump until the Pump Stop Pressure (set at 190Bar) is reached.
Once the accumulator is charged there is a one minute time delay before allowing the skid mounted manual open/close pushbuttons buttons to be operate the pump and open the valve.

After the operator has opened the valve fully the system will be idle but continue monitoring the accumulator pressure and will run the pump if this falls to the Pump Start Pressure level.

After each time the accumulator is charged, there is a one minute time delay before the actuator can be operated from the local pushbuttons.

If the remote ESD is operated then the controller prevents the accumulator charging until the valve is closed (below 2%) for one minute.

Diagnostics

The A-HC- monitors the signals and system operation and provides the user with on screen and relay output indication.

The fault is displayed on the top line of the screen and can be viewed in the Event Log.

Fault/Monitor	**Description**
Valve Feedback Position Signal	Loss or Overrange of 4-20mA signal
Pressure Transmitter Signal	Loss or Overrange of 4-20mA signal
Fail to Position	The system fails to position the actuated valve due to a hydraulic or solenoid/pump control problem.
Pump Low Pressure	Accumulator system - the system pressure has dropped to a low pressure if the accumulator has failed to be re-charged. Ring Main system – the hydraulic oil supply is low
Pump Overrun	When the system uses a pump for the hydraulic oil then a timer can be set to prevent the pump running excessively. The cause could be a leak, lack of oil or a pump motor problem.

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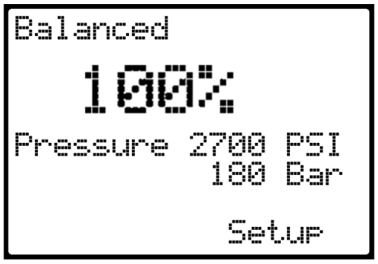
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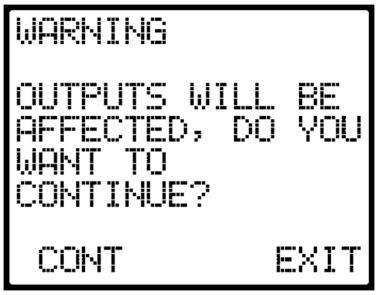
Home Screen

On power up the below screen is shown, this is the standard home screen. The large number is the actual valve position.

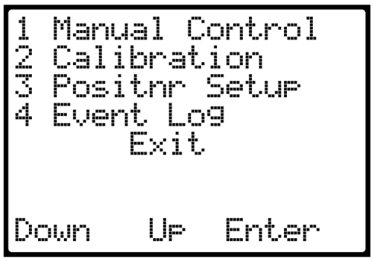
The top line shows the status of the actuator – Balanced, Acc Charge Cycle or if there is an alarm condition then this is shown on the top line.



On pressing the Setup buttons the following warning screen is displayed -

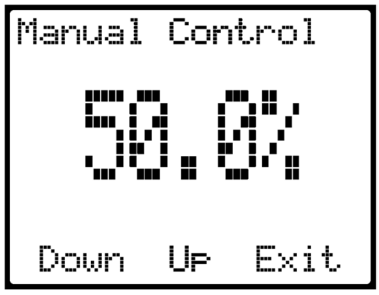


On pressing “Cont” to continue then the main set up menu screen is displayed –



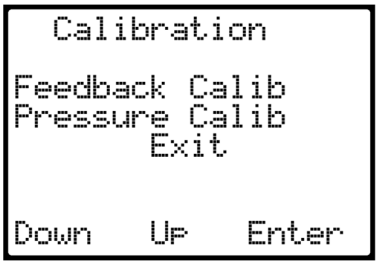
1. Manual Control

This screen shows the actuated valve position with the ability to move the actuator “Down” and “Up” on the pushbuttons, Press Exit to return to Setup screen.



2. Calibration

This screen displays the calibration menu. Select the appropriate option to access the desired function.



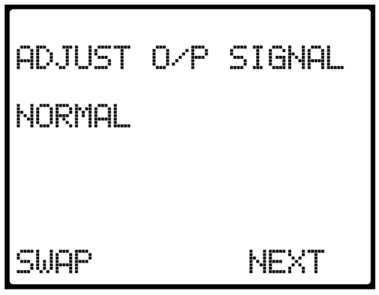
2.1 Feedback Calibration

This screen shows the actuated valve position in relation to the “digital” internal number with the ability to move the actuator “Down” and “Up” on the pushbuttons. The values from the previous calibration are shown on this display also.

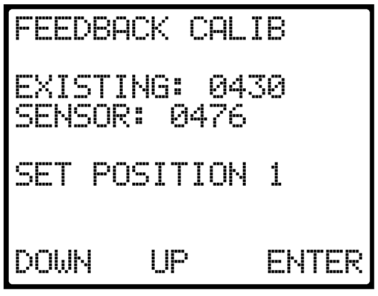
The first screen enables the feedback signal to be reversed

Normal 4mA = 0%, 20mA = 100%
Reversed 4mA = 100%, 20mA = 0%

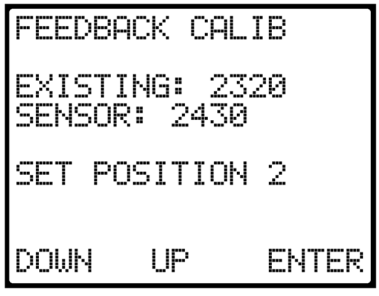
The retransmitted signal follows the display value



SENSOR: 398
SET ZERO – press Enter once the actuator valve is at the fully closed position

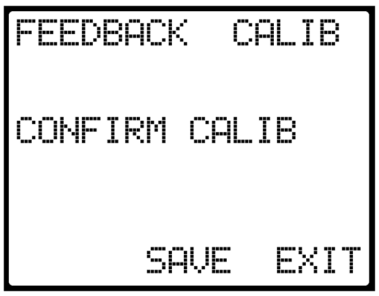


SENSOR: 1798
SET MAXIMUM – press Enter once the actuator valve is at the fully open position



CONFIRM CALIB

This calibration can then be Saved or Exit without saving



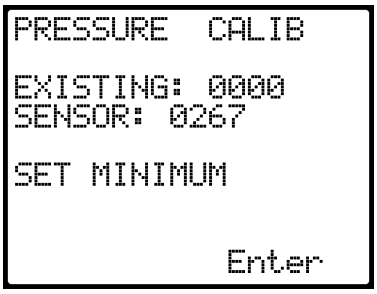
2.2 Accumulator Pressure Calibration

The values from the previous calibration are shown on this display, if none are shown then it uses the factory default settings.

Use either the Pressure Transmitter signal or a current simulator then

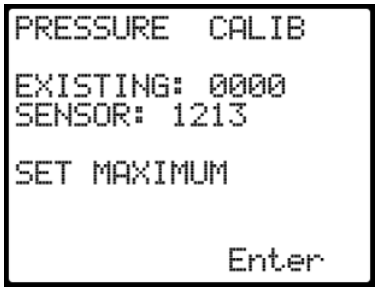
SENSOR: 412

SET ZERO – press Enter once Command is set at 4mA (or minimum)



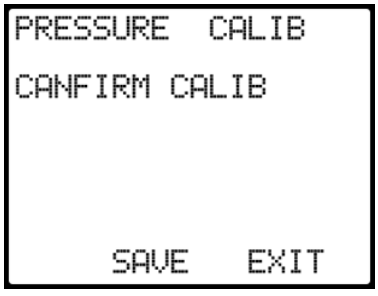
SENSOR: 1840

SET MAXIMUM – press Enter once Command is set at 20mA (or maximum)

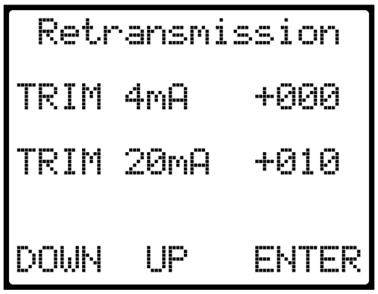


CONFIRM CALIB

This calibration can then be Saved or Exit without saving



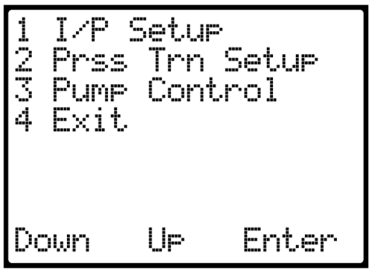
The retransmission can then be set and is calibrated to the pressure signal. This screen provides the signal to be trimmed to allow for equipment tolerances.



TRIM 4mA +0010 Press up/down to adjust the signal then “Enter” to move on to 20mA
TRIM 20mA -0100 Press up/down to adjust the signal then “Enter” to return to setup screen

3 Positioner Setup

This screen displays the positioner setup menu. Select the appropriate option to access the desired function.

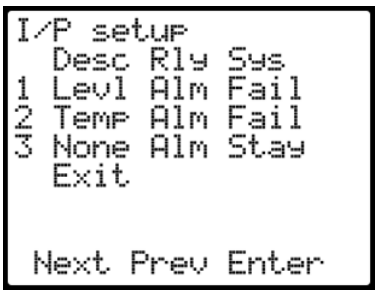


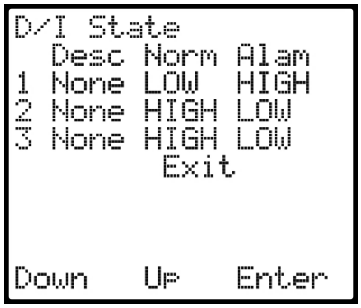
3.1 Dig I/P Settings

Dig I/P Setup
This menu allows the three digital inputs to be assigned and set up. In addition, it has the alarm handling for the analogue signals and system functions.

Rly – Relay output – ALM pulses the relay until the fault is recovered (automatically reset), TRP de-energises the relay until it is reset on the alarm screen (latched off). The relay is failsafe – energised when healthy.

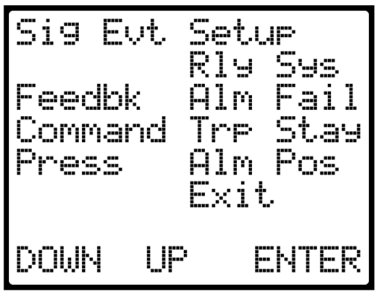
Sensor is a choice of
Pressure/Level/Temperature/ESD/Motor Fault
Scroll though each setting using Prev/Next – change each setting using Enter, then exit to move to the next screen





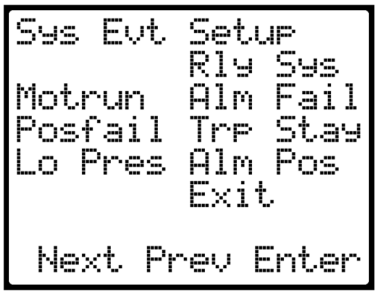
Sig Evt Setup – Signal Event Setup

	Rly	Sys
Feedback	Alm/Trp	Pos/Fail/Stay
Command	Alm/Trp	Pos/Fail/Stay
Pressure	Alm/Trp	Pos/Fail/Stay
Exit		



Sys Evt Setup – System Event Setup

Motrun	Motor Overrun Fault
Posfail	Fail to position Fault
Lo Press	Low pressure Fault

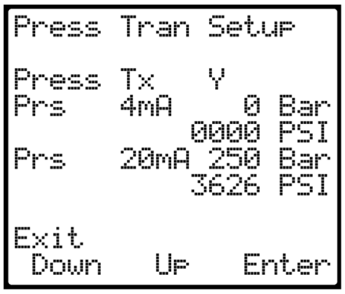


3.2 Press Trn Setup

(Pressure Transmitter Setup)

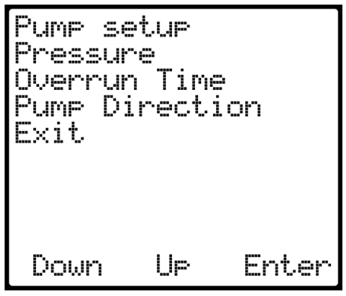
This menu allows the selection and range of the pressure transmitter.

Press Tx N – this disables all pressure transmitter alarms
Prs 4mA Match the 4mA to the transmitter minimum setting
Prs 20mA Match the 20mA to the transmitter maximum setting
Exit



3.3 Pump Control

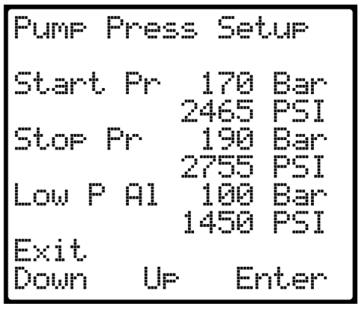
This menu allows the pump control to be set.



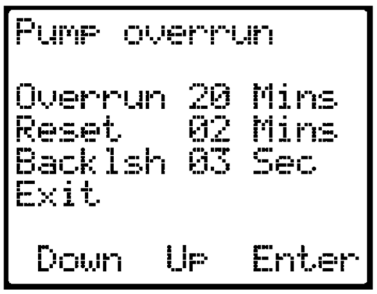
Enter “Pressure”

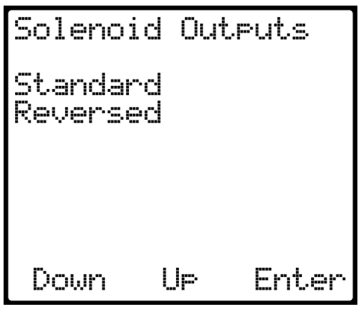
Pump on pressure can be used on Electro-Hydraulic actuators and refers to operating a pump to maintain pressure in an accumulator. To use pump on pressure features, the Press Trn should be enabled in the Pressure Setup Menu.

Pump Start Pressure - adjustable from 0-Max Range
Pump Stop Pressure - adjustable from 0-Max Range
Low Pressure Alarm - adjustable from 0-Max Range



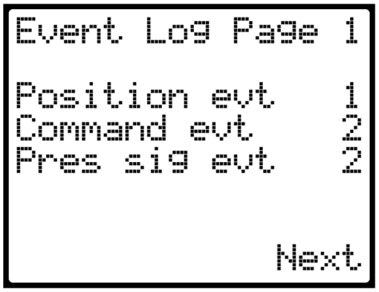
Enter “Pump Overrun”
This sets the Pump maximum continuous running time before the pump is shutdown and then will not restart until the reset time has completed. This is to prevent overheating of the motor.
Overrun - adjustable 0-99 Mins
Reset - adjustable 0-99 Mins
Backlsh – backlash compensation pulse for pump at Max speed for 0-99 Sec
Exit





4 Event Log

These screens shows the events that have occurred and the number of occurrences. The last screen allows the events to be reset/cleared.



Troubleshooting

Display Error	**Position sig event**
Details	The controller detects when the actuator feedback signal is lost or falls outside the acceptable range
Effect	The controller triggers Alarm Relay 1 to either activate an alarm or initiate a trip. The actuator can be selected stay or go to the fail position.
Trouble shooting	Check the loop current and ensure it is within the specified operating range.
Display Error	**Pressr sig event**
Details	The controller detects when the accumulator pressure signal is lost or falls outside the acceptable range
Effect	The controller triggers Relay 1 to either activate an alarm or initiate a trip. The actuator can be selected to continue positioning, stayput or go to the fail (closed) position.
Trouble shooting	Check the loop current and ensure it is within the specified operating range.
Display Error	**Pump lp event**
Details	A 'Pump Low Pressure Event' is triggered by the controller when the accumulator pressure drops below the low-pressure alarm setpoint configured in the settings menu.
Effect	The controller triggers Relay 1 to either activate an alarm or initiate a trip. The actuator will continue trying to position.
Trouble shooting	1 Use the hand pump to pressure the accumulator manually. 2 Restart the controller by toggling the power off and on. After powering on, the controller will activate the motor to drive the pump and build pressure in the accumulator. This may restore normal system operation. Check the pre-charge pressure on the accumulator is correct. If pressure is not building, check for possible oil leaks and ensure the oil level in the tank is adequate.

Terminal Layout

The terminals are on the main board, access to the terminal screw heads is eased by removing the top two boards carefully. Note terminals can only accept 1.0mm sq wiring.

