Conair
PAVC
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Instruction Manual

⚠ **WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

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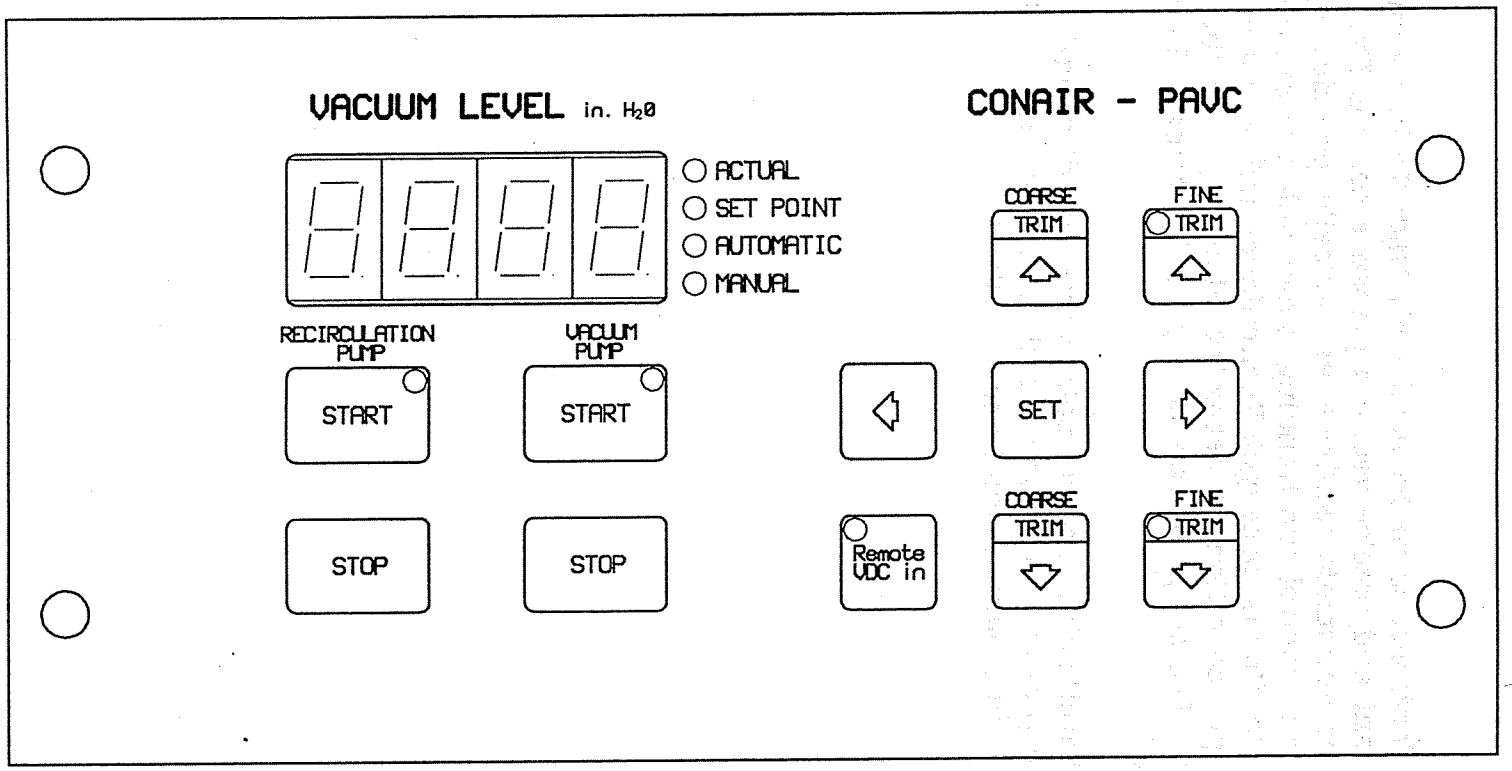
VACUUM LEVEL in. H2O
CONAIR - PAVC
ACTUAL
SET POINT
AUTOMATIC
MANUAL
COARSE TRIM
FINE TRIM
RECIRCULATION PUMP
VACUUM PUMP
START
START
SET
STOP
STOP
Remote VDC in
COARSE TRIM
FINE TRIM

Conair PAVC Vacuum Controller

Introduction

The Vacuum Controller is to be used with High Tech. Vacuum Tanks to maintain constant and precise vacuum pressure control. External facilities are provided for automatic feedback as typically provided by X/Y Laser scanners. External control and trending is available via an RS232 port. The controller provides (in one package); Recirculation and Vacuum pump on/off control with input conditioning, set-point adjustment via the facia and/or external remote. The set-point can be adjusted externally by digital scroll, analog or RS232.

The "Vacuum Level" actual and set-point values are displayed on a four digit display. A wide pressure range is possible due to control of the vent valve position and vacuum pump revolutions per minute.

Power Up Reset

When power is first applied to the Vacuum Controller all outputs are switched off. An initial test is made to ensure that presets have not been corrupted. This test is made using a check-sum (sum of all presets added together). Copies of presets are retained so that the system can discover and correct any error using one of the good back-ups. The display will initially show the Eprom version number. If an error was encountered "Err." will then be displayed. The operator may check to see if it was fixed correctly before continuing. The facia will eventually display the actual value with the "ACTUAL" and "MANUAL" LED's lit. The "REMOTE VDC in" function will be at the state previous to power down.

Facia Panel

The facia is a flat membrane type consisting of a four digit display, LED indicators and operator key pad switches. Primarily the display is used to show actual Vacuum pressure. Set point will be displayed when making adjustments in Automatic mode. Displays are large, 0.56" high, Red Light Emitting Diodes (LED's) for clear and distant visibility.

Key Pads

Each press of a key pad will cause a momentary beep to be heard from the built in buzzer. Some key pads have no functions in certain modes, yet a beep will still indicate a response. A click will be felt as the key pad flexes.

Functions

The keys available consist of Start / Stops for pump control, Remote on/off and edit keys.

START will switch on the associated Pump provided its input conditioning signal is closed. The indicator in the START switch will light to show that START has been accepted. If the input condition is open then the START function will be refused. External logic is arranged so that the Recirculation pump has to be on before the Vacuum pump can be energised. The Vacuum pump Start switch is also used to toggle between Automatic and Manual modes after the Vacuum pump has been started.

STOP — will switch off the associated Pump. STOP is selected automatically after a power up condition or when its input conditioning signal is opened. Stopping the Recirculation pump will, through external logic, also switch off the Vacuum pump.

REMOTE VDC in — has a alternating action (toggle) i.e. each press will select the opposite state, off to on, or on to off. The remote analog input is active when the indicator (LED) inside the switch is lit. In this mode the vacuum pressure is compared to the analog input voltage terminal at the rear of the controller. The voltage should range between 0 and 10 volts DC. The display will show the actual vacuum pressure as monitored via the vacuum transducer circuit.

Any modifications to the digital set-point preset can be made while in the Remote mode. This value will not be used for vacuum control until the Remote function is switched off.

Edit Functions

Manual Mode - Initial Mode

After Vacuum start as been accepted the controller enters Manual mode. Manual mode allows the operator to use the up and down edit keys to adjust the vacuum pump RPM and the position of the motorised valve. The operator would probably use the up and down keys while visually monitoring the extruded product. The display will monitor the actual vacuum pressure and the external scroll inputs will be locked out.

FINE TRIM  — Trim up. Each press of this key will cause an approximate increase of 0.1 inches of water.

FINE TRIM  — Trim down. Each press of this key will cause an approximate decrease of 0.1 inches of water.

COARSE TRIM 

has a similar function to the fine trim up except that the preset changes by approximately 2.0 inches of water for each key press. Coarser changes will occur after the key has been held down for more than two seconds.

COARSE TRIM 

has a similar function to the fine trim down except that the preset changes by approximately 2.0 inches of water for each key press. Coarser changes will occur after the key has been held down for more than two seconds.

no function during manual mode.

no function during manual mode.

SET no function during manual mode.

Automatic Mode

The vacuum pressure will initially be set using Manual mode. Once the product is deemed to be stable and correct the Vacuum Start switch should be pressed again to toggle to the Automatic mode. A bump-less transition is made by initially setting the Set-point to the same value as the Actual value. The vent valve will also be locked in the current optimum position. The system will now use built-in automatic correction routines to make fine variations to the vacuum pump in order to keep Set-point and Actual the same. The external scroll inputs become active so that external systems (X/Y Scanners) may make fine adjustments to the Set-Point.

FINE
TRIM


Trim up. Each press of this key will cause an increase of 0.1 inches of water. The set-point will appear in the display and the LED to the right of the display called "SET POINT" will light. Any further presses of the key pad will cause the whole display to count up (0.1 inches of water for each press). The display will return to show an actual "sensed" value after a short delay with the "ACTUAL" LED lit. A scroll up terminal is available at the rear of the controller. This has a similar action to the key pad except that the display will continue to show an actual value. Activity at the scroll up terminal will light the LED inside the TRIM up switch. This terminal is ignored when the "MANUAL" or "SET POINT" LED's are on.

FINE
TRIM


Trim down. Each press of this key will cause a decrease of 0.1 inches of water. The set-point will appear in the display and the LED to the right of the display called "SET POINT" will light. Any further presses of the key pad will cause the whole display to count down (0.1 inches of water for each press). The display will return to show an actual "sensed" value after a short delay with the "ACTUAL" LED lit. A scroll down terminal is available at the rear of the controller. This has a similar action to the key pad except that the display will continue to show an actual value. Activity at the scroll down terminal will light the LED inside the TRIM down switch. This terminal is ignored when the "MANUAL" or "SET POINT" LED's are on.

COARSE
TRIM


has a similar function to the fine trim up except that the preset changes 2.0 inches of water for each key press. Coarser changes will occur after the key has been held down for more than two seconds.

COARSE TRIM

has a similar function to the fine trim down except that the preset changes 2.0 inches of water for each key press. Coarser changes will occur after the key has been held down for more than two seconds.

no function during normal running of the automatic mode.

no function during normal running of the automatic mode.

SET — has an alternating action while in Automatic mode. The initial press of the SET key displays the Set-Point in an editable mode (one of the digits will be flashing). The operator would then use the edit keys (**see Programming using the Set Key**). A further press of the SET key is used to accept the new value.

Programming using the Set Key

Set-Point

Step 1

SET — The set-point will be displayed with one of the digits flashing. This display is ready for editing on a digit by digit basis. The set-able range is from 0.1 to 150.0 psi although the full range may not be achievable. The LED's to the right of the display will change from showing "ACTUAL" to showing "SET POINT".

Step 2

Use the following edit keys :-

TRIM 

increases the value of the flashing digit by 1. Numbers step from 0 through 9 and then back to 0 with each key press. Coarse and fine trim buttons will work in the same way.

TRIM 

decreases the value of the flashing digit by 1. Numbers step from 9 through 0 and then back to 9 with each key press. Coarse and fine trim buttons will work in the same way.

selects the digit to the left of the flashing digit. This becomes the next editable digit and the previous digit stops flashing. Wrap around is used so that if the left-most digit was editable then the right-most digit will become the next editable digit after a "<" key press.

selects the digit to the right of the flashing digit. This becomes the next editable digit and the previous digit stops flashing. Wrap around is used so that if the right-most digit was editable then the left-most digit will become the next editable digit after a ">" key press.

Step 3

SET will accept the set-point as displayed. Normal running will be resumed. After a short delay the display will revert to showing the actual value sensed with the "ACTUAL" LED lit.

External Connections

Inputs

Mains Supply

120 volts A.C. supply. Two terminals are provided labelled "Live" and "Neutral". A fuse is provided @ 250 milli-amps connected between the transformer and the Live terminal.

Ground

Two terminals marked "Ground" are connected through to the metal case and should be taken to the machine frame ground. Regulations suggest that it is not suitable to rely on the panel screws alone to provide the suitable grounding.

Sensor Inputs

The following sensor inputs all have similar characteristics. An internal load is connected to the available 12 volts DC supply and draws about 10 milli-amps from the supply and through the external source. All sensors should use the Controller 12 volts power supply.

Up (Scroll Up)

Each time this terminal is taken to 0 volts a Scroll Up request will be acknowledged. The LED inside the Fine Trim Up key will light when this terminal is at 0 volts. The Scroll function will be ignored during set-point adjustment via the facia or RS232. At other times it will have a similar action to the Fine Trim Up key.

Down (Scroll Down)

Each time this terminal is taken to 0 volts a Scroll Down request will be acknowledged. The LED inside the Fine Trim Down key will light when this terminal is at 0 volts. The Scroll function will be ignored during set-point adjustment via the facia or RS232. At other times it will have a similar action to the Fine Trim Down key.

Recirc. (Recirculation Pump Enable)

With this terminal connected to 0 volts it is possible to start the recirculation pump. If this terminal is opened the recirculation pump will stop.

Vacuum (Vacuum Pump Enable)

This has the same action as the recirculation pump enable except that it affects the vacuum pump.

Sensor Outputs

Recirc. (Recirculation Pump)

This output is used to drive an external 24 volt D.C. relay @ < 50mA. The relay contact will switch a 120 volt A.C. motor starter used to power the Recirculation pump. When this output is on the potential will be the same as Outputs Common.

Vacuum (Vacuum Pump Enable)

This output has the same characteristics as the Recirc. output. It is switched to common when the Vacuum pump has been started. It should be connected to the vacuum pump driver "RUN/ENABLE" terminal and both Commons should be joined so that they share the same reference. When a positive Run signal is required the Vacuum Output should be used to enable a relay which in turn is used to operate the pump run terminal.

Valve

This is a 6 pin connector which connects to the valve. The Motor + and Motor - terminals connect across the motor. The position of the valve is an analog value developed across a potentiometer. The PAVC Controller supplies 0 and 12 volts to the potentiometer.

Analog

VDC in (Remote Analog Input)

This input is used as a set-point when the "REMOTE VDC in" mode is selected via the front panel switch. The default voltage range is 0 to 10 volts. Jumper links are internally available to select an optional 0 to 5 volt, or -5 to +5 volt range.

Vacuum Pump Speed Control (Ref,, An. out,, Common)

This is an analog output with which has been calibrated for a maximum output of 10 volts. An optional jumper selection allows the pump controller to supply the reference voltage via the Ref. terminal. The possible range would then be from 0 through to reference voltage supplied. These connections are intended to be joined to the pump driver circuit "SPEED REFERENCE". The Ref. voltage can range between -12 and +12 volts (amplifier supplies).

RS232 Input/Output

This connector is a 9 pin D' type which can be joined to other RS232 systems via a suitable lead. The set-point can be adjusted and both the actual and set-point values read. The Vacuum controller RS232 is normally in a listen only mode. Modifying a preset is made by sending the command followed by the value. Monitoring a value is made by sending a command followed by a question mark (?). This makes the controller respond by returning the referenced value. This facility is not available in the first batch of units.

Vacuum Port

This is a non electrical connection intended to join to the vacuum system via a length of 6mm o.d. tubing. It is plumbed into the vacuum system and used to monitor the vacuum pressure.