

EC Motor Constant Pressure Controller

Installation and Operation Manual

P/N 928216



FEATURES

The EC Motor is a Constant Pressure Controller that monitors the pressures (up to +/-1" WC) to be controlled and provides a 0-10 VDC analog output for EC Motor controllers. The unit has an on board pressure sensor. It also has a 3 color backlight for indication of the pressure control status, a digital input for remote override of fan speed and a relay output for remote alarm indication.

Operating Modes:

- Auto: Controls pressure to the set-point- backlight will be green if pressure is in range, red if pressure is out of range
- Manual: Manual Control of fan speed- yellow backlight indicating manual operation.
- Off: Fan off – backlight will turn off to indicate that control is inactive

Constant Pressure Control can be used for exhaust (negative pressure) or pressurization (positive pressure) control. Attach the pressure line tap before the fan if exhaust or draft control is required or after the fan if positive pressure control is needed.

Energy Savings:

If desired there is a cutout feature that can be enabled so that when the fan speed drops below a pre-determined level (low demand) the fan will be shut off. The unit will recover active control if the pressure drops below or above a pre-set level.

Remote over-ride:

There is an input for a dry contact closure (switch or relay) so that fan speed can be remotely set to a pre-programmed fixed speed.

User Interface

- Large LCD 2 line display
- Green (Normal), Yellow (Warning), Red (Alarm) backlit display for indicating room status
- Membrane keypad for ease of configuration and menu navigation.
- Password Protection for security.

Audible Visual and Remote Alarms

- Color Backlight LEDs.
- Alarm on Pressure outside of limits
- Audible Buzzer.
- Alarm delay, mute timeout, alarm enable/disable, buzzer enable/disable
- SPDT Relay for remote alarms.

Ease of Installation, Use and Calibration

- Rotatable pressure fittings to eliminate crimping of pressures hoses, allows installation flexibility.
- Snap on cover, no visible fasteners.
- Modular Plug-in design using sub-base. Simultaneous electrical and plumbing connections reduce initial installation and calibration costs. Unit can be calibrated in house or sent to Calibration service without removing the wiring or plumbing.
- Push button auto zero and auto span calibration, no potentiometer adjustments.
- PG9 and ½” Conduit fitting in same unit, field selectable.

Intended Use

The EC Motor Constant Pressure Controller is designed for pressure control applications that require pressure monitoring, control and alarming. The Controller can be configured to monitor positive or negative pressures. The membrane keypad user interface enables access to setup, security, calibration, and alarm setups. Backlight LED's provide a local visual indication of the pressure alarm status and a local audible alarm to alert personnel to system status.

This device is intended for indoor applications, the housing is rated NEMA1.

1.0 Installation

Included with the Controller are:

Duct Probe for installation into the duct to measure the static pressure

PG9 fitting, can be used when not using conduit.

Plugs for the ½” conduit and PG9 openings if they are not used.

Install the duct probe into the duct or exhaust stack by drilling a ¼” hole and screwing the probe to the sheet metal using the 2 provided mounting screws. Connect the probe tubing (1/4” OD, supplied by customer) from the end of the probe to where the Controller will be mounted.



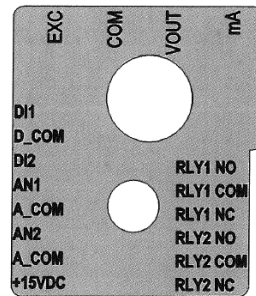
Fig. 1-3 Removing bezel from the base



Fig 1-4 View of terminal strips on rear



Fig 1-5 Pressure ports and electrical terminals



Pull wires through the openings in the bottom of the base. 1/2" Conduit or PG9 fitting openings are provided.

Terminal	Function
EXC	+24 VDC supply
COM	Power Supply COM and Analog Out COM, connect to EC Motor Controller
VOUT	Analog Output + (VDC mode), connect to EC Motor Controller
mA	Not Connected
D1	Remote Over-ride of auto mode control
D_COM	Remote over-ride common
DI2	Not Connected
AN1	Not Connected
A_COM	Not Connected
AN2	Not Connected
COM	15V Power Common (return)
+15VDC	Power for remote annunciator (if used)
RLY1 NO	Relay 1 Normally open contact
RLY1 COM	Relay 1 Common contact
RLY1 NC	Relay 1 Normally closed contact
RLY2 NO	Not Connected
RLY2 COM	Not Connected
RLY2 NC	Not Connected

Table 1 Wiring

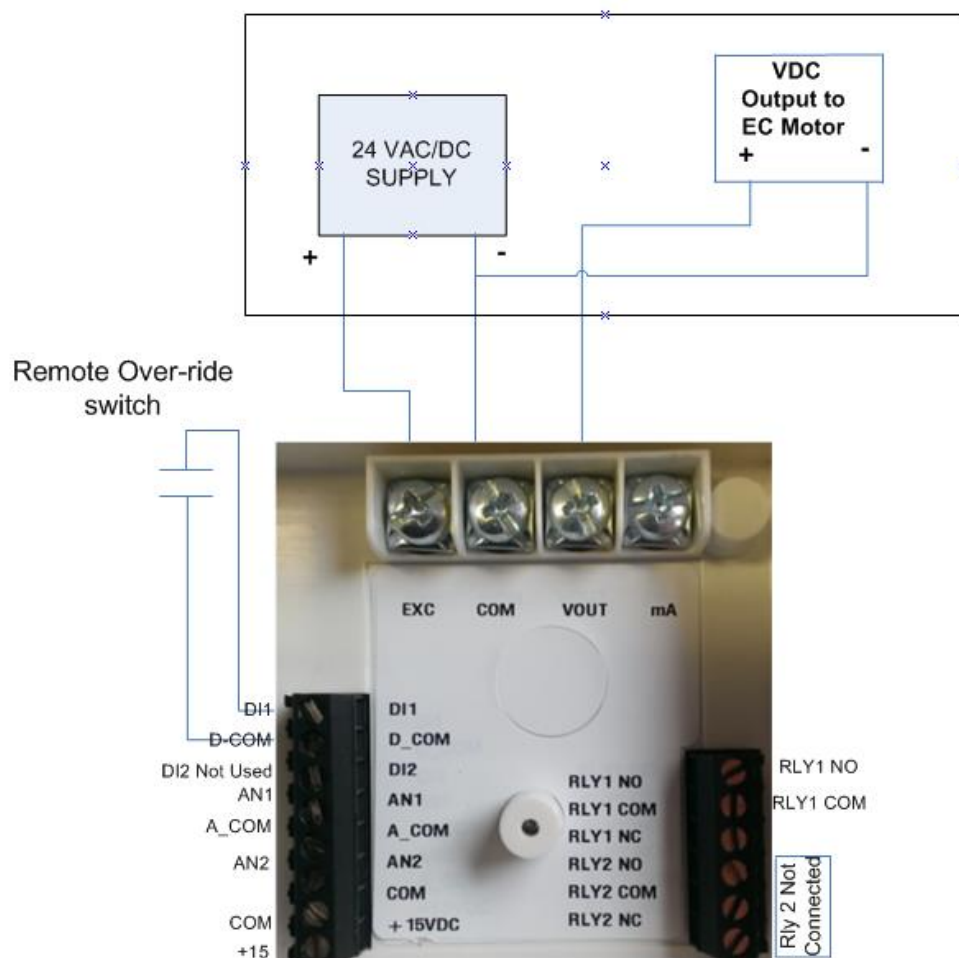


Figure 1-6 Wiring

Notes:

Relay 1 (RLY1) is a SPDT relay that can be used to signal a remote unit of an alarm condition. The relay contacts are rated for 3 A, 120 VAC.



Fig. 1-7 Installed plugs on unused openings in the base.

Connect the pressure tube to the high (+) port. The low (-) port may be left open to atmosphere. Wire to the electrical terminals on the back of the housing. If desired, place electrical plugs on the unused holes in the base. Mount the unit on the wall using #6 screws, avoid surfaces with high vibration. Avoid damage to the Printed Circuit.

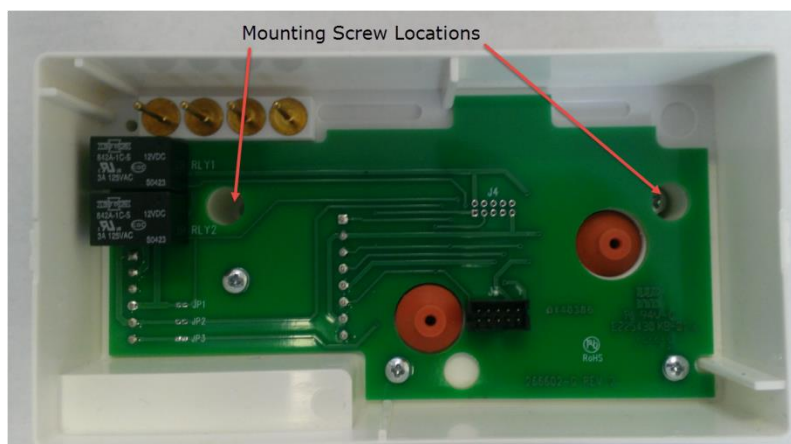
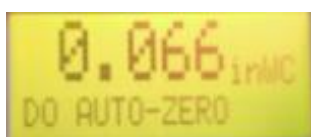


Fig. 1-8 Mounting hole locations

Complete the installation by installing the bezel onto the base by aligning the two and pushing the bezel into the base until the bezel snaps to both sides. Be sure to carefully align the 2 parts and push straight in. There are alignment features on the front bezel and rear housing.

Auto Zero the unit on first installation with the fans off. See Auto Zero function in menu.

AUTO ZERO: “Tares” out any 0 pressure error. This must be done with 0 pressure applied.



2.0 Menu Navigation and Configuration

The LCD display is standard and provides valuable feedback during configuration and gives the user feedback when in normal and alarm modes.

Apply 24 VDC power.

When the display goes through the initialization sequence, the LCD screens will be displayed in the following order:

Software version information.

Product pressure range, +/-1"WC

Analog output, 0-10 VDC.



Unit shown in the auto mode (normal) state. Line 1 is the indicated pressure in "W.C. Line 2 indicates the pressure control set-point on the left and the output voltage to the EC Motor on the right. The green backlight indicates that the pressure is within the allowable alarm limits.



Unit shown in the alarm state. Red backlight, audible alarm if enabled.

Menu Operation



Menu key – Provides access to the menu structure



Down arrow key – Allows selection of numerical parameters. Pushing the down arrow causes the digits to move upwards in a 1 digit count and will cycle through. The cursor below the indicated item indicates that this is the digit that is being changed. If you do not need to make a change to that position, press the enter key to move to the next position to the right. This key moves to select menu items in the sub menu.



Enter key – Use this key to move left to right in a current menu screen. It is also used to save the current menu selected settings, or to confirm current menu operation; press the Enter key to save the current settings. The display shows the current setting value and flashes twice to prompt the user that the current set value has been saved.



Return/Silence button – This button provides a quick way to return to the home screen from anywhere within the menu structure. It has the secondary purpose of temporarily silencing the audible alarm. If the mute timeout setting is reached the audible alarm will again sound.

Menu items are in the order that they appear in the menu. These are placed in order of the anticipated most used functions near the top of the menu tree. It is suggested that in the initial configuration that the user progress through each section in order. When in the menu the screen background will turn yellow to indicate that the menu is being accessed and to improve readability.

OPERATION MODE:

Auto Mode: Pressure is automatically maintained to the set-point. Pressing the down arrow key moves between auto, manual and off modes. Pressing the menu button drops down to the auto mode configuration menu. The screens shown below are the default factory settings.



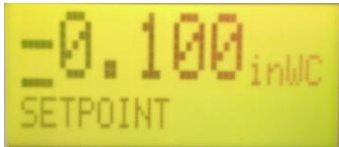
Manual Mode: User can adjust the fan speed manually from 0 to 100%



OFF Mode: Fan is turned off



AUTO MODE CONFIGURATION: Select Setpoint, Proportional Gain and Integral Time terms. Move from one to the other by pressing the menu key.



Setpoint of pressure control

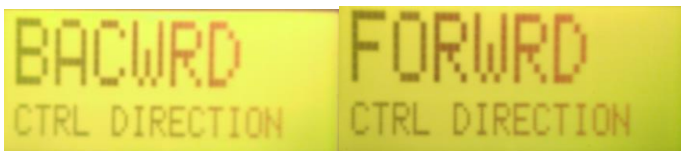


Proportional band constant: A high proportional gain results in a large change in the output for a given change in the error



Integral Time

CONTROL DIRECTION: These can be used for changing the direction of operation of the PID Control. For example, increasing the output versus reducing the output. This can be used if the operation of the unit is opposite what is expected when installed. This can offset conditions



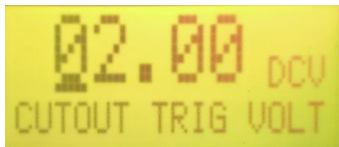
CUTOUT ENABLE: Enables energy saving feature that will shut off the fan when the fan speed stays at min. speed for a pre-determined time, cutout delay time



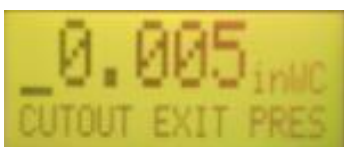
CUTOUT DELAY TIME



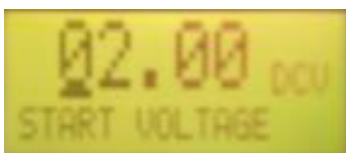
CUTOUT TRIGGER VOLTAGE: Voltage for min. fan speed



CUTOUT EXIT PRESSURE: Pressure at which the fan control will become active after unit goes into cutout mode



START VOLTAGE



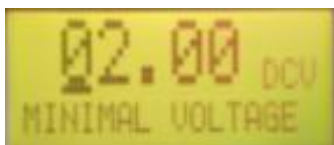
START DELAY TIME



VERRIDE VOLTAGE



MINIMAL VOLTAGE



ALARM ENABLE: Enables the audible and visual alarms indicators



ALARM DELAY: Sets the delay (sec) between the time that the alarm high or low limits are exceeded and when the alarm is indicated.



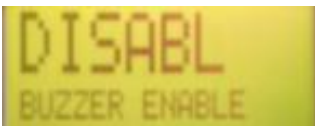
ALARM HIGH LIMIT: Sets the high pressure alarm limit; the high pressure limit must be greater than the low pressure limit.



ALARM LOW LIMIT



BUZZER ENABLE: Turn local audible alarm on and off



MUTE TIME OUT: Sets the time delay (sec) between when the buzzer mute button is pressed and when it will re-sound if the pressure is still out of range.



FILTER SETTING: (1-99), default is 1 for fastest response time. This feature is used to set up a data averaging filter. The lowest numbers provide the fastest output response but highest analog output noise. In a pressure noisy environment use higher numbers until the pressure display flickering is reduced.



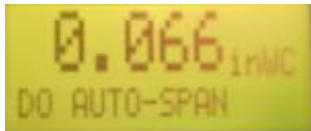
PASSWORD CONTROL: Enables or disables the 4 digit numeric password. Use backdoor password 0159, if the password is lost.



AUTO ZERO: "Tares" out any 0 pressure error. This must be done with 0 pressure applied.



AUTO SPAN: "Tares" out any Span pressure error. This must be done with the +Full Range (FR) pressure applied. For example: if the pressure range is +/-0.1" WC, apply 0.1" WC.



RESTORE CAL DATA: Restores factory calibration settings in case a calibration may have been performed incorrectly.



EXIT MENU



RETURNING PRODUCTS FOR REPAIR

Before returning this product, please contact the factory at 918-682-7791. When returning a product to ACME, the material should be carefully packaged and shipped prepaid to:
ACME 1820 N. York Street Muskogee, OK 74403
To assure prompt handling, please refer to return instructions

WARRANTY AND LIMITATION OF LIABILITY

LIMITED WARRANTY

WARRANTY AND DISCLAIMER: the Company extends this limited warranty to the original purchaser and warrants that products supplied by the Company, shall be free from original defects in workmanship and materials for two years from date of shipment (except for the warranty periods noted for products listed below), provided same have been properly handled, stored, installed, serviced, maintained and operated. This warranty shall not apply to products which have been altered or repaired without the Company's express authorization, or altered or repaired in any way so as, in the Company's judgment, to affect its performance or reliability, nor which have been improperly installed or subjected to misuse, negligence, or accident, or incorrectly used in combination with other substances. The Purchaser assumes all risks and liability for results of use of all products.

Evaporative cooling pads are warranted to be free of defects in materials and workmanship for a period of two years from date of shipment provided same have been properly handled, stored, installed, serviced, maintained and operated; and further, not subjected to excessive heat, corrosive agents or chemicals, or mechanical abuse that may cause tearing, crushing or undue deterioration, nor used on a system or in a manner other than that for which it was designed as explained in the product literature.

The following products are warranted to be free of defects in materials and workmanship for the periods shown from date of shipment: Acme's exclusive duplex split pillow block bearings and shaft five years, belts one year, Polyethylene tubing 90 days, AIR40 Heater warranty one year, AIR40 Emitter warranty three years and DDP fan lifetime warranty on its propeller, cone, and housing.

LIMITATION OF REMEDY AND DAMAGES: All claims under this warranty must be made in writing and delivered to P. O. Box 978, Muskogee, Oklahoma, 74402, within 15 days after discovery of the defect and prior to the expiration of two years from the date of shipment by the Company of the product claimed defective, and Purchaser shall be barred from any remedy if Purchaser fails to make such claim within such period.

Within 30 days after receipt of a timely claim, the Company shall have the option either to inspect the product while in Purchaser's possession or to request Purchaser to return the product to the Company at Purchaser's expense for inspection by the Company. The Company shall replace, or at its option repair, free of charge, any product it determines to be defective, and it shall ship the repaired or replacement product to Purchaser F.O.B. point of shipment; provided, however, if circumstances are such as in the Company's judgment to prohibit repair or replacement to remedy the warranted defects, the Purchaser's sole and exclusive remedy shall be a refund to the Purchaser of any part of the invoice price, paid to the Company, for the defective product or part.

The Company is not responsible for the cost of removal of the defective product or part, damages due to removal, or any expenses incurred in shipping the product or part to or from the Company's plant, or the installation of the repaired or replaced product or part.

The warranties set forth above do not apply to any components, accessories, parts or attachments manufactured by other manufacturers; such being subject to the manufacturer's warranty, if any. To the extent not prohibited by the manufacturer's warranty, the Company shall pass through to Purchaser such manufacturer's warranty.

THE COMPANY'S WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED AND WAIVED. THIS WARRANTY CONSTITUTES THE COMPANY'S SOLE AND EXCLUSIVE WARRANTY FOR DEFECTIVE GOODS AND PURCHASER'S SOLE AND EXCLUSIVE REMEDY FOR DEFECTIVE PRODUCTS.

No employee, agent, dealer, or other person is authorized to give any warranties on behalf of the Company or to assume for the Company any other liability in connection with any of its products except in writing and signed by an officer of the Company.

REPLACEMENT PARTS If replacement parts are ordered, purchaser warrants that the original components in which these replacement parts will be placed are in satisfactory working condition, and when said replacement parts are installed, the resultant installation will operate in a safe manner, at speeds and temperatures for which the original product was purchased.

TECHNICAL ADVICE AND RECOMMENDATIONS, DISCLAIMER: Notwithstanding any past practice or dealings or any custom of the trade, sales shall not include the furnishing of technical advice or assistance or system design. Any such assistance shall be at the Company's sole option and may be subject to additional charge.

The Company assumes no obligation o

