Operating Instructions

Counterpressure Control Module

Rev. 1.4

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Thank you for purchasing your Caropreso Associates Counter Pressure Control Module. This manual tells you how to install, setup, and operate your device. Along with instructions are precautionary statements, which must be observed, in order to protect personnel, this product, and connected equipment.

We have checked this manual for agreement with your hardware and/or software. However, should you find a discrepancy, need clarification, or wish to suggest additions or changes, please contact your salesperson, or mail to:

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Preface

FORWARD

Caropreso Associates assumes no liability or responsibility for errors that may appear in the manual or for indirect or inconsequential damages resulting from the use of the information contained herein.

Any modification of the Caropreso Associates Counterpressure Control Module or associated equipment, without the prior consent of Caropreso Associates may cause the One Year Limited Warranty to become invalid.

The information contained in this manual is only intended for use by individuals qualified to use such equipment or by individuals directly supervised by such people.

Precautionary Statements

1. Personal injury and property damage can result from contact with components in the control cabinet. Always ensure that all energy sources to the control module are disconnected, equalized and locked-out prior to performing any service.

2. Your counterpressure control module should not be used to control flammable fluids or in potentially explosive areas. Flammable materials should be kept away from the control module, fluid lines, and connected wiring.

3. Your control module and fluid lines may produce hazardous temperatures during operation. Take appropriate measures to protect personnel, the control module and other equipment from these hazardous temperatures.

4. Your counterpressure device controls non-flammable fluids at high pressures. Damaged, loose or improper fluid lines can sever and backlash causing injury or death to personnel and damage to equipment. Secure fluid lines against backlash incase of line failure. Also, rapid decompression of fluids can create the potential for low-temperature burns. Protect personnel from the possibility of exposure.

5. Your fluid lines should be inspected for leaks regularly. High-pressure leaks can create fluid knives. Replace damaged or worn fluid lines immediately. Keep connections tight.

6. To ensure proper operation of your counterpressure control module, use only approved replacement parts. Replacement parts are available from the manufacturer.

7. **Do not exceed 1500 PSIG (100 bar)** at the counterpressure control module inlet. Over pressurization will lead to costly component failure. Use an appropriate pressure regulator.

Preparation

Carefully unpack the control module and inspect for shipping damage. Any issues of shipping damage should be resolved immediately. Contact your salesperson.

Your counterpressure control module is wired from the factory for 50-60 Hz, 110 Vac use. The module can be rewired for use with 50-60 Hz, 220 Vac use with a simple transformer jumper change. Refer to the power supply wiring diagram for instructions. Care should be taken to ensure proper grounding connections. For any other electrical service requirements, contact your salesperson.

Your counterpressure control device was engineered specifically for use with industrial grade nitrogen gas. However, any inert gas, including compressed plant air is safe for use with the control module when the appropriate regulator and filter are used. **Do not** use pure oxygen. Performance will vary when gases other than Nitrogen are used with the device.

To ensure the performance of the counterpressure control module, all fluid lines must have an inner diameter no less than 3/16 of an inch. Keep the total length of the fluid lines, including the line between the gas source and the module inlet as short as possible. Total line length should always be less than 16 feet.

Your counterpressure module was engineered to exhaust up to 1000 cubic feet of nitrogen gas, at 1500 PSIG, per minute. The inner diameter of the fluid lines, particularly the line between the tool vent port and the device, governs the actual maximum device vent rate. Care should be taken to ensure that the cavity pressure, as shown by the gage on the device, never exceeds 1500 PSIG, as damage to the module may occur. I.E., machine injection rate should never be greater than the ability of the device to vent and maintain the cavity pressure at a maximum of 1500 PSIG.

The counterpressure control module should be permanently mounted and stationary. Also, the module should be installed and operated in accordance with all applicable codes, laws and ordinances. It is the responsibility of the purchaser to ensure the proper and safe use of the device.

The module has the ability to monitor and record each occurrence of system over-pressurization. Any warranty replacement of system components will be based on the record of over-pressurization. Also, the decision to offer warranty replacement of the device in part or whole will be made by the manufacturer, upon return of the whole device to the manufacturer for examination.

Installation

1. Permanently mount the counterpressure module on a solid and stationary object. Take care to ensure the device is not at risk of impact from other devices, machine operators, automation, doors, etc.

2. Adjust gas supply regulator to 0 PSIG. Connect fluid line to control module and then to the gas supply regulator.

3. Connect a fluid line jumper between the control module mold supply (to mold) and control module mold return port (from mold).

4. Power down the injection molding machine (IMM) and make connections between the counterpressure control module and the IMM.

5. Power the IMM and connect power to the counterpressure control module.

6. Make certain the IMM is in manual operation mode and turn the counterpressure control module power switch to run.

7. While holding the manual purge button, slowly open the gas supply and ramp gas supply pressure up towards 1480 PSIG. The counterpressure control module should vent at 1480 PSIG. If the device does not vent at 1480 PSIG, contact your salesperson, and/or consult the troubleshooting section of the manual.

8. Switch the counterpressure control module to off and remove the fluid line jumper from between the control module mold supply and control module mold vent ports.

9. Connect the fluid lines between the module and the mold.

10. Place one magnet switch marked “MOLD” on each half of the mold. Make sure the arrows on the switch point to each other and that they are lined up with each other when the mold is closed.

11. Place two magnet switches marked “RAM” somewhere on the injection ram so that they come in contact with each other at the end of injection. The arrows on the switch should face each other and be lined up. Sometimes it will be required to make a bracket or some other means of attachment in order to get the two magnets to meet.

12. With the IMM in manual operation mode, press the counter pressure control module manual purge button to purge the fluid supply line.

Initial Startup

Turn the module on by moving the switch located under the power cord inlet location. After a few seconds, the title screen will become visible. Press the “TOUCH HERE TO CONTINUE” bar

Main Screen

Both inlet and cavity pressure is monitored and displayed in real time. The gages are red at the 1400 psig marks to act as a warning to the operator that he/she is approaching the maximum pressure limit.

The manual/run button changes the operation mode by touching the button

The off/purge button is active only in the manual mode. Touching the button will purge the gas from the system. This is a momentary switch and must be held to lengthen the purge time.

Setup

This screen is used to enter the desired pressures and timing for the process. To change pressure and timer values:

a. Turn module on and press “Touch here to continue”
b. Press SETUP key to access setup screen.
c. Locate and press DESIRED CAVITY block
d. Use key pad to enter a value. This value is the high level pressure limit. It should be at least 20 psig higher than the regulated inlet pressure.
e. Locate and press GAS INJECT. LIMIT. This value begins a timer when the mold closed signal is seen. It will vent all gas if the end of injection signal is not seen before the time runs out.
f. Locate and press MIN SUPPLY PRESS. This will sound and alarm is the supply pressure falls below this setting..
g. Locate and press ADJUST SCREEN. This controls the contrast for best visibility.

Example:

If the desired setup were to maintain the cavity pressure at 100PSIG, the external pressure regulator would be adjusted to some pressure value slightly higher than 100PSIG to compensate for any pressure drop across the fluid lines.

Overall

This screen gives the operator visual indicators of the processing sequence. The mold and extrusion bitmaps will blink when the cavity is being pressurized and when the IMM is injecting resin.

The “Run mode” field indicates manual or auto mode. Pressing this key will change the mode to manual or auto

The “Cycles” field indicates the total number of complete cycles

The “Over P” field indicates how many times the inlet or cavity pressure exceeded 1500 psig (100 bar)

The “Operation Status” field indicates the mode of operation

I/O Check

This screen allows the operator to monitor the inlet and cavity pressure transducer readings. Readings will be with 5 psig

Input and output signals from the magnetic switches can be seen by changing button colors in the labeled boxes.

Help

Each screen contains a help button. A tutorial explains the operation of that screen

Alarm

Each screen can indicate a problem in the process. Pressing the red ALARM button will silence the alarm and show the alarm message.

Operation

There are two standard versions of the Caropreso Associates Counterpressure Control Module. The “A” version, which uses two reed-type magnetic switches, one for mold-closed detection, and one for end of injection detection; and the “B” version, which is hard-wired to the injection molding machine.

Version A uses reed-type switches to detect the position of the mold and the position of the injection piston. No electrical connections to the machine are necessary. With this design, the control module manual purge button is always active. Use DESIRED CAVITY block to set cavity pressure. Set the external pressure regulator to the desired inlet pressure and the vent control needle valve to the desired vent rate.

Version B is similar in operation to version A, but with minor differences. Version B is hard-wired to the machine. The electrical connections provide a greater degree of control, such as not allowing the IMM to inject until the mold cavity pressure reaches the upper threshold parameter.

Operational Sequence

During operation, the counterpressure control module will make a rapid “clicking” sound. This sound is produced by the operation of the “fill” and “vent” solenoids and is normal. Also, in order to prevent damage to the control module, the “vent” solenoid will always open if the mold cavity pressure reaches 1480 PSIG. The “vent” solenoid exhausts through an adjustable needle flow control valve.

When the injection molding machine mold closes and activates the mold-closed magnetic switch, the control module opens the “fill” solenoid valve. It may be necessary to delay the resin injection to allow the mold cavity to fully pressurize. As the IMM injects resin into the mold cavity, the control module compares feedback from an internal pressure transducer to the DESIRED CAVITY set point. The control module opens or closes the “vent” solenoid valve based on this comparison.

Once the IMM completes the injection stroke and activates the end-of-injection magnetic switch, the control module opens the “vent” solenoid until the mold-closed magnetic switch is deactivated. Also, the deactivation of the mold-closed magnetic switch resets the counterpressure control module in preparation for the next machine cycle.

ONE YEAR LIMITED WARRANTY

Caropreso Associates (the "Company") warrants, to the original purchaser of this Counterpressure Control Module (the "unit"), that it will be free from defects in materials and workmanship under normal use and service for a period of one year from the date of delivery to the original purchaser. The Company's obligation hereunder shall be limited to repairing or replacing any such part proved to be defective in the opinion of the Company. Defects in or malfunctions of any purchased components are subject to the original equipment manufacturer's warranties and policies.

The warranty shall not apply to any Unit which, in the opinion of the Company, has not been properly maintained or fails to function properly as a result of misuse, abuse or neglect, or is damaged by any cause including, without limitation, fire flood, lightning, improper electrical current, or service by anyone not authorized by the Company, or has been modified, repaired or altered in any way without the express written consent of the Company. No agent or representative of the Company has the authority to increase or alter the obligations of this limited warranty. The buyer shall determine the suitability of the product for its intended use and assume all risks and liabilities thereafter.

The Company reserves the right to make changes in design and changes or improvements to its products without imposing any obligations upon itself to install the same upon products theretofore manufactured. All claims for warranty adjustments must be received by the Company promptly after discovery of the defect and within the one year period, and must be channeled through an authorized Company representative.

Should your unit prove defective during the warranty period, contact Caropreso Associates at 413-243-9870 for warranty repair instructions and return authorization. *Any packaging and shipping costs, to and from the Company's repair facility, are the responsibility of the purchaser.*

DISCLAIMER OF WARRANTY

THE COMPANY DISCLAIMS ALL EXPRESS WARRANTIES EXCEPT THOSE THAT APPEAR ABOVE. FURTHER, THE COMPANY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTIBILTY OF THE GOODS OR OF THE FITTNESS OF THE GOODS FOR ANY PURPOSE. (TO THE EXTENT ALLOWED BY LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITTNESS APPLICABLE TO ANY PRODUCT IS SUBJECT TO ALL THE TERMS AND CONDITIONS OF THIS LIMITED WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THIS LIMITATION MAY NOT APPLY TO A SPECIFIC BUYER.

LIMITATIONS OF REMEDIES

IN NO CASE SHALL THE COMPANY BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES BASED UPON ANY LEGAL THEORY INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOST PROFITS AND/OR INJURY TO PROPERTY. SOME STATES DO NOT ALLOW THIS EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSIQUENTIAL DAMAGES, SO THIS LIMITATION OR EXCLUSION MAY NOT APPLY TO A SPECIFIC BUYER. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE ADDITIONAL RIGHTS WHICH MAY VARY FROM STATE TO STATE.

Purchaser: _____
Model #: _____
Serial #: _____
Date Purchased: _____

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