KUTZNER+WEBER

MUC Multi Use Controller

INSTALLATION INSTRUCTIONS

Contents

Multi Use Controller (MUC) IOM

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. The proper installation and maintenance of this unit will allow the unit to deliver years of dependable service. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage!

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and who are experienced with this type of equipment. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions.

DANGER! Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION! Consult and follow all applicable national, state and local codes. They will supersede this document.

WARNING! No installation, use or maintenance should be done in an explosive or hazardous environment.

Introduction

The Multi Use Controller (MUC) is an intelligent easy to install wall mounted device that is a constant speed controller used to safely exhaust or provide supply air to gas or solid fuel fired fireplaces and heating appliances. Designed for use with electronically commutated motors (ECM), the MUC meets all code requirements for NFPA211, NFPA54, IFGC2012, IMC2012 and UMC2012

Features include:

- User control via Integrated slide switch 0-10 VDC potentiometer to control a draft inducer or power venter
- Enable input for remote operation
- Code compliant safety mechanism designed for ECM fault protection
- Visual and audible alarm if the controller detects a problem with the fan
- Includes an integrated safety function to verify the pressure is negative or if the motor is functioning properly as required per national and local codes
- Device status indicators via a green LED and red LED as well as an audio buzzer that can be muted
- Includes a battery back-up if the control loses power

Note: *Information contained within this manual may be updated without notice.*

Specifications

Power Supply	24 VDC (non-isolated half-wave rectified)
Consumption	32 mA max @ 24 VDC (Run Mode)
Protection Circuitry	Reverse voltage protected, overvoltage protected
Operating Conditions	4-32 °C (40-90 °F), 20-80 %RH non-condensing
Wiring Connections	Screw terminal block (14 to 22 AWG)
Enclosure	Wall mount enclosure, 3.3”w x 4.7”h x 1.15”d (84 x 119 x 29 mm)
Relay Output Contact Ratings	Form C contact (N.O. + N.C.), 5 Amps @ 250 VAC, 5 Amps @ 30 VDC
Slide Potentiometer	Front panel pot is two-wire resistive output, 0-10 KΩ standard
Analog Output	0-10 VDC
Audio Mute Switch	Front panel push-button dry contact
LEDs	Red LED =Super Bright, Low Current, Green LED =Super Bright, Low Current
Audio Buzzer	3V, 2700 Hz +/- 200 Hz, SPL = 80 dBA
Back Up Battery	2 x CR2032 Lithium-Manganese Dioxide Coin Cells, 3V, 220 mAH, 3.0 x 20.0 x 20.0 mm

Component List

The MUC system is made up of several components dependent on the application:

1. **MUC Controller**
2. **System Application Components**
    a. **GF** : gas fireplace system
        i. Draft inducer / vent fan
            1. VFD included with induction motors
        ii. GFS: differential air pressure switch
        iii. Vent probe and tubing
        iv. Power supply (24 VDC)
    b. **GH** : gas heating appliance system
        i. Draft inducer / vent fan
            1. VFD included with induction motors
        ii. GFS: differential air pressure switch
        iii. Vent probe and tubing
        iv. Power supply (24 VDC)
    c. **SA** : supply air system
        i. Supply fan
        ii. CS75 current switch
        iii. Power supply (24 VDC)
    d. **SF** : solid fuel fireplace system
        i. Draft inducer / vent fan
        ii. Power supply (24 VDC)
3. **Optional / Additional Components**
    a. CO detector
    b. GFS: differential air pressure switch
    c. Spill switch kit(s)
    d. XB expansion board

Installation of the MUC

Before Installation

Read these instructions carefully before installing and commissioning the device. Failure to follow these instructions may result in product damage. **Do not use in an explosive or hazardous environment**, with combustible or flammable gases, as a safety or emergency stop device or in any other application where failure of the product could result in personal injury. Take electrostatic discharge precautions during installation and do not exceed the device ratings.

Mounting

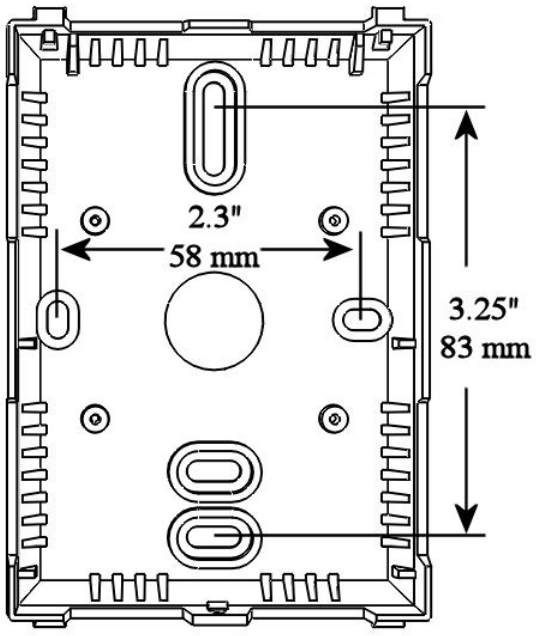
The Multi Use Controller (MUC) installs directly on a standard electrical box. The cover is hooked to the base at the top edge and must be removed from the bottom edge first. Use a small screwdriver to carefully pry each bottom corner if necessary. If a security screw is installed on the bottom edge, then it may have to be loosened or removed also. Tip the cover away from the base and set it aside.

The MUC must be removed from the base to access the mounting holes. Follow normal anti-static procedures when handling the MUC and be careful not to damage any components. The MUC is removed by pressing the enclosure base to unsnap the latch near the bottom edge, then the MUC can be lifted out of the base. Sit the MUC aside until the base is mounted.

After the base is screwed to an electrical box or the wall using the appropriate holes, pull the wires through the wiring hole in the center of the MUC and then reinstall it in the enclosure base. Ensure the MUC is snapped into the base securely and correctly.

The mounting hole locations are shown on figure 1:

Figure 1



Electrical

The MUC may be wired for different applications. Review the supplied wiring diagram(s) and verify the application before attempting to connect the MUC to any associated components or equipment. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electric Code (CEC) in Canada.

Note: *Use 18 AWG shielded wire for all low voltage connections. Do not locate the device wires in the same conduit with high voltage wiring or used to supply inductive loads such as motors.*

Disconnect the power supply before making any connections to prevent electrical shock or equipment damage. Follow proper electrostatic discharge (ESD) handling procedures when installing the device or equipment damage may occur.

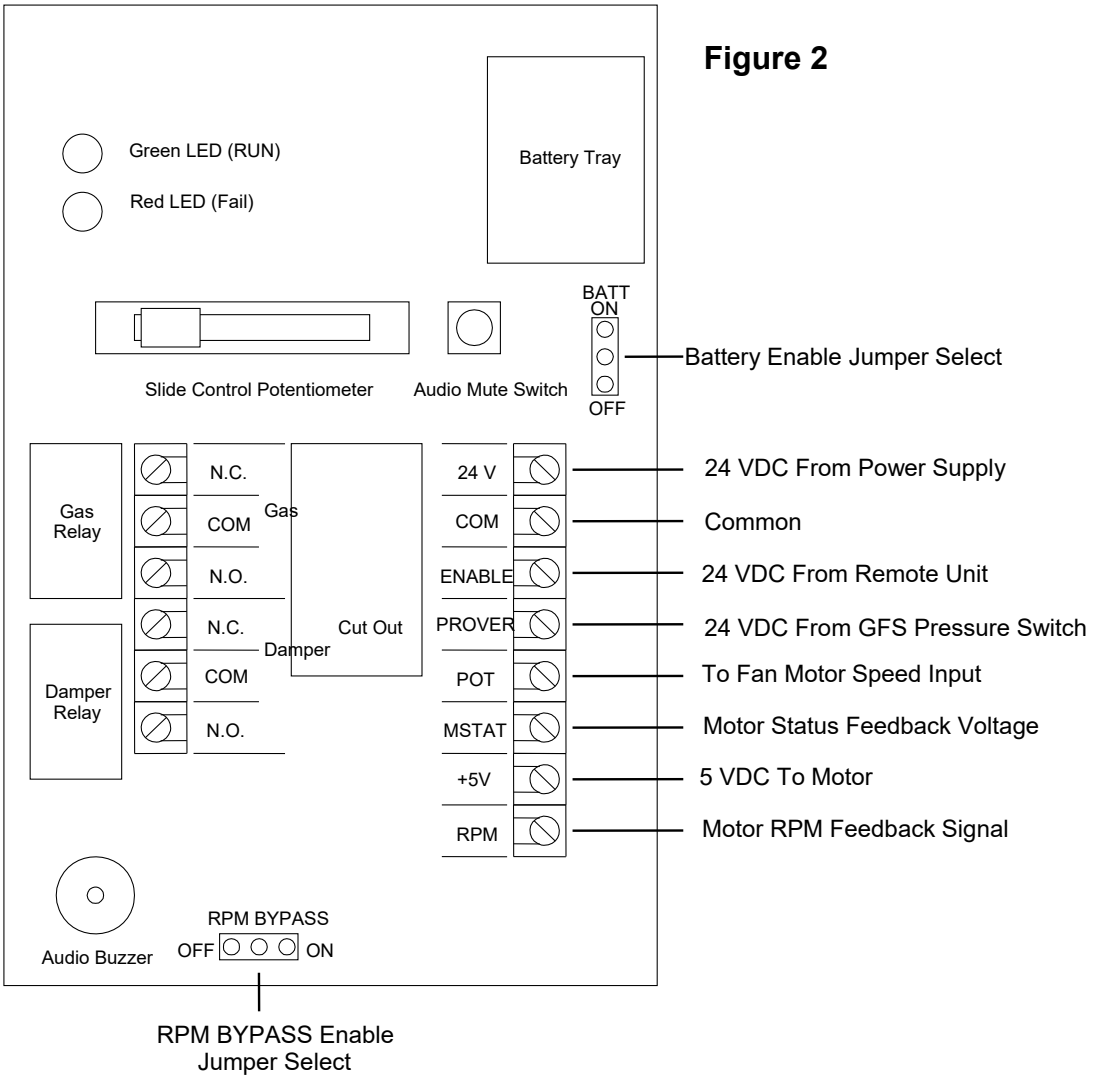


Figure 2

Power Connections

The MUC requires a 24 VDC power supply to operate. The device has a half-wave type power supply so the power supply common is the same as the output signal common. Several devices may be connected to one power supply and share the same signal common.

Use caution when grounding the secondary of a power supply or when wiring multiple devices. Ensure that the circuit ground points are the same on all devices.

Connect the positive DC voltage to the **24V** terminal and the power supply common to the **COM** terminal. The device is reverse voltage protected and will not operate if the power supply is connected backwards.

Note: *the COM terminal is NOT connected to the Relay COM terminals.*

Heating Appliance Connections

Refer to the appliance manufacturer's instructions or contact the appliance manufacture for specific connections within the appliance.

Enable Input (remote operation)
Many appliances have a dry contact to enable external devices (louvers, pumps, etc.) built into the appliance control system. Those that don't may require a relay to be field installed within the appliance to provide the necessary dry contact for the Enable (remote) signal to the MUC.

Note: *Install a jumper between **24V to ENABLE** when remote operation is not required*

Relay Wiring
The MUC relay outputs are completely isolated. The gas and damper relays each have their own 3 terminal connection block, each with a COM, N.O. (Normally Open) contact and N.C. (Normally Closed) contact. Connect the gas valve and damper relay connections as per the labeled terminal blocks for each as illustrated in the system wiring diagrams for the N.O. (normally Open) contact operational control.

- The gas relay is the interlock for enabling the heating appliance or gas log set when all the safety and run conditions are proven
- The damper relay is for enabling an external device such as a damper or VFD when the MUC is enabled to run

Motor Connections

Connect the fan motor as per the supplied system diagram for the motor type.

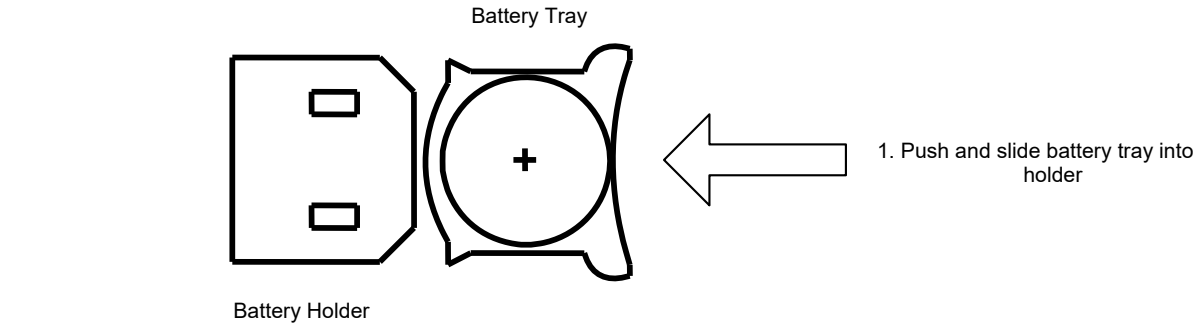
Battery Insertion and Removal

After the MUC has been wired completely into the system insert the backup battery tray into its holder on the MUC.

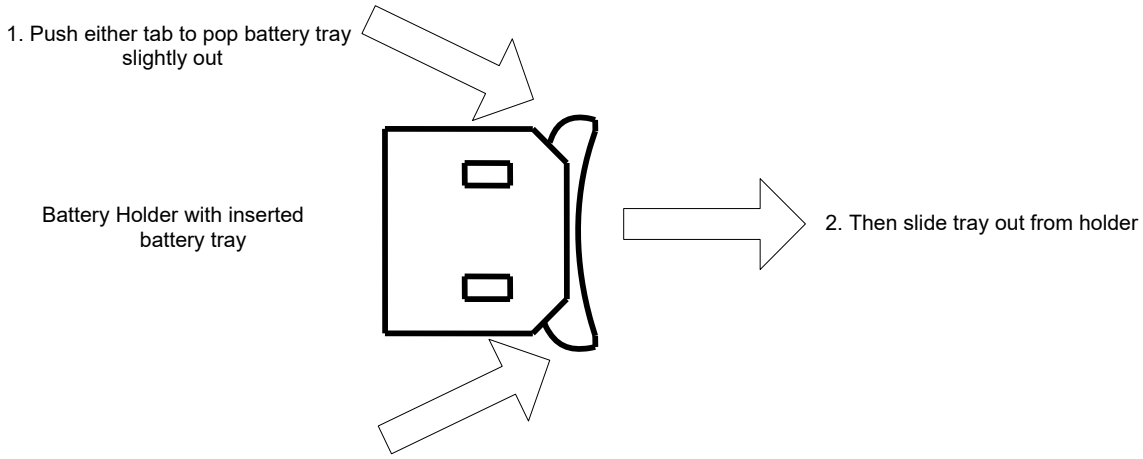
When normal operating power is provided to the MUC the device will enter normal operating mode and exit back up mode.

To insert the backup batteries into the MUC simply slide and push the battery tray into the battery holder on the MUC as illustrated in figure 3, ensuring that the positive terminal is facing upwards. To remove the battery tray from the battery holder on the MUC simply push on either the bottom or top battery tray tab to pop the tray slightly out from the battery holder on the MUC and then pull the tray out from the battery holder as illustrated in figure 3.

Figure 3



Battery Insertion



Battery Removal

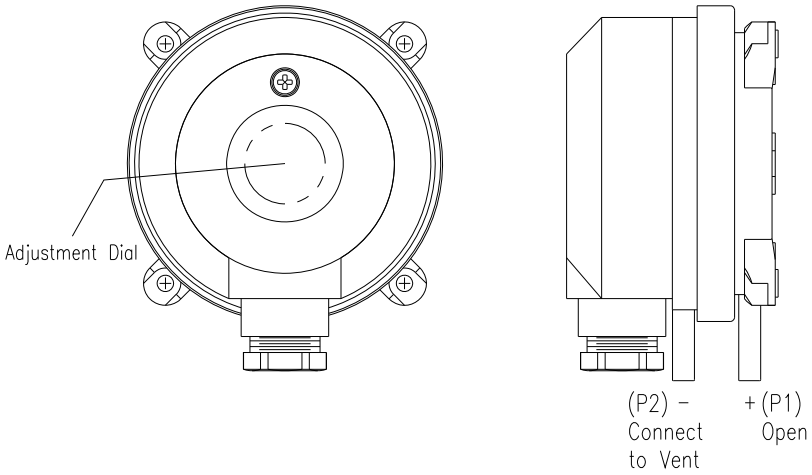
GFS Differential Air Pressure Switch Installation

Systems with a gas heating appliance or gas log set require a GFS differential air pressure switch to prove fan function and available draft in the venting system.

Mounting

Check the pressure switch for damages. Do not use if damaged! Do not mount the pressure switch on uneven, hot, or vibrating surfaces! Do not tighten the screws too much, in order to avoid deforming of the device's base. Mount the pressure switch with the pressure connections pointing downwards, to drain condensation moisture which might occur. In general, the mounting with two screws next to each other is sufficient. The maximum diameter of the screws must not be bigger than 0.315" (8 mm).

Figure 4



Pneumatic Connections

The two pressure ports on the end of the enclosure are labeled P1(+) and P2(-). Ensure these ports are connected correctly and that the shipping cap is removed from port(s).

Install the vent probe as close to the fan as possible on a fireplace system, figure 5. On a gas heating appliance vent system install the vent probe in the common, figure 6. Then connect the pressure tubing between the vent probe and the P2(-) port on the GFS pressure switch. Use the supplied high temperature 0.170" I.D. flexible tubing for the pressure connections.

If mounting location is farther than 10ft use 0.25" I.D. rigid tubing. **Cut 2 short pieces of the supplied tubing and use as couplings** for proper sealing, heat isolation and ease of installation. Arrange the tubing to minimize stress on the connections and ensure there are no kinks in the tubing. In vent systems it is recommended that the tubing slope back to the vent for draining to prevent condensate from collecting in the sensing line.

Ensure the tubing is clean and do not allow material to fall into the pressure ports as contamination could damage the switching mechanism. When removing tubing use care to avoid breaking the ports.

GFS Differential Air Pressure Switch Installation

Figure 5

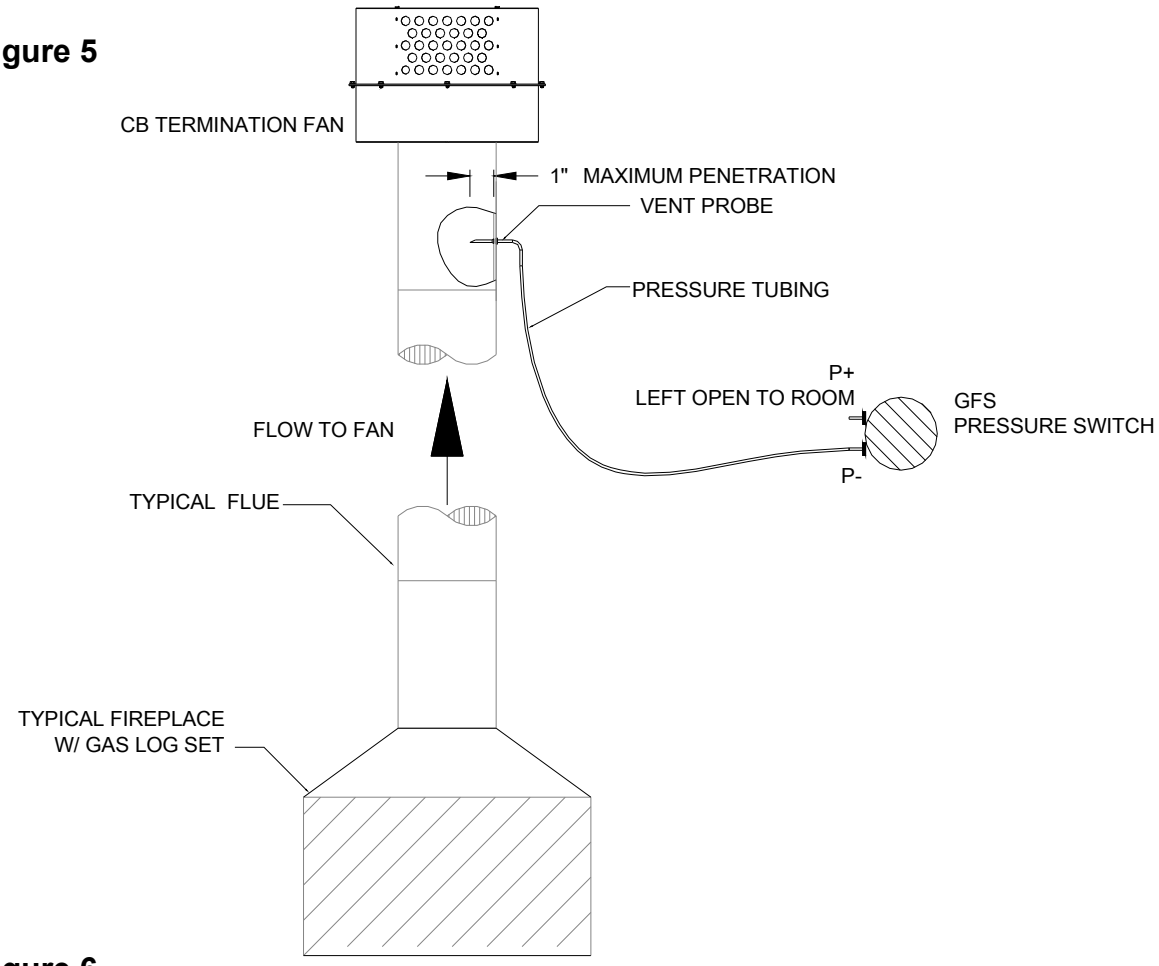
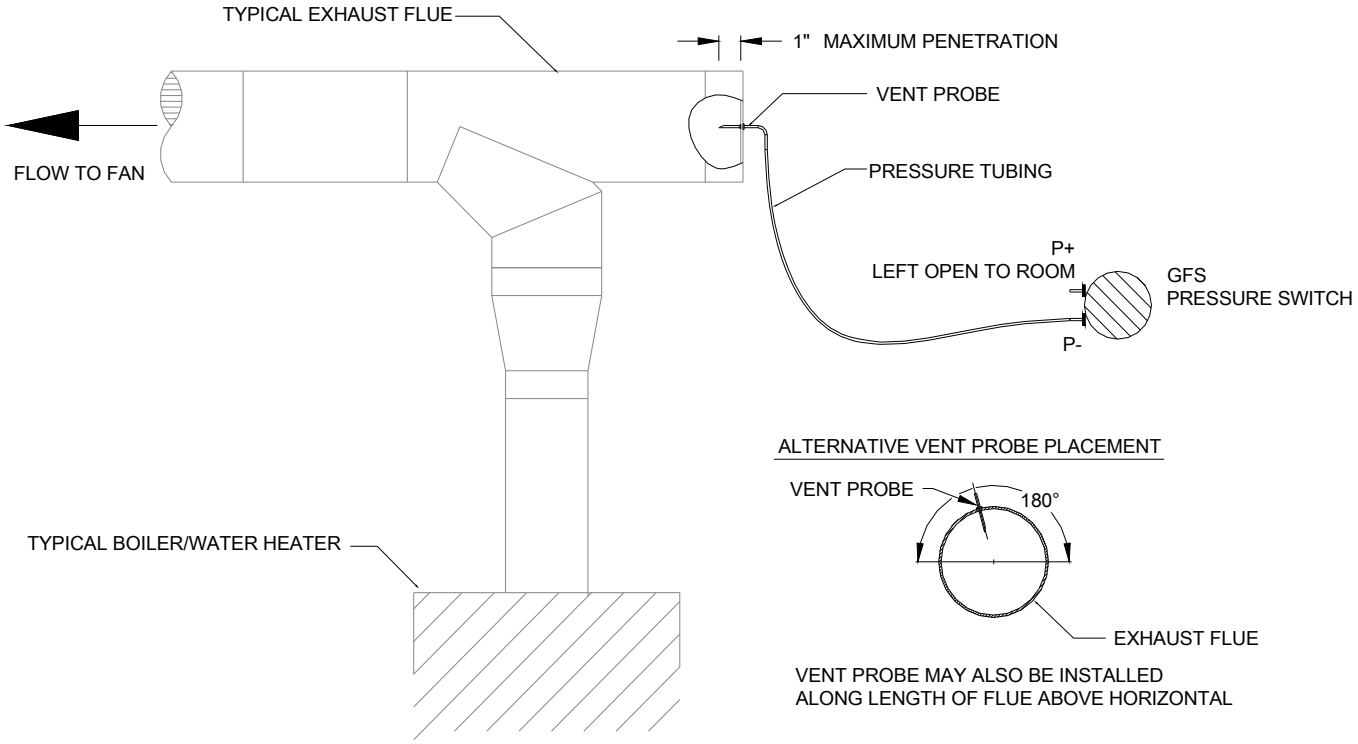


Figure 6



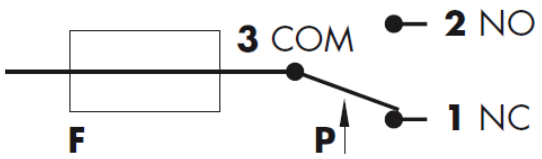
GFS Differential Air Pressure Switch Installation

Electrical

Connect Insert a conduit tube with 1/2” thread and tighten with a torque of 2.5 Nm. Assemble flex- and conductors accordingly.

Note: *This is a low voltage circuit. Do not run low voltage conductors with high voltage conductors.*

Make and verify connections per supplied system wiring diagram. The connections are intended for 0.25" (6.3 mm) crimp-type sockets. The switch (P) in the pressure switch is designed as a change-over contact. Pole 3 (COM) closes to pole 2 (NO) at increasing pressure and to pole 1 (NC) at decreasing pressure.



Connections for GFS		
MUC Terminal	To	GFS Terminal
24V (DC)	↔	**3**
Prover	↔	**2**

Switching Pressure Adjustment

Caution! Make absolutely sure that no voltage is applied to the electrical connections, before any settings on the pressure switch are carried out.

Set the desired pressure, which trips the switch at decreasing pressure, on the setting button using a screwdriver. When the pressure falls, the switch returns into its resting position, as soon as the pressure falls below the set switching differential. Place the cover and screw it to the pressure switch. Do not operate the system until the housing is closed. Check the trip and reset pressure by slowly increasing and decreasing pressure.

Switch should be adjusted so that it makes upon vent fan enabling and opens when fan stops.

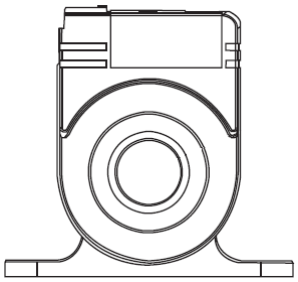
CS75 Current Switch for Supply Fan Installation

The CS75 current switch monitors line current of the supply fan for proof of operation. The switch closes the output contacts and energizes an onboard LED when the adjustable trip point is exceeded. The CS75 factory set trip point is 0.75A with a maximum adjustment range between 0.75 to 75A. The switch should be adjusted for the specific installation and site conditions for proper system operation.

Mounting

Check the CS75 current switch for damages. Do not use if damaged! Do not mount the switch on uneven, hot, or extreme vibrating surfaces! Mount the CS75 using two screws through the holes in the base. Install within an appropriate electrical enclosure. Do not tighten the screws too much, in order to avoid damaging the CS75 base.

Figure 7



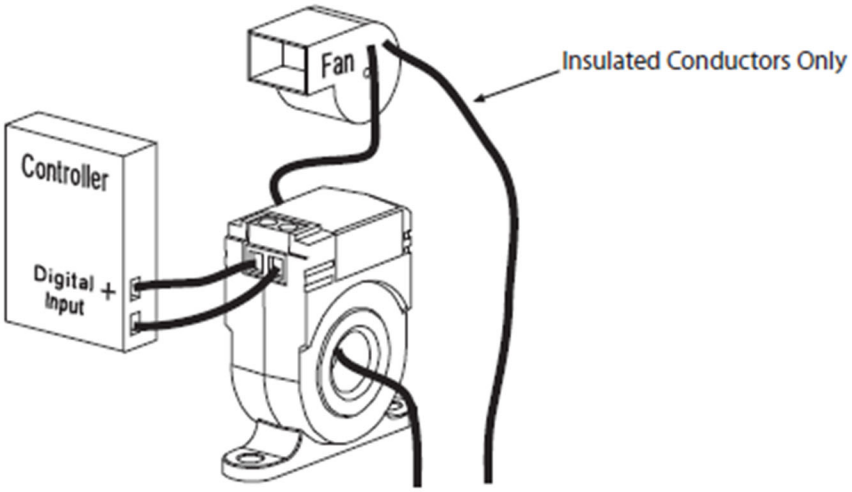
Electrical

Caution, danger to life!

Make absolutely sure that all voltage sources are secured before making any electrical connections!

Disconnect the power supply before making any connections to prevent electrical shock or equipment damage. Make all connections in accordance with national and local electrical codes. Route the load conductor to be monitored through the sensor hole in the CS75 current switch (Figure 8). Ensure the conductors are insulated and in good condition.

Figure 8



CS75 Current Switch for Supply Fan Installation (continued)

Note: *This is a low voltage circuit. Do not run low voltage conductors with high voltage conductors.*

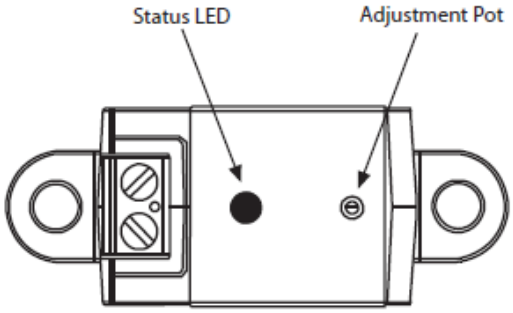
Connections for CS75		
MUC Terminal	To	CS75 Terminal
24V (DC)	↔	**Either**
Prover	↔	**Either**

Switch Adjustment

With the sensor installed, energize supply fan. Enable the MUC controller and adjust so that the supply fan is running at minimum speed or normal speed if non-adjustable.

The CS is factory set to switch at 0.75 Amps the status LED should be lit and the contacts should be closed if the supply fan motor draws more than 0.75 Amps at minimum speed.

Figure 9



With the supply fan running at minimum speed, rotate the multi-turn set point pot counter-clockwise until the status LED turns off. Then slowly turn the pot clockwise until the LED just comes on. Turn clockwise slightly more to eliminate false switching.

Test setting using a voltmeter across the contacts to verify switch operation. Disable the MUC controller. The supply fan should go into standby mode. The CS contacts should open and the LED off. If not readjust the CS switch and retest. After passing this test the CS is now set to detect the supply fan operational condition.

For applications with very small load currents at minimum speed (such as less than 1 Amp), wrap the monitored conductor through the sensor aperture several times to increase the current measured by the sensor.

For example, to monitor a 0-1 Amp load with a CS75, wrap the conductor through the sensor aperture 5 times so the sensor actually sees 0-5 Amps. For any application with multiple wraps, note that the CS75 maximum current rating must be divided by the number of wraps. For example, with one wrap the maximum current is 75 Amps, with 5 wraps the maximum current is 75/5 = 15 Amps. Ensure the load current is < 15 Amps or the device may overheat and be damaged.

GFS Differential Air Pressure Switch for Supply Fan Installation

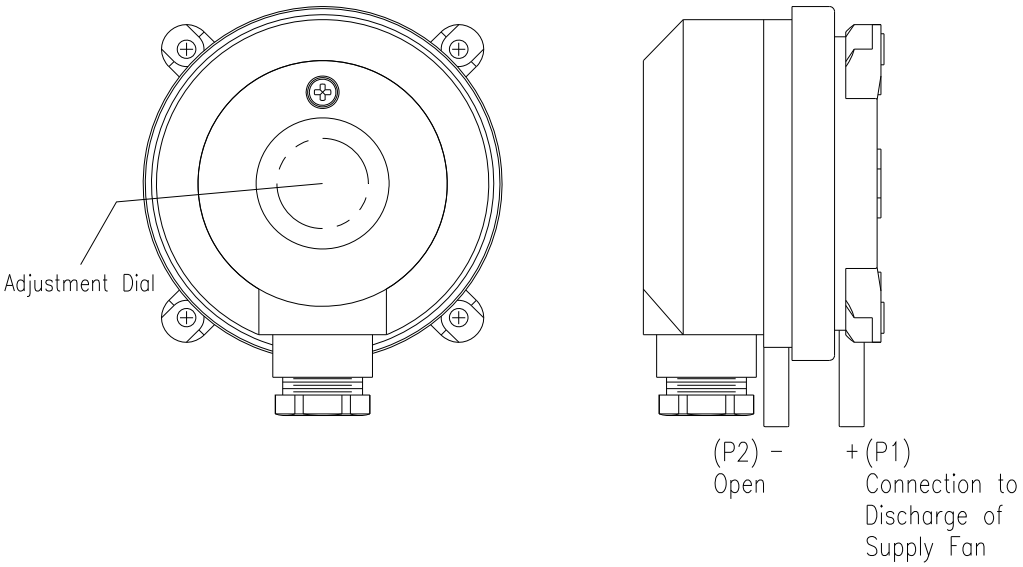
The GFS differential air pressure switch can be used as an alternate or complementary device to the CS75 current switch for supply fan applications. The GFS differential air pressure switch monitors outlet pressure of the supply fan for proof of operation.

The GFS switch normally open contact closes when the adjustable trip point is exceeded. The GFS factory set trip point is 0.08 "WC with a maximum adjustment range between 0.08 to 0.8 "WC. The switch should be adjusted for the specific installation and site conditions for proper system operation.

Mounting

Check the pressure switch for damages. Do not use if damaged! Do not mount the pressure switch on uneven, hot, or vibrating surfaces! Do not tighten the screws too much, in order to avoid deforming of the device's base. Mount the pressure switch with the pressure connections pointing downwards, to drain condensation moisture which might occur. In general, the mounting with two screws next to each other is sufficient. The maximum diameter of the screws must not be bigger than 0.315" (8 mm).

Figure 10



GFS Pneumatic Connections for Supply Fan (continued)

Pneumatic Connections

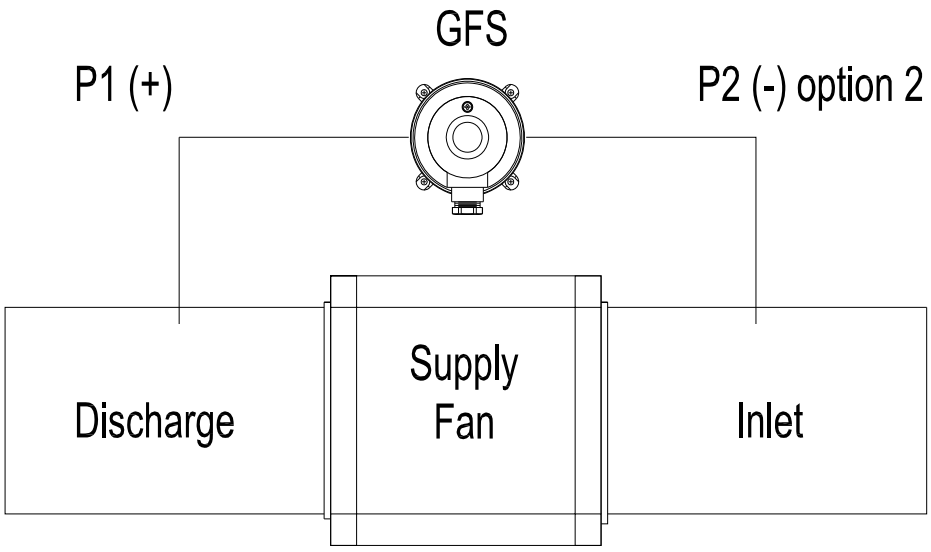
Remove plastic shipping cap(s) from the pressure port(s) on the end of the enclosure labeled P1(+) and P2(-) *(Figure 10).*

Option 1: Connect the tubing between the pressure probe on the discharge side of the supply fan outlet or duct and the P1(+) on the GFS *(Figure 11).* Use the supplied 0.170" I.D. flexible tubing for the pressure connections.

Option 2 (low pressure applications): Connect the tubing between the pressure probe on the discharge side of the supply fan outlet or duct and the P1(+) on the GFS. Install a second pressure probe on the inlet side of the fan or duct. Connect additional pressure tube to the P2(-) port.

Arrange the tubing to minimize stress on the connections and ensure there are no kinks in the tubing. Ensure the tubing is clean and do not allow material to fall into the pressure ports as contamination could damage the switch or block pressure signal.

Figure 11



GFS Differential Air Pressure Switch for Supply Fan (continued)

Electrical

Caution, danger to life!

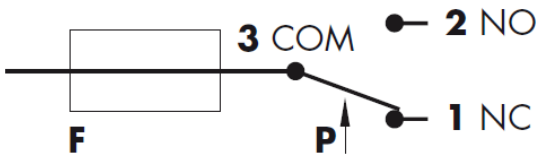
Make absolutely sure that all voltage sources are secured before making any electrical connections!

Disconnect the power supply before making any connections to prevent electrical shock or equipment damage. Make all connections in accordance with national and local electrical codes. Make and verify connections per supplied system wiring diagram.

Note: *This is a low voltage circuit. Do not run low voltage conductors with high voltage conductors.*

Insert a conduit tube with 1/2” thread and tighten with a torque of 2.5 Nm.
Assemble flex- and conductors accordingly.

The connections are intended for 0.25" (6.3 mm) crimp-type sockets. The switch (P) in the pressure switch is designed as a change-over contact. Pole 3 (COM) closes to pole 2 (NO) at increasing pressure and to pole 1 (NC) at decreasing pressure.



Connections for GFS		
MUC Terminal	To	GFS Terminal
24V (DC)	↔	**3**
Prover	↔	**2**

GFS Differential Air Pressure Switch for Supply Fan (continued)

Switching Pressure Adjustment

Caution, danger to life!

Make absolutely sure that no voltage is applied to the electrical connections, before any settings on the pressure switch are carried out.

Set the desired pressure, which trips the switch at increasing pressure, on the setting button using a screwdriver. When the pressure falls, the switch returns into its resting position, as soon as the pressure falls below the set switching differential. Place the cover and screw it to the pressure switch. Do not operate the system until the housing is closed.

Check the trip and reset pressure by slowly increasing and decreasing pressure. Switch should be adjusted so that it makes upon supply fan enabling and opens when supply fan stops. If more switch sensitivity is needed refer to pneumatic connections option 2.

Additionally, if system discharge is open to a space, the speed setting may be increased till the GFS switch makes or the discharge adjusted to increase discharge back pressure.

Operation - Modes

Run Mode 1 (Slide pot)

When the MUC provides at least 2VDC (from slide pot) and the ENABLE input is energized it will turn on the green LED and energize the damper relay to the closed position.

The gas relay will still remain in the normally open position until the PROVER circuit input is energized by 24VDC, the motor ON voltage feedback is >4 VDC, and the motor RPM frequency feedback is >150 pulses per second. If these requirements are not met within 15 seconds after the start command the MUC will go into Fail mode.

If the controller is in Run Mode and experiences a power loss, then the device enters the Back Up Mode with the alarm being activated.

Off Mode 1 (Slide pot)

When the MUC potentiometer is adjusted to the Off position providing a <1.5 VDC signal to the fan motor, the MUC enters Off Mode. The MUC will deactivate the red LED, green LED and alarm buzzer, and releases both the gas relay and damper relay into the normally open position.

Run Mode 2 (Enable Input)

When the MUC Enable input terminal is energized and the slide pot is >2VDC it will turn on the green LED and energize the damper relay to the closed position.

The gas relay will still remain in the normally open position until the PROVER circuit input is energized by 24VDC, the motor ON voltage feedback is >4 VDC, and the motor RPM frequency feedback is >150 pulses per second. If these requirements are not met within 15 seconds after the start command the MUC will go into Fail Mode.

If the controller is in Run Mode and experiences a power loss, then the device enters the Back Up Mode with the alarm being activated.

Off Mode 2 (Enable Input)

When the Enable input terminal loses the 24VDC input the MUC will deactivate the red LED, green LED and alarm buzzer, and releases the gas relay into the normally open position and begins a 60 second (post purge) output off delay timer. After the timer expires the MUC will secure the 0-10VDC analog speed signal to motor and releases the damper relay into the normally open position.

Operation - Modes

Fail Mode (Alarm)

The MUC after a 15 second delay will deactivate the green LED, activate the red LED, activate the alarm buzzer and releases the gas relay into the normally open position if any or combination of the following occurs:

1. If the fan motor provides <4VDC
2. If the RPM frequency feedback is <150 pulses per seconds (if not by-passed by jumper)
3. The Prover input is de-energized

The damper relay remains in the closed position during Fail Mode.

The MUC will automatically reset and resumes normal operation once the alarm condition clears. If the MUC should receive the missing feedback signal while in the Fail Mode for at least 2 seconds, then the MUC will return to the Run Mode and will deactivate the red LED and alarm buzzer, activate the green LED and drive the gas relay to the closed position.

During Fail Mode, an override (Mute/Silence) switch, when depressed will deactivate the audio buzzer for 2 minutes. After 2 minutes if the MUC is still in Fail Mode, the audio buzzer will be activated. Muted audio alert mode will flash the red LED with a 50% duty cycle.

Operation - Modes

Back Up Mode

The MUC has an internal battery installed to provide power back up operation for 5 to 10 minutes in the event of input power loss. The MUC will enter the Back Up Mode if the MUC was initially in the Run Mode providing at least 2VDC to the fan motor or if the MUC was in the Fail Mode.

If either of these initial conditions were present at the start of the power loss event then the MUC will enter a Back Up Mode by initiating an alarm condition thus driving both the green and red LEDs to On. Audio buzzer override functionality is available as in Fail Mode. A total loss of power will result in the gas relay and the damper relay going into the normally open positions thus disabling the gas valve actuator and damper actuator.

If the MUC was in the Off Mode at the start of a power loss event, the MUC will not enter Back Up Mode.

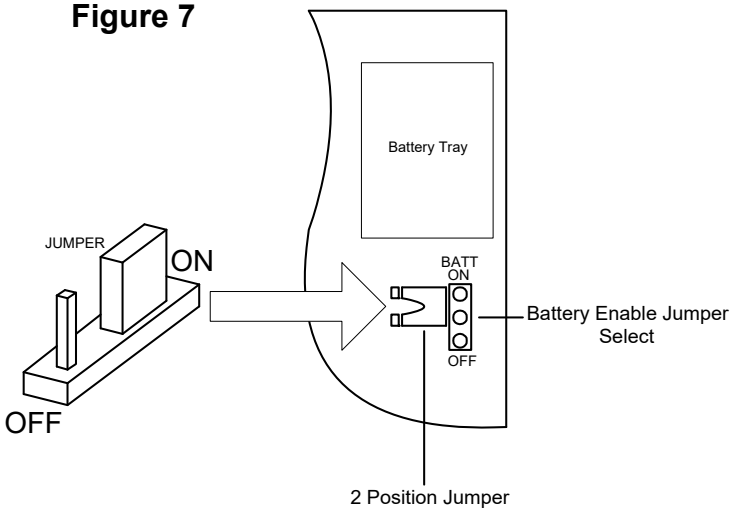
If the power loss event exceeds 10 minutes then the MUC will disable all functionality and will be considered in Off Mode. When power is resumed the MUC will reestablish the proper mode based upon the state of the control potentiometer and Enable input.

If the power loss event timer is not exceeded the MUC will enter back into the mode of operation it was in prior to the power loss event depending upon the state of the control potentiometer and Enable input.

The battery is 2) CR2032 Lithium-Manganese Dioxide Coin cells (3V 220mAH) to allow easier user battery changeability. If the battery requires a change then the user will be alerted via a flashing 50% duty cycle of the green LED (only in Run Mode). Battery servicing is left to the user as the MUC has no battery charging capabilities.

To enable the back up battery the 2 position jumper needs to be put in the battery enable position as illustrated in figure 7. The jumper should short the middle pin with the top pin marked “ON.”

Figure 7



Operation - Inputs and Outputs

Enable Input

The MUC has an Enable terminal point that receives a constant 24VDC signal for normal operation but if disconnected by a remote switch the MUC immediately disables the gas relay. After a 60 second delay the MUC enters the OFF mode without regard to the slide pot position.

If the Enable input is re-energized before the delay expires the MUC will enter RUN mode when all requirements for run are met and energizes the gas relay to closed position.

Prover Input

The MUC has a Prover terminal point that receives a constant 24VDC signal for normal operation but if disconnected by a remote switch the MUC after a 15 second delay enters Fail mode and disables the gas relay.

This input is ignored in OFF mode.

Fan Motor Control

The MUC controls the fan motor speed via a 0-10VDC signal and is set by the slide potentiometer mounted on the unit. Adjusting the slide potentiometer to the right enables the MUC and increases the fan speed. Adjusting the slide potentiometer to the left will decrease motor speed until the signal output is <1.5VDC which places the MUC into Off mode.

RPM Frequency Monitoring

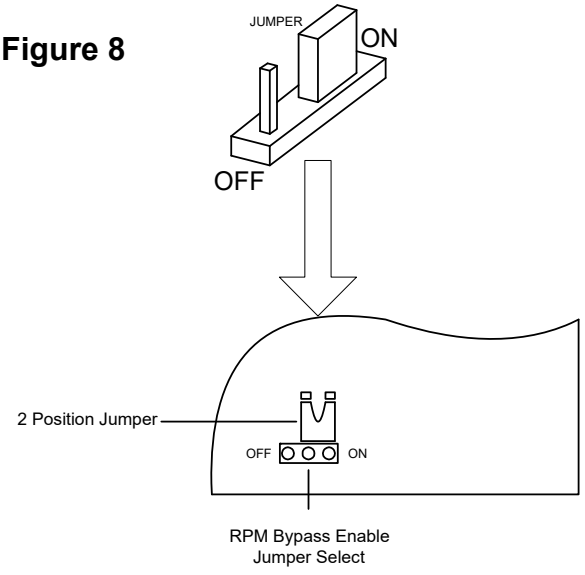
The MUC will provide a constant 5VDC excitation voltage to the fan motor to receive back a pulse train of 36 pulses per revolution. 60 pulses per second = 100 RPMs

When the motor frequency feedback is >150 pulses per second the motor frequency requirement is proven for run operation.

This input is ignored in OFF mode.

A Bypass jumper is available to disable the MUC motor RPM frequency feedback monitoring requirement for run operation. To enable the RPM Bypass Enable, the 2 position jumper for RPM Bypass Enable needs to be put in the RPM Bypass On position as illustrated in figure 8. The jumper should short the middle pin with the right pin marked “ON.”

Figure 8



Operations - Inputs and Outputs

Motor Status Feedback Voltage

A voltage feedback signal of 5VDC is be provided to the MUC for fan status. The motor ON status feedback threshold is >4VDC

This input is ignored in OFF mode.

Relay Control

The gas relay will be in the closed position during Run Mode and in the normally open position when in Fail Mode and Off Mode. The damper relay will be in the closed position during Run Mode and Fail Mode and in the normally open position when in Off Mode.

LED Display

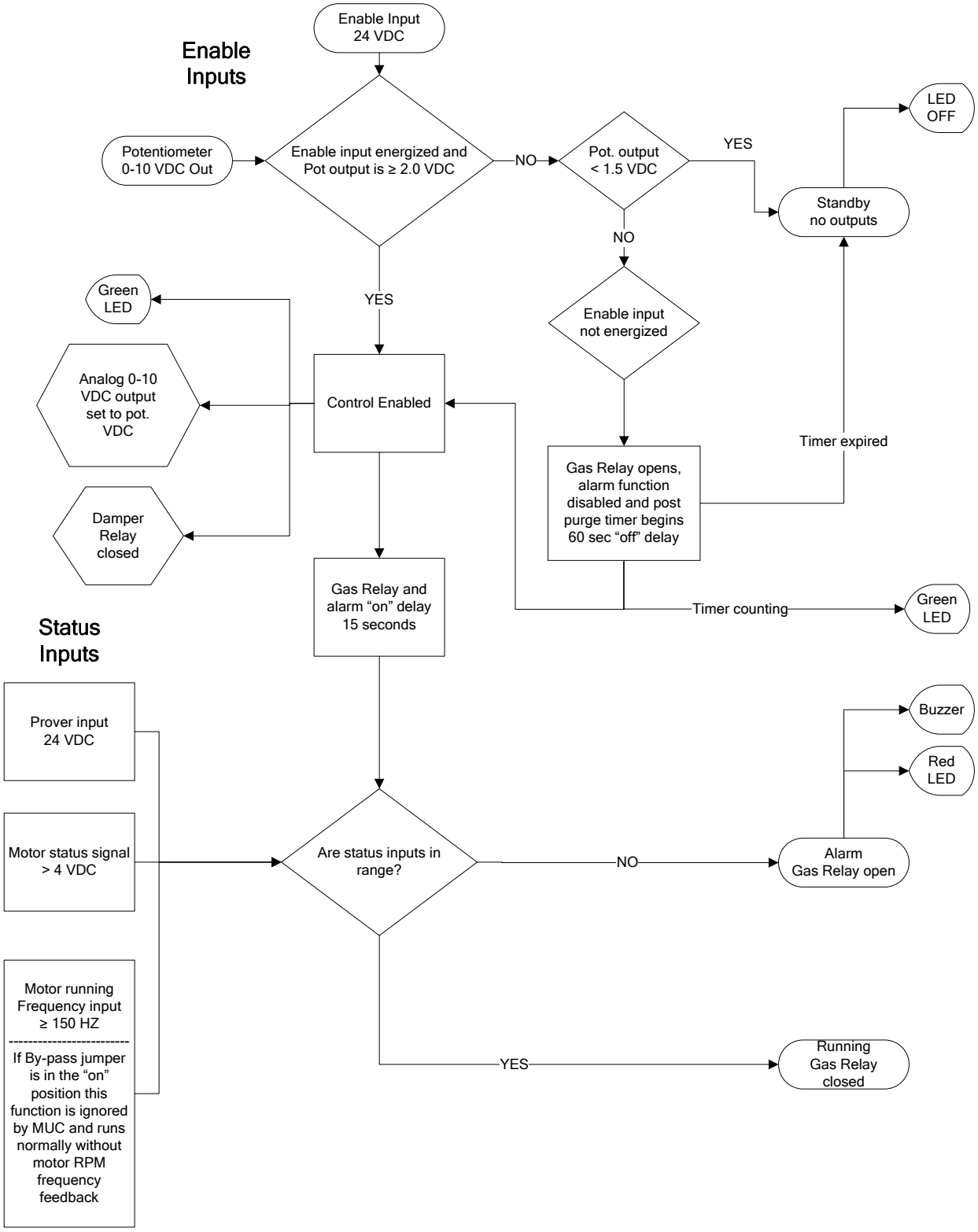
The MUC has two colored LEDs to indicate RUN and FAIL conditions. These LEDs are also be used to indicate battery status and audio alert mute status. When the green LED flashes during the RUN mode this is a low battery voltage status and indicates the batteries should be replaced.

Green	Red	Indication
OFF	OFF	Not running
ON	OFF	Running normally
FLASHING	OFF	Running - Battery voltage level low
OFF	ON	Fail mode active - alarm condition present
OFF	FLASHING	Fail mode active - Audio muted
ON	ON	Back Up mode active - power loss

Audio Alert

The alarm will be activated during Fail Mode and deactivated during Run Mode. The Audio alert can also be muted by the user for 2 minutes during alarm mode via an override push button switch mounted on the MUC.

Operation - Flow Chart



Operation - Troubleshooting Chart

Issue Description	Actions
Fan will not run	1. Check supply voltage 2. Check disconnect (s) 3. Verify control potentiometer setting 4. Verify wiring 5. Verify 0-10 VDC signal and polarity at fan motor 6. Check fan motor
MUC will not run	1. Check supply voltage between the **24V** terminal and the **COM** terminal 2. Verify the **ENABLE** input has 24VDC 3. Check **Back Up** batteries
Red LED On (Fail Mode)	1. Check **PROVER** circuit 2. Check **MSTAT** circuit 3. Check **RPM** feedback circuit 4. Check fan operation
Green LED Flashing	1. Replace batteries

LED Chart

Green	Red	Indication
OFF	OFF	Not running
ON	OFF	Running normally
FLASHING	OFF	Running - Battery voltage level low
OFF	ON	Fail mode active - alarm condition present
OFF	FLASHING	Fail mode active - Audio muted
ON	ON	Back Up mode active - power loss

References

KW
All Fan Models
Installation and Operation Manuals

KW
CS75 Current Switch
Installation and Operations Instructions

KW
GFS - Differential Air Pressure Switch
Installation and Operations Instruction Sheets

Notes

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