



MODULARM

BROUGHT TO YOU BY
KITCHEN BRAINS®

INSTALLATION & OPERATING GUIDE

Model 75, 75B, 75C & Lead/Lag Board



Save the instructions
for future reference.
www.KitchenBrains.com

24/7 Toll-Free Technical Support
1-800-243-9271
(from the U.S., Canada and the Caribbean)

TABLE OF CONTENTS

MODEL 75 & 75B GENERAL DESCRIPTION	2
CONTROLS, INDICATORS & FUNCTIONS	3
INSTALLING THE ALARM	4
SETTING UP THE ALARM	4
OPERATING SEQUENCE OF ALARM	5
CALIBRATION	5
MODEL 75C CONTROL INSTRUCTIONS	5
SPECIAL OPTIONS	6
SAMPLE SPECIFICATION MODEL 75 & 75B	6
WIRING DIAGRAM	7
ADDITIONAL INSTRUCTIONS FOR UL LISTED VERSIONS OF MODEL 75 AND 75B TEMPERATURE ALARMS	8
LEAD/LAG BOARD: INSTALLATION AND OPERATION . . .	9

MODEL 75 & 75B GENERAL DESCRIPTION

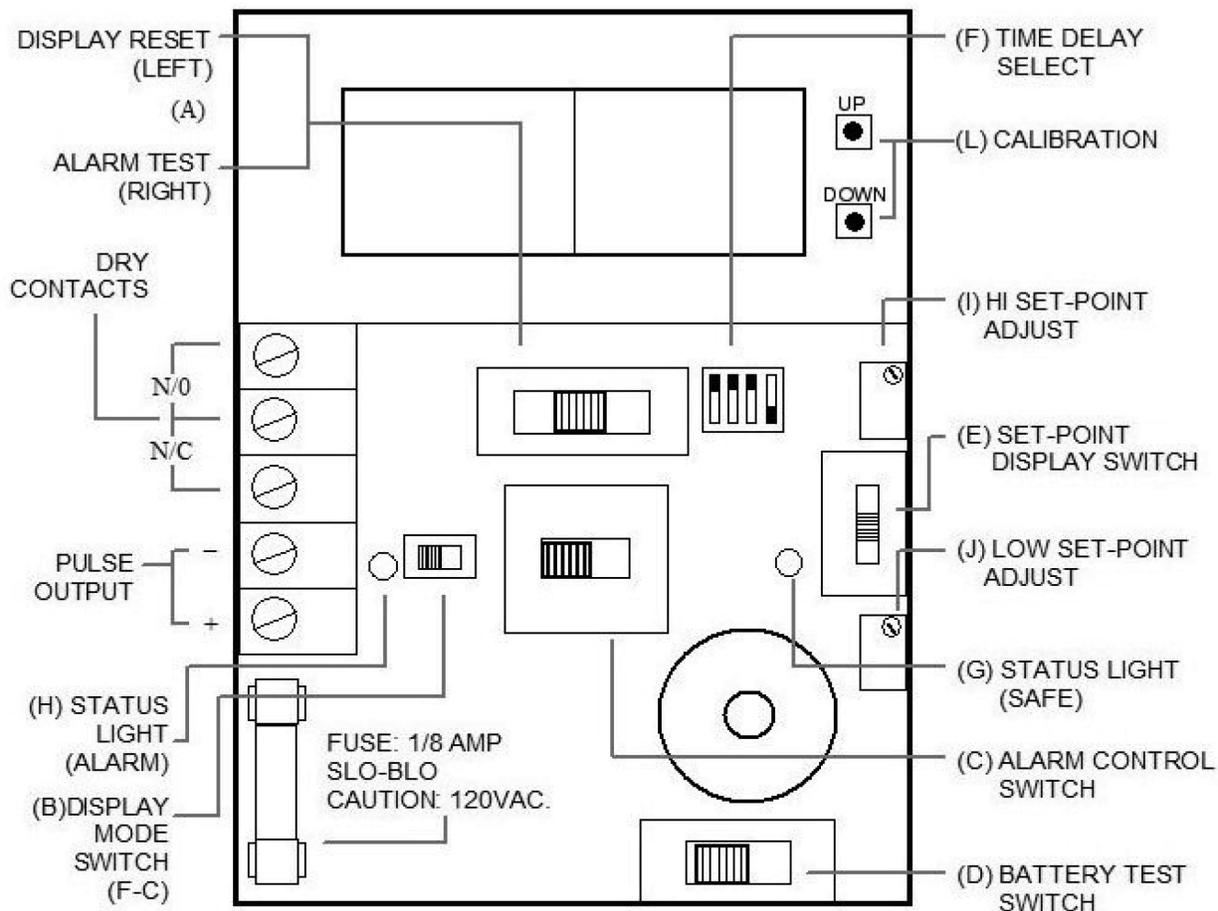
The Modularm Model 75 Temperature Monitoring System is designed to constantly monitor temperature and will provide audible, visual and remote notification whenever refrigeration failure occurs. The basic operation of the Model 75 is described as follows:

Through the use of an electronic temperature probe the ambient temperature of a walk-in cooler or freezer or other temperature sensitive environment is constantly monitored. When the monitored temperature goes above or below the temperature setpoints an electronic time delay circuit is activated. The purpose of the time delay is to override defrost cycles and other short term changes in temperature that occur during normal operation. When temperature in the monitored area exceeds the setpoints beyond the length of the time delay the alarm activates, providing audible, visual and, if so connected, remote notification that an alarm condition has occurred.

NOTE 1: The Model 75 offers Battery Backup as an option. (75B) When so ordered, the Model 75B will also annunciate any power failures which may occur.

NOTE 2: The Model 75 offers Thermostatic Control as an option. (75C) When so ordered, the Model 75C will provide electronic temperature control.

MODULARM MODEL 75 (B)



QUICK SET UP INSTRUCTIONS

1. Slide display reset switch (A) to left to stop display from blinking.
2. Select Fahrenheit or Centigrade with display mode switch (B).
3. Select and adjust high and low setpoints with setpoint display switch (E) and high and low setpoint adjusts (I & J).
4. Select time delay with time delay select switch (F).
5. Alarm control switch must be in right hand (SAFE) position when temperature is okay for normal operation.

CONTROLS, INDICATORS, & FUNCTIONS

- (A) DISPLAY RESET, ALARM TEST SWITCH – Holding switch momentarily to left stops Digital Readout from blinking and provides constantly on temperature display. Holding switch to right provides TEST MODE. In Test, display will read --- F or --- C, and alarm will activate in 3 – 30 seconds depending on length of time delay selected.
- (B) DISPLAY MODE SWITCH – Selects between Fahrenheit or Centigrade.
- (C) ALARM CONTROL SWITCH – Disables or Resets alarm.
- (D) BATTERY TEST SWITCH (75B) – Used to check condition of backup battery. (Battery is rechargeable & 75B contains charging circuitry.)
- (E) SETPOINT DISPLAY SWITCH – Provide display of Alarm Temperature Setpoints on Digital Readout. Holding up displays high setpoint. Holding down displays low setpoint.

- (F) TIME DELAY SELECT SWITCH – Provides selection of length of Time Delay before alarm activates.
- (G, H) STATUS LIGHTS – Provides visual indication of monitored condition. (Green = Safe. Red = Abnormal or Alarm Condition)
- (I, J) SETPOINT ADJUSTMENTS – Allows for adjustment of high & low Alarm Temperature Setpoints.
- (K) DRY CONTACTS, PULSE OUTPUT (Color code on page 8.) – Provides for activation of Remote Notification Equipment. (Bells, Sirens, Lights, Dialers, Central Station, Etc.)
- (L) CALIBRATION SWITCHES – Allows for calibration of the DIGITAL READOUT.

INSTALLING THE ALARM

1. Remove the two screws which hold on the faceplate and remove the faceplate.
2. Mount the unit in a suitable location:
 - a. Surface Mount – Use the four mounting holes on the back wall of the enclosure.
 - b. Flush Mount – Make a cutout in the mounting surface, 9 3/8" high x 4 3/8" wide. Use the four mounting holes on the front flange of the enclosure.
3. Run the probe into the monitored compartment and locate the sensor in a spot which will typify the average ambient temperature. Recommended location is in front of the blower on the ceiling in the center of the room. Make sure that the sensor and sensor wire is positioned so that it will not be damaged by any products or items in the monitored area. Fasten the probe with the provided 3/8" clamp. **NOTE:** If desired, the sensor wire can be lengthened hundreds of feet using ordinary thermostat wire without affecting accuracy of the displayed temperature. It can be shortened as well. If this is necessary, proper polarity must be observed when reconnecting probe. i.e., white to white & black to black. If a splice is made in the monitored compartment, seal with silicone to prevent moisture from causing erroneous temperature readings. Also, if probe is extended into monitored compartment through back wall of alarm, seal opening to prevent moisture from entering alarm.

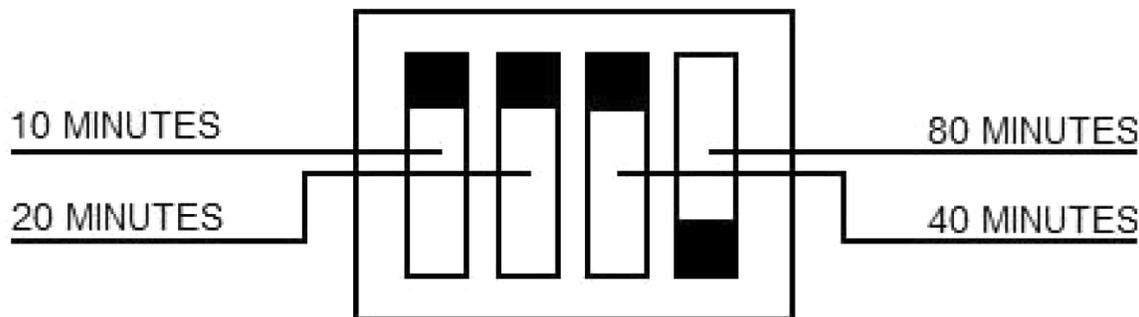
4. Bring AC Power (110VAC Standard) 220VAC Optional if so ordered) through suitable conduit to the hole in the top of the enclosure. Connect to the black & white #18 wires which are located in the small compartment above the actual alarm unit. Insulate the splice and tuck the wires back in the compartment.

SETTING UP THE ALARM

1. Provide the power to the alarm unit. If horn is sounding, throw ALARM CONTROL SWITCH to opposite position.
2. Digital Readout blinks when power is first applied or whenever power is interrupted and restored. Stop the readout from blinking by sliding the DISPLAY RESET SWITCH to the left position and then releasing.
3. Select Fahrenheit or Centigrade with the DISPLAY MODE SWITCH. Left is Fahrenheit, Right is Centigrade.
4. Select the alarm setpoints with the SETPOINT DISPLAY SWITCH and the SETPOINT ADJUSTMENT CONTROLS. The selected setpoint will display on the Digital Readout. (Standard setpoint range is -40F to 120F or -40C to 49C.)
5. Select length of time delay desired with Time Delay Select Switch. This switch matrix provides four switches which may be used singly or in combination to produce any time delay from 10 minutes to 150 minutes in 10 minute increments. A switch is selected if the **top of the rocker** is pushed in. See drawing on following page:

IMPORTANT!! AT LEAST ONE TIME DELAY SWITCH MUST BE SELECTED OR THE ALARM WILL NOT FUNCTION PROPERLY.

**EXAMPLE: SET FOR 70 MINUTES DELAY
(BLACK SQUARE = PUSHED IN)**



OPERATING SEQUENCE OF ALARM

Once properly installed and set up, virtually all user alarm functions are controlled by the ALARM CONTROL SWITCH. This switch has two positions and for all monitored conditions there is only one position of the ALARM CONTROL SWITCH where the alarm will be silent. The Model 75 was designed in this way so as to prevent the user from inadvertently leaving the ALARM CONTROL SWITCH in the “wrong” position. WHEN THE ALARM IS SILENT, THE CONDITION OF THE MONITORED BOX IS INDICATED BY THE STATUS LIGHTS.

Normal Sequence of Operation is as follows:

- GREEN LIGHT = SAFE CONDITION.
- BLINKING RED LIGHT = ABNORMAL CONDITION. TIME DELAY INITIATED.
- SOLID RED LIGHT = ALARM CONDITION. (HORN SOUNDS. RELAY ACTIVATED. 6 VOLT, ONE SECOND PULSE GENERATED ACROSS PULSE OUTPUT TERMINALS.)

NOTE: ON 75B, BLINKING RED LIGHT + BEEPING HORN = POWER FAILURE.

When an alarm condition occurs, throw ALARM CONTROL SWITCH toward RED LIGHT to silence horn and release relay. RED LIGHT will remain on to indicate alarm condition. Restoration of safe condition will cause alarm to sound again indicating that ALARM CONTROL SWITCH must be returned to safe position.

CALIBRATION

In the event that the Model 75 is not reading temperature properly the alarm can be calibrated as follows:

1. Remove the faceplate. Calibration Switches are on the DIGITAL READOUT MODULE
2. Use accurate reference thermometer in physical contact with probe (or immersed in water) or use small ice bath as reference.
3. After probe has stabilized for a few minutes, use the CALIBRATION SWITCHES to change the displayed temperature until it agrees with reference.
4. After calibration is complete, check and readjust setpoints.

MODEL 75C CONTROL INSTRUCTIONS

The Model 75C expands the functions of the regular Model 75 by offering temperature control capability. The control circuitry operates as an “on-off” type thermostat, maintaining temperature between a selected setpoint and a selected differential setting. In all instances, the setpoint is the high limit and the differential is the low limit.

Setup and Connection is as follows:

1. Terminal strip on control board is, from left to right, N/O – COMMON – N/C. Standard control configuration is that normally open contacts make on rise. 115 or 230 VAC may be applied across these contacts, but DO NOT EXCEED THE CONTACT RATING OF 6 AMPS. Use contacts to activate secondary controlling devices such as contactor coils or solenoids.

2. A Pin Jumper Matrix on the Control Board enables the user to read and adjust the Control and Differential Setpoints in accordance with the application. (**NOTE:** On units which share setpoints for the alarm and control function the pin jumper matrix and separate control setpoints are deleted.) This matrix is the two rows of gold pins located near the Control Terminal Strip and it is utilized in the following manner:
 - ◦ ALARM PROBE
 - ◦ CONTROL SETPOINT (HIGH LIMIT)
 - ◦ DIFFERENTIAL (LOW LIMIT)

Standard location for the provided PIN Jumper on the Jumper Matrix is the ALARM PROBE position.

(NOTE: On units which share one probe for the alarm and control function the alarm probe position has been deleted. Therefore, place the jumper in the CONTROL PROBE position to display monitored temperature. To read CONTROL SETPOINT (HIGH LIMIT), relocate the jumper to the CONTROL SETPOINT Pins.

(NOTE: The CONTROL SETPOINT must be adjusted first, as the DIFFERENTIAL adjustment is dependent on and affected by the CONTROL SETPOINT.) The CONTROL SETPOINT will read on the Digital Readout and is adjusted with the gray trimpot located next to the PIN Jumper Matrix. To read the DIFFERENTIAL (LOW LIMIT), relocate the jumper to the DIFFERENTIAL Pins and the DIFFERENTIAL SETPOINT will be displayed. Adjust the differential with the black trimpot next to the Setpoint Trimpot.

(NOTE: Both limits are displayed as actual high and low limit values. Example: A control set with a high limit of 38F and a low limit of 34F will display these temperatures when the control setpoints are read. Therefore, the differential is 4F)

ONCE ADJUSTED, RETURN THE JUMPER TO THE PROBE POSITION IN ORDER TO DISPLAY PROPER MONITORED TEMPERATURE.

SPECIAL OPTION

PANIC ALARM: This option provides a means by which the alarm will annunciate when personnel are inadvertently locked in a compartment. When so ordered, 3 conductor twisted wires are attached to the alarm for activation of this feature. Wires are connected to an IP-2 illuminated push button (sold separately) which is installed in a waterproof enclosure inside of the compartment. Activation of this switch causes the alarm to annunciate.

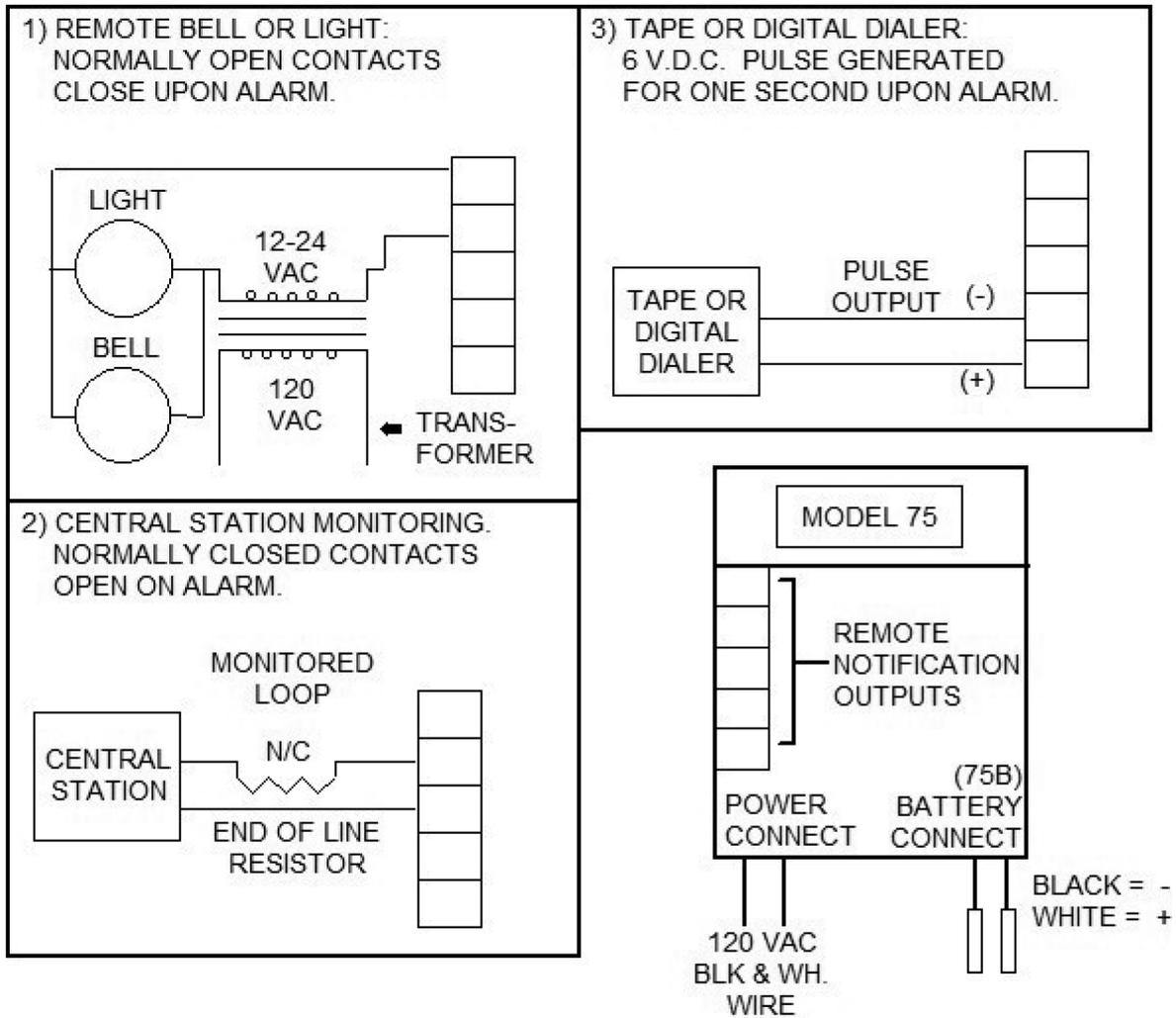
SAMPLE SPECIFICATION: MODEL 75 & 75B

MODEL 75: Each refrigerated compartment shall be monitored by a MODULARM MODEL 75 TEMPERATURE ALARM (Surface or Flush Mount.) The alarm shall provide a constant digital readout of monitored temperature, field adjustable high & low alarm temperature set-points and field adjustable time delay to override normal rises in compartment temperature. Two visual status indicators are provided: a green "Safe" light and a red "Alarm" light. Under normal temperatures the green light is on and the red light is off. Abnormal temperatures cause the green light to extinguish and the red light to blink. Abnormal temperatures exceeding the time delay cause a constantly on red light, activation of the horn for audible annunciation and activation of the self-contained relay for remote notification. The unit shall be reset manually with the Alarm Control Switch. Fail safe circuitry shall prevent accidental disabling of the unit. The alarm shall be enclosed in a drawn aluminum enclosure with a stainless steel faceplate.

75B ADDENDUM: When power failure occurs the green light will extinguish and the red light will begin to blink. Simultaneously, the horn will beep on and off and the internal relay will activate for remote notification. Once AC power is restored, the recharging circuit will recharge the battery so it can be ready for the next AC failure event.

WIRING DIAGRAM

TYPICAL REMOTE NOTIFICATION APPLICATIONS:



ADDITIONAL INSTRUCTIONS FOR UL LISTED VERSIONS OF MODEL 75 AND 75B TEMPERATURE ALARMS

The Model 75 and 75B Temperature Alarms are now offered as UL Listed products (file #E187350). Certain modifications have been made to the original products in order to conform to UL standards. These modifications have to do with access to remote notification functions, namely, dry contact output and pulse output. On page 3 of the instruction booklet is a diagram illustrating component layout of switches, indicators and connection points. A five screw terminal strip is shown as connection points for remote notification functions. Also, on page 7 wiring diagrams of some typical remote notification applications are shown. On the UL Listed version the illustrated terminal strip in these diagrams has been deleted and is replaced by individual 18 gauge wires. Color codes for these wires is as follows:

TERMINAL	WIRE
DRY CONTACTS – N/O	BLUE
DRY CONTACTS – COMMON	PURPLE
DRY CONTACTS – N/C	YELLOW
PULSE OUTPUT – NEGATIVE (-)	GREY
PULSE OUTPUT – POSITIVE(+)	RED

BLACK AND WHITE WIRES ARE FOR CONNECTION TO 120VAC AND GREEN WIRE IS GROUND.

RETROFITTED DEVICES AS MODIFIED IN THE ABOVE MANNER SHALL BE USED WITH A SUITABLE WIRING COMPARTMENT ACCORDING TO THE NEC CODE.

LEAD/LAG BOARD: INSTALLATION AND OPERATION

The Lead/Lag board, when incorporated into the Model 75 Temperature Alarm, provides for sequential activation and deactivation of redundant refrigeration systems. Operation is as follows:

Operation

A single pole double throw relay is driven by a timer circuit to change its condition from inactivated to activated and vice versa at user selectable time intervals. The system is configured so that there is contact closure across the System A contacts when the System A light is lit and there is contact closure across the System B contacts when the System B light is lit. Contacts are rated at 6 amps max @ 120VAC. A clock LED is provided which will blink on and off constantly to indicate that the timer circuitry is operating. The operation of this electronic toggle function is interconnected with the alarm circuitry so that in the event of a refrigeration alarm, the lead/lag board will automatically switch to the "other" system, regardless of the system that was operating at the time the alarm occurred. When such an event happens, the alarm will lock on to the backup system and will prevent the failed system from being reactivated until temperature returns to normal and the alarm has been reset. During such an alarm condition, the timer circuit will temporarily be disabled and the clock LED will stop blinking. (It may be on or off.) A System Select switch has been provided for service purposes and to allow the user to select the desired system operation. Whenever this switch is pressed, in addition to toggling back and forth between the two systems, it will also reset the timer circuit. In the event of an alarm, operation of this switch is locked out until temperature returns to normal and the alarm is reset.

Selecting Time

A pin jumper, labeled A, B and C, is provided for selecting the time delay range, and two dip switches, one for System A and one for System B, are provided for selecting the desired specific operating time interval for each system.

The pin jumper and the dip switches work together to provide the following ranges:

Pin Jumper Position	Dip Switch Range
A	Switch 1 = 6 hours Switch 2 = 12 hours Switch 3 = 24 hours Switch 4 = 48 hours

Press the top of the respective dip switch to select it. **At least one dip switch must be selected for each system for proper operation.** In Pin Jumper position A, switches may be used individually or in combination to produce a time interval from 6 hours to 90 hours in 6 hour increments.

Pin Jumper Position	Dip Switch Range
B	Switch 1 = 12 hours Switch 2 = 24 hours (1 day) Switch 3 = 48 hours (2 days) Switch 4 = 96 hours (4 days)

In Pin Jumper position B, switches may be used individually or in combination to produce a time interval from 12 hours to 180 hours (7.5 days) in 12 hour increments.

Pin Jumper Position	Dip Switch Range
C	Switch 1 = 1 day Switch 2 = 2 days Switch 3 = 4 days Switch 4 = 8 days

In Pin Jumper position C, switches may be used individually or in combination to produce a time interval from 1 day to 15 days in 1 day increments.

Operation example: If you wish to have System A operate for 6 days and you wish to have System B operate for one day, select one of the following:

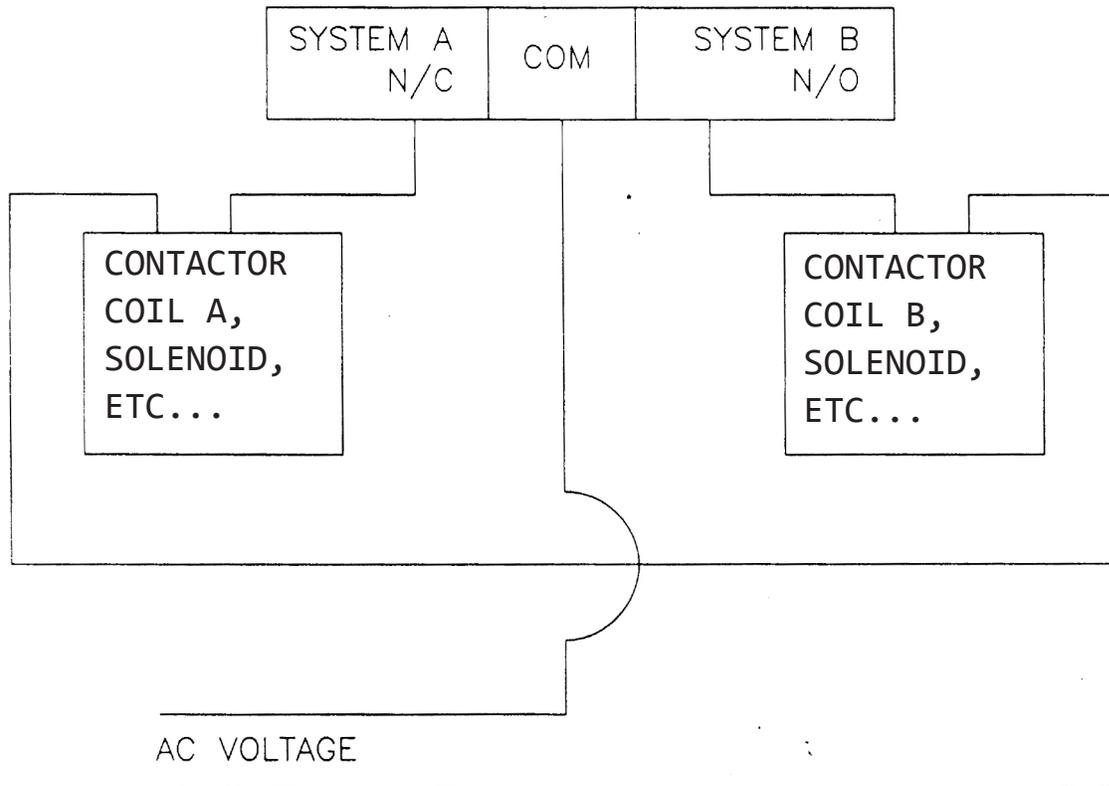
1. Select pin jumper position B. On System A dip switch, select switch 3 **and** switch 4. (2 days + 4 days = 6 days). On System B dip switch, select switch 2 (1 day).
2. Select pin jumper position C. On System A dip switch, select switch 2 **and** switch 3. On System B dip switch, select switch 1.

In either configuration, System A will operate for 6 days and System B will operate for 1 day unless interrupted by an alarm condition or by pressing the System Select Switch.

Installation

Install and configure the alarm itself in accordance with the provided alarm instructions. Connect the refrigeration systems to the 3 screw terminals in the lower left corner of the Lead/Lag board using the provided connectors in accordance with the accompanying diagram. The alarm board may be temporarily removed from the enclosure to facilitate routing of the wires. If the alarm board is removed, use caution when re-installing to avoid pinching wires. Configure the Pin Jumper and the System dip switches to provide desired operation.

TERMINAL STRIP LEAD LAG CONTROL



GENERAL SAFETY MEASURES & PRODUCT LIMITATIONS - INSTALLATION

- This product ("Product") must be installed by a licensed electrician experienced in working in the types of environments for which this Product is intended to be utilized; specifically, commercial walk-in coolers and freezers ("Equipment").
- Personnel installing the Product must carefully and completely read the Operating and Installation Instructions ("Instructions"), and instructions and specifications of the Equipment manufacturers, before attempting to operate and install the Product. Failure to comply with the Instructions, and the Instructions and specifications of the Equipment manufacturers, may result in personal injury and/or property damage and may void the warranty of the Product. Retain the Instructions for future reference.
- The Product shall only be used for the purposes described in the Instructions.
- During Installation of the Product, all applicable laws, regulations and industry rules, including local electrical and safety codes, the National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA), must be strictly followed. Consistent therewith, follow applicable electrical codes regarding running of low voltage wiring and high voltage wiring in separate conduits and use appropriately rated wire (insulation type, voltage rating and wire gauge) for all connections. Supply connection wiring must be rated at least 90°C. Use copper conductors only.
- The enclosure used for mounting the Product must be properly grounded according to electrical code.
- Confirm that the power source conforms to the requirements of the Product before connecting.
- Do not exceed the rated limits of the Product. Refer to the Product specifications for suitability of the Product to the application.
- The Product is not suitable for use in wet locations. Do not expose the Product to water, moisture or condensation. In no event should the Product be exposed to environments where sudden temperature changes with high humidity may result in the formation of condensation.
- **Any openings in the walls, ceiling or floor of the Equipment for wiring or other reason must be sealed (made airtight and watertight) with appropriate materials (e.g., silicone, caulk or foam), both on the outside and inside of the Equipment, to prevent moisture or condensation from entering the compartment of the Equipment and forming and accumulating on the interior walls of the compartment and the contents of the compartment, including the Product. Failure to properly seal such openings may (i) result in damage to the Equipment and contents of the compartment (ii) pose a safety hazard and (iii) void the warranty of the Product.**
- **To prevent moisture or condensation from entering or forming in the enclosure used for the Product, any openings in this enclosure (for wiring access or other purpose) must be appropriately sealed with materials such as silicone, caulk or foam.**
- Installation of the Product should be inspected and the Product tested by qualified personnel to ensure the Product performs safely and in accordance with the Product specifications. Periodic testing of the Product should be performed on an ongoing basis (at least quarterly) to ensure the Product continues to perform properly.
- All personnel operating, maintaining, repairing or interfacing with the Product must be instructed in the use of the Product and provided with the Instructions. The Instructions must be kept in an accessible location for easy reference.
- **WARNING:** Hazard of electric shock! Power sources must be turned off or otherwise disconnected prior to installation or servicing of the Product. Lock and tag power disconnects to prevent an unexpected application of power.

SPECIFICATIONS

DIMENSIONS

SURFACE MOUNT – 9”L x 4”W x 1.8”D
FLUSH MOUNT – FLANGE DIMENSION –
10.375”L x 4.75”W
CUTOUT DIMENSION – 9.375”L x 4.375”W

ENCLOSURE

DRAWN ALUMINUM WITH STAINLESS STEEL
FACEPLATE.

TEMPERATURE RANGE

-40°F TO 212°F, -40°C TO 100°C.*

SETPOINT RANGE

-40°F TO 120°F, -40°C TO 50°C.*

TIME DELAY

10 TO 150 MINUTES IN 10 MINUTE
INCREMENTS.*

AUDIBLE NOTIFICATION

PIEZO TYPE HORN
FREQUENCY -3.8kHz
SPL – 85db @ 3’ TYPICAL.

VISUAL NOTIFICATION

GREEN LED – SAFE LIGHT
RED LED BLINKING – ABNORMAL TEMPERATURE,
RED LED SOLID ON – ALARM CONDITION.

REMOTE NOTIFICATION

DRY CONTACTS – NORMALLY OPEN (N/O) &
NORMALLY CLOSED (N/C)
CURRENT CAPACITY – 6A. @ 120/240VAC, 6A. @
28VDC

PULSE OUTPUT – 6VDC FOR 1 SECOND. (USED
TO TRIGGER AVAILABLE AUTO DIALER)

SENSOR

ELECTRONIC, 1.75”L x .375”DIA. WITH 25’
WIRE. WIRE MAY BE LENGTHENED IN EXCESS
OF 1000’ OR SHORTENED WITHOUT AFFECTING
ACCURACY.

OPERATING

120VAC @ 45mA

CONTROL BOARD

Contacts rated at 120/240VAC @ 6A

LEAD LAG BOARD

Contacts rated at 120VAC @ 6A

*OTHER RANGES AVAILABLE



Part #'s 75 & 75B ONLY



229-40075



MODULARM

BROUGHT TO YOU BY
KITCHEN BRAINS®

Food Automation - Service Techniques, Inc.
905 Honeyspot Road, Stratford, CT 06615-7147 USA

Phone: **+1-203-377-4414**

Sales: **1-800-327-8766**

Fax: +1-203-377-8187

International Callers: **+1-203-378-6860**

www.KitchenBrains.com

Toll-free technical support 24/7 from the U.S.,
Canada, and Caribbean: **1-800-243-9271**

**International offices are located in the
United Kingdom, China and Singapore:**

Europe, Middle East, Africa
31 Saffron Court Southfields Business Park
Basildon, Essex SS15 6SS ENGLAND
Phone: **+44 0 1268544000**

China
1803, 18F, No 922 Hengshan Rd
Shanghai 200030, CHINA
Phone: **+8613916 854 613**

Asia Pacific
13A MacKenzie Road
228676
Singapore
Phone: **+65 983159273**

WARRANTY

Kitchen Brains warrants that its products shall not fail to function in accordance with their specifications because of defects in material or workmanship, for the following warranty periods:

i. New Products: New Products consisting of microprocessor based controllers, timers, data-loggers or remote monitoring devices for 1 year from date of purchase.

ii. Sensors and Accessories: Sensors and accessories (consisting of probes, wireless sensors, hoses, relays, switches, mounting hardware or accessories) for 90 days from date of purchase.

For complete details consult www.kitchenbrains.com/warranty

PATENTS

The products manufactured by Kitchen Brains are protected under one or more of the following U.S. Patents:

5,331,575	5,539,671	5,711,606	5,723,846
5,726,424	5,875,430	6,142,666	6,339,930
6,401,466	6,401,467	6,581,391	7,015,433
7,145,463	7,650,833	7,877,291	8,060,408

Plus foreign patents and patents pending. Plus licensed patent 5,973,297