Saddleback Valley Central Kitchen -SVUSD

DMH
DIELI MURAWKA HOWE
FOOD SERVICE DESIGNERS

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thermalrite

by CrownTonka California, Inc.

custom, modular cold storage

quality

value

service

design

warehouse systems • food service • environmental enclosures

quality

Thermalrite® has been manufacturing Walk-in Coolers and Freezers for the food service industry since 1988. Our goal is to manufacture the finest quality walk-ins available and provide you with an unsurpassed level of service. All of our walk-ins are CAD designed to your exact specifications. Our panels are engineered and built for easy installation. During each phase of the manufacturing process we scrutinize quality, fit and finish to ensure that you get the best possible product.

service

From Quotations to Engineering, from Manufacturing to Delivery and Installation, we offer you outstanding service. Our trained, experienced Inside Sales Team, provides helpful, knowledgeable service from inquiry to delivery. Our plants in California, Minnesota, and Tennessee provide close proximity to all markets.

value

We use only the best U. L. Class 1 Non-CFC Urethane insulation available. Thermalrite® and its suppliers have incurred considerable expense in the development of ENVIROFOAM, an environmentally sensitive urethane foam. Our insulation is designed to bond with our panels to give strength and durability.

All of this translates into superior insulating properties which keep your operating costs at a minimum.

design flexibility

Custom designs – indoor, outdoor, angular, rectangular or any combination are all available in a variety of finishes and in varying thickness of four, five or six inches. We serve the warehouse, food service, institutional and environmental industries with walk-in coolers and freezers. With seamless panels up to 30 feet in length, we are ideal for warehouse applications and long spans. Our modular construction allows for easy remodeling, relocation or expansion.

why thermalrite?

- Custom Designs at Standard Prices. You get the exact size and shape you need.
- In-house design and engineering. We can help you to determine what design or configuration will best fit your unique requirements.
- Strongest all-foam panels on the market. High density foam rail with metal facing and foam-in place bonding equals strong long lasting panels.
- Doors and frames that are second to none. Doors are a full four inches thick and frames are reinforced for strength.
- Highest insulation values and best fire rating add up to the best insulating material available. UL, class 1, Non CFC ENVIROFOAM saves energy costs and meets building code requirements.
- Environmentally Friendly ENVIROFOAM.
- NSF Certified, UL Listed, USDA Approved panels.
- Engineered and Built for ease of installation.
- Experience. Thermalrite® has been manufacturing walk-in coolers and freezers since 1988.
- Foaming conducted in temperature-controlled area and controlled by the latest computerized equipment to insure proper mix density and fill resulting in the finest insulated panel available.

- The best walk-in value on the market.
- Parts department to supply your needs correctly and quickly (usually within 24 hours).
- Three strategically located manufacturing plants for quick and cost-effective delivery throughout North America.
- One-stop-shop for your complete walk-in package; refrigeration, shelving, and installation – hassle-free convenience.
- We stand behind our product – we honor our obligations. Check out our record.

classifications*

- NSF Certified
- U.L., Class 1 listed Urethane foam insulation in all Thermalrite® walk-ins.
- USDA Approved Materials
- UL Electric
- State of New York, MEA
- California Bureau of Home Furnishings and Thermal Insulation License
- State of Oregon
- Wisconsin (DHILR)
- City of Houston

*Thermalrite® insulated panels are manufactured to meet local codes in most cities. It is incumbent upon the customer to consult with the local inspector to assure compliance.

thermalrite installation examples

food service

- Anaheim Arena- The Pond
- Burger King
- Cheesecake Factory
- Hard Rock Cafe
- MGM Grand Hotel
- Kaiser Hospital
- Bakersfield Country Club
- Scenic Heights Elementary- Minnesota
- Brown County Prison
- UCLA

environmental and scientific

- Seattle Zoo
- Santa Barbara Zoo
- Hughes Aircraft
- Allied Signal
- Themodynamics

architectural specifications

metal and finishes

Standard interior and exterior metal finish:

- 26 Ga. Bright stucco embossed galvanized steel

Optional finishes available

- 26 Ga. Painted stucco embossed galvanized steel. Standard colors available are white, black and almond. Optional colors are available by request.
- .032 Stucco embossed aluminum
- .040 Smooth white aluminum
- .040 Stucco embossed aluminum
- 22 Ga. Type 304 stainless steel #4 finish

Interior floor finishes

- .050 Smooth aluminum
- 24 Ga. Type 304 stainless steel with #2B finish
- .100 aluminum diamond thermalrite

Other gauges and finishes are available upon request.

insulation

Standard insulation is foamed-in-place Non-CFC U.L. Class 1 rated urethane foam. It has a thermal conductivity (K Factor) of .120* BTU/Hr/Sq. ft/Degrees/F/in. and overall heat transfer coefficient (U Factor) of not more than .030 BTU/Hr.Sq.Ft.

Class 1 urethane foam has a flame spread of 25 or less overall and smoke developed of less than 450. Recommended wall thickness is nominal 4″. Foam rail panels also available in 4″ - 6″ thickness.

panel construction

Walk-ins are all custom designed to fit the individual customers' needs. Each panel consists of an interior and exterior metal pan with structural, high density foam rail frame. These pans are separated by rigid foam-in place self-extinguishing urethane insulation which adheres to the interior of the pans providing increased structural strength. All panels have tongue and groove construction and gasket is applied to all joints forming an air-tight seal.

panel fasteners

All panels are joined together using a cam-locking fastener, operated with a hex wrench. Access holes are sealed with vinyl snap-in caps. Standard construction is cam-locking ceilings to walls; lag-down ceilings are also available.

floorless models

Alignment screed is furnished for all floorless models. Screeds are designed to be anchored to masonry floors to provide an accurate template for the erection of wall panels.

floor panels

Floors are built with metal bonded to exterior grade underlayment and foamed-inplace. Floors are capable of maintaining a load maximum of 1000lbs./sq/ft. when uniformly distributed, and are NSF certified.

walk-in accessories and features

Standard:

- 2 1/2″ Dial Thermometer
- 100 Watt incandescent light fixture with vapor proof globe
- Flush Mount OSHA press switch factory installed and wired to outside ceiling
- NSF Certified Construction
- UL Listed Class 1 Non-CFC Urethane Foam
- USDA Approved Materials

Optional

- Refrigeration Systems
- Roof Systems for outdoor applications
- Display Doors
- Double Acting Doors
- Strip Curtains
- Alarm Systems
- Digital Thermometers
- Storage Shelving
- Built in Wall Supports
- Heavy Duty Floor Plates
- Foamed in Place Electrical Boxes

door, jamb and hardware

Standard Thermalrite walk-in doors are self-closing, flush mount type.

Standard features:

- High quality heavy duty hardware with safety release
- Magnetic door gasket
- Heated jamb (freezer only)
- Heated threshold (freezer only)
- Heated pressure relief vent (freezer only)
- Doors up to 48″ width are pre-hung
- Heavy duty door frame

Optional Door Features and Accessories:

- Bi-parting doors
- Reach-in Service Doors
- Sliding Doors
- Heavy Duty Impact Plate
- View Ports

Thermalrite® reserves the right to change specifications without notice.

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www.thermalrite.com

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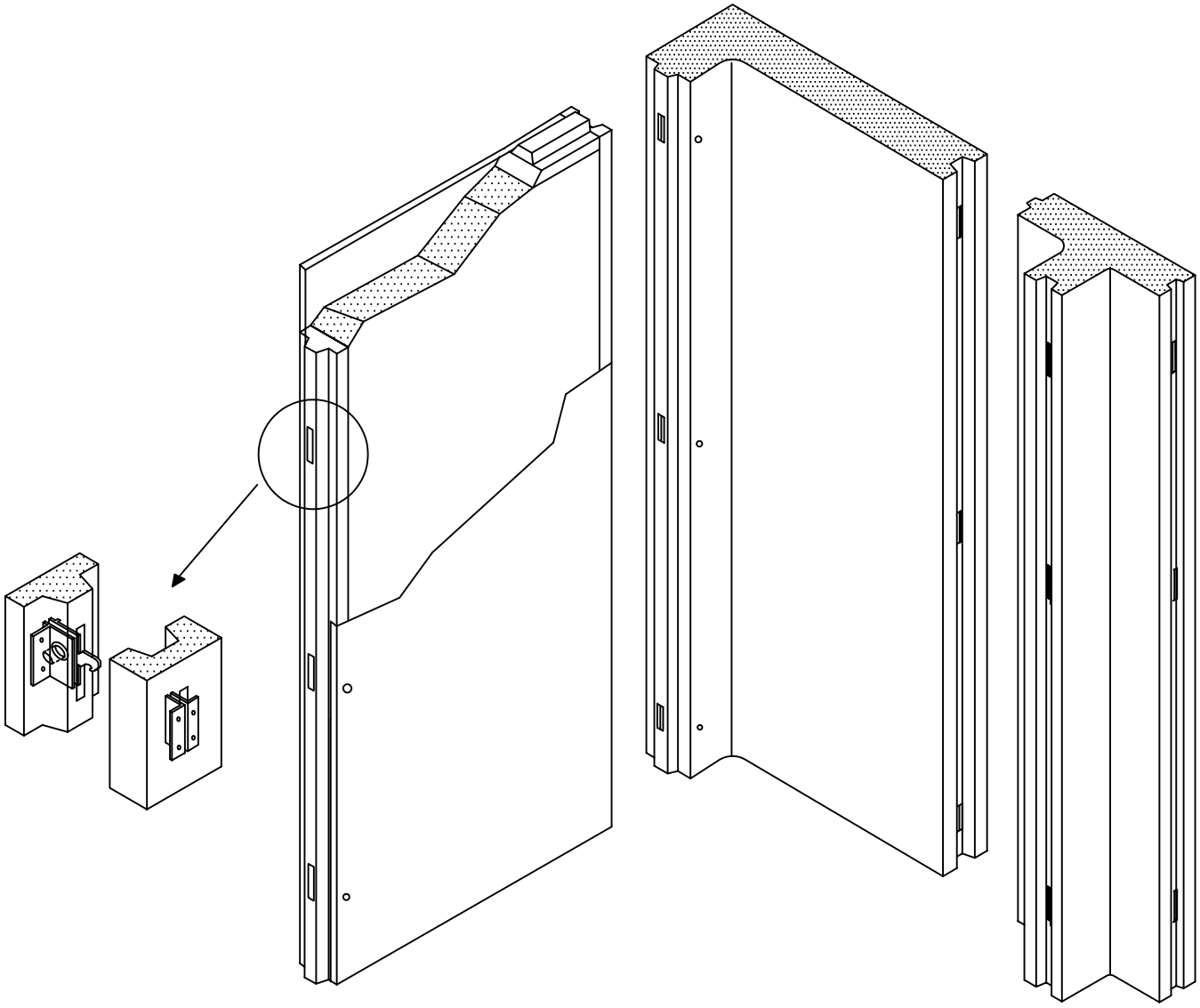
Typical Wall, "T", Corners



STANDARD WALL PANEL SIZES ARE 47" WIDE, CORNER SECTION
5 1/4" x ANY LENGTH (47") TO MEET CUSTOM REQUIREMENTS
WITH 1/4" RADIUS ON INTERIOR FOR N.S.F. REQUIREMENTS.
WALL PANEL HEIGHT PER CUSTOMER REQUEST (FROM 0" UP TO 30'-0" HIGH).

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- Single Sliding Manual Doors
- Single Sliding Power Doors
- Bi-Part Sliding Manual Doors
- Bi-Part Sliding Power Doors

WWW.ICSCO.COM

INTERNATIONAL COLD STORAGE®

OPENING **NEW** OPPORTUNITIES IN **COLD STORAGE**

ICS Sliding Doors are the ultimate solution for temperature controlled environments, including food processing, warehouses, distribution facilities, environmental industries and walk-in coolers and freezers. Suitable for new build or retrofit installations, our robust doors are particularly suited to high traffic environments. ***ICS*** Sliding Doors are UL/ETL listed and covered by a one year warranty.

Aesthetics, functionality, ease of installation, reliability and durability have been the driving factors in the development ***ICS*** Sliding Door products. Structural components are manufactured in aircraft grade aluminium extrusion or heavy duty steel for durability and low maintenance. Door panel frames are produced in aircraft grade aluminium extrusion, reinforced with internal steel corner brackets for enhanced integrity.

4" or optional 6" panel structures are of foamed-in-place non-CFC polyurethane for rigidity and excellent insulation characteristics. Door panels are clad with USDA approved white stucco embossed galvanized steel as standard and incorporate a no wood design with the use of high density polyethylene extrusion (HDPE) for all face frames, jambs and back frames.

Single Sliding Manual and Power Doors

Our single horizontal sliding doors are the perfect solution for applications where space is only available on one side of the door opening. Single sliding doors provide access for personnel and load handling traffic, where space restricts the use of hinged, swing doors or where installation space is limited.

Standard Sizes:

36", 48", 60", 72", 84" and 96" width x 96" height.

72", 84", 96" and 120" width x 120" height.

120" width x 144" height.

Note: Doors over 96" are spliced into two panels for shipping.

WWW.ICSCO.COM

Our controller and motor drive system may be incorporated to provide automated operation for unprecedented control and flexibility. The operator offers programmable acceleration and deceleration, with door opening speeds of up to 30 inches per second per panel and closing speeds of 18 inches per second per panel. Single and bi-part horizontal sliding doors are suitable for new build and retrofit applications.

Bi-Part Sliding Manual and Power Doors

Our bi-part horizontal sliding doors are suitable for applications where space is limited at either side of the door opening. The doors are appropriate for installations where there is high volume fork lift, pallet truck and load handling equipment traffic. Bi-part sliding doors provide single door access for personnel or double door access for load handling traffic.

Standard Sizes:

60", 72", 84" and 96" width x 96" height.

84", 96" and 120" width x 120" height.

96" and 120" width x 144" height.

FEATURES & OPTIONS

"V" grooved wheel on UHMW triangle "down and in" door track system for positive seal

Adjustable reinforced door seals, mounted on casings and header, correct wall irregularities for a positive seal, eliminating warm air infiltration

Exterior bow handles

Floor mounted stayrollers

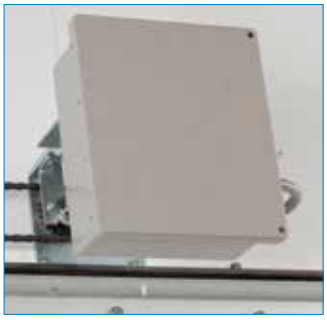
Interior recessed handles

Chain adjustment assembly for #40 roller chain on power models

Options

A comprehensive range of options is available for all ***ICS*** Sliding Doors, allowing you to incorporate features tailored to your specific cold storage application.

Interior jambs · Back frames · Locking devices
Vision panels · Rain hoods · Alternative finishes
Kick plates · Pedestrian doors · Metal clad casings & headers · Additional activation devices



Power models feature a dual speed operator with NEMA 4 control box

Toll free: (800) 835-0001
Tel: (316) 218-4100
Fax: (316) 733-2434
sales@icsco.com

EISA Compliant

PROUDLY MADE IN THE U.S.A.

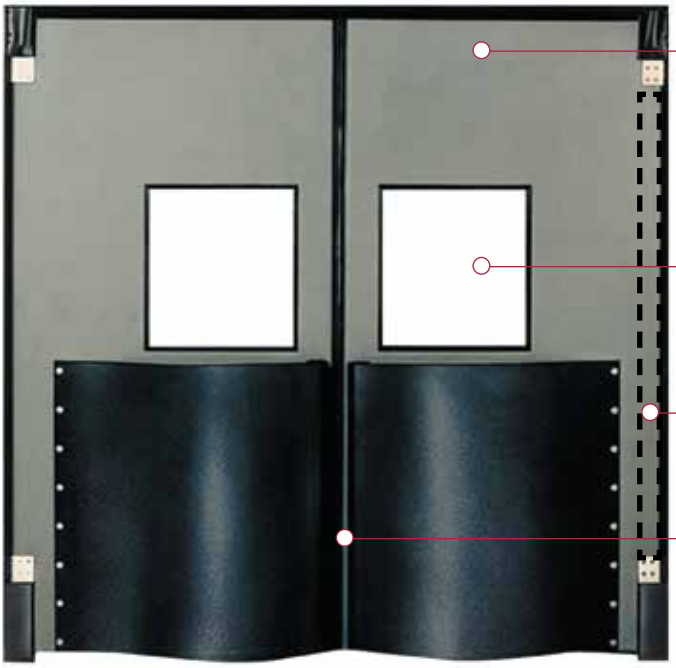
Cold Storage Solutions™

INTERNATIONAL COLD STORAGE®

Ultra Heavy Duty Impact Traffic Door

Durulite® Industrial

The Durulite Industrial Door is the toughest traffic door in the industry. It is known for its ruggedness, ease of maintenance and long service life. This versatile door is capable of filling the needs of a wide variety of applications. From the daily rigors of forklift traffic, to refrigerated applications, to USDA and washdown applications. The strength of the Durulite Industrial is due to its rotationally molded polyethylene construction. Standard tests for impact resistance indicates that rotationally molded polyethylene is 5 times more puncture resistant and 3 times more flexible than ABS material. The corrosion resistant panel is ideal for washdown applications as it has no gaps or joint seams.



Door Panel – Lightweight, weighing only 3.5 pounds per square foot, is easy to open, operates smoothly and allows for safe passage of personnel and damage free equipment. The overall panel thickness is 1-7/8", the skin thickness is 1/4" thick and the door can be sized up to a 10' x 10'. Rotationally molded polyethylene outer skins retains its properties to -40ºF.

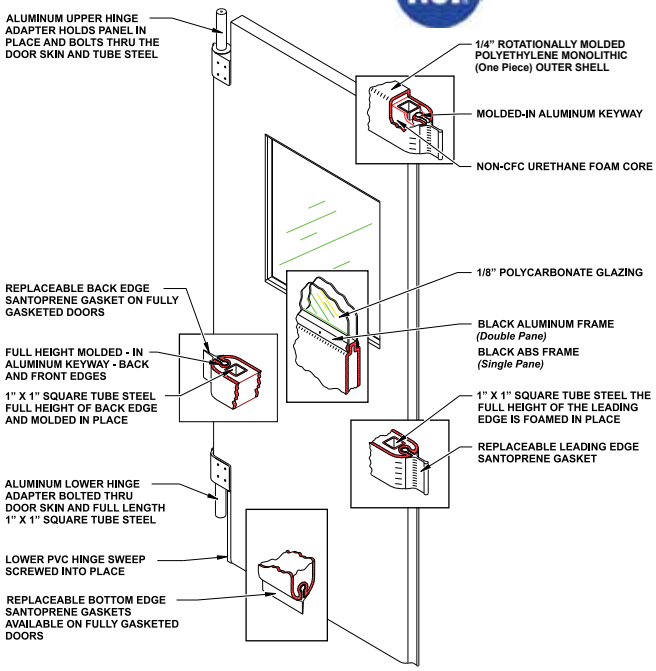
Window – 1/8" thick polycarbonate window with black frame is recessed a minimum of 1/8" from the face of the panel to protect the window's surface from abrasion caused by passing loads.

Internal Reinforcement – The leading and back edge of door are internally reinforced with tubular steel to strengthen the door panel.

Gasketing – USDA accepted durable gasketing is factory applied without the use of metal strips or fasteners, making it easy to replace in the field.

Durulite Industrial shown with optional teardrop bumpers

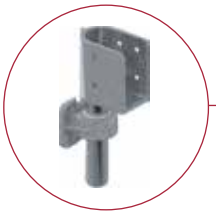
NSF Certified



Applications	Environment	Options
• Food Processing	• Freezer	• 180° x 90° Hardware
• Industrial	• Cooler	• Teardrop Bumpers
• Institutional	• USDA Accepted	• Impact / Kick Plates
• Pharmaceutical	• Personnel	• Lower Hinge Guards
• Postal	• Interior	• Spring Assist
• Cold Storage	• Loading Dock	• Locking Devices
• Warehouse	• Washdown	• Window Options

Insulated Core – The foamed-in-place Non-CFC urethane core (permanently bonded to the outer surface) does not break down when impacted, provides noise control and excellent insulation with an R factor of 10.83.

Upper Hinge – Double-acting V-Cam hinging system operates smoothly and is virtually maintenance free with its permanently lubricated needle bearing roller assembly. Optional stainless steel V-Cam is available.



Bottom Hinge – For additional strength and durability the hinge is designed with pillow block constructed of zinc plated ductile iron (stainless steel is optional) with a UHMW sleeve and solid cast aluminum lower hinge adapter. Plus the lower hinge adapter has a provision for mounting an optional spring assist.

See page 7 for colors and options

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environmental and scientific

- Seattle Zoo
- Santa Barbara Zoo
- Hughes Aircraft
- Allied Signal
- Themodynamics

architectural specifications

metal and finishes

Standard interior and exterior metal finish:

- 26 Ga. Bright stucco embossed galvanized steel

Optional finishes available

- 26 Ga. Painted stucco embossed galvanized steel. Standard colors available are white, black and almond. Optional colors are available by request.
- .032 Stucco embossed aluminum
- .040 Smooth white aluminum
- .040 Stucco embossed aluminum
- 22 Ga. Type 304 stainless steel #4 finish

Interior floor finishes

- .050 Smooth aluminum
- 24 Ga. Type 304 stainless steel with #2B finish
- .100 aluminum diamond thermalrite

Other gauges and finishes are available upon request.

insulation

Standard insulation is foamed-in-place Non-CFC U.L. Class 1 rated urethane foam. It has a thermal conductivity (K Factor) of .120* BTU/Hr/Sq. ft/Degrees/F/in. and overall heat transfer coefficient (U Factor) of not more than .030 BTU/Hr.Sq.Ft.

Class 1 urethane foam has a flame spread of 25 or less overall and smoke developed of less than 450. Recommended wall thickness is nominal 4″. Foam rail panels also available in 4″ - 6″ thickness.

panel construction

Walk-ins are all custom designed to fit the individual customers' needs. Each panel consists of an interior and exterior metal pan with structural, high density foam rail frame. These pans are separated by rigid foam-in place self-extinguishing urethane insulation which adheres to the interior of the pans providing increased structural strength. All panels have tongue and groove construction and gasket is applied to all joints forming an air-tight seal.

panel fasteners

All panels are joined together using a cam-locking fastener, operated with a hex wrench. Access holes are sealed with vinyl snap-in caps. Standard construction is cam-locking ceilings to walls; lag-down ceilings are also available.

floorless models

Alignment screed is furnished for all floorless models. Screeds are designed to be anchored to masonry floors to provide an accurate template for the erection of wall panels.

floor panels

Floors are built with metal bonded to exterior grade underlayment and foamed-inplace. Floors are capable of maintaining a load maximum of 1000lbs./sq/ft. when uniformly distributed, and are NSF certified.

walk-in accessories and features

Standard:

- 2 1/2″ Dial Thermometer
- 100 Watt incandescent light fixture with vapor proof globe
- Flush Mount OSHA press switch factory installed and wired to outside ceiling
- NSF Certified Construction
- UL Listed Class 1 Non-CFC Urethane Foam
- USDA Approved Materials

Optional

- Refrigeration Systems
- Roof Systems for outdoor applications
- Display Doors
- Double Acting Doors
- Strip Curtains
- Alarm Systems
- Digital Thermometers
- Storage Shelving
- Built in Wall Supports
- Heavy Duty Floor Plates
- Foamed in Place Electrical Boxes

door, jamb and hardware

Standard Thermalrite walk-in doors are self-closing, flush mount type.

Standard features:

- High quality heavy duty hardware with safety release
- Magnetic door gasket
- Heated jamb (freezer only)
- Heated threshold (freezer only)
- Heated pressure relief vent (freezer only)
- Doors up to 48″ width are pre-hung
- Heavy duty door frame

Optional Door Features and Accessories:

- Bi-parting doors
- Reach-in Service Doors
- Sliding Doors
- Heavy Duty Impact Plate
- View Ports

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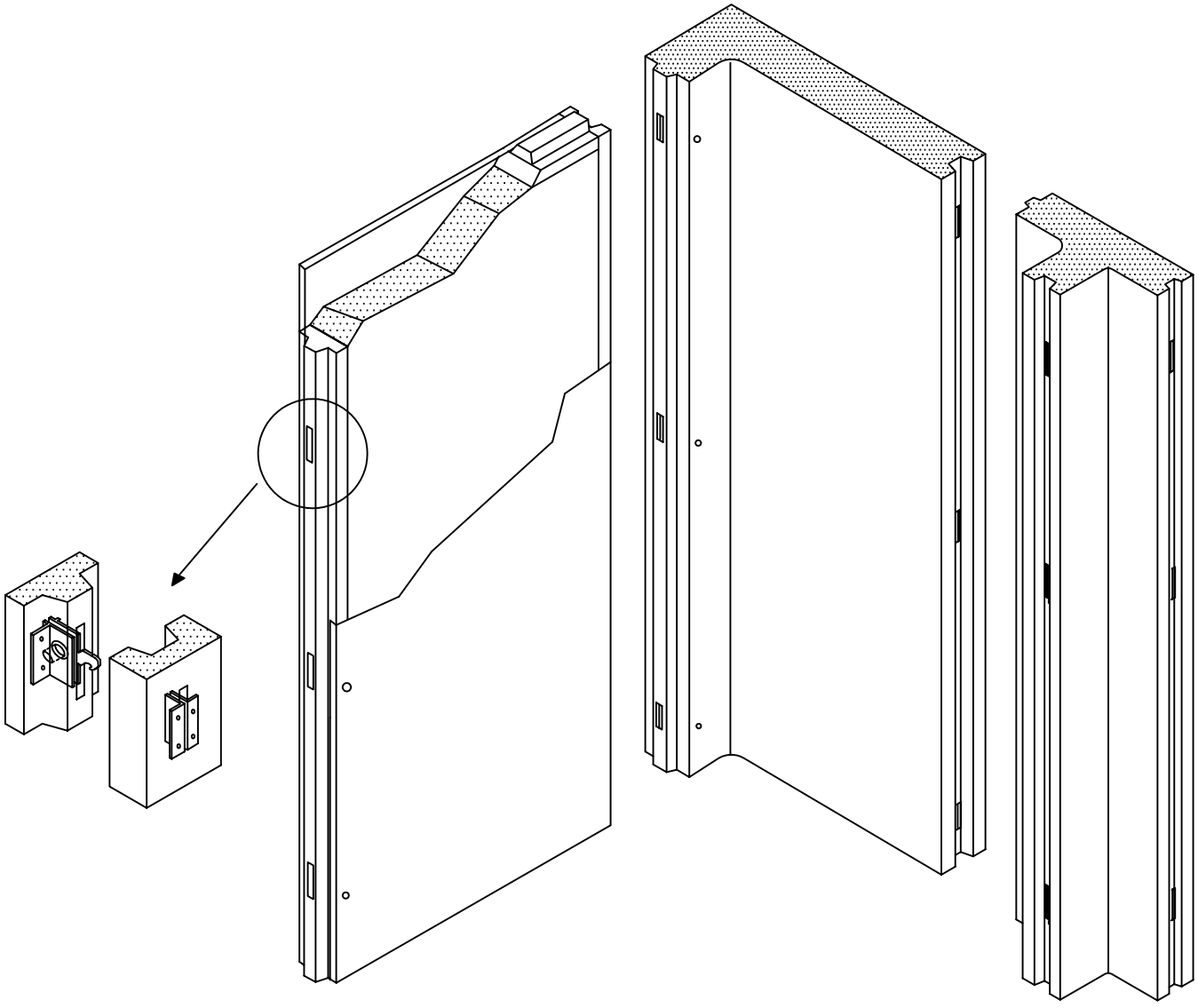
Typical Wall, "T", Corners



STANDARD WALL PANEL SIZES ARE 47" WIDE, CORNER SECTION
5 1/4" x ANY LENGTH (47") TO MEET CUSTOM REQUIREMENTS
WITH 1/4" RADIUS ON INTERIOR FOR N.S.F. REQUIREMENTS.
WALL PANEL HEIGHT PER CUSTOMER REQUEST (FROM 0" UP TO 30'-0" HIGH).

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4" or optional 6" panel structures are of foamed-in-place non-CFC polyurethane for rigidity and excellent insulation characteristics. Door panels are clad with USDA approved white stucco embossed galvanized steel as standard and incorporate a no wood design with the use of high density polyethylene extrusion (HDPE) for all face frames, jambs and back frames.

Single Sliding Manual and Power Doors

Our single horizontal sliding doors are the perfect solution for applications where space is only available on one side of the door opening. Single sliding doors provide access for personnel and load handling traffic, where space restricts the use of hinged, swing doors or where installation space is limited.

Standard Sizes:

36", 48", 60", 72", 84" and 96" width x 96" height.

72", 84", 96" and 120" width x 120" height.

120" width x 144" height.

Note: Doors over 96" are spliced into two panels for shipping.

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Our controller and motor drive system may be incorporated to provide automated operation for unprecedented control and flexibility. The operator offers programmable acceleration and deceleration, with door opening speeds of up to 30 inches per second per panel and closing speeds of 18 inches per second per panel. Single and bi-part horizontal sliding doors are suitable for new build and retrofit applications.

Bi-Part Sliding Manual and Power Doors

Our bi-part horizontal sliding doors are suitable for applications where space is limited at either side of the door opening. The doors are appropriate for installations where there is high volume fork lift, pallet truck and load handling equipment traffic. Bi-part sliding doors provide single door access for personnel or double door access for load handling traffic.

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FEATURES & OPTIONS

"V" grooved wheel on UHMW triangle "down and in" door track system for positive seal

Adjustable reinforced door seals, mounted on casings and header, correct wall irregularities for a positive seal, eliminating warm air infiltration

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Floor mounted stayrollers

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Chain adjustment assembly for #40 roller chain on power models

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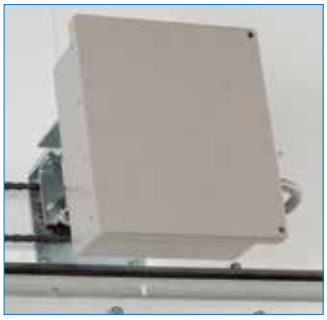

Power models feature a dual speed operator with NEMA 4 control box

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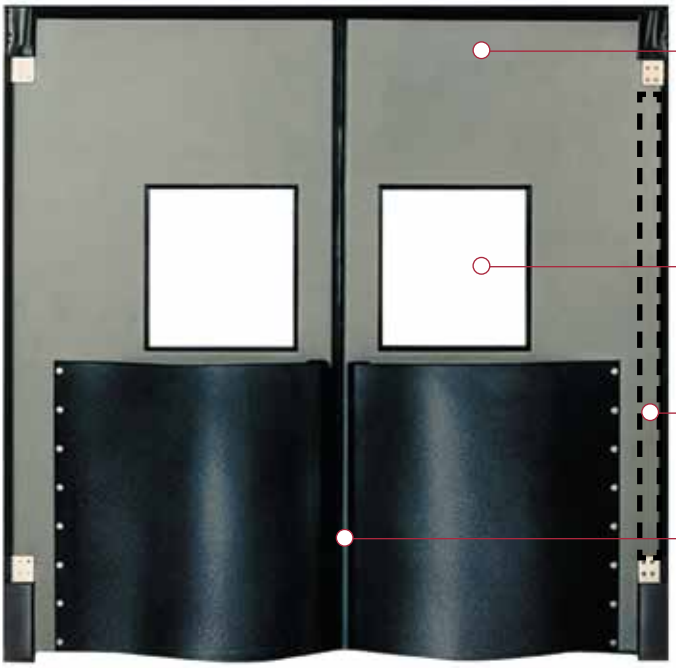
Durulite® Industrial

The Durulite Industrial Door is the toughest traffic door in the industry. It is known for its ruggedness, ease of maintenance and long service life. This versatile door is capable of filling the needs of a wide variety of applications. From the daily rigors of forklift traffic, to refrigerated applications, to USDA and washdown applications. The strength of the Durulite Industrial is due to its rotationally molded polyethylene construction. Standard tests for impact resistance indicates that rotationally molded polyethylene is 5 times more puncture resistant and 3 times more flexible than ABS material. The corrosion resistant panel is ideal for washdown applications as it has no gaps or joint seams.



Door Panel – Lightweight, weighing only 3.5 pounds per square foot, is easy to open, operates smoothly and allows for safe passage of personnel and damage free equipment. The overall panel thickness is 1-7/8", the skin thickness is 1/4" thick and the door can be sized up to a 10' x 10'. Rotationally molded polyethylene outer skins retains its properties to -40ºF.

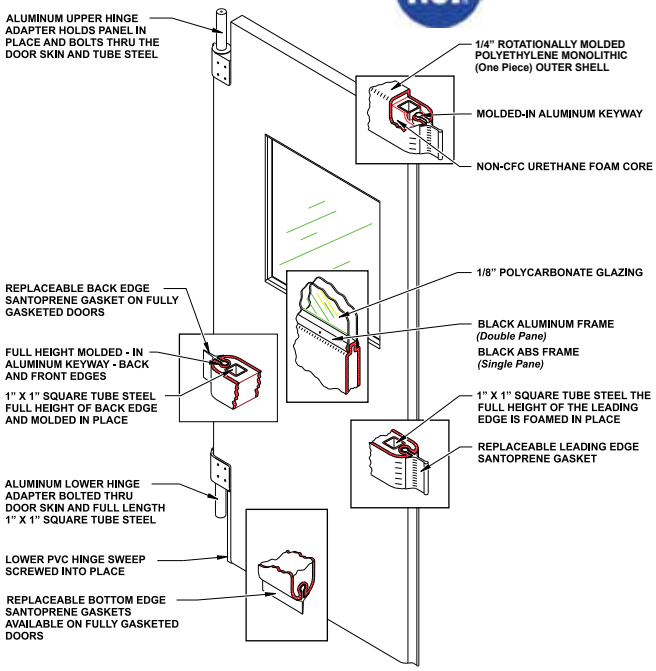
Window – 1/8" thick polycarbonate window with black frame is recessed a minimum of 1/8" from the face of the panel to protect the window's surface from abrasion caused by passing loads.

Internal Reinforcement – The leading and back edge of door are internally reinforced with tubular steel to strengthen the door panel.

Gasketing – USDA accepted durable gasketing is factory applied without the use of metal strips or fasteners, making it easy to replace in the field.

Durulite Industrial shown with optional teardrop bumpers

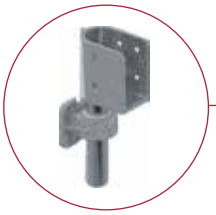
NSF Certified



Applications	Environment	Options
• Food Processing	• Freezer	• 180° x 90° Hardware
• Industrial	• Cooler	• Teardrop Bumpers
• Institutional	• USDA Accepted	• Impact / Kick Plates
• Pharmaceutical	• Personnel	• Lower Hinge Guards
• Postal	• Interior	• Spring Assist
• Cold Storage	• Loading Dock	• Locking Devices
• Warehouse	• Washdown	• Window Options

Insulated Core – The foamed-in-place Non-CFC urethane core (permanently bonded to the outer surface) does not break down when impacted, provides noise control and excellent insulation with an R factor of 10.83.

Upper Hinge – Double-acting V-Cam hinging system operates smoothly and is virtually maintenance free with its permanently lubricated needle bearing roller assembly. Optional stainless steel V-Cam is available.



Bottom Hinge – For additional strength and durability the hinge is designed with pillow block constructed of zinc plated ductile iron (stainless steel is optional) with a UHMW sleeve and solid cast aluminum lower hinge adapter. Plus the lower hinge adapter has a provision for mounting an optional spring assist.

See page 7 for colors and options

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P.O. BOX 622 WAXAHACHIE, TX 75168
WWW.RDTONLINE.COM
INFO@RDTONLINE.COM
TEL (800) 736 9518 FAX (972) 937 0970

MODEL RDMC

Designed for Maximum Dependability and Versatility

Standard Features:

- Stainless Steel One Piece Louvers
- All Stainless Steel Housing
- Factory Pre-Piped and Pre-Wired
- Aluminum Fin Copper Tube Condenser
- Ball Bearing Fan Motor
- Low Ambient Control System
- Rugged Base, Tubular Steel
- Suction Filter, Sight Glass, Drier, Liquid Line Valve (All Brazed)
- Fresh Air Over Compressors
- Pre-Piped Suction and Liquid Line
- Super Hose Connections
- Crankcase Heater
- Micro Set Dual Pressure Control
- Full Perimeter Base With Lifting Provisions at Each Corner
- OSHA Approved Fan Guard
- Oversized Multi-Circuited Condenser and Receiver
- One Point Electrical

Optional Features:

- Fused Disconnect
- Suction Accmulator
- Pre-Piped Crankcase Pressure Regulator
- Oil Separator
- Ice Machine Circuits
- Coated Condenser for Salt Air Environment

Scroll, Semi-Hermetic or Hermetic Compressors

c UL us LISTED

BACHARACH®

MGS•450

Refrigerant Gas Detector

for Machinery Rooms, Cold Rooms & Freezers

Refrigerant Leak Detection

O/N: 1100-2291 | October 2018 Revision 0

Quick Start Guide

Languages

This quick start guide has been translated into the following languages: Deutsch, Español, Français, Italiano and Nederlands. To download a translated document, scan here or visit http://bit.ly/2RSrzur.

1. Introduction

The MGS-450 refrigerant gas detector is designed for use in refrigeration applications and may be used as a standalone device, connected to the MGS-408 controller, or connected to a facility's BMS / BAS. It enables compliance with refrigerant safety codes *(ASHRAE 15 and EN 378)* and features audible and visual alarms to alert personnel in the event of a refrigerant leak.

2. Safety Instructions

DANGER: The MGS-450 is NOT certified or approved for operation in oxygen-enriched atmospheres. Failure to comply may result in severe injury or death.

WARNING: Use this product ONLY for the purposes and under the conditions listed in the user manual. Failure to comply may result in injury and / or damage to the product.

WARNING: The MGS-450 has not been designed to be intrinsically safe for use in areas classified as being hazardous locations. For your safety, DO NOT use in hazardous locations.

WARNING: Consult a qualified professional before connecting the MGS-450 to devices not mentioned in this manual. Failure to comply may result in injury and / or damage to the product..

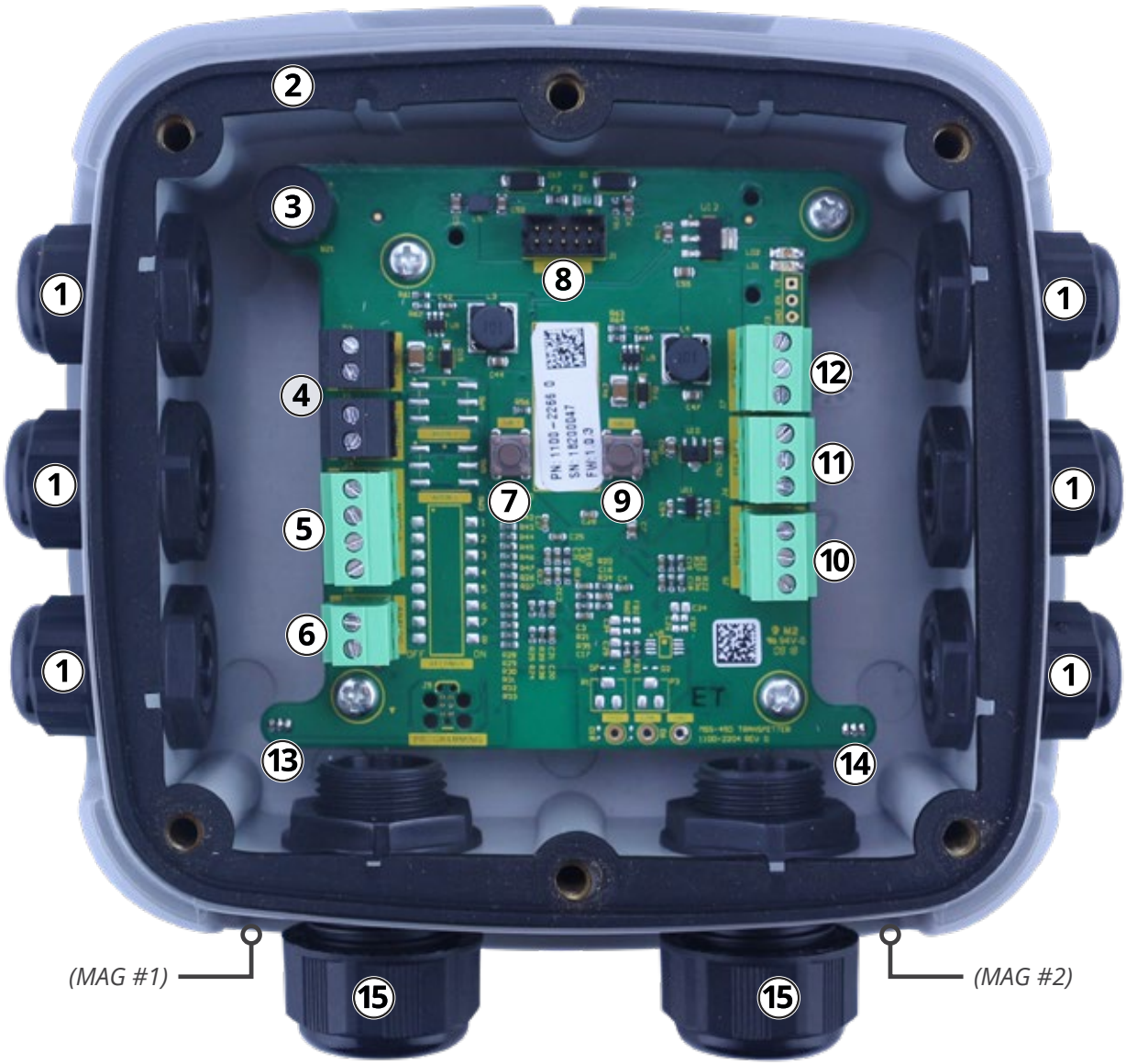
CAUTION: Except for the maintenance detailed in this manual, this product should ONLY be opened and / or serviced by authorized personnel. Failure to comply may void the warranty.

CODE COMPLIANCE: Comply with all local and national laws, rules and regulations associated with this equipment. Operators should be aware of the regulations and standards in their industry / locality for the operation of the MGS-450.

TECHNICIAN USE ONLY: The MGS-450 must be installed by a suitably qualified technician who will install this unit in accordance with these instructions and the standards in their particular industry / locality. This document is only intended as a guide and the manufacturer bears no responsibility for the installation or operation of this unit.

Failure to install and operate the unit in accordance with these instructions and with industry guidelines may cause serious injury or death and the manufacturer will not be held responsible in this regard.

3. Component Overview



#	COMPONENT DESCRIPTION
1	M16 Cable Glands *(×6)*
2	Rubber Gasket *(IP66 Version Only)*
3	Internal Alarm Buzzer
4	Power Connections *(×2)*
5	Digital Connection *(Modbus)*
6	Analog Connection
7	Tactile Switch #1
8	Ribbon Cable Connection *(To Sensor)*
9	Tactile Switch #2
10	Relay 3 Connection *(FAULT)*
11	Relay 2 Connection *(HIGH)*
12	Relay 1 Connection *(LOW)*
13	Magnetic Switch #1
14	Magnetic Switch #2
15	M20 Cable Glands *(×2)*

4. Product Specifications

Size (H×W×D):	8.3" × 8.9" × 3.4" *(210 × 225 × 85 mm)*
Weight:	1.05 lbs *(480 g)*
Indicators:	Multi-color Status LED Internal Alarm Buzzer: 72dB @ 3.9" *(10 cm)*
Alarm Delay:	Configurable *(0 to 15 minutes)*
Inputs:	Tactile Switches *(×2)*, Magnetic Switches *(×2)*
Outputs:	Analog Output: 4 to 20 mA, 0 to 5V, 0 to 10V, 1 to 5V *(default)* or 2 to 10V
Bluetooth®	Bluetooth® Low Energy, BLE 4.2

Modbus:	**Connection:** RS-485 terminal block **Baud Rate:** 9,600 *(default)* or 19,200 **Data Bits:** 8 **Parity:** None *(default)*, odd or even **Stop Bits:** 1 *(default)* or 2 **Retry Time:** 500 ms *(minimum)*
Power Supply:	19.5 to 28.5 VDC or 24 VAC ±20%; 4W
Wiring (Power):	2-core cable, 16 to 28 AWG
Wiring (Relays):	2-core cable, 16 to 28 AWG
Wiring (Modbus):	**Recommended:** Belden 3106A *(or equivalent)* 3-core, 2 twisted pair + ground, shielded cable with 120 Ω characteristic impedance, 16 to 28 AWG
Enclosure:	**Material:** ABS **Protection:** IP41 or IP66
Temperature:	**Semiconductor:** -40 to 122°F *(-40 to 50°C)* **Electrochemical:** Ranges vary by gas type and / or concentration, see the MGS-400 User Manual *(P/N 1100-2294)* for a full list of temperature ranges. **Infrared:** -40 to 122°F *(-40 to 50°C)* **Catalytic Bead:** -40 to 122°F *(-40 to 50°C)*
Humidity:	5 to 90% RH, non condensing
Pressure:	23.6 to 32.5"Hg *(800 to 1,100 mbar)*
Elevation:	0 to 6,560' *(2,000 m)* altitude

5. Installation

IMPORTANT: The manufacturer of this product requires that a bump test or calibration be performed following installation to verify instrument functionality.

STEP 1 | Mount Gas Detector & Remove Lid

WARNING: DO NOT allow the lid / sensor to hang from the ribbon cable. Failure to comply may result in damage to the product.

1. **Mount the MGS-450 according to the product dimensions, maximum wiring lengths and following considerations:**
   - **Environment:** the full range of environmental conditions when selecting a location.
   - **Application:** the specifics of the application *(possible leaks, air movement / draft, etc.)* when selecting a location.
   - **Accessibility:** the degree of accessibility required for maintenance purposes when selecting a location.
   - **Target Gas:** the specific gravity of the target gas when selecting the height of the instrument.
2. **Using a 5/32" (4 mm) hex key / allen wrench (not included) remove the lid and disconnect the ribbon cable from the base.**
3. **Set the lid and rubber gasket (IP66 version only) aside to be reinstalled later**

STEP 2 | Wire Connections

WARNING: Ensure that all wiring connections are made BEFORE applying power.

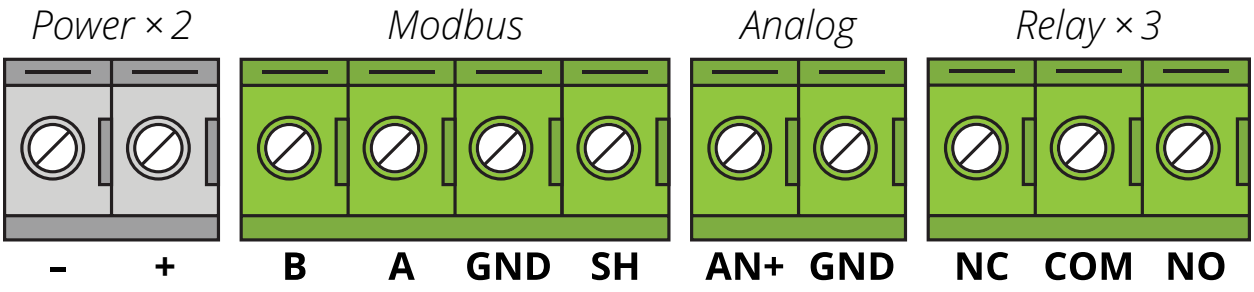
WARNING: Relays are rated for 0 to 30V. DO NOT apply mains power onto these relays.

IMPORTANT: Cable glands are meant to accommodate one cable. DO NOT use cable glands for more than one cable.

IMPORTANT: If analog output is 4 to 20 mA, connect or short the connection to ensure that the gas detector doesn't go into fault.

IMPORTANT: ALWAYS ensure that all cable glands are properly tightened and unused cable glands are plugged.

1. **Locate connections** *(Power, Analog, Modbus, Relays)* **and remove terminal blocks from the PCBA.**



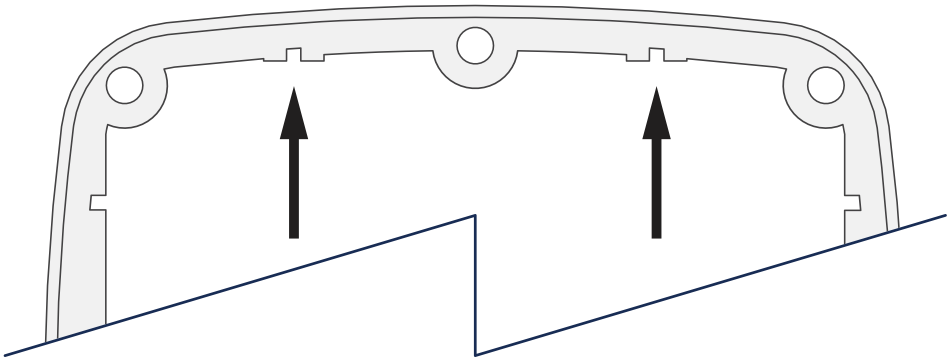
2. **Remove plugs from the corresponding M16 cable glands and pass the cable through the opening.**
3. **Secure wires in each terminal block and, pressing firmly, reinstall the terminal block in the PCBA.**
4. **Remove all excess cable from the housing before firmly securing the cable glands.**

STEP 3 | Reinstall Sensor & Connect Lid

WARNING: DO NOT leave excess cable inside of the gas detector housing. Failure to comply may result in damage to the product.

IMPORTANT: To achieve proper seal in the IP66 version, the lid screws should be torqued to 15 to 20 lbf in (1.5 to 2.0 Nm.

1. **Reinstall the rubber gasket (IP66 version only). Ensure that it is correctly seated by placing the side with two grooves face down and the edge with two bumps on the top.**



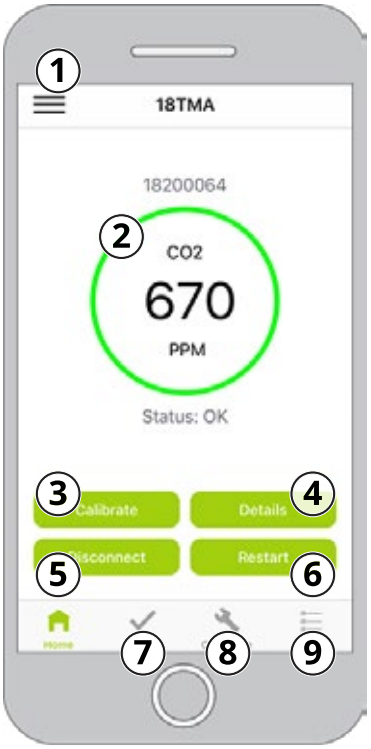
2. **Reconnect the ribbon cable from the sensor to the PCBA.**
3. **Ensure no cables are interferring with the sensor module and close the lid.**
4. **Using a 5/32" (4 mm) hex key / allen wrench, tighten the lid screws in an "X" tightening pattern:**

6. Connect MGS-450 to MGS-400 App *(User Discretion)*

The MGS-450 uses a smartphone application to allow users to interface with the gas detector. To download the app, scan here or visit www.mybacharach.com/apps.

IMPORTANT: Default alias, passkey and unlock code can be changed via the MGS-400 App's configuration menu.

1. **Enable Bluetooth® discovery by tapping** MAG#1 **for 1-second.** *(After 10-seconds, device will indicate that it is discoverable with audible heartbeat until it has been paired, discovery has timed-out or has been cancelled.)*
2. **Launch the MGS-400 App and click the Bluetooth® icon at the bottom of the screen to initiate a scan.**
3. **Select the instrument** *(default is "18TMA")* **from the list of available Bacharach gas detectors.**
4. **When prompted, enter the passkey** *(default is "123456")*.
5. **Go to configure tab to setup device. When prompted, enter unlock code to access device configuration.** *(default is "1234")*



#	APP DESCRIPTION
1	Main Menu *(App Settings)*
2	Status *(Gas Concentration)*
3	Calibrate *(Calibration / Bump Test)*
4	Details *(Instrument Information)*
5	Disconnect Bluetooth®
6	Restart Connected Device
7	Test Mode *(LED / Buzzer / Relays / Analog Output)*
8	Device Configuration
9	Logs

7. Operation Overview

STATE	OUTPUT				
	LED	RELAY 1	RELAY 2	RELAY 3	Buzzer
Warm-up		OFF	OFF	OFF	
Normal		OFF	OFF	OFF	
Low Alarm		ON	OFF	OFF	
High Alarm		ON	ON	OFF	
Offline		OFF	OFF	OFF	
Fault		OFF	OFF	ON	
Negative Gas Fault		OFF	OFF	ON	
Zero Cal. Fault		OFF	OFF	OFF	
Span Cal. Fault		OFF	OFF	OFF	

STATE	INPUT			
	MAG #1 TRAP	MAG #1 HOLD	MAG #2 TRAP	MAG #2 HOLD
Warm-up	Enable Bluetooth® Connectivity	—	Disable Bluetooth® Connectivity	—
Normal		Start Zero Cal.		Start Span Cal.
Low Alarm		Mute Buzzer		Ack. Latched Alarm
High Alarm		Mute Buzzer		Ack. Latched Alarm
Offline		—		—
Fault		Mute Buzzer		Ack. Latched Fault
Negative Gas Fault		Mute Buzzer		Start Zero Cal.
Zero Cal. Fault		Ack. Fault		—
Span Cal. Fault		—		Ack. Fault

8a. General Calibration Procedure

WARNING: The MGS-450 MAY NOT be in an alarm or fault condition during calibration. Acknowledge any alarms or faults BEFORE attempting to begin the calibration process.

WARNING: Except for CO2 or O2 sensors, calibration gas must be in a balance of air, not nitrogen (N2).

IMPORTANT: Calibration and / or bump testing requires the MGS-400 calibration adapter kit (P/N 6302-9990).

IMPORTANT: At elevations higher than 6,560' (2,000 m), calibration will result in a lower reading. See the MGS-400 User Manual (P/N 1100-2294) for additional information.

1. **Fit calibration adapter to the gas detector lid.**

2. **If using a variable flow regulator, adjust the gas flow to approximately 0.3 L/min.**

8b. Zero Adjustment

> **WARNING:** Except for CO2 or O2 sensors, ambient air may be used instead of zero gas if the area is know to be free of the target gas or any gases to which the sensor may be cross-sensitive.

3. **Begin zero adjustment:**
   - MGS-400 App: ***Home Tab*** → ***Calibrate*** → scan barcode on gas cylinder or manually enter values for zero gas.
   - Manual: hold MAG#1 for >5-seconds. The LED will blink green-green-red when the instrument is ready.
4. **Apply zero gas** *(or ambient air per warning above)***.**
5. **Confirm the start of calibration:**
   - MGS-400 App: press the ***Start Zero*** button.
   - Manual: tap MAG#1 within 30-seconds or the instrument will time-out and return to normal operation.
6. **Complete zero adjustment:**
   - MGS-400 App: app will countdown to completion. If calibration is successful, proceed to Step 12.
   - Manual: the LED will blink green-red, green-red-red, green-red-red-red, etc. until calibration is complete. To abort, hold MAG#1 for >5-seconds, turn off gas flow and remove the calibration adapter. If calibration is successful *(green LED)*, proceed to Step 12. If calibration is unsuccessful *(LED blinks orange @ 2 Hz)*, tap MAG#1 to discard the calibration attempt and see the MGS-400 User Manual *(P/N 1100-2294)* for troubleshooting.
7. **Turn off gas flow from zero gas.**
8. **Replace zero gas with calibration gas in preparation for span adjustment.**

8c. Span Adjustment

9. **Begin span adjustment:**
   - MGS-400 App: scan barcode on gas cylinder or manually enter values for calibration gas.
   - Manual: hold MAG#2 for >5-seconds. The LED will blink green-green-orange when the instrument is ready.
10. **Apply calibration gas at the concentration listed on the cal gas concentration label** *(located on top of the instrument)***.**

Part Number
Serial Number
Sensor Type
Max Range

11. Confirm the start of calibration:

- MGS-400 App: press the ***Start Span*** button.
- Manual: tap MAG#2 within 30-seconds or the instrument will time-out and return to normal operation.

12. Complete span adjustment:

- MGS-400 App: app will countdown to completion. If calibration is successful, proceed to Step 18.
- Manual: the LED will blink green-orange, green-orange-orange, green-orange-orange-orange, etc. until calibration is complete. To abort, hold MAG#2 for >5-seconds, turn off gas flow and remove the calibration adapter. If calibration is successful *(LED blinks green-orange-red)*, proceed to Step 18. If calibration is unsuccessful *(LED blinks orange @ 2 Hz)*, tap MAG#2 to discard the calibration attempt and see the MGS-400 User Manual *(P/N 1100-2294)* for troubleshooting.

13. Turn off gas flow from calibration gas and remove the calibration adapter.

14. Allow sensor to recover / stabilize before the instrument returns to normal operation *(green LED)*.

9. Bump Test

IMPORTANT: The manufacturer of this product requires that a bump test or calibration be performed following installation to verify instrument functionality.

1. **Connect adapter and gas cylinder according to the instructions in the General Calibration Procedure.**

2. **If desired, disable / silence external annunciators** *(e.g., shutdown valves, notification of authorities, etc.)***:**
   - MGS-400 App**:** ***Home Tab*** → ***Calibrate*** → ***Bump*** → toggle ***Take Offline*** to disable communications to external devices.
   - Manual**:** Inform building personnel of test so that external devices can be disabled / silenced.
3. **Apply a sufficiently high concentration of the target gas to trigger alarms, but NOT pure refrigerant or hydrocarbons** *(e.g., do not use a butane lighter)***.**
4. **Once thresholds have been exceeded, relays should activate, digital outputs should transmit the gas concentration and:**
   - MGS-400 App**:** gas concentration should be displayed, the instrument status should be "Low Alarm" or "High Alarm" and alarms states should be "On."
   - Manual**:** LED status should display "Low Alarm" or "High Alarm."
5. **Turn off gas flow and remove the calibration adapter.**
6. **Allow sensor to recover / stabilize before the instrument returns to normal operation** *(green LED)***.**

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