SuiteSentry™ Entryway

Operation and Installation Manual

June 2019

400179 Rev A

SuiteSentry Entryway detecting and locating a ferromagnetic threat
before **entering magnet room**

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Revision	Date	Author	Primary Reason for Change
A	June 2019	MS	Initial Release

Damage in Transportation

All packages should be closely examined at time of delivery. If damage to outer package is visible, make certain the notation “damaged in shipment” was written on all copies of the freight or express bill when delivery is accepted by your receiving agent. Whether noted or concealed, **damage must be reported to the carrier** immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. **Transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period**.

Symbols and Terms

NOTE: The following Symbols and Terms may be used in this manual:

WARNING!
Warning statements identify conditions or practices that could result in injury or death.

CAUTION!
Caution statements identify conditions or practices that could result in damage to the product or other property.

TIP or HINT:
The following is a recommendation and may help simplify efforts during the installation.

Acronyms used in this manual

ACR: ..... American College of Radiology
TJC: ..... The Joint Commission
Zone III: .... ACR definition of area immediately outside the MRI magnet room
Zone IV: ... ACR definition of area inside the MRI magnet room
FMD: ..... Ferromagnetic Detector
LED: ..... Light Emitting Diode; electronic replacement for lamp
SAC: ..... Sensor Array Column
DOS: ..... Door Opening Sensor
DPS: ..... Digital Power Supply
XBar: ..... The SuiteSentry housing above the MR door joining the two Sensor Array Columns
PE: ..... Photoelectric

Device Classification

This equipment is classified as follows:

- **Safe Extra Low Voltage (SELV)** - exterior case is grounded only for shielding purposes.
- **Ordinary equipment** - exterior case is enclosed but is not water-proof.
- The equipment may be disinfected by denatured alcohol applied *externally*.
- The equipment is ***not*** **suitable** for use in the presence of flammable anesthetic mixture.
- The equipment may be used in **continuous operation**.

NOTICE:

Transport this product for a period not to exceed 4 weeks. The following environmental conditions must be adhered to in order to avoid damage to the product.

Ambient Temperature:	**-34°C (-11°F) to +60°C (+140°F)**
Relative Humidity:	**15% TO 95% (Non-Condensing)**
Atmospheric Pressure:	**50 kPa (0.5 atm) to 127 kPa (1.25 atm)**

Language Policy – Service Documentation

WARNING

- This Operation & Installation Manual is available in English only.
- If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.
- Do not attempt to service the equipment unless this Operation & Installation Manual has been consulted and is understood.
- Failure to heed this Warning may result in injury to the service provider, operator or patient from electric shock, mechanical or other hazards.

AVERTISSEMENT

- Ce Manuel n'est disponible qu'en anglais.
- Si le technicien du client a besoin de ce manuel dans une autre langue que l'anglais, c'est au client qu'il incombe de le faire traduire.
- Ne pas tenter d'intervention sur les équipements tant que le manuel operation n'a pas été consulté et compris.
- Le non–respect de cet avertissement peut entraîner chez le technicien, l'opérateur ou le patient des blessures dues à des dangers électriques, mécaniques ou autres.

WARNUNG

- Dieses Kundendienst-Handbuch existiert nur in englischer Sprache.
- Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen.
- Versuchen Sie nicht, das Gerät zu reparieren, bevor dieses Kundendienst-Handbuch nicht zu Rate gezogen und verstanden wurde.
- Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch elektrische Schläge, mechanische oder sonstige Gefahren kommen.

AVISO

- Este Manual sólo existe en inglés
- Si algún proveedor de servicios ajeno a KDI solicita un idioma que no sea el inglés, es responsabilidad del cliente ofrecer un servicio de traducción.
- No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual.
- La no observancia del presente aviso puede dar lugar a que el proveedor de servicios, el operador o el paciente sufran lesiones provocadas por causas eléctricas, mecánicas o de otra naturaleza.

ATENCÃO

- Este Manual de Assistência Técnica só se encontra disponível em Inglês.
- Se qualquer outro serviço de assistência técnica, que não a KDI, solicitar estes manuais noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução.
- Não tente reparar o equipamento sem ter consultado e compreendido este Manual de Assistência Técnica.
- O não cumprimento deste aviso pode por em perigo a segurança do técnico, operador ou paciente devido a' choques elétricos, mecânicos ou outros.

AVVERTENZA

- Il presente manuale è disponibile soltanto in inglese.
- Se un addetto alla manutenzione esterno alla KDI richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione.
- Si proceda alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto.
- Non tenere conto della presente avvertenza potrebbe far compiere operazioni da cui derivino lesioni all'addetto alla manutenzione, all'utilizzatore ed al paziente per folgorazione elettrica, per urti meccanici od altri rischi.

Section 1 - DETECTOR OPERATION

1.1 INTRODUCTION

SuiteSentry™ Entryway is a revolutionary new technology in ferrous metal detection. SuiteSentry is a patented device designed to help prevent ferrous material from accidentally entering the Magnetic Resonance Imaging magnet room. This product is intended to provide the MR Technologist the ultimate in patient and ancillary/non-MR staff control. SuiteSentry Entryway enables the user to rapidly and intelligently screen all persons and objects before entering Zone IV, detecting and removing moderate to large sized ferromagnetic objects before they can become threats.

SuiteSentry Entryway incorporates the following features:

- **Accurately and Rapidly Locates Ferromagnetic Hazards attempting to enter the Magnet Room**
- **Incorporates an escalating Visual Pre-Warning**
- **18 Sensor Zones provide Uniform Sensitivity from floor to top of Portal**
- **Automatic "No-Touch" Activation for the ultimate in convenience and hygiene**
- **Can be used to Self-screen or for Supervised Screening**
- **Optional SuiteSentry Entryway features mitigate door opening alarms as well as when persons are leaving Zone IV with any ferrous materials**

1.1.1 Background

MR Scanners generate an enormously strong magnetic field which, because of the significant technical and economic hurdles in generating the magnetic field, is never purposely turned off, but is always in the 'on' condition, 24-7 *(24 hours a day, 7 days a week)*. This extremely powerful magnetic field, invisible but ever-present, continuously attracts anything which is ferromagnetic *(generally containing iron or steel)*. It can and will attract and pull any ferromagnetic object such as hand tools, oxygen bottles, scissors, chairs, IV stands, or even floor buffers toward the magnet.

Worse, if they are brought within a few feet of the scanner, the magnetic field is so strong that it can actually lift hundred pound objects off the floor and pull them, as airborne projectile missiles, to the inside bore of the scanner, accelerating to over 60 mph. Personnel and patients in the path of the object or inside the bore of the scanner are at grave risk if this happens. Such accidents have led to numerous "close calls", many injuries to patients and personnel, and even death.

Although obviously not as important as the human safety aspects, these objects almost always damage the MR scanner as well.

1.1.2 The Current Situation

All personnel who come in close proximity of the MR scanner, within the four progressively restricted zones of danger, (I to IV), are supposed to receive training about the risks the magnet presents, what kind of objects contain ferromagnetic material, and therefore, the danger of bringing these materials in close proximity to the magnet. Since this powerful magnetic field is never shut down, training must include maintenance and security personnel who may come in close proximity during non-scan hours.

The procedures adopted when operating these MR devices has evolved into a careful "pre-screening" of potential patients to try and make sure they do not have anything on their person. Even with appropriate training and copious use of warning signs, people "forget" or are unaware that an object contains ferromagnetic material, thereby increasing the risk of a disaster.

Even small ferrous objects pose a risk of injury. For example, a hairpin can travel at 40 MPH into a 1.5T magnet. Even if no injury occurs, the financial costs from downtime and/or re-imaging can be very large.

1.1.3 The SuiteSentry Entryway Solution

SuiteSentry Entryway ferromagnetic detectors allow the MR Technologist / personnel unprecedented control of what persons and objects may safely gain entrance into the Zone IV / MR Scanner room.

If an approaching object contains ferromagnetic material, the Sensor Array Portal detects the object's ferrous content, analyzes its ferromagnetic mass and threat potential. If it exceeds the preset threshold and starts to enter the Portal, an **AUDIO ALARM sounds and LOCATION indicator lights are illuminated** in the Sensor Array Columns of the detector.

This **rapid acquisition and location-specific result** allows the user to identify potential ferromagnetic threats by pinpointing the location of the offending object within the detector portal for immediate removal.

There are two (2) specific types of SuiteSentry detectors:

A. Personnel Screening Detectors - Small object detection

SuiteSentry Single Screener, with its higher overall sensitivity, is intended to detect and alarm when small ferrous objects, typically hair pin size and larger, are found on ambulatory personnel before entering Zone III *(MRI control room)*.

B. Scan Room Protection Detectors - Medium to Large object detection

SuiteSentry Entryway is recommended to be installed at the approach to the MR magnet room. It is intended to detect and alarm if larger objects or equipment such as oxygen bottles, IV poles, and ferrous pellet filled "sand bags", are about to enter the MRI magnet room *(Zone IV)*.

When the Personnel Screening and Scan Room Protection detectors are used together, the risk is further reduced for personnel or patients bringing any unrecognized ferromagnetic objects that can become dangerously attracted to the magnet.

SuiteSentry Entryway - additional features that REDUCE ALARM FATIGUE:

- **No Alarm on door**. Door opening or closing will not trigger an alarm ***(If Handle is nonferrous!)***
- **No Alarm on Exit**. No audio.

WARNING!
This device should only be used to SUPPLEMENT and NOT REPLACE existing screening procedures. Even the most advanced technology is NOT 100 % foolproof.
To provide your patients and personnel with the most comprehensive safety, we recommend the use of diligent screening protocols together with our high quality ferromagnetic detectors.

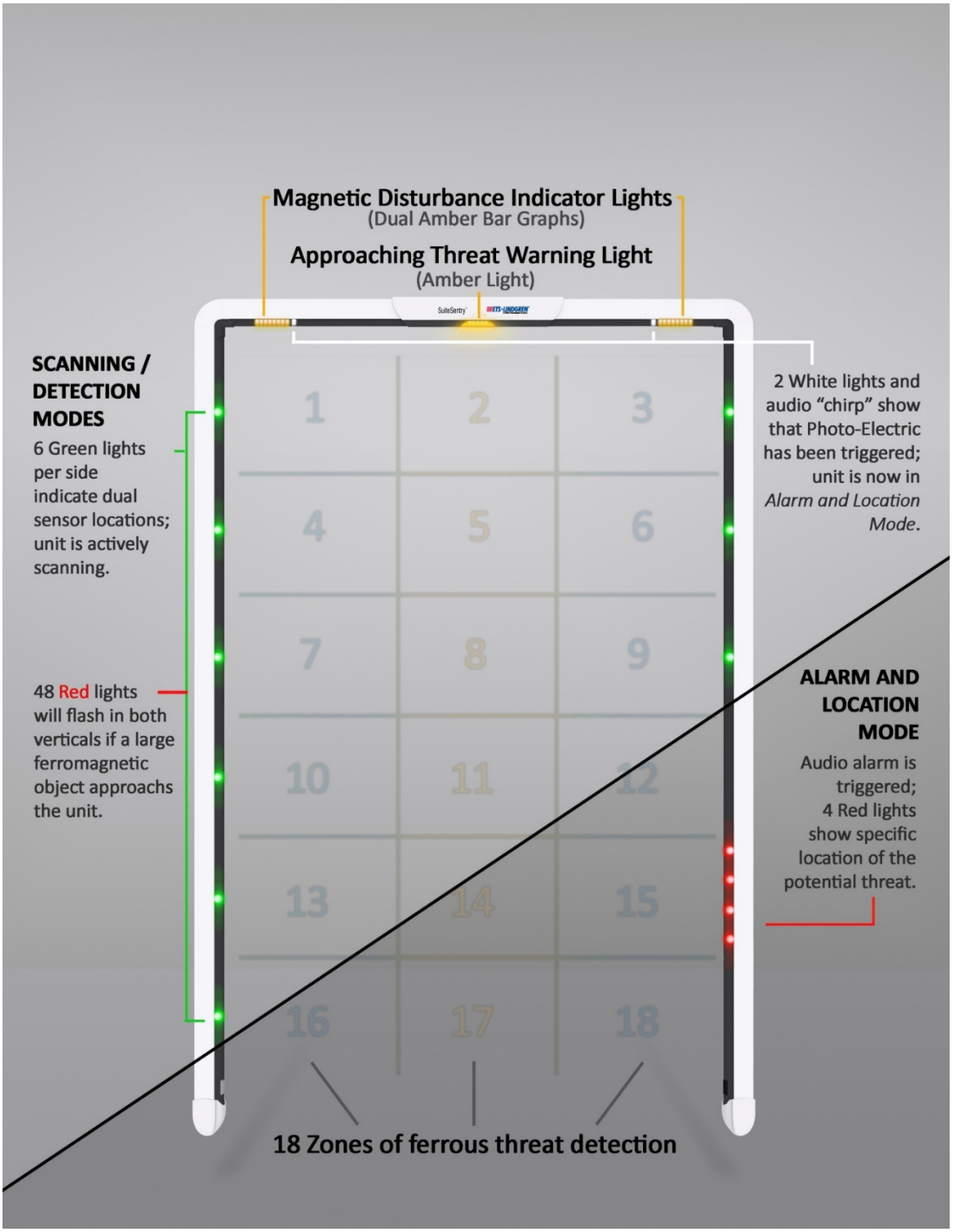
1.1.4 Features of the SuiteSentry Entryway

SuiteSentry Entryway

FERROMAGNETIC DETECTOR SYSTEM

Provides Visual Early Warning and Threat Location simultaneously from both inside and outside of the MRI Magnet Room

Figure 1: SuiteSentry Entryway Features



1.2 The DETECTOR in OPERATION

SuiteSentry Entryway mounted OUTSIDE MR: When **SuiteSentry Entryway** is powered "ON", the device passively senses the magnet fringe field of the specific environment it is placed in and "normalizes" to it. On an *inward swinging door, the Detector is mounted* ***outside*** *the magnet room* and is powered "ON" continuously.

If an approaching object contains ferromagnetic material, the Sensor Array Portal detects the object's ferrous content, analyzes its ferromagnetic mass and threat potential and if it exceeds the preset threshold, the detector progressively turns on visual alarms and an audio alarm.

SuiteSentry Entryway mounted INSIDE MR: On a scan room with outward-swinging door, the detector, which is installed **inside** the magnet room, is powered on/off via a roller arm door limit switch. The switch is typically mounted inside the crossbar's upper corner and removes the electrical power input while the door is closed and the magnet is scanning. When the scanner room door is opened, all the Red ***"STOP"*** LED lights in the Sensor Array Columns illuminate for a few seconds, then they extinguish. The 12 Green ***"SCANNING / GO"*** LEDs then illuminate showing that the detector is now scanning.

CAUTION ! Do not pass thru portal until Green *"SCANNING / GO"* LEDs are illuminated.

SuiteSentry Entryway series detectors have three (3) distinct modes of operation:

1. **SCANNING Mode -** Detector is *passively scanning* the ambient environment for threats.
2. **Pre-Alarm "WARNING" & "STOP" Mode –** *Object is detected* in relative close proximity and general ***visual warnings only*** *are displayed.*
3. **ALARM & LOCATION Mode –** Detected object is above alarm threshold and is attempting entry *into the Magnet Room* – **Visual Location lights *AND* Audio Alarm.**

1.2.1 SCANNING Mode What are the Indicator Lights telling you?

Green *"SCANNING / GO"* LEDs in the Verticals

- Once powered on, and after detector has automatically self-tested, it is always scanning the nearby area for potential ferromagnetic threats.
- It will detect and display potential hazards due to the movement of ferromagnetic objects in relative close proximity of the detector.
- The 6 Green ***"SCANNING / GO"*** indicator LEDs in each of the two columns are illuminated when the unit is scanning for ferromagnetic objects and indicates that no detected objects are ferromagnetic enough to exceed the warning threshold (see Fig. 1).
- There will be no Ferromagnetic Disturbance LEDs on in either the left or right crossbar bar graphs.

1.2.2 Pre-Alarm; Visual "WARNING" & "STOP" Mode – *Potential Threat*

Amber Yellow Bar Graphs on Left and Right of Crossbar – *VISUAL WARNING*

A Ferromagnetic object is Detected and Displayed...but NO Audio Alarm

- The unit detects and displays the disturbance activity on the L & R ferromagnetic disturbance bar graphs *without* audible alarms or location specificity alarms.
- 1 up to 8 Yellow "ferromagnetic disturbance detected" lights per side (bar graphs) can be illuminated in the Crossbar. These lights indicate which direction the threat is approaching from left, right or central and the magnitude of the potential threat.
- The more crossbar corner bar graph LED segments illuminated, the greater the ferromagnetic disturbance, which means the detected object is more ferromagnetic, a larger ferrous mass, or is moving faster. **This equates to a greater attraction to the magnet!**
- The greater the ferromagnetic threat, the greater the distance ahead of the portal the ferromagnetic disturbance bar graphs will be activated.
- Unless a person and/or object passes through the open portal, the detector will stay in Active Detection/Pre-Alarm Mode with NO audio or Location LEDs.

1.2.2 Pre-Alarm; Visual "WARNING" & "STOP" Modes *(continued)*

Amber Yellow Center *"WARNING"* Lights – *Medium Disturbance Detected*

- If the disturbance exceeds the preset threshold in both Sensor Array Columns, the **Center Warning Light will illuminate** indicating the ***object will cause an alarm*** upon reaching the threshold area of the portal…***but NO audio will sound and NO location indicators in the columns*** unless a person and/or object passes through the open portal.

Flashing Red *"STOP"* LED Lights in Verticals - *Large Disturbance Detected*

- If an object with large ferromagnetic mass approaches, the portal will flash the 48 Red ***"STOP"*** LEDs in both Columns, indicating a very serious potential threat.

This is STOP mode! Personnel or object must STOP APPROACH Immediately!

- Ensure the object is fully inspected before being allowed to pass through into the magnet room. If this warning occurs the object will definitely cause an alarm when reaching the threshold area of the portal.
- The Alarm & Location Mode will not be enabled until the person is within the portal and is passing directly through the threshold of each Sensor Array Column. This movement breaks a single or dual laser beam at the column base, enabling the alarm mode of ferromagnetic object detection and location.
- For **SuiteSentry Entryway** detector the Alarm & Location Mode will not be activated while exiting through the portal. The Red ***"STOP"*** LEDs may illuminate for a sufficiently large ferromagnetic mass. Otherwise, the Green ***"SCANNING / GO"*** LEDs will continue to stay illuminated.

1.2.3 ALARM & LOCATION Mode: *Object or person passing thru portal*; What to Expect

White Lights and a "Chirp"

- A "ferrous free" person or device *passing through* the portal will **activate the Alarm & Location Mode**, **but the unit will only ALARM if ferromagnetic material is present.** Alarm Mode is indicated by the 2 White Lights in the crossbar being **illuminated** and an audio "Chirp". This will ***not*** occur for outbound traffic using **SuiteSentry Entryway**.

NOTE: If the Green *"SCANNING / GO"* LEDs stay illuminated, NO ferromagnetic hazards were detected.

Flashing Red *"STOP"* LEDs and an Audio Alarm-OBJECT MOVING THRU PORTAL !!

- Detection of a Ferrous Object is indicated by **Red *"LOCATION"* LEDs** in the columns of the portal, and an **Audio Alarm**.

WARNING! When this Alarm & Location Mode is triggered, DO NOT ENTER ZONE IV until ALL offending objects have been removed.

- **In Alarm & Location Mode, SuiteSentry will DISPLAY the Object's LOCATION.** The Green ***"SCANNING / GO"*** LED lights in the vertical Sensor Array Columns will extinguish and flashing Red ***"STOP"*** LEDs will fully illuminate both columns, then only the Red ***"LOCATION"*** LEDs showing the approximate location *(within 12")* of the offending object, both in height and on which side of the portal is closest to the offending ferrous object in the Sensor Array Column. *(See Figs. 2,3 and 4)*
- If Red ***"LOCATION"*** LEDs on both vertical columns illuminate, the threat is located in the middle third of the portal aperture in between the height of the illuminated Red LEDs on each side.
- **The object(s) can then be identified and removed** so the patient or personnel can safely approach the MR scanner.

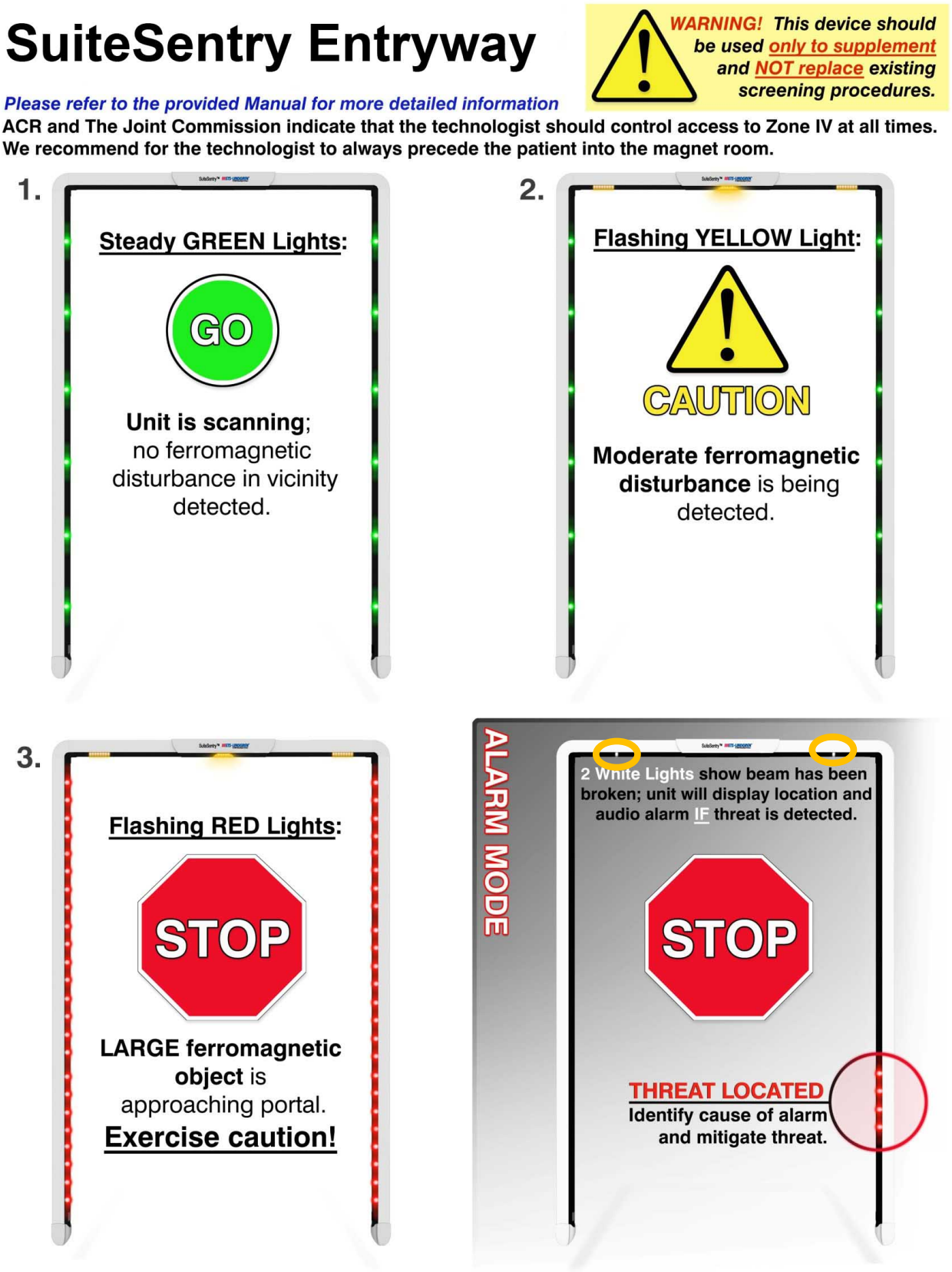
1.2.4 Operation Figures

Figure 2: Large Threat Pre-Warning

Figure 3: Threat Location Alarm

1.2.5 The 4 Status Views of Detection

Figure 4: Detector Status Conditions



1.2.6 Ferromagnetic Objects INSIDE the body

NOTE: SuiteSentry has no detection limitations with regard to locating ferromagnetic material inside an object or human body based on the inherent ability to detect said object dependent on its ferrous mass. If an object has enough ferromagnetic mass to be detected at 10 inches from the Sensor Array Column (SAC) it will still be able to be detected if it is inside a body at same 10 inches from the SAC. Therefore, if a ferrous non-superficial object is detected, we most certainly recommend further investigation by following your facility's standard practice.

Nevertheless, if our product does NOT react, one should NOT automatically assume that there are no ferromagnetic objects on or "in" the person.

1.2.7 Small Ferromagnetic Object Detection

In regards to small ferrous masses, some common examples being cell phones, which are mostly plastic and non-ferrous metals; keys, which are almost always nonferrous and items that have little susceptibility to the field strength even at 3.0T, it is logical to assume the detector will NOT alarm for these small objects. The detector is designed to alarm on moderate and larger threats passing through the middle center and farthest away from the sensors in the Sensor Array Columns.

Any small item that does NOT have enough ferromagnetic susceptibility to cause the detector to alarm can be attracted to the magnet once in the high fields. With that said it is also going to be very easy to remove these objects with very little pull force whatsoever and while there exists a small likelihood of injury to person in or on the magnet the offending ferrous object will not have enough mass to require quench or even mar the finish of the magnet itself.

For small ferrous object concerns and screening we recommend SuiteSentry Single Screener personnel screener for screening down to small ferrous objects on ambulatory patients and staff if that is your primary concern. See section 1.1.3 for more detailed explanation of how to use as a system.

CAUTION!

Small ferromagnetic objects on personnel who routinely enter the magnet room may activate the alarm since these objects have likely been magnetized by exposure to the high magnetic field.

Do not assume, however, that *SuiteSentry Entryway* series of Ferromagnetic Detectors can be used to consistently detect small objects.

Small object screening should be performed with *SuiteSentry Single Screener* personnel screening detector.

WARNING!

This device has not yet been fully evaluated for its efficacy in detection of ferromagnetic objects inside the body, such as *IMPLANTS*.

1.3 USING THE DETECTOR

The ACR Guidance Document on MR Safe Practices; 2013 states:
"Non-MR Personnel should be accompanied by, or under the immediate supervision of, and in visual or verbal contact with one specifically identified Level 2 MR person for the entirety of their duration within Zone III or Zone IV restricted regions."

RECOMMENDATION!
It is good practice for the **Technologist to precede** other personnel or patients entering the magnet room. The technologist is then in the best position to halt further movement into the magnet room should a visual and/or audio alarm occur, allowing them full control of the Magnet Room entrance!

We recommend the level 2 Technologist enter Zone IV first, while asking the patient (or non-level 2 staff member) to remain in Zone III in front of magnet room door. With the detector now between the Technologist and patient, the Technologist will then instruct the patient to enter the magnet room while observing the detector for alarms. With the tech between the detector/Zone IV door threshold and the magnet, the patient/person will alarm almost immediately before they can proceed any further into Zone IV. The 5 gauss line is typically several feet into the room and as long as the technologist halts further ingress, there is not enough of a rise in the gauss field strength to attract even larger ferrous objects

…….**AS LONG AS THEY ARE STOPPED IMMEDIATELY!** *(See figure 3)*.

1.3.1 General Process

- If a person or device approaches the Portal with an object that could become a ferromagnetic projectile threat, **two Yellow bar graph arrays**, placed horizontally in each corner of the portal's crossbar panel, will begin to **display the magnitude of the ferromagnetic threat** in relation to the approaching ferrous object. This typically starts at about 6 feet / 2 meters away from the portal.
- The more Amber Yellow "WARNING" LEDs, the greater the disturbance, which means the detected object is more of a potential threat, regardless of size.
- The detected object can be **quickly located** by stepping into the center of the portal which will activate the detector and **flash the Red *"LOCATION"* LED lights closest to the offending object**.
- The person should step back out of the portal and remove the ferromagnetic object(s) and repeat until no alarms are created. ***NO PIGGY-BACKING!***

LOCATE the Object,
REMOVE the Object,
REPEAT procedure until …
NO ferromagnetic objects are detected.

NOTE: If the Green "SCANNING / GO" LEDs stay illuminated, NO ferromagnetic hazards were detected.

WARNING!
If the center yellow LED warning beacon in the middle of the crossbar or…
All of the Red side LEDs flash, the detected object *WILL* trigger an Alarm & Location condition upon stepping through the portal.

WARNING!
NO personnel or patients should be allowed to proceed to the MR scan room if they have detected ferromagnetic objects or material on their person.

1.3.2 Detector installed *OUTSIDE* Scan room; Opening *INWARD* swinging door

SuiteSentry Entryway – Additional features

- As one of the additional features of a SuiteSentry Entryway detector installed outside the magnet room, the act of opening the door by a "ferrous free" person *(sensed by the detector as they approach)* will enable the suppression of the audio alarm and location LEDs that would normally be caused by the door's motion. The detector will display all Red ***"STOP"*** LEDs in the Sensor Array Columns for the adjustable preset time chosen for the door's opening *(factory preset to about 3.5 seconds)*. These Red ***"STOP"*** LEDs warn any additional person attempting to follow the first person into the Magnet Room, that they should not yet enter. The next person can enter once the 12 Green ***"SCANNING*** / ***GO"*** LEDs re-illuminate.
- Conversely, if the door begins to open and a person or object does contain a detectable ferromagnetic mass, the audio alarm will sound and the Red ***"LOCATION"*** LEDs will be illuminated if the portal is passed through.

Figure 5: SuiteSentry mounted OUTside MR; INswing Door

1.3.3 Detector installed *INSIDE* Scan room; Opening *OUTWARD* swinging door

On a scan room with an outward swinging door the opening of the door would block one side of the detector, but with SuiteSentry Entryway, we are MRI OEM certified to install the detector inside the scan room door so that both Sensor Array Columns and their object location LEDs are fully visible whether inside or outside the MR room.

Although the units are certified for operation inside the scan room, full assurance of non-interference is accomplished by turning off AC voltage to the unit when the scan room door is closed. The unit is powered on/off via a limit switch which removes the electrical power while the door is closed and applies power when the scanner room door begins to open.

Figure 6: SuiteSentry mounted INside MR; OUTswing Door

SuiteSentry Entryway – Additional features

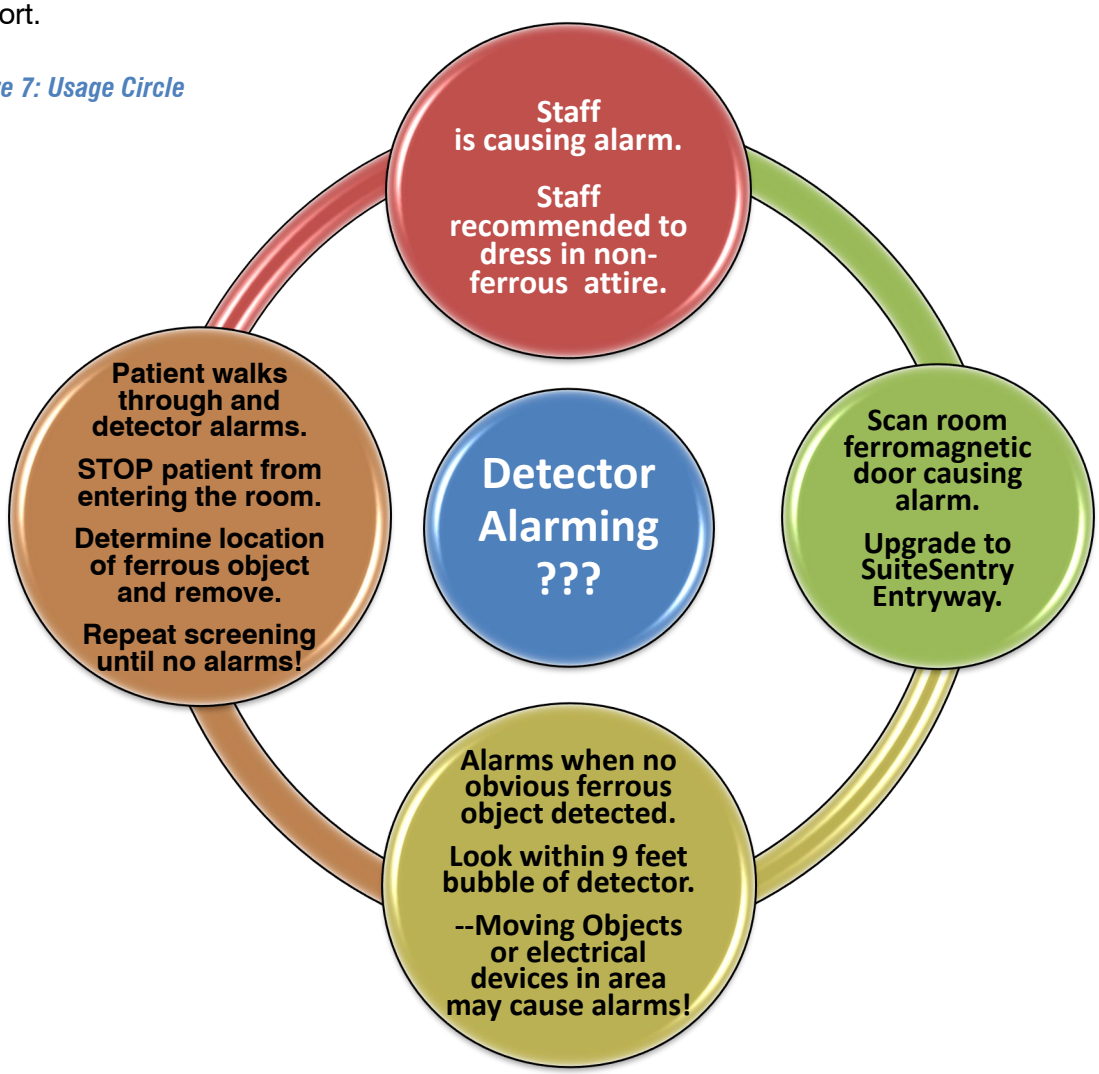
- Upon exiting the magnet room the detector will ignore any ferrous item as it is leaving the "danger" zone and is thereby irrelevant with regard to projectile threat and safety; hence no audio alarms are activated.

1.4 DETECTOR ALARMING? - TROUBLESHOOTING

1.4.1 Basic Usage Circle

Please observe the following diagram. The **SuiteSentry Entryway** is designed to be simple and reliable as well as provide a higher margin of safety. If the detector alarms, there is a reason! If the detector is operating in an undesirable way, please verify all basic conditions listed below are adhered to. If you still have questions, please do not hesitate to contact ETS-Lindgren for product support.

Figure 7: Usage Circle



1.4.2 Summary of Operational Considerations

- Electrical and electronic equipment generate localized magnetic disturbances.
- If electronic equipment is located within 9 feet (3 meters), the SuiteSentry Entryway detector may very well exhibit false positives. *(Disturbance of the field is real, but is not caused by a moving object.)*
- Determine the object/device that causes this condition and remove from immediate vicinity of the detector and allow the detector to stabilize to the environment.
- Staff wearing ferromagnetic material in their clothing will cause the detector to alarm. The detector will alarm for attire such as watches, belts, shoes, and underwire bras. Change out all clothing that exhibits alarms to ensure consistent screening results and remove ignored alarming.
- All staff should acknowledge the detector alarms and Do NOT enter Zone IV if an alarm is displayed until offending ferrous object is removed.

1.5 PREVENTIVE MAINTENANCE

The detector is a very low maintenance device that should provide your facility with years of trouble free and reliable ferromagnetic materials detection. This section describes how to keep your detector operating within factory specifications.

Scheduled Maintenance-The recommended frequency of preventive maintenance is monthly or quarterly at site discretion.

1.5.1 Self-Testing of SuiteSentry Entryway

Inspect the Sensor Array Portal as often as operating conditions require.

1. Perform the SELF TEST routine described in section 2.5.2.

1.5.2 Cleaning of SuiteSentry Entryway

To the exterior surfaces, perform the following steps:

1. Remove loose dust on the outside of the Sensor Array Columns with a lint-free cloth. Use care to avoid scratching the plastic display windows.
2. Use a soft cloth dampened with water to clean the Sensor Array Portal. Use an aqueous solution of 75% isopropyl alcohol or any non-ammonia based cleaner for more efficient cleaning.

1.5.3 Replacing polycarbonate diffusers

Occasionally, due to impacts with gurneys, etc. the light diffusers on the Sensor Array Columns may become scuffed or damaged.

1. Refer to Section 4, Table 4-1 Field Replaceable Components for ordering information. Instructions are provided with the kit. No tools are required.

SUPPORT AND SERVICE

Hardware support: **ETS-Lindgren at:**
Toll Free: **1-800-749-1460**
Fax: 512-531-6500
Email: **technical.support@ets-lindgren.com**

Address: 1301 Arrow Point Dr.
Cedar Park, TX 78613
USA

WARRANTY POLICY

ETS-Lindgren, the supplier of SuiteSentry Ferromagnetic Detector Systems, warrants equipment supplied by it to be free from defects in materials and workmanship for the period listed below.

If, within such period, any such equipment shall be proven to ETS-Lindgren's satisfaction to be defective, an RMA *(Return Merchandise Authorization)* number will be issued. Upon return, such equipment will be repaired or replaced at ETS-Lindgren's discretion with no charge to the customer.

This warranty shall *not* apply to equipment not supplied by ETS-Lindgren,
or to equipment which has been:

a. Repaired or modified by others so as, in ETS-Lindgren's sole judgment to affect the same adversely,
b. Damaged by accident or impact,
c. Damaged by circumstances beyond ETS-Lindgren's control,
d. Damaged by improper operation, maintenance or storage,
e. Subjected to other than normal use or service.

WARRANTY PERIOD

Three (3) years from date of installation at the customer's facility or thirty nine (39) months from the factory ship date, whichever date occurs first.

EXTENDED WARRANTIES ARE AVAILABLE AT ADDITIONAL COST.

WARRANTY LIMITATIONS

The foregoing Warranties are exclusive and in lieu of all other express and implied warranties except warranties of Title, including, but not limited to implied warranties of merchantability and fitness for a particular purpose.

ETS-Lindgren shall not be subject to any other obligations or liability whatsoever with equipment manufactured by ETS-Lindgren or service rendered by ETS-Lindgren and the foregoing shall not obligate ETS-Lindgren to provide reimbursement for transportation, removal, installation or other expenses which may be incurred in connection with repair or replacement. ETS-Lindgren's sole liability for defects or breach of warranty shall be replacement of the materials involved.

CONSEQUENTIAL DAMAGES

ETS-Lindgren will not be liable for special, indirect, incidental or consequential damages, and our liability, whether in contract, in tort, under any warranties, or otherwise, cannot exceed the price of the product or part on which such liability is based.

RETURNS

No equipment may be returned without obtaining permission and a Returned Merchandise Authorization (RMA) from ETS-Lindgren. Returned equipment must be packed securely to reach ETS-Lindgren without shipping damages and shipped prepaid by an appropriate carrier.

Email: technical.support@ets-lindgren.com

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Section 2 - INSTALLATION PROCEDURES

2.1 INTRODUCTION & PREPARATION

2.1.1 Product Identification and Shipping List

The **SuiteSentry** Ferromagnetic Detector System is shipped in one corrugated carton. This long carton contains all the items required for assembly and installation of the system. Part Numbers of the main components are listed below.

Component	*Qty*	*P/N*
Sensor Array Column Assembly - LEFT	1	400161
Sensor Array Column Assembly - RIGHT	1	400162
Sensor Array Crossbar Assembly - Adjustable 44" - 54" Wide Inside +5" OD	1	400163
Power Supply - Digital w/ 12' output cable / for use OUTSIDE MR	1	400164
Power Supply - Digital w/ 8' output cables Certified for use INSIDE MR	1	400165
Output Cable - 8' L – 5pin Conns – used w/ 400165 Pwr Supply	1	400166
Output Cable - 8' L – 3pin+4pin Conns – used w/ 400165 PS	1	400167
Output Cable - 14' L – 5pin Conns – used w/ 400165 Pwr Supply	1	400168
Output Cable - 14' L – 3pin+4pin Conns – used w/ 400165 PS	1	400169
AC mains power cord – w/ 90° Plug – 6 ft long -- USA	1	400170
AC mains power cord – w/ 90° Plug – 3 ft long -- USA	1	400171
AC mains power cord – w/ Straight Plug – 6 ft long -- USA	1	400172
AC mains power cord – w/ 90° Plug – 15 ft long -- USA	1	400173
AC mains power cord – w/ 90° Plug – 1.5 ft long -- USA	1	400174
Installation Hardware Kit - SuiteSentry Entryway	1	400175
Surface Conduit Accessory Kit - Ivory	1	400176
Installation Kit - Door Roller Switch - Entryway w Levers+Arms - 4pin conn.	1	400177
Adjustable Leveling Foot Kit (Pair)	1	400178
Operation & Installation Manual – SuiteSentry Entryway	1	400179
Operation and Training – SuiteSentry	1	400180
Short Form Instruction Card – SuiteSentry Entryway	1	400181

2.1.2 Tools Required for Assembly and Installation *(provided by installer)*

1. #1 and 2 Phillips screwdriver 6 inches long (15 cm) APPROXIMATE
2. #2 stubby Phillips or very low profile screwdriver bit with ratchet
   Overall length should not exceed 1 inch (2.5 cm)
3. Box cutting knife with replacement blades
4. Needle nose pliers-medium to small sized
5. Medium duty electric or battery drill with at least 2 spare charged batteries
6. 3/8 inch nut driver/3/8 inch wrench (ratcheting wrench is best)
7. 1/4 inch nut driver/1/4 inch wrench (ratcheting wrench is best)
8. Drill bit index with at least two (2) 1/8 inch drill bits
9. Measuring tape up to 12 feet (4 meters)
10. Micro screwdrivers, flat head and Phillips
11. 6 inch (15 cm) bubble level
12. Heavy Duty PVC cutters for wire trim moldings *(Sears 3-1 Accu-Cut Model 37310 recommended)*
13. Painter's tape (for detector) and clear packing tape (for parts return box)

2.1.3 Summary of Tasks

The following steps are a general guideline and actual workflow may differ depending on the specific site and installation area. This section is provided so the installer has a general outline of the steps in the installation and training process.

TIP: Use this page as a check list to ensure proper order of mounting detector! Check each box as you go to ensure all steps are followed!

1. r Verify Sensor Array Portal *(detector)* mounting location and Outlet-Always Ask!
2. r Select method and routing for Power cables to Sensor Array Portal
3. r Assemble Sensor Array Portal
4. r Temporary Test Sensor Array Portal in desired location before permanent mounting
5. r Mount Sensor Array Portal
6. r Adjust final calibration of Sensor Array Portal
7. r Mount laminated copy of Short Form Instructions near detector *(SAP)*
   (Only if facility permits, ask first!)
8. r Clean area and remove installation debris
9. r Train staff and have them sign provided "Training Record" roster*
10. r Complete "Installation and Training Acceptance Document"* (Manager signs)
11. r Take pictures of installed detector*
12. r Complete "Quality Assurance Document"*
13. r Have responsible party sign all documents and provide white copy to signee*
14. r Send all documents and pictures to ETS-Lindgren* (Same day preferred, immediately following installation)

* **These items are required for permanent warranty registration file!**

Please make *detailed notes* on each document as they will be added to the device history record.

HINT: The installer should request that the SuiteSentry Entryway be brought to the installation area by the facility staff prior to arrival at the site.

2.2 SITE SELECTION & INSTALLATION GUIDELINES

TIP:
Read the entire section 2.0 guidelines prior to installation- it will explain everything you need to know to assure a problem free installation of the detector!

2.2.1 Overview

SuiteSentry Entryway ferromagnetic detectors allow the MR technologist / personnel unprecedented control of what persons and objects may safely gain entrance into the Zone IV / MR Scanner room.

If an approaching object contains ferromagnetic material, the Sensor Array Portal detects the object's ferrous content, analyzes its ferromagnetic mass and threat potential. If it exceeds the preset threshold and starts to enter the Portal, an **AUDIO ALARM sounds and LOCATION indicator lights are illuminated** in the Sensor Array Columns of the detector.

This **rapid acquisition and location-specific result** allows the user to identify potential ferromagnetic threats by pinpointing the location of the offending object within the detector portal for immediate removal.

There are two (2) specific types of SuiteSentry detectors:

A. Personnel Screening Detectors - Small object detection

SuiteSentry Single Screener, with its higher overall sensitivity, is intended to detect and alarm when small ferrous objects, typically hair pin size and larger, are found on ambulatory personnel before entering Zone III *(MRI control room)*.

B. Scan Room Protection Detectors - Medium to Large object detection

SuiteSentry Entryway is recommended to be installed at the approach to the MR magnet room. It is intended to detect and alarm if larger objects or equipment such as oxygen bottles, IV poles, and ferrous pellet filled "sand bags", are about to enter the MRI magnet room *(Zone IV)*.

When the Personnel Screening and Scan Room Protection detectors are used together, the risk is further reduced for personnel or patients bringing any unrecognized ferromagnetic objects that can become dangerously attracted to the magnet.

SuiteSentry Entryway - additional features that REDUCE ALARM FATIGUE:

- **No Alarm on door**. Door opening or closing will not trigger an alarm ***(If Handle is nonferrous!)***
- **No Alarm on Exit.** No audio.

2.2.2 Functional Siting Requirements

In order to ensure the system will provide detection and an alert for ferromagnetic objects nearing the magnet room *(Zone IV)*, the unit should be positioned so that all equipment, patients and personnel entering the magnet room must pass through the Sensor Portal. The Sensor Portal must also be positioned to provide adequate time to react to an alarm generated by the SuiteSentry Entryway before the ferromagnetic object will be exposed to the high magnetic field strength of the scanner. The MRI Suite Door opening is always preferred!

For a single magnet site, a suitable location is in the approach to the magnet room door. In many sites, there is an outer structural room containing the inner shielded room. A hallway or alcove usually connects the outer structural room to the magnet room door. If the hallway distance between the magnet room door and the outer structural wall is at least 2 to 3 feet, the outer structural wall is the best location for the SuiteSentry Entryway.

Most magnet room doors, handles, or hinges contain *some* amount of ferromagnetic material. The larger the separation distance between the magnet room door and the Sensor Portal, the less likely the act of opening or closing the magnet room door will trigger an alarm. The minimum separation between the Sensor Portal and the magnet room door not causing the door to be detected is not precisely known due to differences in all shield manufacturers rooms and doors.

Summary of Functional Siting Requirements:

- The location should have a measured magnetic fringe field of 5 Gauss or less.
- The preferred location to install SuiteSentry Entryway entry is at the magnet room doorway between Zone III to Zone IV.
- If possible, move detector away from magnet room door a few inches so as to minimize alarms when opening/closing of door if door has ferrous material in it.

CAUTION!

Any moving ferromagnetic objects within 3 meters/9 feet of the detector may display a visual alarm.

TIP:

Locate the detector within the door area to not interfere with patient transportation and to prevent possible damage from patient transport impact. However, be certain the Sensor Array Column LED's remain visible from inside and/or outside the room!

TIP:

Read both sections of this *Operation & Installation Manual* to get a thorough understanding of the SuiteSentry Detector!

2.2.3 Operational Siting Requirements

Since SuiteSentry Entryway is designed to detect moving ferrous objects approaching or passing through the Sensor Portal. Site selection should keep extraneous moving objects such as printers, office chairs and file cabinet drawers away from the Sensor Portal. Special hardware and software incorporated into the design reduces the sensitivity to moving ferromagnetic objects on the far sides of the Sensor Portal.

Maintaining separation from electrical devices, especially those which contain transformers, motors or other moving parts, is important. These devices create magnetic fields which can mimic moving ferromagnetic objects.

Distance should be maintained from electrically locked or electrically opening doors. Some doors have magnets mounted on them to activate reed switches used to indicate that the door is closed. Plan your installation to maintain separation from these doors.

Summary of Operational Siting Requirements:

- Remove electrical devices at least 3 feet (1 M) away from the installed detector to prevent false positive alarms *(possibly farther depending on the level of EM interference).*
- Ensure area of installation is free from electrical and electromagnetic interference when possible.
- If electronic equipment is within 9 feet (3 M) the detector may very well exhibit false positives. Determine the object/device that causes this condition and remove from immediate vicinity of the detector and allow the detector to stabilize to the environment.

2.2.4 Operational Considerations

The highest sensitivity to moving objects occurs along the forward approach to the Sensor Portal. Efforts should be made to minimize traffic at the approach to the Sensor Portal which will not enter the magnet room as this traffic may cause unintended alarms.

Even small ferromagnetic objects on the person of staff who routinely enter the magnet room may trigger an alarm. These ferromagnetic objects will be magnetized by exposure to the magnetic field of the magnet. Once magnetized, even small objects will cause an alarm identical to a larger object.

To minimize these alarms, staff should be trained to eliminate the wearing of ferromagnetic objects such as underwire bras, shoes with steel shanks, belt buckles, pens, badges, eyeglasses, and hair clips.

Summary of Operational Considerations:

- The detector may alarm for attire such as watches, belts, shoes and underwire bras. If you feel it pull at or near the bore, the detector will probably alarm on the object.
- All SuiteSentry Entryway series detectors are not personnel or patient prescreening devices.
- All staff should comply with the detector alarms and not be admitted if an alarm is displayed.
- If patient transports are used, they should be MR Safe and/or totally NON-FERROUS to prevent false positive alarms.

2.2.5 Installation Considerations

Installation instructions are below; however, some general principles should be considered. The SuiteSentry Entryway series Sensor Portal is quite robust and will tolerate all but the hardest impacts without malfunctioning. In consideration of the potential for impact, the attachment of the Sensor Portal to the building structure should tolerate minor to moderate impacts without damage. If possible, the Sensor Portal should attach to a structural surface, not to hollow drywall.

The mounting configuration should minimize the potential for movement of the Sensor Portal during minor impacts. As movement of the Sensor Portal may trigger an alarm if the Sensor Portal is mounted near a doorway, the Sensor Portal should be adjusted to match the width of the door opening.

Please note the following:

- The detector can exhibit false positives if located near electromagnetic source. Be aware of wall or desk mounted phones and stereo speakers as they are electromagnetic.
- Equipment room electronics may cause interference. If the magnet room door is in close proximity to the equipment room, make sure the unit can stabilize in the intended installation location.
- The floor in the area of install may exhibit “flex” and have a small amount of deflection. This can cause a false positive in the lower left or right side when a person steps close to the area. If you are leaving the leveling mount feet on the vertical columns, make sure the floor does not flex. If this is a concern, remove the leveling mount feet after mounting the SuiteSentry Entryway.
- If the area where the SuiteSentry Entryway is to be installed shows significant physical damage from patient transports, set the detector width, if possible, to be slightly wider than the wall surfaces where the transports are striking the wall. Make certain, however, that the SuiteSentry Entryway LED’s are visible from inside and outside of the magnet room if the device is set wider than the opening.

CAUTION!

The RF Shielding enclosure is NEVER to be used as an attachment point as the shielding could be penetrated and then must be repaired and recertified. That is a VERY expensive process!!!

TIP:

If you did not read Section 2.0, please go back and read! It is very useful to know these issues PRIOR to attempting installation!

TIP:

Seriously, READ SECTION 2.2!!!

2.3 ASSEMBLY of DETECTOR PORTAL

2.3.1 SuiteSentry Entryway Sensor Portal (LASER BEAM IN BOTH SENSOR ARRAY COLUMNS)

SuiteSentry Entryway Sensor Portal Mounted INSIDE MR or OUTSIDE MR

The basic configuration is the same as section 2.3.1; a few differences in the internal cables.

- The Entryway option has a slightly different configuration as it uses two Photo-Emitter/PE (Laser) beams; one in each Sensor Array Column.
- Determine **HINGE SIDE** first and "flip" the crossbar to make sure the "**INBOUND**" crossbar cable is on that side! The INBOUND cable is on the Power connector side as shipped from the factory.

TIP: REMOVE the rubber band to separate the column cables prior to plugging in -- the rubber band is to ensure cables do not get pulled out during shipping/unpacking.

- **Ensure all dip switches are "ON"!** *(See Fig. 17)* The "INBOUND" laser beam should always point to the front/outside of the magnet room and be the first beam crossed when stepping INTO the MRI room, which is verified by creating a "CHIRP" sound and the two white LED lights in the crossbar illuminating.
- The "OUTBOUND" laser beam, from the opposite column, will be beamed closest to the MRI, and is the second beam tripped walking through the threshold into the magnet room. If you cross into the magnet room and activate the detector with a chirp and white LED's in crossbar illuminate, this is the correct operation.
  If you walk in and the detector does not chirp and white LED's in crossbar are not illuminated, then the beams are pointing incorrectly.
- **IF Orientation is incorrect:** The PE assembly module can be easily adjusted with the 4 corner adjusting screws- see Figure 18 (screws at corners). If the orientation of the PE beam is reversed this is the most expedient way to correct the orientation of the inbound and outbound laser orientation. **There will be no chirp or audio alarm when walking out of magnet room if configured properly.**

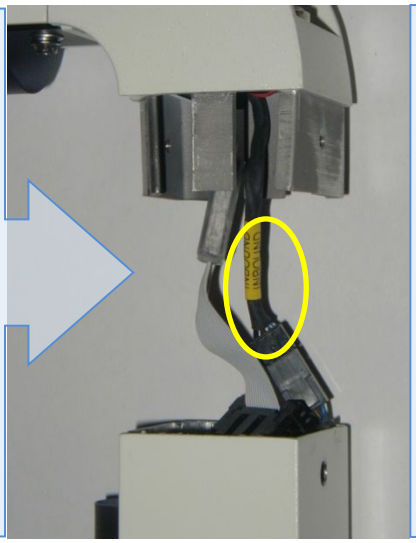
NOTE: The beams should be adjusted to be 2" away from edge of sensor array column whether aligned in front or back.

SuiteSentry Entryway Sensor Portal Mounted OUTSIDE MR; *Additional Door Position Sensor*

- On a SuiteSentry Entryway "INSWING" door version Detector, which mounts OUTSIDE MR, an additional Door Position Sensor/switch that help mitigate the false positive alarm of the magnet room door is mounted on the door opening side of the crossbar. *(see section 2.5.7 for details)*

Figure 8: Sensor Array Column Cabling

Note: The DOOR HINGE side has a **YELLOW** labeled cable for the **INBOUND** laser module mounted inside the column bottom, as well the gray ribbon cable for the sensor array as noted in Figures 9 & 10.



Note: The DOOR OPENING side has a **WHITE** labeled cable for the **OUTBOUND** laser module mounted inside the column bottom, and the gray ribbon cable as noted in Figures 9 & 10.
ALWAYS PLUG IN EVEN IF NO 2ND PE SENSOR IS INSTALLED

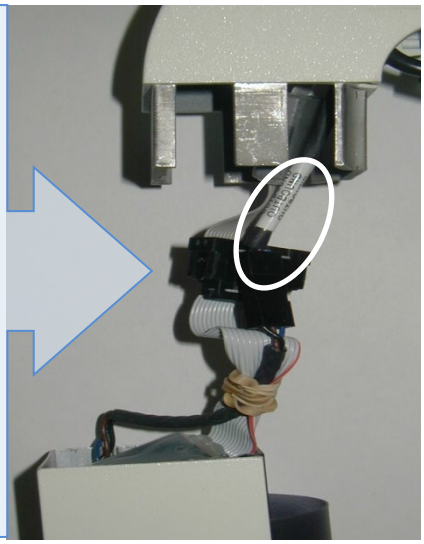
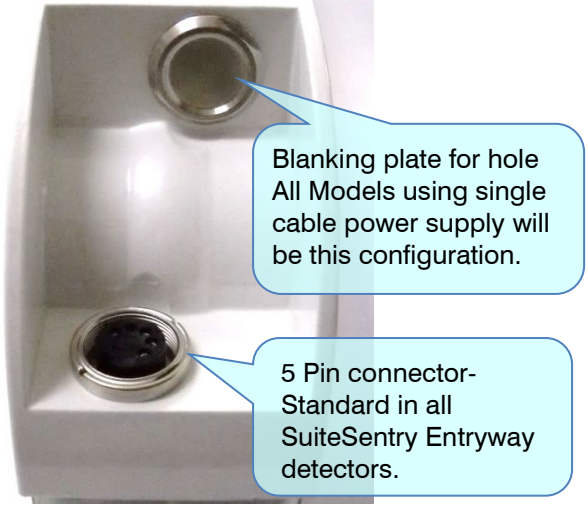


Figure 9: CROSSBAR CONNECTIONS

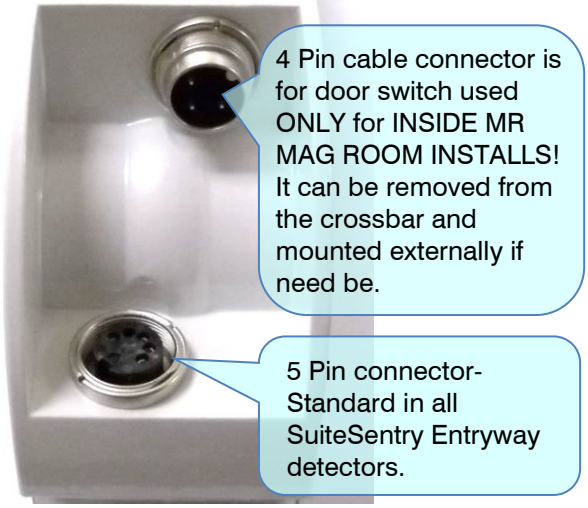
Outside Magnet Room Unit

Power connection without Limit Switch in corner.



Inside Magnet Room Unit

Power connection with additional 4 Pin connector for limit switch controlled power.



- Leave Power Supply ***disconnected*** from input power until all output cables are connected!
- The power cable for the portal has 5 pins in the connection. It is keyed and always plugs into the 5 pin portal mounted connector only.
- If the detector is an inside magnet room version it will have a limit switch in the upper corner of one side of the crossbar bottom. The 4 pin connector cable routes from the main power supply to the 4-pin portal mounted connector and it is keyed. **This plugs in after the 5pin connector! *(see tip below)***
- When installing connectors, align keys and thread on carefully to make solid connections.

TIP: If installing both 4 pin and 5 pin connectors (In magnet room installs) install right angle connector first! You will not be able to tighten it if you put 4 pin (straight connector) on first!

2.4 INSTALLATION

2.4.1 OUTSIDE the MAGNET ROOM Installation (Without Door Switch)

2.4.1.1 Temporary Mounting of Sensor Portal

- A temporary installation at the chosen location of install is required. Use painter's or temporary tape to hold and support the detector in place upright with detector functioning.

  Be sure to use enough tape to prevent unit from falling!

- The installation of the Sensor Portal should be stable since any motion of the Sensor Portal will trigger an alarm.
- Once the Sensor Portal is positioned, acquire a baseline as described in Section 2.5.2. Failure to establish a baseline indicates that the magnetic environment is not stable enough for correct functioning of the SuiteSentry Entryway entry and *may* require moving the installation to a different location.

TIP! Always test unit with temporary mounting prior to permanent mounting to ensure unit is capable of functioning in the specific location environment.

2.4.1.2 Permanent Mounting of Sensor Portal

NOTE: Please review installation / wiring diagrams *(Section 3.2)* before proceeding.

- After verification of detector functionality, position Sensor Portal (detector) at selected mounting position.
- Ensure there is a small amount of clearance above the crossbar and the two vertical columns for connections and access to mounting hardware.
- There are sets of Three (3) mounting holes in each Sensor Portal Vertical column. These mounting holes are used to attach the supplied mounting brackets to the Sensor Portal Verticals. Most installations will require only two mounting points per side, one (1) each at top and bottom for a total of four (4) mounting points. For the most robust installation, six (6) mounting points may be used and there are two (2) more mounting points on the top of the crossbar as well.
- The L-Brackets have slots for adjustment and are provided in 2 sizes: 2 x 2 inch and 2 x 3 inch. Fig. 16 provides some typical examples of mounting methods.
- Where possible, direct mount with L-Brackets and/or double L-Brackets, providing the most rigid installation. Combining other techniques, such as the T-Style or S-Style with L-Brackets so the brackets are not visible from the front on the SuiteSentry Entryway entry is another alternative.
- The width of the detector should be set so that the LED's in the Sensor Array Columns are visible when inside or outside the MR suite. NOTE: Pay close attention to gurney usage as it will affect the width. Set the detector as wide as possible to avoid damage from gurney's striking columns yet ensure visibility from both inside and outside the MR room!
- Before permanently mounting the Sensor Portal, make sure that the Sensor Portal is square, level and adjusted to the correct height. The leveling mount foot kit, *(part # 400178)*, screwed into the bottom of the Sensor Portal verticals allow for vertical adjustment. If further vertical adjustment range is required, remove the screw adjuster pads and install the coupling nut and threaded rod.
- NOTE: Test the floor for flex/deflection if leaving foot kit in bottom caps- REMOVE IF FLOOR FLEXES AND USE BRACKETS AT TOP OF CROSSBAR!
- Place screw covers on the 8-32 X 3/8 inch screws into the Sensor Portal bar and insert the screws into the captured nuts in the mounting surfaces.

CAUTION!

MAKE SURE TO KEEP ALL MOUNTING HARDWARE FROM MAKING AN ELECTRICAL CONNECTION TO THE SHIELDING OF THE MAGNET ROOM.

2.4.2 INSIDE the MAGNET ROOM Installation (With Door Switch)

2.4.2.1 Temporary Mounting of Sensor Portal

TIP! Always test unit with temporary installation prior to permanent mounting to ensure unit is capable of functioning in the environment prior to drilling holes in dry wall!

WARNING! -- WHEN INSIDE MAGNET ROOM, OBSERVE THE FOLLOWING:

- Identify the mounting attachment points for all brackets and ensure that the RF Shield will *not* be penetrated by either drill bits or screws.
- Only bring the tool or tools you need for the specific task into the magnet room and remove when not used.
- Do not approach the magnet with tools; the field is very powerful and you or others may be injured or worse!
- Do not place tools on floor. Keep tools in your pocket to avoid being moved too close to the magnet.
- Keep all tools and equipment as far from the magnet as possible!

TIP: Verify FUNCTION however do not worry about aligning the photoelectric switch until AFTER the detector has been permanently mounted to the brackets, THEN align Photoelectric Beam! *(Section 2.5.5)*

1. Measure magnet room door opening for proper height and width adjustment. Set width dimension that will allow approximately ½ inch (1.25 cm) of each vertical's lexan strip to be seen when entering the doorway or set at end users preference.
   a. Make sure there is approximately 1 inch (2.5 cm) clearance around portal to access mounting points. (at least as much as needed to access mounting hardware)
   b. Determine which bracket configuration is best for the Portal installation. (See pictures in Figure 16 for different bracket configurations)
   c. Determine power supply location, which MUST stay at least 3 inches *(7.5 cm)* from portal. Make sure location of the power supply is <30 gauss. Always secure power supply with brackets. *(See fig. 14, Figs. a. thru d. in Section 2.4.3)*
   d. Determine door limit switch location and mounting configuration to ensure the best possible position and ensure it engage and disengages properly.
2. Assemble SuiteSentry Entryway entry outside magnet room and attach all necessary brackets.
3. Power up and test unit for correct operation before bringing it into magnet room; operate door switch to cycle power supply on/off to ensure unit is functional.
4. Bring unit into magnet room, keeping it as close to the magnet door as is possible. Angle the detector into the door opening and wrap around opening limiting movement into the room.
   a. Lean assembled unit against door frame; secure with painters tape to keep from falling. Attach power supply. Power up unit, test, and calibrate prior to permanent physical installation.
   b. Once it has been determined there are no issues with in-room conditions and calibration of device is completed, proceed with permanent physical installation.

2.4.2.2 Permanent Mounting Inside the Magnet Room

Figure 10: IN MR ROOM POWER SUPPLY MOUNTING DISTANCE

NOTE: Actual parts may look different, however all functions and basic features are the same!

2.4.3 Cable Routing

Please review section 3.2 ARCHITECTURAL DRAWINGS before proceeding.

1. Follow the requirements of the local code during installation. Except for the hospital grade mains cord from the facility outlet to the power supply module, all voltages are Safe Extra Low Voltage (SELV).
2. Choose the shortest line cord cable length possible.
3. Avoid pinch points between the detector frame and cables. NEVER place cable where detector can be pushed into the cable and crush or pinch cable.
4. All excess cable INSIDE magnet room is to be coiled neatly and "dog-boned" so as not create an RF loop and cause artifacts in the MR imaging (See figure 14a.).
5. All cable should be installed to the highest standard possible using wire mold/surface conduit. *(See figures 14a through 14d for examples)*
6. Zip ties should be used to secure cable and should be trimmed.
7. All excess cable not inside the magnet room is to be coiled and secured with zip tie to avoid damage.

Figure 11a, 14b, 14c, 14d: CABLE ROUTING

Figure 14a: Dog Bone of Cable

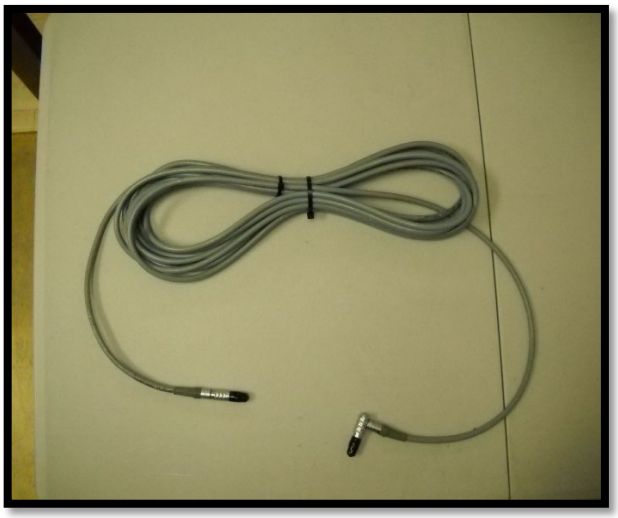


Figure 14b: Power Supply bracket and Cable Cover

Figure 14c: Cable Routing Example

Figure 14d: Neat and aesthetically pleasing

2.4.4 Mounting Detector to Wall

Using the supplied brackets, it is possible to mount the detector in any configuration required. Once you have determined the attachment method and configure the bracket type *(see Figure 16)*, it is a simple matter of mechanically attaching to wall/support.

TIP: It is best to line up the leading edge of the column to the edge of the door/wall opening PLUS an additional 1/8th"- this can be accomplished by holding a straight edge to wall and then using a supplied L-bracket as the 1/8th spacer. This will stop the column lexan cover from being hit by transports and still leave column LED's visible. SEE FIGURE 15.

WARNING! Do not over tighten or cross-thread the bracket mounting screws into the detector! It is possible to strip the mounting nuts and then the SS screws will need to be cut with a saw blade to remove! Use only hand tools, NEVER electric drills!

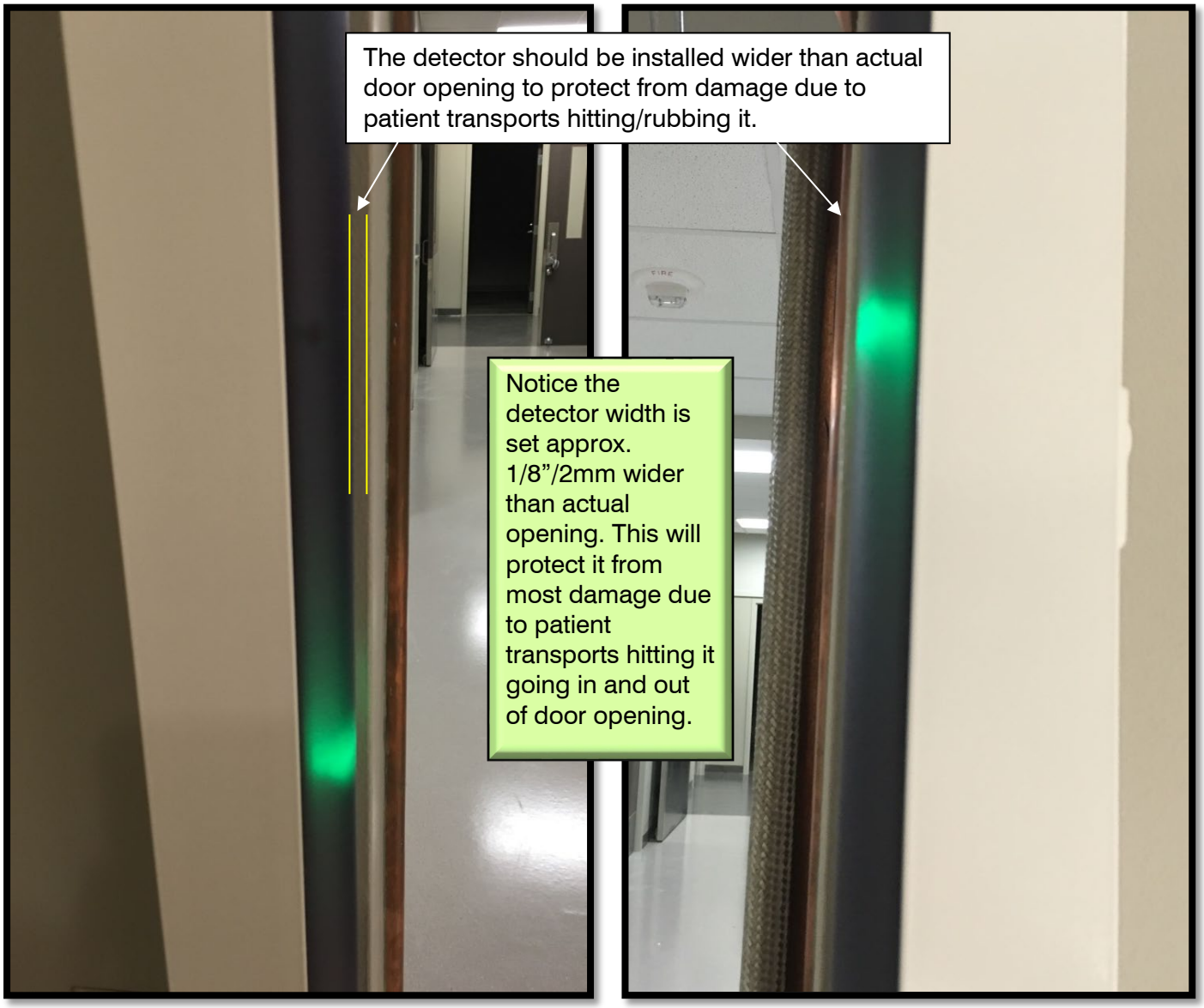
We recommend that the installer use the provided double-sided tape and heavy-fluted "Wall Dog" screws to stick the bracket to the wall using the following method:

- Place a piece of the double-sided tape *(leaving the red tape cover on)* across the part of the bracket that will be against the wall/mounting surface.
- Attach the bracket to the detector mounting point using one screw with a very slight amount of tension between bracket and detector so it can be moved. DUPLICATE THIS FOR ALL ATTACHING POINTS AND BRACKETS!
- Ensuring the detector is still plumb and level, REMOVE the tape cover exposing the 2nd adhesive side.
- CAREFULLY stick to the wall ensuring all brackets are adhered to mounting surface.
- With all brackets thoroughly sticking to mount surface (wall), remove the screw holding the bracket to the detector column and CAREFULLY pull detector away from brackets. The brackets are now attached to the wall where they will permanently mount.
- Pre-drill a 1/8ths pilot hole through bracket slots to allow the mounting screws with supplied #10 washers. **Use supplied PRO-DEC screw covers if screw heads are exposed**. When using the included PRO-DEC screw covers, the screw goes into cover with #10 flat washer on underside of screw cover- it will not fit inside screw cover.
- Run the cables as neatly as possible using supplied wire molding trim. The trim molding installation kit has every piece available to make a perfectly enclosed cable run from outlet to detector power plug- USE THE TRIM PIECES!
- All ends are to be covered with trim caps! NO UNFINISHED ENDS!
- The power supply bracket is designed to fit over AC wall outlet and when the cover is in place COMPLETELY hides all visible cables for the neatest install. If the power outlet is placed high above the floor near the detector it is to be covered by the power supply bracket/cover assembly for best aesthetics.

SUITESENTRY ENTRYWAY SYSTEM SETTINGS AND ADJUSTMENTS ARE IN SECTION 2.5

2.4.4 Mounting Detector to Wall (continued)

Figure 12: Detector slightly wider than door opening to prevent damage from patient transport devices



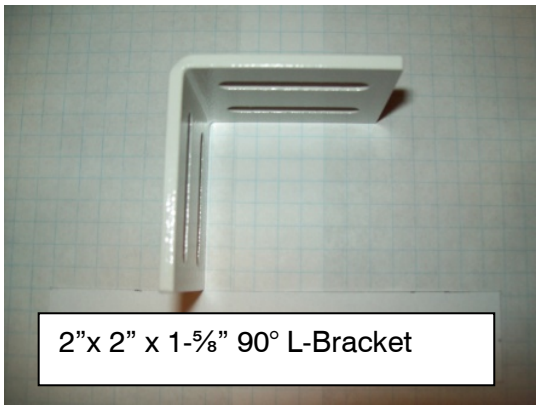
It is important to set the detector slightly wider than actual opening to mitigate the potential of patient transports damaging the semi-transparent optical diffusers.

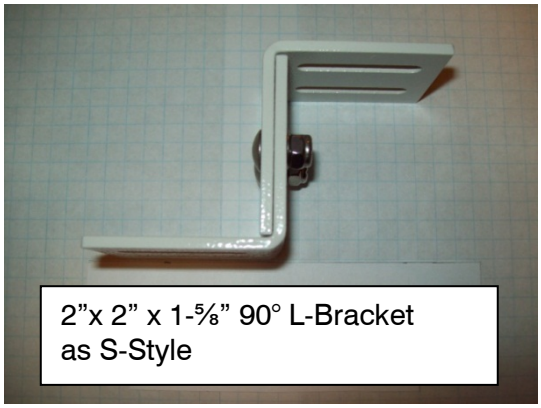
2.4.5 Mounting Sensor Portal

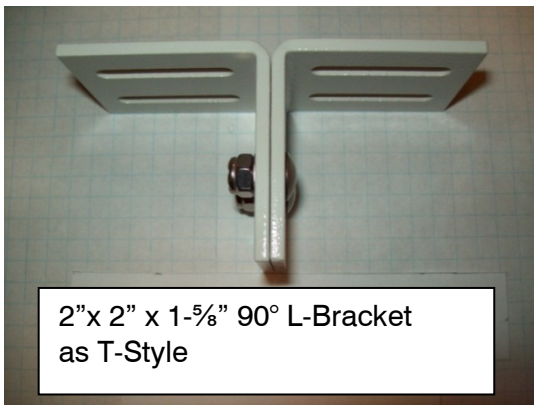
All brackets are mated to each other using #10 SS Carriage bolts with #10 SS washer and Nylok-nuts that are supplied in the hardware kit shipped with every detector, *(Kit Part # 400175)*.

TIP- Brackets are almost always able to be installed NOT VISIBLE from front as one faces detector for cleanest looking installation! Brackets should wrap behind!

Figure 13: Bracket Types/Configurations


2”x 2” x 1-⅝” 90° L-Bracket


2”x 2” x 1-⅝” 90° L-Bracket as S-Style

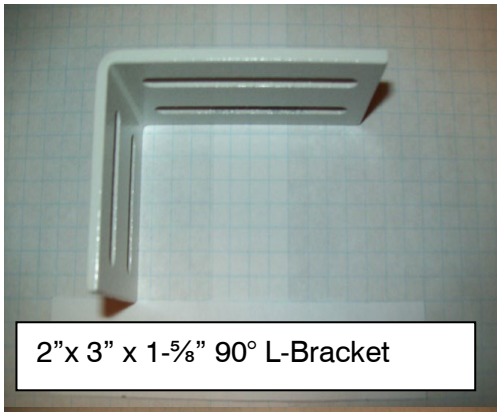

2”x 2” x 1-⅝” 90° L-Bracket as T-Style

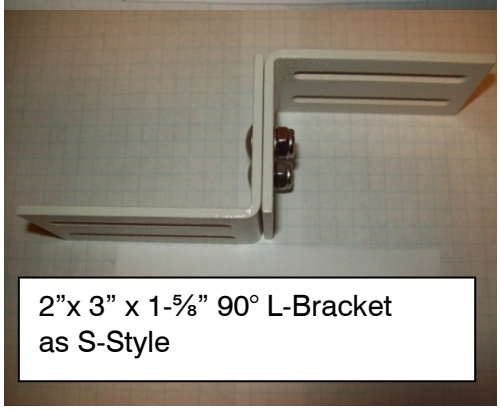
Shown are the mounting brackets included for use in installing the SuiteSentry Entryway entry detector.

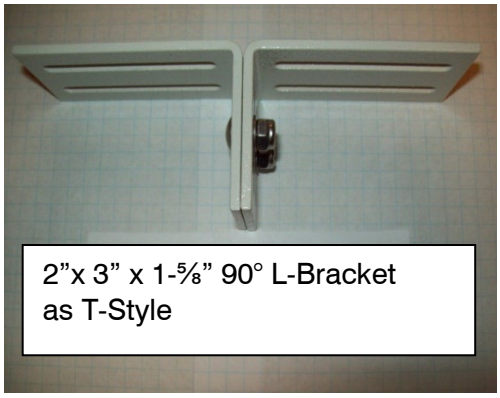
By configuring the brackets, nearly any scenario for installation can be accommodated, providing the end user with an install that best fits the specific room and magnet room door configuration.

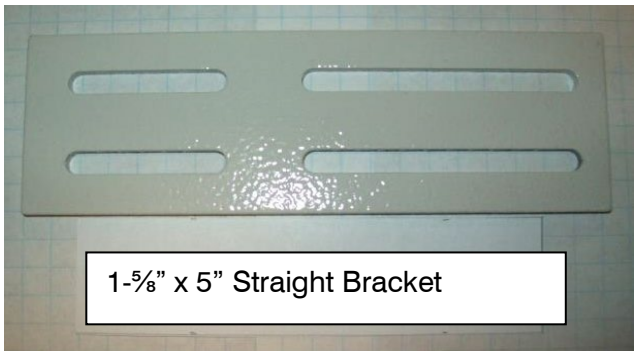
TIP: See section 3.5 for Installation pictures!

By using the examples in the pictures in section 3.5 the installation will be as aesthetically pleasing as possible.


2”x 3” x 1-⅝” 90° L-Bracket


2”x 3” x 1-⅝” 90° L-Bracket as S-Style


2”x 3” x 1-⅝” 90° L-Bracket as T-Style


1-⅝” x 5” Straight Bracket

2.5 SYSTEM SETTINGS

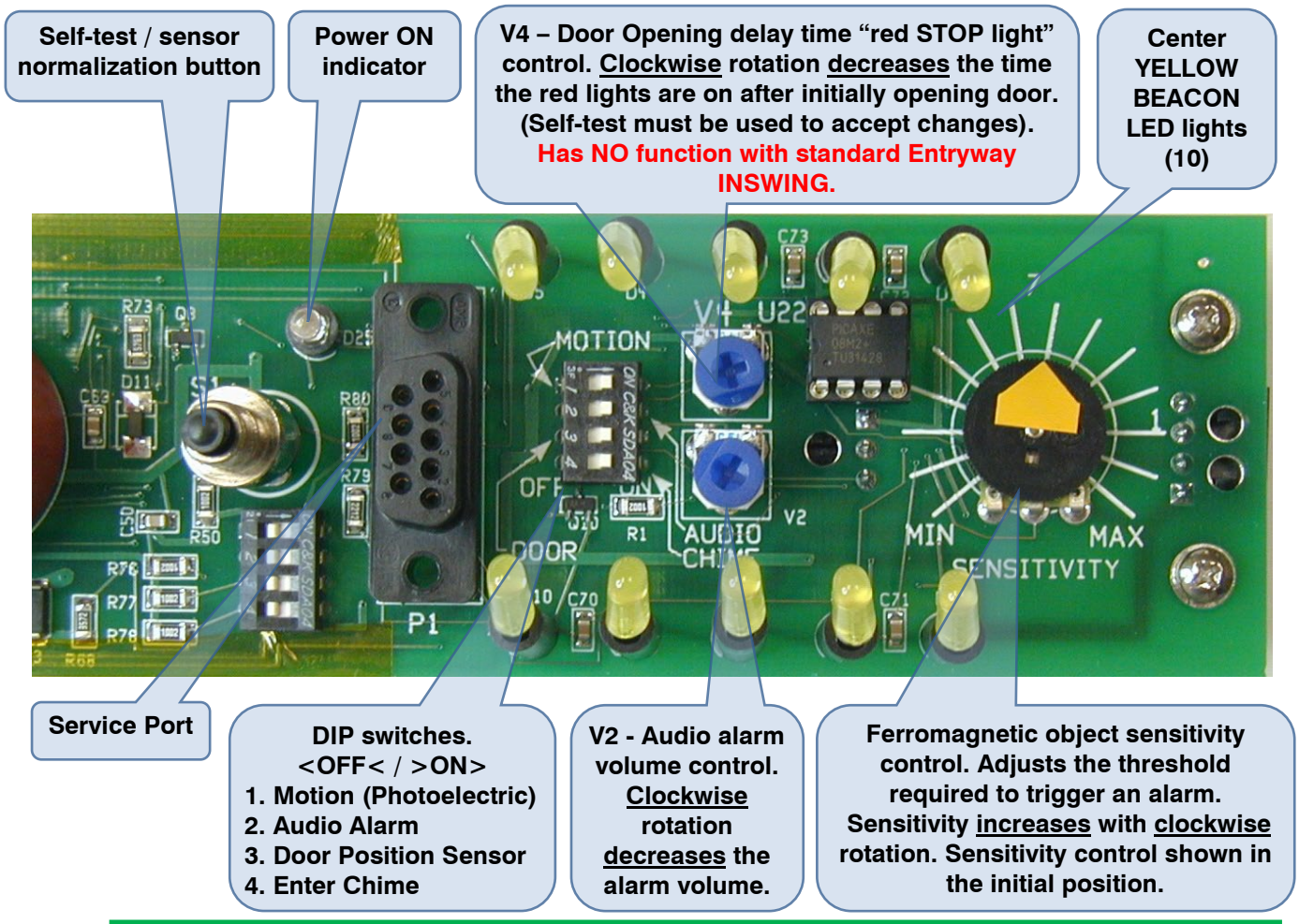
2.5.1 Crossbar Controls – SuiteSentry Entryway

Control functions are set at the time of product installation by the installer. Changing of the control settings should be approached with care as they will alter the expected behavior of the unit.

- Access to the various controls is above the center bottom cover of the Crossbar Keystone. The cover slides away to gain access. A second sliding cover has the Serial Number and Software Version.
- The crossbar audio alarm can be deactivated with DIP switch 2 labeled ALARM in figure 17. *(Unit is shipped with Audio "OFF")* In operation, the audio is usually left "ON" since this audio provides immediate feedback to the personnel passing through the portal. Audio alarm volume can be adjusted by the ALARM control, V2. *(See Tip below)*
- The photo-electric beam can be deactivated with DIP switch 1 labeled MOTION in figure 17. Temporarily disabling the function keeps the unit continuously active. This is useful for setting the system sensitivity and finding sources of stray interference.
- With the door sensor switch ON, the door opening off-time, V4, can be used to adjust how long the solid Red ***"STOP"*** LEDs will remain on after the door is opened (outswing door opened).
- For a **SuiteSentry Entryway** version with an inswing door, V4 controls the off-time after the door begins to open.

NOTE: Self-Test button MUST be used to accept changes made to V4.

Figure 14: Control Functions in Crossbar



TIP: Make sure Audio Alarm DIP switch is shut off while installing to minimize annoying MR staff as they may be present during this time! First impressions are lasting impressions! Be sure to enable audio once install is complete.

2.5.2 Self-test -- Sensor Normalization - aka “Hard Start”

The self-test performs a total reboot of the system and is also used as a diagnostics feature to ensure all wiring and circuits are operational.

The self-test is done for one of two reasons:

- Initially upon powering detector it will verify proper cabling and electrical connections by illuminating each specific LED light on the entirety of the detector.
- To accept any changes made to V4 Pot to alter time limits for door opening delay time function on **all *SuiteSentry Entryway models Outswing to accommodate door timing.***

1. Starting: An alarm tone will sound, defining the sensitivity level in beep counts. One long beep tone is MAXIMUM sensitivity: **the detector should never be left at this setting**. The short beeps are measured with 1 (short) beep being most sensitive, to 25 beeps being least sensitive.
2. In the crossbar-on one end the LED lights will sequentially flash one after the other as the circuits are checked for proper function.
3. After the crossbar LED’s are processed the Red “STOP” LED’s will flash in the Sensor Array Columns; starting at the base of one column working up and then repeating this process on the second column.
4. By watching this process, one can ensure the cables and circuits are functioning properly.
5. This process takes approximately 20 seconds with an additional 25 seconds to fully “boot” and become active. When the self-test process is complete, the Red ***“STOP”*** LED’s in columns will flash for 2 seconds and then the 12 Green ***“SCANNING / GO”*** LEDs will illuminate indicating the detector is fully operational and ready. No other LED lights should be illuminated!

2.5.3 Detector Functional Adjustments

1. The crossbar audio alarm can be deactivated with DIP switch 2 labeled AUDIO in figure 17. The audio is usually left “ON” since this audio provides immediate feedback to the personnel passing through the portal. Audio alarm volume can be adjusted by the AUDIO control, V2.
2. The photo-electric beam(s) can be deactivated with DIP switch 1 labeled MOTION in figure 17. Temporarily disabling the function keeps the unit continuously active. This is useful for setting the system sensitivity and finding sources of stray interference.
3. **OUTSIDE THE MAGNET ROOM INSTALLATION-(SuiteSentry Entryway INSWING ONLY)**
   With the Door Opening Sensor dip switch ON *(DIP switch 3)*, POT V4,in figure 17, can be adjusted to change the door entry delay on time duration of the “solid” Red ***“STOP”*** LEDs. This is the period of time needed to ignore the ferromagnetic signature of the door while it is being opened so as not to create an audible alarm. The door’s ferrous signature is recognized and ignored via the Door Opening Sensor. Do note that if a second person enters the room before the Red ***“STOP”*** LEDs have extinguished, no other potential threat warning will be provided until the system resets to Green ***“SCANNING / GO”*** LEDs. Pot V4 can be used to adjust how long the Red ***“STOP”*** LED’s will remain on after the door is initially opened. Adjust only if needed and remember to push the self-test button after each change.
4. **INSIDE THE MAGNET ROOM INSTALLATION**
   V4 controls the door entry delay / Red ***“STOP”*** LEDs duration; same adjustment procedure as step 3. The only difference is if the detector threshold is crossed while the “solid” Red ***“STOP”*** LED’s are illuminated, there will also be an audible alarm. The user should WAIT until the Red ***“STOP”*** LED’s are extinguished before proceeding into room so as to not trigger an audible alarm.

NOTE: The door entry delay time is adjustable from 1 to 15 seconds. Factory setting is approximately 3½ seconds, and this should be sufficient for most installation requirements.

2.5.4 Sensitivity Adjustment – SuiteSentry Entryway

SuiteSentry Entryway is designed to alarm when objects of significant ferromagnetic mass are brought through the portal.

SuiteSentry Entryway sensitivity adjustment is set at the time of detector installation by the installer. Changing of the sensitivity control should be approached with care since too high a sensitivity setting may produce undesired alarm activation and too low a sensitivity setting may cause larger ferromagnetic objects not to trigger the alarm. Ideal maximum sensitivity is when no ferromagnetic activity is occurring within 8 ft of the unit and the detector crossbar "bar graph" indicator has only 0 to 1 Amber Yellow LEDs flashing while in standby mode.

1. Access to the **SENSITIVITY** control is located beneath the bottom middle cover of the crossbar on the Portal, called the Keystone. Slide the cover to the side to access the controls.
2. Before adjustment is attempted, turn off the motion detector function *(DIP switch 1 labeled MOTION in figure 17)*. This will keep the portal activated continuously in **ALARM MODE** to allow determination of the magnetic environment in which the portal is located. Make sure that the **AUDIO ALARM** switch *(DIP switch 2 in figure 17)* is in the **ON** position during the adjustment.

NOTE: Once the RESET button has been depressed and released, the detector will go through the entire self-test routine, however, this button is disabled when the system is alarming. You must wait for the Green LEDs to re-illuminate.

3. Begin by noting the current setting of the **SENSITIVITY** control as the original setting as measured in number of "beeps":
   a. To determine exactly where the **SENSITIVITY** control is set, push and release the **SELF TEST** / **SENSOR NORMALIZATION** button *(shown in Figure 17)* and count the number of beeps produced by the audio alarm. The number of beeps indicates the specific sensitivity setting of the **SENSITIVITY** control.
   b. One long beep, approx. 2.5 seconds long, indicates the sensitivity is set to maximum while one shorter beep, approx. 0.5 seconds, indicates that the sensitivity has been reduced slightly from maximum, approx. 95%. The ***greater the number of beeps*** indicates how much the sensitivity has been **reduced** by the **SENSITIVITY** control from maximum. 25 beeps is the lowest sensitivity.
   c. Push the **SELF TEST** / **SENSOR NORMALIZATION** button after each adjustment and note the change of the sensitivity setting, as indicated by the number of beeps.
4. If increased sensitivity is desired, rotate the **SENSITIVITY** dial clockwise about ½ of a division at a time and re-evaluate the performance. It is recommended to adjust the sensitivity in one beep increments as described in step 3. If the sensitivity is set too high, moving objects nearby the portal as well as other sources of interference, may trigger the alarm.
5. If decreased sensitivity is desired, rotate the **SENSITIVITY** dial counter-clockwise about ½ of a division at a time and re-evaluate the performance. It is recommended to adjust the sensitivity in one beep increments as described in step 3. The evaluation should include testing the system with objects which are desired to be detected and insuring that the alarm is indeed triggered. The test object should be passed through the portal at normal walking speed, half-way between the two vertical columns.
6. When adjustment is complete, close the sliding cover.

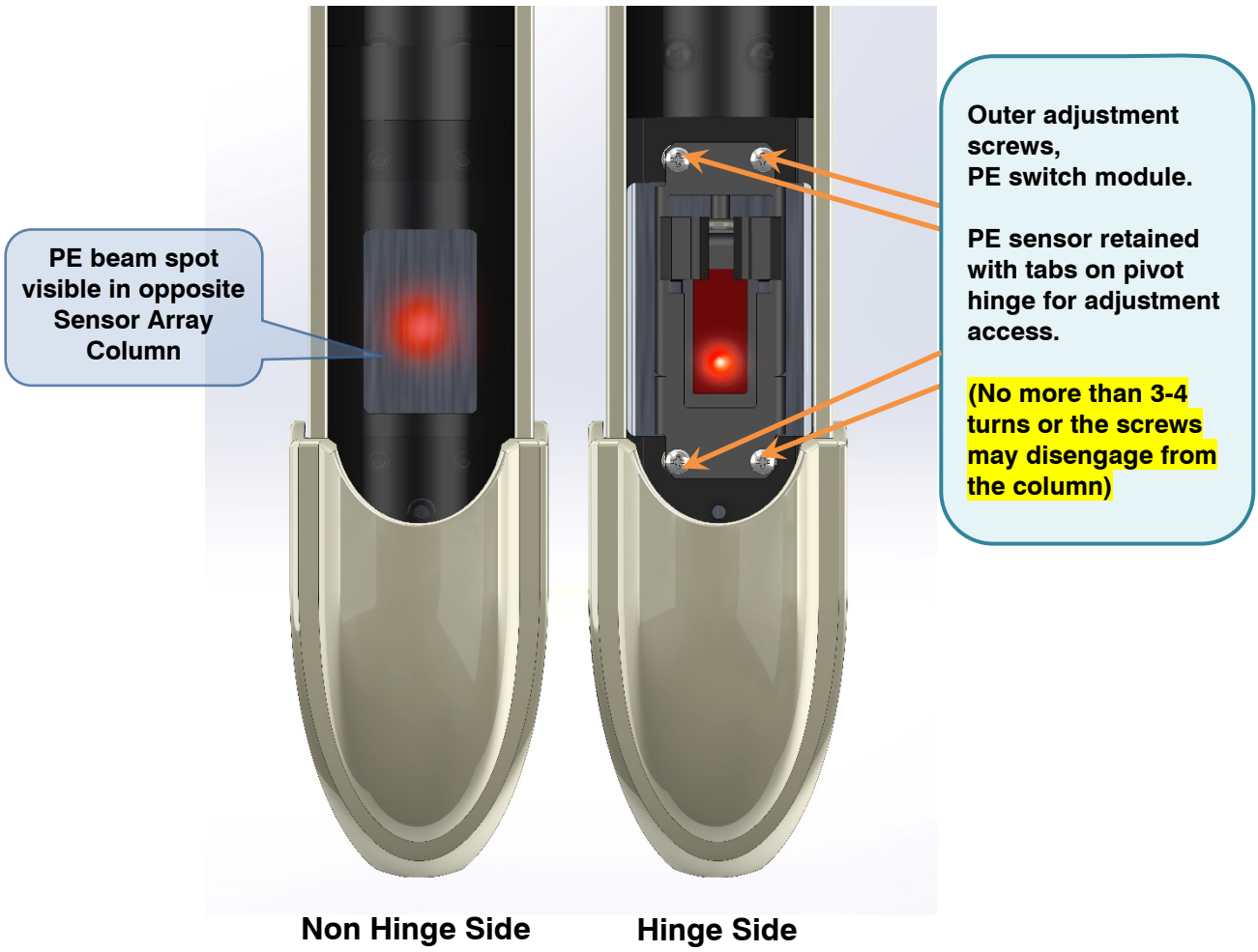
2.5.5 Photoelectric/Laser Beam -- Function and Adjustment NON PLUS

This **SuiteSentry Entryway** unit will be equipped with a *photoelectric switch*, which is installed (typically) in the hinge-side Sensor Array Column. It will always connect to crossbar cable labeled "INBOUND" on yellow tag.

NOTE: Only **SuiteSentry Entryway** a PE/Laser is installed in EACH column allowing for the detector to distinguish movement either IN towards MAGNET room and setting the detector to ACTIVE mode and if walking OUT, AWAY from MAGNET room there will be no activation and thus no ALARMS. The beam(s) will appear as a laser dot on the opposite wall/vertical surface (see Fig. 19).

- **SuiteSentry Entryway** SINGLE PE beam is shown reflecting ***inside*** opposite column, "Beaming" straight across door opening. This is correct method

Figure 15: Photo Electric Switch without Reflector (without Plus option shown)



2.5.6 Photoelectric/Laser Beam -- Function and Adjustment for PLUS

This **SuiteSentry** OPTION unit will be equipped with 2 *photoelectric switches*, one in each side Sensor Array Column. The hinge side will be inbound beam and door open side will be outbound beam. It will always connect to crossbar cable labeled “INBOUND” on yellow tag. The opposite side or door open side will have a cable labeled “OUTBOUND” on white tag.

- **SuiteSentry Entryway** DUAL Beams; PE/Laser “INBOUND” beam is adjusted to be 2.0 inch in front of opposite column and “OUTBOUND” will be 2.0 inch behind opposite column +/-.5”.

Figure 16: PE Beam alignment

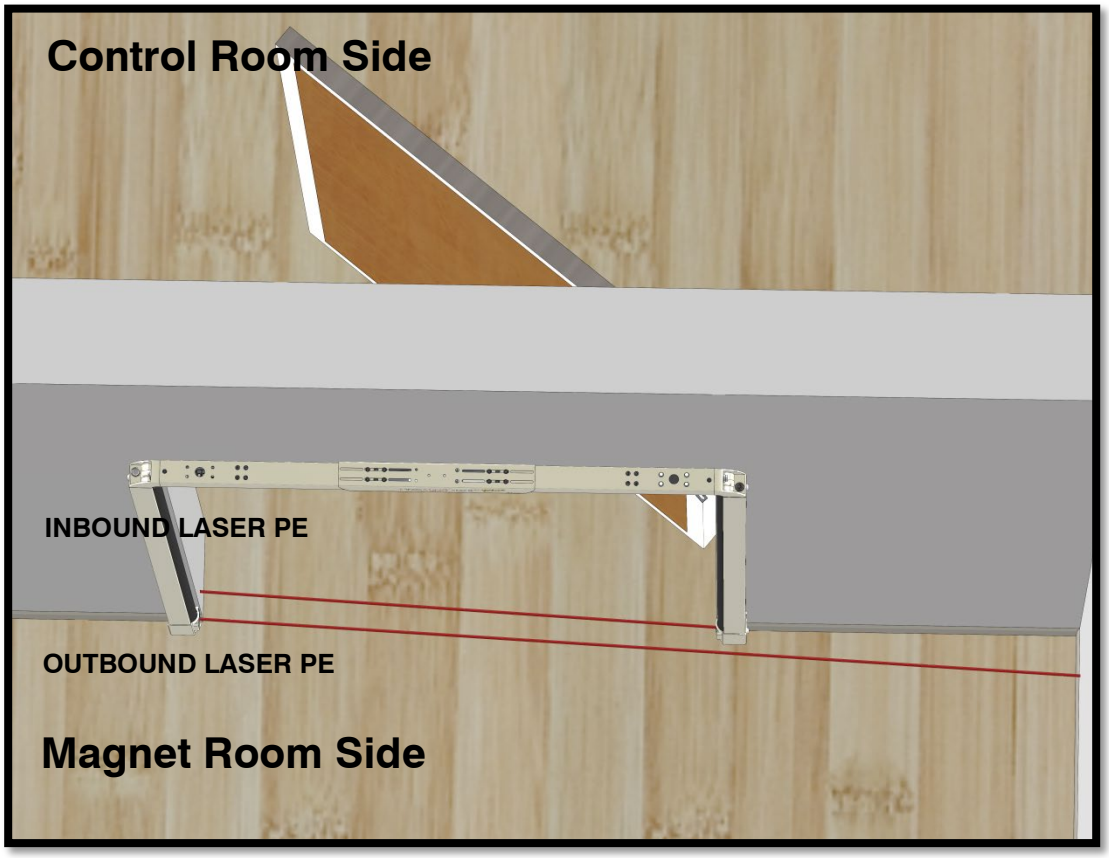
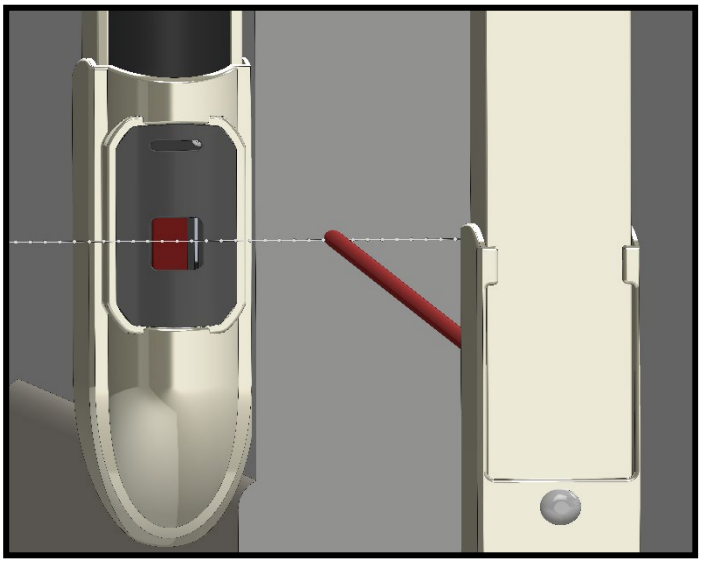


Figure 17: PE Beam Distance and Plane adjustment



Beam is to be set @ 2 in / 5 cm from the leading edge of each column respectively.

NOTE: The beams should not be allowed to reflect off of surface into either sensor as it may create intermittent/erroneous triggering! Ensure each beam is spread far enough and on equal plane/height or it can malfunction.

2.5.7 Photoelectric/Laser Beam -- Function and Adjustment Trip Distance

NOTE: The PE Switch is held in place with 4 adjustable screws on springs to allow for adjustment.

Figure 19: PE sensor adjustment access

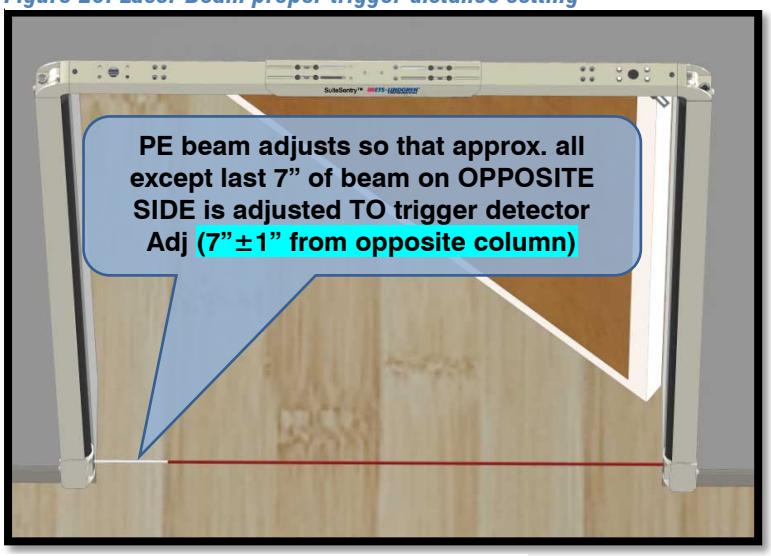
If the amber and the Green LEDs on the top of the photoelectric switch are illuminated and the 2 white lights in the crossbar are illuminated when there is no obstruction between the photoelectric switch and the opposite side, then the photoelectric switch may need "DISTANCE" setting alignment.

Adjust the trip distance screw to activate detector at-7"±1" inward/towards center, from opposite side column

(USE SMALL 1/16th TURNS;-it is very sensitive!)

When adjusted, the yellow LED at the top of the photoelectric switch and the white lights in the crossbar should no longer be illuminated (ONLY GREEN LED ON PE WILL BE ILLUMINATED!) If Green LED is instead Red, Ignore it. It still functions properly.

Figure 20: Laser Beam proper trigger distance setting



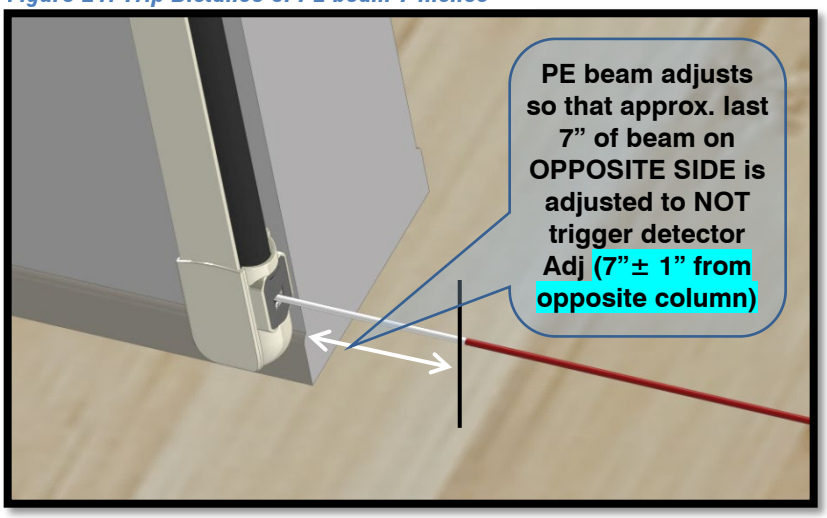
Note: The PE Sensor is a technologically advanced transmit/receive sensor based on Time of Flight (TOF) technology. This type of sensor requires no traditional reflector. The sensor is easily adjusted as described in Figure 19 and is to be SET TO NOT TRIGGER the detector to active mode.

Note: Make sure DIP switch is turned to ON position when verifying PE Laser adjustment/calibration or the white crossbar LED's will stay illuminated!

Check to make sure that the trip distance is set so that from both directions, away from and toward the PE sensor, the beam is set accurately!

Note: There is approximately 2 to 5 inch difference moving away from the beam as moving towards it, so verify the beam is set properly!

Figure 21: Trip Distance of PE beam 7 inches



2.5.8 Door Limit Switch Function and Adjustment

The door limit switch is typically built into the crossbar on all in-room MR room installation applications. This is to accommodate the out-swing of the door at Zone IV swinging into Zone III and powers the detector off when the door is at approx. 90% of its closed position. This also guarantees the detector is incapable of interfering/artifacting the imaging process as the detector is electrically inert when powered off and no electricity is flowing from the wall outlet to the power supply to the detector. Adjustment of the roller arm to the door will be required. Installation on the door hinge side is recommended for aesthetic reasons, but is not required for proper function.

The door switch has extension arms to ensure proper fit to the door spacing under most conditions. The location will be determined at time of installation and should not require any further attention from the end-user.

To test the function of the limit switch:

1. With the door open and NOT moving, gently rotate the extension arm a quarter turn in either direction. There should be a distinct "click" and the detector will power down. Alternatively you may stand inside the room and pull the door shut to observe this function.
2. Upon release the extension arm will move toward the fully deployed position, which will cause the detector to power "ON" followed by the Red "STOP" LEDs illuminating for the time set by Pot V4. (see Fig. 14)
3. IF adjustment is required a 3mm ALLEN wrench and #2 Phillips are all that is needed.

Figure 22: Door Limit Switch and Roller Arm – Right Hinge

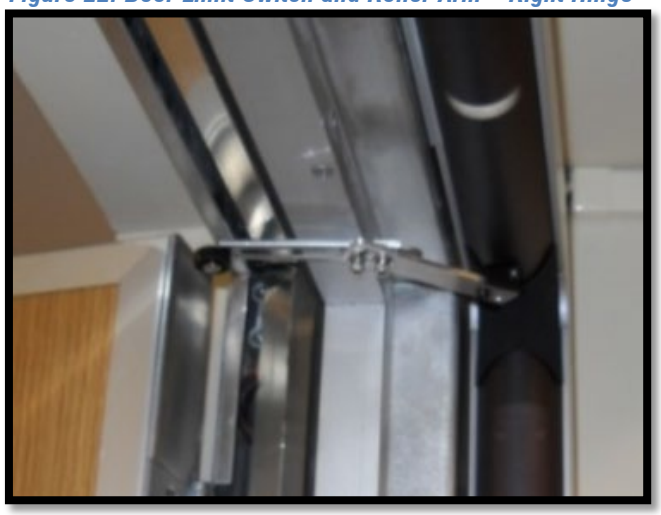
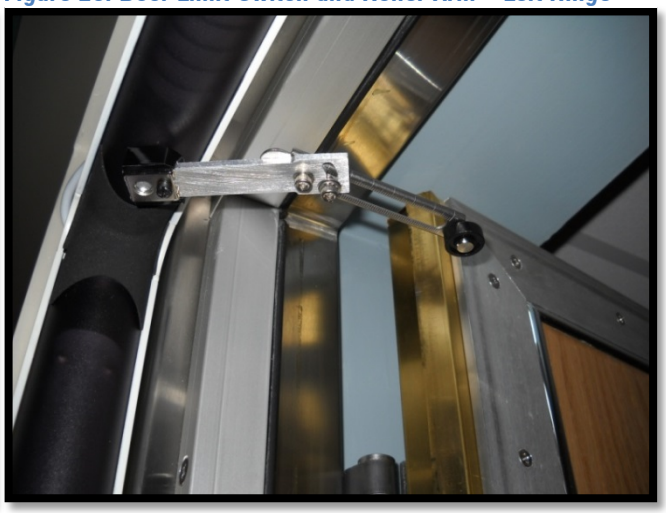
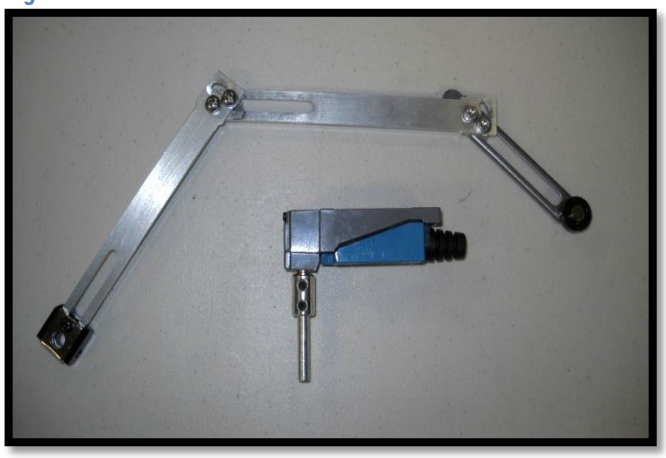


Figure 23: Door Limit Switch and Roller Arm – Left Hinge



4. The extension arms are shown attached. *(Figs. 21-23)* Installer may need only the roller arm or possibly one or both extension arms additional. The extension arms may be articulated approx. 45 degrees side to side in each direction. The set screw may be either one or two screws and require a 3mm Allen wrench (provided). Do not over-articulate! The internal mechanism can break.
5. By using the various extensions arms, plus the ability to remove the switch entirely from the crossbar and pull the cable out through bottom of crossbar, it should accommodate every installation configuration possible.

Figure 24: Switch and extension arms



RECOMMENDATION! It is good practice for all screw heads on extension brackets to be facing down for easier adjustments, as shown in Fig. 22.

2.5.9 Door Limit Switch Function and Adjustment *(continued)*

CAUTION! Always disconnect mains voltage source when working on switch!

The door switch can be removed if needed by removing the 4 mounting bolts on the crossbar top. The corner piece comes off with the two mount screws and the DIN connector will unscrew from the corner and can then be removed from the crossbar. The cable and DIN connector can then be reinserted back into its original corner location.

Figure 25: Switch mounted in crossbar

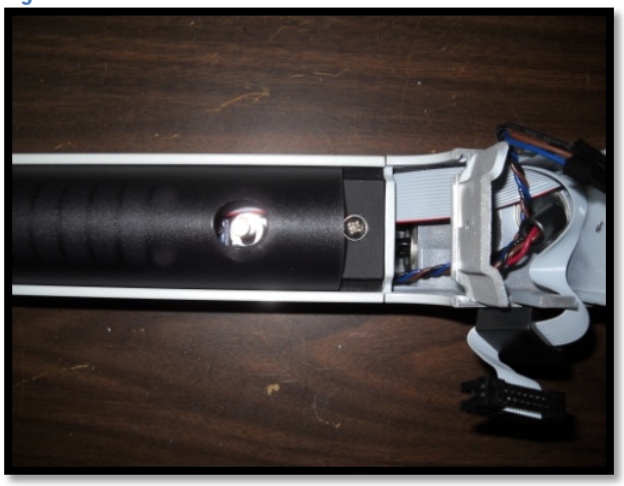


Figure 26: Cable extended to mount switch externally

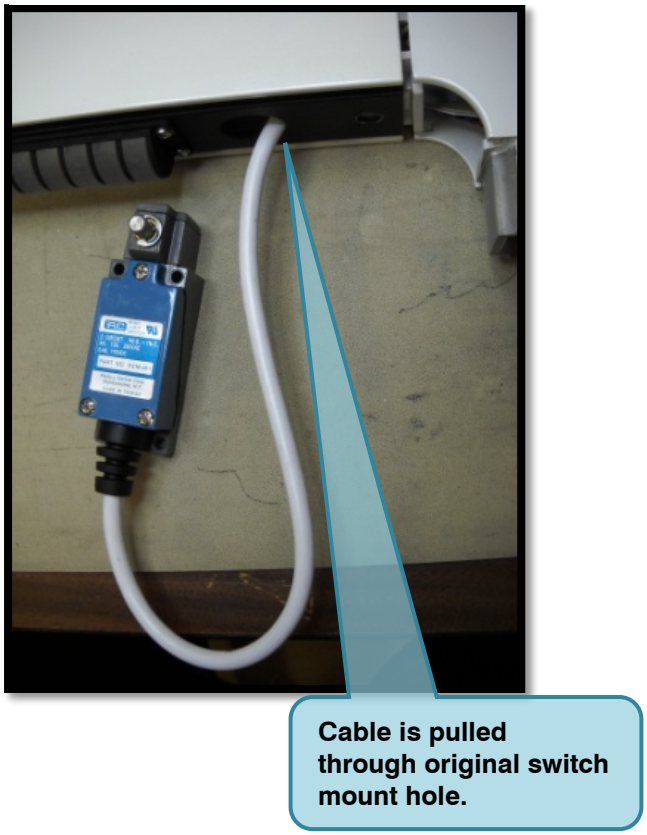


Figure 27: Door Switch remotely mounted

Limit Switch removed from detector and mounted independently using parts in installation kit 400177

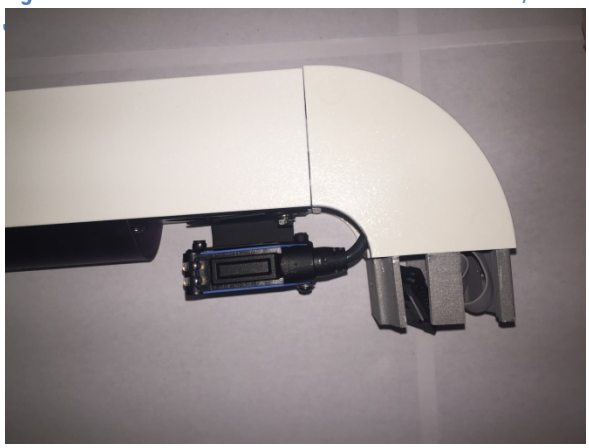
2.5.10 Door Opening Sensor (DOS) adjustment

The Door Opening Sensor/DOS is located in the corner of the Sensor Array Portal **opposite** from the door hinge. Both the green power LED and the orange LED should be illuminated when the door is fully closed and ONLY the green LED when the door is opened approx. ½" *(12.7mm)*. Start by opening the scanner room door slowly. When the door is open not more than 1 inch (2.5 cm), the orange indicator light *(figures 31, 32 and 33)* should change from illuminated to OFF. If the orange light does not transition at <1 inch, adjustment of the sensor is necessary.

To adjust the sensor:

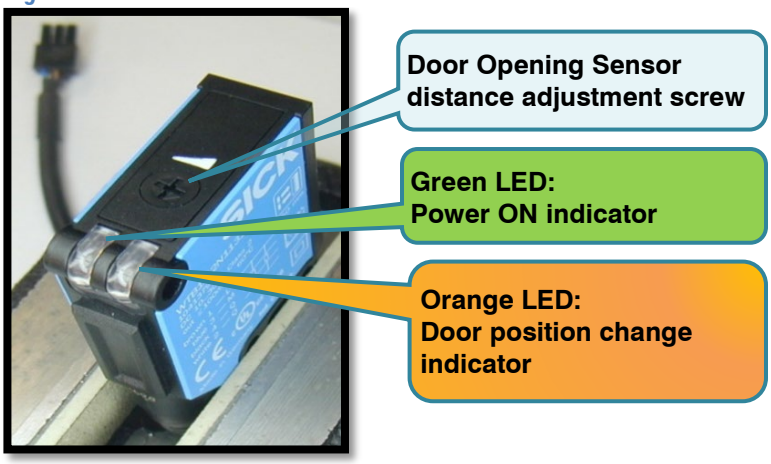
- **NOTE:** If in Place- Carefully unsnap and remove the sensor cover from the extrusion.
- Position the MRI room door so that it is open 1 inch (2.5 cm). If the orange indicator is ON, turn the sensor adjustment screw counter-clockwise until the orange indicator just turns OFF. If the orange indicator is OFF, turn the sensor adjustment screw clockwise until the orange indicator just turns ON. It may take some fine-tuning.
- The DOS can be removed (IF needed- 1/4" open end wrench) and adjusted as needed. If minor adjustment needed using gentle physical hand pressure one can manipulate the DOS bracket to aim in top door corner as needed (Fig. 30)

Figure 28: DOS mounted on Cross Bar Bracket w/o



Sensor is included with SuiteSentry Entryway for INSWING Door

Figure 29: DOS controls



To test the door opening suppression function, close the door; the Door position change indicator should be on. Without anything ferromagnetic on your person, open the door. All the red LEDs in the uprights should illuminate/hold for approximately 3 to 4 seconds and there should be no alarm. **The hold time is adjustable, see Fig. 14**

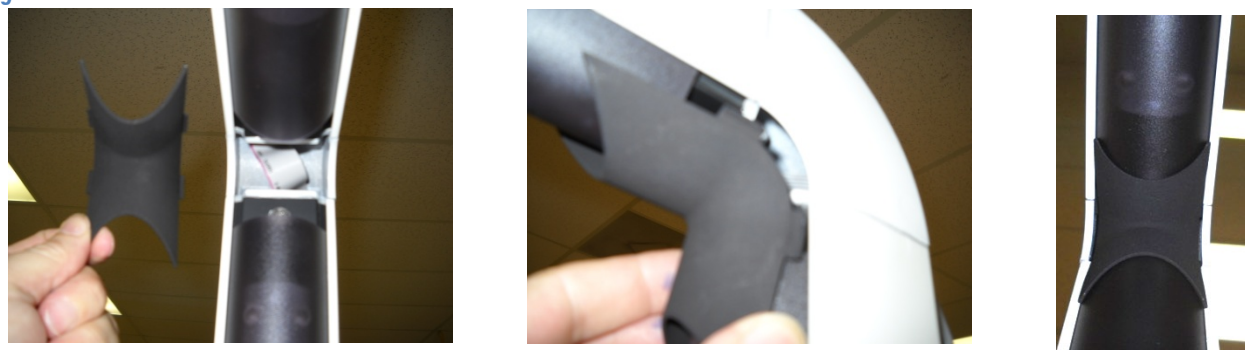
The adjustment screw is a small Philips however a small thin flat blade screwdriver will suffice as well.

Figure 31: DOS with laser dot aligned

Figure 30: DOS fully installed with cover

2.5.11 Installing Sensor Trim Covers

Figure 32: INSTALLING TRIM COVER ON INSIDE CORNERS



Once the detector is permanently installed into door opening/final installation place, there are two (2) trim pieces that are to be placed in each of the upper inside corners. They are held in with tabs on each side. Simply place one side and GENTLY squeeze the cover with your hand and it will “pop” in to the proper fitment position. FOR PLUS MODELS- the DOS Sensor cover is larger and fits over the DOS same as standard corner trim covers.

DO THIS STEP LAST after all adjustments have been made and detector is mounted to the wall

To insert PE/Laser cover trim piece slightly squeeze tabs and insert into opening with LED viewing slot facing top. Cover should “snap” into place.

Figure 34: Attach cover to SAC PE

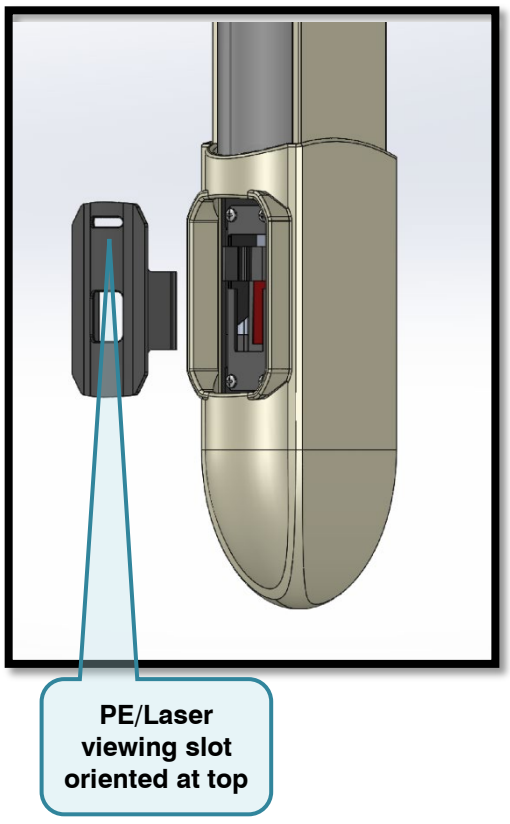
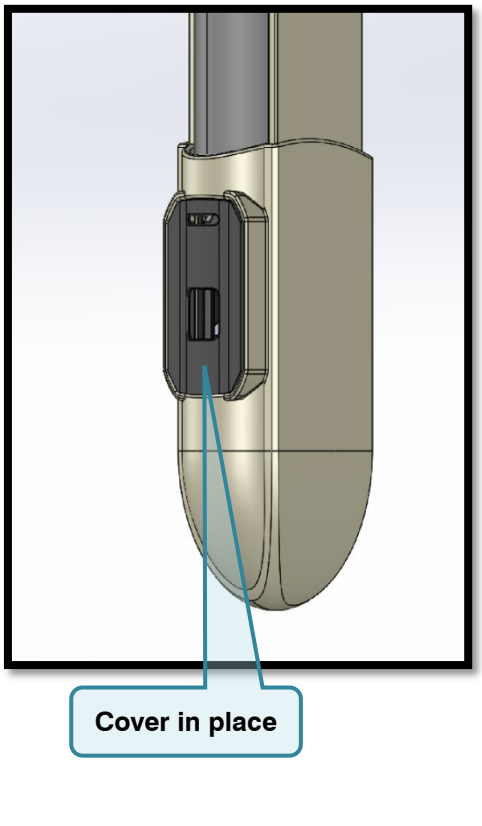


Figure 33: Cover in place SAC PE/Laser



When Installation is complete, prepare to train staff.
Refer to Section 1.2 for operation and 1.3 for usage.

Section 3 - SPECIFICATIONS & DRAWINGS

3.1 Unit Specifications

Dimensions – Sensor Array Portal:

Height 83” (211 cm),
Depth 2.25” (5.7 cm)

Adjustable Width:

44” (112 cm) to 54” (137 cm) Inside width;
49” (124 cm) to 59” (150 cm) Outside width

31” (79 cm) to 41” (104 cm) Inside width;
36” (91 cm) to 46” (117 cm) Outside width

Sensitivity: Adjustable

Audio Alarm: In Portal, activated when portal is entered, adjustable volume

Portal Pass through Chirp: User selectable activation

Yellow Center Beacon / **Pre-alarm warning lights:** User selectable

Door Motion Alarm Suppression: SuiteSentry Entryway option

Exiting Room Alarm Suppression: SuiteSentry Entryway option

Complies with ES60601-1-8 International Standard for Medical Device Alarms

Complies with IEC 60101-1:2005 Medical Device Specification Requirements

Medical Rated Power Supply: ***(OUTSIDE Magnet Room Installation):***

Input Power: 90 to 264 VAC, 47 to 63 Hz, 42 VA
Size: 3.0 inches(76mm)H x 5.75 in(146mm)W x 1.75 in(43mm)D
Output Cable: 12 ft =144 inches(366mm)
Cover / Wall Bracket Size: 5.55 in(141mm)H x 17.55 in(446mm)W x 2.72 in(69mm)D

Medical Rated Power Supply: ***(INSIDE Magnet Room Installation CERTIFIED):***

Input Power: 90 to 264 VAC, 57 to 440 Hz, 40W
Size: 4.25 inches(108mm)H x 6.0 in(152mm)W x 2.19 in(55.5mm)D
Output Cables: 2 x 8 ft =96 inches (244mm)
Or.. 2 x 14ft = 168 inches (427mm)
Cover / Wall Bracket Size: 5.55 in(141mm)H x 17.55 in(446mm)W x 2.72 in(69mm)D

3.2 Architectural Drawings

3.2.1 Facility Supplied Electrical Outlet Location OUTSIDE MR INSWING DOOR

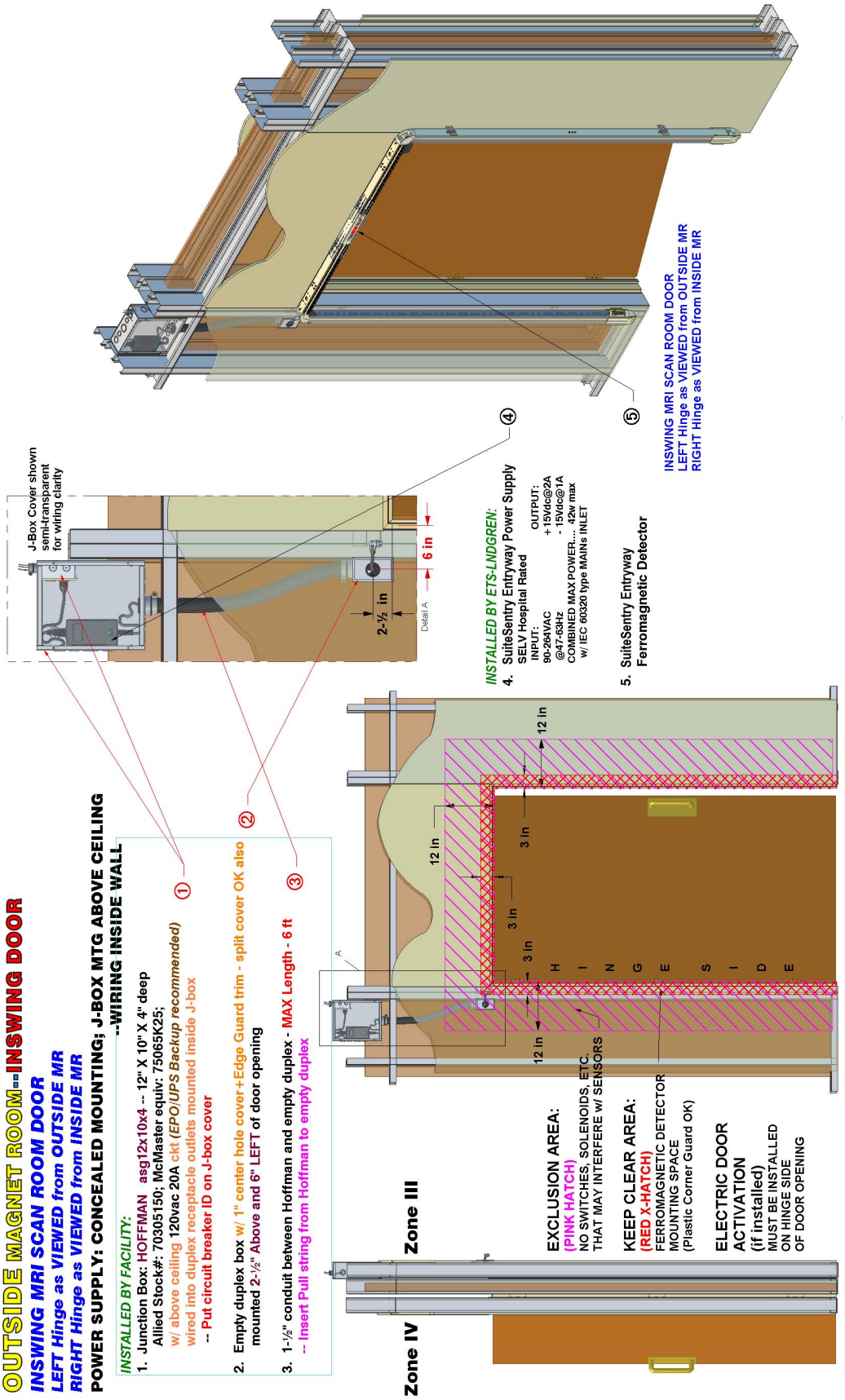


Figure 35: Facility Wiring OUTSIDE MR, INswing, L Hinge Door, PWR SUP in Ceiling Mtd J-BOX

3.3 Architectural Drawings (continued)

3.2.2 Facility Supplied Electrical Outlet Location OUTSIDE MR INSWING DOOR

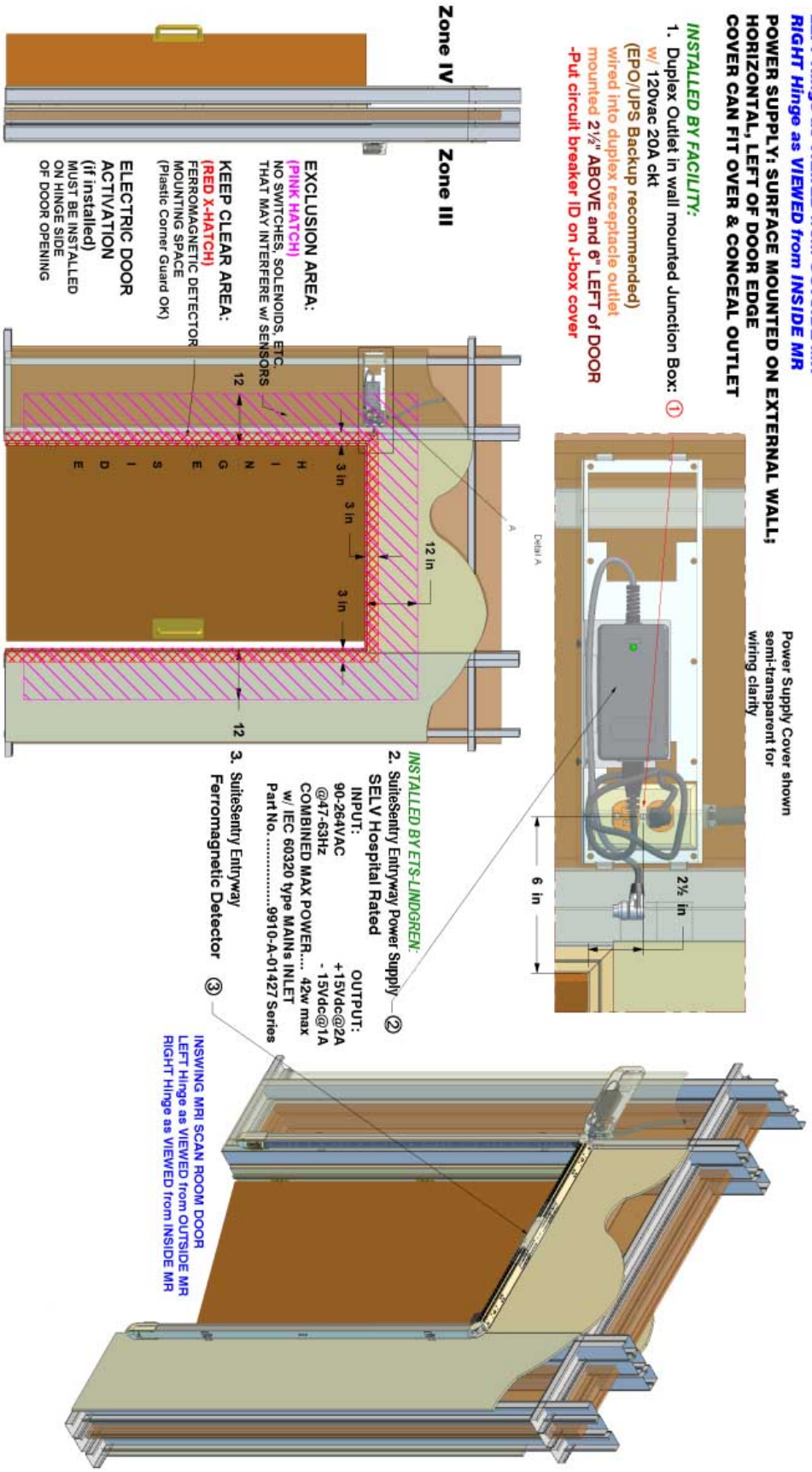


Figure 36: Facility Wiring OUTSIDE MR, INswing, L Hinge Door, PWR SUP Surface Mtd LEFT

3.2.3 Facility Supplied Electrical Outlet Location OUTSIDE MR INSWING DOOR

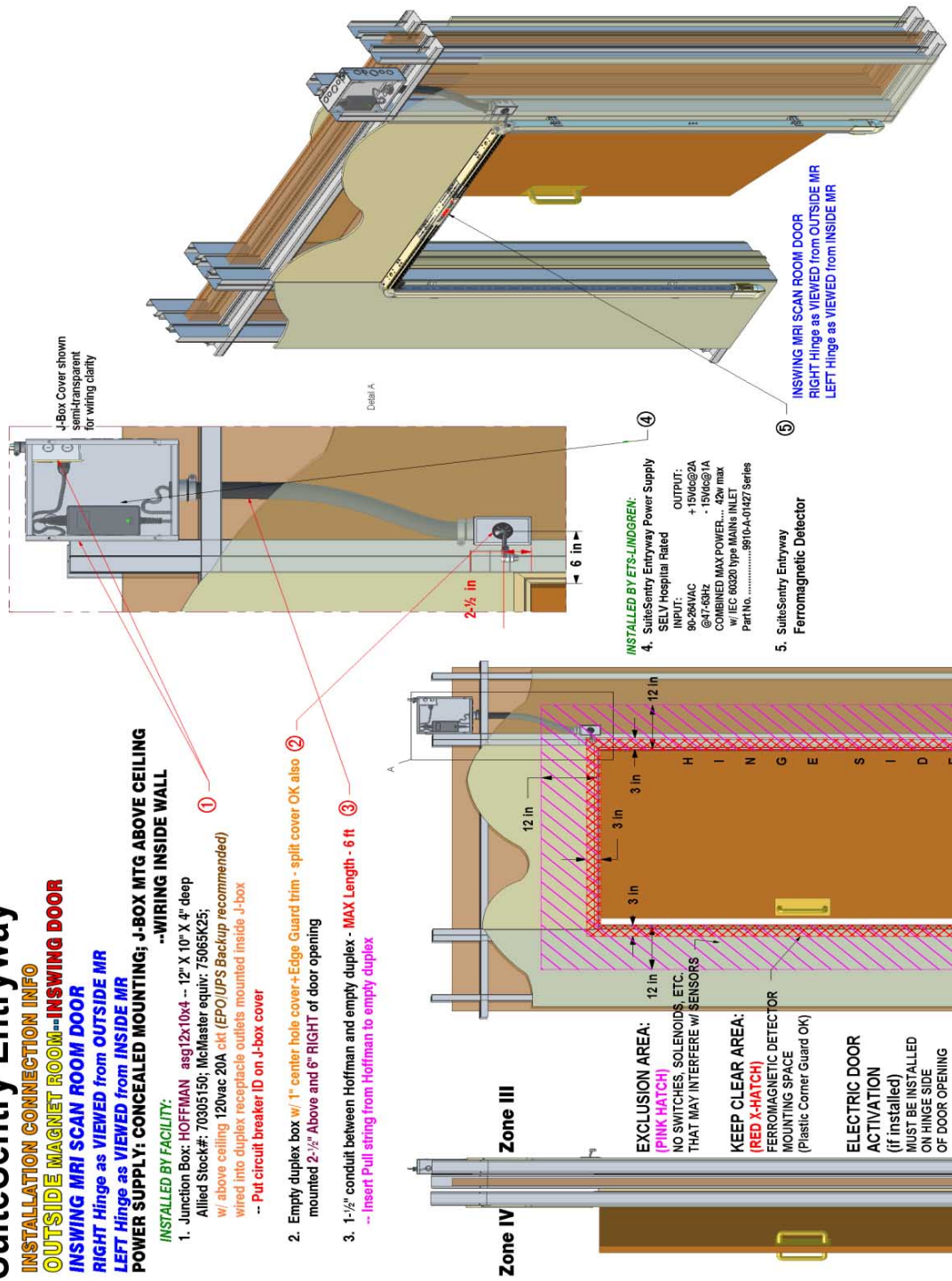


Figure 37: Facility Wiring OUTSIDE MR, INswing, R Hinge Door, PWR SUP in Ceiling Mtd J-BOX

3.2.4 Facility Supplied Electrical Outlet Location OUTSIDE MR INSWING DOOR

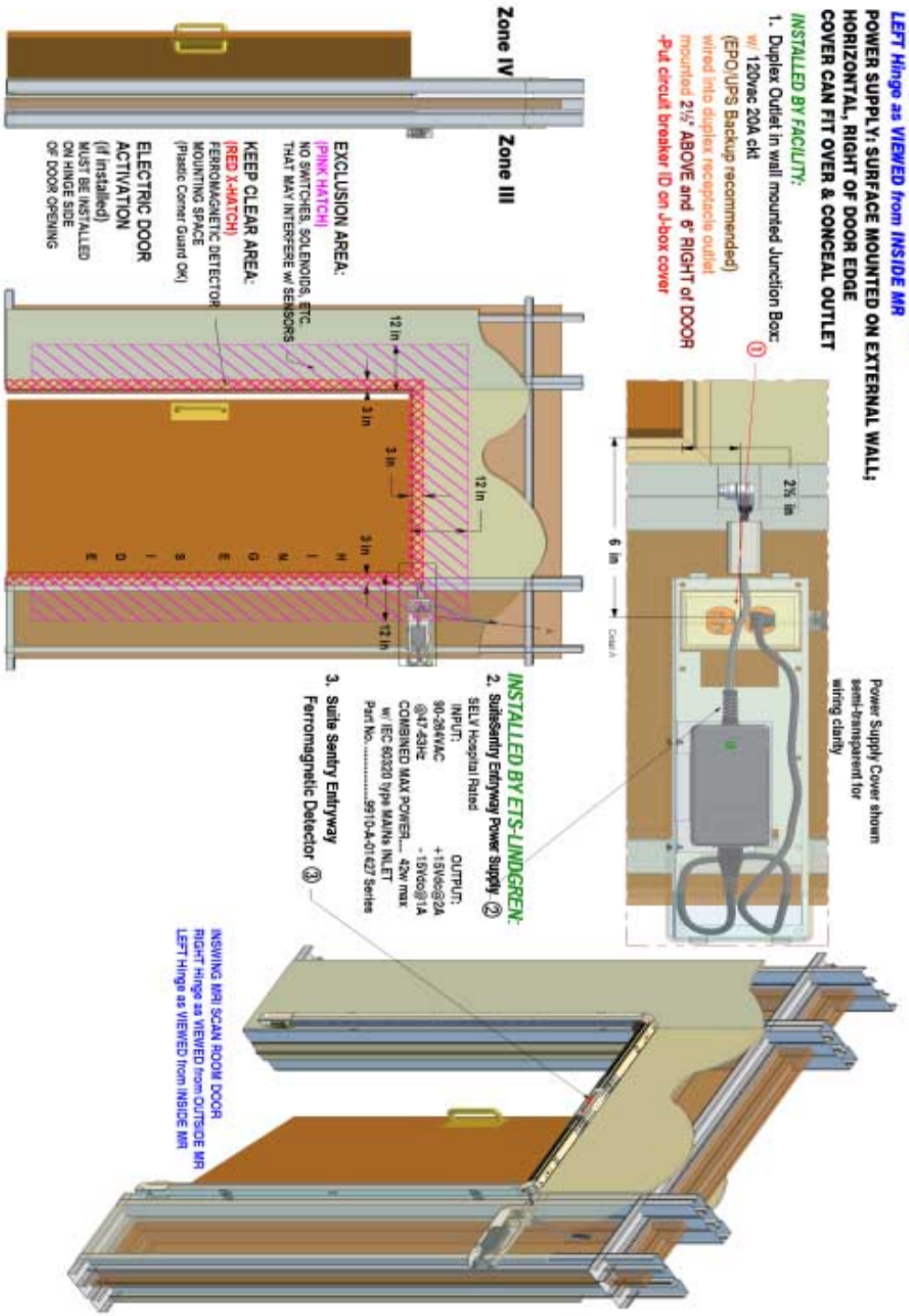


Figure 38: Facility Wiring OUTSIDE MR, INswing, R Hinge Door, PWR SUP Surface Mtd RIGHT

3.2.5 Facility Supplied Electrical Outlet Location INSIDE MR OUTSWING DOOR

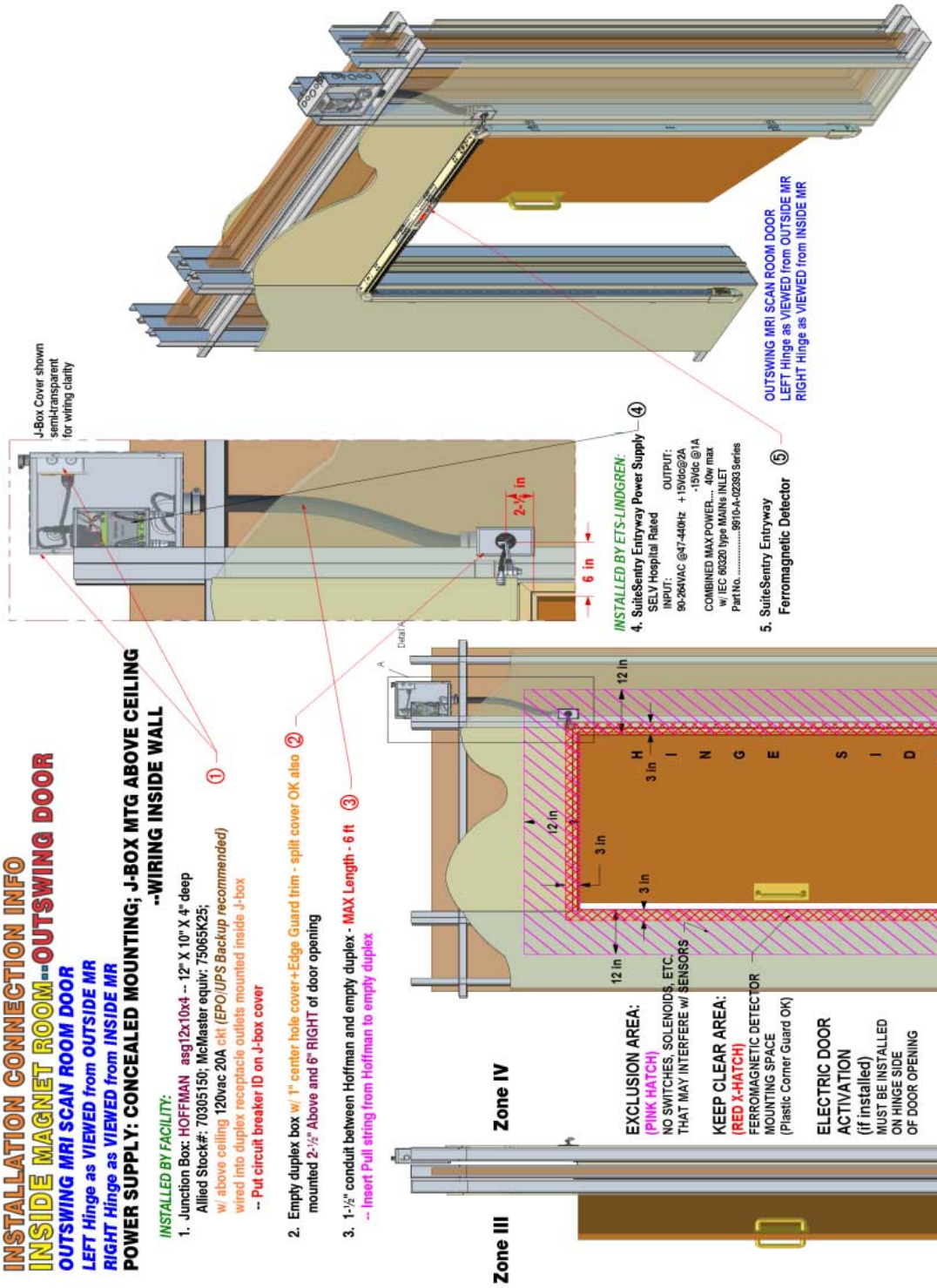


Figure 39: Facility Wiring INSIDE MR, OUTswing, R Hinge Door viewed from outside, PWR SUP in Ceiling Mtd J-Box

3.3 Architectural Drawings (continued)

3.2.6 Facility Supplied Electrical Outlet Location INSIDE MR OUTSWING DOOR

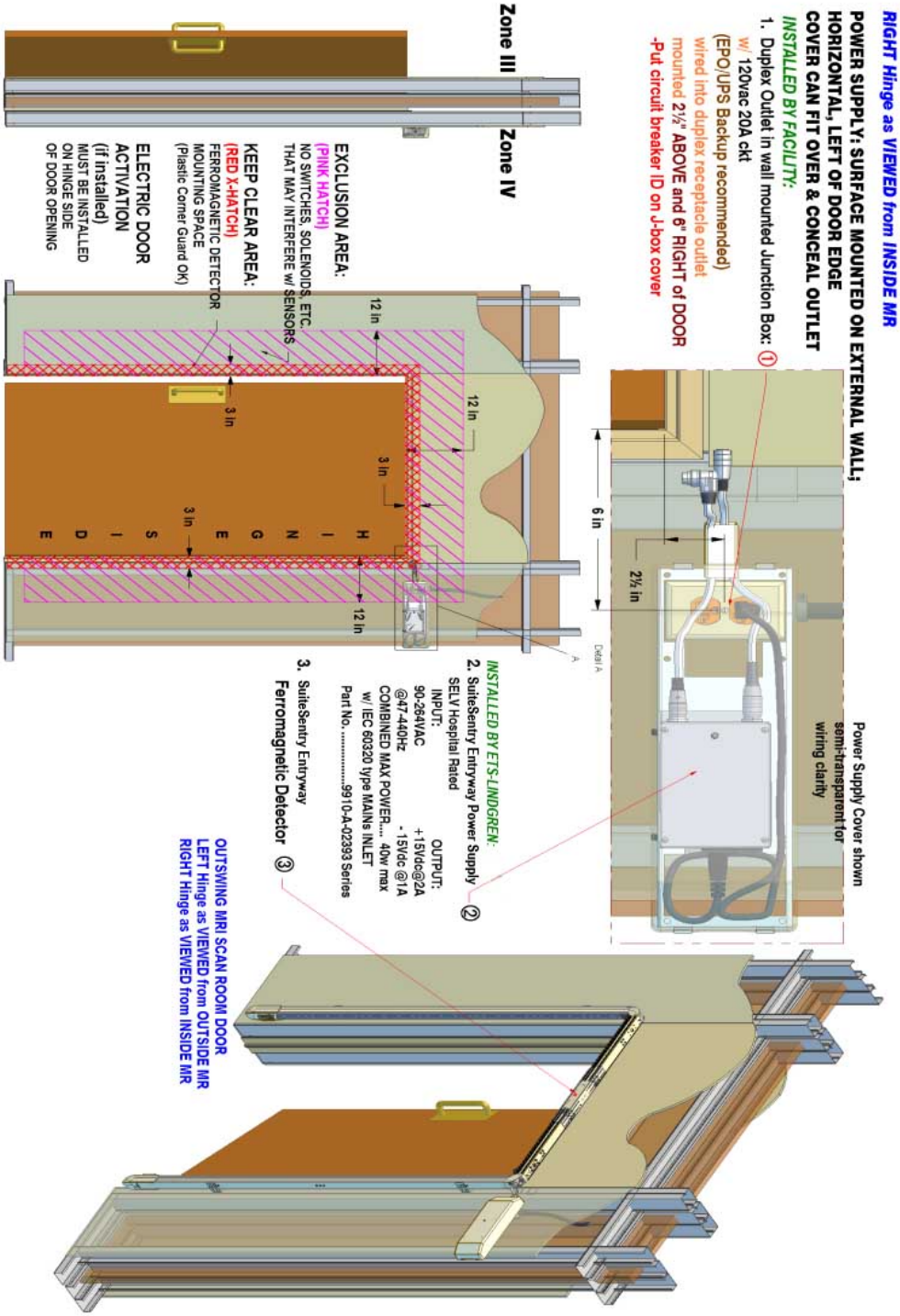


Figure 40: Facility Wiring INSIDE MR, OUTswing, L Hinge Door viewed from outside, PWR SUP Surface Mtd RIGHT

3.2.7 Facility Supplied Electrical Outlet Location INSIDE MR OUTSWING DOOR

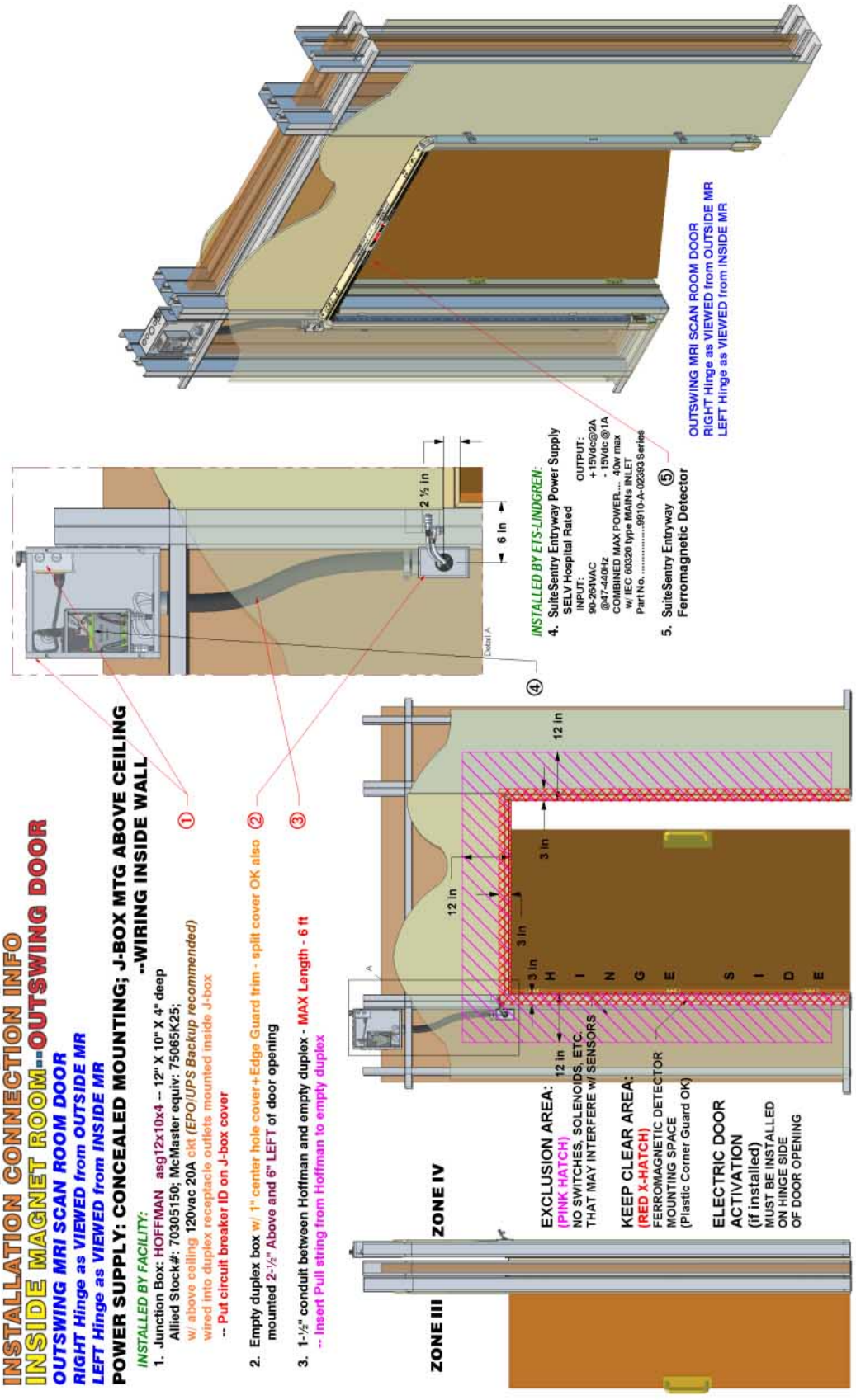


Figure 41: Facility Wiring INSIDE MR, OUTswing R Hinge Door viewed outside MR, PWR in Ceiling Mtd J-Box

3.2.8 Facility Supplied Electrical Outlet Location INSIDE MR OUTSWING DOOR

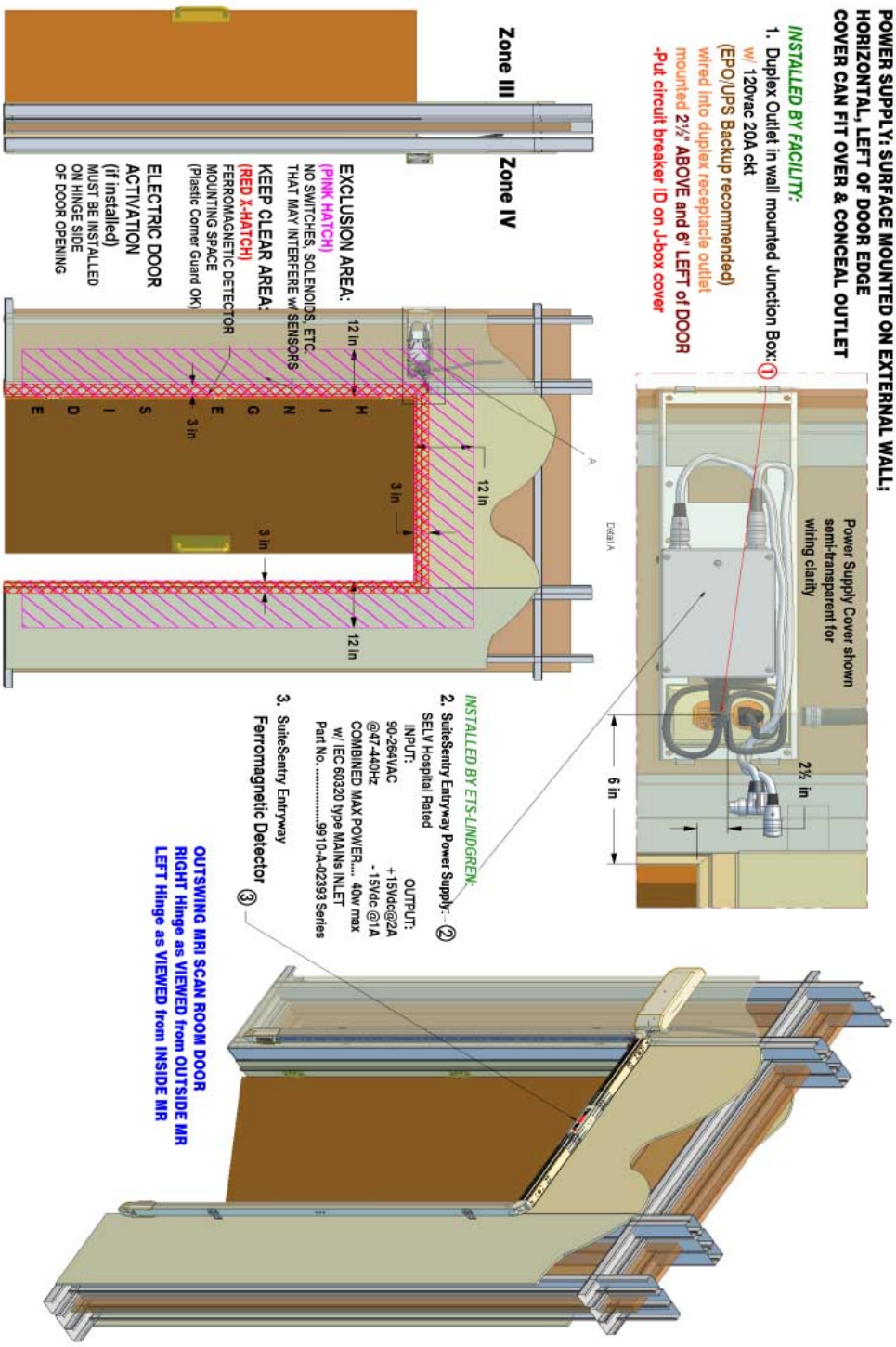
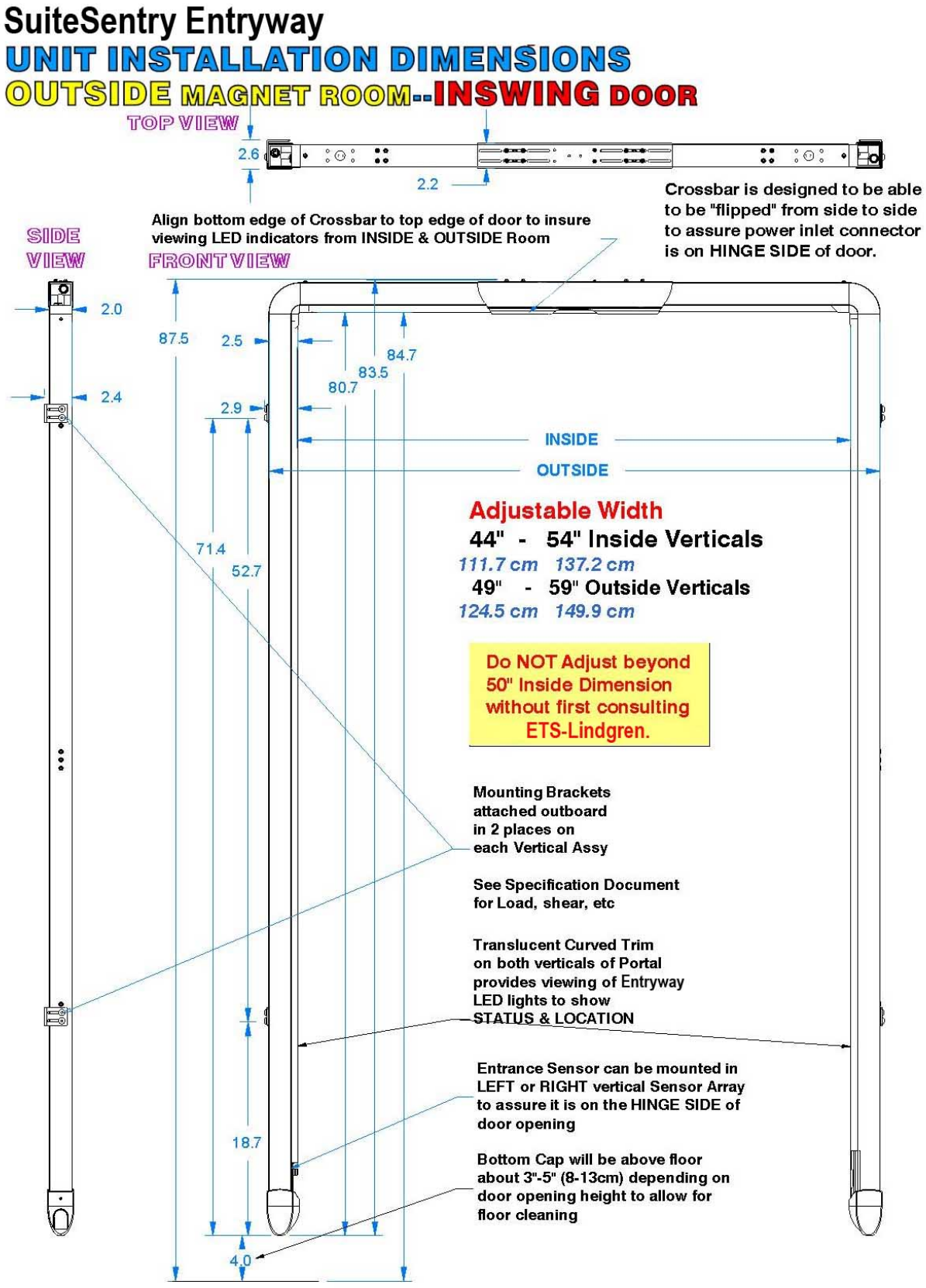


Figure 42: Facility Wiring INSIDE MR, OUTswing, R Hinge Door viewed outside MR, PWR Surface Mtd LEFT

3.3 Dimensions & Features

3.3.1 Detector System Dimension Diagram OUTSIDE MR

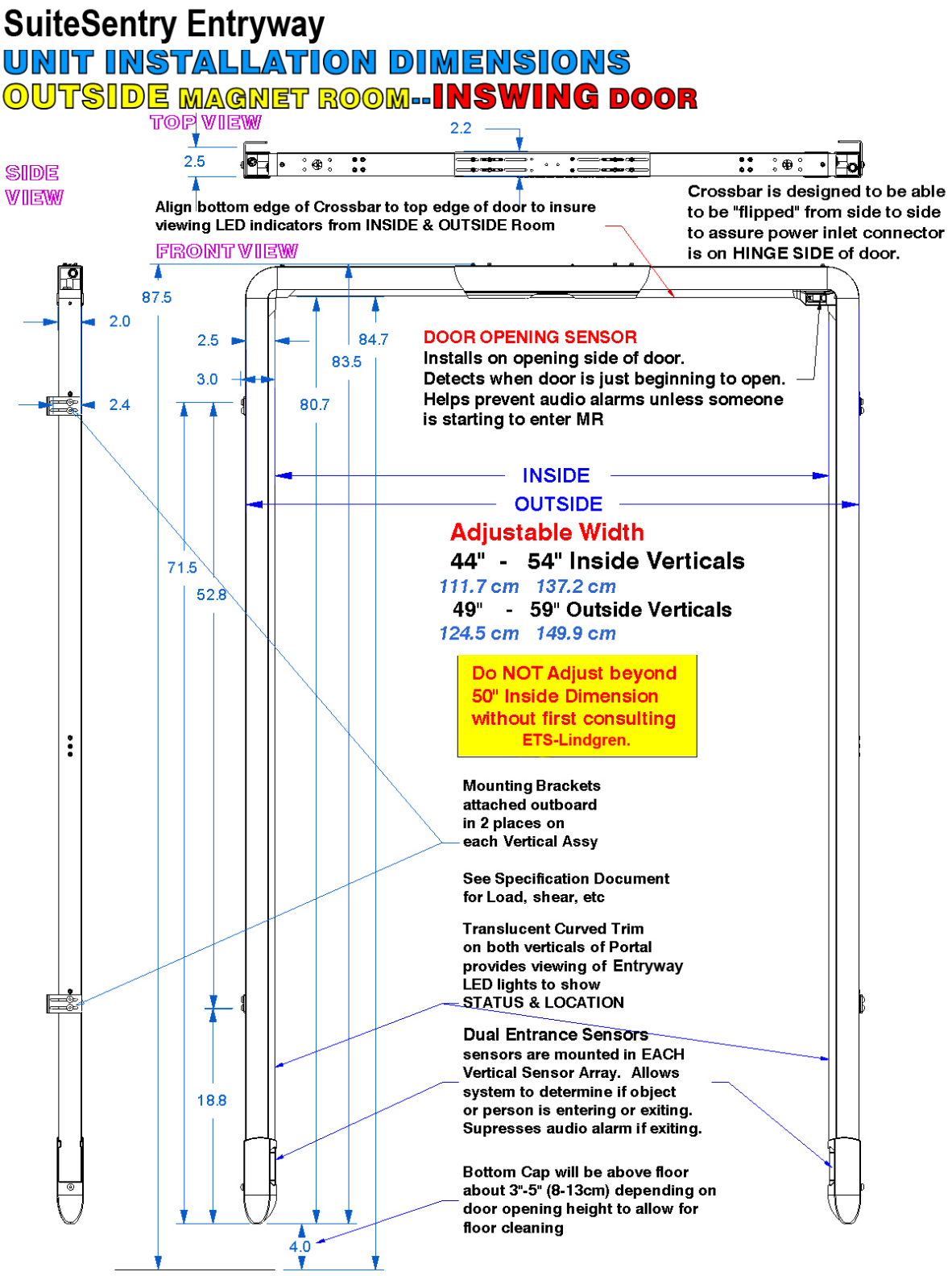
System Dimensions Diagram – STD DOOR OUTSIDE MR Installation



3.3 Dimensions & Features *(continued)*

3.3.2 Detector System Dimension Diagram OUTSIDE MR

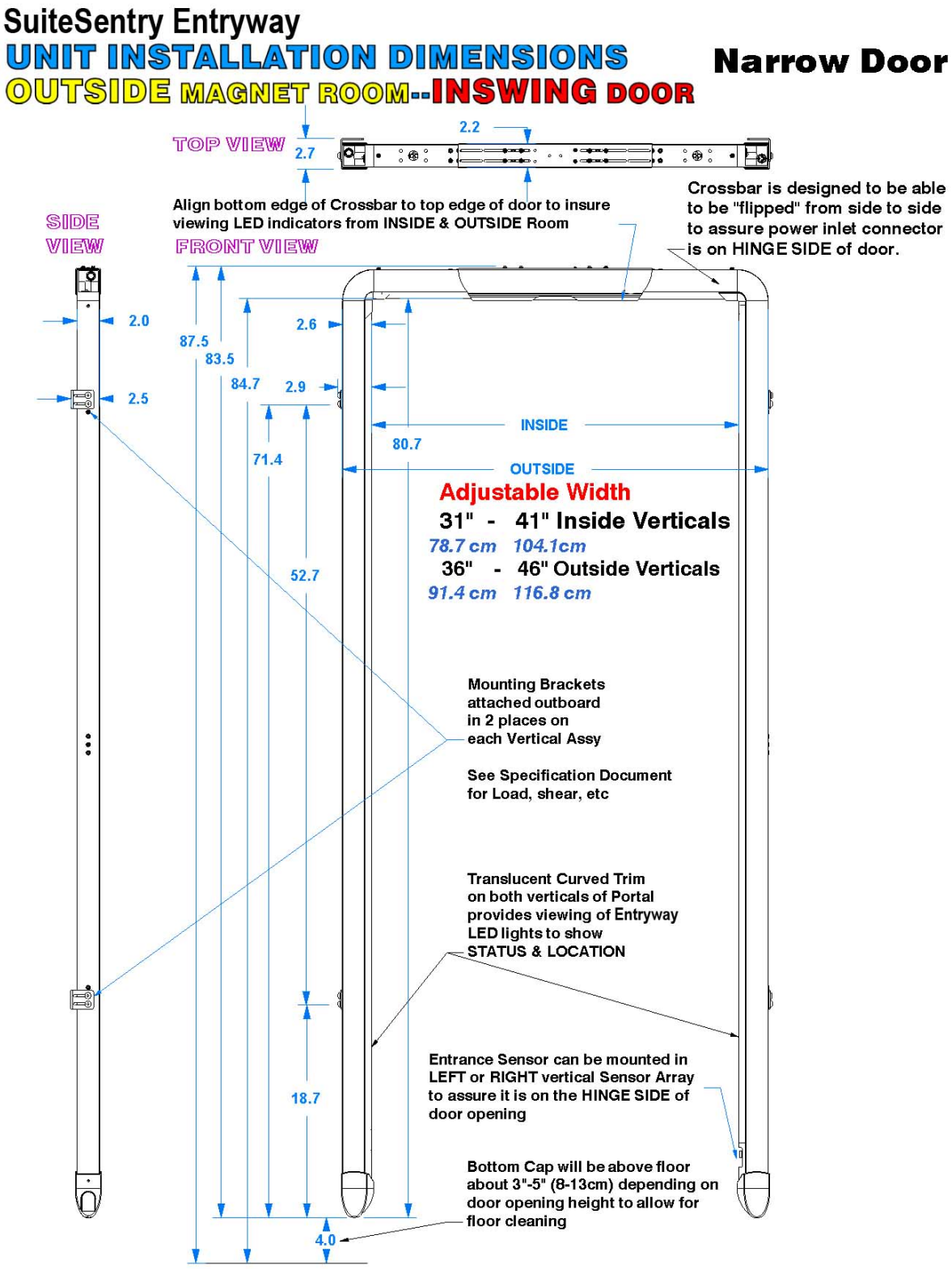
System Dimensions Diagram – STD DOOR OUTSIDE MR Installation



3.3 Dimensions & Features *(continued)*

3.3.3 Detector System Dimension Diagram OUTSIDE MR

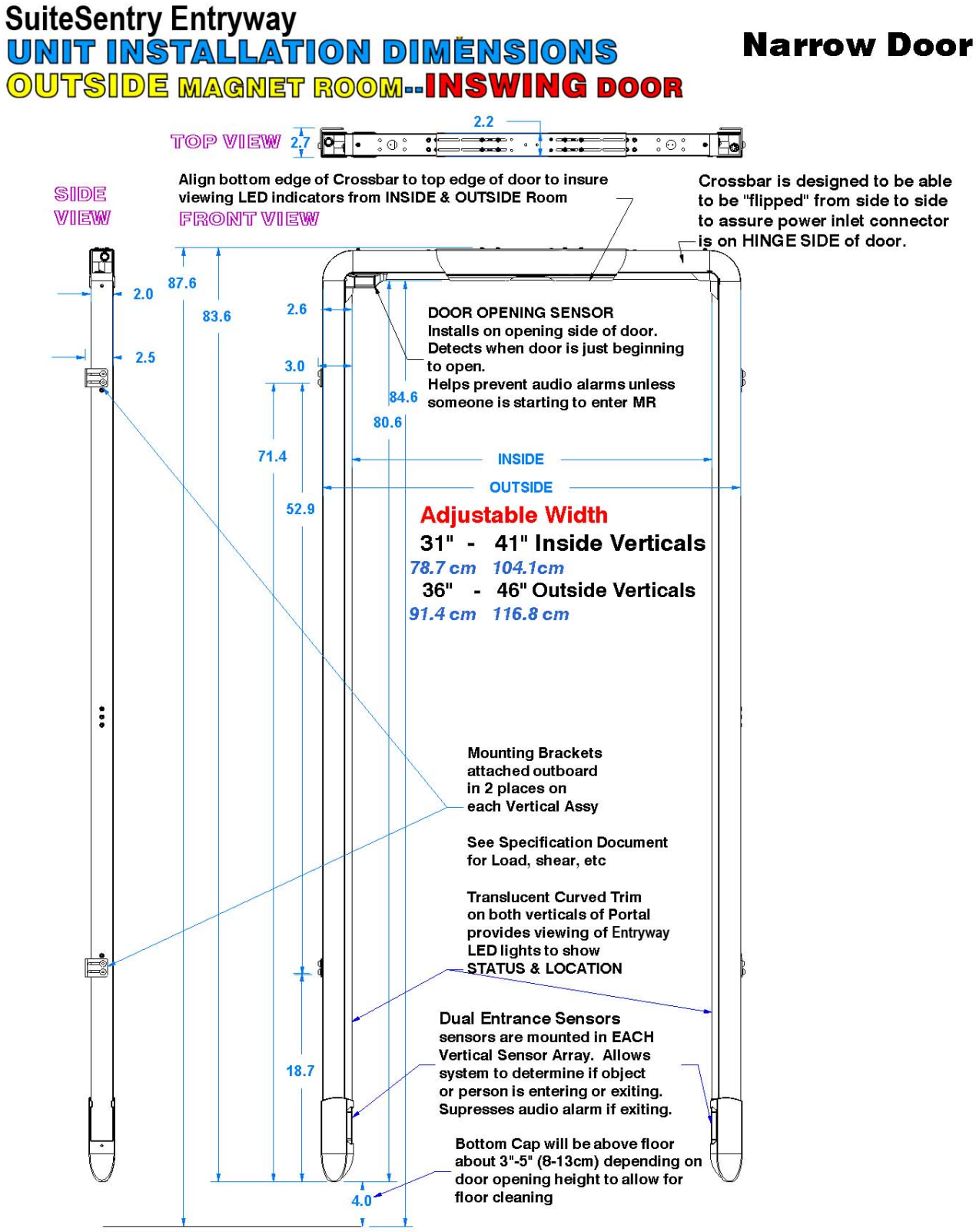
System Dimensions Diagram – NARROW DOOR OUTSIDE MR Installation



3.3 Dimensions & Features *(continued)*

3.3.4 Detector System Dimension Diagram OUTSIDE MR

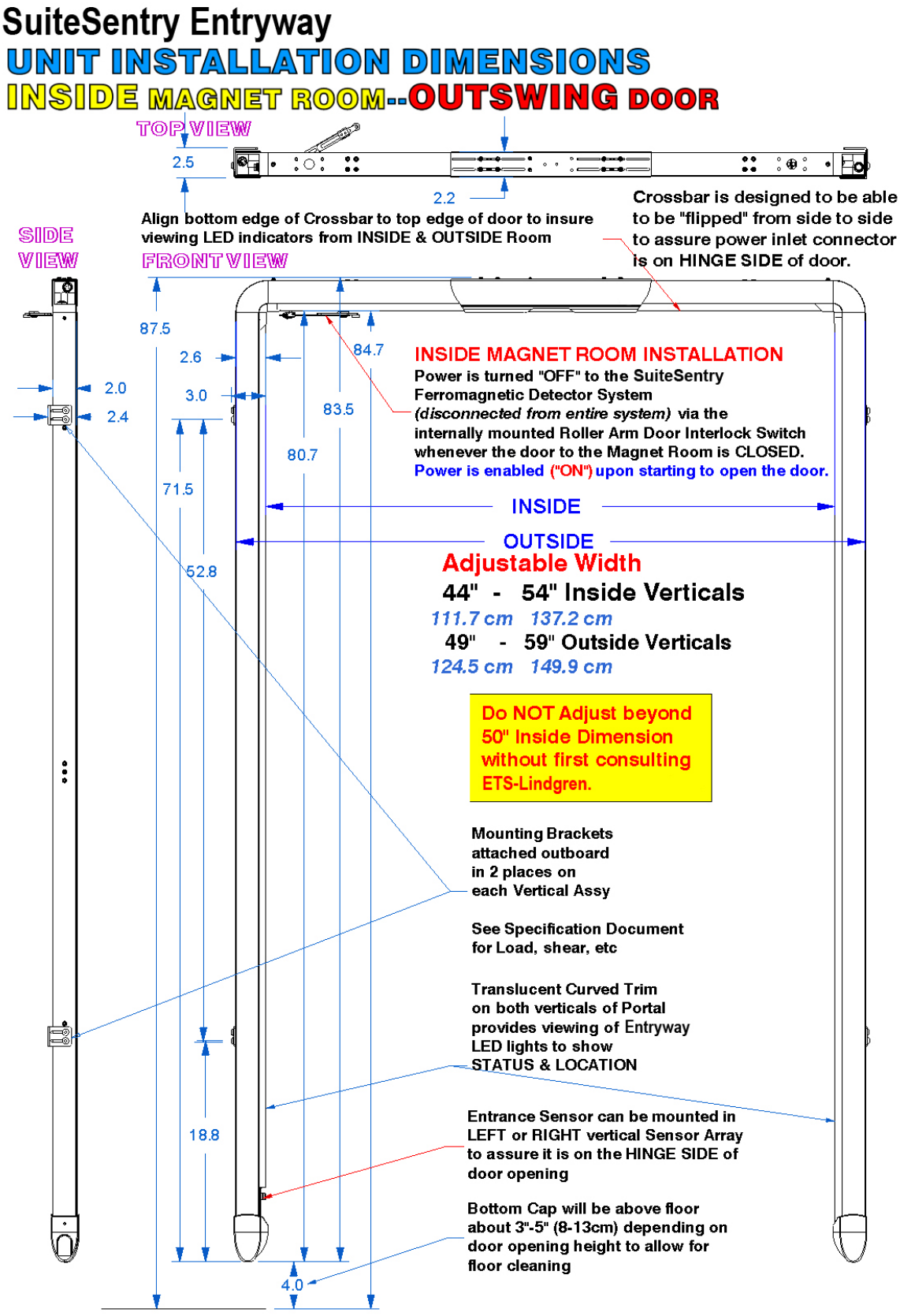
System Dimensions Diagram – NARROW DOOR OUTSIDE MR Installation



3.3 Dimensions & Features *(continued)*

3.3.5 Detector System Dimension Diagram INSIDE MR

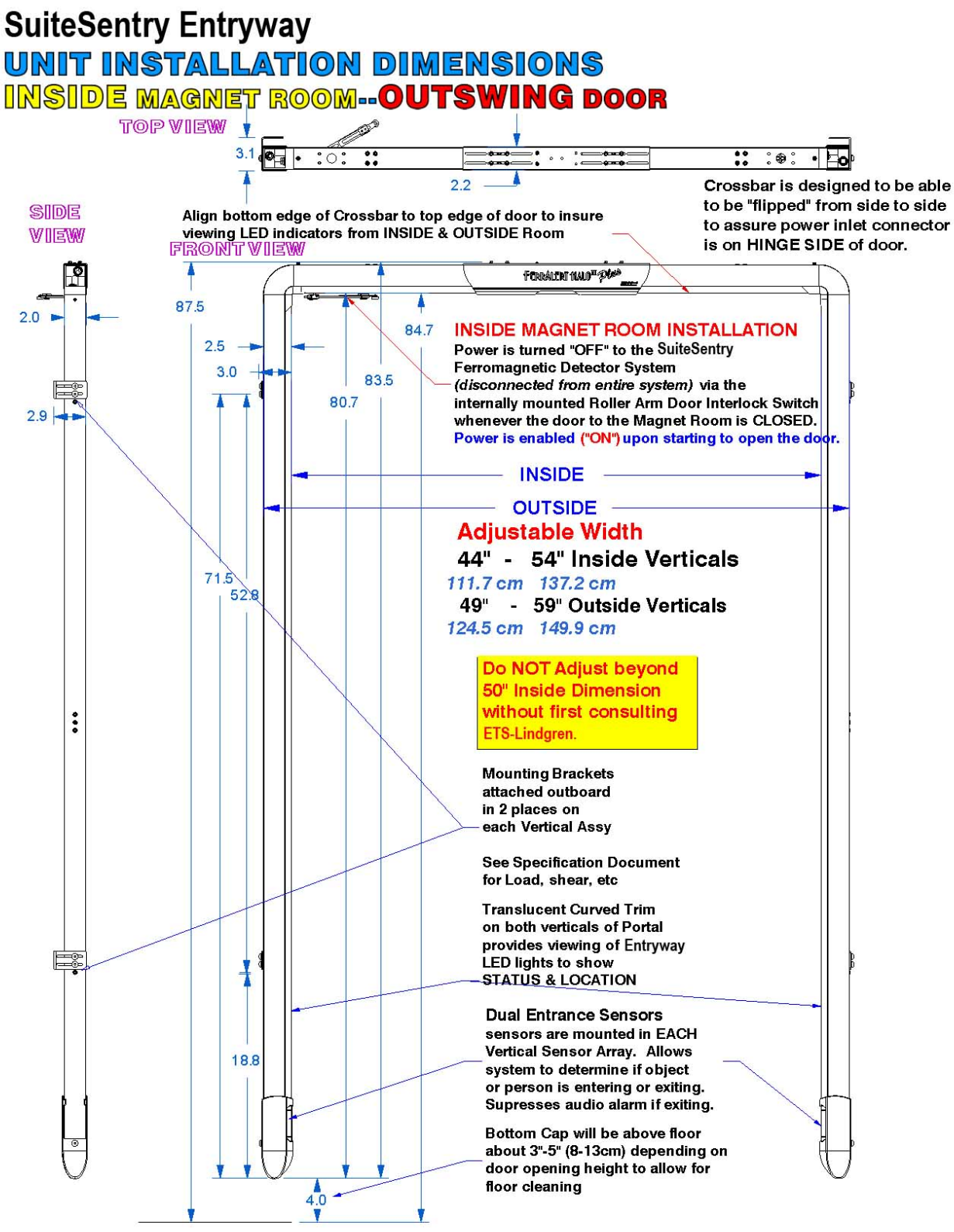
System Dimensions Diagram – STD DOOR INSIDE MR Installation



3.3 Dimensions & Features *(continued)*

3.3.6 Detector System Dimension Diagram INSIDE MR

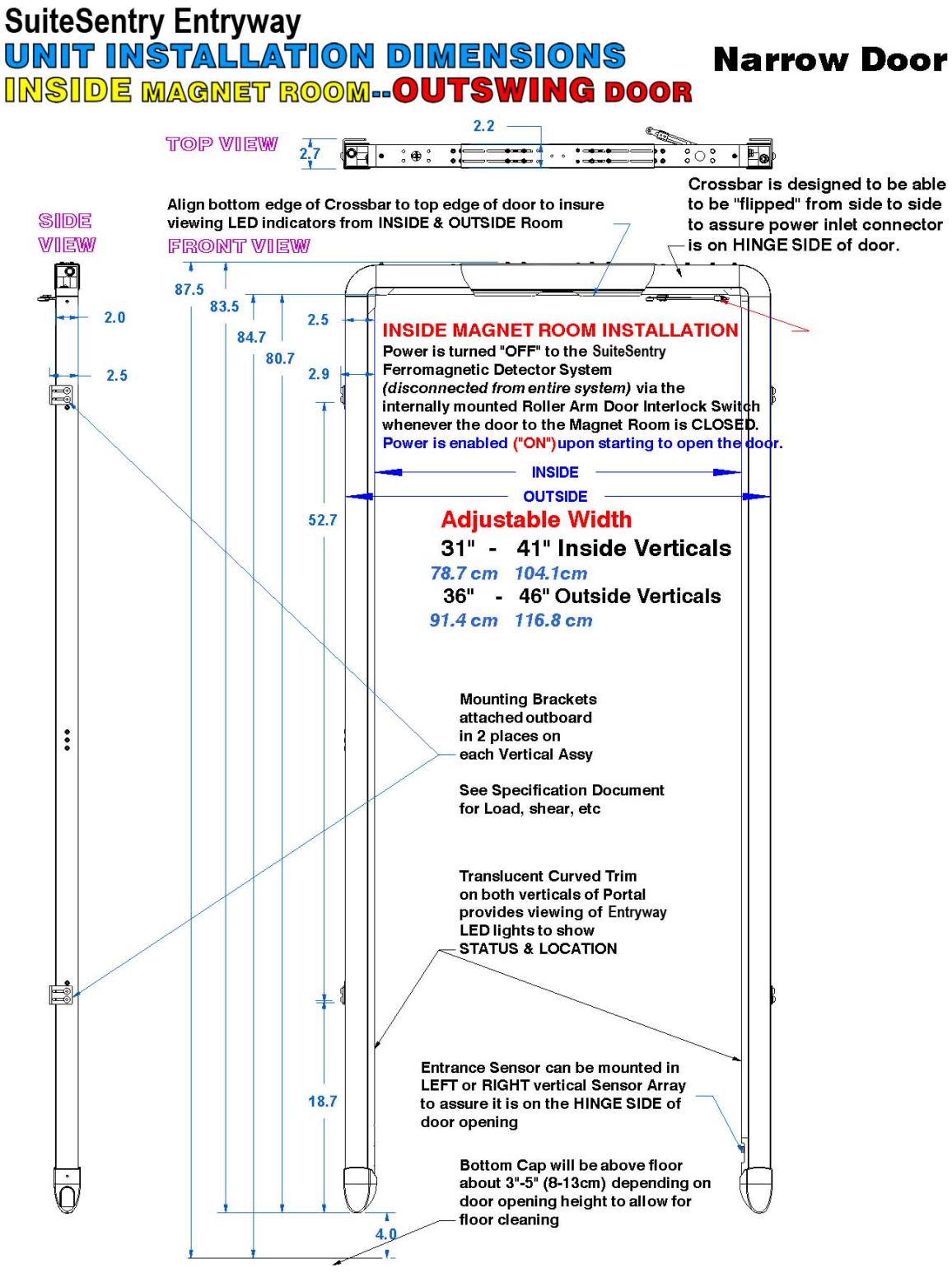
System Dimensions Diagram – STD DOOR INSIDE MR Installation



3.3 Dimensions & Features *(continued)*

3.3.7 Detector System Dimension Diagram INSIDE MR

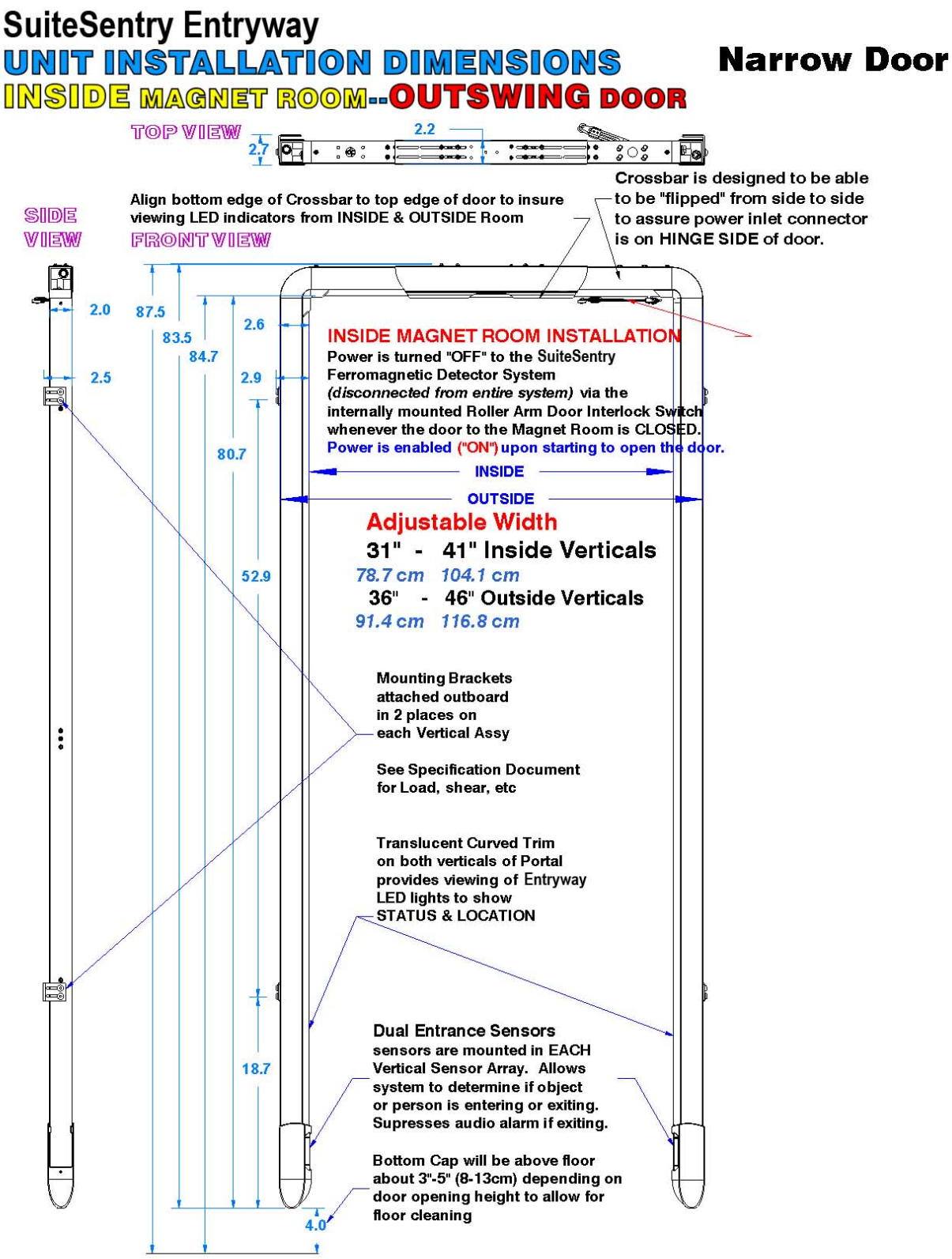
System Dimensions Diagram – NARROW DOOR INSIDE MR Installation



3.3 Dimensions & Features *(continued)*

3.3.8 Detector System Dimension Diagram INSIDE MR

System Dimensions Diagram – NARROW DOOR INSIDE MR Installation

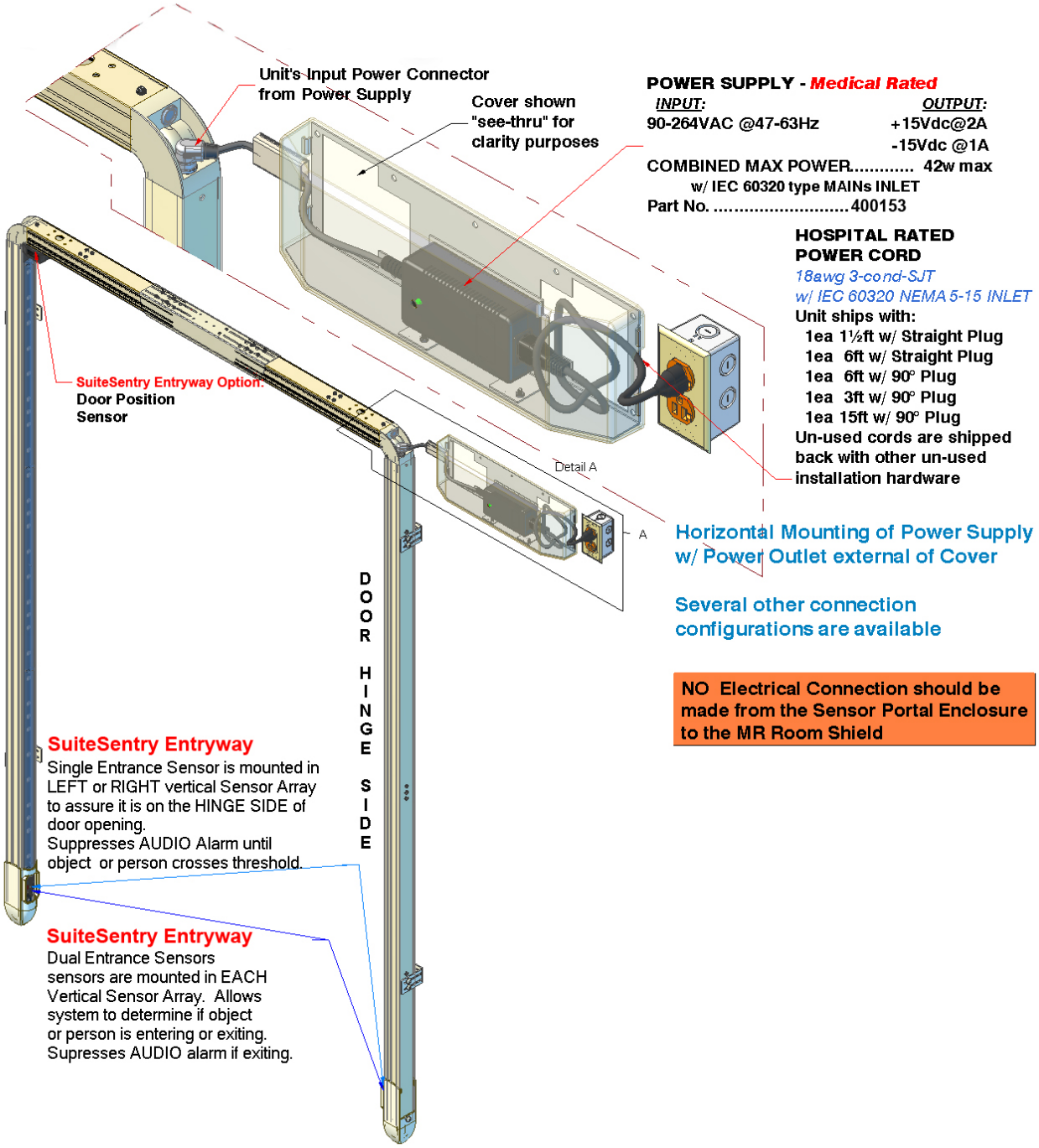


3.4 Detector Connector Diagrams

3.4.1 Detector & Power Supply Connection Diagram OUTSIDE MR Installation

System Wiring Diagram – OUTSIDE MR – INSWING DOOR Installation

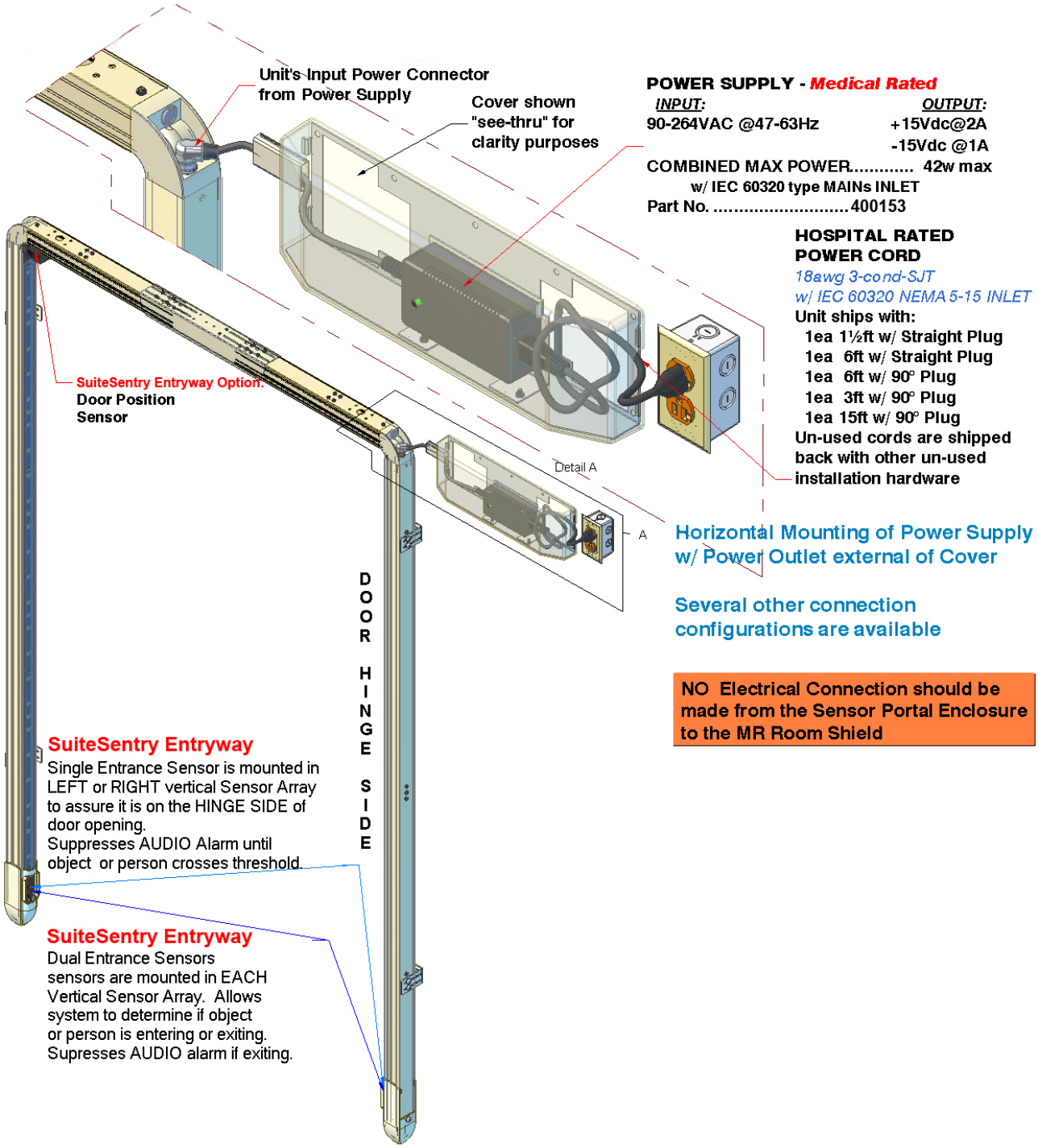
UNIT CONNECTION INFORMATION
OUTSIDE MAGNET ROOM--INSWING DOOR
MRI FERROMAGNETIC DETECTOR
SuiteSentry Entryway



3.4.2 Detector & Power Supply Connection Diagram INSIDE MR Installation

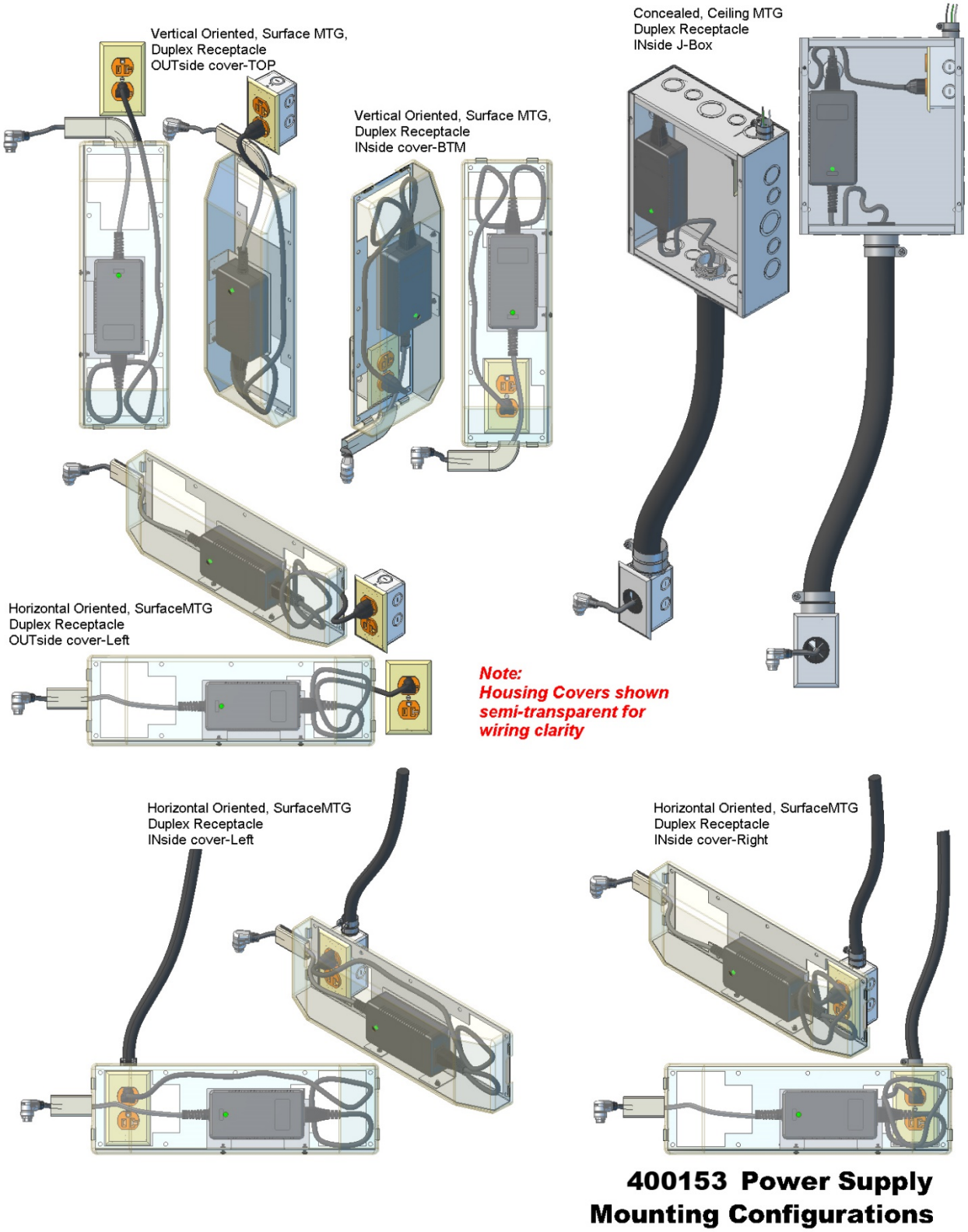
System Wiring Diagram – INSIDE MR – OUTSWING DOOR Installation

UNIT CONNECTION INFORMATION
OUTSIDE MAGNET ROOM--INSWING DOOR
MRI FERROMAGNETIC DETECTOR
SuiteSentry Entryway



3.4.3 - Power Supply Mounting Configurations OUTSIDE MR - 400164

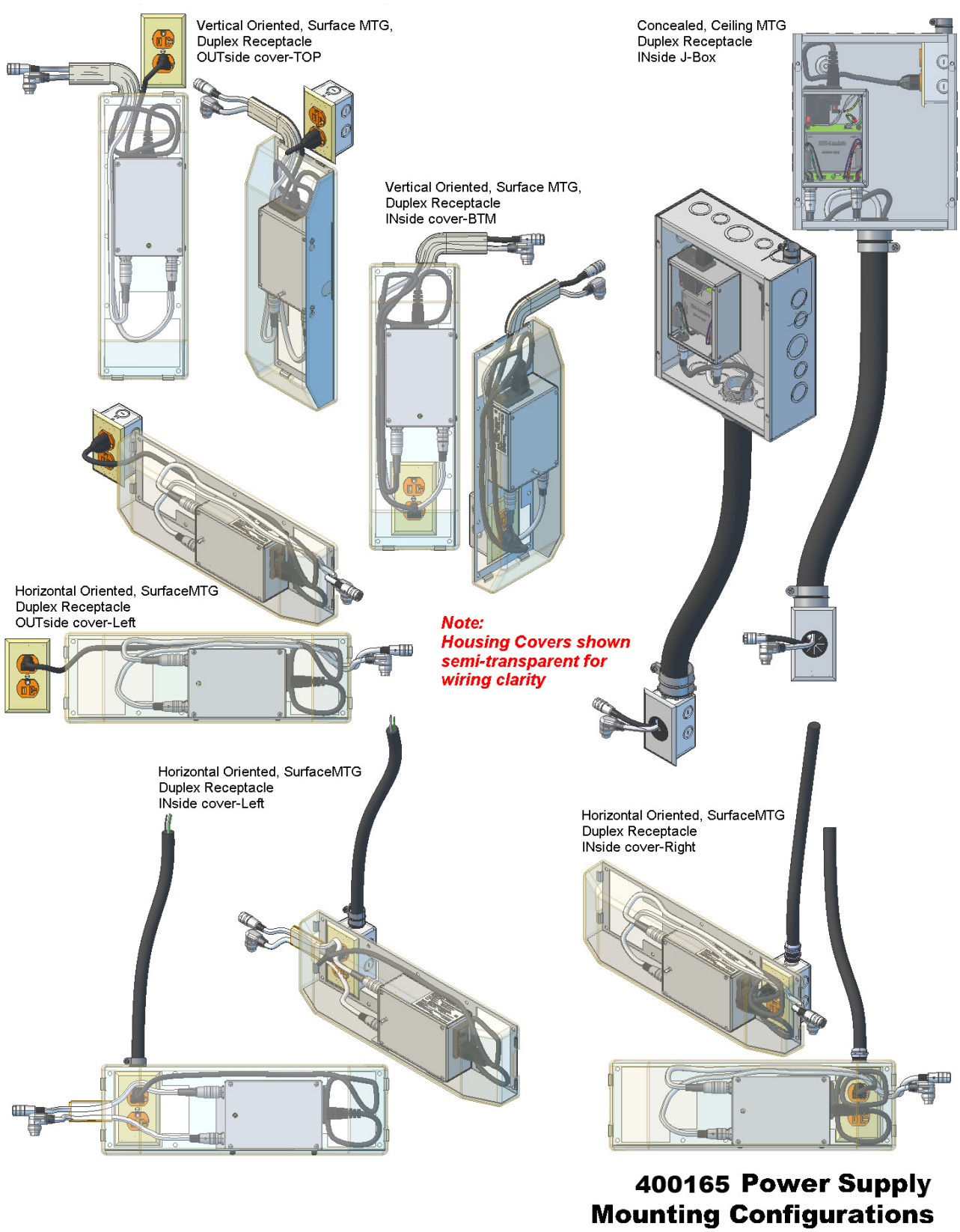
Power Supply Mounting Choices -- 400164



400153 Power Supply Mounting Configurations

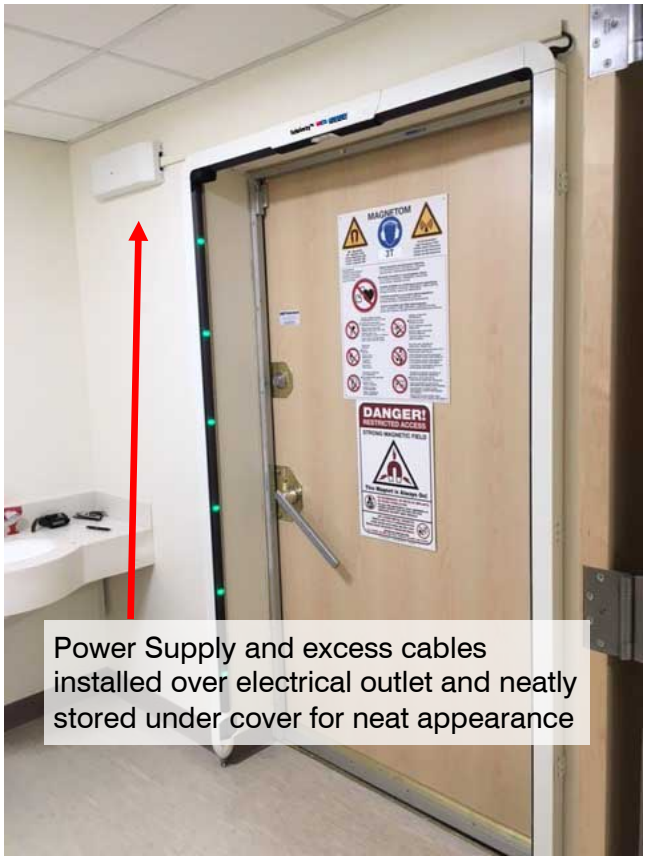
3.4.4 - Power Supply Mounting Configurations INSIDE MR - 400165

Power Supply Mounting Choices -- 400165

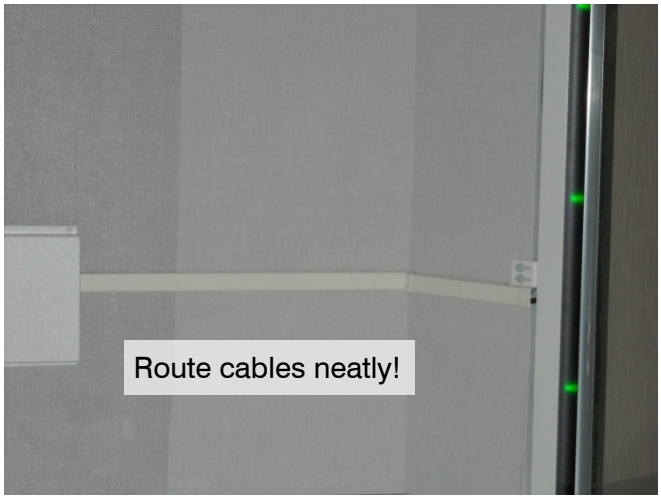


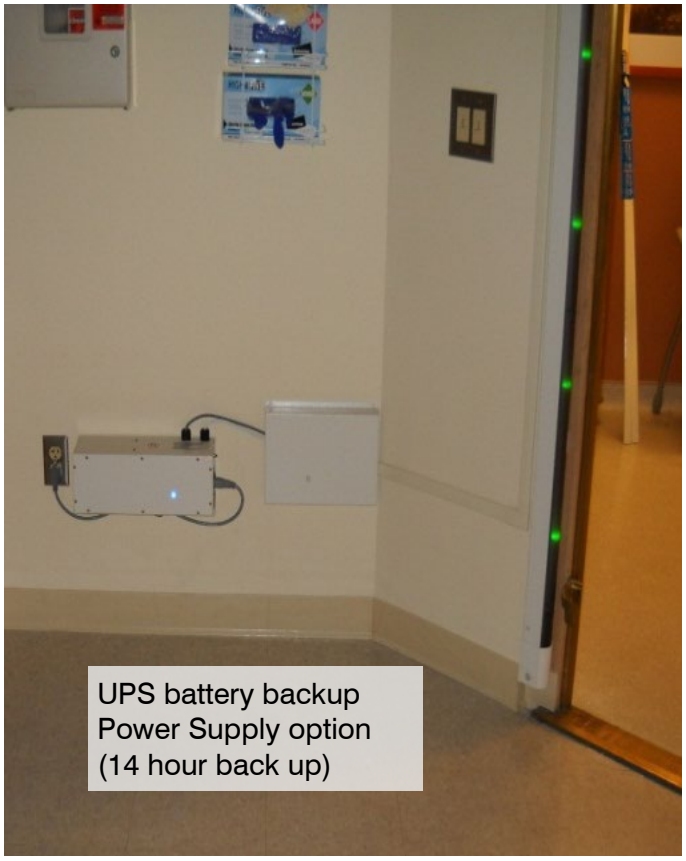
400165 Power Supply Mounting Configurations

3.5 Typical Installation Photos



3.5 Typical Installation Photos (continued)





3.5 Typical Installation Photos (continued)

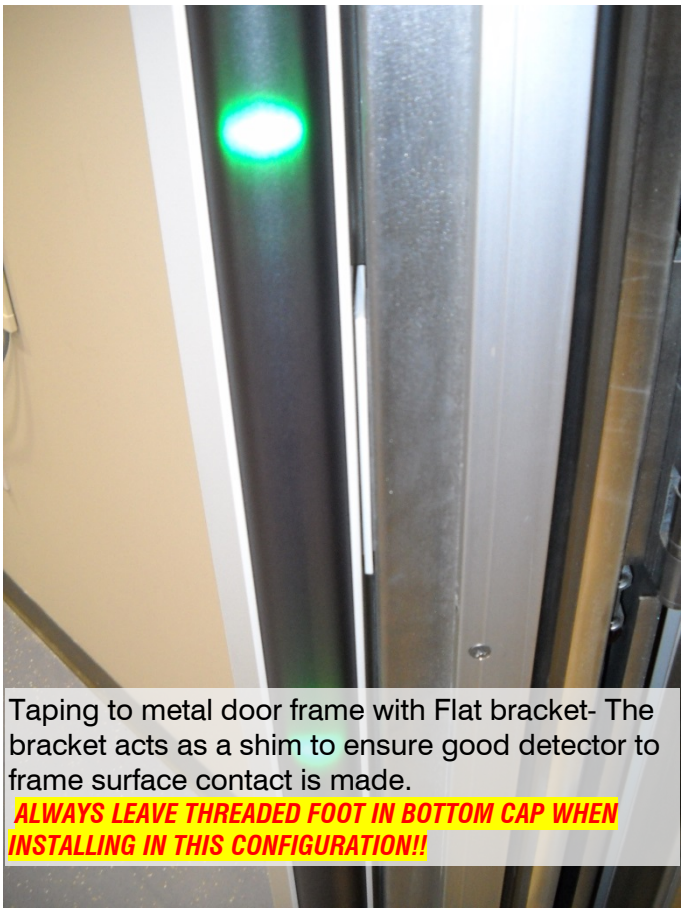
Power Supply of typical IN MAGNET room installation without cover

Power Supply of typical IN MAGNET room installation finished with cover in place

Power Supply wall bracket can be configured vertically or horizontally to cover electrical outlet for clean install

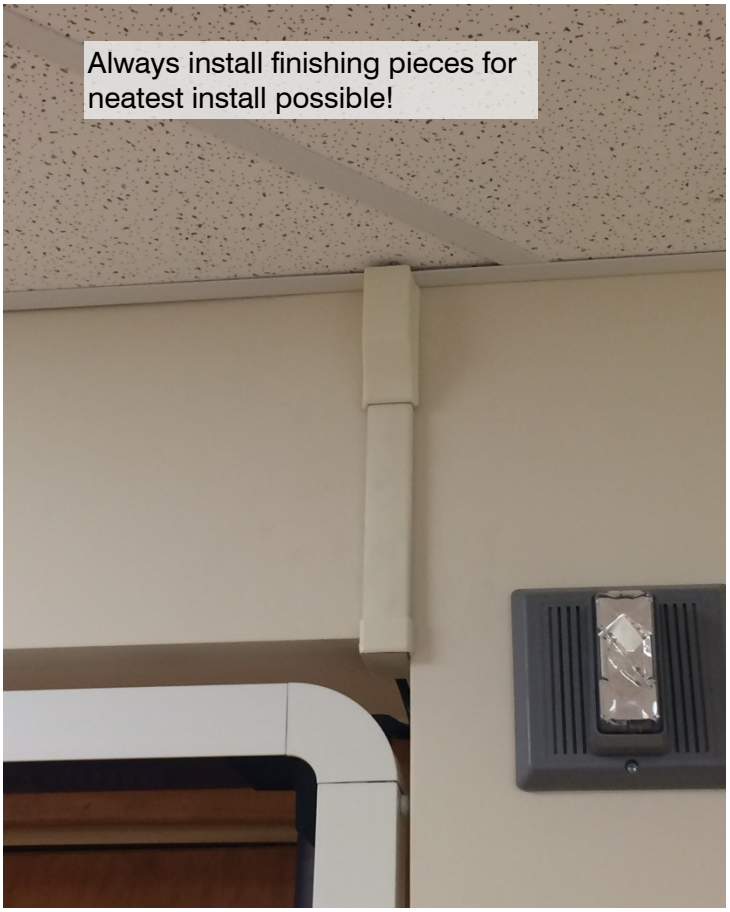
Power Supply of typical IN MAGNET room installation finished outlet covered

3.5 Typical Installation Photos (continued)



Taping to metal door frame with Flat bracket- The bracket acts as a shim to ensure good detector to frame surface contact is made.

ALWAYS LEAVE THREADED FOOT IN BOTTOM CAP WHEN INSTALLING IN THIS CONFIGURATION!!



Always install finishing pieces for neatest install possible!

Install wiring should always be as neat as possible and minimum exposed cables at outlet and detector!

Section 4 - RENEWAL PARTS

4.1 Field Replaceable Components

Table 4-1

Description	Part Number
Power Supply - Digital--Certified for INSIDE MAGNET ROOM	400165
Power Supply - Digital w/ 12’ output cable / connector-OUTSIDE MR	400164
Output Cable - 8’Lg - 3pin+4pin Connectors used w/ 400165	400167
Output Cable - 8’Lg - 5pin Connectors used w/ 400165	400166
Output Cable - 14’Lg - 3pin+4pin Connectors used w/ 400165	400169
Output Cable - 14’Lg - 5pin Connectors used w/ 400165	400168