



Installation & Operational Manual
MasterRad MX40 v.2
Universal Radiographic System

Table of Contents

Introduction:	Page 3
Section I: Installation	Page 4
Tools:	Page 4
Pre-Check:	Page 4
Hardware Installation:	Page 6
Tube:	Page 8
Collimator:	Page 9
Generator:	Page 10
Tube Cover:	Page 11
Section II: Operation	Page 16
Movements:	Page 16
Power On/Off:	Page 18
Control Panel:	Page 19
Section III: Troubleshooting	Page 20
Power:	Page 20
Section IV: Appendixes	Page 21
Drawings	Page 21-23

Introduction:

Important! .. X-ray Protection

**X-RAY EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR
UNLESS**

MEASURES OF PROTECTION ARE STRICTLY OBSERVED

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein should be thoroughly read and understood before attempting to place this equipment in operation. We will be glad to assist and cooperate in placing this equipment

Although this apparatus I built to the highest safety and incorporated a high degree of protection against x-radiation other than the useful beam, no practical precautions to prevent the possibility of any persons carelessly, unwisely, or unknowingly exposing themselves or other to x-radiation.

It is important that everyone working with x-radiation be properly trained and take adequate steps to insure protection against injury. The manufacturer assumes that all operator and service personnel authorized to use, install, calibrate and maintain this equipment is cognizant of the danger of excessive exposure to x-radiation, is sufficiently trained and has the required knowledges for it. The equipment herein described which may result from exposure to x-radiation.

Various protective material and devices are available. It is recommended that such materials and devices be used at all times around x-rays.

SECTION 1: INSTALLATION

TOOLS

The following hand tools are required for the installation:

- Standard service engineers tool kit.
- Electric drill motor and assorted bits.

Pre-installation checks

- Prior to beginning installation, it is recommended to inspect the site and verify that the x-ray room complies with requirement such as:
- Space requirements to allow installation and system movements must consider the maximum dimensions and travels of the equipment.

Maximum Height	96 in (8 ft)
Maximum Width	144 in (12 ft)
Maximum Length	180 in (15 ft)

- Conduits and walls are ready to install the system.
- Electricity installation:
 - ° Main supply: Single phase, 50/60 Hz
115/208/230/240 V ~
- Minimum Power input required: 400 VA

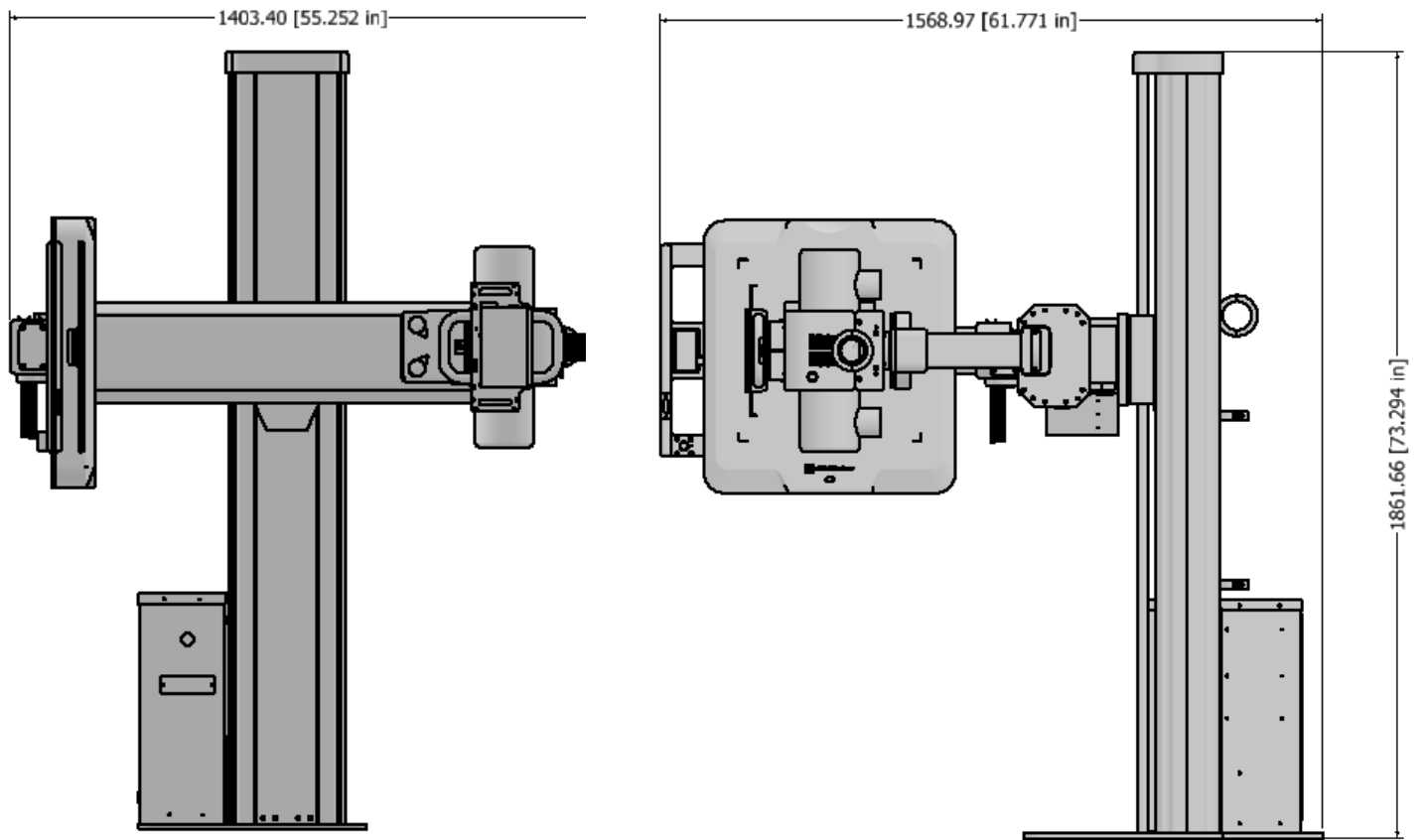
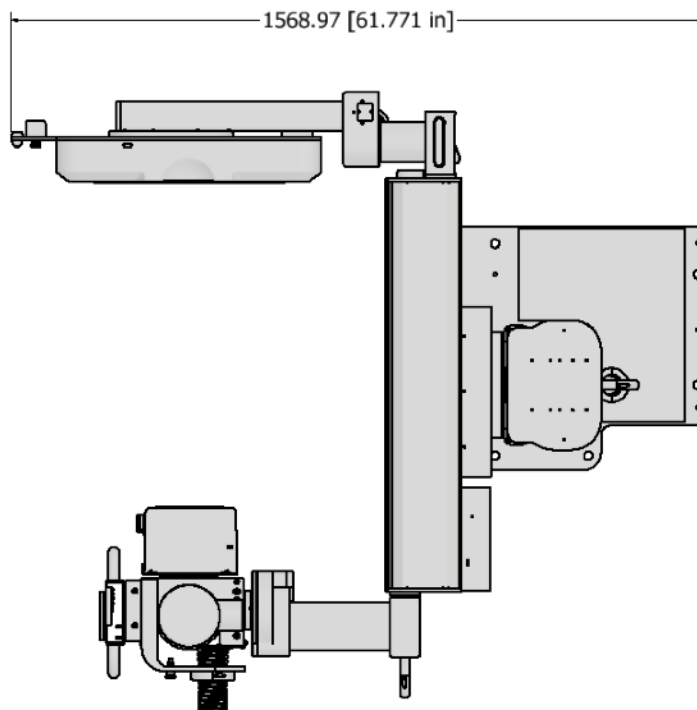


Figure 1: showing MX40 measurements



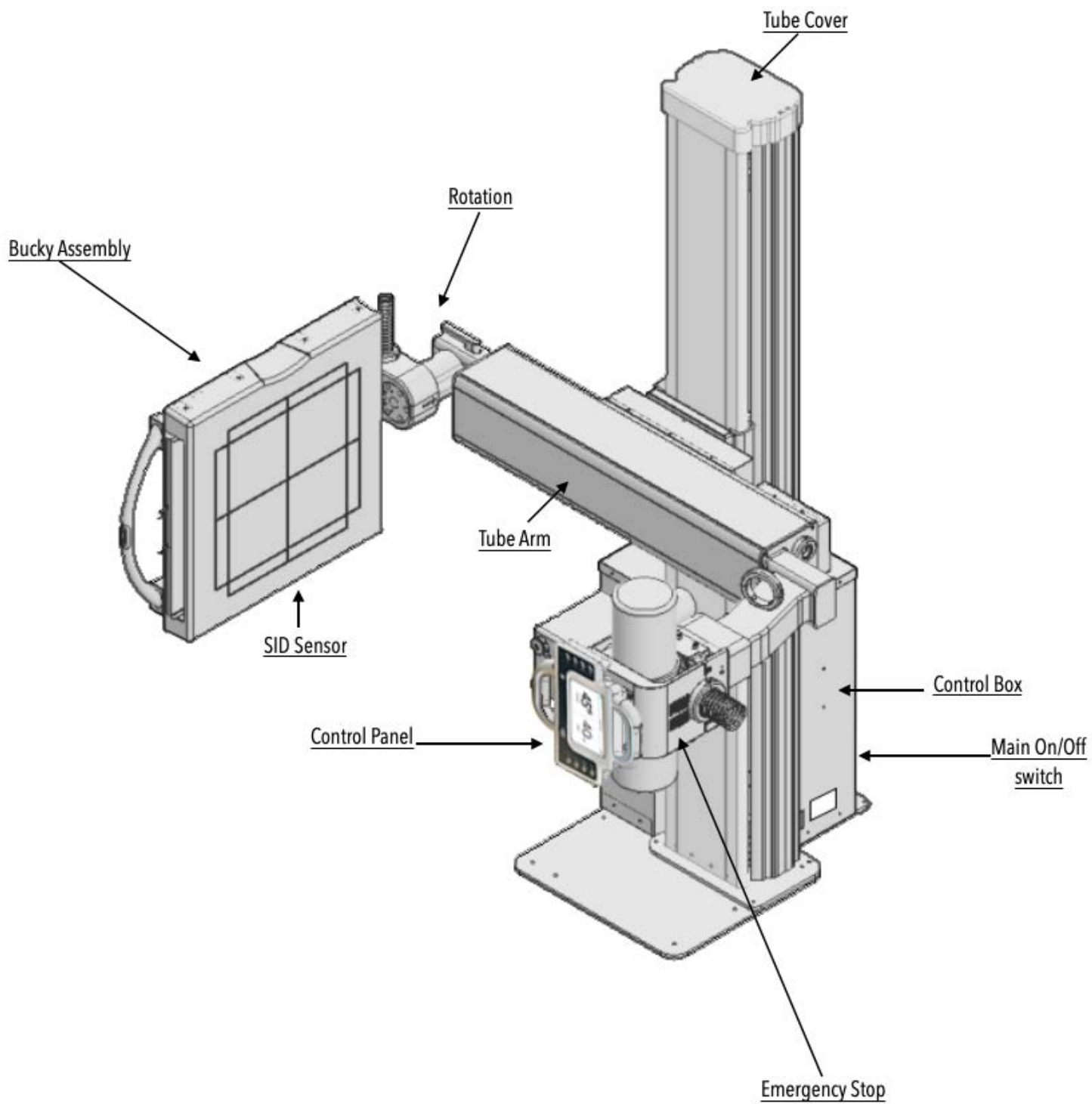
Hardware Installation:

Figure 2: anchoring the MX40 to the floor



Use proper sized mounting bolts to secure the system to the floor.

Mounting plate openings are .75" in diameter.



Tube, collimator, and generator installation.

- Place the tube on top of the arm.
- Place the collimator ring at the bottom of the arm below the tube through the arm
- Place the collimator below the arm as shown in the picture, then screw the collimator inside screws to fix the collimator to the collimator ring. (refer to the collimator Manual)

Refer to the following pages for proper cable management and connections for the tube, collimator and generator

Collimator: (refer to the collimator manual)

- Align the tube using the screws found with the metal plates inside of the blue binder. (note: there are two different types of screws used according to the type of X-ray tube).
- There are two main tools used to install collimator; Allen key for screws
- Allen key for the mounting plate remove the collimator mounting plate.

Tube, collimator, and generator installation (con't)

- connect the collimator mounting plate to the tube using the screws **previously used to align and keep tube in place**
- place collimator on to mounting plate and tighten all four screws in order to secure collimator on the tube arm
- connect collimator to CPI generator cable then other collimator cable located at the back of the table to foot pedal cable (there is only one way to connect the cables)



Figure 3: showing the 4 mounting holes at the bottom of the arm to mount the tube and ring

Tube: (refer to the generator manual and the tube manual)

- Place tube on holder so that it is stable
- Unscrew the tap (be gentle with cap screws as they are easy to strip)
- Grey tube wire is connected to the tube with the wire side labeled 1,2,3, etc.
- Connect the grey wire as follow inside the tube to its relative number: (refer to figure 10)
 - Black wire is 1
 - Red wire is 2
 - Yellow wire is 3
 - White wire is 5
 - Blue wire is 6
- Get the wire through the built in zip tie in order to adjust the fix the grey wire in place inside the tube



Figure 4: Internal wiring of tube



*Hooking up Wiring to Tube
Black is 1, Red is 2, Yellow is 3,
White is 5 and Blue is 6*

- Screw the cap back on
- Feed the loose end of the grey cable through the arm and through to the bottom access point

Generator connections:

- Connect the high-tension cables to the tubes. Connect one cable to the positive end on the tube
- Connect the second cable to the negative end on the tube.
- Remove the cover for the electrical CPI generator
- Connect the high-tension cable it their designate place,
- Apply silicon on the top of the wire head and distribute it all over the head of the cable, you end up with a thin layer of silicon that cover the head of high-tension cable.
- Connect the positive end of the cable to the positive end inside the generator and so for the negative as well.



Figure 5: Connecting the high tension cables to the generator

- Close the generator cover
- Organize the cables through the cable tray Connect the power cable to the wall disconnect.

Note: Most of the other wiring are connected for you as a courtesy

Tube Cover Mounting:

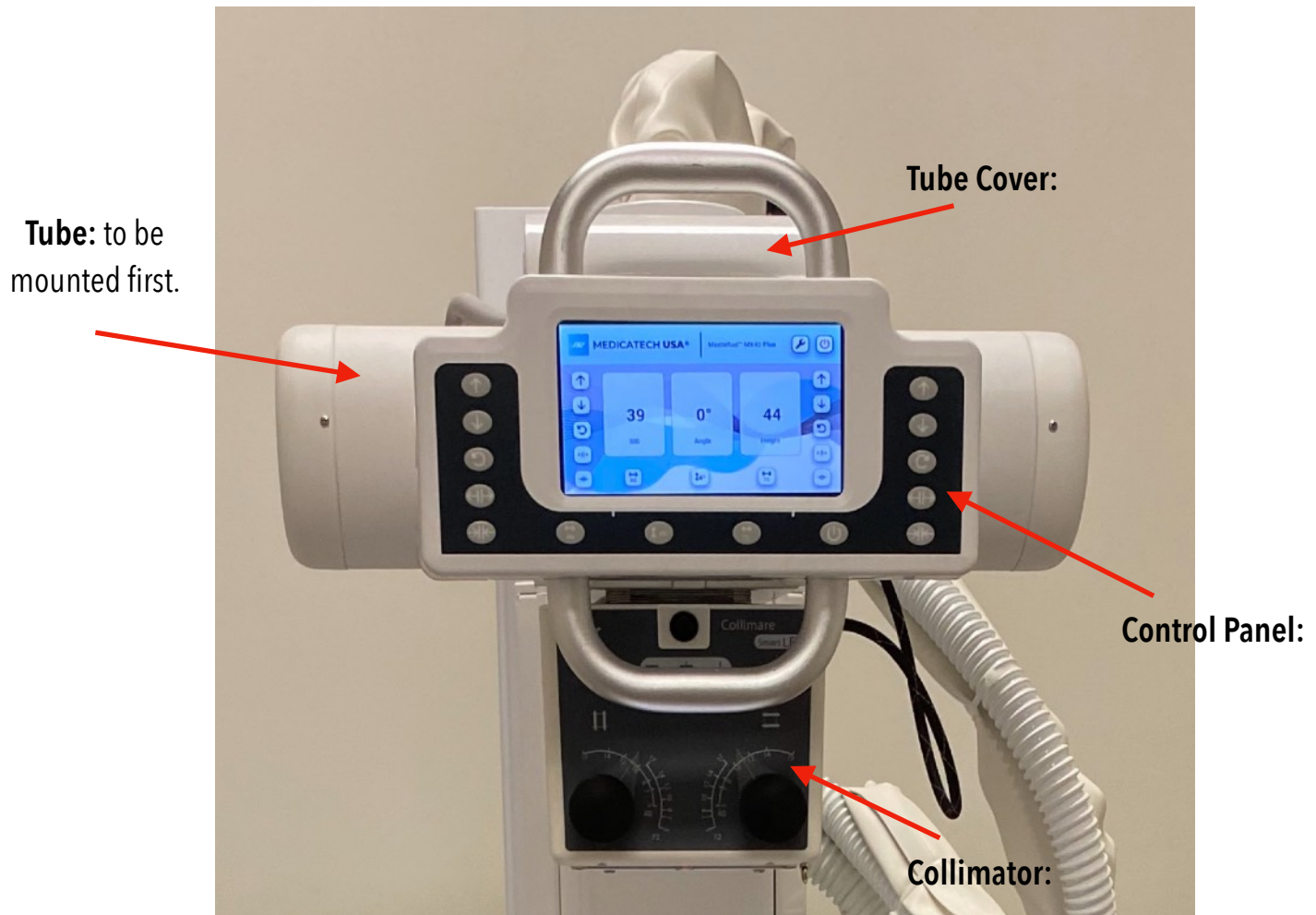
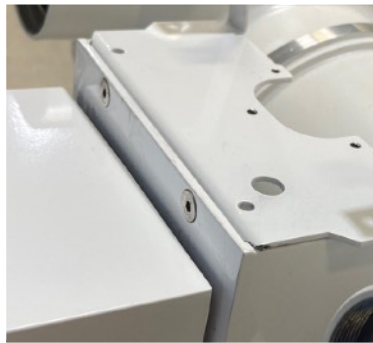


Figure 6: Tube Cover Assembly with Control Panel



The Tube Cover Assembly: This cover is made of several parts that are held in place by several screws. Have handy an Allen wrench set and a Phillips head screwdriver.

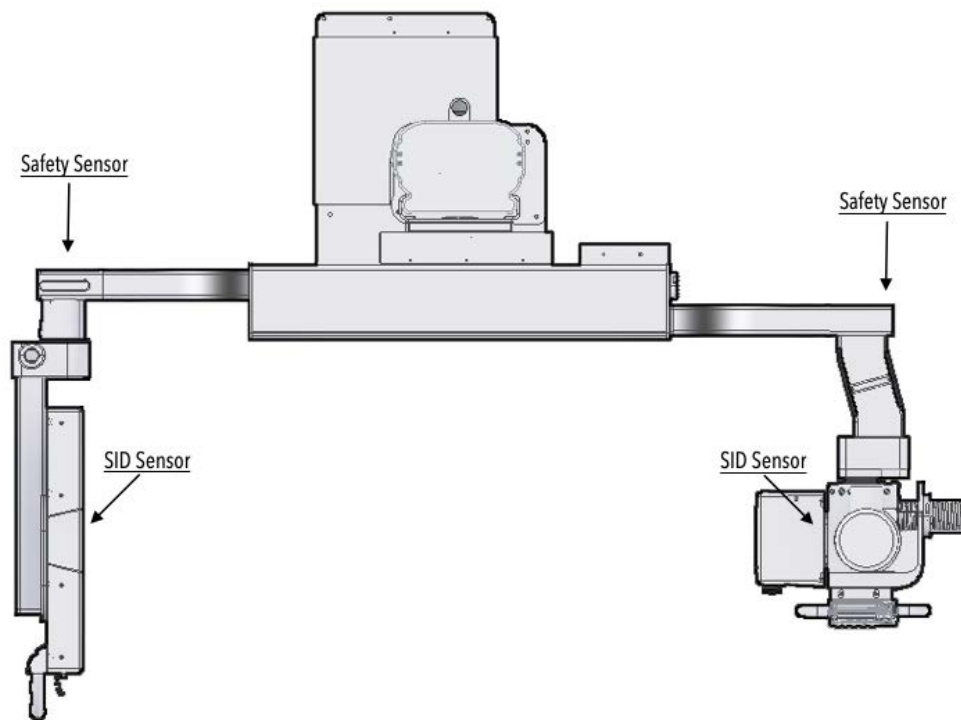
Step One: Locate the Tube Cover Bracket and install using two screws.



Step Two: Locate the Tube Cover Face Plate and install using four screws.



Step Three: Locate the Control Panel Connector Cable set, this will be packed with the Control Panel. Feed it through the large opening of the Tube Cover Face Plate.



Step Five: Locate and connect the top Finishing Plate and secure with two screws.



Step Six: Locate the two Neck Collar Plates. These are not marked, but one is for the left side and the other for the right - they will not align properly if not on the correct side.



Secure with two screws on both sides.

Tethered DR Panel, Workstation Installation (Skip this step if wireless):**DR Panel**

- Remove the DR panel from the packing (take care don't drop it or hit).
- Connect the DR Panel to the power box to the 25 Pin connector's cable (female connector).
- Connect the male side of the cable to the power box.
- Position the DR Panel inside the table panel Bucky.
- Connect the cat6 cable from power box to the Ethernet port on the workstation.

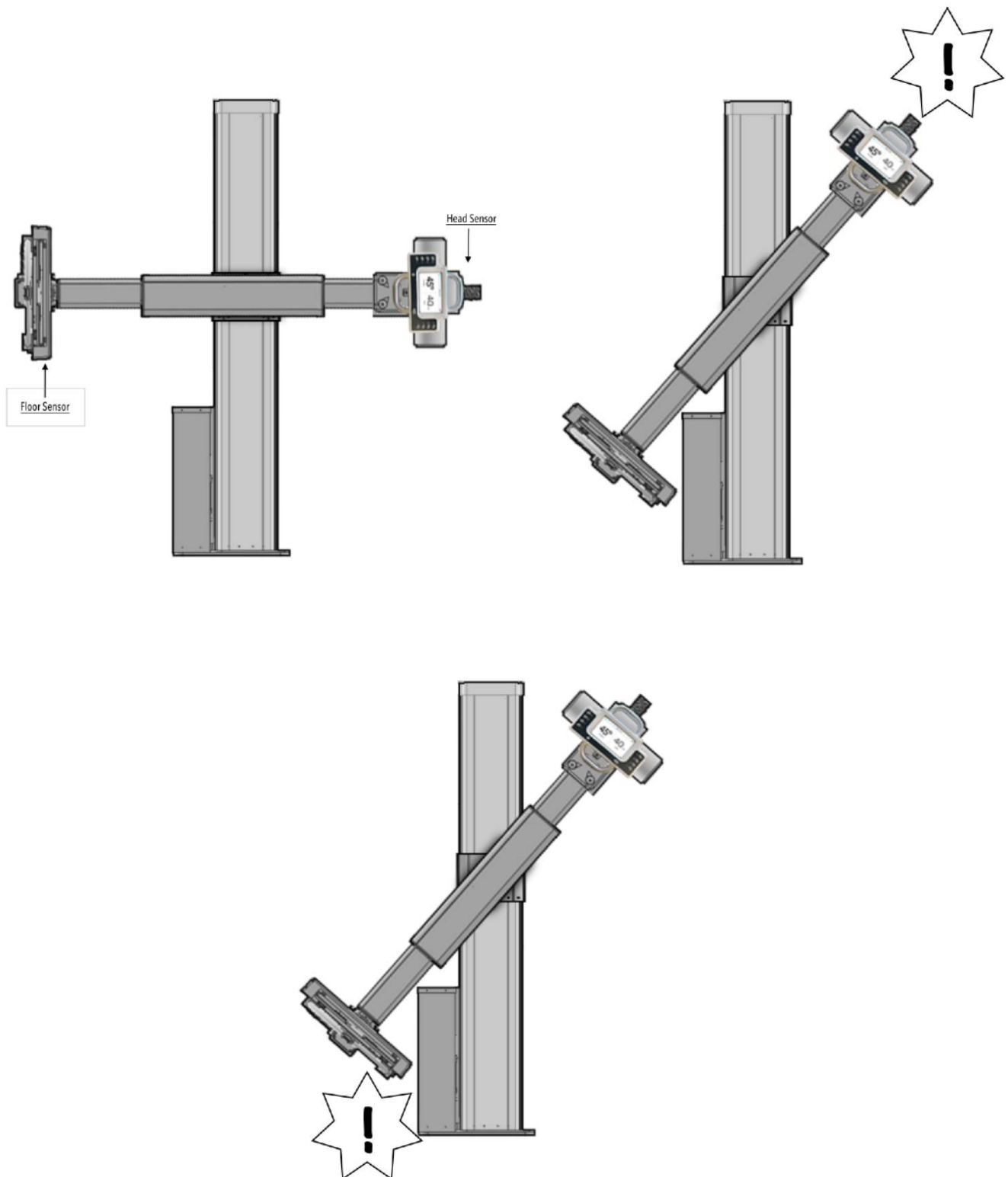
To be able to use it, you need to power on both the power box and the workstation, then open Voyance® software on the workstation (Kindly consult the user manual of Voyance® for more details).



Figure 7: View of the DR power box connection and the tethered DR Panel

Figure 11: Table Movement

Section II: Operation



Section II: Operation

1. Please make sure that the system is connected to its appropriate power source:

NOTE: THE POWER REQUIREMENT IS SUBJECT TO CHANGE IN COMPLIANCE WITH THE COUNTRY'S POWER REQUIREMENTS

2. Locate the main power button on the side of the system.

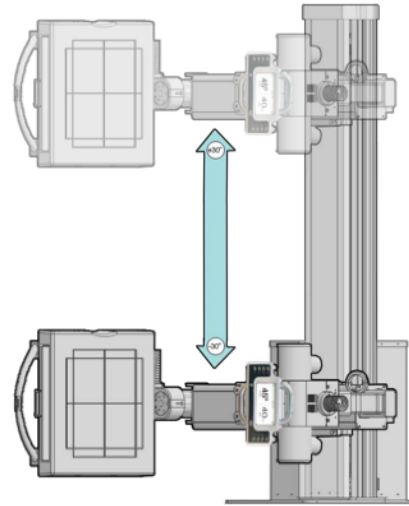
Main Power: Make sure this is turned on.



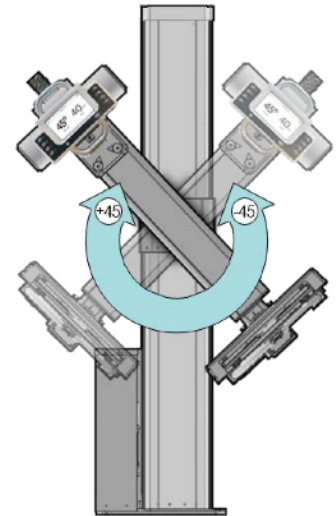
Figure 8: MX40 showing manual power switch location

3. Movements

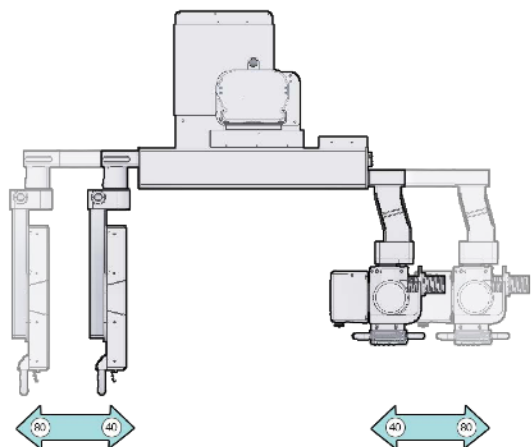
A. Up and Down:



B. Arm Rotation:



C. Arm Extension and Retraction:



3. Control Panel

- To turn on the panel press the power switch indicated in the picture below. Software will take a few minutes to reboot. Make Sure the Manual Power is On (See Section II #2).
- All button functions are available on the digital screen as well.

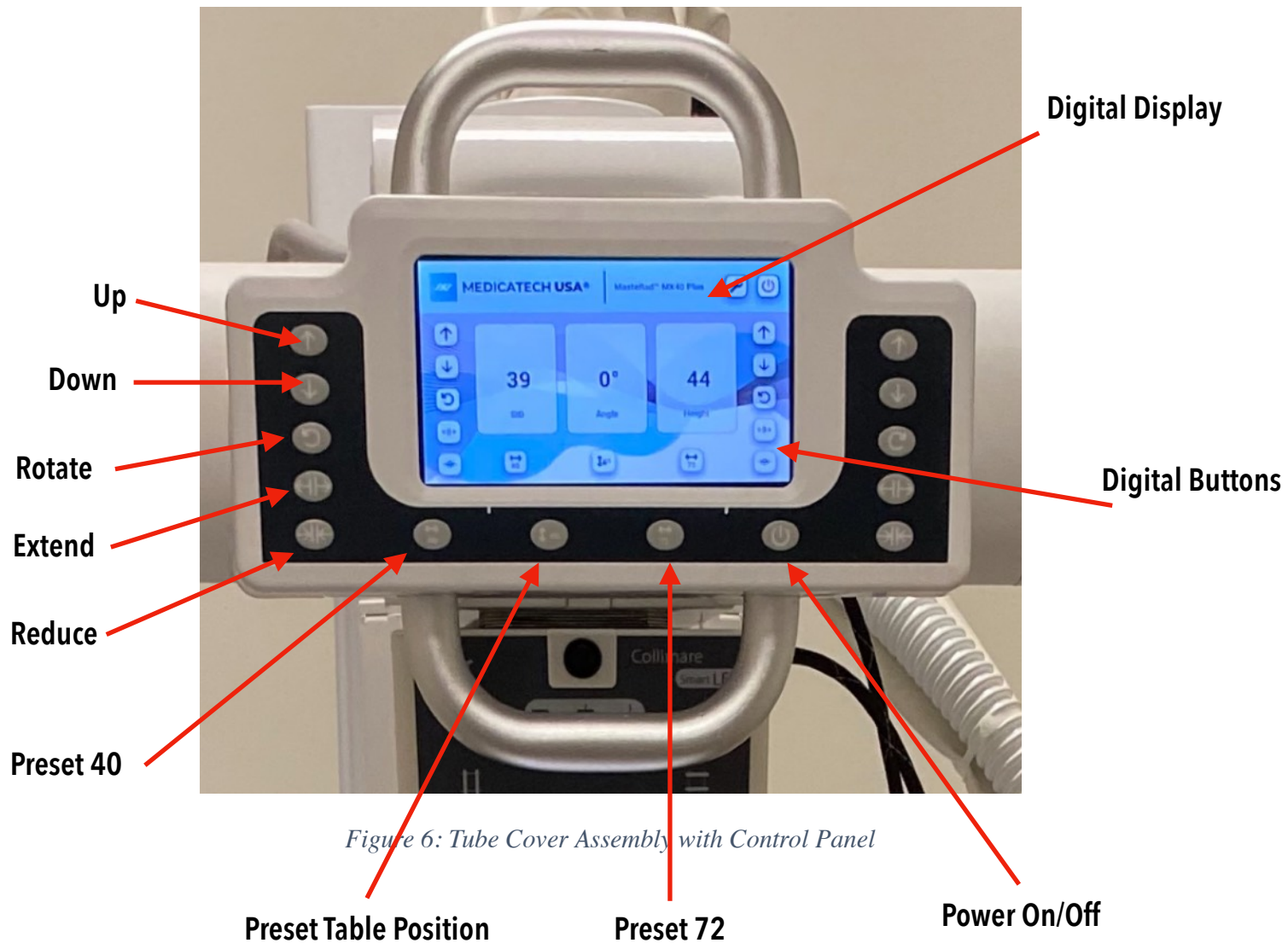
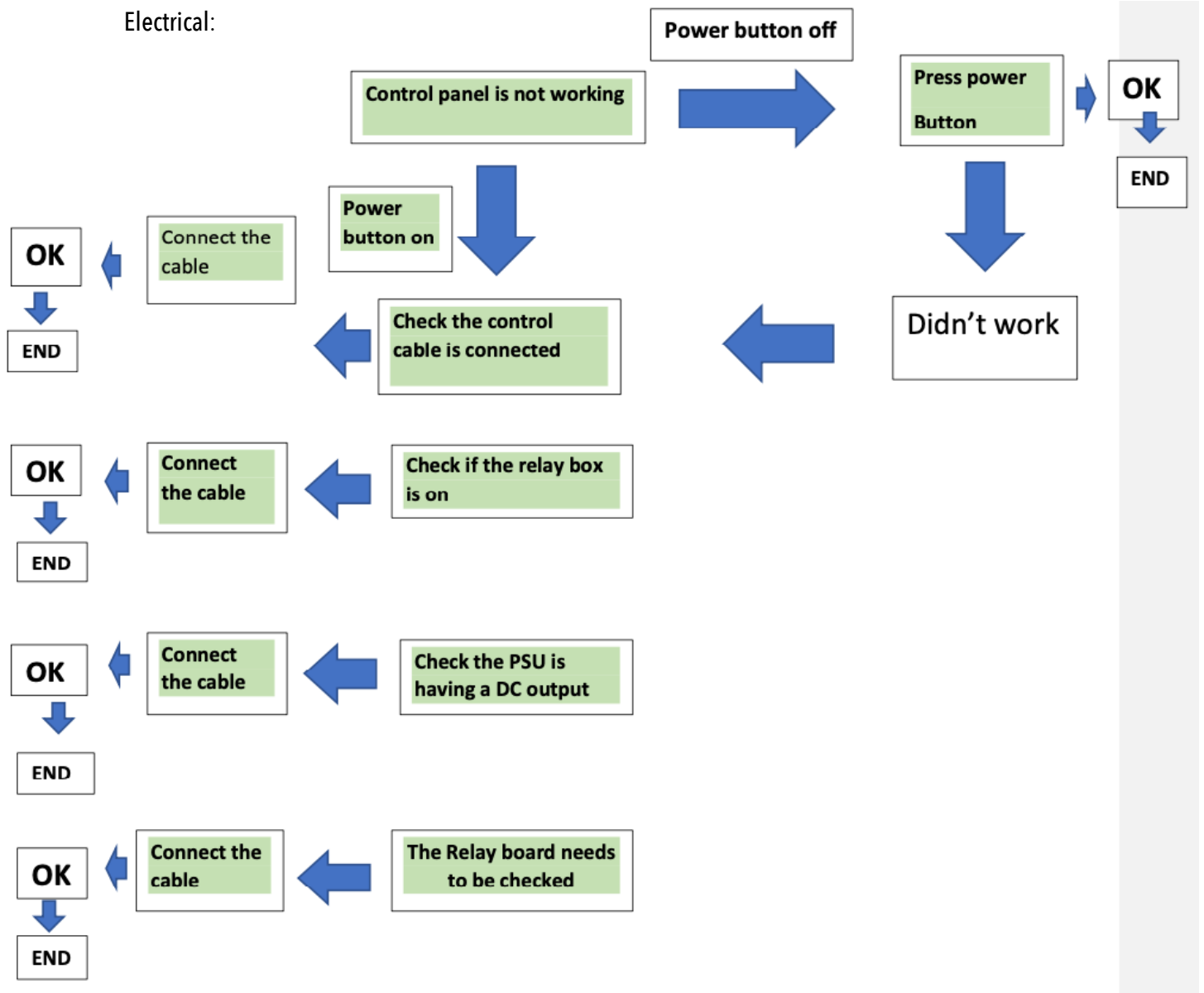


Figure 6: Tube Cover Assembly with Control Panel

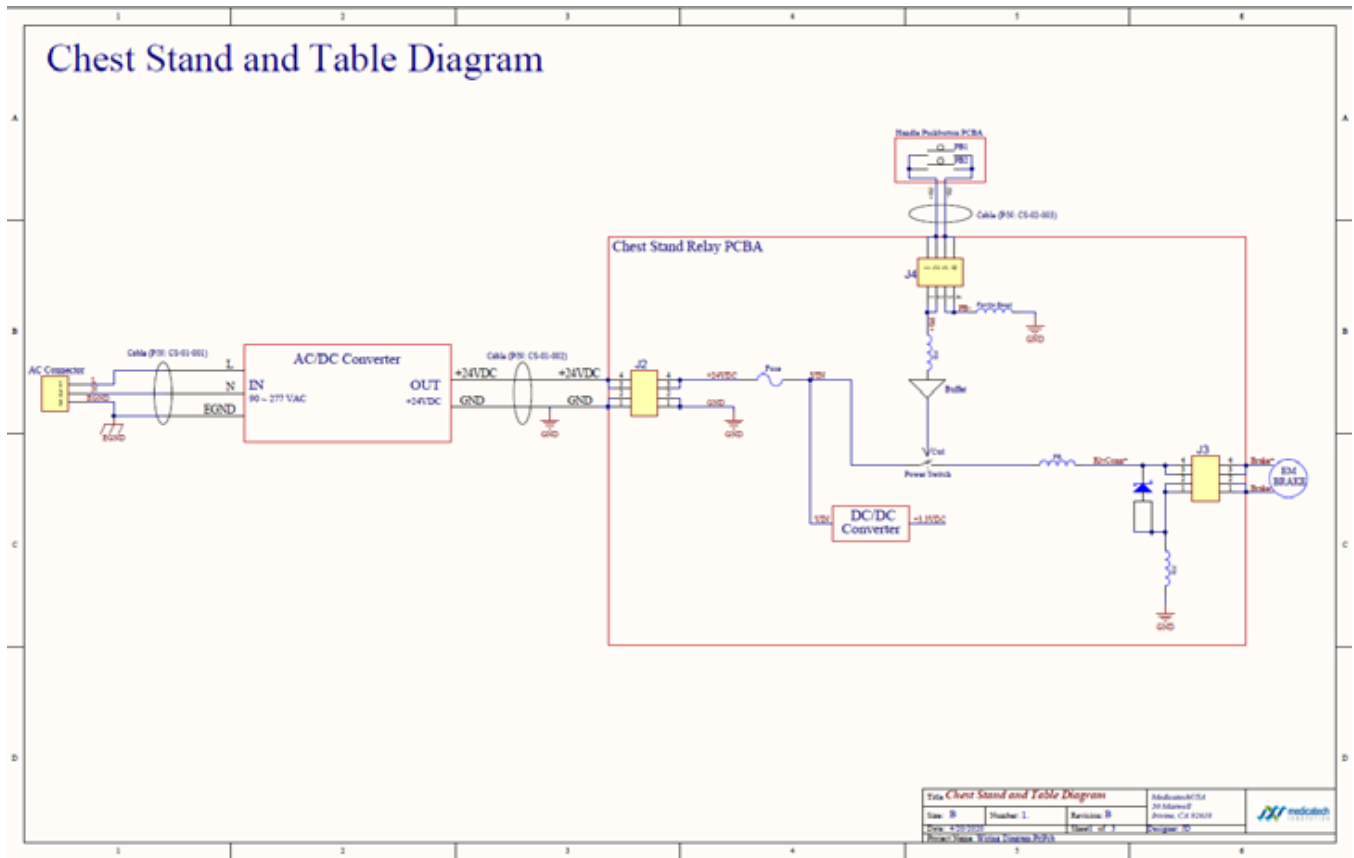
Section III: Troubleshooting

Electrical:

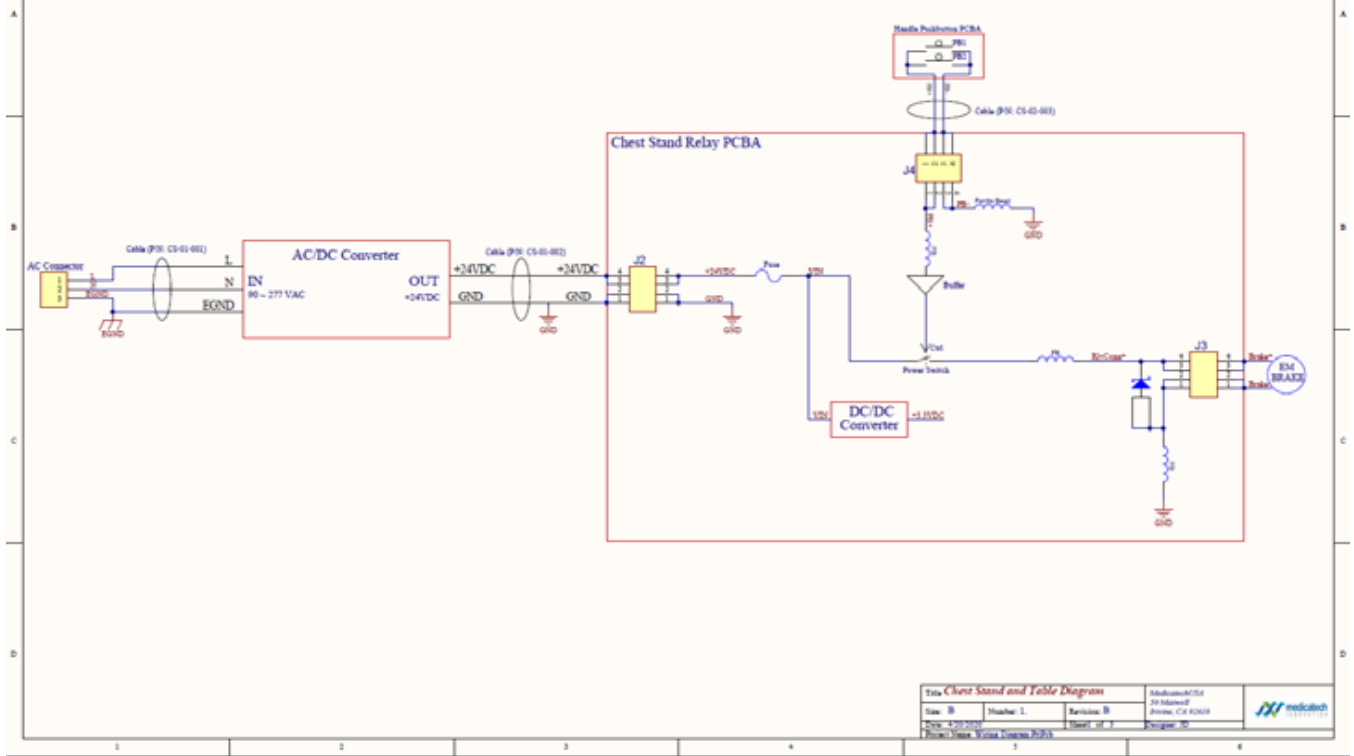


Section IV: Appendixes

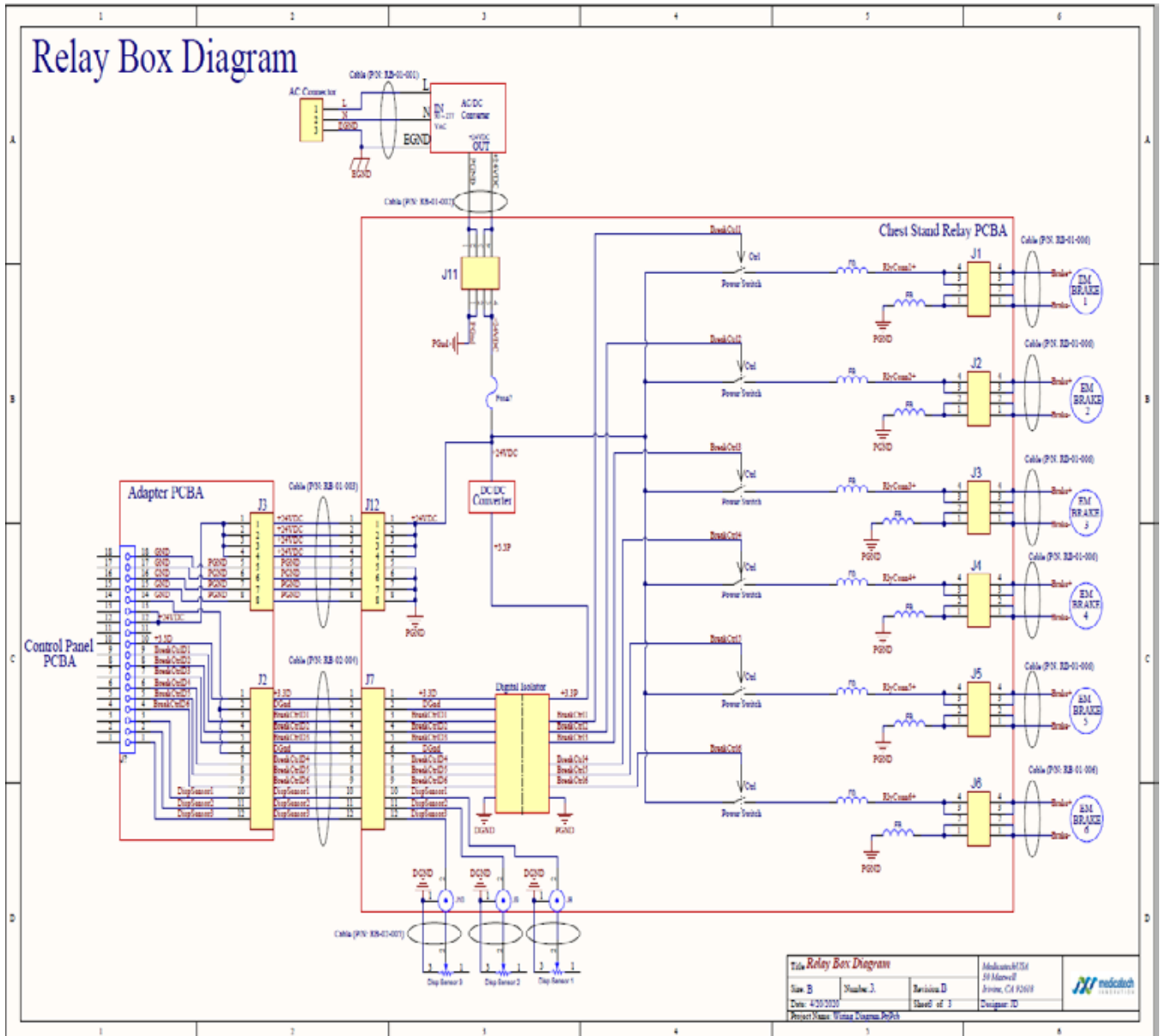
Appendix 1: Electrical Drawings



Chest Stand and Table Diagram



Relay Box Diagram



Title: Relay Box Diagram			
Rev: B	Sheet: 3	Revision: D	Mediatech/MSA
Date: 4/20/2010	Drawn: J	Checked: J	Shreve, CA 92618
Project Name: Wireless Imaging System		Designer: JD	mediatech