Omnera® 400T

Manual-Positioning Digital Radiographic System

Installation and Service Manual

Technical Publication: 0180-095-408-EN Rev. 9.1

Canon

CANON MEDICAL SYSTEMS USA, INC.

Disclaimer

The standard warranty is void if the product has been intentionally modified, or damaged by accident, abuse or misuse. Additionally, this warranty is void if untrained personnel service the OMNERA®400T equipment.

Lost profits, downtime, goodwill, damage to or replacement of property, and any costs of repairing the OMNERA®400T resulting from a breach of warranty are not the responsibility of Canon Medical Systems.

Specifications are subject to change without notice. Not responsible for typographical errors.

Notices

Note: Photos and drawings used in this guide may be slightly different from the actual product.

Dispose of electronic equipment in accordance with local, state, and federal regulations.

Trademarks

Reason for change	Rev	Date
New release	6.1	2020-09
Updated Added warning “Risk of electrical hazard or damage to the system” to **2.3 Precautions, Safety** Updated **2.12 Safety functions** Updated **4.24.7.2 Install Positioning Index** UBD-0183_OTC_4_Display is replaced by UBD-0183-OTC_4_DMG_ Display in Electrical drawings Added **10.1.2 X-ray Tube** Added info in **17.1.2.1 Mechanical Installation of OTC** in **17 Appendix C**	7.1	2021–09
The Stitching feature added	8.1	2023–02
Minor updates	9.1	2023–06

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1 Introduction

1.1 Document information

It is important to keep this document for the life of the equipment, and pass the document on to any subsequent holder or user of the equipment.

Training is provided by or via Canon Medical Systems. Training material is the Operation manual and the Installation and service manual.

1.1.1 System Documentation

The following documentation is available for the system:

- OMNERA® 400T Planning guide
- OMNERA® 400T Installation and service manual
- OMNERA® 400T Operator´s manual

1.1.2 Stylistic Conventions

All warning label texts are shown in *italic* style in this manual.

All references are shown in *italic* style in this manual.

1.1.3 Document Producer

This document has been produced by:

Arcoma AB
Annavägen 1
S–352 46 VÄXJÖ,
Sweden

www.arcoma.se

1.1.4 Text Emphasis

WARNING!

All texts labelled with "WARNING" call attention to potential risk to health or life.

CAUTION!

All texts labelled with "CAUTION" contain information about dangerous situations and measures to avoid risk.

Note!

All texts labelled with "NOTE" contain additional information regarding the work step, and is provided for a better understanding or as a warning about unnecessary and avoidable difficulties.

1.2 Identification Labels

The figure shows the location of the identification labels on the equipment.

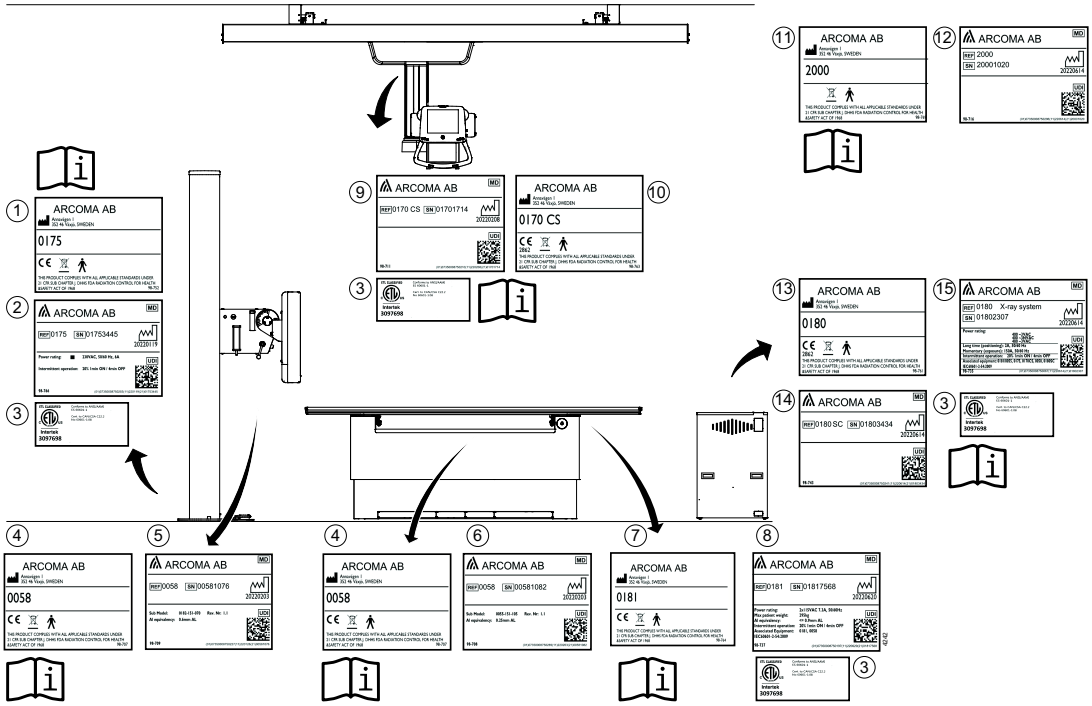

Fig. 1-1

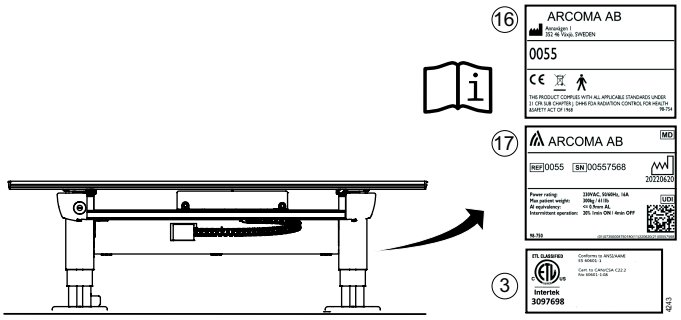

Fig. 1-2

Table 1-1 . Identification Labels

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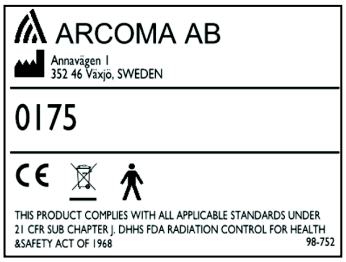
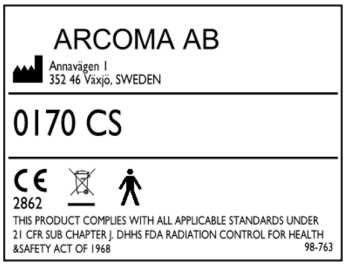
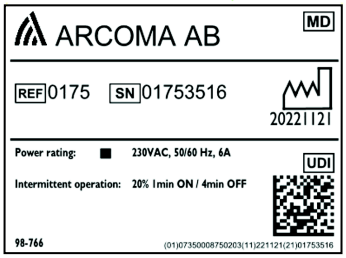
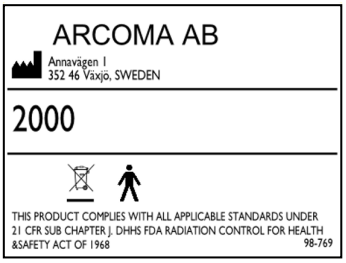
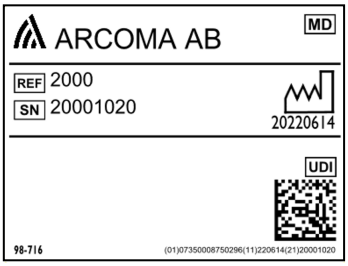
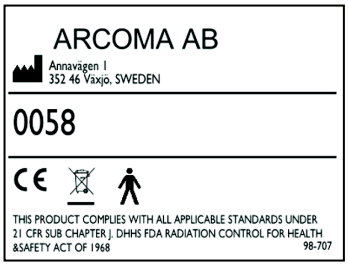
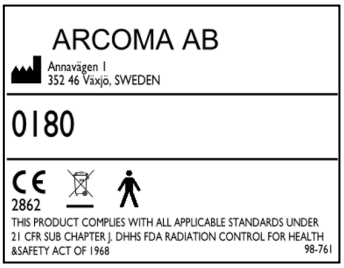
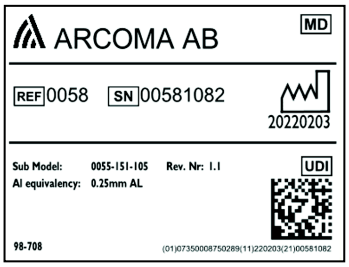
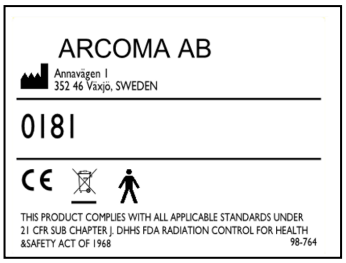
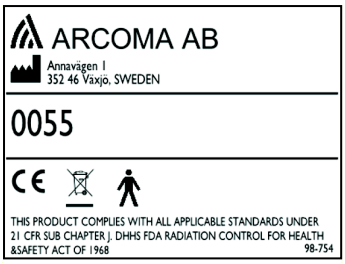
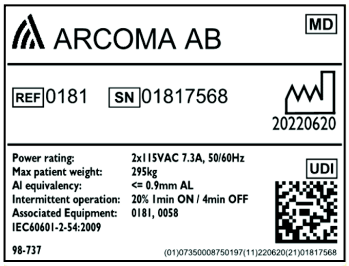
1		10	
2		11	
3		12	
4		13	
5		14	

No	Label	No	Label
6		15	
7		16	
8		17	
9			

1.3 System Description

1.3.1 Intended Use

Stationary X-ray device intended for obtaining radiographic images of various portions of the human body in a clinical environment.

The system is not intended for mammography.

1.3.2 System Overview

The System may be configured in several different versions with a base consisting of an Image system, a cabinet and a ceiling system.

Starting with the base System, there is an option to include a Wallstand and/or a Table. There are two different Table options. **Fig. 1-3** shows the main parts of a System.

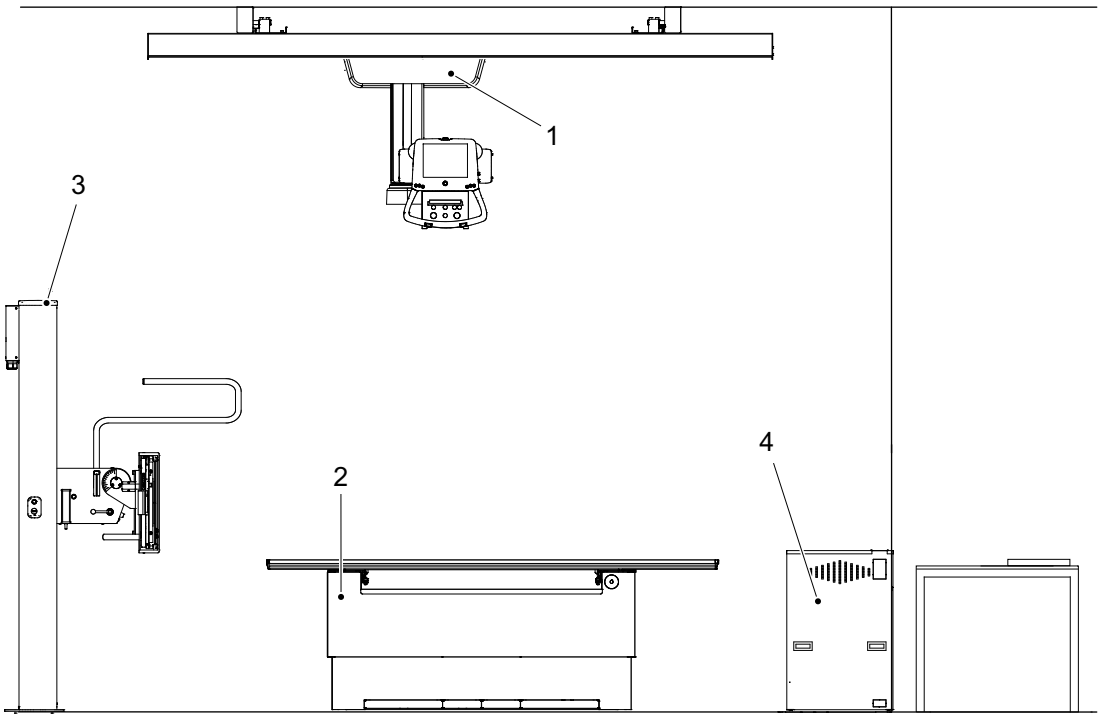


Fig. 1-3 System Overview

1. *Overhead Tube Crane (OTC)*
2. *Table (Closed table 0181 Standard or Two column table 0055 option)*
3. *Wallstand*
4. *Cabinet*

1.3.3 Overhead Tube Crane Overview

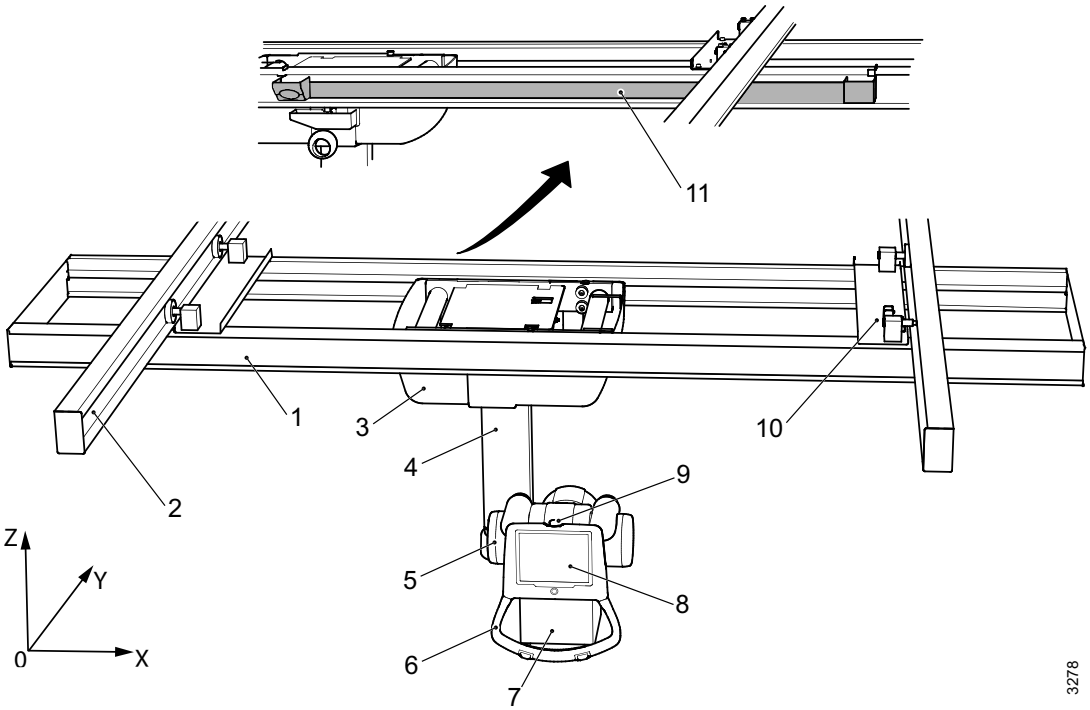


Fig. 1-4 Overview

1. *Traverse rail (X)*
2. *Ceiling rail (Y)*
3. *Ceiling wagon*
4. *Column (Z)*
5. *X-ray tube*
6. *Manoeuvre handle*
7. *Collimator*
8. *Display*
9. *Emergency stop*
10. *Distance plate and brake*
11. *Cable channel*

1.3.4 0181 Closed Table 0181 Overview

The figure shows the main parts of the closed table.

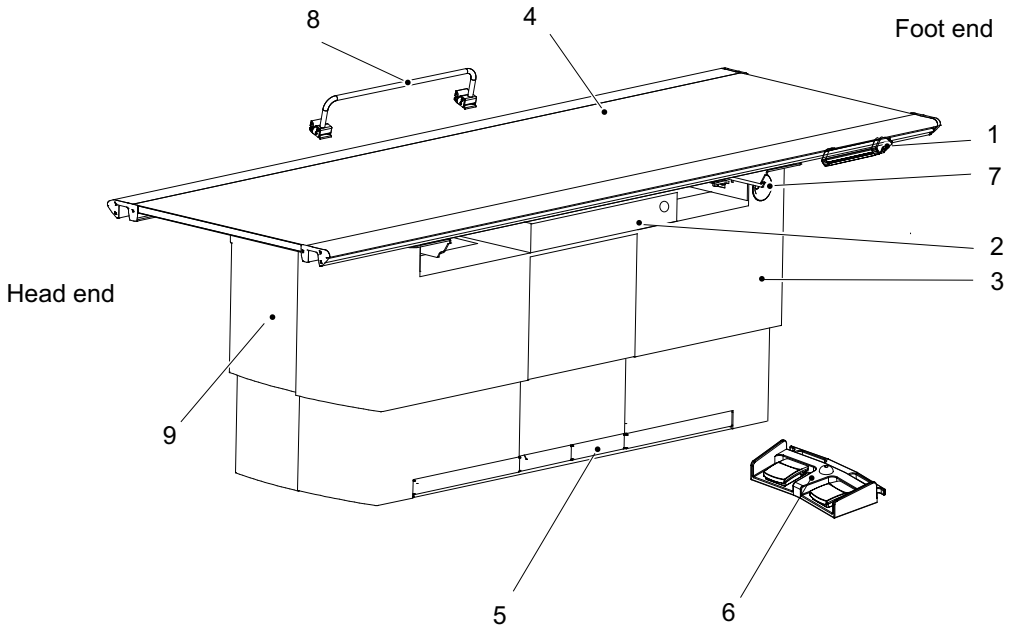


Fig. 1-5 Main parts closed table

1. *Maneuver hand control (optional)*
2. *Image receptor holder*
3. *Vertical lift*
4. *Table top*
5. *Kick box control*
6. *Foot control (optional)*
7. *Emergency stop*
8. *Patient hand grip (optional)*
9. *Cover segments for the vertical lift*

1.3.4.1 Intended Use, Closed Table 0181

The Table is intended for use in a hospital environment during radiographic diagnostic examinations, together with an X-ray tube support and an image receptor holder.

The Table is only intended to be used by trained radiographers, service technicians and product specialists

The main purpose of the Table is to supply the patient with a positioning support during a diagnostic examination and to make it possible to position the detector.

Other use of the closed table may result in potentially hazardous conditions to the operator and/or patient.

1.3.5 0055 Two Column Table 0055 Overview

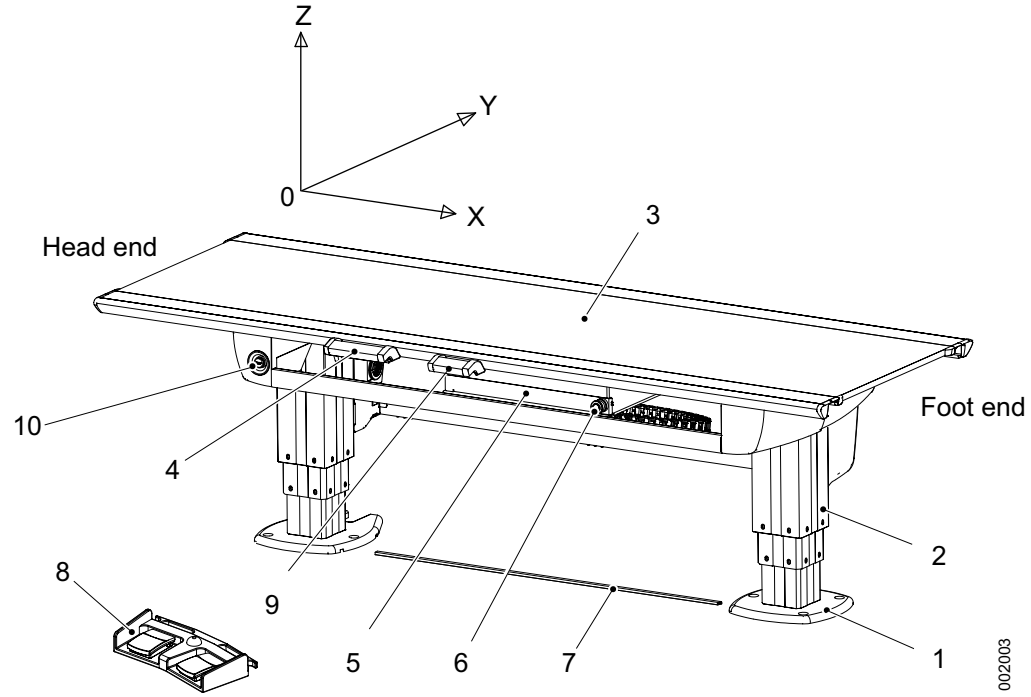


Fig. 1-6 Table overview

1. *Foot plate*
2. *Column*
3. *Table top (X/Y/Z)*
4. *Table hand control (X/Y/Z) Ceiling tube pendulum movement)*
5. *Detector holder*
6. *Brake release button for detector holder*
7. *XY foot control strip type (option)*
8. *Foot control table (X/Y/Z) (option)*
9. *Collimator hand control (option)*
10. *Emergency stop*

1.3.5.1 Intended use, two column table 0055

The two column table is only intended to be used by trained radiographers, service technicians and product specialists.

The two column table is a flexible high performance patient support system that is intended to be used in X-ray systems for radiographic examinations.

The table is intended for use in a hospital environment during radiographic diagnostic examinations together with an X-ray tube support and a detector holder.

The main purpose of the table is to supply the patient with a positioning support during a diagnostic examination and to make it possible to position the detector.

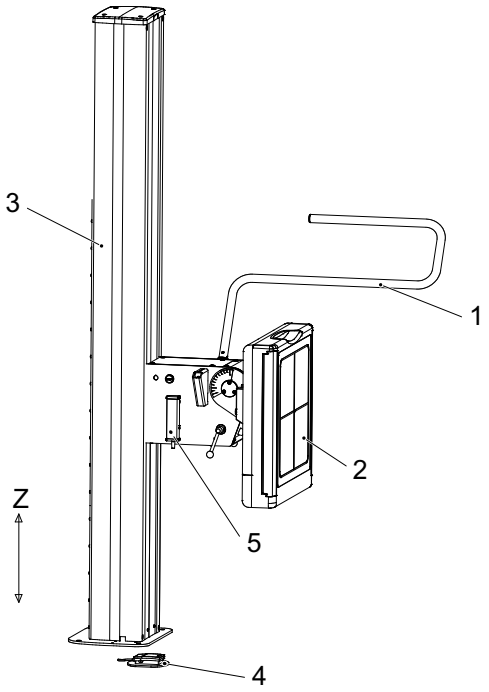
Other use of the two column table may result in potentially hazardous conditions to the operator and/or patient.

The two column table can also be supplemented with external products, such as detectors, detector holders, grids, ion chambers and accessories supplied by Arcoma AB and intended for use with the Table 0055.

The design of the two column table allows a wide range of detectors, of various types and models, to be adapted to the system. The flexibility of the two column table also ensures extensive possibilities for customizing of functions and design.

1.3.6 Wallstand Overview

The figure shows the main parts of the wallstand.



1. Lateral armrest
   (Accessory)
2. Imaging unit
3. Column
4. Standard Foot control (Brake release for manually moving the detector holder up/down)
   Optional Foot control (Motorized movement; Z-movement up and down and brake release)
5. Hand control for collimator control (Option)

Fig. 1-7 Wallstand Overview

1.3.6.1 Models and Designs

The wallstand has different options:

- Tiltable detector holder wagon.
- Motorized Z movement.
- Prepared for different types of detectors; fixed or portable in different sizes.
- The detector/receptor holder for the portable detector is available for either left-hand or right-hand loading.

1.3.6.2 Intended Use, Wallstand

The wallstand is intended for use in a hospital environment during radiographic diagnostic examinations together with an X-ray tube support and a detector. The main purpose of the wallstand is to hold and position the detector.

2 Safety

2.1 Modification of equipment

WARNING!

No modification of this equipment is allowed.

2.2 Compliance

External equipment intended for connection to signal input, signal output or other connectors shall comply with the relevant product standard e.g. IEC 60950–1 for IT equipment and the IEC 60601–series for medical electrical equipment.

In addition, all such combinations – systems – shall comply with the safety requirements stated in the collateral standard IEC 60601–1–1 or the general standard IEC 60601–1, edition 3.1, clause 16. Any equipment not complying with the leakage current requirements in IEC 60601–1 shall be kept outside the patient environment i.e. at least 1.5 m from the patient support.

Any person who connects external equipment to signal input, signal output or other connectors has formed a system and is therefore responsible for the system to comply with the requirements.

If in doubt, contact qualified medical technician or your local representative.

If external equipment is connected, an isolation device is needed to isolate the equipment located outside the patient environment from the equipment located inside the patient environment. In particular such a separation device is required when a network connection is made. The requirements on the separation device is defined in IEC 60601–1–1 and in IEC 60601–1, edition 3.1, clause 16.

This product conforms to DHHS radiation Standards of 21 CFR subpart J as of the date of manufacture.

2.3 Precautions, Safety

WARNING!

Do not use this device if you see smoke or notice unusual odors or noises.

If smoke, unusual odors or noise are being generated, continued use of this product may result in fire. Turn OFF the power source breaker immediately, unplug the device, and contact your nearest service representative. Do not attempt to repair it.

WARNING!

Although the precautions indicated on this device or in this document or device Manuals are provided based on various considerations, unpredictable events may still occur.

While operating this product, pay constant attention to possible hazards in addition to observing the instructions.

WARNING!

The equipment is intended for use in radiographic examinations and under the guidance of trained health care professionals. Operating personnel must be familiar with the equipment and the instructions given in this Manual before using the equipment.

WARNING!

Safety devices must not be removed or modified. Any modification or removal will immediately impair the safety.

WARNING!

All motorized movements shall be supervised by trained personnel.

WARNING!

Risk of electrical hazard or damage to the system.

- ***Before cleaning or disinfection, switch off the system to prevent electric shocks, for exceptions see section 6, 0180-095-418.***
- ***Do not spray or pour cleaning liquid on any part of the system.***
  Use a lint-free cloth moistened with a moderate amount of liquid to avoid that cleaning liquids seep into the openings of the system, e.g., air openings, gaps between covers.
- ***Do not restart the system if cleaning liquids have leaked in.***

CAUTION!

After using the device, return the switches and dials to the original positions using the specified procedures, and turn the power OFF.

CAUTION!

Do not use any flammable or explosive gases near the device.

CAUTION!

Before using this device, read the Manuals supplied with the devices in order to understand functions, operation, and performance. Follow the Manuals for correct procedures.

CAUTION!

Before using the device again after a prolonged discontinuance, check that the equipment operates correctly and safely.

CAUTION!

Be sure to observe the precautions indicated on this device or in this document or device Manuals. Failure to observe them can cause personal injury or damage to this device.

CAUTION!

While using the device, always keep an eye on all devices and patients in order to detect unfavorable conditions.

CAUTION!

The System is provided with air intakes and outlets to prevent the equipment from overheating. Do not block these air intakes and outlets.

CAUTION!

When operating this device, be sure to follow the instructions and procedures described in this document and the device Manuals.

CAUTION!

Always be careful, when handling loose objects so they will not fall down on patient or at the surrounding articles. This may cause injury to the patient or damage at the System.

CAUTION!

When using this device, be sure to observe the installation environment requirements (temperature, humidity, and power rating conditions, or restriction of use near a device generating strong magnetic or electromagnetic waves).

CAUTION!

The installation environment and location, device configuration, network, power supply, and other conditions are optimized for this device. If you want to change any condition, contact your nearest service representative. Otherwise, the functions and performance of this device may be impaired.

CAUTION!

Preferably, no objects shall be positioned within the working area. If this is necessary, they must be removable.

CAUTION!

Do not put liquids, or foreign objects such as pins and clips into the equipment. Otherwise, fires, electric shocks, or malfunctions may result. If any foreign objects have fallen into the equipment, turn OFF the power source breaker immediately and unplug the equipment. Contact your nearest service representative.

Never disassemble the device.

CAUTION!

The display must not be used for diagnostic purposes.

CAUTION!

If cracking or breakage occurs on the display, immediately stop using it. Never use it when the display is damaged.

CAUTION!

If the touch panel is broken, and the liquid inside it is leaked, do not put it into your mouth. If the liquid is put on the part of your body or clothes, immediately wash it off in soapy water.

Note!

The following radio interference standards apply to this equipment: Voluntary Control Council for Information Technology Equipment (VCCI) Class B.

Note!

The following radio interference standards apply to this equipment: Federal Communications Commission (FCC) Part 15 Class B.

2.4 Qualifications of personnel

WARNING!

The equipment is intended for use in radiographic examinations under the guidance of trained health care professionals. Operating personnel must be familiar with the equipment and the instructions given in this manual before using the equipment.

CAUTION!

Federal law restricts this device to be sold by or on the order of a physician. (US market only.)

2.4.1 Operating personnel

Before using the product it is required that the operating personnel is thoroughly familiar with the product and its operating instructions, in particular:

- Safety
- Function and safety check list

Note!

It is the responsibility of the owner to ensure that the product is operated only by trained radiologist, service technicians or product specialists.

2.4.2 Service personnel

The equipment shall be serviced only by qualified personnel who:

- is completely familiar with the system
- has read and understood *Operation Manual* and *Installation and Service Manual*.
- knows how to remove power to the unit in case of an emergency
- is trained in the use of equipment and procedures of this type.

Failure to follow the instructions given in this Manual could result in serious injury to the service person, patient and operator.

Note!

It is the responsibility of the owner to ensure that the technicians have the correct training and knowledge to perform service and maintenance.

2.5 Service and Maintenance

WARNING!

Always turn off the power and lock the main switch before service or maintenance.

WARNING!

No service is allowed while the system is in use with a patient.

Note!

When service or maintenance will be performed, the technician shall lock the equipment from all energy sources.

The equipment must be checked according to the *Function and Safety Checks Instructions* to maintain reliability and serviceability, and to ensure the safety of the patients, the operator and third parties.

If national rules or regulations specify more frequent checks and/or maintenance, such regulations must be observed.

2.6 Installation and Repair

WARNING!

To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

CAUTION!

Only service technicians are allowed to open the covers.

CAUTION!

Do not remove, disassemble, change, modify, repair, or add any part.

CAUTION!

When installing this equipment in a different location, contact the manufacturer or the designated dealer.

Note!

For exchange of the collimator light field lamp, see the Collimator manual.

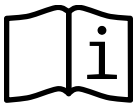
Modifications of, or additions to, the system must be made in accordance with the legal regulations and generally accepted engineering standards.

The manufacturer cannot assume responsibility for the safety features and for the reliability and performance of the equipment, if:

- installation of equipment expansions or modification are not approved by the manufacturer.
- installation of equipment expansions or modification are not carried out by persons authorized by the manufacturer.
- components are not replaced by original spare parts in case of a malfunction.
- the electrical installation of the room concerned does not meet the requirements or the corresponding national regulations.
- the system is not used in accordance with the operating instructions.

2.7 Safety and Warning Symbols

The following symbols are used for the system.

	Attention consult accompanying documents.
	To signify a general warning. This symbol is used in various places throughout the Manual where special precaution shall be observed.
	Type B applied part.
	Protective earth terminal.
	Earth terminal.
N	Connection point for the neutral conductor on permanently installed equipment.
	Squeezing hazard.
	This symbol indicates compliance of the equipment with Directive 93/42/EEC.
	Separate collection for electrical and electronic equipment.
	Manufacturer
	Date of manufacture
	To indicate the emission or the imminent emission of X-radiation.
	Marking on the emergency stop button. Activation of the actuator interrupts all mechanical movements and prohibits exposures.

2.8 Safety and Warning Labels on the Equipment

WARNING!

Table;

Squeezing hazard can occur between the:

- ***Table top and the top of the detector holder***
- ***Detector holder rail and the detector holder***
- ***Vertical lift segments when moving in Z-direction down***

The figures shows the location of the safety and warning labels.

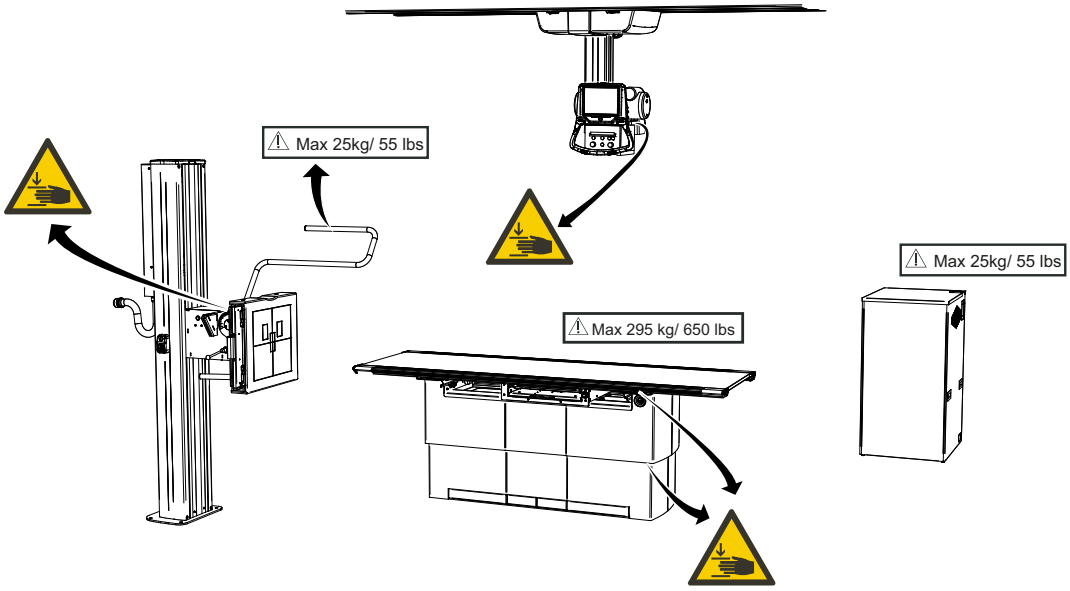


Fig. 2-1 Location of the Safety and Warning labels, with table 0181

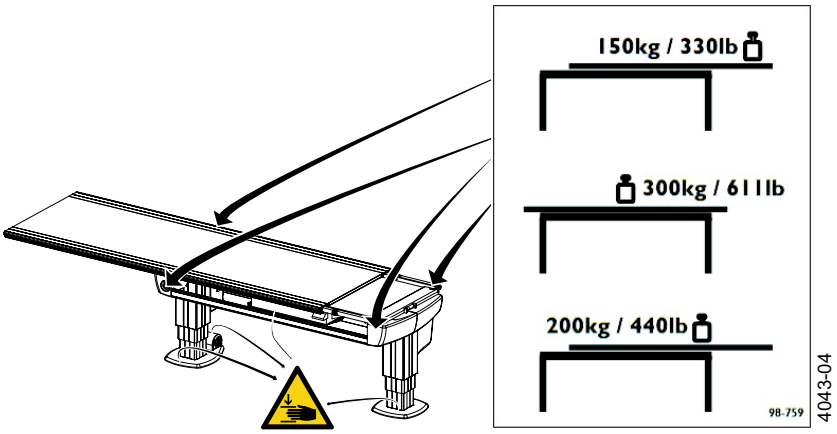


Fig. 2-2 Location of the weight restriction labels and warning labels, table 0055

Possible squeeze hazard areas are indicated in the figures above.

2.9 Emergency Stop

Note!

It is recommended to train the operator regularly in the use of the emergency stop function so the operator feels confident in using it.

The System has five emergency stops; one on the Ceiling suspended X-ray tube support, two on each side of the Table (at the head end), and two on the wallstand.

Pressing one of the emergency stop buttons, immediately cuts the power to all motorized movements. The emergency stop is also connected to the generator. The emergency stop will prevent a new exposure and terminate an ongoing exposure.

To reset the emergency stop position, turn the emergency stop button clockwise. The button is released and the system is ready for use again.

There are additional external emergency stops as option.

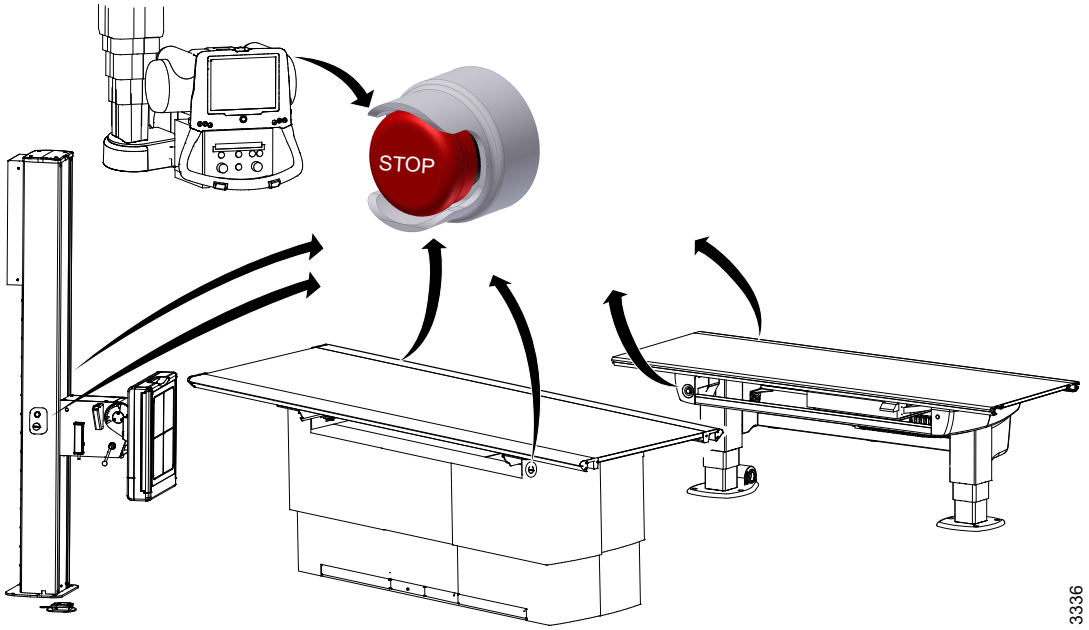


Fig. 2-3 Emergency Stop Positions

2.10 Radiation and X-ray Tube

WARNING!

Make sure that the patients, the operators and third parties are protected against unnecessary X-ray radiation according to the local regulations.

WARNING!

The surfaces on the Collimator and the X-ray tube can be warm. The collimator temperature will not reach 60 degrees Celsius, but the X-ray tube may be up to 85 degrees Celsius.

WARNING!

Verify that correct filter is used during exposure.

WARNING!

Make sure that the SID shown in the display corresponds to that shown on the collimator.

Note!

Audio and visual communication must be possible between the operator and the patient when exposure is performed.

Note!

The X-ray beam must never be outside the boundaries of the detector holder.

2.11 Mechanical Safety

WARNING!

Tracking is only allowed under supervision of personnel.

WARNING!

Squeezing hazard can occur between column segments and beta rotational assembly interface.

WARNING!

Squeezing hazard can occur between the column and the plastic corner around the alpha movement.

WARNING!

Squeezing hazard can occur between support arm and high tension cable inlet to the tube.

WARNING!

All obstacles placed within the working area, must be moveable for easy patient release. This is necessary due to the squeezing hazard.

Note!

Surrounding equipment are not subject of the collision warning.

2.11.1 General

It is the operator's duty to ensure that any danger to the patient and/or third person is prevented, before movements are released.

2.11.2 OTC, Mechanical Safety

WARNING!

Make sure that the personnel who are trained in the use of the equipment are beside the patient for support, to avoid any potential risk of injury when handling the OTC, for example squeezing between the Wallstand/Table.

WARNING!

All motorized movements shall be supervised by trained personnel.

CAUTION!

The IR sensor underneath the Ceiling stand is exclusively intended for Table protection. It is not intended for patient protection.

Possible squeezing hazard areas are indicated in **Fig. 2-4**.

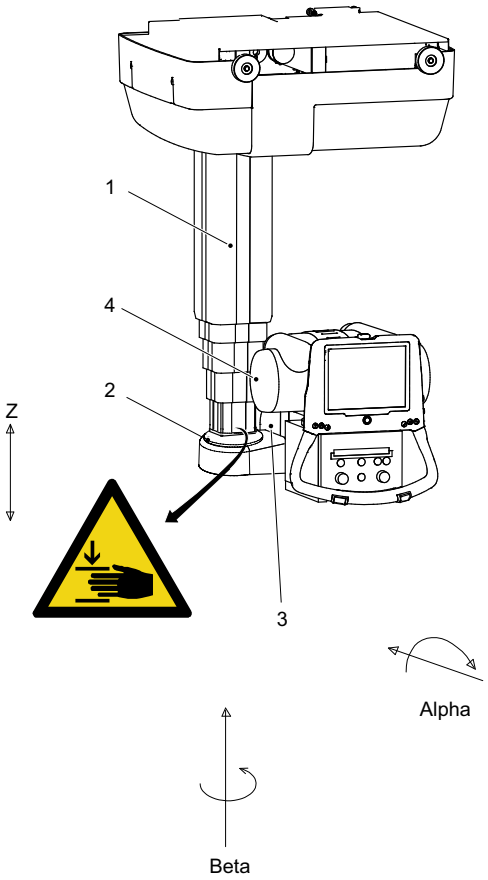


Fig. 2-4 Mechanical Safety

1. *Column (Z)*
2. *Column bottom plate*
3. *Cover*
4. *X-ray tube*

Squeezing hazard can occur between the:

- column (1) and the column bottom plate (2) when the column is moving upward (Z-direction).
- cover (3) and the column (1) when the X-ray tube (4) is moving in beta direction.

2.11.3 Mechanical Safety, Table

2.11.3.1 Safety Issues when Placing the Patient, Table

WARNING!

The hospital bed shall be placed in direct contact and in the same height as the Table, to avoid any potential risk of injury during transfer of the patient.

WARNING!

Due to squeezing hazards, the patient shall always have their extremities placed over the table top.

WARNING!

Be aware of unwanted motion when releasing the brakes.

WARNING!

To avoid any potential risk of injury when handling the product. Make sure that personnel trained in the use of the equipment, is at the side of the patient for support.

WARNING!

If a fully extended table top is subject to extreme forces laterally, there is a risk for damage to the floor attachment. Contact the Manufacturer for further information about the attachments.

Note!

Do not lean against the table top when the table top is floating.

WARNING!

Squeezing hazard can occur between the:

- ***table top and the top of the detector holder***
- ***table top and the detector holder rail***
- ***detector holder rail and the detector holder***
- ***detector holder and the cover***
- ***vertical lift segments when moving down in Z-direction (closed table)***
- ***columns and the footplate (two column table)***
- ***cover and the column foot cover***
- ***detector holder and vertical lift segment***

Possible squeezing hazard areas and placement of warning labels:

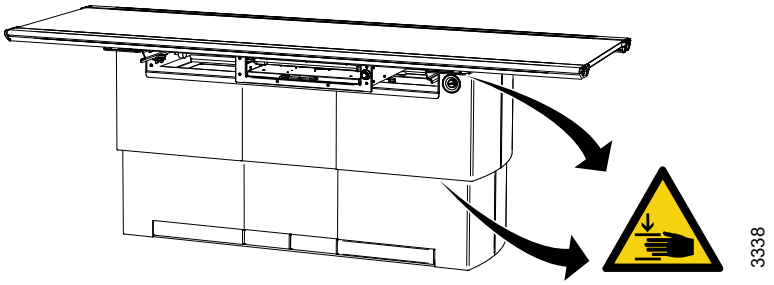


Fig. 2-5 Closed table 0181

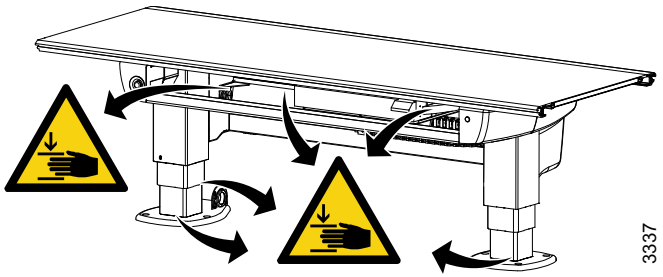


Fig. 2-6 Two column table 0055

When transferring the patient from the hospital bed to the X-ray Table, the table top has to be locked and centered over the Table. To avoid any potential risk of injury during transfer of the patient the hospital bed shall always be placed in direct contact and in the same height as the X-ray Table.

To reduce the lateral forces on the Table the operator shall be placed on the opposite longitudinal side of the patient and the hospital bed. The operator shall then drag the mattress with the patient from the hospital bed to the x-ray Table.

Note!

Wheelchair patients shall always be placed outside the working area, when operating any motorized movement.

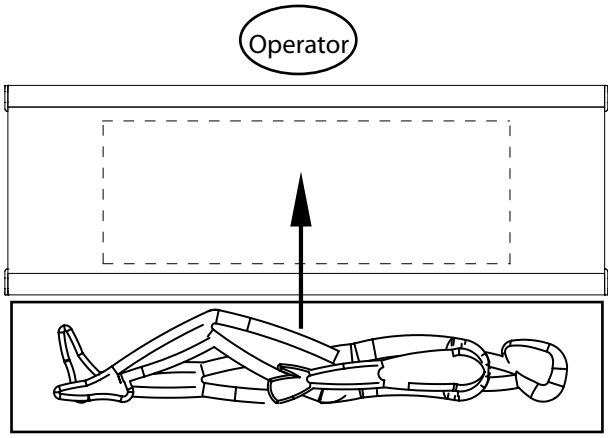


Fig. 2-7 Transferring patient to Table

The figure shows the placement of the table top, the operator and the patient when transferring the patient to the X-ray Table.

When transferring the patient back to the hospital bed, the operator shall be placed in the opposite place near the hospital bed.

2.11.3.2 Weight Restrictions Table 0181

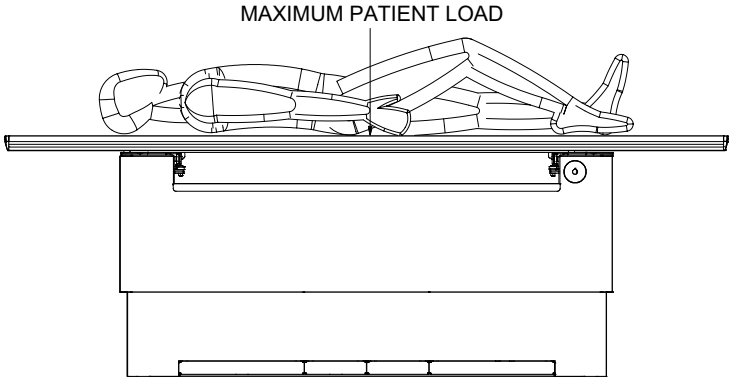


Fig. 2-8 Maximum patient load, patient centered

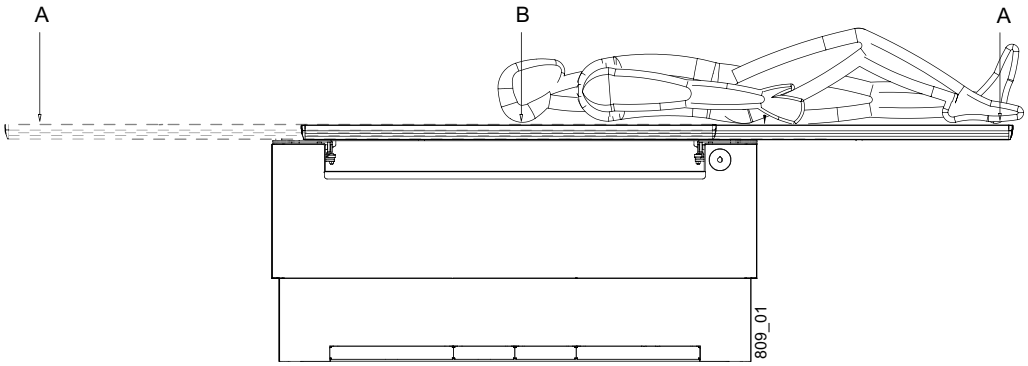


Fig. 2-9 Maximum patient load, position A – B

Table 2-1

Pos.	**Model 0181–1**
A	200 kg / 440 lb
B	295 kg / 650 lb

2.11.3.3 Weight Restrictions Table 0055

The following figures show the maximum load at different positions of the table.

When the table top is centered over the table frame, the maximum load of a patient either lying or sitting is 300 kg/, 611 lb, see **Fig. 2-10**

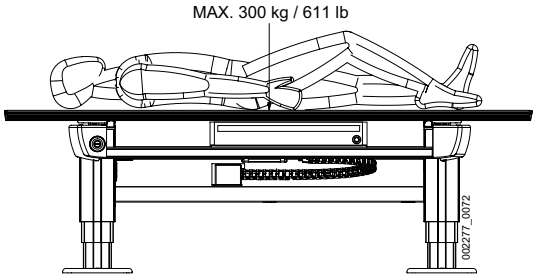


Fig. 2-10 Maximum patient load, patient centered

When the table top is positioned outside the table frame, the maximum load of at patient lying on the table top is 200 kg/ 440 lb and the maximum load of at patient sitting on the table top is 150 kg / 330 lb.

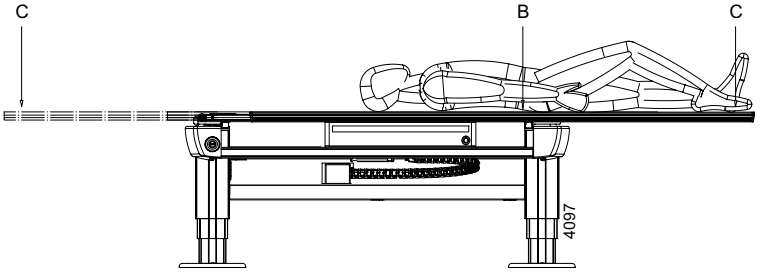


Fig. 2-11 Maximum patient load position B – C

Table 2-2

Pos.	**Model 0055**
B	200 kg / 440 lb
C	150 kg / 330 lb

The table frame is marked on the upper side with the maximum weight when positioning in outer positions, see **Fig. 2-12**

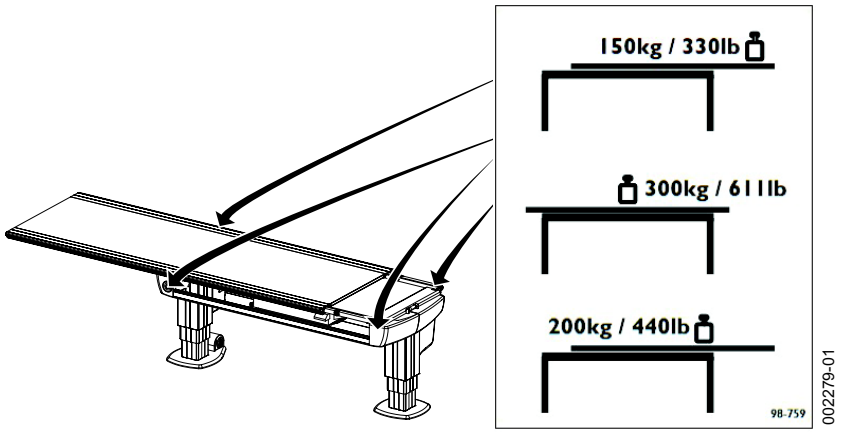


Fig. 2-12

2.11.3.4 Working Area, Table 0181

WARNING!

Due to squeezing hazard, when operating any motorized movement — when not placed on the Table — patients shall always be outside the working area.

WARNING!

All obstacles placed within the working area, must be moveable for easy patient release. This is necessary due to the squeezing hazard.

CAUTION!

To avoid any injuries to patient, user or System, peripherals should always be placed outside the working area.

The working area is the size of the table top including the stroke length of the table top in the X- and Y-direction. The measurements in the figure show the length of stroke in the X- and Y-direction. The dimensions have some tolerances and can differ from the Manufacturer.

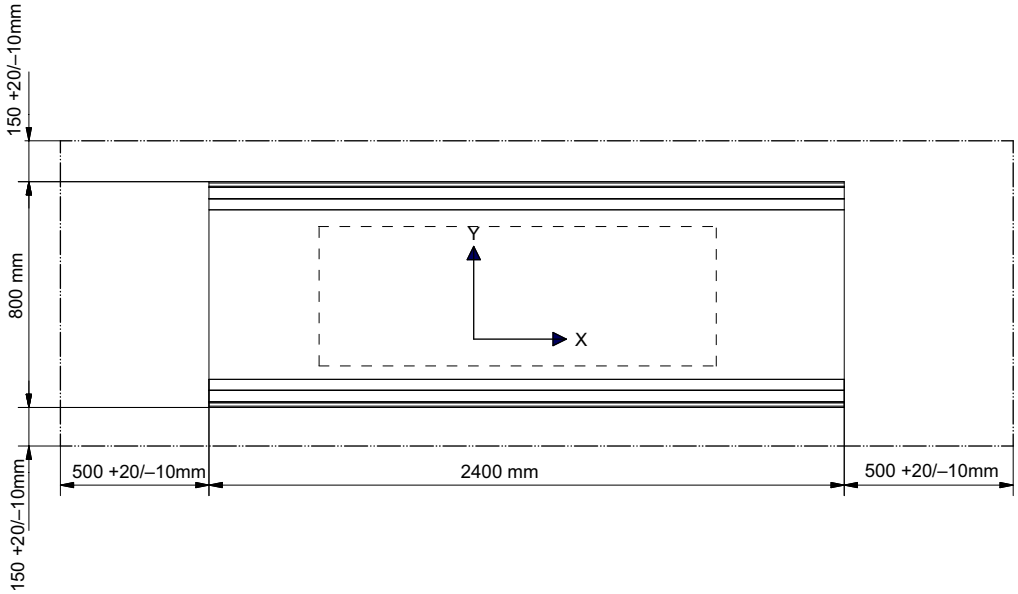


Fig. 2-13 Stroke length

The figure below shows the dimension underneath the Table

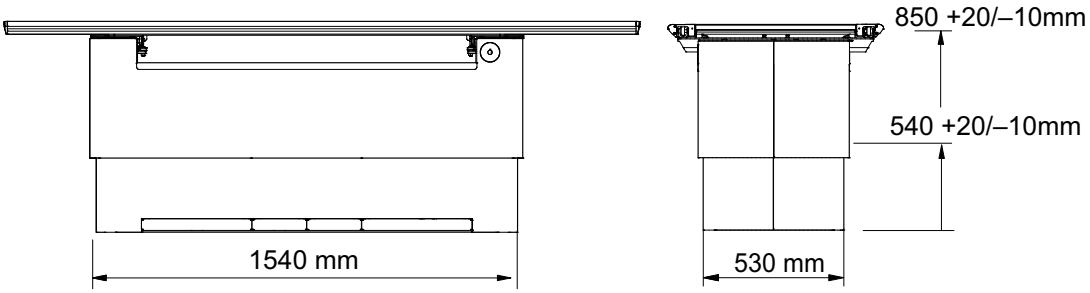


Fig. 2-14 Dimensions underneath the Table

Area for the Detector holder

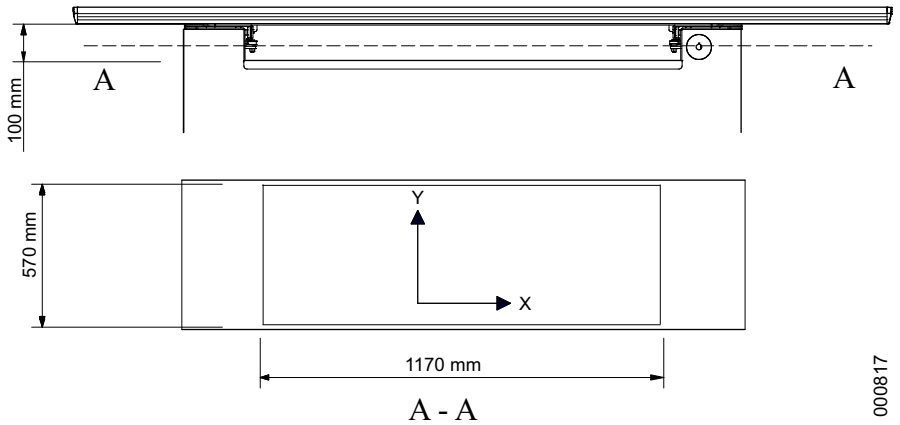


Fig. 2-15 Dimensions

2.11.4 Working area, Table 0055

WARNING!

Due to squeezing hazard, when operating any motorized movement — when not placed on the table — patients shall always be outside the working area.

The working area is the size of the table top, including the length of stroke of the table top in the X- and Y-direction.

The measurements in **Fig. 2-16** show the length of the stroke in the X- and Y-direction.

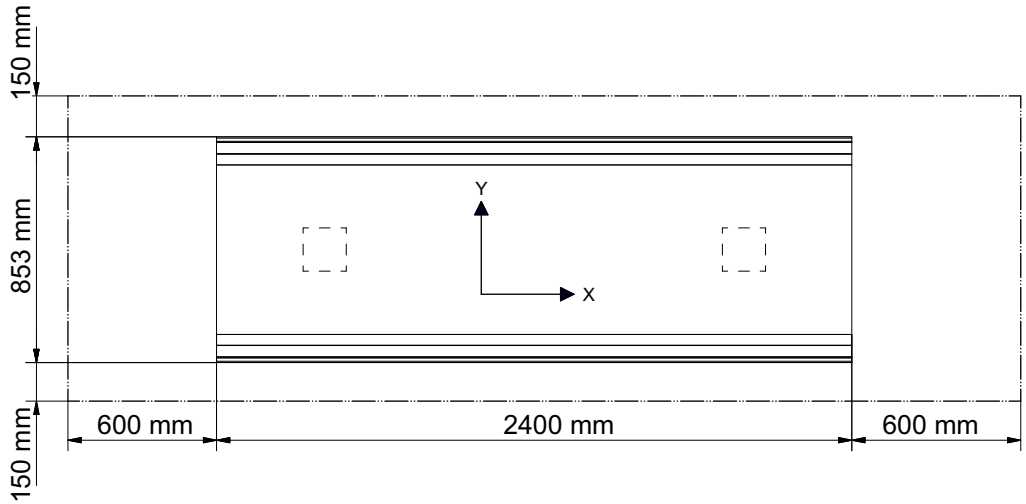


Fig. 2-16

The **Fig. 2-17**shows the dimensions underneath the table

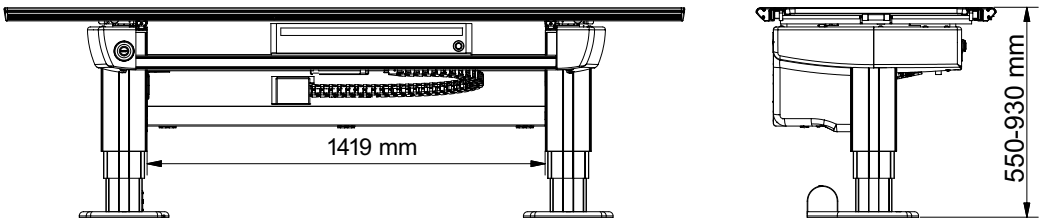


Fig. 2-17

2.11.5 Mechanical Safety, Wallstand

Note!

*The patient or operator is allowed to lean against the Wallstand patient handle or armrest, but **not** to put any weight on it.*

2.11.5.1 General

It is the operator's duty to ensure that any danger to the patient and/or third person is prevented, before movements are released.

2.11.5.2 Standard Version

Possible squeeze hazard areas are indicated in figure. Getting stuck in the imaging unit slide opening (1) causes squeezing hazard if the imaging unit is moving downward (Z-direction).

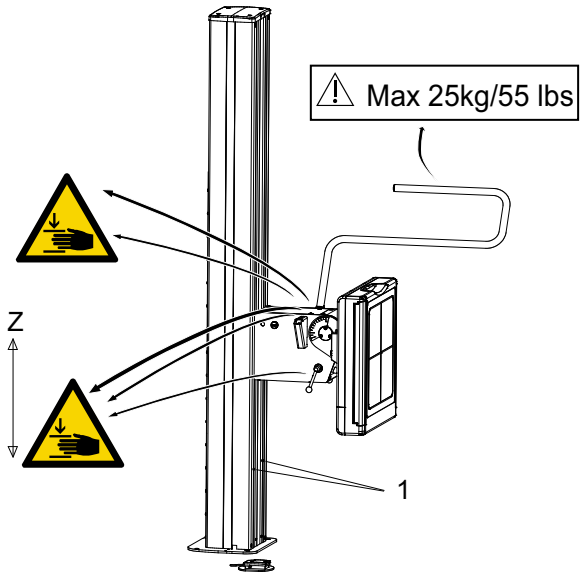


Fig. 2-18 Possible squeeze hazards

1. *Slide opening of the imaging unit*

2.11.5.3 Motorized Wallstand

CAUTION!

It is not allowed to have the patient sitting or standing in the wallstand surroundings, when the motorized movement is operated.

2.12 Safety functions

2.12.1 System

2.12.1.1 Opposite Buttons Pressed

If, at any time, two from each other opposite buttons are pressed, for example movements up and down, the movement is stopped. Both buttons must be released before any movement is allowed.

2.12.1.2 Dead Man's Grip

All movements require constant activation of the chosen button.

If the operator releases one of the buttons/controls, the system will immediately stop or engage the brakes (manual movements). The exposure operator console has the same functionality.

2.12.1.3 Watchdog

One important issue for the safety in the system is the node error handling e.g. transmission error, software error or irregular behaviour of a node. The system is built to prevent an uncontrolled movement.

2.12.1.4 Two Column Table (Option)

Table Top Guard (option)

The table has a collision detection system that protects the table. It activates if a collision is detected and all movement is stopped.

2.12.1.5 Closed table

Vertical travel (Z-movement) safety

The table has a vertical travel safety system to protect the table top. When the table top collide with something, the Z-movement will stop. You will have to push a button (kick box control/manoeuvre hand control/foot control) in either direction to be able to move the table again.

When a collision in Z-direction is detected, the stand has to be moved in the opposite direction before it can be moved in the original direction again.

Indication of power to the table

The device is powered when the green indicator light (A) on the table frame is lit.

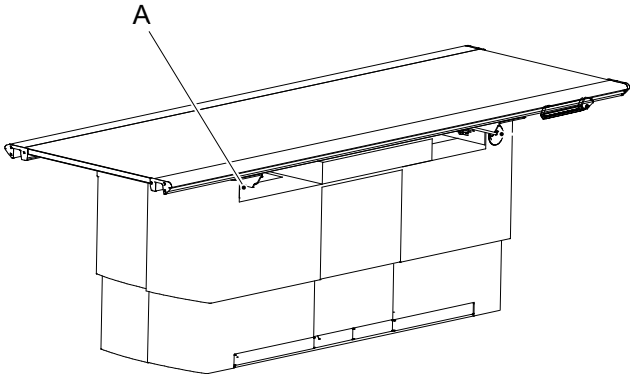


Fig. 2-19

2.12.1.6 Wallstand

The product is balanced with counterweights and whenever any item is removed from the wallstand it becomes unbalanced. If the brake is released when the wallstand is unbalanced, the detector holder moves and can cause injury.

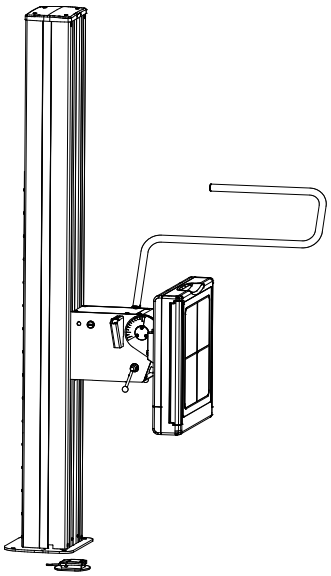


Fig. 2-20 Wallstand

WARNING!

Be aware of unwanted motion when releasing the brakes.

Manual Wallstand

The wallstand is strictly manually controlled. All movements are balanced which means that very little force needs to be applied. To move the system up or down, the brake has to be released, by pressing constantly and pushing the detector holder manually up or down.

Motorised Wallstand

Collision Detection

Every motorized movement has a collision detection. All movements are stopped when the collision detection is activated and the display shows an error message.

2.13 Safety Zone, Definition

At installation, a safety zone is defined.

The intention of the safety zone is to prevent collision with the patient, during automatic movements (tracking) downward. When the lowest part of the OTC is above the safety zone automatic movements is allowed. When it is inside the safety zone, automatic movements is not allowed.

The safety zone (1) does not affect the function of the manual movement (no tracking) or the automatic movement (tracking) upward.

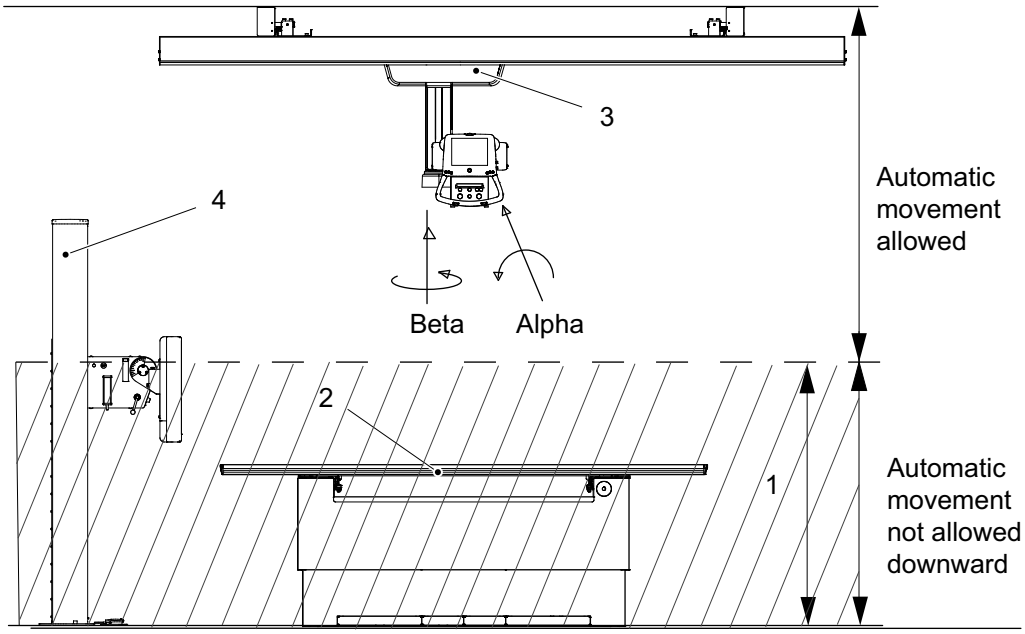


Fig. 2-21 Safety zone

1. *Safety zone*
2. *Table*
3. *Ceiling stand*
4. *Wallstand*

2.13.1 Safety Zone, Table

2.13.1.1 Table 0181

The automatic movement downward (tracking) is not possible in safety zone (1)

The safety zone (1) does not affect the function of the automatic movement upward (tracking).

2.13.1.2 Table 0055 (option)

There is a squeezing risk when driving the table to a low position.

Within the safety zone the table moves at a low speed, to increase the possibility for the user to react in case of a collision (squeezing). The safety zone appear 120 mm above the floor, according to IEC 60601-1. The safety zone automatically stops the two column table, 120 mm above the floor. The user must then activate the foot control again to make the table move further down.

2.13.2 Safety Zone, Wallstand

When the alpha angle is outside the range of +45 degrees to –45 degrees, the automatic movement downward (tracking) is possible in safety zone (1).

The safety zone (1) does not affect the function of the automatic movement upward (tracking).

2.14 Electromagnetic Compatibility (EMC)

The System complies with the requirements of IEC 60601-1-2:2007 regarding electromagnetic compatibility. Surrounding equipment shall follow the standard IEC 60601-1-2:2007.

CAUTION!

Do not place this device near MRI equipment or other equipment that generates a strong magnetic field.

CAUTION!

Mobile telephones and other radiating equipment can interfere with the function of the System and can therefore cause safety hazards.

Guidance and manufacturer's declaration - electromagnetic emissions		
The System is intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 1	The System uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The System is suitable for use in all establishments, other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purpose. For information purpose the System complies with IEC61000-3-11 and is suitable for connection to public mains network if the impedance is 0.32 Ohm or lower
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations/ Flicker emissions IEC 61000-3-3	Not applicable	

Guidance and manufacturer's declaration - electromagnetic immunity			
The System is intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharger (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.

Guidance and manufacturer's declaration - electromagnetic immunity			
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines + 1 kV for input/ output lines	± 2 kV for power supply lines n/a. for input/ output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines. IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	<5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the System requires continued operation during power mains interruptions, it is recommended that the System should be powered from an uninterrupted power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Note!

U_T is the AC mains voltage prior to application of the test level.

Guidance and manufacturer's declaration - electromagnetic immunity			
The System is intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the System, including cables, than the recommended separation distance, calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance;
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms 150 kHz to 80 MHz	$d = 1.2 \sqrt{p}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m 80 MHz to 2.5 GHz	$d = 1.2 \sqrt{p}$ 80 MHz to 800 MHz $d = 2.3 \sqrt{p}$ 800 MHz to 2.5 GHz where *p* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be range. [b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the System is used exceeds the applicable RF compliance level above, the System should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as relocating the System. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 10 V/m.			

Recommended separation distances between portable and mobile RF communications equipment and System

The System is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the System can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the System as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter**		
	150 kHz to 80 MHz $d = 1.17 \sqrt{p}$	80 MHz to 800 MHz $d = 0.35 \sqrt{p}$	800 MHz to 2.5 GHz $d = 0.7 \sqrt{p}$
0.01	0.12	0.04	0.07
0.1	0.37	0.11	0.22
1	1.17	0.35	0.7
10	3.69	1.11	2.21
100	11.67	3.5	7

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where *p* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption as reflection from structures, objects and people.

3 Theory of Operation

3.1 System Description

3.1.1 General

The System consists of a system cabinet and a Ceiling suspended unit (with an X-ray tube and a collimator).

The System can be integrated with the following components:

- a Wallstand with an Image receptor
- a Table with an Image receptor
- a Wallstand and a Table with an Image receptor.

3.2 Safety

The Z-movement in the Ceiling suspended unit is strictly motorized and has a suspended mass of approximately 50 kg, depending on tube/collimator configuration. These two factors together generates a potential risk of injury on patients and operators, as well as a potential risk of damaging the System and/or its environment.

The System design minimizes this risk with a number of measures. The strongest of these measures is that the System is hardware supervised which removes the risk of unauthorized/ uncontrolled movements. This hardware supervision is realized via a hardware circuit that must be closed in order to allow downward movement below a specified height.

All movements, including the Z-movement, are considered to be safe above a certain height and as long as movement is performed outside the patient area. This later statement allows automatic movement below the safety height in some cases, such as tracking against a Wallstand. Although the ceiling height may differ between 2500 and 3000 mm, the height is calculated to give a safety zone above the table top of minimum 300 mm.

Additional safety measures, in form of electrical switches on the Alpha movement, is included in the System, to secure that the System is in position for enabling tracking below the safety height. The System allows tracking below the safety height, if Alpha is positioned outside the range of +45° to -45°, although it requires an activation of the tracking function toward the Wallstand.

The activation of an automatic movement, i.e. a tracking movement, is performed by activating control buttons with a double switch feature. One switch is connected in series with the emergency stop circuit and the other switch is for enabling the tracking function. The switch connected to the emergency stop circuit is used as a safety measure (DMG, Dead Man Grip) with a delayed activation function. The delay is necessary in order to maintain a controlled retardation of the movement when the control button is released. The time frame for the delay is set to < 1 sec. giving a maximum movement of 150 mm on release of the control button. Note that this switch shall be used as a measure in case of a single fault in the function switch and not as a "quick-stop" function.

Above all internal safety measures, the System includes a number of emergency stops that are connected in the same circuit (see Electrical design, Emergency stop circuit).

3.3 Electrical Design

3.3.1 General

3.3.1.1 System Power Supply

The entire System, except for the Image system PC, is powered from the System power supply, placed in the cabinet. The System is designed for the following power inputs:

- 480V 3 ~
- 400V 3 ~
- 400V 3N ~

The System power supply design allows the main part of the System to be powered when the generator ON button is pressed. Consequently it is also switched off when the generator OFF button is pressed. The power to the image system, i.e. the DR sensors, is however always powered

3.3.1.2 Interface and System Logic

The internal System interface has a gathered connection point in the System cabinet. Most of the internal interfaces are collected into one interface board.

The interface toward the image system is handled through a separate board. This board acts as a master in the System and communicates with the image system via Ethernet bus, and with the X-ray system via CAN bus.

3.3.1.3 Exposure Control

The generator has a set of input and outputs, used to validate the conditions for exposure.

These I/Os are validated in different states of the exposure sequence. The behaviour of the System, i.e. the exposure control sequence, is set during installation/production. The System supports the following control signals:

- *Door interlock (input)*

  The *Door interlock* input is designed to inhibit exposure and terminate an on-going exposure. This signal is normally used as signal to determine if the door to the examination room is closed. The exposure is inhibited if the circuit is open.
- *EM-Interlock (input)*

  The *EM-interlock* input is designed to inhibit a new exposure if the emergency stop circuit is open, i.e. an emergency stop has been activated. An activation of the emergency stop during exposure, does not terminate the exposure but requires that the emergency stop circuit is closed before enabling a new exposure.
- *System Interlock*

  The System Interlock signals (Table, Wallstand) are used to inhibit exposure if the Ceiling suspended unit is not in position.
- *X-ray light (output)*

  The *X-ray light* output is designed to be used for exposure indication. The output is activated during exposure.

3.3.1.4 Emergency Stop Circuit

The emergency stop circuit is an independent circuit which means that by activating an emergency stop, the power to the motors cuts unconditionally and inhibits exposure.

By opening the emergency stop circuit, the power to the motor is switched off and the exposure control circuit is opened, which will inhibit exposure. The logic power to the System control boards is however independent of the emergency stop circuit and is therefore always live. Note that activation of the emergency stop does not stop an on going exposure, just inhibits a new exposure.

3.3.2 Electrical Design, Ceiling Suspended Unit

The electronics of the column, consist of a motor (AC) with a frequency converter, motor brake, electrical end stops, safety switches for detection of chain failure and position sensor (absolute encoder).

The motor is powered by the frequency converter which is controlled from the Z/Master control board. The control board also controls the motor brake (electric). The brake is released during movement and engaged at stand still. The brake is also activated by the emergency stop, securing that the column is brought to a complete stop.

The positioning of the column is supervised using an absolute encoder and electrical end stop switches. The encoder is connected to the Z/Master board which, as mentioned above, is controlling the motor and the motor brake. The end stop switches are wired directly to the control signals of the frequency converter and when activated they are inhibiting a movement to be initiated. The design of this circuit allows movement in the opposite direction, e.g. if the high end stop is activated, only a downward movement is possible.

The motor drives the column with the use of two parallel chains to secure the suspension from a single fault (one broken chain). A broken chain is detected via electrical switches that are connected to the emergency stop circuit. On detection, the emergency stop circuit is opened, inhibiting movement until the chain is replaced.

3.3.2.1 The Electrical Brakes for the X and Y Movements

The electrical brakes for the X and Y movements are controlled via relays on the CIB-board (placed in the Ceiling wagon). The Relays are in their turn controlled by the Z/Master board. The Z/Master board communicates with the display board that supervises the handle bar control buttons (release X, release X/Y, release Y). The brakes are powered with 24V which means that the brakes can always be released as long as the System has logic power (emergency stop circuit does not inhibit the brake release function).

The X and Y movement can also be supplied with electrical index switches (option). The function of the index switches is to inhibit exposure if the Ceiling suspended unit is not placed at the specified position.

Alpha, Beta

The electrical brakes for the Alpha and Beta movement are controlled via relays on the SBB-board (placed behind the X-ray tube). The Relays are in turn controlled by the display board that supervises the handle bar control buttons. The brakes are powered with 24V which means that the brakes can always be released as long as the System has logic power (emergency stop circuit does not inhibit the brake release function).

The alpha rotation also includes a switch that is used for enabling and disabling tracking below the System safety height limit. The switch needs to be activated in order to enable tracking against a Wallstand (Alpha angle $\geq$45°).

3.3.3 Electrical Design Table 0181

The Table is powered from the system cabinet. The Table has its own power supply, generating the internal 24 V power.

The Table control board “TCB” is the main hub in the system, all internal electrical components connects to the board.

The only motorized movement is the vertical movement (Z). The vertical movement is controlled via a kick list (foot pedal) or a hand control. The controls have separate controls for each direction (up/down).

3.3.3.1 Vertical Lift

The electronic parts of the lift consists of a frequency inverter, motor (AC), electrical end stops, low speed switches and a safety switch.

The movement starts when the frequency inverter receives a signal from the foot switch/ handlebar which starts the motor. In case of hardware failure the safety switch will stop the movement downward and the movement upward will be stopped by a mechanical end stop.

3.3.3.2 Table Top Brakes

When activating the brake release control, a relay on the TCB board activates the brake magnets. The magnets affect the friction coated metal plates and the unit is released.

3.3.4 Electrical Design Two column table (option)

The table has its own power supply, generating the internal 36 V power and the 24 V logic power.

The main power (230 V) to the table as well as the detector holder control signals are routed via the system cabinet. The table mains is controlled in the same manor as the OTC, e.g. the On/Off- function is controlled via the generator On/Off- function.

The table control board controls all functions of the table besides the detector release function and the emergency stops which are controlled by the user directly. All signals, except the emergency stop circuit, pass through the control board where they are validated. If the requested operation is cleared by the control board, the operation is carried out.

The control board controls a trig relay which is connected to a relay that is used for switching on and off the power to the drivers (36 V). The trig relay will react in case of signal loss from the control board, i.e. if the control board is malfunctioning.

Note!

The emergency stop does not affect the logic power (24 V), hence the control board will be powered at all times.

The only motorized movement is the vertical movement (Z).

The vertical movement is controlled via a hand control (standard control unit) and/or a foot control unit. The controls has separate controls for each direction (up/down). Each control has two switches that are supervised by the table control board. The control board controls to the two drive units (that in turn controls the power to the motors. The movement is continuously controlled by the master node via the position sensors that are placed within each column.

3.3.4.1 Electronic Parts

The components included in the table are mainly dependent on the configuration of the columns (motorized vertical movement, motorized detector movement or fixed table height).

The main components (including motorized vertical movement) are:

- A power supply
- A control board (CB)
- Two drivers
- Controls (foot control for the vertical movement and the table top brakes and a switch for controlling the brake for the detector holder).
- A tilt sensor
- A power relay (36 V)
- A trig relay (time relay), used as watchdog, timer triggered.
- Emergency stops (2 pcs.)
- Electrically controlled brakes for the table top and the detector holder.
- Sensor for the table height (potentiometer).
- Electrical options available for two column table (including motorized vertical movement) are:
- An output (relay) that will be activated when the table top brakes are released.
- Table top crash guard (stops the vertical movement if a collision is detected).
- External emergency stop input
- Controls (table top brakes only)

3.3.4.2 Columns

The electronics of the columns consists of a motor (DC), motor brake, electrical end stops and position sensor (potentiometer).

The movement is started when the motor receives power from the driver and the control board releases the motor brake. The sensor feeds the position back to the control board. In one of the two columns an additional sensor is added. The extra sensor is used as a position input to the system and is isolated from table internal electronics. In case of hardware failure or an incorrect calibration the movement is stopped when one of the electrical end stops is activated. The end stops activates a hardware input on the driver which automatically inhibits the movement in the current direction (movement stopped).

3.3.4.3 Brakes

The table top brakes are controlled via an output of the control board. The detector brake is connected via a relay on the 24 V logic power. This means that the brakes can always be released as long as the table is powered (24 V logic power). On activation of a brake release control, the control board activates a relay that in its turn activates (power is activated) the brake magnets. The magnets affect the friction-coated metal plates and the unit is released.

The brakes include a solenoid and two friction-coated metal plates. The solenoid releases the brake, two metal plates away from the table top U-bar. When the solenoid has pulled the two metal plates, a micro-switch deactivates the larger coil of the solenoid which reduces the current used. When the brake is deactivated (engaged), the power to the smaller coil is cut and a spring pulls a gear mechanism, which pushes the metal plates toward the U-bar. This means that the brake is normally engaged and is not dependent on power to stay engaged.

The detector brake consists of a simple magnet that is activated when the powered (24 V). When powered the magnet becomes magnetized and reacts against a metal plate inserted in the table frame.

3.3.4.4 Table Top Output (option)

The system is able to deliver an output that is activated when the table top brakes are released. The CB activates a relay when the brake output is activated. The output is intended to be used for activating a collimator lamp but may be used for other purposes defined by the user.

3.3.4.5 Tilt Sensor

A sensor that detects the angle (tilt angle) of the table is used for protecting the system.

The tilt sensor delivers an analogue signal to the control board. The control board deciphers the signal and if the tilt angle is outside the specified range the control board activates an output that in turn activates a relay. The activation of the relay affects the hardware inputs on the drivers and the movement in the current direction is inhibited (movement stopped). To secure a quick and effective stop the motors for the vertical movement is short circuit.

3.3.4.6 Table Top Crash Guard (option)

The table top crash guard shall only be primarily used as a safety precaution for the system but will of course limit the risk of personal injury as well, although the function does not guarantee the accuracy needed for usage as a patient protection.

To be able to detect a collision, four sensors are placed between the table frame and the columns. The sensor produces an analogue signal that goes to an input on the guard board. The guard board amplifies the signal and check if the value is within the specified range. If the signal is not within range the guard board activates an output which in turn activates a relay. The activation of the relay affects the hardware inputs on the drivers and the movement in the current direction is inhibited (movement stopped).

The guard function is only activated during movement to prevent a temperature deviation and other possible effects that the placing of the guard board might inflict. The activation of the function is made by the control board and is communicated via a CAN-bus. The CAN-bus goes through a second board (BCM) to secure the termination of the bus.

3.3.4.7 Controls

The system has a number of control units allowing the user to control the movements and the functions of the system. There are three different types of foot controls and two types of hand controls.

Each control has two separate switches for the functions, operating safety critical movements. The separate switches shall be used for validation of the functionality of the control (validation performed by software).

The hand control is designed to support the functions with two separate switches (DMG). The control is structured by laminate, including domes, switch layer and a silk-screen layer, connected to a small PCB placed inside the aluminium profile.

The advanced hand control includes functions for controlling functions of the OTC. The signals used for controlling table functions are connected to CB-module used for supervising the table. This means that the signal wires, coming from the hand control are split up inside the table and connected to two separate modules.

3.3.4.8 Detector holder, table

The manoeuvre control, controls the detector carriage brake.

When the control is activated, the carriage is free to move and when released, the brake is activated holding the carriage in position. The brake is normally activated, at power loss the brake will release.

The detector carriage is designed to accommodate detectors and detector holders. The electrical design of the detector holder is made in the same manner, e.g. standard electronics are used for all detector/detector holder options and additional electronics are added to suit each individual option.

When using a fixed detector in the table, a power box for the detector is mounted underneath the table.

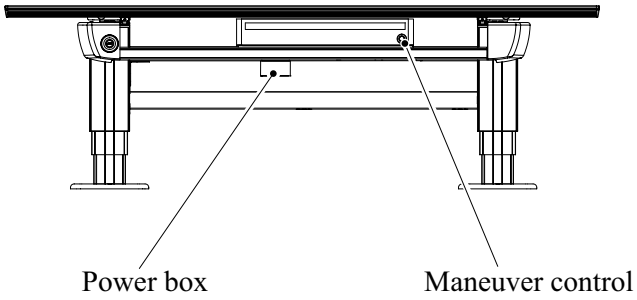


Fig. 3-1 Location of power box

3.3.4.9 System Nodes, Motorized, Vertical Movement

General

The system is divided into two logical subgroups. Each group contains several nodes, all with different responsibility and tasks. The difference between the two sub groups, is their emphasis of functionality.

The main priority of the control nodes subgroup is to act as a link to the surrounding world and to feed the system (other nodes) with input. The input of the control nodes are used to control and manage the nodes of the motor nodes subgroup. All data is passed through the master node, which main task is to supervise and control the system.

The task of the nodes in the motor nodes subgroup is to, based on the commands from the master node, move the system in different directions. Each motor node controls a specific axis (direction of movement).

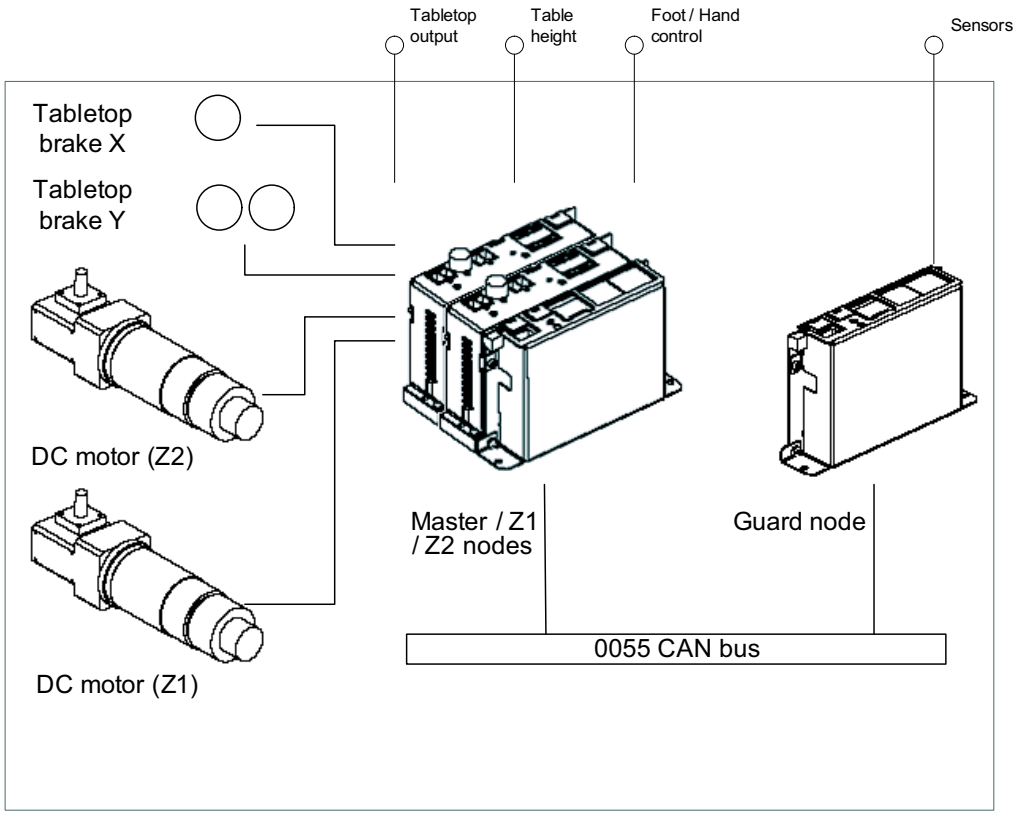


Fig. 3-2 System nodes

3.4 Mechanical Design

The System is mechanically designed to be ergonomic and at the same time robust.

3.4.1 OTC, Mechanical Design

The OTC is designed to be extremely light and maneuverable. The OTC has five individual movable axis; X, Y, Z, Alpha and Beta (see Picture 1). All axis of the OTC are manually maneuverable except for the Z-movement (up/down).

All movements have mechanical end stops. The Alpha and Beta movements also have mechanical indexes to indicate fixed positions (-90°, 0° and 90°).

The Z-movement is strictly motorized and controlled via buttons on the handlebar. All brakes are electrical and controlled by a simple press of a button. All control buttons are placed on the handlebar, placed at the front of the X-ray tube. The control buttons for the collimator are placed adjacent to the handlebar, giving the operator a single access point. For a more detailed design description of the OTC.

3.4.2 0181 Table, Mechanical Design

The Table is a high performance product, designed to cover most kinds of examinations and patient types. Maximum load is 295 kg.

The floating table top is manually moved, whereas the Table Z-movement is motorized. The table top brakes are electrical, allowing the operator to control them with a simple press of a button.

3.4.2.1 Table Top Crash Guard

The Table top crash guard shall only be primarily used as a safety precaution for the System. It will as well limit the risk of personal injury, although the crash guard does not guarantee patient protection.

To be able to detect a collision, four micro switches are placed between the Table and the table top. If the Table crashes into an object, the micro switches will stop the moment in the on-going direction, but it will allow the movement in the opposite direction. When the object is removed, the Table can be moved in both directions again.

3.4.3 Two Column Table (option)

3.4.3.1 Power Supply Box

The power supply box contains electronics of the table and for external products such as power supply for detectors etc. the design allows electrical plates to be pre-assembled and attached as a whole into the power supply box.

All cables, used for installing the table is passed though a conduit, running from the head end foot plate to the power supply box.

3.4.3.2 Column

For the motorized solution the columns will consist of three segments. The mechanics and the electrical components are placed within each column. The concept of the mechanics includes a movable ball screw, ball nut, a safety nut and a mechanical brake. A motor rotates a cylindrical bracket that holds the ball nut. When the ball nut is rotated the ball screw is moved upward or downward dependent on the direction the ball nut is rotated. The brake operate on friction which means that an increase of load causes the brake force to increase. There is also an electrical brake at the motor axle.

3.4.3.3 Detector Holder

The detector holder is manually movable along the table top in the X-direction. The detector holder moves between two aluminium profiles that are attached to the table frame. The attachment of the detectors is adjustable to decrease the distance between the table top and the detector holder. The detector holder is normally locked via a magnet, locking against a steel plate inserted in the aluminium profile. The brake is controlled via a switch placed on a handlebar directly beside the detector holder. It can be supplemented with up to three mechanical indexes that are used for an easy positioning of the unit.

3.4.3.4 Controls

There are three different types of foot controls and two types of hand controls available as standard or as options. Each control has two separate switches for the functions operating safety critical movements. The separate switches shall be used for validation of the functionality of the control (validation performed by software).

3.4.4 Wall stand

The up and down movement of the Wallstand can be both manually and motorized controlled. The movement is counter-weighted, allowing a manual movement with a very small applied force. For motorized movement the motor is connected to the shaft with a clutch, this is also to reduce the force for manual movement.

The tilting function is balanced in order to reduce the applied force. With a tilting function the imaging unit can be set in any angle within a range of 90 to minus 20 degrees. The imaging unit is locked in position using a mechanical brake. To help the user to find the most frequently used positions, three mechanical indexes (90°, 0° and –20°) are implemented.

3.5 Functional Description

3.5.1 General

The functional design of the System is based on the fundamental requirements and values of the System. Functions of the System are intuitive, i.e. the System is intended to be easy to use without any extensive training and understanding of the functions of this particular System.

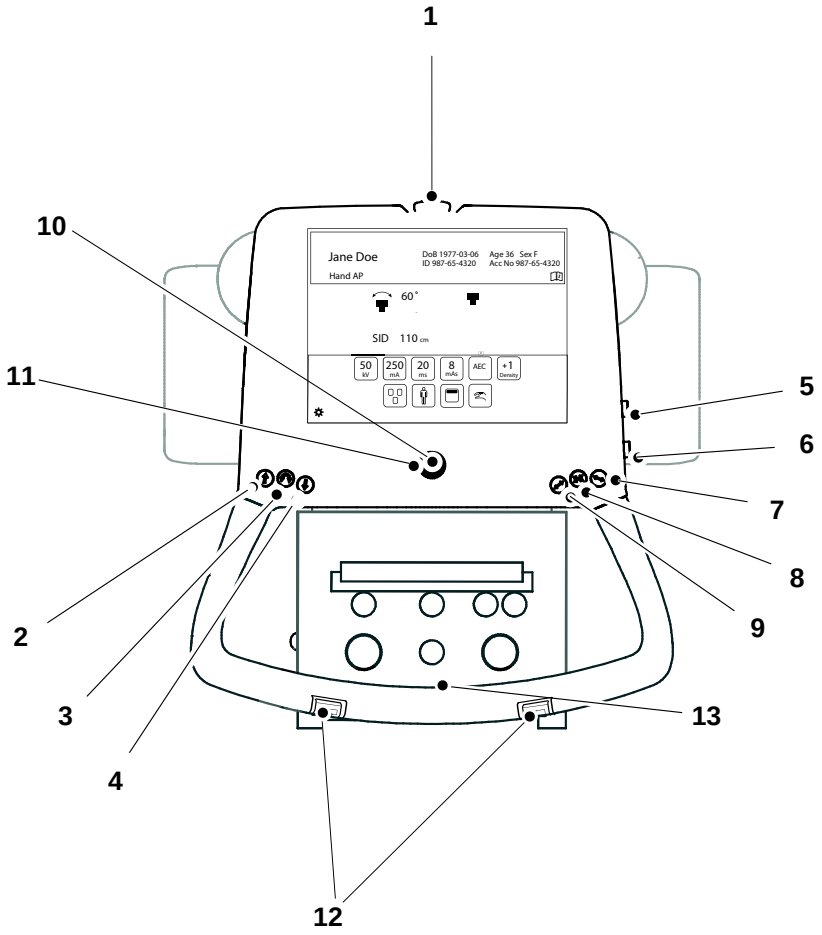
3.5.2 Description

The System is operated from interfaces inside the examination room and from the operating room. The exposure controls are placed at the display, and in the operating room whereas the positioning controls are placed in the examination room (lab). The basic idea is that the functions shall be operated from the position where they are needed, which will enhance the workflow and increase the efficiency.

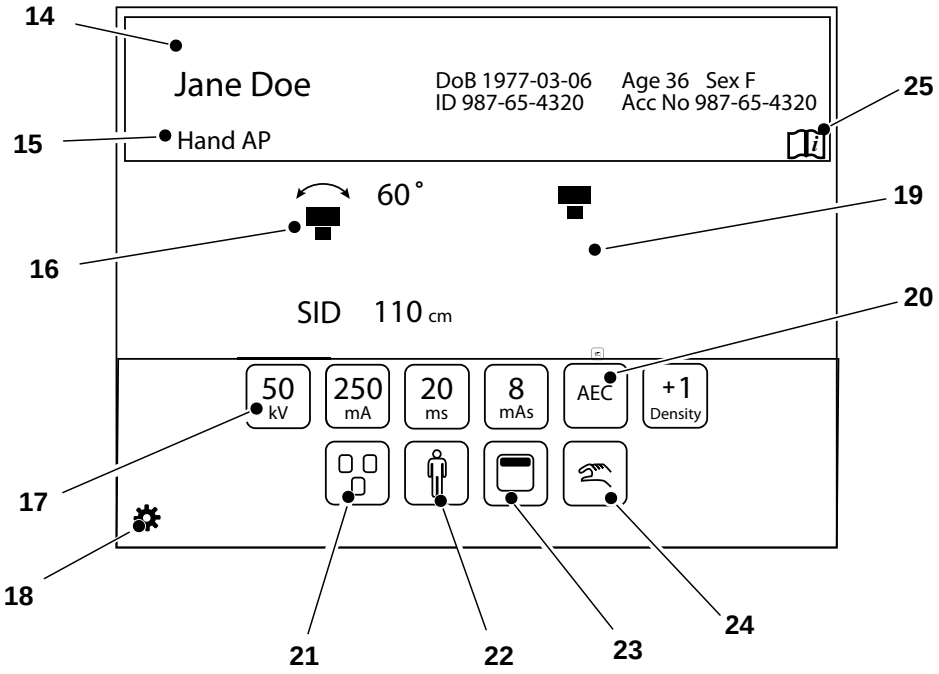
3.5.2.1 Positioning Function Controls

The positioning of the System is performed inside the examination room, i.e. the controls for the positioning functions are also placed inside the examination room. All position controls use a "continuous activation technique" which basically means that the operator must press and hold the key to activate the function. On release, the function will be deactivated.

3.5.3 Overhead tube crane



1. Emergency brake
2. Z movement up
3. Alpha Beta rotation
4. Z movement down
5. Z movement up
6. Z movement down
7. Unlock X brake
8. Unlock X and Y brake
9. Unlock Y brake
10. Indication light, tracking
11. Synchronization button, tracking
12. Z-movement, up/down
13. Handle frame (option): X-/Y-brake release button



14. Patient information
15. Active protocol
16. Position information
17. Adjustment of generator parameters: kV, mA, ms, mAs, Density
18. Settings and service menu
19. Active mode, see chapter
20. Selection of Technique mode
21. Selection of active AEC field (AEC mode only)
22. Patient size
23. Collimator centering
24. Activation of wallstand or Table tracking
25. Hospital manual

3.5.4 Automatic Collimator Version (option)

Below is a description of the controls on the Siemens AL02 collimator.

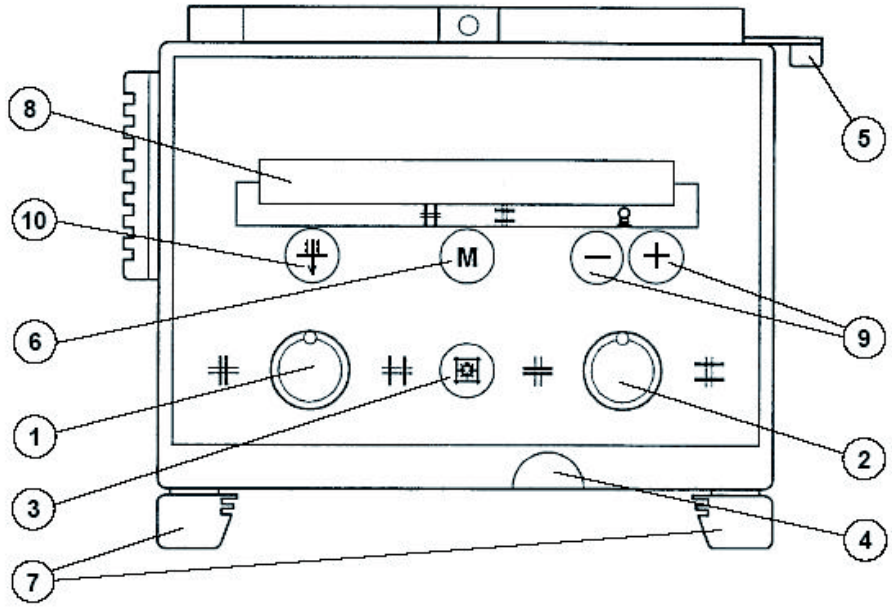


Fig. 3-3 Siemens AL02 Collimator Controls

1. Adjusting knob for formatting height collimation (Turning to the left closes the collimator, turning to the right opens the collimator).
2. Adjusting knob for formatting width collimation (Turning to the left closes the collimator, turning to the right opens the collimator).
3. Button turns the X-ray field illumination and linear light localizing on/off. Cut-out is also performed automatically via a time switch.
4. Measuring tape grip for SID measurement - Take reading at bottom edge of multi-leaf collimator. - The measuring tape has both a cm— and an inch-graduation.
5. Detent lever for ±45° rotation of the collimator around the central beam axis. - The collimator only stops in the 0° position.
6. Button for changing between automatic and manual mode. A long activation (approximately 2 seconds) of the M button will set the light field to maximum size.
7. Two accessory rails.
8. Function display will indicate manual or automatic mode of the collimator.
9. Buttons for manual changing of SID. The new SID value will then be used for calculating the field size instead of the *collimator default value*, steps: 100, 115, 150, 180, 200.
10. Button for selecting collimator filtration.

3.5.4.1 SID

Changing SID

The SID used for calculating the size of the light field can be changed manually with button no. 9 on the collimator.

The new SID value will then be used for calculating the field size instead of the SID *Collimator default value*.

Pre-programmed SID values

If the SID values for each APR are pre-programmed at the Canon NE user interface, this will override the *Collimator default value*.

3.5.5 Functional Description, Table

The control of the Table is placed on the lower part of the vertical lift as a kick box or on the floor as a foot control, there is an optional hand control. The controls are used for enabling and disabling of functions of the Table. These functions are described below.

3.5.5.1 Movements

The Table can be moved in Z-direction for up and down movements and in X- and Y-direction for longitudinal and lateral movements. See figure below for different controllers.

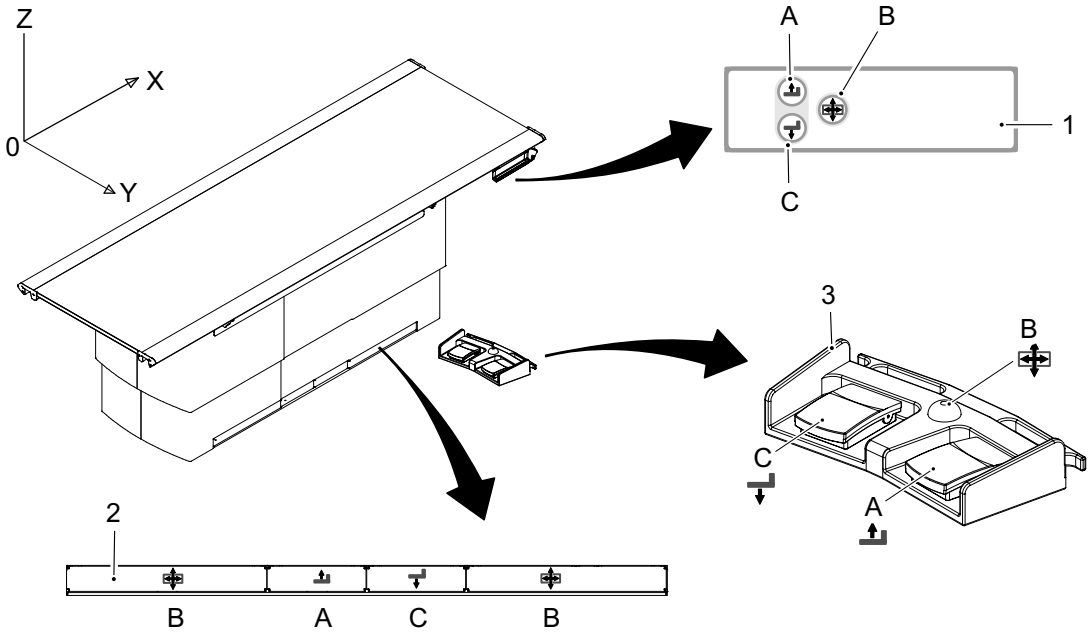


Fig. 3-4 Table controls

1. *Maneuver hand control (optional)*
2. *Kick box control*

Table 3-1

Pos.	Direction	Movement	Activation
A	Z up	motorized	Press and hold the button to activate the movement. Release the button to stop the movement.
C	Z down		
B	X and Y lateral and longitudinal	Manual	Press and hold the button to release the break and to be able to move the Table top. Release the button to activate the brake and the Table top will be locked.

CAUTION!

- ***When moving the Table with the patient or devices nearby, be careful so the Table does not come in contact with the patient and devices.***
- ***When lowering the Table, be careful so the patient does not carelessly come in contact with the Table.***
- ***When moving the Table or the Table top, be careful not to get your arms and fingers caught in the device.***
- ***When moving the Table by foot control or maneuver handle, be careful not to get your arms and fingers caught between the Table and surrounding objects.***

CAUTION!

When turning on power, do not operate foot control, maneuver handle or kick box control. It may lock.

Moving the Table Top

To manually move the Table top, release the brakes and use the hand grip rails located at the long sides of the Table top.

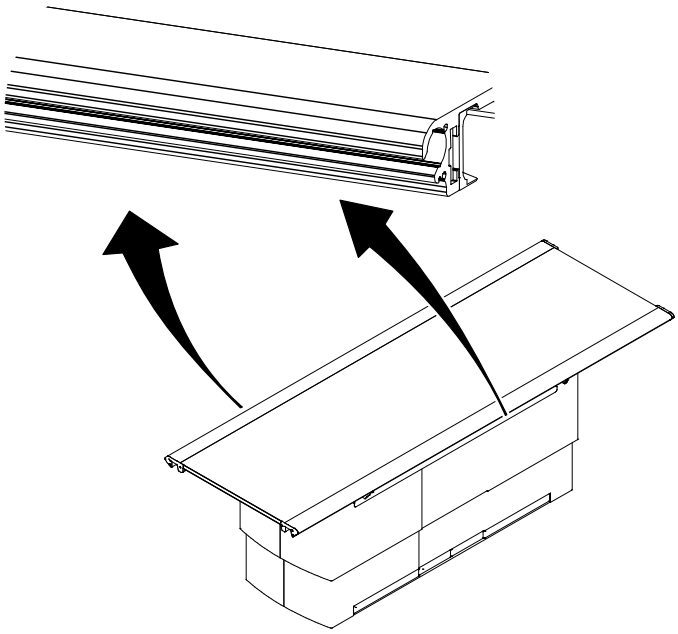


Fig. 3-5 Manually movement of Table top

3.5.5.2 Grid, Closed Table

Remove Grid

1. Pull out the grid.

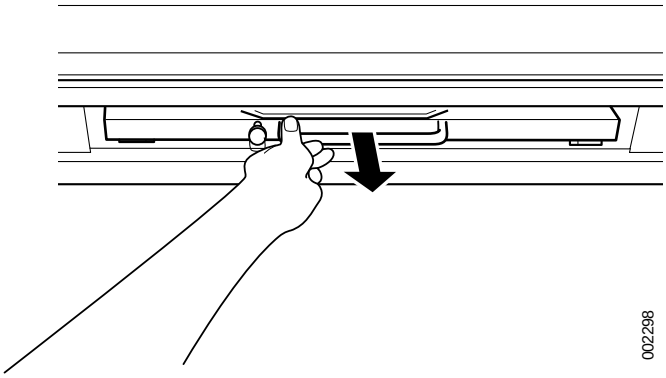


Fig. 3-6

Insert Grid

WARNING!

Failure to insert the grid in the correct orientation, with the tube side facing towards the X-ray source, can result in unsuccessful patient imaging.

Additional corrective patient imaging and additional ionising radiation exposure for the patient may be needed.

Ensure the grid is inserted in the correct way.

CAUTION!

Use the grid that is appropriate for exposure conditions (focus distance, etc.)

Hold the grid in both hands holding the metal on the sides of the grid, and insert the grid along the grid holder rail on the top of the detector tray.

CAUTION!

Properly insert the grid along with the rail. The device may be damaged if not mounted properly.

Note!

When mounting the grid, after confirming that right side is up, check to make sure that it is mounted correctly with the top surface towards you.

The top surface is the one with the sticker affixed to the metal handle of the grid surface.

1. Insert the grid with the tube side facing upwards, towards the X-ray source. The tube side of the grid has the specification label and the grid centre line identification.
2. Push in the grid, until it clicks.

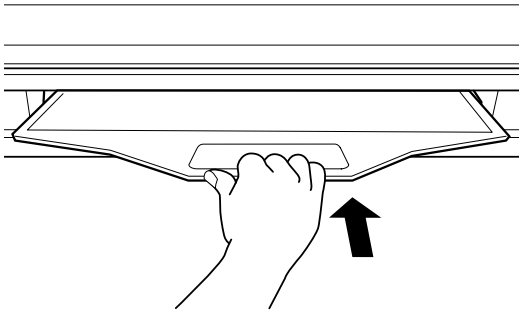


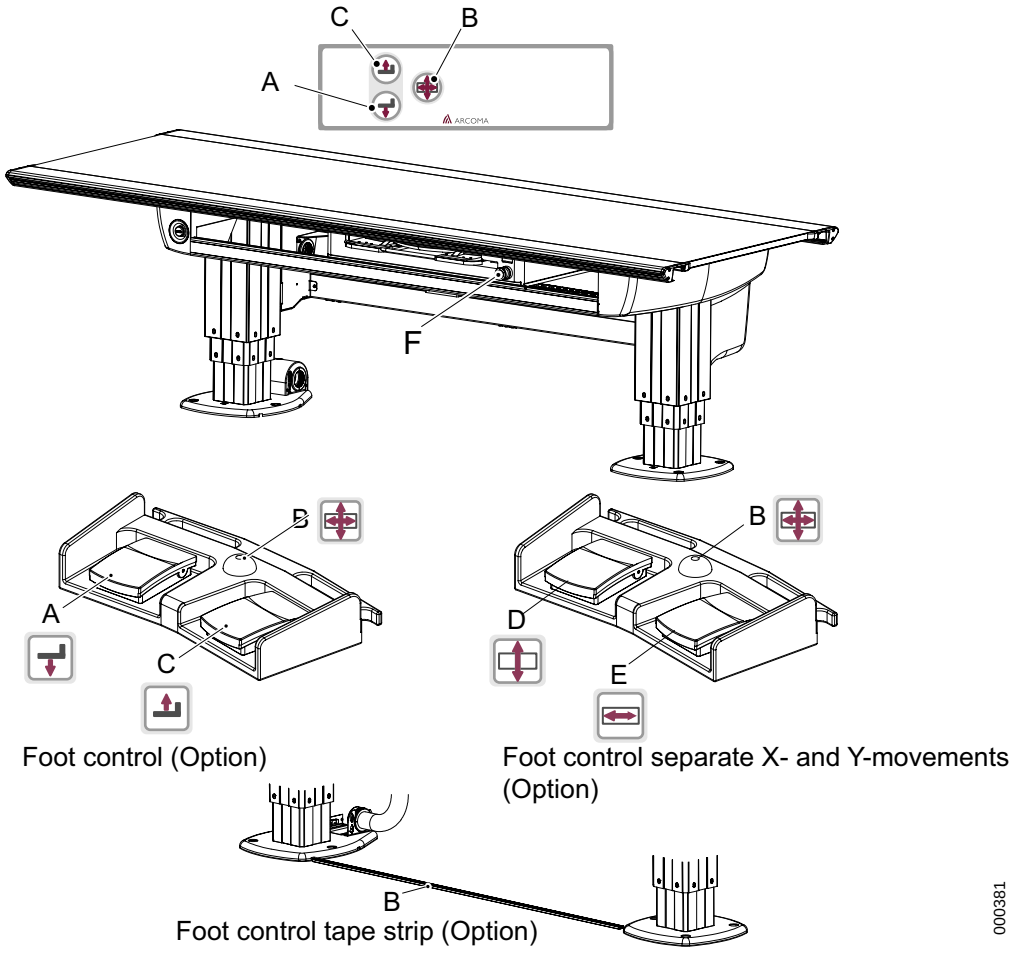
Fig. 3-7

3.5.5.3 Two Column Table (option)

The control of the table is placed at the handlebar installed on the table top and/or on the floor in form of a foot control (option) or a strip tape switch (option).

Movements

The control for the brake is placed on the right side of the detector holder. The controls are used for enabling and disabling of functions concerning the table. These functions are:



Foot control (Option)

Foot control separate X- and Y-movements (Option)

Foot control tape strip (Option)

Fig. 3-8

A Move down
B Release/engage brakes of the table top (X- and Y-direction)
C Move Up
D Release/engage table top brake (Y-direction)
E Release/engage table top brake (X-direction)
F Release/engage detector holder brake

The table top release key (B) automatically lights the collimator lamp on activation. The collimator lamp is automatically switched off after a pre-defined time when the table top release key has been deactivated (released).

Note!

The collimator light is not switched on during vertical movement. The light is only for positioning of the patient and or the radiation beam.

The Up/Down function keys (A, C), also generally named movement keys, are also used for enabling movement of the overhead tube crane (Z-direction). This function is used when tracking is activated.

The user must keep the function key activated during the movement. When the function key is released the movement stops.

On activation of the Up/Down function keys an automatic movement of the OTC is allowed. The automatic movement is used for tracking the vertical movement of the detector.

The tracking of the table detector is only valid if the tracking is activated.

Grid, Two Column Table

See **3.5.5.2 Grid, Closed Table, Page 65**.

3.5.6 Automatic Collimator Control, Table (option).

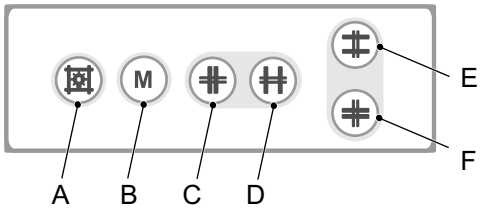


Fig. 3-9 Table Automatic Collimator Control

A. Button turns the X-ray field illumination and linear light localized on/off. Cutout also performed automatically via a time switch.
B. Button for changing between automatic and manual mode. A long activation (approximately 2 seconds) of the button will set the light field to maximum size.
C. Button for closing the format height collimation
D. Button for opening the format height collimation
E. Button for opening the format width collimation
F. Button for closing the format width collimation

3.5.7 Functional Description Wallstand

3.5.7.1 Manual Wallstand

The Wallstand can be delivered with two different receptor holder wagons:

- Fixed image receptor holder wagon.
- Tiltable image receptor holder wagon.

The control of the Wallstand is placed on the image receptor holder wagon, there is an optional foot control. The controls are used for enabling and disabling functions concerning the Wallstand. These functions are described below.

The Wallstand is always manually moveable in the Z-direction. The movement is counter weighted, allowing a movement with a very limited force applied. The tilting function is also balanced in order to reduce the applied force. With a tilting function the receptor holder can be set in any angle within a range from –20° to +90°. The receptor holder is locked in its position using a mechanical brake. There are mechanical index positions in 0° and +90° and a grade scale that displays the angle of the tilt in every 5th degree.

The Wallstand controls are placed on the image receptor holder bracket and at the foot of the column. These functions are:

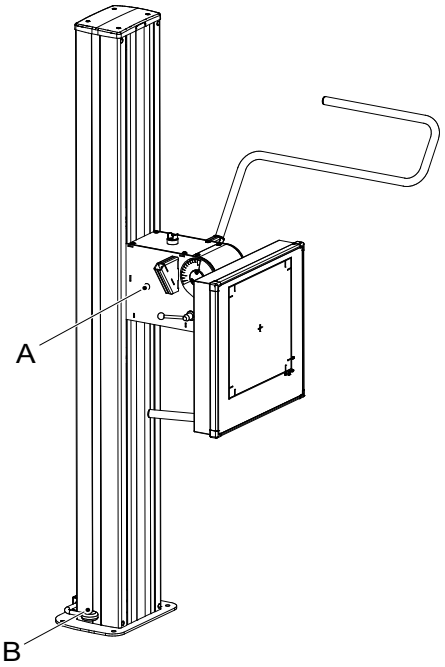


Fig. 3-10 Wallstand Controls

A Tracking function key

B Release/Engage image receptor brake (Z-direction)

If tracking against the Wallstand is selected, the image receptor brake (B) automatically lights the collimator lamp on activation. The collimator lamp is automatically switched off after a pre-defined time when the image receptor brake key has been deactivated (released).

The image receptor brake (B) can externally be used for enabling movement of the OTC (Z-direction). This function is used when tracking is activated. On activation of the image receptor brake an automatic movement of the OTC is allowed. The automatic movement is used for tracking the movement of the image receptor and to synchronize (align) the X-ray tube and the image receptor.

The Wallstand is also supplied with an additional synchronisation key (A). By pressing and holding this key an automatic movement is initialized in order to align the X-ray tube and the image receptor. See also OTC, Tracking function keys.

The tracking of the Wallstand image receptor is only valid if the tracking is activated.

3.5.7.2 Manual Z Movement

The Wallstand can be moved manually in Z-direction for movements upward and downward. A button (B) for brake release is placed on the left and right sides of the image receptor holder wagon. An optional button for brake release is placed on the foot control.

Press and hold the button (A or B) to release the brake and push the wagon up or down.

Release the button (A or B) when the image receptor holder is in position and the brake will be activated and locked.

WARNING!

Hazardous situations when moving the tilted image receptor holder in Z-direction to the floor:

- ***Image receptor collision with the floor***
- ***Squeezing hazard for patient***

WARNING!

Whenever any item is removed from the Wallstand, e.g. image receptor holder, it will become highly unbalanced.

Whenever the brake is released it will move upward and can cause injury.

Make sure that the operation will be carried out by personnel who are trained in the use of the equipment.

CAUTION!

- ***Before raising or lowering the image receptor holder, be sure to check the position of the patient.***
- ***When raising or lowering the device with the patient nearby, be careful so the device does not come in contact with other devices or the patient.***
- ***When raising or lowering the patient support grip, be sure the patient is not hanging down from the grip.***

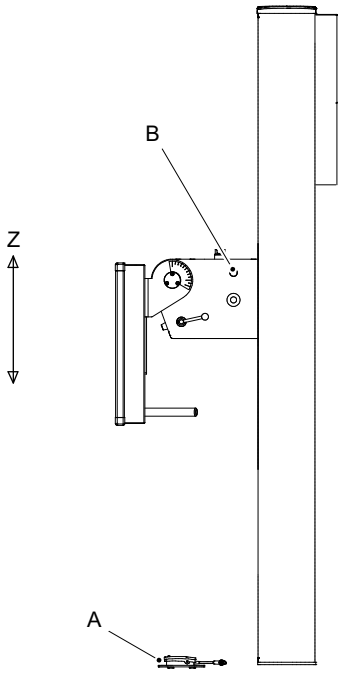


Fig. 3-11 Manual Z-movement Controls

A Foot control (optional)
B Control

3.5.7.3 Motorized Z Movement

The controls concerning the motorized wallstand are placed on the imaging unit holder bracket and at the foot of the column.

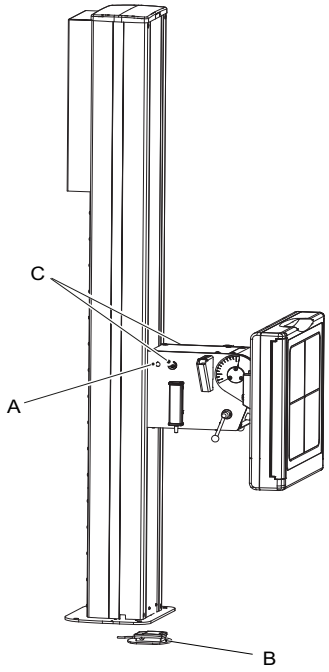


Fig. 3-12 Motorized Z-movement controls

These functions are;

- A. Release/Engage imaging unit brake (Z-direction)
- B. Release/Engage imaging unit brake (Z-direction)
- C. Emergency STOP

The imaging unit brake key (B) automatically lights the collimator lamp on activation, if wall tracking is selected and detector is moved. The collimator is automatically switched off after a pre-defined time when the imaging unit brake key has been deactivated (released).

The imaging unit brake key (B), generally named movement key, is also used for enabling movement of the OTC (Z-direction).

On activation of the imaging unit brake key, an automatic movement of OTC is allowed. The automatic movement is used for tracking the movement of the image receptor and to synchronize (align) the x-ray tube and the imaging unit.

3.5.7.4 Detector, detector holder and grid

Tiltable detector holder (option)

The wallstand has an optional tiltable detector holder wagon. The wagon can make it possible to tilt the detector holder from -20° +90°. See index positions in the figure below

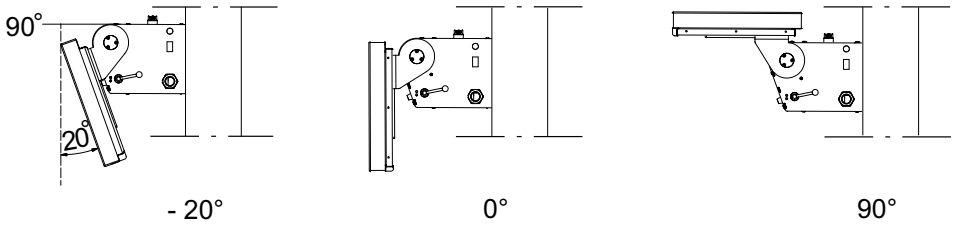


Fig. 3-13 Index positions

Tilt the detector holder

Turn the handle (1) up to unlock the tiltable detector holder according to picture B in figure below. Push the detector holder up in right position and then turn the handle down to lock the holder, see picture C in the figure below.

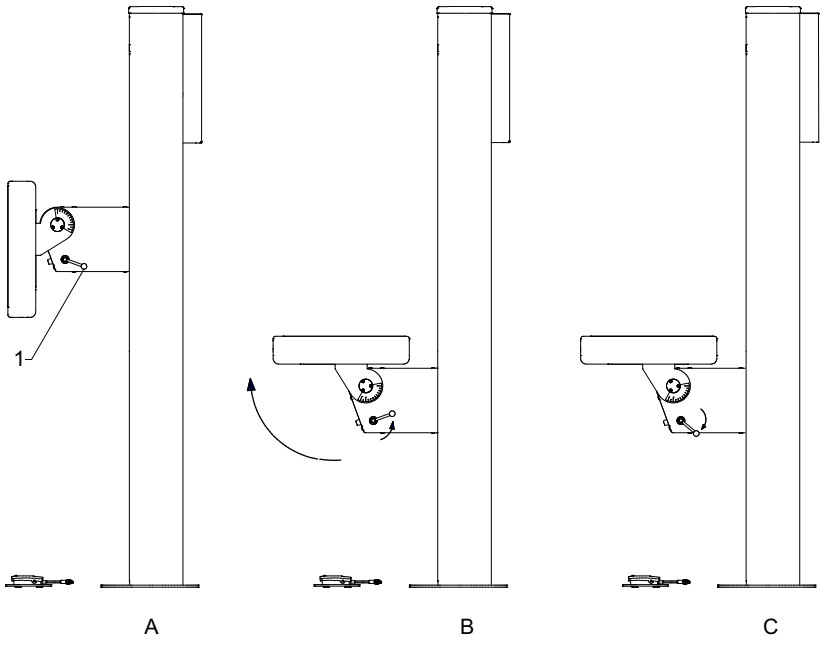


Fig. 3-14 Tilting detector holder

Start position of the handle

CAUTION!

Squeezing hazards:

between the detector holder and other parts or devices when adjusting the angle of the detector holder.

for fingers when operating the detector.

for arm and fingers when operating the detector holder

To position the handle (See pos.1 in **Fig. 3-14**, in its start position:

1. Drag the handle out from the wagon
2. Turn the handle to the right position
3. Push the handle back toward the wagon

14x17 Detector, wallstand

Method to load the 14x17 detector, removable grid

The method of setting the detector to the detector holder is as follows. Following instruction describes the detector operated from the right side.

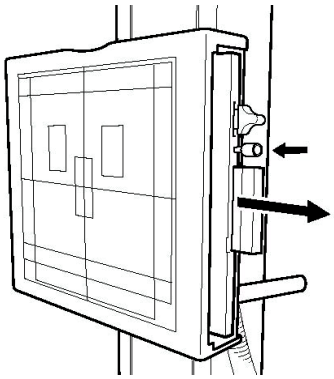
WARNING!

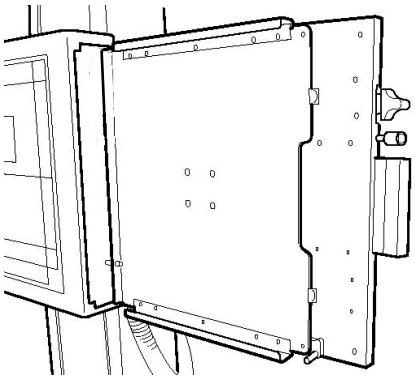
- ***Before setting or adjusting of detector and other equipment, complete the setting of the counterweights.***
- ***Whenever any item is removed from the wallstand, e.g. detector, it will become highly unbalanced.***
- ***Whenever the brake is released, it will move upward and can cause injury. Make sure that the operation will be carried out by personnel who are trained in the use of the equipment.***
- ***Shut down the power when changing of the detector. Confirm that it is not possible to elevate. If the detector holder elevates accidentally while work is being carried out, it may fall against the operator and result in serious injury.***

Note!

- Depending on left or right operated wallstand, the location of the detector tray and position of button and latches is different.

1. Pull the detector tray toward you until it locks.

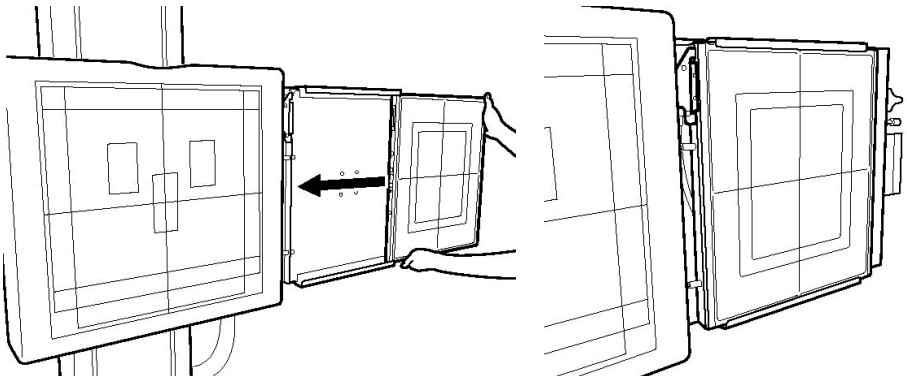




Note!

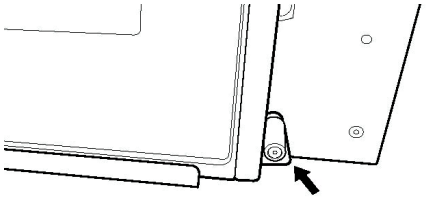
- Install the detector with the detector tray pulled into the locked position. When pulling the detector tray, first the button on the side of the tray will recede before snapping back into its original position when it locks.

2. Insert the detector into the detector tray as shown below and set it by pushing it in until it clicks.

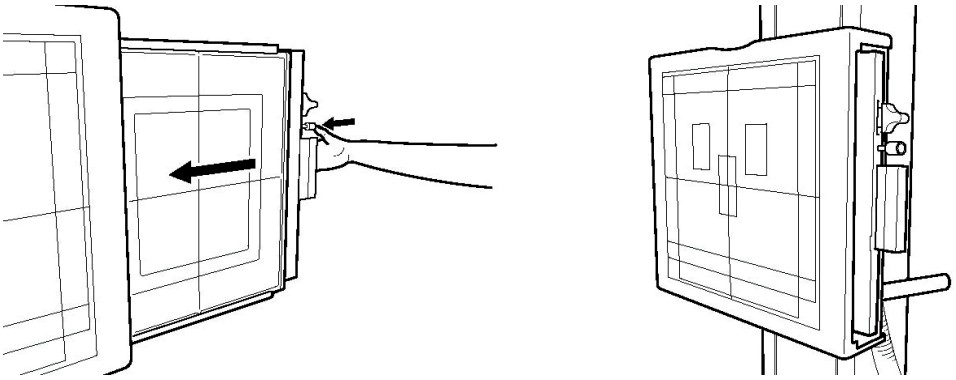


CAUTION!

- ***Confirm that the latch is going up firmly, as shown below.***



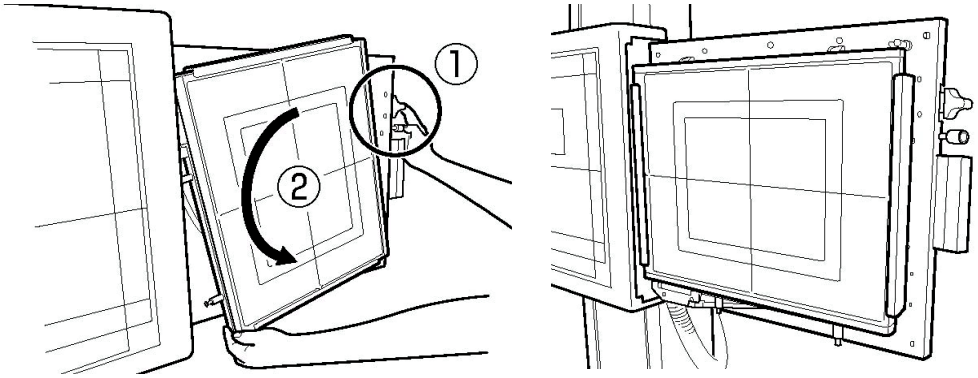
3. While pressing and holding the button of the detector tray, return it back to the inside of the detector holder.



Method to rotate the 14x17 detector, removable grid

The method of rotating the detector in the detector holder, is as follows.

1. To rotate the detector by 90°, , in the step 2 of “Method to set the detector”, hold the lower side of the detector and turn it from the below, toward you (2) while pulling the latch upward or downward of the detector tray (1) in the direction of the arrow.



Note!

- To set the detector, pull the latch
  - upward at upper position of the tray.
  - downward at the center of the tray.
- Depending on left or right operated wallstand, the location of the detector tray and position of button and latches is different.

Method to remove the 14x17 detector, removable grid

The method of removing the detector from the detector tray is as follows.

1. To remove the detector, in the step 2 of “Method to set the detector”, unlock the connector by pulling the latch of the detector tray in the direction of the arrow.

Note!

- Depending on left or right operated wallstand, the location of the detector tray and position of button and latches is different.

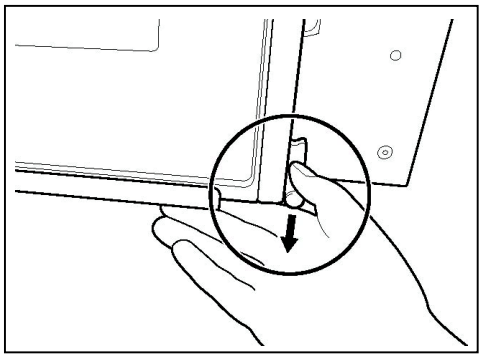


Fig. 3-15

17x17 Detector, wallstand

WARNING!

- ***Before setting or adjusting of detector and other equipment, complete the setting of the counterweights.***
- ***Whenever any item is removed from the wallstand, e.g. detector, it will become highly unbalanced.***
- ***Whenever the brake is released, it will move upward and can cause injury. Make sure that the operation will be carried out by personnel who are trained in the use of the equipment.***
- ***Shut down the power when changing of the detector. Confirm that it is not possible to elevate. If the detector holder elevates accidentally while work is being carried out, it may fall against the operator and result in serious injury.***

Method to Load 17x17 inches Detector

Note!

- Depending on left- or right-operated wallstand, the location of the detector tray and position of button and latches is different.

The method of setting the detector to the detector holder is as follows;

The following instruction describes the detector operated from the left side.

1. Pull the detector tray toward you. Make sure the detector tray is completely brought out.

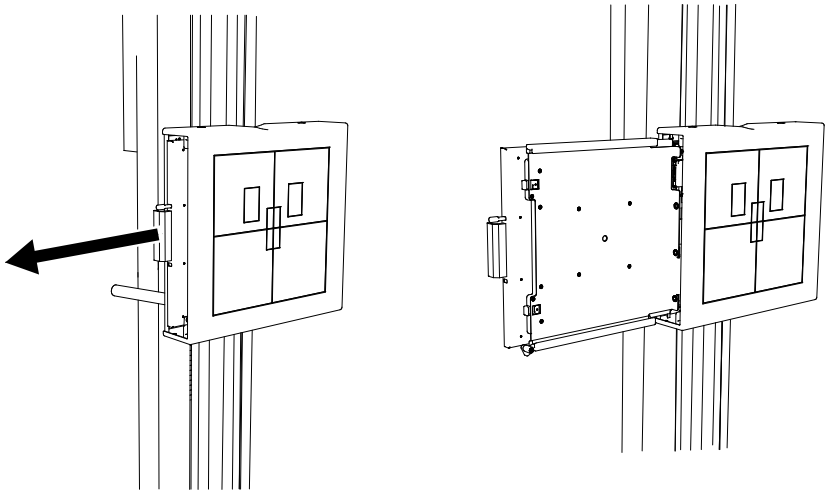


Fig. 3-16 Pull out detector tray

2. Insert the detector into the detector tray as shown below and set it by pushing the detector, holding down the latch.

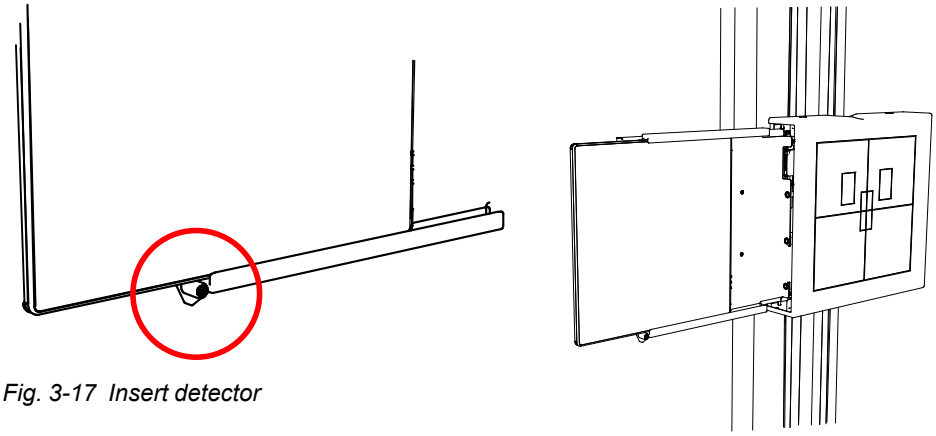


Fig. 3-17 Insert detector

3. While pressing and holding the button of the detector tray, return it back to the inside of the detector holder.

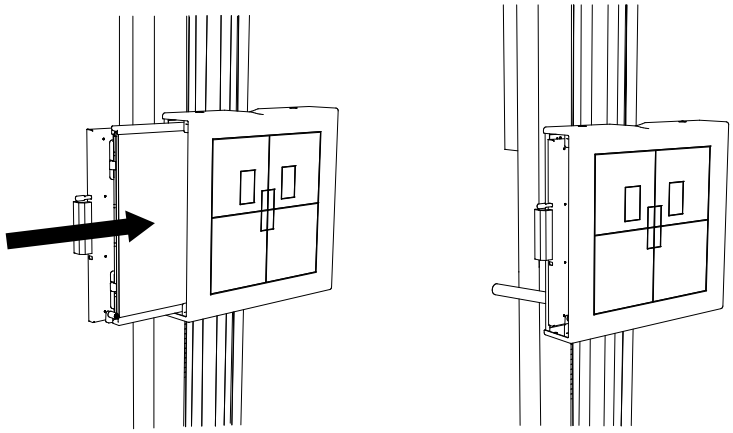
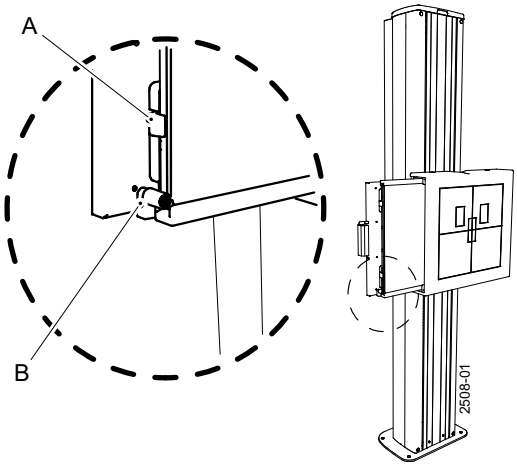


Fig. 3-18 Return detector

4. Push the detector until the hold-backs are set. Then the detector is in the correct position. Chargeable detectors start charging when set in this position.



A. Hold-back
B. Latch

Fig. 3-19 Lock hold-back

CAUTION!

It is important that the hold-backs lock outside the detector end. Failure to position the detector in the proper position leads to incorrect images.

Note!

If the detector or the detector holder is not properly inserted, a warning symbol is shown at the display.

Method to remove the 17x17 detector, wallstand

1. Pull the detector tray toward you. Make sure the detector tray is completely brought out.

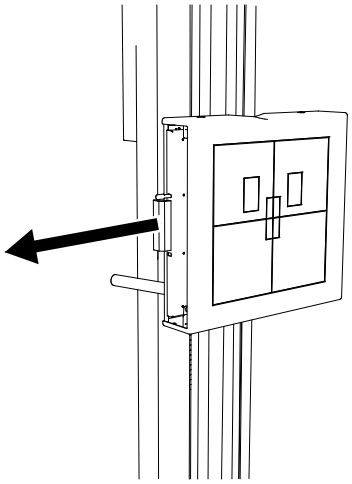


Fig. 3-20

2. Hold down the latch, removing the detector from the detector tray as shown below.

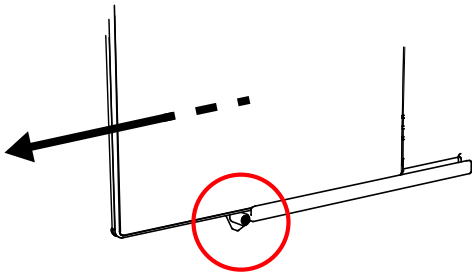


Fig. 3-21

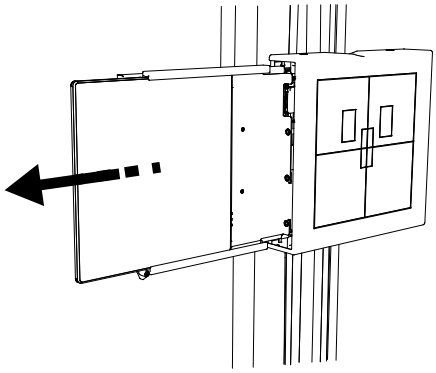


Fig. 3-22

3.5.7.5 Grid

Installing the Grid, Removable Grid

The following procedures are used for installing the grid or when you need to replace the grid.

CAUTION!

- ***Use the grid that is appropriate for exposure conditions (distance, etc).***

Hold the grid in both hands, with your hands holding the metal on the sides of the grid, and insert the grid along the grid holder rail on the top of the detector tray.

CAUTION!

- ***Properly insert the grid along with the rail. The device may be damaged if not mounted in properly***

Note!

- When mounting the grid, after confirming that it is right side up, check to make sure that it is mounted correctly with the top surface toward you, as shown below.

The top surface is the one with the sticker affixed to the metal handle of the grid surface.

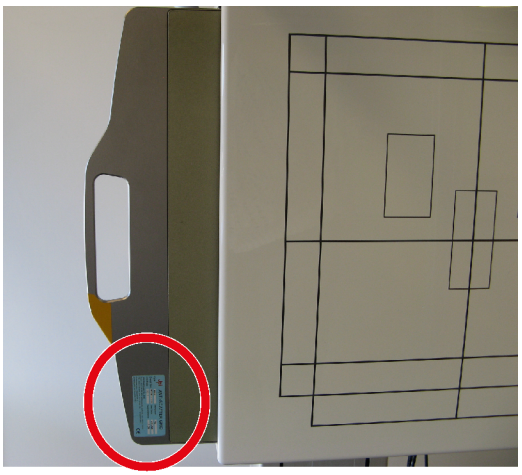
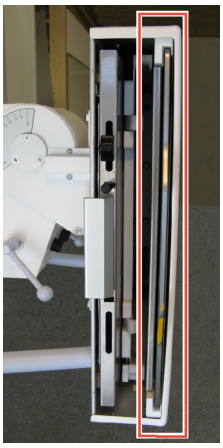
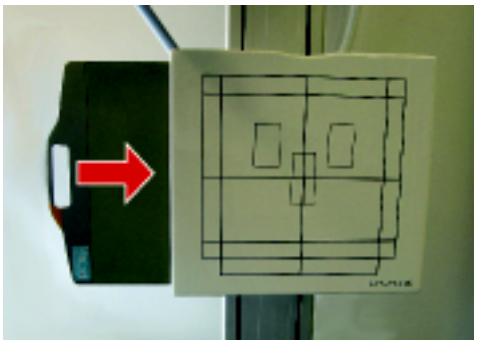


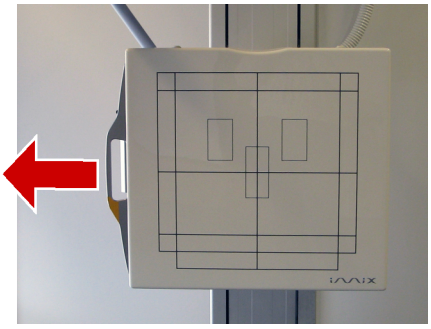
Fig. 3-23 Correct grid mounting

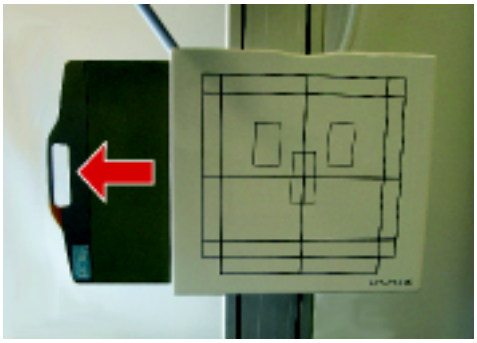
- When mounting the grid, your fingers will come in contact with the detector holder cover. First remove the hands from the cover, and then mount by pressing the grid in by the edges of the metal handles on the grid surface.
- When the grid is mounted correctly in position, there is a peak (click) at the end.
  After sensing that you have pressed passed that peak, the grid is properly in position.





When there is need to replace the grid, or when removing the grid to perform gain calibration, pull the grid in the direction of the arrow by holding the metallic handle on the side of the grid. (See *"Image System Installation/Service Manual"* for gain calibration).





3.5.7.6 Collimator Control Handle, Wallstand (option)

Note!

This function is only possible when connected to an X-ray system.

The figure shows the functions of the collimator control handle.

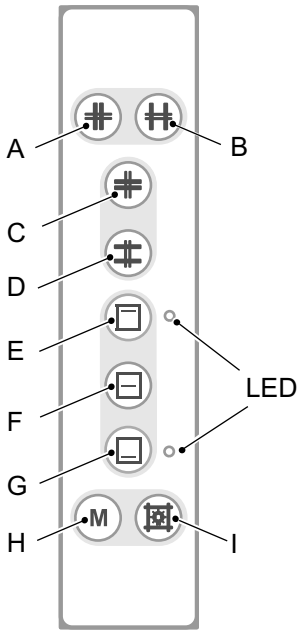


Fig. 3-24 Collimator control handle

A. Button for closing the format width collimation.
B. Button for opening the format width collimation.
C. Button for closing the format height collimation.
D. Button for opening the format height collimation.
E. Button for top centering of the collimator light field. LED indicating the selected position.
F. Button for middle centering of the collimator light field.
G. Button for bottom centering of the collimator light field. LED indicating the selected position
H. Button for changing between automatic and manual mode. A long activation of the M button set the light field to cassette size (based on the pre-programmed SID value).
I. Button for switching the light, the laser line and automatic mode on/off. The light and laser line is automatically switched off via a time switch.

3.6 System techniques

The system has three different techniques which are described in this chapter. The functionality and features of the techniques is also described in this chapter.

Note!

The available techniques are depending on the actual configuration of the system.

The techniques in the system are:

- *Free Technique*
- *Table Tracking*
- *Wallstand Tracking*

Table and wallstand tracking are both possible against a vertically and horizontally placed detector.

3.6.1 General user interface

The alpha angle is always shown on the display.

In *Free technique* the height (H) is always shown. In *Table* and *Wallstand Tracking Techniques*, the SID is shown toward a horizontally placed detector.

Against a vertically placed detector no height indication or SID is shown.

3.6.2 Free technique

3.6.2.1 General description

The *Free Technique* is the most basic mode in the system. The mode holds no special features or functionality. It is intended as a manual mode with a high level of freedom in positioning and exposure, e.g. for emergency examinations or examinations with the patient sitting in a wheel chair or lying in a bed. The *distance H*, shown in the display, is the distance to the floor.

3.6.2.2 Exposure validation

Exposure is allowed (the interlock relay is closed) if the ceiling stand is standing still and is operating properly (not in an error state).

3.6.3 Tracking

There are four different default tracking distances in the system, two for each tracking technique, i.e. *Wallstand* and *Table Tracking Technique*.

The two types for both tracking techniques are against vertically and horizontally placed detectors.

These default distances are set during installation of the system. Which default tracking distance that is used depends on which tracking technique that is chosen on the tube holder and the angle of the X-ray tube. *Wallstand* or *Table Tracking* is selected from the display and an image at the display shows if the wallstand or the table is selected.

The synchronization button below the display, indicates the status.

CAUTION!

The user shall control if the tracking is activated, or not. This is done by checking if the synchronization button, at the wallstand or the OTC, is lit.

The light indication can be flashing or constant. The light indication will be constant if the system is in the correct position for tracking (normally default tracking distance) and flashing if it is not. If the light indication is flashing, there are two ways to get the system to its correct tracking distance.

1. Move wallstand or table (depending on which tracking is activated).
2. Push and hold the synchronization button at the wallstand or at the OTC.

Tracking movement is performed as long as the movement is activated on the tracked stand, i.e. wallstand or table, the ceiling stand will move to find the correct distance and then continue to track at that distance.

If the tracked stand is already in the desired position, the synchronization button at the wallstand or at the OTC can be pushed and held to get the system to move to the correct position.

When the system has reached the correct distance for tracking, any manual movement on the tube holder (Z-direction) will change the tracking distance to the distance it is placed on when stopping the tube holder movement.

Moving the tube angle will affect the correct distance for tracking if it is moved across the -45 or 45 degree angle.

The correct distance for tracking is then set to the default tracking distance, since it has changed between horizontally and vertically placed detector.

Except for tracking against a vertically placed detector on the wallstand, tracking is always prohibited downward below the safety zone.

3.6.3.1 Synchronization control/tracking

The automatic tracking is activated at the display.

Activation of the synchronization button will drive the OTC to the position for tracking.

The activation will lead to a synchronization and tracking between the tube holder and the detector.

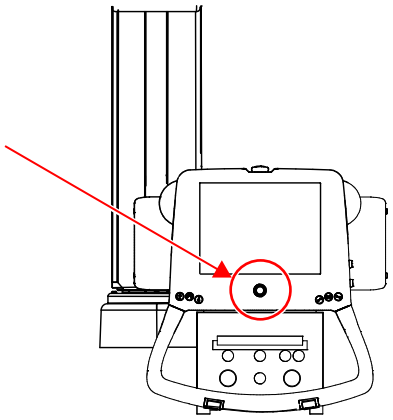


Fig. 3-25 Synchronization button with indication light — display

The synchronization button at the display, also comprises a yellow indication light. This light indicates if there is an alignment.

- Permanent yellow light — indicates; *Alignment*.
- Flashing yellow light — indicates; *No alignment*.

3.6.3.2 Table tracking technique

General description

The *Table tracking technique* is intended for examinations against a table.

In this technique the tube holder will track the movements of the table to assist the operator to always keep the distance to the detector.

Table tracking

The tube holder can track the table detector in two different positions depending on if the detector is placed vertically or horizontally.

The system decides which way, depending on the angle of the X-ray tube.

If the angle is between -45 and +45 degrees, the detector is assumed to be horizontally placed and thereby the default tracking distance for a horizontally placed detector is chosen.

The SID is shown on the display.

If the angle is outside -45 to +45 degrees, the system assumes that the detector is placed vertically and thereby the vertical default tracking distance is chosen.

No SID or height is shown on the display.

The default tracking distances are set during installation of the system.

Note!

In table tracking technique, the exposure is blocked whenever a wallstand workstation is chosen on the generator.

Table synchronization

At table synchronization, a predetermined collimator height is set. When tracking, the OTC will seek the determined height.

If the distance: collimator — table, differs from the predetermined, the yellow indication light at the ceiling stand, will flash.

Activate the synchronization button at the ceiling stand, and the OTC will move to the determined SID.

When synchronized, the indication light will stop flashing and shine with a permanent yellow light.

3.6.3.3 Wallstand tracking technique

General description

The *Wallstand tracking technique* is intended for examinations against a wallstand.

In this technique the tube holder will track the movements of the wallstand to assist the operator to always keep the correct position to the detector.

Wallstand tracking

The tube holder can track the wallstand in two different positions depending if the detector is placed vertically or horizontally.

The system decides which way depending on the angle of the X-ray tube.

If the angle is between -45 and +45 degrees the detector is assumed to be horizontally placed and the default tracking distance for a horizontally placed detector is chosen.

The SID is shown on the display.

If the angle is outside -45 to +45 degrees the system assumes that the detector is placed vertically and the vertical default tracking distance is chosen.

No SID or height is shown on the display. The default tracking distances are set during installation of the system.

Note!

In Wallstand tracking technique, the exposure is blocked whenever a table workstation is chosen on the generator.

Wallstand Synchronization

WARNING!

Before performing any wallstand tracking, assure that the wallstand indication light is lit and thereby, that the wallstand is activated.

At wallstand synchronization, the collimator reticle shall be aligned with the detector cross.

When performing fast or long movements of the wallstand detector, it may occur that the collimator does not synchronize with the wallstand detector. The automatic wallstand tracking may not make it all the way and the indication light will start flashing.

In this case, activate the synchronization button at the wallstand, see **Fig. 3-26**.

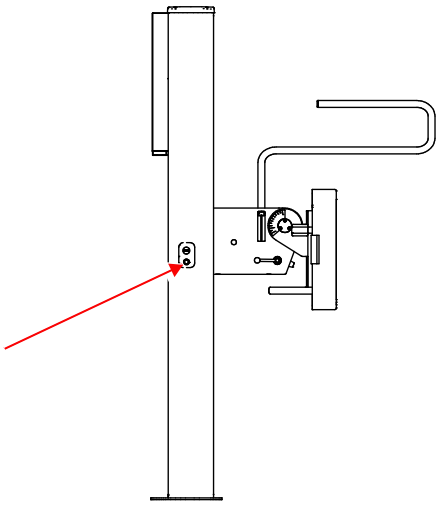


Fig. 3-26 Wallstand synchronization button

Then the tracking will carry out the full movement and synchronize. The indication light will shine permanently.

3.6.3.4 Tracking (horizontal/vertical)

Tracking operation when horizontal

- For the detector holder of the table when the *Table icon button* is active:
- When the *Wallstand icon button* is active and the detector holder of the wallstand tilt model is positioned at 90 degrees:

  Tracking operation is only performed when the alpha angle of the display is between +45 and –45 degrees. When performing horizontal tracking of each device, check that the alpha angle display is within the above range.

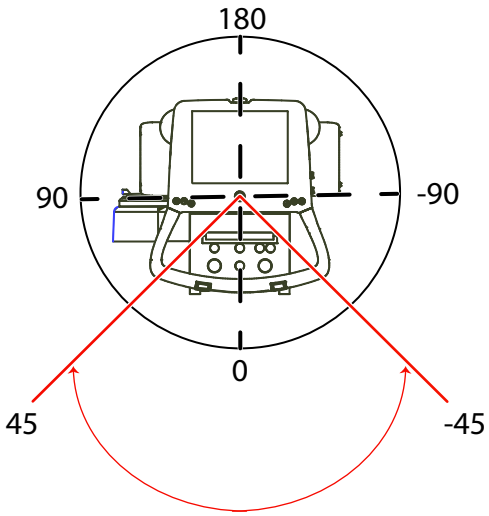


Fig. 3-27 Tracking operation when horizontal

Tracking operation when vertical

- For the holder of the wallstand when the *Wallstand icon button* is active:
- When the *Table icon button* is active and when using the vertical on the table:

  Tracking operation is only performed when the alpha angle of the display is between +46 and +134 degrees and between 46 and 134 degrees. When performing vertical tracking of each device, check that the alpha angle display is within the above range.

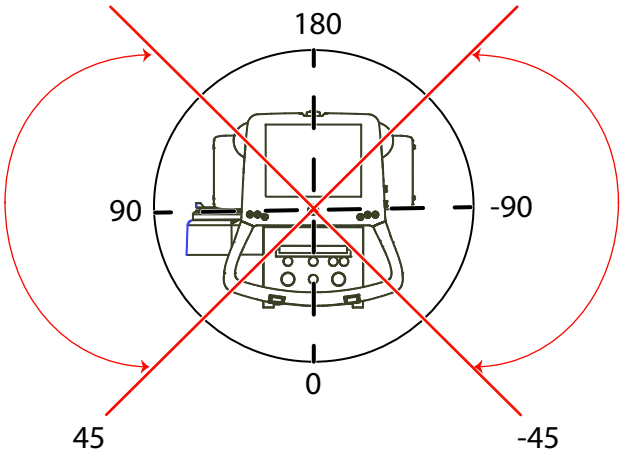


Fig. 3-28 Tracking operation when vertical

3.7 Software Design

Architectural Goals and Constraints

Basic Concepts

The System is built with a number of separate subsystems, acting as individual units in the System.

The different subsystems are:

- *The High voltage generator*.

  Responsible for the emission of X-rays.
- *The Cabinet.*

  The interface between the image system and other parts in the System. Responsible for the tracking of Table and Wallstand.
- *The Ceiling unit.*

  Responsible for handling of the ceiling support. Important functions for this sub-system are, moving Z up/down, X, Y, Alpha and Beta. The display is mounted in this subsystem but controlled by the Cabinet.
- *The Wallstand.*

  Responsible for holding the detector for chest examinations. Also possible to move the detector in Z and tilt direction.
- *The Table.*

  Holding the detector and a patient. Moving the Table up/down, detector and handling of a brake for the Table top.

4 Installation

4.1 General

This chapter describes how to unpack and install the product. Follow the instructions given in this chapter and use the installation checklist, located in Appendix C.

After completing the installation, fill in the Installation Report and send it back to Arcoma AB. If not, the time of guarantee will be considerably reduced.

Note!

Surrounding equipment, that is not the manufacture equipment, shall follow the standard IEC 60601-1-2 regarding electromagnetic compatibility.

Note!

It is the responsibility of the one who combines the Product with other equipment, to secure that the use of the combination is in compliance with MDD 93/42/EEC or other directives that may be mandatory on the market in question.

Note!

Refer to the Product Planning Guide for information about installation location, space and transfer.

4.2 Precautions, Installation

WARNING!

Do not switch on the power, before the cabling is checked for damage, completely installed and connected according to the installation chapter.

WARNING!

To prevent dangerous situations, make sure that only formally trained service engineers remove the cover or touch the inside of the equipment (except when the front cover is opened to replace the grid).

WARNING!

When working on the image receptor holder, be sure to use fixing bolts to fix the holder to be the main unit frame. If the holder falls accidentally while work is being carried out, it may fall against the worker and result in serious injury.

WARNING!

Electrical shock. Covers removed, exposure to electrical shock.

WARNING!

Be careful not to touch the power line while performing work, such as voltage measurement, that requires the power supply to be turned ON.

WARNING!

Be sure to keep the power turned OFF while performing work that involves contact with the circuit boards, connectors, cables, or other electronic parts in the System. If the power is kept ON, a serious accident may occur.

WARNING!

Check that the System is grounded in a correct way.

WARNING!

Check that the cables are correctly connected and free from damage

WARNING!

When accessing a motor or other driving parts, be careful to ensure that no parts of your body or items of your clothes get caught. Otherwise, you may be injured.

WARNING!

Be aware of live parts when the covers are removed.

CAUTION!

- ***Danger or risk for injuries if installation instruction is not followed***
- ***When installing the System, follow the installation procedure described in this chapter, see also Installation checklist, Appendix C.***
- ***When installing the System, pay attention to the power supply frequency, voltage, and allowable current.***
- ***Static electricity can damage the electronic circuits. Handle the main unit and removed electronic parts carefully during repair.***
- ***Be sure to wear a grounding strap when handling a circuit board.***
- ***Store spare screws and other parts of this carefully. Using the System with screws removed, may cause accidents.***
- ***If a failure occurs on this, turn OFF the power and contact your nearest service representative.***
- ***Do not use any flammable or explosive gases near the.***
- ***Do not move the device with the power and other cables connected. Doing so may cause the power and other cables to get caught, causing the System to drop or fall, which may result in injury.***
- ***When installing this in a different location, contact us or our designated dealer.***

CAUTION!

All mains supply cables are allowed to be changed only by engineers trained by supplier.

CAUTION!

Remaining energy may exist when the equipment is switched off. Always wait at least 15 seconds before working on the System.

CAUTION!

Be aware of possible squeezing hazards when the covers are removed.

CAUTION!

Placing Covers: After installing covers, check the tightness of the fixing screws. In particular, when you have to tighten multiple screws, check that all screws have been tightened.

CAUTION!

When disassembling/assembling this equipment, follow the specified procedures. Be sure to turn off the main unit power source breaker and remove the power cable from the main unit.

CAUTION!

If the power supply voltage is unstable and falls by 10% or more compared to the specified voltage, internal devices malfunctions may result in unsuccessful X-raying.

CAUTION!

After installation or service, protective earth measurements shall be performed.

CAUTION!

Keep the Table top in proper height in Installation/Maintenance.

CAUTION!

- ***Do not place objects under the Table when you do not use it for a long period of time.***

  Due to the elevating mechanism, the Table automatically falls down a little (approximately 10 mm/day). If falling much more, please contact service personnel.

Note!

For a safe and reliable function of the System, it is crucial to follow the installation instructions regarding the insulation.

Note!

The insulation kit is designed to isolate System components, e.g. System cabinet, Table, Wallstand and Ceiling stand from the hospital building.

The insulation kit will prevent stray currents from reaching the System e.g. via screw attachments. Stray currents can be present e.g. in reinforcement bars or in water pipes in a building. These currents can be of several hundred amperes and can affect the leakage current from the System to the patient and thereby the safety for patient and user. Stray currents in the building shall be regarded as a failure in the building but the insulation kit provides an extra safety barrier.

The insulation kit will also prevent unwanted ground loops due to e.g. electrical contact through the wall or floor lead X-ray shielding via screw attachments of the System components.

4.3 Tools Required

4.3.1 Standard Tools

- Standard hand tools and service tools
- Tools for unpacking
- Dynamometer (0–400 N)
- Torque wrench (15–47Nm)
- Multimeter
- Digital water level
- Rotation laser
- Allen keys (metric)
- Steel straight
- Hammer drill
- Lift
- Leakage current tester for measurements according to IEC 60601-1
- Assorted cable ties
- Protective ground wire tester for measurements according to IEC 60601-1
- Installation tool
- Loctite 243
- Tape
- Service PC
- Service cable (See **13**)
- Working gloves
- Circlip pliers for external circlips

- Customized Allen keys

Fig. 4-1

4.4 Service PC

System requirements:

- 128Mb Internal memory
- 100 Mbyte free disk space
- Minimum 1.6 Ghz processor
- CD drive
- 1pc Com port or 1pc USB port with a RS232 converter
- CD/RW or USB (USB stick)
- Windows 2000 or later
- Microsoft. NET 2.0 + SP1

4.5 Tightening Torque

At installation, all screws shall be tightened with the moment (Nm) shown in the Table below, according to ISO 898-1.

10% deviation is permitted.

Nominal Thread Diameter	Screw Material				
	Iron/Steel				
	Hardness Rating				
					
	Tightening Torque (ft-lb)				
M3	0.3	0.6	0.9	1.3	1.6
M3.5	0.5	0.9	1.4	1.99	2.4
M4	0.8	1.3	2.1	2.95	3.6
M5	1.6	2.7	4.2	5.97	7.2
M6	2.7	4.5	7.2	10.3	12.5
M8	6.6	11	17.7	24.3	29.5
M10	12.5	21.4	34.7	47.9	58.3
M12	22.1	37.6	59.7	84	100.3

4.6 Shipping/Receiving

4.6.1 Receiving

Verify that the site is ready for installation.

Remove the tops and the sides of the crates.

Inspect the equipment for transport damage immediately upon arrival at its destination. If there is any damage, save the packing material and notify the transport company at once.

To determine whether the complete shipment has arrived, compare items received to those listed on the shippers packing list and the Manufacturer order.

Any discrepancies should be reported to:

Canon Medical Systems, USA
2441 Michelle Drive
Tustin, CA 92780
800–421–1968

4.6.2 Storage Precautions

CAUTION!

Store the System in a place where it will not be exposed to water.

CAUTION!

Store the System in a place where atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, salt, or air containing sulphur will not adversely affect the equipment.

CAUTION!

Avoid placing the System on angled surfaces, and subjecting it to vibration, shock (including during transportation) and other factors that may impair stability.

4.6.3 Return Authorizations

Goods returned for credit, exchange or repair will not be accepted by the Manufacturer unless written authorization has been issued. Contact Manufacturer at the above address for return authorizations.

4.6.4 OTC

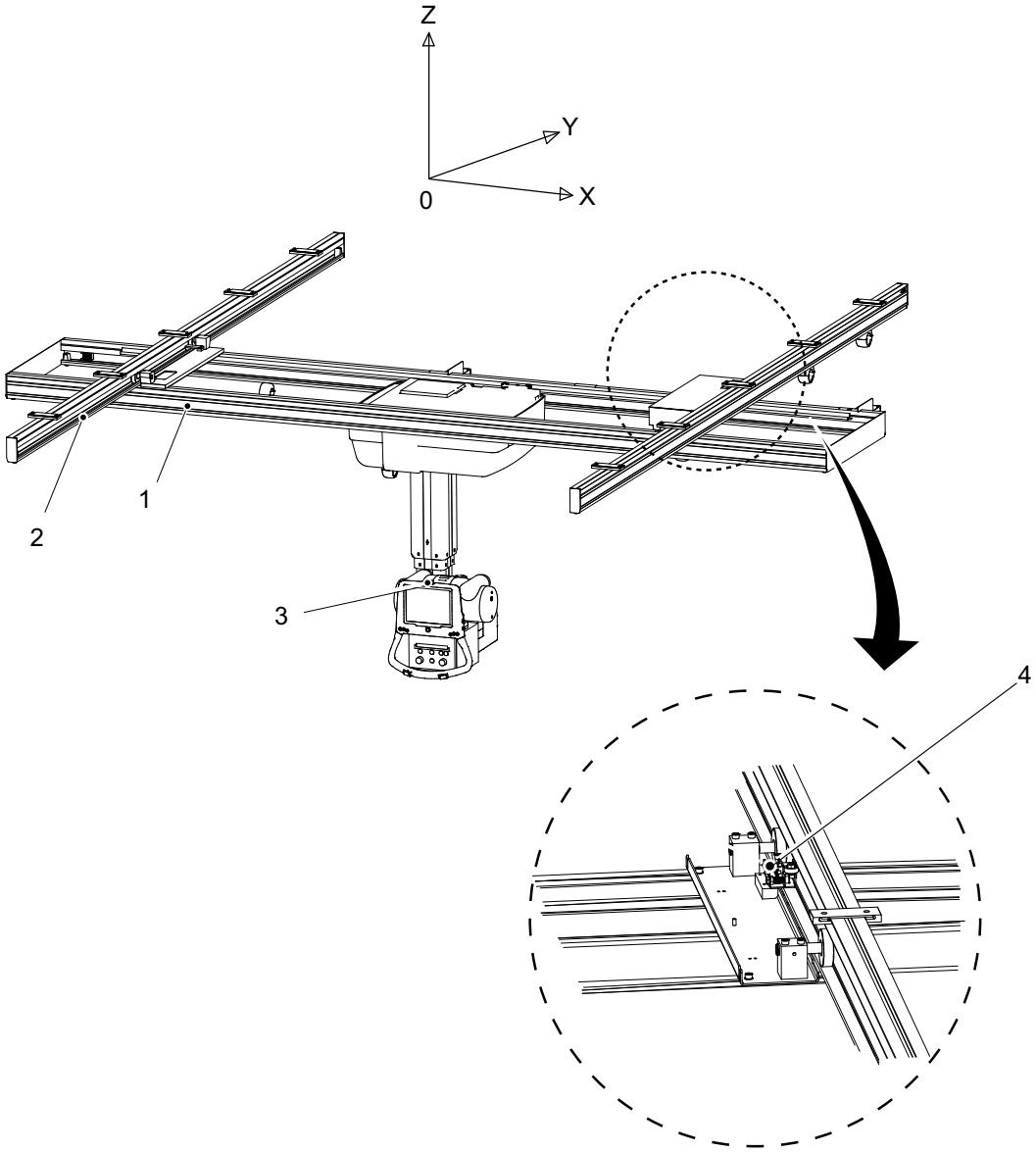


Fig. 4-2 OTC details

1. *Traverse rail (X)*
2. *Ceiling rail (Y)*
3. *Emergency stop*
4. *Brake*

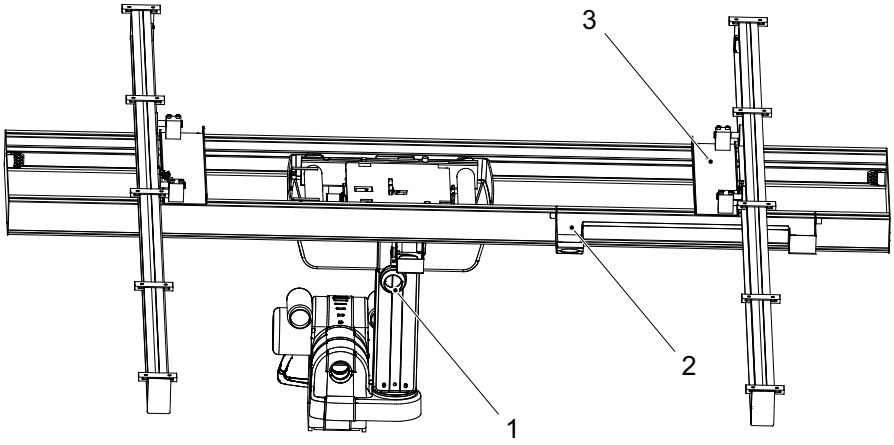


Fig. 4-3 OTC details

1. *Cable carriage*
2. *Cable channel*
3. *Distance plate*

4.7 Mechanical Installation of OTC

4.7.1 Ceiling Rails Y

Check that needed fixation point are present in the ceiling.

The ceiling must be free from hanging and extruding objects. The ceiling unit is moving and requires free space.

Spread the pre-installed fixation blocks on the ceiling rail Y, with the same distance (A) as the fixation points in the ceiling, see figure and table below.

The distance (A) between the fixation points depends on the length of the traverse rails Y.

Note!

The ceiling suspended unit rails shall also be parallel +/- 1 mm.

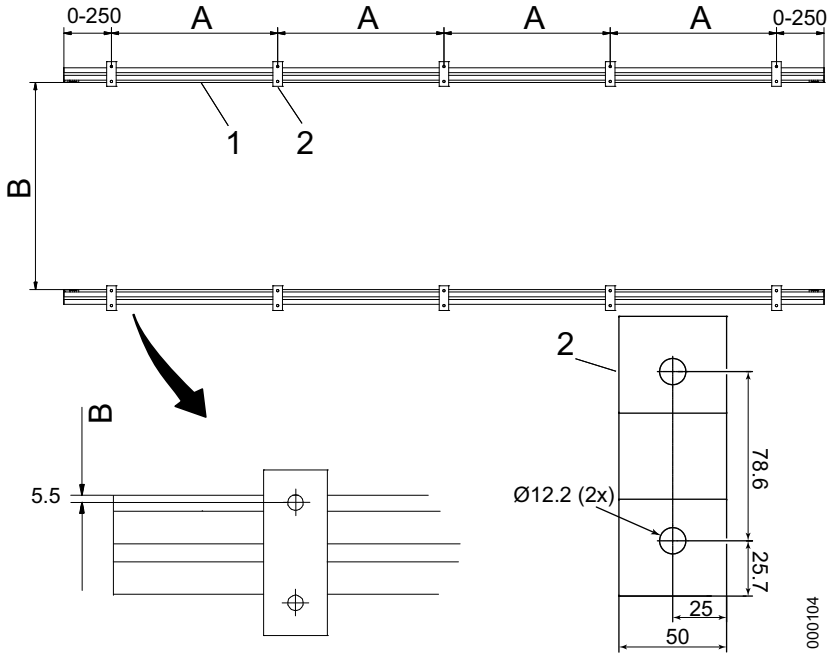


Fig. 4-4 Ceiling rails Y

1. *Ceil suspended unit rail (Y)*
2. *Fixation block*

Table 4-1

Length traverse rail X	3000 mm	2748 mm (low ceiling)
Measure A	850-1100 mm	850-1100 mm
Measure B	1800-2200 mm	2778 mm

Spread the pre-installed fixation blocks on the ceiling rail Y, with the same distance (A) as the fixation points in the ceiling.

The distance (A) between the fixation points depends on the length of the traverse rails Y, see **Fig. 4-4** and **Table 4-1**.

Lift up the ceiling rails Y and bolt the fixation blocks into the Unistrut or similar with the enclosed M10 screws and washer. Also install the insulation plates and cases on the fixation blocks, see figure below.

Note!

The insulation kit is designed to isolate System components, e.g. System cabinet, Table, Wallstand and Ceiling stand, from the hospital building.

The insulation kit will prevent stray currents from reaching the System e.g. via screw attachments. Stray currents can be present e.g. in reinforcement bars or in water pipes in a building. These currents can be of several hundred amperes and can affect the leakage current from the System to the patient and thereby the safety for patient and user. Stray currents in the building shall be regarded as a failure in the building but the insulation kit provides an extra safety barrier.

The insulation kit will also prevent unwanted ground loops due to e.g. electrical contact through the wall or floor lead X-ray shielding via screw attachments of the System components.

The ceiling rail Y must be level in X, Y and Z direction ±1 mm. If not use the enclosed shims.

The distance (B) between the ceiling suspended unit rails Y is depended on the length of the traverse rails X, see **Fig. 4-4**.

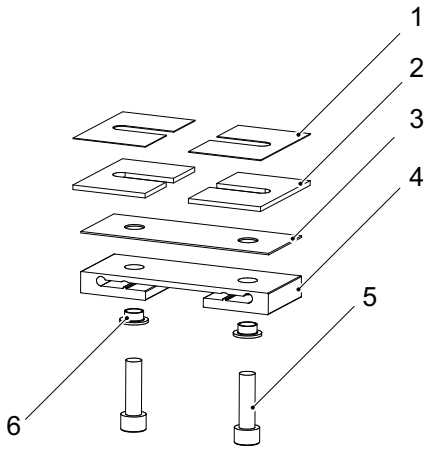


Fig. 4-5 Mounting ceiling rail Y

1. *Shims*
2. *Shims*
3. *Insulation plate*
4. *Fixation block*
5. *Installation screw*
6. *Insulation case*

4.7.2 Traverse Rail X

Note!

One of the traverse rail X contains a steel bar for the brakes. See the room layout to know the orientation of the steel bar for the brakes in the room.

Loosen the screws (4) and push on the flat bar (3), with the distance plate (2), onto the traverse rail X (1) according to figure.

The distance (B) between the distance plates is depended on the length of the traverse rail X, see **Fig. 4-4**and **Table 4-1**

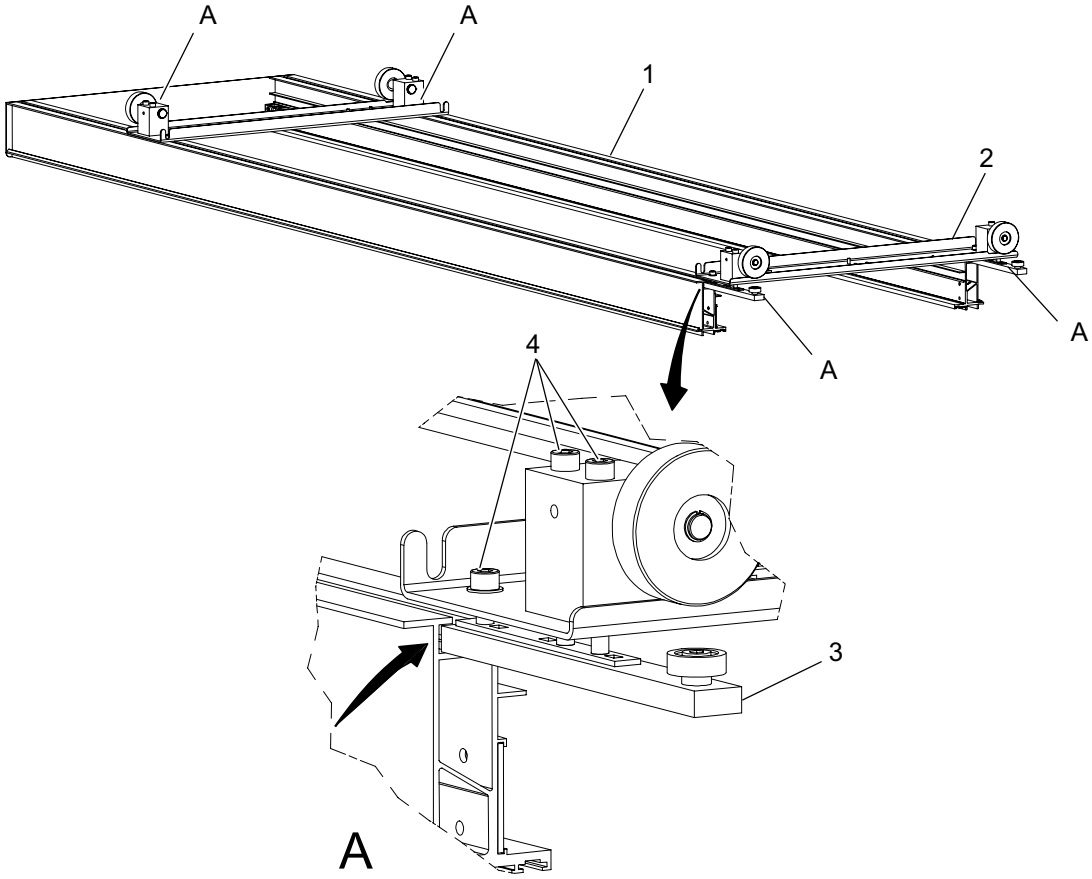


Fig. 4-6 Traverse rails X

1. *Traverse rail X*
2. *Distance plate*
3. *Flat bar*
4. *Screws*

See figure below for the distance between the traverse rails X.

The traverse rails X must be parallel in X direction ±2 mm.

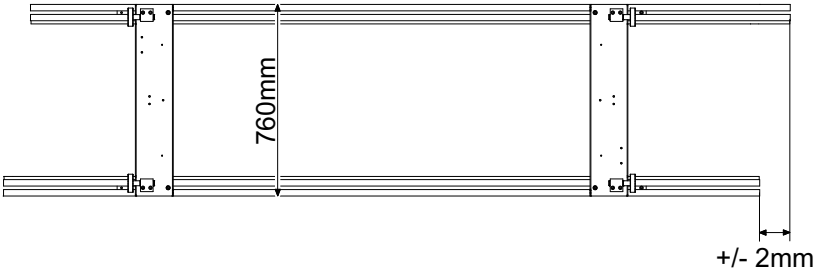


Fig. 4-7 Distance between traverse rails X

Install the end covers on the traverse rails X.

Fig. 4-8

Before installing the traverse rails X, check that the steel bar for the brakes is placed in the correct traverse rail X.

The placement of the steel bar for the brakes depends on the orientation of the ceiling wagon to secure the function of the brake X.

The steel bar for the brakes has to be placed on the same side of the ceiling wagon as the brake X.

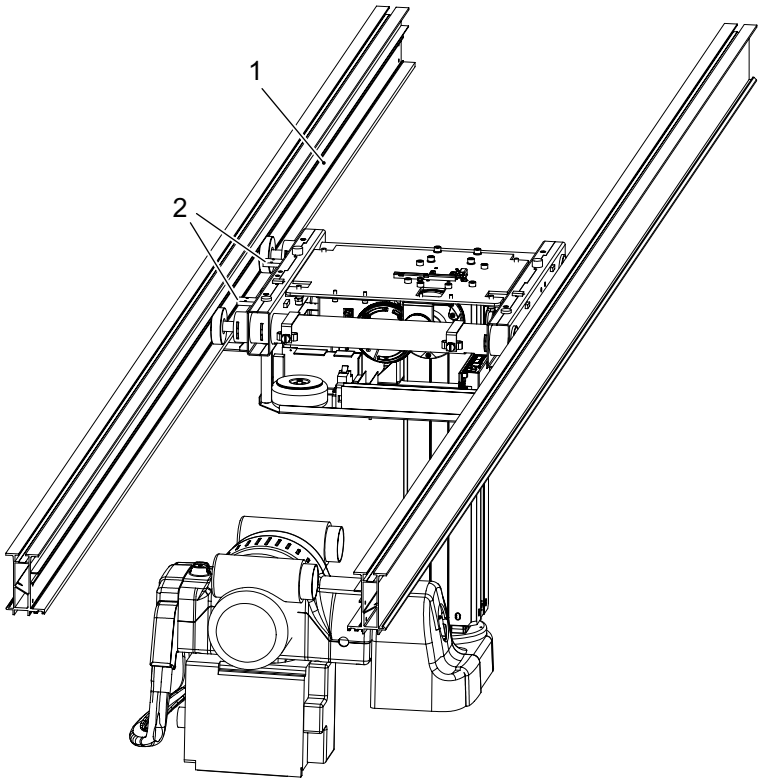


Fig. 4-9 Brake steel bars

1. *Steel bar for the brakes*
2. *Bracket for brake X.*

Lift up the traverse rails X and check that the wheel on the flat bar, see **Fig. 4-6**, ends up into the track of the ceiling rail Y.

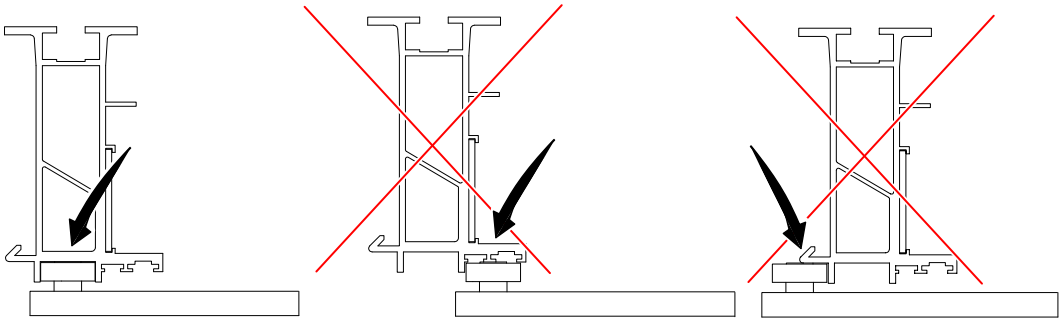


Fig. 4-10 Mounting traverse rail X

When the traverse rail X is in place, push out the wheels on the distance plates into the tracks on the ceiling rails Y, see picture A and B in **Fig. 4-12**.

The wheels must not be outside the tracks or too close to the ceiling rail Y, see figure below.

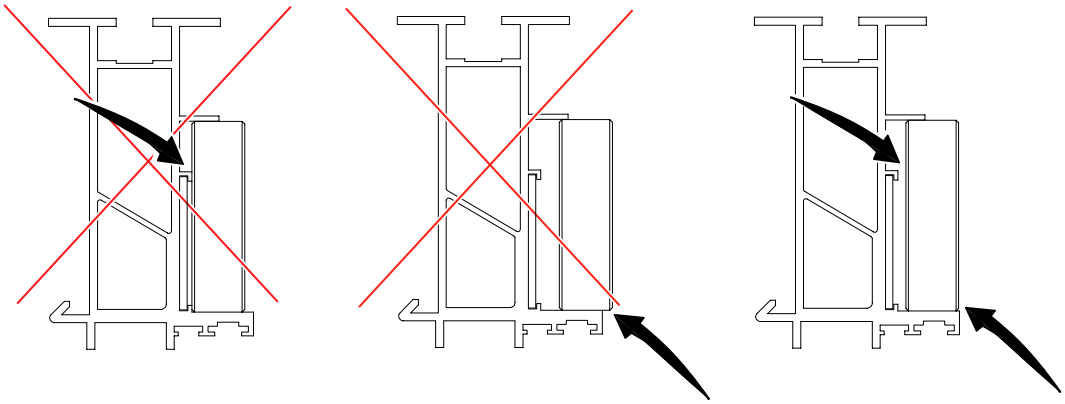


Fig. 4-11 Mounting of wheels

Install the set screws to lock the wheels when they are in position, also install the clamp ring into the shaft groove.

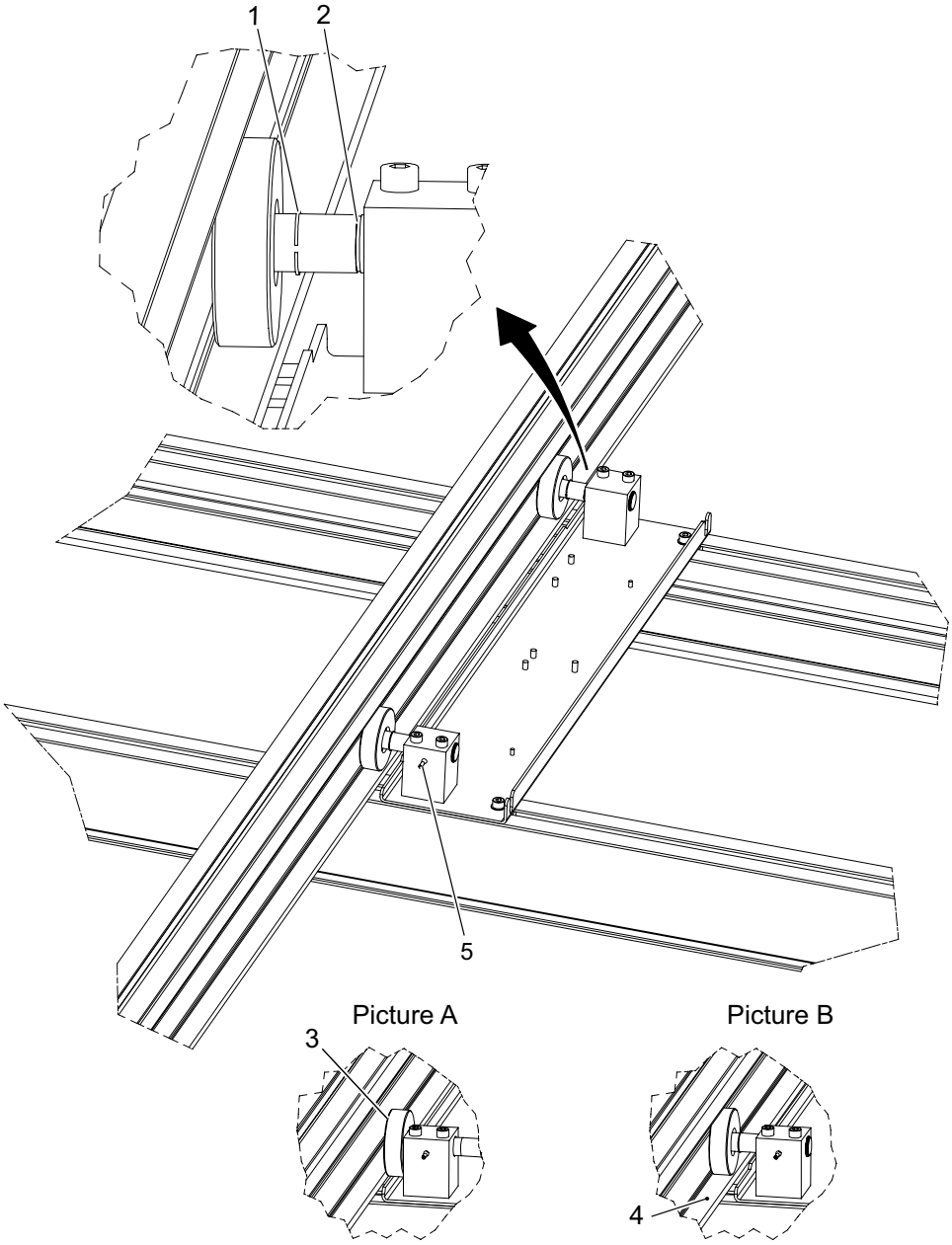


Fig. 4-12 Locking the wheels

1. *Clamp ring*
2. *Shaft groove*
3. *Wheel*
4. *Track*
5. *Set screw*

4.7.3 Y Brake

Note!

Having installed the brakes, it will not be possible to move the traverse until after the power-up.

Install the Y brakes on the distance plate, one on each distance plate.

Install the Y brakes against the steel bar for the brakes on the ceiling rail Y.

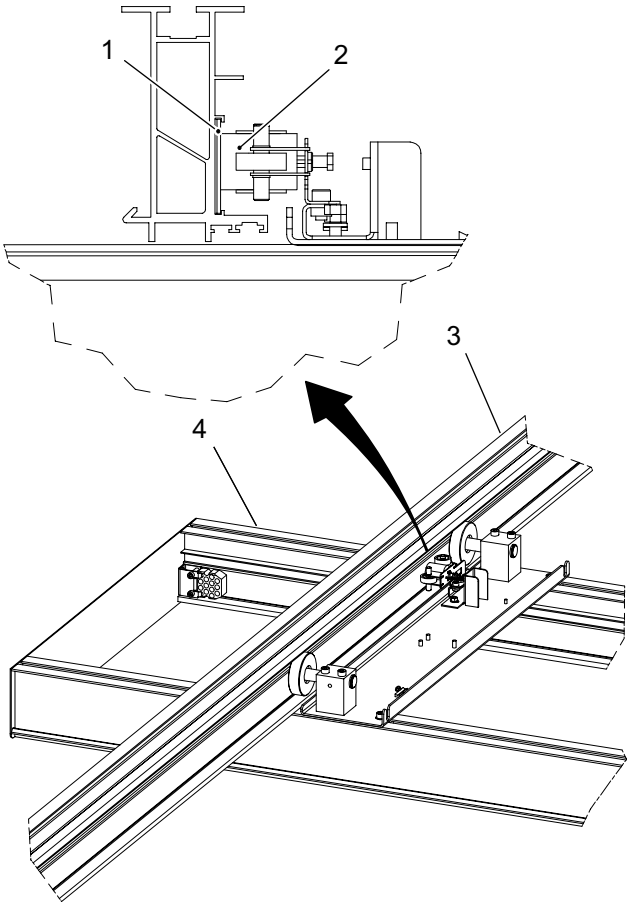


Fig. 4-13 Installing the Y brakes

1. *Steel bar for the brakes*
2. *Y Brakes*
3. *Ceiling rail Y*
4. *Traverse rail X*

4.7.4 Ceiling Wagon

Note!

Check the room layout for orientation of the ceiling wagon.

The ceiling wagon can either be lifted with the four enclosed rings (1), this shall be installed on top of the wagon, or lifted on the pallet with an industrial truck.

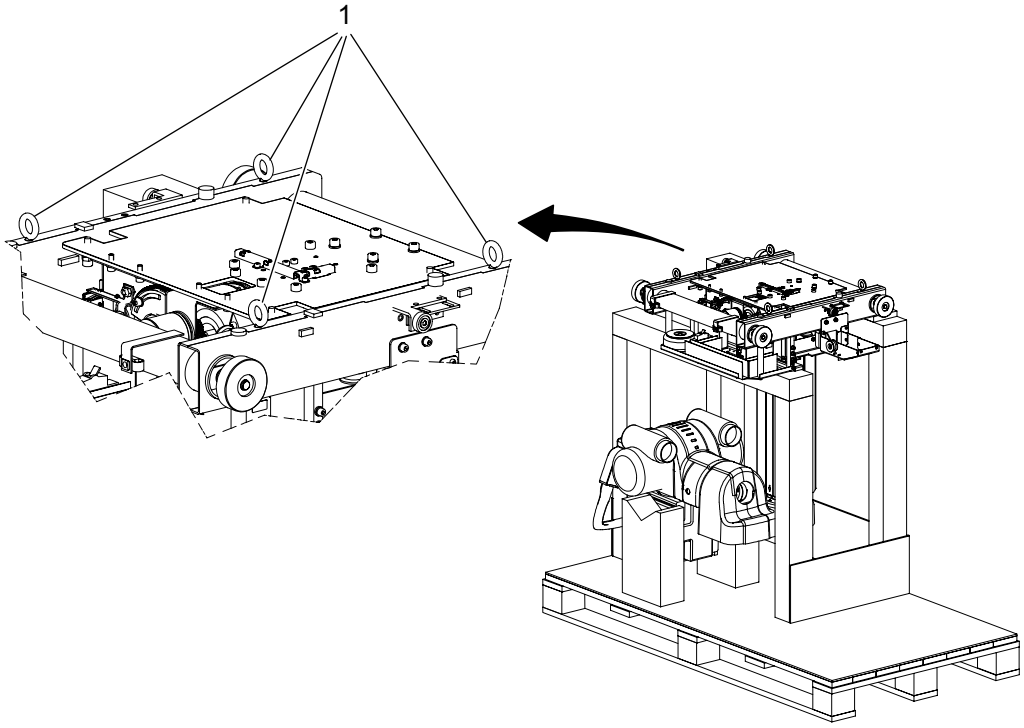


Fig. 4-14 Lifting ceiling wagon

Lift up the ceiling wagon and check that the side position bearings ends up into the track of the traverse rails X, see figure below and **Fig. 4-16**.

Check that the steel bar for the brakes is placed on the correct side of the ceiling wagon.

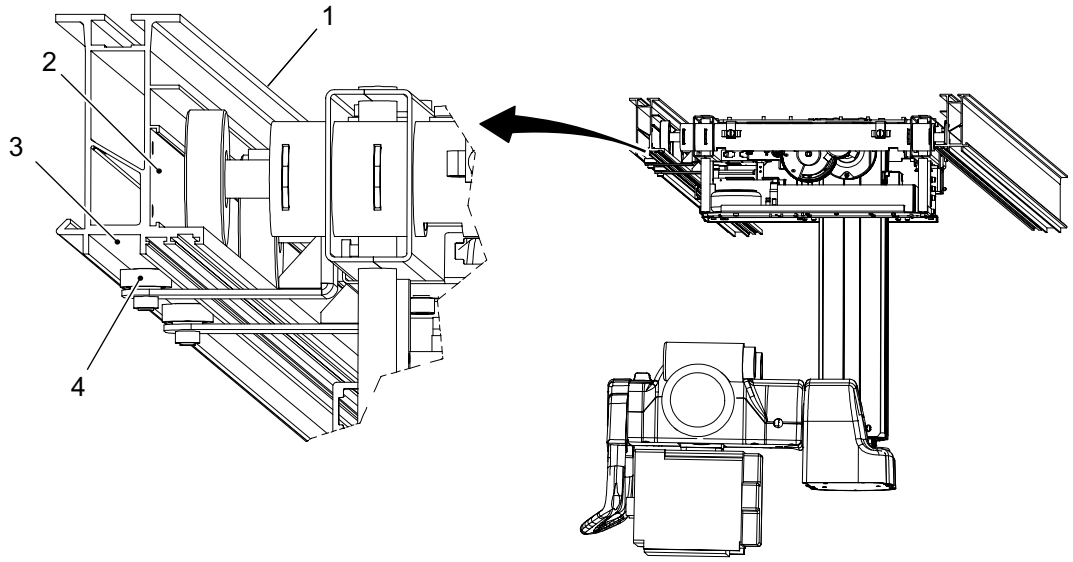


Fig. 4-15 Ceiling wagon

1. *Traverse rail X*
2. *Steel bar for the brakes*
3. *Track*
4. *Side position bearings*

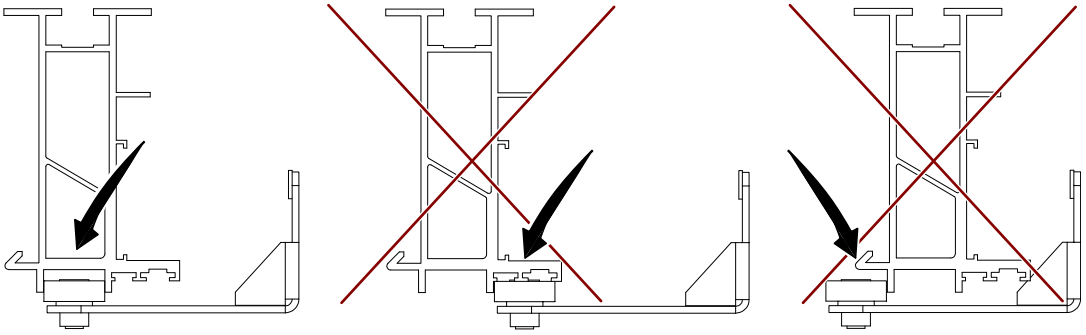


Fig. 4-16 Wheel position

Push out the wheels into the tracks on the traverse rails X, see picture A and B in **Fig. 4-12**.

The wheels must not be outside the tracks or too close to the traverse rails X, see **Fig. 4-11**.

When the wheels are in position, install the clamp rings into the shaft groove, see figure below.

Check that the ceiling wagon runs smoothly.

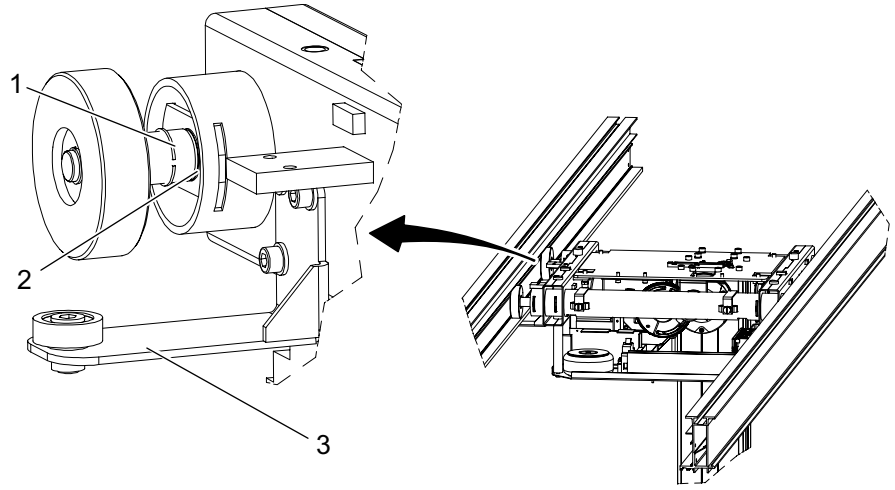


Fig. 4-17

1. *Clamp ring*
2. *Shaft groove*
3. *Side position bearings*

4.7.5 Install Safety Clamp Ring

Move the OTC manual to all positions in X, Y and Z direction and make sure it runs smoothly and sounds OK.

When the position is absolutely decided; Push the safety clamp ring (1) toward the clamp ring (2) as far as possible.

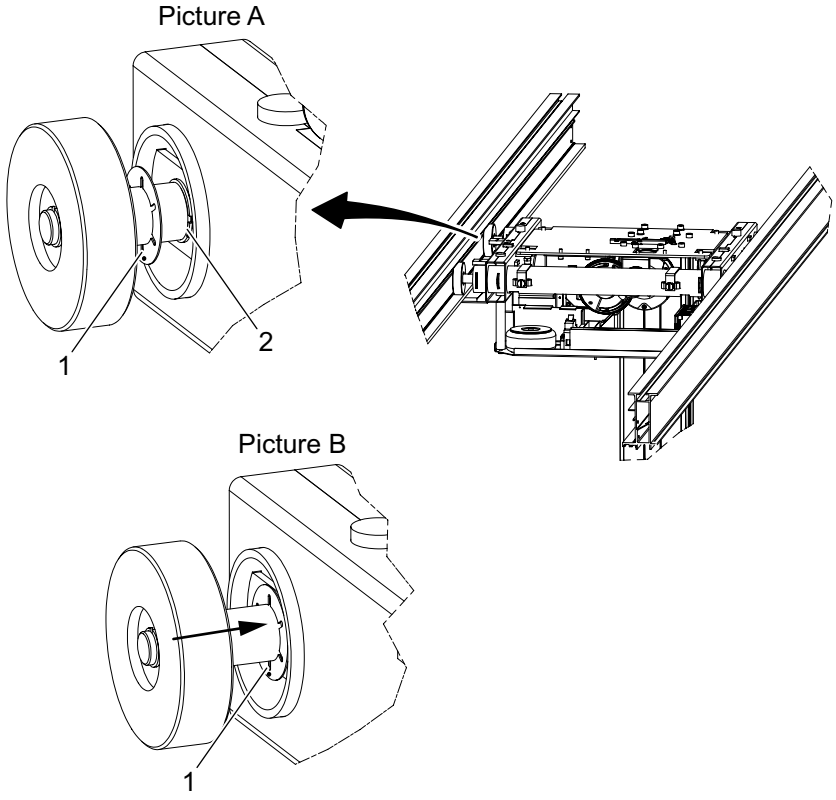


Fig. 4-18 Safety clamp ring

1. *Safety clamp ring*
2. *Clamp ring*

4.7.6 X-Brakes

Note!

Having installed the brakes, You will not be able to move the Ceiling stand until after the power-up.

Install the X brakes on the bracket on the ceiling wagon, see picture 1 in figure below, one on each bracket.

Install the X brakes against the steel bar for the brakes on the traverse rail X.

Connect both the X brakes according to picture 2, in **Fig. 4-19**.

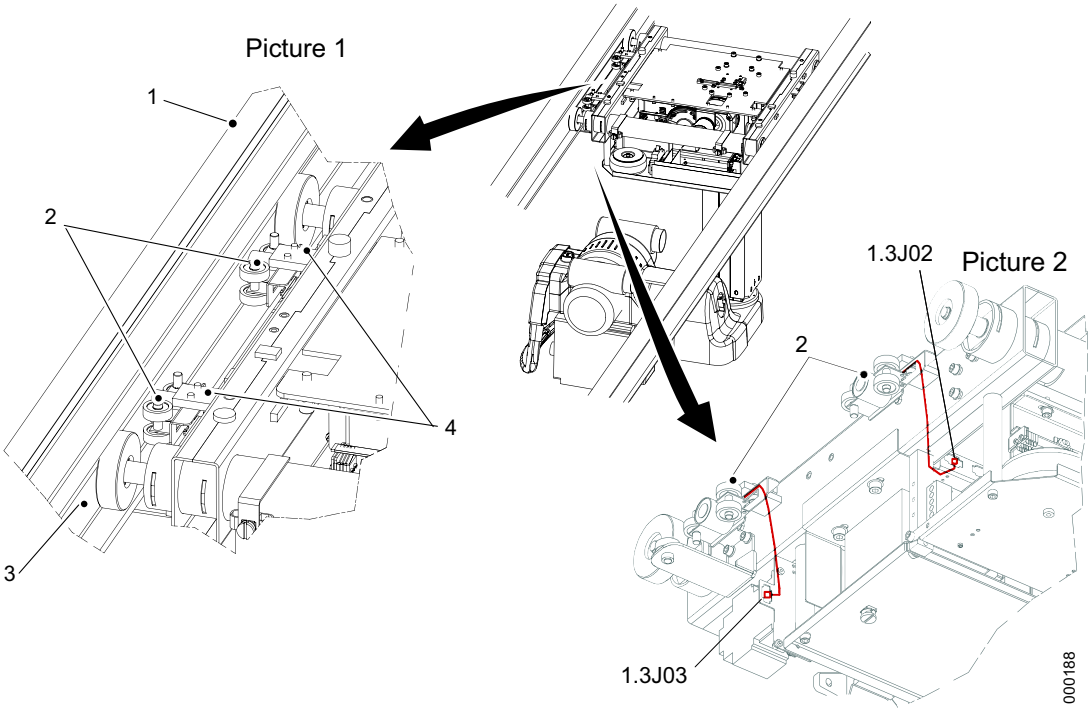


Fig. 4-19 X-brakes

1. *Traverse rail X*
2. *Brake X*
3. *Steel bar for the brakes*
4. *Bracket for brake X*

4.7.7 Cable Channel

Depending on the orientation of the ceiling wagon in the room, the cable channel can be installed on the left or the right side of the ceiling wagon.

Figure below shows how right respective left hose frame of the cable channel looks like.

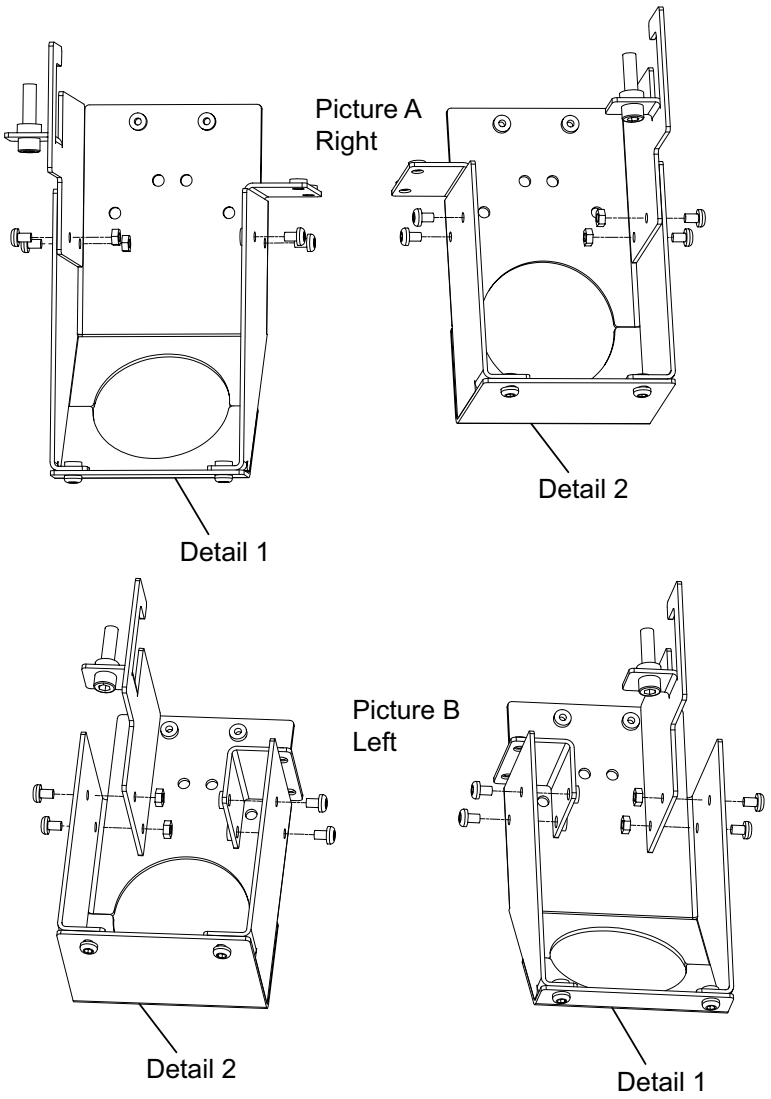


Fig. 4-20 Cable channel hose frames

Install the cable channel, see the figure, and tighten the screws (1) to lock the cable channel.

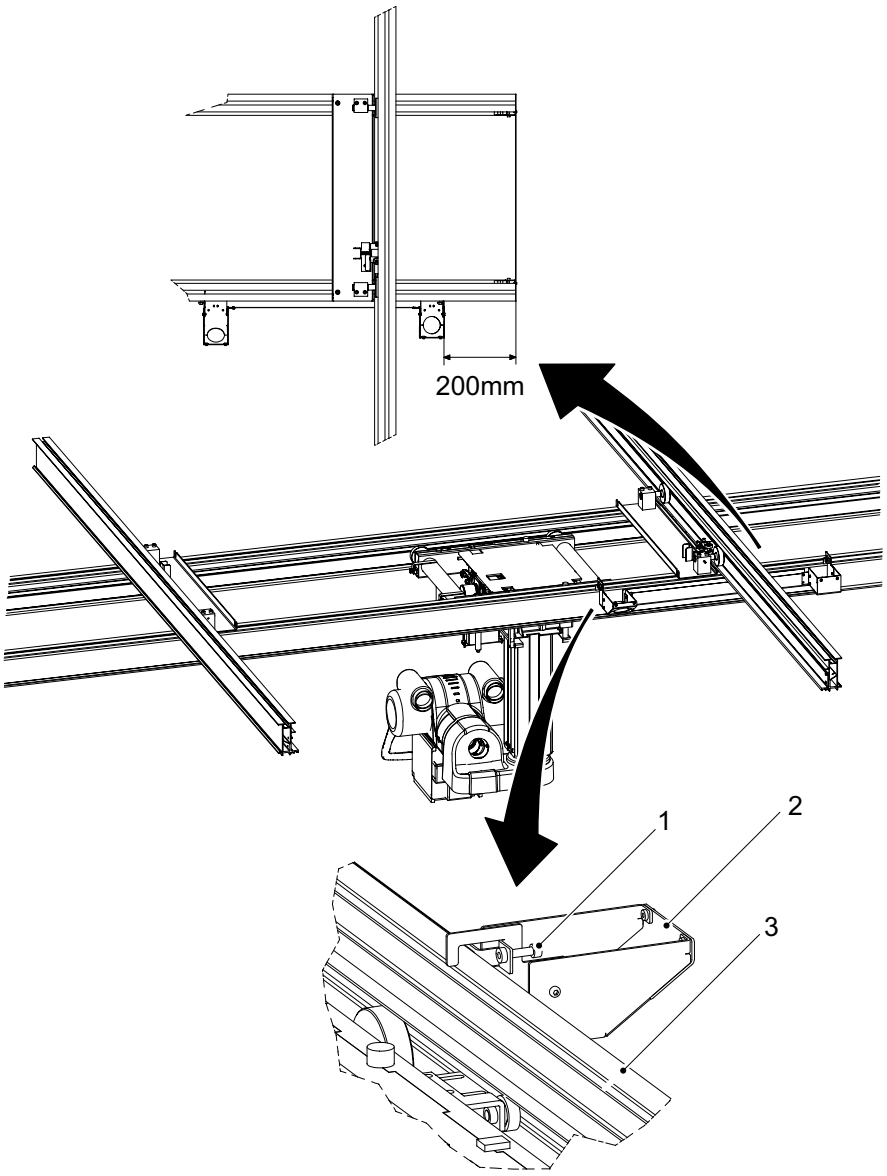


Fig. 4-21 Installing cable channel

1. *Screw*
2. *Cable channel*
3. *Traverse rail X*

4.7.8 Connect Brake Y

Connect the cables to the brakes Y according to figure below. For more information see Chapter Electrical drawings. Bundle remaining cable length and place it on top of the distance plates.

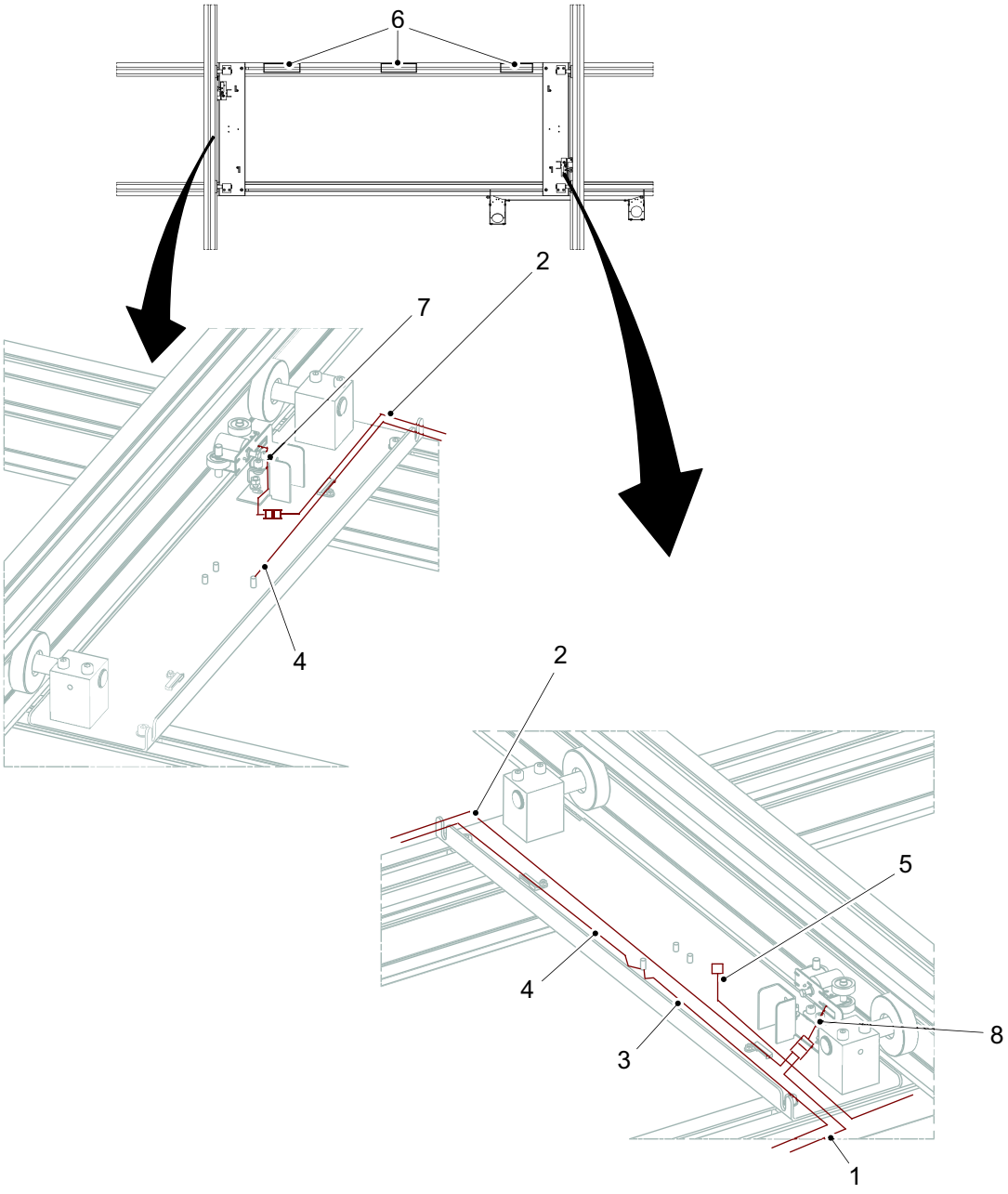


Fig. 4-22 Connecting cables to Y-brakes

1. *1,4BRA01*
2. *1,4BRA02*
3. *1,4PE01*
4. *1,4PE02*
5. *1,4SIG01 (option fail safe Y)*
6. *Tape*
7. *1,4 J03*
8. *1,4 J02*

To change the cable channel from right to left side, loosen the four screws according to picture C in **Fig. 4-23**.

Loosen the screws according to picture A in **Fig. 4-20**and switch place on the hose frames (detail 1 and 2).

Tighten the screws according to picture B in **Fig. 4-20** and D in **Fig. 4-23**. The cable channel can now be installed on the left side of the ceiling wagon.

Insert the cables inside the cable channel.

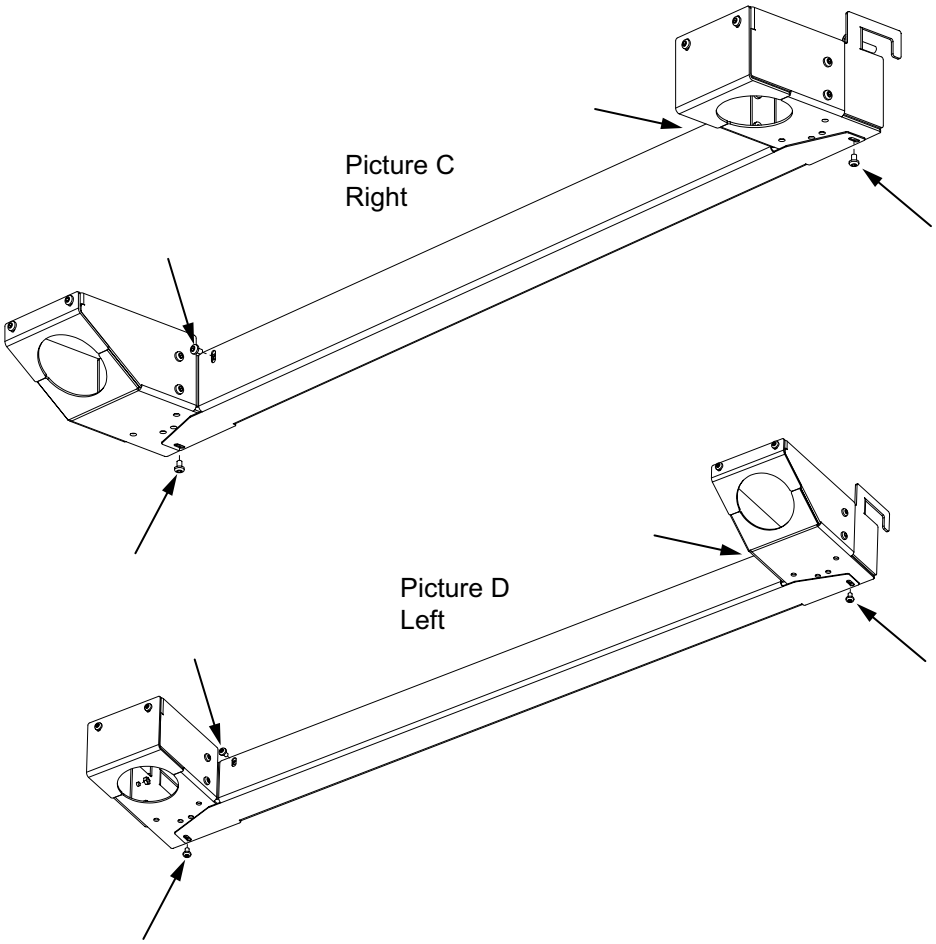


Fig. 4-23 Cable channels

4.7.9 Wall Attachment

Move the traverse rail X to its end position so the cable channel, installed on the traverse rail X, shall point toward the middle of the ceiling rail Y, according to figure below. If the OTC is not moved to its end position the hose may not be long enough when the OTC is positioning after installation.

Measure the distance A and install the wall attachment on half this distance (distance B) and at the same height as the ceiling rails Y. Use screws (M8x16), for locking the cable holder into the traverse. Shorten the hose if necessary after installing the wall attachment.

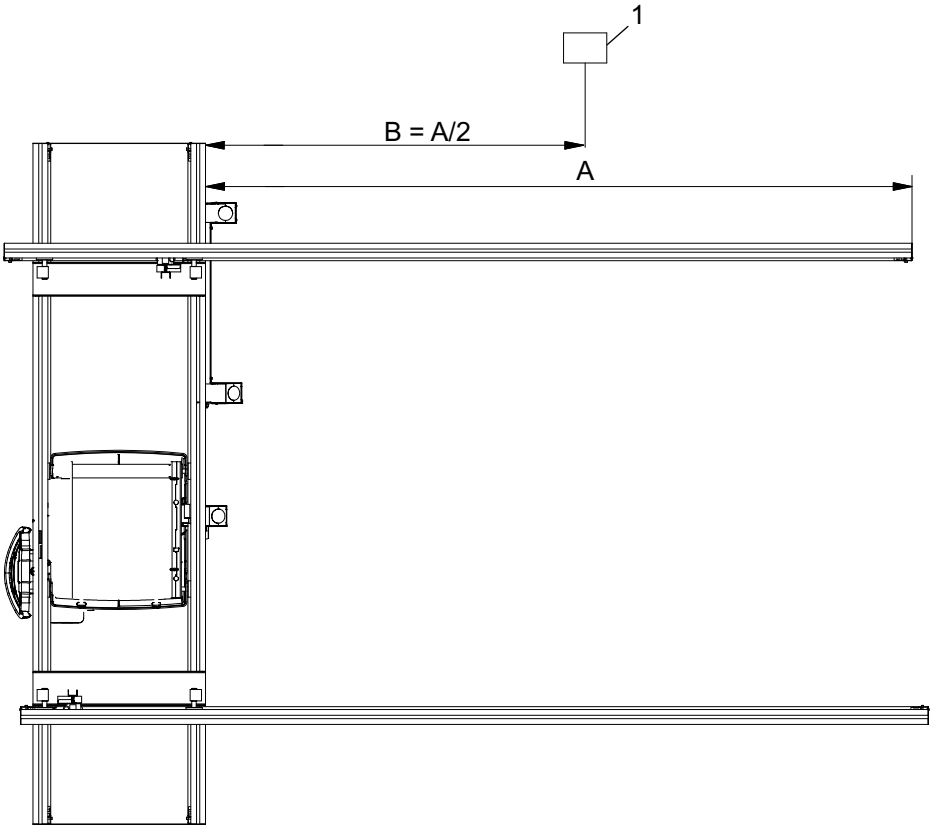


Fig. 4-24 Installing wall attachment

1. Wall attachment

4.8 Mechanical Installation of Cabinet

Place the cabinet in a corner of the room.

See the Planning Guide for further instruction of location in the room.

4.8.1 Cover for Cable Outlet

The corner marked (1) in figure below must be placed in one corner of the room. Depending on the installation of the cables from the OTC, Table and Wallstand, one of the cable outlets (2) is used.

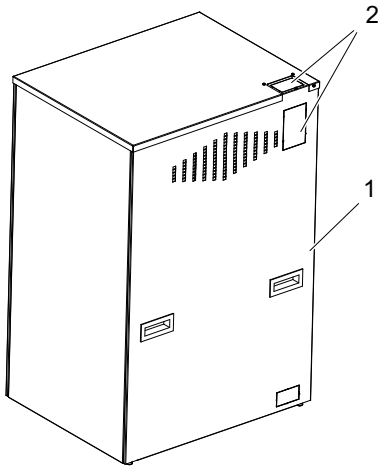


Fig. 4-25 Cable outlets

- Remove one of the covers to the cable outlets (2).
- The borders of the outlet have to be covered with the enclosed edging strip.

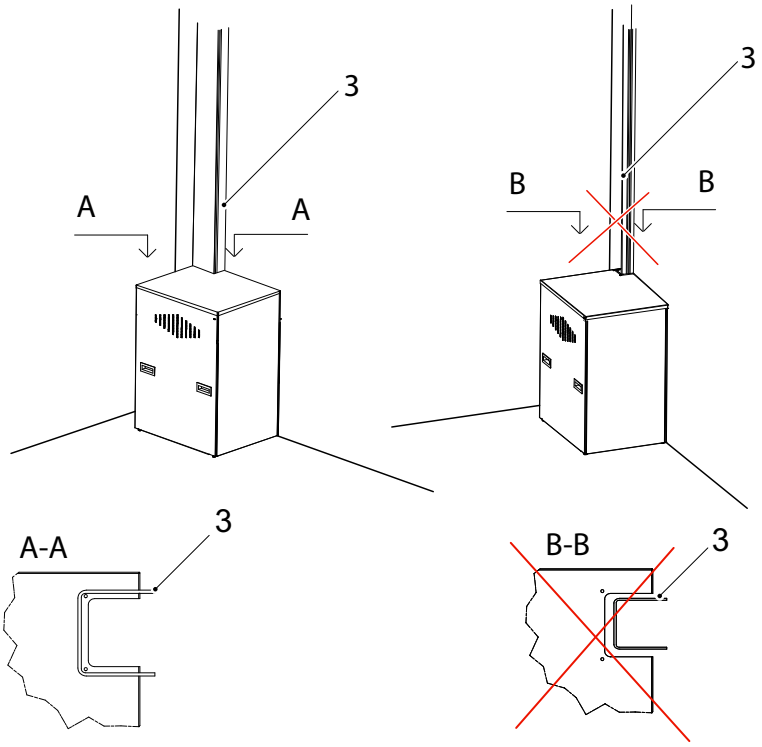


Fig. 4-26 Positioning cabinet

- The cables must be covered with a cable channel. The cable channel has to cover the cable outlet completely see section A-A up of and figure below. The cable channel should only be possible to open with a tool.
- The cables have to be secured with a cable clamp or a suitable strain relief.

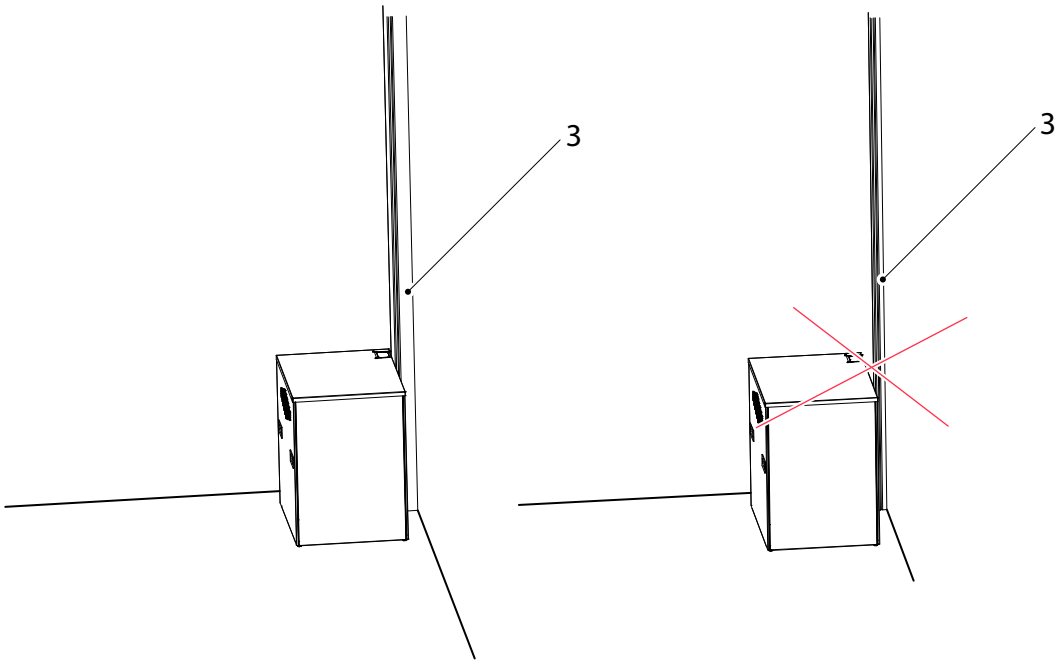


Fig. 4-27 Covered cables

4.8.2 Remove Covers, Cabinet

Open the top cover of the cabinet, by removing the two screws (one at each side). Raise the top cover and then fasten the cover in the raised position by fastening the screws in the new position. This will considerably improve the workspace.

Remove the front, right and back cabinet covers according to figure below, in the order that fits best.

Preferably the left cover (seen from the front) can stay mounted.

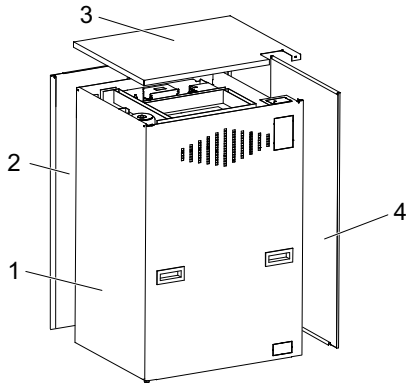


Fig. 4-28 Remove cabinet covers

Remove the following components from the system cabinet;

1 pc Cable CPI 732091–00	Control cable from generator to mini console.
1 pc Cable 90178000F	RS 232 cable from generator to Image system computer
1 pc Mini console	On/Off and exposure for generator/System

4.9 General

WARNING!

To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

WARNING!

All components shall be connected to the same earth connector on the System.

Note!

A disconnecting device from the mains shall be incorporated external to the equipment according to the national wiring rules.

4.9.1 Interfacing

to the following standards and local regulations.

- IEC 60601-1
- IEC 60601-1-2
- IEC 60601–2–54
- MDD 93/42/EEC

4.10 Cable Paths

The cable paths shall be as shown in **Fig. 4-29**.

CAUTION!

It is important to tie the cables carefully to the frame. Otherwise there is a cable squeezing hazard.

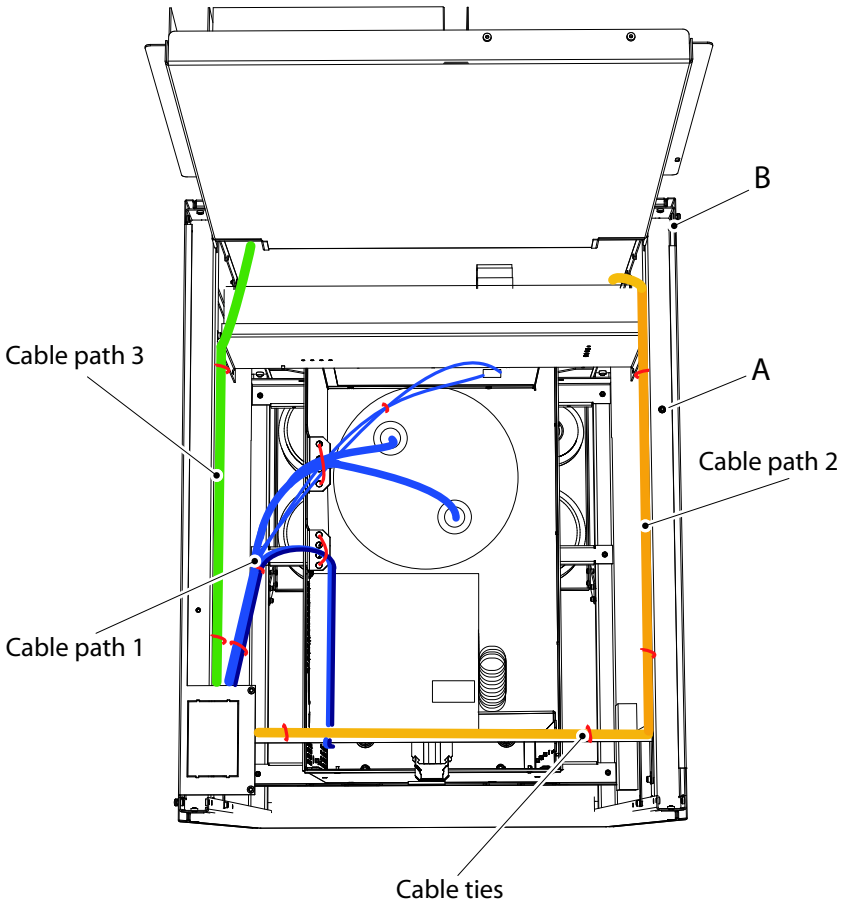


Fig. 4-29 Cable paths

1. *Cable path number 1 — to the generator.*
2. *Cable path number 2 — to the electrical plate 4.2.*
3. *Cable path number 3 — to the electrical plate 4.4.*

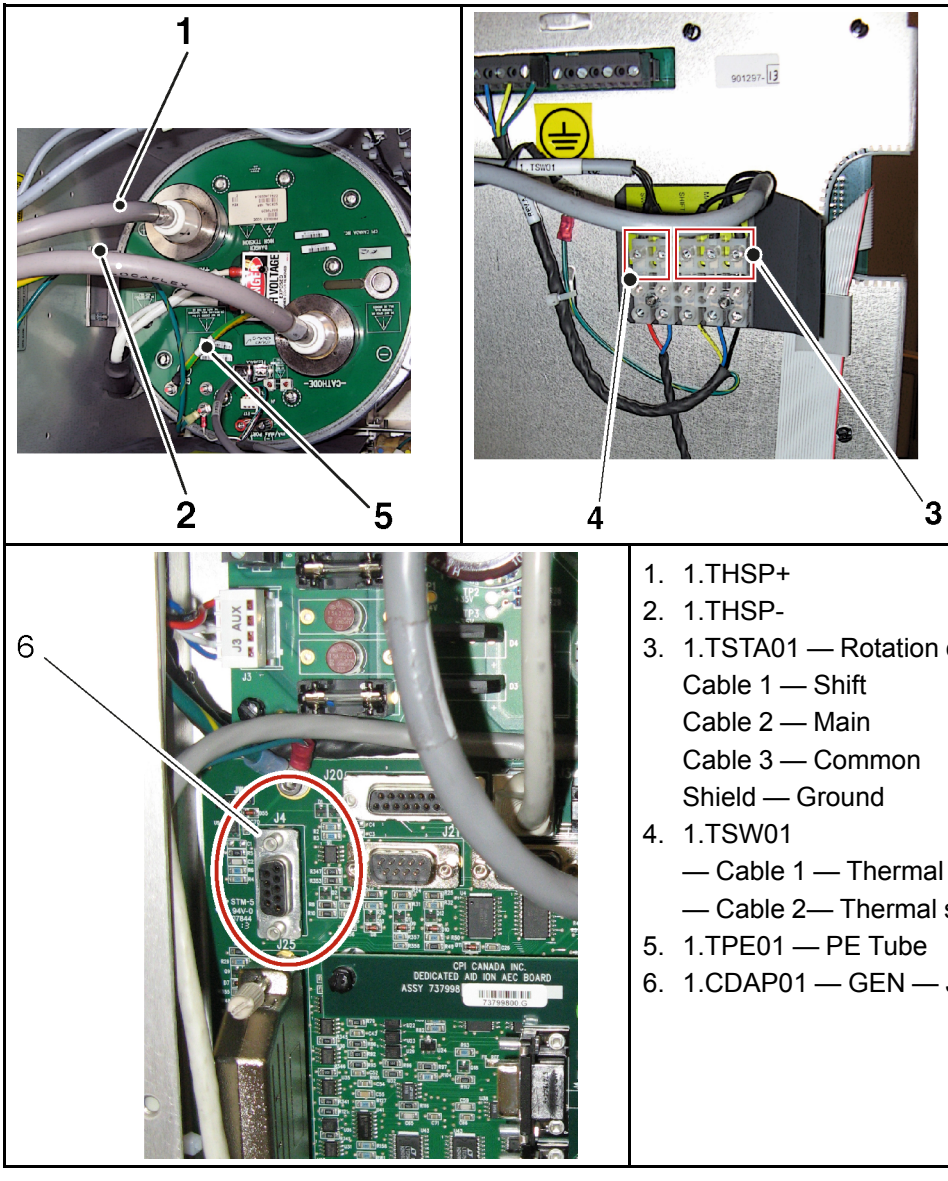
4.11 Electrical Installation of OTC

Note!

The installation cables from the overhead tube crane must be installed covered. They shall not be placed on the floor.

Lubricate the HSP connectors generously with silicone oil. Use the silicone gaskets.

Wiring to Generator, is made according to path 1, **Fig. 4-29**.



1. 1.THSP+
2. 1.THSP-
3. 1.TSTA01 — Rotation cable
   Cable 1 — Shift
   Cable 2 — Main
   Cable 3 — Common
   Shield — Ground
4. 1.TSW01
   — Cable 1 — Thermal switch
   — Cable 2— Thermal switch
5. 1.TPE01 — PE Tube
6. 1.CDAP01 — GEN — J4

Wiring to electrical plate 4.2 is made in accordance with cable path 2, **Fig. 4-29**.

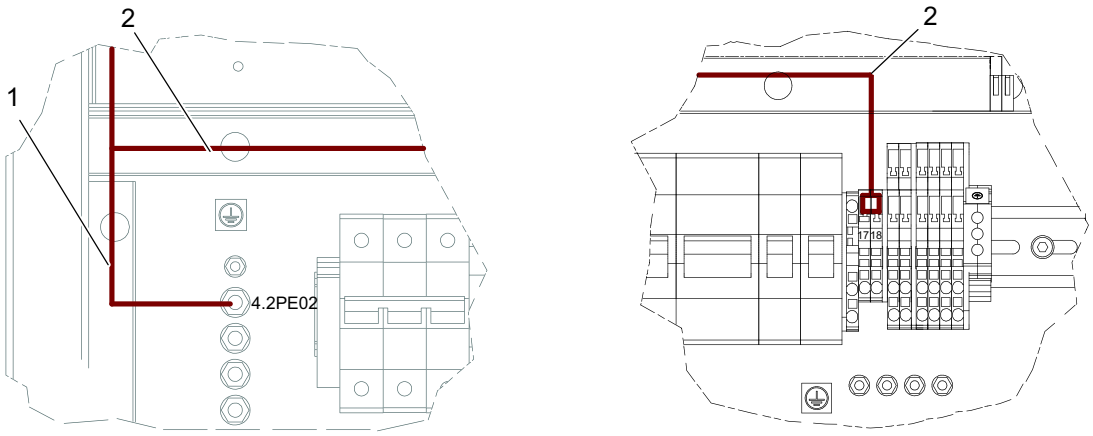


Fig. 4-30 Electrical plate 4.2

1. 1.3PE01

2. 1.1POW01

Wiring to electrical plate 4.4 is made in accordance with cable path 3, see **Fig. 4-29**.

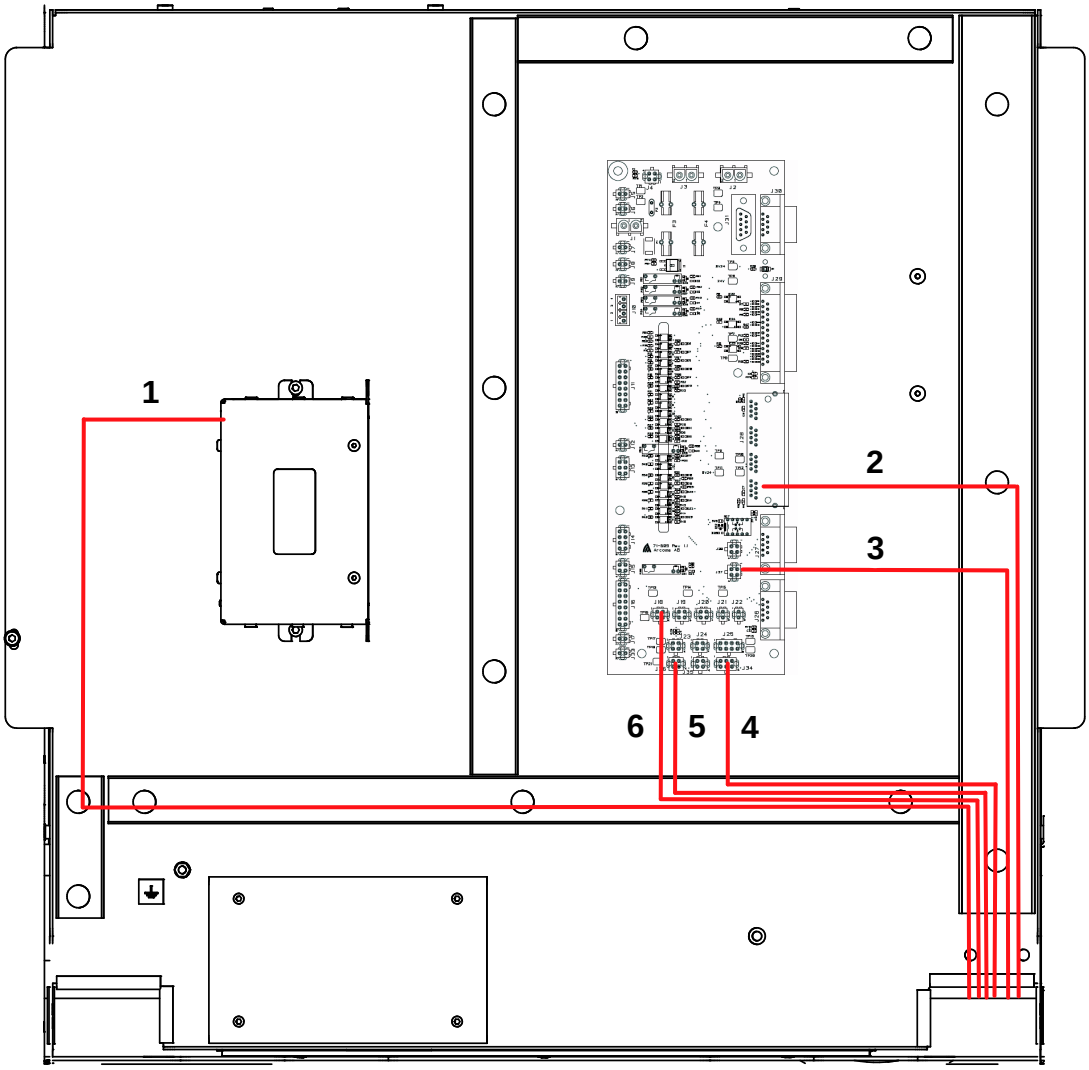


Fig. 4-31 Electrical plate 4.4

1. 1.1DSP01	*4.4CB800_01–J0*
2. 1.1CAN02	*4.4FIB01 J28–P1*
3. 1.1SIG01	*4.4FIB01–J37*
4. 1.1FS01	*4.4FIB01–J34*
5. 1.4SIG01	*4.4FIB01–J36*
6. 1.1EM01	*4.4FIB01–J18*

4.11.1 External Exposure Switch

There is an option to connect an external exposure switch at J20, see **Fig. 4-32**

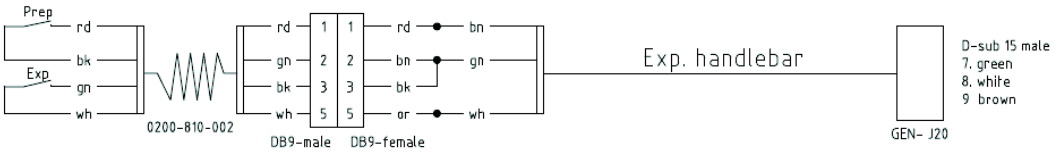


Fig. 4-32

4.12 Install Imaging System

Below is the configuration upon delivery.

Note!

It is up to the installer to customize the configuration for the customer needs.

There are 6 receptors (to the 3 power boxes).

The green indication light on the Table will activate on selection of a Table APR.

The green indication light on the Wallstand will activate on selection of a Wallstand APR.

1. **Receptor 1**

- is used for a fixed detector in the Table,
- or a portable detector placed in the Table detector holder.

AEC will be ON.

This receptor shall be used for all APR's where the detector is to be placed in the detector holder of the Table.

2. **Receptor 2**

- is used for a portable detector **on** the Table top.

AEC will be OFF.

This receptor is used for all APR's where the detector shall be placed **on** the Table top, or nearby the Table.

It is important to setup the receptor symbols on the Canon side so it matches the intended examination.

If the 801–detector is connected to the "first Canon power box", the one in the control room, the receptor 2 may be used for the 801.

3. **Receptor 3**

- is used for a fixed detector in the Wallstand
- or a portable detector placed in the Wallstand detector holder.

AEC will be ON.

This receptor shall be used for all APR's where the detector is to be placed in the detector holder of the Wallstand.

4. **Receptor 4**

- is used for a portable detector, related to the Wallstand.

AEC will be OFF.

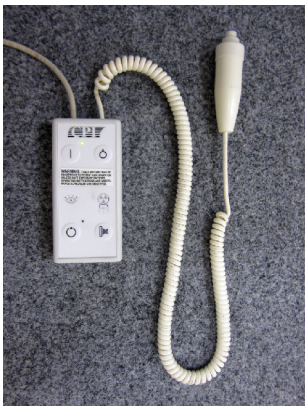
5. **Receptor 5**

- is used when using a third Canon power box connected to a portable detector, free in the room.

4.13 Electrical Installation of CPI Mini Console

Position the Mini console in the operation room and connect cable CPI 732 091–00 between the mini console and the cabinet.

Connect the Canon cable 90178000F between the generator and the Image system computer.

	
Connecting Mini Console	Cable 732 091–00 is hanging, rolled together, inside the cabinet.

Wiring shall be made according to path 1.

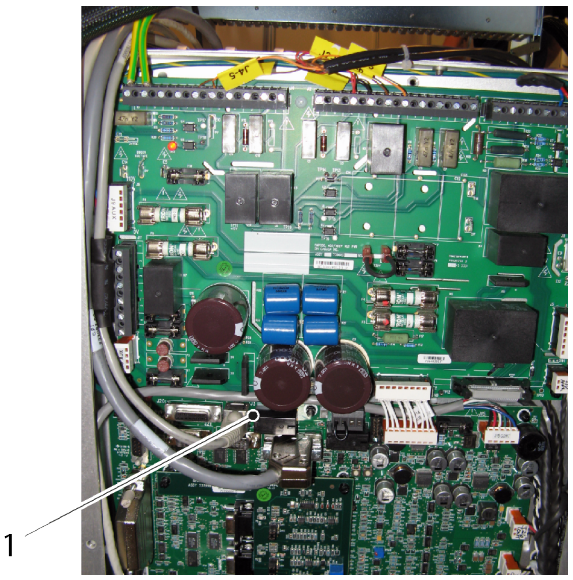


Fig. 4-33 Connecting CPI mini console

1. Cable 90178000F — J3

4.14 Wireless Detector

When using a wireless detector in Wallstand or Table, an X-ray interface box for the detectors, is assembled inside the Cabinet. For location, see **Fig. 4-34**

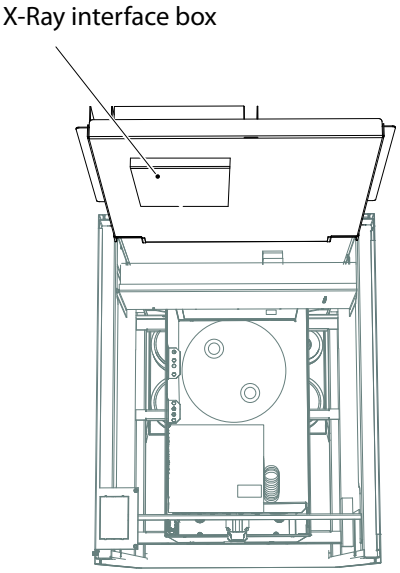


Fig. 4-34 X-ray interface box

4.15 Electrical Building Installation

The Machinery Directive 2006/42/EC requires the System to be fitted with means to isolate it from all energy sources.

Note!

When Service or Maintenance will be performed, the technician shall lock the equipment from all energy sources.

Note!

A disconnecting device from the mains shall be incorporated external to the equipment according to the national wiring rules.

- 3 Phase VAC +/- 10%
- 400 VAC 50 Hz
- 400 VAC with neutral 50 Hz
- 480 VAC 60 Hz
  Maximum wire gauge 4 AWG (25 mm^2)
- Required fuse 63A, 3–phase, b-curve

Generator Series and Mains Voltage	Minimum Recommended **Mains Disconnect to Generator (15 ft/5 m maximum)**	**Generator Momentary Line Current**	Minimum Recommended **Generator Service Rating**	Minimum Recommended **Distribution Transformer Rating**	Minimum Recommended **Ground Wire Size**	**Apparent Mains Resistance**
50kW 400 VAC, 3p.	(13.3 mm^2)	100 A	100 A	65 kVa	(13.3 mm^2)	0.17 Ω
65kW 400 VAC, 3p.	(13.3 mm^2)	125 A	100 A	85 kVa	(13.3 mm^2)	0.13 Ω
80kW 400 VAC, 3p.	(13.3 mm^2)	155 A	100 A	105 kVa	(13.3 mm^2)	0.10 Ω
50 kW480 VAC, 3p.	(13.3 mm^2)	80 A	100 A	65 kVa	(13.3 mm^2)	0.24 Ω
65 kW480 VAC, 3p	(13.3 mm^2)	105 A	100 A	85 kVa	(13.3 mm^2)	0.19 Ω
80 kW480 VAC, 3p	(13.3 mm^2)	130A	100 A	105 kVa	(13.3 mm^2)	0.15 Ω

Recommended Service Disconnect (as per the above table):

- All wiring and grounding should comply with the national electrical code or equivalent.
- All wiring must be copper.
- The disconnecting switch shall be located within reach of the operator.

4.15.1 Tap configuration 400 VAC

Having selected the voltage, make a mark at the system serial number label, at the related check box for the power rating.

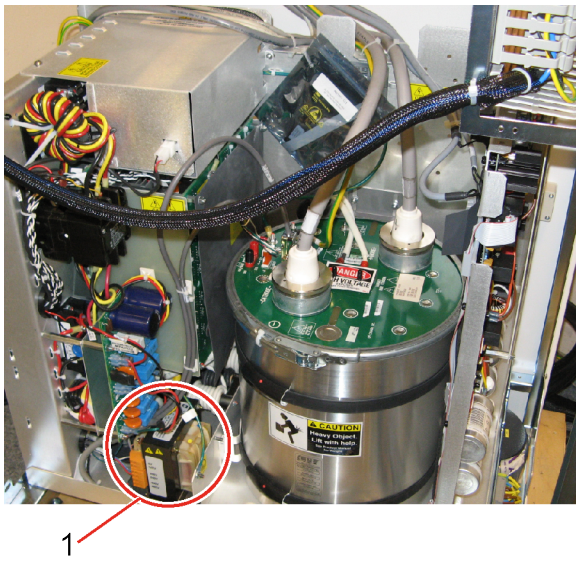


Fig. 4-35 400VAC

1. *Position of generator transformer.*

Check that the red wire is connected to 400V, at the generator transformer. See **Fig. 4-36**

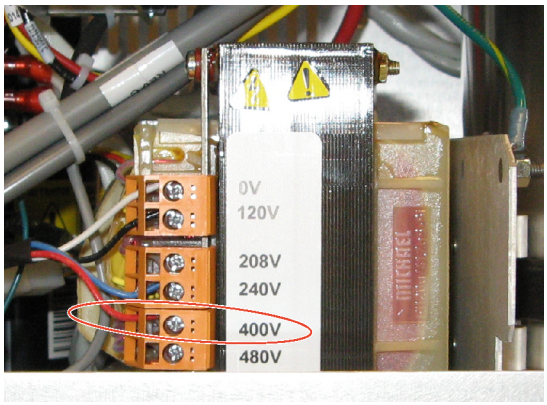


Fig. 4-36 Connection 400V

When changing voltage, set the DIP switch SW3–8 according to the mains voltage. See **Fig. 4-37**

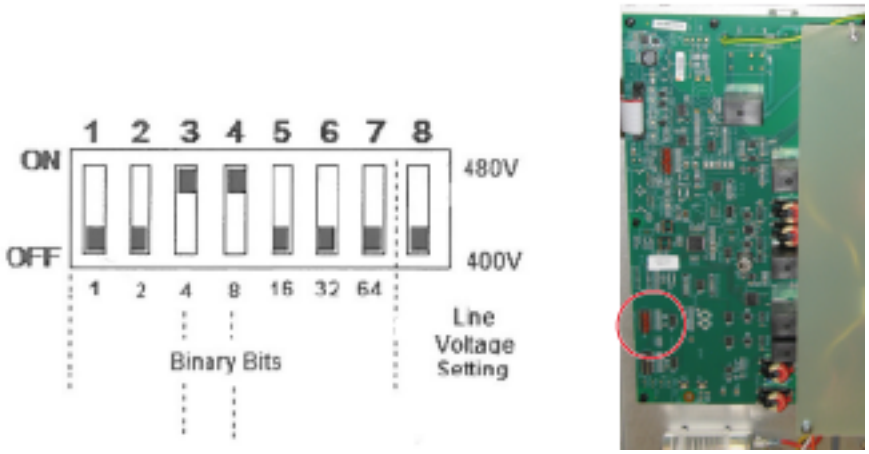


Fig. 4-37 400V, DIP switch SW3–8

Make sure the wire (A) is connected according to **Fig. 4-38**.

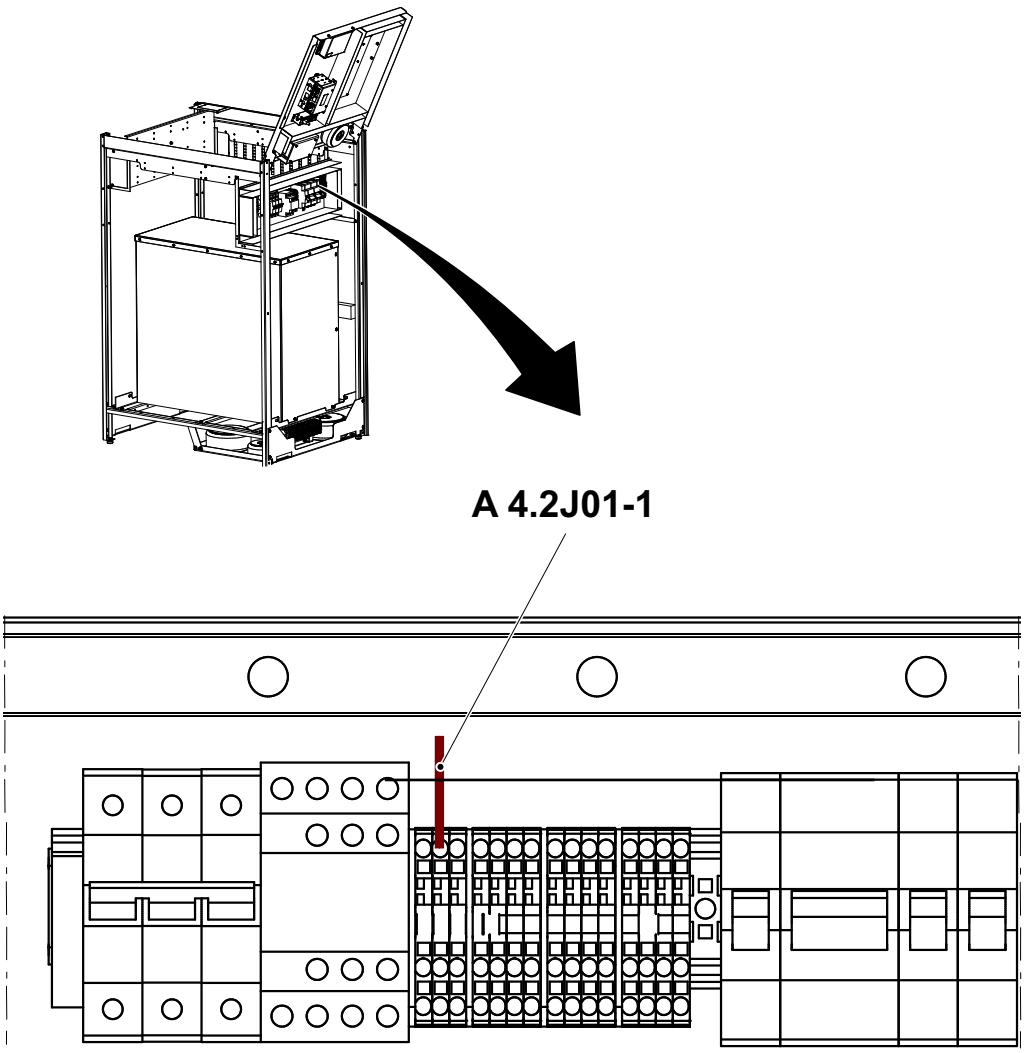


Fig. 4-38

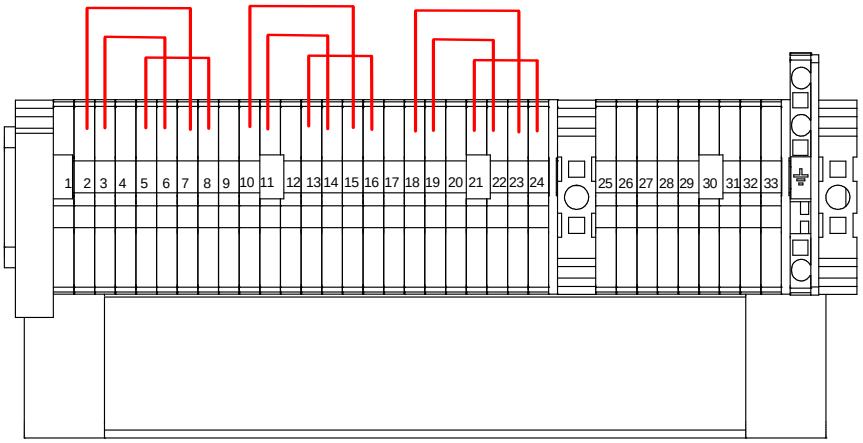


Fig. 4-39 380V

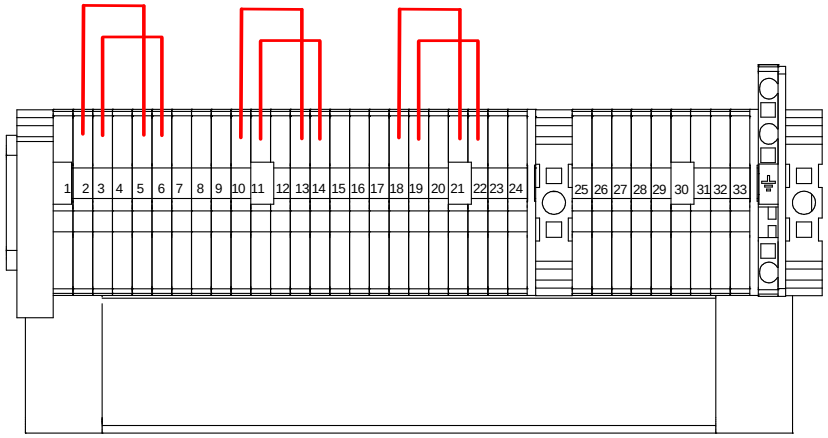


Fig. 4-40 390V

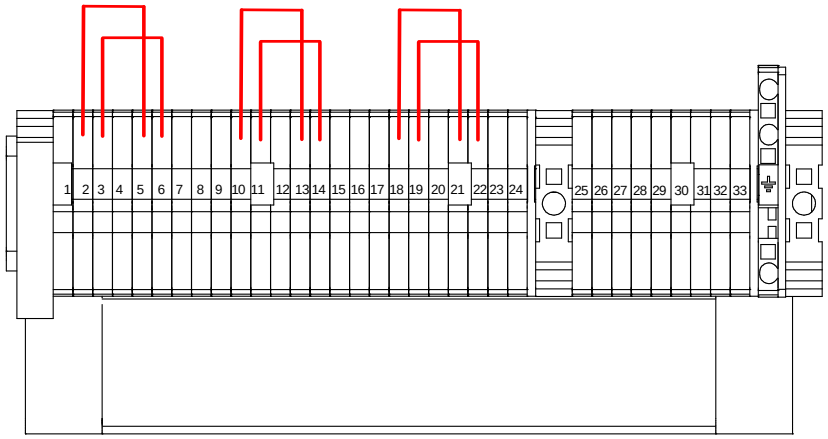


Fig. 4-41 390V

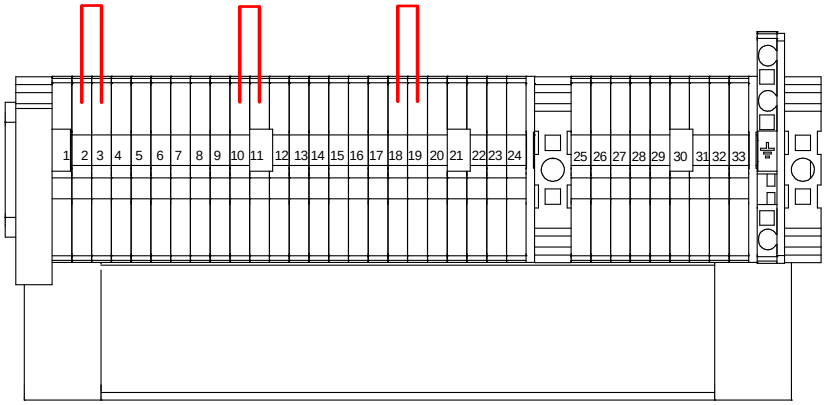


Fig. 4-42 400V

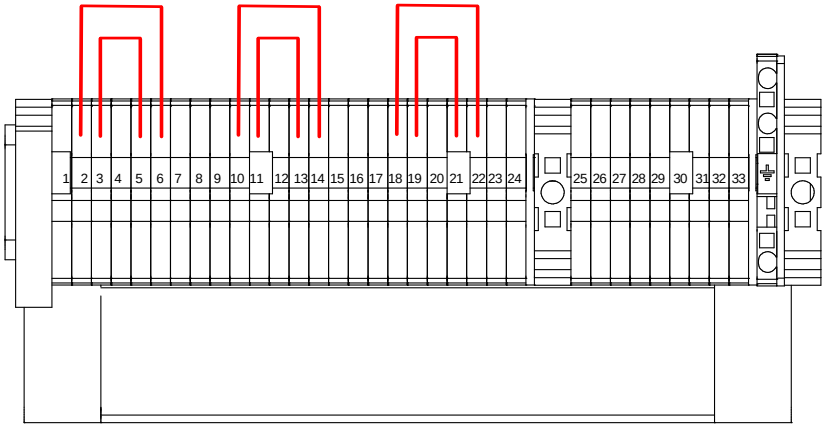


Fig. 4-43 410V

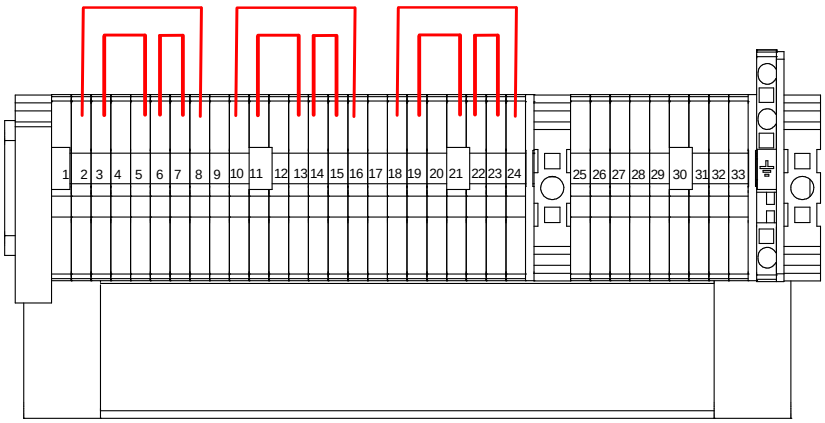


Fig. 4-44 420V

4.15.2 Tap configuration 480 VAC

Having selected the voltage, make a mark at the system serial number label, at the related check box for the power rating.

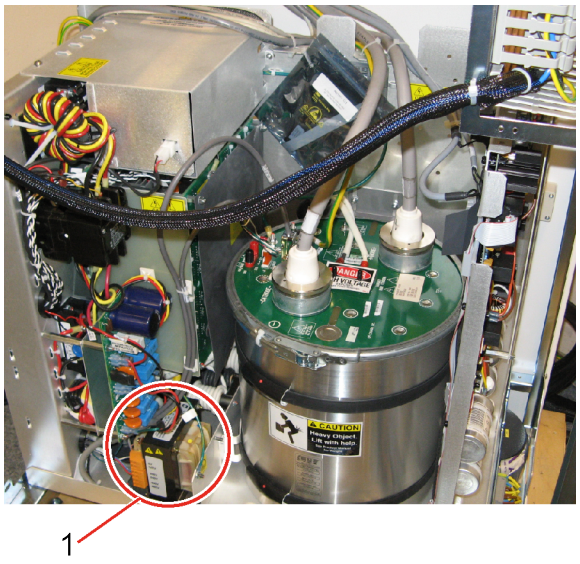


Fig. 4-45 480VAC

1. *Position of generator transformer.*

Check that the red wire is connected to 480 V, at the generator transformer. See **Fig. 4-46**

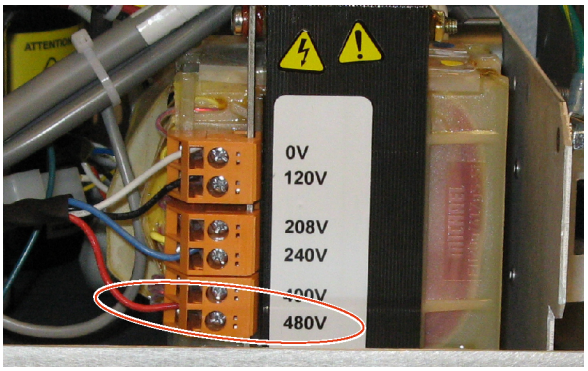


Fig. 4-46 480V connection

When changing voltage, set the DIP switch SW3–8 according to the mains voltage. See **Fig. 4-47**

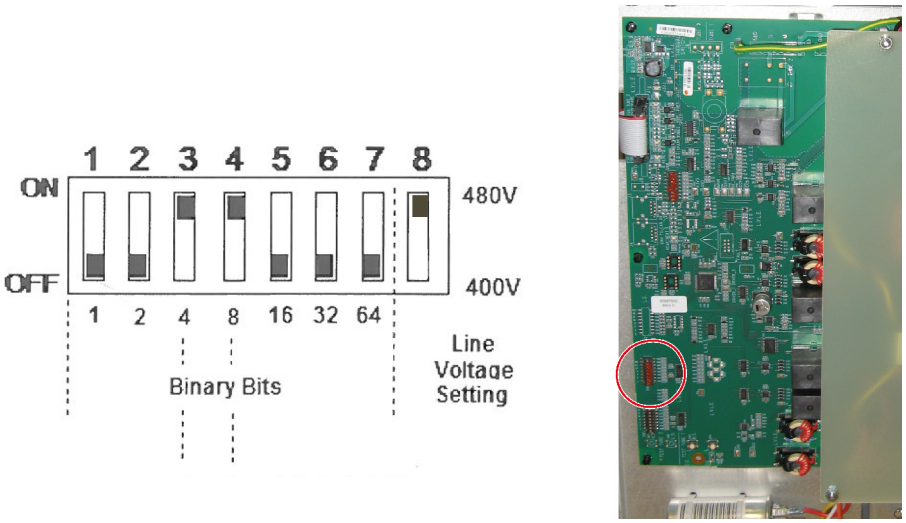


Fig. 4-47 480V, DIP switch SW3–8

Make sure the wire (A) is connected according to figure.

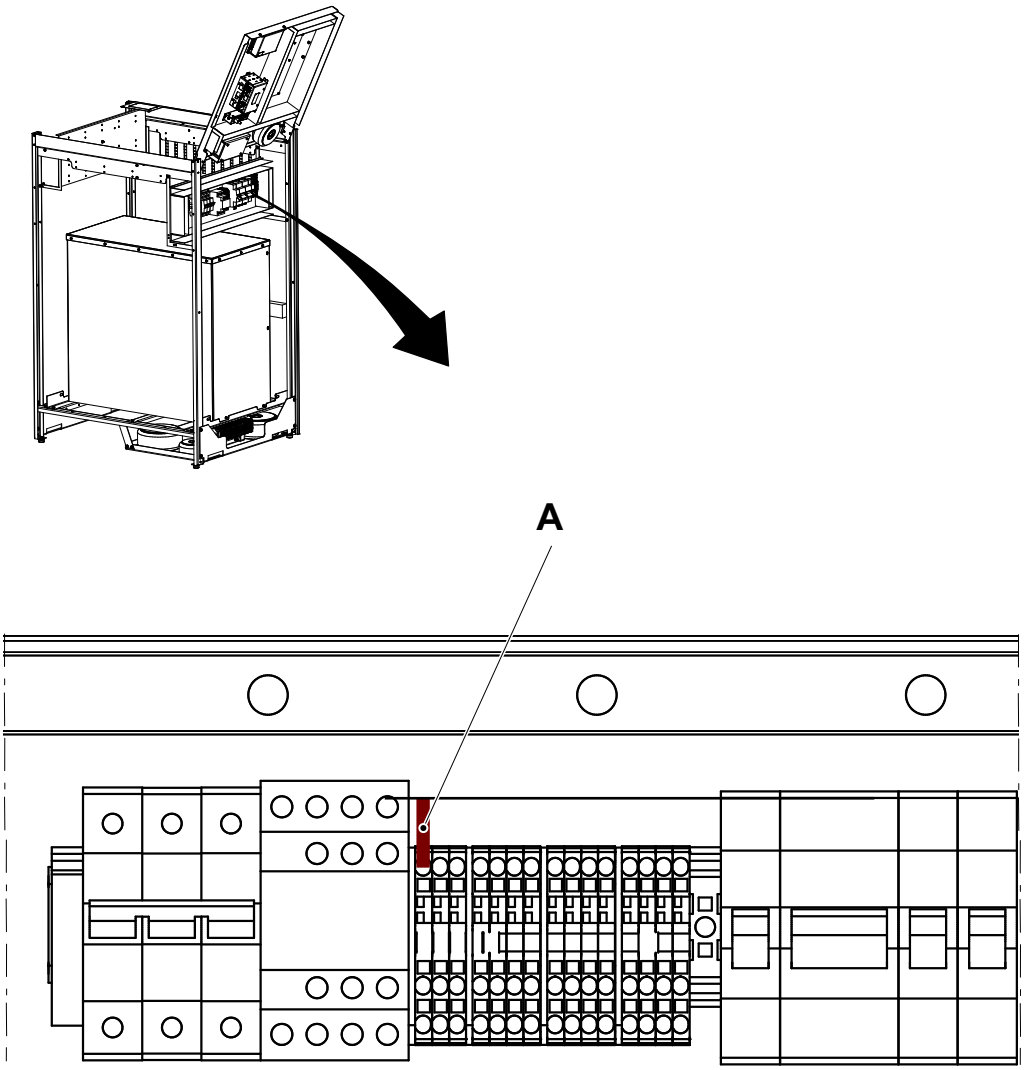


Fig. 4-48

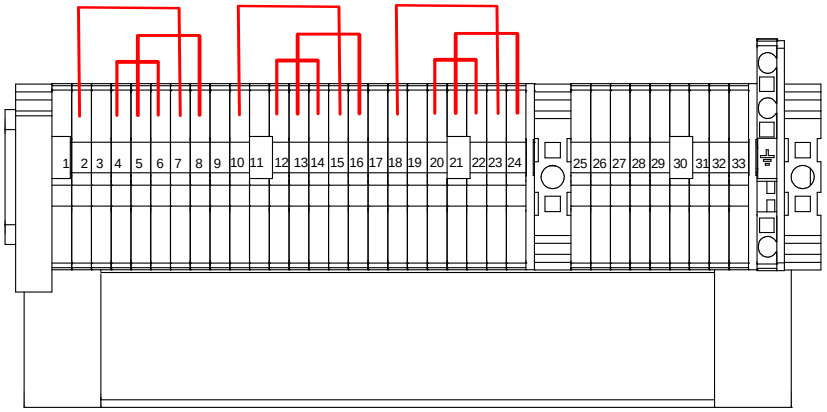


Fig. 4-49 460V

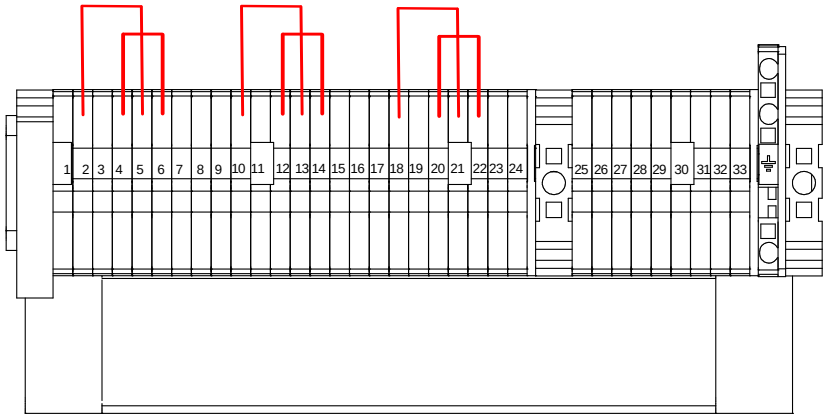


Fig. 4-50 470V

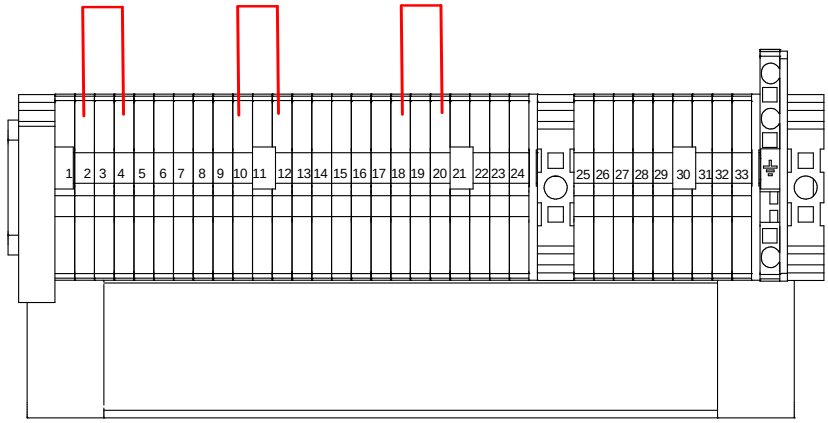


Fig. 4-51 480V

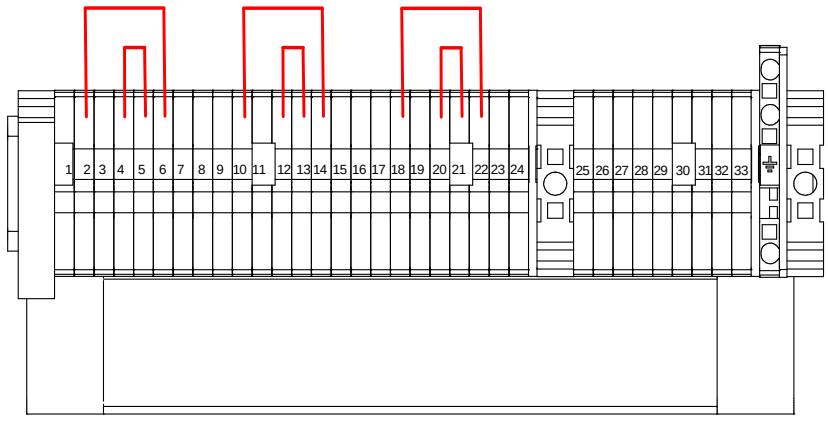


Fig. 4-52 490V

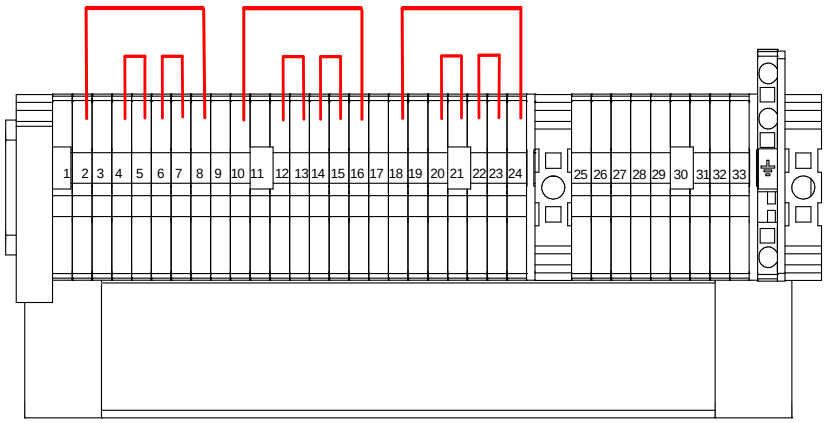


Fig. 4-53 500V

4.15.3 Mains

Connect mains power and mains protective earth according to **Fig. 4-54**.

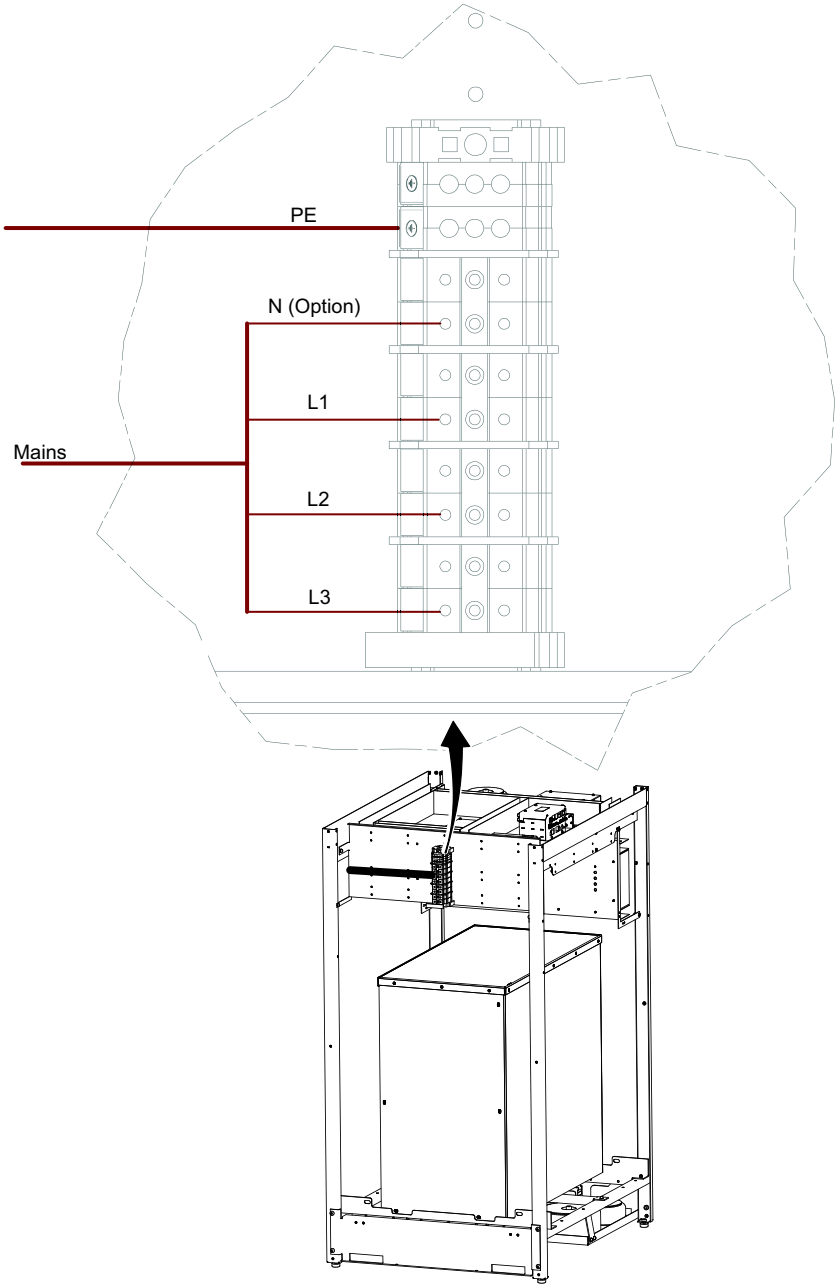


Fig. 4-54 Connecting mains power and mains protective earth

4.16 Start-up Procedure

4.16.1 Check Voltage of the Subsystem

Switch off (press down) the fuses according to picture 1 in **Fig. 4-55**, and switch on the power to the System from the mains switch.

Measure at the fuse 4.2F02 and 4.2F05 according to picture 2 in **Fig. 4-55**.

- U1 = 230V +/-10%
- U4 = 230V +/-10%

If the measured value fails to correspond with the levels listed above, check the tap configuration.

If the measured values correspond with the levels listed above, switch on (press up) 4.2F02.

Switch on the power to the system from the generator console *"On"* button according to picture 3 in figure.

Measure at the 4.2F03 and 4.2F04 according to picture 2.

- U2 = 230V +/-10%
- U3 = 230V +/-10%

If the measured values correspond with the levels listed above, switch off the power at generator console *"Off "* button (picture 3 in figure) and switch on (press up) 4.2F03, 4.2F04 and 4.2F05.

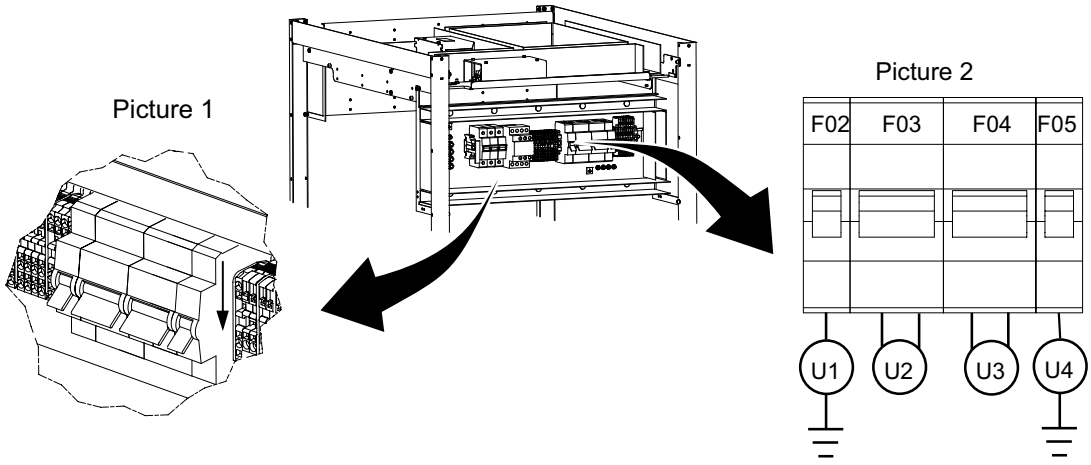


Fig. 4-55 Checking power of the subsystem

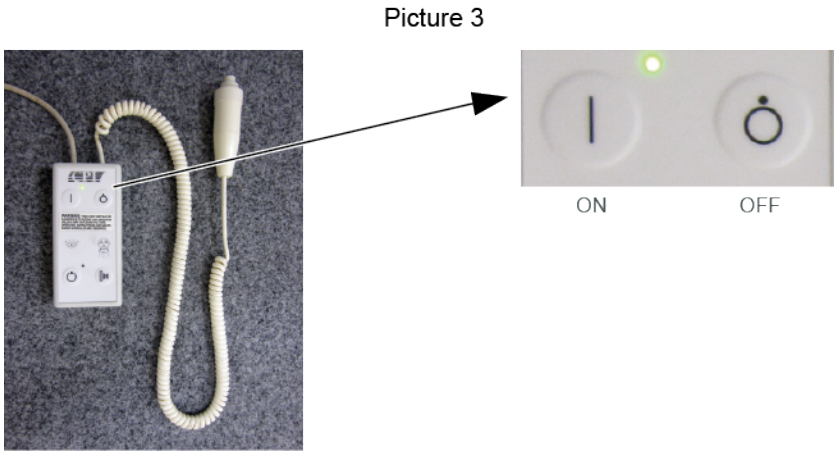


Fig. 4-56 Power switch off

4.17 Alignment of OTC

1. Switch on the power to the System from the generator console.
2. Enter the display menu. Deactivate the Wallstand and/or the Table at the menu.
3. Place a spirit level on the column, see figure below, and check that the column is vertical (±1°).
4. Place a spirit level on the OTC tube and check that the tube is horizontal (±1°) in both directions.

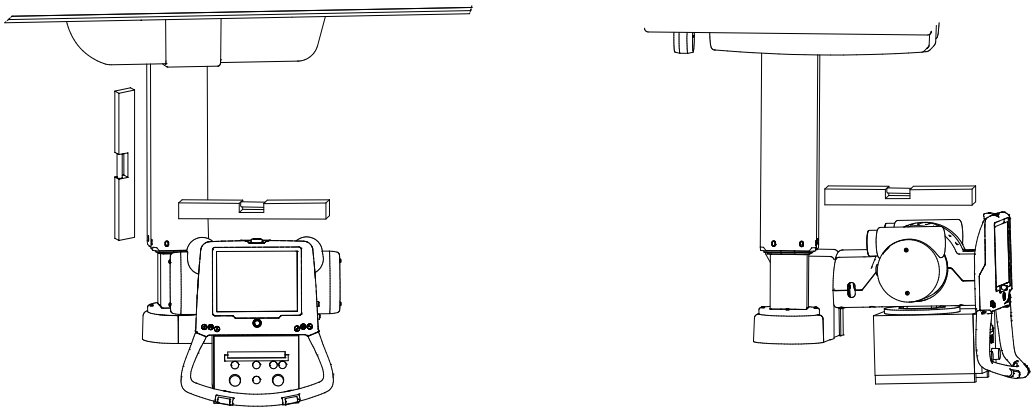


Fig. 4-57 Checking alignment

5. Turn on the collimator light and mark a cross in the center of the collimator light field on a piece of paper placed on the floor, according to the figure below.
6. Drive the column upward/downward and the center of the collimator light field must stay on the same mark on the paper.

   If the collimator light field moves in X or Y direction, check the ceiling rails Y and traverse rail X to verify that they are level.

4.17.1 Alignment of OTC, X- and Y-direction

1. Turn on the collimator light and mark a cross in the center of the collimator light field on a piece of paper placed on the wall according to **Fig. 4-58**below.
2. Move the OTC backward/forward and the center of the collimator light field must stay on the same mark on the paper, see **Fig. 4-59**below.

   If the collimator light field moves in Z direction, check the ceiling rails Y, and the traverse rail X. They must be level.

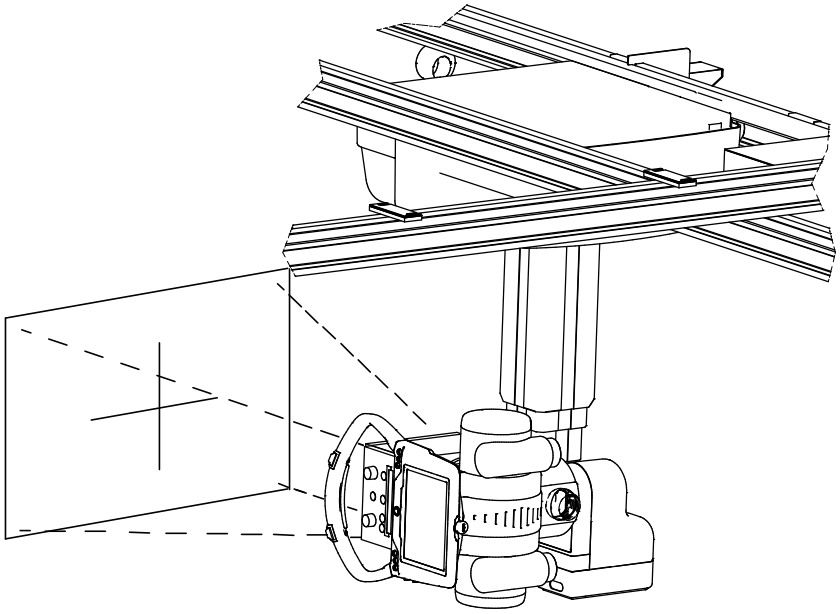


Fig. 4-58 OTC vertical alignment

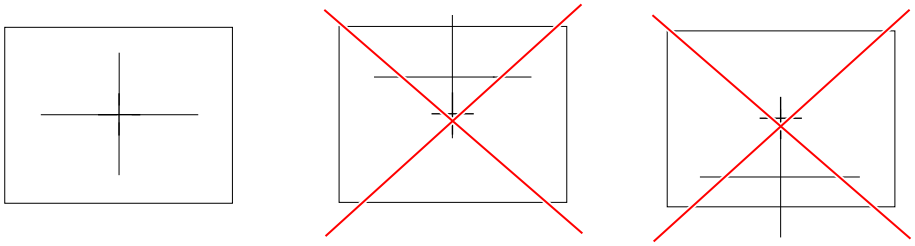


Fig. 4-59 Paper marks

3. Turn on the collimator light and mark a cross in the center of the collimator light field on a piece of paper placed on the floor according to **Fig. 4-60**below.
4. Drive the column upward/downward. The center of the collimator light field must stay on the same mark, see **Fig. 4-61**below.

   If the collimator light field moves in X or Y direction, check the ceiling rails Y and traverse rail X. They must be level.

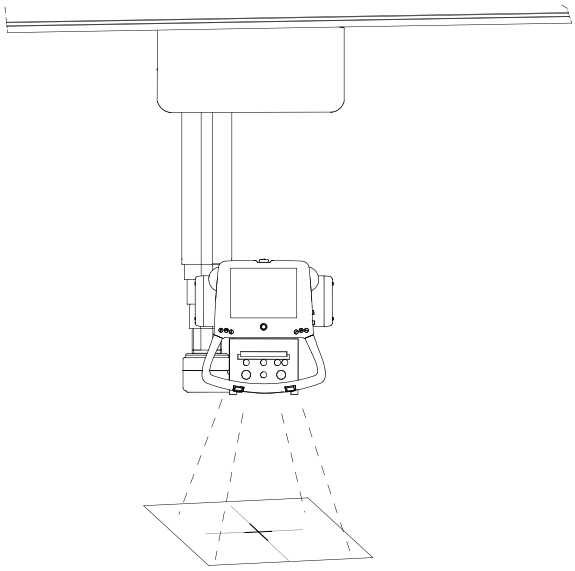


Fig. 4-60 OTC horizontal alignment

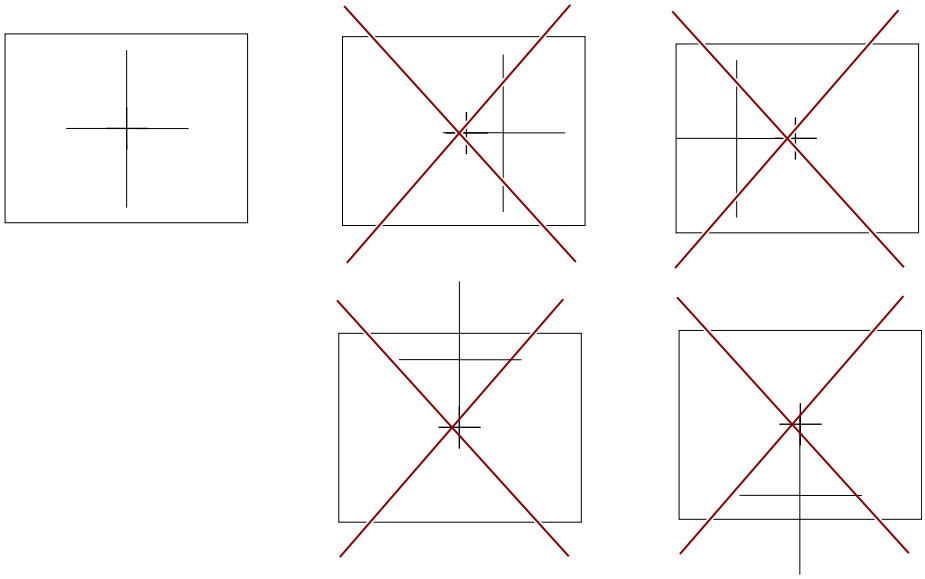


Fig. 4-61 Paper marks

5. Switch off the power to the System from the generator console.
6. Switch off the power to the System from the mains switch.

4.18 Mechanical Installation of Wallstand

WARNING!

Whenever any item is removed from the Wallstand, e.g. the detector holder, the Wallstand will become highly unbalanced.

Whenever the brake is released, part of the Wallstand will move upward and can cause injury.

Make sure that the operation will be performed by personnel who are trained in the use of the equipment.

4.18.1 Orientation of Wallstand

Before unloading and placing the Wallstand on the floor, check for enough free space around the device to allow free movement. See the Planning Guide for further information of required space around the Wallstand and the position in the room.

4.18.2 Unloading

WARNING!

When the Wallstand is not bolted to the floor, the Wallstand is unstable and front-heavy and may fall down. When you get the Wallstand upright, make sure to bolt the Wallstand to the floor. Then, to balance the Wallstand, mount the counterweights.

Note!

Packages are marked with "Up" and "Down" on the top and bottom side of the wallstand, respectively.

Follow the instruction for unloading the Wallstand.

1. Remove the package band from the package.
2. Remove all the mounting screws on the top and bottom of the crate sides.
3. Remove the top crate, then the crate sides as a set.
4. Remove the screws from two cross-ties, securing the Wallstand

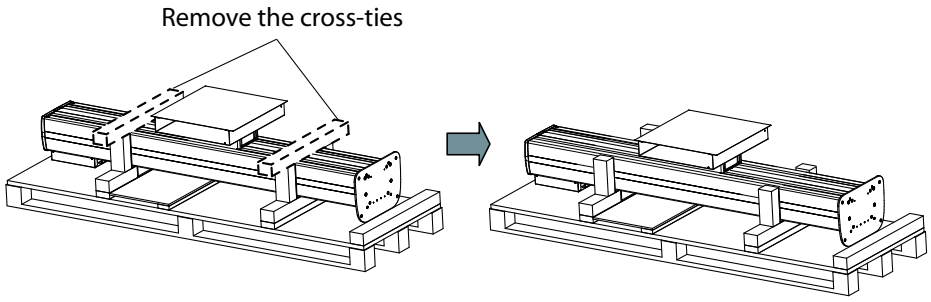


Fig. 4-62 Removing cross-ties

CAUTION!

Do not hold the Wallstand by the base when lifting it up.

Note!

*Do **not** lift the Wallstand from the bottom.*

5. With help from at least two persons, lift the Wallstand, as indicated in the figure below. Lift the Wallstand off the pallet, see **Fig. 4-63**.

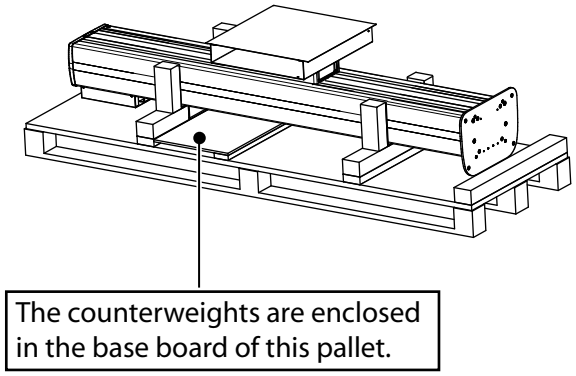


Fig. 4-63 Lifting Wallstand off the pallet

6. Position the Wallstand.
7. Mount the insulation washer (5) between the plate and the floor.
8. Temporarily attach the stand to the floor, with 1 bolt (1, 2, 3, 6) at the floor. Making it possible to readjust the parallelism to the Ceiling stand.
9. Drill just 1 hole (C) in accordance with **Fig. 4-64**.
   The 3 remaining holes shall be drilled after the adjustment.

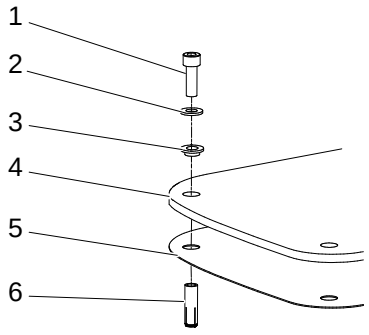


Fig. 4-64 Temporarily attachment

1. *Bolt*
2. *Insulation washer*
3. *Insulation case*
4. *Bottom plate*
5. *Insulation plate*
6. *Expanders (enclosed)*

4.18.3 Install CXDI-401G/401C Detector

If applicable, install the CXDI–401G/401C detector.

4.18.4 Remove Back Cover

1. Remove the two screws (hex-head screws, 3 mm diameter) under the electrical box.

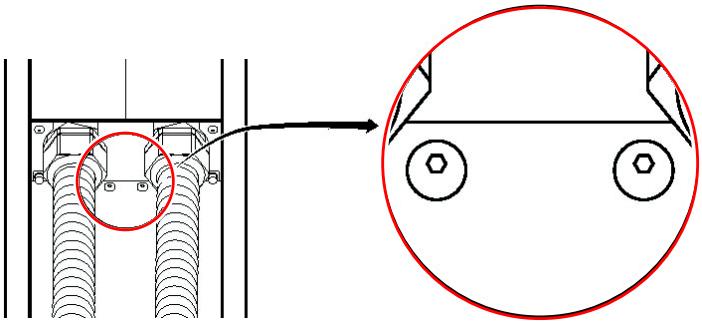


Fig. 4-65 Removing the two screws under the electrical box

2. Remove the two screws (hex-head screws, 2.5 mm diameter) at the bottom of the back of the Wallstand.

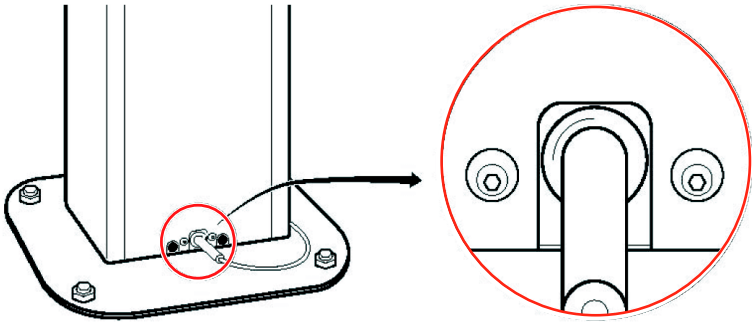


Fig. 4-66 Removing the two screws at the Wallstand back

4.18.5 Install Counterweights

CAUTION!

Squeezing hazard when the back cover is removed, your hands etc. may be caught in the internal moving parts (e.g. counterweights).

Do not remove the safety bolts and pins for transportation, unless it is stipulated in this manual.

CAUTION!

Install the counterweights before installing the detector.

The counterweights are enclosed in the base board of the pallet. There are two types of counterweights enclosed: the final-adjustment and fine-adjustment counterweights.

Counterweights Tiltable, pieces, Non-tiltable, pieces

2.37 kg bottom plate marked “Bottom plate”, already installed.

2.37 kg

0.26 kg

1. When installing or removing the counterweights, loosen the screws in position A, see figure below.

   Release and remove the long screws (B) that fix the counterweights in their position.

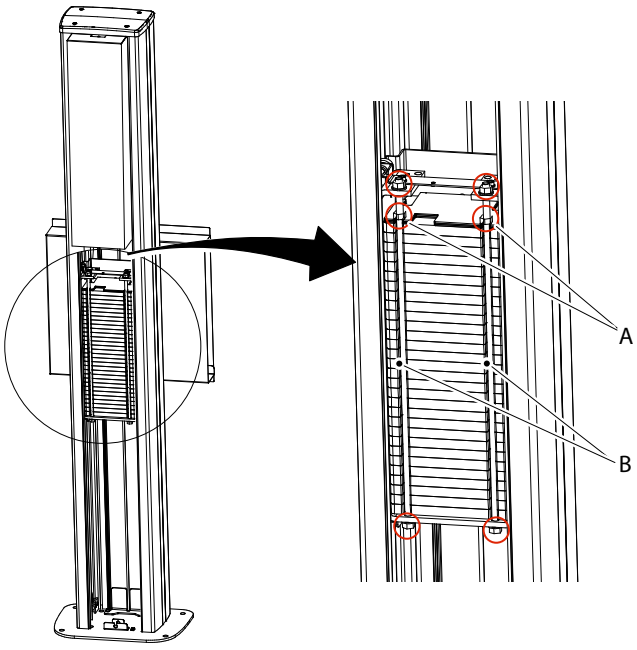


Fig. 4-67 Loosen screws

2. Install the enclosed counterweights from the back of the Wallstand.
3. Start to install the bottom plate.
4. Install the counterweights as in the figure below. Leave a space for removing the transport locking device.

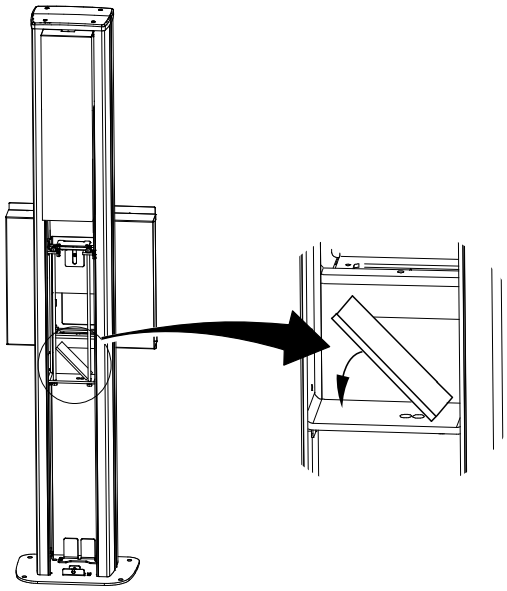


Fig. 4-68 Installing counterweights

CAUTION!

Hazardous situation when removing the transport locking device the image receptor holder may become unbalanced.

5. Remove three screws to the transport locking device and remove locking device, see figure below.

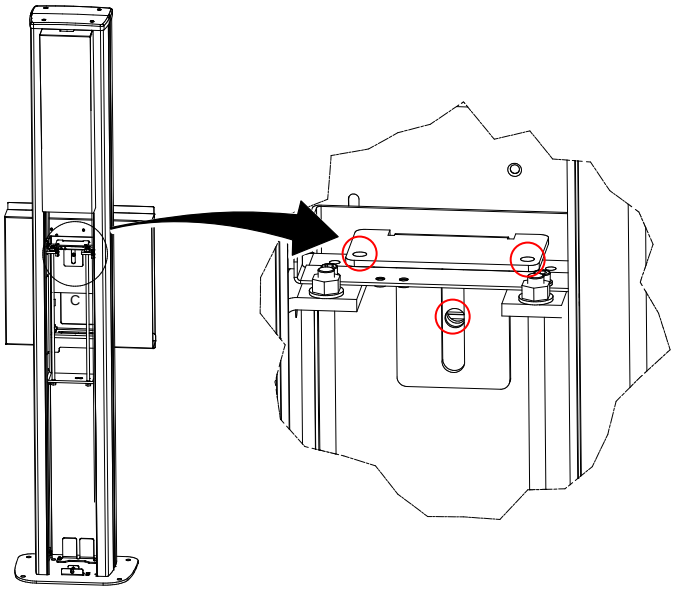


Fig. 4-69 Removing locking device

6. Install the remaining counterweights.
7. The counterweights must be fixed with two long screws (B) and six nuts. Three on each side to make sure that they are pulled together, see **Fig. 4-67**.
8. Check that the Wallstand is balanced, push the image receptor holder down.

It shall run equally smooth up as down, no scraping sound.

4.18.6 Alignment of Wallstand

1. Place a spirit level on the column and check that the Wallstand is level.
2. Move the OTC and place the collimator 10 mm from the image receptor of the Wallstand according to **Fig. 4-70**.
3. Move the OTC sideways, measure the distance.
   The distance should be 10 mm.
4. If the two measured values fail to correspond adjust the Wallstand column by moving it sideways.

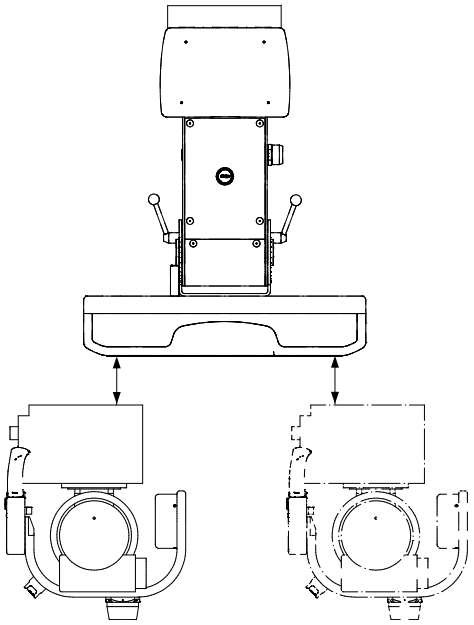


Fig. 4-70 Alignment of Wallstand

Note!

It is important to mount the remaining 3 bolts into the floor.

4.18.7 Anchor Location

The Wallstand must be installed on a solid base with sufficient load capacity. The floor must be able to withstand the pull forces supplied on the expansion bolts.

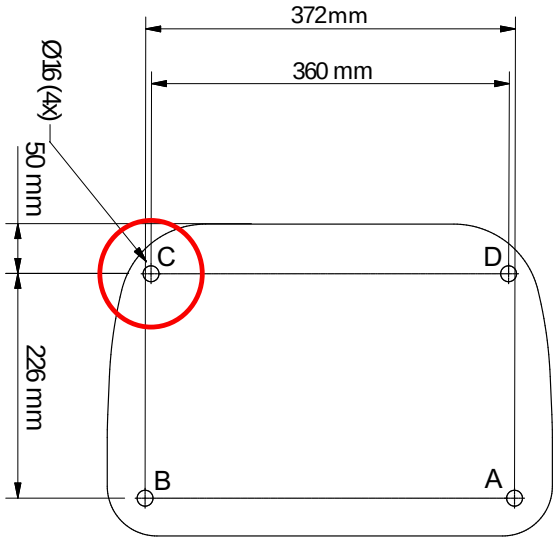


Fig. 4-71 Marking template Wallstand (Isolation plate)

Drill pilot holes for the anchor (outer diameter 12 mm) with the drill template. Depths of holes for the enclosed anchor are 45 mm, see **Fig. 4-72**.

Pilot holes for the anchors:	Four locations
Outer diameter of the anchor:	12 mm
Anchor total length:	45 mm
Length of screws for the anchors:	10 mm
Drill diameter to be used:	12.5 mm

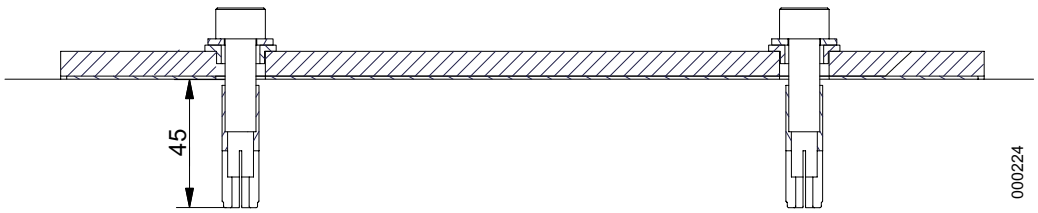


Fig. 4-72

1. Remove any chips left in the pilot holes with a dust collector etc. Top of the anchor may extend from the floor if chips are left in the pilot holes for the anchor when you insert the anchor.
2. Insert the enclosed anchor into the anchor hole and lightly tap it with a plastic hammer etc. and insert it 5-10 mm.

   Or, insert the anchor 5-10 mm using a manual drill.

3. Fix the Wallstand to the floor with the enclosed M10 bolts, install the insulation washers and insulation cases, and fix the insulation plate.
   - Securing bolt : Four pieces (enclosed: M10×30).
   - Tightening torque: 25 Nm.
4. Insert the bolt cap into the bolt fixed in step 7.
   - Bolt cap: Four pieces (enclosed).

Note!

The insulation kit is designed to isolate System components, e.g. System cabinet, Table, Wallstand and Ceiling stand, from the hospital building.

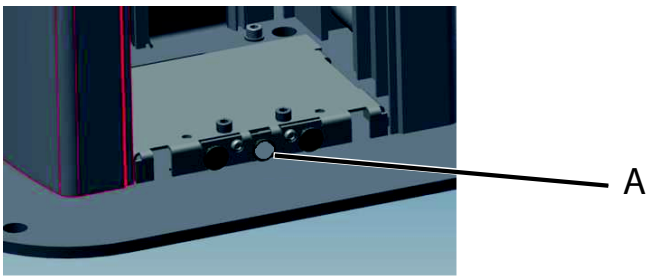
The insulation kit will prevent stray currents from reaching the System e.g. via screw attachments. Stray currents can be present e.g. in reinforcement bars or in water pipes in a building. These currents can be of several hundred amperes and can affect the leakage current from the System to the patient and thereby the safety for patient and user. Stray currents in the building shall be regarded as a failure in the building but the insulation kit provides an extra safety barrier.

The insulation kit will also prevent unwanted ground loops due to e.g. electrical contact through the wall or floor lead X-ray shielding via screw attachments of the System components.

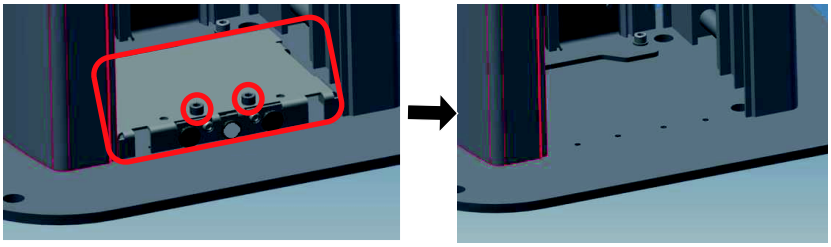
4.18.8 Install Foot Control

Connect the foot control on the lower back side of the Wallstand, see figure below position A.

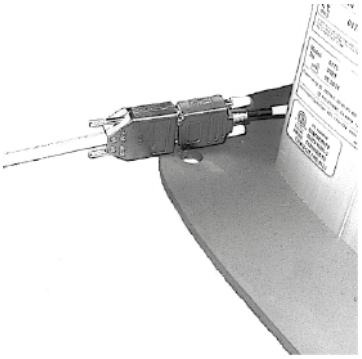
The foot pedal should be positioned so that it cannot be activated accidentally.



1. Remove two screws and remove the mounting bracket.



2. Connect the foot control.



3. Install the mounting bracket. See the figure below.

4.18.9 Reassemble Back Cover, Wallstand

1. Reassemble the two screws (hex-head screws, 2.5 mm diameter) at the bottom of the back of this equipment.

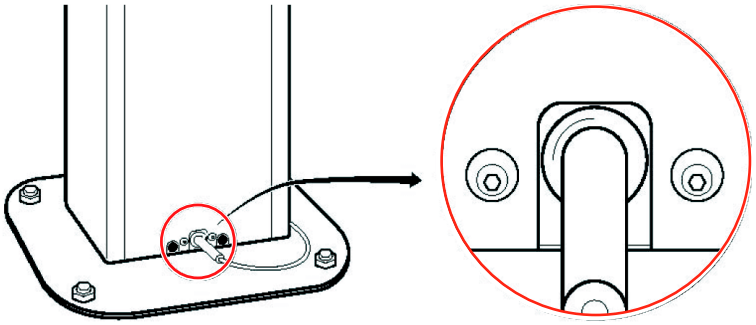


Fig. 4-73 Reassembling the two screws at the Wallstand back

2. Reassemble the two screws (hex-head screws, 3 mm diameter) under the electrical box.

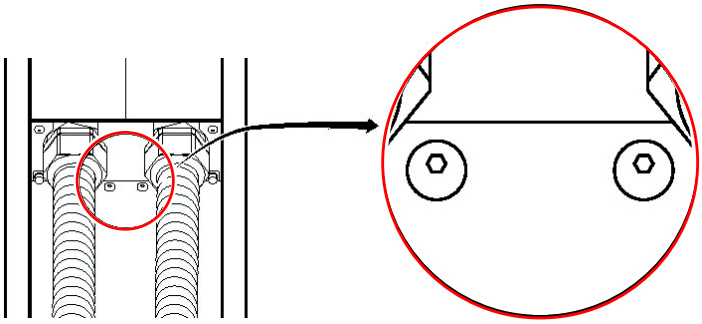


Fig. 4-74 Reassembling the two screws under the electrical box

4.18.10 Wall Attachment for Cable Hose

Install the wall attachment for the cable hose on the wall on a suitable place behind the Wallstand.

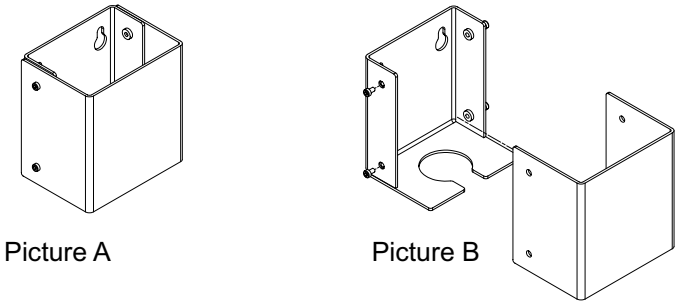


Fig. 4-75 Wall attachments

4.19 Electrical Installation of Wallstand

4.19.1 Wallstand Detector with Charging

When using a fixed detector or wireless detector with charging in the Wallstand, a power box or ac/dc box is pre-assembled to the Wallstand.

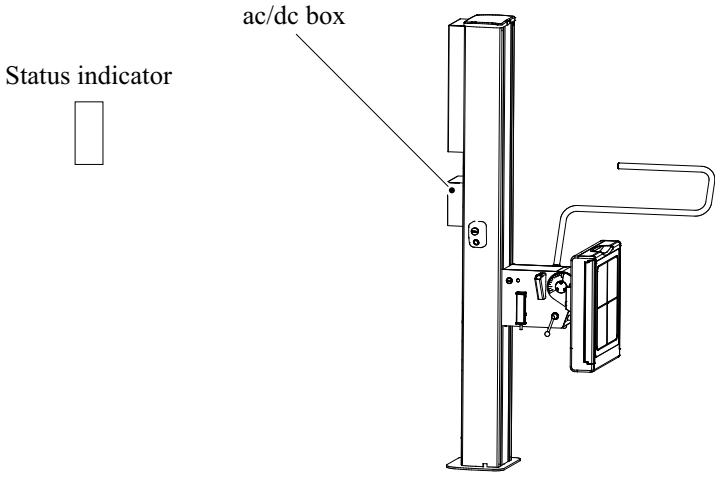


Fig. 4-76 Power box — ac/dc box

- Mount the status indicator at the wall. Position it for an apparent user view
- Route the 3.DETH01 to the switching hub.

For locations, see **Fig. 4-76**.

4.19.2 Connect Wallstand

Note!

The cables from the wall stand must be installed covered.

They shall not be placed on the floor.

Wiring to electrical plate 4.2 is made in accordance with path 2.

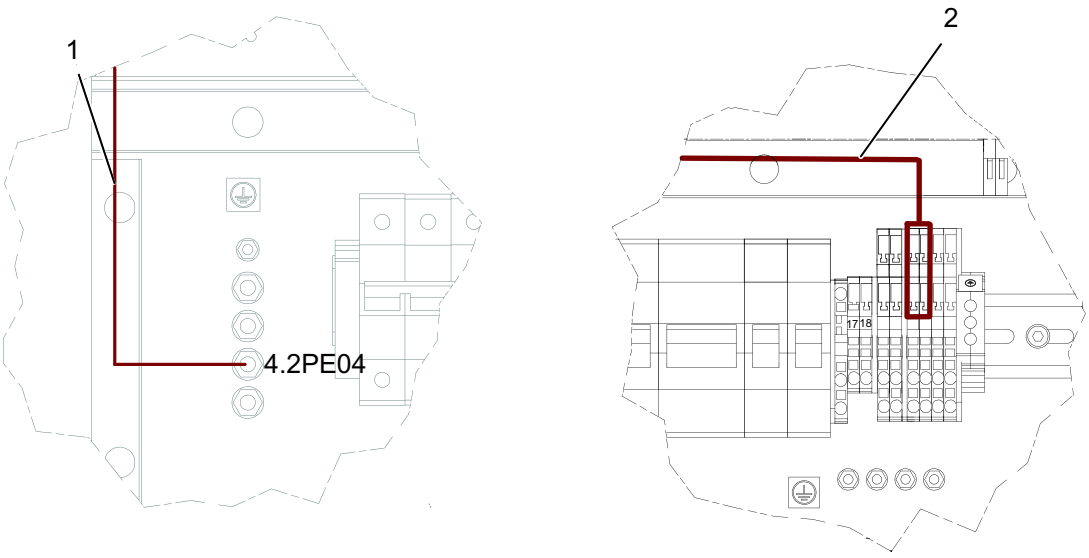


Fig. 4-77 Connecting the Wallstand

1. *3.0PE01*
2. *2.3.DPOW01 (The cable is only present if a fixed detector, or a wireless detector with charging, is installed at the Wallstand)*

Wiring to electrical plate 4.4 is made in accordance with path 3, see **Fig. 4-29**.

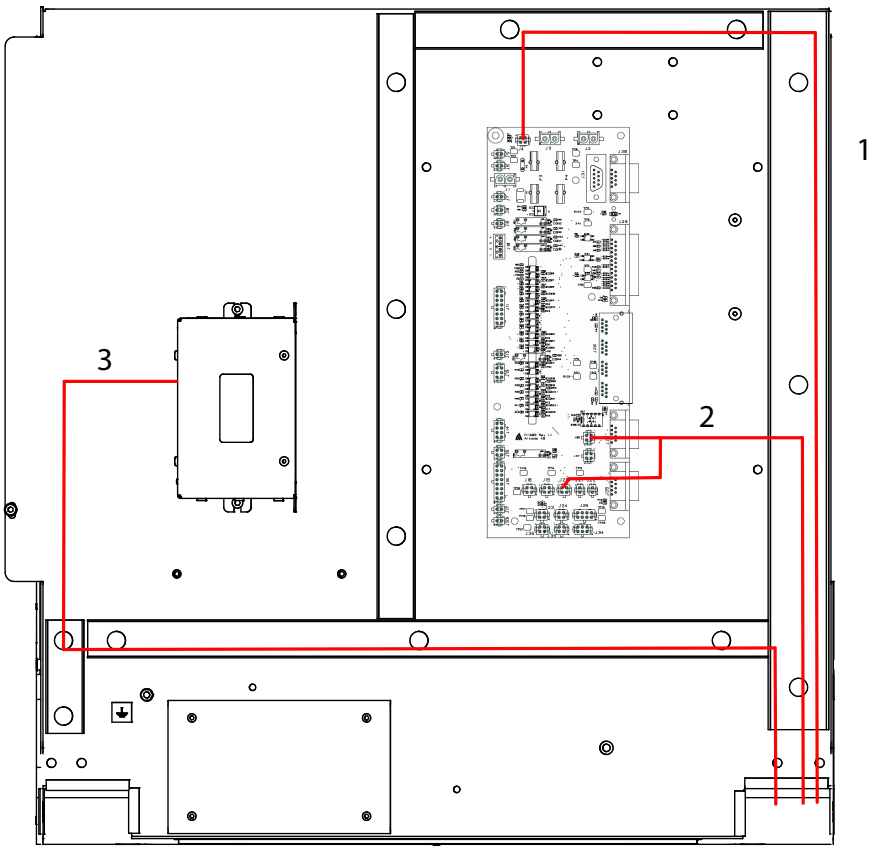


Fig. 4-78 Electrical plate 4.4

1. 3.0POW01

2. 3.0SIG01

3. 3.0CAN01

4.4FIB01–J4

4.4FIB01–J20 and J38

4.4CB800_01_J2

Wiring to the generator is made in accordance with path 1.

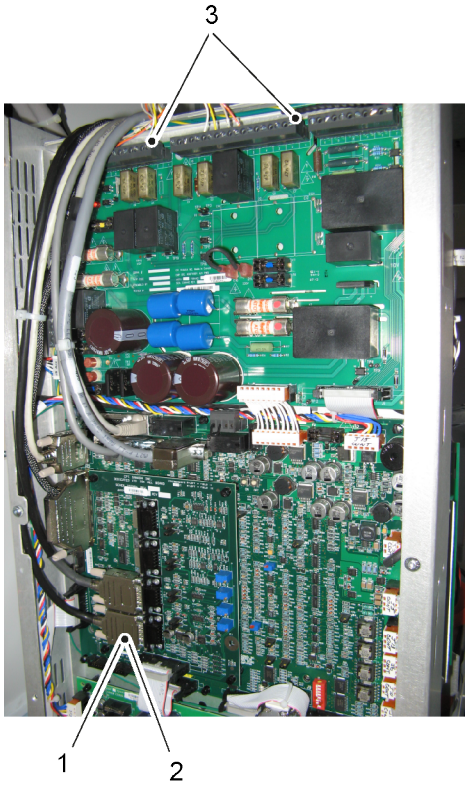


Fig. 4-79 Connecting the Wallstand AEC

1. *3.DAID01 — ION chamber*
2. *3.DB3C01 (option) (channel 1) — Solid state chamber*
3. *The cable no. 3 is only present if a fix detector is installed at the Wallstand.*

4.20 Mechanical Installation of 0181 Table

4.20.1 Positioning the Pallet

Note!

It is necessary to energize the Table to remove the covers. Put the pallet near the place where the power supply can be taken.

4.20.2 Unloading the Table

Unpack the Table from box.

Before lifting off the Table from the pallet, remove both the upper covers, and the front lower cover of the Table.

4.20.2.1 Cover Removal Method

(1) Preparing to Remove the Upper cover

CAUTION!

Check that the circuit breaker of the facility is turned off.

1. Remove the service hatch (6 screws), and lift the hatch away.

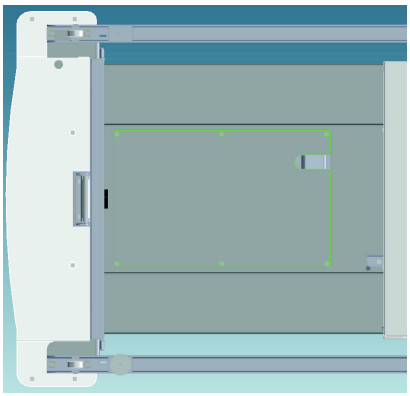
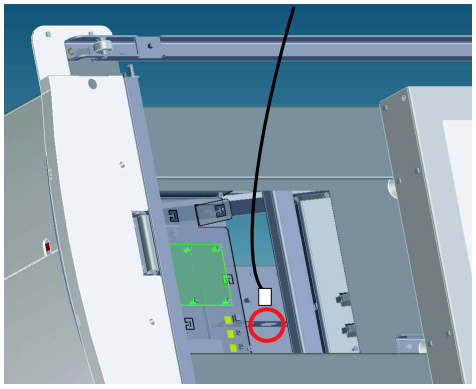
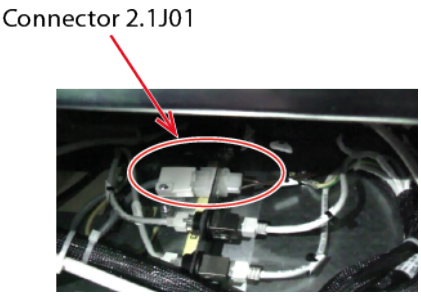


Fig. 4-80 Service hatch

2. Insert the power cable from the System cabinet into the device.
3. Reach your arm into the area on the right side of the TCB, and connect the power cable (2.POW01) to connector 2.1J01 circled in red in the diagram. (Connector 2.1J01 is panel mounted to the sheet metal part, located on the bottom plate of the main unit.)



Connect power cable 2.POW01



Power cable connected to connector 2.1J01

4. Turn on the System, at the generator console.

(2) Removal of the Upper Cover

WARNING!

All work without covers, shall be done with the voltage turned off.

Both upper covers (front and back) are removed in the same way.

1. Press the “X/Y button” on the kick box to release the table frame. Move the table frame to the position at which the cover fixing screws can be removed, and remove the 2 screws at both “A” locations (a total of 4 screws).

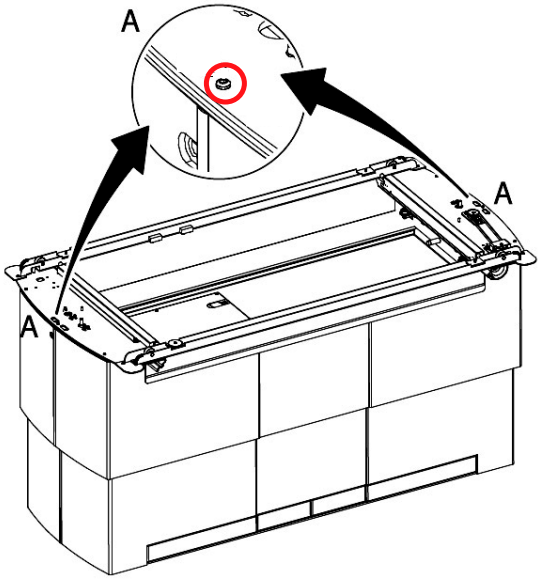


Fig. 4-81 Remove the 2 screws at “A”

2. Move the table frame again, to a new position where the 2 screws at the four “B” locations (a total of 8 screws) can be removed. See **Fig. 4-82**

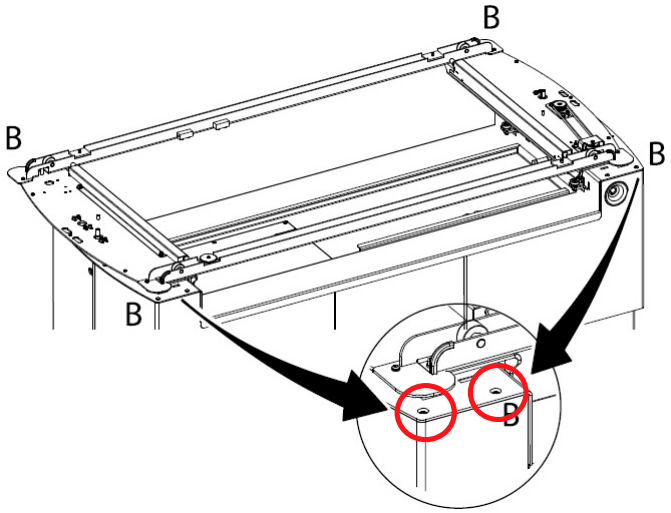


Fig. 4-82 Remove the 8 screws at “B”

Note!

The upper cover is fastened with these screws, and will loosen when the screws at the “B”—locations, are removed.

Note!

Be careful, the emergency stop button is attached to the upper cover with the circuit cable (2.3J03, 2.4J03) connected. When removing the upper cover, also remove the emergency stop cable from the connector, unclip carefully.

Fig. 4-83

3. Remove the cover from the working area.

(3) Removal of the Front Lower Cover

1. Loosen the front screw of the lower cover at the “C” locations (one at each side), shown in the graphic below.
2. Unlock the locking parts on both sides.

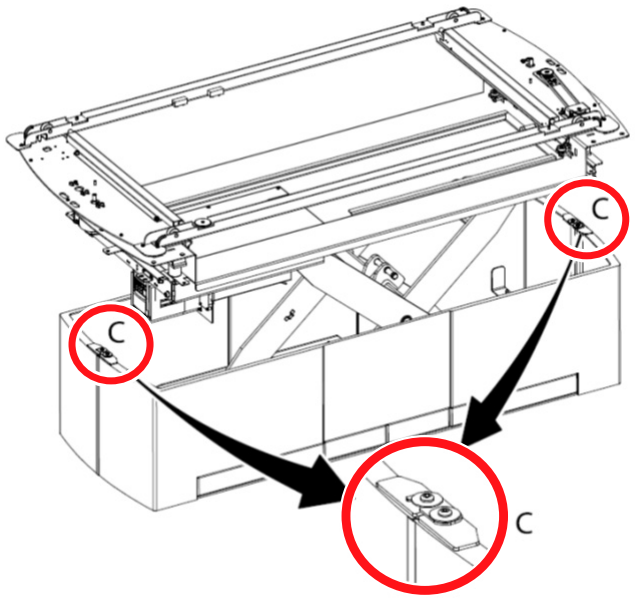
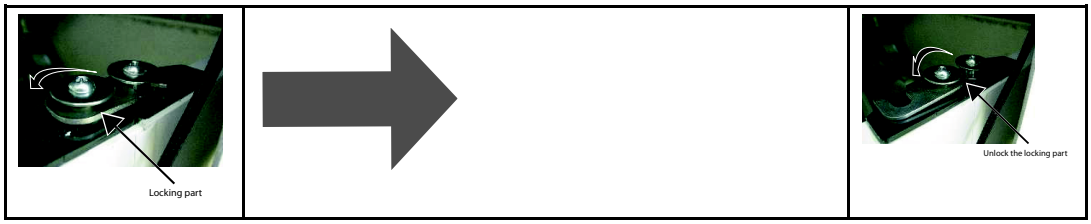
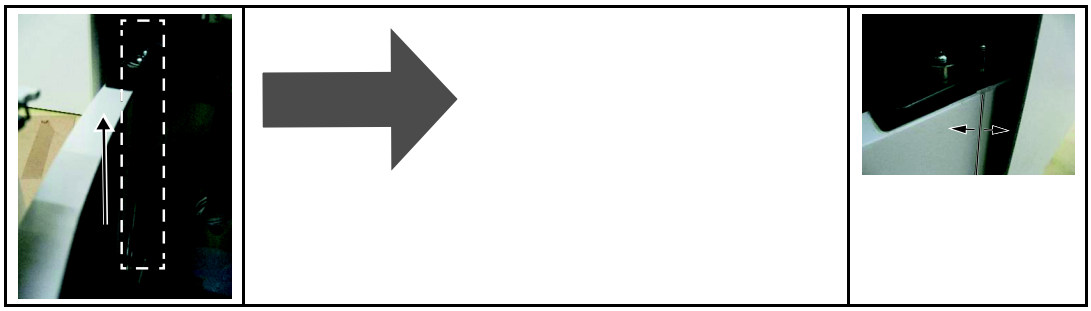


Fig. 4-84 Front screw of lower cover



3. Pull up the bar extending below the screw location and remove the lower cover by lifting and pulling out the plate. This procedure shall be done at both sides.



3. Remove the cover from the working area.

4.20.2.2 Unload Table from Pallet

Orientation of Table

Before placing the Table on the floor, check for enough free space around the Table, to allow free movement.

See the Planning Guide for further information of required space around the Table. Plan the positioning of the Table in accordance with the room layout.

It is possible that a cable duct is already made in the floor where the Table shall be placed.

Unloading

WARNING!

All work without the covers, shall be done with the voltage turned off

WARNING!

Do NOT enter under the table while power supply of the table is ON and the table is travelling vertically (up or down).

WARNING!

Squeezing hazard can occur between the vertical lift segments when moving in Z-direction

CAUTION!

Before unloading the Table, verify that the safety clamp is attached in transport position.

Before unloading the Table from pallet, the covers shall be removed.

1. Release the Table from the pallet, by removing the 4 bolts.

CAUTION!

The Table may overturn when not bolted to the pallet or the floor.

4.20.3 Safety Clamp

WARNING!

Remove the safety clamp before starting to move the Table in Z-direction.

WARNING!

Be careful when moving the safety clamp between different positions.

4.20.3.1 Safety Clamp Use

The safety clamp has two areas for use:

- to secure the device at service or maintenance.
- to secure the device during transport

The safety clamp has three positions for different occasions:

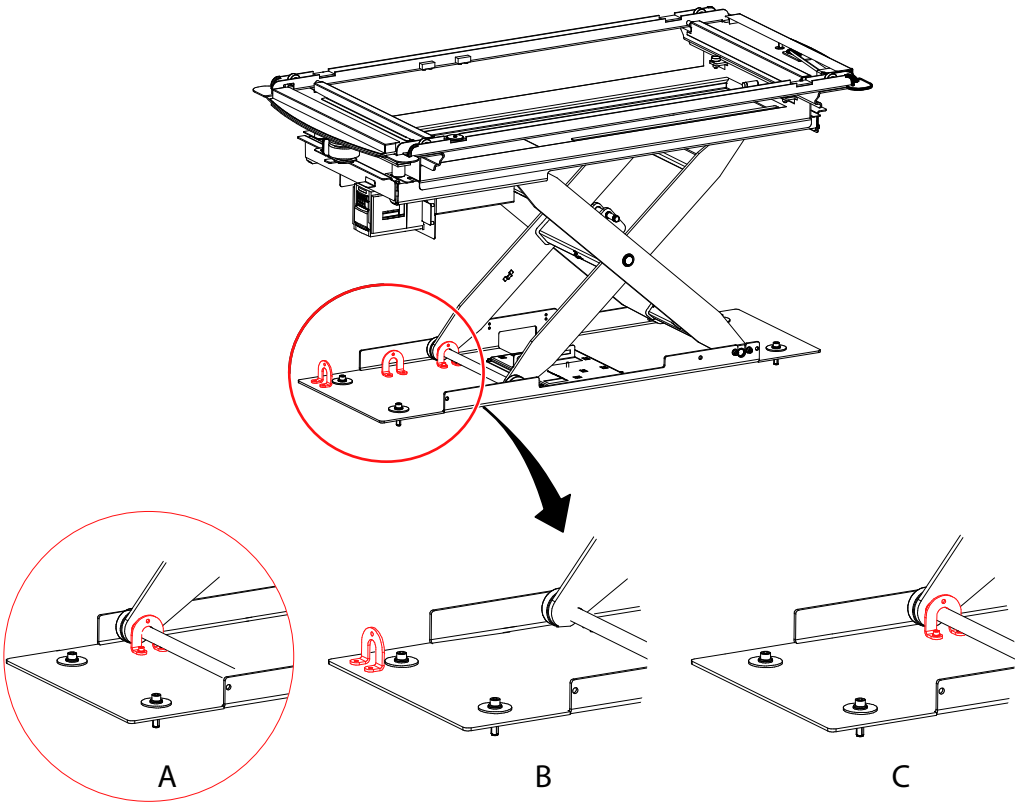


Fig. 4-85 Safety clamp positions

Safety clamp position:

A During transport

B During operation (parking position).

C During service performance.

4.20.3.2 Removal of Safety Clamp

WARNING!

Do NOT enter under the table while power supply of the table is ON and the table is travelling vertically (up or down).

WARNING!

Turn off the system when you need to enter under the table in order to attach or detach the safety clamp or to install the table.

For facilitating a removal of the safety clamp, first remove the covers and the service hatch.

1. Remove the 2 screws at the safety clamp.
2. Move the safety clamp from the transport position to the service position, and attach the safety clamp in the service position by the 2 screws.

4.20.4 Insulation

Note!

Before starting to fasten the Table to the floor, ensure that there is enough space for the Table movements, at the room.

Put the enclosed expanders in the holes. Place a mandrel in the expander and drive in 5-10 mm to attach the expander. Place the Table over the drilled holes and install the insulation plate and washers according to figure below.

Note!

The insulation kit is designed to isolate System components, e.g. System cabinet, Table, Wall stand and Ceiling stand, from the hospital building.

The insulation kit will prevent vagabond currents from reaching the System e.g. via screw attachments. Vagabond currents can be present e.g. in reinforcement bars or in water pipes in a building. These currents can be of several hundred amperes and can affect the leakage current from the System to the patient and thereby the safety for patient and user. Vagabond currents in the building shall be regarded as a failure in the building but the insulation kit provides an extra safety barrier.

The insulation kit will also prevent unwanted ground loops due to e.g. electrical contact through the wall or floor lead X-ray shielding via screw attachments of the System components.

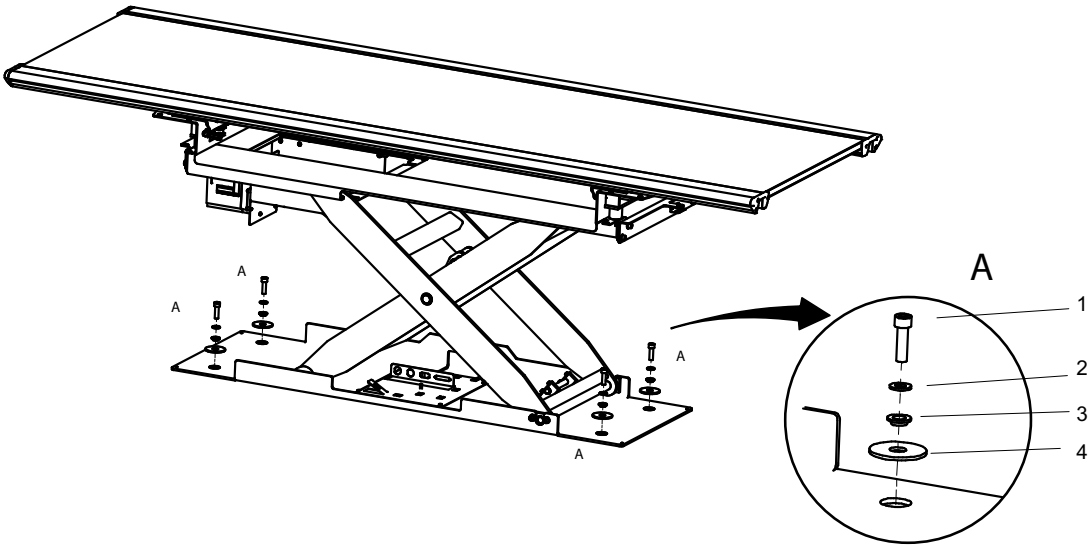


Fig. 4-86

1. *Bolt*
2. *Washer*
3. *Insulation washer*
4. *Washer*

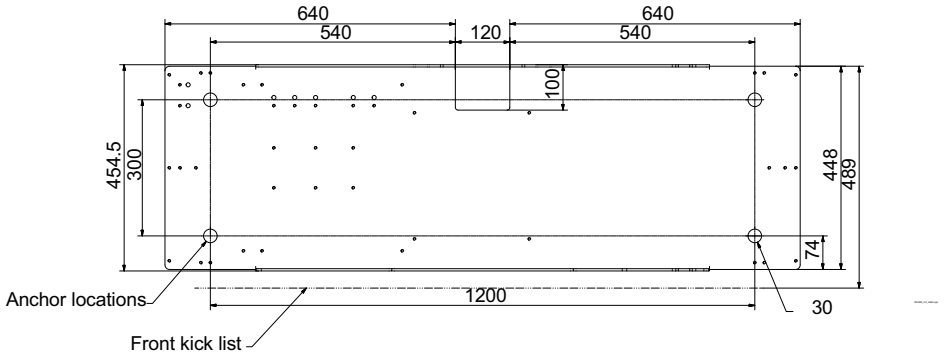


Fig. 4-87 Measurements for the Table bottom plate

4.20.5 Adjust Horizontal Alignment

Place a spirit level on the center of the Table top. The Table shall be 90° with a tolerance of ±0.5°.

4.20.5.1 Shims

Shims are used to adjust differences in the floor gradient. It is possible to use shims ±10 mm, shims should then be under the whole track for the wheels, see marks in the figure below.

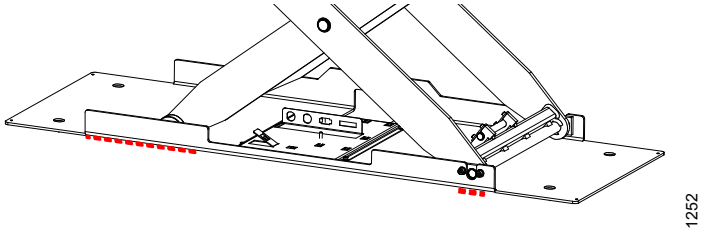


Fig. 4-88 Adjusting horizontal alignment

4.20.6 Attachment to Floor

This shall be done when the Table is in its exact position.

The maximum deviation between the floor attachment points should be ±10 mm, see further requirements on the floor in the OMNERA® 400T Planning Guide.

Make marks on the floor for holes and cable outlet, where the Table shall be placed. Drill the holes 12 mm diameter for the expanders. The hole depth for the enclosed expanders shall be 45 mm, see figure below. For an alternative attachment to the floor, see planning guide for requirement of the floor and demands on attachment.

Bolt the Table into the floor. Use M10 screws and apply Loctite 243.

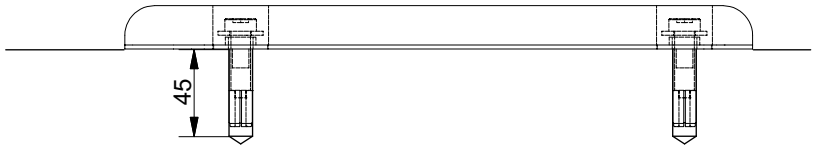


Fig. 4-89

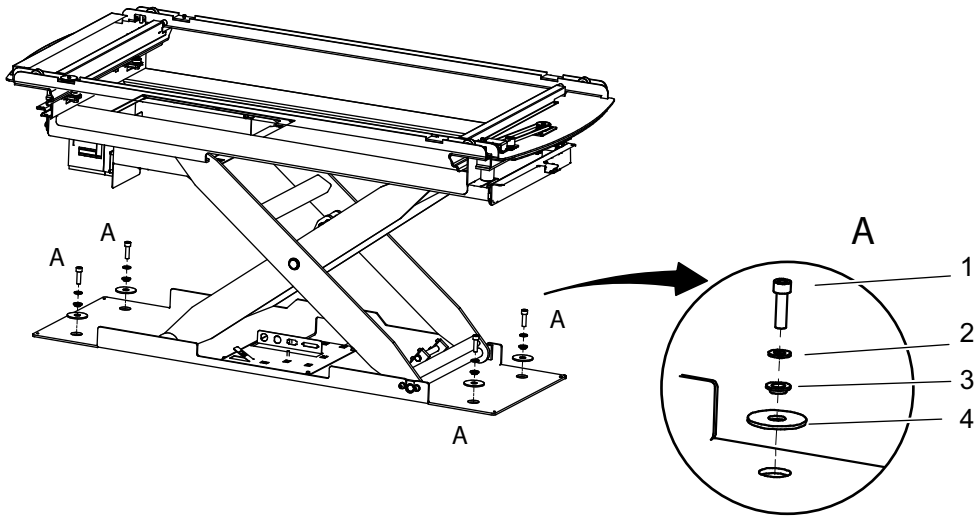


Fig. 4-90

4.20.7 Micro Switch End Stops

Check the upper and lower end stops for the Table Z direction. The lowest Table position shall be 500 mm and the highest position 800 mm. See **Fig. 4-91**

If necessary, make adjustments by loosening the valid screw, and then slide the micro switch to the correct position.

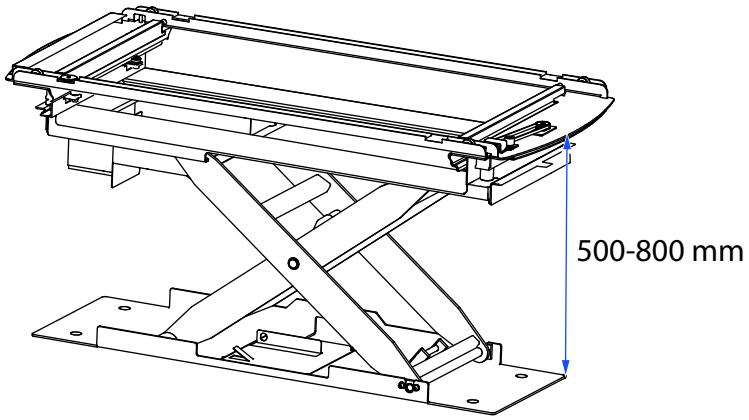


Fig. 4-91

The left micro switch is controlling the lower table end stop.

The right micro switch is controlling the upper table end stop.

4.20.8 Attachment of Foot Pedal (X/Y/Z)

Connect the foot pedal according to figure below.

The contact should have the reference point 2.1J05.

The foot pedal shall be positioned so that it cannot be activated accidentally.

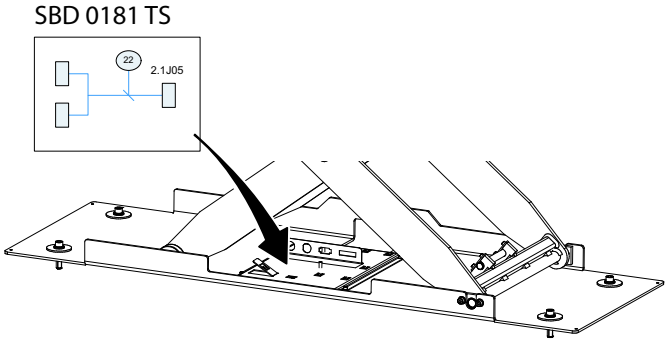


Fig. 4-92 Foot pedal attachment

4.20.9 Attachment of Maneuver Hand Control

Connect the maneuver hand control according to figure below. The contact should have the reference point 2.3J02 or 2.4J02 (for the Collimator hand control use connection point 2.3J01 or 2.4J01).

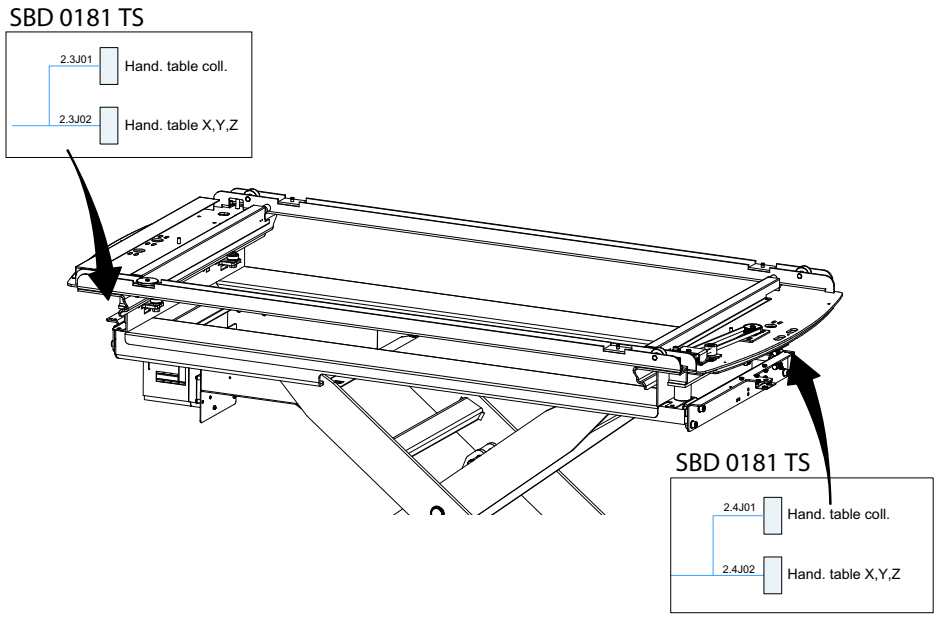


Fig. 4-93 Hand control attachment

4.20.10 Adjust Detector Holder

The detector holder can be adjusted by moving the index, see figure below.

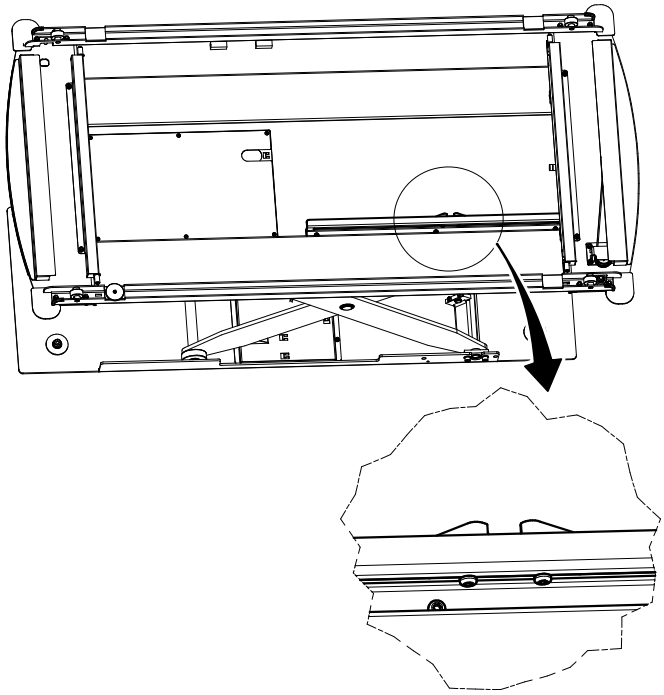


Fig. 4-94 Detector holder adjustment

4.20.11 Remove the Red Safety Clamp

Set the Safety clamp in position “B”, see **Fig. 4-85**.

4.20.12 Reassemble the Covers

Reassemble all the covers including the cover for the electrical plate.

Attach the covers, see **4.8.2 Remove Covers, Cabinet, Page 128**

Remember to assemble the lists between the lower covers.

CAUTION!

Be careful to connect the cables for the emergency stop in accordance with the markings.

4.20.13 Two Column Table (option)

4.20.13.1 Orientation of Two Column Table

Before placing the table on the floor, check for enough free space around the table, to allow free movement.

See the Planning Guide for further information of required space around the table. Plan the positioning of the table in accordance with the room layout.

Clearance to Wall

Note!

According to IEC60601-1 clause 9.2.2.2, the clearance between the table top and the wall shall be minimum 500 mm.

There are squeezing hazards between the moving table top and the wall. The measurements in the figure are important, according to IEC60601-1 clause 9.2.2.2.

Consider maximum cable length. The mechanical stop can be moved closer to the center of the table top. The stroke of the table top will then be shorter.

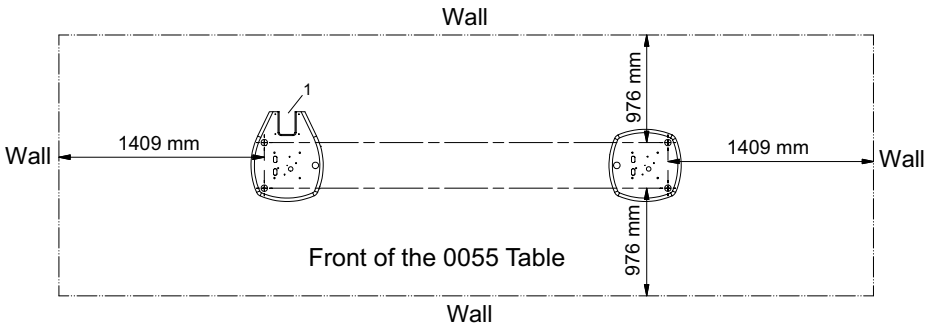


Fig. 4-95 Necessary space, table movement

Cable Duct in Floor

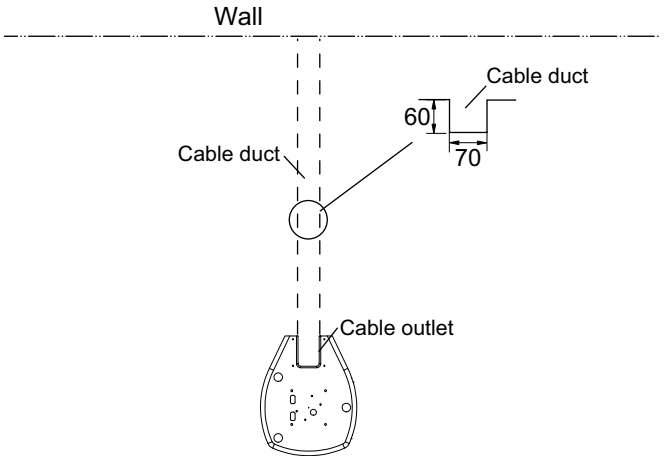


Fig. 4-96 Cable duct in the floor

4.20.13.2 Unload Two Column Table

WARNING!

Do not sit on the table until it is attached to the floor.

The table may overturn when not bolted to the pallet or the floor.

WARNING!

Do not tilt the table when unloading.

The columns may bend towards the middle when the table is lifted.

Two persons must keep the columns vertical.

1. Slide/lift off the table from the pallet by grabbing underneath the table frame. Do not tilt the table, keep the columns vertical.
2. Place the insulation plate (A) under the footplates.

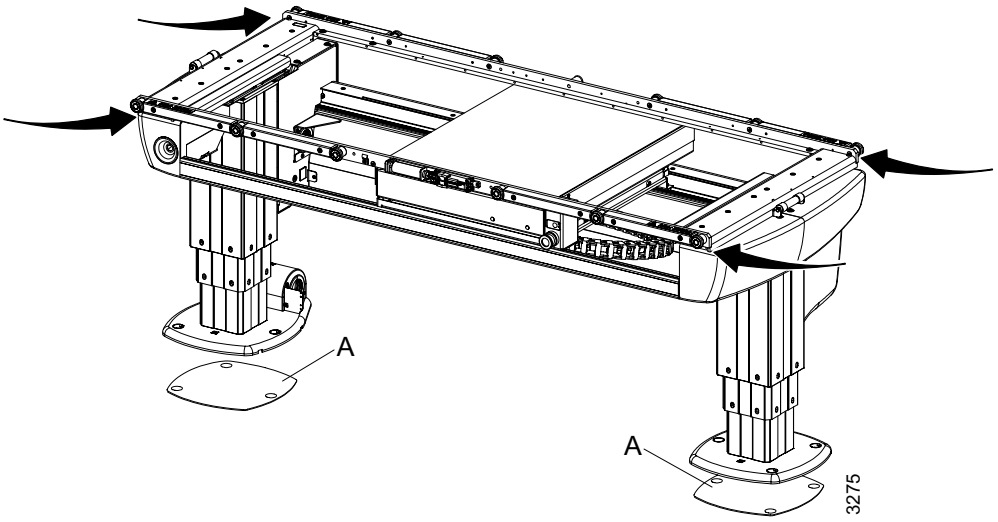


Fig. 4-97 Insulation and alignment

Transport Protection, Detector Holder

Remove the transport protection of the detector holder, one on each side.

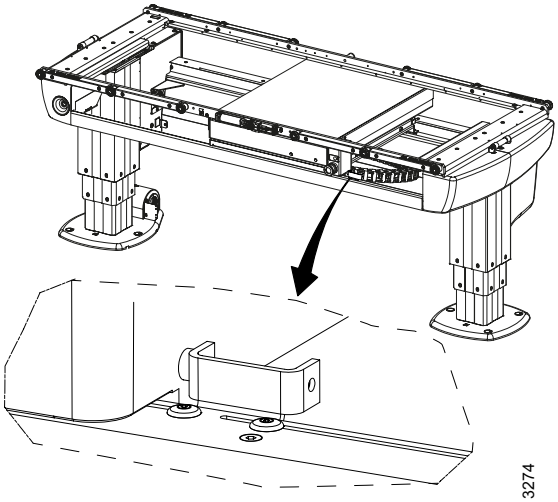


Fig. 4-98

4.21 Electrical Installation of Table

4.21.1 Connect Table

Note!

The installation cables from the Table must be installed covered. They shall not be placed on the floor.

Connect the Table according to the figures.

Wiring to electrical plate 4.2 is made according to cable path 2.

Fig. 4-99 Connecting the Table

1. 2.0PE01

2. 2.0POW01

Wiring to electrical plate 4.4 is made according to cable path 3, see **Fig. 4-29**.

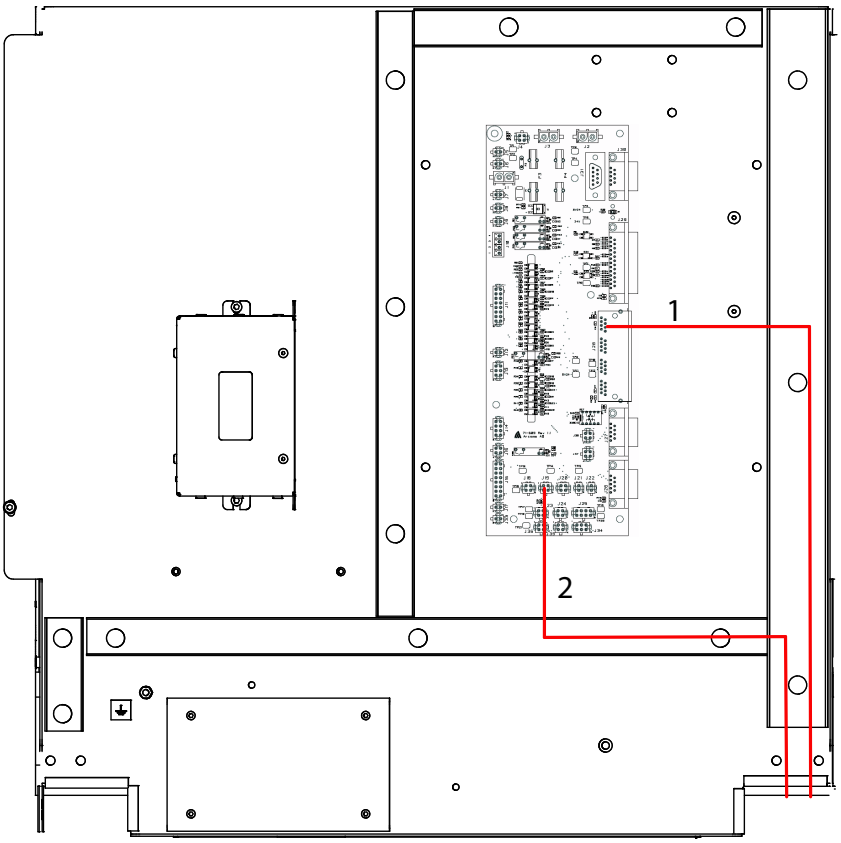


Fig. 4-100 Connecting the Table

1. 2.0CAN01 *4.4FIB01 J28–P4*

2. 2.01SIG01 *4.4FIB01–J19*

Wiring to the generator is made according to cable path 1.

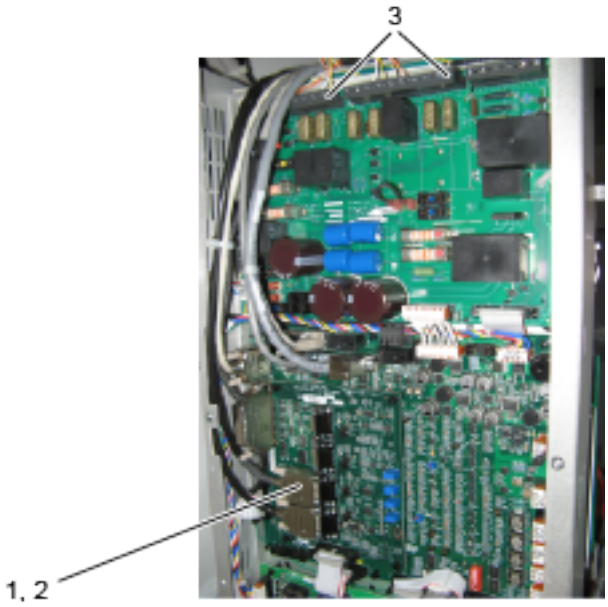


Fig. 4-101 Connecting the Table AEC

1. *2.0SIG03 (channel 2) (Standard) — ION chamber*
2. *2.DB3C01 (Option) — Solid state chamber*

4.22 Finalize Table Installation

Switch on the power to the System from the mains switch.

Switch on the power to the System from the generator console.

4.22.1 The Mechanical Stop

Beneath the table top there are mechanical stops installed, see figure below.

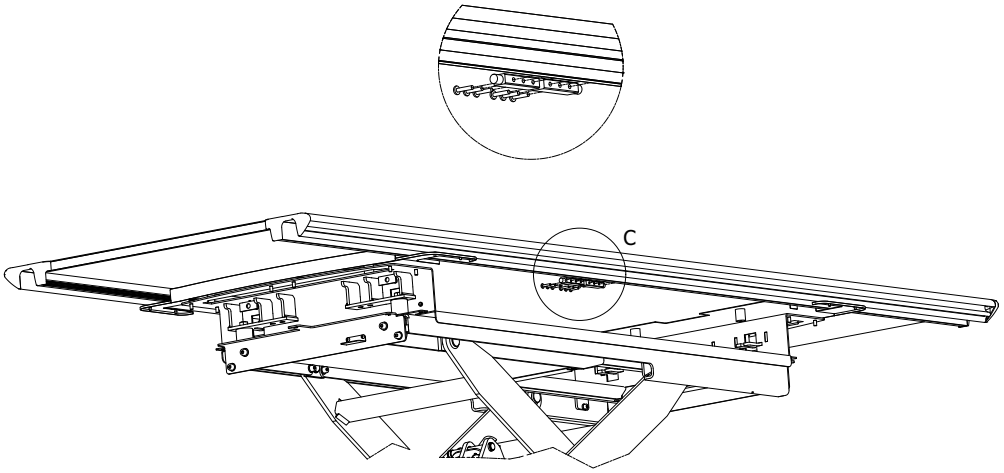


Fig. 4-102 Table mechanical stops

Note!

In case of insufficient space, it is possible to shorten the table top stroke. The table top is delivered with 2 mechanical stops initially centered on the same side. Depending on which side that needs to be shorter, move one of the mechanical stops to an appropriate hole set for 80, 160, 240 or 320 mm reduction. If necessary move the mechanical stop to the opposite side and use the appropriate hole set.

4.22.2 Install Table Top

Start with removing the mechanical end stops, see **Fig. 4-102**

Check that the Table top is placed at the right position. There is a rack rail at one side of the Table top, and this should be put to the same side as the pinion at the Table.

Lift the Table top onto the Table frame from one side to another so it can roll on the wheels. See figures below.

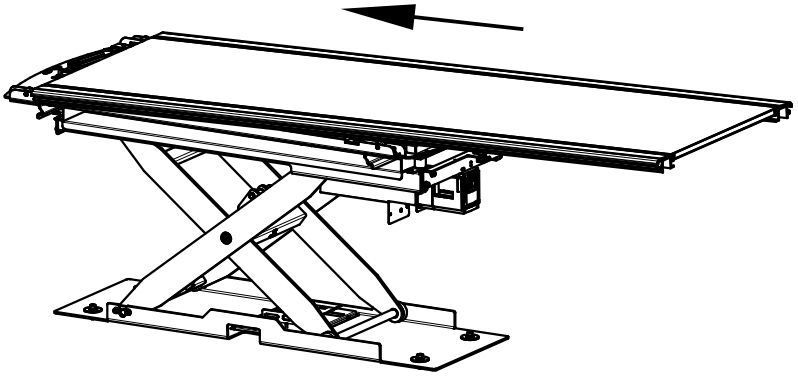


Fig. 4-103 Slide on the wheels to one side

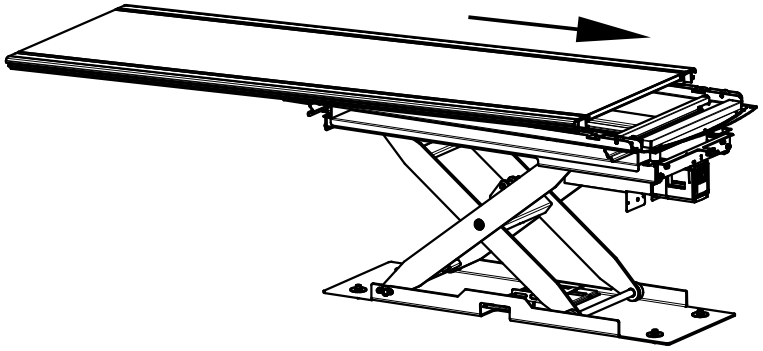


Fig. 4-104 Slide to the other side

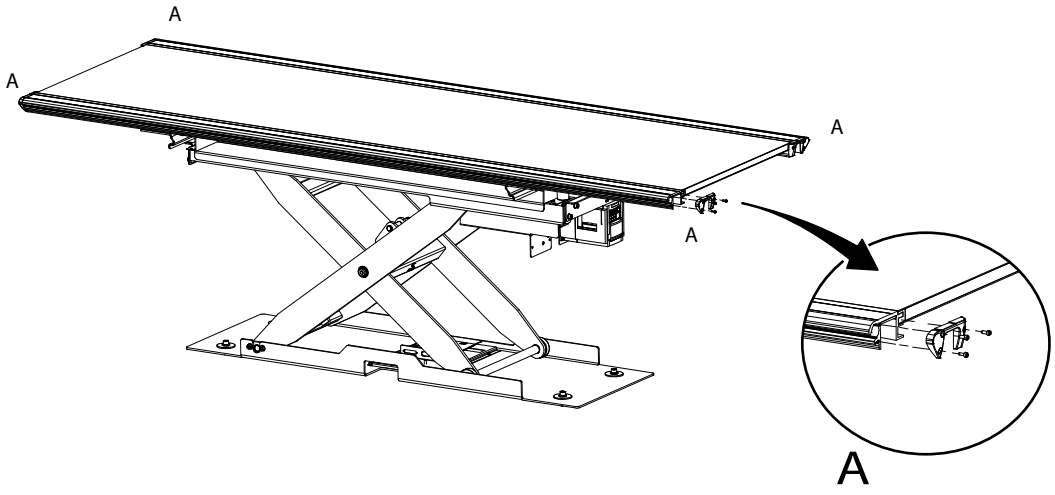


Fig. 4-105 Install the four end covers (A) according to figure

Finalize with installing the mechanical end stops, see **Fig. 4-102**.

WARNING!

It is important that the end stops are correctly installed.

Switch off the power to the System from the generator console.

Switch off the power to the System from the mains switch.

4.22.3 Two Column Table (Option)

Note!

Be aware of the difference between the two rails (A) and (B).

Note!

When sliding the table top in place, make sure the friction pads of table top brakes aren't damaged.

1. Remove one of the table top end stops.
2. Switch on the power to the table and release the X/Y brake.
3. Press the brake pad against the magnets. Keep the brakes released (button pressed) when carefully sliding the table top in place.
   Rail (B) has to be installed on the front.
4. Install the mechanical stop (A), use Loctite 243. Tighten the bolts with 24 Nm.
5. Check that the table top runs smoothly.
6. Check the function of the table top brake.

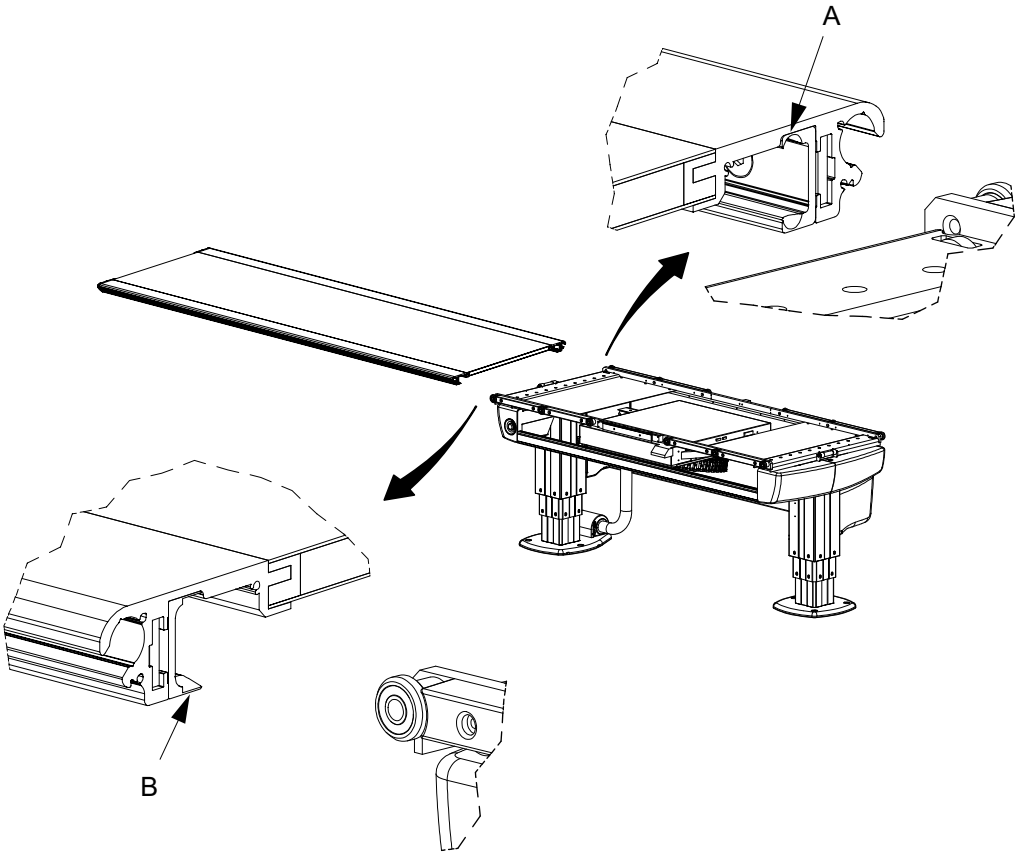


Fig. 4-106

4.22.4 Installation of Foot Control, Two column table (option)

Install the foot control and connect the cable 2.4J01 or 2.4J02 according to **Fig. 4-107**.

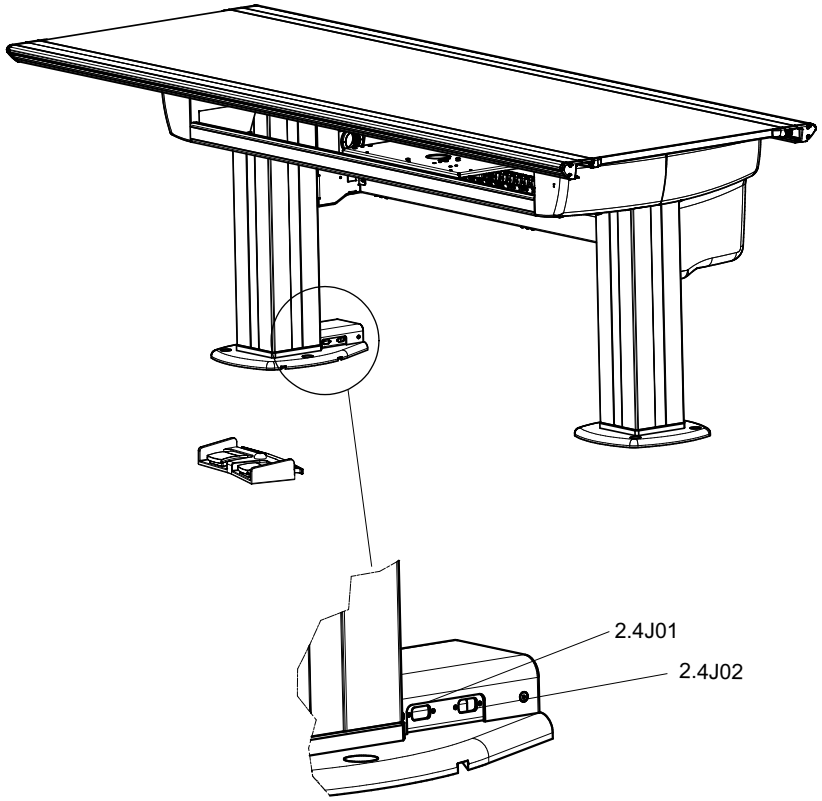


Fig. 4-107 Connect the foot control X/Y/Z or foot control X/Y separate (option)

4.22.5 Installation of Foot Control Strip Type, Two Column Table (option)

1. Install the foot control X/Y between the two columns.
   The foot control X/Y shall be placed against the foot plate or in a cable duct.

   Note!

   Open installation of the foot control X/Y cable is not allowed.

2. Place the cable from the foot control X/Y (A) in the track (C) underneath the foot plate.
3. Attach the foot control X/Y to the floor with double-sided tape.

   Note!

   The foot control X/Y is attached to the floor with double-sided tape, because of isolation between the floor and the foot control.

4. Cut the cable in suitable length and connect on contact 2.4J03 (B).

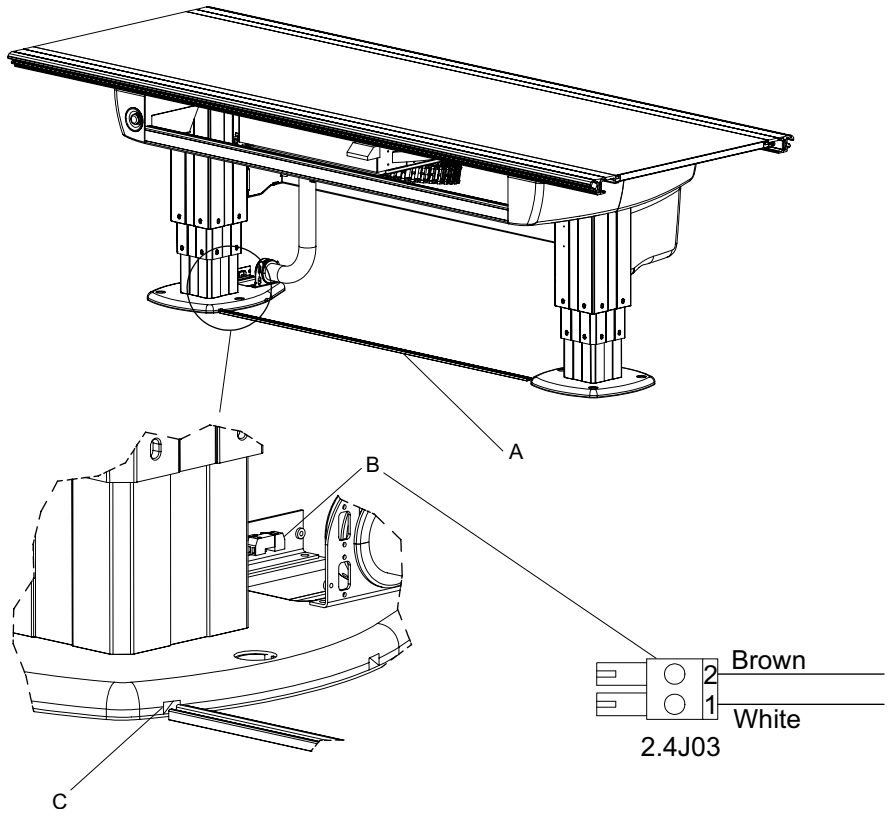


Fig. 4-108 Connect the foot control X/Y

4.23 Protective Earth

4.23.1 Check Protective Earth

Make sure the protective earth cables are connected and the bolts are tightened, see **Fig. 4-109**.

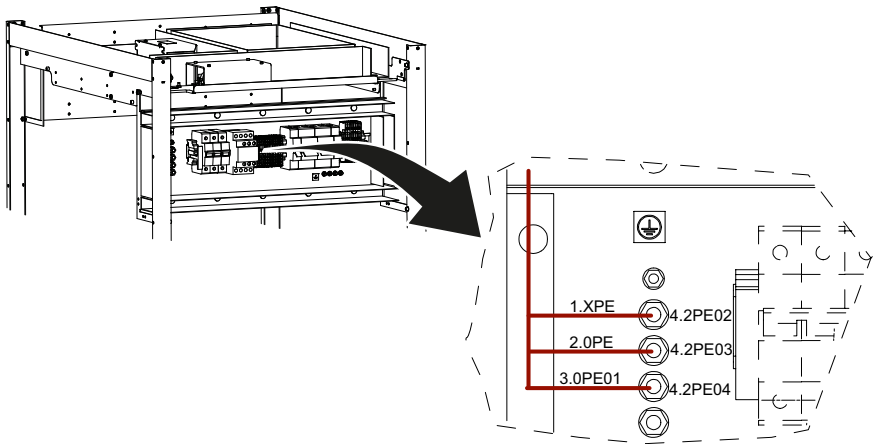


Fig. 4-109 Checking the protective earth cables and bolts

4.23.2 Measure Protective Earth

WARNING!

Make sure the mains power is switched off before the mains protective earth cables are disconnected.

Protective earth is measured to ensure that all cables are correctly connected.

A visual or audible device (Ohmmeter, buzzer, etc.) may be used to indicate grounding continuity.

Before measuring protective earth on the ceiling unit, Table and Wallstand as follows, make sure the mains protective earth cable from the building is not connected, see **Fig. 4-110**.

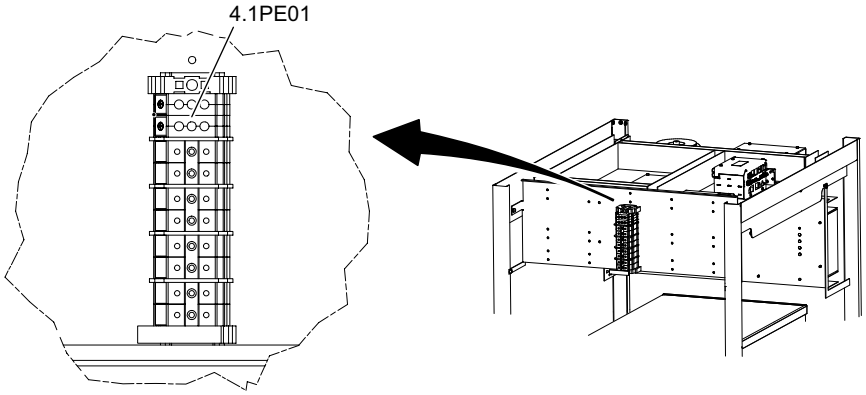


Fig. 4-110 Measuring protective earth

4.23.3 Protective Earth CS

Measure the continuity between the measuring point 1.CS and the ground terminal 4,1PE01.

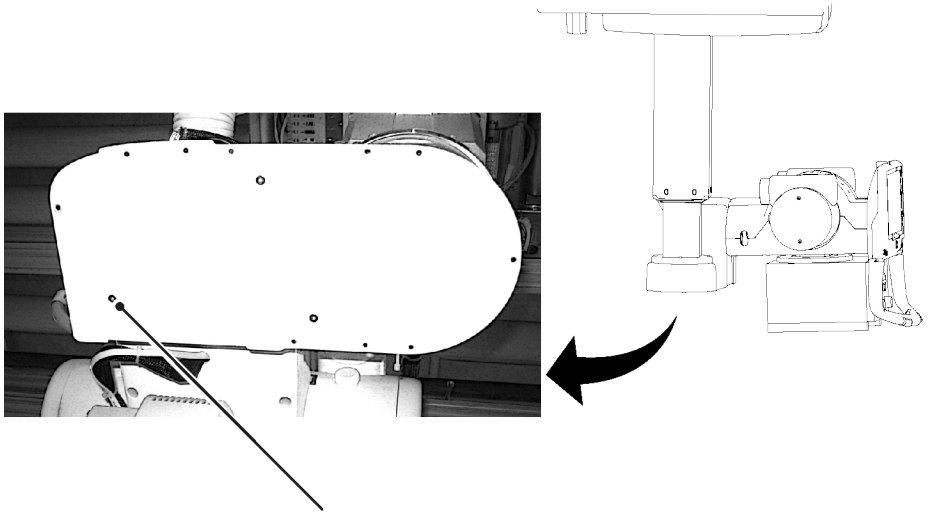


Fig. 4-111 Measuring point 1.CS

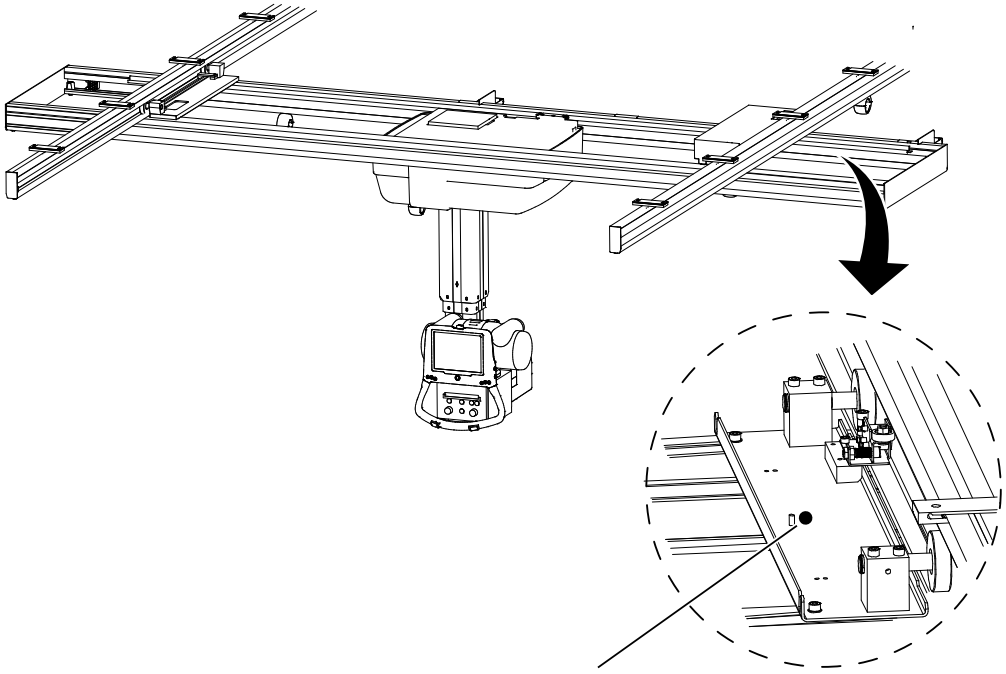


Fig. 4-112 Measuring point 2.CS

4.23.4 Protective Earth Wallstand

Measure the continuity between the measuring point 1.WS and the ground terminal 4,1PE01.

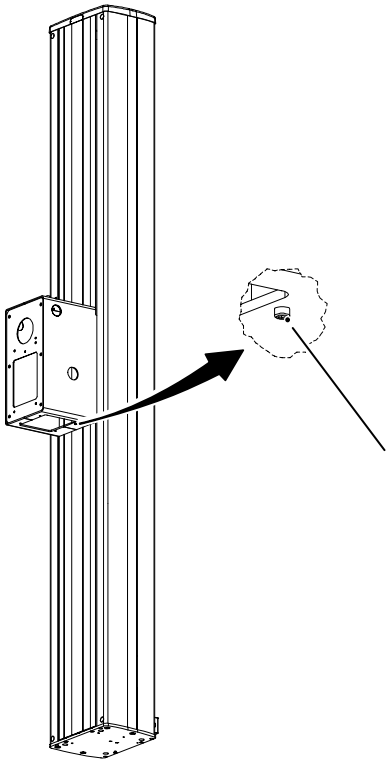


Fig. 4-113 Measuring point 1.WS

Measure at the earthing screw at the electrical plate.

Reconnect the earthing cable.

4.23.5 Protective Earth Table

Measure the continuity between the measuring point 1.TS and the ground terminal 4.1PE01.

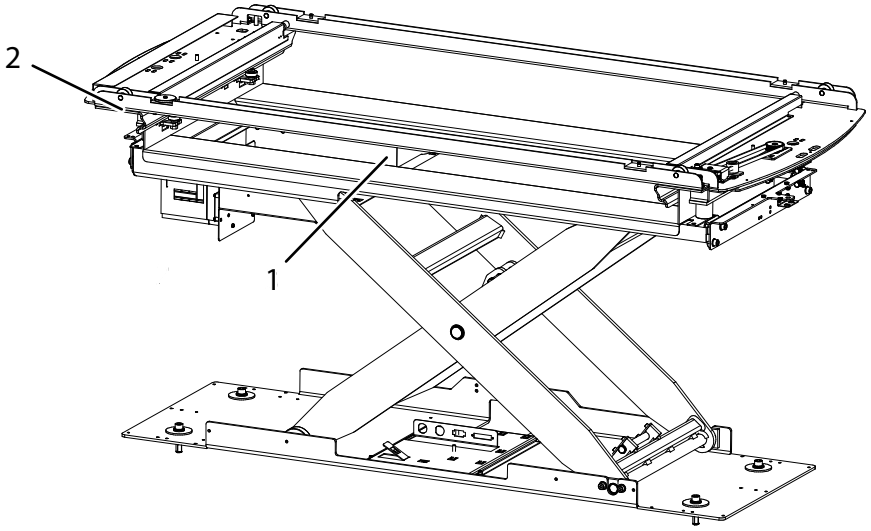


Fig. 4-114 Measuring points, 1.TS, 2.TS

1. *Measuring point 1 (Detector holder wagon)*
2. *Measuring point 2 (Table frame wagon)*

4.24 Alignment, Calibration and Adjustment

4.24.1 Collimator Light- and X-ray Field Alignment

The collimator light field and the X-ray field are normally adjusted at delivery. However, the alignment must still be done at the installation.

1. Align the tube with the detector.
2. Attach some suitable objects on the detector holder cover. Position the objects within the active image receptor area, nearby the edges.
3. Perform an exposure and evaluate the alignment (images vs. the collimator light field) using the references applied in the previous step.
4. The maximum deviation between light field and X-ray field is +/-1% of SID, see figure below.
5. Adjust the collimator light field according to the collimator manual.

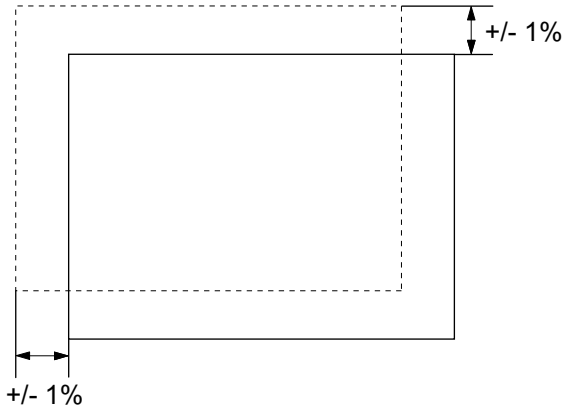


Fig. 4-115 Collimator light and X-ray field alignment

4.24.2 Adjustment of the Collimator Light Field

4.24.2.1 Manual Collimator

4.24.2.1.1 Remove Cover

Fig. 4-116

1. Tighten the four Allen screws to allow removal of the cover.

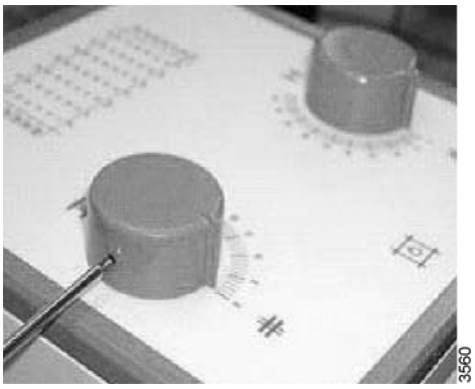


Fig. 4-117

2. Remove the two knobs.

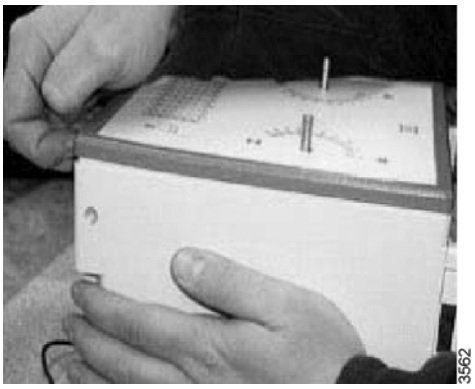


Fig. 4-118

3. Carefully remove the snap-on front panel.

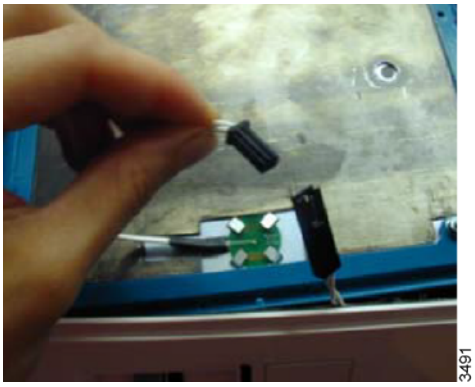


Fig. 4-119

4. Disconnect the connector.

Fig. 4-120

5. Remove the tape stop by lifting it off with a screw driver.

   Gently ease the tape into its container within the collimator.

Fig. 4-121

6. Turn the collimator over and unscrew the four screws.

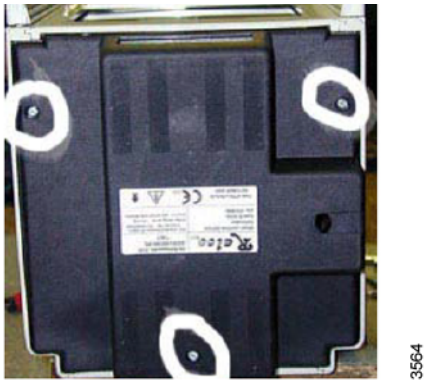


Fig. 4-122

7. Remove the rear cover by unscrewing the screws.

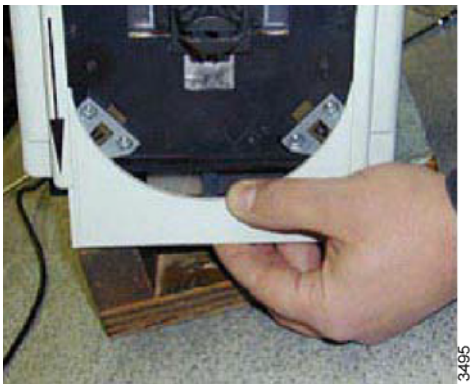


Fig. 4-123

8. Place the collimator lower side down and slightly raise.

   Slip the semi-circle out.

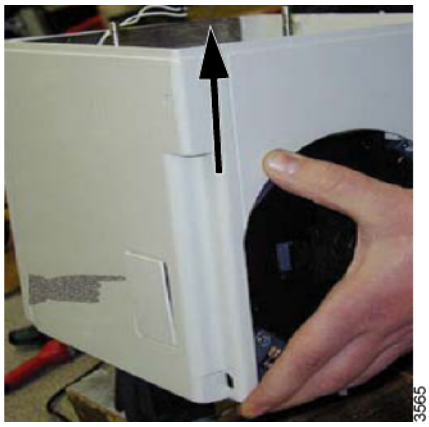


Fig. 4-124

9. Ease the cover upwards gently. This will also release the small panel.

Access to Collimator Components

Fig. 4-125

1. Laser

   Access to the laser by removing the two knobs and/or the front panel depending on the collimator model.

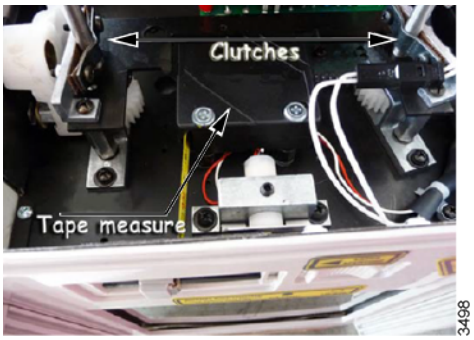


Fig. 4-126

2. Friction

   Access the clutches by removing the two knobs and/or the front panel depending on the collimator model.

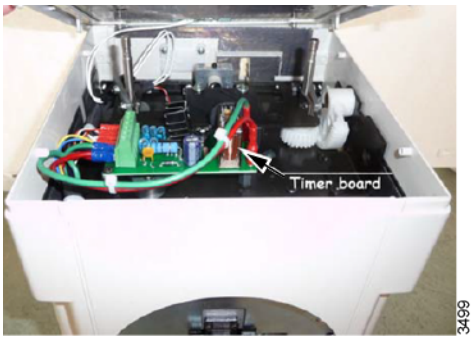


Fig. 4-127

3. Timer board

   Access the timer board by removing the two knobs and/or the front panel depending on the collimator model.

Fig. 4-128

4. Power supply

   Access the collimator power supply by removing collimator back panel.

Fig. 4-129

5. Transversal movement

   Access the transversal adjustment parts by removing the lateral plate.

4.24.2.1.2 Adjustment of Light Field Size

Longitudinal Calibration (LONG)

1. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
2. Remove the light source protection heatsink by unscrewing the fixing screws .
   This allows you to access the light source.
3. If the light-field needs to be moved laterally, loosen (not remove) the fixing screws A.
4. Adjust through screw B.
5. When calibration is terminated, lock the screws A.

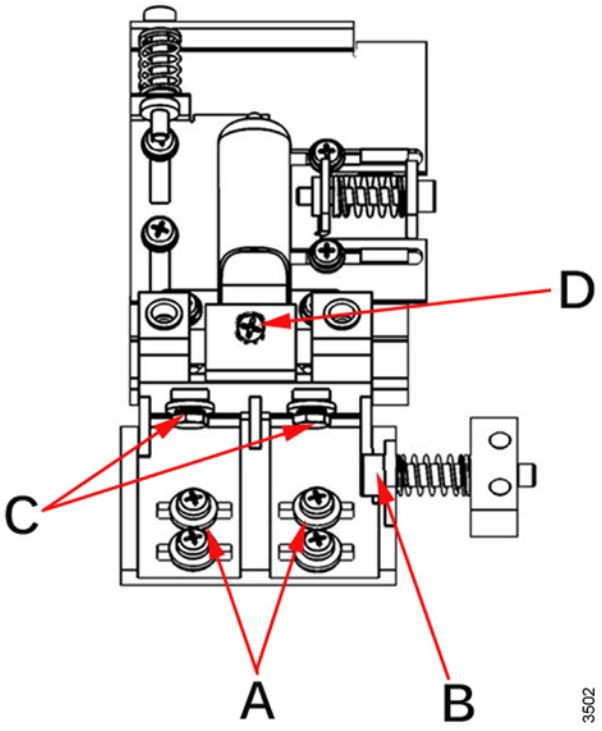


Fig. 4-130 Light field adjustment

Vertical Alignment

1. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
2. If adjustment is required loosen the two screws C holding the light support, see **Fig. 4-130**.
3. If the light-field is smaller than the X-ray field, lower the light source by adjusting screw D.
4. If the light-field is bigger than the X-ray field, raise the light source by adjusting screws D.
5. Tighten the two screws C.

4.24.2.1.3 Adjustment of Light Field – Radiation Field

If the light-field needs calibration, the mirror needs to be adjusted.

1. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
2. Loosen the mirror fixing screw A (not remove) and shift it to adjust the position of the mirror.

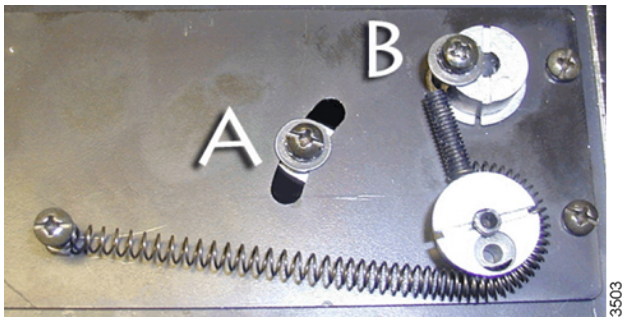


Fig. 4-131

3. Tighten the screw A and remount the cover.

4.24.2.1.4 Adjustment of Crosshairs

1. Activate the light field.
2. Adjust the light field to a narrow line for each pair of shutters by turning the two knobs alternately.
3. Check that the project cross line is exact halfway between the edges of the shutters.

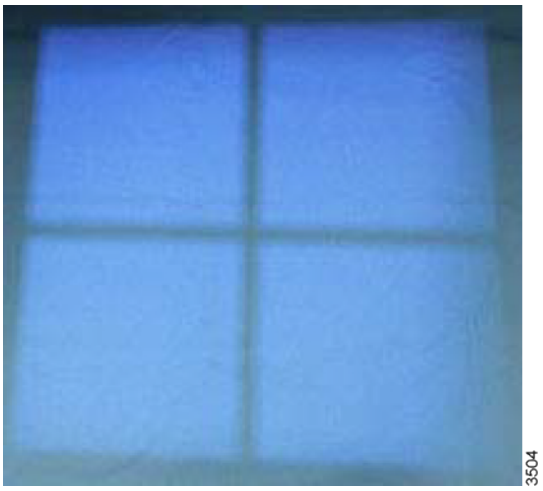


Fig. 4-132

4. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
5. Loosen the four screws securing the plastic panel and adjust the cross lines to coincide with the light lines.
6. Tighten the screws.

4.24.2.1.5 Adjustment of Line Laser

WARNING!

Class II laser system.

Do not stare into the beam.

Class II laser beam < 1 m W - wavelength = 645 nm.

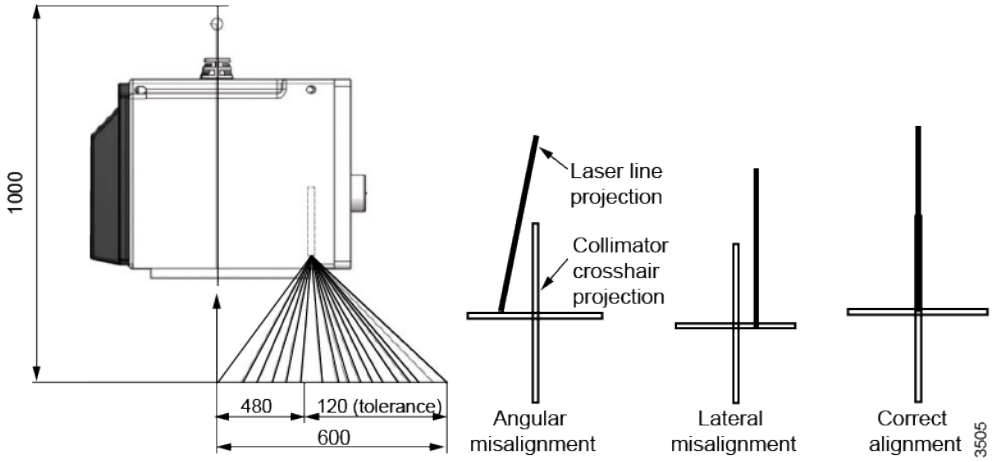


Fig. 4-133

1. Activate the light-field.
2. Turn the control knobs and adjust the light to a narrow line for each pair of shutters.
   Check that the laser line is projected on the light field and that it is midway from the edges.
3. To adjust, remove the collimator cover, see **4.24.2.1.1 Remove Cover, Page 203**.
4. Rotate the laser or tilt the laser support if possible.
5. To rotate the laser, loosen the screw A the laser support.
6. To move the laser support, loosen the screws B.

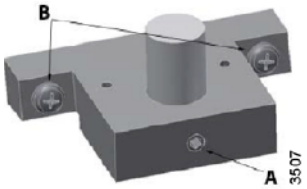


Fig. 4-134

7. When calibration is finished, tighten the screws.

WARNING!

Do not apply excessive force to the screws.

The laser shell is plastic and excessive pressure could crack the plastic and possibly short-circuit the laser.

4.24.2.2 Automatic Collimator

4.24.2.2.1 Adjustment of Light Field – Radiation Field

If the coincidence of the light field and the radiation field is not adequate (e.g. tolerances of the focus point), the light field can be centered using the two Allen screws (2), (3) on the top of the collimator.

Note!

The slot-head screw (1) next to the two adjustment screws may not be loosened under any circumstances!

Fig. 4-135

1. Adjustment in the x-direction (height): If the screw (2) is turned clockwise, the light field moves to the right and vice versa.
2. Adjustment in the y-direction (width): If the screw (3) is turned clockwise, the light field moves to the back and vice versa. The adjustment range in this direction is about three times larger than the range in the x-direction.
3. The maximum adjustment range is approximately ±5 mm (with SID 115 cm).

   Note!

   The adjustment screws may only be turned until the resistance of the compression springs can be felt. The screws must not be loose!

4. After adjusting the light field, the crosshairs window can be readjusted by loosening the 4 fastening screws of the holding frame and the line laser if needed.

   Note!

   The adjustment of the light field may have an effect on the adjustment of the system. If necessary, it must be readjusted, too.

4.24.2.2.2 Adjustment of Light Field Size

Halogen Lamp

In order to change the size of the light field, remove the lamp cover and the heat shield first.

CAUTION!

Risk of burns!

If the halogen lamp of the light localizer burns for a long time, the lamp housing can heat up.

Avoid contact with lamp housing to prevent burns.

CAUTION!

The maximum permissible operation time duty cycle is 50% (90 seconds on to 90 seconds off).

The permanent on time of the light must not exceed 10 minutes.

1. Use a 5.5 mm open-end wrench to loosen the clamping screw (1).
2. To enlarge the light field, turn the screw (2) clockwise.

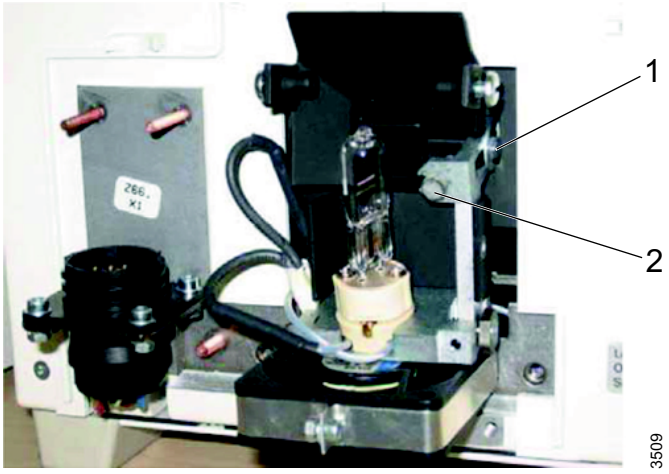


Fig. 4-136

3. To reduce the size of the light field, turn the screw (2) counterclockwise.
4. After adjusting the size of the light field, tighten the clamping screw (1) again.

LED

In order to adjust the light field, it is necessary to remove the lamp cover at first.

CAUTION!

Risk of burns!

If the LED of the light localizer burns for a long time, the heatsink can heat up.

Avoid contact with heatsink to prevent burns.

CAUTION!

Risk of eye injury!

Photobiological effect of ultraviolet radiation.

Do not look into the light beam for longer than 15 seconds.

Always keep enough distance to the collimator.

1. Use a 5.5 mm open-end wrench to loosen the clamping screw (1).
2. To enlarge the light field, push the heatsink (2) towards the housing.

Fig. 4-137

3. To reduce the size of the light field, pull out the heat sink (2).
4. Tighten the clamping screw (1) again.

4.24.2.2.3 Adjustment of Crosshairs

The crosshairs (1) of the collimator can be adjusted after loosening the 4 fastening screws of the holding frame (2).

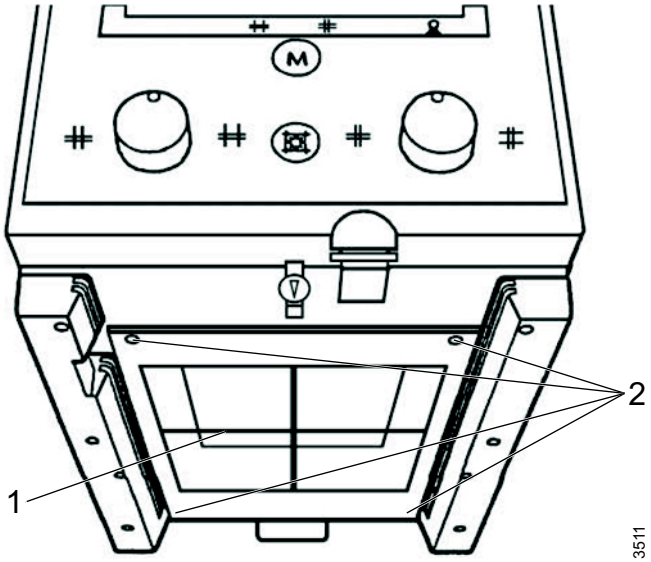


Fig. 4-138

4.24.2.2.4 Adjustment of Line Laser

1. Loosen the screws (1) and (2) to get the line laser (4) centered again.
2. The laser holder may now be turned around the axis of the screw (2).
3. To realign the laser line coaxial to the crosshairs, the screw (3) has be loosened so the laser (4) can be rotated around its axis in the holder.

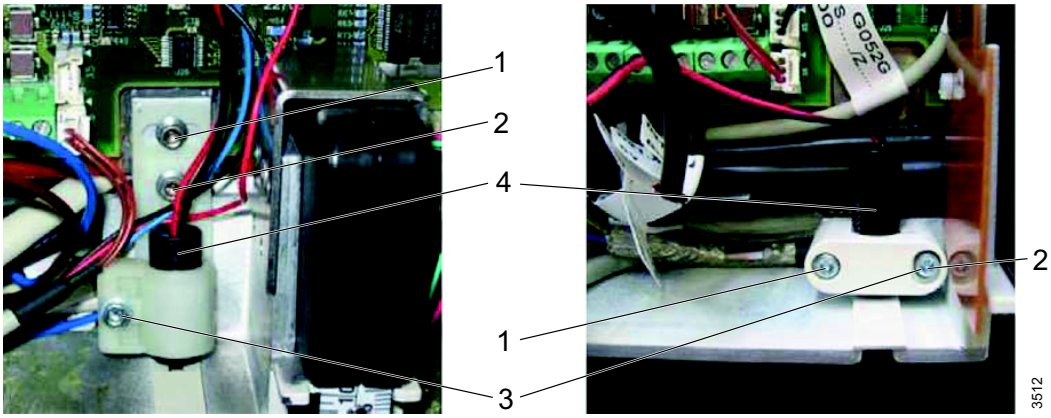


Fig. 4-139

4.24.2.3 Stitching Collimator

4.24.2.3.1 Remove Cover

Fig. 4-140

1. Remove the two knobs.

Fig. 4-141

2. Carefully remove the snap-on front panel.

Fig. 4-142

3. Disconnect the connector.

Fig. 4-143

4. Remove the tape stop by lifting it off with a screw driver.

   Gently ease the tape into its container within the collimator.

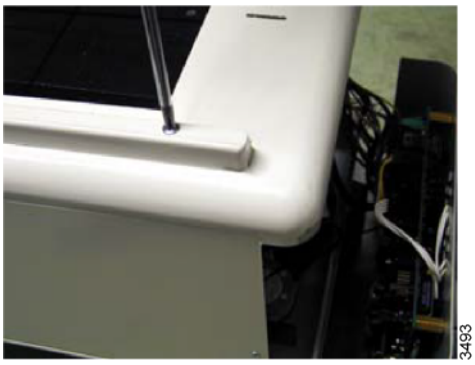


Fig. 4-144

5. Turn the collimator over and unscrew the four screws.

6. Remove the rear cover by unscrewing the screws.

7. Remove the lateral cover by lifting it off from the two spacers.

Fig. 4-145

4.24.2.3.2 Adjustment of Light Field Size

Vertical Alignment

1. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
2. If adjustment is required loosen the two screws C holding the light support.
3. If the light-field is smaller than the X-ray field, move away the light source by adjusting screw D.
4. If the light-field is bigger than the X-ray field, move the light source closer by adjusting screws D.
5. Tighten the two screws C.

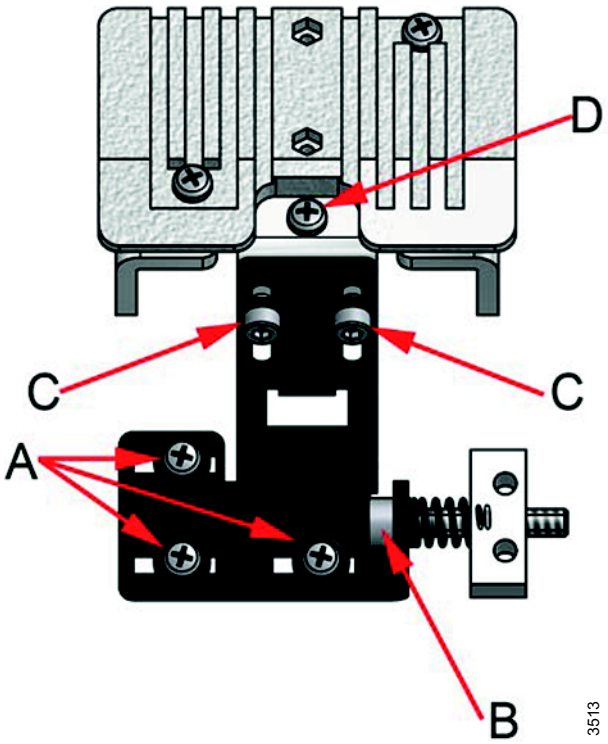


Fig. 4-146

Longitudinal Alignment (Long)

CAUTION!

Risk of burns!

Do not touch the dissipater with your hands; it could be hot and cause severe burns.

1. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
2. If the light-field needs to be moved laterally, loosen (not remove) the fixing screws A, see **Fig. 4-146**.
3. Use screw B to adjust transversely.
4. When calibration is terminated, lock the screws A.

4.24.2.3.3 Adjustment of Light Field – Radiation Field

If the light-field needs calibration, the mirror needs to be adjusted.

1. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
2. Loosen the mirror fixing screw A (not remove) and rotate the cam B to adjust the position of the mirror.

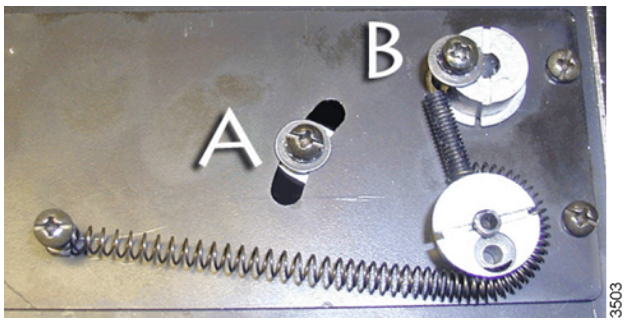


Fig. 4-147

3. Tighten the screw A and remount the cover.

4.24.2.3.4 Adjustment of Crosshairs

1. Activate the light field.
2. Adjust the light field to a narrow line for each pair of shutters by turning the two knobs alternately.
3. Check that the project cross line is exact halfway between the edges of the shutters.

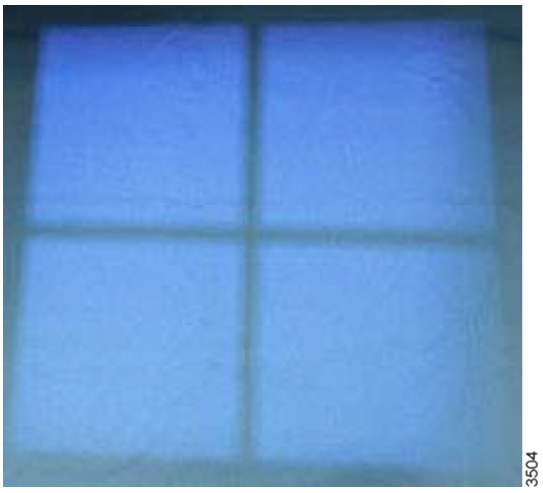


Fig. 4-148

4. Remove the part of the cover necessary to access the screws, see **4.24.2.1.1 Remove Cover, Page 203**.
5. Loosen the four screws securing the plastic panel and adjust the cross lines to coincide with the light lines.
6. Tighten the screws.

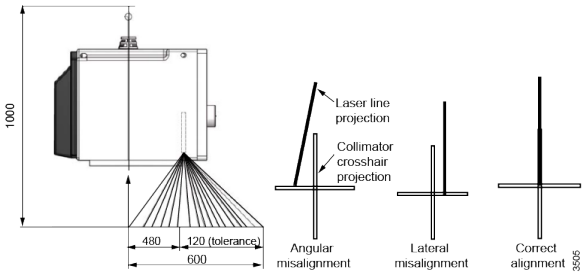
4.24.2.3.5 Adjustment of Line Laser

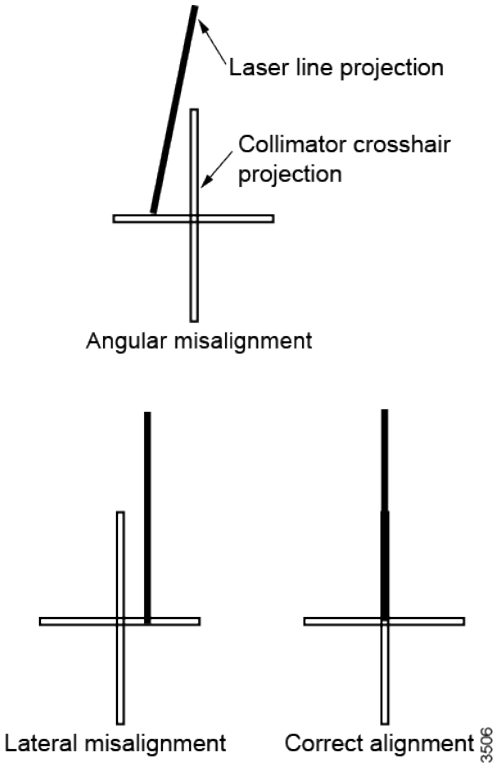
WARNING!

Class II laser system.

Do not stare into the beam.

Class II laser beam < 1 m W - wavelength = 645 nm ± 10 nm.





1. Remove part of the cover to access the point of adjustment, see **4.24.2.1.1 Remove Cover, Page 203**.
2. The line is to fall on a perpendicular cross-line on the plastic anti-dust panel near the collimator controls.
3. Adjust the position of the line by rotating or moving the base of the laser system.
4. To rotate the laser, loosen the Allen screw A.

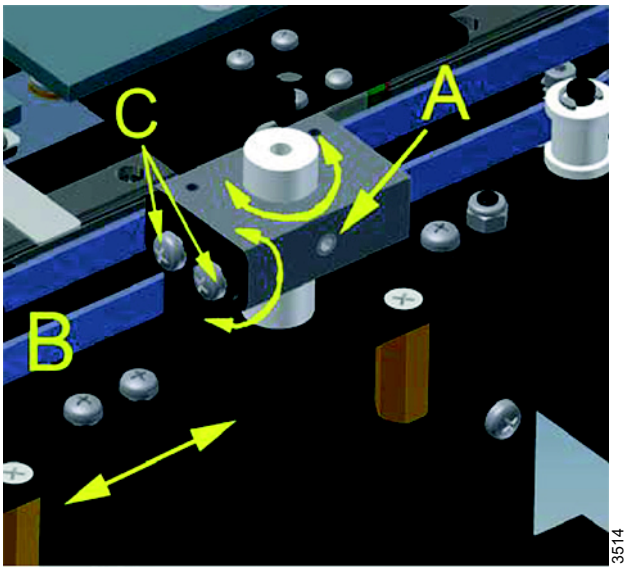


Fig. 4-149

5. Tighten the Allen screw when the laser beam falls on or is parallel to the bisector line drawn on the antidust panel.
6. To tilt the laser system, loosen the 2 screws C placed on the laser support and shift it upwards or downwards.
7. Once the position of the laser line has been adjusted, tighten the 2 screws C.
8. Shift the laser system by loosening the two B screws holding the laser system base to the beam limiting device front plate.
9. Move the base until the laser beam falls over the perpendicular bisector line on the anti-dust panel.
10. Tighten the two B screws.

WARNING!

Do not apply excessive force to the screws.

The laser shell is plastic and excessive pressure could crack the plastic and possibly short-circuit the laser.

4.24.3 Correspondence Between X-ray Field and Image Reception Area

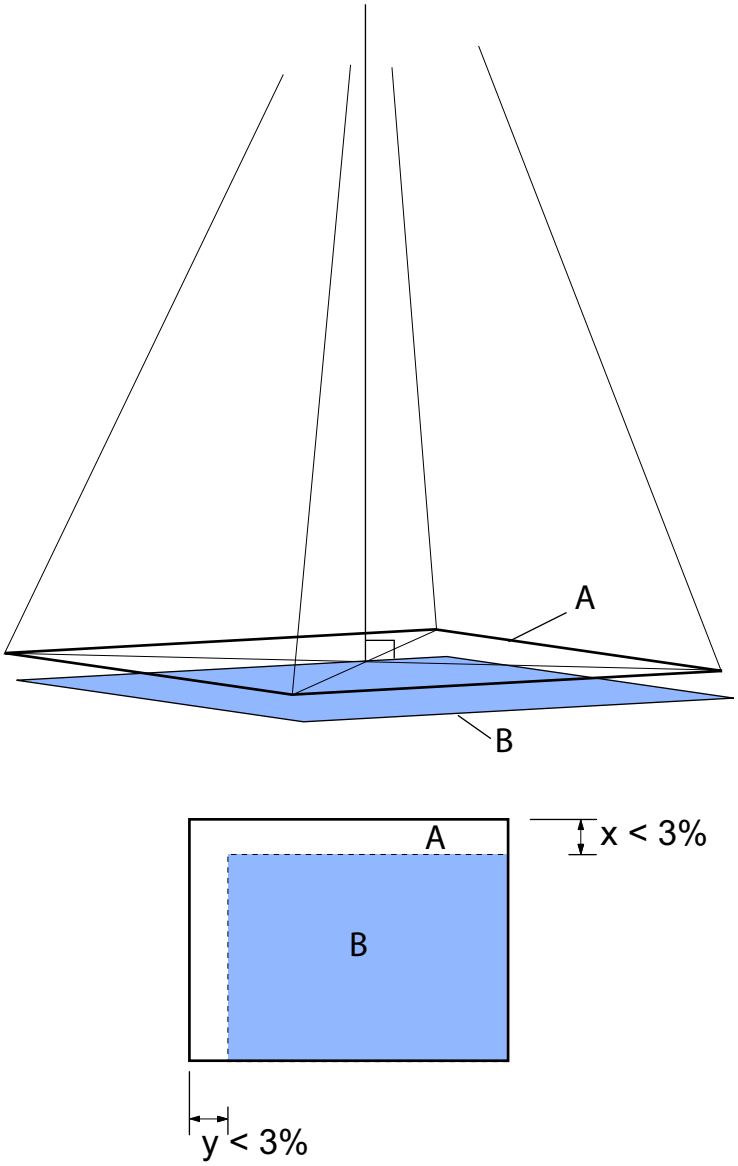


Fig. 4-150 X-ray field and Image reception area

1. Align the tube with the detector.
2. Perform an exposure and evaluate the alignment (images vs. the collimator light field) using the references applied in the previous step.
3. When the X-ray field (A) is adjusted in normal use for full coverage of the image reception area (B), it should correspond to the image reception area (B) within the following limits:

   x < SID x 0.03 **OR** y < SID x 0.03 **AND** x + y < SID x 0.04

   See **Fig. 4-150**.

4.24.4 Calibration of System and Service Software

Calibrate the System and the Service Software.

4.24.5 Connections Image System Control PC

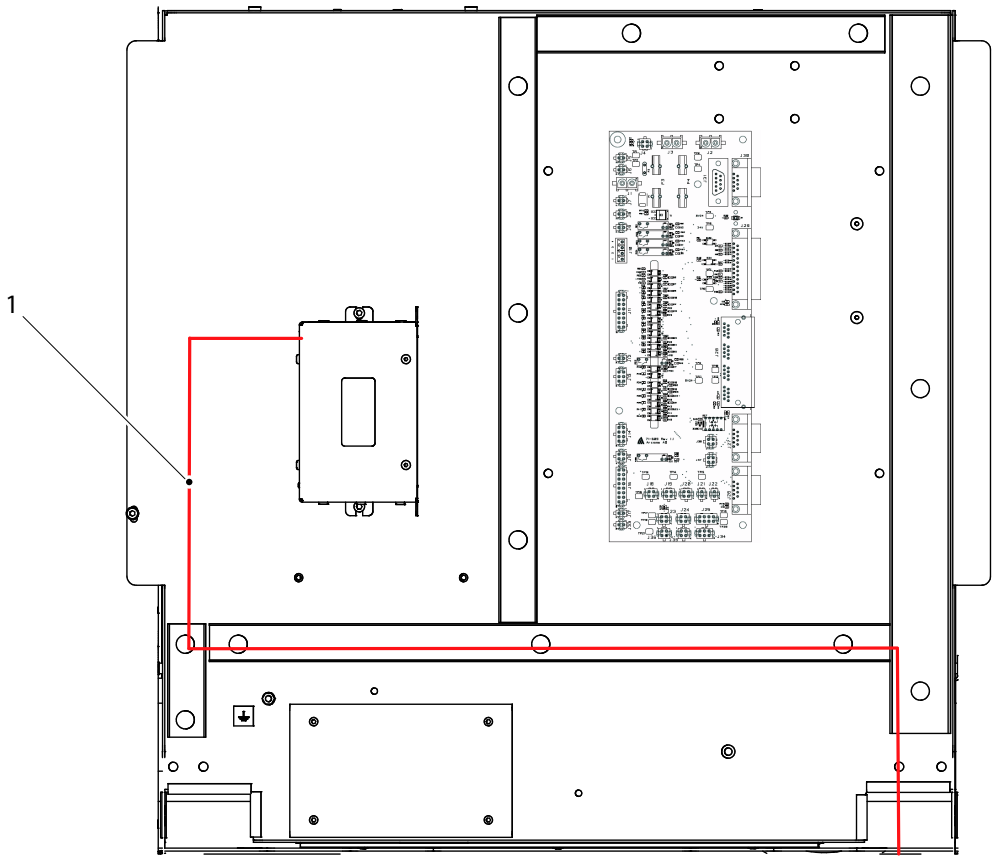


Fig. 4-151 Connecting the image system control PC (RS232)

1. Generator control board J3 — Image system control PC (RS232)

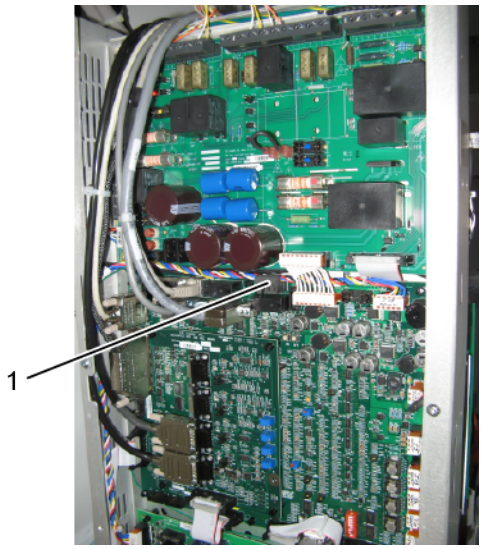


Fig. 4-152 Image system control PC (Ethernet)

1. System cabinet 4.4 CB800_01 — J1 — Image system control PC (Ethernet)

4.24.6 Detector Calibration

For detector calibration, refer to Manufacturer’s Detector Manual.

4.24.7 Connect OTC

4.24.7.1 General

Note!

A disconnecting device from the mains shall be incorporated external to the equipment according to the national wiring rules.

Connect the OTC to the cabinet.

Note!

The installation cables from the overhead tube crane must be installed covered. They shall not be placed on the floor.

4.24.7.2 Install Positioning Index

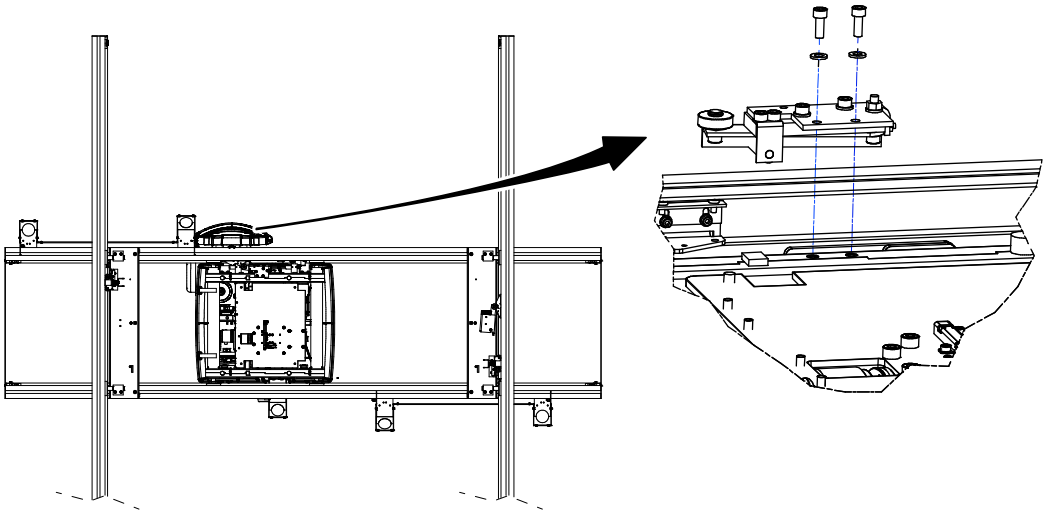
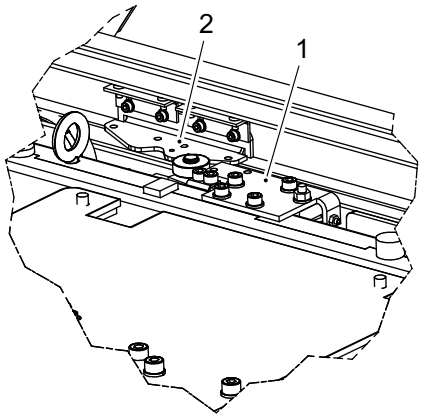


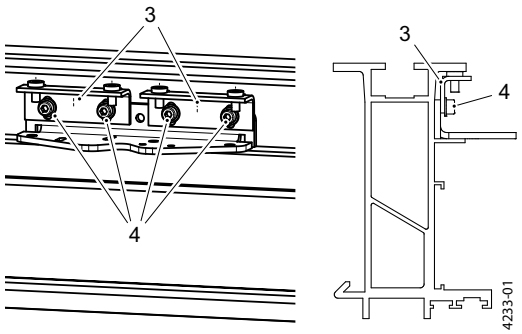
Fig. 4-153 Position index, table

The positioning index is intended for easily positioning of the OTC in the center of the detector, over the table, see **Fig. 4-153**, and at the desired SID from the wallstand, see **Fig. 4-158** and **Fig. 4-159**.



1. Place the positioning index (2) in position next to the index positioning arm (1).

Fig. 4-154 Positioning index



2. Slide the index lock brackets (3) upward until it touches the profile.
3. Tighten the screws (4).

Fig. 4-155

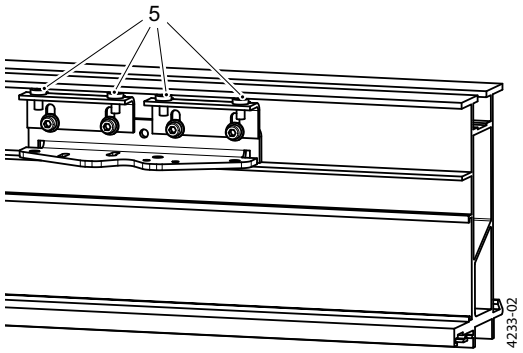


Fig. 4-156

4. Temporary tighten the set screws (5)
5. Check the position of the positioning index. Adjust if necessary.
6. Loosen the set screws (5), apply Loctite 243 and tighten the set screws again (5)

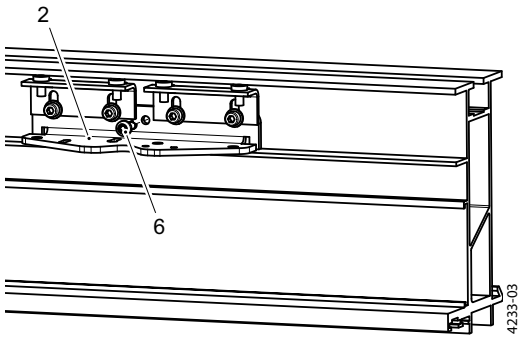


Fig. 4-157

7. Secure the positioning index (2) with the self-tapping screw (6).

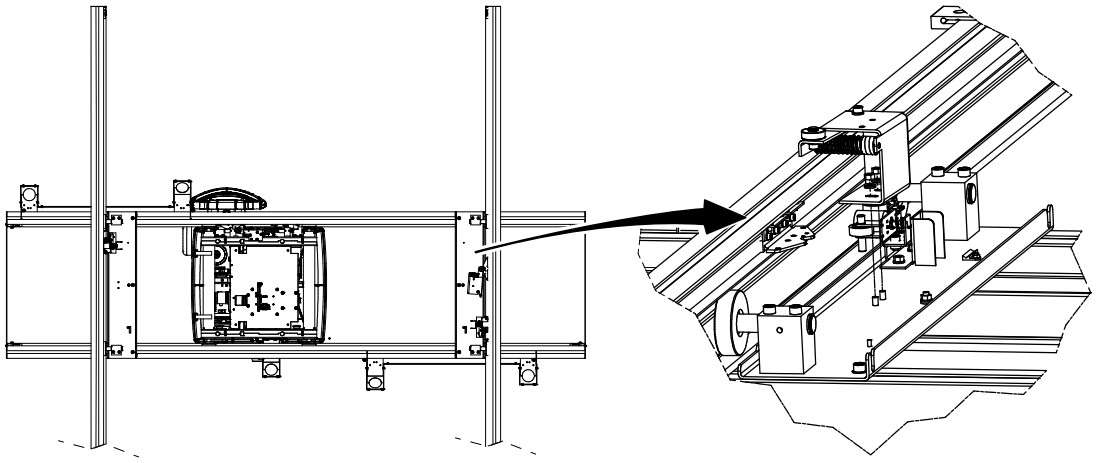


Fig. 4-158 Position index, wallstand

For mounting of positioning index for the wallstand see step **2.** – step **7.** on page **227** .

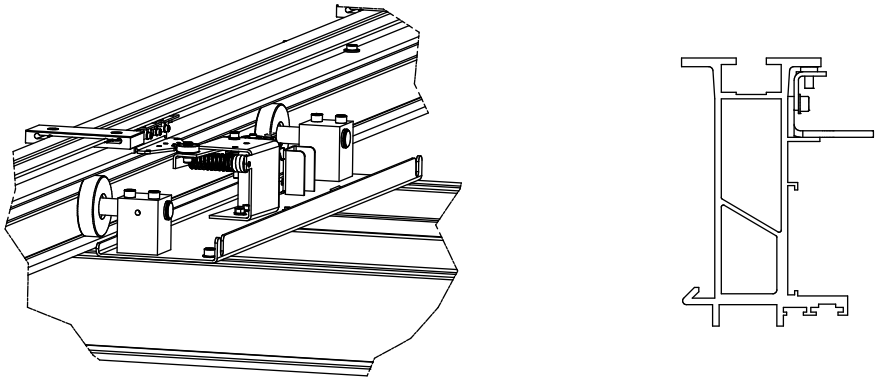


Fig. 4-159

To make it easier for the user to find the right SID from the wallstand, use the enclosed stickers. Consult with the user and install the index(-es) at the desired SID and mark with the stickers according to **Fig. 4-160**.

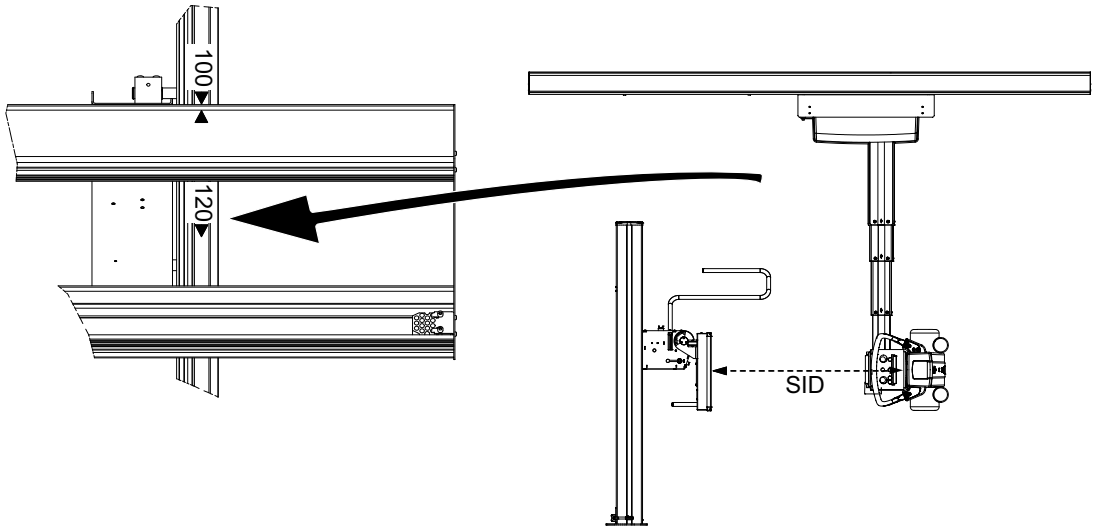


Fig. 4-160 Marking with stickers

Micro Switch

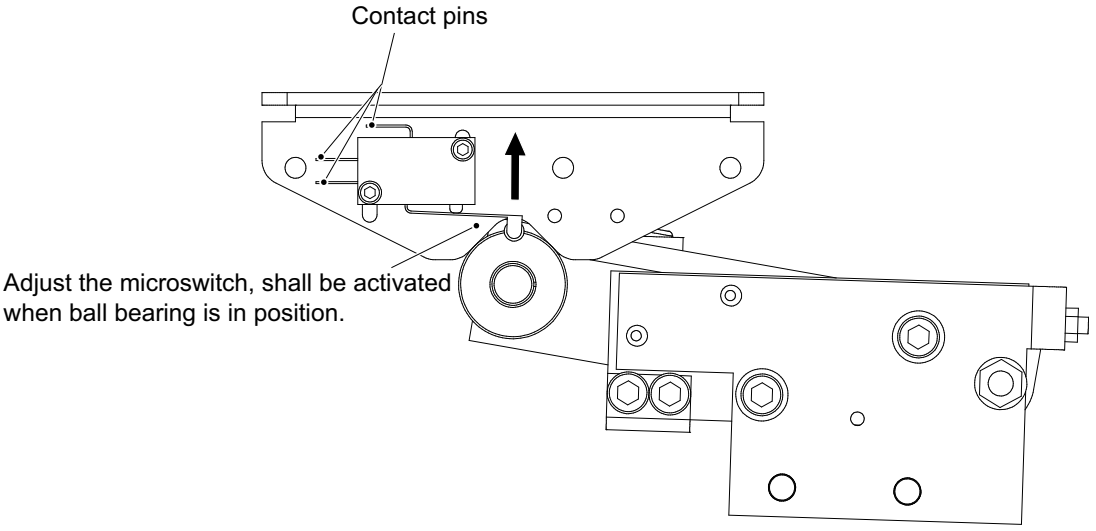


Fig. 4-161 Micro switch

The micro switch must be mounted in the arrow direction. It is important that the microswitch contact pins cannot touch moving parts during manual movement of the ceiling suspension in X/Y directions.

Electrical Indexes

Connect the electrical indexes according to **Fig. 4-162**

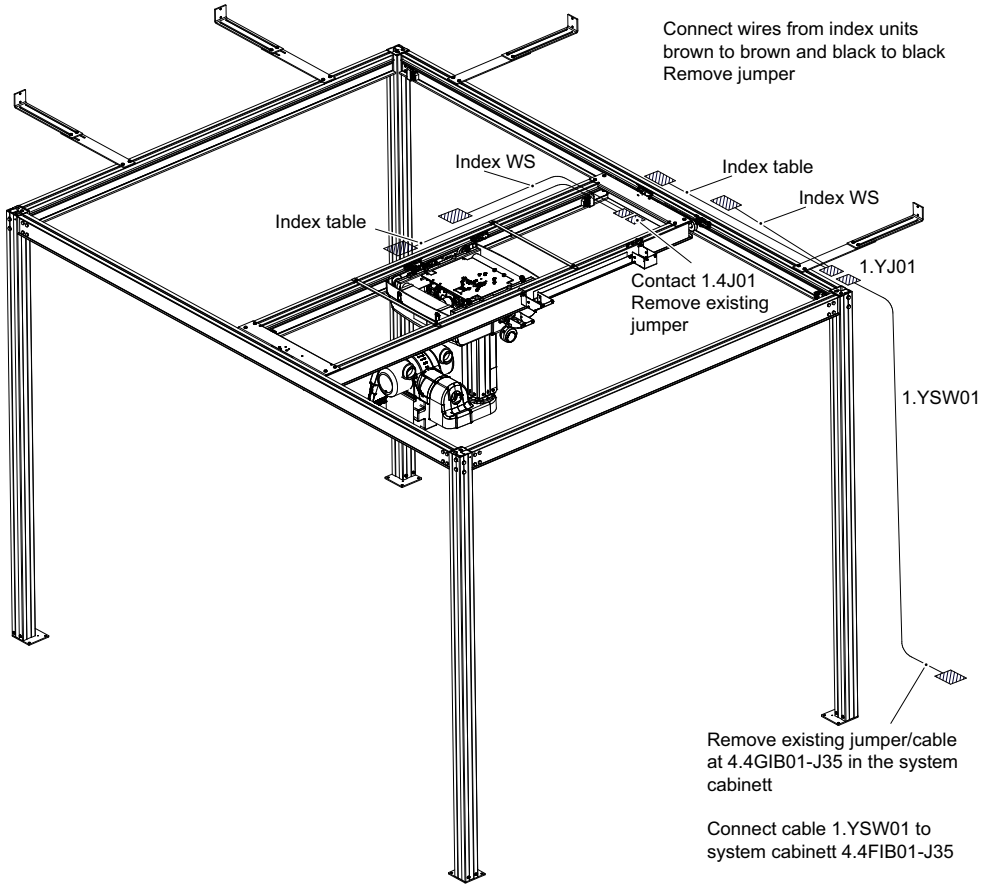


Fig. 4-162 Connecting electrical indexes

Check functionality of the electrical indexes.

X-ray exposure shall be inhibited when ceiling suspension is placed outside the index positions.

4.24.8 Calibration of OTC Movement

The movements of the OTC can be calibrated at the *SETTINGS* Menu, at the *SERVICE* view.

Description:

When folder *SERVICE* is selected, a numerical keyboard is shown to the user. A four digit access code is required.

At access, vertical folders are selectable for the full system.

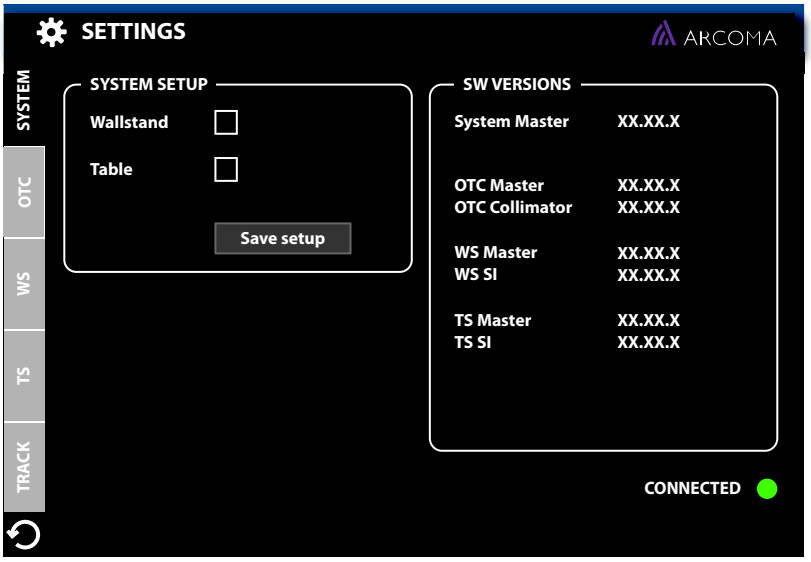


Fig. 4-163 Service tag selected

- *SYSTEM* - Always available.
- *OTC* - Always available.
- *WS* - Available when *WS* is selected in *SYSTEM* in the*SYSTEM SETUP*.
- *TS* - Available when *TS* is selected in *SYSTEM* in the *SYSTEM SETUP*.
- *TRACK* - Always available.

The activation of a button will result in:

a green check box, beside the button, if the value/change is accepted/defined.

a red cross, beside the button, if the value/change is not accepted/defined.

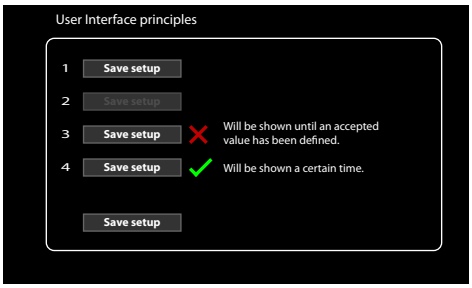


Fig. 4-164 Value/Change is accepted or denied

4.24.8.1 Z Position

CAUTION!

When operating the column (Z-position) from the service program, software end stops are bypassed. Take great care when driving close to the end stop positions to prevent collisions.

Note!

When recalibrating, perform all the steps below from 1 to 6.

Take the following actions:

1. Navigate in the menu to the "*Z Position*" view at *SERVICE/SETTINGS/OTC/Z CALIBRATION*.

Fig. 4-165 OTC view

2. Measure the focal spot to floor distance, preferably using the measuring tape in the collimator.
3. Enter the height at the "*Calibration position*" box. The height shall be entered in mm.

   Note!

   Restart directly after each calibration to save the calibrated values.

If it is a recalibration of the Z position, also perform the steps below.

4. Calibrate the Z high end stop, Z low end stop and Z safety zone.
5. Go to the *WS* resp. *TS* menus.
6. Recalibrate entering the values at *TS* "*Calibration position*" resp. *WS* "*Calibration position*".

4.24.8.2 Z High End Stop

The correct position for setting the high end stop is approximately 20 mm below the mechanical end stop, which is placed in the column.

The distance can easiest be measured as in the figure below.

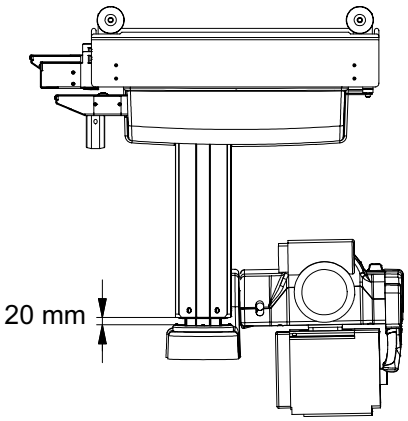


Fig. 4-166 High end stop

Take the following actions:

- Navigate to: *SERVICE/SETTINGS/OTC/End stops.*
- Select ”*Clear values*”. This enables to drive the OTC (Ceiling suspended tube support) to any position.
- Drive the OTC to the new desired position for the high end stop.

Procedure to define the high end stop:

When the OTC is in position, select “*Set high*” and the new position for high end stop is now defined. The position for the low end stop will remain the same.

- Restart directly after the calibration to save the calibrated values.

4.24.8.3 Z Low End Stop

For setting the Z low end stop, use the same procedure as for setting the definition of the high end stop.

But when the OTC is in the desired position for the low end stop, select "*Set low*" and the new position for low end stop is now defined. The position for the high end stop will remain the same.

Restart directly after the calibration to save the calibrated values.

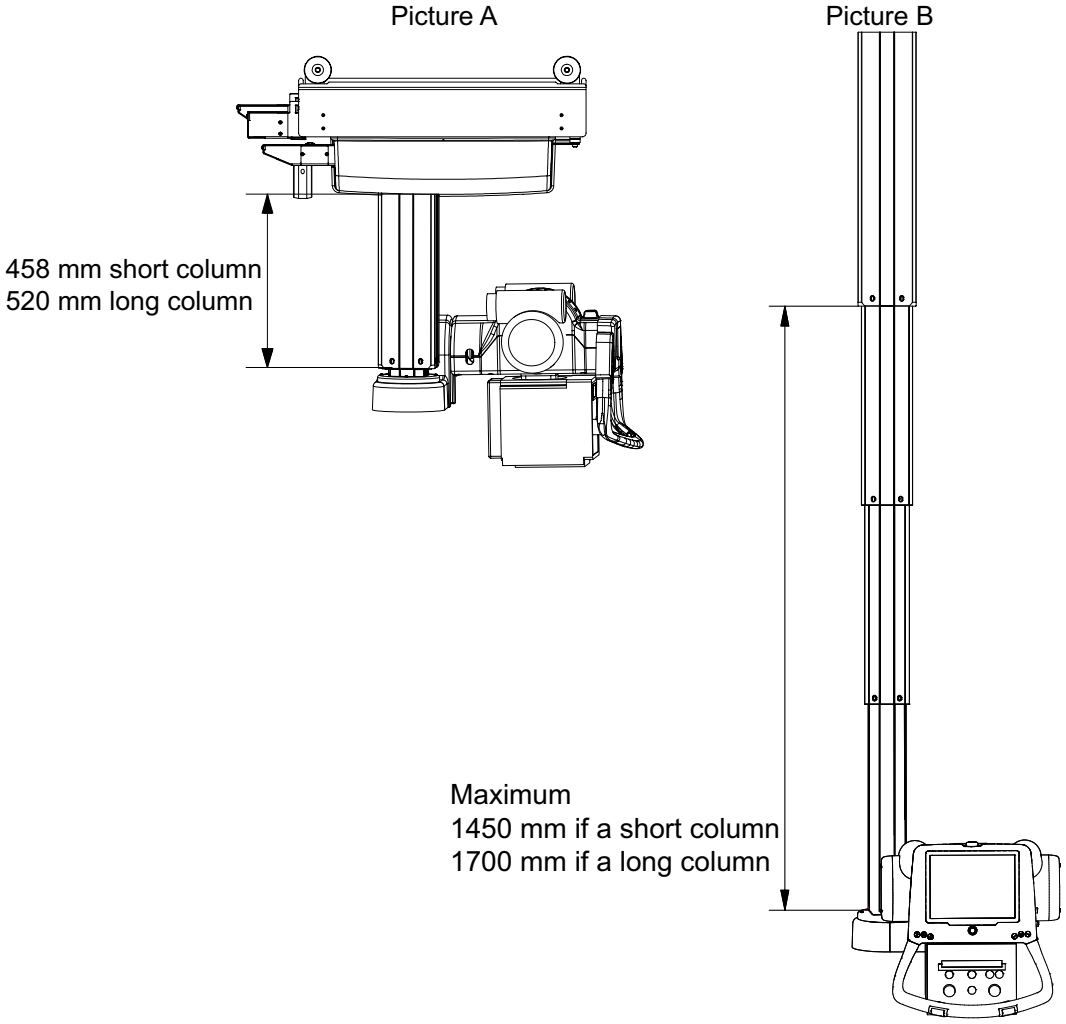


Fig. 4-167 Low end stop

4.24.8.4 Z Safety Zone

The correct position for calibrating the mechanical part of the Z safety zone is at a height of 1170 mm, from the floor to the lowest part of the OTC. The software safety zone is set at the same position. Make sure that the safety arm is not affected when setting the software safety zone.

Take the following actions:

1. Navigate in the *SERVICE/SETTINGS/OTC* menu to the *SAFETY HEIGHT* view.

Fig. 4-168 Safety Height

2. The correct position for calibrating the mechanical part of the Z safety zone, is at a height of 1170 mm, from the floor to the lowest part of the OTC. The software safety zone is set at the same position. Make sure that the safety arm is not affected when setting the software safety zone.

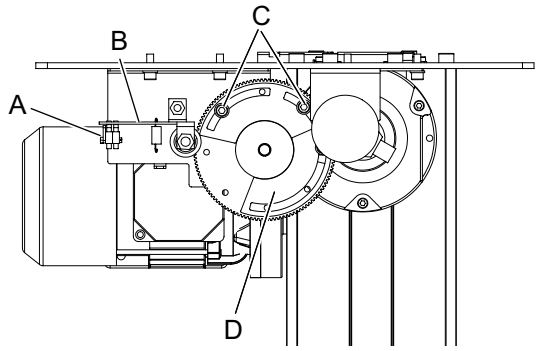


Fig. 4-169 Tilting lever

A Switch
B Tilting lever
C Screws
D Plate

3. Press the "*Save Safety height*" button to set the Z Safety zone.
4. Drive the column downward as low as possible. The tilting lever shall lift off the switches according to **Fig. 4-170**. If not, adjust the plates.
5. The correct position for calibrating the mechanical part of the Z safety zone, is at a height of 1170 mm from the floor to the lowest part of the OTC. The software safety zone is set at the same position. Make sure that the safety arm is not affected when setting the software safety zone.

6. Restart directly after the calibration to save the calibrated values.

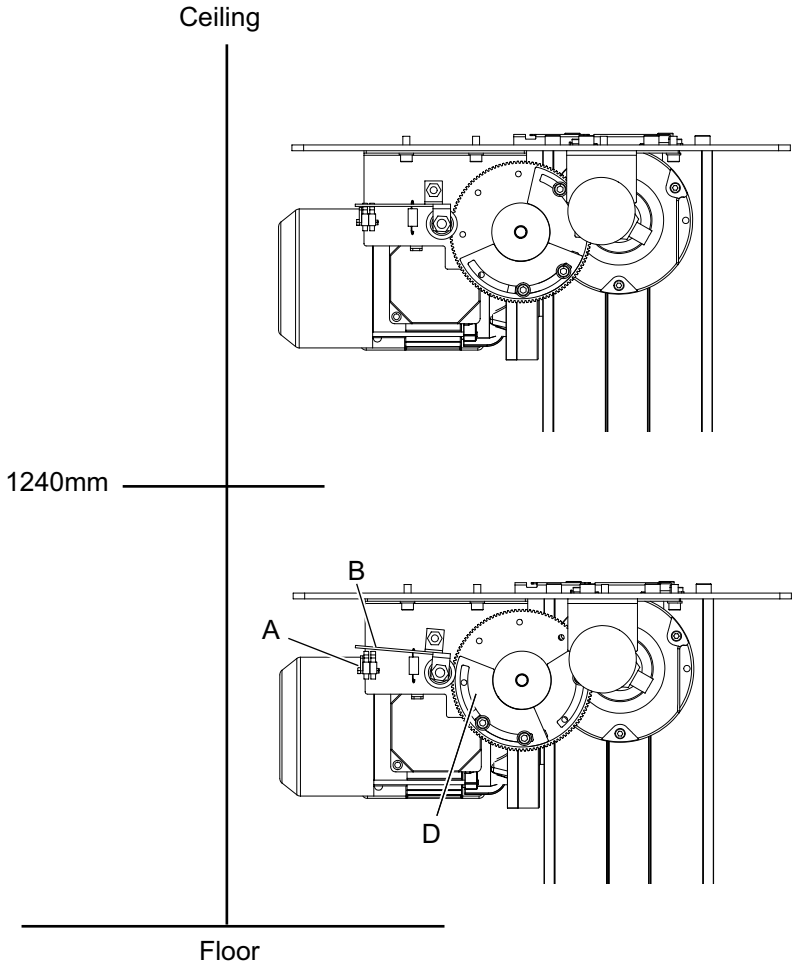
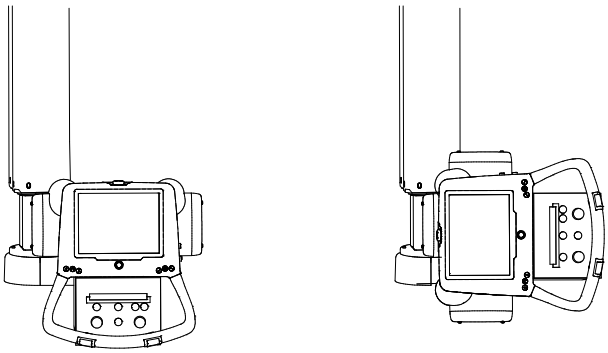


Fig. 4-170 Setting Z safety zone

A Switch
B Tilting lever
C N/A
D Plate

4.24.8.5 Alpha Calibration

The calibration of Alpha requires two positions. The first position is with the alpha in 0° and the second with alpha in +90° clockwise.



0 degrees -90 degrees

Fig. 4-171 Calibrating Alpha

Take the following actions:

1. Navigate in the *SERVICE/SETTINGS/OTC* menu to the *ALPHA CALIBRATION* view.

Fig. 4-172 Alpha calibration view

2. Release the alpha brake and turn alpha to 0°.
3. Press the *Set 0°*- button.
4. Release the alpha brake and turn alpha 90° counter clockwise.
5. Press the *Set 90°*- button.
6. Restart directly after the calibration to save the calibrated values.

4.24.8.6 Setup Collimator

Note!

The collimator type is pre-set from factory, only perform the calibration if necessary.

1. Navigate to: *SERVICE/SETTINGS/OTC/Collimator/Collimator*.

Fig. 4-173 Collimator view

2. Choose the collimator type used in the system.
3. Enter the collimator “Light on time”.
4. Restart directly after the calibration to save the calibrated values.

4.24.8.7 Stitching Overlap (option)

1. Navigate to: *SERVICE/SETTINGS/OTC/Stitching*.

Fig. 4-174

2. Enter the stitching “Overlap”.
   This parameter can be used to increase the overlap between images in a stitching examination.
3. Enter the stitching “Collimator Adjustment”.
   Increase this value if the collimator does not cover the detector edge.
4. Restart directly after the calibration to save the calibrated values.

4.24.8.8 TS Menu

Under this menu all movements of the Table stand can be calibrated. A requirement for all calibrations in this chapter is that the OTC calibration has been performed.

It is strongly advised to perform the resolution calibration for the table stand before doing the position calibration.

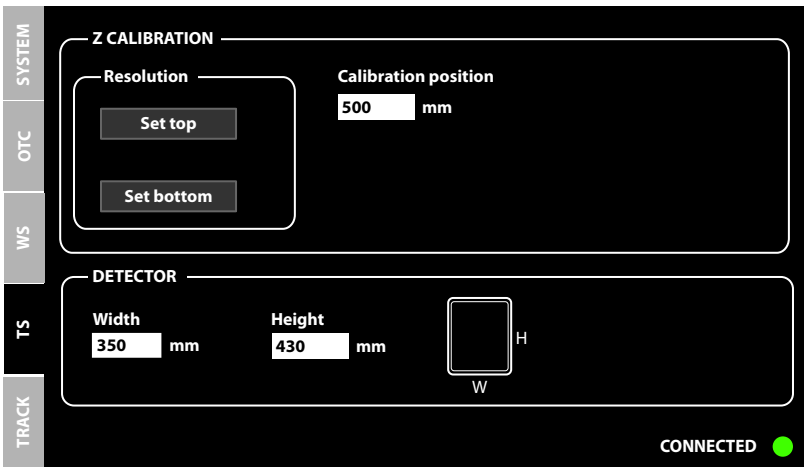


Fig. 4-175 Table stand view

Resolution Table

Calibration of the resolution requires two positions.

Take the following actions:

1. Navigate in the *SERVICE* menu to the *TS* view.
2. Move the Table to the lowest position, using the collimator light to point at the image plane (the surface of the detector) on the Table.
   Position the OTC with the navigation buttons. See **Fig. 4-176**.

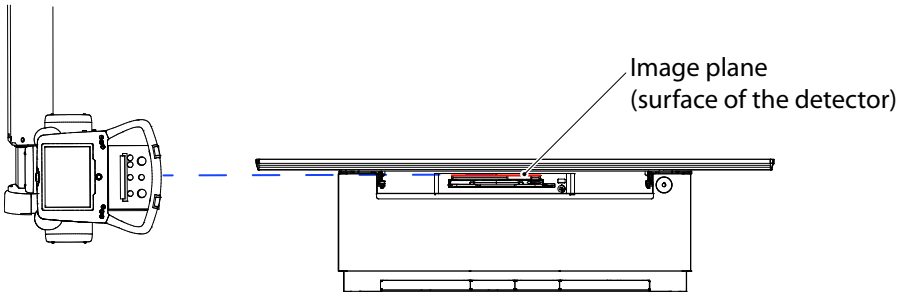


Fig. 4-176 Highest Table position

3. Press the *Set bottom*- button.
4. Move the Table to the highest position and point at the same spot as mentioned above. See **Fig. 4-176**.
5. Press the *Set bottom*- button.
6. Restart directly after the calibration to save the calibrated values.

Position Table

Take the following actions:

1. Navigate in the SERVICE menu to the *TS* view.
2. Measure the distance from the floor to the surface of the detector.
3. Enter the height at the "*Calibration position*" box. The height shall be entered in mm.
4. Restart directly after the calibration to save the calibrated values.

4.24.8.9 WS Menu

Under this menu all movements of the Wallstand can be calibrated. A requirement for all calibrations in this chapter is that the OTC calibration has been performed.

It is strongly advised to perform the resolution calibration for the Wallstand before doing the position calibration.

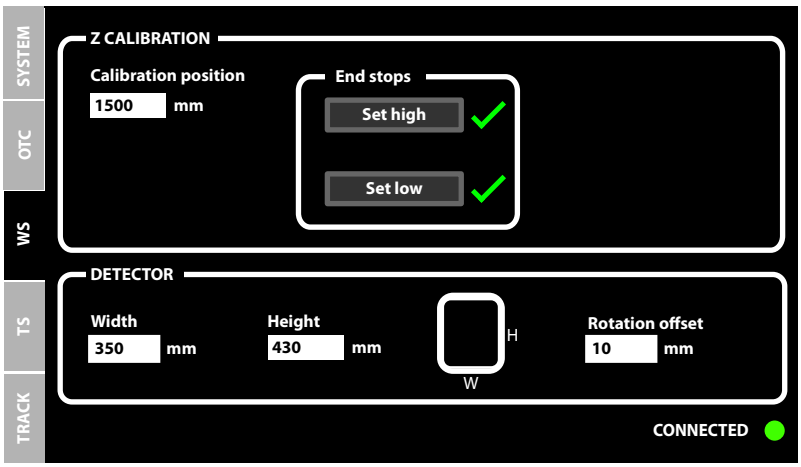


Fig. 4-177 Wallstand menu

Resolution Wallstand

Calibration of the resolution requires two positions.

Take the following actions:

1. Navigate in the SERVICE menu to the *WS/Z CALIBRATION* view.
2. Move the Wallstand to the lowest position. The Ceiling stand should be positioned against a spot on the Wallstand, preferably using the collimator to choose the position. Position the OTC with the navigation buttons. See **Fig. 4-178**.
3. Restart directly after the calibration to save the calibrated values.

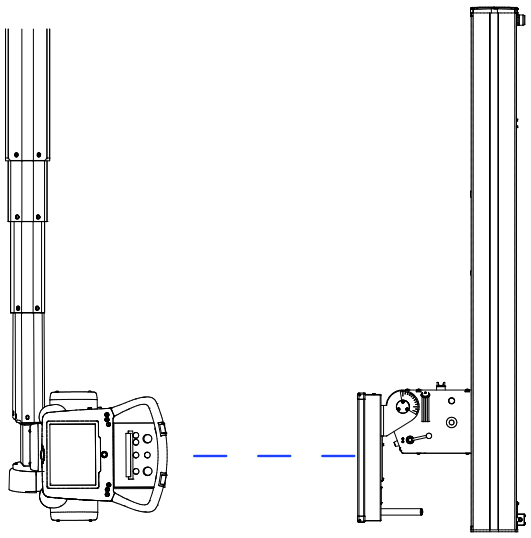


Fig. 4-178 Wallstand lowest position

4. Press the *Set bottom-* button.

5. Move the Wallstand to the highest position. Position the OTC against the same spot on the Wallstand by using the navigation buttons. See **Fig. 4-179**.

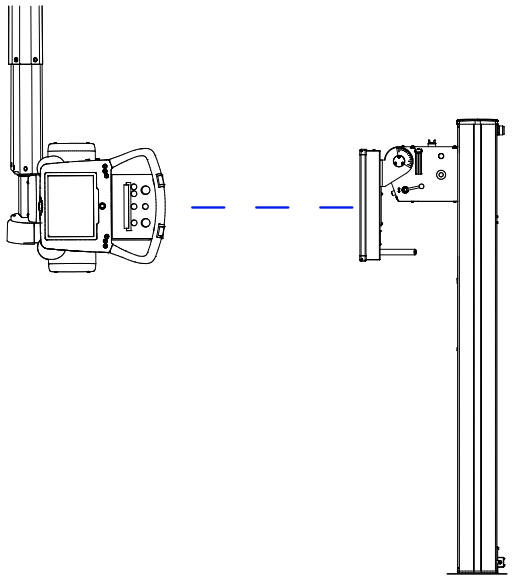


Fig. 4-179 Wallstand highest position

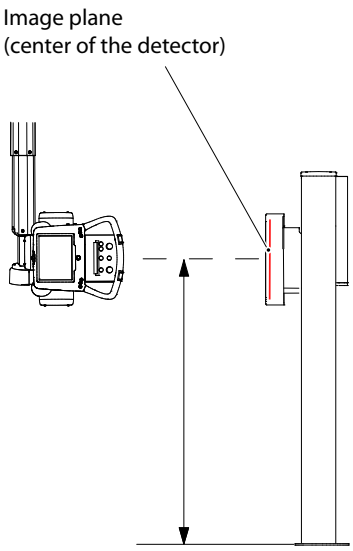
6. Press *Set top*- button.
7. Restart directly after the calibration to save the calibrated values.

Position Wallstand

Take the following actions:

1. Navigate in the SERVICE menu to the *WS* view.
2. Measure from the floor to the center of the detector (picture A in figure below), or to the image plane (surface of the detector) if it is a tiltable detector (picture B in figure below).

Picture A



Picture B

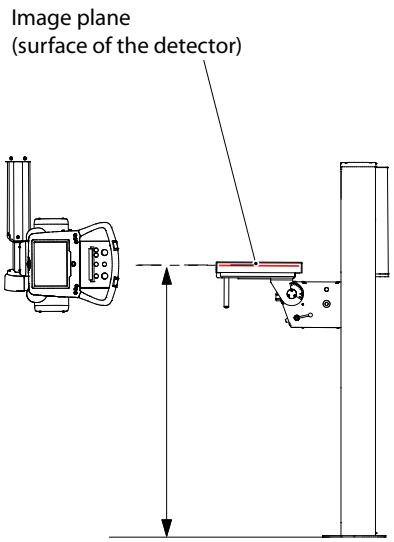


Fig. 4-180 Measuring the height

3. Enter the height at the "*Calibration position*" box. The height shall be entered in mm.
4. Restart directly after the calibration to save the calibrated values.

4.24.8.10 TS and WS Tracking

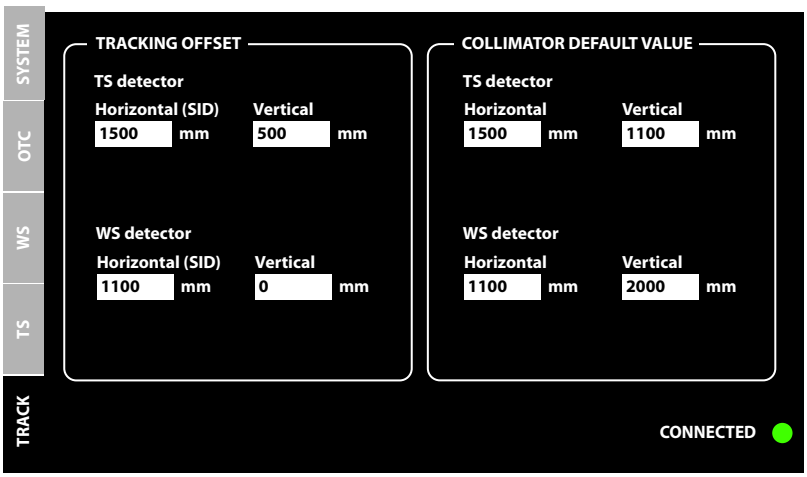


Fig. 4-181 Track menu

For setting the tracking offsets, navigate to *SERVICE/SETTINGS/TRACK* menu.

At the *TRACKING OFFSET* view, set the values for Table stand detector, resp. Wallstand detector. Enter both the horizontal (SID) and vertical values, in mm.

Enter the *COLLIMATOR DEFAULT VALUE* in mm.

Restart directly after the calibration to save the calibrated values.

4.25 Acceptance Tests

Note!

The generator is to be used by qualified persons having been trained in radiation protection.

For further information of the installed X-ray tube, see the X-ray tube Data sheet.

4.25.1 General

This section goes through the functional X-ray acceptance testing criteria that should be used to determine necessary compliance with the general performance requirements of the manufacturer.

It is not intended to prove conformance for all applicable regulatory requirements. The complete assessment of compliance regulatory as well as local/national requirements relies on the installer of the System.

For further acceptance test, please check the generator's Technical Manual and/or the relevant Standard(s).

4.25.1.1 System Requirements

- Make sure the System is installed as described in *Installation in Chapter 4* of the Installation and Service Manual.
- Make sure the generator is setup, installed and calibrated as described in its Technical Manual.

4.25.1.2 Terminology and Definitions

AEC	Automatic Exposure Control, in RAD mode. In an X-ray Generator, mode of operation in which one or more loading factors are controlled automatically in order to obtain at a preselected location a desired quantity of radiation.
kV	Peak voltage applied between the anode and cathode of an X-ray tube, in thousands of volts.
kW	Describes the product of both kV and mA output at the generator or loaded at the terminals of the X-ray tube.
mA	Average X-ray tube current, in milliAmperes, during the irradiation time. The operator console can also display the peak mA rather than the average mA, during the optional Pulsed Fluoro, if the user does want so.
mAs	X-ray tube current by time product (mA x Time), in milliamperes-seconds.
SID	Source to Image Distance
Time	Irradiation time, in milliseconds (ms) or seconds (s). Irradiation time represents the time interval between the instant that the tube potential has risen for the first time to a value of 80% and the instant at which it finally drops below the same value.

4.25.2 Peak Tube Potential

4.25.2.1 Test Equipment

Use the following calibrated measurement device:

- Non-invasive or invasive kV meters

4.25.2.2 kV Accuracy

Perform the following 3-points exposures (12) using the loading factors of **Table 4-2** and verify the accuracy of the tube kV.

The error of the measured X-ray Tube Voltage of the different loading factors combination shall not be greater than ± 10%.

All tests must be passed for compliance.

Table 4-2

Set KV (kV)	Set mA (mA)	Set Time (ms)	Measured kV	Compliance criteria	Test passed	Test failed
60	50	100		60 +\- 10%		
60	100	100		60 +\- 10%		
60	250	100		60 +\- 10%		
80	50	100		80 +\- 10%		
80	100	100		80 +\- 10%		
80	250	100		80 +\- 10%		
100	50	100		100 +\- 10%		
100	100	100		100 +\- 10%		
100	250	100		100 +\- 10%		
120	50	100		120 +\- 10%		
120	100	100		120 +\- 10%		
120	250	100		120 +\- 10%		

4.25.3 Tube Current

4.25.3.1 Test Equipment

Use the following calibrated measurement device:

- mA/ mAs meter
- Oscilloscope

4.25.3.2 mA Accuracy

Perform the following 3-point exposures (12) using the loading factors of accuracy**Table 4-3**, and verify the accuracy of the tube current. The error of the measured X-ray Tube current of the different loading factors combinations shall not be greater than ± 20%.

All tests must be passed for compliance.

Table 4-3

Set KV (kV)	Set mA (mA)	Set Time (ms)	Measured mA	Compli-ance criteria	Test passed	Test failed
60	50	100		50 +\- 20%		
60	100	100		100 +\- 20%		
60	250	100		250 +\- 20%		
80	50	100		50 +\- 20%		
80	100	100		100 +\- 20%		
80	250	100		250 +\- 20%		
100	50	100		50 +\- 20%		
100	100	100		100 +\- 20%		
100	250	100		250 +\- 20%		
120	50	100		50 +\- 20%		
120	100	100		100 +\- 20%		
120	250	100		250 +\- 20%		

4.25.4 Exposure Time

4.25.4.1 Test Equipment

Use one of the following calibrated measurement device:

- Non-invasive or invasive kV meters
- mA/ mAs meter
- X-ray Dose meter

4.25.4.2 Irradiation Time Accuracy

Perform the following 3-point exposures (12) using the loading factors of **Table 4-4** and verify the accuracy of the irradiation time. The error of the measured irradiation time of the different loading factors combinations shall not be greater than ± (10% + 1 ms).

All tests must be passed for compliance

Table 4-4

Set KV (kV)	Set mA (mA)	Set Time (ms)	Measured ms	Compliance criteria	Test passed	Test failed
60	50	100		100 +\- (10% + 1ms)		
60	100	100		100 +\- (10% + 1ms)		
60	250	100		100 +\- (10% + 1ms)		
80	50	100		100 +\- (10% + 1ms)		
80	100	100		100 +\- (10% + 1ms)		
80	250	100		100 +\- (10% + 1ms)		
100	50	100		100 +\- (10% + 1ms)		
100	100	100		100 +\- (10% + 1ms)		
100	250	100		100 +\- (10% + 1ms)		
120	50	100		100 +\- (10% + 1ms)		
120	100	100		100 +\- (10% + 1ms)		
120	250	100		100 +\- (10% + 1ms)		

4.25.5 Beam Quality

4.25.5.1 Test Equipment

Use the following calibrated measurement device and material:

- X-ray dose meter.
- Non-invasive or invasive kV meters.
- 1100 aluminium with a purity of 99%.

Determine the HVL layer value at 4 different points. Use each of the following loading factors, see **Table 4-5**. Compliance criteria is depending on the KV.

All tests must be passed for compliance.

Table 4-5

Set KV (kV)	Set mA (mA)	Set Time (ms)	Measured µGy/mAs	Compliance criteria	Test passed	Test failed
120	50	100	X1	See above		
120	100	100	X2	See above		
120	250	100	X3	See above		

4.25.6 Reproducibility

4.25.6.1 Test Equipment

Use the following calibrated measurement device:

- X-ray dose meter

When you measure the reproducibility, expose several times on the same irradiation condition, and verify the reproductively with the exposed images. You also have to repeat the procedures for other irradiation conditions with some factors fixed.

Perform the following 3-point exposures (3) using the loading factors of and verify the dose (uGy). Compliance is achieved if the coefficient of variation between the average dose (X1 +X2+X3)/3 and every dose measurement X1, X2 and X3 < 0.05.

All tests must be passed for compliance.

$0.95 * (X1+X2+X3)/3 \leq X1 \leq 1.05 * (X1+X2+X3)/3$

$0.95 * (X1+X2+X3)/3 \leq X2 \leq 1.05 * (X1+X2+X3)/3$

$0.95 * (X1+X2+X3)/3 \leq X3 \leq 1.05 * (X1+X2+X3)/3$

Table 4-6

Set KV (kV)	Set mA giving dose 1-5 µGy	Set Time Between 10-320 ms	Measured µGy	Compliance criteria	Test passed	Test failed
80	50	100	X1	See above		
80	100	100	X2	See above		
80	250	100	X3	See above		

4.25.7 AEC (Automatic Exposure Control)

Use the following test to demonstrate the constancy of the AEC mode.

4.25.7.1 Test Equipment

Use the following calibrated measurement device and material:

- X-ray Dose meter
- Plexiglas Phantom (or equivalent density)

In AEC mode, perform the following 3-point exposures (3) on every measuring field, using the loading factors and phantom sizes in **Table 4-7** - **Table 4-13** and measure the dose (µGy)*[1]. We assume two chambers (Table and Wallstand), each having three measuring fields (Left, Center, Right).

Compliance is achieved if:

- The maximum dose error between two adjacent KV steps is between -15% and 18%. Example for 60 KV:
  –15% ≤ (1-(X1/X2)) * 100 ≤ 18%
  –15% ≤ (1-(X1/X3)) * 100 ≤ 18%
  –15% ≤ (1-(X2/X1)) * 100 ≤ 18%
  –15% ≤ (1-(X2/X3)) * 100 ≤ 18%
  –15% ≤ (1-(X3/X1)) * 100 ≤ 18%
  –15% ≤ (1-(X3/X2)) * 100 ≤ 18%
- The maximum dose error between any dose measurement and the mean of all dose measurements is between -20% and 25% (e.g. for 60 KV: -20% $\leq$ |1-(X1/(X1+X2+X3)/3) | * 100 $\leq$ 25%. Example for the Table Left field:
  –20% ≤|1-(X1/(X1+X2+X3)/3) | * 100 ≤ 25%
  –20% ≤ |1-(X2/(X1+X2+X3)/3) | * 100 ≤ 25%
  –20% ≤ |1-(X3/(X1+X2+X3)/3) | * 100 ≤ 25%

*[1]: The 60601-2-54 § 203.6.3.2.102 standard defines the acceptance limits in optical density. To make production testing easier we have converted these optical density limits into the following dose limits:

Table 4-7

OD limit	Lower Dose limits	Upper Dose limits
±0.1	-10.8%	+12.2%
±0.15	-15.86%	+18.85%
±0.2	-20.87%	+25.87%

4.25.7.2 Table

Table 4-8

Set KV (kV)	Set mA (mA)	Phantom (cm)	Measured dose (µGy)	Compliance criteria	Test passed	Test failed
60	100	10	X1	See above		
80	100	15	X2	See above		
100	100	20	X3	See above		

Left field

Table 4-9

Set KV (kV)	Set mA (mA)	Phantom (cm)	Measured dose (µGy)	Compliance criteria	Test passed	Test failed
60	100	10	X1	See above		
80	100	15	X2	See above		
100	100	20	X3	See above		

Center field

Table 4-10

Set KV (kV)	Set mA (mA)	Phantom (cm)	Measured dose (µGy)	Compliance criteria	Test passed	Test failed
60	100	10	X1	See above		
80	100	15	X2	See above		
100	100	20	X3	See above		

Right field

4.25.7.3 Wallstand

Table 4-11

Set KV (kV)	Set mA (mA)	Phantom (cm)	Measured dose (µGy)	Compliance criteria	Test passed	Test failed
60	100	10	X1	See above		
80	100	15	X2	See above		
100	100	20	X3	See above		

Left field

Table 4-12

Set KV (kV)	Set mA (mA)	Phantom (cm)	Measured dose (µGy)	Compliance criteria	Test passed	Test failed
60	100	10	X1	See above		
80	100	15	X2	See above		
100	100	20	X3	See above		

Center field

Table 4-13

Set KV (kV)	Set mA (mA)	Phantom (cm)	Measured dose (µGy)	Compliance criteria	Test passed	Test failed
60	100	10	X1	See above		
80	100	15	X2	See above		
100	100	20	X3	See above		

Right field

5 Setup

5.1 Stitching (option)

5.1.1 Stitching Protocol Definition

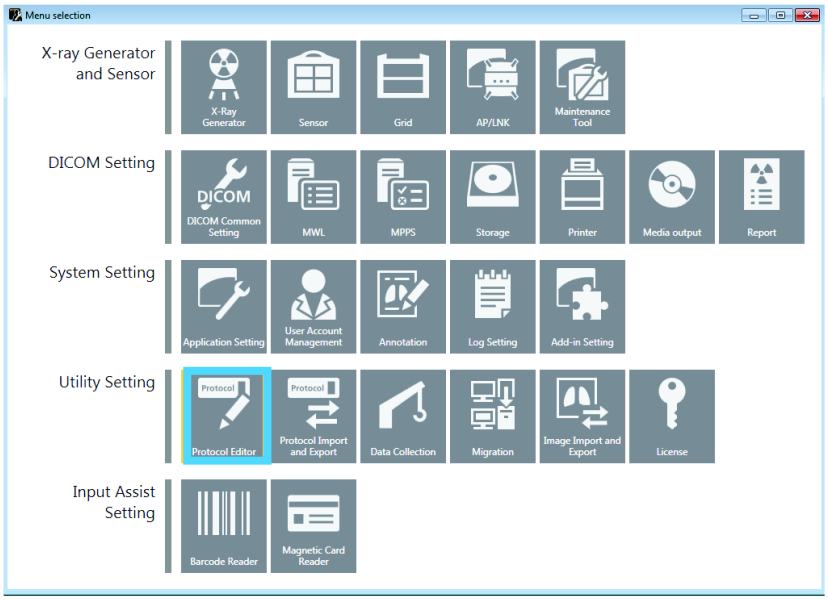


Fig. 5-1

1. Enter Canon ServiceTool.
2. Select *Utility Setting/Protocol Editor*.

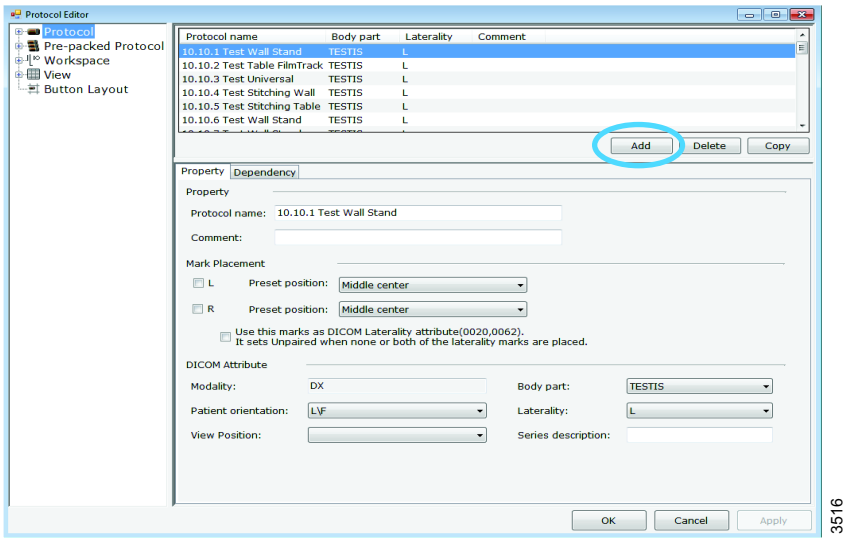


Fig. 5-2

3. Select `Add` to define a stitching protocol.

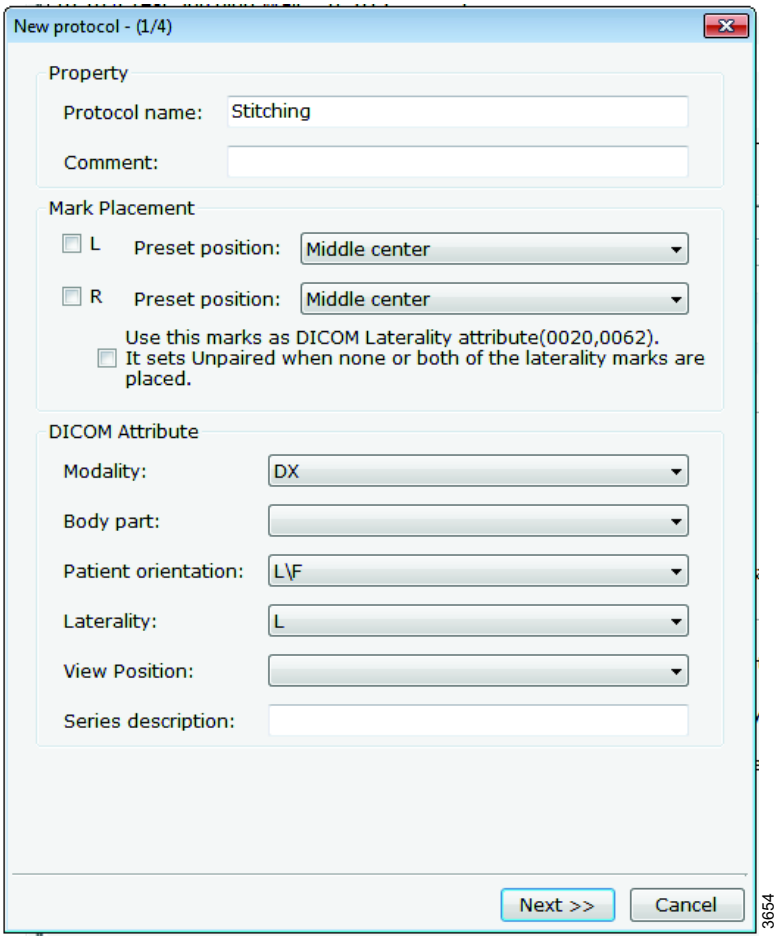


Fig. 5-3 New Protocol page 1

4. Type Stitching as `Protocol name`

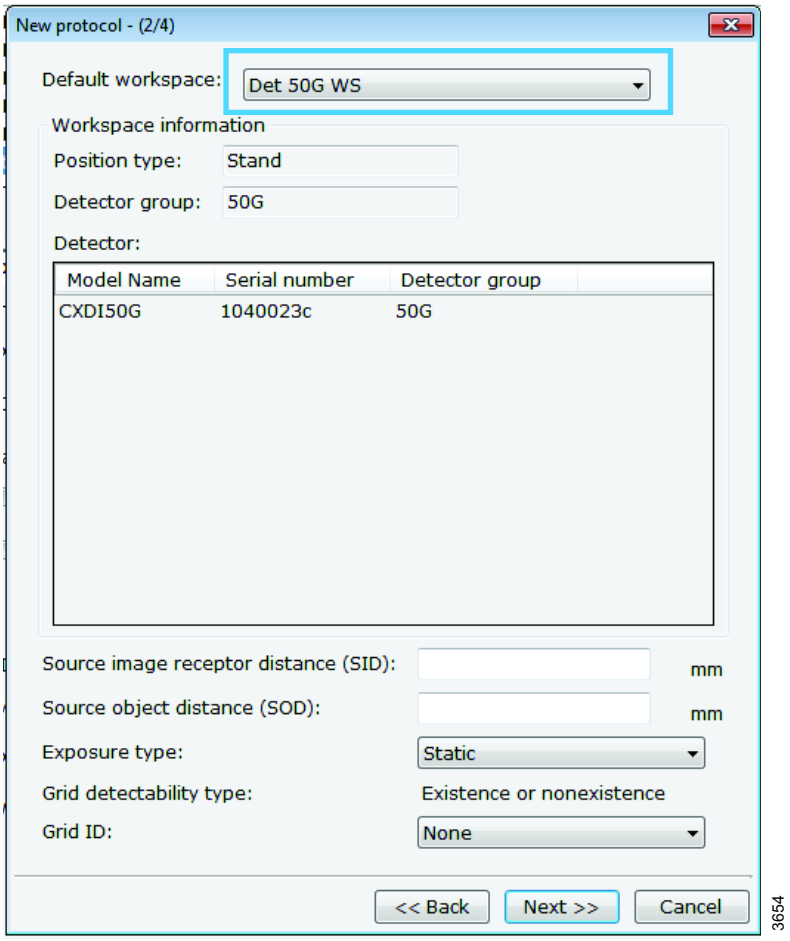


Fig. 5-4 New Protocol page 2 - Default workspace

5. Select wallstand as `Default workspace`.

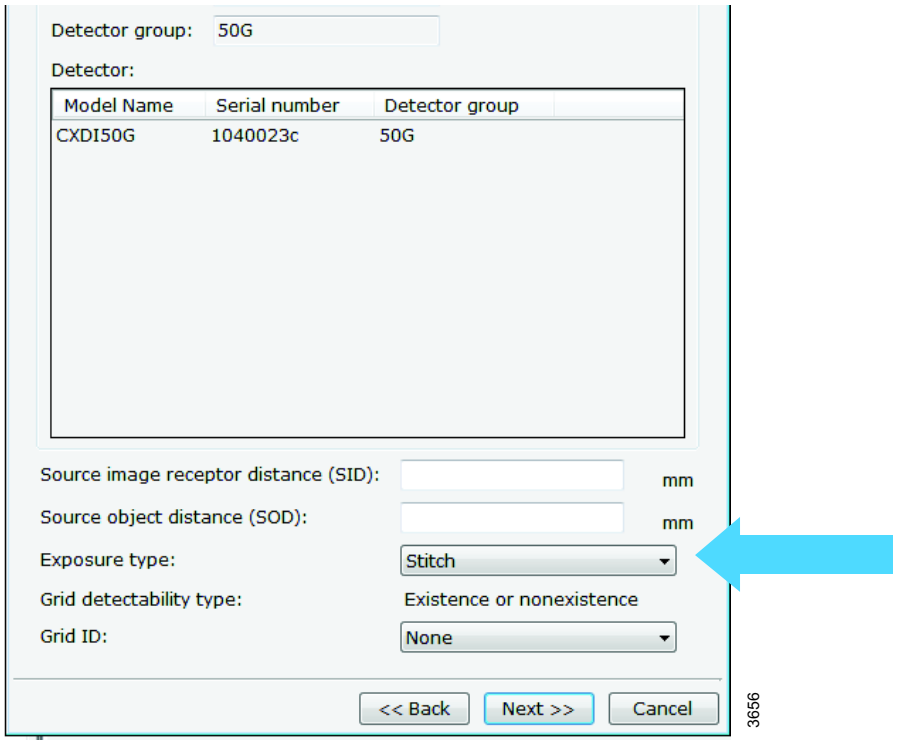


Fig. 5-5 New Protocol page 3 – Exposure type/Stitch

6. Select `Stitch` as `Exposure type`.

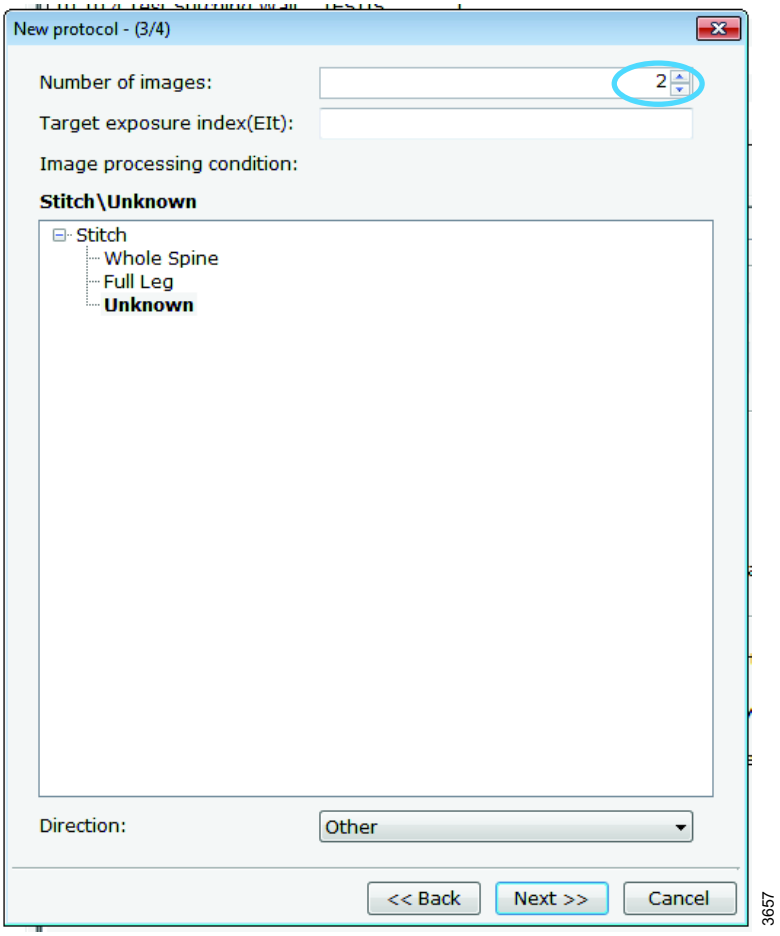


Fig. 5-6 New Protocol page 3 – Number of images

7. Define `Number of images` to be included in the stitching sequence.

   It is better to define one image more than expected than too few images. Based on the size of the region of interest, the system calculates the number of images needed and removes the protocols for images that are not exposed.

   A stitching protocol is now defined containing the number of protocols (Radiography) corresponding to the selected number of images.

   Exposure values shall be defined for all included protocols/images.

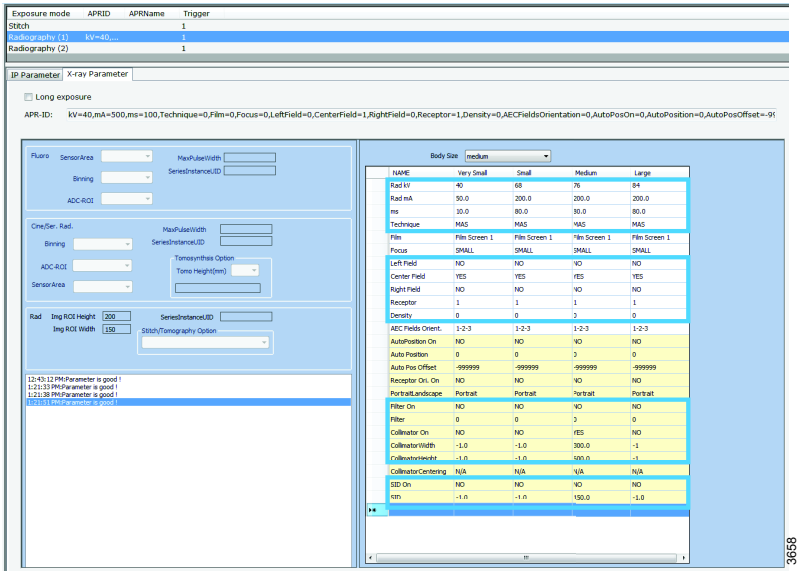


Fig. 5-7 Used parameters in Intuition system

8. Define exposure parameters for the first protocol/image.

NAME	Very Small	Small	Medium	Large
Rad mA	50.0	200.0	200.0	200.0
ms	10.0	80.0	80.0	80.0
Technique	MA/MS	MA/MS	MA/MS	MA/MS
Film	Film Screen 1	Film Screen 1	Film Screen 1	Film Screen 1
Focus	SMALL	SMALL	SMALL	SMALL
Left Field	NO	NO	NO	NO
Center Field	YES	YES	YES	YES
Right Field	NO	NO	NO	NO
Receptor	1	1	1	1
Density	0	0	0	0
AEC Fields Orient.	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait
AutoPosition On	NO	NO	NO	NO
Auto Position	0	0	0	0
Auto Pos Offset	-999999	-999999	-999999	-999999
Receptor Ori. On	NO	NO	NO	NO
PortraitLandscape	Portrait	Portrait	Portrait	Portrait
Filter On	NO	NO	NO	NO
Filter	0	0	0	0
Collimator On	YES	YES	YES	YES
CollimatorWidth	-1.0	-1.0	300.0	-1.0
CollimatorHeight	-1.0	-1.0	600.0	-1.0
CollimatorCentering	N/A	N/A	N/A	N/A
SID On	YES	YES	YES	YES
SID	150.0	150.0	150.0	150.0

3659

9. First protocol: Define exposure parameters as for a regular protocol.
   Set Collimator ON to Yes.
   Define width and the expected total length of the stitched image.
   Set SID ON to Yes and define the SID value.

NAME	Very Small	Small	Medium	Large
Rad kV	40	68	76	84
Rad mA	50.0	200.0	200.0	200.0
ms	10.0	80.0	80.0	80.0
Technique	MA/MS	MA/MS	MA/MS	MA/MS
Film	Film Screen 1	Film Screen 1	Film Screen 1	Film Screen 1
Focus	SMALL	SMALL	SMALL	SMALL
Left Field	NO	NO	NO	NO
Center Field	YES	YES	YES	YES
Right Field	NO	NO	NO	NO
Receptor	1	1	1	1
Density	0	0	0	0
AEC Fields Orient.	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait	1-2-3 Portrait
AutoPosition On	NO	NO	NO	NO
Auto Position	0	0	0	0
Auto Pos Offset	-999999	-999999	-999999	-999999
Receptor Ori. On	NO	NO	NO	NO
PortraitLandscape	Portrait	Portrait	Portrait	Portrait
Filter On	NO	NO	NO	NO
Filter	0	0	0	0
Collimator On	NO	NO	NO	NO
CollimatorWidth	-1.0	-1.0	-1.0	-1.0
CollimatorHeight	-1.0	-1.0	-1.0	-1.0
CollimatorCentering	N/A	N/A	N/A	N/A
SID On	NO	NO	NO	NO
SID	-1.0	-1.0	-1.0	-1.0

3630

Fig. 5-8

10. For the second and third image the Collimator ON shall be set to NO.
    The SID ON shall be set to NO and no SID value shall be defined.

6 Maintenance

6.1 General

WARNING!

Before working with service and maintenance that does not require power, always turn off the mains power breaker and make sure to lock it, so it cannot be mistakenly turned on.

WARNING!

Service to the System is restricted to authorized service representatives only.

Attempts to service the System by unauthorized or unqualified personnel, could result in death, personnel injury or equipment damage, and will cease the equipment warranty.

WARNING!

Be aware of live parts when the covers are removed.

WARNING!

Squeezing hazard can occur between the vertical lift segments when moving in Z-direction.

WARNING!

Reduced safety when intentionally disabling of safety mechanism.

CAUTION!

Remaining energy may exist when the equipment is switched off. Always wait at least 15 seconds before working on the System.

CAUTION!

Be aware of possible squeezing hazards when the covers are removed.

CAUTION!

When the main unit power source breaker is turned OFF, the image receptor cannot be moved up or down using the brake release for Z-movement.

For safety reasons, however, the image receptor must be fixed to the main unit frame while the parts of the image receptor are being replaced.

CAUTION!

Electrical shock. Remaining voltage when System switch is turned off.

CAUTION!

Electrical shock. High leakage current due to stray currents.

CAUTION!

Use gloves when in contact with grease.

Note!

All main supply cables are only allowed to be changed by engineers trained by the supplier.

Note!

Before performing any maintenance, please read the Safety chapter.

Note!

For maintenance of components attached to the System (tube, generator, collimator etc.), refer to chapter 1 and System Documentation.

This chapter contains the instructions necessary for maintaining the devices. This include:

- Alignments and settings
- Preventive maintenance
- Performance testing

To guarantee the safety of the patient and to ensure the functions and availability, the operator and third parties shall follow the instructions in this chapter.

Annual checks shall be performed either by local technical staff trained by the supplied or authorized service representatives. Daily and monthly checks are normally performed by the user/operator and is found in the Operator's Manual.

6.2 Software Version / Update

There are different software systems in the product.

1. Generator
2. Cabinet
3. Ceiling unit
4. Table
5. Wallstand

   The software can be updated as described in the upgrade instructions, attached to the update document.

6.2.1 The Software and Its Update Location Point

The software is physically located according to the Table below:

	System software	Connection point for software upload*	Upgrade instructions (UDI)
1.	Generator	See upgrade instruction	Upgrade_EMD_software
2.	Cabinet	See upgrade instruction.	SwUDI_0180–4C_x_y_z.pdf
3.	Ceiling unit	See upgrade instruction.	SwUDI_0170_x_y_z.pdf SwUDI_0180–4C_x_y_z.pdf
4.	Table	See upgrade instruction.	SwRLN_0181_x_y_z-.pdf SwUDI_0180–4C_x_y_z.pdf and SwRLN_0181_x_y_Z.pdf
5.	Wall stand	See upgrade instruction.	SwUDI_0180–4C_x_y_z.pdf

6.3 Function and Safety Checklist

If any malfunction is detected, the entire equipment must be taken out of use until the malfunction is eliminated or usage of the System is approved by a service engineer from the supplier or by the local technical staff trained by the supplier.

Daily and monthly checks are normally performed by the user/operator.

Annual checks shall be performed either by local technical staff trained by the supplier or authorized service representatives.

The Manufacturer recommends use of the Checklist, Appendix B.

6.3.1 Annual Checklist

WARNING!

Precautions for Supply Voltage.

A voltage of 400 to 480 VAC is supplied to the device. Observe the following points to protect yourself against receiving an electric shock;

- ***Check that the device is securely grounded.***
- ***Check that all cables are connected correctly and free from damage.***
- ***Do not touch the parts of the cabinet while the LED (red) inside the Generator is ON. It may result in electric shocks due to remaining voltage.***
  Shut down the breaker of the facility and lock it.
  Confirm the LED (red) is OFF before touching.
- ***While performing work that requires the power supply to be turned ON, be careful not to touch the power line.***
- ***Even if the power is OFF, touching parts inside the device with the power cable plugged-in, may result in electric shocks.***
  Disconnect the power plug and wipe off dust and dirt with a dry cloth from time to time. Accumulated dust can generate heat and cause fires.

6.3.1.1 General

☐ 1. Cable terminals.

Remove the high voltage cable terminals and note weather corona or high voltage discharges have taken place.

Clean the receptacle and cable terminal and check for carbon tracks. (If carbon tracks are visible it will be necessary to replace the affected parts).

Recoat the cable terminal with dielectrical component.

6.3.1.2 OTC

- ❑ 1. Turn on the collimator light and position the center of the collimator light field against a horizontal detector. Drive the column upward/downward. The center of the collimator light field must stay on the same spot. Check that the readouts for the tube angulation is 0º.
- ❑ 2. Perform the Alignment of OTC. Check that the readouts for the tube angulation is 90º.
- ❑ 3. Check the alignment of the light field and X-ray light field according to “Collimator light alignment”, in Chapter 4.

6.3.1.3 0181 Table

CAUTION!

Attach the safety clamp in maintenance position C.

Be sure that the attachment is well secured in the bottom plate.

- ❑ 4. Check for abnormal sound.
- ❑ 5. Check for oil leaks.
- ❑ 6. Check for fallen foreign matter.
- ❑ 7. Check that the bolts that attach the Table to the floor are tightened properly. If there is evidence that the attachment to the floor has been damaged, order new bolts from the Manufacturer and reattach the Table to the floor.
- ❑ 8. Move the Table in X, Y and Z directions and make sure it runs smoothly and sounds OK.
- ❑ 9. Check the table top brakes:
  - Move the brakes in X or Y direction. The table top should run smoothly in X or Y direction whenever the brakes are released.
  - Lock the brakes and place a dynamometer against the table top and push slowly, it should be impossible to move the table top with a force under:
    – Y-direction < 300 N
    – X-direction < 250 N
  - When there is no power to the table top all brakes shall be applied.
  - Check the cables to the table top brakes.
- ❑ 10. Clean the profiles at the sides of the table top.
- ❑ 11. Clean the profiles for the image receptor tray movement (1).

- ❑ 12. Check the installation of internal cabling underneath the covers.
  Check the cable ties and that the cables are in right position.
  The harness should go under the metal part in position A.
- ❑ 13. Check all internal and external cabling for damage. Squeezing and wear damages.
- ❑ 14. Check protective earth according to **4.23.2 Measure Protective Earth, Page 199**. Enter the measured values in the Safety checklist Appendix B.

  Measured value:
  ..... Ω
  ..... Ω
  ..... Ω
  ..... Ω
- ❑ 15. Check status of critical circlips.
- ❑ 16. Check the screws of both mechanical end stops on the table top. If any screws are loose, tighten them.
- ❑ 17. Check both mechanical stops of the lifting unit. Feel if the clamp is loose, tighten if necessary.
- ❑ Remove safety clamp. Be careful, removed safety clamp — Squeezing hazard!
- ❑ 18. Lubricate the screw of the lifting unit with grease. Use grease *Klüber Duotempi PMY45.*
  Always order the grease from the manufacturer.
  To best get to the screw, drive the Table to the highest position. Use a brush to apply the grease.
- ❑ 19. Check both Emergency stop buttons on the Table. By activating the emergency stop all motorized movements are locked.
- ❑ 20. Check the vertical travel safety of the table top. Hold and restrain at the same time as moving the table top up or down. The travel safety will then stop the movement of the table top in the on going direction.
- ❑ 21. Check the function of the movements in X/Y/Z by pressing the buttons on all the controls. The buttons shall not be damaged or get stuck when they are pressed.

6.3.1.4 0055 Table

22. Check that the bolts fixing the Table to the floor, are properly tightened with 7 Nm (be careful the Loctite joint could break).

    If any bolts are loose, use Loctite 243 and tighten with 15 Nm.

Note!

This check is only valid when components from the Manufacturer have been used (i.e. valid expanders).

23. Move the Table in X, Y and Z directions and make sure it runs smoothly and sounds OK.
24. Check the function of the table top brakes by moving it in X or Y direction.

    The table top should run smoothly in X or Y direction whenever the brakes are released.

    Lock the brakes and place a dynamometer against the table top and push slowly. It shall be impossible to move the table top with a force below $\leq$ 200 N.

    Also check the cables to the table top brakes.

If needed, adjust Y-brakes as follows:

Y-Brakes, adjustment

Adjust by moving rail up and down.

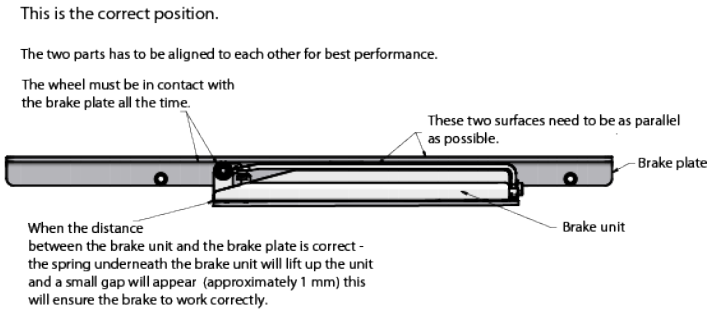


Fig. 6-1

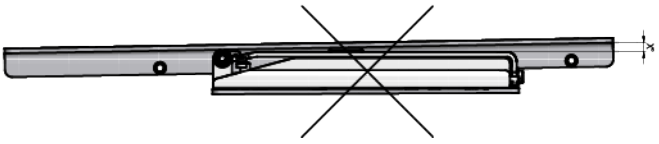


Fig. 6-2

Low Brake Force or Brake Release Problems.

If the distance is larger in the rear end than in the front, it will reduce the braking force. There will be a big risk that the brake unit will not release correctly and stock. This is due to the large distance between the magnets and the brake bar.**Fig. 6-2**

The same problem will appear, if the general distance between the brake unit and the brake plate is too large.

Solution: Align the brake unit and the brake plate when the magnets are active (i.e. the brake is released). Make sure there is a gap of approximately 1 mm underneath the brake unit.

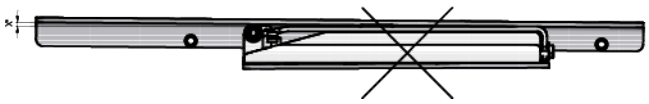


Fig. 6-3

The Force Needed to Move the Table Top is Too Large.

If the distance is larger at the front than in the rear end, the table top will tend to jam when the brake unit is released.

The same problem will appear if the general distance between the brake unit and the brake plate is too small and the force on the wheel is too big.

Solution: Align the brake unit and the brake plate when the magnets are active (i.e. the brake is released). Make sure there is a gap of approximately 1 mm underneath the brake unit.

If needed, adjust X-brakes as follows:

X-Brakes, Adjustment

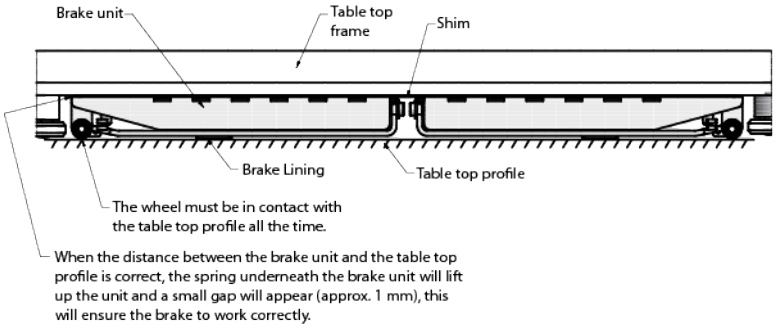


Fig. 6-4

Low Brake Force and (or) Brake Release Problems.

If the distance is too large between the magnets and the brake bar, it will reduce the braking force and there is a risk that the brake unit will not release correctly, and stuck.

Solution: Add another shim, underneath the brake unit.

The Force Needed to Move the Table Top is Too Large.

The table top tends to jam, when the brake unit is released.

The distance between the brake unit and the angle bar, is too small and the force on the wheel is too large.

Solution:

- *If the brake releases correctly* the distance between the brake unit and the table top profile is too small, remove shim from underneath the brake unit to increase the distance.
- *If the brake doesn't release correctly* the distance is too big then add shims to the brake unit.

25. Clean the profiles at the sides of the table top.
26. Clean the profiles for the imaging unit tray movement (1), according to figure

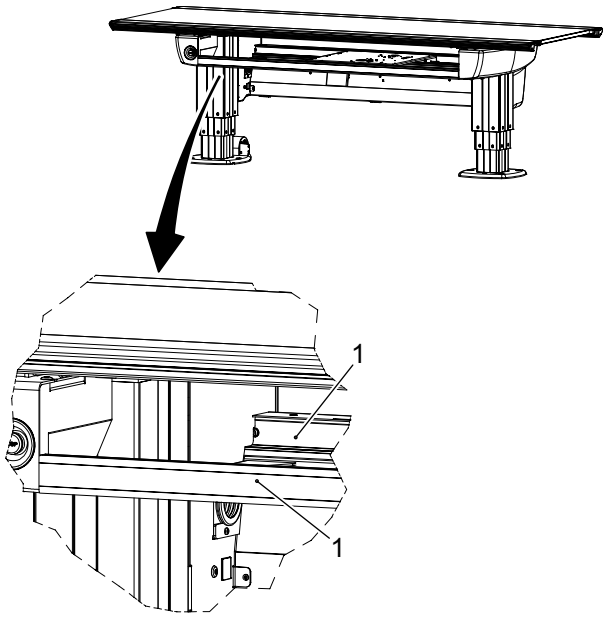


Fig. 6-5

27. Check the column segments on the Table (full stroke), they should run smooth and sounds OK. Lubricate the columns with BP Energol GR-XP 220, if necessary.
28. Check all cables for damage.
29. Check protective earth according to .

    Enter the measured values in the Safety checklist Appendix B.

30. Check the bolts of both mechanical end stops on the table top with 10 Nm.
    If any screws are loose, use Loctite 243 and tighten with 24 Nm. See figure.

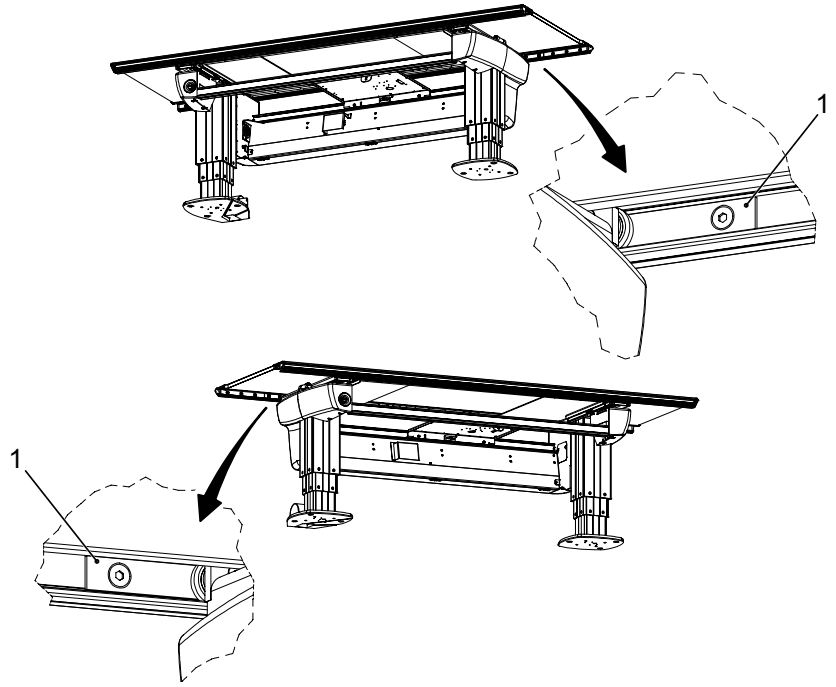
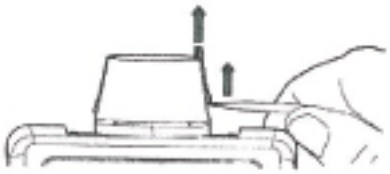
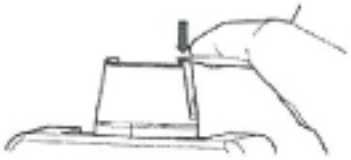


Fig. 6-6

31. Check the *Emergency stop* button on the Table. By activating the emergency stop all motorized movements are inhibited.
32. Check the guard function on the Table (if present). Hold and restrain at the same time as moving the table top up or down. The guard function will then stop the movement of the table top.
33. Check the buttons on the foot control, they shall not be damaged or get stuck when they are pressed.
34. Batteries in the wireless foot control (option), shall be changed at a minimum once a year. When changing the batteries, visually inspect the gasket for signs of degradation.

Table 6-1 Battery Replacement

1 Remove the screw covers using a small flat bladed screwdriver or similar. Unscrew the lid.	
1 Release the battery clip hinge by firmly, but carefully, pressing the clip posts outward.	
 	
1 Fit the batteries, taking care to observe the polarity as marked on the PCB. Push the clip back into place by holding the sides of the clip. Do **not** push on the antenna when clipping back into place.	
1 Screw the lid back into place. Press the screw covers back into place using the flat part of the flat-blade screwdriver or alternatively, loosely fit both covers. Press the whole assembly down onto a flat clean work surface.	

35. Check the function of the AEC chamber, the Back up timer and the mAs. Calibrate if necessary.
36. Check the indication light, by choosing *Table flexible mode* on the generator console. Make sure the Table indication light is lit and that the display handle shows the corresponding mode.

6.3.1.5 Wallstand

- ❑ 1. Check for abnormal sound.
- ❑ 2. Check for fallen foreign matter.
- ❑ 3. Check that the bolts that fix the Wallstand to the floor are properly tightened with 7Nm (be careful the Loctite joint could break). If any bolts are loose, use Loctite 243 and tighten with 15Nm.
- ❑ 4. Check all cables for damage.
- ❑ 5. Clean all outer surfaces.
- ❑ 6. Make sure that the Operating Instructions are available.

☐ 7. **Check lifting mechanism of Wallstand.**
See **4.18.4 Remove Back Cover, Page 157**.

CAUTION!

Secure the Wallstand with a locking device.

There is no need to dismount the front cover.

☐ 8. The lift mechanism should be balanced and run smooth, without any sound.

☐ 9. Check the condition of the two lifting chains, the six chain locks and the attachment points of the chain, see **Fig. 6-7** A and B. Adjust if necessary.

☐ 10. Check the attachment points of the counterweights, see **Fig. 4-67**.

☐ 11. Check the circlips (two) that secure the yoke to the axis. They should be in position, see **Fig. 6-7** C.

☐ 12. Check the mechanical end stops for the Z-movement.
Check that they are intact and in position. There are four stops, two at the top and two at the bottom of the column.

☐ 13. Check the function of the brake. When the brake is released move the Wallstand up and down and the movement should stop.

☐ 14. Check protective earth according to **4.23.2 Measure Protective Earth, Page 199**.
Enter the measured values in the Safety checklist, Appendix B.

Measured value:
..... Ω
..... Ω

0175 Tiltable Wagon

☐ 15. Check the function of the gas springs for the tilt. The maximum force should be 50 Nm.

☐ 16. Check that the two mechanical end stops are intact. There are two stops located on the wagon.

17. Check the Emergency stop button on the Wallstand. By activating the emergency stop all motorized movements shall be inhibited. When the emergency stop is activated a message will be shown at the image display.

6.3.1.6 Remark

No.	Remark	Action	Int note
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

6.3.1.7 Check Points

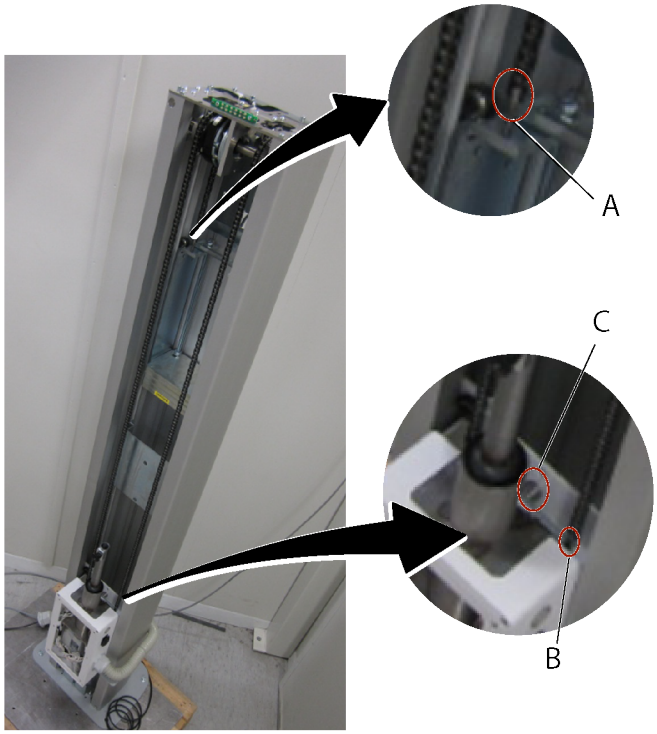


Fig. 6-7 Check points

A 1 Chain lock on both chains
B 2 Chain locks on both chains
C 2 Circlips

7 Diagnostic

7.1 General

The OTC display shows error messages in case of fault.

7.1.1 Fault Handling

There are three types of NOTIFICATIONS - Shows the present occurence. For example; collision. They are listed below in ranking order.

1. ERROR — The error information appears as a red bar in the lower part of the display. Sound; two beeps.
2. WARNING - Appears as a grey bar in the lower part of the display. Sound; one beep.
3. INFO - Not shown to the user. Only registered in the setting menu.

7.1.1.1 Notifications

Error

When an error occurs, an Error pop-up window will appear in the display.

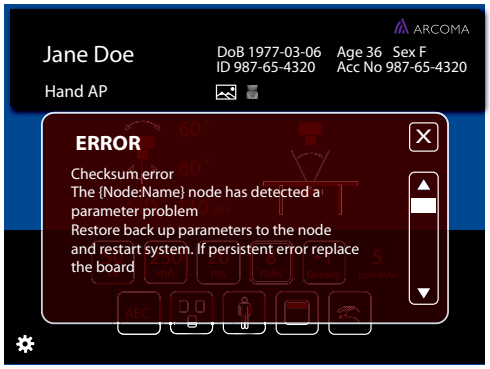


Fig. 7-1 Error pop-up window

The Error pop-up window will disappear when the user pushes the close button.

Fig. 7-2 Close button

When closing the Error pop-up window (**Fig. 7-1**), a red information bar will appear (see **Fig. 7-3** and **Fig. 7-4**).

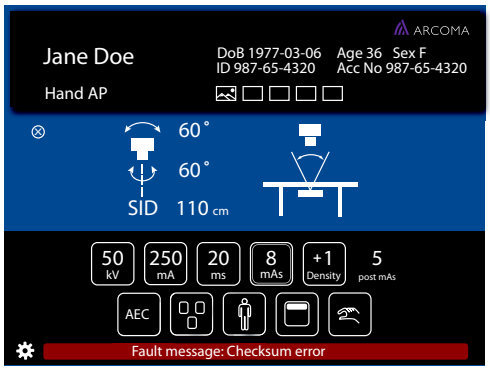


Fig. 7-3 Error information bar, Table

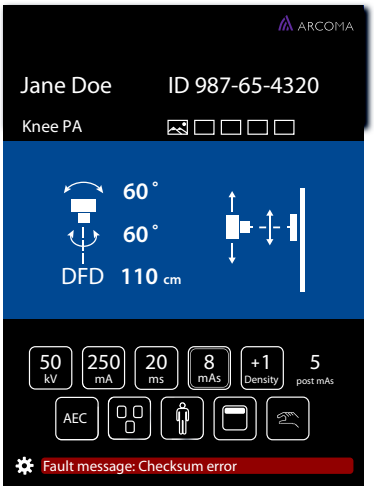


Fig. 7-4 Error information bar, Wallstand

When the user pushes the red information bar, the Error pop-up window will appear again.

The Error information bar (lower part of the window) is present until the error is fixed or the System is restarted.

Warning

A warning message will appear in a Warning information bar (lower part of the display), when the handling of the System justifies that.

The Warning information bar will be cleared if/when a new warning is displayed, or after time.

The latest sent warning is shown.

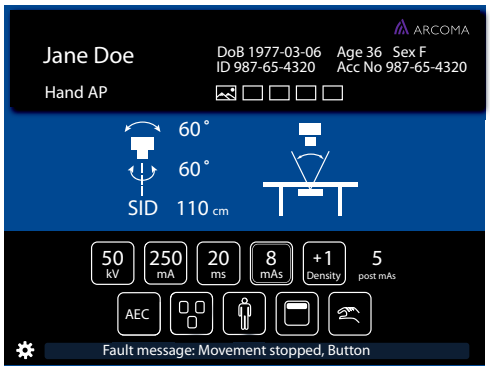


Fig. 7-5 Warning information bar, Table

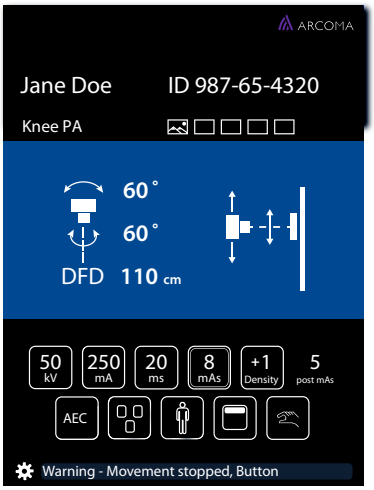


Fig. 7-6 Warning information bar, Wallstand

When pushing the Warning information bar, (see **Fig. 7-5** and **Fig. 7-6**), a pop-up window will appear (see **Fig. 7-7** and **Fig. 7-8**).

Fig. 7-7 Pop-up window — Warning information bar

When the user closes the pop-up window, the Warning Information bar will appear again.

The Warning pop-up window will also appear again, when the user pushes the information bar.

Fig. 7-8 Pop-up window — Information bar

The *Warning pop-up window* disappears when the user pushes the close button.

Fig. 7-9 Close button

Log

The *Log file* is part of the *Setting menu* and reached by pressing the gear or the *Error/ Warning messenger* bars.

7.2 System Message Two Column Table (option)

7.2.1 General

If the action says "Contact dealer" shall the entire error messages be noted and given to dealer.

That a valid System software release is used can be checked by the service software, the release should be shown in the lower right corner of the service software. It may also be checked by comparing the node and service software version shown in the service software with the versions stated in the RVL_0055S_SW document.

7.2.2 Description

A System message consists of the following parts, Type, Node, Component, Reason and Extra. Where:

- Type, defines the severity of the system message. This may be information, warning or error.
- Node, the node that sent the system message.
- Component, the component that caused the error.
- Reason, the cause of the message.
- Extra, four bytes of extra information. These bytes are always sent, even with messages that don't have any extra information. The extra information is shown as up to 4 parts, with the following format: <part number>:<description>< number of bytes used.>.

7.2.2.1 Definitions

The following ids are used to identify the node in a system message.

IDs used to identify the different nodes in a system message

Node	Id
Master	1
Z1	2
Z2	3
Guard	4

7.2.3 All Nodes

7.2.3.1 Component Id 01, Software Error

Reason	Description and status of System	Extra	Corrective action
01, Default error	Internal Software error.	N.a.	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
02, Error Value	Internal Software error.	N.a.	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.3.2 Component Id 02, Base Node

Reason	Description and status of System	Extra	Corrective action
01, Watchdog timeout	The node has detected that a watchdog was not received in time.	1: Component. 1 byte. 2: Time-out time in ms. 2 bytes.	- Check that all nodes are functional. - Check tat the CAN bus cables are correctly connected.
02, Checksum error	The node has detected a checksum error in the parameter memory.	1: The calculated checksum. 1 byte. 2: Stored inverted checksum. 1 byte. 3: Stored checksum. 1 byte.	- Download the correct parameter file. - Change board.
03, Unknown command	The node has detected a CAN command that is not implemented in the node.	1: The unknown command. 1 byte. 2: Sender part of the CAN identifier. 2 bytes.	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
04, Logic power low	The node has detected that the logic power is low.	Not used.	- Check the 24 V logic voltage, measure at the logic power connector to the board.

7.2.4 Motor Nodes

7.2.4.1 Definitions

The following collision types is defined.

Table 7-1 Description of the different collision types

Collision type	Description	Corrective action
1	Control error larger than specified by the "max position error" parameter.	- Remove any blocking obstacle. - Check the mechanics. - Check that the correct parameter file is used.
2	Time out, did not reach final position in time.	- Remove any blocking obstacle. - Check the mechanics. - Check that the correct parameter file is used.
3	No power, the power to the DC-board was switched off during a movement.	- Check the 36V power voltage (measure at the power connector to the DC-board). - Check the DC-board fuse.
4	Drive unit externally inhibited.	- Check that the voltage between J3:2-J3:6 and J3:3-J3:6 (on the DC-boards) are zero volts.
5	Position transducer has not moved, in spite that the output voltage has had an output voltage for a time. The voltage is specified in the "moved voltage" parameter and the time is specified in the "moved time" parameter.	- Remove any blocking obstacle. - Check the mechanics. - Check that the correct parameter file is used. - Check the potentiometer.

7.2.4.2 Component Id 03, Motor Node

Reason	Description and status of System	Extra	Corrective action
01, Transducer diff error	A motor node equipped with two position transducers, whose positions differs more than specified.	Not used.	- Check that the correct parameter file is used. - Check the position transducers.
02, Transducer not present	The position transducer is not connected to the node.	Not used.	- Check that the correct parameter file is used. - Check the position transducer.
03, Collision	A collision has occurred.	1: Collision type. 1 byte.	- See table 6.1
04, Encoder overflow	An encoder overflow has been detected.	Not used.	- Check that the correct parameter file is used. - Check the encoder. - Contact dealer.
05 Uncontrolled movement	An uncontrolled movement has been detected.	Not used.	- Check if it was an actual movement or just a false position reading that caused the uncontrolled movement. - Check the potentiometer.

7.2.4.3 Component Id 04, Driver Error

Reason	Description and status of System	Extra	Corrective action
01, Servo on error	Failed to perform a servo on	Not used.	- Check the 36V power voltage. - Check the DC-board fuse. - Check that the voltage between J3:2-J3:6 and J3:3-J3:6 (on the DC-boards) are zero volts.
02, Temperature error	Temperature of the driver is too high.	Not used.	- Let the DC-board cool off.
03, Shoot through error	Shoot through currents detected in the H-bridge of the driver.	Not used.	- Check for shortcuts in motor cabling and motor. Both between cables and toward chassis. - Change board.
04, Output current error	Error with the output current from the driver.	Not used.	- Check the 36V power voltage. - Check the DC-board fuse.
05, Output over voltage error	Error with the output voltage on the driver.	Not used.	- Check that the correct parameter file is used. - Contact dealer.
06, Driver watchdog error	A watchdog error from the driver was detected.	Not used.	- Check that the correct parameter file is used. - Contact dealer.
07, Communication error	Failed to communicate with the driver.	Not used.	- Check that the correct parameter file is used. - Contact dealer.
08, Motor error	Error with the motor detected.	Not used.	- Check that the correct parameter file is used. - Contact dealer.

7.2.4.4 Component Id3, CAN Driver Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.5 Component Id 4, Timer Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.6 Component Id 10, Communication Interface Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.7 Component Id 11, ACAN Component

Reason	Description and status of System	Extra	Corrective action
01 Message not decoded	Internal software error.		- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
02 Add node reason	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
03 Bus off	CAN-bus error.	N.a	- Check that the CAN bus cables are correctly connected. - Check that the CAN bus cables aren't damaged. - Change boards.
04 Bus off not present	A previously reported CAN error has now been cleared.	N.a	

05 Error warning	CAN-bus error.	N.a	- Check that the CAN bus cables are correctly connected. - Check that the CAN bus cables aren't damaged. - Change boards.
06 Error warning not present	A previously reported CAN error has now been cleared.	N.a	
07 RX buffer overflow	Internal software error.	N.a	- Contact dealer.
08 SJA1000 data overrun	Internal software error.	N.a	- Contact dealer.
09 Transmit error	CAN-bus error.	N.a	- Check that the CAN bus cables are correctly connected. - Check that the CAN bus cables aren't damaged.
10 TX buffer overflow	Internal software error.	N.a	- Check that the CAN bus cables are correctly connected. - Check that the CAN bus cables aren't damaged. - Contact dealer.

7.2.4.8 Component Id 12, ASAP Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.9 Component Id 13, Data Reader Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.10 Component Id 20, JMATH Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.11 Component Id 21, Linked List Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.12 Component Id 30, Event Server Component

Reason	Description and status of System	Extra	Corrective action
01 Add event reason	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.13 Component Id 31, Event Source Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.14 Component Id 32, Client Manager Component

Reason	Description and status of System	Extra	Corrective action
01 Client id invalid	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
02 Add client reason	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.15 Component Id 33, Call Back Receiver Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.16 Component Id 34, System Message Manager

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.17 Component Id 35, Time Out Server Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.18 Component Id 36, Memory Manager Component

Reason	Description and status of System	Extra	Corrective action
01 Memory exhausted	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.19 Component Id 40, System Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.20 Component Id 41, Master Component

Reason	Description and status of System	Extra	Corrective action
01 Enable nodes timeout	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
02 Enable managers timeout	Internal software error.	1: Line number in the code. 4 bytes.	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

03 Unexpected disable node	Internal software error.	1: Line number in the code. 4 bytes.	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
04 Emergency stop	An emergency stop button was activated.	Not used.	- Release emergency button.
06 Event queue overflow	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
08 Unknown node	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.21 Component Id 42, Configuration Component

Reason	Description and status of System	Extra	Corrective action
01 Parameter checksum	An checksum error has been detected.	1: The calculated checksum. 1 byte. 2: Stored inverted checksum. 1 byte. 3: Stored checksum. 1 byte.	- Download the correct parameter file. - Change board.

7.2.4.22 Component Id 50, Movement Manager Component

Reason	Description and status of System	Extra	Corrective action
01 Add movement	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
02 Unknown movement	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.23 Component Id 51, Movement Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.24 Component Id 54, Single Movement Component

Reason	Description and status of System	Extra	Corrective action
01 Start not allowed	A start of a movement was denied.	1: Start allowed result. 1 byte. 2: Movement direction. 1 byte. 3: Source id. 2 bytes, see tables at page 8-18.	- Check that the table top is leveled, this is checked by: Difference between Z1 and Z2 height (read in service software) should be less than 4 millimeters. - Use the service software to check the angle given from the tilt sensor. If appropriate calibrate the tilt sensor.

7.2.4.25 Component Id 55, Auto-position Component

Reason	Description and status of System	Extra	Corrective action
01 Movement fail	A start of an auto position movement failed	1: Start allowed result. 1 byte. 2: Line number in the code. 3 bytes.	- Check that the table top is leveled, this is checked by: Difference between Z1 and Z2 height (read in service software) should be less than 4 millimeters. - Use the service software to check the angle given from the tilt sensor. If appropriate calibrate the tilt sensor.
02 All paused	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.26 Component Id 56, Brake Movement Component

Reason	Description and status of System	Extra	Corrective action
01 Incorrect configuration	The brake movement was told to start a directional movement.	1: source id.4 byte.	- Check that a valid System software release is used. - Check the configuration.
02 Unlock brakes not allowed	It was not possible to unlock the brakes.	1: Start allowed result. 1 byte. 2: source id.3 bytes, see tables.	- Check that the table top is leveled. - Check the angle given from the tilt sensor.

7.2.4.27 Component Id 57, Double Movement Component

Reason	Description and status of System	Extra	Corrective action
01 Start not allowed	A start of a movement was denied.	1: Start allowed result. 1 byte. 2: Movement direction. 1 byte. 3: Source id. 2 bytes (see tables).	- Check that the table top is leveled, this is checked by: Difference between Z1 and Z2 height (read in service software) should be less than 4 millimeters. - Use the service software to check the angle given from the tilt sensor. If appropriate calibrate the tilt sensor.
02 End set point timeout	Internal software error.	Not used.	- Contact dealer.

7.2.4.28 Component Id 70, Supervisor Component

Reason	Description and status of System	Extra	Corrective action
01 Table top alignment error	The table top is not level.	1: Height difference between Z1 and Z2, in 0.1 mm. 4 bytes	- Press foot pedal until table top is leveled; this may require that the pedal is pressed more than once.
02 Tilt sensor full movement	The tilt sensor does not prevent any movement.	1: Table top angle (0.01°), given from the tilt sensor. 4 bytes.	
03 Tilt sensor restricted angle	The tilt sensor does prevent movement.	1: Table top angle (0.01°), given from the tilt sensor. 4 bytes.	- Press foot pedal until table top is leveled; this may require that the pedal is pressed more than once. - If table top is leveled (measure with water level) calibrate the tilt sensor.
04 Guard crash detected	The guard board has detected a crash.	1: Crash direction, 1 for a positive crash and 2 for a negative crash. 1 byte.	- Remove obstacle.

7.2.4.29 Component Id 80, Node Component

Reason	Description and status of System	Extra	Corrective action
01 Message decode	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
02 Communication not established	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.30 Component Id 81, Slave Node Component

Reason	Description and status of System	Extra	Corrective action
01 watchdog timeout	A watchdog timeout occurred.	1: Source id. 1 byte. 2: Line number in the code. 2 bytes.	- Check the state of the node (shown I service software). - Check the LED's on the board (for error indication).
02 Unexpected node state	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
03 Set state failed	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
04 Acknowledge status	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

05 Init timeout	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.
06 Node ready	Internal software error.	N.a	- Check that the correct parameter file is used. - Check that a valid System software release is used. - Contact dealer.

7.2.4.31 Component Id 82, Motor Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.32 Component Id 83, Guard Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.33 Component Id 90, Foot Pedal Component

Reason	Description and status of System	Extra	Corrective action
01 Switch active at start up	A pedal was active at start up.	1: Current foot pedal input status. 4 bytes. The following masks are used: Z up 0x0000 0001 Z down 0x0000 0002 X brake 0x0000 0004 Y brake 0x0000 0008 XY brake 0x0000 0200 DMG 0x0000 0100	- Check foot pedal.

01 Switch active at start up	The time between activation/ deactivation of the Z up/down and the dmg switch was too large.	Not used.	- Check foot pedal.
03 Switch function deactivated	The activated switch functionality was deactivated.	Not used.	- Some earlier error caused that this function has been deactivated.

7.2.4.34 Component Id 91, Tilt Sensor Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.4.35 Component Id 93, Emergency Switch Component

Reason	Description and status of System	Extra	Corrective action
01 Switch active at start up	An emergency switch was active at start up.	1: Current emergency switch input status. 4 bytes. The following masks are used: Internal 0x00000400 External 0x00000800	- Check the emergency switches.
02 Internal emergency switch is activated	The internal emergency switch was activated.	Not used.	
03 External emergency switch is activated	The external emergency switch was activated.	Not used.	
04 Emergency switch released	The last emergency switch was deactivated.	Not used.	

7.2.4.36 Component Id 94, ASAP Client Component

Reason	Description and status of System	Extra	Corrective action
N.a.			

7.2.5 Master Node

7.2.5.1 Definitions

The information in the tables below refer to the notes in the column “Extra” in the tables above.

Table 7-2 IDs used to identify the movements.

Movement ID	Number	Description
Z1 movement	0	Z1 column
Z2 movement	1	Z2 column
Table top x movement	2	Table top X-direction
Table top x movement	3	Table top Y-direction
Table top movement	16	Table top Z-direction
Auto-position movement	32	Auto-positioning table top Z-direction

Table 7-3 IDs used to identify the different parts within the master.

Source ID	ID
None	0
Internal	1
Supervisor	2
System	3
Master	4
Movement manager	10
Movement Z1	11
Movement Z2	12
Movement table top X	13
Movement table top Y	14
Movement table top	15
Movement auto-position	16
System message manager	30
Motor Z1	40
Motor Z2	41
Guard	42
Foot pedal	50
Emergency switch	51

Tilt sensor	52
CLI handler	60
ACAN client	61

Table 7-4 IDs used to identify the different start allowed results.

Movement	**Number**	**Description**
OK	0	Ok to start.
Supervisor not enabled	1	
Auto-position already started	2	
Tilted	3	Table top not level.
Crash	4	Guard crash active.
Error	5	An error has occurred.

Table 7-5 IDs used to identify the different movement directions.

Movement	**Number**	**Description**
No direction	0	Ok to start.
Positive direction	1	
Negative direction	2	
Unknown direction	3	Table top not level.

8 Electrical drawings

Electrical drawings

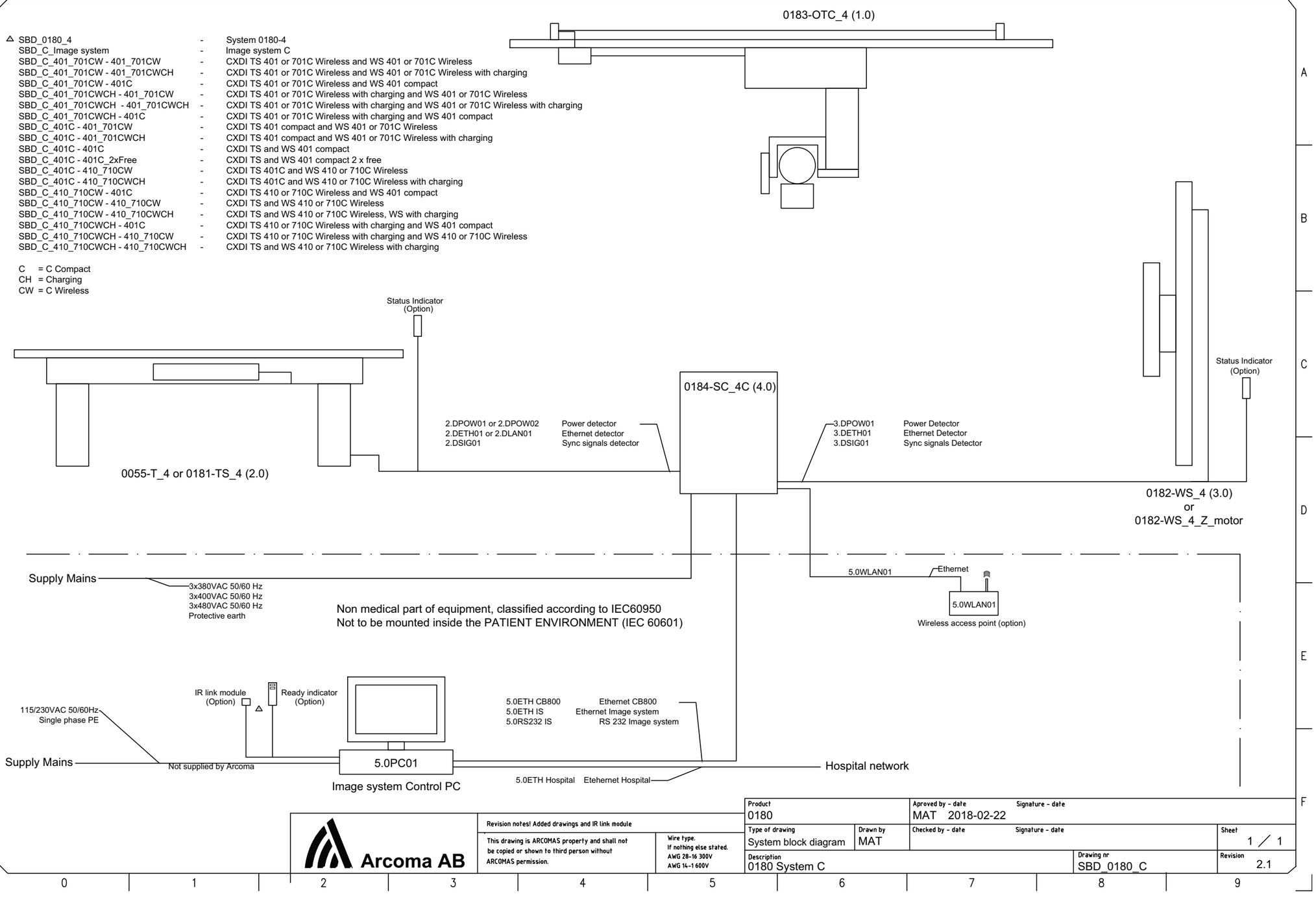
8.1 Notes regarding the electrical drawings

- Options are not available on all markets.
- Where electrical drawings describes several versions, 4C is applicable for Omnera 400T.
- Electrical drawings for CXDI410C and 710C are also valid for CXDI402C and 702C.

Electrical drawings

△	SBD_0180_4	-	System 0180-4
	SBD_C_Image system	-	Image system C
	SBD_C_401_701CW - 401_701CW	-	CXDI TS 401 or 701C Wireless and WS 401 or 701C Wireless
	SBD_C_401_701CW - 401_701CWCH	-	CXDI TS 401 or 701C Wireless and WS 401 or 701C Wireless with charging
	SBD_C_401_701CW - 401C	-	CXDI TS 401 or 701C Wireless and WS 401 compact
	SBD_C_401_701CWCH - 401_701CW	-	CXDI TS 401 or 701C Wireless with charging and WS 401 or 701C Wireless
	SBD_C_401_701CWCH - 401_701CWCH	-	CXDI TS 401 or 701C Wireless with charging and WS 401 or 701C Wireless with charging
	SBD_C_401_701CWCH - 401C	-	CXDI TS 401 or 701C Wireless with charging and WS 401 compact
	SBD_C_401C - 401_701CW	-	CXDI TS 401 compact and WS 401 or 701C Wireless
	SBD_C_401C - 401_701CWCH	-	CXDI TS 401 compact and WS 401 or 701C Wireless with charging
	SBD_C_401C - 401C	-	CXDI TS and WS 401 compact
	SBD_C_401C - 401C_2xFree	-	CXDI TS and WS 401 compact 2 x free
	SBD_C_401C - 410_710CW	-	CXDI TS 401C and WS 410 or 710C Wireless
	SBD_C_401C - 410_710CWCH	-	CXDI TS 401C and WS 410 or 710C Wireless with charging
	SBD_C_410_710CW - 401C	-	CXDI TS 410 or 710C Wireless and WS 401 compact
	SBD_C_410_710CW - 410_710CW	-	CXDI TS and WS 410 or 710C Wireless
	SBD_C_410_710CW - 410_710CWCH	-	CXDI TS and WS 410 or 710C Wireless, WS with charging
	SBD_C_410_710CWCH - 401C	-	CXDI TS 410 or 710C Wireless with charging and WS 401 compact
	SBD_C_410_710CWCH - 410_710CW	-	CXDI TS 410 or 710C Wireless with charging and WS 410 or 710C Wireless
	SBD_C_410_710CWCH - 410_710CWCH	-	CXDI TS and WS 410 or 710C Wireless with charging

C = C Compact
CH = Charging
CW = C Wireless



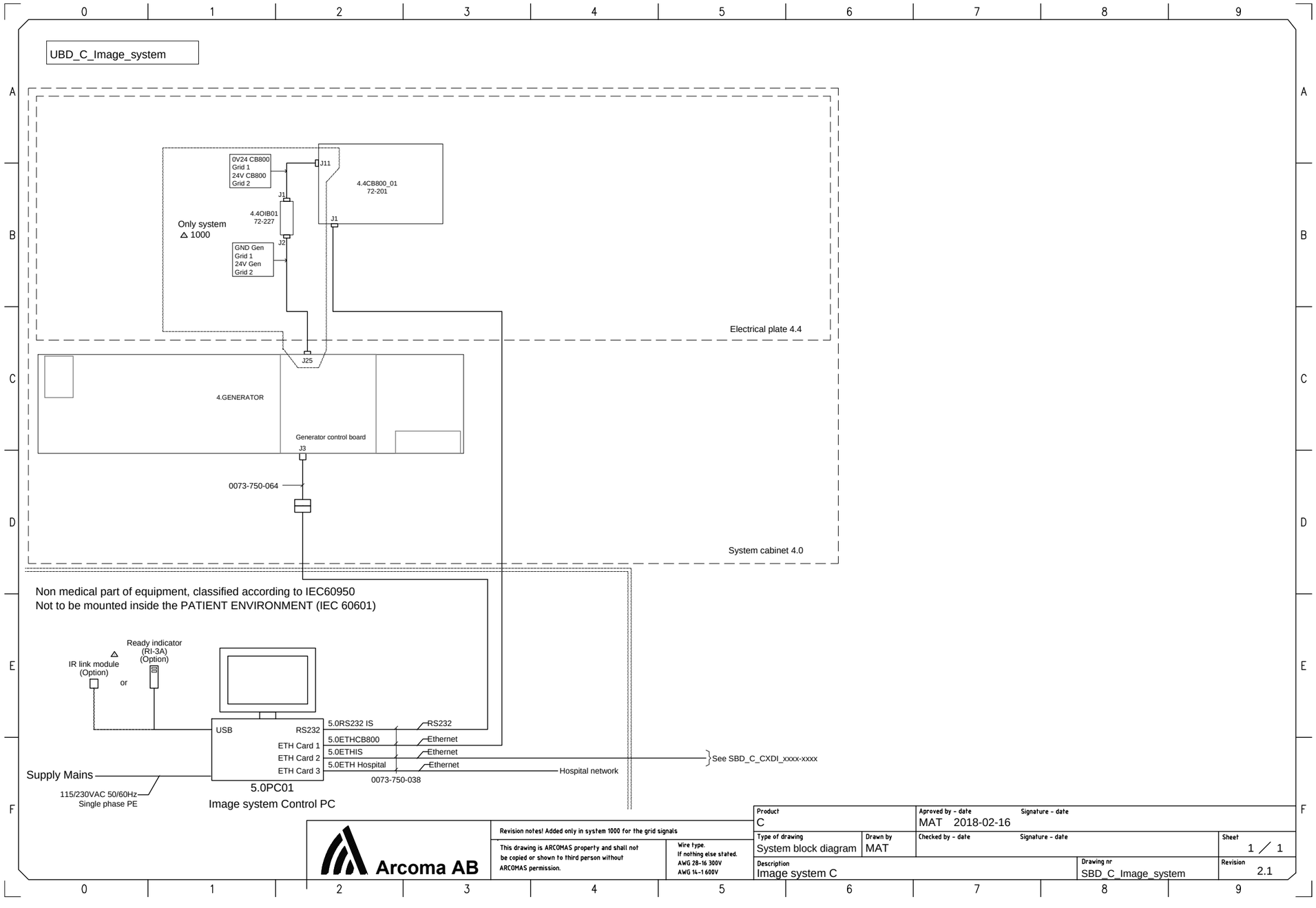
Arcoma AB

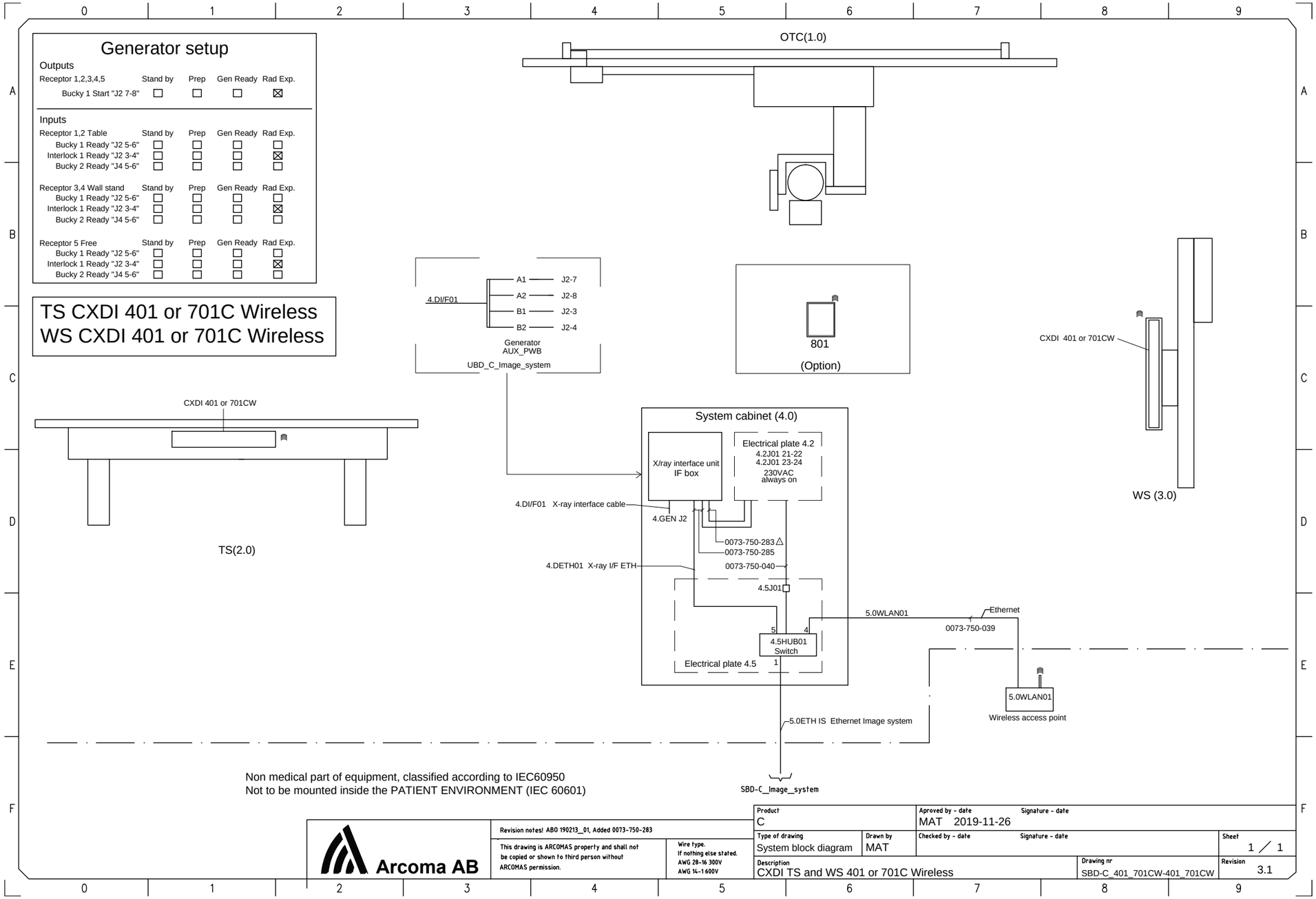
Revision notes! Added drawings and IR link module

This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

Product: 0180		Aproved by - date / Signature - date: MAT 2018-02-22	
Type of drawing: System block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: 0180 System C		Drawing nr: SBD_0180_C	Revision: 2.1


UBD_C_Image_system
0V24 CB800
Grid 1
24V CB800
Grid 2
J11
4.4CB800_01
72-201
J1
4.4OIB01
72-227
J1
Only system
△ 1000
J2
GND Gen
Grid 1
24V Gen
Grid 2
Electrical plate 4.4
J25
4.GENERATOR
Generator control board
J3
0073-750-064
System cabinet 4.0
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Ready indicator
(RI-3A)
(Option)
IR link module
(Option)
or
USB
RS232
ETH Card 1
ETH Card 2
ETH Card 3
5.0RS232 IS
5.0ETHCB800
5.0ETHIS
5.0ETH Hospital
RS232
Ethernet
Ethernet
Ethernet
0073-750-038
Hospital network
See SBD_C_CXDI_xxxx-xxxx
Supply Mains
115/230VAC 50/60Hz
Single phase PE
5.0PC01
Image system Control PC
Revision notes! Added only in system 1000 for the grid signals
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Arcoma AB
Product
C
Aproved by - date
MAT 2018-02-16
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Image system C
Drawing nr
SBD_C_Image_system
Revision
2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401 or 701C Wireless
WS CXDI 401 or 701C Wireless
OTC(1.0)
4.DI/F01
A1 J2-7
A2 J2-8
B1 J2-3
B2 J2-4
Generator AUX_PWB
UBD_C_Image_system
801
(Option)
CXDI 401 or 701CW
TS(2.0)
CXDI 401 or 701CW
WS (3.0)
System cabinet (4.0)
X/ray interface unit IF box
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
0073-750-283
0073-750-285
4.DETH01 X-ray I/F ETH
0073-750-040
4.5J01
5.0WLAN01
Ethernet
0073-750-039
4.5HUB01 Switch
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! ABO 190213_01, Added 0073-750-283
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2019-11-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS and WS 401 or 701C Wireless
Drawing nr SBD-C_401_701CW-401_701CW
Revision 3.1

Generator setup

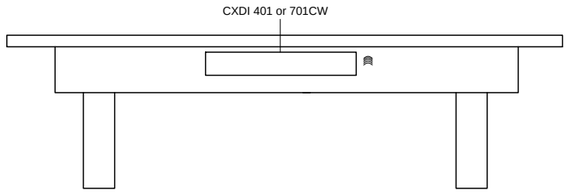
Outputs

Receptor 1,2,3,4,5	Stand by	Prep	Gen Ready	Rad Exp.
Bucky 1 Start "J2 7-8"	☐	☐	☐	☒

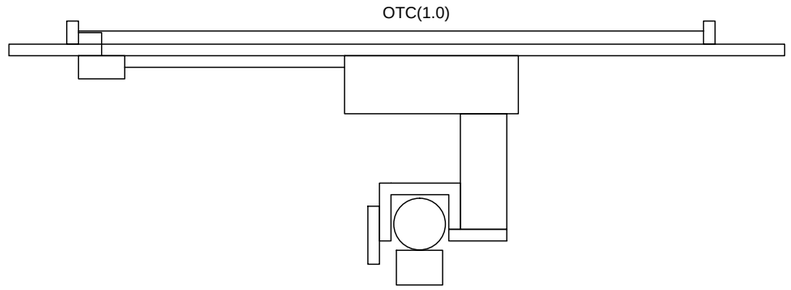
Inputs

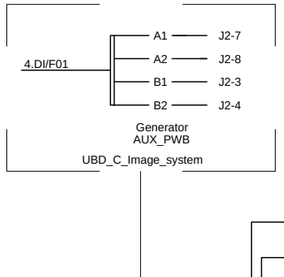
Receptor 1,2 Table	Stand by	Prep	Gen Ready	Rad Exp.
Bucky 1 Ready "J2 5-6"	☐	☐	☐	☐
Interlock 1 Ready "J2 3-4"	☐	☐	☐	☒
Bucky 2 Ready "J4 5-6"	☐	☐	☐	☐
Receptor 3,4 Wall stand	**Stand by**	**Prep**	**Gen Ready**	**Rad Exp.**
Bucky 1 Ready "J2 5-6"	☐	☐	☐	☐
Interlock 1 Ready "J2 3-4"	☐	☐	☐	☒
Bucky 2 Ready "J4 5-6"	☐	☐	☐	☐
Receptor 5 Free	**Stand by**	**Prep**	**Gen Ready**	**Rad Exp.**
Bucky 1 Ready "J2 5-6"	☐	☐	☐	☐
Interlock 1 Ready "J2 3-4"	☐	☐	☐	☒
Bucky 2 Ready "J4 5-6"	☐	☐	☐	☐

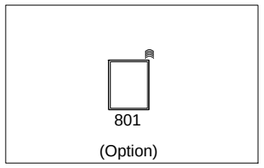
TS CXDI 401 or 701C Wireless
WS CXDI 401 or 701C Wireless with charging

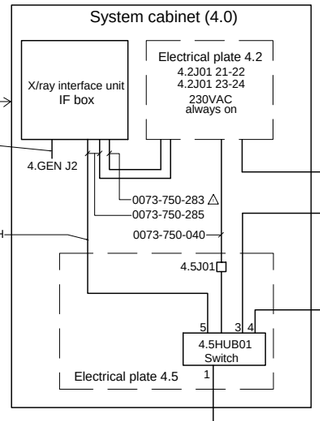


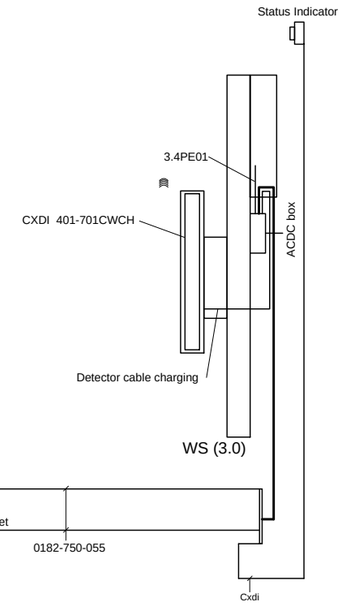
TS(2.0)











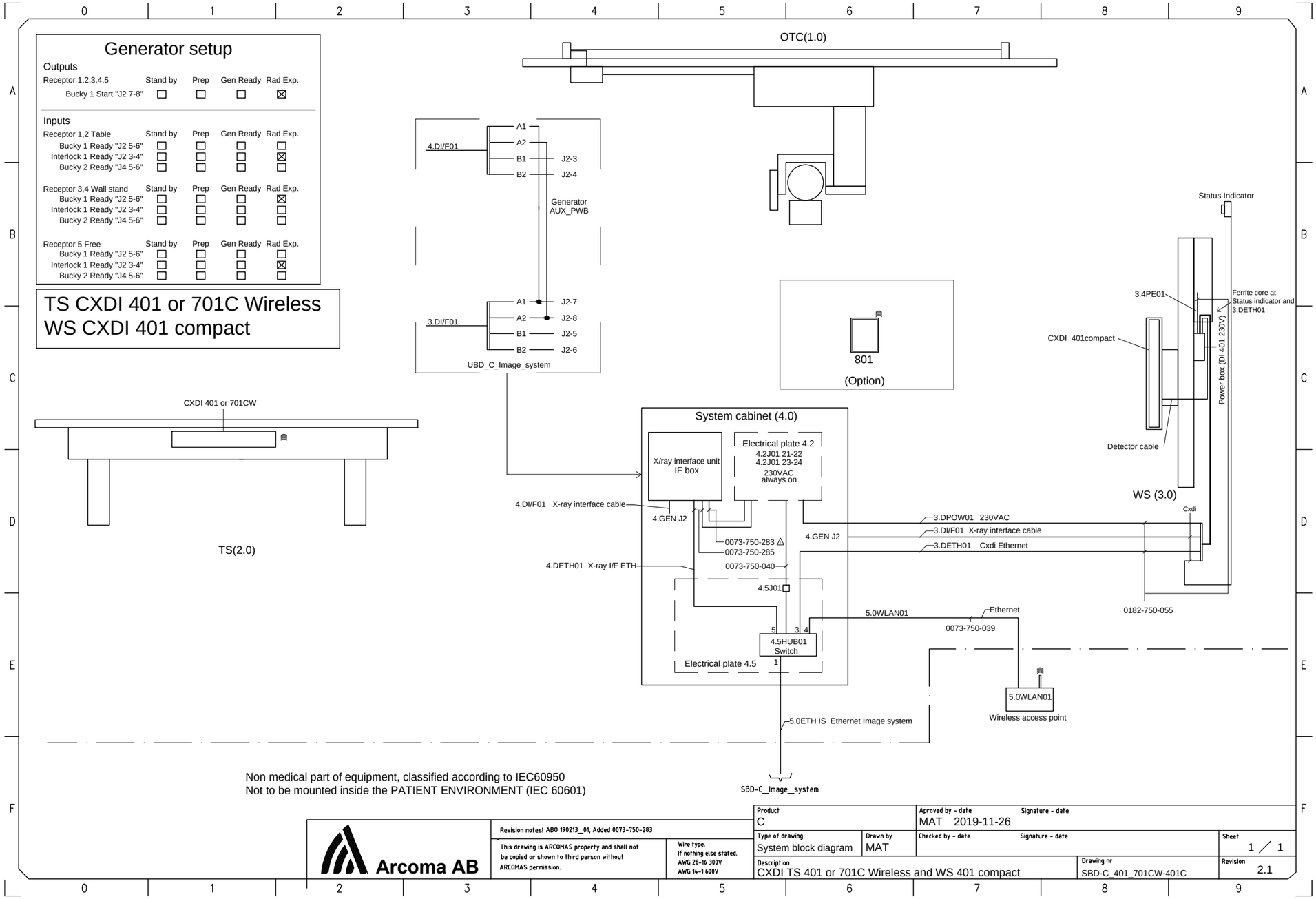
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)

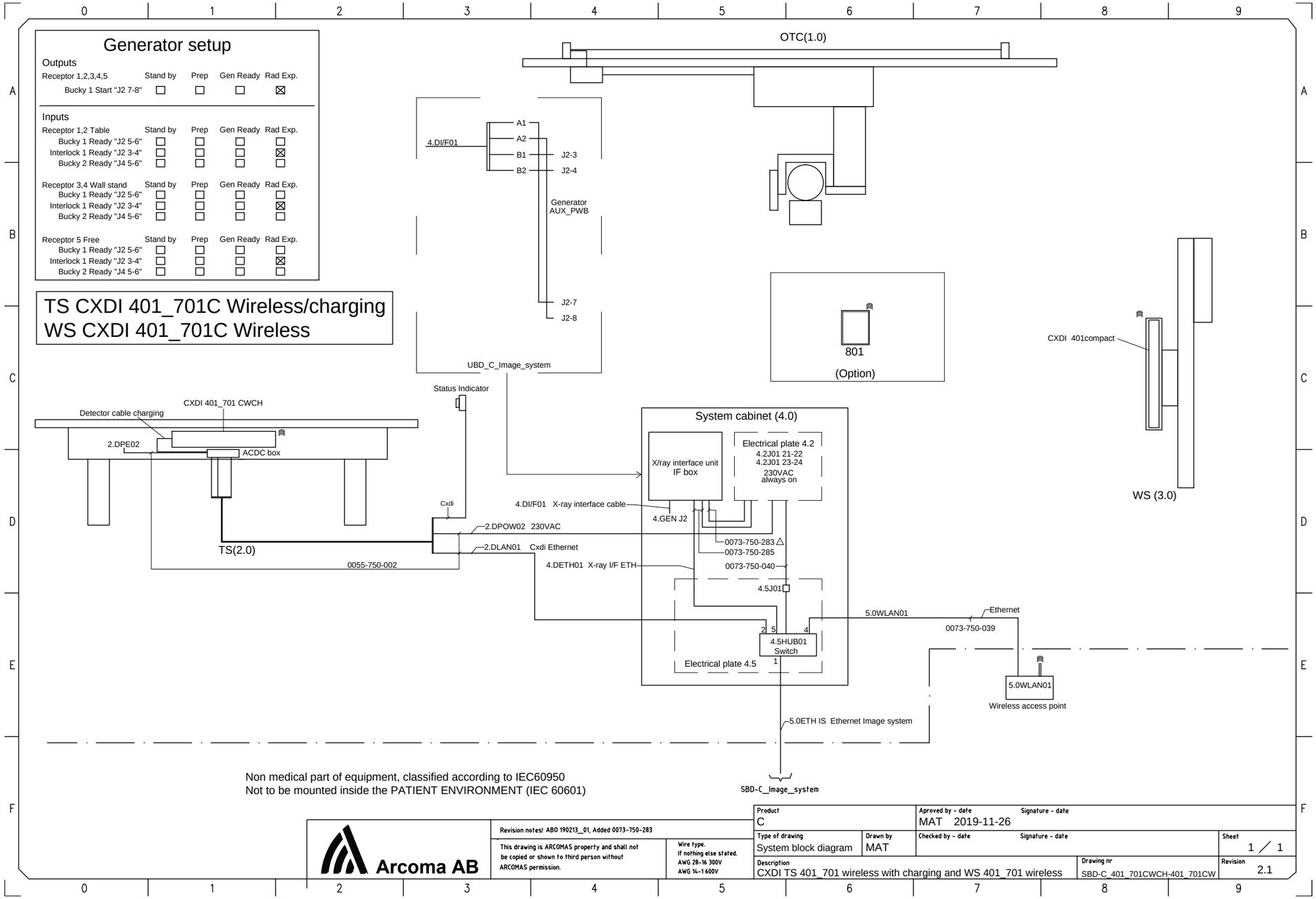
Arcoma AB

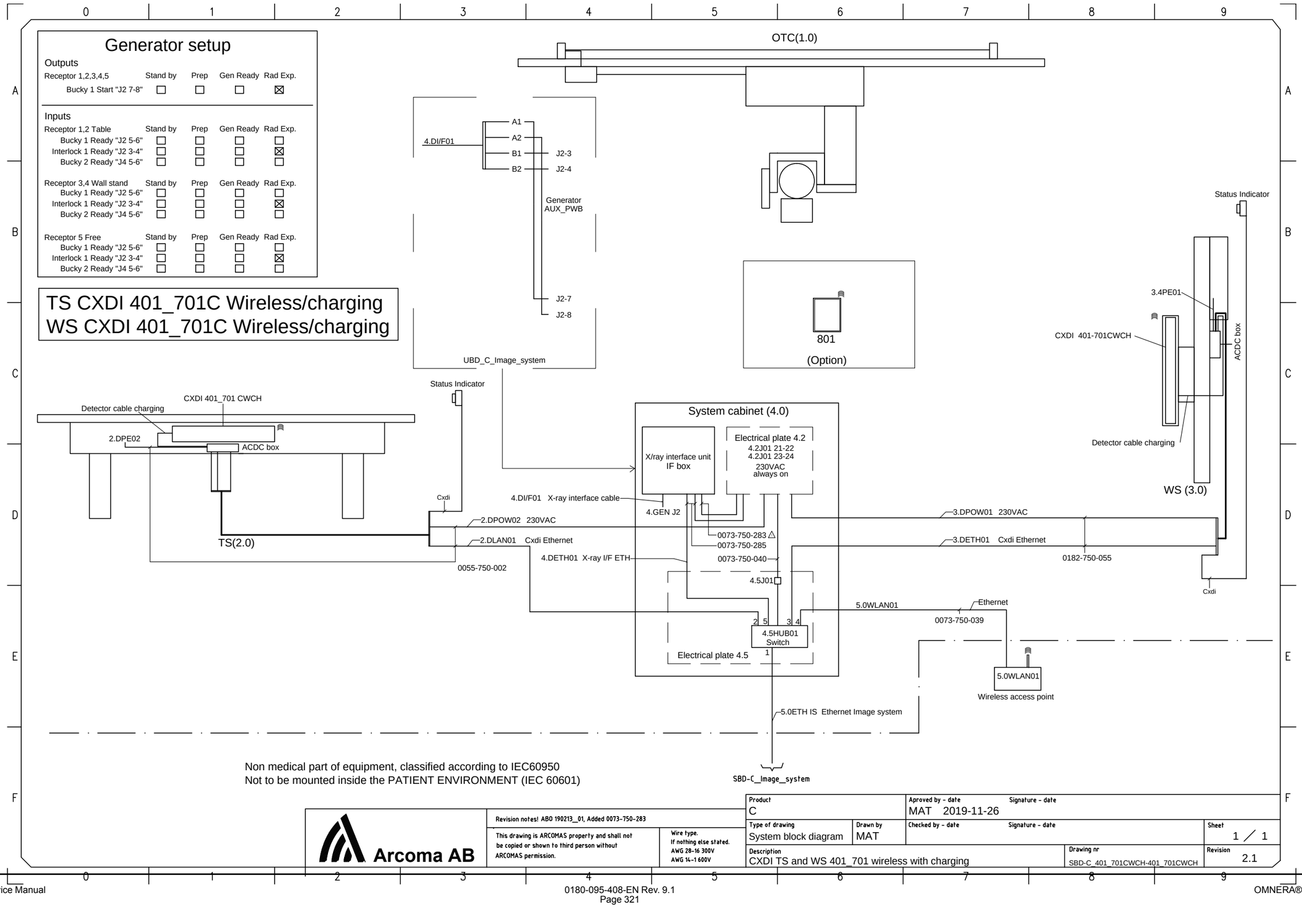
Revision notes! ABO 190213_01, Added 0073-750-283

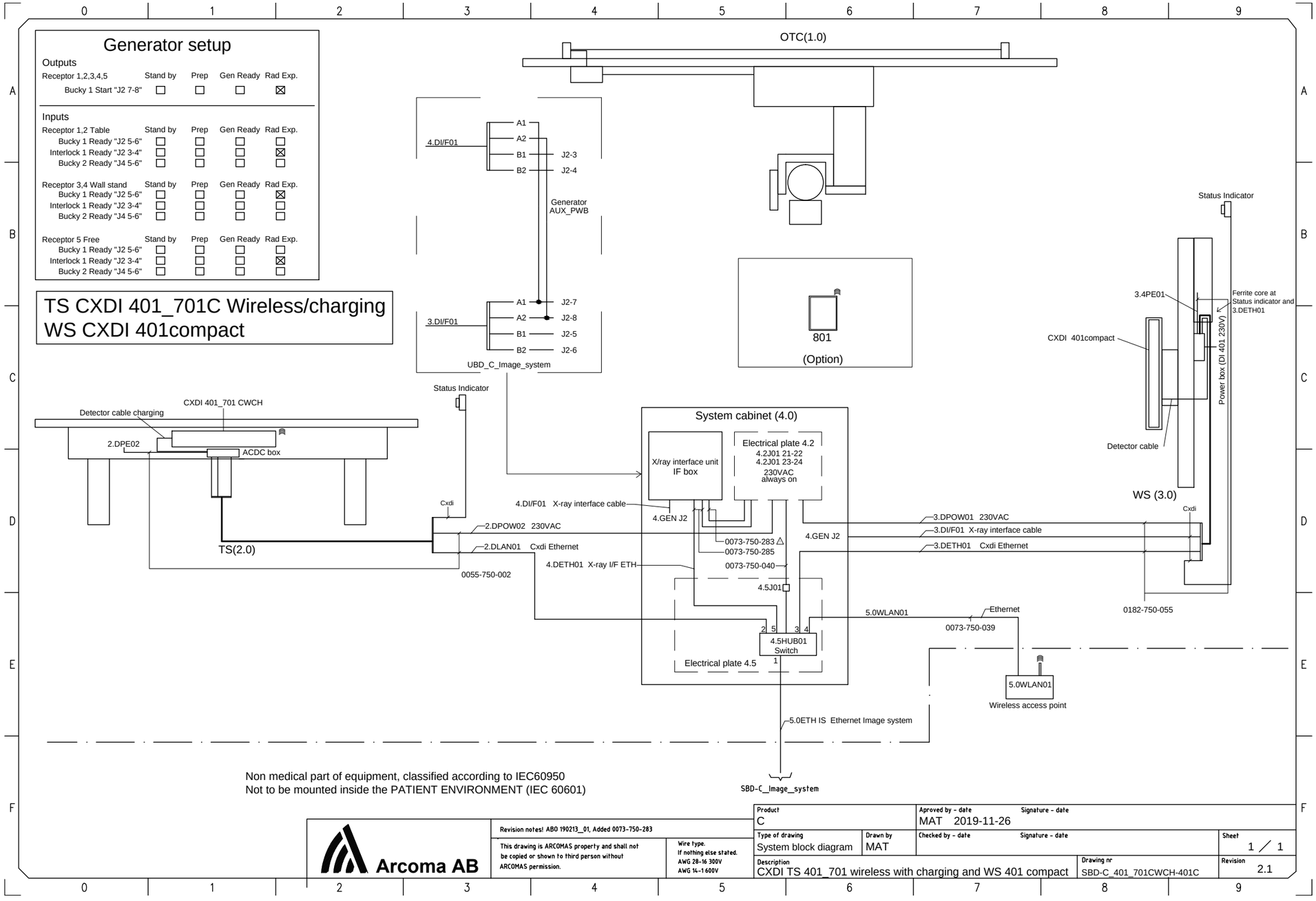
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

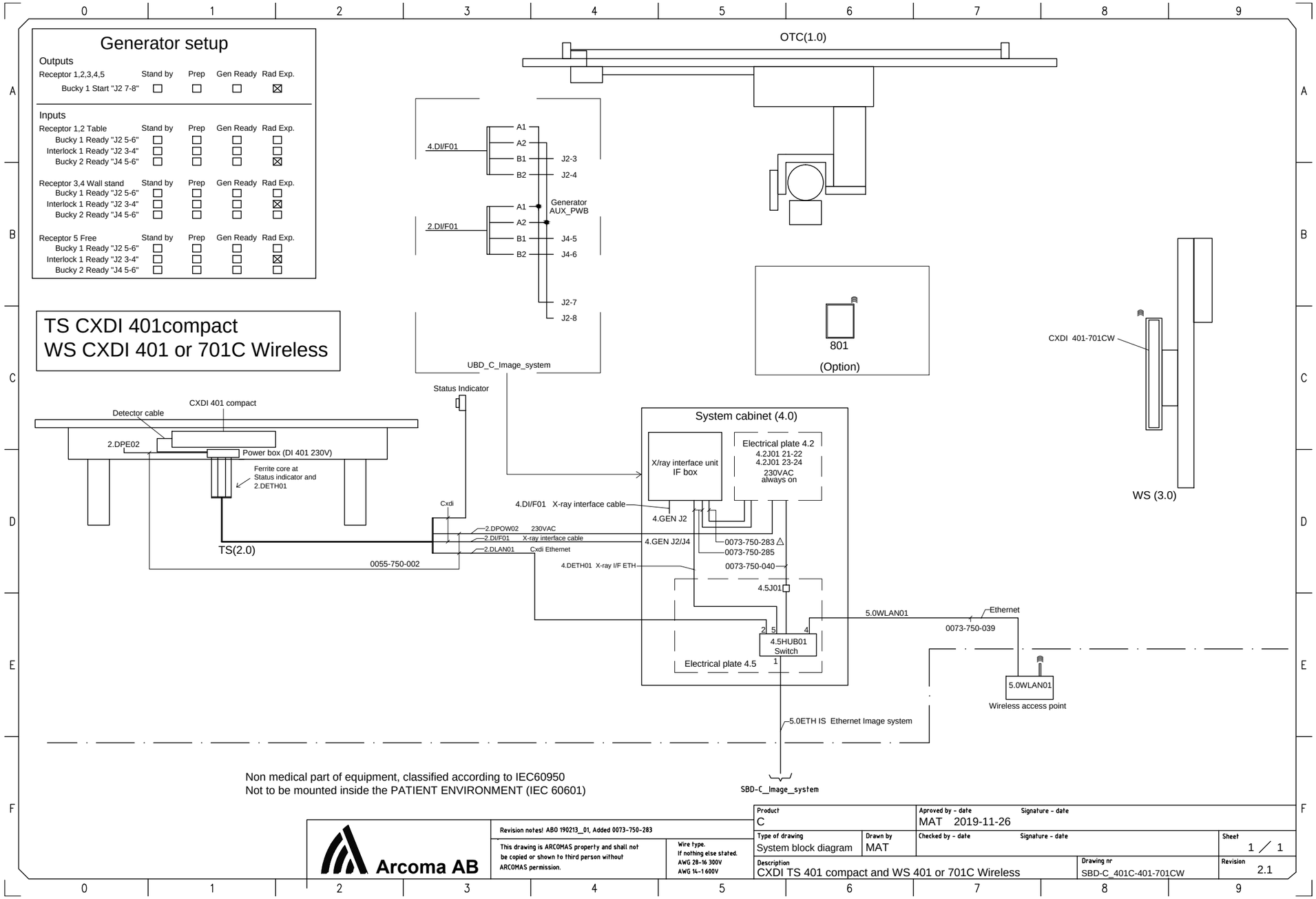
Product	Aproved by - date / Signature - date	
C	MAT 2019-11-26	
Type of drawing: System block diagram / Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: CXDI TS and WS 401 or 701C Wireless WS with charging	Drawing nr: SBD-C_401_701CW-401_701CWCH	Revision: 3.1

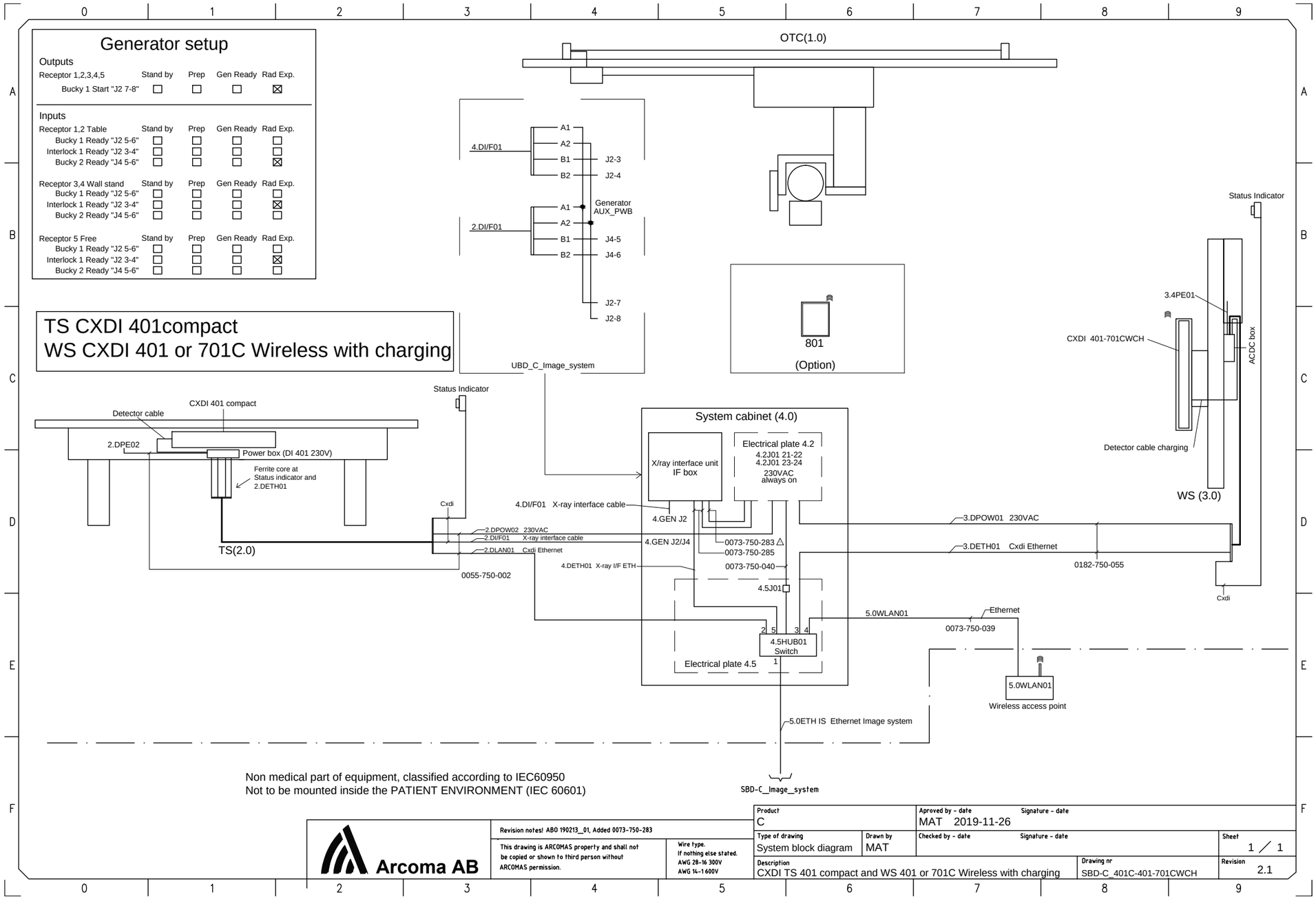

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401 or 701C Wireless
WS CXDI 401 compact
OTC(1.0)
4.DI/F01
A1
A2
B1
J2-3
B2
J2-4
Generator AUX_PWB
3.DI/F01
A1
J2-7
A2
J2-8
B1
J2-5
B2
J2-6
UBD_C_Image_system
801
(Option)
Status Indicator
3.4PE01
Ferrite core at Status indicator and 3.DETH01
CXDI 401compact
Power box (DI 401 230V)
Detector cable
WS (3.0)
Cxdi
CXDI 401 or 701CW
TS(2.0)
System cabinet (4.0)
X/ray interface unit IF box
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
0073-750-283
0073-750-285
0073-750-040
4.DETH01 X-ray I/F ETH
4.5J01
4.GEN J2
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
0182-750-055
5.0WLAN01
Ethernet
0073-750-039
5 3 4
4.5HUB01 Switch
1
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! ABO 190213_01, Added 0073-750-283
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2019-11-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 401 or 701C Wireless and WS 401 compact
Drawing nr SBD-C_401_701CW-401C
Revision 2.1

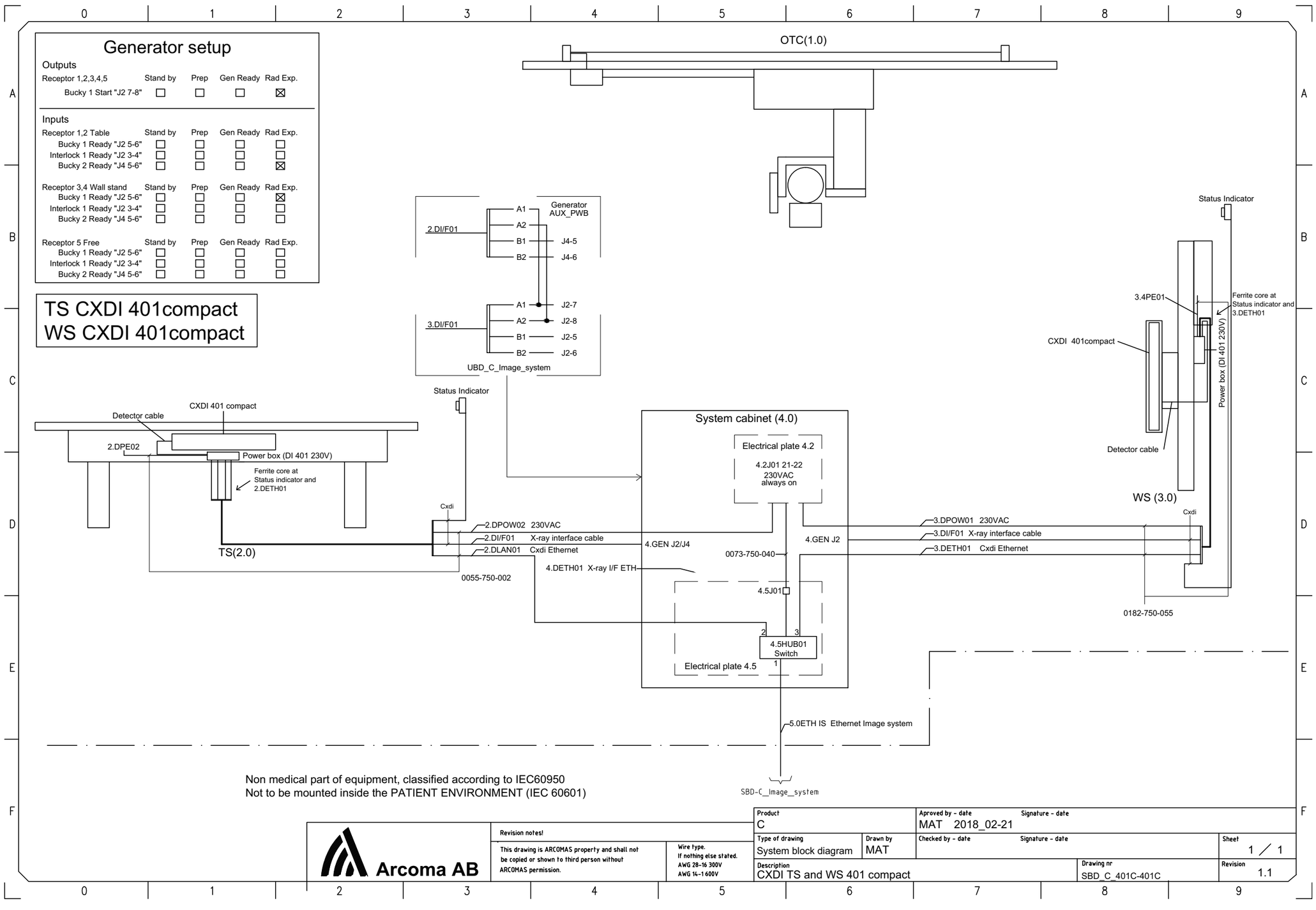

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401_701C Wireless/charging
WS CXDI 401_701C Wireless
OTC(1.0)
4.DI/F01
A1
A2
B1
J2-3
B2
J2-4
Generator AUX_PWB
J2-7
J2-8
UBD_C_Image_system
801
(Option)
CXDI 401compact
WS (3.0)
Status Indicator
CXDI 401_701 CWCH
Detector cable charging
2.DPE02
ACDC box
TS(2.0)
Cxdi
0055-750-002
System cabinet (4.0)
X/ray interface unit IF box
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
2.DPOW02 230VAC
2.DLAN01 Cxdi Ethernet
4.DETH01 X-ray I/F ETH
0073-750-283
0073-750-285
0073-750-040
4.5J01
Electrical plate 4.5
4.5HUB01 Switch
5.0WLAN01
Ethernet
0073-750-039
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! ABO 190213_01, Added 0073-750-283
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2019-11-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 401_701 wireless with charging and WS 401_701 wireless
Drawing nr SBD-C_401_701CWCH-401_701CW
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401_701C Wireless/charging
WS CXDI 401_701C Wireless/charging
OTC(1.0)
4.DI/F01
A1
A2
B1
B2
J2-3
J2-4
Generator AUX_PWB
J2-7
J2-8
UBD_C_Image_system
801
(Option)
Status Indicator
3.4PE01
CXDI 401-701CWCH
ACDC box
Detector cable charging
WS (3.0)
CXDI 401_701 CWCH
Detector cable charging
2.DPE02
ACDC box
TS(2.0)
Status Indicator
Cxdi
System cabinet (4.0)
X/ray interface unit IF box
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
2.DPOW02 230VAC
2.DLAN01 Cxdi Ethernet
4.DETH01 X-ray I/F ETH
0055-750-002
0073-750-283
0073-750-285
0073-750-040
4.5J01
3.DPOW01 230VAC
3.DETH01 Cxdi Ethernet
0182-750-055
Cxdi
5.0WLAN01
Ethernet
0073-750-039
2 5 3 4
4.5HUB01 Switch
1
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! ABO 190213_01, Added 0073-750-283
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2019-11-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS and WS 401_701 wireless with charging
Drawing nr SBD-C_401_701CWCH-401_701CWCH
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401_701C Wireless/charging
WS CXDI 401compact
OTC(1.0)
4.DI/F01
A1
A2
B1
B2
J2-3
J2-4
Generator AUX_PWB
3.DI/F01
J2-7
J2-8
J2-5
J2-6
UBD_C_Image_system
801
(Option)
Status Indicator
CXDI 401_701 CWCH
Detector cable charging
2.DPE02
ACDC box
TS(2.0)
Cxdi
0055-750-002
2.DPOW02 230VAC
2.DLAN01 Cxdi Ethernet
4.DETH01 X-ray I/F ETH
4.DI/F01 X-ray interface cable
System cabinet (4.0)
X/ray interface unit
IF box
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC
always on
4.GEN J2
0073-750-283
0073-750-285
0073-750-040
4.5J01
4.5HUB01
Switch
Electrical plate 4.5
5.0WLAN01
Ethernet
0073-750-039
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Status Indicator
3.4PE01
Ferrite core at
Status indicator and
3.DETH01
CXDI 401compact
Power box (DI 401 230V)
Detector cable
WS (3.0)
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
0182-750-055
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! ABO 190213_01, Added 0073-750-283
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2019-11-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 401_701 wireless with charging and WS 401 compact
Drawing nr SBD-C_401_701CWCH-401C
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401compact
WS CXDI 401 or 701C Wireless
OTC(1.0)
4.DI/F01
A1
A2
B1
B2
J2-3
J2-4
2.DI/F01
Generator AUX_PWB
J4-5
J4-6
J2-7
J2-8
UBD_C_Image_system
801
(Option)
CXDI 401-701CW
WS (3.0)
Status Indicator
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at Status indicator and 2.DETH01
TS(2.0)
0055-750-002
Cxdi
System cabinet (4.0)
X/ray interface unit IF box
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
4.GEN J2/J4
2.DLAN01 Cxdi Ethernet
0073-750-283
0073-750-285
4.DETH01 X-ray I/F ETH
0073-750-040
4.5J01
5.0WLAN01
Ethernet
0073-750-039
2 5 4
4.5HUB01 Switch
1
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! ABO 190213_01, Added 0073-750-283
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2019-11-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 401 compact and WS 401 or 701C Wireless
Drawing nr SBD-C_401C-401-701CW
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401compact
WS CXDI 401 or 701C Wireless with charging
OTC(1.0)
4.DI/F01
2.DI/F01
A1
A2
B1
B2
J2-3
J2-4
J4-5
J4-6
J2-7
J2-8
Generator AUX_PWB
UBD_C_Image_system
801
(Option)
Status Indicator
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at Status indicator and 2.DETH01
TS(2.0)
Cxdi
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
0055-750-002
System cabinet (4.0)
X/ray interface unit IF box
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
4.GEN J2/J4
4.DETH01 X-ray I/F ETH
0073-750-283
0073-750-285
0073-750-040
4.5J01
Electrical plate 4.5
4.5HUB01 Switch
2 5 3 4
1
5.0WLAN01
Ethernet
0073-750-039
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Status Indicator
3.4PE01
CXDI 401-701CWCH
ACDC box
Detector cable charging
WS (3.0)
3.DPOW01 230VAC
3.DETH01 Cxdi Ethernet
0182-750-055
Cxdi
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! ABO 190213_01, Added 0073-750-283
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2019-11-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 401 compact and WS 401 or 701C Wireless with charging
Drawing nr SBD-C_401C-401-701CWCH
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401compact
WS CXDI 401compact
OTC(1.0)
Generator AUX_PWB
A1
A2
B1
B2
J4-5
J4-6
2.DI/F01
3.DI/F01
J2-7
J2-8
J2-5
J2-6
UBD_C_Image_system
Status Indicator
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at
Status indicator and
2.DETH01
Cxdi
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
TS(2.0)
0055-750-002
System cabinet (4.0)
Electrical plate 4.2
4.2J01 21-22
230VAC
always on
4.GEN J2/J4
4.DETH01 X-ray I/F ETH
4.5J01
2
3
4.5HUB01
Switch
1
Electrical plate 4.5
5.0ETH IS Ethernet Image system
SBD-C_Image_system
4.GEN J2
0073-750-040
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
0182-750-055
Status Indicator
3.4PE01
Ferrite core at
Status indicator and
3.DETH01
CXDI 401compact
Power box (DI 401 230V)
Detector cable
WS (3.0)
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes!
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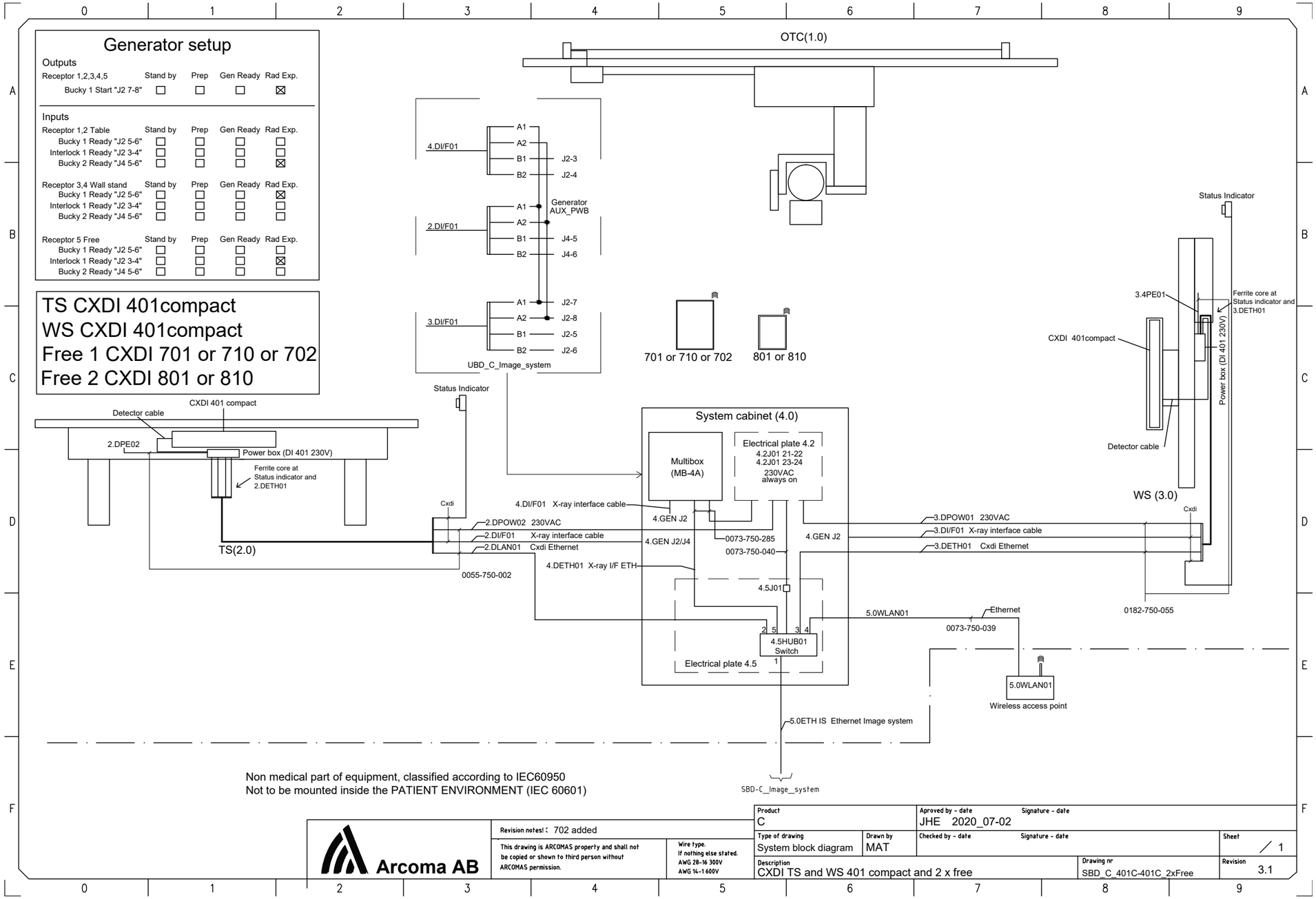
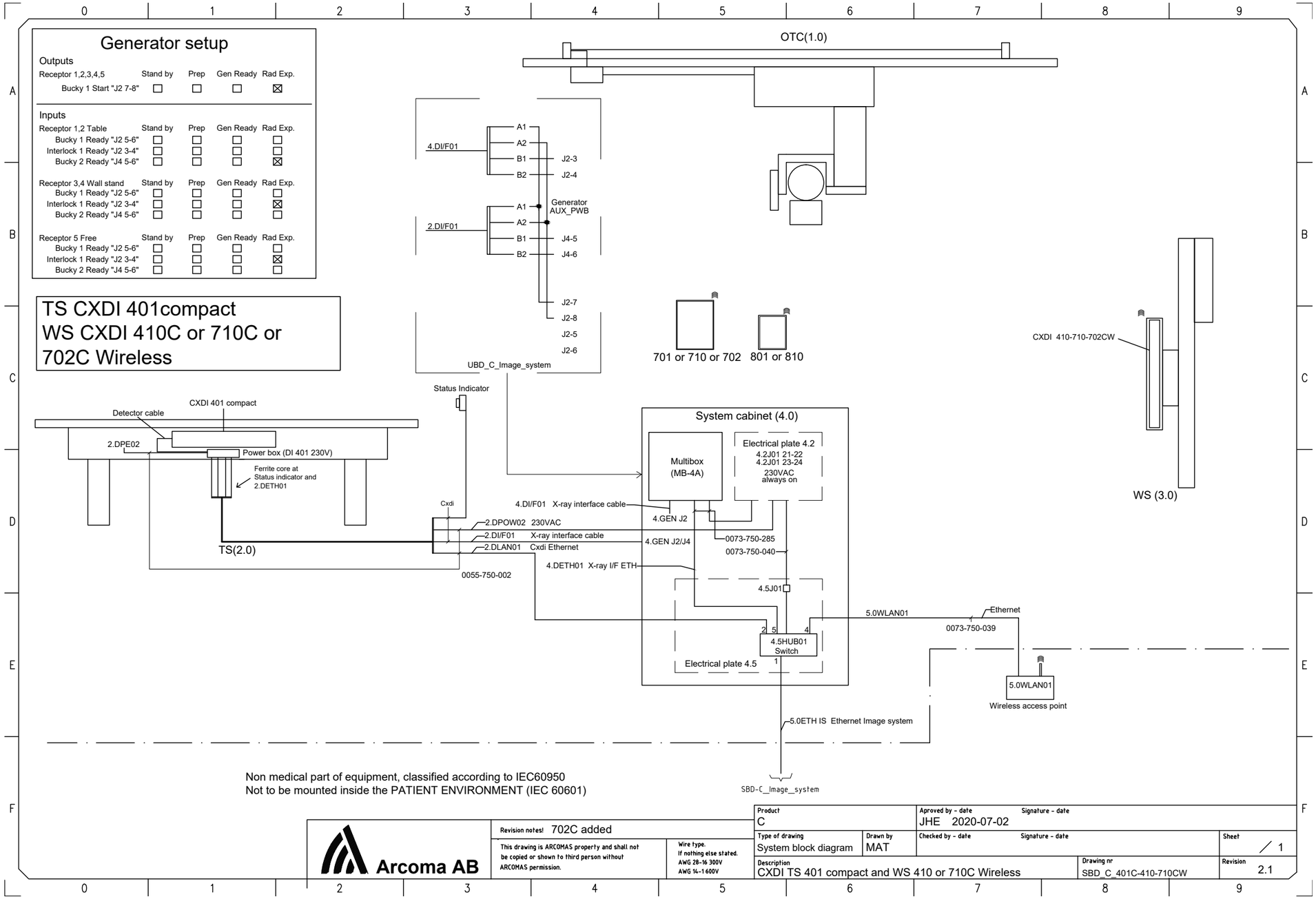
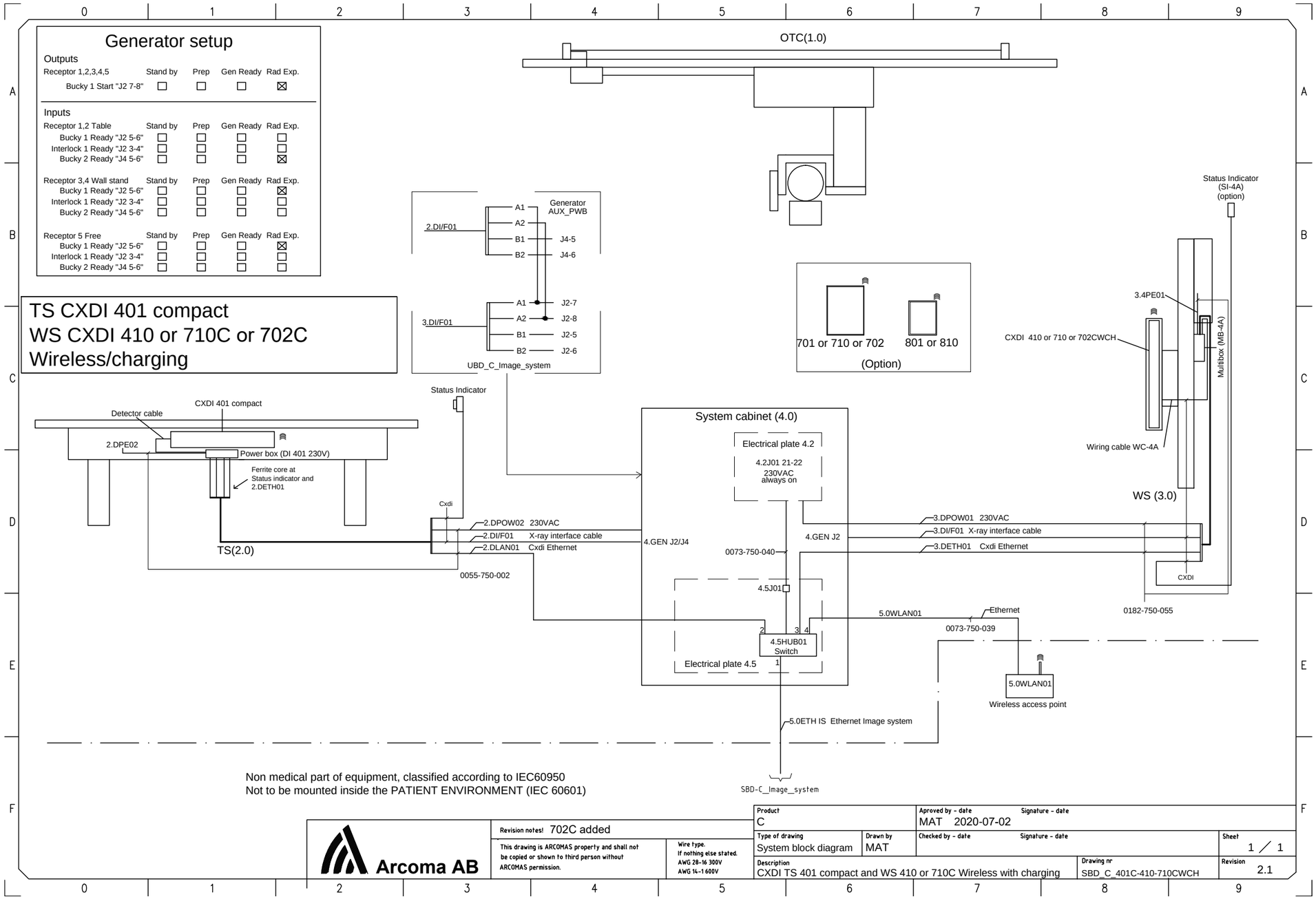
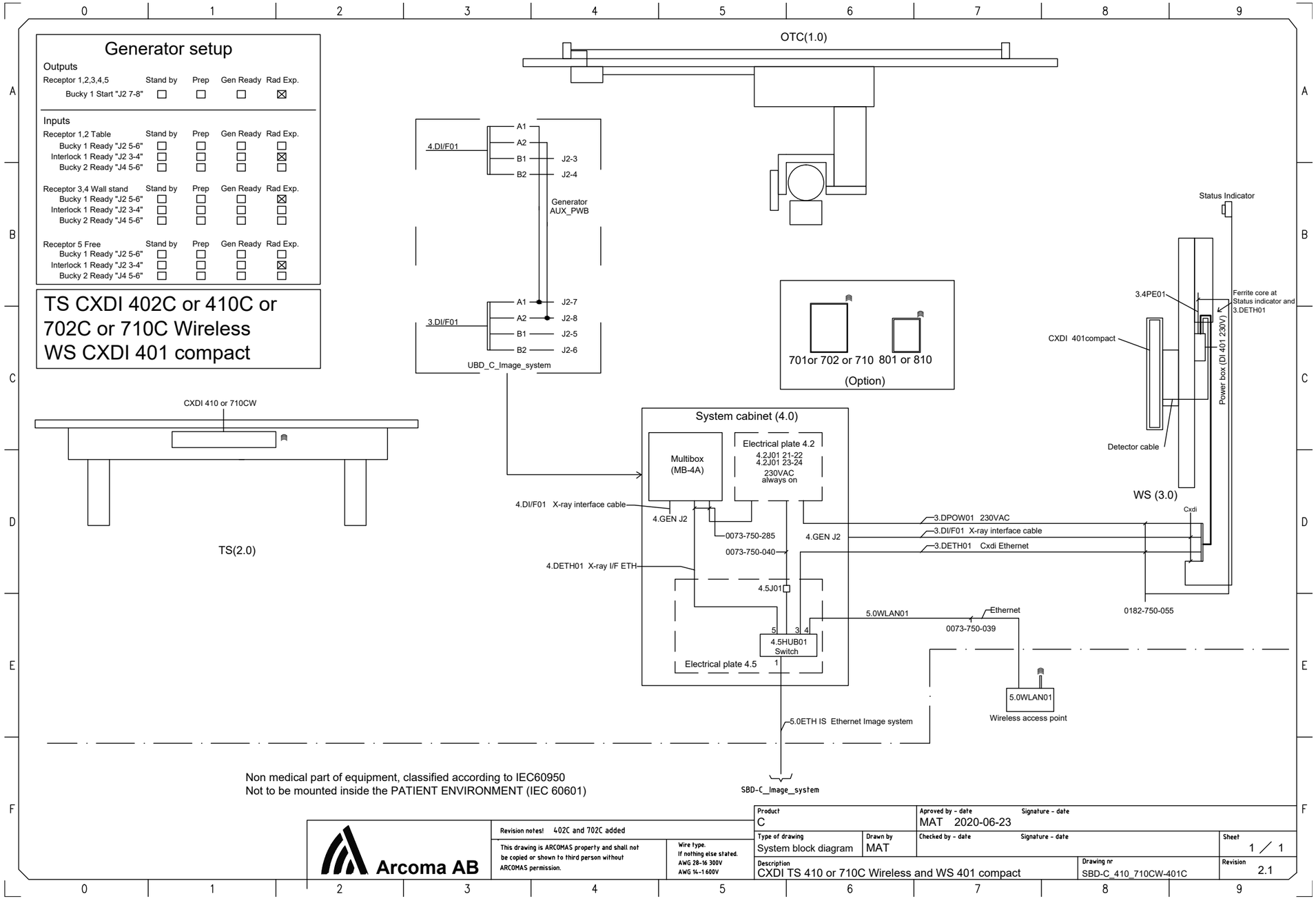
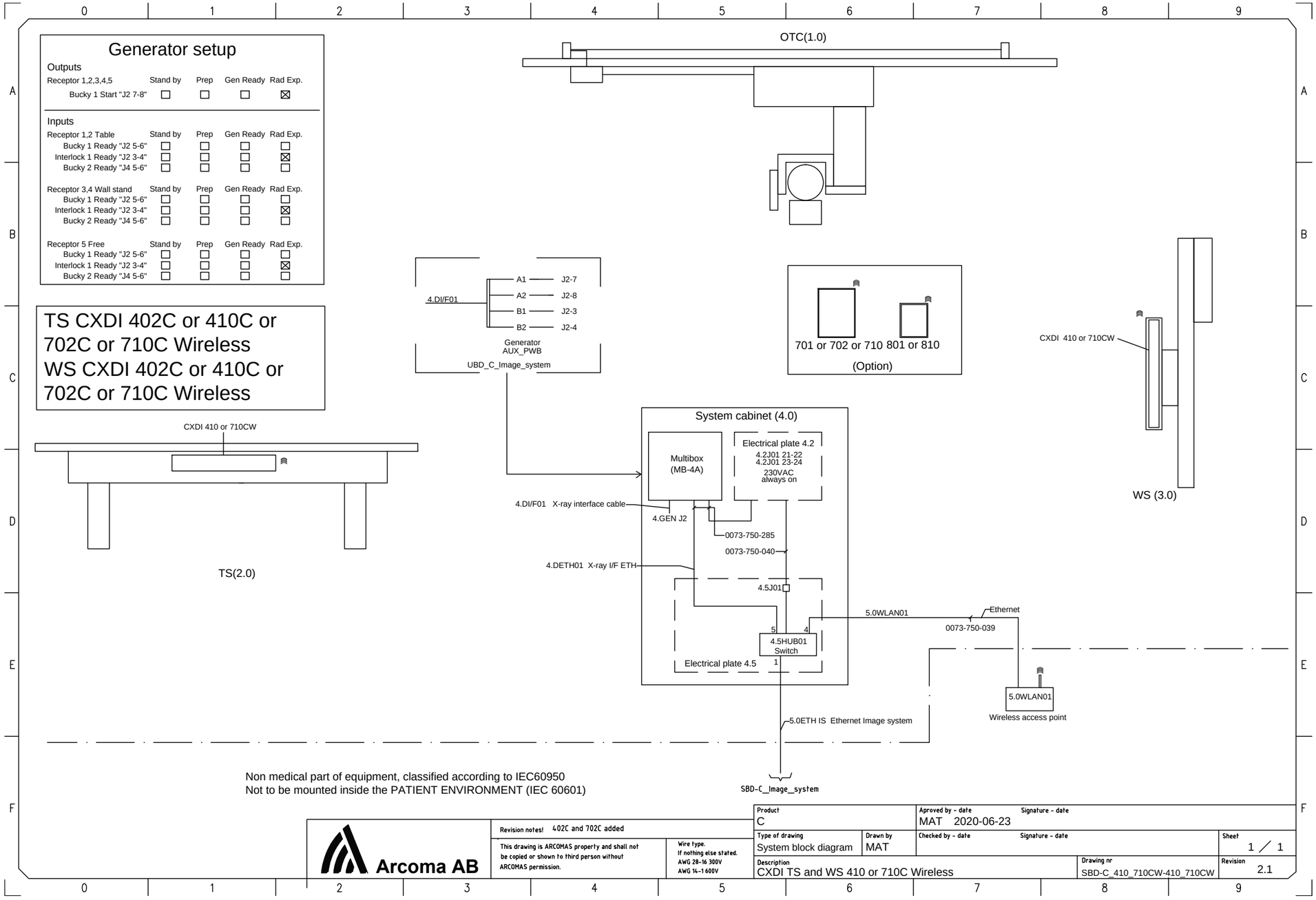
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
C
Aproved by - date
MAT 2018_02-21
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
CXDI TS and WS 401 compact
Drawing nr
SBD_C_401C-401C
Revision
1.1

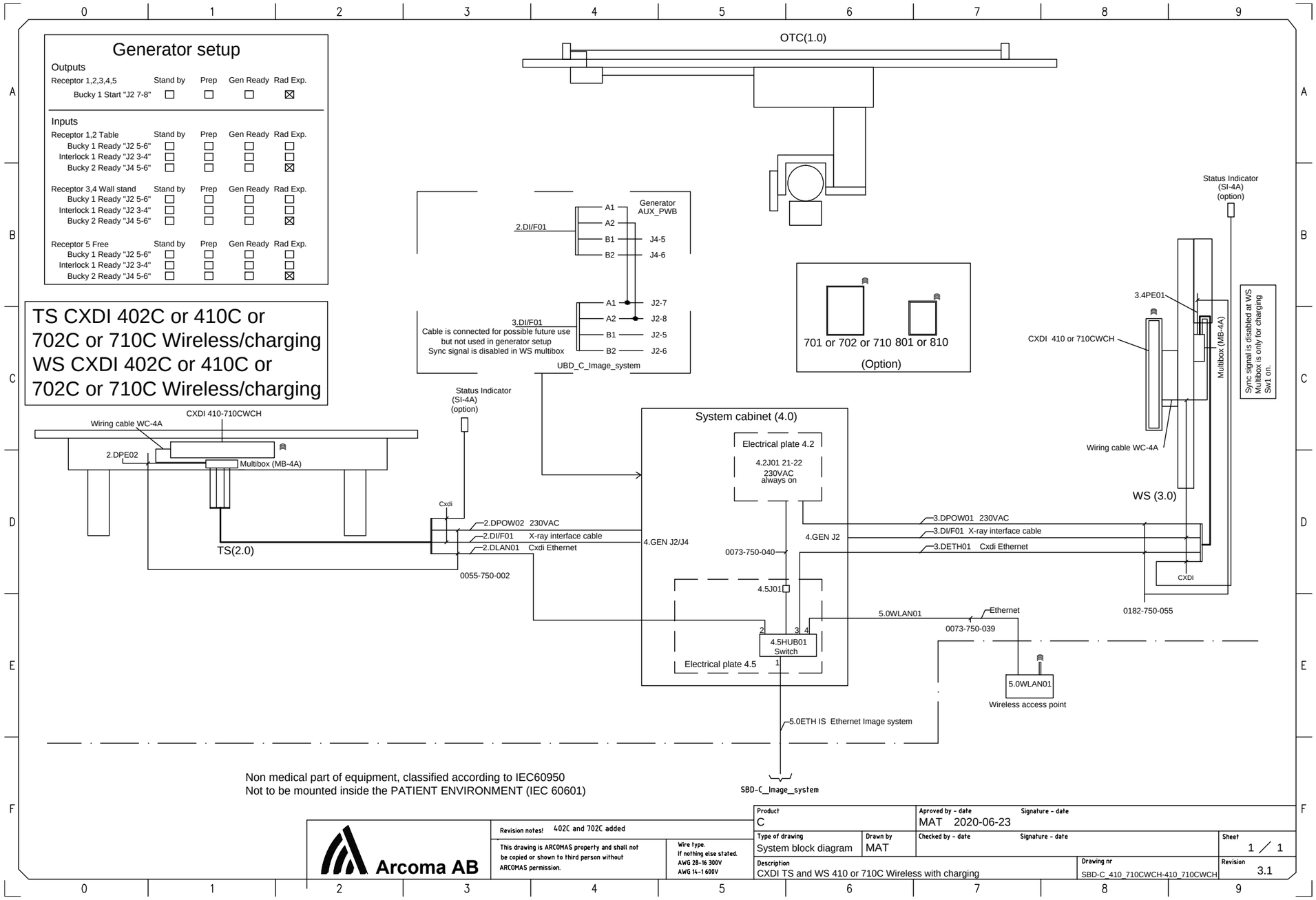

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401compact
WS CXDI 401compact
Free 1 CXDI 701 or 710 or 702
Free 2 CXDI 801 or 810
OTC(1.0)
4.DI/F01
2.DI/F01
3.DI/F01
A1
A2
B1
B2
J2-3
J2-4
J4-5
J4-6
J2-7
J2-8
J2-5
J2-6
Generator AUX_PWB
UBD_C_Image_system
701 or 710 or 702
801 or 810
Status Indicator
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at Status indicator and 2.DETH01
TS(2.0)
Cxdi
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
0055-750-002
4.DETH01 X-ray I/F ETH
System cabinet (4.0)
Multibox (MB-4A)
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
4.GEN J2/J4
0073-750-285
0073-750-040
4.5J01
Electrical plate 4.5
4.5HUB01 Switch
5.0WLAN01
Ethernet
0073-750-039
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Status Indicator
3.4PE01
Ferrite core at Status indicator and 3.DETH01
CXDI 401compact
Power box (DI 401 230V)
Detector cable
WS (3.0)
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
0182-750-055
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! : 702 added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date JHE 2020_07-02
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1
Description CXDI TS and WS 401 compact and 2 x free
Drawing nr SBD_C_401C-401C_2xFree
Revision 3.1

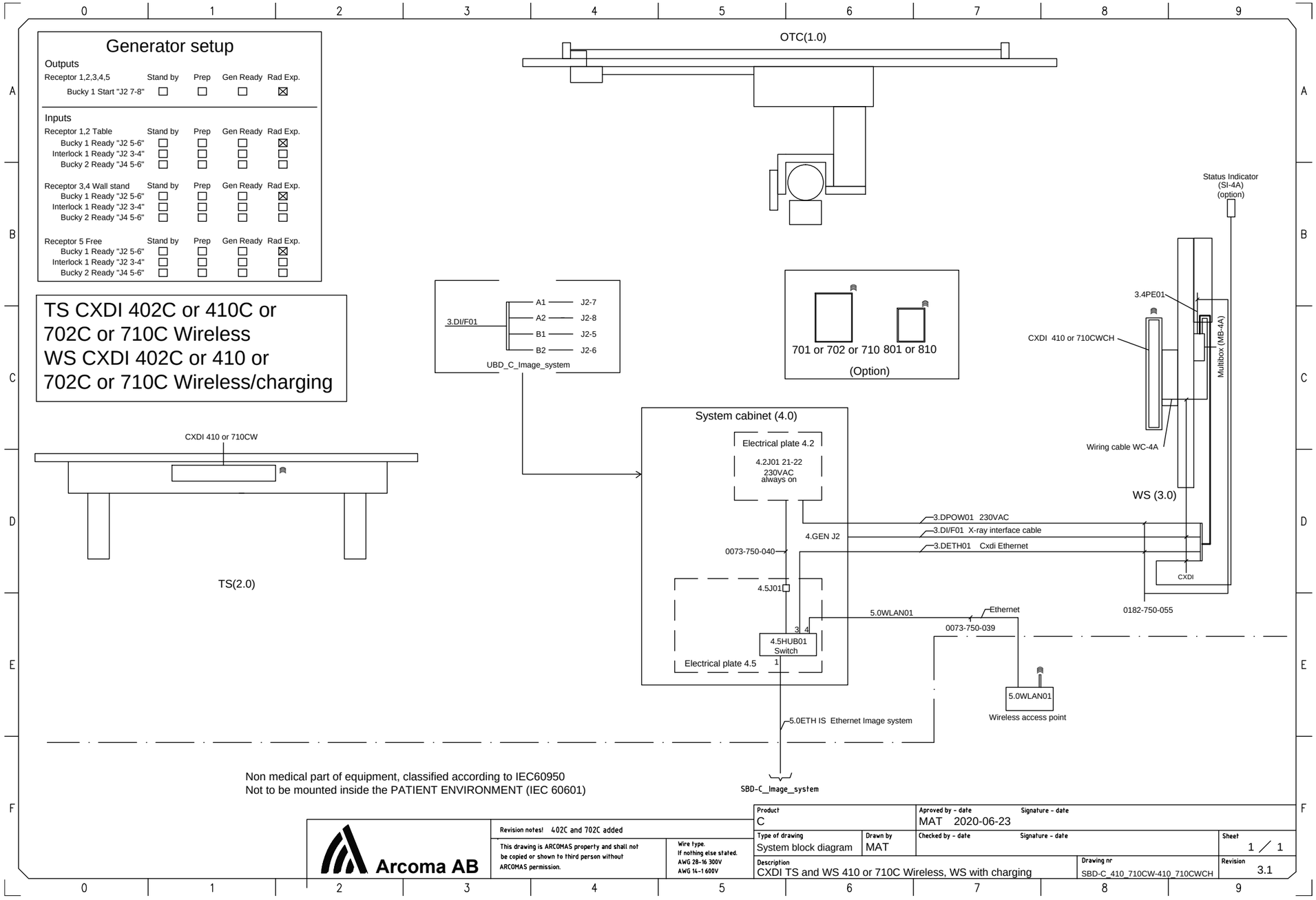

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401compact
WS CXDI 410C or 710C or 702C Wireless
OTC(1.0)
4.DI/F01
2.DI/F01
A1
A2
B1
B2
J2-3
J2-4
J4-5
J4-6
J2-7
J2-8
J2-5
J2-6
Generator AUX_PWB
UBD_C_Image_system
701 or 710 or 702
801 or 810
CXDI 410-710-702CW
WS (3.0)
Status Indicator
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at Status indicator and 2.DETH01
TS(2.0)
Cxdi
0055-750-002
System cabinet (4.0)
Multibox (MB-4A)
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
4.GEN J2/J4
2.DLAN01 Cxdi Ethernet
0073-750-285
0073-750-040
4.DETH01 X-ray I/F ETH
4.5J01
5.0WLAN01
Ethernet
0073-750-039
4.5HUB01 Switch
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date JHE 2020-07-02
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1
Description CXDI TS 401 compact and WS 410 or 710C Wireless
Drawing nr SBD_C_401C-410-710CW
Revision 2.1

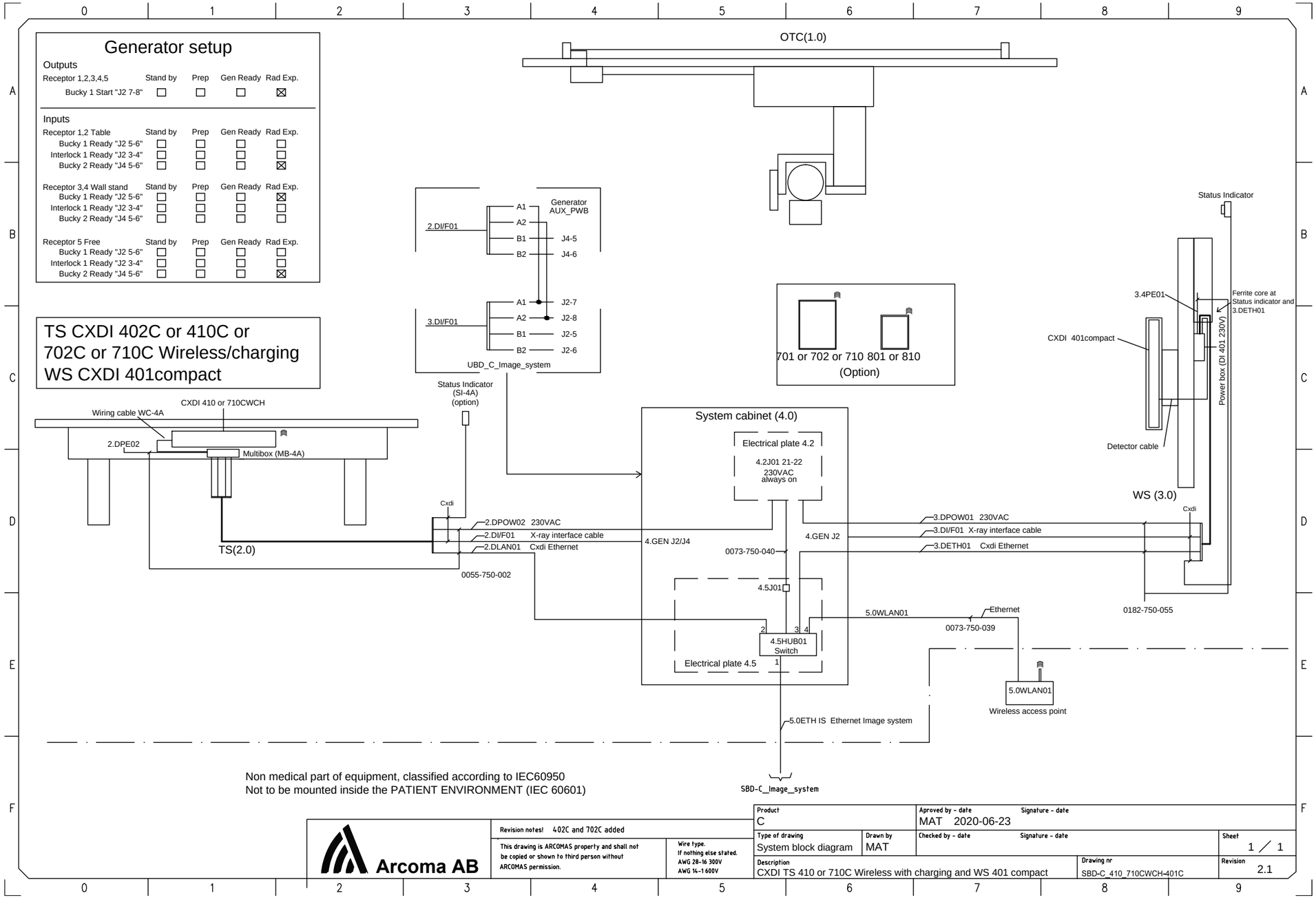

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 401 compact
WS CXDI 410 or 710C or 702C
Wireless/charging
OTC(1.0)
Generator AUX_PWB
2.DI/F01
A1
A2
B1 J4-5
B2 J4-6
3.DI/F01
A1 J2-7
A2 J2-8
B1 J2-5
B2 J2-6
UBD_C_Image_system
701 or 710 or 702
801 or 810
(Option)
Status Indicator (SI-4A) (option)
3.4PE01
CXDI 410 or 710 or 702CWCH
Multibox (MB-4A)
Wiring cable WC-4A
WS (3.0)
CXDI
0182-750-055
Status Indicator
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at Status indicator and 2.DETH01
Cxdi
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
TS(2.0)
0055-750-002
System cabinet (4.0)
Electrical plate 4.2
4.2J01 21-22
230VAC
always on
4.GEN J2/J4
4.GEN J2
0073-750-040
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
4.5J01
5.0WLAN01
Ethernet
0073-750-039
2 3 4
4.5HUB01
Switch
Electrical plate 4.5 1
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2020-07-02
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 401 compact and WS 410 or 710C Wireless with charging
Drawing nr SBD_C_401C-410-710CWCH
Revision 2.1

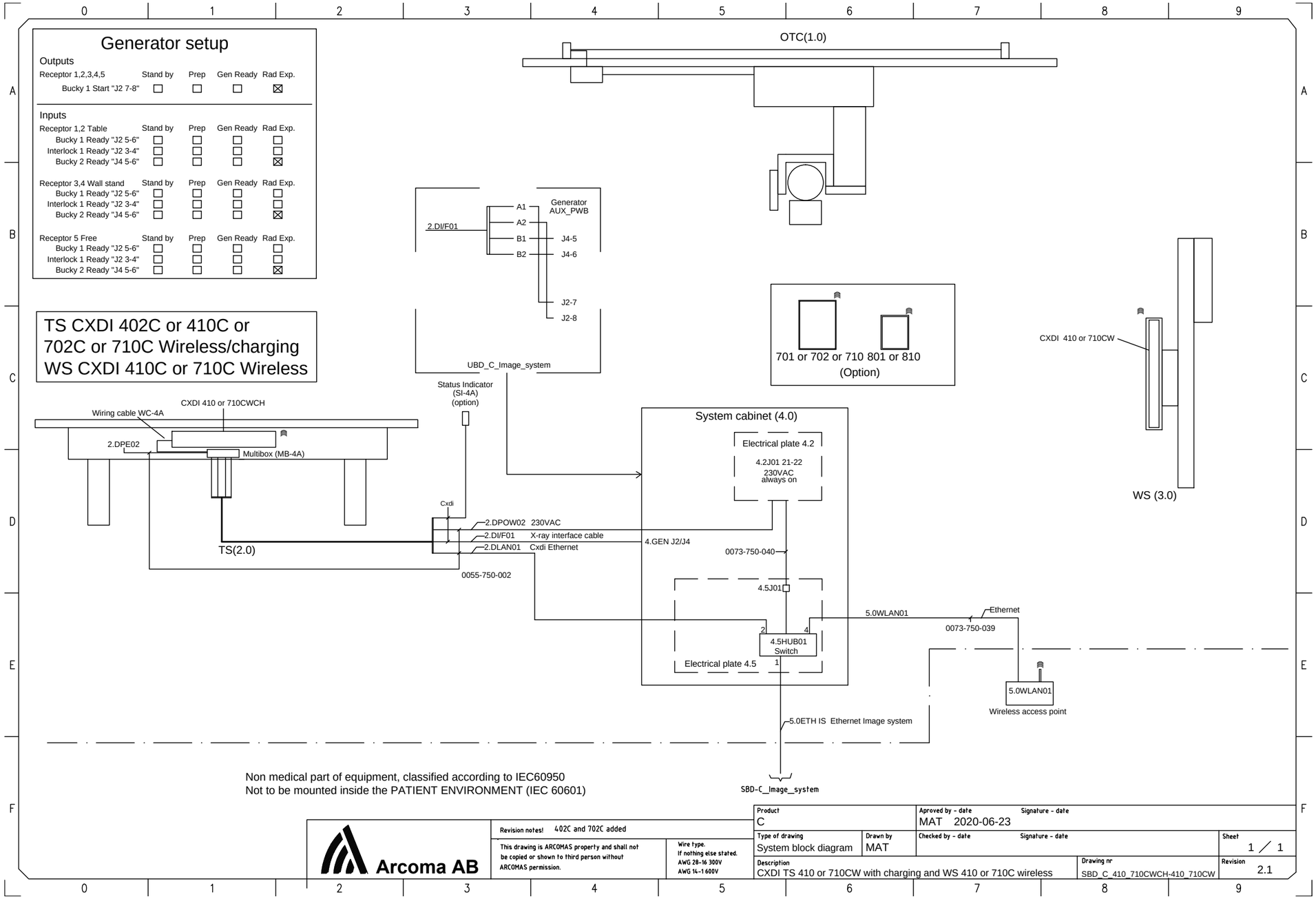

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 402C or 410C or 702C or 710C Wireless WS CXDI 401 compact
CXDI 410 or 710CW
TS(2.0)
OTC(1.0)
4.DI/F01
A1
A2
B1
B2
J2-3
J2-4
Generator AUX_PWB
3.DI/F01
J2-7
J2-8
J2-5
J2-6
UBD_C_Image_system
701or 702 or 710 801 or 810
(Option)
System cabinet (4.0)
Multibox (MB-4A)
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
0073-750-285
0073-750-040
4.DETH01 X-ray I/F ETH
4.5J01
Electrical plate 4.5
4.5HUB01 Switch
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Status Indicator
3.4PE01
Ferrite core at Status indicator and 3.DETH01
CXDI 401compact
Power box (DI 401 230V)
Detector cable
WS (3.0)
Cxdi
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
0182-750-055
5.0WLAN01
Ethernet
0073-750-039
5.0WLAN01
Wireless access point
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 402C and 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2020-06-23
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 410 or 710C Wireless and WS 401 compact
Drawing nr SBD-C_410_710CW-401C
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 402C or 410C or 702C or 710C Wireless
WS CXDI 402C or 410C or 702C or 710C Wireless
CXDI 410 or 710CW
TS(2.0)
OTC(1.0)
4.DI/F01
A1 J2-7
A2 J2-8
B1 J2-3
B2 J2-4
Generator AUX_PWB
UBD_C_Image_system
701 or 702 or 710 801 or 810
(Option)
CXDI 410 or 710CW
WS (3.0)
System cabinet (4.0)
Multibox (MB-4A)
Electrical plate 4.2
4.2J01 21-22
4.2J01 23-24
230VAC always on
4.DI/F01 X-ray interface cable
4.GEN J2
0073-750-285
0073-750-040
4.DETH01 X-ray I/F ETH
4.5J01
5.0WLAN01
Ethernet
0073-750-039
4.5HUB01 Switch
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 402C and 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2020-06-23
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS and WS 410 or 710C Wireless
Drawing nr SBD-C_410_710CW-410_710CW
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 402C or 410C or 702C or 710C Wireless/charging
WS CXDI 402C or 410C or 702C or 710C Wireless/charging
OTC(1.0)
Generator AUX_PWB
2.DI/F01
A1
A2
B1
B2
J4-5
J4-6
3.DI/F01
Cable is connected for possible future use but not used in generator setup
Sync signal is disabled in WS multibox
J2-7
J2-8
J2-5
J2-6
UBD_C_Image_system
701 or 702 or 710 801 or 810
(Option)
Status Indicator (SI-4A) (option)
CXDI 410-710CWCH
Wiring cable WC-4A
2.DPE02
Multibox (MB-4A)
TS(2.0)
Cxdi
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
4.GEN J2/J4
0055-750-002
System cabinet (4.0)
Electrical plate 4.2
4.2J01 21-22
230VAC
always on
4.GEN J2
0073-750-040
4.5J01
Electrical plate 4.5
4.5HUB01
Switch
5.0WLAN01
Ethernet
0073-750-039
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
Status Indicator (SI-4A) (option)
3.4PE01
CXDI 410 or 710CWCH
Multibox (MB-4A)
Sync signal is disabled at WS Multibox is only for charging Sw1 on.
Wiring cable WC-4A
WS (3.0)
CXDI
0182-750-055
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 402C and 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2020-06-23
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS and WS 410 or 710C Wireless with charging
Drawing nr SBD-C_410_710CWCH-410_710CWCH
Revision 3.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 402C or 410C or 702C or 710C Wireless
WS CXDI 402C or 410 or 702C or 710C Wireless/charging
OTC(1.0)
3.DI/F01
A1 J2-7
A2 J2-8
B1 J2-5
B2 J2-6
UBD_C_Image_system
701 or 702 or 710 801 or 810
(Option)
Status Indicator (SI-4A) (option)
3.4PE01
CXDI 410 or 710CWCH
Multibox (MB-4A)
Wiring cable WC-4A
WS (3.0)
CXDI 410 or 710CW
TS(2.0)
System cabinet (4.0)
Electrical plate 4.2
4.2J01 21-22
230VAC
always on
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
4.GEN J2
0073-750-040
CXDI
4.5J01
0182-750-055
5.0WLAN01
Ethernet
0073-750-039
3 4
4.5HUB01
Switch
Electrical plate 4.5
1
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 402C and 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2020-06-23
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS and WS 410 or 710C Wireless, WS with charging
Drawing nr SBD-C_410_710CW-410_710CWCH
Revision 3.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 402C or 410C or 702C or 710C Wireless/charging WS CXDI 401compact
OTC(1.0)
Generator AUX_PWB
2.DI/F01
A1
A2
B1
B2
J4-5
J4-6
3.DI/F01
J2-7
J2-8
J2-5
J2-6
UBD_C_Image_system
701 or 702 or 710 801 or 810 (Option)
Status Indicator
3.4PE01
Ferrite core at Status indicator and 3.DETH01
CXDI 401compact
Power box (DI 401 230V)
Detector cable
WS (3.0)
CXDI 410 or 710CWCH
Wiring cable WC-4A
2.DPE02
Multibox (MB-4A)
TS(2.0)
Status Indicator (SI-4A) (option)
Cxdi
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
0055-750-002
System cabinet (4.0)
Electrical plate 4.2
4.2J01 21-22 230VAC always on
4.GEN J2/J4
4.GEN J2
0073-750-040
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
0182-750-055
4.5J01
5.0WLAN01
Ethernet
0073-750-039
4.5HUB01 Switch
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 402C and 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2020-06-23
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 410 or 710C Wireless with charging and WS 401 compact
Drawing nr SBD-C_410_710CWCH-401C
Revision 2.1


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 5 Free Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
TS CXDI 402C or 410C or
702C or 710C Wireless/charging
WS CXDI 410C or 710C Wireless
OTC(1.0)
2.DI/F01
A1
A2
B1
B2
Generator
AUX_PWB
J4-5
J4-6
J2-7
J2-8
UBD_C_Image_system
701 or 702 or 710 801 or 810
(Option)
CXDI 410 or 710CW
WS (3.0)
CXDI 410 or 710CWCH
Wiring cable WC-4A
2.DPE02
Multibox (MB-4A)
TS(2.0)
Status Indicator
(SI-4A)
(option)
Cxdi
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
0055-750-002
System cabinet (4.0)
Electrical plate 4.2
4.2J01 21-22
230VAC
always on
4.GEN J2/J4
0073-750-040
4.5J01
Electrical plate 4.5
4.5HUB01
Switch
5.0WLAN01
Ethernet
0073-750-039
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
SBD-C_Image_system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
Arcoma AB
Revision notes! 402C and 702C added
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product C
Aproved by - date Signature - date MAT 2020-06-23
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description CXDI TS 410 or 710CW with charging and WS 410 or 710C wireless
Drawing nr SBD_C_410_710CWCH-410_710CW
Revision 2.1

SBD-0055_TS_4	Table 0055
SBD-0180_4_CAN	System CAN bus
SBD-0180_4_EM_stop	System emergency stop
SBD-0180_4_Failsafe	System failsafe
SBD-0180_4_Stitching	System stitching Option
SBD-0180_4_Sync	System sync signals
SBD-0180_4C_AEC	System AEC 4C
SBD-0180_4D_AEC	System AEC 4D
SBD-0180_4D_Det _grid_move	Detector grid start 24VDC
SBD-0181_TS_4	Table 0181
SBD-0182_WS_4	Wall stand manual Z
SBD-0182_WS_4_Z_motor	Wall stand motorized Z
SBD-0183_OTC_4	Overhead tube crane
SBD-0184_SC_4C	System cabinet
SBD-0184_SC_4D	System cabinet

0183-OTC_4 (1.0)

1.YSW01 Failsafe

1.1CAN02	OTC CAN
1.1EXP01	Exposure handle *1
1.1EM01	OTC EM. stop
1.1FS01	Failsafe X-Y
1.1POW01	2x115VAC 50/60Hz
1.1SIG01	OTC Sync/delay.
1.3PE01	Protective earth
1.4SIG01	Failsafe
1.6DSP01	OTC ETH
1.CDAP01	DAP meter
1.TPE01	Tube PE
1.THSP+	HSP +
1.THSP-	HSP -
1.TSTA01	Tube Rotation
1.TSW01	Tube heat switch

*1 option

Ext. exp. (5.0EXP01) foot switch or handlebar Option

0184-SC_4C or 0184-SC_4D (4.0)

3.0CAN01	Can bus wall stand
3.0PE01	Protective earth
3.0POW01	230VAC 50/60Hz or 24VDC
3.0SIG01	EM. stop/ Delay
3.DAID01	AEC chamber
△ 3.0DET01	Grid movement *option only CR

0182-WS_4 (3.0) or 0182-WS_4_Z_motor

0055-T_4 or 0181-TS_4 (2.0)

2.0POW01	2x115VAC 50/60Hz
2.0PE01	Protective earth
2.0SIG03	AEC chamber
2.0SIG01	EM. Stop
2.0CAN01	Can bus table
△ 2.0DET01	Grid movement *option only CR

Mini consol (5.0CON01)

△ 3x380VAC 50/60 Hz
3x400VAC 50/60 Hz
3x480VAC 50/60 Hz
Protective earth

Supply Mains

Not supplied by Arcoma

Not supplied by Arcoma

Door switch

X-ray light

Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)

Arcoma AB

Revision notes! ÅBO 170327_01 Added SBD stitching

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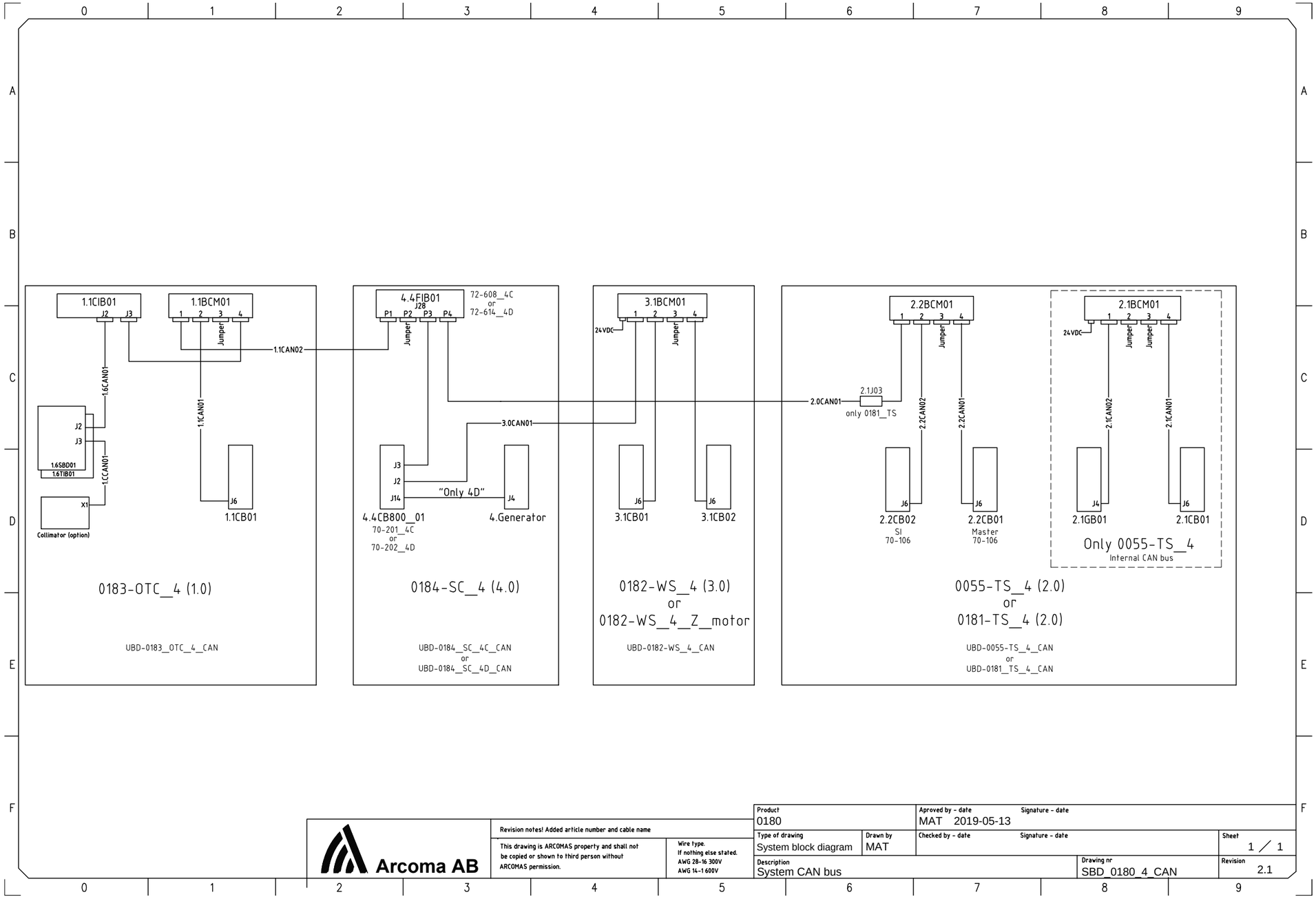
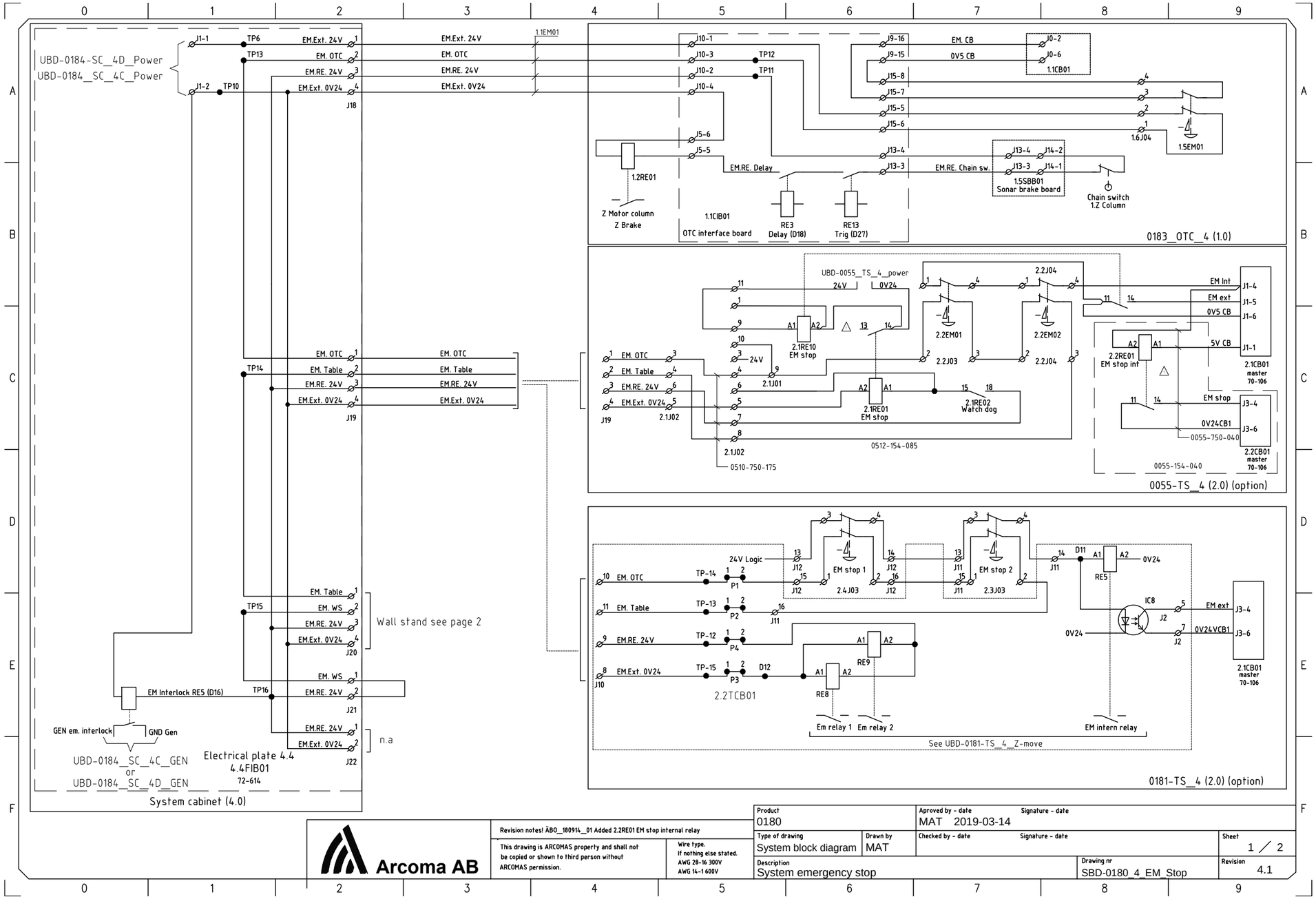
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V

Product: 0180		Aproved by - date / Signature - date: MAT 2017-03-31	
Type of drawing: System block diagram	Drawn by: MAT	Checked by - date / Signature - date:	Sheet: 1
Description: System 0180 4		Drawing nr: SBD-0180_4	Revision: 3.1


1.1CIB01
J2
J3
1.6CAN01
1.6SBD01
1.6TIB01
1.CCAN01
X1
Collimator (option)
1.1BCM01
1 2 3 4
Jumper
1.1CAN01
J6
1.1CB01
1.1CAN02
0183-OTC_4 (1.0)
UBD-0183_OTC_4_CAN
4.4FIB01
J28
P1 P2 P3 P4
72-608_4C
or
72-614_4D
Jumper
3.0CAN01
J3
J2
J14
"Only 4D"
J4
4.4CB800_01
70-201_4C
or
70-202_4D
4.Generator
0184-SC_4 (4.0)
UBD-0184_SC_4C_CAN
or
UBD-0184_SC_4D_CAN
3.1BCM01
1 2 3 4
24VDC
Jumper
J6
3.1CB01
3.1CB02
0182-WS_4 (3.0)
or
0182-WS_4_Z_motor
UBD-0182-WS_4_CAN
2.0CAN01
2.1J03
only 0181_TS
2.2BCM01
1 2 3 4
Jumper
2.2CAN02
2.2CAN01
J6
2.2CB02
SI
70-106
2.2CB01
Master
70-106
2.1BCM01
1 2 3 4
24VDC
Jumper
Jumper
2.1CAN02
2.1CAN01
J4
J6
2.1GB01
2.1CB01
Only 0055-TS_4
Internal CAN bus
0055-TS_4 (2.0)
or
0181-TS_4 (2.0)
UBD-0055-TS_4_CAN
or
UBD-0181_TS_4_CAN
Arcoma AB
Revision notes! Added article number and cable name
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-05-13
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
System CAN bus
Drawing nr
SBD_0180_4_CAN
Revision
2.1



Arcoma AB

Revision notes! ÅBO_180914_01 Added 2.2RE01 EM stop internal relay

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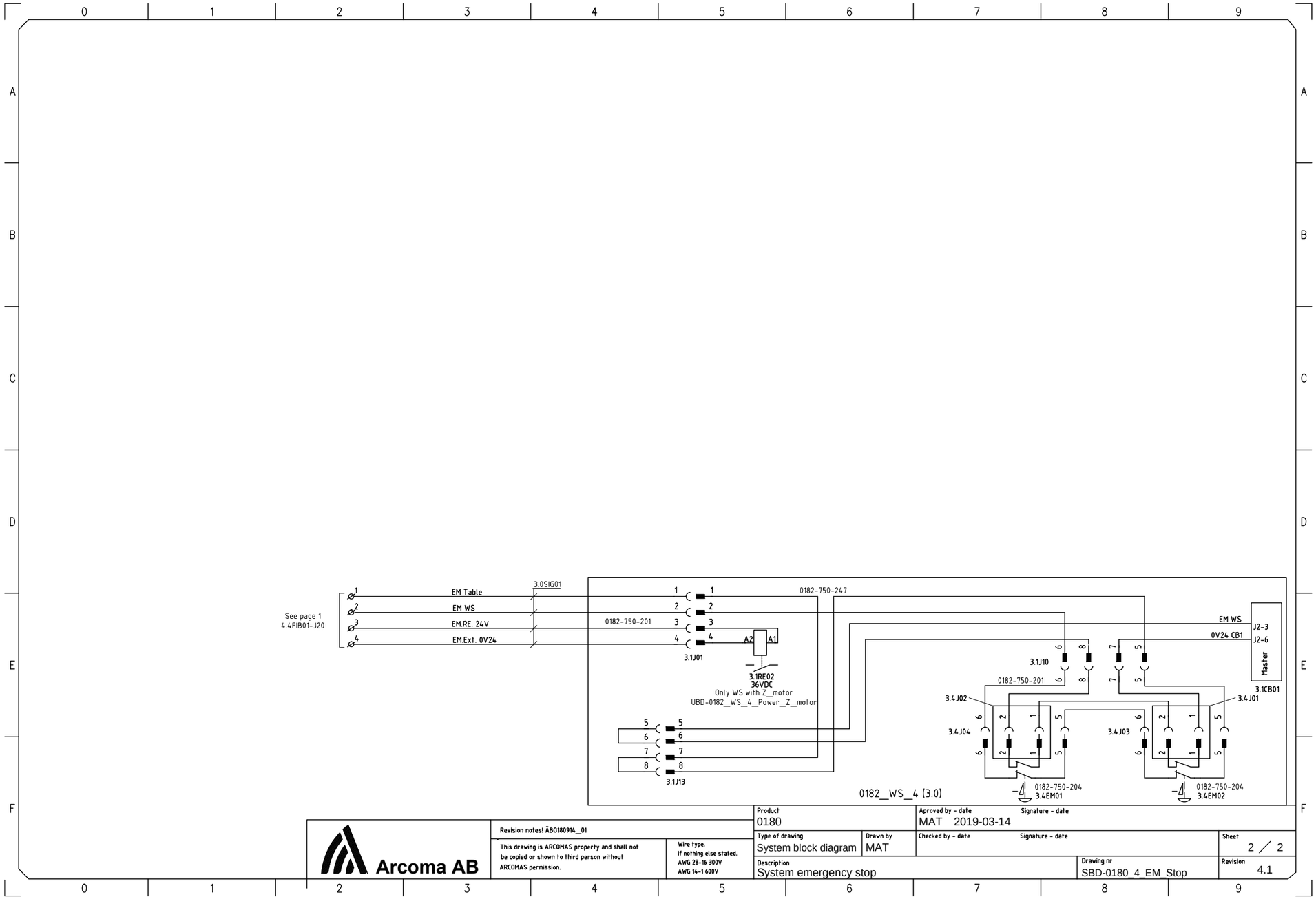
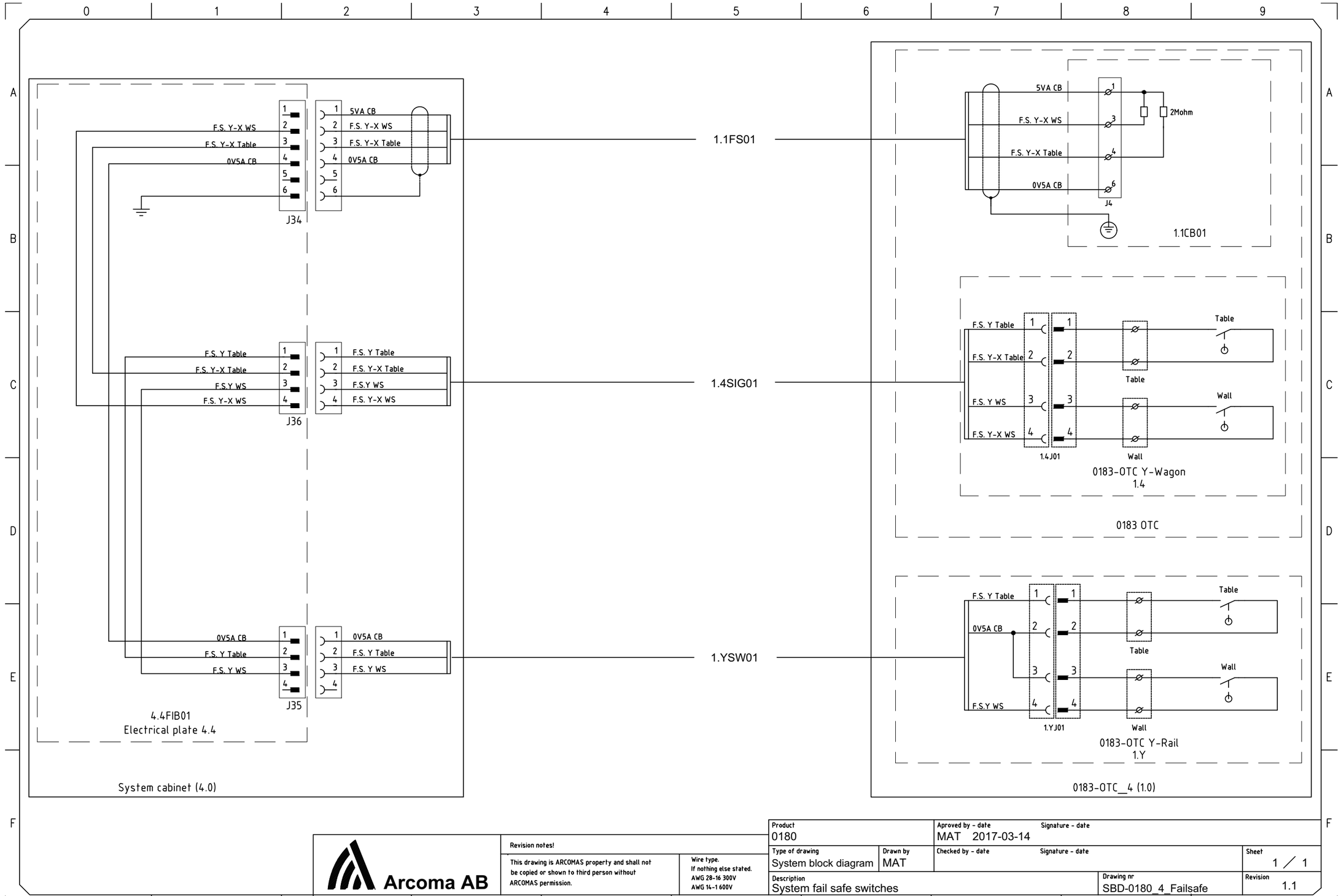
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

Product: 0180		Aproved by - date / Signature - date: MAT 2019-03-14	
Type of drawing: System block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 2
Description: System emergency stop		Drawing nr: SBD-0180_4_EM_Stop	Revision: 4.1


See page 1
4.4FIB01-J20
3.0SIG01
1 EM Table
2 EM WS
3 EM.RE. 24V
4 EM.Ext. 0V24
0182-750-201
3.1J01
A2
A1
3.1RE02
36VDC
Only WS with Z_motor
UBD-0182_WS_4_Power_Z_motor
3.1J13
0182-750-247
EM WS
0V24 CB1
J2-3
J2-6
Master
3.1CB01
3.1J10
3.4J02
3.4J01
3.4J04
3.4J03
0182-750-204
3.4EM01
0182-750-204
3.4EM02
0182_WS_4 (3.0)
Arcoma AB
Revision notes! ÅBO180914_01
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-03-14
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
2 / 2
Description
System emergency stop
Drawing nr
SBD-0180_4_EM_Stop
Revision
4.1



Arcoma AB

Revision notes!

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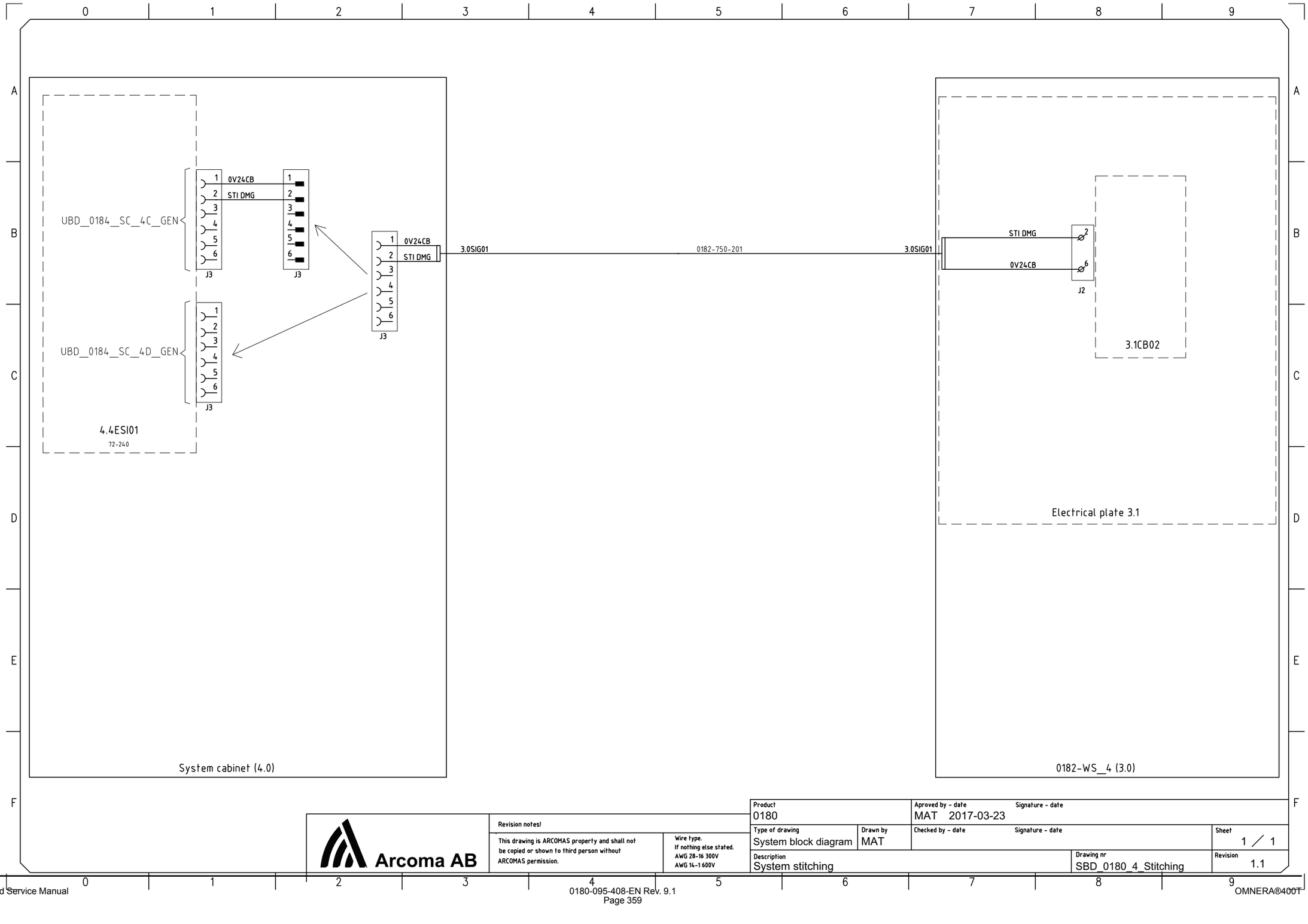
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

Product: 0180		Aproved by - date / Signature - date: MAT 2017-03-14	
Type of drawing: System block diagram	Drawn by: MAT	Checked by - date / Signature - date:	Sheet: 1 / 1
Description: System fail safe switches		Drawing nr: SBD-0180_4_Failsafe	Revision: 1.1



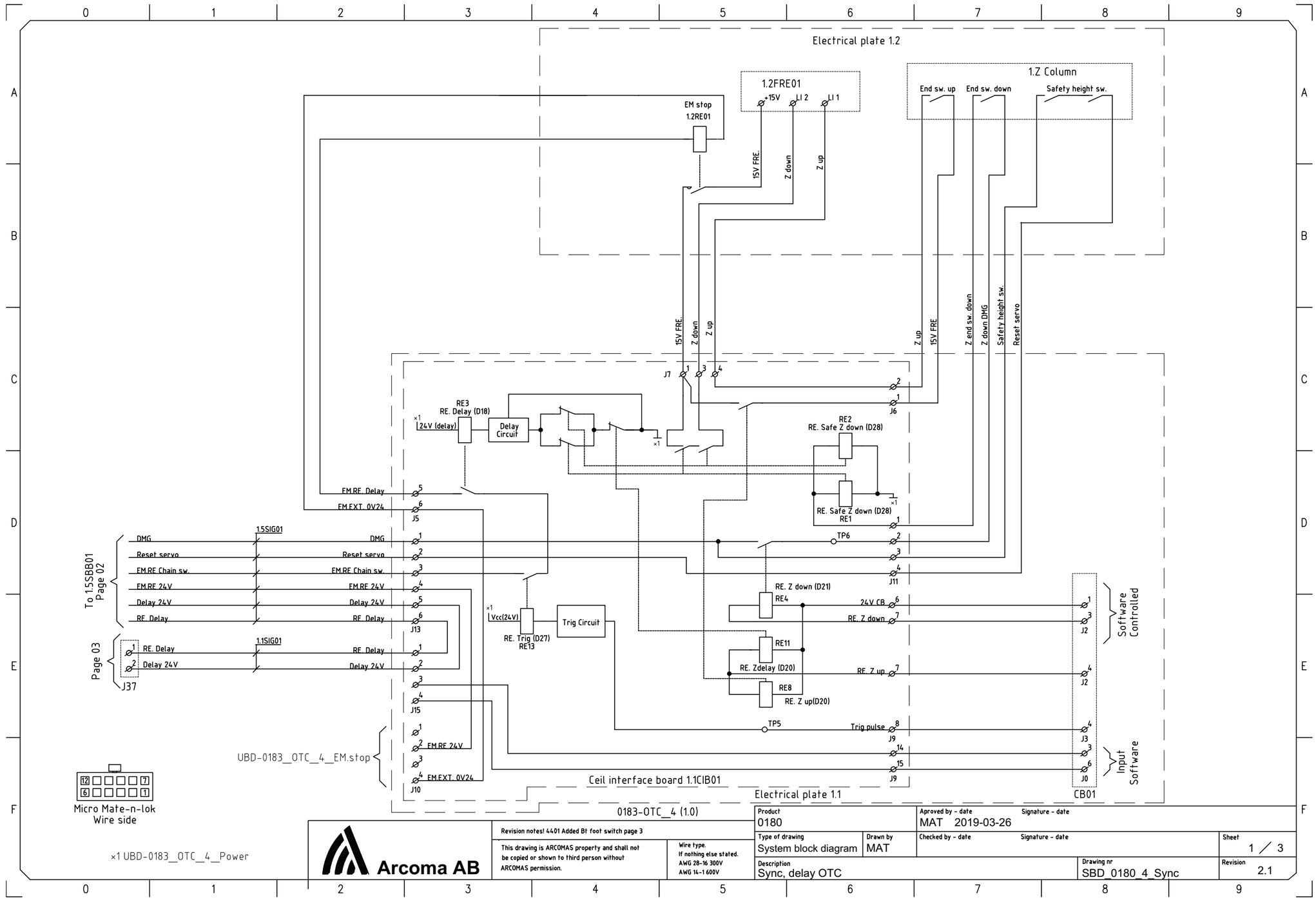
Arcoma AB

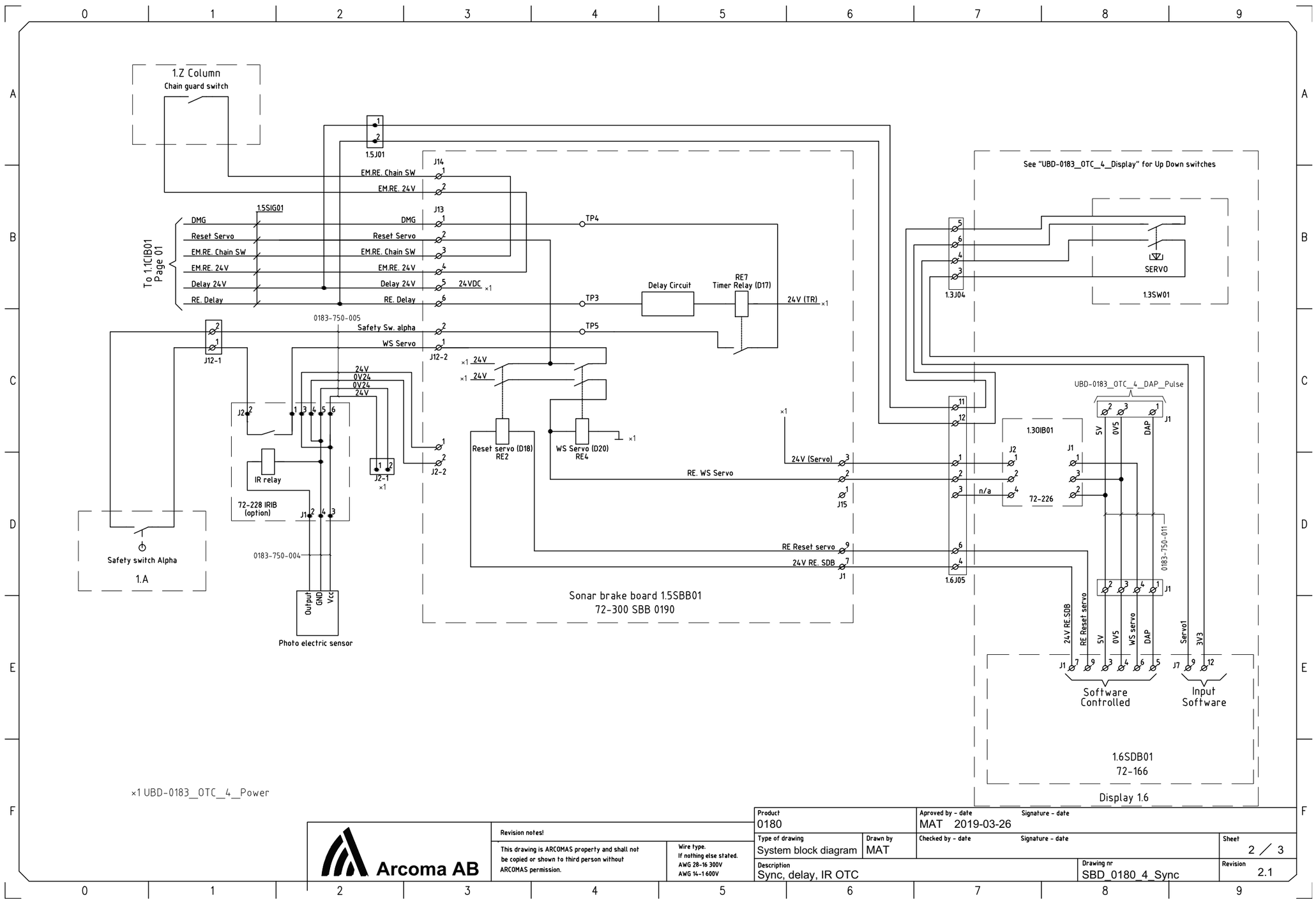
Revision notes!

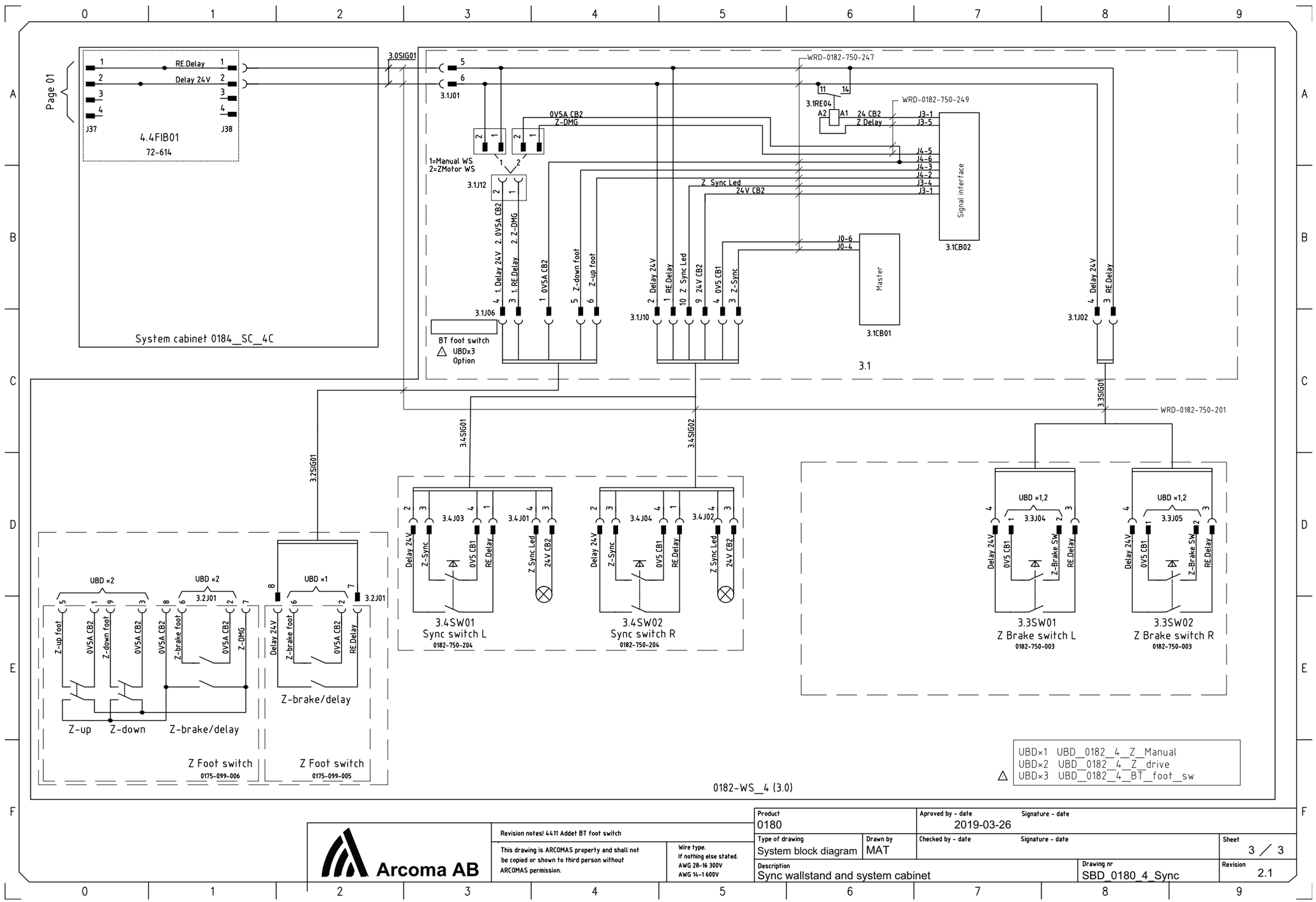
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

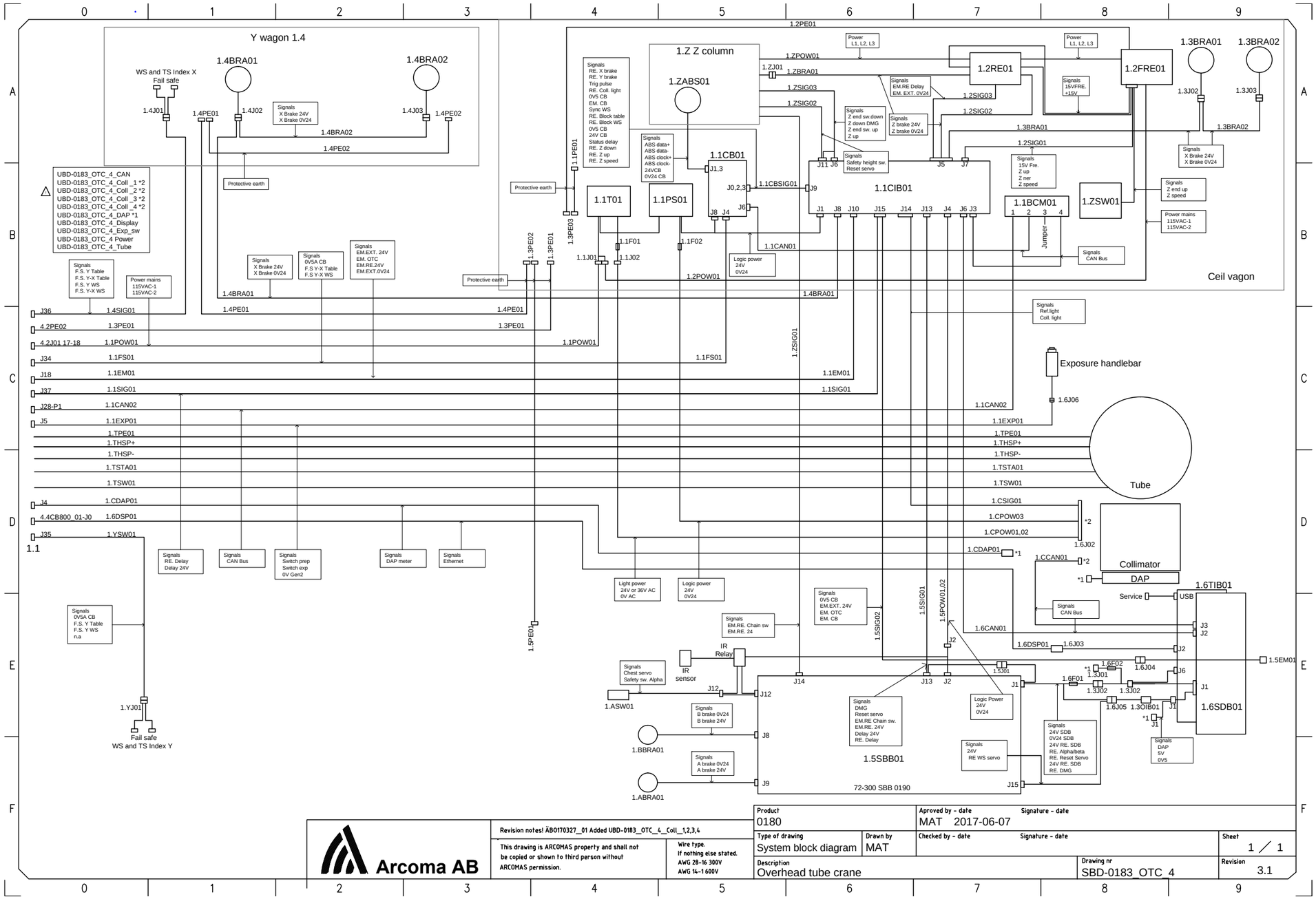
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

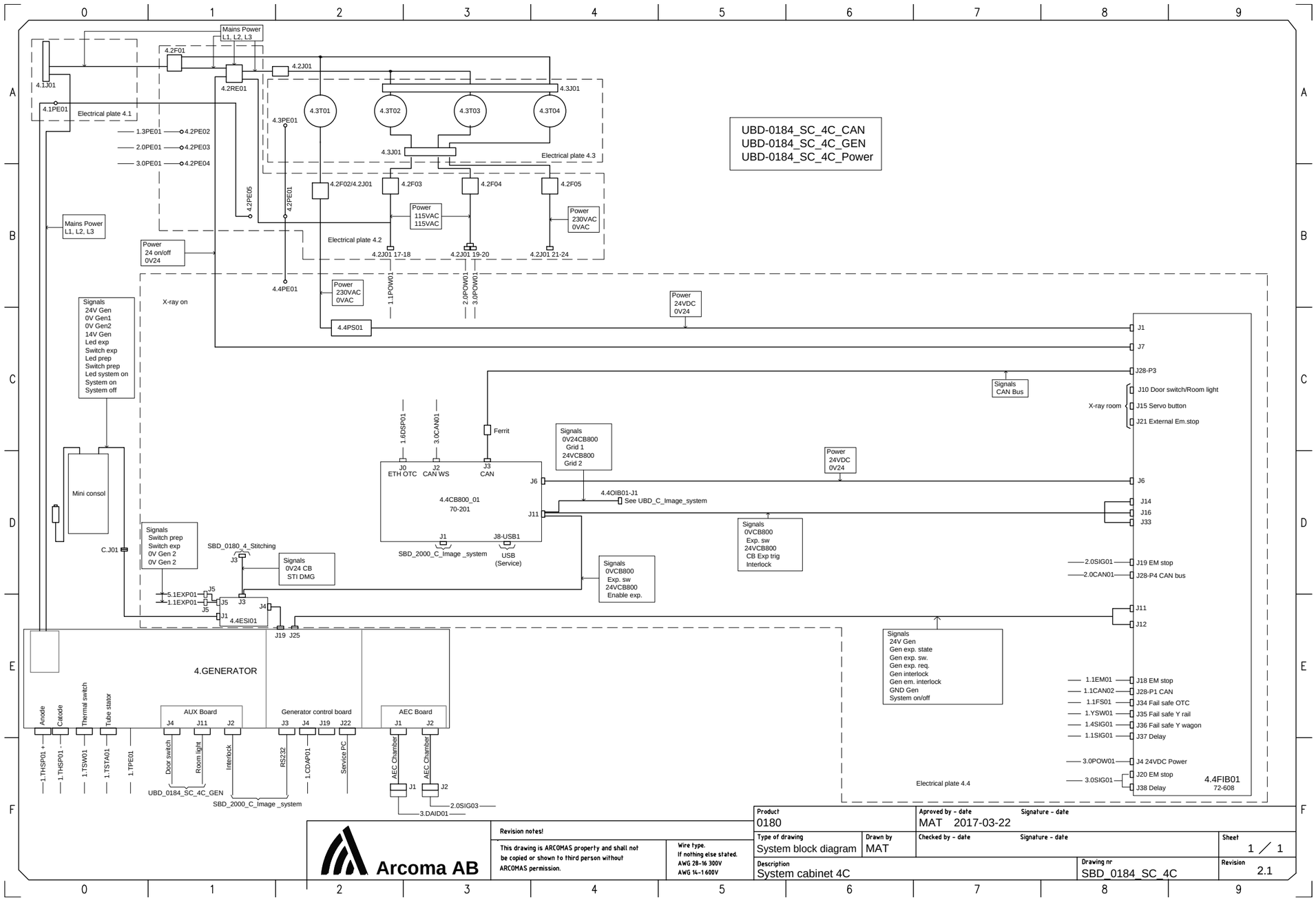
Product: 0180		Aproved by - date / Signature - date: MAT 2017-03-23	
Type of drawing: System block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: System stitching		Drawing nr: SBD_0180_4_Stitching	Revision: 1.1

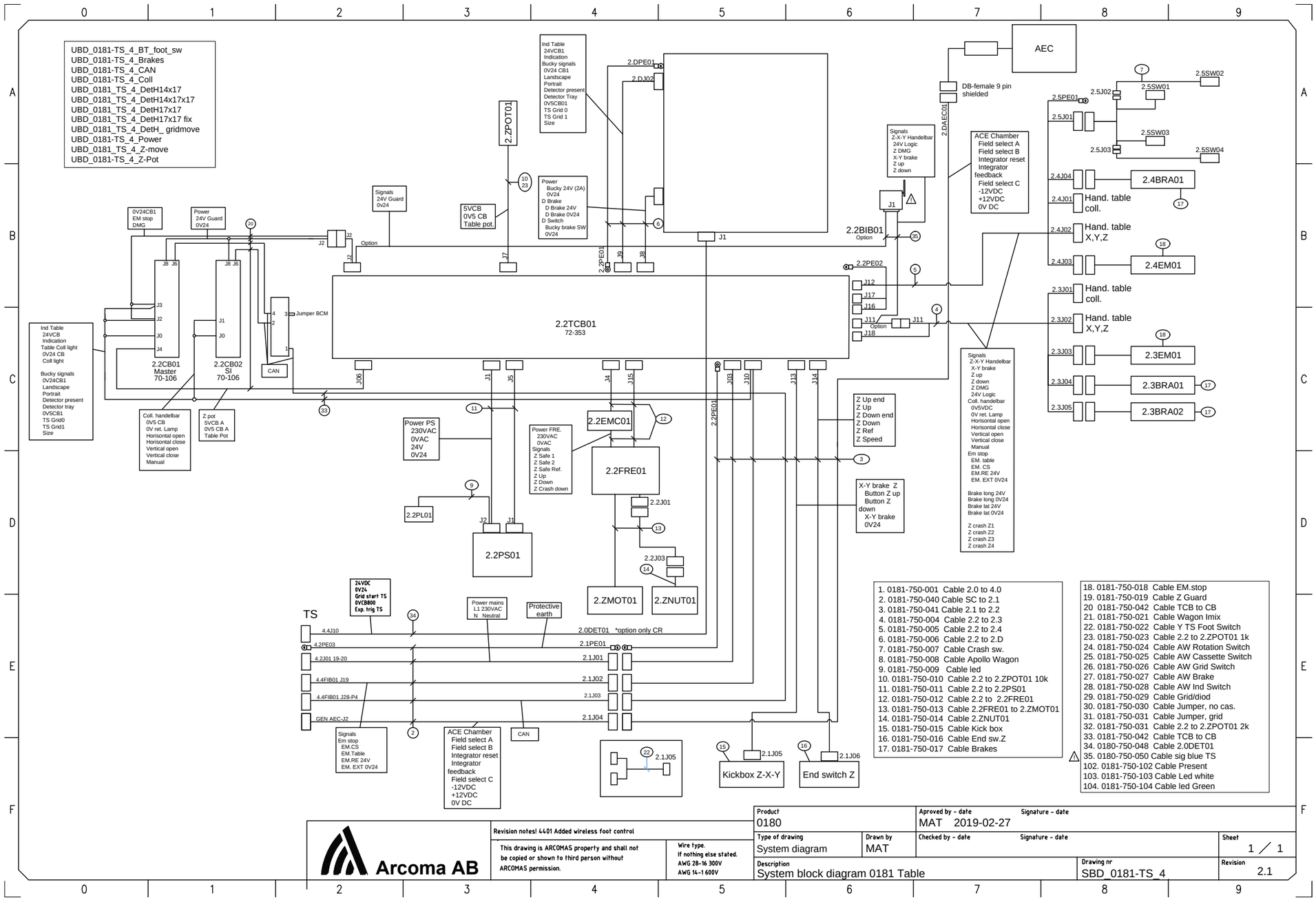

Electrical plate 1.2
1.2FRE01
+15V
LI 2
LI 1
EM stop
1.2RE01
15V FRE.
Z down
Z up
1.Z Column
End sw. up
End sw. down
Safety height sw.
Z end sw. down
Z down DMG
Safety height sw.
Reset servo
J7
J6
RE3
RE. Delay (D18)
×1
24V (delay)
Delay Circuit
RE2
RE. Safe Z down (D28)
RE. Safe Z down (D28)
RE1
FM.RE. Delay
FM.EXT. 0V24
J5
TP6
J11
1.5SIG01
DMG
Reset servo
FM.RE Chain sw.
FM.RE 24V
Delay 24V
RE. Delay
J13
To 1.5SBB01
Page 02
RE. Z down (D21)
RE4
24V CB
RE. Z down
J2
Software
Controlled
RE11
RE. Zdelay (D20)
RE. Z up
RE8
RE. Z up(D20)
1.1SIG01
Page 03
J37
Vcc(24V)
Trig Circuit
RE. Trig (D27)
RE13
TP5
Trig pulse
J9
J3
J15
J10
UBD-0183_OTC_4_EM.stop
Input
Software
J0
Micro Mate-n-lok
Wire side
Ceil interface board 1.1CIB01
Electrical plate 1.1
CB01
×1 UBD-0183_OTC_4_Power
Arcoma AB
0183-OTC_4 (1.0)
Revision notes! 4401 Added Bt foot switch page 3
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-03-26
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 3
Description
Sync, delay OTC
Drawing nr
SBD_0180_4_Sync
Revision
2.1

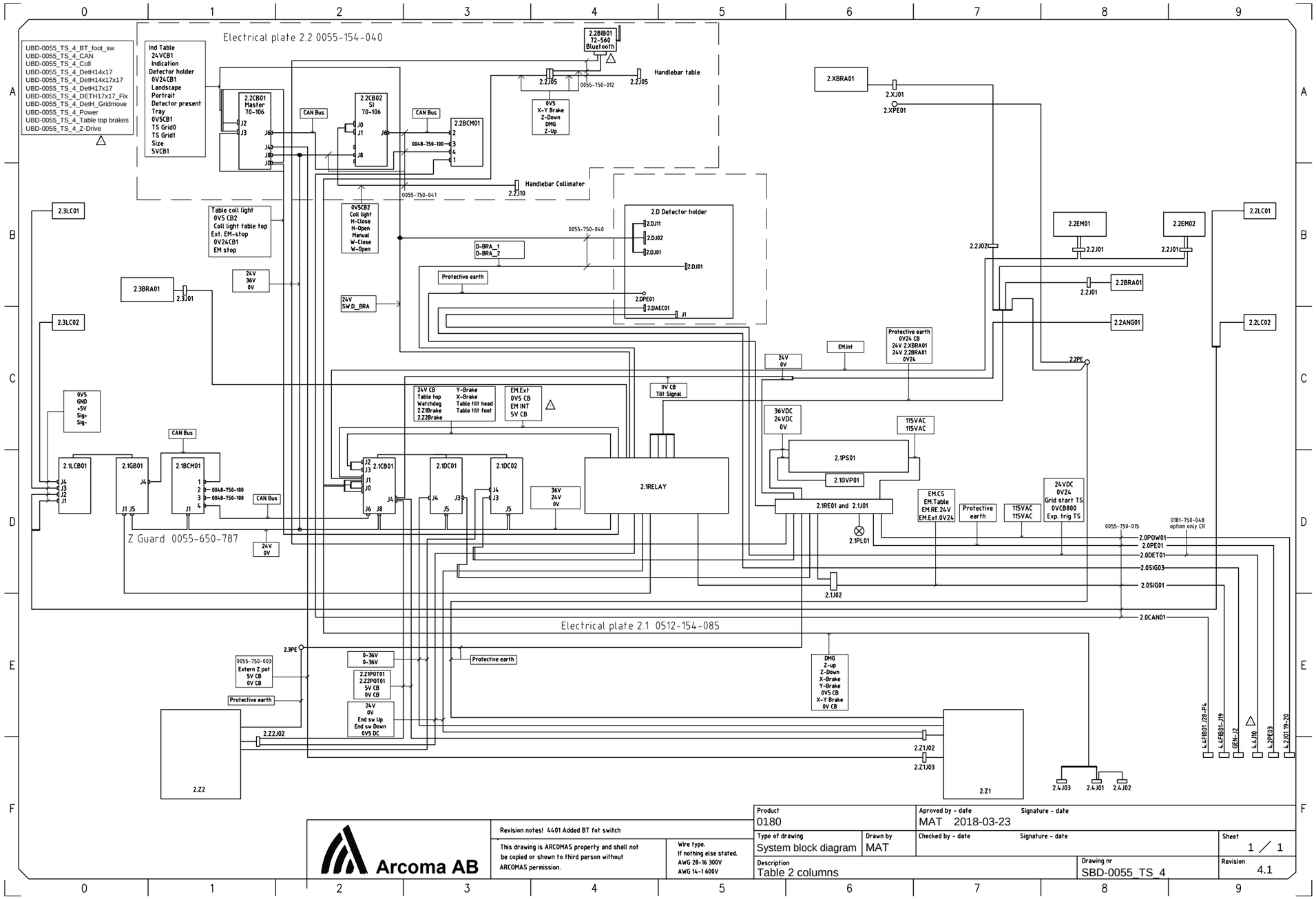

1.Z Column
Chain guard switch
1.5J01
J14
EM.RE. Chain SW
EM.RE. 24V
1.5SIG01
J13
DMG
Reset Servo
EM.RE. Chain SW
EM.RE. 24V
Delay 24V
RE. Delay
To 1.1CIB01 Page 01
TP4
TP3
TP5
24VDC ×1
Delay Circuit
RE7
Timer Relay (D17)
24V (TR) ×1
0183-750-005
Safety Sw. alpha
WS Servo
J12-1
J12-2
×1 24V
×1 24V
24V
0V24
0V24
24V
J2
J2-1
J2-2
IR relay
72-228 IRIB (option)
0183-750-004
Output
GND
Vcc
Photo electric sensor
Safety switch Alpha
1.A
Reset servo (D18)
RE2
WS Servo (D20)
RE4
RE. WS Servo
24V (Servo)
J15
RE Reset servo
24V RE. SDB
J1
1.6J05
Sonar brake board 1.5SBB01
72-300 SBB 0190
See "UBD-0183_OTC_4_Display" for Up Down switches
1.3J04
SERVO
1.3SW01
UBD-0183_OTC_4_DAP_Pulse
1.3OIB01
5V
0V5
DAP
n/a
72-226
0183-750-011
24V RE.SDB
RE Reset servo
5V
0V5
WS servo
DAP
Servo1
3V3
Software Controlled
Input Software
1.6SDB01
72-166
Display 1.6
×1 UBD-0183_OTC_4_Power
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-03-26
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
2 / 3
Description
Sync, delay, IR OTC
Drawing nr
SBD_0180_4_Sync
Revision
2.1

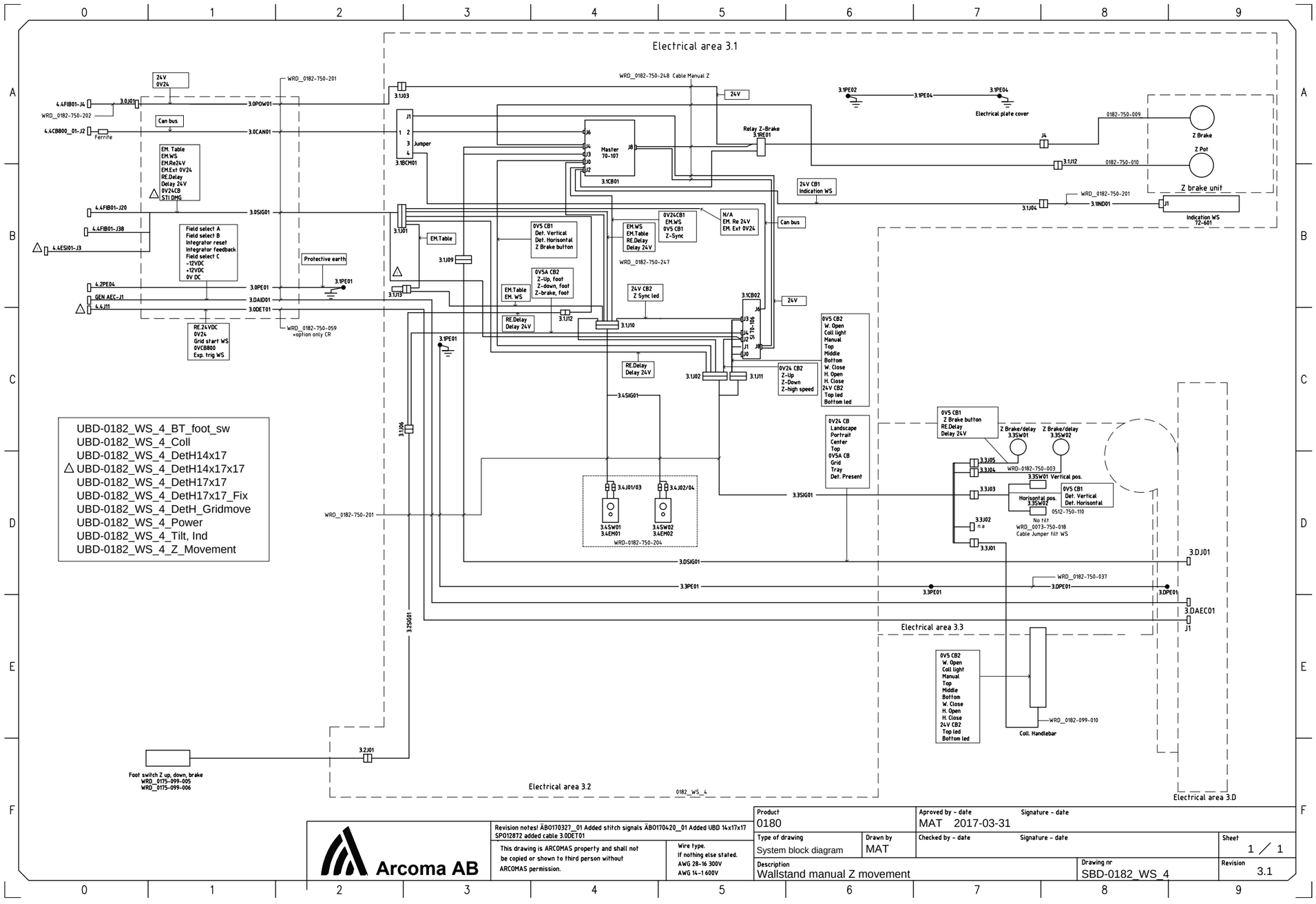

Page 01
RE.Delay
Delay 24V
J37
J38
4.4FIB01
72-614
System cabinet 0184__SC__4C
3.0SIG01
3.1J01
WRD-0182-750-247
3.1RE04
A2
A1
24 CB2
Z Delay
WRD-0182-750-249
J3-1
J3-5
J4-5
J4-6
J4-3
J4-2
J3-4
J3-1
Signal interface
3.1CB02
0V5A CB2
Z-DMG
1=Manual WS
2=ZMotor WS
3.1J12
Z Sync Led
24V CB2
1. Delay 24V
2. 0V5A CB2
1. RE.Delay
2. Z-DMG
0V5A CB2
Z-down foot
Z-up foot
3.1J06
BT foot switch
UBDx3
Option
J0-6
J0-4
Master
3.1CB01
2 Delay 24V
1 RE.Delay
10 Z Sync Led
9 24V CB2
4 0V5 CB1
3 Z-Sync
3.1J10
3.1
4 Delay 24V
3 RE.Delay
3.1J02
3.3SIG01
WRD-0182-750-201
3.4SIG01
3.4SIG02
3.2SIG01
UBD ×2
UBD ×1
3.2J01
Z-up foot
0V5A CB2
Z-down foot
Z-brake foot
Z-DMG
Delay 24V
RE.Delay
Z-up
Z-down
Z-brake/delay
Z-brake/delay
Z Foot switch
0175-099-006
Z Foot switch
0175-099-005
3.4J03
3.4J01
3.4J04
3.4J02
Z-Sync
0V5 CB1
RE.Delay
Z Sync Led
24V CB2
3.4SW01
Sync switch L
0182-750-204
3.4SW02
Sync switch R
0182-750-204
UBD ×1,2
3.3J04
3.3J05
Z-Brake SW
3.3SW01
Z Brake switch L
0182-750-003
3.3SW02
Z Brake switch R
0182-750-003
UBD×1 UBD__0182__4__Z__Manual
UBD×2 UBD__0182__4__Z__drive
UBD×3 UBD__0182__4__BT__foot__sw
0182-WS__4 (3.0)
Arcoma AB
Revision notes! 4411 Addet BT foot switch
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date 2019-03-26
Signature - date
Type of drawing System block diagram
Drawn by MAT
Checked by - date
Signature - date
Sheet 3 / 3
Description Sync wallstand and system cabinet
Drawing nr SBD_0180_4_Sync
Revision 2.1

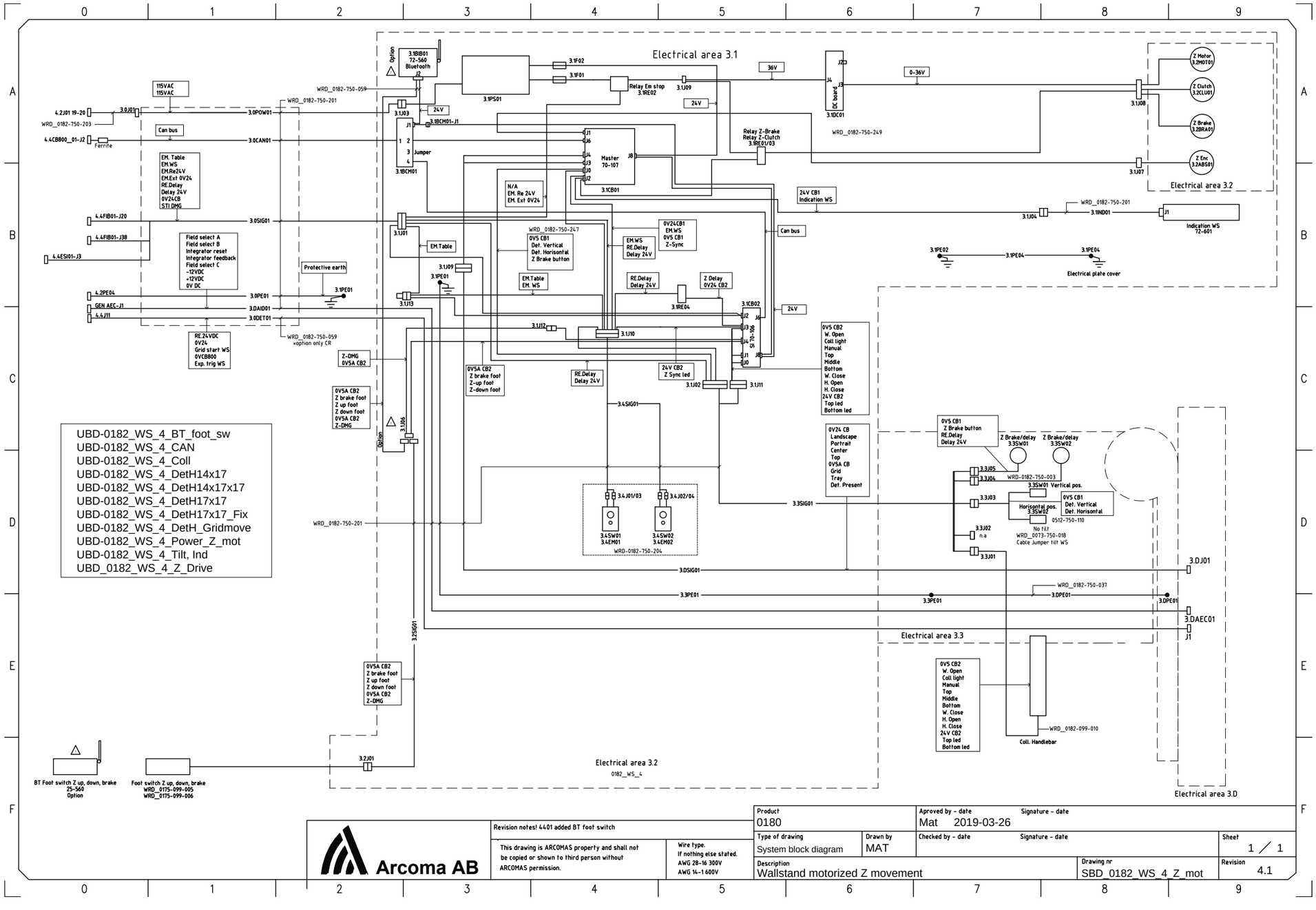

Y wagon 1.4
WS and TS Index X Fail safe
1.4BRA01
1.4BRA02
1.4J01
1.4PE01
1.4J02
1.4J03
1.4PE02
Signals X Brake 24V X Brake 0V24
Protective earth
UBD-0183_OTC_4_CAN
UBD-0183_OTC_4_Coll _1 *2
UBD-0183_OTC_4_Coll _2 *2
UBD-0183_OTC_4_Coll _3 *2
UBD-0183_OTC_4_Coll _4 *2
UBD-0183_OTC_4_DAP *1
UBD-0183_OTC_4_Display
UBD-0183_OTC_4_Exp_sw
UBD-0183_OTC_4 Power
UBD-0183_OTC_4_Tube
Signals F.S. Y Table F.S. Y-X Table F.S. Y WS F.S. Y-X WS
Power mains 115VAC-1 115VAC-2
Signals 0V5A CB F.S Y-X Table F.S Y-X WS
Signals EM.EXT. 24V EM. OTC EM.RE.24V EM.EXT.0V24
1.Z Z column
1.ZABS01
Signals RE. X brake RE. Y brake Trig pulse RE. Coll. light 0V5 CB EM. CB Sync WS RE. Block table RE. Block WS 0V5 CB 24V CB Status delay RE. Z down RE. Z up RE. Z speed
Signals ABS data+ ABS data- ABS clock+ ABS clock- 24VCB 0V24 CB
1.1CB01
1.1T01
1.1PS01
1.1CIB01
1.1BCM01
1.ZSW01
1.2RE01
1.2FRE01
1.3BRA01
1.3BRA02
Signals 15V Fre. Z up Z ner Z speed
Signals Z end up Z speed
Power mains 115VAC-1 115VAC-2
Signals CAN Bus
Signals Ref.light Coll. light
Ceil vagon
Logic power 24V 0V24
Signals Safety height sw. Reset servo
Signals Z end sw.down Z down DMG Z end sw. up Z up
Signals EM.RE Delay EM. EXT. 0V24
Signals Z brake 24V Z brake 0V24
Signals 15V/FRE. +15V
Signals EM.RE Chain sw EM.RE. 24
Signals 0V5 CB EM.EXT. 24V EM. OTC EM. CB
Light power 24V or 36V AC 0V AC
Logic power 24V 0V24
Signals Chest servo Safety sw. Alpha
IR sensor
IR Relay
1.ASW01
1.BBRA01
1.ABRA01
Signals B brake 0V24 B brake 24V
Signals A brake 0V24 A brake 24V
1.5SBB01
72-300 SBB 0190
Signals DMG Reset servo EM.RE Chain sw. EM.RE. 24V Delay 24V RE. Delay
Logic Power 24V 0V24
Signals 24V RE WS servo
Signals 24V SDB 0V24 SDB 24V RE. SDB RE. Alpha/beta RE. Reset Servo 24V RE. SDB RE. DMG
Signals DAP 5V 0V5
1.6SDB01
Exposure handlebar
1.6J06
Tube
Collimator
DAP
1.6TIB01
Service
Signals CAN Bus
1.5EM01
1.6J02
1.6J03
1.6J04
1.6J05
1.6F01
1.6F02
1.3OIB01
1.3J01
1.3J02
Jumper
1.YJ01
Fail safe WS and TS Index Y
1.1
J36 1.4SIG01
4.2PE02 1.3PE01
4.2J01 17-18 1.1POW01
J34 1.1FS01
J18 1.1EM01
J37 1.1SIG01
J28-P1 1.1CAN02
J5 1.1EXP01
1.TPE01
1.THSP+
1.THSP-
1.TSTA01
1.TSW01
J4 1.CDAP01
4.4CB800_01-J0 1.6DSP01
J35 1.YSW01
1.ZSIG01
1.5SIG01
1.5SIG02
1.5POW01,02
1.CSIG01
1.CPOW03
1.CPOW01,02
1.CCAN01
1.6CAN01
1.6J02
Revision notes! ÄBO170327_01 Added UBD-0183_OTC_4_Coll_1,2,3,4
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Arcoma AB
Product 0180
Aproved by - date Signature - date MAT 2017-06-07
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description Overhead tube crane
Drawing nr SBD-0183_OTC_4
Revision 3.1

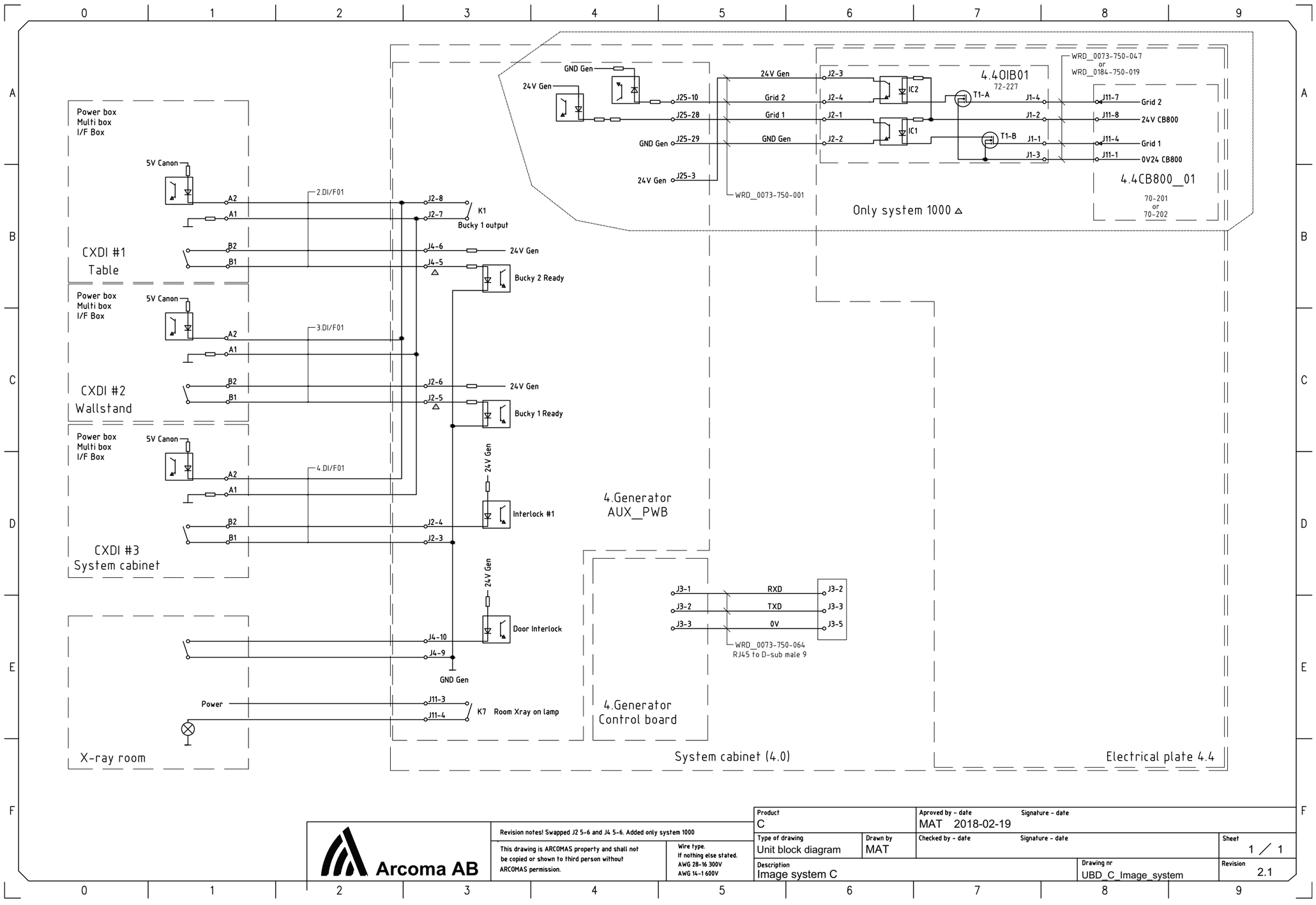

UBD-0184_SC_4C_CAN
UBD-0184_SC_4C_GEN
UBD-0184_SC_4C_Power
Mains Power L1, L2, L3
4.2F01
4.2RE01
4.2J01
4.3J01
4.1J01
4.1PE01
Electrical plate 4.1
4.3T01
4.3T02
4.3T03
4.3T04
4.3PE01
1.3PE01
2.0PE01
3.0PE01
4.2PE02
4.2PE03
4.2PE04
Electrical plate 4.3
4.2F02/4.2J01
4.2F03
4.2F04
4.2F05
4.2PE05
4.2PE01
Power 115VAC 115VAC
Power 230VAC 0VAC
Mains Power L1, L2, L3
Power 24 on/off 0V24
Electrical plate 4.2
4.2J01 17-18
4.2J01 19-20
4.2J01 21-24
4.4PE01
Power 230VAC 0VAC
1.1POW01
2.0POW01
3.0POW01
X-ray on
Signals 24V Gen 0V Gen1 0V Gen2 14V Gen Led exp Switch exp Led prep Switch prep Led system on System on System off
4.4PS01
Power 24VDC 0V24
J1
J7
J28-P3
Signals CAN Bus
J10 Door switch/Room light
X-ray room
J15 Servo button
J21 External Em.stop
1.6DSP01
3.0CAN01
Ferrit
Signals 0V24CB800 Grid 1 24VCB800 Grid 2
Power 24VDC 0V24
J0 ETH OTC
J2 CAN WS
J3 CAN
J6
4.4CB800_01 70-201
4.4OIB01-J1
See UBD_C_Image_system
J11
J14
J16
J33
Mini consol
C.J01
Signals Switch prep Switch exp 0V Gen 2 0V Gen 2
SBD_0180_4_Stitching
J3
Signals 0V24 CB STI DMG
J1
J8-USB1
SBD_2000_C_Image _system
USB (Service)
Signals 0VCB800 Exp. sw 24VCB800 CB Exp trig Interlock
Signals 0VCB800 Exp. sw 24VCB800 Enable exp.
2.0SIG01
2.0CAN01
J19 EM stop
J28-P4 CAN bus
5.1EXP01
1.1EXP01
J5
J3
J4
J1
4.4ESI01
J19 J25
J11
J12
Signals 24V Gen Gen exp. state Gen exp. sw. Gen exp. req. Gen interlock Gen em. interlock GND Gen System on/off
4.GENERATOR
Anode
Catode
Thermal switch
Tube stator
AUX Board
Generator control board
AEC Board
J4
J11
J2
J3
J4
J19
J22
J1
J2
1.THSP01 +
1.THSP01 -
1.TSW01
1.TSTA01
1.TPE01
Door switch
Room light
Interlock
RS232
1.CDAP01
Service PC
AEC Chamber
AEC Chamber
UBD_0184_SC_4C_GEN
SBD_2000_C_Image _system
2.0SIG03
3.DAID01
1.1EM01
1.1CAN02
1.1FS01
1.YSW01
1.4SIG01
1.1SIG01
J18 EM stop
J28-P1 CAN
J34 Fail safe OTC
J35 Fail safe Y rail
J36 Fail safe Y wagon
J37 Delay
3.0POW01
3.0SIG01
J4 24VDC Power
J20 EM stop
J38 Delay
4.4FIB01
72-608
Electrical plate 4.4
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date Signature - date MAT 2017-03-22
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description System cabinet 4C
Drawing nr SBD_0184_SC_4C
Revision 2.1


UBD_0181-TS_4_BT_foot_sw
UBD_0181-TS_4_Brakes
UBD_0181-TS_4_CAN
UBD_0181-TS_4_Coll
UBD_0181_TS_4_DetH14x17
UBD_0181_TS_4_DetH14x17x17
UBD_0181_TS_4_DetH17x17
UBD_0181_TS_4_DetH17x17 fix
UBD_0181_TS_4_DetH_ gridmove
UBD_0181-TS_4_Power
UBD_0181_TS_4_Z-move
UBD_0181-TS_4_Z-Pot
2.2TCB01
72-353
2.2CB01 Master 70-106
2.2CB02 SI 70-106
2.2EMC01
2.2FRE01
2.2PS01
2.2PL01
2.ZPOT01
2.ZMOT01
2.ZNUT01
2.2BIB01
2.DAEC01
AEC
ACE Chamber
Field select A
Field select B
Integrator reset
Integrator feedback
Field select C
-12VDC
+12VDC
0V DC
2.4BRA01
2.4EM01
2.3EM01
2.3BRA01
2.3BRA02
Hand. table coll.
Hand. table X,Y,Z
Kickbox Z-X-Y
End switch Z
TS
1. 0181-750-001 Cable 2.0 to 4.0
2. 0181-750-040 Cable SC to 2.1
3. 0181-750-041 Cable 2.1 to 2.2
4. 0181-750-004 Cable 2.2 to 2.3
5. 0181-750-005 Cable 2.2 to 2.4
6. 0181-750-006 Cable 2.2 to 2.D
7. 0181-750-007 Cable Crash sw.
8. 0181-750-008 Cable Apollo Wagon
9. 0181-750-009 Cable led
10. 0181-750-010 Cable 2.2 to 2.ZPOT01 10k
11. 0181-750-011 Cable 2.2 to 2.2PS01
12. 0181-750-012 Cable 2.2 to 2.2FRE01
13. 0181-750-013 Cable 2.2FRE01 to 2.ZMOT01
14. 0181-750-014 Cable 2.ZNUT01
15. 0181-750-015 Cable Kick box
16. 0181-750-016 Cable End sw.Z
17. 0181-750-017 Cable Brakes
18. 0181-750-018 Cable EM.stop
19. 0181-750-019 Cable Z Guard
20 0181-750-042 Cable TCB to CB
21. 0181-750-021 Cable Wagon Imix
22. 0181-750-022 Cable Y TS Foot Switch
23. 0181-750-023 Cable 2.2 to 2.ZPOT01 1k
24. 0181-750-024 Cable AW Rotation Switch
25. 0181-750-025 Cable AW Cassette Switch
26. 0181-750-026 Cable AW Grid Switch
27. 0181-750-027 Cable AW Brake
28. 0181-750-028 Cable AW Ind Switch
29. 0181-750-029 Cable Grid/diod
30. 0181-750-030 Cable Jumper, no cas.
31. 0181-750-031 Cable Jumper, grid
32. 0181-750-031 Cable 2.2 to 2.ZPOT01 2k
33. 0181-750-042 Cable TCB to CB
34. 0180-750-048 Cable 2.0DET01
35. 0180-750-050 Cable sig blue TS
102. 0181-750-102 Cable Present
103. 0181-750-103 Cable Led white
104. 0181-750-104 Cable led Green
Arcoma AB
Revision notes! 4401 Added wireless foot control
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date MAT 2019-02-27
Type of drawing System diagram
Drawn by MAT
Checked by - date
Sheet 1 / 1
Description System block diagram 0181 Table
Drawing nr SBD_0181-TS_4
Revision 2.1


Electrical plate 2.2 0055-154-040
UBD-0055_TS_4_BT_foot_sw
UBD-0055_TS_4_CAN
UBD-0055_TS_4_Coll
UBD-0055_TS_4_DetH14x17
UBD-0055_TS_4_DetH14x17x17
UBD-0055_TS_4_DetH17x17
UBD-0055_TS_4_DETH17x17_Fix
UBD-0055_TS_4_DetH_Gridmove
UBD-0055_TS_4_Power
UBD-0055_TS_4_Table top brakes
UBD-0055_TS_4_Z-Drive
Ind Table
24VCB1
Indication
Detector holder
0V24CB1
Landscape
Portrait
Detector present
Tray
0V5CB1
TS Grid0
TS Grid1
Size
5VCB1
2.2BIB01
72-560
Bluetooth
2.2J05
0055-750-012
Handlebar table
0V5
X-Y Brake
Z-Down
DMG
Z-Up
2.2CB01
Master
70-106
2.2CB02
SI
70-106
CAN Bus
2.2BCM01
0048-750-100
Handlebar Collimator
2.2J10
0055-750-041
2.3LC01
Table coll light
0V5 CB2
Coll light table top
Ext. EM-stop
0V24CB1
EM stop
0V5CB2
Coll light
H-Close
H-Open
Manual
W-Close
W-Open
2.D Detector holder
0055-750-040
2.DJ11
2.DJ02
2.DJ01
D-BRA_1
D-BRA_2
2.3BRA01
2.3J01
24V
36V
0V
Protective earth
24V
SW.D_BRA
2.DPE01
2.DAEC01
J1
2.3LC02
0V5
GND
+5V
Sig+
Sig-
24V CB
Table top
Watchdog
2.2TBrake
2.2ZBrake
Y-Brake
X-Brake
Table tilt head
Table tilt foot
EM.Ext
0V5 CB
EM INT
5V CB
0V CB
Tilt Signal
2.XBRA01
2.XJ01
2.XPE01
2.2EM01
2.2EM02
2.2J02
2.2J01
2.2BRA01
2.2ANG01
2.2LC01
2.2LC02
2.2PE
24V
0V
EM.Int
Protective earth
0V24 CB
24V 2.XBRA01
24V 2.2BRA01
0V24
36VDC
24VDC
0V
115VAC
115VAC
2.1PS01
2.1OVP01
2.1LCB01
2.1GB01
2.1BCM01
2.1CB01
2.1DC01
2.1DC02
36V
24V
0V
2.1RELAY
2.1RE01 and 2.1J01
2.1PL01
2.1J02
EM.CS
EM.Table
EM.RE.24V
EM.Ext.0V24
Protective earth
115VAC
115VAC
24VDC
0V24
Grid start TS
0VCB800
Exp. trig TS
0055-750-015
0181-750-048
option only CR
2.0POW01
2.0PE01
2.0DET01
2.0SIG03
2.0SIG01
2.0CAN01
Z Guard 0055-650-787
Electrical plate 2.1 0512-154-085
2.3PE
0055-750-003
Extern Z pot
5V CB
0V CB
Protective earth
0-36V
0-36V
2.Z1POT01
2.Z2POT01
5V CB
0V CB
24V
0V
End sw Up
End sw Down
0V5 DC
2.Z2J02
2.Z2
2.Z1J02
2.Z1J03
2.Z1
DMG
Z-up
Z-Down
X-Brake
Y-Brake
0V5 CB
X-Y Brake
0V CB
2.4J03
2.4J01
2.4J02
4.4FIB01 J28-P4
4.4FIB01-J19
GEN-J2
4.4J10
4.2PE03
4.2J01 19-20
Arcoma AB
Revision notes! 4401 Added BT fot switch
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2018-03-23
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Table 2 columns
Drawing nr
SBD-0055_TS_4
Revision
4.1


Electrical area 3.1
UBD-0182_WS_4_BT_foot_sw
UBD-0182_WS_4_Coll
UBD-0182_WS_4_DetH14x17
△ UBD-0182_WS_4_DetH14x17x17
UBD-0182_WS_4_DetH17x17
UBD-0182_WS_4_DetH17x17_Fix
UBD-0182_WS_4_DetH_Gridmove
UBD-0182_WS_4_Power
UBD-0182_WS_4_Tilt, Ind
UBD-0182_WS_4_Z_Movement
Master 70-107
Relay Z-Brake 3.1RE01
Electrical plate cover
Z Brake
Z Pot
Z brake unit
Indication WS 72-601
Jumper
Can bus
Ferrite
Protective earth
Foot switch Z up, down, brake
WRD_0175-099-005
WRD_0175-099-006
Electrical area 3.2
Electrical area 3.3
Electrical area 3.D
Coll. Handlebar
Arcoma AB
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date MAT 2017-03-31
Signature - date
Type of drawing System block diagram
Drawn by MAT
Checked by - date
Signature - date
Sheet 1 / 1
Description Wallstand manual Z movement
Drawing nr SBD-0182_WS_4
Revision 3.1


Electrical area 3.1
Electrical area 3.2
Electrical area 3.3
Electrical area 3.D
UBD-0182_WS_4_BT_foot_sw
UBD-0182_WS_4_CAN
UBD-0182_WS_4_Coll
UBD-0182_WS_4_DetH14x17
UBD-0182_WS_4_DetH14x17x17
UBD-0182_WS_4_DetH17x17
UBD-0182_WS_4_DetH17x17_Fix
UBD-0182_WS_4_DetH_Gridmove
UBD-0182_WS_4_Power_Z_mot
UBD-0182_WS_4_Tilt, Ind
UBD_0182_WS_4_Z_Drive
Arcoma AB
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Revision notes! 4401 added BT foot switch
Product 0180
Aproved by - date Signature - date Mat 2019-03-26
Type of drawing System block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description Wallstand motorized Z movement
Drawing nr SBD_0182_WS_4_Z_mot
Revision 4.1

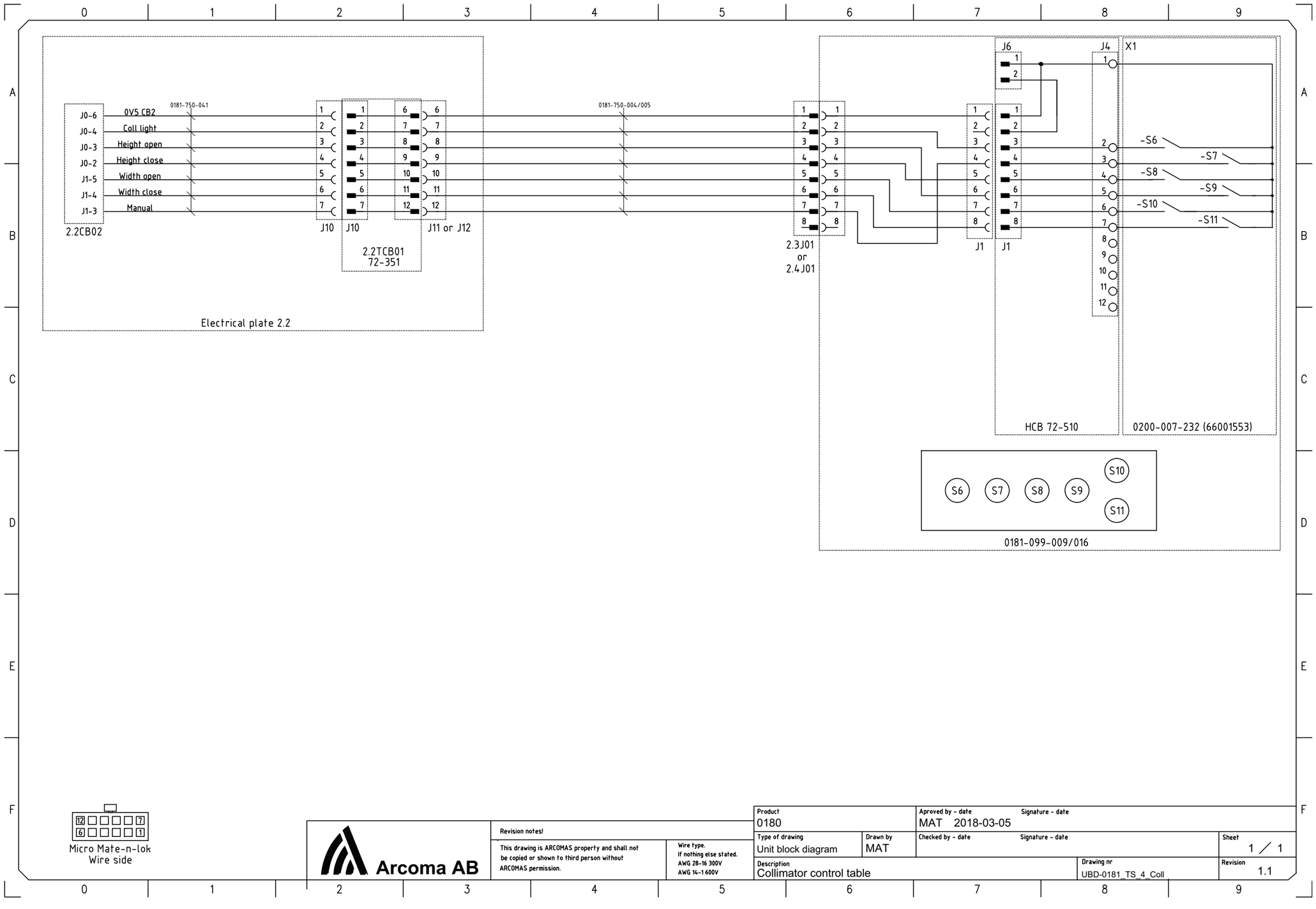


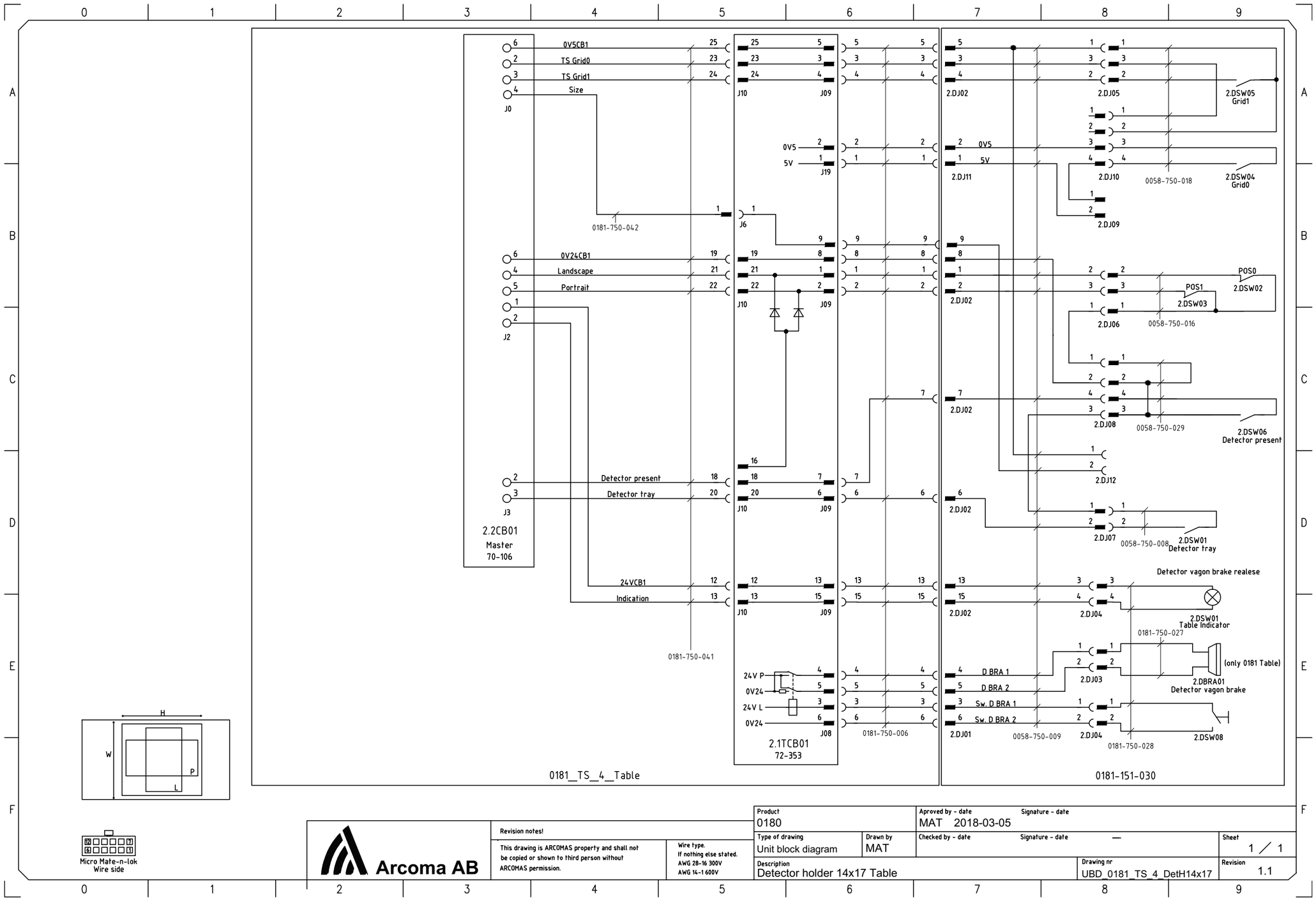
Arcoma AB

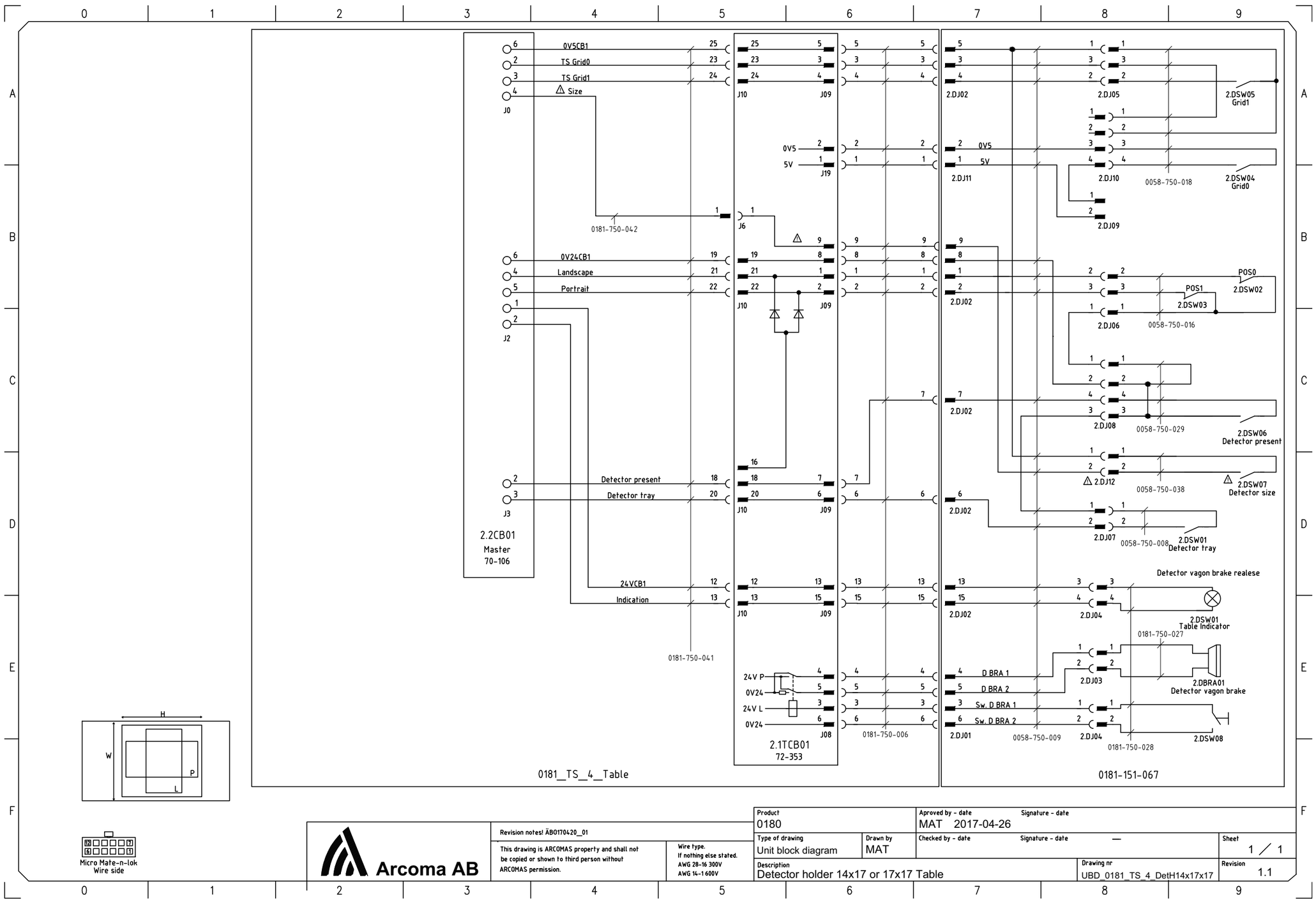
Revision notes! Swapped J2 5-6 and J4 5-6. Added only system 1000

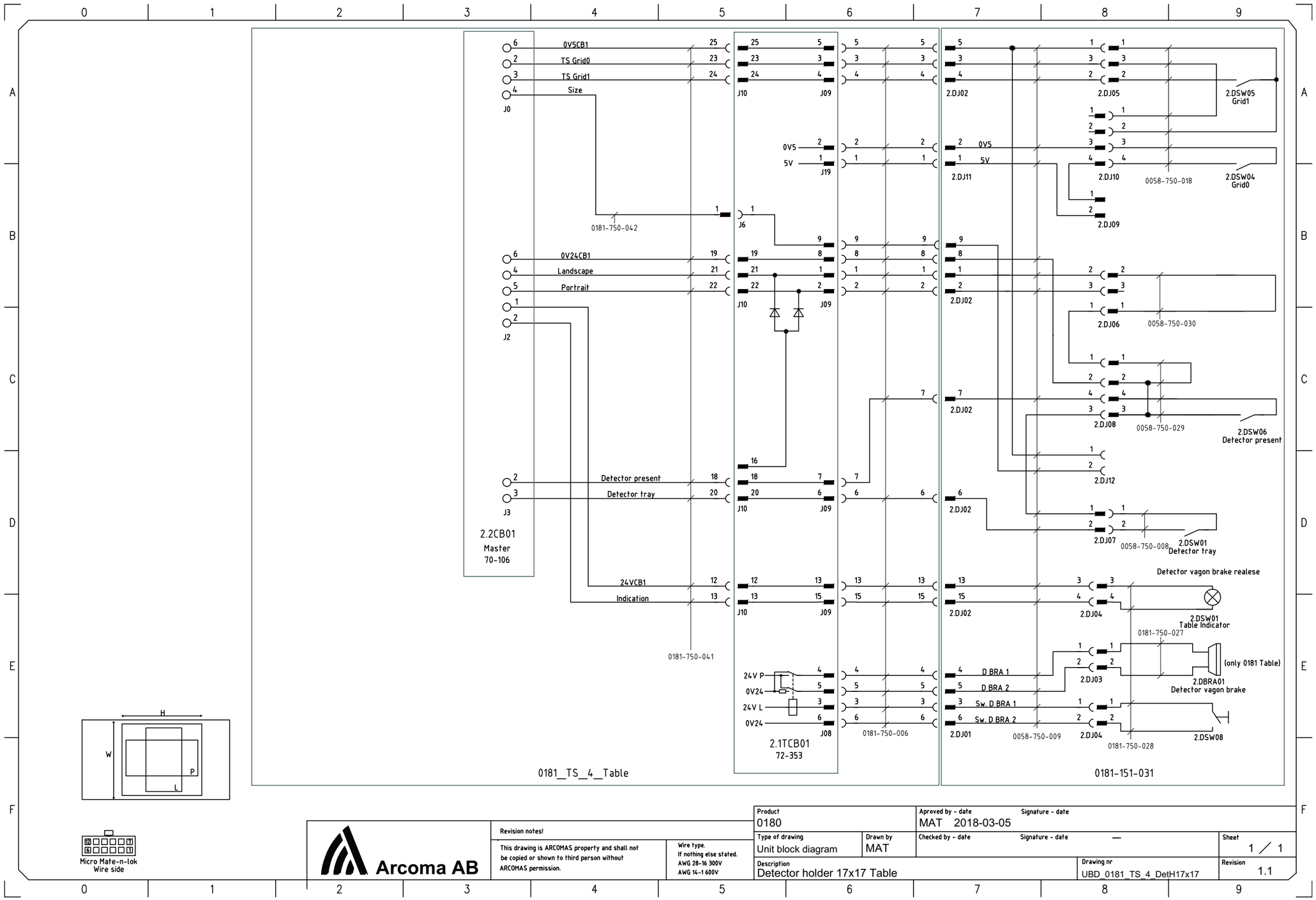
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

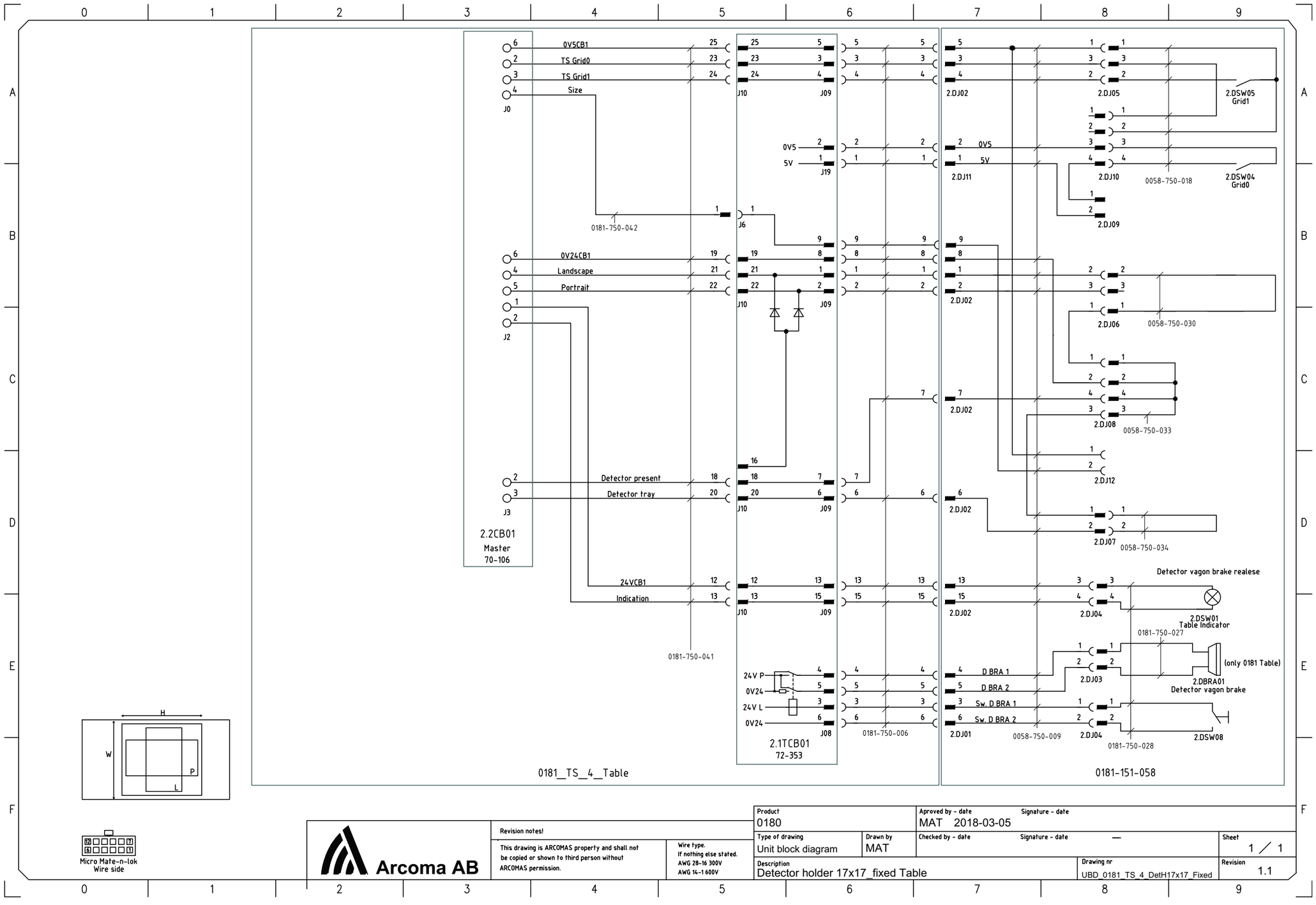
Product: C		Aproved by - date / Signature - date: MAT 2018-02-19	
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date:	Sheet: 1 / 1
Description: Image system C		Drawing nr: UBD_C_Image_system	Revision: 2.1

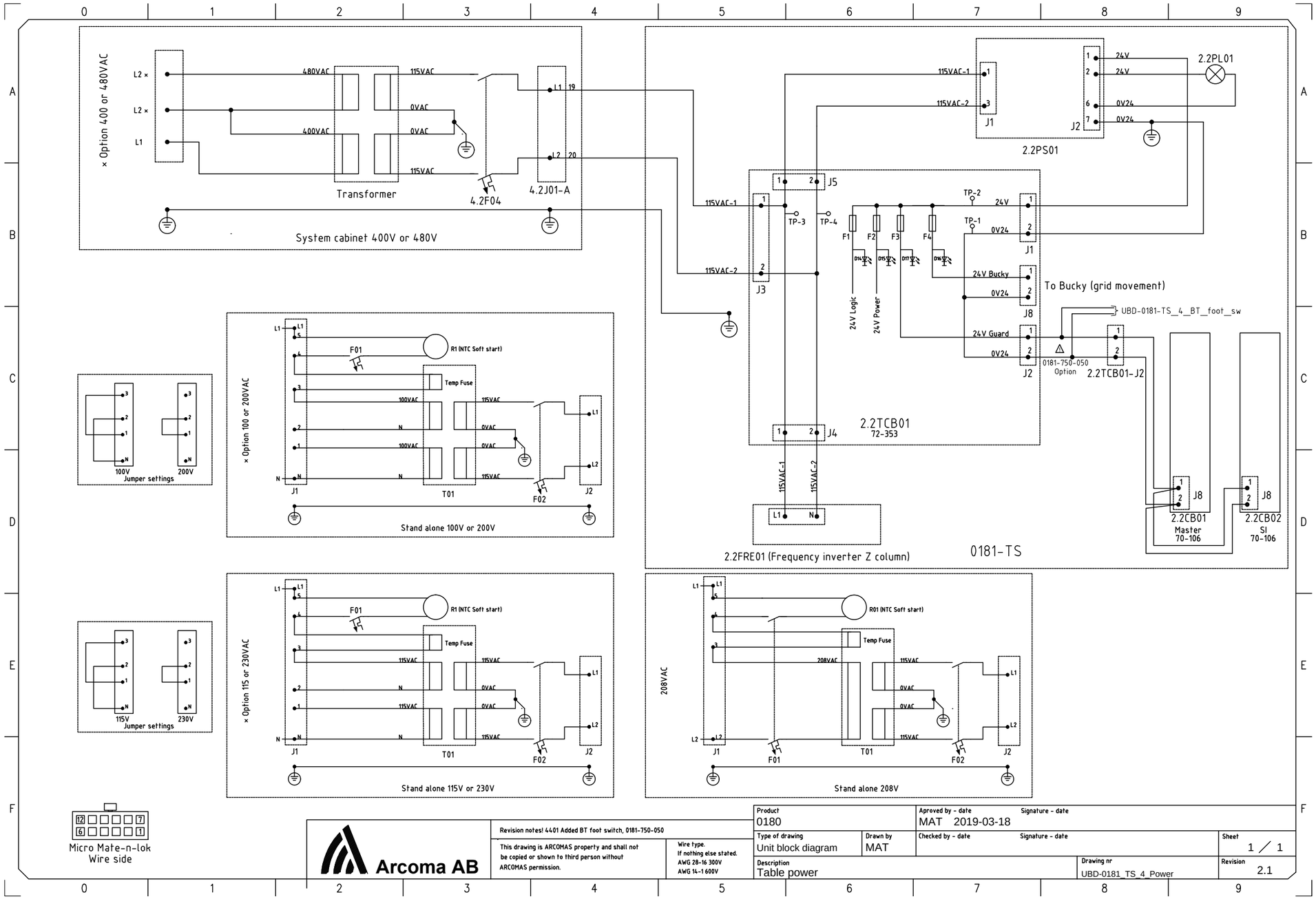

J0-6
J0-4
J0-3
J0-2
J1-5
J1-4
J1-3
0V5 CB2
Coll light
Height open
Height close
Width open
Width close
Manual
0181-750-041
2.2CB02
J10
J10
2.2TCB01
72-351
J11 or J12
Electrical plate 2.2
0181-750-004/005
2.3J01
or
2.4J01
J1
J1
J6
J4
X1
-S6
-S7
-S8
-S9
-S10
-S11
HCB 72-510
0200-007-232 (66001553)
S6
S7
S8
S9
S10
S11
0181-099-009/016
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2018-03-05
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Collimator control table
Drawing nr
UBD-0181_TS_4_Coll
Revision
1.1

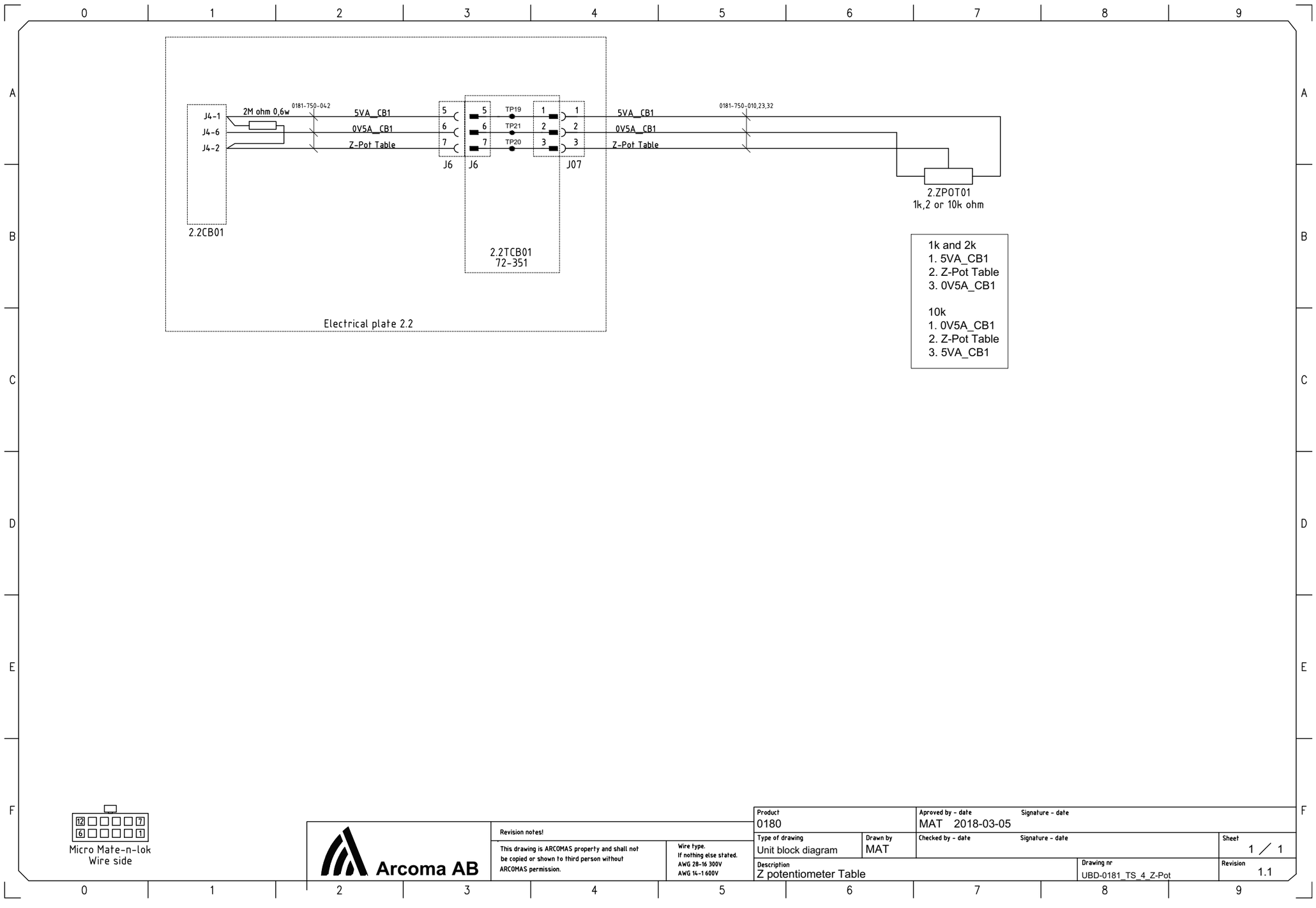

0V5CB1
TS Grid0
TS Grid1
Size
J0
0181-750-042
J6
0V24CB1
Landscape
Portrait
J2
Detector present
Detector tray
J3
2.2CB01
Master
70-106
24VCB1
Indication
0181-750-041
J10
J09
J19
0V5
5V
0V24
24V P
24V L
J08
2.1TCB01
72-353
0181-750-006
0181_TS_4_Table
2.DJ02
2.DJ11
2.DJ05
2.DJ10
2.DJ09
2.DJ06
2.DJ08
2.DJ12
2.DJ07
2.DJ04
2.DJ03
2.DJ01
2.DSW05
Grid1
2.DSW04
Grid0
0058-750-018
POS0
2.DSW02
POS1
2.DSW03
0058-750-016
2.DSW06
Detector present
0058-750-029
2.DSW01
Detector tray
0058-750-008
Detector vagon brake realese
2.DSW01
Table Indicator
0181-750-027
(only 0181 Table)
2.DBRA01
Detector vagon brake
D BRA 1
D BRA 2
Sw. D BRA 1
Sw. D BRA 2
0058-750-009
2.DSW08
0181-750-028
0181-151-030
H
W
P
L
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2018-03-05
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
—
Sheet
1 / 1
Description
Detector holder 14x17 Table
Drawing nr
UBD_0181_TS_4_DetH14x17
Revision
1.1

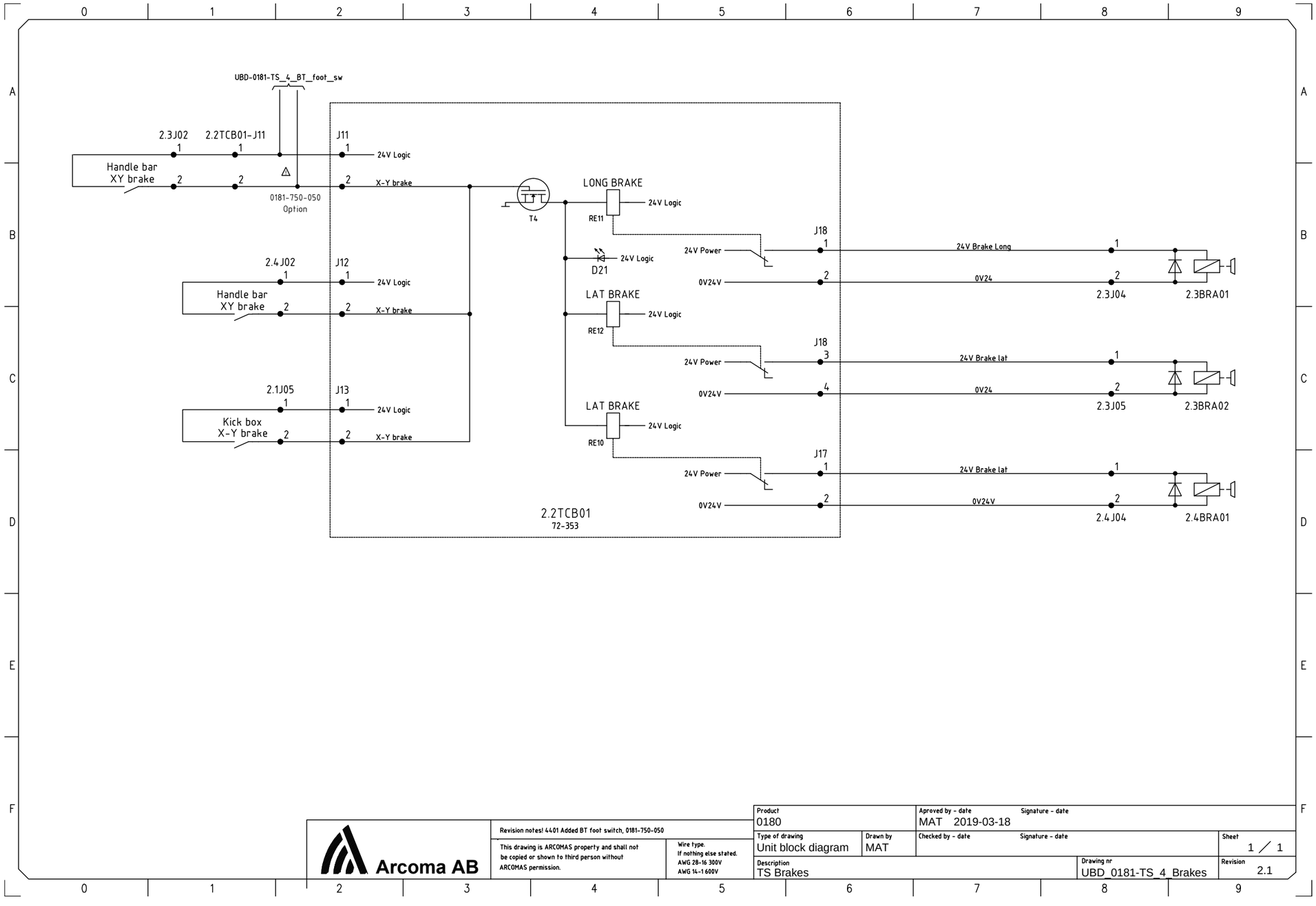

0V5CB1
TS Grid0
TS Grid1
Size
J0
0181-750-042
0V24CB1
Landscape
Portrait
J2
Detector present
Detector tray
J3
2.2CB01
Master
70-106
24VCB1
Indication
0181-750-041
J10
J09
J19
0V5
5V
24V P
0V24
24V L
0V24
J08
2.1TCB01
72-353
0181-750-006
0181_TS_4_Table
2.DJ02
2.DJ11
2.DJ05
2.DJ10
2.DJ09
2.DJ06
2.DJ08
2.DJ12
2.DJ07
2.DJ04
2.DJ03
2.DJ01
0058-750-018
0058-750-016
0058-750-029
0058-750-038
0058-750-008
0058-750-009
0181-750-027
0181-750-028
2.DSW05
Grid1
2.DSW04
Grid0
POS0
2.DSW02
POS1
2.DSW03
2.DSW06
Detector present
2.DSW07
Detector size
2.DSW01
Detector tray
Detector vagon brake realese
2.DSW01
Table Indicator
2.DBRA01
Detector vagon brake
2.DSW08
D BRA 1
D BRA 2
Sw. D BRA 1
Sw. D BRA 2
0181-151-067
H
W
P
L
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! ÄB0170420_01
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-04-26
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
—
Sheet
1 / 1
Description
Detector holder 14x17 or 17x17 Table
Drawing nr
UBD_0181_TS_4_DetH14x17x17
Revision
1.1

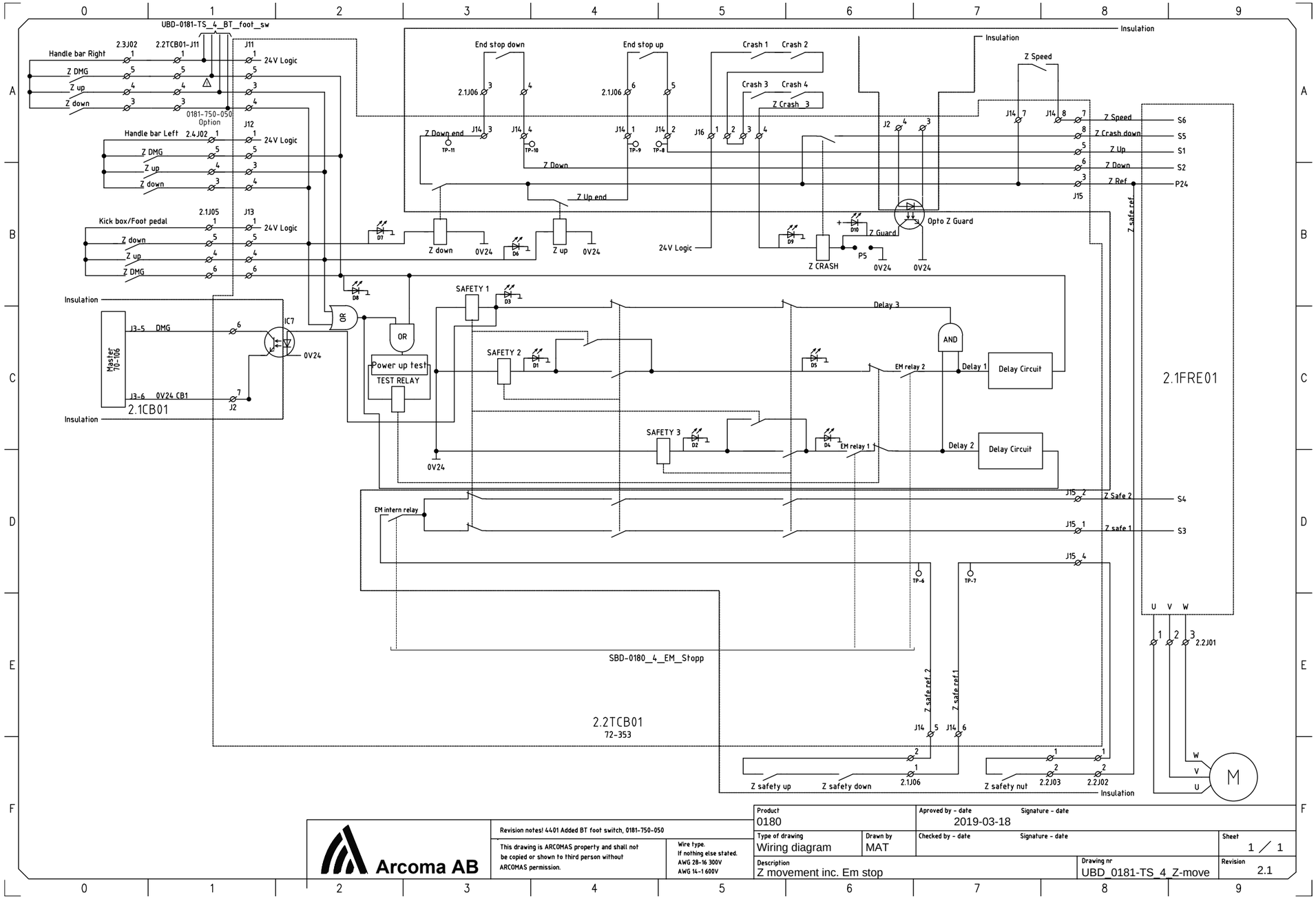

0V5CB1
TS Grid0
TS Grid1
Size
J0
0181-750-042
J6
0V24CB1
Landscape
Portrait
J2
Detector present
Detector tray
J3
2.2CB01
Master
70-106
24VCB1
Indication
0181-750-041
J10
J09
0V5
5V
J19
0V24
24V P
24V L
J08
2.1TCB01
72-353
0181-750-006
0181_TS_4_Table
2.DJ02
2.DJ11
2.DJ05
2.DSW05
Grid1
2.DJ10
0058-750-018
2.DSW04
Grid0
2.DJ09
2.DJ06
0058-750-030
2.DJ08
0058-750-029
2.DSW06
Detector present
2.DJ12
2.DJ07
0058-750-008
2.DSW01
Detector tray
Detector vagon brake realese
2.DJ04
2.DSW01
Table Indicator
0181-750-027
(only 0181 Table)
2.DJ03
2.DBRA01
Detector vagon brake
D BRA 1
D BRA 2
Sw. D BRA 1
Sw. D BRA 2
2.DJ01
0058-750-009
2.DSW08
0181-750-028
0181-151-031
H
W
P
L
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2018-03-05
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
—
Sheet
1 / 1
Description
Detector holder 17x17 Table
Drawing nr
UBD_0181_TS_4_DetH17x17
Revision
1.1

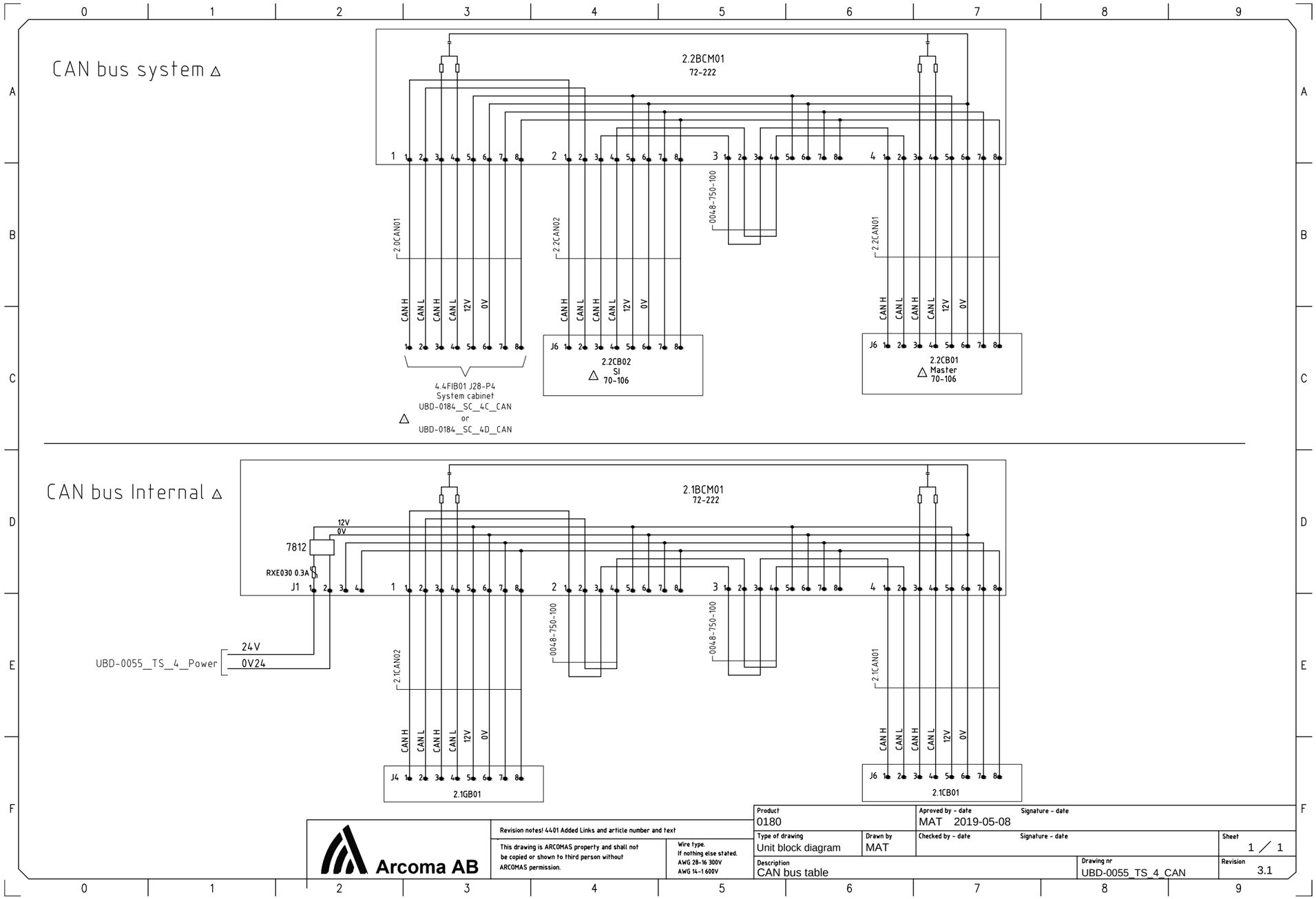

0V5CB1
TS Grid0
TS Grid1
Size
J0
0181-750-042
0V24CB1
Landscape
Portrait
J2
Detector present
Detector tray
J3
2.2CB01
Master
70-106
24VCB1
Indication
0181-750-041
J10
J09
J19
J6
0V5
5V
24V P
0V24
24V L
0V24
J08
2.1TCB01
72-353
0181-750-006
0181_TS_4_Table
2.DJ02
2.DJ05
2.DSW05
Grid1
2.DJ10
0058-750-018
2.DSW04
Grid0
2.DJ11
2.DJ09
2.DJ06
0058-750-030
2.DJ08
0058-750-033
2.DJ12
2.DJ07
0058-750-034
Detector vagon brake realese
2.DJ04
2.DSW01
Table Indicator
0181-750-027
2.DJ03
(only 0181 Table)
2.DBRA01
Detector vagon brake
D BRA 1
D BRA 2
Sw. D BRA 1
Sw. D BRA 2
2.DJ01
0058-750-009
0181-750-028
2.DSW08
0181-151-058
H
W
P
L
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2018-03-05
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
—
Sheet
1 / 1
Description
Detector holder 17x17_fixed Table
Drawing nr
UBD_0181_TS_4_DetH17x17_Fixed
Revision
1.1

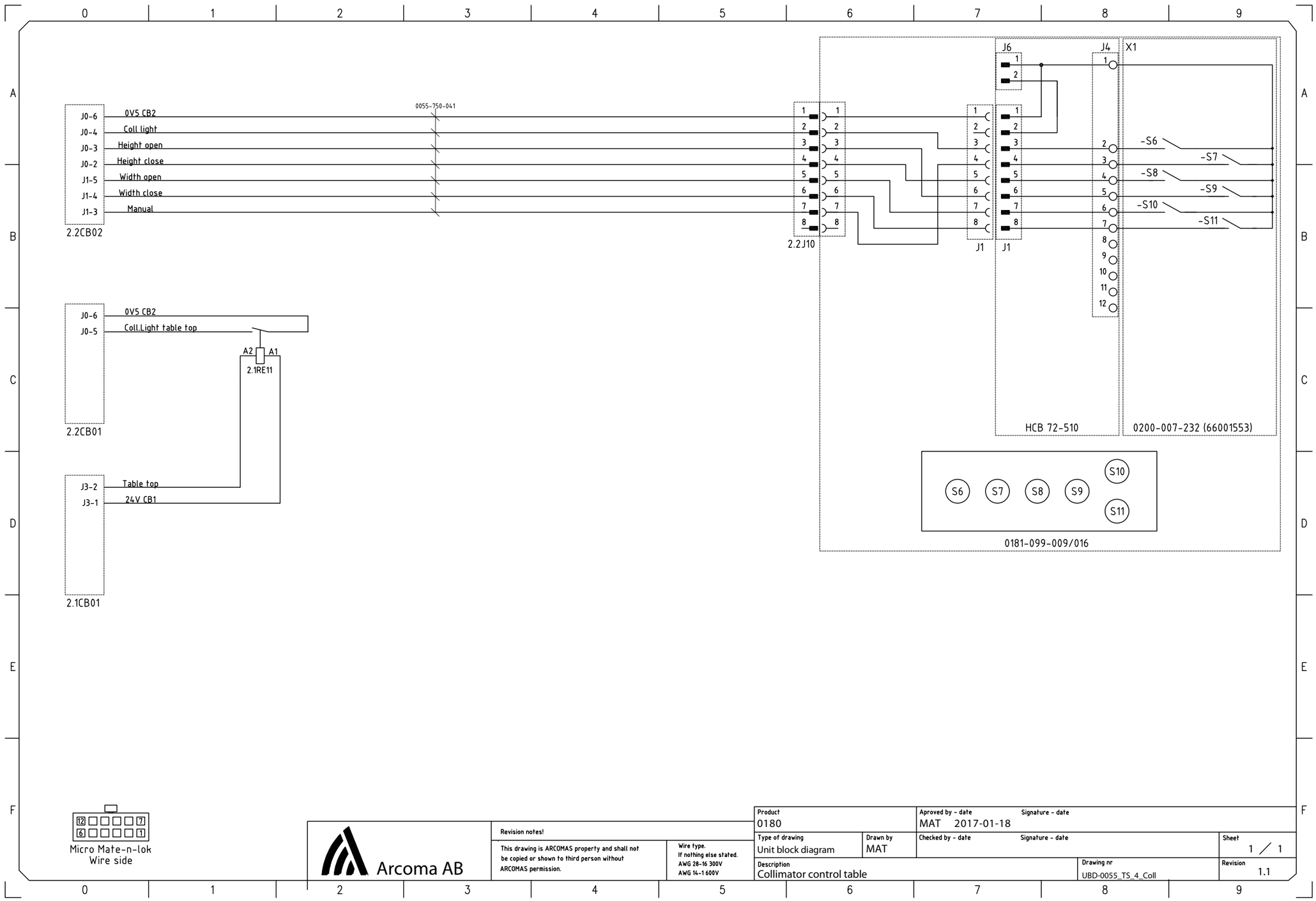

× Option 400 or 480VAC
L2 ×
L2 ×
L1
480VAC
400VAC
115VAC
0VAC
0VAC
115VAC
Transformer
4.2F04
4.2J01-A
System cabinet 400V or 480V
115VAC-1
115VAC-2
J5
TP-3
TP-4
F1
F2
F3
F4
J3
2.2PS01
J1
J2
24V
24V
0V24
0V24
2.2PL01
TP-2
TP-1
24V Bucky
0V24
J8
24V Logic
24V Power
24V Guard
0V24
J2
To Bucky (grid movement)
UBD-0181-TS__4__BT__foot__sw
0181-750-050
Option
2.2TCB01-J2
2.2TCB01
72-353
J4
2.2CB01
Master
70-106
2.2CB02
SI
70-106
2.2FRE01 (Frequency inverter Z column)
0181-TS
× Option 100 or 200VAC
F01
R1 (NTC Soft start)
Temp Fuse
100VAC
N
100VAC
N
115VAC
0VAC
0VAC
115VAC
T01
F02
Stand alone 100V or 200V
100V
200V
Jumper settings
× Option 115 or 230VAC
Stand alone 115V or 230V
115V
230V
R01 (NTC Soft start)
208VAC
Stand alone 208V
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! 4401 Added BT foot switch, 0181-750-050
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-03-18
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Table power
Drawing nr
UBD-0181_TS_4_Power
Revision
2.1

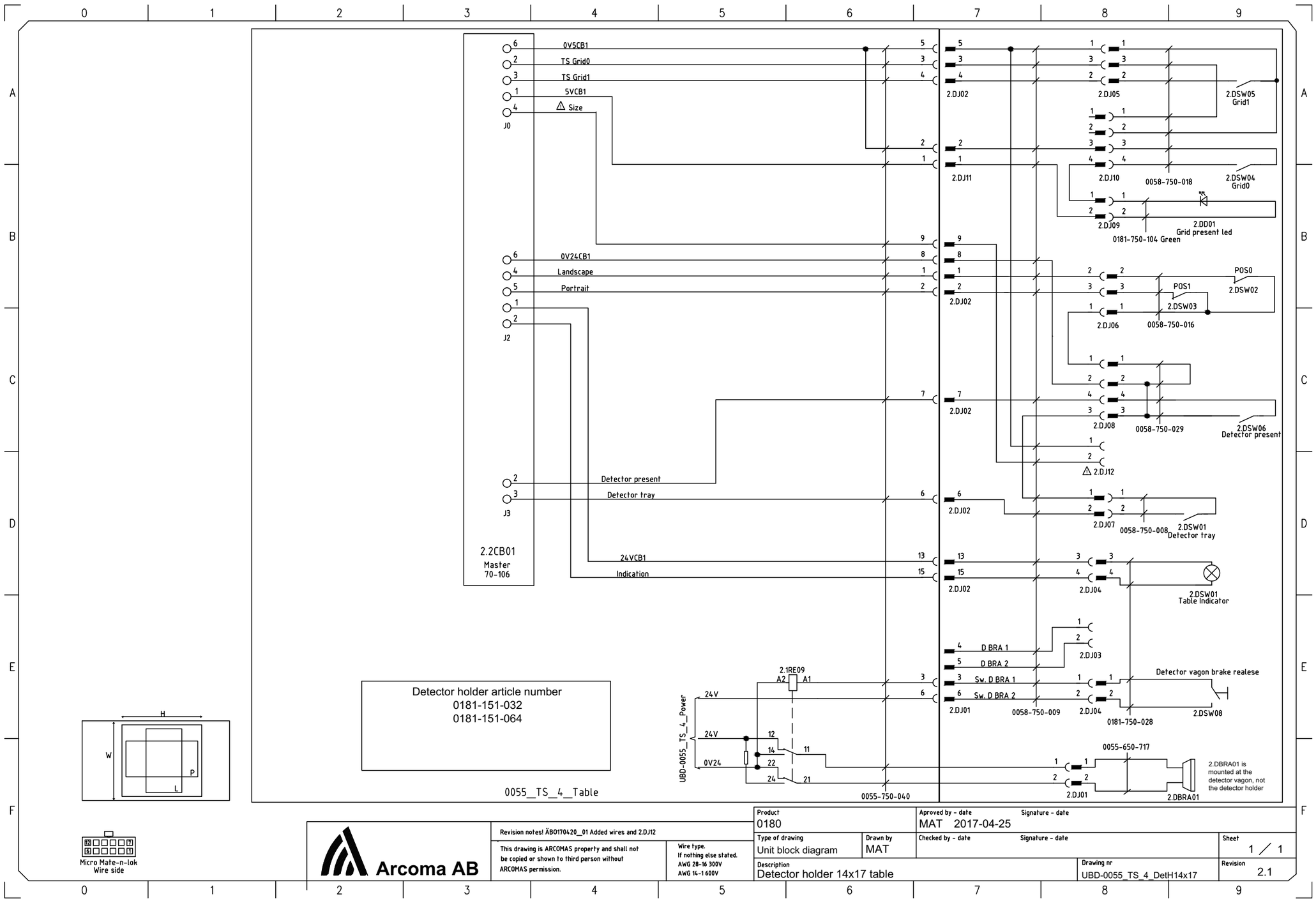

J4-1
J4-6
J4-2
2M ohm 0,6w
0181-750-042
5VA_CB1
0V5A_CB1
Z-Pot Table
J6
J6
J07
TP19
TP21
TP20
2.2CB01
2.2TCB01
72-351
Electrical plate 2.2
0181-750-010,23,32
2.ZPOT01
1k,2 or 10k ohm
1k and 2k
1. 5VA_CB1
2. Z-Pot Table
3. 0V5A_CB1
10k
1. 0V5A_CB1
2. Z-Pot Table
3. 5VA_CB1
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2018-03-05
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Z potentiometer Table
Drawing nr
UBD-0181_TS_4_Z-Pot
Revision
1.1

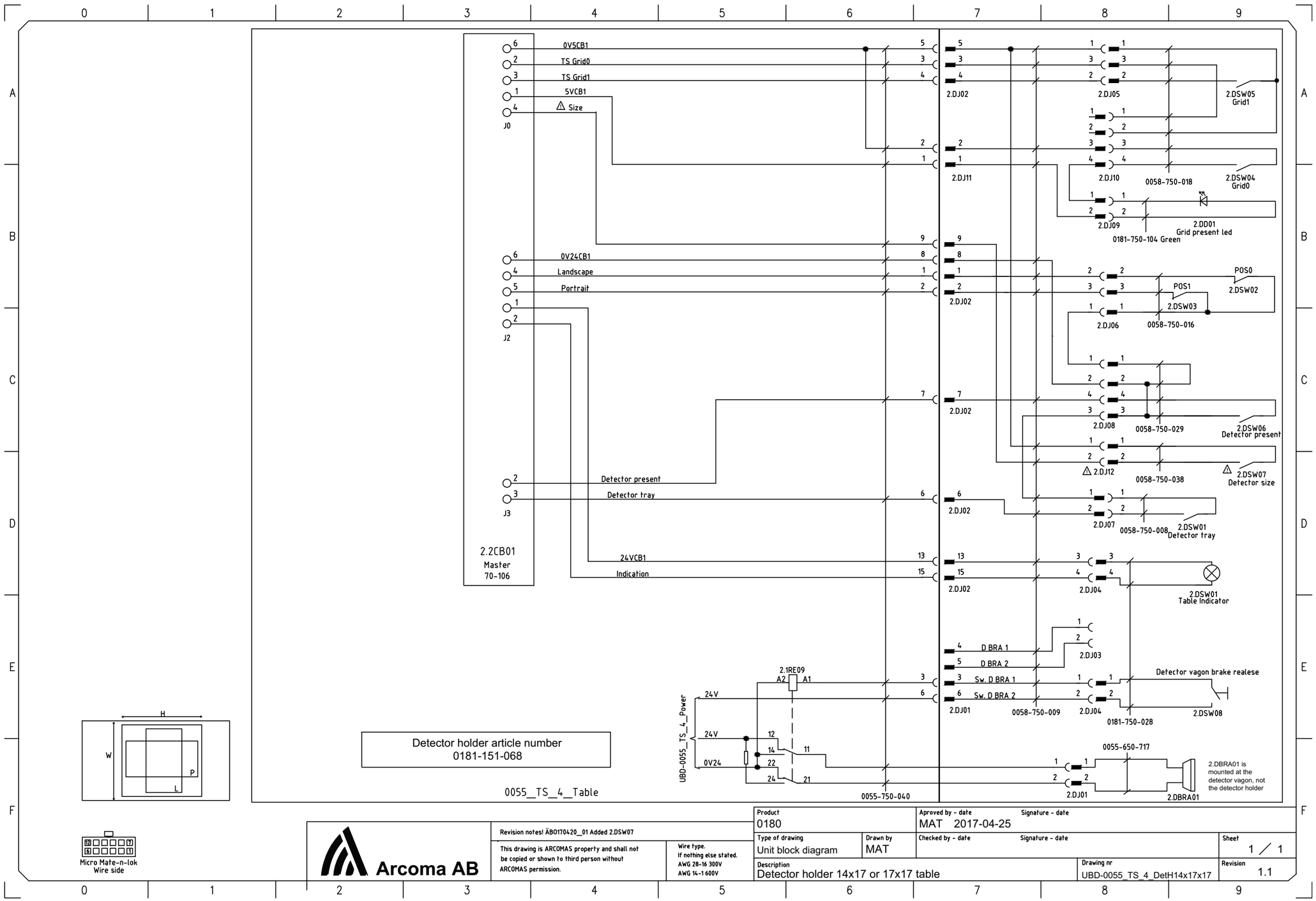

UBD-0181-TS_4_BT_foot_sw
2.3J02
2.2TCB01-J11
J11
24V Logic
Handle bar
XY brake
X-Y brake
0181-750-050
Option
T4
LONG BRAKE
RE11
2.4J02
J12
Handle bar
XY brake
LAT BRAKE
RE12
2.1J05
J13
Kick box
X-Y brake
RE10
D21
J18
24V Power
0V24V
24V Brake Long
0V24
2.3J04
2.3BRA01
24V Brake lat
2.3J05
2.3BRA02
J17
2.4J04
2.4BRA01
2.2TCB01
72-353
Arcoma AB
Revision notes! 4401 Added BT foot switch, 0181-750-050
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date Signature - date MAT 2019-03-18
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description TS Brakes
Drawing nr UBD_0181-TS_4_Brakes
Revision 2.1

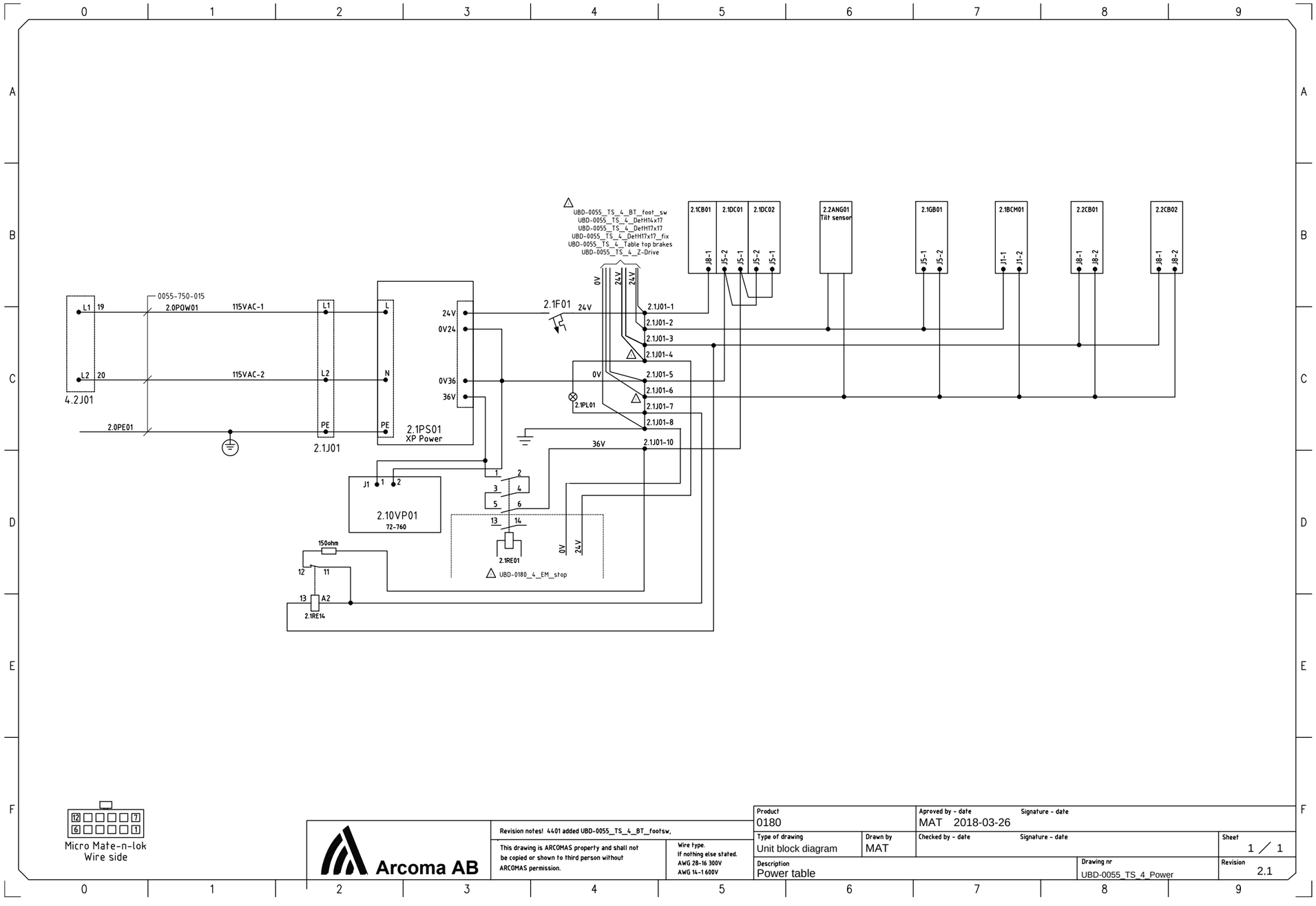

UBD-0181-TS_4_BT_foot_sw
Handle bar Right
Handle bar Left
Kick box/Foot pedal
Z DMG
Z up
Z down
0181-750-050
Option
24V Logic
End stop down
End stop up
Crash 1
Crash 2
Crash 3
Crash 4
Z Crash_3
Z Down end
Z Down
Z Up end
Insulation
Z Speed
Z Crash down
Z Up
Z Down
Z Ref
Z safe ref
Opto Z Guard
Z Guard
Z CRASH
P5
0V24
SAFETY 1
SAFETY 2
SAFETY 3
Delay 3
Delay 2
Delay 1
Delay Circuit
AND
OR
Power up test
TEST RELAY
EM relay 2
EM relay 1
EM intern relay
IC7
Master 70-106
J3-5 DMG
J3-6 0V24 CB1
2.1CB01
2.1FRE01
SBD-0180_4_EM_Stopp
2.2TCB01
72-353
Z safety up
Z safety down
Z safety nut
Z safe 1
Z safe 2
Z safe ref 1
Z safe ref 2
S1
S2
S3
S4
S5
S6
P24
U V W
2.2J01
2.2J02
2.2J03
2.1J06
M
Arcoma AB
Revision notes! 4401 Added BT foot switch, 0181-750-050
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date 2019-03-18
Signature - date
Type of drawing Wiring diagram
Drawn by MAT
Checked by - date
Signature - date
Sheet 1 / 1
Description Z movement inc. Em stop
Drawing nr UBD_0181-TS_4_Z-move
Revision 2.1

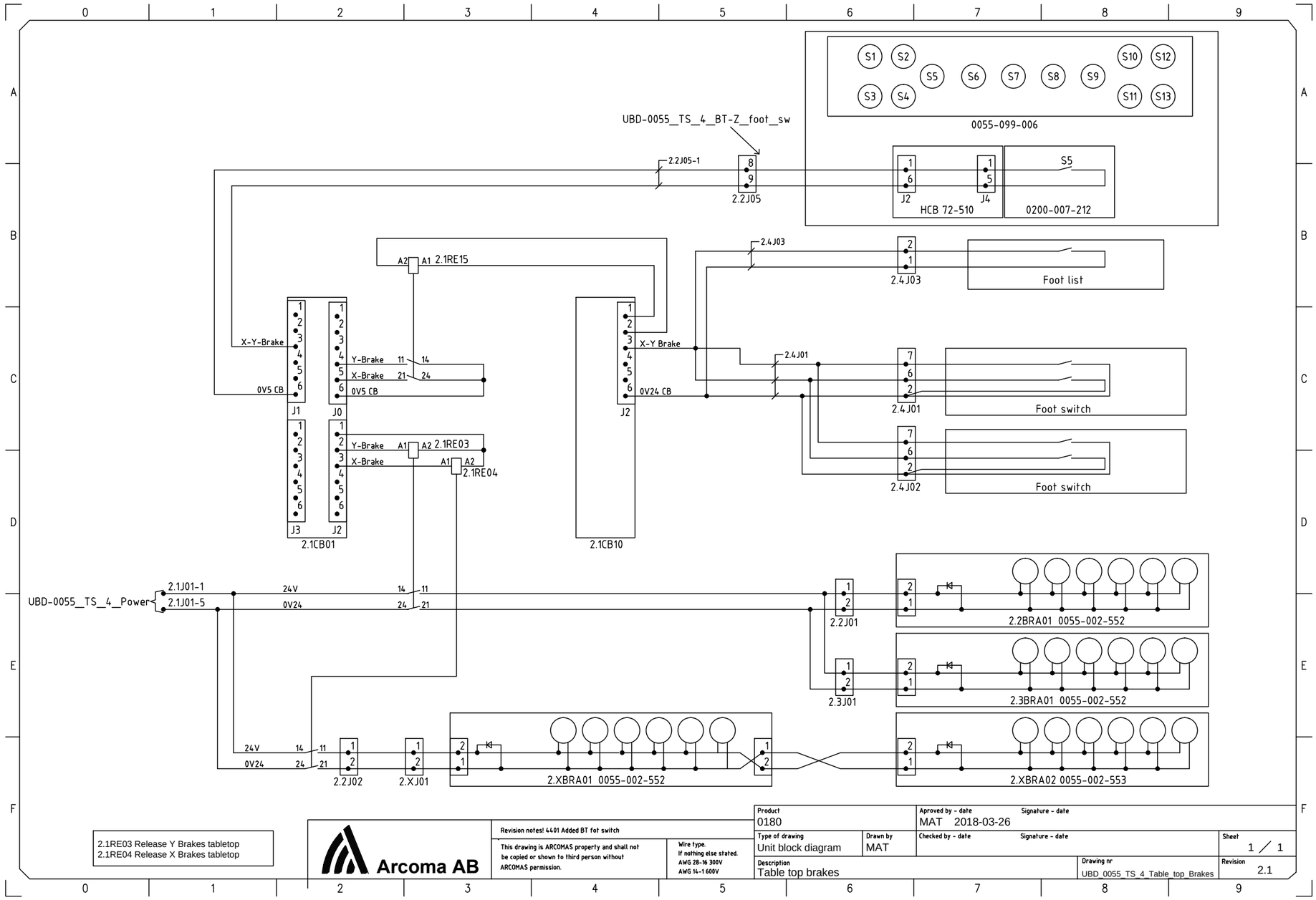

CAN bus system △
2.2BCM01
72-222
2.0CAN01
2.2CAN02
0048-750-100
2.2CAN01
CAN H
CAN L
CAN H
CAN L
12V
0V
J6
2.2CB02
SI
70-106
2.2CB01
Master
70-106
4.4FIB01 J28-P4
System cabinet
UBD-0184__SC__4C__CAN
or
UBD-0184__SC__4D__CAN
CAN bus Internal △
2.1BCM01
72-222
12V
0V
7812
RXE030 0.3A
J1
0048-750-100
0048-750-100
2.1CAN02
2.1CAN01
J4
2.1GB01
J6
2.1CB01
24V
0V24
UBD-0055__TS__4__Power
Arcoma AB
Revision notes! 4401 Added Links and article number and text
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-05-08
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
CAN bus table
Drawing nr
UBD-0055_TS_4_CAN
Revision
3.1

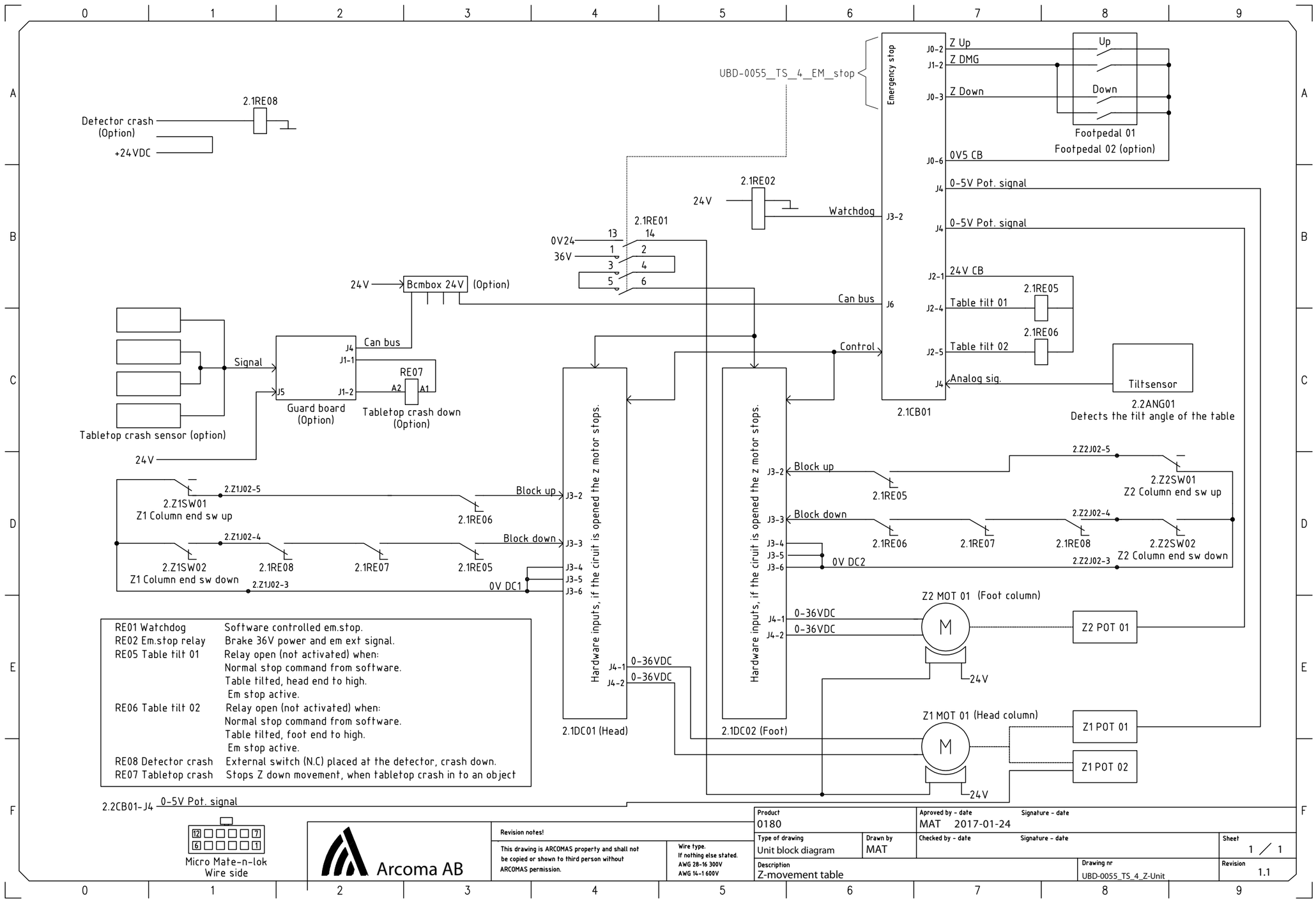

J0-6 0V5 CB2
J0-4 Coll light
J0-3 Height open
J0-2 Height close
J1-5 Width open
J1-4 Width close
J1-3 Manual
2.2CB02
0055-750-041
2.2J10
J1
J1
J6
J4
X1
-S6
-S7
-S8
-S9
-S10
-S11
HCB 72-510
0200-007-232 (66001553)
S6
S7
S8
S9
S10
S11
0181-099-009/016
J0-6 0V5 CB2
J0-5 Coll.Light table top
A2
A1
2.1RE11
2.2CB01
J3-2 Table top
J3-1 24V CB1
2.1CB01
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product 0180
Aproved by - date Signature - date MAT 2017-01-18
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description Collimator control table
Drawing nr UBD-0055_TS_4_Coll
Revision 1.1

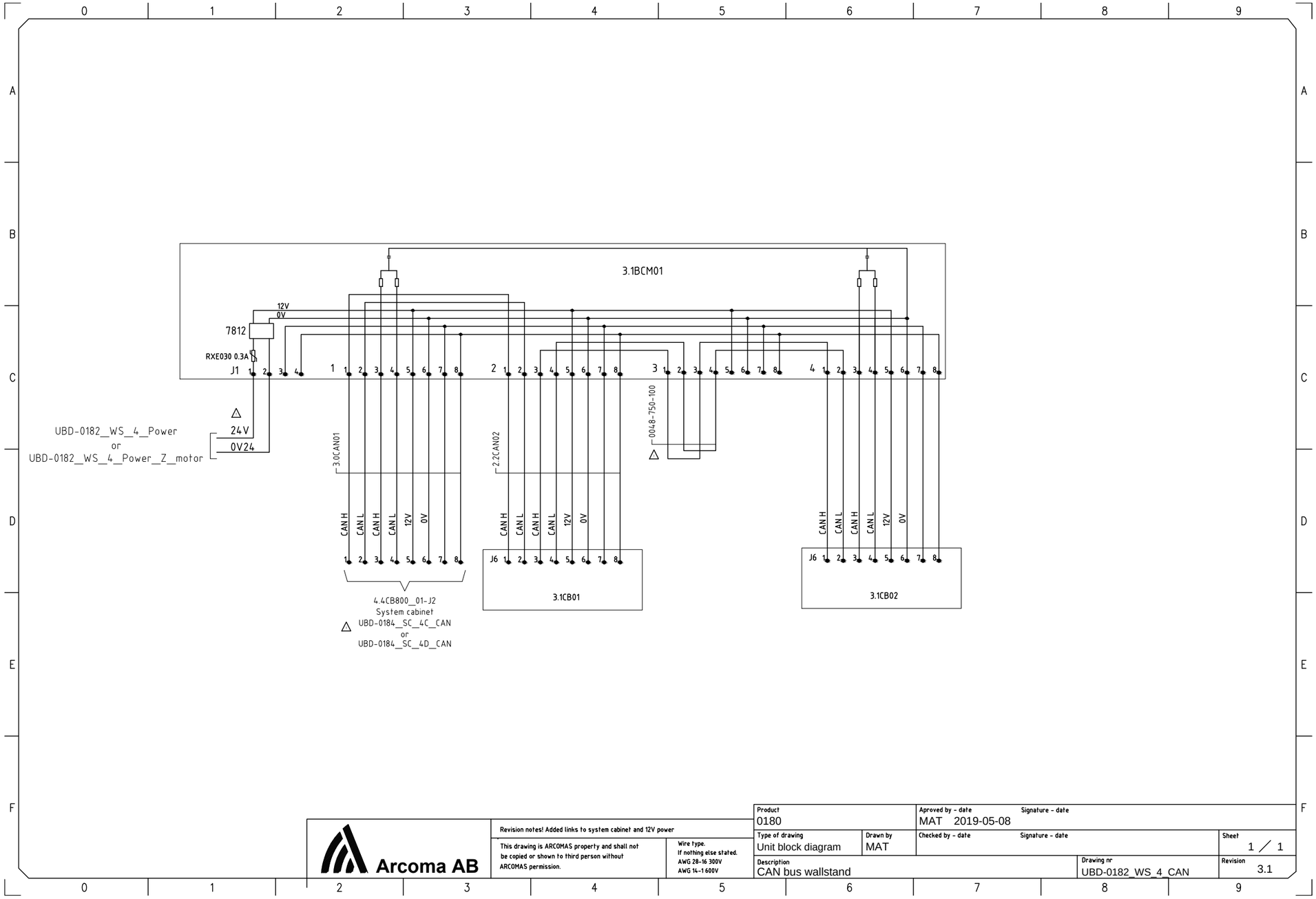

0V5CB1
TS Grid0
TS Grid1
5VCB1
⚠ Size
J0
0V24CB1
Landscape
Portrait
J2
Detector present
Detector tray
J3
2.2CB01
Master
70-106
24VCB1
Indication
2.DJ02
2.DJ05
2.DSW05
Grid1
2.DJ11
2.DJ10
0058-750-018
2.DSW04
Grid0
2.DJ09
2.DD01
Grid present led
0181-750-104 Green
POS0
2.DSW02
POS1
2.DSW03
2.DJ06
0058-750-016
2.DJ08
0058-750-029
2.DSW06
Detector present
⚠ 2.DJ12
2.DJ07
0058-750-008
2.DSW01
Detector tray
2.DJ04
2.DSW01
Table Indicator
D BRA 1
D BRA 2
2.DJ03
Sw. D BRA 1
Sw. D BRA 2
2.DJ01
0058-750-009
0181-750-028
2.DSW08
Detector vagon brake realese
2.1RE09
A2
A1
24V
0V24
UBD-0055_TS_4_Power
0055-650-717
2.DBRA01
2.DBRA01 is mounted at the detector vagon, not the detector holder
0055-750-040
Detector holder article number
0181-151-032
0181-151-064
0055_TS_4_Table
H
W
P
L
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! ÄB0170420_01 Added wires and 2.DJ12
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-04-25
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 14x17 table
Drawing nr
UBD-0055_TS_4_DetH14x17
Revision
2.1

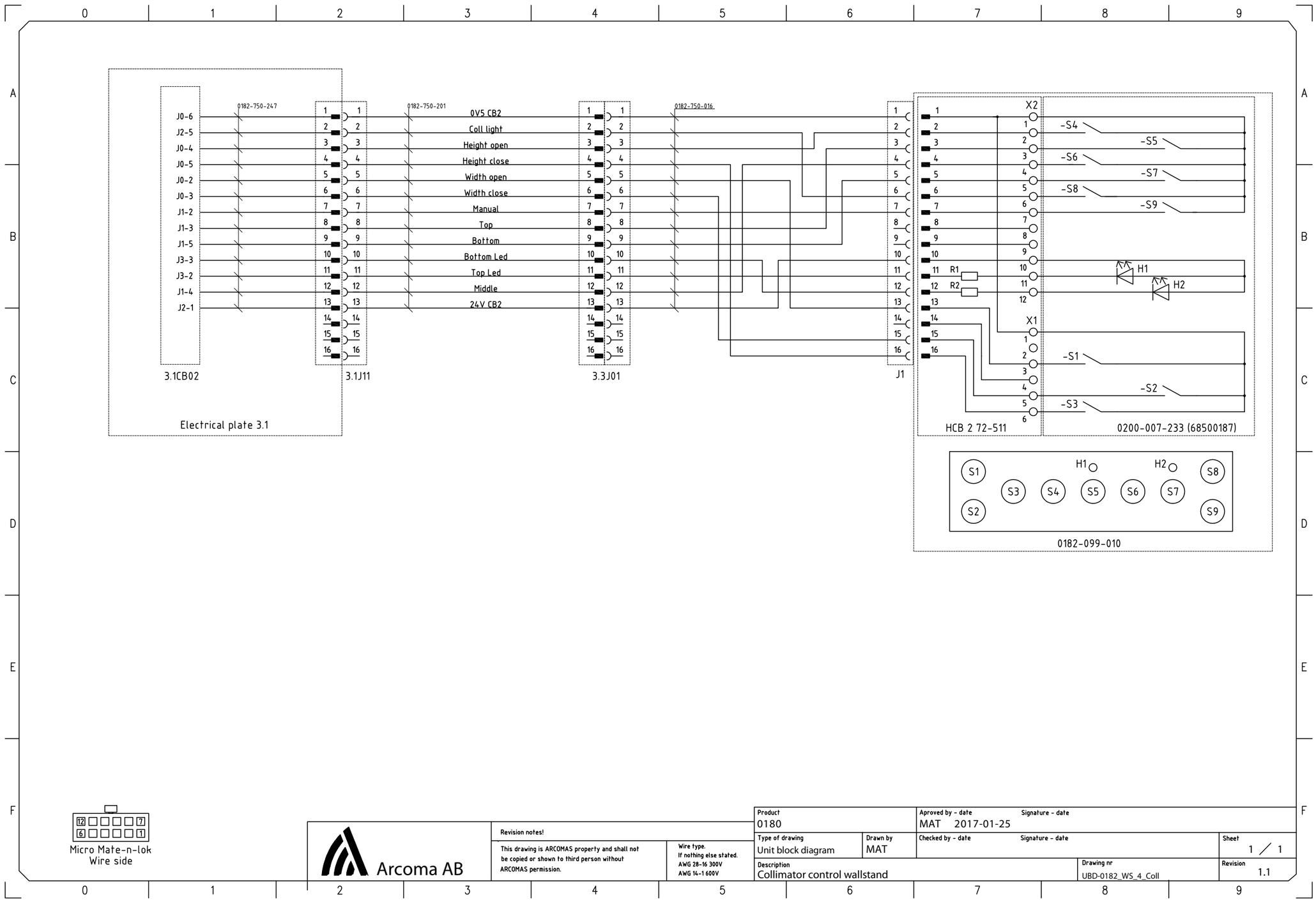

0V5CB1
TS Grid0
TS Grid1
5VCB1
⚠ Size
J0
0V24CB1
Landscape
Portrait
J2
Detector present
Detector tray
J3
2.2CB01
Master
70-106
24VCB1
Indication
2.DJ02
2.DJ05
2.DSW05
Grid1
2.DJ11
2.DJ10
0058-750-018
2.DSW04
Grid0
2.DJ09
2.DD01
Grid present led
0181-750-104 Green
POS0
2.DSW02
POS1
2.DSW03
2.DJ06
0058-750-016
2.DJ08
0058-750-029
2.DSW06
Detector present
⚠ 2.DJ12
0058-750-038
⚠ 2.DSW07
Detector size
2.DJ07
0058-750-008
2.DSW01
Detector tray
2.DJ04
2.DSW01
Table Indicator
D BRA 1
D BRA 2
2.DJ03
Detector vagon brake realese
Sw. D BRA 1
Sw. D BRA 2
2.DJ01
0058-750-009
0181-750-028
2.DSW08
2.1RE09
A2
A1
24V
0V24
UBD-0055_TS_4_Power
0055-650-717
2.DBRA01 is mounted at the detector vagon, not the detector holder
0055-750-040
Detector holder article number
0181-151-068
0055_TS_4_Table
H
W
P
L
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! ÄB0170420_01 Added 2.DSW07
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-04-25
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 14x17 or 17x17 table
Drawing nr
UBD-0055_TS_4_DetH14x17x17
Revision
1.1

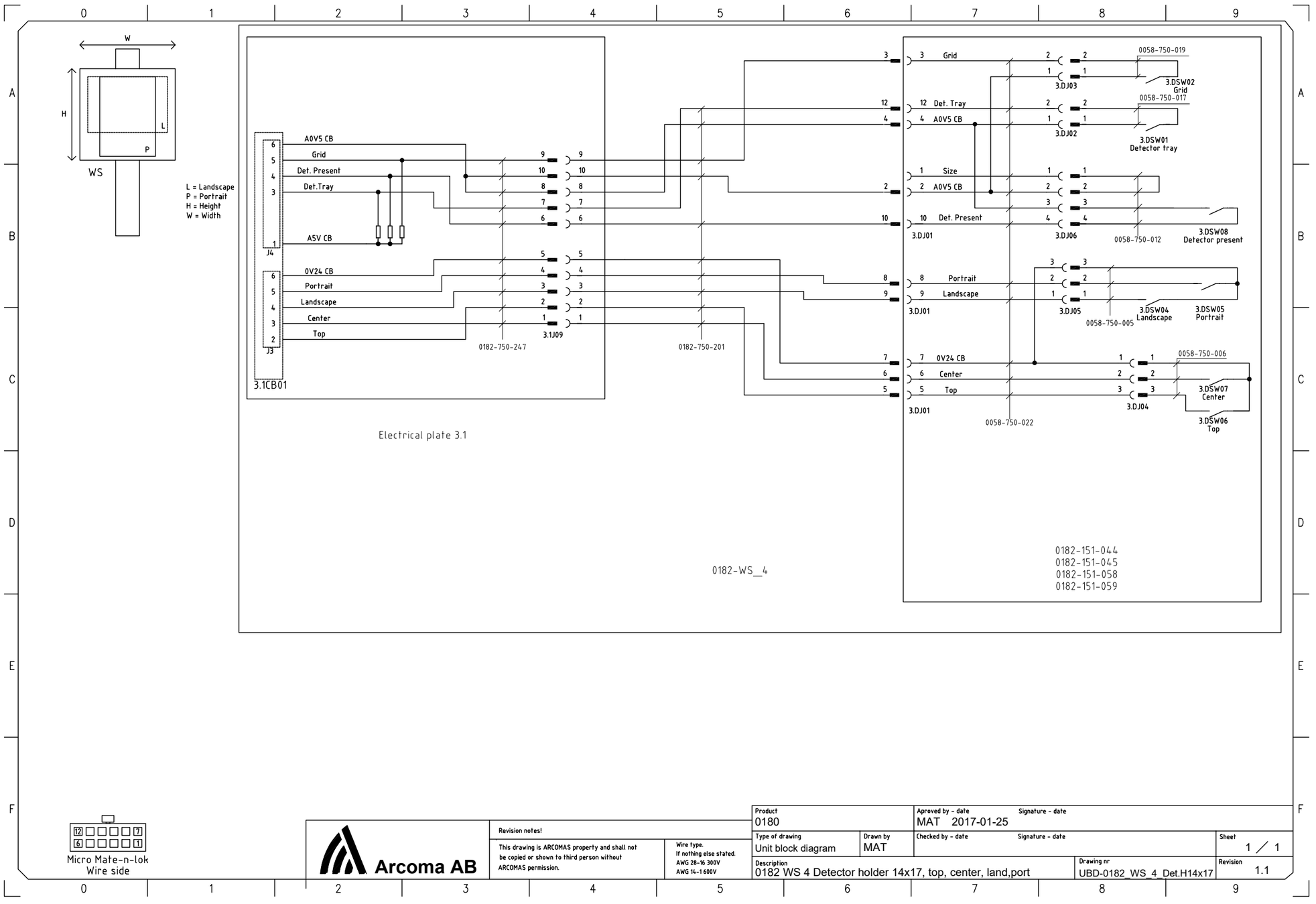

UBD-0055_TS_4_BT_foot_sw
UBD-0055_TS_4_DetH14x17
UBD-0055_TS_4_DetH17x17
UBD-0055_TS_4_DetH17x17_fix
UBD-0055_TS_4_Table top brakes
UBD-0055_TS_4_Z-Drive
2.1KB01
2.1DC01
2.1DC02
2.2ANG01
Tilt sensor
2.1GB01
2.1BCM01
2.2CB01
2.2CB02
0055-750-015
2.0POW01
115VAC-1
115VAC-2
2.0PE01
4.2J01
2.1J01
2.1PS01
XP Power
2.1F01
24V
0V24
0V36
36V
0V
2.1J01-1
2.1J01-2
2.1J01-3
2.1J01-4
2.1J01-5
2.1J01-6
2.1J01-7
2.1J01-8
2.1J01-10
2.1PL01
2.10VP01
72-760
150ohm
2.1RE01
2.1RE14
UBD-0180_4_EM_stop
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! 4401 added UBD-0055_TS_4_BT_footsw,
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2018-03-26
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Power table
Drawing nr
UBD-0055_TS_4_Power
Revision
2.1

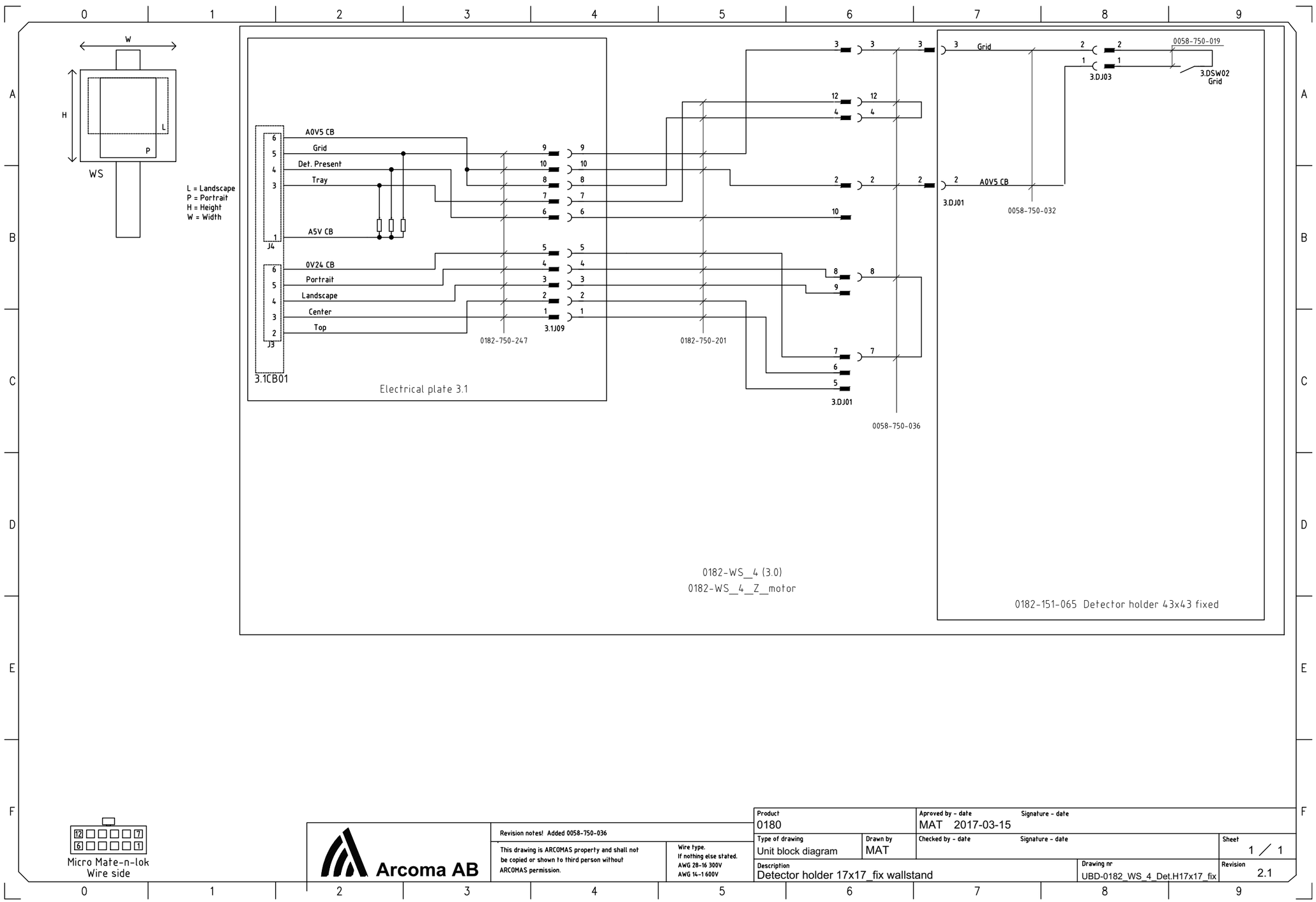

0055-099-006
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
UBD-0055_TS_4_BT-Z_foot_sw
2.2J05-1
2.2J05
J2
HCB 72-510
J4
S5
0200-007-212
2.4J03
Foot list
A2 A1 2.1RE15
X-Y-Brake
Y-Brake 11 14
X-Brake 21 24
0V5 CB
J1
J0
J3
J2
2.1CB01
Y-Brake A1 A2 2.1RE03
X-Brake A1 A2 2.1RE04
X-Y Brake
0V24 CB
2.1CB10
2.4J01
Foot switch
2.4J02
Foot switch
UBD-0055_TS_4_Power
2.1J01-1
2.1J01-5
24V
0V24
14 11
24 21
2.2J01
2.2BRA01 0055-002-552
2.3J01
2.3BRA01 0055-002-552
2.2J02
2.XJ01
2.XBRA01 0055-002-552
2.XBRA02 0055-002-553
2.1RE03 Release Y Brakes tabletop
2.1RE04 Release X Brakes tabletop
Arcoma AB
Revision notes! 4401 Added BT fot switch
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date Signature - date MAT 2018-03-26
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description Table top brakes
Drawing nr UBD_0055_TS_4_Table_top_Brakes
Revision 2.1

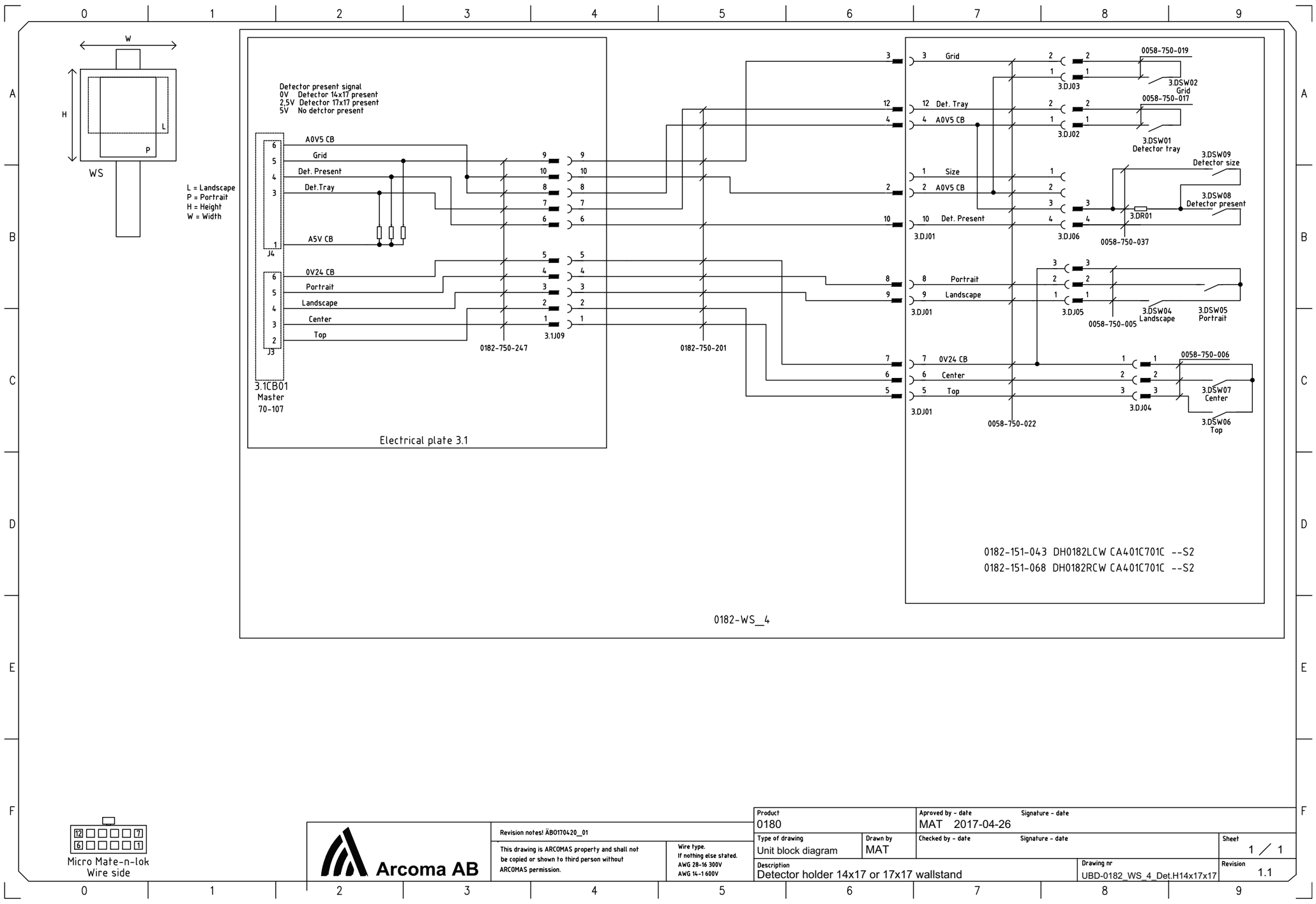

UBD-0055_TS_4_EM_stop
Emergency stop
2.1RE08
Detector crash (Option)
+24VDC
2.1RE02
24V
Watchdog
J3-2
2.1RE01
0V24
36V
13
14
1
2
3
4
5
6
24V
Bcmbox 24V
(Option)
Can bus
J6
Control
J0-2
Z Up
J1-2
Z DMG
J0-3
Z Down
Up
Down
Footpedal 01
Footpedal 02 (option)
J0-6
0V5 CB
J4
0-5V Pot. signal
J4
0-5V Pot. signal
J2-1
24V CB
2.1RE05
J2-4
Table tilt 01
2.1RE06
J2-5
Table tilt 02
J4
Analog sig.
Tiltsensor
2.2ANG01
Detects the tilt angle of the table
2.1CB01
Signal
Can bus
J4
J1-1
RE07
A2
A1
J5
J1-2
Guard board (Option)
Tabletop crash down (Option)
Tabletop crash sensor (option)
24V
2.2Z1J02-5
2.Z1SW01
Z1 Column end sw up
Block up
J3-2
2.1RE06
2.Z1J02-4
Block down
J3-3
2.Z1SW02
Z1 Column end sw down
2.1RE08
2.1RE07
2.1RE05
J3-4
J3-5
0V DC1
J3-6
2.Z1J02-3
Hardware inputs, if the ciruit is opened the z motor stops.
2.1DC01 (Head)
J4-1
0-36VDC
J4-2
0-36VDC
2.1DC02 (Foot)
Hardware inputs, if the ciruit is opened the z motor stops.
2.2Z2J02-5
2.Z2SW01
Z2 Column end sw up
J3-2
Block up
2.1RE05
J3-3
Block down
2.2Z2J02-4
2.1RE06
2.1RE07
2.1RE08
2.Z2SW02
Z2 Column end sw down
J3-4
J3-5
J3-6
0V DC2
2.Z2J02-3
Z2 MOT 01 (Foot column)
J4-1
0-36VDC
J4-2
0-36VDC
M
Z2 POT 01
24V
Z1 MOT 01 (Head column)
M
Z1 POT 01
Z1 POT 02
24V
RE01 Watchdog
Software controlled em.stop.
RE02 Em.stop relay
Brake 36V power and em ext signal.
RE05 Table tilt 01
Relay open (not activated) when:
Normal stop command from software.
Table tilted, head end to high.
Em stop active.
RE06 Table tilt 02
Relay open (not activated) when:
Normal stop command from software.
Table tilted, foot end to high.
Em stop active.
RE08 Detector crash
External switch (N.C) placed at the detector, crash down.
RE07 Tabletop crash
Stops Z down movement, when tabletop crash in to an object
2.2CB01-J4
0-5V Pot. signal
12
7
6
1
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-01-24
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Z-movement table
Drawing nr
UBD-0055_TS_4_Z-Unit
Revision
1.1

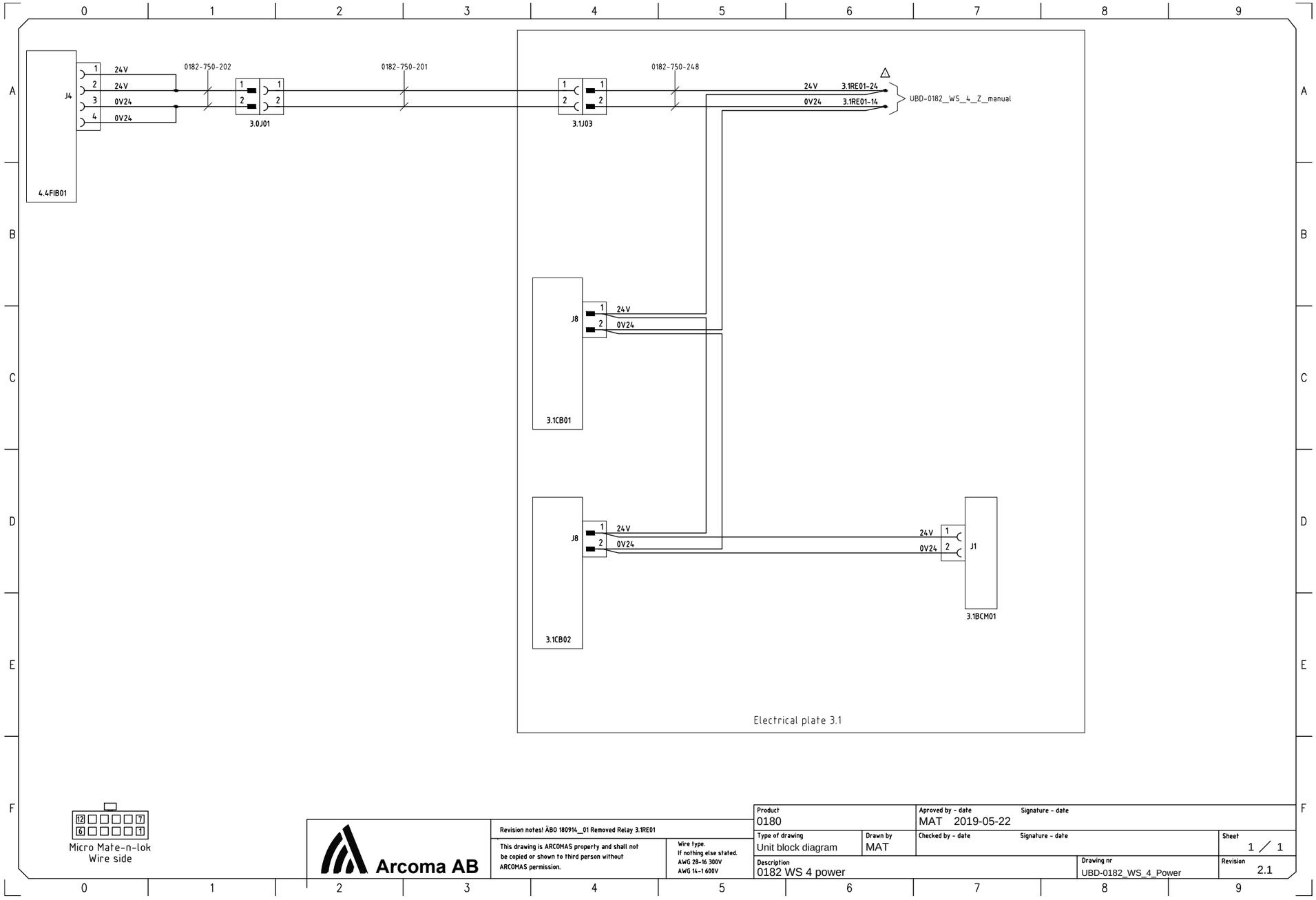

3.1BCM01
12V
0V
7812
RXE030 0.3A
J1
UBD-0182_WS_4_Power
or
UBD-0182_WS_4_Power_Z_motor
24V
0V24
3.0CAN01
2.2CAN02
0048-750-100
CAN H
CAN L
CAN H
CAN L
12V
0V
J6
3.1CB01
3.1CB02
4.4CB800_01-J2
System cabinet
UBD-0184_SC_4C_CAN
or
UBD-0184_SC_4D_CAN
Arcoma AB
Revision notes! Added links to system cabinet and 12V power
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-05-08
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
CAN bus wallstand
Drawing nr
UBD-0182_WS_4_CAN
Revision
3.1

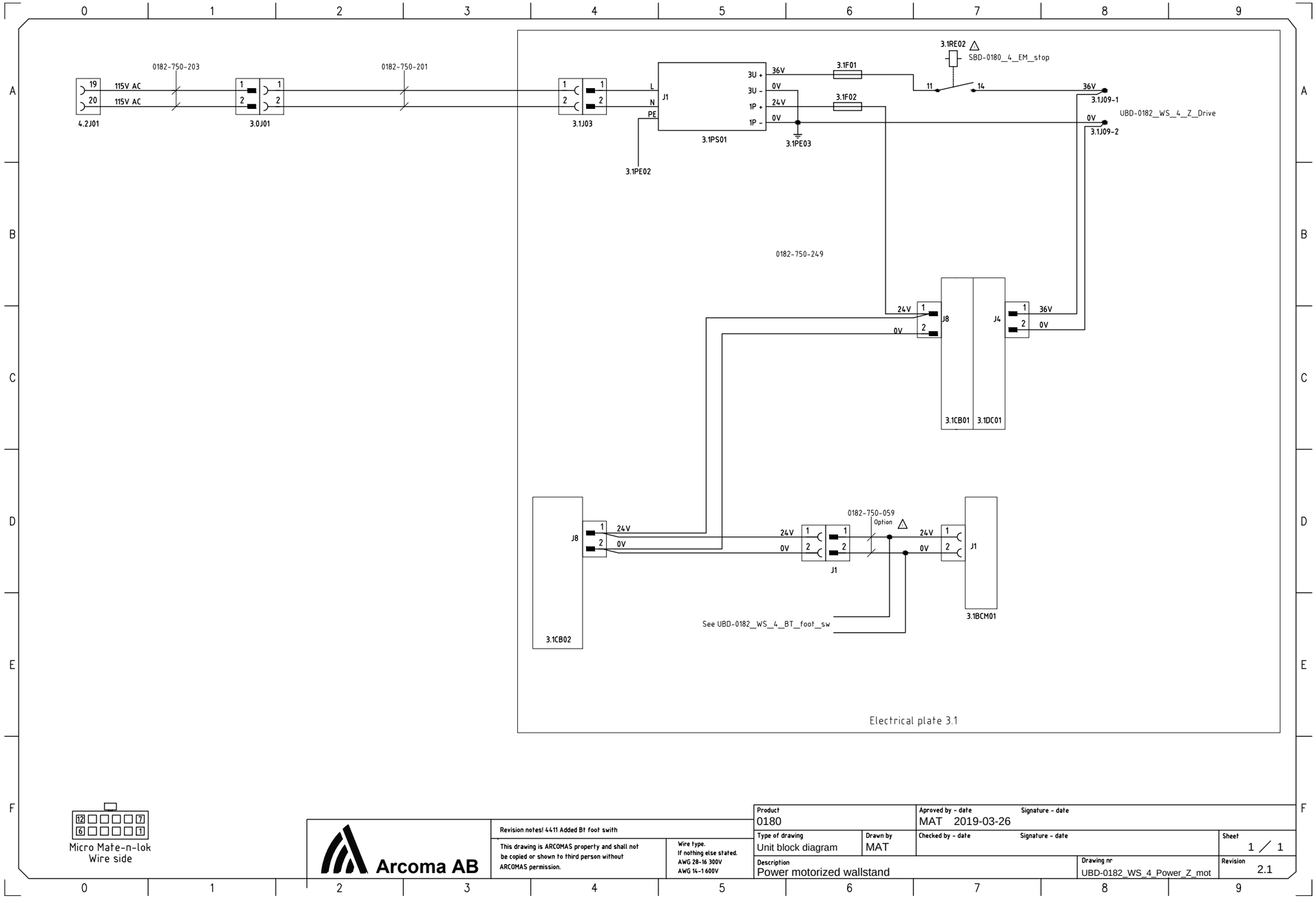

0182-750-247
0182-750-201
0182-750-016
J0-6
J2-5
J0-4
J0-5
J0-2
J0-3
J1-2
J1-3
J1-5
J3-3
J3-2
J1-4
J2-1
0V5 CB2
Coll light
Height open
Height close
Width open
Width close
Manual
Top
Bottom
Bottom Led
Top Led
Middle
24V CB2
3.1CB02
3.1J11
3.3J01
J1
Electrical plate 3.1
X2
X1
-S1
-S2
-S3
-S4
-S5
-S6
-S7
-S8
-S9
R1
R2
H1
H2
HCB 2 72-511
0200-007-233 (68500187)
S1
S2
S3
S4
S5
S6
S7
S8
S9
0182-099-010
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-01-25
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Collimator control wallstand
Drawing nr
UBD-0182_WS_4_Coll
Revision
1.1

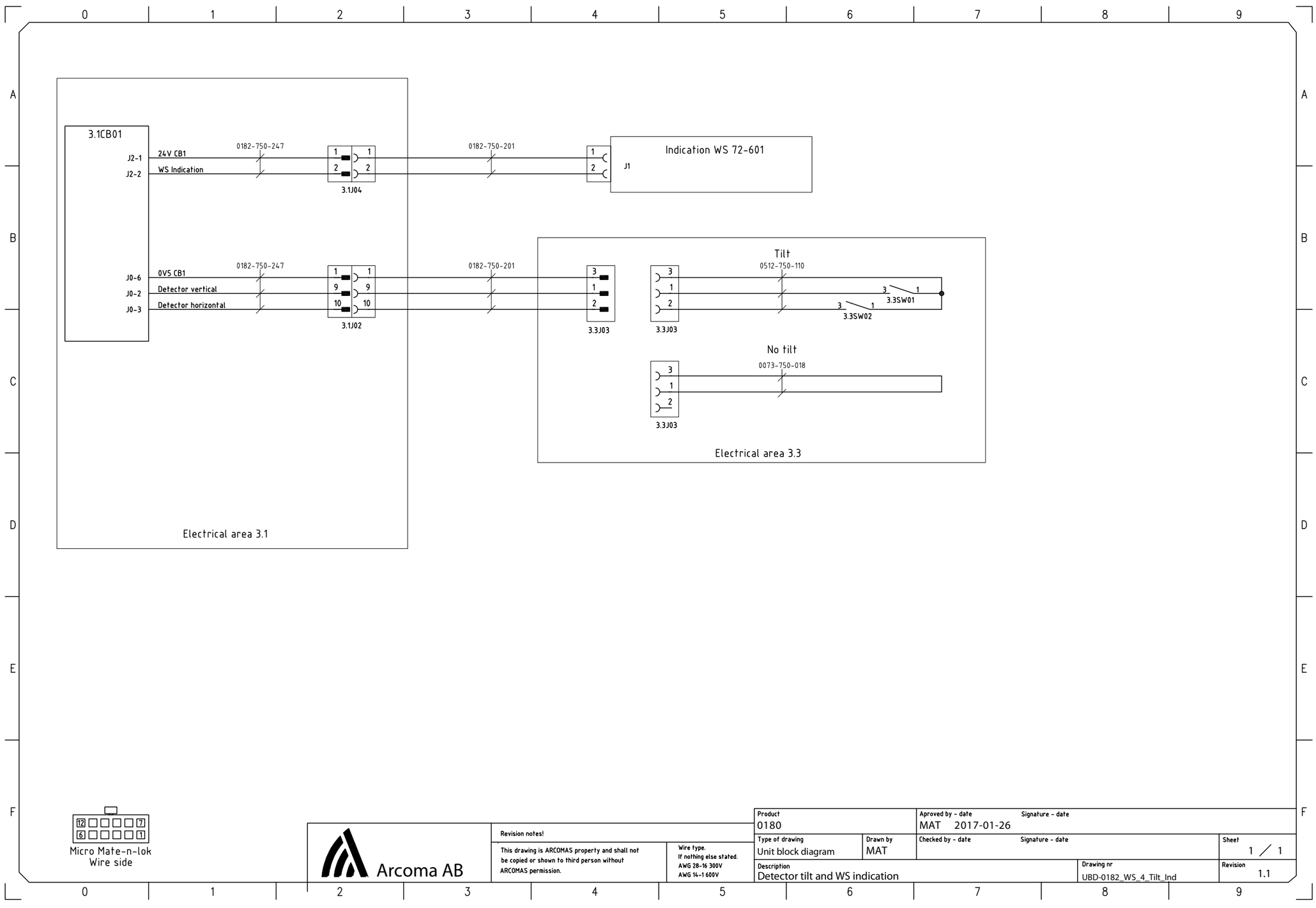

W
H
L
P
WS
L = Landscape
P = Portrait
H = Height
W = Width
A0V5 CB
Grid
Det. Present
Det.Tray
A5V CB
J4
0V24 CB
Portrait
Landscape
Center
Top
J3
3.1CB01
0182-750-247
3.1J09
0182-750-201
Electrical plate 3.1
0182-WS_4
Grid
Det. Tray
A0V5 CB
Size
Det. Present
Portrait
Landscape
0V24 CB
Center
Top
3.DJ01
3.DJ02
3.DJ03
3.DJ04
3.DJ05
3.DJ06
0058-750-022
0058-750-019
3.DSW02
Grid
0058-750-017
3.DSW01
Detector tray
0058-750-012
3.DSW08
Detector present
0058-750-005
3.DSW04
Landscape
3.DSW05
Portrait
0058-750-006
3.DSW07
Center
3.DSW06
Top
0182-151-044
0182-151-045
0182-151-058
0182-151-059
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-01-25
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
0182 WS 4 Detector holder 14x17, top, center, land,port
Drawing nr
UBD-0182_WS_4_Det.H14x17
Revision
1.1

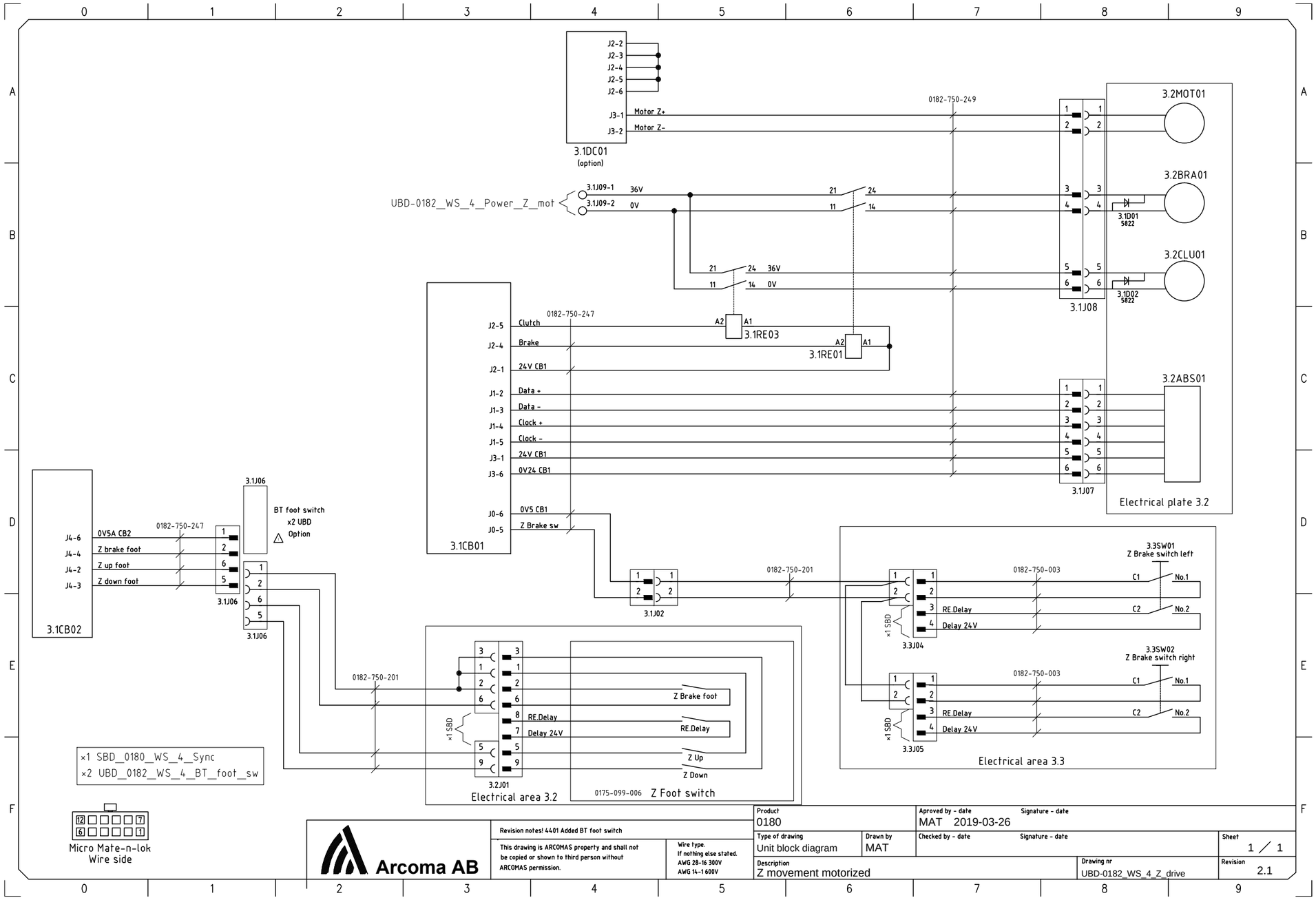

W
H
L
P
WS
L = Landscape
P = Portrait
H = Height
W = Width
A0V5 CB
Grid
Det. Present
Tray
A5V CB
J4
0V24 CB
Portrait
Landscape
Center
Top
J3
3.1CB01
Electrical plate 3.1
3.1J09
0182-750-247
0182-750-201
3.DJ01
0058-750-036
0058-750-019
3.DSW02
Grid
3.DJ03
A0V5 CB
3.DJ01
0058-750-032
0182-WS_4 (3.0)
0182-WS_4_Z_motor
0182-151-065 Detector holder 43x43 fixed
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! Added 0058-750-036
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-03-15
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 17x17_fix wallstand
Drawing nr
UBD-0182_WS_4_Det.H17x17_fix
Revision
2.1

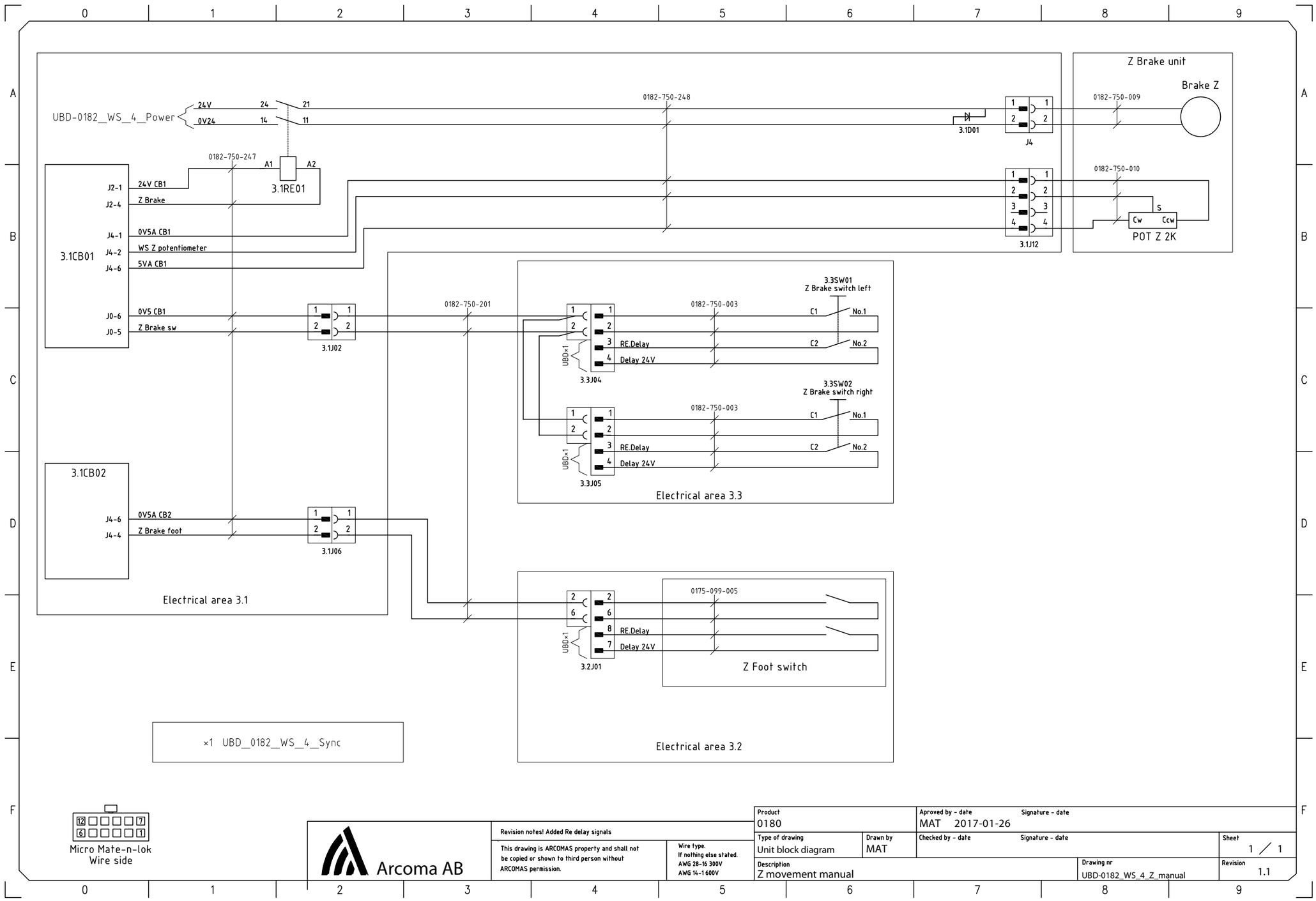

W
H
L
P
WS
L = Landscape
P = Portrait
H = Height
W = Width
Detector present signal
0V Detector 14x17 present
2,5V Detector 17x17 present
5V No detctor present
A0V5 CB
Grid
Det. Present
Det.Tray
A5V CB
0V24 CB
Portrait
Landscape
Center
Top
J4
J3
3.1CB01
Master
70-107
3.1J09
0182-750-247
0182-750-201
Electrical plate 3.1
Grid
Det. Tray
A0V5 CB
Size
A0V5 CB
Det. Present
Portrait
Landscape
0V24 CB
Center
Top
3.DJ01
3.DJ03
3.DJ02
3.DJ06
3.DJ05
3.DJ04
0058-750-019
0058-750-017
0058-750-037
0058-750-005
0058-750-022
0058-750-006
3.DSW02
Grid
3.DSW01
Defector tray
3.DSW09
Defector size
3.DSW08
Defector present
3.DR01
3.DSW04
Landscape
3.DSW05
Portrait
3.DSW07
Center
3.DSW06
Top
0182-151-043 DH0182LCW CA401C701C --S2
0182-151-068 DH0182RCW CA401C701C --S2
0182-WS_4
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! ÄB0170420_01
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-04-26
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 14x17 or 17x17 wallstand
Drawing nr
UBD-0182_WS_4_Det.H14x17x17
Revision
1.1

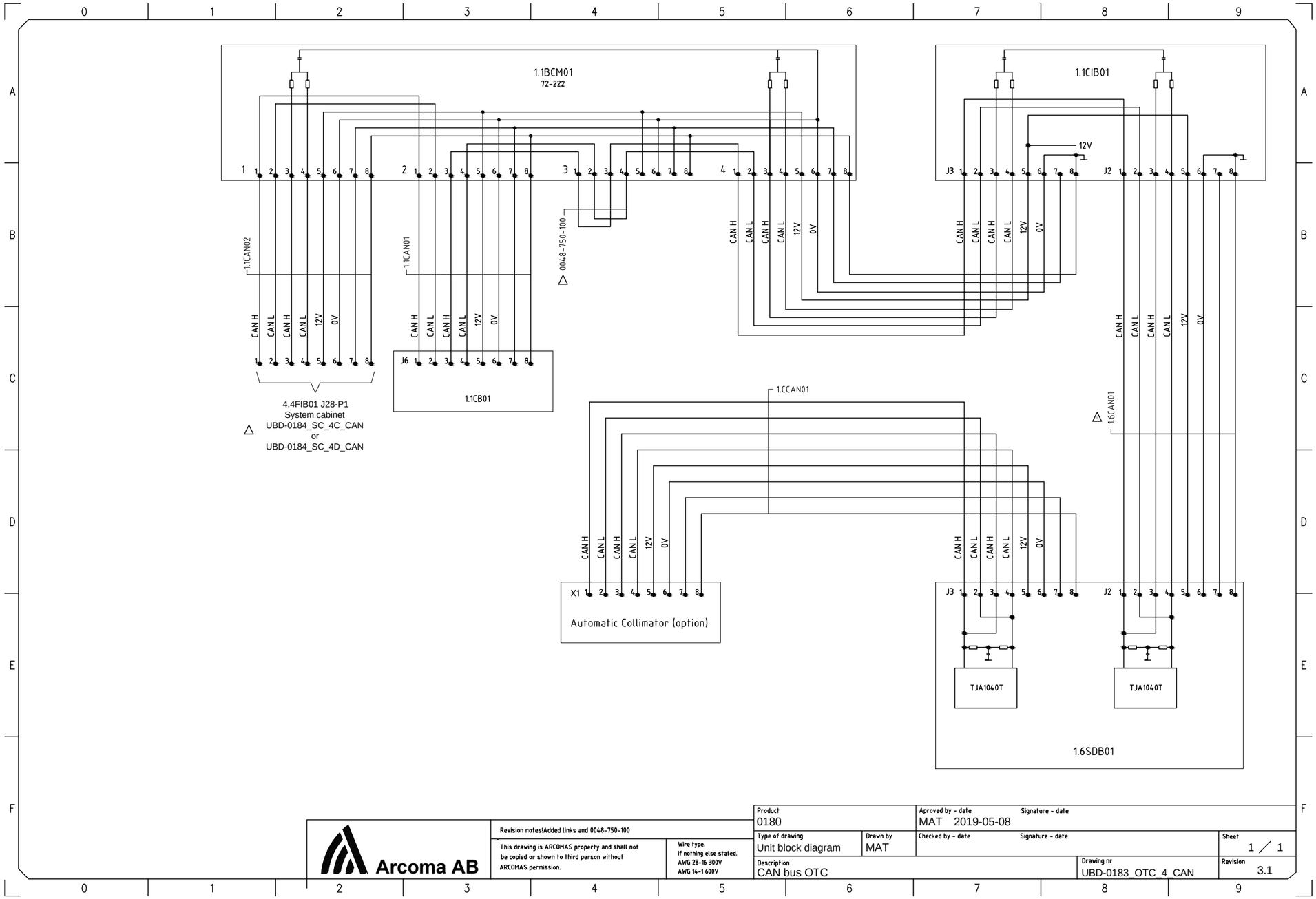

0 1 2 3 4 5 6 7 8 9
A B C D E F
J4
1 24V
2 24V
3 0V24
4 0V24
4.4FIB01
0182-750-202
3.0J01
0182-750-201
3.1J03
0182-750-248
24V 3.1RE01-24
0V24 3.1RE01-14
UBD-0182__WS__4__Z__manual
J8
1 24V
2 0V24
3.1CB01
J8
1 24V
2 0V24
3.1CB02
24V
0V24
J1
3.1BCM01
Electrical plate 3.1
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! ÅBO 180914__01 Removed Relay 3.1RE01
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product 0180
Aproved by - date Signature - date MAT 2019-05-22
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description 0182 WS 4 power
Drawing nr UBD-0182_WS_4_Power
Revision 2.1

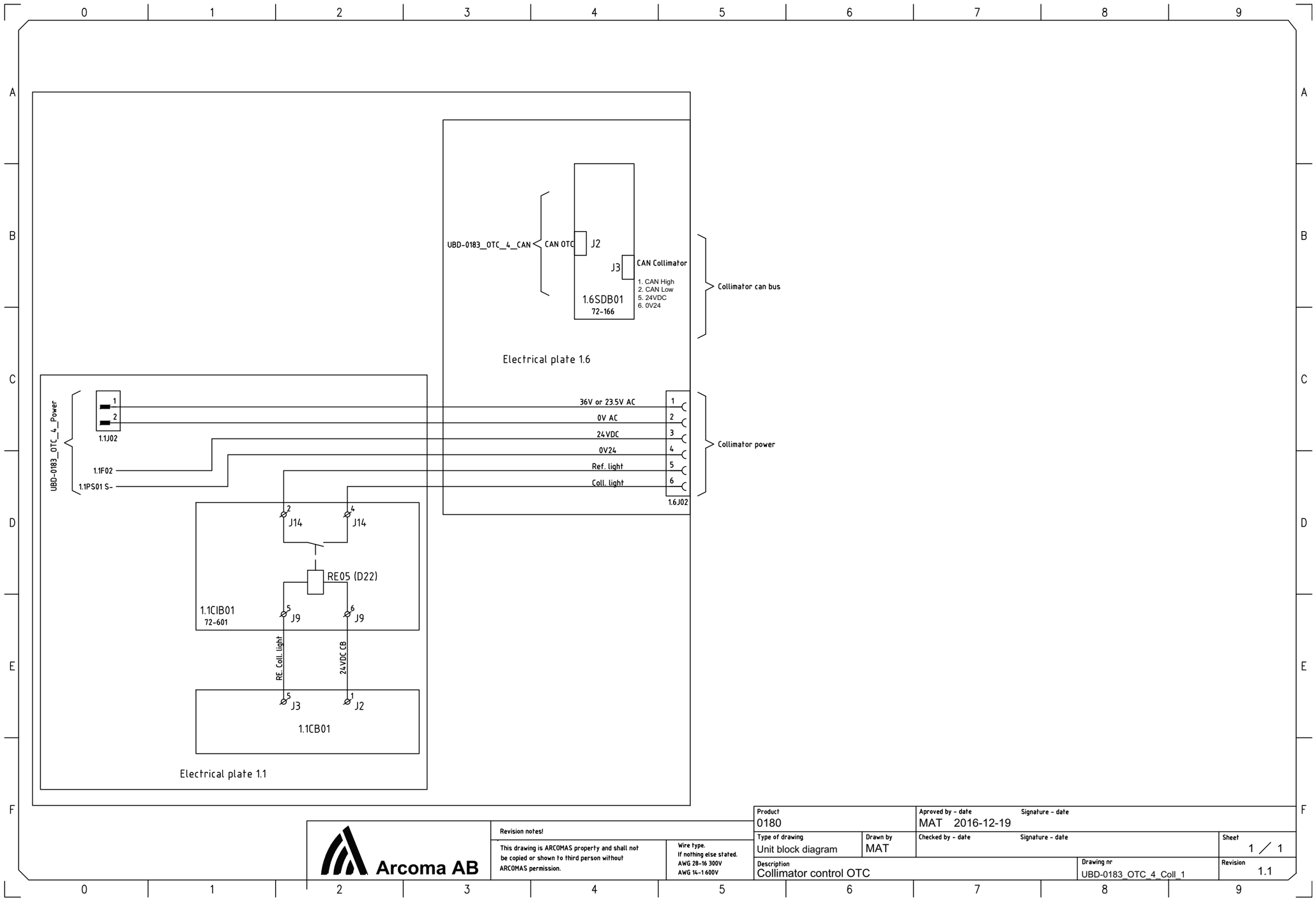

0182-750-203
0182-750-201
19
20
115V AC
115V AC
4.2J01
3.0J01
3.1J03
L
N
PE
J1
3U +
3U -
1P +
1P -
36V
0V
24V
0V
3.1PS01
3.1PE02
3.1PE03
3.1F01
3.1F02
3.1RE02
SBD-0180__4__EM_stop
11
14
36V
3.1J09-1
0V
3.1J09-2
UBD-0182__WS__4__Z__Drive
0182-750-249
24V
0V
J8
J4
36V
0V
3.1CB01
3.1DC01
0182-750-059
Option
See UBD-0182__WS__4__BT__foot__sw
3.1CB02
3.1BCM01
Electrical plate 3.1
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! 4411 Added Bt foot swith
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-03-26
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Power motorized wallstand
Drawing nr
UBD-0182_WS_4_Power_Z_mot
Revision
2.1

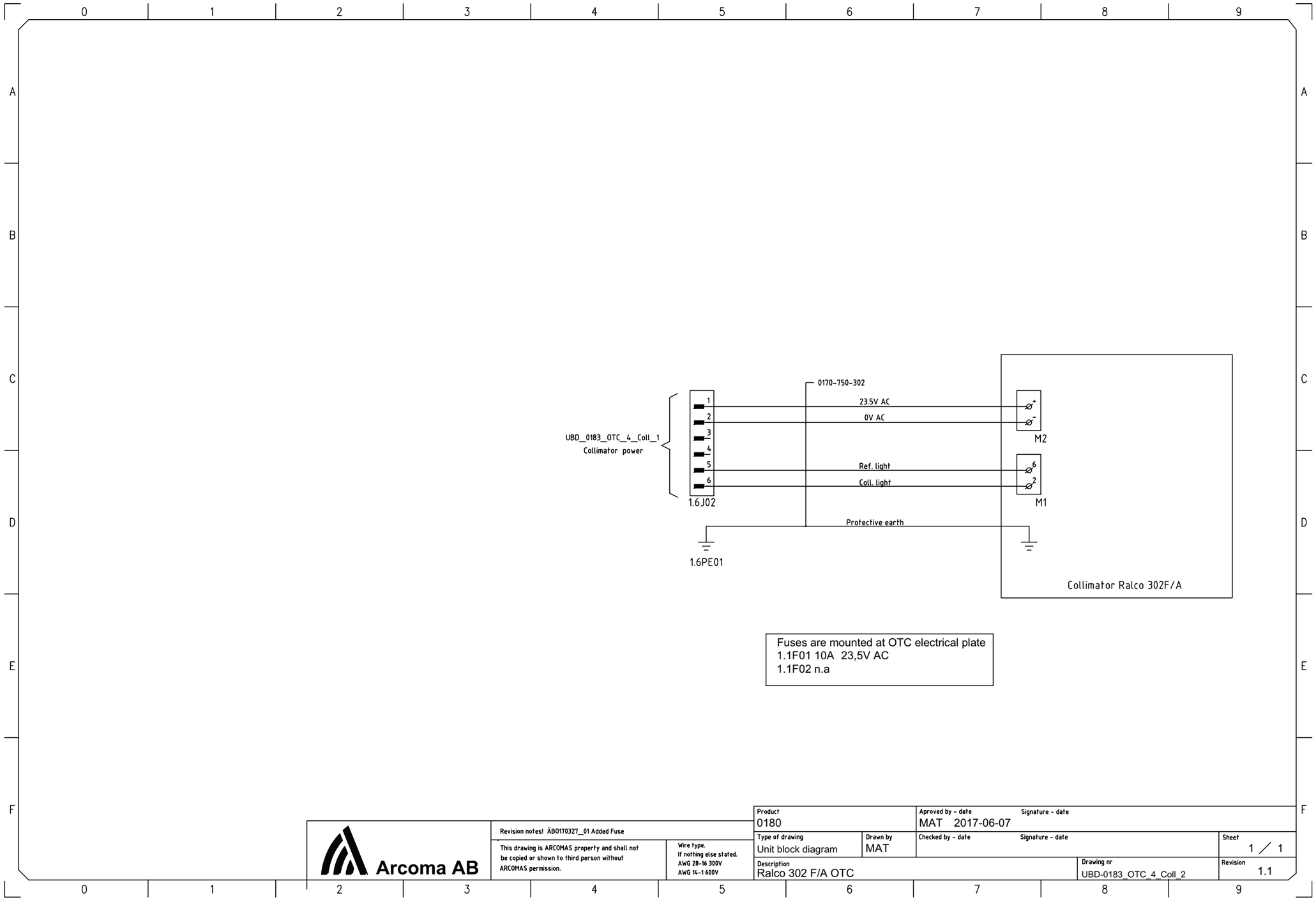

3.1CB01
J2-1
J2-2
24V CB1
WS Indication
0182-750-247
3.1J04
0182-750-201
Indication WS 72-601
J1
J0-6
J0-2
J0-3
0V5 CB1
Detector vertical
Detector horizontal
3.1J02
3.3J03
Tilt
0512-750-110
3.3SW01
3.3SW02
No tilt
0073-750-018
Electrical area 3.1
Electrical area 3.3
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-01-26
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector tilt and WS indication
Drawing nr
UBD-0182_WS_4_Tilt_Ind
Revision
1.1


3.1DC01
(option)
J2-2
J2-3
J2-4
J2-5
J2-6
J3-1
J3-2
Motor Z+
Motor Z-
0182-750-249
3.2MOT01
3.2BRA01
3.1D01
5822
3.2CLU01
3.1D02
5822
3.1J08
UBD-0182_WS_4_Power_Z_mot
3.1J09-1
3.1J09-2
36V
0V
21
24
11
14
3.1RE03
3.1RE01
0182-750-247
Clutch
Brake
24V CB1
Data +
Data -
Clock +
Clock -
24V CB1
0V24 CB1
0V5 CB1
Z Brake sw
3.1CB01
3.2ABS01
3.1J07
Electrical plate 3.2
3.1J02
0182-750-201
3.3SW01
Z Brake switch left
0182-750-003
C1
No.1
C2
No.2
RE.Delay
Delay 24V
×1 SBD
3.3J04
3.3SW02
Z Brake switch right
3.3J05
Electrical area 3.3
3.1J06
BT foot switch
x2 UBD
Option
0V5A CB2
Z brake foot
Z up foot
Z down foot
3.1CB02
3.2J01
Z Brake foot
RE.Delay
Delay 24V
Z Up
Z Down
Electrical area 3.2
0175-099-006 Z Foot switch
×1 SBD_0180_WS_4_Sync
×2 UBD_0182_WS_4_BT_foot_sw
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! 4401 Added BT foot switch
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-03-26
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Z movement motorized
Drawing nr
UBD-0182_WS_4_Z_drive
Revision
2.1


UBD-0182__WS__4__Power
24V
0V24
24
14
21
11
0182-750-247
A1
A2
3.1RE01
0182-750-248
3.1D01
J4
Z Brake unit
Brake Z
0182-750-009
0182-750-010
S
Cw
Ccw
POT Z 2K
3.1J12
3.1CB01
J2-1
24V CB1
J2-4
Z Brake
J4-1
0V5A CB1
J4-2
WS Z potentiometer
J4-6
5VA CB1
J0-6
0V5 CB1
J0-5
Z Brake sw
3.1J02
0182-750-201
3.3SW01
Z Brake switch left
C1
No.1
C2
No.2
0182-750-003
RE.Delay
Delay 24V
UBD×1
3.3J04
3.3SW02
Z Brake switch right
3.3J05
Electrical area 3.3
3.1CB02
J4-6
0V5A CB2
J4-4
Z Brake foot
3.1J06
Electrical area 3.1
0175-099-005
3.2J01
Z Foot switch
Electrical area 3.2
×1 UBD__0182__WS__4__Sync
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! Added Re delay signals
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-01-26
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Z movement manual
Drawing nr
UBD-0182_WS_4_Z_manual
Revision
1.1


1.1BCM01
72-222
1.1CIB01
12V
J3
J2
1.1CAN02
1.1CAN01
0048-750-100
CAN H
CAN L
12V
0V
J6
1.1CB01
4.4FIB01 J28-P1
System cabinet
UBD-0184_SC_4C_CAN
or
UBD-0184_SC_4D_CAN
1.CCAN01
1.6CAN01
X1
Automatic Collimator (option)
TJA1040T
1.6SDB01
Arcoma AB
Revision notes!Added links and 0048-750-100
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2019-05-08
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
CAN bus OTC
Drawing nr
UBD-0183_OTC_4_CAN
Revision
3.1


UBD-0183_OTC_4_CAN
CAN OTC
J2
J3
CAN Collimator
1. CAN High
2. CAN Low
5. 24VDC
6. 0V24
1.6SDB01
72-166
Collimator can bus
Electrical plate 1.6
UBD-0183_OTC_4_Power
1.1J02
1.1F02
1.1PS01 S-
36V or 23.5V AC
0V AC
24VDC
0V24
Ref. light
Coll. light
1.6J02
Collimator power
J14
J14
RE05 (D22)
1.1CIB01
72-601
J9
J9
RE. Coll. light
24VDC CB
J3
J2
1.1CB01
Electrical plate 1.1
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2016-12-19
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Collimator control OTC
Drawing nr
UBD-0183_OTC_4_Coll_1
Revision
1.1



Fuses are mounted at OTC electrical plate
1.1F01 10A 23,5V AC
1.1F02 n.a

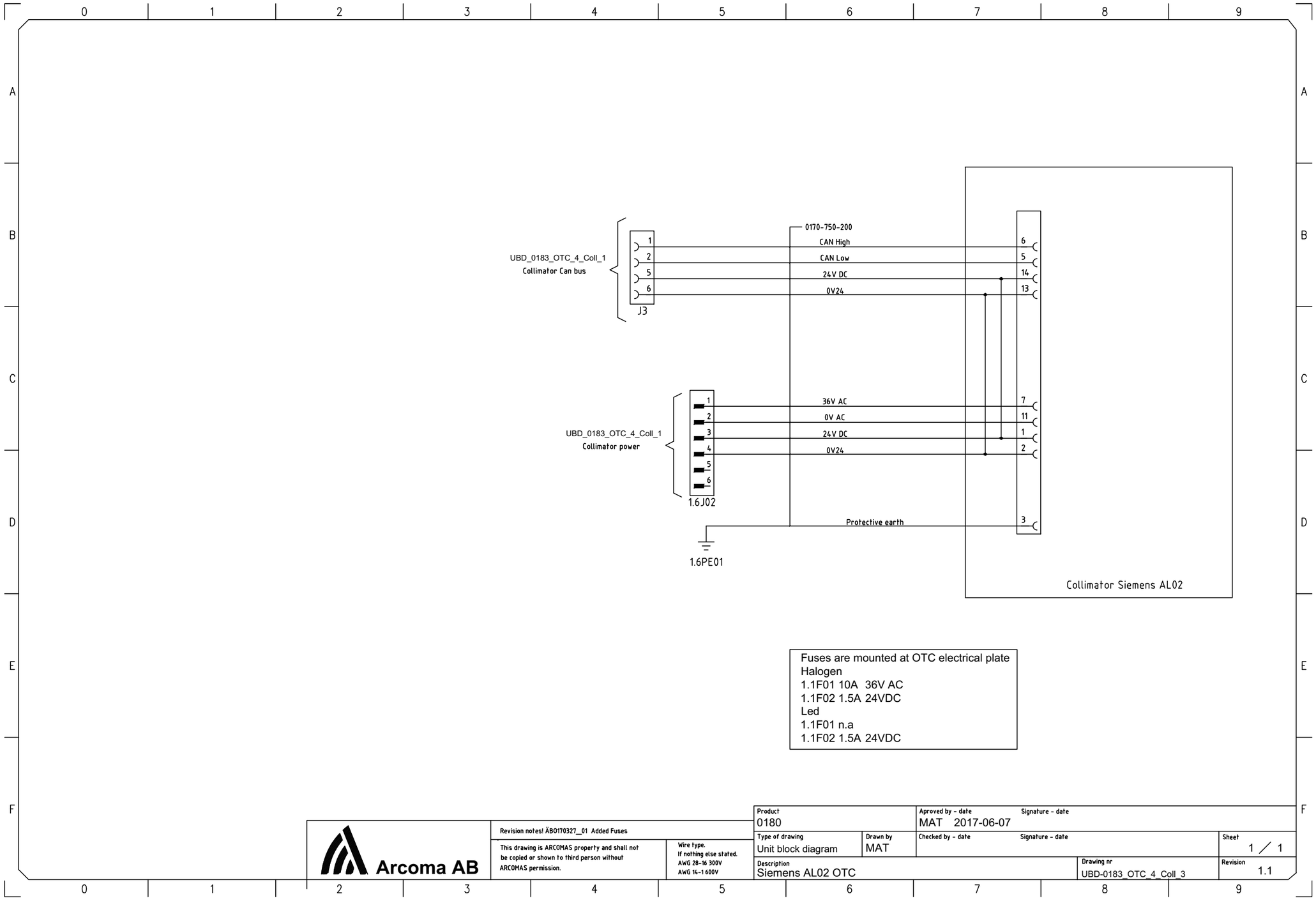
Arcoma AB

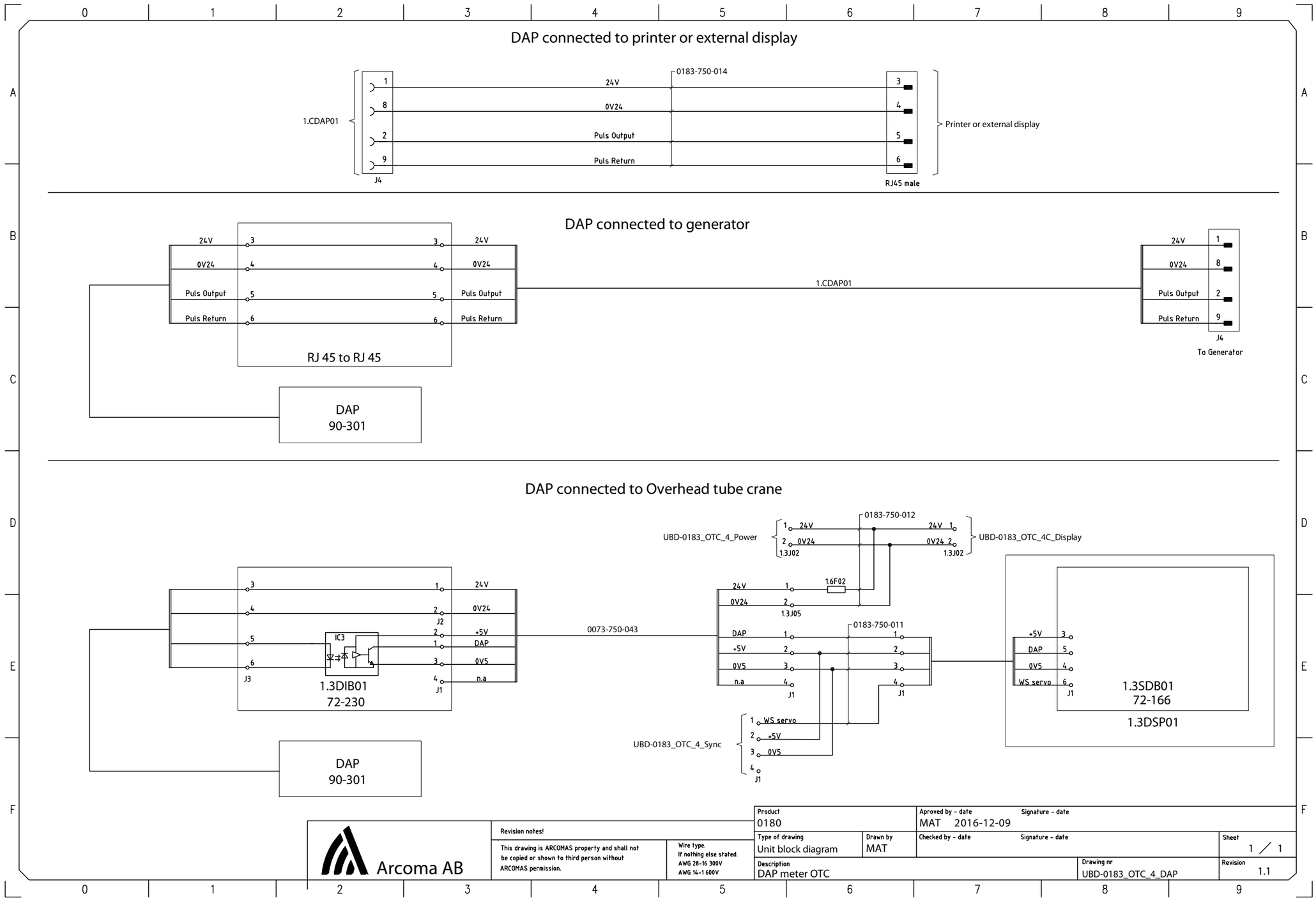
Revision notes! ÄBO170327_01 Added Fuse

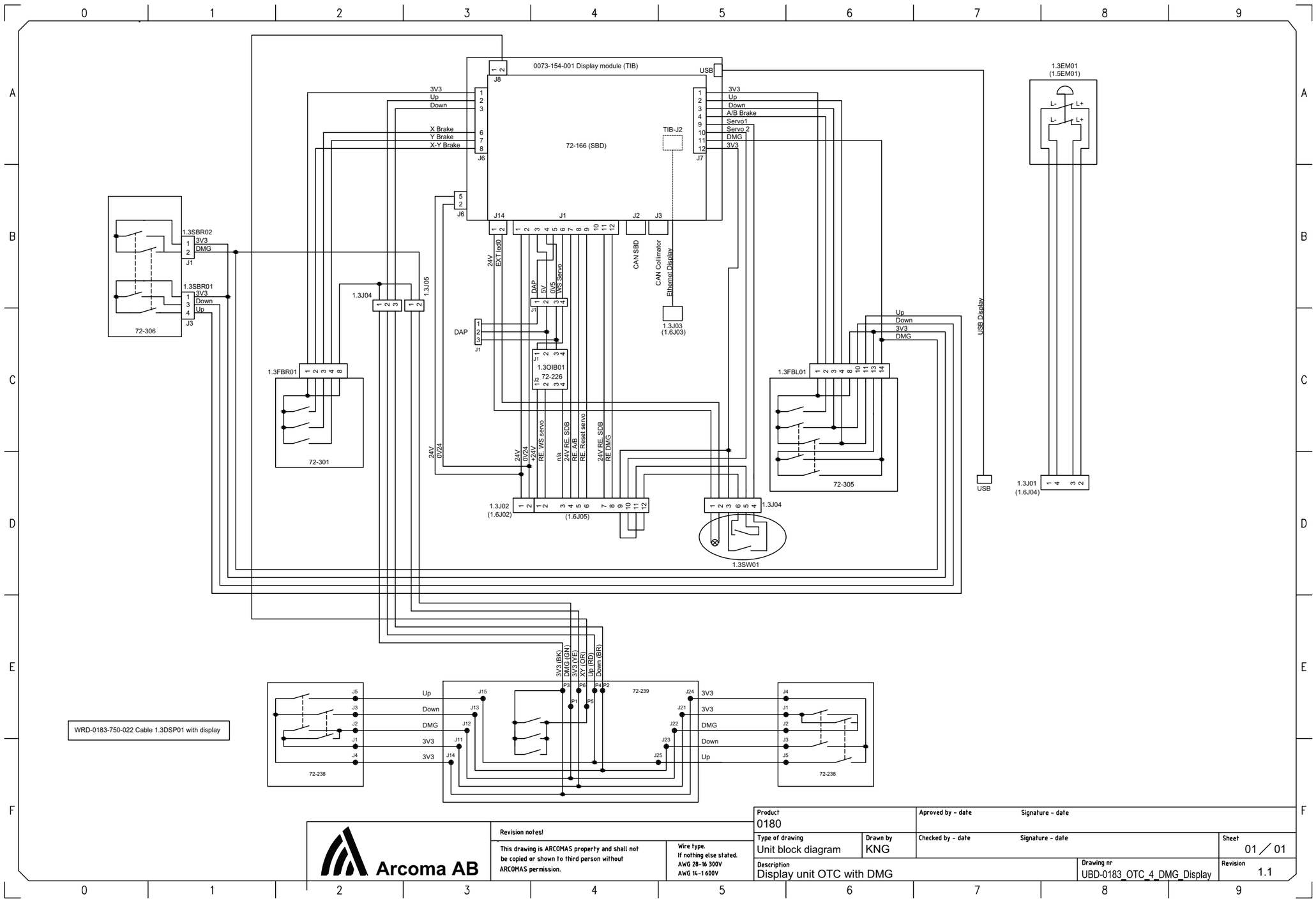
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

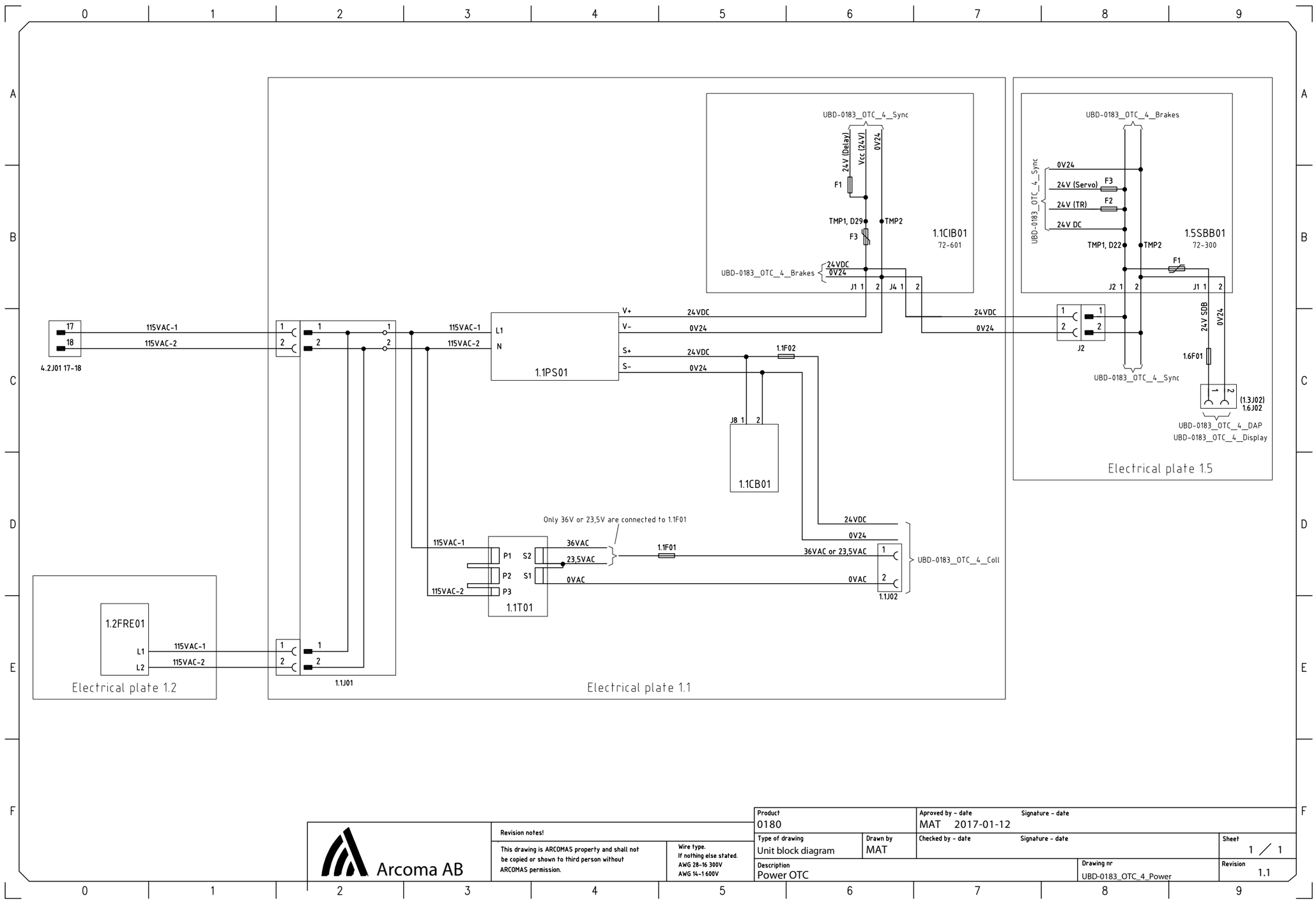
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

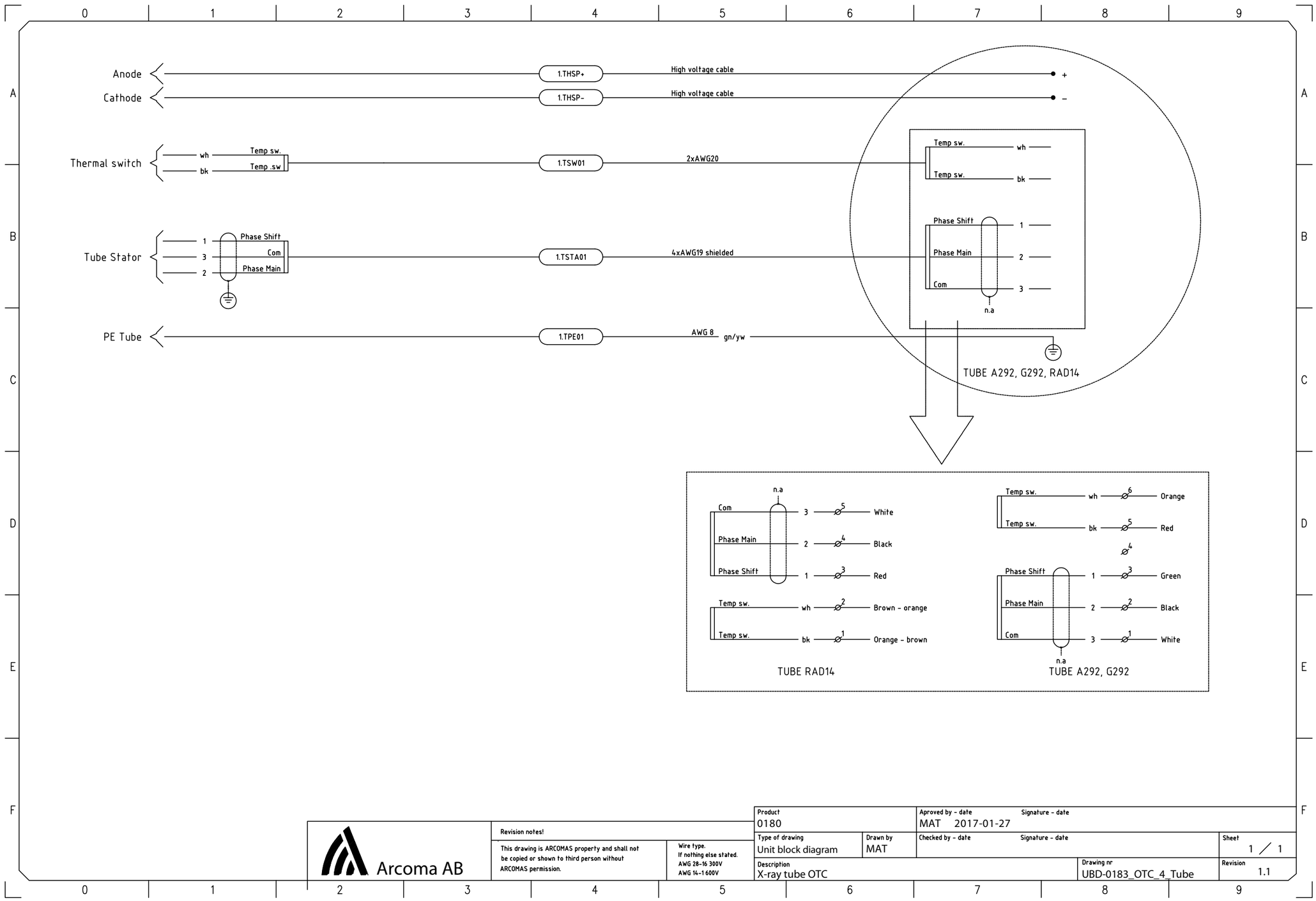
Product: 0180		Aproved by - date / Signature - date: MAT 2017-06-07	
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: Ralco 302 F/A OTC		Drawing nr: UBD-0183_OTC_4_Coll_2	Revision: 1.1

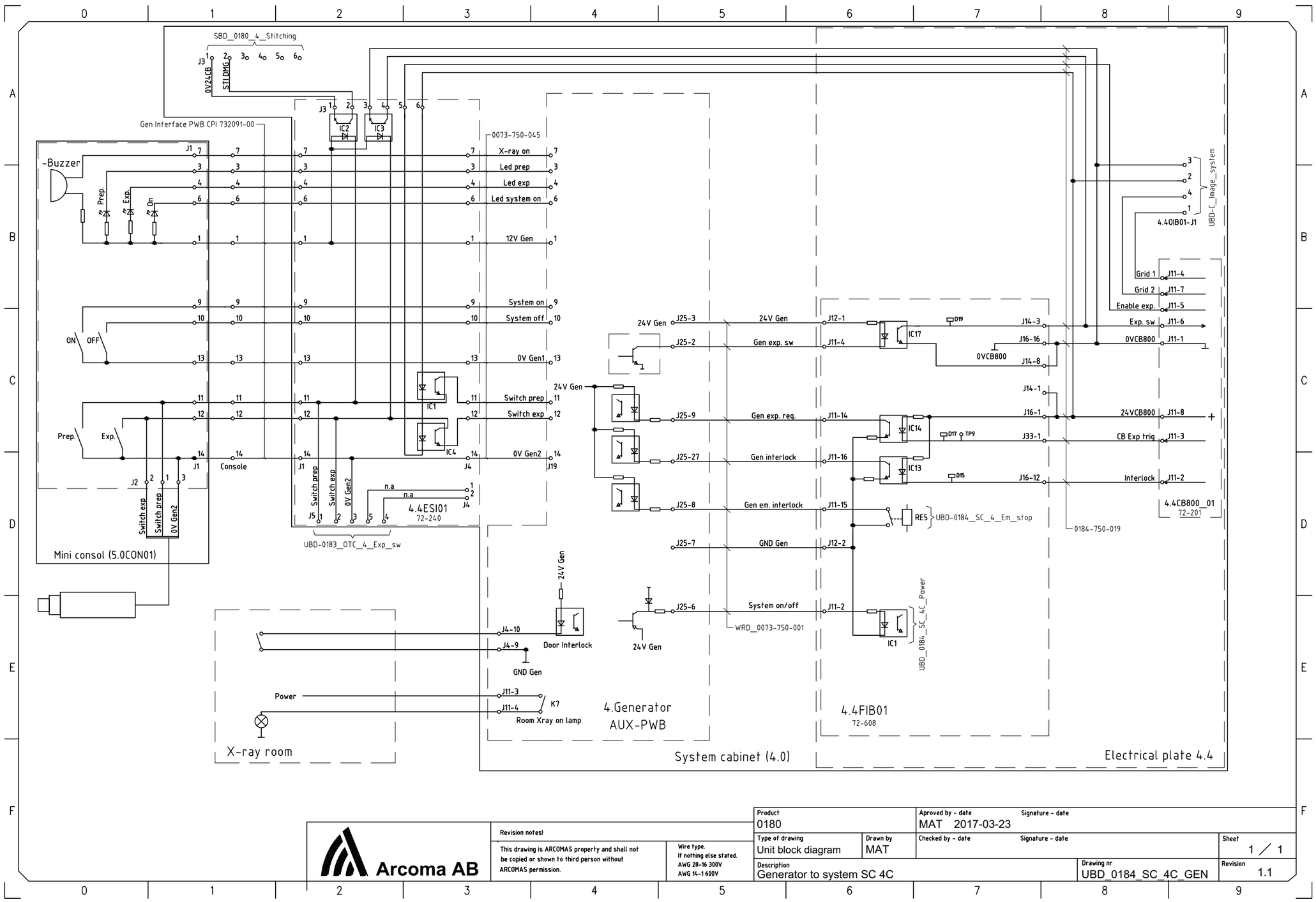

UBD_0183_OTC_4_Coll_1
Collimator Can bus
J3
1
2
5
6
0170-750-200
CAN High
CAN Low
24V DC
0V24
6
5
14
13
UBD_0183_OTC_4_Coll_1
Collimator power
1.6J02
1
2
3
4
5
6
36V AC
0V AC
24V DC
0V24
7
11
1
2
Protective earth
3
1.6PE01
Collimator Siemens AL02
Fuses are mounted at OTC electrical plate
Halogen
1.1F01 10A 36V AC
1.1F02 1.5A 24VDC
Led
1.1F01 n.a
1.1F02 1.5A 24VDC
Arcoma AB
Revision notes! ÄB0170327_01 Added Fuses
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-06-07
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Siemens AL02 OTC
Drawing nr
UBD-0183_OTC_4_Coll_3
Revision
1.1


DAP connected to printer or external display
0183-750-014
1.CDAP01
24V
0V24
Puls Output
Puls Return
Printer or external display
J4
RJ45 male
DAP connected to generator
24V
0V24
Puls Output
Puls Return
RJ 45 to RJ 45
1.CDAP01
J4
To Generator
DAP
90-301
DAP connected to Overhead tube crane
0183-750-012
UBD-0183_OTC_4_Power
UBD-0183_OTC_4C_Display
1.3J02
1.6F02
1.3J05
0073-750-043
0183-750-011
DAP
+5V
0V5
n.a
WS servo
UBD-0183_OTC_4_Sync
J1
J2
J3
IC3
1.3DIB01
72-230
1.3SDB01
72-166
1.3DSP01
DAP
90-301
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2016-12-09
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
DAP meter OTC
Drawing nr
UBD-0183_OTC_4_DAP
Revision
1.1


0073-154-001 Display module (TIB)
J8
USB
3V3
Up
Down
X Brake
Y Brake
X-Y Brake
J6
72-166 (SBD)
TIB-J2
A/B Brake
Servo1
Servo 2
DMG
J7
J14
J1
J2
J3
24V EXT led0
DAP 5V
0V5 WS Servo
CAN SBD
CAN Collimator
Ethernet Display
1.3J03 (1.6J03)
1.3SBR02
1.3SBR01
72-306
1.3J04
1.3J05
DAP
1.3FBR01
72-301
1.3OIB01
72-226
1.3FBL01
72-305
Up
Down
3V3
DMG
USB Display
USB
1.3EM01 (1.5EM01)
L-
L+
1.3J01 (1.6J04)
24V
0V24
+24V
RE. WS servo
n/a
24V RE. SDB
RE. A/B
RE. Reset servo
24V RE. SDB
RE DMG
1.3J02 (1.6J02)
(1.6J05)
1.3J04
1.3SW01
3V3 (BK)
DMG (GN)
3V3 (YE)
XY (OR)
Up (RD)
Down (BR)
72-239
72-238
WRD-0183-750-022 Cable 1.3DSP01 with display
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
Signature - date
Type of drawing
Unit block diagram
Drawn by
KNG
Checked by - date
Signature - date
Sheet
01 / 01
Description
Display unit OTC with DMG
Drawing nr
UBD-0183_OTC_4_DMG_Display
Revision
1.1


UBD-0183_OTC_4_Sync
24V (Delay)
Vcc (24V)
0V24
F1
TMP1, D29
TMP2
F3
1.1CIB01
72-601
24VDC
0V24
UBD-0183_OTC_4_Brakes
J1 1 2
J4 1 2
UBD-0183_OTC_4_Brakes
0V24
24V (Servo)
F3
24V (TR)
F2
24V DC
UBD-0183_OTC_4_Sync
TMP1, D22
TMP2
1.5SBB01
72-300
F1
J2 1 2
J1 1 2
24VDC
0V24
J2
24V SDB
0V24
1.6F01
UBD-0183_OTC_4_Sync
(1.3J02)
1.6J02
UBD-0183_OTC_4_DAP
UBD-0183_OTC_4_Display
Electrical plate 1.5
17
18
115VAC-1
115VAC-2
4.2J01 17-18
L1
N
1.1PS01
V+
V-
S+
S-
24VDC
0V24
24VDC
0V24
1.1F02
J8 1 2
1.1CB01
Only 36V or 23,5V are connected to 1.1F01
115VAC-1
115VAC-2
P1
P2
P3
S2
S1
36VAC
23,5VAC
0VAC
1.1F01
1.1T01
24VDC
0V24
36VAC or 23,5VAC
0VAC
1.1J02
UBD-0183_OTC_4_Coil
1.2FRE01
L1
L2
115VAC-1
115VAC-2
Electrical plate 1.2
1.1J01
Electrical plate 1.1
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-01-12
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Power OTC
Drawing nr
UBD-0183_OTC_4_Power
Revision
1.1


Anode
Cathode
Thermal switch
wh
bk
Temp sw.
Temp .sw
Tube Stator
1
3
2
Phase Shift
Com
Phase Main
PE Tube
1.THSP+
1.THSP-
1.TSW01
1.TSTA01
1.TPE01
High voltage cable
High voltage cable
2xAWG20
4xAWG19 shielded
AWG 8
gn/yw
+
–
Temp sw.
wh
Temp sw.
bk
Phase Shift
1
Phase Main
2
Com
3
n.a
TUBE A292, G292, RAD14
n.a
Com
3
5
White
Phase Main
2
4
Black
Phase Shift
1
3
Red
Temp sw.
wh
2
Brown - orange
Temp sw.
bk
1
Orange - brown
TUBE RAD14
Temp sw.
wh
6
Orange
Temp sw.
bk
5
Red
4
Phase Shift
1
3
Green
Phase Main
2
2
Black
Com
3
1
White
n.a
TUBE A292, G292
Arcoma AB
Revision notes!
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V
Product
0180
Aproved by - date
MAT 2017-01-27
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
X-ray tube OTC
Drawing nr
UBD-0183_OTC_4_Tube
Revision
1.1


SBD_0180_4_Stitching
J3
0V24CB
STI DMG
Gen Interface PWB CPI 732091-00
0073-750-045
IC2
IC3
IC1
IC4
-Buzzer
Prep.
Exp.
On
ON
OFF
Prep.
Exp.
Console
Mini consol (5.0CON01)
X-ray on
Led prep
Led exp
Led system on
12V Gen
System on
System off
0V Gen1
Switch prep
Switch exp
0V Gen2
n.a
n.a
4.4ESI01
72-240
UBD-0183_OTC_4_Exp_sw
24V Gen
Door Interlock
GND Gen
Power
Room Xray on lamp
K7
X-ray room
4.Generator
AUX-PWB
System cabinet (4.0)
J25-3
J25-2
J25-9
J25-27
J25-8
J25-7
J25-6
Gen exp. sw
Gen exp. req.
Gen interlock
Gen em. interlock
GND Gen
System on/off
WRD_0073-750-001
IC17
IC14
IC13
RE5
UBD-0184_SC_4_Em_stop
IC1
UBD_0184_SC_4C_Power
4.4FIB01
72-608
Electrical plate 4.4
4.4OIB01-J1
UBD-C_Image_system
Grid 1
Grid 2
Enable exp.
Exp. sw
0VCB800
24VCB800
CB Exp trig
Interlock
4.4CB800_01
72-201
0184-750-019
Arcoma AB
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V
Product 0180
Aproved by - date Signature - date MAT 2017-03-23
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date Signature - date
Sheet 1 / 1
Description Generator to system SC 4C
Drawing nr UBD_0184_SC_4C_GEN
Revision 1.1

9 Fuses

The fuses part number, size, type, designation and function are listed in the table below. Turn off the power to the product when removing and replacing fuses. Replace only with the exactly same type of fuses.

9.1 OTC

Fuse chart electrical plate 1.1

Designation	Size	Type	Manufacturer	Function
1.1F01	10A	C60N 1P C10A	Schneider Electric/Merlin Gerin	Coll. Halogen lamp power
1.1F02	1.5A	326 series - SloBlo ceramic body 6.3x32 mm	Littlefuse	Coll. 24 VDC power

Fuse chart PCB 1.1CIB01

Designation	Size	Type	Manufacturer	Function
F1	100mA	217 series - Fast acting Glass body 5x20 mm	Littlefuse	Delay circuit table

Fuse chart PCB 1.5SBB01

Designation	Size	Type	Manufacturer	Function
F1	100mA	217 series - Fast acting Glass body 5x20 mm	Littlefuse	Delay circuit wallstand

Fuse chart 1.6

Designation	Size	Type	Manufacturer	Function
1.6F01	1.5AT	326 series - SloBlo ceramic body 6.3x32 mm	Littlefuse	Display 24 V power
1.6F02	0.5AT	313 series - SloBlo glass body 6.3x32 mm	Littlefuse	DAP 24V power

9.2 System Cabinet

Fuse chart electrical plate 4.2

Designation	Size	Type	Manufacturer	Function
4.2F01	C20A	C60N 3P C20A	Schneider Electric/Merlin Gerin	Mains power
4.2F02	C1A	C60N 1P C1A	Schneider Electric/Merlin Gerin	Internal 230 VAC
4.2F03	C6A	C60N 2P C6A	Schneider Electric/Merlin Gerin	Ceil 2x115 VAC
4.2F04	C6A	C60N 2P C6A	Schneider Electric/Merlin Gerin	Table 2x115 VAC
4.2F05	C6A	C60N 1P C6A	Schneider Electric/Merlin Gerin	Detectors 230 VAC

9.3 Two Column Table (option)

Fuse chart electrical plate 2.1

Designation	Size	Type	Manufacturer	Function
2.1F01	6A	C60N 1P C6A	Schneider Electric Merlin Gerin Eaton	24 VDC Logic

Fuse chart 2.1DC01 and 2.1DC02

Designation	**Size**	**Type**	**Manufacturer**	**Function**
2.1DC01–F1	15A	326 series - 3AG SloBlo glass body 6.3x32 mm	Littlefuse	36 VDC motor power
2.1DC02-F1	15A	326 series - 3AG SloBlo glass body 6.3x32 mm	Littlefuse	36 VDC motor power

9.4 Wallstand Z Manual

Fuse chart 4.4FIB01 placed in the system cabinet

Designation	Size	Type	Manufacturer	Function
4.4FIB01–F3	3AT	326 series - 3AB SloBlo ceramic body 6.3x32 mm	Littlefuse	WS 24 V Logic

9.5 Wallstand Z Motorized

Fuse chart 4.4FIB01 placed in the system cabinet

Designation	Size	Type	Manufacturer	Function
3.1F01	10AT	326 series - 3AB SloBlo ceramic body 6.3x32 mm	Littlefuse	36 VDC Z-motor
3.1F02	3AT	326 series - 3AB SloBlo ceramic body 6.3x32 mm	Littlefuse	WS 24 V Logic

Fuses
Wallstand Z Motorized

10 Technical Specifications

10.1 400T System

10.1.1 Electrical characteristics

Mains voltage for the system	400 V 3N, 50/60 Hz 400 V 3~ 480 V 3~ 150 A (Short term peak value), (required fuse 63 A thermal breaker, B-curve).
Heat dissipation	689 BTU/hr

For further information, see the Tube technical data sheet, at the accompanying documents.

10.1.1.1 Classification

Classification according to IEC/EN 60601-1.

Class	Class I equipment. All dead metal parts of the equipment are electrical connected to protective earth.
Applied part	Type B
Protection against ingress of water	IPX0
Mode of operation	Intermittent operation: 20% 1 min ON / 4 min OFF
Use of anesthetic mixtures	The equipment is not suitable for use in the presence of flammable anesthetics mixtures with air, oxygen or nitrous oxide.

Classification according to IEC/EN 60601-1–2

Class	Class A

10.1.1.2 Output parameters

OUTPUT PARAMETER	MODE	GENERATOR SERIES	LOADING FACTOR
Maximum X-ray tube voltage and highest X-ray tube current at that voltage.	Radiographic (Intermittent)	80 kW	150 kV, 500 mA
		65 kW	150 kV, 400 mA
		50 kW	150 kV, 320 mA
Maximum X-ray tube current and highest X-ray tube voltage at that current.	Radiographic (Intermittent)	80 kW	1000 mA, 80 kV
		65 kW	800 mA, 81 kV
		50 kW	630 mA, 80 kV
Combination of X-ray tube current and X-ray tube voltage resulting in highest output power.	Radiographic (Intermittent)	80 kW	800 mA, 100 kV
		65 kW	630 mA, 103 kV
		50 kW	500 mA, 100 kV
Highest constant output power at 100 kV, 0.1 sec.	Radiographic (Intermittent)	80 kW	80 kW (800 mA, 100 kV, 0.1 s)
		65 kW	63 kW (630 mA, 100 kV, 0.1 s)
		50 kW	50 kW (500 mA, 100 kV, 0.1 s)
Nominal shortest irradiation time (AEC exposure).	AEC	All models (AEC control is available over the full kV and mA range)	15 ms. AEC control is achieved by varying the ms of the exposure. The AEC ms range is 15 ms to an installer-programmable maximum not to exceed 600 mAs.

10.1.2 X-ray Tube

Inherent filtration	0.7 mm Al/75KV
Added filtration	0.8 mm Al
Total filtration	1.5 mm Al (0.7+0.8)

For more detailed x-ray tube technical specifications, see the provided tube insert and housing datasheets.

10.1.3 Environmental requirements

Ambient transport and storage temperature	-40 °C - +70 °C
Ambient operating temperature	+10 °C - +40 °C
Transport and storage humidity (relative)	10-90%, non-condensing
Operating humidity (relative)	30-75%, non-condensing
Maximum transport and storage altitude	500-1060 hPa
Maximum operating altitude	700-1060 hPa

10.1.4 OTC

10.1.4.1 General

Rotation range ceiling (beta)	- 193°(±5°) ~ +155°(±10°)
Rotation range tube arm (alpha)	+193°(±5°) ~ -155°(±10°)
Column (Z stroke)	1700 mm, 1450 mm

10.1.4.2 Weight

OTC	127 kg
Tube and collimator	40 kg maximum allowed weight
Traverse rail X	60 kg
Ceiling rail Y (4 m standard)	16 kg

10.1.4.3 Speed

	Low speed	**Maximum speed**
Z movement	40 mm/s	150 mm/s

10.1.5 Cabinet

10.1.5.1 General

Dimensions (L x W x H) mm	750 x 610 x 1130

10.1.6 Wallstand

Column, Z stroke	1470 +40/-10 mm (non-tilt)

Rotation range detector holder wagon (Only the tiltable detector holder wagon).	-20° - 90°

10.1.6.1 Attenuation Equivalent

Detector holder	<=0.6 mm

10.1.6.2 Weight

Wallstand	Maximum 180 kg (160 +20/ -20 kg)
Detector	Maximum 40 kg

10.1.7 Closed table 0181

10.1.7.1 Maximum patient load

Maximum patient load	295 kg

10.1.7.2 Weight of parts

Table (with table top and vertical lift)	241 kg
Table top	47 kg
Vertical lift	14 kg

10.1.7.3 Vertical lift

Lowest table top position (from the floor to the table top surface)	540 +20/–10 mm
Z stroke	310 +40/–20 mm
Maximum travel speed	25 mm/s (MRS ≥30 mm/s)

10.1.7.4 Table top

Dimensions	2400 mm X 800 mm
X-ray transparent area	2350 mm X 580 mm
Thickness	21 mm
Length of stroke X-direction from center position (Longitudinal)	±500 +20/–10 mm
Length of stroke Y-direction from center position (Lateral)	±150 +20/–10 mm
Aluminium equivalence	≤0.9 mm
Aluminium equivalence cover detector holder	< 0.6 mm

10.1.7.5 Detector holder

Weight	Maximum 40 kg
Size (maximum)	D600 mm x W620 mm x H95 mm

10.1.8 Two column table 0055 (option)

10.1.8.1 Column

Two column table, with motorized vertical movement

Lowest table top position (from the floor to the table top surface)	550 mm
Column (Z stroke)	380 mm

10.1.8.2 Table top

Two column table with manual or motorized detector movement

Dimensions	2400 mm X 853 mm
X-ray transparent area	2400 mm X 601 mm
Thickness	21.5 mm
Length of stroke, X-direction	+/- 600 mm
Length of stroke Y-direction	+/- 150 mm
Movement range of the detector	up to 850 mm
Aluminum equivalence	0.9 mm
Aluminum equivalence cover detector holder	< 0.6 mm

10.1.8.3 Weight

Two column table, compl.	Maximum 147 kg
Table top	Maximum 47 kg
Maximum patient load	300 kg

11 Options

11.1 General

WARNING!

Risk of squeezing during motorized movements.

Only accessories approved by the manufacturer are allowed for the system.

This chapter describes options that can be ordered for the system.

11.2 Options for the system, with Canon image system

11.2.1 Ceiling Suspended X-ray Tube Support, Canon US

Part no.	Ceiling height	Vertical column stroke	Description
0170-925-029	2.5 to 2.7 m	1450 mm	3x5m, low ceiling version
0170-925-032	2.7 to 2.85 m	1450 mm	3x5m
0170-925-033			4x5m
0170-925-034			Special order: X(<4m)0 Y(<4m)=0
0170-925-040	Over 2.85 m	1700 mm	3x5m
0170-925-030			4x5m
0170-925-031			Special order: X(<4m)0 Y(<4m)=0
0170-925-003	>2.5 — 2.8 m	1450 mm	Installation cube low ceiling 3x4m
0170-925-016	>2.8 m	1700 mm	Installation cube low ceiling 3x4m
0170-925-039	16 m High voltage cables		
0170-925-005	24 m High voltage cables		
0170-925-006	Extra mechanical index in ceiling rails for positioning (2 pieces)		
0540-925-010	400 kHU X-ray tube, 40/100kW, 150 kV		
0540-925-011	600 kHU X-ray tube, 40/100kW, 150 kV		
0540-925-014	Automatic collimator and collimator handle for WS		
0540-925-022	Automatic collimator with LED and collimator handle for WS		

11.2.2 Options for Table

11.2.2.1 Closed Table 0181

Part no.	Description
0180-925-116	Mechanical index for manual detector movement

11.2.2.2 Optional Table

Part no.	Description
0180-925-117	Two column table Specification • Motorized elevation (555 - 930 mm) • Patient load 250 kg • Floating table top • Manoeuvre handle (Up/Down, Table top release)

11.2.2.3 Two Column Table

Part no.	Description
0170-925-101	Vertical collision protection, option
0170-925-103	Mechanical index for manual bucky movement

11.2.3 Options for Wallstand

Code	Description
0180–925–201	No Wallstand tilt
0180–925–202	Wallstand tilt
0180-925-225	Manual movements of detector
0180-925-224	Motorized movement of detector
0072-925-006	WS: Foot control Release of brake for manual vertical movement

11.2.4 Detectors

The following detector options are available for the System

Prepared for:

- CXDI 401C compact
- CXDI-701C, 710C, 702C Wireless - detector rotation
- CXDI-401C, 410C, 402C Wireless
- CXDI-701C, 710C, 702C - Automatic battery charging when loading the detector.
- CXDI-401C, 410C, 402C - Automatic battery charging when loading the detector.

11.2.5 System Cabinet

Code	Description
0072–925–302	50 kW, 100 kHz — 200 kHz High frequency generator
0072–925–300	65 kW, 100 kHz — 200 kHz High frequency generator
0072–925–301	80 kW, 100 kHz — 200 kHz High frequency generator

11.2.6 Other options

Code	Description
0170-925-014	Integrated DAP for automatic collimator
0170-925-041	DAP for manual collimator
0170-925-007	Electrical and mechanical index for positioning (2 pcs)
0170-925-307	External emergency stop

11.2.7 Canon integration

Code	Description
0072–925–149	*2 detectors:* Wall stand CXDI-701C Wireless Table CXDI-701C Wireless
0072-925-157	*2 detectors:* Wall stand CXDI-701C Wireless Table CXDI-401CW Wireless
0072-925-158	*2 detectors:* Wall stand CXDI-701C Wireless Table CXDI-401CW Wireless
0072-925-159	*2 detectors:* Wall stand CXDI-401CW Wireless Table CXDI-401CW Wireless
0072-925-160	*2 detectors:* Wall stand CXDI-401CW Wireless Table CXDI-701C Wireless

Code	Description
0072-925-161	*2 detectors:* Wall stand CXDI-401CW Wireless Table CXDI-401C Compact
0072-925-162	*2 detectors:* Wall stand CXDI-401C Compact Table CXDI-401C Compact
0072-925-163	*2 detectors:* Wall stand CXDI-401C Compact Table CXDI-701C Wireless
0072-925-164	*2 detectors:* Wall stand CXDI-401C Compact Table CXDI-401CW Wireless
0072-925-007	*2 detectors:* Wall stand CXDI-710C Wireless Table CXDI-410C Wireless
0072-925-008	*2 detectors:* Wall stand CXDI-710C Wireless Table CXDI-410CW Wireless
0072-925-009	*2 detectors:* Wall stand CXDI-710C Wireless Table CXDI-401C Compact
0072-925-016	*2 detectors:* Wall stand CXDI-410CW Wireless Table CXDI-410CW Wireless
0072-925-017	*2 detectors:* Wall stand CXDI-410CW Wireless Table CXDI-710C Wireless
0072-925-018	*2 detectors:* Wall stand CXDI-410CW Wireless Table CXDI-401C Compact
0072-925-019	*2 detectors:* Wall stand CXDI-401C Compact Table CXDI-710C Wireless

Options
Options for the system, with Canon image system

Code	Description
0072-925-020	*2 detectors:* Wall stand CXDI-401C Compact Table CXDI-410CW Wireless
Charging in detector holder	
0072-925-170	Charging in detector holder in wall stand (CXDI 401CW/410CW wireless or CXDI 701C/ 710C wireless must be selected for wall stand)
0072-925-171	Charging in detector holder in table (CXDI 401CW/410CW wireless or CXDI 701C/ 710C wireless must be selected for table)
Wall stand loading	
0180–925–203	Left-hand loading
0180–925–204	Right-hand loading

11.3 Cube Installation

Install the brackets (1) into the four traverse beams (2).

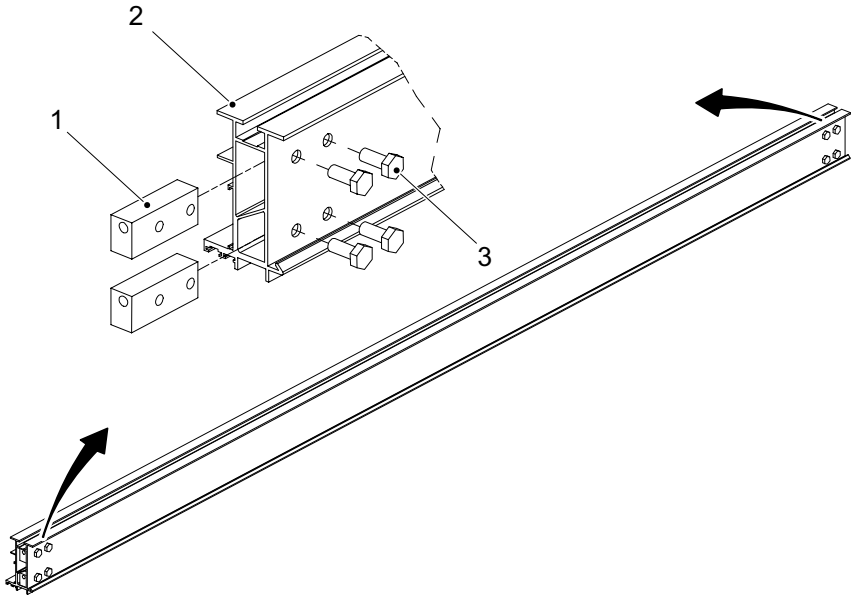


Fig. 11-1 Installing brackets

1. Bracket
2. Traverse beam
3. Screw M10x25

Note!

- Rotate the brackets 180 degrees, and mount them so that the holes on the left side are facing down.

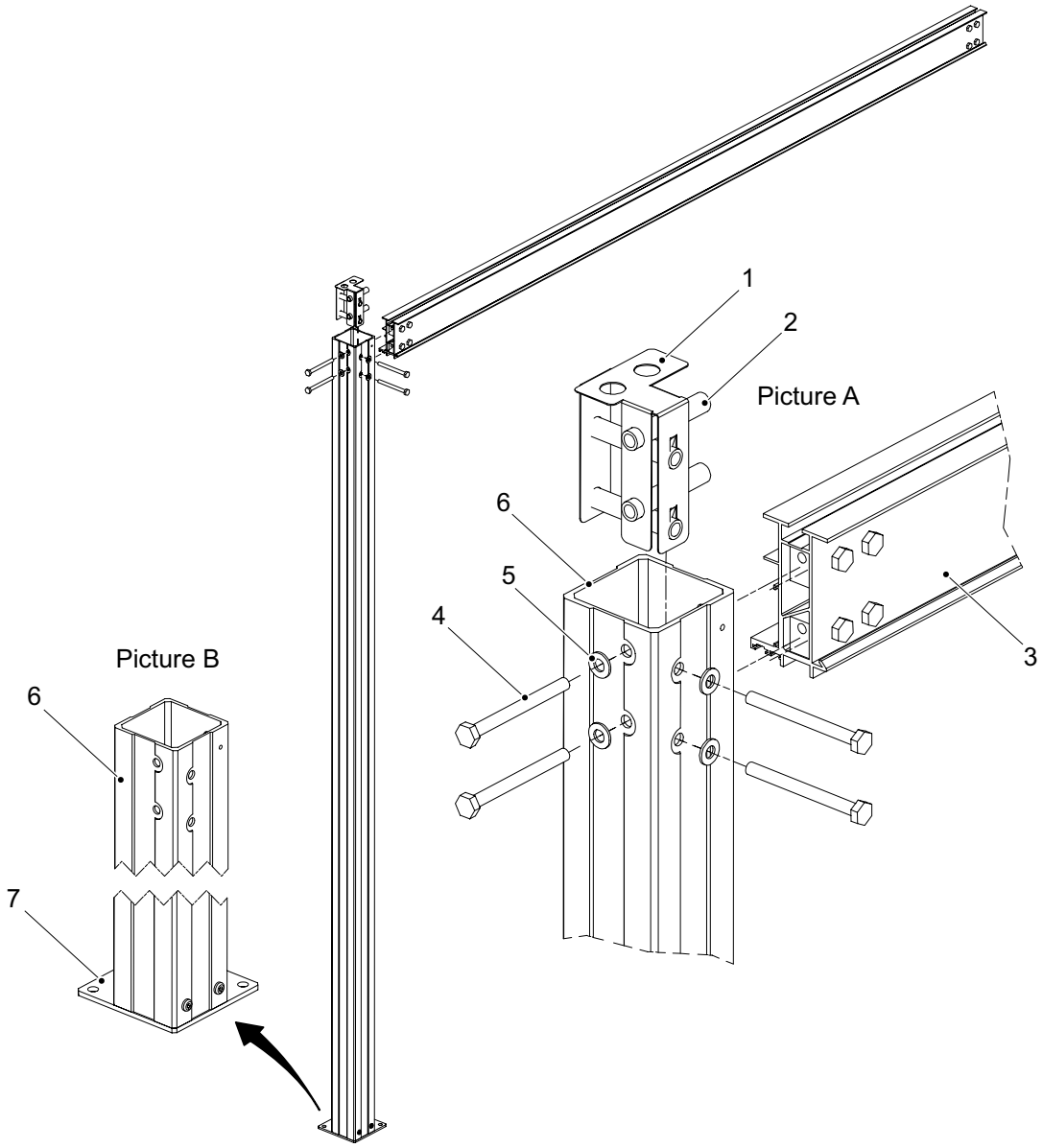


Fig. 11-2 Installing columns

1. Angle
2. Housing
3. Traverse beam
4. Screw
5. Washer
6. Column
7. Base

Install the housing (2) into the angle (1) and place the angle into the column (6), see picture A in **Fig. 11-3**.

Repeat this part on all four columns.

Install the two short traverse beams (3) on two columns each, be aware of the direction on the base (7) of the columns, according to picture B in **Fig. 11-3**.

Install the two long traverse beams in the same way as the short traverse beam, see **Fig. 11-3** and **Fig. 11-4**.

The corners of the installation cube must be in angle of 90°. To achieve angle of 90° measure in a cross from corner to corner, the measurement may differ ±5 mm.

Note!

The installation cube shall also be parallel ±1 mm.

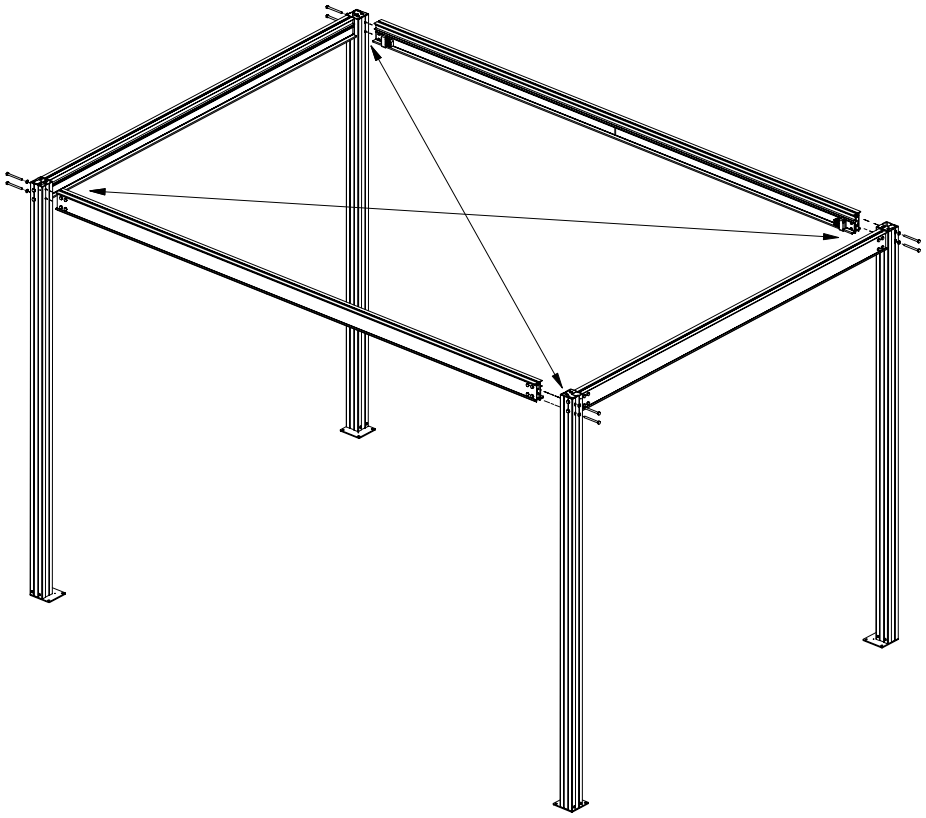


Fig. 11-3 Installation cube

Install the wall attachment on the installation cube, see **Fig. 11-4**. The wall attachment allows a placement of the installation cube 0-1000 mm from the wall.

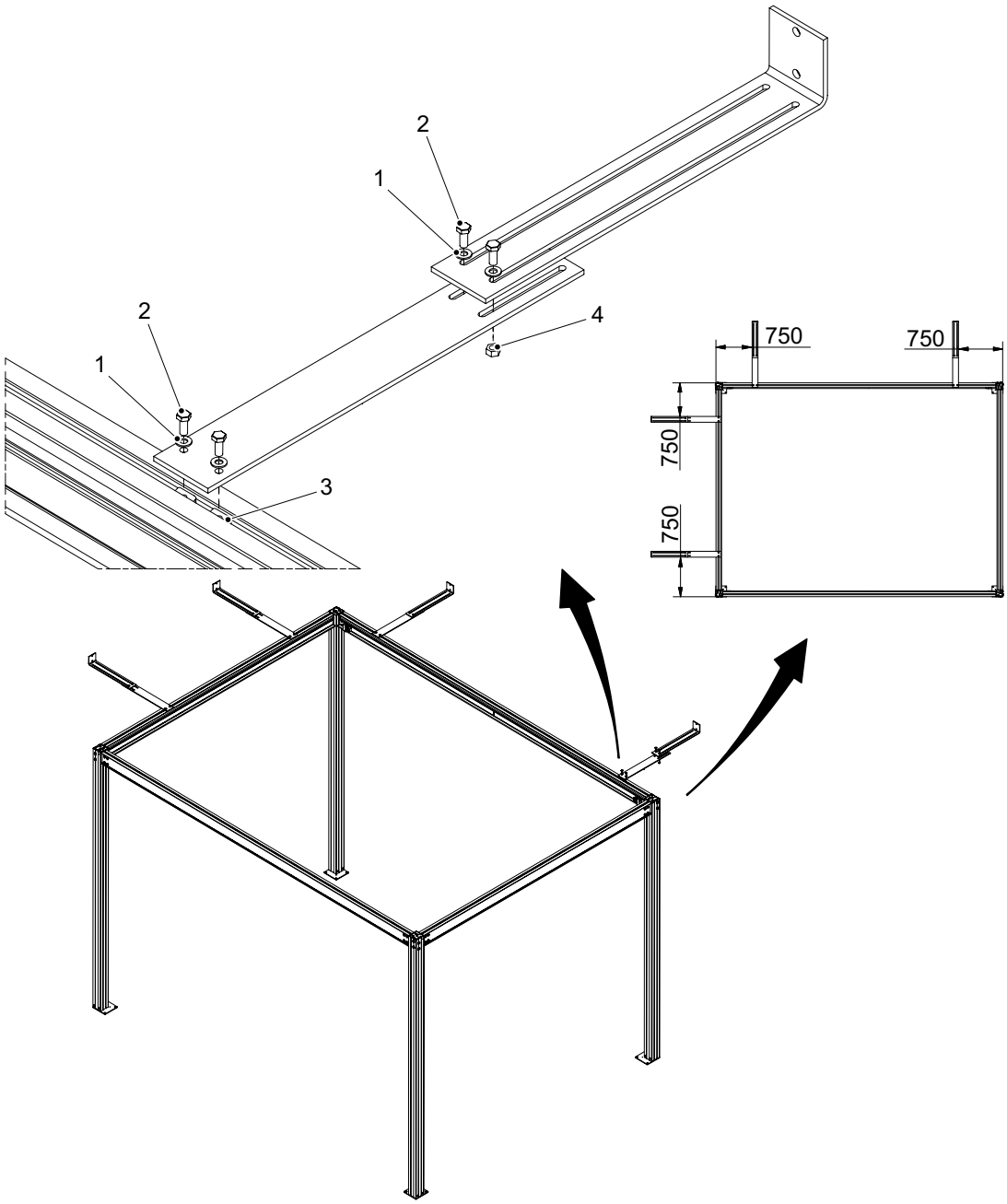


Fig. 11-4 Installing wall attachment

1. Washer
2. Screw
3. Rhomb nut
4. Nut

Place the installation cube over the center-drilled holes and install the insulation plates and cases on the base of the column according to **Fig. 11-5**.

Place a spirit level on the vertical and horizontal beams of the installation cube and check that the beams are vertical and horizontal ±1°. Shim if necessary.

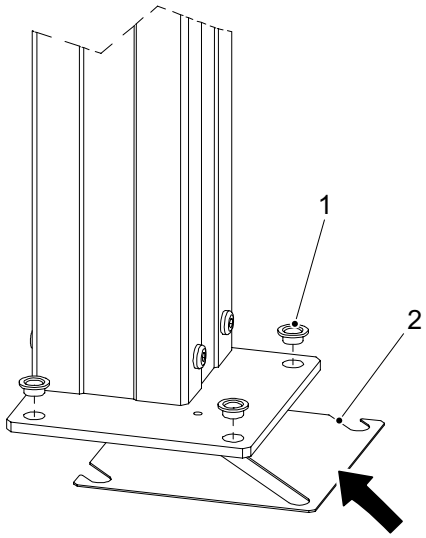


Fig. 11-5 Column base

1. Insulation case
2. Insulation plate

Install the wall attachment, insulation plates and the installation cases into the wall.

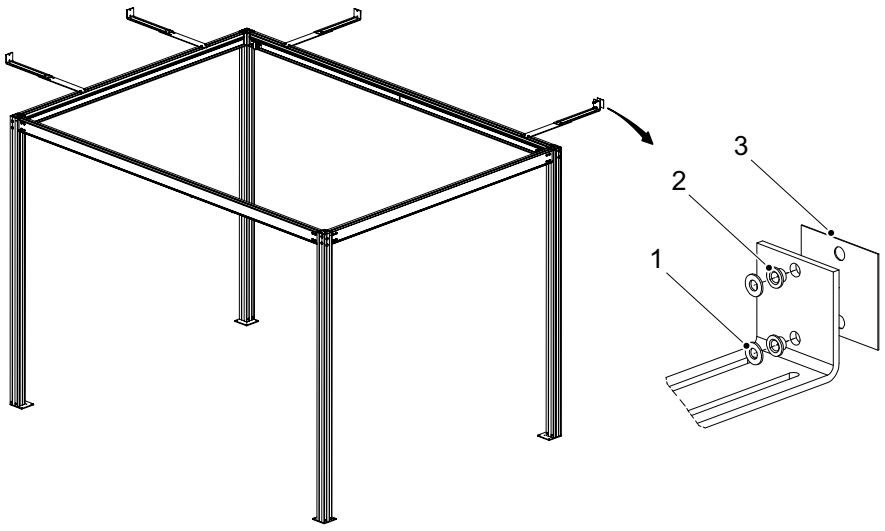


Fig. 11-6 Installing into the wall

1. Insulation case
2. Washer
3. Insulation plate

12 Accessories

WARNING!

Risk of squeezing during motorized movements.

Only accessories approved by the manufacturer are allowed for the system.

This chapter describes accessories that can be ordered for the system.

12.1 Accessories

Code	Description
General	
0512-099-001	Unistruts Rails 4x4
0512-099-002	Unistruts Rails 4x5
0512-099-003	Mounting Kit Unistruts Rails 4x4
0512-099-004	Mounting Kit Unistruts Rails 4x5
0072-099-309	Mobile Stitching Screen
0170-099-002	Cable Outlet for 0170-CS
Wallstand	
0072-099-306	Patient lateral armrest
0540-151-010	Foot pedal, Z-movement (maximum 2 pieces)
0180-099-050	Grid 40 lp/cm, R10:1, F115
0180-099-051	Grid 40 lp/cm, R10:1, F150
0180-099-052	Grid 40lp/cm, 10:1 Ratio, SID 180, Alu type
0180-099-076	Grid 52 lp/cm, R10:1, F140, Alu type
0180-099-061	Grid 51 lp/cm, R10:1, F180, Alu type
0182-099-320	Wall bracket
0175-099-002	Cable Outlet for WS
Table	
0055-099-170	Patient Kit: Compression belt Cost effective, Patient handgrip (2 pieces) and Mattress
0055-099-014	Patient Handgrip (1 piece)
0055-099-028	Compression belt Cost effective

0055-099-029	Compression Belt High-end
0080-099-051	Form pad Small — Rectangle
0080-099-050	Form pad Medium — Wedge
0080-099-052	Form pad Large — Head
0055-099-011	Lateral Cassette/Detector holder
0180-099-051	Grid 40 lp/cm, 10:1 Ratio, SID 150 Alu type
0180-099-060	Grid 52lp/cm, 10:1 Ratio, SID 110 Alu type
0180-099-076	Grid 52lp/cm, 10:1 Ratio, SID 140 Alu type
0181-099-008	X/Y/Z manoeuvre handle
0181-099-009	Hand control for Automatic Collimator (1 piece)
0181-099-005	Additional Foot pedal
0055-099-007	Mattress 2200 mm
	Two column table
0072-099-004	Foot control (Up/Down, Table top release)
0055-099-025	Foot control strip type (Table top release)
0055-099-009	Hand control for automatic collimator (1 pc)

Components	
0180-099-301	Complete System Cabinet with 65kW Generator
0180-099-302	Complete System Cabinet with 80kW Generator
0180-099-310	Complete Transverse with Bridge and Y-rails 4x5 m.

13 Spare Parts

To find and identify spare parts, see 2000-095-072 X.X SPL Catalogue.

Spare Parts

14 Waste disposal

The manufacturing company is responsible for disposal of the product. To avoid environment pollution and human injury, we therefore request that you contact the Manufacturer or your dealer if you wish to cease operation of your product with the intention of disposal.

For disposal of other components, refer to corresponding documentation.

Please follow the rules and regulations of your relevant authorities in the disposal of this product, accessories, options, consumables, media and their packing materials.

Waste disposal

15 Appendix A

15.1 Glossary

A

Accessories	Extra facilities to the system which easily can be mounted by the user.
AEC	Automatic Exposure Control.
Alpha	A direction for a rotation movement.

B

Beta	A direction for a rotation movement. The tube turns around the Z-axis.
Btu/hr	British thermal unit/hour.
BU/Back-up	A precautionary measure that shuts off the exposure, if the AEC chamber does not.
Bucky	See Detector holder.

C

CE	A CE-marked product verifies that the Manufacturer guarantees that the product fulfils the EU fundamental health, environment and security requirements.
Centering	The field of image is centered over the detector.
Collision	Either a physical collision with an obstacle or the node cannot reach its end position.
CR	Image plates.

D

DAP meter	Dose Area Product meter. The DAP-meter is placed next to the collimator and measures the amount of X-ray radiation that leaves the collimator.
Diode	Electrical component that leads voltage and current in one direction.
Dealer	See “Supplier”.
Detector	Image receptor for X-ray that does not require a cassette. The reception and transfer of an image is digital.

Appendix A
Glossary

E

EMC	Electromagnetic Compatibility.
End stop	See mechanical end stop and software end stop.
Exposure	An image is taken against an image receptor.

G

Guard function	Collision detection of the Z-movement (option).
Guard sensor	A sensor in the top of the Z-column that registers variations of force.

I

IEC	International Electrotechnical Commission.
Image receptor	Receptor for images: Film, CR, DR, or Cassette.
Image receptor holder	Holder for the image receptor (Film, CR, DR or Cassette).
Index	Mechanical position markings, for instance alpha 0°, +90° and -90°.
Intermittence	The number of repetitions / unit of time. Recurrent cycles.
ISO	International Organization for Standardization.

M

Mechanical end stop	A physical device that stops an automatic or manual movement if the software end stop is out of order.
Motorized movement	A motor assisted movement.

N

Node	A control and supervision unit, consists of printed circuit board and node specific software.

O

O.D.	Optic Density.
Options	Extra facilities that demand updating of the System software and hardware before use. Options demand installation of an authorized service technician.

P

Position	A location in the room (X, Y and Z).

S

SID	Source to image distance. The distance between the focus spot in the X-ray tube and the active image receptor surface. FFD is also used.
Software end stop	A non-physical device that stops an automatic or manual movement. The software end stop is placed before the mechanical end stop.
SSW	Service software.
Supplier	The company that sells the System to the user (hospital).

T

Table frame	The metallic frame that carries the Table top. The frame is attached to the bottom of the Table top.

W

Working area	The size of the Table top including X- and Y-stroke.

X

X-movement	The System moves in the X-direction.

Y

Y-movement	The System moves in the Y-direction.

Z

Z-node	The Z-node controls the Z-movement.
Z-movement	The System moves in the Z-direction.

Appendix A
Glossary

16 Appendix B

16.1 Checklists

Make a copy of this form before filling in.

If there is any discrepancies, use the Remark table to make a note.

Hospital:.....

ID No:.....

Sign:.....

16.1.1 Annual Checklist

Make a copy of this form before filling in.

If there is any discrepancy please use the remark table to note them.

Hospital:.....

ID No:.....

Sign:.....

16.1.1.1 OTC

- ❑ 1. Clean all tracks for wheels and bearings.
- ❑ 2. Check that the installation bolts for the ceiling rails Y are tightened properly with 15 Nm. If any bolts are loose, use Loctite 243 and tighten with 24 Nm.
- ❑ 3. Check that the installation bolts (12 pcs) for the distance plates, at the ceiling rails Y, are tightened properly with 10 Nm. If any bolts are loose, use Loctite 243 and tighten with 24 Nm.
  Check that there is no play between the traverse rails X, distance plates and the wheel holders, see picture A and B.
- ❑ 4. Check that the installation screws (2) for the turning plate are tightened properly with 10 Nm. If any screw is loose, use Loctite 243 and tighten with 24 Nm. To reach the screws, remove the cover (1) under the column and push the cover upward and check the screws (2).
  Check that there is no play between detail 3 and 4 according to picture A and B.
- ❑ 5. Remove the tube cover and check that the installation screws are tightened properly with 10 Nm. If any screw is loose, use Loctite 243 and tighten with 24 Nm.
  Check also the screws for the collimator installation. How this is done depends on collimator type.
- ❑ 6. Take hold of the collimator and move the collimator gently to feel if it is loose.
  Also check that there is no play between the collimator and the X-ray tube. If the collimator is the slightest loose or if there is a play between them, tighten the 3 screws.

❑ 7. Check the lifting cord for damage and make sure that is runs smoothly. It might be a subject for exchange when the tension gets too low. Also check the attachment point of the lifting cord.

❑ 8. Check the functions of the safety switches according to electrical drawing UBD_0170_Sync_DMG_01.

❑ 9. Check the safety switches in the column by using the following procedure: Press the downward button and stop the movement by applying force.

Note that force applied needs to exceed the weight of the tube assembly approx. 35 kg). The movement shall stop when force is applied.

To move the System upward, the switches has to be activated, the column chains must straightened.

❑ 10. a) Press the synchronization control (1) on the Wallstand. The diode D17 (C) on 1.5SBB01 will light up, see picture B. The diode will not light up when the synchronization control is not activated.

b) If there is a foot pedal present;

Press the foot pedal the diode D17 (C) on 1.5SBB01 will light up, see picture B. The diode will not light up when the foot pedal is not activated.

❑ 11. Check the safety switch alpha by tracking the Wallstand. The OTC shall follow the Wallstand the whole stroke.

If the OTC stops at the safety height check the safety switch alpha.

❑ 12. When the column drives upward the contactor shall be activated and when the movement is stopped the contactor shall release.

❑ 13. Check all outer cabling for damage.

❑ 14. Check protective earth.

Enter the measured values in the Safety checklist, Appendix B.

Measured value:

..... Ω

..... Ω

..... Ω

❑ 15. Check the emergency stop, by activating the emergency stop during motorized movement. The display of both the OTC and the image display shall show a message when the emergency stop is activated and all motorized movements are inhibited.

❑ 16. Check the column segments of the OTC (full stroke). It should run smooth and without dissonance.

Lubricate the columns with BP Energol GR-XP 220, if necessary.

- ❑ 17. Check the brake for the column motor by running the column in Z direction. The brake shall activate when the movement stops.
- ❑ 18. Move the OTC manually to all positions in X, Y and Z directions and make sure it runs smoothly and sounds OK.
- ❑ 19. Turn on the collimator light and position the center of the collimator light field against a horizontal detector.

  Drive the column upward/downward. The center of the collimator light field must stay on the same spot.

  Check that the readouts for the tube angulation is 0º.
- ❑ 20. Perform the Alignment of OTC. Check that the readouts for the tube angulation is 90º.
- ❑ 21. Check the alignment of the light field and X-ray light field according to “Collimator light Alignment”, in Chapter 4.
- ❑ 22. Check the function of the buttons on the maneuver handle.
- ❑ 23. If the System is cassette based and the detector is not present; check that you will get information on the generator console. See “Collimator light alignment” in Chapter 4.
- ❑ 24. Correspondence between x-ray field and image reception area. See **Correspondence Between X-ray Field and Image Reception Area** chapter 4.
- ❑ 25. Choose Table position and make sure tracking is activated.

  Measure between the X-ray tube focal spot and the active image receptor surface of the detector. The measured SID shall correspond with the displayed SID. The SID is allowed to differ ±1%.
- ❑ 26. Verify the receptor indication light function on both Wallstand and Table according to Chapter 3 **3.3.1.3 Exposure Control, Page 47**.
- ❑ Check the function of the DAP meter.
- ❑ 27. Verify that the measured DAP value (Area dose:dGycm2) is shown in the Image system. "DAP value (Area dose:dGycm2)" is displayed in "Exp.Info: Irradiation results" of "Exposure screen control panels". Refer to Operator’s Manual.
- ❑ 28. Verify the alpha angle.

16.1.1.2 Table 0181

- ❑ 1. Attach the safety clamp in maintenance position C. Be sure that the attachment is well secured in the bottom plate.
- ❑ 2. Check for abnormal sound.
- ❑ 3. Check for oil leaks.
- ❑ 4. Check for fallen foreign matter.
- ❑ 5. Check that the bolts fixing the Table to the floor are properly tightened.

  If there are evidence that the attachment in the floor has been damaged. Order new bolts from the Manufacturer and exchange the floor attachment.

- ❑ 6. Move the Table in X, Y and Z directions and make sure it runs smoothly and sounds OK.
- ❑ 7. Check the table top brakes:
  - Move the brakes in X or Y direction. The table top should run smoothly in X or Y direction whenever the brakes are released.
  - Lock the brakes and place a dynamometer against the table top and push slowly, it should be impossible to move the table top with a force less than:
    – Y-direction < 300 N
    – X-direction < 250 N
  - When there is no power to the table top, all brakes shall be applied.
  - Check the cables to the table top brakes.
- ❑ 8. Clean the profiles at the sides of the table top.
- ❑ 9. Clean the profiles for the image receptor tray movement.
- ❑ 10. Check the installation of internal cabling underneath the covers.

  Check the cable ties and that the cables are in right position. The harness should go under the metal part.
- ❑ 11. Check all internal and external cabling for damage. Squeezing and wear damages.
- ❑ 12. Lubricate the screw of the lifting unit with grease. Use grease *Klüber Duotempi PMY45*.

  Always order the grease from the manufacturer.

  To best get to the screw drive the Table to the highest position. Use a brush to apply the grease.

- ❑ 13. Check protective earth according to **4.23.2 Measure Protective Earth, Page 199**.
  Enter the measured values in the Safety checklist, Appendix B.

  Measured value:
  ..... Ω
  ..... Ω
  ..... Ω
  ..... Ω
- ❑ 14. Check status of critical circlips.
- ❑ 15. Check the screws of both mechanical end stops on the table top. If any screws are loose, tighten them.
- ❑ 16. Check both mechanical stops of the lifting unit.
  Check if the clamp is loose, tighten if necessary.
- ❑ 17. Check both Emergency stop buttons on the Table. By activating the emergency stop all motorized movements are locked.
- ❑ 18. Check the vertical travel safety of the table top.
  Hold and restrain at the same time as moving the table top up or down. The travel safety will then stop the movement of the table top in the on going direction.
- ❑ 19. Check the function of the movements in X/Y/Z by pressing the buttons on all the controls. The buttons shall not be damaged or get stuck when they are pressed.
- ❑ 20. Check the indication light, by choosing the Table mode.
  Make sure the table indication light is lit.
- ❑ 21. Check the function of the AEC chamber, and calibrate if necessary.

16.1.1.3 Two column table (option)

☐	1. Check the tightening of bolts fixing the table to the floor.	_____ (Nm)
☐	2. Check the function and clean the table top ball bearings.	
☐	3. Clean the table top profiles.	
☐	4. Clean the profiles for the image receptor tray and detector wagon wheels.	
☐	5. Check the cabling to the table top brakes.	
☐	6. Check the condition of the table top brake pads.	
☐	7. Check the X-Y function of the table top brakes.	X:____ (Nm) Y:____ (Nm)
☐	8. Check the column segments on the table (full stroke).	
☐	9. Check the buttons on the foot control X/Y/Z.	
☐	10. Batteries in the wireless foot control (option).	
☐	11. Check the table guard function (option).	_____ (Nm)

16.1.1.4 Wallstand

- ☐ 1. Check for abnormal sound.
- ☐ 2. Check for fallen foreign matter.
- ☐ 3. Check that the bolts that fix the Wallstand to the floor are tightened properly, if not, tighten them.
- ☐ 4. Check the function of the AEC chamber, and calibrate if necessary.
- ☐ 5. Check the indication light, by choosing Wallstand mode on the image display.
  Make sure the Wallstand indication light is lit.
- ☐ 6. Check all cables for damage.
- ☐ 7. Clean all outer surfaces.
- ☐ 8. Make sure that the Operating instructions are available.
- ☐ 9. **Check lifting mechanism of Wallstand.**
  Remove the back cover, see
  4.18.4 Remove Back Cover, Page 157.

CAUTION!

Secure the Wallstand with a locking device.

There is no need to dismount the front cover.

- ☐ 10. The lift mechanism should be balanced and run smooth, without any sound.
- ☐ 11. Check the condition of the two lifting chains, the six chain locks and the attachment points of the chain, see **Fig. 6-7** A and B.
  Adjust if necessary.
- ☐ 12. Check the attachment points of the counterweights, see **Fig. 4-67**.
- ☐ 13. Check the circlips (two) that secure the yoke to the axis. They should be in position, see **Fig. 6-7** C.
- ☐ 14. Check the mechanical end stops for the Z-movement. Check that they are intact and in position. There are four stops, two at the top and two at the bottom of the column.
- ☐ 15. Check the function of the brake. When the brake is released move the Wallstand up and down and the movement should stop.
- ☐ 16. Check protective earth according to
  4.23.2 Measure Protective Earth, Page 199.
  Enter the measured values in the Safety checklist Appendix B.

Measured value:

..... Ω

..... Ω

- ☐ 17. Check the Emergency stop buttons on the Wallstand.
  By activating the emergency stop all motorized movements shall be inhibited.
  The image display will display a message when the emergency stop is activated.

Wallstand, Tiltable wagon

- ☐ 18. Check the function of the gas springs for the tilt. The maximum force should be 50 Nm.
- ☐ 19. Check that the two mechanical end stops are intact. There are two stops located on the wagon.

16.1.1.5 Remark

No.	Remark	Action	Int note
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

17 Appendix C

17.1 Installation Checklist

Hospital:.....

ID No:.....

Sign:.....

17.1.1 Shipping / Receiving

Check with heading chapter Installation.

- ❑ 1. Verify that the site is ready for installation.
- ❑ 2. Remove the crate's top and sides. Inspect for any shipping damage.
- ❑ 3. Inventory the shipment against the packing list, note any differences.

17.1.2 Mechanical Installation

17.1.2.1 Mechanical Installation of OTC

- ❑ 1. Ceiling rails Y.
- ❑ 2. Traverse rail X.
- ❑ 3. Y Brake.
- ❑ 4. Ceiling wagon.
- ❑ 5. Install safety clamp ring.
- ❑ 6. X Brakes.
- ❑ 7. Cable channel (Option).
- ❑ 8. Connection brake Y.
- ❑ 9. Wall attachment.
- ❑ 10. Mechanical index assemblies secured with self-tapping screws.

17.1.2.2 Mechanical Installation of Cabinet

- ❑ 1. Cover for cable outlet.
- ❑ 2. Remove covers.

17.1.2.3 Mechanical Installation of Table 0181

- ❑ 1. Unload the Table.
- ❑ 2. Remove covers.
- ❑ 3. Safety clamp.
- ❑ 4. Orientation of the Table.
- ❑ 5. Insulation.
- ❑ 6. Adjust alignment.
- ❑ 7. Attachment to the floor.
- ❑ 8. Transport protection of the image receptor holder.
- ❑ 9. Adjust image receptor holder.

17.1.3 Electrical Installation

17.1.3.1 Electrical Installation of Table 0181

- ❑ 1. Interfacing.
- ❑ 2. Connect the Table.
- ❑ 3. Mains power line connection.
- ❑ 4. Connect the mains power line.
- ❑ 5. Measure protective earth.

Measured value:

..... Ω

..... Ω

..... Ω

..... Ω

17.1.3.2 End Installation of Table 0181

- ❑ 6. Mount the table top.
- ❑ 7. Safety clamp.
- ❑ 8. Attach the covers.
- ❑ 9. Start up procedure
  Check voltage of the Table.

17.1.3.3 Installation, Wallstand

- ❑ 1. Unload the Wallstand.
  — Orientation of the Wallstand.
  — Unload.
- ❑ 2. Mechanical installation of the Wallstand.
  — Fixation of the anchor.
  — Remove the back cover.
  — Mount the counterweights.

❑ 3. Mounting of parts.
— Mount the image receptor.
— Mount the patient support grip.
— Install the foot control.

❑ 4. Electrical installation of the Wallstand.
— Mains power line connection.
— Connect Wallstand.

❑ 5. Measure protective earth.

Measured value:

..... Ω

..... Ω

17.1.3.4 Electrical Installation of Parts

❑ 1. Connect OTC.

❑ 2. Connect the Table.

❑ 3. Connect the Wallstand.

❑ 4. Connect the Image system.

17.1.3.5 Electrical Installation of X-ray light

❑ 1. Connect X-ray light.

❑ 2. Connect door switch.

❑ 3. Connect external emergency stop.

17.1.3.6 Electrical Installation of Operating Room

❑ 1. Operating room.

❑ 2. DAP display / printer.

❑ 3. Generator (option).

17.1.3.7 Voltage Selection

❑ 1. Power ratings and Line requirements.

❑ 2. Manual voltage selection.

❑ 3. Check protective earth.

❑ 4. Measure protective earth on cabinet.

❑ 5. Protective earth OTC.

❑ 6. Mains.

❑ 7. Start-up procedure.

17.1.4 Check Alignment of System

❑ 1. Alignment of the OTC.

❑ 2. Alignment of the OTC X- and Y-direction.

- ❑ 3. Alignment of the Wallstand.
- ❑ 4. Alignment of the Table.
- ❑ 5. Install the positioning index.

17.1.5 Calibration and Adjustments of Generator

- ❑ 1. Calibration process generator.
- ❑ 2. Communication setup.
- ❑ 3. Tube calibration

  Temperature of the X-ray tube

  Verify the function of the x-ray tube temperature (Sw) by loosen the cable (A), and check that the generator console displays the following message: *"E020".*

  Check the status of the tube, visual inspection. Ref. to the tube manual for further instruction.
- ❑ 4. Image receptor calibration.
- ❑ 5. Collimator light- and X-ray field alignment.

  If the System is cassette based and the detector is not present, check that you will get information on the image display.
- ❑ 6. Correspondence between x-ray field and image reception area.
- ❑ 7. APR-setup.
- ❑ 8. OTC calibration.
- ❑ 9. Ready exposure control signal.
- ❑ 10. Check that all exposure is inhibited when the detector is disconnected. See section;**Exposure Control**.
- ❑ 11. AEC calibration.
- ❑ 12. Generator backup.

17.1.6 Acceptance Tests

- ❑ 1. Peak tube potential.
- ❑ 2. Tube current.
- ❑ 3. Exposure time.
- ❑ 4. Linearity.
- ❑ 5. Beam quality.
- ❑ 6. Reproducibility.
- ❑ 7. DAP meter.
- ❑ 8. AEC (Automatic Exposure Control).
- ❑ 9. Emergency stops.
- ❑ 10. Check the SID calculation.

- ❑ 11. Verify the receptor indication light function on both Wallstand and Table according to Chapter 3 **3.3.1.3 Exposure Control, Page 47**.
- ❑ 12. Check the applicable exposure controls. See **3.3.1.3 Exposure Control, Page 47**.
- ❑ 13. If applicable, check the detector ready signal.

17.1.7 Remark

No.	Remark	Action	Int note
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

18 Installation Report

18.1 Attention

The installation report is an important form for to receive feed-back from our dealers, in order to keep track of delivered systems and their current status. The report is required from all performed installations in order to comply with CFR 21 §1020.30.

The CE-mark to MDD Class II products is fulfilled through MDD ANNEX II 93/42/EEC where our Quality system is an essential part.

We kindly ask you to take the time needed to fulfil the report. The installation report form are delivered with each system (included in the Service and Installation Manual). There is also a digital form (this document) available which can be used.

Please send the fulfilled and signed report to service@arcoma.se. Sending the report confirms that you have installed the unit and that it is working properly on site.

If you encounter product related issues during the installation, it is important that we receive this information as input to our CAPA-process (Corrective and Preventive Action).

Best regards,

INFORMATION FROM THE DEALER

Product Identification

Equipment type:_____

System Serial number:_____

Date:_____

Dealer:_____ **Installer:** _____

Site Identification

Hospital/address:_____

Department:_____ **Lab/room:**_____

☐ I hereby confirm that this installation is performed in accordance with the Installation chapter of Installation and Service Manual.

Signature of Installer

Date Signature

_____ _____