OMNERA® 400A
Auto-Positioning Digital Radiographic System

Installation and Service Manual

Technical Publication: 0073-095-408-EN Rev. 5.1

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® 400A equipment.

Lost profits, downtime, goodwill, damage to or replacement of property, and any costs of repairing the OMNERA® 400A 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

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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 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™ 400A Planning Guide
- OMNERA™ 400A Installation and Service Manual
- OMNERA™ 400A Operator’s Manual

1.1.2 Stylistic Conventions

All warning label texts are shown in red 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

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.

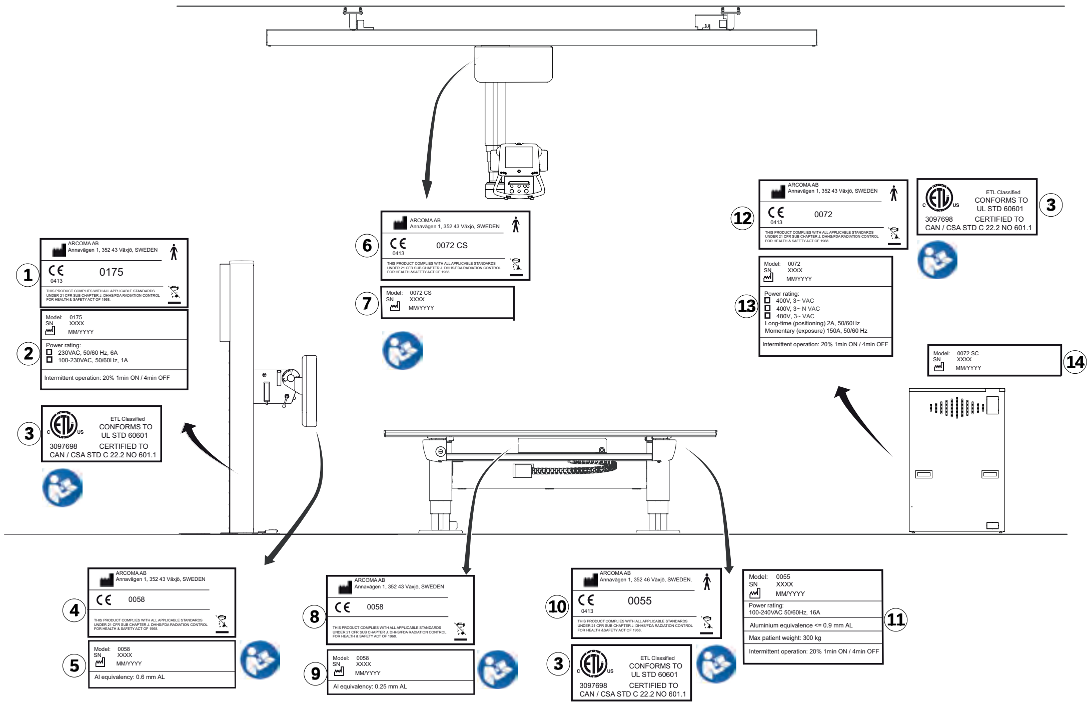


Fig. 1-1

The labelling for accompanying components are shown in their documentation.

1

ARCOMA AB
Annavägen 1, 352 43 Växjö, SWEDEN

CE 0413 0175

THIS PRODUCT COMPLIES WITH ALL APPLICABLE STANDARDS UNDER 21 CFR SUB CHAPTER J. DHHS/FDA RADIATION CONTROL FOR HEALTH & SAFETY ACT OF 1968.

2

Model: 0175
SN XXXX
MM/YYYY

Power rating:
- ☐ 230VAC, 50/60 Hz, 6A
- ☐ 100-230VAC, 50/60Hz, 1A

Intermittent operation: 20% 1min ON / 4min OFF

3

ETL Classified
c US
CONFORMS TO UL STD 60601
3097698
CERTIFIED TO CAN / CSA STD C 22.2 NO 601.1

4

ARCOMA AB
Annavägen 1, 352 43 Växjö, SWEDEN

CE 0058

THIS PRODUCT COMPLIES WITH ALL APPLICABLE STANDARDS UNDER 21 CFR SUB CHAPTER J. DHHS/FDA RADIATION CONTROL FOR HEALTH & SAFETY ACT OF 1968.

5

Model: 0058
SN XXXX
MM/YYYY

Al equivalency: 0.6 mm AL

6

ARCOMA AB
Annavägen 1, 352 43 Växjö, SWEDEN

CE 0413 0072 CS

THIS PRODUCT COMPLIES WITH ALL APPLICABLE STANDARDS UNDER 21 CFR SUB CHAPTER J. DHHS/FDA RADIATION CONTROL FOR HEALTH &SAFETY ACT OF 1968.

7

Model: 0072 CS
SN XXXX
MM/YYYY

8

ARCOMA AB
Annavägen 1, 352 43 Växjö, SWEDEN

CE 0058

THIS PRODUCT COMPLIES WITH ALL APPLICABLE STANDARDS UNDER 21 CFR SUB CHAPTER J. DHHS/FDA RADIATION CONTROL FOR HEALTH & SAFETY ACT OF 1968.

9

Model: 0058
SN XXXX
MM/YYYY

Al equivalency: 0.25 mm AL

10

ARCOMA AB
Annavägen 1, 352 46 Växjö, SWEDEN.

CE 0413 0055

THIS PRODUCT COMPLIES WITH ALL APPLICABLE STANDARDS UNDER 21 CFR SUB CHAPTER J. DHHS/FDA RADIATION CONTROL FOR HEALTH &SAFETY ACT OF 1968.

11

Model: 0055
SN XXXX
MM/YYYY

Power rating:
100-240VAC 50/60Hz, 16A

Aluminium equivalence <= 0.9 mm AL

Max patient weight: 300 kg

Intermittent operation: 20% 1min ON / 4min OFF

12

ARCOMA AB
Annavägen 1, 352 43 Växjö, SWEDEN

CE 0413 0072

THIS PRODUCT COMPLIES WITH ALL APPLICABLE STANDARDS UNDER 21 CFR SUB CHAPTER J. DHHS/FDA RADIATION CONTROL FOR HEALTH & SAFETY ACT OF 1968.

13

Model: 0072
SN XXXX
MM/YYYY

Power rating:
- ☐ 400V, 3~ VAC
- ☐ 400V, 3~ N VAC
- ☐ 480V, 3~ VAC

Long-time (positioning) 2A, 50/60Hz
Momentary (exposure) 150A, 50/60 Hz

Intermittent operation: 20% 1min ON / 4min OFF

14

Model: 0072 SC
SN XXXX
MM/YYYY

1.3 System Description

1.3.1 General

OMNERA™ includes a system cabinet with a high voltage generator, generator user interface, a ceiling suspended unit (with an x-ray tube and a collimator), a Table and a Wallstand.

1.3.2 Intended Use (Rx Only)

It is a stationary X-ray system intended for obtaining radiographic images of various portions of the human body in a clinical environment.

The System is not intended for mammography.

1.3.3 Configuration

Two System configurations are supported. System Cabinet (including generator), Imaging System and Ceiling suspended unit are always included;

• Table and Wallstand System

• Wallstand System

1.3.4 System Overview

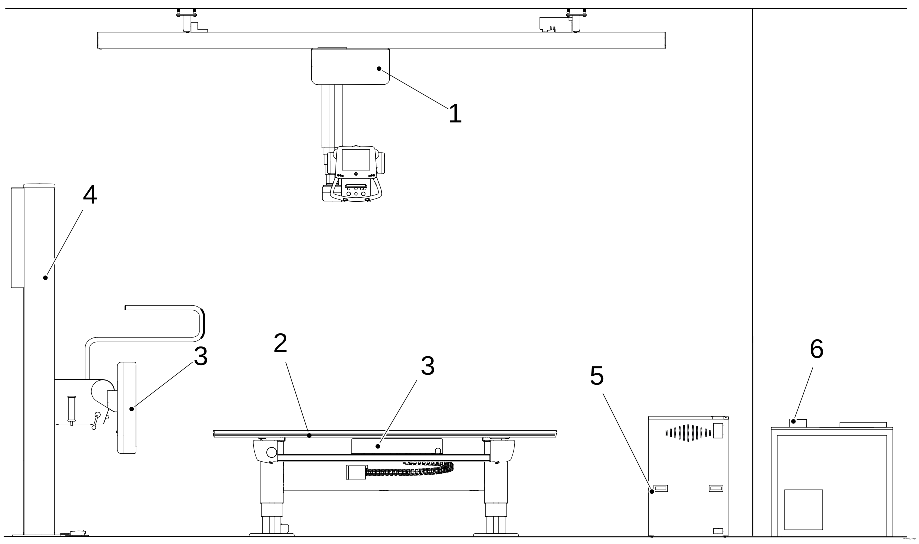


Fig. 1-2 System components

1. Overhead Tube Crane (OTC)
2. Table
3. Detector holder
4. Wallstand
5. System Cabinet
6. External emergency stop/sync.

1.3.4.1 OTC, Overview

The figure shows the main parts of the OTC.

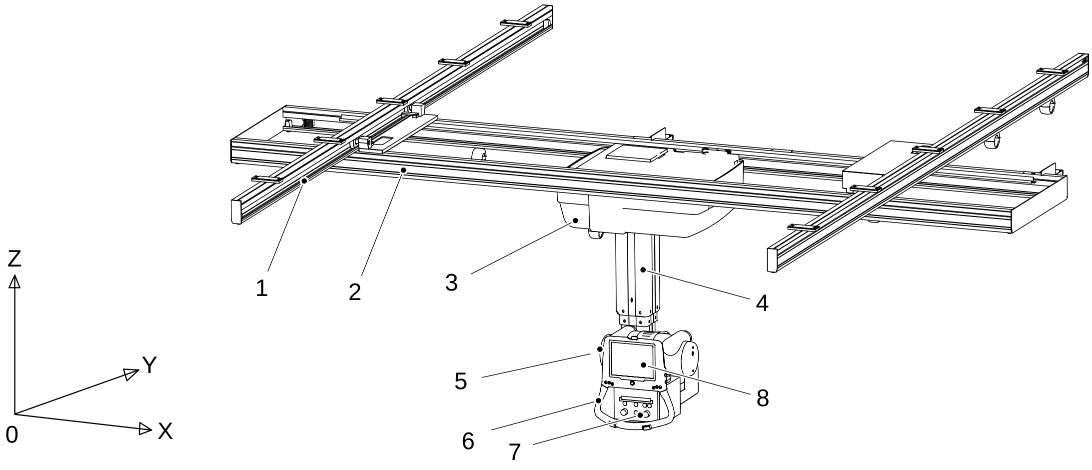


Fig. 1-3 OTC

1. Traverse rail (X)
2. Ceiling rail (Y)
3. Ceiling wagon
4. Column (Z)
5. X-ray tube
6. Maneuver handle
7. Collimator

1.3.4.2 Wall stand Overview

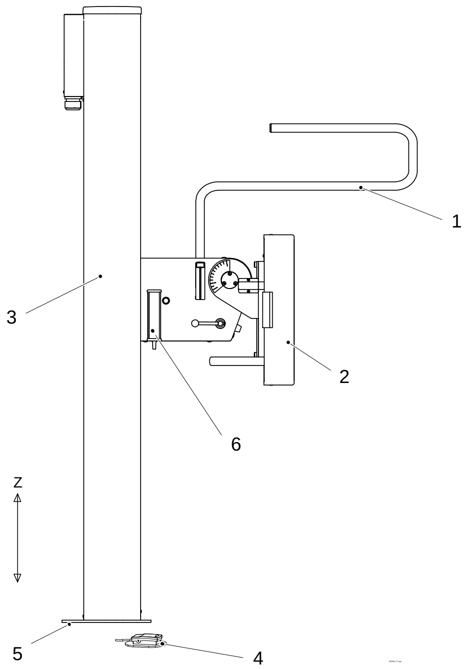


Fig. 1-4 Wall stand overview.

1. Lateral armrest
2. Detector holder
3. Column
4. Foot control (brake release)
5. Foot plate
6. Hand control (collimator adjustments, and up/down movement)

1.3.4.3 Table overview

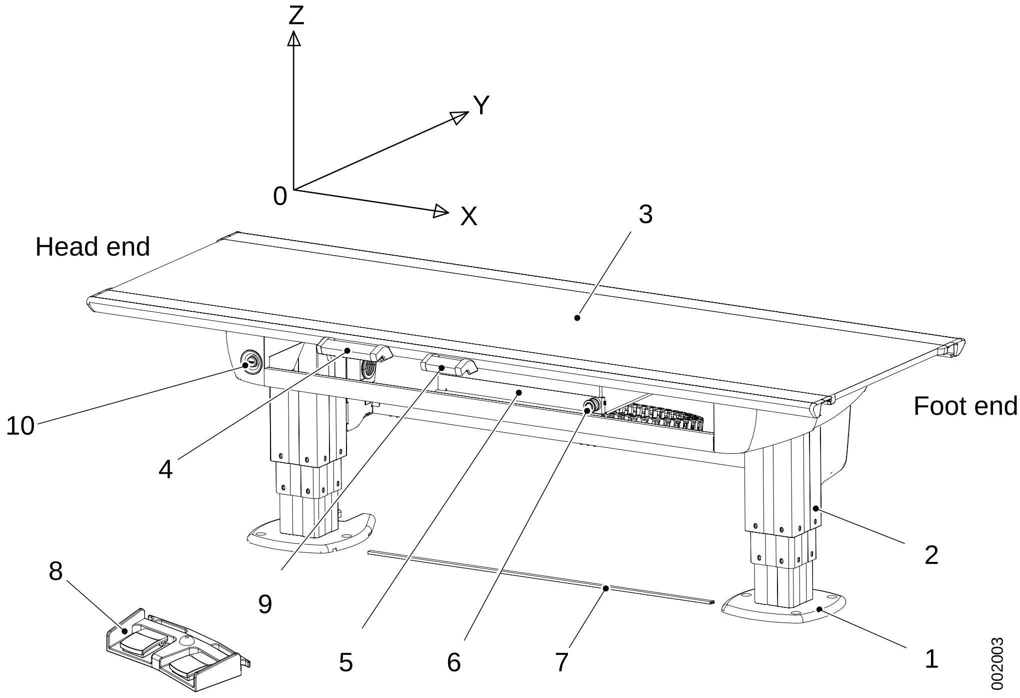


Fig. 1-5 Table overview

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

2 Safety

2.1 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.

2.2 Qualifications of Personnel

CAUTION!

Federal law restricts this device to sale by, or on the order of a physician.

CAUTION!

This equipment is intended for use in radiographic examinations under the guidance of trained health care professionals.

2.2.1 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 Checks

2.2.2 Service Personnel

WARNING!

Before working with service and maintenance, always turn off the power and make sure to lock it, so it cannot be mistakenly turned on.

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 right training and knowledge to perform service and maintenance.

Note!

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

2.3 Service and Maintenance

WARNING!

Do not modify this equipment without authorization of the manufacturer.

WARNING!

If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of equipment.

WARNING!

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

WARNING!

Hazardous power can still exist in the System after power-off.

WARNING!

When service or maintenance shall be performed, the technician shall always lock the equipment from all energy sources using a lockable switch. Make sure to lock it, so the power cannot unintentionally be turned on.

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.

2.3.1 Operation, Installation and Repair

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

WARNING!

The Manufacturer cannot be held responsible 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 product is not used in accordance with the operating instructions.***

CAUTION!

Only service engineers are allowed to remove the covers.

CAUTION!

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

CAUTION!

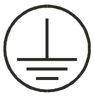
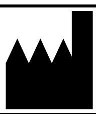
When installing this equipment in a different location, contact us or our designated dealer.

CAUTION!

Do not modify the equipment.

2.4 Safety and Warning Symbols

The following symbols are used for the product.

	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
	Manufacture date producer
	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.

2.5 Safety and Warning Labels on the Equipment

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

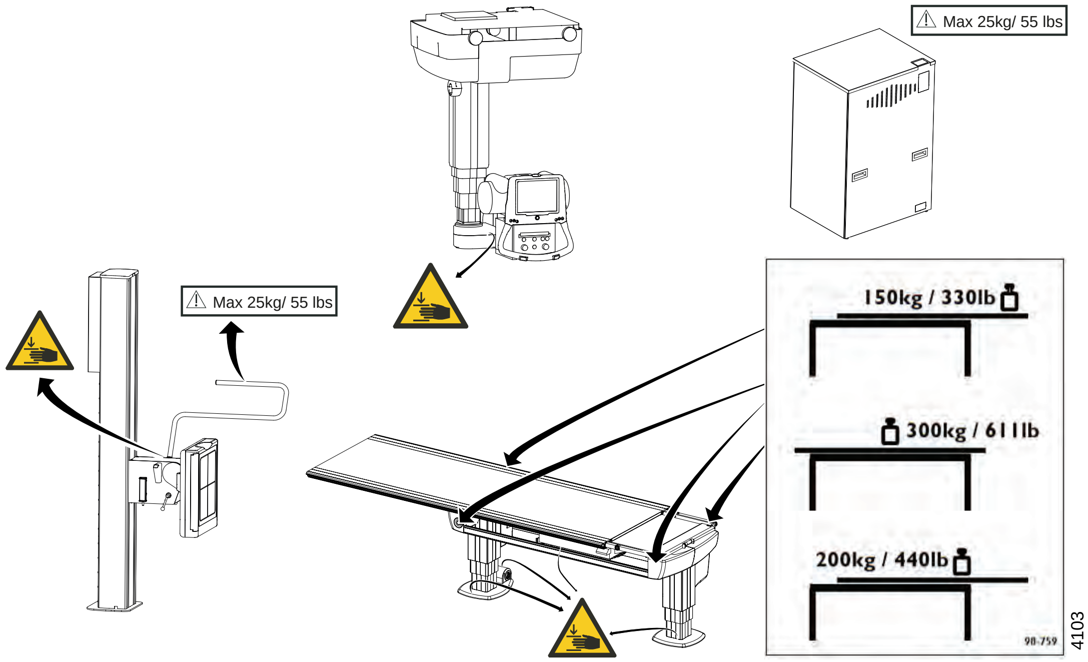


Fig. 2-1 Safety and Warning Labels

2.6 Emergency Stop

The System has six emergency stops, one on the ceiling suspended X-ray tube support, two on each side of the Table (at the head end), two on the Wallstand and one external.

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 but not terminate an ongoing exposure.

To leave the emergency stop position, turn the button clockwise and the button will be released and the System can be used again.

There are additional external emergency stops as option.

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.

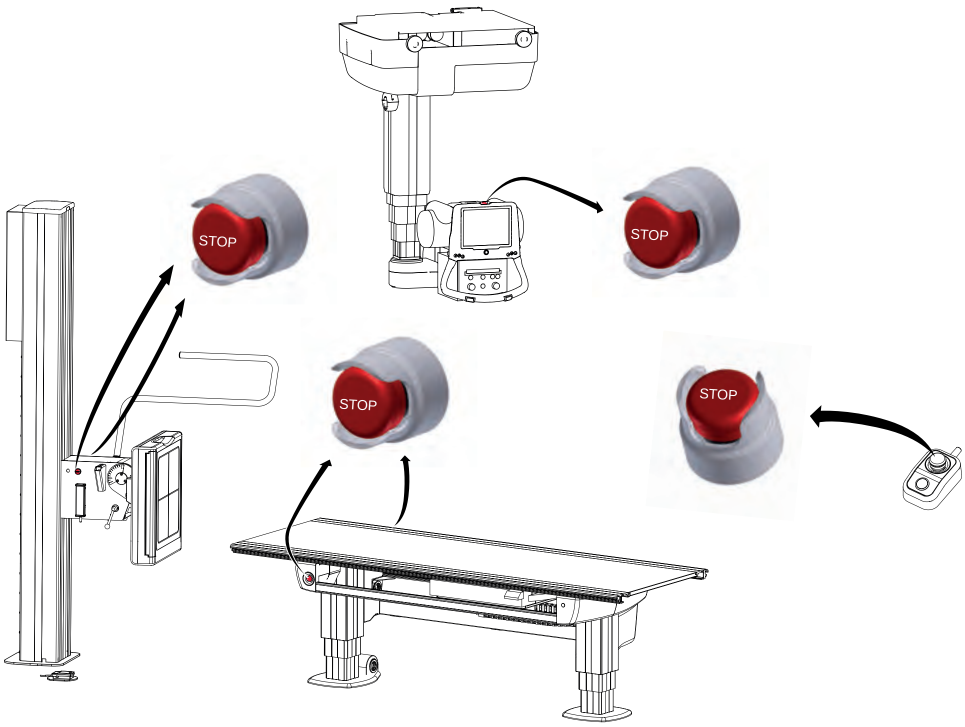


Fig. 2-2

2.7 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 surface on the X-ray tube that is not protected by cover, can be warm and may be up to 85 degrees Celsius. The collimator temperature will not reach 60 degrees Celsius.

WARNING!

The collimator filter must be verified so that correct filter is used during exposure.

WARNING!

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

Note!

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

Note!

The X-ray beam must never be outside the boundaries of the active receptor area.

2.8 Mechanical Safety

WARNING!

Tracking is only allowed under supervision of trained personnel.

WARNING!

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

Note!

Surrounding equipment is not subject of the collision warning.

2.8.1 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.

2.8.2 Ceiling Suspended X-ray Tube Support

Possible squeezing hazard areas are indicated in the figure.

Squeezing hazard can occur between the:

- column (1) and the column bottom plate (3), when the column is moving upward (Z-direction).

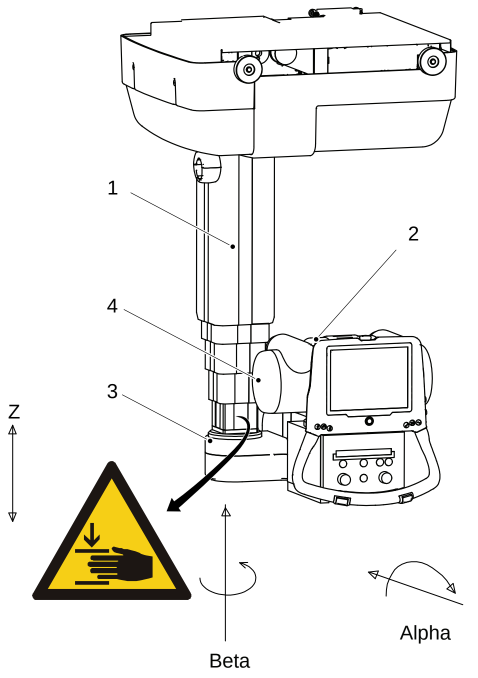


Fig. 2-3

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

2.8.3 Table

Possible squeeze hazard areas are indicated in the figure.

Squeezing hazard can occur between the:

- table top (1) and the top of the imaging unit (4); when the table top (1) is in the outer position (Y-direction) or moving in a longitudinal direction (X-direction).
- table top (1) and the imaging unit rail (6); when the table top (1) is in the outer position (Y-direction).
- imaging unit (4) and the cover (5); when the imaging unit is moving in a longitudinal direction (X-direction).
- column (7) and the footplate (8); when the column (7) is moving downwards (Z-direction).
- cover (2) and the column cover foot (3); when the column (7) is moving downwards (Z-direction).

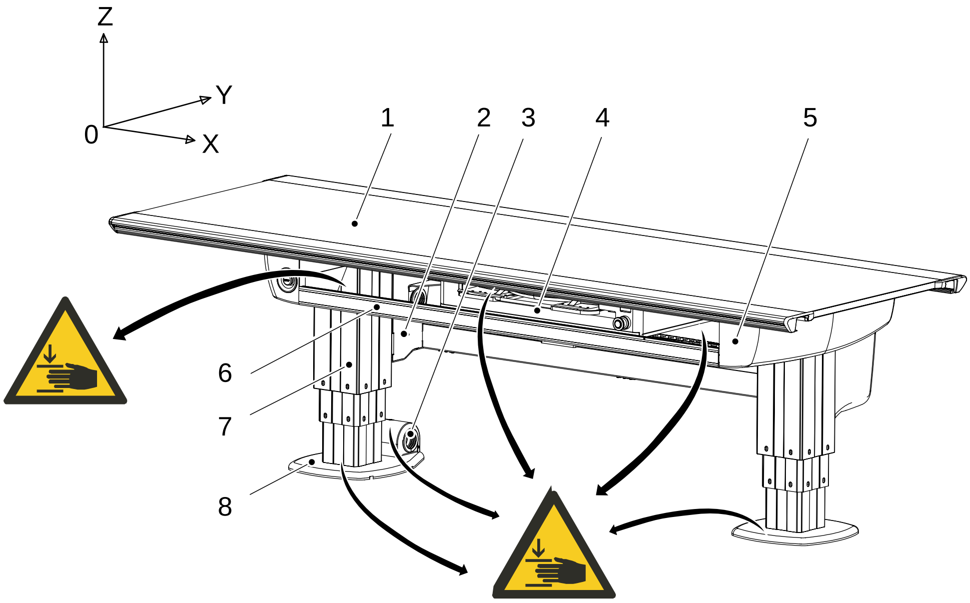


Fig. 2-4

1. Table top (X/Y/Z)
2. Cover
3. Column cover foot
4. Imaging unit (X)
5. Cover
6. Imaging unit rail
7. Column (Z)
8. Footplate

WARNING!

Squeezing hazards may occur between the table top and the imaging unit or the imaging unit rail.

2.8.3.1 Detector Unit, Table

The manoeuver control (2) controls the detector holder 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 is released.

The detector holder is designed to accommodate detectors and detector holders. The electrical design of the detector unit 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 or a wireless detector with a charging cable in the table, a power box for the detector is mounted under the Table. For location, see Fig. 2-5 *Location of Power box*.

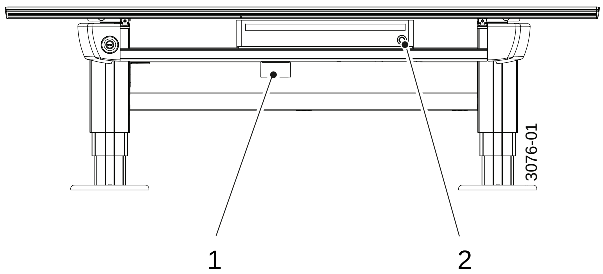


Fig. 2-5 Location of Power box

1. Power box
2. Manoeuver control

2.8.4 Wall stand

Note!

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

2.8.4.1 Standard Version of the Wall stand

Possible squeezing hazard areas are indicated in Fig. 2-6 *Warning labels*. Getting stuck in the imaging unit slide opening (1), causes squeezing hazard, if the imaging unit is moving downward or upward (Z-direction).

CAUTION!

If the motorized movement is operated in high speed level, it is not allowed to have patient sitting or standing in the surroundings of the Wall stand.

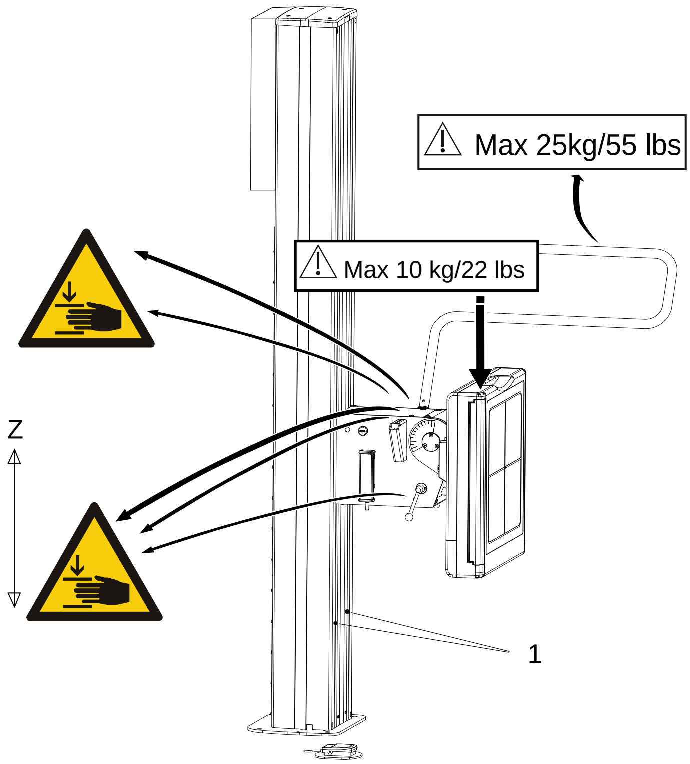


Fig. 2-6 Warning labels

1. Slide opening of the imaging unit

2.8.4.2 Weight Restrictions

- The maximum weight to put on the wall stand lateral armrest is restricted to 25 kg/ 55 lbs.
- For the wall stand detector holder the maximum weight is set to 10 kg/ 22 lbs.

2.8.4.3 Indication of Power to Wall stand

The device is powered when the indicator light on the electrical box is lit.

2.9 Safety issues when placing the patient

WARNING!

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

WARNING!

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

WARNING!

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

CAUTION!

When the table top switch is activated, the table top will be floating, therefore do not lean against the table top

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.

The table shall always be operated from the front, i.e. the same side as the image receptor holder is operated. To reduce the lateral forces on the table, the operator should be placed on the opposite longitudinal side of the patient and the hospital bed. The operator should then drag the mattress with the patient from the hospital bed to the X-ray Table.

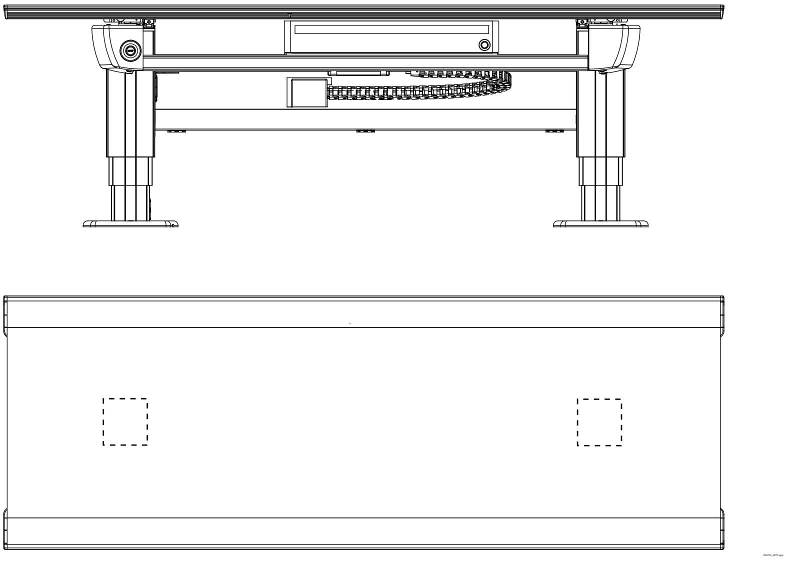


Fig. 2-7 Placement of the table top when loading the patient.

2.9.1 Working area

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. 2-8 show the length of the stroke in the X- and Y-direction.

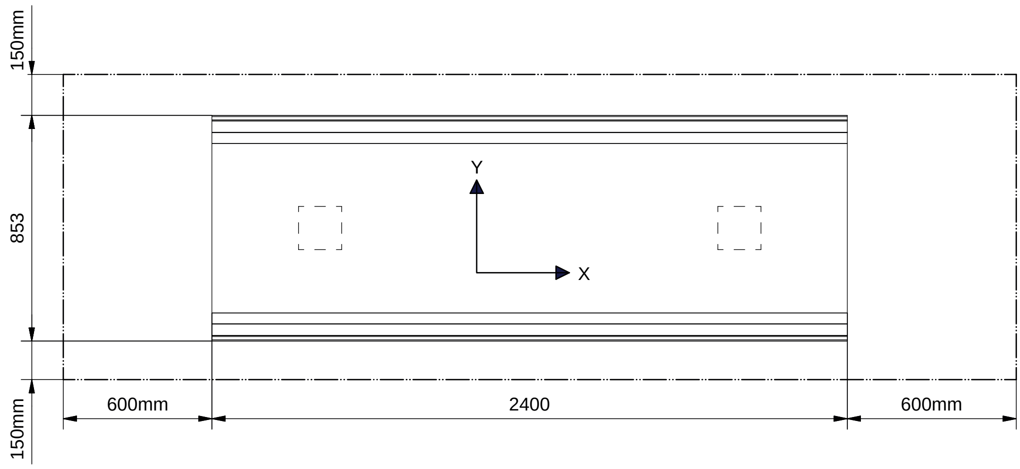


Fig. 2-8

The Fig. 2-9 shows the dimensions underneath the table

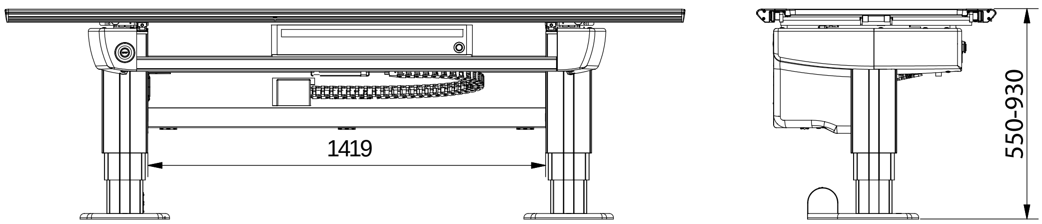


Fig. 2-9

2.9.2 Weight restrictions, table

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 lbs, see Fig. 2-10

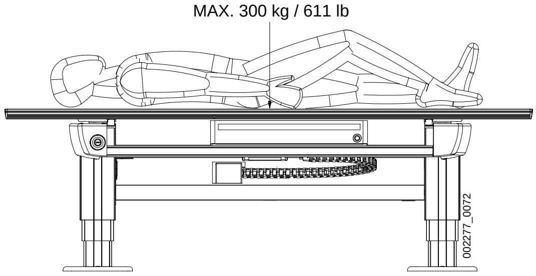


Fig. 2-10

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 lbs and the maximum load of at patient sitting on the table top is 150 kg / 330 lbs.

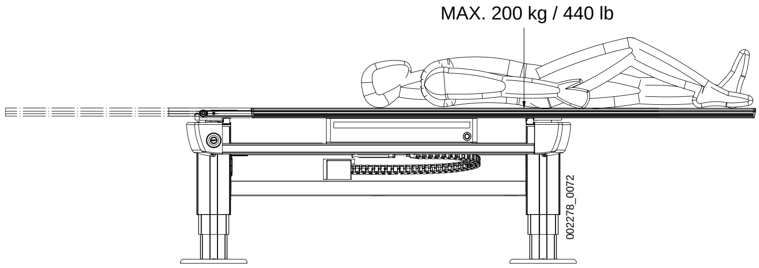


Fig. 2-11

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

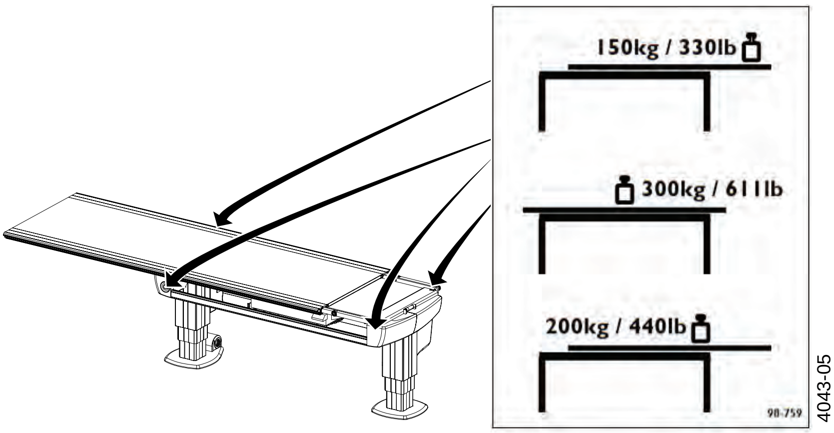


Fig. 2-12 Weight restriction labels on the table

2.10 Safety Functions

WARNING!

The operator must always have supervision of the System.

2.10.1 Wall stand Safety Zone

With consideration of detector tilting and the safety height of the tube there is a collision validation when moving in Autoposition. The System validates if it is possible to move to the position without any collision between tube and detector.

In *Wall Flexible mode* when the user activates the *Servo button* and Z has reached the transport height the System checks the auto position target with the detector tilting and the safety height of the tube to detect possible collision points. If a possible collision is detected, the System stops moving and displays a message.

2.10.2 Table Safety Zone and OTC

There is a safety zone over and around the Table. The safety zone reaches from the table top surface and vertical up 500 mm and from the table top edge and horizontal out 120 mm.

Inside the zone the OTC moves vertically with reduced speed. Not until the OTC is outside the zone the vertical movements are performed with full speed.

WARNING!

When the stand has passed the table top level, on its way downward, the speed will increase to normal speed again.

Additionally, when the stand moves manually down into the zone, at a distance of 50 cm from the Table, the OTC stops the vertical movement and the movement has to be restarted by releasing and pressing the button again.

2.10.3 Collision Detection

2.10.3.1 Motorized Movements

Every motorized movement has a collision detection.

All movements are stopped when the collision detection activates and the display shows an error message. When a collision in Z-direction is detected, the OTC has to be moved in the opposite direction before it can be moved in the original direction again.

2.10.3.2 Z Column

A guard plate installed on top of the column, registers vertical pressure on the column, for instance a vertical impact.

When the pressure exceeds the trig level vertically, all movements are stopped and a warning message is displayed. To be able to release the pressure, a movement in the opposite direction is allowed. When the pressure on the column has returned to normal, see Fig. 2-13 *Collision detection* the warning message is removed and motorized movements are allowed again.

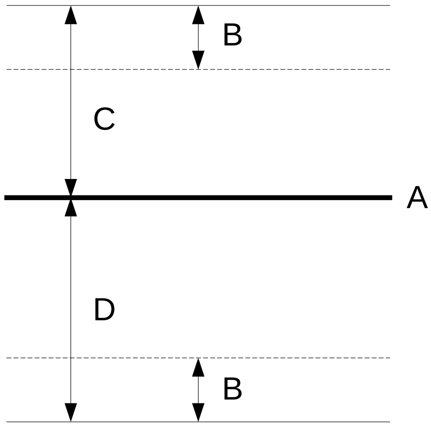


Fig. 2-13 Collision detection

A Zero force level
B Hysteresis
C Upper trig level
D Lower trig level

Note!

In some situations it is possible to force a false detection of a collision. This can occur if the column is affected by a pressure at the time the movement starts. This could be for example the case if the collimator rests on the Table, when the operator moves the column upward, a collision is detected.

The reason for the collision detection is that, when the movement starts, the zero force level is calculated based on the actual pressure affecting the column at that moment. As soon as the movement starts and the collimator is no longer resting on the Table, the guard plate catch a change in pressure and a collision is detected.

To solve the problem the operator must affect pressure on the column, for example manually pull the column up or down. The System will take this as a sign that the operator has removed the obstacle and that no collision exists any more. If the problem is yet not solved, the System must be restarted.

2.10.3.3 Motor Nodes

Every motor node has collision detection on its own movement. A collision can be detected in different ways, for instance if the control error in the motor node's regulator is too large, if the final position is not reached in time, or if the position transducer has not moved although the drive unit had an output voltage for a given time.

A detected collision stops all movements in that part of the System (e.g. OTC, Table or Wall stand) where the collision is detected. An error message is displayed.

2.10.3.4 Malfunctioning Node

If any node stops functioning, all movements are stopped and the power to the motors in the System is removed.

2.10.3.5 Quick Abortion of an Auto Positioning

There is a possibility to quickly stop the stand while it is automatically moving to its position.

Pressing any of the buttons while the stand is moving toward its position, has the same effect as when the servo button is released; all movements are stopped.

2.10.3.6 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.

2.10.4 Dead Man's Grip

All buttons for motorized movements require constant activation. If the operator releases one of the buttons/controls, the System will immediately stop or engage the brakes (manual movements). The exposure hand control has the same functionality.

2.11 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!

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%.
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.

Guidance and manufacturer’s declaration - electromagnetic immunity			
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	$d = 1.2 \sqrt{p}$

Guidance and manufacturer's declaration - electromagnetic immunity			
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

Recommended separation distances between portable and mobile RF communications equipment and System			
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 General User Interface

The following information is always displayed on the System display.

- Alpha angle
- Beta angle
- Distance, or the distance to the floor (depending on modes)
- Mode
- Position

See Operation Manual for user description of the controls.

3.2 System Techniques

The System has a number of different modes. All modes are described below with their special functionalities and features.

Note that depending on the particular System, different modes and actual configurations are available.

- *Free mode*
- *Auto position mode*
- *Wall flexible mode*
- *Table flexible mode*
- *Film tracking mode*
- *Pendulum mode*, Table
- *Stitching mode* (toward the Table and Wall stand)

3.2.1 Free Mode

General Description

The *Free mode* 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 lot of freedom in positioning and exposure, e.g. for emergency examinations or examinations with the patient in a wheel chair or lying in a bed. This mode is available in all Systems.

The distance shown in display for *Free mode* is the distance to the floor.

3.2.1.1 Exposure Validation

Exposure is allowed if the stand is not moving and operating properly (not in an error state).

3.2.2 Auto Positioning Mode

General Description

The *Auto position mode* functions as the *Free mode* with the added functionality of automatic positioning in the room.

Automatic positions are a number of positions that can be programmed and saved into the System. The stand will upon activation of the servo button, move to the programmed position chosen from the imaging unit.

The mode is intended as a flexible, easy to use mode. The mode can also be used as a parking mode.

The distance (H) shown in display for *Auto position mode* is the distance to the floor.

3.2.2.1 Exposure Validation

Exposure is allowed if the stand is not moving and operating properly (not in an error state). The chosen position must have been reached successfully.

3.2.3 Wall Flexible Mode

General Description

The *Wall Flexible mode* is intended for examinations toward a wall stand.

The wall stand detector angle is controlled from the APR.

The OTC will upon activation of the servo button move to the programmed position associated with *Wall mode*. The stand will stop at the transport height and wait for a change in position of the wall stand (detector height). When a change in position is detected (the user moves/drives the wall stand up or down) the OTC will move downward and start tracking the position of the detector.

The value is constantly updated as soon as the wall stand/OTC is moved. It is possible for an operator to change the position so the value cannot be calculated or would be incorrect; in those situations the display will clear the field for the value.

3.2.3.1 No Wait

At the installation of the System it is possible to select, that the OTC shall not wait for the user to move the Wallstand before tracking starts. The OTC will then start the tracking as soon as it reaches its final position.

3.2.3.2 Exposure Validation

Exposure is allowed if the stand is not moving, operating properly (not in an error state) and the servo button is activated.

3.2.4 Table Flexible Mode

General Description

The *Table flexible mode* is equal to *Auto positioning mode* with functionality added for tracking the height of the Table (compare with Wall flexible mode). The mode is intended for Table examinations.

The stand will upon activation of the servo button, move to the programmed *Table mode* position and start tracking the Table height, thereby keeping the film focus distance constant. The *Film focus distance* shown in the display is the actual distance to the detector. The Table position in the room is set during the installation of the System.

3.2.4.1 Exposure Validation

Exposure is allowed if the stand is not moving, operating properly (not in an error state) and the servo button is activated. Movement is allowed in X and alpha direction.

3.2.5 Film Tracking Mode

General Description

The *Film Tracking mode* functions as the *Table mode* with added functionality for controlling the position of the detector in one direction. The mode is intended for fast and easy positioning with the X-ray tube always aimed at the center of the detector.

The motorized detector holder will move the detector to the right position. The stand will upon activation of the servo button move to the pre-programmed *Film-tracking position* and start tracking the Table height, thereby keeping the film focus distance constant. The film focus distance shown in the display is the actual distance to the detector. When *Film Tracking mode* is chosen all buttons except X and alpha-brake buttons will be deactivated. The tube stand is operated manually by releasing one or both of the brakes. The position of the detector is changed according to the change in X and or alpha position of the tube. That is the X and alpha positions can be changed independently.

3.2.5.1 Exposure Validation

Exposure is allowed if the stand is not moving, operating properly (not in an error state), the X-ray tube is aimed to the center of the detector and the servo button is activated.

3.2.6 Pendulum Mode, Table

General Description

The *Pendulum mode* can be seen as a variation of film tracking.

The X-ray tube is always aimed at the center of the detector. The alpha angle of the tube and the position of the detector changes according to the change in X-position of the tube stand. Also *Pendulum mode* incorporates all the functionality of the more simple Table mode. The mode is intended for fast and easy positioning with the X-ray tube always aimed at the center of the detector.

For moving and controlling the position of the detector, a motorized detector holder is required. The stand will upon activation of the servo button move to the programmed position associated with the *Pendulum mode* and start tracking the Table height, thereby keeping the film focus distance constant.

All table handle bar buttons, except (move left) and (move right) buttons, will be deactivated when the *Pendulum mode* is activated. The X-position of the stand is controlled by these two buttons and thereby also the detector and the alpha angle of the tube.

3.2.6.1 Exposure Validation

Exposure is allowed if the stand is not moving, operating properly (not in an error state), the X-ray tube is aimed to the center of the detector and the servo button is activated.

3.2.7 Stitching Mode

3.2.7.1 General Description

Stitching is the process of combining multiple images with overlapping fields of view to produce a larger image.

When imaging long parts of the human body, there is need for an image with extended length. In digital radiography the image size is limited due to the sensitive area of flat-panel detectors. In order to produce a large image, images are assembled from multiple exposures with a small, spatial overlap.

Stitching is possible at both Table and Wallstand.

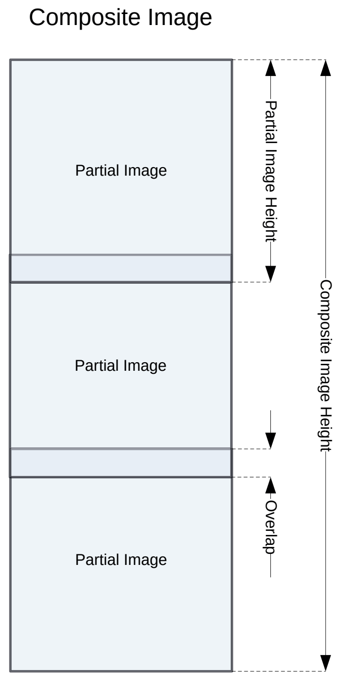


Fig. 3-1 Stitching, schematic description

3.2.7.2 Wallstand/Table Stitching

The user must define the area that shall be captured in the stitching sequence.

When choosing *Stitching mode*, new information will be present on the maneuver handle; high (left) position, low (right) position, total length and number of exposures. The tube support moves to the pre-defined position for X, Y, Alpha, Beta and Wallstand (detector holder for TableStitching). Z moves to the position received from the Image system (*SID value for TableStitching*).

To start the stitching procedure, press *Start exam*.

The movement for stitching is:

- From head to foot, for booth Wallstand and Table.

The operator sets the size of the stitching area (the composite image) by positioning the light field.

Note!

A patient protection shall always be used at Wallstand examinations when performing stitching examinations.

For detailed information about the stitching operation, see the Operator’s Manual.

Exposure Validation

It is only possible to perform an exposure when the System is ready;

- indication light is fixed
- generator is enabled.

The exposure will be blocked and the user needs to activate the start button once more if; a new parameter setting is received, the System is moved out from the start position, a collision when moving, patient position removed, or collimator size is changed.

3.3 Motorized Movements

Motorized motions are performed with a PID-controller, using position feedback. An absolute encoder may be used as position transducer. The speed of the movement follows a trapezoid-shaped curve.

The movement is stopped when a collision or a faulty position transducer is detected. A collision is detected if the control error is too large. The control error is defined as the difference between the set point and the actual position. The set point is given by the ramp generation, and the actual position is given from the position transducer. The maximum allowed difference is set by a parameter.

Ramp Generation

The set point speed of the ramp is generated as an integration of the ramp acceleration (deceleration); the set point position of the ramp is generated as an integration of the ramp speed. The acceleration, deceleration and the maximum speed of the ramp are set as parameters.

The speed of the ramp is increased until the maximum speed is reached. For this increase in speed, the acceleration parameter used, independent of the direction of the acceleration. This maximum speed is maintained until it is time to start the deceleration. The deceleration point is given by the current speed, the rate of the deceleration and the desired final position of the ramp.

The dynamic calculation of the ramp gives that it is possible to change direction of an active ramp generation. In this case, the ramp will first decelerate, using the deceleration value until zero speed is reached. Then will the acceleration in the other direction, commence.

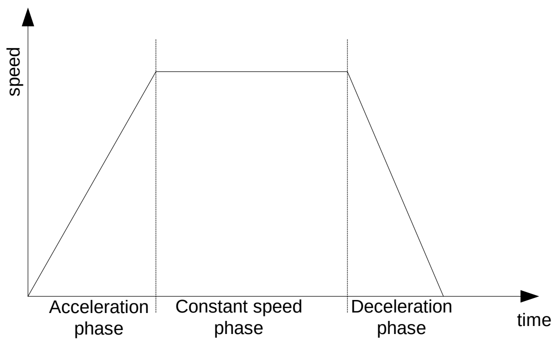


Fig. 3-2 Speed profile of a motorized movement

PID Controller

The control loop is implemented as a PID-controller with both acceleration and velocity feed forward. The function of the anti-wind up is to prevent any increase of the integration part, when the driver board limits the output voltage to a value less than the desired output voltage.

3.4 Mechanical Design

Table

The Table is designed to cover all kind of examinations and patient types.

It is operational with a load up to 300 kg /611 lbs. The Table Z-movement is motorized whereas the floating table top is manually maneuverable. The table top brakes are electrical, allowing the operator to control them with a simple press of a button.

Note that the Table is customized for the 0072 System.

Wallstand

The up and down movement of the Wallstand is both manually and motorized controlled. The movement is counter-weighted, allowing a manual movement with a very limited 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 0 to 105 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 (0°, 90° and 105°) are implemented.

4 Functional Description

4.1 User Interface Description

The System is operated from the user interface controls, inside the examination room and from the operating room.

The exposure controls are placed 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.

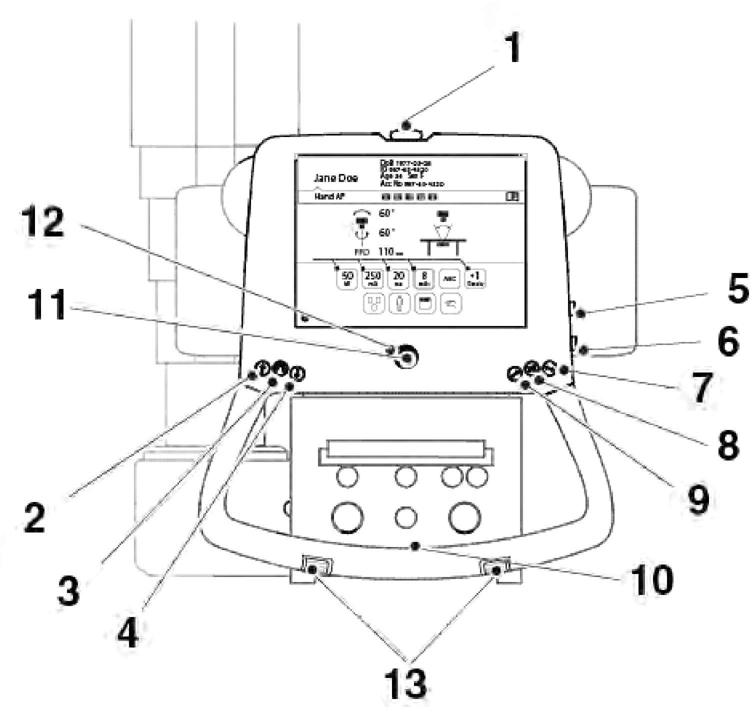
All position controls use a continuous activation technique which basically means that the operator must press and hold the key to activate the function. On release, the function will be deactivated. An extra external servo button can be ordered for the operation room.

4.2 Overhead Tube Crane

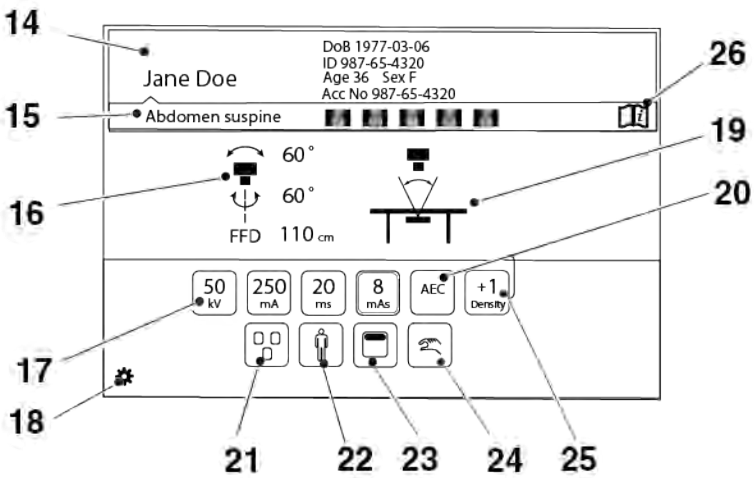
The overhead tube crane (OTC) can be moved to the correct position by autopositioning, motorized movements or manual movements.

The OTC has a display that shows patient information, information of the tube angulation and the selected workstation etc. The exposure parameters are shown and can easily be changed from the OTC.

4.2.1 System Display Overview



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. Handle frame (option): X/Y brake release button
11. Servo button
12. Servo Mode indication light
13. Z movement up/down



14. Patient information
15. Active protocol
16. Position information
17. Adjustment of generator parameters: kV, mA, ms, mAs
18. Select the settings menu
19. Active mode
20. Selection of Technique mode
21. Selection of active AEC field (AEC mode only)
22. Patient size
23. Collimator centering
24. Manual or Servo mode
25. Density
26. Hospital manual

See the following pages for detailed description of the functions.

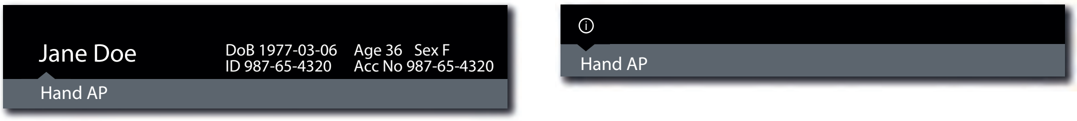
4.2.2 Patient Information

In this field the *Patient Name*, *Patient ID*, *Date of Birth*, *Age, Sex* and *Accession number* can be shown.

The information shown is defined in the *Setting menu*. In the *Setting menu* it is also possible to decide if the *Patient information* shall be shown always (picture 1), or on demand (picture 2).

When the button is shown on demand, the *Patient information* can be obtained by pushing the “i” on the black bar.

The *Patient information* closes automatically, or when the bar is pushed once again.



Picture 1 Picture 2

Fig. 4-1 Patient information display

4.2.3 Position Information

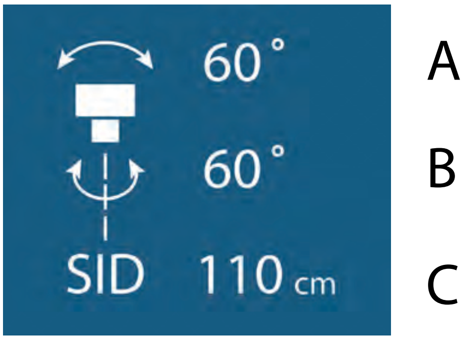


Fig. 4-2 Position information

A. Alpha angle (°)
B. Beta angle (°)
C. Source Image Distance (SID), or Height to floor (H) in Free or Auto Position Mode (cm/inch)

The height to floor (H) is shown in *Free mode* and *Auto position mode*. In all other modes the source image distance (SID) is shown. The unit for the distance can be either cm or inch, and is set in the *Setting menu* (Fig. 4-2 *Position information*).

4.2.4 Adjustment of Generator Parameters (kV, mA, ms, mAs, Density)

In order to change the exposure values, the button with the parameter that shall be changed, is pushed. Then the user may select to increase or decrease the value.

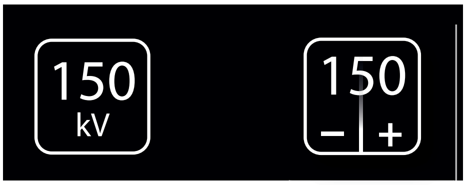


Fig. 4-3 Adjustment of generator parameters

Note!

The Operator/User is always responsible for checking and validating the exposure parameters in the Image system before performing exposure.

4.2.4.1 Exposure Index

The exposure index, EXI, is a measure of the amount of exposure received by the detector and depends on mAs, the total detector area irridiated respective the beam attenuation. It is indicative of the image quality.

4.2.5 Selection of Technique Mode

There are three different technique modes available that are selected by pushing the *Technique mode selection* button. The selected mode is highlighted and the pop-up window closes automatically.

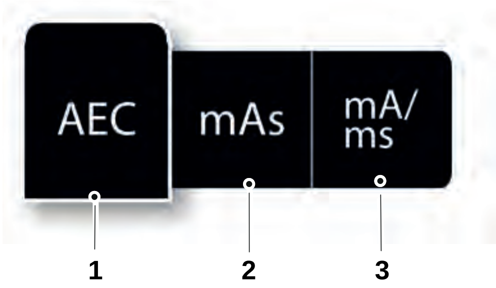


Fig. 4-4 Technique mode selection

1. AEC mode
2. mAs mode
3. mA/ms mode

Depending on what mode is active, different parameters will be available. Parameters not available for selection will be grayed out, see the *mAs selection* button in Fig. 4-5 *mAs selection button grayed out*, below.

In *AEC mode* the value that will be used as back-up value (ms, mAs or fixed), is indicated with the text *AEC Backup*.

CAUTION!

For avoiding unnecessary radiation, make sure that the AEC back-up values are properly defined.

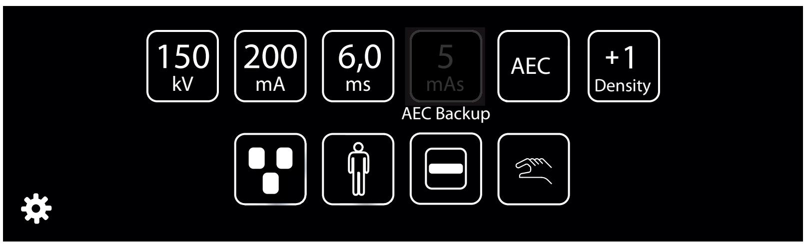


Fig. 4-5 mAs selection button grayed out

For more detailed information about the different technique modes, please see Operator's Manual for Canon single console CXDI NE.

4.2.5.1 Selection of Active AEC Field (AEC Mode Only)

The *AEC field selection* button is available in *AEC mode*.

When selecting the *AEC field* button, a pop-up-window with the different AEC fields according to Fig. 4-6 *AEC field selection*, will appear. The *AEC fields* are activated by a selection in the pop-up window to the right (2). All activated *AEC fields* will be shown in the left picture (1). *AEC fields* are deactivated by selecting them again in the pop-up window (2).

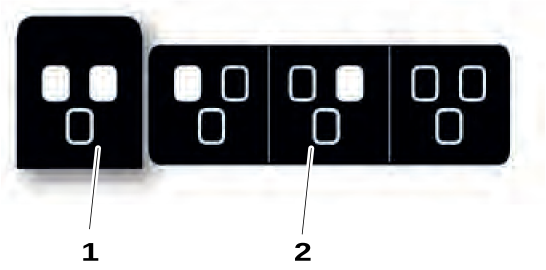


Fig. 4-6 AEC field selection

4.2.6 Patient Size

The *Patient size setting* is used for a quick setting of the generator parameters to suit the physique of the patient.

Patient size is adjusted by pressing the *Patient size selection* button. A pop-up window, according to Fig. 4-7 *Patient size selection*, will open and show available patient sizes.

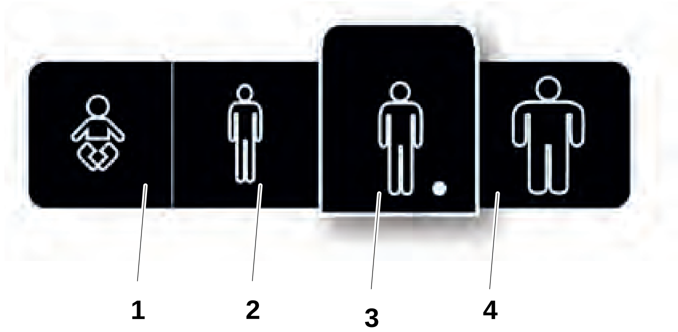


Fig. 4-7 Patient size selection

1. Paediatric
2. Small
3. Medium
4. Large

Select the desired *Patient size*. The pop-up window will automatically close shortly after the selection.

Note!

The generator parameters and the collimator settings (field size and filter) will change to the defined values for the new Patient size.

If no generator parameters or collimator settings are defined for the new Patient size (defined in APR), the current values will be kept.

Note!

At the stitching procedure, a change of the Patient size for the first included image in the sequence, will not be kept for the following included images.

4.2.7 Grid Status

4.2.7.1 Grid Not Present

The user has defined in the *Anatomic Protocol*, that a grid shall be present for the selected examination, but no grid is attached.

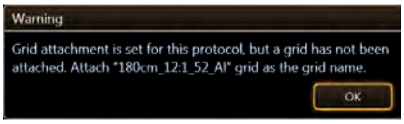


Fig. 4-8 Grid not present.

A warning will be displayed at the PC screen, see Fig. 4-8 *Grid not present.*

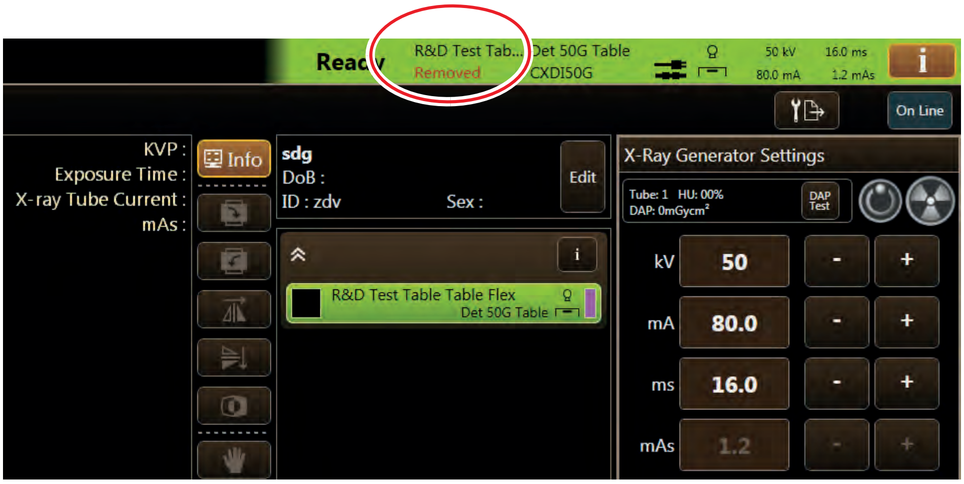


Fig. 4-9 Grid removed.

At the same time, a message is displayed at the *Information field*, saying *Removed*. This message is always shown when the grid shall be present, according to the settings at the *Anatomic Protocol*, but is absent. See Fig. 4-9 *Grid removed.*

4.2.7.2 Grid Present

The user has defined, in the *Anatomic Protocol*, that a grid shall not be used for the selected examination, but a grid is attached.

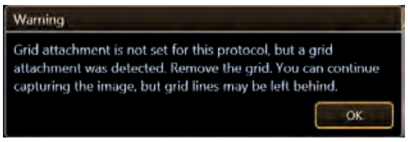


Fig. 4-10 Grid present.

A warning will be displayed at the PC screen, see Fig. 4-10 *Grid present.*

Fig. 4-11 Grid data displayed.

When a grid is attached, the grid data will be displayed at the *Information field*. See Fig. 4-11 *Grid data displayed.*

4.2.8 Collimator Centering

The collimator centering is adjusted by pressing the *Collimator centering* button.

A pop-up window according to Fig. 4-12 *Collimator centering selection*, will appear with the alternatives *Top centering*, and *Bottom centering*. Select the desired collimator centering.

The pop-up window will automatically close shortly after the selection, and the light field will adjust accordingly.

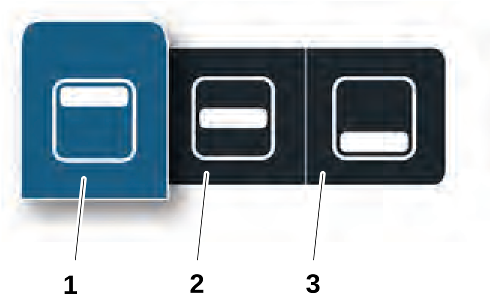


Fig. 4-12 Collimator centering selection

Collimator centering selection 1) Top, 2) Center and 3) Bottom

4.2.9 Servo State Mode

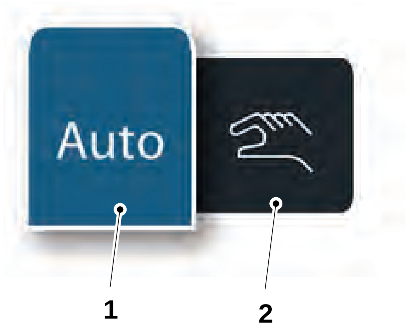


Fig. 4-13 Servo state mode

1. Automatic mode
2. Manual mode

The Servo state can be either *Automatic mode* (1) or *Manual mode* (2).

A pop-up window according to Fig. 4-13 *Servo state mode*, will appear with two alternatives. When the System is in *Manual mode* all movements are allowed and exposure can be performed in any position, also outside the detector.

For further information about *Manual mode*, see corresponding section.

4.2.10 Hospital manual

The hospital manual is reached by a activating the *Hospital manual* button for 1 second.

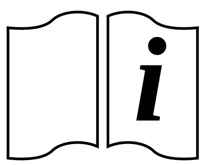


Fig. 4-14 Hospital manual button

4.2.11 Settings

The *Setting menu* is reached by a activating the *Setting* button for 1 second.

Fig. 4-15 Setting button

The *Setting menu* has the following tabs; *User Settings* and *Service*.

User settings has the following tabs: *Display*, *Settings* and *Themes*.

Service has the following tabs: *Log*, *Settings* and *Display*.

4.2.11.1 User settings

User settings – Display

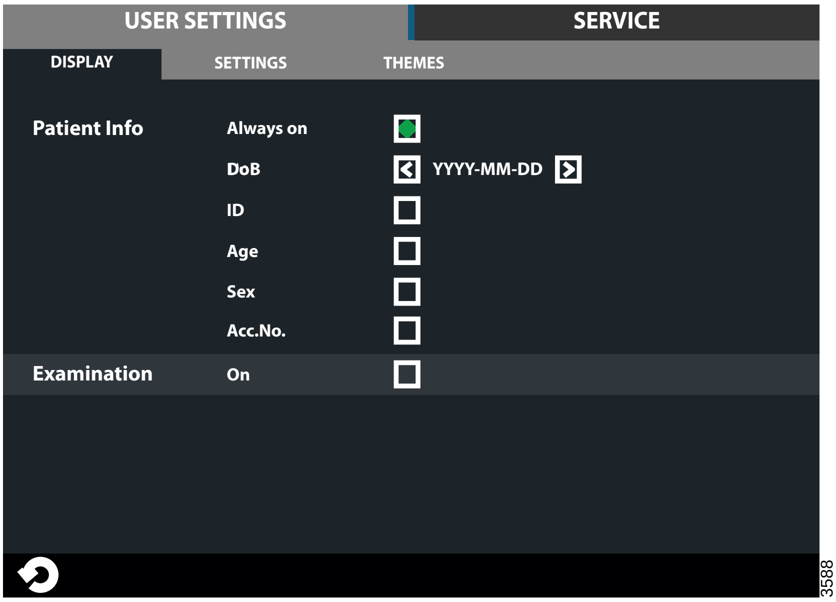


Fig. 4-16 User settings – Display

Patient Info

CAUTION!

The user shall always assure that the Patient info and the type of examination is corresponding to the one in HIS and RIS.

Fig. 4-17 “Always On” selected

When the *Always on* is marked, the *Patient information* is shown as soon as the information is selected in the imaging display.

Fig. 4-18 “Always On” not selected.

When the *Always on* is **not** marked, the *Patient information* is shown when pushing the black field where the *‘i’* is.

The *Patient information* closes automatically.

It is also possible to select what patient information to show on the display. The following parameters can be selected:

- *Date of Birth (DoB)*, different formats selectable
  - YYYY-MM-DD
  - DD-MM-YYYY
  - MM-DD-YYYY
- ID
- Age
- Sex
- Accession number
- Examination/Active Protocol

Settings

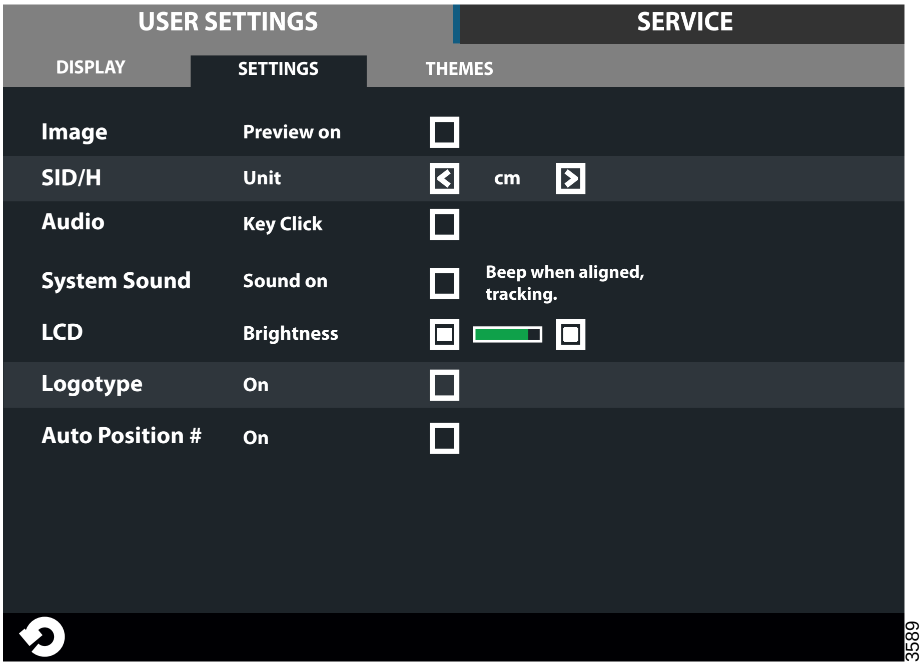


Fig. 4-19 Settings

In the *Settings* tab, it is possible to adjust the following:

- Preview Image (not applicable for CR systems)
- SID/H unit selection
- Audio key click, On/Off
- System sound, On/Off
- LCD brightness, Plus/Minus
- Arcoma logotype in display, On/Off

– Image preview on	By selecting this, a small preview image will be shown next to the Active Protocol name (see figure on page).
– SID/H Unit	Changes between cm and inch. (Changes unit on both display and collimator.)
– Audio Key Click	By selecting this, a key click will be heard when touching the System display.
– Sound on	By selecting this, a beep will be heard when OTC is aligned with the detector, at tracking.

LCD

The display brightness can be adjusted. There is also a setting if the logo shall be shown or not.

Preview Image (not applicable for CR systems)

WARNING!

The preview image must not be used for diagnostics or positioning

It is possible to select if a *Preview image* shall be shown on the touchscreen display or not.

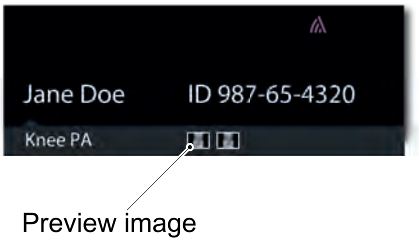


Fig. 4-20 Preview image displayed

If preview is selected, a small preview image, see Fig. 4-20 *Preview image displayed*, is shown on the touchscreen display when an exposure is performed.

Touch the small image on the display, and the image is shown as a large image.

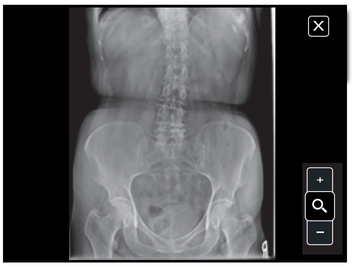


Fig. 4-21 Preview image enlarged

By touching the zoom button +/-, it is possible to zoom in and out, in the image.

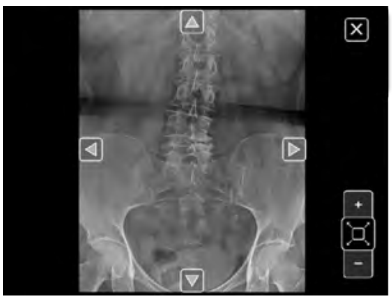


Fig. 4-22 Zooming In/Out

The arrows appearing in the image are used to pan in the image.

Themes

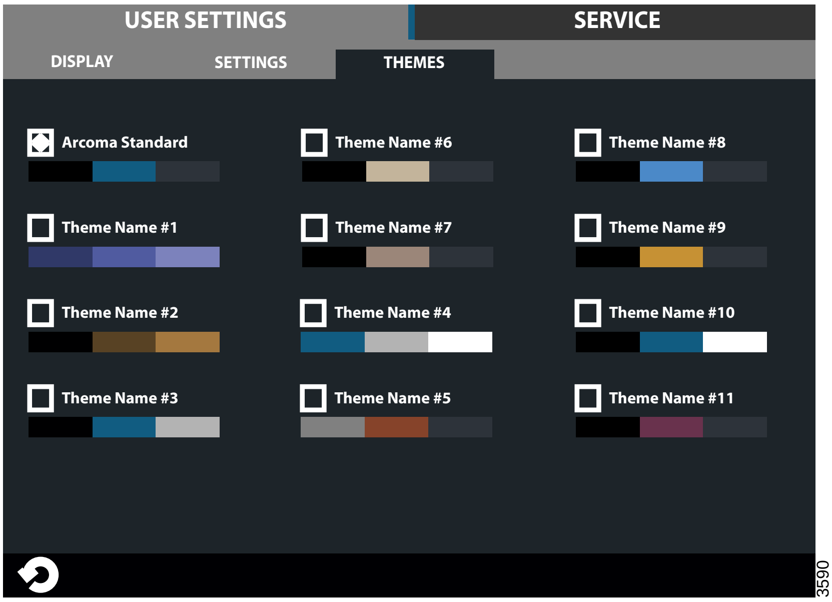


Fig. 4-23 Themes

Select a pre-set theme.

4.2.11.2 Service

The Service tag is meant to be used by the service technician.

Log

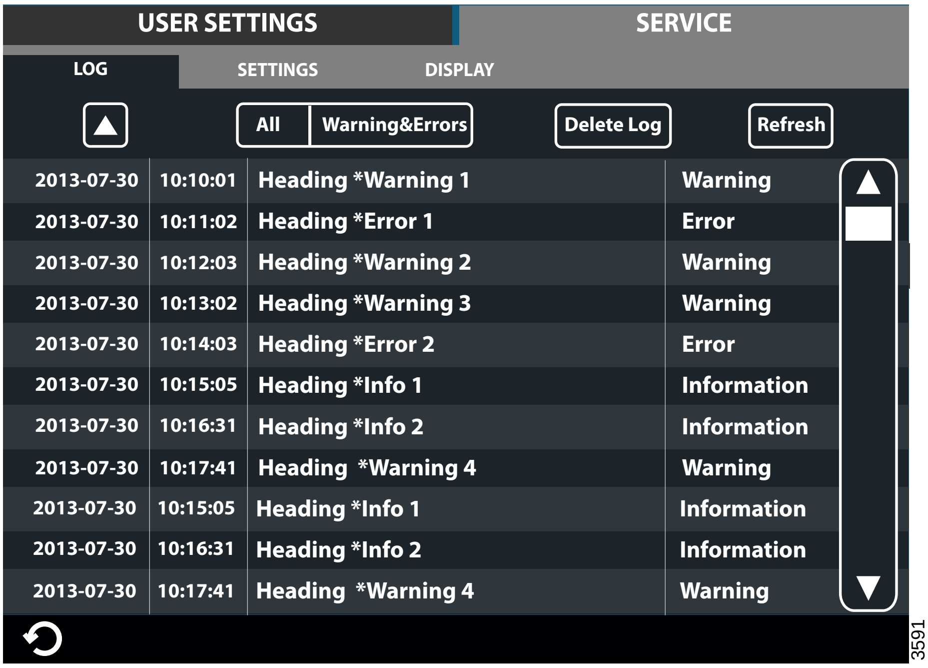


Fig. 4-24 Log

The log file shows warnings, errors and events that have occurred in the system. The log file can be filtered to show all information, or just warnings and errors. By selecting *Information*, *Warning* or *Error*, more information concerning the current issue will be shown.

The log file may be used for troubleshooting.

It is possible for service personnel to delete the log file which can be helpful when fault tracing. The refresh button retrieves the latest events.

Delete log file

Note!

This procedure shall only be performed by service personnel.

When selecting *Delete Log* a four digit access code is required before the log is deleted.

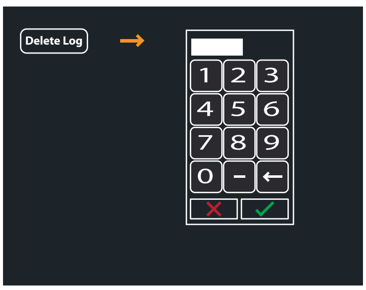


Fig. 4-25 Delete log file

Settings

The Service menu shows system set up and system software versions. A more detailed description can be found in the Service and installation manual.

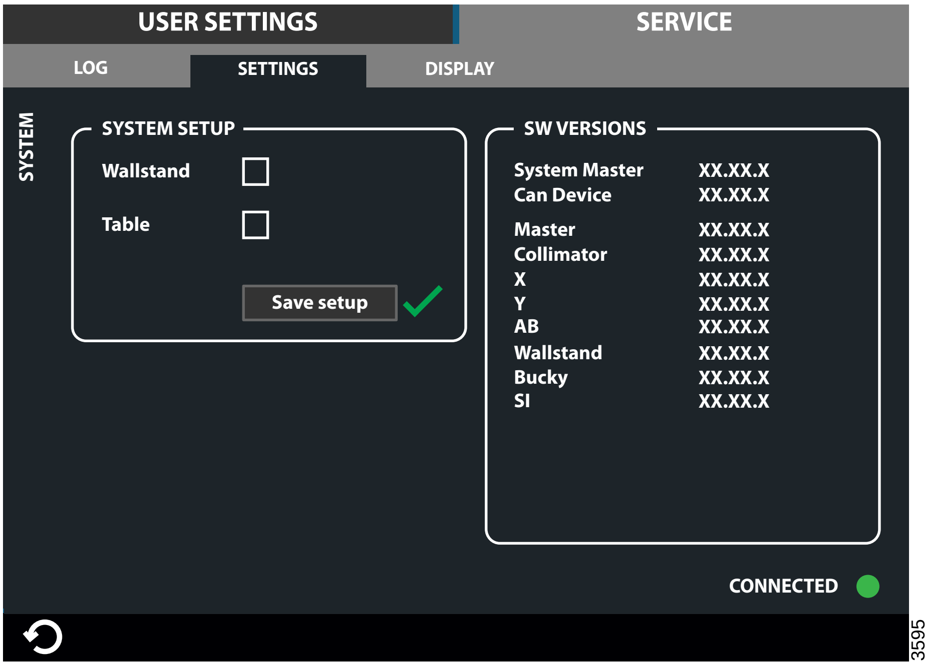


Fig. 4-26

Display

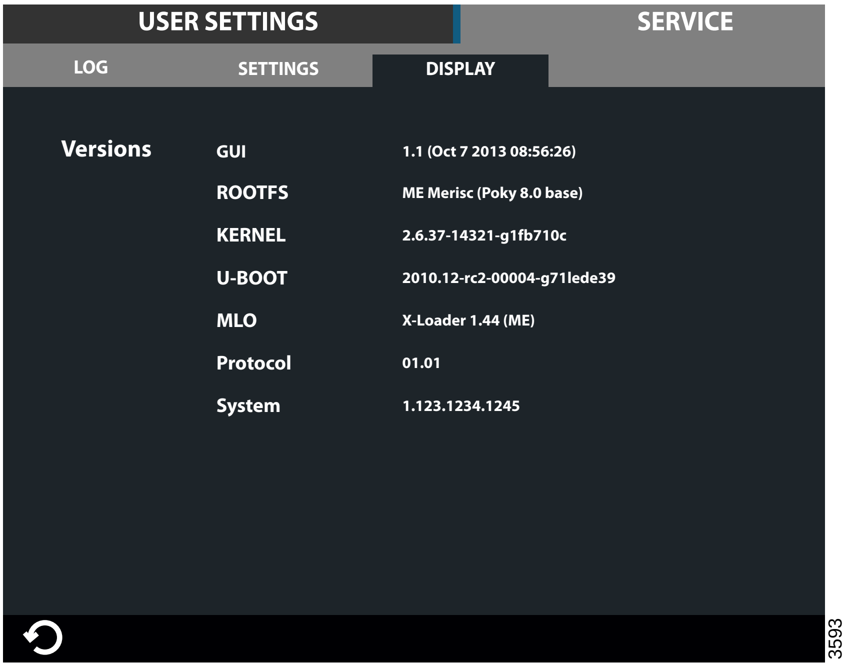


Fig. 4-27 Display

Information of the display software versions.

4.2.12 Exposure

CAUTION!

The operator is responsible for validation of the exposure parameters before performing an exposure.

Exposures are done by using the hand control.

4.2.12.1 Exposure Hand Control

A. Exposure control in normal position.
B. Exposure control in preparation position.
C. Exposure control in exposure position.

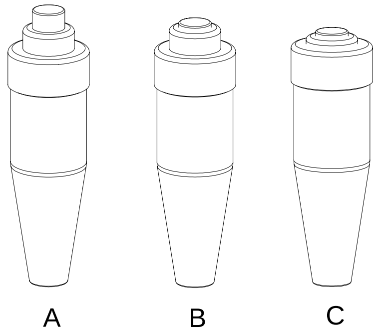


Fig. 4-28 Exposure hand control

4.2.12.2 Exposure Index

After exposure the Exposure Index (EXI) and Deviation Index (DI) will be shown in the image, in order to indicate the dose level. See further description of the indexes below.

The exposure index, is a measure of the amount of exposure received by the detector and depends on mAs, the total detector area irradiated respective the beam attenuation. It is indicative of the image quality.

4.2.12.3 Deviation Index

The deviation index, DI, gives an indication of the dose level used for capturing the image. The DI value compares the current standard EXI with the target EXI.

The target EXI is defined by the user. See Imaging system for further description.

4.3 Positioning Function Controls

The positioning of the System is performed inside the examination room, i.e. are the controls for the positioning functions also placed inside the examination.

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. An extra external servo button can be ordered for the operation room.

4.4 OTC

The controls of the OTC are placed at the handlebar in front of the X-ray tube. The controls are used for enabling and disabling functions concerning the OTC.

Fig. 4-29 Handlebar.

See Operation Manual for user description of the controls.

4.5 Collimator

The collimator, placed directly below the X-ray tube

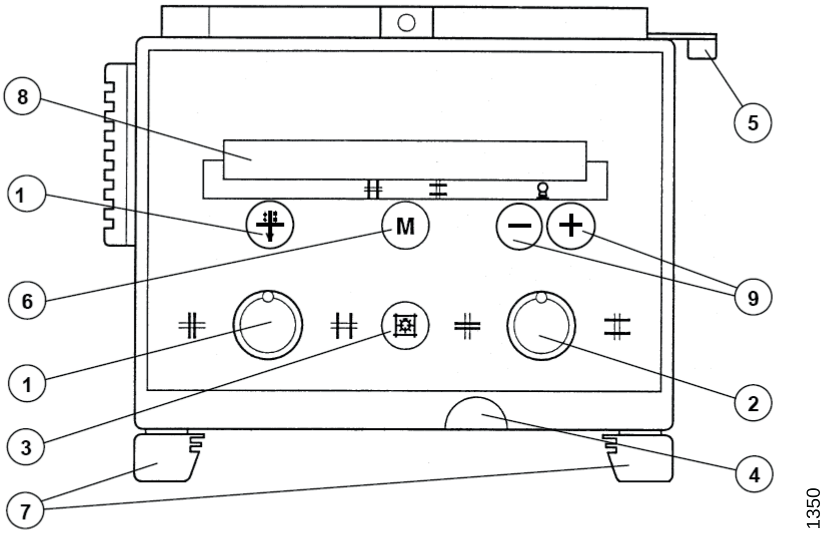


Fig. 4-30 Collimator

1. Adjusting knob for format height collimation. (Turning to the left, closes the collimator. Turning to the right, opens the collimator.)

2. Adjusting knob for format 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 localizer on/off. Automatic switch-off 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 of the “M”-button will restore the collimator settings, to the last settings that were sent to the collimator.

Note!

If the System is in a manual mode, the collimator ignores the instructions of sent collimator filtration from console screen.

7. Two accessory rails.

8. Function display will indicate manual or automatic mode (ACSS) of the collimator.

9. “+”-button used for selecting maximum image size. This function is not available in *Free technique*. (There are buttons for manual changing of film-focus distance in *Free technique*.)

10. Button for selecting collimator filtration.

4.6 Table

4.6.1 Controls

The controls concerning the Table are situated at the handlebar, mounted on the table top and/or at the floor, in form of a foot control (option) or a strip-tape switch (option). The control for the detector brake is placed on the right side of the detector holder. The controls are used for enabling and disabling functions concerning the Table. These functions are:

A. Move down

B. Release/engage brakes of the table top (X- and Y-direction)

C. Move Up

D. Release/Engage detector brake

E. Emergency stop

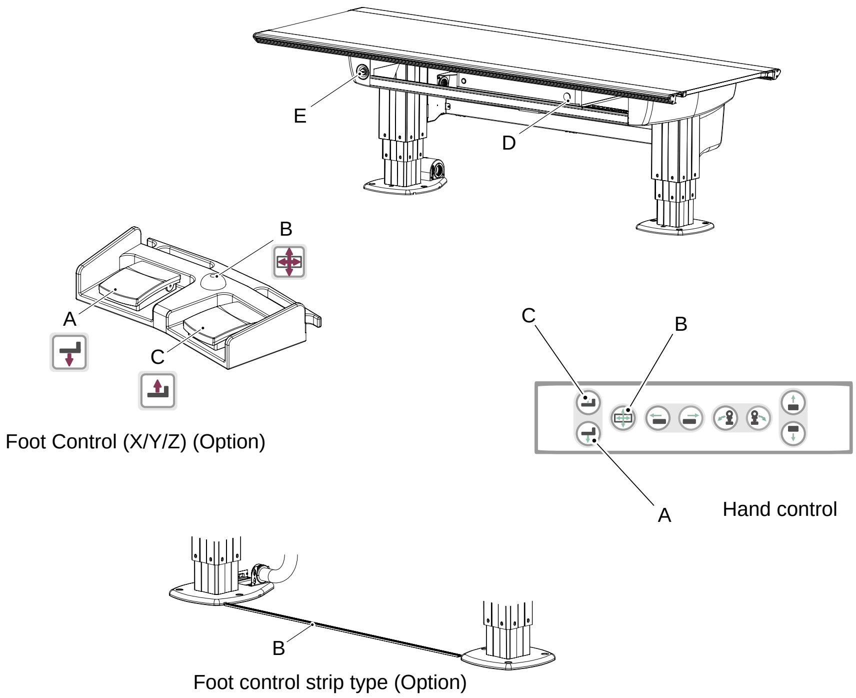


Fig. 4-31

The table top release key (B) automatically switches on 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!

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

4.6.2 Motorized Imaging Unit Movement

The Table imaging unit can be moved in X-direction motorized. The motorized movement is maneuvered from the Table hand control, see Fig. 1-5 *Table overview*. The function can synchronize the imaging unit and follow the movement of the OTC.

4.6.2.1 Synchronization Function

A mechanical solution enables the detector holder to be moved manually. The synchronization function finds the detector holder, moves to end position and lights up the green indicator. The imaging unit will now follow the movement of the OTC during the synchronization.

If the user moves the imaging unit (motorized) from the hand control, see Fig. 1-5 *Table overview*, the synchronization will be performed as described above, also when auto position is activated in following modes:

- *Pendel* (pendulum)
- *Film tracking*

For the modes *Table flexible* and *Auto position* the System will not synchronize the imaging unit, if the detector holder is not in its cradle. The user can select if the imaging unit should synchronize and follow the movement of the OTC or not, by moving the imaging unit manually into, or from the cradle.

Note!

It is the user's responsibility to verify that the imaging unit is in position when exposing in "Table flexible" and "Auto position" modes.

4.7 Wallstand

4.7.1 Motorized Movement

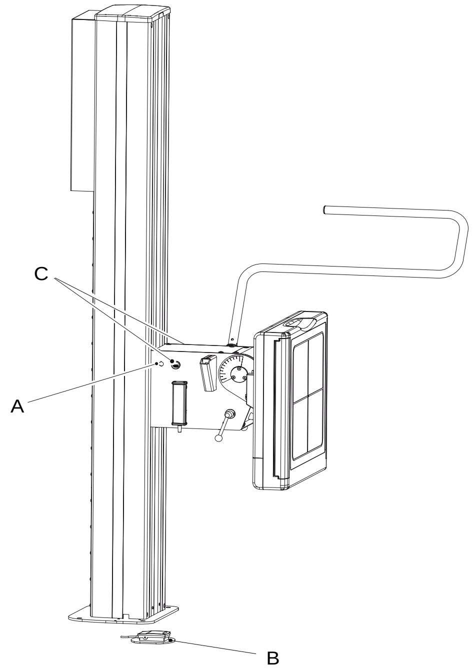


Fig. 4-32

The controls concerning the motorized Wallstand, are placed on the detector holder bracket and at the foot of the column. These functions are;

- A. Grid exchange
- 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 flexible mode* is selected and the 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 detector unit brake key, an automatic movement of the OTC is allowed. The automatic movement is used for tracking the movement of the detector and to synchronize (align) the X-ray tube and the imaging unit.

At auto-positioning the Wallstand, the Wallstand detector unit will move into a basic position.

4.8 Software Design

4.8.1 Basic Concepts

The 0072 Version C, 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 the generator
- The OTC.

  Responsible for handling of the X-ray tube ceiling support. Important functions for this subsystem are: moving Z up/down, X, Y, Alpha and Beta, tracking of Table and Wallstand and to inform the user about System status.
- The Wallstand.

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

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

5 Installation

5.1 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 Manufacturer . If not, the time of guarantee will be considerably reduced.

Note!

Surrounding equipment, not supplied by the manufacture, shall comply to 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 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.

5.2 Precautions

WARNING!

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

WARNING!

Electrical shock. Covers removed, exposure to electrical shock.

WARNING!

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

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 suspended unit, 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.

5.3 Service PC

System requirements:

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

5.4 Tools Required

5.4.1 Standard Tools

- Standard hand tools and service tools
- Tools for unpacking
- Dynamometer (400N)
- Torque wrench (47Nm)
- Multimeter
- Dose probe
- Digital spirit 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
- Loctite 243
- Tape
- Service PC
- Service cable (See Spare Parts chapter 9)
- Standard serial cable
- Working gloves
- Customized allen keys

Fig. 5-1

5.5 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.

Table 5-1

Nominal thread diameter		Screw material				
		Iron/Steel				
	Hardness rating	4.6	5.8	8.8	10.9	12.9
M3		0.46	0.77	1.2	1.7	2.1
M3.5		0.73	1.2	1.9	2.7	3.3
M4		1.1	1.8	2.9	4	4.9
M5		2.2	3.6	5.7	8.1	9.7
M6		3.7	6.1	9.8	14	17
M8		8.9	15	24	33	40
M10		17	29	47	65	79
M12		30	51	81	114	136

5.6 Cable Marking

All cables and electronics are marked in accordance with the following;

1.xx — OTC

2.xx — Table

3.xx — Wallstand

4.xx — Cabinet

5.7 Shipping/Receiving

5.7.1 Receiving

1. Verify that the site is ready for installation.
2. Remove the crate's top and sides.

   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.
3. Compare items received to those listed on the shippers packing list and the Manufacturer's order to determine whether the complete shipment has arrived.

Any discrepancies should be reported to:

ARCOMA AB
Annavägen 1
SE-352 46 Växjö
Sweden
Phone +46 (0)470 70 69 70

5.7.2 Storage Precautions

CAUTION!

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

CAUTION!

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

CAUTION!

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

5.7.3 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.

5.8 Mechanical Installation of OTC

5.8.1 Installation Rails (Unistrut)

The described installation is performed with Unistruts, but naturally there are other methods.

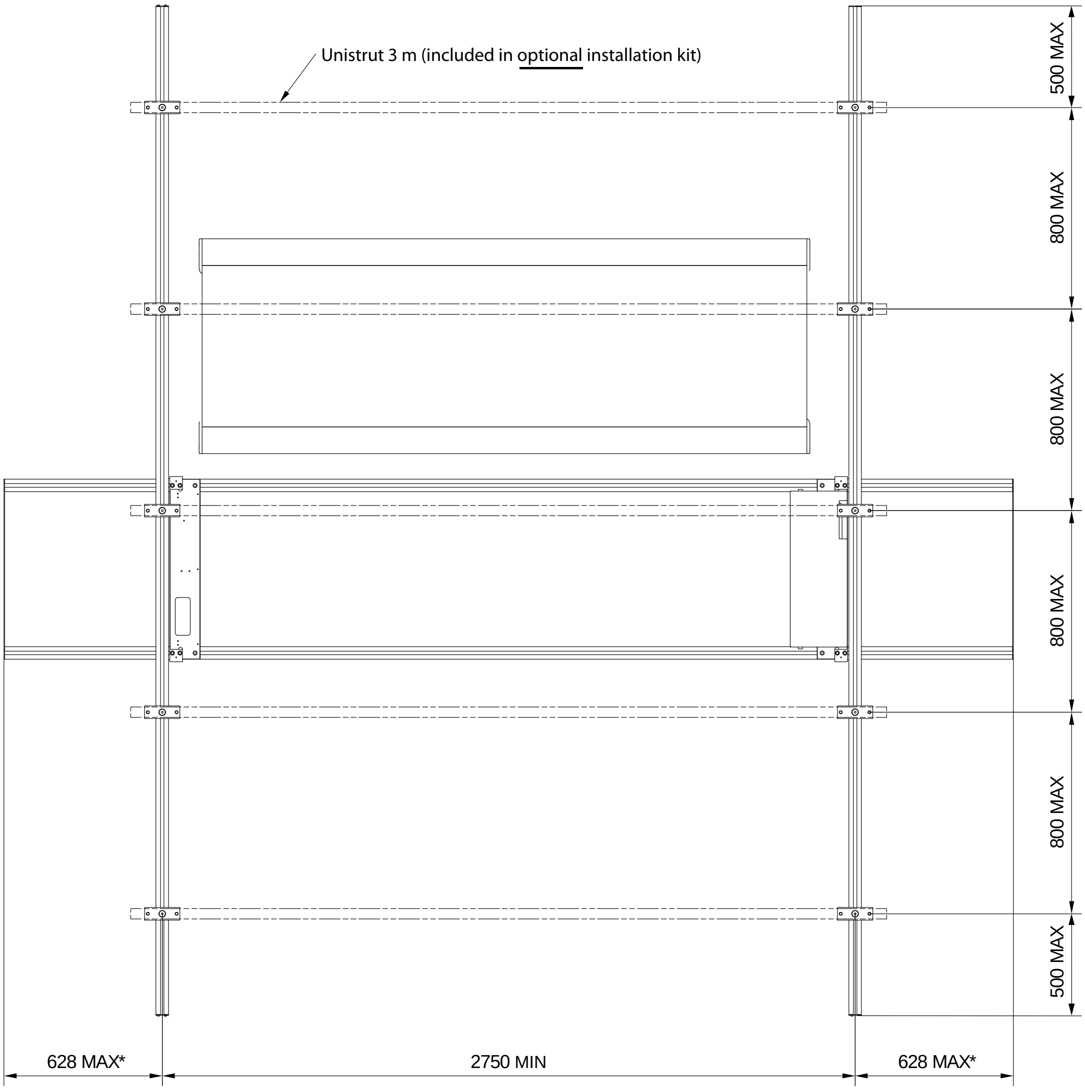
Check that necessary fixation points are present on the ceiling.

Use Unistrut rails or similar, installed with a distance of 800 mm and 2900-3100 mm above the floor. The Unistrut rails should be parallel with the long side of the patient Table. Vertical alignment shall be within +/- 1 mm. For more information, see Planning guide.

Every single attachment point must be able to carry a load of at least 400 kg. The OTC with 4x4 m rails must have at least 10 brackets in the ceiling. All attachment points together, must be able to carry at least 2000 kg. +/- 1 mm deformation is allowed.

To be able to install the cable carriage, see 5.8.5.2 *Installing the Cable Carriages*, Page 85. The distance between the wall and the ceiling rail Y must be minimum 120 mm.

To install the ceiling wagon, see section 5.8.8 *Ceiling Wagon*, Page 92, the distance between the wall and the ceiling rail X must be at least 650 mm



*625mm + lid and screwhead

Fig. 5-2 Example for 4 m traverse

The length of the traverse rails X, outside the ceiling rails Y must not exceed 600 mm, see Fig. 5-2 *Example for 4 m traverse*If the traverse rails are more than 4000 mm, a third rail must be used in the middle, for increased stability.

X-rail (mm)	Y-rail (mm)	Jirva rails	Number of brackets	Number of Y-rails
3000	3000	4	8	2
3000	4000	5	10	2
3000	5000	7	14	2
3000	6000	8	16	2
4000	3000	4	8	2
4000	4000	5	10	2
4000	5000	7	14	2
4000	6000	8	16	2
5000	3000	4	12	3
5000	4000	5	15	3
5000	5000	7	21	3
5000	6000	8	24	3

5.8.2 Insulation

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

Note!

The insulation kit is designed to isolate System components, e.g. System cabinet, Table, Wallstand and ceiling suspended unit, 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.

5.8.3 Traverse

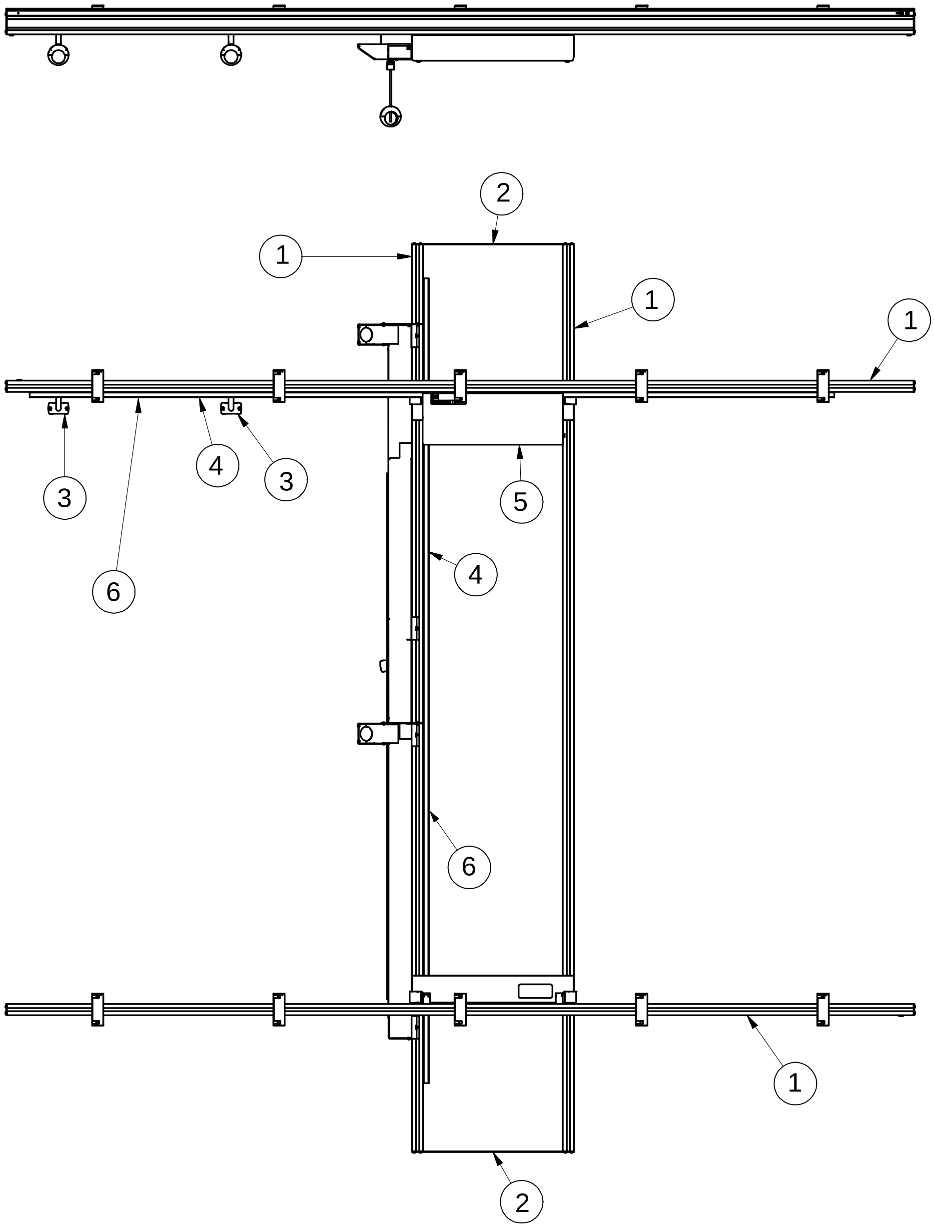


Fig. 5-3 Traverse 4x4 m

1. Beam
2. End cover, large (0070–001–021)
3. Cable carriage (0070–099–001)
4. Tooth belt profile
5. Cover, electronics (0070–063–247)
6. Tooth belt

5.8.4 Tooth Belt

- Install the tooth belt profile on the ceiling rail (Y) and traverse rail (X), see figures below.

The screws and nuts are pre-assembled at the tooth belt profile.

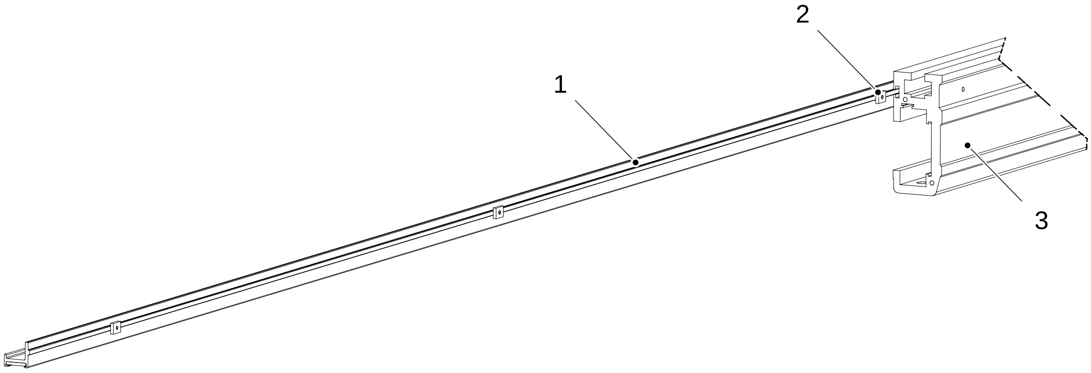


Fig. 5-4 Tooth belt profile

1. Tooth belt, included in rail package
2. Installation nut M4
3. Ceiling rail Y or Traverse rail X

- Loosen the screws.
- Slide the rail into ceiling rail Y and traverse rail X.
- Tighten the screws again.

For distances, see Fig. 5-5 *Mounting distance*

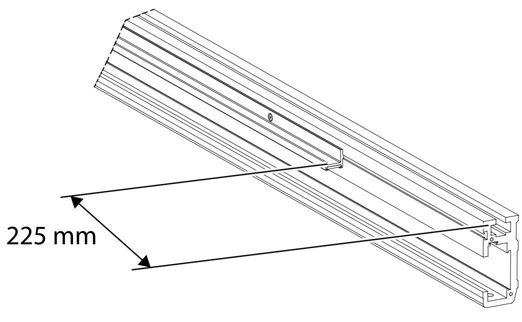


Fig. 5-5 Mounting distance

5.8.5 Ceiling Rails Y

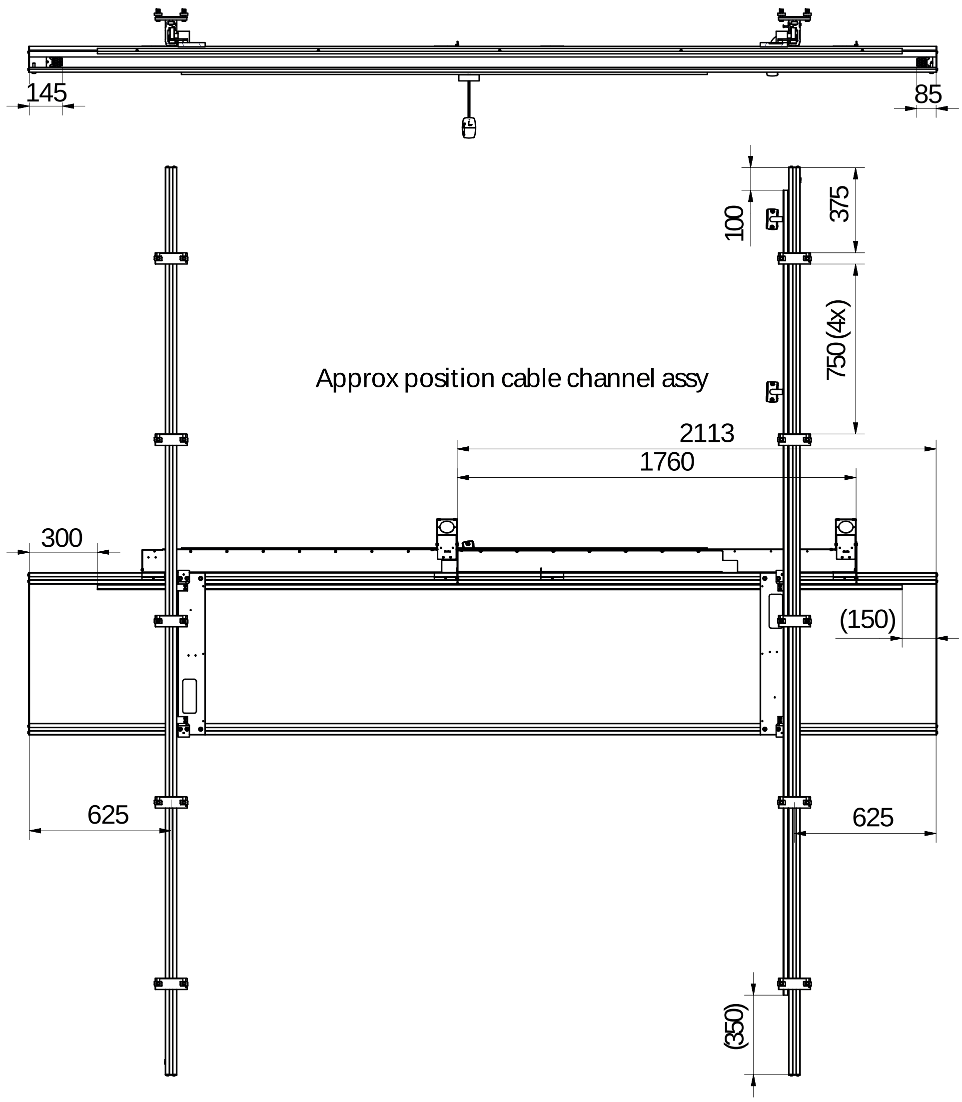


Fig. 5-6 Approximate position cable channel assembly

Start by opening the pack box CS Box 1.

Take the ceiling rails Y, 1 with tooth belt and the other(s) without tooth belt (standard 4000 mm), and install the fixation blocks at the same distance as the Unistrut rails. Use the M12x30B and the installation nut M12.

For the position of the ceiling rail with tooth belt, see Fig. 5-6 *Approximate position cable channel assembly*.

Install the insulation plates and cases on the fixation blocks.

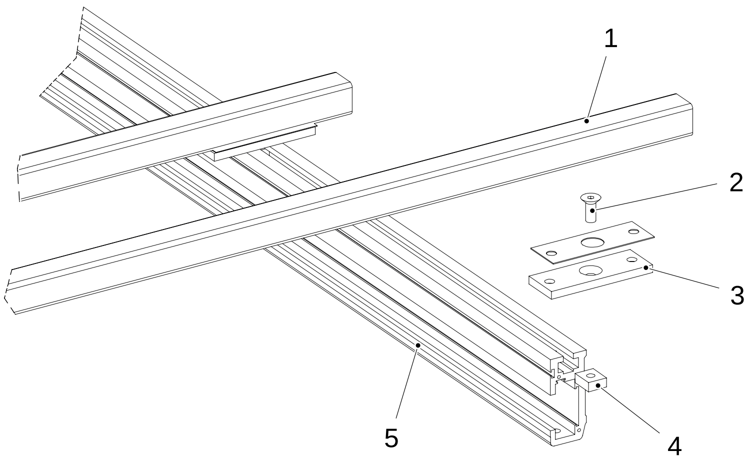


Fig. 5-7

1. Unistrut rail
2. MF6S 10.9 M12X30B
3. Fixation blocks
4. Installation nut M12
5. Ceiling rail (Y)

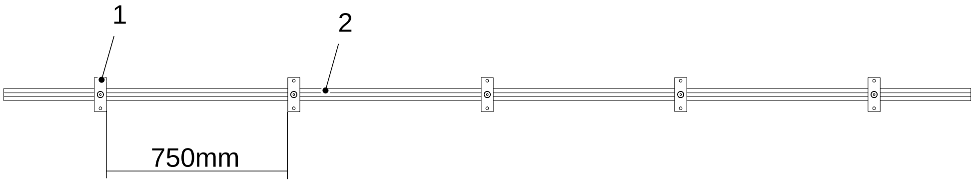


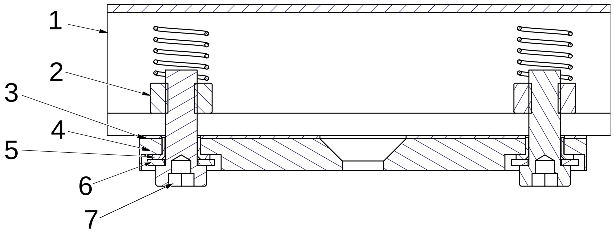
Fig. 5-8

1. Fixation block
2. Ceiling rail (Y)

Note!

For location of the tooth belts, see Fig. 5-3 Traverse 4x4 m

Lift up the ceiling rails Y and bolt them into the ceiling attachment points.



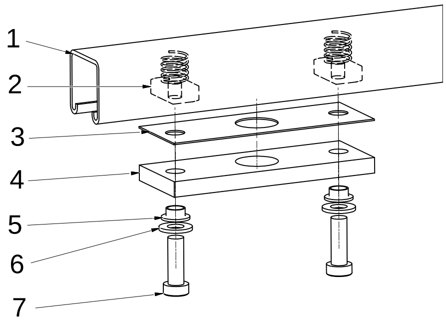


Fig. 5-9

1. Jirva rail
2. Spring channel nut
3. Isolation plate, traverse
4. Fixation block
5. Isolation case, traverse
6. BRB FZB
7. MC6LS M10x30A

To bolt the ceiling rails Y into the Unistrut or similar, use M10 low-head bolts and a suitable (M10) washer, between the bolts and the insulation housing.

Note!

It is important to use low-head bolts for this installation.

Loctite 243 on the bolts is required. The torque on the bolts, is 47 Nm. The ceiling rails Y have to be parallel ±2 mm.

5.8.5.1 Alignment of Ceiling Rails Y

- Level the ceiling rails Y with a spirit level.
  The ceiling rails Y must be horizontal. If necessary, adjust with the shims kit 1 mm or 2 mm.

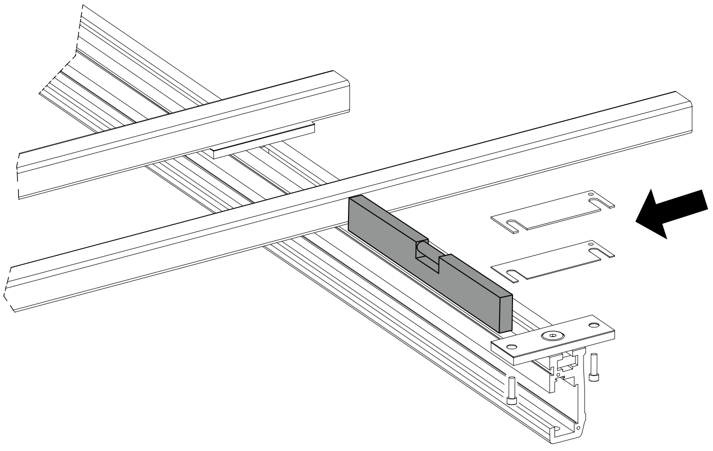


Fig. 5-10

5.8.5.2 Installing the Cable Carriages

- Open the pack boxes CS Box 4, and CS Box 2.
- Decide from what side to slide the distance plates.
- Mount the end stop and cover at the opposite side.

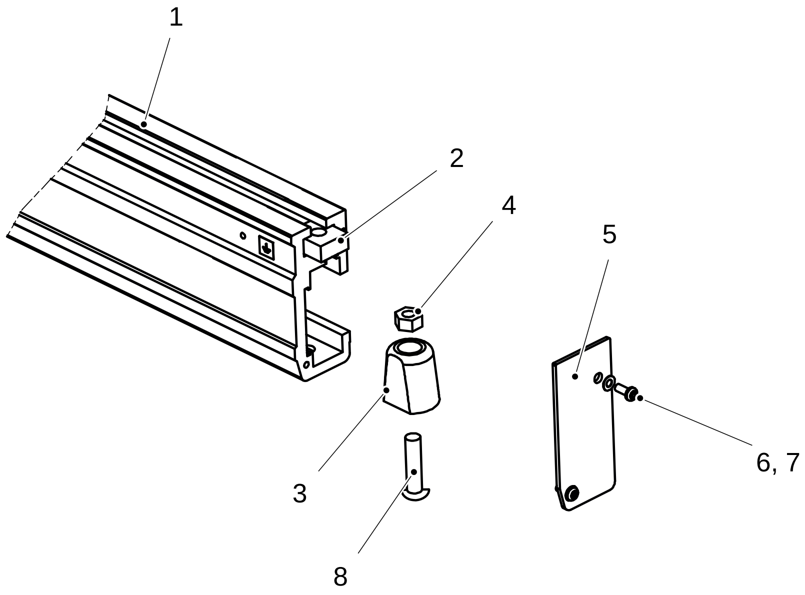


Fig. 5-11

1. Ceiling rail (Y)
2. M6M M10
3. End cover, small, ceiling rail (0070–001–020)
4. K6S 4.6 M5X10 A
5. Contact washer KB 5.1x10.2
6. K6S M10x40 A
7. End stop, rubber (0070–001–022)
8. Anchoring nut M12 (0070–001–016)

Install as many cable carriages as needed in the ceiling rail Y.

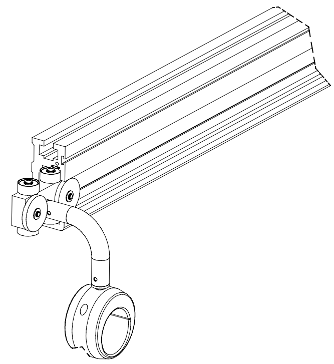


Fig. 5-12 Cable carriage

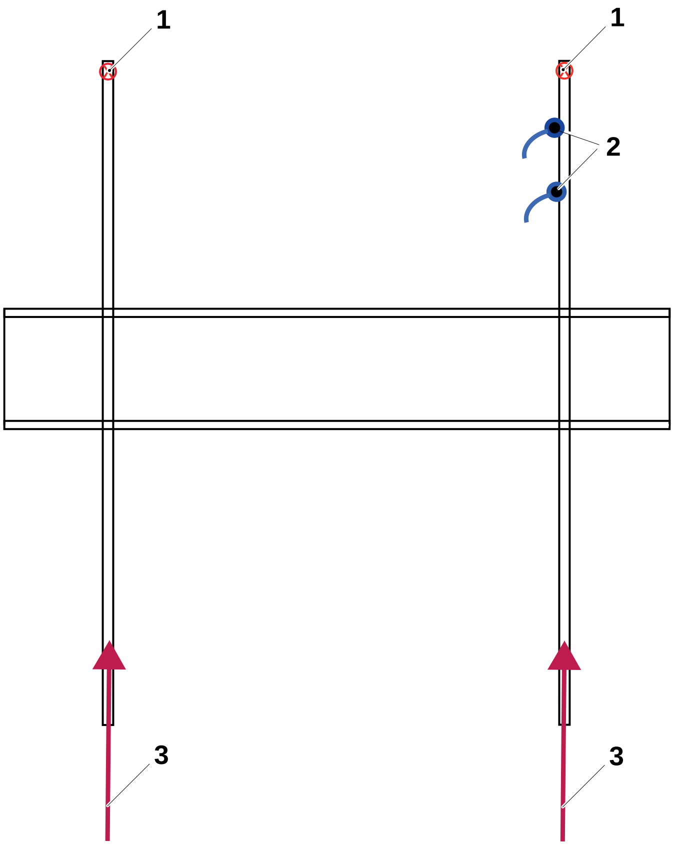


Fig. 5-13 Installations at Ceiling Rails Y

1. End stops
2. Cable carriages
3. Distance plates

5.8.5.3 Distance Plates

Note!

Install the M10x75 bolts before rolling in the distance plates all the way.

The tooth belt obstructs installation of the bolts afterward.

- Roll in the distance plates into each ceiling rail Y, see Fig. 5-14 *Distance plates*.

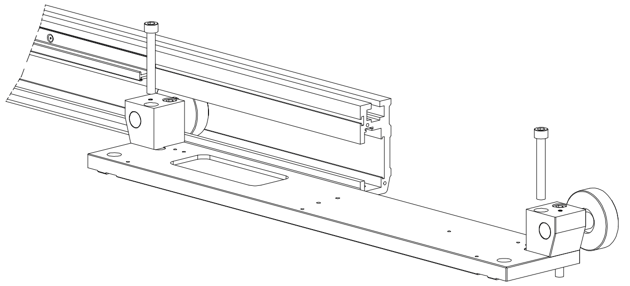


Fig. 5-14 Distance plates

5.8.5.4 End Stops and Covers, Ceiling Rails Y

- Mount the resting end stops and covers.

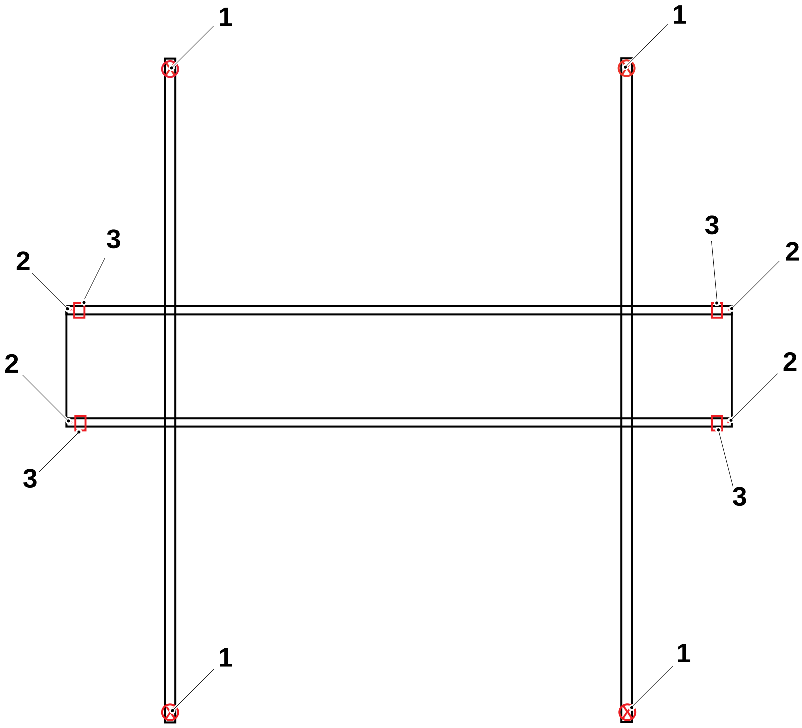


Fig. 5-15 Overview rubber/adjustable end stop

1. Rubber end stop + K6S bolt and nut
2. K6 bolt and nut
3. Adjustable end stop

5.8.5.5 Protective Earth

Connect the protective earth from the generator to each ceiling rail Y.

5.8.6 Traverse Rail X

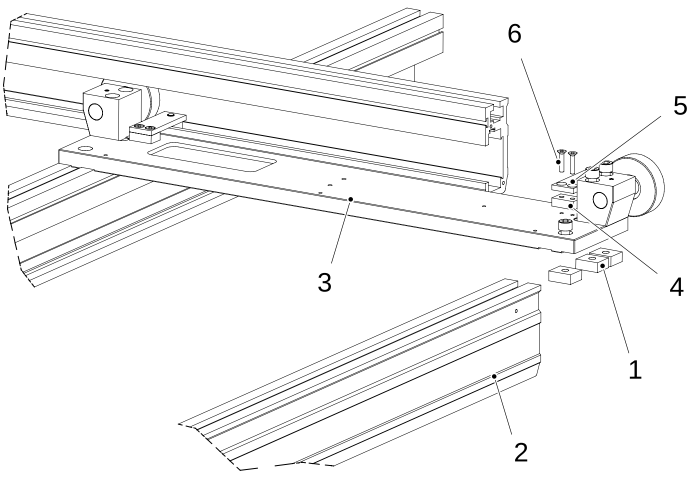


Fig. 5-16

Pack box CS Box 2 and 4.

1. Installation nut M10, 0070–001–034	4. 0070–001–044
2. Traverse rails X	5. 0070–001–242
3. Distance plate, 0070–001–223, CS Box 4	6. MF6S M5x25 (2x)

- Lift up the traverse rails X and bolt them into the distance plate, see figure below. See also Fig. 5-2 *Example for 4 m traverse* for measurements.
- Select the tooth-belt rail and position it in accordance with Fig. 5-3 *Traverse 4x4 m*
- Put 3 installation nuts M10 into each rail. Attach by 2 pcs of M10x75 and 1 pc of M10x25.

5.8.6.1 Side Position Bearings

- Install the side position bearings on the distance plates. See Fig. 5-16 .
- Run the traverse rails X all the way and make sure it runs smoothly.
- Check that the rails are parallel and that the wheels are centered in the ceiling rails Y. Adjust if necessary.

5.8.7 Electrical Plate Y and Drive Unit Y

Unpack the electrical plate.

Install the electrical plate Y and drive unit Y, by using the 3 pcs of M5x8A screws and contact washers.

Note!

The drive unit, (pos.1) must be mounted at the right side of the traverse, see Fig. 5-17 Drive unit mounting position

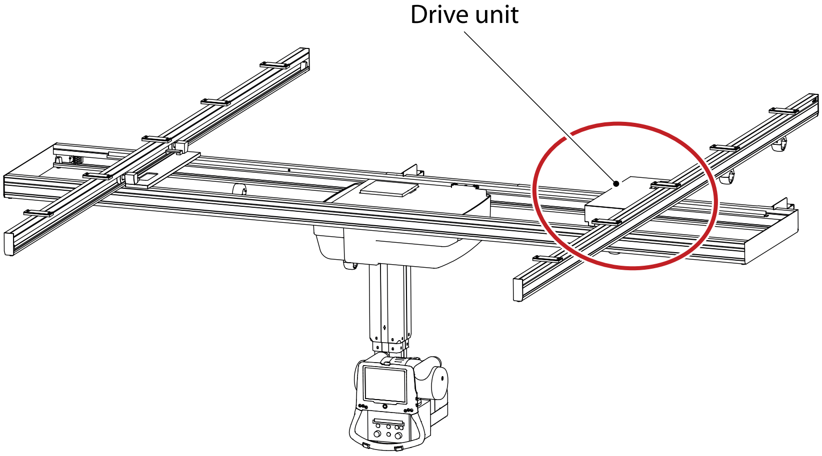


Fig. 5-17 Drive unit mounting position

- Assemble the electrical plate Y.
- Unscrew the assembling screws from the support wheel bracket.

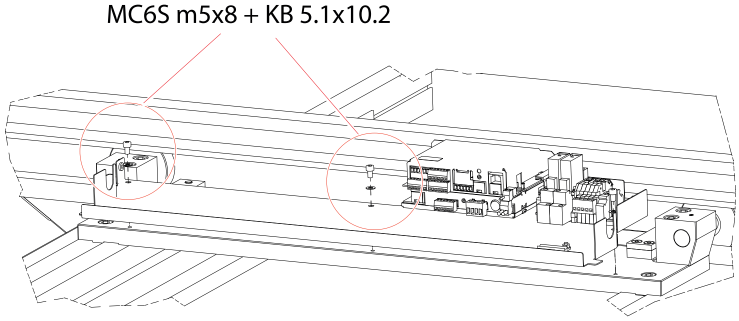


Fig. 5-18 Assembling the electrical plate

- Disassemble the support wheel bracket from the braking unit.
- Assemble the drive unit with 2 screws — do not tighten the screws.

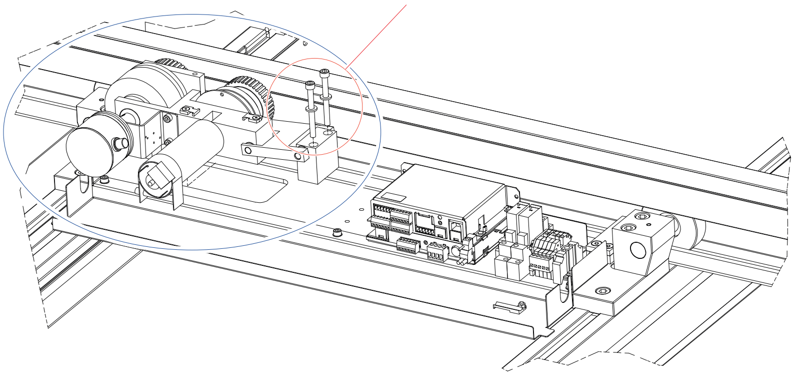


Fig. 5-19

- Reassemble the support wheel bracket at the braking unit.
- Adjust by loosening the nuts at the eccentric wheel axles. Turn the eccentric wheel axles, with a screw driver, until their are no play and the bearings are not possible to turn.

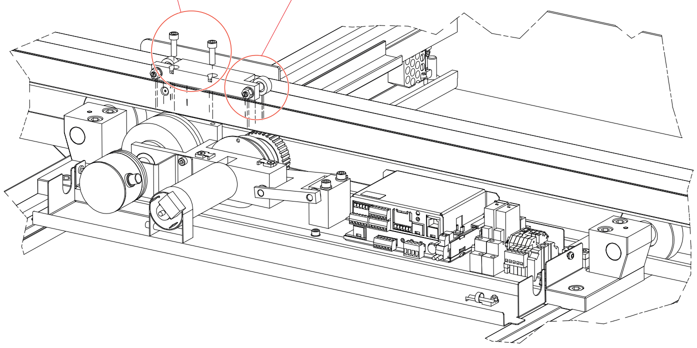


Fig. 5-20

- Connect the drive unit to the electrical plate Y, see Fig. 5-23

Note!

As soon as the drive unit is installed, the traverse rail (X) is locked in its position. The traverse cannot be moved until the power is supplied and the brake is released.

5.8.8 Ceiling Wagon

- Check room layout for the correct orientation of the ceiling wagon. There should be enough space in accordance with Fig. 5-2 *Example for 4 m traverse*
- Decide from which side the ceiling wagon shall be inserted. Mount end stops at the opposite side of the X traverses.

5.8.8.1 End stops and Covers, Traverse Rails X

Install the end stops and the cover plate onto the traverse rails X, see figure.

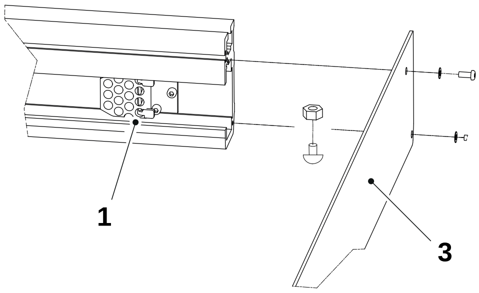


Fig. 5-21

1. Mount the adjustable end stops. See Fig. 5-21
2. Mount the non-adjustable end stops.
3. Mount the end plates. See Fig. 5-21

5.8.8.2 Install the Ceiling Wagon

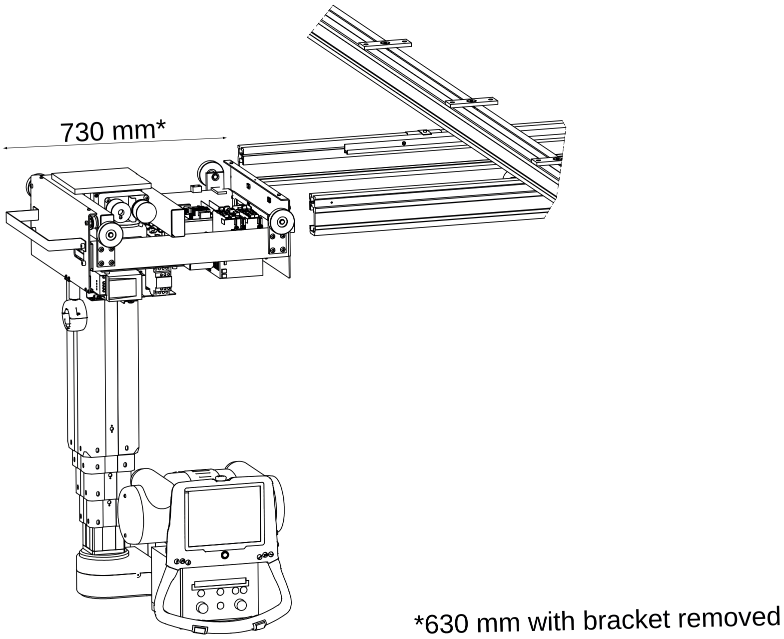


Fig. 5-22

- Lift up the ceiling wagon and roll it into the traverse rails X, see Fig. 5-22
  If this distance cannot be obtained;
  1. Unscrew the 4 wheels.
  2. Lift the ceiling wagon into position.
  3. Reassemble the wheels, see 5.5 *Tightening Torque*, Page 73

5.8.8.3 Side Position Bearings

Install the side position bearings on the ceiling wagon.

Run the traverse rails X all the way and make sure it runs smoothly.

Check that the rails are parallel and that the wheels are centered in the ceiling rails Y. Adjust if necessary.

5.8.8.4 Cable Hose

Install the loose end of the cable hose, referring to the room planning. Preferred position is close to the parking position.

Move the ceiling wagon around and check that the cables are not caught into something in the room. The cable hose may be shortened to avoid from hanging down too much.

5.8.8.5 Drive Unit

Lower the electronic plate.

Install the drive unit X and connect the cables.

As soon as the drive unit is installed, the traverse rail (X) is locked in its position. The traverse cannot be moved until the power is supplied and the brake is released.

5.8.9 Cable Support

5.8.9.1 1.YJ01. 1.YCan and 1.YPE

Connect to electrical plate 1.Y, see Fig. 5-23

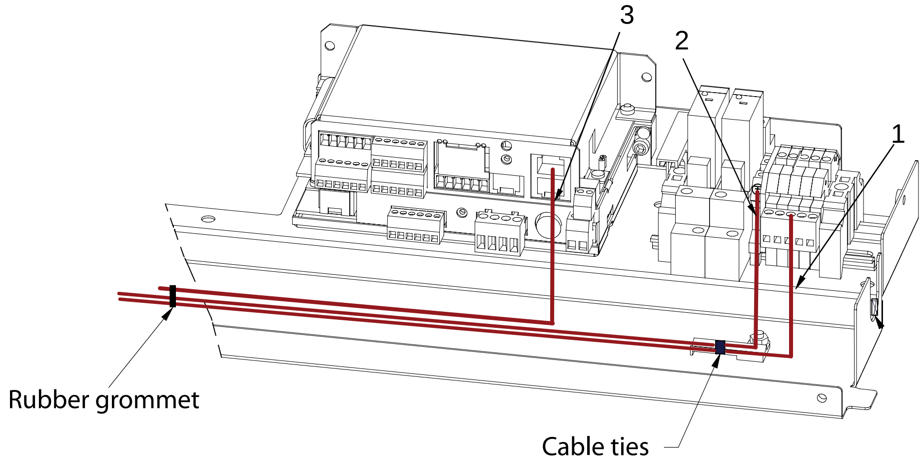


Fig. 5-23

Connect the cables on the drive unit Y.

1. Cable 1.YJ01 1.YJ01
2. Cable 1.YPE 1.YPE
3. Cable 1.YJ01 1.YCB01-J6

Place redundant cabling under the cover.

5.8.10 Cable Channel

5.8.10.1 Measurements

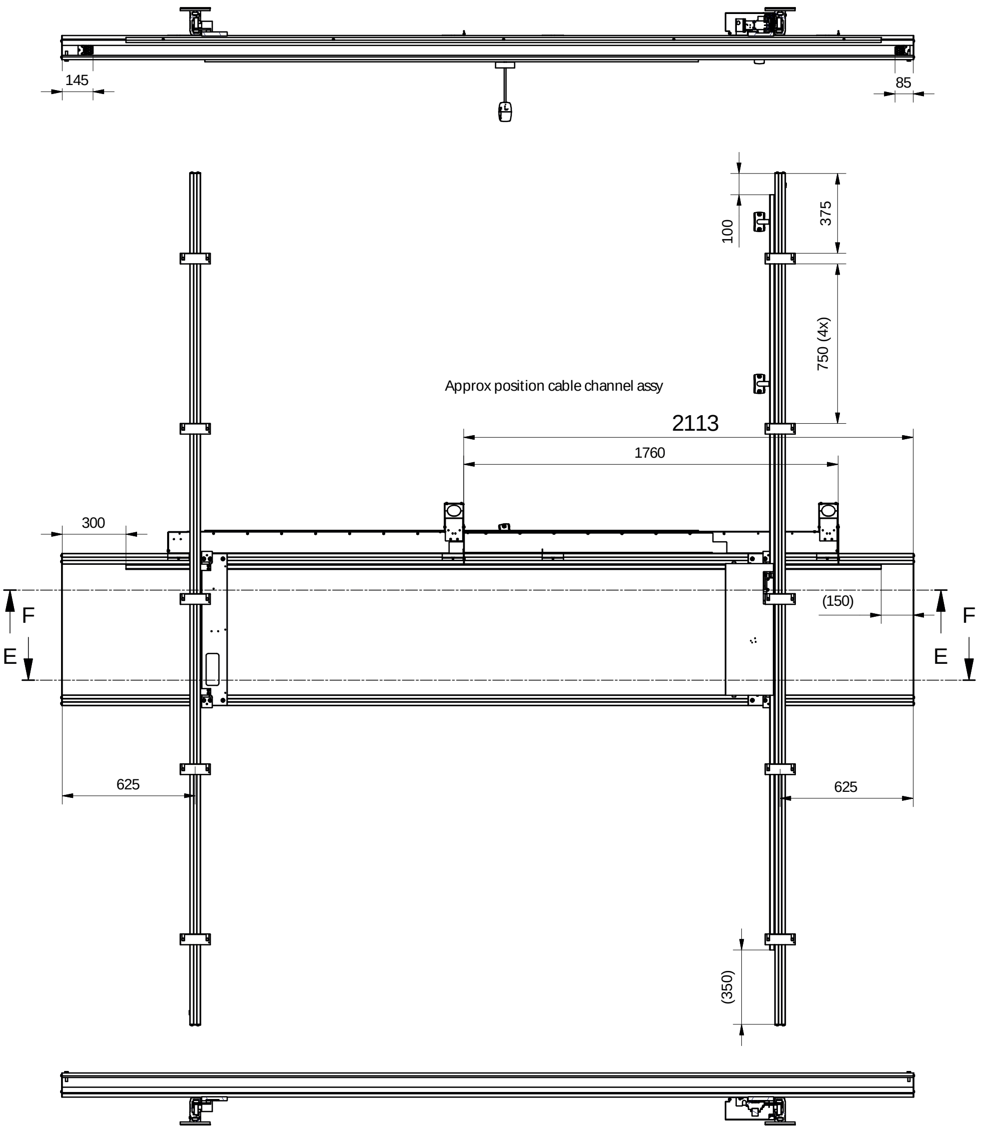


Fig. 5-24 Measurements for rails, 4x4 m

The outer cable attachment shall be close to the Y-beam.

Note!

The measurement 2113 mm, is used to get the same cable length at both sides.

For a 5 m rail, this measurement will be 2613 mm.

5.8.10.2 Mounting the Cable Channel

Start by deciding at which side the cable hose shall leave the cable channel.

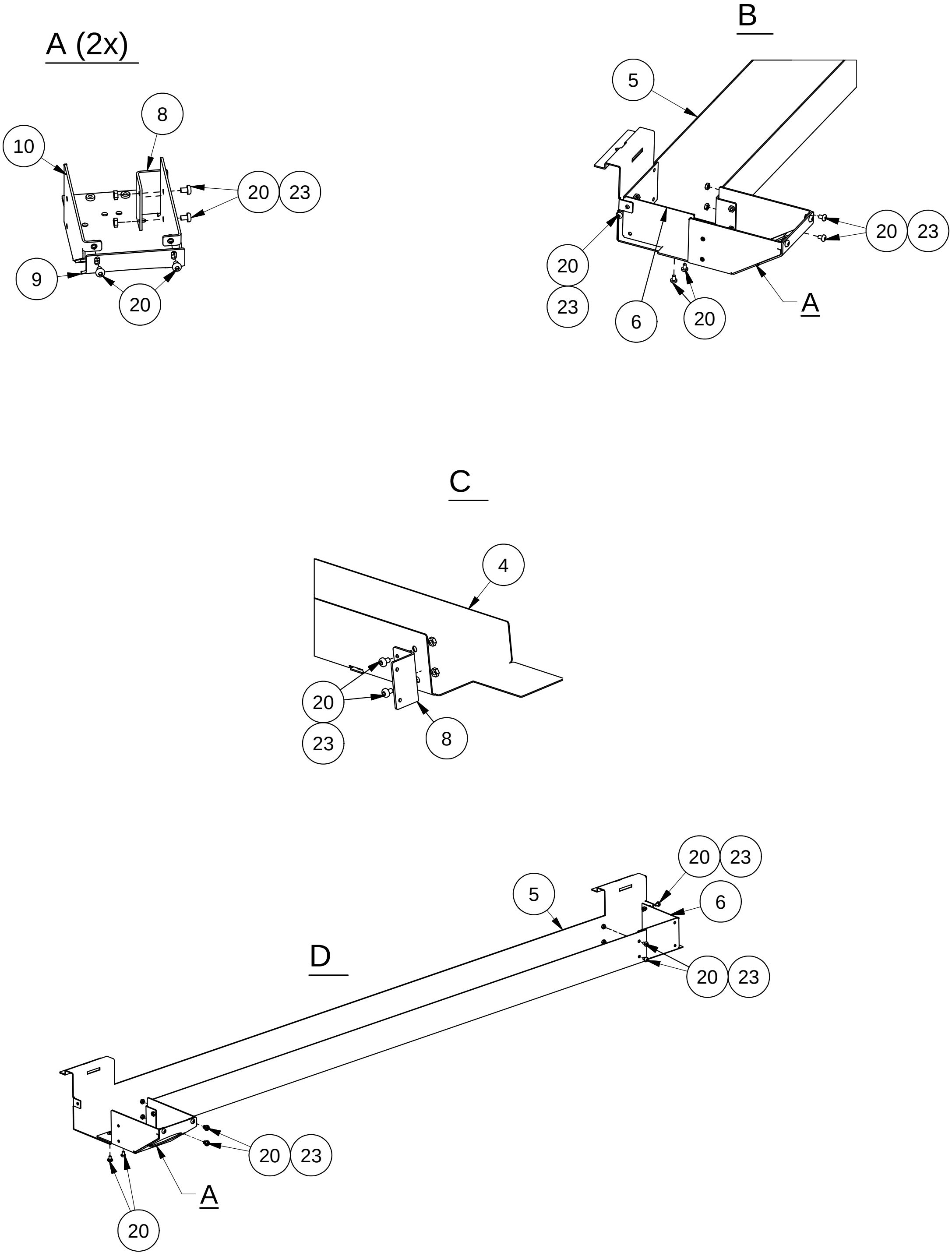


Fig. 5-25

Mount the channel brackets, the end plates and the supporting angles at the cable channel ends, in accordance with the numbers in Fig. 5-26 *Cable channel bracket, left*.

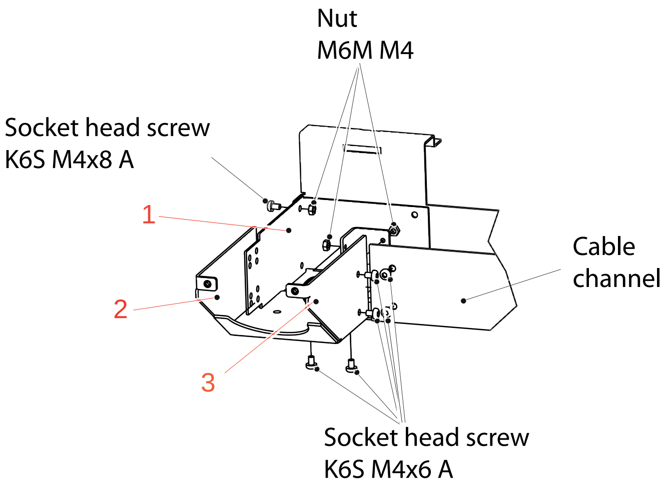


Fig. 5-26 Cable channel bracket, left

Mounting order:

1. End cover, cable channel (0073–600–034)
2. Cable channel bracket, intermediate (0170–600–009)
3. Angle, cable channel (0170–002–148)

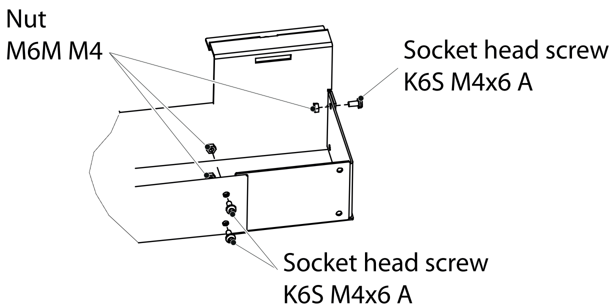


Fig. 5-27 Cable channel bracket, right

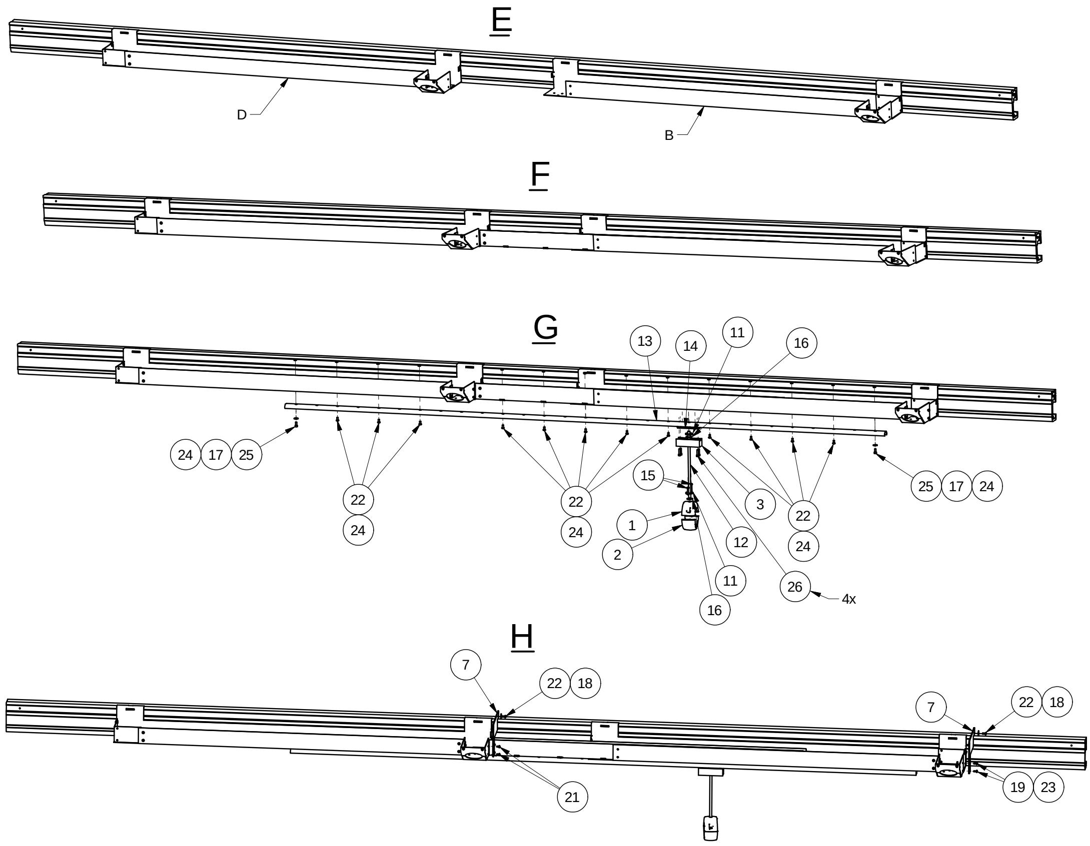


Fig. 5-28 Right hanging

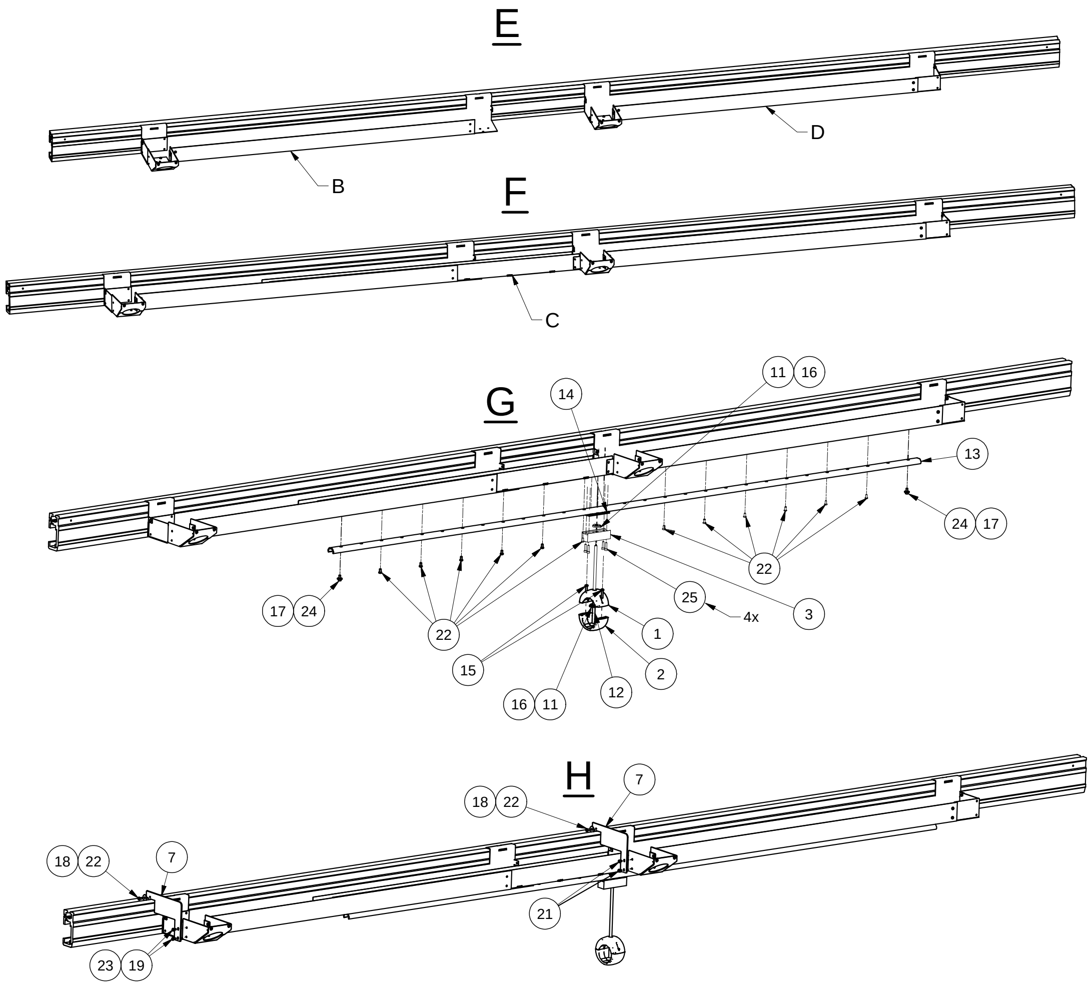


Fig. 5-29 Left hanging

1. Cable holder, part A(0070–600–045A)
2. Cable holder, part B (0070–600–045B)
3. Wagon, cable suspension (0073–003–018)
4. Cable channel (0073–600–028)
5. Cable channel, for 4 m (0073–600–029)
6. End cover, cable channel (0073–600–034)
7. Support, cable channel (0073–600–042)
8. Cable channel, angle (0170–002–148)
9. Cable channel bracket hose (0170–600–007)
10. Cable channel, intermediate (0170–600–009)
11. Cable ties
12. Rubber rope (52–101_300mm)
13. Rollco SXTE30–2320 (53–237)
14. Rollco LSWL30_wagon (53–238)
15. Plastic screw KT-PT 5x25mm (54–430)
16. BRB FZB (BRB 1.5x21x2)
17. BRB FZB 5.3x15x2 (BRB 5.5x19NB)
18. SRKB FZB 5.5x19 (BRB 5.5x19NB)
19. K6S 10.9 FZB 4x10 (K6S M4X10 A)
20. K6S 10.9 FZB 4x6 (K6S M4x6 A)
21. K6S 10.9 FZB 4x8 (K6S M4x8 A)
22. K6S 10.9 FZB 4x10 (K6S M4x10 A)
23. M6M-8 FZB 4 (M6M M4)
24. MC6S 8.8 FZB 5x12 (MC6S M5x12 A)
25. MC6S 8.8 FZB 5x20 (MC6S M5x20 A)

The length of the cable channel is adjusted according to Fig. 5-24 *Measurements for rails, 4x4 m*. This is done by pushing one part of the channel into the other. It shall be locked in a later step of the mounting.

Cable Into Channel

Put the cable into the channel, and haul it through the holes in the cable channel brackets. Assemble the hose plate to the cable channel bracket, see Fig. 5-30 . Join the hose to the hose plate.

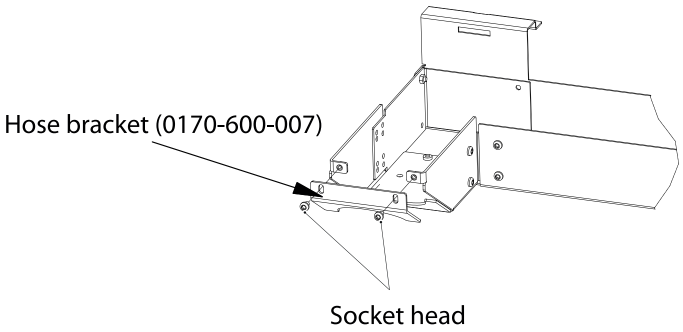


Fig. 5-30

Stabilizing Plates

Mount the stabilizing plates at the outside of the cable channel brackets.

Note!

The cable must be put inside the channel, before the stabilizing plates are mounted.

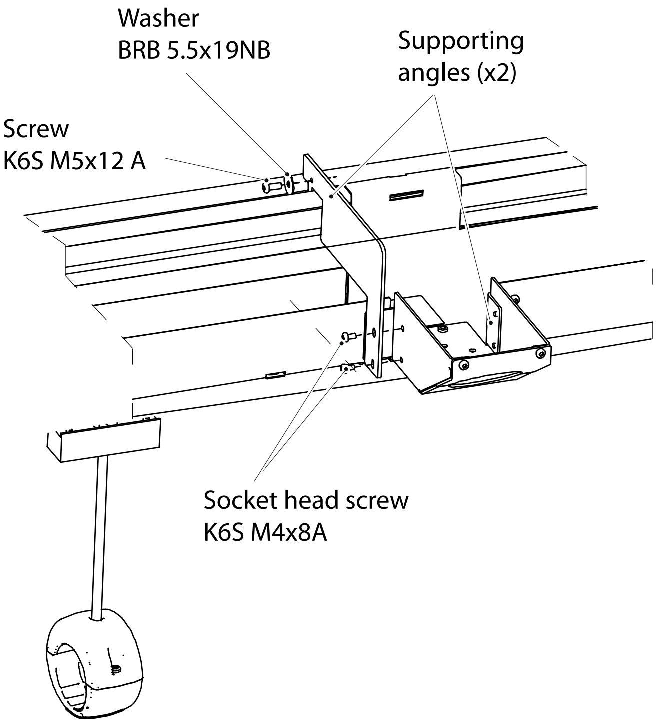


Fig. 5-31 Intermediate cable channel bracket

Note!

The channel bracket at the channel extension, shall have 2 angles mounted.

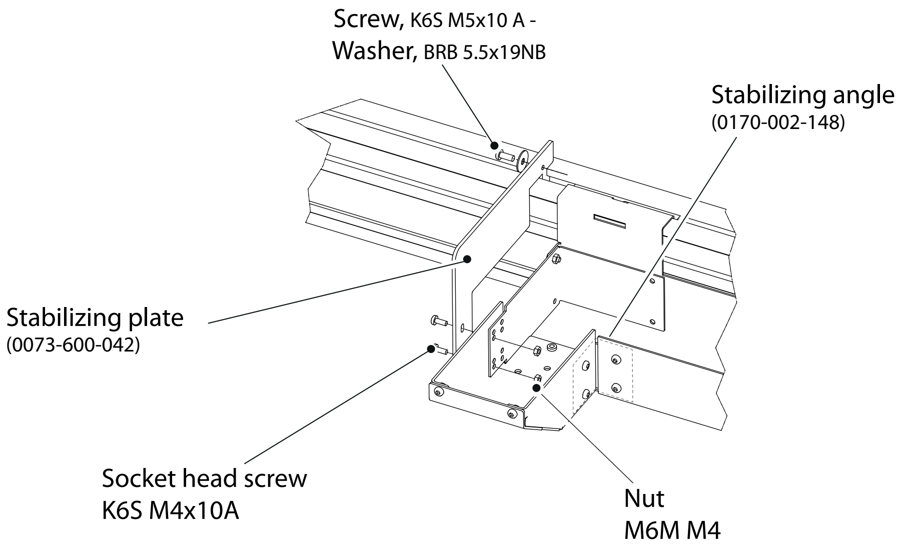


Fig. 5-32

CAUTION!

Remember to assemble the nut and washer at the upper side of the stabilizing plate, in accordance with the picture above.

Sliding Rail, Cable Wagon and Cable Suspension

Fasten the sliding rail for the cable holder, at the middle of the cable channel, lower side.

Mount the cable wagon and the cable suspension.

See Fig. 5-25 , view G.

Note!

Item number 17 and 24 are used as end stops for the carriage. See Fig. 5-29 Left hanging.

5.8.11 Wall Attachment for Cable (option)

Move the traverse rail X to its end position so the cable channel, mounted on the traverse rail X, will point toward the middle of the ceiling rail Y.

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 and mount the wall attachment on half this distance, and at the same height as the ceiling rails Y.

Shorten the hose if necessary, after mounting the wall attachment.

5.8.12 X-ray Tube

The X-ray tube is pre-installed from the Manufacturer. For more information on mechanical installation and adjustment refer to X-ray tube Manufacture documentation.

5.8.13 Collimator

The collimator is pre-installed by the Manufacturer. For more information on mechanical installation and adjustment refer to collimator Manufacture documentation.

Note that the automatic collimator AL02 is delivered with transport safety bolts. These must be removed before power on the System/collimator.

WARNING!

Remove all 3 transport safety bolts (marked red), before powering up the System.

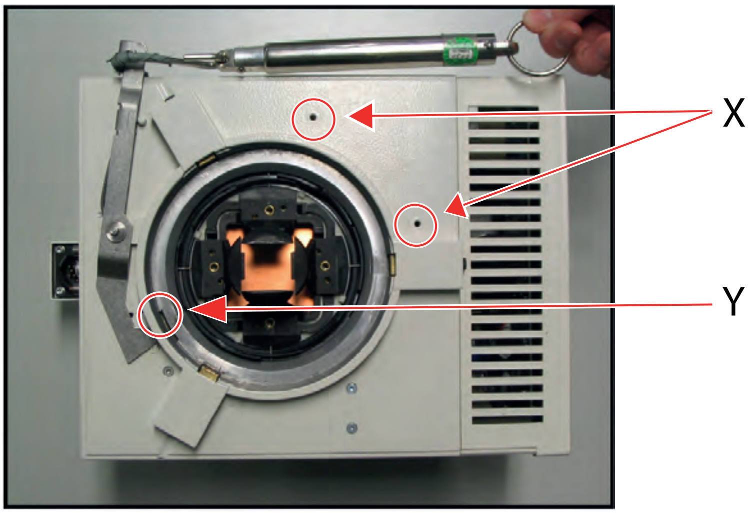


Fig. 5-33 Collimator

5.9 Electrical Installation Ceiling Suspended X-ray Tube Support

5.9.1 Connect OTC

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.

Lubricate the HSP connectors generously with silicone oil. Use the silicone gaskets. Connecting the OTC, see drawing, WRD-0073–Generator — Tube.

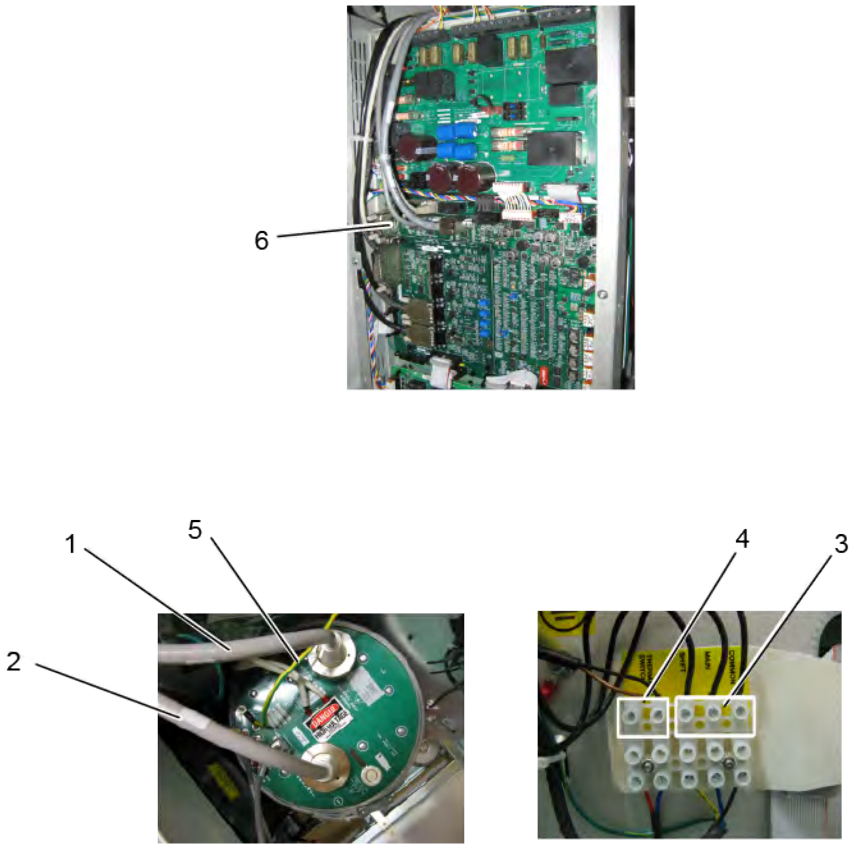


Fig. 5-34 Connecting the OTC.

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

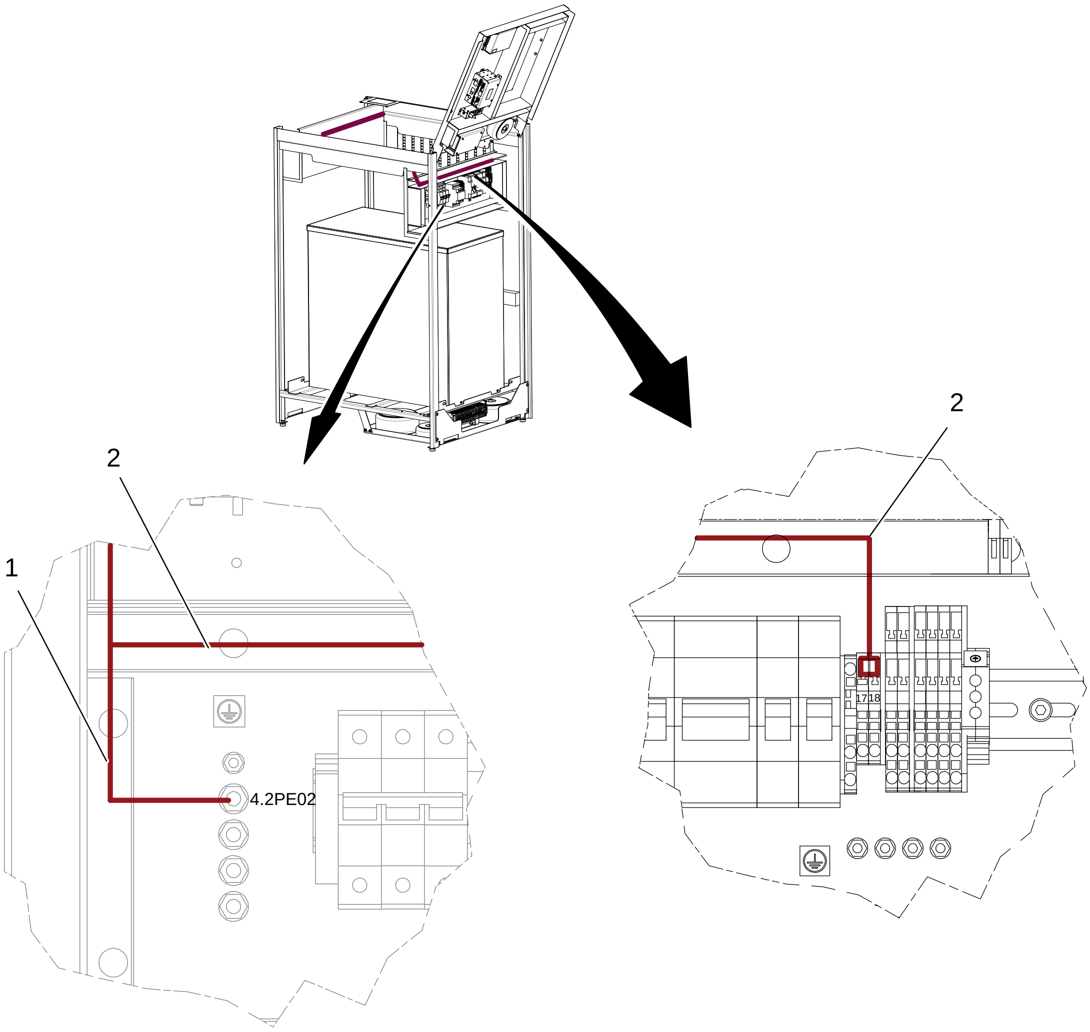


Fig. 5-35 Connecting the OTC.

1. 1.XPE — 4.2PE02
2. 1.1MAINS — 4.2J01 17–18

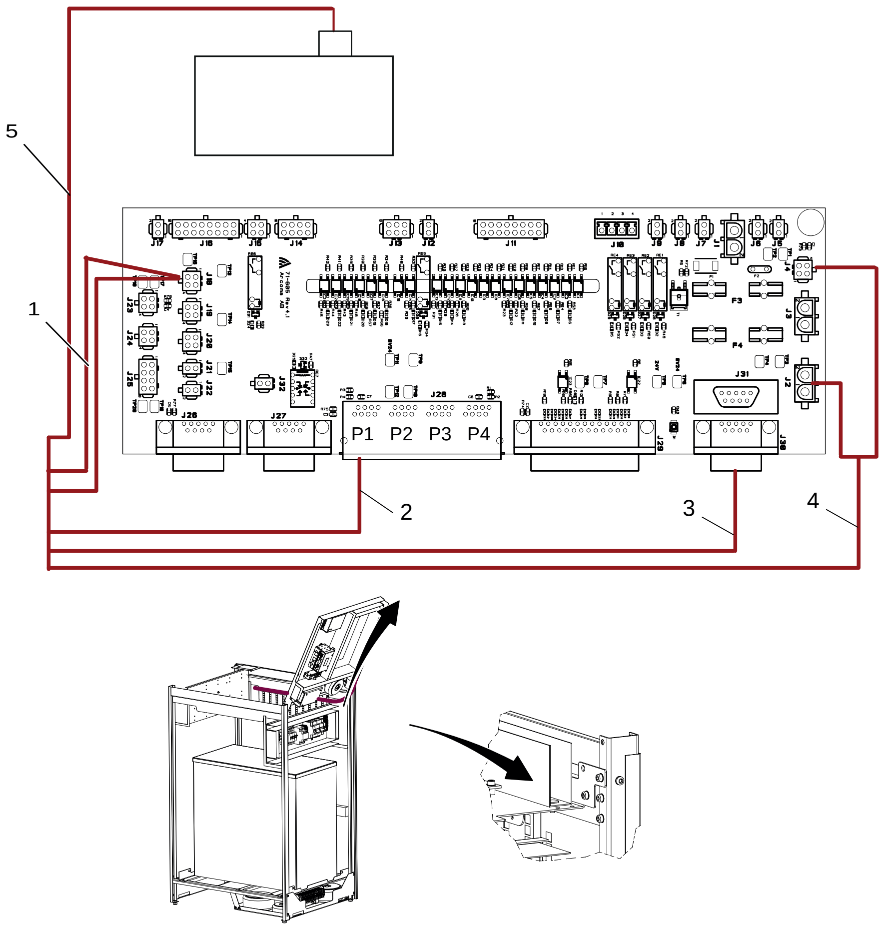


Fig. 5-36 Connecting OTC

1. 1.EMRE01
   1.EMSTOP
2. 1.1CAN
3. 1.1Service
4. 1.1Collsig

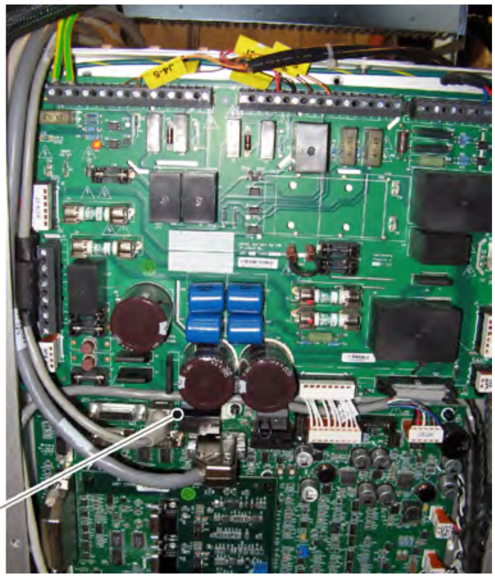
5.10 Electrical Installation of CPI Mini Console

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.



1

Fig. 5-37 Connecting CPI mini console

1. Cable 90178000F — J3

5.11 Mechanical Installation of Table

5.11.1 Orientation of the Table

Before placing the Table on the floor, check for enough free space around the Table to allow free movement. See Planning Guide for further information of required space around the Table. Place the Table on the floor according to the room layout.

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

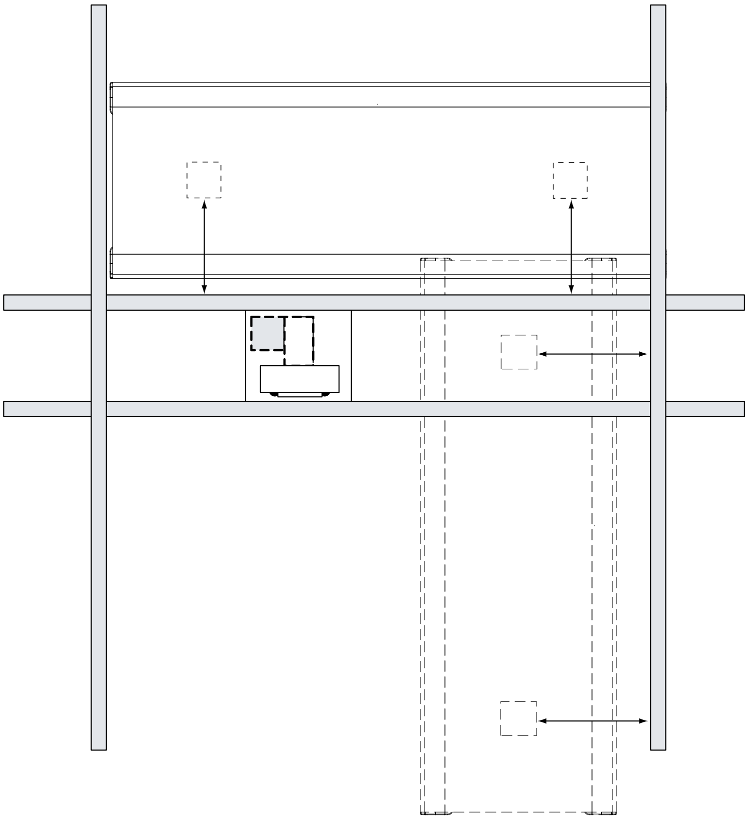


Fig. 5-38

5.11.2 Unload Table

WARNING!

Squeezing hazard! When the Table is lifted, the columns will bend toward the middle of the Table. Two persons must keep the columns vertical.

Slide/lift off the Table from the pallet by grabbing underneath the Table frame according to Fig. 5-39 .

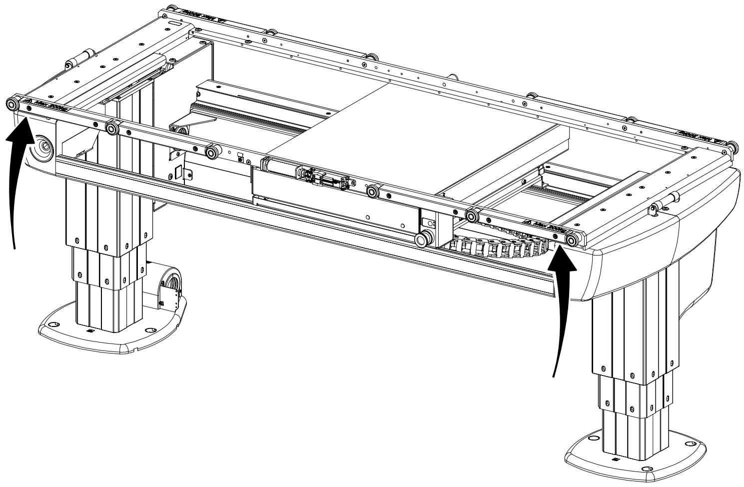


Fig. 5-39

Note!

Do not tilt the Table when unloading.

Note!

Make sure there is enough free space to slide on and off the table top, see Planning guide.

Note!

Do not place anything at the Table when it is not attached.

Place the Table where intended in the room.

Continue the mechanical installation of the Table after the alignment of the Table is ready. See 5.11.4 *Horizontal alignment of table*, Page 112.

5.11.2.1 Transport Protection of the Detector

Remove the transport protection of the detector according to Fig. 5-40 *Transportation holder*. There is one on each side of the detector.

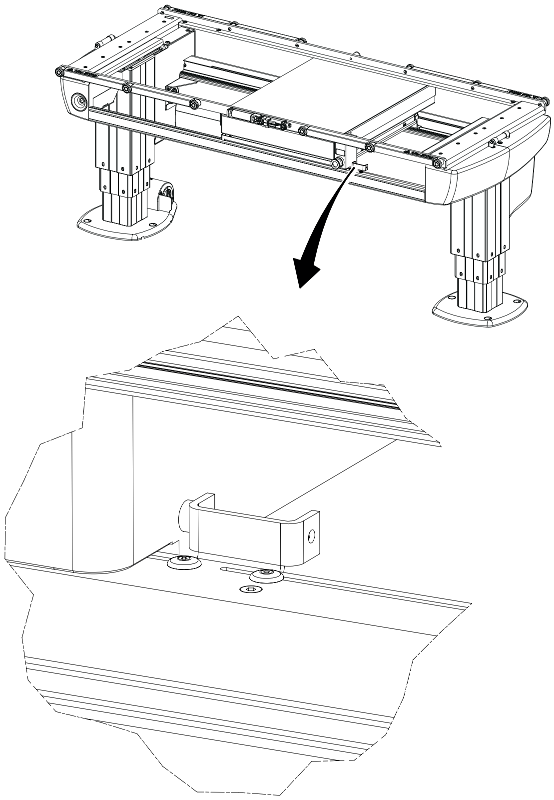


Fig. 5-40 Transportation holder

5.11.3 Fixed Detector, Canon

5.11.3.1 Assemble the Pre-amplifier

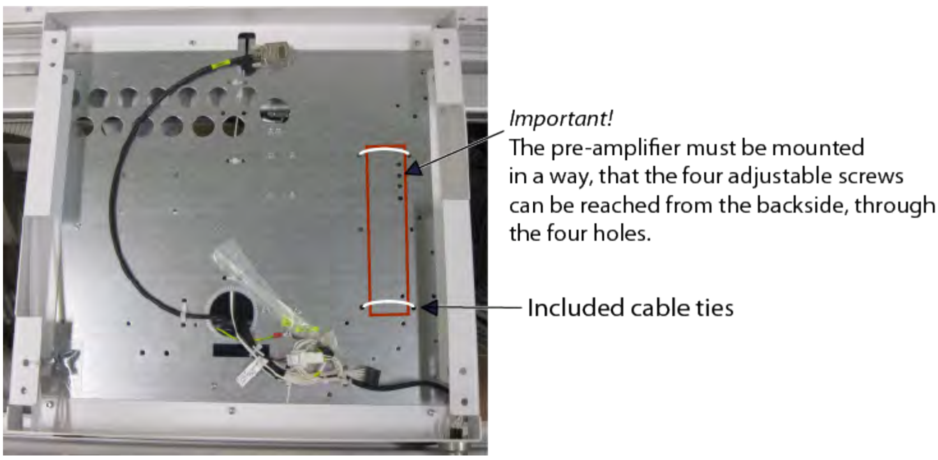


Fig. 5-41

5.11.3.2 Install Detector

Install the detector according to Manufacturer’s instructions.

5.11.4 Horizontal alignment of table

1. Move the table and place the collimator above the table frame.
2. Light up the collimator and place the light field on the detector.
3. Move OTC and detector and observe the alignment.
4. Move the OTC forward/backward along the table frame. The border of the light field must not move from the border of the table frame, see Fig. 5-42 .

If needed, adjust the table position.

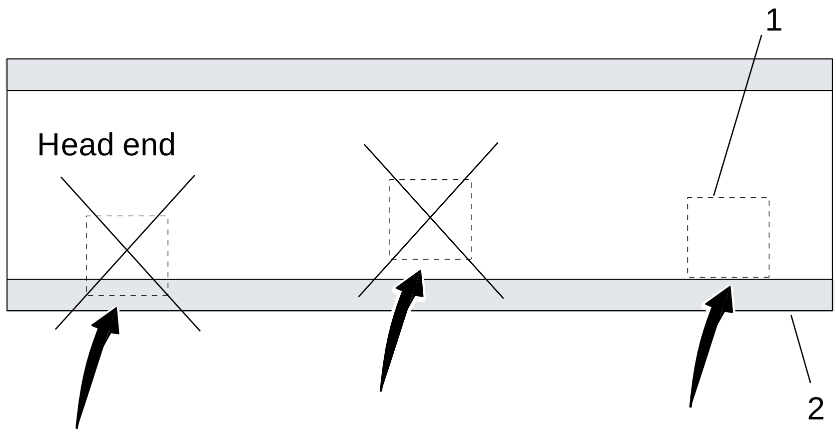


Fig. 5-42

1. Light field
2. Table frame

Note!

Make sure there is enough space to slide on and off the table top, see Planning Guide.

5.11.5 Attachment to Floor, Table

1. Drill the holes using the drill template see Fig. 5-38 , 12 mm diameter, for the expanders. The hole depth for the enclosed expanders shall be 45 mm.

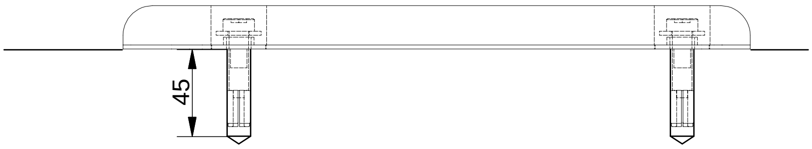


Fig. 5-43

For an alternative attachment to the floor, see the requirements in the Planning guide.

5.11.5.1 Insulation

2. Put the enclosed expanders in the holes. Place a mandrel in the expander and drive in 5-10 mm to attach the expander.
3. Place the Table over the drilled holes and install the insulation plate and washers according to Fig. 5-43 and Fig. 5-44 .

Note!

The insulation kit is designed to insulate the Table from the hospital building, and will prevent stray currents from reaching the System e.g. via bolt 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 bolt attachments of the Systems components.

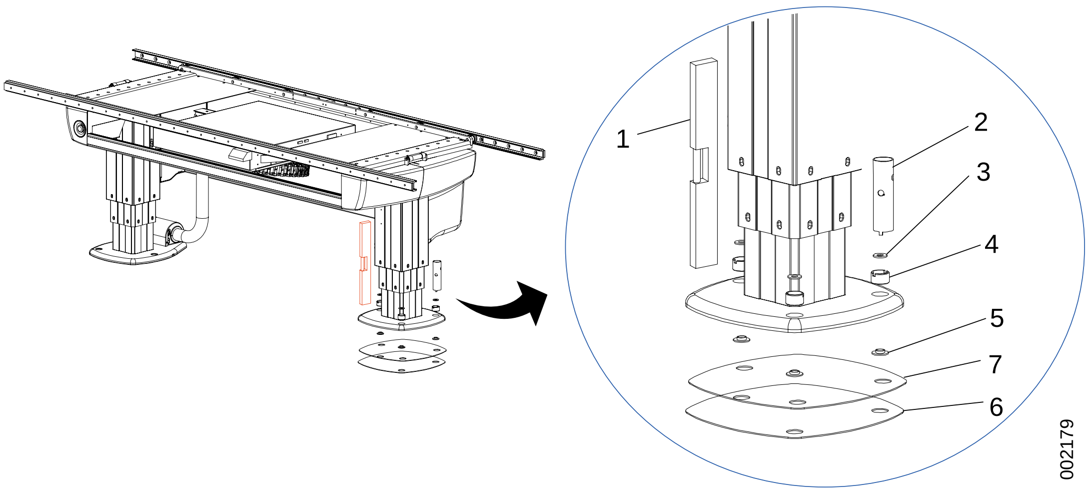


Fig. 5-44

1. Spirit level
2. Installation tool
3. Insulation washer
4. Adjusting bolt
5. Insulation washer
6. Insulation plate
7. Shims

4. Place a spirit level on the table top and check if the table top is horizontal (±1 mm), see Fig. 5-45 . Shim each column if necessary.

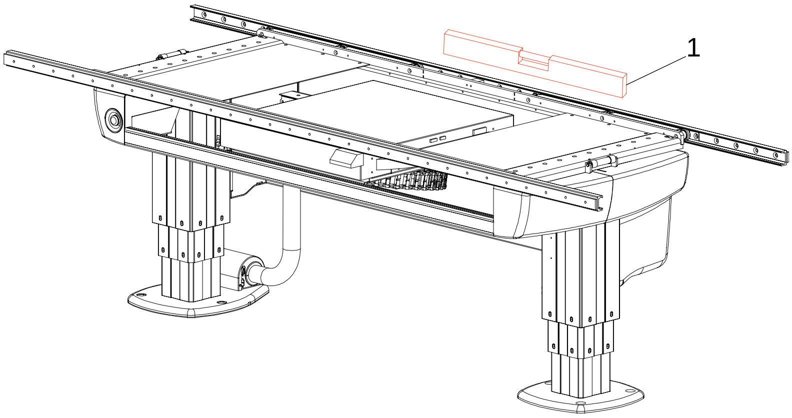


Fig. 5-45

5. Place a spirit level (1) on two adjacent sides of each column. The column shall be 90° with a tolerance of ±0.5°.
6. To adjust the column use the adjusting bolts (4) and the installation tool (2), see Fig. 5-44 The adjusting bolts are only for alignment.

   Shims shall be used to align table top.
7. Bolt the Table into the floor. Use the M10 screws included in the shipment. Apply Loctite 243 and tighten with 15 Nm.
8. Every attachment point shall be able to carry a load of at least 4.2 kN.

5.12 Mechanical Installation of System Cabinet

Place the System cabinet in a corner of the room, see Planning guide and room layout for further information. The cabinet corner (1), see figure, must be placed in a 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, see Fig. 5-46 .

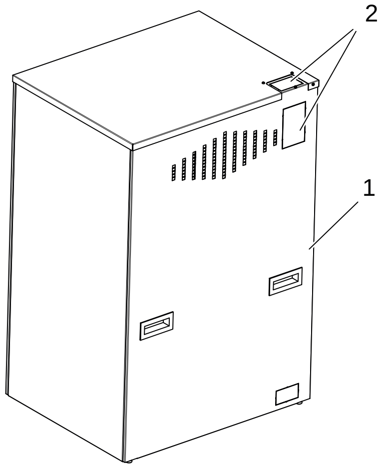


Fig. 5-46

- Remove one of the cable outlet covers(2). If the upper outlet is used, assure that the outlet is covered by the cable run. Otherwise objects may fall into the cabinet and down to the generator.
- The borders of the outlet have to be covered with the edge protection.

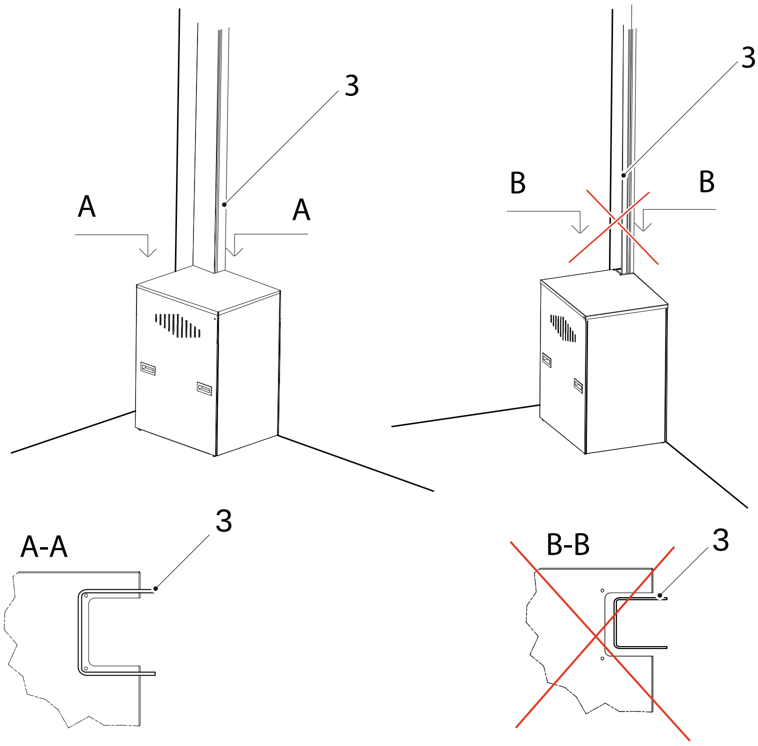


Fig. 5-47 Alternative 1

- The cables must be covered with a cable channel. The cable outlet shall be completely covered by the cable channel.
- The cable channel must not be possible to open without a tool.
- The cables have to be secured with a cable clamp or a suitable strain relief.

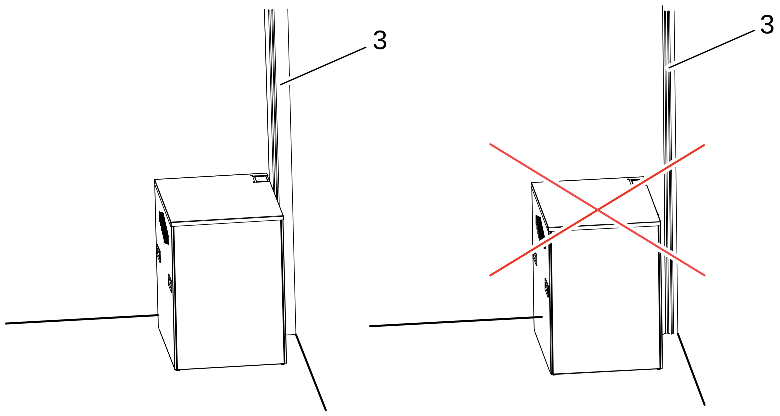


Fig. 5-48 Alternative 2

Remove the covers of the cabinet according to the Fig. 5-49 .

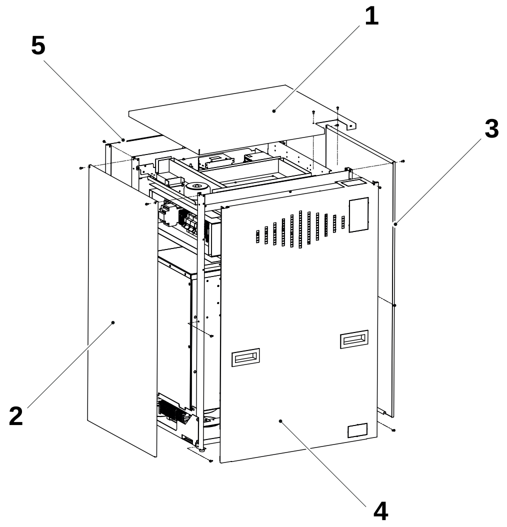


Fig. 5-49

Remove the cabinet cover in the order that fits best.

5.13 Electrical Installation of Table

5.13.1 Connect Table

Note!

The cables from the Table to the System cabinet, must be installed covered.

They shall not be placed on the floor.

Connect the Table according to the figures.

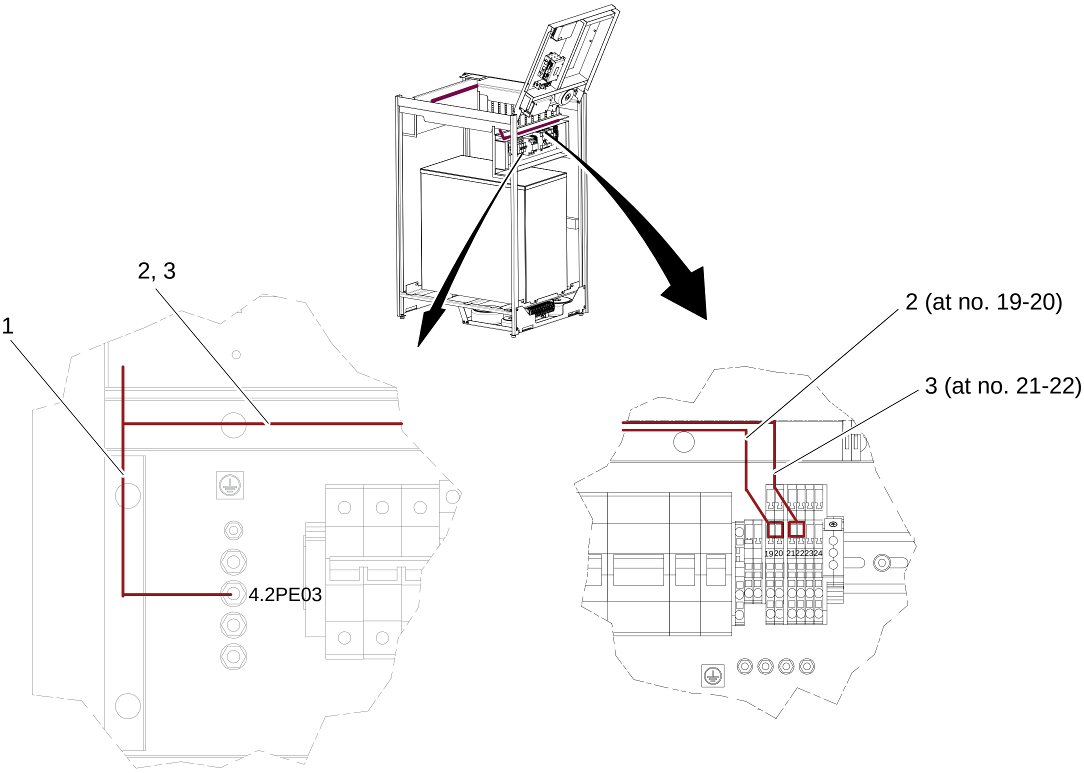


Fig. 5-50 Connecting the table

1. 2.0PE — 4.2PE03
2. 2.0MAINS — 4.2J01 19–20
3. *CXDI 401 fix or 401 fix Compact, CXDI 401W (with charging) or 701 (with charging):* 2.DPOW01 — 4.2J01 21–22
4. *CXDI 401 fix or 401 fix Compact:* 2.D1/F01 — 4.GEN J2/J4

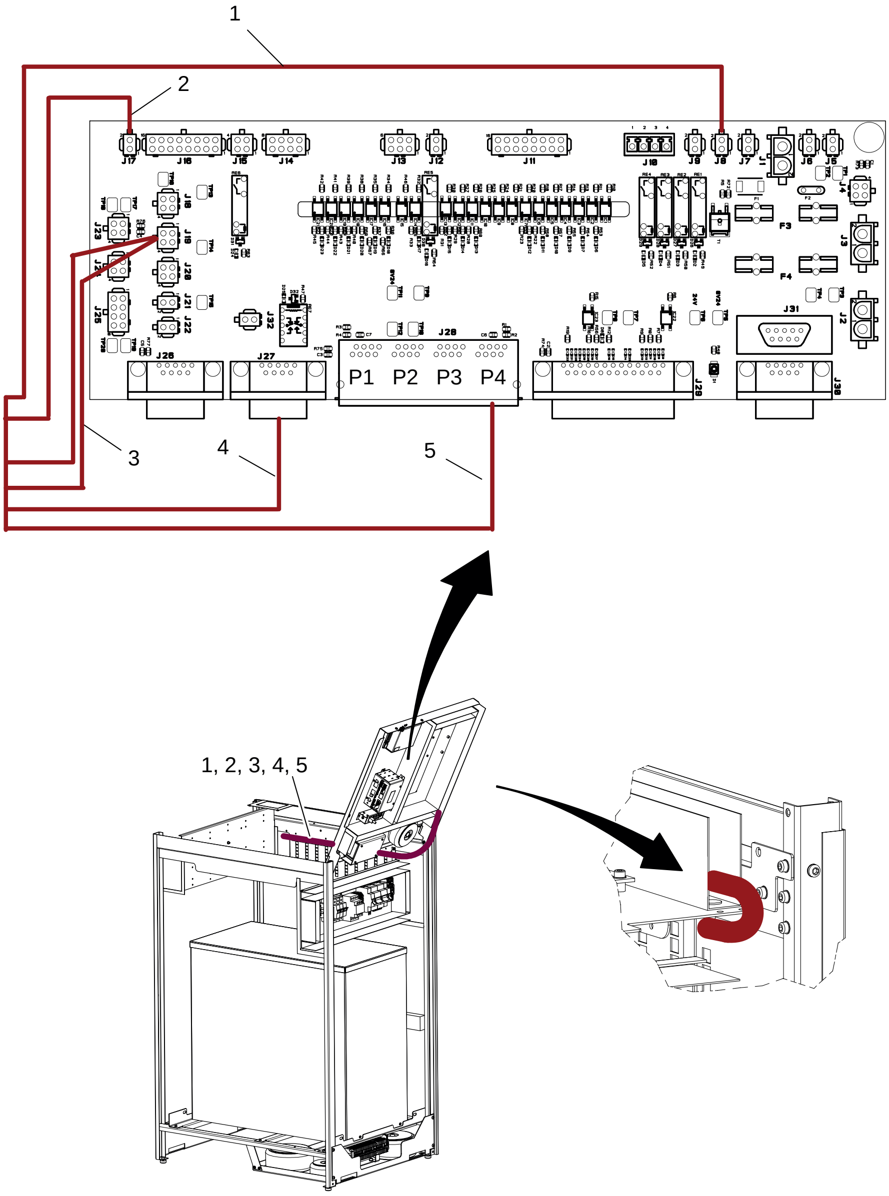


Fig. 5-51 Connecting the table

1. 2.0IND01 — J8
2. 2.0I/O01 — J17
3. 2.0RE01 / 2.0EM01 — J19
4. 2.0COLL01 —J27
5. 2.0CAN01 — J28P4

5.13.1.1 Connecting Canon Detectors, Table

1. *CXDI 401 fix or 401 fix Compact:* 2.DI/F01 4.GEN J2/J4
2. *CXDI 401 fix or 401 fix Compact & 401W (with charging) or 701 (with charging):* 2. DETH01 — Switching hub (not supplied by Arcoma) (no graphic)
3. *CXDI 401W:* No cables from table.

5.13.1.2 Install Detector

Install the detector according to Manufacturer's instructions.

5.13.1.3 Connecting the Table AEC

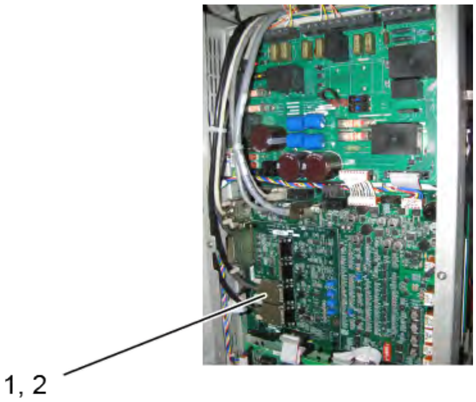


Fig. 5-52 Connecting the Table AEC

1. 2.DAID01 — J1 and J2

5.14 Mechanical Installation of Wallstand

5.14.1 Orientation of Wall Stand

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

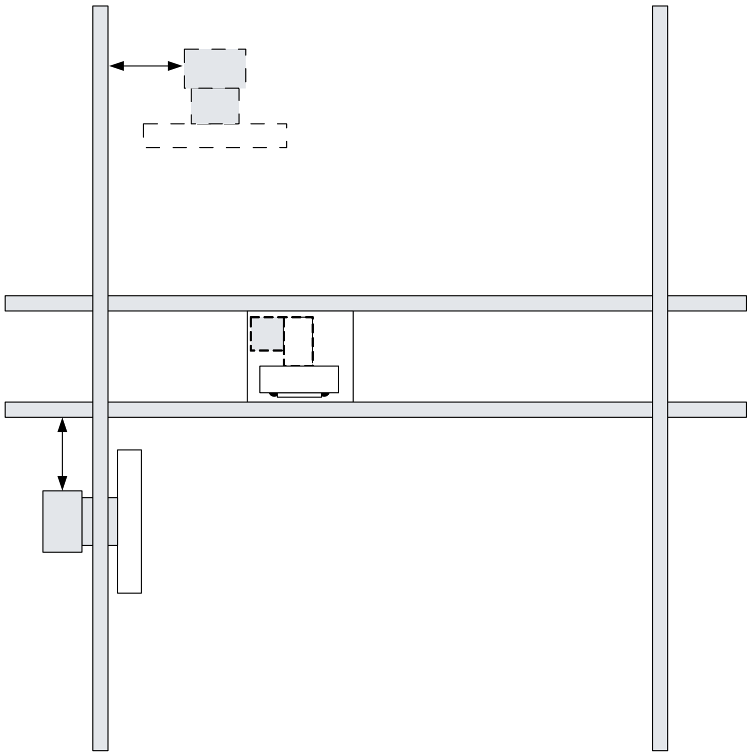


Fig. 5-53

5.14.2 Unload Wall Stand

5.14.2.1 Transport Protection of the Wallstand

WARNING!

Whenever any item is removed from the Wallstand, e.g. detector 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 done by personnel who are trained in the use of the equipment.

5.14.2.2 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 wall stand, 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

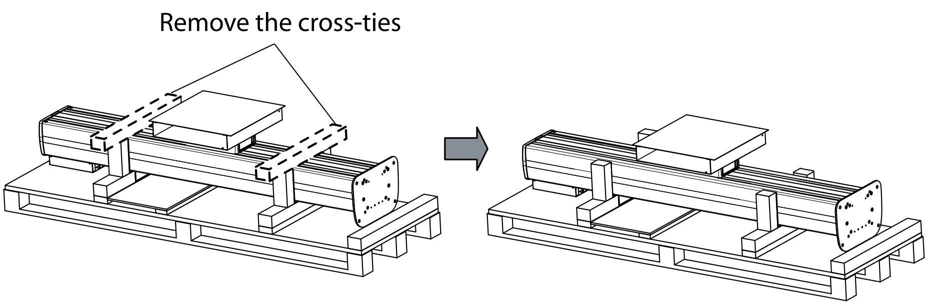


Fig. 5-54 Removing cross-ties

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. 5-55 *Lifting Wallstand off the pallet*.

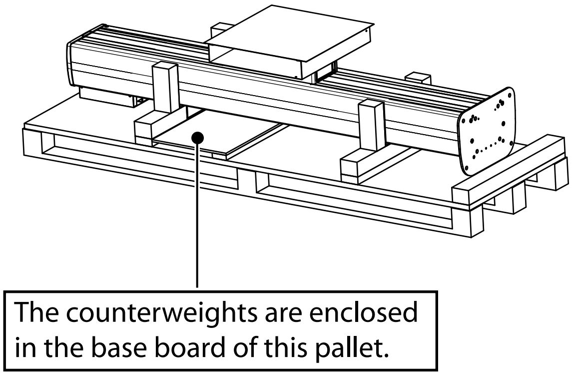


Fig. 5-55 Lifting Wallstand off the pallet

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. 5-56 *Temporarily attachment*.
   The 3 remaining holes shall be drilled after the adjustment.

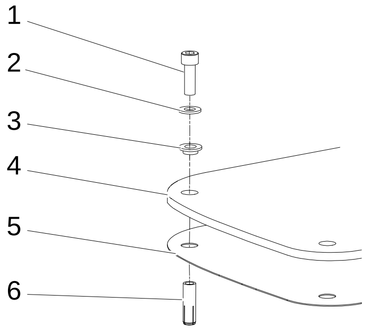


Fig. 5-56 Temporarily attachment

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

5.14.3 Wall Stand Insulation and Attachment to Floor

Bolt the wall stand into the floor with the enclosed M10 bolt, also install the enclosed insulation plate and washer according to Fig. 5-57 . Apply Loctite 243, and tighten the bolts with 15 Nm.

Note!

The insulation kit is designed to insulate the wall stand from the hospital building, and will prevent stray currents from reaching the System e.g. via bolt 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 bolt attachments of the Systems components.

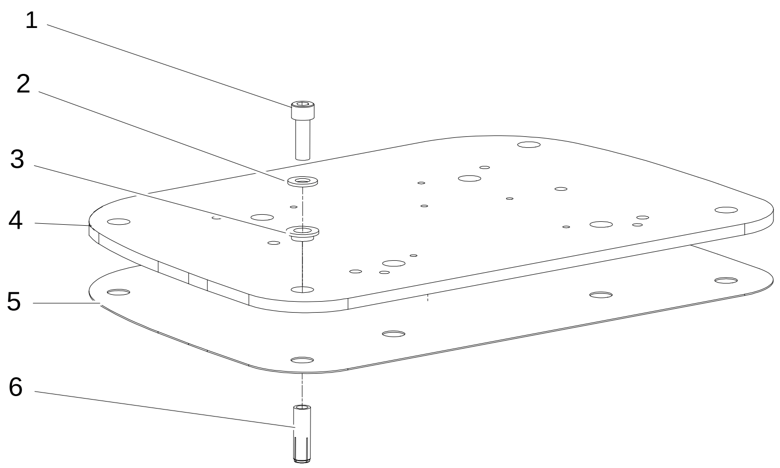


Fig. 5-57

1. Bolt
2. Insulation washer
3. Insulation case
4. Bottom plate
5. Insulation plate
6. Enclosed expanders

5.14.4 Alignment of Wall Stand

1. Place a spirit level on the column and check that the wall stand is in level.
2. Move the OTC and place the collimator 10 mm from the detector of the wall stand according to Fig. 5-58 .
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 wall stand column by moving it sideways.

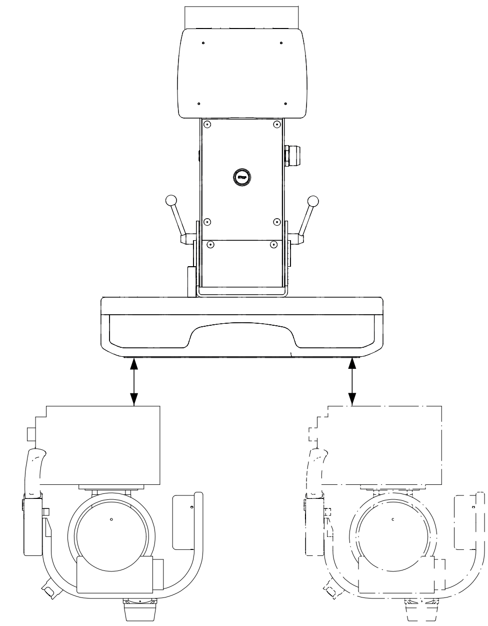


Fig. 5-58

5.14.5 Wall Attachment for Cable Hose

Install the wall attachment for the cable hose on the wall on a suitable place behind the Wallstand, see Fig. 5-59 .

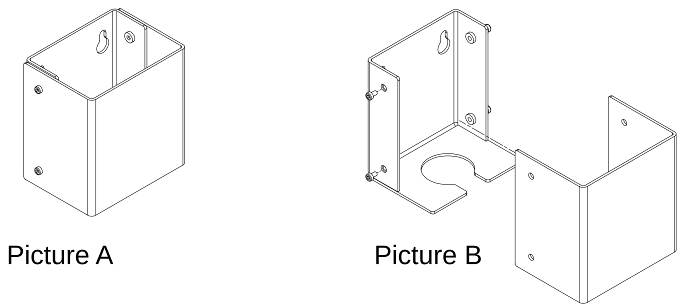


Fig. 5-59

5.14.6 Install Detector

Install the detector according to Manufacturer’s instructions.

5.15 Electrical Installation of Wall Stand

5.15.1 Connect Wall Stand

Note!

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

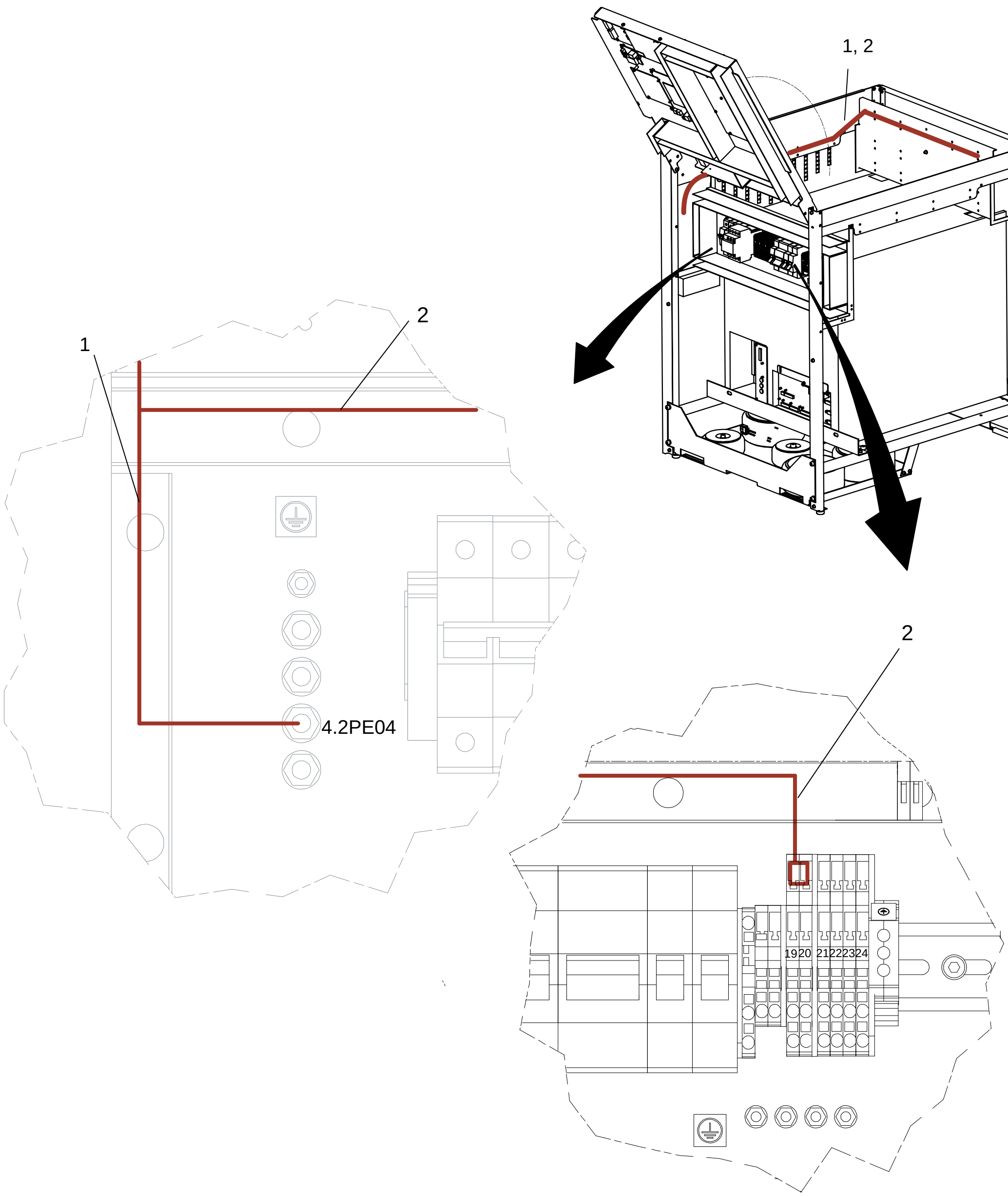


Fig. 5-60 Connecting the Wallstand

1. 3.0PE01
2. 3.0MAINS
3. 3.POW01 4.2J01 21–22

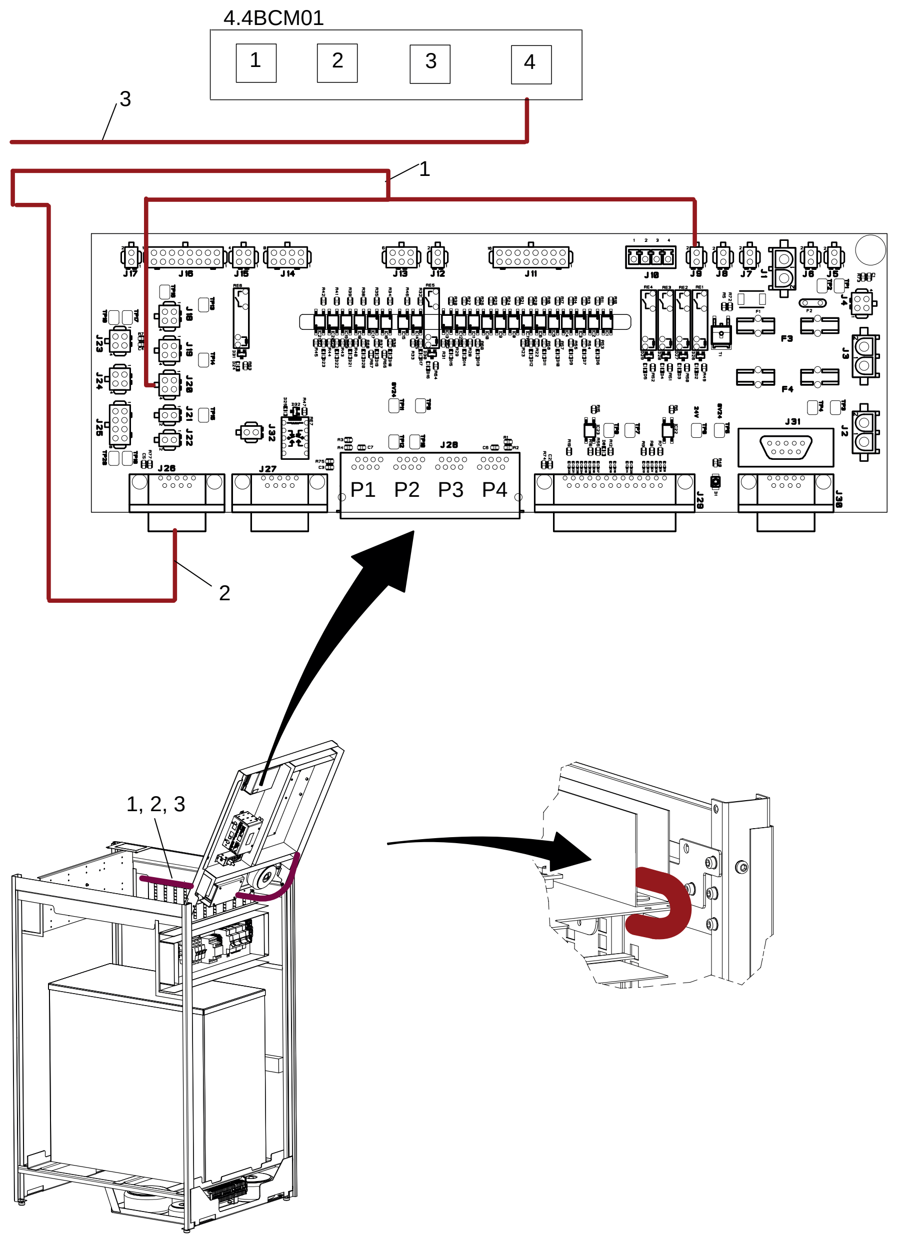


Fig. 5-61 Connecting the wall stand.

1. 3.0SIG01 — J9–J20
2. 3.0COLL01 — J26
3. 3.0CAN01 — 4.4BCM01–4
4. 3.DETH01 — Switching hub (Not supplied by the Manufacturer)
5. *CXDI 401 fix or 401 fix Compact:* 3.D1/F01: 4 – GEN J2 (no graphic)

CXDI 401W, no cables from wall stand.

5.15.1.1 Connecting the Wall Stand AEC

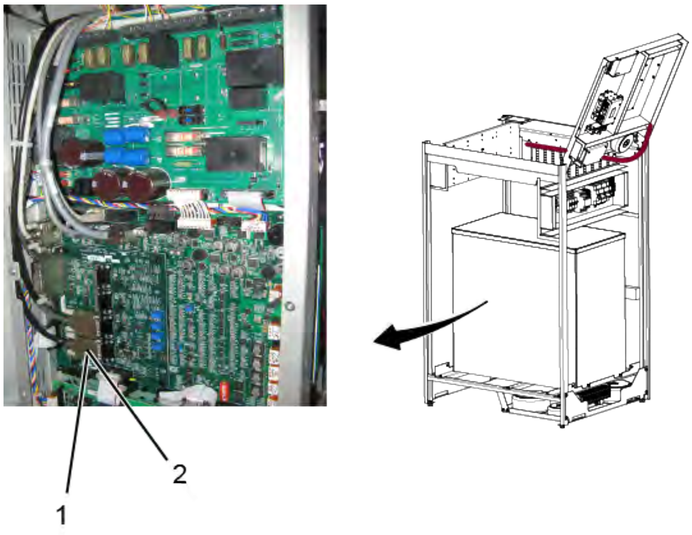


Fig. 5-62 Connecting the Wall Stand AEC.

1. 3.DAID01 — J3 and J4
2. 3.DB3C01 (option)
3. External exposure switch — J20

5.15.1.2 Connection Detectors

For connecting the detectors, see Table 5-3 , Page 135.

5.15.2 Wall Stand 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.

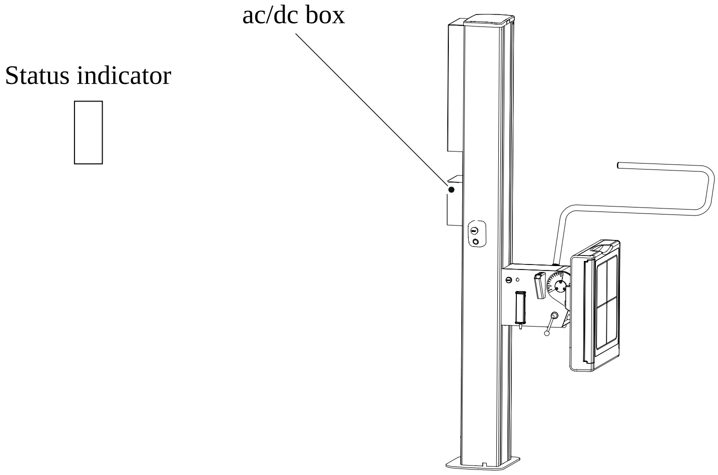


Fig. 5-63 Power box — ac/dc box

- 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. 5-63 *Power box — ac/dc box*.

5.16 Electrical Installation of System

WARNING!

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

Connections:

J22 — Service tool / Com port

J3 — _RAD console — Canon

J25 — Digital interface

J4 — DAP

To connect X-ray light resp. door switch, see drawing .5.16.7 *Room lights (option)*

5.16.1 Electrical installation of image system computer

CAUTION!

The image system PC should only have the image system software installed.

Other software installations could interfere with system operation.

Note!

The cables must be installed covered.

They shall not be placed on the floor.

Position the image system PC in the operation room.

Connect the cable Image PC 0073–750–038 between the image system PC and the system cabinet.

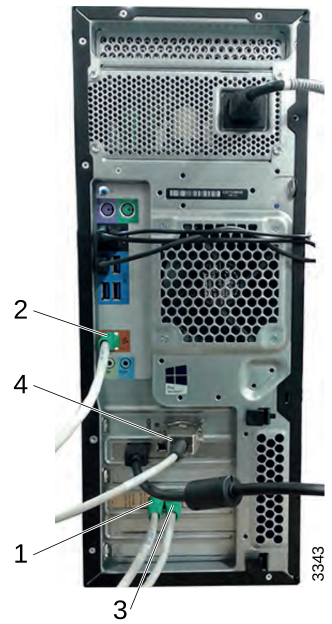


Fig. 5-64 Connections image system PC

1. Cable 5.0ETHCB800 – 5.0PC01-ETH1
2. Cable 5.0ETHIS – 5.0PC01-ETH2
3. Cable 5.0ETHHospital – 5.0PC01-ETH3
4. Cable 5.0RS232IS – 5.0PC01-I/0

5.16.1.1 Hospital network

Connect cable 5.0ETHHospital to the Hospital ETH network.

5.16.1.2 Connections to system cabinet

Wiring shall be made according to path 3 in Table 5-2 *Cable paths*.

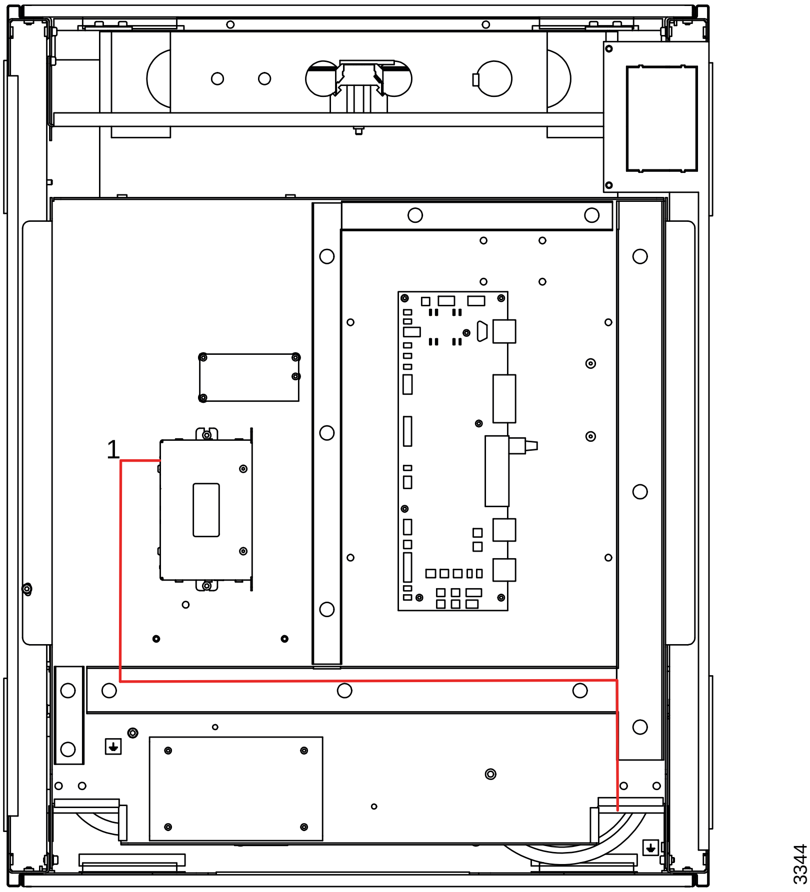


Fig. 5-65 Electrical plate 4.4 with CB800

1. Cable 5.0ETHCB800 – 4.4CB800_01–J1

Wiring shall be made according to path 1 in Table 5-2 *Cable paths*.

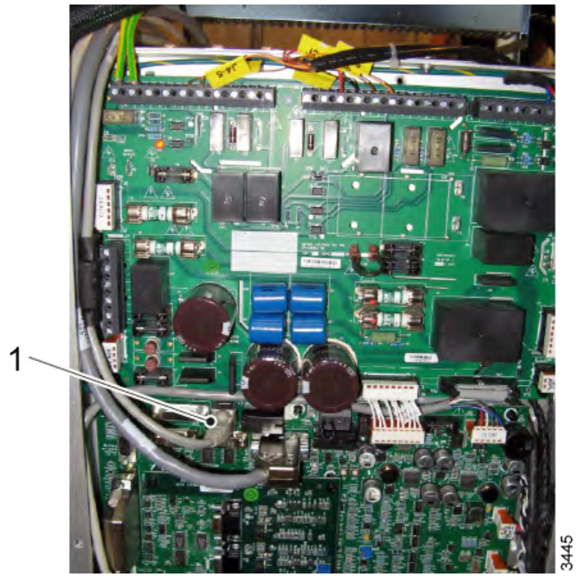
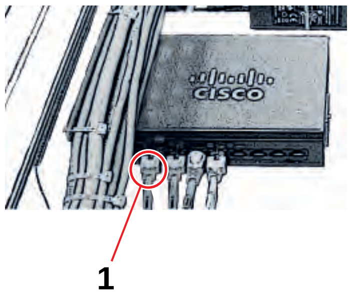


Fig. 5-66

1. Cable 5.0RS232IS – 4.GEN–J3

Wiring shall be made according to path 4 in Table 5-2 *Cable paths*.

Cable 5.0ETHIS	4.5HUB01–1	

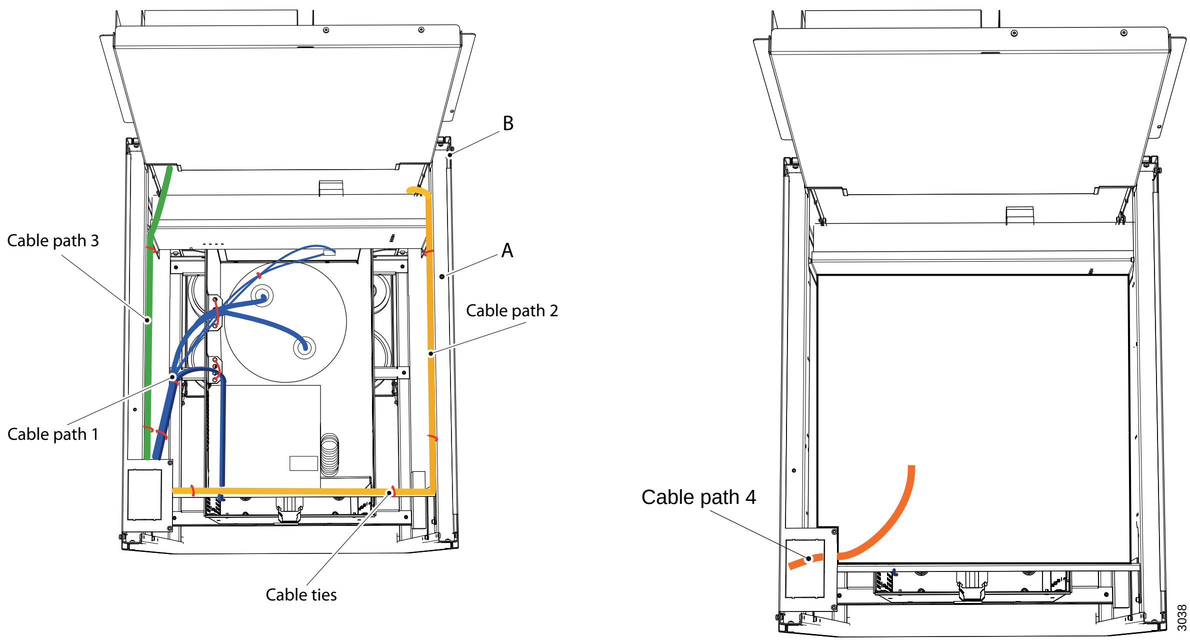
5.16.2 Cable path

1. Remove screw (A) according to Table 5-2 *Cable paths*.
2. Lift up the electrical plate 4.4 and secure it with screw (A) in position (B).

CAUTION!

Tie the cables carefully to the frame. Otherwise there is a cable squeezing hazard.

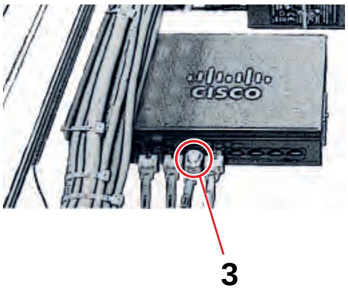
Table 5-2 Cable paths



- Cable path number 1 — to the generator.
- Cable path number 2 — to the electrical plate 4.2.
- Cable path number 3 — to the electrical plate 4.4.
- Cable path number 4 — to the electrical plate 4.5.

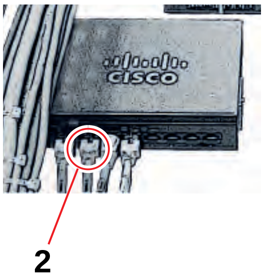
5.16.3 Wall stand detector installation

Table 5-3

Wiring shall be done according to cable path 2, see Table 5-2 *Cable paths*.		
3.DPOW01	4.2J01 21–22	
Wiring shall be done according to cable path 4, see Table 5-2 *Cable paths*.		
3.DETH01	4.5HUB01–3	

5.16.4 Table detector installation

Wiring shall be done according to cable path 2, see Table 5-2 *Cable paths*.		
2.DPOW01 or 2. DPOW02	4.2J01 21–22	

Wiring shall be done according to cable path 4, see Table 5-2 *Cable paths*.		
2.DLAN01 or 2. DETH01	4.5HUB01–2	

5.16.5 External Servo Button

5.16.5.1 Mechanical Installation of External Servo Button

Install the external servo button in the operation room, using M4 bolts.

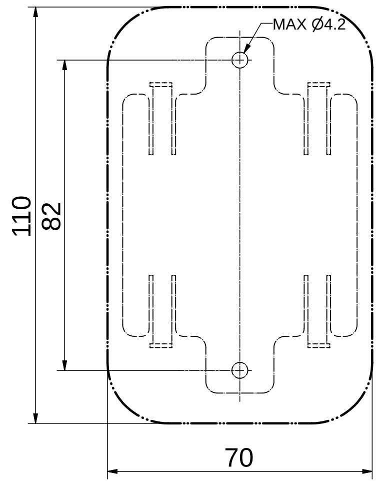


Fig. 5-67 Installation plate external servo button

5.16.5.2 Electrical Installation of External Servo Button

Position the external servo button in the operation room and connect the cable to the system cabinet.

Wiring shall be done according to cable path 3, see Table 5-2 *Cable paths*.

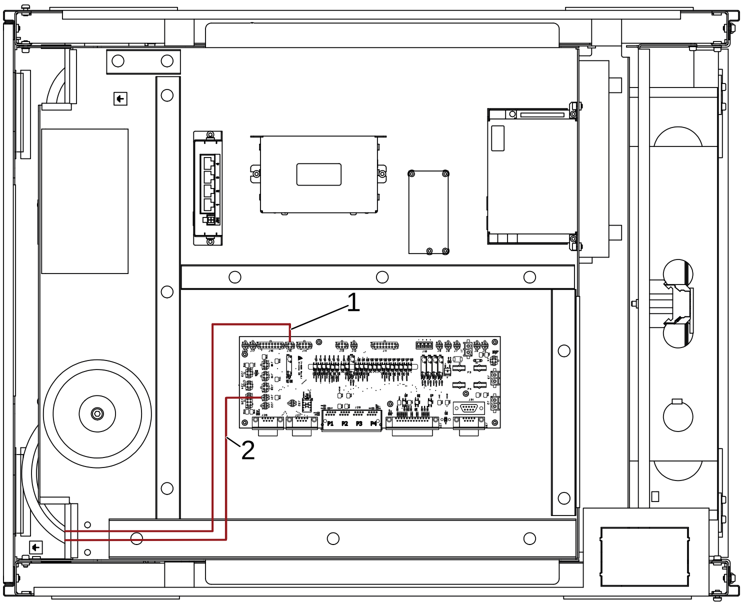


Fig. 5-68 Connecting to FIB

1. J15
2. J21

5.16.6 Foot control, wireless (option)

CAUTION!

Make sure that the correct control is activated, as there is one foot control for the table and one for the wall stand.

The table and the wall stand with motorized vertical movement, can be manoeuvred from the foot control.

The wireless foot control is an optional control unit for table and wall stand.

Consider the working area when manoeuvred.

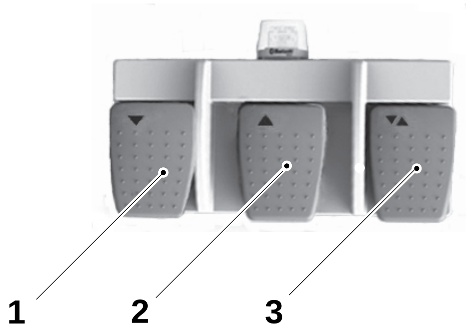
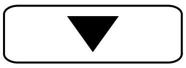
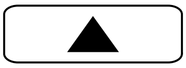
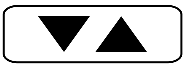
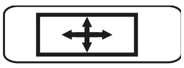


Fig. 5-69 Wireless foot control

1. Z movement down 
2. Z movement up 
3. Release pedal:

    Unlocks wall stand detector brake. Manual movement is possible.

    Unlocks table top. Manual movement is possible, table top is floating.

5.16.6.1 How to manoeuver

1. Press pedal to move downward.
2. Press pedal to move upward.
3. Press the pedal to release the brakes. On activation, the table top or the wall stand detector holder, can be moved manually.

   When the release pedal is activated, the collimator light will be lit.

Note!

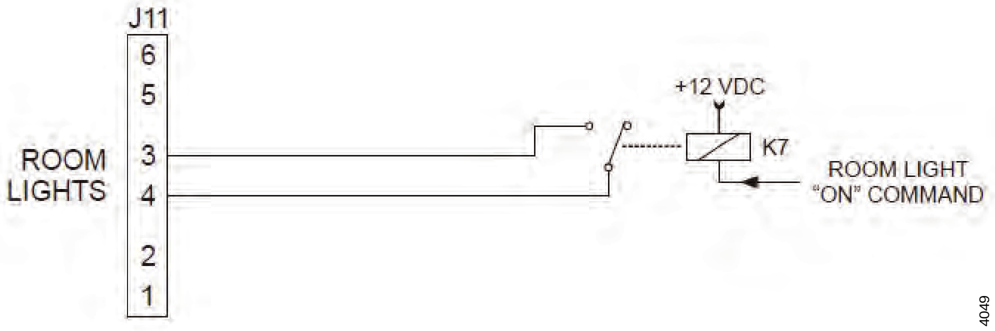
The foot control must not be used outside the examination room.

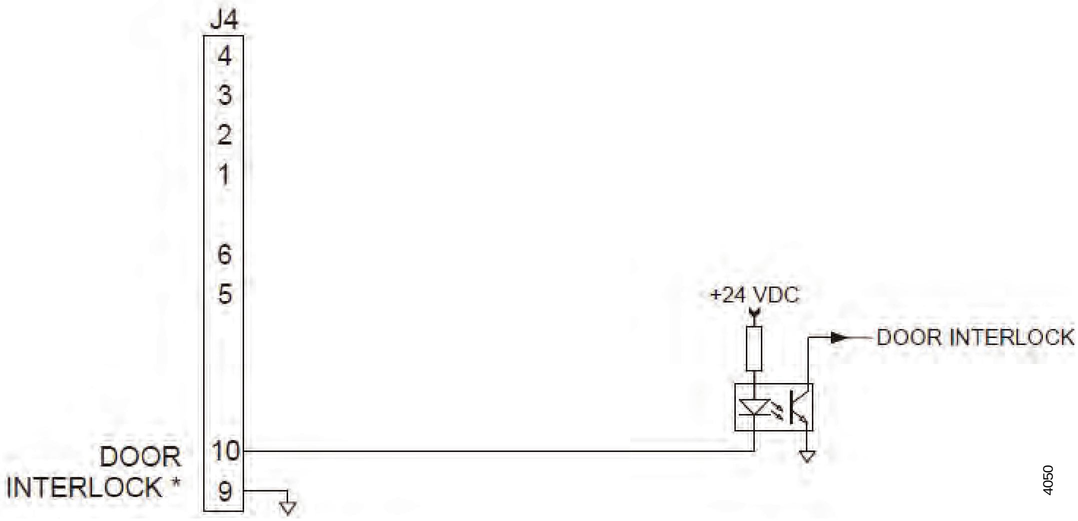
The device has no applied parts and should not be accessible to patients.

5.16.6.2 Battery

The yellow battery indication LED will begin to flash once every two seconds, when the remaining battery capacity is approximately 1 week of constant use, or 168 hours. It will then change to 2 flashes per second when the capacity has been reduced to approximately 2 days, or 48 hours.

5.16.7 Room lights (option)





The generator supplies a dry contact closure when the room light is to be activated. Relay K7 is energized during X-ray exposure

5.16.8 Installation of wireless access point (option)

WARNING!

The cable must be installed covered. It must not be placed on the floor.

WARNING!

The wireless access point must be installed out of reach from patient and user.

Note!

The wireless access point is only used with the wireless detector.

1. Install the wireless access point at the wall in the x-ray room out of reach from patient and user.
2. Connect cable 5.0WLAN01 to connection 1.

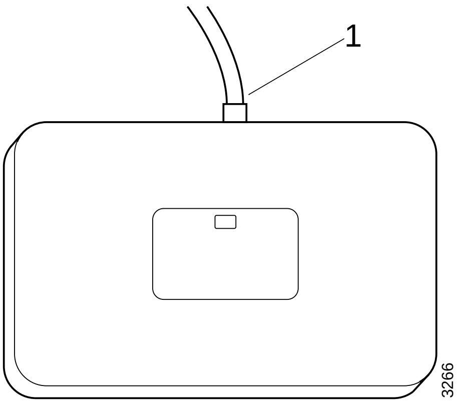


Fig. 5-70

3. Connect cable 5.0WLAN01 to 4.5HUB01-4 in the system cabinet.

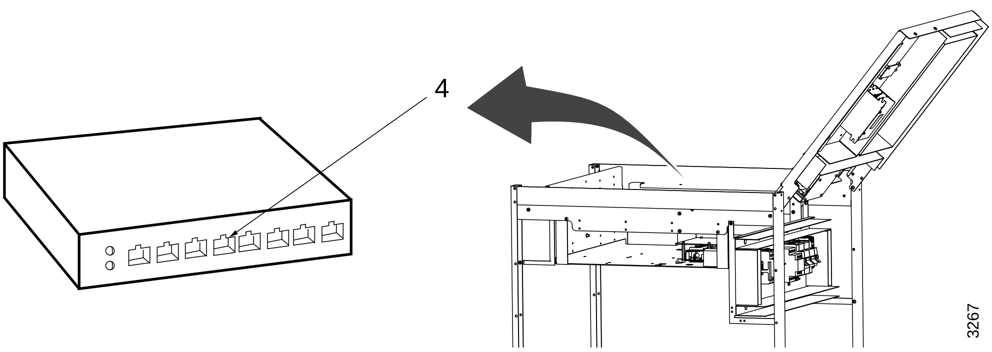


Fig. 5-71

5.16.9 Electrical Installation of Image System

Receptor configuration is specified as below.

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

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, and the green indication light at the Table will activate upon selection.

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 and the green indication light at the Table will not activate upon selection.

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 wall stand,
- or a portable detector placed in the wall stand detector holder.

AEC will be ON and the green indication light at the wall stand, will activate upon selection.

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

4. Receptor 4

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

AEC will be OFF and the green indication light at the wall stand will not activate upon selection.

5. Receptor 5

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

See drawings 8.2.2.2 *CXDI TS 401 or 701C Wireless and WS 401 or 701C Wireless* to 8.2.2.19 *CXDI TS 410 or 710CW with charging and WS 410 or 710C wireless*.

5.17 Electrical Building Installation

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

WARNING!

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

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.

5.17.1 Power ratings and line requirements

The product requires a three-phase electrical line with a protective earth ground (4 or 5 wires).

The transformers in the system cabinet, requires a tap configuration.

The generator has an automatic main line selection (no transformer tap configuration required).

The voltage has to be manually set to:

- 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 Recom- mended **Mains Discon- nect to Generator (15 ft/5 m maxi- mum)**	**Generator Momenta- ry Line Current**	Minimum Recom- mended **Generator Service Rating**	Minimum Recom- mended **Distribu- tion Trans- former Rating**	Minimum Recom- mended **Ground Wire Size**	**Apparent Mains Re- sistance**
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):

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

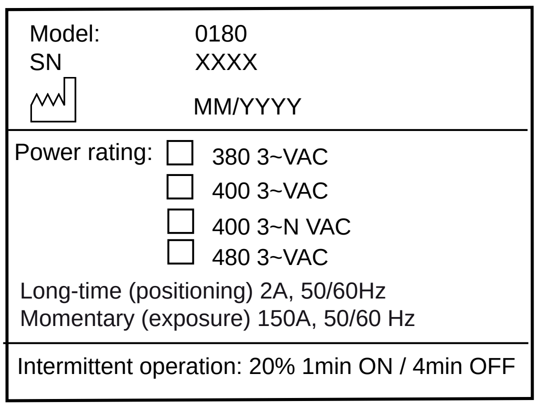


Fig. 5-72

- 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.

5.17.2 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.

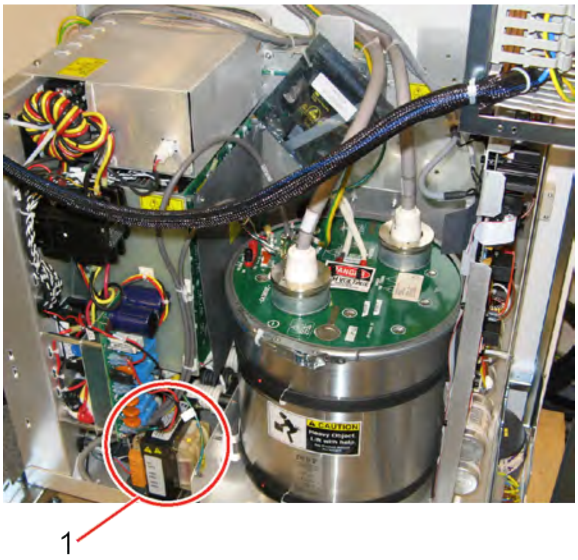


Fig. 5-73 400VAC

1. Position of generator transformer.

Check that the red wire is connected to 400V, at the generator transformer. See Fig. 5-74 *Connection 400V*

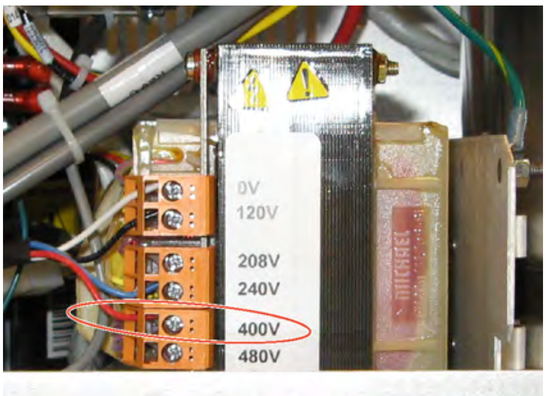


Fig. 5-74 Connection 400V

When changing voltage, set the DIP switch SW3–8 according to the mains voltage. See Fig. 5-75 *400V, DIP switch SW3–8*

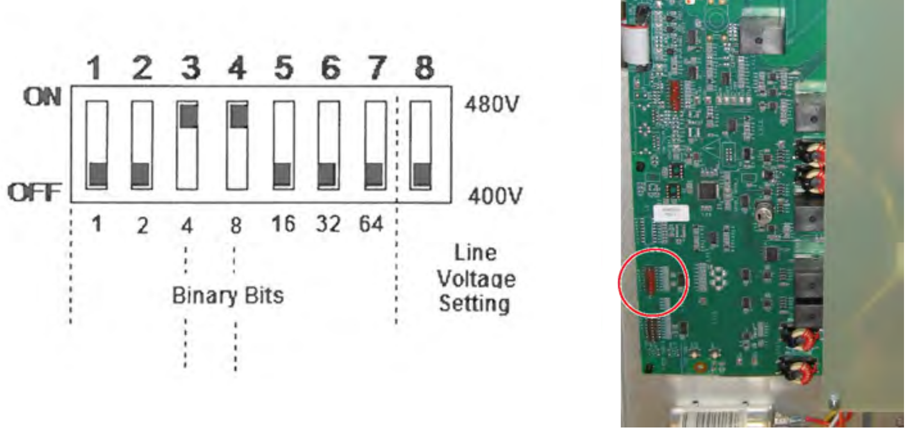


Fig. 5-75 400V, DIP switch SW3–8

Make sure the wire (A) is connected according to Fig. 5-76 .

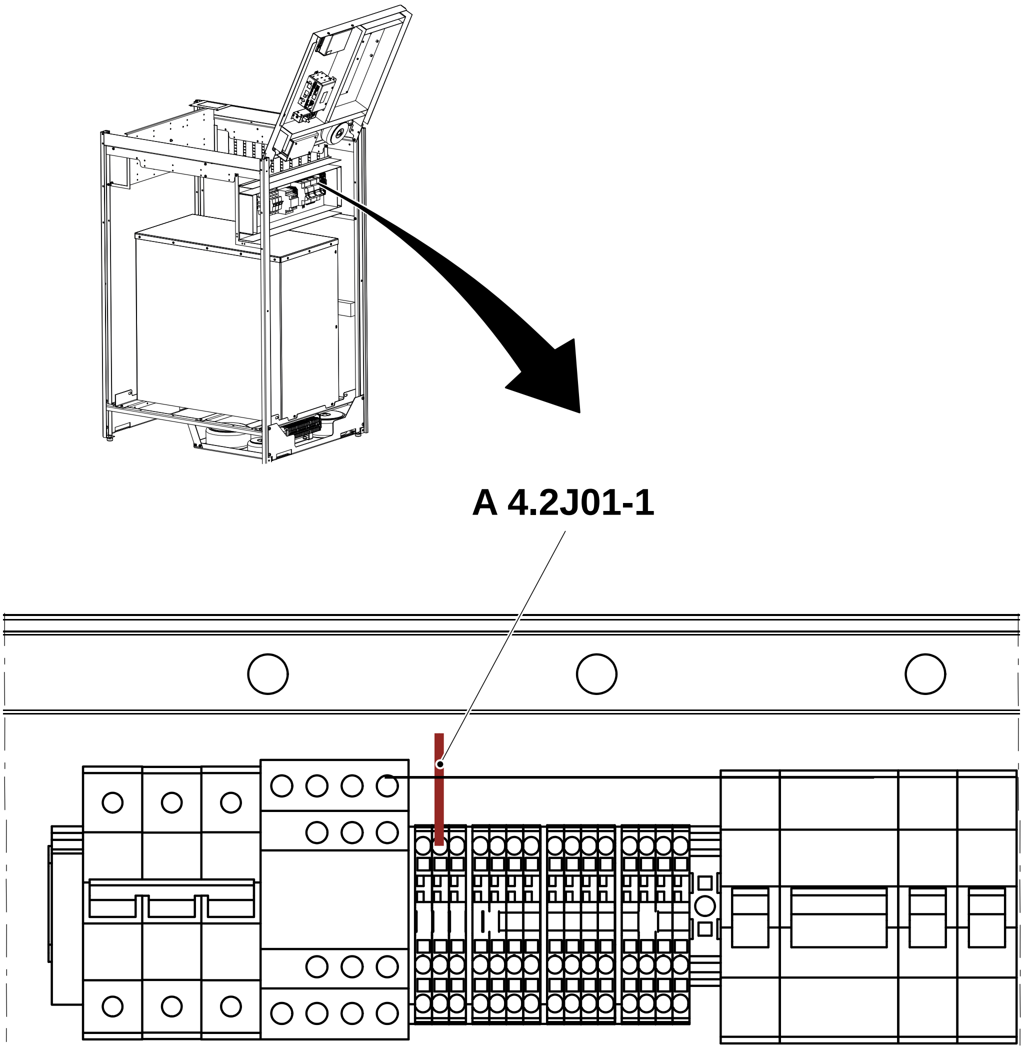


Fig. 5-76

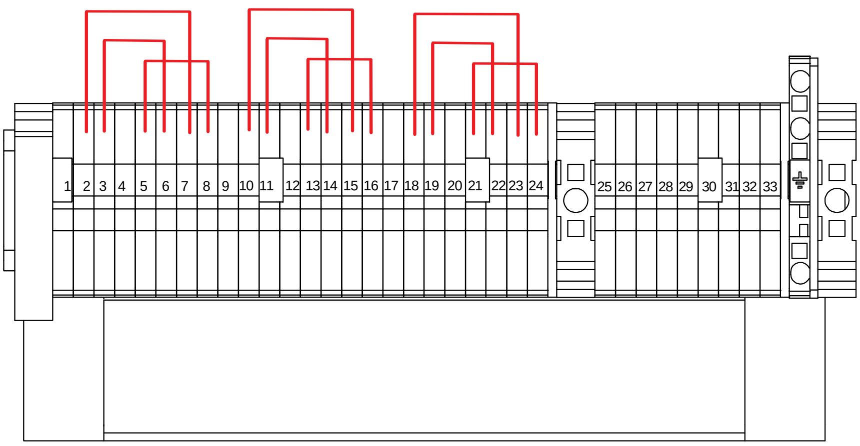


Fig. 5-77 380V

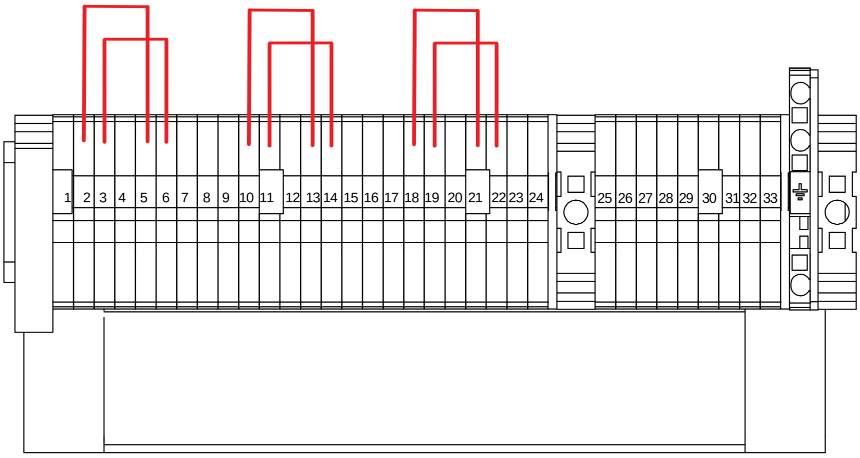


Fig. 5-78 390V

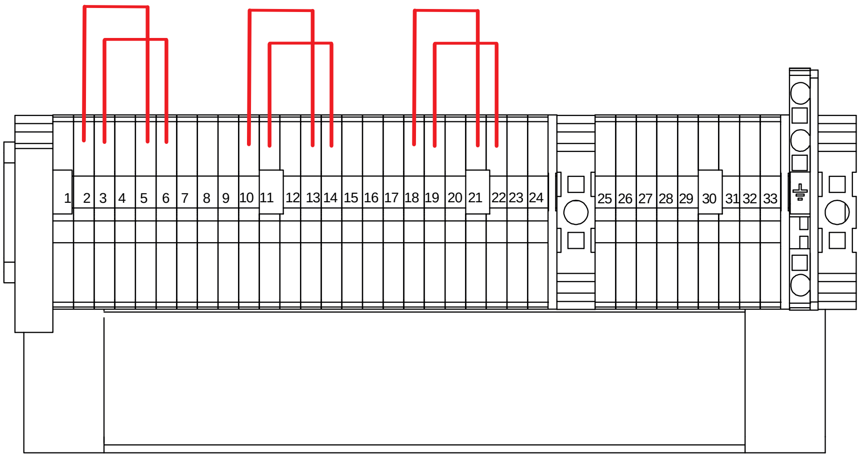


Fig. 5-79 390V

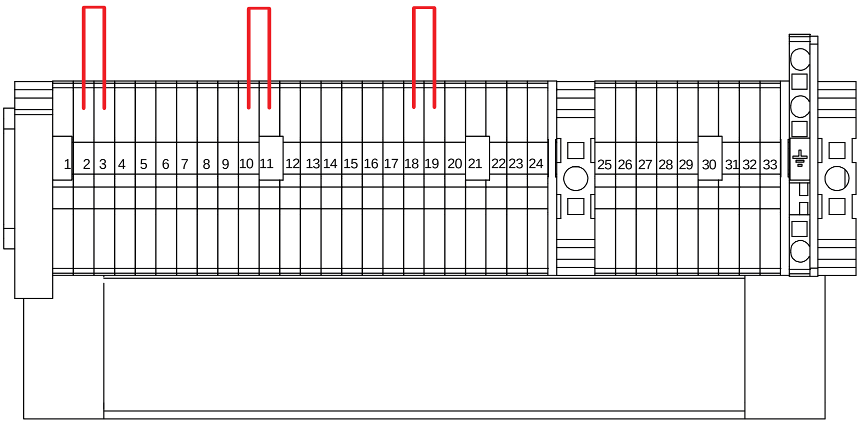


Fig. 5-80 400V

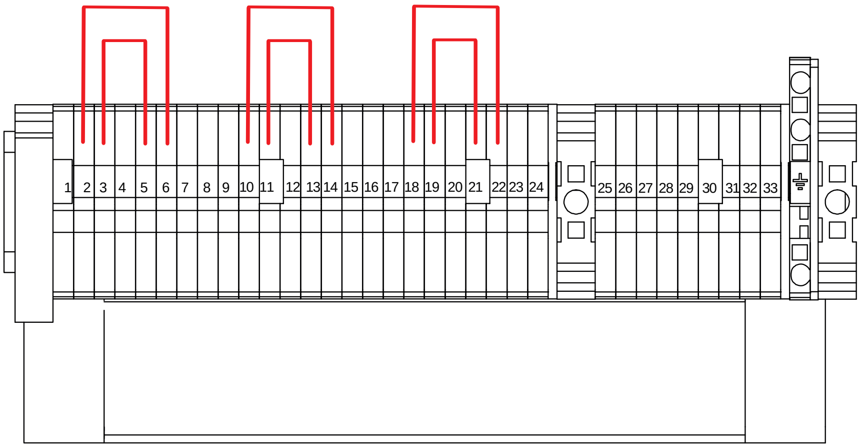


Fig. 5-81 410V

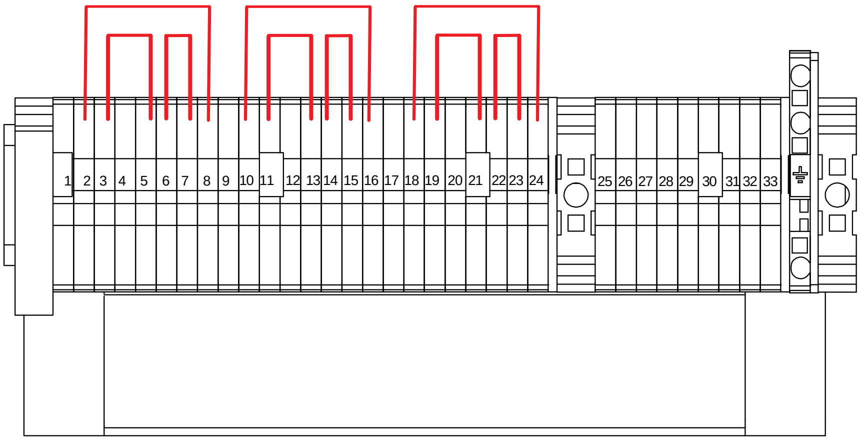


Fig. 5-82 420V

5.17.3 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.

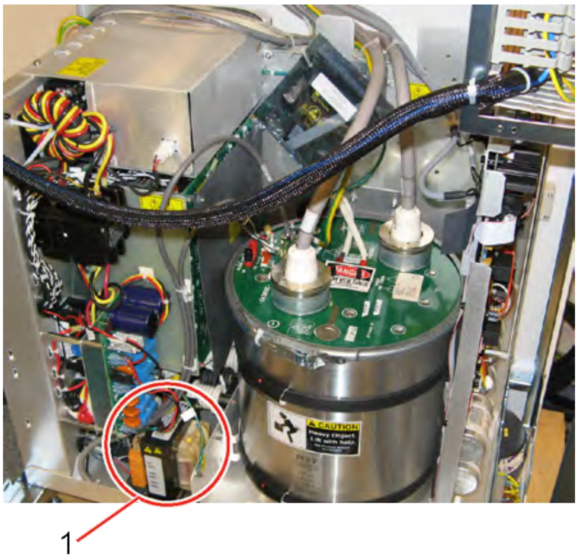


Fig. 5-83 480VAC

1. Position of generator transformer.

Check that the red wire is connected to 480 V, at the generator transformer. See Fig. 5-84 *480V connection*

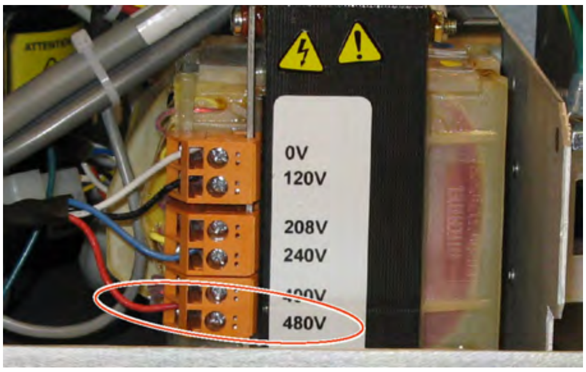


Fig. 5-84 480V connection

When changing voltage, set the DIP switch SW3–8 according to the mains voltage. See Fig. 5-85 *480V, DIP switch SW3–8*

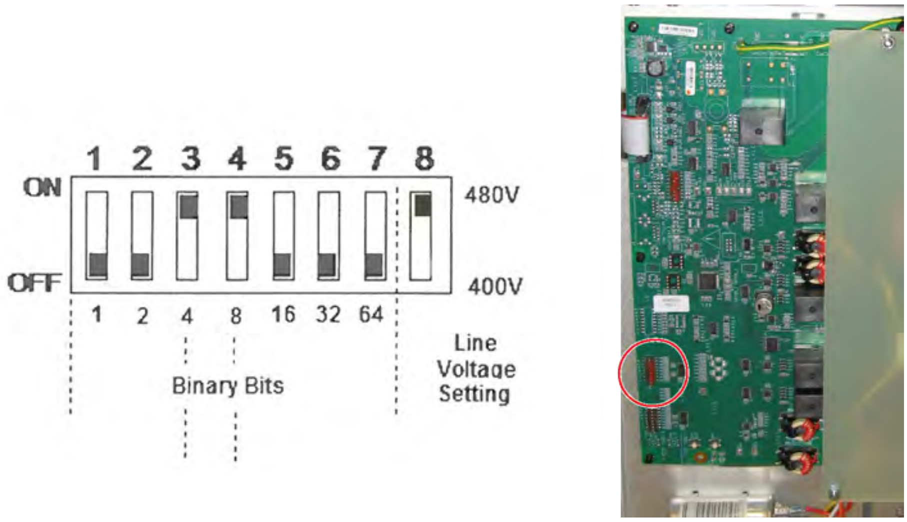
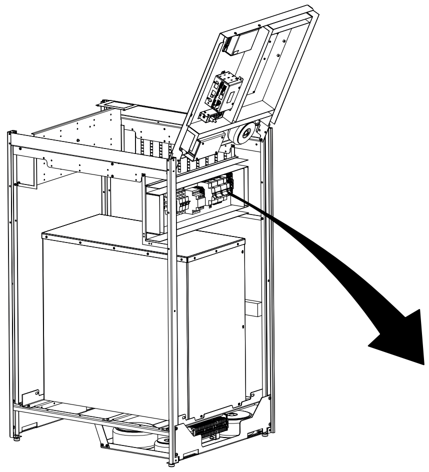


Fig. 5-85 480V, DIP switch SW3–8

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



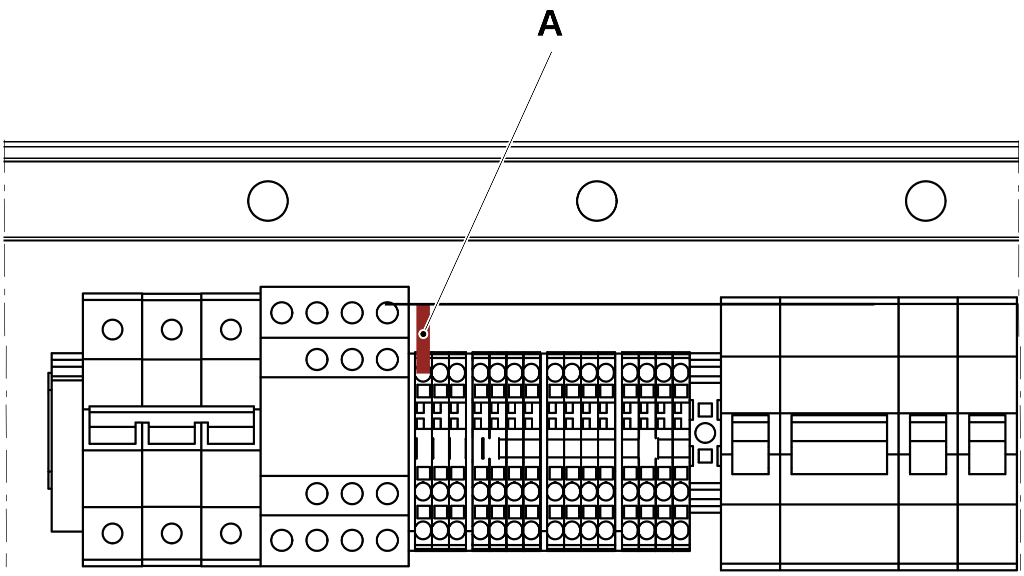


Fig. 5-86

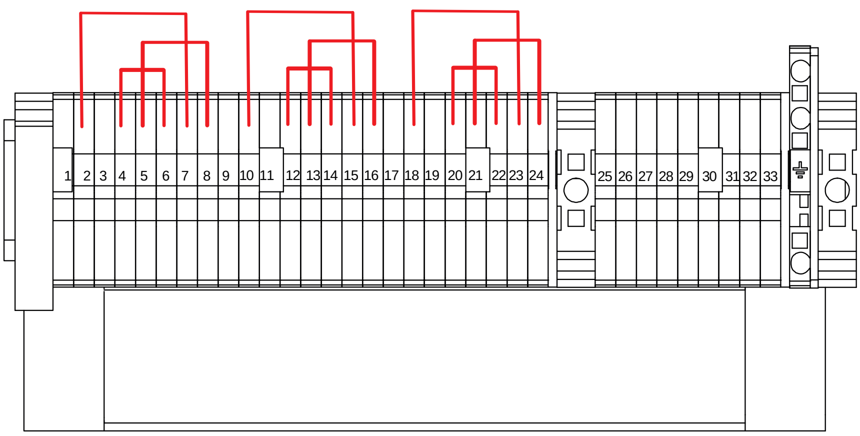


Fig. 5-87 460V

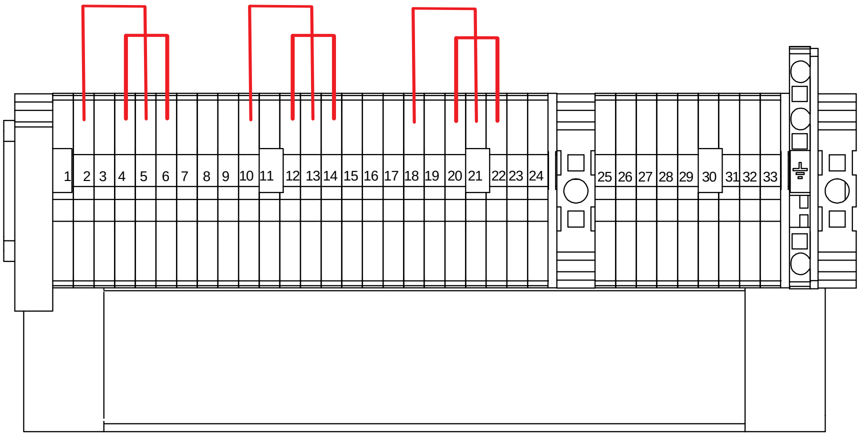


Fig. 5-88 470V

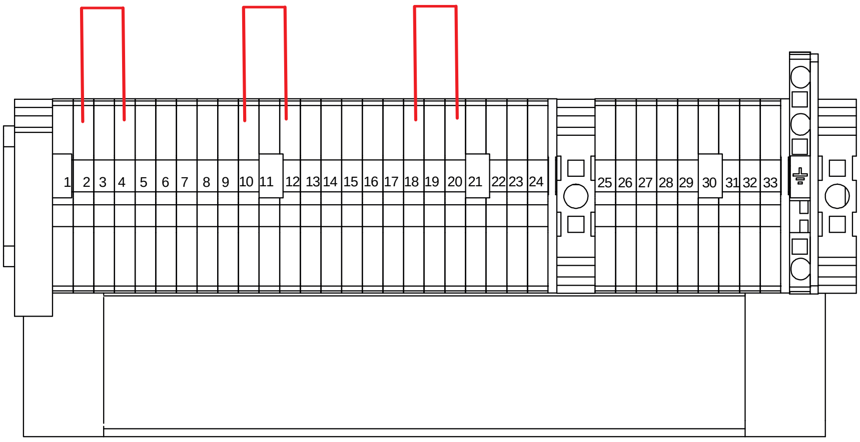


Fig. 5-89 480V

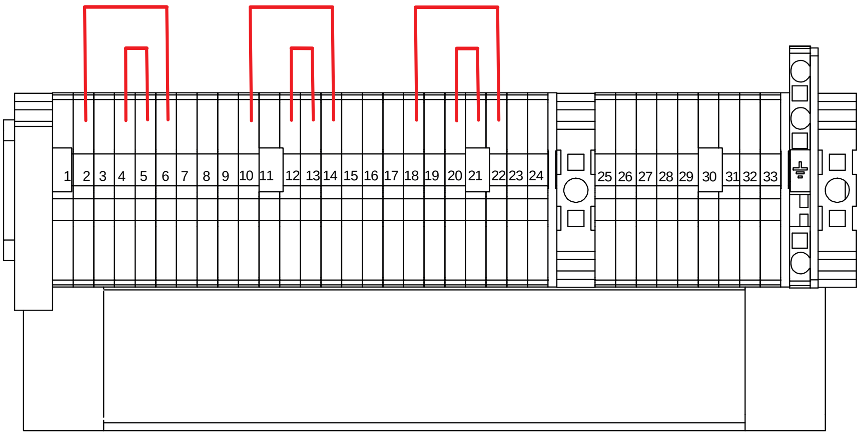


Fig. 5-90 490V

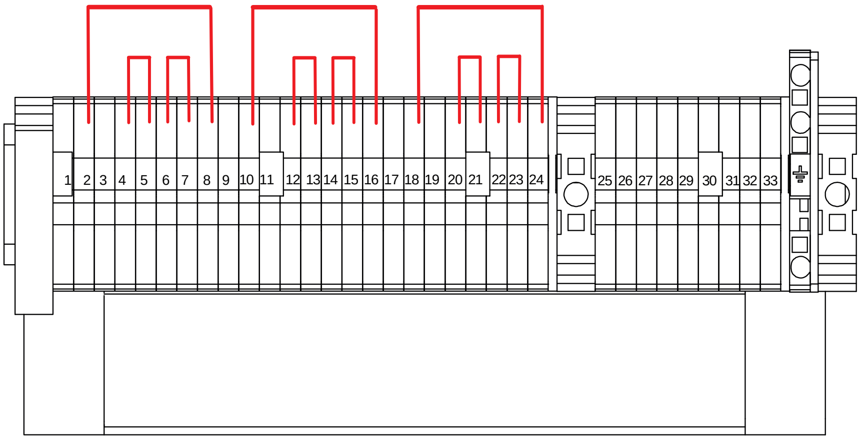

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Fig. 5-91 500V

5.18 Check Protective Earth

Make sure the protective earth cables are connected and the bolts are tightened, see Fig. 5-92 *Check protective earth*

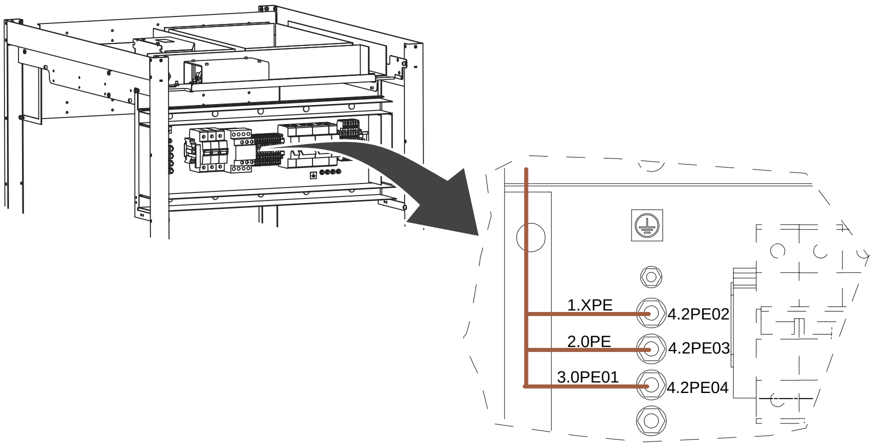


Fig. 5-92 Check protective earth

5.18.1 Measure Protective Earth

WARNING!

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

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

Before measuring protective earth on the OTC, Table and wall stand as follows, make sure the mains protective earth cable from the building is not connected, see Fig. 5-93 *Disconnecting protected earth*.

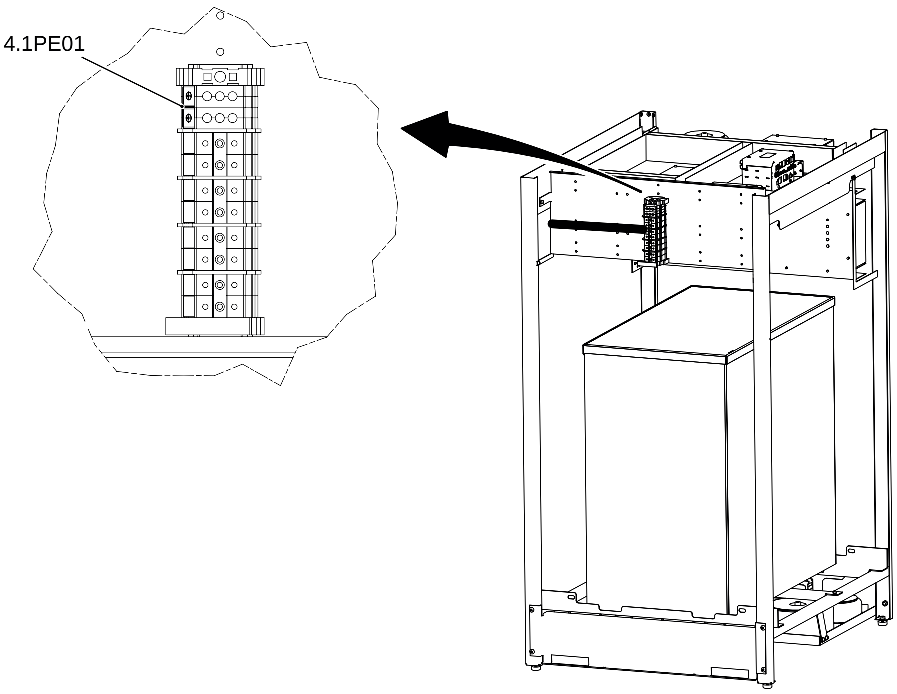


Fig. 5-93 Disconnecting protected earth

5.18.1.1 Protective Earth, OTC

Measure the protective earth resistance on an uncovered metal surface.

Measure the continuity between the measuring points 1.CS resp. 2.CS and the ground terminal 4,1PE01.

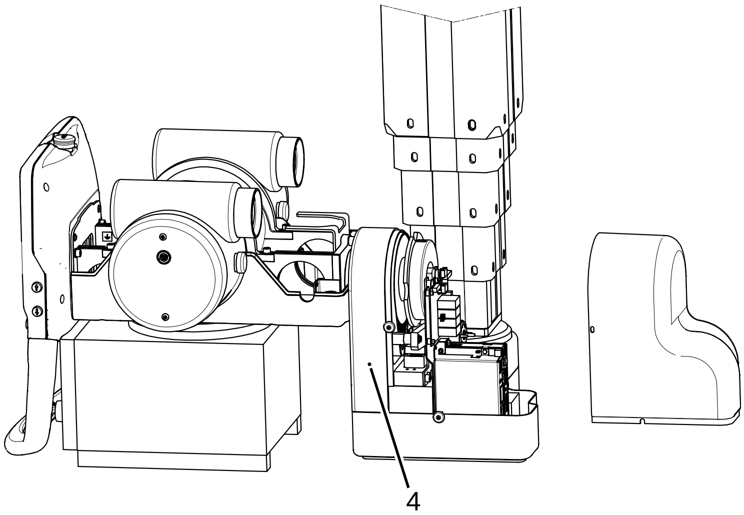


Fig. 5-94 Measuring point 1.CS

1. Alpha/Beta arm (1A PE)

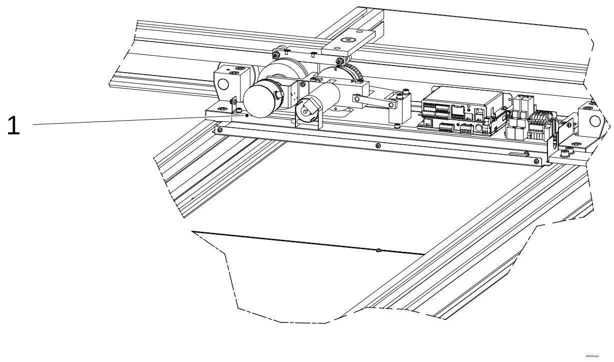


Fig. 5-95 Measuring point 2.CS

1. Traverse wagon Y

5.18.1.2 Protective Earth, Table

Note!

Measure protective earth of the Table after the attachment to the floor, see 5.11 Mechanical Installation of Table, Page 109.

Measure the continuity between the measuring points 1.TS. 2.CS and the ground terminal 4,1PE01.

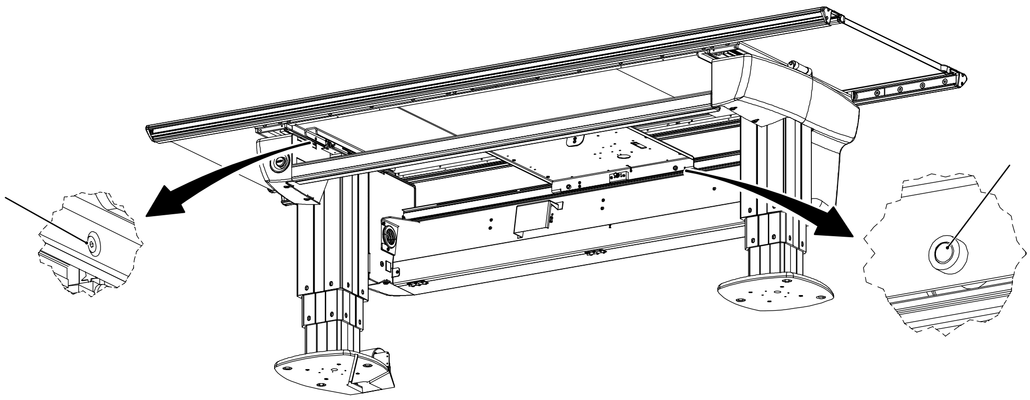


Fig. 5-96

5.18.1.3 Protective Earth, Wall Stand

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

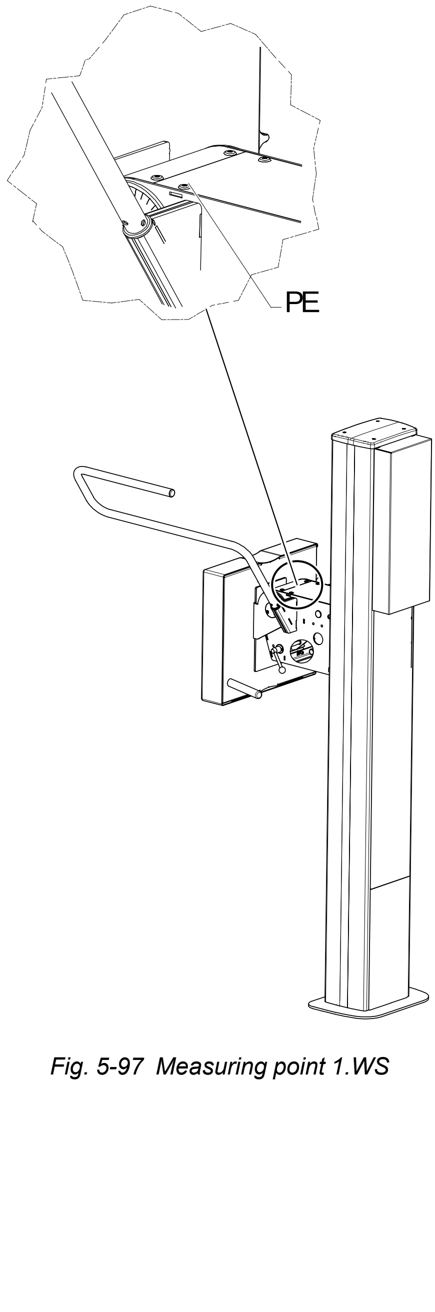


Fig. 5-97 Measuring point 1.WS

5.19 Electrical Installation Mains

Connect mains power and mains protective earth according to Fig. 5-98 *Electrical installation mains*.

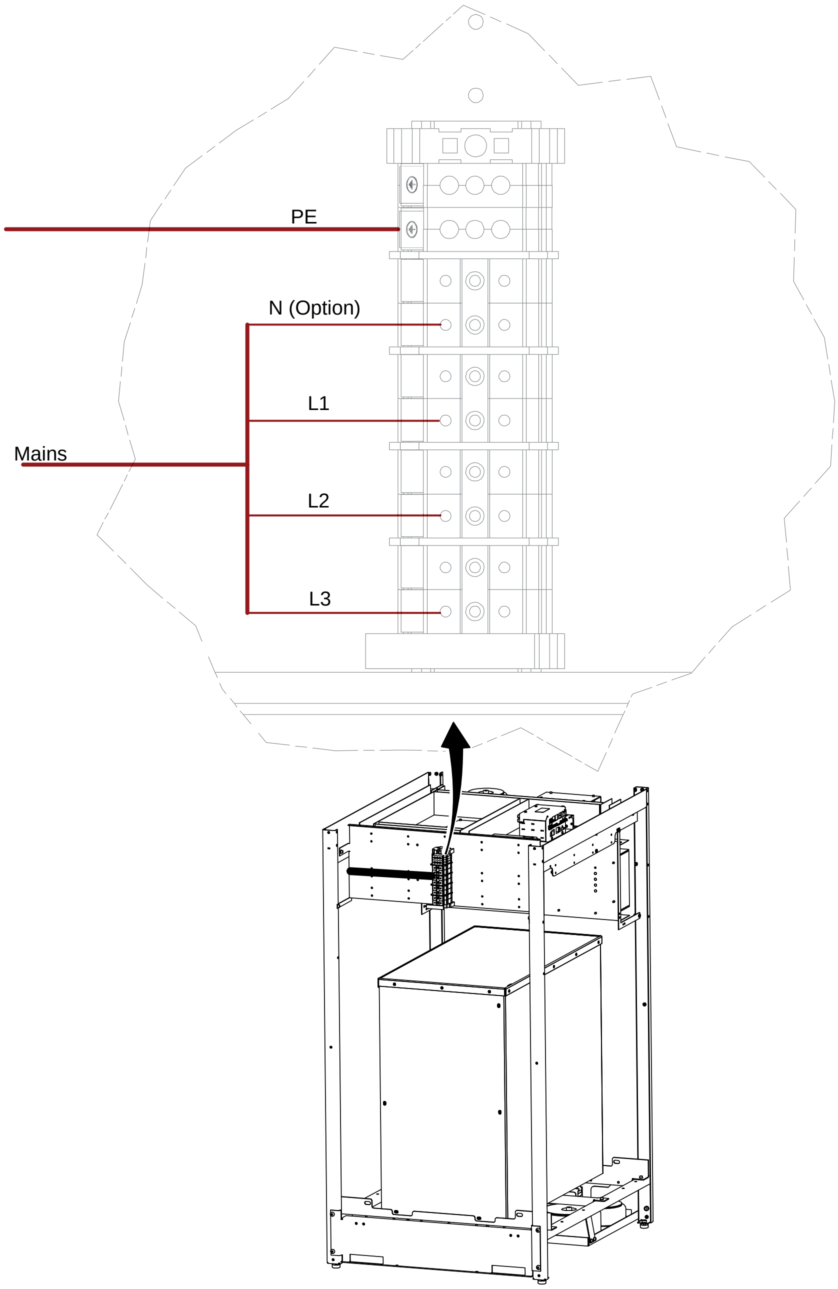


Fig. 5-98 Electrical installation mains

5.20 Start-up Procedure

5.20.1 Check Voltage of the Subsystem

Switch off (press down) the fuses according to picture 1 in Fig. 5-99 , and switch on the power to the System from the main switch.

Measure at the fuse 4,2F02 and 4,2F05 according to picture 2 in Fig. 5-99 .

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

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

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.

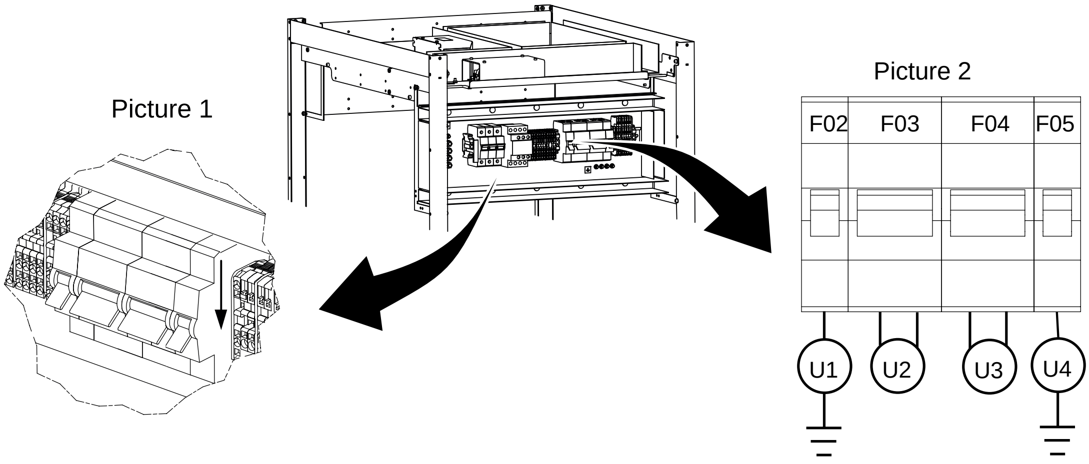


Fig. 5-99

Picture 3

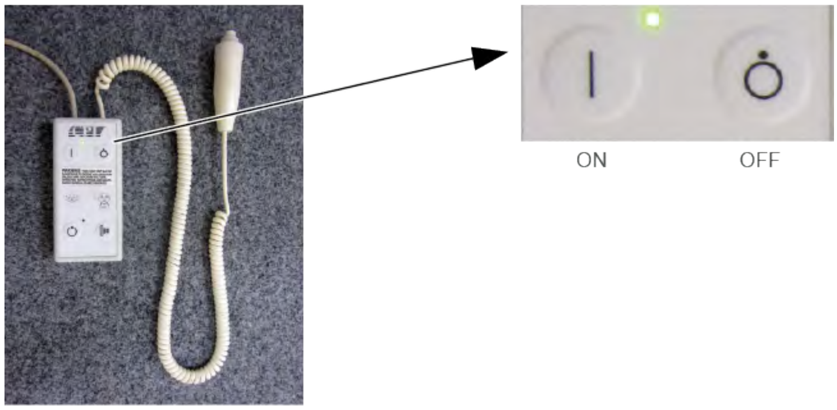


Fig. 5-100

5.20.2 Check Power

1. Switch on power to the System.
2. Check that the display is lit, when the System is switched on.

Note!

Error messages may occur as the System is not fully installed.

5.21 Check Alignment, OTC

WARNING!

The Z movements are factory default, and may not conform to the current conditions.

1.
- Place a spirit level on the OTC column.
- Check that column is vertical (± 1°) in two directions.
- If necessary, check the wheels of the ceiling wagon.

2.
- Place a spirit level on the OTC tube.
- Check that the tube is horizontal (± 1°) in both directions.
- If not horizontal, see 5.21.1 *Adjust Alpha Index*, Page 164.

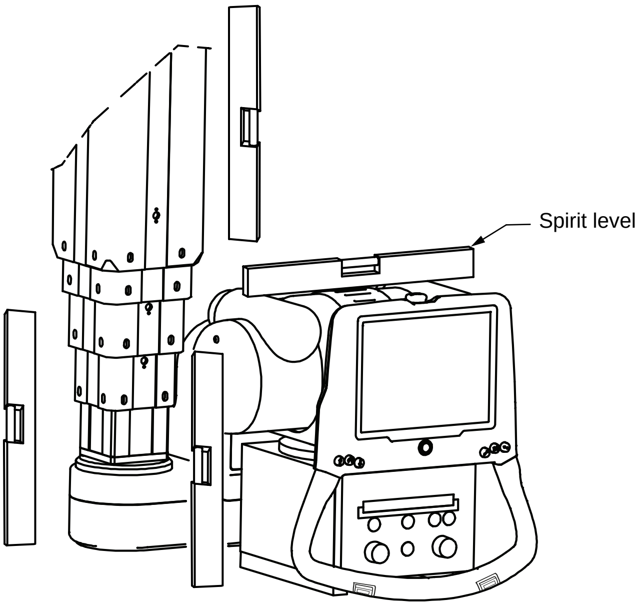


Fig. 5-101

3. Check that the collimator is placed in its index position.
4. 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.

   Drive the column upward/downward and the center of the collimator light field must stay on the same mark on the paper.

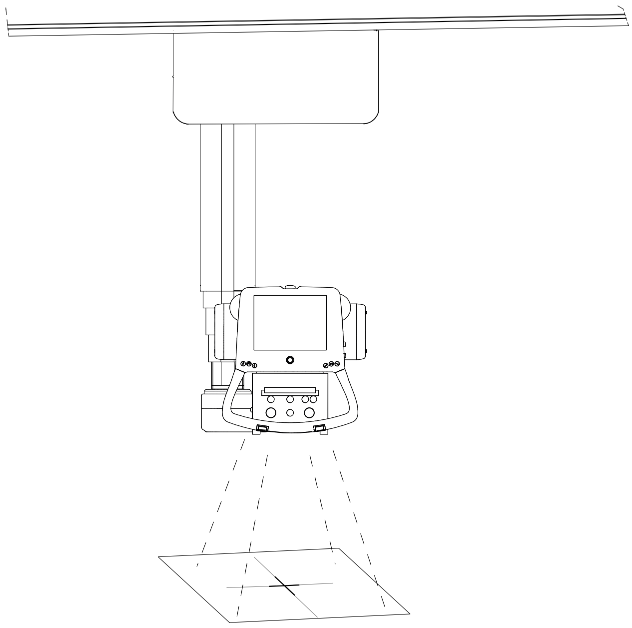


Fig. 5-102

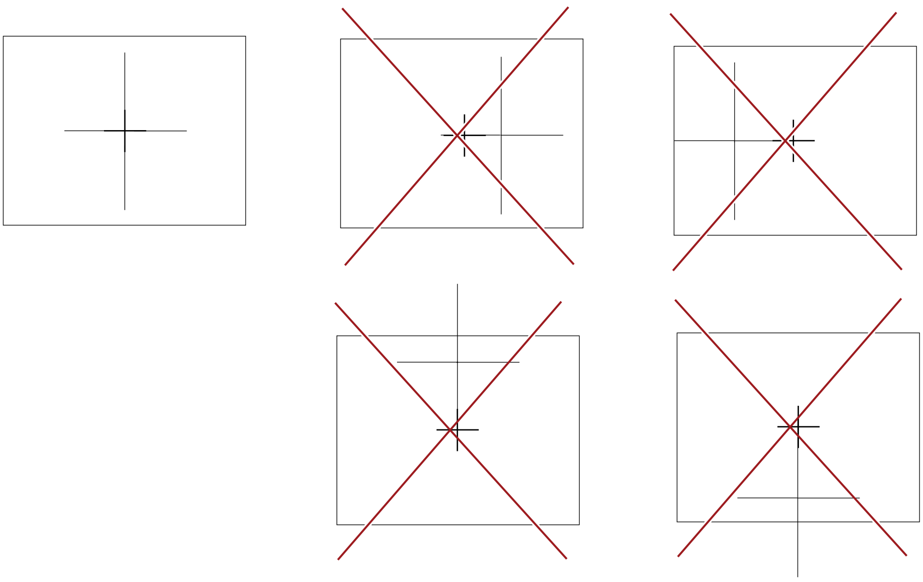


Fig. 5-103

If the collimator light field moves in x or y direction, check the 5.8.5 *Ceiling Rails Y*, Page 81 and 5.8.6 *Traverse Rail X*, Page 89. These must be level. If necessary adjust the Alpha index.

5.21.1 Adjust Alpha Index

Note!

Adjusting the alpha index must be done before using the OTC as a reference to other devices.

Check that the tube is horizontal by using a spirit level.

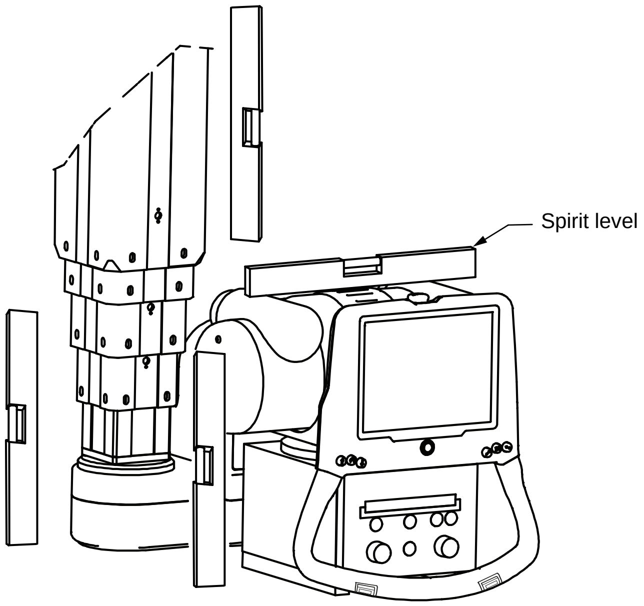


Fig. 5-104

Adjust the alpha index if necessary:

- Loosen the nut (A).
- Adjust the tube to horizontal level, use a spirit level.
- Tighten the nut (A).

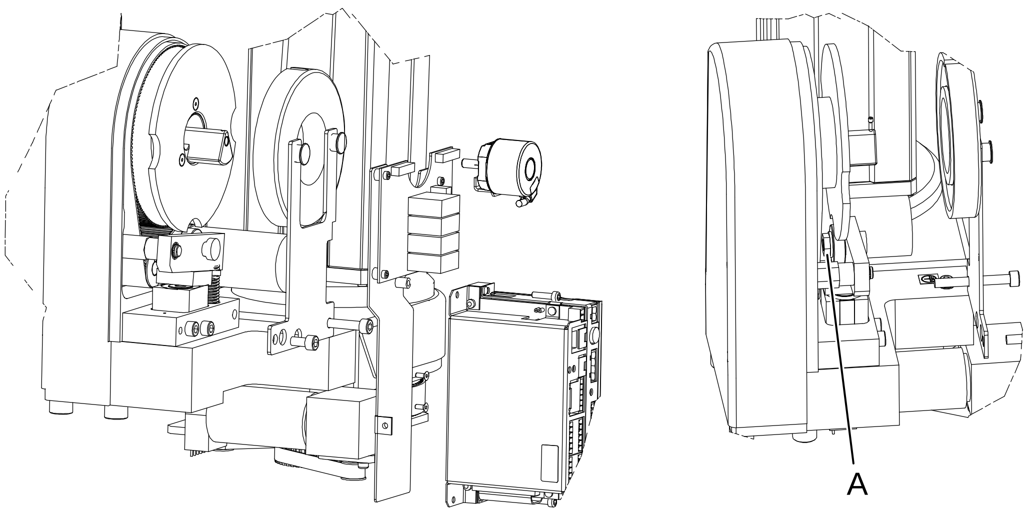
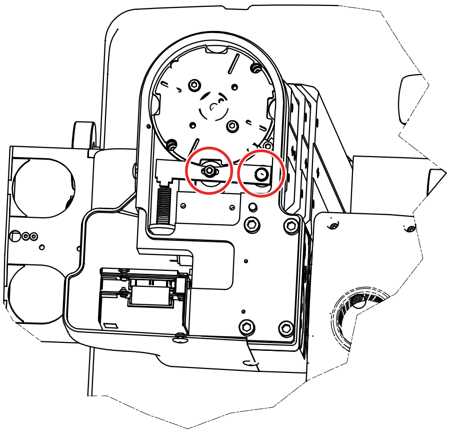


Fig. 5-105

5.21.2 Adjust Beta Index



1. Loosen the two nuts.
2. Align by the method described in Fig. 5-103 .
3. Fasten the nuts.

5.21.3 Adjust Index Magnet

The index magnet shall be adjusted if the movement of the OTC is irregular in the middle of the sweep (alpha 0°), during Tomo-movement.

1. Remove the covers.
2. Loosen the bolt (A) that is behind the hole.
3. Turn the handle (D) until the arm (C) is against the magnet (B).
   Rail (B) has to be installed on the front.
4. Activate the magnet from the node A view in the service software, see Fig. 6-9 *Measure point, protective earth traverse wagon Y.*.
5. When the arm (C) is against the magnet (B) tighten the bolt (A).

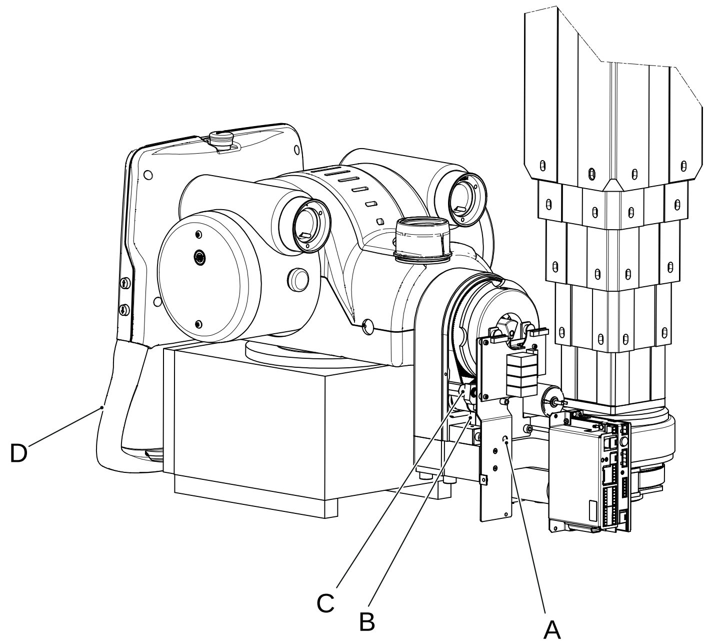


Fig. 5-106

5.21.4 Adjust the Mechanical End Stop, Beta

Depending on how the OTC is installed, you might need to adjust the mechanical end stop beta.

1. Disconnect power.
2. Remove cover and cables connected to beta drive unit.
3. Release screws (1), holding potentiometer and release tension of belt.
4. Hold beta drive unit (2) to prevent it from falling.
5. Remove screw (3), pulley (4) and belt (5).
6. Remove beta drive unit (2) by sliding it downward.

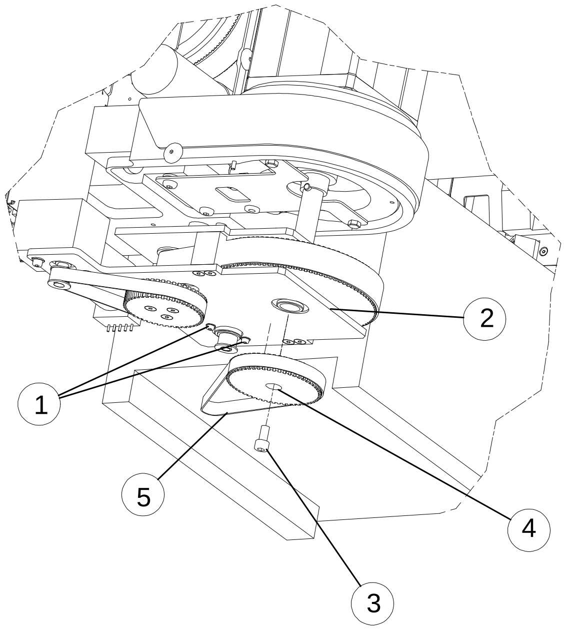


Fig. 5-107

7. Release the two screws at no. 7, Fig. 5-108 . Remove the beta magnet.

Note!

There may be shims or washers needing to be reassembled in the same way afterward.

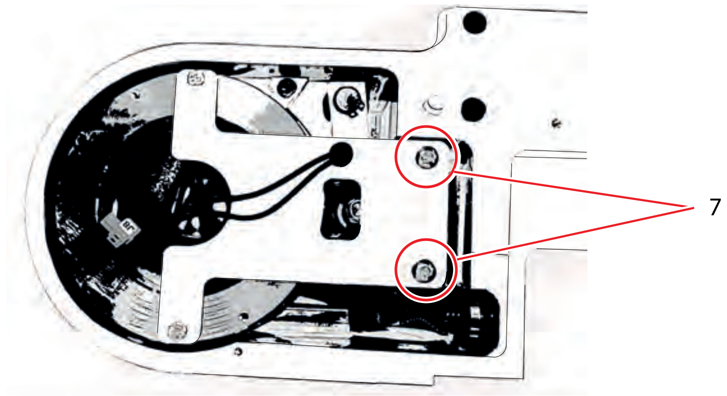


Fig. 5-108

8. Unscrew the bolts (A), see Fig. 5-109
9. Turn the detent plate into desired position.
10. Fasten the bolts (A) in desired position for the end stop (4 different positions are possible).
11. Reassemble any removed shims or washers.

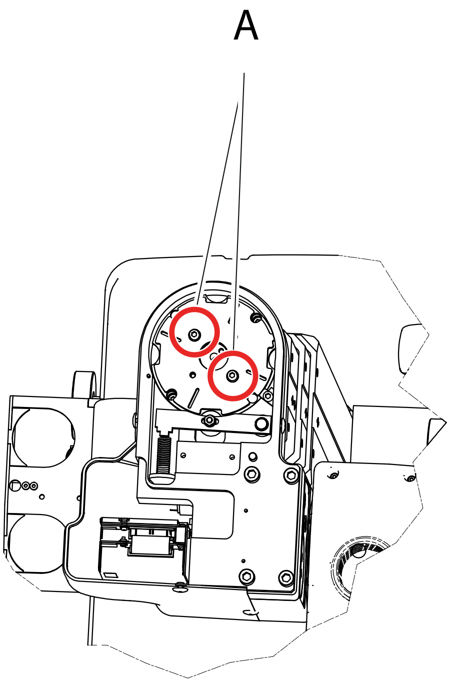


Fig. 5-109

12. Reassemble drive unit.
13. Install pulley (4) with screw (3). Torque 9.8 Nm, Loctite 243.
14. Install belt (5).
15. Adjust tension by pushing potentiometer and tighten screws. Tension = +/-2 mm when pushing on the belt between the c/c of the pulleys.

5.21.5 Adjust the Drive Unit X and Y

Move the OTC in both X and Y direction.

Adjust the drive units if:

- the drive units run too stiff (e.g. object protection error during automatic movement).
- the drive units lose contact with the tooth belt when the brake is activated (the OTC shall not be able to move when the brake is activated).

1. To adjust the drive units loosen the nut (A).
2. Turn the eccentric bolts (B), see Fig. 5-110 .

   It shall be possible to rotate the wheels (C) by finger pressure. Repeat until the drive units runs smoothly.

When the calibration of the OTC is done, a fine adjustment of the drive units may be needed.

Check that the tooth belt wheels does not lose contact with tooth belt, during the entire stroke of X/Y-direction.

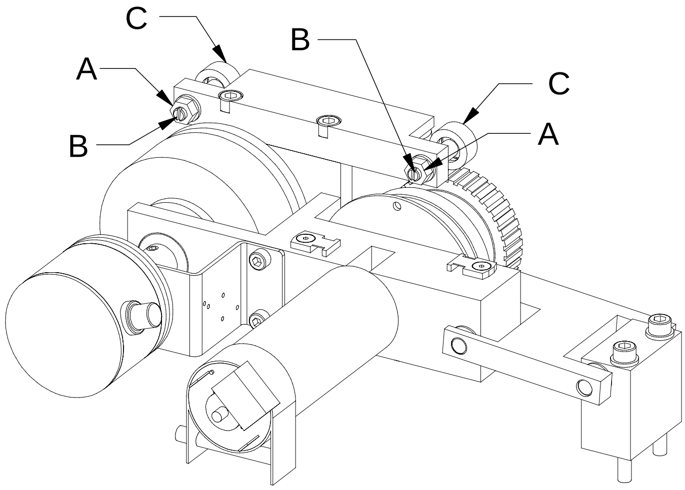


Fig. 5-110

The tooth belt should not give any vibrations down to the maneuver handle, when the OTC is moved manually.

5.21.6 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.

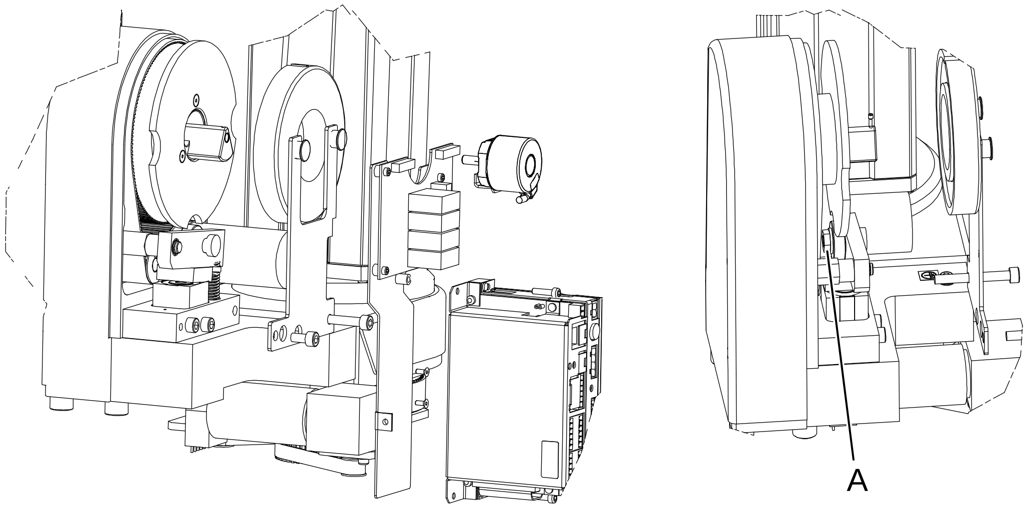


Fig. 5-111

2. Move the OTC backward/forward and the center of the collimator light field must stay on the same mark on the paper.

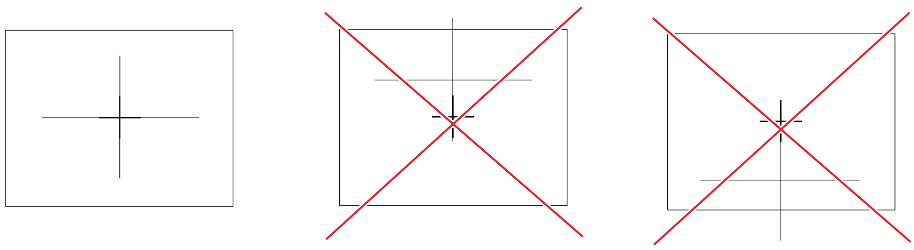


Fig. 5-112

If the collimator light field moves in z direction, check the 5.8.5 *Ceiling Rails Y*, Page 81 and 5.8.6 *Traverse Rail X*, Page 89. These must be level.

5.22 Install Imaging System

1. Install the imaging system according to the Image System Manual.
2. Connect the imaging system’s ethernet cable to the System master.

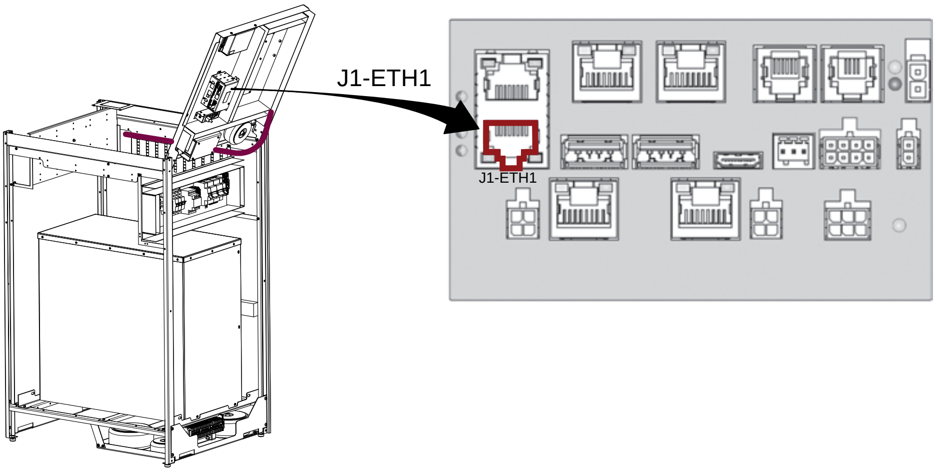


Fig. 5-113

5.23 Calibration OTC

5.23.1 OTC Definitions

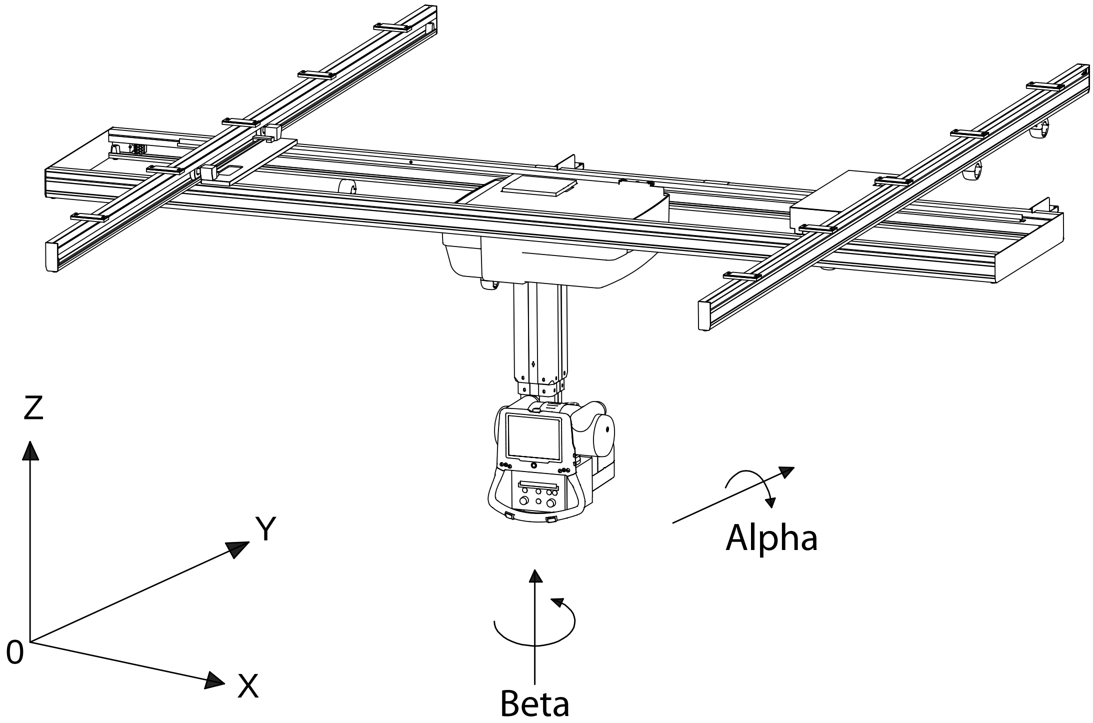


Fig. 5-114

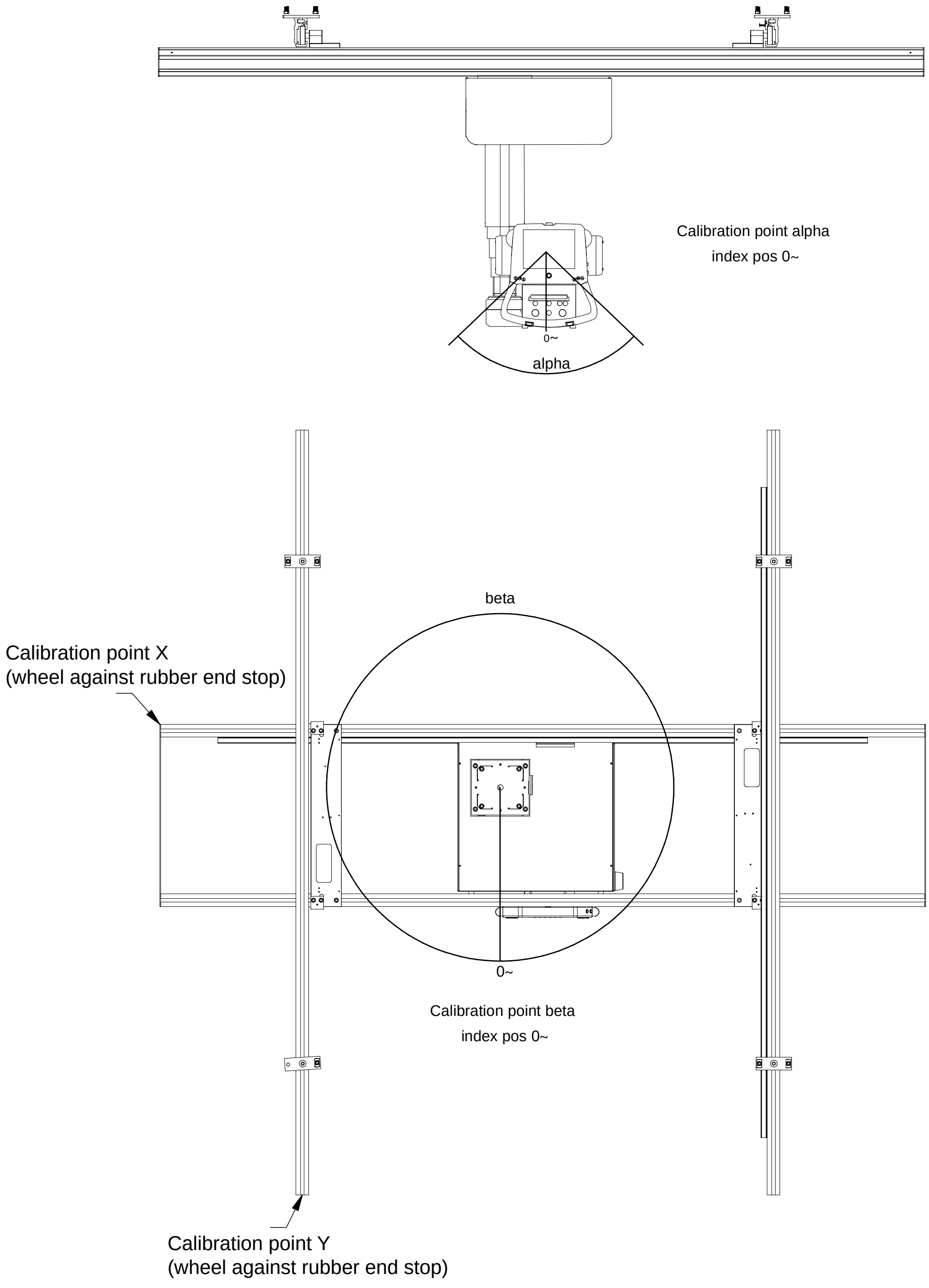
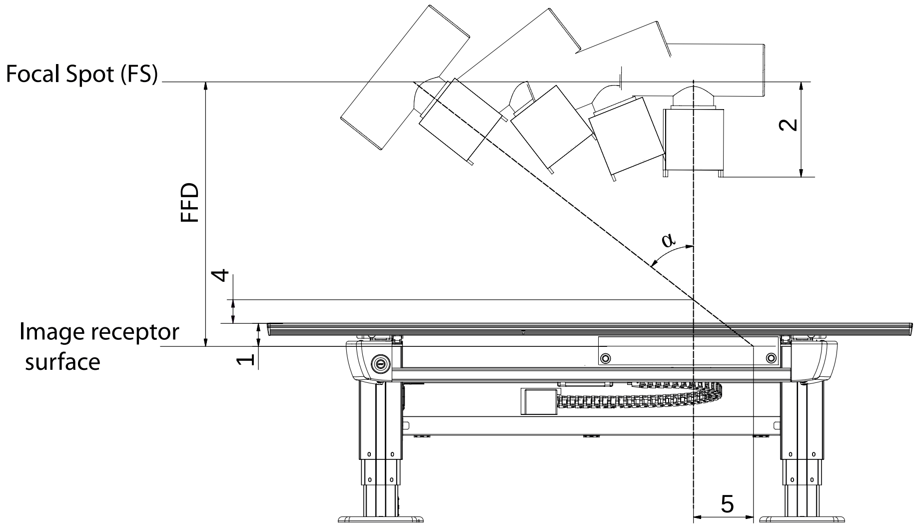


Fig. 5-115

Note!

The OTC must be calibrated according to Fig. 5-115 , irrespective of how the OTC is going to be used after the installation, (i.e. normal installation or reverse installation) and the placement of the Table in relation to X and Y.

5.23.2 Table Definitions



1. Tabletop surface to Image receptor surface
1+2 FS to Image receptor holder offset.
3. Not applicable
4. Rotation point (pendulum parameters)
5. Calculated movement range (Image receptor holder)

1 - 4 = parameters

Fig. 5-116 Important measures

5.24 Service Program

Move the Service Software folder from the enclosed System USB to the System computer.

Note!

It is important to use the Service Software included with the System.

- Open the folder and start by clicking the Icon.
- Open *Arco Ceil*.
- Select the correct *Com. port*.

5.24.1 Password

There are two access levels:

- Basic level for the Operator. Only used for reading purposes.
- Advanced level for the Service technician. Used for setting up the System and perform basic error detection.

To change the access level:

1. Chose the *File menu* and *Change user.*
2. Enter the password for the selected type of access level.
3. Press the *OK button*.
4. If no change shall be done, chose *Cancel button*.

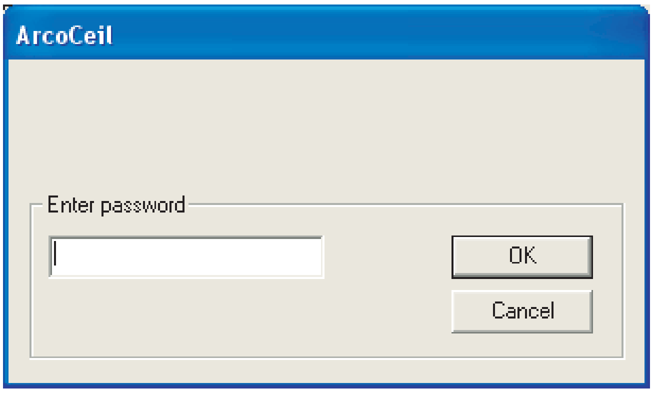


Fig. 5-117

5.24.2 System Setup

Before setting up the OTC, check the following:

1. Connect a standard serial cable (maximum length 2 m), between the System cabinet (J31 at the FIB) and the serial interface port (COM), on the service lap top (PC).
2. Start the service program.
3. Choose COM-port.
4. Start the OTC service software from the enclosed USB and enter password.

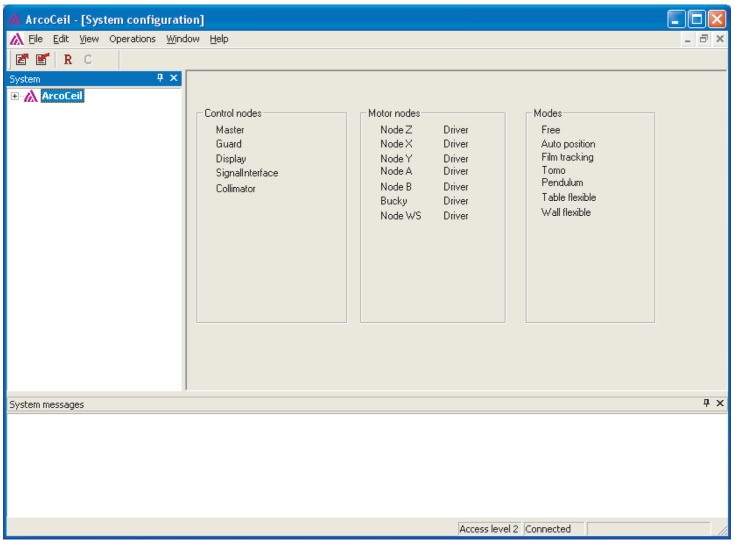


Fig. 5-118

Note!

Note that the software in all nodes, including service software and the parameters are tested and verified as a software package.

The version on all nodes, service software and parameters must belong to the same software package in order to guarantee the function.

Further check can be made against the SwRLN_document.

5. Check that the System software version is shown in the service program. The box must not be blank.

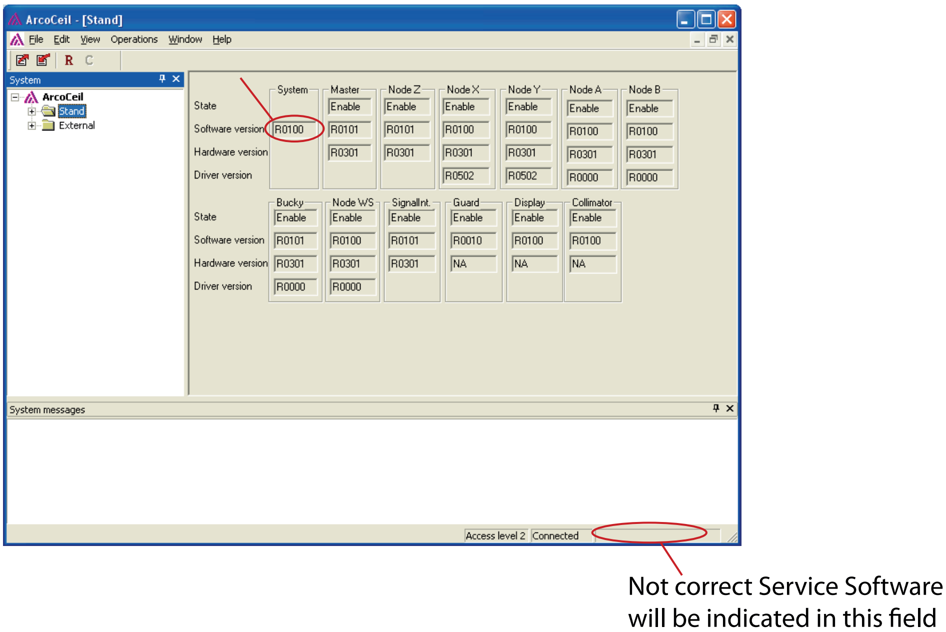


Fig. 5-119

6. Check the state of all the nodes. All nodes shall be in enable state.

5.24.2.1 Hardware Key

To identify the current configuration in the System, the dialogue box *Hardware Key Mask* is used.

The hardware key is made based on the ordered options for the System. The information describes the setting unique for each System.

It is possible to disable functionality in the System by unmarking a check box. This could be helpful if a node is broken. Then it is still possible to use the System if the node is removed.

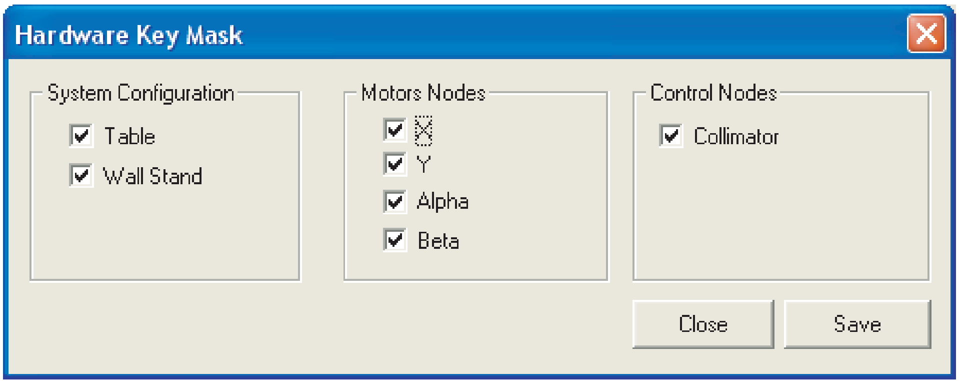


Fig. 5-120

1. To reach the dialogue box chose *Edit menu* and *HW-Key Mask* from the ceiling System service software.
2. Make your chooses in the dialogue box
3. Press *Close* to return without saving changes
4. Press *Save* to save parameters.

Descriptions of dialogue box options;

System Configuration:	Current configuration for the System; - Wall stand - Table or - Table and wall stand
MotorNodes:	Nodes with motorized movement.
ControlNodes:	Nodes with specific control functionality, for example to control the collimator.

5.24.2.2 Beta Resolution

Before altering the resolution of the Beta node check the following:

1. Check that all nodes are alive (a green led is toggling on the control board).
2. Check that the service cable is connected to the serial interface port on the service application host (PC)
3. Start the service application.

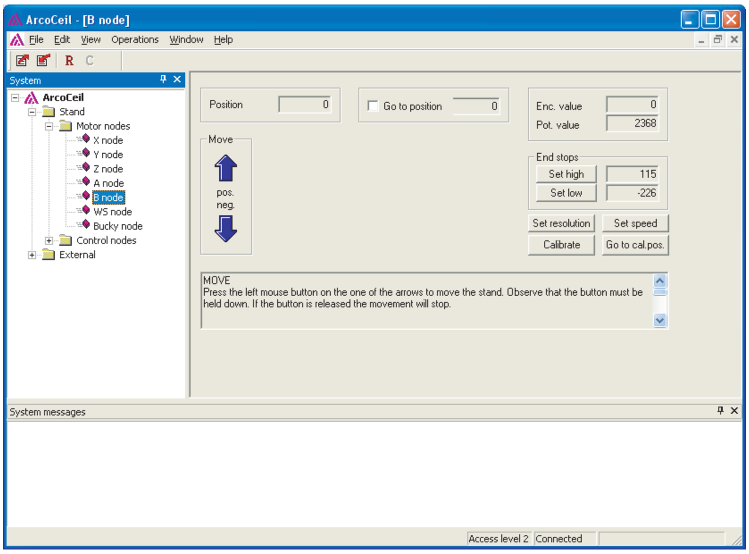


Fig. 5-121

4. Enter the view of the node, which resolution is to be altered (node A or node B).
5. Check that all the potentiometer value is changing (the potentiometer value can be read in the SSW) when moving the axis.
6. Check that all the encoder value is changing (the encoder value can be read in the SSW) when moving the axis.
7. Set the axis in the -90º mechanical index. Read out the potentiometer and the encoder value.
8. Set the axis in the 90º mechanical index. Read out the potentiometer and the encoder value.
9. Calculate the resolution, using the following formula:

   (180 / (Pot.value 1 - Pot.value 2)) * 10 000 = Potentiometer resolution

   (180 / (Enc.value 1 - Enc.value 2) / 180) * 100 000 = Encoder resolution

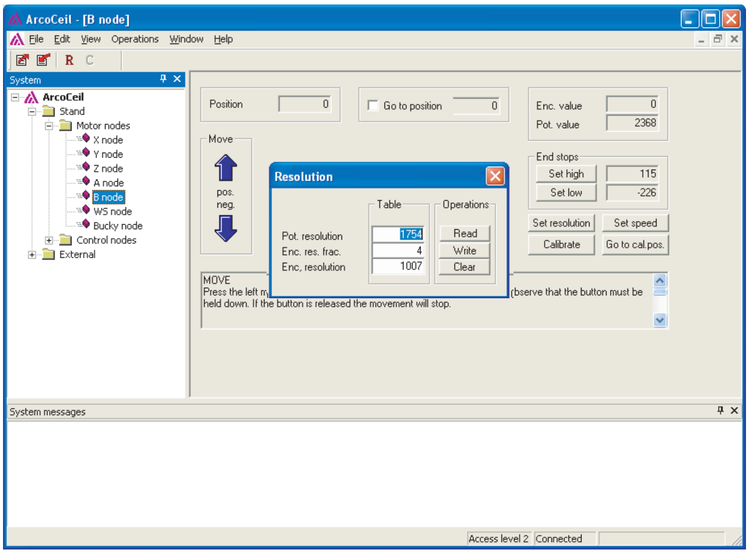


Fig. 5-122

10. Press the *Set Resolution* button.
11. Enter the *Potentiometer Resolution* and the *Encoder resolution* in the coherent edit boxes.
12. Enter the fraction of the encoder resolution in the coherent edit box (see example below). If the Encoder resolution value is 1009,416564…, the “Enc. res frac.” shall be set to 4.
13. Press *Write button* to store the values.
14. Close the dialogue box.
15. Move the axis, with the blue arrows, and check that the movement works correctly.
16. Place the axis (manually) in the mechanical indexes. Verify that the position is coherent with the position of the indexes.

5.24.3 Calibration of OTC

5.24.3.1 Calibration of X-axis

1. Enter the *Node X* view.
2. Move the stand (X-axis) to its calibration point. See Fig. 5-114 .
3. Make sure that the stand is placed against the mechanical end stop.
4. Press the *Calibrate* button in the Node X view.
5. Check that the position of the X-node has been set to zero.
6. Move the stand (X-axis) in the positive direction and check that the position changes concurrently.
7. Place the stand 1-2 cm from the mechanical end stop (if no external object is in the way), at the same side where the calibration point (position 0) is located.
8. Press the *Set Low* button to set the low end stop.
9. Place the stand 1-2 cm from the opposite mechanical end stop (if no external object is in the way).
10. Press the *Set high* button to set the high end stop.
11. Move the X-axis, from the service software with the blue arrows, and check that the System stops at the defined positions (the end stop positions that has been set).

Note!

The end stops shall be set at a minimum distance of 500 mm, between the stand and the surrounding walls (consider the Beta rotation).

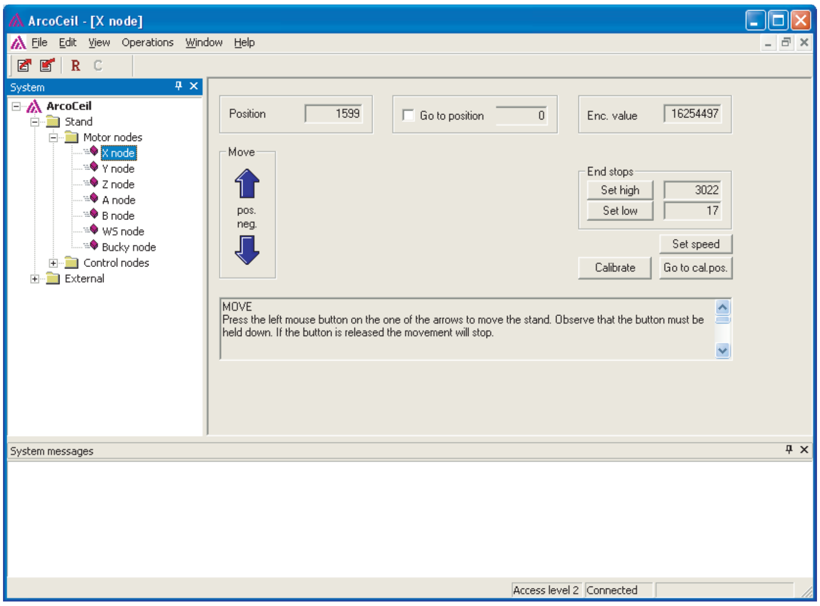


Fig. 5-123

5.24.3.2 Calibration of Y-axis

1. Enter the *Node Y* view.
2. Move the stand (Y-axis) to its calibration point. See Fig. 5-116 *Important measures*.
3. Make sure that the stand is placed against the mechanical end stop.
4. Press the *Calibrate* button in the *Node Y view*.
5. Check that the position of the Y-node has been set to zero.
6. Move the stand (Y-axis) in the positive direction and check that the position changes concurrently.
7. Place the stand 1-2 cm from the mechanical end stop (if no external object is in the way), at the same side where the calibration point (position 0) is located.
8. Press the *Set Low* button, to set the low end stop.
9. Place the stand 1-2 cm from the opposite mechanical end stop (if no external object is in the way).
10. Press the *Set high*, button to set the high end stop.
11. Move the Y-axis, from the service software with the blue arrows, and check that the System stops at the defined positions (the end stop positions that has been set). The OTC shall run smoothly, if not adjust the drive unit Y. See 5.21.5 *Adjust the Drive Unit X and Y*, Page 169.

Note!

The end stops shall be set at a minimum distance of 500 mm, between the stand and the surrounding walls (consider the Beta rotation).

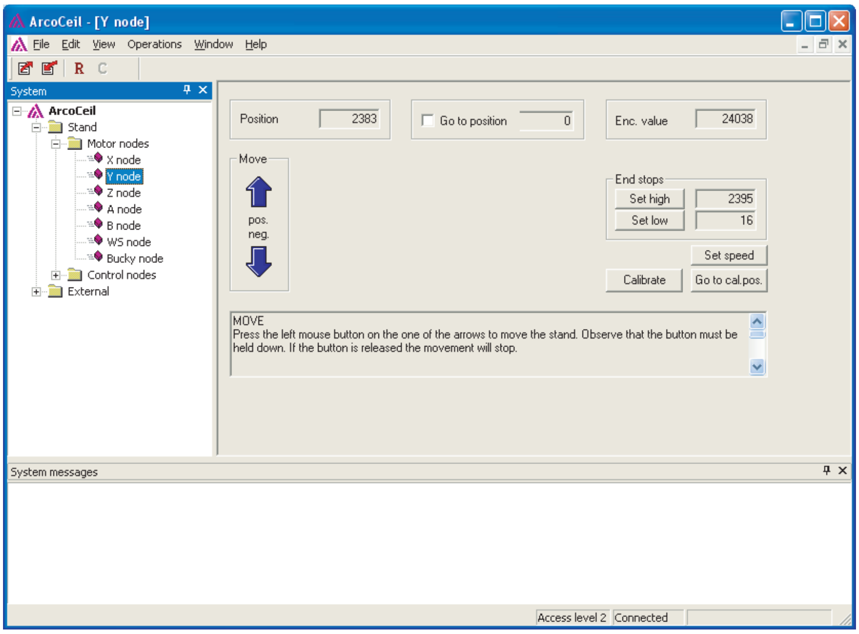


Fig. 5-124

5.24.3.3 Calibration of Z-axis

1. Enter the *Node Z* view.
2. Move the stand (Z-axis) to its calibration point (1500 mm between the focal spot and the floor).
3. Press the *Calibrate* button in the Node Z view.
4. Check that the position of the Z-node has been set to 1500.
5. Press the *System reset* button or power the OTC off/on (Operations => System reset).
6. Press the *Connect* button (File => Connect) and check in the service software that the position (Node Z) has been set to 1500.
7. Move the stand (Z-axis) in the positive direction and check that the position changes concurrently.
8. Measure the distance between the floor and the focal spot on at least five different positions and check that the distance is concurrent (±3 mm) with the displayed position in the service software.

   If the distance differs more than the specified value (±3 mm) helix compensation must be performed. See *Helix Adjustment*.

   Note!

   After the helix compensation has been performed the Calibration of the Z-axis must be redone from step one.

9. Move the Z-axis upward until the inner segment of the column is 5 cm from the outer segment (see Fig. 5-126 *High and low end stops*).
10. Press the *Set high* button to set the high end stop.
11. Place the stand (Z) at the position for the low end stop (maximum range of 1750 mm, between the end stops, see Fig. 5-126 *High and low end stops*).

    Observe that the end stop must be set so that there is a space between the lowest part of the stand and the floor of at least 120 mm, due to squeeze hazard.
12. Press the *Set low* button to set the low end stop.
13. Move the Z-axis and check that the System stops at the defined positions (the end stop positions that have been set).

Note!

If the present end stops inhibits the movement, press the ***Remove*** *button.*

If this button has been pressed the end stops must be set again.

CAUTION!

Observe that the end stop must be set so that there is a space between the lowest part of the stand and the floor of at least 120 mm, due to squeeze hazard.

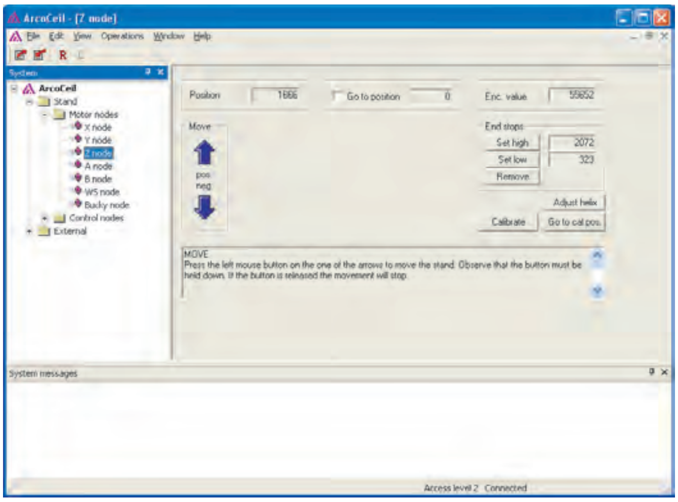


Fig. 5-125 Z node

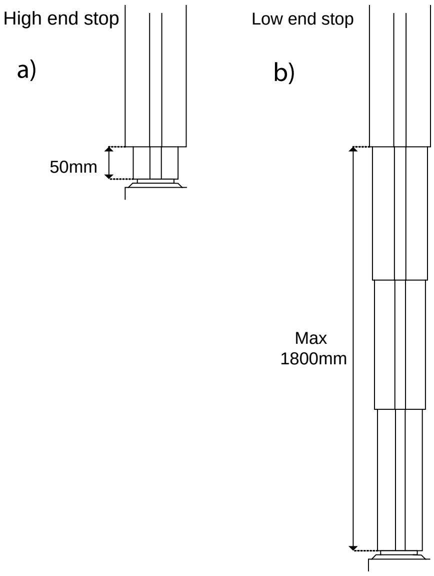


Fig. 5-126 High and low end stops

5.24.3.4 Helix Adjustment

Only perform if necessary. Check if helix is correct according to step 8 at *Calibration of the Z-axis*.

1. Enter the *Node Z* view.
2. Press the *Helix* button.
3. Move the Z-axis upward until the inner segment of the column is 7 cm from the outer segment, see a) in Fig. 5-126 *High and low end stops*.
4. Measure the actual height between the floor and the focal spot.
5. Enter the value in the *Height 1* edit box.
6. Press the coherent *Enc. value* button.
7. Move the Z-axis downward until the focal spot is approximately 1200 mm above the floor.
8. Measure the actual height between the floor and the focal spot.
9. Enter the value in the *Height 2* edit box.
10. Press the coherent *Enc. value* button.
11. Place the stand (Z) at the position for the low end stop (maximum range of 1750 mm, between the end stops), see b) in Fig. 5-126 *High and low end stops*
12. Measure the actual height between the floor and the focal spot.
13. Enter the value in the *Height 3* edit box.
14. Press the coherent *Enc. value* button.
15. Press the *Write* button to calculate and set the helix compensation value.
16. Redo the calibration of the Z-axis.

Note!

After the helix compensation has been performed, the calibration of the Z-axis must be redone from step one.

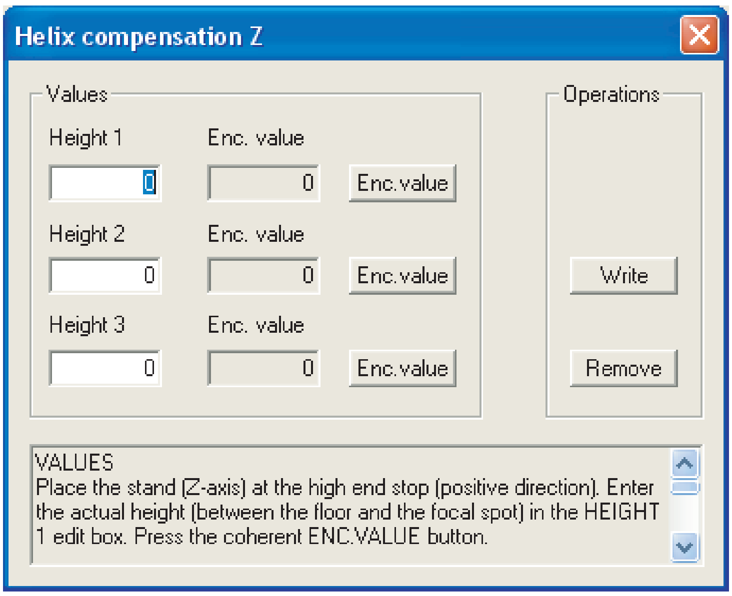


Fig. 5-127

5.24.3.5 Calibration of Alpha-axis

Only perform if necessary. Start with a check.

1. Turn the alpha-axis in +/- 90°.
2. Check that the display shows the correct value.
   If correct value is shown the alpha-axis is correct and no calibration is needed.

Before calibration of alpha-axis make sure that the alpha-axis is in the 0 position.

If not, see 5.21.1 *Adjust Alpha Index*, Page 164.

1. Enter the *Node A* view.
2. Move the stand (alpha-axis) to its calibration point, see Fig. 5-115 . Set the A-axis in the 0° index.
3. Press the *Calibrate* button.
4. Move the alpha-axis until the display shows an angle of max 135º.
5. Press the *Set High* button to set the high end stop.
6. Move the alpha-axis until the display shows an angle of max -135º.
7. Press the *Set low* button to set the low end stop.
8. Verify that the value for that Alpha angle in the display is correct in all the indexes (-90°, 0° and 90°).

5.24.3.6 Calibration of Alpha Compensation

Only perform if necessary.

1. Turn the alpha-axis in +/- 90°.
2. Check that the display shows the correct value.

   If correct value is shown the alpha-axis is correct and no calibration is needed.

Before calibration of alpha-axis make sure that the alpha-axis is in the 0 position. If not, see 5.21.1 *Adjust Alpha Index*, Page 164.

1. Press the *Reset Alpha comp. param.* button to reset the Alpha compensation parameters.
2. Press the *Calibrate* button.
3. Set the A-axis in the -90° index.
4. Press the *-90 deg.*. button to get the compensation values in -90°.
5. Set the A-axis in the 90° index.
6. Press the *90 deg.*. button to get the compensation values in 90°.
7. Press the *System reset* button.

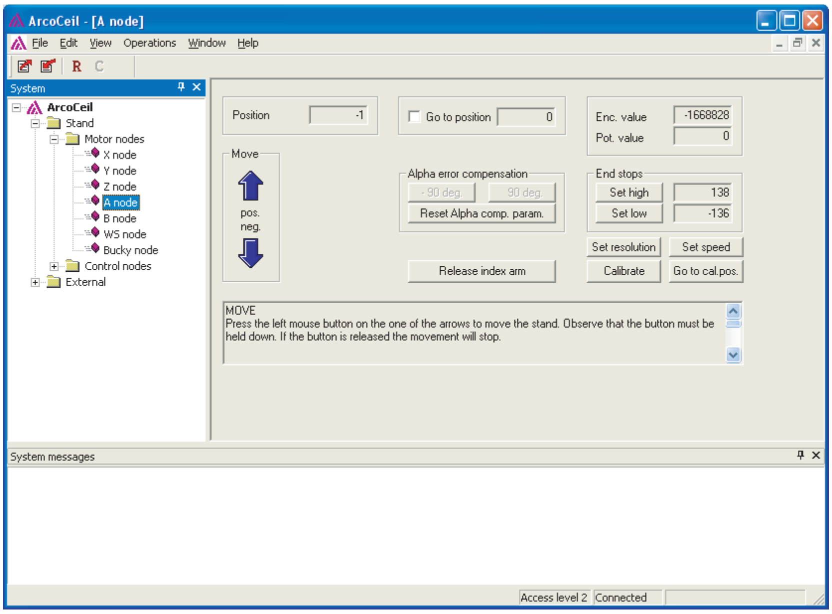


Fig. 5-128

5.24.3.7 Calibration of Beta-axis

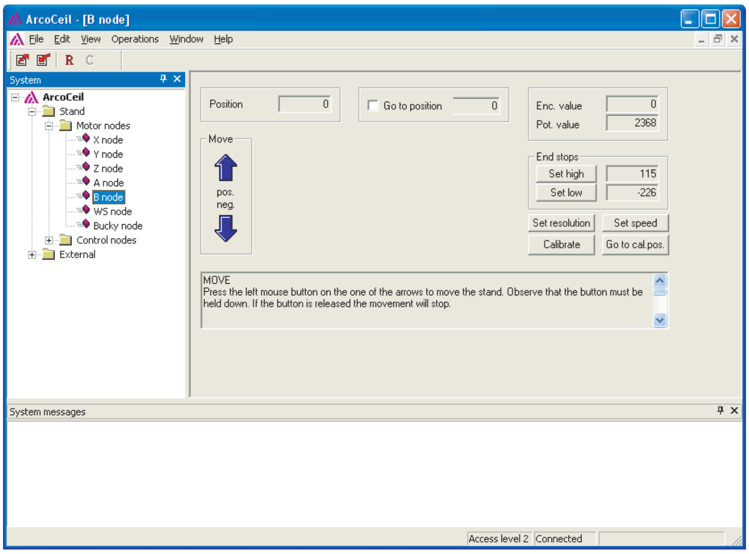


Fig. 5-129

Only perform if necessary:

1. Turn the beta-axis in +/- 90°.
2. Check that the display shows the correct value.
   If correct value is shown, the beta-axis is correct and no calibration is needed.

Note!

If the mechanical end stop is kept in the factory preset position; paragraph 2 through 6 shall be disregarded.

---

1. Enter the *Node B* view.
2. Adjust the mechanical end stop (if necessary), so that the Beta rotation suits the particular installation.
3. Move the beta-axis to the mechanical end stop (positive direction).
4. Remove the potentiometer for the Beta-movement.
5. Rotate the potentiometer until the encoder value reaches 4090 (+ 0 -50).
6. Install the potentiometer and check the value again.
7. Turn the beta-axis toward the mechanical end stops (in both directions) and check that the displayed value is correct (the displayed value does not flicker or changes uncontrolled).
8. Move the stand (beta-axis) to its calibration point (see Fig. 5-115).
9. Make sure that the beta-axis is in the 0º index.
10. Press the *Calibrate* button in the Node B view.
11. Check that the position of the B-node has been set to zero.
12. Move the stand (beta-axis) in the positive direction (turn counter clockwise). Check that the position changes concurrently.
13. Move the stand (beta-axis) in the positive direction (turn counter clockwise). Place the stand approximately 1º from the mechanical end stop (mechanical end stop of the b-axis).
14. Press the *Set high* button, to set the high end stop.

15. Move the stand (beta-axis) in the negative direction (turn counter-clockwise). Place the stand approximately 1º from the opposite mechanical end stop (mechanical end stop of the beta-axis).
16. Press the *Set Low* button to set the low end stop.
17. Move the beta-axis, from the service software with the blue arrow. Check that the System stops at the defined positions (the end stop positions that has been set).

5.24.4 Calibration of Bucky-axis on Table

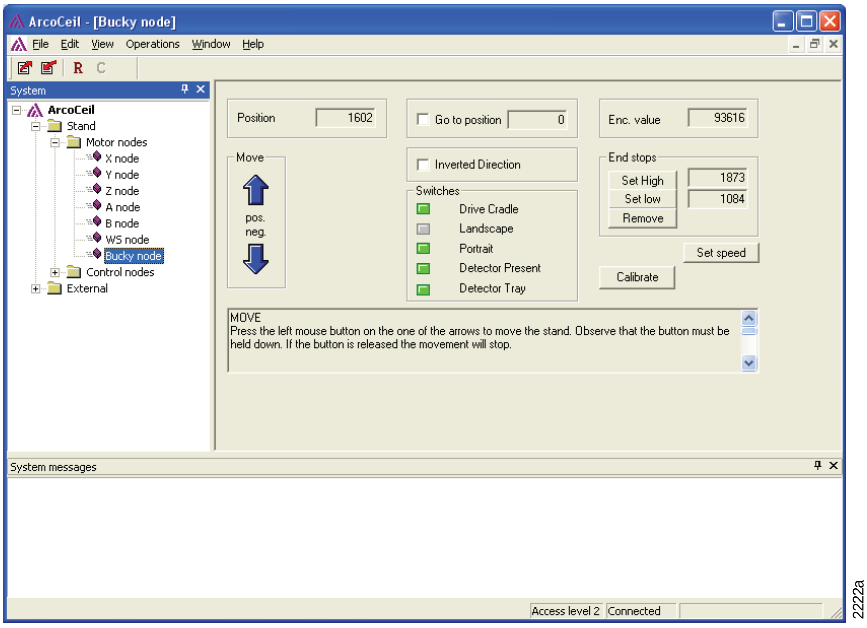


Fig. 5-130

Note!

The value on the position must increase when moving in positive X or Y direction.

If it does not increase then activate the inverted direction.

Note!

If the present end stops inhibit the movement, press the Removebutton .

If this button has been pressed, the end stops must be set again.

Note!

To be able to calibrate, the bucky axis must be placed in the cradle. The drive cradle box is marked green, when the bucky is correctly positioned.

---

1. Enter the *Bucky view* .
2. Move the ceil stand (X- and Y-axis) until the light field of the collimator is aligned with the center of the bucky.
3. Press the *Calibrate* button in the *Bucky view.*
4. Check the position.

   If the Table is installed in the X-direction the bucky shall have the same position as the X-node.

   If the Table is installed in the Y-direction the bucky shall have the same position as the Y-node.
5. Move the Bucky-axis, from the service application, in the positive direction. Place the detector approximately 1 cm from the mechanical end stop.
6. Press the *Set high* button to set the positive end stop.
7. Move the Bucky-axis, from the service application, in the negative direction. Place the detector approximately 1 cm from the mechanical end stop.

8. Press the *Set Low* button to set the negative end stop.
9. Move the Bucky-axis, from the service software with the blue arrows. Check that the System stops at the defined positions (the end stop positions that have been set).
10. The Table can be installed in four directions in the room. The value on the position must increase when moving in positive X or Y direction.
11. If it does not increase then activate the inverted direction.

5.24.5 Calibration of Table

Note!

Observe that the room coordinates are critical to get the correct Table position.

The Z-node, X-node, Y-node, A-node and B-node must have been calibrated before the Table position can be set.

To get the correct Table area, observe the Beta-rotation for each position.

The Table calibration is performed by the manufacturer is made by the manufacturer. Any further calibration is not needed if the function is good.

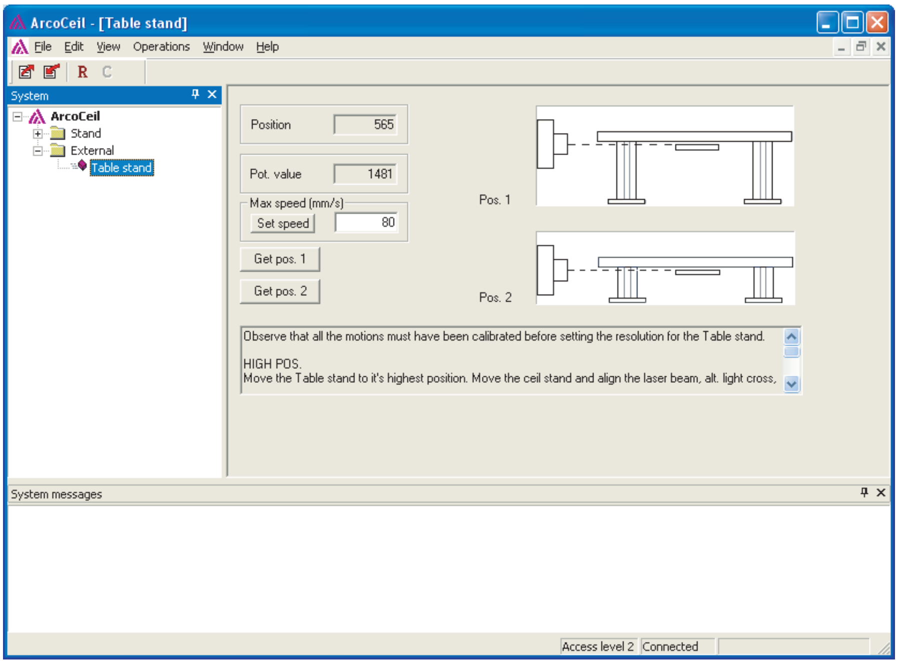


Fig. 5-131 Table stand

1. Enter the *Z Table view.*
2. Move the Table to its highest position, and then down 2 cm.
3. Measure the height between the active image area and the floor.

4. Move the Z to the height corresponding to the measured height. Use the collimator measuring tape.

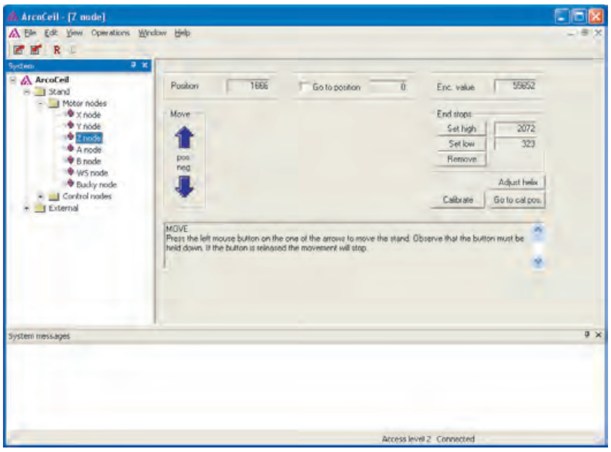


Fig. 5-132

5. Press the *Get pos.1* button.
6. Move the Table to its lowest position, and then up 2 cm.
7. Measure the new height between the active image area and the floor.

Note!

It is important to measure the height at exactly the same spot at the detector.

8. Move the Z to the height corresponding to the measured height. Use the collimator measuring tape.

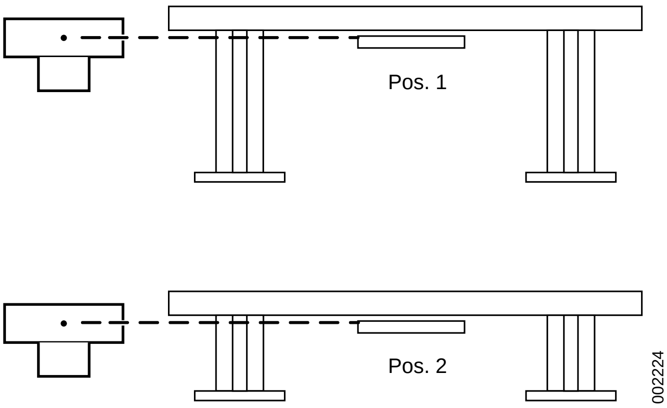


Fig. 5-133 Pos 1 and Pos 2

9. Press the *Get pos.2* button.
10. Check that the position of the Table has changed to the position of the Z-node.
11. Measure the speed of the Table (mm/s) and multiply the value with 2.
12. Enter the value in the *Max Speed* edit box.
13. Press the *Set speed* button to store the value.

Note!

The height of the Table stand is measured from the floor, to the active detector surface.

5.24.5.1 Table Safety Zone

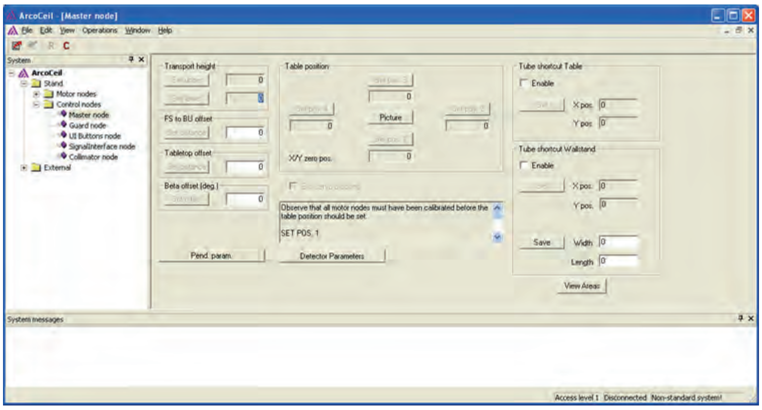


Fig. 5-134

Note!

The Table safety zone is for low speed area.

1. Enter the *Master node* view. *(Stand/Control nodes/Master node)*
2. Move the stand to position 1 (see figure). Press the *Set pos. 1* button.
3. Move the stand to position 2 (see figure). Press the *Set pos. 2* button.
4. Move the stand to position 3 (see figure). Press the *Set pos. 3* button.
5. Move the stand to position 4 (see figure). Press the *Set pos. 4* button.

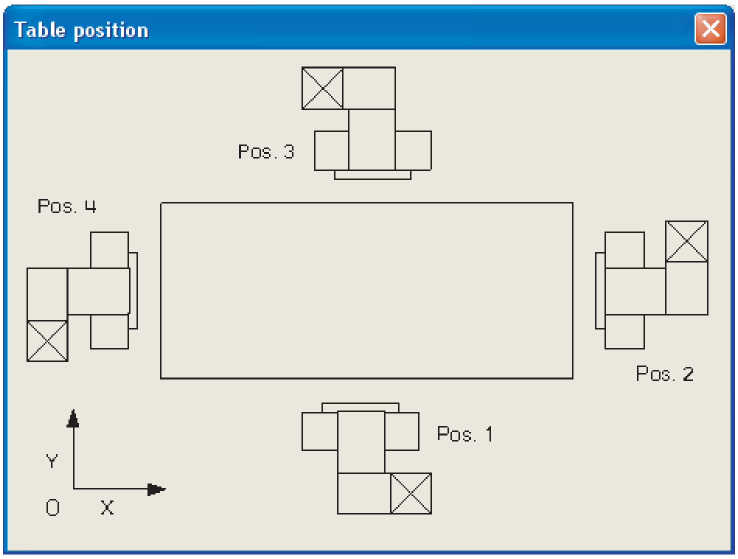


Fig. 5-135 Table position.

There shall be a distance of 120 mm between the stand (front of the display) and the table top. If the table top is “floating”, consider the maximum and minimum position of the table top when setting the Table safety zone.

5.24.5.2 Transport Interval Zone

Movements between auto-positions is performed in a defined transport interval zone. The upper and lower limits are pre-defined from factory, but shall at installation be adjusted to the actual circumstances in the operating room.

- The upper transport height shall be set as high as possible, considering the cable hoses etc. See note below.
- The lower transport height, shall be set with consideration taken to the Table.
- None of the values shall be 0.

Setting of the transport interval zone, must be done after the calibration of all axis.

To set the transport interval zone;

1. Enter the *Master node* view (Stand/Control nodes/Master node).
2. Move the Z-axis node upward to the desired position.

   Note!

   *We recommend the upper limit, **not** to be higher than when the inner segment of the column is 10 cm from the outer segment. See Fig. 5-136 Recommended highest limit.*

   See also Fig. 5-134 Master node view.

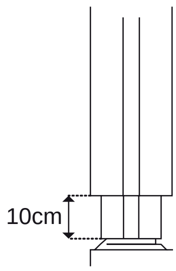


Fig. 5-136 Recommended highest limit.

3. Press the *Set upper* button, for transport height.
4. Check that the upper value has changed to the position value of the Z-node.
5. Move the Table upward until the Table top has reached the maximum height of approximately 1 m. Move the Z-axis downward to the desired position for the lower transport height.

   Note!

   When the OTC is within the area above the Table, the lower transport height shall be at least 30 cm over the highest point of the Table.

6. Press the *Set lower* button.
7. Check that the lower value has changed to the position value of the Z-node.

5.24.5.3 Focal Spot to Bucky Offset

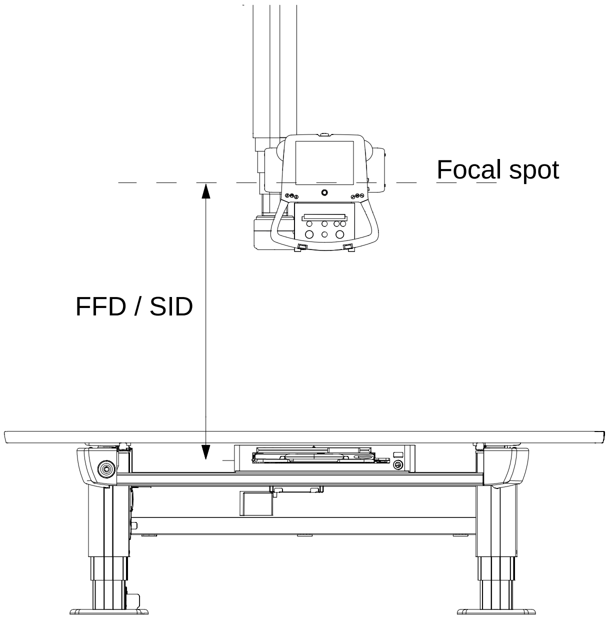


Fig. 5-137

See Fig. 5-134 Master node view:

1. Enter the *Master node view*.
2. Move the stand over the Table.
3. Place the tube directly over the table top (the lowest point of the stand shall almost touch the table top).
4. Measure the distance between the focal spot and the active detector surface of the detector. Addition distance 1 and distance 2, gives the FS to BU parameter value
5. Enter the value in the *FS to BU offset* edit box in millimetres.
6. Press the *Set distance* button.
7. Move the stand (Z-axis) up at least 800 mm above the table top and down again.
8. Check that the System stops 500 mm above the table top (lowest point of the stand).
9. Press down again and check that the speed is reduced to half speed.

Note!

This distance must be set to secure that the safety distance (500 mm) is accurate.

5.24.5.4 Table Top Offset

See Fig. 5-134 Master node view:

1. Enter the *Master node view*.
2. Measure the distance between the active detector surface of the detector, and the surface of the table top.
3. Enter the value (in mm) in the *Table top offset* edit box.
4. Press the *Set distance* button.

5.24.5.5 Movement Short-cut Zones

At installation a movement short-cut zones shall be set up for the Wallstand resp. the Table. The zones are defined as rectangular cubes. Inside these zones, short-cuts are allowed and there is no need for the OTC to attain the transport interval zone before moving.

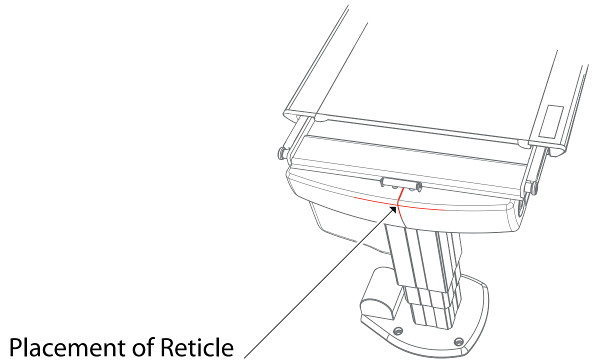
Outside these short-cut zones, the OTC will first move in Z direction, to the transport interval zone, before moving to position.

The recommended transport height is set as; The first Table stop + SID.

Table Movement Short-cut Zone

When defining the Table movement zone, it will be activated toward the direction of the light field.

1. Start the zone definition by setting the OTC alpha to 0.
2. Position the light field with the reticle at the middle of the Table head end, exactly where the cover ending and the middle seam, cross each other. See Fig. 5-138 . The OTC handle shall be positioned at the same direction as the front of the detector tray.



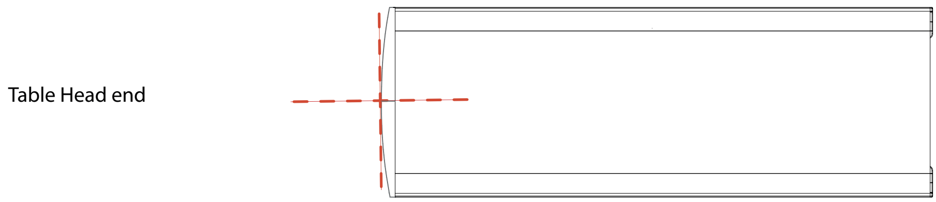


Fig. 5-138

Also see Fig. 5-134 .

Table Service Program

3. Move to the *Master view*. See Fig. 5-134 Master node view.
4. Mark the *Enable* box. Marking this box enables short-cuts.
5. Enter *Set*. The X-position and the Y-position for the area, will be saved as to the OTC position.

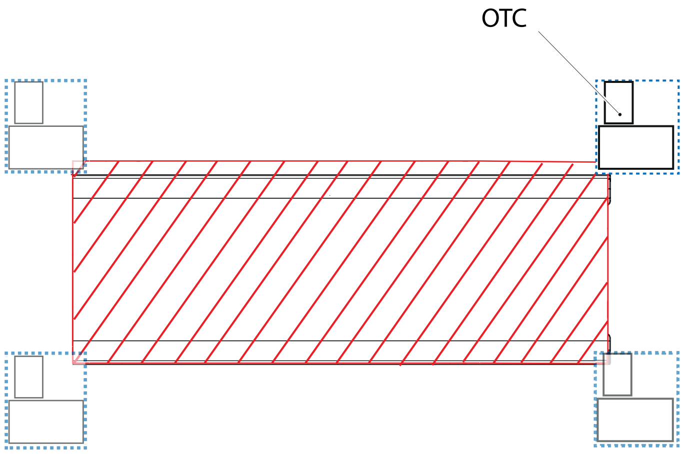


Fig. 5-139

As long as at least one of the OTC corners stays inside the Table movement zone, the OTC will perform a short-cut at positioning.

5.24.5.6 Wallstand Movement Short-cut Zone

When defining the Wallstand movement short-cut zone, it will be activated toward the direction of the light field.

1. Angle the OTC light field against the floor.
2. Move the OTC light field to the point where the area is to begin.
3. Angle the OTC light field against the center of the Wallstand detector.

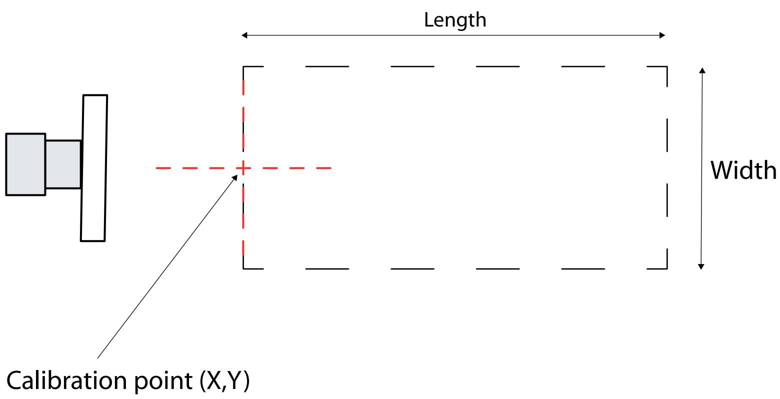


Fig. 5-140 Wallstand movement short-cut zone.

WARNING!

The Wallstand movement short-cut zone must not be set too wide. Consider the Table safety zone.

Setting Wallstand Safety Zone

See Fig. 5-134 Master node view.

1. Tube short-cut Wallstand: Mark the *Enable* box. Marking this box enables shortcuts.
2. When the OTC is positioned where the zone is intended to start, press *Set*.

The position of the short-cut zone can be seen by selecting *View Areas*.

If the settings shall be changed, define the width and length of the short-cut zone by setting the values *Width* and *Length* in mm. Press *Save*.

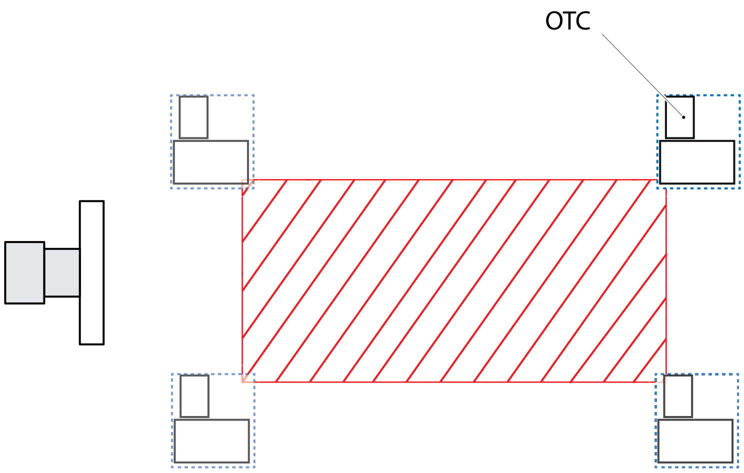


Fig. 5-141 Wallstand short-cut zone.

5.24.5.7 Beta Offset

See Fig. 5-134 Master node view:

1. Enter the *Master view* .
2. Move the B-axis to a typical working position.
3. Enter the current B-position value (deg.) in the Beta offset edit box.
4. Press the *Set to zero* button.
5. Check that the value, shown on the display, has changed to 0.

Note!

The Beta offset only manipulates the value shown in the display.

The actual position of the Beta-rotation will not be changed and the position in the service software will not be changed.

5.24.5.8 Calibration of Wall stand

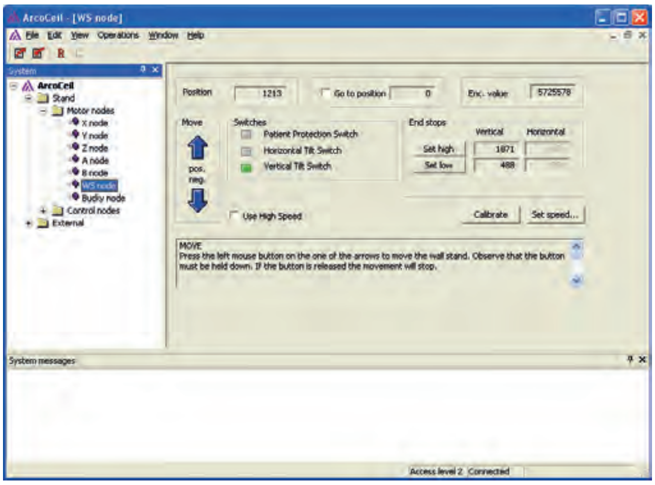


Fig. 5-142 WS node

1. Enter the *WS node* view.
2. Make sure the collimator is directed against the detector.

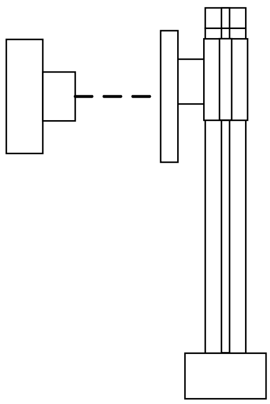


Fig. 5-143

3. Make sure that the focal spot of the tube is aligned with the center of the detector.
4. Press *Calibrate*.
5. Check that the position of the wall stand has changed to the position of the Z-node.

Calibration of end stops:

6. High end stop.

   Move the wall stand to its highest position and then down approximately 2 cm. Press Set high.
7. Low end stop.

   Move the wall stand to 12 cm up of the floor and then up approximately 2 cm.

   Press set low.

Note!

The lowest position must be set so that there is a space between the lowest part of the stand and the floor of at least 12 cm, due to squeeze hazard.

Patient Protection End stop

- Move the wall stand to a position where the distance between the lowest moving part and the floor is 2.5 cm.
- Press the *Patient Protection* button.
- Check that the *Patient Protection value* is changed to the same value as the wall stand position.

Wallstand Switches

1. Enter the *Wallstand view*.
2. Place Wallstand detector in vertical position.
3. Check that the vertical tilt switch box is green and that the horizontal tilt switch box is gray.
4. Place the Wallstand detector in horizontal position.
5. Check that the horizontal tilt switch box is green and that the vertical tilt switch box is gray.

5.24.5.9 WallFlexible parameters

Movements

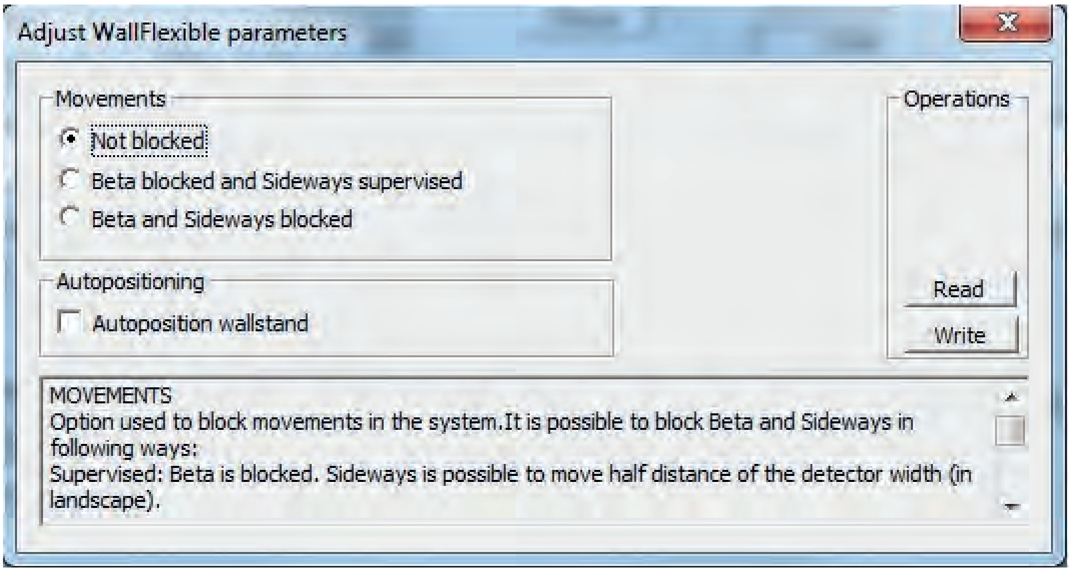


Fig. 5-144 Adjust WallFlexible parameters.

There are 3 different Wall Flexible Modes, all accessible from the Arcoma Service program; *Adjust WallFlexible parameters*.

The active mode for the installation is selected in the Service program and applies for all autopositions with Wall Flexible Mode.

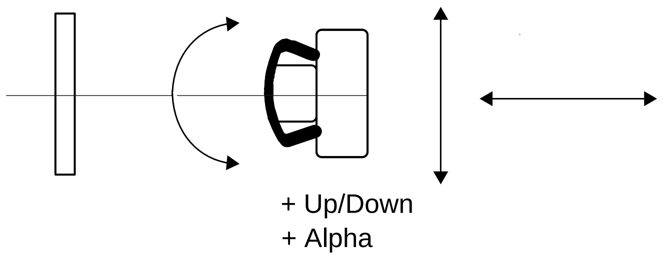


Fig. 5-145 Not Blocked.

1. *Not Blocked* — All OTC movements are allowed.

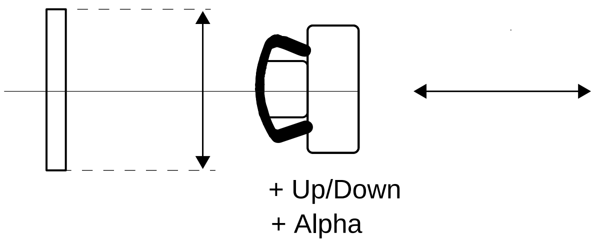


Fig. 5-146 Beta blocked and Sideways supervised.

2. *Beta blocked and Sideways Supervised* — Beta movements are blocked. A beta rotation will turn the servo off and prevent exposure. The OTC can be moved sideways, for a distance of half the detector width (landscape position). When the OTC is outside this area, the servo turns off and exposures will not be possible. It is also possible to move the OTC in FFD-direction.

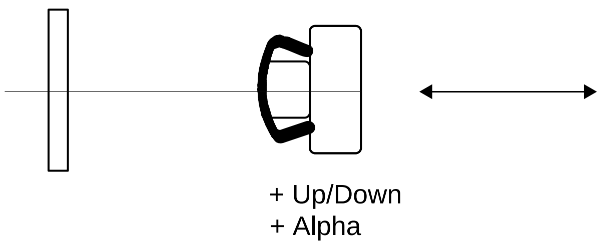


Fig. 5-147 Beta and Sideways blocked.

3. *Beta and Sideways Blocked* — Beta movements and sideways movements of the OTC are blocked. It is only possible to move the OTC upward, downward and in FFD-direction.
   A movement will turn the servo off and block any exposure.

Autopositioning — WS

To enable the Wallstand autopositioning, check the box *Autoposition Wallstand*. Enabling this feature, means that the Wallstand detector holder will move to the programmed position, at the autopositioning.

5.24.5.10 Adjust Stitching parameters

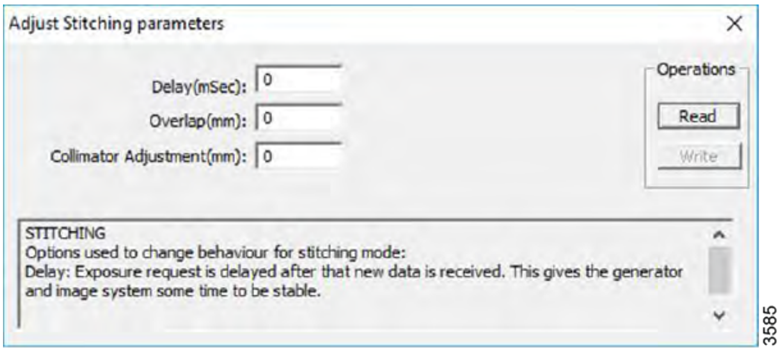


Fig. 5-148

Options used to change behaviour for stitching mode:

Delay: Exposure request is delayed after that new data is received. This gives the generator and image system some time to be stable.

Overlap: This parameter can be used to increase the overlap between images in a stitching examination.

Collimator adjustment: Increase this value if the collimator does not cover the detector edge.

5.24.5.11 Detector Parameters

This dialogue is used to define the connected detector.

It is possible to define two detectors, one for the Table and one for the Wallstand.

Information in this dialogue is mainly used to control the collimator.

See Fig. 5-134 *Master node view*:

1. Enter the *Master node view* .
2. Press the button Detector parameters.
3. When the parameters are updated, press *Save* and you will return to the *Master node view*.

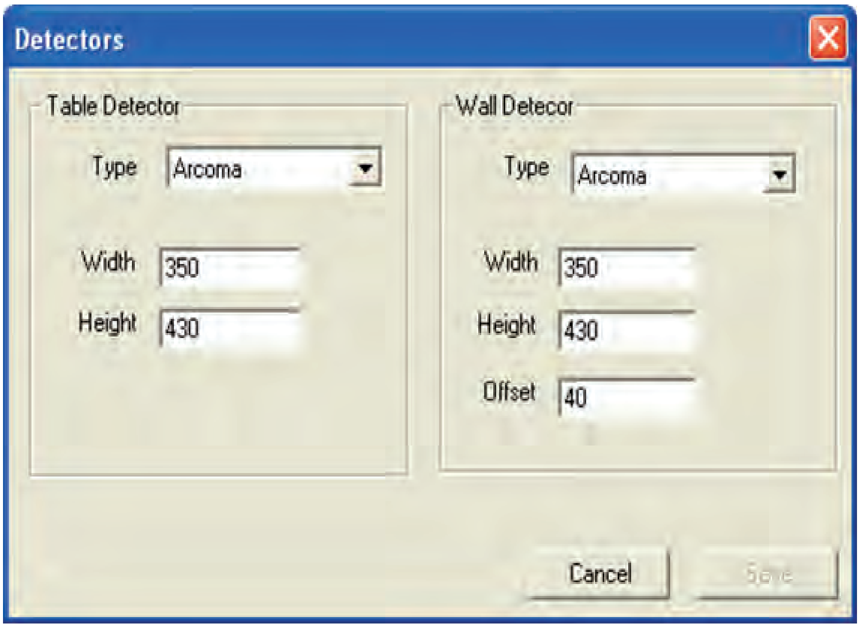


Fig. 5-149 Detectors.

Type	Current type of detector. For example “Stationary” or “Arcoma”.
Width/Height	The maximum size for the detector surface. Used, for example, to maximize the collimator light field.
Offset	Used for the Arcoma detector holder to handle the detector offset, if the detector is positioned in the top of the detector holder in landscape orientation.

5.24.5.12 Calibration of Guard Function (Z-axis)

Check the impact force.

The force must not exceed 170+/-30 N (use a force gauge).

If the force does not exceed 170+/-30 N (upward or downward), the following section may be skipped.

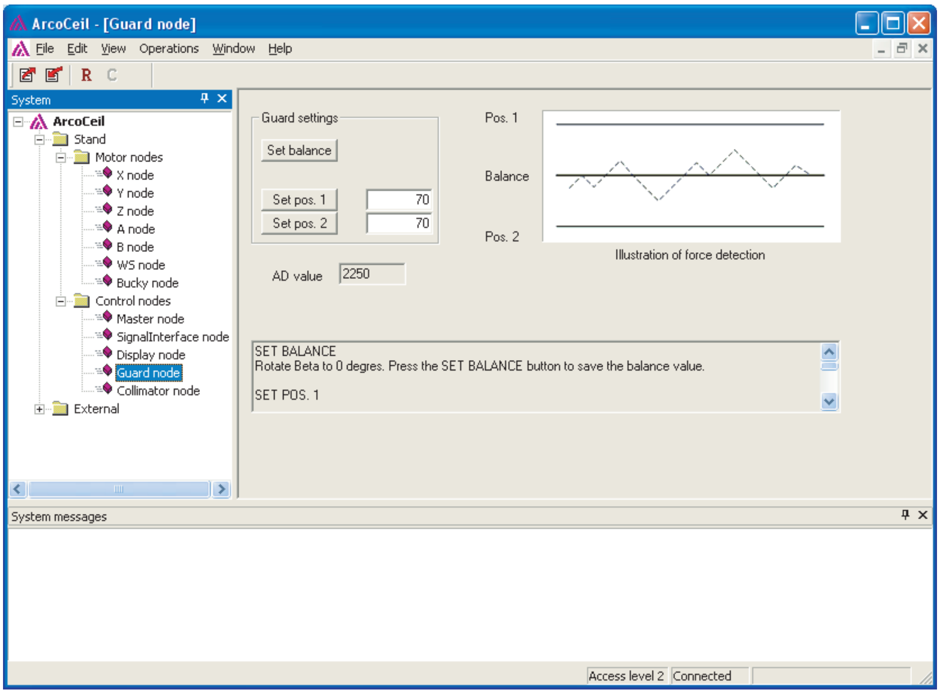


Fig. 5-150 Guard node.

1. Enter the *Guard view* .
2. Place the stand in the specified position.

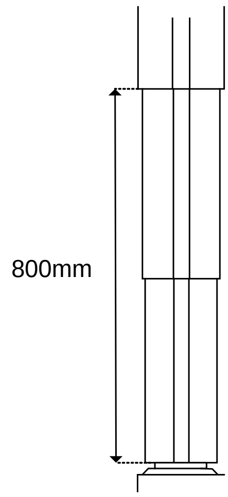


Fig. 5-151 Stand position.

3. Press the *Set balance* button.
4. Reset the System.
5. Move the Z-axis downward.

6. Measure the force required to trig the collision guard (movement stops and an error message is displayed), when moving downward (use a dynamometer).
7. Adjust the value for Pos.1.
8. Press the *Set pos.1*—button to store the value to the stand.
9. Measure the force needed to trig the collision guard (use a dynamometer).
10. Move the Z-axis upward.
11. Measure the force required to trig the collision guard (movement stops and an error message is displayed) when moving upward.
12. Adjust the value for Pos.2.
13. Press the *Set pos.2* button to store the value to the stand.
14. Measure the force needed to trig the crash guard (use a dynamometer).

Note!

The required force for activation of the guard function must not exceed 170+/-30 N. The values displayed in the edit boxes are not directly compatible with the force. 2-3 points are approximately 10 N.

5.24.5.13 Calibration Service Software for Table

Note!

The Table is calibrated on Manufacturers site and only has to be recalibrated if a problem occurs.

WARNING!

Standard RS232 cable shall not be used. Service cable shall be ordered from Manufacturer.

Note!

The electrical plate is heavy. Be careful when the plate opens.

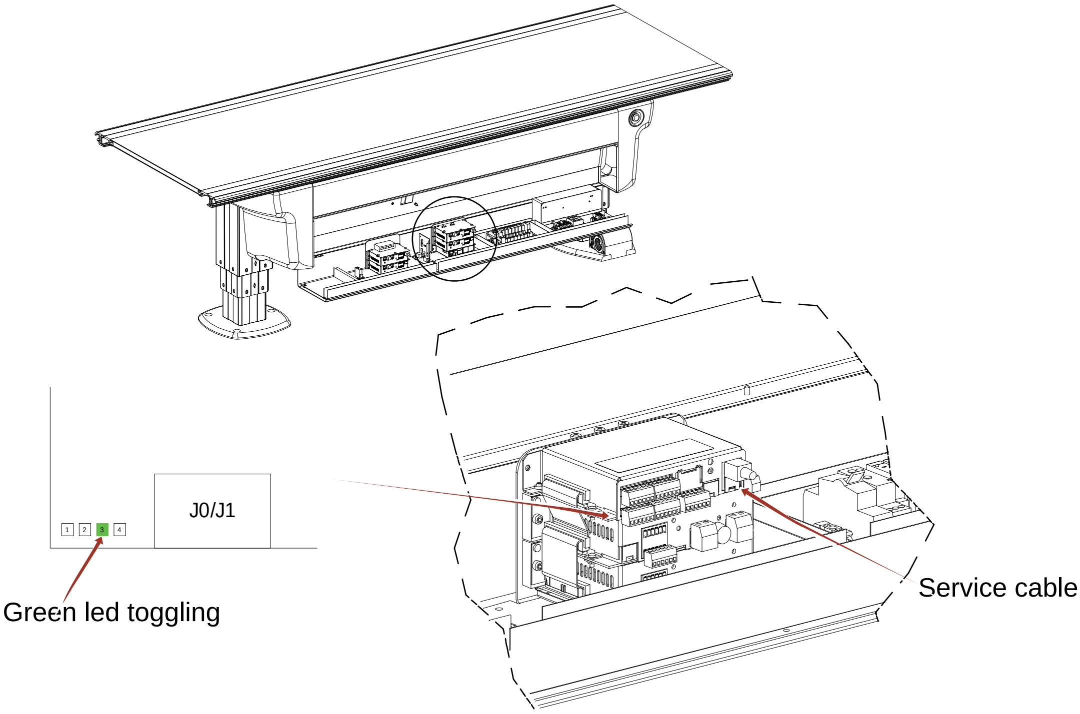


Fig. 5-152

System Setup

Before setting up the Table:

1. Check that the Table can go the entire stroke, up and down.
2. Check that the Table stops at the correct end stops.
3. Check that the guard works. (Option)

- If the Table works correctly, go to 5.23 *Calibration OTC*, Page 172.
- If the Table needs further calibration:

Note!

Note that all the software nodes including service software and the parameters are tested and verified as a software package. The version on all nodes, service software and parameters must belong to the same software package for Manufacturer to guarantee the function of the Table.

Note!

Parameters shall always be saved before any adjustments are made. The parameter settings shall always be physically stored nearby the System.

4. Verify that all nodes are alive (a green led is toggling on the control board).
5. Connect the service cable from the lap top (PC) to the serial interface port (COM). (The service cable can be ordered as a spare part).
6. Start the service software (enclosed). Check that the version of the service software and the version on the System software belong to the same software package. Check against the enclosed accompanying documents.
7. Choose COM-port and enter password. See Fig. 5-153 *Login*
8. Verify that the User Level in Fig. 5-153 *Login*, changes from 0 to 1, when entering the correct password.
9. Verify that all nodes are in enable state, see Fig. 5-154 *SSW 0055*.

   Note!

   The state also depends on the System configuration, thus the System might be fully functional even if an optional node is in another state.

   If a node is not present, the text “NO CONNECTION” is displayed.

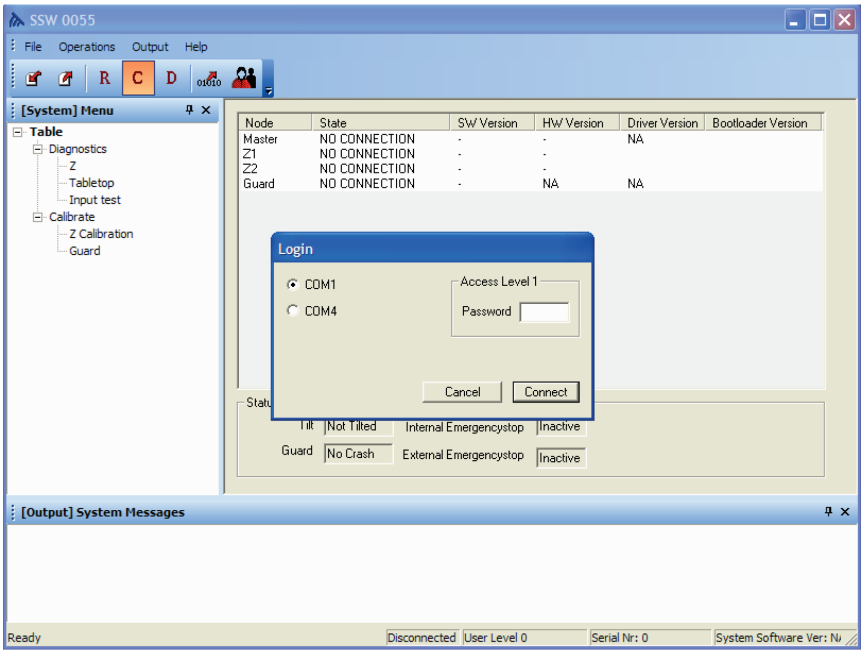


Fig. 5-153 Login

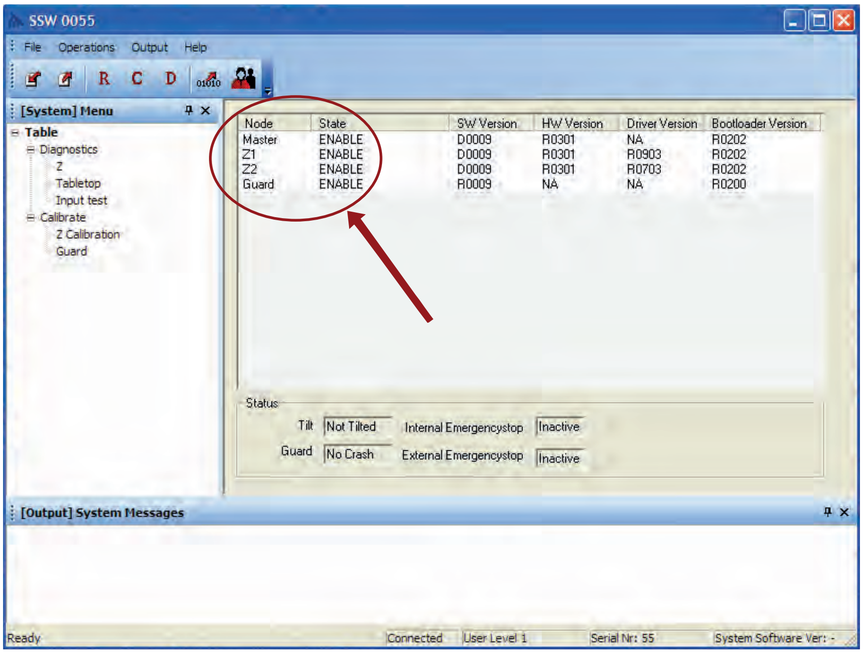


Fig. 5-154 SSW 0055

Calibration of the Tilt Sensor

1. Enter the *Calibrate Z view*.
2. Place a spirit level on the table top.
3. On condition that the floor is horizontal (±1 mm), level the table top by moving one of the columns. See also 5.11.4 *Horizontal alignment of table*, Page 112.
4. Press the *Tilt Calibrate*—button (lower left corner of the view).

Note!

Be careful when moving the columns separately. If the angle of the table top exceeds 7º the Table might be damaged.

5. Adjust the tilt sensor mechanically.

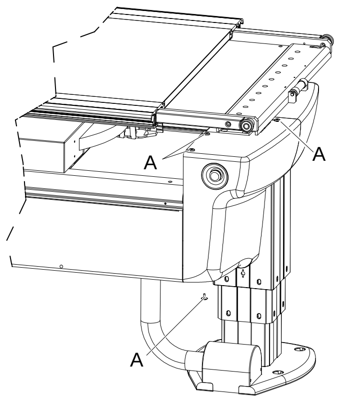


Fig. 5-155 Removing left back cover

a. Measure the voltage between J4:4 and J4:6 on the control board. If the voltage is 3 V ±0.2 V re-install the cover and go the paragraph 6.
b. Remove the left back cover by removing the bolts (A) shown in Fig. 5-155 *Removing left back cover*. Observe the placement of the cable chain before removing the cover.

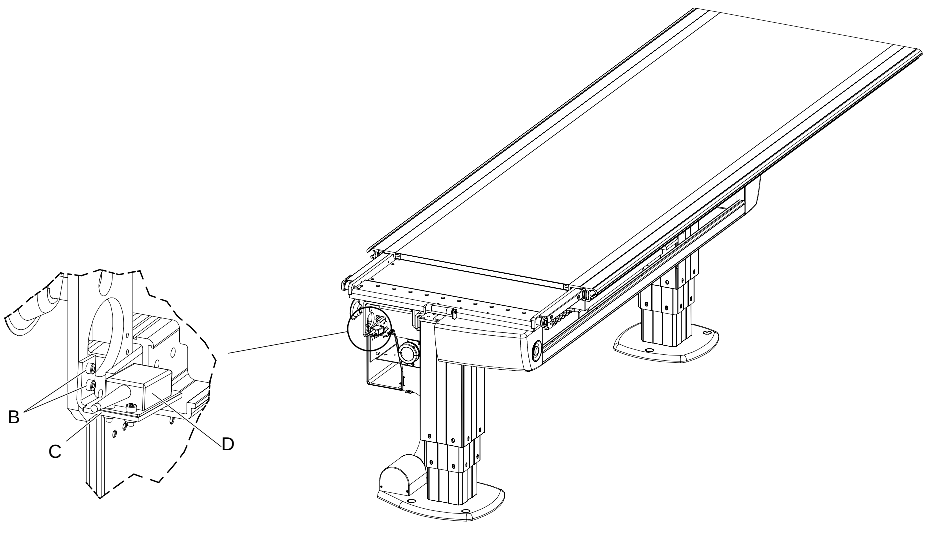


Fig. 5-156

c. Loosen the bolts (B), see Fig. 5-156 , and angle the bracket (C) until the output of the tilt sensor (D) is 3V +/-0.2V.
d. Tighten the bolts (B), use Loctite 243, see Fig. 5-156 .
e. Install the cover.

Note!

Beware of the cable chain when installing the cover.

6. Press the *Tilt Calibrate* button (lower left corner of the view), see Fig. 5-157 *Reset button*. The displayed angle shall now be set to 0.0º.
7. Press the reset button (R), see Fig. 5-157 *Reset button*.

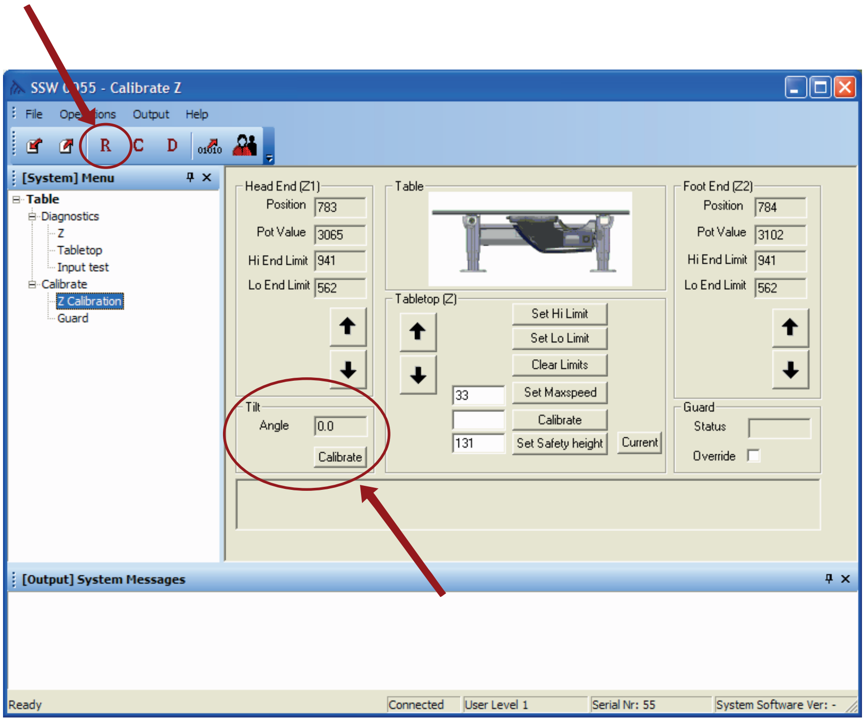


Fig. 5-157 Reset button

Calibration of Table Height

1. Enter the *Calibrate Z view*.
2. Place a spirit level on the table top.
3. Level the table top by moving one of the columns.

Note!

Be careful when moving the columns separately. If the angle of the table top exceeds 7º the Table might be damaged.

4. If the displayed angle of the tilt sensor exceeds 0.4º the tilt sensor has to be re-calibrated, see *Calibration of the Tilt Sensor*, Page 213.
5. Measure the distance between the floor and the surface of the table top
6. Enter the distance (in millimeters) in Edit box beside the Calibrate button of the table top (Z), see Fig. 5-158 *Calibration Table height*.
7. Press the Calibrate button.
8. Press the reset (R) button.
9. Verify that the position of the Head End column and the Foot End column is changed to the entered value.

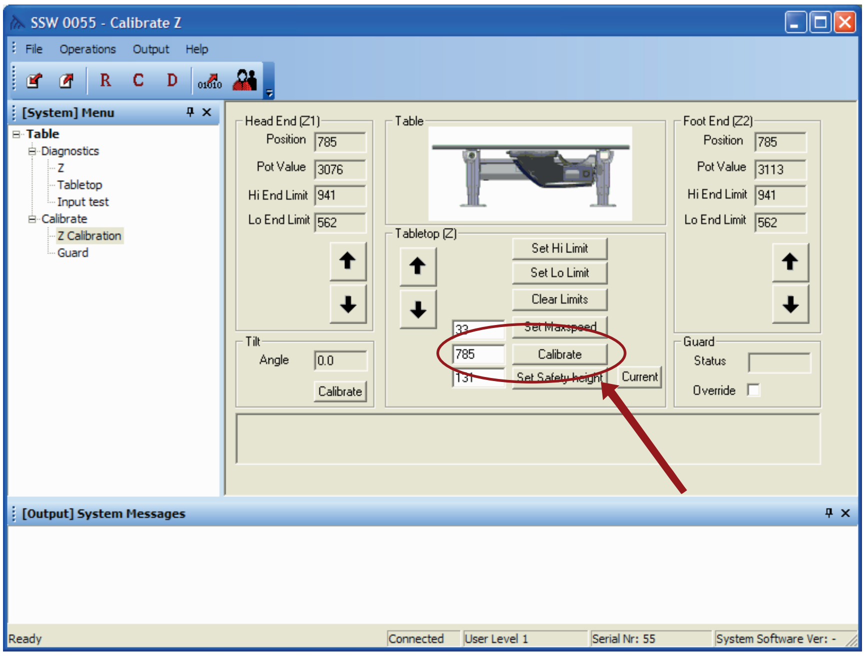


Fig. 5-158 Calibration Table height

Calibration of Software End stops

Note!

Calibrate the software end stops, to prevent collision whit external objects.

1. Enter the *Calibrate Z view*.
2. Enter the value “20” in the *Edit box* beside the *Set Max Speed* button.
3. Press the *Set Max Speed* button.
4. Press the *Clear Limits* button, see Fig. 5-159 *Setting the Table top limits*.

   Note!

   Be aware that the end stops now are removed. Be careful when moving the Table.

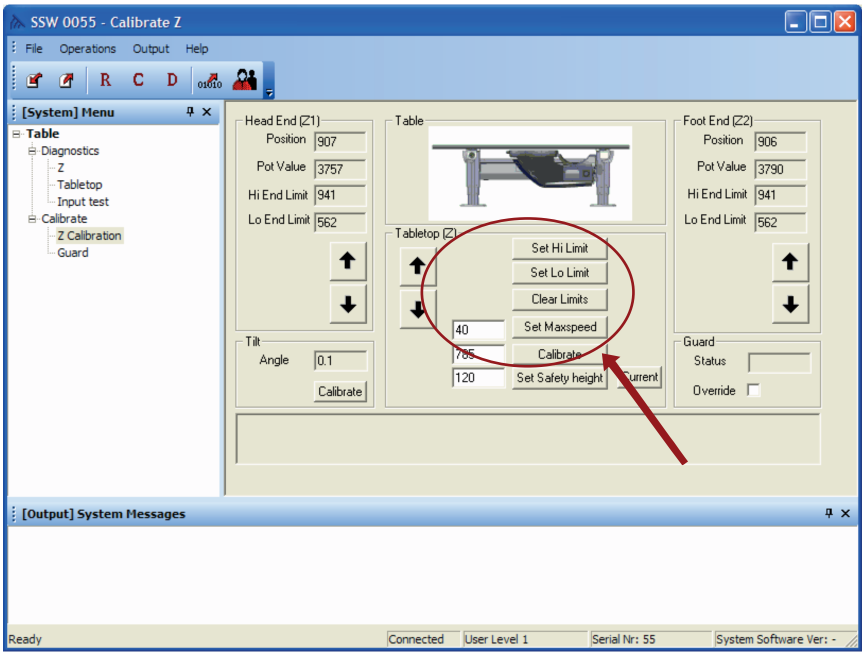


Fig. 5-159 Setting the Table top limits

5. Enter the *Z view*.
6. Press the *Arrow Down* button and keep it pressed until the movement stops. The text “DOWN” shall now be visible in the *Blocking edit* box for both the *Head End* and the *Foot End*.
7. Press the *Arrow UP* button and keep it pressed until the text “NO” is visible in the *Blocking edit* box for both the *Head End* and the *Foot End*.
8. Enter the *Calibrate Z view*.
9. Press the *Set Lo Limit* button.
10. Enter the *Z view*.
11. Press the *Arrow Up* button and keep it pressed until the movement stops. The text ‘UP’ shall now be visible in the *Blocking edit* box for both the *Head End* and the *Foot End*.

12. Press the *Arrow Down* button and keep it pressed until the text “NO” is visible in the *Blocking edit box* for both the *Head End* and the *Foot End,* see Fig. 5-160 .

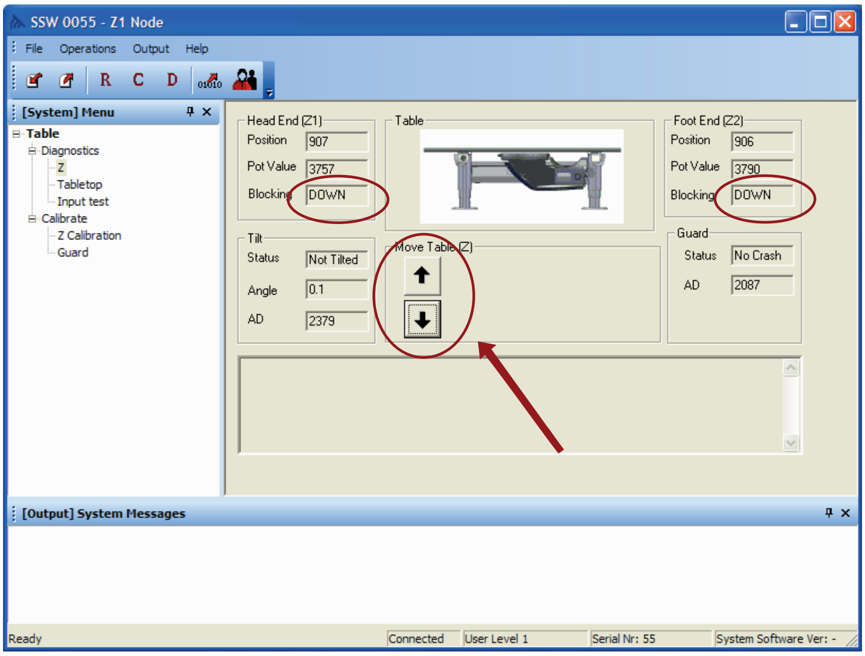


Fig. 5-160

13. Enter the *Calibrate Z view*.
14. Press the *Set Hi Limit* button.
15. Enter the value “40” in the *Edit box* besides the *Set Max Speed* button.
16. Enter the *Z view* and move the Table up and down, to verify the functionality. The text in the *Blocking Edit box* shall say “NO” at all times.

Note!

The software end stops shall be set at minimum 4 mm +/-1 mm from the mechanical end stops.

Calibration of Max Speed

1. Enter the *Calibrate Z view*.
2. Enter the new speed value (mm/sec) in the *Edit box* beside the *Set Max Speed* button, see Fig. 5-161 *Calibration Table Max Speed*. Observe that 40 mm/sec is the maximum speed.
3. Press the *Set Max Speed* button.

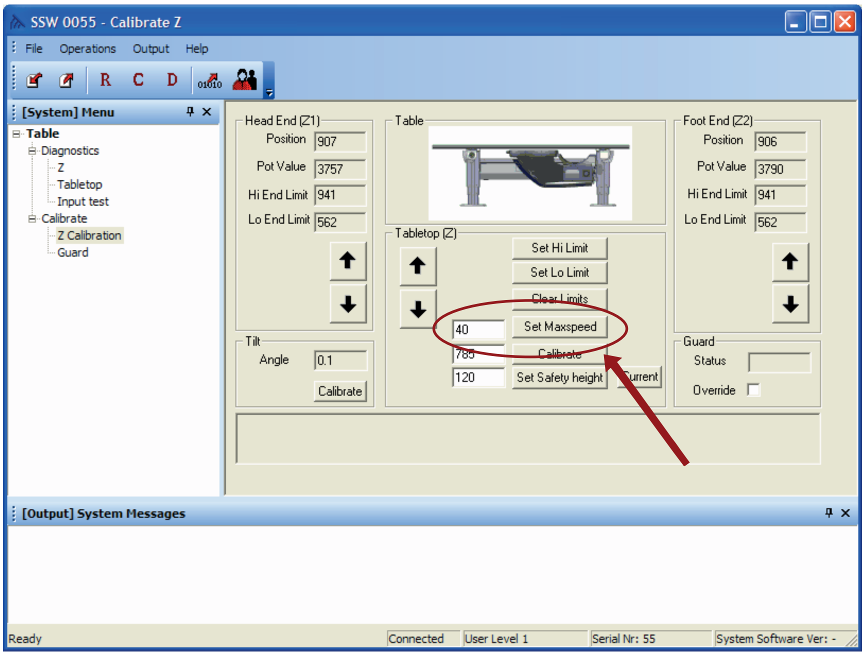


Fig. 5-161 Calibration Table Max Speed

Calibration of Safety Zone

The safety zone is the distance (120 mm) from the lowest moving point of the Table to the floor.

1. Enter the *Calibrate Z view*.
2. Move the Table until the height for the safety zone is reached.

Note!

It shall always be at least 120 mm between the lowest moving point of the Table and the floor.

3. Press the *Current* button beside the *Set Safety Height* button, see Fig. 5-162 .
4. Press the *Set Safety Height* button.
5. Verify the functionality by moving the Table up and down. The movement shall stop when entering the safety zone and when the downward button is pressed again it shall proceed at half speed.

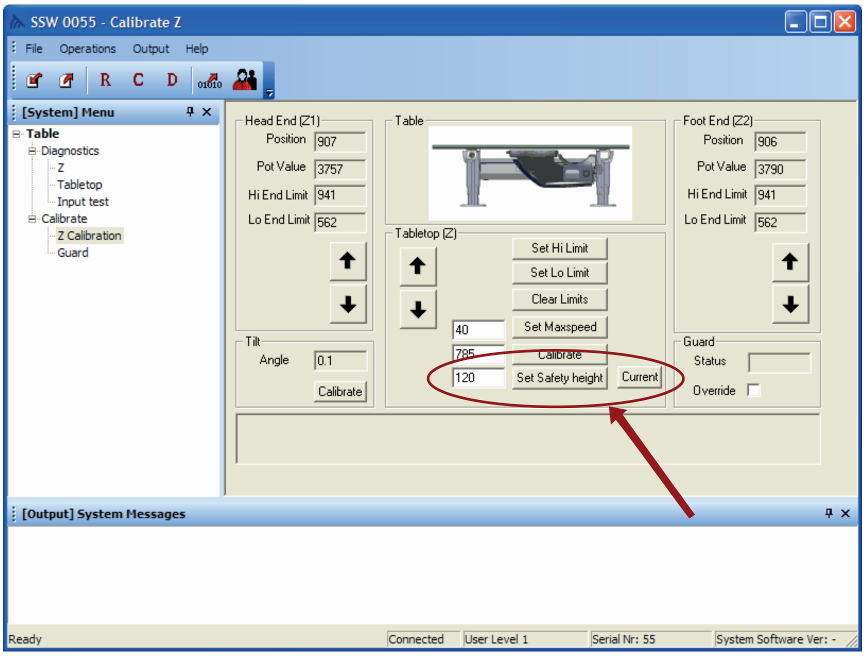


Fig. 5-162

Calibration of Crash Guard Detection

1. Enter the *Guard* view.
2. Press the *Calibrate* button.
3. Check the value displayed in the *AD value Edit* box. The value shall be 2500 +/-500, see Fig. 5-163 *Guard Setting*.
4. Use a dynamometer to check the impact force by moving the table top upward and downward. The needed force of impact shall not exceed 200N +/-70N before movements is stopped.
5. If necessary adjust the trig levels by entering a new value Guard settings Edit boxes and pressing the coherent button (Set Trig level 1 and/or Set Trig level 2) see Fig. 5-163 *Guard Setting*. 2-3 points are approximately 10N.
6. Check the guard function in each corner of the table top.

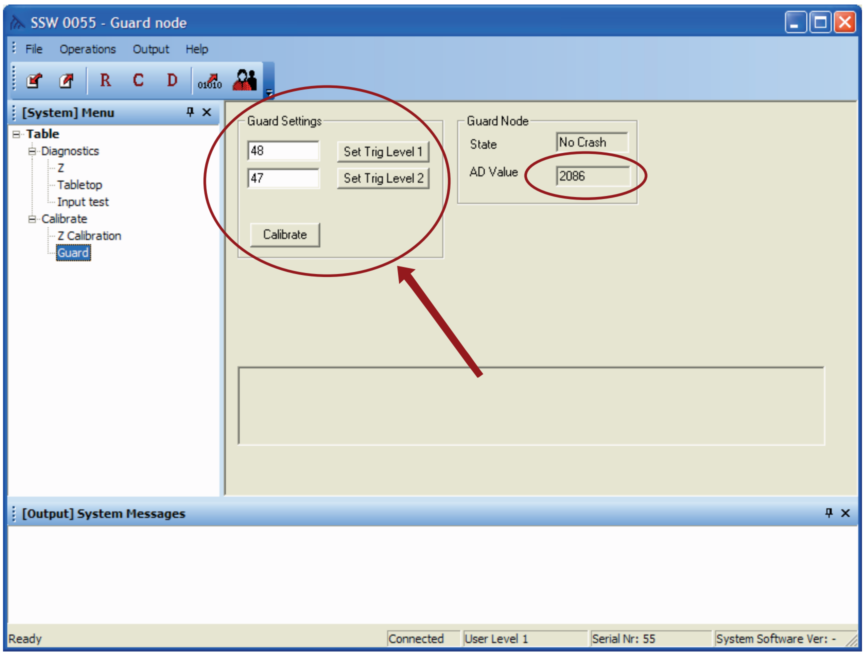


Fig. 5-163 Guard Setting

5.24.5.14 Save Parameters (Settings) Table

If there are problems with the Table functionality, calibrate and save back up described below.

In case of failure, the Table may be restored to the same state as it was initially.

1. Open the *Table service software* program.
2. Press *Operations* in menu and select *Save Parameters*, see Fig. 5-164 .
3. Select folder to where the parameters shall be saved.
4. Press the *Save* button.

Note!

Parameters shall always be saved before any adjustments are made. The parameter settings shall always be stored near by the System.

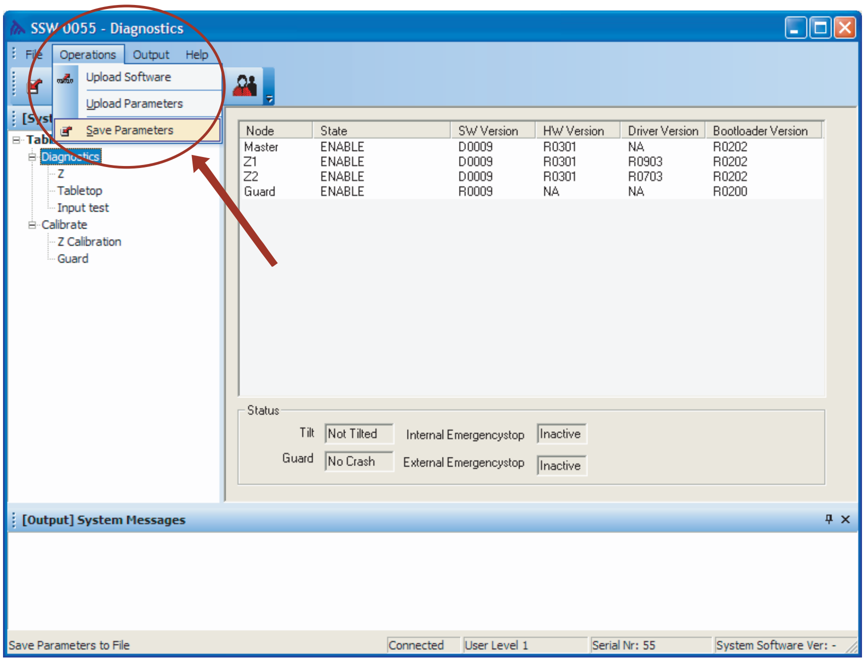


Fig. 5-164

5.24.6 Calibration of Collimator

The collimator is preset from factory.

5.24.6.1 Detector X/Y Orientation

The X/Y orientation of the Table and Wallstand detectors are defined in figure.

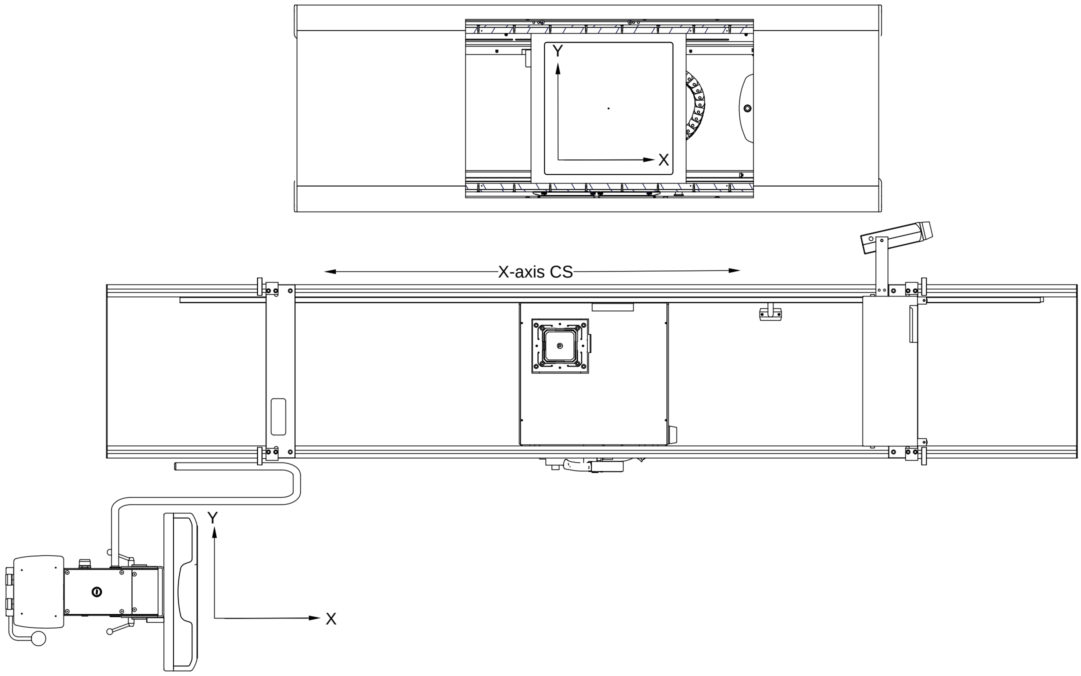


Fig. 5-165

5.24.7 Automatic Timer for the Collimator Lamp

1. Enter the *Collimator node view* .
2. Set the value (in seconds) for the Light time-out.
3. Press the *Set time* button.

5.24.8 Definition of Collimator Settings

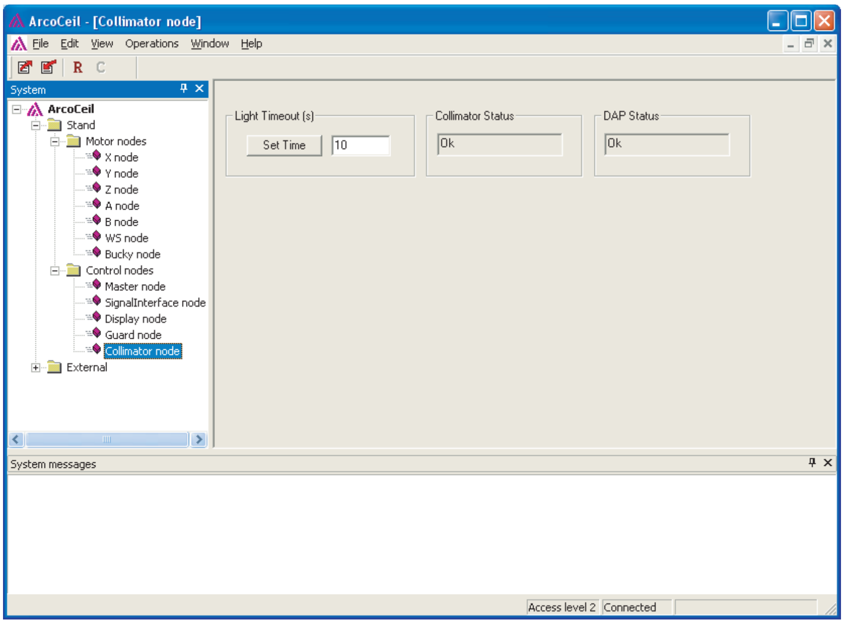


Fig. 5-166

5.24.9 Installation of AEC

For Systems with a detector holder for a portable detector, the AEC is pre-mounted at factory.

If applicable, install and calibrate the AEC according to manufacturers instructions. A chamber of ionic type, has to be flatly mounted. If it should be mounted in any tension, the result cannot be guaranteed. Adjust the chamber brackets until a flat position is reached.

CAUTION!

Make sure the AEC back-up values are properly defined.

5.24.10 Gain adjustment of AID (ICX-3922) AEC

Note!

For adjusting the exposure settings, see the Image System User Manual, Section C, “Adjusting Technique Settings”.

When adjusting AEC, remember to check against the dose value.

5.24.10.1 Wall stand

The description below, relates to a left-loaded detector holder. When using a right-loaded detector holder, the adjustments screws shall be in the opposite order.

Fig. 5-167

1. Remove the 4 screws from the cover at the back of the detector holder, and remove the small cover.
2. Adjust AEC gain from the adjustment hole to the AEC amplifier using a precision standard screwdriver.
3. Adjust from the MASTER adjustment hole.
4. Adjusting in the clockwise direction increases sensitivity = reduces time = reduces dose = reduces exposure index.
5. Adjusting in the counterclockwise direction reduces sensitivity = increases time = increases dose = increases exposure index.

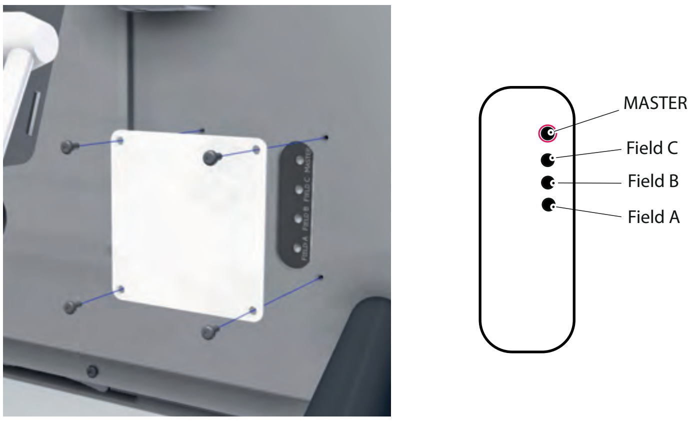


Fig. 5-168

Note!

In case of a right-loaded detector holder, adjustment holes are Field A, Field B, Field C, and MASTER in order from the top.

5.24.10.2 Table

Adjust AEC gain from the adjustment hole to the AEC amplifier on the side of the reader part (detector holder) using a precision standard screwdriver.

- Adjust from the MASTER adjustment hole.
- Adjusting in the clockwise direction increases sensitivity = reduces time = reduces dose = reduces exposure index.
- Adjusting in counterclockwise direction reduces sensitivity = increases time = increases dose = increases exposure index.

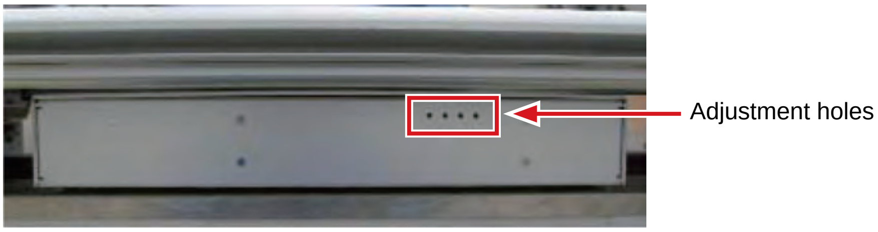


Fig. 5-169 Adjustment holes

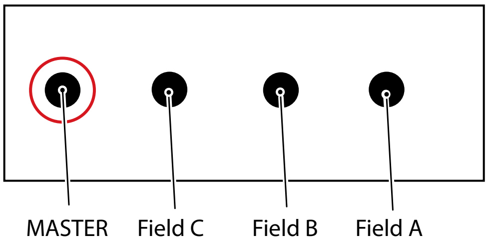


Fig. 5-170 Adjustment holes

5.24.11 Calibration of auto positions

1. Enter the *Positions view* (Operations => Positions).
2. Move the ceiling tube support (A, B, X, Y, Z, Bucky/Wallstand) to the position.
3. Press a position, in the Pos. column, with the cursor.
4. Select mode (check which modes that are valid for the System).
5. Enter the offset Z value (see below a).
6. Enter the SID value (in *Free mode* and the *Auto position* mode the SID value is only used for the automatic collimator).
7. Check or uncheck *NoWait* , depending on desired function.

   See the *System Operation Manual Chapter 4 Operating the System and Wall Flexible mode* for description of *NoWait configuration*.
8. Press the *Write* button to save the position.

   a) The offset Z value is only available in *Table Flexible mode*.

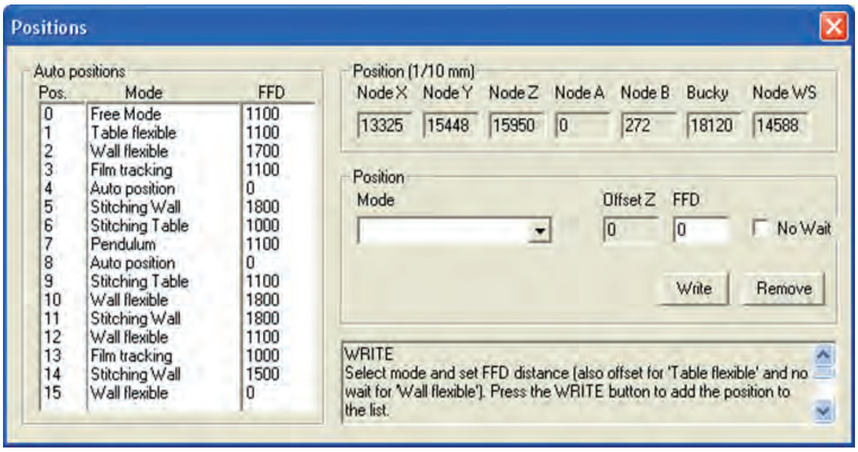


Fig. 5-171

9. After saving the *“Auto positions”* , check the X-ray field alignment with the image receptor and adjust if necessary.

- Run the *“Install_Overwrap”* file from the System USB.
- Follow “SwUDI_0072–C_System_1_x_x.pdf”, Chapter *“first installation”, subsection 4.1.*

5.24.12 Alpha Angles

At the APR protocol, it is possible to save different alpha angles for the same auto position, .

This is done at the Canon Service tool — Protocol editor.

At the *Menu selection*, *Utility Setting*, choose the *Protocol Editor*.

Fig. 5-172

At the *Protocol Editor*, choose the *Radiography folder* and the tag *X-ray Parameters.*

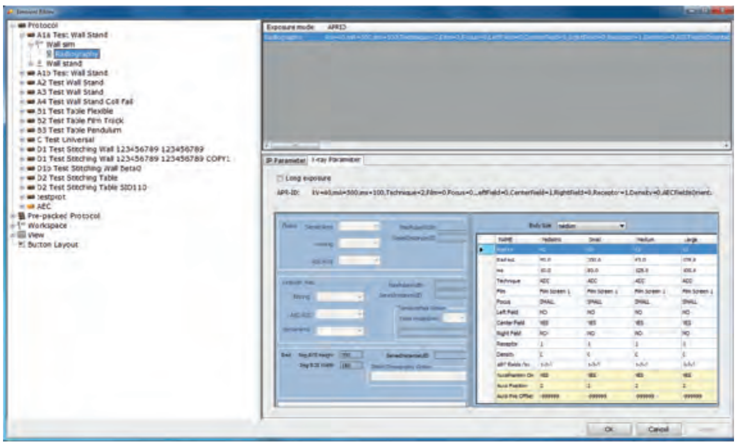


Fig. 5-173

At the row *Auto pos Offset*, fill in the values for all *Patient sizes*.

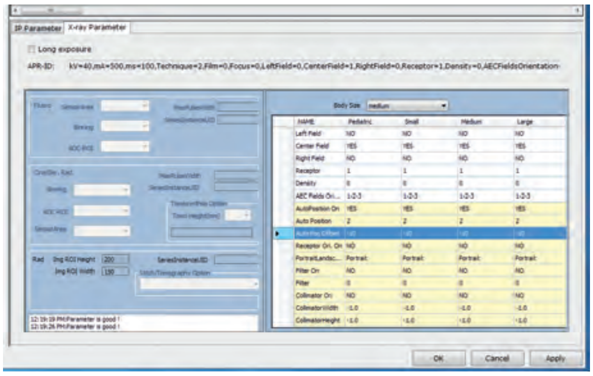


Fig. 5-174

5.24.13 DAP

Check that the right options are available at *About* in the generator software; Genware.

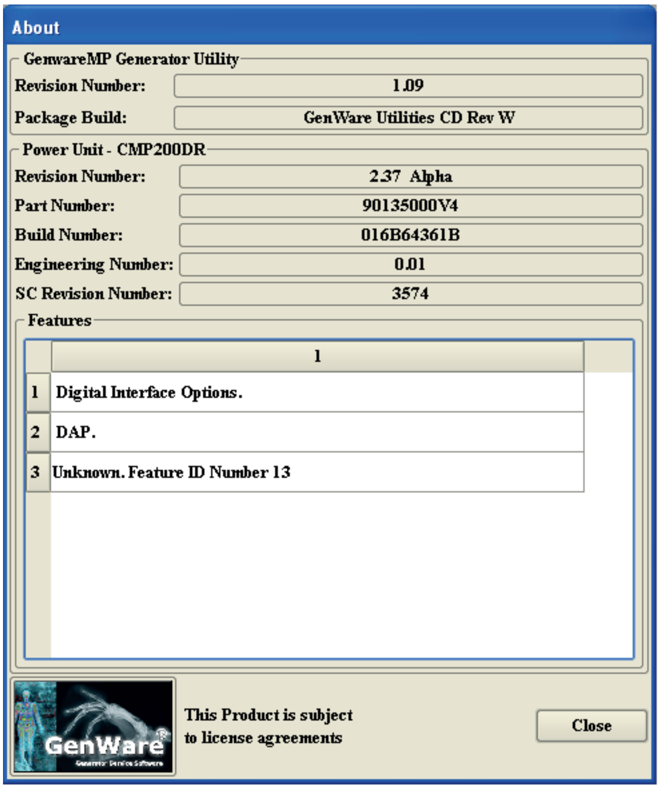


Fig. 5-175

Check that the Interface option 27 is chosen for all receptors, R1–R6.

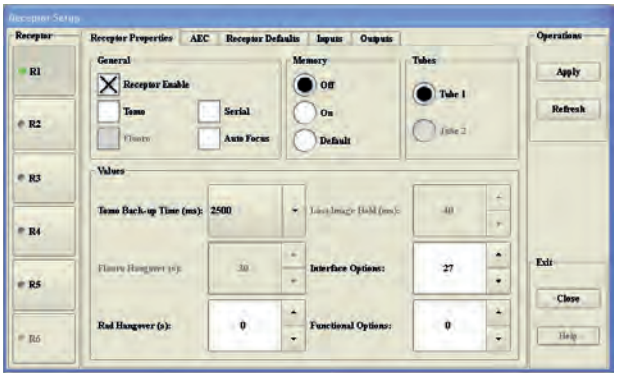


Fig. 5-176

Check that the right *DAP Device type* is chosen, and that the *Test value* is set to ‘1000’.

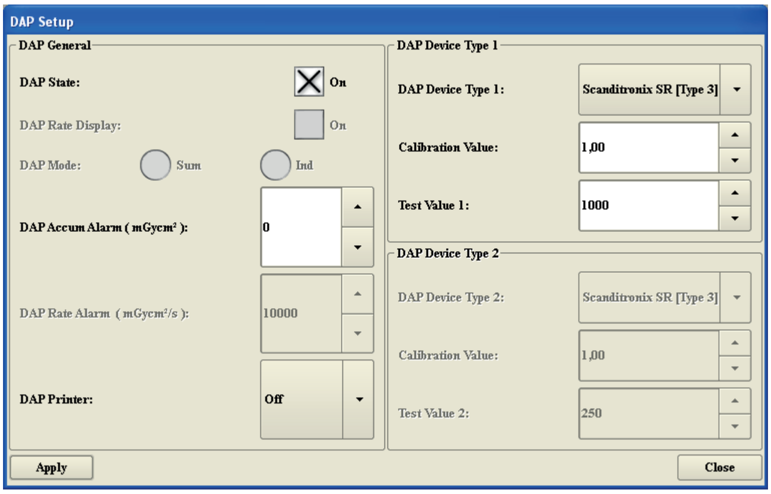


Fig. 5-177

5.25 Overwrap License

The generator installation USB delivered together with the System contains a 30 days trial version of the overwrap license.

Before finishing the installation, a permanent license must be obtained from CPI.

Collect the *canonkit.txt* file from the imaging system workstation PC and send it together with the generator serial number to CPI

Upon receiving the new *canonkit.lic* file place it in the *CXDI_NE_Overwrap* folder of the imaging system workstation PC.

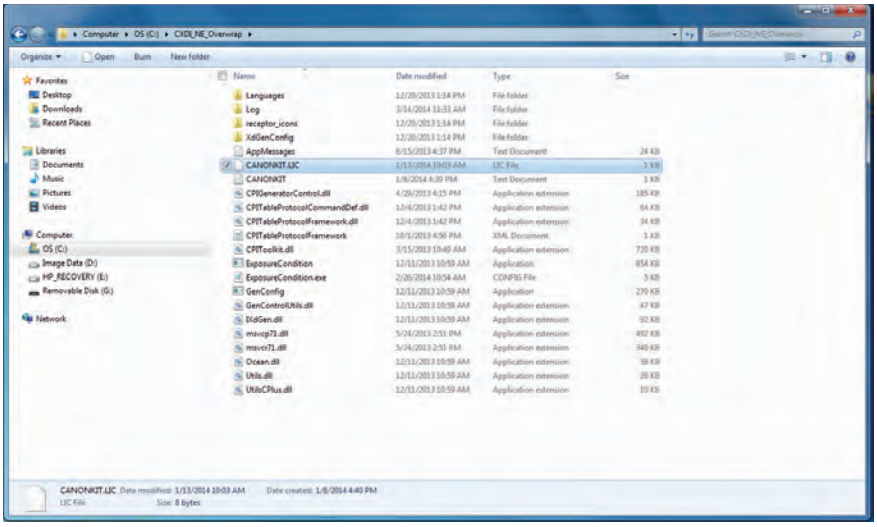


Fig. 5-178

5.26 Save OTC Parameters

1. Connect service laptop to the service cable of Arco Ceil (1.1Service).
2. Launch Service software from Arcoma System USB.
3. Connect the service program to the System using the appropriate COM port. Make sure that the connection state in the lower part of the screen changes from *Disconnected* to *Connected*.
4. Check that all nodes are in enable state.

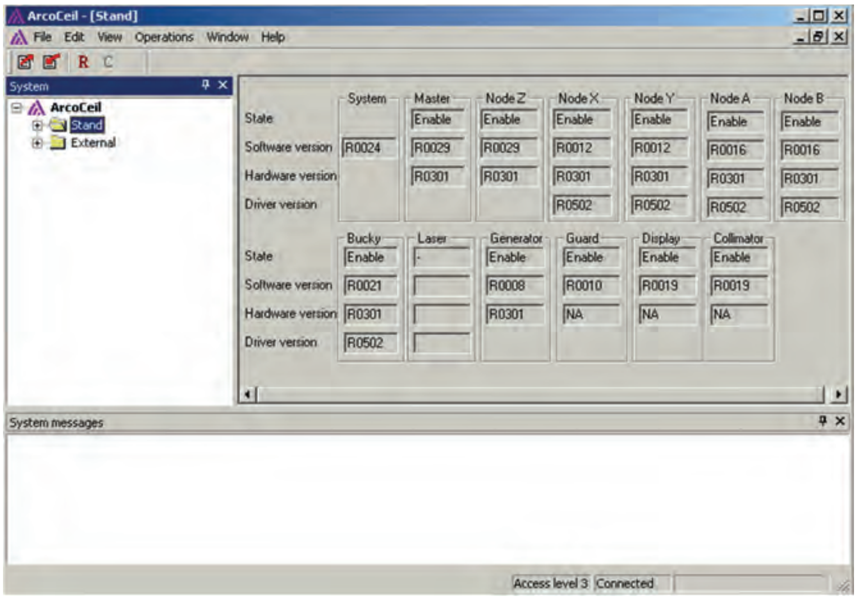


Fig. 5-179

5. Select *File* and *Save parameters As*.
   The file is saved as a .txt-file.

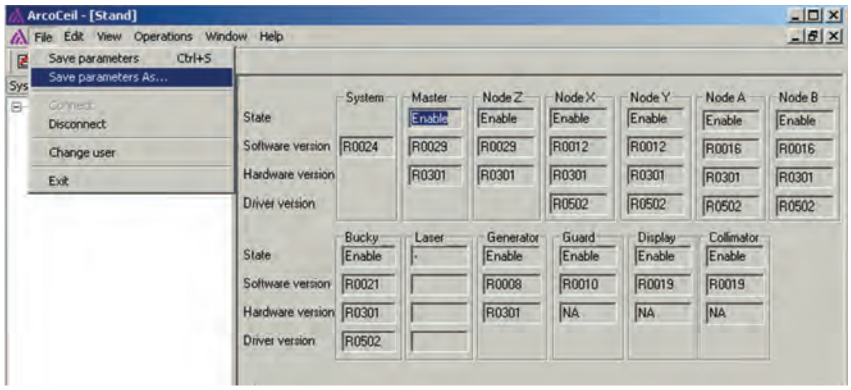


Fig. 5-180

6. Make a generator backup.

5.27 Calibration of Tube

The tube calibration is done at the manufacture and shall be done once again at the installation.

For tube calibration, see *Generator documentation*.

5.28 Collimator Light and X-ray Field Alignment

The collimator light field and the X-ray field are normally adjusted at delivery.

However, check the following when installing.

1. Align the tube with the detector.
2. Attach some suitable objects on the detector holder cover (within the active detector area).
3. Perform an exposure and evaluate the alignment (images vs. the collimator light field) using the references applied in the previous step.

   Rail (B) has to be installed on the front.
4. The maximum deviation between light field and X-ray field is ±1% of SID, see figure
5. Adjust the collimator light field according to the Collimator Manual.

Note!

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

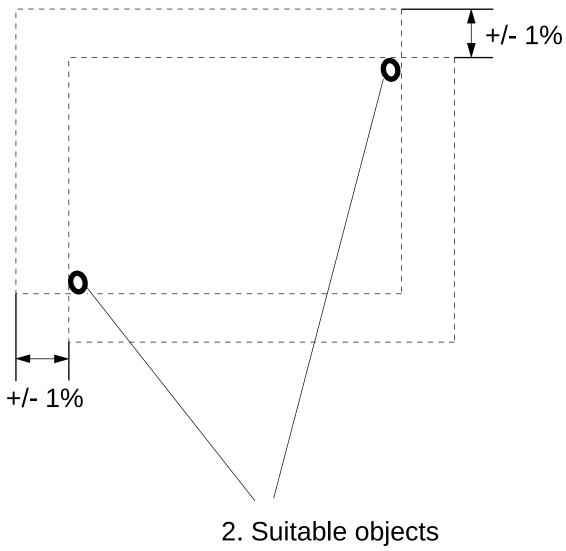


Fig. 5-181 Alignment.,

5.29 Adjustment of the Light Field

CAUTION!

Do NOT, under any circumstances loosen the slot-head screw (3) next to the two adjustment screws!

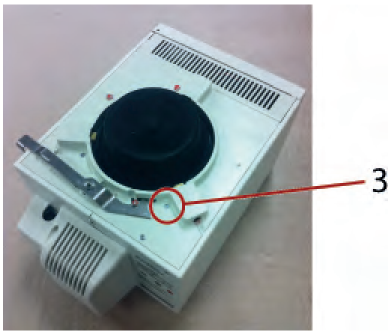


Fig. 5-182 Do NOT loosen!

Note!

Before starting adjusting, read the complete instruction

If the light field and the radiation field do not coincide adequately, use the two Allen screws (1 and 2) on top of the collimator, to center the light field, see Fig. 5-183 *Light field centering.*.

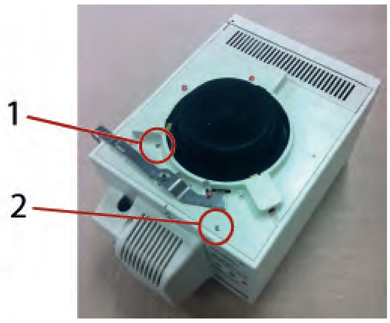


Fig. 5-183 Light field centering.

For HEIGHT (X) adjustment;

- Turn the screw (1) clockwise, and the light field will move to the right.
- Turn the screw (1) counterclockwise, to move the light field to the left.

For WIDTH (Y) adjustment;

- Turn the screw (2) clockwise, and the light field will move backward.
- Turn the screw (2) counterclockwise, to move the light field forward.

The adjustment range in the Y-direction, is about three times larger than the X-direction range.

Note!

The adjustment screws may only be turned until the resistance of the compression springs can be felt.

The screws must not be loose!

If needed, the cross-hairs window can be readjusted when the light field is adjusted. To readjust, loosen the 4 fastening screws at the holding frame and the line laser.

5.30 Install Table Top

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, see figure.

   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 that the brakes are working in a correct way.
7. Check that the table top runs smoothly. If not, see 6.3.3 *Table*, Page 256.

Note!

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

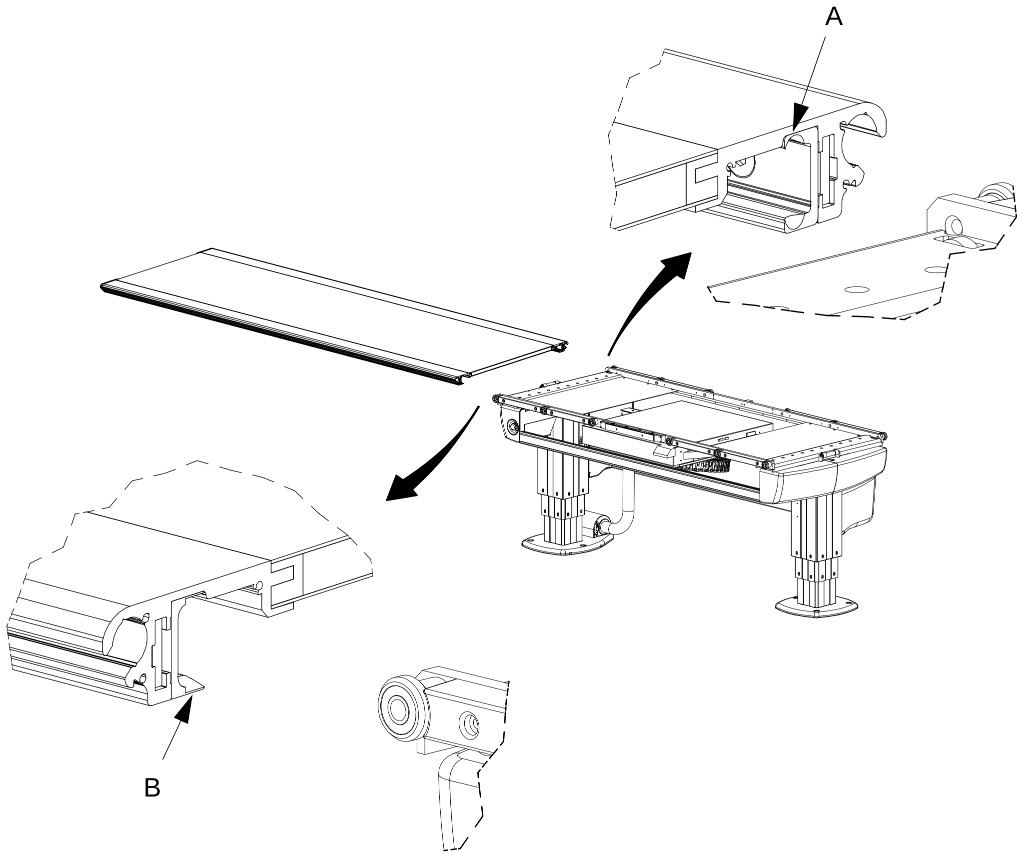


Fig. 5-184

5.31 Tests

5.31.1 System Test

Perform a number of X-ray examinations.

5.31.1.1 Exposure Parameters

Check the Exposure parameters.

5.31.1.2 Auto positioning

Check the auto positioning.

5.31.1.3 Collimation

Check the collimation.

5.31.1.4 AEC calibration

Measurement of system attenuation factor

General

On delivery of the system, the AEC is pre-calibrated and should only need minor corrections. In case a new AEC chamber is to be installed, proceed as following:

Installation of new AEC chamber

1. Turn all four gain potentiometers on the amplifier (not the AEC board in the generator) completely to minimum.

   Turn clockwise until you can hear a click on every turn, max 15 turns.
2. Turn all four gain potentiometers approx. 3.5 turns positive (3.5 turns anti clockwise).
3. All master gain adjustments need to be performed on the generator AEC board.
4. Make sure the central beam is perpendicular and centered relative to the image receptor.
5. Ensure the X-ray field completely covers all three AEC fields.
6. Ensure the size of the used phantom is larger than the X-ray field.
7. All AEC post exposure times should be between 30 and 100 ms.

   Adjust tube current if necessary.
8. Only one film speed is activated on delivery (medium).

Check of AEC chamber field versus image system AEC fields

Check that all three AEC fields on both table and wall stand correspond to the selected fields in the image system.

1. Activate AEC on the image system.
2. Make sure that only the left field is activated.
3. Completely cover the left field on the table or wall stand with a suitable object with high attenuation, e.g. a lead apron.

   Make sure the other two fields are not covered, here center and right field.
4. Make an exposure with suitable exposure parameters, e.g. 50 KV, 10 mAs, no phantom, SID according to grid focal distance, X-ray beam covering all three AEC fields.

   The exposure should be finished by the backup timer.
5. Remove the object mounted in front of the relevant field and repeat the exposure. Now a very short exposure time should be the result.
6. Repeat on all fields of the table and wall stand.

Adjustment of balance between the three fields

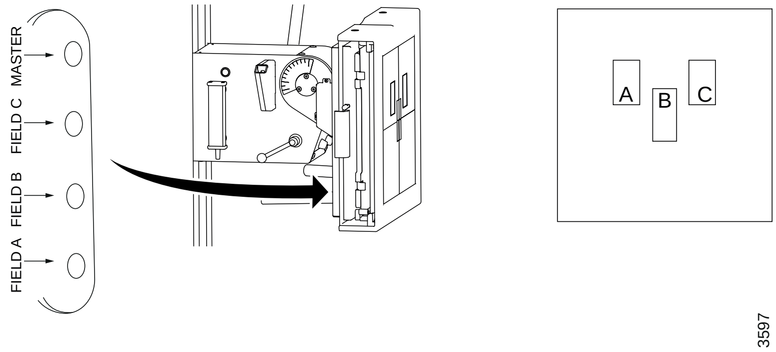


Fig. 5-185

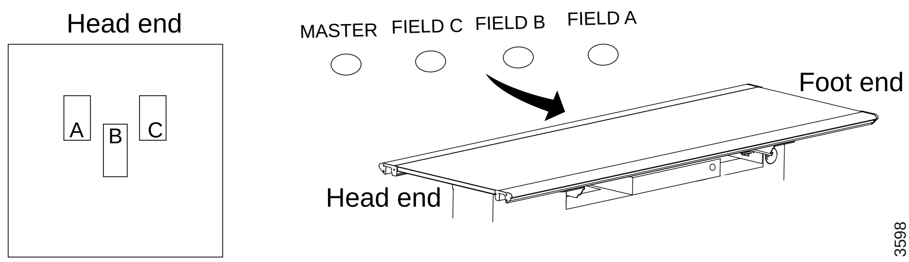


Fig. 5-186

Balance calibrations in GenwareMP

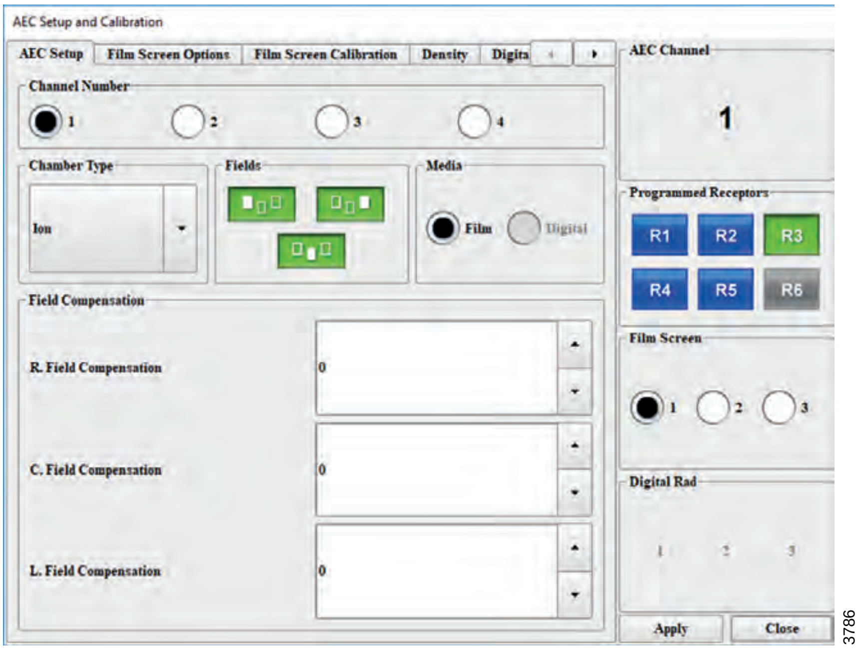


Fig. 5-187

Field balance check

Exposure parameters:	SID 100 cm
	80 KV
	25 mAs backup mAs
	25 mm aluminum Phantom in front of collimator
	AEC ON
	Collimator filter off = 0 mm AL and CU
	X-ray field set to cover all three fields
	Grid mounted. If more than one grid is available, mount the one with the highest ratio.

1. On the image system, activate only the left field (C).
2. Expose and note the mAs (or measure the radiation dose).
3. Repeat 1–2 for both the center (B) and right field (A).
4. Compare the three mAs (or µGy) results and if necessary adjust the corresponding gain potentiometer (field A-C potentiometer) until all three mAs values are the same. As accurate as possible, max deviation is ±10%.

   During this procedure, do not change the master gain potentiometer.

Fine tuning of KV compensation

Determination of AEC cut off EI

The required EI (Exposure Index) value is depending on detector type. The detector entrance dose is depending on the detector type/manufacturer and can be regulated by national requirements, if unknown, a suitable value is 180 (corresponds to ca 1,8 µGy detector entrance dose).

The CXDI software has AEC protocols used for calibration installed, which are used to calibrate the cut off EI level. The below exposure parameters might need to be adjusted for your own needs.

Exposure parameters:	SID according to grid focal distance
	75 KV
	Set the value in the 75 KV dialog box to 4,50, see Fig. 5-188 *AEC setup and calibration*(see figure 5 below) for the relevant AEC channel and filmscreen
	25 mAs backup mAs
	15 cm PMMA in front of the collimator, alternatively a suitable thickness of aluminium or a water phantom can be used.
	AEC ON
	Collimator filter off = 0 mm AL and CU
	X-ray field covering all AEC fields but smaller than the Phantom.
	Grid mounted (If more than one Grid is available, mount the one with the highest Ratio).
	Center field

1. Make an exposure.

2. Note the resulting EI value.

   Make sure the post exposure time is between 30–100 ms, adjust tube mA if necessary
3. Adjust the master gain on the generator AEC board and repeat the procedure until the right EI value is reached.

   A suitable value is 180.

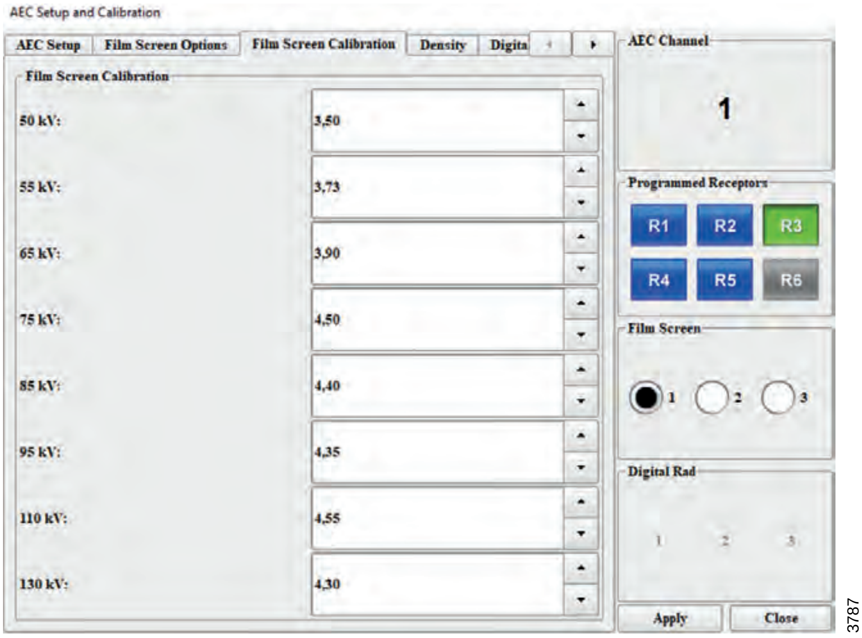


Fig. 5-188 AEC setup and calibration

KV compensation calibration

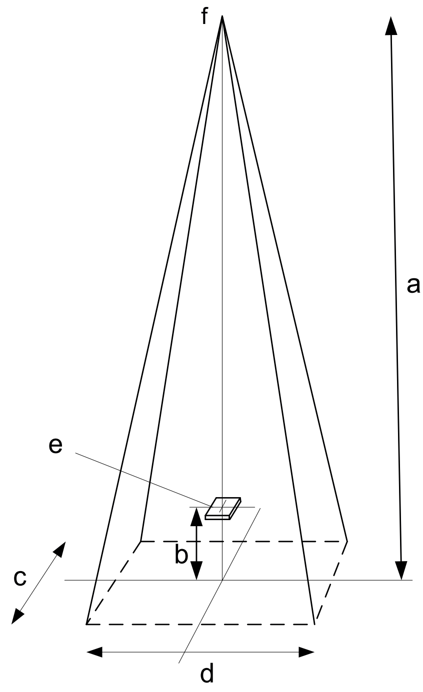
1. Repeat the *Determination of AEC cut off EI* procedure, with the KV levels (except 75 KV) shown in Fig. 5-188 *AEC setup and calibration*, using the phantom sizes in the table:

KV	Acrylic Phantom (cm
50	10
55	10
65	10
75	15
85	15
95	15
110	20
130	20

2. For every KV level (except 75 KV), adjust the corresponding dialog box value until the correct EI is reached.
3. Make sure the post exposure time is between 30–100 ms, adjust tube mA if necessary.
4. Repeat for both the table and wall stand.

   Remember to adjust the SID according to the grid focal distance when changing between table and wall stand.

5.31.1.5 DAP test



$$k = \frac{D*c*d*((a-b)/a)^2)}{DAP}$$

Fig. 5-189 DAP test

a Focus distance (cm)

b Distance to active detector area of air kerma meter (cm)

c Height of xray (cm)

d Width of xray (cm)

e Active detector area air kerma meter

f focus

k= DAP correction factor, where DAP = DAP value ($mGycm^2$)

D = Measured dose with air kerma instrument (mGy)

A DAP value test is performed at manufacture and needs to be checked again after the installation. The DAP shall be tested in accordance with the hospital-preferred settings.

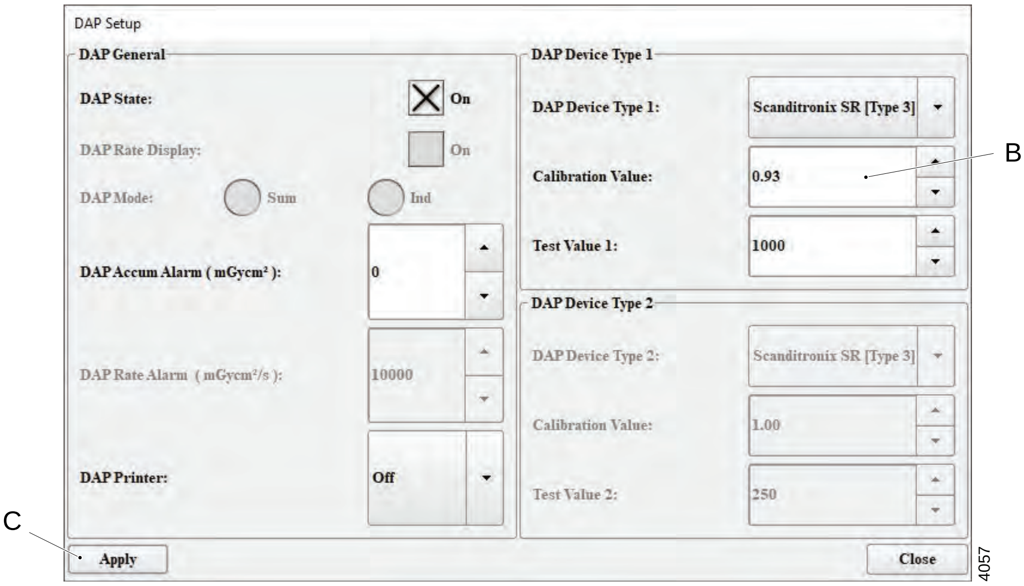
If adjustment is needed:

1. Open Genware MP (CPI generator software, typically installed on image PC) and connect to generator, using the same wired connection as during normal communication between image PC and generator. No extra cable or tools required.

Note!

Canon NE must be turned OFF

2. Select the DAP-menu (A) to open the DAP Setup window:



3. Set the `Calibration Value` (B) to the measured reference value.
4. Press `Apply` (C) to activate the change.

5.31.2 Emergency Button Test

The emergency buttons should be tested in order to see that they work properly.

See *Chapter 2 Safety* , for description on how the emergency stop should react on command.

5.31.3 Indication Light Test

Check that the indication lights on the Table and the Wallstand are lit when the respective receptor is selected.

5.31.4 Automatic Collimator Test

1. Check collimator status on the collimator view.
   Check SID, collimator light field and filter settings for send settings.
2. Check collimator handlebar functions.
3. Check collimator function for top/bottom alignment.
4. Check collimator light on/off signal (typical from table top release).

5.31.5 Generator Software File

Check that the permanent license file is loaded into the generator.

5.32 Send Installation Report to Arcoma Service

Fill in the Installation Report and send it to Arcoma Service; service@arcoma.se

6 Maintenance

6.1 General

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.

Note!

For exchange of the collimator light field lamp, see the Collimator Manual

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.

External equipment shall fulfill standards 60601–1/60650.

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 *Operation Manual*.

6.2 Precautions

WARNING!

Electrical shock. Covers removed, exposure to electrical shock.

WARNING!

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

WARNING!

Reduced safety when intentionally disabling of safety mechanism.

WARNING!

Electrical shock. Remaining voltage when equipment is turned off.

CAUTION!

Electrical shock. High leakage current due to stray currents.

CAUTION!

When the main unit power source breaker is turned OFF, the Wallstand detector cannot be moved up or down using the brake release for Z-movement.

For safety reasons, the detector must be fixed to the main unit frame while the parts of the detector are being replaced.

CAUTION!

Use gloves when in contact with grease.

6.3 Annual Checks

6.3.1 General

1. Clean all outer surfaces.
2. Lubricate all columns with BP Energol GR-XP 220.26.
3. Check all cables for damage.
4. Make sure that the Operation Manual is present and up to date.

6.3.2 OTC

1. Clean all wheel tracks.
2. Clean all wheels.
3. Check that the installation bolts for the ceiling rails are tightened with 47 Nm. Check the rest of installation, all the way up to the ceiling.

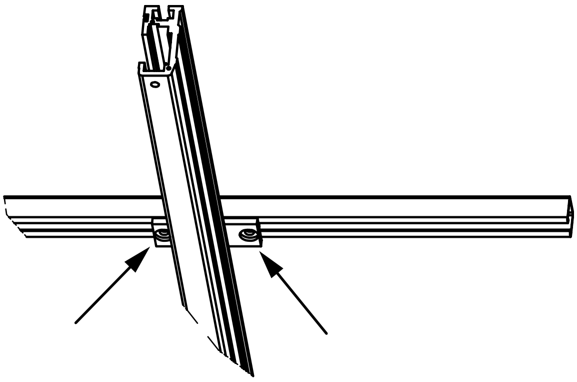


Fig. 6-1

4. Check the installation bolts (12 pcs) for the transverse rails with an Allen key.

Note!

Do not turn the bolts if they are not loose. They are fastened with Loctite.

If the bolts are loose, they shall be tightened with 47 Nm. Use Loctite 243.

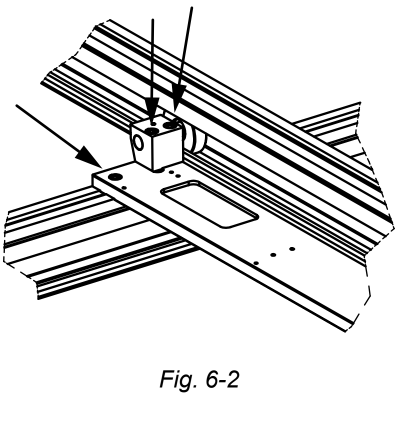


Fig. 6-2

5. Check the installation bolts (8 pcs) for the Z-column with an Allen key.

   Note!

   Do not turn the bolts if they are not loose. They are fastened with Loctite.

   If the bolts are loose, they shall be tightened with 47 Nm. Use Loctite 243.

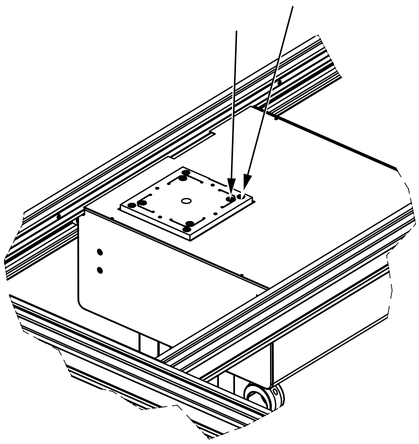


Fig. 6-3

6. Check the installation bolts (4 pcs) for the turning plate with an Allen key.

   Note!

   Do not turn the bolts if they are not loose. They are fastened with Loctite.

   If the bolts are loose, they shall be tightened with 9.8 Nm. Use Loctite 243.

   To reach the bolts, remove the cover under the horizontal turning plate, the gearbox and the magnets, see Fig. 5-107 .

   Then the two bolts are visible (A).

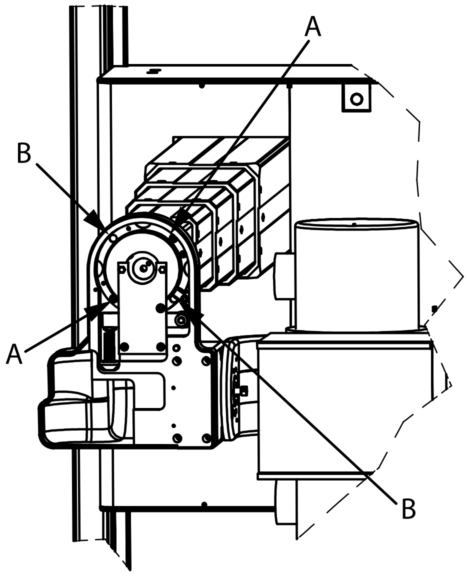


Fig. 6-4

Turn the plate 90° and the other two bolts comes visible (B).

Remove the magnet and check the installation bolts (C, 4 pcs) for the attachment flange.

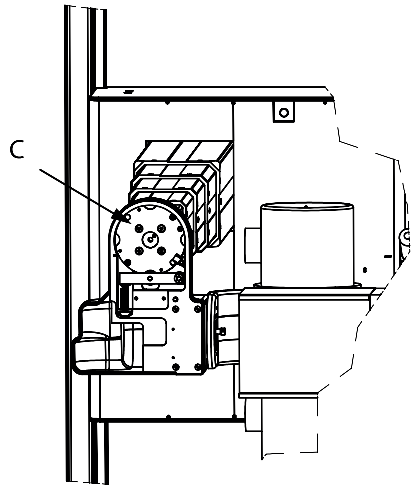


Fig. 6-5

After the installation, check the Beta according to 5.24.3.7 *Calibration of Beta-axis*, Page 189.

7. Check the wedge-lock between the tube and collimator installation. You should be able to move the collimator 45° without any play.
8. Remove the cover and check that the belt is tightened. The tooth belt can be flexible +/-2 mm. If the tooth belt has to be tightened see the instruction below.

   The tooth belts are adjusted by the Manufacturer, and normally no further adjustments are needed.

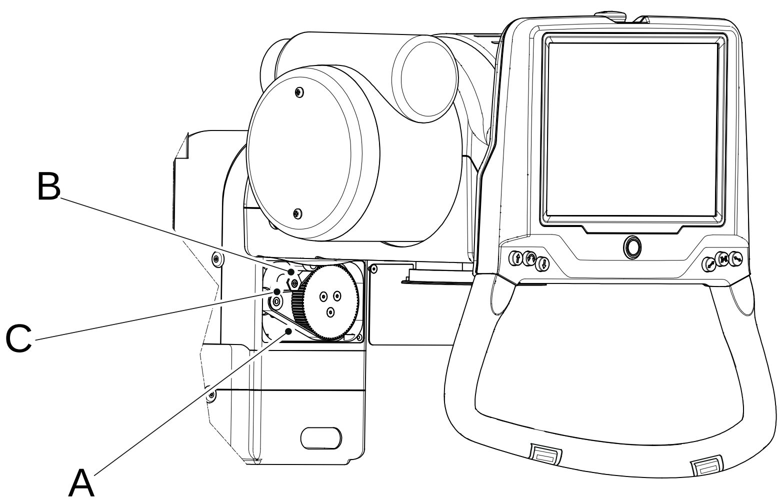


Fig. 6-6

- Loosen the bolt (B).
- Turn the eccentric bolt (C).
- The tooth belt (A) should be flexible +/- 2 mm.

  If the tooth belt is too tight, the alpha will be heavy to move manually.

9. Check the lifting cord for damage and make sure that is runs smoothly. It might be subject for exchange when tension gets to low.

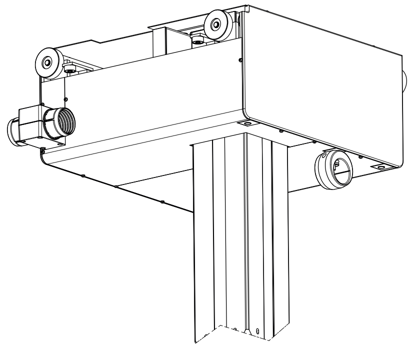


Fig. 6-7

10. Check all outer cabling for damage.

11. Check the protective earth resistance, refer to for further instructions. Measure protective earth resistance on open metal on the following points:
    - X-ray tube
    - collimator
    - alpha (1.3 PE)
    - display
    - alpha/beta arm (1A PE)
    - column phase
    - ceiling wagon
    - frequency converter plate
    - electrical plate
    - electrical plate 1.1 traverse
    - traverse wagon Y
    - Measure according to IEC 60601-1
    - Measurement on more points may be needed depending on the installation

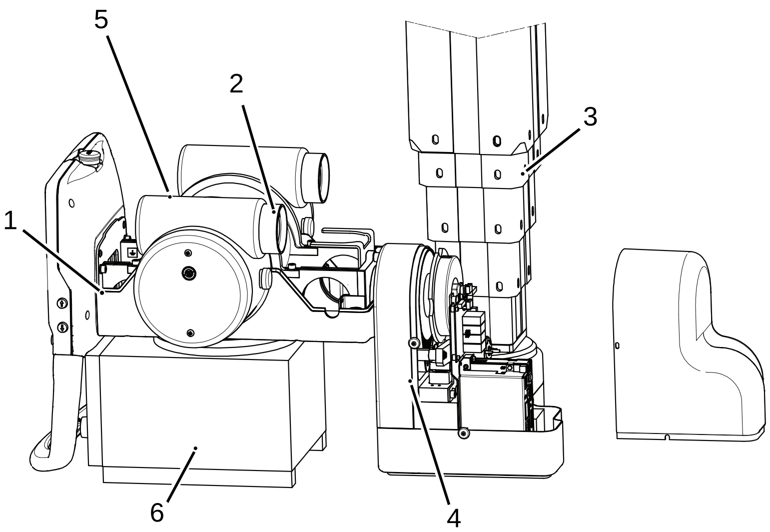


Fig. 6-8 Measure points, protective earth.

1. Display
2. Tube
3. Column phase
4. Alpha/Beta arm (1A PE)
5. Alpha (1.3 PE)
6. Collimator (Option)

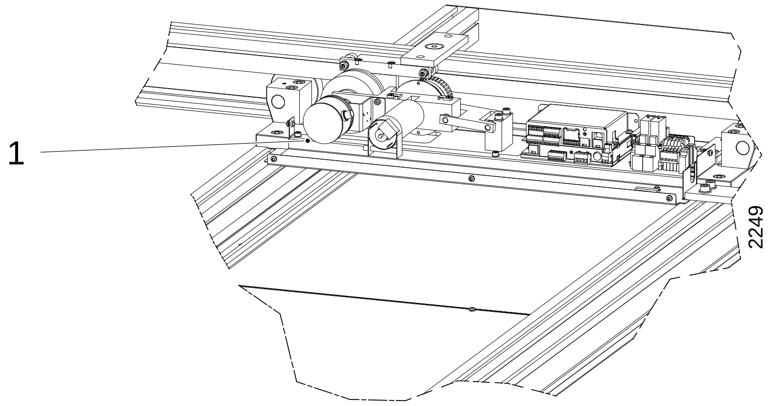


Fig. 6-9 Measure point, protective earth traverse wagon Y.

1. Traverse wagon Y

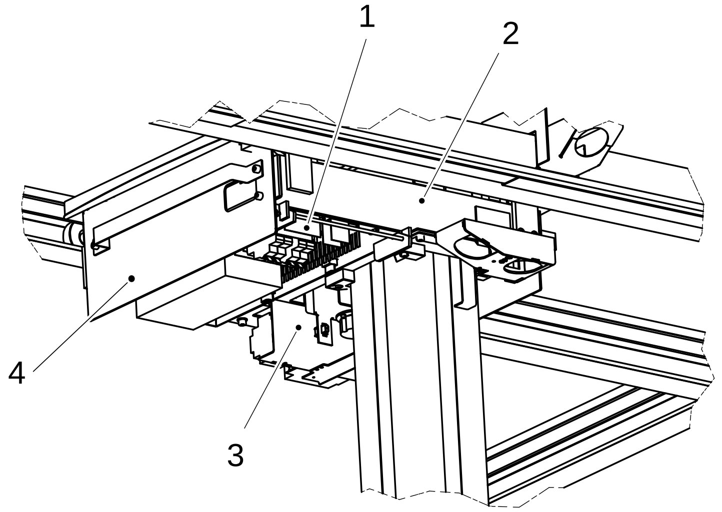


Fig. 6-10 Measure points, protective earth ceiling wagon.

1. Electrical plate
2. Electrical plate 1.1 traverse
3. Frequency converter plate
4. Ceiling wagon

12. Measure leakage current < = 0.5 mA. Measure according to IEC 60601-1.
13. Test the emergency buttons and see that they work properly.

    See *Chapter 2 “Safety”* for description on how the emergency stop should react on command.
14. Check the guard function with a force gauge. Fix the force gauge to the manoeuvre handle and resist when the OTC runs upward respective downward.

    The guard function shall activate by 170 N ±30 N.

    If the guard function activates by 170 N ±30 N adjust the guard function according to 5.24.5.12 *Calibration of Guard Function (Z-axis)*, Page 208.
15. Check the column segments (full stroke), it should run smooth and silent. Observe that the column normally have a membrane of oil, see paragraph 25.
16. Check that there are no oil leak from the gear box or motor.

    If any of those problems occur, please contact dealer.

17. Check the brake for the column motor. The brake shall activate when
    – the movements have stopped or
    – the emergency stop activates during movement.
18. Move the ceiling suspended unit manually to all positions and make sure it runs smoothly.
19. Check the read-outs for tube rotation. Turn the alpha and beta to the index stop and check that correct measurement is displayed.
20. Check the read-outs for the SID in a Table position. Measure between the X-ray tube focal spot and the active detector surface of the detector. The measured value shall correspond with the displayed value.
21. Check the read-outs for the SID in a Wallstand position. Measure between the X-ray tube focal spot and the active detector surface of the detector. The measured value shall correspond with the displayed value.
22. Check the buttons on the manoeuvre handle, they shall not be damaged or stuck when they are pressed. To check the function of the manoeuver buttons use the service software, see 5.31.4 *Automatic Collimator Test*, Page 245.
23. Read and follow the chapter *Operating the System* in the *Operation Manual* .
    - Check that the OTC function according to the description.
    - Check all the functions and motorized movements.
    - Different installations could have different options installed.

6.3.3 Table

24. 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).

25. Move the Table in X, Y and Z directions and make sure it runs smoothly and sounds OK.
26. 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 ≤ 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.

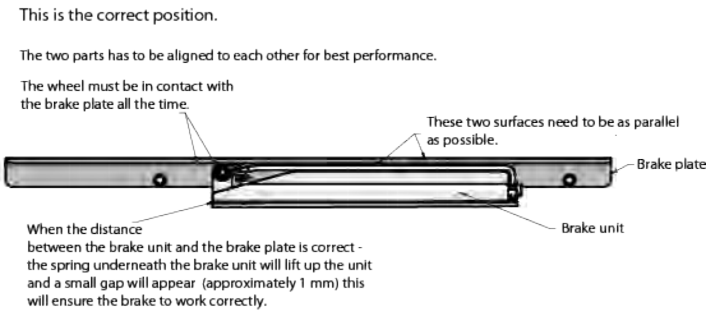


Fig. 6-11

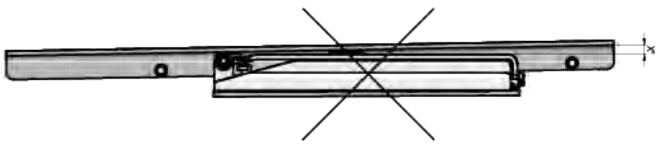


Fig. 6-12

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. 6-12

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.

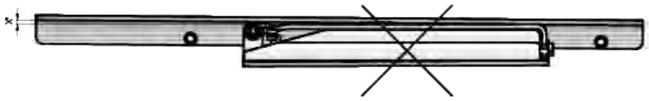


Fig. 6-13

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

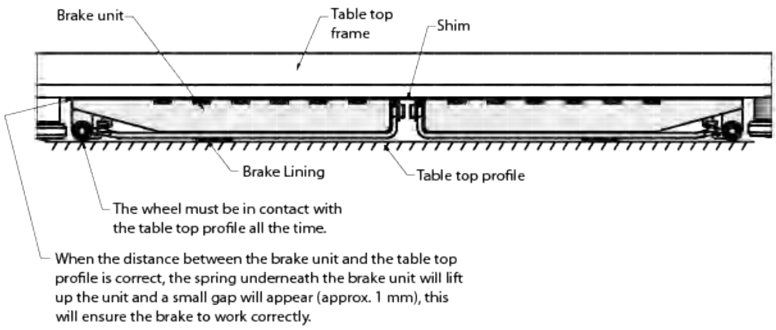


Fig. 6-14

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.

27. Clean the profiles at the sides of the table top.
28. Clean the profiles for the imaging unit tray movement (1), according to figure

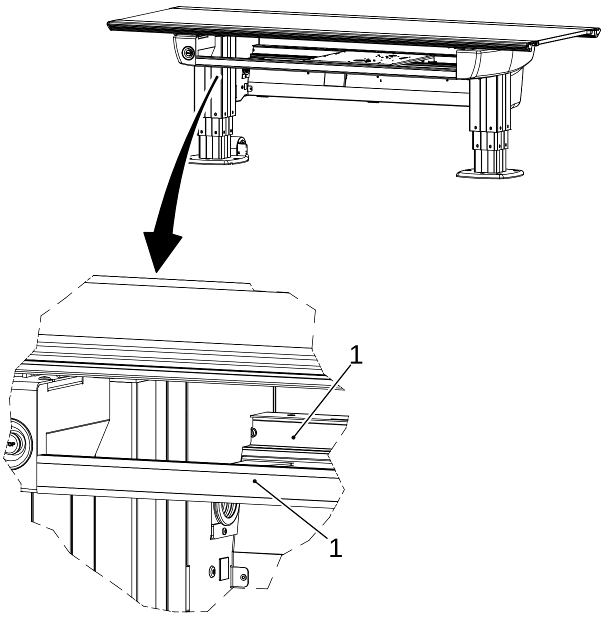


Fig. 6-15

29. 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.
30. Check all cables for damage.
31. Check protective earth according to .

    Enter the measured values in the Safety checklist Appendix B.

32. 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.

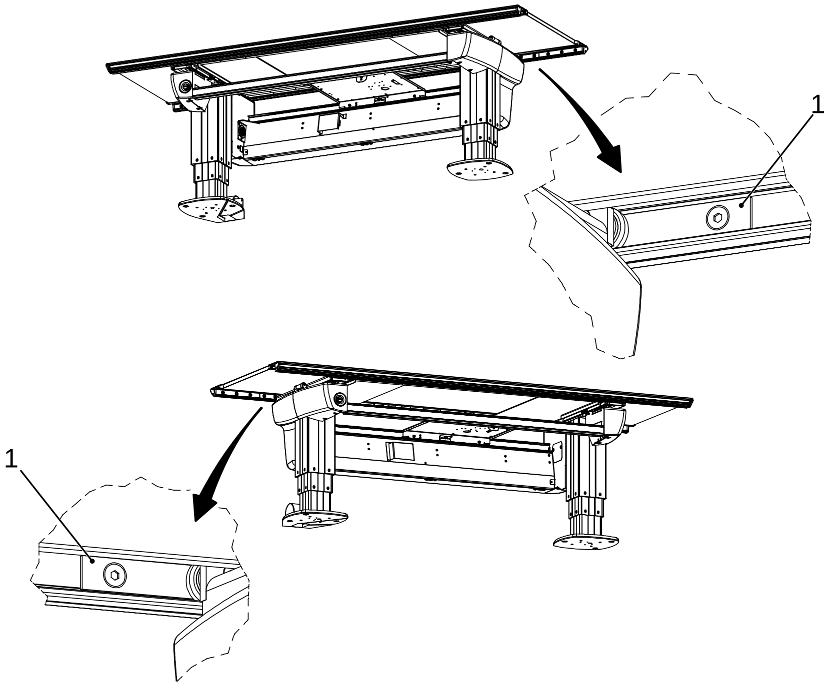
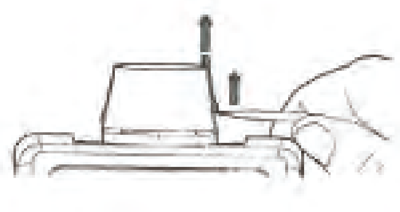
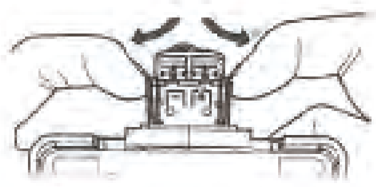
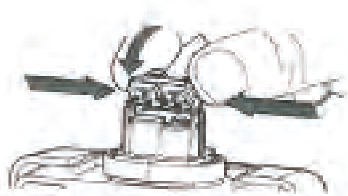
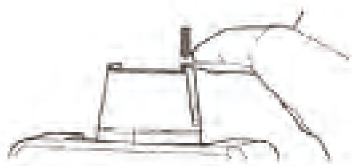


Fig. 6-16

33. Check the *Emergency stop* button on the Table. By activating the emergency stop all motorized movements are inhibited.
34. 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.
35. Check the buttons on the foot control, they shall not be damaged or get stuck when they are pressed.
36. 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, prising 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 plat part of the flat bladed screwdriver or alternatively. Loosely fit both covers. Press the whole assembly down onto a flat clean work surface.	

37. Check the function of the AEC chamber, the Back up timer and the mAs. Calibrate if necessary.
38. 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.

6.3.4 Wallstand

39. Check that the bolts fixing the Wallstand to the floor, are tightened properly with 7 Nm (be careful the Loctite joint can break).

    If any bolts are loose, use Loctite 243 and tighten with 15 Nm.
40. Check the 6 attachment points (H) of the chains inside the Wallstand.

    Put the detector (C) in the lowest position, remove the top cover (A) and then remove the cover on the front side (B) of the Wallstand. See figure below.

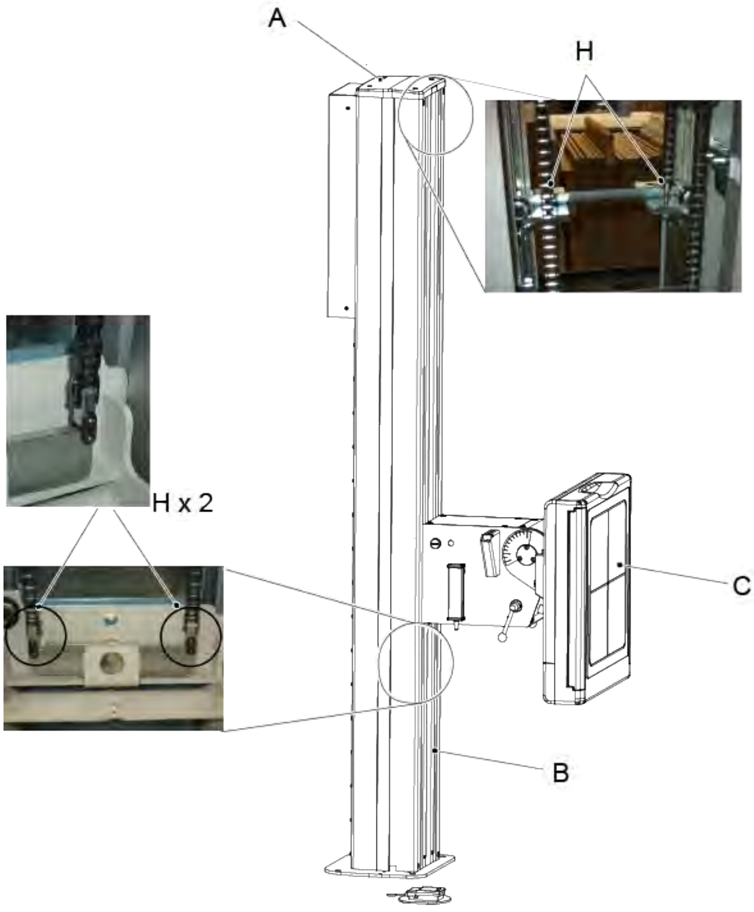


Fig. 6-17

41. Check protective earth according to .

    Enter the measured values in the checklist Appendix B.
42. Check the function of the brake.

    Move the Wallstand up and down, when the brake is released, the movement should stop.
43. Check the emergency stop button on the Wallstand.

    By activating the emergency stop all motorized movements are inhibited. The generator console will display a message when the emergency stop is activated.
44. Check the function of the AEC chamber, the back up timer and mAs. Calibrate if necessary.
45. Check the indication light, by choosing *Wallstand flexible mode* on the generator console. Make sure the Wallstand indication light is lit and that the display handle shows the corresponding mode.

46. 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. See Table 6-1 *Battery Replacement*.

6.4 Software Version / Update

6.4.1 The Software Location

The software is physical located according to the illustration and the table below.

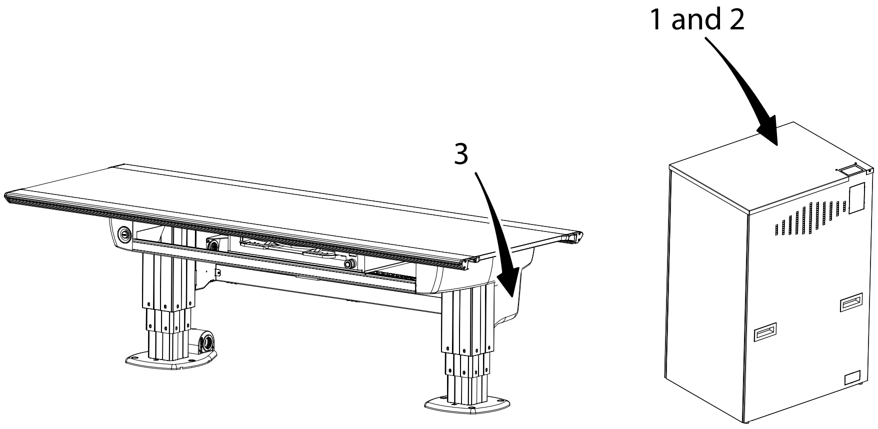


Fig. 6-18

	System software	Connection point for software upload *	Upgrade instruction (UDI)
1.	Cabinet	CB800 in the cabinet	SwUDI_0072.docx
2.	System	FIB-board in the cabinet	SwUDI_0070-T2.docx
3.	Table	CB 2DC5 Board in the Table	SwRLN_0055_x_y_z. pdf

6.4.2 OTC

To see the System software version, start the service software.

The installed version can be seen in the marked square.

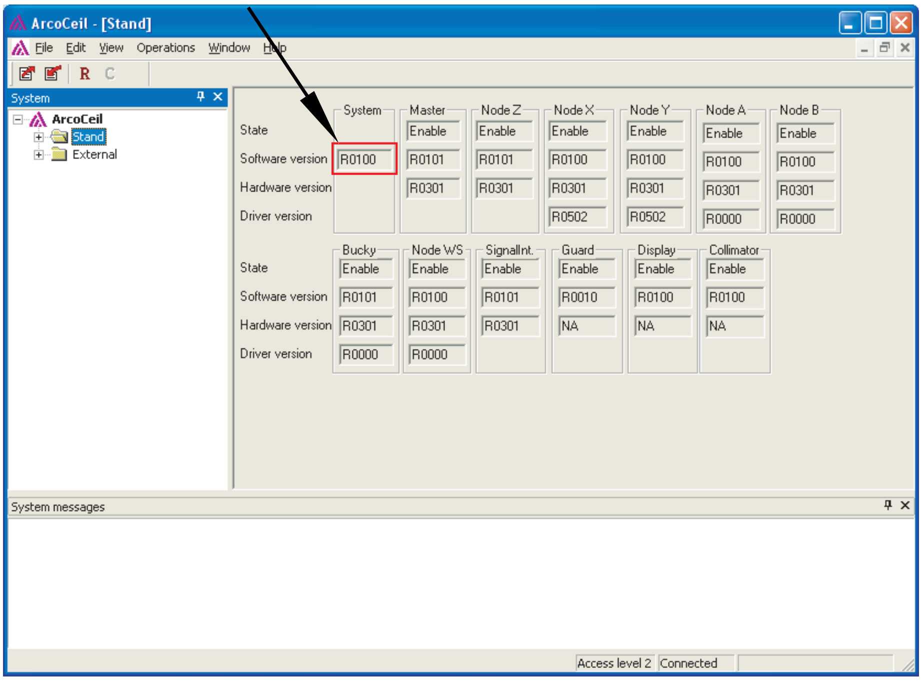


Fig. 6-19

6.4.3 Load Parameters to System

This dialogue is used to load parameters to the System. It is possible to store parameters to either all, or one specific node. One parameter file stores parameters to all nodes, but it is possible to just select specific nodes for new parameters.

To reach the dialogue box:

1. Chose the *Operations* menu and *Load parameters to System*
2. Select the file…: In this field it shall be written the file with all parameters.
3. Select the nodes…: A number of check boxes for each node that shall be updated with new parameters.
4. Select *OK* button to start loading parameters to the System.

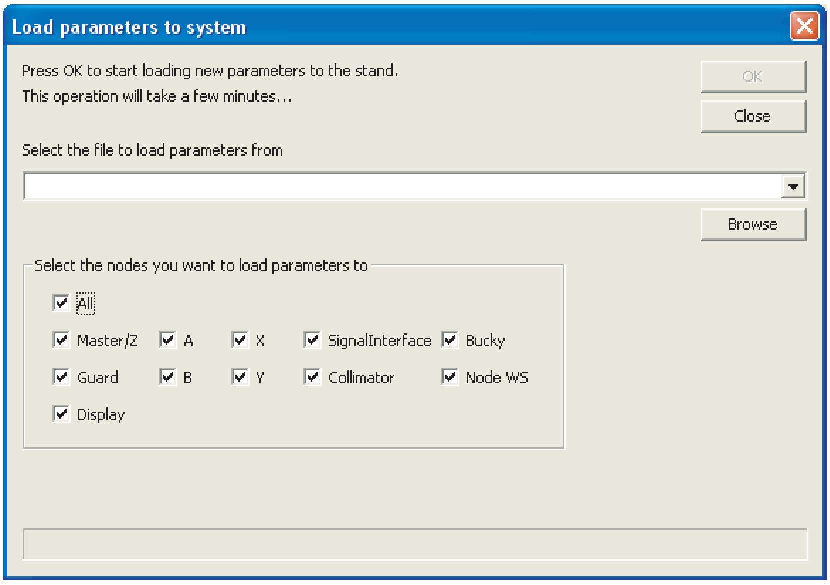


Fig. 6-20

6.4.4 Load Software to System

Refer to SwUDI_0072–C_OTC_x_y_z.pdf and SwUDI_0072–C_System_x_y_z.pdf

7 Diagnostics

7.1 Button Test

1. Enter the *Display node view*, see figure.
2. The System will automatically be set to disable to inhibit any movements during tests.
3. Press a button on the System handlebar.
4. The corresponding LED will turn green and stay green as long as the button is pressed.
5. Press the *Beep* button and the display beeper will sound for a short time
6. Press the *Laser* button and the handlebar laser will be activated for approximately three seconds.
7. Press the *Back light* button and the display back light will be turned off or on.

Note!

The laser and the back light will be set to normal state when the view is closed.

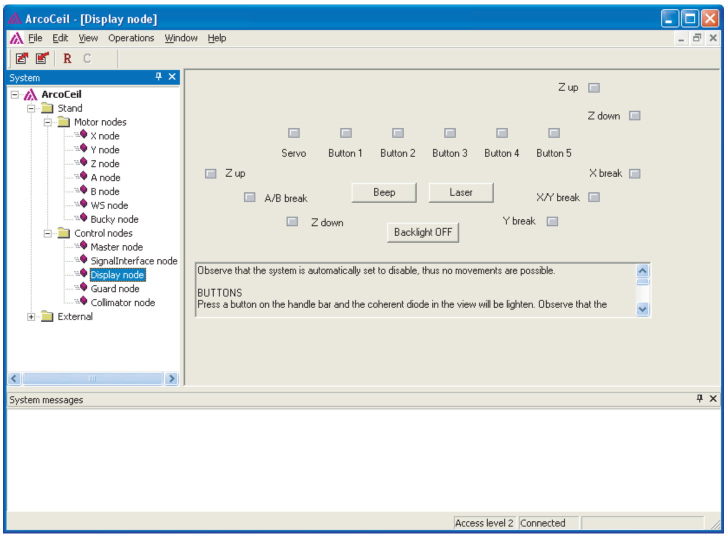


Fig. 7-1

7.2 System Message

7.2.1 Description

System messages are shown in the output view in the service software in the following format:

<Type><Node><Component><Reason><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 do not have any extra information.

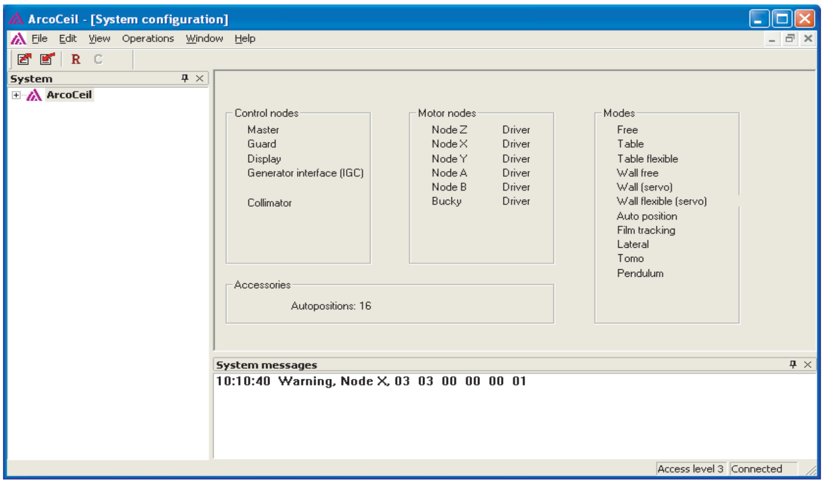


Fig. 7-2

7.2.2 Nodes

There is an over-all System Master node. Then there are 10 different nodes;

Master/Z, Alpha, Beta, Collimator, User Interface, X, Y, SI, Wallstand and Bucky.

7.3 Error Handling

A node is always in a specified state.

When all nodes are working correctly and no errors have been detected, the System and the nodes, are in the ENABLE state. It is only possible to perform active commands in this state. If a node is in some other state it is only possible to request information from a node.

As soon as a problem is detected the node changes its internal state.

In the System, two different error states are specified; one that it is possible to recover from (*ERROR*) and one that is not (*UNRECOVERABLE ERROR*).

One special state is the *DISABLE* state that is used to force a node to not perform any active commands.

It is however possible to change to *ENABLE* state with just one command, for example in case of an emergency stop button pressed.

It is also possible to check state of the node via the LED-indication on the control board of the node.

The diode indication will always reflect the state priority for the physical node. A node that receives CAN messages for a number of nodes, will indicate the state with the highest priority. For example if one logical node is in the enable state and the other is in the disable state, the diodes shall show the disable state indication.

7.3.1 CB-board

The CB-board has a number of diodes (led) that are used as indication on different states and events in the System.

The following is a description on each diodes value.

Fig. 7-3

Diode 1	Diode 2	Node State	Priority
Off	Off	Enable	4 = Low
Off	On	Disable	3
On	Off	Startup/Init	2
On	On	NonRecoverableError / Error	1 = High

Diode 1 and 2 will indicate the node state.

Diode 3 shall toggle each time a message is received.

Diode 4 indicates that logic power exists.

7.3.2 CB800-board

7.3.2.1 General Description

The symbols in the table below are throughout this document used to show the different LED states.

LED symbol		Description
Slow (1Hz)	Fast (5Hz)	
		Off.
		Constant green.
		Constant red.
		Blinking green
		Blinking red.
		Alternating green/red.

The top (first) LED is used to show the overall status of the board, the usage of the other three depends on the first.

Top LED	Description	Limitations
	Everything is ok, both software and hardware, the application is running. The usage of the other LEDs may be different for every board in the system. The System Manual shall for every board describe the usage of these LEDs.	None of the other LEDs may show constant or blinking red.
	Reserved for Boot applications.	None of the other LEDs may show constant or blinking red.
	The application (or bootloader) has encountered an error. The reason may be a hardware error but the error cause cannot be exactly pin-pointed as a hardware error. The usage of the other LEDs may be different for every board in the System. The System Manual shall for every board describe the usage of these LEDs.	None

Top LED	Description	Limitations
	A hardware error has been detected. The usage of the other LEDs shall be identical for all boards in all Systems.	None
	May be used to show that the application (or bootloader) has encountered an error. Constant red or alternating green/red should be used instead.	

7.3.2.2 Hardware Error

The table below shows the LED indications for various hardware errors.

LED	Description	Limitations
	No bootloader image found. All boards shall have a bootloader installed	This is shown by the bootstrap application.
	RAM error. The memory test found an error in the SDRAM.	
	NAND-flash error. A boot application image was found, but the image had a CRC error. This may also be an undetected SDRAM error.	
	Processor internal error.	

7.3.3 Hardware Key

To identify the current configuration in the System, the dialogue box *Hardware Key Mask* is used.

The hardware key is made based on the ordered options for the System. The information describes the setting unique for each System.

It is possible to disable functionality in the System by unmarking a check box. This could be helpful if a node is broken. Then it is still possible to use the System if the node is removed.

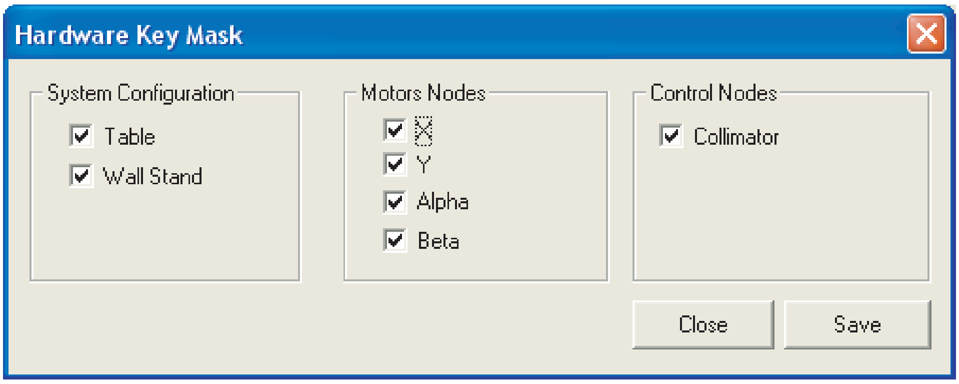


Fig. 7-4

1. To reach the dialogue box chose *Edit menu* and *HW-Key Mask* from the ceiling System service software.
2. Make your chooses in the dialogue box
3. Press *Close* to return without saving changes
4. Press *Save* to save parameters.

Descriptions of dialogue box options;

System Configuration:	Current configuration for the System; - Wallstand - Table or - Table and Wallstand
MotorNodes:	Nodes with motorized movement.
ControlNodes:	Nodes with specific control functionality, for example to control the collimator.

7.4 System Message for Table

7.4.1 General

The messages can be seen at the *Service program*. If the action says “Contact dealer”, the entire error message shall be noted and given to dealer.

The service software can be used to check that a valid System software release is used. 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.

7.4.2 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.>*.

7.4.2.1 Definitions

The following ID:s are used to identify the node in a System message.

Node	Id
Master	1
Z1	2
Z2	3
Guard	4

Fig. 7-5 IDs used to identify the different nodes in a System message

7.4.3 All Nodes

7.4.3.1 Components 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.

7.4.3.2 Components 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 that 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 24V logic voltage, measure at the logic power connector to the board.

7.4.3.3 Motor Nodes

Definitions

The following collision types is defined.

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.

7.4.3.4 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.

7.4.3.5 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.

7.4.3.6 Component ID11, 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.

7.4.3.7 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.

7.4.3.8 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.

7.4.3.9 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.

7.4.3.10 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.

7.4.3.11 Component ID42, 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.

7.4.3.12 Component ID 50, Movement Manager Component

Table 7-1

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.

7.4.3.13 Component ID 54, Single Movement Component

Table 7-2

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.	- Check that the table top is levelled, 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.

7.4.3.14 Component ID 55, Auto Position Component

Table 7-3

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 levelled, 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.

7.4.3.15 Component ID 56, Brake Movement Component

Table 7-4

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.	- Check that the table top is levellled. - Check the angle given from the tilt sensor.

7.4.3.16 Component ID 57, Double Movement Component

Table 7-5

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.	- Check that the table top is levelled, 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.

7.4.3.17 Component ID 70, Supervisor Component

Table 7-6

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 doesn't 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 movements.	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 levelled (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.

7.4.3.18 Component ID 80, Node Component

Table 7-7

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.

7.4.3.19 Component ID 81, Slave Node Component

Table 7-8

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 LEDs 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.

7.4.3.20 Component ID 90, Foot Pedal Component

Table 7-9

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.
02 DMG time-out	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.

7.4.3.21 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.	

7.4.3.22 Master Node

Definitions

The information in the tables below refer to the notes in the column “Extra” in the tables above.

Table 7-10 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 Y 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 7-11 IDs used to identify the different parts within the master

Source id	Id		Source id	id
None	0		Movement auto position	16
Internal	1		System message manager	30
Supervisor	2		Motor Z1	40
System	3		Motor Z2	41
Master	4		Guard	42
Movement manager	10		Foot pedal	50
Movement Z1	11		Emergency switch	51
Movement Z2	12		Tilt sensor	52
Movement table top X	13		CLI handler	60
Movement table top Y	14		ACAN client	61
Movement table top	15			

Table 7-12 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 7-13 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

7.4.4 Service Logs

For information about exporting Service Logs see .

8 Electrical drawings

8.1 Notes regarding the electrical drawings

- Options are not available on all markets.
- Where electrical drawings describes several versions, C is applicable for Omnera 400A.
- Electrical drawings for CXDI410C and 710C are also valid for CXDI402C and 702C.

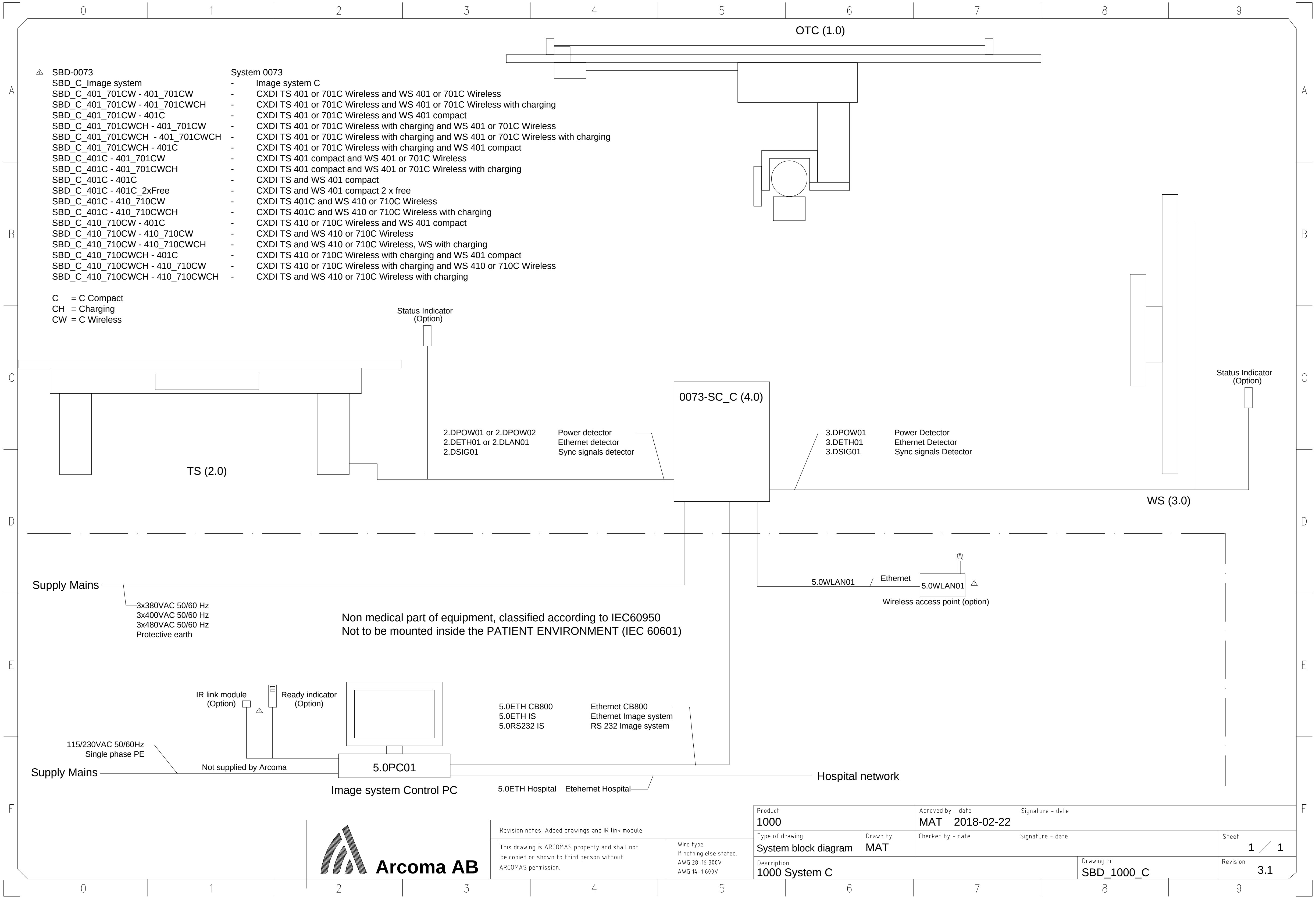
Note!

All references to colour of electrical cables might be different in the final installation.

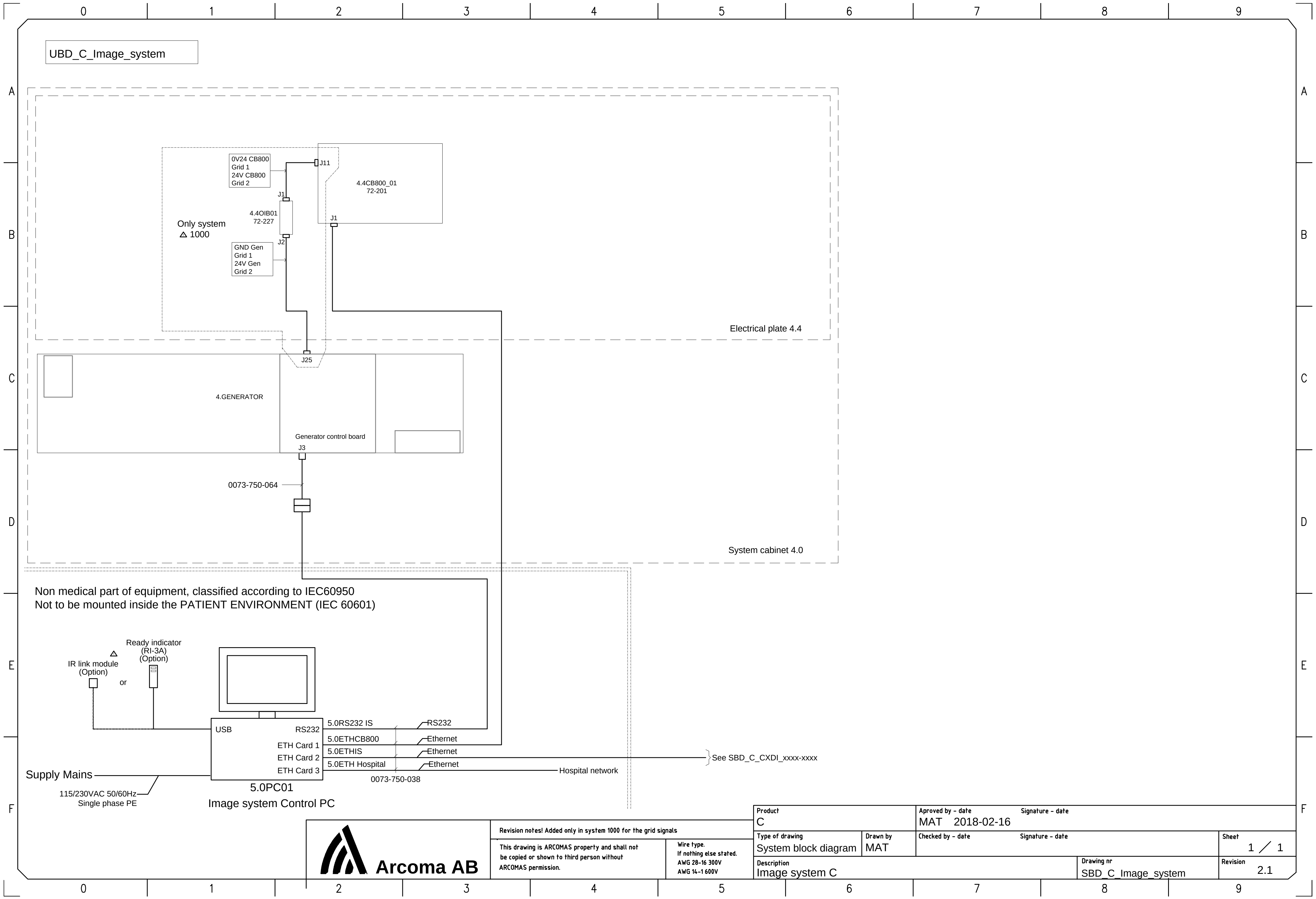
Please refer to the cable text!

8.2 System block diagram (C valid for Omnera 400A)

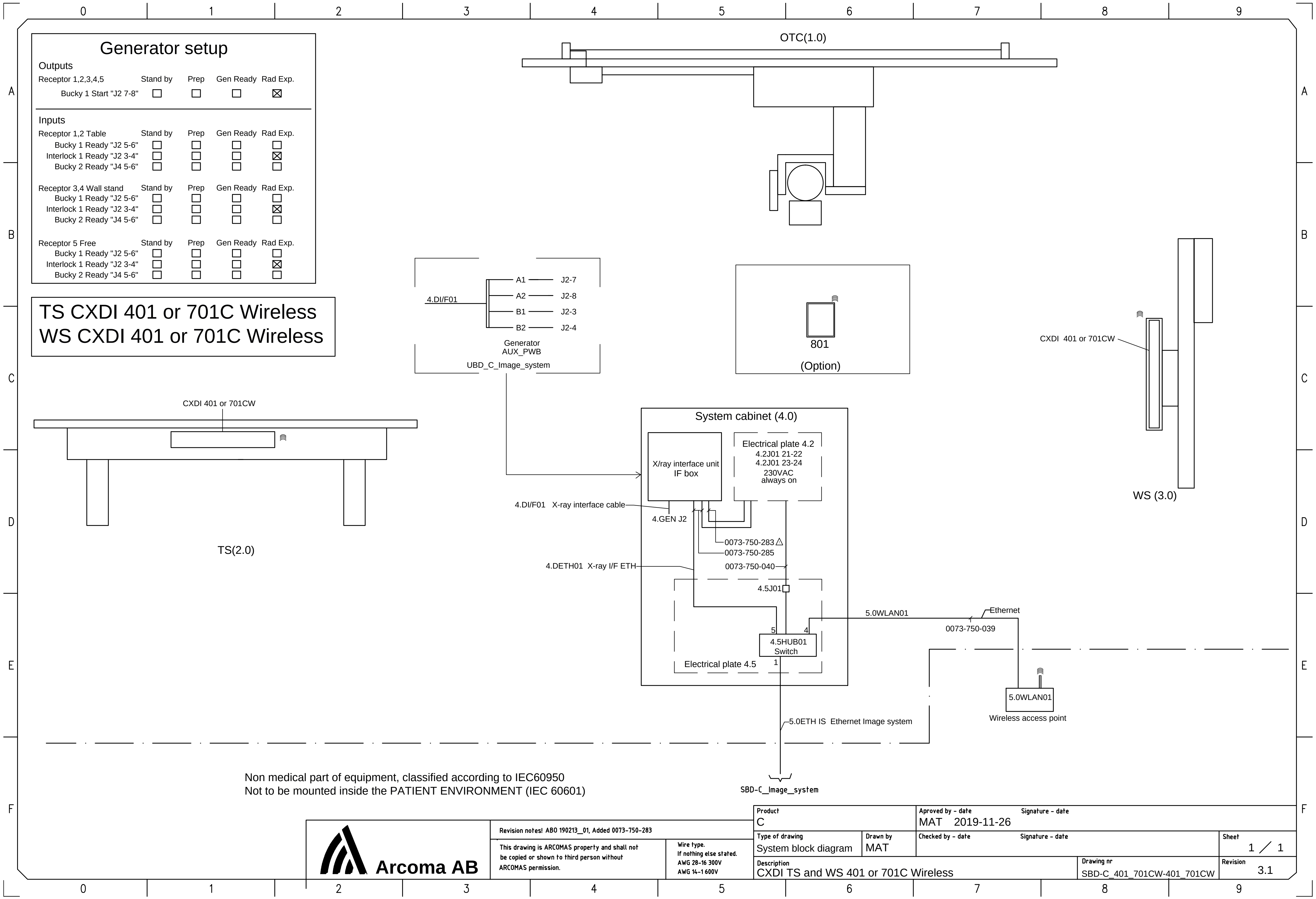
8.2.1 System

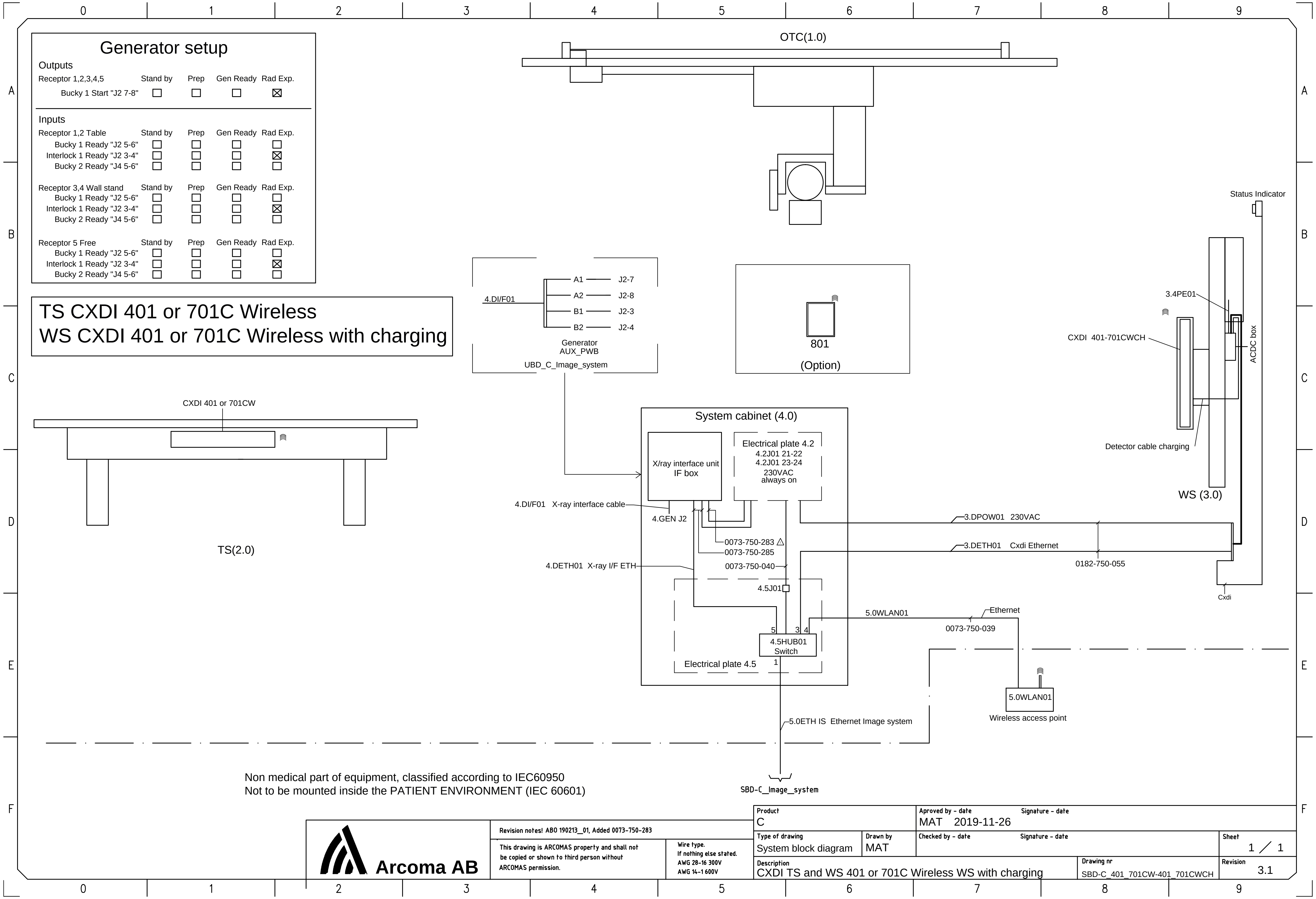

OTC (1.0)
SBD-0073
SBD_C_Image system
SBD_C_401_701CW - 401_701CW
SBD_C_401_701CW - 401_701CWCH
SBD_C_401_701CW - 401C
SBD_C_401_701CWCH - 401_701CW
SBD_C_401_701CWCH - 401_701CWCH
SBD_C_401_701CWCH - 401C
SBD_C_401C - 401_701CW
SBD_C_401C - 401_701CWCH
SBD_C_401C - 401C
SBD_C_401C - 401C_2xFree
SBD_C_401C - 410_710CW
SBD_C_401C - 410_710CWCH
SBD_C_410_710CW - 401C
SBD_C_410_710CW - 410_710CW
SBD_C_410_710CW - 410_710CWCH
SBD_C_410_710CWCH - 401C
SBD_C_410_710CWCH - 410_710CW
SBD_C_410_710CWCH - 410_710CWCH
System 0073
- Image system C
- CXDI TS 401 or 701C Wireless and WS 401 or 701C Wireless
- CXDI TS 401 or 701C Wireless and WS 401 or 701C Wireless with charging
- CXDI TS 401 or 701C Wireless and WS 401 compact
- CXDI TS 401 or 701C Wireless with charging and WS 401 or 701C Wireless
- CXDI TS 401 or 701C Wireless with charging and WS 401 or 701C Wireless with charging
- CXDI TS 401 or 701C Wireless with charging and WS 401 compact
- CXDI TS 401 compact and WS 401 or 701C Wireless
- CXDI TS 401 compact and WS 401 or 701C Wireless with charging
- CXDI TS and WS 401 compact
- CXDI TS and WS 401 compact 2 x free
- CXDI TS 401C and WS 410 or 710C Wireless
- CXDI TS 401C and WS 410 or 710C Wireless with charging
- CXDI TS 410 or 710C Wireless and WS 401 compact
- CXDI TS and WS 410 or 710C Wireless
- CXDI TS and WS 410 or 710C Wireless, WS with charging
- CXDI TS 410 or 710C Wireless with charging and WS 401 compact
- CXDI TS 410 or 710C Wireless with charging and WS 410 or 710C Wireless
- CXDI TS and WS 410 or 710C Wireless with charging
C = C Compact
CH = Charging
CW = C Wireless
Status Indicator (Option)
TS (2.0)
2.DPOW01 or 2.DPOW02
2.DETH01 or 2.DLAN01
2.DSIG01
Power detector
Ethernet detector
Sync signals detector
0073-SC_C (4.0)
3.DPOW01
3.DETH01
3.DSIG01
Power Detector
Ethernet Detector
Sync signals Detector
Status Indicator (Option)
WS (3.0)
Supply Mains
3x380VAC 50/60 Hz
3x400VAC 50/60 Hz
3x480VAC 50/60 Hz
Protective earth
5.0WLAN01
Ethernet
5.0WLAN01
Wireless access point (option)
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
IR link module (Option)
Ready indicator (Option)
5.0ETH CB800
5.0ETH IS
5.0RS232 IS
Ethernet CB800
Ethernet Image system
RS 232 Image system
115/230VAC 50/60Hz
Single phase PE
Supply Mains
Not supplied by Arcoma
5.0PC01
Image system Control PC
5.0ETH Hospital
Etehernet Hospital
Hospital network
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
1000
Aproved by - date
MAT 2018-02-22
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
1000 System C
Drawing nr
SBD_1000_C
Revision
3.1

8.2.2 Image system

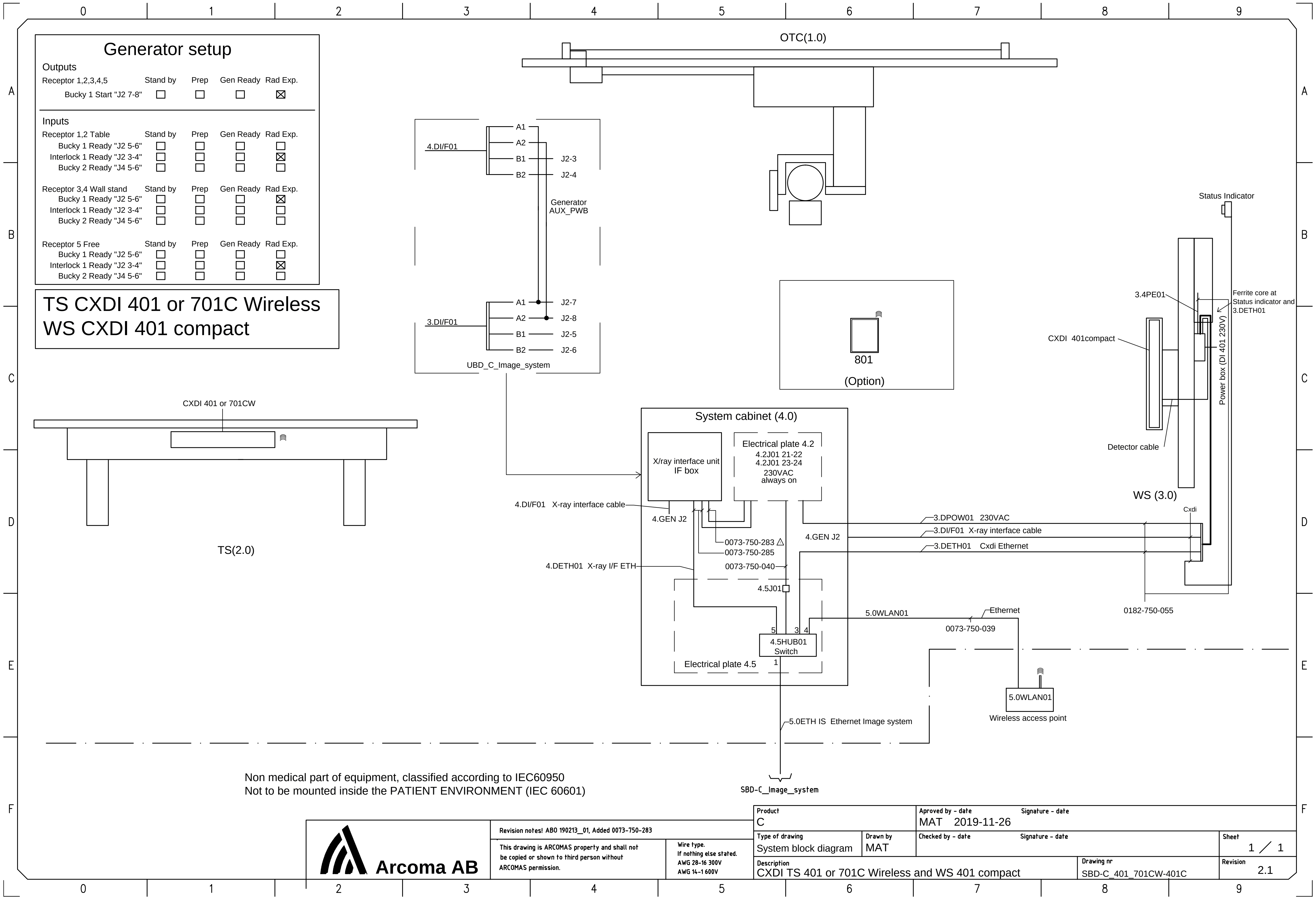


UBD_C_Image_system
0V24 CB800
Grid 1
24V CB800
Grid 2
J11
4.4CB800_01
72-201
J1
4.4OIB01
72-227
J2
Only system
1000
GND Gen
Grid 1
24V Gen
Grid 2
Electrical plate 4.4
J25
4.GENERATOR
Generator control board
J3
0073-750-064
System cabinet 4.0
Non medical part of equipment, classified according to IEC60950
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
See SBD_C_CXDI_xxxx-xxxx
Hospital network
0073-750-038
Supply Mains
115/230VAC 50/60Hz
Single phase PE
5.0PC01
Image system Control PC
Arcoma AB
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
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
WS (3.0)
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
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
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
SBD-C_Image_system
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 MAT 2019-11-26
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 or 701C Wireless
Drawing nr SBD-C_401_701CW-401_701CW
Revision 3.1

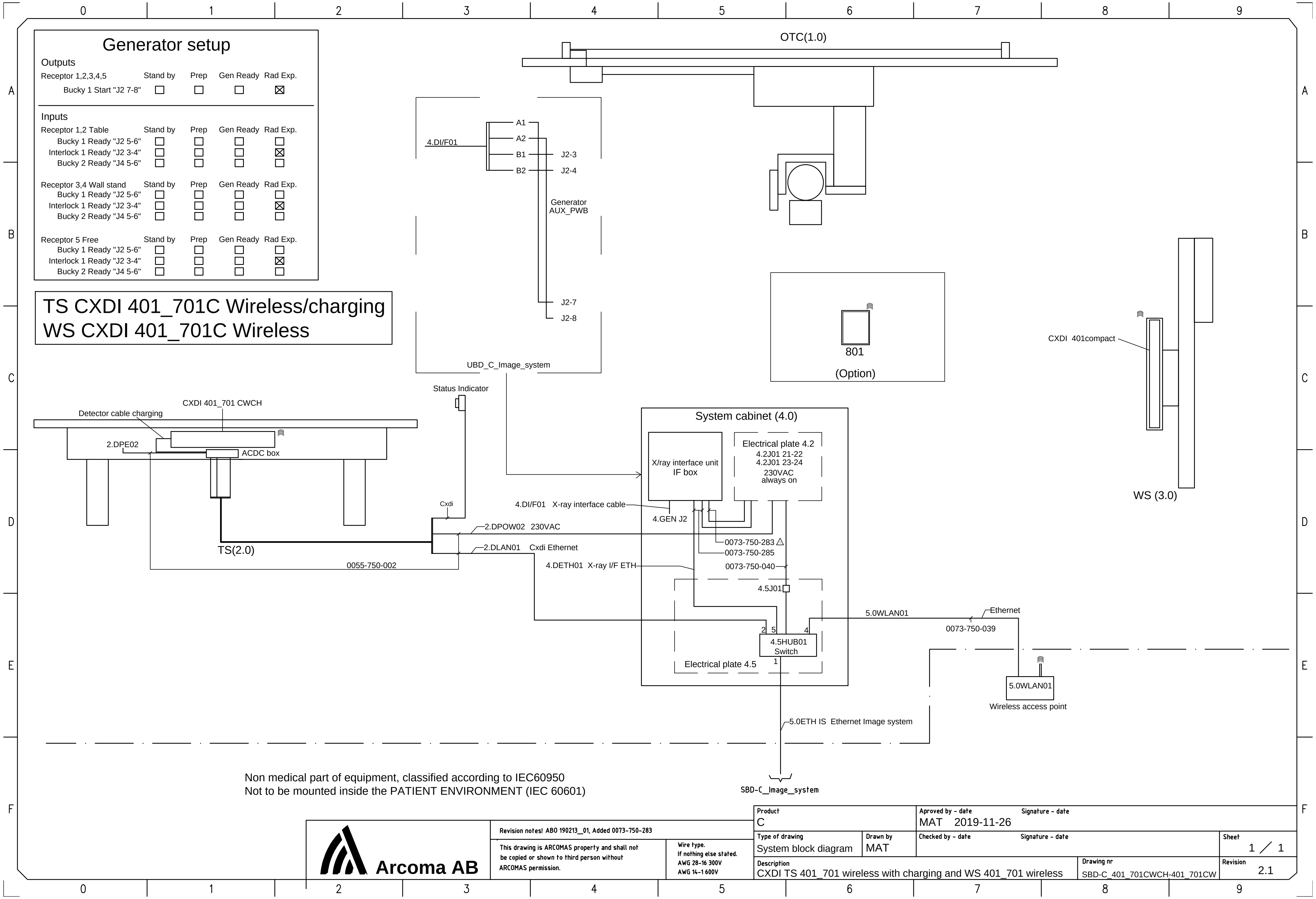


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
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)
Status Indicator
3.4PE01
CXDI 401-701CWCH
ACDC box
Detector cable charging
WS (3.0)
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
5 3 4
4.5HUB01
Switch
1
Electrical plate 4.5
3.DPOW01 230VAC
3.DETH01 Cxdi Ethernet
0182-750-055
Cxdi
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 MAT 2019-11-26
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 or 701C Wireless WS with charging
Drawing nr SBD-C_401_701CW-401_701CWCH
Revision 3.1

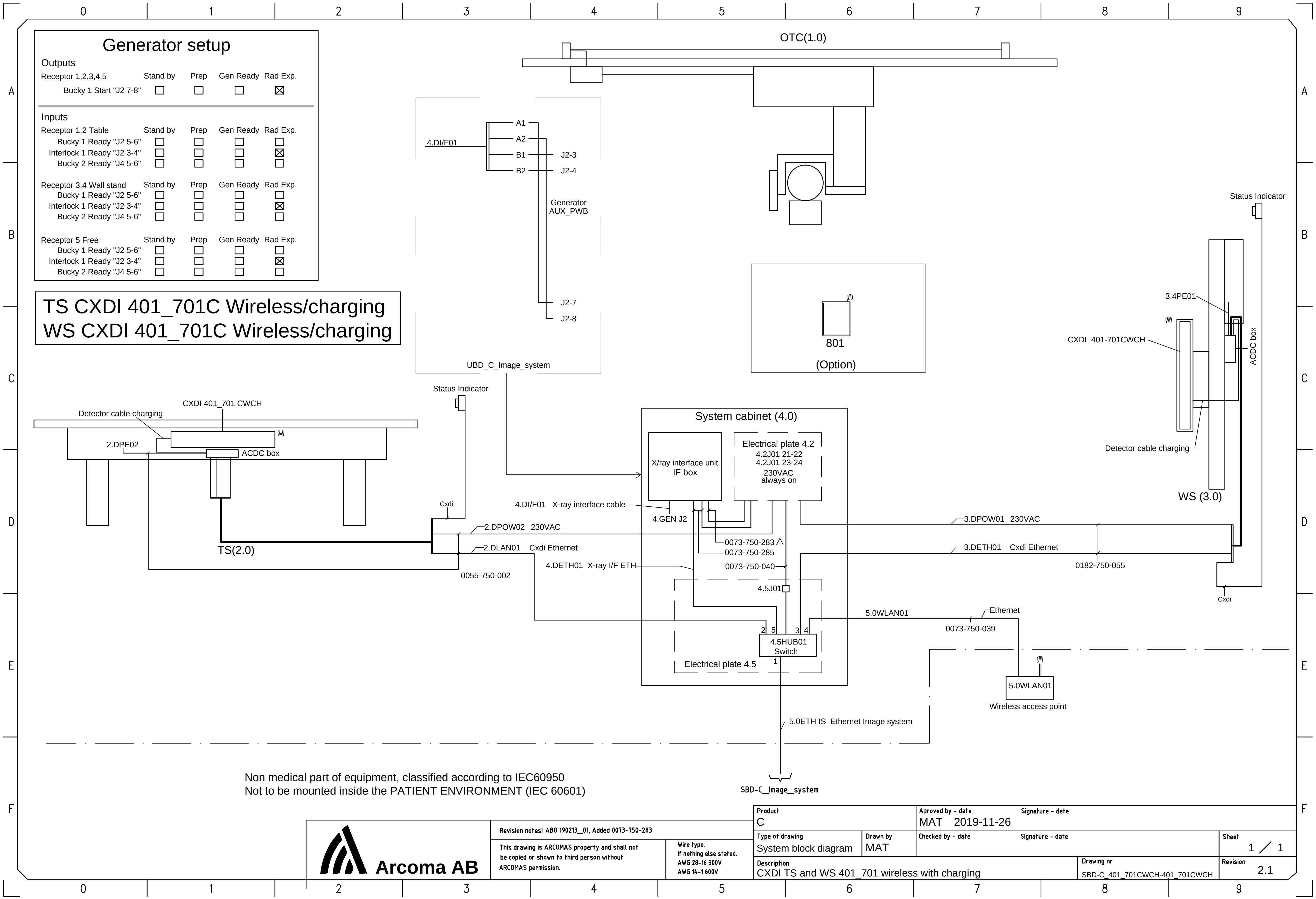


Generator setup

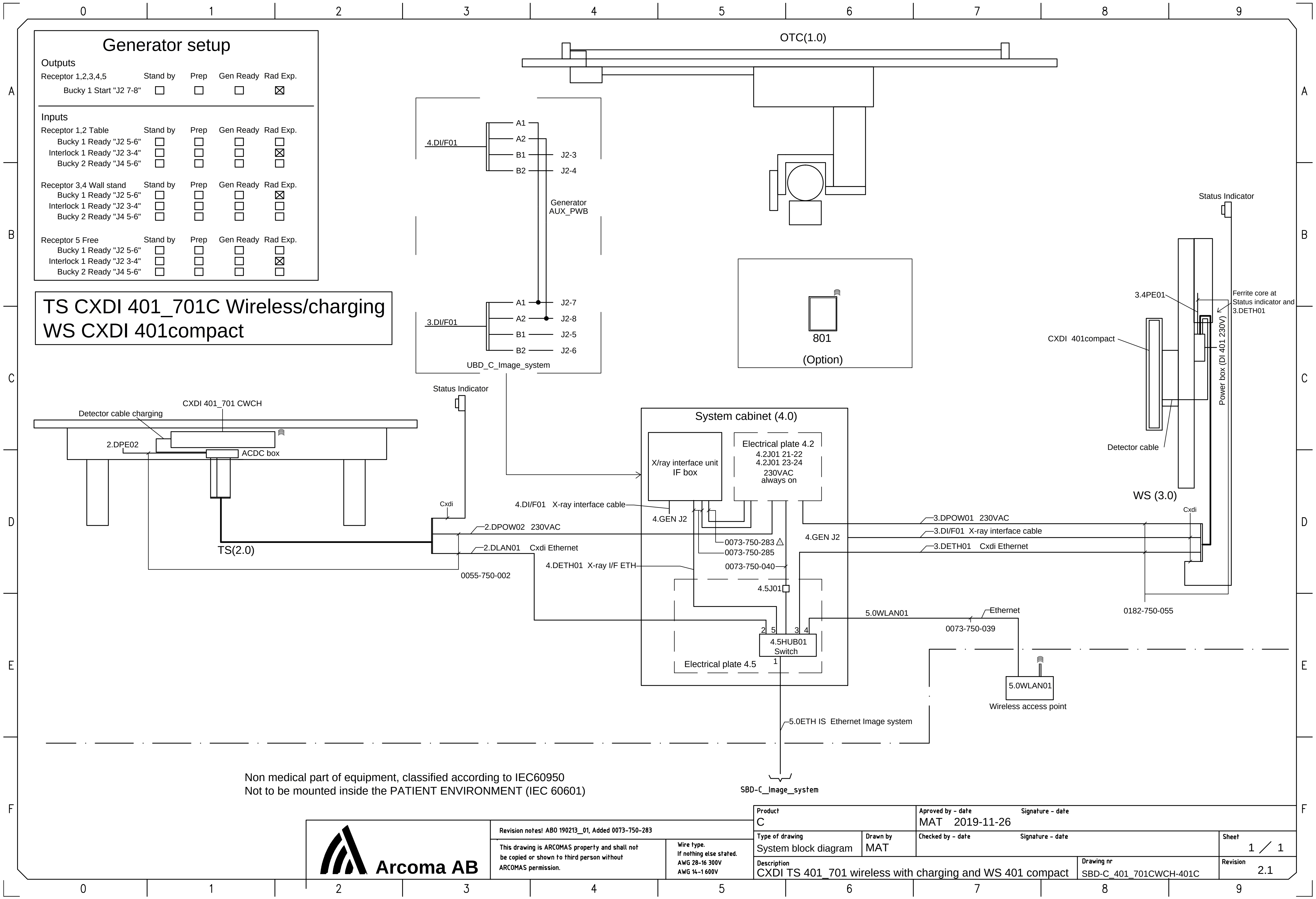
Outputs	Stand by	Prep	Gen Ready	Rad Exp.
Receptor 1,2,3,4,5				
Bucky 1 Start "J2 7-8"	☐	☐	☐	☒
Inputs				
Receptor 1,2 Table	Stand by	Prep	Gen Ready	Rad Exp.
Bucky 1 Ready "J2 5-6"	☐	☐	☐	☐
Interlock 1 Ready "J2 3-4"	☐	☐	☐	☒
Bucky 2 Ready "J4 5-6"	☐	☐	☐	☐
Receptor 3,4 Wall stand	Stand by	Prep	Gen Ready	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"	☐	☐	☐	☐



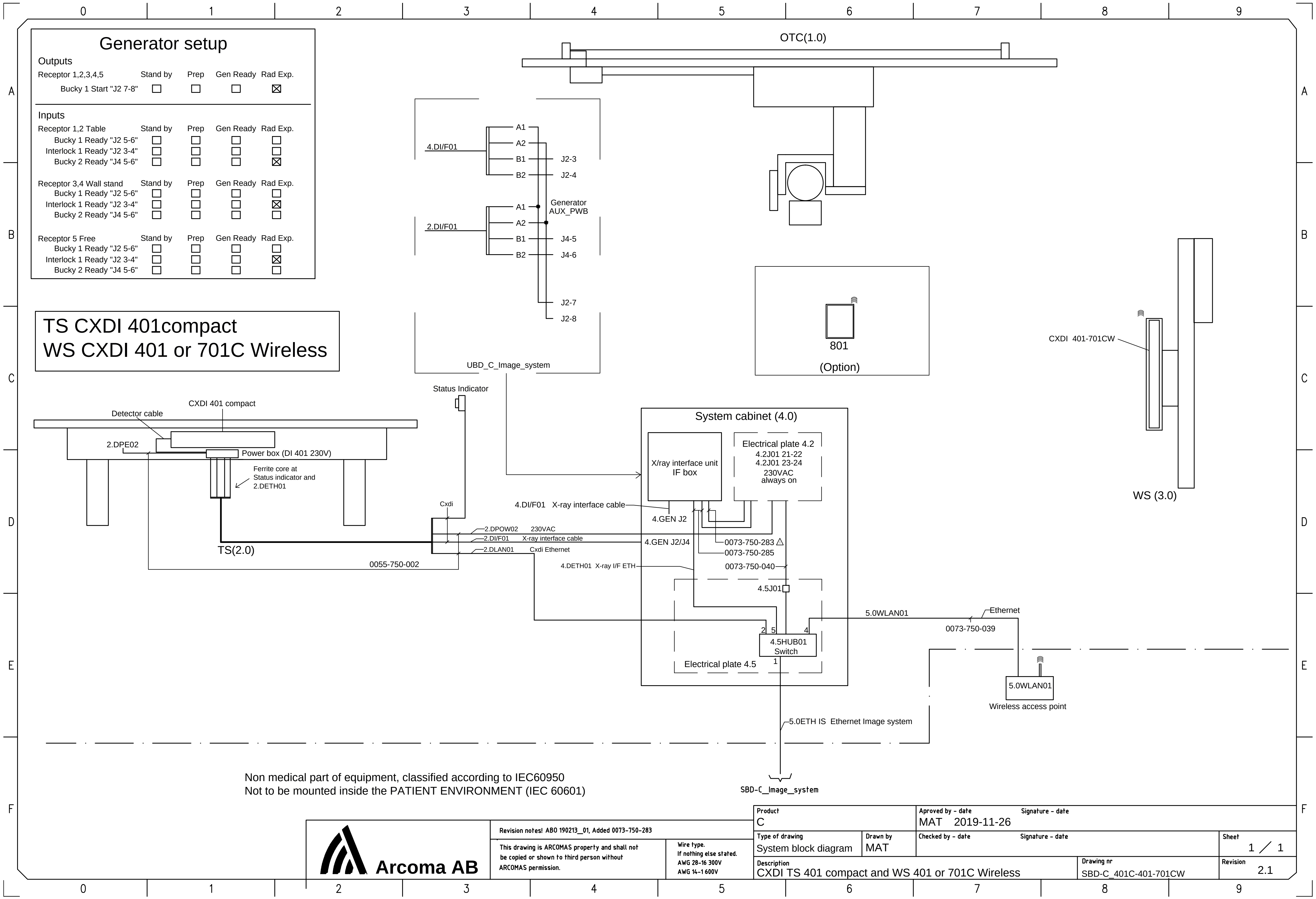
Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
B2
J2-3
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
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
Cxdi
4.DI/F01 X-ray interface cable
4.GEN J2
2.DPOW02 230VAC
2.DLAN01 Cxdi Ethernet
TS(2.0)
0055-750-002
4.DETH01 X-ray I/F ETH
0073-750-283
0073-750-285
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 MAT 2019-11-26
Signature - date
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



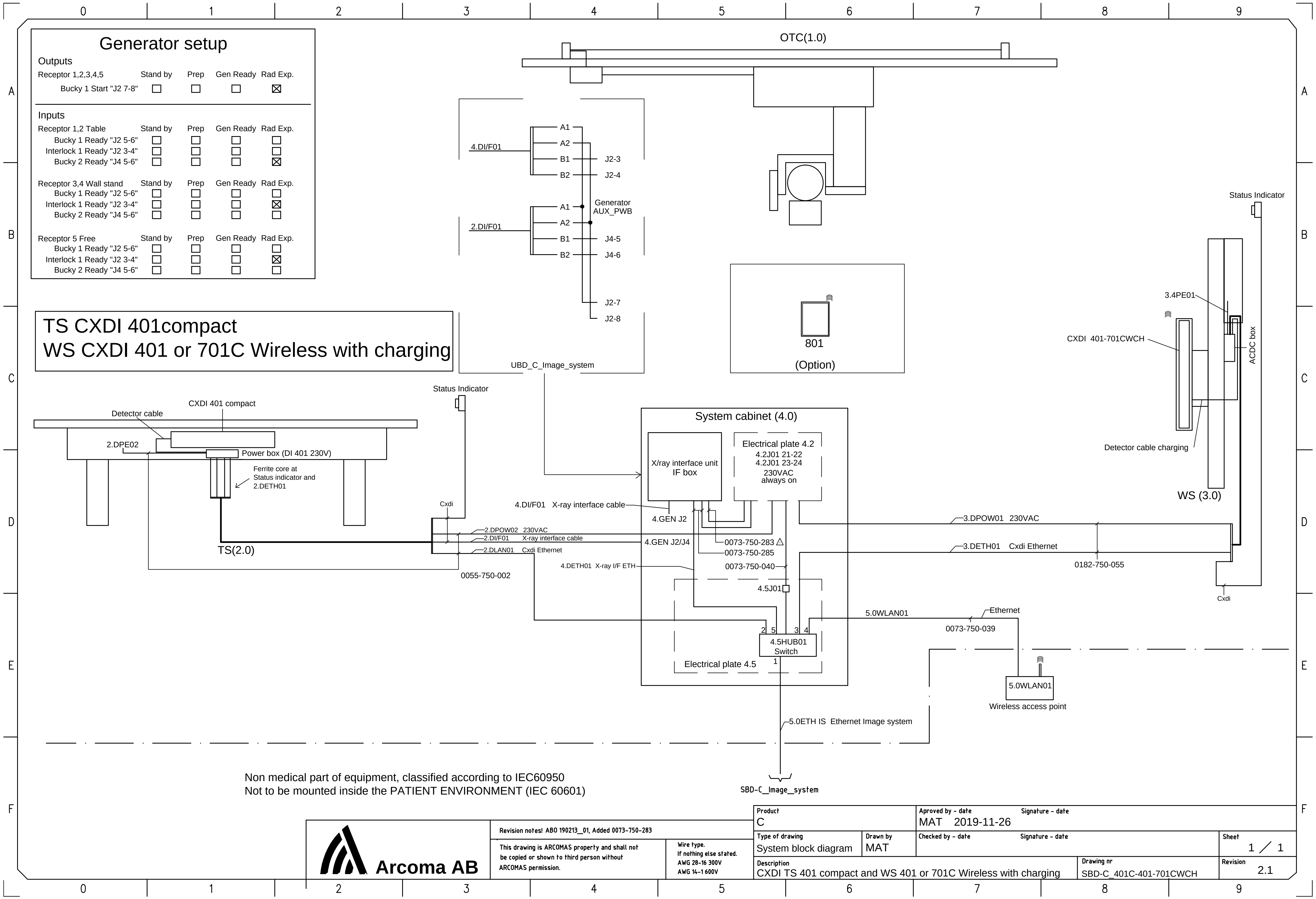
Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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)
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
Cxdi
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
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 MAT 2019-11-26
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_701 wireless with charging
Drawing nr SBD-C_401_701CWCH-401_701CWCH
Revision 2.1

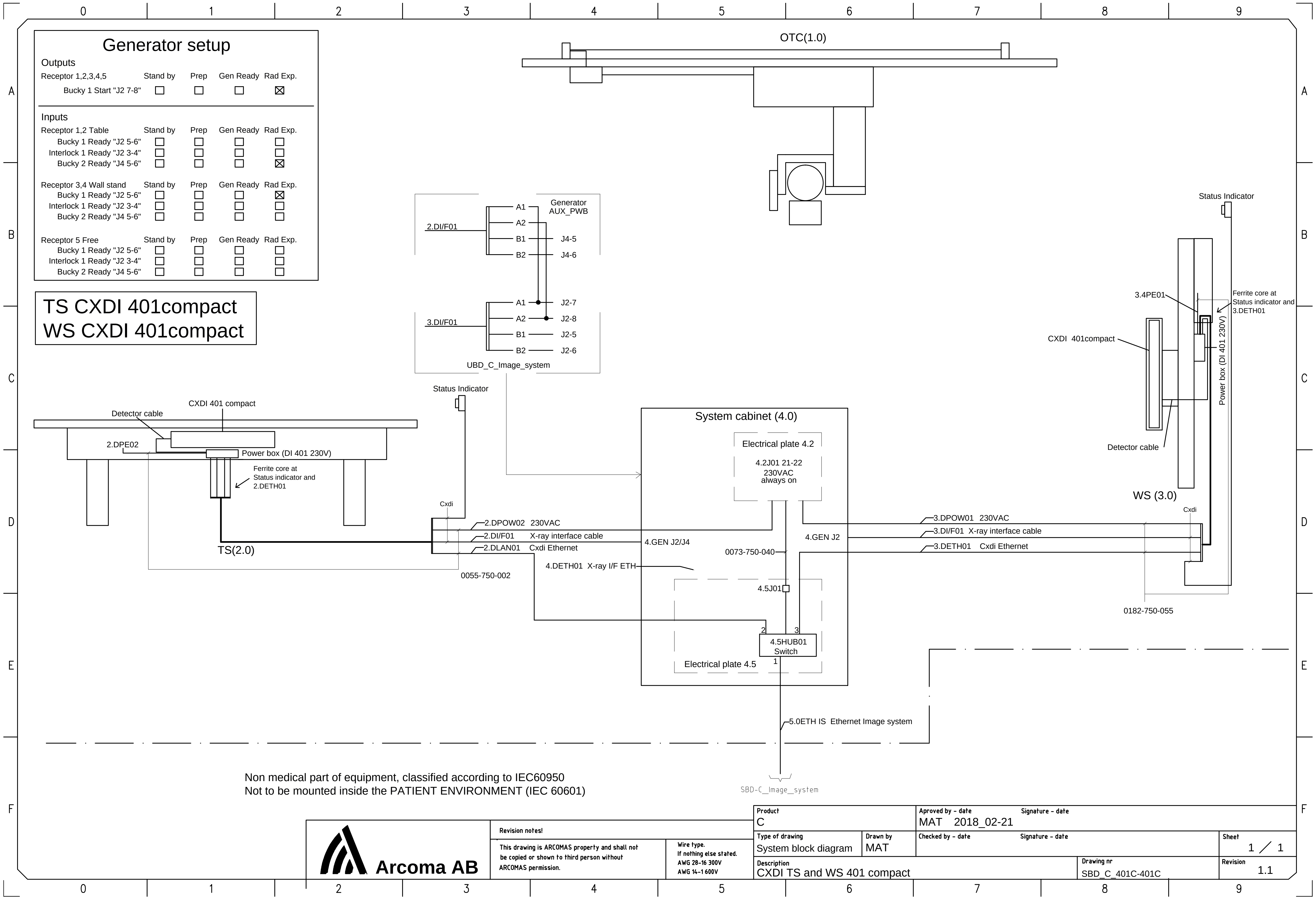


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
4.DI/F01 X-ray interface cable
2.DPOW02 230VAC
2.DLAN01 Cxdi Ethernet
4.DETH01 X-ray I/F ETH
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.GEN J2
0073-750-283
0073-750-285
0073-750-040
4.5J01
4.5HUB01 Switch
Electrical plate 4.5
5.0WLAN01
0073-750-039
Ethernet
5.0WLAN01
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
0182-750-055
WS (3.0)
3.4PE01
CXDI 401compact
Detector cable
Ferrite core at Status indicator and 3.DETH01
Power box (DI 401 230V)
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 MAT 2019-11-26
Signature - date
Type of drawing System block diagram
Drawn by MAT
Checked by - 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

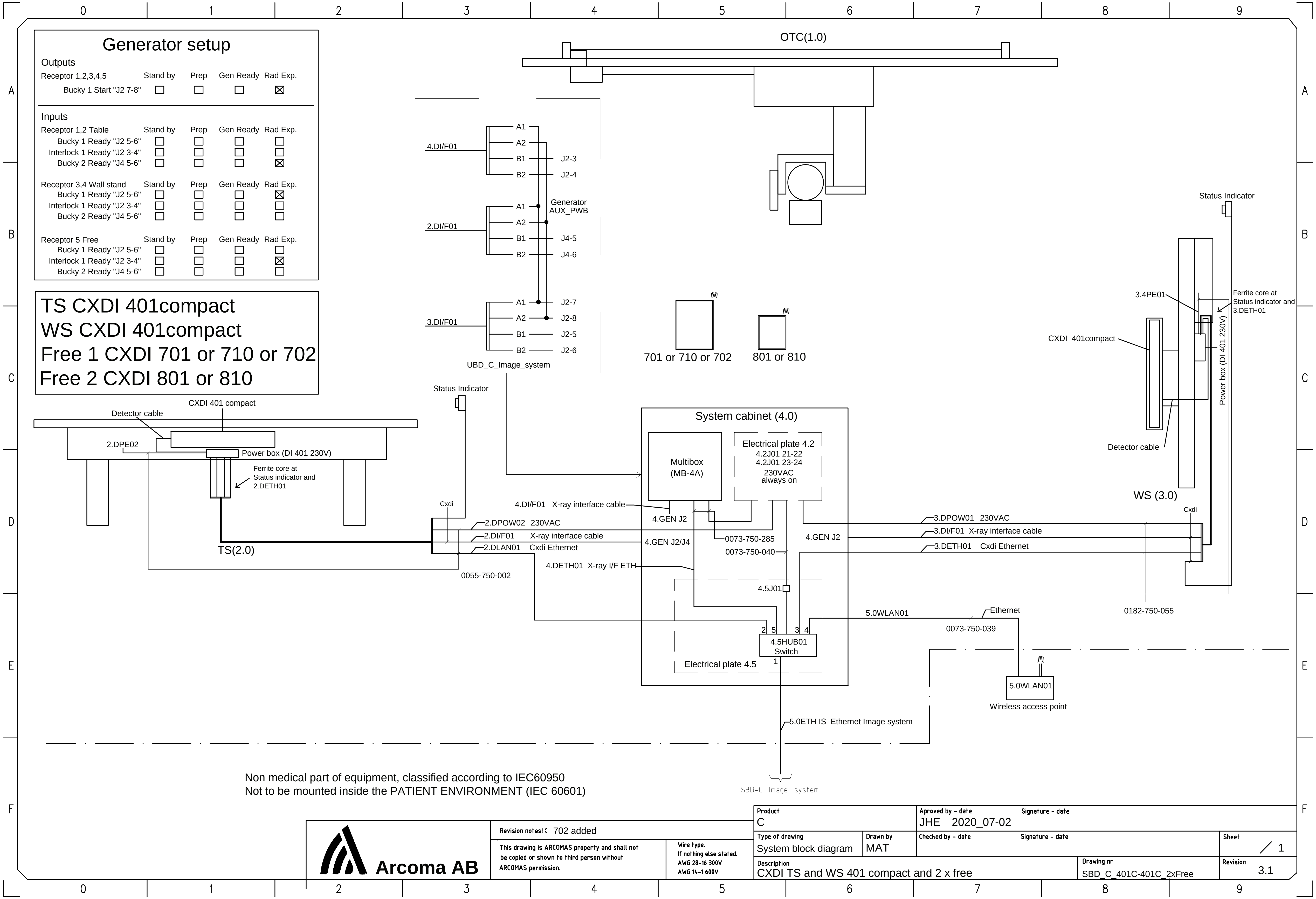


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
2.DI/F01
A1
A2
B1
B2
J2-3
J2-4
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
Cxdi
TS(2.0)
0055-750-002
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
4.DI/F01 X-ray interface cable
4.DETH01 X-ray I/F ETH
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
4.GEN J2/J4
0073-750-283
0073-750-285
0073-750-040
4.5J01
4.5HUB01
Switch
Electrical plate 4.5
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
MAT 2019-11-26
Signature - date
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

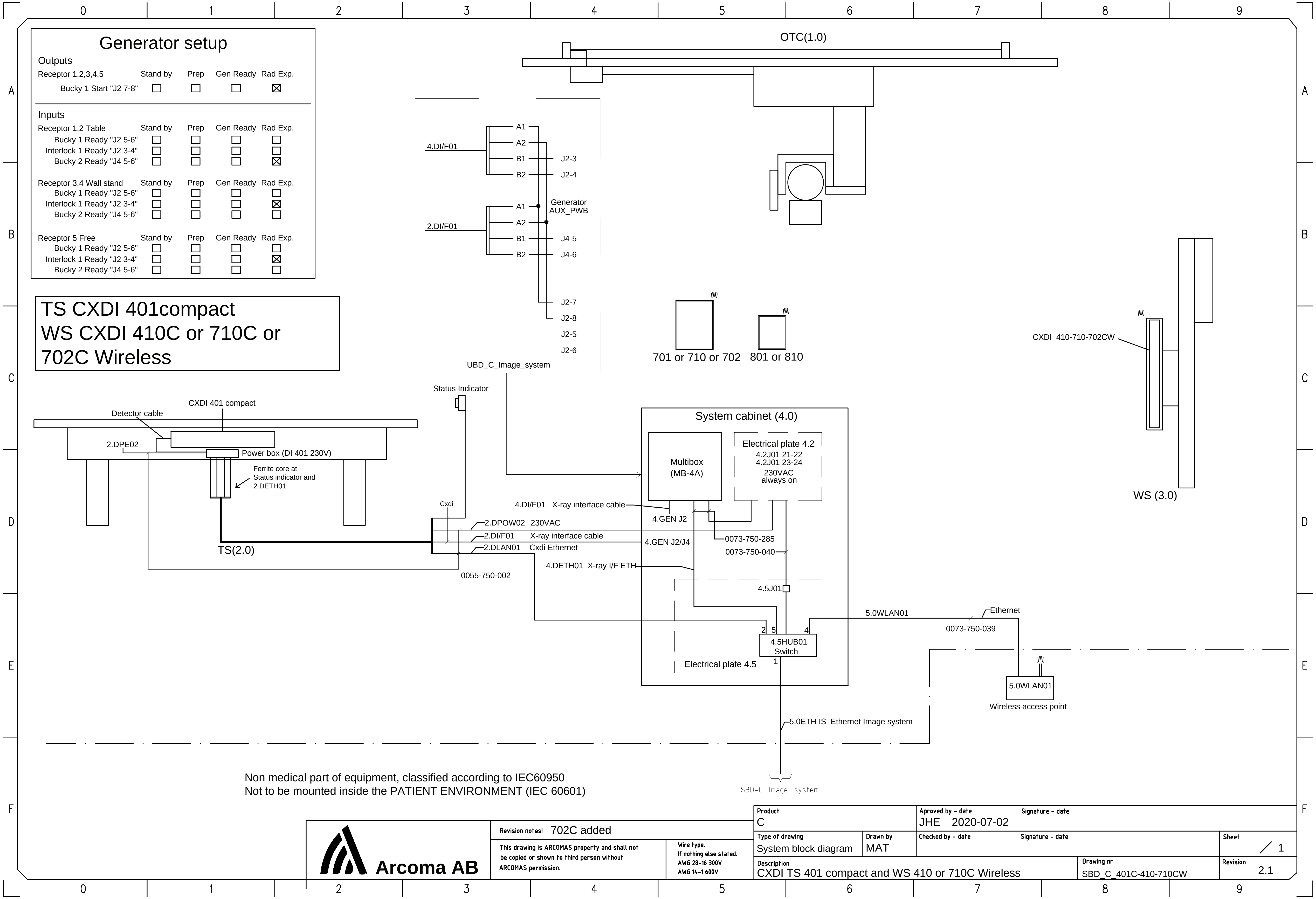

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
Generator AUX_PWB
J4-5 J4-6
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 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.DI/F01 X-ray interface cable
4.DETH01 X-ray I/F ETH
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
4.GEN J2/J4
0073-750-283
0073-750-285
0073-750-040
4.5J01
4.5HUB01 Switch
Electrical plate 4.5
3.DPOW01 230VAC
3.DETH01 Cxdi Ethernet
0182-750-055
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 MAT 2019-11-26
Signature - date
Type of drawing System block diagram
Drawn by MAT
Checked by - 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



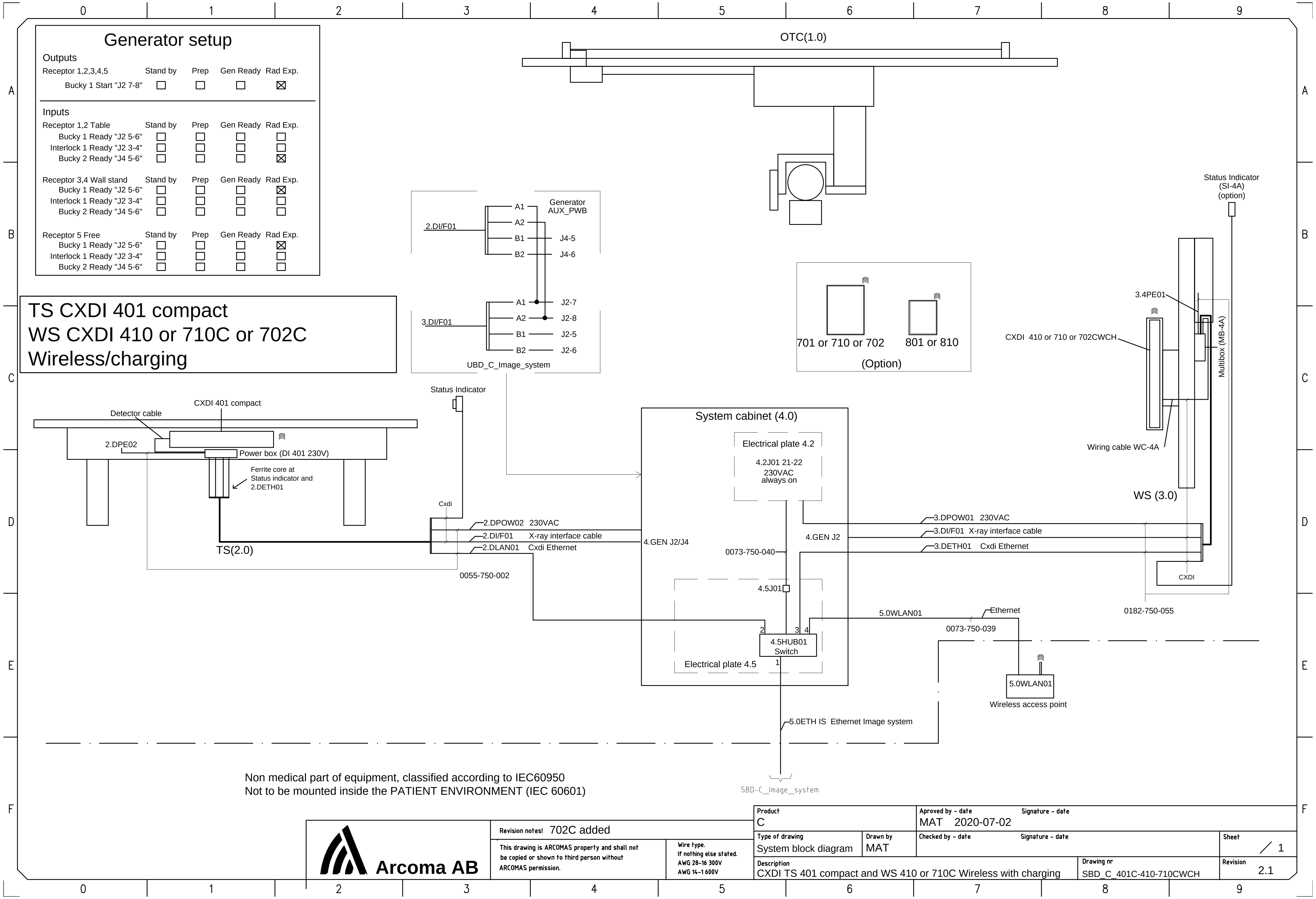
Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
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
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)
Electrical plate 4.2
4.2J01 21-22
230VAC
always on
4.GEN J2/J4
4.GEN J2
0073-750-040
4.DETH01 X-ray I/F ETH
4.5J01
4.5HUB01
Switch
Electrical plate 4.5
5.0ETH IS Ethernet Image system
SBD-C_Image_system
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!
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 MAT 2018_02-21
Signature - date
Type of drawing System block diagram
Drawn by MAT
Checked by - date
Sheet 1 / 1
Description CXDI TS and WS 401 compact
Drawing nr SBD_C_401C-401C
Revision 1.1

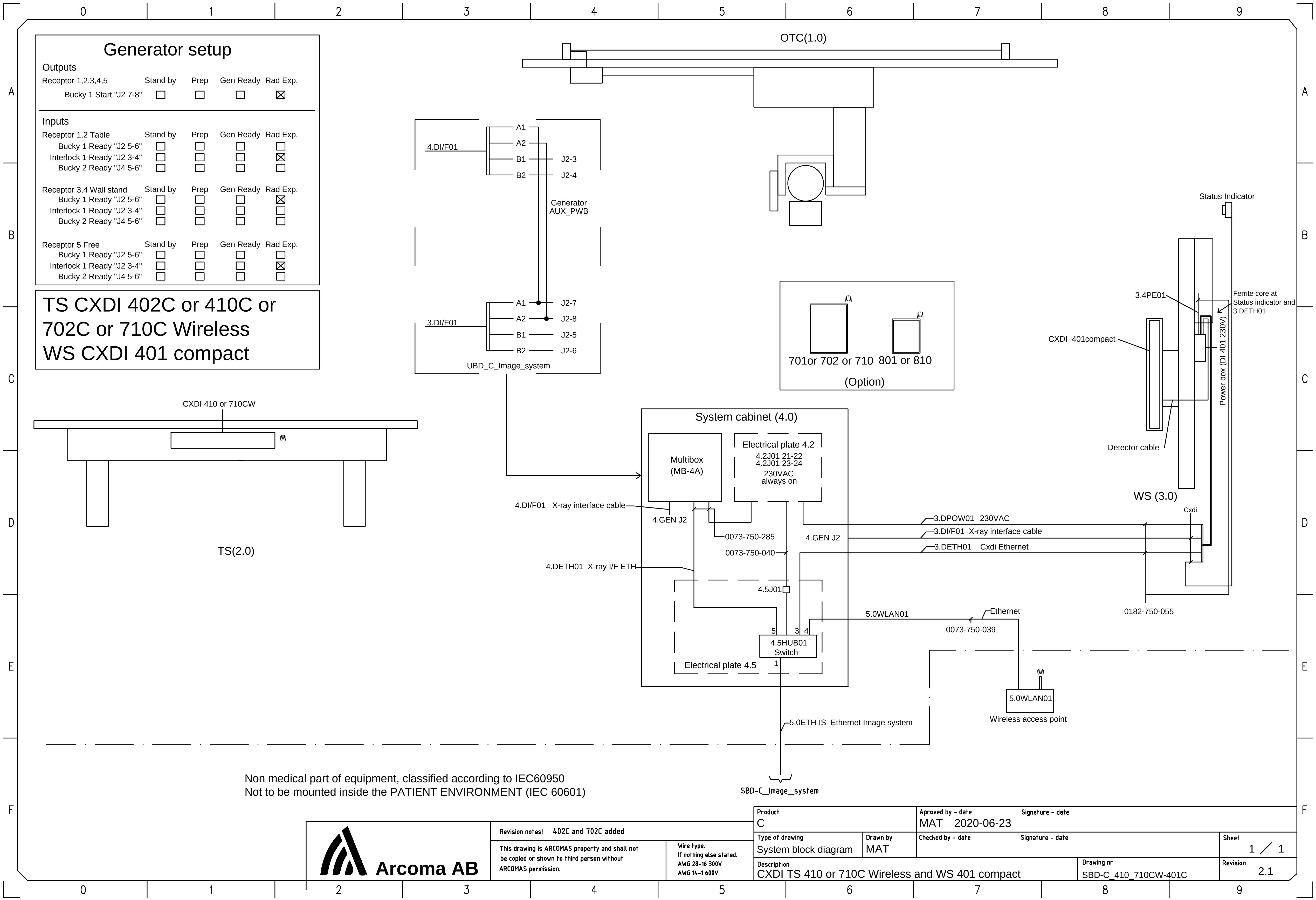


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
Generator AUX_PWB
J4-5 J4-6
J2-7 J2-8 J2-5 J2-6
UBD_C_Image_system
701 or 710 or 702
801 or 810
Status Indicator
Ferrite core at Status indicator and 3.DETH01
3.4PE01
CXDI 401compact
Power box (DI 401 230V)
Detector cable
WS (3.0)
Cxdi
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at Status indicator and 2.DETH01
Status Indicator
Cxdi
TS(2.0)
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
0055-750-002
4.DI/F01 X-ray interface cable
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.GEN J2
4.GEN J2/J4
0073-750-285
0073-750-040
4.GEN J2
4.5J01
4.5HUB01 Switch
Electrical plate 4.5
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
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! : 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 JHE 2020_07-02
Signature - date
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

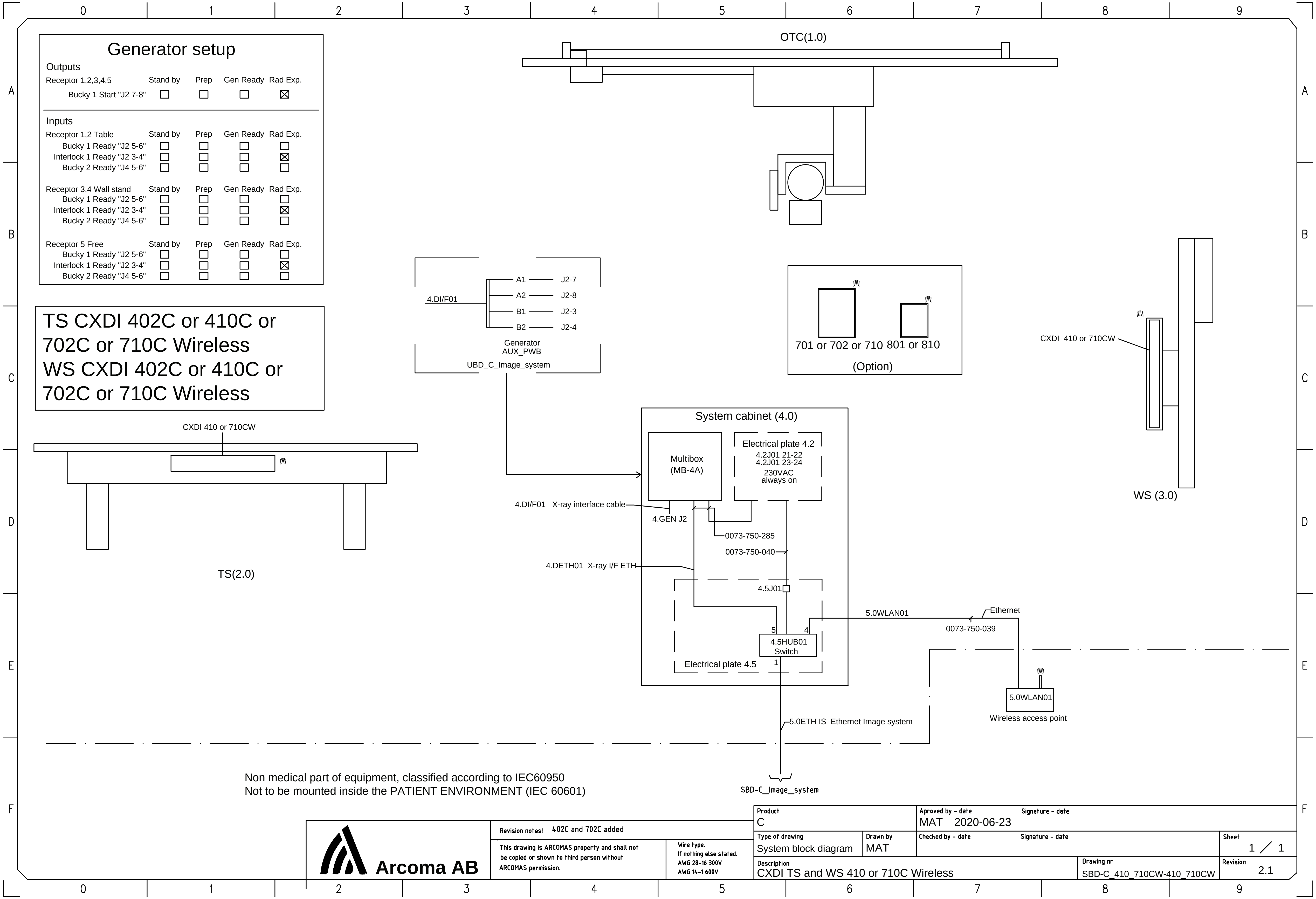


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
Generator AUX_PWB
J4-5 J4-6
J2-7 J2-8 J2-5 J2-6
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
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
2.DPOW02 230VAC
2.DI/F01 X-ray interface cable
2.DLAN01 Cxdi Ethernet
0073-750-285
0073-750-040
4.DETH01 X-ray I/F ETH
0055-750-002
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 JHE 2020-07-02
Signature - date
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

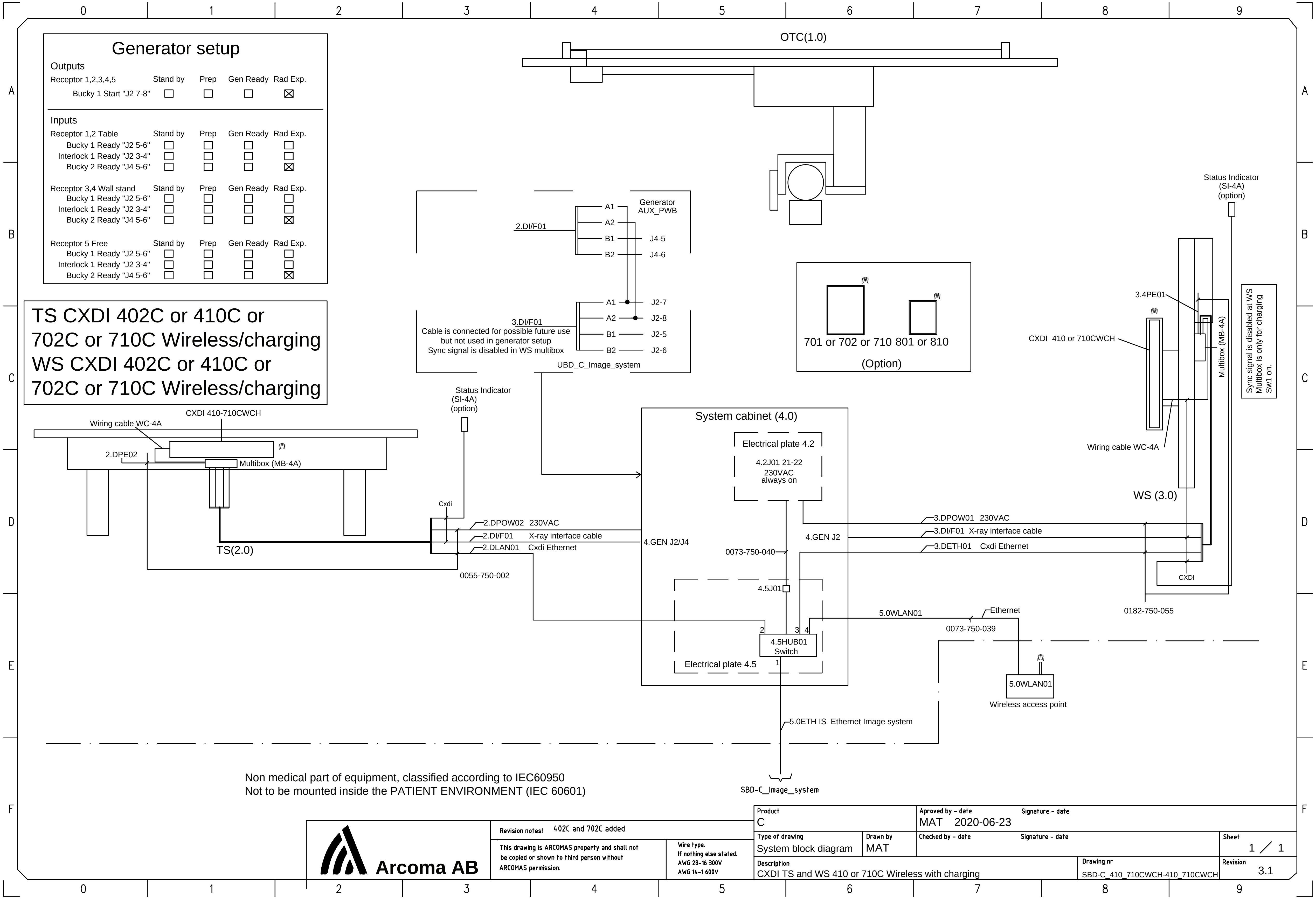

Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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 B2 J4-5 J4-6
3.DI/F01
A1 A2 B1 B2 J2-7 J2-8 J2-5 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)
Status Indicator
CXDI 401 compact
Detector cable
2.DPE02
Power box (DI 401 230V)
Ferrite core at Status indicator and 2.DETH01
Cxdi
TS(2.0)
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
4.5J01
4.5HUB01 Switch
Electrical plate 4.5
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
CXDI
0182-750-055
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! 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 MAT 2020-07-02
Signature - date
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 with charging
Drawing nr SBD_C_401C-410-710CWCH
Revision 2.1



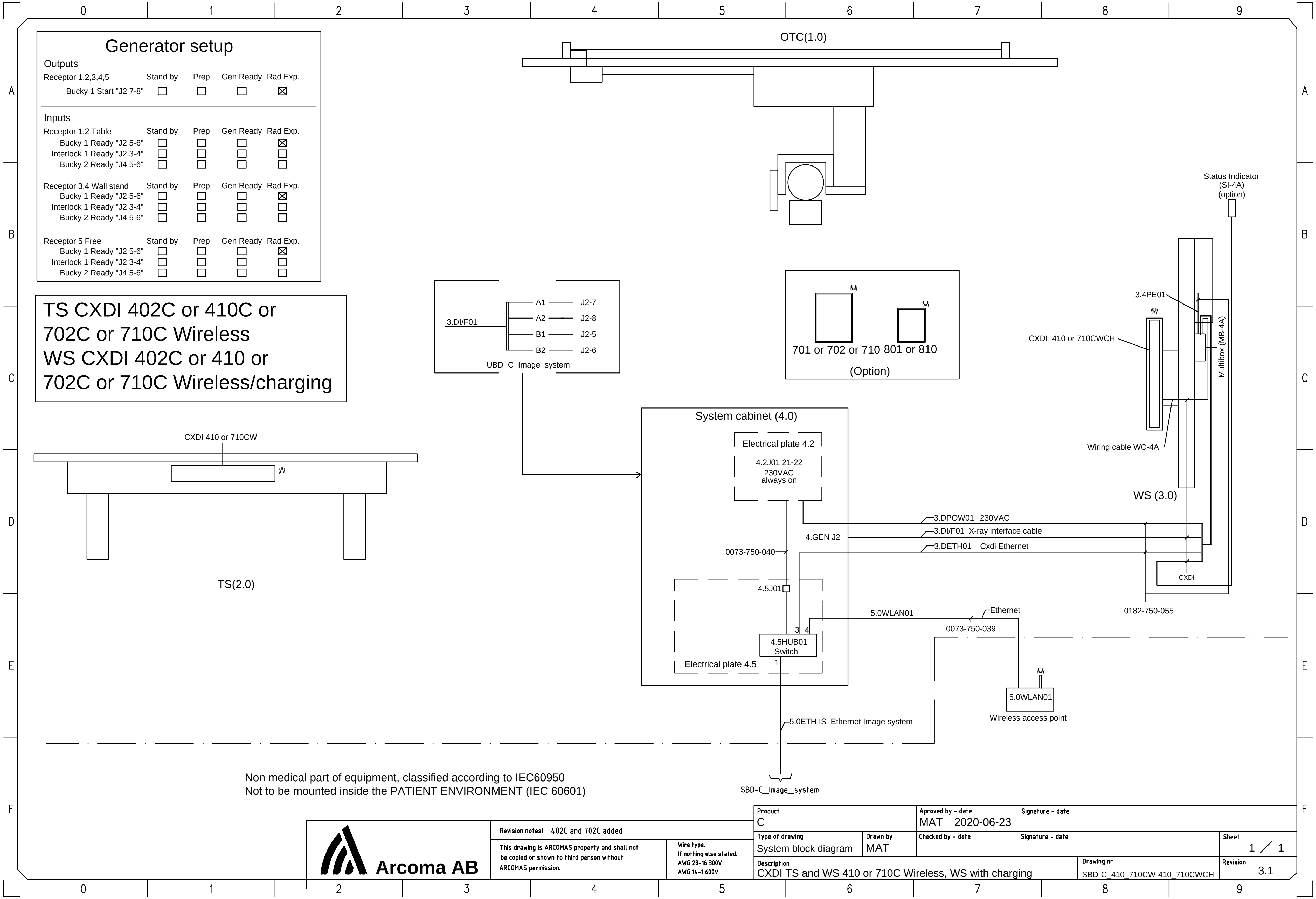
Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
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)
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 410 or 710CW
TS(2.0)
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.GEN J2
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
4.DETH01 X-ray I/F ETH
4.5J01
5.0WLAN01
Ethernet
0073-750-039
0182-750-055
4.5HUB01 Switch
Electrical plate 4.5
5.0WLAN01
Wireless access point
5.0ETH IS Ethernet Image system
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
SBD-C_Image_system
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 MAT 2020-06-23
Signature - date
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



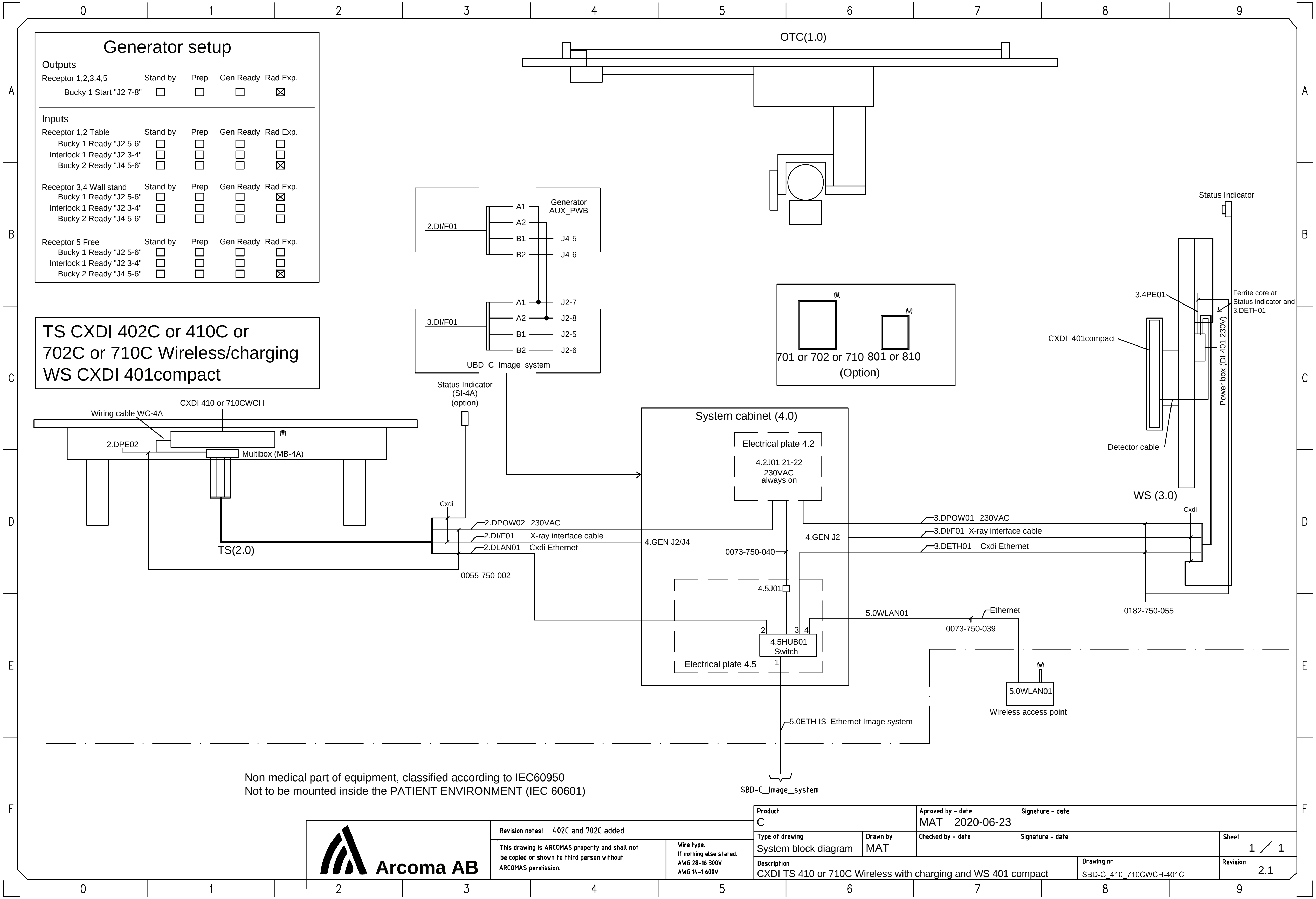
Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
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)
CXDI 410 or 710CW
TS(2.0)
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
Non medical part of equipment, classified according to IEC60950
Not to be mounted inside the PATIENT ENVIRONMENT (IEC 60601)
SBD-C_Image_system
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 MAT 2020-06-23
Signature - date
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



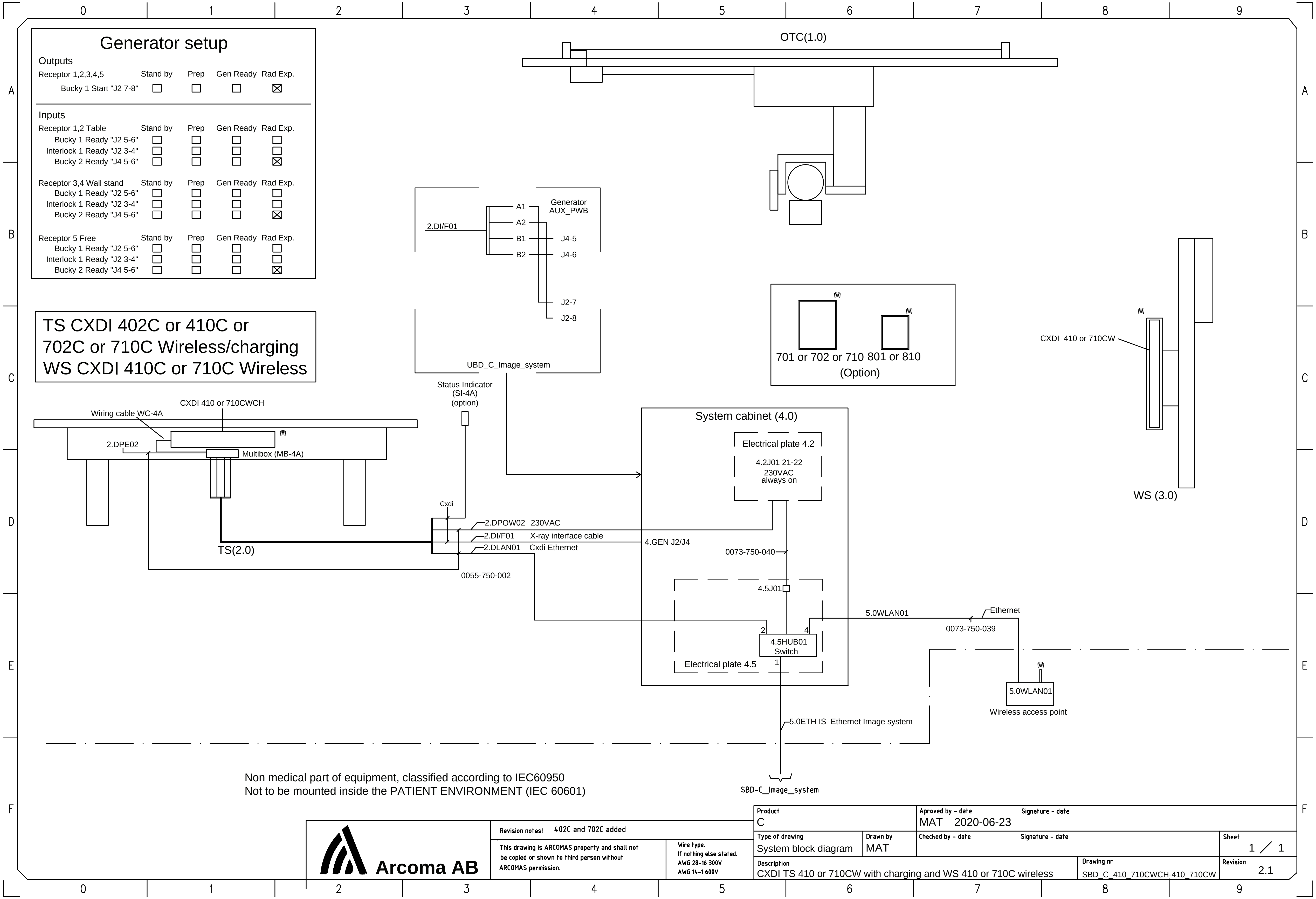
Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
A1 A2 B1 B2 J2-7 J2-8 J2-5 J2-6
3.DI/F01
Cable is connected for possible future use but not used in generator setup
Sync signal is disabled in WS multibox
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)
Sync signal is disabled at WS Multibox is only for charging Sw1 on.
Wiring cable WC-4A
WS (3.0)
CXDI 410-710CWCH
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
4.5J01
4.5HUB01 Switch
Electrical plate 4.5
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
CXDI
0182-750-055
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 MAT 2020-06-23
Signature - date
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
4.GEN J2
0073-750-040
3.DPOW01 230VAC
3.DI/F01 X-ray interface cable
3.DETH01 Cxdi Ethernet
CXDI
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 MAT 2020-06-23
Signature - date
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

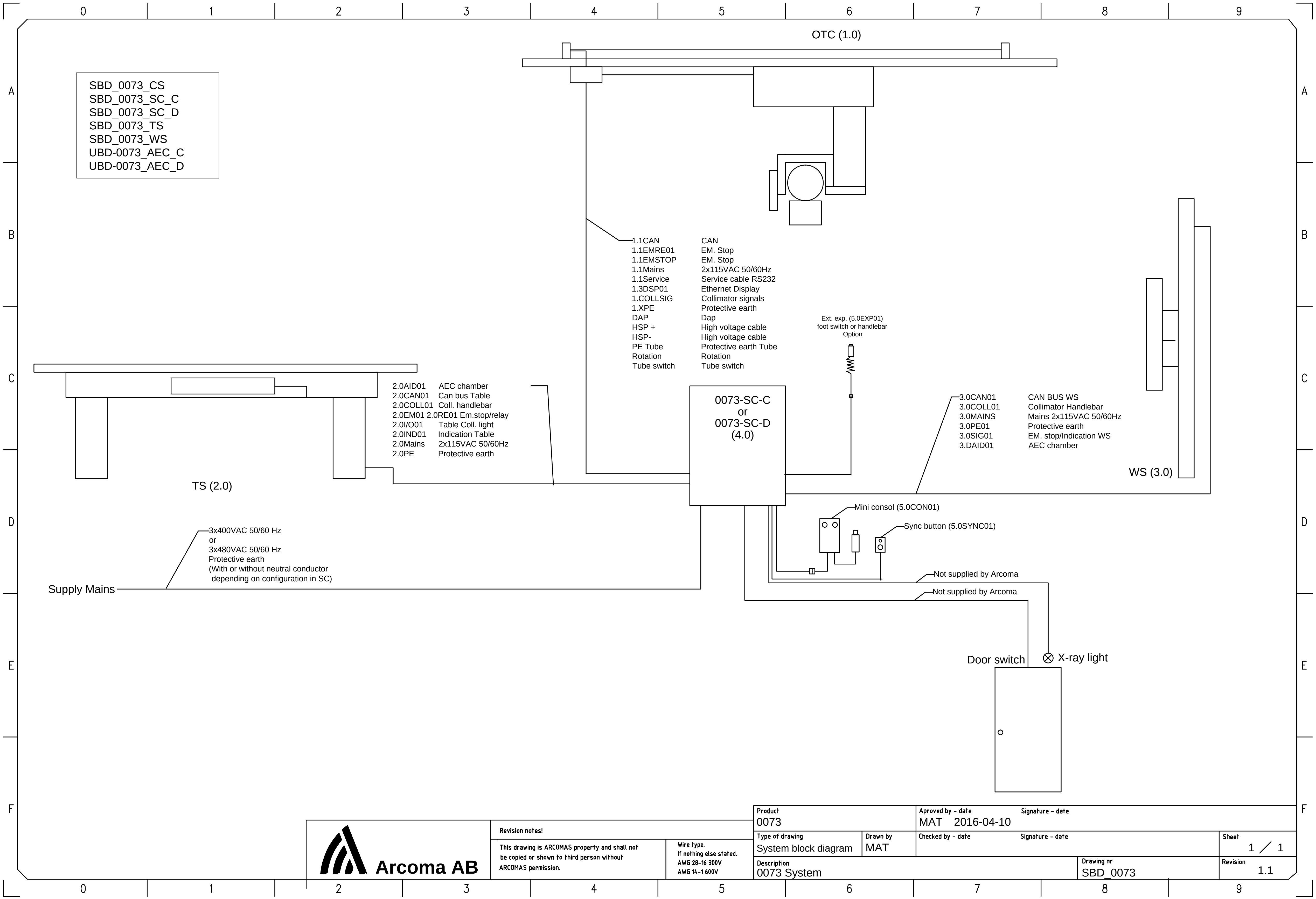


Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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
A1 A2 B1 B2 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)
Status Indicator (SI-4A) (option)
CXDI 410 or 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
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
4.5J01
4.5HUB01 Switch
Electrical plate 4.5
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
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 MAT 2020-06-23
Signature - date
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



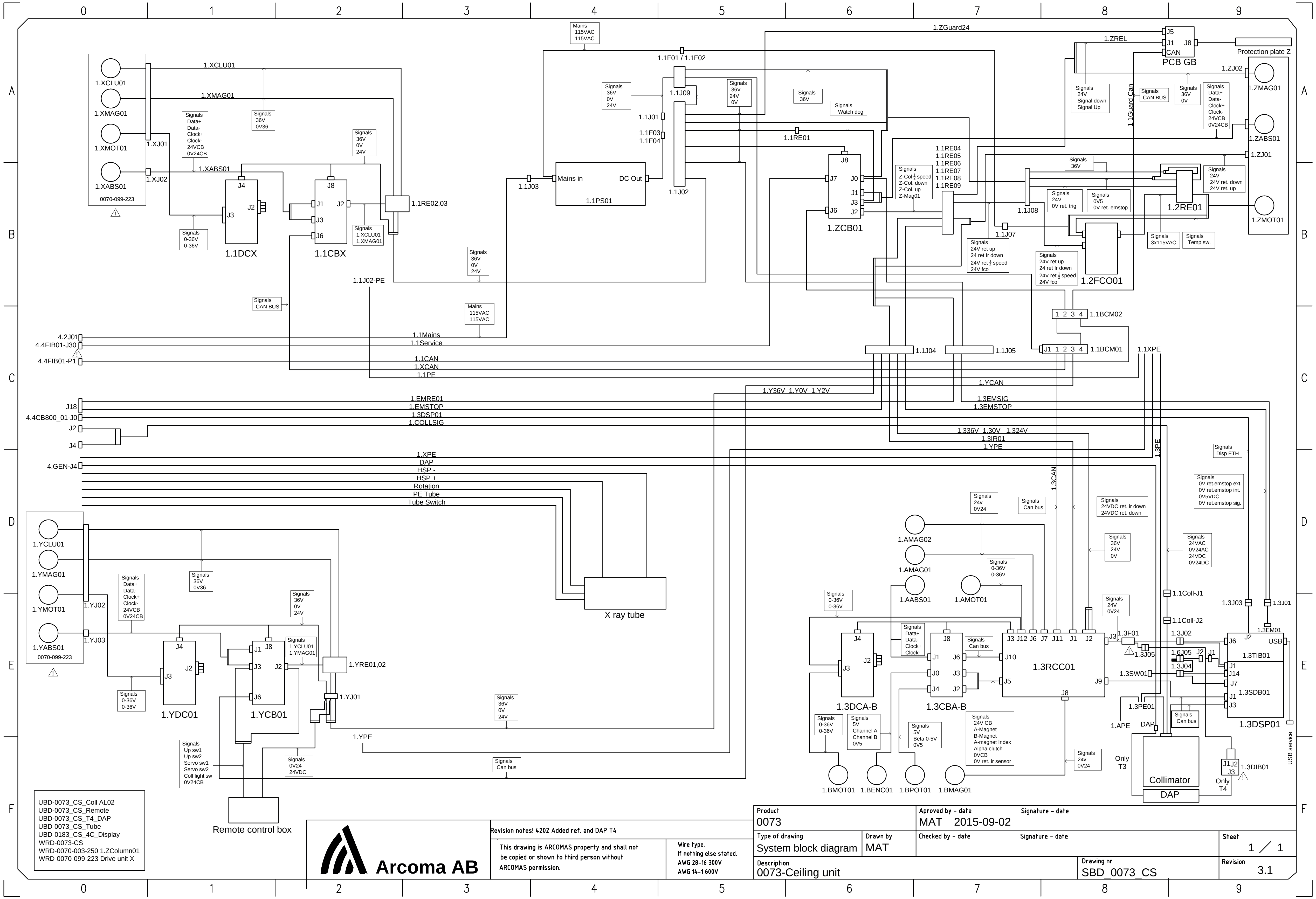
Generator setup
Outputs
Receptor 1,2,3,4,5 Stand by Prep Gen Ready Rad Exp.
Bucky 1 Start "J2 7-8"
Inputs
Receptor 1,2 Table Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "J2 5-6"
Interlock 1 Ready "J2 3-4"
Bucky 2 Ready "J4 5-6"
Receptor 3,4 Wall stand Stand by Prep Gen Ready Rad Exp.
Bucky 1 Ready "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)
Status Indicator (SI-4A) (option)
CXDI 410 or 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
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
4.5HUB01 Switch
Electrical plate 4.5
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 MAT 2020-06-23
Signature - date
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

8.2.3 Subsystem



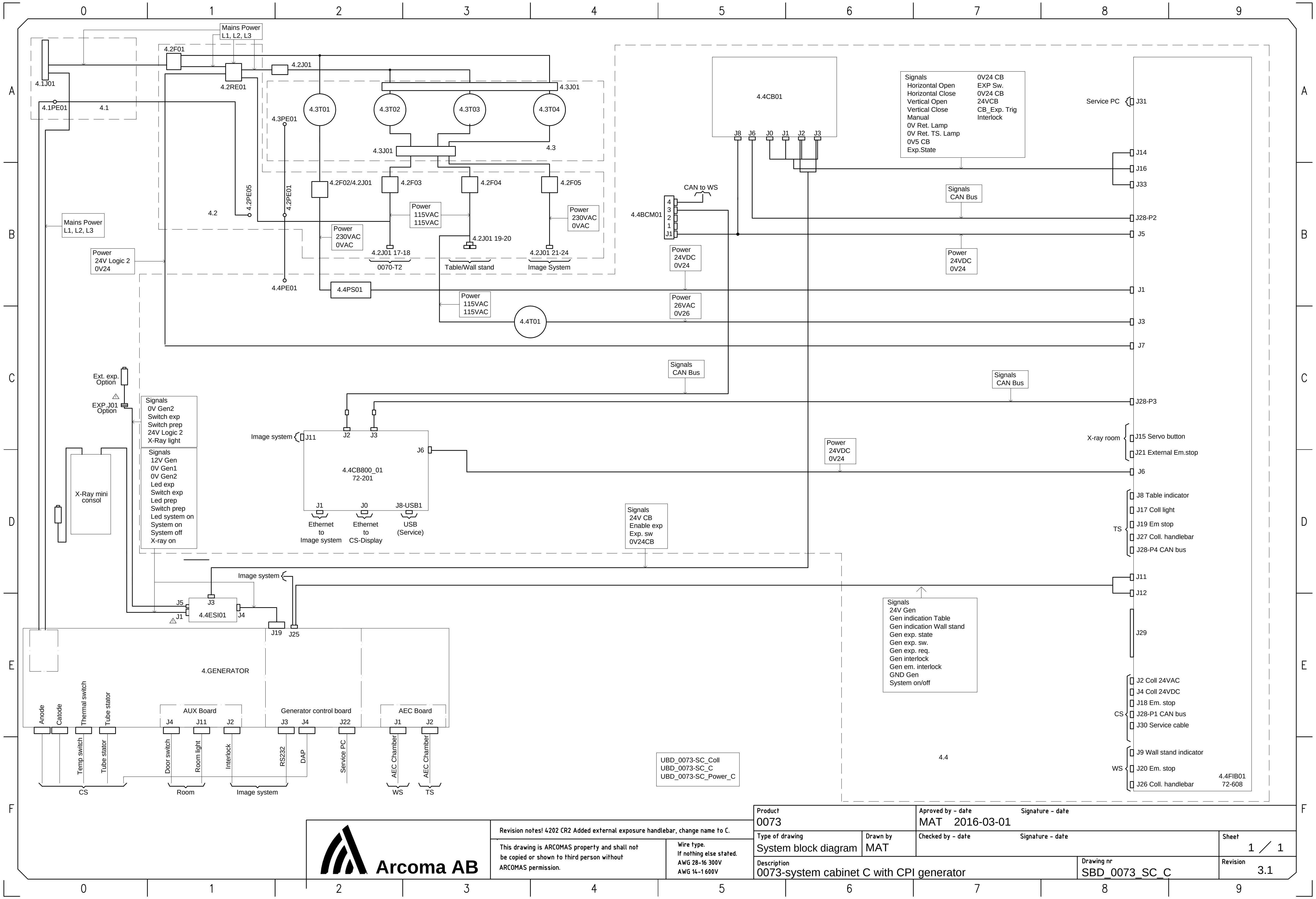
SBD_0073_CS
SBD_0073_SC_C
SBD_0073_SC_D
SBD_0073_TS
SBD_0073_WS
UBD-0073_AEC_C
UBD-0073_AEC_D
OTC (1.0)
1.1CAN CAN
1.1EMRE01 EM. Stop
1.1EMSTOP EM. Stop
1.1Mains 2x115VAC 50/60Hz
1.1Service Service cable RS232
1.3DSP01 Ethernet Display
1.COLLSIG Collimator signals
1.XPE Protective earth
DAP Dap
HSP + High voltage cable
HSP- High voltage cable
PE Tube Protective earth Tube
Rotation Rotation
Tube switch Tube switch
Ext. exp. (5.0EXP01) foot switch or handlebar Option
2.0AID01 AEC chamber
2.0CAN01 Can bus Table
2.0COLL01 Coll. handlebar
2.0EM01 2.0RE01 Em.stop/relay
2.0I/O01 Table Coll. light
2.0IND01 Indication Table
2.0Mains 2x115VAC 50/60Hz
2.0PE Protective earth
TS (2.0)
0073-SC-C or 0073-SC-D (4.0)
3.0CAN01 CAN BUS WS
3.0COLL01 Collimator Handlebar
3.0MAINS Mains 2x115VAC 50/60Hz
3.0PE01 Protective earth
3.0SIG01 EM. stop/Indication WS
3.DAID01 AEC chamber
WS (3.0)
Mini consol (5.0CON01)
Sync button (5.0SYNC01)
3x400VAC 50/60 Hz
or
3x480VAC 50/60 Hz
Protective earth
(With or without neutral conductor depending on configuration in SC)
Supply Mains
Not supplied by Arcoma
Not supplied by Arcoma
Door switch
X-ray light
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 0073
Aproved by - date MAT 2016-04-10
Signature - date
Type of drawing System block diagram
Drawn by MAT
Checked by - date
Signature - date
Sheet 1 / 1
Description 0073 System
Drawing nr SBD_0073
Revision 1.1

8.2.4 Overhead tube crane



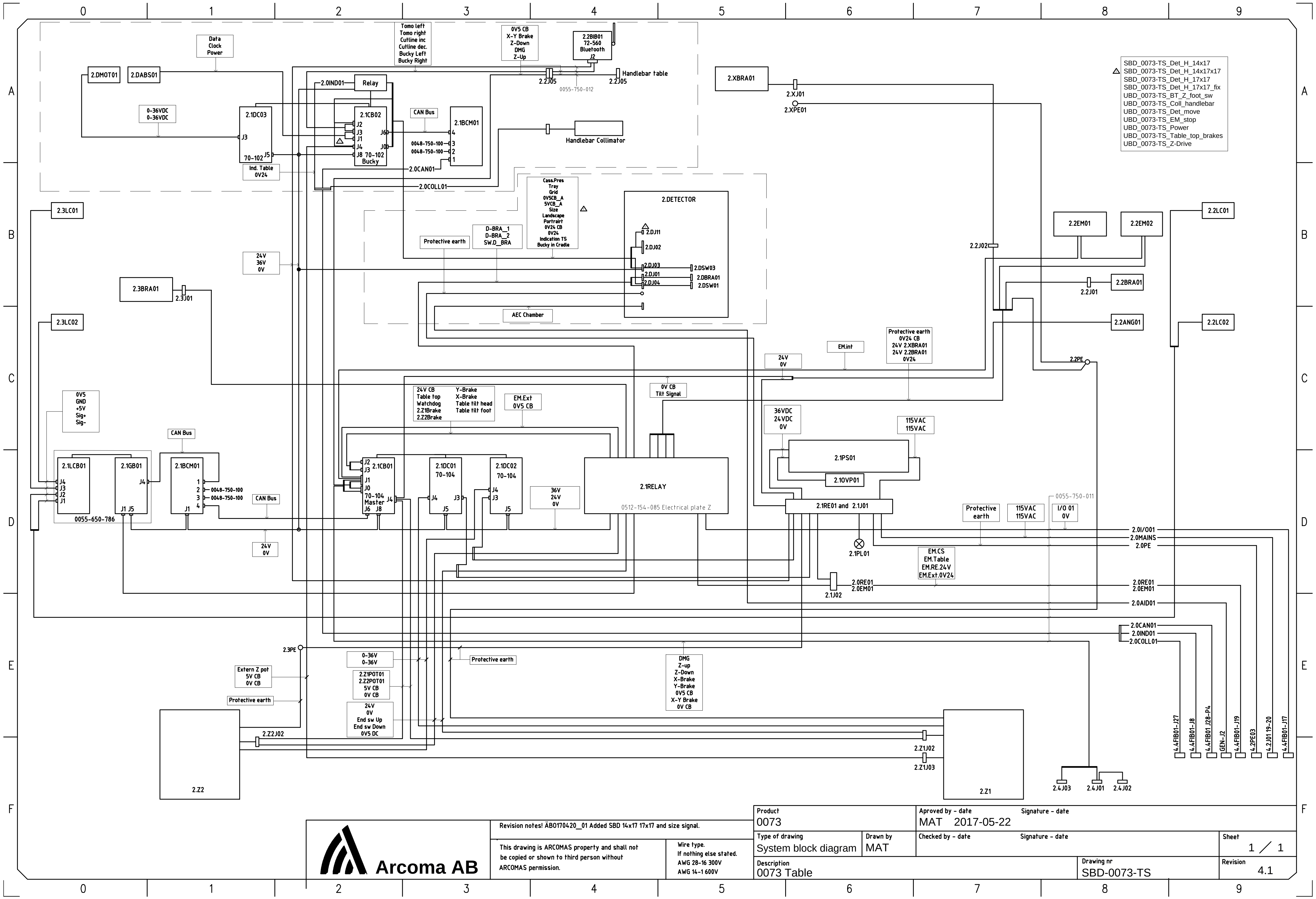
1.XCLU01
1.XMAG01
1.XMOT01
1.XABS01
0070-099-223
1.XJ01
1.XJ02
1.XABS01
1.1DCX
1.1CBX
1.1RE02,03
1.1J02-PE
Mains
115VAC
115VAC
1.1F01 / 1.1F02
1.1J09
1.1J01
1.1F03
1.1F04
1.1J02
1.1J03
Mains in
DC Out
1.1PS01
1.1RE01
1.ZGuard24
1.ZREL
PCB GB
Protection plate Z
1.ZJ02
1.ZMAG01
1.ZABS01
1.ZJ01
1.ZMOT01
1.1Guard Can
1.1RE04
1.1RE05
1.1RE06
1.1RE07
1.1RE08
1.1RE09
1.ZCB01
1.1J08
1.1J07
1.2RE01
1.2FCO01
1.1BCM02
1.1BCM01
1.1XPE
1.1J04
1.1J05
4.2J01
4.4FIB01-J30
4.4FIB01-P1
1.1Mains
1.1Service
1.1CAN
1.XCAN
1.1PE
1.YCAN
1.Y36V 1.Y0V 1.Y2V
J18
4.4CB800_01-J0
J2
J4
1.EMRE01
1.EMSTOP
1.3DSP01
1.COLLSIG
1.3EMSIG
1.3EMSTOP
1.336V 1.30V 1.324V
1.3IR01
1.YPE
4.GEN-J4
1.XPE
DAP
HSP -
HSP +
Rotation
PE Tube
Tube Switch
X ray tube
1.3CAN
1.3PE
1.YCLU01
1.YMAG01
1.YMOT01
1.YABS01
0070-099-223
1.YJ02
1.YJ03
1.YDC01
1.YCB01
1.YRE01,02
1.YJ01
1.YPE
Remote control box
1.AMAG02
1.AMAG01
1.AABS01
1.AMOT01
1.3DCA-B
1.3CBA-B
1.3RCC01
1.BMOT01
1.BENC01
1.BPOT01
1.BMAG01
1.1Coll-J1
1.1Coll-J2
1.3J03
1.3J01
1.3EM01
1.3F01
1.3J02
1.3J05
1.3TIB01
1.3J04
1.3SW01
1.3SDB01
1.3PE01
1.3DSP01
1.APE
DAP
1.3DIB01
Only T3
Only T4
Collimator
DAP
USB service
UBD-0073_CS_Coll AL02
UBD-0073_CS_Remote
UBD-0073_CS_T4_DAP
UBD-0073_CS_Tube
UBD-0183_CS_4C_Display
WRD-0073-CS
WRD-0070-003-250 1.ZColumn01
WRD-0070-099-223 Drive unit X
Arcoma AB
Revision notes! 4202 Added ref. and DAP T4
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
0073
Aproved by - date
MAT 2015-09-02
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
0073-Ceiling unit
Drawing nr
SBD_0073_CS
Revision
3.1

8.2.5 System cabinet

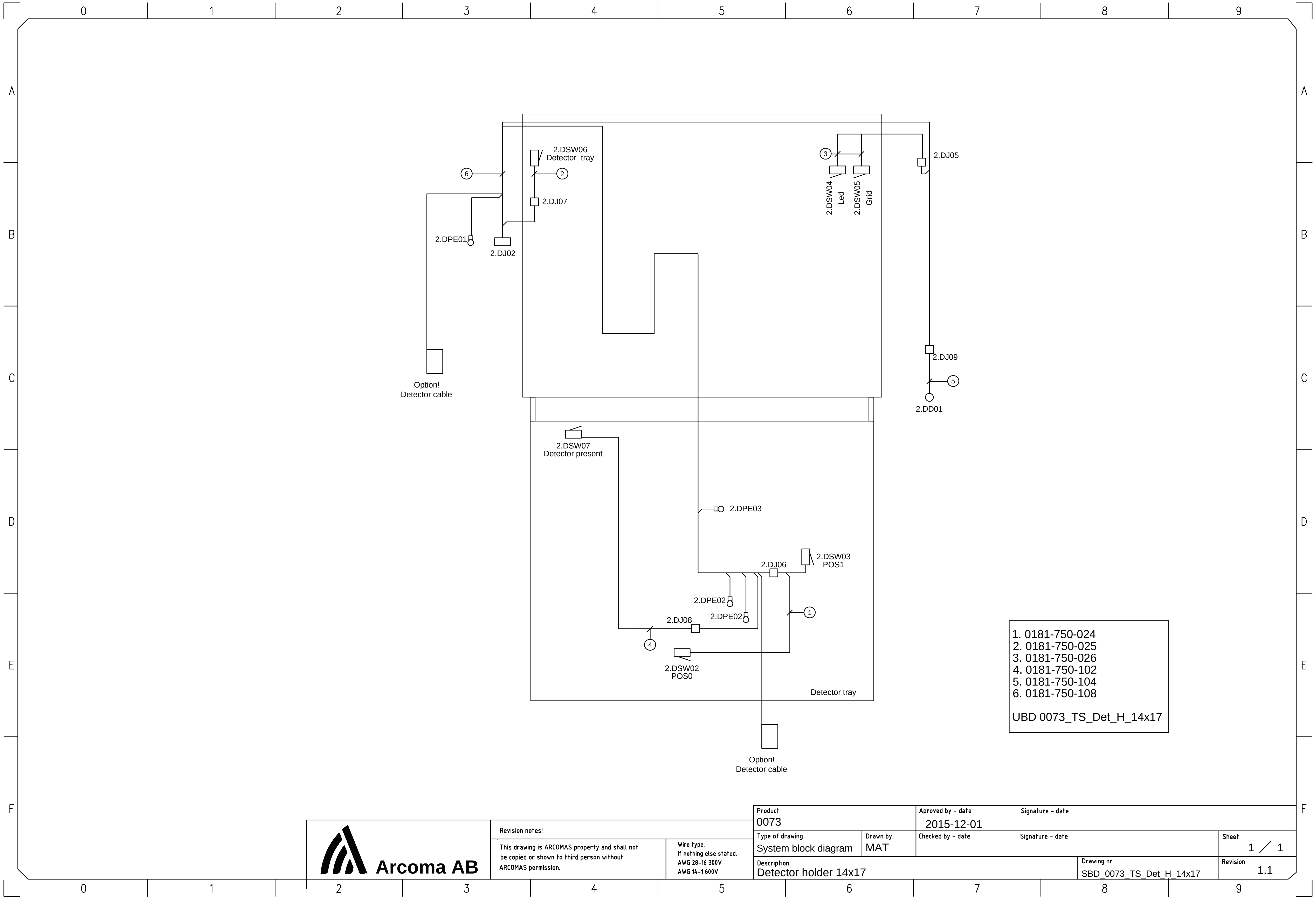


0 1 2 3 4 5 6 7 8 9
A B C D E F
Mains Power
L1, L2, L3
4.2F01
4.1J01
4.2RE01
4.2J01
4.3J01
4.1PE01
4.1
4.3PE01
4.3T01
4.3T02
4.3T03
4.3T04
4.3J01
4.3
4.4CB01
J8 J6 J0 J1 J2 J3
Signals
Horizontal Open
Horizontal Close
Vertical Open
Vertical Close
Manual
0V Ret. Lamp
0V Ret. TS. Lamp
0V5 CB
Exp.State
0V24 CB
EXP Sw.
0V24 CB
24VCB
CB_Exp. Trig
Interlock
Service PC
J31
J14
J16
J33
4.2F02/4.2J01
4.2F03
4.2F04
4.2F05
4.2PE05
4.2PE01
4.2
Power
115VAC
115VAC
Power
230VAC
0VAC
Power
230VAC
0VAC
4.2J01 19-20
4.2J01 17-18
4.2J01 21-24
0070-T2
Table/Wall stand
Image System
Mains Power
L1, L2, L3
Power
24V Logic 2
0V24
CAN to WS
4.4BCM01
4 3 2 1 J1
Power
24VDC
0V24
Signals
CAN Bus
Power
24VDC
0V24
J28-P2
J5
4.4PE01
4.4PS01
Power
115VAC
115VAC
4.4T01
Power
26VAC
0V26
J1
J3
J7
Signals
CAN Bus
Signals
CAN Bus
Ext. exp.
Option
EXP J01
Option
Signals
0V Gen2
Switch exp
Switch prep
24V Logic 2
X-Ray light
J28-P3
Image system
J11
J2
J3
J6
4.4CB800_01
72-201
X-ray room
J15 Servo button
J21 External Em.stop
Power
24VDC
0V24
J6
X-Ray mini
consol
Signals
12V Gen
0V Gen1
0V Gen2
Led exp
Switch exp
Led prep
Switch prep
Led system on
System on
System off
X-ray on
J1 J0 J8-USB1
Ethernet
to
Image system
Ethernet
to
CS-Display
USB
(Service)
Signals
24V CB
Enable exp
Exp. sw
0V24CB
TS
J8 Table indicator
J17 Coll light
J19 Em stop
J27 Coll. handlebar
J28-P4 CAN bus
Image system
J5
J3
J1
4.4ESI01
J4
J19
J25
J11
J12
Signals
24V Gen
Gen indication Table
Gen indication Wall stand
Gen exp. state
Gen exp. sw.
Gen exp. req.
Gen interlock
Gen em. interlock
GND Gen
System on/off
J29
4.GENERATOR
Anode
Catode
Thermal switch
Tube stator
AUX Board
J4 J11 J2
Generator control board
J3 J4 J22
AEC Board
J1 J2
Temp switch
Tube stator
Door switch
Room light
Interlock
RS232
DAP
Service PC
AEC Chamber
AEC Chamber
CS
Room
Image system
WS
TS
CS
J2 Coll 24VAC
J4 Coll 24VDC
J18 Em. stop
J28-P1 CAN bus
J30 Service cable
WS
J9 Wall stand indicator
J20 Em. stop
J26 Coll. handlebar
4.4FIB01
72-608
4.4
UBD_0073-SC_Coll
UBD_0073-SC_C
UBD_0073-SC_Power_C
Arcoma AB
Revision notes! 4202 CR2 Added external exposure handlebar, change name to C.
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
0073
Aproved by - date
MAT 2016-03-01
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
0073-system cabinet C with CPI generator
Drawing nr
SBD_0073_SC_C
Revision
3.1

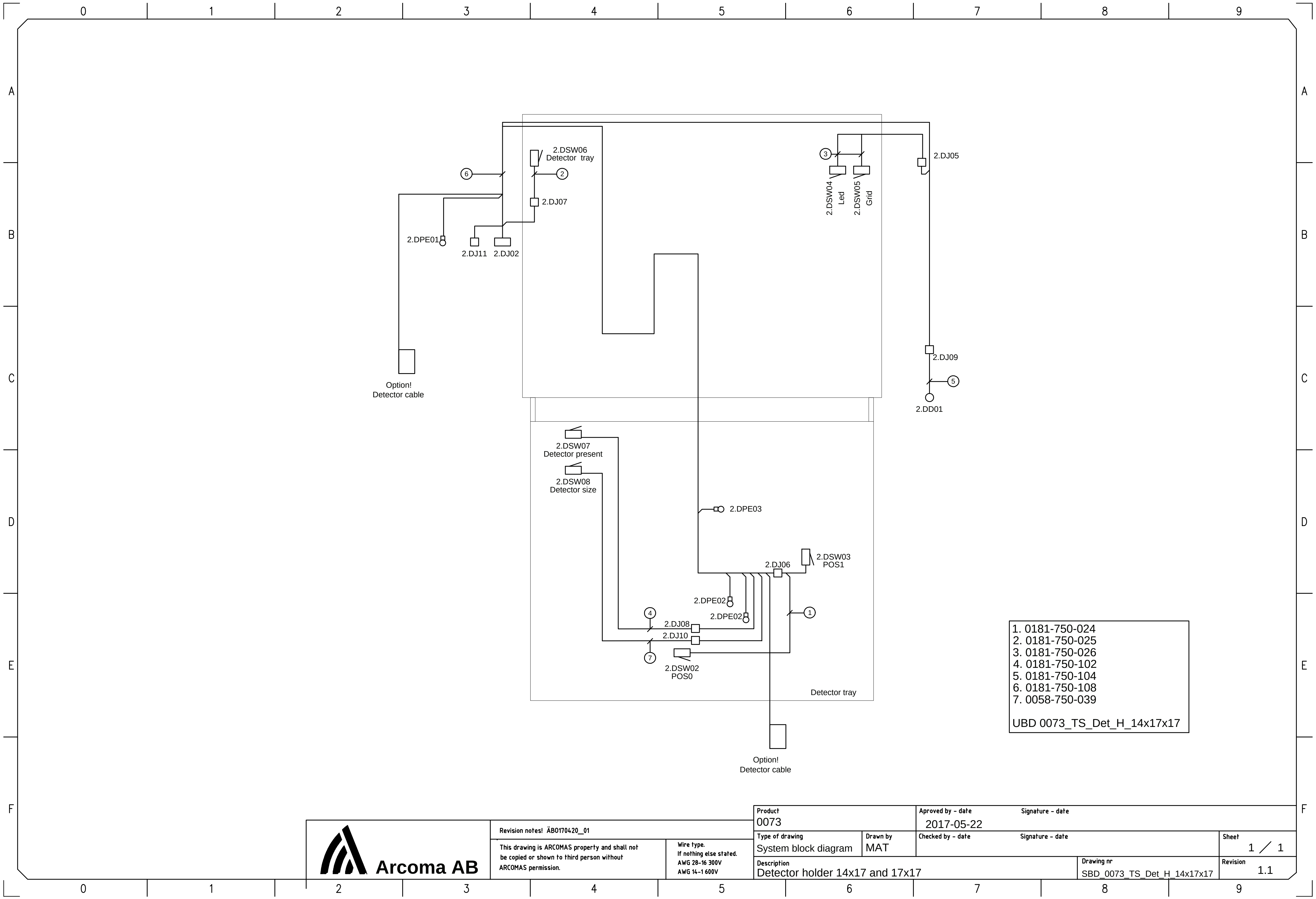
8.2.6 Two column table



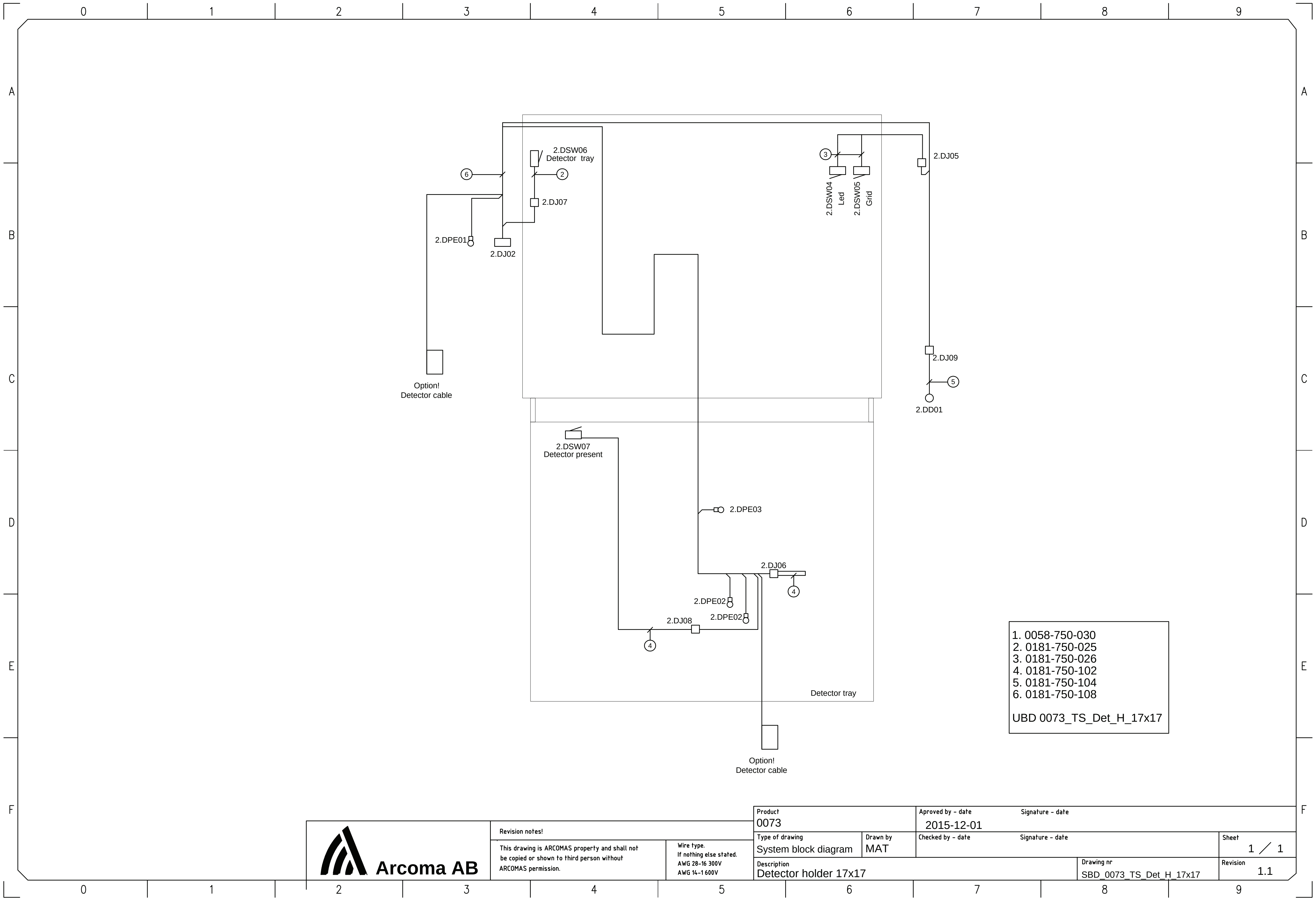
SBD_0073-TS_Det_H_14x17
SBD_0073-TS_Det_H_14x17x17
SBD_0073-TS_Det_H_17x17
SBD_0073-TS_Det_H_17x17_fix
UBD_0073-TS_BT_Z_foot_sw
UBD_0073-TS_Coll_handlebar
UBD_0073-TS_Det_move
UBD_0073-TS_EM_stop
UBD_0073-TS_Power
UBD_0073-TS_Table_top_brakes
UBD_0073-TS_Z-Drive
2.DMOT01
2.DABS01
2.1DC03
2.1CB02
Relay
2.0IND01
2.1BCM01
CAN Bus
2.2BIB01
72-560
Bluetooth
Handlebar table
Handlebar Collimator
2.XBRA01
2.XJ01
2.XPE01
2.0CAN01
2.0COLL01
2.DETECTOR
AEC Chamber
Protective earth
2.3LC01
2.3LC02
2.3BRA01
2.3J01
2.2EM01
2.2EM02
2.2LC01
2.2LC02
2.2BRA01
2.2ANG01
2.2J01
2.2J02
2.2PE
2.1LCB01
2.1GB01
2.1BCM01
2.1CB01
2.1DC01
2.1DC02
2.1RELAY
0512-154-085 Electrical plate Z
2.1PS01
2.1OVP01
2.1RE01 and 2.1J01
2.1PL01
2.1J02
2.0I/O01
2.0MAINS
2.0PE
2.0RE01
2.0EM01
2.0AID01
2.0IND01
2.0COLL01
2.3PE
2.Z2
2.Z2J02
2.Z1
2.Z1J02
2.Z1J03
2.4J03
2.4J01
2.4J02
Revision notes! ÄB0170420_01 Added SBD 14x17 17x17 and size signal.
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
0073
Aproved by - date
MAT 2017-05-22
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
0073 Table
Drawing nr
SBD-0073-TS
Revision
4.1



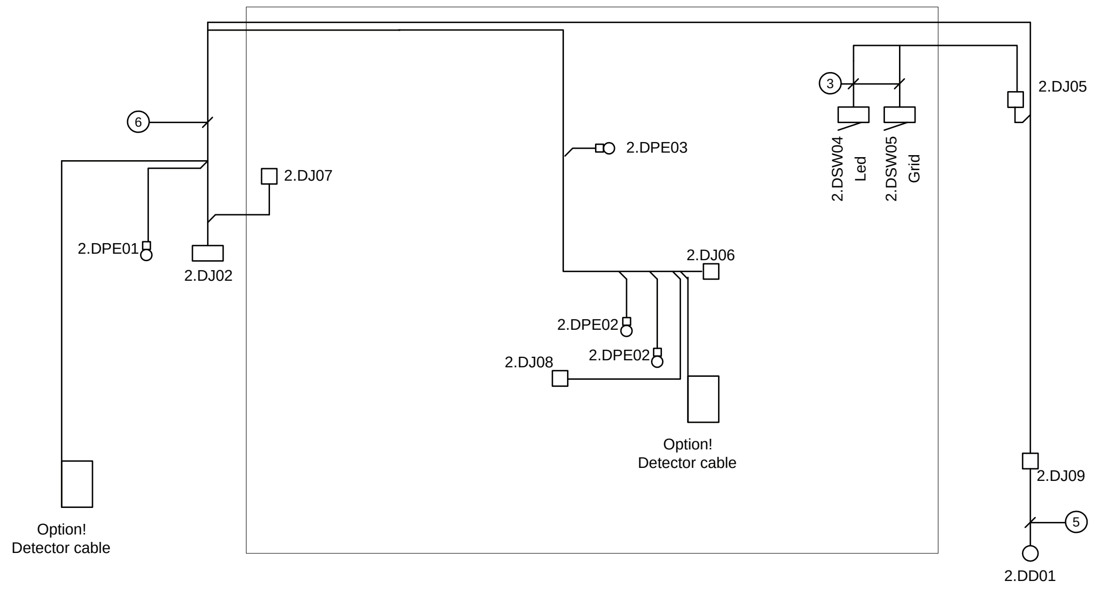
2.DSW06
Detector tray
2.DJ07
2.DPE01
2.DJ02
2.DJ05
2.DSW04
Led
2.DSW05
Grid
2.DJ09
2.DD01
Option!
Detector cable
2.DSW07
Detector present
2.DPE03
2.DJ06
2.DSW03
POS1
2.DPE02
2.DPE02
2.DJ08
2.DSW02
POS0
Detector tray
Option!
Detector cable
1. 0181-750-024
2. 0181-750-025
3. 0181-750-026
4. 0181-750-102
5. 0181-750-104
6. 0181-750-108
UBD 0073_TS_Det_H_14x17
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
0073
Aproved by - date
2015-12-01
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 14x17
Drawing nr
SBD_0073_TS_Det_H_14x17
Revision
1.1



2.DSW06
Detector tray
2.DJ07
2.DPE01
2.DJ11
2.DJ02
Option!
Detector cable
2.DJ05
2.DSW04
Led
2.DSW05
Grid
2.DJ09
2.DD01
2.DSW07
Detector present
2.DSW08
Detector size
2.DPE03
2.DSW03
POS1
2.DJ06
2.DPE02
2.DPE02
2.DJ08
2.DJ10
2.DSW02
POS0
Detector tray
Option!
Detector cable
1. 0181-750-024
2. 0181-750-025
3. 0181-750-026
4. 0181-750-102
5. 0181-750-104
6. 0181-750-108
7. 0058-750-039
UBD 0073_TS_Det_H_14x17x17
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
0073
Aproved by - date
2017-05-22
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 14x17 and 17x17
Drawing nr
SBD_0073_TS_Det_H_14x17x17
Revision
1.1



2.DSW06
Detector tray
2.DJ07
2.DPE01
2.DJ02
Option!
Detector cable
2.DSW04
Led
2.DSW05
Grid
2.DJ05
2.DJ09
2.DD01
2.DSW07
Detector present
2.DPE03
2.DJ06
2.DPE02
2.DPE02
2.DJ08
Detector tray
Option!
Detector cable
1. 0058-750-030
2. 0181-750-025
3. 0181-750-026
4. 0181-750-102
5. 0181-750-104
6. 0181-750-108
UBD 0073_TS_Det_H_17x17
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
0073
Aproved by - date
2015-12-01
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 17x17
Drawing nr
SBD_0073_TS_Det_H_17x17
Revision
1.1

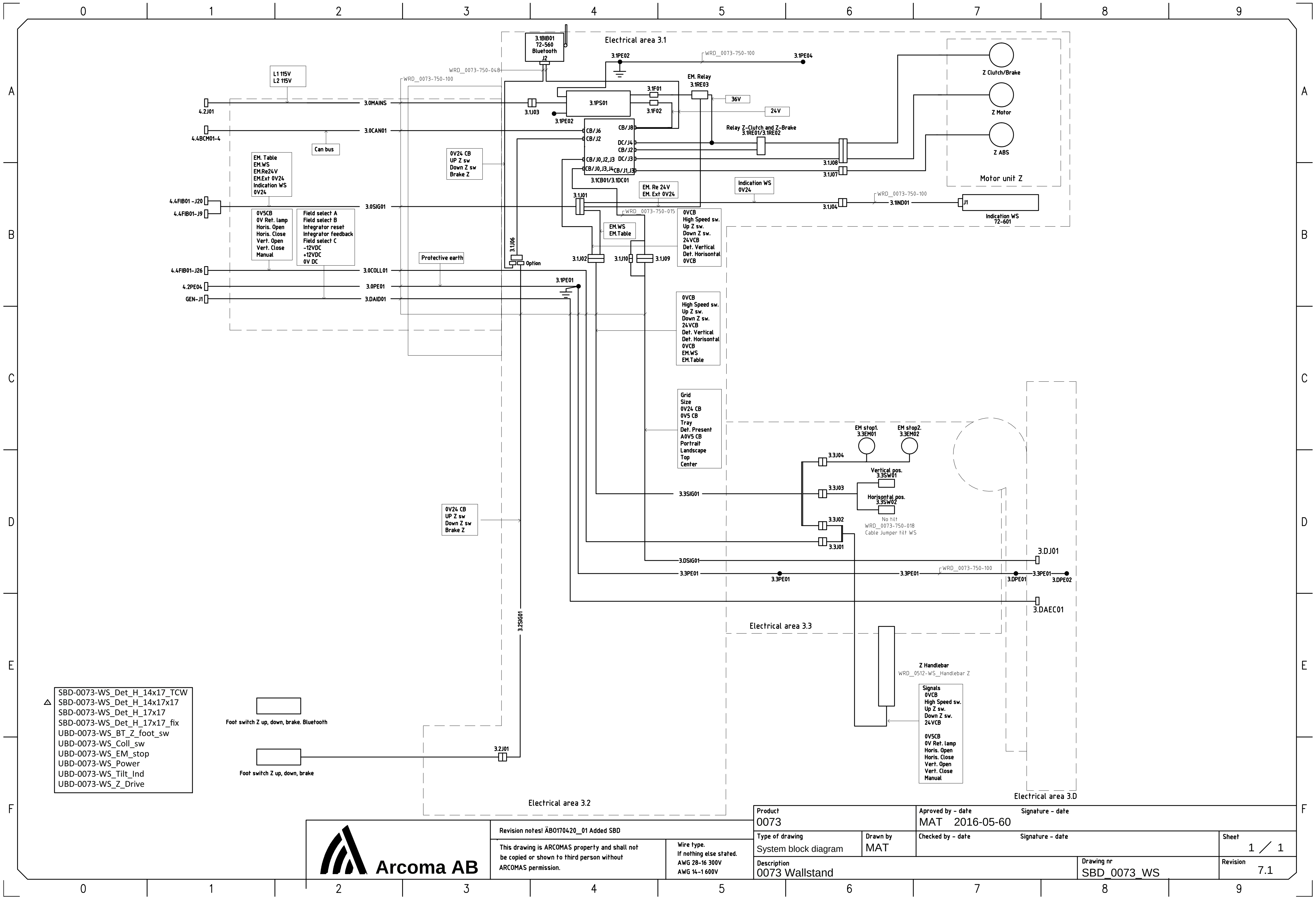


1. 0181-750-026
2. 0181-750-104
3. 0181-750-108

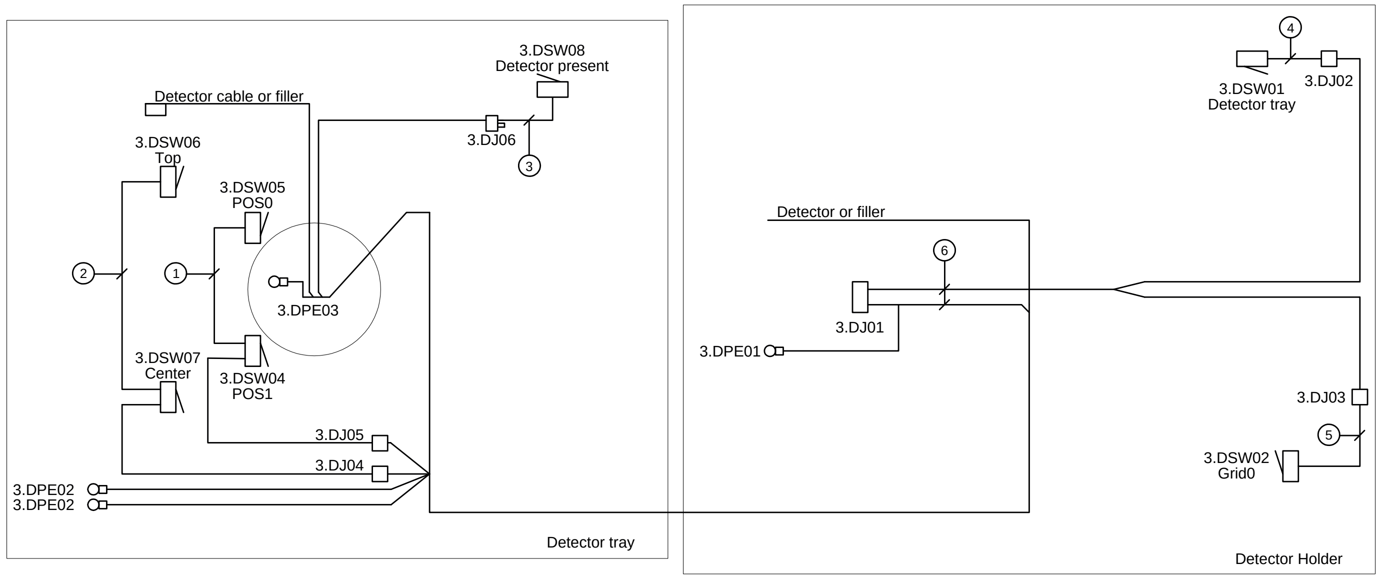
UBD 0073_TS_Det_H_17x17_fix

Arcoma AB	Revision notes!	Product: 0073	Aproved by - date: 2015-12-01	Signature - date
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	Type of drawing: System block diagram	Drawn by: MAT	Checked by - date / Signature - date / Sheet: 1 / 1
		Description: Detector holder 17x17_fix	Drawing nr: SBD_0073_TS_Det_H_17x17_fix	Revision: 1.1

8.2.7 Wall stand



Electrical area 3.1
Electrical area 3.2
Electrical area 3.3
Electrical area 3.D
Motor unit Z
Z Clutch/Brake
Z Motor
Z ABS
3.1PS01
3.1CB01/3.1DC01
EM. Relay 3.1RE03
36V
24V
Relay Z-Clutch and Z-Brake 3.1RE01/3.1RE02
Indication WS 72-601
Protective earth
Can bus
L1 115V
L2 115V
3.0MAINS
3.0CAN01
3.0SIG01
3.0COLL01
3.0PE01
3.0AID01
EM stop1. 3.3EM01
EM stop2. 3.3EM02
Vertical pos. 3.3SW01
Horisontal pos. 3.3SW02
Z Handlebar
3.DJ01
3.DAEC01
Foot switch Z up, down, brake. Bluetooth
Foot switch Z up, down, brake
SBD-0073-WS_Det_H_14x17_TCW
SBD-0073-WS_Det_H_14x17x17
SBD-0073-WS_Det_H_17x17
SBD-0073-WS_Det_H_17x17_fix
UBD-0073-WS_BT_Z_foot_sw
UBD-0073-WS_Coll_sw
UBD-0073-WS_EM_stop
UBD-0073-WS_Power
UBD-0073-WS_Tilt_Ind
UBD-0073-WS_Z_Drive
Arcoma AB
Revision notes! ÄBO170420_01 Added SBD
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 0073
Aproved by - date MAT 2016-05-60
Type of drawing System block diagram
Drawn by MAT
Sheet 1 / 1
Description 0073 Wallstand
Drawing nr SBD_0073_WS
Revision 7.1



1. 0058-750-005
2. 0058-750-006
3. 0058-750-012
4. 0058-750-017
5. 0058-750-019
6. 0058-750-022

UBD__0073_WS_Det_H_14x17_TCW

Product: 0073		Aproved by - date	Signature - date
Type of drawing: System block diagram	Drawn by: MAT	Checked by - date: MAT 2015-12-01	Signature - date
Description: Detector holder 14x17, 17x17, top, center Wall stand		Drawing nr: SBD_0073_WS_Det_H_14x17_TCW	Revision: 1.1

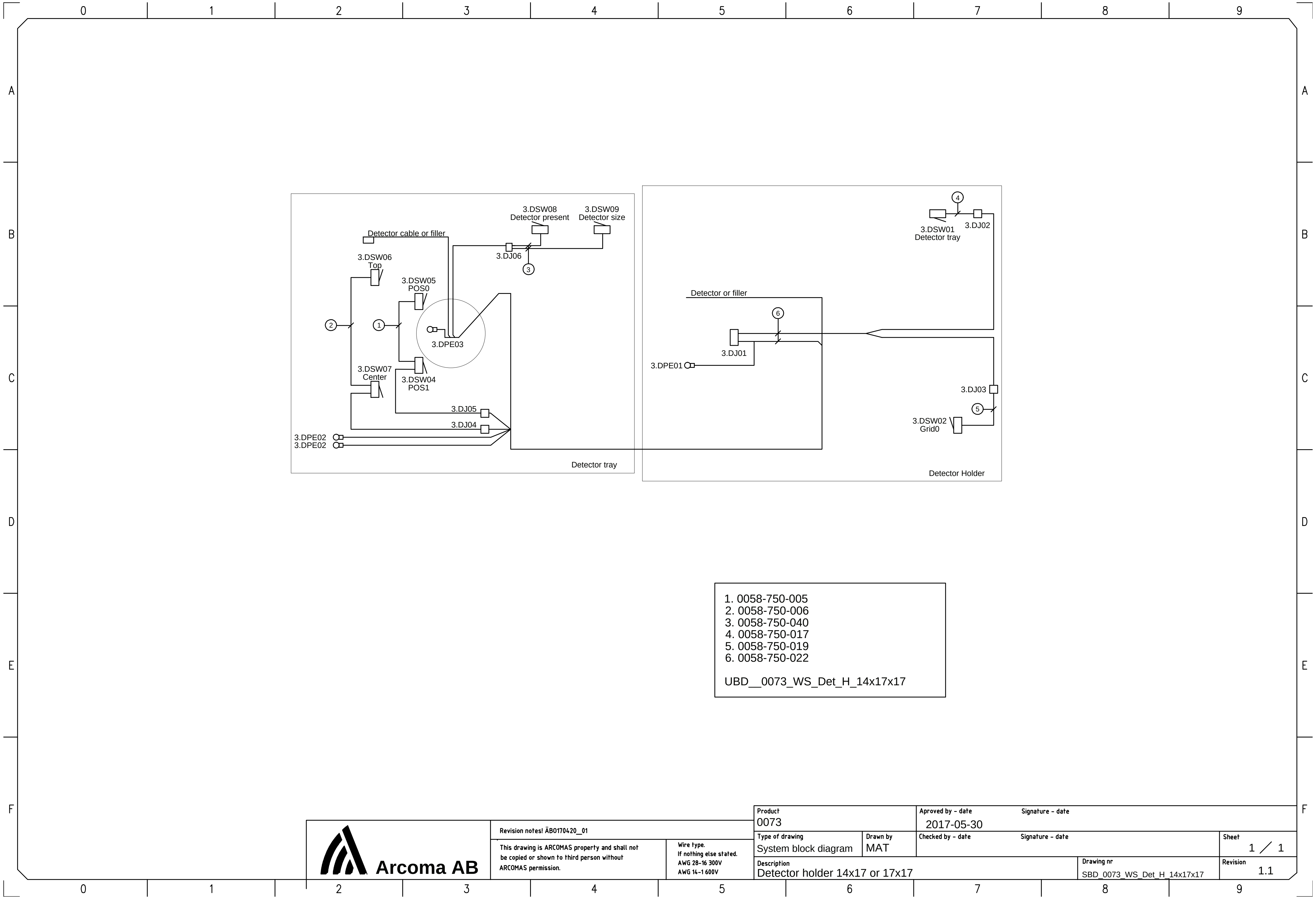
Sheet: 1 / 1

Arcoma AB

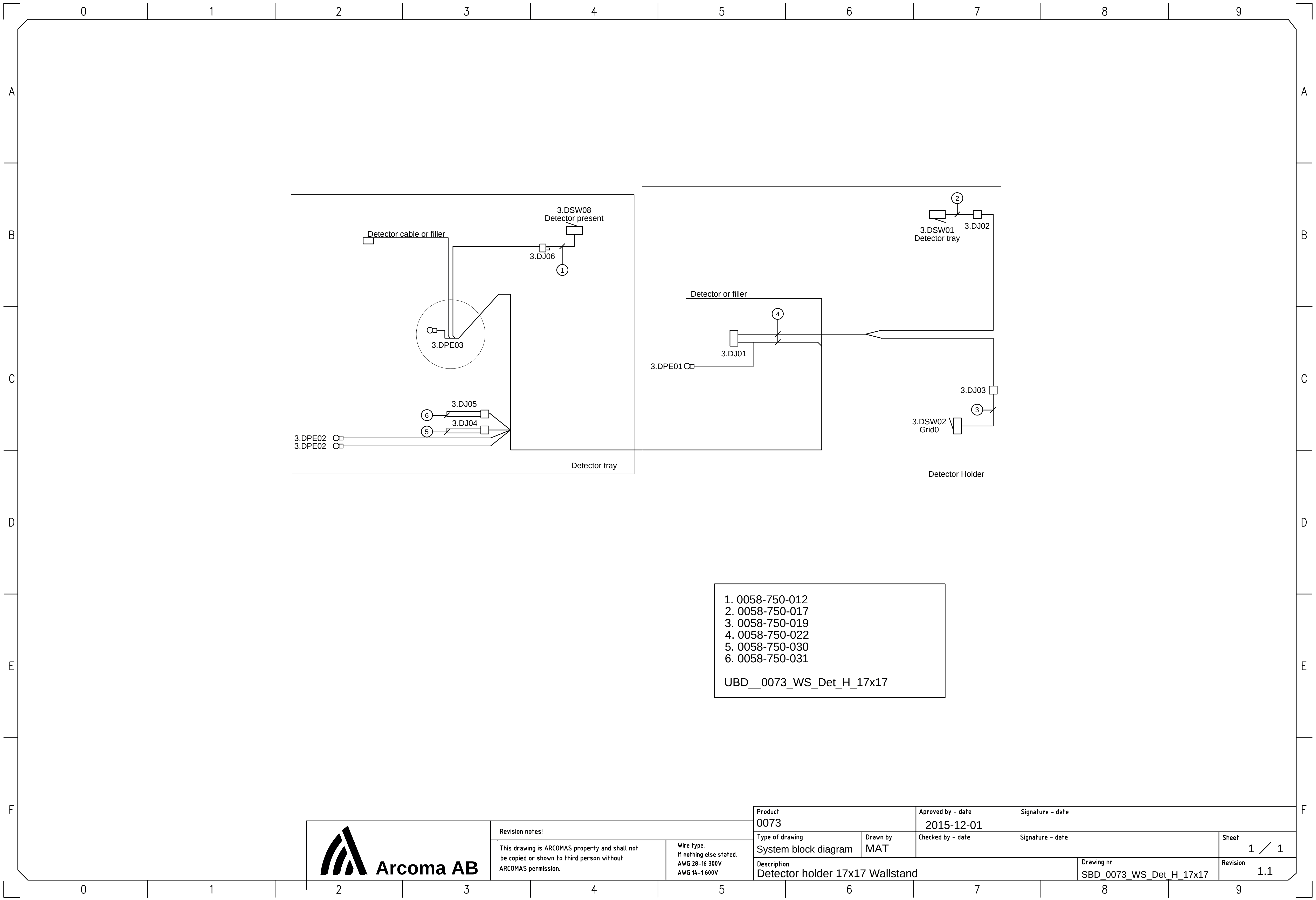
Revision notes!

This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

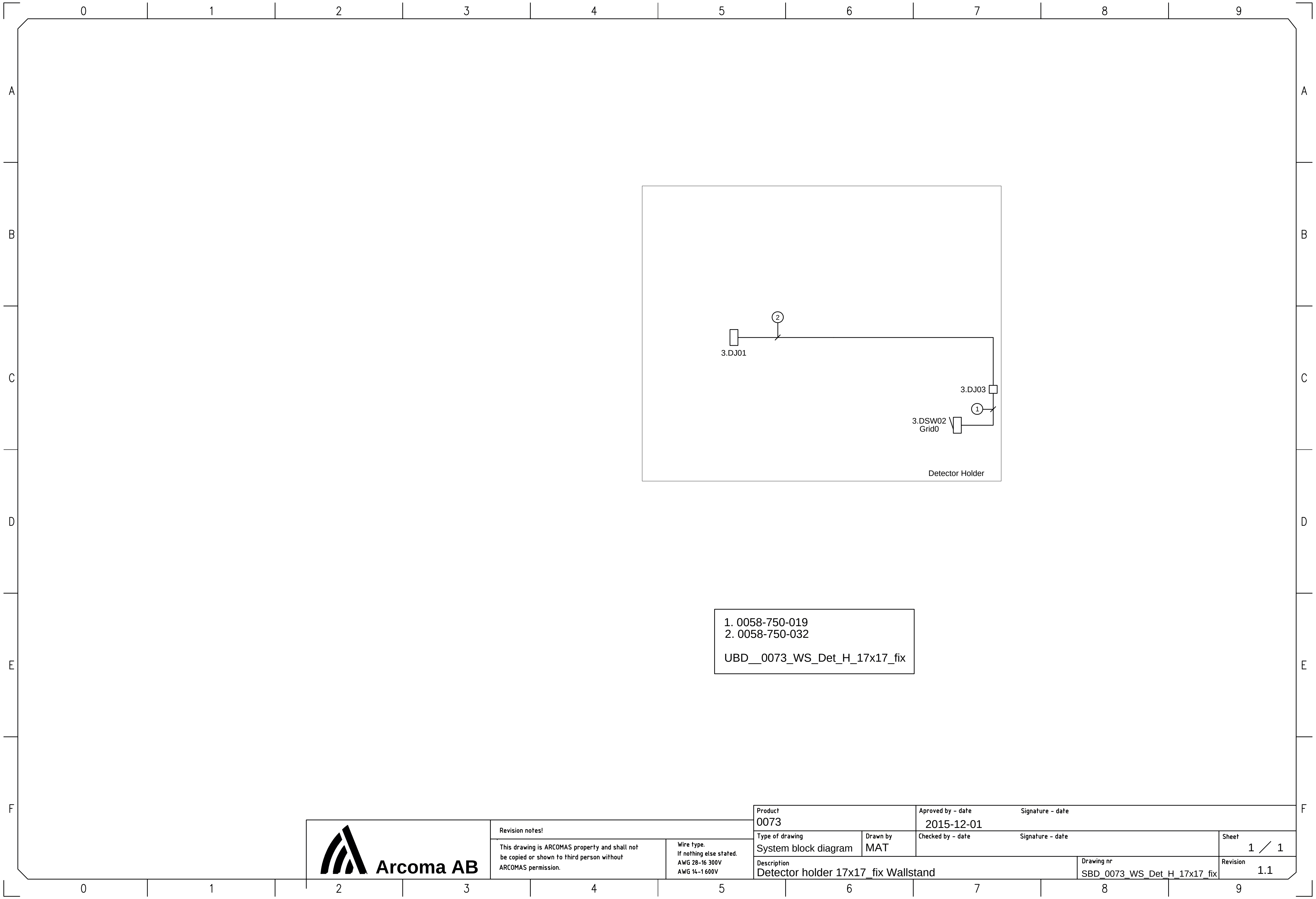
Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V



3.DSW08
Detector present
3.DSW09
Detector size
Detector cable or filler
3.DJ06
3.DSW06
Top
3.DSW05
POS0
3.DPE03
3.DSW07
Center
3.DSW04
POS1
3.DJ05
3.DJ04
3.DPE02
3.DPE02
Detector tray
3.DSW01
Detector tray
3.DJ02
Detector or filler
3.DJ01
3.DPE01
3.DJ03
3.DSW02
Grid0
Detector Holder
1. 0058-750-005
2. 0058-750-006
3. 0058-750-040
4. 0058-750-017
5. 0058-750-019
6. 0058-750-022
UBD__0073_WS_Det_H_14x17x17
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
0073
Aproved by - date
2017-05-30
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 14x17 or 17x17
Drawing nr
SBD_0073_WS_Det_H_14x17x17
Revision
1.1

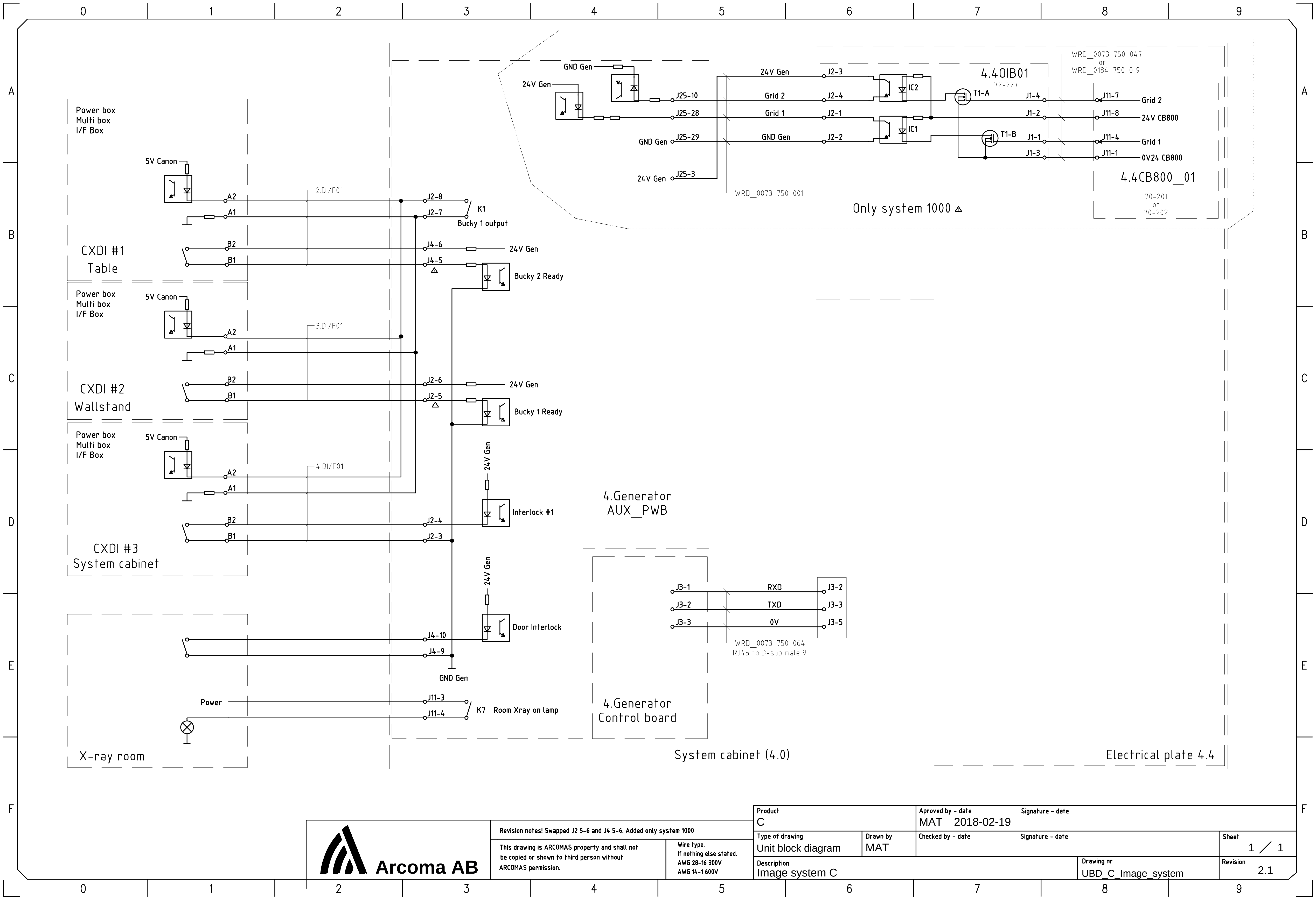


3.DSW08
Detector present
Detector cable or filler
3.DJ06
3.DPE03
3.DJ05
3.DJ04
3.DPE02
3.DPE02
Detector tray
3.DSW01
Detector tray
3.DJ02
Detector or filler
3.DJ01
3.DPE01
3.DJ03
3.DSW02
Grid0
Detector Holder
1. 0058-750-012
2. 0058-750-017
3. 0058-750-019
4. 0058-750-022
5. 0058-750-030
6. 0058-750-031
UBD__0073_WS_Det_H_17x17
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
0073
Aproved by - date
2015-12-01
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 17x17 Wallstand
Drawing nr
SBD_0073_WS_Det_H_17x17
Revision
1.1


0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
2
3.DJ01
3.DJ03
1
3.DSW02
Grid0
Detector Holder
1. 0058-750-019
2. 0058-750-032
UBD__0073_WS_Det_H_17x17_fix
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
0073
Aproved by - date
2015-12-01
Signature - date
Type of drawing
System block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Detector holder 17x17_fix Wallstand
Drawing nr
SBD_0073_WS_Det_H_17x17_fix
Revision
1.1

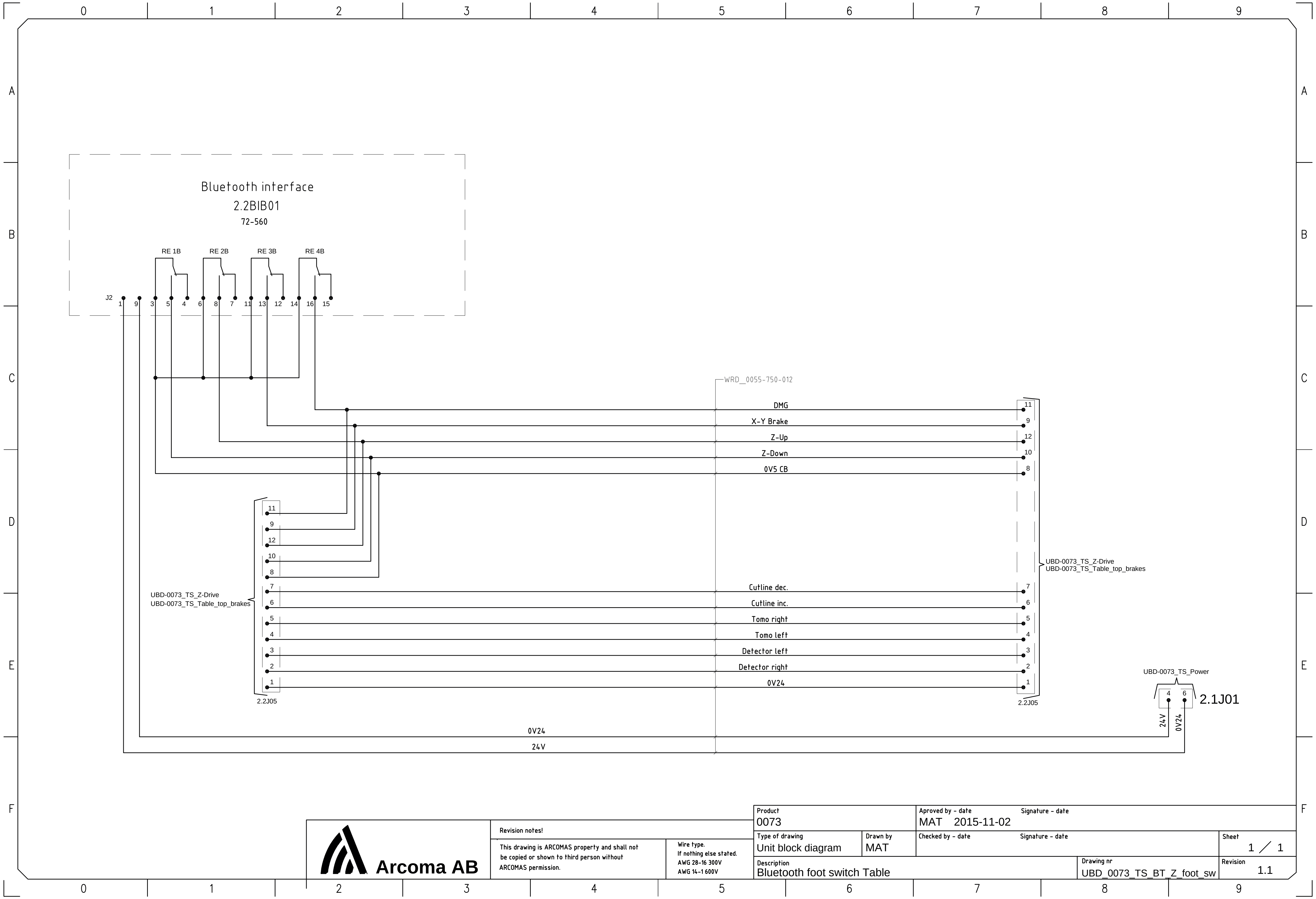
8.3 Unit block diagram (C valid for Omnera 400A)

8.3.1 Image system C



Power box
Multi box
I/F Box
5V Canon
A2
A1
B2
B1
CXDI #1
Table
CXDI #2
Wallstand
CXDI #3
System cabinet
X-ray room
Power
2.DI/F01
3.DI/F01
4.DI/F01
J2-8
J2-7
K1
Bucky 1 output
J4-6
J4-5
24V Gen
Bucky 2 Ready
J2-6
J2-5
Bucky 1 Ready
J2-4
J2-3
Interlock #1
J4-10
J4-9
Door Interlock
GND Gen
J11-3
J11-4
K7 Room Xray on lamp
4.Generator
AUX_PWB
4.Generator
Control board
J3-1
J3-2
J3-3
RXD
TXD
0V
J3-5
WRD_0073-750-064
RJ45 to D-sub male 9
GND Gen
24V Gen
J25-10
J25-28
J25-29
J25-3
Grid 2
Grid 1
J2-2
J2-1
IC2
IC1
WRD_0073-750-001
4.4OIB01
72-227
T1-A
T1-B
J1-4
J1-2
J1-1
J1-3
J11-7
J11-8
J11-4
J11-1
24V CB800
0V24 CB800
WRD_0073-750-047
or
WRD_0184-750-019
4.4CB800_01
70-201
or
70-202
Only system 1000
System cabinet (4.0)
Electrical plate 4.4
Arcoma AB
Revision notes! Swapped J2 5-6 and J4 5-6. Added only system 1000
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
MAT 2018-02-19
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Sheet
1 / 1
Description
Image system C
Drawing nr
UBD_C_Image_system
Revision
2.1

8.3.2 Two column table



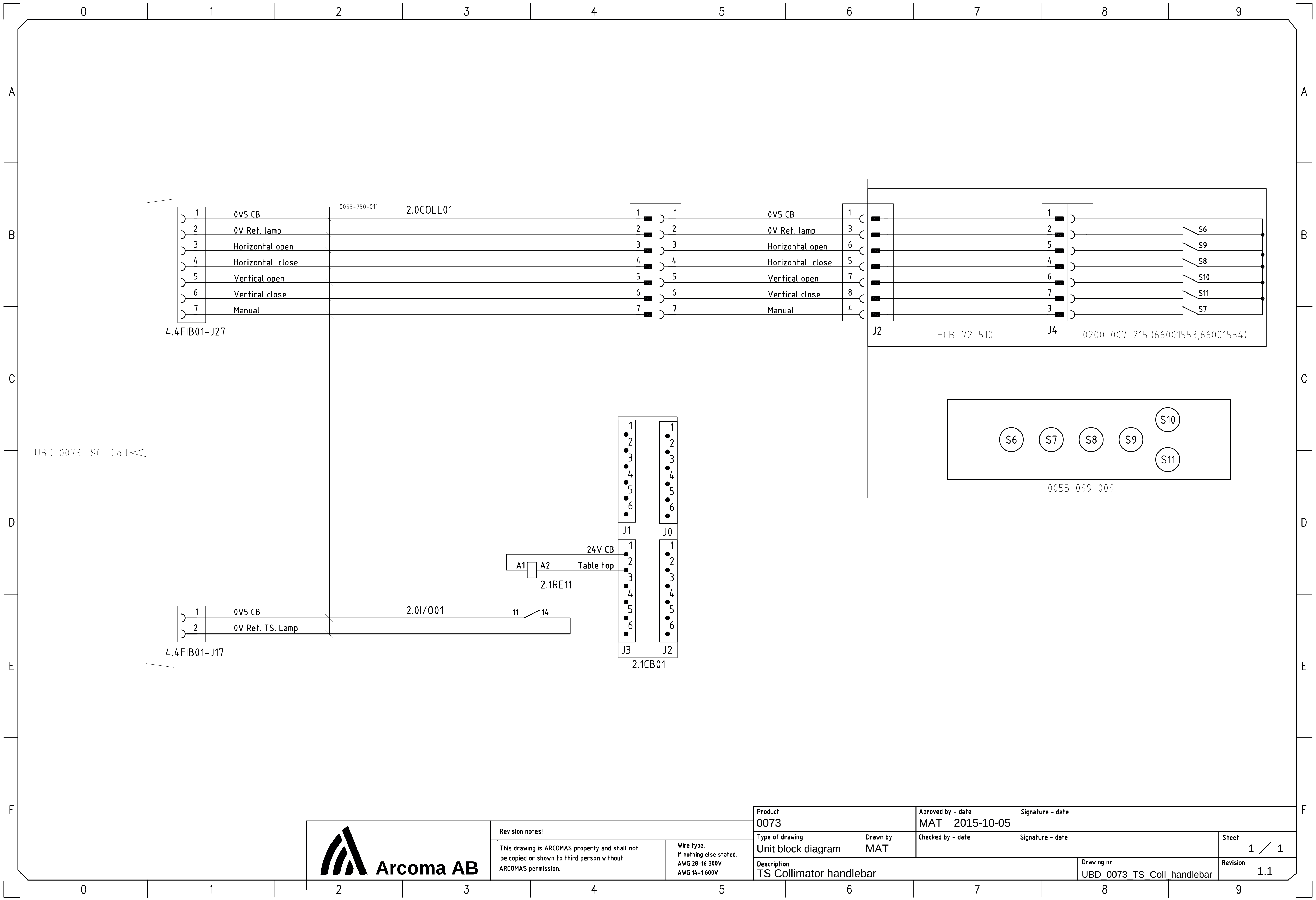
Product: 0073	Aproved by - date: MAT 2015-11-02	Signature - date
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date / Sheet: 1 / 1
Description: Bluetooth foot switch Table	Drawing nr: UBD_0073_TS_BT_Z_foot_sw	Revision: 1.1

Arcoma AB

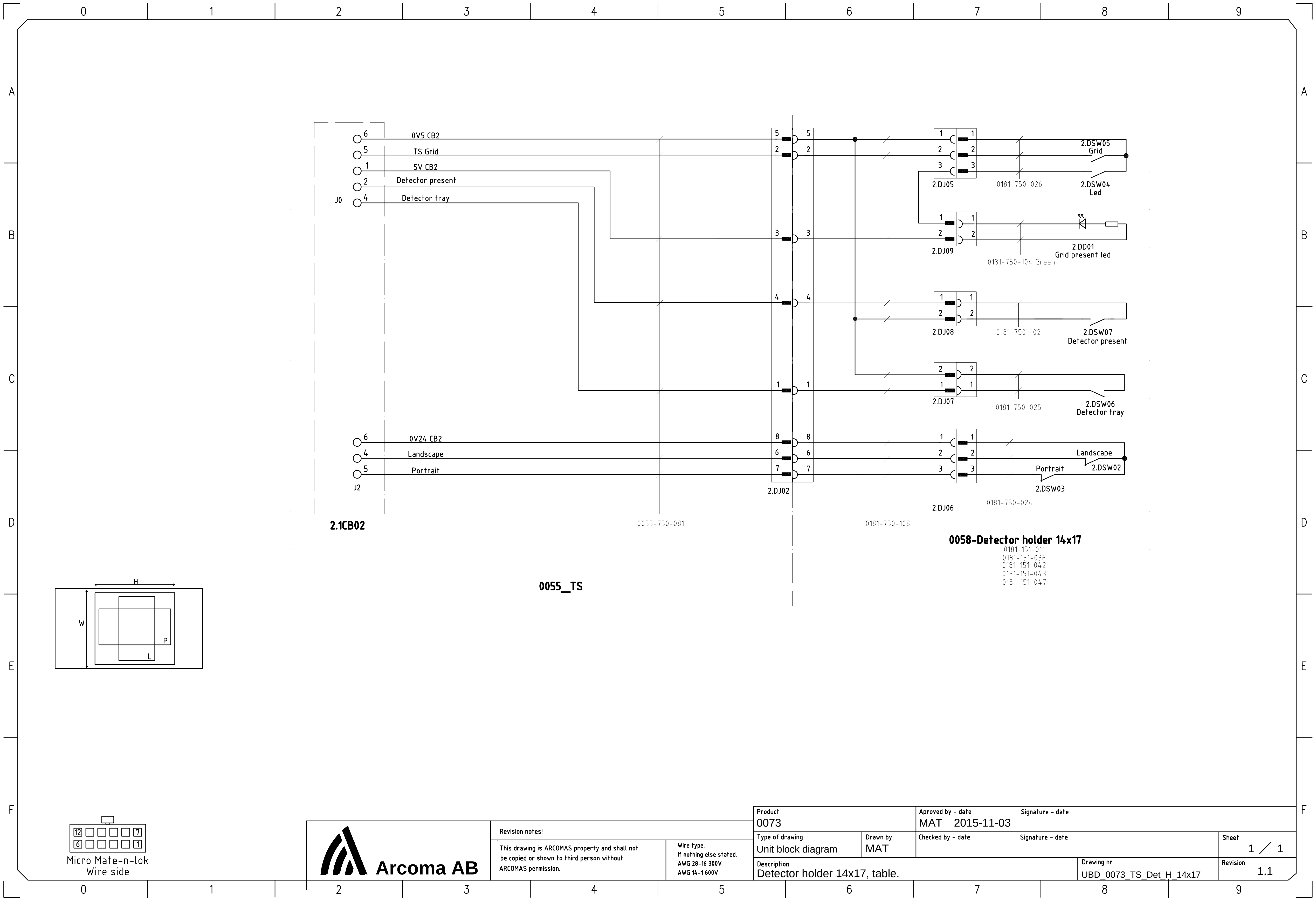
Revision notes!

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



UBD-0073__SC__Coll
4.4FIB01-J27
0V5 CB
0V Ret. lamp
Horizontal open
Horizontal close
Vertical open
Vertical close
Manual
0055-750-011
2.0COLL01
J2
HCB 72-510
J4
0200-007-215 (66001553,66001554)
S6
S9
S8
S10
S11
S7
0055-099-009
J1
J0
24V CB
Table top
A1
A2
2.1RE11
J3
J2
2.1CB01
2.0I/O01
0V Ret. TS. Lamp
4.4FIB01-J17
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
0073
Aproved by - date
MAT 2015-10-05
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
TS Collimator handlebar
Drawing nr
UBD_0073_TS_Coll_handlebar
Revision
1.1



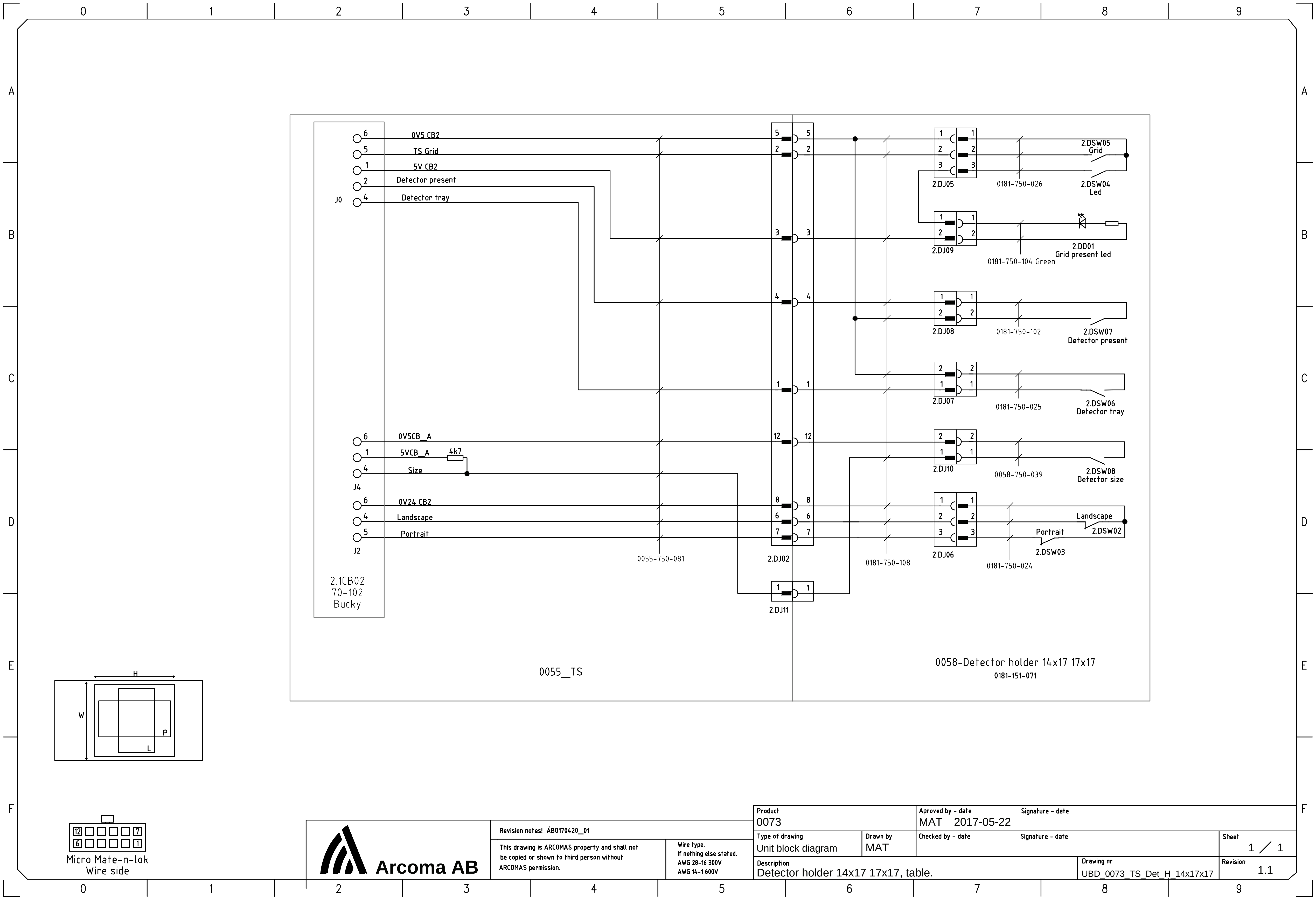
Arcoma AB

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: 0073	Aproved by - date: MAT 2015-11-03	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_0073_TS_Det_H_14x17	Revision: 1.1



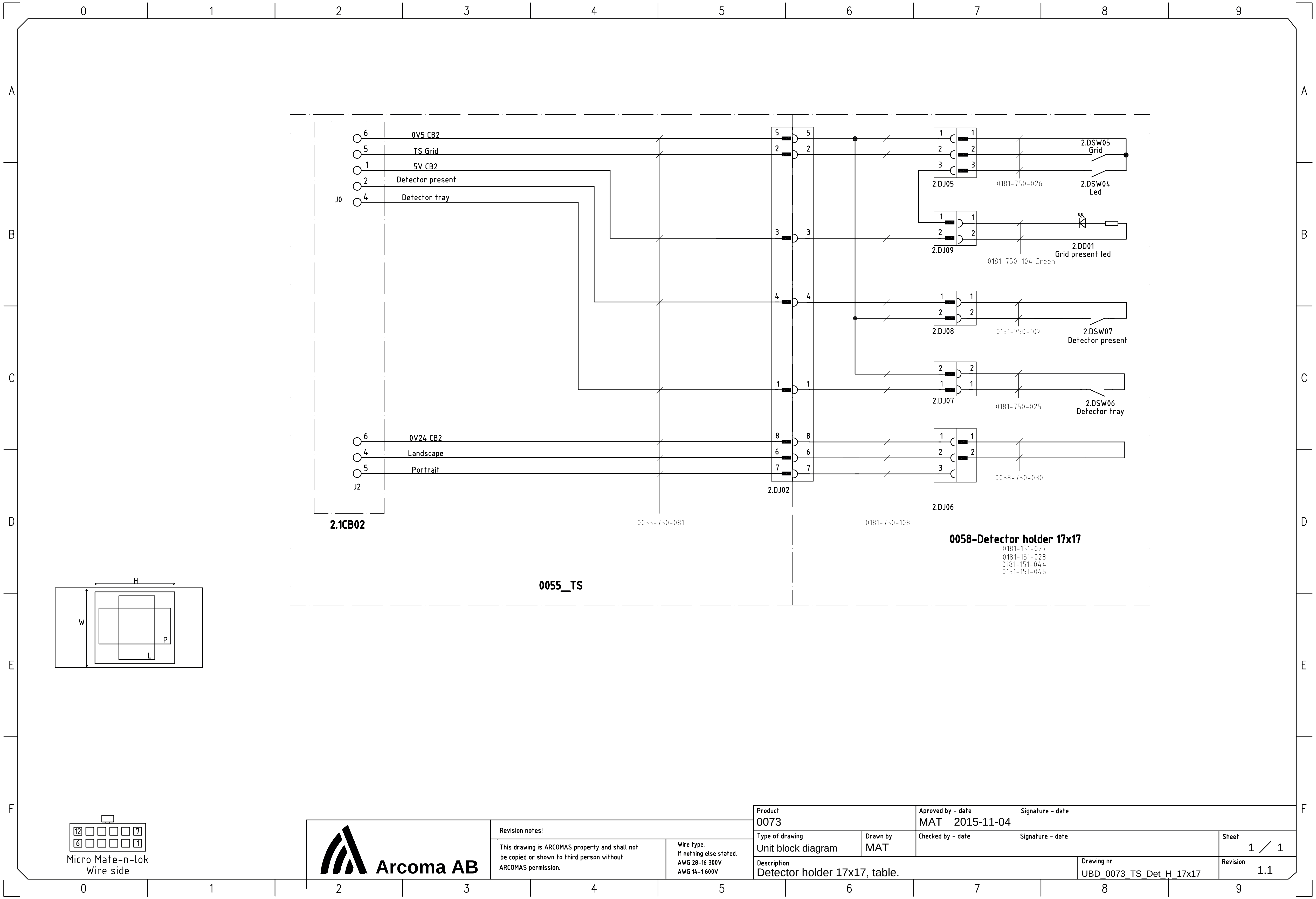
Arcoma AB

Revision notes! ÄB0170420_01

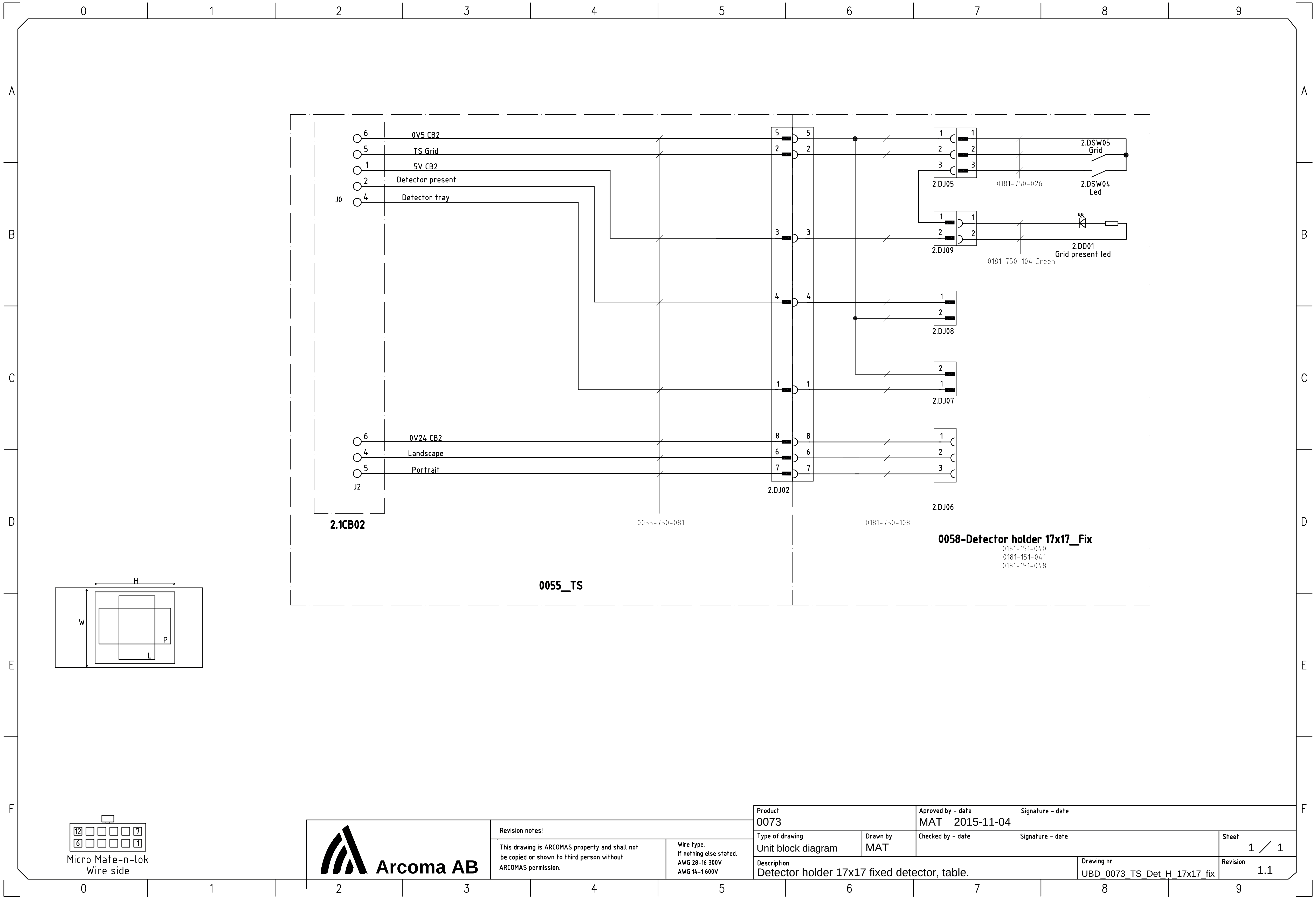
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

Product	Aproved by - date	Signature - date	
0073	MAT 2017-05-22		
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: Detector holder 14x17 17x17, table.		Drawing nr: UBD_0073_TS_Det_H_14x17x17	Revision: 1.1



0V5 CB2
TS Grid
5V CB2
Detector present
Detector tray
J0
0V24 CB2
Landscape
Portrait
J2
2.1CB02
2.DJ02
0055-750-081
0181-750-108
0055_TS
2.DSW05
Grid
2.DSW04
Led
2.DJ05
0181-750-026
2.DJ09
2.DD01
Grid present led
0181-750-104 Green
2.DJ08
0181-750-102
2.DSW07
Detector present
2.DJ07
0181-750-025
2.DSW06
Detector tray
0058-750-030
2.DJ06
0058-Detector holder 17x17
0181-151-027
0181-151-028
0181-151-044
0181-151-046
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
0073
Aproved by - date
MAT 2015-11-04
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_0073_TS_Det_H_17x17
Revision
1.1



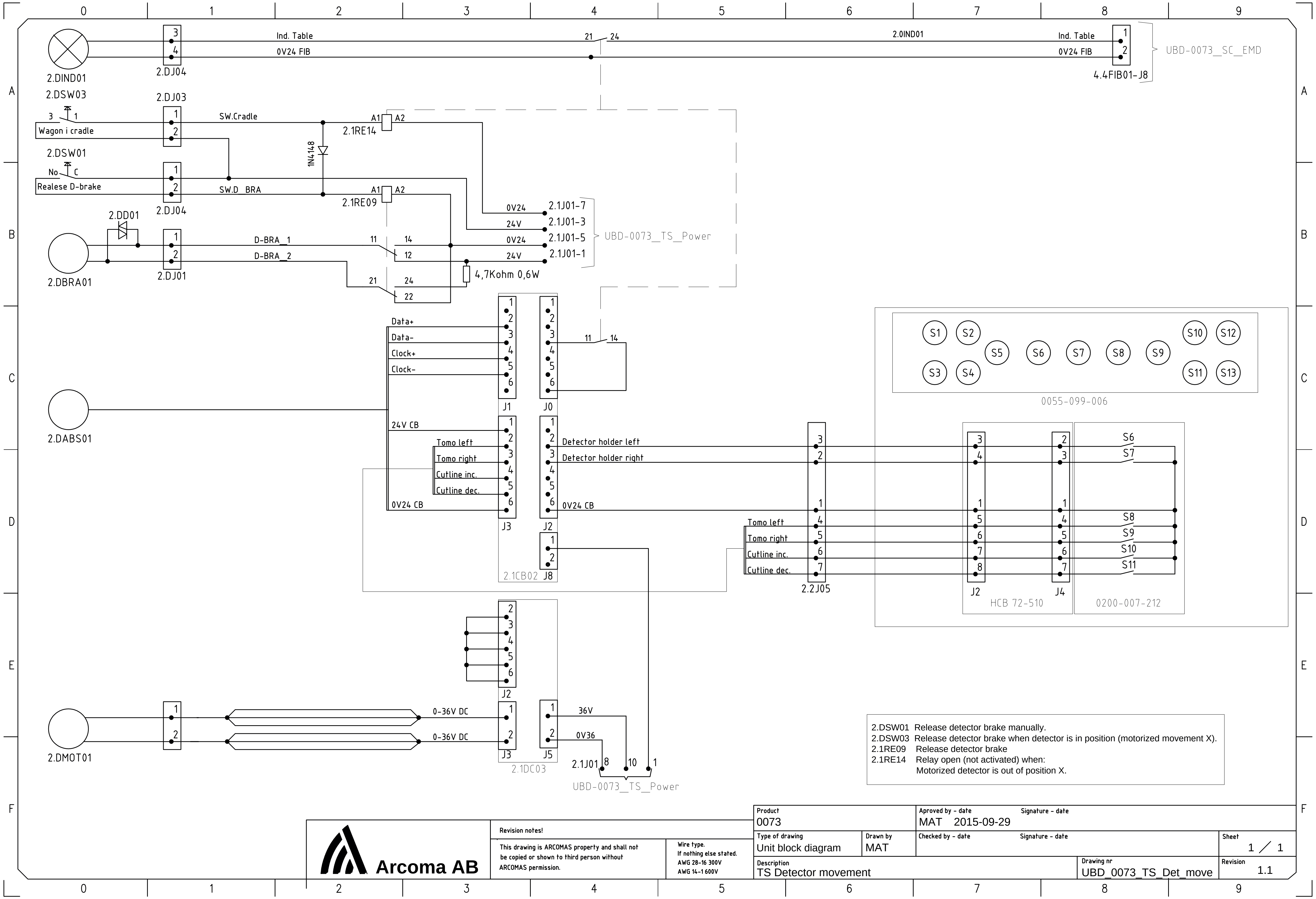
Arcoma AB

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: 0073	Aproved by - date: MAT 2015-11-04	Signature - date		
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date	Signature - date	Sheet: 1 / 1
Description: Detector holder 17x17 fixed detector, table.			Drawing nr: UBD_0073_TS_Det_H_17x17_fix	Revision: 1.1



2.DSW01	Release detector brake manually.
2.DSW03	Release detector brake when detector is in position (motorized movement X).
2.1RE09	Release detector brake
2.1RE14	Relay open (not activated) when: Motorized detector is out of position X.

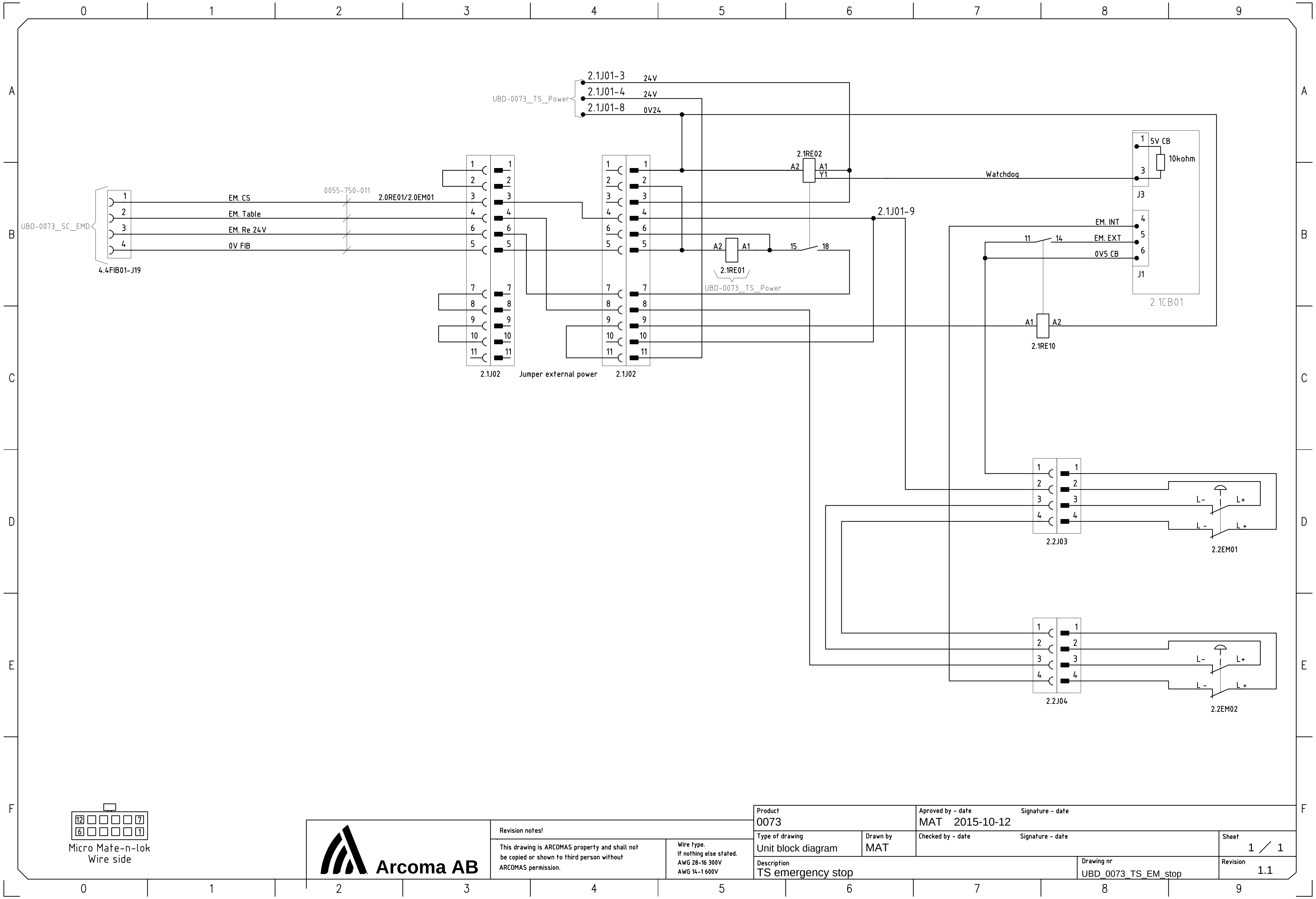
Arcoma AB

Revision notes!

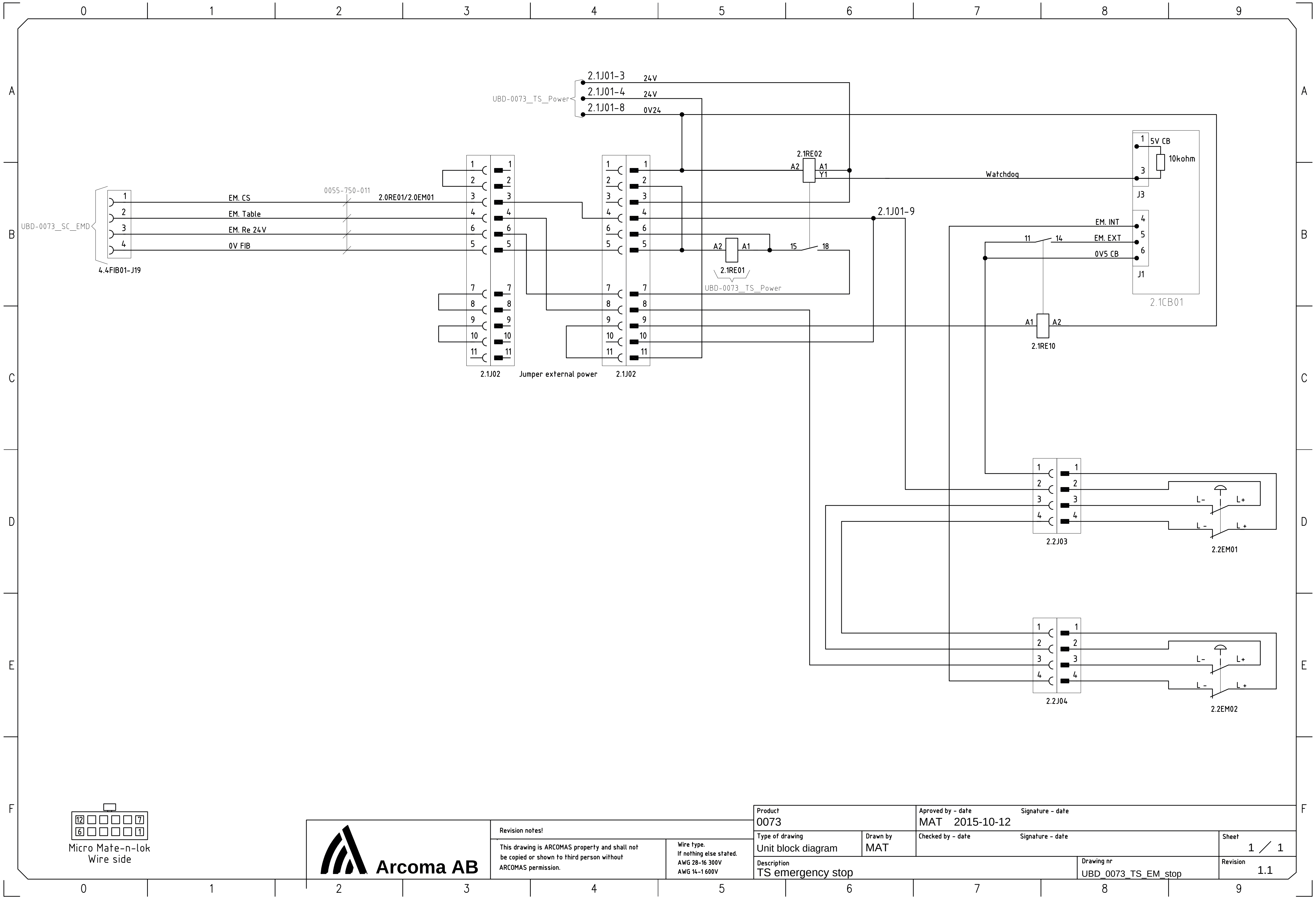
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V

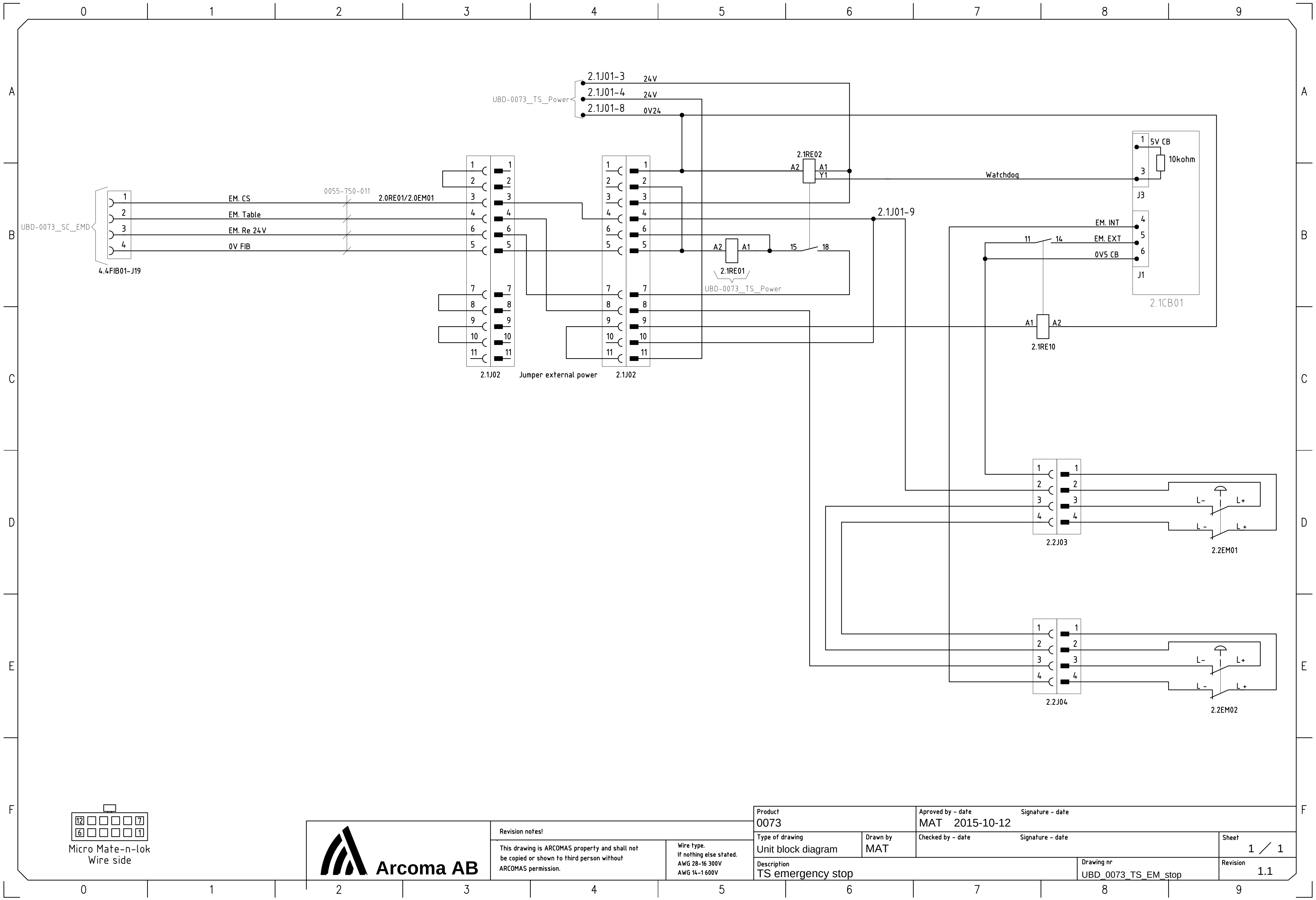
Product	Aproved by - date	Signature - date	
0073	MAT 2015-09-29		
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: TS Detector movement		Drawing nr: UBD_0073_TS_Det_move	Revision: 1.1



Arcoma AB	Revision notes!		Product: 0073	Aproved by - date: MAT 2015-10-12	Signature - date	
	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	Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
			Description: TS emergency stop		Drawing nr: UBD_0073_TS_EM_stop	Revision: 1.1



2.1J01-3
2.1J01-4
2.1J01-8
24V
24V
0V24
UBD-0073_TS_Power
UBD-0073_SC_EMD
4.4FIB01-J19
EM. CS
EM. Table
EM. Re 24V
0V FIB
0055-750-011
2.0RE01/2.0EM01
2.1J02
Jumper external power
2.1J02
2.1RE02
2.1RE01
UBD-0073_TS_Power
2.1J01-9
Watchdog
5V CB
10kohm
J3
EM. INT
EM. EXT
0V5 CB
J1
2.1CB01
2.1RE10
2.2J03
2.2EM01
2.2J04
2.2EM02
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
0073
Aproved by - date
MAT 2015-10-12
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
TS emergency stop
Drawing nr
UBD_0073_TS_EM_stop
Revision
1.1



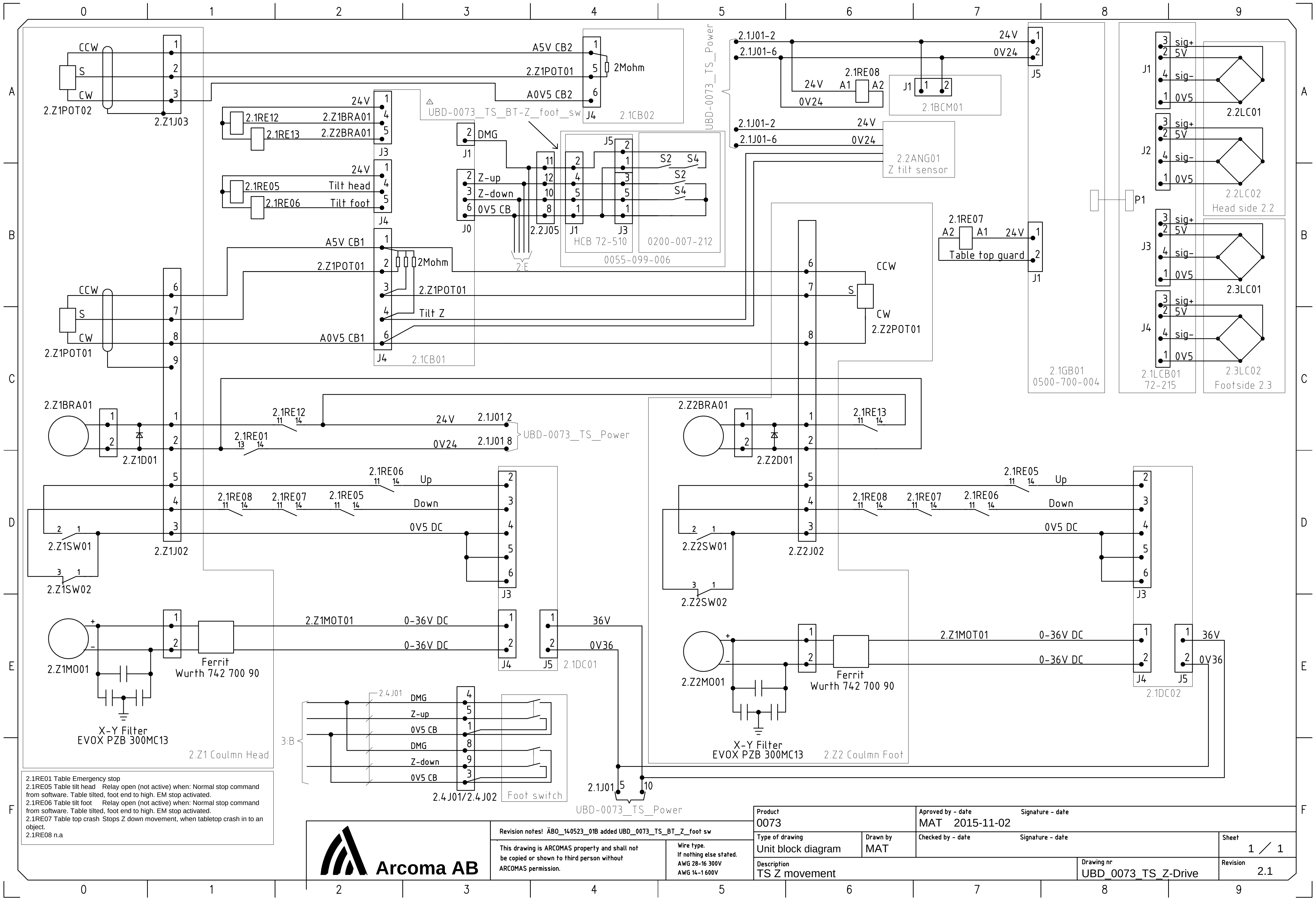
Product	Aproved by - date	Signature - date	
0073	MAT 2015-10-12		
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: TS emergency stop		Drawing nr: UBD_0073_TS_EM_stop	Revision: 1.1

Arcoma AB

Revision notes!

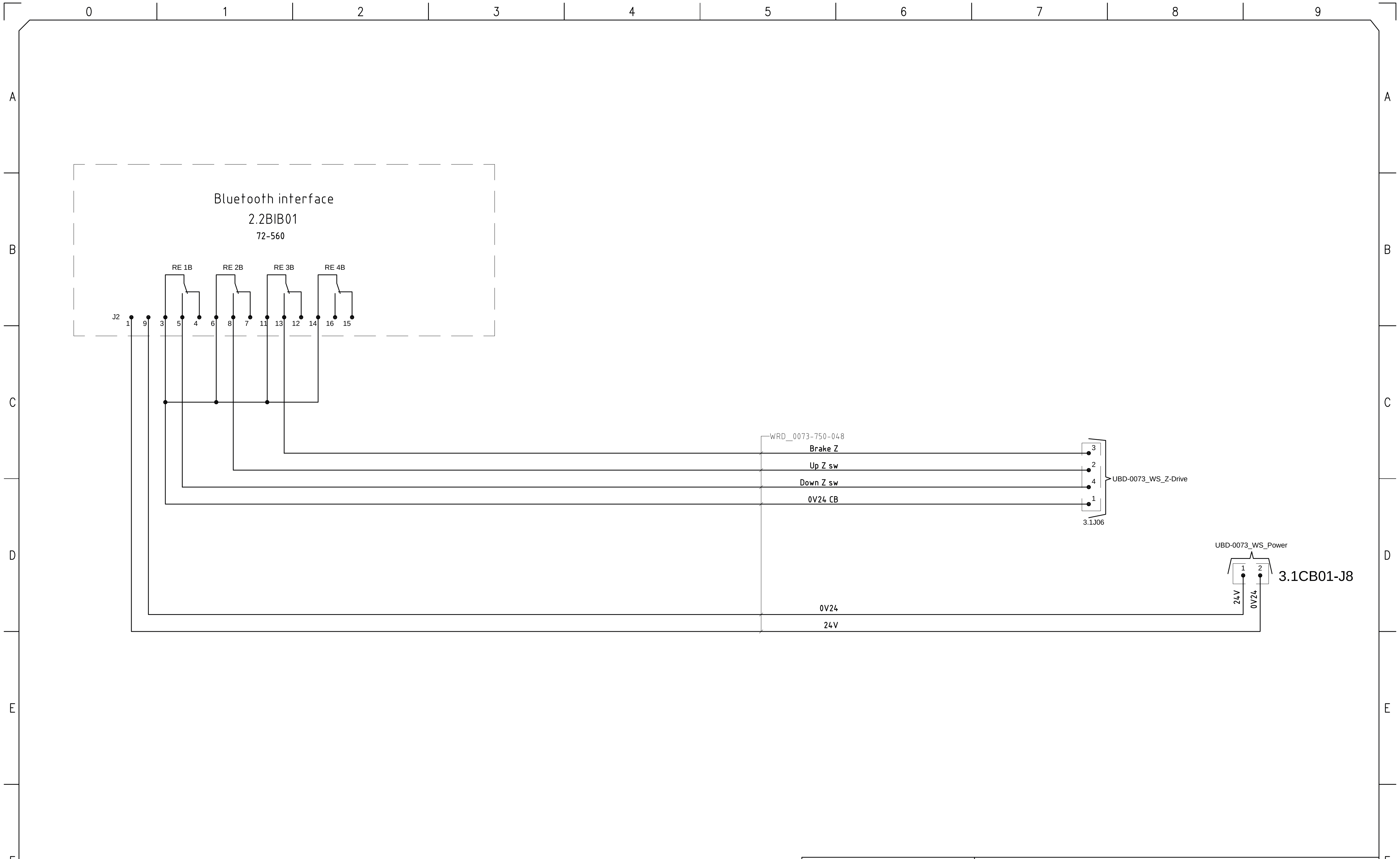
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V



2.Z1POT02
2.Z1J03
2.Z1POT01
2.Z1J02
2.Z1BRA01
2.Z1D01
2.Z1SW01
2.Z1SW02
2.Z1MO01
2.Z1MOT01
Ferrit
Wurth 742 700 90
X-Y Filter
EVOX PZB 300MC13
2.Z1 Coulmn Head
A5V CB2
2.Z1POT01
A0V5 CB2
2Mohm
2.1CB02
UBD-0073__TS__BT-Z__foot__sw
2.1RE12
2.1RE13
2.1RE05
2.1RE06
Tilt head
Tilt foot
24V
DMG
Z-up
Z-down
0V5 CB
2.2J05
HCB 72-510
0200-007-212
0055-099-006
A5V CB1
A0V5 CB1
Tilt Z
2.1CB01
2.1J01-2
2.1J01-6
24V
0V24
2.1RE08
2.1BCM01
2.2ANG01
Z tilt sensor
2.1RE07
Table top guard
2.1GB01
0500-700-004
2.1LCB01
72-215
sig+
5V
sig-
0V5
2.2LC01
2.2LC02
Head side 2.2
2.3LC01
2.3LC02
Footside 2.3
P1
CCW
S
CW
2.Z2POT01
2.1RE01
UBD-0073__TS__Power
2.Z2BRA01
2.Z2D01
2.Z2SW01
2.Z2SW02
2.Z2J02
Up
Down
0V5 DC
0-36V DC
36V
0V36
2.1DC01
2.1DC02
2.Z2MO01
2.Z2MOT01
2.Z2 Coulmn Foot
2.4J01
3:B
2.4J01/2.4J02
Foot switch
2.1J01
2.1RE01 Table Emergency stop
2.1RE05 Table tilt head Relay open (not active) when: Normal stop command from software. Table tilted, foot end to high. EM stop activated.
2.1RE06 Table tilt foot Relay open (not active) when: Normal stop command from software. Table tilted, foot end to high. EM stop activated.
2.1RE07 Table top crash Stops Z down movement, when tabletop crash in to an object.
2.1RE08 n.a
Arcoma AB
Revision notes! ÄBO__140523__01B added UBD__0073__TS__BT__Z__foot sw
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 0073
Aproved by - date MAT 2015-11-02
Signature - date
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date
Sheet 1 / 1
Description TS Z movement
Drawing nr UBD_0073_TS_Z-Drive
Revision 2.1

8.3.3 Wall stand



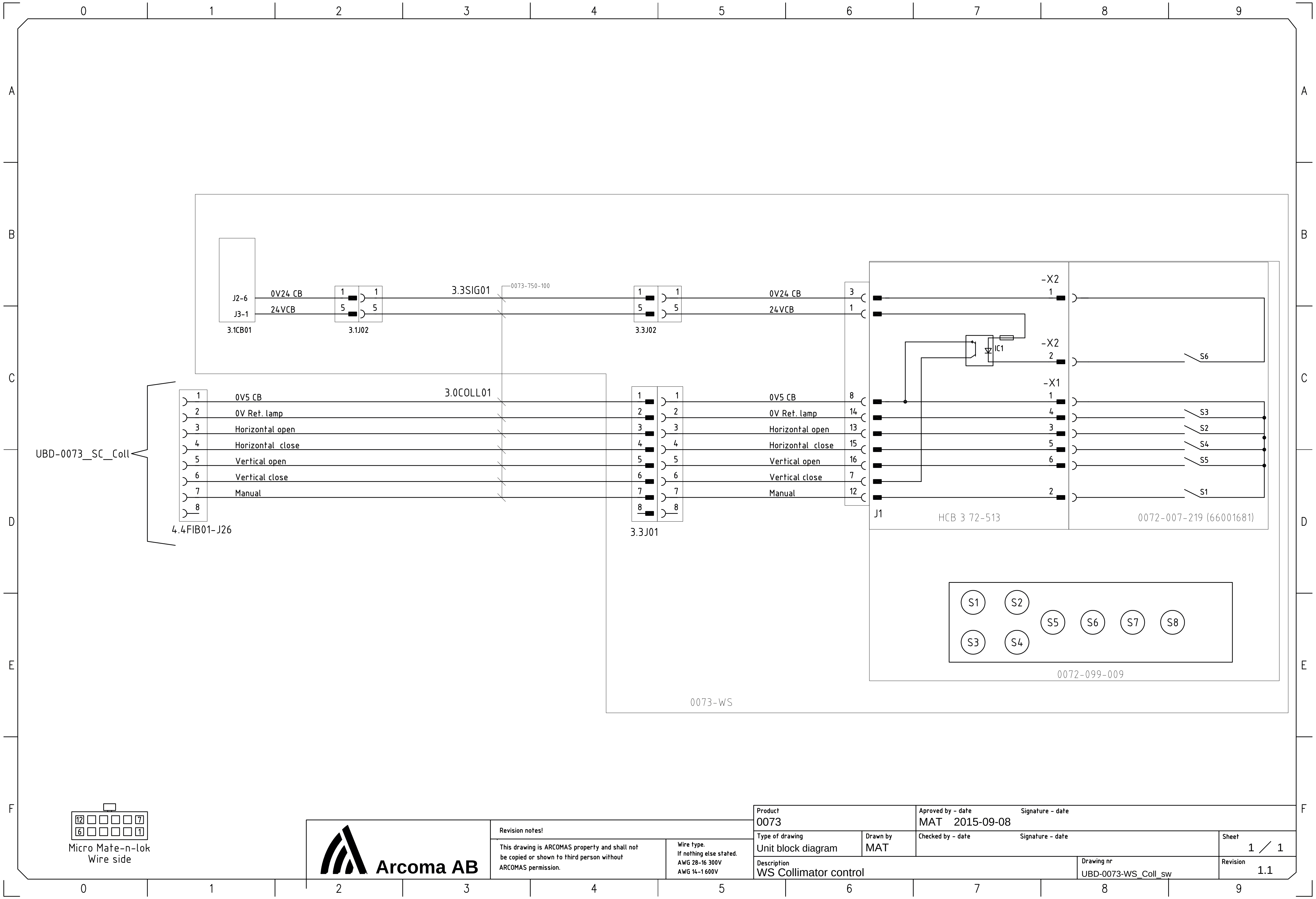
Product	Aproved by - date	Signature - date	
0073	MAT 2015-11-02		
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: Bluetooth foot switch Wall stand		Drawing nr: UBD_0073_WS_BT_Z_foot_sw	Revision: 1.1

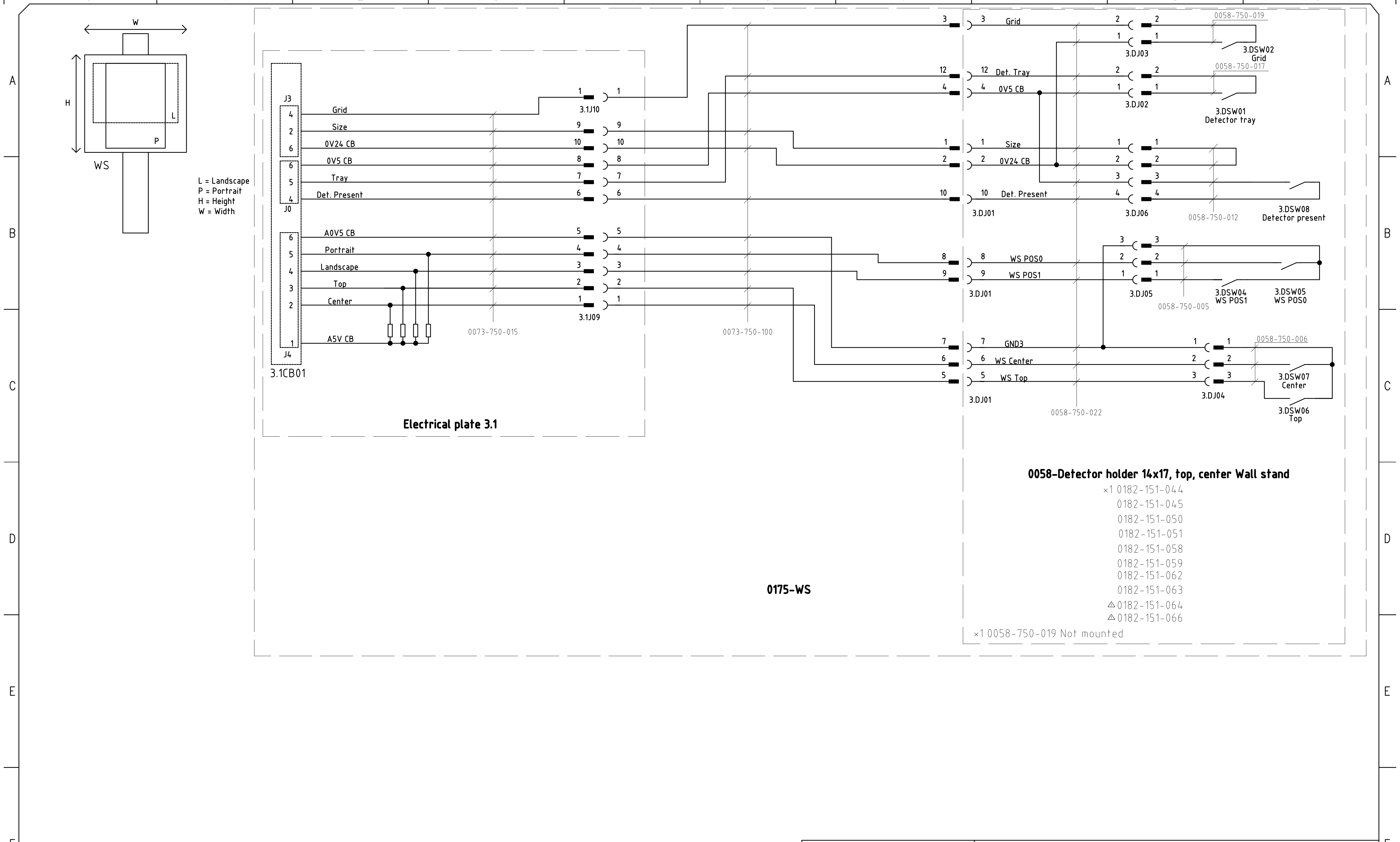
Arcoma AB

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


3.3SIG01
0073-750-100
J2-6
J3-1
0V24 CB
24VCB
3.1CB01
3.1J02
3.3J02
-X2
IC1
S6
-X1
3.0COLL01
UBD-0073__SC__Coll
0V5 CB
0V Ret. lamp
Horizontal open
Horizontal close
Vertical open
Vertical close
Manual
4.4FIB01-J26
3.3J01
S3
S2
S4
S5
S1
J1
HCB 3 72-513
0072-007-219 (66001681)
S1 S2 S5 S6 S7 S8 S3 S4
0072-099-009
0073-WS
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
0073
Aproved by - date
MAT 2015-09-08
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
WS Collimator control
Drawing nr
UBD-0073-WS_Coll_sw
Revision
1.1



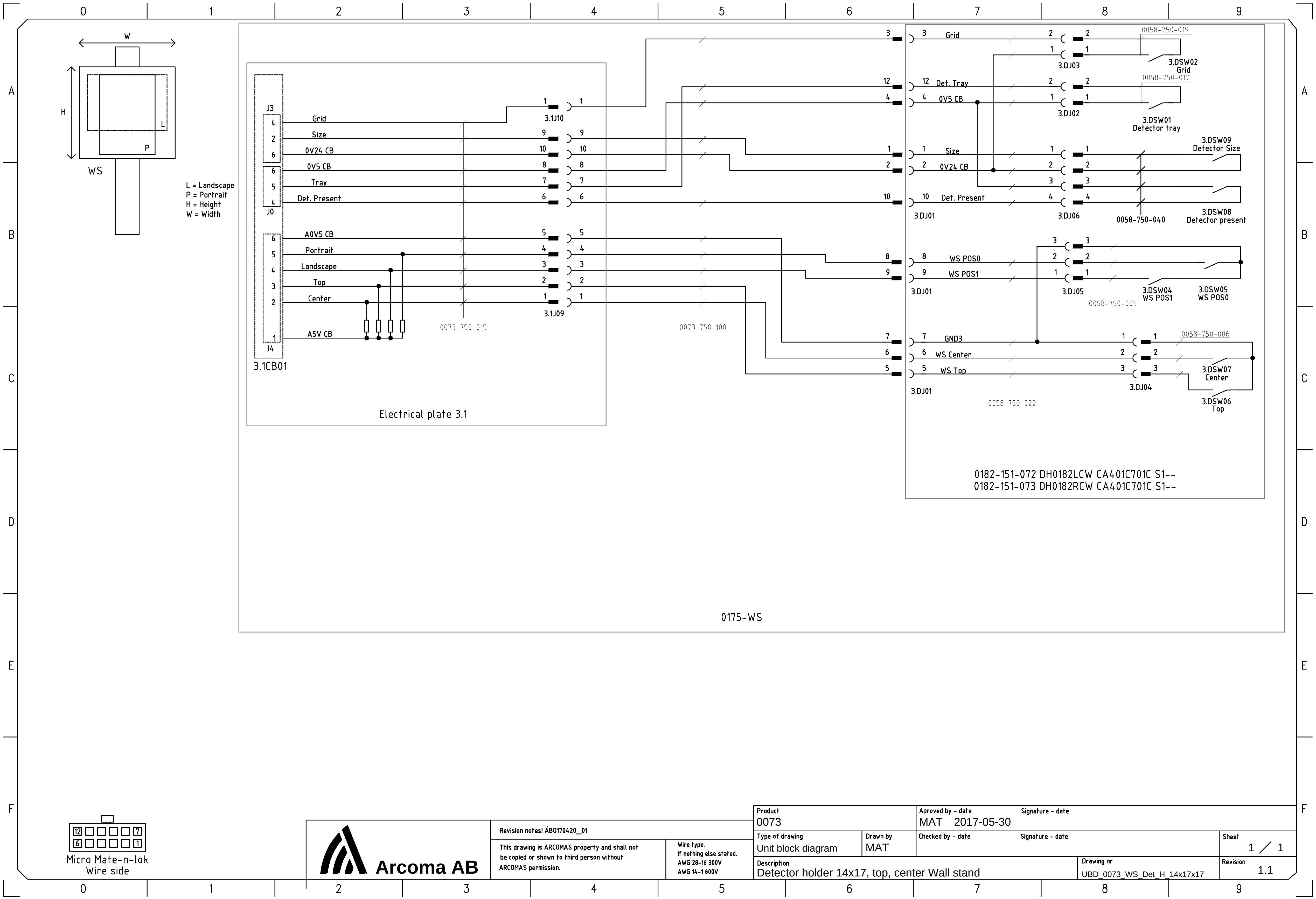
Arcoma AB

Revision notes! 4202 Added Detectors

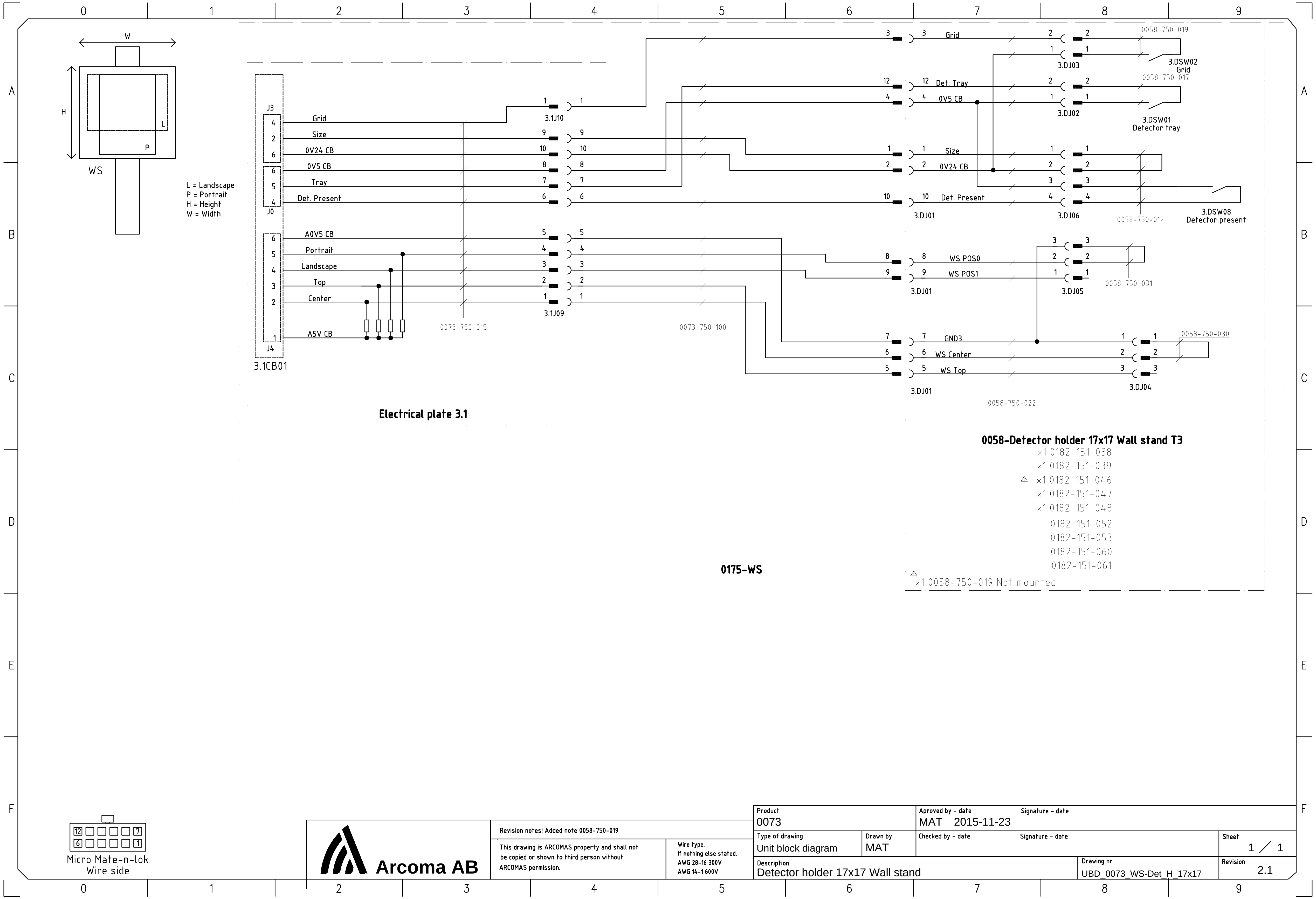
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

Product: 0073	Aproved by - date: MAT 2015-11-04	Signature - date	
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: Detector holder 14x17, top, center Wall stand		Drawing nr: UBD_0073_WS_Det_H_14x17_TCW	Revision: 2.1



WS
L = Landscape
P = Portrait
H = Height
W = Width
3.1CB01
Grid
Size
0V24 CB
0V5 CB
Tray
Det. Present
A0V5 CB
Portrait
Landscape
Top
Center
A5V CB
3.1J10
3.1J09
0073-750-015
0073-750-100
Electrical plate 3.1
3.DJ01
3.DJ02
3.DJ03
3.DJ04
3.DJ05
3.DJ06
3.DSW01 Detector tray
3.DSW02 Grid
3.DSW04 WS POS1
3.DSW05 WS POS0
3.DSW06 Top
3.DSW07 Center
3.DSW08 Detector present
3.DSW09 Detector Size
WS POS0
WS POS1
GND3
WS Center
WS Top
0058-750-005
0058-750-006
0058-750-017
0058-750-019
0058-750-022
0058-750-040
0182-151-072 DH0182LCW CA401C701C S1--
0182-151-073 DH0182RCW CA401C701C S1--
0175-WS
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
0073
Aproved by - date
MAT 2017-05-30
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Sheet
1 / 1
Description
Detector holder 14x17, top, center Wall stand
Drawing nr
UBD_0073_WS_Det_H_14x17x17
Revision
1.1



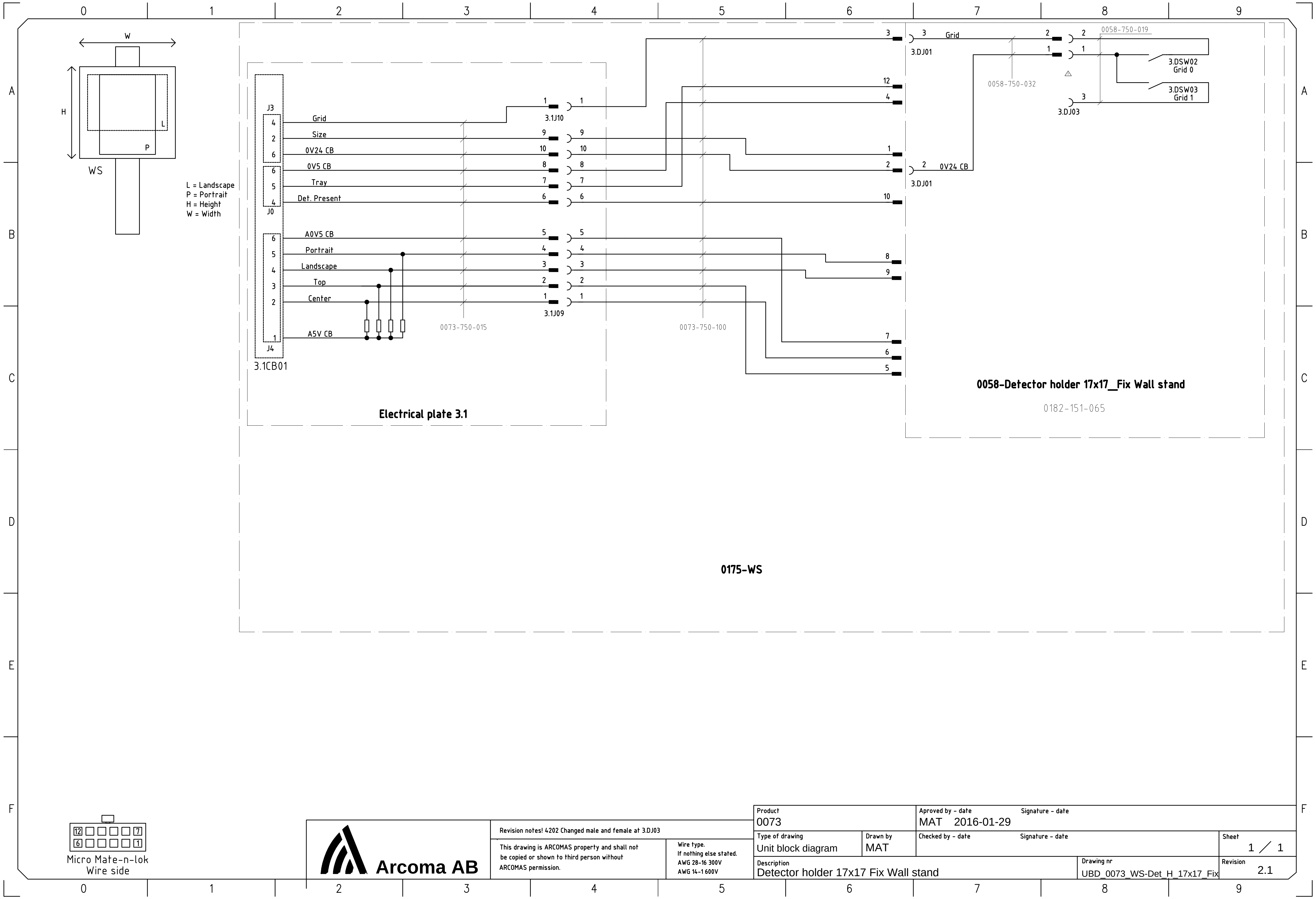
Arcoma AB

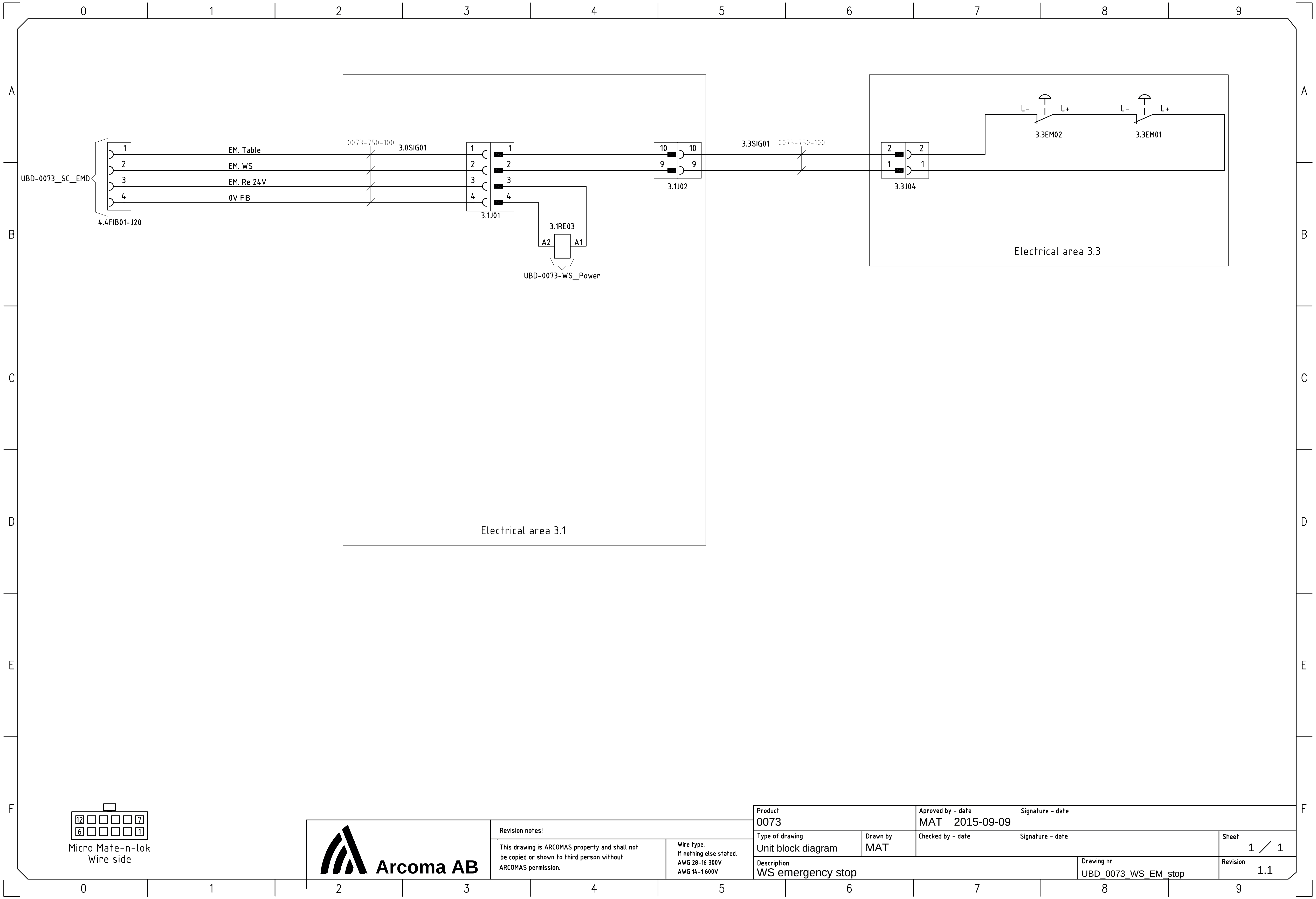
Revision notes! Added note 0058-750-019

This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

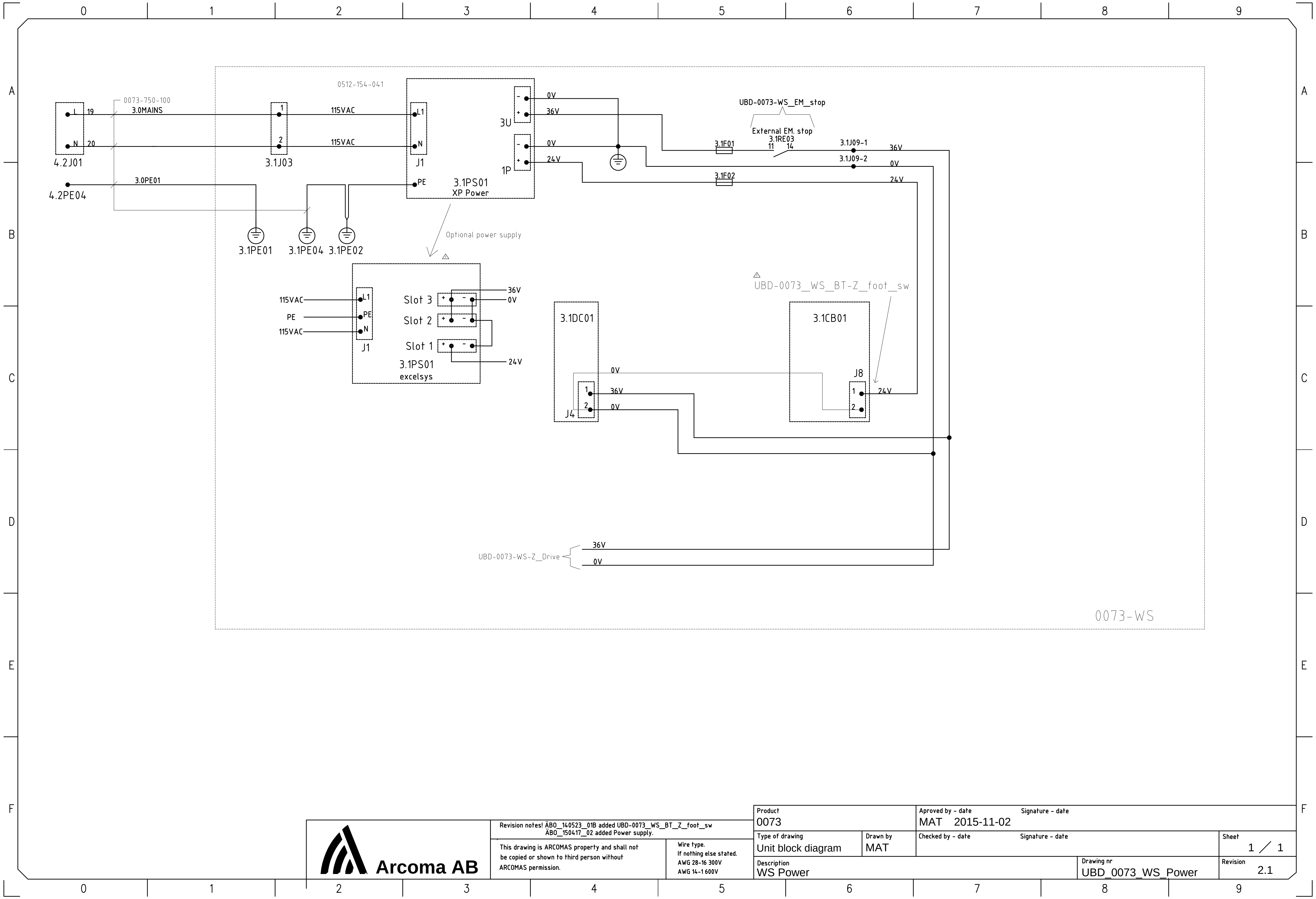
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 14-1 600V

Product	Aproved by - date	Signature - date	
0073	MAT 2015-11-23		
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date / Signature - date	Sheet: 1 / 1
Description: Detector holder 17x17 Wall stand		Drawing nr: UBD_0073_WS-Det_H_17x17	Revision: 2.1

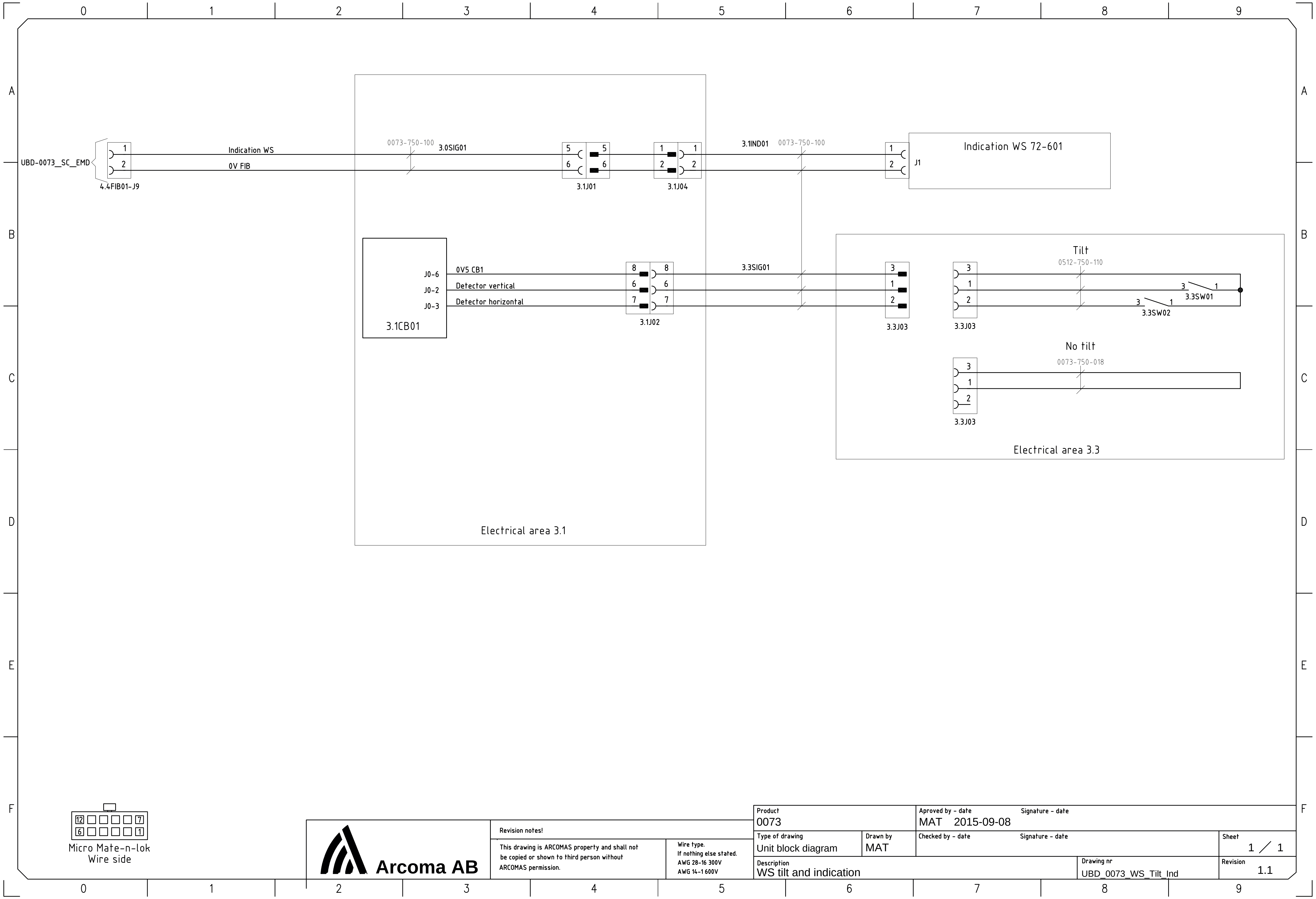

WS
L = Landscape
P = Portrait
H = Height
W = Width
Grid
Size
0V24 CB
0V5 CB
Tray
Det. Present
A0V5 CB
Portrait
Landscape
Top
Center
A5V CB
3.1CB01
3.1J10
3.1J09
0073-750-015
0073-750-100
Electrical plate 3.1
3.DJ01
3.DJ03
3.DSW02 Grid 0
3.DSW03 Grid 1
0058-750-019
0058-750-032
0058-Detector holder 17x17_Fix Wall stand
0182-151-065
0175-WS
Micro Mate-n-lok
Wire side
Arcoma AB
Revision notes! 4202 Changed male and female at 3.DJ03
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 0073
Aproved by - date MAT 2016-01-29
Signature - date
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date
Sheet 1 / 1
Description Detector holder 17x17 Fix Wall stand
Drawing nr UBD_0073_WS-Det_H_17x17_Fix
Revision 2.1

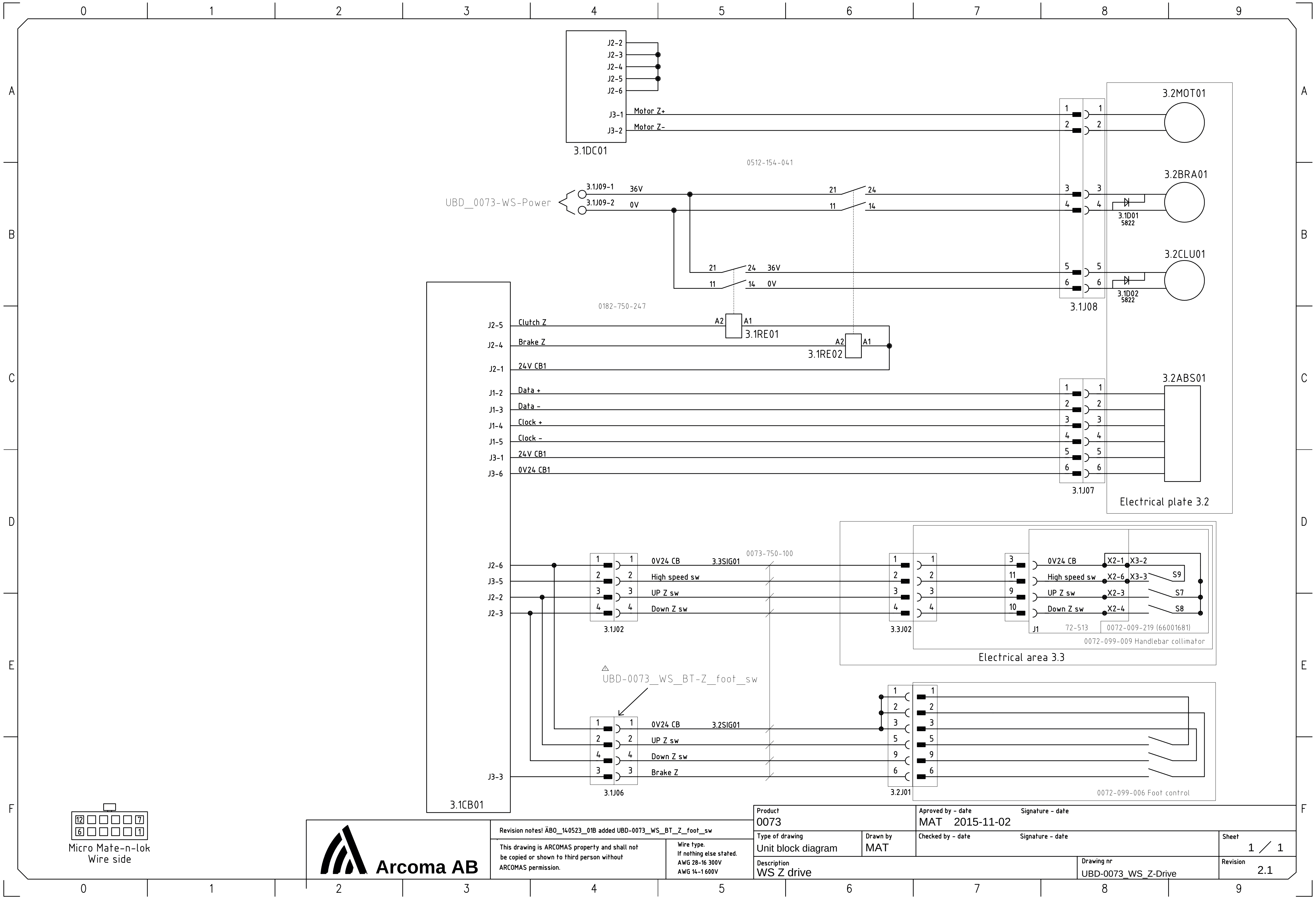


Arcoma AB	Revision notes!	Product: 0073	Aproved by - date: MAT 2015-09-09 / Signature - date
	This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.	Type of drawing: Unit block diagram / Drawn by: MAT	Checked by - date / Signature - date / Sheet: 1 / 1
	Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V	Description: WS emergency stop	Drawing nr: UBD_0073_WS_EM_stop / Revision: 1.1



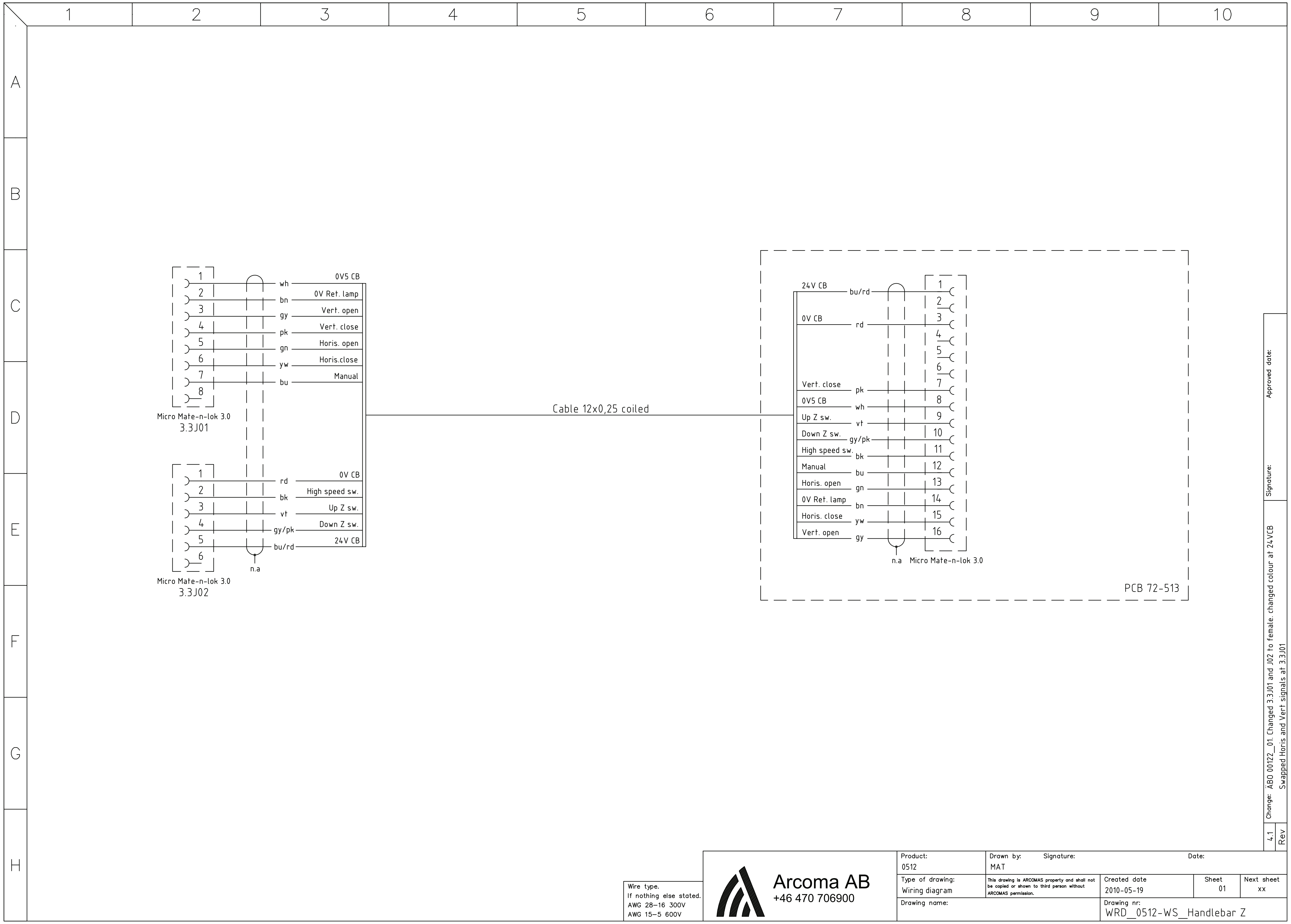
0512-154-041
0073-750-100
3.0MAINS
115VAC
115VAC
4.2J01
3.1J03
J1
3.0PE01
4.2PE04
3.1PS01
XP Power
3U
1P
0V
36V
0V
24V
UBD-0073-WS_EM_stop
External EM. stop
3.1F01
3.1RE03
3.1F02
3.1J09-1
3.1J09-2
3.1PE01
3.1PE04
3.1PE02
Optional power supply
Slot 3
Slot 2
Slot 1
3.1PS01
excelsys
UBD-0073_WS_BT-Z_foot_sw
3.1DC01
3.1CB01
J4
J8
UBD-0073-WS-Z_Drive
0073-WS
Revision notes! ÄBO_140523_01B added UBD-0073_WS_BT_Z_foot_sw
ÄBO_150417_02 added Power supply.
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
0073
Aproved by - date
MAT 2015-11-02
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
WS Power
Drawing nr
UBD_0073_WS_Power
Revision
2.1


UBD-0073_SC_EMD
4.4FIB01-J9
Indication WS
0V FIB
0073-750-100
3.0SIG01
3.1J01
3.1J04
3.1IND01
0073-750-100
J1
Indication WS 72-601
J0-6
J0-2
J0-3
0V5 CB1
Detector vertical
Detector horizontal
3.1CB01
3.1J02
3.3SIG01
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
0073
Aproved by - date
MAT 2015-09-08
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
WS tilt and indication
Drawing nr
UBD_0073_WS_Tilt_Ind
Revision
1.1

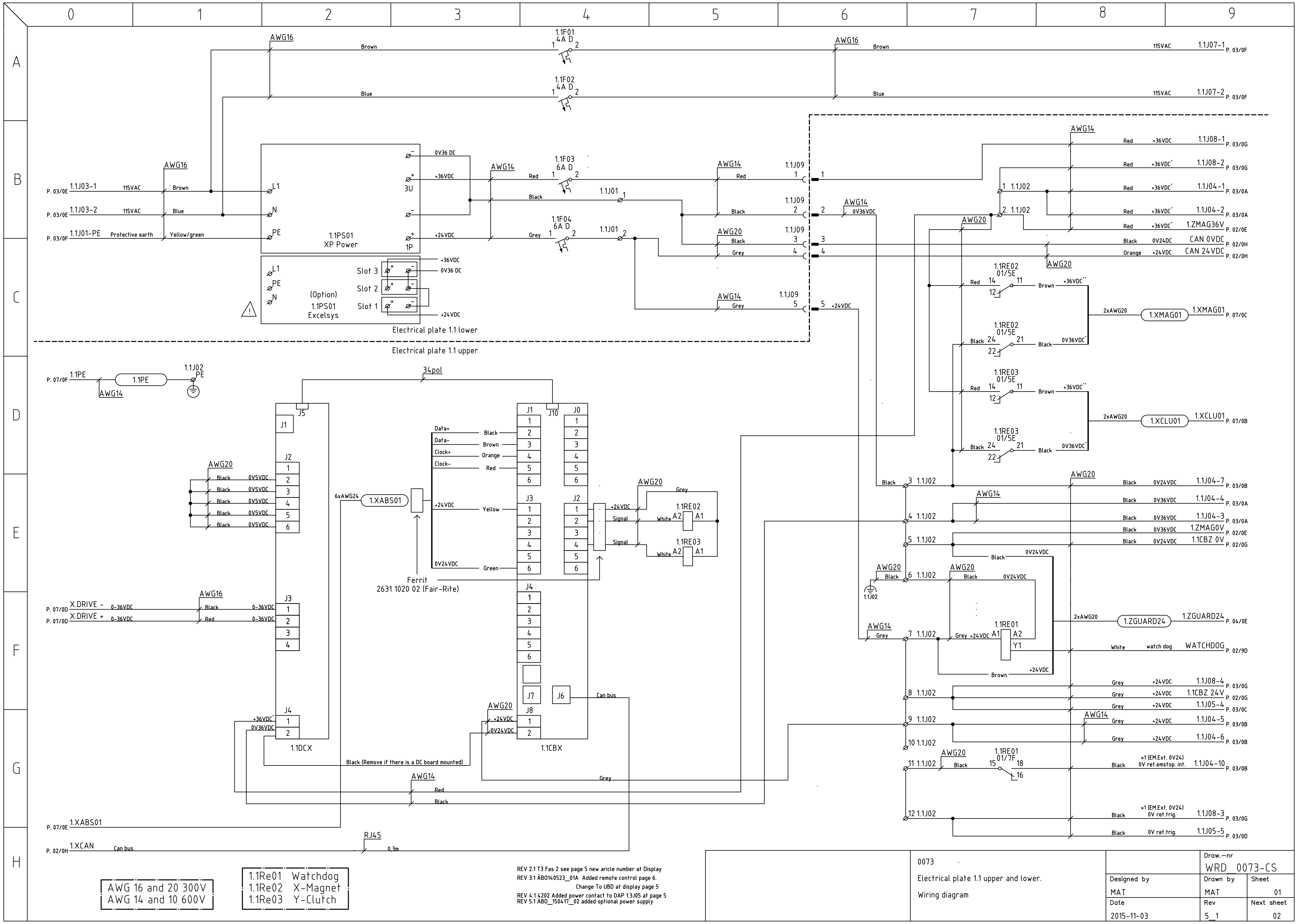


Arcoma AB	Revision notes! ÄBO__140523__01B added UBD-0073__WS__BT__Z__foot__sw		
	This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.	Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V	

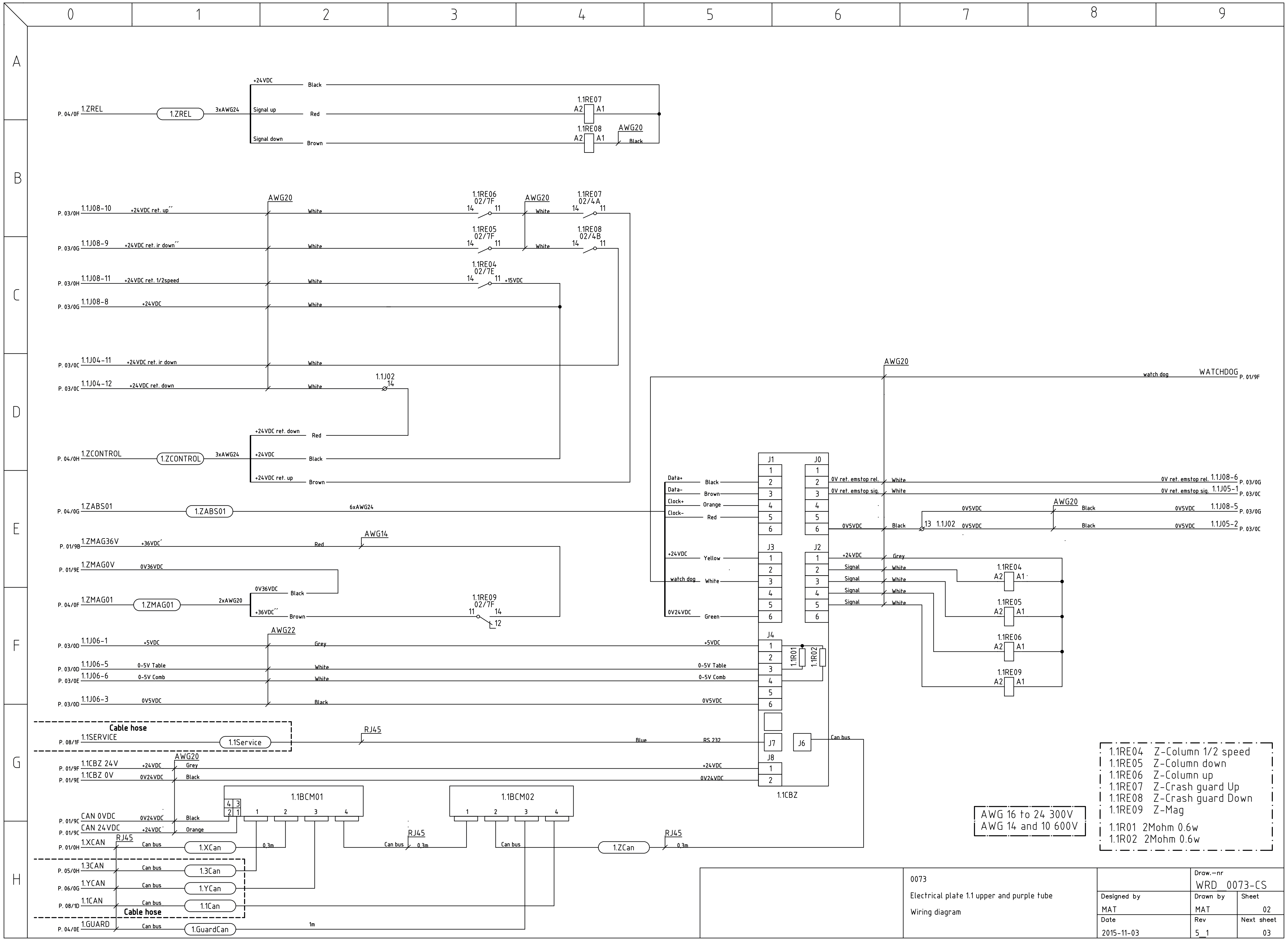
Product	Aproved by - date	Signature - date	
0073	MAT 2015-11-02		
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date	Sheet: 1 / 1
Description: WS Z drive		Drawing nr: UBD-0073_WS_Z-Drive	Revision: 2.1


0V5 CB
0V Ret. lamp
Vert. open
Vert. close
Horis. open
Horis.close
Manual
wh
bn
gy
pk
gn
yw
bu
Micro Mate-n-lok 3.0
3.3J01
0V CB
High speed sw.
Up Z sw.
Down Z sw.
24V CB
rd
bk
vt
gy/pk
bu/rd
n.a
Micro Mate-n-lok 3.0
3.3J02
Cable 12x0,25 coiled
24V CB
0V CB
Vert. close
0V5 CB
Up Z sw.
Down Z sw.
High speed sw.
Manual
Horis. open
0V Ret. lamp
Horis. close
Vert. open
n.a
Micro Mate-n-lok 3.0
PCB 72-513
Approved date:
Signature:
Change: ABO 00122_01. Changed 3.3J01 and J02 to female. changed colour at 24VCB
Swapped Horis and Vert signals at 3.3J01
4.1
Rev
Wire type.
If nothing else stated.
AWG 28-16 300V
AWG 15-5 600V
Arcoma AB
+46 470 706900
Product:
0512
Drawn by:
MAT
Signature:
Date:
Type of drawing:
Wiring diagram
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.
Created date
2010-05-19
Sheet
01
Next sheet
xx
Drawing name:
Drawing nr:
WRD__0512-WS__Handlebar Z

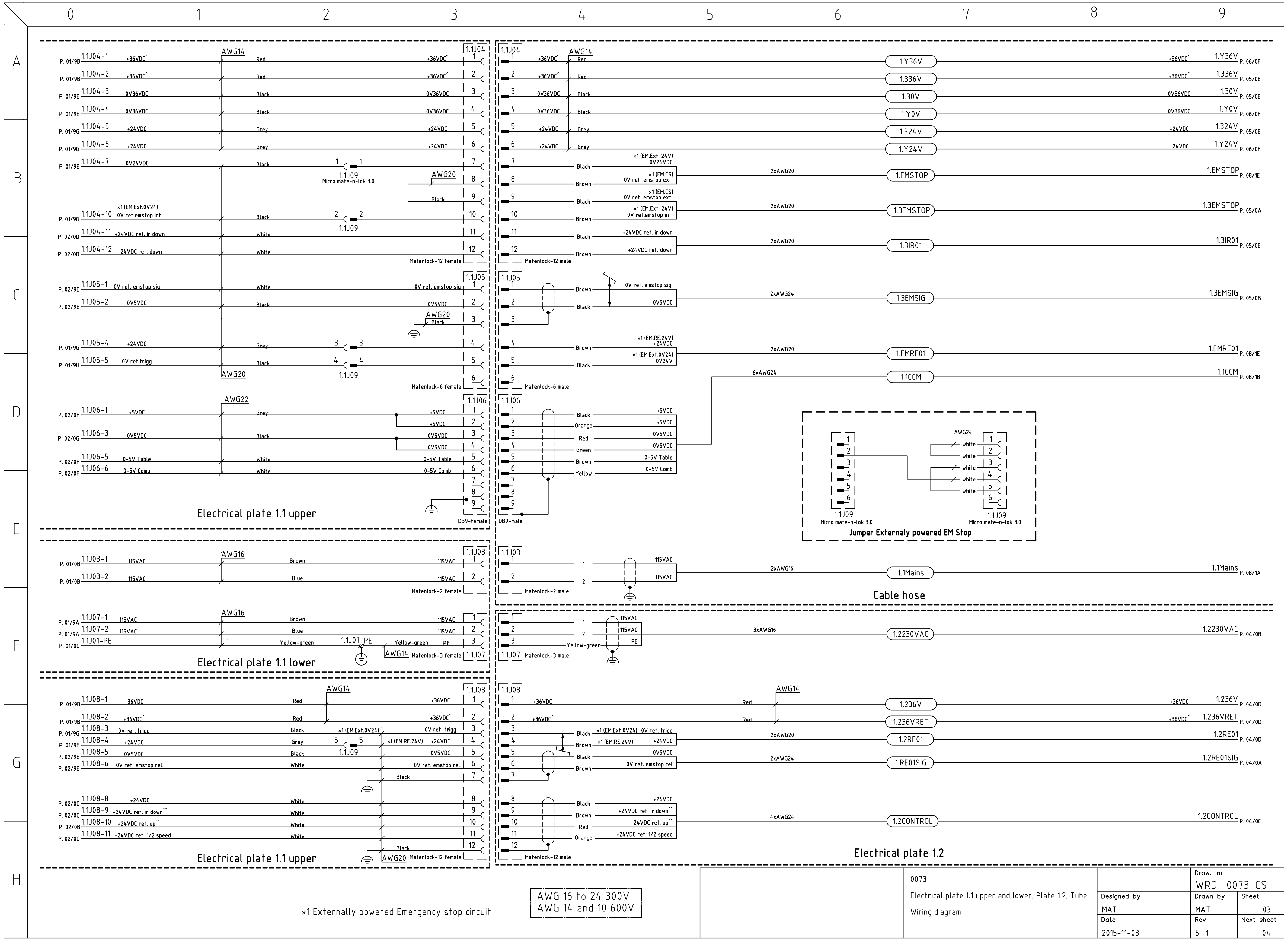
8.3.4 OTC



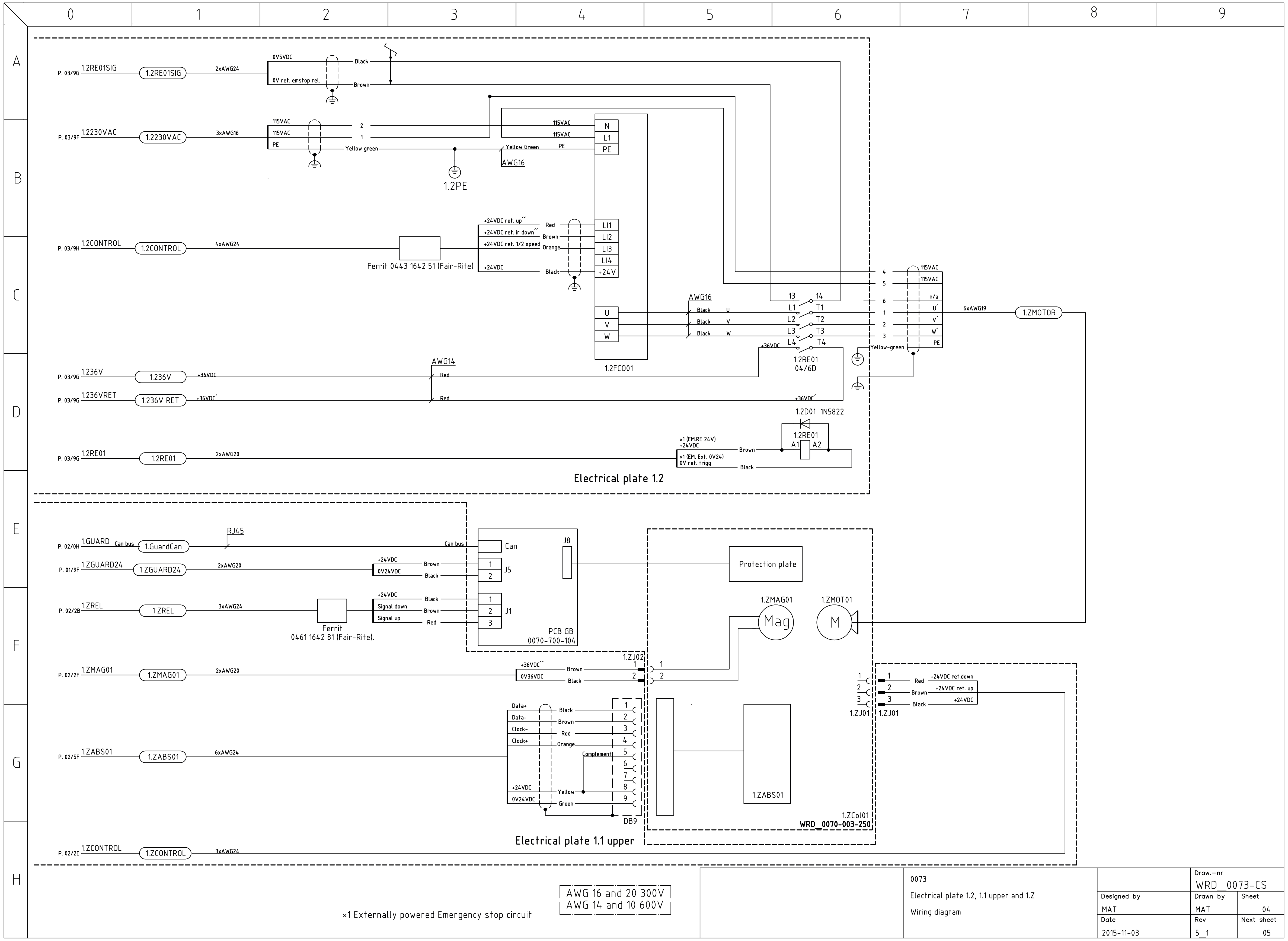
1.1F01 4A D
1.1F02 4A D
1.1F03 6A D
1.1F04 6A D
1.1PS01 XP Power
(Option) 1.1PS01 Excelsys
Slot 3
Slot 2
Slot 1
Electrical plate 1.1 lower
Electrical plate 1.1 upper
1.1J07-1
1.1J07-2
1.1J08-1
1.1J08-2
1.1J04-1
1.1J04-2
1.ZMAG36V
CAN 0VDC
CAN 24VDC
1.XMAG01
1.XCLU01
1.ZGUARD24
WATCHDOG
1.1DCX
1.1CBX
1.XABS01
Ferrit
2631 1020 02 (Fair-Rite)
34pol
X.DRIVE -
X.DRIVE +
1.XCAN
RJ45
Black (Remove if there is a DC board mounted)
AWG 16 and 20 300V
AWG 14 and 10 600V
1.1Re01 Watchdog
1.1Re02 X-Magnet
1.1Re03 Y-Clutch
REV 2.1 T3 Fas 2 see page 5 new aricle number at Display
REV 3.1 AB0140523_01A Added remote control page 6.
Change To UBD at display page 5
REV 4.1 4202 Added power contact to DAP 1.3J05 at page 5
REV 5.1 ABO_150417_02 added optional power supply
0073
Electrical plate 1.1 upper and lower.
Wiring diagram
Draw.-nr
WRD 0073-CS
Designed by
MAT
Drawn by
MAT
Sheet
01
Date
2015-11-03
Rev
5_1
Next sheet
02



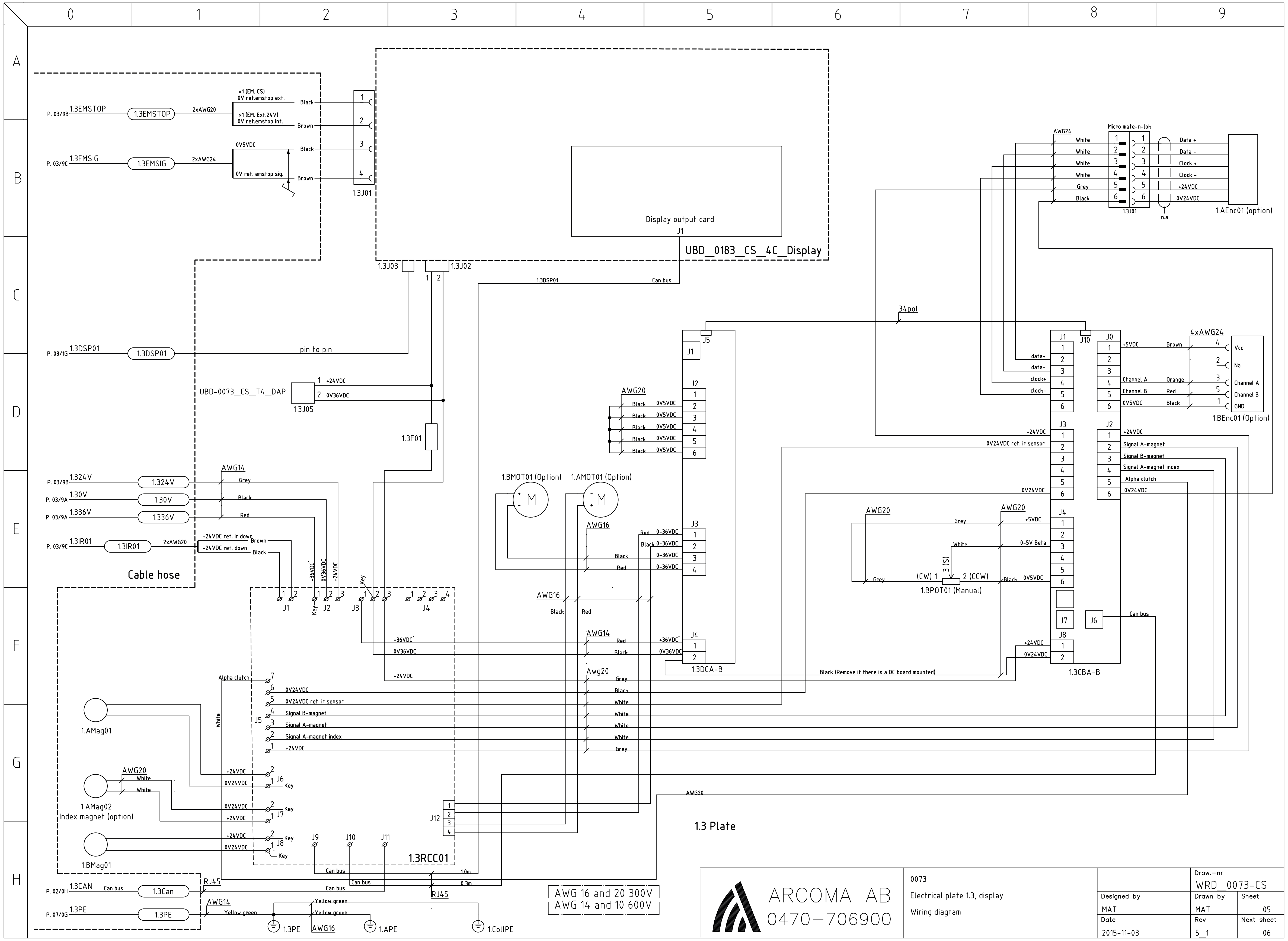
1.1RE04 Z-Column 1/2 speed
1.1RE05 Z-Column down
1.1RE06 Z-Column up
1.1RE07 Z-Crash guard Up
1.1RE08 Z-Crash guard Down
1.1RE09 Z-Mag
1.1R01 2Mohm 0.6w
1.1R02 2Mohm 0.6w
AWG 16 to 24 300V
AWG 14 and 10 600V
1.1CBZ
1.1BCM01
1.1BCM02
Cable hose
0073
Electrical plate 1.1 upper and purple tube
Wiring diagram
Draw.-nr
WRD 0073-CS
Designed by
MAT
Drawn by
MAT
Sheet
02
Date
2015-11-03
Rev
5_1
Next sheet
03



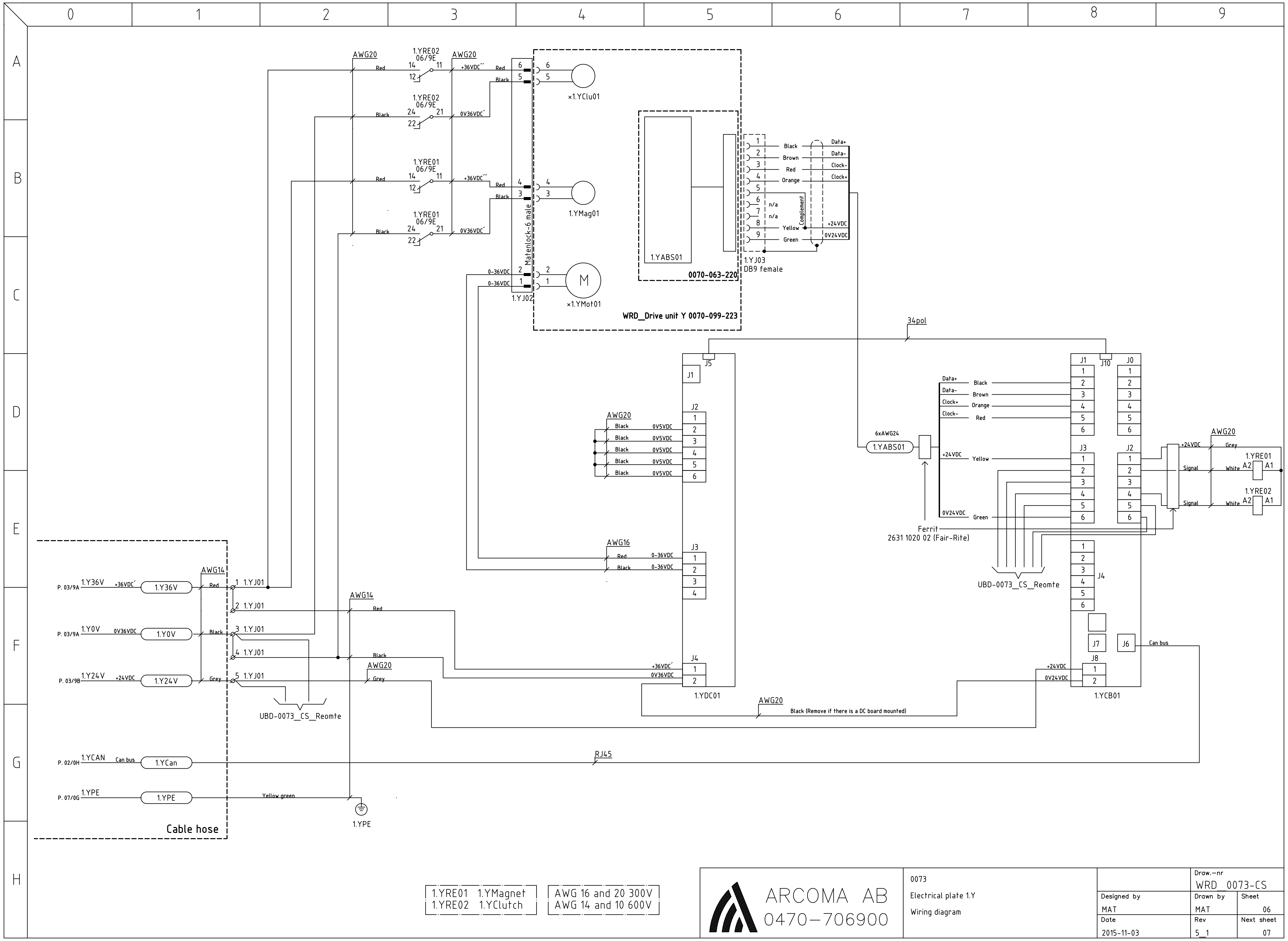
Electrical plate 1.1 upper
Electrical plate 1.1 lower
Electrical plate 1.2
Cable hose
Jumper Externaly powered EM Stop
x1 Externally powered Emergency stop circuit
AWG 16 to 24 300V
AWG 14 and 10 600V
0073
Electrical plate 1.1 upper and lower, Plate 1.2, Tube
Wiring diagram
Draw.-nr
WRD 0073-CS
Designed by
Drawn by
Sheet
MAT
MAT
03
Date
Rev
Next sheet
2015-11-03
5_1
04



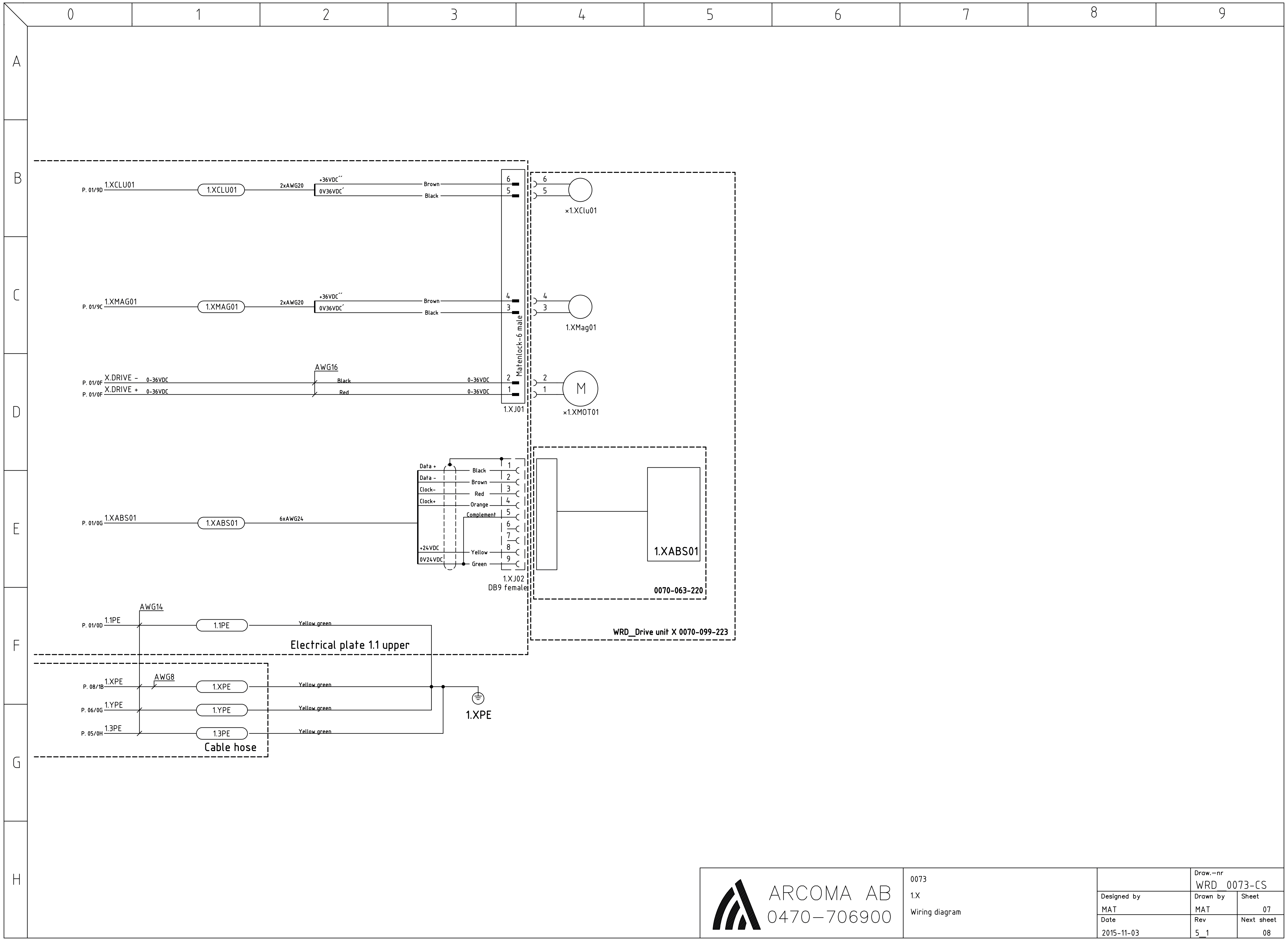
1.2RE01SIG
1.2230VAC
1.2PE
1.2CONTROL
Ferrit 0443 1642 51 (Fair-Rite)
1.2FC001
1.2RE01 04/6D
1.ZMOTOR
1.236V
1.236VRET
1.236V RET
1.2D01 1N5822
1.2RE01
Electrical plate 1.2
1.GUARD
1.GuardCan
RJ45
1.ZGUARD24
1.ZREL
Ferrit 0461 1642 81 (Fair-Rite).
PCB GB 0070-700-104
Protection plate
1.ZMAG01
1.ZMOT01
1.ZABS01
DB9
1.ZCol01
WRD_0070-003-250
Electrical plate 1.1 upper
1.ZCONTROL
AWG 16 and 20 300V
AWG 14 and 10 600V
×1 Externally powered Emergency stop circuit
0073
Electrical plate 1.2, 1.1 upper and 1.Z
Wiring diagram
Draw.-nr
WRD 0073-CS
Designed by
MAT
Drawn by
MAT
Sheet
04
Date
2015-11-03
Rev
5_1
Next sheet
05



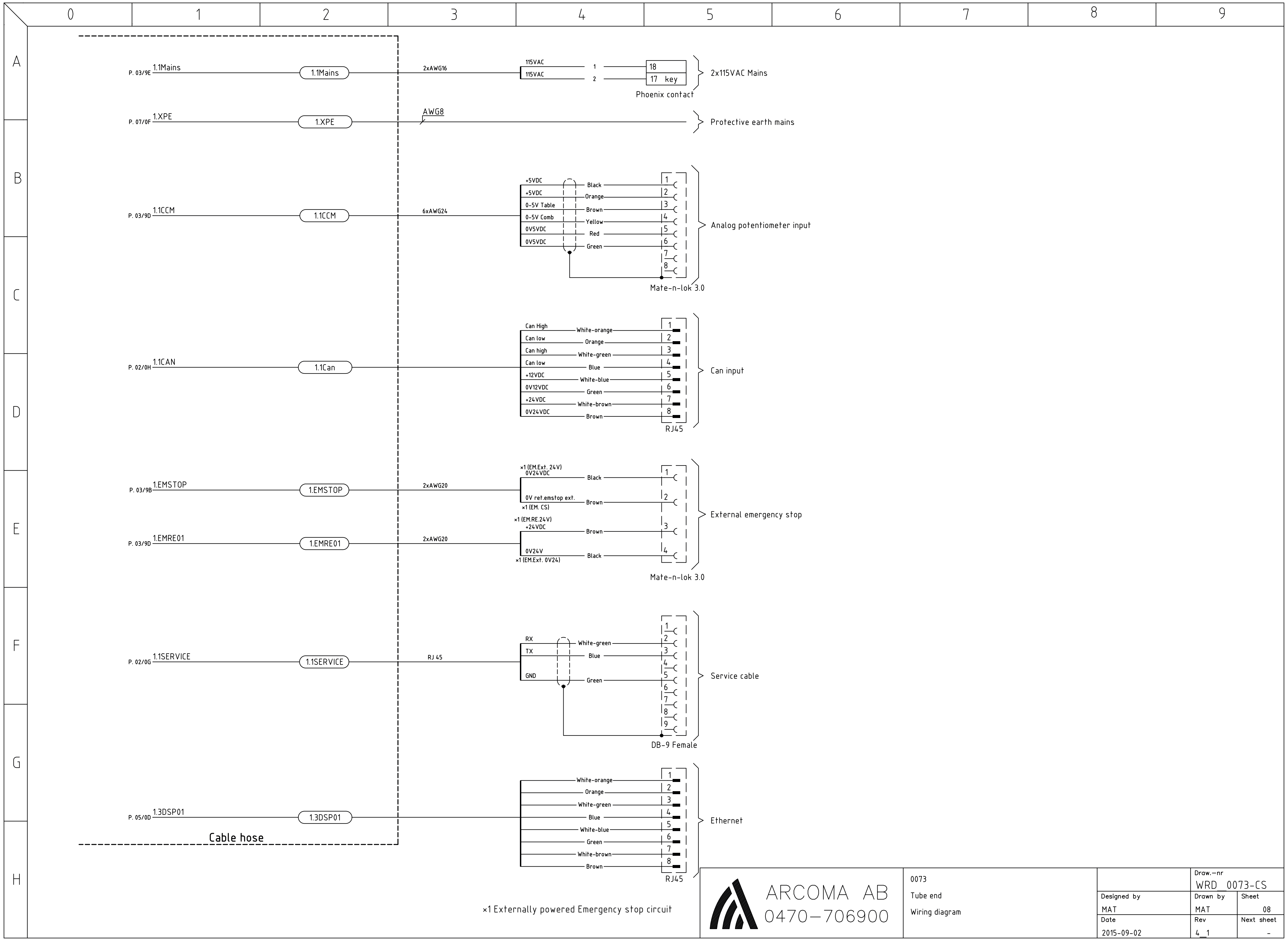
ARCOMA AB 0470-706900	0073		Draw.-nr WRD 0073-CS
	Electrical plate 1.3, display	Designed by MAT	Drawn by MAT / Sheet 05
	Wiring diagram	Date 2015-11-03	Rev 5_1 / Next sheet 06

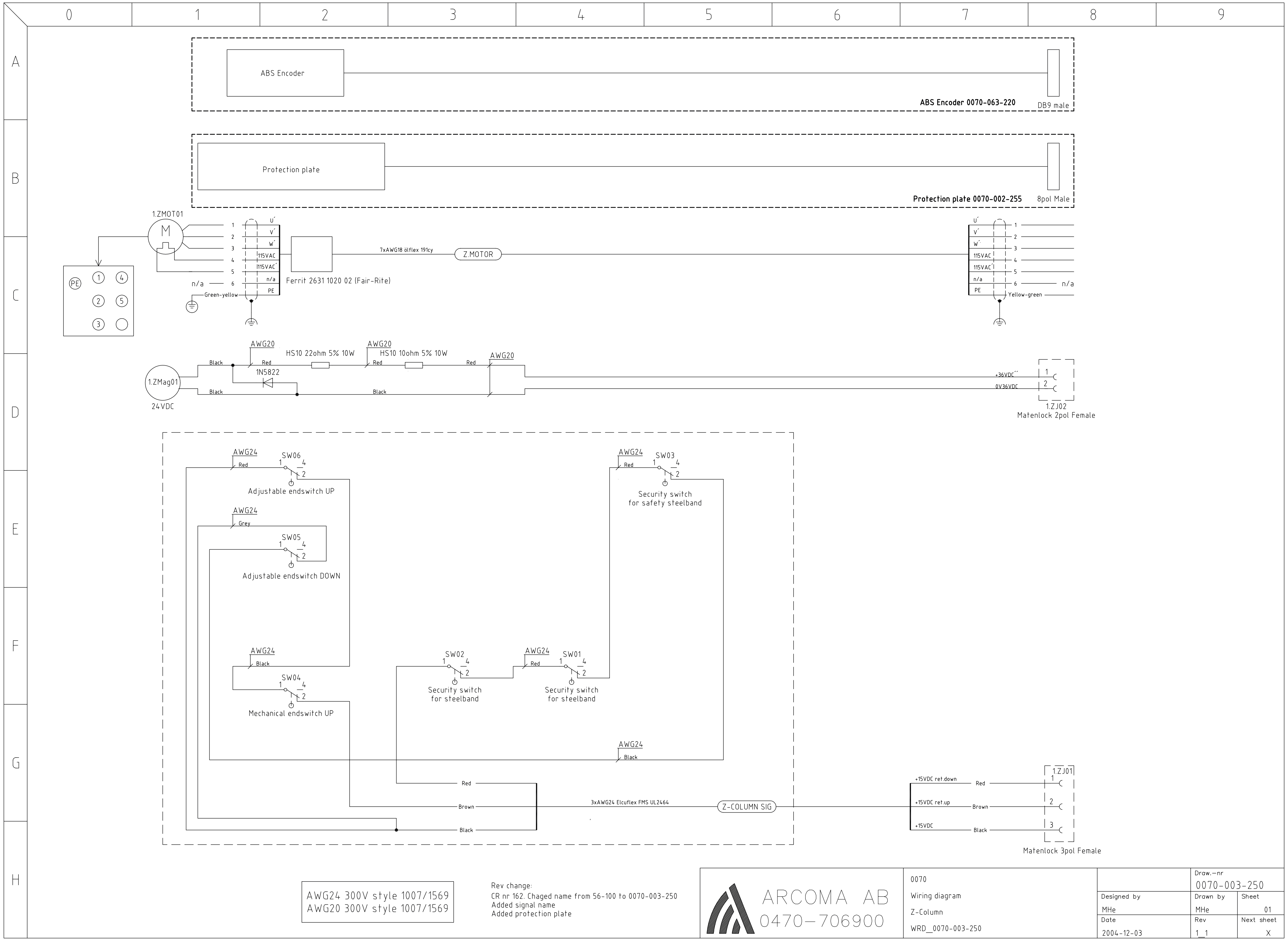


Cable hose
WRD_Drive unit Y 0070-099-223
0070-063-220
1.YABS01
1.YJ03
DB9 female
1.YJ02
Matenlock-6 male
x1.YClu01
1.YMag01
x1.YMot01
1.YDC01
1.YCB01
34pol
Ferrit
2631 1020 02 (Fair-Rite)
UBD-0073_CS_Reomte
Black (Remove if there is a DC board mounted)
RJ45
1.YPE
1.YRE01 1.YMagnet
1.YRE02 1.YClutch
AWG 16 and 20 300V
AWG 14 and 10 600V
ARCOMA AB
0470-706900
0073
Electrical plate 1.Y
Wiring diagram
Designed by
MAT
Date
2015-11-03
Draw.-nr
WRD 0073-CS
Drawn by
MAT
Sheet
06
Rev
5_1
Next sheet
07

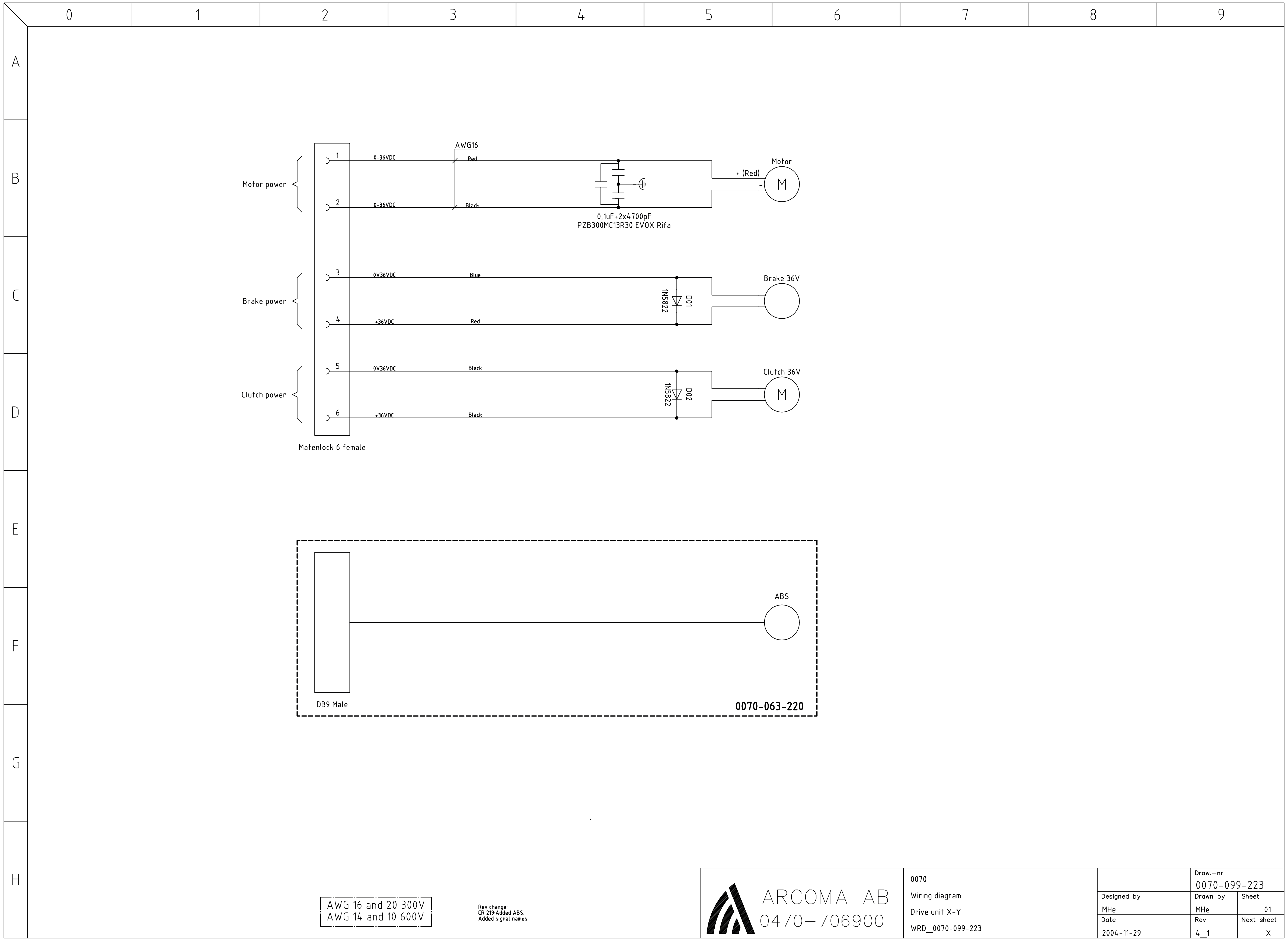


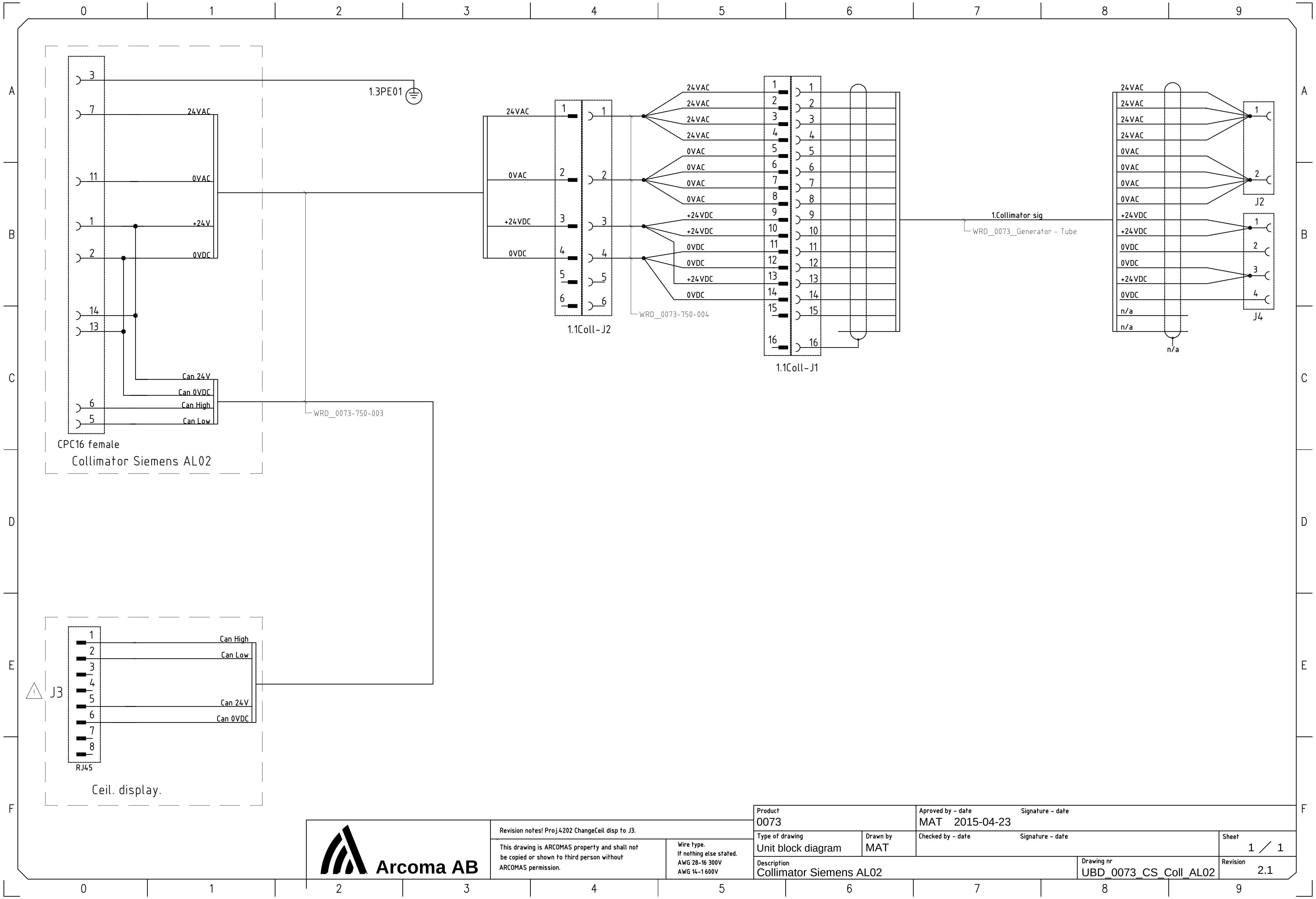
1.XCLU01
1.XMAG01
X.DRIVE -
X.DRIVE +
1.XABS01
1.1PE
1.XPE
1.YPE
1.3PE
AWG14
AWG8
AWG16
Matenlock-6 male
1.XJ01
1.XJ02
DB9 female
×1.XClu01
1.XMag01
×1.XMOT01
M
1.XABS01
0070-063-220
WRD_Drive unit X 0070-099-223
Electrical plate 1.1 upper
Cable hose
1.XPE
ARCOMA AB
0470-706900
0073
1.X
Wiring diagram
Designed by
MAT
Date
2015-11-03
Draw.-nr
WRD 0073-CS
Drawn by
MAT
Sheet
07
Rev
5_1
Next sheet
08


1.1Mains
2xAWG16
115VAC
2x115VAC Mains
Phoenix contact
1.XPE
AWG8
Protective earth mains
1.1CCM
6xAWG24
Analog potentiometer input
Mate-n-lok 3.0
1.1CAN
1.1Can
Can input
RJ45
1.EMSTOP
1.EMRE01
2xAWG20
External emergency stop
Mate-n-lok 3.0
1.1SERVICE
RJ 45
Service cable
DB-9 Female
1.3DSP01
Ethernet
RJ45
Cable hose
x1 Externally powered Emergency stop circuit
ARCOMA AB
0470-706900
0073
Tube end
Wiring diagram
Draw.-nr
WRD 0073-CS
Designed by
MAT
Drawn by
MAT
Sheet
08
Date
2015-09-02
Rev
4_1
Next sheet
-

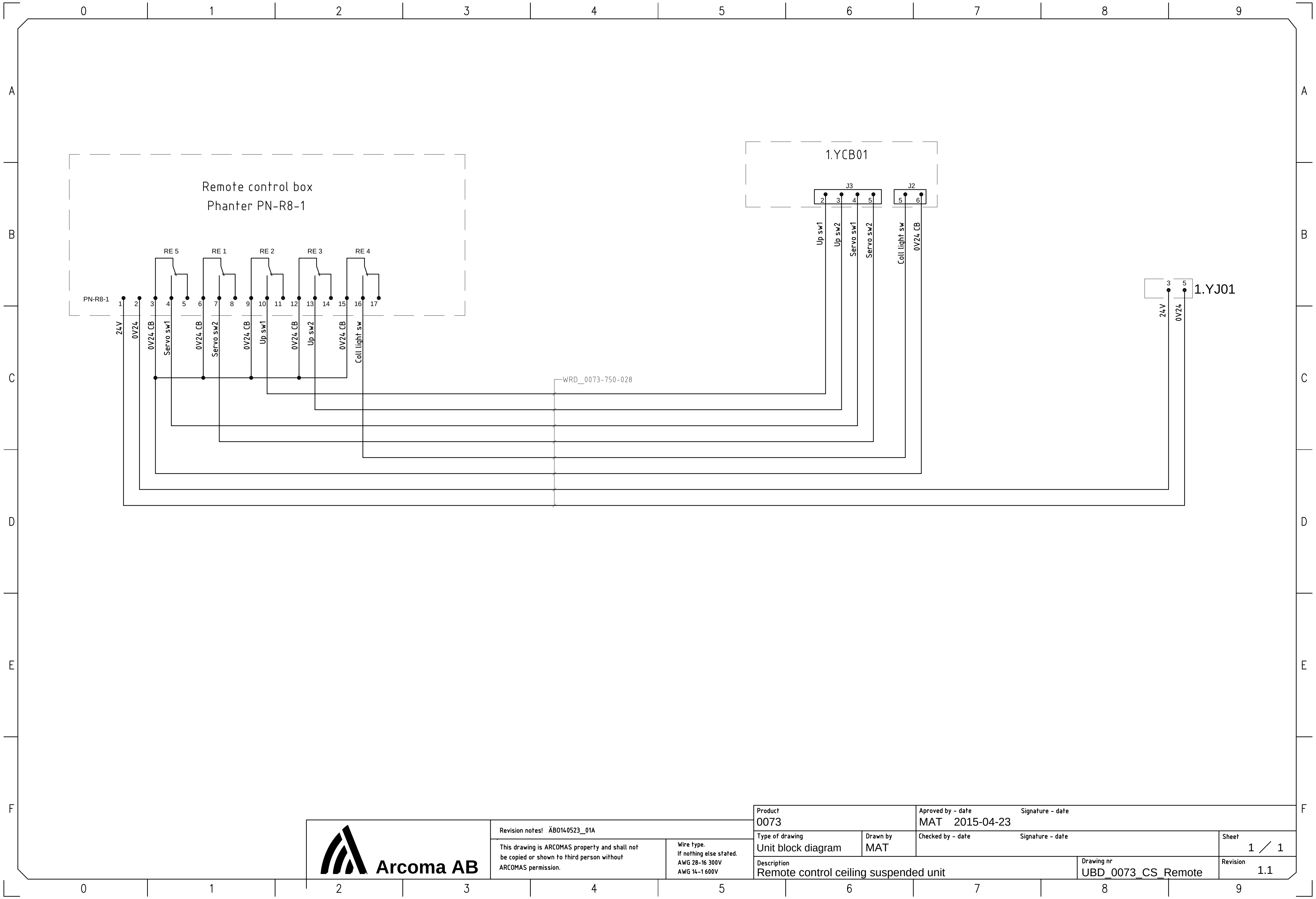


ABS Encoder
ABS Encoder 0070-063-220
DB9 male
Protection plate
Protection plate 0070-002-255
8pol Male
1.ZMOT01
M
Ferrit 2631 1020 02 (Fair-Rite)
7xAWG18 ölflex 191cy
Z.MOTOR
115VAC
n/a
PE
Green-yellow
Yellow-green
1.ZMag01
24VDC
AWG20
HS10 22ohm 5% 10W
HS10 10ohm 5% 10W
1N5822
Red
Black
+36VDC
0V36VDC
1.ZJ02
Matenlock 2pol Female
SW06
Adjustable endswitch UP
AWG24
Grey
SW05
Adjustable endswitch DOWN
SW04
Mechanical endswitch UP
SW03
Security switch
for safety steelband
SW02
Security switch
for steelband
SW01
Security switch
for steelband
Brown
3xAWG24 Elcuflex FMS UL2464
Z-COLUMN SIG
+15VDC ret.down
+15VDC ret.up
+15VDC
1.ZJ01
Matenlock 3pol Female
AWG24 300V style 1007/1569
AWG20 300V style 1007/1569
Rev change:
CR nr 162. Chaged name from 56-100 to 0070-003-250
Added signal name
Added protection plate
ARCOMA AB
0470-706900
0070
Wiring diagram
Z-Column
WRD_0070-003-250
Draw.-nr
0070-003-250
Designed by
Drawn by
Sheet
MHe
MHe
01
Date
Rev
Next sheet
2004-12-03
1_1
X

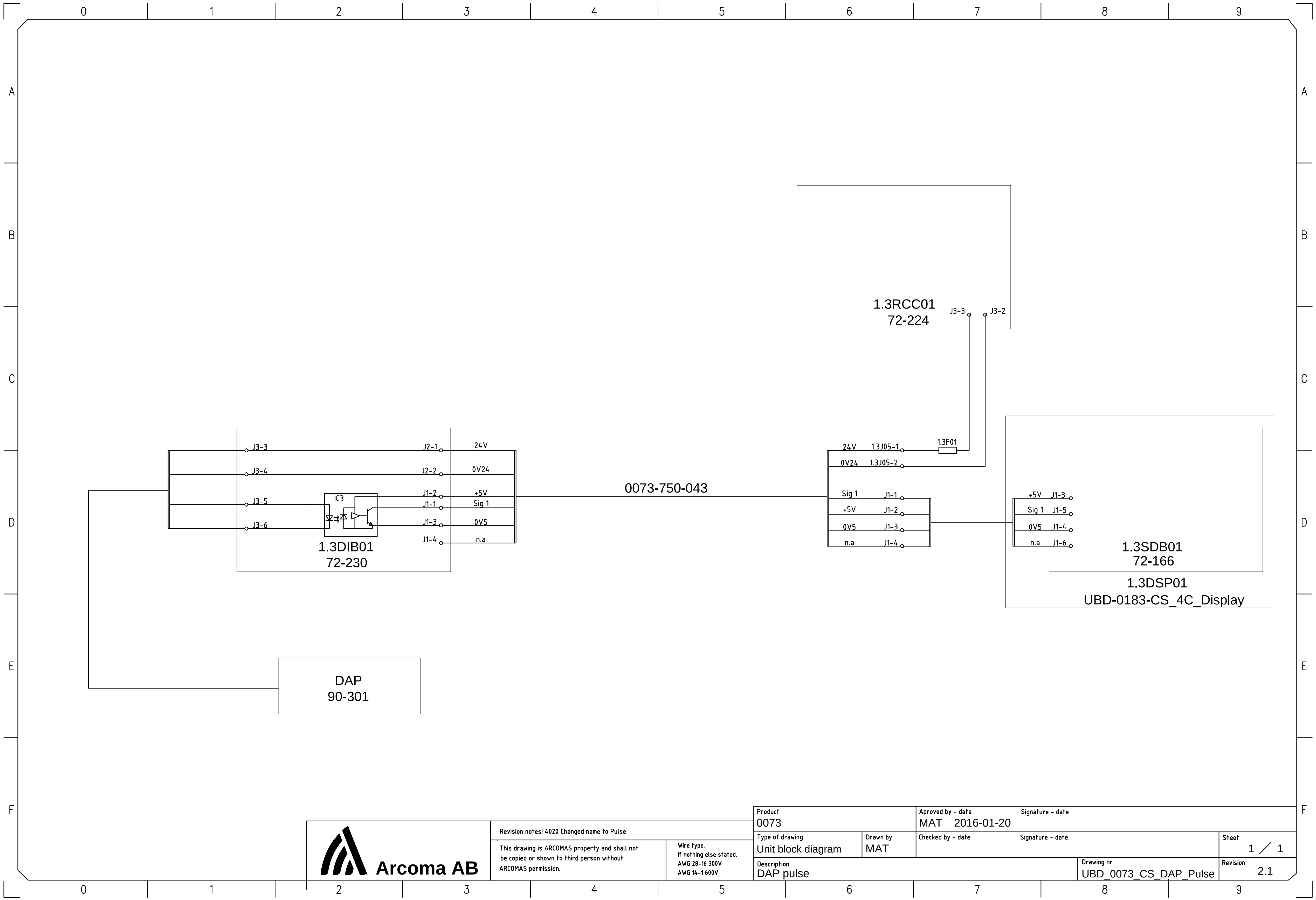

AWG16
Motor power
Brake power
Clutch power
0-36VDC
0V36VDC
+36VDC
Red
Black
Blue
0,1uF+2x4700pF
PZB300MC13R30 EVOX Rifa
+ (Red)
Motor
M
Brake 36V
Clutch 36V
1N5822
D01
D02
Matenlock 6 female
ABS
DB9 Male
0070-063-220
AWG 16 and 20 300V
AWG 14 and 10 600V
Rev change:
CR 219:Added ABS.
Added signal names
ARCOMA AB
0470-706900
0070
Wiring diagram
Drive unit X-Y
WRD__0070-099-223
Draw.-nr
0070-099-223
Designed by
MHe
Drawn by
MHe
Sheet
01
Date
2004-11-29
Rev
4_1
Next sheet
X

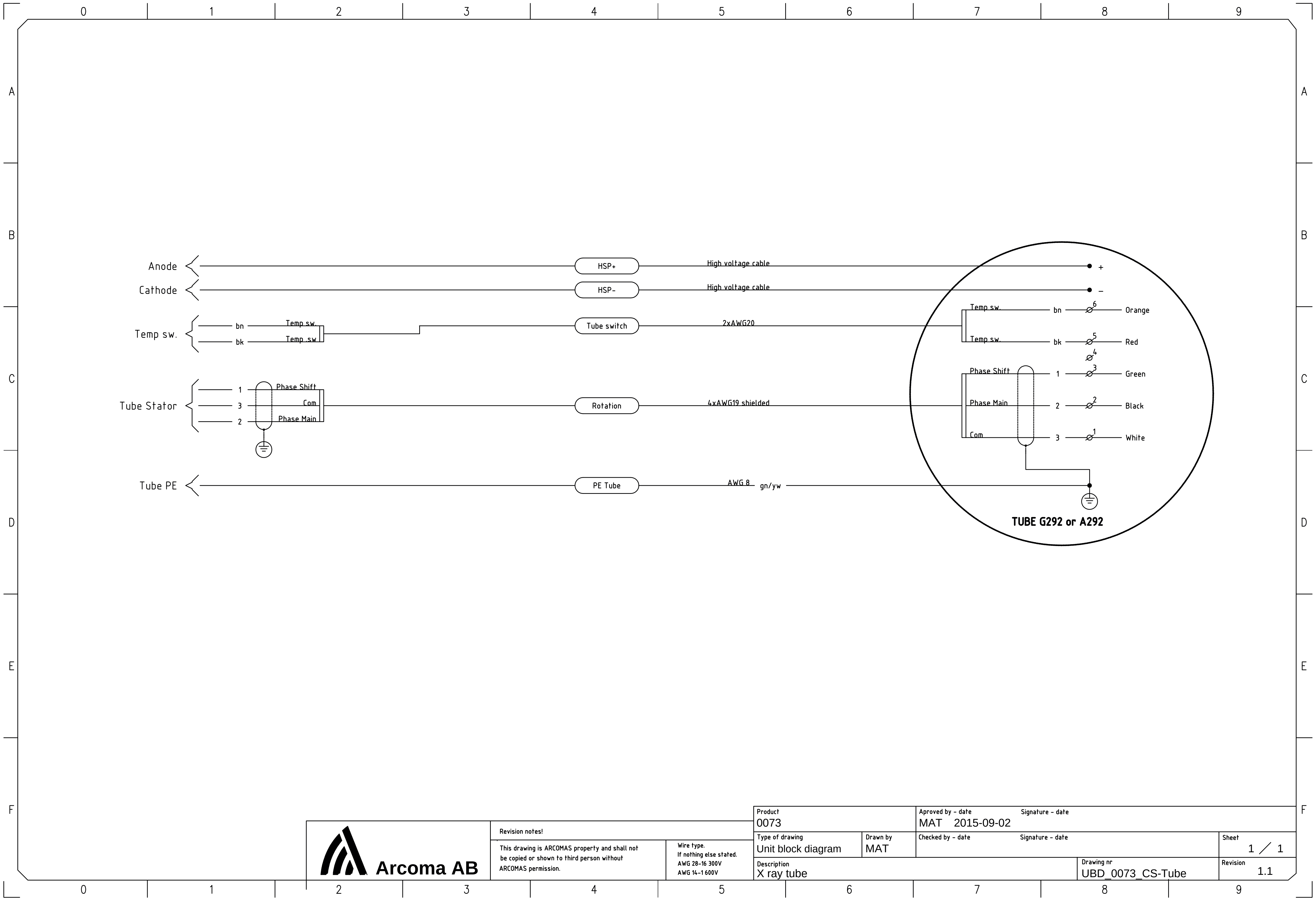


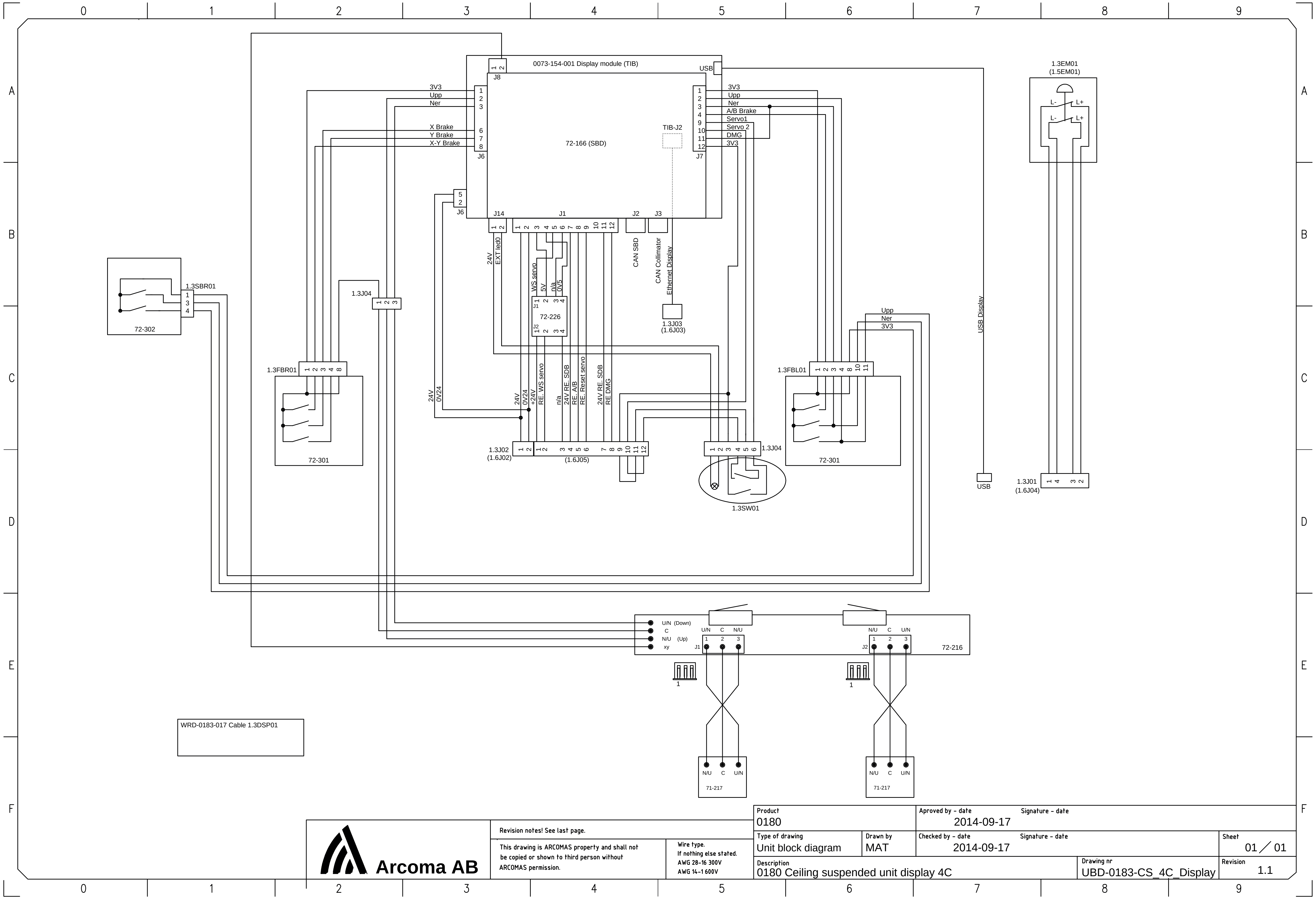
1.3PE01
24VAC
0VAC
+24V
0VDC
Can 24V
Can 0VDC
Can High
Can Low
CPC16 female
Collimator Siemens AL02
WRD__0073-750-003
+24VDC
1.1Coll-J2
WRD__0073-750-004
1.1Coll-J1
1.Collimator sig
WRD__0073__Generator - Tube
n/a
J2
J4
J3
RJ45
Ceil. display.
Arcoma AB
Revision notes! Proj.4202 ChangeCeil disp to J3.
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
0073
Aproved by - date
MAT 2015-04-23
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Collimator Siemens AL02
Drawing nr
UBD_0073_CS_Coll_AL02
Revision
2.1



Remote control box
Phanter PN-R8-1
RE 5
RE 1
RE 2
RE 3
RE 4
PN-R8-1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
24V
0V24
0V24 CB
Servo sw1
0V24 CB
Servo sw2
0V24 CB
Up sw1
0V24 CB
Up sw2
0V24 CB
Coll light sw
1.YCB01
J3
J2
2 3 4 5
5 6
Up sw1
Up sw2
Servo sw1
Servo sw2
Coll light sw
0V24 CB
3 5
1.YJ01
24V
0V24
WRD_0073-750-028
Arcoma AB
Revision notes! ÄB0140523_01A
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
0073
Aproved by - date
MAT 2015-04-23
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
Remote control ceiling suspended unit
Drawing nr
UBD_0073_CS_Remote
Revision
1.1


1.3RCC01
72-224
J3-3
J3-2
J3-3
J3-4
J3-5
J3-6
IC3
J2-1
J2-2
J1-2
J1-1
J1-3
J1-4
24V
0V24
+5V
Sig 1
0V5
n.a
1.3DIB01
72-230
0073-750-043
24V
1.3J05-1
0V24
1.3J05-2
1.3F01
Sig 1
J1-1
+5V
J1-2
0V5
J1-3
n.a
J1-4
+5V
J1-3
Sig 1
J1-5
0V5
J1-4
n.a
J1-6
1.3SDB01
72-166
1.3DSP01
UBD-0183-CS_4C_Display
DAP
90-301
Arcoma AB
Revision notes! 4020 Changed name to Pulse
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
0073
Aproved by - date
MAT 2016-01-20
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
DAP pulse
Drawing nr
UBD_0073_CS_DAP_Pulse
Revision
2.1


Anode
Cathode
Temp sw.
Tube Stator
Tube PE
bn
bk
Temp sw
Temp sw
1
3
2
Phase Shift
Com
Phase Main
HSP+
HSP-
Tube switch
Rotation
PE Tube
High voltage cable
High voltage cable
2xAWG20
4xAWG19 shielded
AWG 8
gn/yw
+
-
Temp sw.
Temp sw.
Phase Shift
Phase Main
Com
bn
bk
1
2
3
6
5
4
3
2
1
Orange
Red
Green
Black
White
TUBE G292 or A292
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
0073
Aproved by - date
MAT 2015-09-02
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
1 / 1
Description
X ray tube
Drawing nr
UBD_0073_CS-Tube
Revision
1.1



Product: 0180		Aproved by - date: 2014-09-17	Signature - date	
Type of drawing: Unit block diagram	Drawn by: MAT	Checked by - date: 2014-09-17	Signature - date	Sheet: 01 / 01
Description: 0180 Ceiling suspended unit display 4C			Drawing nr: UBD-0183-CS_4C_Display	Revision: 1.1

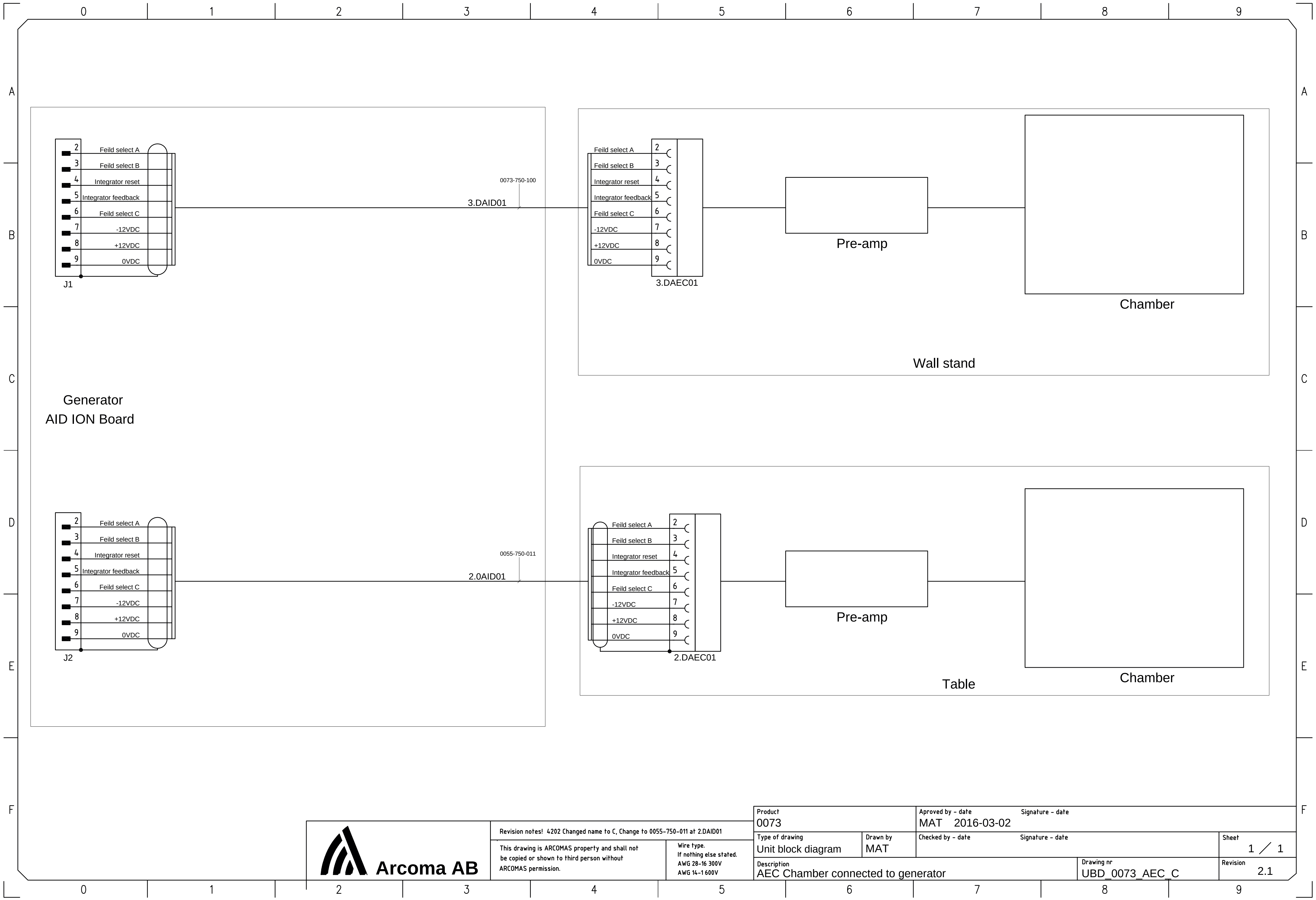
Arcoma AB

Revision notes! See last page.

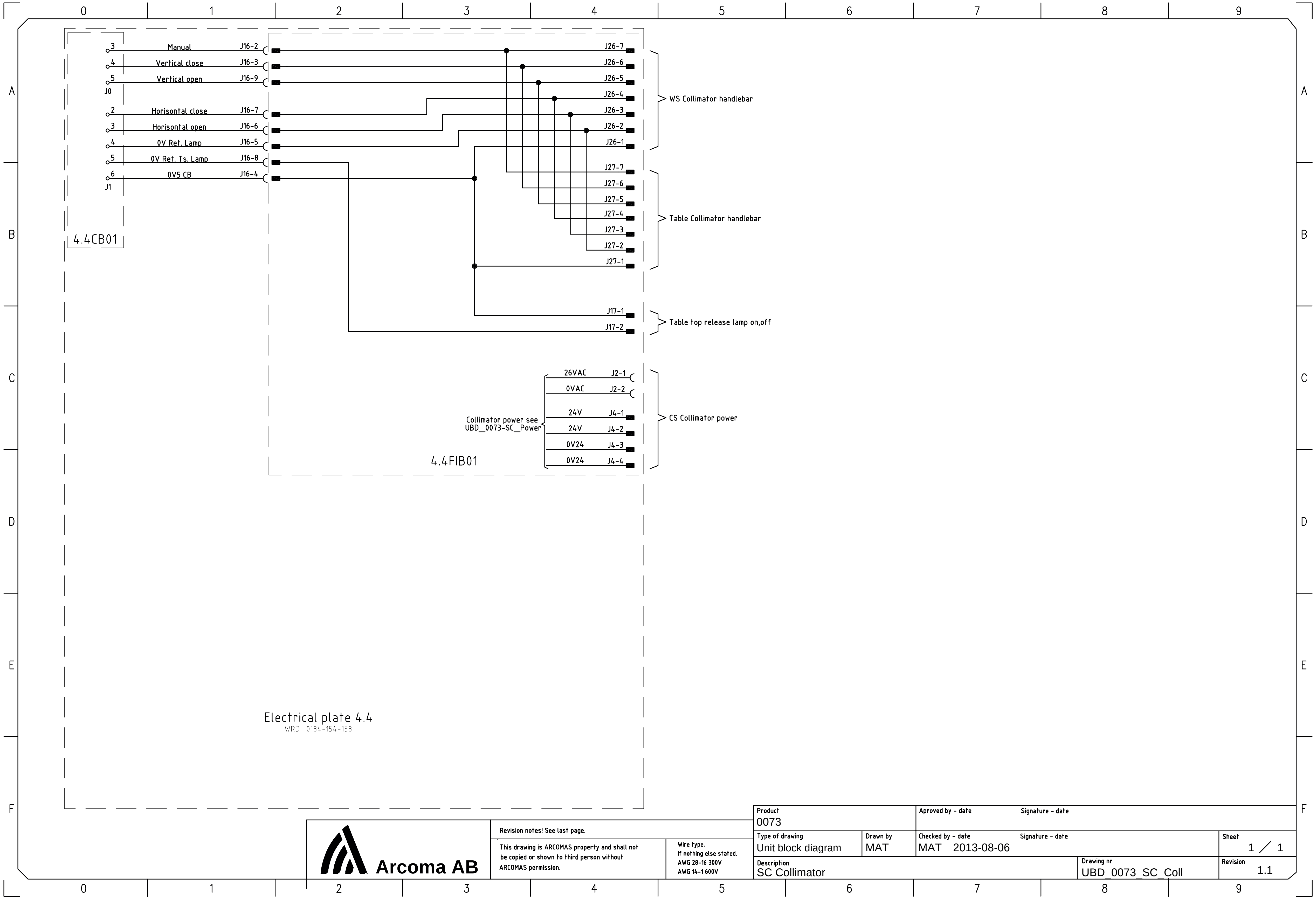
This drawing is ARCOMAS property and shall not be copied or shown to third person without ARCOMAS permission.

Wire type. If nothing else stated. AWG 28-16 300V AWG 14-1 600V

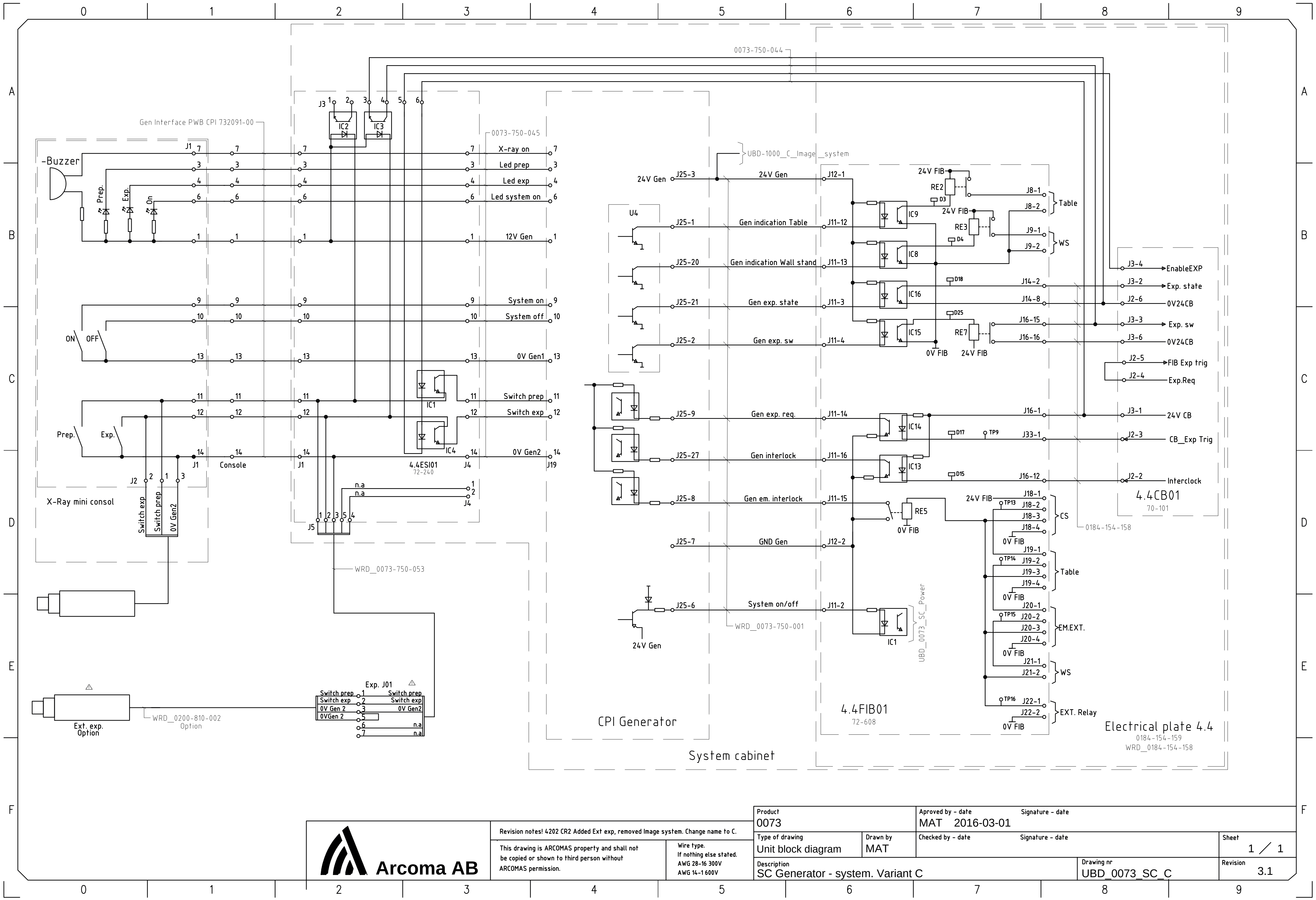
8.3.5 System cabinet



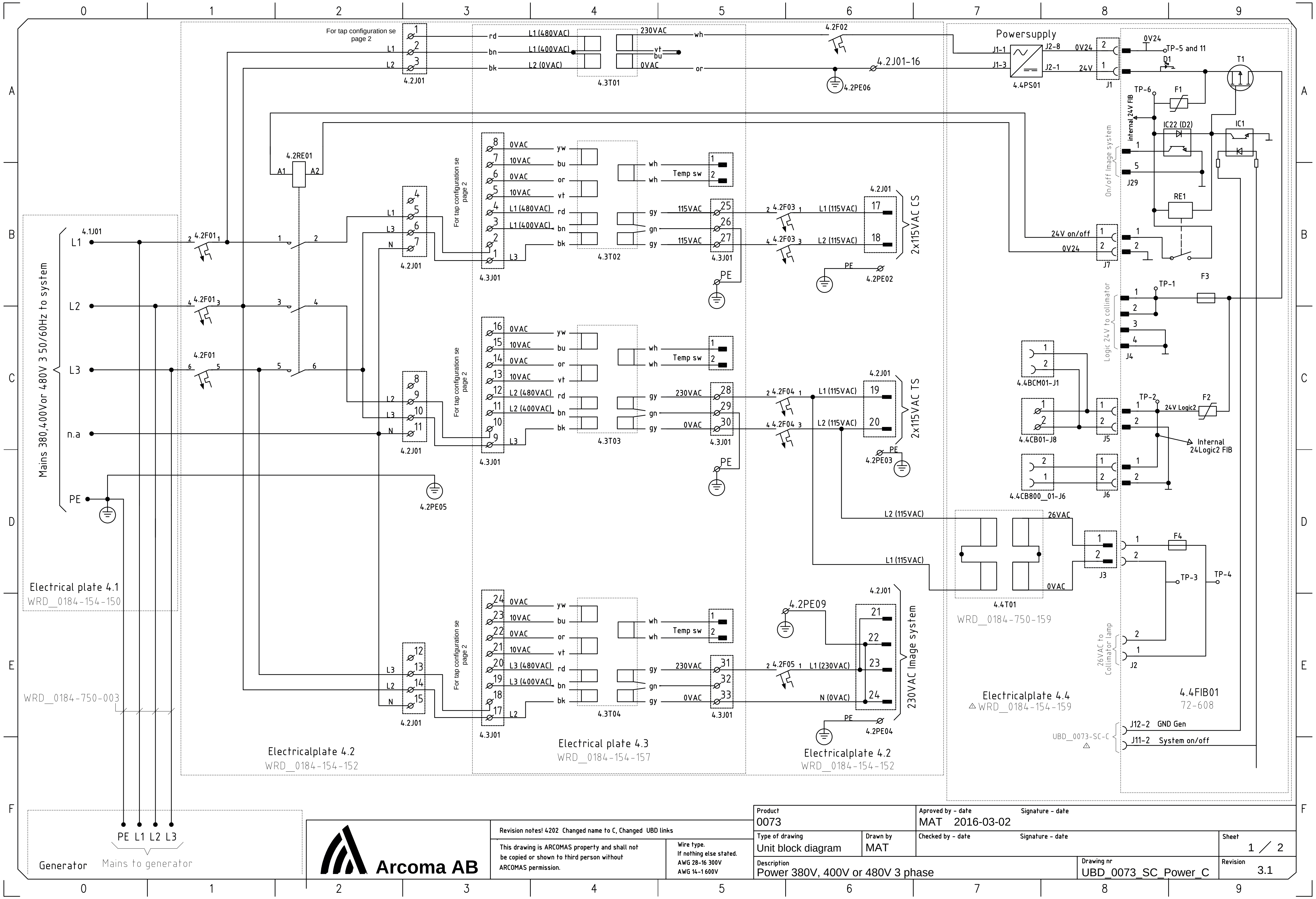
Generator
AID ION Board
J1
J2
Feild select A
Feild select B
Integrator reset
Integrator feedback
Feild select C
-12VDC
+12VDC
0VDC
0073-750-100
3.DAID01
0055-750-011
2.0AID01
3.DAEC01
2.DAEC01
Pre-amp
Chamber
Wall stand
Table
Arcoma AB
Revision notes! 4202 Changed name to C, Change to 0055-750-011 at 2.DAID01
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 0073
Aproved by - date MAT 2016-03-02
Signature - date
Type of drawing Unit block diagram
Drawn by MAT
Checked by - date
Sheet 1 / 1
Description AEC Chamber connected to generator
Drawing nr UBD_0073_AEC_C
Revision 2.1



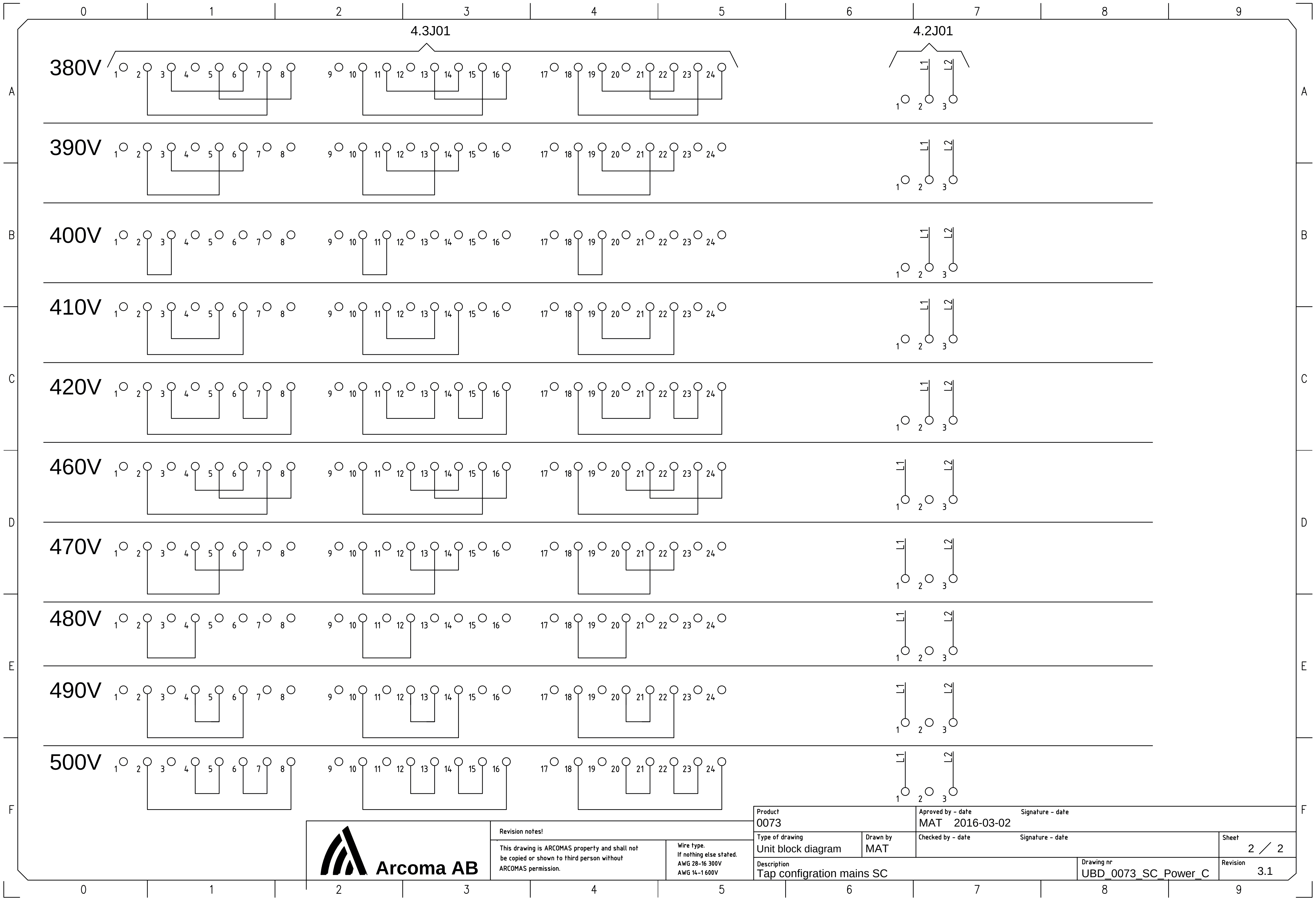
Manual
Vertical close
Vertical open
J0
Horisontal close
Horisontal open
0V Ret. Lamp
0V Ret. Ts. Lamp
0V5 CB
J1
J16-2
J16-3
J16-9
J16-7
J16-6
J16-5
J16-8
J16-4
4.4CB01
J26-7
J26-6
J26-5
J26-4
J26-3
J26-2
J26-1
WS Collimator handlebar
J27-7
J27-6
J27-5
J27-4
J27-3
J27-2
J27-1
Table Collimator handlebar
J17-1
J17-2
Table top release lamp on,off
26VAC
J2-1
0VAC
J2-2
24V
J4-1
24V
J4-2
0V24
J4-3
0V24
J4-4
Collimator power see
UBD_0073-SC_Power
CS Collimator power
4.4FIB01
Electrical plate 4.4
WRD_0184-154-158
Arcoma AB
Revision notes! See last page.
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
0073
Aproved by - date
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
MAT 2013-08-06
Signature - date
Sheet
1 / 1
Description
SC Collimator
Drawing nr
UBD_0073_SC_Coll
Revision
1.1



0073-750-044
Gen Interface PWB CPI 732091-00
0073-750-045
UBD-1000_C_Image_system
Buzzer
Prep.
Exp.
On
X-ray on
Led prep
Led exp
Led system on
12V Gen
System on
System off
0V Gen1
Switch prep
Switch exp
0V Gen2
ON
OFF
Console
4.4ESI01
72-240
X-Ray mini consol
Switch exp
Switch prep
0V Gen2
n.a
WRD_0073-750-053
Exp. J01
0V Gen 2
OVGen 2
Ext. exp.
Option
WRD_0200-810-002
Option
U4
24V Gen
Gen indication Table
Gen indication Wall stand
Gen exp. state
Gen exp. sw
Gen exp. req.
Gen interlock
Gen em. interlock
GND Gen
System on/off
WRD_0073-750-001
UBD_0073_SC_Power
CPI Generator
System cabinet
24V FIB
0V FIB
Table
WS
CS
EM.EXT.
EXT. Relay
EnableEXP
Exp. state
0V24CB
Exp. sw
FIB Exp trig
Exp.Req
24V CB
CB_Exp Trig
Interclock
4.4CB01
70-101
0184-154-158
4.4FIB01
72-608
Electrical plate 4.4
0184-154-159
WRD_0184-154-158
Revision notes! 4202 CR2 Added Ext exp, removed Image system. Change name to C.
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
0073
Aproved by - date
MAT 2016-03-01
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Sheet
1 / 1
Description
SC Generator - system. Variant C
Drawing nr
UBD_0073_SC_C
Revision
3.1



Revision notes! 4202 Changed name to C, Changed UBD links		Product: 0073	Aproved by - date: MAT 2016-03-02
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	Type of drawing: Unit block diagram	Drawn by: MAT
Arcoma AB		Description: Power 380V, 400V or 480V 3 phase	Drawing nr: UBD_0073_SC_Power_C
Sheet: 1 / 2	Revision: 3.1		



4.3J01
4.2J01
380V
390V
400V
410V
420V
460V
470V
480V
490V
500V
L1
L2
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
0073
Aproved by - date
MAT 2016-03-02
Signature - date
Type of drawing
Unit block diagram
Drawn by
MAT
Checked by - date
Signature - date
Sheet
2 / 2
Description
Tap configration mains SC
Drawing nr
UBD_0073_SC_Power_C
Revision
3.1

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	4AD	C60SP 1P D4A	Schneider Electric	115V Freq.
1.1F02	4AD	C60SP 1P D4A	Schneider Electric	115V Freq.
1.1F03	6AD	C60SP 1P C6A	Schneider Electric	36V AC
1.1F04	6AD	C60SP 1P C6A	Schneider Electric	24V AC

Fuse chart Display Unit

Designation	Size	Type	Manufacturer	Function
1.3F01	1AT	326 series - SloBlo ceramic body 6.3x32 mm	Littlefuse	Display 24 V power

9.2 System cabinet

Fuse chart electrical plate 4.2

Designation	Size	Type	Manufacturer	Function
4.2F01	C20A	C60SP 3P C20A	Schneider Electric	Mains power
4.2F02	C1A	C60SP 1P C1A	Schneider Electric	Internal 230 VAC
4.2F03	C6A	C60SP 2P C6A	Schneider Electric	Ceil 2x115 VAC
4.2F04	C6A	C60SP 2P C6A	Schneider Electric	Table 2x115 VAC
4.2F05	C6A	C60SP 1P C6A	Schneider Electric	Detectors 230 VAC

9.3 Two column table

Fuse chart electrical plate 2.1

Designation	Size	Type	Manufacturer	Function
2.1F01	6A	C60SP 1P C6A	Schneider Electric	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
2.1DC01–F2	15A	326 series - 3AG SloBlo glass body 6.3x32 mm	Littlefuse	36 VDC motor power

9.4 Wall stand 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

10 Spare parts

Refer to Spare part catalogue documents *1000-095-072 3.1_SPL Catalogue* for the spare part list.

10.1 General

Note!

Contact the manufacturer for information about how to exchange spare parts.

11 Accessories

11.1 General

WARNING!

Due to squeezing hazards from motorized movements, only accessories approved by the Manufacturer are allowed for the 0072.

Part no.	Description
0510–099–001	Cable carriage (1 pc)
0072–099–210	External servo button incl. emergency stop
0170–099–002	Cable outlet CS
0512–099–001	Unistruts for rails 4x4m
0512–099–002	Unistruts for rails 4x5m
0512–099–003	Mounting kit, unistruts for rails 4x4m
0512–099–004	Mounting kit, unistruts for rails 4x5m

11.1.1 Table

Part no.	Description
0072–095–170	Patient kit incl.;
	- Compression belt cost effective
	- Patient handgrip (2 pcs)
	- Mattress
0072-099-014	Patient handgrip
0055–099–007	Mattress 2200 mm
0055–099–009	Hand control for automatic collimator (1 pc)
0072-099-011	Lateral cassette holder
0072-099-004	X, Y, Z Foot control
0055-099-025	X, Y Foot control strip type
0072-099-028	Compression belt cost effective
0072-099-029	Compression belt high-end
0055-099-007	Table top Mattress 2200x690x20 mm

Part no.	Description
0080-099-051	Form pad small- rectangle
0080-099-050	Form pad medium- wedge
0080-099-052	Form pad large- head
0072–099–060	Grid 52 lp/cm, 10:1 Ratio, FFD110 Alu type
0180–099–050	Grid 40lp/cm, 10_1 Ratio, F115, Al.type

11.1.2 Wallstand

Part.no.	Description
0072–099–306	Patient Lateral armrest
0072-099-307	Stitching; patient protection shield
	Stitching removable footstep
0175-099-002	Cable outlet WS
0180-099-061	Grid 52lp/cm, 10:1 Ratio, SID 180 Alu type
	Grid 52lp/cm, 10:1 Ratio, SID 140 Alu type
	Grid 40lp/cm, 10:1 Ratio, F115, Alu type
	Grid 40lp/cm, 10:1 Ratio, F150, Alu type
	Grid 40lp/cm, 10:1 Ratio, F180, Alu type
	Cable outlet WS
0182–099–320	Wall brackets WS

11.1.3 Detector

Part.no.	Description
CXDI-401C, wireless 43x43	Canon
CXDI-401C, wireless 43x43 compact	Canon
CXDI-402C, wireless 43x43	Canon
CXDI-410C, wireless 43x43	Canon
CXDI-701C, wireless 35x43	Canon
CXDI-702C, wireless 35x43	Canon
CXDI-710C, wireless 35x43	Canon
CXDI-801C, wireless ~28x35	Canon
CXDI-810C, wireless ~28x35	Canon

12 Technical Specifications

12.1 0072 Sub-system

12.1.1 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)
Heat dispation	1713 BTU/hr

For further information, see the tube's Technical data sheet at the accompanying documents.

12.1.2 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

12.1.3 Ceiling Suspended X-ray Tube Support

Rotation range ceiling (beta)	>340°
Rotation range tube arm (alpha)	>±135°
Column (Z stroke)	1750 mm

12.1.4 Configuration

OTC	The OTC is a mechanical part of an X-ray System.

12.1.5 Weight

OTC	Maximum 240 kg
Tube and collimator	Maximum 40 kg
Ceiling wagon	95 kg

Column	40 kg
Ceiling rail Y (4 m standard)	28 kg

12.1.6 Electrical Characteristics

Mains voltage:	230 VAC, 50/60 Hz Center-tapped Single phase 4 A

12.1.7 Classification

Classification according to IEC 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	IPXO
Mode of operation	Intermittent operation: 20%, max. 1 min ON / 4 min OFF
Use of anaesthetic mixtures	The equipment is not suitable for use in the presence of flammable anaesthetic mixtures with air or with oxygen or with nitrous oxide.

12.1.8 Speed

	Low speed	Maximum speed
Z movement	60 mm/s	
X movement	250 mm/s	500 mm/s
Y movement	250 mm/s	500 mm/s
a movement	16°/s	
b movement	16°/s	
Bucky movement (with 50 kg mass)	166 mm/s	350 mm/s

12.2 Table 0055

12.2.1 Column

Lowest table top position (from the floor to the table top surface)	550 mm
Column (Z stroke)	380 mm

12.2.2 Table Top

Table top dimension	2424 mm X 850 mm
Table top transparent area	2400 mm X 613 mm
Table top thickness	21.5 mm
Length of stroke, X direction	+/- 600 mm
Length of stroke, Y direction	+/- 150 mm
Movement range of the imaging unit	>650 mm

12.2.3 Weight

Table	Approximately 150 kg
Imaging unit	Approximately 21 kg
Table top	Approximately 47 kg
Maximum patient load	300 kg

12.2.4 Electrical Characteristics

Maximum power without external electronics:	500 W

12.2.4.1 External Electrical Characteristics

The external electronics must be approved according to IEC60601-1.

If any external electronics is installed the end product must be tested according to IEC60601-1.

Power output to external	110-240 VAC 50-60 Hz Single phase 10 A
Power output external 24 VDC	24 VDC 3 A

12.2.5 Classification

Classification according to IEC 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	IPX2
Mode of operation	Intermediate use: 20% 1 min ON / 4 min OFF
Use of anaesthetics mixtures	The equipment is not suitable for use in the presence of flammable anaesthetics mixtures with air or with oxygen or with nitrous oxide.

12.2.6 Attenuation Equivalent

Table top	$\leq$ 0.9 mm AL at 3.7 mm HVL

12.3 Wallstand

Column, Z stroke	1470 +40/-10 mm (non-tilt) 1400 +40/-10 mm (tilt) 1550 +40/-10 mm (tilt)

Rotation range detector holder wagon (Only the tiltable detector holder wagon).	-20° - 90°

12.3.1 Attenuation Equivalent

detector holder	<=0.6 mm

12.3.2 Configuration

Wall stand	The Wall stand is the mechanical part of an X-ray system.

12.3.3 Weight

Wall stand	Maximum 180 kg (160 +20/ -20 kg)
detector	Maximum 40 kg

12.3.4 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 anaesthetic mixtures	The equipment is not suitable for use in the presence of flammable anaesthetics mixtures with air or with oxygen or with nitrous oxide.

Classification according to IEC/EN 60601-1–2

Class	Class B

12.4 Cabinet

12.4.1 General

Dimensions (L x W x H) mm	750 x 600 x 1125 mm

12.4.2 Weight

Cabinet	Max 134 kg

13 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.

Waste Disposal

14 Options

14.1 General

Options cannot be mounted afterward.

14.1.1 Mandatory Options

Unit	Option	Description
OTC		
0070-925-006	4 * 5m	XxY rails
0070-925-007	4 * 6m	XxY rails
0070-925-009	5* 4 m	XxY rails
0070-925-027	5* 6m	XxY rails
0072-925-010	600 kHU X-ray tube, 40/ 100kW, 150 kV	Tube
0072–095–013	24 m High voltage cables	
0072-925-014	Handle frame on X-ray tube support with X/Y brake release button	Maneuver handle on X-ray tube support
0072-925-024	Automatic collimator with LED	
Cabinet 50	/ 65 / 80 KW	Generator
0072-925-300	65 kW, 100kHz — 240 kHz High frequency generator	
0072-925-301	80kW, 100kHz — 240 kHz High frequency generator	
Vertical Wallstand		
0072-925-006	Wallstand foot control	Release of brake for manual vertical movement and control of motorized movement.
0072-925-200	Tilt	Manual tilt from vertical to horizontal (-20º — +90º)
Table		
0070-925-100	Vertical collision protection	
0072-925-202	Hand control for automatic collimator (1 pcs)	

14.1.2 Other Options

Unit	Option	Description
0072-925-015	Integrated DAP	
0072-925-500	Stitching functionality, Wall-stand and Table	

14.2 Variant C

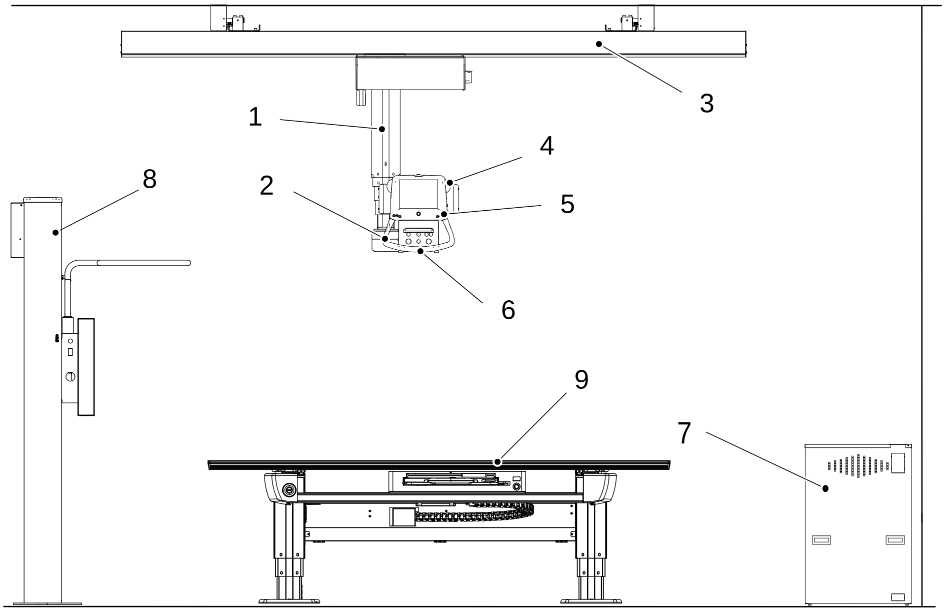


Fig. 14-1

No.	Description	Options
1	Column	Short 1450 mm
2	OTC handle	
3	Ceiling rails	
4	X-ray tube	
5	Collimator	
6	DAP	
7	Generator	
8	Wallstand	
9	Table	

15 Appendix A

15.1 Glossary

A	
Accession Number	In DICOM, a term to uniquely identify a visit to a site by a patient. The meaning and use of accession numbers is not consistent in medical information. The Digital Radiography System uses the DICOM definition of the term
Accessories	Extra facilities which easily can be mounted by the user.
AEC	Automatic Exposure Control.
Alpha	Direction for a rotation movement.
Antiscatter grid	Device used to prevent the radiation scattered within the patient from reaching the Digital Radiography Detector and fogging it.
AP	Anterior/Posterior view position for X-ray exposure.
Artifact	Changes to an image due to outside influences such as defective pixels or Digital Radiography Detector scan lines.
Autoclave	The process of disinfecting articles by heating them with pressurized steam.
Automatic Exposure Control (AEC)	Ion chamber within the Bucky. Used to terminate X-ray when image density is achieved by measuring the amount of dosage occurring at the Digital Radiography Detector and providing feedback to the X-ray Generator to stop the exposure.
B	
Beta	Direction for a rotation movement. The tube turns round the Z-axis.
Btu/hr	British thermal unit /hour
BU	Backup
Bucky	Detector holder. The component that houses the Digital Radiography Detector, AEC, moving grid, and related components. In the Digital Radiography System, the bucky contains the Digital Radiography Detector instead of the conventional film cassette.

C	
CE	A CE-marked product verifies that the manufacture guarantees that the product fulfills EU:s fundamental health-, environment- and security requirements.
Centering	The field of image is centered over the imaging unit.
Collimator	The Collimator regulates the size and shape of the X-ray beam to accurately localize the area of interest on the patient, while reducing overall patient irradiation exposure.
Collision	Either a physical collision with an obstacle or the node cannot reach its end position.
CR	Image plates
D	
DAP	Dose Area Product. DAP (Dose Area Product) is a quantity used in assessing the radiation risk from diagnostic X-ray examinations and is presented in $dGycm^2$. Defined as the absorbed dose multiplied by the area irradiated. The DAP is independent of distance from source.
DAP meter	The DAP meter is placed next to the collimator and measures the amount of X-ray radiation that leaves the collimator.
Diagnostic X-ray System	An X-ray system designed for irradiation of any part of the human body for the purpose of diagnosis or visualization.
Diode	Electrical component that leads voltage and current in one direction.
Dealer	See supplier.
DI	Deviation Index. According to Standard IEC 62494-1: “Deviation Index (DI) is a number quantifying the deviation of the actual exposure index from a target exposure index.”
DICOM	Digital Imaging and Communications in Medicine (DICOM). An industry standard specifications for interconnection of medical imaging equipment. Digital Radiography Operating Console.

Digital Radiography (DR)	The Digital Radiography Detector is a flat panel that receives the X-ray image and converts it to digital information. The Digital Radiography Detector replaces conventional X-ray film and cassettes.
Direct Radiography (DR)	A term used to distinguish the use of a photoconductor-based method as opposed to the X-ray capture and conversion method used in a scintillator or phosphor-based detector.
DR	*Digital Radiography/Direct Radiography*
E	
EMC	Electromagnetic Compatibility
End stop	See Mechanical end stop and Software end stop.
ESA	Exam Specific Algorithm. Algorithm used to optimize raw image data for a particular type of exam.
EXI value	Exposure Index. According to Standard IEC 62494-1: “Exposure index (EI) measures the detector response to radiation in the relevant image region of an image acquired with a digital x-ray imaging system. The exposure index allows the operator to judge if an image was taken at a detector exposure level suitable for the intended level of image quality. It is important to note that the exposure index, as defined in IEC 62494-1, is derived from the image signal, which in turn is usually related to the energy absorbed in the detector, i.e. the detector dose, but not directly to the air kerma at the image receptor. The relation to image receptor air kerma (air kerma at the detector surface) is introduced only at one radiation quality through calibration. However, this definition is appropriate as the image quality in digital radiography is determined mainly by the signal-to-noise level, which in turn is determined by the absorbed energy”
Exposure	An image is taken against an imaging unit.
F	
Focal Distance	The distance from the source of the X-rays to the patient.

G	
Generator	Device that supplies power to and controls the X-ray tube.
H	
HIS	Hospital Information System
Hospital Information System	In a hospital, the computer system that tracks patient demographic information, visit information, and other patient records.
I	
IEC	International Electrotechnical Commission.
Image Artifact	Non-desirable qualities on a printed image.
Imaging unit	Detector for X-ray. The reception and transfer of an image is digital.
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.
J	
K	
Kvp	Peak kilo-volts. The highest energy of X-rays emitted by an X-ray tube (equal to the peak applied tube voltage).
L	
Lateral	Possible view position for X-ray exposure.
Look-Up Table (LUT)	A table of values used to convert raw image data to output data for a specific ESA setting.
LUT	Look-Up Table.
M	
mA	Milliamperes.

mAs	Milliampere-seconds. Combined with kVp, it indicates the dose of X-rays.
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	
Oblique	Possible view position for X-ray exposure.
O.D.	Optic Density.
Operating System (OS)	The basic software control system of the PC.
Options	Extra facilities that demand updating of the software and hardware before use. Options demand installation of an authorized service technician.
OTC	Overhead Tube Crane.
P	
PA	Posterior/Anterior view position for X-ray exposure.
PC	Central Processing Unit of the Digital Radiography Operating Console.
Position	A location in the room (X, Y and Z).
Procedure	A predefined collection of images (views) for X-ray exposure.
Q	
R	
RIS	Radiology Information System.
S	

SID	The distance between the focus-spot in the X-ray tube and the active image area. The distance is given in centimeter.
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.
Study	A specific instance of a procedure consisting of a set of X-ray images.
Supplier	The company that sells the 0072 Variant A 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.
Technique factor	Any of the parameters describing the properties of an X-ray beam, including beam energy (kVp), beam intensity (mA), exposure (mAs), duration (seconds), and, at times, the Source to Image Distance (SID).
U	
V	
View	Prescription for the technique factors and geometric arrangement of the X-ray source, patient, and image sensor that yields and image of organs of interest seen on a specific orientation.
Visit	A set of studies identified in a locally unique manner and performed on a particular patient at a particular site for a particular reason. A visit is normally identified by an accession number or a Visit ID and is associated with a diagnosis
W	
Working area	The size of the table top including X and Y stroke.
X	
X-movement	The OTC moves in the X-direction.

Y	
Y-movement	The OTC moves in the Y-direction.
Z	
Z-node	The Z-node controls the Z-movement.
Z-movement	The OTC moves in the Z-direction

Appendix A
Glossary

16 Appendix B

16.1 Annual Checklist

Make a copy of this form before filling in.

If there is any discrepancy please use the table to make a note.

Hospital:..

Id no:..

Sign:...

16.1.1 OTC

- ☐ 1. Clean all tracks for wheels and bearings.
- ☐ 2. Check that the installation bolts for the ceiling rails Y are tightened properly. If any bolts are loose, use Loctite 243 and tighten with 47Nm.
- ☐ 3. Check that the installation bolts (12 pcs) for the distance plates, at the ceiling rails Y, are tightened properly. If any bolts are loose, use Loctite 243 and tighten with 47Nm.

  Check that there is no play between the traverse rails X, distance plates and the wheel holders, see picture A and B.
- ☐ 4. Check the ceiling installation bolts for the column.
- ☐ 5. Check that the installation screws (2) for the turning plate are tightened properly.

  If any screw is loose, use Loctite 243 and tighten with 47Nm. 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.
- ☐ 6. Remove the tube cover and check that the installation screws are tightened properly.

  If any screw is loose, use Loctite 243 and tighten with 47 Nm.

  Check also the screws for the collimator installation. How this is done depends on collimator type.

- ☐ 7. 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.

- ☐ 8. 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.

- ☐ 9. Check the safety switches in the column by using the following procedure: Press the downward button and stop the movement by applying some force.

  Note that force applied needs to exceed the weight of the tube assembly approximately 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. When the column drives upward the contactor shall be activated and when the movement is stopped the contactor shall release.

- ☐ 11. Check all outer cabling for damage.

- ☐ 12. Check protective earth according to 5.18.1.1 *Protective Earth, OTC*, Page 156. Enter the measured values in the Safety checklist Appendix B.

  Measured value:

  .... Ω

  .... Ω

  .... Ω

- ☐ 13. Check the emergency stop, by activating the emergency stop during motorized movement.

  The display of both the OTC and the generator console will show a message when the emergency stop is activated and all motorized movements are inhibited.

- ☐ 14. 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.

- ☐ 15. Check the brake for the column motor by running the column in Z direction. The brake activates when the movement stops.

- ☐ 16. Move the OTC manually to all positions in X, Y and Z directions and make sure it runs smoothly and sounds OK.

- ☐ 17. 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.

- ☐ 18. Perform the Alignment of OTC, 5.8.5.1 *Alignment of Ceiling Rails Y*, Page 84. Check that the readouts for the tube angulation is 90º.
- ☐ 19. Check the alignment of the light field and X-ray light field in Chapter 4.
- ☐ 20. Check the function of the buttons on the maneuver handle.
- ☐ 21. If the System is cassette based and the detector is not present, check that you will get information on the generator console. See Chapter 4.
- ☐ 22. Correspondence between X-ray field and image reception area. See Chapter 4.
- ☐ 23. Choose Table position and make sure tracking is activated. Measure between the X-ray tube focal-spot and the active detector surface of the detector. The measured SID shall correspond with the displayed SID. The SID is allowed to differ ±1%.
- ☐ 24. Choose Wallstand position and make sure tracking is activated. Measure between the X-ray tube focal-spot and the active detector surface of the detector. The measured SID shall correspond with the displayed SID. The SID is allowed to differ ±1%.
- ☐ 25. Verify the receptor indication light function on both Wallstand and Table according to Chapter 3.
- ☐ 26. 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 the "exposure screen control panels". Refer to Operation Manual.
- ☐ 27. If needed, perform a DAP value test.
- ☐ 28. Verify that the AEC value is in accordance with the hospital-preferred settings.
- ☐ 29. Verify the alpha angle.

17 Appendix C

17.1 Installation Checklist

Hospital:...

Id no:...

Sign:..

Check with heading chapter 5 *Installation*

Shipping/Receiving

- ☐ 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.

Mechanical Installation of OTC

- ☐ 1. *Installation Rails (Unistrut)*
- ☐ 2. *Insulation*
- ☐ 3. *Traverse*
- ☐ 4. *Tooth Belt*
- ☐ 5. *Ceiling Rails Y*
- ☐ • *Alignment of Ceiling Rails Y*
- ☐ • *Installing the Cable Carriages*
- ☐ • *Distance Plates*
- ☐ • *End Stops and Covers, Ceiling Rails Y*
- ☐ 6. *Traverse Rail X*
- ☐ • *Side Position Bearings*
- ☐ 7. *Electrical Plate Y and Drive Unit Y*
- ☐ 8. *Ceiling Wagon*
- ☐ • *End stops and Covers, Traverse Rails X*
- ☐ • *Install the Ceiling Wagon*
- ☐ • *Side Position Bearings*
- ☐ • *Cable Hose*
- ☐ • *Drive Unit*
- ☐ 9. *Cable Support*
- ☐ 10. *Cable Channel*
- ☐ 11. *Wall Attachment for Cable (option)*
- ☐ 12. *X-ray Tube*
- ☐ 13. *Collimator*

Electrical Installation Ceiling Suspended X-ray Tube Support

- ☐ 1. *Connect OTC*

Electrical Installation of CPI Mini Console

- ☐ 1. *Electrical Installation of CPI Mini Console*

Mechanical Installation of Table

- ☐ 1. *Orientation of the Table*
- ☐ 2. *Unload Table*
- ☐ 3. *Fixed Detector, Canon*
- ☐ 4. *Horizontal alignment of table*
- ☐ 5. *Attachment to Floor, Table*

Mechanical Installation of System Cabinet

- ☐ 1. *Mechanical Installation of System Cabinet*

Electrical Installation of Table

- ☐ 1. *Connect Table*

Mechanical Installation of Wallstand

- ☐ 1. *Orientation of Wall Stand*
- ☐ 2. *Unload Wall Stand*
- ☐ 3. *Wall Stand Insulation and Attachment to Floor*
- ☐ 4. *Alignment of Wall Stand*
- ☐ 5. *Wall Attachment for Cable Hose*
- ☐ 6. *Install Detector*

Electrical Installation of Wall Stand

- ☐ 1. *Connect Wall Stand*
- ☐ 2. *Wall Stand Detector with Charging*

Appendix C
Installation Checklist

Electrical Installation of System

- ☐ 1. *Electrical installation of image system computer*
- ☐ 2. *Cable path*
- ☐ 3. *Wall stand detector installation*
- ☐ 4. *Table detector installation*
- ☐ 5. *External Servo Button*
- ☐ 6. *Foot control, wireless (option)*
- ☐ 7. *Room lights (option)*
- ☐ 8. *Installation of wireless access point (option)*
- ☐ 9. *Electrical Installation of Image System*

Electrical Building Installation

- ☐ 1. *Power ratings and line requirements*
- ☐ 2. *Tap configuration 400 VAC*
- ☐ 3. *Tap configuration 480 VAC*

Check Protective Earth

- ☐ 1. *Measure Protective Earth*

Electrical Installation Mains

- ☐ 1. *Electrical Installation Mains*

Start-up Procedure

- ☐ 1. *Check Voltage of the Subsystem*
- ☐ 2. *Check Power*

Check Alignment, OTC

- ☐ 1. *Adjust Alpha Index*
- ☐ 2. *Adjust Beta Index*
- ☐ 3. *Adjust Index Magnet*
- ☐ 4. *Adjust the Mechanical End Stop, Beta*
- ☐ 5. *Alignment of OTC, X- and Y-direction*

Install Imaging System

- ☐ 1. *Install Imaging System*

Calibration OTC

- ☐ 1. *OTC Definitions*
- ☐ 2. *Table Definitions*

Service Program

- ☐ 1. *Password*
- ☐ 2. *System Setup*
- ☐ 3. *Calibration of OTC*
- ☐ 4. *Calibration of Bucky-axis on Table*
- ☐ 5. *Calibration of Table*
- ☐ 6. *Calibration of Collimator*
- ☐ 7. *Automatic Timer for the Collimator Lamp*
- ☐ 8. *Definition of Collimator Settings*
- ☐ 9. *Installation of AEC*
- ☐ 10. *Gain adjustment of AID (ICX-3922) AEC*
- ☐ 11. *Calibration of auto positions*
- ☐ 12. *Alpha Angles*
- ☐ 13. *DAP*

Overwrap License

- ❑ 1. *Overwrap License*

Save OTC Parameters

- ❑ 1. *Save OTC Parameters*

Calibration of Tube

- ❑ 1. *Calibration of Tube*

Collimator Light and X-ray Field Alignment

- ❑ 1. *Collimator Light and X-ray Field Alignment*

Adjustment of the Light Field

- ❑ 1. *Adjustment of the Light Field*

Install Table Top

- ❑ 1. *Install Table Top*

Tests

- ❑ 1. *System Test*
- ❑ 2. *Emergency Button Test*
- ❑ 3. *Indication Light Test*
- ❑ 4. *Automatic Collimator Test*
- ❑ 5. *Generator Software File*

Send Installation Report to Arcoma Service

- ❑ 1. *Send Installation Report to Arcoma Service*

18 Installation Report

18.1 Attention

The installation report is an important form for Arcoma AB 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). For such reports please contact service@arcoma.se (+46 470 70 69 70).

Best regards, ARCOMA AB

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 _____________________________

CANON MEDICAL SYSTEMS USA, INC.