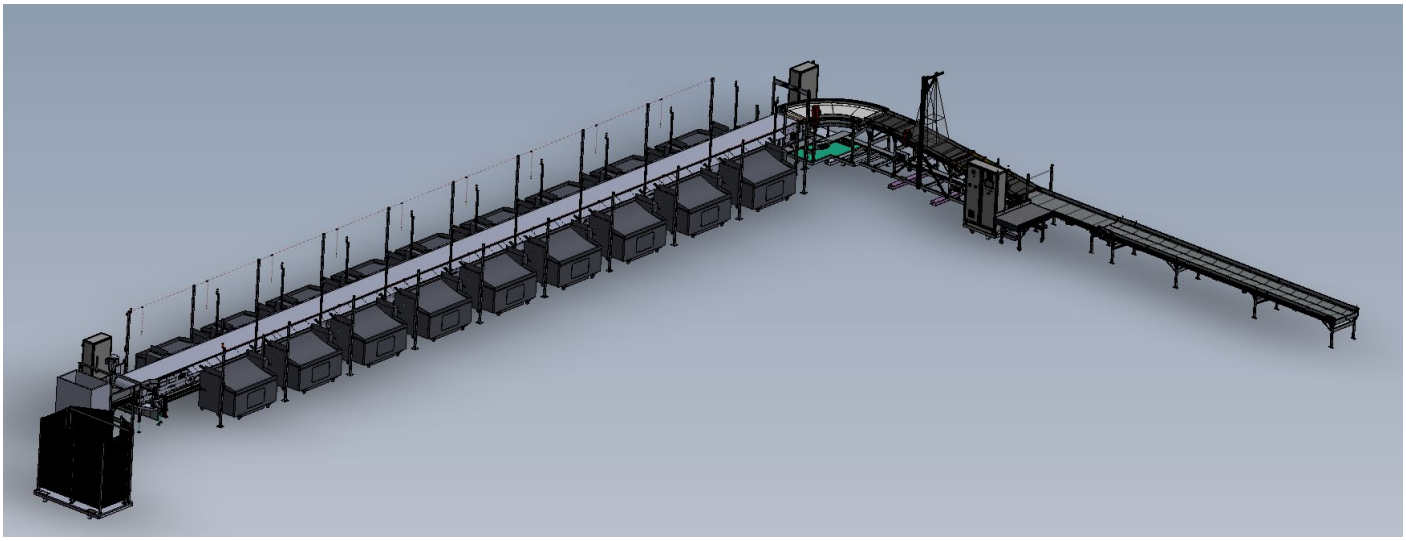
VANDERLANDE – AMZL

Installation manual – Site-deployment

ADTA – Auto Divert to Aisle



Rev.: 3.0
Date: 24/07/2023
Responsible/contact persons: nlntep, nltvers, nlrvda

1. CONTENTS

2. USEFULL LINKS AND INFORMATION

3D view of DHE4 system (view in browser): LINK most recent 3D view

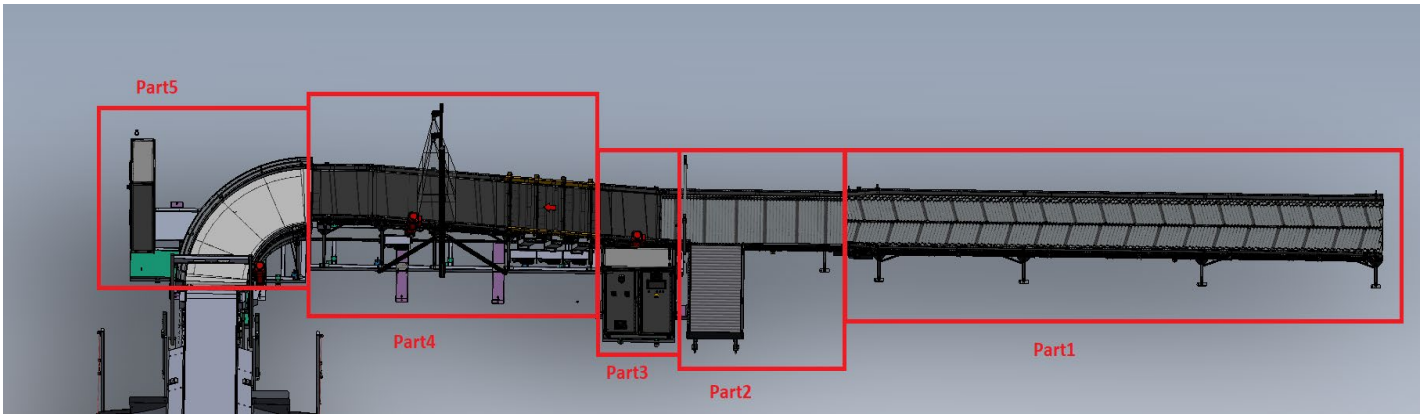
3D view of FAT system (view in browser): *LINK*
Solidworks engineering 3D model: *LINK (some details outdated in comparison with this manual)*

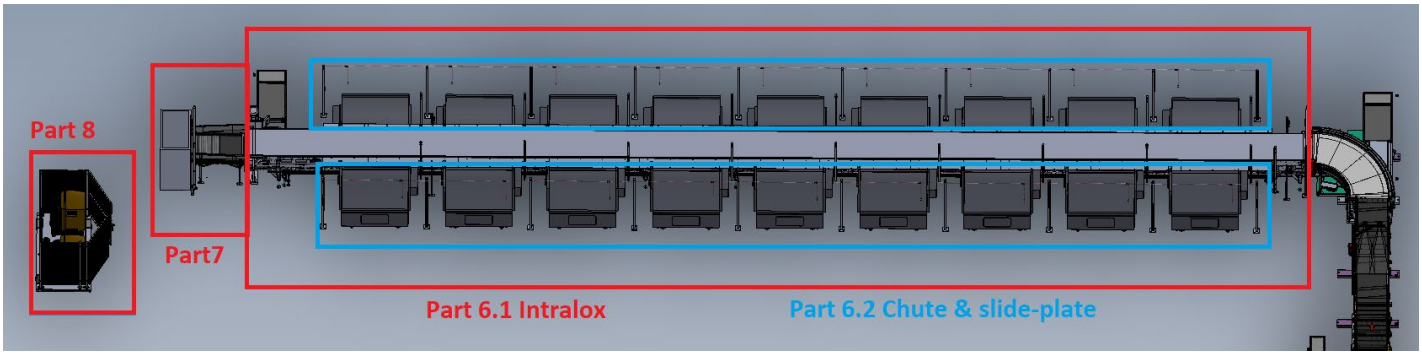
3. GENERAL PREVIEW

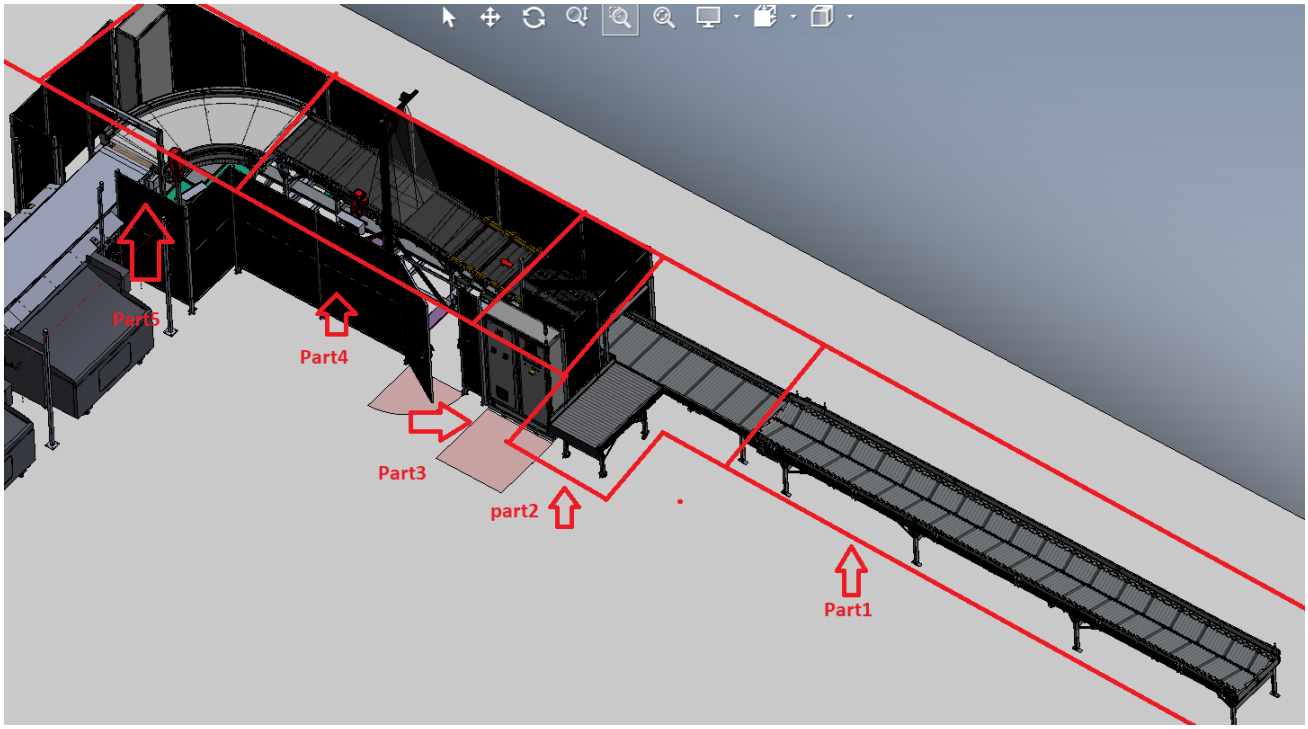
The system is delivered in 8 parts.

Parts supplied by Vanderlande arrive completely pre-installed and pre-commissioned to site. The supplier focuses on swift placement and inter-connecting of the large pre-installed segments.

The Intralox-sorter is the only larger item requiring standard on-site installation.

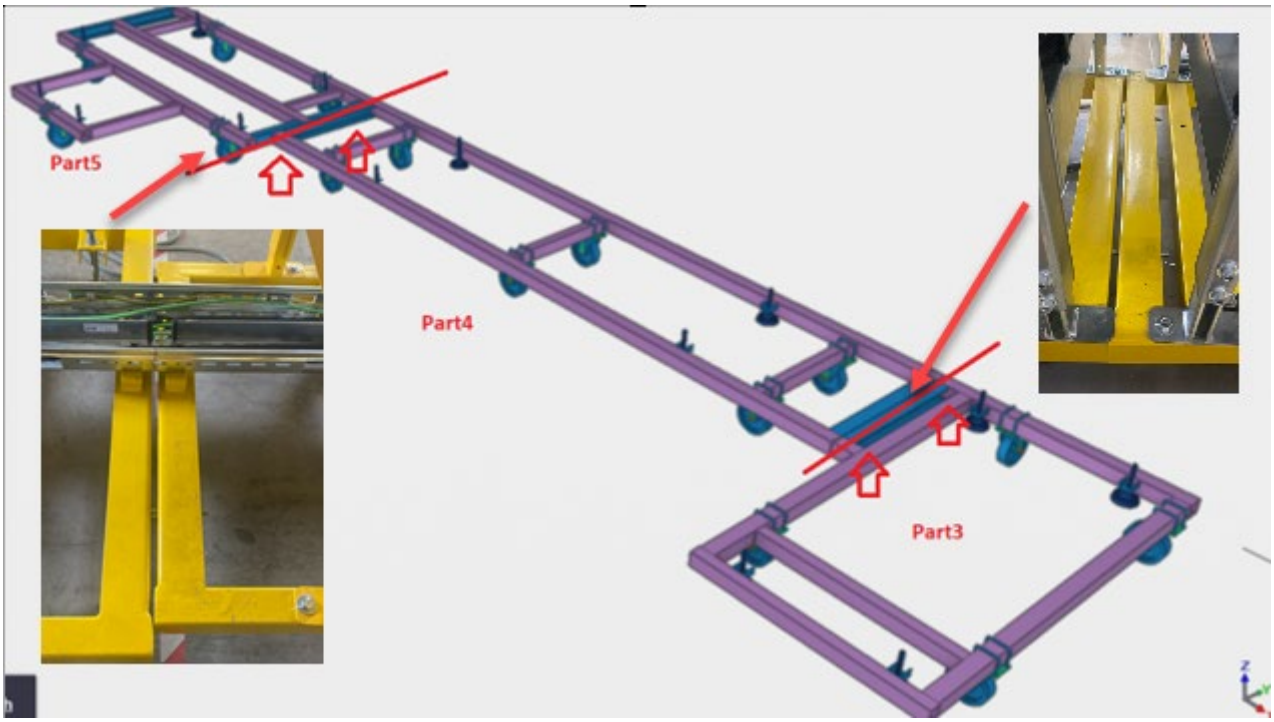


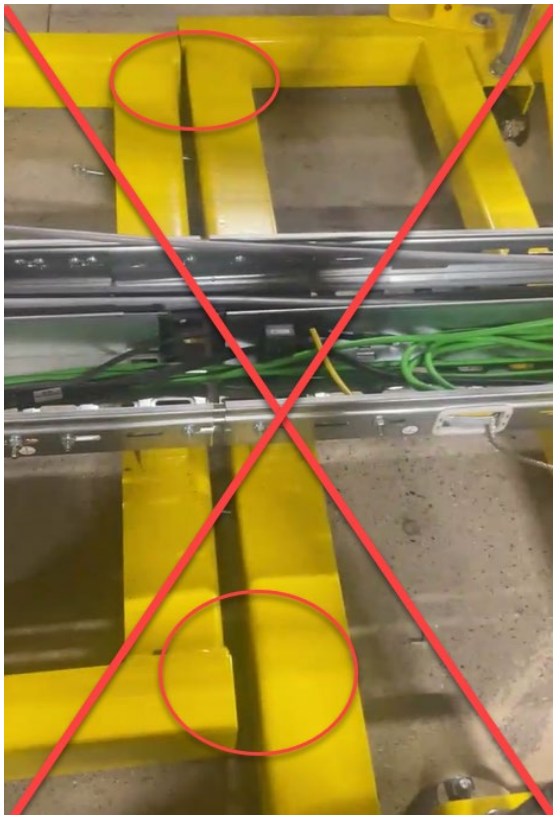




3.1. General guidelines – Steel-frame (handling & transport)

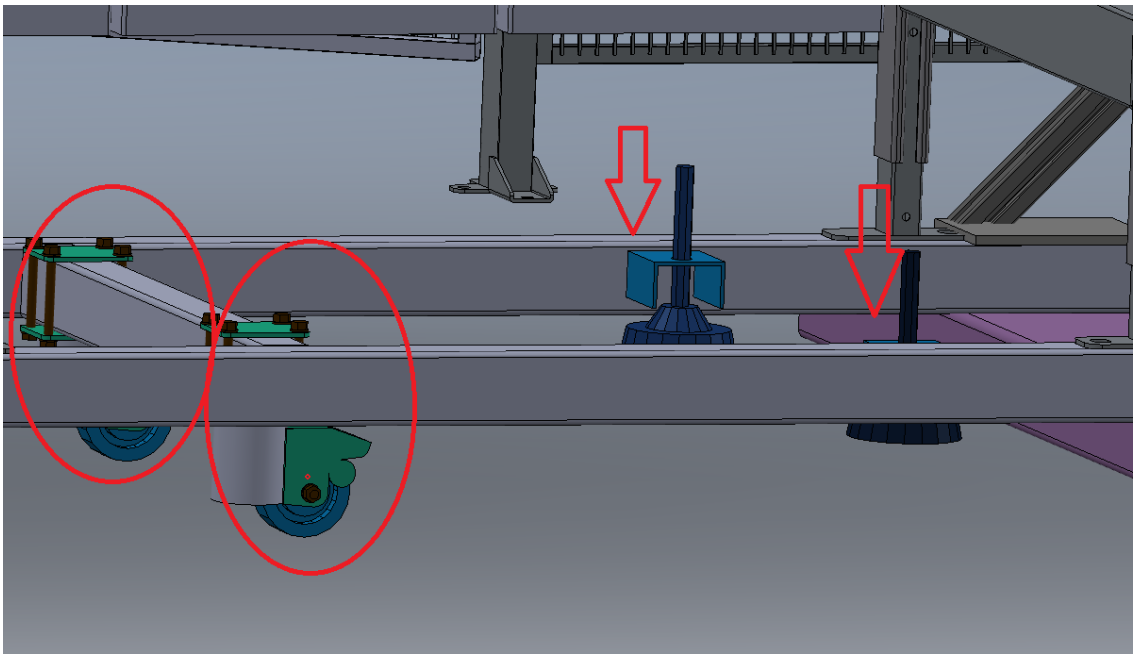
- The steel frame will be deliveret in 3 parts (in manual defined as Part3, Part4 & Part5)





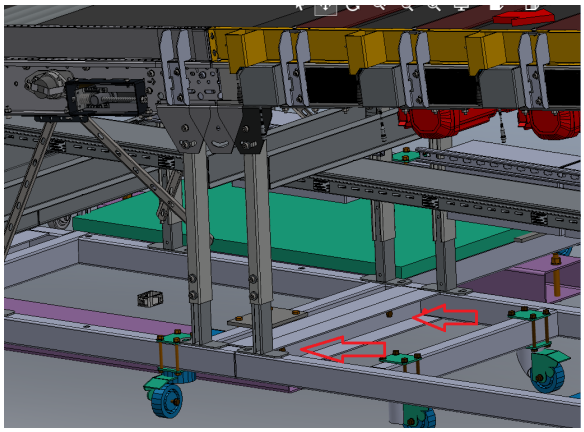
- Each part of the frame will have wheels for easier transport on site; allows for manual handling and transport through narrow passages

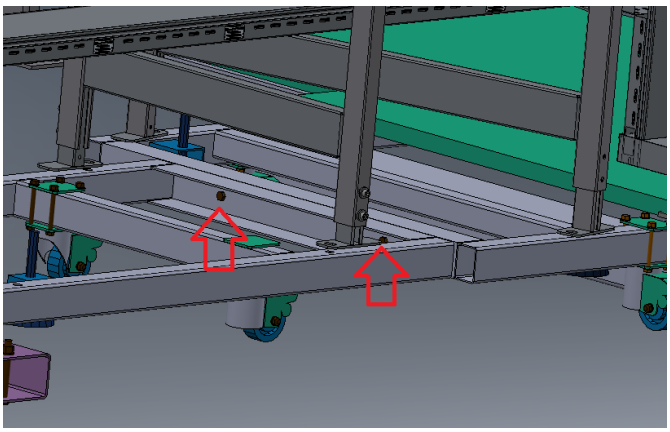
- When the frame will be positioned on site, the supports (**spindle-supports**) of the frame are used to **lift the frame into position to remove the transport wheels**. After that the frame is **lowerd to it's correct transport height**; again using the spindle-supports. Spindle supports are anchored to the floor when the skid is in its final position.



CRITICAL!!! Wheels have to be collected and returned to the VI supervisor in full quantity!!!
(supervisor to return wheels to pre-install facility for use on next sequence of systems)

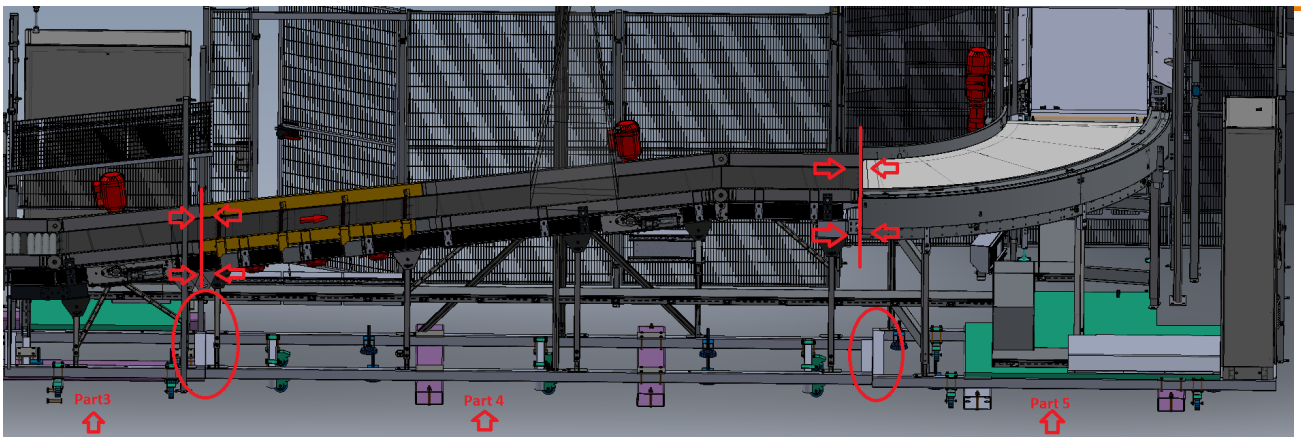
- All three parts of frame are bolted together in two fixed positions.



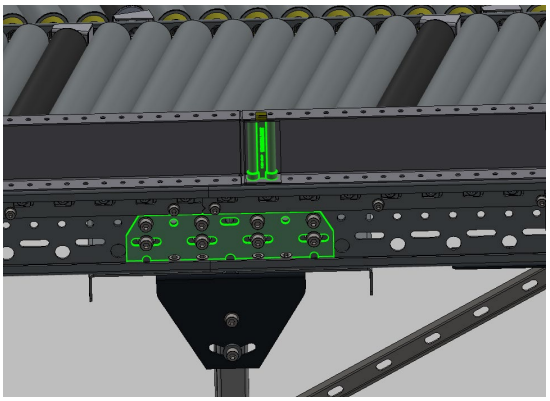


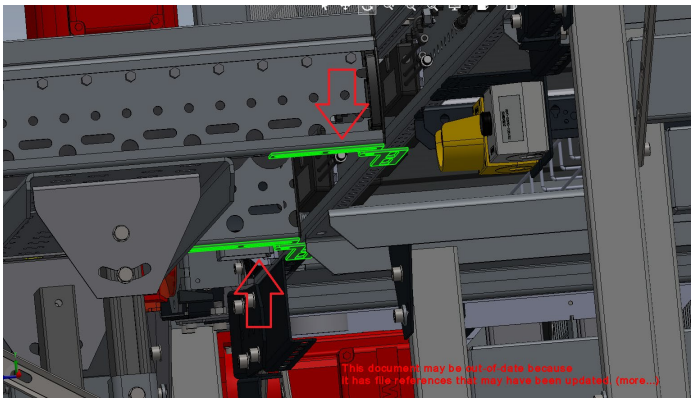
3.2. General guidelines - Mech

Mechanical intersections of the conveying system on the steel frame sections

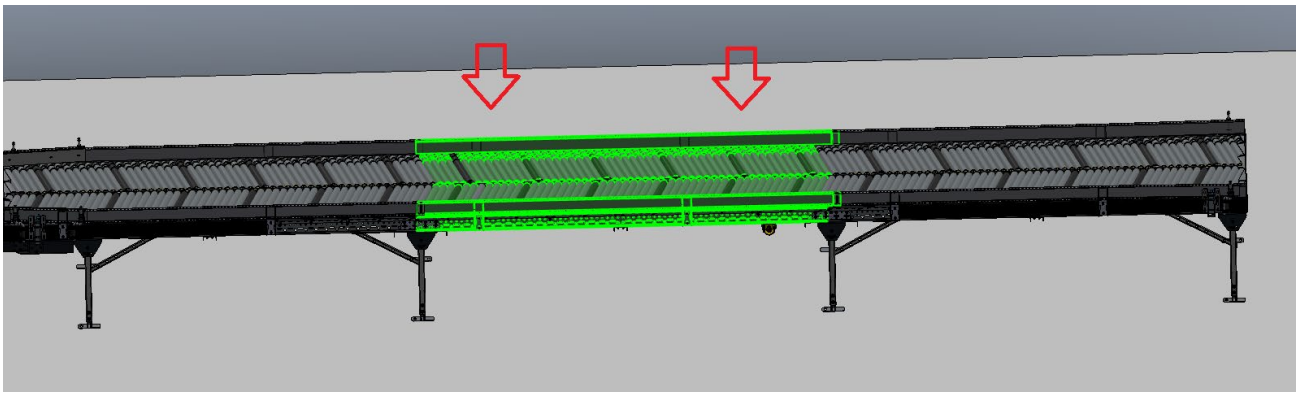


The conveyors have to be connected between each other on site with the defined channel & side-guard connection brackets. Example:





Part of the supplied conveying system consists of non-steel-supported conveyors that will be delivered to site on wooden frames and require to be placed in their indicated floor position next to the main steel-framing.



3.3. General guidelines - EM

All components on all conveyors are already pre-installed. The conveying system will be delivered to site fully commissioned. The system will be take apart in sections for transport and re-assembled on site.

The pre-installed system from the factory includes:

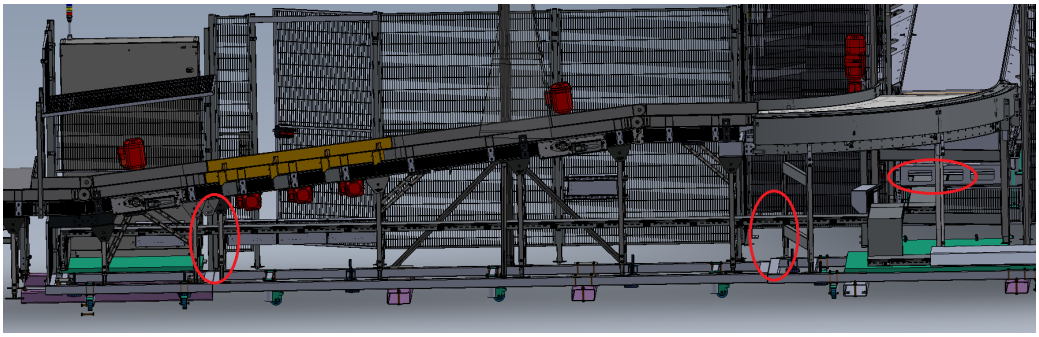
- PEC's are installed, adjusted & tested. During the on-site I/O check verify and **only adjust if is necessary**. 3mm detection of pecs is mandatory!
- Drive controllers (VFD, LM, CBK, IB-P05) are installed, configured and tested
- PBB's are wired and tested; for transport purpose some are mechanically removed from their position and are to be placed back on-site; their cable isn't disconnected and comes rolled together with the PBB

All intersections between parts are equipped with connectors or other coupling types:

1. Profinet with M12 plugs male/female.
2. ASi Splitter box for 24VDC (ASi black & ASi gray) – **NO ASi YELLOW on AMZL systems** (all communication via Profinet)
3. Ground connection clamp for earthing connections
4. 400VAC flat-cable tap-off quick-connectors (flat-to-flat)



Electrical conduit on pre-installed steel-frame sections needs to be correctly interconnected when assembled on-site. Example: cable tray along Part3-Part4-Part5



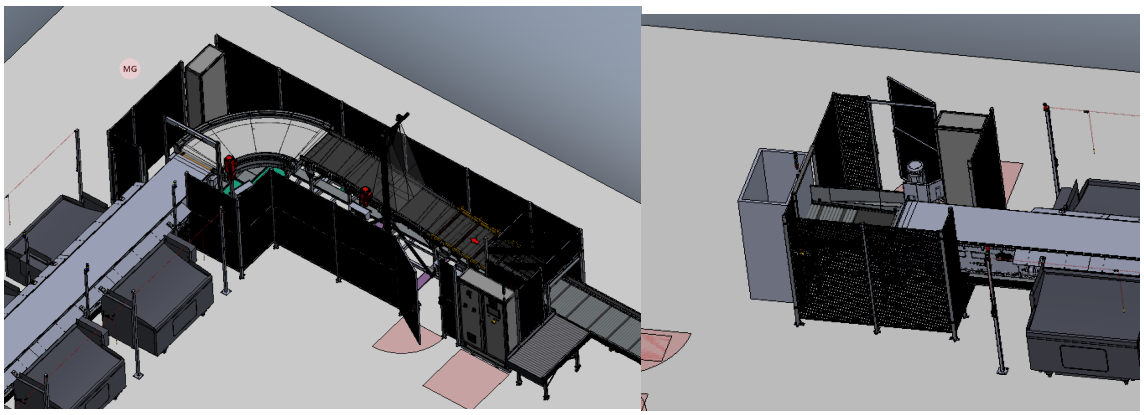
EM test-reports & labelling that applies to the site-tasks:

- Power up protocol
- Labels on cables and components which do not arrive pre-installed (applies to PART 6)
- EM field-wiring test-report:
    - Profinet measuring length and connections
    - 24VDC/400VAC measurements (insulation, rotation, values, etc.)
    - Equipotential bonding

Note: Partial labelling and measurements to be already done in the Pre-install

3.4. General guidelines – Fencing (Troax)

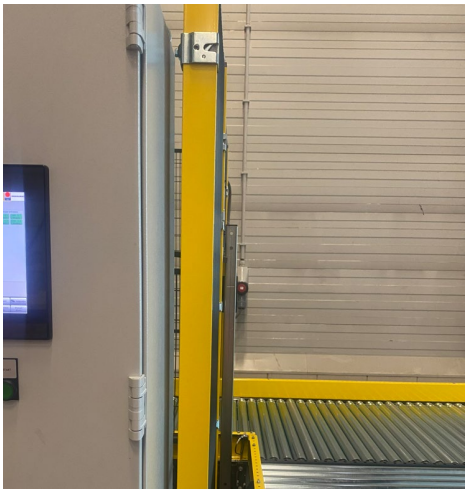
Fencing panels will be delivered to site depending on building layout. Supplier to install fencing on site as per site-specific layouts.



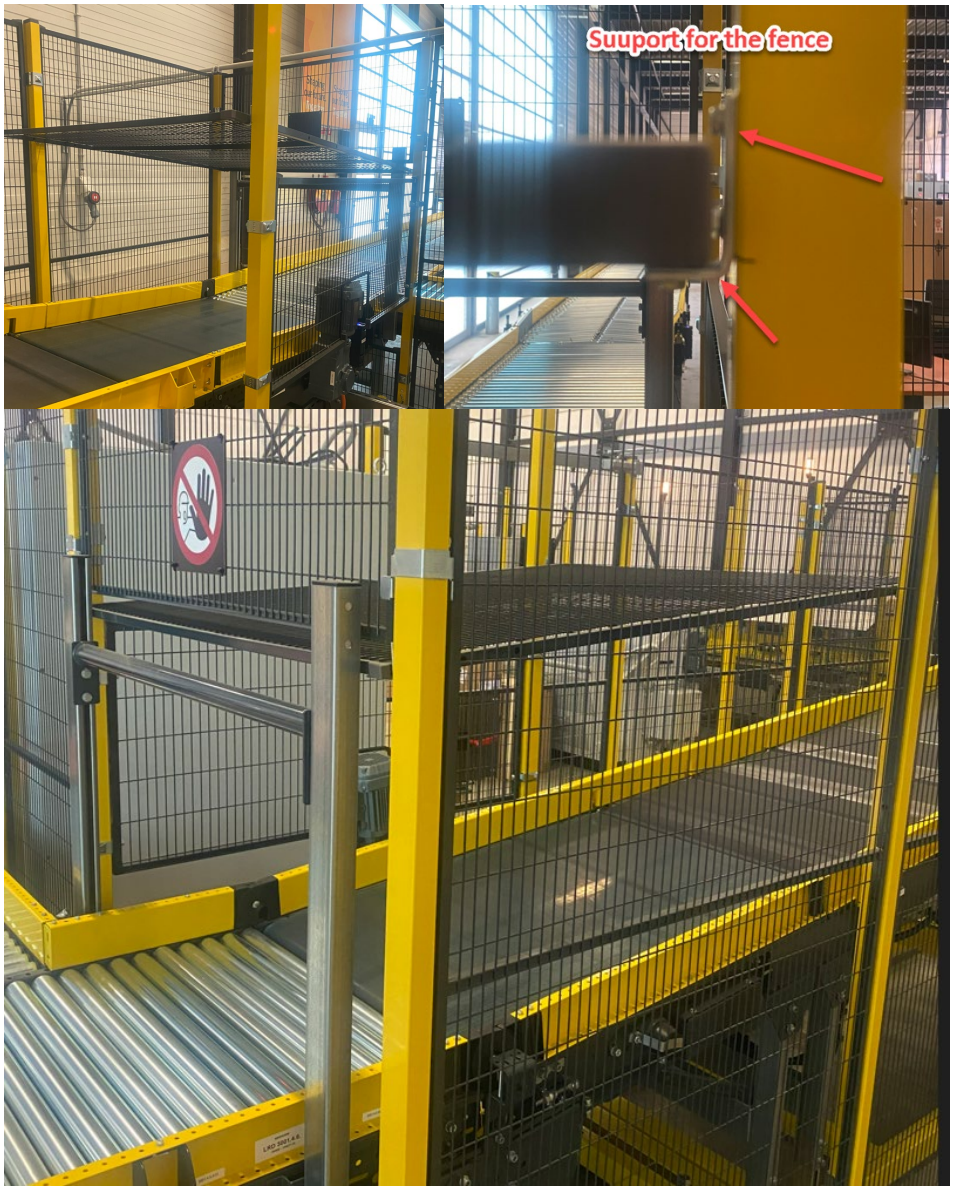
1. The first fence that needs to be installed is under the sorter so that there is the same gap on both sides (Start of the sorter)

2. There is more than a 5-10cm gap between the main cabinet and the fence post, but maximum gap between fence post and equipment <120mm:

3. On the left side of the main cabinet, the fence must have a minimum gap between the cabinet and the fence post:



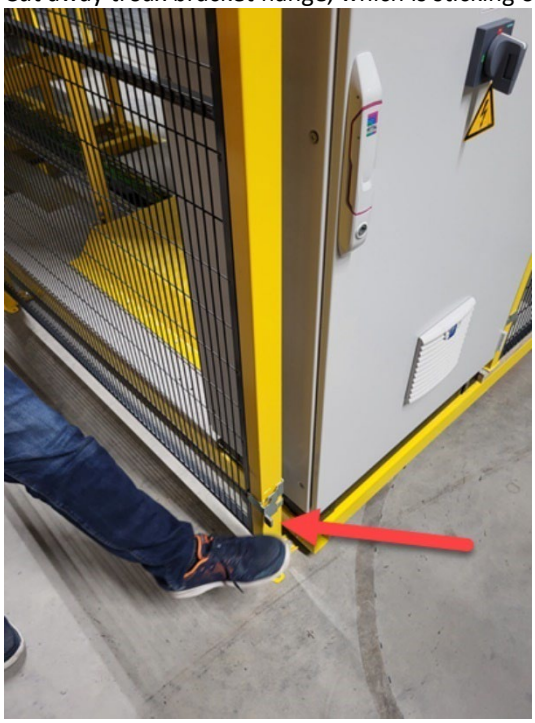
4. At the back of the main cabinet, it is necessary to make a tunnel out of the fence:



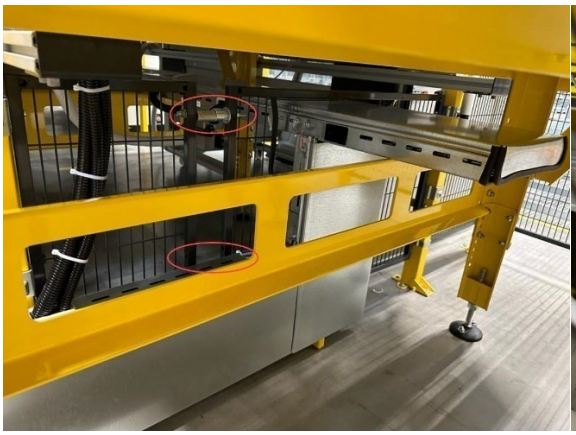
5. The fence near the motor needs to be cut (put protection on the cut part):

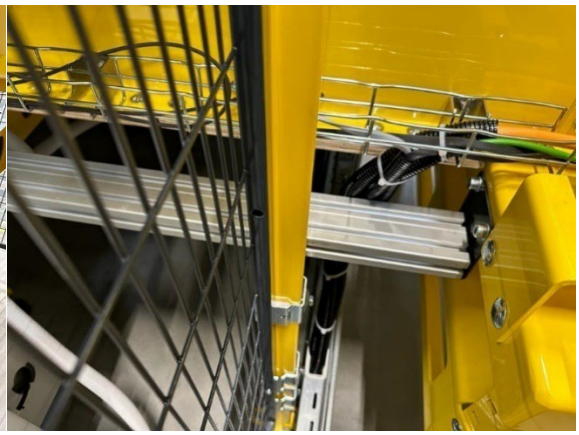
6. The post from the fence at the LCC11 cabinet must be mounted on wood:

7. Cut away troax bracket flange, which is sticking out, at belt curve LCC cabinet and at CCC cabinet:

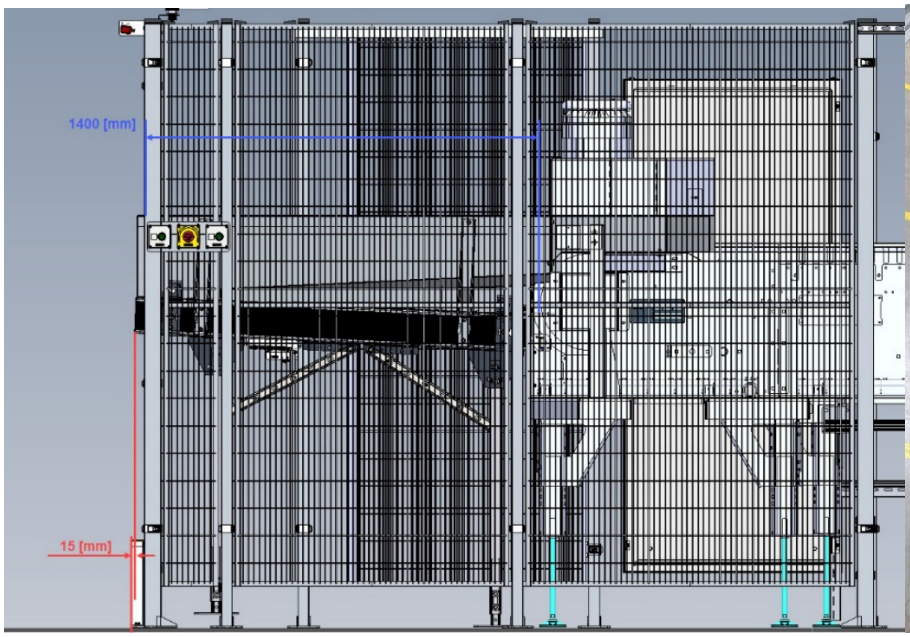


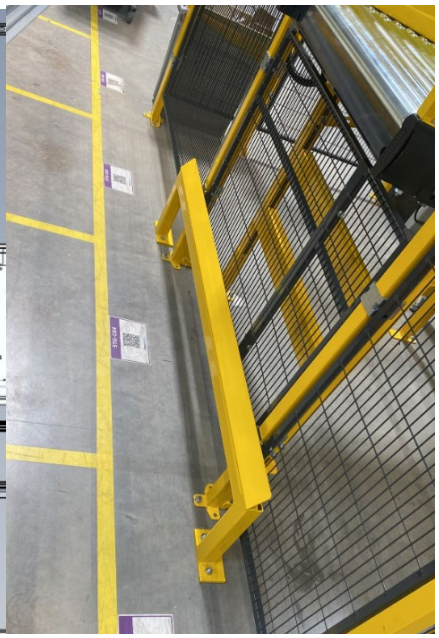
8. On the jackpot, you must first install the fence under the sorter. Between the fence of 300 and 800 [mm] we should put spacers to achieve the required distance. This was missed during engineering and could not be corrected anymore. This should allow the aluminum profile to be mounted against the discharge section of the Intralox.





9. The blue dimension below is critical and should always be ensured, as this is to cover the distance to danger from the discharge side of the end of the Intralox. The red dimension is the distance between the end of the jackpot and the front side of the crash barrier, this is to prevent Amazon personal from hitting the jackpot with the JP cart.
   Crash barrier must be positioned against the fence. No gap in between is allowed, because of stepping on hazard.

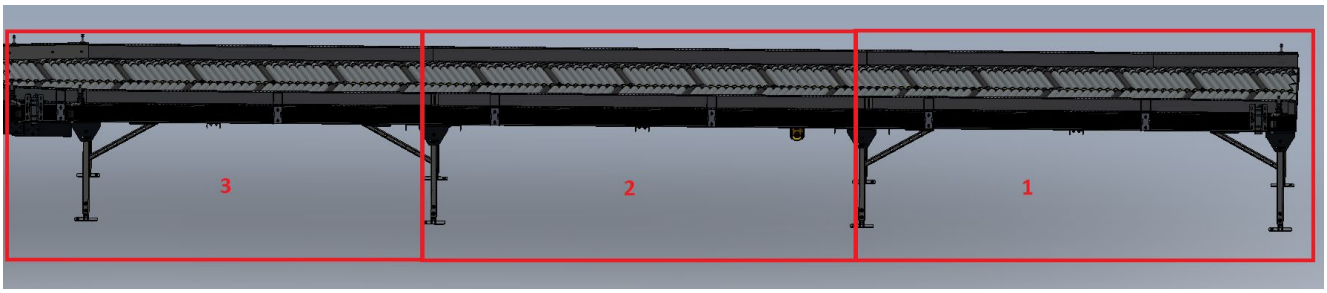




4. SYSTEM OVERVIEW - PART 1 (SINGULATOR)

4.1. General description

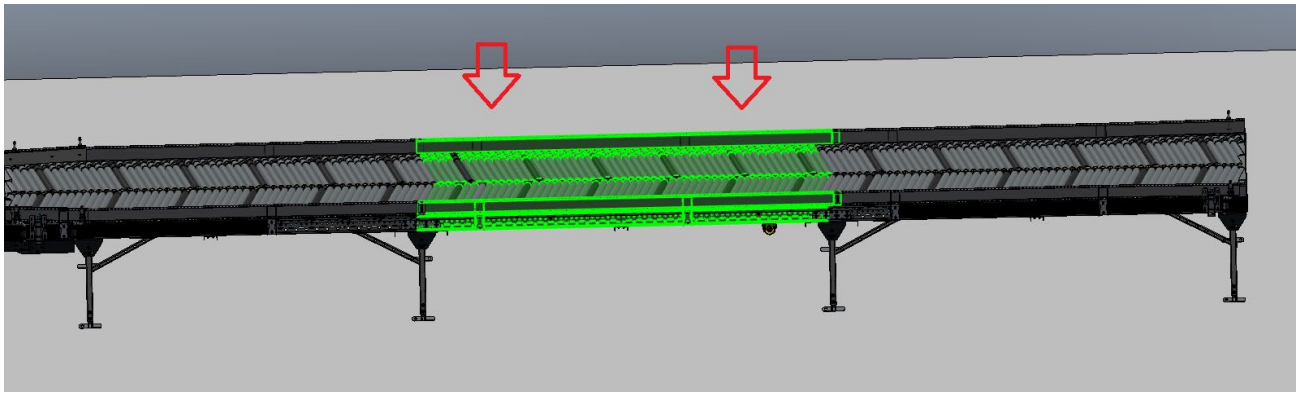
The conveyor will be delivered to site divided into three sections (3m long) – stored in transport position on wood frame



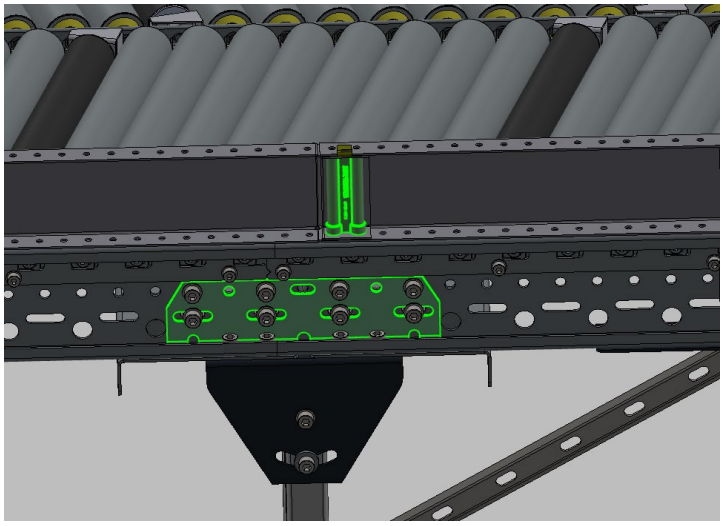
4.2. Installation steps - Mech

- On sections 1 and 3 supports will already be mounted; on site they have to be folded down from their transport position and anchored on centre-line

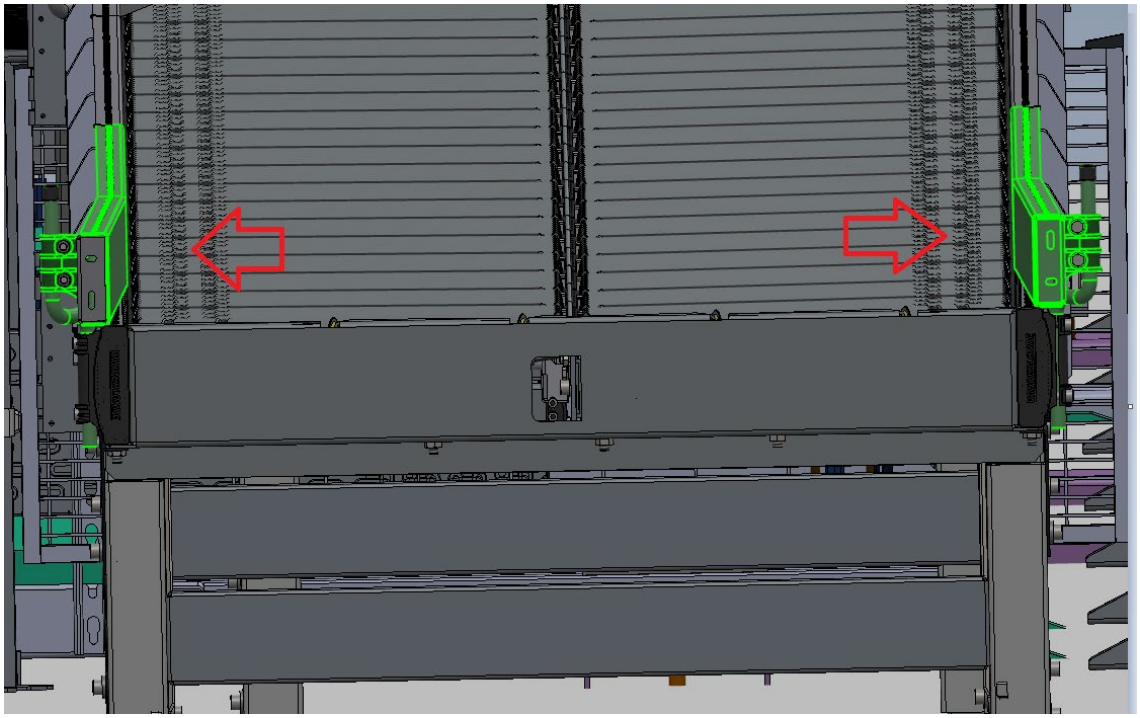
- Section 2 is without supports and comes **placed between sections 1 and 3**



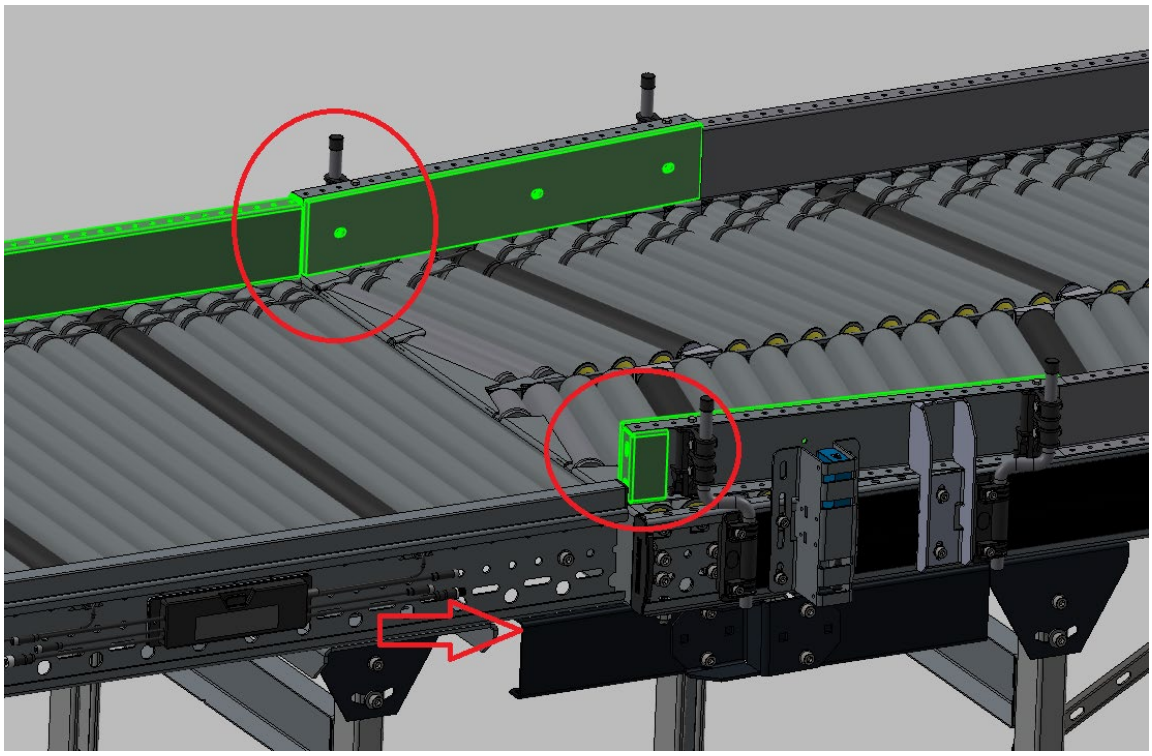
- On each side, install **side-guarding connection** and **bed-bed connection** between section



- On section 1 (**upstream**) side guarding has to be **adjusted to the existing customer MHS width, conveyor always has to be installed according layout (standard configuration is center to center)**

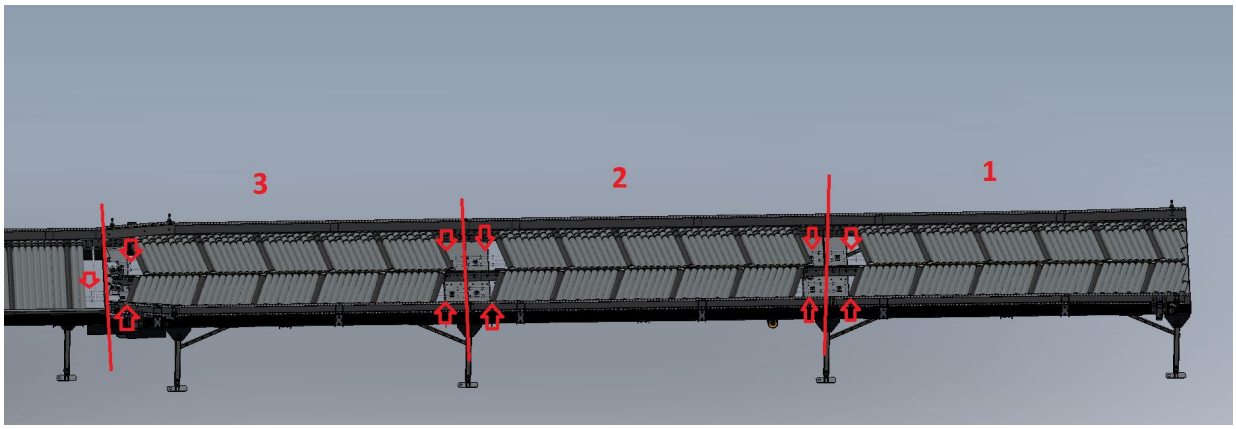


- On section 3 (**downstream**) the connection to PART2 (Cleaning station) has to be done with **reduced connection-plate** under the channel and the side-guarding funnel **alignment needs to be checked** that it didn't move during transport

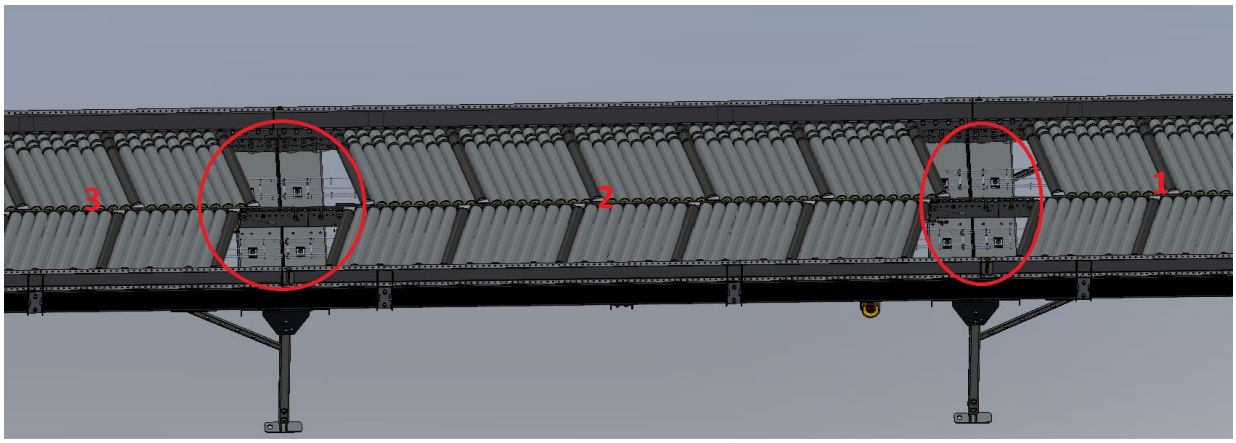


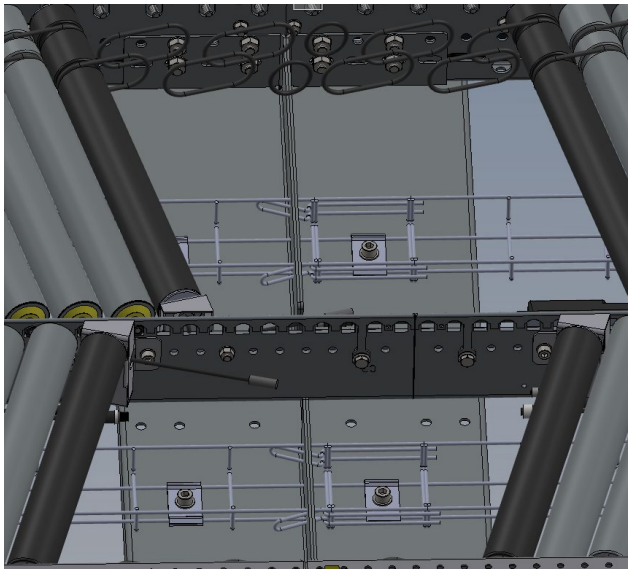
4.3. Installation steps – EM

- The cable basket will be divided in three sections:

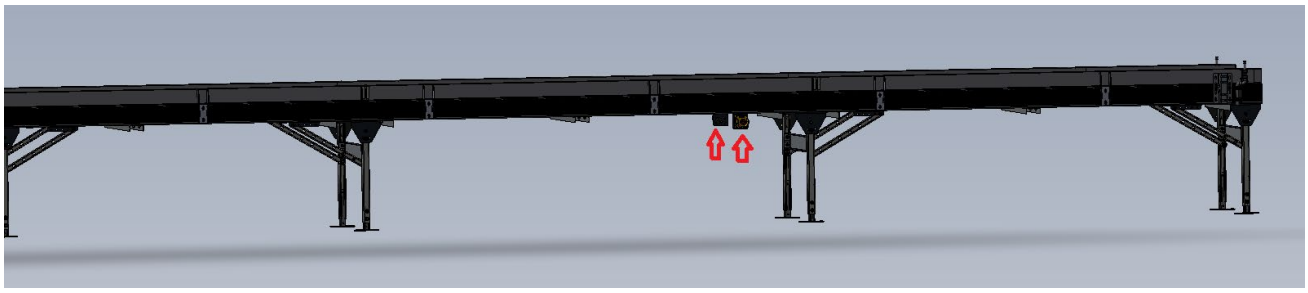


- On every part off the section (1,2,3) cable baskets are pre-installed under the conveyor and pre-wired.
- When the conveyer is assembled on site, the cable basket has to be **connected in two positions**

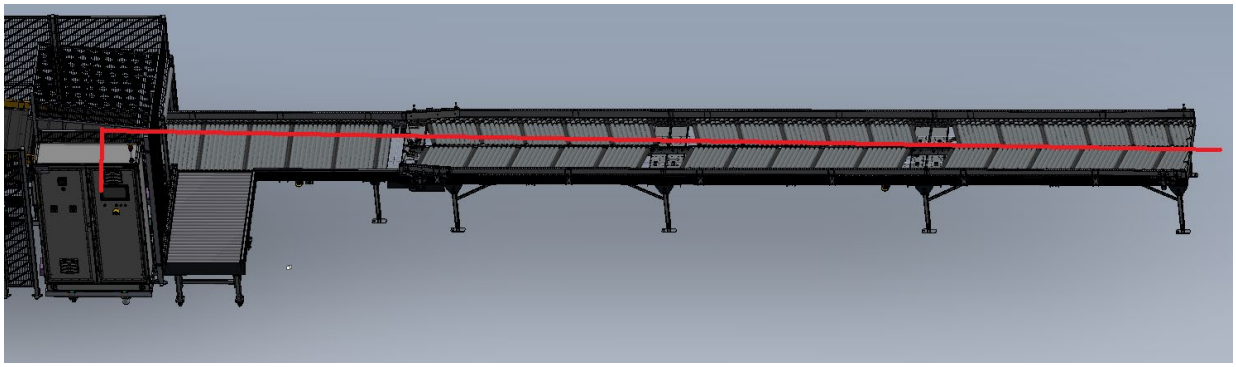


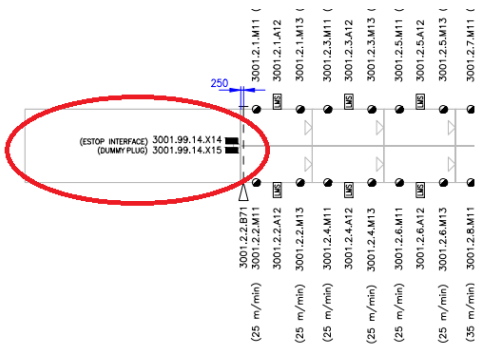


- On Section 2, two e-stops are **pre-mounted in transport position**; they need to be **moved in final position** and **connected with M12-male/female** connector (cable is already in the cable basket and has M12-male/female connectors also between the individual Singulator and Cleaning-station sections).

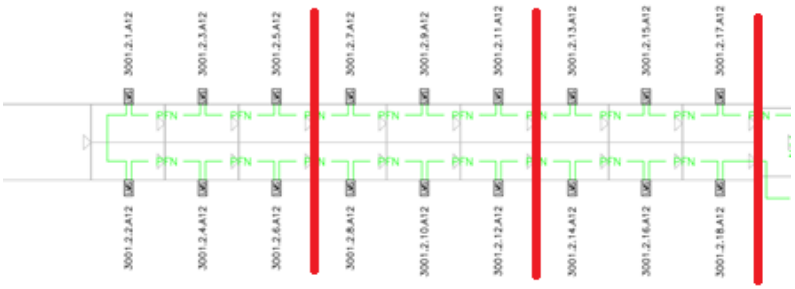


- When Part1 (Singulator) + Part2 (Cleaning station) are completely installed, two interface cables (e-stop & dummy-plug) from the main cabinet have to be pulled to the beginning off the Vanderlande ADTA conveyors, connecting to Amazons existing MHS on Part1 Section1 (upstream Singulator).





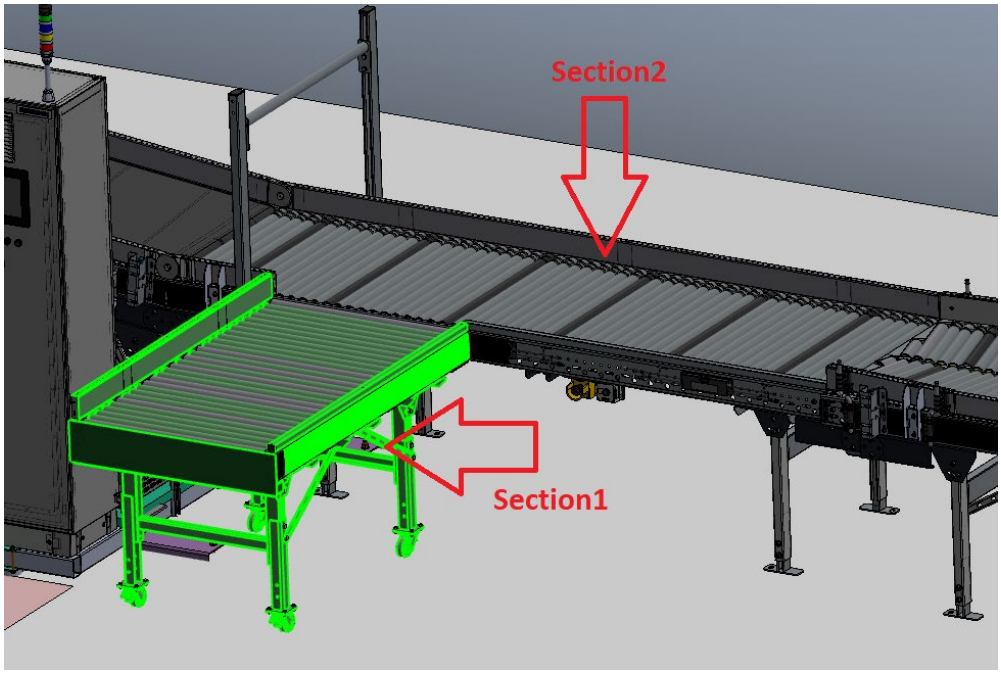
- Network layout Singulator (Section 1,2,3); all drive controllers on a single section come connected to the loop. Only the last drive controller on a section needs to be connected to the first drive controller on the next section.



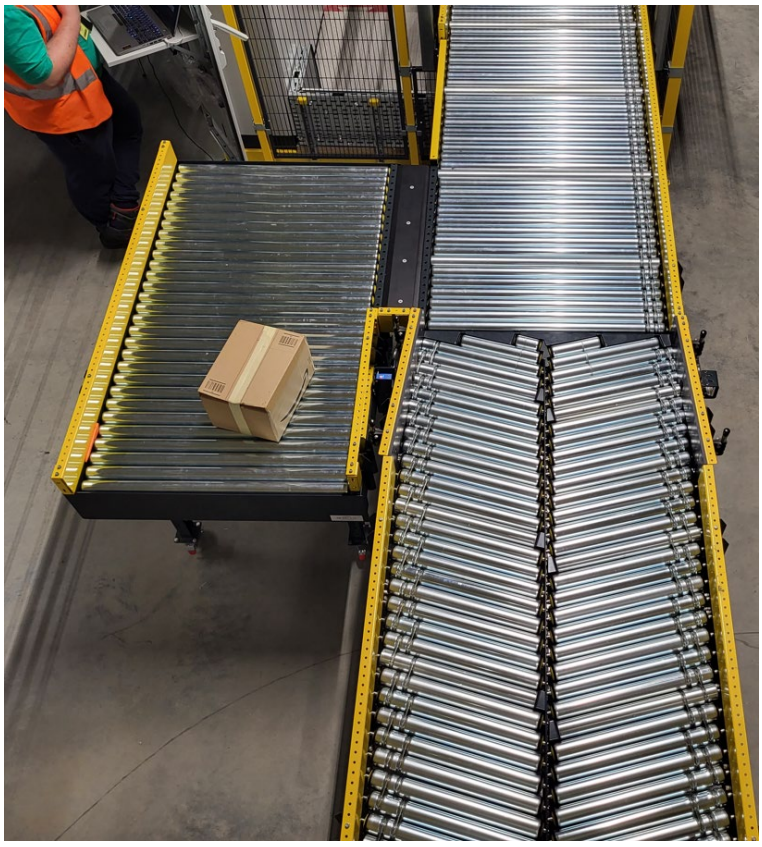
5. SYSTEM OVERVIEW - PART 2 (CLEANING STATION)

5.1. General description

The conveyor will be delivered to site divided into two sections (main-line *(cleaning station)* + gravity-table *(buffer table)*) – stored in transport position on wood frame

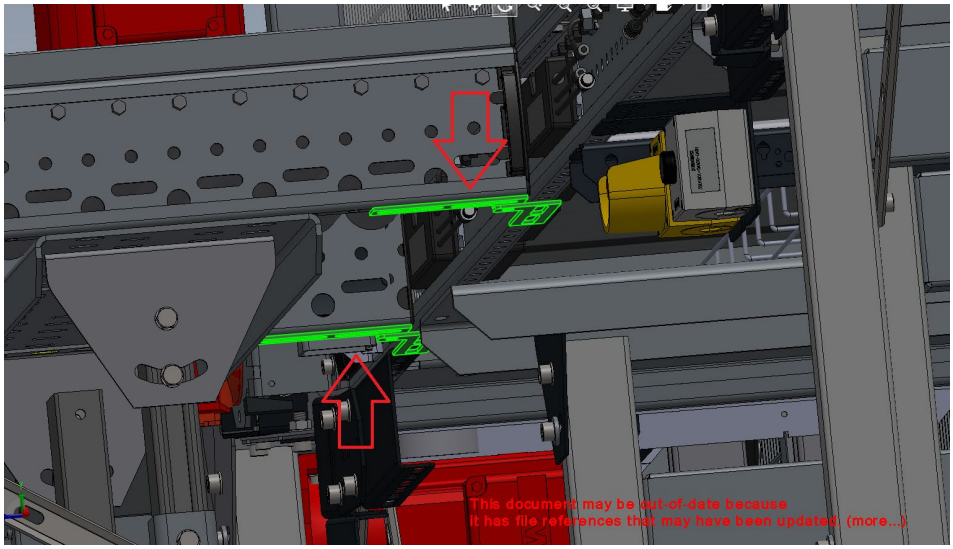


Additional: A mod-kit will be supplied to allow for different buffer table configuration. See site specific layouts. See example below:

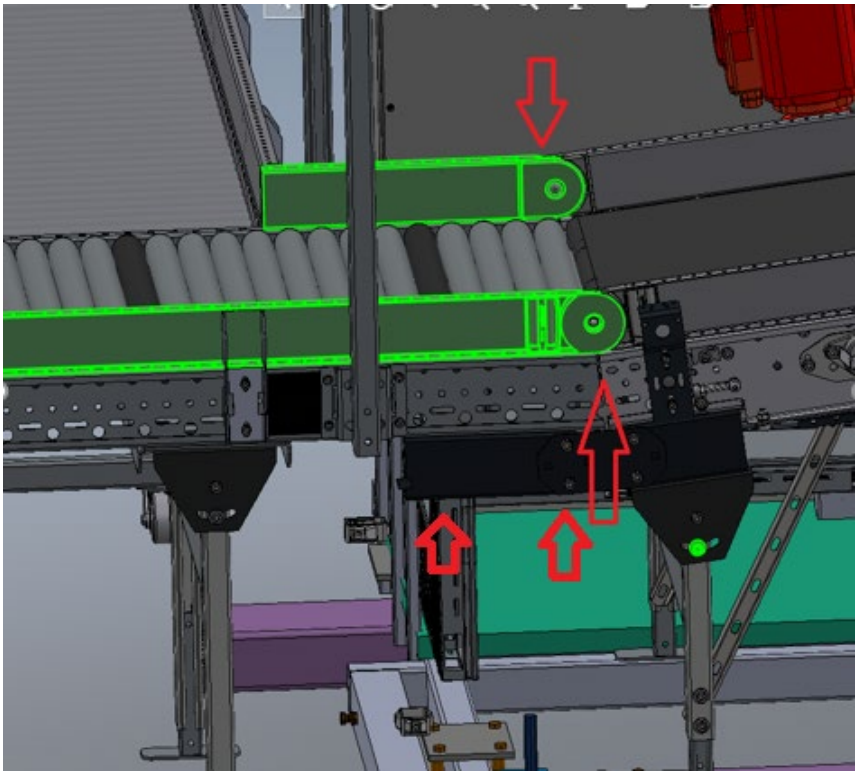


5.2. Installation steps- Mech

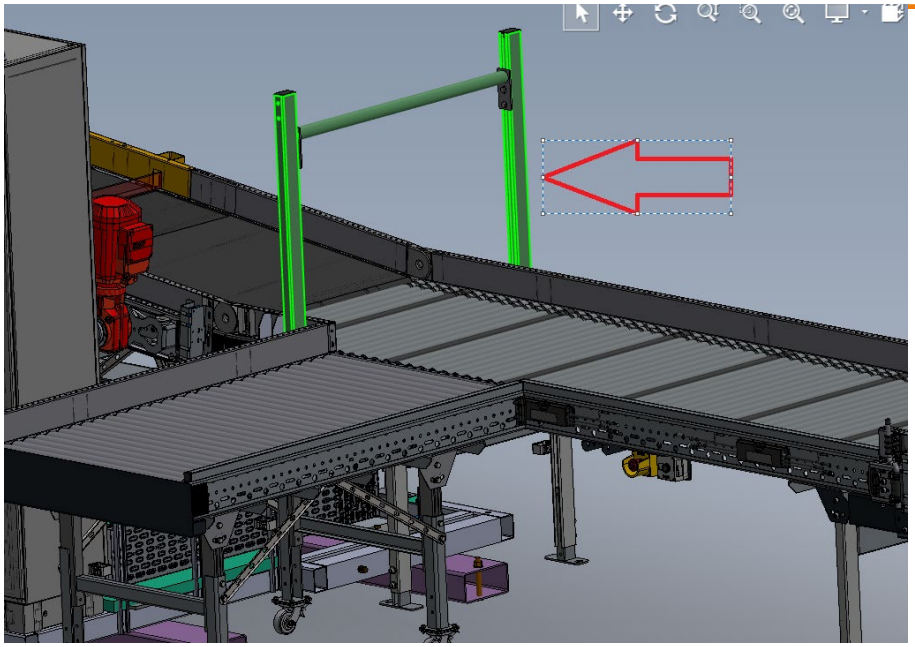
- Connect Section 1 (buffer table) to Section 2 cleaning station with **angled connection profiles** under the conveyor channel.



- Part 2 (Cleaning station) connects downstream to Part 3 (Pre-gapper) with an **adjustable connection plate** under the conveyor and **adjustable side-guarding connections**



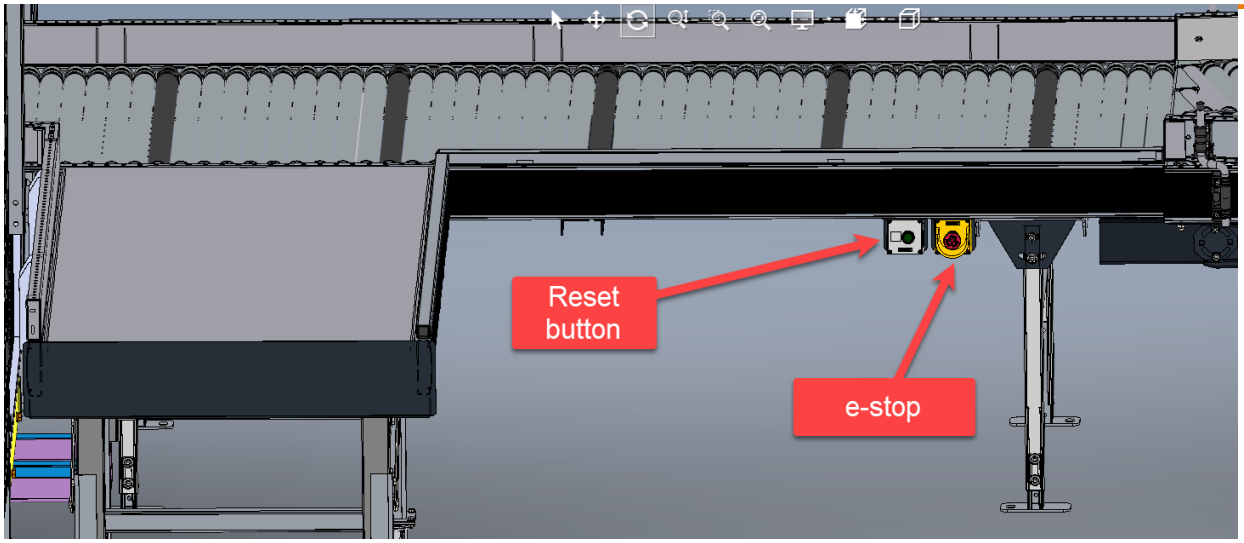
- Height check is **stored in transport position** and to be placed correctly at height on site **(650mm from top of roller)**



5.3. Installation steps- EM

- When the conveyor is installed, the cable basket has to be **connected in both upstream/downstream positions of Section2**

- Both **e-stop and PBB** will be connected to the main cabinet upstream of the Cleaning-station; they will come **stored in transport position on the first steel frame** with the cable winded in a loop. **On site unloop the cable and attach both buttons in the indicated position**. Leave spare cable in the basket under the main-line to allow Amazon for later re-positioning of the buttons.

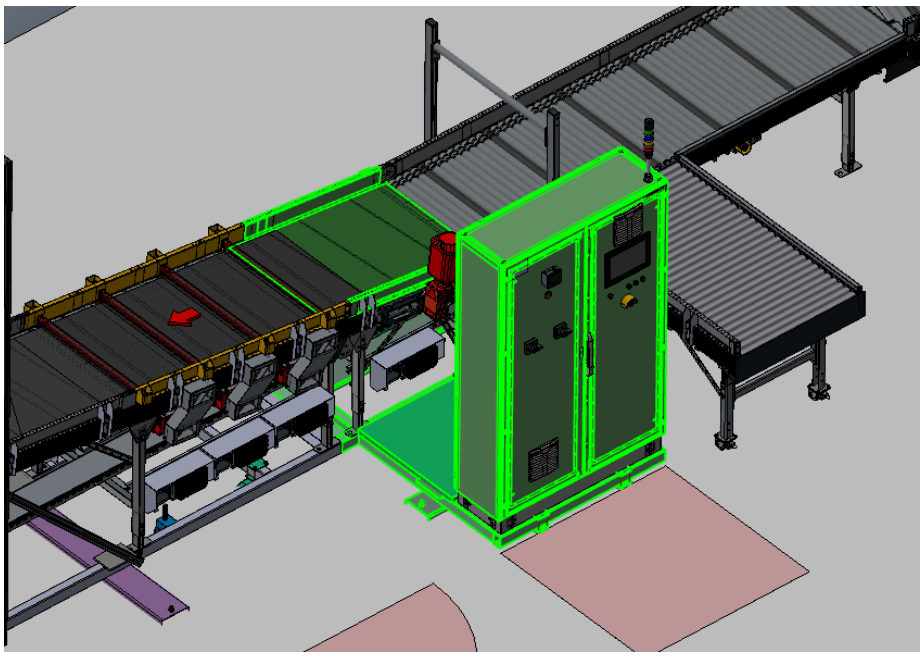


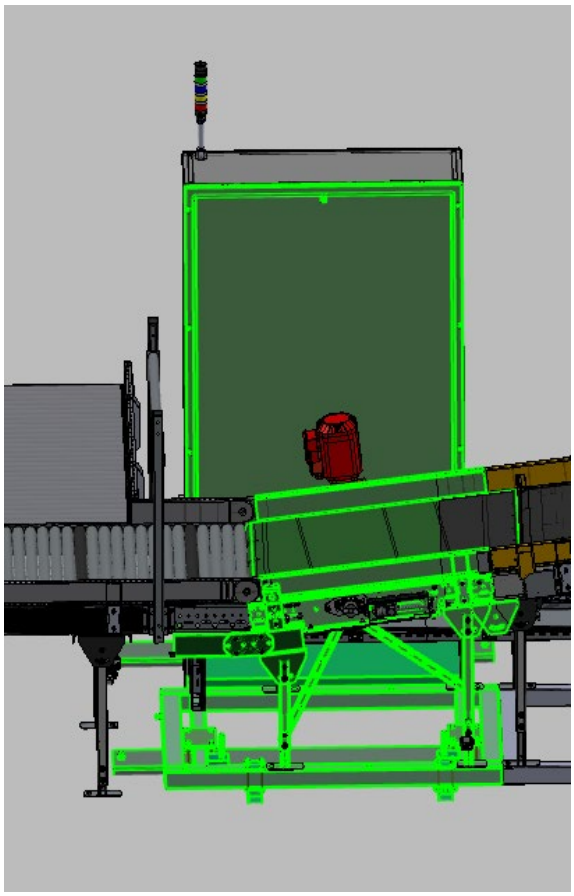
6. SYSTEM OVERWIEV - PART 3 (PRE-GRAPER)

6.1. General description

The pre-gapper is delivered in 1 piece in combination with the main controls cabinet – stored in final position on steel frame

ATTENTION – Follow general steel-frame assembly guidelines to correctly interconnect all 3 steel-frames

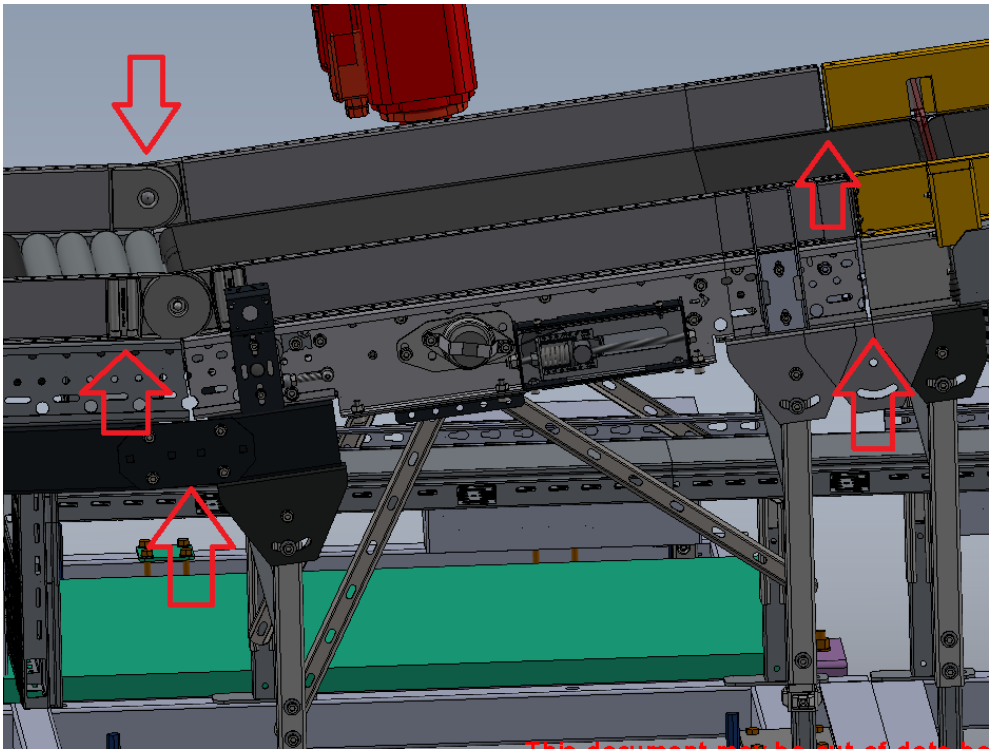




6.2. Installation steps- Mech

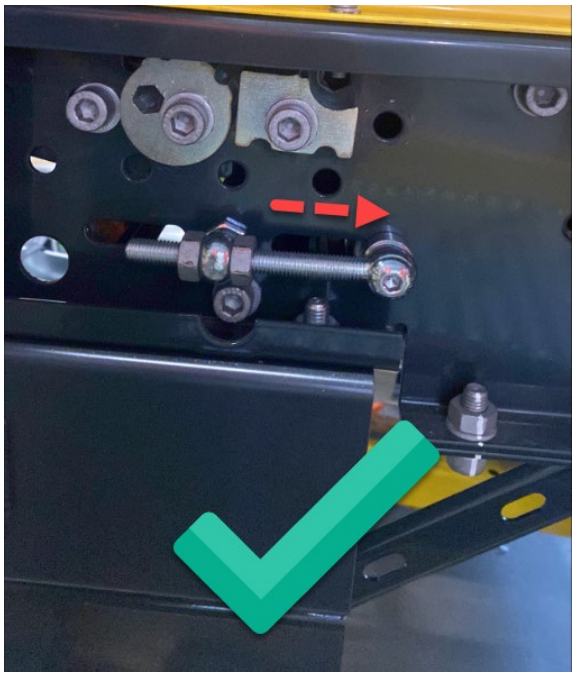
- Part 3 (Pre-gapper) connects with Part 4 (Gapper) downstream with **standard DotM bed-bed connection plates and side-guarding end-cap connections.**

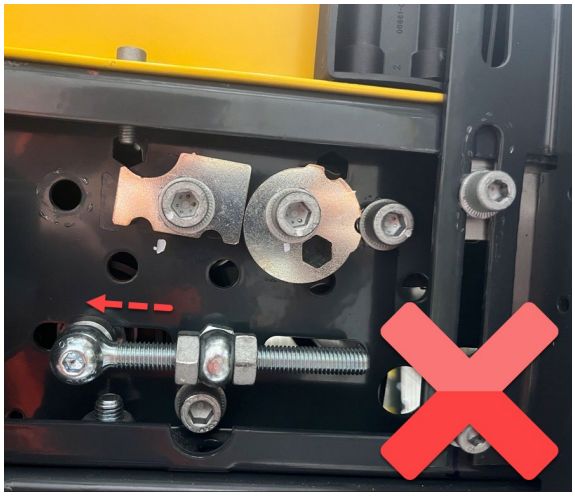
ATTENTION: When inserting the knife-ETU of the Pre-gapper into the Gapper be VERY CAREFUL not to damage the ETU or gapper.

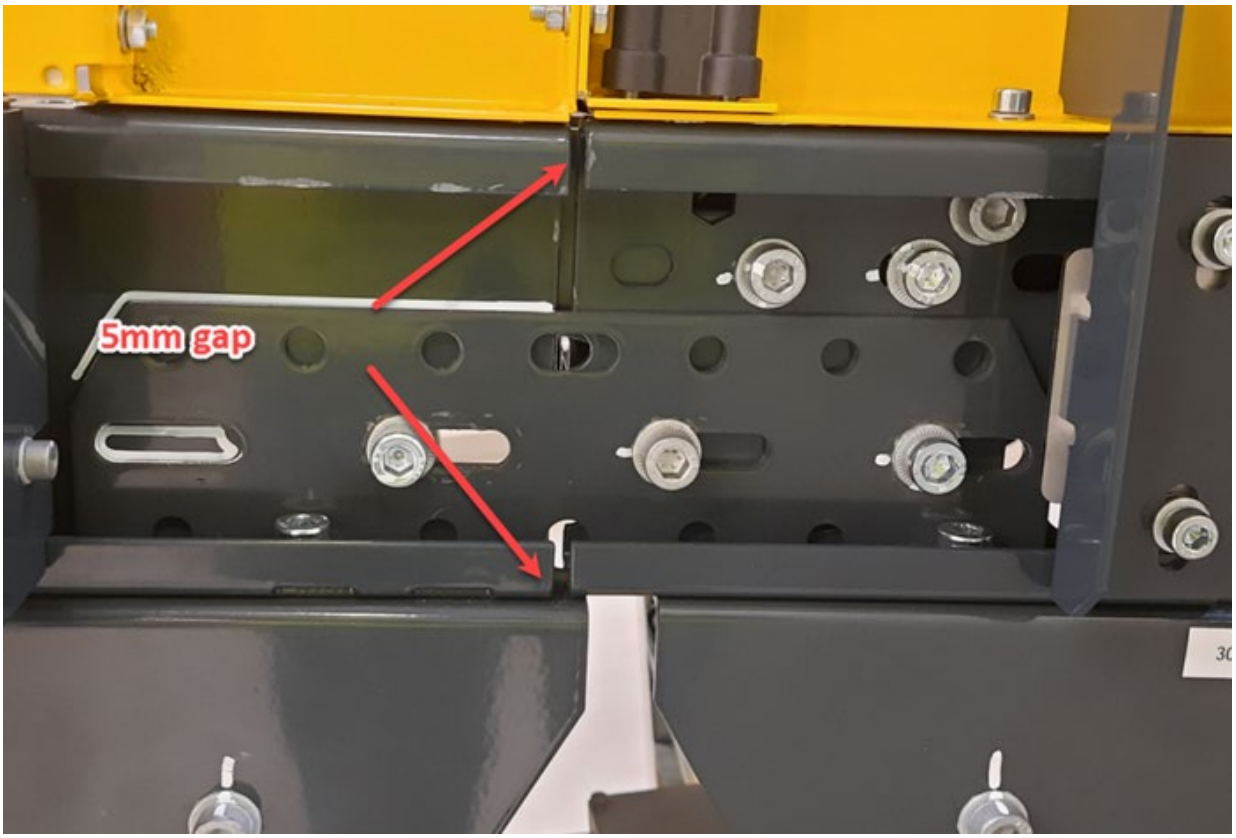


ATTENTION – Old solidworks picture with downstream smiley-plate instead of connection plate

- **ATTENTION – Make sure that the tracking roller remains as pre-installed, this cannot be touched on site! If moved this will result in the tracking roller and return roller in the ETU being to close, this will break the tracking roller!**



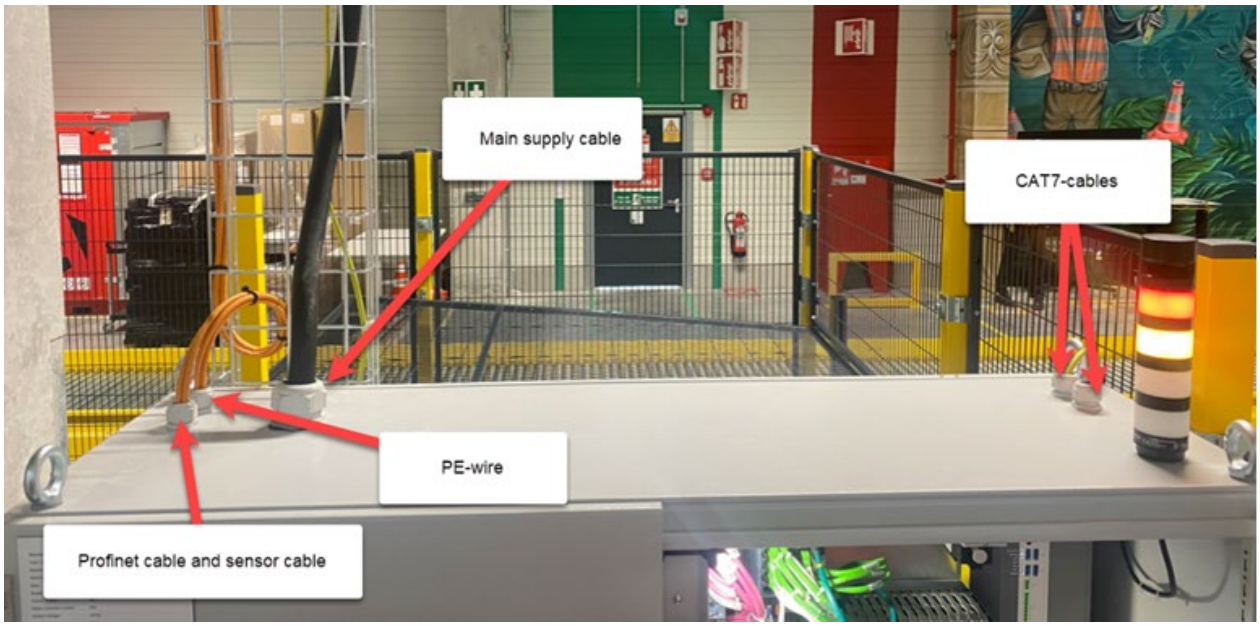



5mm gap


no gap

6.3. Installation steps- EM

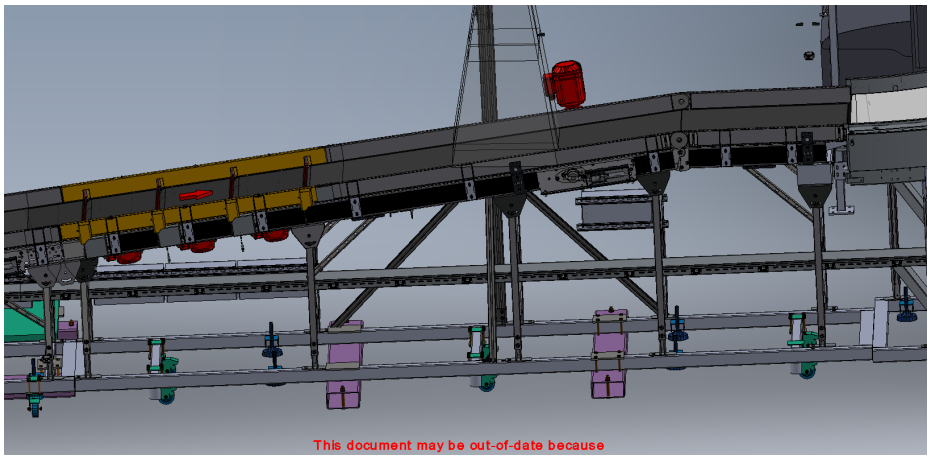
- Cable tray and other connections between the steel-frames to follow the general EM installation guidelines of the ADTA
- The picture shows the correct arrangement of the cables on the cabinet.
- Such a cable arrangement was confirmed during inspection in Doornhoek pre-install center.



7. SYSTEM OVERWIEV - PART 4 (GAPPER)

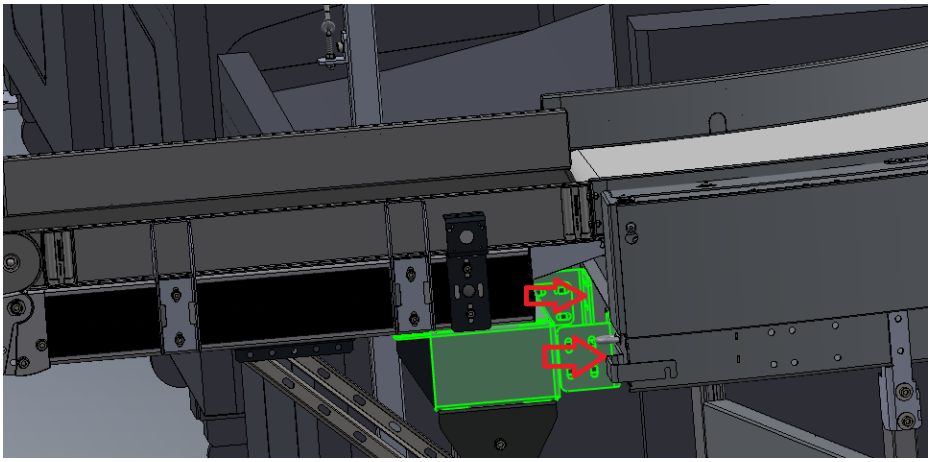
7.1. General description:

- Will be delivered in 1 section of steel-frame combining incline conveyer and scanner frame.

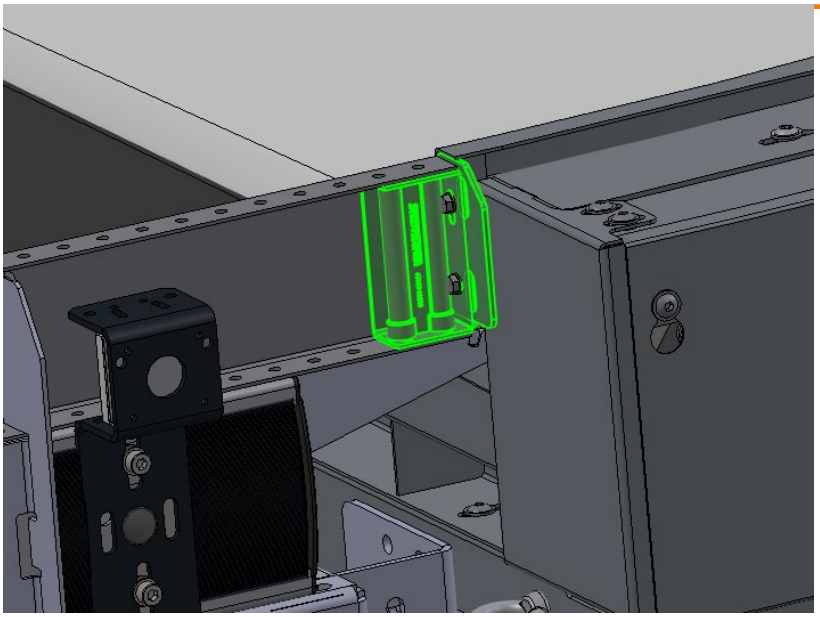


7.2. Installations steps- Mech

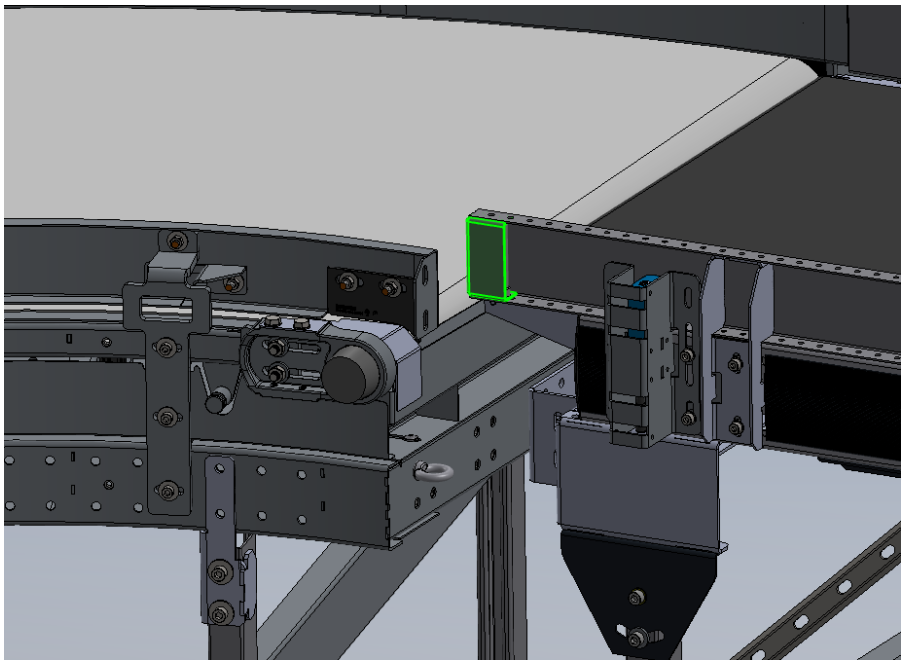
- This section have to be **connected with adjustable connection plate** to part5. Make sure gap is max 3mm between scanner BF and belt curve



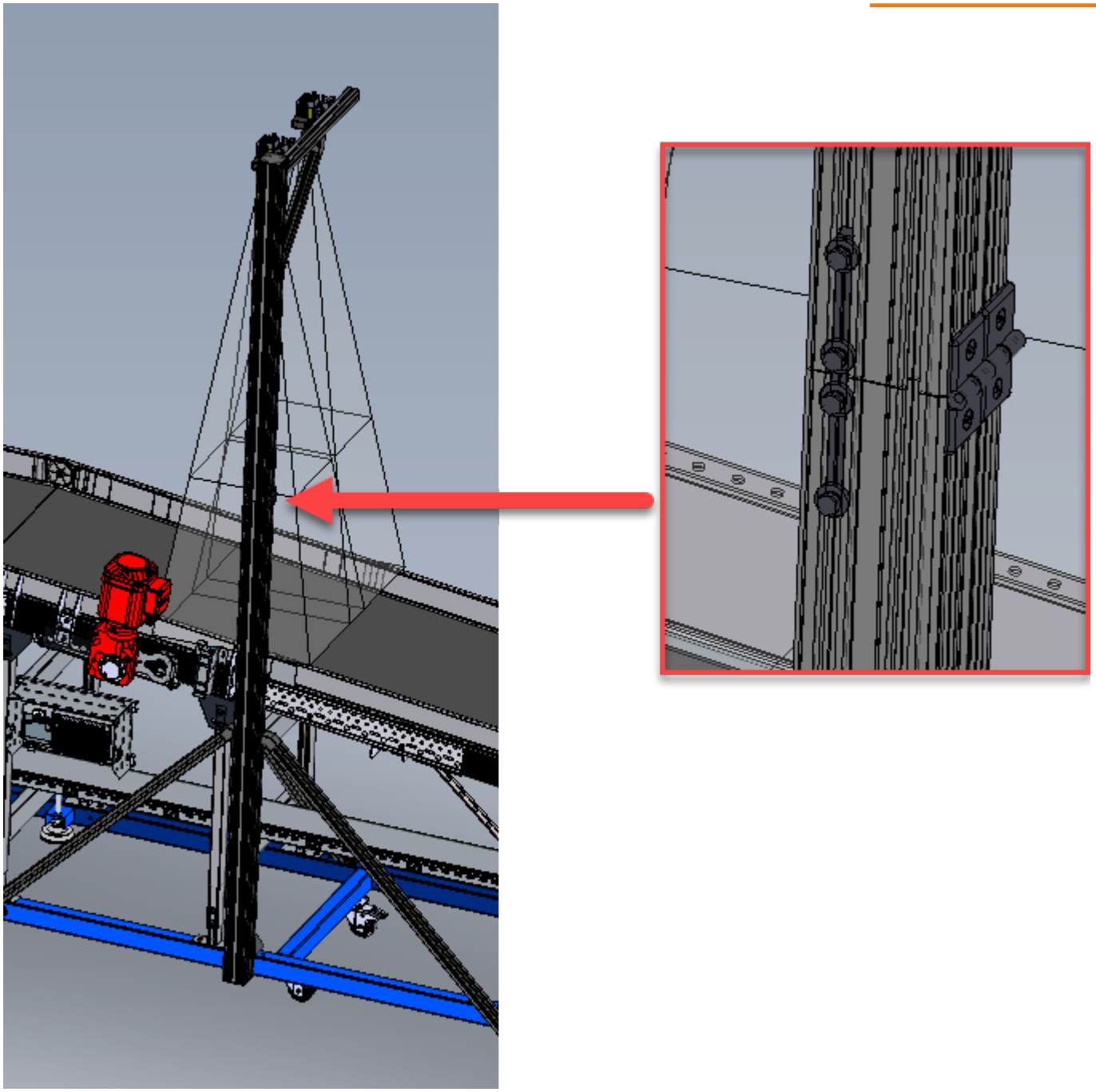
- On one side **connect side-guarding** to the curve



- On other side end cap on side guarding

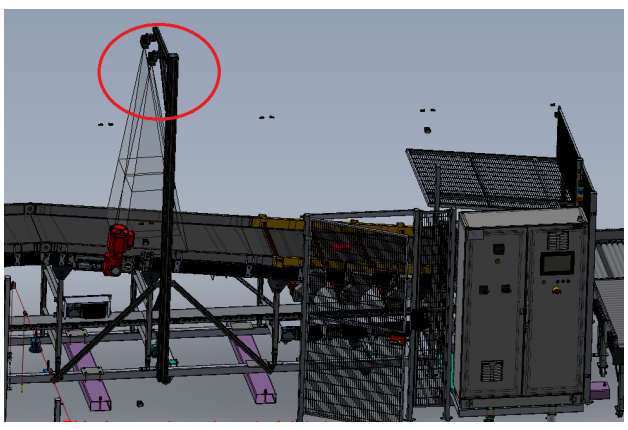


- Scanner has a special hinge in the middle. Frame is folded down during transport and has to be unfolded during installation. See image below.

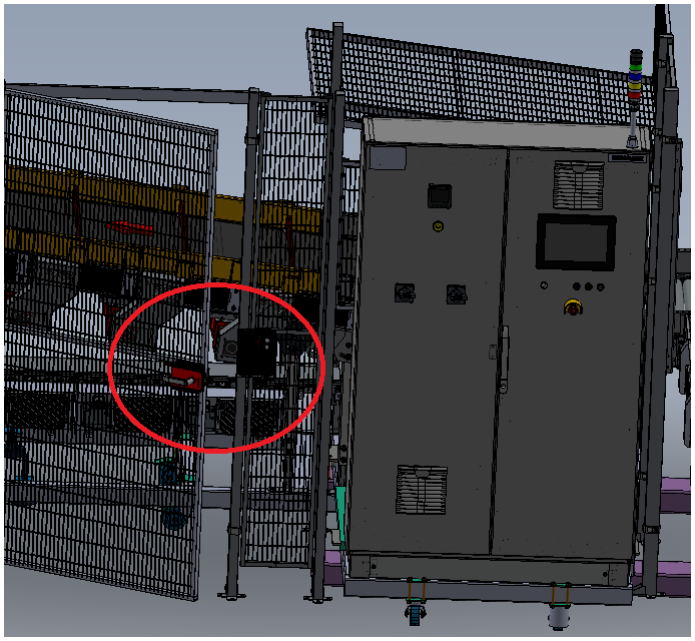


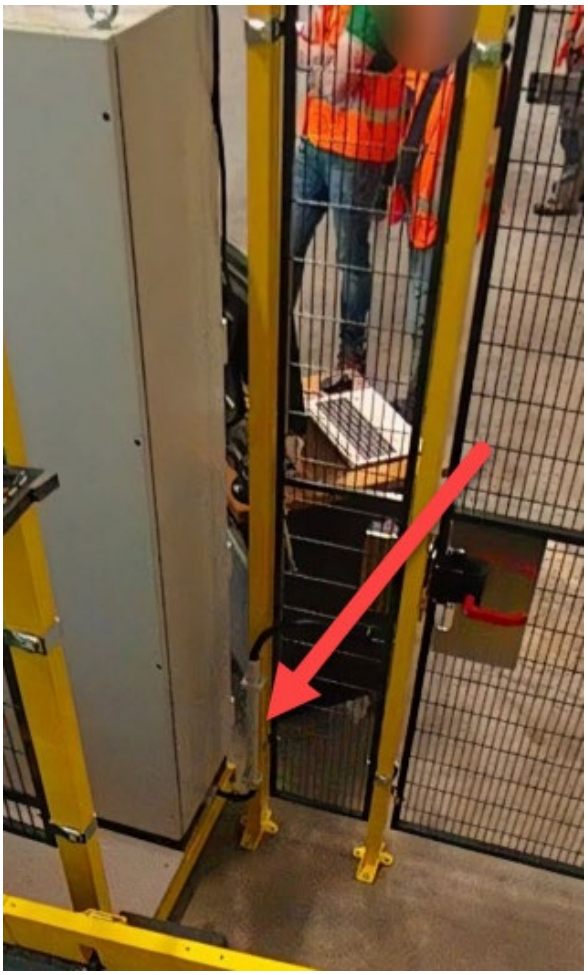
7.3. Installation steps- EM

- Scanner will be connected, cables will be on scanner frame, they have to pull cables to the main cabinet.



- Door lock; they will have to pull cable to main cabinet (top of cabinet are two cable glands) and make some protecting tubing on side. Like example below but then instead route to top of cabinet.

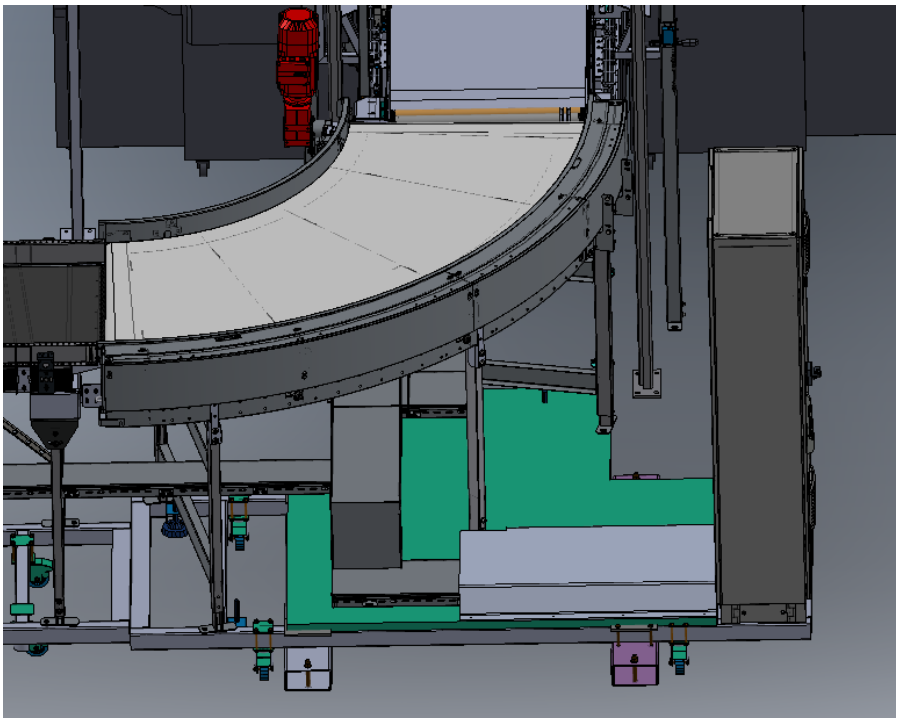




8. SYSTEM OVERWIEV - PART 5 (BC & CHUTE-CONTROLS)

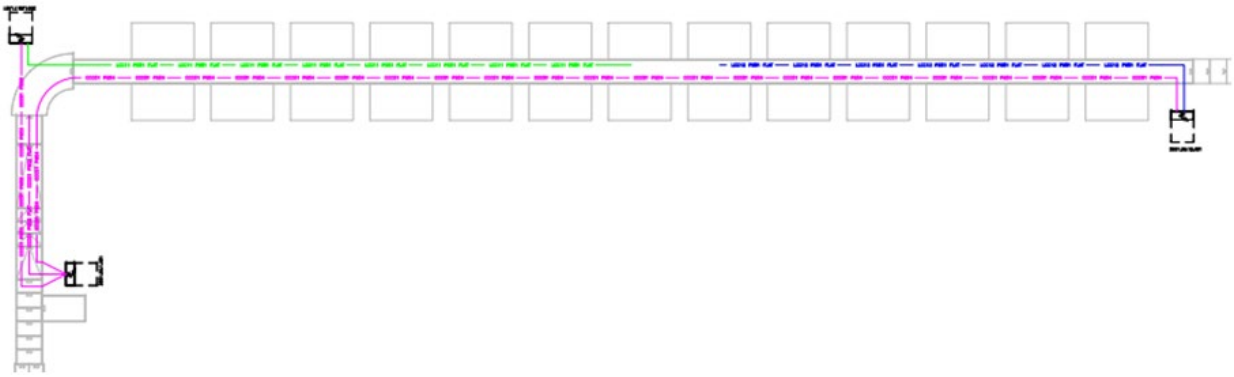
8.1. General description:

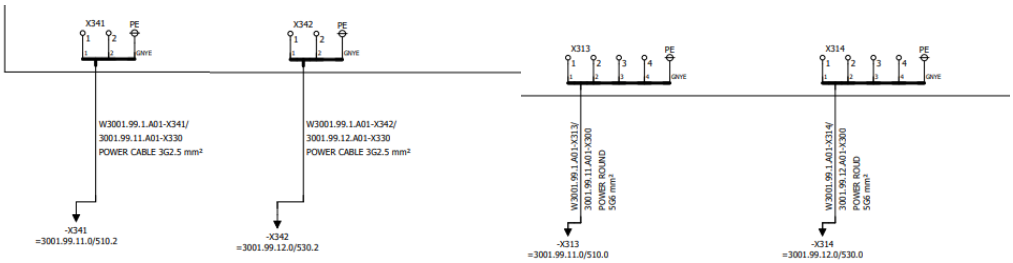
- Will be delivered in 1 section of steel-frame combining curve and LCC cabinet.



- Spindle supports of the skid frame, which are accessible, must be anchored to the concrete floor
- **Gap between upstream section and downstream sorter or BF must be max 3mm. Check before anchor belt curve skid and sorter to the floor.**

- All main cables what are coming from main cabinet (CCC) they will connected in LCC and pull back to main cabinet. They will not be installed in cable tray.(They have to installed them on side)





9. SYSTEM OVERWIEV - PART 6.1 (INTRALOX)

1. Installation steps:

- before starting the installation, you must place the first 2 rollers and the sorter belt at the same height (points 1, 2 & 3)

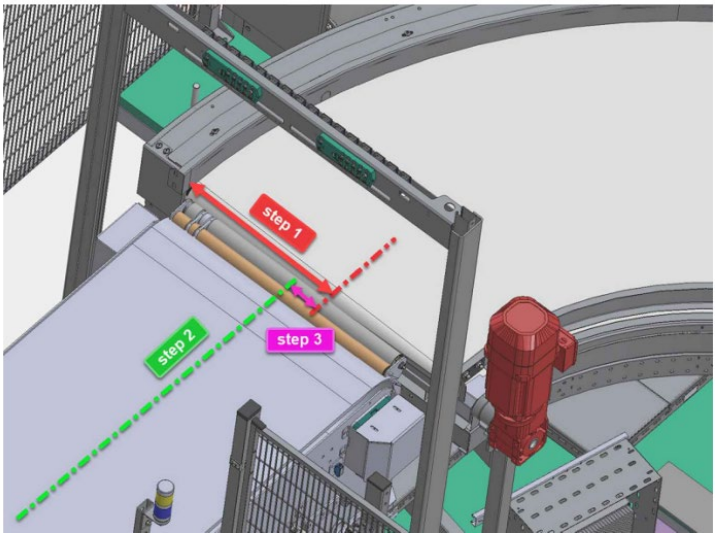
- assembly of the first section of the sorter to bc:

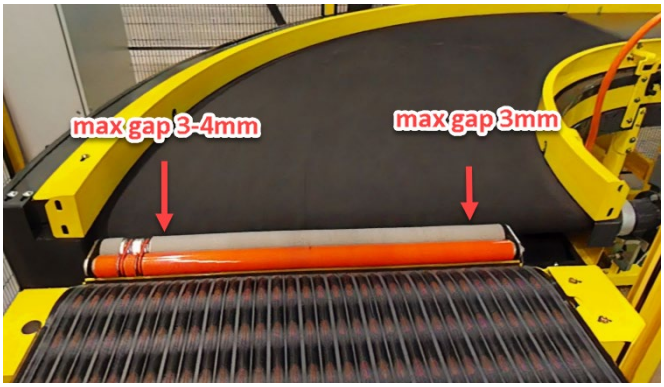
Detail: Beltcurve transition

step 1: measure 510mm from outer sideguarding to centre line of beltcurve and put marking on beltcurve belt.

step 2: mark centre line of Intralox on grey Intralox roller.

step 3: make sure offset is 80mm and gap between grey roller and beltcurve ETU/belt is max. 3mm



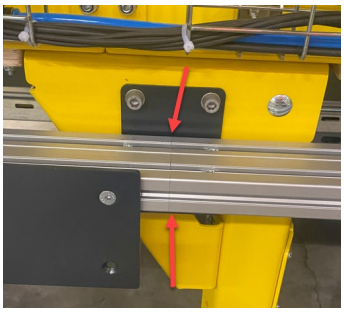


- before starting the installation, you must place the belt curve, the first 2 rollers and the sorter belt at the same height (points 1, 2, 3 & 4)

- when the first section is in position and all the gaps are adjusted, anchor the first sorter section to the floor.

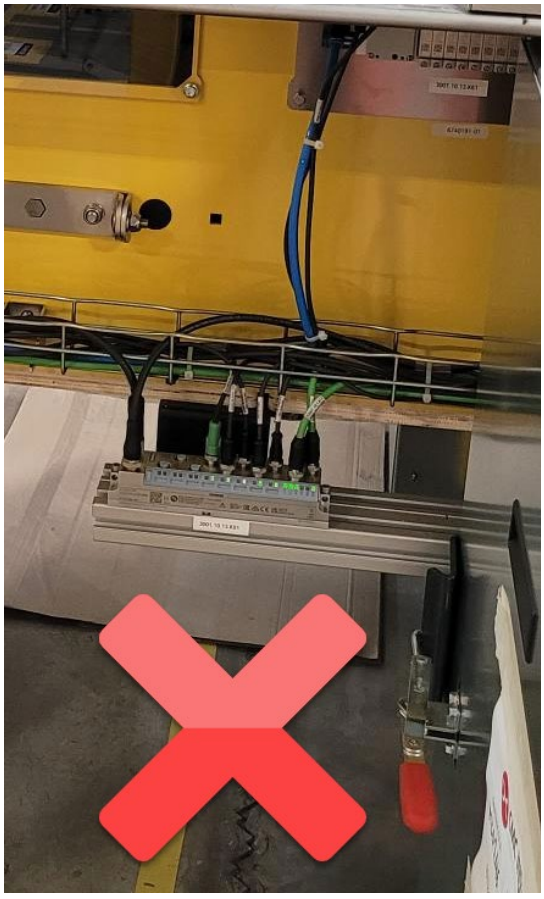
- Next install the support brackets for the aluminium profile alongside both sorter sides. See starting point below. You can use screws from intralox or use standard M10 screws from Vanderlande.

- make sure that the alu- profile is always in the middle of the support when the alu-profiles meet.



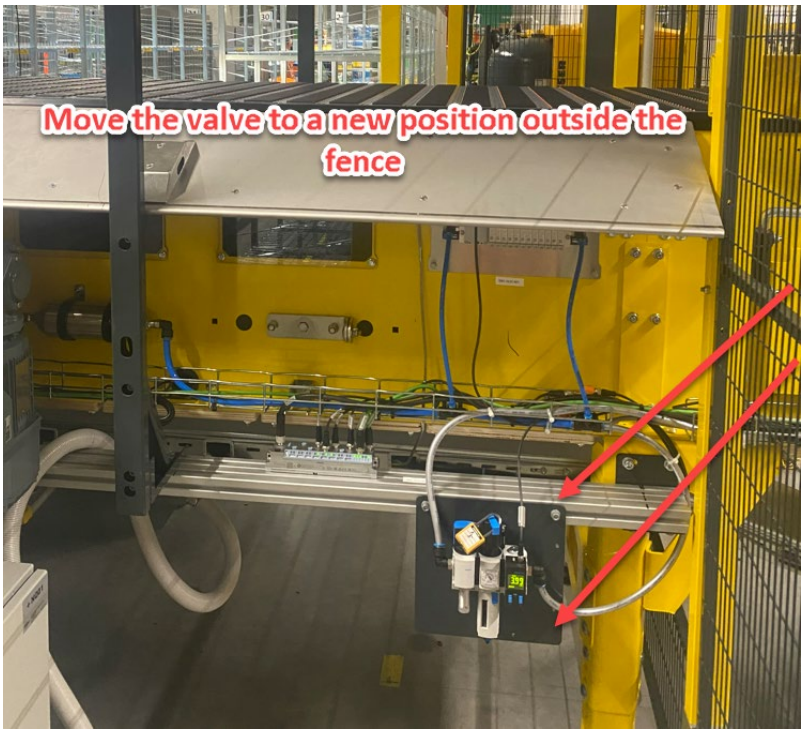
- it is necessary to drill holes for the last aluminum profile support (on both sides of the sorter at the sorter drive end)

- Make sure the I/O modules are mounted correctly on the aluminum profile, has to be mounted on the slot closest to the sorter with the LED's facing away from the sorter.



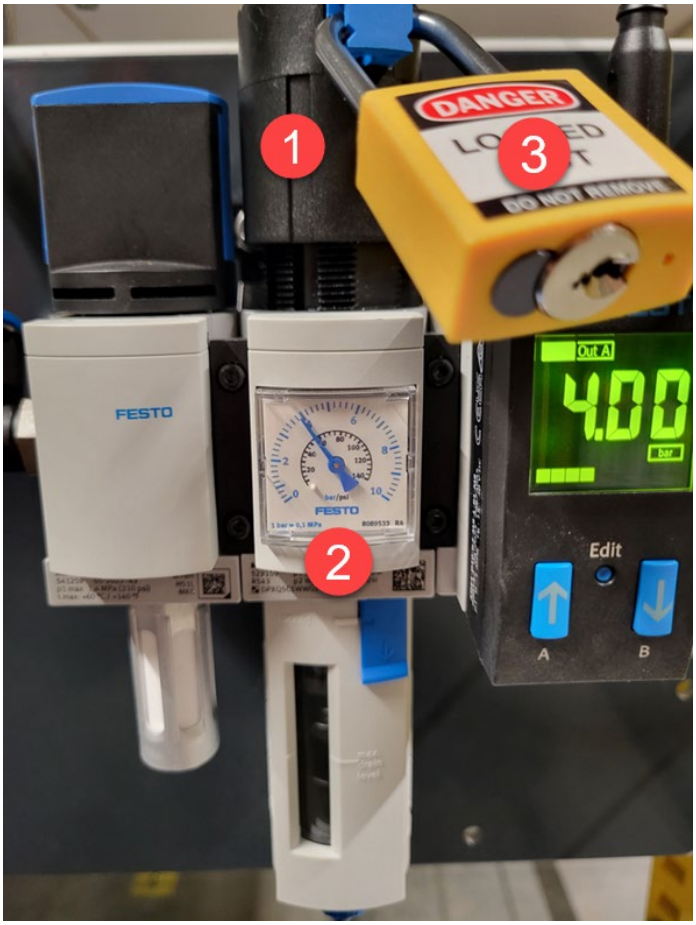
- On site, extra sideguarding will be mounted to the troax fence with an adjustable Z-bracket (bolted through and through the troax post). The required material will be delivered with the loose items, you will receive a 1 [m] piece of sideguarding and the Z-bracket (0L1752-10255). Sideguarding must be installed with an endcap to the end of the BC sideguarding. The bottom of the sideguarding should be 3 [mm] lower than the transport surface of the BC/ Intralox to prevent parcels going under the sideguard.

- Intralox safety valve:



- Adjusting working pressure
  A. Rotate valve knob (1) till pressure dial (2) indicates **4 bar**
  B. Lock valve knob (1) with lock (3)*
  C. Re-check pressure setting on dial after first run of sorter. If pressure is not correct, repeat step A and B

  ** Lock to be replaced by Amazon lock at handover*



- Setting low and high pressure warning signal

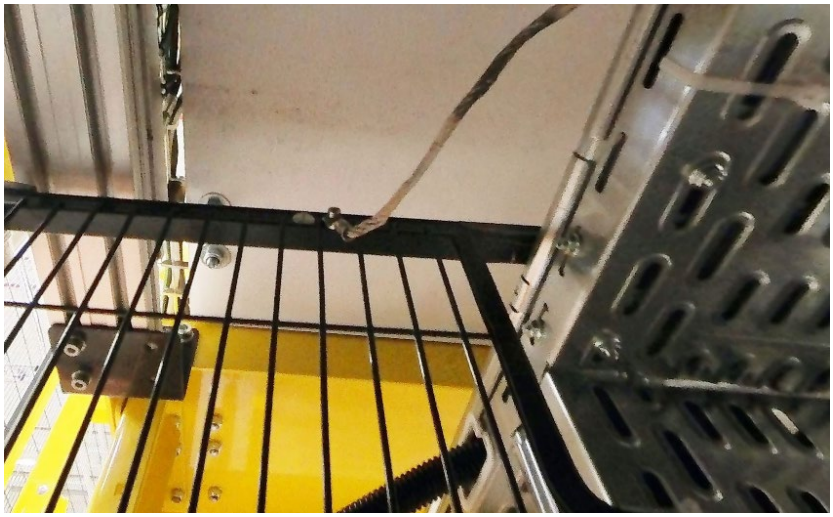
Pressure must be set on the digital display on the valve assembly. To set the low and high pressure setting, follow the steps below:

A. Press “Edit” 2x
B. Press ↓ till you see display showing the symbol of the firgure below

C. Press “Edit” 1x. Shortly “SP.L” is shown
D. Set minimum pressure setting to 3.5 bar (50 psi) with ↓ or ↑
E. Press “Edit” 1x. Shortly “SP.H” is shown
F. Set minimum pressure setting to 5.5 bar (70 psi) with ↓ or ↑
G. Press “Edit” 3x to return to the home screen

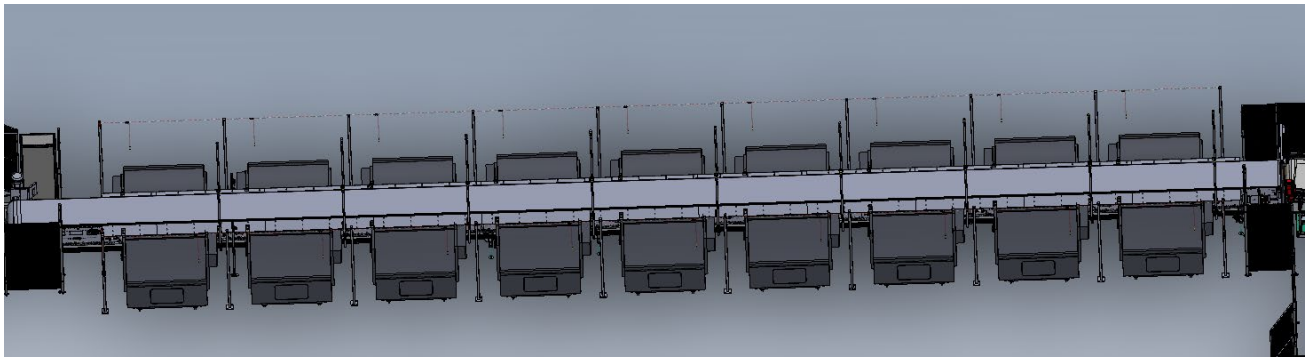
- ground connections on the sorter

- connect earth to five points on the sorter (use a contact washer) and connect the ground to the fence on both sides of the system.



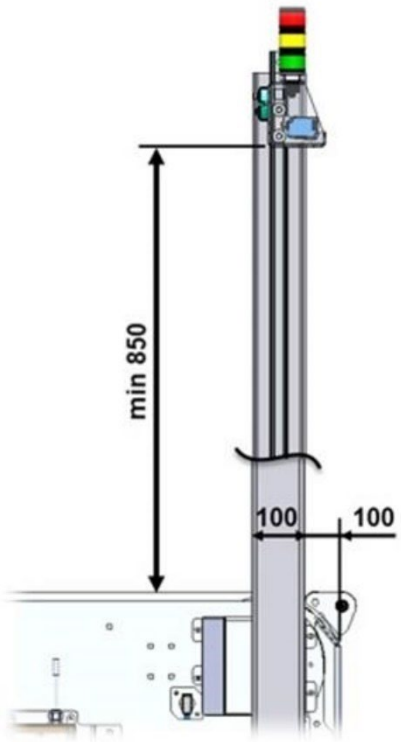
10. SYSTEM OVERWIEV - PART 6.2 (HAMPER CHUTE AND SLIDE PLATE)

10.1. General description:

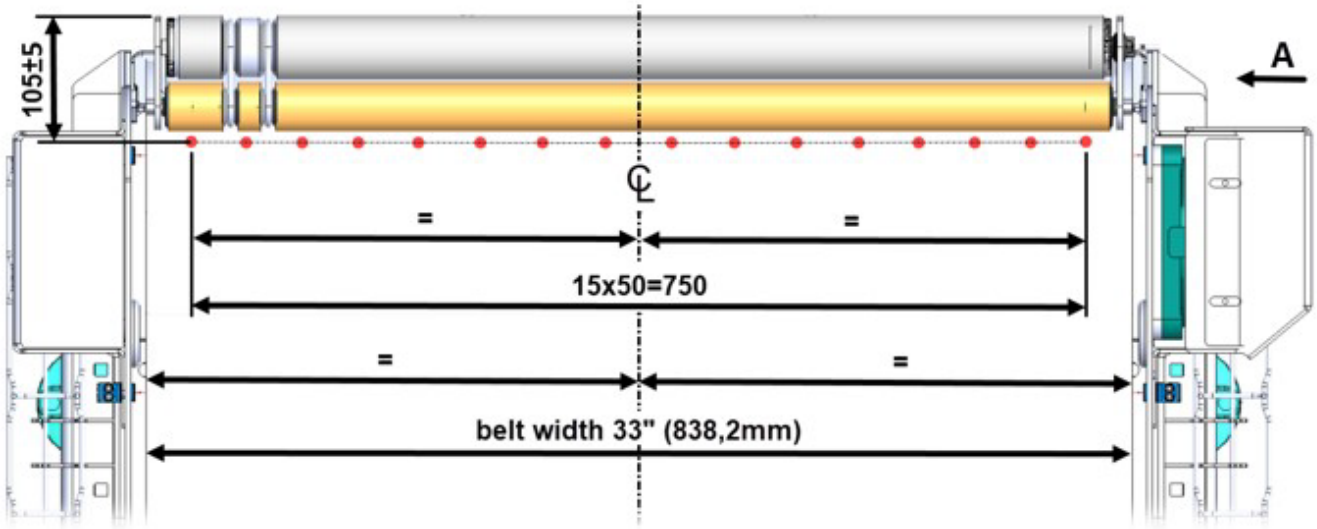


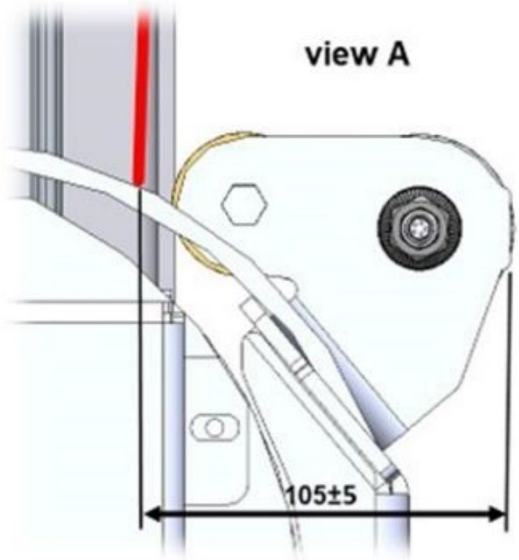
10.2. Array bridge – Mech

- Make sure the array bridge is installed according the below snips.
- The support posts for the array bridge are heavy R4 profiles 0R0130-02400 (loose items)
- Portal position in X-direction 100mm (measured from front plate of Intralox)
- Minimum base height in Z-level 850mm (measured from top of belt)



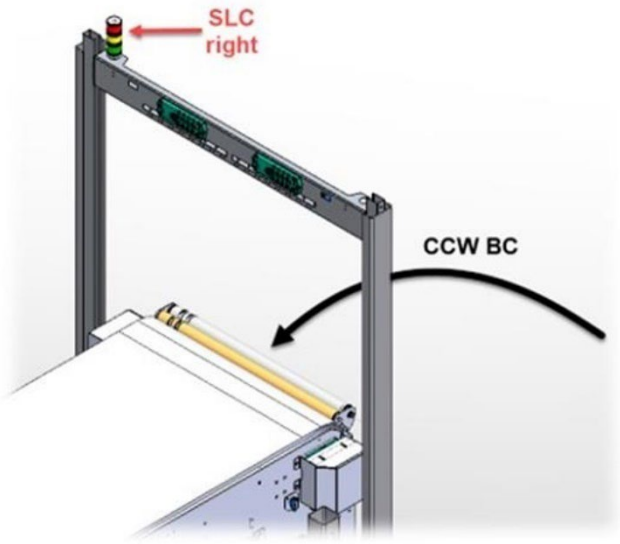
- Sensors on a mutual distance of 15x50=750mm, taken from the centerline of the Intralox belt. In transport direction, the distance taken from the straight edge of bridge roller bracket 105±5mm.

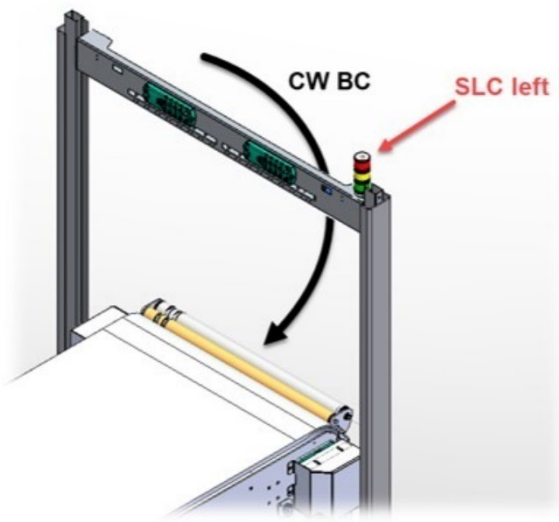




Signal Light Column (SLC) to be placed on outside of curve.

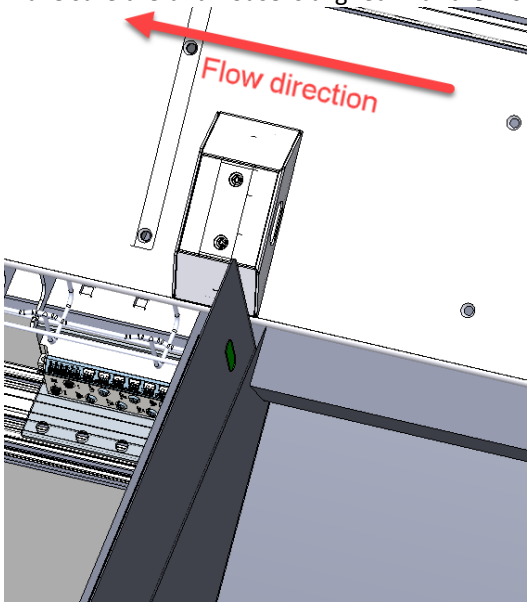
- CW (clockwise) belt curve; SLC (signal light column) on the left side (seen from transport direction)
- CCW (counterclockwise) belt curve; SLC on the right side (seen from transport direction)

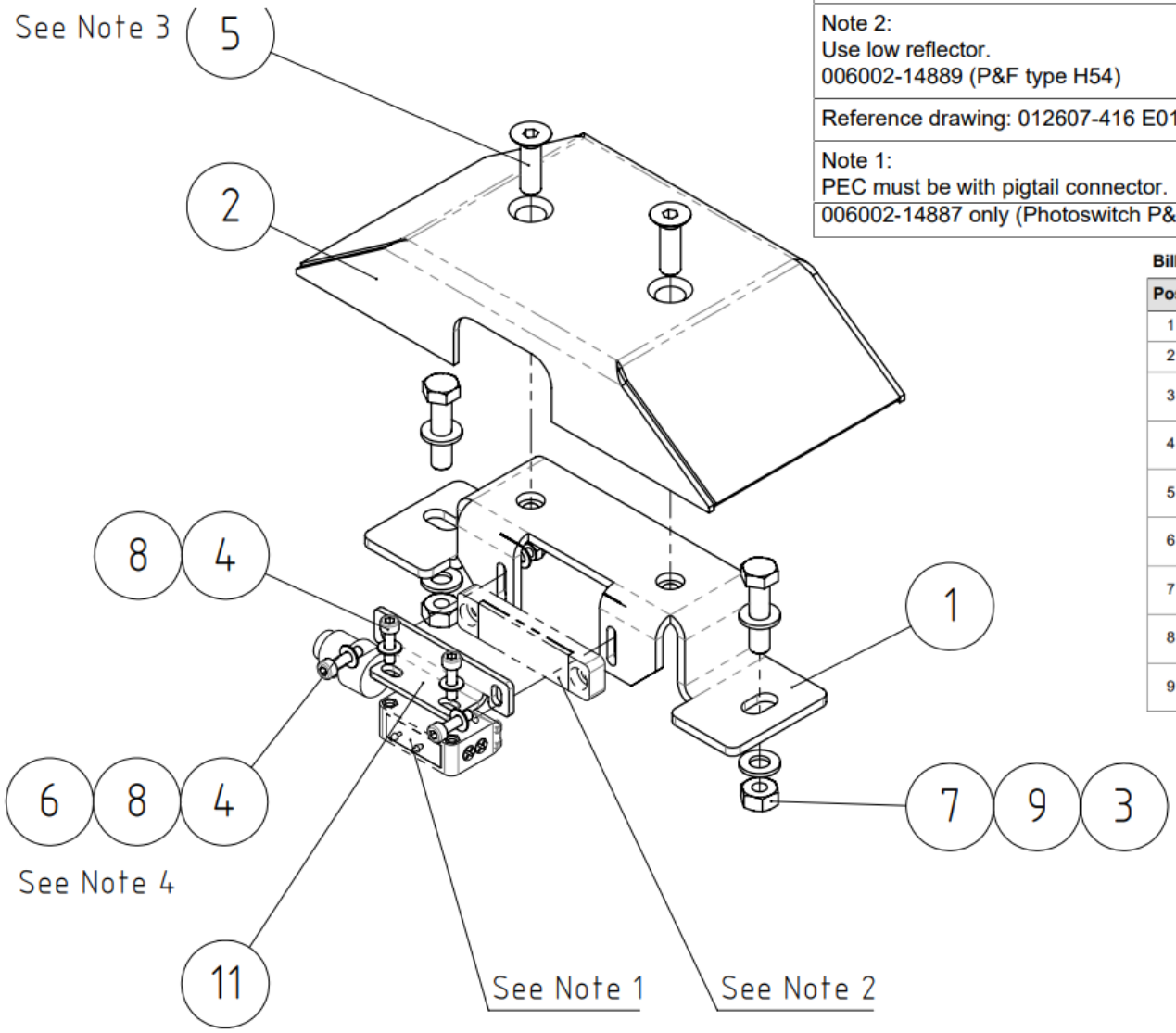




10.3. Hamper chutes - Mech

- Make sure the bird house is aligned with the inside of the sideguarding





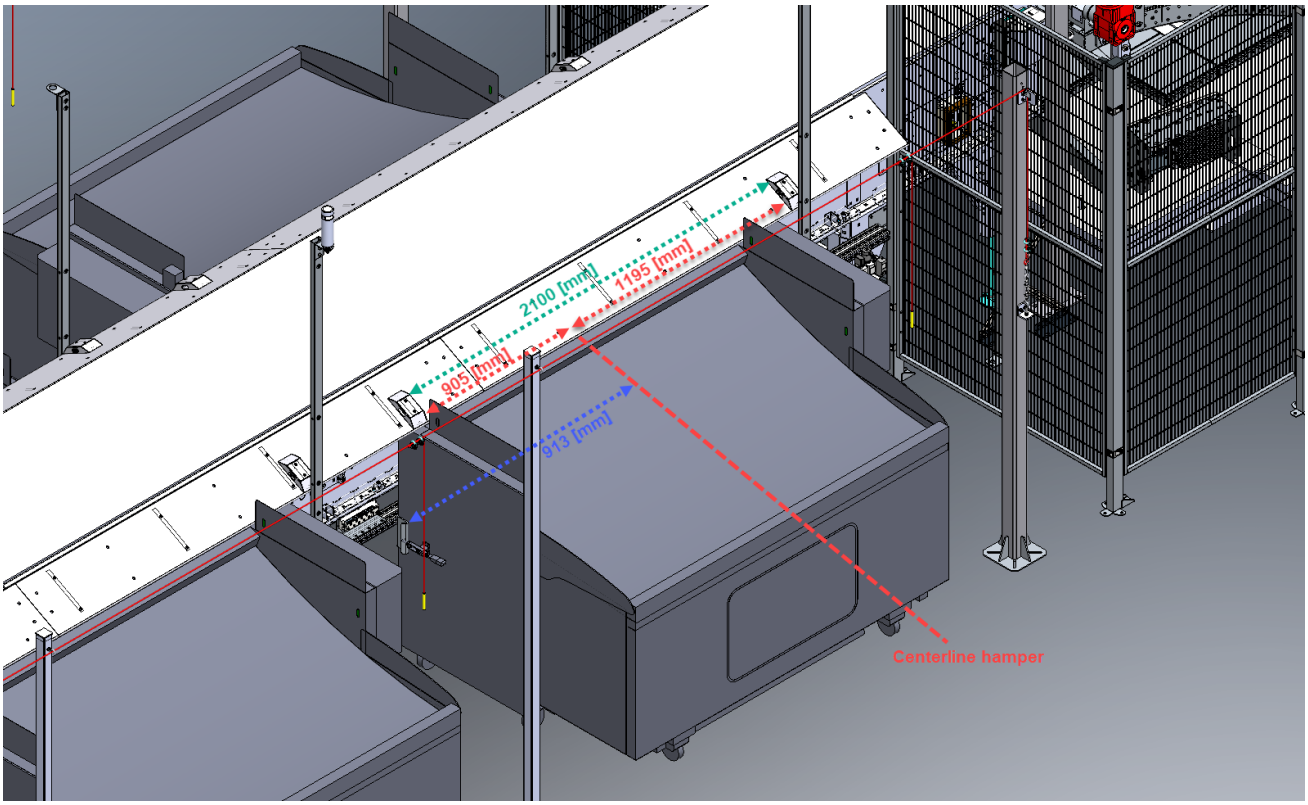
Note 3: Use Loctite 2400 to fix POS. 5 on site.
Note 4: Bag loose fasteners with assembly during shipping.
Note 2: Use low reflector. 006002-14889 (P&F type H54)
Reference drawing: 012607-416 E01.
Note 1: PEC must be with pigtail connector.
006002-14887 only (Photoswitch P&F ML100 pigtail 300mm, M12)

Bill of Material

Pos.	Qty.	Part number	Rev.	Description
1	1.0	028616-206-00001	A01	Weldment reflector support
2	1.0	028616-161-00001	B01	PEC housing st. st.
3	2.0	002300-06025	A01	Bolt HH FT M6x25 ISO4017/DIN933 CL8.8 flZn/nc/L/480H ISO10683
4	2.0	002414-03012	A01	Screw HS M3x12 ISO4762 A2-070
5	2.0	002413-00620	A01	Screw HS countersunk FT M6x20 ISO10642/DIN7991 A2-070
6	2.0	002371-56103	A01	Nut hex lock Nyloc M3 ISO10511/ DIN985 A2-070
7	2.0	002370-89206	A01	Nut hex M6 ISO4032/DIN934 CL8 flZn/nc/L/480H ISO10683
8	2.0	002763-00303	A01	Washer M3 flat without chamfer ISO7089-3-200 HV-A2
9	4.0	002766-00006	A01	Washer contact toothed M6 grounding flZn/nc/L/600H ISO10683

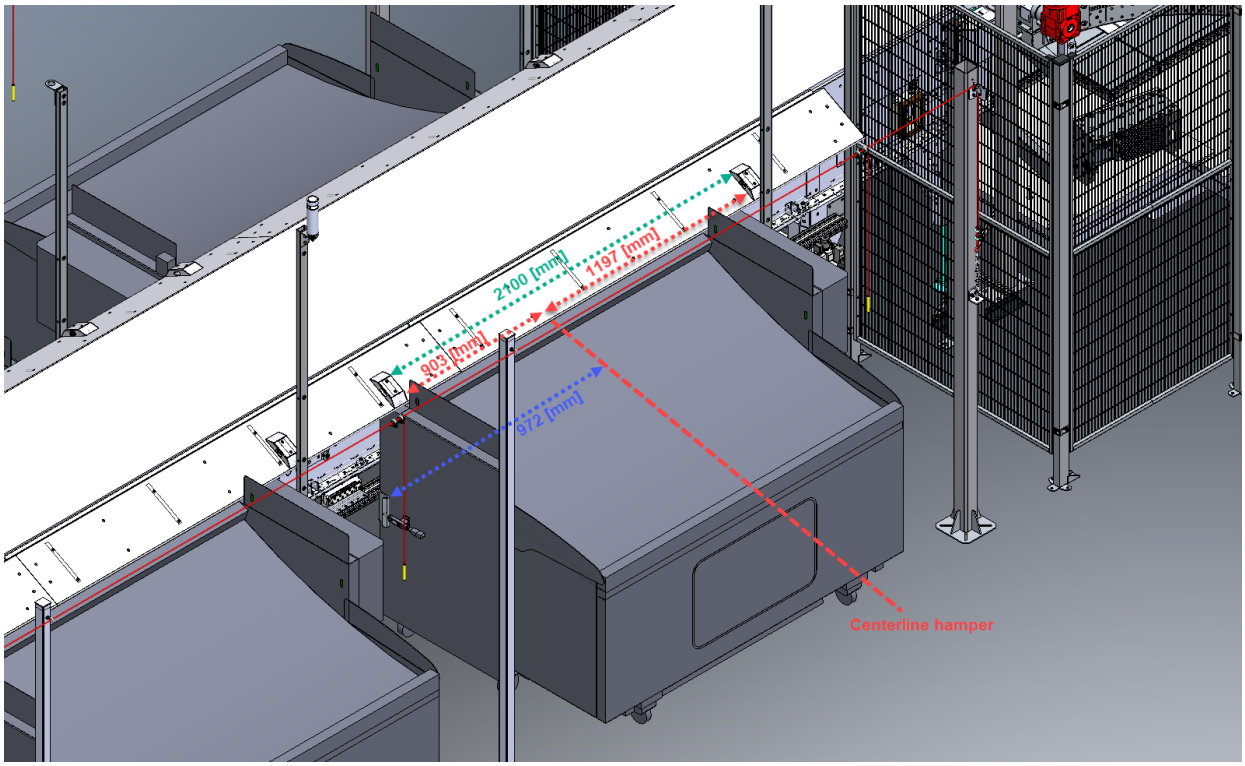
Details for Interroll hamper:

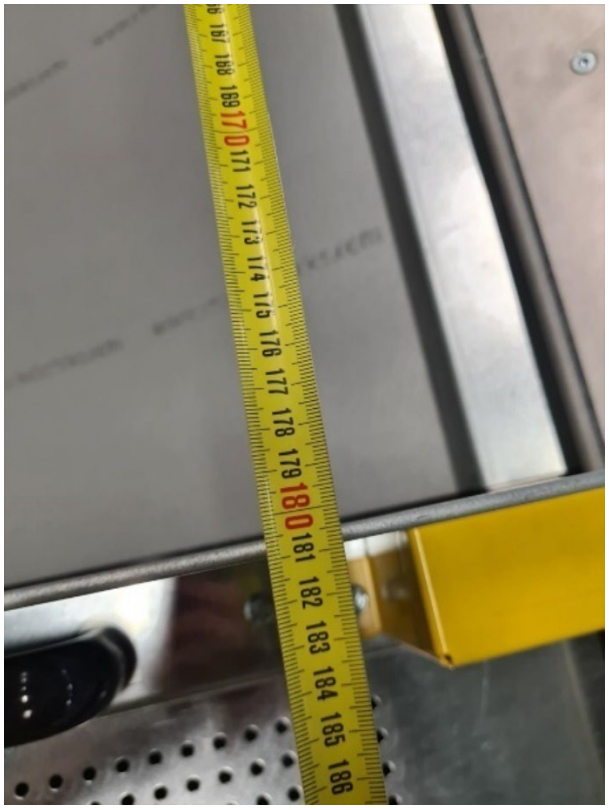
- The effective width of the **Interroll hamper (DE and FR sites) is 1810 [mm]**

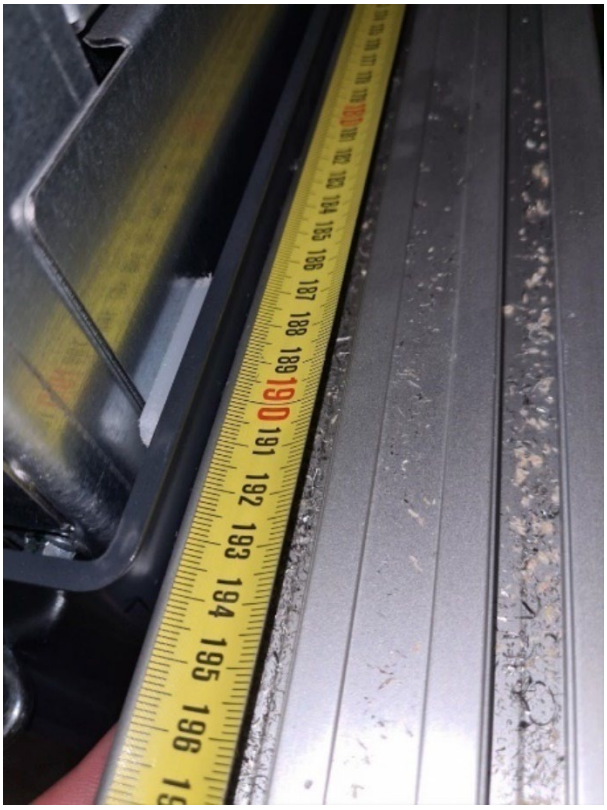


Details for the CNC hamper:

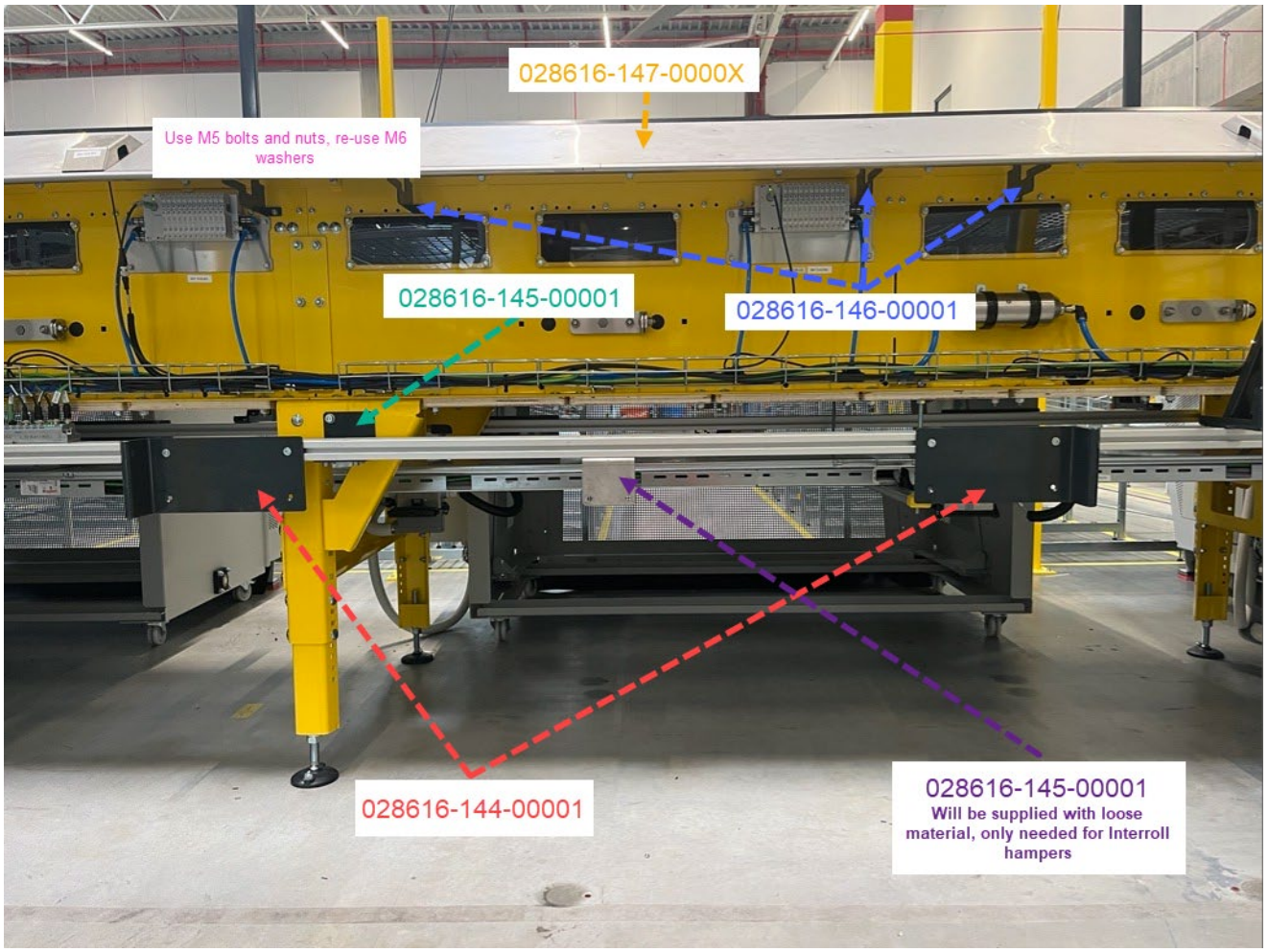
- The effective width of the **CMC hamper (IT and UK sites) is 1805 [mm].**



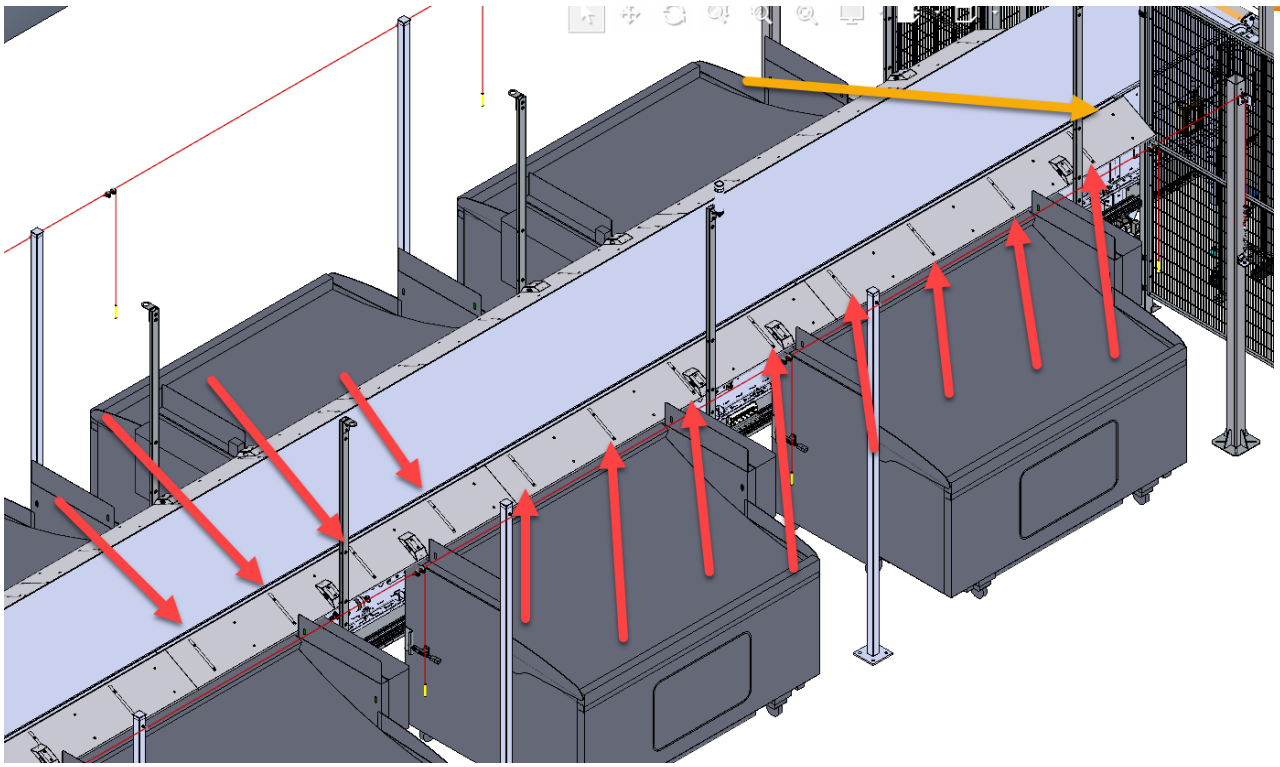




- Chute on Intralox ADTA sorter:
- Chutes fold up for transport and you can push them around on wheels
- Chute is pushed into position on the sorter line and lock on the aluminum profile



- You will need 4 brackets per slide plate. See red arrows below. If you have 1 spare per sorter side you can use that at the very beginning of the sorter for extra strength. See yellow arrow. But this is not mandatory.



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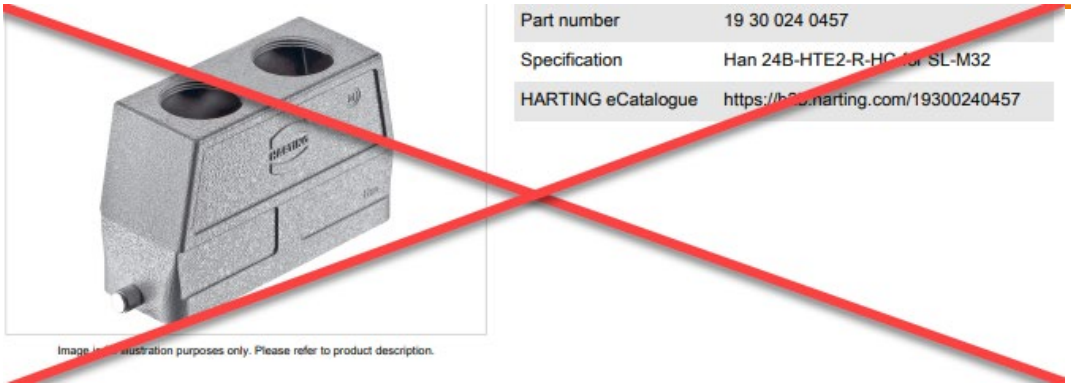
- Slide plates are mounted to the support brackets with M5 countersunk stainless steel bolts. **M6 is supplied but those stick out on the sliding surface (Not allowed)**. M6 to be replaced with M5 bolts but re-use the M6 contact washers.

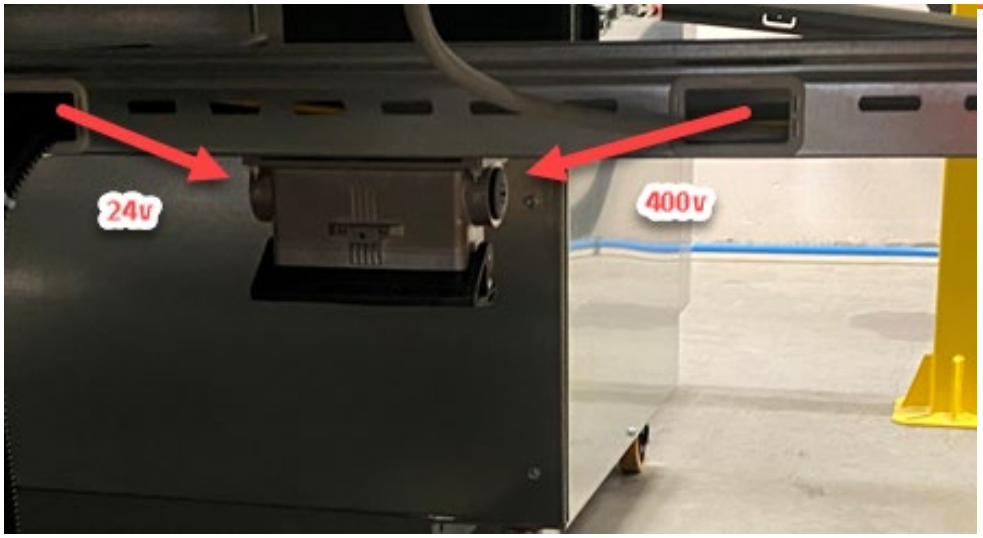
10.4. Installation steps- EM

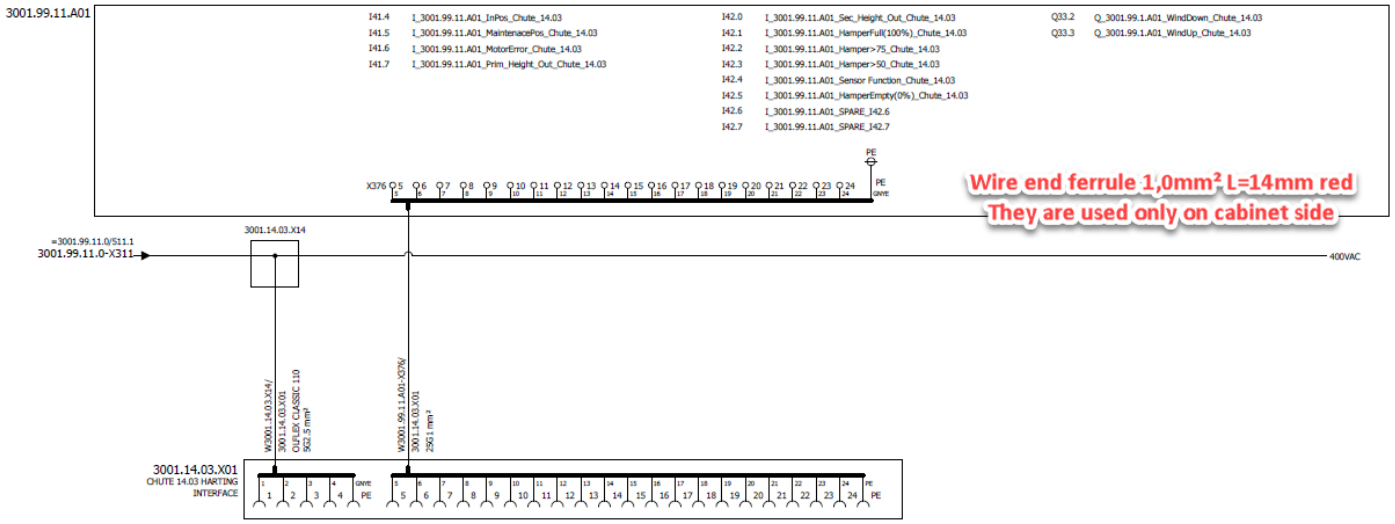
- Item 000000-10390 Hood HAN B top entry 2x32 we don't use it!!



- Installation on the site:
- The material can be found in the specification 1446*160:
- 4x 002311-30416 Bolt M4x16
- 4x 002763-00004 Washer M4
- 4x 002370-88304 Nut Hex M4
- 2x 006002-12116 Cable gland M25x1,5 metric ST-M25 9-17mm

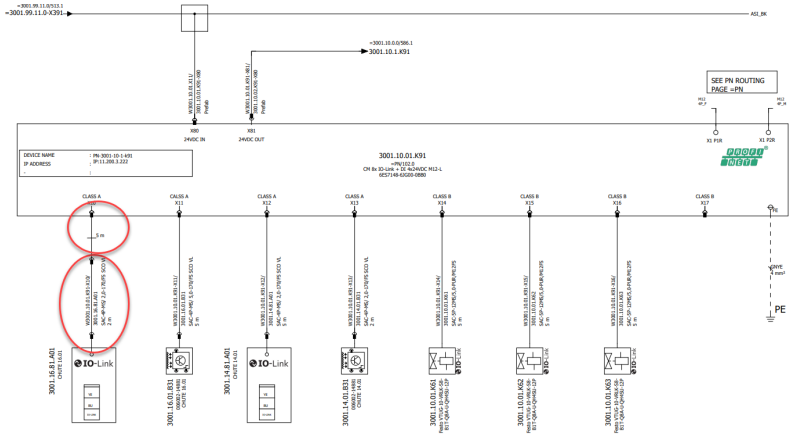
- To be installed at the bottom of the cable tray, they need drill holes (size 4,5 or 5) to be able to fix harting on cable tray.

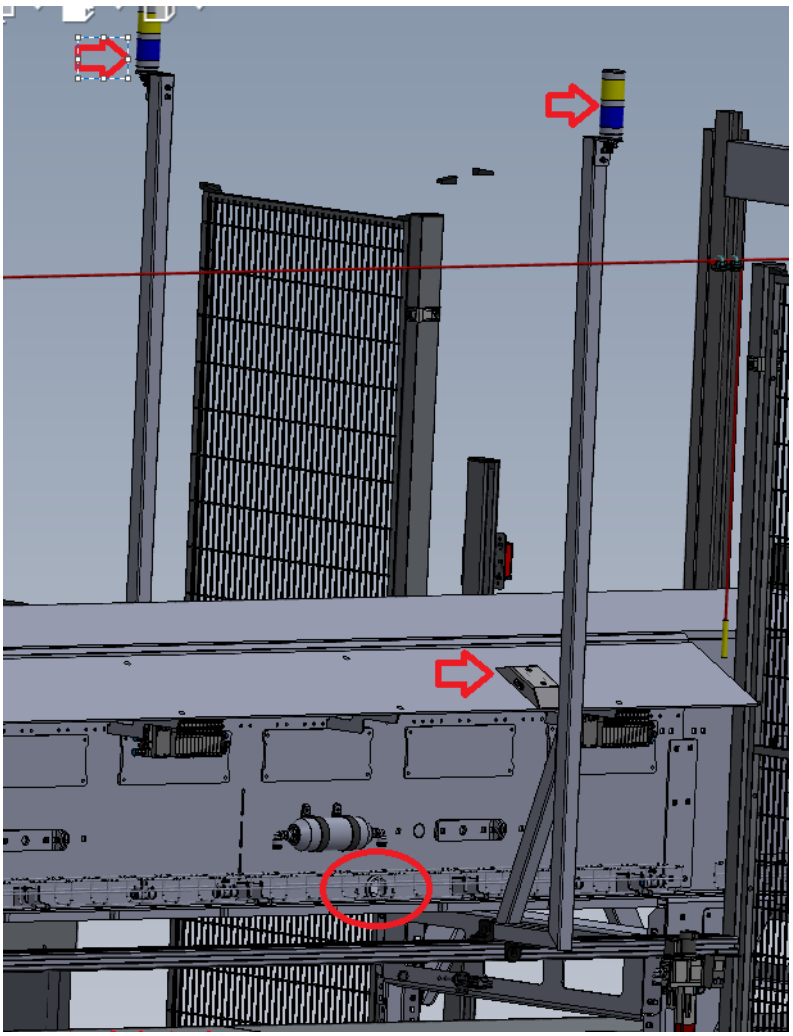




- Sorter has to be wired completely: 24v, profinet, sensor cables..

- IO modules will be installed on the left side of the sorter for two photocells and two signal light columns. Cable for photocell and signal light column on right side off sorter can be pulled through the sorter. For SLC on left site of sorter you have to use sensor cable extension of 2m in SLC support and 5m long cable to I/O module. On right site of sorter you use only 5m long sensor cable.





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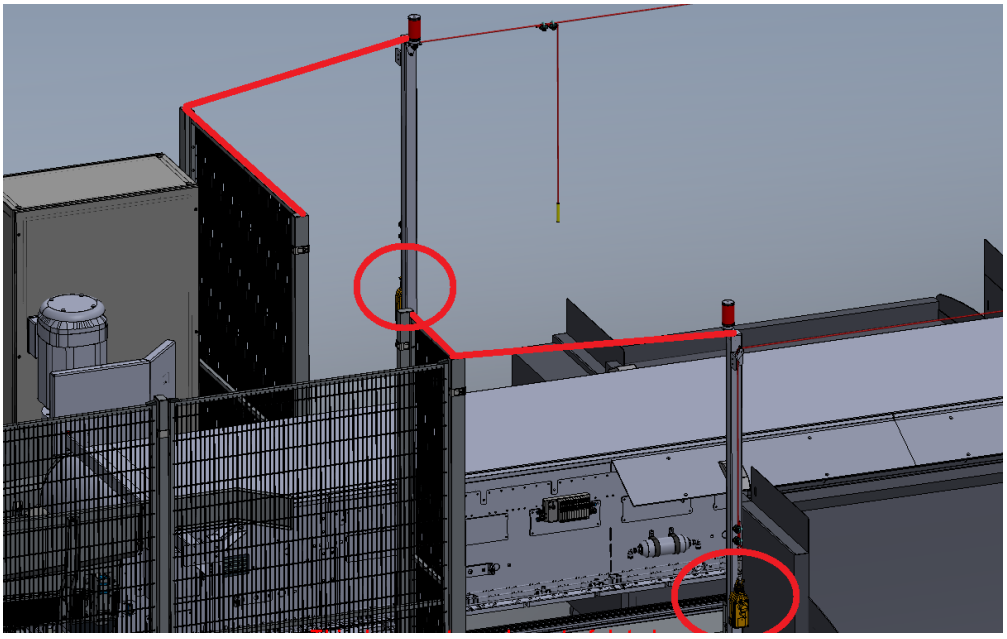
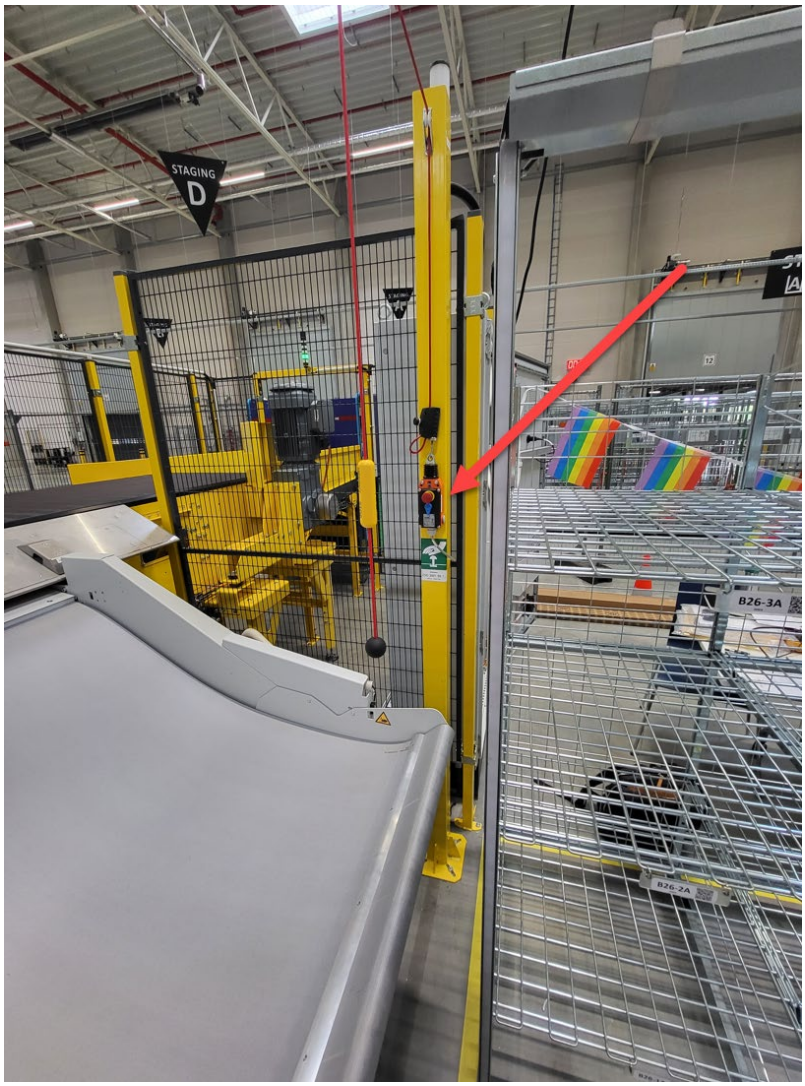
- Emergency pull-wire switch has to be wired on the side of the last column. The cable is routed on c-profile from the post to the fence. Cable have to be protected with tubes.



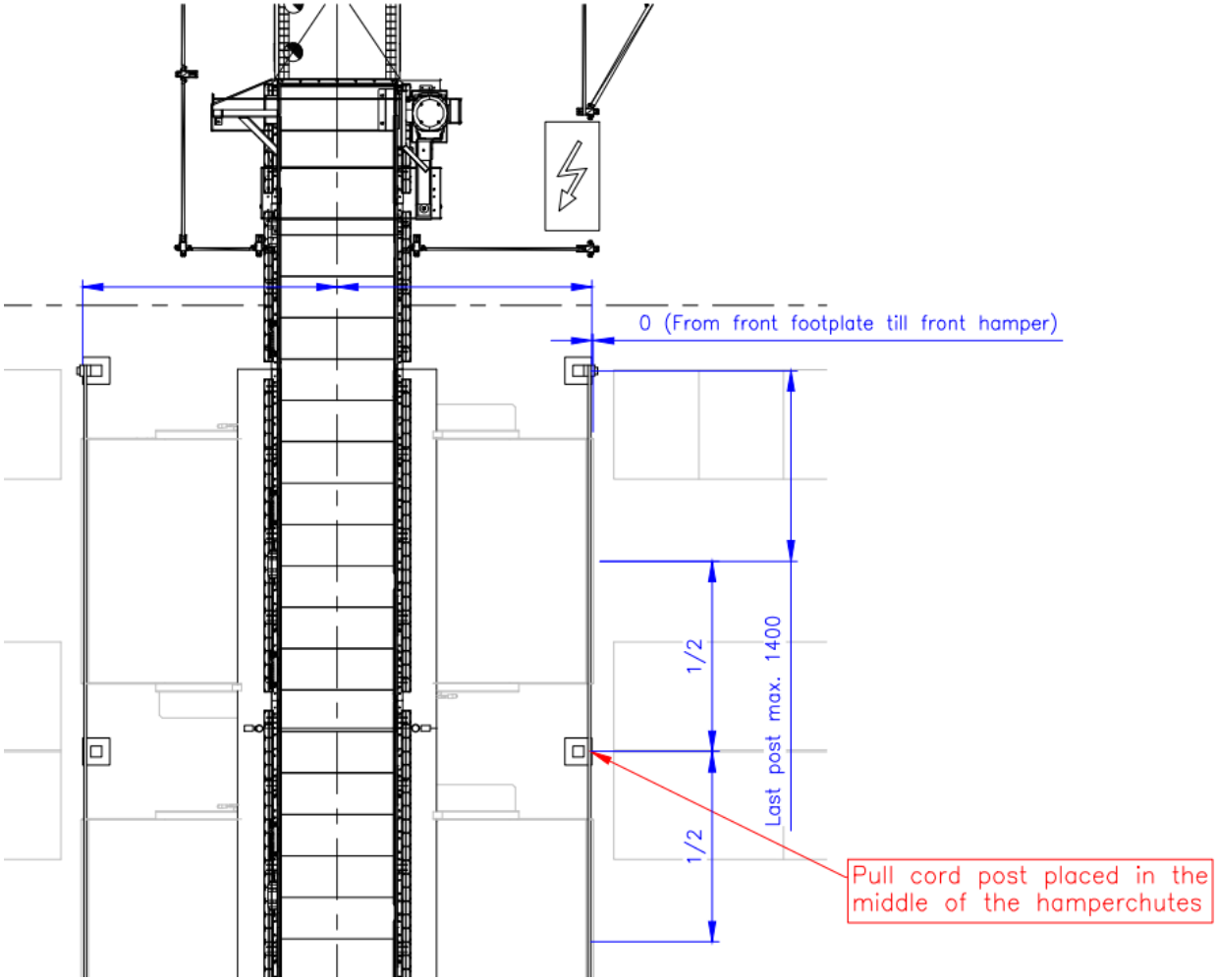
- In case the e-stop module from the pullcord is blocked by the racking the pullcord post can be rotated 90 degrees on the right side of the sorter or moved more downstream on the left side of the sorter. See image below for the rotated version:

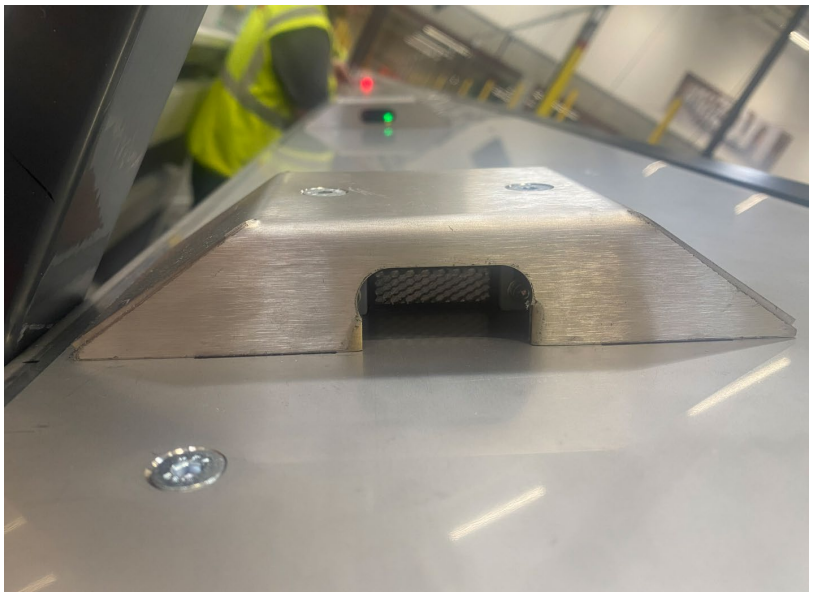


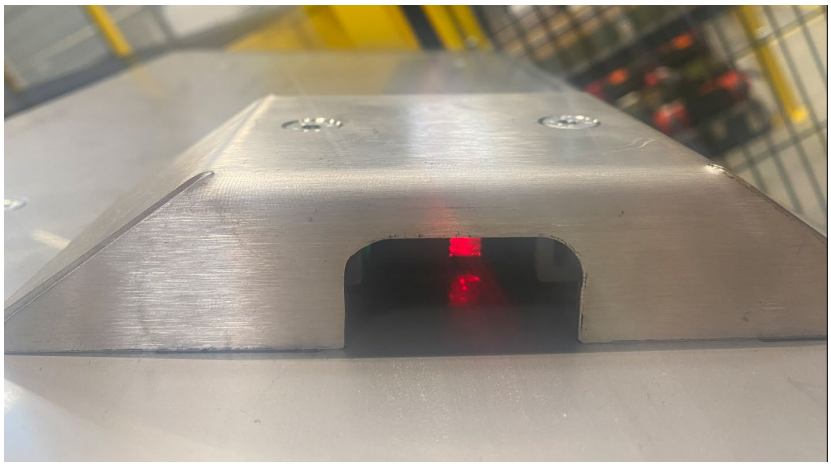
- the birdhouse that is mounted on the slide plate, the photocell and the mirror must be mounted flush to the slide plate. Must detect a 3-5mm parcel.

1

Detail E–STOP
SCALE: 1:50



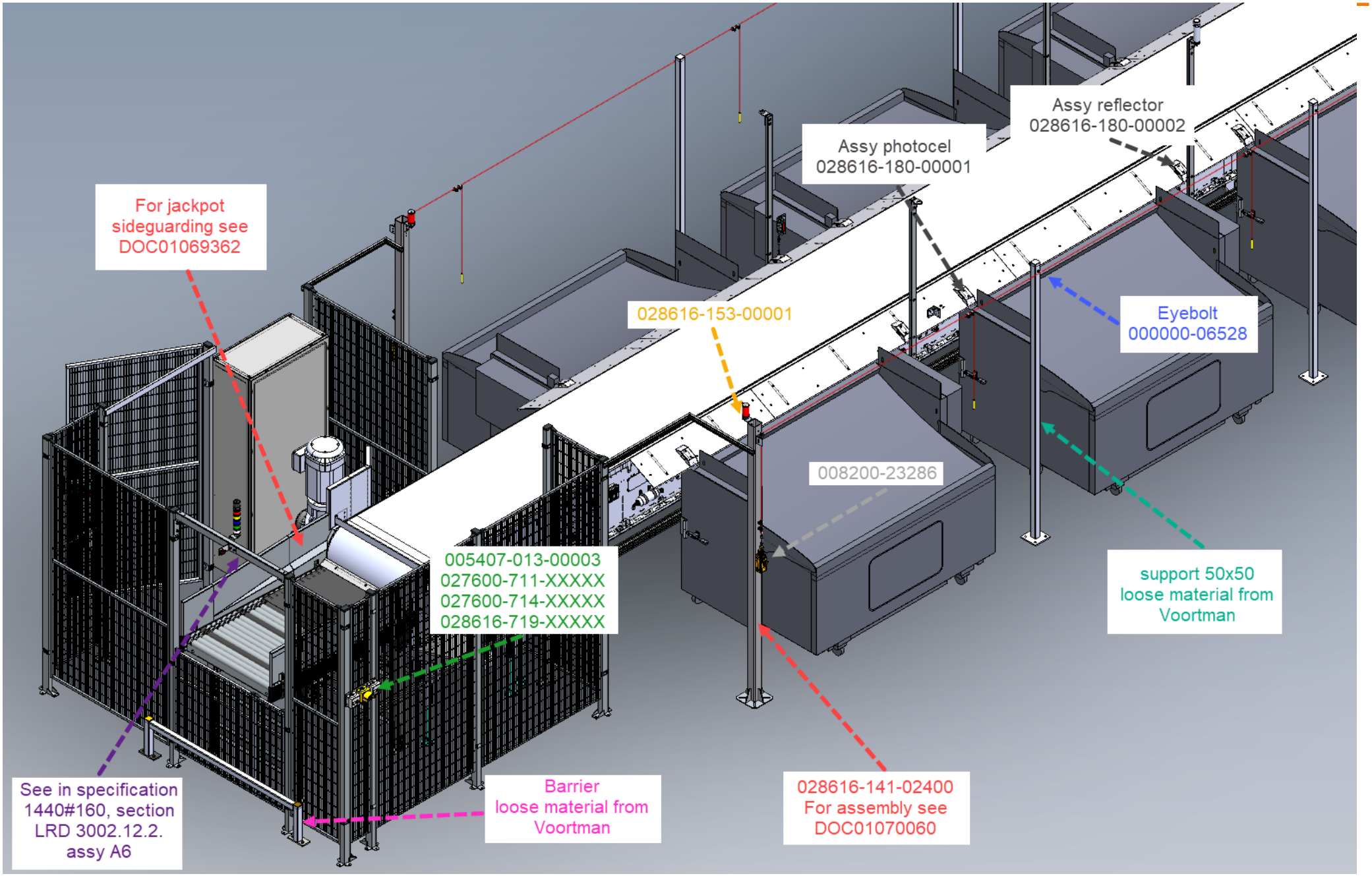




- Use rubber grommet to protect the cable

- Pec and reflector before last hamper must be mounted on the andon post (downstream side of the post):

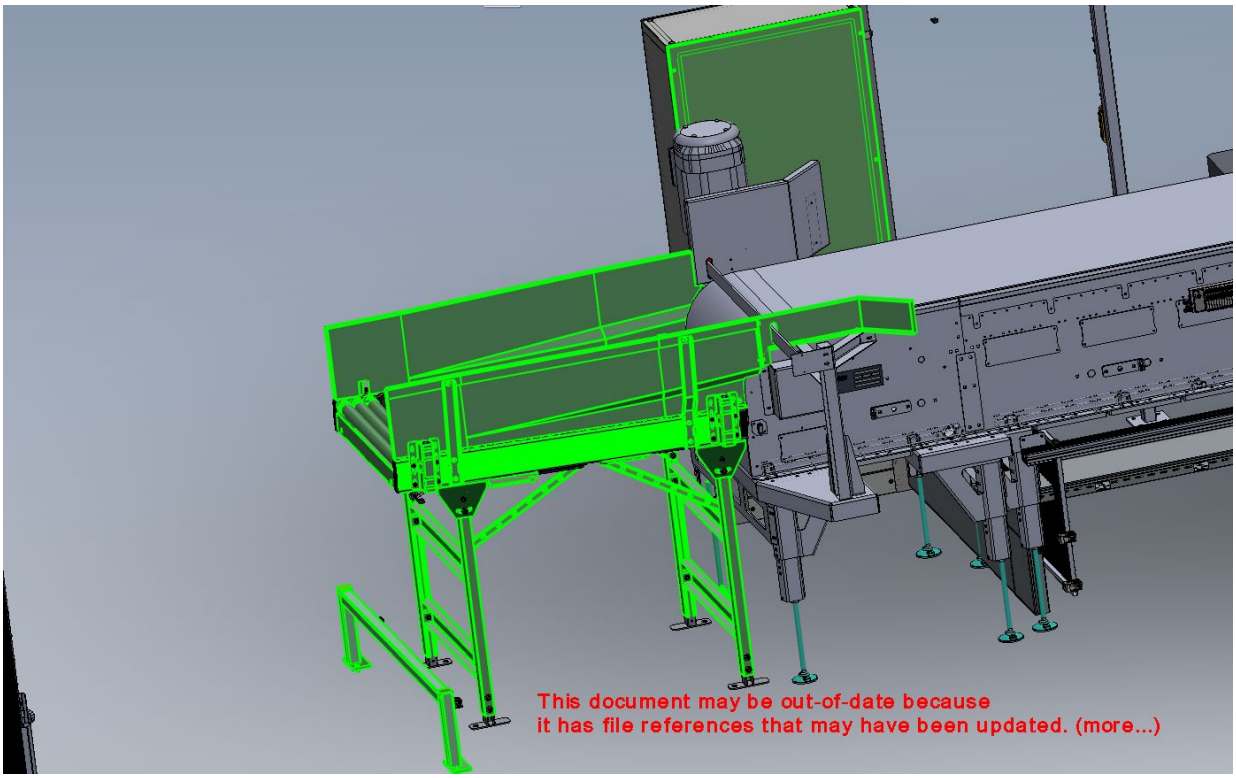
- Pec and reflector before last hamper must be mounted on the andon post (downstream side of the post):



11. SYSTEM OVERWIEV - PART 7 (JACKPOT & CHUTE-CONTROLS)

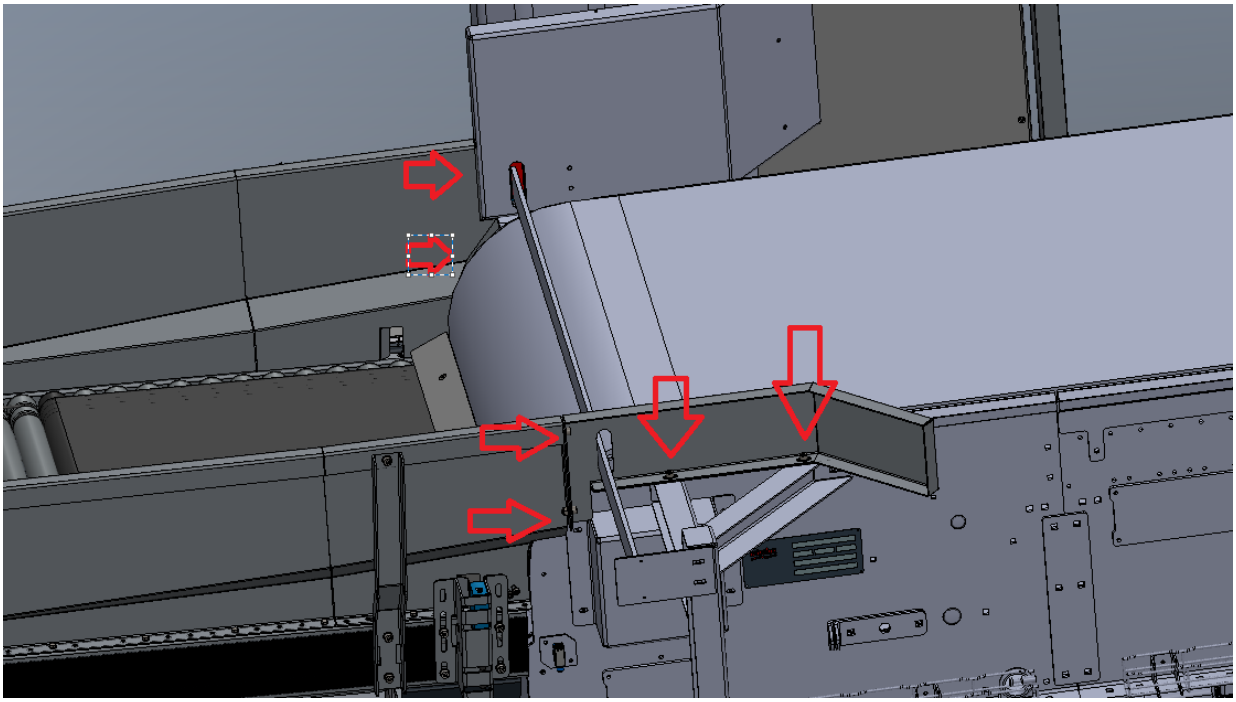
11.1. General description:

- Part7 (Jackpot) will be delivered on site completely assembled, only supports will be folded because of transport + cabinet LCC and JP crash barrier.

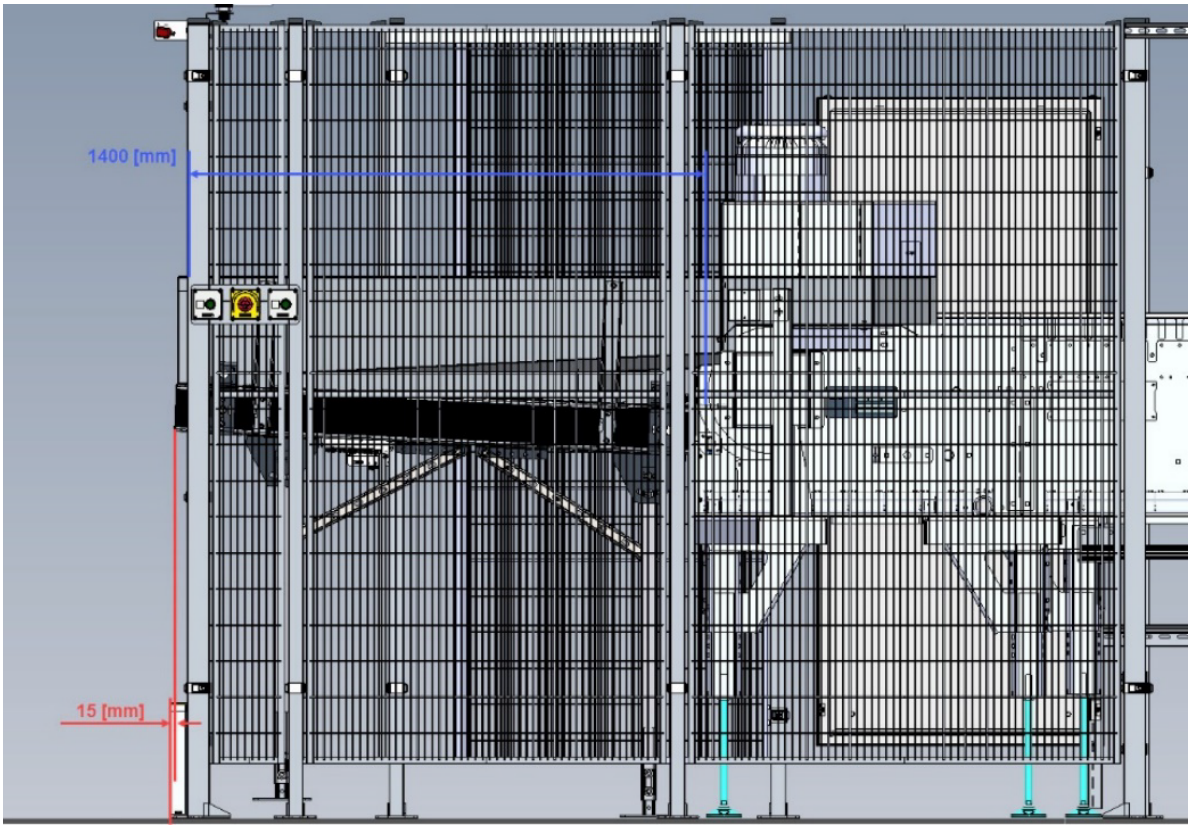


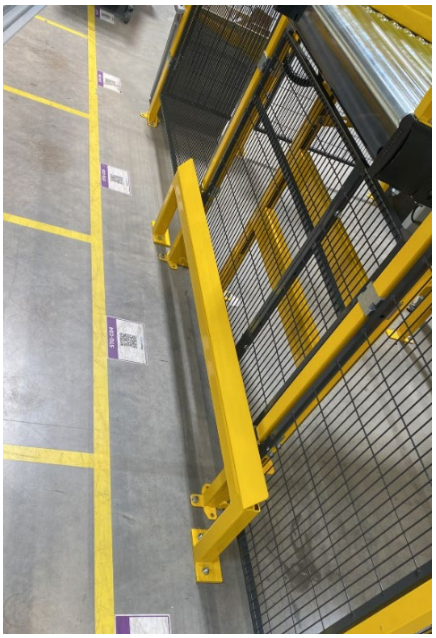
11.2. Installation steps- Mech-

- Side gurding have to be connected to the sorter:

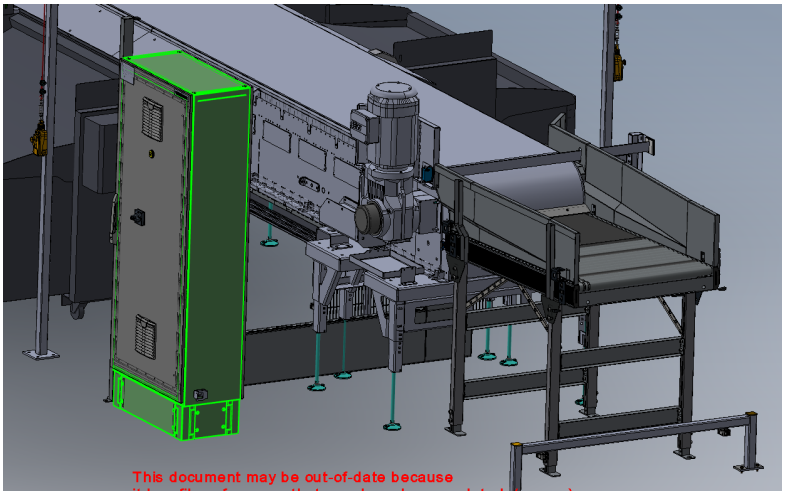


- JP barrier has to be mounted on the correct position. Flush to the fence.



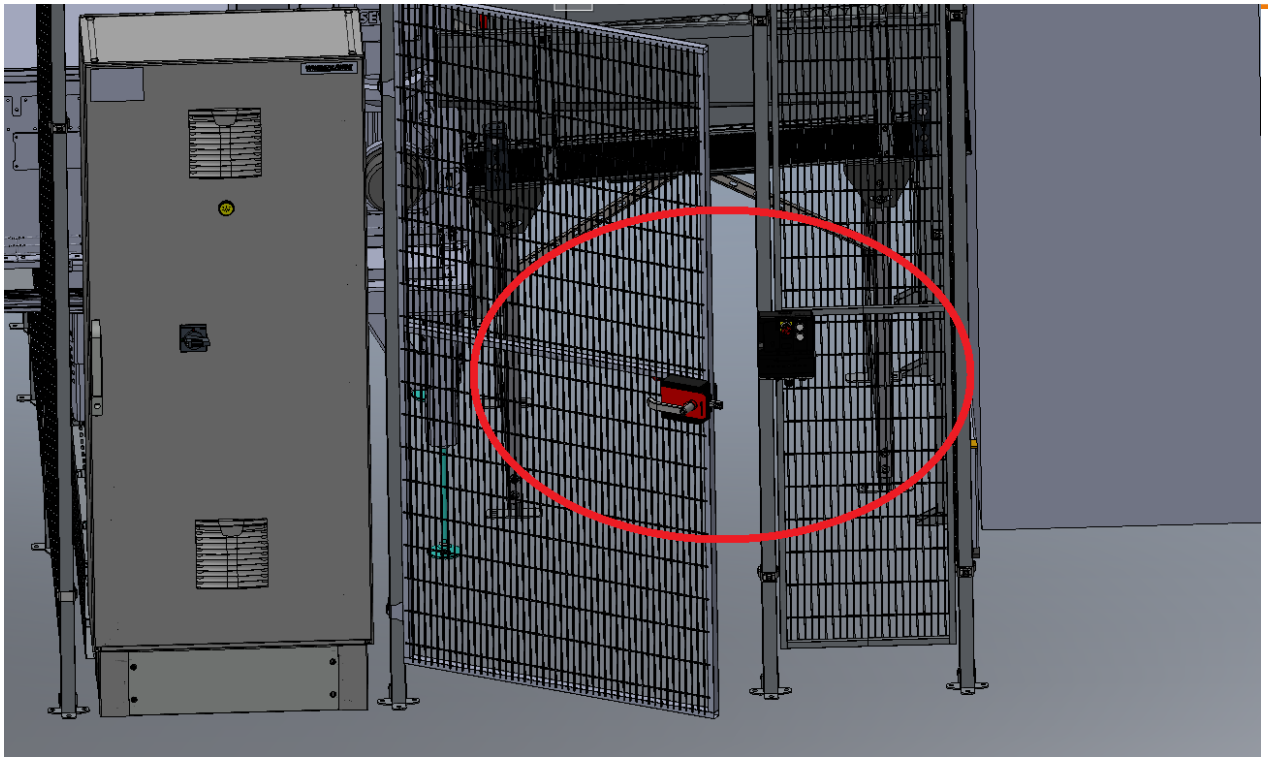


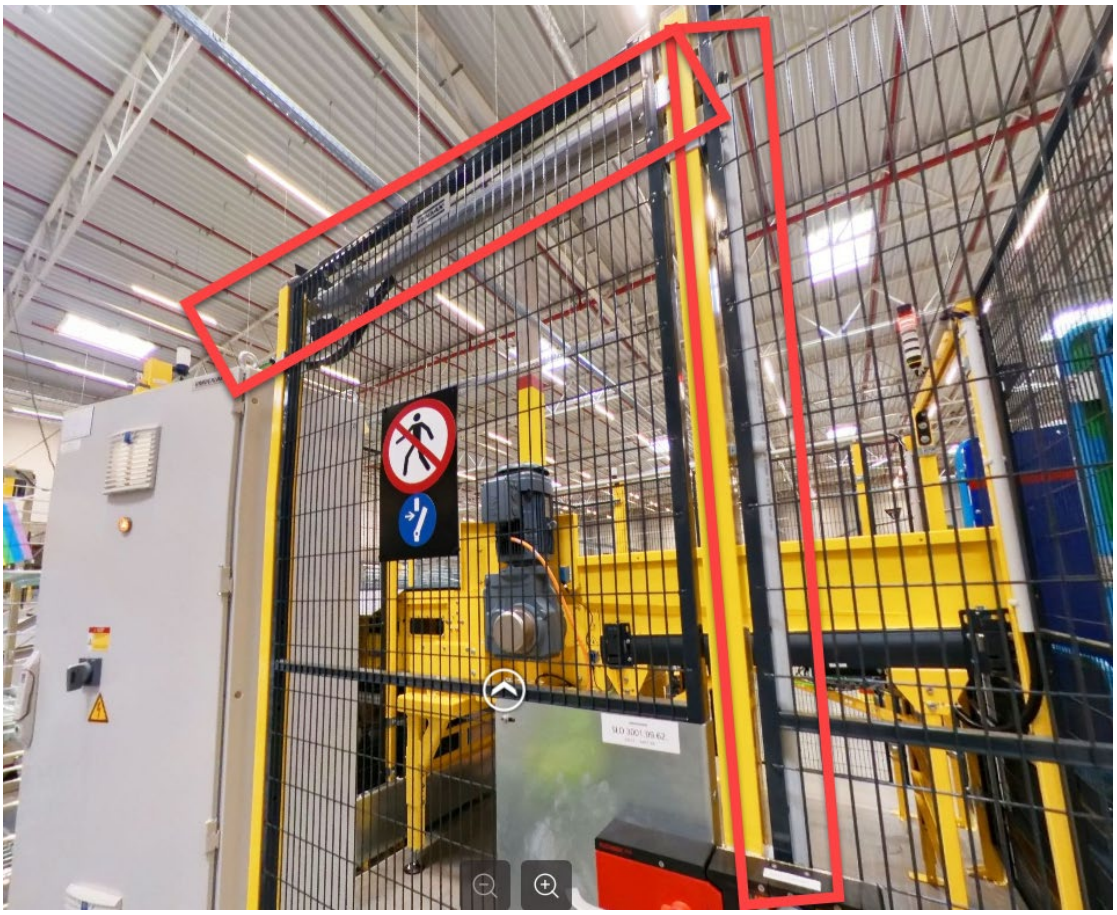
- Cabinet from the sorter has to be mounted on correct position:



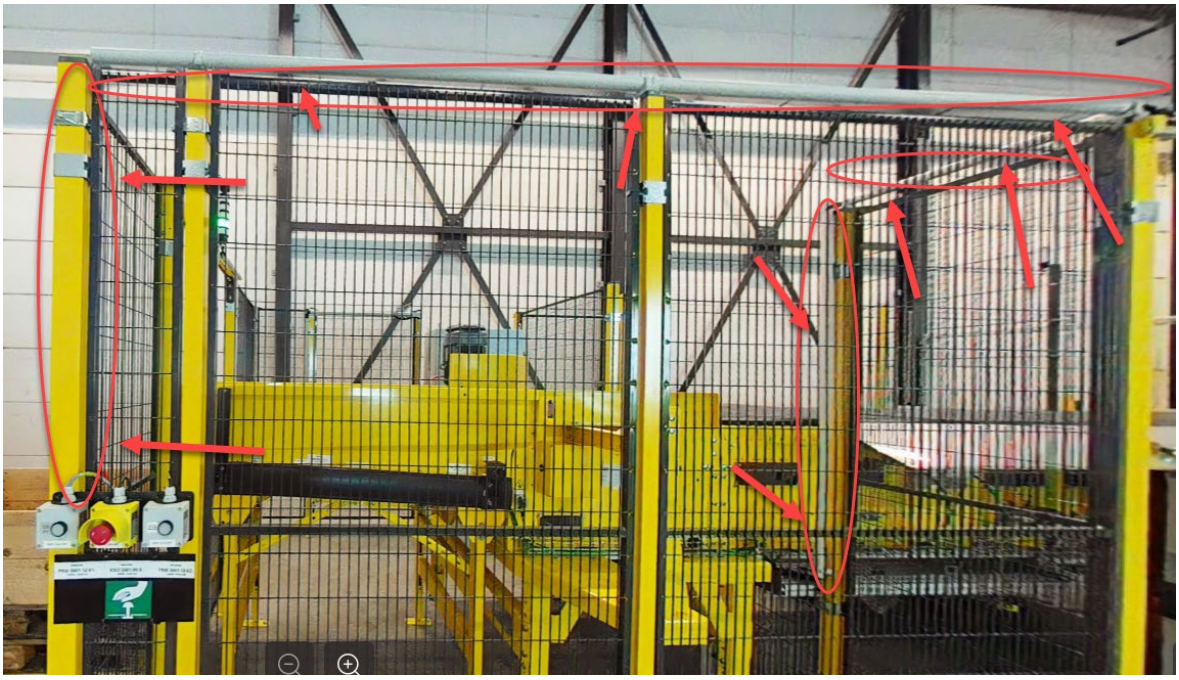
11.3. Installation steps- EM

- Door lock have to pull cable to cabinet (on cabinet will be two cable glands) and make some protecting tubing on side. Cables can go only on top off fence.





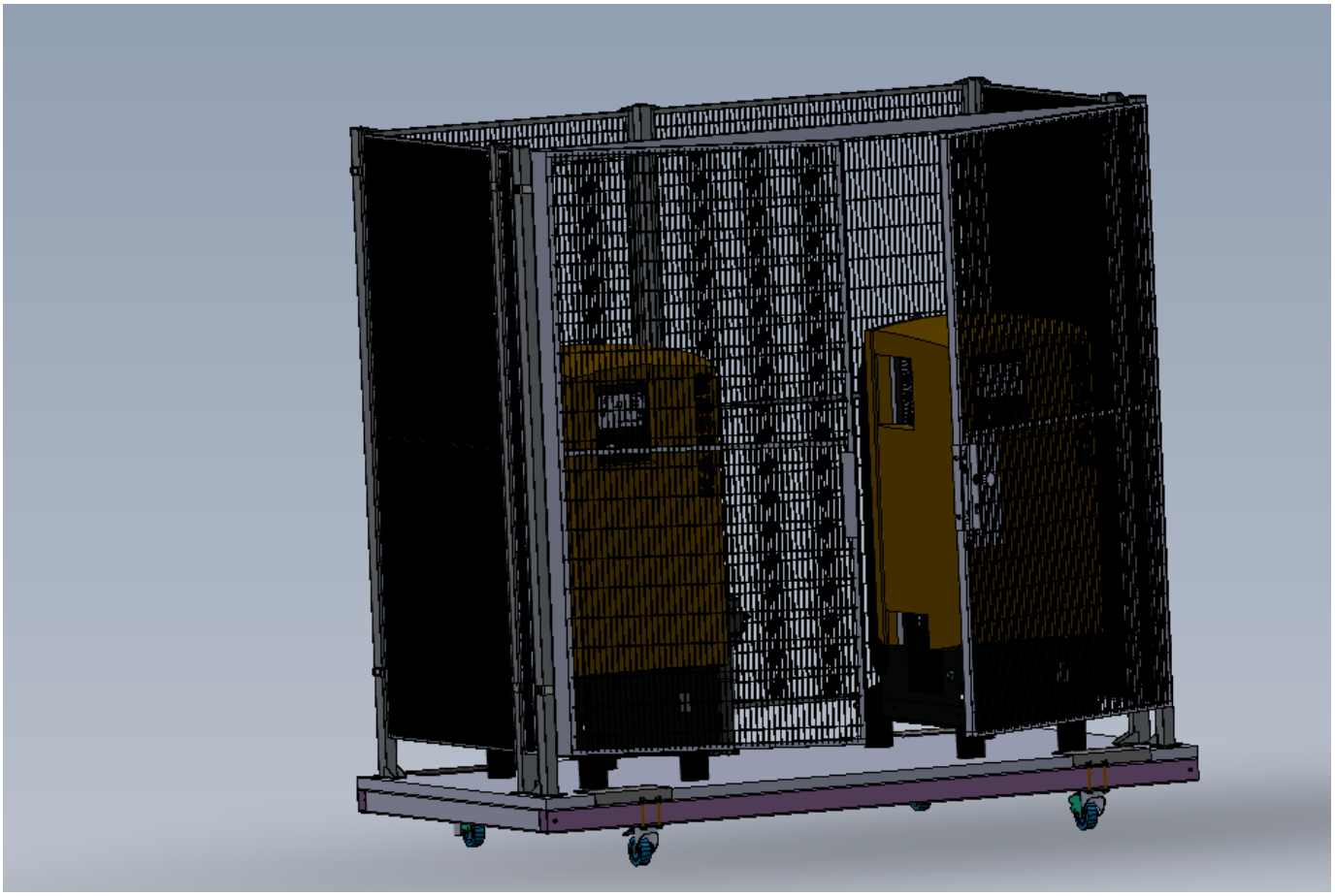
- PBB and e-stop will be vertical mounted on fence support they will have to pull cables to cabinet and some protecting tubing on side. Cables can go only on top off fence.



12. SYSTEM OVERWIEV - PART 8 (COMPRERSSOR)

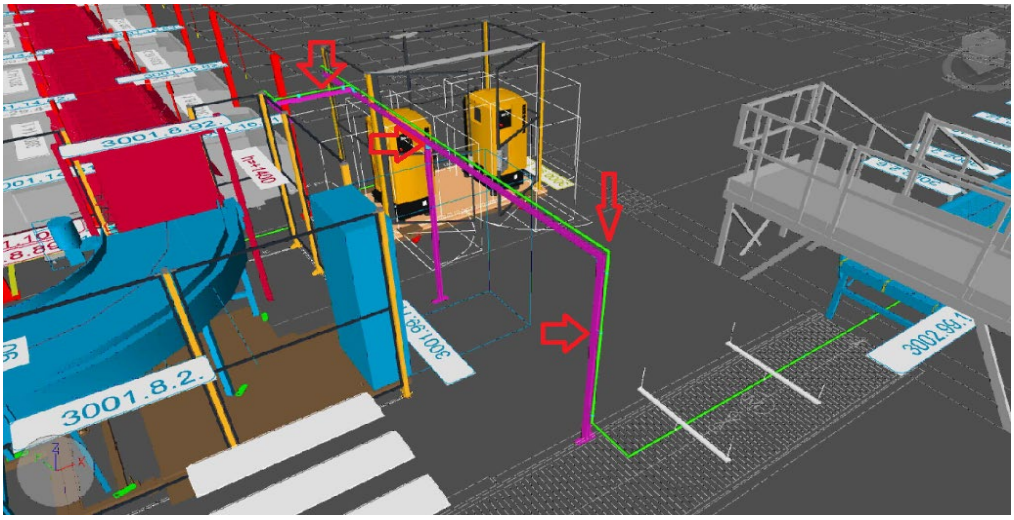
12.1. General description

- Compressor will be delivered on side full assembled on steel frame and to the frame will be attached wheels witch can be lather removed:
-

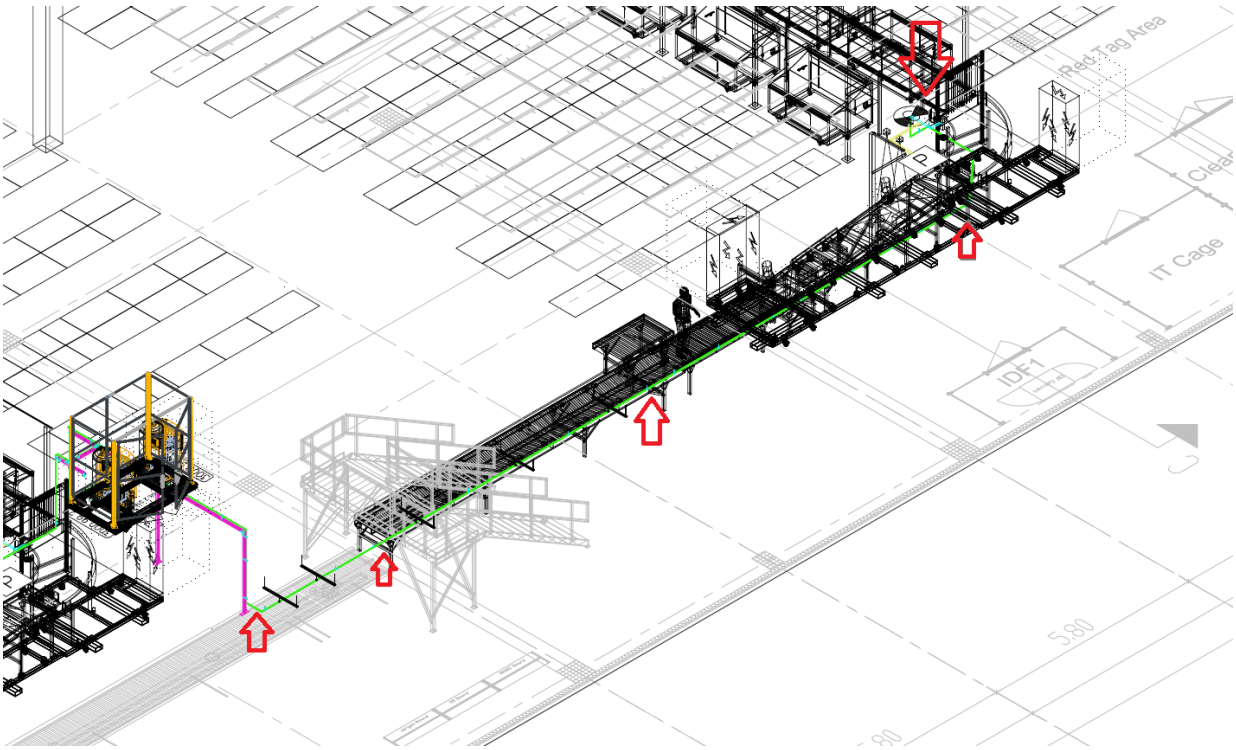


12.2. Installation steps- Mech

- Compressor will not be always on same position on all side sometimes will be required to install bridge because of the walkway beneath.



- On some sides pneumatic will be necessary to install under conveyors:

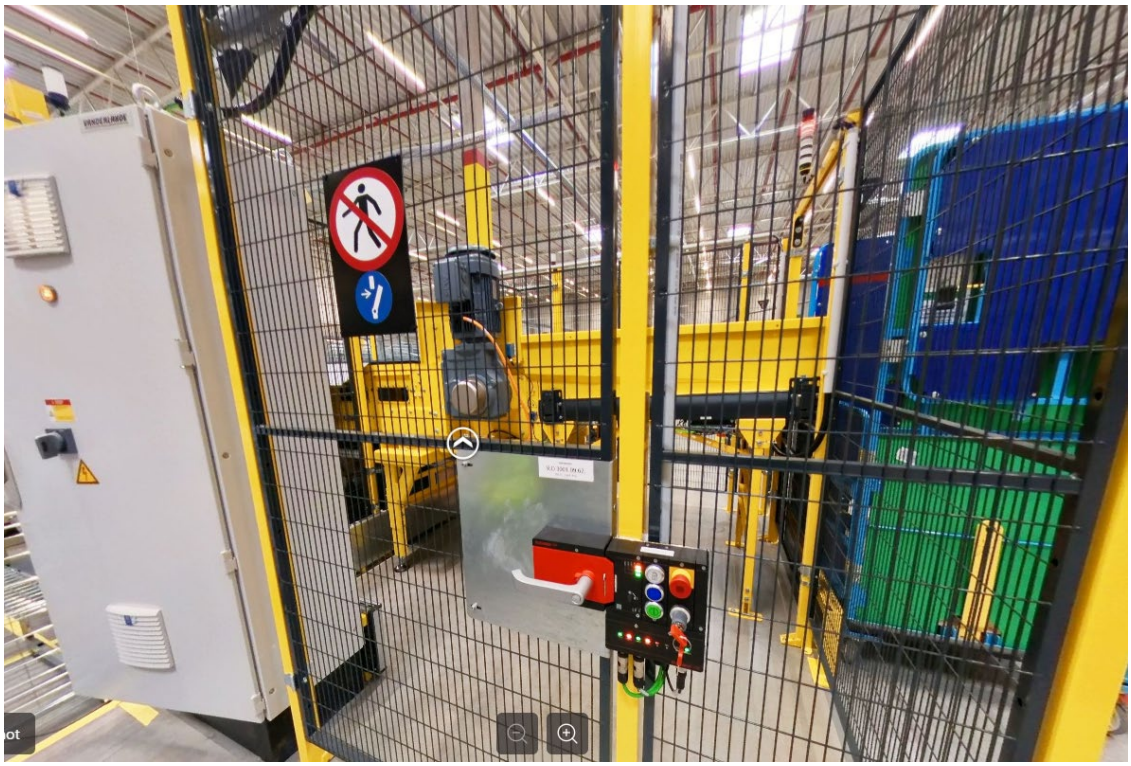


12.3. Installation steps: EM

- Compressor will have power plug and they have to connect plug to amazon outlet.

13. STICKERS

- These stickers have to be on every door:



- These stickers have to be on the tunnel at the cleaning workstation:

- This sticker has to be on the sideguarding of the jackpot: