

Basic requirements for the start of assembly

- Completed hall incl. lighting
- Clean and level foundation
- Completely installed and grouted foundation frame for the peeling machine incl. gratings. The frame must be completely free of concrete residue!
- Cable ducts must be clean and dry
- Indoor crane ready for operation and available
- Construction site reference point defined and communicated
- Functioning construction site power supply 400 V 32 A , 230 V 16 A
- Location for Bültmann construction site container (LxWxH) 6100x2450x2600 mm the container must be equipped with a power supply (400 V 32 A)
- Space for assembly workbench
- Provision of sanitary facilities
- Provision of heated office/break rooms or containers incl. seating and tables
- Provision of changing facilities
- Provision of an Internet connection
- Provision of a lockable material container, preferably with shelving. (Size 20 feet sea container or similar)
- Provision of drawing tables in the field
- The tools listed in the tool list are available to Bültmann's fitters and also to the installation company.
- The installation company must assess which tools or lifting equipment etc. they must provide for the local conditions; this should be clear to a specialist company from these instructions and the weights stated in the installation plan.
- Responsible site manager from AL Invest should be determined
- Responsible site manager from the installation company should be appointed
- Foremen responsible for electrical and mechanical work at the installation company should be appointed
- The persons listed above should be able to communicate professionally in English.

General mechanical assembly procedure (explanation of the basics)

Construction site preparations :

- Safety training
- Project meeting with all parties involved
- Site inspection
- Setting up the workplace
- Visual inspection of foundation
- Checking the reference point
- Measurement of foundation (highest and lowest point)
- Determine height reference
- Marking the reference lines (plant reference point Bültmann)

390-00-casting line HPI

Works before installation:

- Foundation check
- Safety barriers at pits (preliminary)
- Cross check reference points
- Alignment of center line brackets
- Installation of center lines
- Preparations of foot plates / frames / beams / ...
- On site weldings must be protected with paint or similar afterwards
- All pipe + hose- lines must be tested for leakage on site

General instructions for installation:

- Personal safety equipment must be worn all the time and the erection company is responsible for every kind of injuries of their people
- All people for erection of the equipment, must follow the instructions of supervisors from HPI
- If the erection staff fails to follow instructions or if HPI supervisors on site determine that the staff lacks the required skills, the supervisors are entitled to request the customer replace the personnel

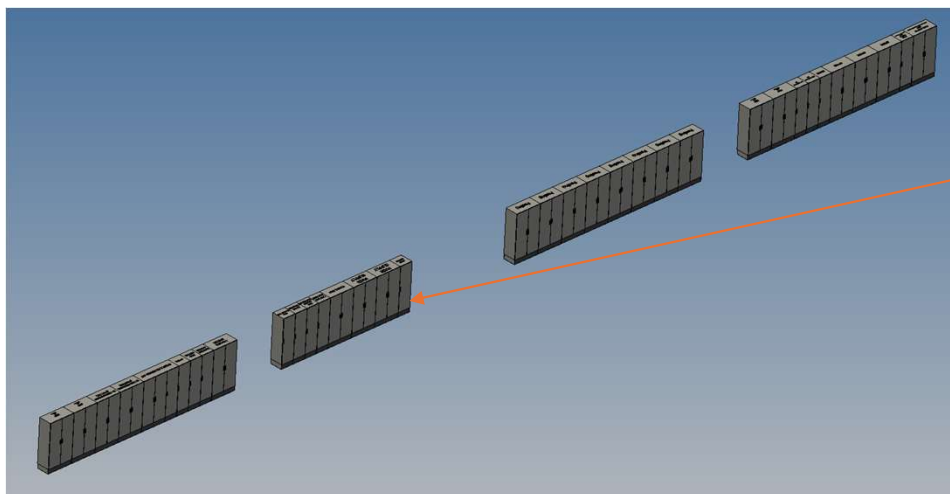
390-04- Electric cabinets

Pre-assembled units :

- 390-04 – E-cabinets
 - Rough dimensions [LxWxH]: x.xxx x 600 x 2.200
 - Several packing units with lengths from 600mm – 3.000mm
 - Weights of packing units: 200kg – 3.000kg

Main installation works:

- Cabinet support structures must be installed in the intended channels – by customer
- Lifting units to final area
 - Attention: no overhead crane access
- Alignment to foundation channel
- Alignment to hall axis
- Anchoring of foot plates to the support structures
- Additional fastening at the rear upper edge, if stability of the cabinets is not given. Decided by supervisor on site



390-04 – E-cabinets

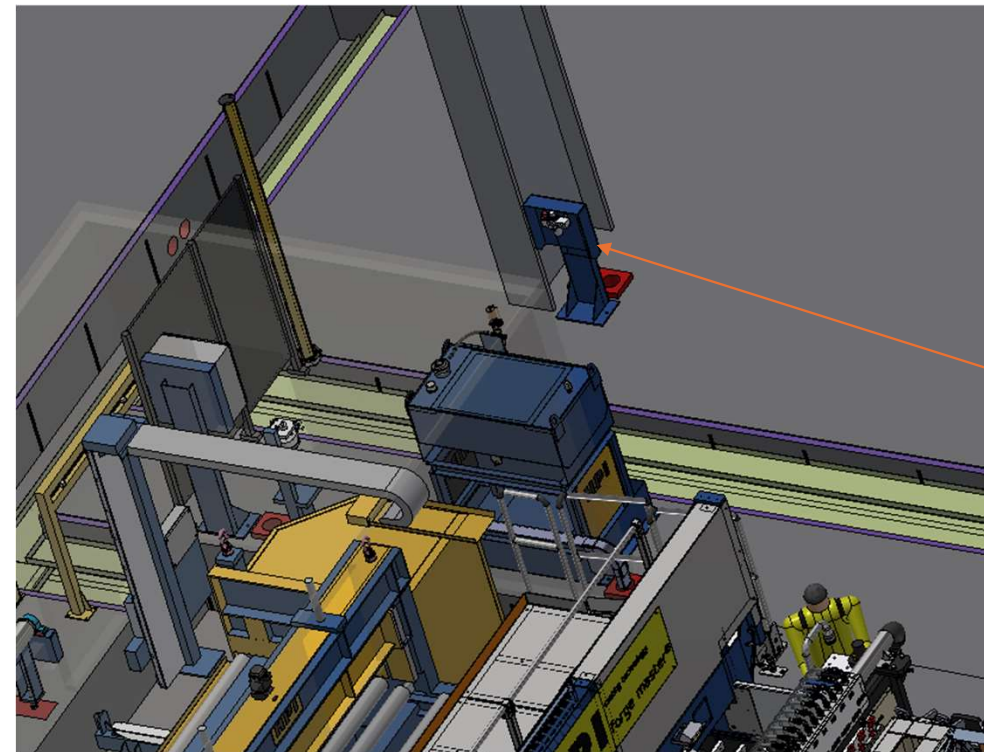
390-03- Pneumatics

Pre-assembled units :

- 390-03 – Pneumatic main control station (~80kg)
 - Rough dimensions [LxWxH]: 800 x 400 x 1.400

Main installation works:

- Lifting parts to final area
 - Attention: no overhead crane access
- Alignment to hall coloumns / axis
- Anchoring of foot plates (4x)
- Completing of possible cable trays on floor level
- Pneumatic piping + leakage test (cooling air)



390-03 – Pneumatic main control station

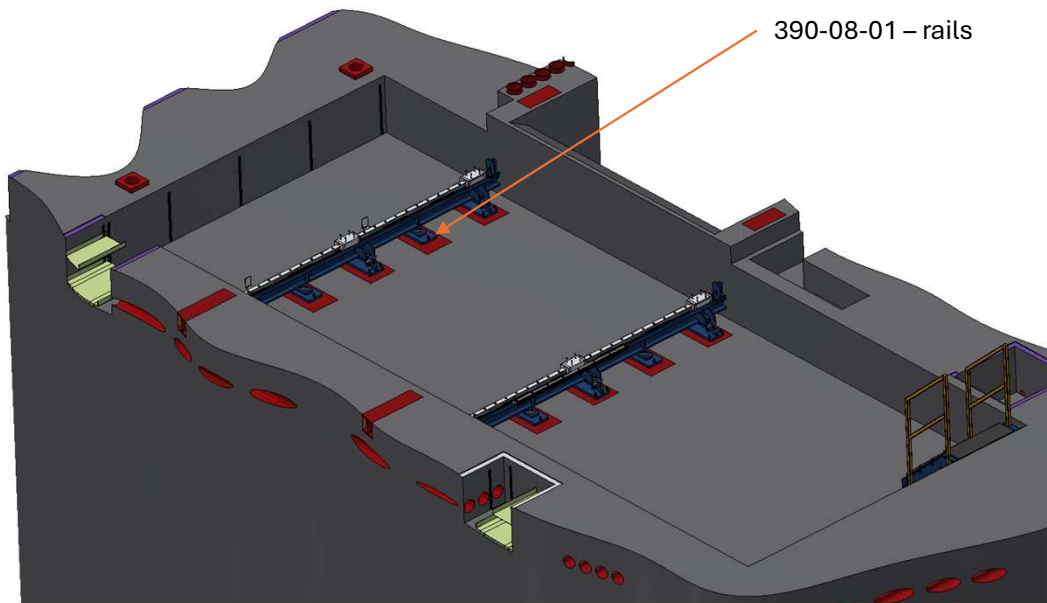
390-08-flying saw

Pre-assembled units:

- 390-08-01 – rails
- Lifting weights: ~600kg (2x)
- Rough dimensions [LxWxH]: 3.900 x 600 x 500 (2x)

Main installation works:

- Rough alignment of foot plates
- Spot welding of foot plates
- Lifting to final area (saw pit)
- Placing of rail-assemblies
- Alignment to casting center line
- Alignment in height
- General alignment tolerance 0,2mm
- Welding of foot plates (10x)



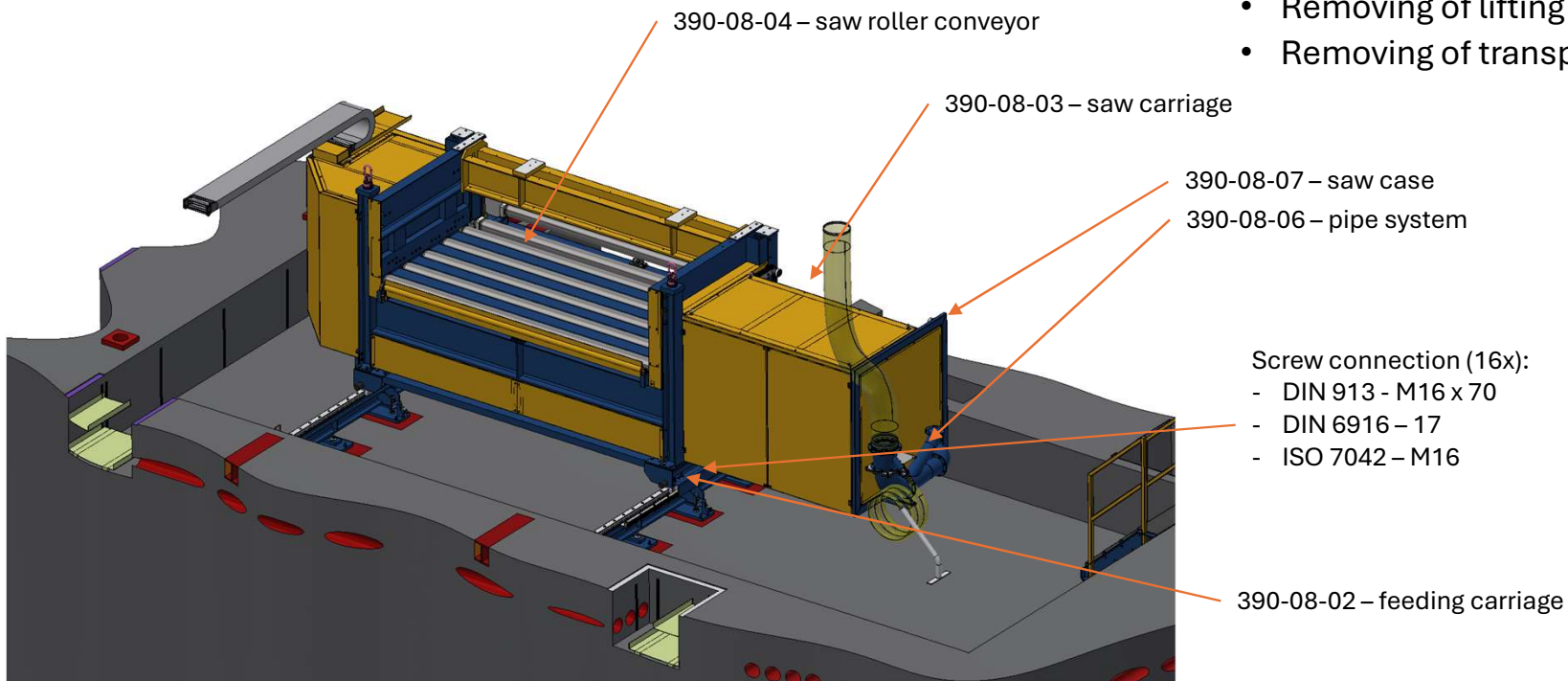
390-08-flying saw

Pre-assembled units:

- 390-08-02 – feeding carriage
- 390-08-03 – saw carriage
- 390-08-04 – saw roller conveyor
- 390-08-06 – pipe system
- 390-08-07 – saw case
- Lifting weight: ~7.500kg
- Rough dimensions [LxWxH]: 2.300 x 7.300 x 2.500

Main installation works:

- Lifting to final area
- Screw connection with 390-08-01 – rails
- Alignment to casting center line
- Alignment in height
- General alignment tolerance 0,2mm
- Piping of pneumatic + saw blade lubrication
- Removing of lifting supports
- Removing of lifting anchors
- Removing of transport lockings



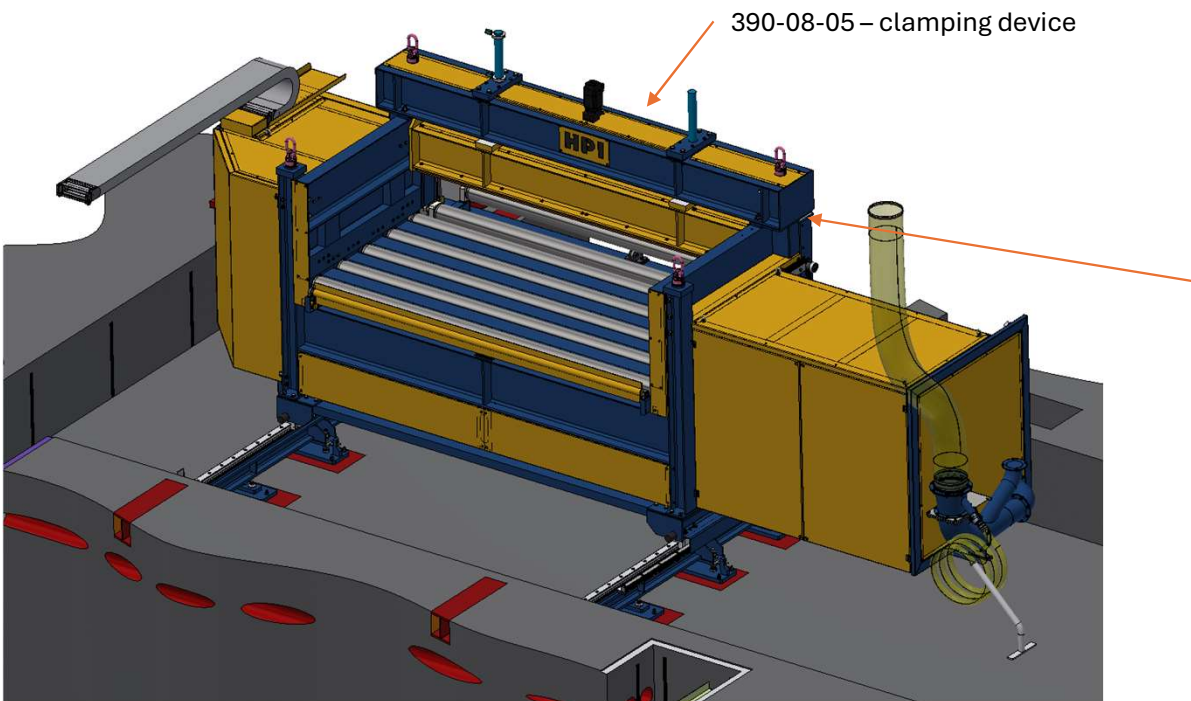
390-08-flying saw

Pre-assembled units:

- 390-08-05 – clamping device
- Lifting weight: ~1.300kg
- Rough dimensions [LxWxH]: 500 x 3.700 x 900

Main installation works:

- Lifting to final area
- Screw connection with 390-08-04 – saw roller conv.
- Alignment to casting center line
- Alignment in height
- Removing of lifting anchors



Screw connection (12x):

- DIN 913 – M20 x 110
- DIN 6916 – 21
- DIN 434 – 22
- DIN 934 – M20

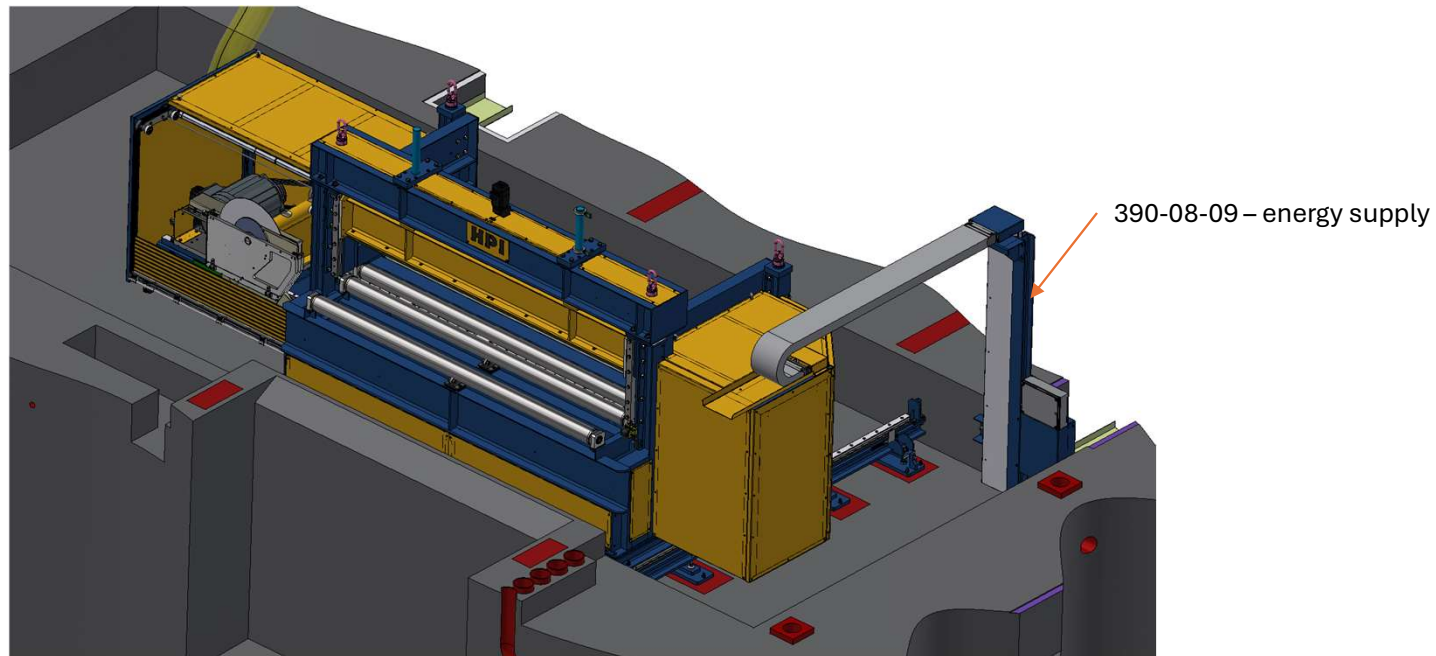
390-08-flying saw

Pre-assembled units:

- 390-08-09 – energy supply
- Lifting weight: ~200kg
- Rough dimensions [LxWxH]: 500 x 1.000 x 2.600

Main installation works:

- Lifting to final area
- Alignment to casting center line
- Anchoring to foundation / saw pit wall
- Screw connection to energy chain saw
- Piping / hosing of pneumatic + lubrication



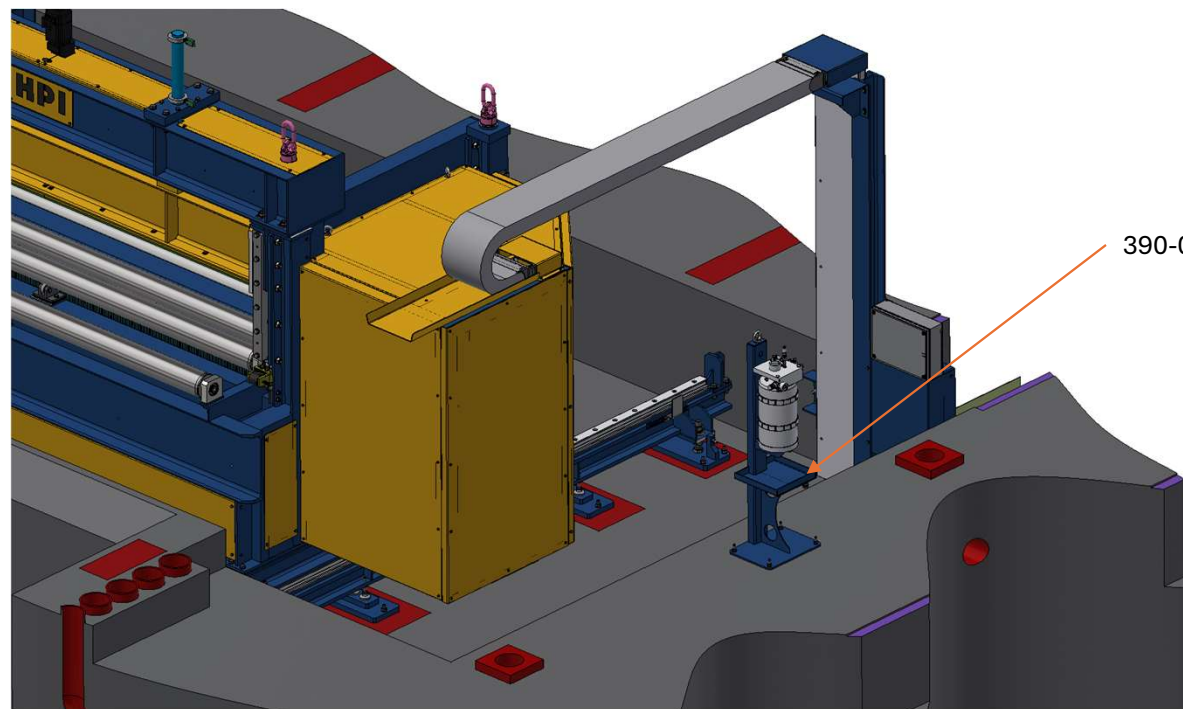
390-08-flying saw

Pre-assembled units:

- 390-08-08 – saw blade lubrication
- Lifting weight: ~50kg

Main installation works:

- Lifting to final area
- Alignment to foundation / reference points
- Anchoring to foundation
- Piping / hosing of pneumatic + lubrication



390-08-08 – saw blade lubrication

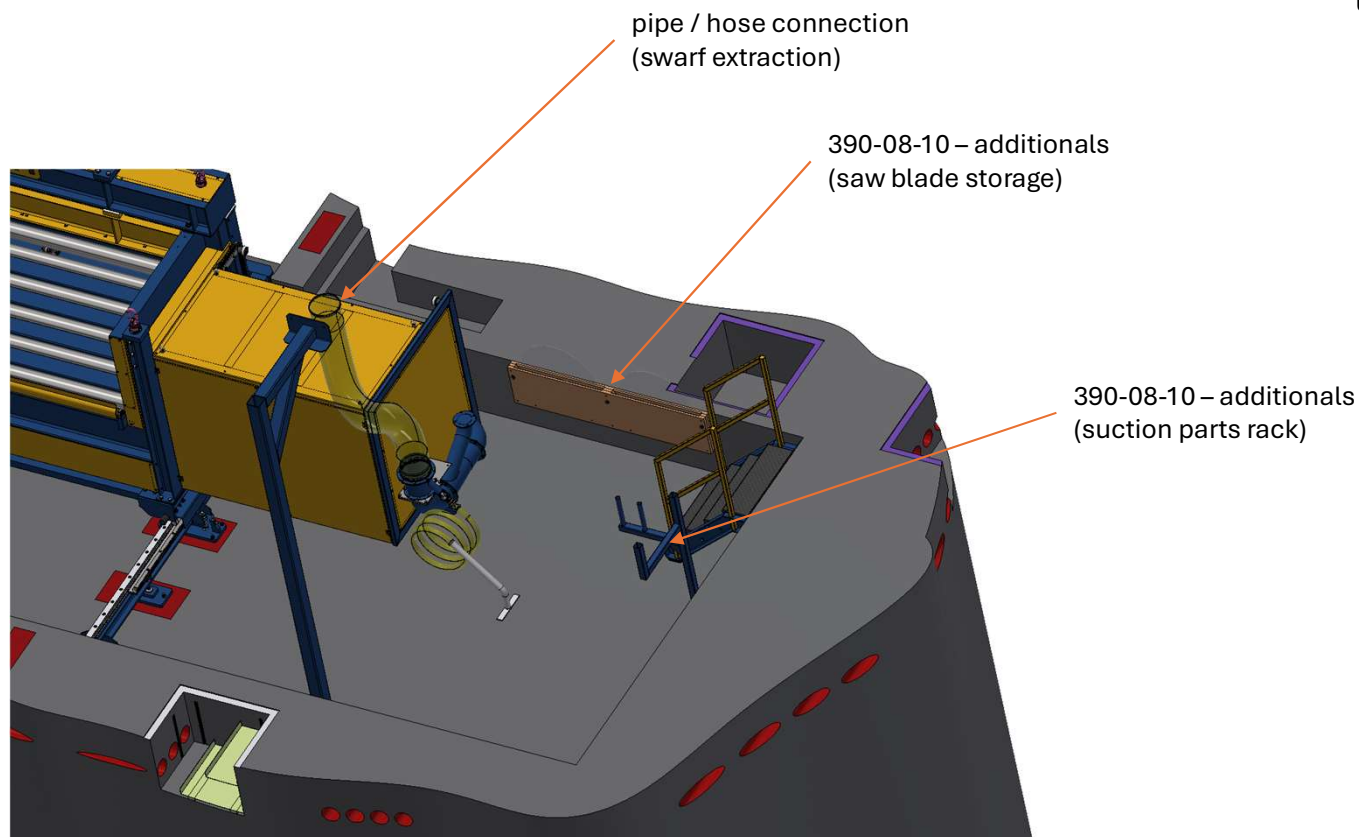
390-08-flying saw

Pre-assembled units:

- 390-08-10 – additional
- Lifting weights: 30 – 100kg

Main installation works:

- Lifting to final area
- Alignment to foundation / reference points
- Anchoring to foundation / saw pit wall
- Connection of saw pipe system to swarf extraction line (DN0250)



390-07-casting machine

Pre-assembled units:

- 390-07-01 – casting frame
- 390-07-03 – drive unit
- 390-07-04 – casting conveyor
- total weight: ~7.800 kg
- Rough dimensions [LxWxH]: 3.600 x 3.900 x 1.100

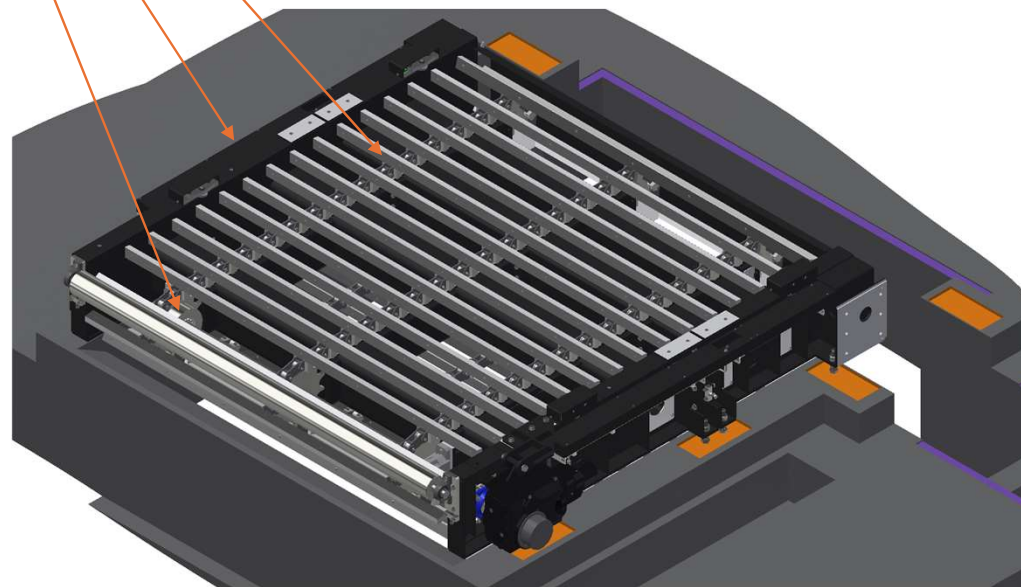
Main installation works:

- Lifting to final area
- Alignment to casting center line
- Alignment in height
- General alignment tolerance 0,2mm
- Welding of leveling screws (8x)
- Piping of pneumatic (12L) + mould lubrication (6L)
- Piping of pneumatic + mould lubrication to supply units

390-07-04 – casting conveyor

390-07-01 – casting frame

390-07-03 – drive unit



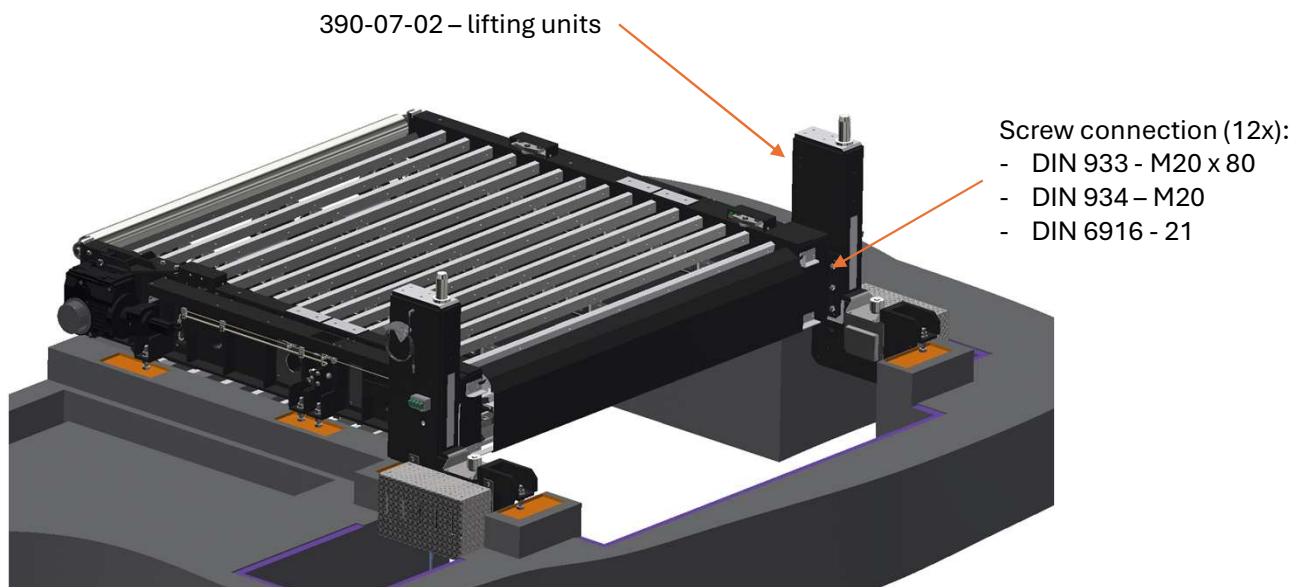
390-07-casting machine

Pre-assembled units:

- 390-07-02 – lifting units
- lifting weight: ~1.100 kg (2x)
- Rough dimensions [LxWxH]: 1.100 x 560 x 1.700 (2x)

Main installation works:

- Lifting to final area
- Alignment at right angle to casting center line
- Alignment in height
- General alignment tolerance 0,2mm
- Screw connection with 390-07-01 – casting frame
- Welding of leveling screws (4x)
- Piping of pneumatic (12L) + mould lubrication (6L)



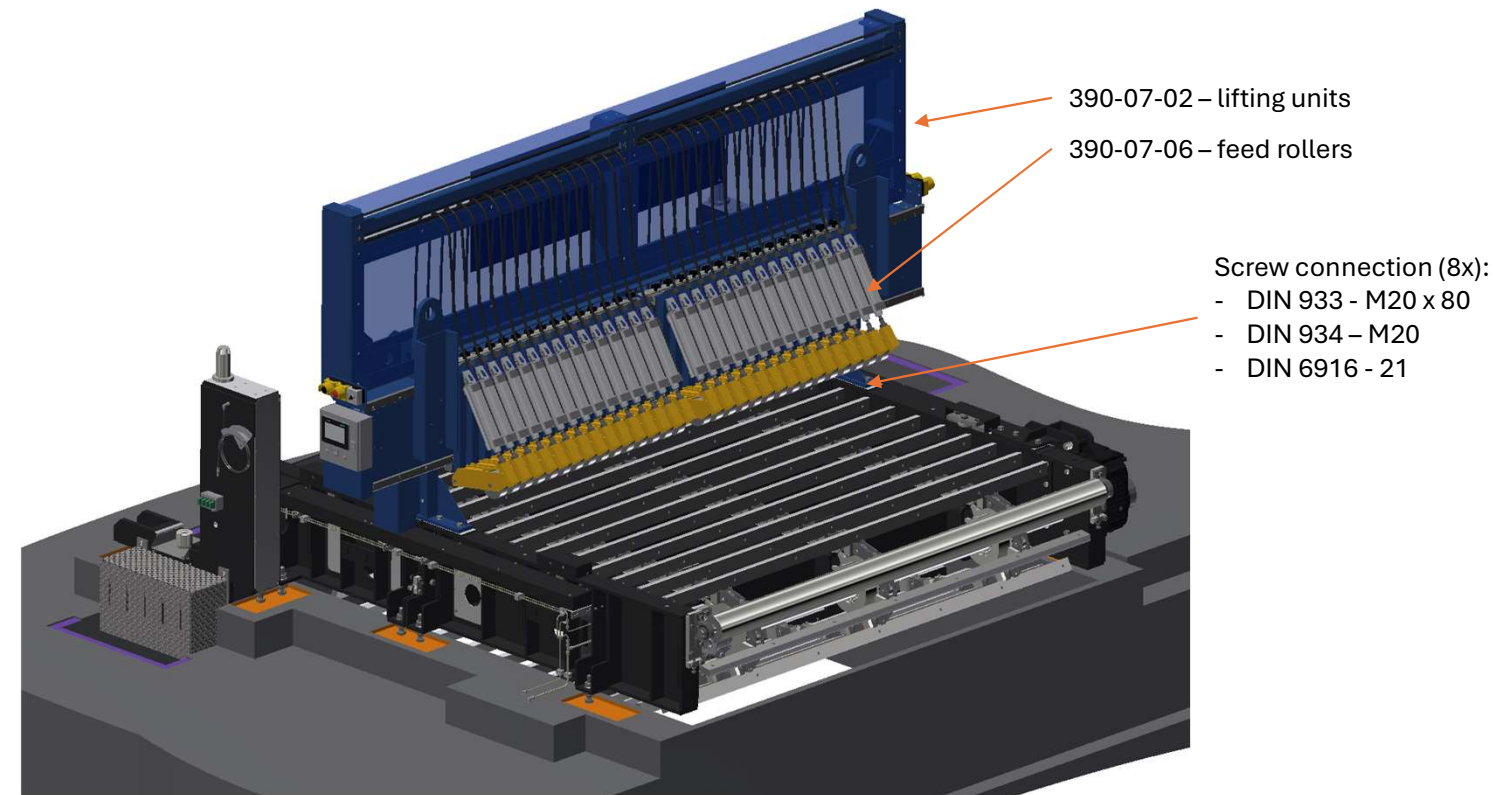
390-07-casting machine

Pre-assembled units:

- 390-07-05 – clamping beam
- 390-07-06 – feed rollers (30x)
- lifting weight: ~2.300 kg
- Rough dimensions [LxWxH]: 1.100 x 4.700 x 2.000

Main installation works:

- Lifting to final area
- Alignment to casting center line
- Alignment in height
- Screw connection with 390-07-01 – casting frame
- Piping of pneumatic (12L)
- Remove lifting brackets



390-07-casting machine

Pre-assembled units:

- 390-07-09 – cross platform (main part)
- 390-07-09 – cross platform (stairs + railings)
- lifting weights: ~700 kg / ~200kg (2x)
- Rough dimensions [LxWxH]: 1.400 x 4.400 x 1.600
- Rough dimensions [LxWxH]: 900 x 1.200 x 2.200 (2x)

Main installation works:

- Lifting to final area
- Anchoring and alignment of foot plates
- Alignment in height and foundation
- Screw connection with 390-07-01 – casting frame
- Welding of leveling screws (4x)
- Installation of missing railings

Screw connection (8x):

- DIN 933 – M12 x 50
- DIN 934 – M12
- DIN 7093 - 12

Screw connection (4x):

- DIN 933 - M20 x 70
- DIN 934 – M20
- DIN 7093 - 20

390-07-09 – cross platform (stairs + railing)

390-07-09 – cross platform (main part)

390-07-09 – cross platform (stairs + railing)

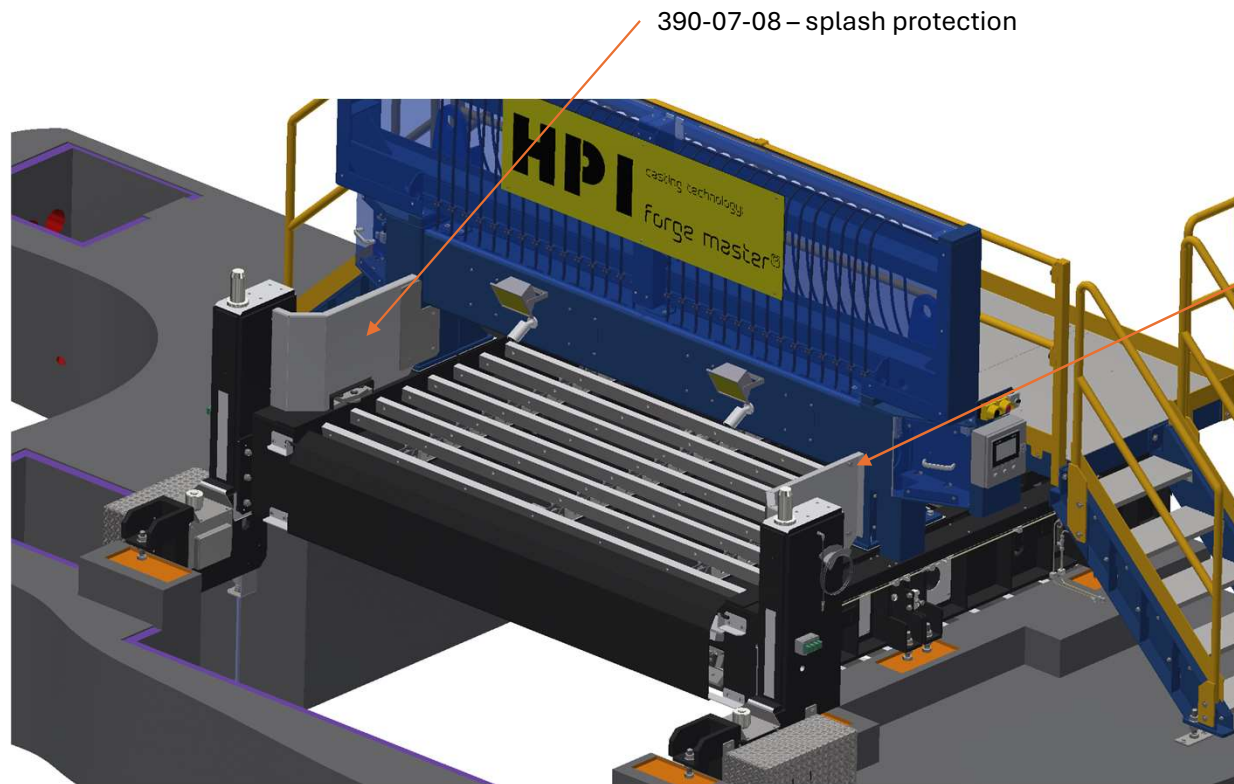
390-07-casting machine

Pre-assembled units:

- 390-07-08 – splash protection
- lifting weights: ~10 kg (2x)

Main installation works:

- Lifting to final area
- Connection with 390-07-02 – lifting units
- Screw connection with 390-07-05 – clamping beam



390-07-08 – splash protection

Screw connection (4x):
- DIN 464 – M8x25

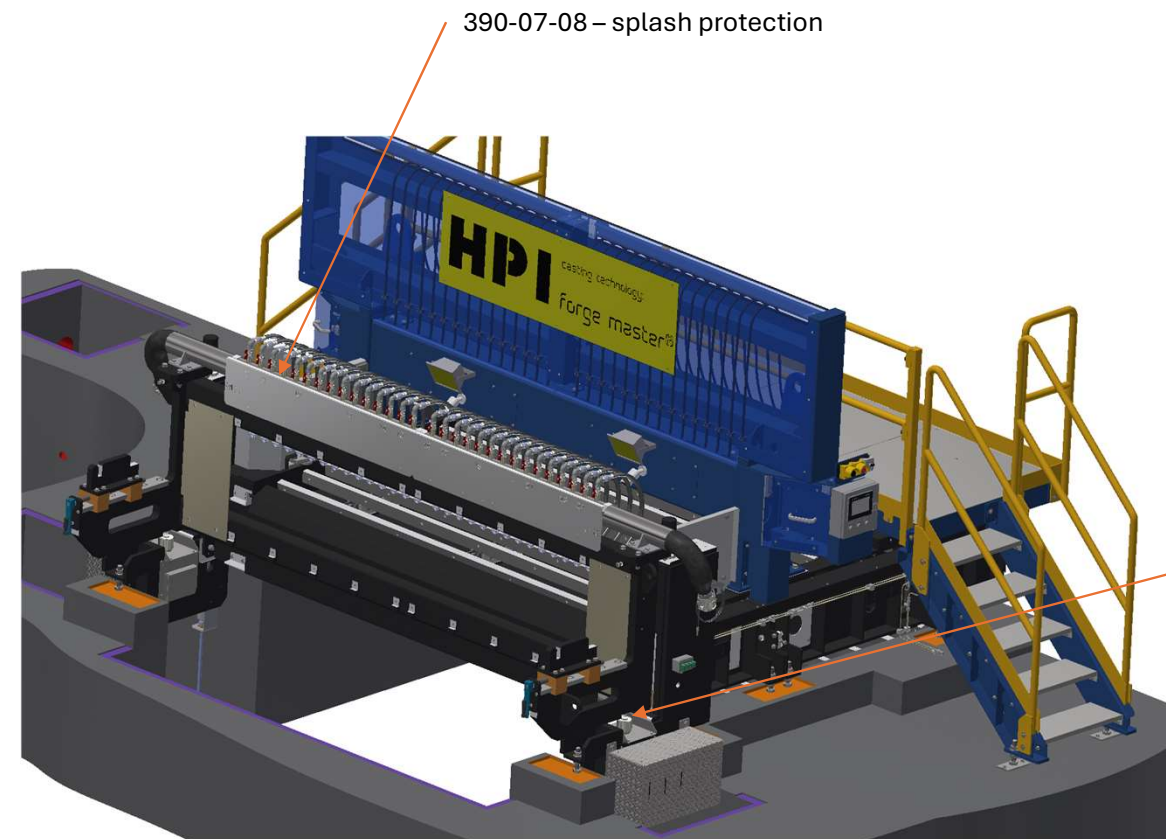
390-07-casting machine

Pre-assembled units:

- 390-07-07 – mounting frame
- lifting weight: ~1.200kg
- Rough dimensions [LxWxH]: 1.400 x 4.800 x 1.400

Main installation works:

- Lifting to final area
- Alignment to casting center line
- Alignment in height
- General alignment tolerance 0,2mm
- Set-up of height adjusting pins
- Alignment of guiding bushes



390-07-08 – splash protection

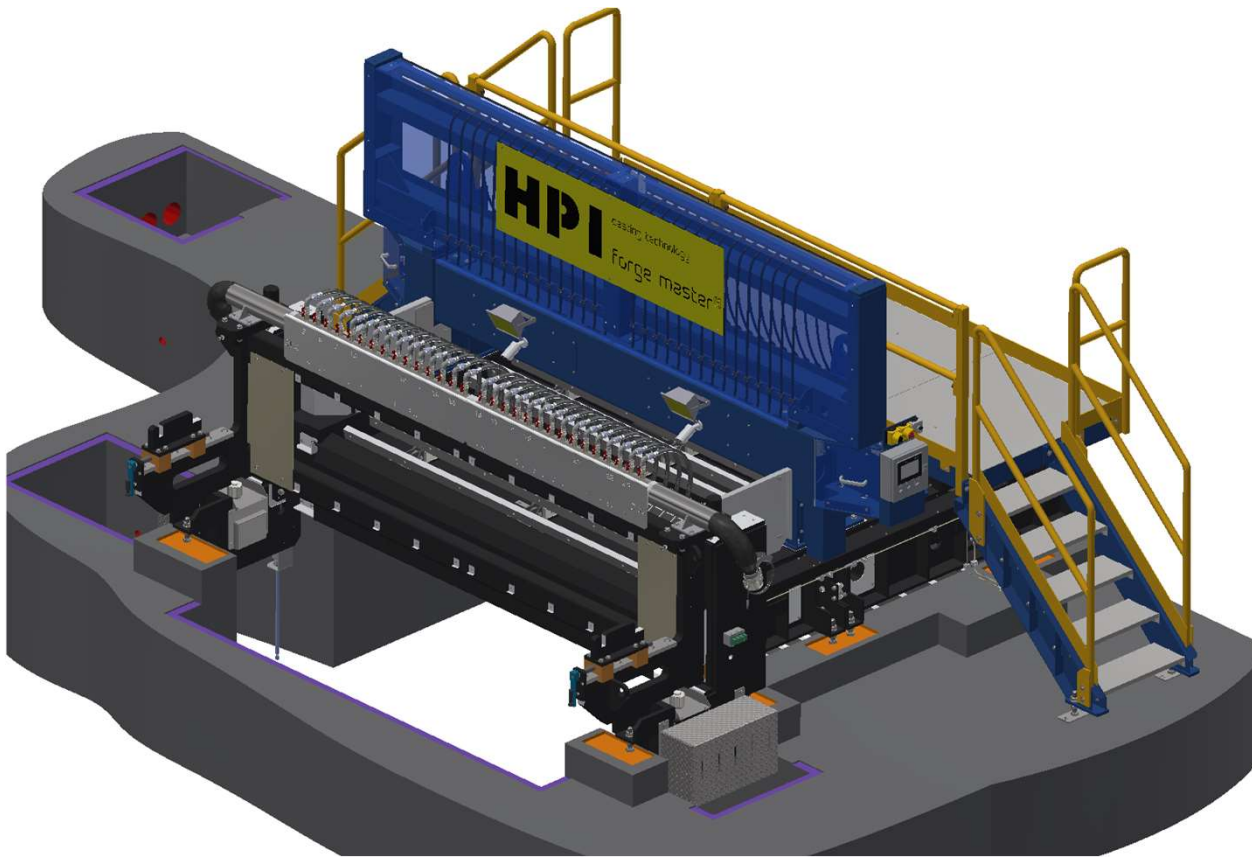
Height adjusting pins (2x)

- Thread M30x1,5
- AF 24 (key size)
- DIN 1804 – M30

390-07-casting machine

Finishing works:

- Adding safety barriers to foundation / pit
 - By customer / installation company
 - To be decided on site (where / how)
- Supplement of painting defects
- Corrosion protection for welding spots
- Piping leakage tests



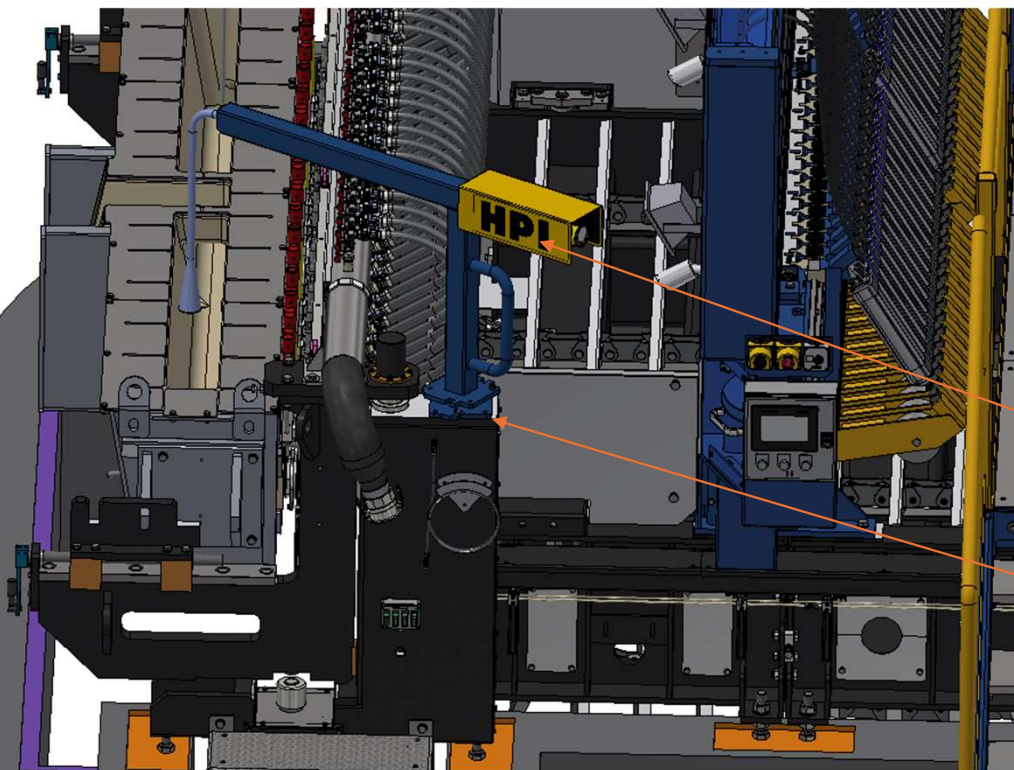
390-05- Tundish

Pre-assembled units :

- 390-05-02 – tundish level measurement
- Lifting weight: ~60kg
- Rough dimensions [LxWxH]: 1.600 x 300 x 900

Main installation works:

- Lifting parts to final area
- Alignment to tundish position / HDC
- Screw connection with casting machine
- Pneumatic piping + leakage test



390-05-02 – tundish level measurement

Screw connection (4x):

- DIN 933 – M12 x 60
- DIN 934 – M12
- DIN 6916 - 13

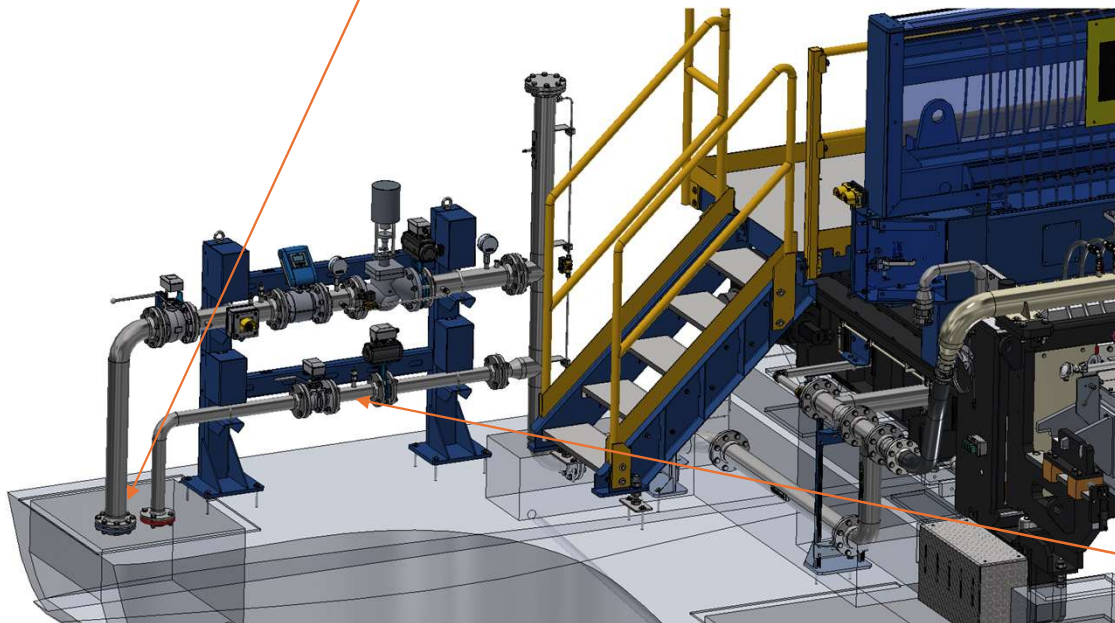
390-14- cooling water

Pre-assembled units:

- 390-14-01 –cooling water control line
- Total weight: ~400kg
- Rough dimensions [LxWxH]: 500 x 2.900 x 2.200

Screw connection (12x):

- DIN 933 – M16 x 60
- DIN 934 – M16
- DIN 125 - 17



390-14-01 – cooling water control line

Main installation works:

- Lifting assembly to final area
- Alignment to casting center line
- Alignment to casting machine reference
- Anchoring of foot plates (8x)
- Connection of cooling water supply
- Connection of emergency water supply
- Supply lines to be screw connected
- Connection flanges to be weld with supply line
- DN100 – PN16 – stainless steel
- Piping of pneumatic
- Piping of ventilation line
- Leakage test

390-14- cooling water

Pre-assembled units:

- 390-14-02 –cooling water supply line
- Disassembled for transport
- Lifting weights: 50-200kg
- Rough dimensions [LxWxH]: 2.200 x 1.000 x 1.100

Screw connection flanges (40x):

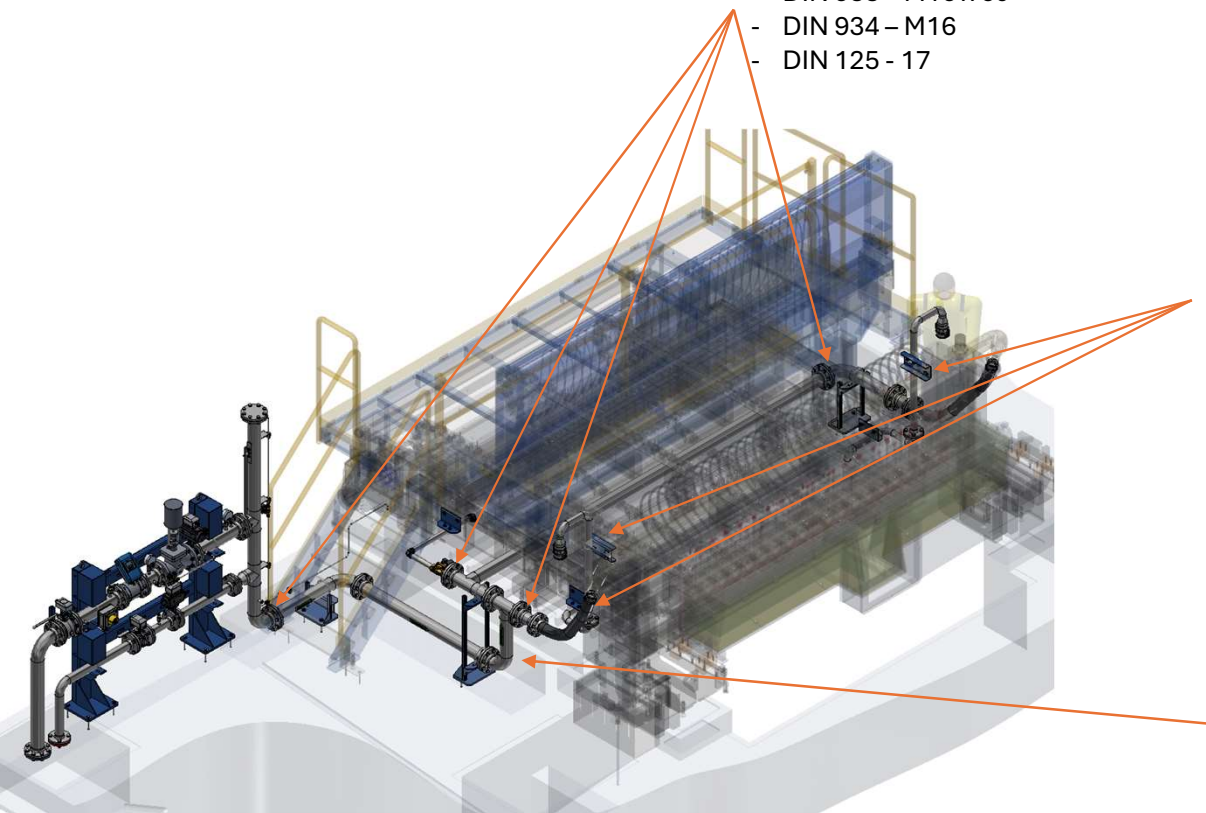
- DIN 933 – M16 x 60
- DIN 934 – M16
- DIN 125 - 17

Main installation works:

- Lifting assemblies to final area
- Alignment to casting center line
- Alignment to casting machine reference
- Alignment in height
- Anchoring of foot plates (6x)
- Screw connection of transport assemblies
- Pipe welding (if pipes must be adjusted to deviations)
- DN100 – PN16 – stainless steel
- Piping of ventilation line
- Leakage test

Screw connection brackets (10x):

- DIN 933 – M10 x 50
- DIN 934 – M10
- DIN 125 - 11



390-14-02 – cooling water supply line

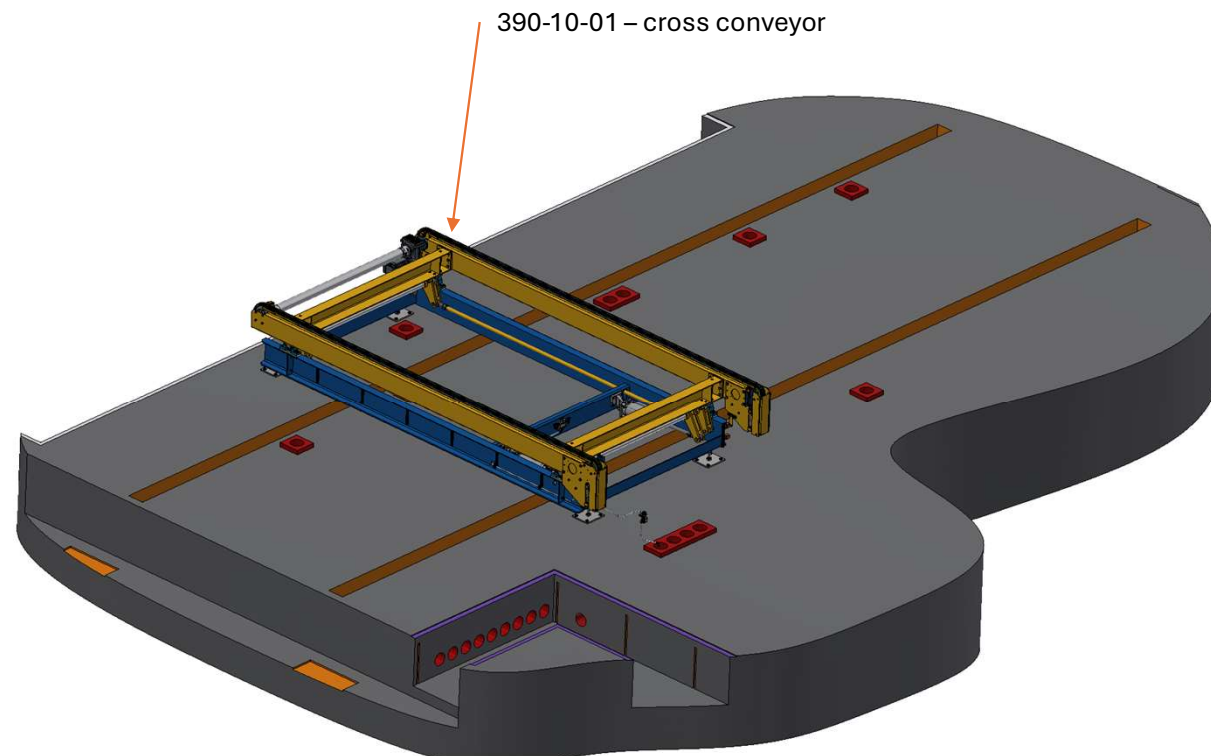
390-09/10- exit roller conveyor + cross conveyor

Pre-assembled units:

- 390-10-01 – cross conveyor
- Lifting weight: ~2000kg
- Rough dimensions [LxWxH]: 2.700 x 5.100 x 1.000

Main installation works:

- Alignment of foot plates
- Anchoring of foot plates (16x)
- Lifting assembly to final area
- Alignment to casting center line
- Alignment to cross conveyor center line
- Alignment in height
- General alignment tolerance 1mm
- Welding of leveling screws (4x)
- Piping of pneumatic



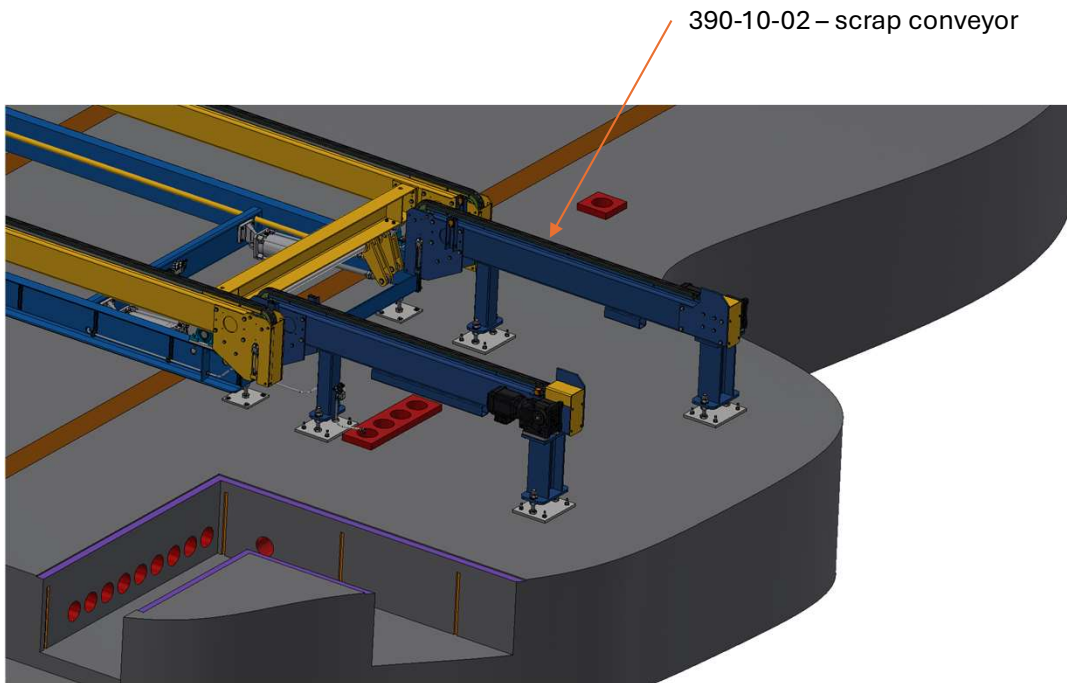
390-09/10- exit roller conveyor + cross conveyor

Pre-assembled units:

- 390-10-02 – scrap conveyor
- Lifting weights: ~450kg (2x)
- Rough dimensions [LxWxH]: 500 x 2.900 x 1.000 (2x)

Main installation works:

- Alignment of foot plates
- Anchoring of foot plates (16x)
- Lifting assemblies to final area
- Alignment to casting center line
- Alignment to cross conveyor center line
- Alignment in height
- General alignment tolerance 2mm
- Welding of leveling screws (8x)



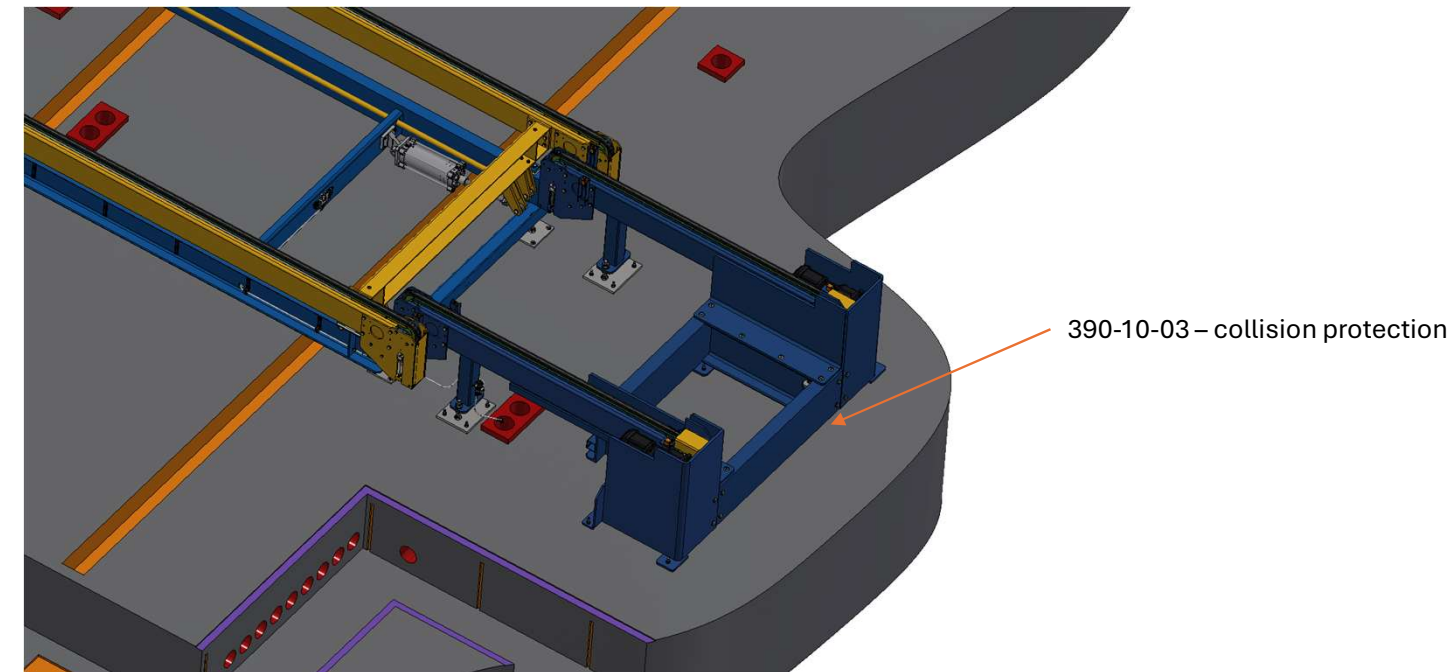
390-09/10- exit roller conveyor + cross conveyor

Pre-assembled units:

- 390-10-03 – collision protection
- Lifting weight: ~1.150kg
- Rough dimensions [LxWxH]: 2.800 x 1.200 x 1.100

Main installation works:

- Lifting assembly to final area
- Anchoring of foot plates (10x)
- Alignment to casting center line
- Alignment to cross conveyor center line



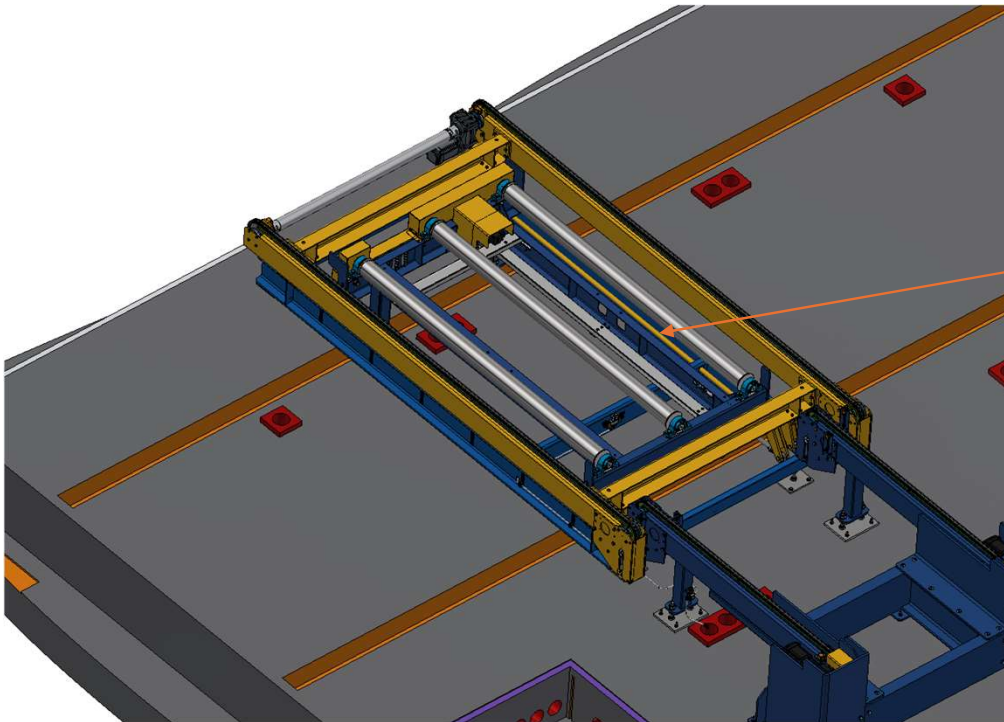
390-09/10- exit roller conveyor + cross conveyor

Pre-assembled units:

- 390-09 – roller conveyor (section 2)
- Lifting weight: ~950kg
- Rough dimensions [LxWxH]: 2.000 x 3.400 x 900

Main installation works:

- Lifting assembly to final area
- Alignment to casting center line
- Alignment to cross conveyor center line
- Alignment in height
- General alignment tolerance 1mm
- Welding of leveling screws (4x)



390-09 – roller conveyor
(section 2)

390-09/10- exit roller conveyor + cross conveyor

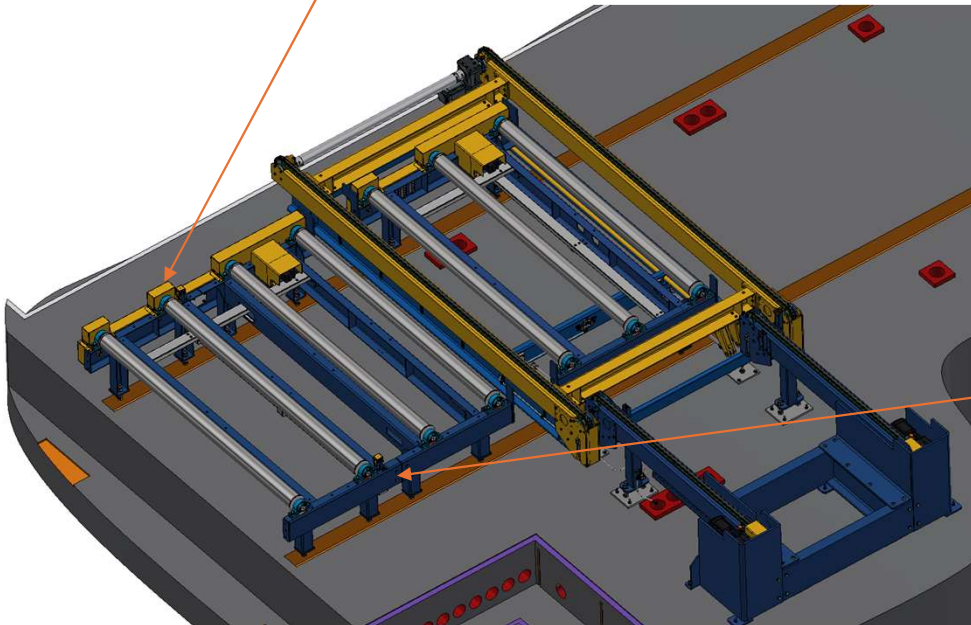
Pre-assembled units:

- 390-09 – roller conveyor (section 1)
- Lifting weights: ~700kg (2x)
- Rough dimensions [LxWxH]: 1.400 x 3.400 x 900 (2x)

Main installation works:

- Lifting assembly to final area
- Alignment to casting center line
- Alignment to saw pit reference
- Alignment in height
- General alignment tolerance 1mm
- Screw connection of transport units
- Welding of leveling screws (8x)

390-09 – roller conveyor
(section 1)



Screw connection (8x):

- DIN 933 – M16 x 50
- DIN 985 – M16
- DIN 6916 - 17

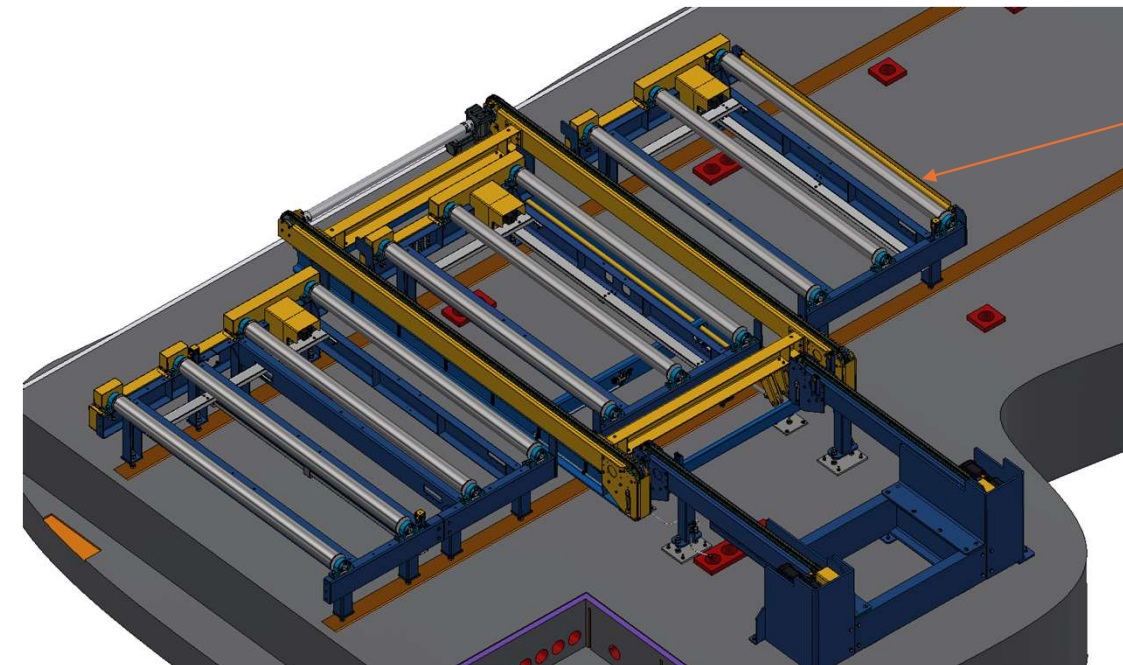
390-09/10- exit roller conveyor + cross conveyor

Pre-assembled units:

- 390-09 – roller conveyor (section 3)
- Lifting weight: ~1.000kg
- Rough dimensions [LxWxH]: 2.000 x 3.400 x 900

Main installation works:

- Lifting assembly to final area
- Alignment to casting center line
- Alignment to cross conveyor center line
- Alignment in height
- General alignment tolerance 1mm
- Welding of leveling screws (4x)



390-09 – roller conveyor
(section 3)

390-09/10- exit roller conveyor + cross conveyor

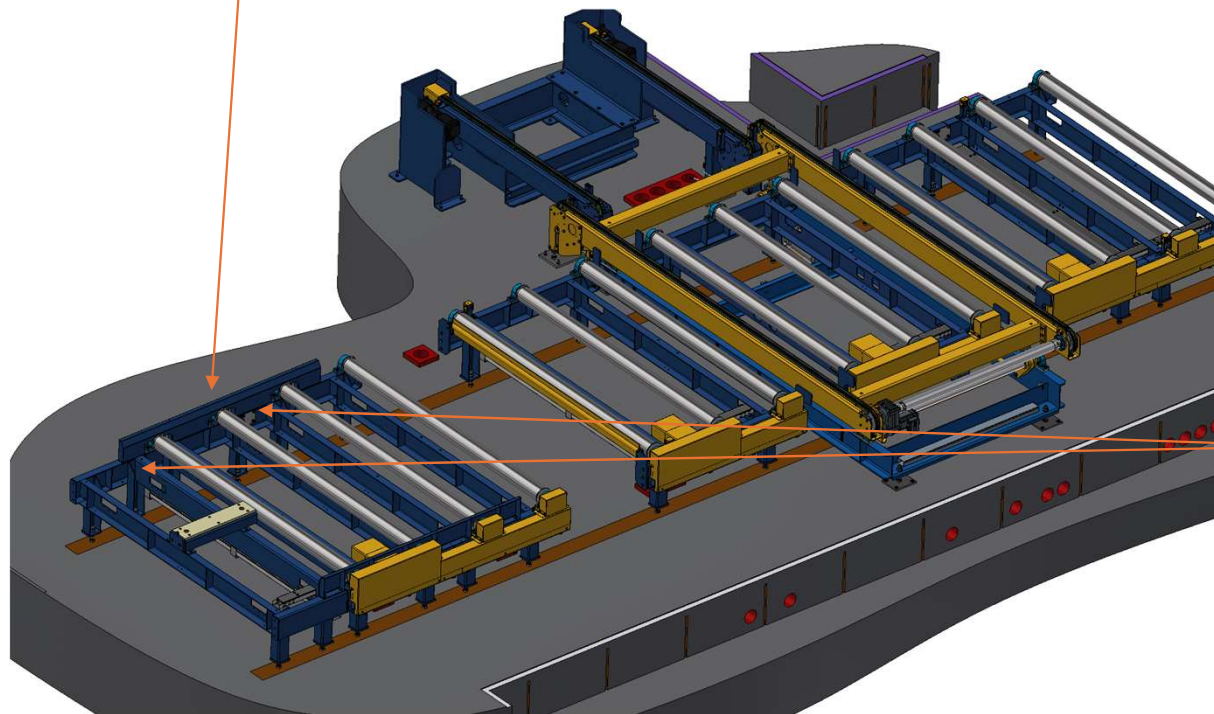
Pre-assembled units:

- 390-09 – roller conveyor (section 4)
- Lifting weights: ~600kg (3x)
- Rough dimensions [LxWxH]: 1.400 x 3.400 x 900 (3x)

Main installation works:

- Lifting assembly to final area
- Alignment to casting center line
- Alignment to saw pit reference
- Alignment in height
- General alignment tolerance 1mm
- Screw connection of transport units
- Welding of leveling screws (12x)

390-09 – roller conveyor
(section 4)



Screw connection (16x):

- DIN 933 – M16 x 50
- DIN 985 – M16
- DIN 6916 - 17

390-12- starterbar

Pre-assembled units:

- 390-12-01 –starterbar (2 halves)
- Lifting weights: ~800kg (2x)
- Rough dimensions [LxWxH]: 3.000 x 1.500 x 100 (2x)

Main installation works:

- Lifting assembly to storage place
- Alignment in height (on support surface)
- General alignment tolerance 0,2mm
- Screw connection of the 2 halves
- Position fixation with pin connection

390-12-01 – starterbar (half)

Screw connection (16x):

- DIN 933 – M12 x 60
- DIN 934 – M12
- DIN 6916 - 13

390-12- starterbar

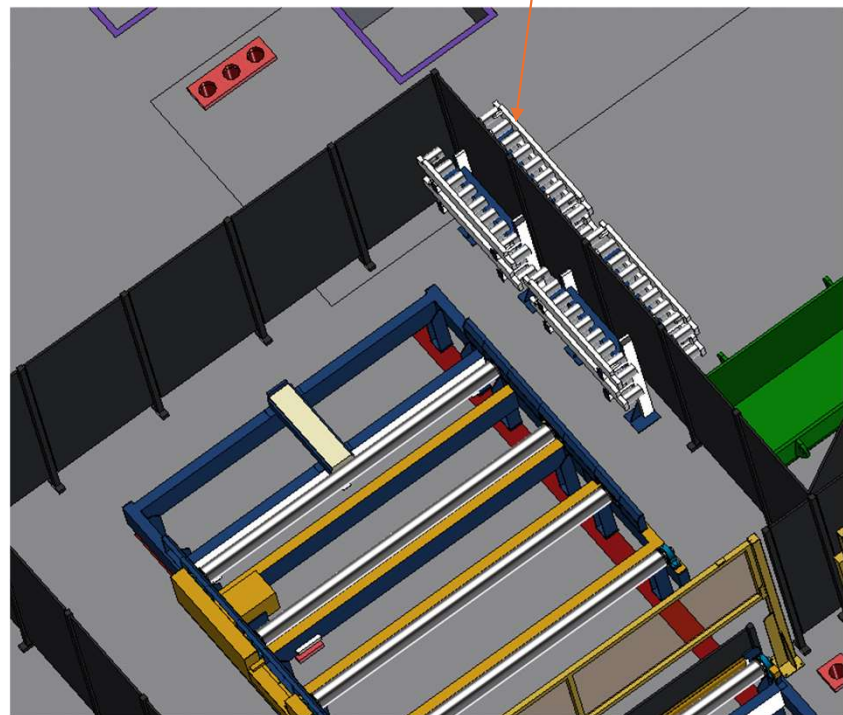
Pre-assembled units:

- 390-12-02 –starterhead storage
- Lifting weights: ~80kg (4x)

Main installation works:

- Lifting assembly to final area (after safety fence installation)
- Alignment to casting center line
- Alignment to cross conveyor center line
- Anchoring of foot plates (32x)

390-12-02 – starterhead storage



390-30- cabins

Units:

- 390-30-01 – sound protection cabin (flying saw)
- Delivered in pre-assembled segments
 - Roof: 9-11 segments
 - Short walls: 8-10 segments
 - Long walls: 22-26 segments
- Lifting weights: ~20 – 80kg (per segment)
- Rough dimensions [LxWxH]: 1.000 x 3.000 x 100 (per segment)

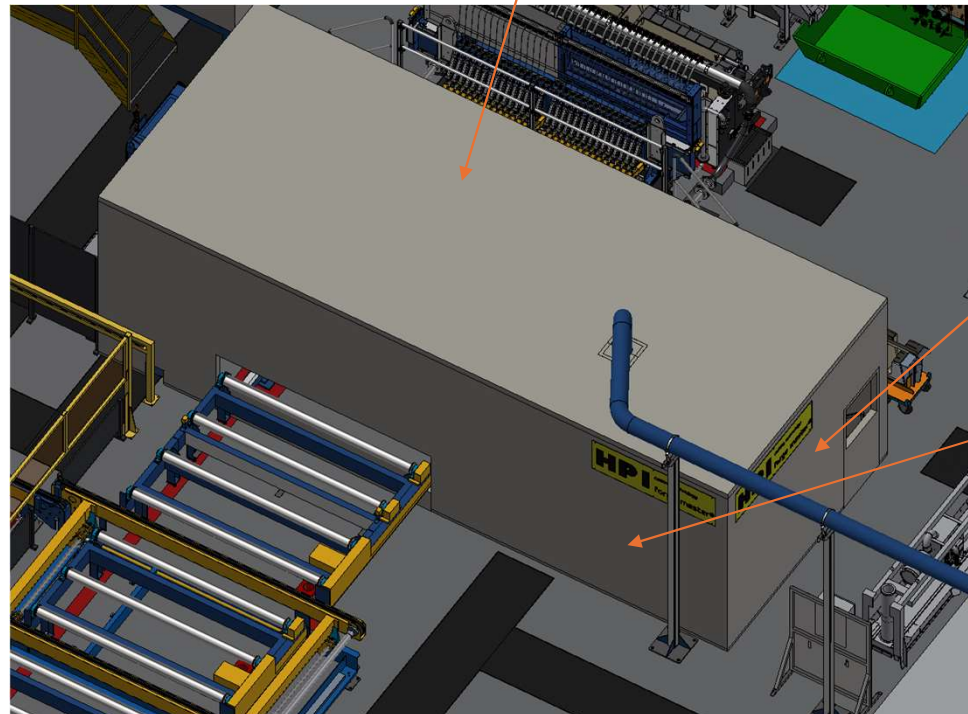
Main installation works:

- Lifting segments + frame parts to final area
- Installation of base frame
- Alignment to casting center line
- Alignment to saw pit
- Anchoring of base frame to foundation + saw pit wall
- Installing wall segments (connection with self-tapping screws)
- Installing top frame (connection with self-tapping screws)
- Installing roof segments (connection with self-tapping screws)
- Installation of safety door (screw connection + safety door lock)
- Installing of apertures (chip exhaust, roller conveyor, ...)
- Installing of company shields

390-30-01 – Cabin roof segments

390-30-01 – Short wall segments

390-30-01 – Long wall segments



390-13- mould lubrication

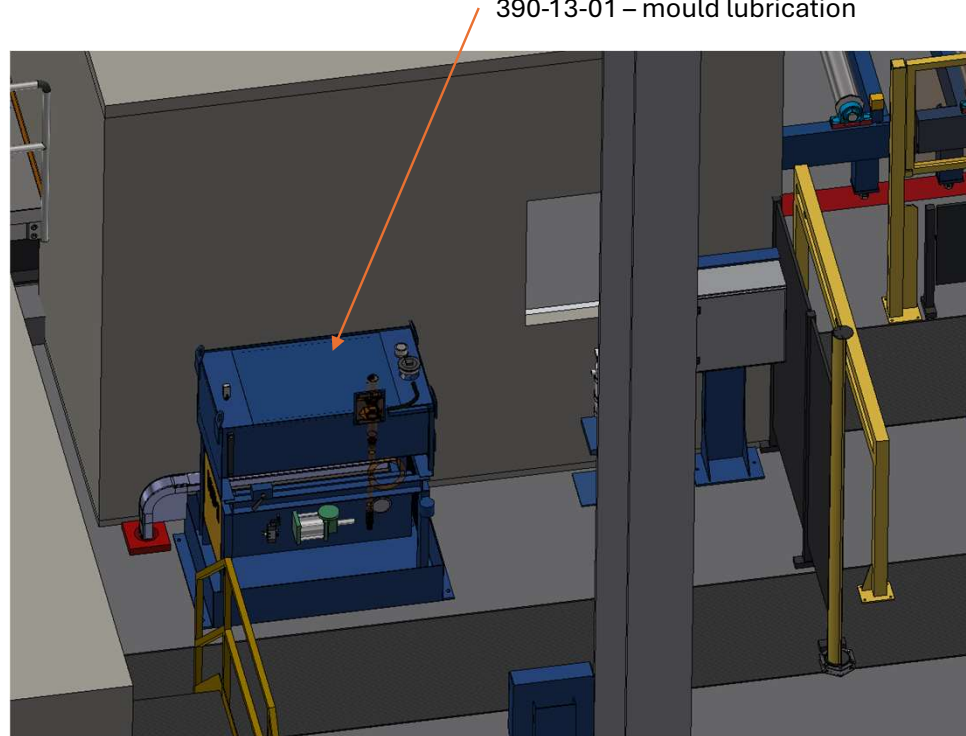
Pre-assembled units:

- 390-13-01 –mould lubrication
- Total weight: ~450kg
- Rough dimensions [LxWxH]: 1.600 x 1.000 x 1.600

Main installation works:

- Lifting assembly to final area
- Alignment to casting center line
- Alignment to saw pit wall
- Anchoring of foot plates (4x)
- Adjustment of media channel to conduit
- Piping of pneumatic
- Piping of mould lubrication
- Installing of suction pump (by customer)
- Prefilling of oil + final (on site) leakage test

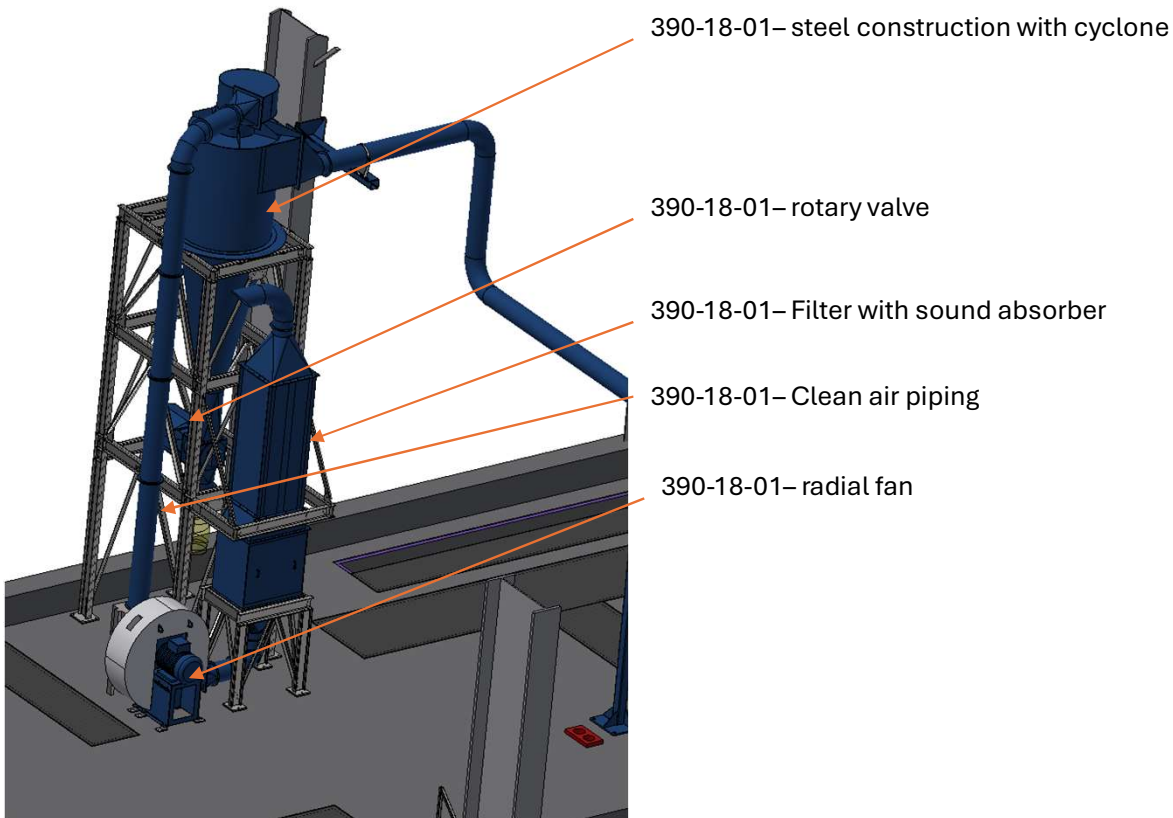
390-13-01 – mould lubrication



390-18- chip extraction

Pre-assembled units:

- 390-18-01 – chip extraction
- Disassembled for transport
 - Steel construction with cyclone (1.500x2.800x7.700)
 - Rotary valve (400x1.200x700)
 - Radial fan with insulation (1.500x1.100x1.500)
 - Filter with sound absorber (1.100x900x5.700)
 - Clean air piping
- Lifting weights: ~200 – 2.100kg



Main installation works:

- Lifting assemblies to final area
 - Attention: no overhead crane access
- Alignment to reference axis wall
- Alignment to saw pit reference
- Screw connection of transport units
- All pipe connections to be screwed and sealed together
- Anchoring of foot plates (38x)
- Adjustments on piping (length, flange, ...) with welding works (DN0250)

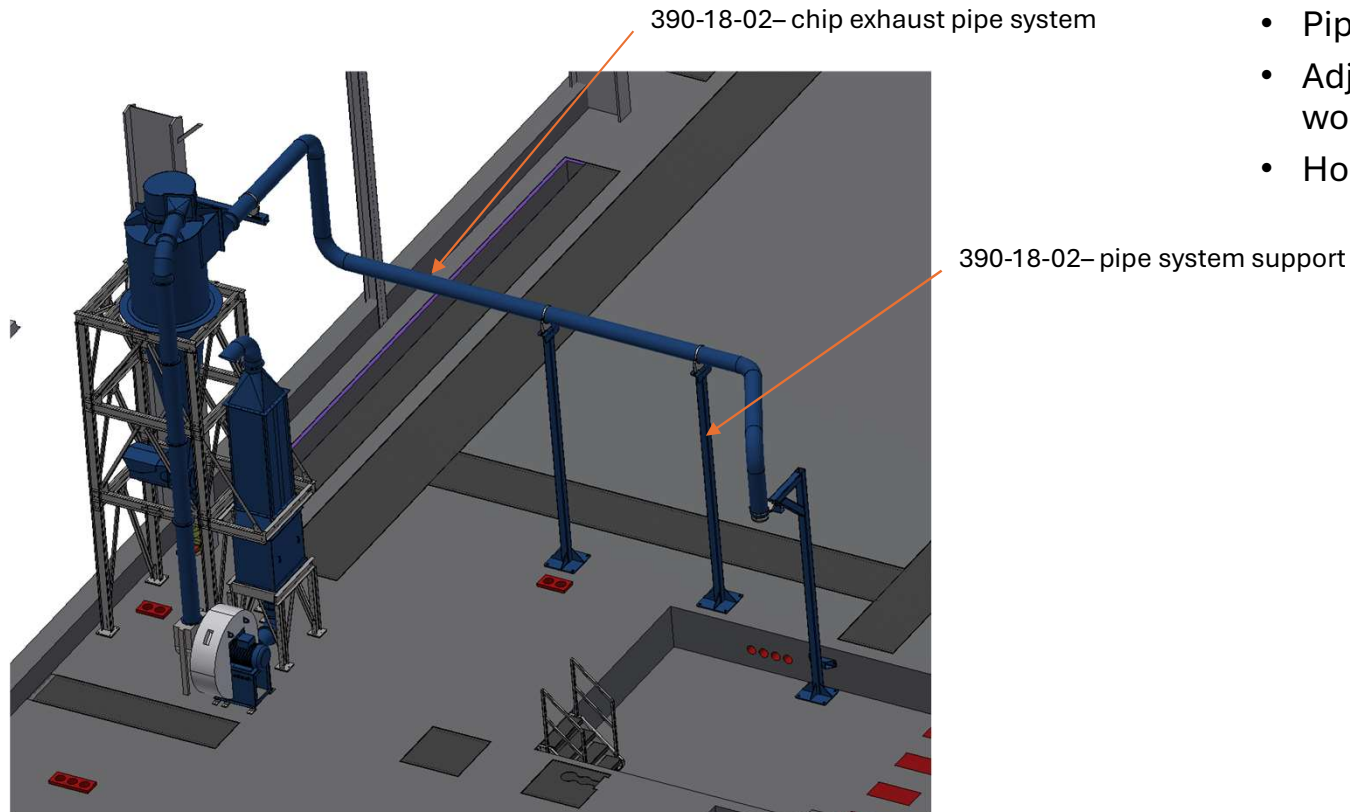
390-18- chip extraction

Units:

- 390-18-02 – chip exhaust pipe system
- Delivered in single parts
- Lifting weights: ~50 – 200kg

Main installation works:

- Lifting parts to final area
- Alignment to saw pit reference
- All pipe connections to be screwed and sealed together
- Pipe supports to be anchored on foundation (12x)
- Pipe support on hall-beam (clamp connection)
- Adjustments on piping (length, flange, ...) with welding works (DN0250)
- Hose connection with flying saw (DN0250)



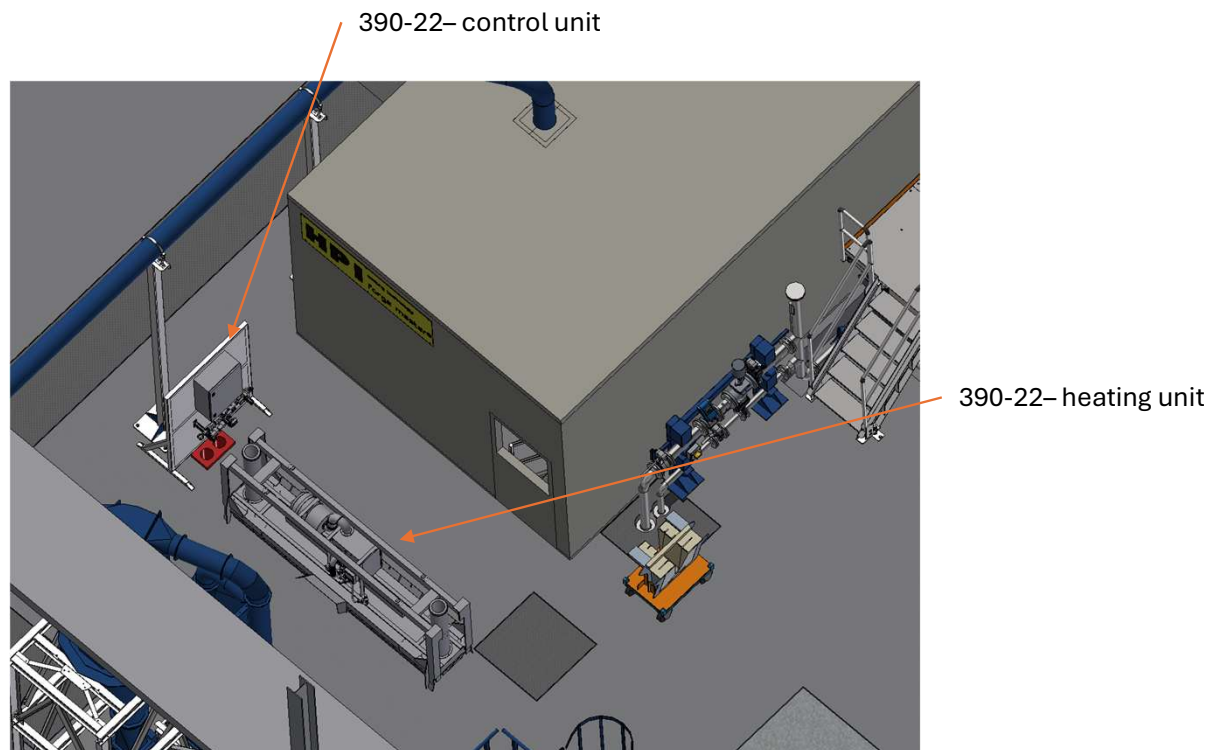
390-22- tundish preheating

Pre-assembled units:

- 390-22 – tundish preheating (heating unit)
- 390-22 – tundish preheating (control unit)
- Lifting weights: ~100 – 500kg
- Rough dimensions [LxWxH]: 3.300 x 700 x 1.400 (heating)
- Rough dimensions [LxWxH]: 900 x 1.300 x 1.800 (control)

Main installation works:

- Lifting parts to final area
- Alignment to casting center line
- Alignment to saw pit wall
- Anchoring of foot plates (4x)
- Piping of natural gas supply + leakage test
- Installation of hoses between heating and control unit



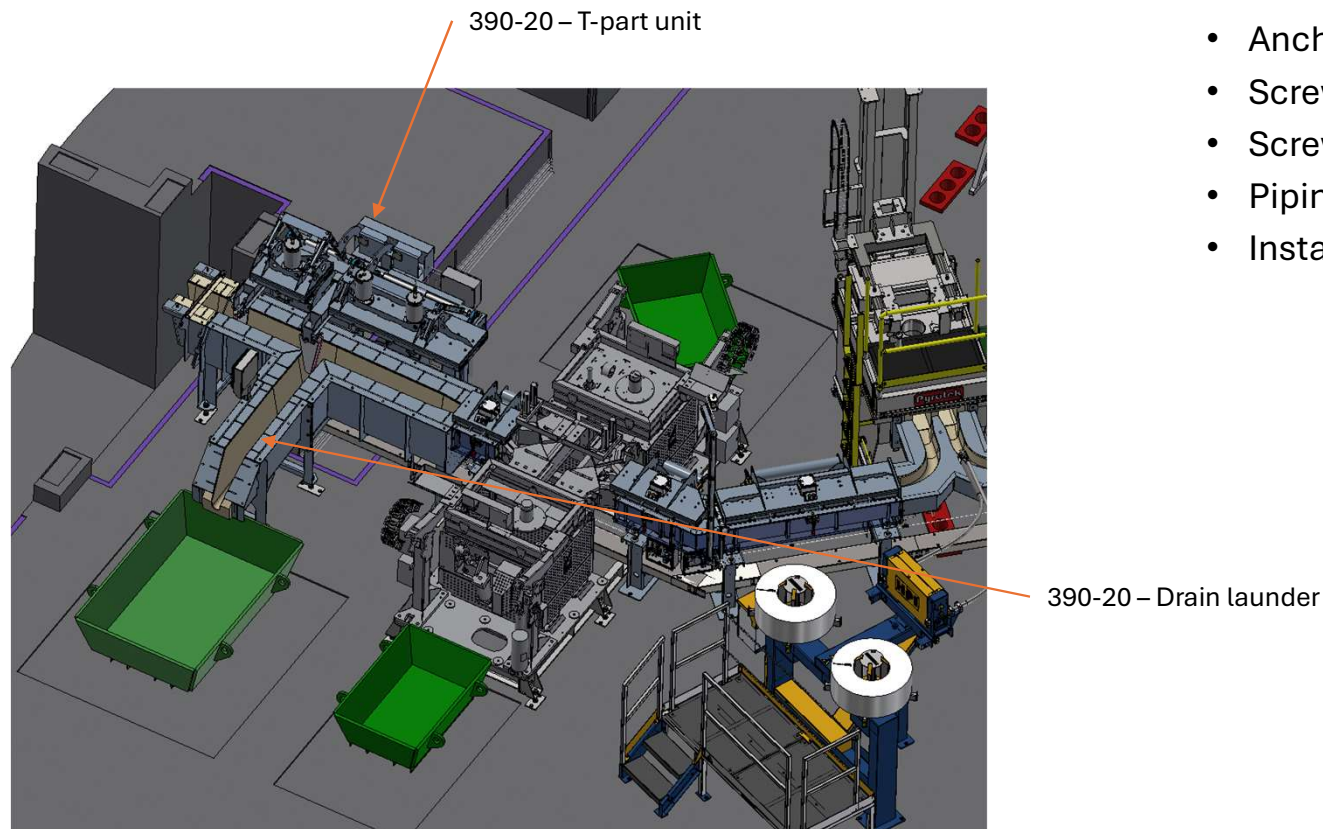
390-20- casting system

Pre-assembled units:

- 390-20 – T-part unit – 3.300kg
 - Rough dimensions [LxWxH]: 1.900 x 3.200 x 2.400
- 390-20 – Drain launder – 500kg
 - Rough dimensions [LxWxH]: 1.300 x 600 x 1.800

Main installation works:

- Alignment and anchoring of foot plates (8x)
- Lifting to final area
- Alignment to casting center line (tolerance 1mm)
- Alignment in height (tolerance 1mm)
- Welding of leveling screws (8x)
- Anchoring of additional supports (2x)
- Screw connection with CFF XS launder
- Screw connection between T-part + drain launder
- Piping of pneumatic
- Installation of cable trays



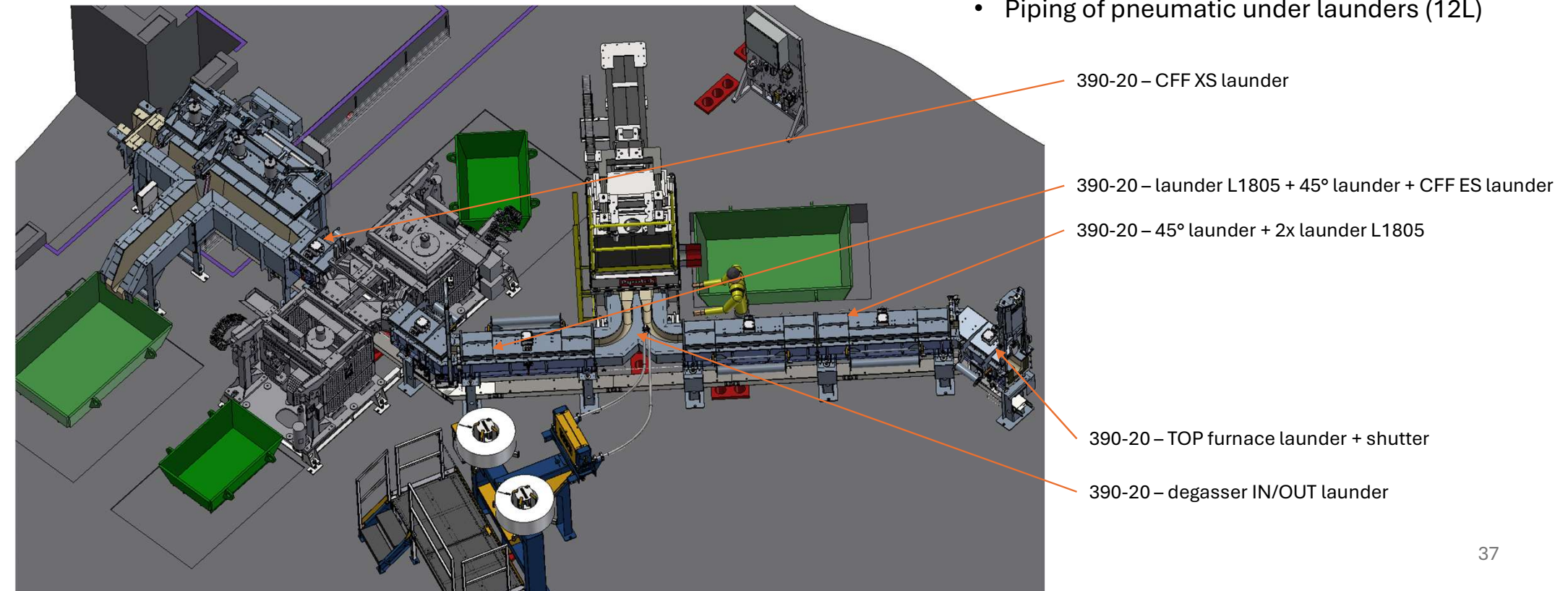
390-20- casting system

Units for assembling:

- 390-20 – TOP furnace launder + shutter – 480 kg (1.300x900x2.800)
- 390-20 – 45° launder + 2x launder L1805 – 1.100 kg (3.900x900x1.500)
- 390-28 – degasser IN/OUT launder – 250 kg (1.100x1.200x600)
- 390-28 – launder L1805 + 45° launder + CFF ES launder – 950 kg (3.000x1.200x1.500)
- 390-28 – CFF XS launder – 250 kg (600x900x1.500)

Main installation works:

- Lifting parts to final area
- Alignment to casting center line (tolerance 2mm)
- Alignment to casting machine reference + height (tolerance 1mm)
- Screw connections with transport units
- Anchoring of foot plates (8x)
- Installation of cable trays under launders
- Piping of pneumatic under launders (12L)



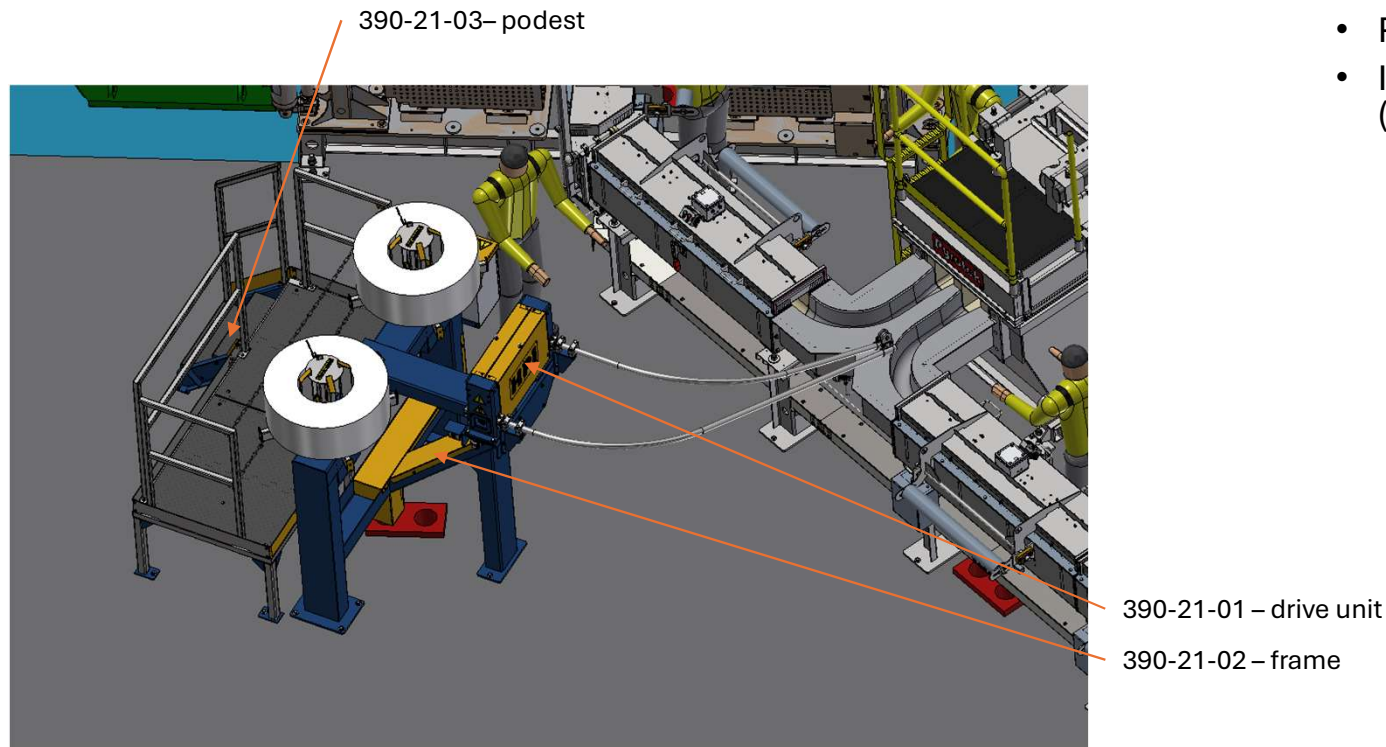
390-21- rod feeder

Pre-assembled units:

- 390-21-01 – drive unit
- 390-21-02 - frame
- 390-21-03 – pedestal (several delivery unit)
- Lifting weights: ~600 – 1.300kg
- Rough dimensions [LxWxH]: 2.200 x 1.600 x 2.100 (drive+frame)
- Rough dimensions [LxWxH]: 2.200 x 1.500 x 1.700 (podest)

Main installation works:

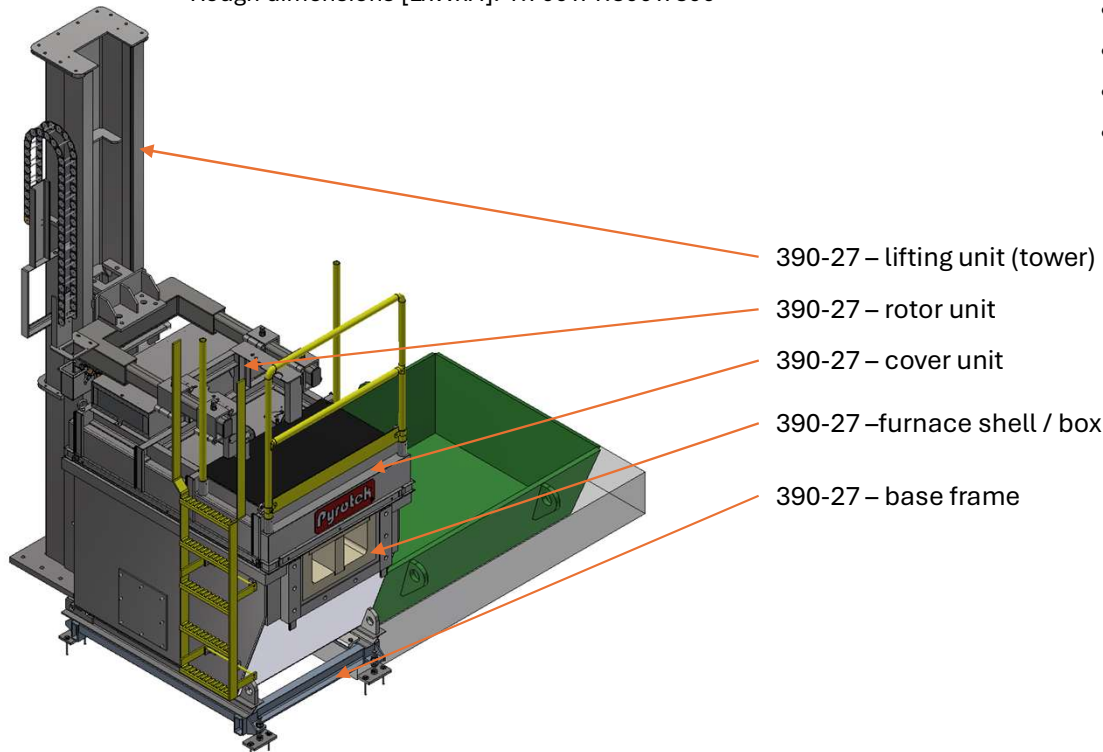
- Lifting parts to final area
- Alignment to casting center line
- Alignment casting machine reference
- Alignment to degasser inlet launder
- Installation and connection of pedestal
- Anchoring of foot plates (18x)
- Piping of pneumatic
- Installation of supply pipes to degasser inlet (adjustments in angles and length Ø42x3mm)



390-27- degasser

Units for assembling:

- 390-27 – furnace shell (box) – 4.100kg
 - Rough dimensions [LxWxH]: 1.700 x 1.300 x 1.200
- 390-27 – cover unit – 700kg
 - Rough dimensions [LxWxH]: 1.700 x 1.300 x 1.400
- 390-27 – rotor unit – 200kg
- 390-27 – lifting unit (tower) – 800kg
 - Rough dimensions [LxWxH]: 1.000 x 1.000 x 3.800
- 390-27 – base frame – 150kg
 - Rough dimensions [LxWxH]: 1.700 x 1.300 x 300



Main installation works:

- Lifting parts to final area
- Alignment to casting center line (tolerance 2mm)
- Alignment to casting machine reference (tolerance 2mm)
- Alignment to launder assemblies (tolerance 2mm)
- Anchoring of base frame foot plates (8x)
- Clamping connection between base frame and furnace shell
- Installation of lifting unit (tower)
- Alignment in height + screw connection with launder (tolerance 1mm)
- Welding of leveling screws (4x)
- Piping of pneumatic + process gas line (leakage test)
- Piping of exhaust gas line DN100 (with possible radial fan)
- Installation of cover unit + rotor unit
- ...
- Installation of argon + chlorine gas mixing panels (in mixing room from Al Invest)

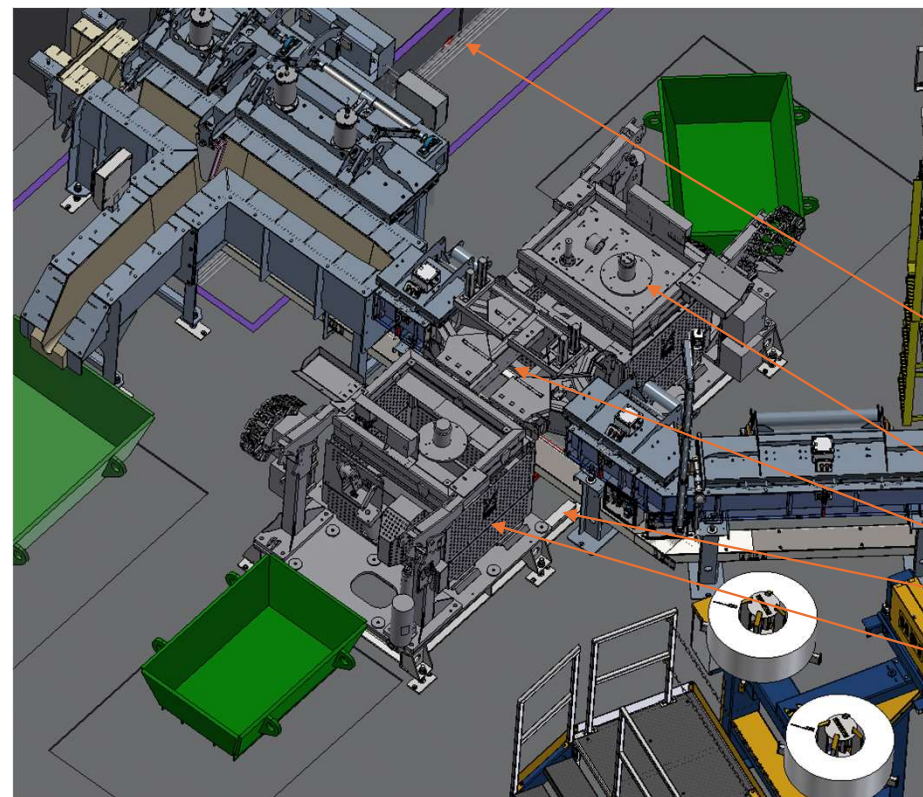
390-28- filterbox

Units for assembling:

- 390-28 – filterbox left – 2300 kg (1.600x1.600x1.500)
- 390-28 – filterbox right – 2300 kg (1.600x1.600x1.500)
- 390-28 – filterbox H-laundry – 550 kg (1.400x900x1.000)
- 390-28 – base frame – 550 kg (4.200x1.700x400)
- 390-28 – valve stand – 200 kg (600x1.100x1.500)

Main installation works:

- Alignment of foot plates + anchoring (16x)
- Lifting parts to final area
- Alignment to casting center line (tolerance 2mm)
- Alignment to casting machine reference
- Alignment to laundry assemblies (tolerance 2mm)
- Alignment in height + screw connection with laundries (tolerance 1mm)
- Welding of leveling screws (4x)
- Piping of pneumatic + natural gas (leakage test)
 - Between valve stand and filterbox (~17m pipe lengths)
 - 20L for natural gas (2x)
 - 12L & 8L for compressed air (4x & 4x)
 - 8L compressed air (H-laundry – 8x)



390-28 – piping (natural gas + pneumatic)

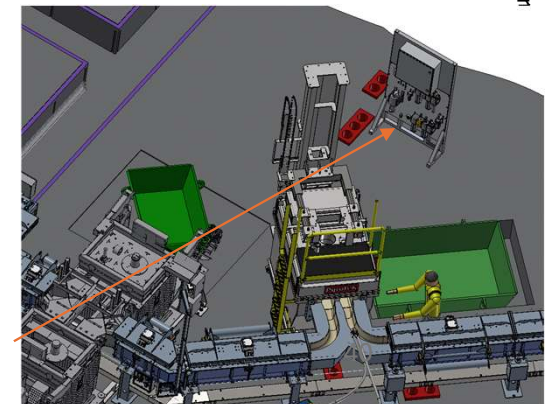
390-28 – filterbox right

390-28 – filterbox H-laundry

390-28 – base frame

390-28 – filterbox left

390-28 – valve stand



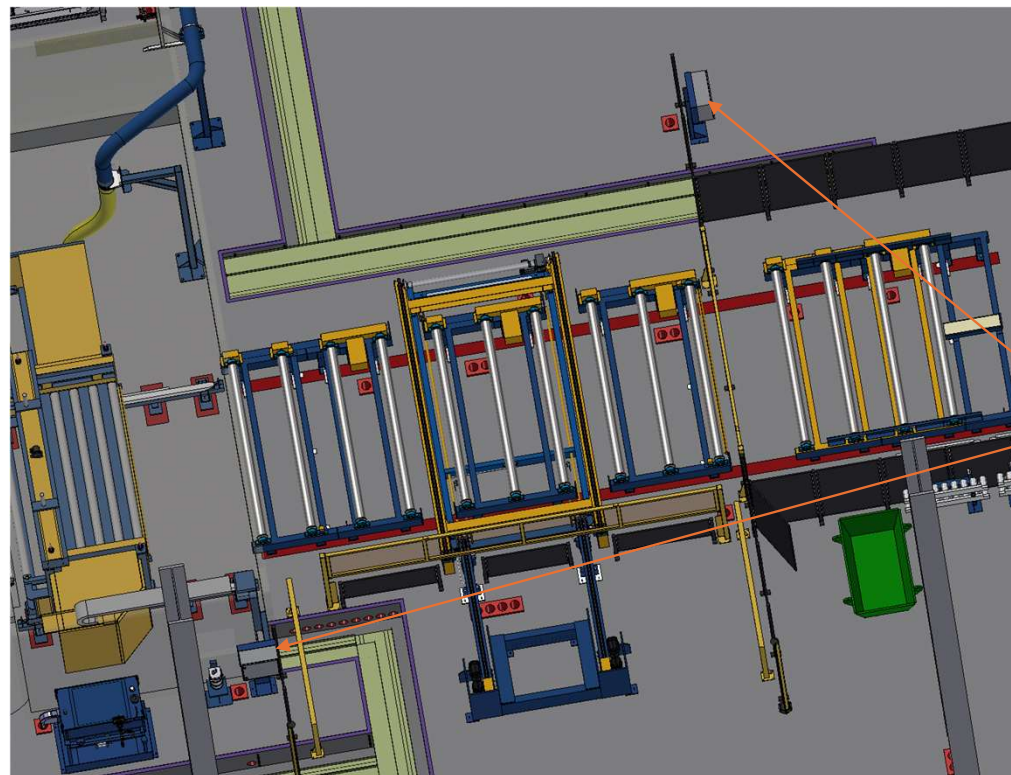
390-04- Electric accessories

Pre-assembled units :

- 390-04 – E-cabinets (exit control station) (2x 100kg)
 - Rough dimensions [LxWxH]: 700 x 400 x 1.700

Main installation works:

- Lifting parts to final area
- Alignment to casting center line
- Alignment to cross conveyor center line
- Anchoring of foot plates (8x)
- Completing of possible cable trays on floor level



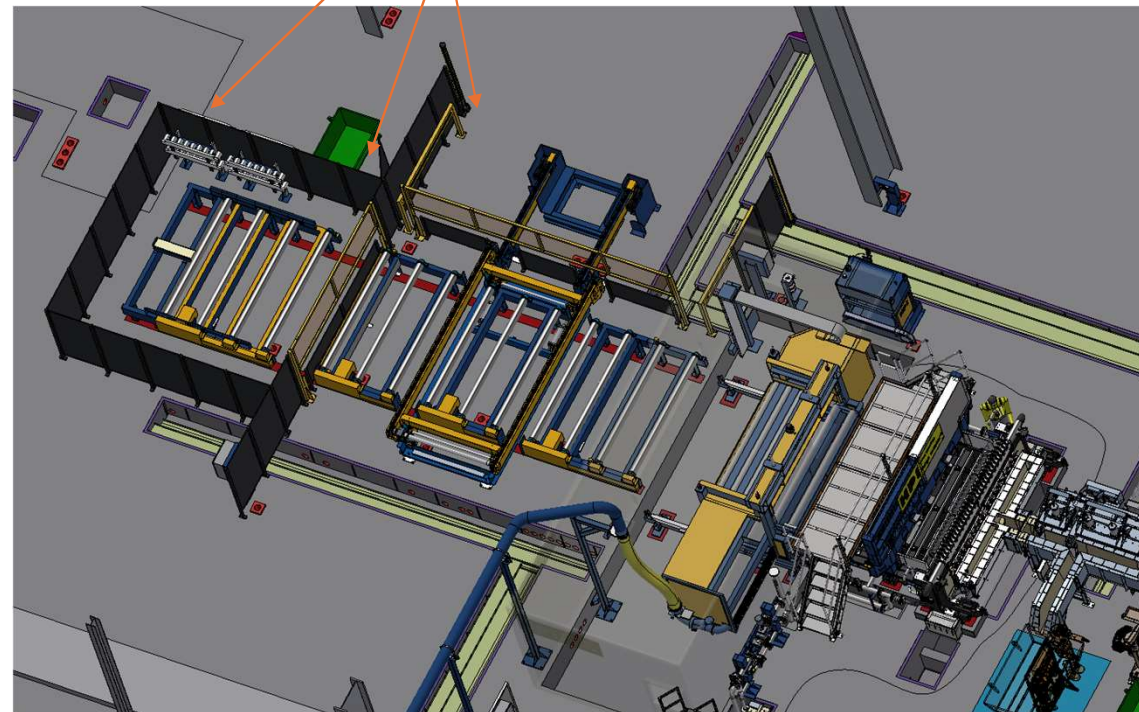
390-04 – E-cabinet (exit control stations)

390-31- Safety fences

Installation equipment:

- 390-31 – Safety fences / Safety doors / Light barriers

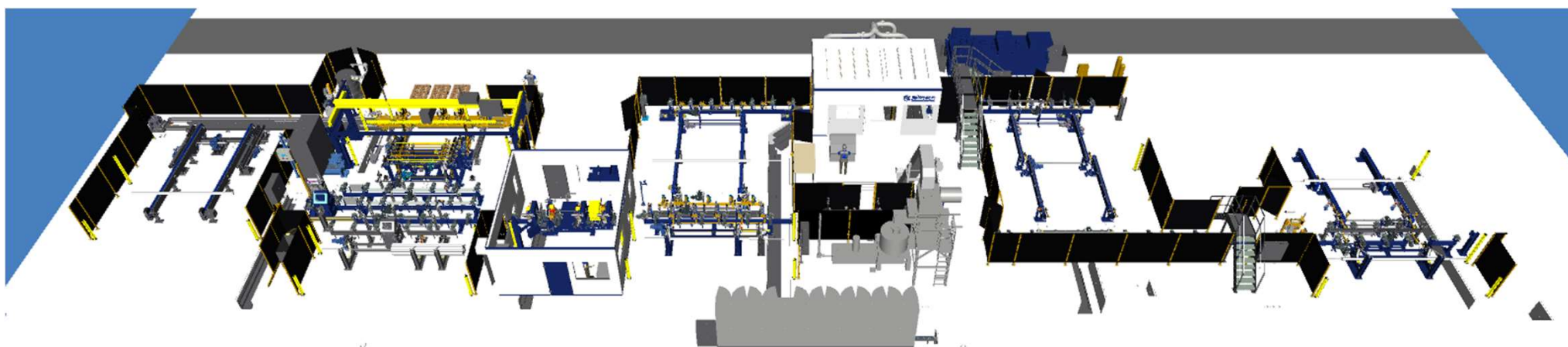
- 390-31 – Safety fences
- 390-31 – Safety doors with locking mechanism
- 390-31 – Light barriers



Main installation works:

- Lifting parts to final area
- Alignment to center lines / references / axis ...
- Alignment of light barriers to each other
- Installation of safety door mechanism to doors
- 3x safety doors
- 3x light barriers
- Expected total length of safety fences: 43m
- Anchoring foot plates of safety door stands (~25x)

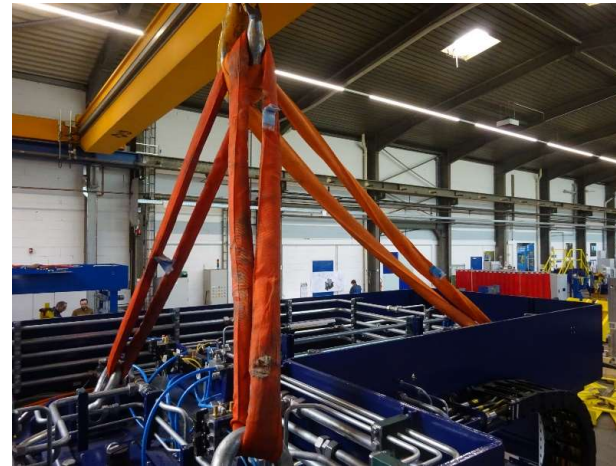
Assembly description Peeling- testing- and packing line type SPL 130 AL



Example pictures of delivery packages



Peeling machine
H24013A899.000



Chip conveyor B24013A889.000



Emulsion tank B24013AH22.000



Hydraulic unit B24013-041.000



Valve stand



Hydraulic tubes



Cross conveyors



Roller tables



Transport arms



Collecting cradle



Stopper



Testing table B24013 A661.000



Saw



Stacking cradle B24013A920.000



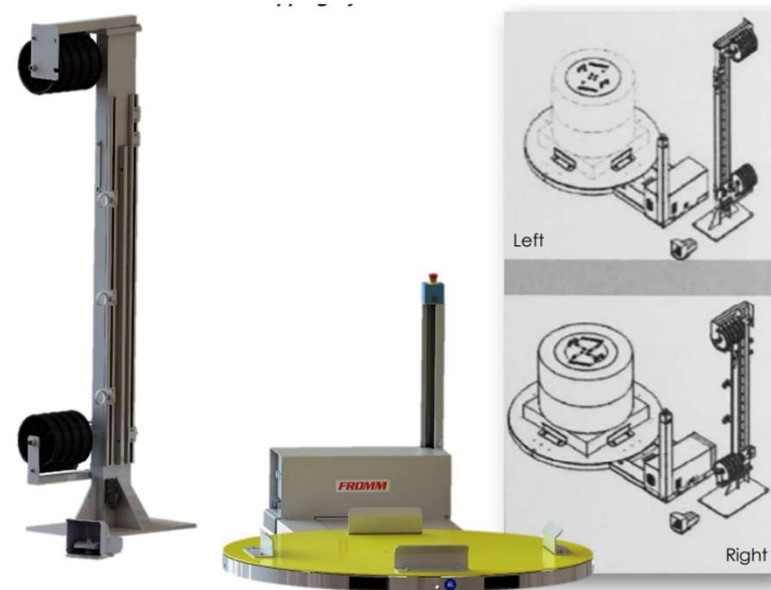
Bundle transport carriage B24013 A930.000



Bundle transport B24013 A940.000



Strapping unit B24013 A950.000



Bundle cross transport B24013A960.000



Bundle cross transport B24013A960.000



Junction boxes and operator desk



Electrical cabinet and brake resistor



Basic requirements for the start of assembly

- Completed hall incl. lighting
- Clean and level foundation
- Completely installed and grouted foundation frame for the peeling machine incl. gratings. The frame must be completely free of concrete residue!
- Cable ducts must be clean and dry
- Indoor crane ready for operation and available
- Construction site reference point defined and communicated
- Functioning construction site power supply 400 V 32 A , 230 V 16 A
- Location for Bültmann construction site container (LxWxH) 6100x2450x2600 mm the container must be equipped with a power supply (400 V 32 A)
- Space for assembly workbench
- Provision of sanitary facilities
- Provision of heated office/break rooms or containers incl. seating and tables
- Provision of changing facilities
- Provision of an Internet connection
- Provision of a lockable material container, preferably with shelving. (Size 20 feet sea container or similar)
- Provision of drawing tables in the field
- The tools listed in the tool list are available to Bültmann's fitters and also to the installation company.
- The installation company must assess which tools or lifting equipment etc. they must provide for the local conditions; this should be clear to a specialist company from these instructions and the weights stated in the installation plan.
- Responsible site manager from AL Invest should be determined
- Responsible site manager from the installation company should be appointed
- Foremen responsible for electrical and mechanical work at the installation company should be appointed
- The persons listed above should be able to communicate professionally in English.

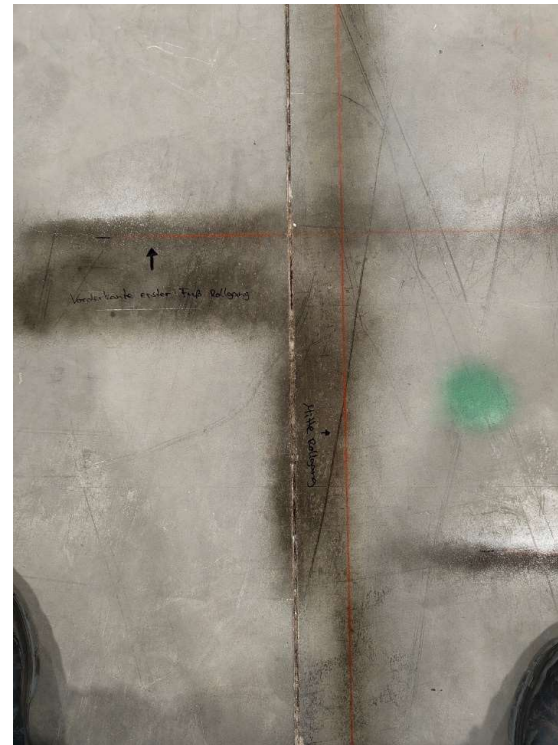
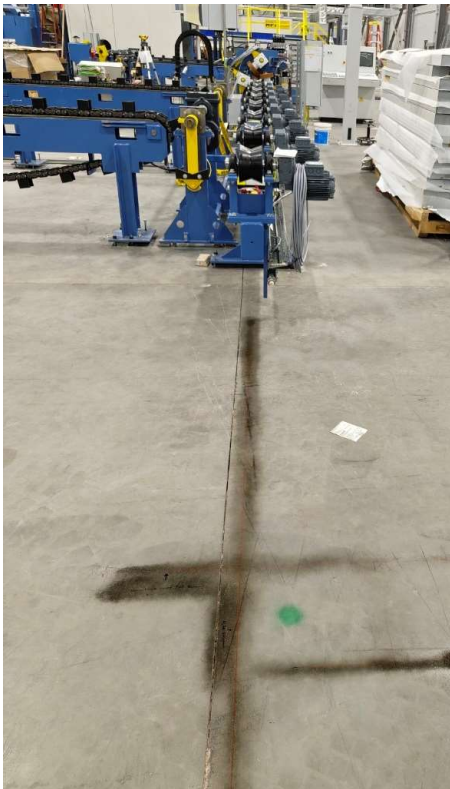
General mechanical assembly procedure (explanation of the basics)

Construction site preparations :

- Safety training
- Project meeting with all parties involved
- Site inspection
- Setting up the workplace
- Visual inspection of foundation
- Checking the reference point
- Measurement of foundation (highest and lowest point)
- Determine height reference
- Marking the reference lines (plant reference point Bültmann)

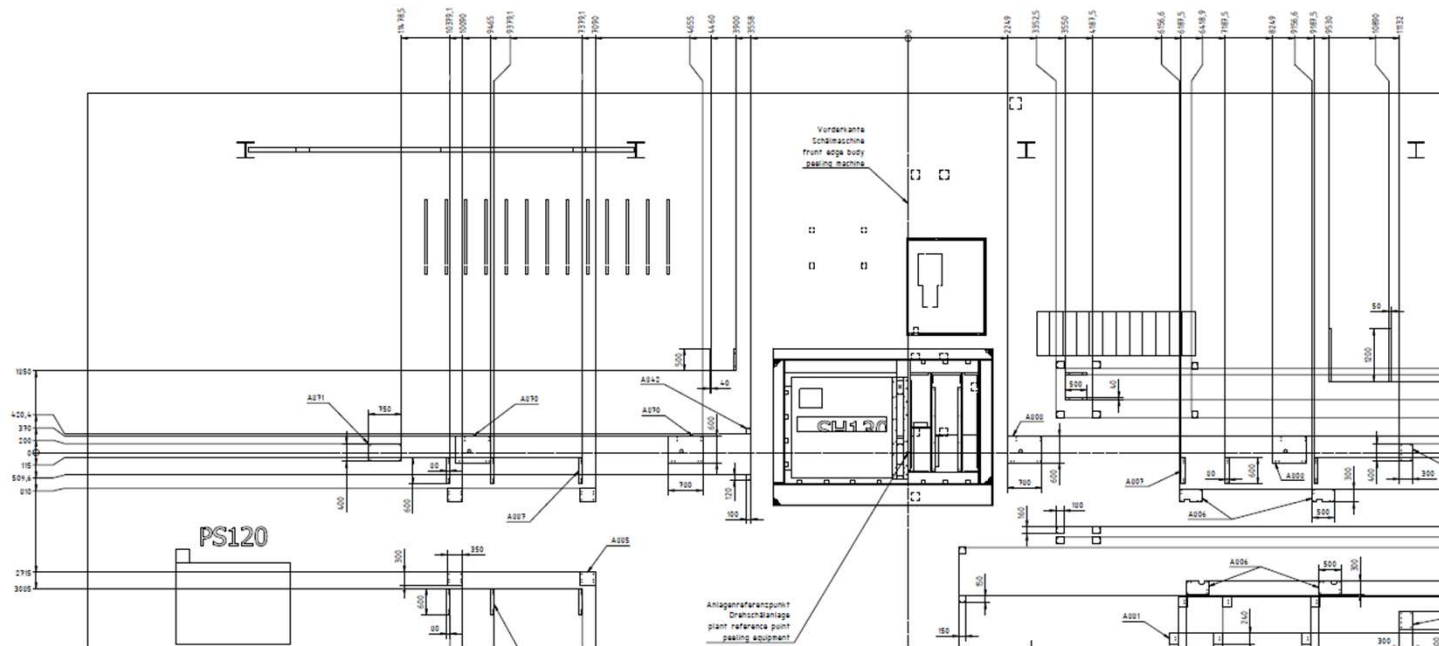
67

Example marking center lines

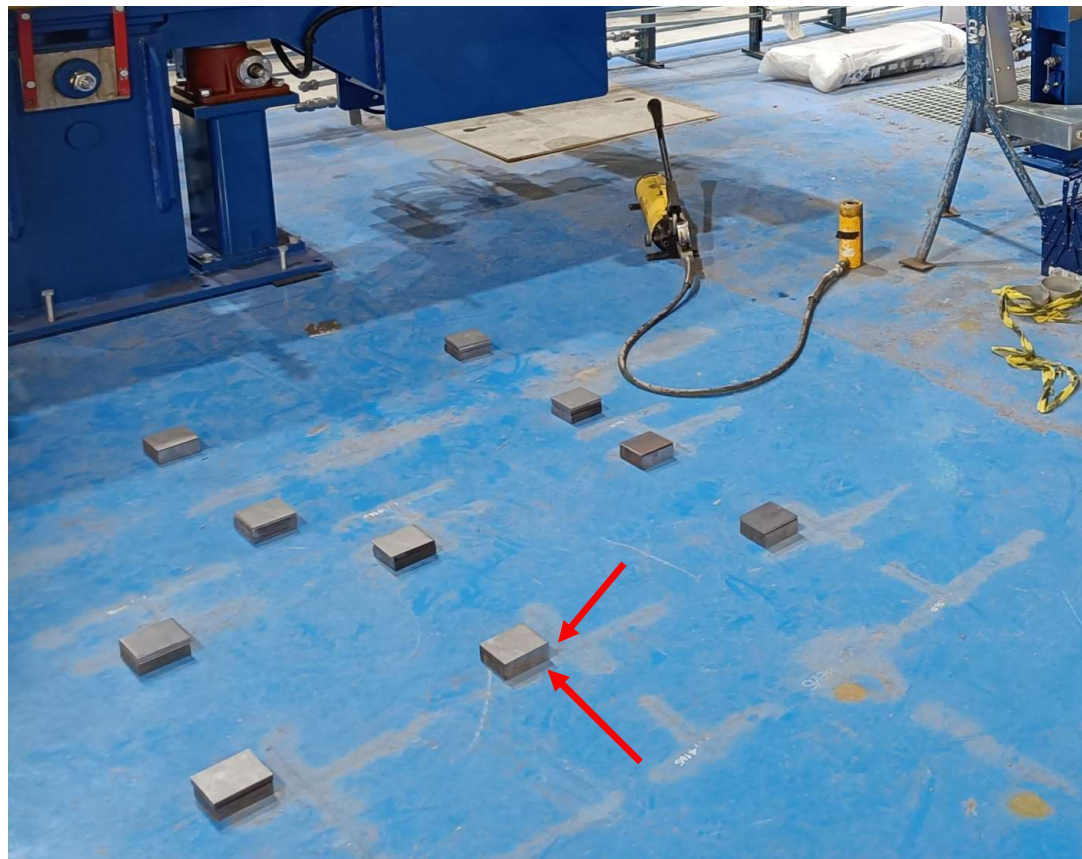


Marking of foot plates

In the next step, all base plates of the assemblies to be set up are marked using a punch line and tape measure as specified by the Bültmann personnel. Marking the base plates serves to roughly position the assemblies.



Example marking base plates



Preparation of relining material

In this step, relining sheets are placed on the points marked in the previous step with the aid of a rotary laser or cross line laser and all brought to the same height (tolerance +/- 2 mm) to compensate for foundation unevenness. This step must be carried out for all assemblies under the close supervision of a Bültmann employee.



Placing the machine parts

Next, the assemblies can be placed on the aligned shims and aligned according to the markings on the floor. If the assemblies have been transported separately, they must also be reassembled at the separation points using screws and pins.



Fine adjustment of machine parts

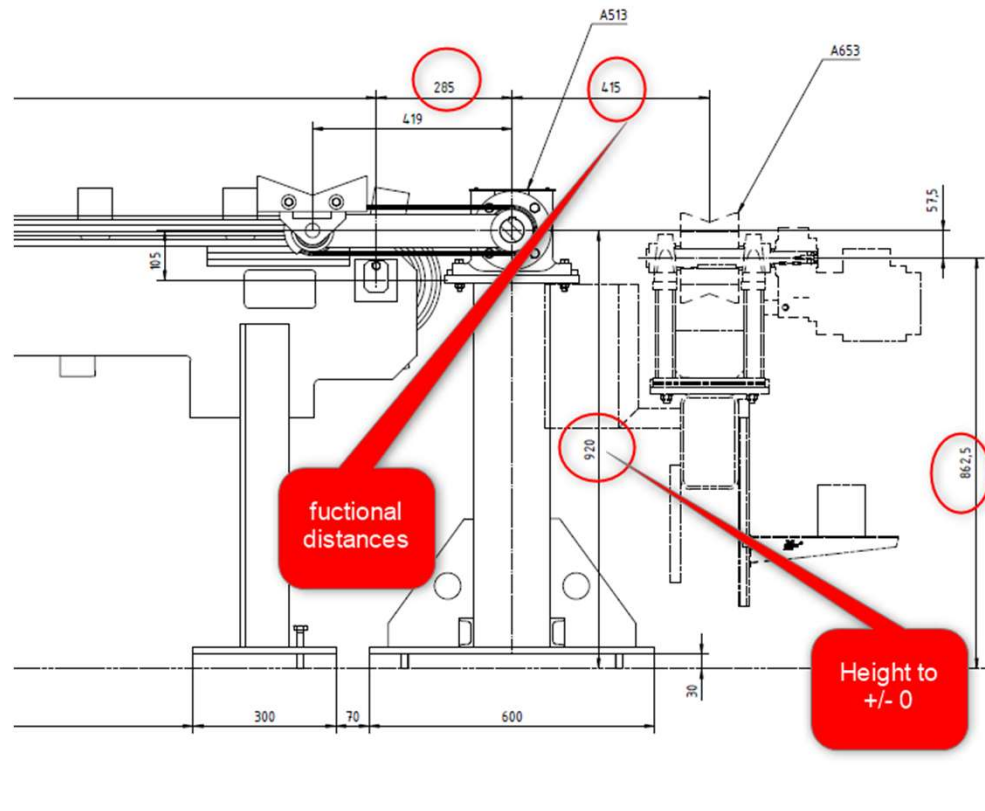
In this step, the assemblies are aligned to each other in height and direction according to their functional dimensions; the assembly company's employees are provided with the dimensions for this purpose and the Bültmann employee checks these randomly.

The height measurements are to be aligned with each other using a rotation laser or cross line laser, referenced to the marked reference height on the hall pillar.

The alignment in direction and scale must be aligned to each other and to the marked center lines using a water level, cross line laser or plumb line and tape measure.

The alignment tolerance should not exceed ± 1 mm; if this cannot be adhered to, this must be agreed with a Bültmann employee who will decide whether this deviation is acceptable or unacceptable.

Example of section view with functional distances



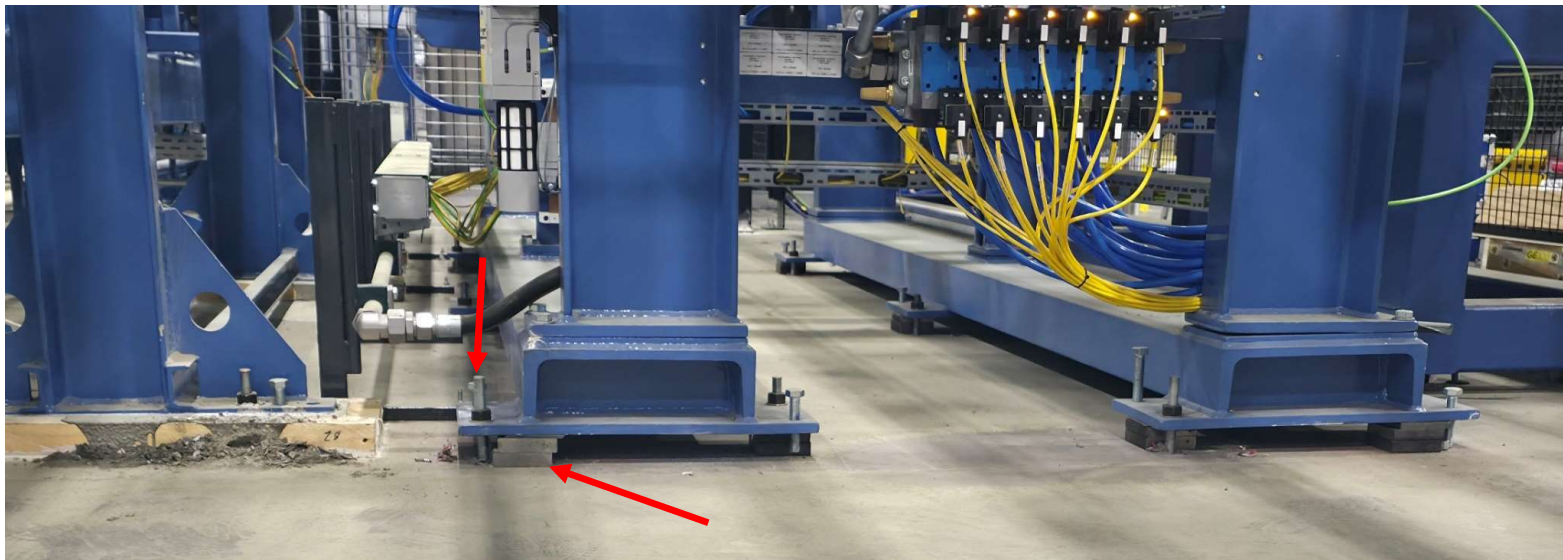
Fastening the components

Once the assemblies are aligned and **fully** supported with shims next to the anchor (see next slide for explanation), they must be fastened with anchor bolts.

Fastening is carried out with Hilti HVU2 composite anchor cartridges in combination with HAS-U 5.8 M12 x 160 or M16 x 190 anchor rods or with HST 3 impact dowels (M10, M12 in various lengths). Installation instructions for these dowels can be found in the appendix. The fixing material as well as the shims are provided by Bültmann.



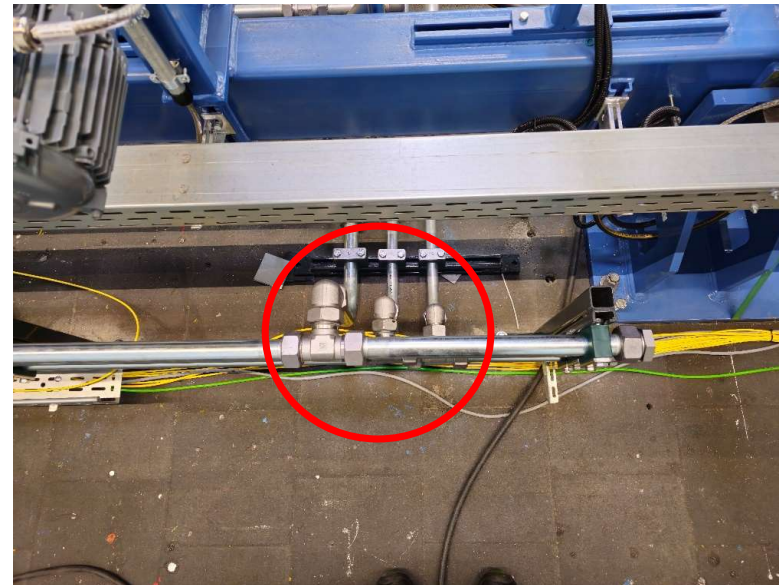
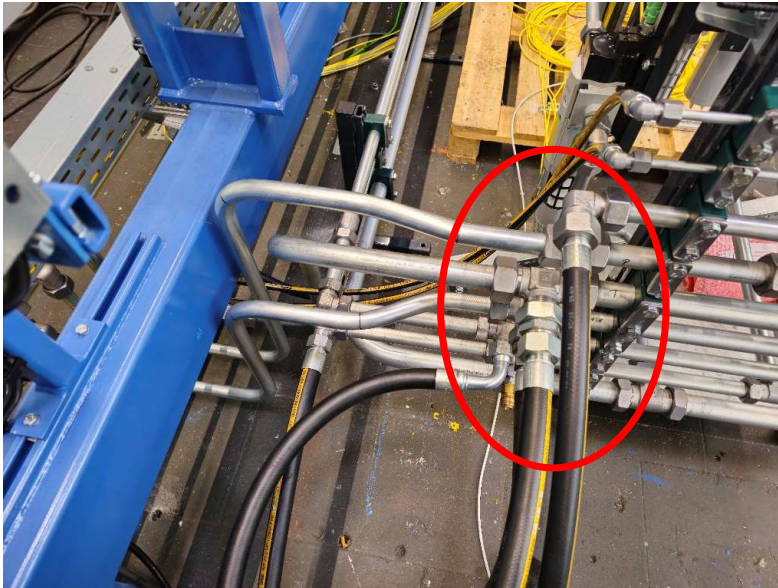
After fine adjustment, the base plates directly next to the dowels must be completely underlaid with shims; the adjusting screws do not serve as a support, they are only used for fine adjustment; in the best case, they should no longer be loaded after the shims have been underlaid !



Connection and installation of pipes and cable ducts

Once the assemblies have been aligned and secured, the prefabricated pipes and cable ducts can be installed.

Hoses, pipes and cable ducts must be connected and the uprights dowelled to the pipes.



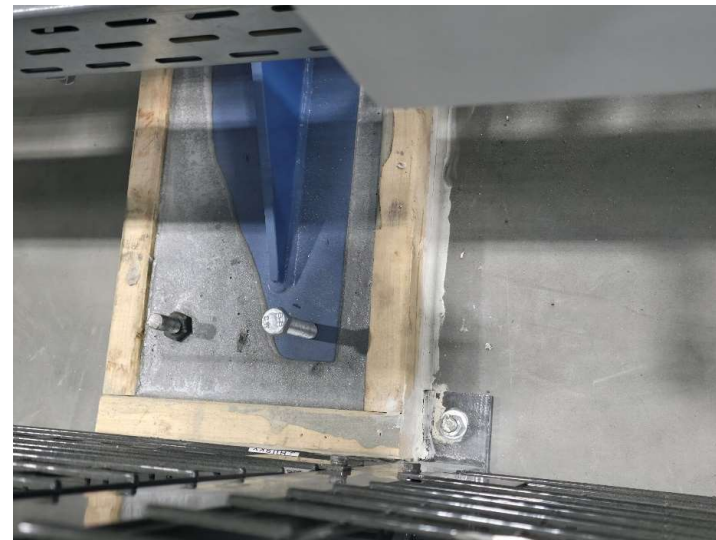


Grouting of base plates

Once an area has been fully installed and the dowels have been tightened, the base plates can be cast with a grout.

The grouting must be carried out by a specialist company assigned by AIB.

A data sheet for a suitable product can be found in the appendix.



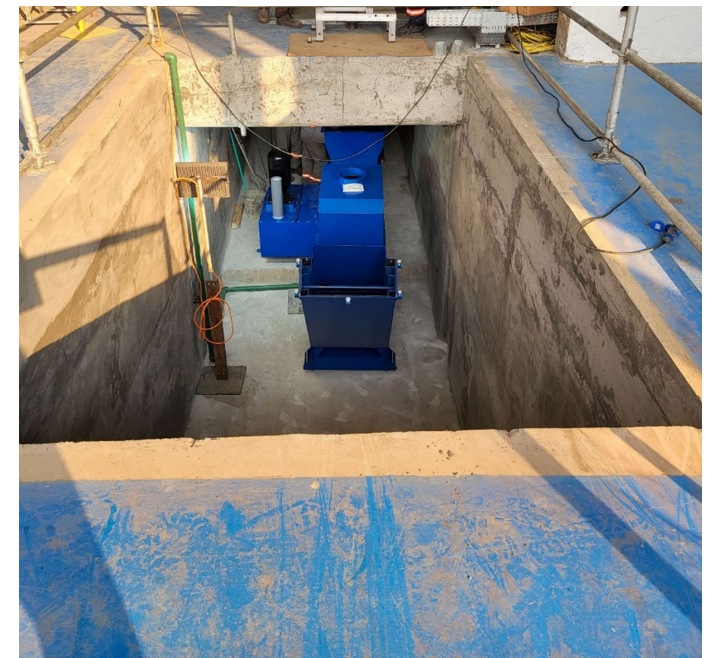


Detailed machanical assembly sequence

The exact assembly procedure is explained in the following section. The detailed time sequences as well as the weights of the assemblies can be found in the assembly plan.

The chip conveyor is delivered disassembled and must be assembled on site

Assembly of part 1



Assembly of part 2 and ^ 3



Assembly of chain



Chip conveyor and chip preparation





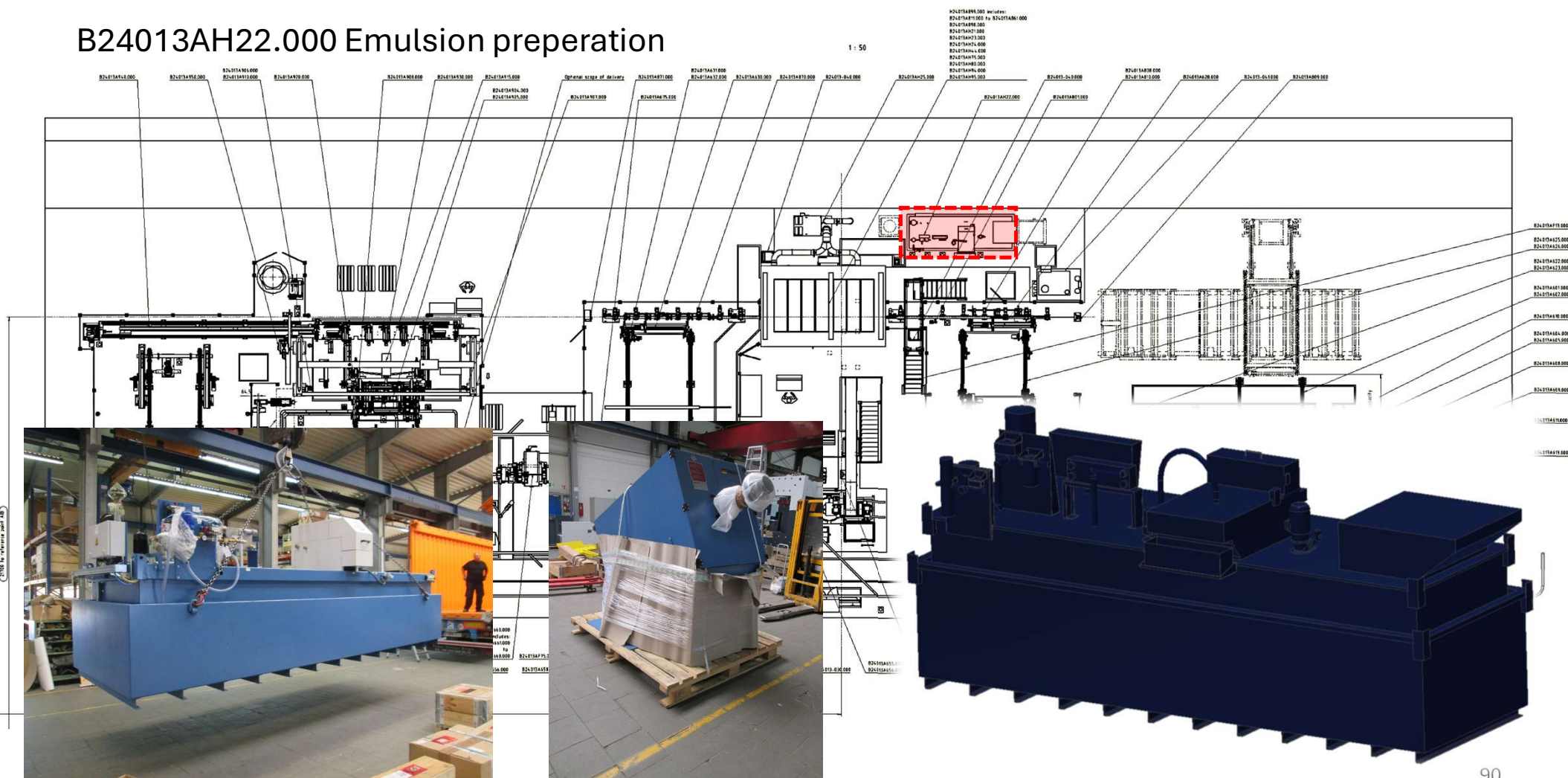


Assembly peeling machine :

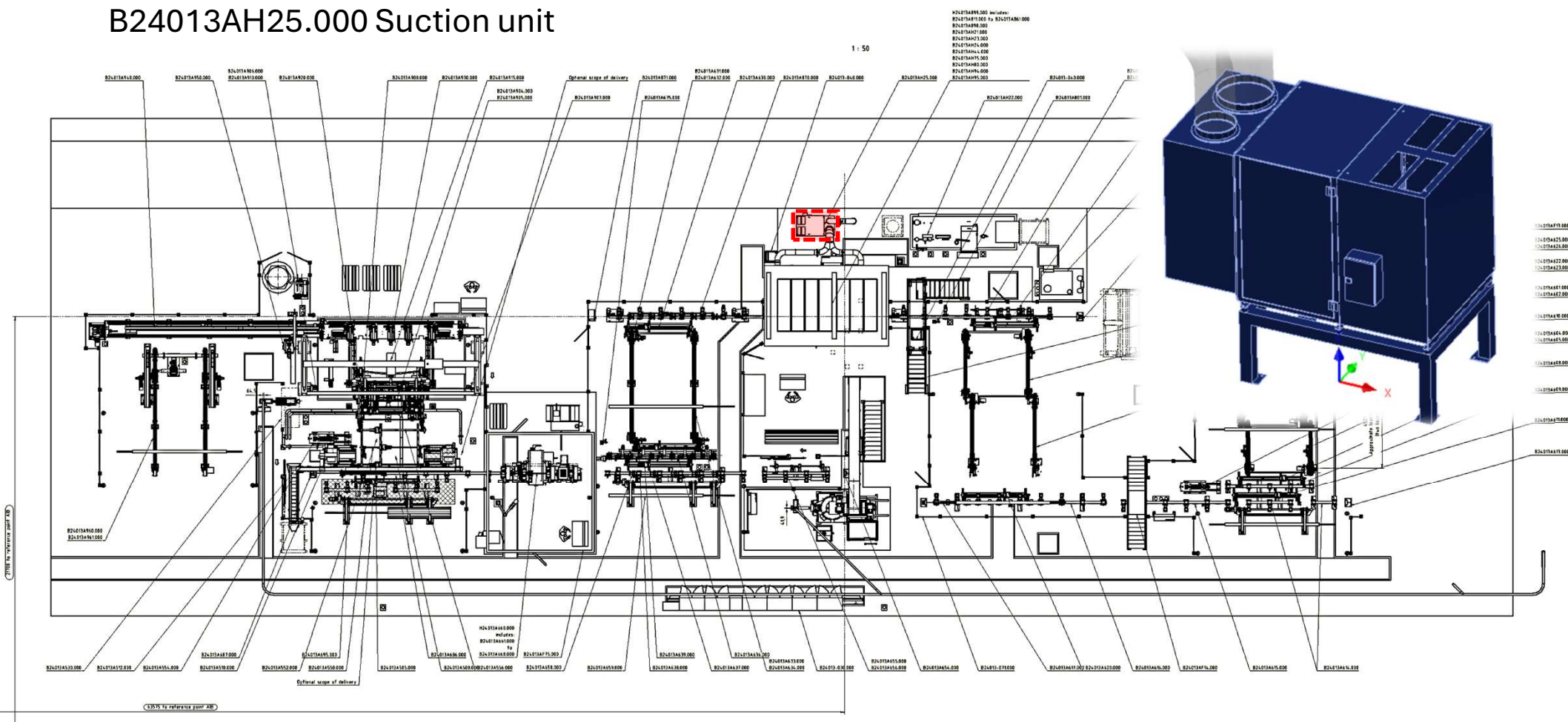
- Place the peeling machine with mobile crane on the markings of the foundation frame
- Align the peeling machine with the marked center lines
- Align the peeling machine with the machine water level
- Welding the peeling machine

	<p>Filled weld:</p> <ul style="list-style-type: none"> + normal tolerances according to DIN EN ISO 13920-BF + evaluation group C according to DIN EN ISO 5817
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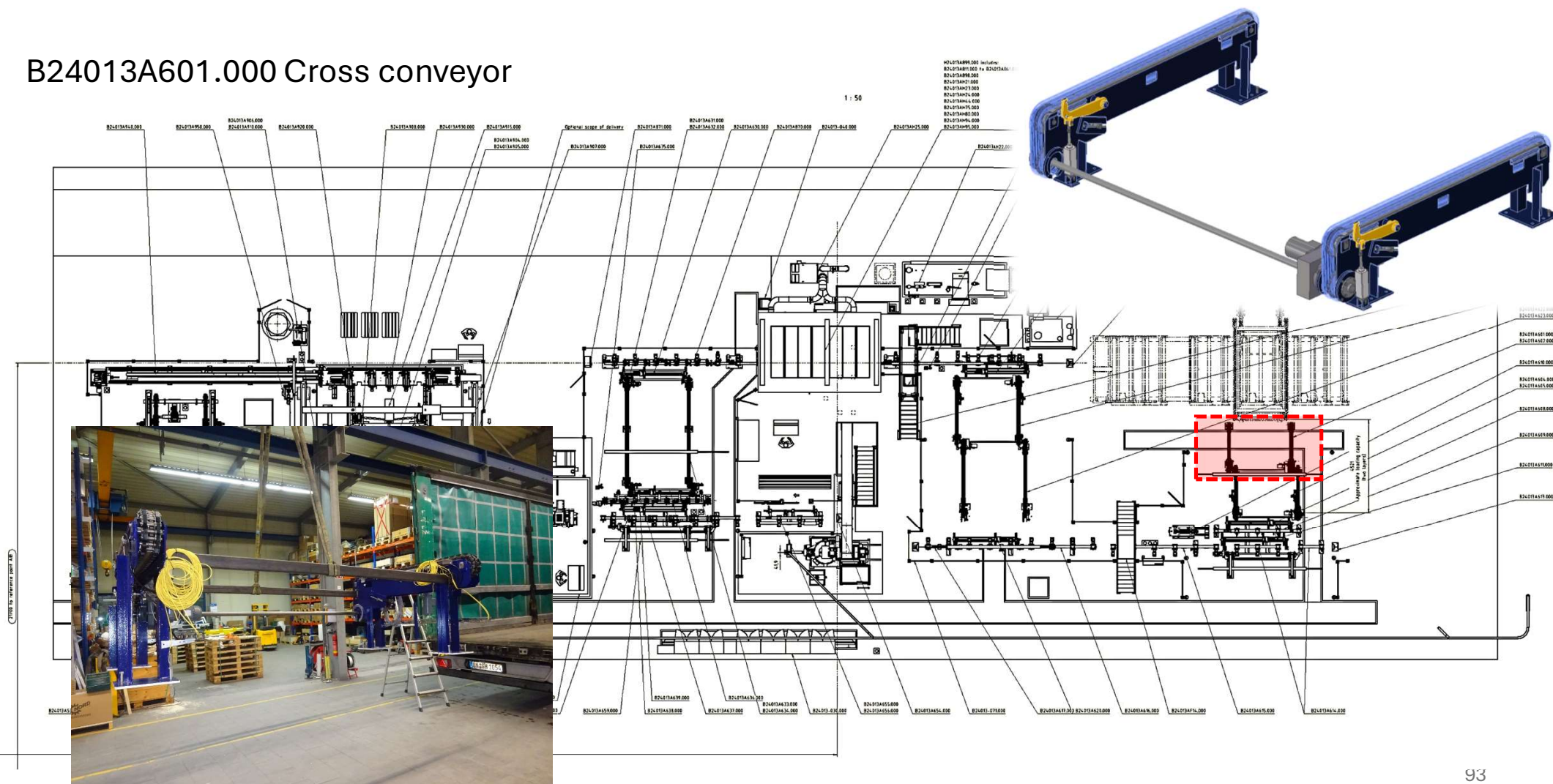
B24013AH22.000 Emulsion preperation



B24013AH25.000 Suction unit

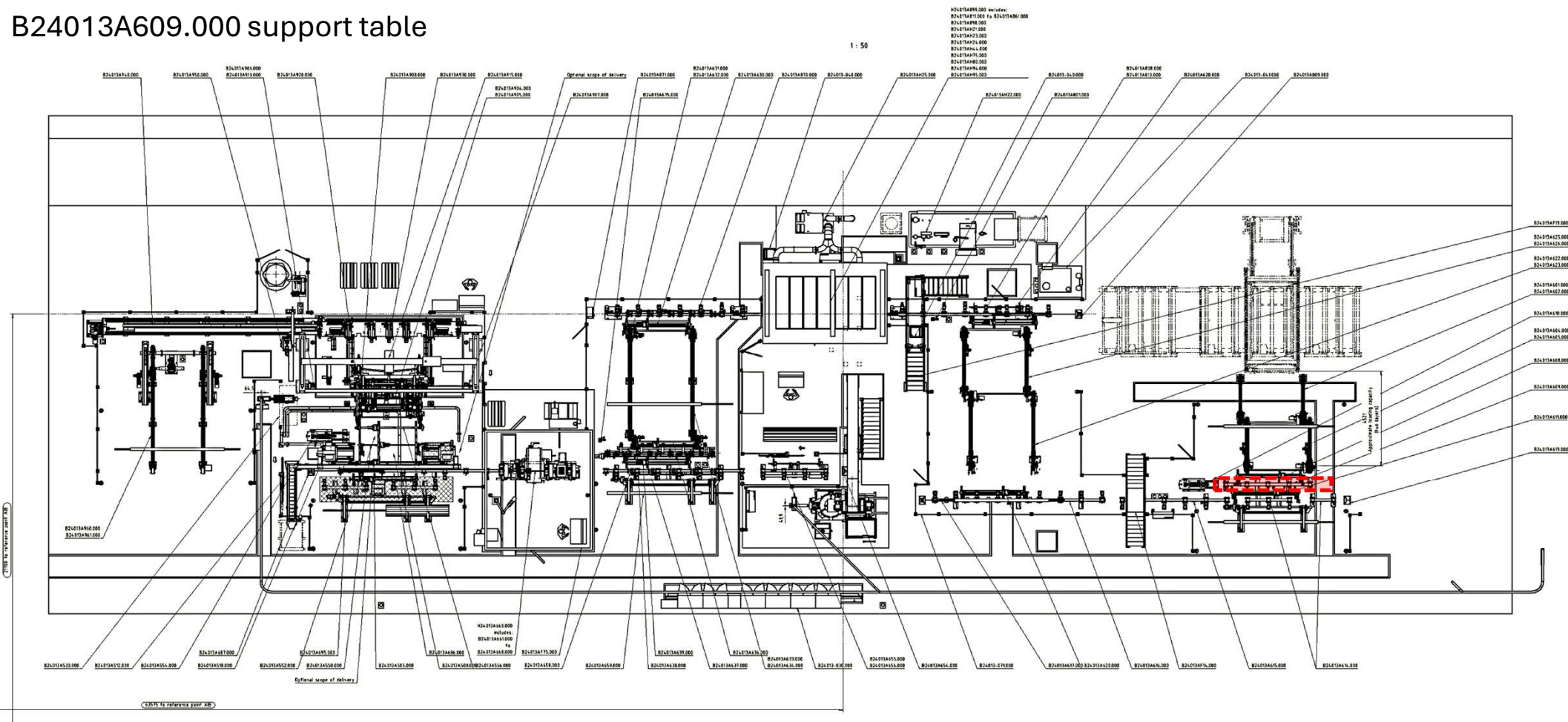


B24013A601.000 Cross conveyor

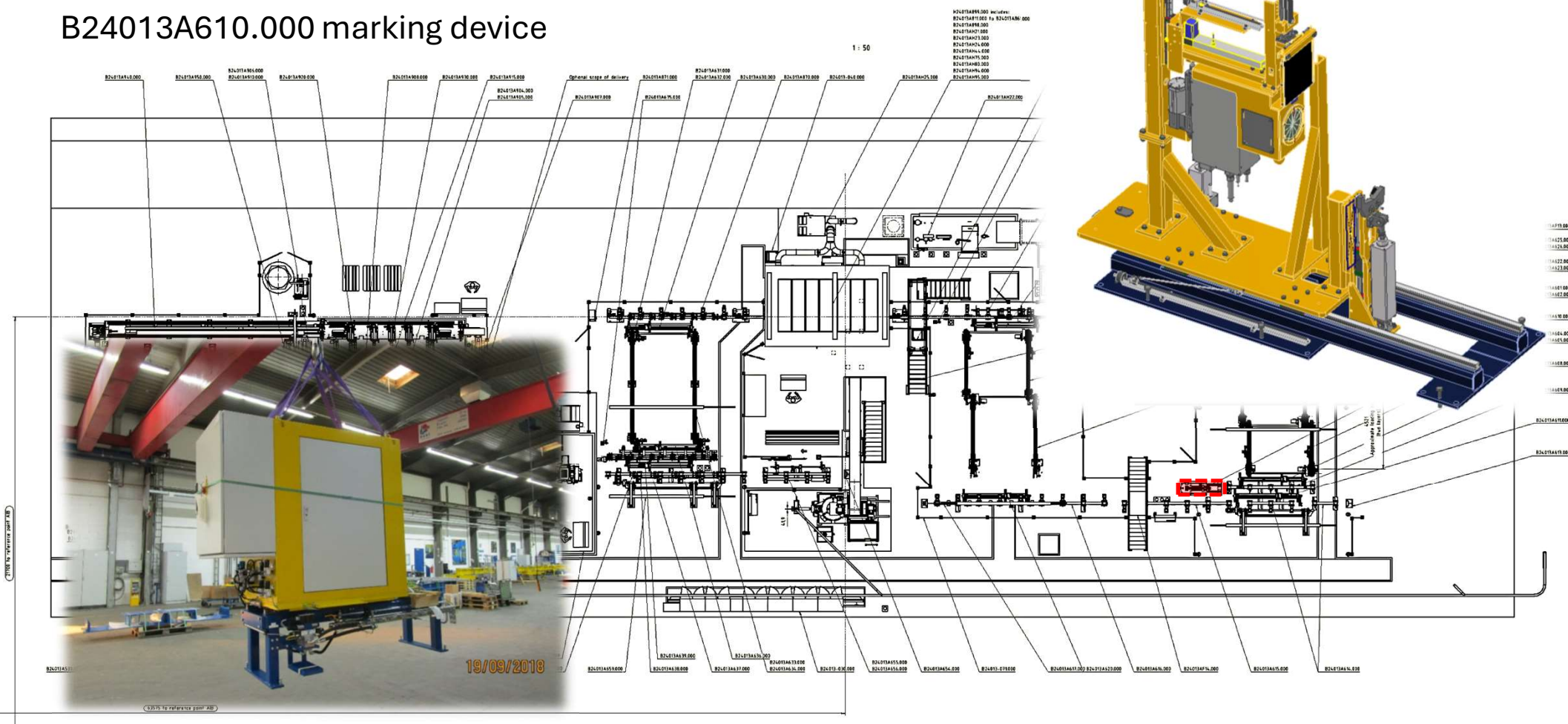




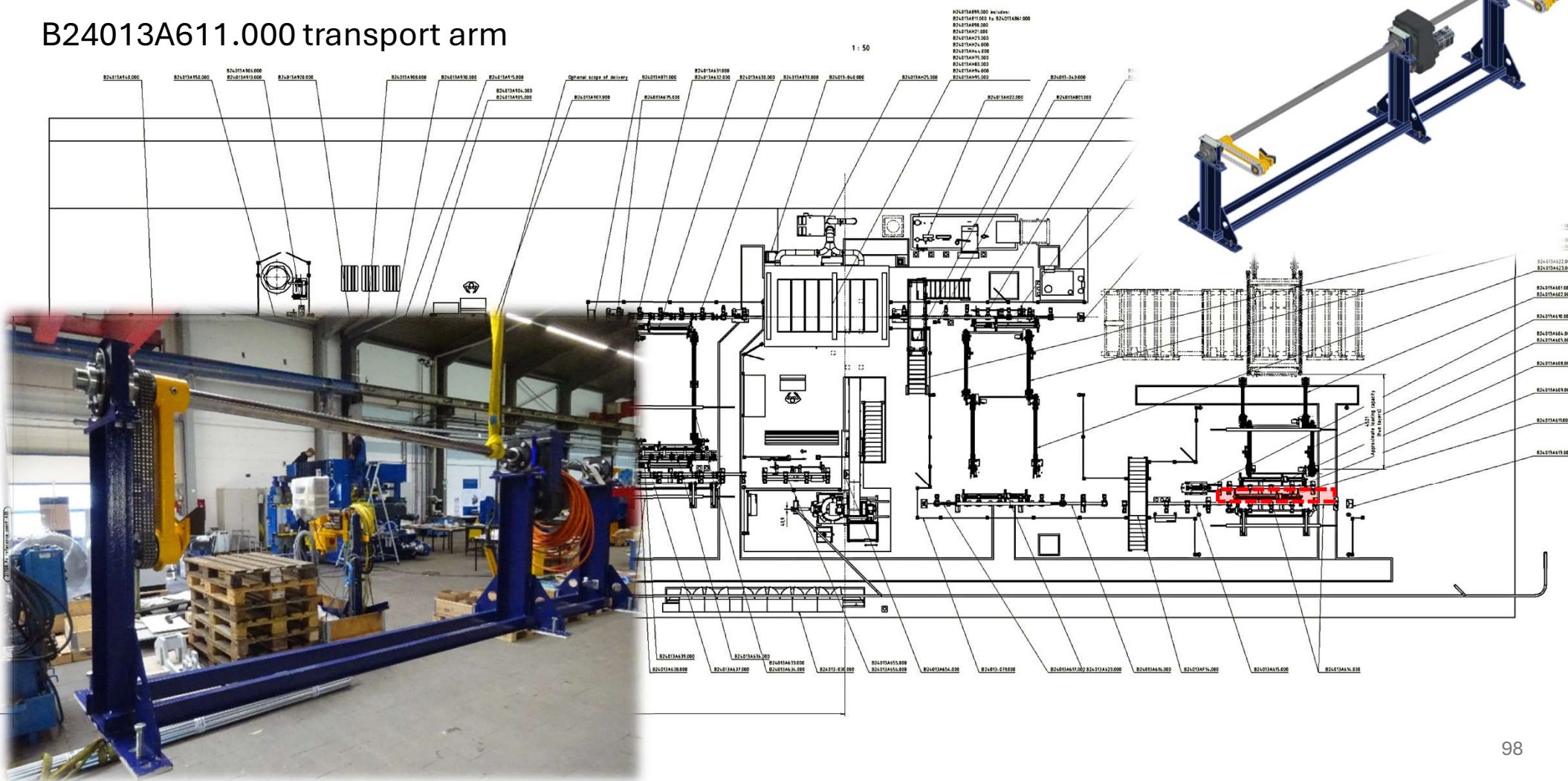
B24013A609.000 support table



B24013A610.000 marking device

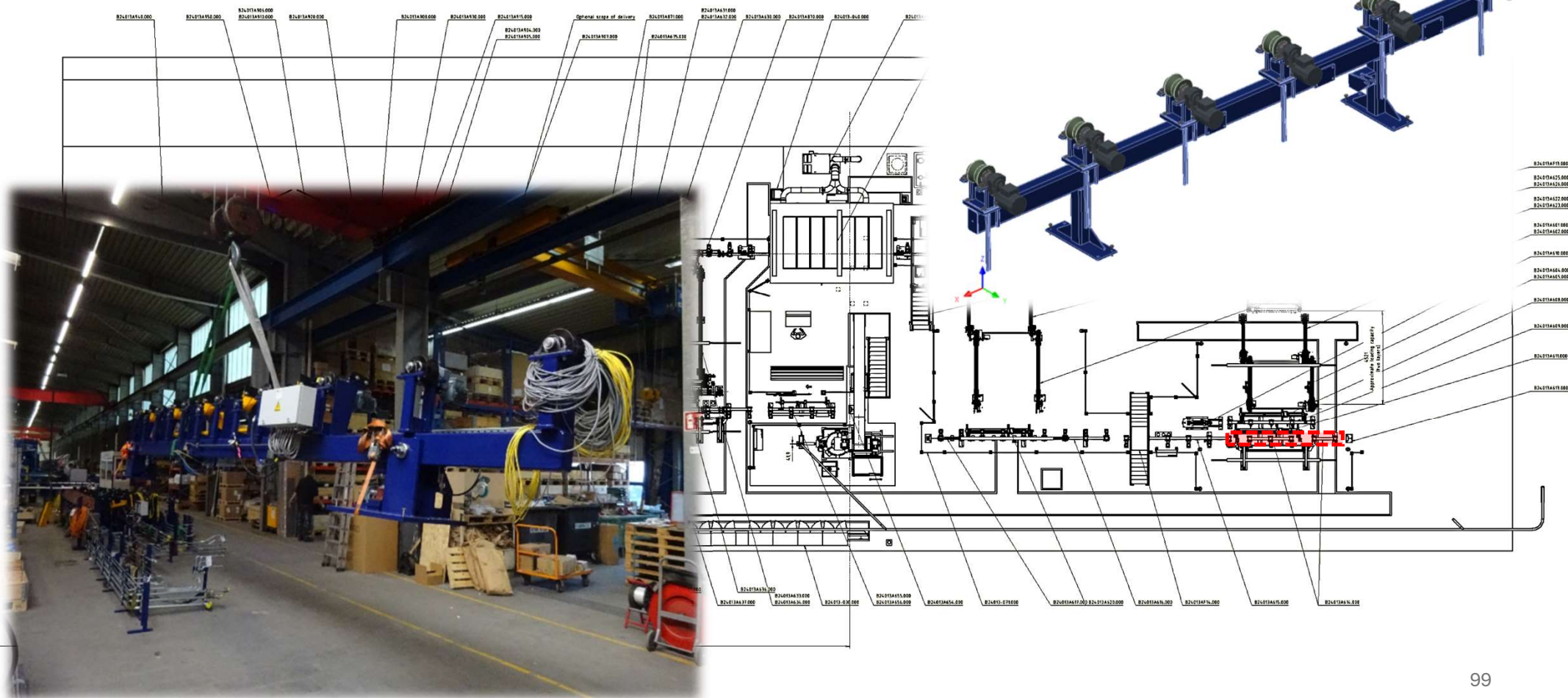


B24013A611.000 transport arm



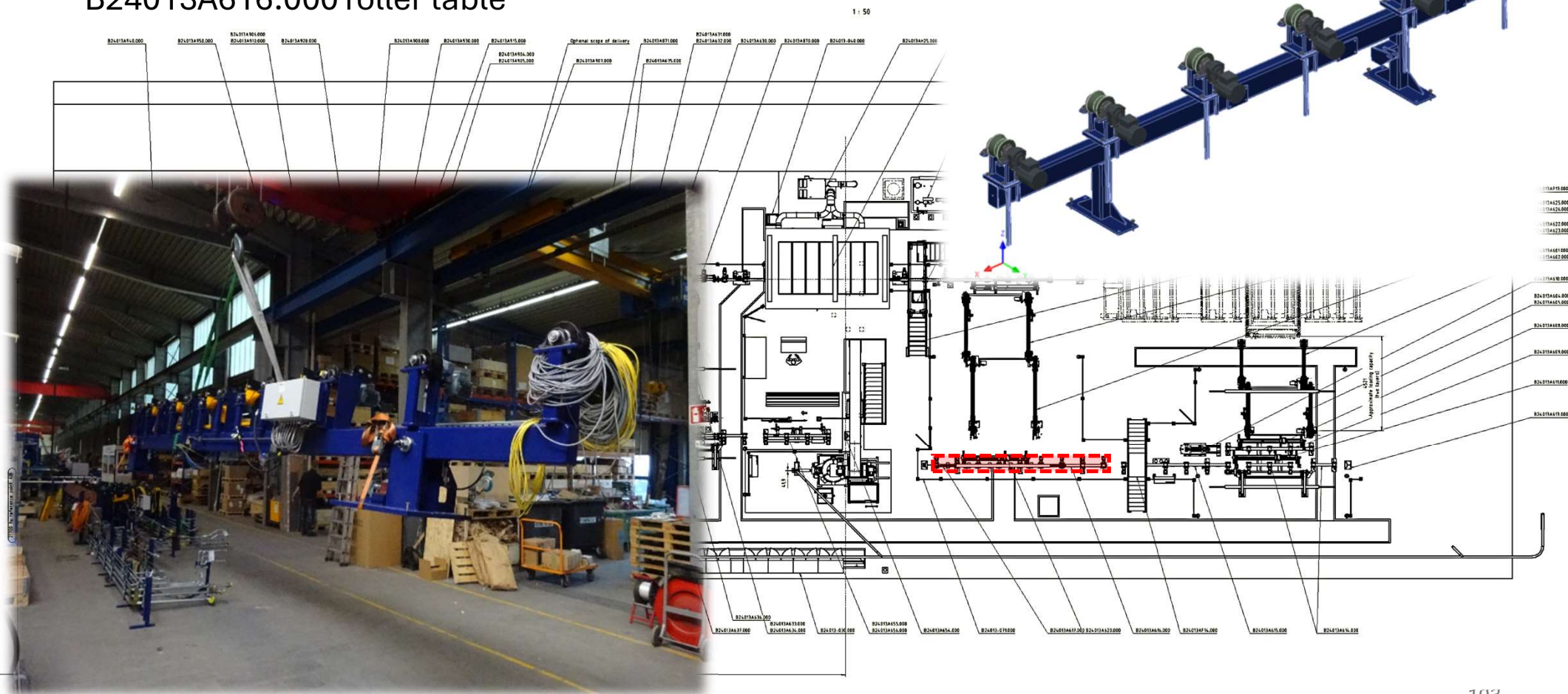
B24013A614.000 roller table

1 : 50



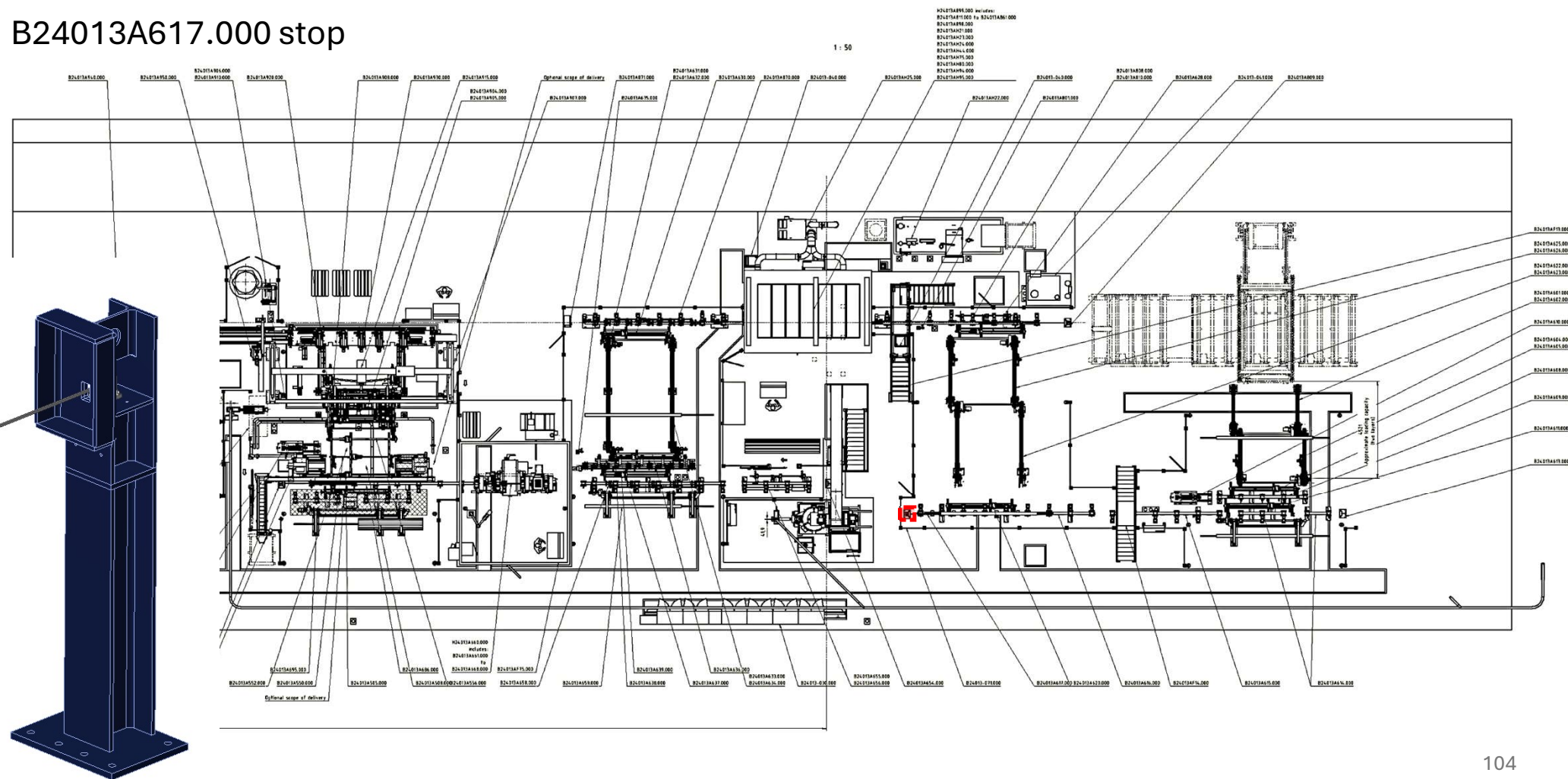


B24013A616.000 roller table

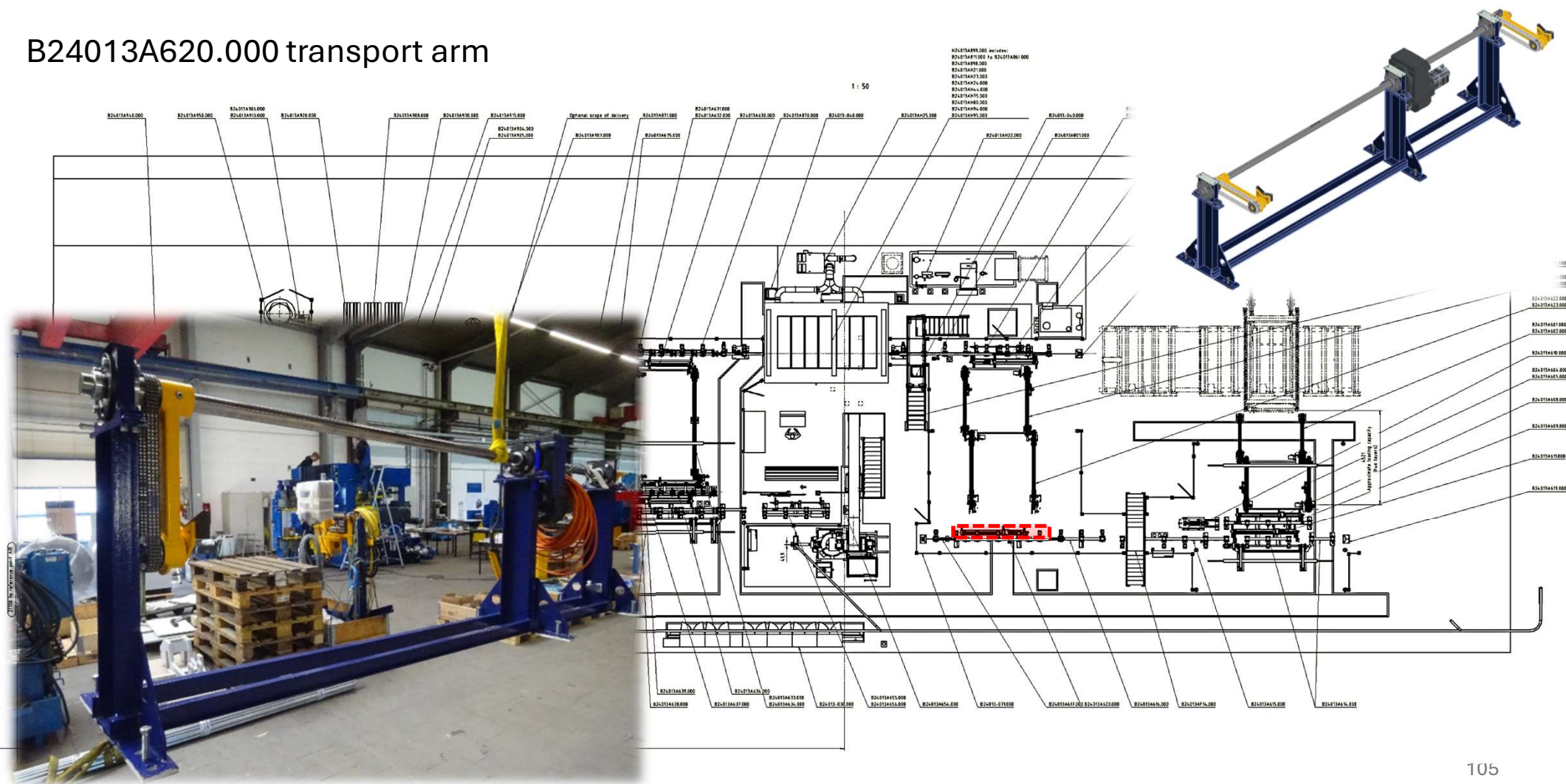


B24013A617.000 stop

1 : 50

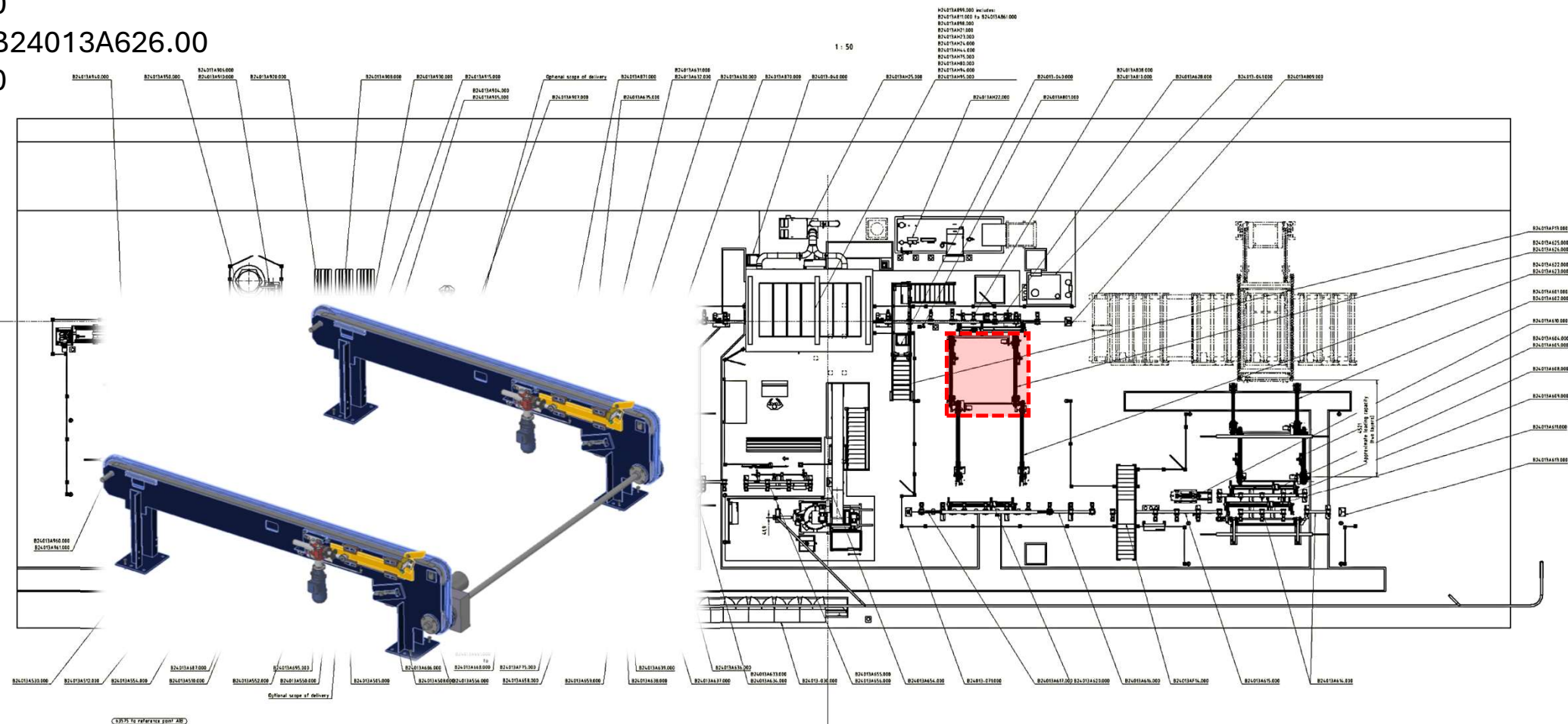


B24013A620.000 transport arm

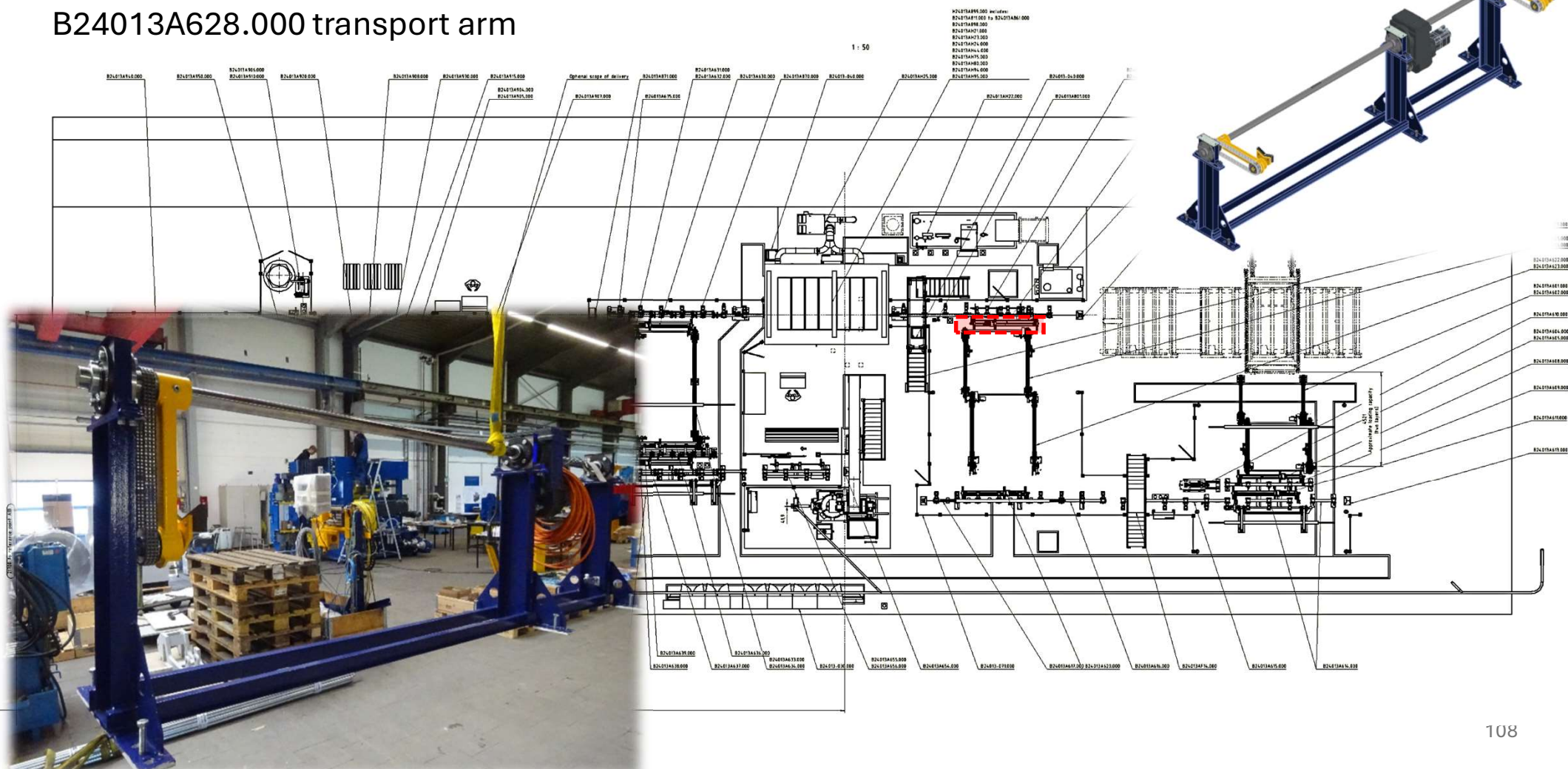


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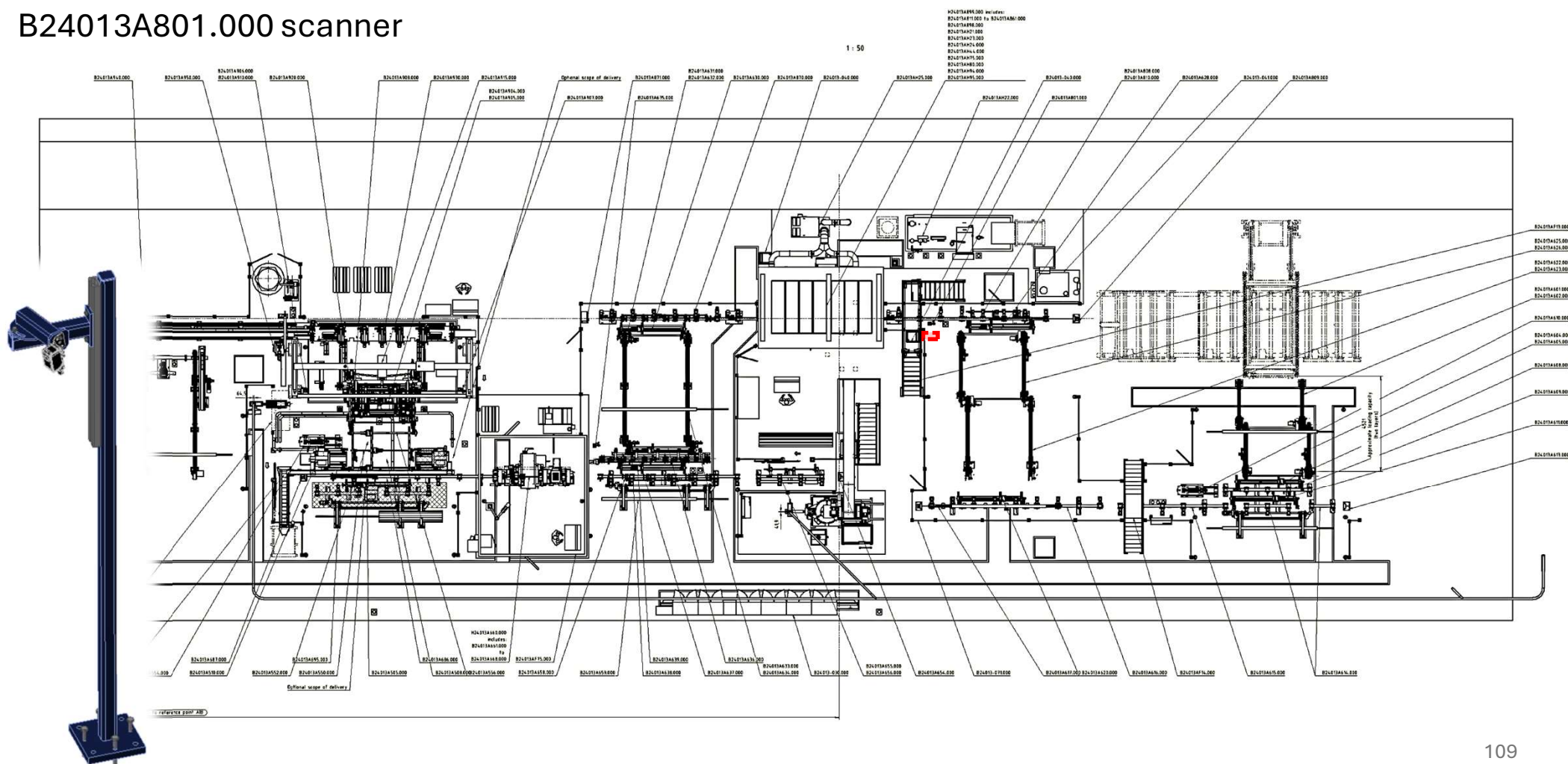
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B24013A628.000 transport arm

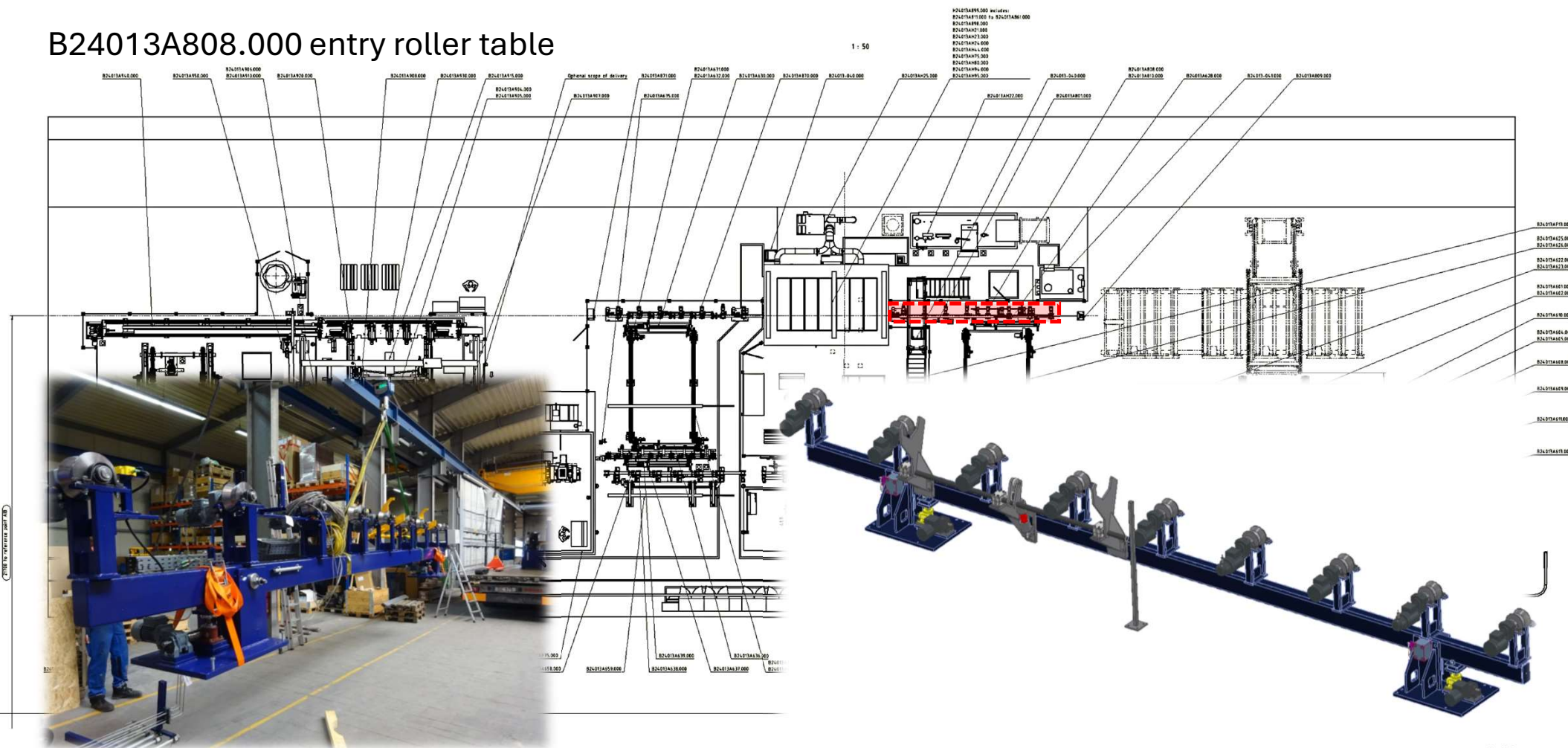


B24013A801.000 scanner

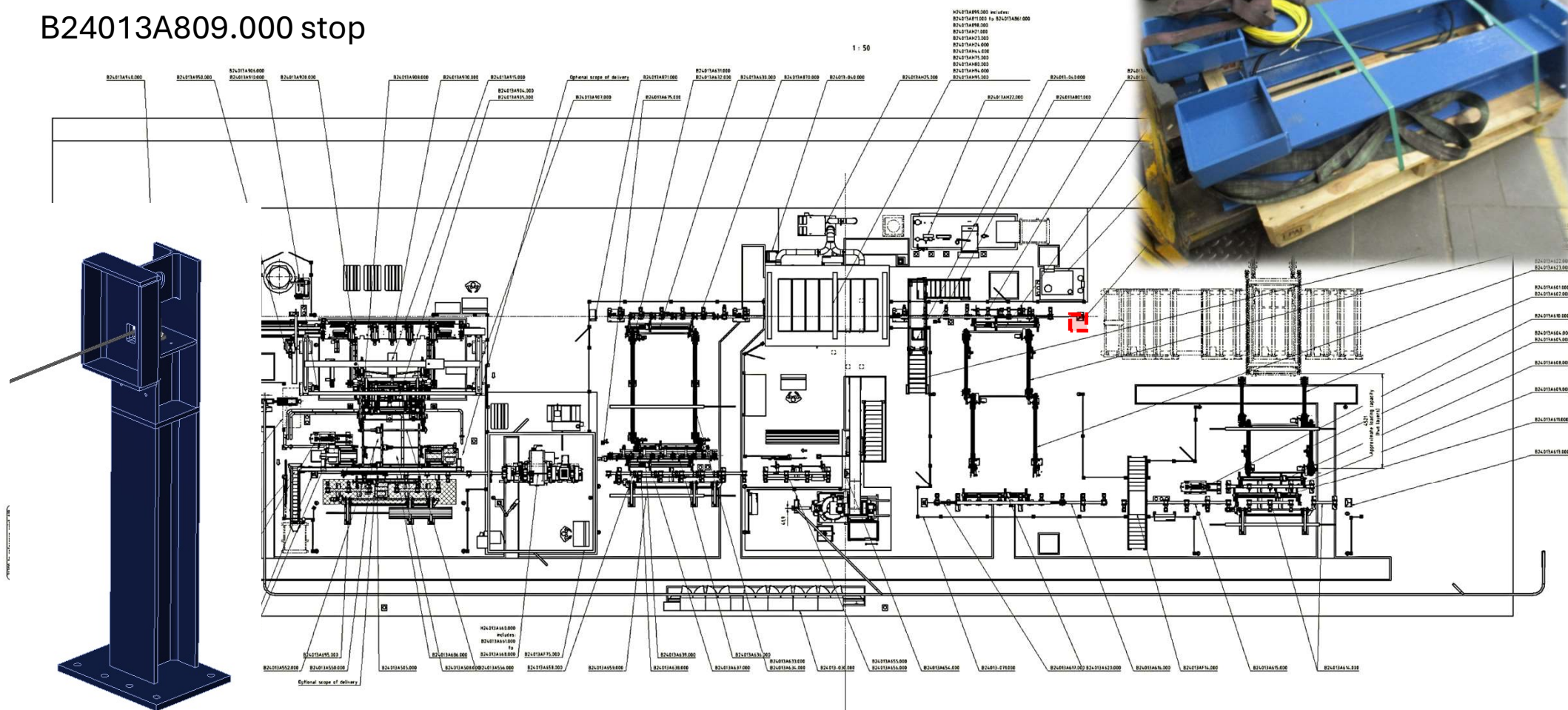


B24013A808.000 entry roller table

1 : 50

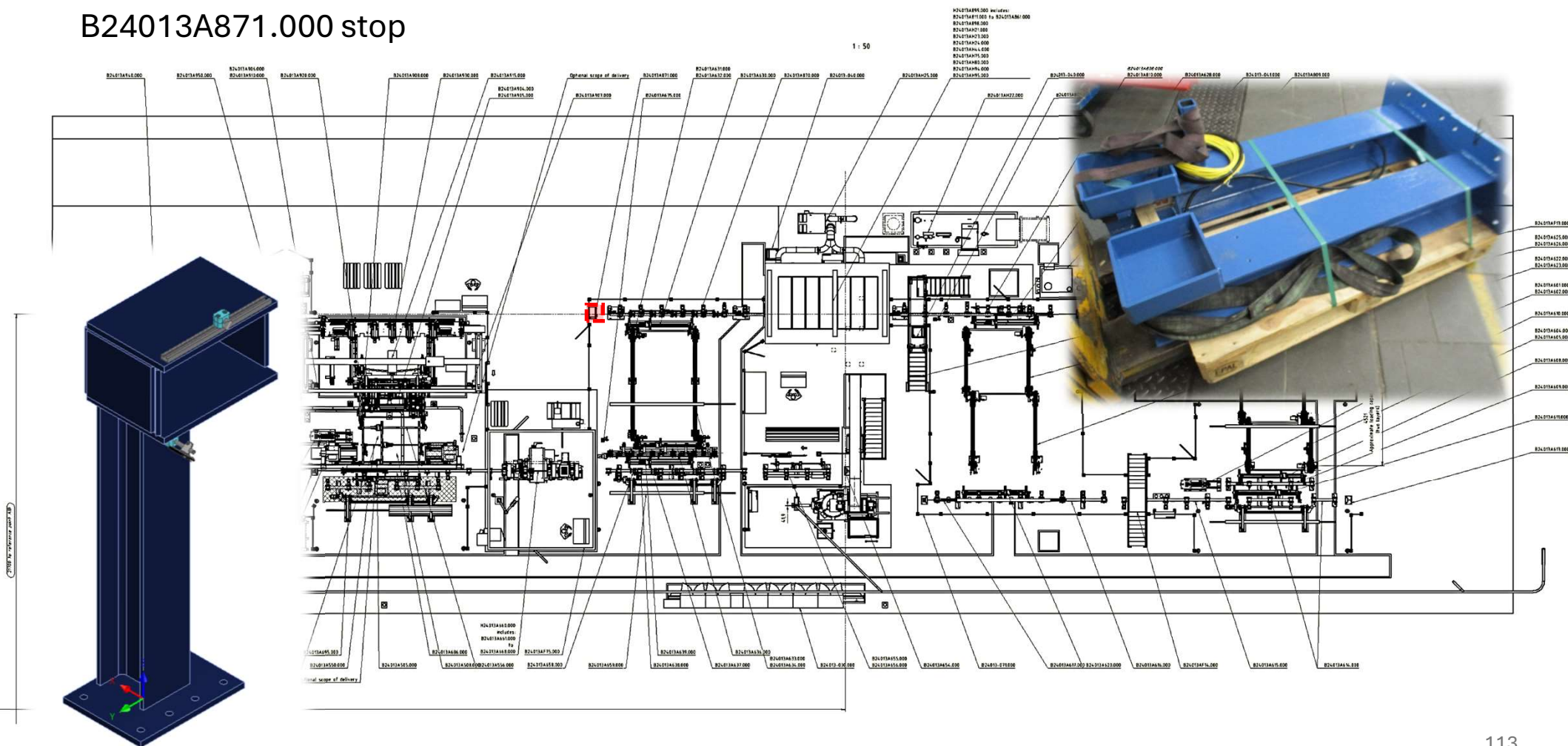


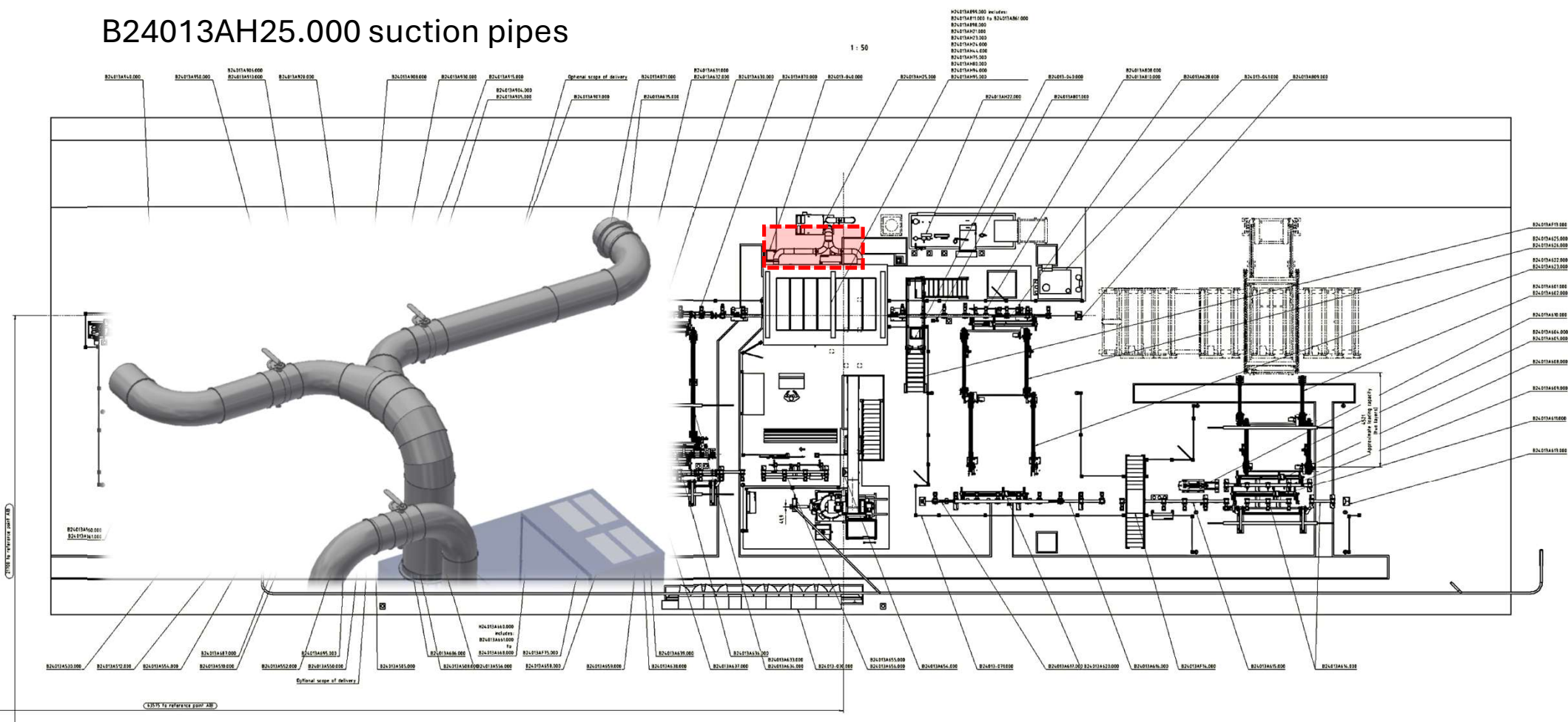
B24013A809.000 stop



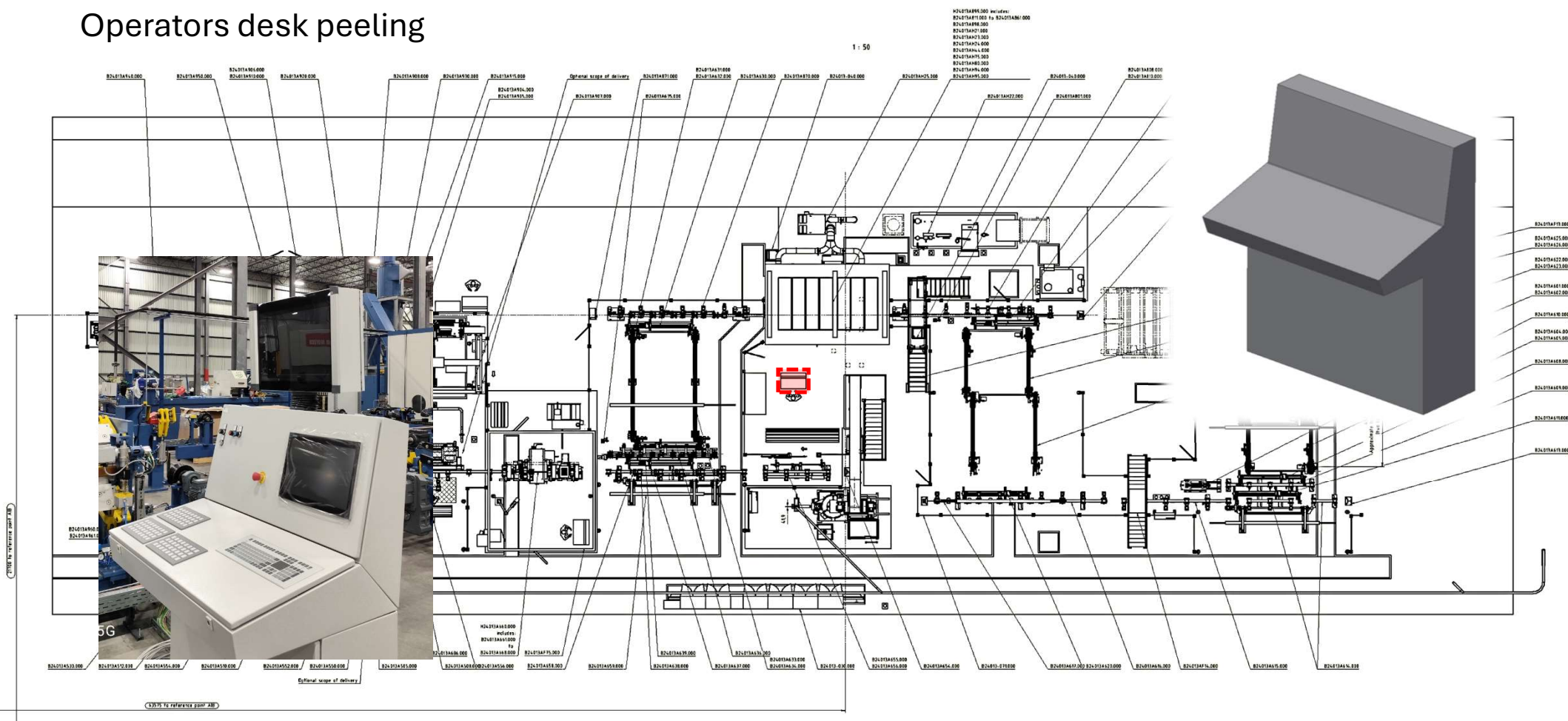
B24013A871.000 stop

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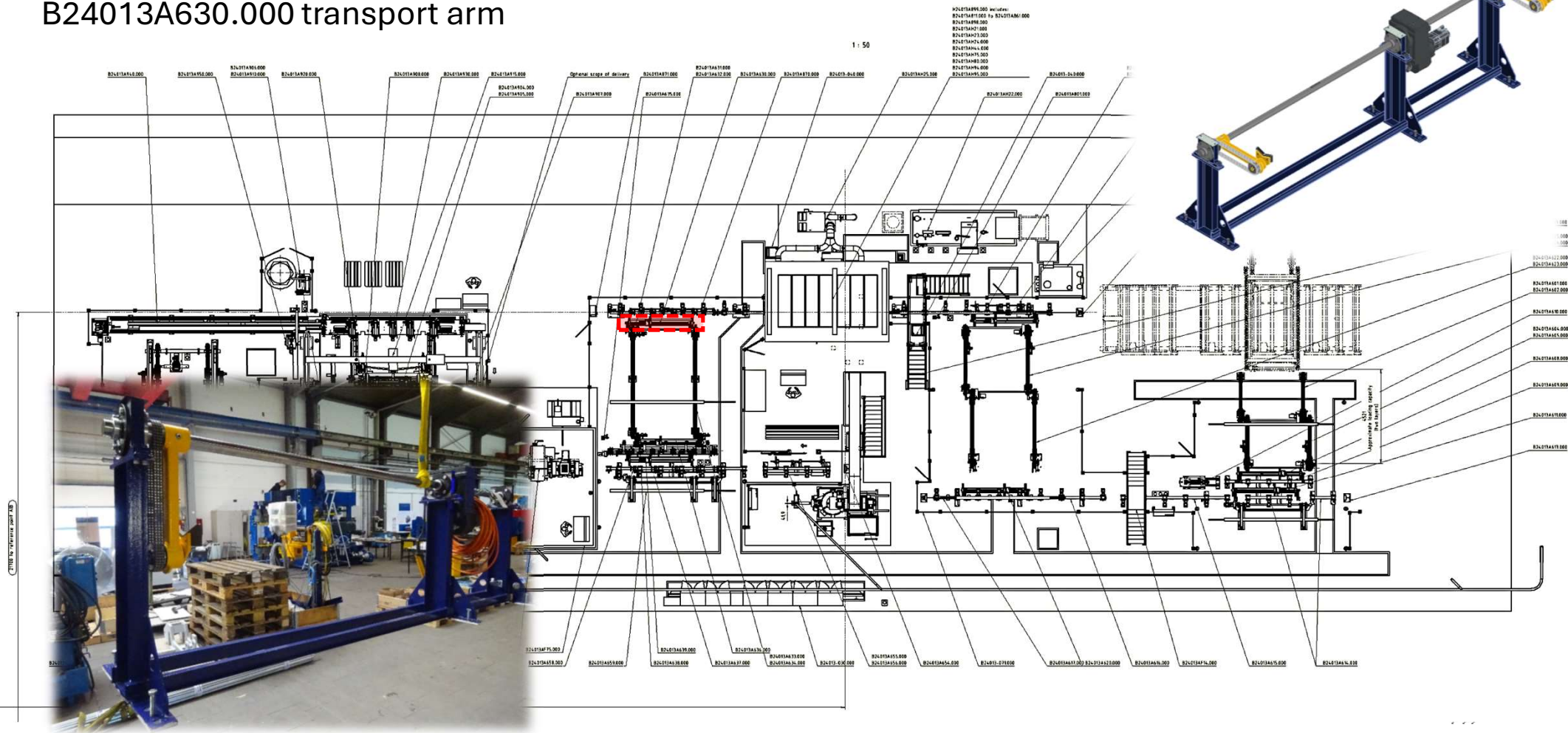




Operators desk peeling



B24013A630.000 transport arm



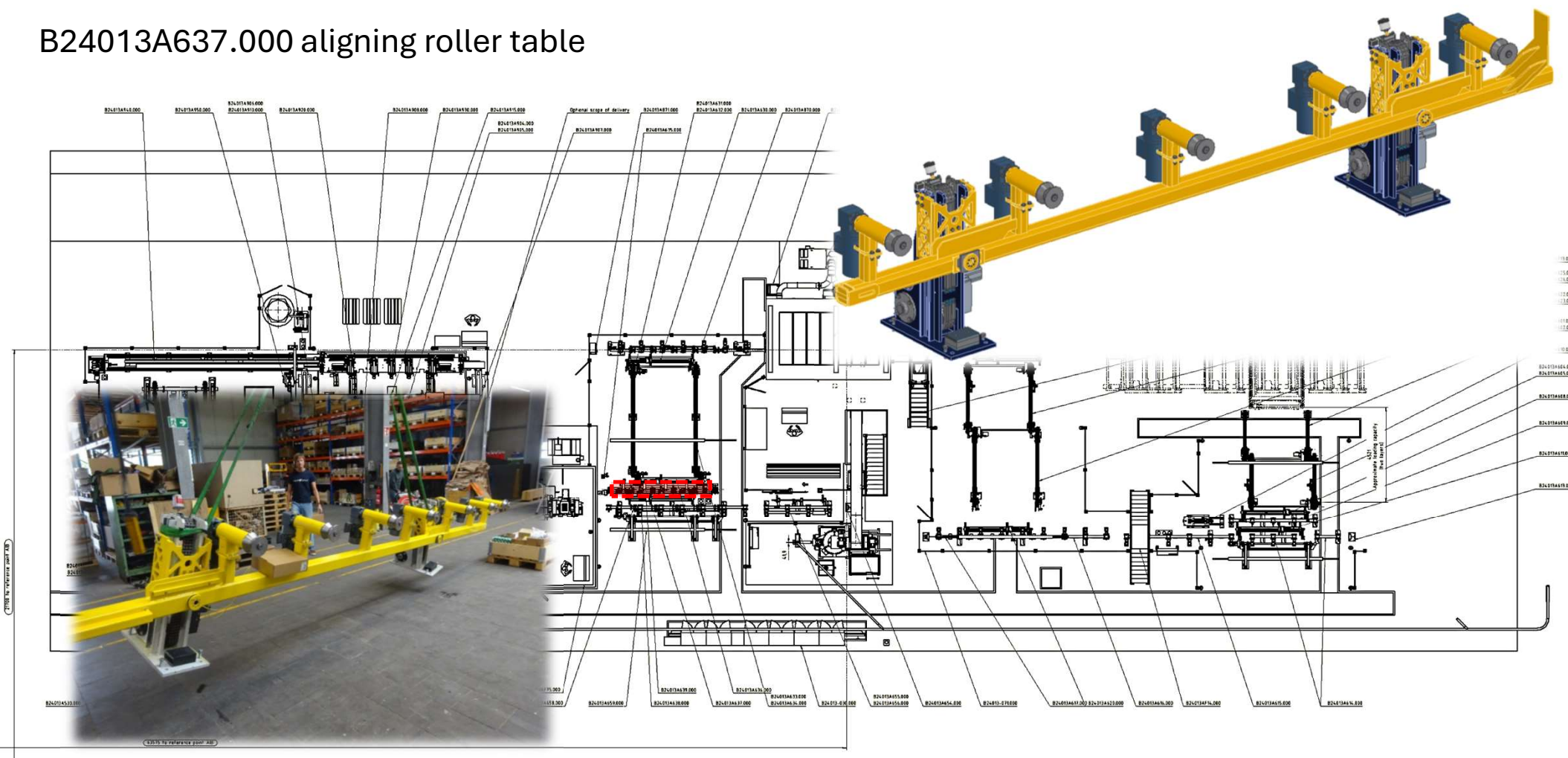


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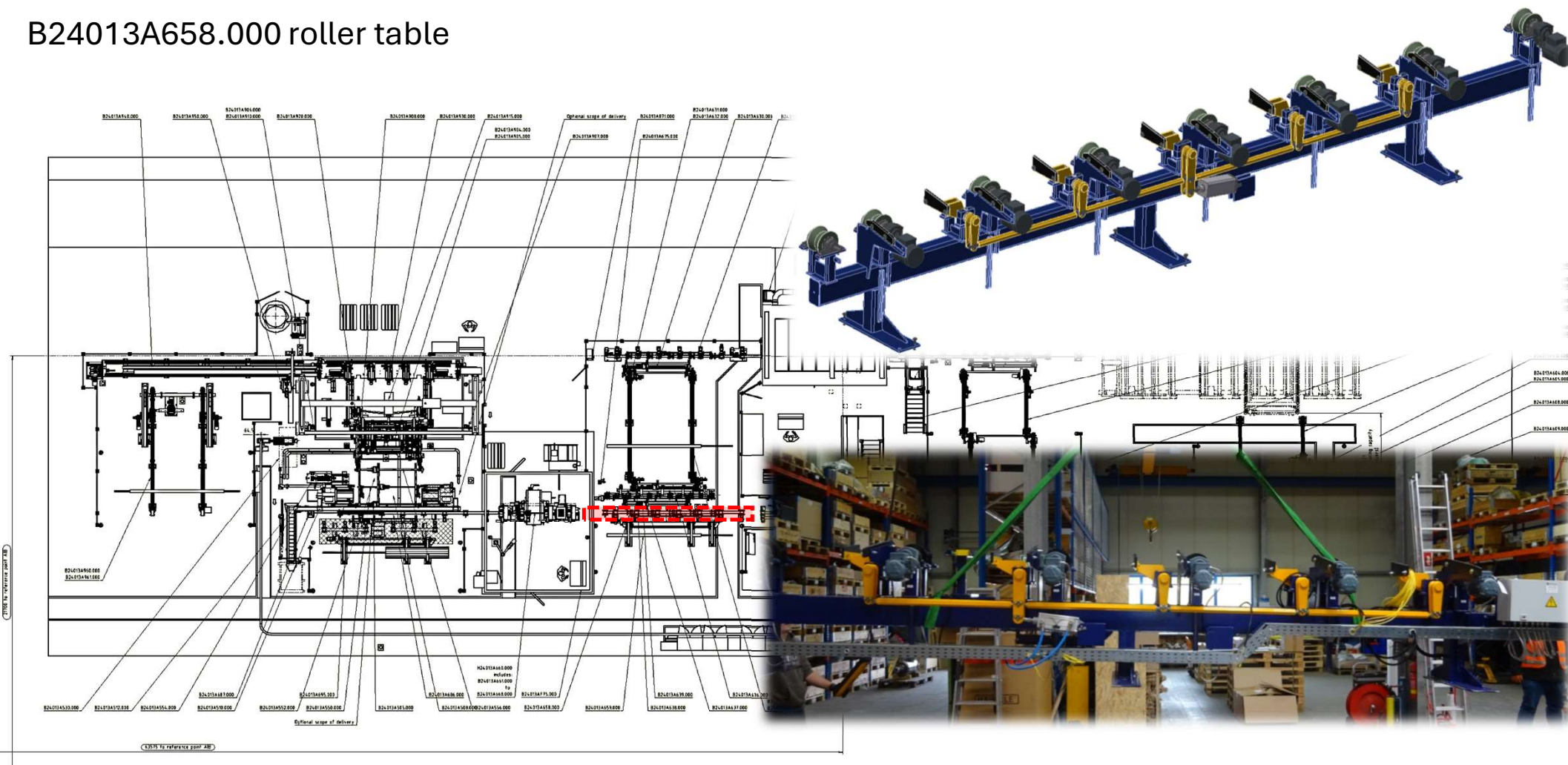




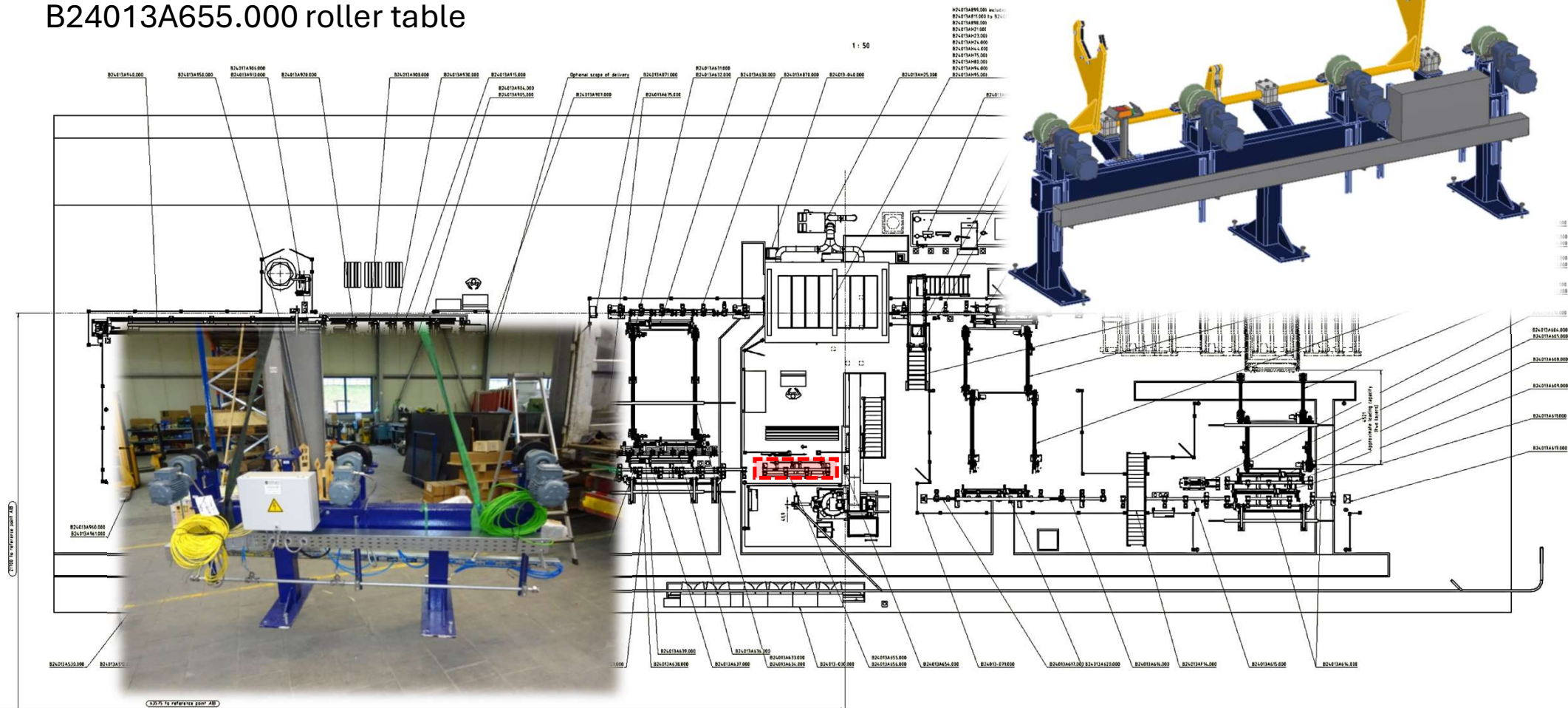
B24013A637.000 aligning roller table



B24013A658.000 roller table



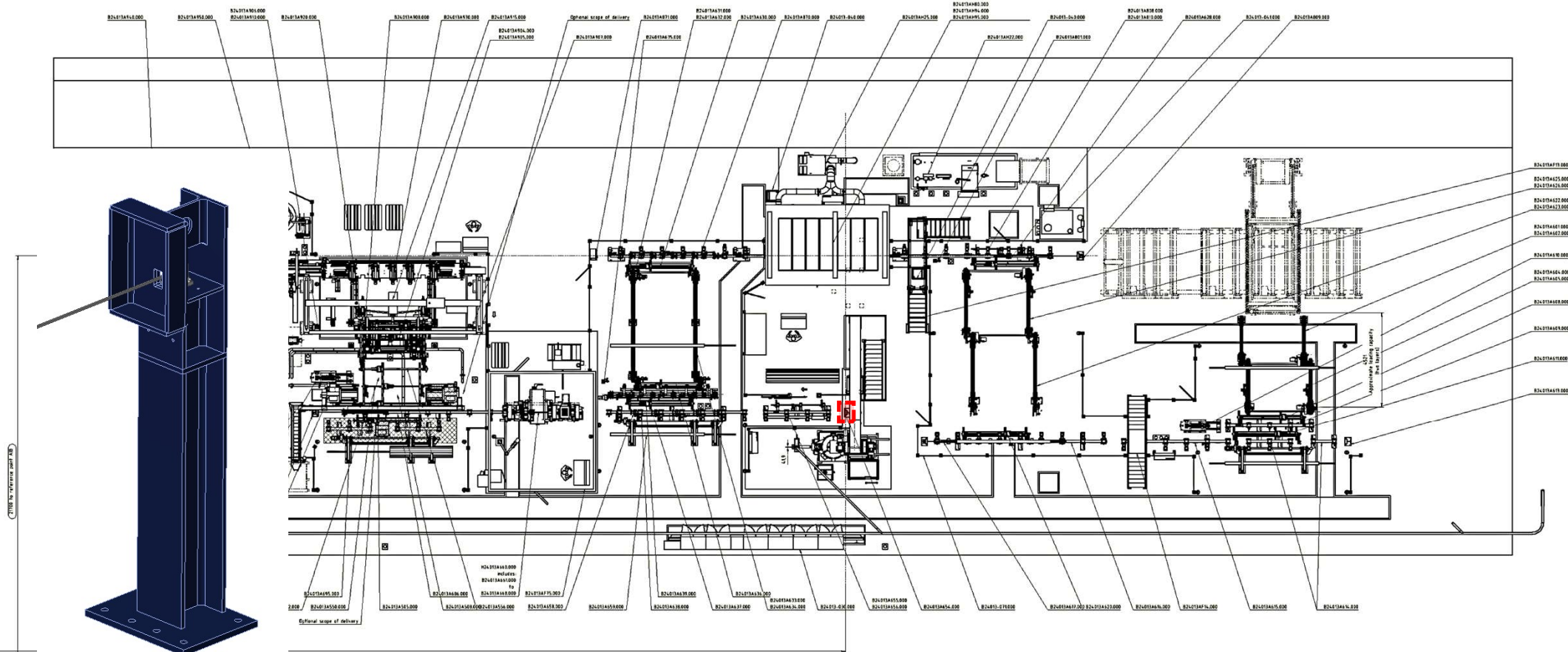
B24013A655.000 roller table



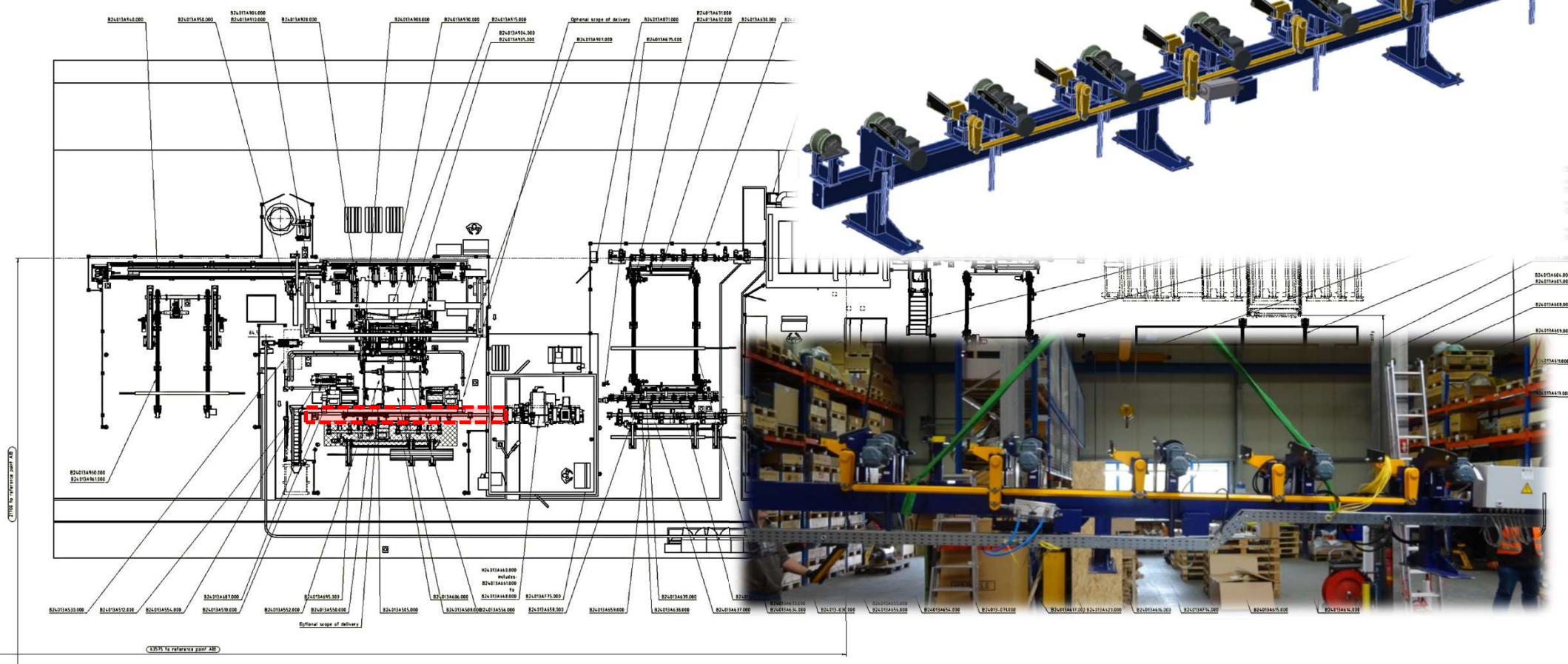
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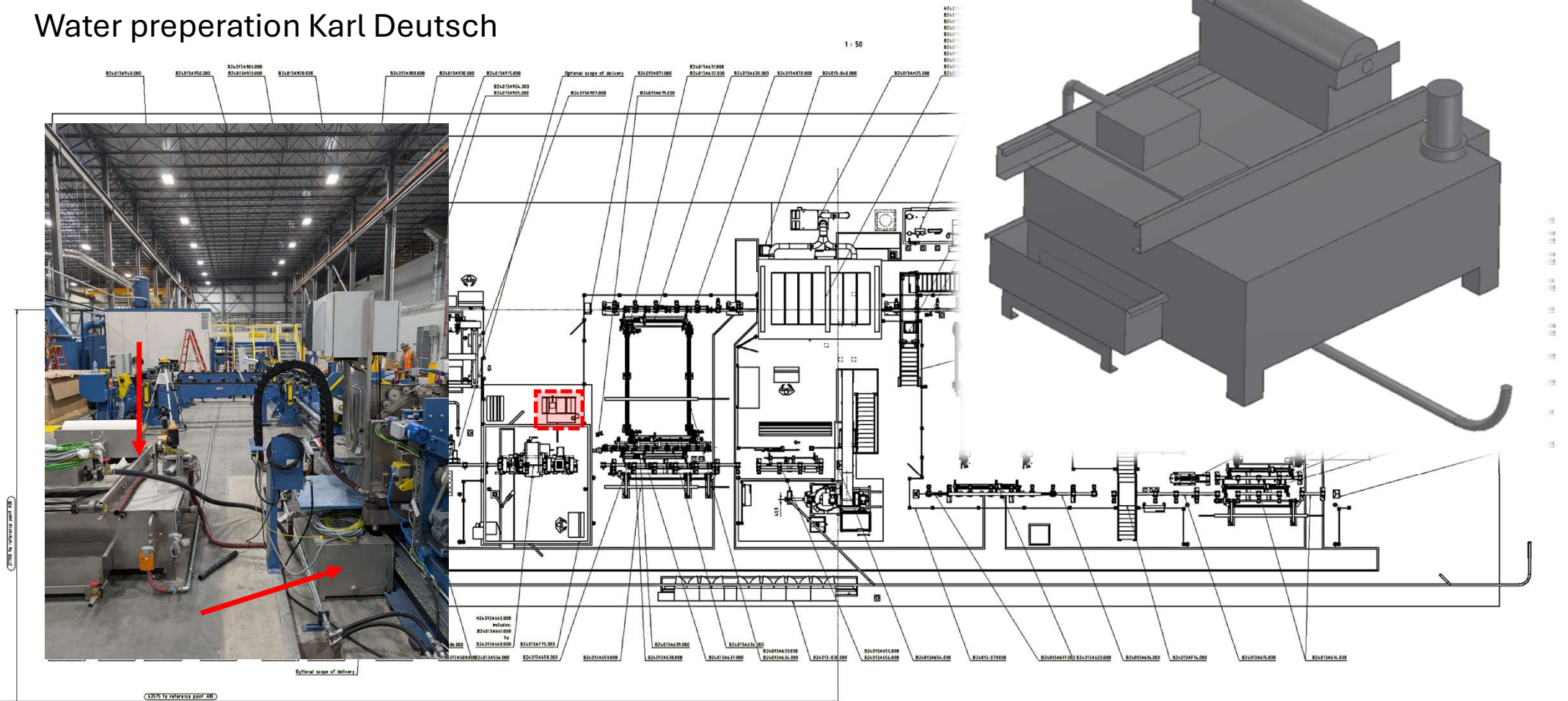
B24013A654.000 includes:
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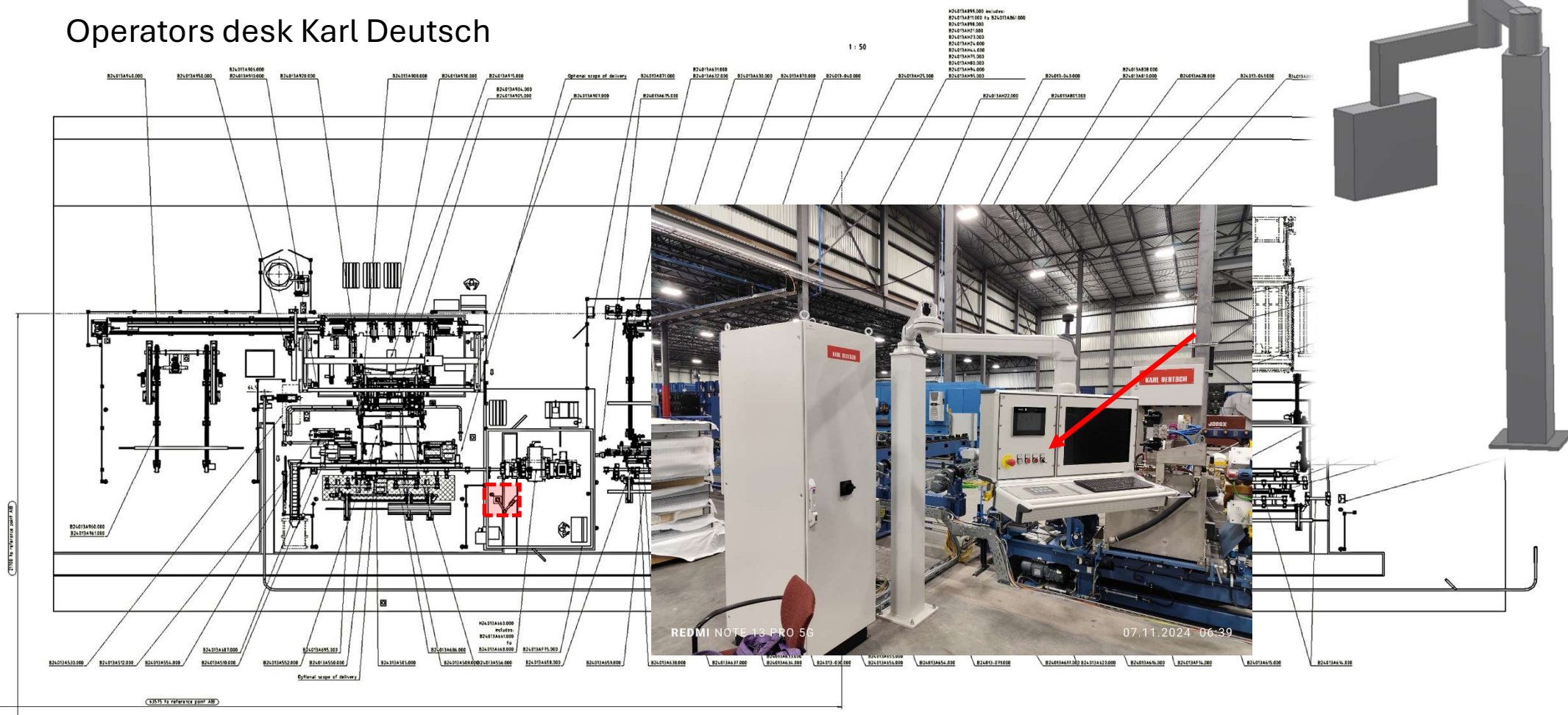
B24013A686.000 roller table



Water preperation Karl Deutsch

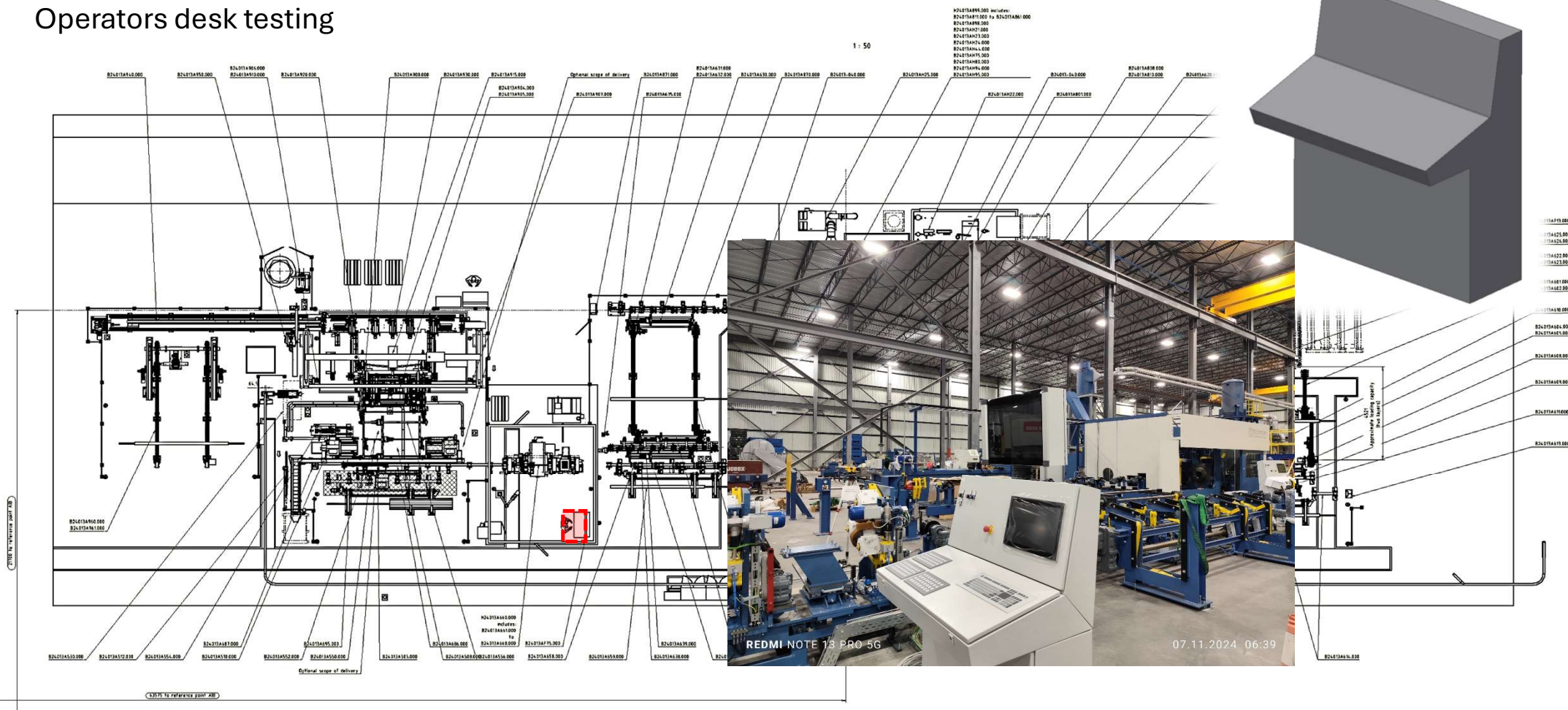


Operators desk Karl Deutsch



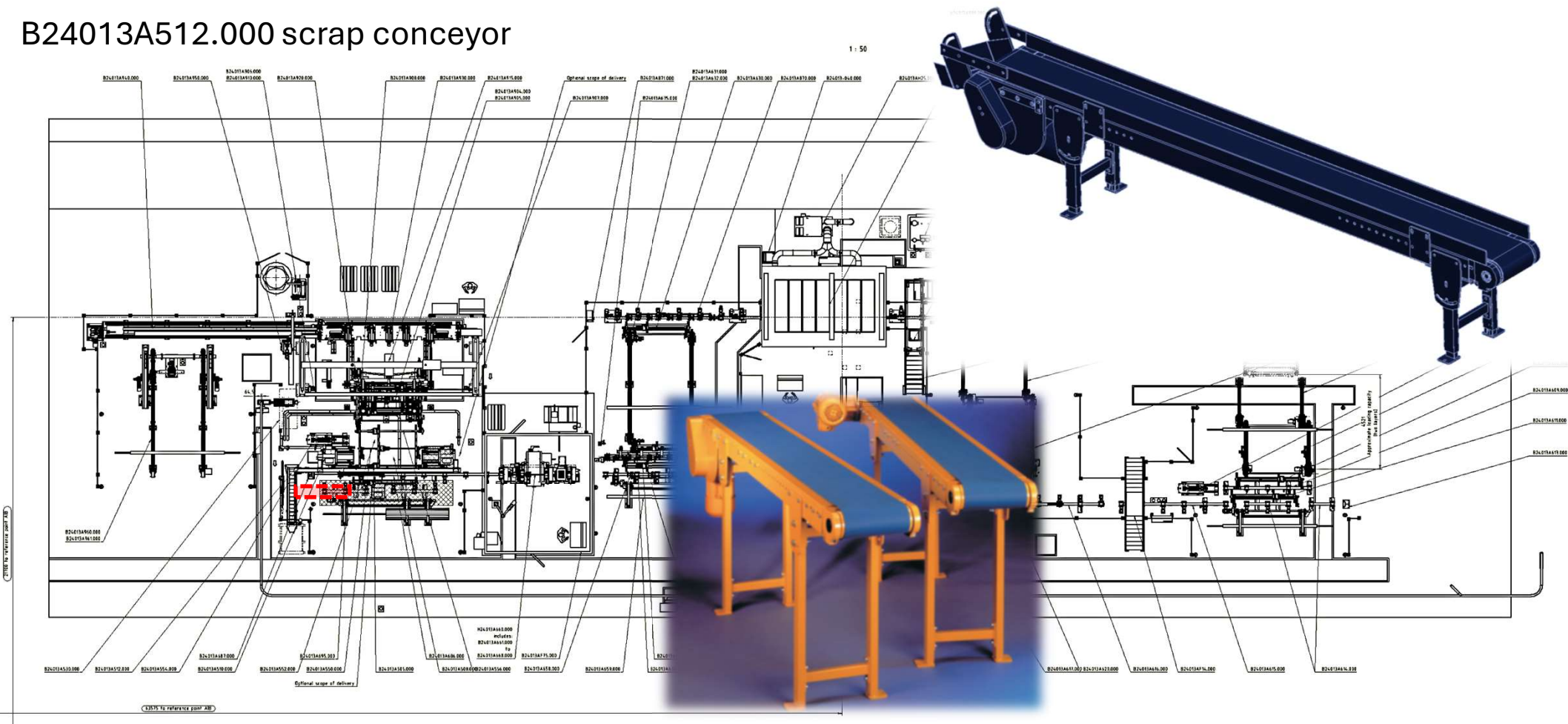
Operators desk testing

1 : 50

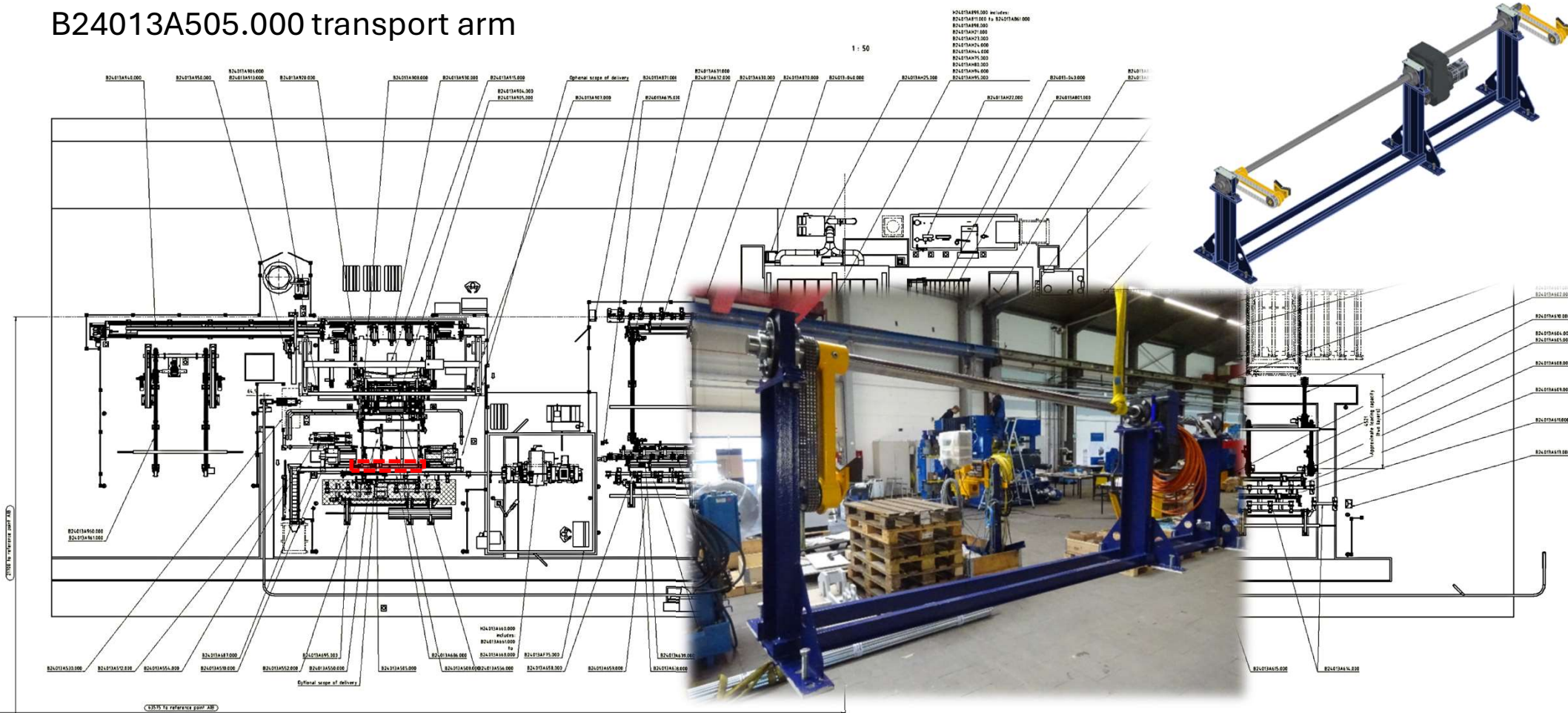


B24013A512.000 scrap conceyor

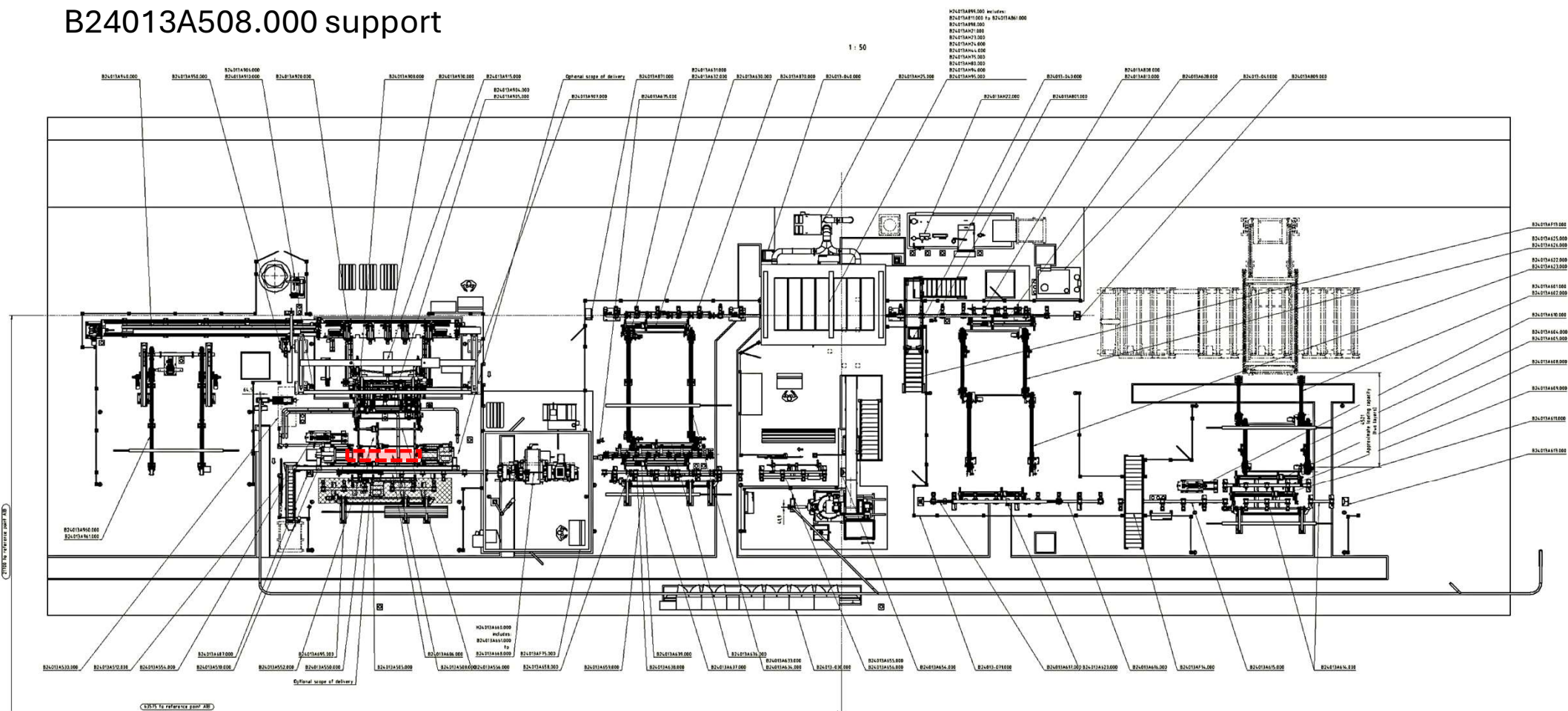
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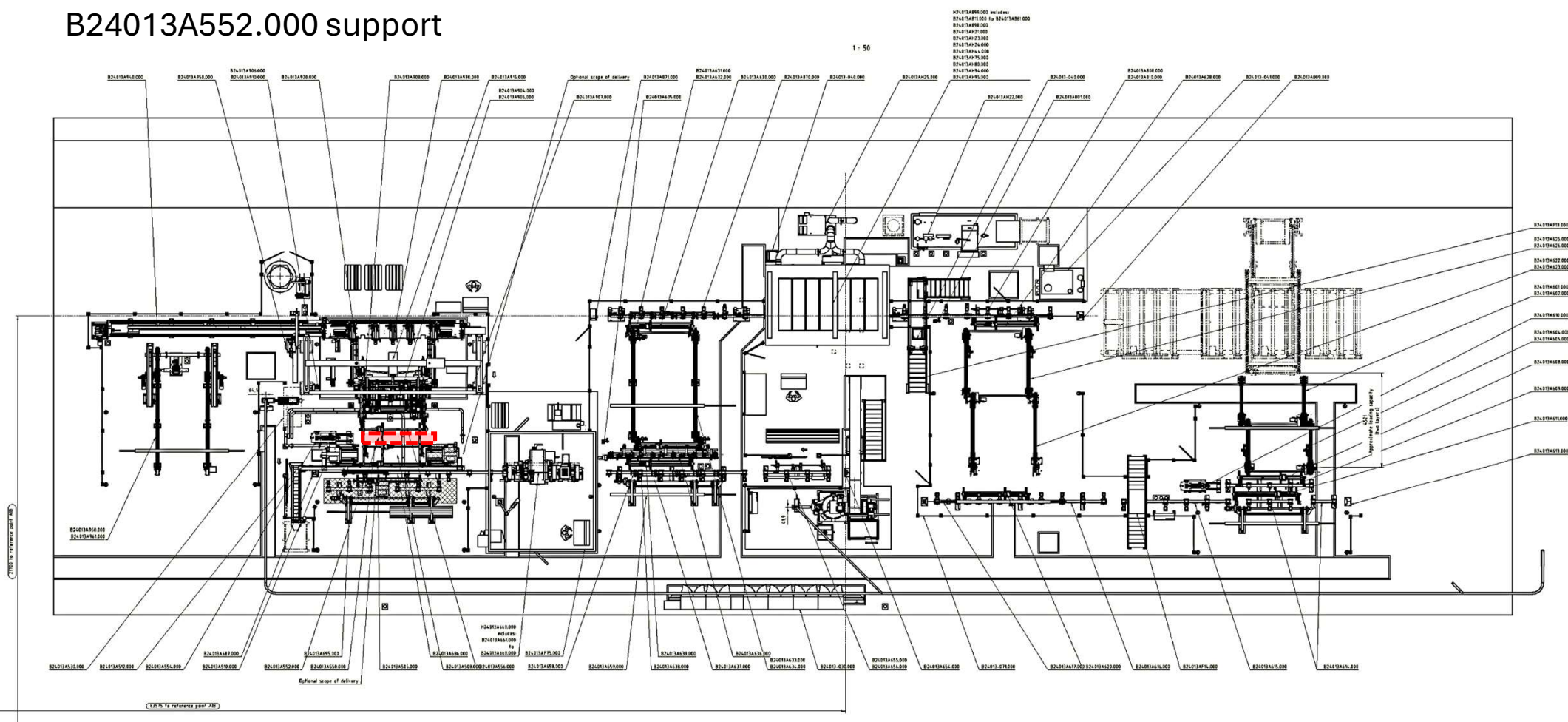
B24013A505.000 transport arm



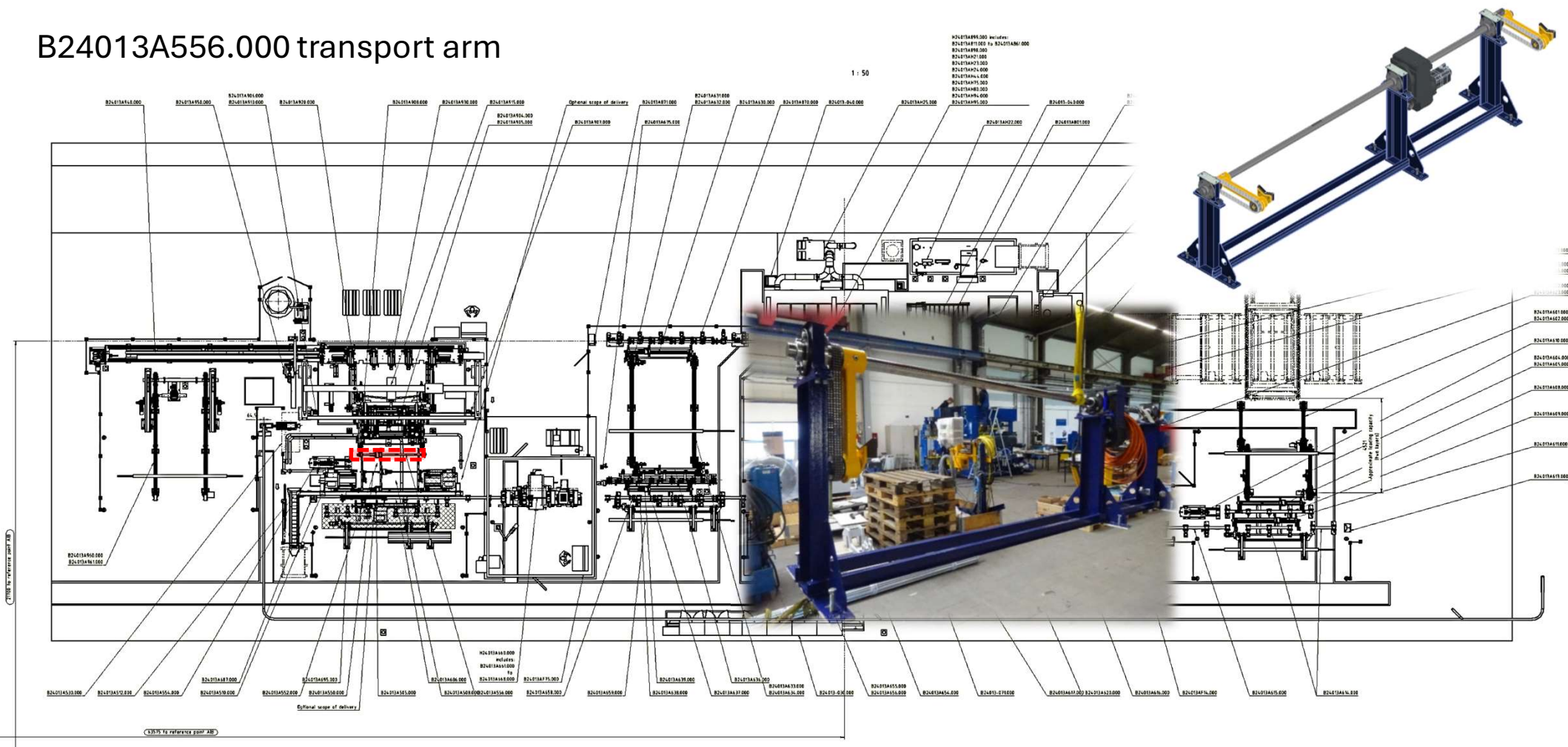
B24013A508.000 support



B24013A552.000 support



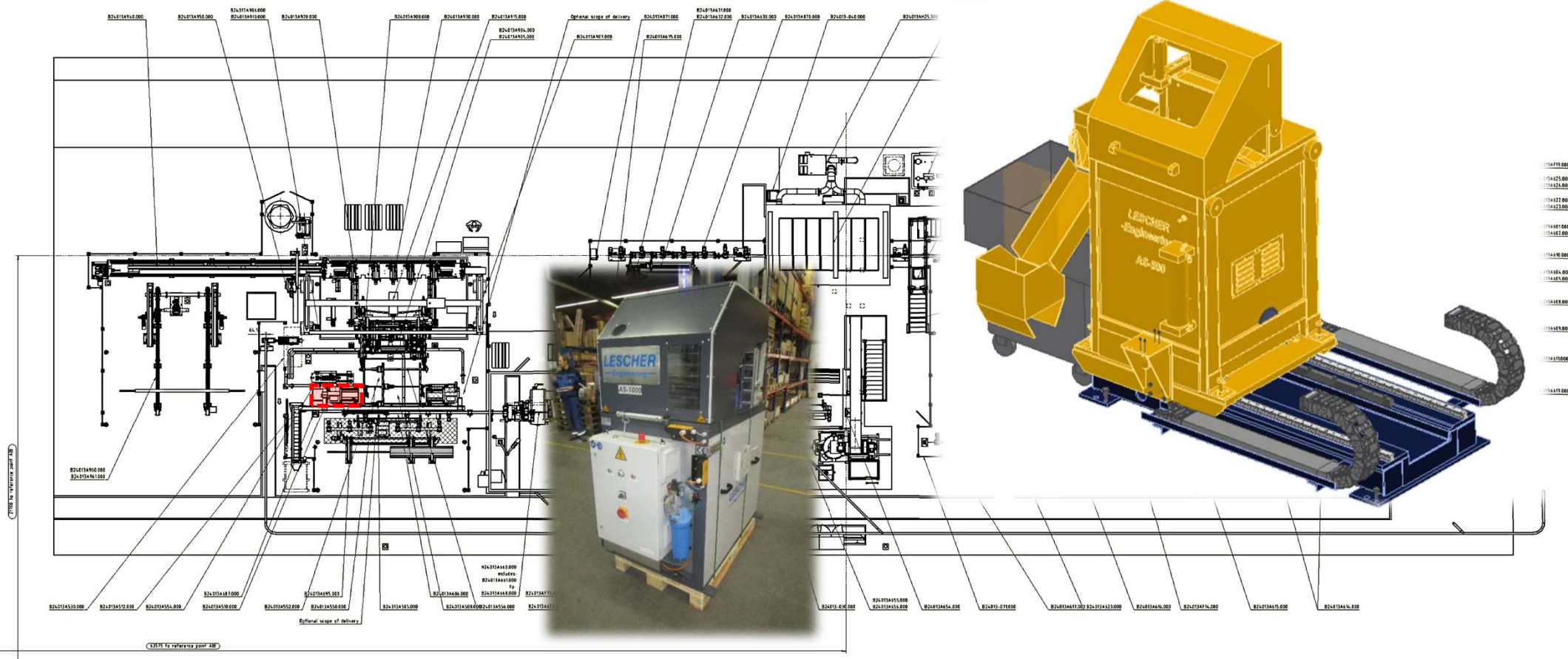
B24013A556.000 transport arm



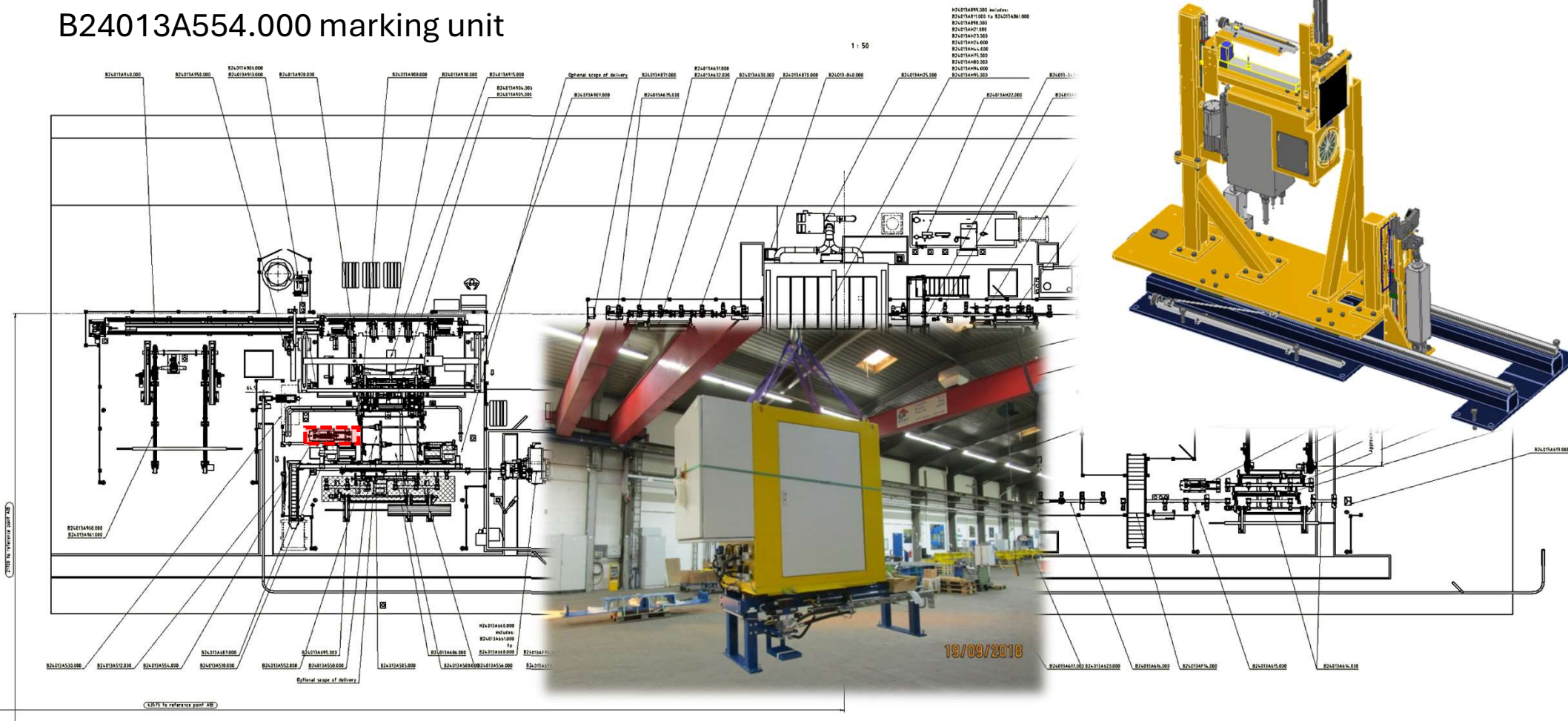
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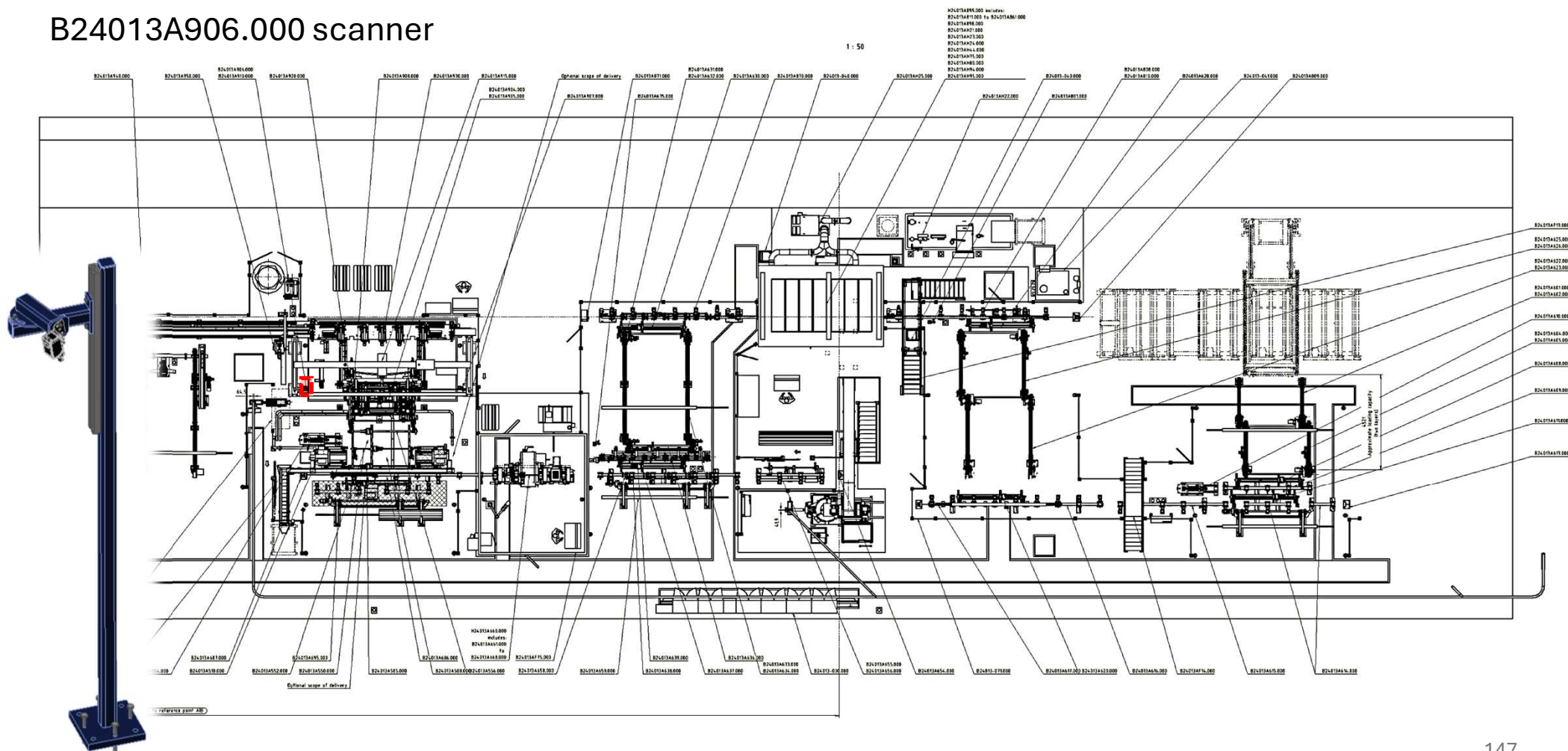


B24013A554.000 marking unit



B24013A906.000 scanner

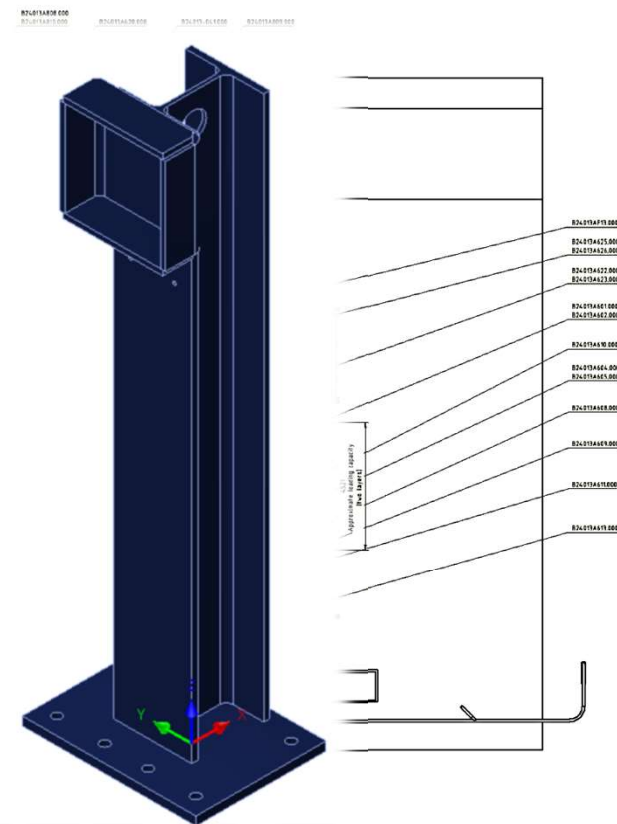
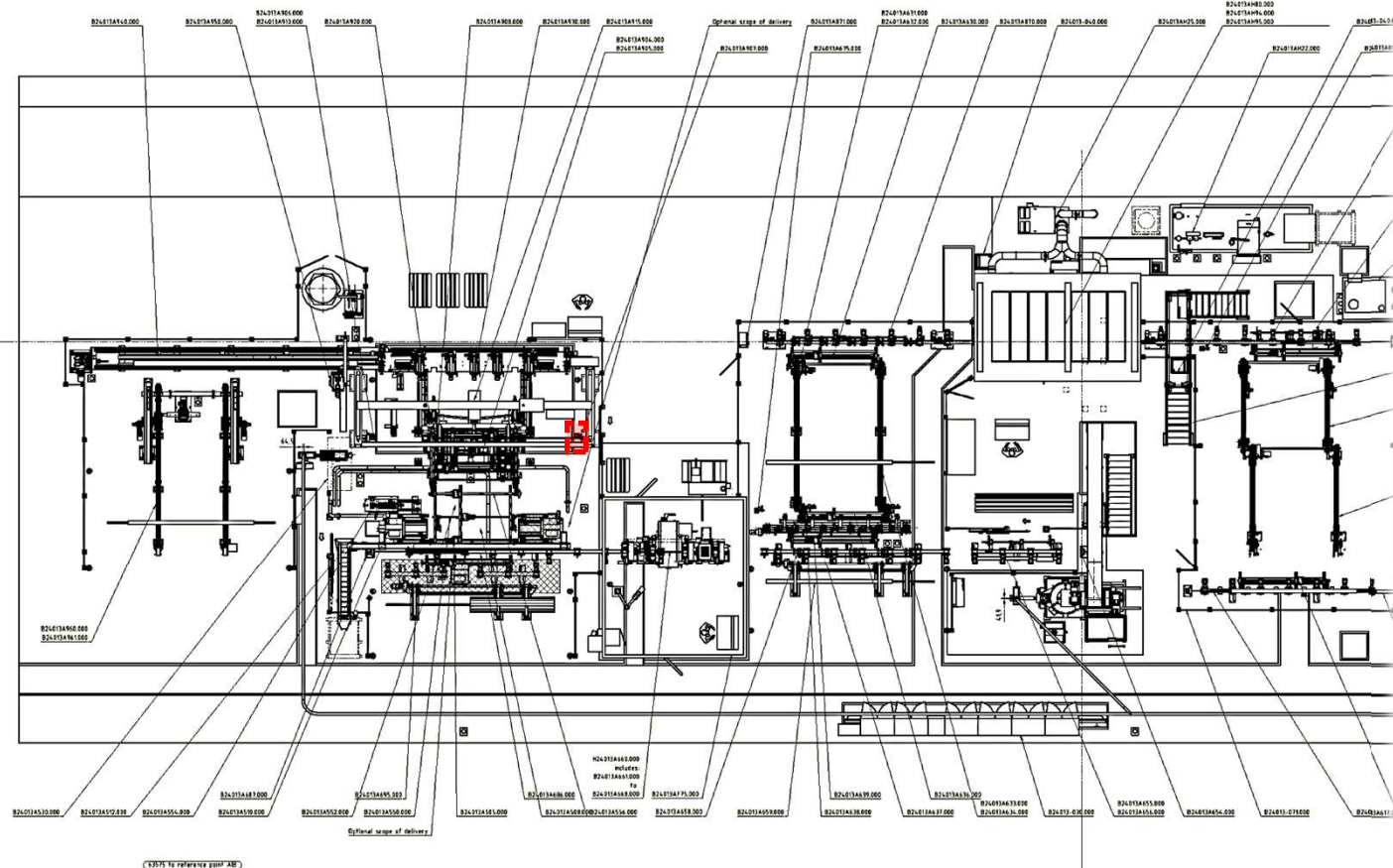
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B24013A907.000 stop

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B24013A920.000



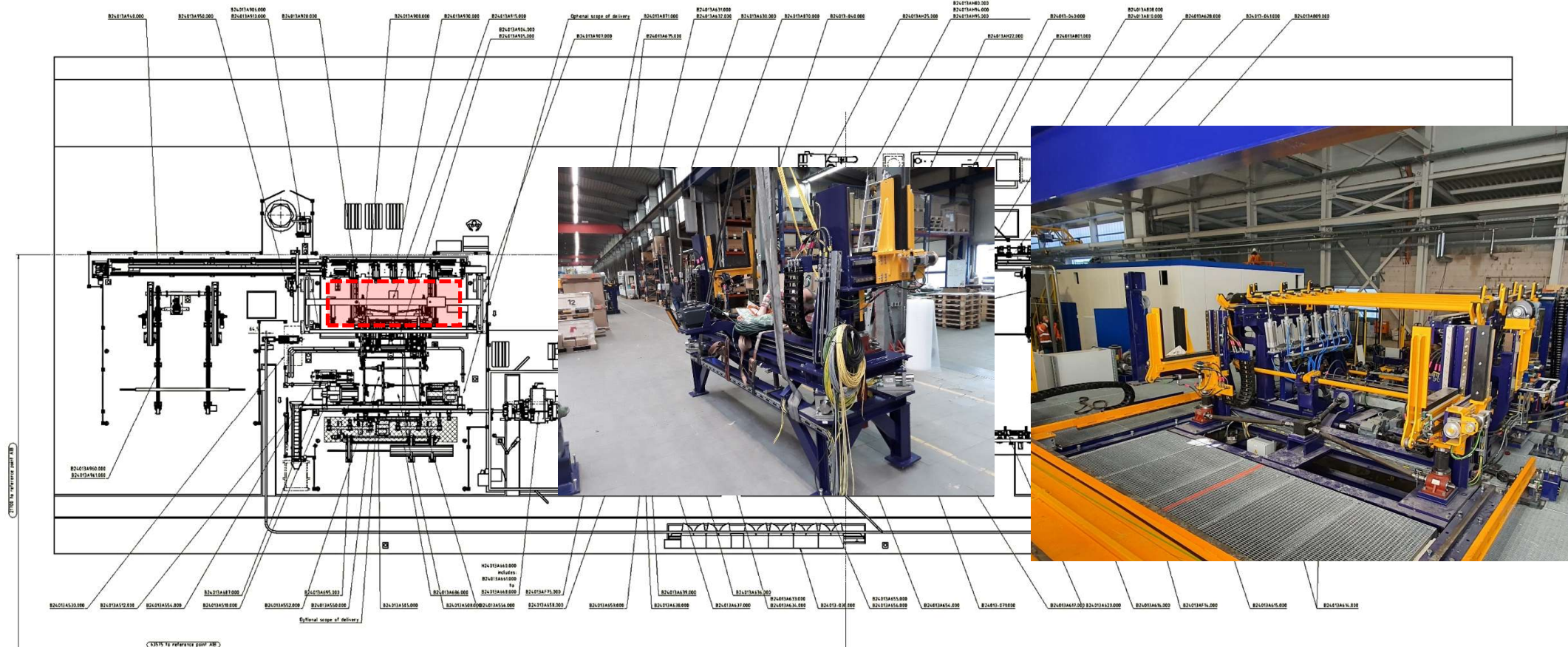
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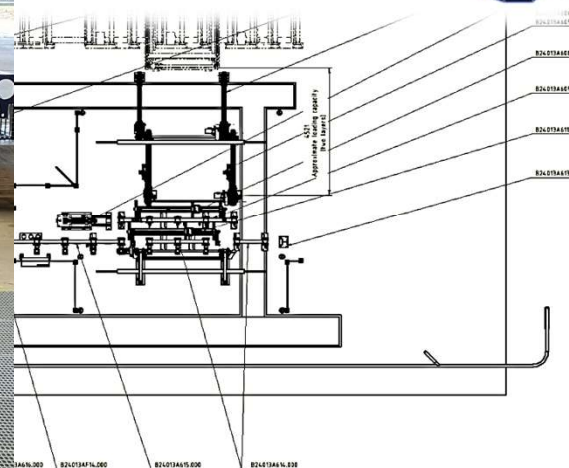
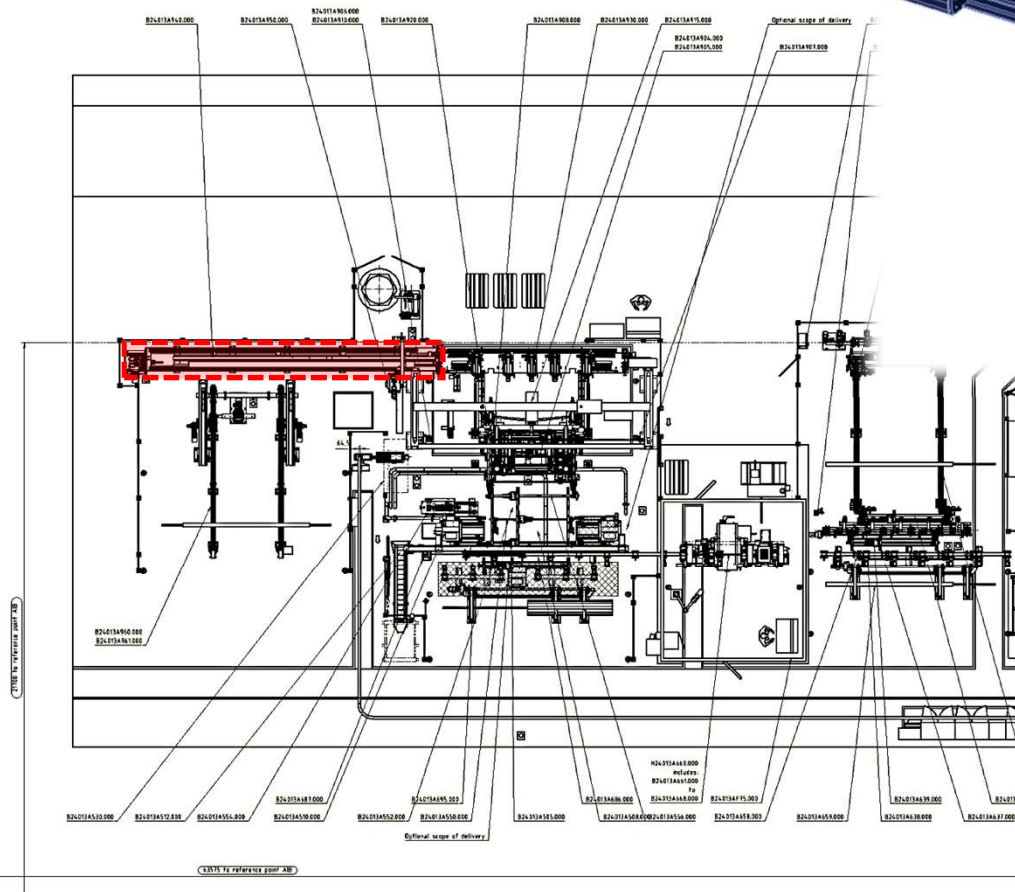
B24013A920.000 stacking cradle

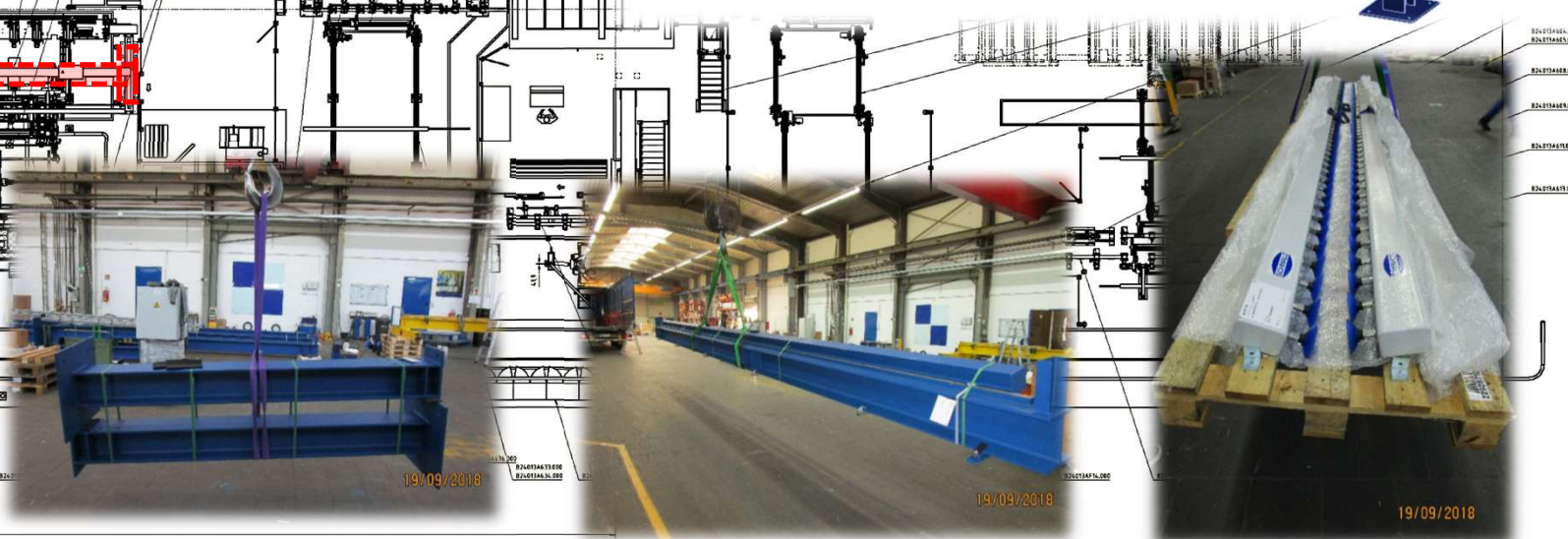
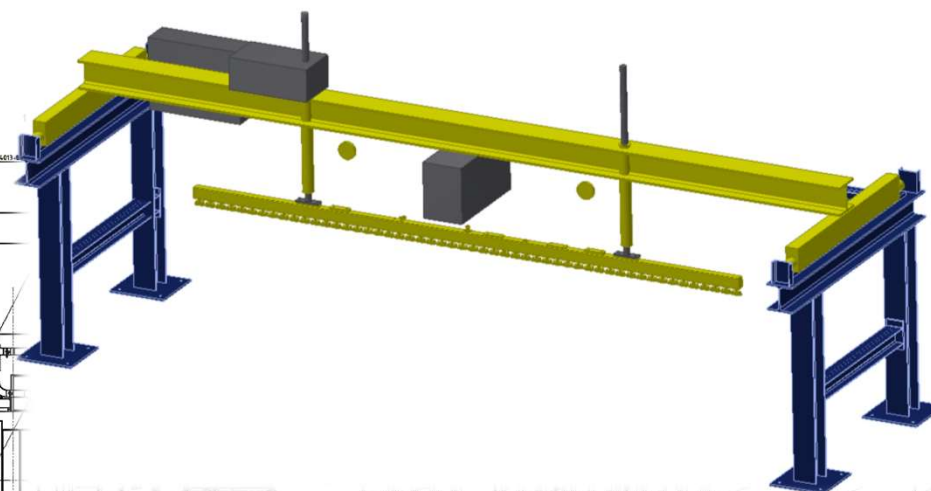
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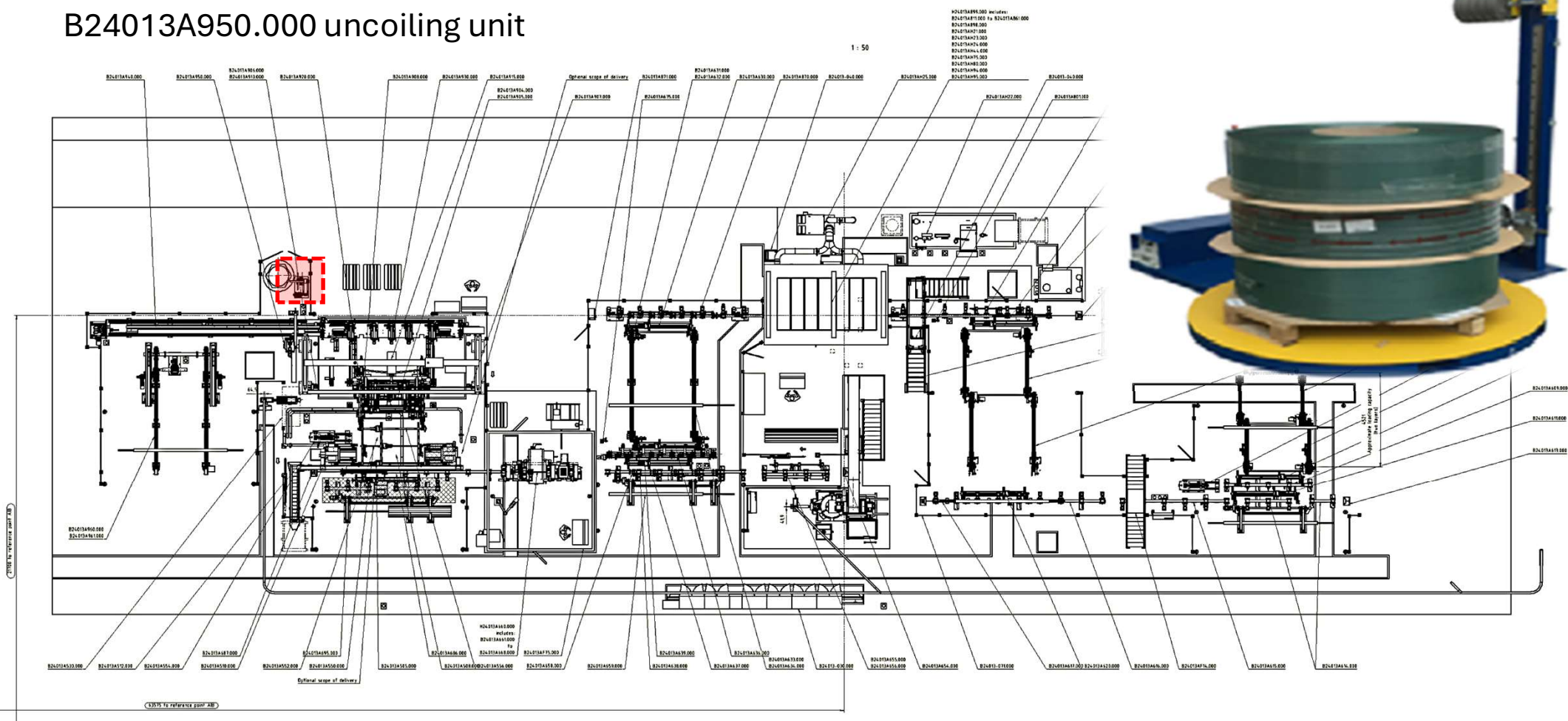


B24013A940.000 bundle transport

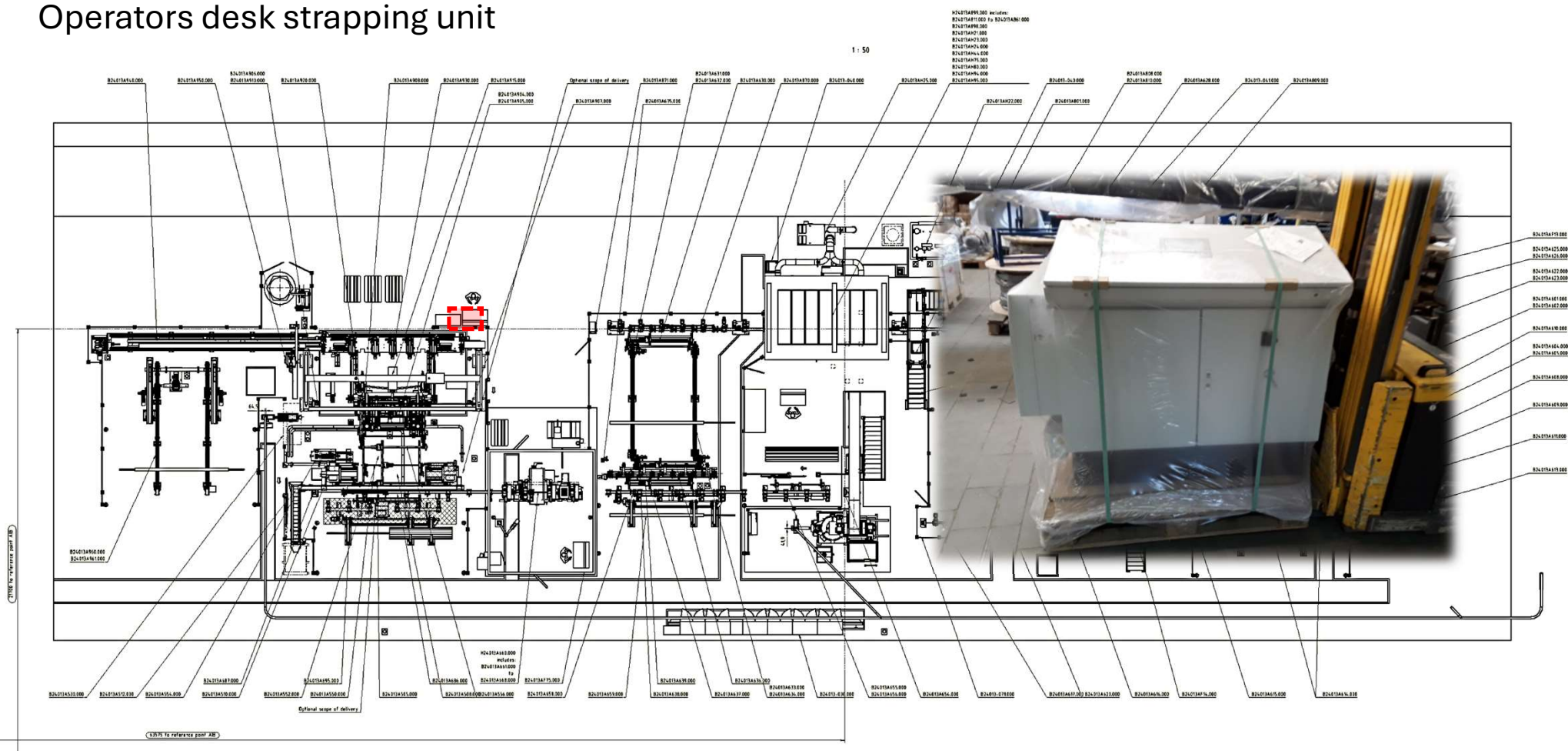


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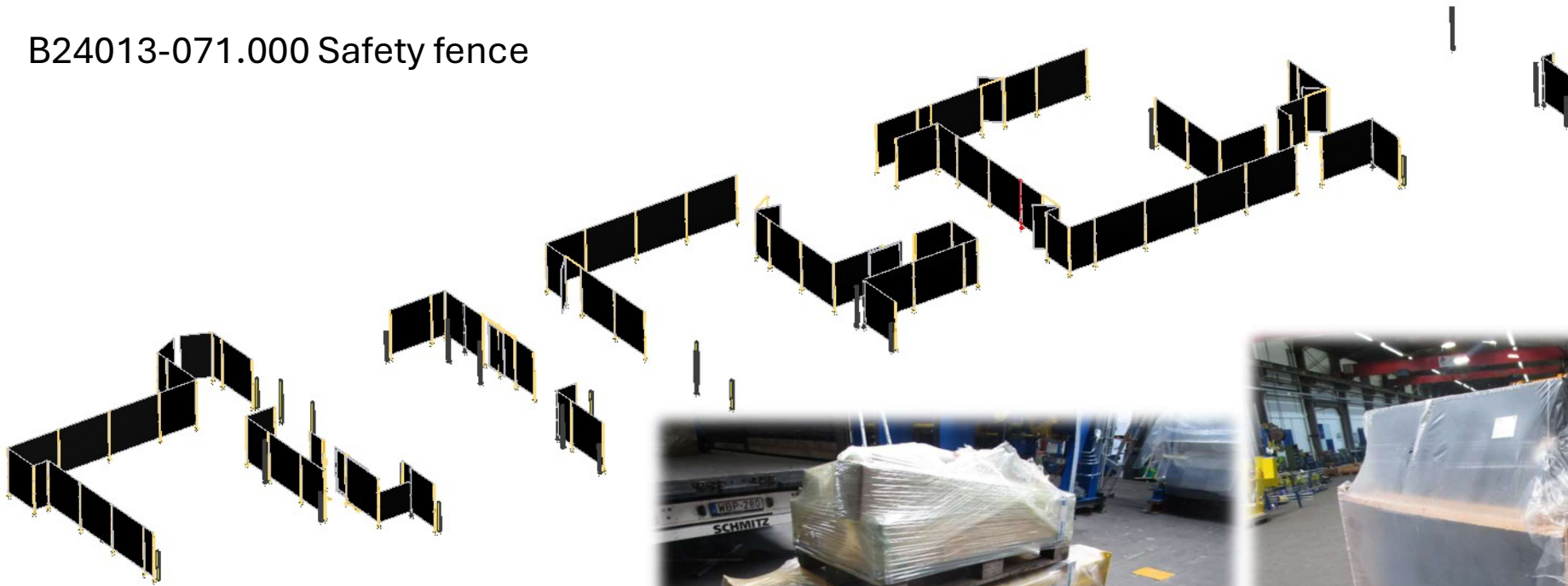
B24013A950.000 uncoiling unit



Operators desk strapping unit



B24013-071.000 Safety fence



Electrical assembly description

The following section describes the electrical installation.

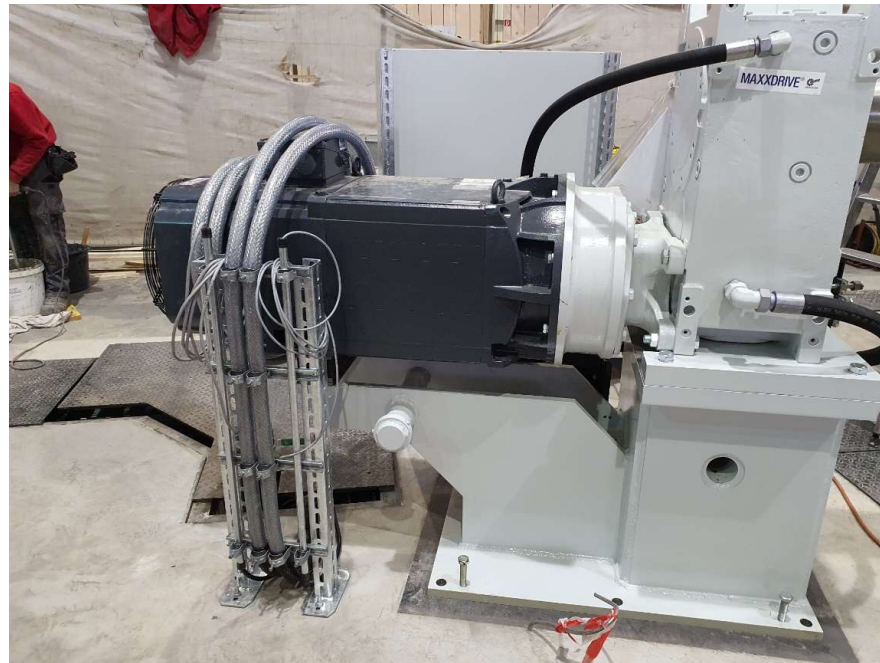
Cable channels under floor

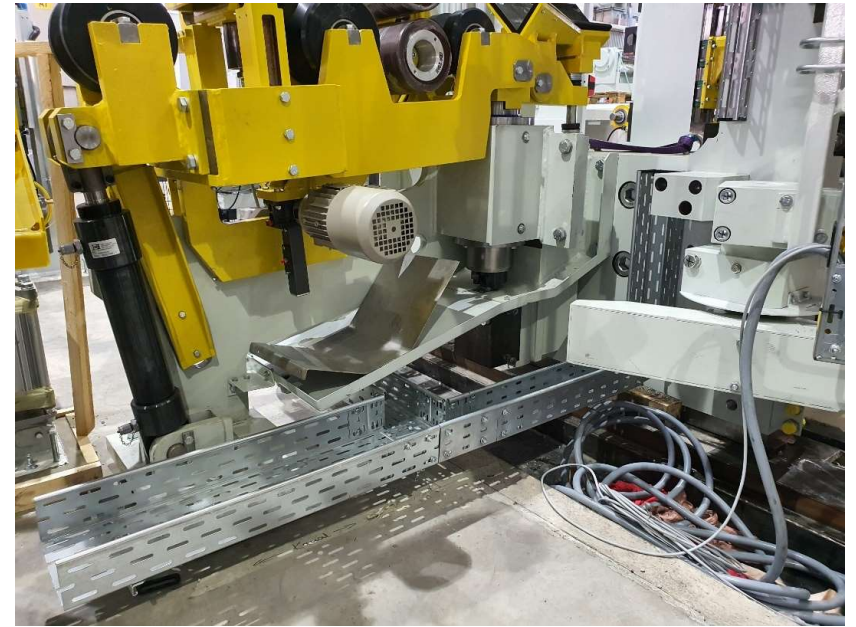
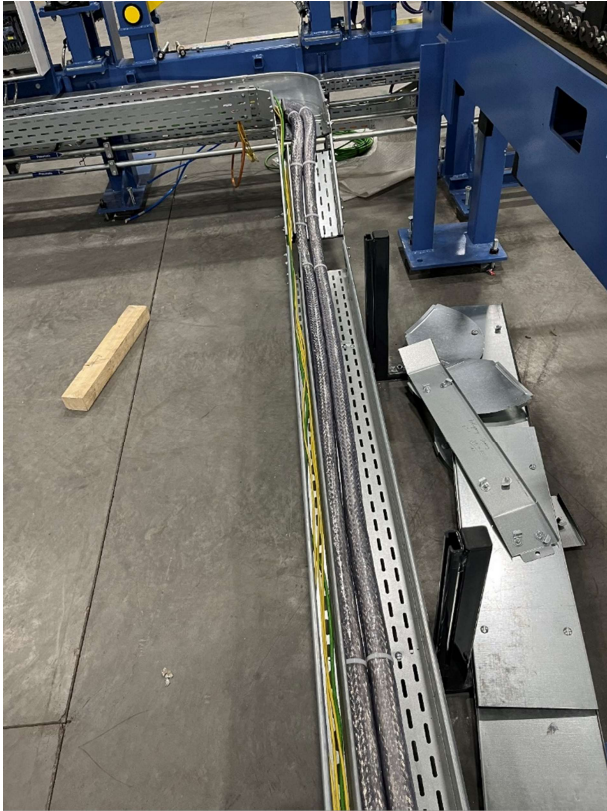
- Expansion of floor channels with metal cable ducts.
- Metal trunking must be connected to the equipotential bonding system.
- Min. 3 levels. Power section thick cables (bottom) Power section 400V cables (middle) Data / 24V cables (top)



Cable routes on the machine

- Connecting the cable routes between the assemblies and to the floor channels





Laying the cable

- All cables from the control cabinet to the system / terminal boxes / control consoles
- Cables from assemblies to terminal boxes
- Camera cables, if necessary also on hall pillars, e.g. at a height of 3-4 m (obtain/clarify appropriate permission and working platform in advance) with corresponding cable route expansion
- Earthing cables from equipotential bonding rail to machine components

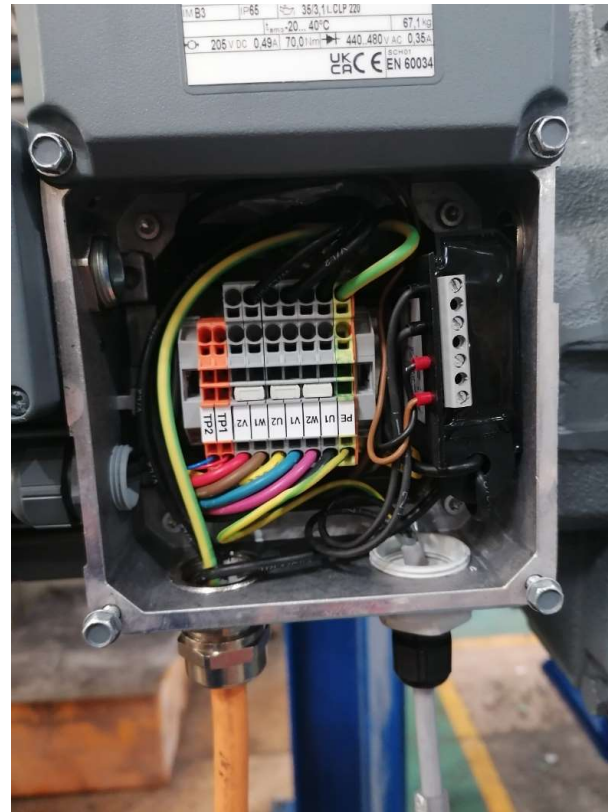
Preparation of cables (terminal box)

- Pull label carriers onto cables and attach cable labels (reading direction: tilt head to the left); ideally, these are already attached by Bültmann at the factory.
- Cable labels are always sorted according to material flow and circuit diagram sequence in the groups.
- Cables sorted by connection point in the box, pull into the terminal box
- Place cables in blocks of 4 on the cable busbar for sensors/actuators
- Shielded cables on the cable busbar, relieve strain at the bottom and connect the shield at the top. Wrap the braided shield with copper tape!



Connection of cables

- Cables in the entire system area must be wired according to the circuit diagram
- All wires must be fitted with wire end ferrules/cable lugs (if necessary) (crimping pliers are not provided and must be brought along)
- A reserve of approx. max. 20cm per cable must be provided in the cable duct of the terminal box
- Wires $< 0.5\text{mm}^2$ are still fitted with 0.5^2 ferrules on the ET200SP.
- All wire end ferrules $\geq 0.75^2$ must be crimped using crimping pliers with a round contour. Otherwise the wires can no longer be removed from the ET200SP or will be damaged



Connection of EMC cables (switch cabinet)

- The braided shield must be connected to the shield plates of the inverters with EMC clamps

