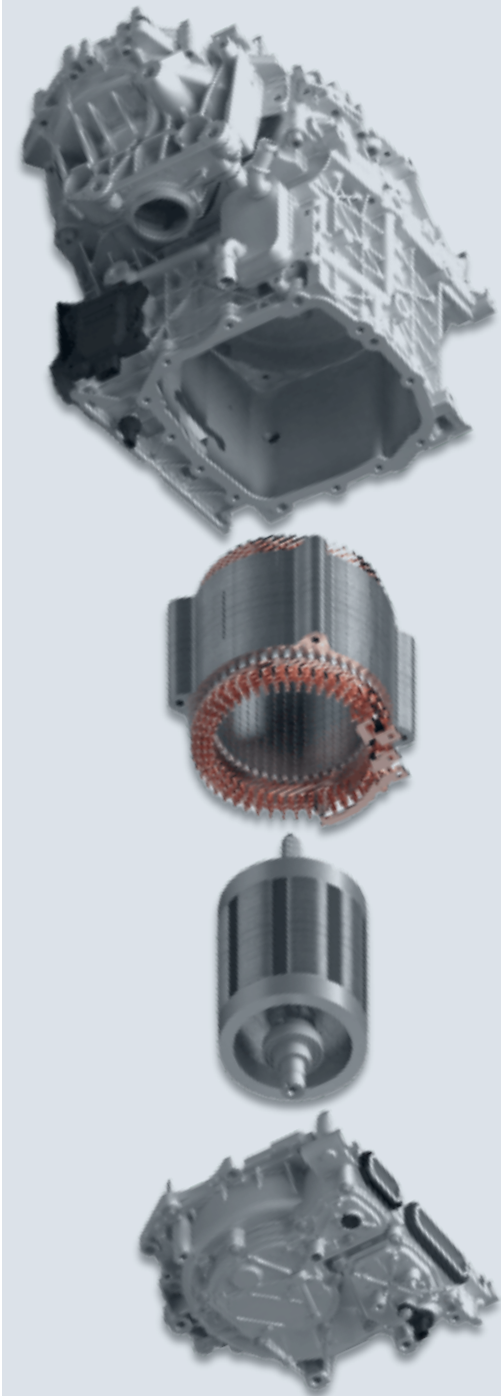




2 Complete Lines for High Voltage eMotor Assembly & Testing

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SUMMARY

High Voltage eMotor Production Lines

The offering consists of two complete, fully automated production lines for high-voltage electric motor manufacturing. Each line comprises one rotor line, one stator line, and one final assembly (FAL) motor line, forming an integrated end-to-end production system. All equipment is currently installed at location cze2, in fully operational condition, and will be available from April 2026.

Production Line 1 (Rotor Line 1, Stator Line 1, FAL Motor Line 1)

This complete production line was manufactured in **2020** by **Teamtechnik (rotor line), Grob / Tecnofirma (stator line), and PIA (FAL line)**.

The line covers the full manufacturing process chain:

Rotor production: shaft pressing into stack, magnet assembly, varnishing, balancing

Stator production: winding, stack welding, wire welding, varnishing, testing

Final assembly (FAL): stator shrink-fitting into housing, rotor magnetization and insertion, mechanical assembly, and comprehensive end-of-line testing (electrical, NVH, leakage)

Cycle time: approx. 86 seconds per unit across all processes

Equipment condition: fully operational

Availability: from 04/2026

Production Line 2 (Rotor Line 2, Stator Line 2, FAL Motor Line 2)

This second, identical production line was manufactured in **2021** by **Teamtechnik (rotor line), Grob / Tecnofirma (stator line), and PIA (FAL line)** and provides the same full process capability.

The integrated workflow includes:

Rotor assembly and finishing

Stator manufacturing and testing

Complete eMotor assembly and validation including electrical, NVH, and leakage testing

Cycle time: approx. 86 seconds per unit

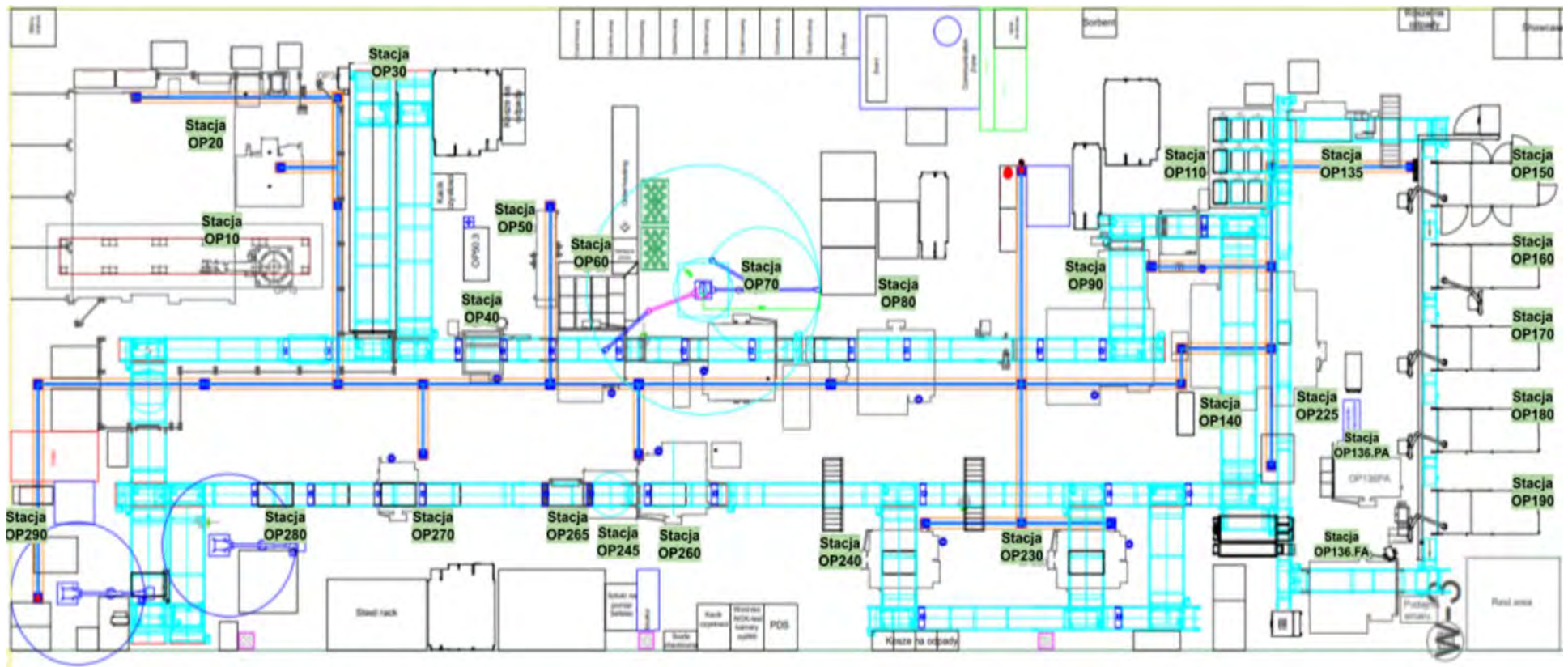
Equipment condition: fully operational

Availability: from 04/2026

FAL Motor Assembly Line 1

FAL Motor Assembly Line 1

Basic information	
Localization	Poland, Valeo CZE 2 plant
Cycle time	86 s
TRP/OEE	85%
Surface	855m ²



FAL Motor Assembly Line 1

PROCESS DESCRIPTION

LP	Station	Quantity	Type of Process	Description of the Process
1	OP10	1	Semi-automatic	Robot - loading of components
2	OP20	1	Automatic	Shrinking (Heating inner housing and joining stator)
3	OP30	1	Automatic	Cooling tunnel
4	OP40	1	Manual	Assembly X-Ring & D-Ring inner housing
5	OP50	1	Semi-automatic	Pre-Assembly outer housing
10	OP60	1	Semi-automatic	Joining inner in outer housing
11	OP70	1	Automatic	Rotor magnetization and measuring
12	OP80	1	Semi-automatic	Pre-Assembly Ashield and joining rotor into A-shield
13	OP90	1	Automatic	Wedding A-Shield to outer housing
14	OP110	1	Semi-automatic	Screwing Ashield to outer housing
15	OP135	1	Manual	Assembly Interconnector
16	OP136FA	1	Semi-automatic	Counter ring insertion, cooling cover joining into eMotor, vent assembly
17	OP136PA	1	Semi-automatic	Counter ring insertion, cooling cover joining into eMotor, vent assembly
18	OP140	1	Automatic	Handling to EOL loop
19	OP150-190	1	Automatic	End of line test
20	OP230/240	1	Automatic	Leak test 1 / Leak test 2
21	OP245	1	Automatic	Rotation of eMotor & EM graver verification
22	OP260	1	Automatic	Laser marking + stamping
23	OP270	1	Semi-automatic	Assembly of yellow plugs, Transportation Cover, Cap
24	OP280	1	Manual	Packaging and final control
25	OP290	1	Semi-automatic	Reintegration process

OP10 - Robot - loading of components



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Robot - Kuka KR150 R2700
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Loading of components
Description	The machine is used for insertion of blisters by forklift

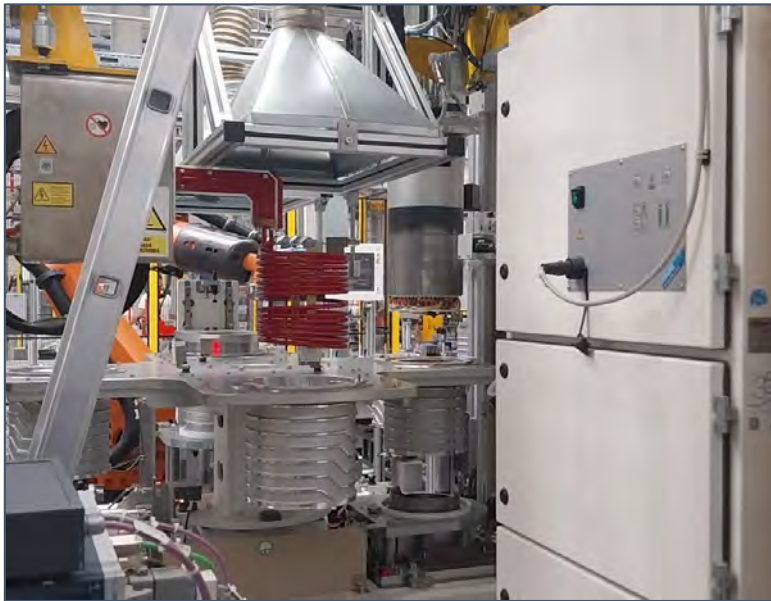
OP10 - Robot - loading of components



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Glueing & laser marking
Description	Machine used for adjusting glue by Loctite dispensing unit on stack sheets. Additionally the same station is used for laser engraving.

OP20 - Shrinking (Heating inner housing and joining stator)



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Press - TOX 10 KN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Merge of inner housing and stator
Description	The machine is heating up component by induction coil and pressing stator into housing

OP30 - Cooling tunnel



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Cooling of part
Description	The machine is used for cooling the part in the tunnel

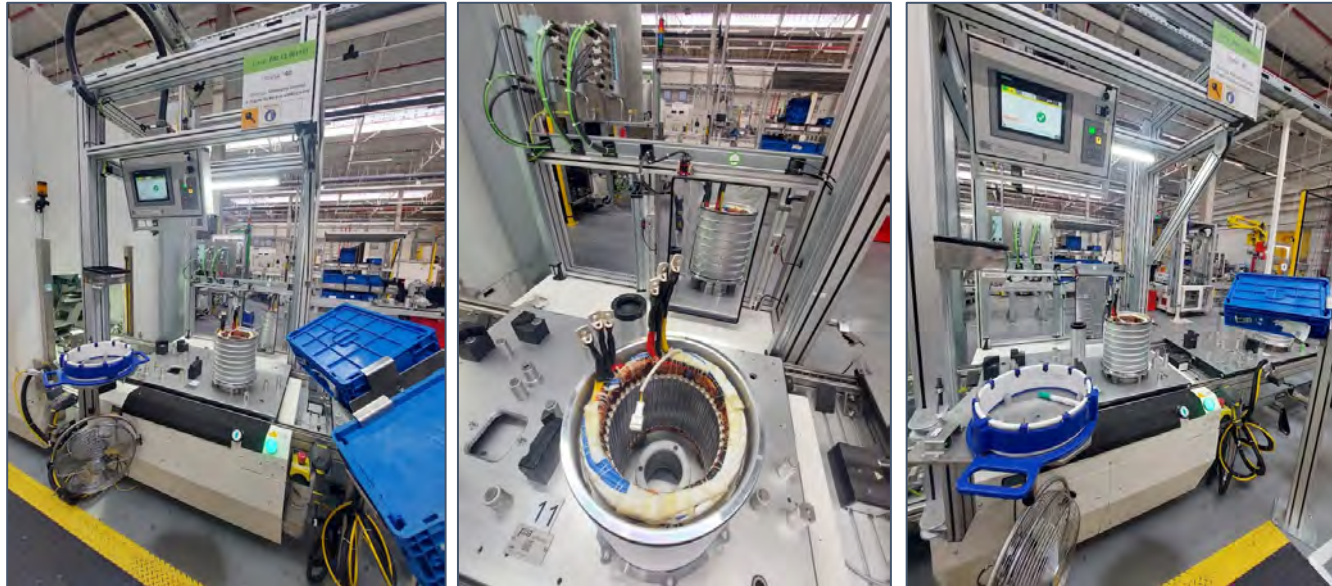
OP30 - Cooling tunnel



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Cooling of part
Description	The machine is used for cooling the part in the tunnel

OP40 - Assembly X-Ring & D-Ring inner housing



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of the product
Description	The station is used for manual assembly of two sealings

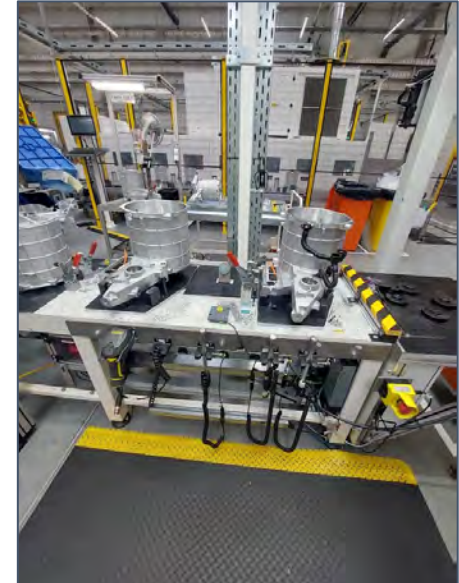
OP40 - Assembly X-Ring & D-Ring inner housing



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of the product
Description	The station is used for manual assembly of two sealings

OP50 - Pre-Assembly outhouse housing



Driver - Siemens Simatic S7 - 1500
Screwdriver - BOSCH SPINDLE x2
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Pres-assembly of component
Description	The station is used for screw flanges into housing by screwdriver

OP60 - Joining inner in outer housing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Servo Press TOX 30 KN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of components
Description	The machine is used for manual insertion of outer housing into the station TMC scanning and automatic pressing of the component

OP60 - Joining inner in outer housing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Servo Press TOX 30 KN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of components
Description	The machine is used for manual insertion of outer housing into the station TMC scanning and automatic pressing of the component

OP70 - Rotor magnetization and measuring



MAGSYS magnet systeme	MAGSYS magnet systeme GmbH Rohwedderstrasse 7 44369 Dortmund Germany
Magnetisiergerät Typ magnetizer type	MC3K82 s
Serien Nr. serial no.	201100
Projekt Nr. project no.	P190765
Energie energy	B1900 Ws(J)
Max. Spannung max. voltage	3000 V
Kondensatorbank capacitor bank	18200 µF
Betriebsspannung operating voltage	400V 50Hz 3—
Nennstrom Nominal current	14 A
Sicherung der Zuleitung incoming line fuse	B16 A
Ladeleistung power	1800 W
Baujahr build year	2020
CE	Warnung: Alle internen Bauteile können gefährliche Spannung führen ! Service Warning: Any component inside may be on dangerous potential !

Driver - Siemens Simatic S7 - 1500
Magnetization system - MAGSYS
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnetization of rotor & measurement
Description	The machine rotates the assembled outer housing, picks up the rotor, and performs the magnetization process

OP70 - Rotor magnetization and measuring



Driver - Siemens Simatic S7 - 1500
Magnetization system - MAGSYS
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnetization of rotor & measurement
Description	The machine rotates the assembled outer housing, picks up the rotor, and performs the magnetization process

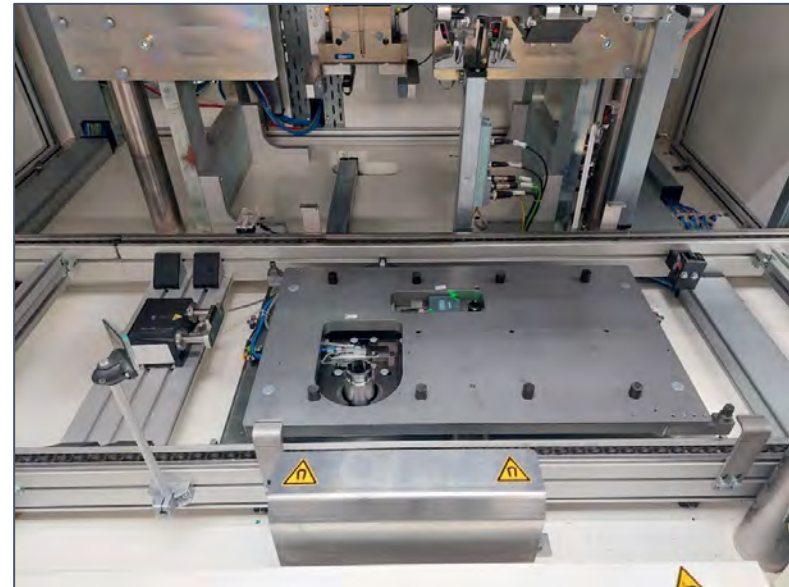
OP80 - Pre-Assembly A-shield and joining rotor into A-shield



Driver - Siemens Simatic S7 - 1500
Servo press - TOX 30 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Preparation of A-shield
Description	The machine is designed for the final assembly of the A-shield, involving the precision press-fitting of the rotor, bearing, and resolver

OP80 - Pre-Assembly A-shield and joining rotor into A-shield



Driver - Siemens Simatic S7 - 1500
Servo press - TOX 30 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Preparation of A-shield
Description	The machine is designed for the final assembly of the A-shield, involving the precision press-fitting of the rotor, bearing, and resolver

OP90 - Wedding A-Shield to outer housing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Servo press - TOX 10 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Merge of components
Description	The station inverts the A-shield to an upside-down position, press-fits it into the assembled outer housing, and performs the pre-screwing operation

OP135 - Assembly Interconnector



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of interconnector
Description	Manual attachment of the interconnector and installation of the insulating tubes

OP136PA - Counter ring insertion , cooling cover joining into eMotor, vent assembly



Driver - Siemens Simatic S7 - 1500
Press - TOX 10 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Pre assembly of rotor cooling cover
Description	The machine is used for pre-assembly of the components

OP136PA - Counter ring insertion , cooling cover joining into eMotor, vent assembly



Driver - Siemens Simatic S7 - 1500
Press - TOX 10 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Pre assembly of rotor cooling cover
Description	The machine is used for pre-assembly of the components

OP136FA - Counter ring insertion , cooling cover joining into eMotor, vent assembly



Driver - Siemens Simatic S7 - 1500
Press - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Final assembly
Description	The station press-fits the rotor cooling cover onto the rotor and performs the screw fastening operation

OP136FA - Counter ring insertion , cooling cover joining into eMotor, vent assembly



Driver - Siemens Simatic S7 - 1500
Press - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Final assembly
Description	The station press-fits the rotor cooling cover onto the rotor and performs the screw fastening operation

OP140 - Handling to EOL loop



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Transport of component
Description	Transport of the component from assembly part of FAL line into the EOL line

OP150-190 - End of line test



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
High voltage hipot tester - ETL ATS 400
Resistance measurement - HIOKI RM3545
Guard safety components - Pilz
EOL analyser v3 - Reilhofer
PLC - Siemens s71500 CPU 1515
Motion measurement systems - Sinamics S120, Yokogawa DL850 + WT1800
HMI - Siemens KP700 Comfort + TP1200 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Electrical test
Description	Electrical test of the product

OP150-190 - End of line test



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
High voltage hipot tester - ETL ATS 400
Resistance measurement - HIOKI RM3545
Guard safety components - Pilz
EOL analyser v3 - Reilhofer
PLC - Siemens s71500 CPU 1515
Motion measurement systems - Sinamics S120, Yokogawa DL850 + WT1800
HMI - Siemens KP700 Comfort + TP1200 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Electrical test
Description	Electrical test of the product

OP225



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Glueing & laser marking
Description	Machine used for adjusting glue by Loctite dispensing unit on stack sheets. Additionally the same station is used for laser engraving.

OP230 - Leak test 1



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Leak tester - Innomatec 902
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Leak test of component
Description	The component undergoes dual-channel leak testing using both vacuum and overpressure methods

OP230 - Leak test 2



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Leak tester - Innomatec 902
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Leak test of component
Description	The component undergoes dual-channel leak testing using both vacuum and overpressure methods

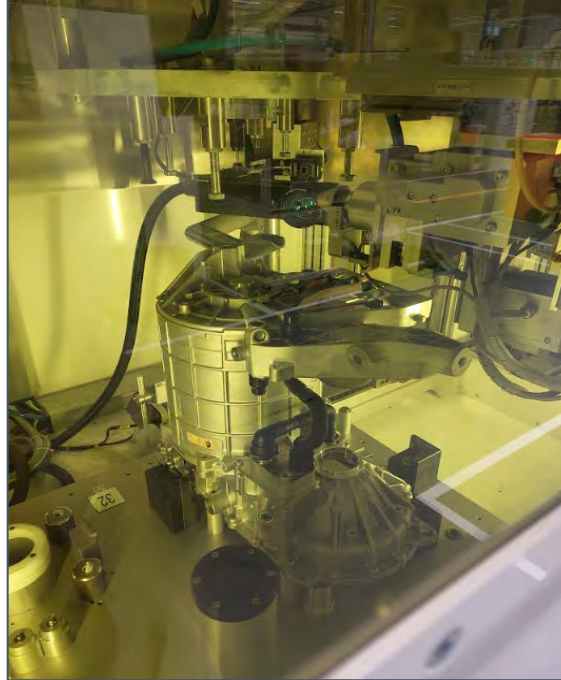
OP245 - Rotation of eMotor & EM graver verification



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Rotation of the component
Description	The pallet carrying the finished part is rotated horizontally 180° into the final orientation for packing

OP260 - Laser marking + stamping



Driver - Siemens Simatic S7 - 1500
Laser - Arex
Stamping machine - ADT
Camera - Keyence
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Laser marking and stamping, and verification
Description	The station is used for the mechanical engraving of the part to ensure permanent component identification

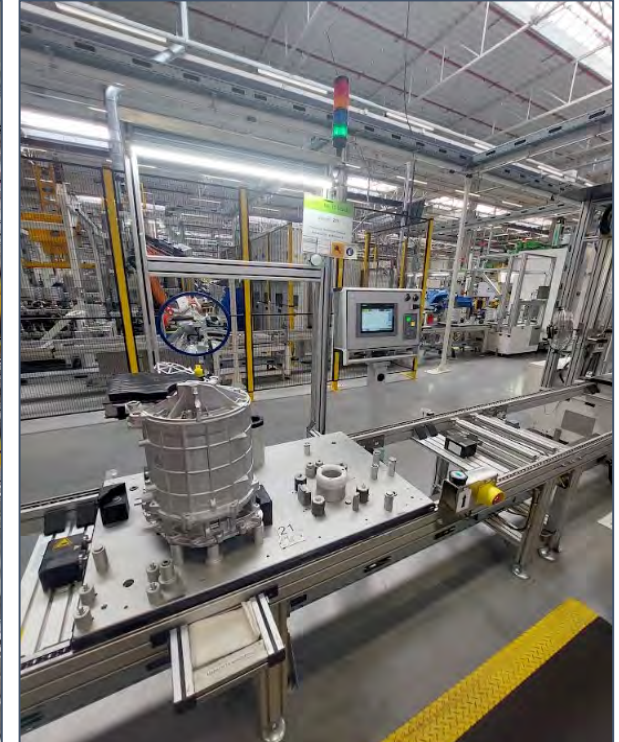
OP270 - Assembly of yellow plugs, Transportation Cover, Cap



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Preparation of the component for transport
Description	Assembly of transport covers

OP280 -Packaging and final control



Driver - Siemens Simatic S7 - 1500
Crane - DALMEC
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Packaging & final control
Description	Packaging & final control of the final component

OP290 - Reintegration process



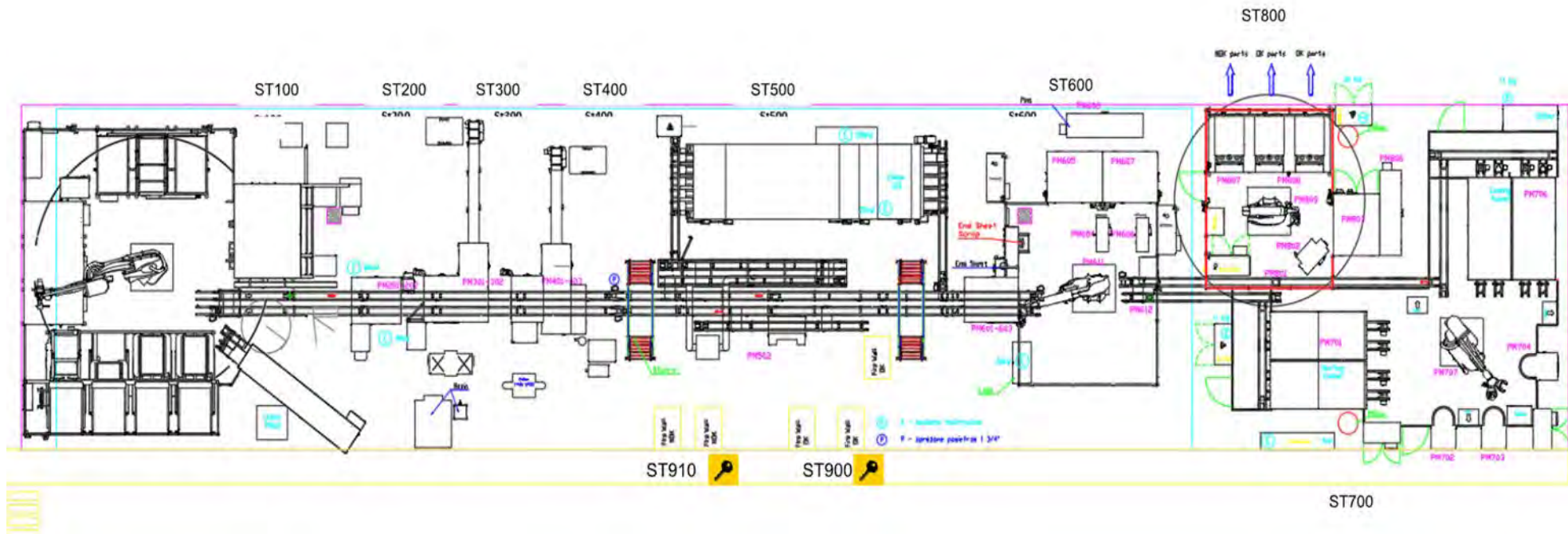
Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Reintegration of component
Description	The station is designed for manual loading and unloading of parts, as well as the execution of rework procedures

Rotor Assembly Line 1

Rotor Assembly Line 1

Basic information	
Localization	Poland, Valeo CZE 2 plant
Cycle time	86 s
TRP/OEE	85%
Surface	509m ²



Rotor Assembly Line 1

PROCESS DESCRIPTION

Lp.	Station	Quantity	Type of Process	Description of the Process
1	OP100	1	Semi Automatic	Loading of rotor package, shaft, shrinking and cooling
2	OP200	1	Automatic	Rotor pressing and locking, Laser marking
3	OP300	1	Automatic	Resin application and Big Magnets assembly
4	OP400	1	Automatic	Resin application and Small Magnets assembly
5	OP500	1	Automatic	Resin gelling & Curing
6	OP502	1	Automatic	WPC preparation
7	OP503	1	Automatic	Press plate cleaning
8	OP600	1	Automatic	Package unlocking, control resin level and magnets position
9	OP650	1	Automatic	Balancing
10	OP700	1	Automatic	Spinning
11	OP800	1	Automatic	Final balancing

OP100 - Loading of Rotor Package, Shaft, Shrinking and Cooling



Driver - Siemens Simatic S7 - 1500
Press Kistler - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Shrinking and cooling
Description	Machine used for download and load packages into the station, then heats the packages and releases the gravity force into the package.

OP100 - Loading of Rotor Package, Shaft, Shrinking and Cooling



Driver - Siemens Simatic S7 - 1500
Press Kistler - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Shrinking and cooling
Description	Machine used for download and load packages into the station, then heats the packages and releases the gravity force into the package.

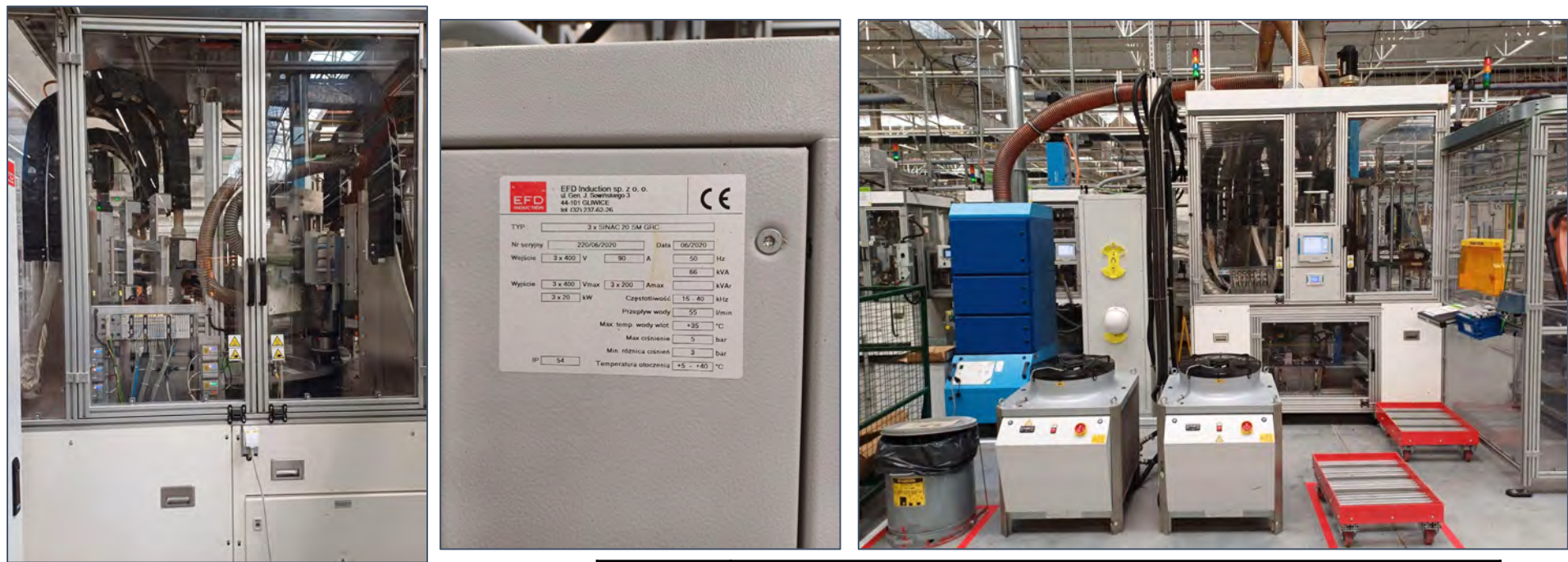
OP100 - Loading of Rotor Package, Shaft, Shrinking and Cooling



Driver - Siemens Simatic S7 - 1500
Press Kistler - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Shrinking and cooling
Description	Machine used for download and load packages into the station, then heats the packages and releases the gravity force into the package.

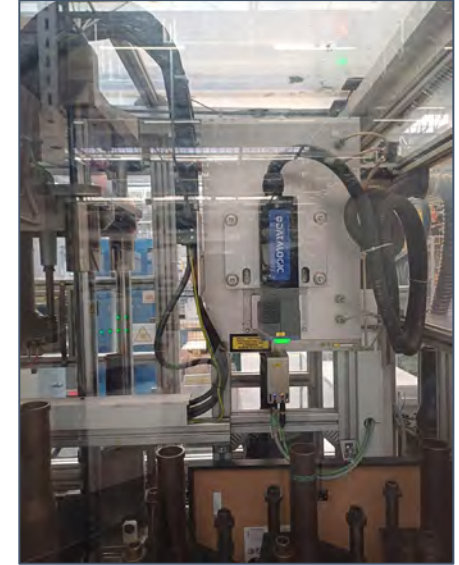
OP100 - Loading of Rotor Package, Shaft, Shrinking and Cooling



Driver - Siemens Simatic S7 - 1500
Press Kistler - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Shrinking and cooling
Description	Machine used for download and load packages into the station, then heats the packages and releases the gravity force into the package.

OP200 - Rotor Pressing and Locking and Laser Marking



Driver - Siemens Simatic S7 - 1500
Press Kistler - Screwdriver Bosch 90 Nm
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Locking and laser marking
Description	Machine used to compressing packets by using tooling and then maintaining that compression by tightening screws.

OP200 - Rotor Pressing and Locking and Laser Marking



Driver - Siemens Simatic S7 - 1500
Press Kistler - Screwdriver Bosch 90 Nm
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Locking and laser marking
Description	Machine used to compressing packets by using tooling and then maintaining that compression by tightening screws.

OP300 - Resin Application and Big Magnets Assembly



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Resin dosing - Scheugenpflug
HMI - Siemens KP700 Comfort

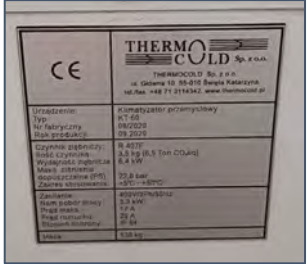
Quantity	1 PCS
Application	Specific for product
Usage	Magnet assembly and resin application
Description	Machine used for mounting magnets, the magnets are loaded by vibrating feeders, picked up by grippers in automatic mode and inserted into the holes in the package and the resin is dosed.

OP300 - Resin Application and Big Magnets Assembly

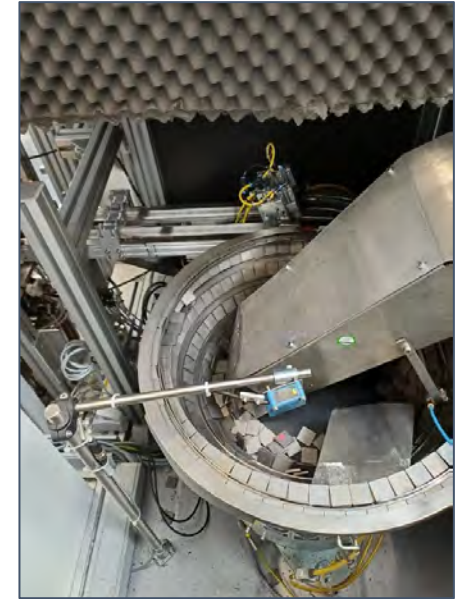


Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Resin dosing - Scheugenpflug
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnet assembly and resin application
Description	Machine used for mounting magnets, the magnets are loaded by vibrating feeders, picked up by grippers in automatic mode and inserted into the holes in the package and the resin is dosed.



OP300 - Resin Application and Big Magnets Assembly



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Resin dosing - Scheugenpflug
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnet assembly and resin application
Description	Machine used for mounting magnets, the magnets are loaded by vibrating feeders, picked up by grippers in automatic mode and inserted into the holes in the package and the resin is dosed.

OP400 - Resin Application and Small Magnets Assembly



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Resin dosing - Scheugenpflug
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Resin application and small magnets assembly
Description	Machine used for mounting magnets, the magnets are loaded by vibrating feeders, picked up by grippers in automatic mode and inserted into the holes in the package and the resin is dosed.

OP400 - Resin Application and Small Magnets Assembly



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Resin dosing - Scheugenpflug
HMI - Siemens KP700 Comfort



Quantity	1 PCS
Application	Specific for product
Usage	Resin application and small magnets assembly
Description	Machine used for mounting magnets, the magnets are loaded by vibrating feeders, picked up by grippers in automatic mode and inserted into the holes in the package and the resin is dosed.

OP500 - Resin Gelling & Curing



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Resin gelling and curing
Description	Machine used for curing the resin, capacity: 150 pcs.



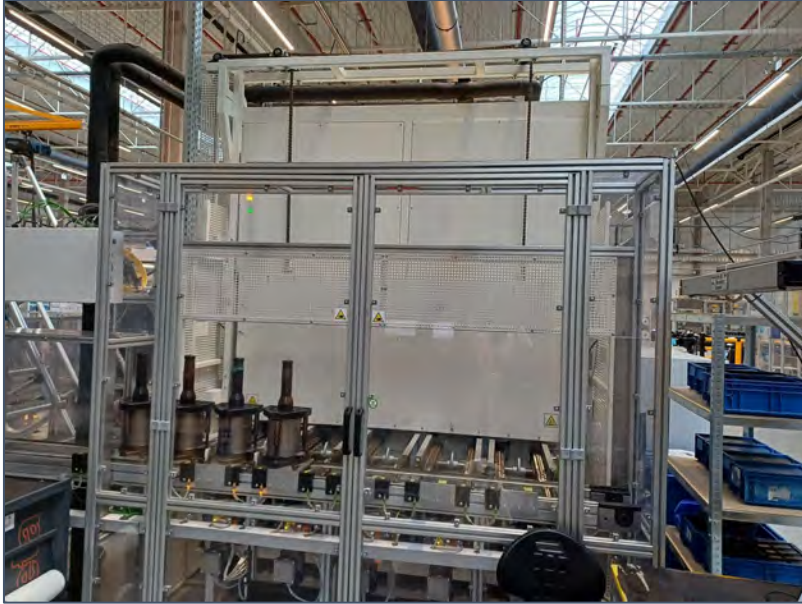
OP500 - Resin Gelling & Curing



Quantity	1 PCS
Application	Specific for product
Usage	Resin gelling and curing
Description	Machine used for curing the resin, capacity: 150 pcs.

Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

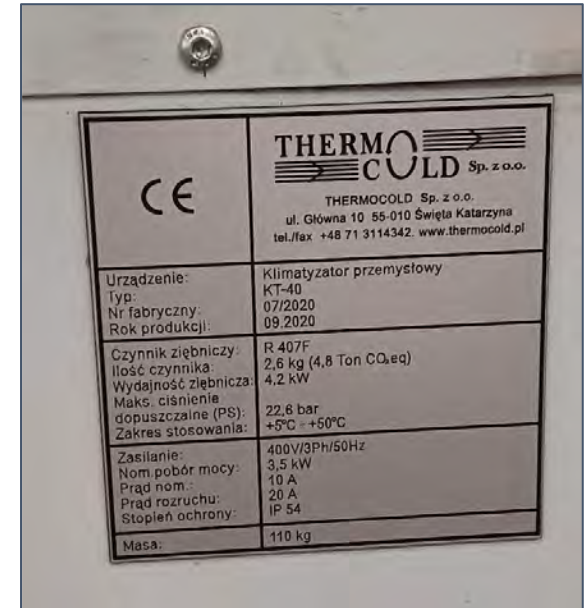
OP500 - Resin Gelling & Curing



Quantity	1 PCS
Application	Specific for product
Usage	Resin gelling and curing
Description	Machine used for curing the resin, capacity: 150 pcs.

Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

OP500 - Resin Gelling & Curing



Quantity	1 PCS
Application	Specific for product
Usage	Resin gelling and curing
Description	Machine used for curing the resin, capacity: 150 pcs.

Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

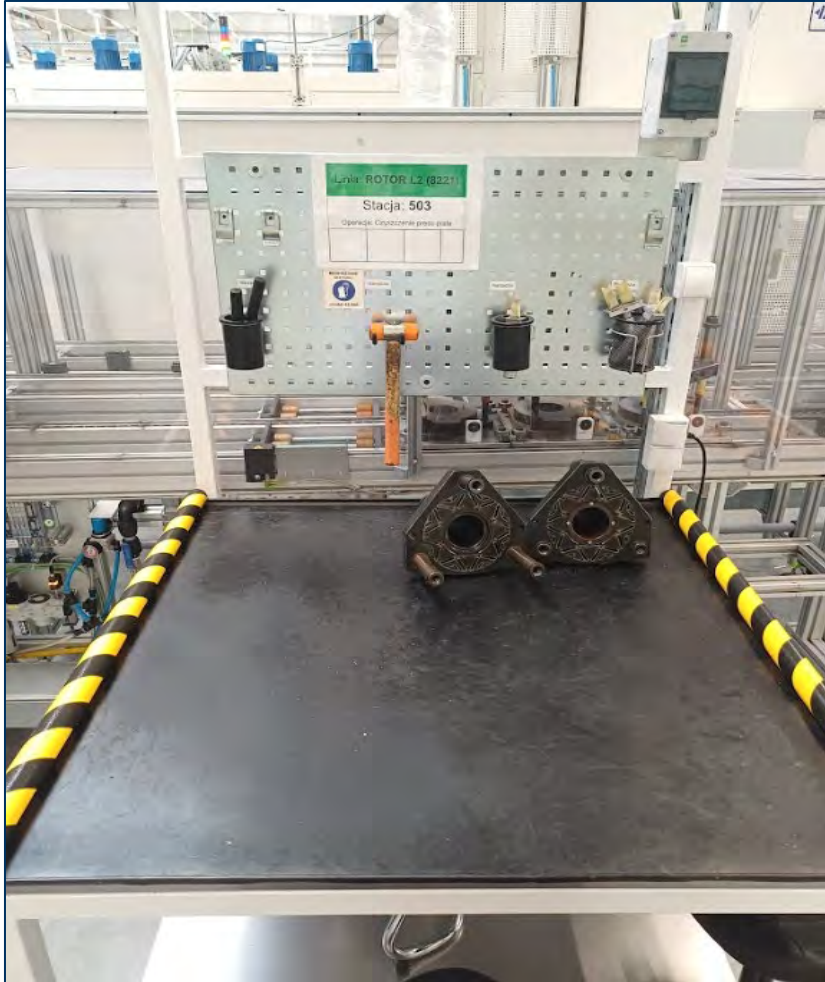
OP502 - WPC Preparation



HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	WPC Injection
Description	The station is used to prepare tooling for use on the line.

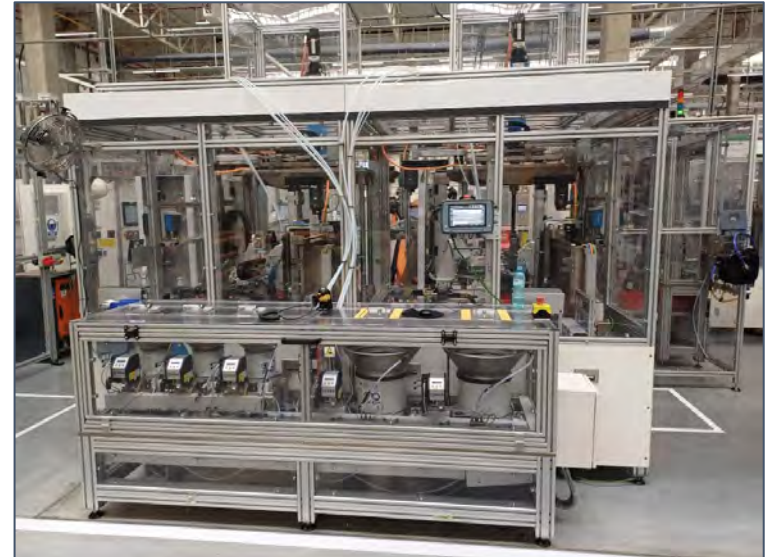
OP503 - Press Plate Cleaning



HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	WPC Injection
Description	The station is used to prepare tooling for use on the line.

OP600 - Package unlocking, control resin level and magnets position



Driver - Siemens Simatic S7 - 1500

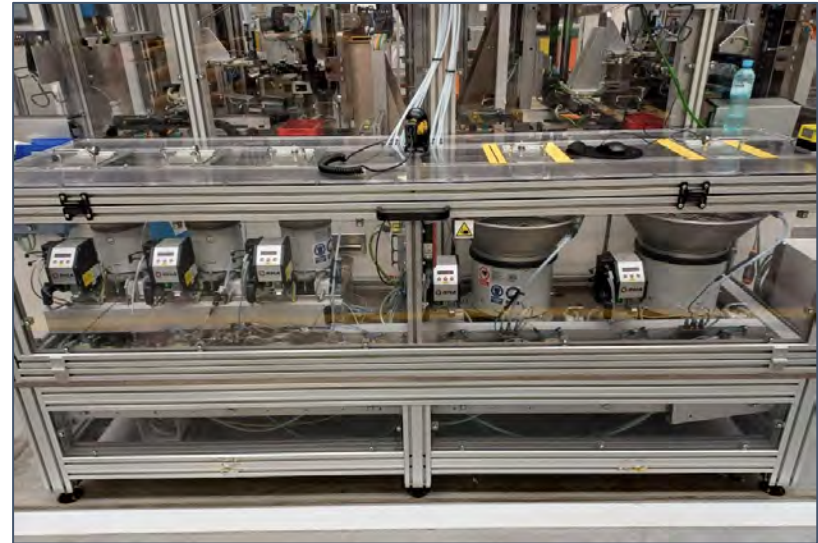
Pneumatics - Festo

Press Kistler - Screwdriver Bosch 90 Nm

HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Unlocking of tooling
Description	Machine used to unscrew the upper part of the tolling tool from the lower one and release the package. The resin level is verified through a special mask, and the product is picked up by the robot. After the robot picks up the product, the upper tooling tool is returned to the lower one and evacuated from the station.

OP600 - Package unlocking, control resin level and magnets position



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Press Kistler - Screwdriver Bosch 90 Nm
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Unlocking of tooling
Description	Machine used to unscrew the upper part of the tolling tool from the lower one and release the package. The resin level is verified through a special mask, and the product is picked up by the robot. After the robot picks up the product, the upper tooling tool is returned to the lower one and evacuated from the station.

OP600 - Package unlocking, control resin level and magnets position



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Press Kistler - Screwdriver Bosch 90 Nm
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Unlocking of tooling
Description	Machine used to unscrew the upper part of the tolling tool from the lower one and release the package. The resin level is verified through a special mask, and the product is picked up by the robot. After the robot picks up the product, the upper tooling tool is returned to the lower one and evacuated from the station.

OP650 - Balancing



Driver - Siemens Simatic S7 - 1500
Balancing machine - Schenck
Kistler Press - 15 kN x2
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Balancing of product
Description	Initial balance measurement, balancing through pin insertion, balance recheck, evacuation from the station.

OP700 - Spinning



Quantity	1 PCS
Application	Specific for product
Usage	Spinning of the product
Description	Machine used to heating the package to 120 degrees, then spinning the product and cooling it in a cooling tunnel.

Driver - Siemens Simatic S7 - 1500
3 x Hoffman spinning machines
HMI - Siemens KP700 Comfort

OP700 - Spinning



Quantity	1 PCS
Application	Specific for product
Usage	Spinning of the product
Description	Machine used to heating the package to 120 degrees, then spinning the product and cooling it in a cooling tunnel.

Driver - Siemens Simatic S7 - 1500
3 x Hoffman spinning machines
HMI - Siemens KP700 Comfort

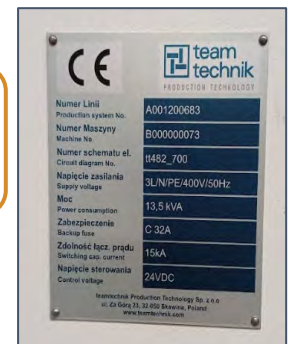


OP700 - Spinning



Quantity	1 PCS
Application	Specific for product
Usage	Spinning of the product
Description	Machine used to heating the package to 120 degrees, then spinning the product and cooling it in a cooling tunnel.

Driver - Siemens Simatic S7 - 1500
3 x Hoffman spinning machines
HMI - Siemens KP700 Comfort



OP700 - Spinning



Quantity	1 PCS
Application	Specific for product
Usage	Spinning of the product
Description	Machine used to heating the package to 120 degrees, then spinning the product and cooling it in a cooling tunnel.

Driver - Siemens Simatic S7 - 1500
3 x Hoffman spinning machines
HMI - Siemens KP700 Comfort

OP800 - Final Balancing



Quantity	1 PCS
Application	Specific for product
Usage	Final balancing
Description	Initial balance measurement, balancing through pin insertion, balance recheck, evacuation from the station.

Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Press Kistler - Screwdriver Bosch 90 Nm
HMI - Siemens KP700 Comfort

OP800 - Final Balancing



Quantity	1 PCS
Application	Specific for product
Usage	Final balancing
Description	Initial balance measurement, balancing through pin insertion, balance recheck, evacuation from the station.

Driver - Siemens Simatic S7 - 1500

Pneumatics - Festo

Press Kistler - Screwdriver Bosch 90 Nm

HMI - Siemens KP700 Comfort

Stator Assembly Line 1

Stator Assembly Line 1

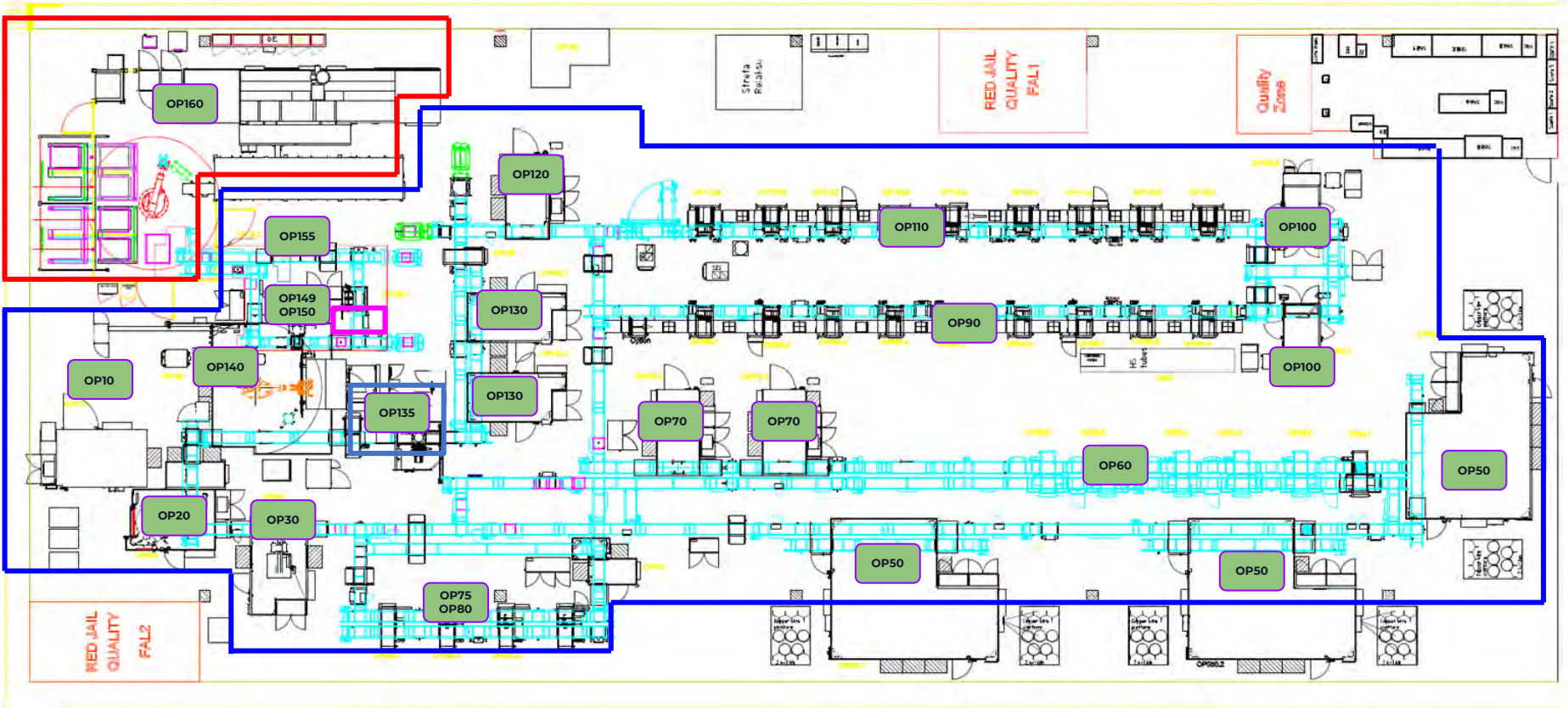
Basic information	
Localization	Poland, Valeo CZE 2 plant
Cycle time	86s
TRP/OEE	75%
Surface	1500 m ²

GROB

Tecnofirma

ZAW

Teknomatic



Stator Assembly Line 1

PROCESS DESCRIPTION

LP	Station	Quantity	Type of the process	Description of the process
1	OP10	1	Semi-auto	End plate subassembly (glueing)
2	OP20	1	Semi-auto	Stator stack preparation
3	OP30	1	Auto	Insertion of slot insulators
4	OP50	3	Auto	Winding
5	OP60	1	Manual	Assembly of insulation tubes
6	OP70	2	Auto	Pre forming of wires
7	OP75 & OP80	1	Manual	Phase separators assembly
8	OP90	1	Manual	Preparing of stator for hot crimping
9	OP100	2	Auto	Hot crimping of connectors
10	OP110	1	Manual	Preparing of stator for final forming
11	OP120	1	Auto	Final forming of wires
12	OP130	2	Auto	Lancing
13	OP135	1	Semi-auto	Phase separators cutting
14	OP140	1	Auto	Skewing and laser welding of stator stack
15	OP149 & OP150	1	Semi-auto	EOL electric measurement (low and high voltage)
16	OP155	1	Semi-auto	Assembly of heat shrink tubes

OP10 - End Plate Subassembly (Glueing)



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Glueing & laser marking
Description	Machine used for adjusting glue by Loctite dispensing unit on stack sheets. Additionally the same station is used for laser engraving.

OP10 - End Plate Subassembly (Glueing)



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Glueing & laser marking
Description	Machine used for adjusting glue by Loctite dispensing unit on stack sheets. Additionally the same station is used for laser engraving.

OP20 - Stator Stack Preparation



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Measuring system & manipulator for transport
Description	Manual loading of lamination. Height measurement system with auto adjustment by adding or removing single lamination based on the measurement result. Transport of stator stack on WPC

OP30 - Insertion of Slot Insulators



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Universal
Usage	Any type of Stator for HV Motor
Description	Machine is designed to insert 48 paper insulators in "U" shape

OP50 - Winding

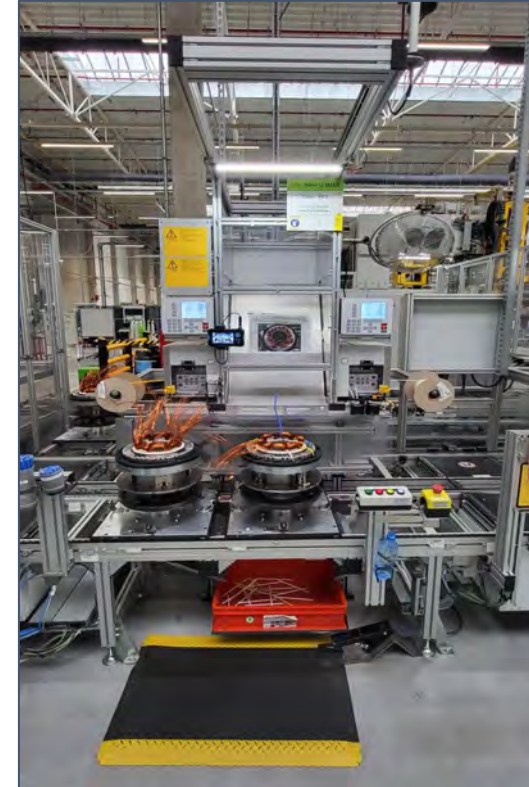


Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens TP900 Comfort

Quantity	3 PCS
Application	Universal
Usage	Winding of any type with adapted tooling
Description	A copper wire winding machine, capable of winding the required size of coil using the appropriate tool



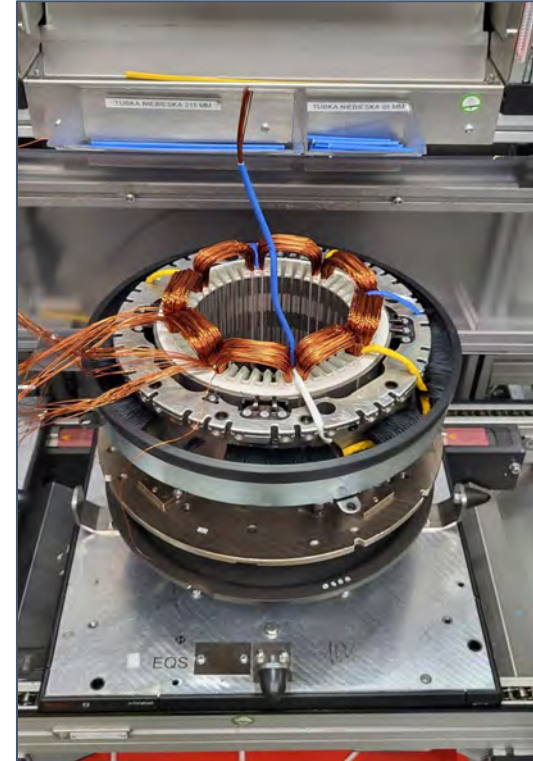
OP60 - Assembly of Insulation Tubes



Quantity	6 PCS + 1PCS
Application	Universal
Usage	Manual station for components assembly
Description	6 pcs - stations located on the conveyor for assembly of insulation tubes, 1 psc - station additionally equipped for 4 machines for cutting insulation tubes according to current demand

Pneumatics - Festo

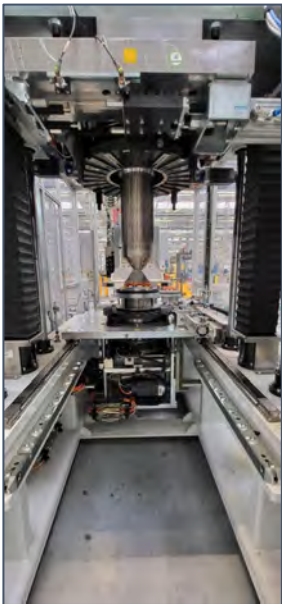
OP60 - Assembly of Insulation Tubes



Quantity	6 PCS + 1PCS
Application	Universal
Usage	Manual station for components assembly
Description	6 pcs - stations located on the conveyor for assembly of insulation tubes, 1 psc - station additionally equipped for 4 machines for cutting insulation tubes according to current demand

Pneumatics - Festo

OP70 - Pre-Forming of Wires



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	2 PCS
Application	Universal
Usage	High capacity press with stator shaping tooling
Description	A standard press with a clamping force of 20kN. Equipped with force and displacement monitoring. Kistler equipment - details in the documentation. Loading and unloading are performed by a pick-and-place mechanism from a pallet.



OP75 & OP80 - Phase Separators Assembly



Pneumatics - Festo



Quantity	6 PCS + 1PCS
Application	Universal
Usage	Manual station for components assembly
Description	6 pcs - stations located on the conveyor for assembly of phase separators between coils, 1 psc - station dedicated for rotation of stator with cradle upside down.

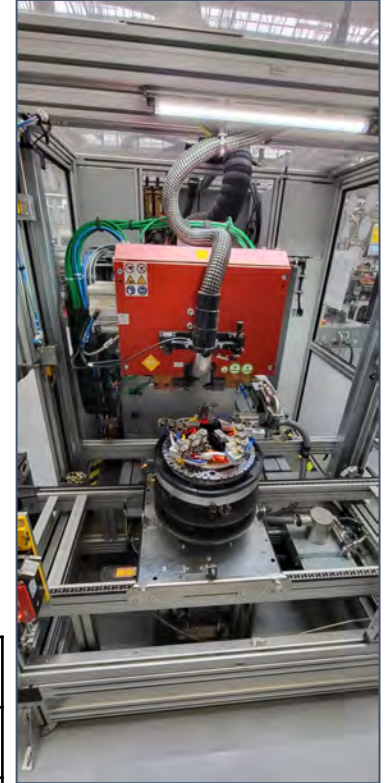
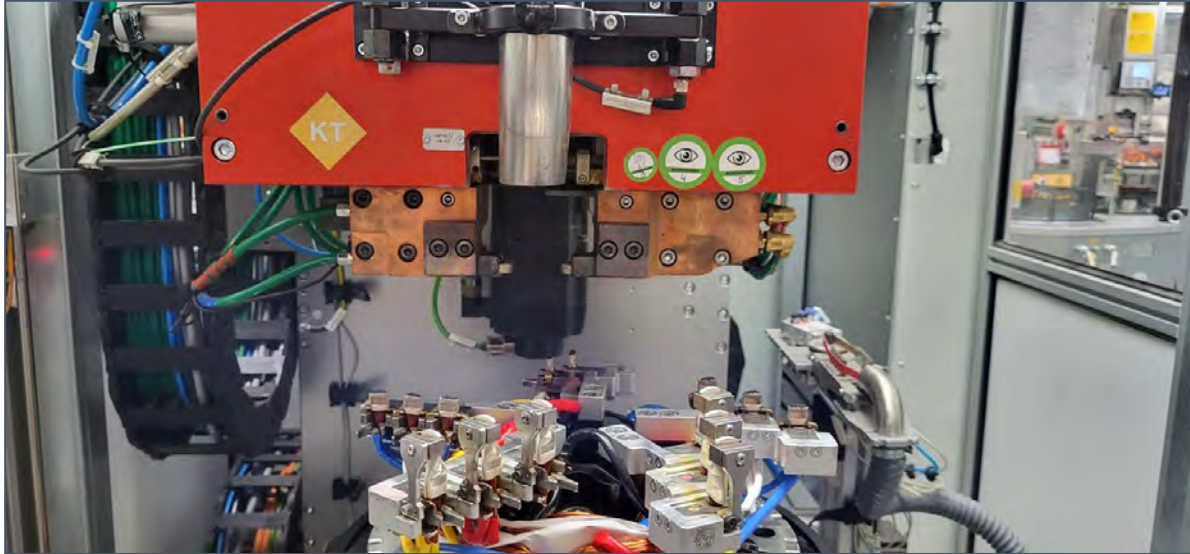
OP90 - Preparing of Stator for Hot Crimping



Pneumatics - Festo

Quantity	8 PCS
Application	Universal
Usage	Manual station for components assembly
Description	8 pcs - places located on the conveyor for manual operations.

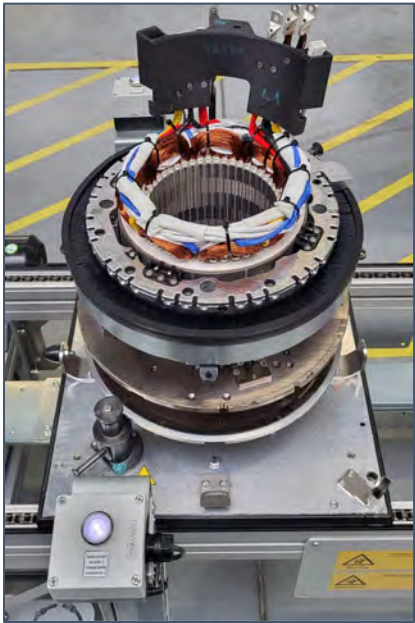
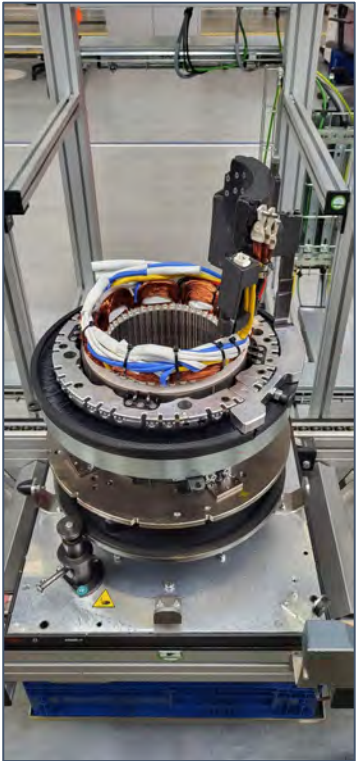
OP100 - Hot Crimping of Connectors



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	2 PCS
Application	Universal
Usage	Crimping with welding
Description	Transformer resistance welder with full monitoring of collapsing force and welding current intensity

OP110 - Preparing of Stator for Final Forming



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	10 PCS
Application	Universal
Usage	Manual station for components assembly
Description	10 pcs - places located on the conveyor for manual operations.

OP120 - Final Forming of Wires



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Universal
Usage	High capacity press with stator shaping tooling
Description	A standard press with a clamping force of 20kN. Equipped with force and displacement monitoring. Kistler equipment - details in the documentation. Loading and unloading are performed by a pick-and-place mechanism from a pallet.

OP130 - Lancing



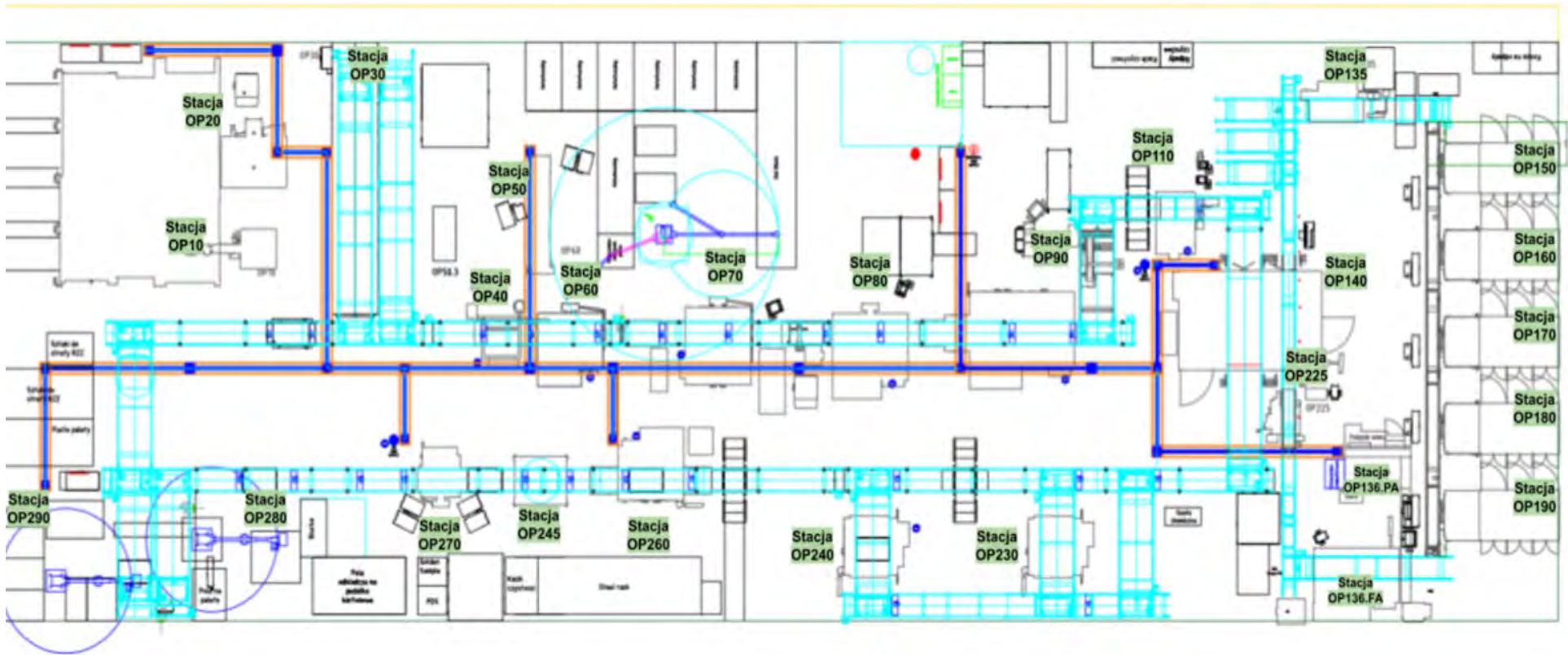
Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	2 PCS
Application	Universal
Usage	Automatic lancing process of stator
Description	A universal machine for the lacing process. The machine is configurable, with tooling adapted for a stator of 210mm or 140mm of height..

FAL Motor Assembly Line 2

FAL Motor Assembly Line 2

Basic information	
Localization	Poland, Valeo CZE 2 plant
Cycle time	86 s
TRP/OEE	85%
Surface	760m ²



FAL Motor Assembly Line 2

PROCESS DESCRIPTION

LP	Station	Quantity	Type of Process	Description of the Process
1	OP10	1	Semi-automatic	Robot - loading of components
2	OP20	1	Automatic	Shrinking (Heating inner housing and joining stator)
3	OP30	1	Automatic	Cooling tunnel
4	OP40	1	Manual	Assembly X-Ring & D-Ring inner housing
5	OP50	1	Semi-automatic	Pre-Assembly outer housing
10	OP60	1	Semi-automatic	Joining inner in outer housing
11	OP70	1	Automatic	Rotor magnetization and measuring
12	OP80	1	Semi-automatic	Pre-Assembly Ashield and joining rotor into A-shield
13	OP90	1	Automatic	Wedding A-Shield to outer housing
14	OP110	1	Semi-automatic	Screwing Ashield to outer housing
15	OP135	1	Manual	Assembly Interconnector
16	OP136FA	1	Semi-automatic	Counter ring insertion, cooling cover joining into eMotor, vent assembly
17	OP136PA	1	Semi-automatic	Counter ring insertion, cooling cover joining into eMotor, vent assembly
18	OP140	1	Automatic	Handling to EOL loop
19	OP150-190	1	Automatic	End of line test
20	OP230/240	1	Automatic	Leak test 1 / Leak test 2
21	OP245	1	Automatic	Rotation of eMotor & EM graver verification
22	OP260	1	Automatic	Laser marking + stamping
23	OP270	1	Semi-automatic	Assembly of yellow plugs, Transportation Cover, Cap
24	OP280	1	Manual	Packaging and final control
25	OP290	1	Semi-automatic	Reintegration process

OP10 - Robot - loading of components



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Robot - Kuka KR150 R2700
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Loading of components
Description	The machine is used for insertion of blisters by forklift

OP10 - Robot - loading of components



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Robot - Kuka KR150 R2700
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Loading of components
Description	The machine is used for insertion of blisters by forklift

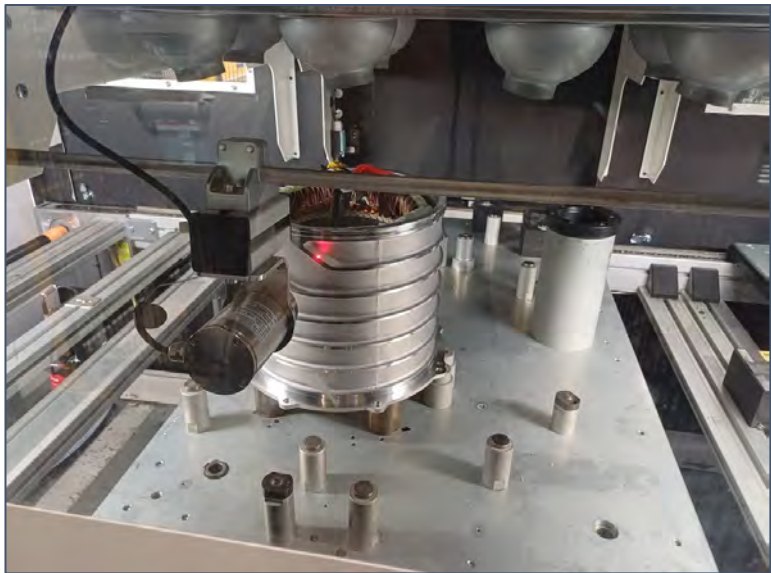
OP20 - Shrinking (Heating inner housing and joining stator)



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Press - TOX 10 KN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Merge of inner housing and stator
Description	The machine heats up component by induction coil and presses stator into housing

OP30 - Cooling tunnel



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Cooling of part
Description	The machine is used for cooling the part in the tunnel

OP30 - Cooling tunnel



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Cooling of part
Description	The machine is used for cooling the part in the tunnel

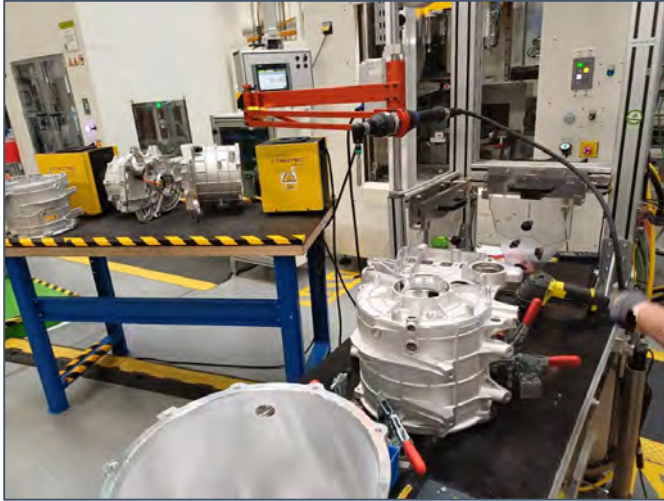
OP40 - Assembly X-Ring & D-Ring inner housing



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of the product
Description	The station is used for manual assembly of two sealings

OP50 - Pre-Assembly outhouse housing



Driver - Siemens Simatic S7 - 1500
Screwdriver - BOSCH SPINDLE x2
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Pres-assembly of component
Description	The station is used for screw flanges into housing by screwdriver

OP60 - Joining inner in outer housing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Servo Press TOX 30 KN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of components
Description	The machine is used for manual insertion of outer housing into the station, TMC scanning, and automatic pressing of the component

OP60 - Joining inner in outer housing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Servo Press TOX 30 KN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of components
Description	The machine is used for manual insertion of outer housing into the station, TMC scanning, and automatic pressing of the component

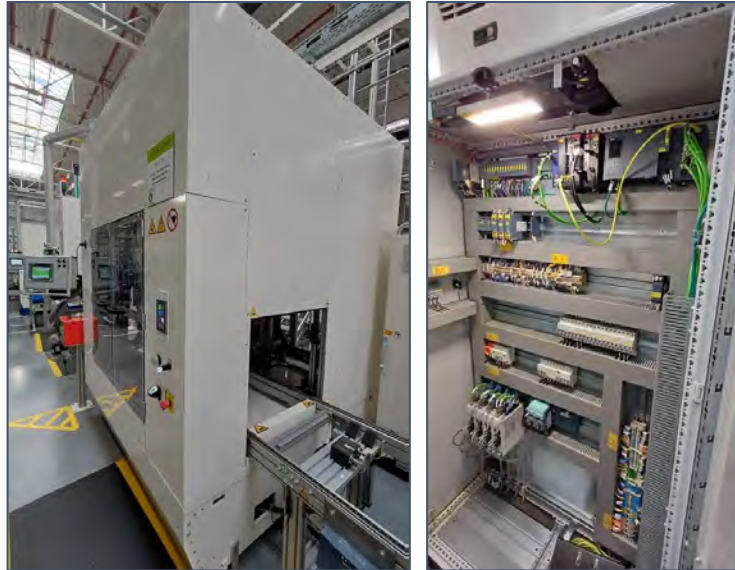
OP70 - Rotor magnetization and measuring



Driver - Siemens Simatic S7 - 1500
Magnetization system - MAGSYS
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnetization of rotor & measurement
Description	The machine rotates the assembled outer housing, picks up the rotor, and performs the magnetization process

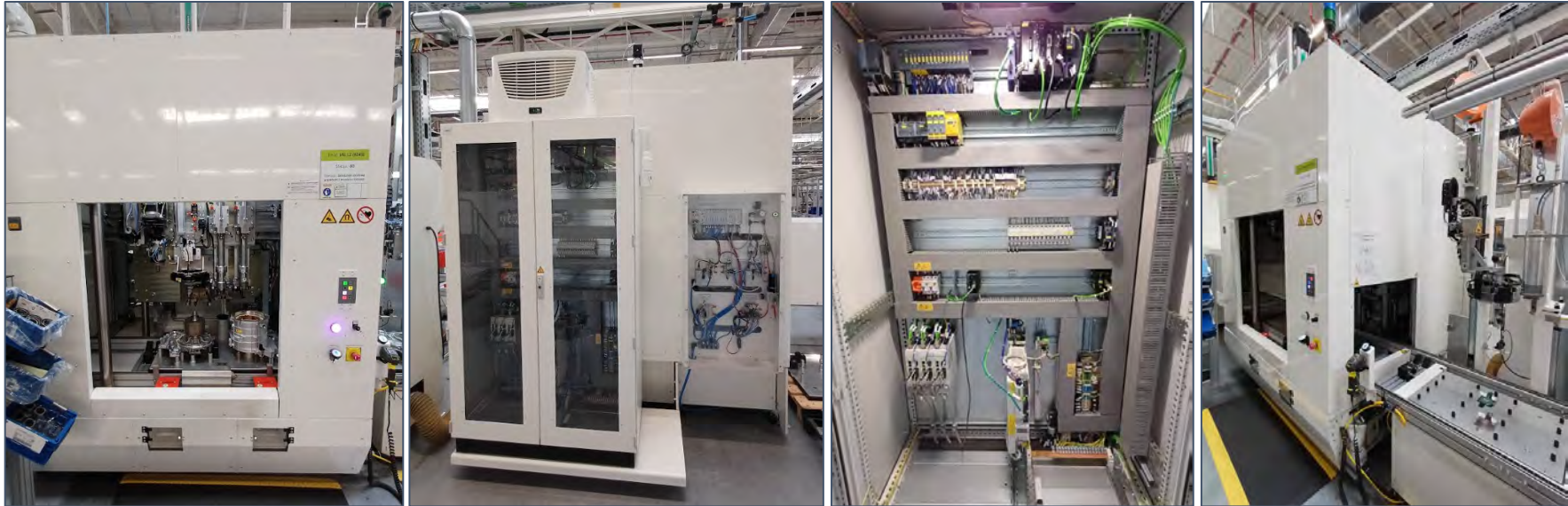
OP70 - Rotor magnetization and measuring



Driver - Siemens Simatic S7 - 1500
Magnetization system - MAGSYS
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnetization of rotor & measurement
Description	The machine rotates the assembled outer housing, picks up the rotor, and performs the magnetization process

OP80 - Pre-Assembly Ashield and joining rotor into A-shield



Driver - Siemens Simatic S7 - 1500
Servo press - TOX 30 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Preparation of A-shield
Description	The machine is designed for the final assembly of the A-shield, involving the precision press-fitting of the rotor, bearing, and resolver

OP90 - Marriage A-Shield to outer housing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Servo press - TOX 10 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Merge of components
Description	The station inverts A-shield to upside-down position, press-fits it into the assembled outer housing, and performs the pre-screwing operation

OP90 - Marriage A-Shield to outer housing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Servo press - TOX 10 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Merge of components
Description	The station inverts A-shield to upside-down position, press-fits it into the assembled outer housing, and performs the pre-screwing operation

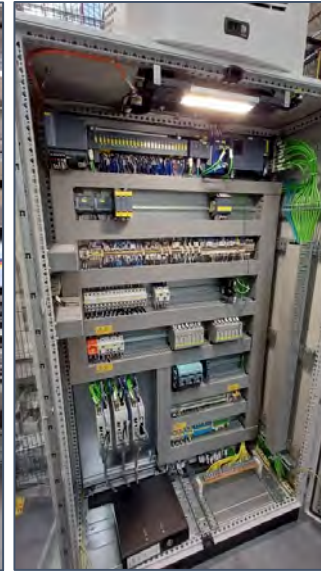
OP110 - Screwing Ashield to outer housing



Driver - Siemens Simatic S7 - 1500
Screwdriver - BOSCH with Position encoder
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Final screwing, oil dosing
Description	The station performs the final fastening of the e-motor components and dispenses a precise, small volume of oil onto the bearing

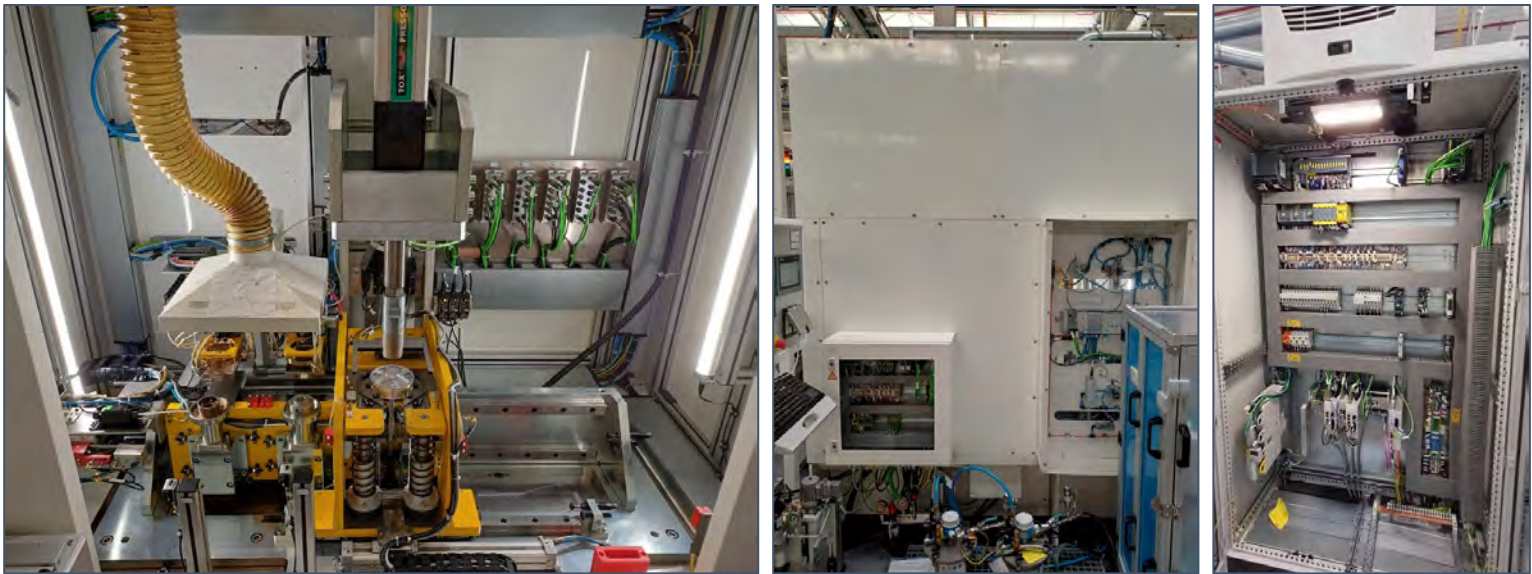
OP135 - Assembly Interconnector



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Assembly of interconnector
Description	Manual attachment of the interconnector and installation of the insulating tubes

OP136PA - Rotor cooling system assembly



Driver - Siemens Simatic S7 - 1500
Press - TOX 10 kN
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Pre assembly of rotor cooling cover
Description	The machine is used for pre-assembly of the components

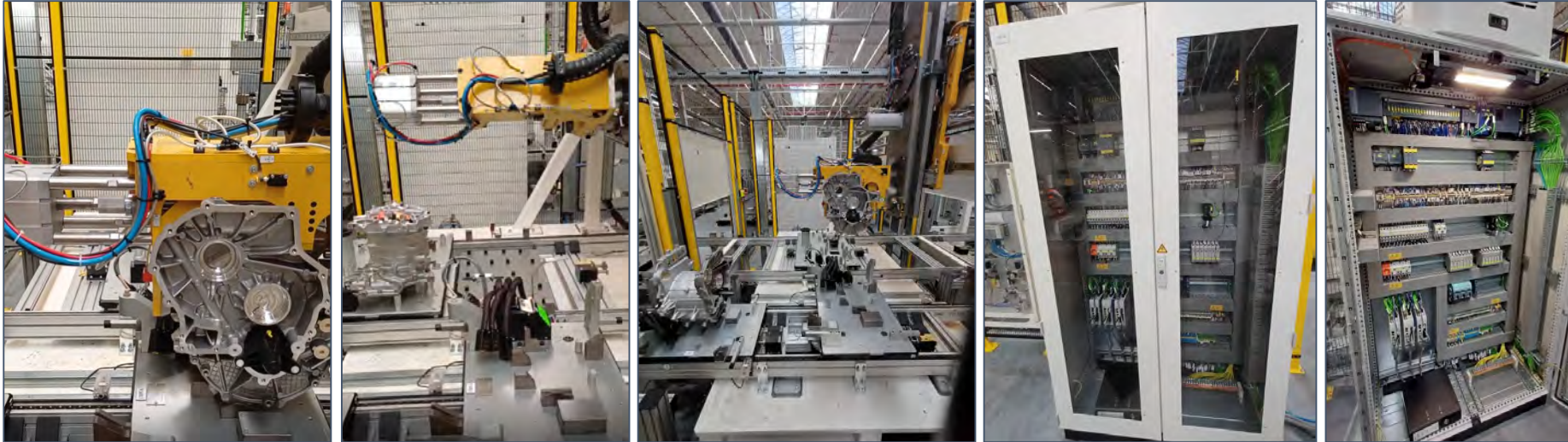
OP136FA - Counter ring insertion, cooling cover joining into eMotor, vent assembly



Driver - Siemens Simatic S7 - 1500
Press - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Final assembly
Description	The station press-fits the rotor cooling cover onto the rotor and performs the screw fastening operation

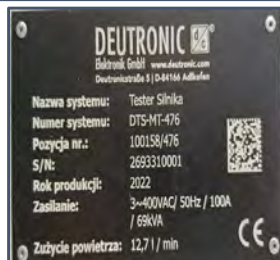
OP140 - Handling to EOL loop



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Transport of component
Description	Transport of the component from assembly part of FAL line into the EOL line

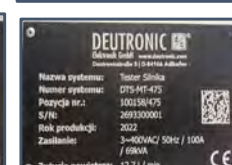
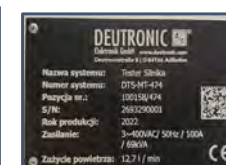
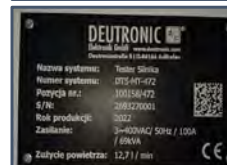
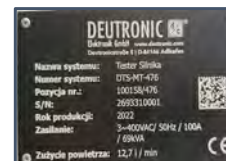
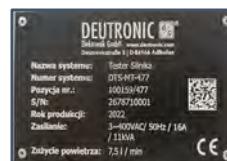
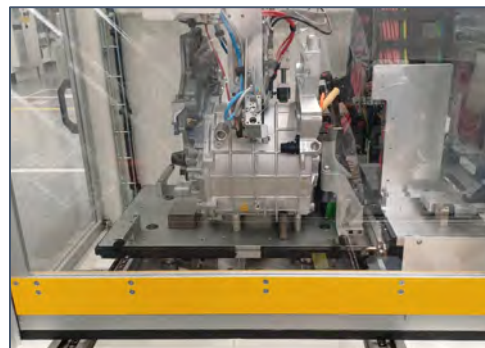
OP150-190 - End of line test



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
High voltage hipot tester - ETL ATS 400
Resistance measurement - HIOKI RM3545
Guard safety components - Pilz
EOL analyser v3 - Reilhofer
PLC - Siemens s71500 CPU 1515
Motion measurement systems - Sinamics S120, Yokogawa DL850 + WT1800
HMI - Siemens KP700 Comfort + TP1200 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Electrical test
Description	Electrical test of the product

OP150-190 - End of line test



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
High voltage hipot tester - ETL ATS 400
Resistance measurement - HIOKI RM3545
Guard safety components - Pilz
EOL analyser v3 - Reilhofer
PLC - Siemens s71500 CPU 1515
Motion measurement systems - Sinamics S120,
 Yokogawa DL850 + WT1800
HMI - Siemens KP700 Comfort + TP1200 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Electrical test
Description	Electrical test of the product

OP150-190 - End of line test



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
High voltage hipot tester - ETL ATS 400
Resistance measurement - HIOKI RM3545
Guard safety components - Pilz
EOL analyser v3 - Reilhofer
PLC - Siemens s71500 CPU 1515
Motion measurement systems - Sinamics S120,
Yokogawa DL850 + WT1800
HMI - Siemens KP700 Comfort + TP1200 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Electrical test
Description	Electrical test of the product

OP230 - Leak test 1



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Leak tester - Innomatec 902
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Leak test of component
Description	The component undergoes dual-channel leak testing using both vacuum and overpressure methods

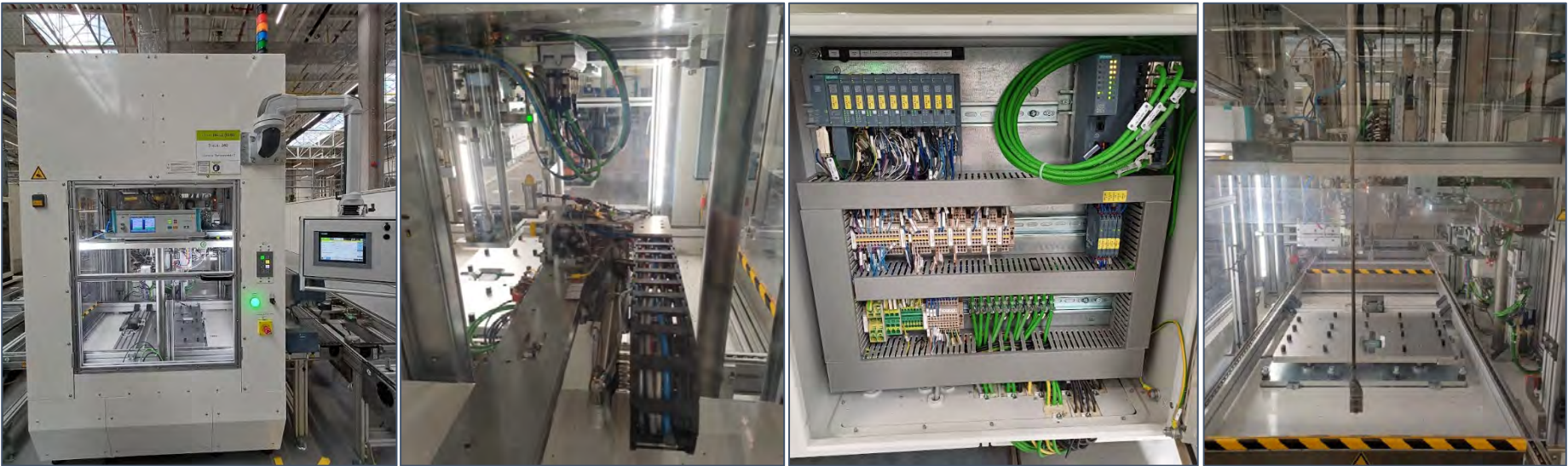
OP230 - Leak test 1



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Leak tester - Innomatec 902
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Leak test of component
Description	The component undergoes dual-channel leak testing using both vacuum and overpressure methods

OP240 - Leak test 2



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Leak tester - Innomatec 902
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Leak test of component
Description	The component undergoes dual-channel leak testing using both vacuum and overpressure methods

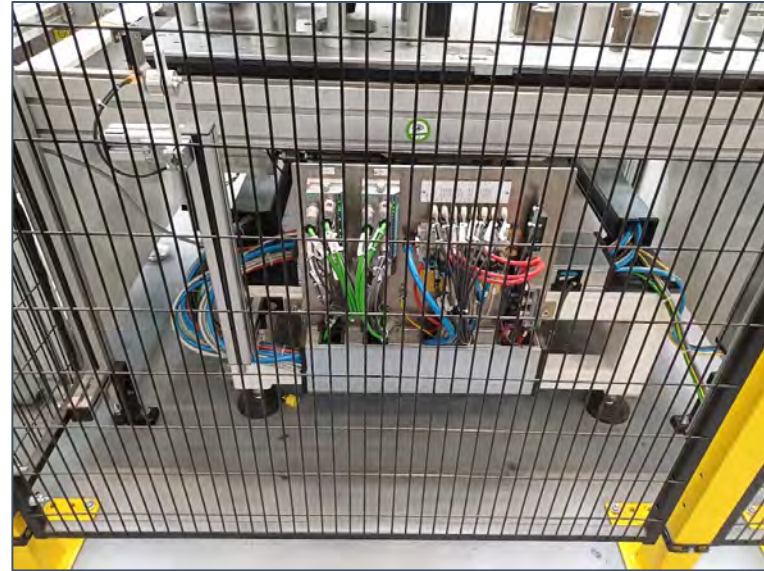
OP240 - Leak test 2



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Leak tester - Innomatec 902
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Leak test of component
Description	The component undergoes dual-channel leak testing using both vacuum and overpressure methods

OP245 - Rotation of eMotor



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Rotation of the component
Description	The pallet carrying the finished part is rotated horizontally 180 degrees into the final orientation for packing

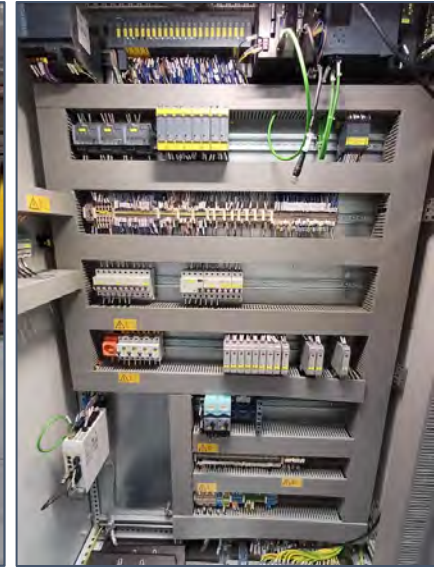
OP260 - Laser marking, stamping + EM graver verification



Driver - Siemens Simatic S7 - 1500
Laser - Arex
Stamping machine - ADT
Camera - Keyence
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Laser marking and stamping, and verification
Description	The station is used for the mechanical engraving of the part to ensure permanent component identification

OP260 - Laser marking + stamping



Driver - Siemens Simatic S7 - 1500
Laser - Arex
Stamping machine - ADT
Camera - Keyence
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Laser marking and stamping, and verification
Description	The station is used for the mechanical engraving of the part to ensure permanent component identification

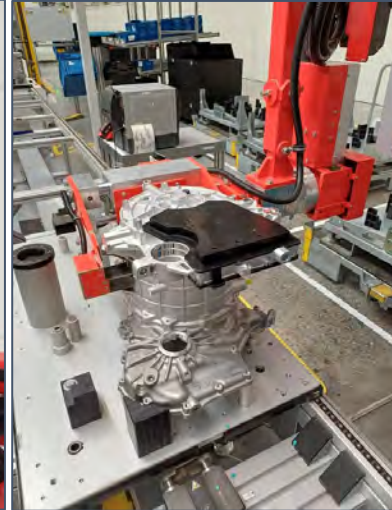
OP270 - Assembly of yellow plugs, Transportation Cover, Cap



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Preparation of the component for transport
Description	Assembly of transport covers

OP280 - Packaging and final control



Driver - Siemens Simatic S7 - 1500
Crane - DALMEC
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Packaging & final control
Description	Packaging & final control of the final component

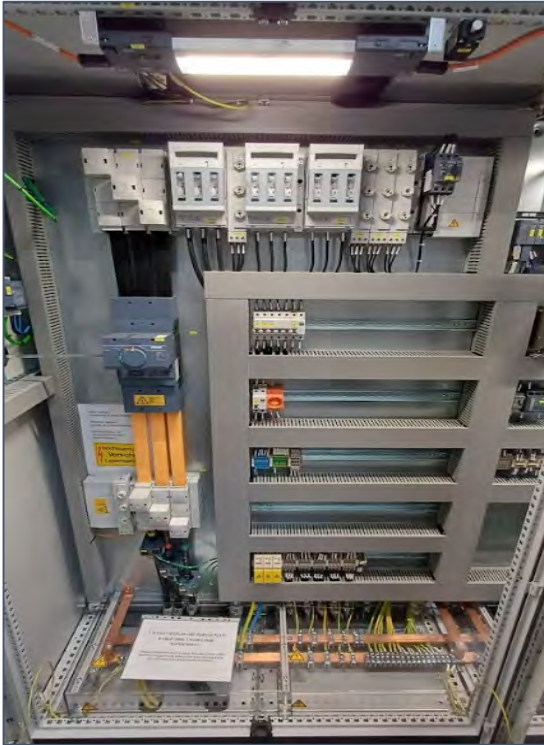
OP290 - Reintegration process



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Reintegration of component
Description	The station is designed for manual loading and unloading of parts, as well as the execution of rework procedures

Main cabinet - FAL Motor Assembly Line 2



PIA Automation Austria
Teslastraße 8
8074 Grambach /Graz, Austria
Tel. +43 316 4000-0
Fax. +43 316 4000-29
www.piagroup.com

PIA AUTOMATION

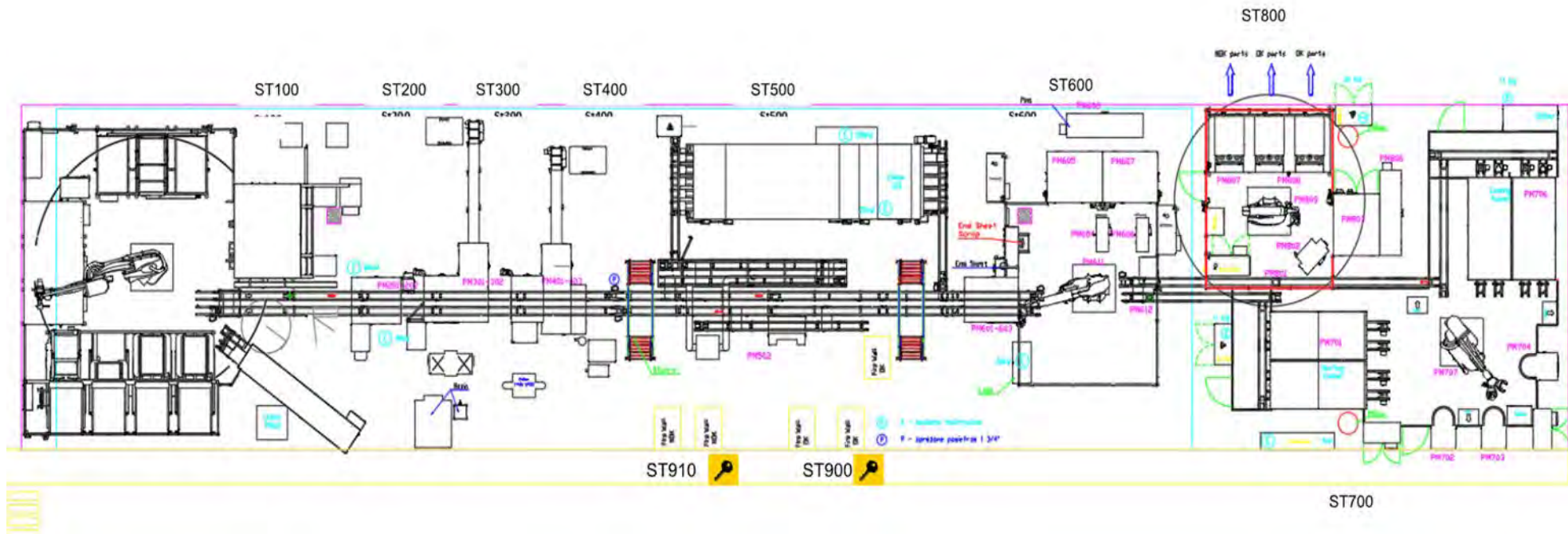
Assembly Line 2 M1 e-motor

Machine No., Job No.	10200081001	CE
Year of construct.	2022	
Operating voltage	3x400VAC+N+PE / 50Hz	
Nominal current	175A	
Max. Pre-fuse	315A	
Operating pressure	5,5bar	
Customer name	Valeo - Siemens eAutomotive Poland Sp. z o. o.	

Rotor Assembly Line 2

Rotor Assembly Line 2

Basic information	
Localization	Poland, Valeo CZE 2 plant
Cycle time	86 s
TRP/OEE	85%
Surface	509m ²



Rotor Assembly Line 2

PROCESS DESCRIPTION

Lp.	Station	Quantity	Type of Process	Description of the Process
1	OP100	1	Semi Automatic	Loading of rotor package, shaft, shrinking and cooling
2	OP200	1	Automatic	Rotor pressing and locking, Laser marking
3	OP300	1	Automatic	Resin application and Big Magnets assembly
4	OP400	1	Automatic	Resin application and Small Magnets assembly
5	OP500	1	Automatic	Resin gelling & Curing
6	OP502	1	Automatic	WPC preparation
7	OP503	1	Automatic	Press plate cleaning
8	OP600	1	Automatic	Package unlocking, control resin level and magnets position
9	OP650	1	Automatic	Balancing
10	OP700	1	Automatic	Spinning
11	OP800	1	Automatic	Final balancing

OP100 - Loading of rotor package, shaft, shrinking and cooling



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Robot - KUKA KR120 R3900
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Rotor shaft and packages up to 175 mm
Usage	Shrinking, cooling
Description	The machine picks and loads packages onto the station, heats them up, and inserts a shaft into the package

OP200 - Rotor pressing and locking, Laser marking



Driver - Siemens Simatic S7 - 1500
Press Kistler - Screwdriver BOSCH 90 Nm
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	ASM Rotor up to 175 mm
Usage	Locking, marking
Description	The machine compresses packages using specialized tooling and maintains that compression by tightening bolts

OP300 - Resin application and Big Magnets assembly



Driver - Siemens Simatic S7 - 1500
Pneumatics - Teamtechnik
Resin dosing - Scheugen PFLUG
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	ASM Rotor up to 175 mm
Usage	Magnet assembly, resin application
Description	Magnets are manually loaded onto a feeder tray, picked by automated grippers and inserted into package slots. Final operation involves resin dispensing

OP300 - Resin application and Big Magnets assembly

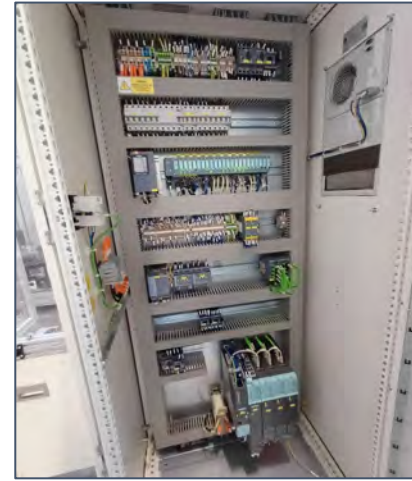


 	
Anlagen Nr.	A001200681
Production system No.	
Maschinen Nr.	B01578280
Machine No.	
Stromlaufplan Nr.	t1481_300
Circuit diagram No.	
Betriebsspannung	3L/N/PE/400V/50Hz
Supply voltage	
Leistung	17kVA
Power consumption	
Vorsicherung	C 25A
Backup fuse	
Schaltvermögen Strom	15kA
Switching cap. current	
Steuerspannung	24VDC
Control voltage	
teamtechnik Production Technology Sp. z o.o. ul. Za Górą 23, 32-050 Skawina, Poland www.teamtechnik.com	

Driver - Siemens Simatic S7 - 1500
Pneumatics - Teamtechnik
Resin dosing - Scheugen PFLUG
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	ASM Rotor up to 175 mm
Usage	Magnet assembly, resin application
Description	Magnets are manually loaded onto a feeder tray, picked by automated grippers and inserted into package slots. Final operation involves resin dispensing

OP400 - Resin application and Small Magnets assembly



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnet assembly, resin application
Description	The machine is used for magnet assembly. Magnets loaded onto feeder tray, picked by automated grippers and inserted into package slots. Final operation involves resin dispensing.

OP400 - Resin application and Small Magnets assembly



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Magnet assembly, resin application
Description	The machine is used for magnet assembly. Magnets loaded onto feeder tray, picked by automated grippers and inserted into package slots. Final operation involves resin dispensing.

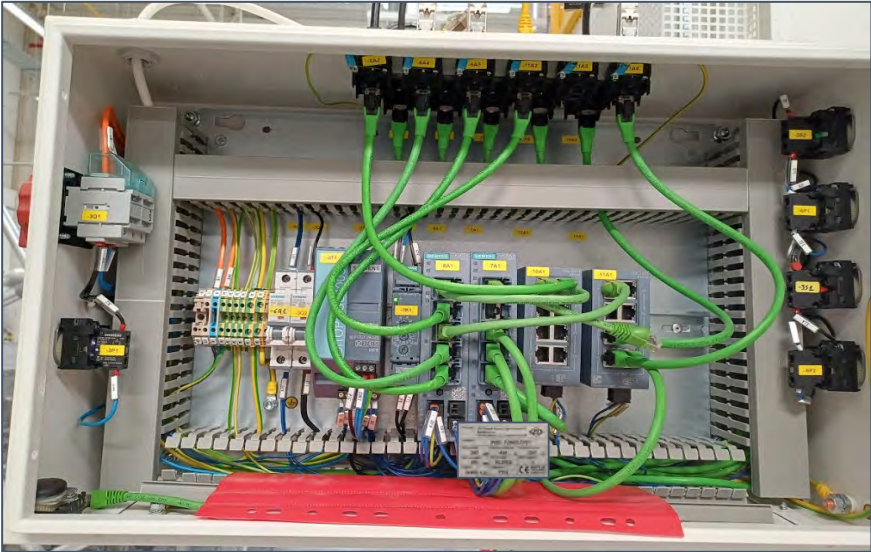
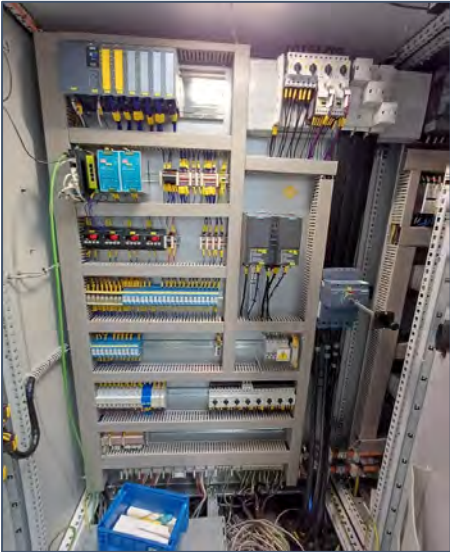
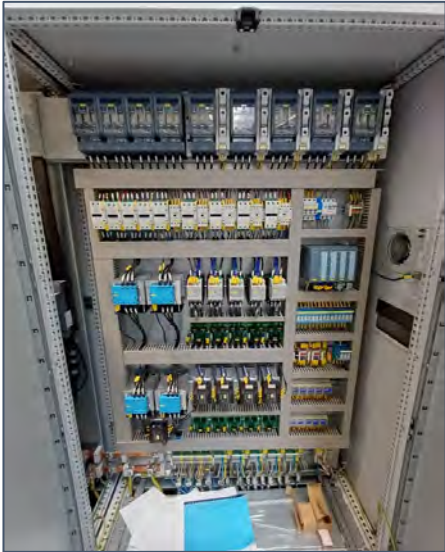
OP500 - Resin gelling & Curring



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Resin gelling & Curring
Description	The machine is used for resin curing. The oven has a capacity of up to 150 product units

OP500 - Resin gelling & Curring



Driver - Siemens Simatic S7 - 1500
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Resin gelling & Curring
Description	The machine is used for resin curing. The oven has a capacity of up to 150 product units

OP502 - WPC preparation



HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Injection
Description	The station is used for preparing tooling for use on the production line

OP503 - Press plate cleaning



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Robot - Kuka KR150 R2700
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Press plate cleaning
Description	The station is used for press plate cleaning

OP600 - Package unlocking, control resin level and magnets position



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Press Kistler - Screwdriver BOSCH 90 Nm
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Unlocking of tooling
Description	The machine unscrews the upper tooling from the lower part, verifies the resin level using a special mask, picks the product by robot, and returns the upper tooling

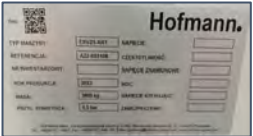
OP600 - Package unlocking, control resin level and magnets position



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Press Kistler - Screwdriver BOSCH 90 Nm
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Unlocking of tooling
Description	The machine unscrews the upper tooling from the lower part, verifies the resin level using a special mask, picks the product by robot, and returns the upper tooling

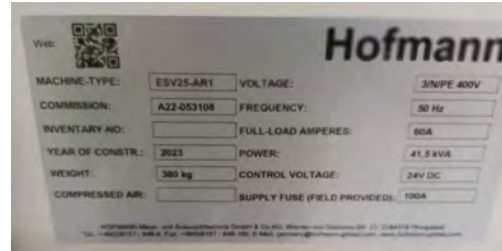
OP650 - Balancing



Driver - Siemens Simatic S7 - 1500
Balancing machines - Schenck x2
Robot - KUKA KR120 R3100
Kistler press 15 KN x2
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Balancing of product
Description	The machine performs initial balance measurement, balancing through pin insertion, and balance recheck

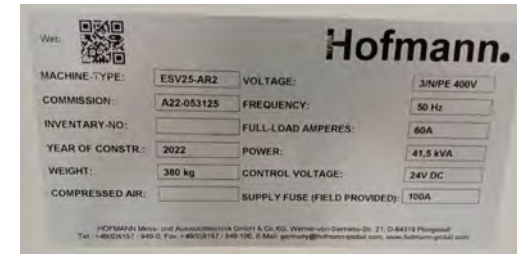
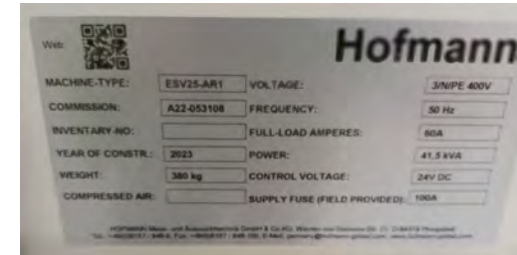
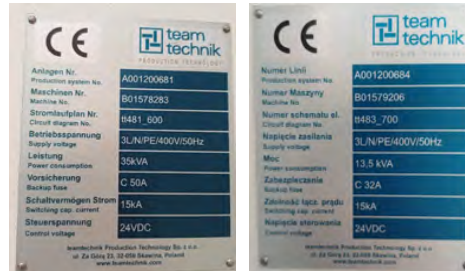
OP700 - Spinning



Driver - Siemens Simatic S7 - 1500
Spinning machines - Hoffmann x3
Robot - KUKA KR120 R3100
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Spinning of the product
Description	The machine heats the package to 120 degrees Celsius, followed by product spinning and cooling in a cooling tunnel

OP700 - Spinning



Driver - Siemens Simatic S7 - 1500
Spinning machines - Hoffmann x3
Robot - KUKA KR120 R3100
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Spinning of the product
Description	The machine heats the package to 120 degrees Celsius, followed by product spinning and cooling in a cooling tunnel

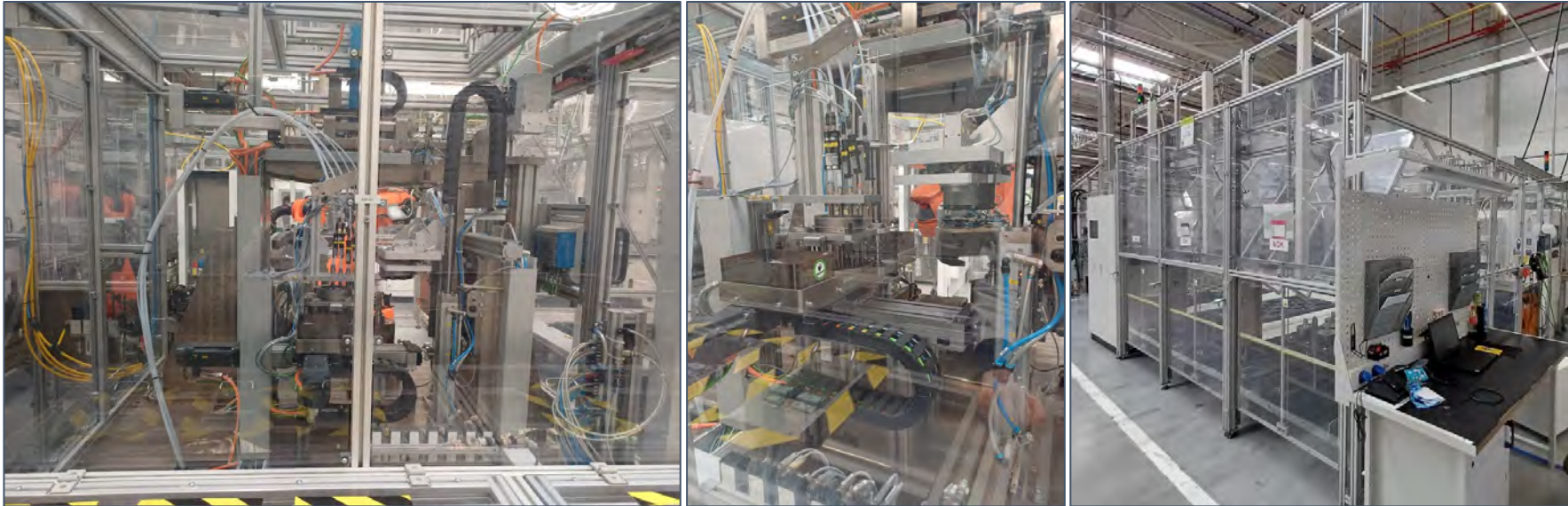
OP700 - Spinning



Driver - Siemens Simatic S7 - 1500
Spinning machines - Hoffmann x3
Robot - KUKA KR120 R3100
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Spinning of the product
Description	The machine heats the package to 120 degrees Celsius, followed by product spinning and cooling in a cooling tunnel

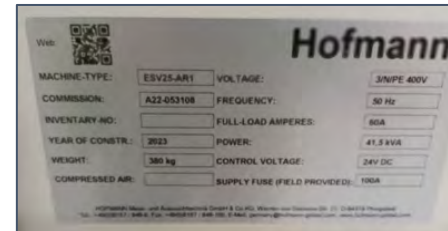
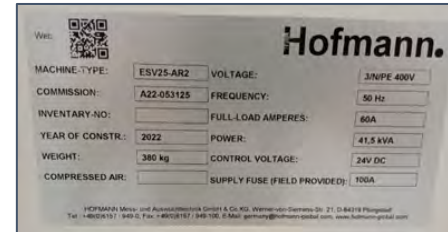
OP800 - Final balancing



Driver - Siemens Simatic S7 - 1500
Balancing machines - Schenck x2
Kistler press 15 KN x2
Robot - KUKA KR120 R3100
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Balancing of product
Description	The machine performs initial balance measurement, balancing through pin insertion, and balance recheck

OP800 - Final balancing



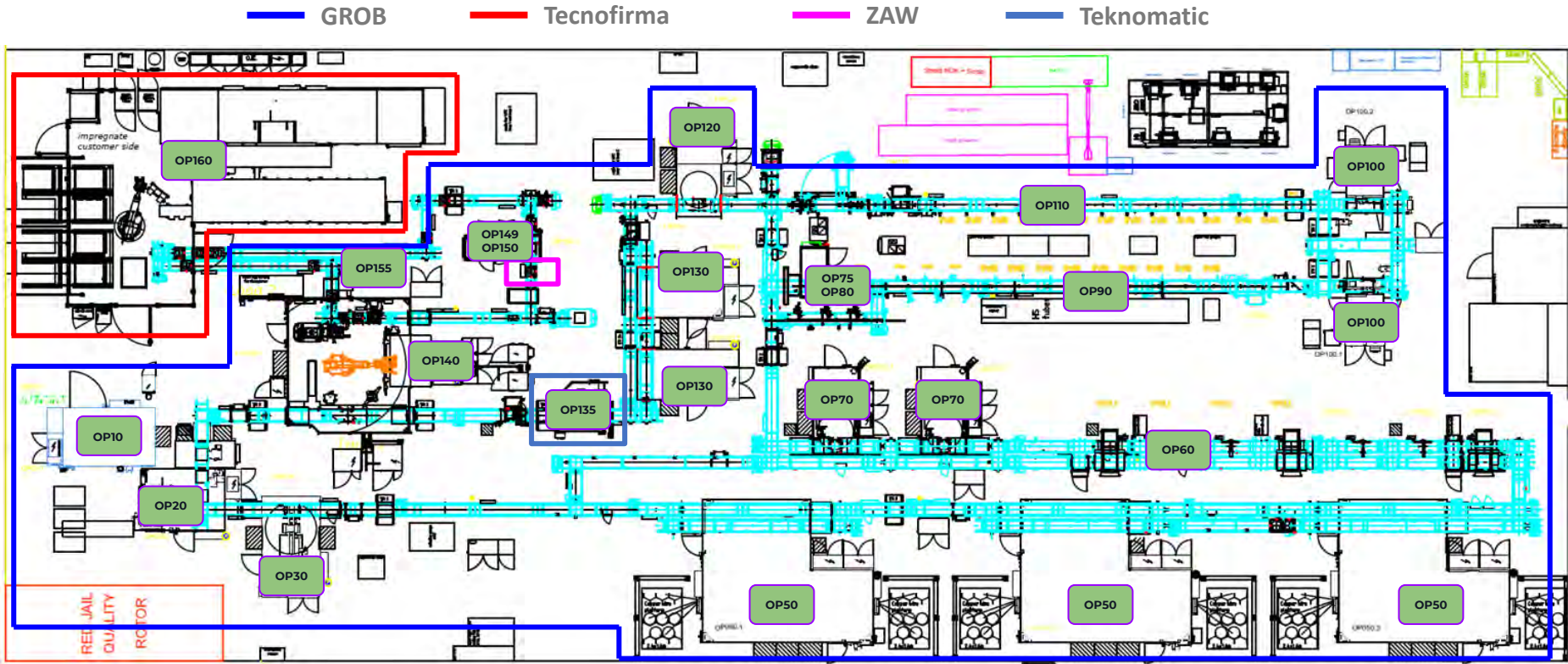
Driver - Siemens Simatic S7 - 1500
Balancing machines - Schenck x2
Kistler press 15 KN x2
Robot - KUKA KR120 R3100
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Balancing of product
Description	The machine performs initial balance measurement, balancing through pin insertion, and balance recheck

Stator Assembly Line 2

Stator Assembly Line 2

Basic information	
Localization	Poland, Valeo CZE 2 plant
Cycle time	86s
TRP/OEE	75%
Surface	1500 m ²

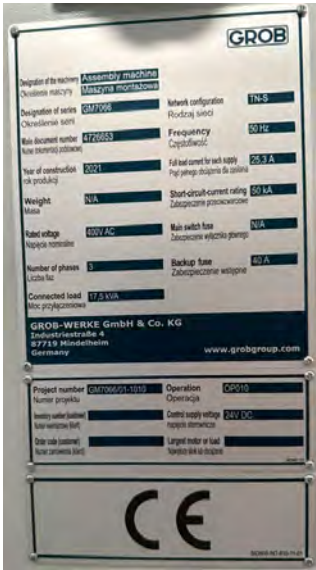


Stator Assembly Line 2

PROCESS DESCRIPTION

LP	Station	Quantity	Type of the process	Description of the process
1	OP10	1	Semi-auto	End plate subassembly (glueing)
2	OP20	1	Semi-auto	Stator stack preparation
3	OP30	1	Auto	Insertion of slot insulators
4	OP50	3	Auto	Winding
5	OP60	1	Manual	Assembly of insulation tubes
6	OP70	2	Auto	Pre forming of wires
7	OP75 & OP80	1	Manual	Phase separators assembly
8	OP90	1	Manual	Preparing of stator for hot crimping
9	OP100	2	Auto	Hot crimping of connectors
10	OP110	1	Manual	Preparing of stator for final forming
11	OP120	1	Auto	Final forming of wires
12	OP130	2	Auto	Lancing
13	OP135	1	Semi-auto	Phase separators cutting
14	OP140	1	Auto	Skewing and laser welding of stator stack
15	OP149 & OP150	1	Semi-auto	EOL electric measurement (low and high voltage)
16	OP155	1	Semi-auto	Assembly of heat shrink tubes
17	OP160	1	Auto	Impregnation of Stator by the Resin (trickling)

OP10 - End plate subassembly (glueing)



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Glueing & laser marking
Description	Machine used for adjusting glue by Loctite dispensing unit on stack sheets. Additionally the same station is used for laser engraving.

OP20 - Stator stack preparation



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Measuring system & manipulator for transport
Description	Manual loading of lamination. Height measurement system with auto adjustment by adding or removing single lamination. Transport of stator stack on WPC

OP30 - Insertion of slot insulators



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Universal
Usage	Any type of Stator for HV Motor
Description	Machine is designed to insert 48 paper insulators in U shape

OP50 - Winding



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens TP900 Comfort

Quantity	3 PCS
Application	Universal
Usage	Winding of any type with adapted tooling
Description	A copper wire winding machine, capable of winding the required size of coil using the appropriate tool

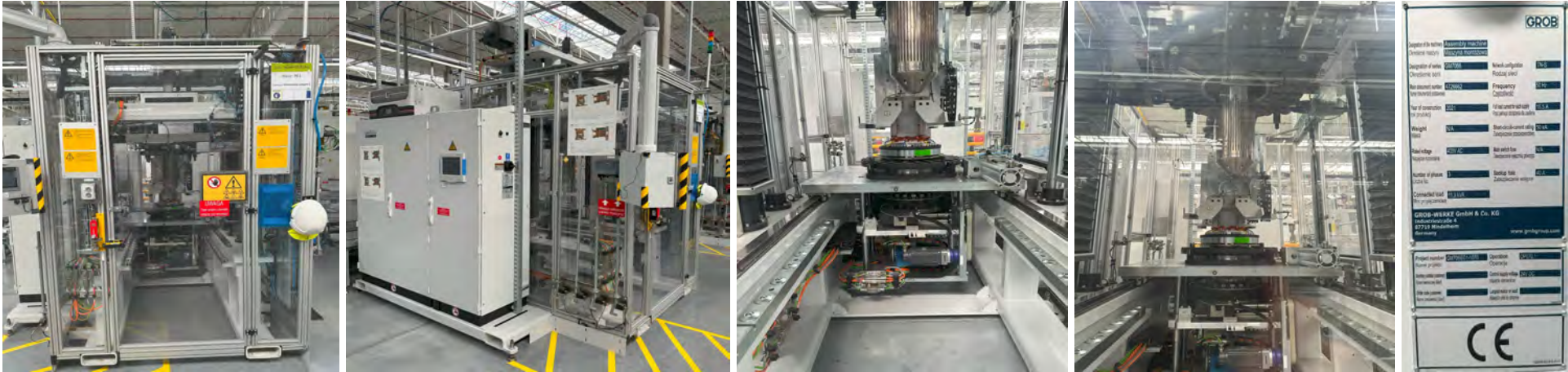
OP60 - Assembly of insulation tubes



Pneumatics - Festo

Quantity	6 PCS + 1PCS
Application	Universal
Usage	Manual station for components assembly
Description	6 pcs - stations on conveyor for assembly of insulation tubes, 1 pcs - station additionally equipped for 4 machines for cutting insulation tubes according to current demand

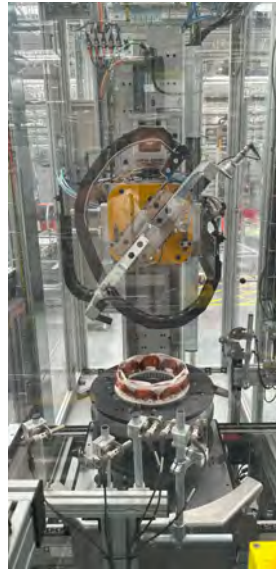
OP70 - Pre forming of wires



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	2 PCS
Application	Universal
Usage	High capacity press with stator shaping tooling
Description	Standard press with clamping force of 20kN. Equipped with force and displacement monitoring. Loading and unloading performed by pick-and-place mechanism from pallet.

OP75 & OP80 - Phase separators assembly



Pneumatics - Festo

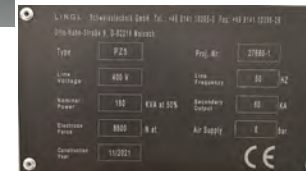
Quantity	6 PCS + 1PCS
Application	Universal
Usage	Manual station for components assembly
Description	6 pcs - stations on conveyor for assembly of phase separators between coils, 1 pcs - station for rotation of stator with cradle upside down.

OP90 - Preparing of stator for hot crimping



Quantity	8 PCS
Application	Universal
Usage	Manual station for components assembly
Description	8 pcs - places on conveyor for manual operations.

OP100 - Hot crimping of connectors



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	2 PCS
Application	Universal
Usage	Crimping with welding
Description	Transformer resistance welder with full monitoring of collapsing force and welding current intensity

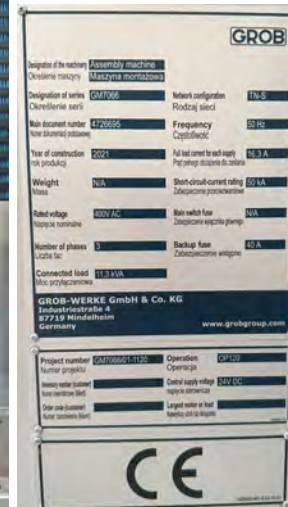
OP110 - Preparing of stator for final forming



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
Robot - Kuka KR150 R2700
HMI - Siemens KP700 Comfort

Quantity	10 PCS
Application	Universal
Usage	Manual station for components assembly
Description	10 pcs - places on conveyor for manual operations.

OP120 - Final forming of wires



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Universal
Usage	High capacity press with stator shaping tooling
Description	Standard press with clamping force of 20kN. Equipped with force and displacement monitoring. Loading and unloading performed by pick-and-place mechanism.

OP130 - Lancing



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	2 PCS
Application	Universal
Usage	Automatic lancing process of stator
Description	Universal machine for the lancing process. Configurable with tooling adapted for stator of 210mm or 140mm height.

OP135 - Phase separators cutting



Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Specific for product
Usage	Manual cutting operations and quality controls
Description	Machine for capturing and lifting stator with tooling from WPC, to enable the operator to perform operations

OP140 - Skewing and laser welding of stator stack



Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort
KUKA

Quantity	1 PCS
Application	Universal welding equipment
Usage	Laser welding & laser engraving
Description	Machine for skewing stator by 2 servo motors from up and down. After skewing 4 laser heads make welding process simultaneously. Part is marked by laser at the end.

OP149 & OP150 - EOL electric measurement (low and high voltage)



Driver - Backhoff
Pneumatics - Festo
HMI - Siemens KP700 Comfort

Quantity	1 PCS
Application	Universal
Usage	Electrical testing equipment
Description	Electrical testing equipment for complete inspection of product low and high voltage measurements.

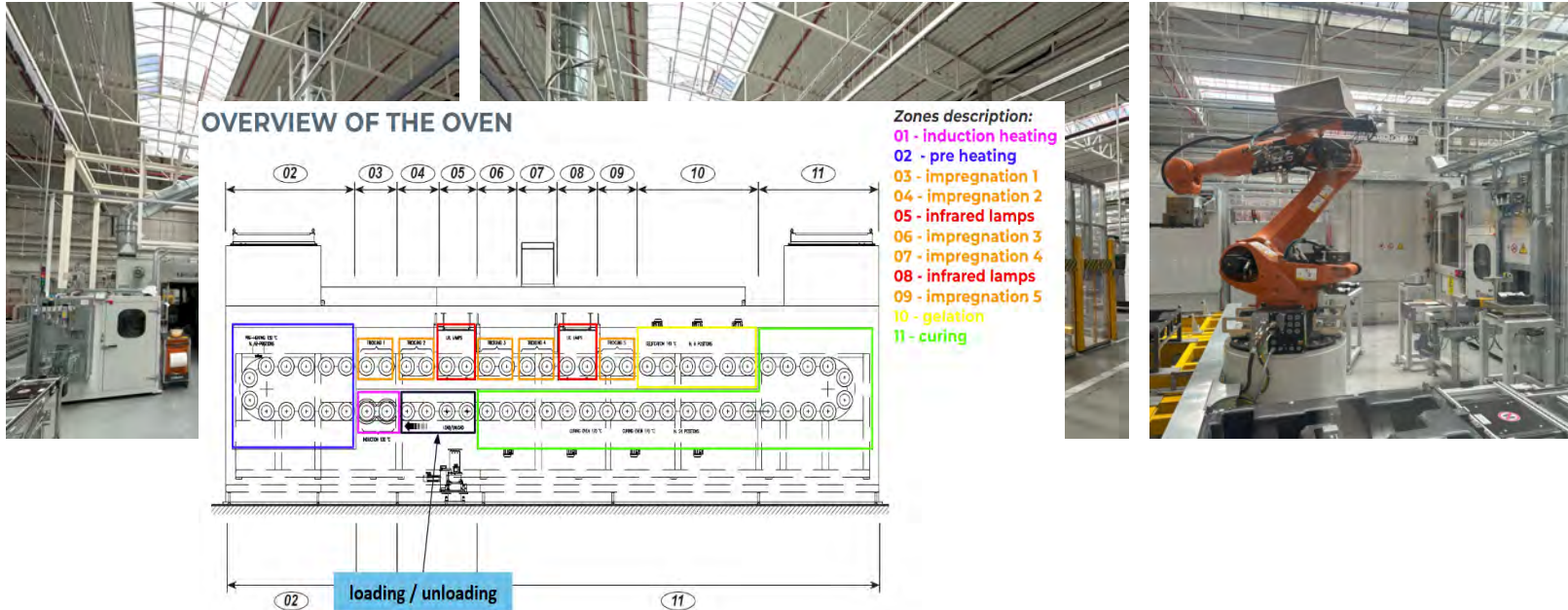
OP155 - Assembly of heat shrink tubes



Pneumatics - Festo
HMI - Siemens TP400

Quantity	1 PCS
Application	Universal
Usage	Infrared heating
Description	Machine for heating heat shrink tubes on the wires

OP160 - Impregnation of stator by the resin (trickling)

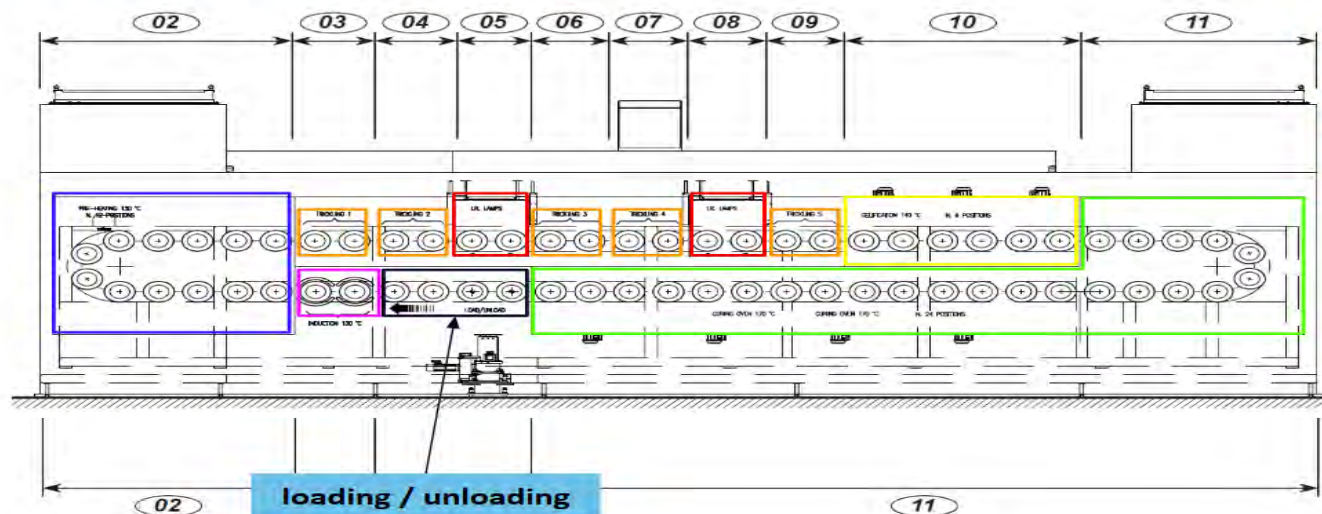


Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort
KUKA

Quantity	1 PCS
Application	Universal
Usage	Resin application and heating
Description	Impregnation by the resin (trickling method)

OP160 - Impregnation of stator by the resin (trickling)

OVERVIEW OF THE OVEN



Zones description:
 01 - induction heating
 02 - pre heating
 03 - impregnation 1
 04 - impregnation 2
 05 - infrared lamps
 06 - impregnation 3
 07 - impregnation 4
 08 - infrared lamps
 09 - impregnation 5
 10 - gelation
 11 - curing

Driver - Siemens Simatic S7 - 1500
Pneumatics - Festo
HMI - Siemens KP700 Comfort
KUKA

Quantity	1 PCS
Application	Universal
Usage	Resin application and heating
Description	Impregnation by the resin (trickling method)

CONTACT



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