COIL WINDING LINE CWL 058 12-20-20

WINDING AND ASSEMBLY TECHNOLOGY FOR E-MOBILITY

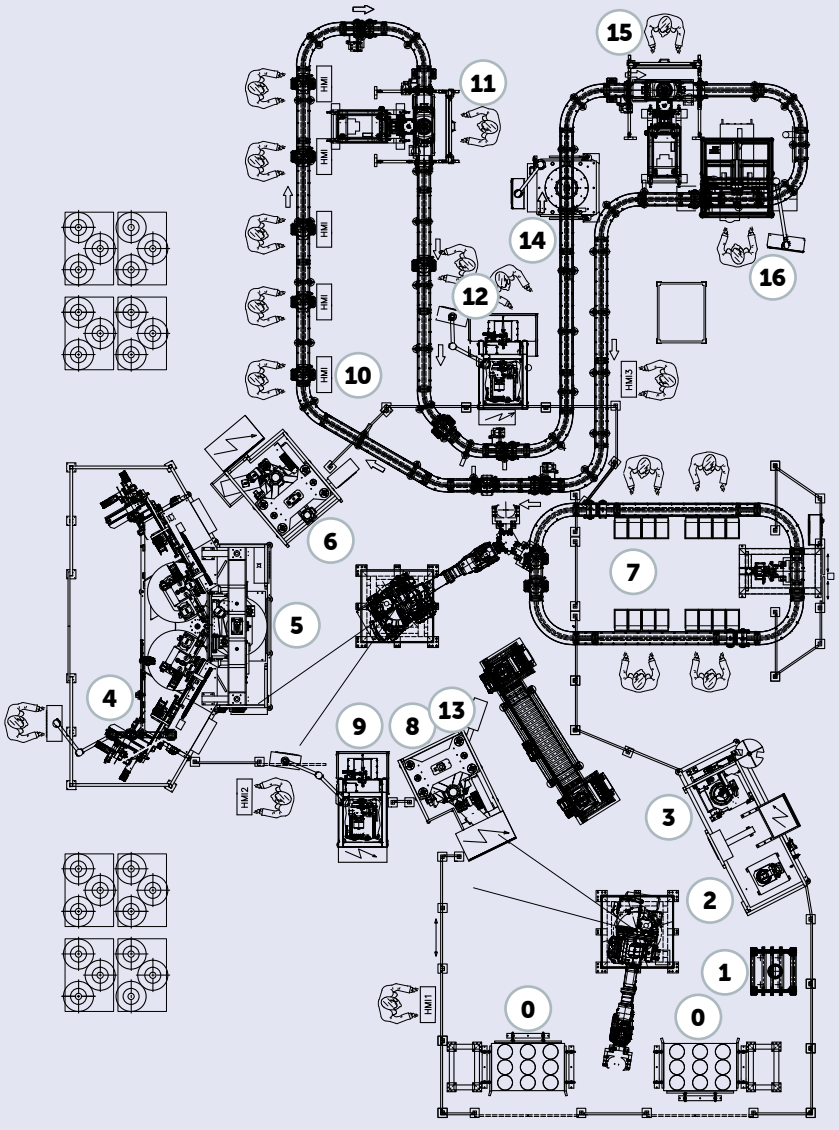
POWERED BY IMA AUTOMATION

IMA EV-TECH
Technologies for E-Mobility

THE TECHNOLOGY

IMA EV-TECH designed and developed a fully automatic coil winding line for the production of wound stators for electric vehicle traction motors.

- 0 BOXES FOR STATORS UNLOAD
- 1 GEOMETRICAL TEST BY 2D VIDEO CAMERA
- 2 GEOMETRICAL TEST BY MECHANICAL CALIBRE
- 3 SLOT BOTTOM INSULATION
- 4 COIL WINDING AND WEDGE MAKING PROCESS
- 5 COIL INSERTING PROCESS BY HIGH EFFICIENCY INSERTION TECHNOLOGY
- 6 WINDING HEADS EXPANDING PROCESS
- 7 WINDING HEADS PHASES INSULATION PROCESS
- 8 - 13 INTERMEDIATE AND FINAL WINDING HEADS FORMING PROCESS
- 9 WINDING HEAD LACING MACHINE ON OPPOSITE LEADS STATOR SIDE
- 10 LEADS PREPARATION FOR CONNECTION PROCESS
- 11 - 15 AUTOMATIC WINDING LEADS CONNECTION PROCESS
- 12 WINDING HEAD LACING MACHINE ON LEADS STATOR SIDE
- 14 FINAL PROCESS OF SLOT WEDGES COMPACTING
- 16 END COIL WINDING PROCESS WITH IN LINE ELECTRICAL TEST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THE SOLUTION

This coil winding line makes the coil windings, by the special rotating form units ''WRF13'', with the integration of IMA EV-TECH's wire stratification and leads managing CNC manipulators, for the best performances on coil winding process and high level of process quality and ''Full Fill Factor''.

The winding heads expanding process, made with the expanding machine with three effect CNC movements, permits the flexibility of process on case of coil insertion process in two times.

The single head lacing process, is executed with diamond lacing technology, for strong winding heads fixing.

The machine is commanded by CNC movements for stator indexing lacing synchronized movements and cord tensioning with brake management.

The line is also equipped with a slot bottom insulating station, made on special configura-tion adapt for the special stator's lamination thickness.

The end of the line provides a series of integrated processes directly on the conveyor line. The wedges and slots compacting process, made with the expanding machine with two effect movements, giving to the process the high level of quality. The electrical test verifies the arrangement of the connection and auxiliary devices in accord with the Electrical Test Standards.

0

Boxes for stators unload with 2D vision by camera.

1

Geometric test by 2D Video camera.

2

Geometrical test by mechanical calibre.

3

Slot bottom insulation.

4

Coil winding and wedge making process.

THE ADVANTAGES

- HIGH LEVEL OF AUTOMATION
- HIGH QUALITY OF LAYERING FOR HIGH FILL FACTOR
- PRODUCT TRACEABILITY, AND INTERACTION WITH CUSTOMER'S MES
- DEEP QUALITY CONTROL AFTER EACH PROCESS

5

Coil inserting process by high efficiency insertion technology.

6

Winding heads Expanding process.

7

Winding heads phases insulation process.

8

Intermediate and final winding heads forming process.

9

Winding head lacing machine on opposite leads stator side.

10

Leads preparation for connection process.

11

Automatic winding leads connection process.

12

Winding head lacing machine on leads stator side.

13

Intermediate and final winding heads forming process.

14

Final process of slot wedges compacting.

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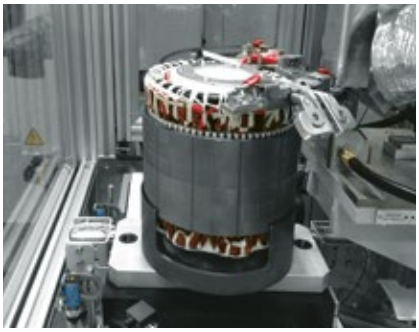

Automatic winding leads connection process.

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End coil winding process with in line electrical test.

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POWERED BY
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