

Indar

SOURCING UNIT

OUTSOURCING PRODUCT SHEETS

REV.-1

HYDRO

Beasain 20/02/19

INTRODUCTION

Classification of products

- **Raw Material**
 - Basic material from which a product is made.
- **General Supply Products / Services**
 - Products that are commons to other type of final product. Not specific for electric rotating machines.
 - General services usually are mechanized, sandblasting, and painting
- **Specific Supply Products / Services**
 - Products and/or services that are typical, and tailor made, for electric rotating machines.
- **Commercial Elements**
 - Products that are from catalogue, or similar.

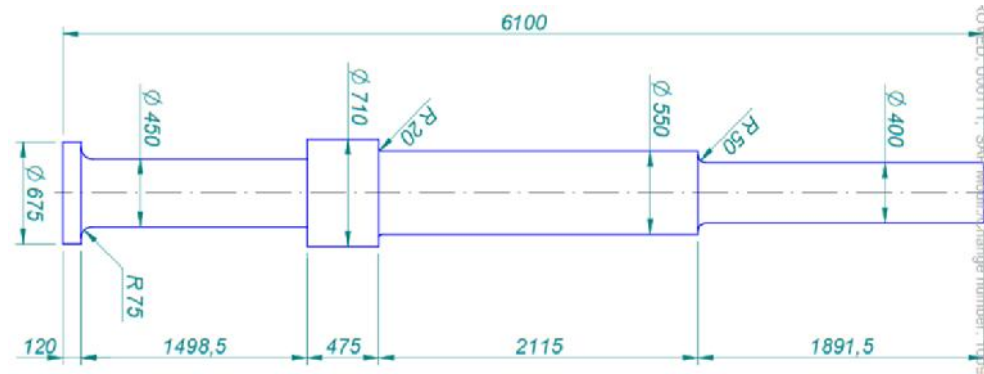
Stages of Outsourcing

- **First stage**
 - At this stage, the idea is to engage single product to single company.
- **Second stage**
 - At this stage, the ides is to engage products & services to several companies
- **Third stage**
 - At this stage, the idea is to engage products & services to single companies

Some products have potential services, that can add more value to the original product.

PRODUCT SHEET: FORGE – SHAFT

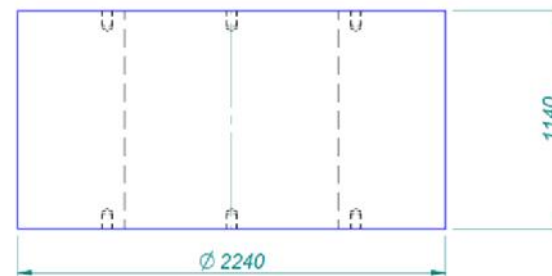
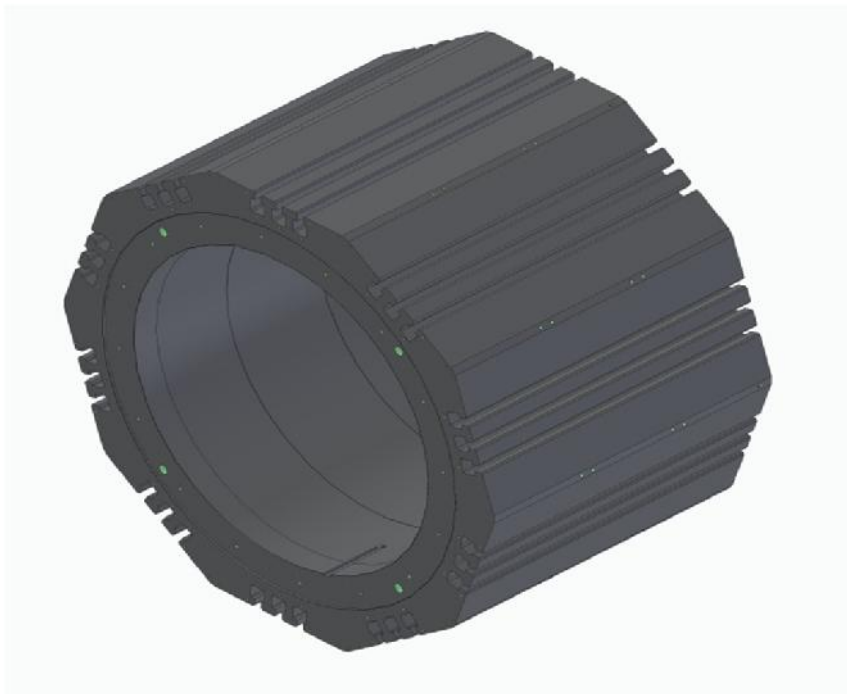
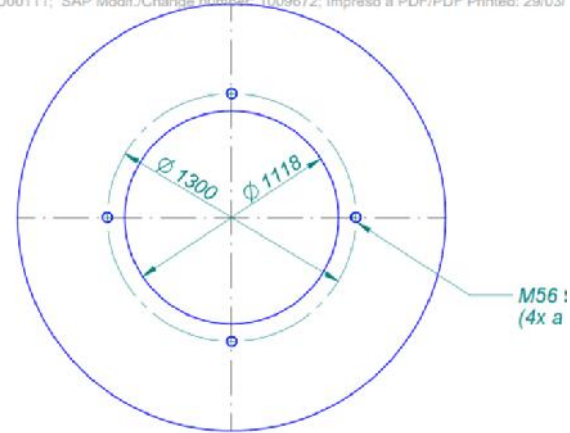
- **TYPE:** Raw material
- **DESCRIPTION:** Shaft for generators
- **DETAILS:**
 - Forge material of S355J2G3
 - Typical yield point >300 MPa
 - Typical length 4m – 7m
 - Maximum diameter: 800mm
 - Typical weight 10Tn – 16 Tn.
- **POSSIBLE OPTIONAL SERVICES:**
 - Horizontal Lathe mechanize
 - Boring Machine mechanize



PRODUCT SHEET: FORGE – POLAR WHEEL

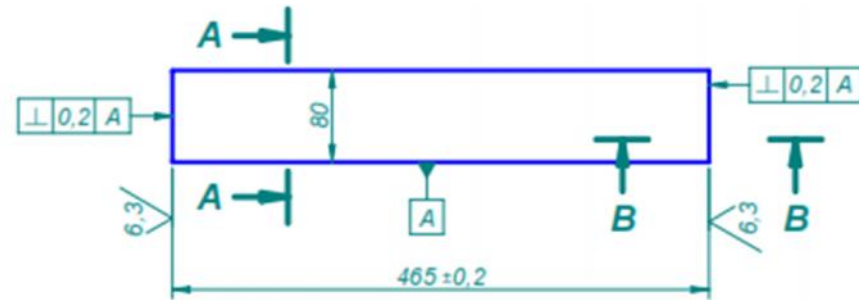
- **TYPE:** Raw material
- **DESCRIPTION:** Polar wheel for generators
- **DETAILS:**
 - Forge material of S355J2G3
 - Typical yield point >300 MPa
 - Typical length 4m – 7m
 - Maximum diameter: 800mm
 - Typical weight 10Tn – 16 Tn.
- **POSSIBLE OPTIONAL SERVICES:**
 - Vertical Lathe mechanize
 - Boring Machine mechanize

UUU111; SAP Modif./Change number: 1U0967Z; Impreso a PDF/PDF- Printed: 29/03/



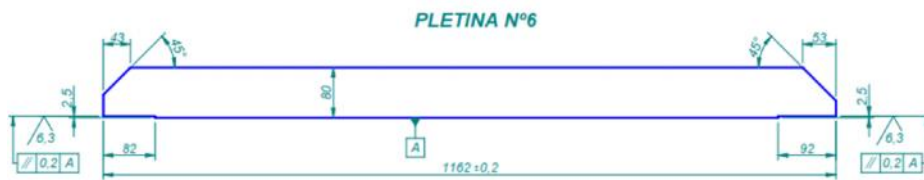
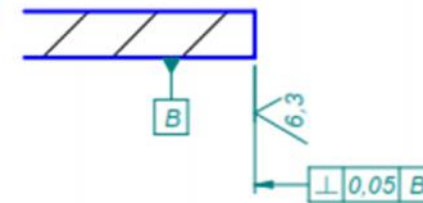
PRODUCT SHEET: COPPER – BARE PLATE

- **TYPE:** Raw material
- **DESCRIPTION:** Bare plate for rotor windings
- **DETAILS:**
 - ETP-R250-RD
 - Typical thickness 4mm.
 - Typical Width 80-90mm.
 - Typical Length 400 – 500mm
- **POSSIBLE OPTIONAL SERVICES:**
 - Normal Mechanized
 - Specific Services:
 - Welding of polar winding . (Special Workshop)

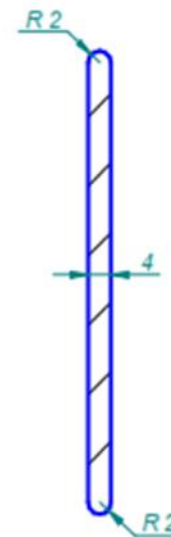


SECCION B-B
2/1

SECCION A-A
1/1

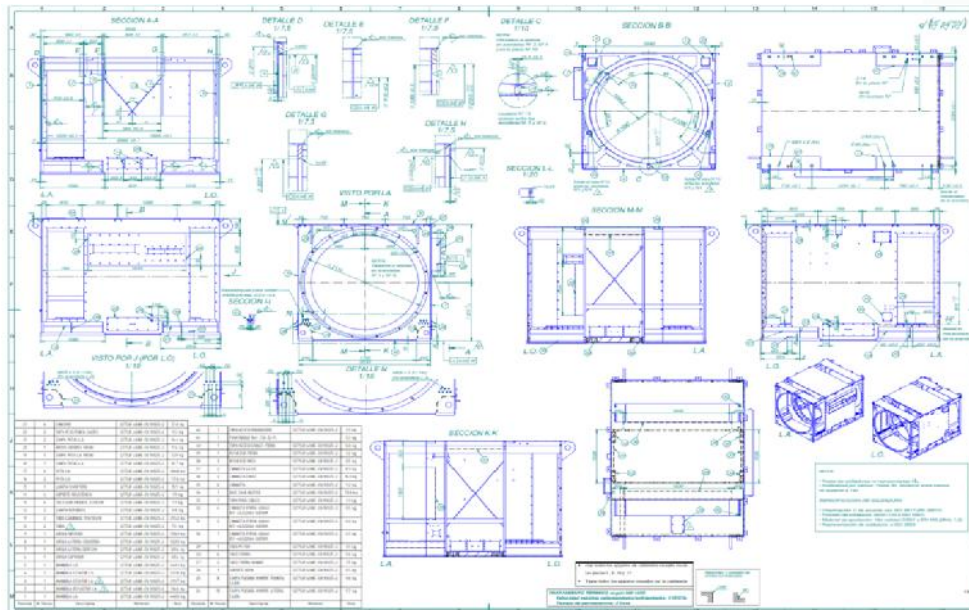
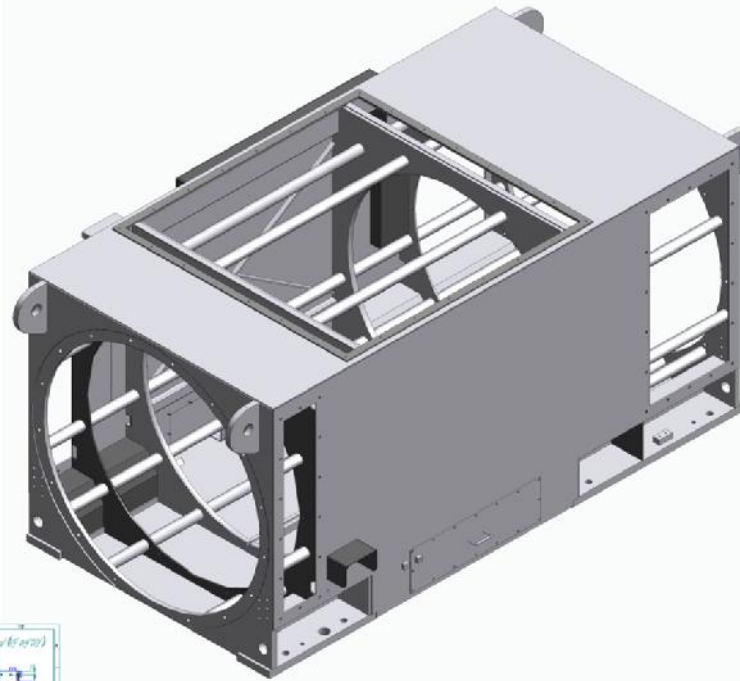


Normal Mechanized



PRODUCT SHEET: HORIZONTAL FRAME

- **TYPE:** General Supply Products
- **DESCRIPTION:** Steel welded construction of Frame
- **DETAILS:**
 - Carbon steel material S235 JR
 - BOM
 - Laser cutting material
 - Oxi-cutting material
 - Tubes
- **POSSIBLE OPTIONAL SERVICES:**
 - Vertical Lathe mechanize
 - Boring Machine mechanize
 - Heat Treatment
 - Sandblasting
 - Painting

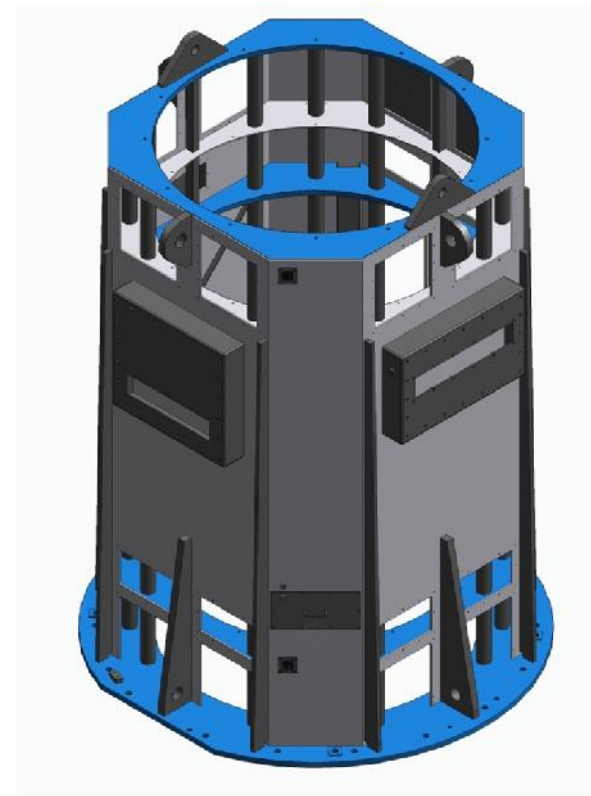
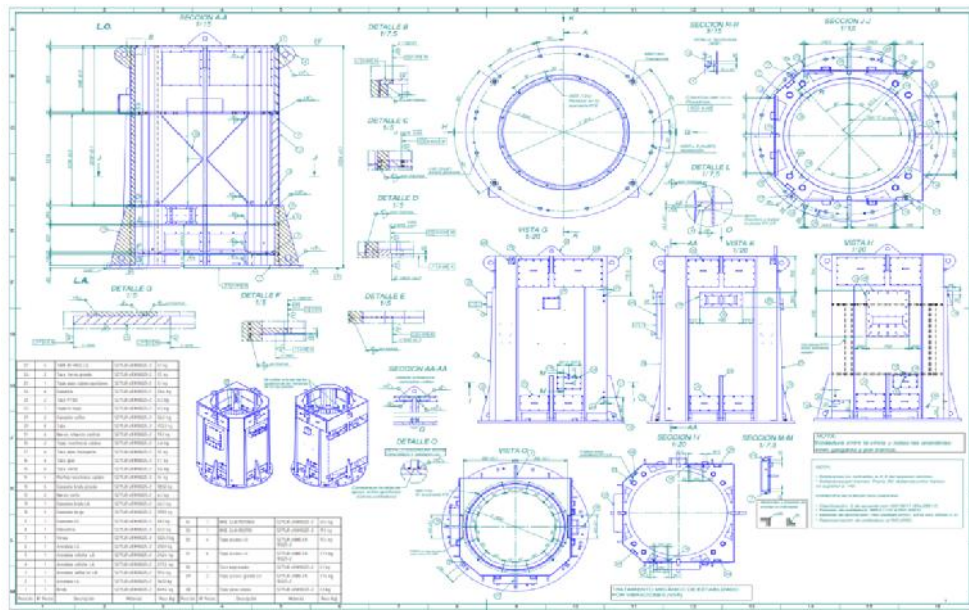


Note:

- Material can be deliver by the welding workshop or by INDAR

PRODUCT SHEET: VERTICAL FRAME

- **TYPE:** General Supply Products
- **DESCRIPTION:** Steel welded construction of Frame
- **DETAILS:**
 - Carbon steel material S235 JR
 - BOM
 - Laser cutting material
 - Oxi-cutting material
 - Tubes
- **POSSIBLE OPTIONAL SERVICES:**
 - Vertical Lathe mechanize
 - Boring Machine mechanize
 - Heat Treatment
 - Sandblasting
 - Painting

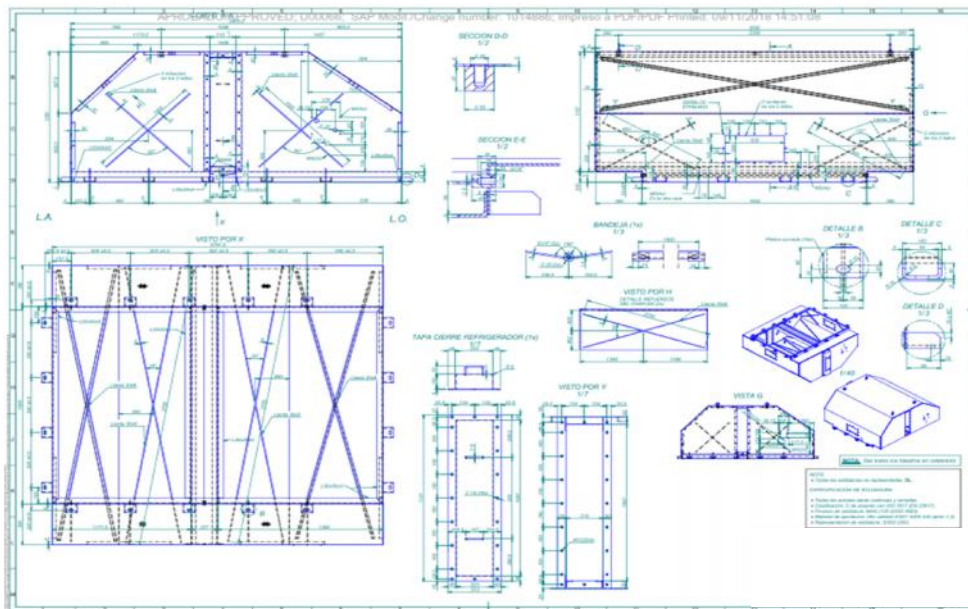
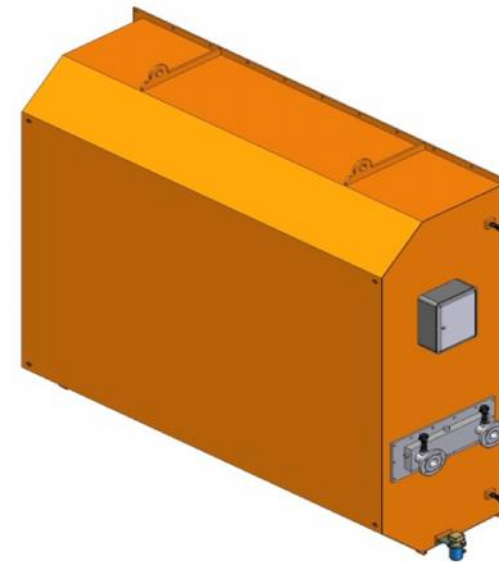


Note:

- Material can be deliver by the welding workshop or by INDAR

PRODUCT SHEET: COOLER FRAME

- **TYPE:** General Supply Products
- **DESCRIPTION:** Steel welded construction of cooler frame
- **DETAILS:**
 - Carbon steel material S235 JR
 - BOM
 - Laser cutting material
 - Oxi-cutting material
- **POSSIBLE OPTIONAL SERVICES:**
 - Sandblasting
 - Painting
 - Air-Water exchanger mounting
 - Electric sensors mounting

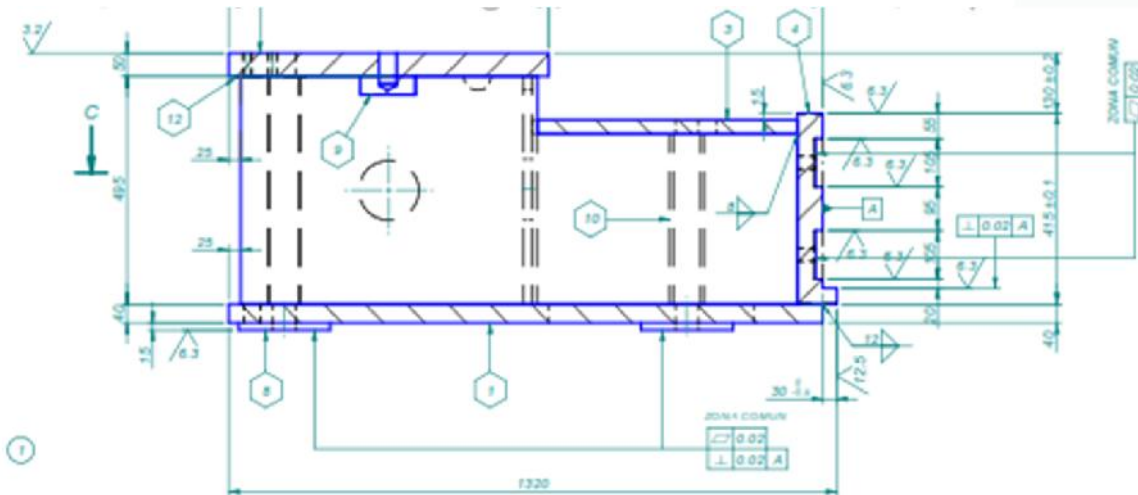
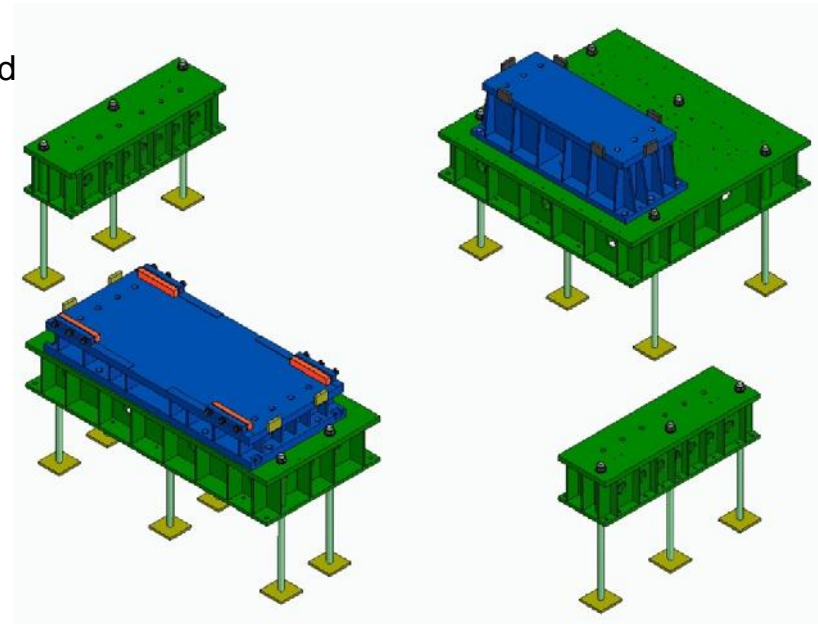


Note:

- In case of mounting of exchanger, sensors, ... These will be delivered by INDAR

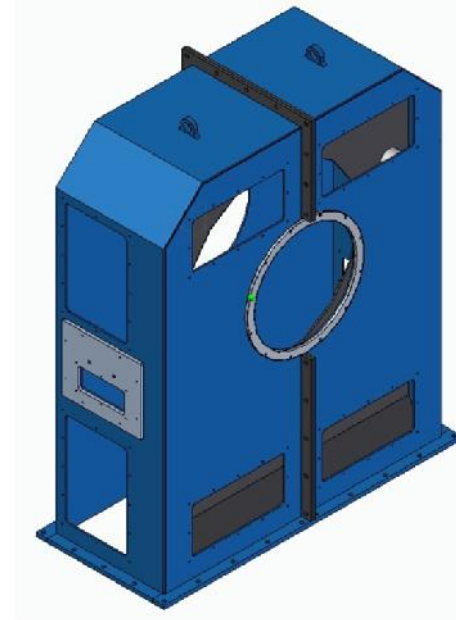
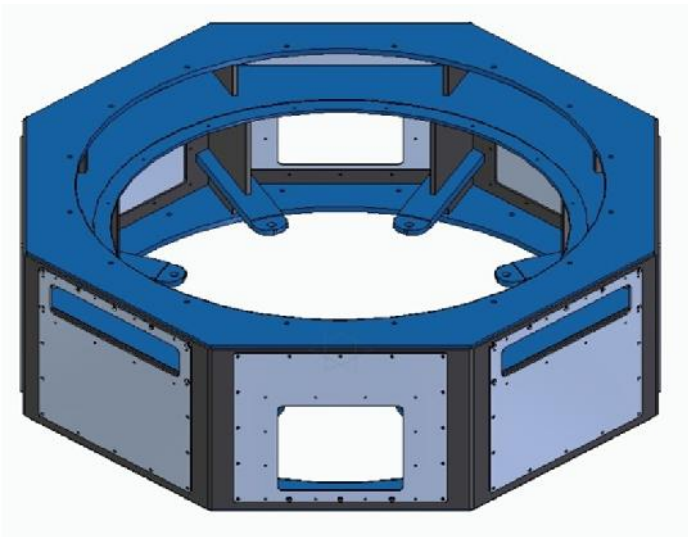
PRODUCT SHEET: BASE PLATES

- **TYPE:** General Supply Products
- **DESCRIPTION:** Steel welded construction of base plates and pedestals
- **DETAILS:**
 - Carbon steel material S235 JR
 - BOM
 - Laser cutting material
 - Oxi-cutting material
- **POSSIBLE OPTIONAL SERVICES:**
 - Boring Machine mechanize
 - Sandblasting
 - Painting



PRODUCT SHEET: EXCITER FRAME AND COVERS

- **TYPE:** General Supply Products
- **DESCRIPTION:** Steel welded construction of Frame
- **DETAILS:**
 - Carbon steel material S235 JR
 - BOM
 - Laser cutting material
 - Oxi-cutting material
- **POSSIBLE OPTIONAL SERVICES:**
 - Vertical Lathe mechanize
 - Boring Machine mechanize
 - Sandblasting
 - Painting

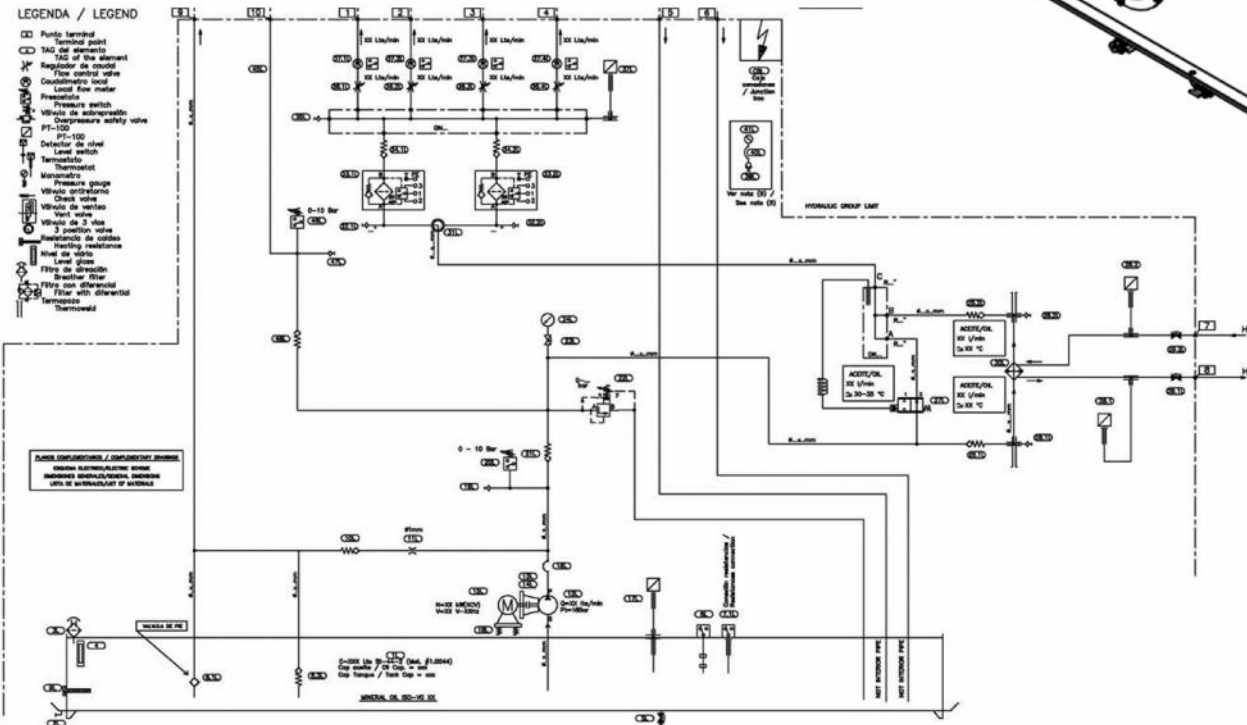
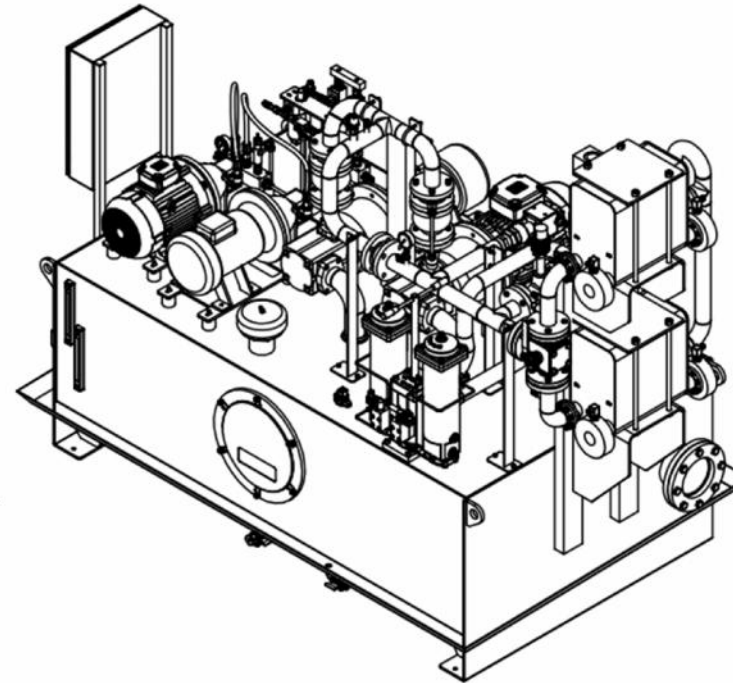


Note:

- Material can be deliver by the welding workshop or by INDAR

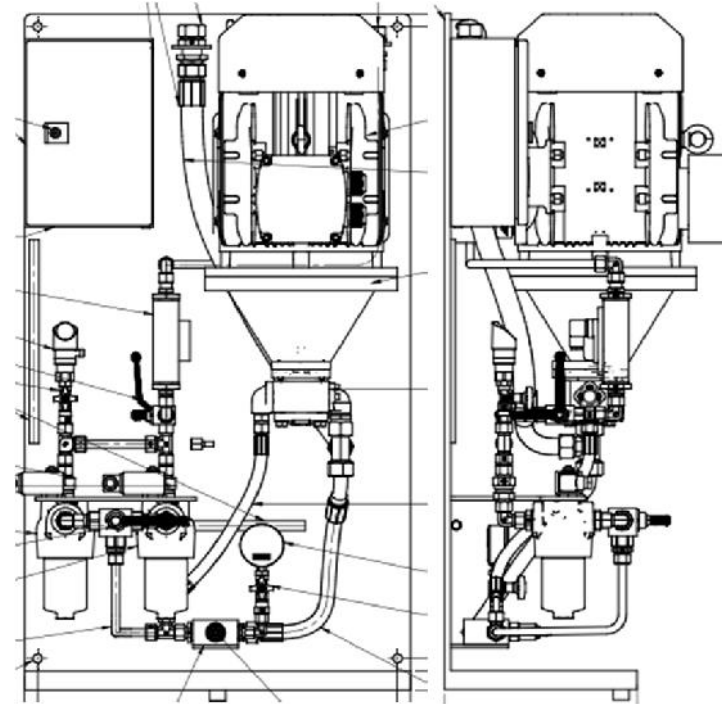
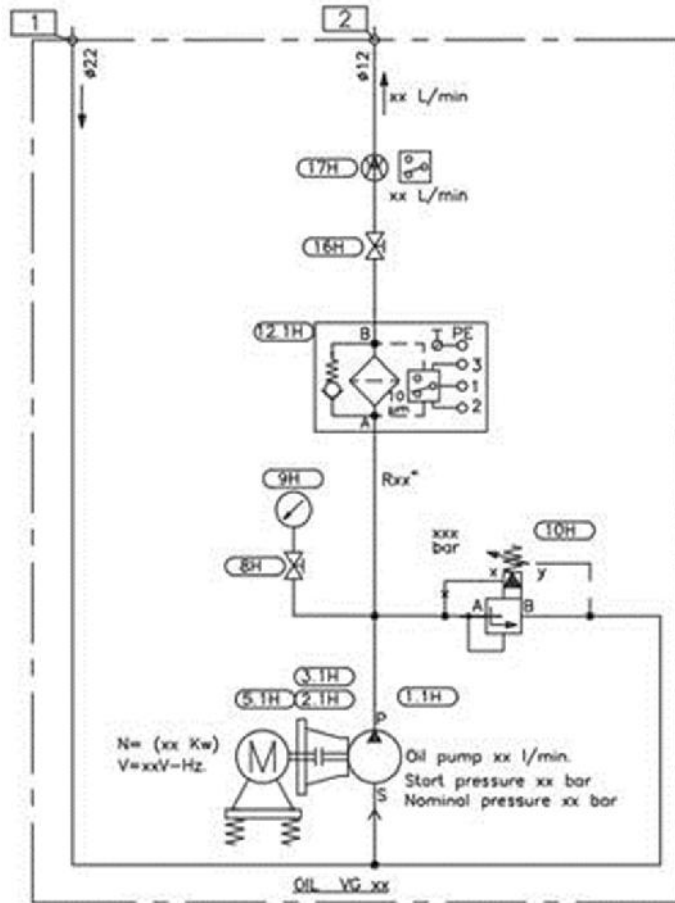
PRODUCT SHEET: LUBRICATION UNIT

- **TYPE:** General Supply Products
- **DESCRIPTION:** Lubrication unit for sleeve bearings
- **DETAILS:**
 - Carbon Steel tank & Pipes
 - Sensors
 - AC or DC, motors
 - Oil-Water heat Exchanger



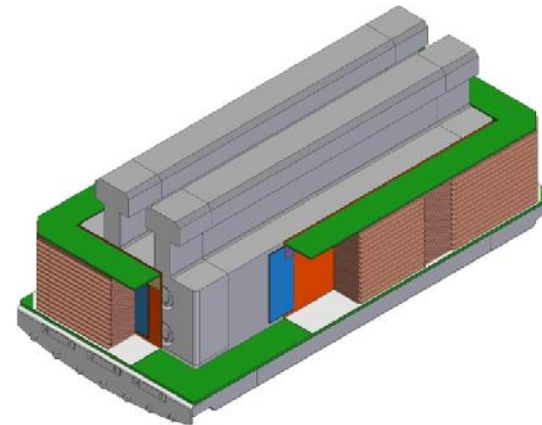
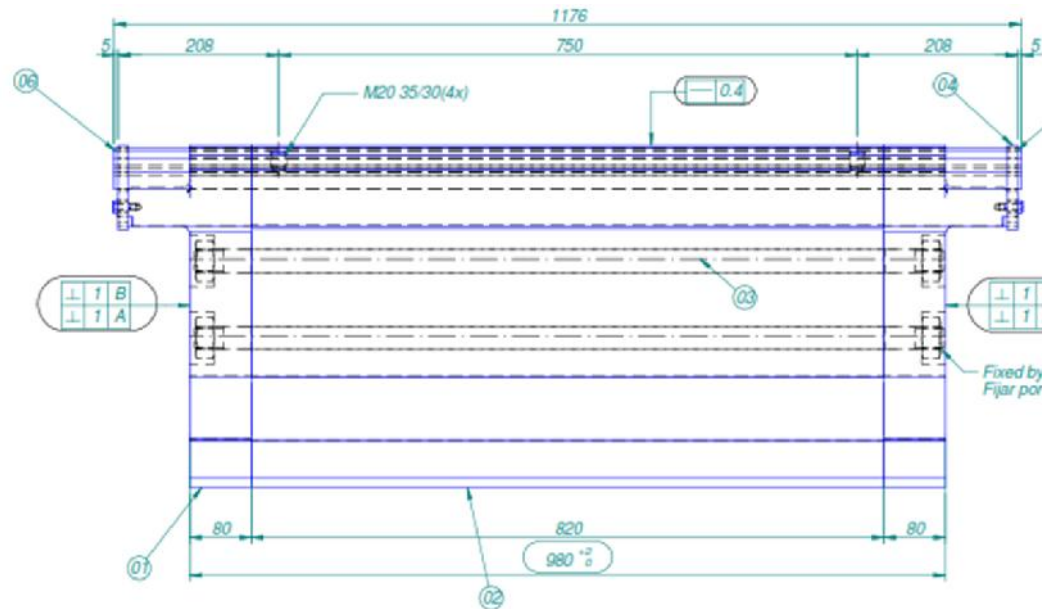
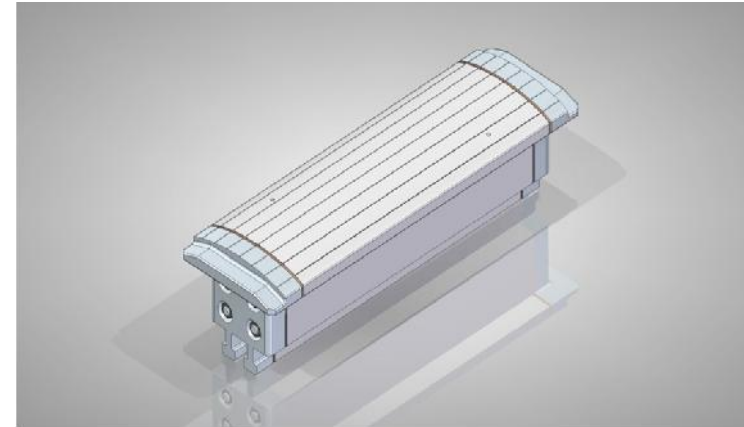
PRODUCT SHEET: HYDROSTATIC UNIT

- **TYPE:** General Supply Products
- **DESCRIPTION:** Hydrostatic unit
- **DETAILS:**
 - Carbon Steel Plate & Pipes
 - Sensors
 - AC or DC, motors



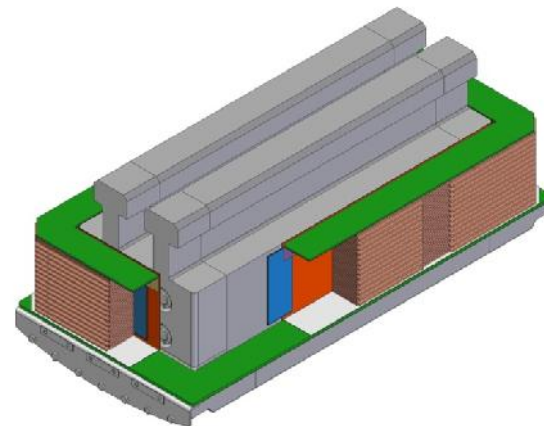
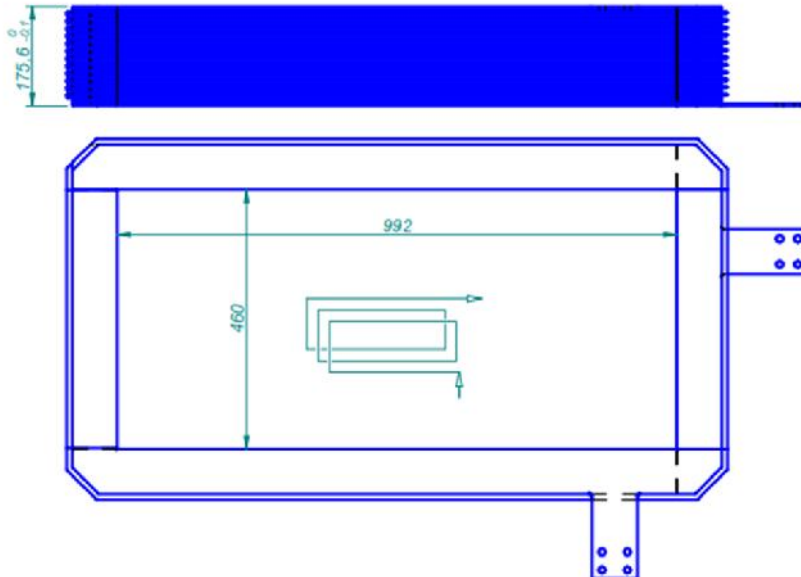
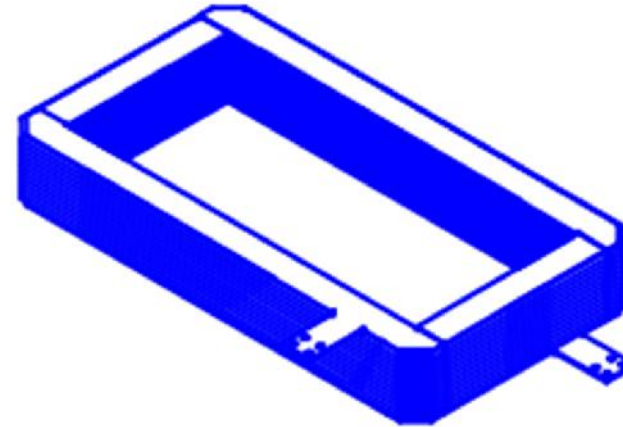
PRODUCT SHEET: POLE MASS

- **TYPE:** Specific Supply Products
- **DESCRIPTION:** Mass of the Rotor Poles
- **DETAILS:**
 - Typical length 1-2m.
 - Weight 1-3 Tn.
 - BOM
 - Laser cutting plates
 - Copper rods and Plates
 - Forge / Casting Side Plates
 - Welding and machining capacities required
- **POSSIBLE OPTIONAL SERVICES:**
 - Specific Services:
 - Assembly of polar winding. (Special Workshop)



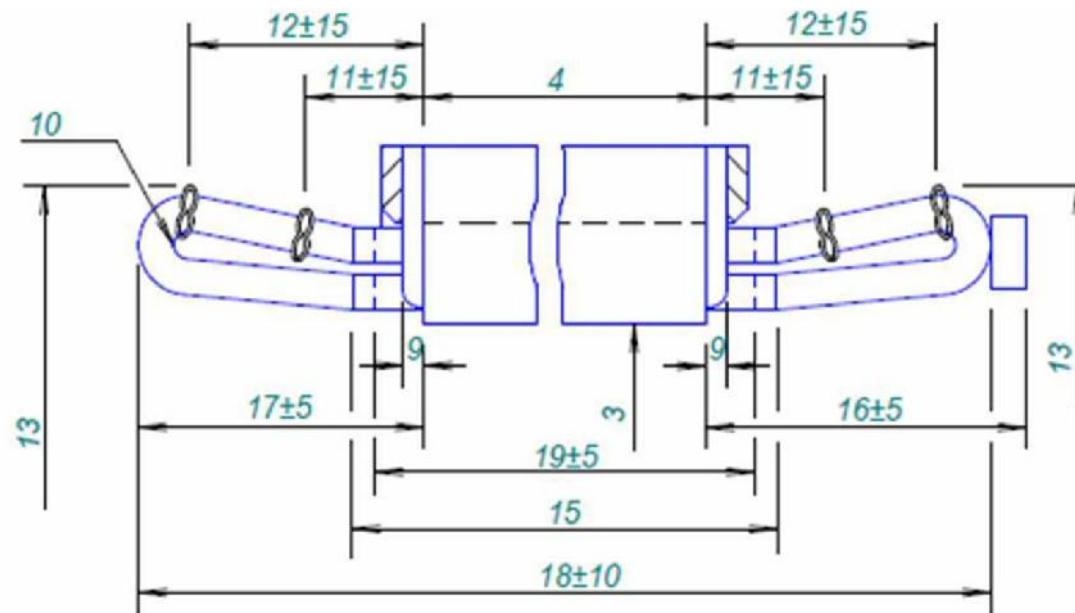
PRODUCT SHEET: POLE WINDING

- **TYPE:** Specific Supply Products
- **DESCRIPTION:** Winding of Rotor Poles
- **DETAILS:**
 - ETP-R250-RD
 - Typical thickness 4mm.
 - Typical Width 80-90mm.
 - Typical Length 400 – 500mm
- **POSSIBLE OPTIONAL SERVICES:**
 - Specific Services:
 - Assembly in polar mass (Special Workshop)



PRODUCT SHEET: STATOR COILS

- **TYPE:** Specific Supply Products
- **DESCRIPTION:** Stator coils
- **DETAILS:**
 - Up to 15 kV (green stage)
 - Multi turn coil.
 - VPI Technology
- **POSSIBLE OPTIONAL SERVICES:**
 - Specific Services:
 - Stator winding (Special Workshop)

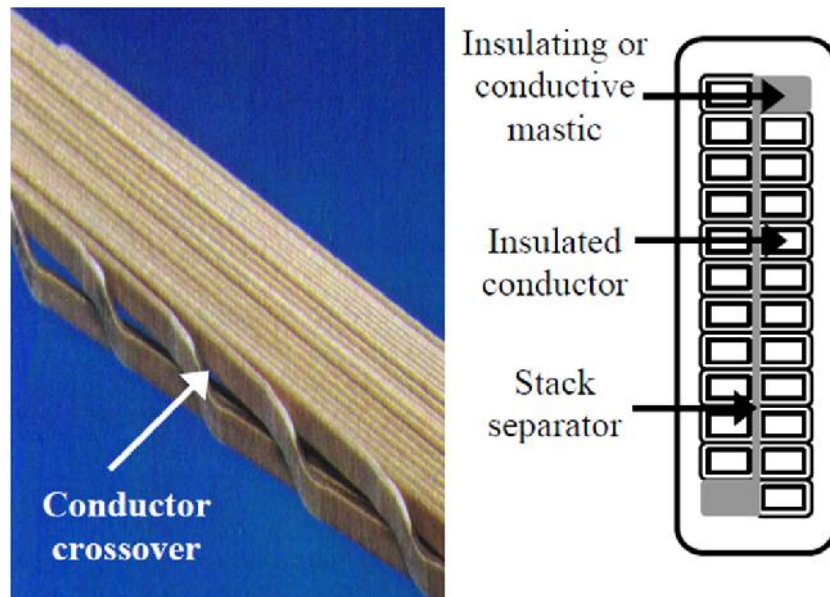


Note:

- Material can be deliver by the workshop or by INDAR

PRODUCT SHEET: STATOR ROEBEL BARS

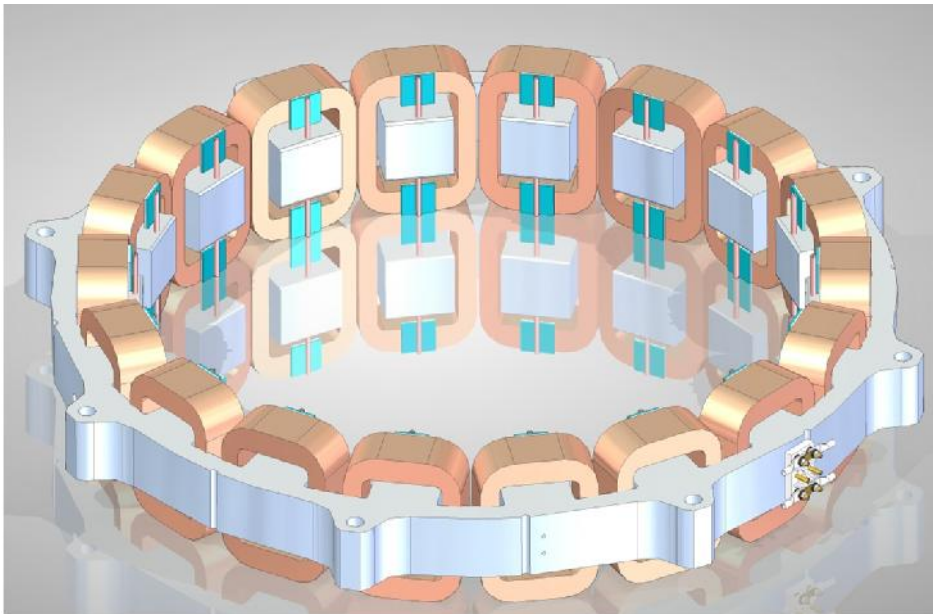
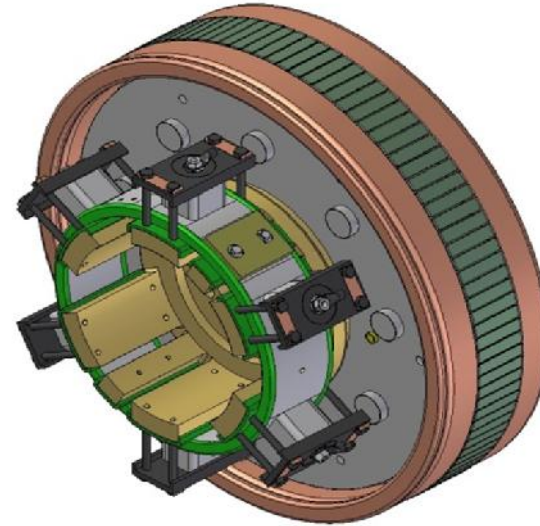
- **TYPE:** Specific Supply Products
- **DESCRIPTION:** Stator Roebel Bar
- **DETAILS:**
 - Up to 15 kV (green stage)
 - VPI Technology
 - Performed or straight
- **POSSIBLE OPTIONAL SERVICES:**
 - Specific Services:
 - Stator winding (Special Workshop)

**Note:**

- Material can be deliver by the workshop or by INDAR

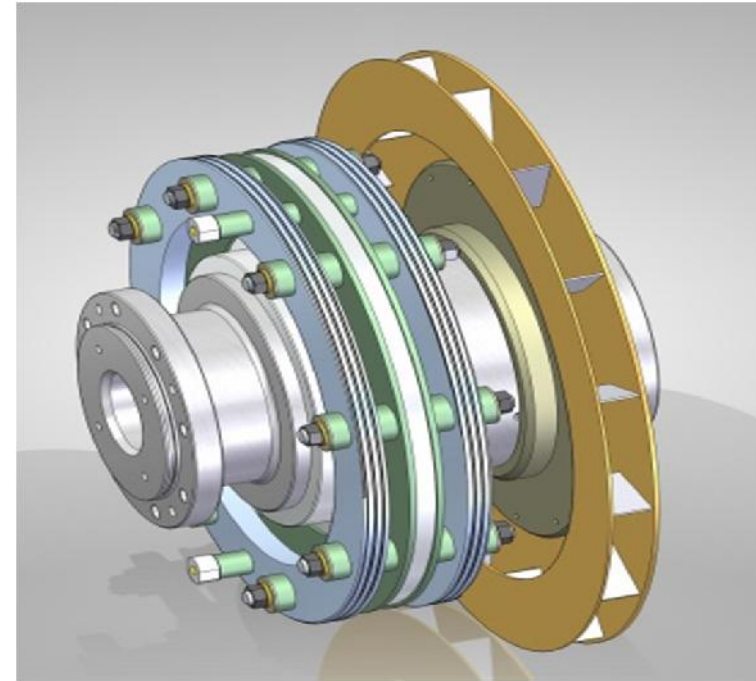
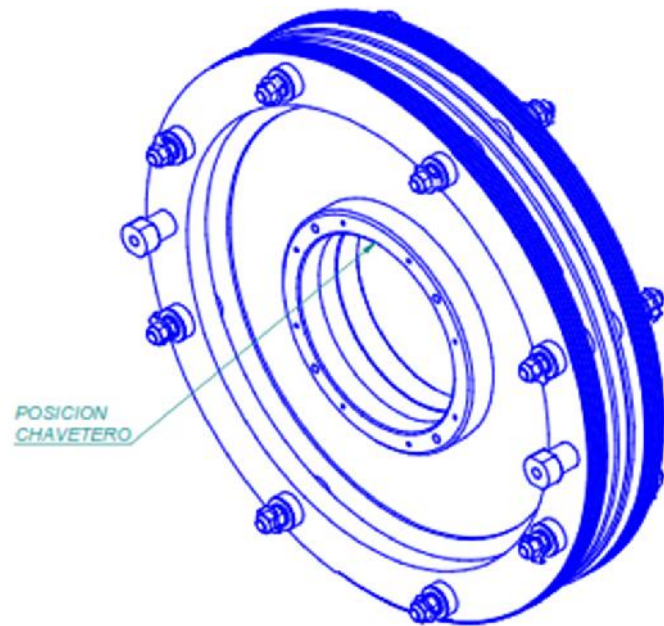
PRODUCT SHEET: EXCITER

- **TYPE:** Specific Supply Products
- **DESCRIPTION:** Stator and Rotor of Exciter
- **DETAILS:**
 - Up to 300 kVA
 - Diodes rectifier (normal or Boxclamp)
 - Copper coils
 - Class F/B
- **POSSIBLE OPTIONAL SERVICES:**
 - Exciter Frame included



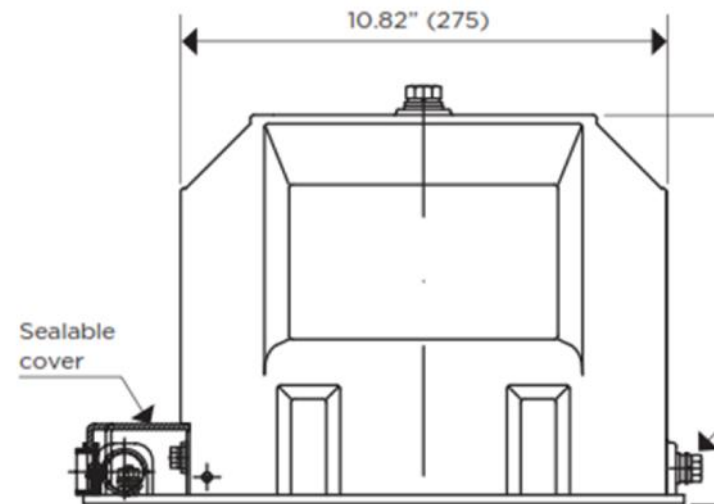
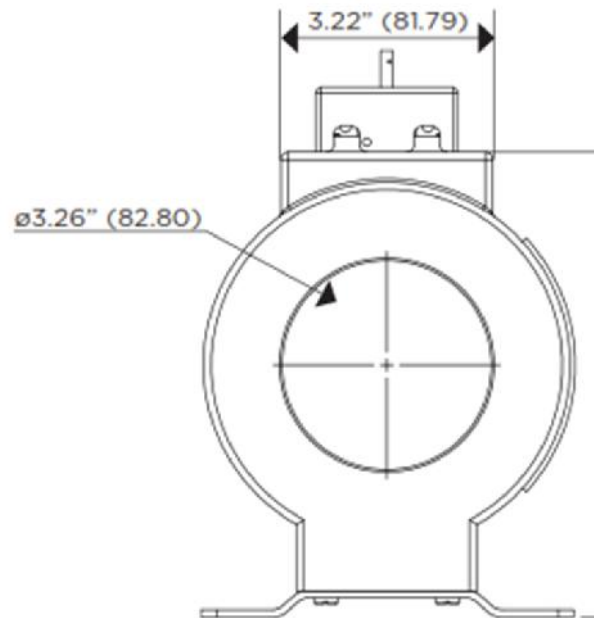
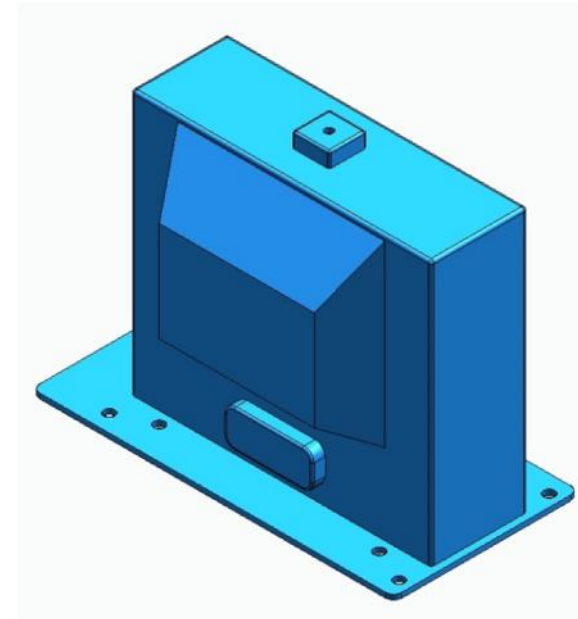
PRODUCT SHEET: ROTATING RINGS

- **TYPE:** Specific Supply Products
- **DESCRIPTION:** Slip ring for direct excitation generators
- **DETAILS:**
 - Machined slips rings
- **POSSIBLE OPTIONAL SERVICES:**
 - Fans & shaft included



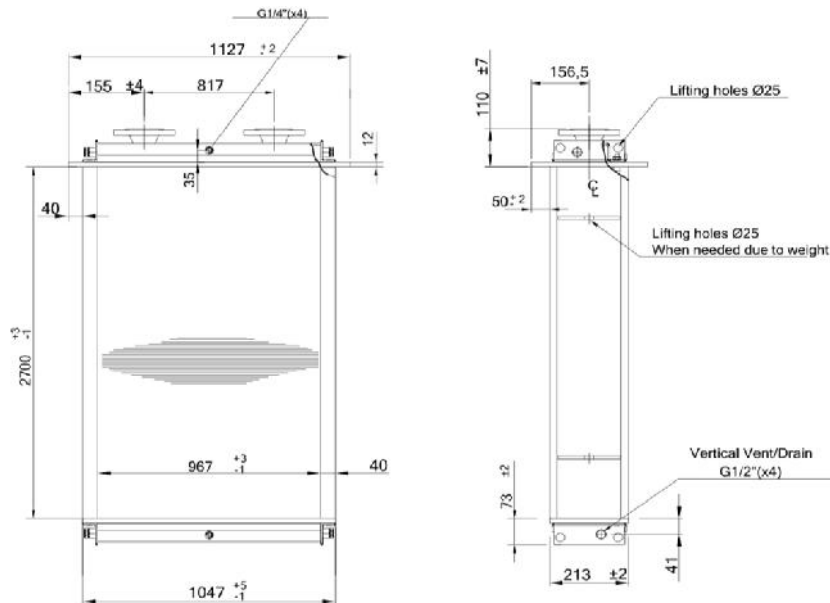
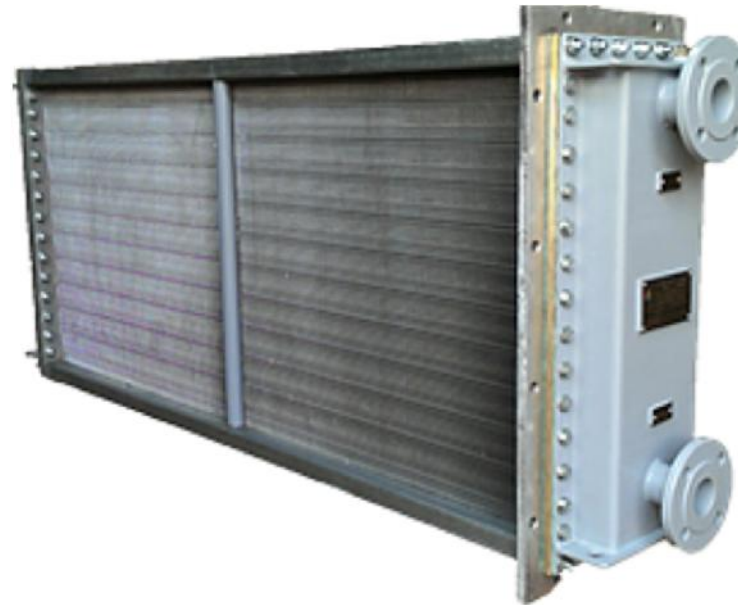
PRODUCT SHEET: CURRENT & VOLTAGE TRANSFORMER

- **TYPE:** Commercial Element Products
- **DESCRIPTION:** Indoor Current & Voltage transformer
- **DETAILS:**
 - Up to 15 kV
 - 50VA Burden
 - IEC and ANSI
 - Resin Type



PRODUCT SHEET: AIR-WATER HEAT EXCHANGER

- **TYPE:** Commercial Element Products
- **DESCRIPTION:** Air – Water Heat Exchanger
- **DETAILS:**
 - Cu or Cu-Ni tubes
 - Single tube.
 - Finned Tubes
- **POSSIBLE OPTIONAL SERVICES:**
 - Frame included
 - Electric sensors mounting



PRODUCT SHEET: INDUSTRIAL SENSORS

- **TYPE:** Commercial Element Products
- **DESCRIPTION:** Temperature, level sensors,
- **DETAILS:**
 - PT-100
 - For Air
 - For Water
 - For Oil
 - Level Sensor
 - For Oil
 - Digital display

Control of Revisions

Rev.-0	Initial edition.
Re.-1	New data for Stamping Product