

<u>תשתיות אנרגיה בע"מ</u>

<u>החלפת שנאים במתקנים אשל ובילו</u>

Standard Specification for Three Oil Immersed Power Transformers 1X(22/0.4KV – 1000KVA) 2X(22/0.4KV – 1250KVA)

| P0 | 30/01/2022 | FOR APPROVAL | A. Shvartsman | |
|------|------------|--------------|---------------|-----|
| Rev. | Date | | BY | ORL |
| | | Description | Approved | |

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<u>APENDIX</u>

a. Transformer Data Sheet

1. <u>SCOPE</u>

1.1 <u>General</u>

This specification covers the design, manufacture, painting, test, and the supply of three sealed oil immersed power transformers 22/0.4KV - 1000KVA, 22/0.4KV - 1250KVA. In addition, for each tender, a Data Sheet and Bill of materials (BOM) will be issued.

1.2 Quote Conditions

Purchaser and Final Owner: Energy Infrastructures ltd.

Installation Site Eshel & Bilu, Israel.

1.3 <u>Transport and Erection</u>

The vendor shall be responsible for the transportation of the transformers to the final installation location at **Eshel Hanasi site & Bilu site** (Israel), this includes all loading, unloading, coordinating local law authorities during land transportation (if needed).

2. <u>APPLICABLE CODES AND STANDARDS</u>

The following documents form part of this specification, according to their latest published issue.

All aspects, tests etc., not covered by the IEC publications shall be executed according to the latest published issue of the official or otherwise approved standards of the manufacturer's country.

| No. | Title |
|--------------------------|--|
| IEC 60050 | International Electro technical vocabulary |
| IEC 60076-1 (2004-04) | Power transformers General |
| IEC 60076-1 (am1) | Power transformers General |
| IEC 60076-2 (1993-04) | Power transformers Temperature rise |
| IEC 60076-3 (2000-03) | Power transformers Insulation levels dielectric tests and external clearances in air |
| IEC 60076-4 (2002-06) | Power transformers Lightning impulse and switching-impulse testing |
| IEC 60076-5 (2006-02) | Power transformers ability to withstand short circuits |
| IEC 60076-7 (2005-12) | Power transformers Loading guide for oil immersed transformers |
| IEC 60076-8 (1997-11) | Power transformers application guide |
| IEC 60076-10 | Power transformers Determination of sound levels |
| IEC 60076-10-1 | Power transformers Determination of sound levels |
| IS 50464 | Distribution transformer Requirements for energy efficiency and labeling |

3. ENVIRONMENTAL AND GRID CONDITIONS

Environmental conditions

| Temperature | 0^{0} C to 45^{0} C the ambient temperature |
|-------------|---|
| | shall be considered for design as 45° C. |
| Humidity | max 95% |
| Altitude | less than 100 m. |
| Location: | Outdoor, corrosive, with heavy |
| | industrial pollution, such as H_2S and |
| | SO ₂ gases. |

4 <u>TECHNICAL SPECIFICATION</u>

The terminology used in this section is, in general, according to IEC Publications 60076. The term "guaranteed" used in this Specification in connection with specified quantities means that the magnitude of the quantity to which it is applied shall be subjected to the tolerances given in IEC Publication 60076.

4.1 **Transformer Data**

| 4.1.1 | Rated Power (ONAN) | See Data Sheet |
|--------|----------------------------------|---------------------------|
| 4.1.2 | Number of phases | 3 |
| 4.1.3 | Rated frequency | 50Hz |
| 4.1.4 | Rated primary voltage | 22KV |
| 4.1.5 | Impulse withstand voltage | 125KV respective. |
| 4.1.6 | One-minute power frequency test | 50KV R.M.S. |
| 4.1.7 | Rated secondary voltage between | |
| | any two phases and neutral | |
| | (when transformer is not loaded) | 400V |
| 4.1.8 | No. of L.V. bushings | 4 |
| 4.1.9 | Rated current of phase bushing | according to transf. size |
| 4.1.10 | Rated current of neutral bushing | according to transf. size |
| 4.1.11 | Cooling | ONAN |
| 4.1.12 | Connection vector group | Dyn-11 |
| 4.1.13 | Guaranteed impedance voltage | |
| | (short circuit impedance) | 6% |

| 4.1.14 H.V. and L.V. winding material Copper or Aluminum | | | | |
|---|--------------------------------|-----------|--|--|
| 4.1.15 Maximum top oil temperature rise | 55°K | | | |
| 4.1.16 Maximum winding temperature rise (measured by resistance) | 60°K | | | |
| 4.1.17 Nameplate | as per IEC sta 60076 and IS | | | |
| 4.1.18 Off load tap changer on | H.V. side | | | |
| • No. of Taps | 5 | | | |
| • Voltage range | ±2x2.5% | | | |
| 4.1.19 Losses: Tolerance | 5% | | | |
| | 1250KVA | 1000KVA | | |
| • Maximum No load losses (PO) | AO (950W) | AO (770W) | | |
| | | | | |

• Maximum load losses (Pe)..... AK (9500W) AK (7600W)

4.1.20 Ability to withstand short circuit.

The transformer shall be designed and constructed to withstand the thermal and dynamic effects of external short circuits according to IEC Publication.

4.1.21 Max noise level 60 db (A)

4.1.22 Oil..... EDHELL DIALA Ax or NYNAS Nitro 10GBx, or equivalent approved by Israel Electric Corporation.

4.2 <u>Construction</u>

4.2.1 The transformer shall be an oil immersed natural air cooled (ONAN), suitable for outdoor installation.The tank shall be fabricated from cold rolled steel (CRS) sheets folded and welded complete. The top cover shall be sealed and bolted.

The transformer shall be a hermetic sealed type transformer without conservator.

4.2.2 The transformer shall be provided with a metal flange welded around the L.V terminals enabling the client to seal the connection of the L.V. by installing a terminal box.

4.3 <u>Transformer Auxiliaries, Accessories and Components</u>

4.3.1 Bushings

| | 0.4 KV | 22KV |
|---|--------|------|
| Number | 4 | 3 |
| Insulation class (KV) | 1 | 24 |
| Impulse withstand voltage positive and negative (kV peak) | | 125 |
| One-minute power frequency test (kV r.m.s.) | 2.5 | 50 |

- L.V. Terminals shall permit connection to copper busbars or cables.
- The high voltage terminals' connection shall be EUROMOLD-ELASTIMOLD or approved equivalent, 400A, screw type, totally insulated elbow connectors.

The Supplier will provide without extra costs, both male and female plug connectors, suitable for a cable cross section as given in the Data Sheet.

4.3.2 <u>Transformer Base</u>

Transformers shall be supplied with castor wheels.

4.3.3 <u>Oil Filling Cap</u> Transformer shall be provided with oil filling cap.

4.3.4 Drainage of the Transformer Tank

There shall be an opening at the bottom of the tank for removing oil, by means of a $\frac{3}{4}$ " spherical high-quality tap.

4.3.5 Pressure Relief Device

The transformer shall be equipped with a pressure relief device.

The pressure relief device shall be for 0.3 Atm. with a diameter opening in the transformer's lid of 68 mm. The device shall meet the relevant IEC requirements.

4.3.6 Protection

The transformer shall be equipped with a DGPT protection relay. The relay shall include the following functions:

- Gas emission in oil.
- Oil low level.
- Pressure increase.
- High oil temperature (with two separate levels, one for alarm and one for protection).
- Oil temperature measurement.
- 4.3.7 The transformer shall be equipped with a stainless-steel nameplate showing the wiring diagram and giving all data according to IEC standard 60076.
- 4.3.8 Transformer shall be provided with lifting lugs.
- 4.3.9 Two earthing screws with M12 Thread shall be welded to the Transformer, one on the base and one on the cover.

4.4 Painting

4.4.1 The painting of the transformer tank and other steel parts will be in accordance with Manufacturer's standard procedures for tropical corrosive atmosphere, as approved by Purchaser. The colour of the topcoat shall be medium grey.

- 4.4.2 The minimum requirements are the following:
 - 4.4.2.1 Cleaning by sand blasting to "near white metal" (prior to assembly/welding).
 - 4.4.2.2 Phosphatizing.

4.4.3 <u>Coating procedures</u>:

- 4.4.3.1 <u>Exterior surfaces</u>
 - Base coat: Two coats of epoxy-based primer Thickness of dry film: at least 80 microns
 - Top coat: Epoxy based glossy finish coating Thickness of dry film: 40 microns
 - Total thickness of the coating system: at least 120 microns

4.4.3.2 Interior surfaces

Oil resistant varnish coating Thickness of dry film at least: 20 microns

<u>Remarks</u>

Field repairs with commercially available epoxy enamels shall be feasible.

5. **DOCUMENTATION**

- 5.1 Vendor shall provide with the bid the following documents and information in three copies + reproducible.
 - 5.1.1 Customer's Data Sheet.
 - 5.1.2 Detailed dimension drawings specifying also weights.
 - 5.1.3 Technical catalogue.
 - 5.1.4 Type test report (see paragraph 7).
 - 5.1.5 No load, full load and the total losses corrected to 75° C.
 - 5.1.6 Noise level according to the latest IEC recommended methods of measurement.
 - 5.1.7 Information about manufacturer's experience and list of similar transformers installed in Israel.
 - 5.1.8 Summary of data.
 - 5.1.9 Best delivery time.
- 5.2 Three weeks after award of order the contractor shall supply the following:
 - 5.2.1 Final dimension drawings and weights.
 - 5.2.2 Certified data sheet.
 - 5.2.3 Civil guide
 - 5.2.4 Sub-vendor list
 - 5.2.5 Catalogues and instruction books.
- 5.3 Vendor shall supply copies of routine test when accomplished and before shipping.

6. WARRANTY

Three years warranty of satisfactory performance under normal utilization conditions from date of first operation or two years from date of delivery to site shall be included in the price of each transformer.

During the warranty period any request of assistance shall be dealt with within 24 hours. Repairs shall be made as far as possible on the spot with any other repair being carried out in the Manufacturer's repair station in Israel in reasonable time and to full Purchaser's satisfaction.

Transport of the transformer to and from the repair station shall be at the Manufacturer's expense.

7. <u>TESTS</u>

- 7.1 The transformer shall be subjected to routine tests as per IEC 60076 at the Manufacturer's works.
- 7.2 The Manufacturer shall submit with the bid a copy of the type test performed on an identical transformer as per I.E.C 60076 by an internationally recognized laboratory.

Has the type test report not been submitted with the bid, one of the transformers shall be subject to a full type test on manufacturer's expense.

TRANSFORMER DATA SHEET

| | 1.0 | Customer Data | 1 | |
|------------------|------|---|---------------------|------------------|
| General Data | 1.1 | Data Sheet No. | | |
| | 1.2 | Location: | BILU | |
| | 1.3 | Plant/Unit: | BILU | |
| | | Project Name: | | |
| | 1.6 | Transformer Tag Number | TR-1 | |
| | 1.7 | Max./Min. Ambient. Temp.: | 0-45 ⁰ C | |
| D | 1.8 | Altitude Over Sea Level | 10m. | |
| ata | 1.9 | Relative Humidity: | 95% | |
| | | Atmosphere: | Petrochemicals | |
| | | Specification: | | |
| | | Prepared By: | A. Shvartsman | |
| | | Date: | 30/01/2022 | |
| | 2.0 | Customer Transform | <u>ner Data</u> | |
| | 2.1 | Transformer Type | Oil Imerased Sealed | |
| Tr | 2.2 | Rated Power | 1000 | KVA |
| ans | 2.3 | Rated Secondary Voltage | 400 | V |
| for | 2.4 | Rated Primary Voltage | 22000 | V |
| me | 2.5 | Frequency: | 50 | Hz |
| ΫD | 2.6 | Tap Changer Steps | ±2x2.5 | % |
| Transformer Data | 2.7 | Connection (Vector) Group | Dyn-11 | |
| - | 2.8 | Suitable for outdoor installation | Yes | 2 |
| | 2.9 | Primary Connecting Cable Size/Secondary Connection | 3X95 | mm ² |
| | 2.10 | Primary Terminal's Rated Current | 400 | A |
| | 3.0 | Manufacturer transfor | rmer Data | |
| Ge | | | | |
| nei | 3.1 | Prepared By: | | |
| General Data | 3.2 | Date: | | |
| Dai | 3.3 | Manufacturer: | | |
| โล | 3.4 | Transformer Type | | |
| | 3.5 | Type of cooling | | |
| | 3.5 | Rated Power | | KVA |
| | 3.6 | Short-circuit impedance at rated current at 75 [°] C, X _k | | % |
| | 3.7 | Temperature rise of the top layer of oil: | | ⁰ C |
| | | | | °C °C |
| | 3.8 | Temperature rise of the windings: | | _ |
| Electri | 3.9 | Rated short circuit current for 2 sec. | | (KA) |
| ctri | 3.10 | No-load current: | | %xI _n |
| cal | | No-load losses: | | W |
| cal Data | 3.12 | Rated load losses at 75 [°] C | | W |
| Ita | 3.13 | Noise level (measured at a distance of one meter): | | db (A) |
| | 3.14 | Total Weight | | Kg. |
| | | Weight of Oil | | Kg. |
| | 3.16 | Dimensions [W x L x H] | | cm. |
| | 3.17 | Type of mineral oil | | |
| | | | | |
| | 3.18 | High voltage winding material: | | |
| | 3.19 | High Voltage bushings type and manufacturer | | |
| — | | (PLUGS INCLUDED) | | |
| Hig | | Number of high voltage bushings: | | |
| High Voltage | 3.21 | Rated voltage of the high voltage bushings: | | KV |
| | 3.22 | Creepage distance of the high voltage bushing: | | mm. |
| | 3.23 | Rated current of the high voltage bushing: | | Α |
| | - | Rated lightning impulse withstand voltage 1.2/50 msec. | | KV peak |
| | 3.25 | Rated short duration power frequency withstand | | KV r.m.s |
| | | voltage at 50Hz, 1min. | | |
| | 3.26 | Low voltage winding material: | | |
| Lov | | Low Voltage bushings type and manufacturer | | |
| W V | 3.28 | Number of low voltage bushings: | | |
| ⁷ olt | | Rated voltage of the low voltage bushings: | | KV |
| tage | 3.30 | Creepage distance of the low voltage bushing: | | mm. |
| | 3.31 | Rated current of the low voltage bushing: | | Α |
| | | | 1 | - |

TRANSFORMER DATA SHEET

| Id Data Sheet No. ESHEL-HANASI 1.1 Data Sheet No. ESHEL-HANASI 1.2 Location: ESHEL-HANASI 1.4 Prepriet Name: T.T.T. 1.4 Transformer Tag Number T.I.T.Z. 1.7 Max/Min.Amblern Temp: 0.4-5°C 1.8 Attinde Over Sea Level Umn. 1.9 Relative Hundilly: 95% 1.14 Attore Sea Level Umn. 1.26 Prepared By: A.Stvartsman 1.16 Date: 3001/2022 2.0 Customer Transformer Data 2.1 Transformer Type Oil Imerased Sealed 2.2 Ratel Power 1250 KVA 2.4 Ratel Power Voltage 22000 V 2.4 Ratel Power Stop 22.2.5 % 2.6 Type Changer Stop 22.2.5 % 2.7 Connecting Cable Size/Scondary Connecting Na Na 2.8 Primary Connecting Cable Size/Scondary Connecting 3.0 A | | 1.0 | Customer Data | 1 | |
|---|---------------------------|------|--|---------------------|------------------|
| Id Project Name: FIFE. 16 Transformer Tag Number FI, T2 17 Max/Min. Anbient. Temp.: 0-45% (C) 18 Altitude Over Sea Level 10m. 19 Relative Humidity: 92% (S) 110 Atmosphere: Petrochemicals 111 Specification: 1 12.0 Relative Humidity: 92% (S) 111.1 Specification: 1 112 Zea Ratel Scoondary Voltage 0011000000000000000000000000000000000 | General | 1.1 | | | |
| Control 1.4 Project Name: Image: Second | | 1.2 | Location: | ESHEL-HANASI | |
| Torus Transformer Tag Number T1, T2 17 Max-Min <anbian, td="" temp:<=""> 0.45°C 18 Altrinde Over Sea Level 10m. 19 Relative Humidity: 9.9%, % 110 Immosyber: Petrochemicals 111 Specification: A.Shvartsman 112 Transformer Type 0011 Mersased Scaled 213 Rated Scondary Voltage 2000 214 Rated Power 1250 22.0 Rated Scondary Voltage 2000 22.1 Transformer Type 0011 Mersased Scaled 22.2 Rated Scondary Voltage 2000 23 Rated Power 1250 24 Rated Primary Voltage 2000 25 Frequency: 500 26 Tap Changer Steps 423.2.5 27 Connection (Vector) Group Dyn-11 28 Suitable for outdoor installation Yes 29 Primary Connection 333% 30 Manufactureret 630 31<!--</td--><td></td><td></td><td>ESHEL</td><td></td></anbian,> | | | | ESHEL | |
| I.10 Atmosphere: Perchemicals 1.14 Specification: | | | | | |
| I.10 Atmosphere: Perchemicals 1.14 Specification: | | | | | |
| I.10 Atmosphere: Perchemicals 1.14 Specification: | | | | | |
| I.10 Atmosphere: Perchemicals 1.14 Specification: | D | | | | |
| I.14 Specification: A. Shvartsman 1.15 Deate: 30001/2022 2.0 Customer Transformer Data 21 2.1 Transformer Type Oil Increased Scaled 2.2 Rated Newer 1250 KVA 2.3 Rated Newer 900 V 2.4 Rated Newer 2000 V 2.4 Rated Newer 2000 V 2.4 Rated Newer 2000 V 2.5 Frequency: 50 Hz 2.6 Tray Changer Steps 420.2.5 % 2.7 Connection (Vector) Group Dyn-11 22 2.8 Primary Connecting Cable SizeScondary Connection 3X95 mm² 2.10 Primary Connecting Cable SizeScondary Connection 3X95 mm² 3.0 Manufacturer transformer Data 630 A 3.1 Prepared By: | ata | | | | |
| I.15 Propared By: A. Shvartsman 1.16 Date: 30001/2022 | | | | Petrochemicals | |
| Term 3001/2022 1.16 Date: 01 2.0 Customer Transformer Data 01 2.1 Transformer Type 01 2.2 Rated Power 1250 KVA 2.3 Rated Power 01 Incrased Scaled 2.4 Rated Power 2000 V 2.4 Rated Power 50 IIZ 2.6 Tag Changer Steps 22.2.5 % 2.7 Connection (Vector) Group Dyn-11 28 2.8 Statable for outdoor installation Yes mail 2.9 Primary Connecting Cable Size/Scondary Connection 3X95 mm ² 3.0 Manufacturer transformer Data 630 A 3.2 Date: | | | | | |
| Image: Second and the second | | | | | |
| Open Oil Increased Scaled 2.1 Transformer Type 0il Increased Scaled 2.2 Rated Secondary Voltage 400 V 2.4 Rated Secondary Voltage 22000 V 2.4 Rated Secondary Voltage 22000 V 2.5 Frequency: 50 Hz 2.6 Tap Changer Steps ±2x2.5 % 2.0 Primary Connecting (Cable Size/Secondary Connection 33x95 mm² 2.9 Primary Terminal's Rated Current 630 A 3.0 Manufacturer transformer Data 630 A 3.1 Prepared By: | | | | | |
| Form 1250 KVA 2.2. Rated Power 400 V 2.4. Rated Scondary Voltage 22000 V 2.4. Rated Primary Voltage 22000 V 2.5. Frequency: 50 Hz 2.6. Tap Changer Steps e2x2.5 % 2.7. Connecting Cable Size/Secondary Connection 3395 mm² 2.8. Suitable for outdoor installation Yes | | 2.0 | Customer Transform | <u>ner Data</u> | |
| Form 1250 KVA 2.2. Rated Power 400 V 2.4. Rated Scondary Voltage 22000 V 2.4. Rated Primary Voltage 22000 V 2.5. Frequency: 50 Hz 2.6. Tap Changer Steps e2x2.5 % 2.7. Connecting Cable Size/Secondary Connection 3395 mm² 2.8. Suitable for outdoor installation Yes | | 2.1 | Transformer Type | Oil Imerased Sealed | |
| Last Suitable for outdoor installation Yes 2.0 Primary Connecting Cable Size/Secondary Connection 3395 mm² 2.10 Primary Connecting Cable Size/Secondary Connection 3395 mm² 3.1 Prepared By: 630 A 3.2 Date: | $\mathbf{T}_{\mathbf{r}}$ | | | | KVA |
| Last Suitable for outdoor installation Yes 2.0 Primary Connecting Cable Size/Secondary Connection 3395 mm² 2.10 Primary Connecting Cable Size/Secondary Connection 3395 mm² 3.1 Prepared By: 630 A 3.2 Date: | an | 2.3 | Rated Secondary Voltage | 400 | V |
| Last Suitable for outdoor installation Yes 2.0 Primary Connecting Cable Size/Secondary Connection 3395 mm² 2.10 Primary Connecting Cable Size/Secondary Connection 3395 mm² 3.1 Prepared By: 630 A 3.2 Date: | sfo | 2.4 | Rated Primary Voltage | 22000 | V |
| Last Suitable for outdoor installation Yes 2.0 Primary Connecting Cable Size/Secondary Connection 3395 mm² 2.10 Primary Connecting Cable Size/Secondary Connection 3395 mm² 3.1 Prepared By: 630 A 3.2 Date: | rm | 2.5 | Frequency: | 50 | Hz |
| Last Suitable for outdoor installation Yes 2.0 Primary Connecting Cable Size/Secondary Connection 3395 mm² 2.10 Primary Connecting Cable Size/Secondary Connection 3395 mm² 3.1 Prepared By: 630 A 3.2 Date: | er l | 2.6 | Tap Changer Steps | ±2x2.5 | % |
| Last Suitable for outdoor installation Yes 2.0 Primary Connecting Cable Size/Secondary Connection 3395 mm² 2.10 Primary Connecting Cable Size/Secondary Connection 3395 mm² 3.1 Prepared By: 630 A 3.2 Date: | Dat | | | Dyn-11 | |
| 2.10 Primary Terminal's Rated Current 630 A 3.0 Manufacturer transformer Data | а | | | | |
| Generation Manufacturer transformer Data 3.0 Manufacturer transformer Data 3.1 Prepared By: 3.2 Date: 3.3 Manufacturer: 3.4 Transformer Type 3.5 Type of cooling 3.6 Short-circuit impedance at rated current at 75°C, X _k 3.7 Temperature rise of the top layer of oil: 3.8 Temperature rise of the windings: 9°C 3.8 3.10 No-load current: 3.11 No-load current: 3.12 Rated loot circuit current for 2 sec. 3.13 Noise level (measured at a distance of one meter): 3.14 Total Weight 3.15 Weight of Oil 3.16 Dimensions [W x L x H] 3.17 Type of mineral oil 3.18 High voltage bushings: 3.20 Number of high voltage bushings: 3.21 Rated short duration power frequency withstand 3.22 Creepage distance of the high voltage bushing: 3.23 Rated voltage of the high voltage bushing: 3.24 Rated lightning imputes withstand voltage 1.2/50 msec. </td <td></td> <td>2.9</td> <td>Primary Connecting Cable Size/Secondary Connection</td> <td>3X95</td> <td>mm²</td> | | 2.9 | Primary Connecting Cable Size/Secondary Connection | 3X95 | mm ² |
| Open Participation Image: | | 2.10 | Primary Terminal's Rated Current | 630 | Α |
| Open Participation Image: | | 3.0 | Manufacturer transfor | rmer Data | |
| 3.4 Transformer Type 3.5 Type of cooling 3.5 Type of cooling 3.6 Short-circuit impedance at rated current at 75°C, X _k % 3.7 Temperature rise of the top layer of oil: °C 3.8 Temperature rise of the windings: °C 3.9 Rated short circuit current for 2 sec. (KA) 3.10 No-load current: % KI, 3.11 No-load closses: W 3.12 Rated load losses at 75°C W 3.13 Noise level (measured at a distance of one meter): db (A) 3.14 Total Weight Kg. 3.15 Weight of Oil Kg. 3.16 Dimensions [W x L x H] cm. 3.17 Type of mineral oil cm. 3.18 High voltage bushings type and manufacturer (PLUGS INCLUDED) mm. 3.21 Rated ourter of the high voltage bushings: at 3.21 Rated voltage of the high voltage bushing: A 3.22 Creepage distance of the high voltage bushing: A 3.23 Rated ourt duration power frequency withstand voltage 1.2/50 msec. KV | Ge | | | | |
| 3.4 Transformer Type 3.5 Type of cooling 3.5 Type of cooling 3.6 Short-circuit impedance at rated current at 75°C, X _k % 3.7 Temperature rise of the top layer of oil: °C 3.8 Temperature rise of the windings: °C 3.9 Rated short circuit current for 2 sec. (KA) 3.10 No-load current: % KI, 3.11 No-load closses: W 3.12 Rated load losses at 75°C W 3.13 Noise level (measured at a distance of one meter): db (A) 3.14 Total Weight Kg. 3.15 Weight of Oil Kg. 3.16 Dimensions [W x L x H] cm. 3.17 Type of mineral oil cm. 3.18 High voltage bushings type and manufacturer (PLUGS INCLUDED) mm. 3.21 Rated ourter of the high voltage bushings: at 3.21 Rated voltage of the high voltage bushing: A 3.22 Creepage distance of the high voltage bushing: A 3.23 Rated ourt duration power frequency withstand voltage 1.2/50 msec. KV | nei | | | | |
| 3.4 Transformer Type 3.5 Type of cooling 3.5 Type of cooling 3.6 Short-circuit impedance at rated current at 75°C, X _k % 3.7 Temperature rise of the top layer of oil: °C 3.8 Temperature rise of the windings: °C 3.9 Rated short circuit current for 2 sec. (KA) 3.10 No-load current: % KI, 3.11 No-load closses: W 3.12 Rated load losses at 75°C W 3.13 Noise level (measured at a distance of one meter): db (A) 3.14 Total Weight Kg. 3.15 Weight of Oil Kg. 3.16 Dimensions [W x L x H] cm. 3.17 Type of mineral oil cm. 3.18 High voltage bushings type and manufacturer (PLUGS INCLUDED) mm. 3.21 Rated ourter of the high voltage bushings: at 3.21 Rated voltage of the high voltage bushing: A 3.22 Creepage distance of the high voltage bushing: A 3.23 Rated ourt duration power frequency withstand voltage 1.2/50 msec. KV | al | 3.2 | Date: | | |
| 3.4 Transformer Type 3.5 Type of cooling 3.5 Type of cooling 3.6 Short-circuit impedance at rated current at 75°C, X _k % 3.7 Temperature rise of the top layer of oil: °C 3.8 Temperature rise of the windings: °C 3.9 Rated short circuit current for 2 sec. (KA) 3.10 No-load current: % KI, 3.11 No-load closses: W 3.12 Rated load losses at 75°C W 3.13 Noise level (measured at a distance of one meter): db (A) 3.14 Total Weight Kg. 3.15 Weight of Oil Kg. 3.16 Dimensions [W x L x H] cm. 3.17 Type of mineral oil cm. 3.18 High voltage bushings type and manufacturer (PLUGS INCLUDED) mm. 3.21 Rated ourter of the high voltage bushings: at 3.21 Rated voltage of the high voltage bushing: A 3.22 Creepage distance of the high voltage bushing: A 3.23 Rated ourt duration power frequency withstand voltage 1.2/50 msec. KV | Da | 3.3 | Manufacturer: | | |
| Image: Property of the second secon | ta | 3.4 | Transformer Type | | |
| Image: Property of the second secon | | 3.5 | Type of cooling | | |
| High Voltage bushings type and manufacturer (PLUGS INCLUDED) M % 3.20 Number of high voltage bushings: 0 3.21 Rated short circuit current for 2 sec. (KA) 3.10 No-load current: % 3.11 No-load losses: W 3.12 Rated load losses at 75°C W 3.13 Noise level (measured at a distance of one meter): db (A) 3.14 Total Weight Kg. 3.15 Weight of Oil Kg. 3.16 Dimensions [W x L x H] cm. 3.17 Type of mineral oil Kg. 3.18 High voltage bushings type and manufacturer (PLUGS INCLUDED) M 3.22 Rated lightning impulse withstand voltage 1.2/50 msec. KV 3.23 Rated lightning impulse withstand voltage 1.2/50 msec. KV peak 3.25 Rated lightning impulse withstand voltage 1.2/50 msec. KV peak 3.26 Low voltage bushings: A 3.27 Low voltage bushings type and manufacturer Z 3.26 Low voltage bushings type and manufacturer XV | | | | | KVA |
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