

INTRODUCING OUR NEW...



**UNIT TYPE
TRANSFORMERS**

Bowers Electricals have innovation at its core, and we serve the needs of our valued customers by offering solutions that remain at the forefront of industry standards.

We are pleased to bring to the market our Unit-Type Distribution transformer. Which offers the same quality that our customers have come to expect in a format that recognises modern standards in substation design.

The Unit Type Transformer reflects modern substation design by:

- **Saving Space.**

HV/LV switchgear can be mounted directly to the unit on the same side – beneficial when space is at a premium.

- **Reducing Site Installation.**

Single lift arrangement reduces site installation and eliminating site assembly requirements.

- **Simplifying Logistics.**

Can be assembled at our factory and delivered as a single unit, simplifying logistics with the complete substation lifted as one unit and delivered directly to the site.

- **Decreasing Cable Costs.**

Minimise costs with the elimination of expensive cabling.



Compliant to Tier 2 Regulations

The 2021 EU Ecodesign regulation came into place on July 1st 2021 which made amendments to Regulation 548/2014. The new regulations tighten the requirements for load-losses on energy-related products. It is in place to improve energy efficiency, environmental compatibility, and reduce CO2 emissions.

The European Commission estimates that 2.9% of all energy generated across the 27 EU countries (EU27) and the UK is wasted through transformer losses. In a survey led by the EU, they found that the EU27 transformer industry produces losses up to 93.4TWh annually. The strict new design regulation aims to reduce energy losses of distribution transformers to save on average 16TWh annually which equates to 3.7Mt CO2 from being emitted into the atmosphere.

Our range of Unit Type Transformers are manufactured using cold rolled grain oriented (CRGO) steel and range from 500kVA to 2000kVA. They are fully compliant with all current UK and EU directives including the 2021 Tier 2 EU directive 548/2014.

ENA TS 35-1

The Energy Networks Association (ENA) Technical Specifications (TS) 35-1 Parts 1 and 2, or ENATS 35-1, are requirements for the specification of distribution transformers. The Energy Networks Association is the industry body funded by UK gas and electricity transmission and distribution licence holders.

The 35-1 parts 1-4 specifications detail the specific electrical and physical requirements of distribution transformers—items relating to the technical aspects, testing, fittings, paint, and dimensions.

Our range of Unit Type Transformers are all designed and manufactured to the UK ENATS 35-1 standards.

Intended Ratings & Footprints



| Rating (kVA) | Length (mm) | Width (mm) | Height (mm) | Weight (kg) |
|--------------|-------------|------------|-------------|-------------|
| 500 | 1706 | 1650 | 1060 | 2500 |
| 800 | 1805 | 1802 | 1341 | 3550 |
| 1000 | 1905 | 1852 | 1436 | 3900 |
| 1500 | 1975 | 2011 | 1571 | 4650 |
| 2000 | 1950 | 2185 | 1807 | 5750 |

Switchgear

Bowers Electricals can supply switchgear to mount on your unit-type transformer. Our team can act as a single provider for all components of your package substation creating a simpler supply chain for your needs.

We benefit from not being tied to a specific switchgear manufacturer providing full flexibility and choice on transformer-mounted HV/LV equipment.

Tailored configurations comprising of:

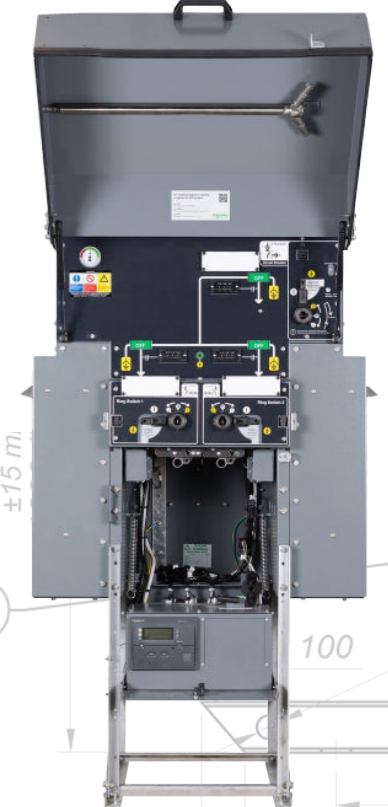
- Unit Type Tier 2 Transformers from 500kVA to 2000kVA, ONAN or KNAN filled.
- HV – Ring Main Units at 11kV rated voltage.
- LV - ACB or MCCB feeder pillars or LV Cabinets 800A – 3200A with different cable entry based on site requirements.

Bowers Electricals provide full flexibility and choice on transformer-mounted HV/LV equipment.

Lucy Electric Fused Distribution Cabinets



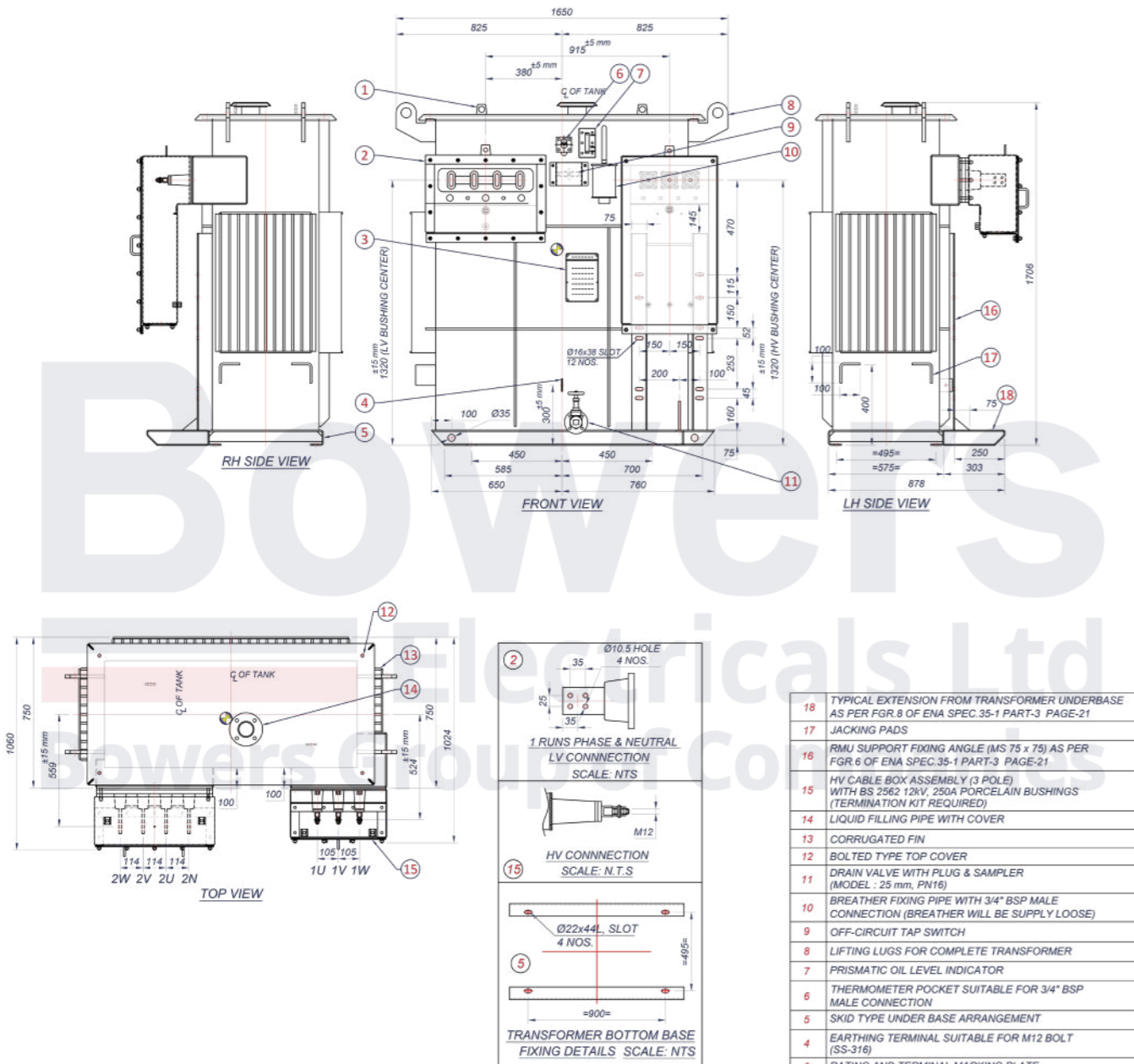
Schneider RN2D



This package substation features:

- 500kVA, 11000/433V, Aluminium, Tier 2, Unit Type Transformer.
- Schneider 1600A LV Cabinet.
- Lucy Electric VRN2a Ring Main Unit.

Unit Type Drawing Example



NOTES:-
 1. DIMENSIONS & WEIGHTS ARE SUBJECT TO +5% TOLERANCE.
 2. PAINTING: DARK ADMIRALTY GREY 632 OF BS 381C, ISO-12944-2 CATEGORY C5M
 3. THIS IS OGA DRAWING ONLY, EXACT LOCATION OF ACCESSORIES & FITTING MAY VARY DURING MANUFACTURING.
 4. EXCEPT OUTLINE ARRANGEMENT OF TRANSFORMER ALL PART DETAILS PREPARED FOR NOT TO SCALE FOR BETTER VISIBILITY
 5. ALL DIMENSIONS IN MM - UNLESS OTHERWISE STATED

| No. | DESCRIPTION |
|-----|--|
| 18 | TYPICAL EXTENSION FROM TRANSFORMER UNDERBASE AS PER FGR.8 OF ENA SPEC.35-1 PART-3 PAGE-21 |
| 17 | JACKING PADS |
| 16 | RMU SUPPORT FIXING ANGLE (MS 75 x 75) AS PER FGR.6 OF ENA SPEC.35-1 PART-3 PAGE-21 |
| 15 | HV CABLE BOX ASSEMBLY (3 POLE) WITH BS 2562 12KV, 250A PORCELAIN BUSHINGS (TERMINATION KIT REQUIRED) |
| 14 | LIQUID FILLING PIPE WITH COVER |
| 13 | CORRUGATED FIN |
| 12 | BOLTED TYPE TOP COVER |
| 11 | DRAIN VALVE WITH PLUG & SAMPLER (MODEL : 25 mm, PN16) |
| 10 | BREATHER FIXING PIPE WITH 3/4" BSP MALE CONNECTION (BREATHER WILL BE SUPPLY LOOSE) |
| 9 | OFF-CIRCUIT TAP SWITCH |
| 8 | LIFTING LUGS FOR COMPLETE TRANSFORMER |
| 7 | PRISMATIC OIL LEVEL INDICATOR |
| 6 | THERMOMETER POCKET SUITABLE FOR 3/4" BSP MALE CONNECTION |
| 5 | SKID TYPE UNDER BASE ARRANGEMENT |
| 4 | EARTHING TERMINAL SUITABLE FOR M12 BOLT (SS-316) |
| 3 | RATING AND TERMINAL MARKING PLATE |
| 2 | LV BUSHING 4 POLE, 1 CONNECTION/PHASE WITH 1.1KV EPOXY MONOBLOCK BUSHING AS PER BS 2562 |
| 1 | LIFTING LUGS (ONLY FOR TOP COVER) |

| BOWERS JOB No. | - |
|----------------|----------------|
| RATING | 500 kVA |
| VOLTAGE RATIO | 11000 / 433 |
| AMPERES | 26.24 / 666.69 |
| PHASES | 3 |
| FREQUENCY | 50Hz |
| VECTOR GROUP | Dyn11 |

| ESTIMATED WEIGHTS | KG |
|-------------------------|------|
| COOLING LIQUID 565 LTRS | 500 |
| TOTAL WEIGHT | 2500 |

Unit Type Data Sheet Example

Bowers
 Electricals Ltd
 Bowers Group of Companies

Unit Type Transformer
DATA SHEET

**500
kVA**

500kVA Aluminium Wound Mineral Oil Filled Unit Substation Transformer

| | |
|--------------------------|-----------------|
| Rated Power, Sr | 500 kVA |
| Rated Frequency, fr | 50 Hz |
| Rated High Voltage, Ur | 11000 v |
| Rated Current, Ir (HV) | 26.24 A |
| HV Tapping Range | +5% to -5% |
| Tap Switch, CFV | Off Circuit |
| Tap Steps | 5 x 2.5% |
| Rated Low Voltage, Ur | 433 v |
| Rated Current, Ir (LV) | 666.69 A |
| Cooling Method | ONAN |
| Thermal Class | A (105°C) |
| Location | Indoor/Outdoor |
| Coolant | Mineral Oil |
| Insulation Level | Li75.Ac28 / Ac3 |
| Vector Group | Dyn11 |
| Core Material | CRGO |
| Winding Material | Aluminium |
| Temperature Rise Oil/Wdg | 60 / 65°C |
| Load Loss @ 75°C | 2550 w |
| No Load Loss | 459 w |
| Impedance | 4.75% |
| Tier 2 EU 548/2014 | Ak Ao-10% |
| Total Weight | 2500kg (+/-10%) |

HV Terminals

3 Pole flanged throat suitable for the client's ENA TS switchgear. Supplied with 3x flexible leads under oil, on the same side as the LV terminations. Compliant with BS 2562 and ENA TS-35.1.
 (Cables, Lugs & Glands are not included in the scope of supply)

LV Terminals

4 pole, 1 connection/phase with 1.1kV epoxy monoblock bushing. On the same side as the HV terminations. Compliant with BS 2562 and ENA TS-35.1.
 (Cables, Lugs & Glands are not included in the scope of supply)

Paint Finish

Painted in accordance with our enhanced system with a dark admiralty grey finish to BS 381C - 632 incorporating corrosion category C5M of ISO 12944.

Neutral Point

A fully rated neutral point is provided as standard.

Accessories & Fittings

- ENA TS 35-1 Terminal Height
- Thermometer pocket with 3/4" BSP male connection
- Stainless steel Rating & connection diagram plate
- Lifting lugs for top cover & complete transformer
- Stainless steel Earthing terminals (M 12)
- Drain valve with closing plug
- Top oil filling pipe with cover
- Prismatic oil level Indicator
- Skid type under base
- Silica gel breather
- Jacking pads
- Corrugated Radiators

Accessories Supplied Loose

- 1 x Desiccant breather
- 2 x Tins touch up paint (1x Grey, 1x Yellow)
- 1 x Paint Brush
- 1 x Transformer routine test certificate
- 1 x Certificate of Conformity
- 1 x O&M

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Bowers

The logo graphic consists of two horizontal bars. The top bar is white and the bottom bar is red. They are positioned to the left of the text 'Electricals Ltd'.

Electricals Ltd

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