



OTDS manufactures a large range of oil filled hermitically sealed and conservator type transformers to be used in conjunction with our package substations. We are able to utilise the different types of transformers depending on our customers' specific requirement and environment.

Available in a number of configurations, OTDS are able to provide our transformers as a complete package substation with HV SF6 switches or Ring main units with LV panels in a multitude of designs and options. Whatever your requirement OTDS are able to provide a complete tailored pre assembled package substation ready for delivery & energising on site.



Key features

DESIGNS:

- Conservator type
- Hermetically sealed

CHOICE OF FLUID:

- Mineral Oil
- Silicon Oil
- Midel Fluid

HV SIDE:

- Oil type AND SF6 switches / Ring main units
- Ring main and switches up to 13.8kv / 630A rated current
- SF6 Circuit breaker protection
- VIP Protection relays and TLF Fuses

LV SIDE:

- Available in 800/1250/1600 & 2000A Ratings
- 4, 6 or 8 ways available
- Fuse Cabinets and MCCB / ACB panels
- G59 relay compatible
- Fully customisable panel with metering

RATING & SIZES:

- Transformer ratings between 200kva - 2500kva
- Up to 13.8kv voltages

RATING:

- IP54 rating for indoor / outdoor installations
- Epoxy finish for harsh environments
- Available in operational temperatures up to +55°C

SPECIFICATIONS AND TESTING:

- IEC60076-2 & ENA 35-1 approved
- Full range of type testing available





Benefits

- Complete package delivered to site
- Directly mounted HV & LV switchgear
- Controlled assembly in our factory
- Reduced Civil foundation and cable connection costs
- One point of Contact for complete package
- Approved by DNO
- Minimised costs
- Quick deliveries of 4 weeks



HV Side

- Gas pressure indicator as standard
- Anti-reflex operating handle with facilities for electrical operation
- Interlocked MV cable test access (no need to remove cable terminations or use loose earthing devices)
- Integral self-powered protection with TFL, adjustable curve & relay options
- IP54 enclosure
- Simple to follow mimic providing user-friendly operation
- Earth screened cast-resin gas module
- Range of dry type metering units
- Mechanical tripped on-fault indication
- Resin encapsulated busbars in air bus chamber for extensible version
- Direct coupling to transformers or cable connection

Ring main units & circuit breakers options:

- Available in SF6 or Oil type
- 200A or 630A circuit breakers
- 12/13.8kv rated
- Multiple Transformer feeder or switching points



LV Side

Our LV cabinets are available in 4, 6 & 8 way versions and in 800/1250/1600 & 2000A ratings.

Designed for use outdoor on three phase four wire systems at either 50 or 60Hz, suitable for use on a system Voltage up to 500V AC.



Each cabinet is manufactured from zinc coated steel that is dark grey polyester paint finished to BS4800 18B25.

The cabinets are complete with a rear transformer connecting flange, removable roof and a removable front apron plate.

LV Side

STANDARD FEATURES:

- Incoming off load phase isolating links.
- Isolating link operating pole.
- Incoming off load isolator shroud box complete with padlockable front door.
- Bolted main neutral link.
- Bolted neutral / earth connection.
- Earth bar with cable earthing points and an external main earthing point.
- Set of 'J' type fuse carriers.
- Set of front IP2x screens (with fuse carriers in place) for the front of fuse ways (one per fuse way).
- Set of uninscribed circuit labels for the outgoing fuse ways.
- Set of undrilled gland plates.
- Cabinets are supplied without cable glands or cable lugs.

OPTIONAL ITEMS:

- Outgoing fuse ways with bolted neutral links.
- Outgoing fuse ways without bolted neutral link.

Our LV panels are available in a large range of configurations in either Fuse cabinet or MCCB form, please contact us direct for a fully tailored option.



OTDS transformers are ENA 35-1 approved and meet the highest standards of specifications set by the UK DNO operators. Our standard range of package substations are between 200 & 2500kva with up to 13.8kv rating and come complete with an impressive list of standard accessories. All our transformers are guaranteed for 2 years as standard, with an option of 5 year warranties, this is unprecedented within our industry.

11/0.433kV TRANSFORMER DIMENSIONS AND LOSSES AS PER ENA 35-1

RATED POWER (kVA)	NO LOAD LOSSES (W)	LOAD LOSSES (W)	IMP. (%)	TOTAL WEIGHT	OIL WEIGHT	DIMENSION A (mm)	DIMENSION B (mm)	DIMENSION C (mm)
200	650	2800	4	2200	760	1800	650	1810
315	850	4200	4,75	2250	780	1800	680	1810
400	950	5300	4,75	2350	800	1800	720	1810
500	1000	6900	4,75	2550	820	1850	750	1810
630	1200	7700	4,75	2750	830	1850	800	1830
800	1350	9500	4,75	3150	840	2050	850	1830
1000	1700	11000	4,75	3500	850	2100	900	1850
1250	2000	14000	5	3800	860	2200	950	1850
1600	2300	17000	5,5	4050	870	2300	1000	1900
2000	2800	20000	6	4950	930	2400	1150	1950
2500	3300	25200	7	5350	980	2550	1250	2000

Above dimensions take into account a 4 way LV panel.

Standard hermitically three phase distribution transformer, core assembled with sheets of grain - orientated steel, primary & secondary windings copper manufactured, hermitically sealed, onan cooling.

- HV flange - for connection with RMU or switch
- LV flange - for connection with OTDS LV PANEL
- H.V. off-load tapping switch at 5 positions, on the side of the tank, lock with padlock
- Thermometer pocket
- Thermometer with two contacts N.O. (alarm and trip)
- Oil level in plexiglass (without contacts) on the side of the tank
- Lifting lugs
- Bursting valve – overpressure valve (type 2” without contact)
- Oil drain valve
- Oil filtering valve
- Skids
- High quality mineral oil first filling
- Earthing terminal
- Rating plate
- RAL 7031 finish



Pre fabricated secondary distribution substations

OTDS offer the option of our package substations to come complete with GRP housing comprising of our HV/LV transformer, HV Switchgear whether a oil type ring main unit or SF6 circuit breaker and a LV distribution panel board.

These are designed to be installed in polluted and coastal environments with Pollution Level IV Very Heavy (as per IEC 60815).

For high ambient temperatures and dusty environments we are able to offer forced ventilation and cooling with dust traps.

Our GRP enclosures are designed around our substations ensuring that the end product is a complete engineered package ready for a quick, hassle free installation on site.



Independent third party temperature rise type test
of a 800kva 11/0.415kV package substation



This Test Report is issued at the request of

OTDS Ltd
Unit 11, Spitfire Business Park
Hawker Road, Croydon, CR0 4WD, UK

Object of the test

Temperature rise test on an oil immersed three phase power transformer with the following nameplate:

Manufacturer:	OTDS Ltd	
S. No. : 31695	Year: 2013	
S _n : 800 kVA	Frequency: 50 Hz	
HV: 11000 ± 2x 2,5 % V	I ₁ : 41,99 A	
LV: 415 V	I ₂ : 1113 A	Dyn11

Test procedure

The tests have been carried out on November 5- 6, 2013 in the High Voltage Laboratory of this Department according to

- **IEC 60076-2 (2011-02):** "Power transformers - Part 2: Temperature rise for liquid-immersed transformers".
- **ENA Technical Specification 35-1 (2007)** "Distribution Transformers (from 16 to 2000 kVA)".

All the data are reported in Ann. 1 to 6, together with the procedure for the determination of the average temperature rise of the windings.

The list of instruments and the reference for the traceability of the measurement are reported in Ann. 7. The transformer plate is reported in Ann. N. 8.

The position of the temperature sensors are shown in the photographs in Ann. 9 and 10.

The tests have been supervised by: Mr. James Portway on behalf of OTDS Ltd.

Test results

Maximum oil temperature rise : **40,5 K**
Winding temperature rise : **HV : 55,7 K** **lv: 57,7 K**

The results confirm that the transformer can operate at 100% of its rated power also with the RMU and LV panel connected.

Chief Engineer
Roberto Gobbo
(Ing. G. Gobbo)

