NEW ERA IN MOBILE HIGH VOLTAGE TESTING

PRODUCT BROCHURE

The 720 kV high voltage mobile test unit brings in a new era of high voltage testing, containing an updated control system, accurate variable reactance and related testing features. A key improvement is the increased rating of the test power supply to 200 kVA, which can be used for single phase induced testing of larger power transformers.

This additional capability also allows the truck to be used for a wider range of site condition assessment tests, applicable to large transformers with an amenable secondary or tertiary winding. Overall the truck allows for complete HV commissioning and condition assessment testing of switchyard primary plant, including its cables (i.e., shorter length HV cables within the switchyard).

The custom designed heavy rigid twin steer truck with suspension levelling and lockout, is able to be manoeuvred into tight spaces. This enables the testing system to be brought in close to the test object and then manoeuvred elsewhere as required; which can significantly improve testing logistics in comparison to a system that is assembled in a fixed location and needs to be dismantled and reassembled for testing in different locations. The standard configuration of the system tests up to 360 kV AC, which means that for the majority of uses it is transportable, mobile and self-contained.

When the 720 kV configuration of the truck is required, additional equipment including reactor, capacitor dividers and corona rings need to be transported to site and assembled with the assistance of a crane.

APPLIED WITHSTAND AND SERVICE VOLTAGE TESTING

Service voltage and over-voltage (stress testing), is a standard functional test for utilities. When energising high voltage apparatus for the first time, or especially after overhauls and upgrade, this provides confidence that everything is in order

Testing equipment by directly connecting to the power network at system voltage (soak testing), in the worst case can lead to a catastrophic failure, resulting in safety concerns, major rework and extended delays.

When using the mobile test unit, failure of the test object is controlled, due to the inherent protection within the test circuit, therefore reducing the risk of damage to equipment and improving safety outcomes when commissioning or restoring to service after an outage.

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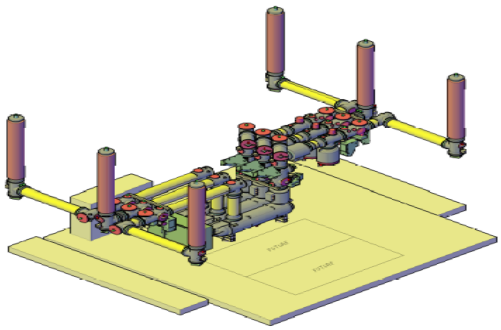
TESTING FUNCTIONS AVAILABLE AT SITE

In association with performing testing using the HV source, additional diagnostic and asset integrity tests can be carried out as indicated below.

Switchyards and Switchgear:

- 0-720kV Applied Withstand and Service Voltage testing
- Partial Discharge
- Insulation Resistance (IR) open and closed positions
- DDF and capacitances of bushings C1 and C2;
- CT Polarity checks
- New switchgear NATA laboratory testing
- New CT, CVT and VT NATA laboratory testing



Transformers:

- 0-720kV - Applied Withstand and Service Voltage testing
- Partial Discharge
- 0-24kV Induced
- Voltage ratio on all taps including vector group and polarity checks
- Low voltage excitation
- Winding resistance of all windings on all taps
- On load and off load tap switch testing, including dynamic resistance.
- Insulation resistance (IR) and Polarisation Index (PI) of windings
- Dielectric Dissipation Factor (DDF) and capacitances of windings
- DDF and capacitance of bushings C1 and C2
- Induced overvoltage withstand test at 1.1pu at 50Hz (depends on txf design, may be up to 1.15pu), can achieve up to 1.2 when operating from 60Hz supply.
- Frequency Response Analysis (FRA)
- Winding paper moisture
- Bushing C1 capacitance and DDF spectroscopy (using DIRANA)
- Oil samples e.g. DGA, Oil Quality, Furan, PCB and Corrosive Sulphur test
- New bushing NATA laboratory testing
- Life management and service support

Surge arrestors, Insulators and Earth switches:

- 0-720kV Applied Withstand and service voltage testing
- Partial Discharge
- Corona testing
- Micro-ohm resistance

HIGH VOLTAGE CABLE

- HV cables by their nature will require an amount of reactive power to energise to test voltage which is dependent on the total cable capacitance.
- The current available from the test truck and its duration can be limiting factors when considering cable testing.

Obtaining information such as cable type, length, capacitance, test voltage and any specific testing requirements from the client, to determine applicability.

TYPICAL CABLE TESTING ROUTINE:

- Apply 10kV D.C. for one minute to each cable phase
- Applied High Voltage test
- Measurement of Conductor Resistance
- Tan Delta at 50Hz up to the rated voltage of the cable (carried out at 0.5U0, 1.0U0)
- Cable resonance characteristics
- DC conductor resistance (including phasing and continuity)
- Insulation resistance (IR) measurements (before and after HV Test)
- Positive and negative sequence impedance (including sheath current)
- Capacitance measurements
- Partial Discharge
- New bushing NATA laboratory testing

HIGH VOLTAGE – PFC AND HARMONIC FILTER YARDS, STATIC VAR COMPENSATORS:

- 0-720kV Applied Withstand and Service Voltage testing
- Partial discharge tests
- Measure component values
- Measure filter characteristics

GENERATOR AND MOTOR TESTING (24KV TO 8.0A MAX):

- Applied Withstand and Service Voltage testing
- Partial Discharge
- Insulation resistance (IR)
- DDF and capacitances
- Rotor tests

HIGH VOLTAGE TRANSMISSION LINES:

- 0-720kV Applied Withstand and Service Voltage testing
- Overvoltage testing
- Measurement of transmission line characteristics

ELECTRICAL			
Version	Single Stage- 360kV	Dual Stage Series- 720kV	Dual Stage Parallel- 720kV
Rated Capacity	792kVA	1584 kVA	1584 kVA
Rated Voltage	Max 360kV	Max 720kV	Max 360kV
Rated Current	2.2A	2.2A	4.4 A (360kV)
Reactor Inductance Adjustable	7317H - 332H	14364H - 664H	
Reactor Capacirance Adjustable	0 to 30nF	0 to 15nF	
Site Powr Supply Required	Yes- 415 V AC		

SYSTEM SUPPLY AND DUTY CYCLE

- Power supply 415V AC, 50 Hz
- 1 min on, 4 min off, 2 modules 3.4A
- 15min on, 15 min off, 1 module 2.2 A
- Continuous, 1 module 1.5 A

TRUCK

- IVECO Max 2 persons can travel in cabin
- No sleeper cabin fitted
- GPS locator fitted
- UHF radio (Truckies) Call sign –40

TRAVEL:

- Maximum distance per day – ~800 km
- Maximum driving per day – 12 hours – As per fatigue management policy

TYPICAL TRAVEL DURATION TIMES: (NOT FOR QUOTING)

Location	Travel Time	Overnight Accomodation
Sydney	3.0 hours	0
Brisbane	12.5 hours	1
Mackay	24 hours	1
Melbourne	15 hours	1
Darwin	59 hours	5
Perth	55 hours	4
Adelaide	23 hours	1
Hobart	34 hours	4- ferry crossing

WEIGHT AND MEASUREMENTS

	Left	Right	Total
Axel Weight Static	11855	12220	24075
Turning Circle*	18300	20000	22600
Stabilisers	Hydraulic x 2	Hydraulic x 2	4

Measurements	360kV	720kV
Overall Length	11.6m	11.6m
Width	2.46m	2.46m
Height	4.24m	8.0m Note 1
Rear Overhang	3.24m	3.24m
GVM	31,000kg	38,9000kg Note 1
Tare Weight	24,075kg	31,957kg Note 1
Trailer	No	No

Note 1: Measurement and weight are only applicable at site installation. The 720kV double stack reactor and capacitor dividers are assembled at site testing point. Transported separately.

FUEL SYSTEM

- 1 x 500 litre rectangular aluminium tank (RHS) – Approx 8L/100km
- 1 x 55 litre AdBlue tank – (Diesel additive to reduce particulate emissions) ***http://goblue.com.au/what-is-adblue/***