

## TDX 120

### TRAX accessory for measuring capacitance and tan delta/power factor



- Easy to use with automatic and manual operation
- Wide frequency test voltage (1-500 Hz)
- Accurate measurement results under high noise conditions as tested to 765 kV substations
- Lightweight, rugged design
- Patented built-in individual temperature correction eliminates the need for temperature correction tables

#### DESCRIPTION

The TRAX accessory TDX 120 is a fully automatic 12 kV insulation dissipation factor (tan $\delta$ )/ power factor test set designed for condition assessment of electrical insulation in high voltage apparatus such as transformers, bushings, circuit breakers, cables, lightning arresters and rotating machinery. In addition to performing insulation power factor tests, the TDX 120 can be used to measure the excitation current of transformer windings as well as to perform automatic tip-up tests and HV turns-ratio testing (an optional TTR capacitor is available).

The test set is designed to provide a comprehensive AC insulation diagnostic test. The high power variable frequency design generates its own test signal independent of line frequency quality and the hardware design uses the latest technology available for digital filtering of the response signal. As a result, the TDX 120 produces reliable results and stable readings in the shortest time with the highest accuracy, even in high interference substations.

TDX 120 test set is to be used with an external computer (not included). Measurements include voltage, current, power (loss), tan delta, inductance, power factor and capacitance. The test results are automatically stored in the computer and can also be downloaded directly to USB storage or a printer.

#### APPLICATION

In addition to performing insulation tests, TRAX/TDX can also measure the excitation current of transformer windings and perform automatic tip-up tests and HV turns-ratio testing with an optional reference capacitor/resistor.

- Power transformers
- Distribution transformers
- Instrument transformers
- Rotating machines
- Oil insulation
- Bushings
- Cables
- Capacitors
- Circuit breakers
- Surge arresters

#### Test capabilities

- Tan delta/power factor
- Capacitance
- Excitation current
- Tan delta/Power factor tip-up
- Watts loss
- Inductance
- Voltage
- Current

**FEATURES AND BENEFITS**

Generates its own test signal resulting in accurate and clean measurements even in the most severe conditions and in the event power is required from a portable generator.

High noise suppression and advanced signal acquisition circuitry can handle up to 15 mA interference current or a signal to noise ratio of up to 1:20 resulting in extremely accurate and clean measurements even in the most severe conditions.

Individual Temperature Correction (ITC) (patented) of tan delta allows the user to estimate the actual temperature dependence of the test object by measuring tan delta over a frequency range. Mathematically calculating accurate individual temperature correction results in a more accurate measurement of the insulating material's condition.

Automatic voltage dependence detection (patented): Various high voltage components may have an unexpected voltage dependence where tip-up testing should be performed. TRAX TDX has a patented method for detecting potential voltage dependence suggesting the user to do additional tests at different voltage levels.

Wide frequency range test output (1-500Hz) for DFR measurements.

Possibility to use an external test transformer and standard capacitor for testing at EHV (< 12 kV).

**SPECIFICATIONS**

Specifications are valid at nominal input voltage and an ambient temperature of +23°C ±5°, (77°F). Specifications are subject to change without notice.

**Environment**

*Application field* The instrument is intended for use in medium and high-voltage substations and industrial environments.

*Temperature*

*Operating* -20°C to +55°C (-4°F to +131°F)

*Storage & transport* -40°C to +70°C (-40°F to +158°F)

*Humidity* 0% – 95% RH, non-condensing

**CE-marking**

*EMC* EN 61 326-1:1997 + A1:1998

*LVD* EN 61 010-1:2010

*Vibration* IEC 60 068-2-6

*Shock* IEC 60 068-2-27

*Transport* ISTA 2A

*Encapsulation class* IP 21

**General**

*Dimensions* 480 x 310 x 250 mm (18.9" x 12.2" x 9.8") excluding handles

*Weight* 23 kg (51 lbs)

**Input**

*AUX power input* From TRAX (AUX Power) 0-240 V AC, 1-500 Hz<sup>1)</sup>

*AUX Control input* Power over Ethernet for power supply and communication

**Output**

*0-12 kV AC* 45-70 Hz  
*0-250 V AC* 1-500 Hz

*500 mA* 30 seconds

*300 mA* 4 minutes

*200 mA* 30 minutes

*100 mA* continuous

**Measurements**

*Voltage* 0 - 12 kV

*Current* 0 - 5 A

*Capacitance* 0 – 100 µF

*Inductance* 6 H – 10 MH

*Power* 0 – 1 MW

*Power factor* 0 – 1/0 – 100%

*Dissipation factor* 0 – 100/0 – 10000%

**Accuracy**

*Internal generator*

*Capacitance* ±0.5% of reading + 0.1 pF

*Dissipation factor* ±0.005%, I<sub>x</sub> > 15 uA to 10 mA, U<sub>test</sub> > 300V

*Inductance* ±0.5% of reading + 1 mH

*Watt loss* ±1% of reading + 1 mW

**External generator and reference**

*Capacitance* ±0.05% of reading + 0.1 pF

*Dissipation factor* ±0.005%, I<sub>x</sub> 15 uA to 10 mA, I<sub>ref</sub> > 15 uA ±0.02%, I<sub>x</sub> > 10 mA, I<sub>ref</sub> > 15 uA

*Inductance* ±0.05% of reading + 1 mH

*Watt loss* ±1% of reading + 1 mW

**Noise immunity**

*Electrostatic* 15 mA induced noise into any test lead with no loss of measurement accuracy at maximum interference to specimen current of 20:1

<sup>1)</sup> Signals below 45 Hz or above 200 Hz with derating

**INCLUDED ACCESSORIES**



GC-31201



GC-30070



GA-00725



GA-01005



GC-32520



GC-32532



GC-32535

**OPTIONAL ACCESSORIES**



Hand switch interlock, GC-31103



Interlock foot switch, GC-31150



TIB 225, indicator box, AJ-90030



TIB extension cable, GC-31155



Trolley/cart, AJ-90045



Oil test cell, 670511



Light transport case, GD-31050



Accessory kit, AG-90100

### ORDERING INFORMATION

Item	Art. No.
<b>TDX 120</b>	<b>AJ-69090</b>
Included accessories:	
Aux Power cable, 1 m (3 ft)	GC-31201
Ground cable, 1 m (3 ft)	GC-30070
Ethernet cable, 1 m (3 ft)	GA-00725
Extension cable 10 m (33 ft)	GA-01005
High voltage cable, 21 m (66 ft)	GC-32520
Measuring cable, 18 m (60 ft), red	GC-32532
Measuring cable, 18 m (60 ft), blue	GC-32535
Transport case	GD-30200
Case for cables/accessories	GD-30220
<b>Optional accessories</b>	
Safety hand switch interlock, 3 m (10 ft)	GC-31103
Interlock foot switch, 3 m (10 ft)	GC-31150
TIB 225, indicator box (green/red warning beacon), cable 2 m (6.5 ft)	AJ-90030
TIB extension cable, 10 m (33 ft)	GC-31055
Light transport case	GD-31050
Trolley/cart for TRAX and TDX	AJ-90045
Accessory kit	AG-90100
HV reference standard	670500-1
HV TTR capacitor, 10 nF, 10 kV	36610
Capacitor kit (TTR cap, 2 ref caps + case)	36610-KIT2
Resonating inductor	670600-1
Oil test cell, field model with case	670511