Modular Automatic Insulation Power Loss Field Test System Type 2816/5284U

for on-site measurements

HAEFELY TRENCH
HIGH VOLTAGE TECHNOLOGY

Tettex Instruments

General

- Easy to handle with three separate cases for bridge, control box and power supply
- Lightweight design for advanced mobility
- Rugged interlocking cases ensure field proof set-up
- Mobile version with optional handcart
- Unbeaten accuracy of 0,05% for capacitance, 1% reading +/- 0,01% for PF/tan δ, and 1 V resolution for voltage
- Line synchronous interference suppression at the operating frequency between 45...65 Hz as recommended in the standards IEEE / ANSI 56.12.90
- No field calibration is necessary

Field testing with precision

The type 2816/5284U is designed for on-site testing of high voltage apparatus. The three piece modular design incorporates shock absorbing characteristics to facilitate transporting the instrument without affecting it's precision.
The primary application of the instrument is to perform periodic maintenance inspections to evaluate the high voltage insulation losses of apparatus. Additional functions are provided, which make this instrument ideal for detailed analysis of power transformer conditions.

The complete test cycle is automated to ensure reliable and repeatable test results.

Modular System Facilitates Transportability and One Person Handling

Features

- Digital displays
  - Power loss direct or standardised to 10 kV
  - Power factor
  - Test current
  - Test voltage
  - Test frequency
  - Capacitance
- Two measurement inputs to accommodate ANSI/IEEE (UST, GST and GSTg) testing without changing connections
- Automatic interference suppression
- Built in printer
- RS 232 output
- 200 mA, 12 kV AC Power supply
- Polarity reversal switch
- Manual voltage adjustment
- Measures while the voltage is being adjusted
- Fast setup and measuring

Additional Features

- Built in operator safety features
  - Safety ground monitor circuit to ensure safe connections between the high voltage ground and earth ground before high voltage can be turned on. A light on the power supply indicates the ground status.
  - Hand held safety push button switch
- Other parameters that can be selected for display
  - Dissipation factor tan δ
  - Apparent power
  - Reactive power
  - Inductance
  - Quality factor
  - Magnetising current
  - Iron loss current

Technical specifications

- Built in standard capacitor
- Can be used with an external standard capacitor
- Operator entry of the number of measurements to be averaged
- Facilitates ratio entry for use with an external current comparator to extend the measuring range
- Simplified color coordinated operator input controls
- Retains last display and measuring mode setup when power is turned off
- Plain language error messages are displayed on a 2 line 16 character LCD display
- Permits entering up to seven ANSI temperature conversion tables to provide power factor printout standardised to 20°C
- Automatic date and time on report print outs
- Operator entry of a test object identification (site, object, S/N) that will be printed on all reports
- A built in hardware self test sequence
- Field replaceable plug in printed circuit assemblies which are accessible from the front of the instrument
- Front panel mounted HV fuses and circuit breaker
- Optional test cells are available for testing transformer oil or other liquid or solid insulants.

Capacitance

Range 10 kV	8 pF...53 nF (50Hz) 8 pF...44 nF (60Hz)
Resolution	0.01 pF
Accuracy	± 0.01% reading ± 1 digit
Minimum I_c	31 µA

Inductance

Range 10 kV:	132 Hz...855 kHz
Range 1 kV:	13 Hz…85 kHz
Resolution	0.1 mH
Accuracy	± 0.01% reading ± 2 digits

Power Factor

Range	0…1.00
Resolution	0.0001
Accuracy	± 1% reading ± 0.0001

Dissipation Factor tan δ

Range	0...9.99
Resolution	0.0001
Accuracy	± 1.0% reading ± 2 digits

Test Voltage

Range	0…12.00 kV
Resolution	0.001 kV
Accuracy	± 1.0% reading ± 2 digits

Test Current

Range	0…15.00 A
Resolution	0.001 mA
Accuracy	± 1.0% reading ± 2 digits

Test Frequency

Range	45.00…65.00 Hz
Resolution	0.01 Hz
Accuracy	± 0.02% reading

Quality Factor

Range	0.1…9999

Measuring Time

First reading	4 s
Update readings	0.6 s intervals

Display Range of other Parameters

Apparent power:
(S) 0 mVA...999.9 kVA
Actual power:
(P) 0 mW...999.9 kW
Reactive power:
(Q) 0 mVAr...999.9 kVAr
Magnetising current:
(I_m) 0…999.9 A
Iron loss current:
(I_{fe}) 0…999.9 A

Standard Capacitor

Internal	~100 pF/12 kV max.

Test Current Limitations

C_X: A and B test objects capacitances are limited to 15 A maximum

High Voltage Output

The high voltage section is a (12 kV) manual voltage adjustment

Voltage	0.1 kV…12 kV
Current	200 mA (continuous)

Stated Accuracy is based on the following Test Conditions

Standard capacitor	(C_n) = 100 pF
Test voltage	≥ 1000 V
Unknown capacitance	
(C_x)	>50 pF <20 nF

Technical specifications

Operating Temperature

+0°C to + 50°C

Mains Supply

Voltage	230 V/115 V ± 10%
Current	180 mA/360 mA no load 11 A/22 A full load
Frequency	50/60 Hz

Weights and Dimensions

Identical interlocked stacking cases

width	x	height	x	depth
570	x	380	x	560 mm
22.5	x	14.9	x	22.0 in

Measuring instrument:
31 kg (68 lbs)
Control unit:
27 kg (59 lbs)
HV-transformer:
46 kg (101 lbs)

Applicable Standards

The measuring system is designed in accordance with the appropriate sections of the following specifications:

- ANSI/IEEE C 57.12.90
- VDE 0411/Part 1
- IEC 348/Safety Category 1
- IEC 359

Standard System includes

1 Measuring instrument
1 HV transformer
1 Control unit
1 Cable case

Cable Case contains the following

1 Cable "HIGH" max. 12 kV
2 Cable "LOW" red and blue
1 Cable "Ground"
1 Cable with safety switch (for interlock system)
1 Hook for HV connection
Large and small alligator-clips
1 Cable "Ground" to 6835 test cell for liquid insulants
Cables for connections between types 2816 and 5284

Optional Test Cells

Test cells for liquid insulants (max. 10 kV) Type 6835

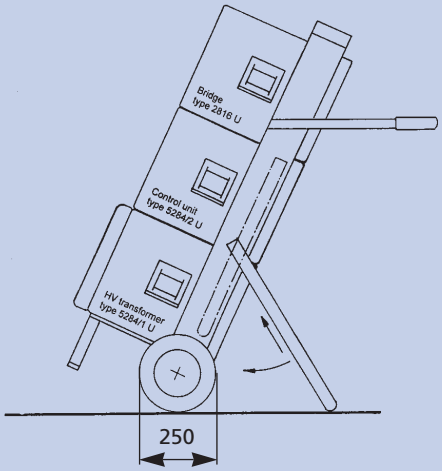
Optional Equipment

Resonant power supply
Type 5288
Field test software
Type FTAS

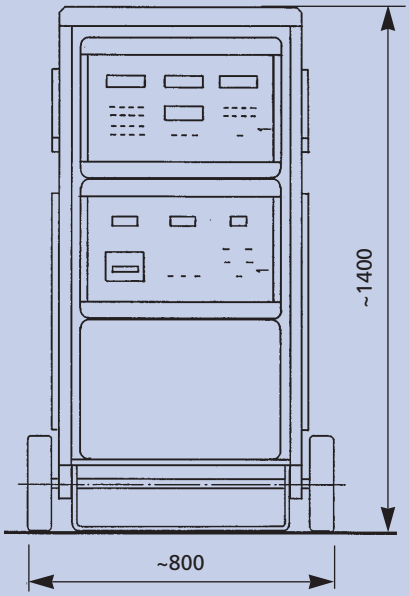
Hand Cart

Collapsible design
Ergonomic set up
Weight 26kg (57 lbs)

Side view



Front view



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