FT6/12 Mk2
Breakdown, Leakage and Ionisation Tester

- **Nondestructive testing**
- **Output voltages up to 6 kV a.c. and 12 kV d.c. continuously variable**
- **For safety, output current limited and displayed on a meter (in-phase and total current)**

DESCRIPTION

The Megger, FT6/12 Mk 2 is an a.c./d.c. breakdown, leakage and ionisation tester. The instrument operates from a 240, 220 or 110 V, 50/60 Hz mains power supply.

The instrument supplies a continuously variable output voltage up to 12 kV d.c. or up to 6 kV a.c. rms each in two ranges. Provision is made for the measurement of a.c. and d.c. leakage current, the detection of ionisation and the indication of breakdown from the item under test. The total leakage current and the in phase leakage current are indicated; a.c. capacitive current and both a.c. and d.c. leakage resistance can be calculated. Panel meters are used to show the output voltage level and the leakage current value. The instrument can be set so that the voltmeter shows the level at which breakdown occurred.

Breakdown

Breakdowns and flashovers are shown, on both a.c. and d.c. tests, by an amber neon on the front panel illuminating and by the sounding of a buzzer. The level at which the peak leakage current will trip off the output voltage can be adjusted between 0,1 and 1 mA. The output voltage will always trip off and discharge when a breakdown occurs unless the fault-burning mode has been selected. The relay controlling this part of the circuit has a pair of closing contacts that may be used to operate a remote indicator, if required.

Leakage

The amount of leakage current prior to the output being tripped off is shown on the current meter. The instrument can be set so that the output voltage will not trip off, but rather is maintained, enabling the current to continue to flow through the leakage path so that the operator may more easily identify a weak point in the item under test. The maximum output current level is5 mA.

Ionisation

An internal loudspeaker provides an audible indication of ionisation and a volume control adjusts the level of this signal. Alternatively, provision is made for the connection of a high impedance oscilloscope so the ionisation (the onset of breakdown) can be more easily detected.

Safety Features

The high voltage output terminal sockets, one a.c. the other d.c., have been designed with safety of paramount importance. Each is covered by a spring loaded cap when not in use. In addition, provision is made so that there is no high voltage present at the output sockets until a nonlatchable pushbutton on the front panel is pressed. A similar pushbutton is fitted into the low voltage probe (available separately) by which the output voltage can be controlled.

A protective, earth bond terminal is fitted for separate connection to earth to provide additional safety. There is also provision for connecting the instrument for remote control of the output.

The instrument meets, in general, the safety requirements of BS 4743 (1979), IEC 348 (1978) and VDE 0411 (1973).

High voltage and low voltage probes and leads are not supplied with the instrument unless ordered separately.

Megger

FT6/12 Mk2

Breakdown, Leakage and Ionisation Tester

APPLICATIONS

The FT6/12 Mk 2 is used for flash testing and nondestructive insulation testing of materials, electrical components and equipment, with measurements of the breakdown voltage easily made.

The source impedance of the output voltage is low enough to permit the rapid testing of high capacitance components, and at the same time automatically limiting the available output current.

The facilities provided for remote control of the instrument make it very suitable for mounting permanently as part of a test equipment console.

FEATURES AND BENEFITS

- Non-destructive testing
- Output voltages up to 6 kV a.c. and 12 kV d.c. continuously variable
- For safety, output current limited and displayed on a meter (in-phase and total current)
- Audible and visible indication of breakdown, audible indication of ionisation
- Ionisation detected via a loudspeaker or through a separately connected oscilloscope
- Fault burning facility
- Provision for external programming of test voltage from remotely variable supply and indication of breakdown

SPECIFICATIONS

Test Voltage Ranges

0 to 4 kV d.c.

0 to 12 kV d.c.

0 to 2 kV a.c. rms

0 to 6 kV a.c. rms

Current Meter

Total Current:

0 to 1 mA (first meter calibration 0,02 mA) indicating leakage current for d.c. and total leakage current for a.c.

In-Phase Current:

0 to 100 µA (first meter calibration 2 µA), indicating leakage current for d.c. and in-phase leakage current for a.c.

Voltage Meter

0 to 4 kV d.c. (first meter calibration 100 V)

0 to 12 kV d.c. (first meter calibration 250 V)

0 to 2 kV a.c. rms (first meter calibration 100 V)

0 to 6 kV a.c. rms (first meter calibration 250 V)

Direct Reading

Indicating loaded output voltage

Maintained Reading

Indicating unloaded output voltage

Accuracy

Voltage d.c. (direct reading):

±1,5% of full scale deflection ±1% of reading

Voltage a.c. (maintained reading):

±1,5% of full scale deflection ±4,5% of reading (load resistance ≥ 100 MΩ)

Voltage a.c. (direct reading):

±1,5% of full scale deflection ±2% of reading

Voltage a.c. (maintained reading):

±1,5% of full scale deflection ±5% of reading (load resistance ≥ 6 MΩ)

Current d.c. (leakage):

±2% of full scale deflection ±1% of reading

Current a.c. (in-phase or total leakage)

±4% of full scale deflection

Output Short-Circuit Current

Output voltage control set at full scale deflection readings

5 mA a.c. rms max.

2 mA d.c. max.

Breakdown and Flashover Indication

For continuous breakdown, a front panel amber neon illuminates and a buzzer sounds.

Breakdowns, for time periods from 1 ms d.c. and 5 ms a.c., are indicated by the illuminating neon and sounding buzzer when the peak current flowing exceeds a preset limit between 0,1 and 1 mA. For short duration breakdown, the amber neon will remain illuminated for 3 seconds approx. For breakdown periods greater than 3 seconds, the neon will remain illuminated for as long as the breakdown exists. Additionally, when full breakdown occurs, the voltmeter reading will fall to zero with the DIRECT/MAINTAIN button set to DIRECT, since it is monitoring the output voltage. With the button in the MAINTAIN position, the voltmeter will retain the voltage level immediately prior to breakdown.

Leakage Indication

For a.c., leakage is indicated by the 0 to 100 µA IN PHASE scale of the current meter and total (including capacitive current) by the 0 to 1 mA TOTAL scale of the current meter. For d.c., leakage is indicated on either scale of the meter.

Ionisation Indication

- Audible indication from front panel-mounted loudspeaker
- An oscilloscope connected to a jack socket on the front panel; output impedance suitable for loads down to 10 kΩ.

Display

Two analogue panel meters show output current and output voltage.

Ripple Content (d.c.)

Less than 5% peak-to-peak of mean d.c. at output current up to 0,1 mA and load resistance greater than 100 MW

Waveform

The a.c. output waveform will not deviate from the fundamental by more than ±5% at any point on the supply voltage waveform for load impedances greater than 6 MW on a.c.

Output Voltage Decay Times

a.c.: Typically 20 ms after output voltage cutoff

d.c.: 10 seconds unloaded,5 seconds for a 100 µA load, 1 second for a 1 mA load after output voltage cut-off (Loading capacitance will extend these times.)

Safety
The instrument meets the requirements for IEC 1010-1 (1992), EN61010-1 (1993). The instrument is intended for use with non powered circuits only.

EMC
In Accordance with IEC61326 including Amendment No. 1.

Fuses
For operation from 200 to 265 V supply, 500 mA (T) HBC, 20 x 5 mm

For operation from 100 to 125 V supply, 1 A (T) HBC IEC 127/5, 20 x 5 mm

Power Supply
110, 220 and 240 V, 50/60 Hz (nominal values)

Instrument set for 240 V, voltage adjuster at the rear of the instrument

Can be used for ±10% of the nominal values in accordance with the IEC specification

Power consumption 80 VA

Dimensions
495 H x 190 W x 298 D mm

19,5 H x 7,5 W x 11,75 D in. approx

Weight
13,4 kg (29,5 lb) approx

ORDERING INFORMATION

Item (Qty)	Order No.
A.C./D.C. Breakdown, Leakage & Ionisation Tester	FT6/12 Mk 2
Included Accessories	
Plug for low voltage output socket	25424-855
Plug for high voltage output sockets, with 3 m cable	6131-831
Jack plug for ionisation output	25446-008
Spare 500 mA (T) HBC fuse	25950-014
Spare 1 ampere (T) HBC IEC127/5 fuse	25950-004
Instrument dust cover	6260-012
Operating instruction book	6171-390
Optional Accessories	
High voltage test probe with lead and connector, including approx 1,5 m of flexible lead; probe electrode is spring-loaded to the safe, shrouded position.	6420-061
Low voltage test probe with lead and connector, including approx 0,5 m of 3-core flexible lead fitted with a 3-pin plug; probe has a microswitch operated by the trigger for on/off control of the high voltage output.	6420-062

UK
Archcliffe Road Dover
CT17 9EN England
T +44 (0) 1304 502101
F +44 (0) 1304 207342

UNITED STATES
4271 Bronze Way
Dallas TX 75237-1088 USA
T 800 723 2861 (USA only)
T +1 214 333 3201
F +1 214 331 7399

OTHER TECHNICAL SALES OFFICES
Norristown USA, Toronto CANADA, Mumbai INDIA, Le Raincy FRANCE, Cherrybrook AUSTRALIA, Guadalajara SPAIN and the Kingdom of BAHRAIN.

ISO STATEMENT
Registered to ISO 9001:2000 Reg no. Q 09290
Registered to ISO 14001 Reg no. EMS 61597
FT6_12mk2_DS_En_V04