

OTS100AF, OTS80AF & OTS60AF Laboratory Oil Test Set

USER GUIDE



SAFETY WARNINGS

Safety warnings and precautions **must** be read and understood before the OTS100AF/OTS80AF/OTS60AF is used. They must be observed during use.











- The OTS100AF/80AF/60AF **must** only be used in the way intended and for the stated purposes described by Megger.
- The OTS100AF/80AF/60AF **must not** be used if any part of it is damaged.
- The OTS100AF/80AF/60AF **must** be properly earthed. A supplementary earth terminal is provided.
- Position the OTS100AF/80AF/60AF so that power can be easily removed.
- The OTS100AF/80AF/60AF **must not** be used in wet locations or with rain falling on the instrument.
- The OTS100AF/80AF/60AF **must** only be used for testing electrical grades of insulating liquids. No other objects or substances should be placed in the test chamber.
- The OTS100AF/80AF/60AF **must** only be used with one of Megger's precision test vessels or VCM100D/VCM80D correctly fitted on the support horns in the test chamber.
- Replacement fuses **must** be of the correct type and rating.
- Calibration or repair **must** only be carried out by a Megger qualified repair facility.
- The test chamber **must** be kept clean and free from lint or other fibres.
- The OTS100AF/80AF/60AF weigh 30 kg. Care should be taken when lifting the instrument.
- It is prohibited to insert foreign objects into any gap on the instrument before or during a test.
- Unit must be used in a well ventilated location. Small quantities of Ozone may be created after prolonged testing.

NOTE

THE OTS100AF/OTS80AF/OTS60AF MUST ONLY BE USED BY SUITABLY TRAINED AND COMPETENT PERSONS.

IF THESE INSTRUMENTS ARE NOT USED IN THE MANNER SPECIFIED PROTECTION MAY BE IMPAIRED

Symbols used on this instrument

-  Caution: refer to accompanying notes
-  Danger high voltage, risk of electrical shock
-  DC voltage
-  AC voltage
-  Equipment complies with current EU Directives
-  Earth terminal
-  Fuse
-  USB terminal
-  Equipment complies with 'C tick' requirements
-  Do not dispose of in the waste stream

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General description

Megger's OTS100AF/80AF/60AF Oil test sets are laboratory liquid dielectric breakdown testers. They are fully automatic, line powered and facilitate accurate breakdown voltage tests on mineral, ester and silicon insulating oils. The precision test vessel sets the accuracy standard for the liquid insulation test industry. For ease of use the instruments come pre-programmed with a 'library' of international breakdown test standards and the ability to create custom tests.

The instrument is housed in a metal case with moulded end caps that accommodate handles. The test chamber is designed with an easy-clean surface and provides a drain for spilt oil through an internal pipe routed to the rear of the instrument. A beaker or similar can be used for spillage collection. The test area is covered by a transparent lid with an electrically conductive screen which, with the metal case, provides a safe equipotential enclosure for high voltage testing.



The lid allows in plenty of ambient light enabling users to confirm stirring and witness breakdown. The chamber lid is dual redundant safety protected with micro-switches to prevent accidental electrification. A zero volt touch bar at the entrance to the chamber enhances safety for the user.

The precision test vessel design yields highly accurate and repeatable results. Two stirring options are available; an internal magnetic bean stirrer which is dropped into the oil and an optional lid mounted impeller that conforms to ASTM D 1816 requirement. Stirring during breakdown testing is used to produce a homogeneous distribution of contaminants within the oil and to free any carbon generated between electrodes during testing.

Electrode gap is set by precision adjustment wheels that lock in position ensuring that the electrodes do not move during a busy day. It is, however, advisable to check the electrode condition and gap daily because it is the most critical parameter in breakdown voltage testing. Flat anodised Aluminium gap setting gauges are supplied in popular sizes to facilitate electrode gap setting. Electrodes are detachable and are available in shapes that meet all international standards, i.e. disk, spherical and mushroom (VDE) electrodes.

A selection of international breakdown tests are chosen from a library of standard sequences and started from the user friendly menu on the LCD display. The top level test screen displays all pertinent test information to ensure the correct electrodes are used with the specified electrode gap setting.

Results are viewed on screen and printed on either an external USB printer or the internal printer following a test result. In the event of a breakdown not occurring before reaching the maximum voltage, the instrument will return maximum voltage result. This is a safety measure to ensure the instrument is not driven over its designed maximum voltage.

The instrument automatically turns off the display 15 minutes after completion of a test sequence or last use.

Safety features incorporated in the design include the safety micro-switches and zero volt touch bar, the screened chamber lid and an easily operated power supply On/Off switch. Pressing any button during a test will immediately remove the high voltage and terminate the test.

Features and benefits

- Fully automatic breakdown tester with test voltages up to 100 kV/ 80 kV / 60 kV depending on model
- Advanced 400 ml oil vessel with accurate electrode gap setting and adjustment locking mechanism
- Flat electrode gap gauges that will not damage electrodes
- Easy clean test chamber with oil drain
- Magnetic bead stirrer or optional lid mounted impeller (conforming to ASTM D 1816)
- Direct trip control employing voltage and current measurement
- Rapid response to trip ($<10 \mu\text{s}$)
- Automatic oil temperature measurement
- Intuitive user interface with backlit QVGA colour display (visible outdoors)
- Simple transfer of test results via USB flash drive
- USB barcode reader scans oil sample barcode labels
- Optional VCM100D/VCM80D voltage check units measure voltage directly

Applications

The OTS100AF/80AF/60AF are used for determining the dielectric strength of high voltage insulating liquids, such as the insulating oils used in transformers, switchgear and other electrical apparatus. The dielectric breakdown voltage is a measure of the insulating ability of a liquid to withstand electrical stress. Contaminants such as cellulosic fibres, conducting particles, dirt, and water reduce breakdown voltage of an insulating liquid. A low result indicates the presence of one or more of these contaminants.

The test set is fully automatic. The operator has simply to prepare the test vessel, load it with sample oil, place it in the test chamber, select the appropriate specification for the tests and then start the test sequence. The test set automatically carries out the sequence of tests as defined by the pre-selected national specifications. Oil testing specifications, for which the sets are pre-programmed, are as follows:

- ASTM D 1816-04
- ASTM D 877 A & B
- BS EN 60156
- CEI EN 60156
- IEC 60156 1995-05
- IRAM 2341-72
- JIS C2101-99 (M) & (S)
- PA SEV EN 60156
- UNE EN 60156
- NF EN 60156
- SABS EN 60156
- VDE 0370 Part 5
- AS1767.2.1

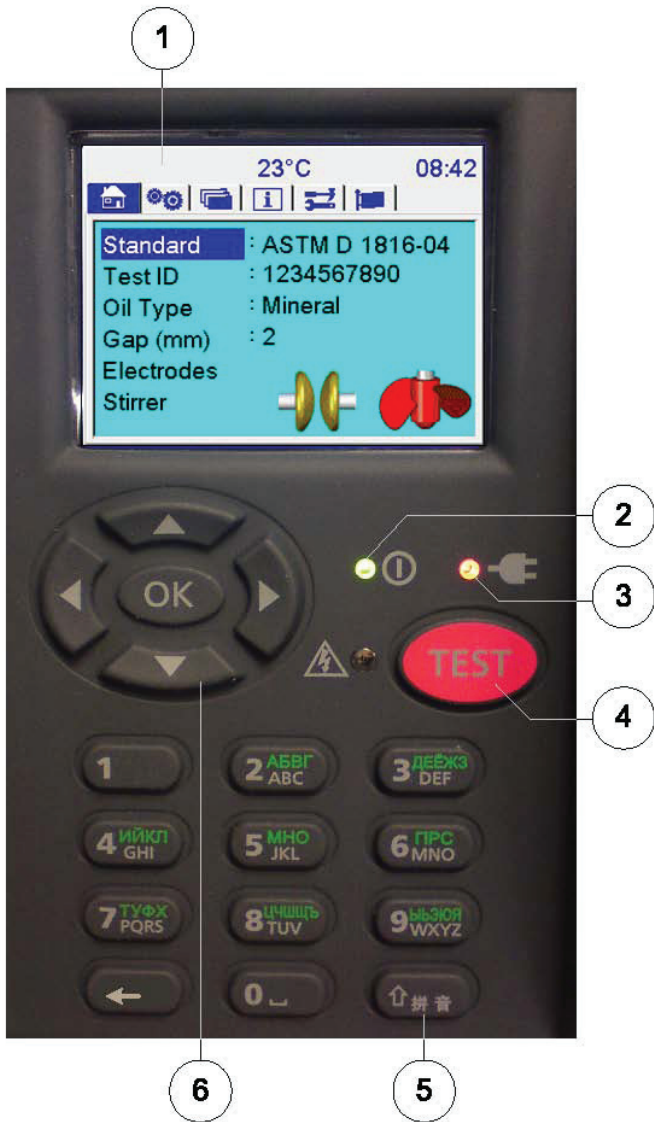
A critical factor with respect to field testing of oil is its temperature, because samples from a transformer taken shortly after switch off can be many degrees hotter than equivalent room temperature laboratory tests performed at 20 °C to 23 °C. The OTS100AF/80AF/60AF instruments measure the oil temperature during the test so that temperature correction can be applied to results.

NB: Certain standards require field tests to be performed between 20 °C and 30 °C.

Instrument controls and indicators

Keypad printer panel

The control panel, illustrated below, is located to the front right side of the instrument and contains a QVGA colour screen (1), navigation keypad with 'OK' (6) button and a 'TEST' (4) button. The operation is user friendly and driven from six top level windows. A start-up LED (2) is used during instrument initialisation. The lower, vertical section of the front panel houses an ON/OFF power switch and a USB Type A interface socket



Item Description

- | Item | Description |
|------|---|
| 1 | 3.5 inch, backlight, bright colour QVGA display |
| 2 | On/off LED |
| 3 | External power LED / icon |
| 4 | 'TEST' button with associated red warning LED |
| 5 | 12 key alphanumeric keypad |
| 6 | Navigation keypad with 'OK' select button |

The instrument printer panel, shown below, houses the optional internal printer. A flat panel replaces the printer if not ordered. The printer is a dot matrix impact printer with 57.5 mm wide paper roll. Paper results printed on this printer will not blacken in high temperatures. The panel has two locking studs and a central print advance button.



Rear panel

The rear panel illustrated below accommodates all connections to the instrument with the exception of a front facing USB interface.



Item	Description
1	Ground connection with cable lug
2	IEC line power socket
3	Fuses
4	USB Type A socket
5	USB Type B socket

Line power is applied via an IEC socket (2) and is fused (3). It is mandatory for safe operation that an earth ground cable is attached to this instrument before performing tests. The ground connection is identified as item 1 in the illustration. Attention must be paid to product warnings and markings.

Two USB interface connectors, one type A (4) and one type B (5), offer USB host and device interfaces. A second USB type A (host) interface is located on the front of the instrument for user convenience. The USB type A interface (4) is used to drive a printer or flash/hard disk drive and the USB type B interface (5) can be used to connect the instrument to a laptop PC or other computing device

Preparations for use

Getting started

It is important to read the user guide thoroughly before operating the OTS100AF/80AF/60AF for the first time. The safety warnings are particularly important.

Supply voltage

Before connecting line power to the instrument the ground connector should be connected to a suitable earth point.

The OTS100AF/80AF/60AF are designed to operate on 50/60 Hz AC line power in the range 90 to 265 V.

Assembly

- Unpack instrument and contents of the packing box.
- Ensure that the instrument is placed on a solid surface or table with sufficient working space.
- Connect ground to a suitable earth connector.
- Fit selected electrodes to the threaded shafts in the test vessel taking care not to scratch electrode surfaces. Electrodes should be hand tightened onto the shafts to prevent any movement during use.
- Adjustment of the electrode gap should be done with the feeler gauges provided, adjustment wheels locked and the gap rechecked.
- Fit test vessel into instrument chamber.
- Connect line power.
- Turn on the instrument.
- Follow the instrument setup procedure detailed below.

Instrument setup procedure

The required language option is selected from the top level tabbed window. The flag symbol is used as an icon representing language option. Simply use the up/down arrow buttons to use the right arrow key to navigate across the tabs to the language screen, select the required language and press 'OK'.

The following actions, accessed from the Settings tab window, should be taken before running a test for the first time:

1. Set date and time – Time/Date option.
2. Adjust the display backlight for optimum legibility – Display Setup option.
3. Select units - metric or imperial.
4. Set printer options.

A library of international oil test standards is preloaded into the instrument. It is important to select the test standards that will actually be used to prevent having to navigate through the complete list. Navigate across the top level tabs using left/right arrow buttons to the 'Tools' window and use the up/down arrow buttons to go to 'Select Favourite Tests'.

Navigate to a required test and press OK to select or deselect a standard test. Functions like, 'SELECT ALL' and 'RETURN' when all required standard tests have been selected.

Calibration

The OTS100AF/80AF/60AF are calibrated in the factory prior to delivery so there is no need to calibrate on initial setup.

The VCM100D/VCM80D voltage check devices can be used to confirm the output voltage of the instrument by reading the voltage directly at the electrode before running tests. Periodic checking of actual test voltage using the VCM100D/VCM80D is recommended. The voltage check test is accessed from the Tools tab window.

Test vessel mortised stirrer

Unpack the optional motorised stirrer assembly from its box and fit the stirrer shaft to the underside of the stirrer assembly. The unit is ready for use. The oil test vessel lid is removed and the stirrer assembly used as a lid for tests that require stirring.

When not in use care should be taken to store the stirrer shaft and stirrer lid assembly in the carry bag provided with the instrument.

Transportation and storage

The OTS100AF/80AF/60AF are precision instruments that generate HV up to 100 kV depending on model and need to be transported and stored carefully.

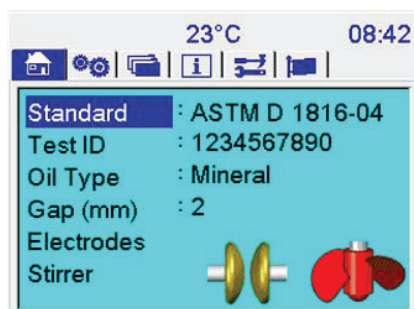
The unit should be stored in a room or area where the environment is within the temperature range of -30 °C to 65 °C and maximum humidity of 95% at 45 °C.

Operating instructions

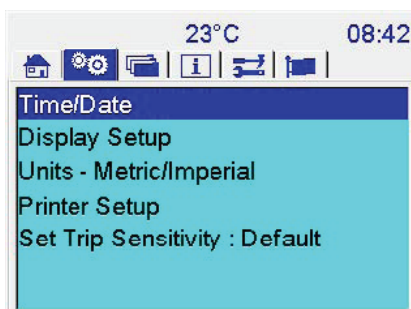
Top level tabs

The user is presented with a set of six tabbed, top level windows as depicted below which facilitate instrument control. Left and right arrow keys navigate between tabs.

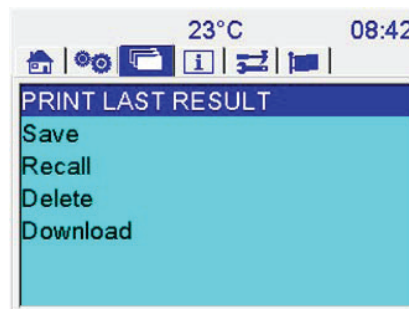
Home



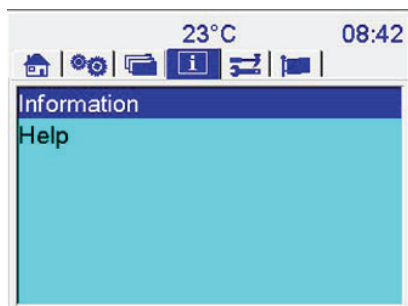
Setup



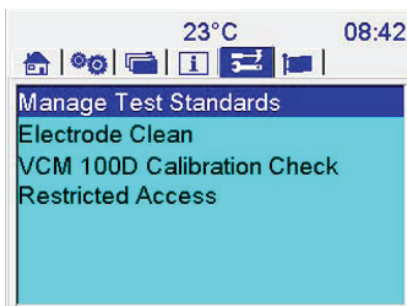
File



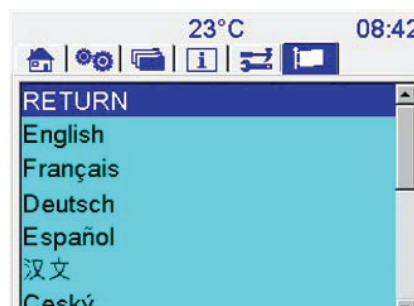
Information



Tools



Language



The home tab contains summary information for each showing the selected automatic test standard, ID of the asset the insulating liquid comes from, the type of insulator, electrode gap and the stirrer if required. This is the main screen from which tests are run.



Setup window offers instrument settings of language (can also be set from language window – overcomes difficulty when instrument is set to unknown languages), time/date, display, units, printer and a setting to select fast detection of breakdown.



Users can print, save, recall, delete and download results to PC or USB drive from the file window.



The Information window offers details about the instrument software configuration/version as well as a help function that serves as an indexed user guide.



The Tools window offers the ability to manage test standards including the ability to define custom tests, favourite tests and add and remove new standards and standard upgrades via USB disk or computer connection. An automatic electrode clean function is included as a means of removing deposits from electrode surfaces. This window also runs a test using the VCM100D/VCM80D voltage testers to check output voltage at the electrode barrier.



The flag symbol is used as an icon representing language option. Simply use the up/down arrow buttons to use the right arrow key to navigate across the tabs to the language screen, select the required language and press 'OK'.

Navigation and Character Entry

The keypad consists of arrow keys surrounding an 'OK' button used for navigating the screens and selecting functions and options. These six buttons fully control the instrument.

Within each user interface window the up and down arrow buttons are used to navigate up and down the functions listed on the left side of the screen.

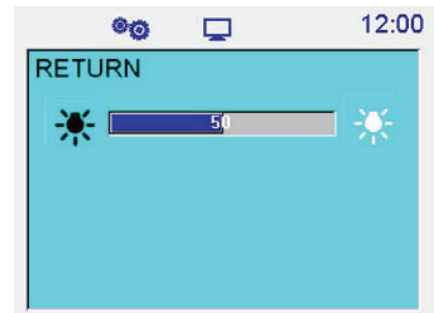
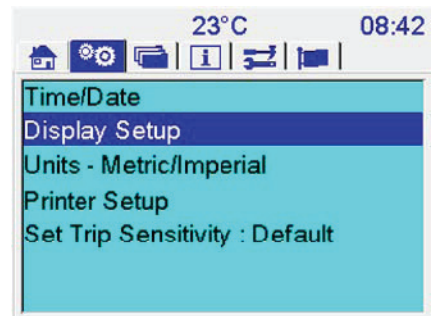


Left and right arrow buttons navigate between tabs on the top level window for optimum speed.

Users can navigate into lower level windows using the up/down arrow buttons and the 'OK' button to reach, for example, the 'Display Setup' function.

The user navigates to 'Display Setup' and presses 'OK' to get to the display setup window. The up/down or the left/right buttons adjust brightness with a bar indicator showing brightness percentage. The 'OK' button is used to set brightness after adjustment and subsequent return to the settings window.

The following images illustrate this functionality.

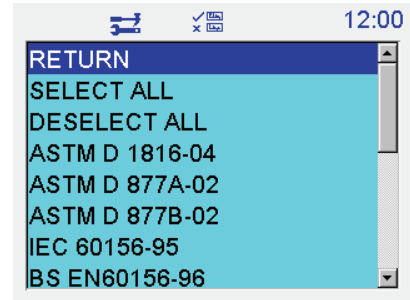
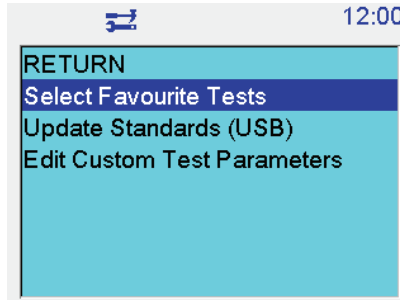
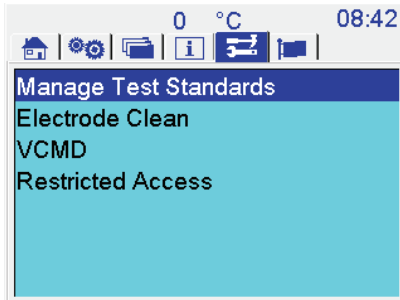


Keypad entry is via the 12 button keypad. If an alpha character is required the relevant key is pressed until the character appears in the screen entry field. Uppercase alpha characters are default and lower case mode is entered by pressing the shift (⇧) key before entering the desired character. Pressing shift again will enter numeric digit entry mode.



Favourite test standards

It is important to setup favourite test standards from the standards library to avoid navigating through the entire list each time you want to change to a different test. To do this navigate to the 'Tools' top level window and select 'Manage test standards'. Then move down to 'Select favourite tests' and choose only those tests which you require, making sure you have the most recent version of each test, unless you specifically want to use an old test standard. Tests are greyed out when selected. Simply return to the previous screens to save your selection. The screens below illustrate this process.



Performing a breakdown test

Select the 'Home' tab window using the arrow keys and 'OK' button. This window offers a summary of information required for a measurement. The following image shows a typical setup with the selected standard test, the test ID comprised of an asset number or a serial number, the type of oil, required electrode gap, electrode shape and finally the stirrer.

When the user selects a particular standard only valid options are presented with respect to gap setting, electrodes and stirrer options.

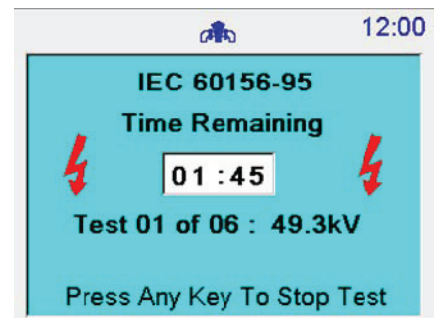
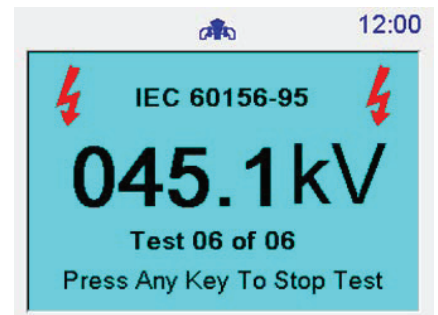
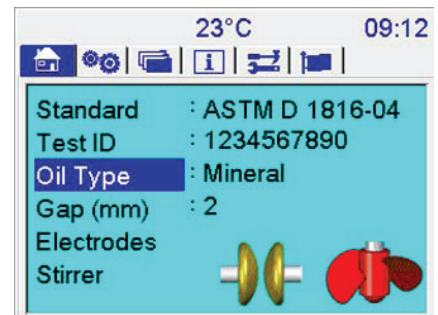
Navigation is simple; up and down arrow buttons move up and down the left side of the window whilst options for each line can be scrolled through using the 'OK' key, or information entered in the case of Test ID.

Test in progress

During a test the screen flashes red warning HV symbols to remind the user that a high voltage test is in progress. As a safety measure, any key press will immediately halt the test.

The electrode potential difference is displayed as it ramps up in over-sized digits to emphasise the presence of high voltage.

Between tests there is a dwell time and possibly a stirring action. A count down timer indicates period of dwell or stirring remaining.

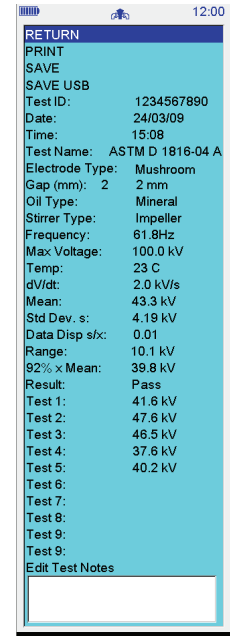


Test results

At the end of any test results are shown on the screen. A typical example is the ASTM D 1816-04A test. This image shows the complete on-screen information presented to the user however the screen size is naturally smaller so a slider function enables the user to navigate through the result and print it if required.

All screen based test results accommodate 10 breakdown tests but tests with less than 10 breakdowns use only the relevant results to produce statistics i.e. statistics of mean breakdown voltage, data dispersion, range and standard deviation.

Printing a result can be selected as default or from the PRINT function within the results window.



Custom tests

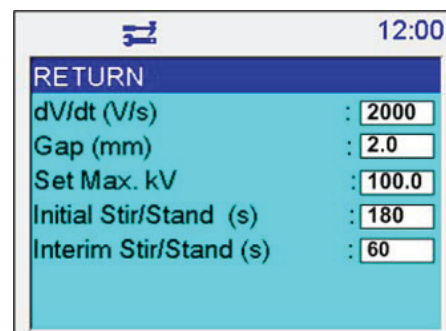
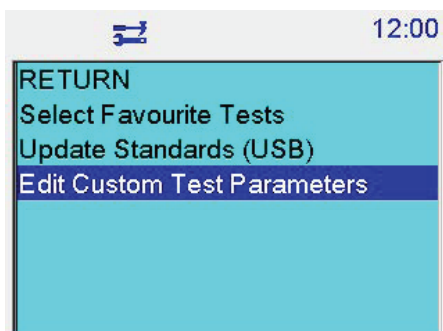
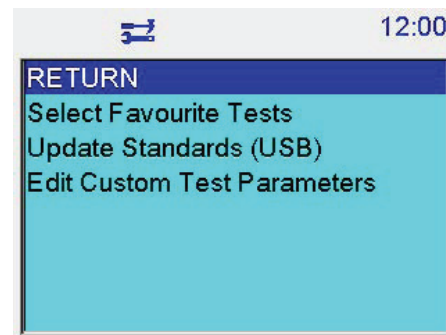
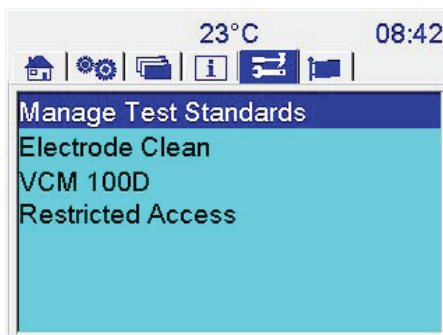
Custom tests are tests that can be defined by a user by giving the user control over the range of parameters set in a test. Three custom tests have been pre-programmed for user definition;

- Custom (5) – this test contains five successive breakdown tests
- Custom (6) – this test contains six successive breakdown tests
- Custom (10) – this test contains ten successive breakdown tests

Navigate to the Tools top level screen as illustrated below. Select, “Manage Test Standards” by pressing the OK button. Go down to, “Edit Custom Test Parameters” and press the OK button. The custom parameters screen shows a set of variables that control a breakdown test. Each variable is user settable, simply navigate down to the required setting, press the OK button and proceed to change the value as required. For numeric entry on the OTS AF models the decimal point can be entered by quickly pressing the digit ‘1’ twice. So to enter 2.5 mm gap setting the user enters the following sequence:

- 2
- 1, 1
- 5
- OK

In the customs test parameters screen ‘set max. kV’ may appear as, ‘set kV (max. xxx)’ in certain versions of firmware. All entry fields in the custom test parameters screen are range checked to ensure it is valid. When all values are set the user navigates back to the Tools screen via the RETURN function. The user should ensure that Custom (5) and Custom (6) are selected as favourite tests before leaving the manage test standards screen.

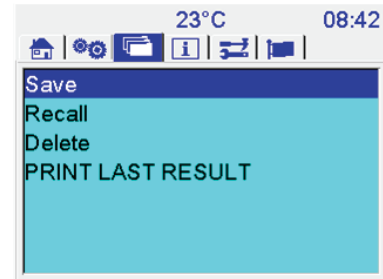


Basic memory functions

The internal memory is limited to fifty test records where a record represents a full result of one of the programmed standard tests. Best practice is to backup internal results on a daily basis by either downloading data via USB cable to PowerDB Lite or saving onto a USB memory device. When saving to USB memory device, a filename in the format of a maximum of eight characters is required and the filename entered must only contain characters A-Z, a-z and 0-9.

Memory functions are accessible from the files menu and include the following:

- Save
- Recall
- Delete
- Print last result



The user can select between internal memory and a USB memory device for the save, recall and delete functions. After selection of a memory location the relevant files are displayed on screen. Navigation is via the arrow keys as follows:

Up and down arrow move up and down one item at a time. Left and right arrows implement a page up and page down function to assist navigation where large numbers of file are present.

In the delete function window the user can select all, deselect all or select one file at a time. Select a single file by navigating to the file (blue highlight) and pressing OK to select (red highlight changing to grey when navigating away from the selected file.)

The recall function operates on one file at a time.

Transfer results to a USB flash drive

Users may want to copy results from internal memory to a USB memory device as either an end-of-day procedure or whenever the 50 result file limit is reached. The following procedure will backup files to a USB memory device:

1. From the file menu, select 'Save'
2. Then 'Select USB'
3. Enter a filename using only characters A-Z, a-z and 0-9 and return to save function screen
4. Navigate down to 'Select Results' – a full list of internally saved results are presented by TestID.
5. Select required results and then 'SAVE' to transfer the results to filename (as entered) on the memory device.
6. Navigate back to top level functions and remove the memory device (if required)

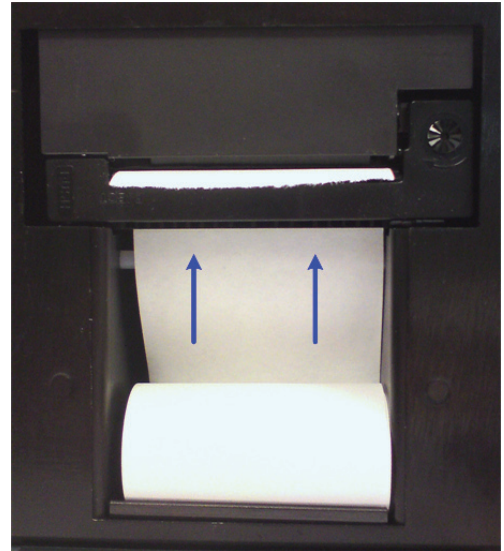
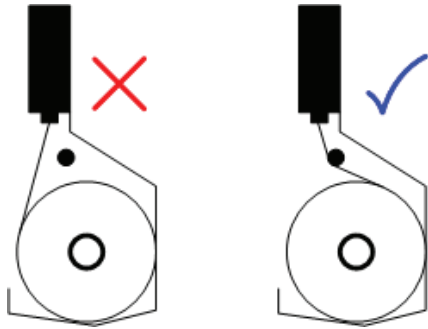
Print quality and changing paper

The printer cover is removed by turning the two fasteners through a quarter turn and pulling the panel off.

The printer ribbon may need to be moved on to improve print quality. To do this, remove the printer cover and turn the right hand rotary winder in direction indicated on the ribbon case.

To change the printer ribbon, simply press the ribbon assembly where it says, "PUSH EJECT," to remove the old ribbon and replace with a new one. The part is an Epson ERC-09, Megger part number 25995-002.

Paper is fed into the housing with the loose paper facing the rear of the instrument. Ensure that the paper is neatly cut and not curled up at the end.

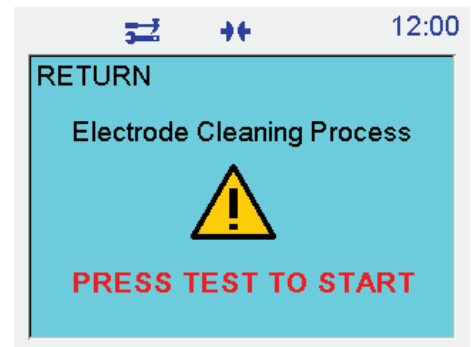


Holding the end of the paper roll, insert the paper under the cross bar and into the printer slot as shown (blue arrows) in the drawing opposite. Press the print feed key repeatedly until the paper is just visible feeding through the print mechanism.

Replace the printer front cover by first locating it at the base of the panel and secure it with the fasteners which are turned back a quarter turn to secure the panel in place. Finally press the paper feed button to advance the paper through the front cover paper slot.

Vessel and Electrodes

The oil test vessel and electrodes require no maintenance other than cleaning. Electrodes can be unscrewed and replaced with another shape electrode. Electrodes should be examined regularly to ensure no pitting has occurred and the electrodes renewed where pitting is evident.



VCM100D/VCM80D

The VCM100D/VCM80D is not a user serviceable items but may require periodic cleaning using a clean cloth dampened with Isopropyl Alcohol (IPA).

Test vessel motorised stirrer

Megger's motorised stirrer is integrated into a modified lid assembly and simply replaces the vessel lid. Power is connected via a flush mounted rear insert and is disconnected as the stirrer assembly is lifted. This unit is not user serviceable.

Preventive maintenance

General

The OTS100AF/80AF/60AF are HV instruments generating up to 100 kV and is **not user serviceable**. The user should ensure that the lid is not cracked or distorted before use. The only internal part of the instrument that is accessible to the user is the printer paper housing allowing renewal of paper and ribbon when required. Opening the OTS100AF/80AF/60AF is strictly forbidden and will constitute a breach of warranty. There is no need for any tools to be used with this instrument other than the supplied gauges and magnetic bean retriever. Printer cover locks can be turned using a suitable coin.

Cleaning

To clean the outer surfaces of the OTS100AF/80AF/60AF, first disconnect from line power and then wipe the instrument using a clean cloth dampened with Isopropyl Alcohol (IPA).

The user must ensure that the test chamber is always kept clean, particularly prior to a test. Wipe away any spilt oil in the chamber or on the outside of the test vessel with a lint free cloth. When a lot of oil is spilt the unit is designed with a drain facility at the rear. Simply unclip the clear tube and drain oil into a beaker or other suitable container.

To clean the inside of the test vessel follow the instructions given in the relevant test specification or, in the case of no instructions, cleaned with a small volume of the next sample of oil to be measured.

Care for OTS electrodes

Brass electrodes supplied with the Megger oil test sets will show signs of deposits built up from insulating oil breakdown testing. If left they will oxidise and appear dull.

New electrodes

Megger electrodes are supplied in a kit with gap gauges and magnetic stirrer beans and retrieval stick. the electrodes have different shapes but are cared for in the same way. If new electrodes require cleaning, isopropyl alcohol (IPA) may be used to clean them off. It is advisable to immerse the electrodes in clean insulating oil for a couple of hours prior to use.

Cleaning oxidised/dirty electrodes

Dirty electrodes may be cleaned with a clean, soft cloth and brass cleaner but care should be taken to use minimal pressure to avoid removal of excessive electrode material. After removing the dirt clean the electrodes with a clean cloth and IPA. It is advisable to immerse the electrodes in clean insulating oil for a couple of hours prior to use.

If electrodes are pitted or scratched they should be discarded and new electrodes fitted.

Electrode storage

Electrodes may be stored in a suitable container immersed in clean mineral insulating oil. Electrodes in a test vessel left to stand overnight may be left with the last oil sample tested in the vessel.

OTS100AF/80AF/60AF Technical Specification

The following technical specifications apply to the OTS100AF/80AF/60AF:

Test voltage	-50 to 0 to 50 kV, -40 to 0 to 40 kV, -30 to 0 to 30 kV @ 61.8 Hz
Voltage resolution	0.1 kV
Voltage accuracy	±1% ±2 digits
Vessels 400 ml (standard) 150 ml (option)	Thermoplastic polyamide chamber provides precision electrode alignment, adjustment wheels lock electrodes in position
Temperature sensor resolution	1 °C
Power supply	Line voltage/power 90 to 264 VAC, 300 VA Line frequency 48 / 63 Hz
Fuses	2 x 4 A CFST ceramic, 20 mm x 5 mm, for 250 V
Internal printer (option)	Dot matrix impact printer with graphical output Paper 57.5 mm wide, weight 52 gm per roll Epson black ribbon cassette ERC-09B
Protection	Safety interlock on test chamber Discharge barrier on polycarbonate test chamber cover
Display	320 x 240 QVGA colour display with backlight
Dimensions (W x H x D) OTS100AF/80AF/60AF	520 mm x 420 mm x 290 mm
Weight OTS100AF/80AF/60AF	30 kg
Operating temperature	0 °C to +50 °C
Storage temperature	-30 °C to +65 °C
Humidity	80% RH at 40 °C operation 95% RH at 40 °C storage
Altitude	1000 m
Safety	Designed in accordance with IEC61010
EMC	Light industrial IEC 61326-1 Class B, CISPR 22, CISPR 16-1 and CISPR 16-2

VCM100D/VCM80D Voltage Check Meter

Technical Specification

The VCM100D and VCM80D are OTS accessories that enable the voltage output of the oil test set to be checked by measuring the actual voltage at the HV electrodes. The calibration meters fit in the oil test set chamber in place of a standard vessel and are designed to ensure that the load on the OTS transformer is similar to the load during an oil dielectric strength test.

Meter type	Proprietary 100 kV/80 kV Megger OTS voltmeter with 4 seven-segment digit digital readout
Accuracy at 23 °C	2.0% plus 2 digits to 50 kVrms 2.5% plus 2 digits >50 kVrms to 75 kVrms 3.0% plus 2 digits >75 kVrms to 100 kVrms (VCM100D only above 80 kV)
Temperature range	
Operational	0 °C to 40 °C
Storage	-30 °C to +70 °C
Humidity range	
Operational	50% RH at 20 °C
Storage	93% RH at 40 °C
Safety	The meter is only approved for use with Megger oil test sets
Dimensions (W x H x D)	250 mm x 150 mm x 115 mm
Weight	1.8 kg

Storage and transportation

The OTS100AF/80AF/60AF are a precision instruments that generates high voltage to 100 kV and needs to be transported and stored carefully.

The unit should be stored in a room or area where the environment is within the temperature range of -30 °C to 65 °C and maximum humidity of 95% at 45 °C.

Only Megger supplied accessories can be used with the OTS range. Non approved equipment cannot be guaranteed to work with the OTS.

Factory fitted accessories

- Internal printer
- Electrode sets – IEC, ASTM and full electrode set containing one of each type of electrode
- Vessel lid mounted impeller for use with 400 ml vessel
- Power lead
- PowerDB Lite CD

Optional accessories & spares

- VCM100D/VCM80D voltage check meters
- Vessel assembly 400 ml
- Vessel assembly 150 ml
- Vessel lid mounted impeller for use with 400 ml vessel
- Electrode set IEC 156
- Electrode set ASTM D 877/1816
- Full electrode set – contains all electrodes
- Printer paper
- Barcode reader, USB

Repair and warranty

The test set circuit contains static sensitive devices, and care must be taken in handling the printed circuit board. If the protection of a product has been impaired it should not be used, and be sent for repair by suitably trained and qualified personnel. The protection is likely to be impaired if, for example, the product shows visible damage, fails to perform the intended measurements, has been subjected to prolonged storage under unfavourable conditions, or has been exposed to severe transport stresses.

New products are guaranteed for 1 year from the date of purchase by the user.

Note: Any unauthorized prior repair or adjustment will automatically invalidate the warranty.

Instrument repair and spare parts

For service requirements contact:–

Megger Limited	or	Megger
Archcliffe Road		Valley Forge Corporate Center
Dover		2621 Van Buren Avenue
Kent, CT17 9EN		Norristown, PA 194
England		U.S.A.

Tel: +44 (0) 1304 502243	Tel: +1 (610) 676-8579
Fax: +44 (0) 1304 207342	Fax: +1 (610) 676-8625

or an approved repair company.

Approved repair companies

A number of independent companies have been approved for repair work on most Megger products, using genuine Megger spare parts. Consult the Appointed Distributor / Agent regarding spare parts, repair facilities and advice on the best course of action to take.

Returning a test set for repair

If returning a test set to the manufacturer for repair, it should be sent freight pre-paid to the appropriate address. A copy of the invoice and of the packing note should be sent simultaneously by airmail to expedite clearance through customs. A repair estimate showing freight return and other charges will be submitted to the sender, if required, before work on the instrument commences.

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The company reserves the right to change the specification or design without prior notice.

Megger is a registered trademark

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