

# OTS60PB, 60AF/2, 80AF/2, 100AF/2, VCM100 Automatic Oil Test Sets



- **Microprocessor controlled fully automatic oil test sets**
- **Wide choice of vessels and accessories**
- **Portable and laboratory units**

## DESCRIPTION

The Megger range of automatic oil testers offer fully automatic testing with many advanced features. The design allows the operator to simply prepare an oil test vessel, load it with the sample oil, place it in the chamber and initiate the test sequence. The test set then carries out, the series of tests as specified in a large number of oil testing specifications. These define the sequence of tests including the stand and stir times, rate of voltage rise and number of tests resulting in a calculation of the average value of the oil breakdown strength. Withstand or proof testing can also be selected. This test subjects the oil to a preselected voltage for 1 minute to check for a breakdown.

The OTS60PB is a fully automatic, battery powered, portable oil test set. The test voltage is electronically controlled to the maximum of 60 kV. Designed for on site testing, the instrument is supplied in a rugged carrying case with a handle for ease of transportation. An internal rechargeable battery gives a large number of tests before recharging. A clear display shows a menu of test options and guides the operator through the set up programme, illustrates the correct test electrodes and gap to use, shows the progress of each test and gives the results of the test sequence. The result can be set to give either a numerical average (with standard deviation where specified) or a pass/fail message. The display can be set to read in English, French, German, Italian, Spanish and Portuguese. An optional printer kit enables hard copies of results to be produced. Accessories, such as the battery charger, spare vessels, spare electrodes and a spacing gauge are located

in an attached compartment. Stirring is carried out by a motor driven paddle stirrer.

The OTSAF/2 range are laboratory instruments with many advanced features. Three versions are available with maximum test voltages of 60 kV, 80 kV and 100 kV. They offer fully automatic operation plus the benefit of a built in printer to produce a hard copy of the test results and the ability to program up to five user defined tests for individual applications. The withstand test can be set to operate at any test voltage and with an initial stand time. The dot matrix liquid crystal display can also be set to read in one of six languages. An oil test vessel, configured to suit the IEC156 test specification, is supplied with the instrument.

A large, backlit, liquid crystal display shows test menus, set up screens and results. The resolution of the high voltage output is displayed to 0,1 kV.

Results can be printed on the internal dot matrix printer or transferred via the RS232 interface to an external printer or PC. Printouts are automatically time and date stamped.

Standard stirring with the OTSAF/2 is achieved by a magnetic stirrer bar. Additional vessels are available optionally, including one suitable for testing to the ASTM D1816 specification. This calls for stirring to be carried out by a motor driven impeller. Each test can be selected with either magnetic stirring, propeller stirring or no stirring.

The VCM100 is a calibration meter suitable for verifying the calibration of oil test sets. The meter will enable the

high voltage output to be checked, traceable to national standards, and is suitable for all recent laboratory models of Megger oil dielectric strength test sets such as the OTSAF series and the OTS auto and semi automatic series.

The calibration meter fits in the oil test set chamber in place of a standard vessel. The design ensures that the load to the transformer is similar to the load during an oil dielectric strength test. The voltage indication is viewed on an analogue display marked from 0 to 100 kV with 2 kV divisions. The scale also shows pass tolerance bands to enable a quick assessment of the accuracy to be made. The meter is supplied in a protective bag.

Oil test sets will display the individual breakdown voltage and their average value. The VCM100 allows the actual applied voltage to be quickly and easily checked against the displayed value giving immediate confidence in the calibration of the oil test set.

### OTS/VCM100

- Allows a quick check of high voltage output to be made
- Tests up to 100 kV with accuracy of 3%
- Easy to read mirror arc display with tolerance bands

### OPERATION

The OTSAF/2 series are programmed with a test sequence suitable for using the VCM100 called 'CHECK CALIBRATION'. This sequence causes the output of the oil test set to ramp up from 0 kV to the maximum voltage value, pausing at each 10 kV point for 10 seconds to allow the calibration to be checked.

Other versions of Megger oil test sets (such as the OTSAF, OTS60 auto and OTS75 auto) can be used in manual mode or with a low rate of voltage rise to allow checking

with the VCM100. Later versions of the OTSAF also have the 'CHECK CALIBRATION' procedure.



### SPECIFICATION

**Panel meter scaling** 0 - 100 kV in 2 kV divisions

**Accuracy** ±3% of full scale

#### Temperature Range

**Operational** 0°C to 40°C (32 to 104°F)

**Storage** -30°C to +70°C (-22 to 158°F)

#### Humidity Range

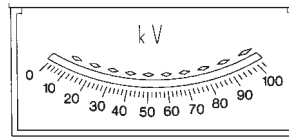
**Operational** 80% RH at 40°C (104°F)

**Storage** 93% RH at 40°C (104°F)

**Safety** The meter is only approved for use with Megger oil test sets.

**Dimensions** 198 mm x 235 mm x 102 mm  
(7,8 x 9,25 x 4 inches)

**Weight** 2,4 kg (5,3 lbs)



OTS VCM100 Scale Plate

Parameters of test specifications (programmed in OTS60PB, OTS60AF/2, OTS80AF/2 and OTS100AF/2)									
Test Spec. Selected	Electrode Shape	Initial Stand	Rate of rise of Test Voltage	Intermediate Stir Time	Intermediate Stand Time	Number Of Tests	Maximum Duration of Selected test sequence		
							OTS60B	OTS80AF/2	OTS100AF/2
5min test	B	1 min.	2kV/s	30 s	30 s	3	4min. 30s	5min.	5min. 30s
IEC156 etc	A,B	5 min.	2kV/s	2 min. (option 1)	2 min. (option 2)	6	18min.	19min.	20min.
ASTM D877	C	2 min. 20 s	3 kV/s	-	1 min.	5	8min.	8min. 33s	9min. 7s
ASTM D1816	A	3 min.	0,5 kV/s	Continuous	1 min.	5	17min.	20 min. 20s	23 min. 40s
UNE21	A,B	10min.	2 kV/s	1 min.	4 min.	6	38 min.	39 min.	40 min.
Withstand A	B	0-99 min 55s **	2 kV/s	Ramps to preselected value of 1 minute or breakdown					
Withstand B	B	0-99 min 55s **	2 kV/s	As above and continues to breakdown or maximum value of test set					
Custom (1-5)*	-	0-99 min 55s *	0,5-5,0 kV/s*	0-99 min 55s*	0-99 min 55s*	1-99	-	-	-
BS5730a		A,B	-	2 kV/s	1 min.	1 min.	Withstand test at 22 kV, 30 kV or 40 kV (depending on equipment category and electrode gap) for 60 s. If breakdown occurs another two tests are carried out, both must pass if sample is OK.		

IEC156 etc. includes BS148, BS5874, VDE 0370, NFC 27, CE1344, OCT 6581, SABS555, AS1767, STA8286 and IP295.  
NFC27, STAS286 and UNE21 omit the first breakdown value from the average calculation.  
STAS286 has a 2 minute intermediate stand time.  
The OTS60PB is also programmed with BS5730-LEPLC which is similar to BS5730a but ramps to breakdown after a successful test.

\* User Schedule  
\*\* OTSAF/2 only.


**OTS60PB**
**OTS60AF/2, OTS80AF/2 AND OTS100AF/2**

<b>Features</b>	<ul style="list-style-type: none"> <li>■ Powered by internal, rechargeable battery</li> <li>■ Fully automatic operation (see table opposite)</li> <li>■ Pass/fail limit setting</li> </ul>	<ul style="list-style-type: none"> <li>■ Automatic laboratory set (see table opposite)</li> <li>■ Built in printer and RS232 output</li> <li>■ Custom test facility</li> </ul>
<b>Test voltage</b>	60 kV maximum (30 kV - 0 - 30 kV)	OTS60AF/2:60 kV maximum (30 kV - 0 - 30 kV) @ 61,8 Hz OTS80AF/2:80 kV maximum (40 kV - 0 - 40 kV) OTS100AF/2:100 kV maximum (50 kV - 0 - 50 kV)
<b>Power supply</b>	Internal, rechargeable 12 V, 12 Ah battery (giving typically 12 hours continuous use) Charger supply 85 to 265 V, 50/60 Hz Optional 12 V supply lead enables operation from vehicle cigarette lighter socket	110 V, 120 V, 220 V, 240 V ± 10% 50/60 Hz Four pre-selectable values
<b>Display</b>	Dot matrix LCD giving alphanumeric information and kV test voltage	
<b>Resolution</b>	1 kV	0,1 kV
<b>Dimensions</b>	373 H x 259 W x 247 D mm (without accessories) 14,6 H x 10,2 W x 9,8 D in. approx.	464 H x 502 W x 319 D mm 18,3 H x 19,7 W x 12,5 D in. approx.
<b>Weight</b>	19 kg (42 lb) without accessories	41 kg (90 lb) approx.
<b>Fuses</b>	2 x F6,3 A, IEC127/1, 20 mm x 5 mm, HBC	2 x F6,3 A, IEC127/1, 20 mm x 5 mm, HBC T2 A, IEC127/5, 20 mm x 5 mm, HBC for 220/240 V T4 A, IEC127/5, 20 mm x 5 mm, HBC for 110/120 V
<b>Temperature</b>	Operation: 0°C to 40°C	Operation: 0°C to 40°C
<b>Range</b>	Storage: -30°C to +65°C	Storage: -40°C to +70°C
<b>Humidity</b>	Operation: 80% RH at 40°C	Operation: 80% RH at 40°C
<b>Range</b>	Storage: 93% RH at 40°C, 95% RH at 25°C cyclic	Storage: 93% RH at 40°C, 95% RH at 25°C
<b>Safety</b>	Designed to incorporate where appropriate IEC61010-1, safety class I. Safety interlock to BS5304 (1988) 'Guarding of Machinery' standard.	Meets the requirements of IEC61010-1 (1991) Safety interlock to BS5304 (1988) 'Guarding of Machinery' standard.
<b>EMC</b>	IEC61326-1	
<b>Other</b>	RS232 output plus optional printer kit Includes battery charger and four test vessels Option to set pass/fail breakdown values	RS232C 5 pin DIN socket Five custom tests allowing; 1 to 99 tests 0,5 to 5 kV/s rate of voltage rise 0 to 99 min. 59 s stir and stand times Averaging start from first to last test



**Electrode Shape A**  
36mm Mushroom Electrodes



**Electrode Shape C**  
25,4 mm (1 in) Cylindrical Electrodes



**Electrode Shape B**  
12,7 mm (0,5 in) Spherical Electrodes



**Electrode Shape D**  
25,4 mm (1 in) Cylindrical Electrodes  
with 0,5mm edge radius

### PRINTER INFORMATION

The OTS60PB Printer Kit includes a 24 column impact printer with integral rechargeable batteries and a mains adaptor which operates from 85 V to 265 V a.c. (50/60 Hz).

The printer is 105 mm x 195 mm x 90 mm and weighs 625 g.

### ORDERING INFORMATION

Item (Qty)	Order Code	Item (Qty)	Order Code
Laboratory Oil Test Set		Oil test vessel with motorised stirrer suitable for testing to ASTM D1816, electrodes shape A	6111-146
OTS60AF/2 UK 60 kV	6410-834	Transportation trolley	6111-147
OTS60AF/2 AUS/NZ 60 kV	6111-391	0-100 kV Voltage calibration check meter complete with case	6410-810
OTS60AF/2 FR/GER 60 kV	6111-397	Pair of cylindrical electrodes with 0.5mm radius	6220-538
OTS60AF/2 SA 60 kV	6111-394		
OTS60AF/2 US 60 kV	6111-400		
OTS80AF/2 UK 80 kV	6410-835	<b>Item (Qty)</b>	<b>Order Code</b>
OTS80AF/2 AUS/NZ 80 kV	6111-392	Portable oil test set (60 kV)	OTS60PB
OTS80AF/2 FR/GER 80 kV	6111-398	<b>Included Accessories</b>	
OTS80AF/2 SA 80 kV	6111-395	Padded protective carrying case with handle and shoulder strap	6420-102
OTS80AF/2 US 80 kV	6111-401	4 x 600 ml capacity oil test vessels without lid	
		Pair of spherical electrodes (fitted) (shape B)	6220-484
OTS100AF/2 100 kV	6410-836	Oil test set preparation kit	6121-552
OTS100AF/2 AUS/NZ 100 kV	6111-393	comprising:	
OTS100AF/2 FR/GER 100 kV	6111-399	2 mushroom electrodes 1 in. (25.4 mm) dia.	
OTS100AF/2 SA 100 kV	6111-396	2 cylindrical electrodes 36 mm dia.	
OTS100AF/2 US 100 kV	6111-402	electrode spacing gauge; 1,2 2.5 and 4 mm spacing	
<b>Included Accessories</b>		Pair of mushroom electrodes (shape A)	6220-580
Mains power supply lead	25424-860	Pair of cylindrical electrodes (shape C)	6220-483
Oil test vessel fitted with spherical electrodes, 0,5 in. (12,7 mm) dia, shape B	6231-445	Battery charger unit	6331-659
Oil test set preparation kit	6121-486	Printer lead, OTS 60PB to 25 way 'D'	6340-091
comprising:		Spare fuse	25413-285
2 magnetic stirrers		User Guide	6171-585
2 mushroom electrodes 1.4 in. (36 mm) dia.		<b>Optional Accessories for OTS60PB</b>	
2 cylindrical electrodes 1 in. (25.4 mm) dia.		Close fitting test vessel lid (10)	6121-402
electrode spacing gauge; 1, 2, 2.5 and 4 mm dia.		Pack of 10 reuseable/disposable oil test vessels	6220-487
Protective cover	5340-334	Lead for connection to a vehicle battery via the cigar/cigarette lighter socket	6231-509
Operating instruction book	6172-064	Pair of cylindrical electrodes with 0,5 mm edge radius	6220-538
<b>Optional Accessories for OTS AF's</b>		Printer kit	6220-568
Oil test vessel fitted with mushroom electrodes, 36 mm dia, shape A	6231-447	Paper roll - 57,5 mm wide, 15 m long, 50 mm dia.	25995-001
Oil test vessel fitted with cylindrical electrodes, 1 in. (25,4 mm) dia. shape C	6231-446	Ribbon - Epson part no. ERC-09 (IRC 160)	25995-002
		Download lead	6340-105

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