

# OTS100AF, OTS80AF and OTS60AF

## Laboratory oil testers



- **Laboratory instruments for measuring insulating oil breakdown voltage**
- **Lock in precision – oil vessel with lockable adjustment**
- **Bright 3.5" colour display visible out doors**
- **Suitable for mineral, ester and silicon oils**
- **Trip detection circuit with direct measurement of voltage and current**
- **Ultra fast (< 10  $\mu$ s) HV switch off time**

### DESCRIPTION

Megger's automatic laboratory oil test sets perform accurate breakdown voltage tests on mineral, ester and silicon insulating liquids. Moulded test vessels give repeatable results with lock in precision electrode gap setting adjustment wheels. The transparent, shielded lid and large test chamber enable easy access to the test vessel.

All three laboratory models are fitted with a 12 key alphanumeric keypad to facilitate entry of test ID, filenames, notes etc. Alpha characters are entered by repetitive pressing on a key, the same way as text is entered modern cellular telephones.

Test standards are preloaded in the instrument and new versions can be uploaded via USB flash drive. All laboratory models support the creation of user defined custom tests. Test results are identified either by a serial number or asset ID and are time and date stamped. Megger's asset and data management software, PowerDB Lite, is bundled at no extra cost providing an excellent tool for downloading and printing results.

An optional internal printer provides a hard copy of results. Ink based printout ensures durability at all temperatures. USB interfaces (x3), USB flash drive, external USB printer and barcode scanner.

User safety is paramount and Megger have designed independent and dual redundant high voltage cut-off circuitry to ensure safety. During a test the operator can terminate by pressing any button on the keyboard which will remove high voltage immediately and abort the test. The transparent lid provides ample visibility within the chamber yet is protected and electrically shielded by a screen with multiple links to instrument ground.

### FEATURES AND BENEFITS

- Test voltages : 60 kV, 80 kV and 100 kV
- Lock in precision oil vessel - lockable gap setting
- Flat electrode gap gauges that will not damage electrodes
- Automatic oil temperature measurement
- QVGA colour display with backlight visible in sunlight
- Large, easy clean test chamber with oil drain
- High visibility test chamber
- Safe operation with dual redundant micro switch
- Intuitive user interface

### OPTIONAL FEATURES

- Internal printer
- Motorised lid impeller
- Voltage check unit (VCM100D/VCM80D)

### APPLICATION

Monitoring and maintenance of oil quality is essential in ensuring the reliable operation of oil filled electrical equipment. Codes of practice have been established in many countries that include several different types of test on insulating oils.

One of the fundamental tests of oil quality is the breakdown voltage test, which is a measure of the oil's ability to withstand electric stress. A low breakdown voltage can indicate the presence of contaminants such as water or conducting particles.

Care should be taken to ensure the process of sampling oil and subsequent testing does not in any way contaminate it with foreign objects. Cleaning vessels between oil tests should be a rinse with the next sample, never clean with fibrous materials. To ensure an accurate reading set gap carefully and lock adjusting wheels.

## SPECIFICATIONS

### Test voltage

OTS60AF 0 to 60 kV rms maximum (30 kV - 0 - 30 kV)

OTS80AF 0 to 80 kV rms maximum (40 kV - 0 - 40 kV)

OTS100AF 0 to 100 kV rms maximum (50 kV - 0 - 50 kV)

### Voltage resolution and accuracy

0.1 kV  $\pm 1\%$   $\pm 2$  digits

### Programmed test sequences

ASTM D 1816-04	BS EN 60156-96	SABS EN60156
ASTM D 877A-02	CEI EN 60156-95	VDE0370 part 5
ASTM D 877B-02	IRAM 2341	AS1767.2.1
IEC 60156-95	UNE EN 60156	PA SEV EN60156
	NF EN 60156	JIS C 2101-99 (M)
		JIS C 2101-99 (S)
		plus 3 custom test sequences

### Vessels 400 ml (standard) 150 ml (option)

Nylon 12 chamber provides precision electrode alignment, adjustment wheels lock electrodes in position, option of 150 ml vessel for low volume oil samples

### Oil temperature measuring range

10 °C to 65 °C

### Oil temperature sensor resolution

1 °C

### Power supply

Line voltage 85 to 265 VAC  
Line frequency 50/60 Hz

### Interfaces

USB 2.0 compatible  
2 x USB type-A (Flash drive, printer, other)  
1 x USB type-B (Factory use only)

### Internal printer (option)

Matrix impact printer  
Paper 57.5 mm wide

### External printer

Any printer with USB interface and PCL3 driver

### Protection

Dual safety micro switches on chamber cover

### Display

320 x 240 QVGA colour display with backlight

### Environment

**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

2000 m

### Safety

Designed in accordance with IEC61010

### EMC

Light industrial IEC 61326-1 Class B, CISPR 22, CISPR 16-1 and CISPR 16-2

### Dimensions

All models 580 mm x 420 mm x 290 mm

### Weight

All models 30 kg with printer option fitted

### Langauges

English, French, German, Spanish, Chinese, Czech, Dutch, Finnish, Italian, Norwegian, Polish, Portuguese, Russian and Swedish.



400 ml vessel assembly (with electrodes fitted)



VCM100D/VCM80D

**Programmed test sequence overview**

Standards complied with and programmed	Oil types tested		Electrode gap options (mm)				Electrode shape options			Oil stirring options			Voltage rise rate options			Breakdown test sequence		
	Mineral Ester HMWH	Silicon	1.0	2.0	2.5	2.54							0.5 kV/s	2 kV/s	3 kV/s	Number of tests	Initial stand time	Time between tests
IEC 60156-95	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
BS EN 60156-96	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
CEI EN 60156-95	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
IRAM 2341	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
UNI EN 60156	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
NF EN 60156	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
SABS EN 60156	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
VDE 0370 part 5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
AS1767.2.1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
PA SEV EN 60156	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6	5 mins	2 mins
JIS C 2101-99 (M)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	5 x 2	2 mins	1 min
JIS C 2101-99 (S)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1 x 5	2 mins (x5)	N/A
ASTM D 1816-04	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	5	3 mins	1 min 15s
ASTM D 877A-02	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	5	2 mins	1 min
ASTM D 877B-02	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	1 x 5	2 mins (x5)	N/A
Custom tests (x3) (Programmable)	■	■	1.0 to 7.0				■	■	■	■	■	■	0.5 kV/s to 5 kV/s			5, 6 or 10	10s to 600s	10s to 600s

## ORDERING CONFIGURATION

Example of an ordering configuration:-

OTS100AF-USA-P4 = This order is for an OTS100AF with US power lead, ASTM electrode set, internal printer and lid stirrer.

Model:	OTS	AF-	-	-	-	Weights
Select Model	100 kV	100				29.5 kg
	80 kV	80				29.5 kg
	60 kV	60				29.5 kg
Select Power Cord		EU Lead	EU			
		UK Lead	UK			
		US Lead	US			
		Australian Lead	AU			
		No Plug Lead	BL			
Select Electrode Set			ASTM Set	A		
			IEC Set	E		
			Full Set	U		
Select Printer Option			Internal Printer	P		0.54 kg
			No Printer	X		0.08 kg
Select Stirrer Option			Stirrer Lid Assembly Fitted	4		0.3 kg
			Stirrer Lid Assembly Not Fitted	X		

**ORDERING INFORMATION**

Product	Order Code	Product	Order Code
OTS60AF	configured*	<b>Optional accessories</b>	
OTS80AF	configured*	Vessel 400 ml assembly (no electrodes supplied)	1001-473
OTS100AF	configured*	Vessel 150 ml assembly (no electrodes supplied)	1001-474
<b>Included accessories (on all configurations)</b>			
Vessel 400 ml assembly		VCM100D digital voltage checker	1001-105
Magnetic bead stirrers (2 off)		VCM80D digital voltage checker	1001-801
Magnetic bead retriever		Printer paper, 1 roll (MOV applies) (4 rolls supplied if printer configured)	25995-001
Electrode gauge set 1, 2, 2.5, 2.54 mm	1002-144	Barcode reader, USB	1001-047
User manual CD		* See ordering configuration on previous page	
PowerDB Lite software			
<b>Configured accessories (to order additional or spares)</b>			
IEC60156 electrode Set - 12.7 mm spherical (2), 36 mm mushroom (2)	1001-477		
ASTM D877/1816 electrode set - 25.4 mm cylindrical (2 std, and 2 none std), 36 mm mushroom (2)	1001-478		
Full electrode set ASTM and IEC electrodes	1001-479		
Vessel lid mounted impeller (ASTM D1816) for use with 400 ml vessel	1001-102		

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**CERTIFICATION ISO**  
 Registered to ISO 9001:2008 Cert. no. Q 09250  
 Registered to ISO 14001:2004 Cert. no. EMS 61597

**OTS100AF\_80AF\_60AF\_DS\_EN\_V07**  
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