

OTS PB and OTS AF Range

Fully automatic insulating oil dielectric breakdown testing



- NEW - IEC60156-2018
- NEW - IEC60156-2018 V for Viscous Oils
- NEW - IEC60156-2018 Annex A
- NEW - IEC60156-2018 Annex A (V) for Viscous Oils
- NEW - GBT 507-2002 - Chinese Standard
- NEW - Chinese language on screen
- NEW - Withstand tests
- Full Range to suit all user needs
- Easy adjust – locking electrode gap
- Fast precision breakdown detection
- Ultra-fast HV switch off time
- Suitable for mineral, ester and silicone oils

DESCRIPTION

Megger's range of automatic oil test sets performs accurate breakdown and withstand voltage tests on mineral, ester and silicone insulating liquids. Common across the range precision, shatter proof test vessels are easy to clean and provide repeatable results, whether they are used in the field or laboratory featuring lock in precision electrode gap setting adjustment wheels. The transparent, shielded lid and large test chamber allows easy access to the test vessel, enabling users to see what is happening within the test chamber.

All of the current test standards world wide are preloaded in the instrument for convenient automatic operation, however should a new test standard or an existing standard be amended there are 3 custom tests that can be configured to the new requirements. This enables testing to continue to cover the short period while Megger updates the test procedure files. New updated files are then downloaded by the user and installed into the test instrument via a USB memory stick / flash drive.

Test results are identified either by a serial number or asset ID and are time and date stamped. The Megger asset and data management software, PowerDB Lite, is bundled at no extra cost providing an excellent tool for downloading and printing results.

An internal printer provides a hard copy of results. Ink based printout ensures durability at all temperatures. USB flash drive for easy transfer of test results, external USB printer and on the AF model a 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.

OTS PB models

These 60 kV and 80 kV oil test sets are small and the lightest on the market with weight ranging from 16.8 kg to 20.8 kg depending on model configuration. The transport case and carry bag are optional accessories. The carry bag has pouches for electrode accessory pack, leads, quick user guide, paper roll etc. these units supplied mains powered and battery operated for additional flexibility in portable applications. All PBs are fitted with NiMH batteries and are also supplied with an internal 12 V DC charger and vehicle adaptor cable as standard.

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OTS AF models

These 60 kV, 80 kV and 100 kV models have a much larger test chamber for even easier access and cleaning, particularly useful in a lab environment. They are fitted with a 12 key alpha-numeric keypad to facilitate entry of test ID, file names, notes etc. Alpha characters are entered by repetitive pressing on a key. The AF models also have the ability to use a USB barcode reader to scan oil sample barcode labels, ideal for better integration within a laboratory.

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.

In addition to the breakdown test, the withstand test is a measure of the oils ability to withstand a constant electrical stress. Failure to achieve this also indicates contaminants.

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.

Refer to the OTSVesselPrep--2007-993_AN_en_V0# for more details.

FEATURES AND BENEFITS

COMMON ACROSS PB AND AF

- Lock in precision oil vessel - lockable gap setting
- Flat electrode gap gauges that will not damage electrodes
- Oil temperature is measured continuously so it can be determined whether the oil test sample is within the range allowed by the test standards before the test is started
- QVGA colour display with adjustable backlight (easy to read in sunlight or dark conditions)
- Large, easy clean test chamber with oil drain
- High visibility test chamber
- Safe operation with dual redundant micro switches
- Intuitive user interface
- Fully automatic operation with preloaded international test standards
- User configurable test sequences to cover transition period of new / updated test standards (standards maintained via USB updates from Megger)
- All instruments supplied with one 400 ml test vessel in the box as standard
- Built onto a rigid box section chassis to prevent flexing on impact that otherwise would damage the transformer
- Unique built in chamber drain pipe for easy removal of oil accidentally spilt in test chamber, this can easily be connected to a lab waste system
- Selecting favourite tests speeds up selection by only displaying the standards regularly used by the user

OTS PB ADDITIONAL FEATURES AND BENEFITS

- Small and lightweight, lightest on the market starting at 16.8 kg
- Mains and battery powered for portable applications

OTS AF ADDITIONAL FEATURES AND BENEFITS

- Barcode scanning capability for oil sample ID
- Extra large test chamber for ease of use in high productivity application
- 12 key alpha-numeric keypad to facilitate entry of test ID, file names, notes etc.

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COMMON PB AND AF OPTIONAL ITEMS

- Voltage check unit (VCM100D/VCM80D)
- 150 ml test vessel.
- Superuser Kit. This cost effective solution supplies everything you need to carry out effective oil testing. Includes:
 - A 150 ml test vessel for low volume testing.
 - A standard 400 ml test vessel.
 - A stirrer lid with choice of impellers for ASTM and IEC standards
 - A useful guide booklet to provide essential advice on how to get the best from your new OTS.
 - All supplied in a durable Megger case to easily and safely transport your test essentials.

OTS60PB and OTS80PB OPTIONAL ITEMS

- Carry bag
- Transport case

OTS60AF, OTS80AF and OTS100AF OPTIONAL ITEMS

- Barcode scanner (USB)






AVAILABLE UPGRADE

To update your OTS to the new IEC60156-2018 standard please contact your local Megger Authorised Service Centre for details.



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		OTS60PB	OTS80PB	OTS60AF	OTS80AF	OTS100AF
* Optional item						
** IEC 60156 recommends a separate test vessel is used for each type of fluid to be tested						
*** Important future proof feature						
Standard items						
Internal printer		■			■	
NiMH battery		■				
Power cord		■			■	
Full electrode set - IEC and ASTM		■			■	
OTS Range Differentiating Features						
Max test voltage	60 kV	■		■		
	80 kV		■		■	
	100 kV					■
Power Supply	Mains and NiMH battery operation	■				
	Vehicle 12 V skt lead	■				
	Mains only operation				■	
Data management	Internal test result memory	■			■	
	Download results to USB stick	■			■	
	Barcode scanning capability				■	
	Keypad for easy asset ID and memo entry				■	
Ruggedness	Tough display and chamber lid	■			■	
	Low cost shatter proof test vessel	■			■	
	Large corner protecting rubber feet	■			■	
	Rugged non-flex construction	■			■	
Transport	Transport case	■*				
	Protective carry case	■*				
	Light weight (<20.8 kg) one man carry	■				
Operating costs	Low cost test vessel (Vessel of each oil **)	■			■	
	Annual full calibration	■			■	
Test standards	Fast favourite list selection	■			■	
	Fully automatic test sequence	■			■	
	Test standards update via USB device ***	■			■	
	Custom tests	■			■	
Cleanliness	Easy pour / clean vessel design	■			■	
	Large test chamber (easy access)				■	
	Test chamber spilt oil drain	■			■	
Accuracy	Continuous oil temperature measurement	■			■	
	Lockable thumb wheel adjustable electrode gap	■			■	
	Voltage output verification unit available	■			■	

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SPECIFICATIONS

Test voltage

OTS60PB 0 to 60 kV rms maximum (30 kV - 0 - 30 kV)

OTS80PB 0 to 80 kV rms maximum (40 kV - 0 - 40 kV)

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 rise time

0.5 kV/s, 2.0 kV/s or 3 kV/s depending on selected test standard and 0.5 kV/s up to 10kV/s in custom test

Voltage rise time accuracy

better than 5%

Voltage resolution and accuracy

Up to 5 kV/s: 0.1 kV +/- 1% +/-2 digits

5 kV/s up to 10 kV/s: 0.1 kV

+/- 1% +/-4 digits

Programmed test sequences

- ASTM D 1816-12
- ASTM D 1816-12E (ester oil)
- ASTM D 877A-19
- ASTM D 877B-19
- AS1767.2.1
- BS EN 60156-96
- BS 5730a AD 30 kV
- BS 5730a AD 40 kV
- BS 5730a BCEF 22 kV
- BS 5730a BCEF 30 kV
- BS 148 / EN 60156
- CEI EN 60156-95
- Custom 5, 6 and 10
- GB/T 507-2002
- GOST 6581-75
- IEC 60156-95
- IEC 60156-2018
- IEC 60156-2018V
- IEC 60156-2018 Annex A
- IEC 60156-2018 Annex A (V)
- IRAM 2341
- IS 6792-2017
- IS 6792-2-2017
- JIS C 2101-99 (M)
- JIS C 2101-99 (S)
- NF EN 60156
- PA SEV EN60156
- SABS EN60156
- UNE EN 60156
- VDE0370 part 5
- Withstand A
- Withstand B

Vessels

400 ml (standard)

150 ml (superuser pack)

Carefully designed test vessels manufactured from the most chemical resistant clear polymer on the market provides tried and tested reliable test results. Featuring precision electrode alignment and adjustment wheels that lock electrodes in position, the option of a 150 ml vessel for low volume oil samples is also available

Temperature measuring range

10 °C to 65 °C (ASTM D877 requires oils to be within 20 °C and 30 °C) (IEC 60156 required oil to be within 15 °C and 25 °C)

Temperature sensor resolution

1 °C

Power supply

Line voltage 85 to 265 VAC

Line frequency 50/60 Hz

Battery type

NiMH 24 V 2 Ah (OTS60PB or OTS80PB ONLY)

Power source:

85 V – 265 V 50/60/400 Hz input. Portable unit can be powered from 85 V – 265 V or its internal battery. Battery can be charged from a 12 V car battery (10 V to 18 V).

Battery life:

10 test sequences up to 70 kV using 2 Ah battery

Charge retention at 20°C:

NiMH 50% discharged after 1 month

Battery charging:

Automatic when connected to power source. Charge time 16 hours slow or 2 hour fast charge to >90%

Interface

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

Internal printer

Matrix impact printer
Paper 57.5 mm wide

External printer:

supports PCL3, PCL6, PS and EPS

Protection

Dual safety micro switches on chamber cover

Display

3.5 in display. 320 x 240 QVGA colour display with backlight

Operating temperature range and humidity

0 °C to +50 °C.
80% RH at 40 °C
non-condensing conditions

Storage temperature range and humidity

-30 °C to +65 °C .
95% RH at 40 °C
non-condensing conditions

Maximum altitude

1000 m

IP rating

IP30

Safety

Designed in accordance with IEC61010

EMC

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

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Dimensions

OTS60PB	520 mm x 340 mm x 250 mm
OTS80PB	520 mm x 380 mm x 250 mm
OTS60AF	580 mm x 420 mm x 290 mm
OTS80AF	580 mm x 420 mm x 290 mm
OTS100AF	580 mm x 420 mm x 290 mm

Weight

OTS60PB	16.8 kg
OTS80PB	20.8 kg
OTS60AF	30 kg
OTS80AF	30 kg
OTS100AF	30 kg
Test vessels	1.1 kg (400 ml and 150 ml)

Language

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

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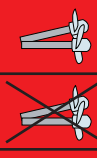
PROGRAMMED TEST SEQUENCE OVERVIEW

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*	Silicone	1.0	2.0	2.5	2.54	4.0						0.5 kV/s	2 kV/s	3 kV/s	Number of tests	Initial stand time	Time between tests
AS1767.2.1	■	■		■				■			■			■		6	5 mins	2 mins
ASTM D 1816-12	■	■	■					■			■					5	3 mins	1 min 15s
ASTM D 1816-12E (Ester)	■	■	■					■			■					5	30 mins	1 min 15s
ASTM D 877A-19	■	■				■			■			■				5	2 mins	1 min
ASTM D 877B-19	■	■				■			■		■					1 x 5	2 mins (x5)	N/A
BS148 EN60156	■	■					■		■		■					6	5 mins	2 mins
BS 5730a AD 30 kV/40 kV	■	■			30 kV = 2.5	40 kV = 4.0		■	■		■					3	10s to 600s	N/A
BS 5730a BCEF 22 kV/30 kV	■	■			22 kV = 2.5	30 kV = 4.0		■	■		■					4	10s to 600s	N/A
BS EN 60156-96	■	■						■			■					6	5 mins	2 mins
CEI EN 60156-95	■	■						■			■					6	5 mins	2 mins
Custom 5, 6 and 10	■	■			1.0 to 7.0			■	■		■			0.5 kV/s to 10 kV/s	5, 6 or 10	10s to 600s	10s to 600s	
GBT 507-2002	■	■						■	■		■					6	5 mins	2 mins
GOST 6581-75	■	■						■	■		■					6	10 mins	5 mins
IEC 60156-95	■	■						■	■		■					6	5 mins	2 mins
IEC 60156-2018	■	■						■	■		■					6	5 mins	2 mins
IEC 60156-2018 (V)	■	■						■	■		■					6	15 mins	6 mins
IEC 60156-2018 Annex A	■	■						■	■		■					10	5 mins	1 mins
IEC 60156-2018 Annex A (V)	■	■						■	■		■					10	15 mins	3 mins
IRAM 2341	■	■						■	■		■					6	5 mins	2 mins

* High Molecular Weight Hydrocarbon

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...Continued	Oil types tested		Electrode gap options (mm)				Electrode shape options			Oil stirring options		Voltage rise rate options			Breakdown test sequence		
	Mineral Ester HMMH*	Silicone	1.0	2.0	2.5	2.54	4.0			0.5 kV/s	2 kV/s	3 kV/s	Number of tests	Initial stand time	Time between tests		
IS6792 -2017	■	■		■				■	■	■			6	10 mins	2 mins		
IS6792-2 -2017	■	■		■				■	■	■			6	10 mins	6 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		
NF EN 60156	■	■		■				■	■	■			6	5 mins	2 mins		
PA SEV EN 60156	■	■		■				■	■	■			6	5 mins	2 mins		
SABS EN 60156	■	■		■				■	■	■			6	5 mins	2 mins		
UNE EN 60156	■	■		■				■	■	■			6	5 mins	2 mins		
VDE 0370 part 5	■	■		■				■	■	■			6	5 mins	2 mins		
Withstand A	■	■	2.5 to 4.0					■	■	■	■		1	10s to 600s	N/A		
Withstand B	■	■	2.5 to 4.0					■	■	■	■		2	10s to 600s	N/A		

* High Molecular Weight Hydrocarbon

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ORDERING INFORMATION

Description	Order Code	Description	Order Code
OTF PB Models		Optional accessories	
OTS60PB		OTS IEC60156 Electrode set contents - supplied in accessory case	
OTS60PB-EU	1014-525	12.7 mm spherical electrodes (2)	
OTS60PB-UK	1014-526	36 mm mushroom electrodes (2)	
OTS60PB-US	1014-527	Magnetic stirrer bar (2)	
OTS60PB-AU	1014-528	Magnetic stirrer bar retriever (1)	
OTS80PB		Gap gauge set	1001-477
OTS80PB-EU	1014-529	OTS ASTM D877/D1816 Electrode set contents – supplied in accessory case	
OTS80PB-UK	1014-530	25.4 mm standard (sharp edges) cylindrical electrodes (2)	
OTS80PB-US	1014-531	25.4 mm non-standard (round edges) cylindrical electrodes (2)	
OTS80PB-AU	1014-532	36 mm mushroom electrodes (2)	
Included accessories (OTS PB models)		Magnetic stirrer bar (2)	
Vessel 400 ml assembly (stirrer lid fitted)		Magnetic stirrer bar retriever (1)	
12 V vehicle charger lead		Gap gauge set	1001-478
Full electrode set - IEC and ASTM		Full electrode set (covers IEC and ASTM standards)	
IEC and ASTM impeller		12.7 mm spherical electrodes (2)	
Printer,		36 mm mushroom electrodes (2)	
NiMH battery,		25.4 mm standard (sharp edges) cylindrical electrodes (2)	
Electrode gauge set		25.4 mm non-standard (round edges) cylindrical electrodes (2)	
Calibration certificate		Magnetic stirrer bar (2)	
Power DB guide		Magnetic stirrer bar retriever (1)	
Quick Start Guide		Gap gauge set	1001-479
OTS Vessel Preparation Guide		Vessel lid mounted impeller (ASTM or IEC)	
		for use with 400 ml vessel	1001-102
		Carry bag (padded) OTS80PB	1001-476
		Carry bag (padded) OTS60PB	1001-480
		Vessel 400 ml assembly (no electrodes supplied)	1001-473
		Vessel 150 ml assembly (no electrodes supplied)	1001-474
		VCM100D digital voltage checker	1001-105
		VCM80D digital voltage checker	1001-801
		Printer paper, 20 rolls	
		(4 rolls supplied if printer configured)	1008-030
		Printer Ribbon Cassette	25995-002
		Barcode reader, USB	1001-047
		Transport case (with wheels)	1001-475
		ASTM alternative propeller shaft assy	1007-153
		IEC alternative propeller shaft assy	1007-154
		Electrodes - Spherical (pair)	6220-484
		Electrodes - Mushroom (pair)	6220-580
		Electrodes - Cylindrical (pair)	6220-483
		Electrodes - Non-standard cylindrical with 0,5 mm edge radius (pair)	6220-538
		Electrode gauge set 1, 2, 2.5, 2.54, 4 mm	1002-144
OTF AF Models			
OTS60AF			
OTS60AF-EU	1014-533		
OTS60AF-UK	1014-534		
OTS60AF-US	1014-535		
OTS60AF-AU	1014-536		
OTS80AF			
OTS80AF-EU	1014-537		
OTS80AF-UK	1014-538		
OTS80AF-US	1014-539		
OTS80AF-AU	1014-540		
OTS100AF			
OTS100AF-EU	1014-541		
OTS100AF-UK	1014-542		
OTS100AF-US	1014-543		
OTS100AF-AU	1014-544		
Included accessories (OTS AF models)			
Vessel 400 ml assembly (stirrer lid fitted)			
Printer			
Full electrode set - IEC and ASTM			
Electrode gauge set			
IEC and ASTM impeller			
Calibration certificate			
Power DB guide			
Quick Start Guide			
OTS Vessel Preparation Guide			



EU Lead



UK Lead



US Lead



AU Lead

If you wish to upgrade your existing OTS please contact your local Megger Authorised Service Center for prices and availability

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ORDERING INFORMATION

Description	Order Code	Calibration certificates
Optional accessories		
OTS Super-user kit:		
Vessel 400 ml assembly (stirrer lid fitted)		Calibration Certificate OTS AF 1001-921
150 ml vessel kit		Calibration Certificate OTS PB 1001-920
IEC impeller		UKAS Calibration Certificate OTS60 AF 1000-089
ASTM impeller		UKAS Calibration Certificate OTS80 AF 1000-091
'Megger Guide to break down testing' booklet		UKAS Calibration Certificate OTS100 AF 1000-088
Oil testing application note		UKAS Calibration Certificate OTS60 PB 1000-090
Carry case	1007-467	UKAS Calibration Certificate OTS80PB 1005-943

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ISO 9001

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OTS60PB--OTS80PB--OTS60AF--OTS80AF--OTS100AF_DS_en_V09