

Rapid oil quality tester LWB-12

instruction manual

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1. outlined

LWB-12 portable oil quality rapid tester, used to detect oil samples of metal particles and non-metallic particles and oil temperature, viscosity, density, trace moisture, water activity, dielectric constant. It can be widely used in aviation, aerospace, electric power, petroleum, chemical industry, transport, ports, metallurgy, machinery, automobile manufacturing and other fields of hydraulic oil, lubricating oil, transformer oil (insulating oil), turbine oil (turbine oil), gear oils, engine oils, aviation paraffin, water-based hydraulic oil and other oils for testing.

二. Detection indicators

Viscosity, density, percentage of trace moisture saturation, moisture PPM, dielectric constant, temperature, moisture content, number of ferrous and non-ferrous particles in the oil.

2.1 Instrument Configuration

1. Power supply: AC220V \pm 10%; 50Hz;
2. Built-in metering pump, you can adjust the detection of liquid flow.
3. Built-in thermal printer
4. Built-in lithium polymer battery
5. Built-in six-parameter sensor
6. Built-in iron chip sensor
7. In-line test pressure control under 5Bar.

三. Individual sensor specifications

3.1 Six-parameter sensor technical specifications

Measurement indicators	Moisture (ppm), Density (kg.m-3), Dynamic Viscosity (cP), Dielectric Constant, Water Activity, Temperature (°C)	
Measurement range	moisture	0-30000ppm(calibrated for different oils)
	density	600 kg.m-3...1250 kg.m-3 *
	viscosity	1cP...400cP(500cSt)
	water activity	0...1aw
	dielectric constant	1...6
	temp	0°C...100°C *
Accuracy @25° C	moisture	10% or 10ppm whichever is the greater
	density	2% or 5kg.m-3 whichever is the greater
	viscosity	5% or 1cP whichever is the greater
	water activity	3%
	dielectric constant	5%
	temp	0.5°C
resolution	moisture	1ppm
	density	0.1 kg.m-3
	viscosity	0.1cP
	water activity	0.001
	dielectric constant	0.01
	temp	0.1°C
response time	Less than 30 seconds (first time), data refresh 1 time/second	
digital output	RS485 MODBUS RTU	
Supply Voltage	DC 9V-32V@RS485 · DC20V-32V@4-20mA	
Power Consumption	< 20mA@24Vdc RS485	
Probe pressure resistance	max 10bar	
fluid temperature	0°C... 100°C	
environmental temperature	-40°C... 85°C	
Storage temperature	-40°C... 80°C	
Shell material	316/304 Stainless steel Hastelloy	
mechanical interface	M39*1.5	
weight	550g	
protection class	IP65	
Seal Material	FKM fluoroelastomer	
connection cable	2 metres M12 8 pole	
Maximum flow rate	<0.3 metres/second	

3.2 Iron Chip Sensor Technical Specification

Detection capability	Ferromagnetic abrasive Fe > 40µm (ESD) 5 grades
	Non-ferromagnetic abrasive grain NFe > 150µm (ESD) 5 grades
Statistical cycle	Start-up self-test 30 seconds (first time), counting interval 300 ~ 3600 seconds adjustable
Particle count	Max 100 pcs/sec
Allowed flow	0.3 ... 9 L/m (0.1 ... 3m/s)
Piping specifications	Φ8mm
Digital output	RS485 MODBUS RTU, Isolation voltage 2.5kv
Operating power	DC 24V±10%, < 200mA
Probe pressure resistance	10bar Max
Applicable fluids	Lubricants and hydraulic fluids (synthetic and mineral base), etc.
Fluid temperature	-20 ... 80 °C
Environmental temperature	-20 ... 85 °C
Shell material	Stainless Steel, Anodised Aluminium
Structural dimension	108×70×80 mm (Length x Width x Height)
Screw interface	M14*1.5
Weight	<1.0 kg
Protection class	IP65
Connection cable	2 metres M8 - 6-core straight
Electromagnetic compatibility	EN 61326-1 EN 61326-2-3 ICES-003 Class B

四. Instrument construction

3.1 Front panel of main unit

Main components.

1, Panel: with display, printer, power switch



There is an intelligent lithium battery charger installed inside the instrument, it takes 3 hours to be fully charged under the state of power loss, 6-8 hours of continuous use for normal detection, and 3 hours of continuous use for heating detection;

2, Left side configuration: power switch, power socket, USB memory stick interface



3, Right side configuration: oil inlet, oil outlet



4, Packing box photo



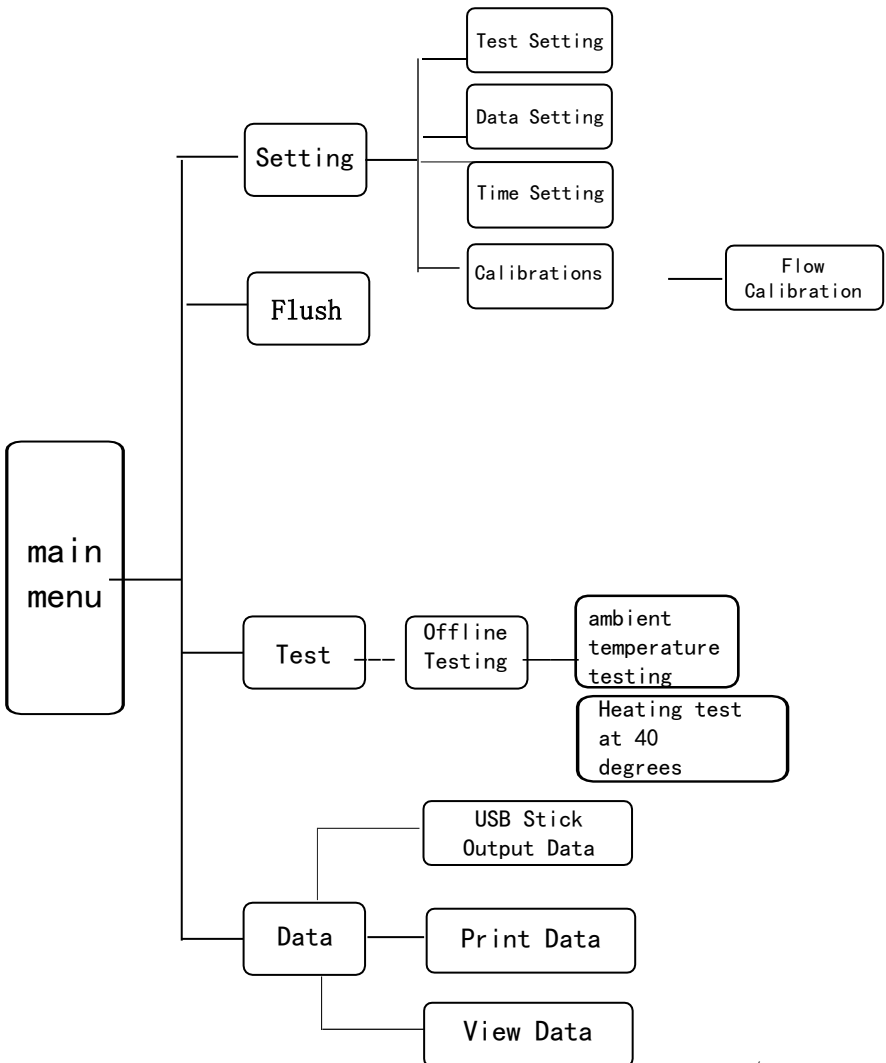
Instrument power-up

Booting process:

1. Built-in lithium battery, press the power switch to switch on and start. If it doesn't start, the battery is weak, just plug it into the 220V power cord to recharge it.
2. Plug in the 220 Volt power cord to activate the on button.
- 3 Connect the hose: Pull out the stainless steel dust plug. Insert inlet and outlet hoses.
- 4 Clean the instrument: use petroleum ether (90-120) to reverse flush the instrument 30-50ml. 5, Test the oil: connect the oil hose to test the oil, testing.
- 6, after testing, use the emptying function (reverse emptying) to empty the internal oil, and use 20-50ml of petroleum ether to clean the pipeline in the reverse direction.

五. menu functions

5.1 Menu screen function list



5.2 Home Page Functions

Test, flush, alarm, setup, historical data;



5.3 set up

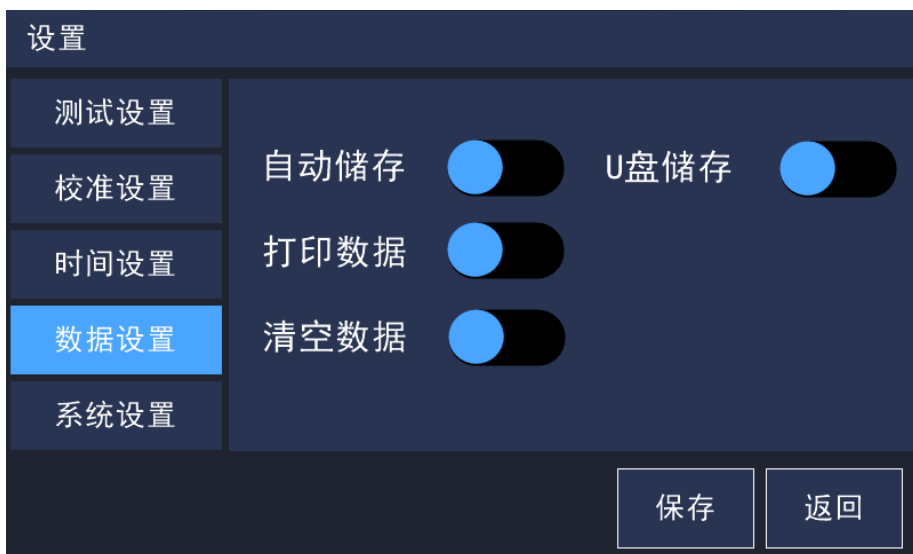
Main Screen Press the **Setup** button to enter the main setup screen. Test settings (flow rate setting, test volume, pre-test sampling time) are available;

Calibration setting, time setting, storage setting and other operations. Press to select the corresponding setting to enter the setting interface; press the icon key to enter the corresponding setting options;



5.3.1 Storage Settings

Data settings in the setup interface You can choose whether to store data and print whether to print data, and save it after selection. At the end of the test will automatically save the test results, in the data can be viewed;



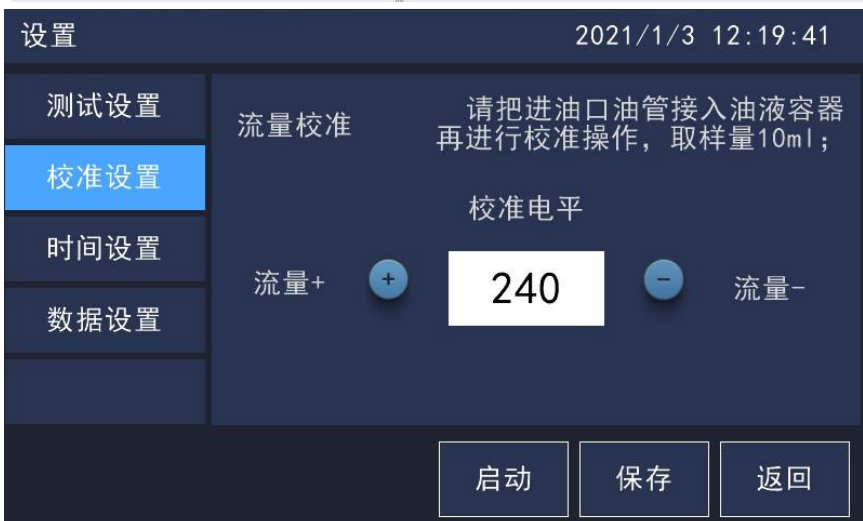
5.3.2 time setting

You can adjust the system time in the **time setting** in the setting interface, and **click** Save when the adjustment is finished.



5.3.3 Calibrations

Calibration settings in the setup interface Click OK to enter the calibration page, you can calibrate the flow rate, according to the actual flow rate is too large or too small to calibrate the flow rate, save the settings after completion.



5.3.4 Emptying and cleaning

In the home screen, click Empty to empty the liquid inside the instrument. The instrument is emptied in the reverse direction, and the inlet and outlet ports need to be switched. The inlet and outlet ports need to be switched. The outlet port is empty and the inlet port is connected to a container for emptying.

If you need to clean the instrument, you can prepare petroleum ether solvent, access the outlet line, click on the evacuation, cleaning operation, after cleaning 20-30ml, the outlet line leaves the petroleum ether solvent and evacuate the instrument;

排空

出油口油管悬空后再进行排空操作（反向排空）

排空

返回

5.4 Data

In the main interface **data**, you can see the test results saved after the test is completed, and you can export the data to a USB stick by using the export button;

If you need to clear the data, in the Settings screen , **Data Setting** select Clear Settings and save;

历史数据

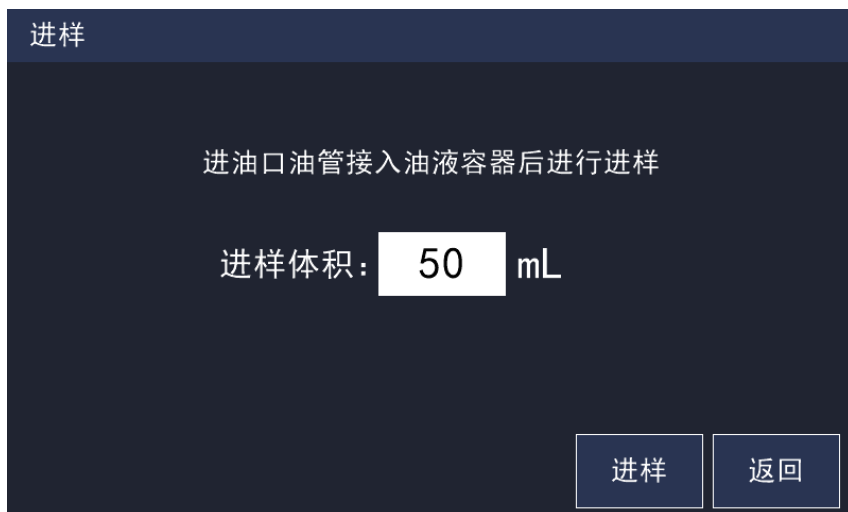
当前地址:				温 度 °C:
铁磁颗粒	非铁磁颗粒			水 分 PPM:
40-99um	0	150-199um	0	水活性 aw:
100-199um	0	200-299um	0	粘 度 CST:
200-299um	0	300-399um	0	密度 kg/m ³ :
300-399um	0	400-499um	0	介电常数 :
>400um	0	>500um	0	
总数量	0	总数量	0	

上一组
下一组
打印
输出
返回

5.5 test

feed

The test oil can be injected before the test, and can be tested normally after the oil has completely flowed out of the outlet. The sample volume can be adjusted in the sampling interface.



detection mode

Home Click on the Test button to enter the test screen.
test



Clicking on the test starts the test and displays the current number of particles as well as the moisture, temperature, kinematic viscosity, water activity, dielectric constant, density and water content. At the end of the test, the data is saved and printed. If the test is performed under heating, the test can only be terminated when the temperature value reaches 40 degrees after the ferromagnetic particles have been tested;



六. test

6.1 Pre-test preparation

Turn on the instrument, connect the inlet and outlet pipes, click on the homepage-emptying (reverse emptying) option, connect the petroleum ether reverse cleaning pipeline 30ml to the outlet, and then empty the pipeline in the reverse direction after the cleaning is completed; Click Test - Sample Inlet to wait for the oil sample to flow out completely from the oil outlet, the preparation before testing is completed. After the oil sample flows out from the oil outlet completely, it can be tested normally;

6.2 test

1. Make settings for parameters such as test volume, number of tests, and test criteria;
(See above for details)
2. after the setting is completed, enter the test interface, press the test key to select the start of the test test interface real-time refresh the number of particles of each size and the oil parameters and after the completion of the test, the display printer to print the test data. 3;
3. Press the End key to end the current test, and the data will be stored automatically after the test;

6.3 Cleaning & Maintenance

When testing contaminated oil for a long period of time, remove the stainless steel cartridge in the inlet fitting of the instrument (4mm hexagonal spanner) and use a clean detergent to clean the cartridge and piping.

Appendix I Equipment shape and installation size



Size:450X350X200MM Weight:9.5KG

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