

SPARK TEST APPARATUS

FOR INTRINSICALLY SAFE CIRCUITS – Ex I – IEC 60079-11

MAIN SPECIFICATIONS:	
Design	Compact design
Spark chamber volume	≈ 1000 cm ³
Lock system	security clamping device
Automatic ignition detection	built in optical sensor with ambient light calibration
Chamber maximum pressure	P _{max} > 25 Bar
Safety valves	Incorporated safety valves P _{max} > 80 Bar
Automatic stop	ignition detection procedure completed
Internal safety	high pressure safety valves on the gas, air and purging inputs
Rotating cadmium disk holder	double sealed and chromed
Electrode material	tungsten wires
Electric motor	brushless swiss made motor with internal gearing and rotation calibration
Gear wheels	50:12 ration made of copper and ZX-100 material
Rotating connectors	resistance below 1mΩ and 8-point contact
Electric terminals	external banana plugs testing current up to 10A (optional)
Fusing instrument	tungsten wire cutting device with safety protector cover
Gas Mixing Device	mixtures I, IIA, IIB, IIC safety factor x1

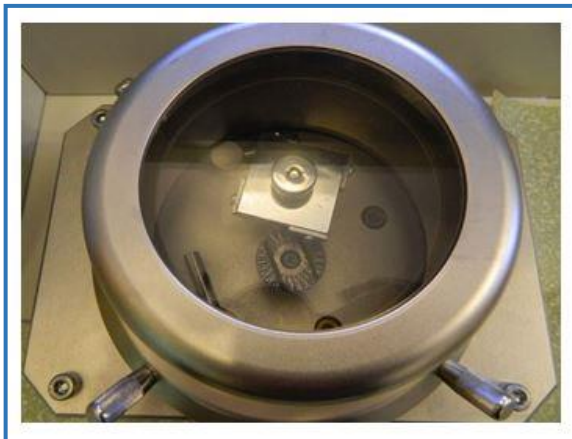


MAJOR BENEFITS
All in One design
Automatic ignition detection & pressure release to the outlet tube
User control with 21,5" Full HD display
2 pairs of lock keys
Built in flame arresters
Tungsten wire fusing instrument
Internal automatic calibration unit for every gas group
Automatic pressure release and automatic purging after ignition
Incorporated Gas Mixing Unit which can be used separately

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	mixtures I, IIA, IIB safety factor x1,5
Automatic disk conditioning	20000 revolutions or configured manually
Weight	140 Kg
Dimensions (WxDxH)	1200 x 750 x 1600 [mm]
Power supply	230 VAC



TUNGSTEN WIRE FUSING INSTRUMENT:

Tungsten bare wire must be fused to make short electrodes

Design according to: IEC 60079-11:2011

230 VAC design

Output 7,2V 25A

Chromed contacts

Protective thick plastic cover and safety switch

CADMIUM DISK AND ELECTRODE HOLDER:

Brushless electric motor 80 rpm

Gear wheels ratio: 50:12 made of copper and ZX-100 material

Due the high quality materials used for gear wheels, they do not need to be replaced

Rotating connectors with contact in 8 points on the shafts

Resistance below 1mΩ

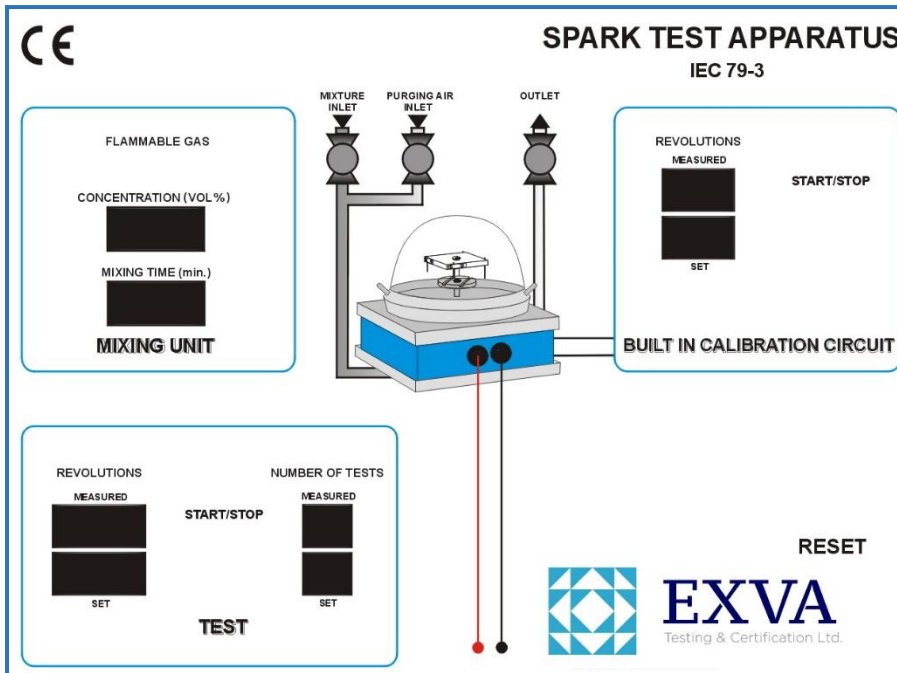
Tungsten electrode holder double sealed and chromed surface

Cadmium disk holder double sealed and chromed surface



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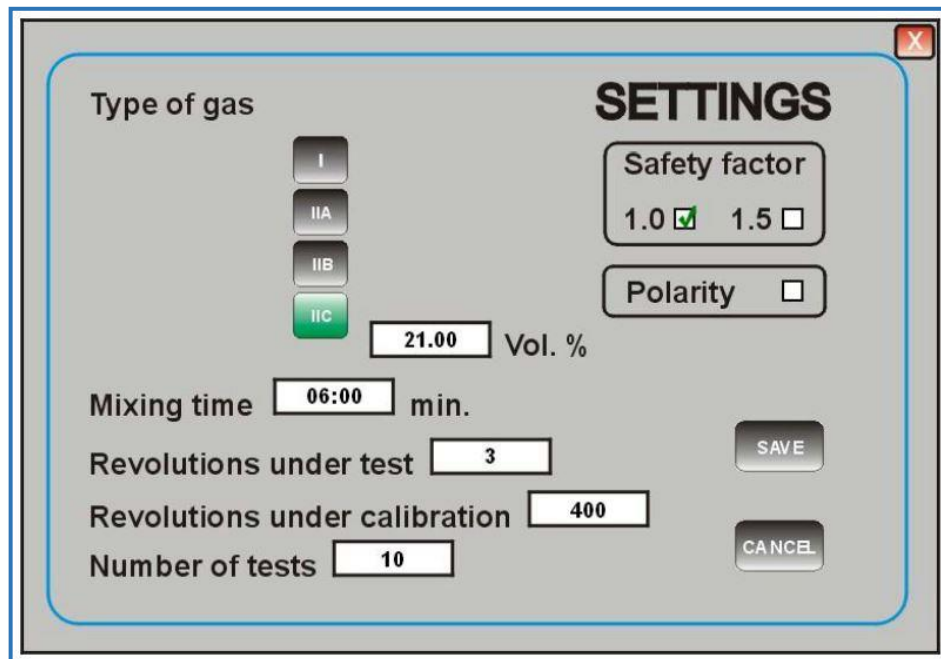
SPARK TEST APPARATUS MAIN WINDOW

MAIN WINDOW SETTINGS:	
LCD DISPLAY	mixing, test and built in calibration windows
MIXING UNIT WINDOW	shows the adjusted concentration and mixing time
TEST WINDOW	shows the measured rotations adjusted, the taken rotations and the number of tests
BUILT IN CALIBRATION CIRCUIT	shows the required revolutions according to the standard and the number of rotations taken at the calibration phase

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SETTINGS BUTTON MENU:	
TYPE OF GAS	selects the required gas group
VOL %	shows the selected concentration (it can be selected and adjusted manually not only for the gas groups)
SAFETY FACTOR	select 1,0 or 1,5 safety factors
POLARITY	selects the AC / DC mode
MIXING TIME	the mixing time can be adjusted (the default time is 6 min.)
REVOLUTION UNDER TEST	setting the number of revolutions according to standard 60079-11
REVOLUTION UNDER CALIBRATION	setting the number of revolutions according to standard 60079-11
NUMBER OF TESTS	possible to make complete automatic tests
SAVE	saving the actual settings



The screenshot shows a software window titled "SETTINGS" with a close button (X) in the top right corner. The window contains the following controls:

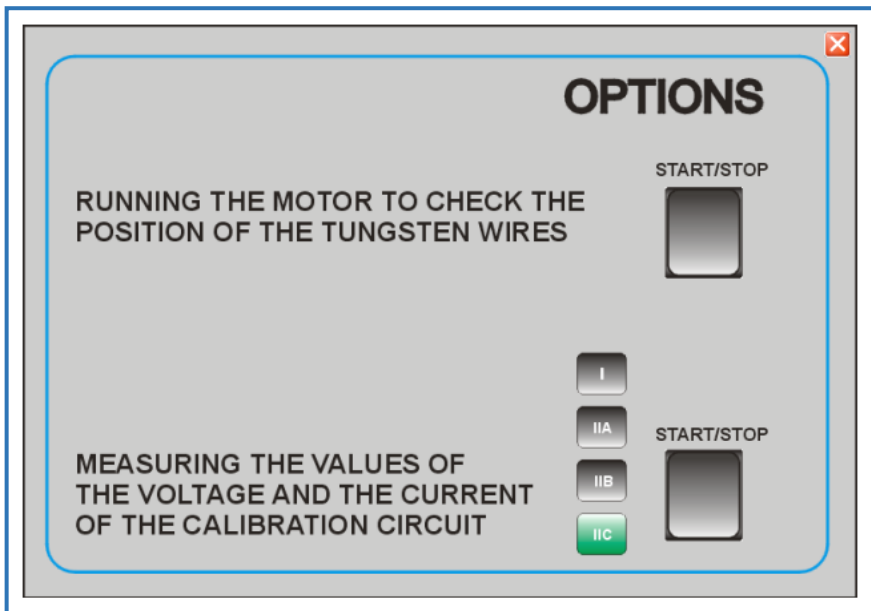
- Type of gas:** Four buttons labeled I, IIA, IIB, and IIC. The IIC button is highlighted in green.
- Vol. %:** A text input field containing "21.00".
- Mixing time:** A text input field containing "06:00" followed by "min.".
- Revolutions under test:** A text input field containing "3".
- Revolutions under calibration:** A text input field containing "400".
- Number of tests:** A text input field containing "10".
- Safety factor:** Two radio buttons labeled "1.0" (checked) and "1.5".
- Polarity:** A checkbox that is currently unchecked.
- SAVE** and **CANCEL** buttons are located on the right side of the window.

SPARK TEST APPARATUS SETTINGS WINDOW

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OPTIONS BUTTON MENU:	
START / STOP (UPPER)	running the motor to check the position of the tungsten wires
START / STOP (LOWER)	measuring the values of the voltage and the current of the calibration circuit for every gas group



SPARK TEST APPARATUS SETTINGS WINDOW

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Value & Quality Award winner in the year 2020

In 2020 both the *High capacity precision digital gas mixer*, *precision digital gas mixer* and the *Spark test apparatus for intrinsically safe circuits* won the Value & Quality Award.



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GAS MIXING DEVICE:

MAIN ADVANTAGES:

- very high mixing precision $\leq 0,1\%$
- complex and microprocessor controlled mixing operation
- can be used for other applications also (testing gas sensors, producing different gas mixes other than I, IIA, IIB, IIC)
- 8 mm flexible tubing
- incorporated cutt-off valves
- 2 stepping motors for precise mixing
- 2 stainless steel pistons for long service life
- 2 cylinders made of aluminum and teflon coated for anti friction
- fully automated mixing process



ACCESORIES:

- sight glasses
- sealing gasket for sight glasses 1 set
- sealing gasket for explosion chamber 1 set
- sealing gasket for the shafts 1 set
- cadmium disk 1 pc.
- tungsten electrodes 4 pieces
- tungsten wire cutting device
- flexible tubing
- pressure reducer for air inlet
- pressure reducer for gas inlet