

SPARK TEST APPARATUS - Ex-i

FOR INTRINSICALLY SAFE CIRCUITS
AND GAS MIXING DEVICE x1 & 1,5

Model: SPARK 2

ver. 2.0, 2016

STANDARD REFERENCES:

- IEC 60079-11:2011 Explosive atmospheres - Part 11:
- EN 60079-11 Equipment protection by intrinsic safety "i",
- ISA 60079-11 Spark Test Apparatus

SPECIFICATION:

Spark chamber volume	0,5 L
Chamber working pressure	$P_{max} > 20$ bar
Quick open/close system	bayonet lock
Automatic ignition detection	built-in pressure sensor
Cut-off safety switch	top head closed position
Warning sound	test completed automatic stop ignition
Automatic stop	procedure completed ignition detected top head opened
Internal flame arresters	on gas inlet and outlet
Broken electrode detection	calibration procedure new disc conditioning
Rotating cadmium disk holder	double sealed gold plated
Rotating electrode holder	double sealed gold plated
Electrode material	tungsten wire
Electric step-motor	80 rpm
Gear wheels	50:12 ratio
Rotating connectors	hermetic resistance below $1m\Omega$ current allowed $\geq 100A$
Electric contacts & terminals	gold plated
Fusing instrument	tungsten wire cutting
Gas mixing device	mixtures I, IIA, IIB, IIC safety factor x1 & x1,5 automatic % control safety circuit
Automatic disc conditioning	20 000 revolutions
Weight:	14kg
Dimensions (WxDxH) :	520 x 425 x 486 [mm]
Power supply:	110 or 230 VAC



UNIQUE FEATURES OF SPARK 2 APPARATUS:

Very compact desktop design

Turn-key project ready to work just after delivery

Automatic ignition detection & pressure release to the outlet tube

User control panel

Gold plated electric contacts

Built-in flame arresters

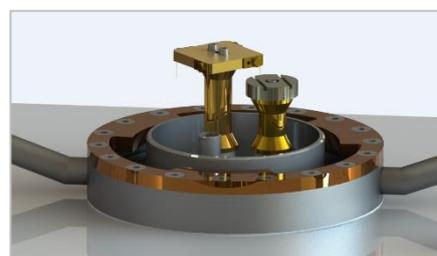
Tungsten wire fusing instrument

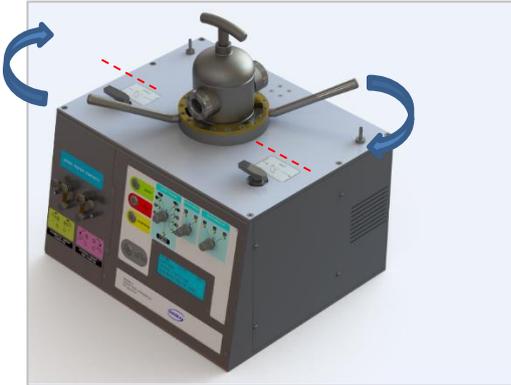
External current circuit available

Automatic pressure release after ignition detected

Gas mixing device

Broken electrode detection



QUICK OPEN/CLOSE SYSTEM – BAYONET LOCK APPLIED**TOP HEAD WITH VERTICAL SIGHT GLASS (optional)****CADMIUM DISK AND ELECTRODE DRIVE BLOCK**

Electric step-motor 80 rpm.

Gear wheels: 50:12 ratio.

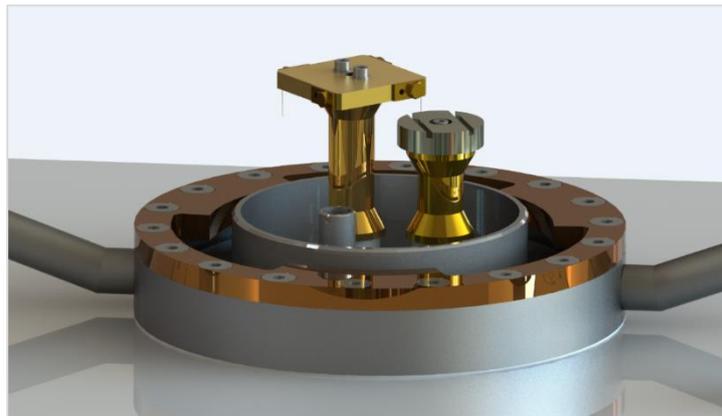
Rotating connectors

resistance below 1m Ω

maximum current allowed \geq 100A.

Tungsten electrode holder:
double sealed, gold plated.

Cadmium disk holder:
double sealed, gold plated

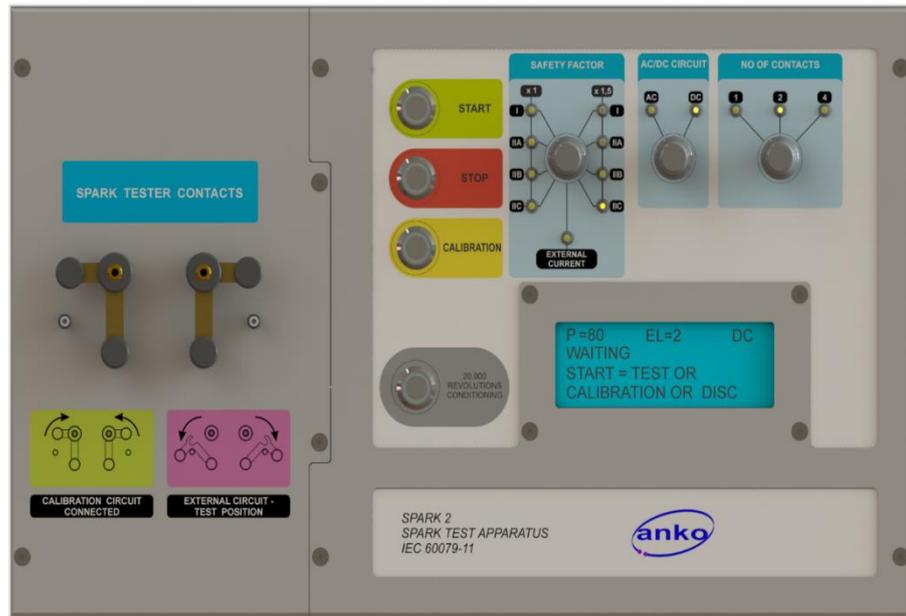
**TUNGSTEN WIRE FUSING INSTRUMENT**

Tungsten bare wire must be fused
to make short electrodes

Design according to: IEC 60079-11:2011



SPARK 2 FRONT PANEL



FRONT PANEL FUNCTIONALITY

LCD DISPLAY:	All necessary comments are shown for operator before, during and after the test.
START:	Activates selected option.
STOP:	Stops immediately all actions.
CALIBRATION:	Ignition sensitivity test before each series. Gas mixtures I, IIA, IIB, IIC and safety factor x1 or x1,5. LED diode displays selected option.
AC/DC:	Tested circuit AC or DC
NO OF ELECTRODES:	1, 2 or 4. Number of electrodes is defined prior to the test.
EXTERNAL CURRENT:	optional external current circuit. Any current supply circuit can be connected for calibration procedure.
20.000 REVOLUTIONS CONDITIONING:	Automatic 20.000 revolutions procedure (cadmium disk conditioning) with broken electrode detection.
BROKEN ELECTRODE DETECTION:	Calibration and 20.000 procedures are stopped automatically if broken electrode is detected.

SPARK TESTER CONTACTS

POSITION OPENED:

- Test circuit can be connected for examination
- External current supply can be connected for sensitivity test before each series.

POSITION CLOSED:

- Internal calibration circuit is connected to spark electrodes. Ignition sensitivity test should be performed before each test series.
- Current block corresponding to group: I, IIA, IIB, IIC and safety factor x1 or x1,5 is connected to spark electrodes.

GAS MIXING DEVICE

Gas mass flow controllers applied

Rotary switch gas selector

Gas mixtures I, IIA, IIB, IIC
safety factor x1

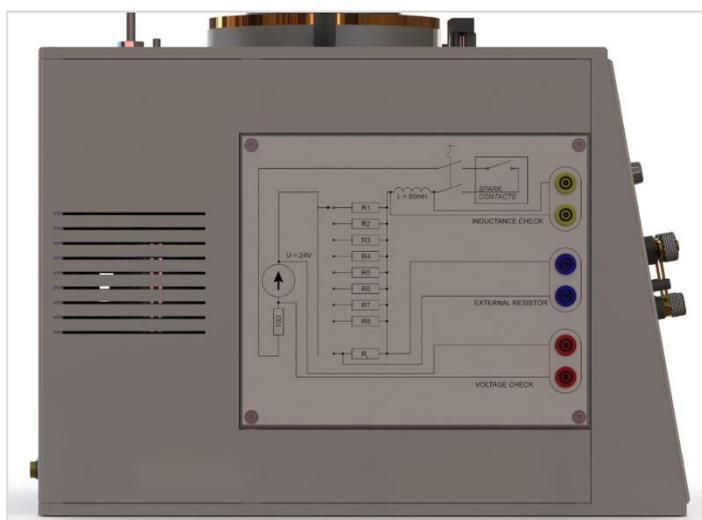
Gas mixtures I, IIA, IIB, IIC
safety factor x1

Gas % concentration control block

LCD display Flame interrupters

Pneumatic cut-off valves stainless steel
visual on/off indicator

High pressure tubes, fittings
stainless steel



SPARK 2 SIDE PANEL - ELECTRIC CIRCUIT DIAGRAM OF SPARK TEST APPARATUS

Banana connectors	gold-plated
Voltage check	red connectors 24VDC power supply
Inductance check	yellow connectors
External resistor	blue connectors for current control
Resistance check	yellow + red
R1 ... R4	I, IIA, IIB, IIC x 1
R5 ... R8	I, IIA, IIB, IIC x 1,5 current adjustment

ACCESSORIES

sight glasses	1 set
cut-off valves	1 set
gaskets	1 set
gears	1 set
cadmium disk	1 pc.
tungsten electrodes	2 sets
copper electrodes for tungsten wire fusing instrument	1 set

MANUALS

Installation manual	English
Operating manual	English
Maintenance guide	English

TRAINING AND ASSISTANCE

Installation assistance
Training on-site

The specifications given in this document represents the state of engineering at the time of publishing. We reserve the right to make modifications to above specifications.