

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

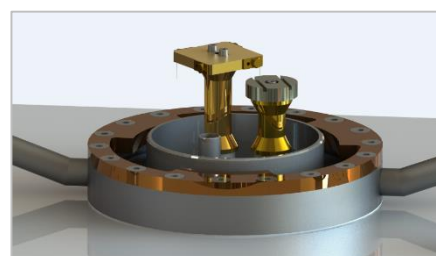
## SPECIFICATION:

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 1mΩ 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.

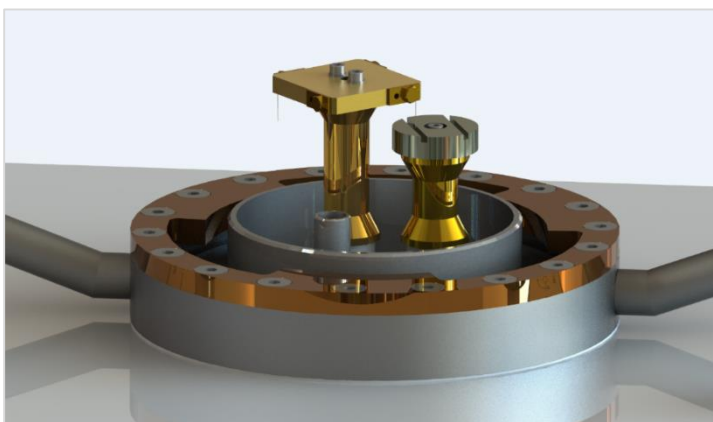
Rotating connectors

resistance below  $1\text{m}\Omega$

maximum current allowed  $\geq 100\text{A}$ .

Tungsten electrode holder:  
double sealed, gold plated.

Cadmium disk holder:  
double sealed, gold plated



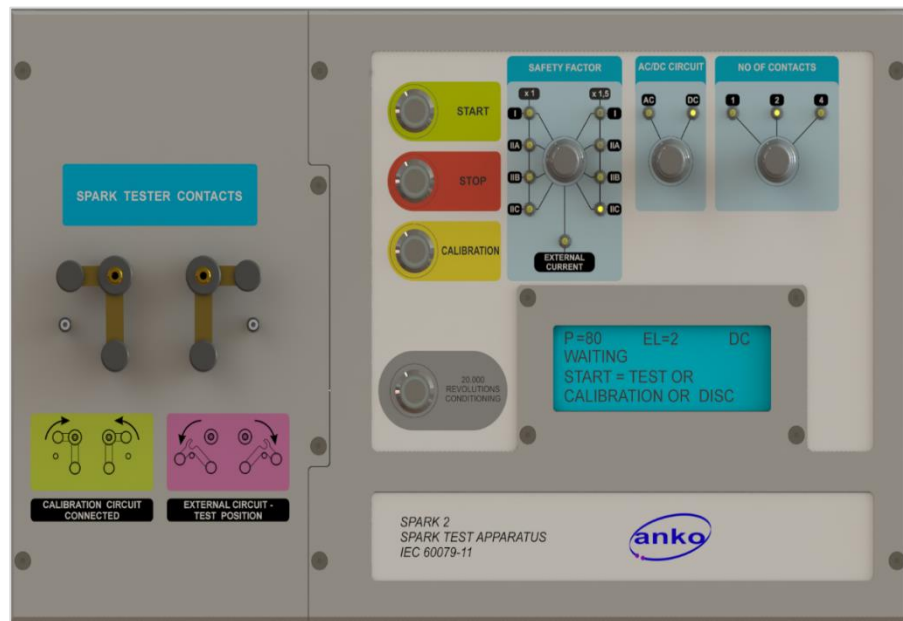
## TUNGSTEN WIRE FUSING INSTRUMENT

Tungsten bare wire must be fused  
to make short electrodes

Design according to: IEC 60079-11:2011



## SPARK 2 FRONT PANEL



### FRONT PANEL FUNCTIONALITY

<b>LCD DISPLAY:</b>	All necessary comments are shown for operator before, during and after the test.
<b>START:</b>	Activates selected option.
<b>STOP:</b>	Stops immediately all actions.
<b>CALIBRATION:</b>	Ignition sensitivity test before each series. Gas mixtures I, IIA, IIB, IIC and safety factor x1 or x1,5. LED diode displays selected option.
<b>AC/DC:</b>	Tested circuit AC or DC
<b>NO OF ELECTRODES:</b>	1, 2 or 4. Number of electrodes is defined prior to the test.
<b>EXTERNAL CURRENT:</b>	optional external current circuit. Any current supply circuit can be connected for calibration procedure.
<b>20.000 REVOLUTIONS CONDITIONING:</b>	Automatic 20.0000 revolutions procedure (cadmium disk conditioning) with broken electrode detection.
<b>BROKEN ELECTRODE DETECTION:</b>	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

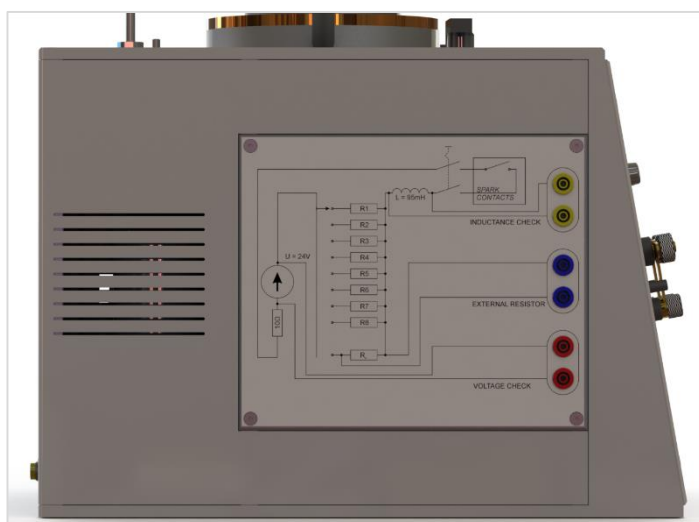
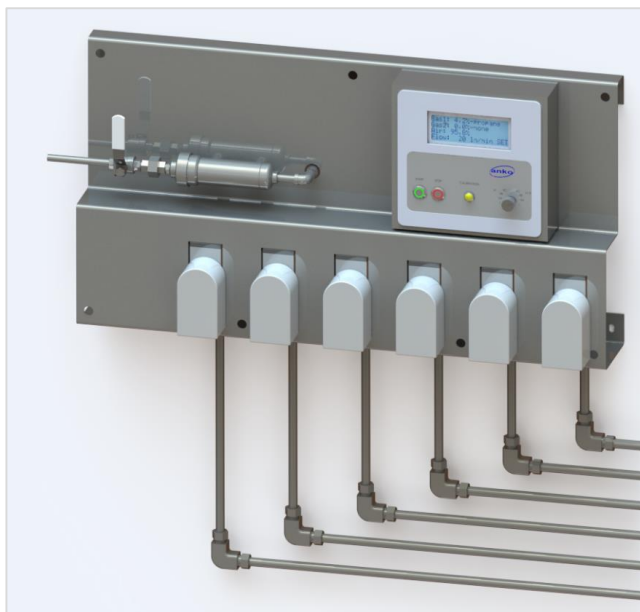
Gas mixtures I, IIA, IIB, IIC  
safety factor x1

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

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