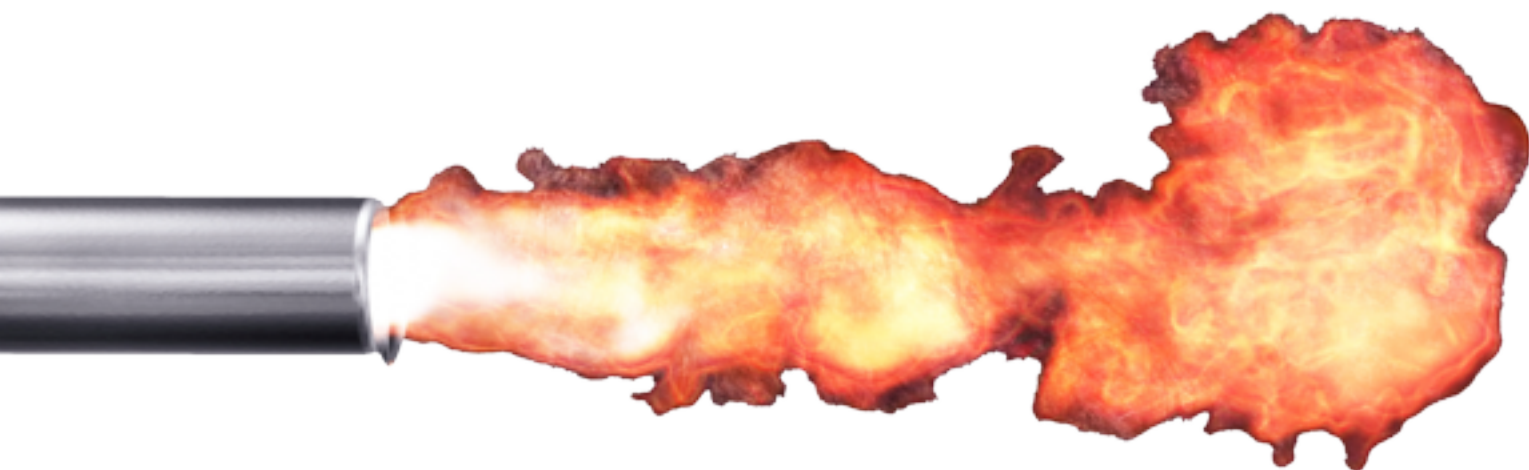


A low-angle photograph of an industrial refinery or chemical plant. Several tall, silver-colored distillation columns are visible, surrounded by a complex network of pipes, walkways, and yellow safety railings. The sky is a clear, vibrant blue with a few wispy white clouds.

Ignition devices

Lighting up Innovation



Proven leader in the industrial ignition industry, Tesi manufactures a unique range of **HIGH ENERGY, HIGH VOLTAGE** and **PORTABLE IGNITION SYSTEMS** assuring ignition in any conditions, supplying major petrochemical players worldwide.

Tesi is a globally renowned company and a **proven leader in the ignition industry**.

We design and manufacture best in class **ignition systems for gas, oil, coal and multi-fuel burners**, supplying major petrochemical, chemical and energy players at a worldwide level with state of the art devices.

Relying on **more than 30 years of expertise** and highly skilled technicians, Tesi offers a unique range of new generation ignition systems, electrodes and spark plugs. Our mission is to provide our customers with the most suitable solutions, **specifically designed to satisfy their operational requirements and specifications**.



HIGH ENERGY IGNITION SYSTEMS

High Energy ignition systems assure **easy ignition in any conditions**, providing the following advantages:

- they **can replace traditional air/gas pilot torches**, providing the most reliable and cost-effective fuel ignition whether gas, light oil, diesel or heavy oil is used
- they are **not affected by humidity or liquids** (100% waterproof) or by dirty deposits left onto electrodes by burning processes
- they are **maintenance free**, offering **lower ignition costs** and high adaptability in all kind of burners, even replacing old traditional ignition devices
- they are safer for end users, with no risks of electric shocks.

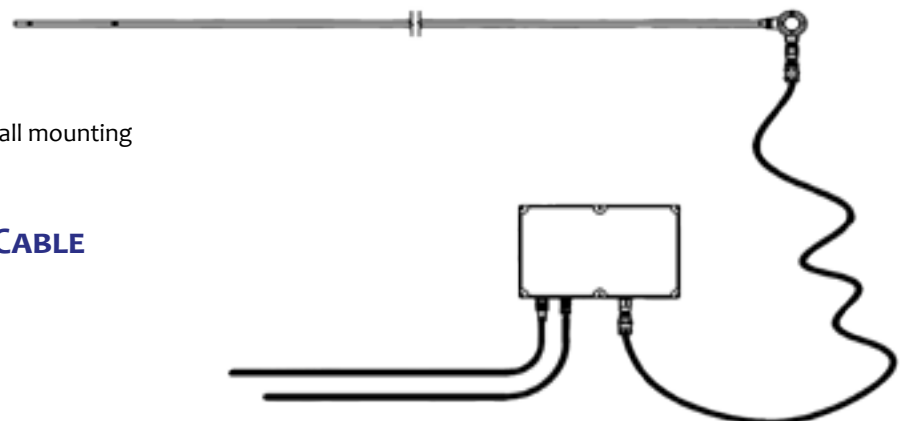


The main components of the ignition system are:

- a **POWER PACK UNIT**
installed in an enclosure box suitable for wall mounting
- a **HIGH ENERGY IGNITION ROD**
- a **HIGH VOLTAGE CONNECTION CABLE**



All Tesi products are CE marked



HIGH ENERGY POWER UNITS AND ENCLOSURES

Tesi ignition systems feature a high flexibility of applications, both in safe and hazardous areas.

According to the areas where ignition systems shall be installed, Tesi can provide **POWER UNITS IN DIFFERENT TYPES OF ENCLOSURES**, suitable for **potentially explosive atmospheres (ATEX classified)**:



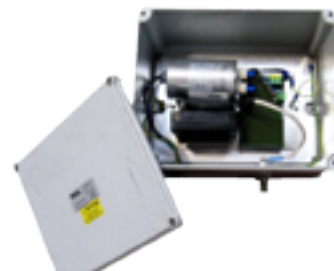
XEC SYSTEM WITH EJB ENCLOSURE

Fixed and portable systems that can satisfy even the most critical applications for **hazardous areas**
II2G Ex d IIB T5 IP54



XEC WITH GUB ENCLOSURE

Fixed and portable systems that can satisfy even the most critical applications for **hazardous areas**
II2G Ex d IIC T5 IP66



XEC WITH SA ENCLOSURE

Fixed and portable systems that can satisfy even the most critical applications for **safe areas IP65**

SOLID STATE HIGH ENERGY POWER UNIT

Tesi Solid State spark gas circuit is the most recent product in the ignition range.

It is **100% electronic** and features an innovative technology which makes it the **MOST POWERFUL** ignition device available on the market.

FEATURES

EXTREME POWER:

from 144 Watt (Joules per sec) to 250 Watt of delivered power

MAXIMIZED OPERATIONAL LIFE:

sparks persist on the tip 20 times more ($>600 \mu s$).
Since a greater persistence of the spark usually causes faster wear for normal tips, the system comes with heavy-duty tips, which tests indicate to have an average life of 1.5 million sparks.

EASE OF LIGHTING:

the solid state power unit can light all kind of Heavy Liquid Fuels in an extremely more effective way

CONSTANT SPARK FREQUENCY:

due to extremely customized power module designs

ENHANCED DURABILITY:

no wear

HIGH SAFETY:

built-in red light flashing until capacitor holds residual charge



BACK UP SPARK GAP:

allows to never stop the unit even in case of failure

AUTO PROTECTION:

in case of capacitor failure, spark tip damage/failure or ignition cable breaking, output shortcut, solid state module fault, transformer over-heating.

RETROFIT & UPGRADE:

Designed to operate jointly with XEC24 power unit (see next page), the solid-state circuit offers the possibility to upgrade an existing system with a gas spark gap.

MAINTENANCE FRIENDLY:

also thanks to an optional built-in spark counter available

STANDARD HIGH ENERGY POWER UNITS

Standard high energy power units are suitable to light all gases and light oil in boilers, furnaces or gas turbines.

The output energy of up to 18 Joules provides powerful sparks ensuring ignition in any conditions and environments, with no risk of failure due to contaminants or humidity.



MODEL	ENERGY	MAIN INLET VOLTAGE	INPUT POWER
XEC 18-H	18 J	115/230 VAC	60 W
DIMENSIONS	235 x 135 x 110 (h) mm		
DUTY CYCLE	20 sec ON - 40 sec OFF max 3 times 33%		
SPARK FREQUENCY	2 sparks / second		
OPERATING TEMPERATURE	-5°C ÷ +60°C	-30°C ÷ +60°C on request	

data subject to change without notice



The latest innovation in Tesi standard power units range is the development of a main board equipped with a **FEEDBACK SYSTEM** detecting the ongoing ignition process.

HEAVY DUTY HIGH ENERGY POWER UNITS

Heavy duty high energy power units feature a considerably higher power compared to standard power units, and are able to **ignite diesel and heavy oil directly**. They come in different configurations depending on **whether a higher power or spark frequency is required**.



Heavy Duty power unit in certified ATEX enclosure



Heavy Duty power unit in certified ATEX enclosure



Heavy Duty power unit in Safe Area enclosure

XEC - 10 TECHNICAL DATA

INPUT VOLTAGE	115 or 230 Vac 50 Hz (60 Hz on request)	
INPUT CURRENT	max 10 A	RMS current ~ 4 A (at 24 sparks/sec)
INPUT POWER	according to spark frequency	750 W (at 24 sparks/sec)
OUTPUT VOLTAGE	1400 V	+/- 10%
OUTPUT ENERGY	10 J	each spark +/- 10%
DUTY CYCLE (60°C)	according to spark frequency	max 1 minute ON / min 2 minutes OFF max 3 subsequent sequences (at 24 sparks/sec)
SPARK FREQUENCY	24 sparks / second (adjustable on request)	
OPERATING TEMPERATURE	-5°C ÷ +60°C	-30°C * ÷ +60°C on request
PROTECTION GRADE	IP66	other options on request

data subject to change without notice

XEC - 15 TECHNICAL DATA

INPUT VOLTAGE	115 or 230 Vac 50 Hz (60 Hz on request)	
INPUT CURRENT	max 5 A	RMS current ~ 3.5 A (at 4 sparks/sec)
INPUT POWER	according to spark frequency	350 W (at 4 sparks/sec)
OUTPUT VOLTAGE	1400 V	+/- 10%
OUTPUT ENERGY	15 J	each spark +/- 10%
DUTY CYCLE (60°C)	according to spark frequency	max 15 minute ON / min 3 minutes OFF max 3 subsequent sequences (at 4 sparks/sec)
SPARK FREQUENCY	4 sparks / second (adjustable on request)	
OPERATING TEMPERATURE	-5°C ÷ +60°C	-30°C * ÷ +60°C on request
PROTECTION GRADE	IP66	other options on request

data subject to change without notice

XEC - 24 TECHNICAL DATA

INPUT VOLTAGE	115 or 230 Vac 50 Hz (60 Hz on request)	
INPUT CURRENT	max 10 A	RMS current ~ 3.15 A (at 6 sparks/sec)
INPUT POWER	according to spark frequency	550 W (at 6 sparks/sec)
OUTPUT VOLTAGE	1400 V	+/- 10%
OUTPUT ENERGY	24.5 J	each spark +/- 10%
DUTY CYCLE (60°C)	according to spark frequency	max 8 minute ON / min 16 minutes OFF max 3 subsequent sequences (at 6 sparks/sec)
SPARK FREQUENCY	6 sparks / second (adjustable on request)	
OPERATING TEMPERATURE	-5°C ÷ +60°C	-30°C * ÷ +60°C on request
PROTECTION GRADE	IP66	other options on request

data subject to change without notice

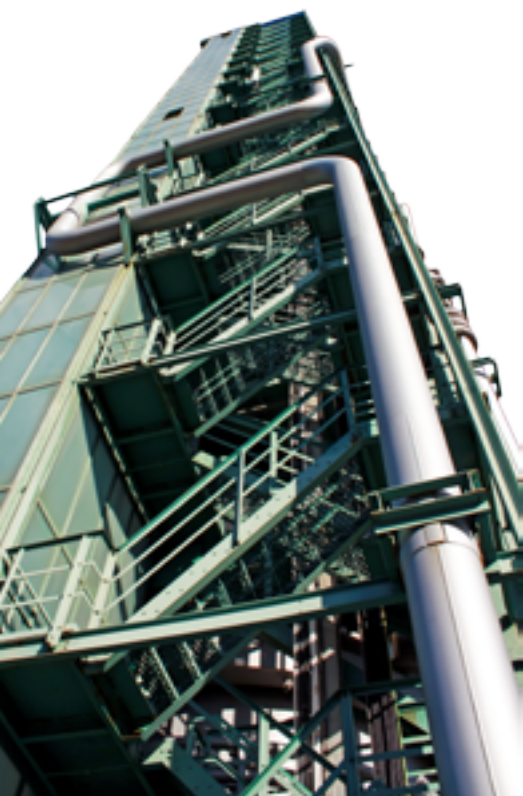
* special execution

HIGH ENERGY IGNITION MODULES

Tesi ignition modules are primarily intended for installation in electrical panels to ignite **ground and tall flares**. They are specifically designed to provide a good spark at **very long distances**, with a **power cable up to 500 m long**. The new housing is filled with resin, in order to ensure **waterproof** performance under all conditions, which is particularly important in outdoor applications.

The positioning of the flares typically requires the ignition units power supply to be installed far from the ignition rod. This often makes it difficult to generate a powerful spark, because of the length of the power supply cable.

As is known, since flares systems are responsible for the disposal of process gas in refineries and petrochemical plants, they need to be fitted with an **extremely reliable ignition system** that ensures instant flare ignition on demand.



TECHNICAL DATA

POWER SUPPLY UNIT	
INPUT VOLTAGE	115 - 230 Vac 50/60 Hz
OUTPUT VOLTAGE	1000 VDC
OUTPUT ENERGY (PER SPARK)	18 J
SPARK FREQUENCY	2 sparks / second
INPUT POWER	110 W

ENCLOSURE	
PROTECTION CLASS	IP65
MATERIAL	Powder Coated Steel
DIMENSIONS	170 x 140 x 85 mm
WEIGHT	2,5 kg
DUTY CYCLE 33%	20 sec ON - 40 sec OFF max 3 times

ADDITIONAL SPECIFICATIONS	
IN-OUT CONNECTIONS	2 cables 1 m long
INPUT VOLTAGE	12/24 Vdc on request

data subject to change without notice

HIGH ENERGY IGNITION SPARK RODS

Tesi product range includes a broad selection of ignition rods.

The recent and ever increasing demand for **direct ignition of main burners** led Tesi to develop a dedicated range **specifically designed for overexposure to high temperatures**. This range, allowing to replace pilots, leads also to a considerable reduction in the plants manufacturing and operational costs.

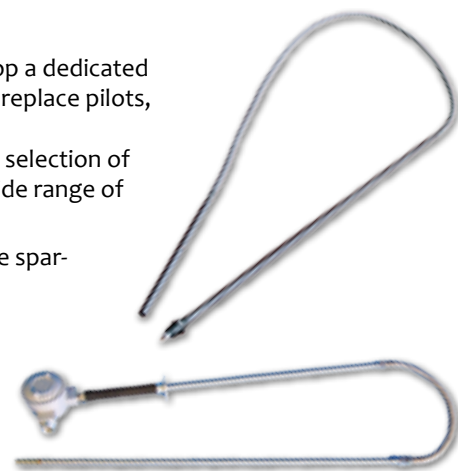
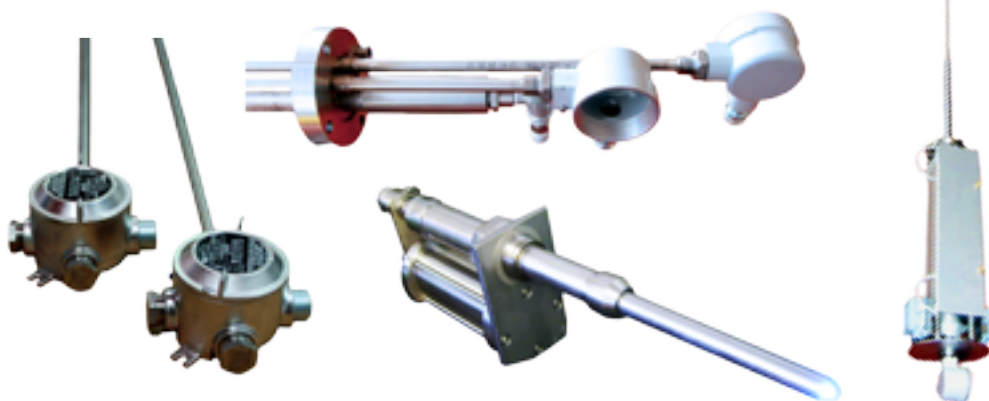
In order to satisfy this operational need for direct ignition of main burners, Tesi introduced a selection of special solutions alongside standard devices, that makes them suitable to ignite directly a wide range of fuels including natural gas, fuel gas, diesel, light fuel oil (LFO) and heavy fuel oil (HFO):

- **side or coaxial retractable pneumatic devices** protecting tips from dirt and flames once sparking is finished
- **tilting flexible rods** to follow the main burner's angle
- **guide pipes**

Our key strength is the ability to provide **CUSTOM CONFIGURATIONS**.

Tesi **utmost flexibility** is highly appreciated among our customers, since it allow us to **meet their real requirements**.

Tesi ignition rods range comes in three main standard diameters: 12 / 14 / 17 mm; **length and diameter of the igniter are customizable**, and various accessories are available in order to satisfy any operational need.



FEATURES

High reliability

The powerful sparks ensure reliable ignition in all conditions and environments, removing any risks of failure due to contaminants or humidity.

Low maintenance

Tesi self-cleaning spark tips guarantee a successful ignition while reducing maintenance efforts. The high power of the sparks cleans the surface of the tip during every ignition.

Igniters and flame ionization electrodes can be easily disassembled, without pulling out the entire pilot.

Easy tip replacement

Being spark tips screwed onto the end of the rod, they can be replaced quite easily, reconditioning the system very quickly and reducing costly downtime.

Accessories & spare parts

A wide range of accessories and spare parts on stock can be quickly supplied and allows for customization of the systems according to customer specifications.

Compact design & flexibility

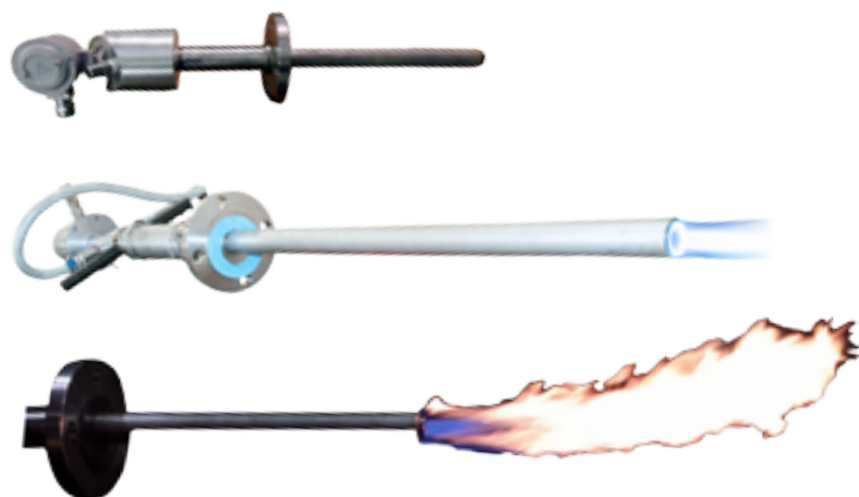
Dimension and shape can be fully customized to match customer requirements.

PILOT BURNERS

Tesi ignition devices include a wide range of pilot burners, available with:

- built-in **High Energy or High Voltage ignition rod**
- **flame monitor device** by optical or ionization rod
- thermocouples

Tesi pilot burners range includes: **GAS, OIL, DUAL FUEL PILOT BURNERS**.



HIGH ENERGY STANDARD REPLACEABLE SPARK TIPS

HERC 17			
CODE	OPERATING TEMPERATURE		DIAMETER
ZZA00106	760°C (max 1000°C)	1400°F (max 1832°F)	17 mm
ZZA00106HT	1000°C	1400°F	17 mm

HEM 17			
CODE	OPERATING TEMPERATURE		DIAMETER
ZZA00100	760°C (max 1000°C)	1400°F (max 1832°F)	17 mm
ZZA00100HT	1000°C	1400°F	17 mm

HEM 14			
CODE	OPERATING TEMPERATURE		DIAMETER
ZZA00130	760°C (max 1000°C)	1400°F (max 1832°F)	14 mm
ZZA00130HT	1000°C	1400°F	14 mm



IDEAL FOR:

OUTDOOR	WATERPROOF
✓	✓
GAS	HEAVY OIL
✓	✓

IGNITION DEVICES TESTING KIT

Tesi ignition testing kit allows to perform a complete set of tests to **check the correct functioning** of retraction devices and accessories, spark rods and high energy cables.

The testing kit consists of a **control panel** and a **test box** in which the sparking components can be tested:

- SPARK TIP TEST
- RETRACTION UNIT TEST
- IGNITION SPARK ROD TEST
- HIGH VOLTAGE CABLE TEST



HIGH ENERGY PORTABLE IGNITERS

Tesi portable ignition devices are designed to ignite burners without an individual pilot torch or electrode assembly. They are the best back up solution to solve existing igniters failures or in case of emergency. Thanks to a solid design and low voltage input, the operator can handle the rod quite easily during maintenance, without any risk of breaking the insulators and avoiding dangerous electric shocks.

XE 18 PB 06

- THEY DON'T NEED TO BE LINKED TO THE MAIN POWER SUPPLY
- INTERNAL 12 V 7.2 Ah RECHARGEABLE BATTERY
- BUILT-IN AUTOMATIC CHARGER
- HIGH ENERGY SPARK GENERATED
- THEY ARE SUITABLE TO IGNITE ALL KINDS OF FUEL EVEN IN TOUGH APPLICATIONS

XE 18 PB 06 TECHNICAL DATA

POWER SUPPLY UNIT	
INPUT VOLTAGE	12 VDC
OUTPUT VOLTAGE	1400 VDC
OUTPUT ENERGY (PER SPARK)	18 J
SPARK FREQUENCY	4 sparks/second

ENCLOSURE	
PROTECTION CLASS	IP65
MATERIAL	aluminium alloy
OPERATING TEMPERATURE	-20°C ÷ +50°C
DIMENSIONS	344 x 272 x 110 mm
WEIGHT	5,7 kg

BATTERY CHARGER	
INPUT VOLTAGE	115 or 230 Vac 50 Hz
RECHARGE OUTPUT VOLTAGE	13,5 VDC

IGNITER	
MATERIAL	stainless steel
OPERATING TEMPERATURE	760°C (max 1000°C)
WEIGHT	0.8 Kg per meter of length
LENGTH	customizable, according to specifications
TIP	High Energy, easily replaceable 17 mm (12/14 mm on request)
HANDLE	rubber, 150 mm as standard, 90° on request
OPTIONAL	adjustable stopping flange

CONNECTION CABLE	
MATERIAL	flexible stainless armoured cable
FITTINGS	bend or straight
OPERATING TEMPERATURE	-60°C ÷ +180°C (200°C for short time)
WEIGHT	0.4 Kg per meter of length
LENGTH	customizable, according to specifications



NOTE:

In case of frequent use, you can leave the charging circuit connected to the mains power supply (115 / 230VAC), in Not Classified Areas, provided you keep the ½ " gas evacuation cap completely open. Once maximum charge is reached, the charger will provide an appropriate holding current. After repositioning the cap and the charging cable, you have an ignition system always ready for use. If you're leaving the device unused for an extended period of time or in case of storage, disconnect the battery from the electronic circuit.

XE 18 PBA 04 ATEX

CERTIFIED ATEX II2G Ex D IIC T5 IP65

- THEY DON'T NEED TO BE LINKED TO THE MAIN POWER SUPPLY
- INTERNAL 12 V 3.6 Ah Ni-Cd RECHARGEABLE BATTERY
- BUILT-IN AUTOMATIC CHARGER
- HIGH ENERGY SPARK GENERATED
- THEY ARE SUITABLE TO IGNITE ALL KINDS OF FUEL EVEN IN TOUGH APPLICATIONS

XE 18 PBA 04 II2G Ex D IIC T5 IP65 TECHNICAL DATA

POWER SUPPLY UNIT	
INPUT VOLTAGE	12 VDC
OUTPUT VOLTAGE	1400 VDC
OUTPUT ENERGY (PER SPARK)	18 J
SPARK FREQUENCY	4 sparks/second
INPUT POWER	21 W

ENCLOSURE	
PROTECTION CLASS	II2G Ex d IIC T5 IP65
MATERIAL	aluminium alloy
OPERATING TEMPERATURE	-20°C ÷ +70°C
DIMENSIONS	355 x 270 x 165 mm
WEIGHT	10 kg

BATTERY CHARGER	
INPUT VOLTAGE	115 or 230 VAC 50 Hz
RECHARGE OUTPUT VOLTAGE	13.5 VDC

IGNITER	
MATERIAL	stainless steel
	electrical connection of aluminium alloy
	Junction Box Ex d IIC IP66 included
OPERATING TEMPERATURE	760°C (max 1000°C)
WEIGHT	0.8 Kg per meter of length
LENGTH	customizable, according to specifications
TIP	High Energy, easily replaceable 17 mm (12/14 mm on request)
HANDLE	rubber, 150 mm as standard, 90° on request
OPTIONAL	adjustable stopping flange

CONNECTION CABLE	
MATERIAL	flexible stainless armoured cable
INSULATION	external silicon rubber
FITTINGS	1/2" ISO 7/1 NPT or metric on request
OPERATING TEMPERATURE	-40°C ÷ +180°C (200°C for short time)
WEIGHT	0.4 Kg per meter of length
LENGTH	customizable, according to specifications



NOTE:

In case of frequent use, you can leave the charging circuit connected to the mains power supply (115 / 230VAC), in Not Classified Areas, provided you keep the 1/2" gas evacuation cap completely open. Once maximum charge is reached, the charger will provide an appropriate holding current. After repositioning the cap and the charging cable, you have an ignition system always ready for use. If you're leaving the device unused for an extended period of time or in case of storage, disconnect the battery from the electronic circuit.

CONNECTION CABLES

Tesi connection cables range includes:



ARMOURED HIGH TEMPERATURE CABLE

This high voltage armoured cable has a single core copper wire and flat stainless steel braid (AISI 304). It is high temperature resistant, non combustible, oil resistant, alogen free and highly flexible.



ARMOURED HIGH ENERGY CABLE

This high voltage double core armoured cable has a flat stainless steel braid (AISI 304). It is non combustible, oil resistant, alogen free, highly flexible and suitable also for ATEX areas.



SAFE AREA ARMOURED HIGH VOLTAGE CABLE

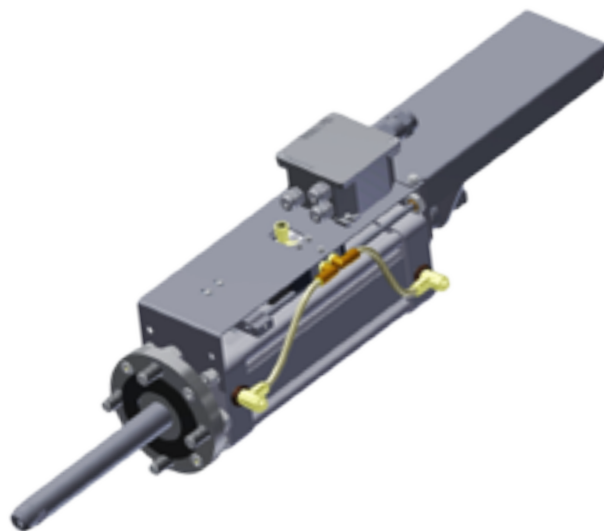
This cable is specifically designed according to the requirements of each ignition box and ignition rod, in order to meet in the best possible way customers operational needs. It is also available in High Temperature configuration.

ACCESSORIES: PNEUMATIC COAXIAL RETRACTION UNIT

In order to prevent tips from flames and corrosive atmospheres (for example in sulfur burners) Tesi developed a **smart and compact retractable device** that can be easily mounted on standard ignition rods. This device allows retraction of the spark tip in a protected area of the combustion chamber, once sparking is finished. On request, **ATEX executions are available**.

ACTUATOR TYPE	Pneumatic
ACTUATOR MATERIAL	Aluminium Cylinder, SS Rod, Viton Seals (SS cylinder on request)
ACTUATOR STROKE	100 ÷ 500 mm
VALVE TYPE	4-way / Dual Coil (or as required)
SOLENOID VOLTAGE	115 VAC, 230 VAC, 24 VDC, 48 VDC
SOLENOID CASING	IP65 - II2GD Ex d IIC for ATEX execution
JUNCTION BOX	Plastic or Aluminium, Factory Wired
JB PROTECTION CLASS	IP 65 / NEMA 4
TEMPERATURE RATING	-5 to 70°C (or as required)
SPEED CONTROL	2 Needle valves
LIMIT SWITCHES	2 Total, inserted / retracted
LIMIT SWITCH CASING	IP65 - II2GD Ex i IIC for ATEX execution

data subject to change without notice



With the aim to meet even the most demanding operational requirements, Tesi developed a **wide range of accessories and configurations**, including:

- insertion switches
- mounting flanges
- 90° handles
- rubber handles and stopping flanges
- ball joints
- positioning sensors
- manual retraction devices
- remote push buttons

