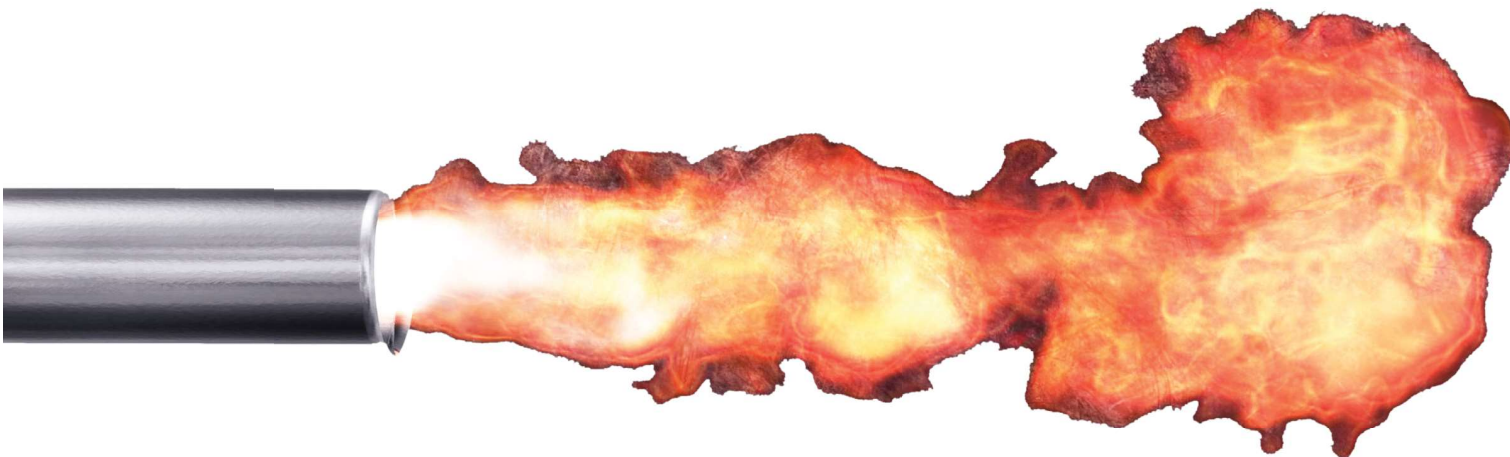




Ignition devices

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.

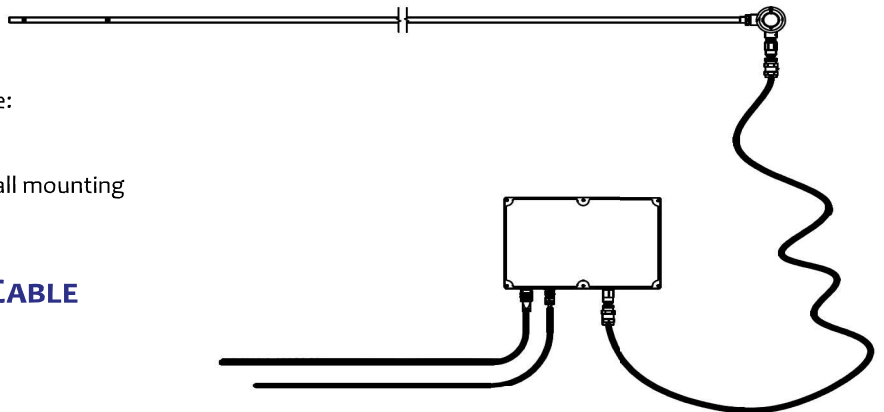
Relying on **more than 30 years of expertise** and highly skilled technicians, Tesi offers a unique range of new generation ignition systems, electrodes and spark plugs. Our mission is to provide our customers with the most suitable solutions, **specially designed to satisfy their real requirements and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



HIGH ENERGY IGNITION SYSTEMS

High Energy ignition systems assure **easy ignition in any condition**, 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**

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, fit to **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**

STANDARD HIGH ENERGY POWER PACKS

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

| 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 | | |

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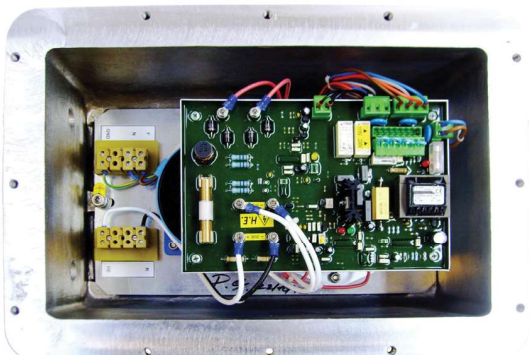


HEAVY DUTY HIGH ENERGY POWER UNITS

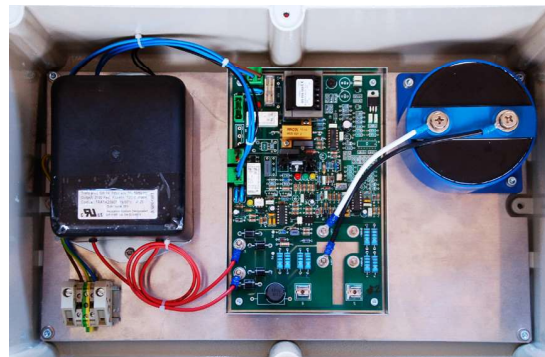
Heavy duty high energy power units feature a considerably higher power compared to standard power units, and are able to **ignite diesel and heavy oil directly**.

They come in three 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 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 | 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

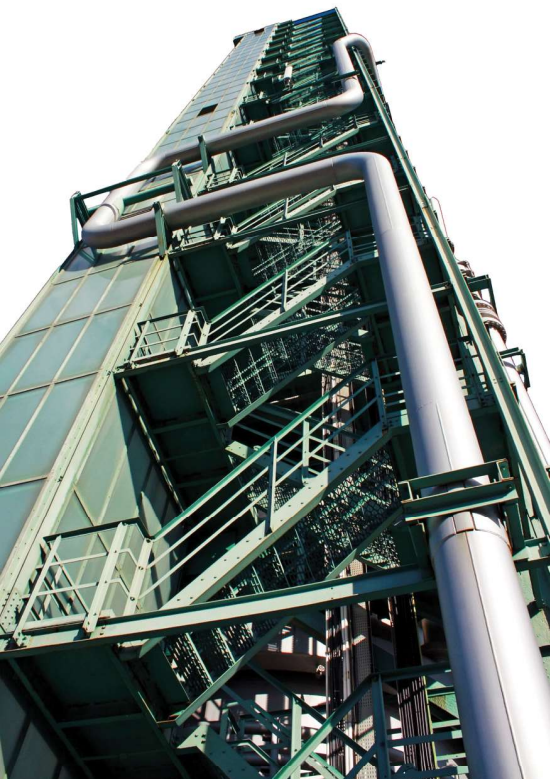
Tesi ignition modules are primarily intended for installation in electrical panels to ignite **ground and tall flares.**

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 |

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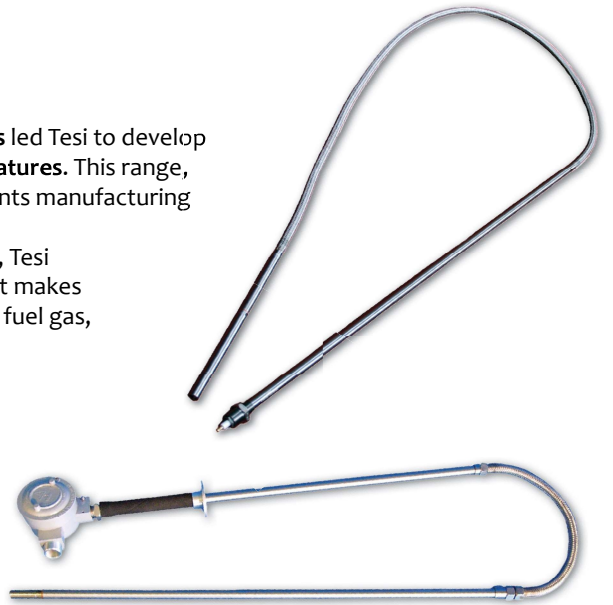
HIGH ENERGY IGNITION SPARK RODS

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.

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.

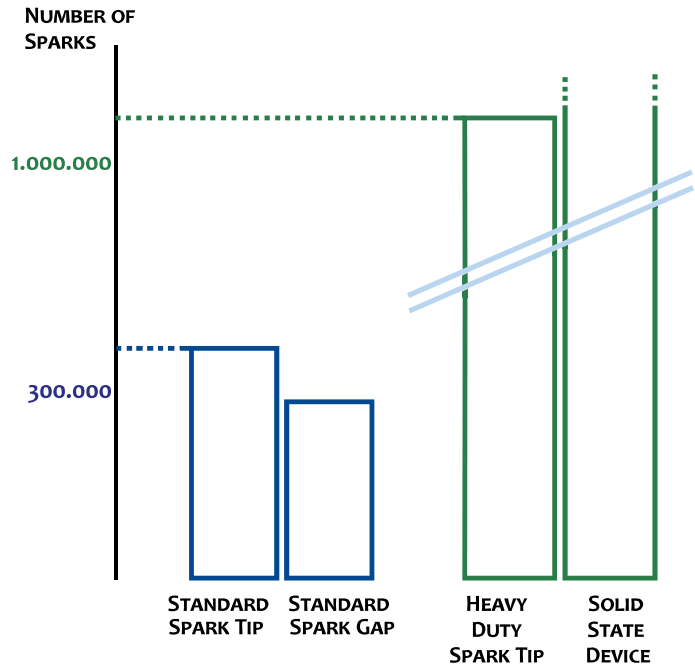


HIGH ENERGY SOLID STATE IGNITERS FOR HEAVY DUTY APPLICATIONS

Tesi solid state spark gap circuit feature an innovative technology allowing **up to 15 min. of continuous sparking** without the need to replace any consumable (gas spark gap).

FEATURES

- **constant performance** throughout the entire lifetime
- **longer durability** than a standard gas spark gap
- it delivers energy up to 24 Joules
- 4-24 sparks per second
- it ignites directly HFO and low flammable fuels
- it can **retrofit** traditional gas pilot torches



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

FEATURES

High reliability

Pressurized air and high energy sparks ensure reliable ignition, without any risk of failures during start up.

Compact design & flexibility

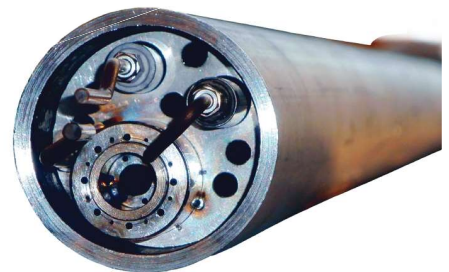
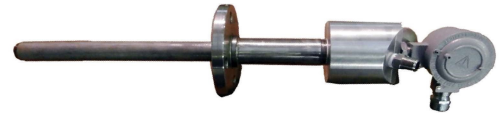
Dimensions and shape can be customized to match customer requirements.

Easy & quick maintenance

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

Tesi pilot burners range includes:

- Gas pilot burners
- Oil pilot burners
- 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 |
| 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 | -20°C ÷ +50°C |
| 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.

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 |
| 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 | -20°C ÷ +60°C (silicon cable only -40°C ÷ +180°C) |
| 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

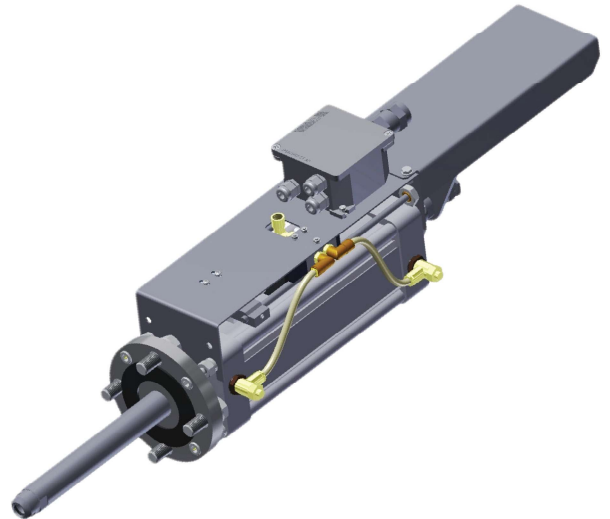
This cable is specifically designed according to the requirements of each ignition box and ignition rod, in order to meet in the best possible way customers operational needs. It is also available in High Temperature configuration.

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