DUVAL MESSIEN

Lightning control

A know how famous since more than one century

MANUFACTURER

STUDIES
AND ADVICES

INSTALLATIONS

CHECKING

Certified ISO 9001 QUALIFOUDRE MASE QUALIFELEC

DUVAL MESSIEN

DUVAL MESSIEN, EXCELLENCE BASED ON ITS STORY

The story of Duval Messien shoes that the length of service, research and innovation lead to excellence. For many years, our company has fought to be the best in its field and best in its service for customers.

The Duval Company was founded **in 1835** by Paul Duval to design, manufacture and sell flexible braided conductors and was honoured at the Universal Exhibition of year 1900 which featured developments in the science of electricity.

The Messien Company was founded **in 1927** by Georges Messien, the brilliant engineer who pioneered work on earthing systems and who is noted for many patented innovations in electrical protection.

These two companies merged **in 1952** under the name of Duval Messien and established a position as a dominant provider of electrical protection goods and services. Duval Messien prides itself on the thoroughness of its analysis of each assignment and believes that the best results can be achieved only by a full understanding of the specific needs of each client.

DUVAL MESSIEN, A CENTURY OF SPECIALIZATION AND INNOVATION

In order to maintain its position as a leader industry in the field of lightning protection and earthing systems, Duval Messien has made a major commitment to Research and Development.

The art to innovate is not natural. To obtain at the right moment the product which complies with the real market demand, results necessarily from a "Research and Development" process, elaborated on a rigorous way. To innovate is an investment, essential to ensure the durability of the product quality, of the service, of the brand and through them the customer satisfaction.

Determined to be able to offer state of the art solutions to its customers, Duval Messien takes the best from the new technologies: electronics, information technology, telecommunication, and high frequency currents to enhance the performance of its product ranges.

Thread the years; the technological innovation became one of the founding values of Duval Messien Company, wedded to the realization of safety equipments of a high liability, due to lightning physical phenomenon and electrical energy.

DUVAL MESSIEN, THE "GLOBAL PROTECTION" SPECIALIST

Our aim is to continue to be a company of first rank, able to offer the best in both fields of competences that is earthing systems conception and lightning protection systems.

On this market, our company is today able to offer a "Global protection" solution: from the study to the advice, from complete provision of installations guaranteed and certified at their installation and maintenance by contracts provided by our national and international network.
Duval Messien, certified ISO 9001, Qualifoudre, Qualifelec and MASE approved, disposes in France of two operational units : Chennevières –sur-Marne, in the department of Val de Marne, company's headquarter, where are brought together the technical and studies Departments : Velaux in the Bouches du Rhône, the Conception and Production center.

DUVAL MESSIEN, AN INTERNATIONAL COMPANY

Our capacity to innovate, our means in terms of Research and Development, of Manufacture and Commercialization, proves that we are one of the leader in the world in the Lightning Protection field.

The active presence of Duval Messien on the international markets from several years, its determination to continue the commercial development of its technologies of protection and to provide for the technical assistance of its customers, are the results of our constant commitment.

During the last twenty years, for all risky structures, industrial, public or private, Duval Messien used its know-how in many countries: south of Europe area and Mediterranean area, Maghreb, Middle-East, Latin America and North America, South of Asia and South East, China (where Duval Messien has a subsidiary).

More than 40 countries of the five continents, in particular those more exposed to the "lightning risk", used Duval Messien's new technologies.

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DUVAL MESSIEN

LIGHTNING PROTECTION
THE LIGHTNING CONDUCTORS

The role of the lightning conductors is to capture lightning to flow it into the ground by down conductors.

Duval Messien manufactures and installs lightning conductors of three categories.

Simple rod, with sharp, steel points, derived from earlier designs. They provide protection for small structures.

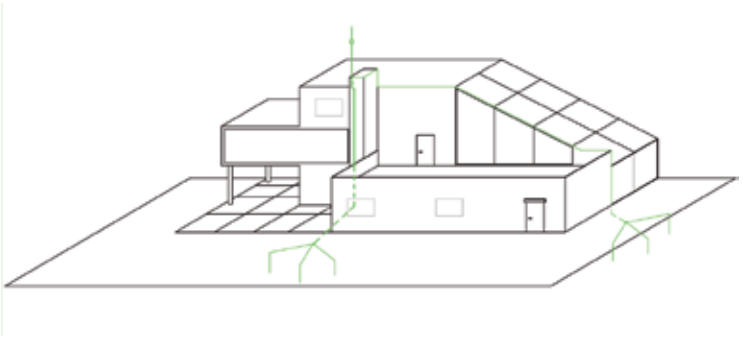
Early Streamer Emission (ESE),a development of simple rod, but in which the efficiency is enhanced by using a device generated High voltage pulses to create a corona / effect. This reduces meeting time between the upward and the downward leaders and makes designs suitable for much larger structures.
Duval Messien SATELIT range uses components from different technologies. They have a high performance and reliability.

Meshed cage or tight strands, based on the **« faraday cage »**, is composed if necessary of several strike points installed around the building and on its prominent features, at regular intervals. These strike points are connected to one another by meshes done with either, conductor installed on the roof, either with wires suspended above the building.

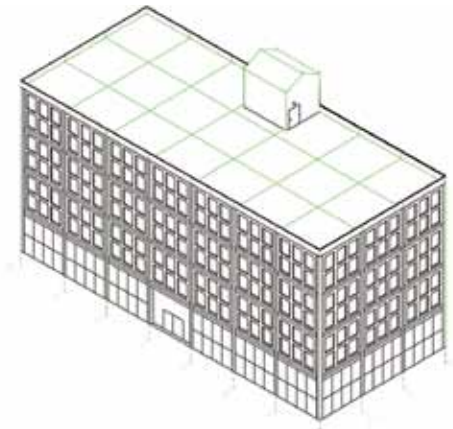
This type of lightning conductors distributes the flow of the discharge current among the various down conductors. By fostering equipotential discharges over the entire building, it reduces internal induction phenomenon and electromagnetical fields. It complies with electronic installations and vulnerable storages requirements.

EXAMPLE OF A SIMPLE ROD PROTECTION

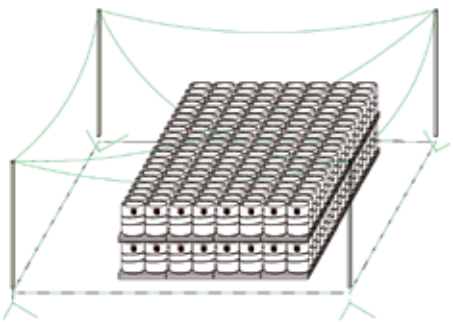
EXAMPLE OF AN ESE PROTECTION



EXAMPLE OF A MESHED CAGE PROTECTION



EXAMPLE OF A TIGHT STRAND PROTECTION



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OVERVOLTAGE PROTECTION: SURGE PROTECTIVE DEVICE

Personal safety has always been a priority for **Duval Messien**.

Nevertheless, installations safety became necessary by the equipment vulnerability due to new technologies.

Duval Messien's objective is to provide global protection, which includes protection against indirect effects of Lightning: induced overvoltage, main causes of damages on sensitive equipments. It can lead to the breakdown of computers and telecom networks, destroy phone cards and causes premature ageing of components.

After installations study, **Duval Messien** proposes efficient solutions installing specifical material at each sensitive equipment. **Duval Messien** takes in charge the conception and realization of implement plans for the equipotential bonding of metal constituents in any type of constructions.

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DIFFUSION INTO THE GROUND: DUVAL MESSIEN EARTHING SYSTEMS SPECIALIST

The aim of an earthing system is to flow the electrical current to the earth.
It can fullfil its role only if its environment and itself are made to allow a great mobility of electrons and ions.

In a conductor, it is a mobility of electrons which allows an electrical current passage.

In the ground, it is a mobility of ions which allows its diffusion. This same current provokes an exchange anion-cathion which contributes the absorption of diffused energy.

All the grounds, according to their nature, contain ions more or less moving, in variable quantities.

A ground with many resistivity contains few moving ions.

In the line of the first patent registered by Georges Messien, a large number of materials and new conceptions of earthing systems were invented by **Duval Messien**.

To obtain low resistance values, **Duval Messien** advices to privilege boring technics for electrodes installation, which were patents registered by Georges Messien.

A best profit and a big life time of the earthing systems can be done by **TEREC+**, a component which accelerates the ionic circulation in the ground.

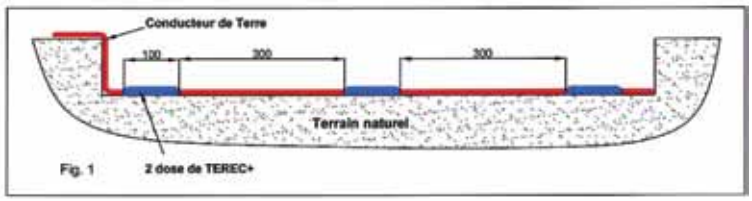
WHY USING TEREC +?

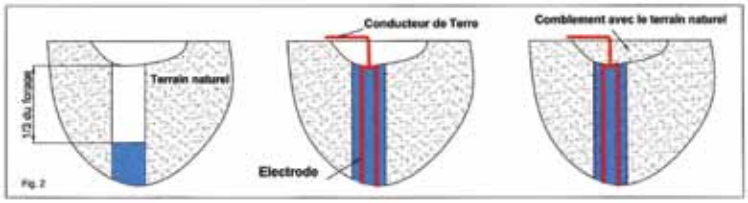
The **TEREC +** process is composed of several components which accelerate the ionic circulation. It provokes an energy absorption in a volume much more important than those of the theorical area of flowing situated around the earth electrode.
The **TEREC+** allows realizing earthing systems with low resistance, with electrode less long.
It reduces in a sensitive way their cost and their installation (trench or drill).
It is also accessible to earthing systems which the soil is useless without it.

ADVANTAGE OF THE TEREC

After the consecutive reaction at the installation, **TEREC+** is fixing and cannot be attacked by acids.
TEREC+ reactive under energy: more the earthing system will be required, more it will be efficient and more its life time will be bigger.

The **TEREC+**, which the ground, protects the earthing system from the frost, until a temperature of -10°C.
For a same dimension, an earthing system realized with TEREC+ will have impedance until five times inferior to an earthing system realized without TEREC;
It will be then more efficient for the flowing of high voltage current like Lightning.





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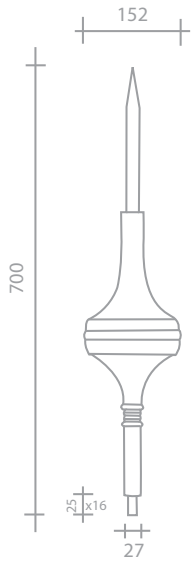
SATELIT™+G2



LIGHTNING CONDUCTOR CHARACTERISTICS:
TIP: DIAM 16MM
STAINLESS STEEL 304L
BODY: STAINLESS STEEL 304L
WEIGHT: 3, 6 KG

LIGHTNING CONDUCTOR

EARLY STREAMER EMISSION

Satelit ™+G2, second generation of Satelit + Early Streamer Emission range, offers by the structure of its optimized electrical circuit and use of specifical components, developed by our engineers, improved performances of impulsional capacity of ionization which the efficiency and reliability are proved by tests of conformity to the NFC 17-102 standard by independent laboratories in France and abroad.

Use of professional and simple utilization, there is a tester for **Satelit™+G2** which check the good functioning of the tool to its proximity.

CERTIFIED PERFORMANCES

The products of **Satelit™+G2** range were tested in Tests Center of Bazet (France) certified COFRAC, with the assistance and under the control of Lloyd's register as well as the High Voltage Laboratory of Pekin (China). The tests done according to NFC 17-102 standards confirm the **Satelit™+G2** performances.
The tests certificates are available upon request.

SATELIT™+G2 RANGE:

This one is composed of three models of distinct performances:
- Satelit ™+G2-25=> Excitation advance (Δt) = 25 µs
- Satelit ™+G2-45=> Excitation advance (Δt) = 45 µs
- Satelit ™+G2-60=> Excitation advance (Δt) = 60 µs

The radius of protection (Rp) classified by level of protection from 1 to 4, result from the application of the formula defined in the NFC 17-102 standards.
$Rp = \sqrt{2rh-h^2}+\Delta(2r+\Delta)$ for h ≥ or = 5m
With Rp= radius of protection
H=height of the Satelit TM+G2 tip above the area to protect
D=excitation distance defined by the standard, either:

-20m in level 1 (severe protection)
-30m in level 2 (reinforced protection)
-45m in level 3 (average protection)
-60m in level 4 (standard protection)
ΔL=gain in length of the ascending tracer
ΔL(m)=Đ(m/ µs).ΔT(µs) with (Đ=1m/µs)

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SATELIT™+G2

LIGHTNING CONDUCTOR

The protection of a building or a site can require one or several lightning conductors regarding to the level of protection required and the area to protect.

The installation of a Lightning protection by ESE should be in compliance with NFC 17-102 standards.

In the case of the maintenance of the installations and periodical checking, think of the impact controller.

IMPACT CONTROLLER
THE NECESSARY ACCESSORY
FOR ALL INSTALLATION

The CCF03 counter is designed for counting the lightning shocks running in the installation down conductors.
The counting device is electromechanic and operates without any source of supply.
The mounting is done in parallel on the down conductor with two clamps and four M6X13 inox screws.

Technical features:
Dimensions: 150x60x50mm
Weight: 530g
Use temperature: -10 to +60°C
Degree of protection: IP65
Display: 6 figures
Threshold of release: 1 to 100 Ka in wave 8/20
Time mini between 2 shocks: 100 ms
Connector: for round from 8 to 10 mm dia and tape 30x2 and 30x3 mm
Maintenance: any necessary
Compliance with NFC 17-106

Type of SATELIT ™ +G2								
	Rod height (in meters)							
	2	4	5	7	10	15	20	30
	Radius of protection (in meters)							
LEVEL1								
SATELIT ™ +G2-25	17	34	42	43	44	45	45	45
SATELIT ™ +G2-45	25	51	63	64	64	65	65	65
SATELIT ™ +G2-60	32	64	79	79	79	80	80	80
LEVEL2								
SATELIT ™ +G2-25	20	40	49	50	51	53	54	55
SATELIT ™ +G2-45	30	60	71	71	72	73	74	75
SATELIT ™ +G2-60	34	68	86	87	88	89	89	90
LEVEL3								
SATELIT ™ +G2-25	23	46	57	59	61	63	65	68
SATELIT ™ +G2-45	34	64	81	82	83	85	86	89
SATELIT ™ +G2-60	40	78	97	98	99	101	102	104
LEVEL4								
SATELIT ™ +G2-25	26	52	65	66	69	72	75	80
SATELIT ™ +G2-45	36	72	89	91	92	95	97	101
SATELIT ™ +G2-60	44	87	107	108	109	111	113	116

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SATELIT 3

THE EARLY STREAMER EMISSION TELETESTED

In order to impose to Lightning a preferential way of flowing toward the earthing system, the solution developed by Duval Messien takes advantage of the new technology of **SATELIT 3** Early Streamer Emission, third generation of Satelit range of Duval Messien.

The concept of **SATELIT 3** consists in polarizing the tip of the lightning conductor to a voltage included between 35 Kv and 45 Kv, in synchronization with the growth of the descending tracer and imposing to the ascending tracer an anticipated release regarding to the tracer which emanated from a simple rod lightning conductor.

With **SATELIT 3**, Duval Messien, always at the top, creates the event equipping it with a remote control tester: the **TELETESTER S-3** which creates a performant concept to answer to the market requirements.

The **SATELIT 3** is composed of three models: **SATELIT 3-25, SATELIT 3-45 and SATELIT3-60**.

SATELIT 3: A NEW CONCEPT OF LIGHTNING CONDUCTOR

In compliance with the procedure described in the NFC 17-102 French standard, this range of lightning conductors generated extensive researches and many tests in independent laboratories, certified and famous in different countries.
For France, we can name Test Center of Bazet, (certified COFRAC) under the control of Lloyd's Register (certification organism).
The certificates of test are available upon request.

The **SATELIT 3** was created around a shell in stainless steel 304L in order to guarantee a very good resistance to shocks, to corrosion and to chemical agents. It can be installed with any risk in chlorine areas, in countries with high humidity rate or on exposed industrial sites.
The electronical components of SATELIT 3 are perfectly protected inside an inert resin block. The spark gap, manufactured in massive inox , allows conducing currents superiors to 180 Ka.

LIGHTNING CONDUCTOR

The **SATELIT 3** is supplied with an accumulator type NI-MH, loaded continuously with three flexible solar cells specially developed for Duval Messien. These solar cells are indestructible. It is encapsulated at hot, which confer it a perfect waterproofness and an excellent protection to exterior attacks. The sides of each of it are created in copolymere material of ethylene tetrafluoroethylene (ETFE). Non stick, it does not become yellow and does not crack in the time

Features:
TIP AND BODY: stainless steel 304L
Weight: 4kg

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SATELIT 3

LIGHTNING CONDUCTOR

TELETESTER-S3 :

For a high level of safety and use simplicity, the maintenance of the **SATELIT 3** Early Streamer Emission is done at distance, with radio frequency, with the new **TELETESTER S-3**.

SATELIT 3 has an emitter with a normalized frequency which transmits a signal every 45 seconds, indicating that the electronic operating of the lightning conductor, tip polarization included is correct.
The operator programs the **TELETESTER S-3** regarding to the **SATELIT 3** addresses to check.
The **TELETESTER S-3** receives the transmitted information by the **SATELIT 3** and indicates with a luminous signal the right functioning of the lightning conductor.

The checking can be done until a distance of 50m between the **SATELIT 3** and the **TELETESTER –S3**.

One **TELETESTER S-3** can check several **SATELIT 3** lightning conductors.

In the field of Lightning protection, this concept of innovating control has for aim:
-to check very quickly the condition of the SATELIT 3 lightning conductor and its good functioning
-to avoid the implementation of hoist very expensive on site very difficult to access.
-To release very quickly an operation of maintenance.

SATELIT 3 RANGE:

The SATELIT 3 is composed of:

- **Satelit 3-25 => excitation advance (Δt) = 25 µs**
- **Satelit 3-45 => excitation advance (Δt) = 45 µs**
- **Satelit 3-60 => excitation advance (Δt) = 60 µs**

The radius of protection (Rp)of the SATELIT 3 is calculated according to the formula defined in the NFC 17 – 102 standard regarding to the excitation advance of the lightning conductor (Δt), of its height and the level of protection required (Np).

Type of SATELIT 3	Rod height (in meters)							
	2	4	5	7	10	15	20	30
	Radius of protection (in meters)							
LEVEL1								
SATELIT 3-25	17	34	42	43	44	45	45	45
SATELIT 3-45	25	51	63	64	64	65	65	65
SATELIT 3-60	32	64	79	79	79	80	80	80
LEVEL2								
SATELIT 3-25	20	40	49	50	51	53	54	55
SATELIT 3-45	30	60	71	71	72	73	74	75
SATELIT 3-60	34	68	86	87	88	89	89	90
LEVEL3								
SATELIT 3-25	23	46	57	59	61	63	65	68
SATELIT 3-45	34	64	81	82	83	85	86	89
SATELIT 3-60	40	78	97	98	99	101	102	104
LEVEL4								
SATELIT 3-25	26	52	65	66	69	72	75	80
SATELIT 3-45	36	72	89	91	92	95	97	101
SATELIT 3-60	44	87	107	108	109	111	113	116

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STORMDETEC™
ANTICIPATE TO PREVENT

The **STORMDETEC™** is a storm detector with mill field of new generation, at professional use, patented, which measures in real time the variations of the electrostatic field determining the high probability of an imminent storm with a local risk of thunderstorm.

Easy to install and to implement, it is entirely configurable to be adapted to the operational needs of the safety politic of the user. It can be piloted at distance with computer.

Lightning and storms are at the origin of many natural damages. It is feared in the world with the extent of direct and indirect destructions that it create on their passage at the point to become an important economical issue.
The advanced detection of storms provided by the STORMDETEC™ allows to

- -give us, with anticipation, the time to implement procedures, means of protection to limit:
- -the risks for people
- -destructions, problems of production
- -give us the means of a reliable and economical control of care principle with a delay of anticipation of a storm arrival which can reach 20 mm and a distance of detection of 20 km and more.

Dimensions
Measurement head TMC: diam 185mm h: 165mm weight: 2, 8 kg
Control and power supply box CCA: L: 390mm l: 200 mm
P: 115 mm
Weight: 9,5 kg (emergency battery included)
Measurement head waterproofing: IP54 waterproof to streaming
Control and power supply box sealing: IP33 indoor use

Power supply
Mains supply voltage: 220 v AC/50-60 Hz or 110 V AC/50-60 Hz
Protection with fuse: 1, 25 ampers in 220 V et 2,5 ampers in 110V
Power consumption: 80 W (active heating)
Power consumption in normal use: 20W
Built in battery back up: lead battery, waterproof,
with maintenance-free 12 volts, 12A/h
Low battery charge limit protection: shutdown when battery expires, automatic reset on return of mains power

Autonomy: 10 hours (energy economy programm)

Measures
Capacity to measure the electrostatic fields of standardized storm: 0 to 20 + or = 200 kv/m
TMC unit electrostatic field measurement range: 0 to + or =600 kv/m
Resolution: 5 V/m

Enclosure
1-A display that shows the operations on the pop-up menu and the value of the measured electrostatic field in real-time.
2- A configurable buzzer with adjustable sound level.
3- A series of alarm indicators light : level 1: distant storm/ local stormy tendency, level 2 : storm approaching/local storm developing
level 3 : local storm in progress/imminent lightning strike probability
4-A set of commands for controlling and managing configuration settings

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OUTPUT ENCLOSURES (CCA)

Measurements signals

RS232 : provides the field measurement values, the level 1, 2 and 3 alarms and the failure alarm.
Data rate 19,200 bauds
RJ45 TCP-IP (pseudo modem) protocol, optional, providing the same signals as the RS232
Relay, dry contact (idle and triggered) :
Relay for level 1,2,3 alarms : 250V/5A – relay for failure alarm
PE5 : 250V/5A-Relay for external indication use PE4 250V/5A

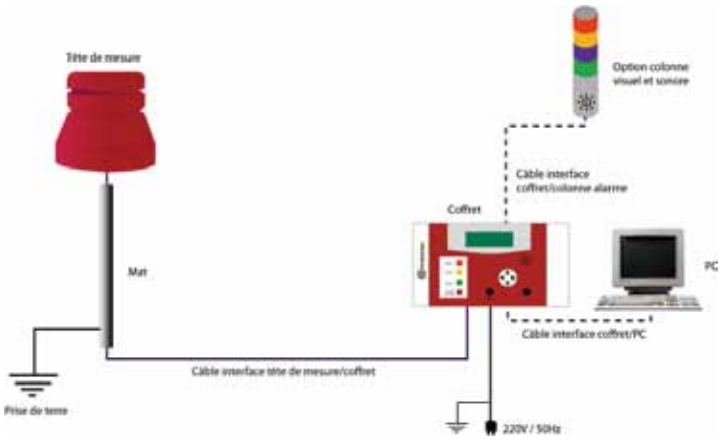
Use conditions

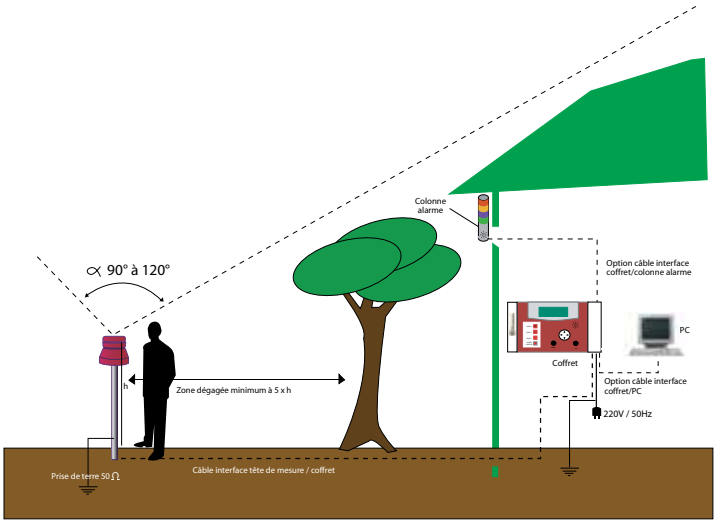
Measurement head: -35C° to +55 C°
Humidity level: up to 100%
Control and power supply box: -5C° to +45C°
Humidity level: up to 80%
Network operation: optional

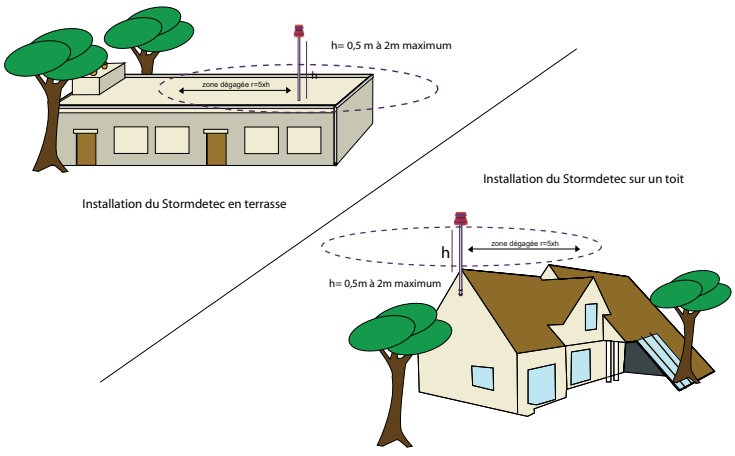
Guarantee

STORMDETEC™ is guaranteed one years parts and labor at the factory for use in compliance with the technical manual supplied with the device.
STORMDETEC™ is supplied with a quality control certificate.

EXAMPLE OF INSTALLATION







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France References

Atomic Energy Commission
- Fontenay aux Roses
- Cadarache
- Saclay
- Marcoule
- Vaujours
- Pierrelatte
- La Hague
- Tricastin...

Army, Air Force, Navy
- Station of transmission
- Arsenals
- P.C. durcis
- Airplane Hangar
- Sensitive installations
- All buildings
- Ammunition dump
- DCN

Chemical industry, Refineries
- Sanofi Aventis
- BP (Lavérat)
- Akzo-Nobel (Dourdan et Montataire)
- Great Lakes Chemical (Persan)
- Dorlyl (Le Havre)
- G.E. Plastics (Saint Soupplet)
- Shell Chimie (Rouen)
- Chevron Chemical (Le Havre)
- Henkel Rubson (Chalon en Champagne)
- SCPO (Chalon / Saône)
- Shell (Rouen / Berre)
- Butagaz (Rennes)
- Nitro-Bickford
- S.M.C.A (Roissy et Orly)
- Yara France (Saint Nazaire)
- Bessier- TOTAL Lubrifiants site de Rouen
- Grande Paroisse- NAUF Plâtres (Usine de Saint-Soupplets)
- ANDRA (Centres de stockages de l'Aube)
- Dépôt BP de Vitry-sur-Seine et de Gennevilliers
- NEXANS site de Bohain-en-Vermandois

French Electricity Company
- Power plants of thermal production
- Nuclear power plants

French Gas Company
- Station of recompression
- Station of storage
- Gas terminal
- Terminal methane carrier

Research – Industry
- CNES
- CNET
- IRSID
- Thomson CSF
- SNECMA
-Aerospace

Administration – Transport
- Paris Airports
-Crédit Lyonnais
- RATP
- Companies of Highway
- Social Security
- Bank of France
- Direction of the equipment
- Bordeaux Airport

International references

Dubai
- Burj Khalifa

Greece
- Makedonia Airport, Thessalokini
- Kos Island Airport
- Rodos Island Airport
- Skyros Island Airport
- King's Tombs of Vergina, Vergina
- Olympic Bandmington Stadium, Athens
- Prefecture of Drama, Drama
- Prefecture of Chaldikidi, Poligiros
- Hospital « Papanikikolaou », Thessalokini
- Hospital « Agios Pavlos », Thessalokini

Mauritius
- New Warehouse & Luxshed

India
- Reserve Bank Note Mudran PVT Ltd-Salboni
- Air force of India-Kalaikunda

Indonesia
- PECGI Cikarang warehouse

Kazakstan
- Oilfields Nuraly

Malaysia
- Malaysia Monorail, Step1
- Gated Bungalow Lot at Saujana Subang, Selangor

Morocco
-Cement works of Oujda

Dominican Republic
- National Insurance Company
- Presa Palomino
- Kesington Tower
- Altec Dominican
- BHD Bank
- Hotel Diminican Beach(Punta Cana)
- Hotel Melia
- Commercial Centre Plaza Lama(La Romana)

Pakistan
- Lahore Airport
- Honda Motors Lahore

Romania
- Tanque de Biogas

Serbia
- "Izvor" Hotel, AranDelovac

Sri Lanka
Hospital of Asiri Surgical

Turkey
- F1 Istanbul Park

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