



# Lightning and overvoltage protection Water treatment plants

# Expertise and overall protection

## Renowned expertise in lightning protection

ABB Lightning Protection Group has several decades of experience and uses its technological expertise to provide protection against lightning and overvoltage.

In addition to up-to-date expertise with its global lightning protection offer (external and internal), ABB Lightning Protection Group now offers a wide range of lightning conductors and surge arresters dedicated to the water cycle: collection, treatment, storage, transport, distribution...

ABB Lightning Protection Group also has a laboratory comprising various generators capable of testing all equipment under real conditions with different amplitudes of surge currents, in order to optimize protection solutions.

## How to protect water treatment plants?

Water is a fundamental utility. Its increased consumption is the reflection of population growth and an improved standard of living.

Due to vast surface areas and exposure of frequently isolated sites, water and wastewater treatment plants are particularly exposed to lightning risks. Lightning strikes are a major component in the risk to be assumed, both because of the direct effect of lightning on the structure (External Lightning Protection Installation), and because of the overvoltages on the facility (Internal Lightning Protection Installation).

The consequences of lightning on treatment plants have repercussions on all equipment. Overvoltage will directly affect instrumentation and remote management devices as well as PLCs... The protection of water cycle facilities against overvoltage involves all types of structures, i.e. pumping stations, treatment plants, storage, transport and distribution.

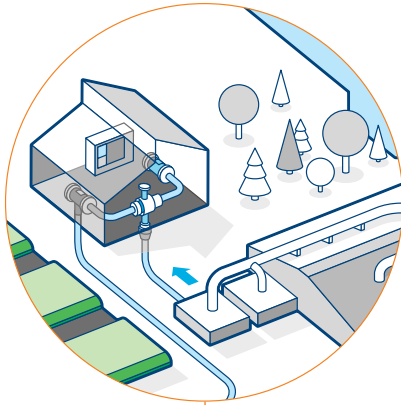


LESPS laboratory in Bagnères-de-Bigorre (65).

Test generator.

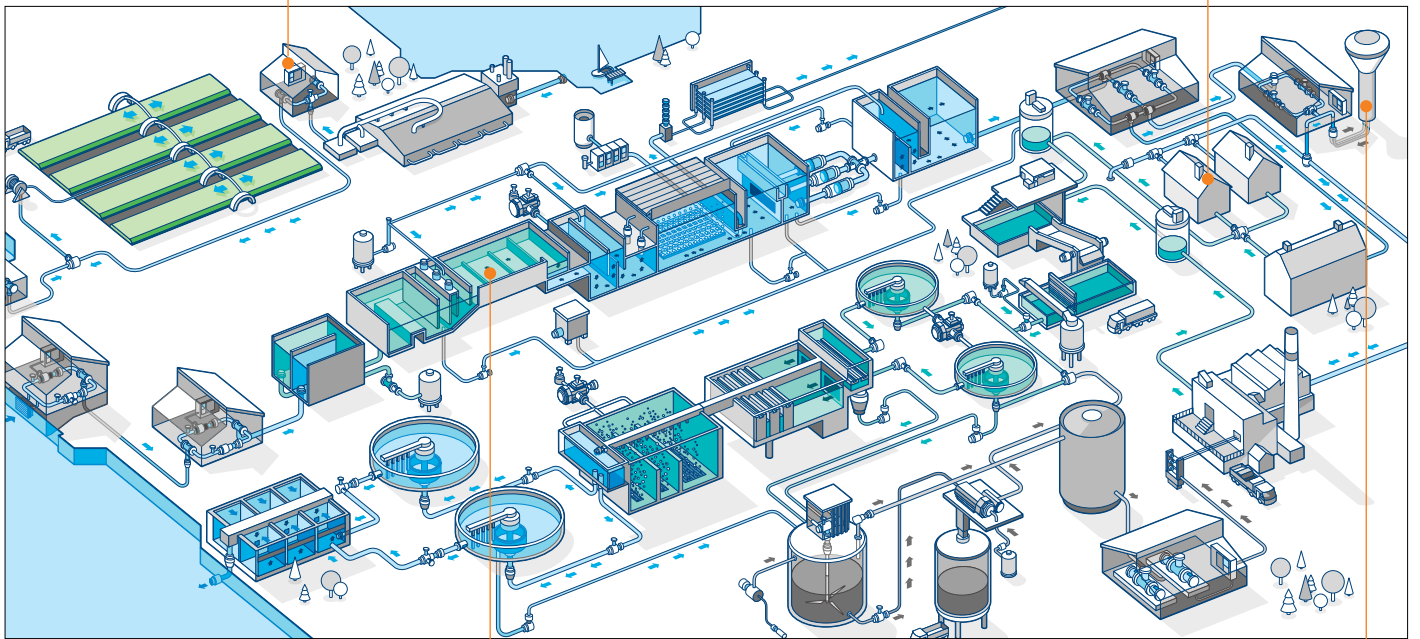
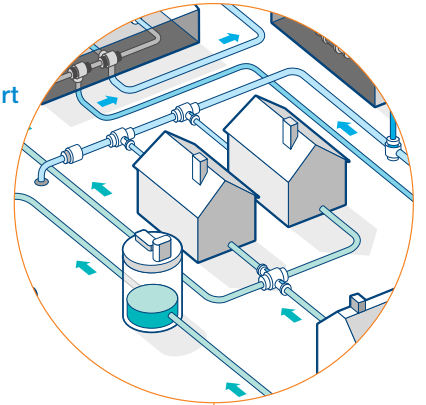
**Protection of pumping station systems**

- Recorders
- Sensors
- Flowmeters
- Level measuring devices
- Temperature measuring devices.



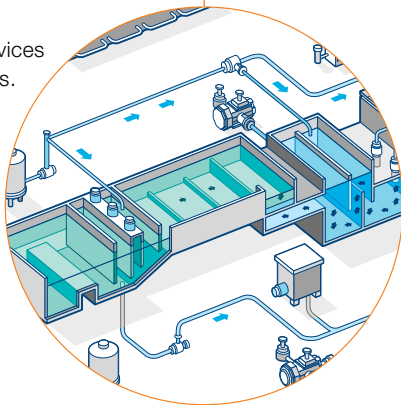
**Protection of transport distribution systems**

- Probes
- Flowmeters
- Meters.



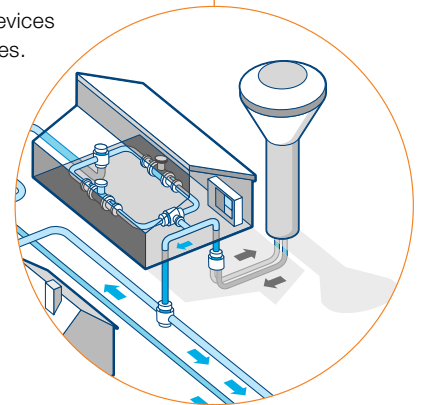
**Protection of treatment plant systems**

- Flowmeters
- Probes
- Level measuring devices
- Temperature measuring devices
- Pressure measuring devices.



**Protection of storage systems**

- Flowmeters
- Level measuring devices
- Temperature measuring devices
- Pressure measuring devices.



# Indirect strikes

## Protection of treatment plants and pumping stations



- ① Protection of the pump feed line
- ② Protection of the power supply line input
- ③ Transmission line protection
- ④ STN protection
- ⑤ Protection of the coaxial links

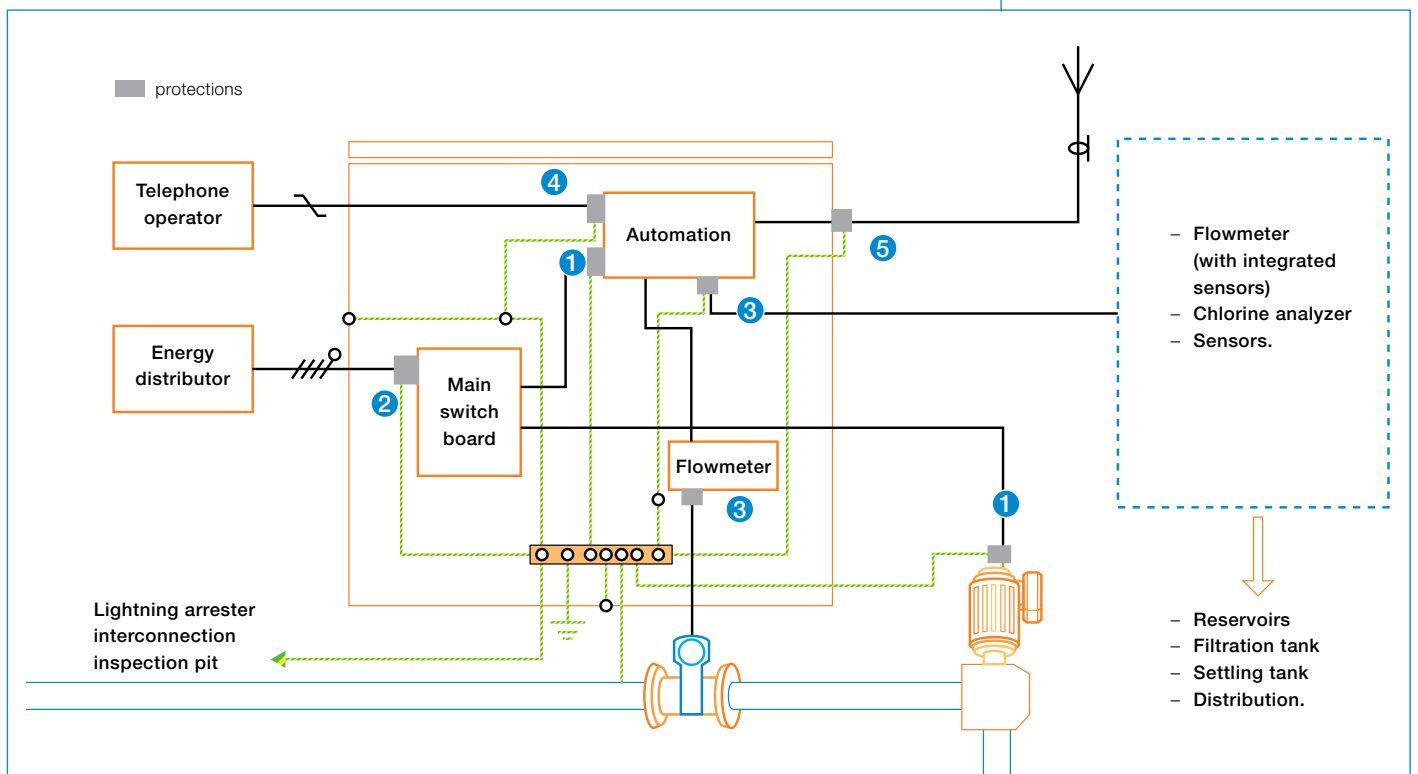


ABB Lightning Protection Group offers a comprehensive range of surge arresters adapted to the protection of water and wastewater treatment plants.

ABB recommends the installation of the lightning arresters Type 1 for use upstream of the facilities. In addition, Type 2 fine protections must be positioned as near as possible to the equipment needing protection. Transmission lines, telephone lines, computer connection or current loop must be protected as well against overvoltages. In this case, ABB Lightning Protection Group recommends pluggable OVR TC P surge arresters.

### Ordering details

Description	Protected lines	Impulse current	Max. discharge current	Follow current interrupting rating	Voltage protection level	Nominal voltage	Max. cont. operating voltage	Type	Order code	Weight
		I <sub>imp</sub> 10 / 350 kA	I <sub>max</sub> 8 / 20 kA	I <sub>fi</sub> kA	U <sub>p</sub> kV	U <sub>n</sub> V	U <sub>c</sub> V			
① Protection of the pump feed line	1+1	–	40	–	1.4	230	275	OVR T2 1N 40 275 s P TS	2CTB803952R0200	0.23
② Protection of the power supply line input	3+1	25	60	7	2	230/400	255	OVR T1 3N 25-255-7	2CTB815101R8800	0.84
③ Transmission line protection	1 pair	–	10	–	0.015	6	7	OVR TC 6V P	2CTB804820R0000	0.05
③ Transmission line protection	1 pair	–	10	–	0.035	24	27	OVR TC 24V P	2CTB804820R0200	0.05
④ STN link protection	1 pair	–	10	–	400	200	220	OVR TC 200FR P	2CTB804820R0500	0.07
⑤ Protection of the coaxial links	–	–	50	–	–	–	–	PHF AN 50 BNC m/f	2CTB815002R1200	0.20

OVR TC P surge arresters are equipped with pluggable cartridges to facilitate maintenance operations.

Type	Order code
OVR TC 6V C	2CTB804821R0000
OVR TC 24V C	2CTB804821R0200
OVR TC 200FR C	2CTB804821R0500

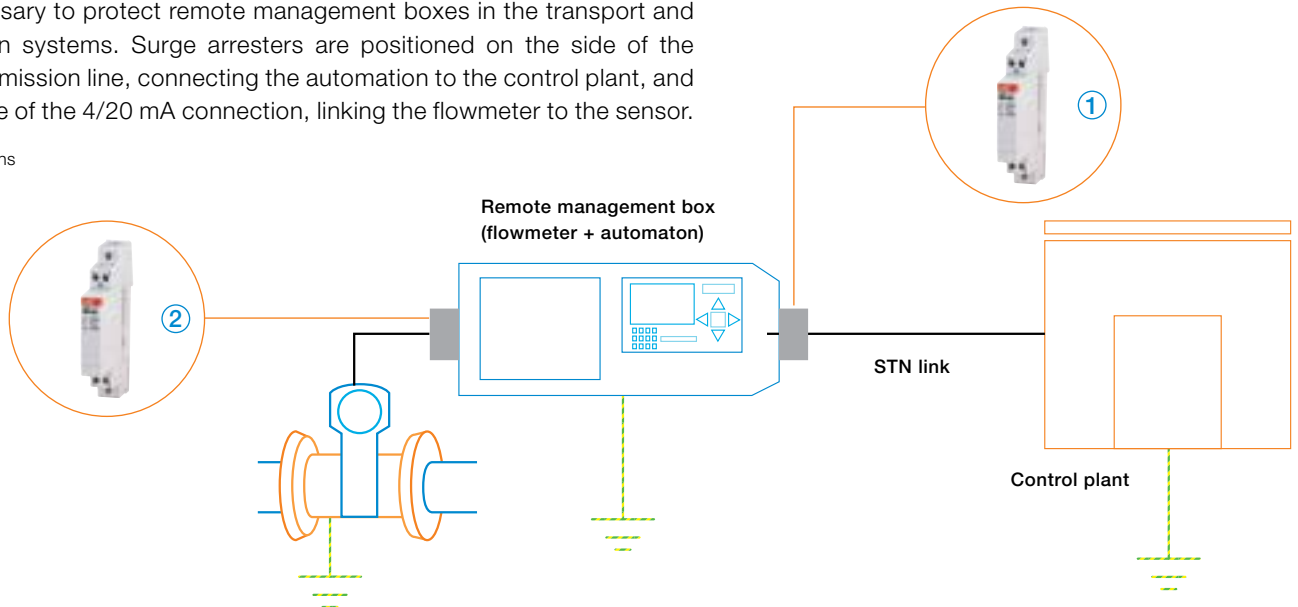
# Indirect strikes

## Protection of transport - distribution systems

### Flowmeter with a separated sensor

It is necessary to protect remote management boxes in the transport and distribution systems. Surge arresters are positioned on the side of the STN transmission line, connecting the automation to the control plant, and on the side of the 4/20 mA connection, linking the flowmeter to the sensor.

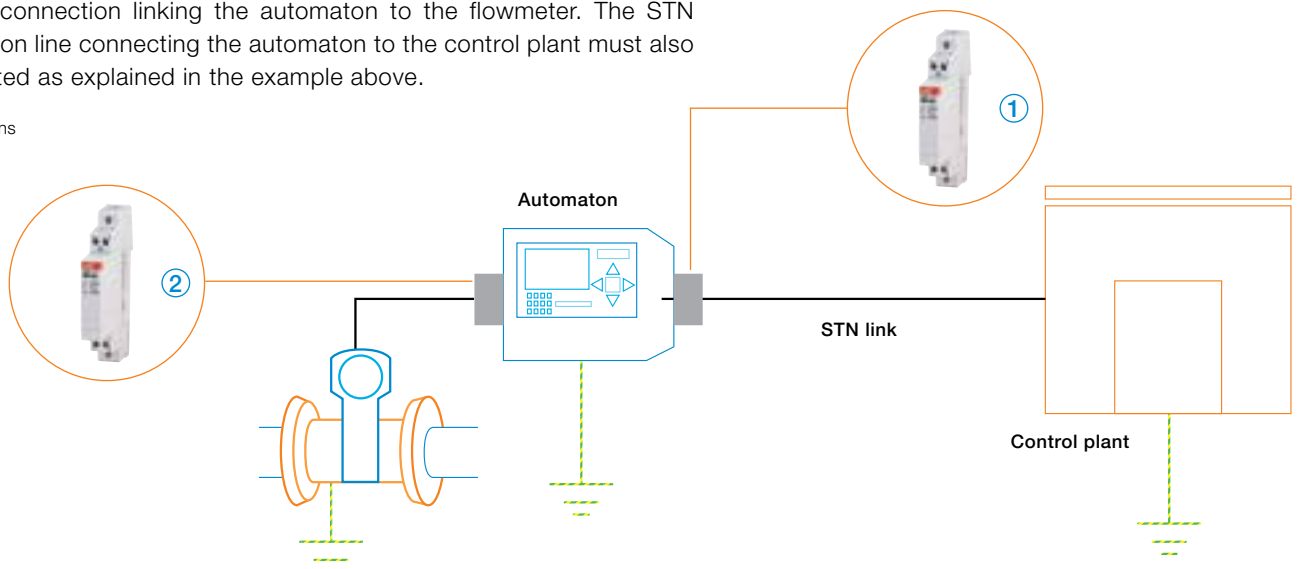
■ protections



### Flowmeter with an integrated sensor

When the sensor is integrated into the flowmeter, only the automaton needs protection. In this case, a surge arrester must be installed on the 4/20 mA connection linking the automaton to the flowmeter. The STN transmission line connecting the automaton to the control plant must also be protected as explained in the example above.

■ protections



### Ordering details

Description	Protected lines	Impulse current Iimp 10 / 350 kA	Max. discharge current Imax 8 / 20 kA	Follow current interrupting rating I <sub>fi</sub> kA	Voltage protection level U <sub>p</sub> kV	Nominal voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Type	Order code	Weight Pkg (1 pce) kg
① STN link protection	1 pair	-	10	-	400	200	220	OVR TC 200FR P	2CTB804820R0500	0.07
② Transmission line protection	1 pair	-	10	-	0.015	6	7	OVR TC 6V P	2CTB804820R0000	0.05
② Transmission line protection	1 pair	-	10	-	0.035	24	27	OVR TC 24V P	2CTB804820R0200	0.05

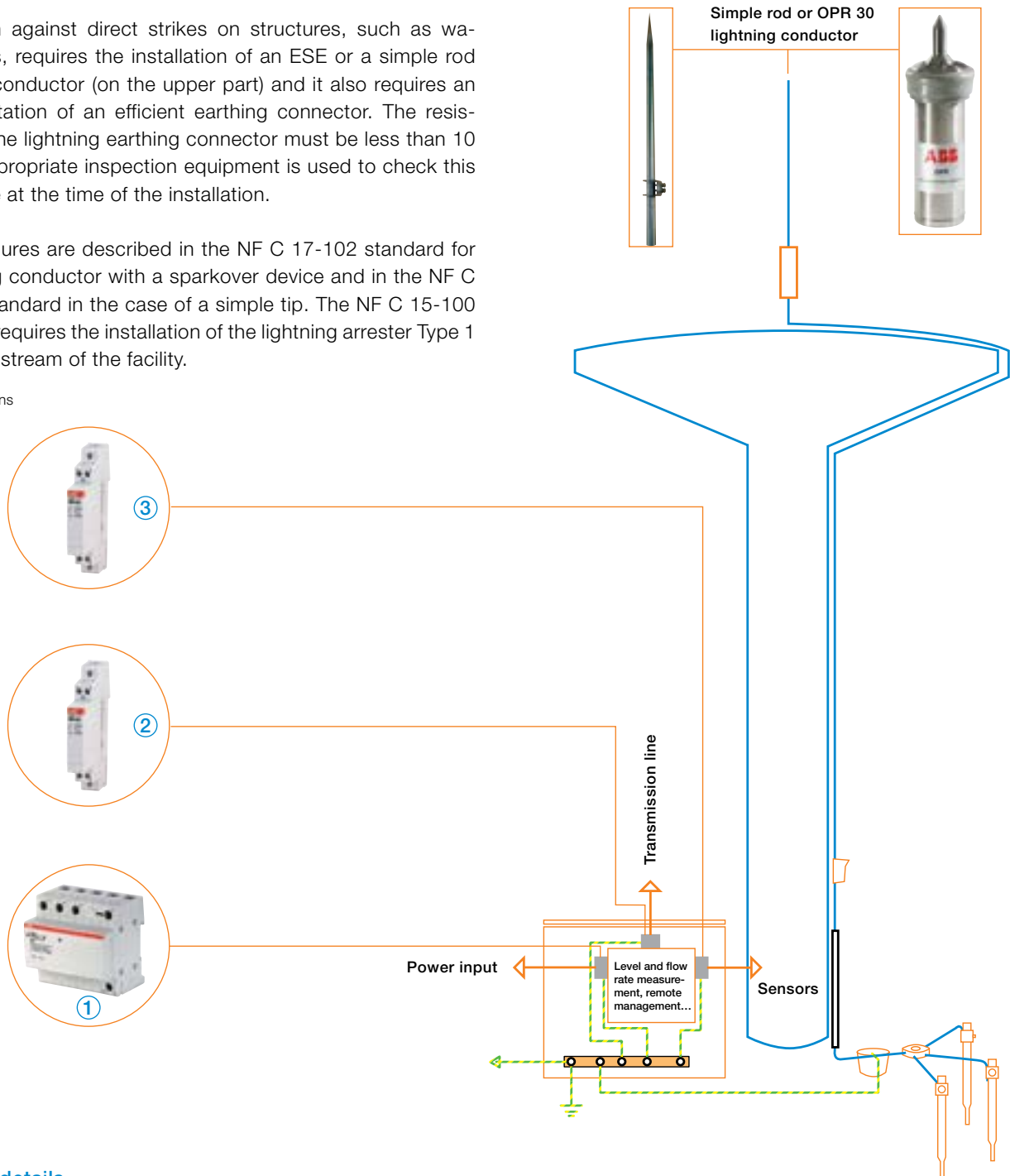
# Direct strikes

## Protection of storage systems

Protection against direct strikes on structures, such as water towers, requires the installation of an ESE or a simple rod lightning conductor (on the upper part) and it also requires an implementation of an efficient earthing connector. The resistance of the lightning earthing connector must be less than 10 ohms. Appropriate inspection equipment is used to check this resistance at the time of the installation.

All procedures are described in the NF C 17-102 standard for a lightning conductor with a sparkover device and in the NF C 17-100 standard in the case of a simple tip. The NF C 15-100 standard requires the installation of the lightning arrester Type 1 for use upstream of the facility.

■ protections



### Ordering details

Description	Protected lines	Impulse current I <sub>imp</sub> 10 / 350 kA	Max. discharge current I <sub>max</sub> 8 / 20 kA	Follow current interrupting rating I <sub>fi</sub> kA	Voltage protection level U <sub>p</sub> kV	Nominal voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Type	Order code	Weight Pkg (1 pce) kg
① Protection of the power supply line input	3+1	25	60	7	2	230/400	255	OVR T1 3N 25-255-7	2CTB815101R8800	0.84
② Transmission line protection	1 pair	-	10	-	0.035	24	27	OVR TC 24V P	2CTB804820R0200	0.05
③ STN link protection	1 pair	-	10	-	400	200	220	OVR TC 200FR P	2CTB804820R0500	0.07

# Contact us

## ABB France

### Electrification Products Division

#### Pôle Foudre Soulé & Hérita

1, avenue des Victimes du 11 juin 1944

BP 303

F-65203 Bagnères-de-Bigorre / France

Tél. : +33 (0)5 62 91 45 60

Fax : +33 (0)5 62 91 45 62

Email : [stv.lpg@fr.abb.com](mailto:stv.lpg@fr.abb.com)



[www.abb.com/windpower](http://www.abb.com/windpower)



[www.furse.com](http://www.furse.com)



<http://www.abb.com/lowvoltage>



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