Lightning Protection
Surge Protection
Safety Equipment

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For information material
and services e.g.

- Surge Protection
  Main Catalogue
- Lightning Protection
  Main Catalogue
- DS 150/E: Yellow/Line
  Easy choice surge protection
- DS649/E: Red/Line
  Surge protection easy choice
- Appointment with
  our sales engineer

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Surge Protection:
Safety for Sewage Plants.

DS107/E/1209

DEHN – Competence in Lightning and Surge Protection.

Surges disturb processes.
Sewage plants are a decisive part of treatment of water as a resource. With a chain of mutually dependent processes, they manage to filter the toxic substances bound in the dirty wastewater and regain drinking water.

Various measuring and analysis methods with extensive system technology are used for process control.
Damage to this equipment can disturb the process sustainably and even lead to a threat to the environment. Therefore, its availability deserves high priority.

Power supply, for example, as well as measuring and control systems of sewage plants are threatened by damage due to surges or direct lightning strokes. Surges are caused by distant or close lightning strokes, but also by switching operations (e.g. when switching heavy loads).

DEHN – Lightning and Surge Protection for Sewage Plants from one Expert.

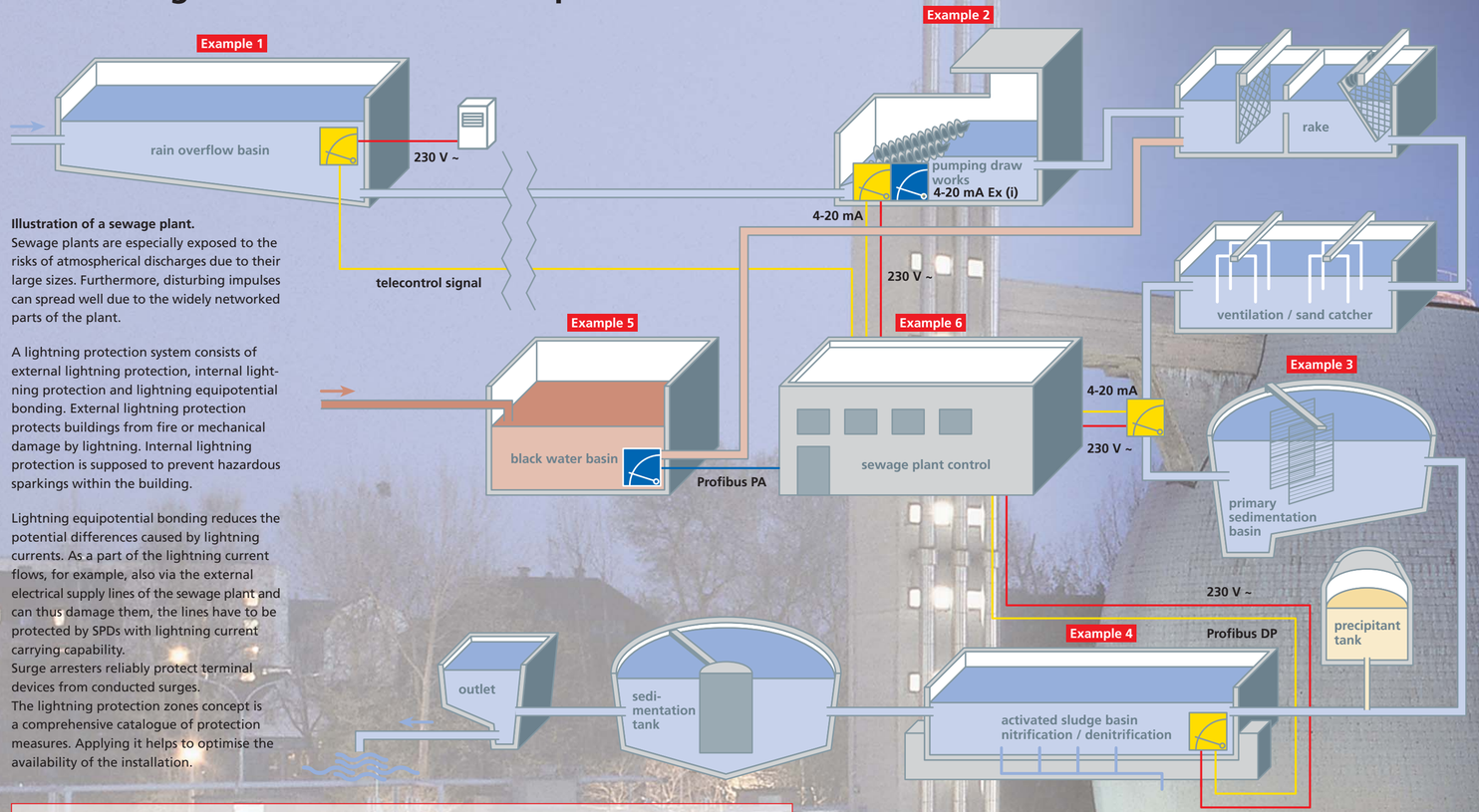
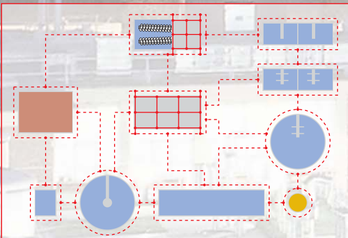


Illustration of a sewage plant.
Sewage plants are especially exposed to the risks of atmospherical discharges due to their large sizes. Furthermore, disturbing impulses can spread well due to the widely networked parts of the plant.

A lightning protection system consists of external lightning protection, internal lightning protection and lightning equipotential bonding. External lightning protection protects buildings from fire or mechanical damage by lightning. Internal lightning protection is supposed to prevent hazardous sparkings within the building.

Lightning equipotential bonding reduces the potential differences caused by lightning currents. As a part of the lightning current flows, for example, also via the external electrical supply lines of the sewage plant and can thus damage them, the lines have to be protected by SPDs with lightning current carrying capability.
Surge arresters reliably protect terminal devices from conducted surges.
The lightning protection zones concept is a comprehensive catalogue of protection measures. Applying it helps to optimise the availability of the installation.



Example: Intermeshed earth-termination system.
A lightning equipotential bonding system should be established for each part or building of the plant. Intermeshing these installations reduces conducted partial lightning currents among the parts of the plant. Powerful surge arresters minimise the risk due to surges.

The following standards apply to the earth-termination system:
- IEC 62305-4: “Electrical and electronic systems within structures”
- prEN 50114: “Materials and size requirements for earth electrodes from the corrosion point of view”

Know-how – Designing aids for lightning and surge protection.
The designer of the installation sets the basis for the later availability of the sewage plant. He takes effective protection measures against harmful surges. For this purpose, he applies important regulations which help to compile a complete protection concept. In the designing stage, both the external lightning protection system, earthing system with equipotential bonding and effective protection in case of surges are taken into consideration.

Lightning and surge protection concept for a sewage plant

↓

Building codes

↓

IEC 62305
Protection against lightning
Part 2: Risk management

↓

IEC 62305
Protection against lightning
Part 3: Physical damage to structures and life hazard
Part 4: Electrical and electronic systems within structures

↑ Application guides
Codes of practice

↑ IEC 60364-...
Erection of power installations with nominal voltages up to 1000 V

↑ IEC 61643-... / IEC 61663-...
Lightning and surge protection for telecommunication and signalling lines

Concepts for Measuring Points.

Example 1: Telecontrol signal and power supply

Lightning and surge protection for the level and spill volume measuring equipment at the distant rain overflow basin

- The short lines going from the measuring transformer to the ultrasonic sensors are supplied with a both-sided shield earthing
- The measuring data are transmitted to the sewage plant control via telecontrol
- The power supply is provided directly by the power authority
- The power supply and telecontrol systems are protected by combined lightning current and surge arresters capable of carrying lightning currents with an appropriate voltage protection level for terminal equipment and minimum requiring space

Example 2: 4-20 mA and power supply (non-Ex) and 4-20 mA Ex (i)

Surge protection for the sewer network flow measuring equipment

- Ex zone: The short lines going from the measuring transformer to the ultrasonic sensors are supplied with a both-sided shield earthing
- If the measuring transformer and Ex isolation amplifier are spatially separated, Ex (i)-type surge arresters are installed at both ends of the connecting cable
- Outside of the Ex zone, surge arresters are installed for protecting the 4-20 mA signal and power supply system

Example 3: 2 x 4-20 mA and power supply

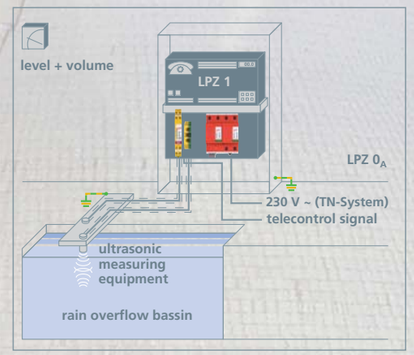
Surge protection for the pH value and temperature measuring equipment

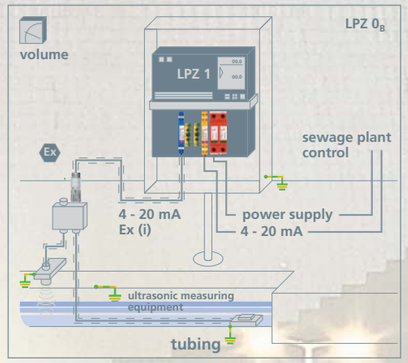
- The line going from the measuring transformer to the electrode situated at the hose fitting is supplied with a both-sided shield earthing
- The pH value and temperature are transmitted to the sewage plant control as two independent 4-20 mA signals
- Power supply is provided by the sewage plant control
- The lines going to the sewage plant control are protected by surge arresters

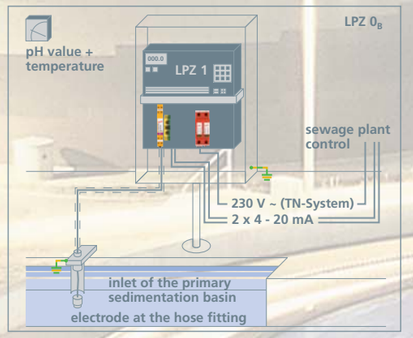
Example 4: PROFIBUS DP and power supply system

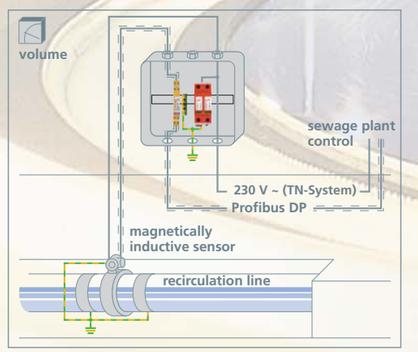
Surge protection for the flow measuring equipment

- Magnetically inductive measuring sensor with PROFIBUS DP and power supply connection
- The SPDs are installed immediately close to a distribution board
- The shield of the bus cable has to be led continuously and earthed with low impedance both via the sensor and SPD
- The bus cable and power supply system are protected by surge arresters

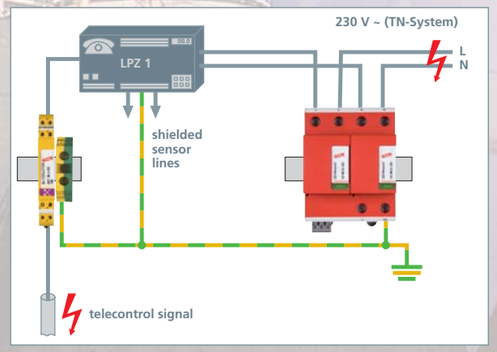


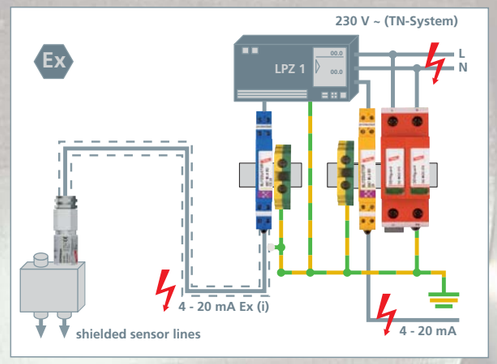


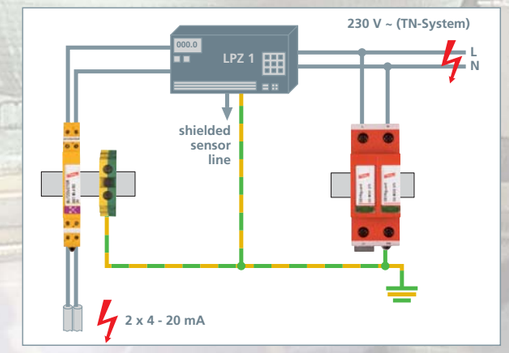


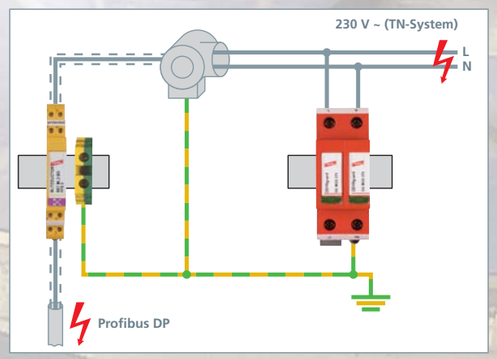


LPZ = Lightning Protection Zone









Example 1:

1 x BLITZDUCTOR® XT ML2 BD 180 *Part No. **920 247**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P2
or
1 x BLITZDUCTOR® XTU ML2 BD S 0-180 *Part No. **920 249**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P1
1 x DEHNventil® M TT 2P 255 FM Part No. **951 115**
Modular combined lightning current and surge arrester with remote signalling contact for TT systems
or
1 x DEHNventil® M TN 2P 255 FM Part No. **951 205**
Modular combined lightning current and surge arrester with remote signalling contact for TN systems
1 x SLK 16 Part No. **910 099**
Accessories, PE Terminal

Example 2:

1 x BLITZDUCTOR® XT ML2 BD S 24 *Part No. **920 244**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P1
or
1 x BLITZDUCTOR® XTU ML2 BD S 0-180 *Part No. **920 249**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P1
1 x BLITZDUCTOR® XT ML4 BD EX 24 **Part No. **920 381**
KEMA 06 ATEX 0274 x II 2 (1) G EEx ia IIC T4/T5/T6, FISCO
1 x DEHNpipe MD EX 24 M 2 Part No. **929 960**
Surge arrester, Y/L SPD Class TYPE 2 P1
PTB 03 ATEX 2088 II 2 (1) G EEx ia IIC T4/T5/T6, FISCO
1 x KV S M20 MS 9.5 Part No. **929 982**
Accessories, EMC cable gland, IP 68, ø 6.5-9.5 mm
2 x SLK 16 Part No. **910 099**
Accessories, PE Terminal
1 x DEHNguard® M TN 275 FM Part No. **952 205**
Surge arrester Type 2 with remote signalling contact, pluggable

Example 3:

1 x BLITZDUCTOR® XT ML4 BD 24 *Part No. **920 344**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P1
or
1 x BLITZDUCTOR® XTU ML4 BD 0-180 *Part No. **920 349**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P1
1 x SLK 16 Part No. **910 099**
Accessories, PE Terminal
1 x DEHNguard® M TN 275 FM Part No. **952 205**
Surge arrester Type 2 with remote signalling contact, pluggable

Example 4:

1 x BLITZDUCTOR® XT ML2 BD HFS 5 *Part No. **920 271**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P1 12 Mbit/s
or
1 x BLITZDUCTOR® XTU ML2 BD S 0-180 *Part No. **920 249**
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 P1
1 x SAK BXT LR Part No. **920 395**
Accessories, EMC spring terminal for shield connection
1 x SLK 16 Part No. **910 099**
Accessories, PE Terminal
2 x DEHNguard® M TN 275 FM Part No. **952 205**
Surge arrester Type 2 with remote signalling contact, pluggable

* in combinaton with Part No. **920 300** ** in combinaton with Part No. **920 301**

Concepts for Measuring Points.

Example 5: PROFIBUS PA Ex (i)

Surge protection for the level measuring equipment

- The level measuring sensor used in hazardous zones is connected to the sewage plant control via an intrinsically safe PROFIBUS PA unit
- As there is no external power supply provided, only the bus connector has to be protected
- Ex (i)-type SPDs have to be installed into metal enclosures upstream of the measuring sensor
- Shielding within the hazardous zone has to be performed in accordance with IEC 60079-14

Example 6: Switchgear cabinets with programming logic control (PLC)

Surge protection for the sewage plant control

- Lines between parts of the plant have to be protected with the same types of SPDs as the connected measuring points
- At the entry of the switchgear cabinet, the cable shields have to be earthed with low impedance and lines have to be protected by SPDs
- The SPDs have to be arranged clearly to avoid installation errors
- If lightning current arresters for the service systems are installed centrally, e.g. into the low-voltage main distribution board, the switchgear cabinets have only to be protected by surge arresters
- Lines within the building of the sewage plant control have also to be integrated into the protection concept

NEW !

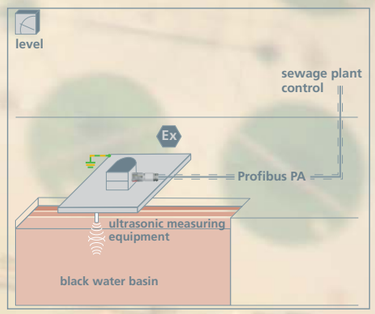
Easy SPD testing due to LifeCheck®

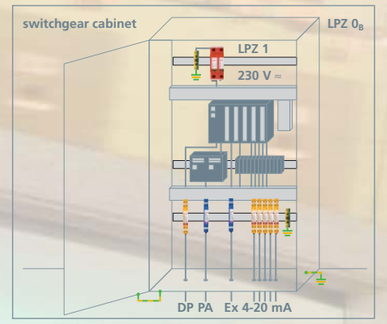
BLITZDUCTOR XT with integrated LifeCheck makes maintenance very easy. LifeCheck applies modern RFID technology for monitoring protective circuits and for communication. Independent from downtimes of the system, LifeCheck allows for quick and easy testing of SPDs by means of a portable testing device type DRC LC M3+.

NEW !

LifeCheck® Condition Monitoring

The LifeCheck technology also allows for the permanent monitoring of the surge arresters. Thus up to 300 twin-wires can be continuously monitored. Faults will be signalled either by remote signalling contact to a superior system control or they can be registered by a PC software which can be provided free of charge. Considering the hazard of lightnings and surges, you will be sure to have utmost protection and availability with this technology.





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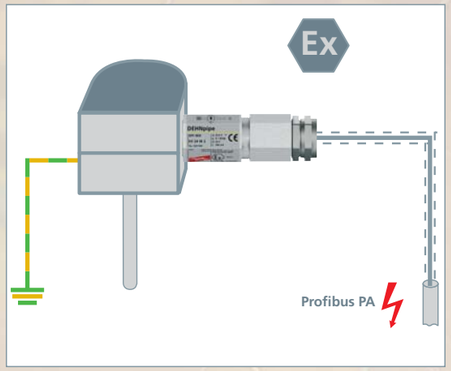

BLITZDUCTOR® XT, Combined lightning current and surge arrester modules with LifeCheck®

Example 5:

1 x DEHNpipe MD EX 24 M 2 Part No. **929 960**
Surge arrester, Y/L SPD Class TYPE 2 P1
PTB 03 ATEX 2088 II 2 (1) G EEx ia IIC T4/T5/T6, FISCO

1 x KV S M20 MS 9.5 Part No. **929 982**
Accessories, EMC cable gland, IP 68, Ø 6.5-9.5 mm

DRC LC M3+ SPD Test Device

Portable handheld device with LifeCheck sensor for flexible use. Visual and acoustic "OK" indication of identified LifeCheck circuits.

- Quick and easy testing of the SPDs within seconds
- During operation
- Electrically isolated, no removing of the module
- Detection of potential thermal and electrical overload of all components
- Battery operated, no external power supply necessary
- USB terminal for transmission of the test results on the PC
- Including PC software for documentation and administration of the test results

Part No. 910 653

DRC MCM XT for Condition Monitoring

Stationary rail-mountable SPD monitoring device to safeguard permanent protection and availability of the systems. Suitable for permanent condition monitoring of up to 10 lightning current arresters BXT with LifeCheck function.

- Permanent SPD monitoring for maximum protection and availability of systems
- Detection of potential thermal and electrical overload of all components
- Remote signalling contacts
- RS 485 interface
- PC software for monitoring available free of charge

Part No. 910 695