



Surge Protection  
Lightning Protection / Earthing  
Safety Equipment

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More information material  
and services, for example

- Surge Protection  
Main Catalogue
- Lightning Protection / Earthing  
Main Catalogue
- DS 150/E: Yellow/Line  
Surge protection - Easy choice
- DS649/E: Red/Line  
Surge protection - Easy choice
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## Surge Protection: Safety for Sewage Plants.

## DEHN – Competence in Lightning and Surge Protection.

### Surges disturb processes.

Sewage plants play a key role in the use of the resource water. 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.

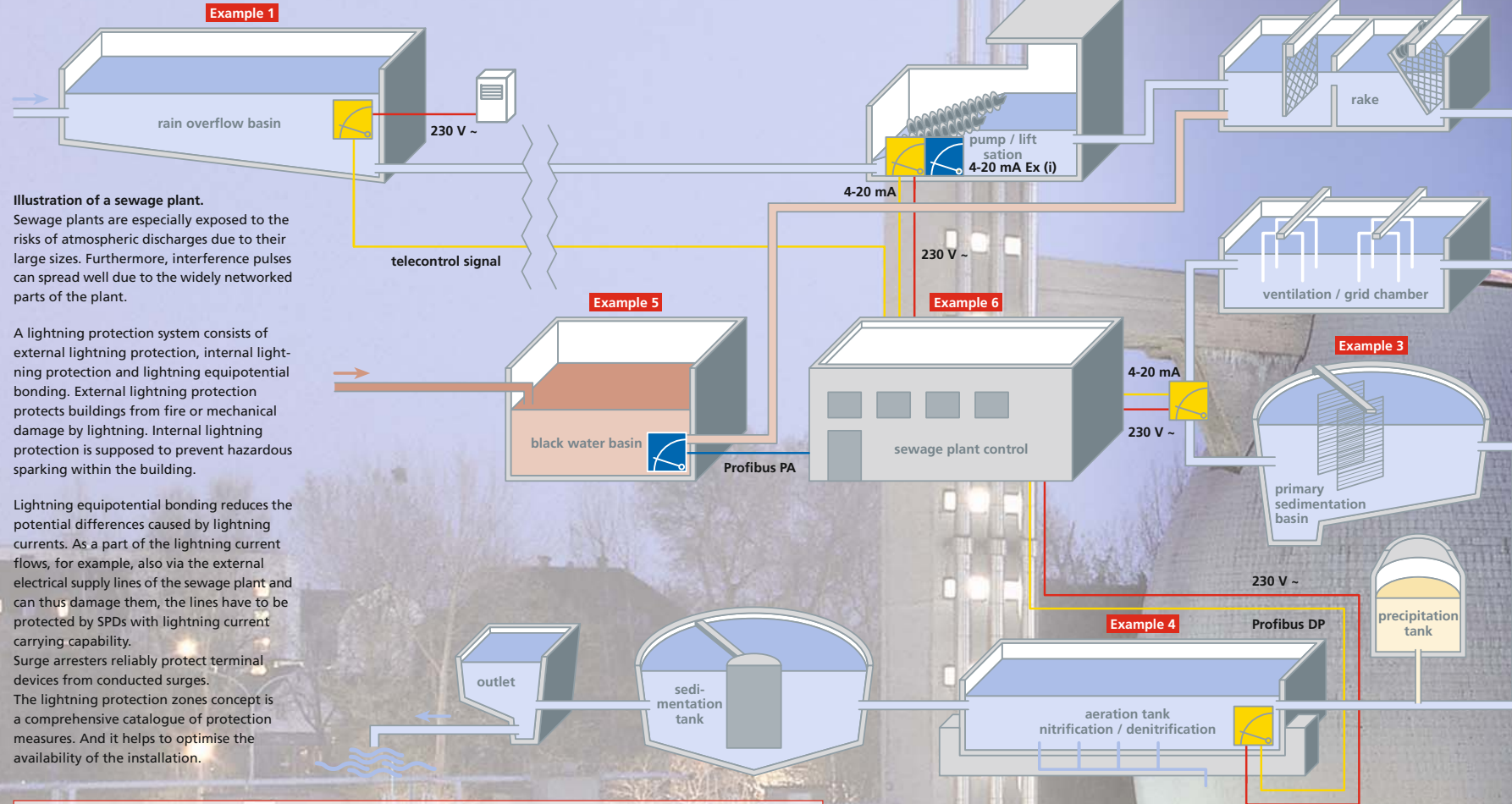
Damage to this equipment can disturb the process sustainably and even lead to a threat to the environment. Therefore, its availability deserves high priority.

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).

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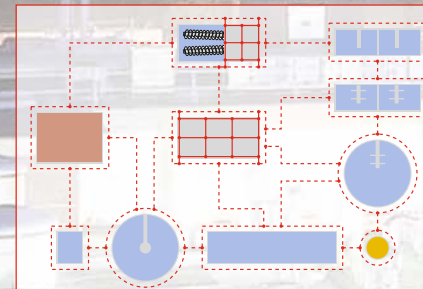
# DEHN – Lightning and Surge Protection for Sewage Plants from one Source.



**Illustration of a sewage plant.**  
Sewage plants are especially exposed to the risks of atmospheric discharges due to their large sizes. Furthermore, interference pulses 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 sparking 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 of protection measures. And it helps to optimise the availability of the installation.

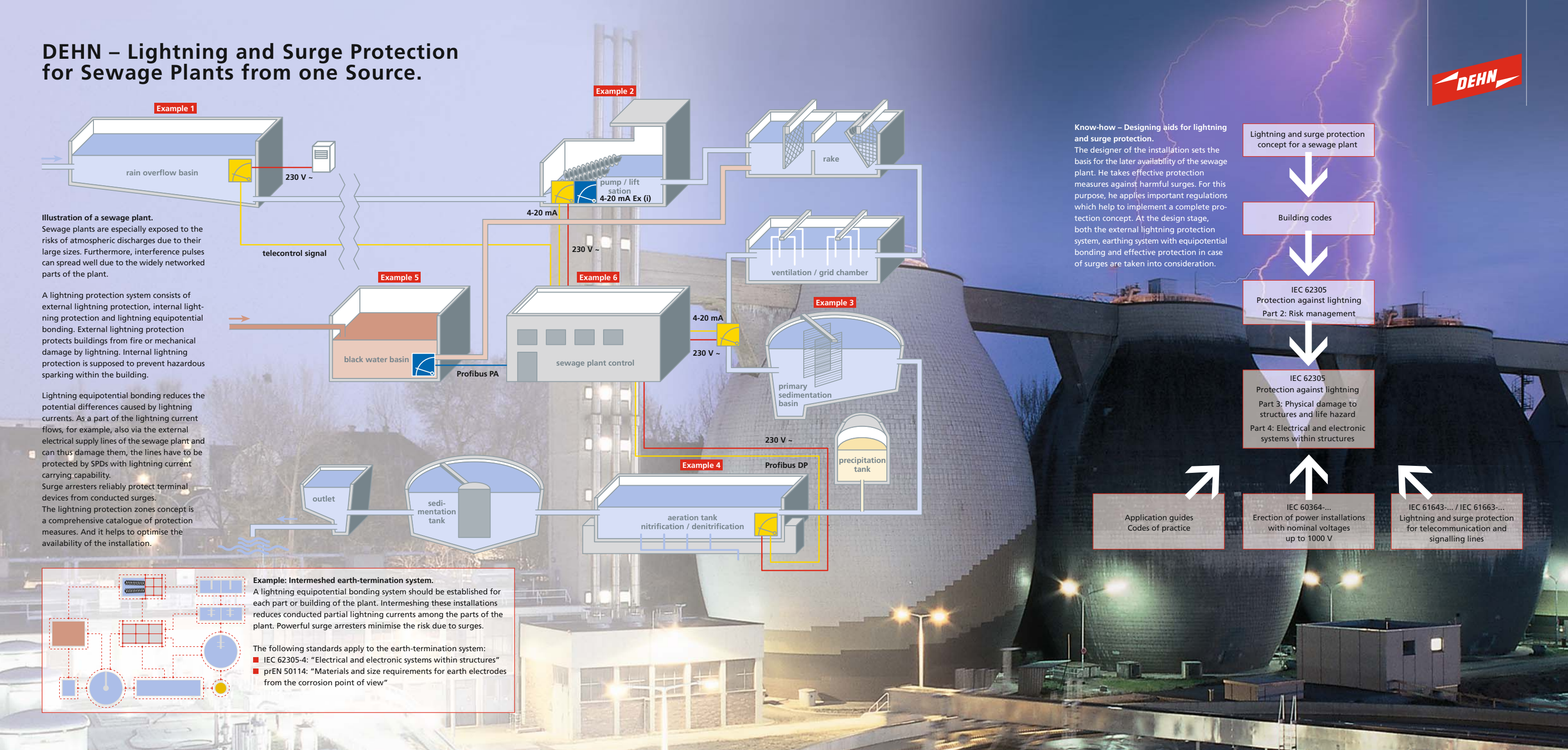
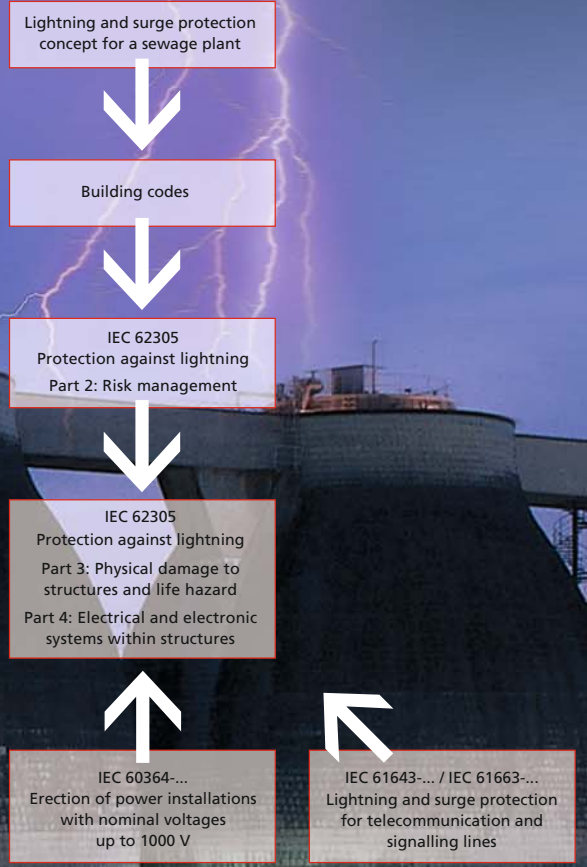


**Example: Intermeshed earth-termination system.**  
A lightning equipotential bonding system should be established for each part or building of the plant. Intermeshing these installations reduces conducted partial lightning currents among the parts of the plant. Powerful surge arresters minimise the 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 implement a complete protection concept. At the design stage, both the external lightning protection system, earthing system with equipotential bonding and effective protection in case of surges are taken into consideration.





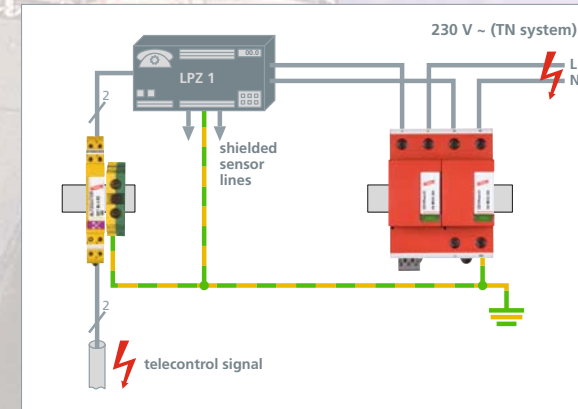
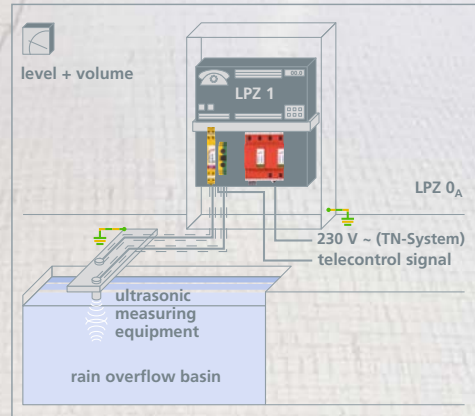
# Concepts for Measuring Points.



## Example 1: Telecontrol signal and power supply

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

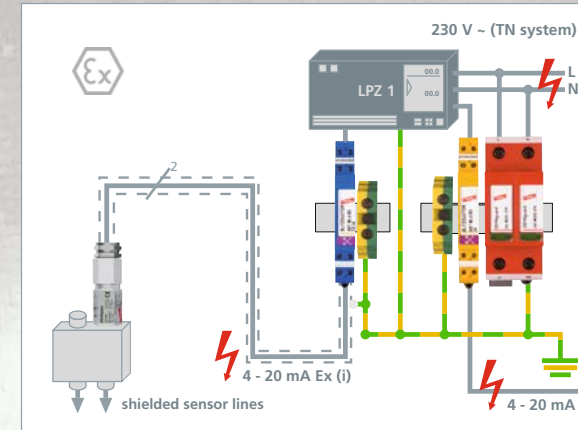
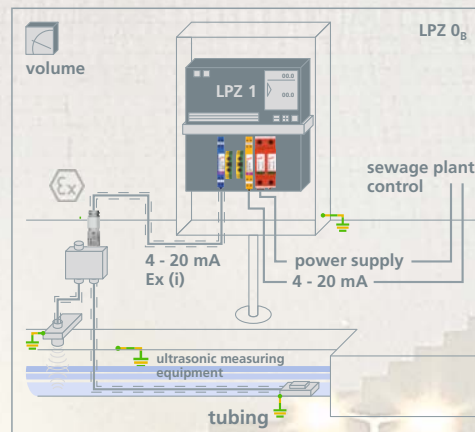
- Shield earthing at both ends of the short wires from the measuring transformer to the ultrasonic sensors
- Measured data are transmitted to the sewage plant control via telecontrol signal
- The power supply is provided directly by the utility
- The power supply and telecontrol systems are protected by combined lightning current and surge arresters capable of carrying lightning currents with an appropriate voltage protection level for terminal equipment and minimum requirements space



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

Surge protection for the sewer network level measuring equipment

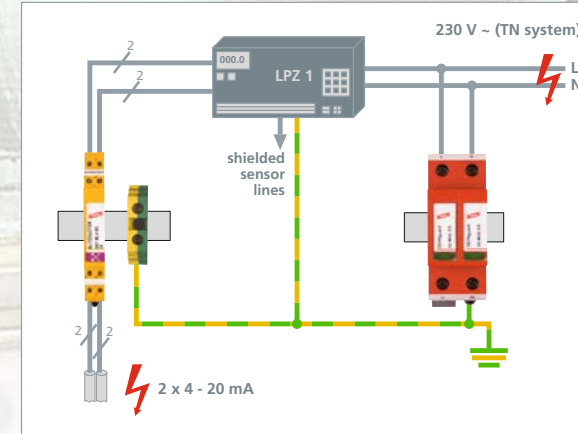
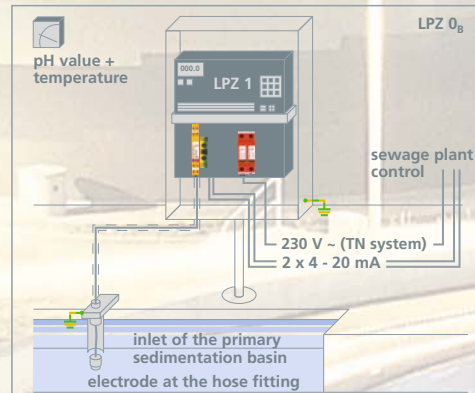
- Ex zone: Shield earthing at both ends of the short wires from the measuring transformer to the ultrasonic sensors
- If the measuring transformer and Ex isolation amplifier are spatially separated, Ex (i)-type surge arresters are installed at both ends of the connecting cable
- Outside of the Ex zone, 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

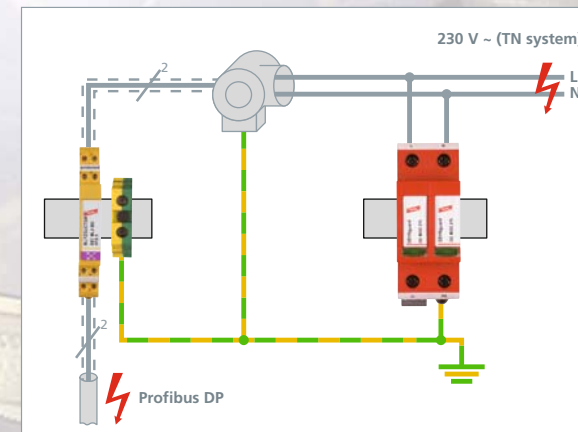
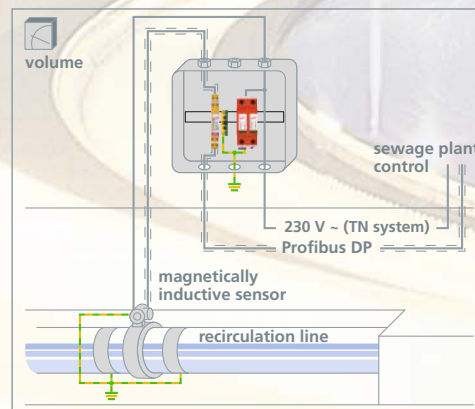
- Shield earthing at both ends of the lines from the measuring transformer to the electrode of the hose fitting
- The pH value and temperature are transmitted to the sewage plant control as two independent 4-20 mA signals
- Power supply is provided by the sewage plant control
- The lines going to the 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 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  
Universal 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 Ex 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
- 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 combination with Part No. 920 300

\*\* in combination with Part No. 920 301



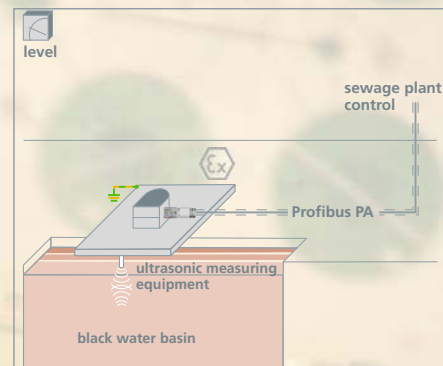
# Concepts for Measuring Points.



## Example 5: PROFIBUS PA Ex (i)

### Surge protection for the level measuring equipment

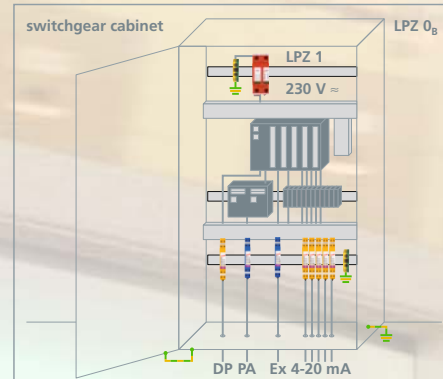
- The level measuring sensor used in hazardous zones is connected to the sewage plant control via an intrinsically safe PROFIBUS PA unit
- As there is no external power supply, only the bus connector has to be protected
- Ex (i)-type SPDs have to be installed into metal enclosures upstream of the measuring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



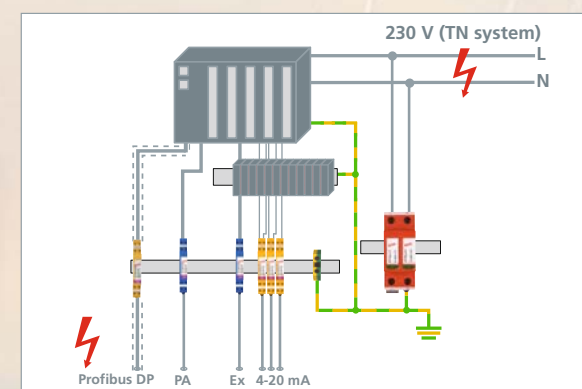
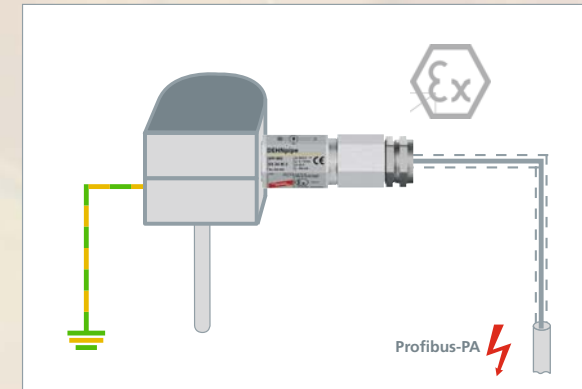
## Example 6: Switchgear cabinets with programmable logic control (PLC)

### 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 supply 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 also have to be integrated into the protection concept



LPZ = Lightning Protection Zone



## Easy SPD testing due to LifeCheck®

BLITZDUCTOR XT with integrated LifeCheck makes maintenance very easy. LifeCheck uses 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 of type DRC LC M3+.



## LifeCheck® Condition Monitoring

The LifeCheck technology also allows for the permanent monitoring of the surge arresters. This technology allows to continuously monitor up to 300 pairs in a system of up to 15 MCM monitoring devices. 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.



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



Condition Monitoring System with BLITZDUCTOR® XT



## Example 5:

- 1 x DEHNpipe MD EX 24 M 2 Part No. 929 960
- Surge arrester, Y/L SPD Class TYPE 2 P1
- KEMA 09 ATEX 0122 X II 2 (1) G Ex ia IIC T4/T5/T6
- 1 x KV S M20 MS 9.5 Part No. 929 982
- Accessories, EMC cable gland, IP 68, Ø 6.5-9.5 mm

## Example 6:

- 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 BLITZDUCTOR® ML2 BD HF EX 6 \*\*Part No. 920 538
- Surge arrester with LifeCheck
- KEMA 06 ATEX 0274 X II 2 (1) G Ex ia IIC T4/T5/T6 TYPE 2 P1
- 1 x BLITZDUCTOR® XT ML4 BD EX 24 \*\*Part No. 920 381
- KEMA 06 ATEX 0274 X II 2 (1) G Ex ia IIC T4/T5/T6, FISCO TYPE 2 P1
- 3 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
- 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
- \* in combination with Part No. 920 300 \*\* in combination with Part No. 920 301

## 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
  - Included PC software for documentation and administration of the test results
- Part No. 910 653

## DRC MCM XT for Condition Monitoring

Stationary DIN-rail-mounted SPD monitoring device to ensure permanent protection and availability of the systems. Suitable for permanent condition monitoring of up to 10 BXT lightning current arresters 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