



DEHN + SÖHNE



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Surge Protection: Safety for Sewage Plants.

More Information

I would like to have more information about the following topics:

- Main Catalogue "Surge Protection"
- Main Catalogue "Lightning Protection"
- DS 150: Yellow/Line "Easy choice surge protection"
- DS 649/E: Red/Line "Surge Protection Easy Choice"

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Lightning Protection Surge Protection Safety Equipment

DEHN + SÖHNE
GmbH + Co.KG.
Hans-Dehn-Str. 1
Postfach 1640
92306 Neumarkt
Germany

Tel.: +49 9181 906-0
Fax: +49 9181 906-100
www.dehn.de
export@dehn.de

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DS107/E/03.08

DEHN – Competence in Lightning and Surge Protection.

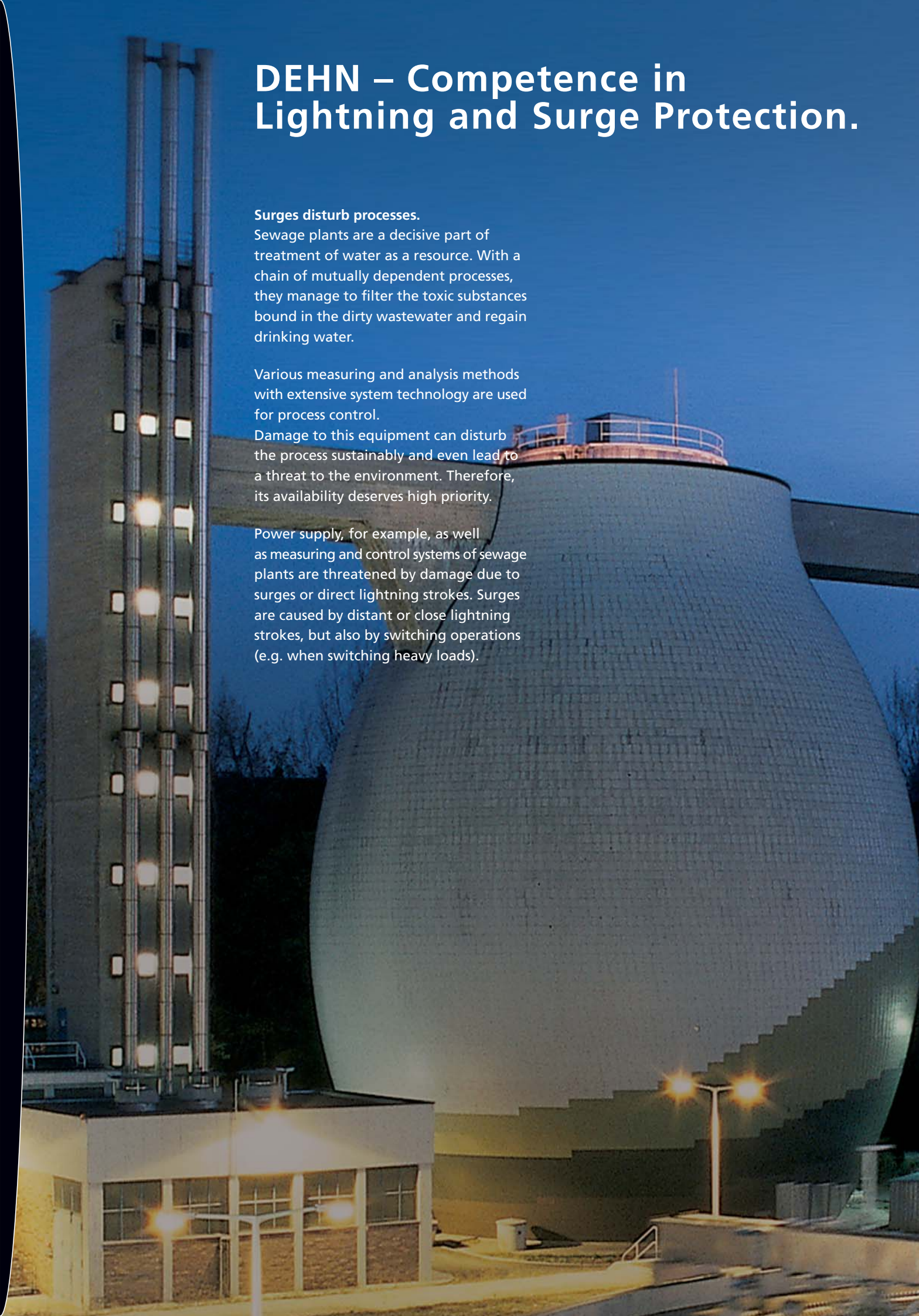
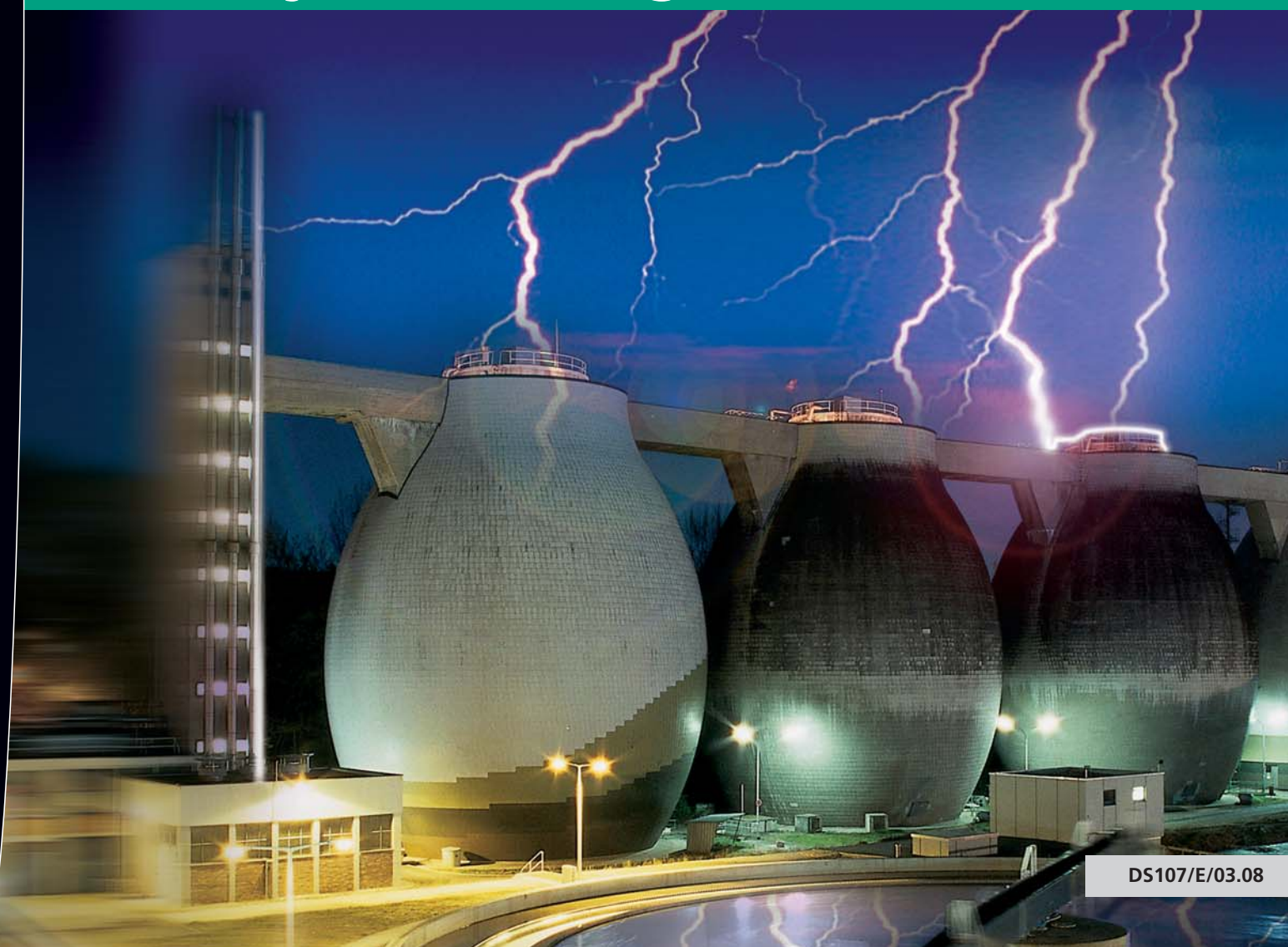
Surges disturb processes.

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.

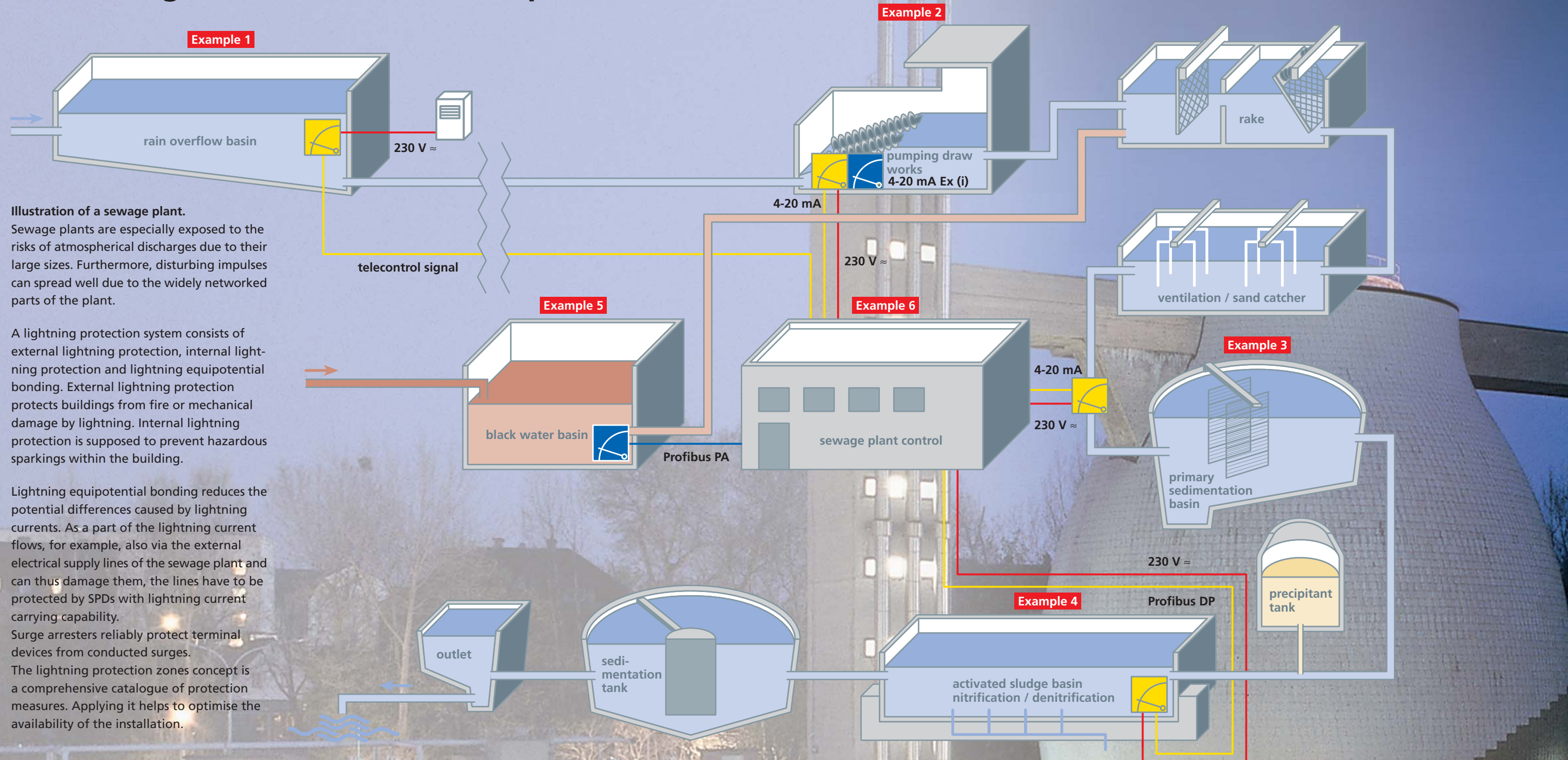


Illustration of a sewage plant.
Sewage plants are especially exposed to the risks of atmospheric discharges due to their large sizes. Furthermore, disturbing impulses can spread well due to the widely networked parts of the plant.

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.

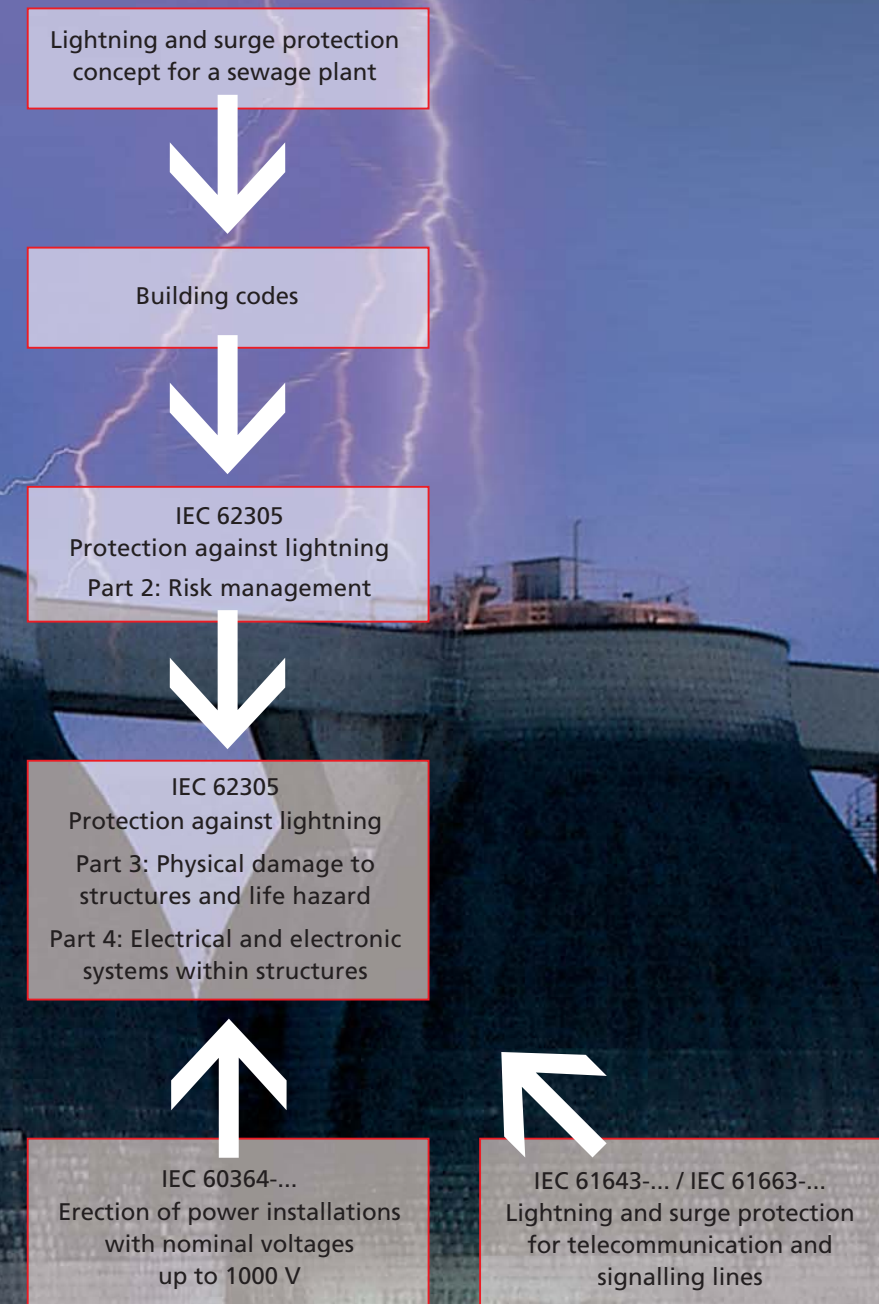
Surge arresters reliably protect terminal devices from conducted surges. The lightning protection zones concept is a comprehensive catalogue of protection measures. Applying it helps to optimise the availability of the installation.

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.



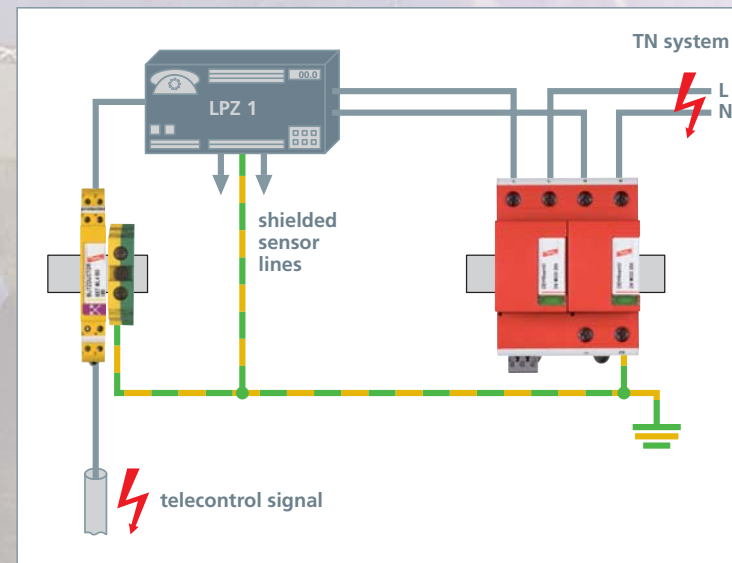
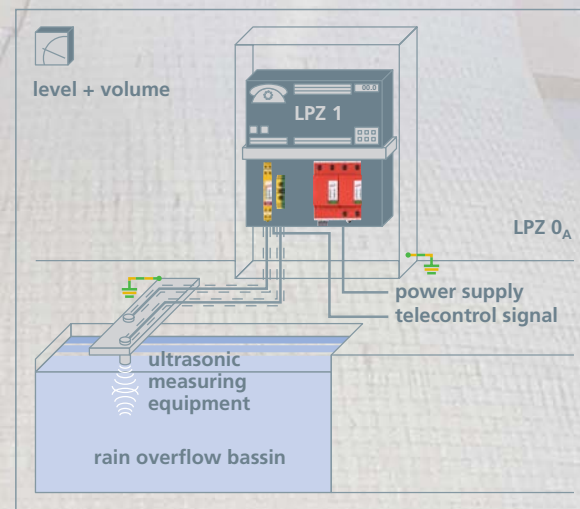
Concepts for Measuring Points.



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

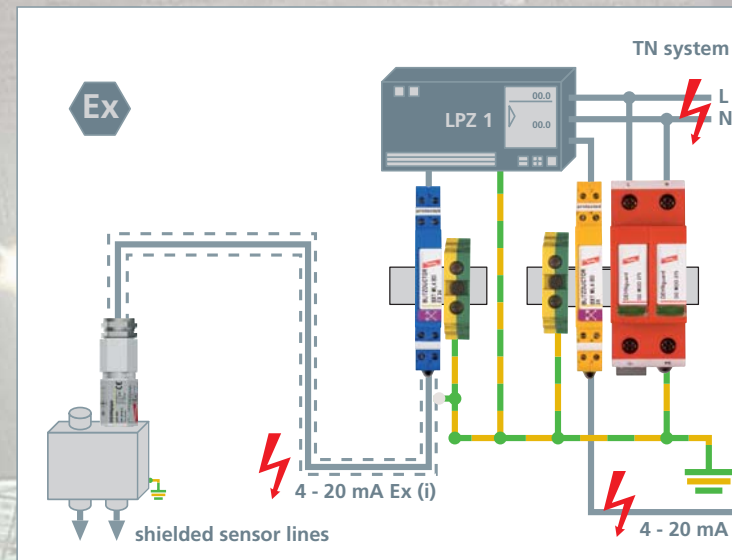
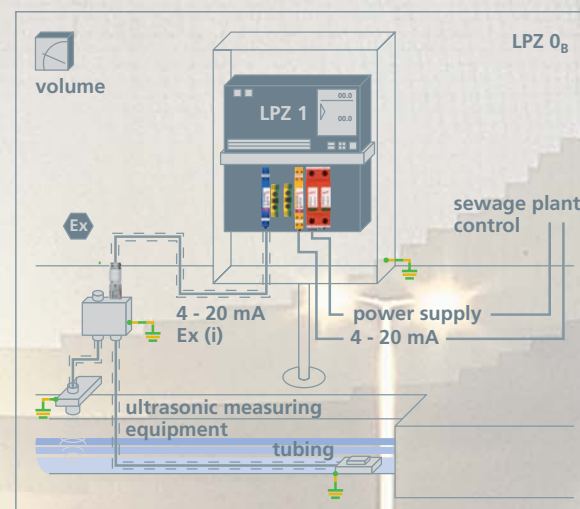
- The short lines going from the measuring transformer to the ultrasonic sensors are supplied with a both-sided shield earthing
- The measuring data are transmitted to the sewage plant control via telecontrol
- The power supply is provided directly by the power authority
- The power supply and telecontrol 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

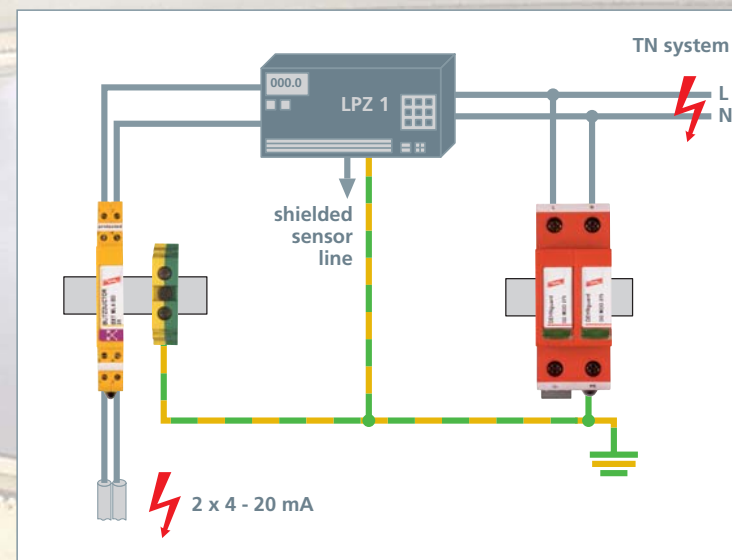
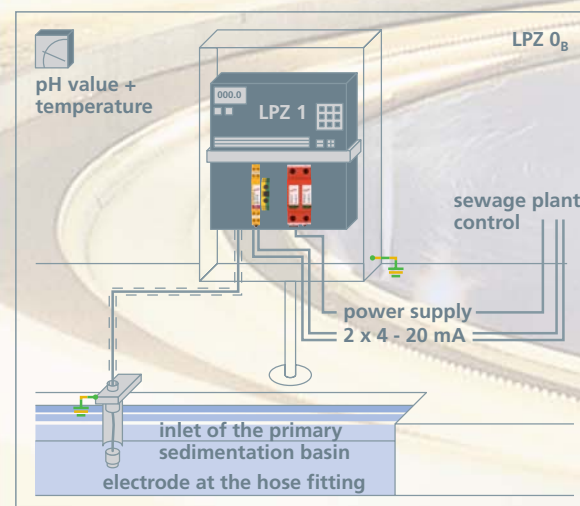
- Ex zone: The short lines going from the measuring transformer to the ultrasonic sensors are supplied with a both-sided shield earthing
- If the measuring transformer and Ex isolation amplifier are spatially separated, Ex (i)-type surge arresters are installed at both ends of the connecting cable
-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



LPZ = Lightning Protection Zone

Example 1:

- 1 x BLITZDUCTOR® XT ML4 BD 180 Part No. 920 300 + 920347
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE1 P2
- 1 x DEHNventil® M TT 2P 255 FM Part No. 951 115
(for TT systems)
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
(for TN systems)
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 ML4 BD 24 Part No. 920 300 + 920 344
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE1 P1
- 1 x BLITZDUCTOR® XT ML4 BD EX 24 Part No. 920 301 + 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 TYPE2 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:

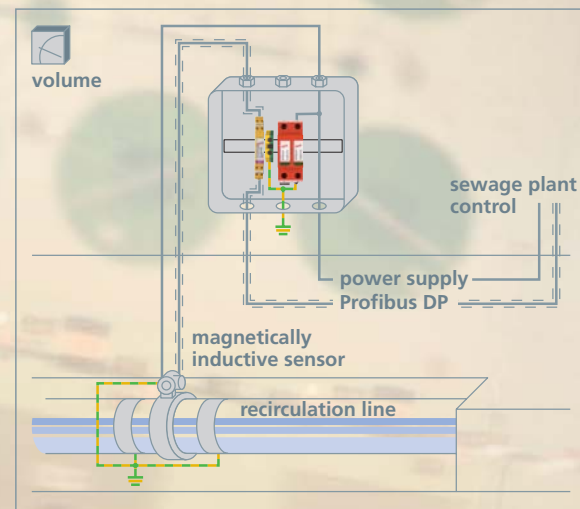
- 1 x BLITZDUCTOR® XT ML4 BD 24 Part No. 920 300 + 920 344
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE1 P1
- 1 x SLK 16 Part No. 910 099
Accessories, PE Terminal
- 1 x DEHNguard® M TN 275 FM Part No. 952 205
Surge arrester Type 2 with remote signalling contact, pluggable

Concepts for Measuring Points.

Example 4: PROFIBUS DP and power supply system

Surge protection for the flow measuring equipment

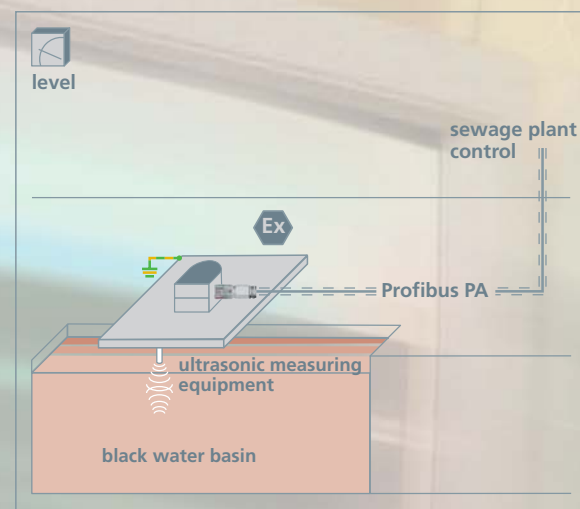
- Magnetically inductive measuring sensor with PROFIBUS DP and power supply connection
- The SPDs are installed immediately close to a distribution board
- The shield of the bus cable has to be led continuously and earthed with low impedance both via the sensor and SPD
- The bus cable and power supply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



Example 5: PROFIBUS PA Ex (i)

Surge protection for the level measuring equipment

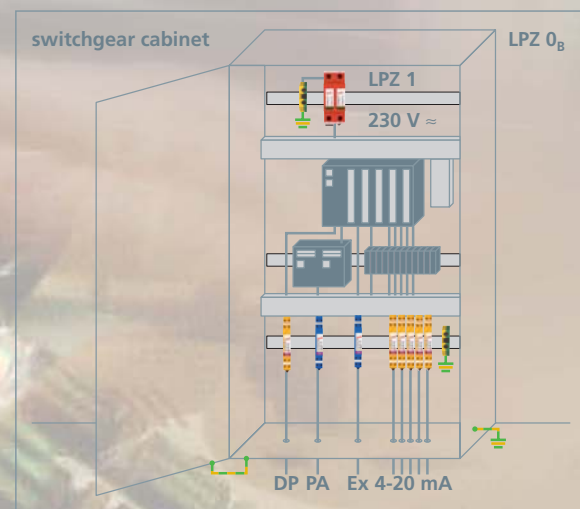
- The level measuring sensor used in hazardous zones is connected to the sewage plant control via an intrinsically safe PROFIBUS PA unit
- As there is no external power supply provided, only the bus connector has to be protected
- Ex (i)-type SPDs have to be installed into metal enclosures upstream of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



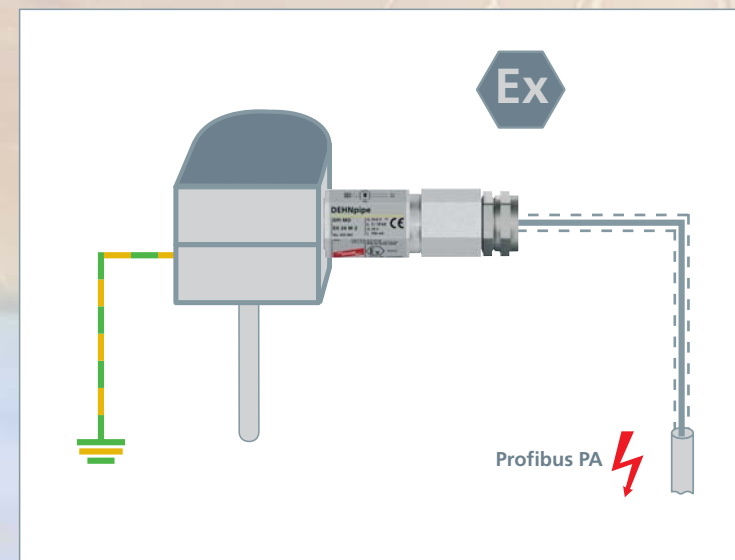
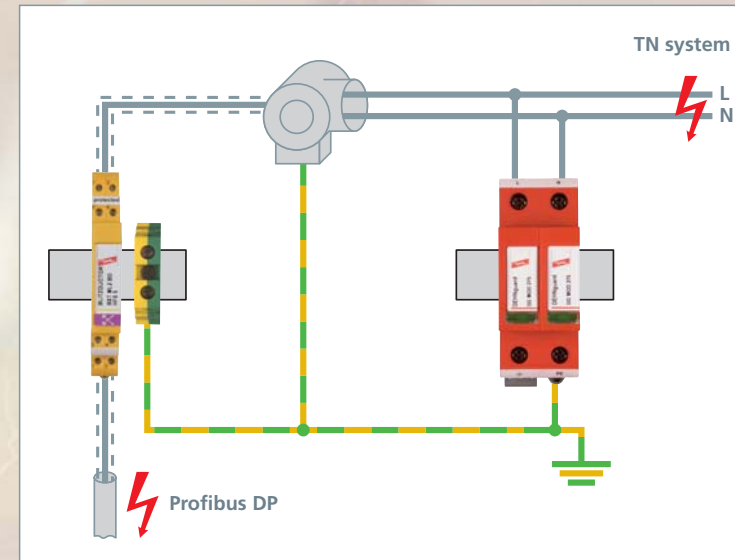
Example 6: Switchgear cabinets with programming logic control (PLC)

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



LPZ = Lightning Protection Zone



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



Example 4:

- 1 x BLITZDUCTOR® XT ML2 BD HFS 5 Part No. 920 300 + 920 271
Combined lightning current and surge arrester, 2-part unit, Y/L SPD Class TYPE 1 PT1 12 Mbit/s
- 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

Example 5:

- 1 x DEHNpipe MD EX 24 M 2 Part No. 929 960
Surge arrester, Y/L SPD Class TYPE 2 PT1
- 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

NEW !

Easy SPD testing due to LifeCheck®

BLITZDUCTOR XT with integrated LifeCheck allows for very easy maintenance. 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. For stationary monitoring and fault indication, new DRC MCM is the right equipment to use.

DRC LC M3

Portable device with LifeCheck sensor for flexible use. Visual and acoustic "OK" indication of detected LifeCheck circuits.
Part No. 910 653

DRC MCM XT

DIN-rail-mountable device with integrated LifeCheck sensor for operating-state-based monitoring of max. 10 BXT devices with LifeCheck.
Part No. 910 695

