

■ Design aspects - Explosion protection strategy

“Give us 5 minutes of your time ...
... and we will give them safely back!”



■ THE PROBLEM: Safe handling of explosive dust

Explosion protection on the Herding® filter units is necessary if

- ⇒ the dust has a minimum ignition energy > 3 mJ and there is an ignition source in the device or in the dust, or there is an external ignition source
- ⇒ the dust has a minimum ignition energy < 3mJ

■ THE SOLUTION: Explosion protection

Explosion-proof Herding® filter unit

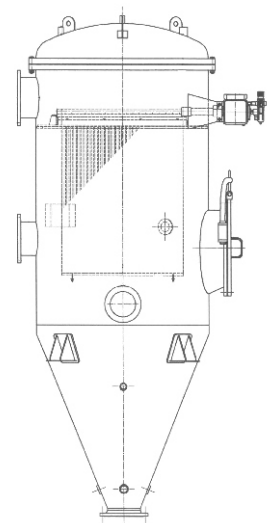
designed to withstand a maximum explosion pressure (p_{max}) of:

- ⇒ up to 11 bar on the surge pressure proof version
- ⇒ design, production and testing in compliance with VDI 2263 Sheet 3

Explosion surge pressure proof Herding® filter unit

designed to withstand reduced maximum explosion surge pressure ($p_{red, max}$):

- ⇒ explosion testing carried out in 1999 at DMT in Dortmund, Derne (DMT 2310/206/99 BVS-Fa)
- ⇒ complies with **VDI 2263 Sheet 3, dust explosion class St2**
- ⇒ tested to verify that the unit is **explosion surge pressure proof at 0.7 bar**



Explosion pressure relief on the explosion surge pressure proof

Herding® filter unit: design based on guidelines contained in VDI 3673 (Software WinVent 3.1e), only approved for non-toxic dust

- ⇒ **bursting disk** with flame and pressure relief, suitable for outdoor installation or for indoor installation with venting to the outside
- ⇒ **Q-Pipe** provides flameless pressure venting, suitable for room installation



Design aspects - Explosion protection strategy

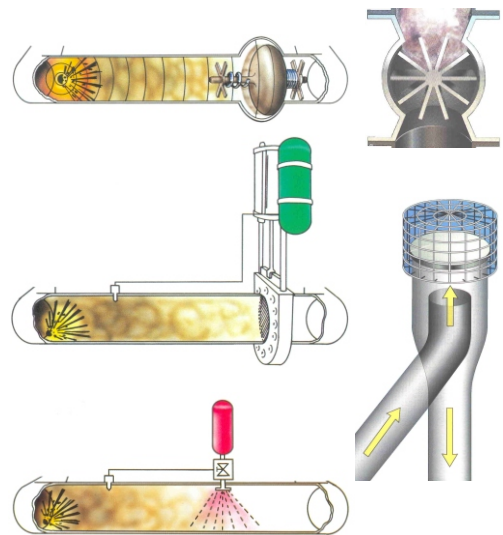
Explosion suppression on the explosion surge pressure proof Herding® filter unit:
Designed in accordance with VDI 2263, Sheet 4, approved for toxic dust, suitable for room installation

- ⇒ pressure sensor for dynamic pressure detection
- ⇒ control unit monitors sensor, activates extinguisher and alarm
- ⇒ extinguisher cylinders with rapid-action valve for fast release of the extinguishing powder



Additional explosion protection should be provided to **decouple** the Herding® filter units from upstream and downstream equipment (in the raw and clean gas lines and the dust/product discharge devices):

- ⇒ passive flame and pressure decoupling systems, e.g. An **explosion protection valve** in the clean gas line and a bucket wheel in the dust or product discharge unit
- ⇒ active flame and pressure decoupling systems, e.g. an **explosion protection slide valve** in the raw and clean gas lines or an **externally controlled explosion protection valve** in the clean gas line
- ⇒ passive pressure decoupling system, e.g. an **relief stack** on the clean and raw gas sides
- ⇒ active flame decoupling system, e.g. an **extinguishing agent barrier** on the clean and raw gas sides



User obligations

Users have an obligation to continually conduct risk assessments and review the process parameters to ensure compliance with occupational safety, hazardous substance and work equipment safety regulations. Users must take appropriate action if they identify changes in intended use or other changes that have taken place since the design phase. As a service, HERDING will create an explosion protection document in accordance with occupational safety regulations.

**“Talk to us ...
... and we will keep you out of harm's way”**

Herding GmbH Filtertechnik
August-Borsig-Str. 3
92224 Amberg
Germany
Phone: +49 (0)9621 630-0
Telefax: +49 (0)9621 630-120
e-mail: info@herding.de
www.herding.com