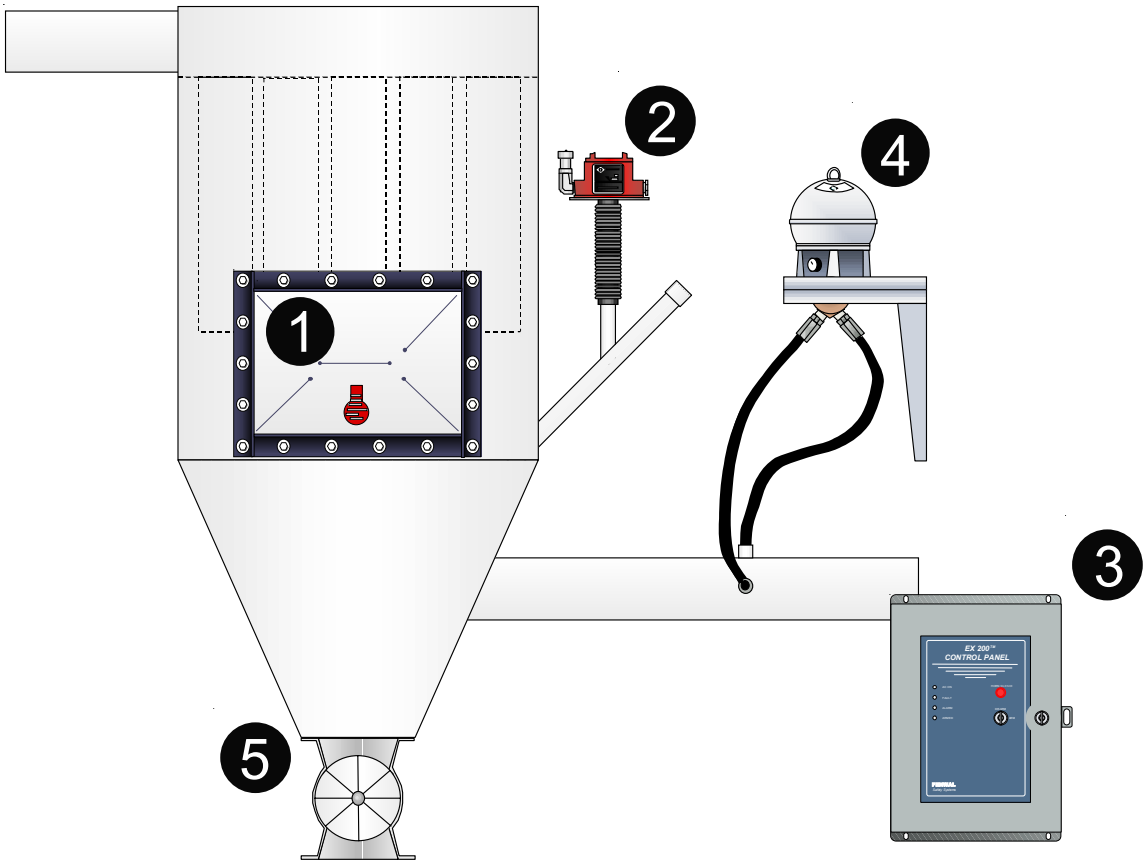
Dust Collectors

Explosion Relief Venting Systems



Application

Dust collectors are typically used as receiving vessels or for the collection of dust. They separate dust from the air stream by employing an array of filter bags or filter cartridges. Dust laden air slows down as it enters the collector, shedding some of its dust load into the collection hopper which may empty via a rotary gate valve. The lighter dust is swept up into the filter components from which it is periodically removed by air blasts or by a shaker mechanism.

System Components

1. **Explosion Relief Vent Panel**
2. **Pressure Detector**
3. **Single Zone Control Panel**
4. **Isolation Extinguisher**
5. **Rotary Gate Valve (by others)**

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Hazard

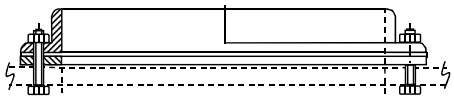
Dust collectors collect the finest and therefore the most readily ignited dust in a process, making them the most commonly protected process vessels. Even dust collectors handling dust loadings below the explosible limit may generate explosive dust levels when their filter components are periodically cleaned by shaker mechanisms or by jets of air. Under these conditions, an ignition source is all that is required to trigger an explosion. This ignition source can be provided by static electricity or by incoming burning particles from upstream equipment such as mills or dryers. In addition to damaging the dust collector, the deflagration may propagate to connected equipment. NFPA 654 requires that deflagration isolation be considered to stop flame propagation between interconnected vessels.

Protection System Description

For dust collectors mounted outside or close to an outside wall, explosion relief venting is a viable protection method. Protection is provided by an explosion relief vent that ruptures at a predetermined burst pressure to relieve pressure caused by a deflagration. Since the vent releases the pressure only, it is vital that the protection method includes a means to mitigate propagation of flame and burning materials. To achieve this, explosion pressure detectors mounted on the collector detect the pressure excursion from an incipient explosion. The detectors transmit a signal to the control panel, which triggers a high rate discharge extinguisher while simultaneously shutting down the process. The extinguisher, which is mounted on the inlet duct, moderates flashback upstream to interconnected process equipment. An explosion-proof rotary gate valve reduces the liklihood of burning materials passing downstream.

Typical Installation Details

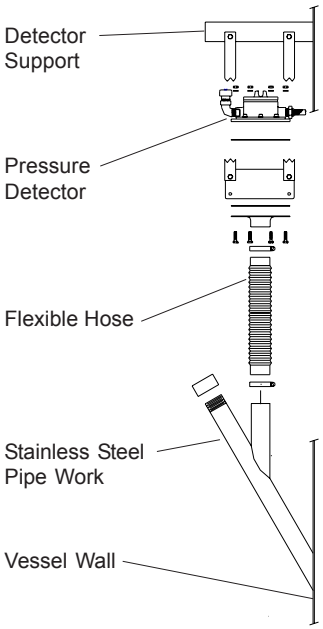
Explosion Relief Vent



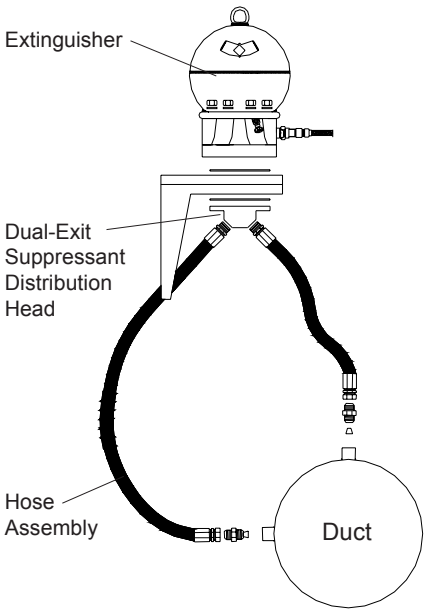
Mounting Frame Option for Bolted Installation

Mounting Frame Option for Welded Installation

Pressure Detector



Duct Isolation Components



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