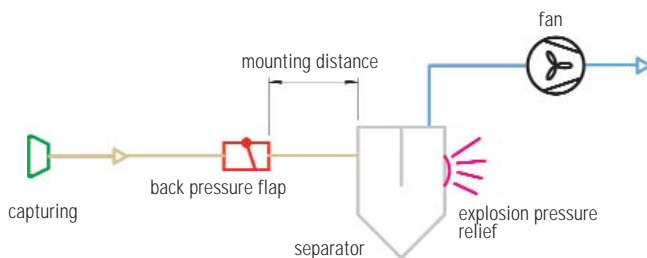


BACK PRESSURE FLAP "ProFlap" AND "ProFlapPlus" FOR EXPLOSION DECOUPLING

THE TASK

Numerous processes can create explosive dust/air mixtures within industrial systems (i.e. dust collectors, mixing machines, fluid bed granulators, mills, etc.). If ignition sources cannot be excluded due to process conditions, these systems are often equipped with constructive explosion protection measures such as pressure relief or pressure suppression. In this regard, connected ductwork is decoupled from containers to be protected so that no flames and explosive pressure can be transferred to other areas.

Example of an application of an exhaust system that is equipped with explosion pressure relief:



THE SOLUTION

Keller Lufttechnik developed the back pressure flap series "ProFlap" for effective explosion protection for nearly all industrial sectors. The "ProFlap" is certified as a protective system according to EU Guideline 94/9/EG (ATEX 95) and is approved for decoupling of dust explosions of organic and inorganic dusts.



SCOPE OF APPLICATIONS

downstream explosion decoupling of dry dust separators

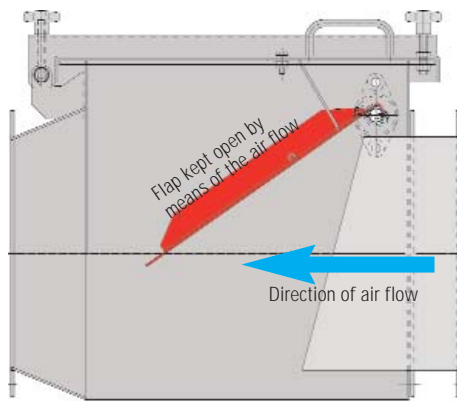
- when grinding glass-fibre reinforced components
- for chemical and pharmaceutical industries
- for the timber industry
- for varnish dust, etc.
- for blasting plants

**explosion decoupling for dryers, air separators, mills,
silos, fluid bed granulators, etc.**

OPERATION

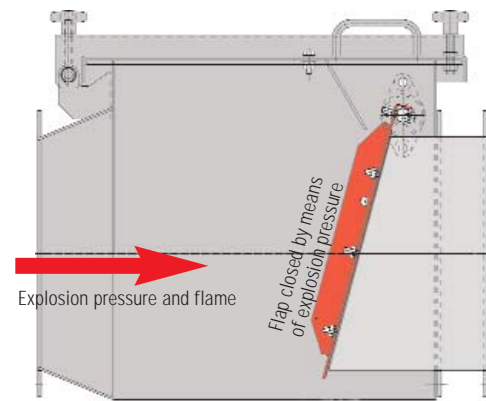
NORMAL OPERATION

During operation, the downstream mounted back pressure flap is kept open by means of the air flow. At standstill, the flap closes due to its own weight. When the system starts up, the opening of the flap is controlled by a damping element.



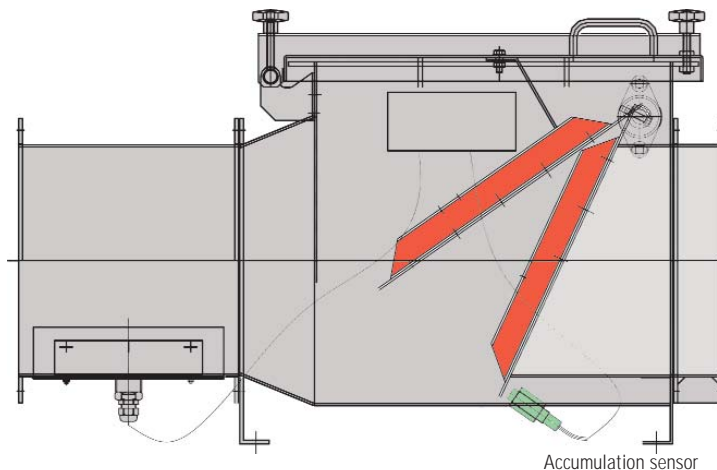
IN THE EVENT OF AN EXPLOSION

During an explosion within a protected system, the flap closes due to the pressure front spreading within the ductwork. The explosion flame and the pressure cannot strike back the ductwork. Personnel working at capturing points or downstream system parts are protected against the explosion effects. The flap damping element prevents the flap from opening shortly after an explosion because of the lowered pressure.



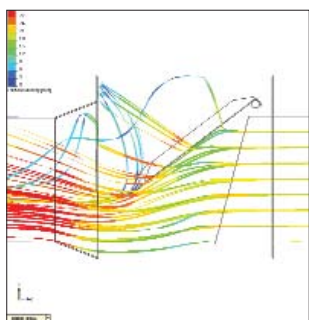
MONITORING FUNCTION ProFlapPlus (OPTION)

To increase inspection intervals, the optional monitoring "ProFlapPlus" is available (patent pending). An integrated wear sensor and a sensor to monitor the flap position control the wear of the flap and the closing operation.

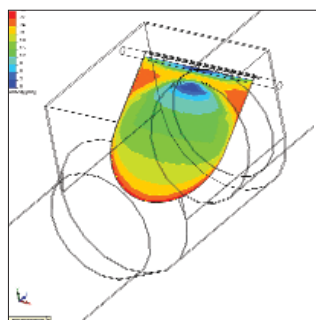


The sensors are completely wired in a terminal cabinet which is mounted at the return valve. The analysis of the signals happens via the electrical cabinet of the total system provided by the customer. Alternatively, it is possible to purchase a separate electrical cabinet (see "accessories").

When developing the monitoring sensors, up-to-date air flow simulation systems were used in order to determine the ideal positioning of the sensors.



Particle size: 10µm,
red: air flow velocity >30m/s



Velocity distribution on the
flap's surface

ADVANTAGES

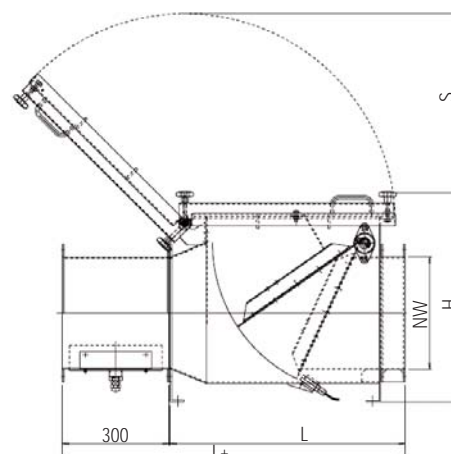
- certified according to the latest test standard prEN 15089 (date 04/2007)
- applicable for organic and inorganic dusts
- passive system, no triggering sensors necessary
- low-priced compared to other decoupling systems
- modular design of monitoring package for a controlled system operation and larger inspection intervals
- easily opened by means of fasteners, without loose components
- ideal accessibility for inspection via swivelling flap
- integrated consoles for easy assembly
- variable mounting distances (in case of aspiration ducts the mentioned distances are minimal).

SIZES, TECHNICAL DATA

Type	Nominal width NW	length ProFlap L	weight ProFlap	length ProFlapPlus L+	weight ProFlapPlus	width B	height H	S	pressure loss on 20 m/s
ProFlap140	NW 140	420 mm	27 kg	720 mm	33 kg	340 mm	410 mm	390 mm	approx. 190 Pa
ProFlap160	NW 160	490 mm	31 kg	790 mm	37 kg	420 mm	442 mm	420 mm	approx. 200 Pa
ProFlap200	NW 200	530 mm	38 kg	830 mm	45 kg	460 mm	485 mm	460 mm	approx. 220 Pa
ProFlap250	NW 250	590 mm	46 kg	890 mm	56 kg	510 mm	510 mm	480 mm	approx. 230 Pa
ProFlap280	NW 280	630 mm	50 kg	930 mm	62 kg	540 mm	552 mm	520 mm	approx. 250 Pa
ProFlap315	NW 315	670 mm	54 kg	970 mm	67 kg	560 mm	590 mm	540 mm	approx. 290 Pa
ProFlap355	NW 355	750 mm	82 kg	1050 mm	95 kg	590 mm	642 mm	590 mm	approx. 340 Pa
ProFlap400	NW 400	750 mm	92 kg	1050 mm	110 kg	650 mm	695 mm	645 mm	approx. 390 Pa
ProFlap450	NW 450	820 mm	99 kg	1120 mm	115 kg	700 mm	730 mm	700 mm	approx. 430 Pa
ProFlap500	NW 500	870 mm	118 kg	1170 mm	135 kg	780 mm	795 mm	760 mm	approx. 480 Pa
ProFlap560	NW 560	930 mm	134 kg	1230 mm	155 kg	850 mm	846 mm	820 mm	approx. 520 Pa

subject to modification

	NW 140 - NW 160	NW 200 - NW 315	NW 355 - NW 560
Dust explosion class:	St 1 and St 2 (max. K_{ST} -value: 300 bar x m/s)	St 1 and St 2 (max. K_{ST} -value: 300 bar x m/s)	St 1 (max. K_{ST} -value: 200 bar x m/s)
Pressure surge protection:	0,5 bar (excess pressure)	0,5 bar (excess pressure)	0,4 bar (excess pressure)
Mounting distance:	3 metre	4 metre	2 metre
Mounting position:	horizontal		
Air flow velocity:	15 - 30 m/s		
Materials:	housing: S235JRG2, flap: stainless steel		
Paint finish:	RAL 3000 "blazing red" (other colours available on additional charge)		



ACCESSORIES

A separate switchboard is available with integrated switch amplifier for the wear sensor.



GUIDELINES AND STANDARDS

Back pressure flaps are subject to a design check according to EU Guideline 94/9/EG (ATEX 95), actual standard prEN 15089 (date 04/2007) applicable. Quality assurance is audited according to 94/9/EG (ATEX 95) and is regularly controlled. Thus it is allowed to put back pressure flaps into circulation as autonomous protective systems.

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