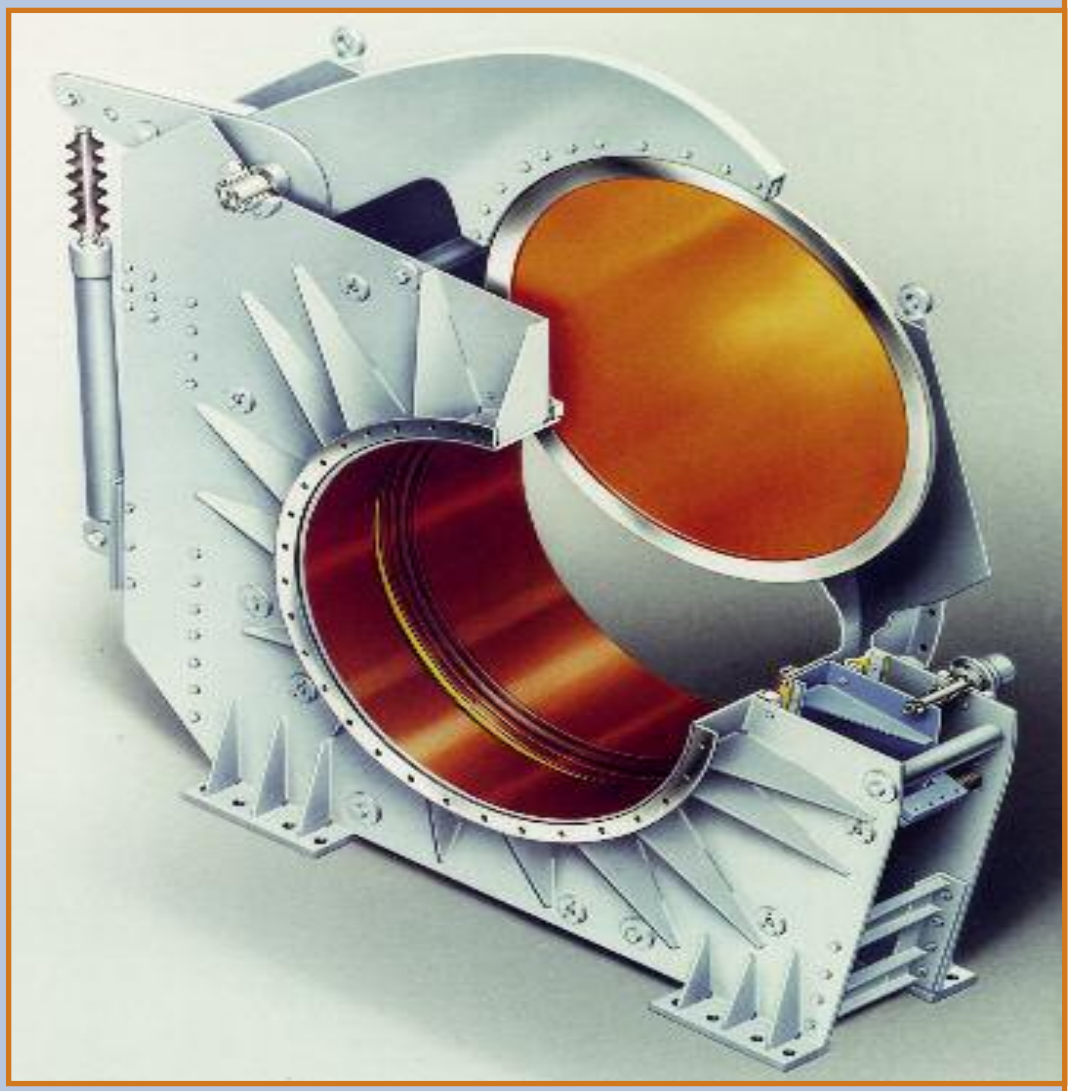
RAUMAG JANICH

A LEADER IN DAMPER TECHNOLOGIES

TOP 100 Top-Innovator

SICKLE ISOLATORS

PERFECT DAMPER TECHNOLOGIES FOR INDUSTRIAL PLANTS



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Sickle isolators

Sickle isolators were developed specifically for the gas-tight closure of flue gas ducts conveying dust-laden media and in which high levels of dust deposits can form. The shut-off is equivalent to a blind flange closure in accordance with UVV (periodic accident prevention inspection) safety regulations. To this end, an axially movable sealing frame is retracted and the blind plate swung into place. The sealing frame is then pressed down again by means of spring force so that the gas-tight closure is achieved without external power.
The sealing element and seal seating cover each other becoming self-protecting. The valve is thus suitable for even severely dust-laden gases. It is supplied as an open construction or with gas-tight cladding, as illustrated. Actuation can be hydraulic, pneumatic or electro-mechanical. The valve can be mounted at any attitude.

Title page:
Sickle isolators in open construction and with hydraulic actuation for the blind plate and sealing frame.

Advantages

- **Absolute leak-tight shut-off (blind flange)** due to a multitude of self-adjusting pressure points on the sealing frame.
- **Free-moving and**
- **insusceptible to dust –** the sickle swings around a dust-tight, encapsulated pivot point – no gear rack.
- **Maintenance-friendly –** all hydraulic cylinders can be exchanged without interrupting operation.
- **Low maintenance requirement and temperature insensitivity –** all moving parts are easily accessible from outside the pipeline and do not come in contact with the dust-conveying medium.
- **No wear to the seals and sealing surfaces –** these cover each other in the open and closed valve positions, becoming self-protecting.
- **No abrasion to the seals –** these are retracted from the sealing surface prior to each traverse.
- **No pressure loss –** with the valve open, no parts remain within the pipeline cross-section.
  The pressure loss is equivalent to a smooth pipe of the same length.
- **Compact and space-saving** due to the special design
- **Good installation options –** the valve can be mounted at any attitude.

Sickle isolator DN 2300 with gas-tight housing for shutting off a ball mill in a cement works. The valve enables shut-off in accordance with UVV (periodic accident prevention inspection). The shut-off is equivalent to a blind flange closure so that when the mill is isolated, maintenance personnel behind the valve are not endangered by the hot furnace exhaust gases. The sealing frame and the blind plate are actuated electro-mechanically. The operating temperature is 380°C, the design temperature 450°C. The pressure with the valve closed is 150 mbar.

Sickle isolators

The sickle isolator consists of two frame elements rigidly connected by bridge pieces. An axially movable sealing frame, mounted on guides, effects the gas-tight closure in the pressed-down position and in the retracted state permits the blind plate to swing in.
A compensator forms a gas-tight connection between the sealing frame and the fixed housing.
In the engaged position, the blind plate effects a gas-tight closure of the pipeline cross-section.
All sealing surfaces on the frame parts and on the blind plate are precision machined. Various options exist for the sealing arrangement according to operating requirements. Material for the special seals is also specified to correspond with the operating conditions (temperature, pressure, medium). The compensator can be executed in steel, stainless steel, special rubber or Teflon coated fabric.
Sickle isolators are supplied in an open or enclosed construction (with gas-tight housing).

Function

Actuation takes place in three phases.

Retraction of the axially moving sealing frame from the sealing surface to allow the blind plate to move freely.
The blind plate is swung in or out.
Pressing down of the sealing frame in the axial direction..

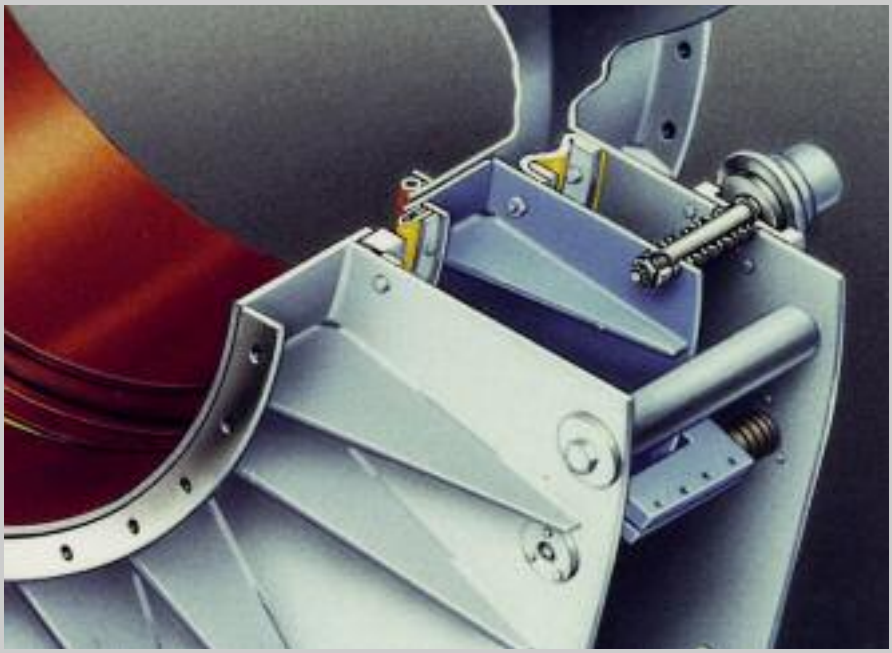
The blind plate can be swung hydraulically, pneumatically, electro-mechanically or mechanically by hand. The sealing frame can be shifted mechanically by hand or also by electro-mechanical or hydraulic means.

Mechanical actuation

The pressing and retraction of the moving frame is done via cardan shafts by synchronously driven jack screw elements. In the end phase, spring packs become active in pressing the frame with the effect that the pressure is maintained evenly over the whole circumference. The jack screw elements can be driven by hand via an appropriate reduction gear unit or by means of an electric actuator.

Hydraulic actuation

The retraction of the moving frame is effected by means of hydraulic cylinders. The contact pressure is generated by spring packs commensurate with safety regulations whereby this pressure always remains constant, independent of the hydraulic fluid pressure and also in the event of a power failure. By virtue of the special design of this detail, it is also possible to remove the hydraulic cylinders during operation and renew these without the sealing pressure declining. Thus even all the cylinders can be simultaneously removed for longer periods, for example to renew the gaiter or seals after long service.



The adjacent illustration shows the movable sealing frame which is connected to the rigid valve housing element by a compensator.

A hydraulic or pneumatic cylinder retracts the sealing frame in the axial direction before the blind plate is moved. The seal is pressed down by plate springs. Thus leak-tightness in the duct is also guaranteed in the event of a power failure in accordance with safety regulations.

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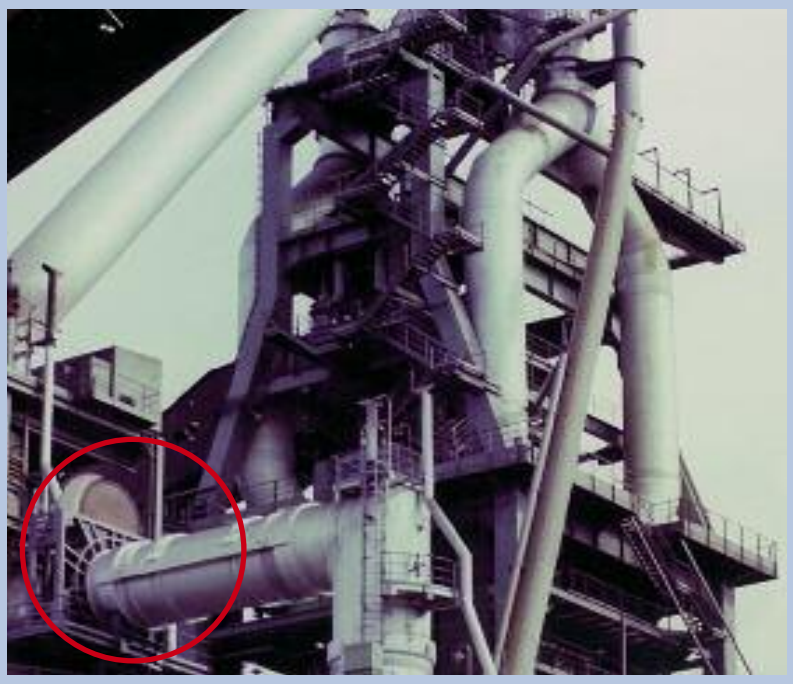
Sickle isolator DN 3000
as primary shut-off device before a furnace gas fired boiler plant at the Mittelsbühren power station.
The shut-off is equivalent to a blind flange closure in accordance with UVV (periodic accident prevention inspection). The sealing frame and blind plate are actuated hydraulically. The valve is provided with gas-tight cladding and venting.
The interior is heated during cold conditions.



Sickle isolator DN 3000,
open construction, in the flue gas line of a blast furnace.

RAUMAG-JANICH – Perfect technique, Quality and Security

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