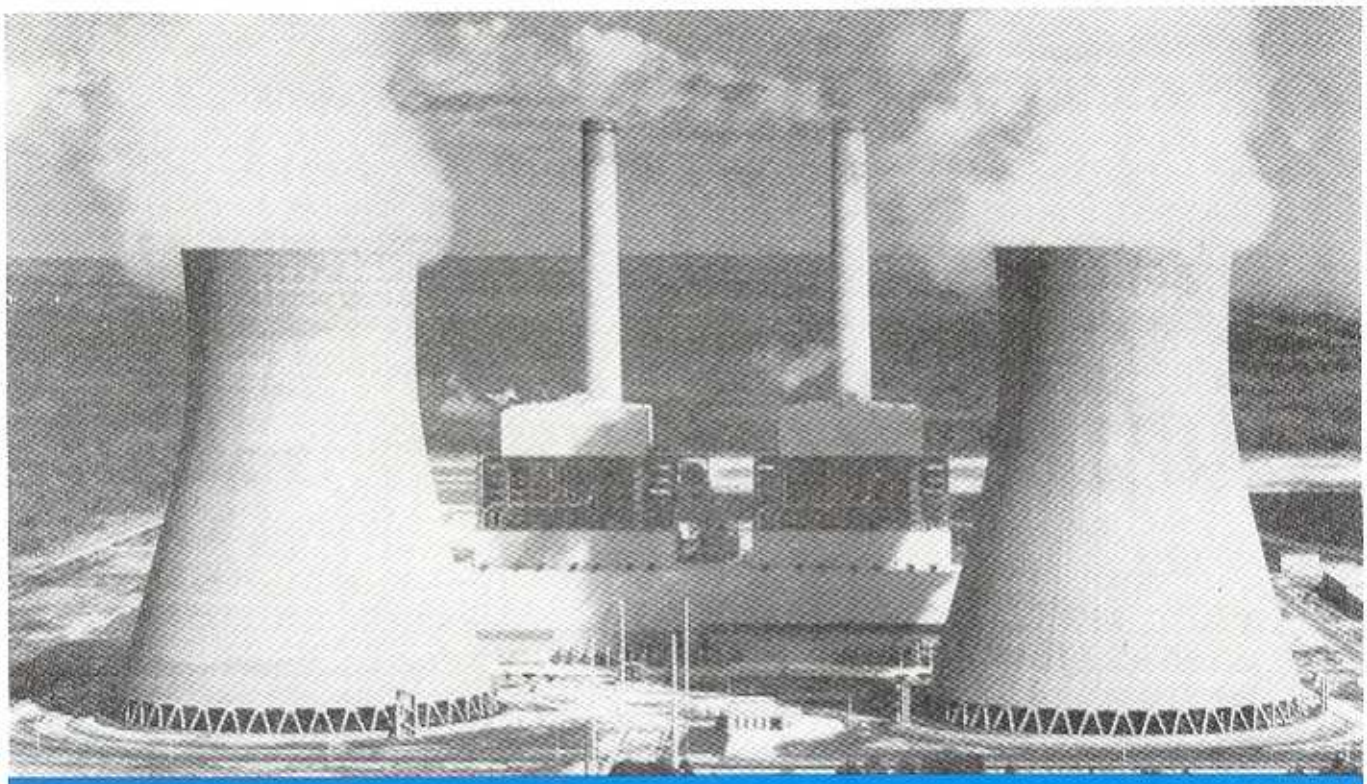
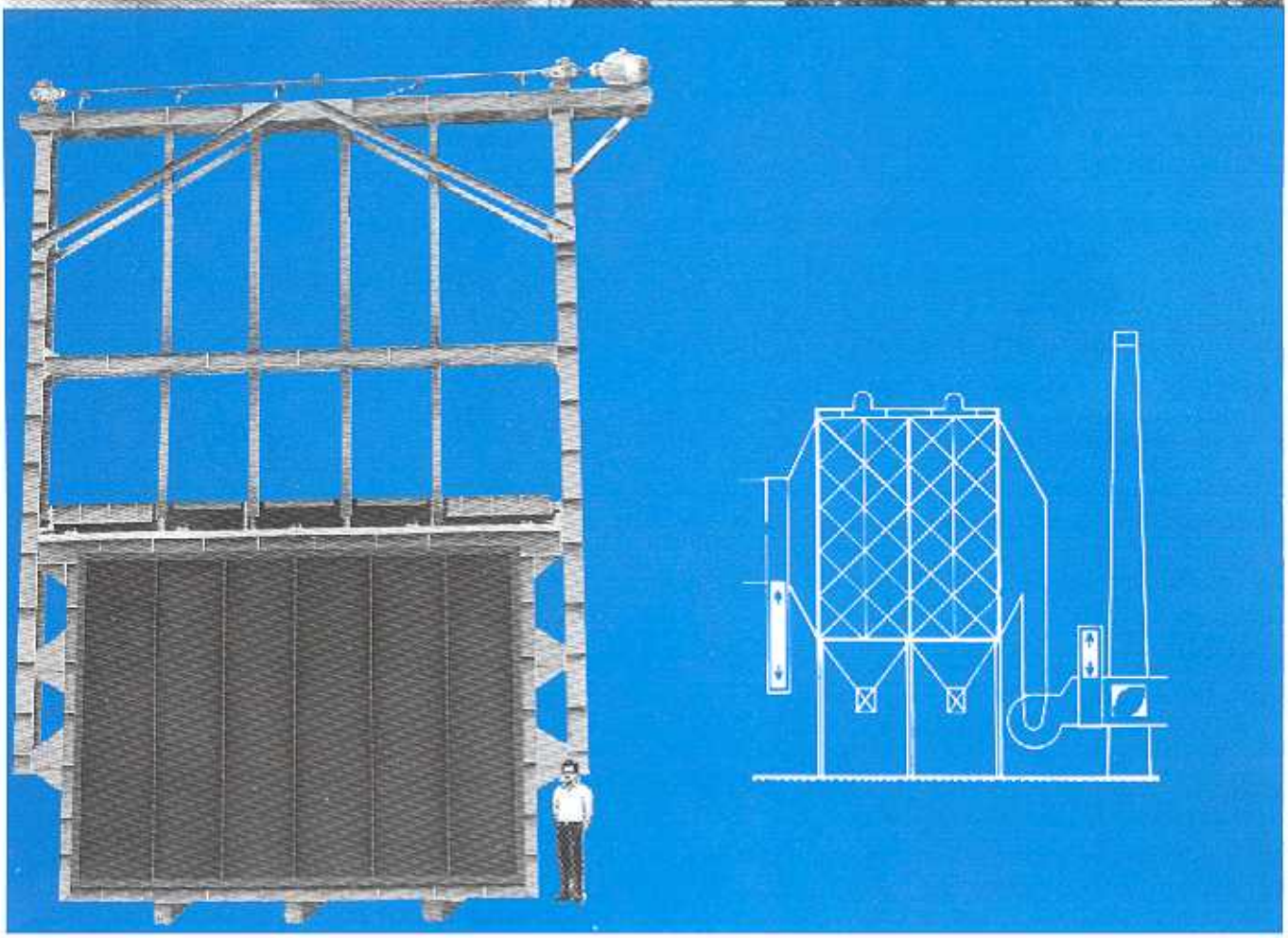
FOURESS

GLANDULAR VALVES





GLANDULAR VALVES

FEATURES

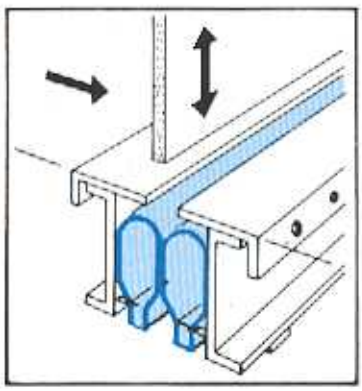
GENERAL

Glandular valves are designed to provide 100% shut-off gas ducts in continuous process plants. They provide complete isolation of ancillary equipments, even against pressure excursions, allowing safe access for on-load inspection or maintenance, without having to close down the main process. Unscheduled emergency outages due to auxiliary equipment troubles can therefore be eliminated.

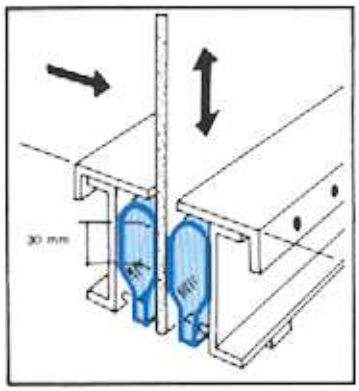
GUARANTEED 100% GAS-TIGHTNESS

FOURESS Glandular valves consist of a steel plate sliding between the proven FOURESS Glandular sealing system. As the blade,in the closed position, extends beyond the seals on all four sides into atmosphere, the valves are 100% gas-tight across the blade, ensuring completely safe isolation of the duct.

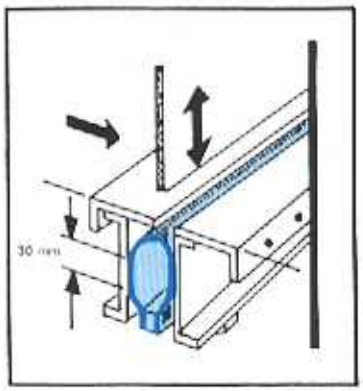
SEALING SYSTEM



Double Seal Spade
Valve-Open Position



Double Seal Spade
Valve-Closed Position



Single Seal Spade
Valve-Open Position

Located around the complete inside of the Glandular valve's frame are one or two sets of flexible metallic looped sealing elements. These seals are constructed of austenitic stainless steel or high nickel alloys, depending on the operating conditions. They are made up in straight sections which, in the unlikely event it should be necessary, can be easily renewed from outside. The seals, whether the valves is open or closed, give a positive metal to metal seal of 30-50 mm width and maintain a constant seal between the duct and atmosphere.

Because of the flexibility of the sealing elements no moving flanges, or similar devices, are requifed to facilitate movement of the blade.

SUITABILITY FOR DUSTY CONDITIONS

FOURESS Glandular valves are particularly suitable for dusty conditions because, when open or closed, the area of the blade in contact with the sealing elements is never exposed to the gas-stream. Furthermore the blade on entry has a self-cleaning action, as its thin section slices through any dust build up. Valves are known which have been successfully operated, for over 10 years, in circumstances where the dust level exceeds 1500 mm.

ISOLATOR MAINTENANCE AND INSPECTION

Seals

As the seals are located on the periphery of the valve frame they can be inspected with the plant on-load. In the unlikely event seals should need replacement, this is done from outside and access is not required to the duct interior.

Operating Gear

The entire valve operating gear is located outside the duct and does not come into contact with the flue gases. The critical components, such as the motor, drive shaft, gear boxes and drive screws can therefore be inspected and serviced at all times. This ensures that, even after long periods of inactivity, the valve will function properly and not, itself, be the cause of a plant outage.

SIZE : FOURESS Glandular valves are available for duct sizes up to 100 m^2. They are suitable for square, rectangular and, with the addition of end plates, circular cross-sections.

GAS CONDITIONS : FOURESS Glandular valves are suitable for conditions where the normal temperature and differential pressures do not exceed 350° C and - 500 mm WG To + 100 mm WG H_20. For the higher pressure temperature, special provision can be made in the design.

STANDARD DESIGN DATA

BLADE ENTRY: FOURESS Glandular valves are suitable for installation in horizontal, vertical and inclined ducts. The blades can be arranged to enter the duct from above (top entry), from the side or at an inclined angle.

Sealing efficiency : 100% on CSA without seal air

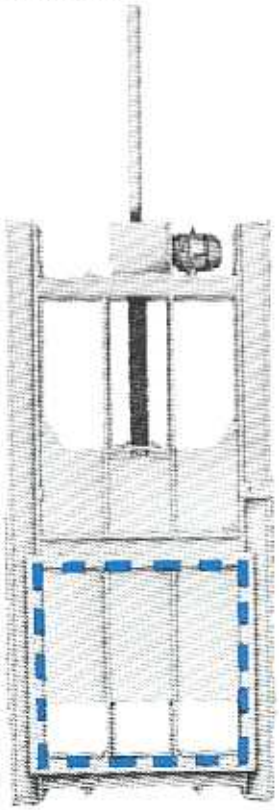
Duty : ON/OFF

SPADE VALVE: For differentials below 1000 mm H_2O the blade consists of a thin steel plate, larger than the duct cross-sectional area, which is withdrawn completely from the seals into atmosphere, when the valve is open.

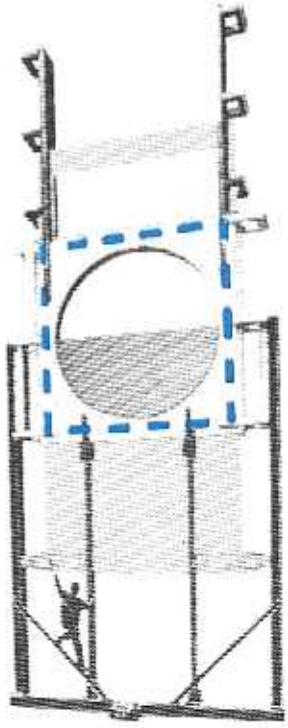
ACTUATION: Standard operating speed is 1.25 metres/minute but, by using double start screws or chain drive, speeds up to 10 metres/minute are attainable. The drive system is normally electrically powered and emergency manual drive is provided for operating the valve in the event of power failure.

SINGLE JACK DRIVE: Spade valves for ducts smaller than 9m² in cross-section can be supplied with a single drive. Thus the blade is moved by means of a single travelling screw jack drive. The screw jack, which has a protective gaiter to prevent dust ingress, is powered by a motor.

DOUBLE SCREW DRIVE: Normally the blade is moved by means of a double screw drive. The screws, in protective gaiters to prevent dust ingress, are powered by a motor through two reduction gear boxes. The main drive member is located at either the extremities of the valve, or at approximately duct level.



Single Drive



Double Drive

CONTROL: Limit switches are supplied to control the 'OPEN' and 'CLOSED' positions of the valve. This facilitates interlocking with other electrical controls.

OPTIONS

CLEARBORE : Usually the flue frame is provided with internal stiffeners and bracings. The central stiffeners consists of one or more high strength vertical members, edge on, offering minimal resistance to flow. Where required, for example with highly erosive gases, the duct opening can be arranged to be free of any restrictions.

POWER: The drive system is normally electrically powered but can alternatively driven by manually.

FOURESS reserve the right to introduce changes in design or specification should we consider them necessary in the interest of improved performance.

The feilds of applications for FOURESS Isolators extends to many industries and activities, including :

Cement	Nuclear	Power Generation
Chemical	Offshore Oil	Refuse Incineration
District Heating	Oil Refining	Steel- making
Metal Processing	Perto-Chemicals	Total Energy Systems

FOURESS Isolators are being used for the isolation of :

Precipitators	By-pass stacks	Waste Heat Boilers
SOx Scrubbers	Auxiliary Fans	LD Converters
Boilers	Fired Heaters	Sinter Strands
Air Preheaters	Lime Kilns	Cement Kilns
Reheaters	Induced Draught Fans	Spray Dryers
Chimneys	Pulverised Fuel Mills	Secondary Fume Systems
Gas Turbines	Gas Recirculation Fans	Copper Smelters
		CO Boilers

USERS OF FOURESS GAS-TIGHT ISOLATORS INCLUDE:

(A) **POWER PLANTS :** Port Kelang (Malaysia); MSEB (Korad, Nashik, Bhusaval, Parli); MPEB Korba, Sarni, Amarkantak); GEB (Ukai, Wanakbori); TNEB (Ennore, Tuticorin); APSEB (Kothagudam); OSEB (Talcher); NTPC (Badarpur, Farakka, Ramagundam, Singrauli), UPSEB (Panki); Renusagar Power Corporation Ltd., (U.P) BSEB (Patratu, Barauni), HSEB (Faridabad, Panipat)

(B) **DESULPHURISATION PLANT :** Tata Electric Company, Trombay.

(C) **CEMENT PLANTS :** Sharjah Cements (UAE); Pedang Portland Cements (Indonesia), ACC (Gagal, Kistna, Porbandar, Sevalia, Wadi, Chanda); Andhra Cement Company Ltd., (Durgapuram); CCI (Mankgarh, Neemuh, Tandur, Yerraguntla); Gujarat Ambuja Cements; Kesoram Cements; L & T (Awarpur); Madras Cements Ltd; Mysore Cements Ltd; Priyadarshini Cements, Rajashree Cements; Modi Cements; Saurashtra Cements; Vasavadatta Cements; Mangalam Cements; TISCO Cements; Dhar Cements, Vikram Cements; Raymond Cements, Texmaco (Yerraguntla) Jaypee, Rewa.

(D) **REFINERY & PETROCHEMICALS:** Gujarat Refinery; Gauhati refinery; Mathura Refinery; Barauni Refinery; Cochin Refineries; Bongaigaon Refinery; Haldia Refinery (IOCL); Madras Refinery, HPCL (Vizag), BPCL (Bombay), Tamil Nadu Petroproducts Ltd. Reliance Petrochemicals Ltd. (Hazira) Cochin Refineries.

(E) **GAS TURBINE :** ONGC (Hazira, Uran), BPCL (Mahul); FCI (Talcher); APGEB (Vijeswaram); AECO (Vatva); HPCL (VIZAG); GEB(Utran); Samtel (Ghaziabad)

(F) **NUCLEAR :** IGCAR (Kalpakkam); KCR (Khammam).

(G) **PAPER :** National Newsprint & Paper Mills (Nepa Nagar), Ballarpur Industries Ltd., Orient Paper Mills (Amla), Century Paper Mills.

(H) **FERTILIZER :** Shriram Fertilizers & Chemicals Ltd. (Kota); HFCL (Barauni); Zuari Agro Chemicals Ltd. (Goa); SPIC (Tuticorin).

(I) **STEEL :** SAIL (Rourkela Steel Plant, Bhilai Steel Plant, Bokaro Steel Plant).

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