

Konrad
Armaturentechnik



WATER ENERGY OIL & GAS STEEL CHEMICAL INDUSTRY

Quality.
Out of tradition & conviction.



Konrad
Armaturentechnik

The Company



EXENTROMAT®
ARMATUREN

Konrad Armaturentechnik GmbH

In 1939 Alfred Konrad founded a machining and equipment manufacturing workshop in Bochum for products such as conveyor belts and wheel discs for rail vehicles.

The young company was initially hampered in its rise by the years of war. But with the **development of high-quality industrial valves** in the mid-sixties, the foundation was laid for continued growth in the decades to come.

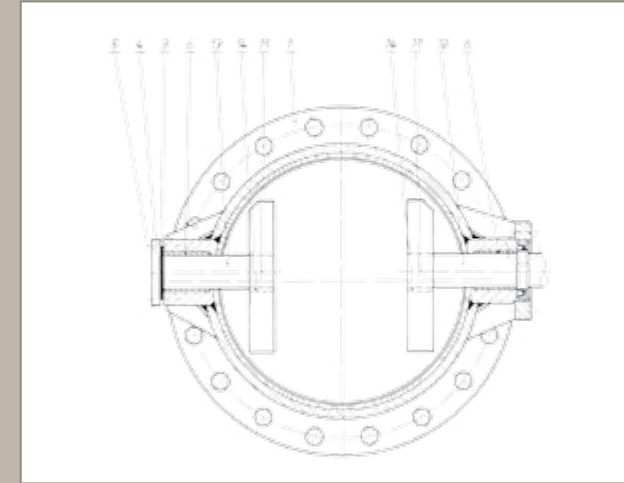
Within the framework of an age-related transfer of undertakings, the newly founded Konrad Armaturentechnik GmbH took over the business operations of Alfred Konrad Maschinenfabrik GmbH & Co. KG on 01.04.2010 and has since managed the company in the usual way and at the same location.

CEO: Dipl.-Ing. (FH) Lutz Lischardt

Product



>> Products from the early days of Alfred Konrad Maschinenfabrik



>> Sectional drawing of one of the initial „EXENTROMAT“ units

History of the EXENTROMAT® - Industrial Valves

The **1960s** saw the development of an **innovative valve design**. A proper metal-to-metal sealing became possible for the first time – thanks to a double eccentric butterfly arrangement which also came with an improved sealing geometry. And it is with this high-quality welded design that customized Konrad valves have earned a great reputation **worldwide** under the registered trademark of EXENTROMAT®.

Our industrial valves are used wherever demanding operating parameters are concerned or particularly stringent safety requirements are applied. Owing to our deep-rooted commitment towards quality and our **decade-long experience** we can assure excellent leak-tightness, technical functionality and an extraordinarily long service life of our products.

Quality. Out of tradition and conviction.

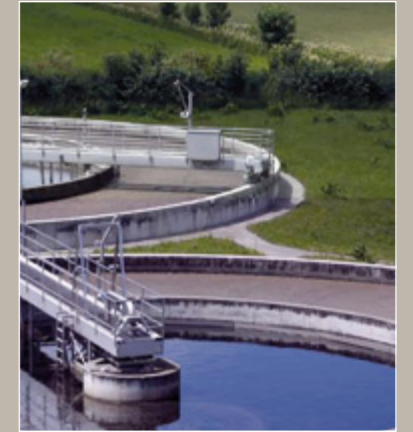
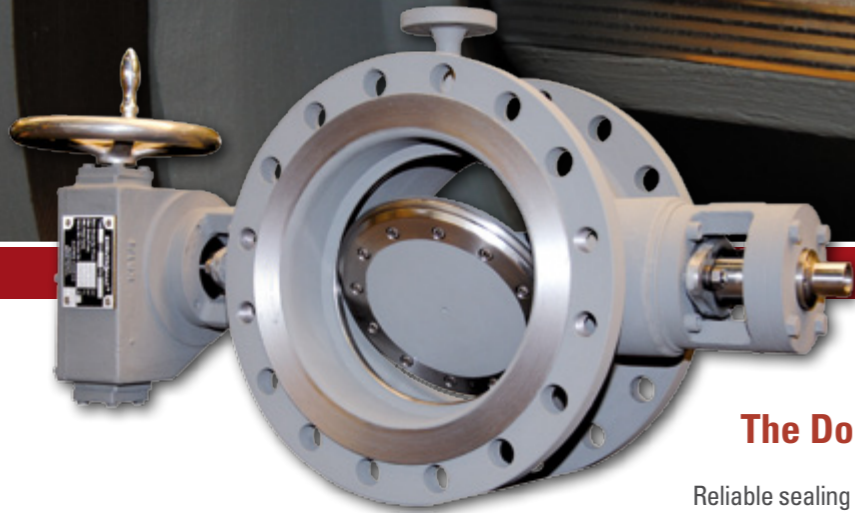




Konrad
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Technology

Fields of Application



WATER

ENERGY

OIL & GAS

STEEL

CHEMICAL INDUSTRY

The Double Eccentric Arrangement

Reliable sealing of Konrad valves is achieved by **low-friction pivoting** of the valve disc into the conical housing seat. This necessitates a double eccentric arrangement of the valve disc whose axis of rotation is outside the sealing axis and the tube axis. This geometry brings about an optimal sealing behaviour **while keeping the actuating forces low**. The **minimized mechanical stress** ensures low wear and tear and thus a long life of the seal.

Media / Areas of Use

Given the large variety of available material combinations, Konrad valves are resistant to numerous types of media. Our valves are employed, among others, in the following fields of application:

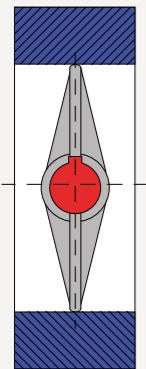
- **Cooling water**
- **Waste water**
- **Hot water**
- **Steam**
- **Waste gas**
- **Process gas**
- **Air**
- **Oxygen**
- **Ammonia**
- **Acrylic acid**
- **Petroleum**
- **Natural gas**

Advantages

- **Absolute leak-tightness**
- **High operational safety**
- **Low maintenance effort**
- **Cost-effective operation**
- **Long service life**
- **Inexpensive to purchase**

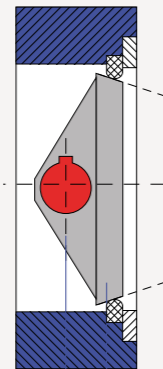
Centric

>> Usually soft sealing with a housing lining



Eccentric

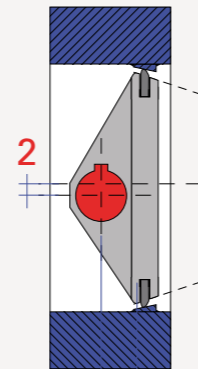
>> Usually soft sealing with an O-ring or profile ring in the disc or in the housing



First eccentricity
The seat is axially offset to the shaft

Double eccentric

>> Soft sealing or metallic sealing (O-ring or profile ring), flexible or solid metal seat



Second eccentricity
The shaft is offset from the centreline of the valve

First eccentricity
The seat is axially offset to the shaft

The areas of use are therefore also highly diversified:

- **Water and waste water management**
- **Fossil power plant**
- **Chemical and petrochemical industry**
- **Petroleum and natural gas industry**
- **Steel industry**
- **Gas industry**
- **District heating industry**
- **Paper industry**



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Product Range



Shut-off valves

Check valves

Combined shut-off check valves



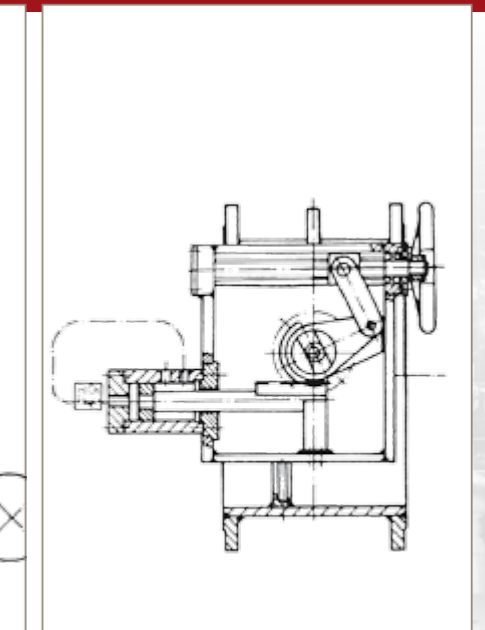
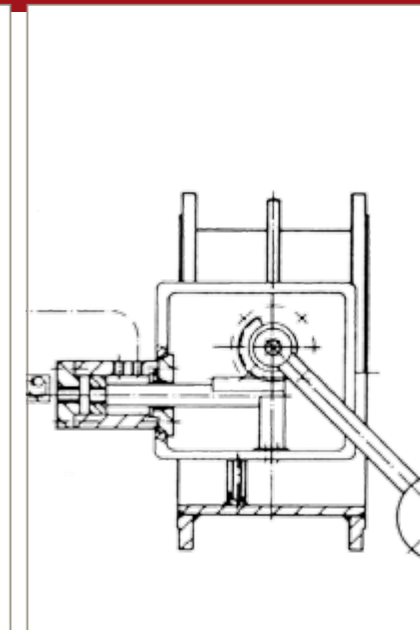
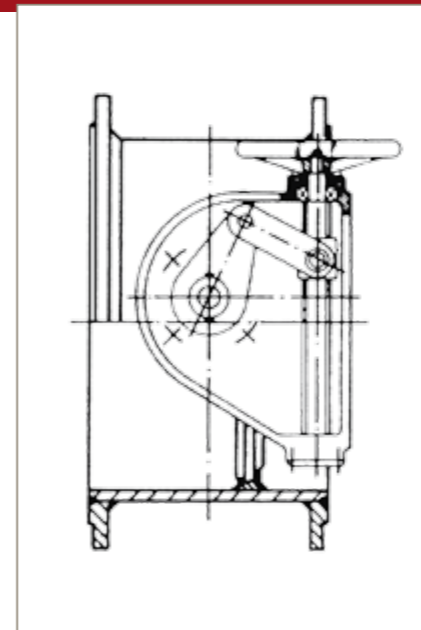
Type: **A**



Type: **RBH with hydraulic brake**



Type: **RA with hydraulic brake**



Design: Industrial valves in double eccentric butterfly design
Welded design

- Types:**
- Tight-closing shut-off valves, also in both directions (type A)
 - Check valves (type R)
 - Combined shut-off check valves (type RA)
 - Safety position valves
 - Valves for vacuum operations
 - Non-stopped and stopped throttle control valves
 - Special valves upon the customer's request
for example with flow protection, heating jacket or outer bearing

Nominal Sizes: DN 100 to DN 2000

Nominal pressures: Up to PN 63

Temperature range: -196 °C up to +550 °C

End connections: DIN, ANSI, BS, MSS, API, JIS etc.
Welding ends (up to DN 800)

Face-to-face dimensions: EN 558-1 / ISO 5752 series 14 (F4) or upon the customer's request

Materials: 1.0038 (S235 JR), 1.0425 (P265 GH/HII), 16 Mo3
1.4301, 1.4401, 1.4439, 1.4462, 1.4541, 1.4571 etc.

Inlet linings: Hard rubber, soft rubber, natural rubber, hard protective coating

Disc seals: NBR (Perbunan®), FKM (Viton®), PTFE, stainless steel, SS graphite or PTFE lamination

- Shaft seals:**
- Stuffing box
 - Double stuffing box or safety stuffing box
 - Lip seal and O-ring made of NBR, FKM, PTFE
 - Double lip seal and O-ring made of NBR, FKM, PTFE

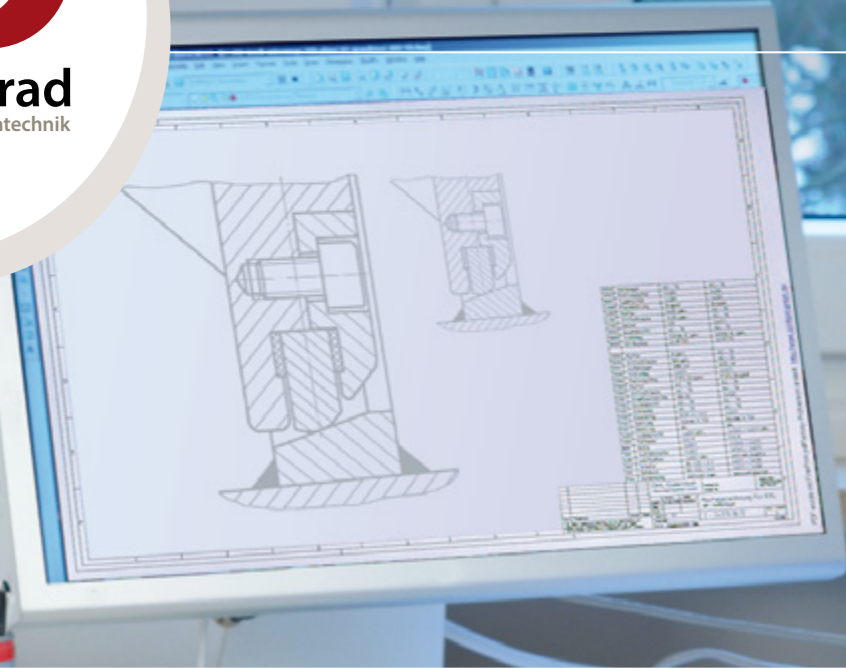
Actuators:

- Self-locking gears with position indicator, handwheel-operated or with direct flanged electric motor
- Pneumatic and hydraulic drives including control applications and safety position by return spring
- Check valve gears with infinitely variable hydraulic brake
- Combined shut-off and check valve gears with hydraulic brake
- Pneumatic and hydraulic force-controlled check valve drives



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Disc seal



Shaft seals

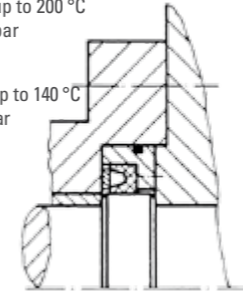
Lip seal and O-ring made of elastomer, with holder

>> Lip seal

NBR
 $T = -20 \text{ up to } 100 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

FKM
 $T = -30 \text{ up to } 200 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

EPDM
 $T = -30 \text{ up to } 140 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

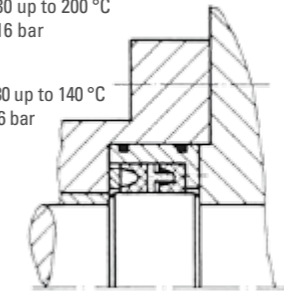


>> Double lip seal

NBR
 $T = -20 \text{ up to } 100 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

FKM
 $T = -30 \text{ up to } 200 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

EPDM
 $T = -30 \text{ up to } 140 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

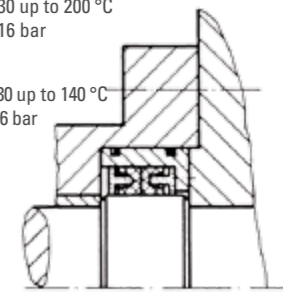


>> Double lip seal (pressure-vacuum)

NBR
 $T = -20 \text{ up to } 100 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

FKM
 $T = -30 \text{ up to } 200 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

EPDM
 $T = -30 \text{ up to } 140 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$



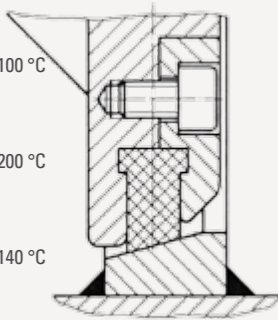
Disc seals

>> Elastomer

NBR
 $T = -20 \text{ up to } 100 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

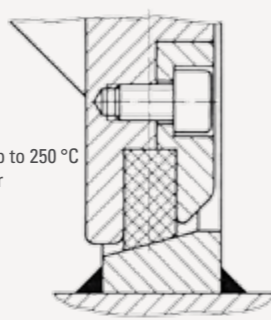
FKM
 $T = -30 \text{ up to } 200 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$

EPDM
 $T = -30 \text{ up to } 140 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 16 \text{ bar}$



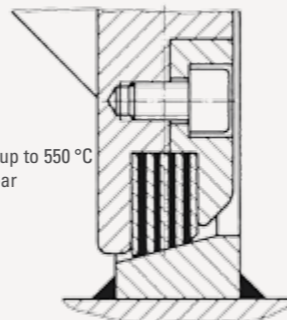
>> PTFE

$T = -200 \text{ up to } 250 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 25 \text{ bar}$



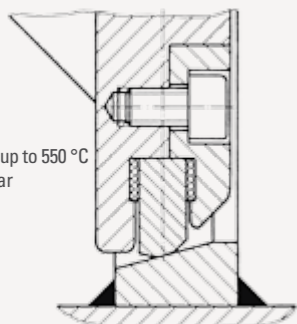
>> SS graphite lamination

$T = -200 \text{ up to } 550 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 40 \text{ bar}$



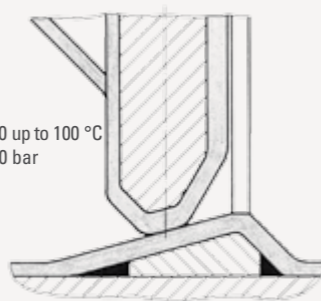
>> Stainless steel

$T = -200 \text{ up to } 550 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 40 \text{ bar}$



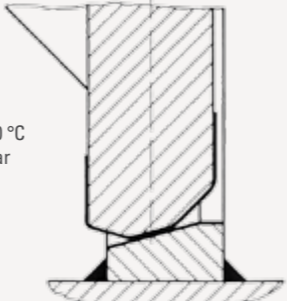
>> Rubber lining

$T = -10 \text{ up to } 100 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 10 \text{ bar}$



>> Coating

$T = > 500 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 40 \text{ bar}$

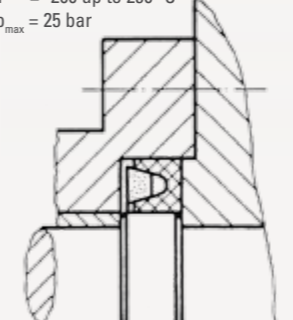


The selection of the type of seal depends on the medium, the pressure and the temperature.

Lip seal and thrust ring made of PTFE, without holder

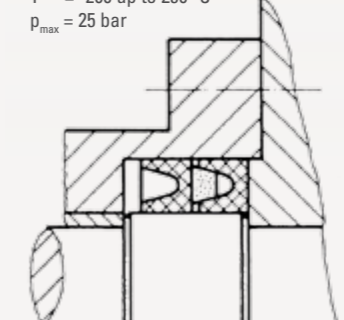
>> Lip seal

$T = -200 \text{ up to } 250 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 25 \text{ bar}$



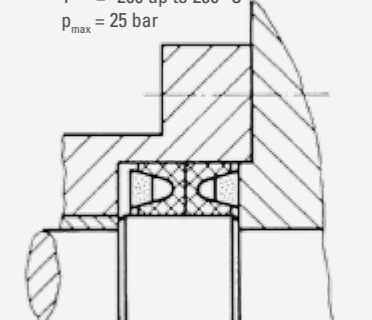
>> Double lip seal

$T = -200 \text{ up to } 250 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 25 \text{ bar}$



>> Double lip seal (pressure-vacuum)

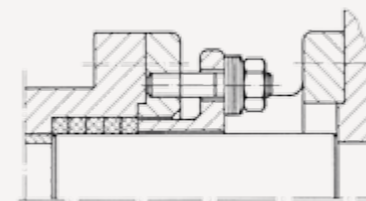
$T = -200 \text{ up to } 250 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 25 \text{ bar}$



Spring-loaded stuffing box

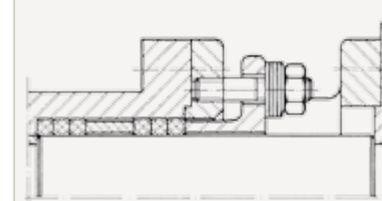
>> Stuffing box

$T = -200 \text{ up to } 550 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 40 \text{ bar}$



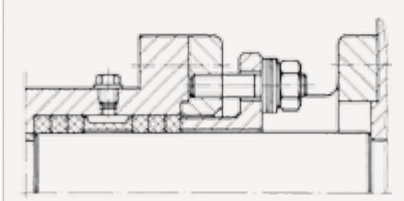
>> Double stuffing box

$T = -200 \text{ up to } 550 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 40 \text{ bar}$



>> Safety stuffing box

$T = -200 \text{ up to } 550 \text{ }^\circ\text{C}$
 $p_{\text{max}} = 40 \text{ bar}$



The selection of the type of seal depends on the medium, the pressure and the temperature.

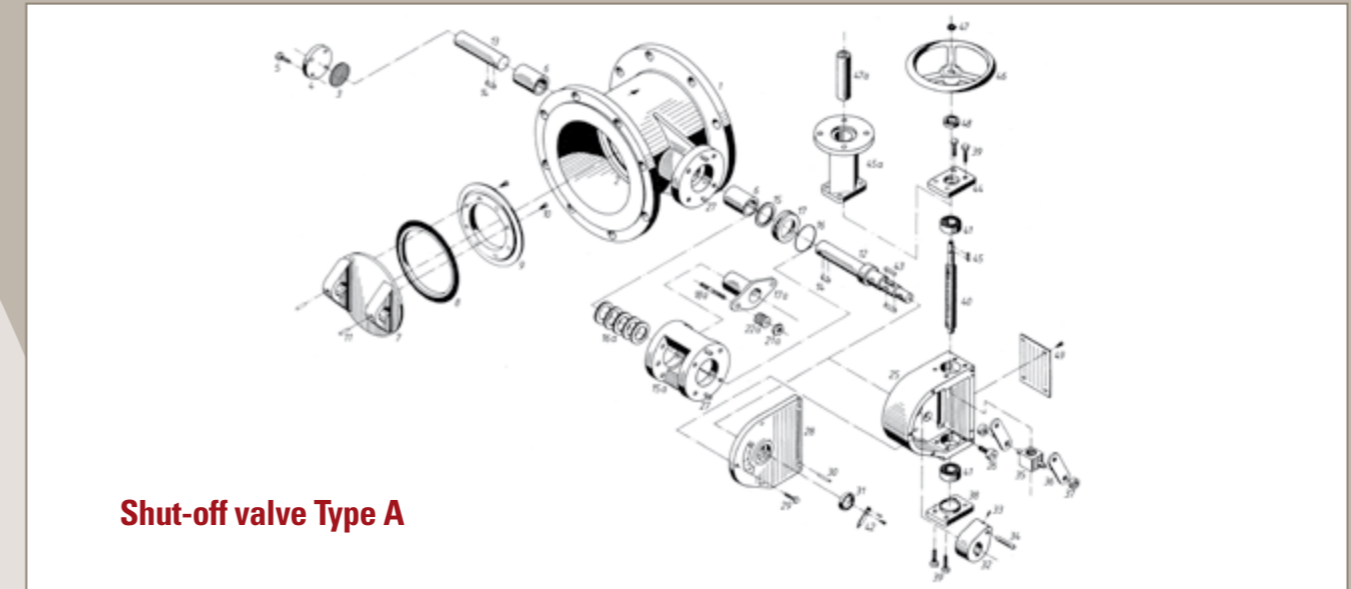


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Gears



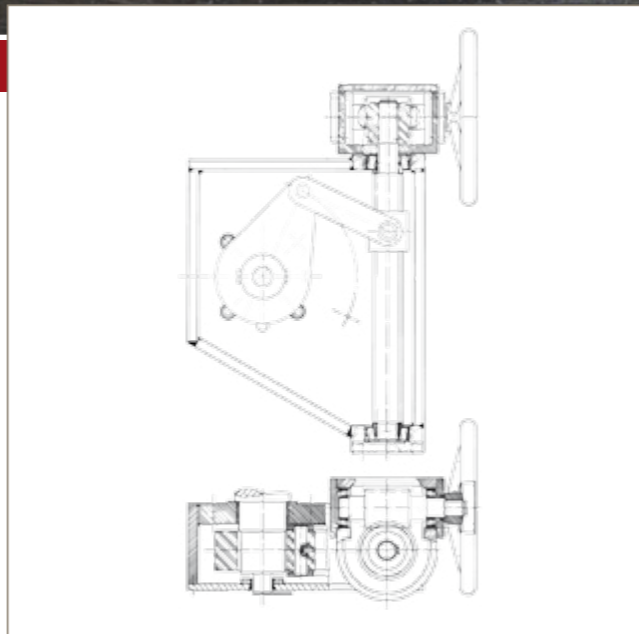
Exploded view drawing



Shut-off valve Type A



Type: Gear KG with reduction gearing



Gears

The **in-house manufactured** Konrad gear mainly consists of a trapezoidal thread spindle with a travelling nut and a lever that is permanently mounted to the drive shaft. The flux of force is transmitted by two straps which are fixed to the travelling nut and the crank arm.

In the closed position, the straps and the crank arm form a toggle lever that continually adapts itself to the load cases and also has a favourable effect on the closing characteristic of the shut-off valve.

The gear is **self-locking**, and the existing valve position is indicated on a scale on the housing cover. If higher torques are necessary, for example in the case of large nominal sizes, the gear can be additionally equipped with a worm transmission unit. All handwheel-operated gears are so designed that electric motors can be easily flange-mounted later on.

Shut-off valve Type A

Pos.	Description	Pos.	Description
01	valve body	25	gear housing
02	sealing strip	26	screw
03	cover gasket	27	dowel pin
04	cover	28	gear cover
05	screw	29	screw
06	bearing bush	30	dowel pin
07	disc	31	shaft seal
08	sealing element	32	lever
09	retaining ring	33	grooved taper pin
10	screw	34	pin
11	dowel pin	35	spindle nut
12	drive shaft	36	strap
13	shaft stub	37	roller
14	feather key	38	bearing cover
15	lip seal	39	screw
16	O-Ring	40	spindle
17	lip seal holder	41	ball bearing
		42	pointer
15 a	actuating bracket	43	feather key
16 a	packing ring	44	bearing cover
17 a	stuffing box gland	45	feather key
18 a	stud	46	handwheel
21 a	nut	47	circlip
22 a	plate spring	48	rotary shaft seal
		49	nameplate
		45 a	intermediate piece
		47 a	plug coupling



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