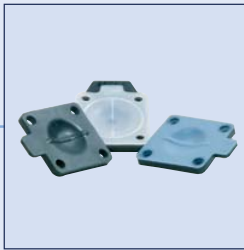


# Valves



**Diaphragm shut-off  
valves, kidney-type**

## Technical Information

# Diaphragm shut-off valves, kidney-type

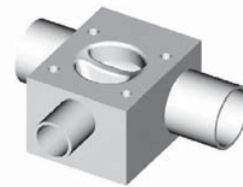
### Application

- When leakage of even the smallest quantities must be avoided with certainty
- For maximum requirements to operating safety
- For maximum requirements to chemical resistance particularly at high temperatures
- For maximum requirements to cleanability
- For liquids and gases
- For steam for sterilization
- Particularly for nominal sizes smaller than DN 25 such as
  - o air vent valve on filter housings
  - o blocked steam or seal water feeding at
    - \* double-acting axial face seals,
    - \* rod seals of lifting valves,
    - \* leakage space of double seat valves
  - o branch valves of main pipes with large nominal sizes (fully demineralised water ring pipeline)
- Can be applied also for extreme low switching frequency (maintenance or emergency shut-off).

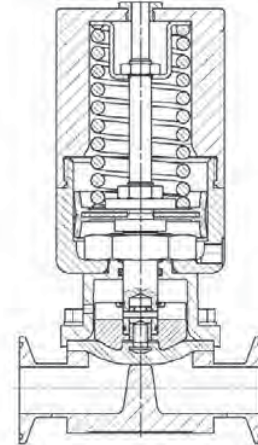
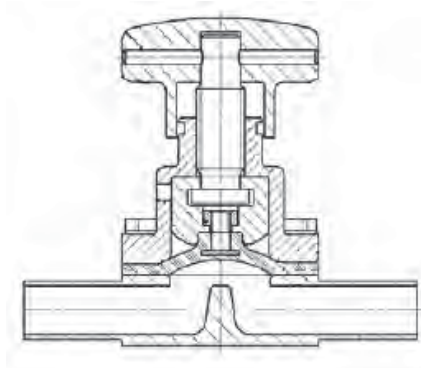
- Easy installation – self-cleaning position due to laser marking at weld end
- CIP-/SIP-compatible version
- Valve housing of forged or cast materials
- Nominal sizes from DN 6 to DN 100
- On T-shaped housings the passage diameter can be combined with a branch of equal or smaller diameter
- Working pressure from vacuum to overpressure of 10 bars
- Working temperature from -10°C to 160°C (depending on the diaphragm)
- Meets GMP requirements

### Design

- Passage, T-shaped and bottom outlet housings



- Manually actuated
- Pneumatically actuated



### Features

- Hermetic separation between product and operating chamber
- Leakage opening for diaphragm leakage control
- Full pressure resistance, independent of flow direction
  - o spring closing
  - o air/air
  - o spring opening
- End position feedback with
  - o proximity initiators (also Namur)
  - o mechanical limit switches

## Technical Information

# Diaphragm shut-off valves, kidney-type

- Control head also with bus
- Nominal diameter in DIN, ISO or inch OD
  - o for welding on
  - o with clamp connection (produced in one piece with the housing)
  - o with pipe connections of the Nocado product lines
- Material
  - o housing in contact with product
    - \* material 1.4435 forged
    - \* material AISI 316 L cast material
    - \* other materials on request
    - \* on actuator side: material 1.4404
  - o pneumatic actuator
    - \* glass fibre reinforced plastic
    - \* material 1.4404
  - o handle
    - \* glass fibre reinforced plastic
    - \* material 1.4404
- Diaphragm sealing material according to FDA directive or USP27 guidelines
  - o EPDM
  - o TFM\*/EPDM (laminated)
  - o TFM\*/EPDM (2-parts)
    - \*PTFE with improved mechanical characteristics and reduced permeability
- Documentation
  - o operating instruction
  - o 3.1 according to EN 10204
  - o 2.2 according to EN 10204
  - o others on request

## Planning instructions

Diaphragm valves, kidney-type are particularly used in small nominal sizes, i.e. in nominal sizes smaller than DN 25, because they have an excellent price-performance ratio.

## Surface quality/Material

The average peak-to-valley height of maximum 0.8µm is significantly under-run for the stainless-steel surfaces in contact with product. This surface quality in combination with the material 1.4435 in forged quality even satisfies very high requirements. Corresponding certificates can be provided particularly for the pharmaceutical in-

dustry or in cases in operation according to the Pressure Equipment Directive. On request these valves can be produced in higher surface qualities or of higher-graded materials.

Due to economical reasons valves with housings of cast stainless-steel are used. These valves are sufficient in many applications. The standard version is available with an average peak-to-valley height of about 3.2µm. Due to additional production steps an average peak-to-valley height of maximum 0.8µm can be obtained for at least 90% of the surface in contact with product. Higher surface qualities or other materials cannot be obtained in cast stainless steel. Independent of the manufacturer and due to the production process and despite of tests during production and continuous quality assurance, minimal hollow spaces (blow-holes) and related faults in surface at the production of cast stainless-steel cannot definitely be excluded. The price advantage of cast stainless-steel material compared to forged quality is primarily based on the easier mechanical treatment of blanks. As Nocado, however, remelts cast stainless-steel blanks with minimal faults, the difference in prices is less than expected due to the quality difference.

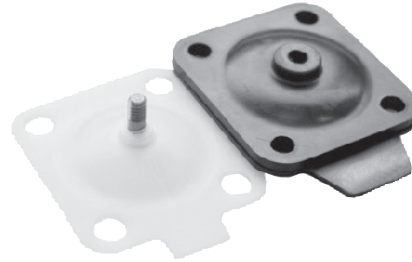
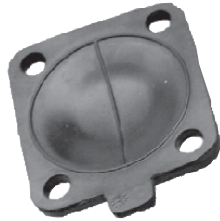
## Diaphragms

In spite of the same chemical designations, the quality of sealing materials differs on the basis of the additives and particularly, the degree of cross-linkage. In addition to the chemical and thermal resistance, particularly the mechanical characteristics define the quality of a diaphragm. EPDM applied by Nocado has excellent mechanical characteristics for a maximum service life. It is very resistant to ozone and suitable for the continuous use at temperatures up to 140°C (steam). The diaphragms are CIP- and SIP-compatible.

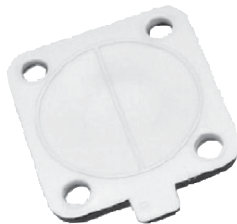
Nocado diaphragms of EPDM are tested and certified according to USP27 (United States Pharmacopoeia) guidelines. EPDM should definitely not be used for concentrate acids, fats and oils and for many hydrocarbons.

## Technical Information

# Diaphragm shut-off valves, kidney-type



Diaphragms of EPDM with laminated TFM – i.e. PTFE with improved mechanical characteristics and lower permeability – offer a higher chemical and thermal resistance compared to EPDM diaphragms. The entire surface of TFM is joined to EPDM.

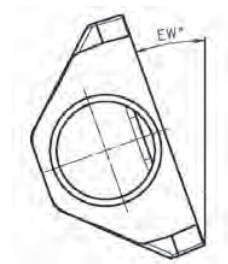


Even a mechanical damage of the TFM coating does not result in pockets between TFM and EPDM. As TFM is stiffer than EPDM, the locking forces of the TFM-laminated diaphragm are higher than those of the EPDM diaphragm. TFM-laminated diaphragms do not reach the very long service life of EPDM diaphragms. The TFM-laminated diaphragm is resistant to vacuum.

In order to reach gas impermeability as high as possible TFM diaphragms with large material thickness are used. On these diaphragms the TFM is not completely joined to the elastomer (2-parts) for reaching an acceptable service life of the diaphragm.

### Self draining

When the valves are installed in horizontal or slightly inclined pipelines, the actuator or the handle should be installed in a defined angle of inclination. For easy adjustment, there is a hygienic permanent laser marking at the connection side of every valve, which has to be vertically adjusted to enable a complete draining of the valve.



### Connections

The valve is preferably welded in, as it must not be removed for maintenance. The connecting piece is designed for orbital and for manual welding. If valves with separable connections shall be integrated, we recommend ordering also the weld-in counterparts, gaskets, clamps to secure the optimum fitting of the pieces.

Technical Information

# Diaphragm shut-off valves, kidney-type

## Special assemblies

