

Valves



Butterfly
valves

Technical Information

Butterfly valves

Application

For shut-off, particularly for use with

- liquid
- pasty and
- gaseous, non-abrasive media

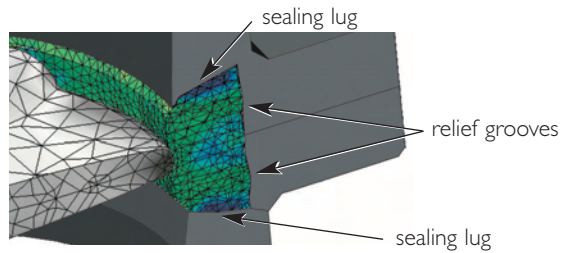
Nocado butterfly valves can also be used for shut-off and regulating pourable dry materials. Special butterfly valves without gaskets can also be produced for these applications.



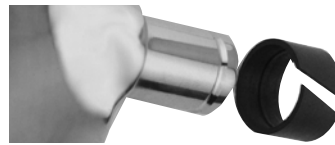
Features

- Hygienic, sturdy, very reliable version with long service life
- With nominal sizes from DN 20 to DN 200
- Housing and plate are always made of forged or hot-rolled pre-material
- Computer-optimized sealing system for a longer service life of the gaskets
 - o sealing lug ensures defined gasket pressure to product chamber

- o relief grooves for controlled expansion of the gasket
- o improved geometry for consistent distribution of forces
- High reliable flow rate
- High reliable working pressures



- Weld-on valves are not pre-assembled
- Bearing bush as clip-on version



Design

- Manually actuated
 - o with ergonomic handle arresting at 0° and 90°, optional arrest every 15°
 - o with stainless-steel scissors-type handle 360°, 4-arrest positions
 - o with knurled screw handle steplessly arrestable between 0° and 90°
- Pneumatically actuated
 - o spring opening

| | nocanorm | nocaplus |
|-----------------------------------|---|--|
| Material in contact with product: | AISI 304/304 L* AISI 316L** | AISI 316 L**, special stainless steel or titanium on request |
| Surface: | matt, machine-finished in contact with product Ra < 0,8 µm | electro-polished, matt blasted, other surfaces on request in contact with product Ra < 0.8 µm |
| Documentation: | | specific test report 2.2 according to EN 10204, e.g. material certificate inspection certificate 3.1 according to EN 10204, e.g. material traceability from melting to finished product operating instructions and spare-parts lists |

*AISI 304/304 L similar to 1.4301/1.4307 **AISI 316 L similar to 1.4404/1.4435

Butterfly valves



- o spring closing
- o air/air
- Actuated by electric motor
- For Welding
- As intermediate flange version
- With pipe connections from the Nocado product lines
- As tank bottom outlet valve
- Feedback with
 - o proximity initiators (also Namur)
 - o mechanical limit switches
- Pneumatic adjuster
- Control top
- Gasket materials according to FDA directive 21 CFR 177.2600
 - o MQV (Silicone) (also transparent version)
 - o HNBR
 - o EPDM
 - o FPM (Viton)
- Approval according ATEX for zone 0, 1 and 2 (see Information brochure ATEX)



Planning instructions

Surface quality

Regardless of the outside surface Nocado butterfly valves always have the same inside surface quality in contact with the product with an average peak-to-valley height of maximum 0.8 µm. The outside surfaces are available in polished or matt version to ensure the uniform overall appearance of the plant.

Connections

- On valves for welding on (including intermediate flange version), the valve connection dimensions have to be identical with the diameter of the pipe used.
- In addition to the usual dimensions listed in the catalogue, Nocado also produces valves with special dimensions on request.
- It must be possible to remove at least one valve half to replace the gasket.
 - o When selecting separable connections, note that e.g. when milk pipe fittings according to DIN 11851 are used, the liner is located in the male part. Therefore, it is necessary to move the tubing in the axial direction several millimetres for disassembly.
 - o On lines subject to alternating temperature loads, a separable connection with metallic stop is preferable. This ensures that the service life of the gasket used for the separable connection is at least as long as the service life for the butterfly valve gasket.

| Pressure loss on Nocado butterfly valves in mbars, depending on flow rate | | | | | | | | | |
|---|-----|----|----|-----|-----|-----|-----|------|------|
| DN (DIN 11850): | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
| Diameter: | 26 | 32 | 38 | 50 | 66 | 81 | 100 | 125 | 150 |
| kvs value: | 18 | 40 | 77 | 183 | 388 | 602 | 998 | 1800 | 2795 |
| 2 m/s | 48 | 21 | 11 | 6 | 4 | 4 | 3 | 2 | 2 |
| 2,5 m/s | 75 | 33 | 18 | 9 | 6 | 6 | 5 | 4 | 3 |
| 3 m/s | 107 | 48 | 25 | 13 | 9 | 9 | 7 | 5 | 5 |
| 3,5 m/s | 146 | 65 | 35 | 18 | 12 | 12 | 10 | 7 | 8 |

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Vacuum stability

Due to the special geometry of the chamber where the sealing is installed complete vacuum stability is guaranteed for valves up to DN 100.

Allowable pressures

- For the allowable pressures, it is necessary to know
 - the differential pressure against which the valve closes
 - the allowable system pressure.

The required system pressure can be quite high particularly on heated systems and for carbonated beverages. Butterfly valves up to DN 65 of the nocanorm line are laid out for 16 bars; valves for higher pressures are available in the nocaplus line.

Flow rates

(see also: General planning information)

- If the flow rates are too low, any solids can settle down in the line and impair the function of the butterfly valve.
- When a butterfly valve is closed quickly, the flow separation causes a vacuum on the flap and in the area of the butterfly valve gasket. At flow rates of approx. 3.5 m/s, the valve should be closed only at significantly reduced speed to reduce pressure impacts and prevent a damage of the valve.

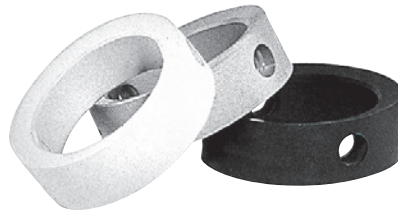
Material selection

Stainless steel

- Stainless steel in the qualities AISI 304/304 L is resistant to most food and luxuries and the cleaning agents used in this context.
- Corrosion is seldom the result of incorrect material selection, but rather usually caused by processing errors.
- In the case of high percentages of halogenides (e.g. chloride), especially at increased temperatures or at high acid concentrations, higher-quality stainless steel or other materials should be used.

Gaskets

- The sealing quality has a decisive influence on the service life of a gasket. In addition to the geometry, the mixture and production process are decisive for the function and service life. In spite of the same chemical designations, gaskets differ on the basis of the additives and particularly, the degree of cross-linkage.



- Exceptionally high product temperatures can also destroy the structure of the gasket. Gaskets may be defective even though they appear to be intact.
 - The usual temperature specifications are based on dry air and are therefore not transferable to practical applications.
 - The allowable temperatures for liquid or steam are considerably lower in general.
- In addition to the resistance to temperature and corrosion, the swelling characteristics of gaskets are decisive for their suitability.
- Due to improvements on the geometry of the gaskets and the installation space, which are applied for a patent, a considerably higher resistance will be obtained against negative influences such as expansion due to temperature and swelling characteristics.
- The following information is required for the selection of gaskets.
 - Product (also CIP/SIP) in contact with gasket, including
 - * duration of contact
 - * concentration
 - * temperature or temperature change
 - * switching cycles
- An abundance of analysis procedures are available for the gasket qualities, but there

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| | MVQ (Silicone) | EPDM | HNBR | FPM (Viton) | |
|---|---|---|---|---|------------------------|
| Characteristics | in Nocado quality has very good all-round characteristics | in Nocado quality has exceptional all-round characteristics | in Nocado quality is an extremely sturdy material for universal use, also for fully desalinated water (at low switching frequency) and products containing grease | in Nocado quality is suitable particularly for applications where this material has proven itself, such as with certain hydrocarbon compounds, aromatics and products containing grease | |
| | Colour | red or transparent | black | black | brown |
| Resistance | Hot water | 110°C | 160°C | 130°C | 80°C |
| | Edible oil | 200°C | not resistant | 140°C | 200°C |
| | Caustic soda solution | 2%, 90°C (no switch at >60°C) | 3%, 95°C | 5%, 100°C | 2,5%, 85°C |
| | Nitric acid | 1,5%, 40°C | 2%, 80°C | not recommendable | 3%, 60°C |
| | Phosphoric acid | 1,5%, 40°C | 4%, 70°C | 2%, 60°C | 2%, 60°C |
| | Hydrogen peroxide/peracetic acid | 0,7%, 40°C | 0,7%, 40°C | 0,7%, 40°C | 0,7%, 40°C |
| | Can be sterilized with steam | 121°C (60 min.) | 160°C | 130°C | 121°C (60 min.) |
| Mechanical characteristics | Density | 1,37 g/cm ³ | 1,12 g/cm ³ | 1,20 g/cm ³ | 2,16 g/cm ³ |
| | Hardness | 75 Shore A | 75 Shore A | 75 Shore A | 75 Shore A |
| | Tensile strength | 5,5 N/mm ² | 12 N/mm ² | 19 N/mm ² | 10 N/mm ² |
| | Elongation at break | 220% | 268% | 202% | 232% |
| | Residual pressure deformation | 14% | 19% | 22% | 14% |
| <p>All sealing materials provided by Nocado are suitable for numerous food and beverages. EPDM, however, offers the highest profitability. EPDM can be used for products with fat content <4,5% and temperatures <80°C as well as for concentrated acids and bases at room temperature.</p> | | | | | |

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are no standards or guidelines which make it easier to measure the performance of a gasket. Gaskets can be optimized only in comprehensive tests.

Actuators

Pneumatic actuator

Available as pneumatic actuator with spring return, non-actuated position: closed or as a pneumatic actuator with spring return, non-actuated position: open. Note: Nocado produces 2 different spring return actuators, because the torque requirement for opening and closing is different. Nocado lays out valves and actuators for a wide range of applications. We lay out actuators for the specific application. When not installed as planned, the torque reserve is lower. When a spring closing actuator is installed improperly, 60 % less torque is available for closing for the function “spring opening” than with an actuator for “spring opening”.

When linear actuators are used, only approx. 50 % of the torque is available for closing in comparison to a Nocado butterfly valve actuator with comparable dimensions (same stroke). Nocado actuators can also be used to actuate other brands of valves (e.g. already present and welded in) using an adapter. Pneumatic positioners are available for pneumatic actuators. For further information see: Technical Information [Control tops](#) or [Positioner](#).

Electric actuators

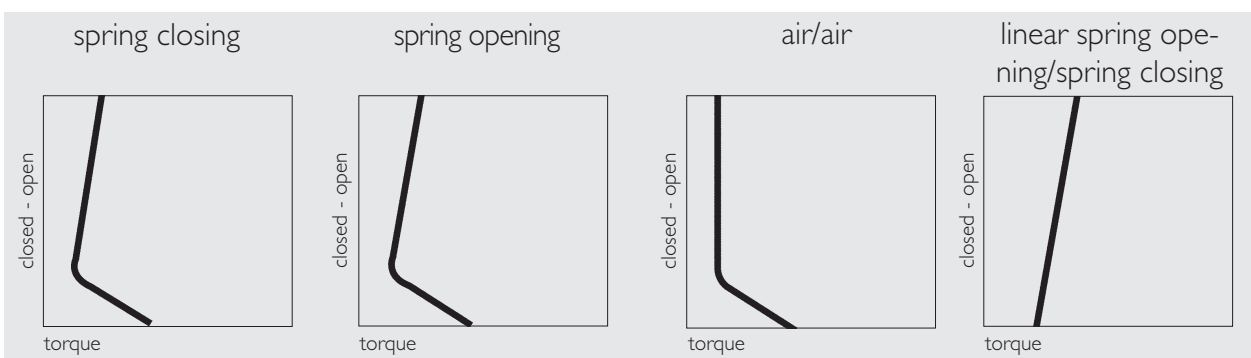
Electric actuators are used on applications in which the valve is to remain in current position, even in the event of a power failure or, where compressed air is not available or can only be provided at relatively high cost. The integrated gear ensures that they remain in the momentary position when power is not present. Electric motor actuators are approx. 200 times more economical in terms of energy than pneumatic actuators. However, since the absolute operating costs per actuator are very low, electric motor actuators should not be selected for this reason alone.

Regulation with butterfly valves

Butterfly valves are suitable for regulation to a very limited extent due to their design. The following equipment is available to reduce the flow rate in comparison to the position “fully open”:

- Solid stainless steel knurled screw handle, steplessly arrestable
- Electro-pneumatic positioner for attachment to pneumatic actuator
- Electric actuators in combination with open/neutral/closed positioner
- Switchable orifices, i.e. butterfly valves with precise hole in plate, if desired with specific pressure loss measurement or test and documentation of the pressure loss.

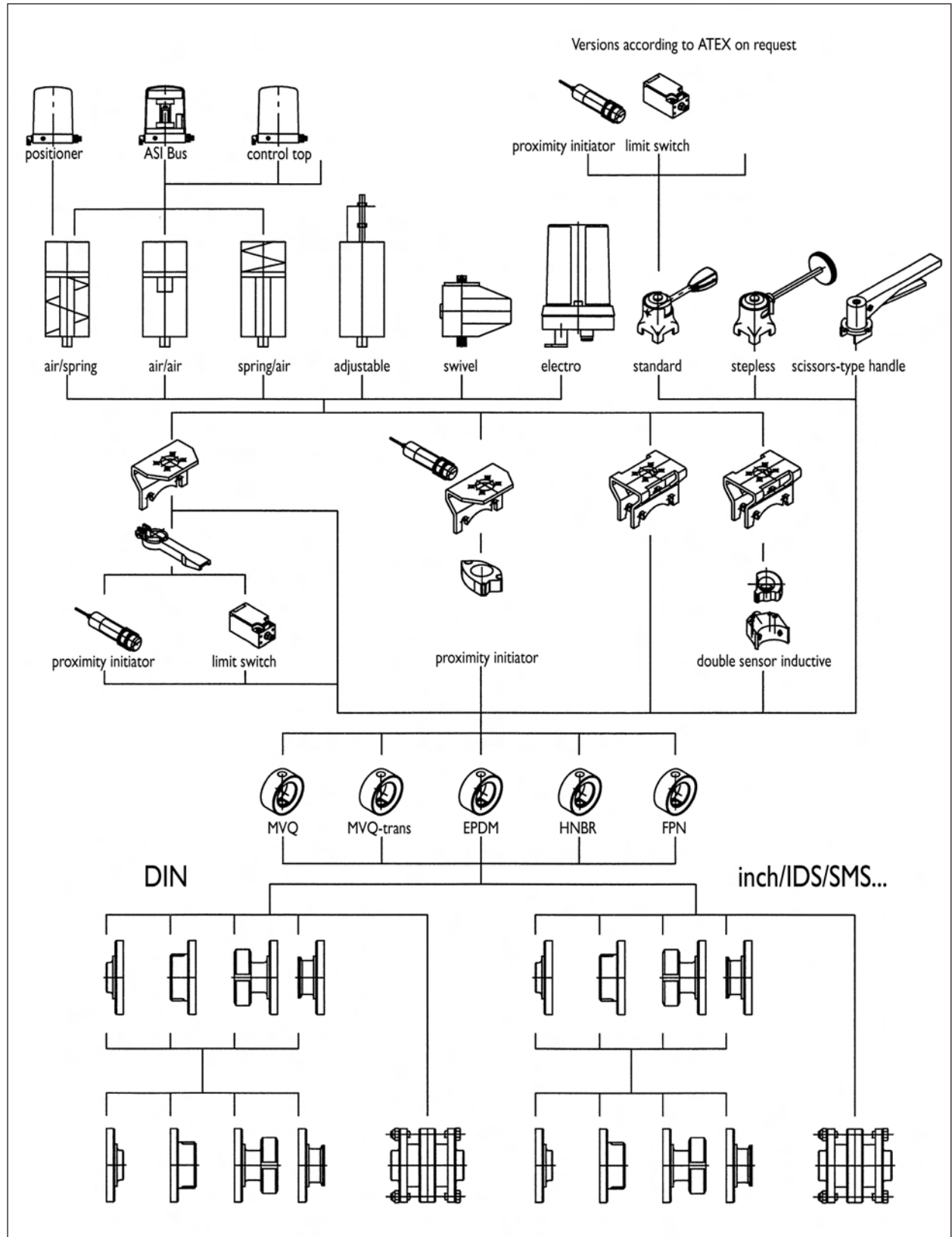
Torques for pneumatic air – spring actuators



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Special assemblies





Subject to technical modifications and changes in prices. Errors excepted.

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