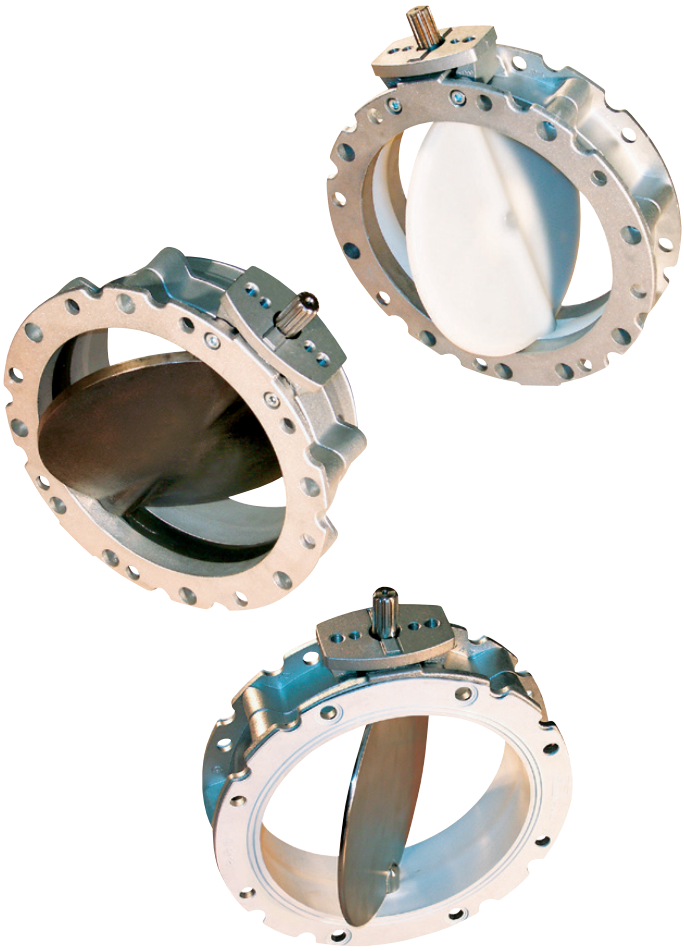
EN

# VFS

*BUTTERFLY VALVES*

2

# ASSEMBLY AND MAIN INSTRUCTIONS FOR USE AND MAINTENANCE

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| ORIGINAL INSTRUCTIONS IN ENGLISH |



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All the products described in this catalogue are manufactured according to **WAMGROUP S.p.A. Quality System procedures**. The Company's Quality System, certified in July 1994 according to International Standards **UNI EN ISO 9002** and extended to the latest release of **UNI EN ISO 9001**, ensures that the entire production process, starting from the processing of the order to the technical service after delivery, is carried out in a controlled manner that guarantees the quality standard of the product.

## SUMMARY

## 1.1 Scope of the Manual

This Manual has been prepared by the Manufacturer to provide the operating technical information for installation, operation and maintenance of the valve concerned.

The Manual, which is an integral part of the valve concerned, must be preserved throughout the life of the valve in a known easily accessible place, available for consultation whenever required.

If the Manual is lost, damaged or becomes illegible, contact the Manufacturer for a copy specifying the serial number of the valve.

If the valve concerned changes ownership, the Manual has to be handed over to the new owner as part of the valve supply.

The Manual is meant for specialist technical personnel appointed and authorized by the Manufacturer, owner and installer to act on the valve concerned for which specific technical skills in the sector concerned are necessary (electrical, mechanical, etc.).

The illustrations may differ from the actual structure of the valve concerned but do not interfere with the explanation of the operations.
In case of doubt, contact the Manufacturer for explanations.

The Manufacturer reserves the right to make changes to the Manual without the obligation to provide prior notification, except in case of modifications concerning the safety level.

The technical information included in this Instruction Manual is the property of the Manufacturer and therefore has to be considered as confidential.

It is forbidden to use the Manual for purposes other than those strictly linked to the operation and maintenance of the valve concerned.

This information is provided by the Manufacturer in the original language (English) and can be translated into other languages to satisfy legislative and/or commercial requirements.

## 1.2 Symbols

To highlight certain parts of the text, for purposes of safety, or to indicate important information, certain symbols are used, the meaning of which is described below.

It is important to comply with and scrupulously follow the information highlighted by the symbols.

**Danger - Warning**

**Indicates situations of serious danger which, if ignored, can be risky for the health and safety of persons.**

**Caution**

**Indicates that appropriate behaviour must be adopted to avoid posing risk for the health and safety of persons and avoid causing economic damage.**

**Important**

**Indicates particularly important technical information which must not be ignored.**

## List of safety and information symbols

| Symbol representation | Symbol description |
|---|---|
|  | **Danger sign:** indicates danger of electric shock caused by the presence of powered components inside the junction box or control panel. |
|  | **Obligation:** read this Manual before carrying out any action on the valve concerned. |
|  | **Forbidden:** indicates that it is forbidden to lubricate or adjust moving parts. |
|  | **Danger:** indicates danger of serious injury to limbs if the internal moving parts of the valve are exposed. Before carrying out inspection operations, isolate the valve concerned from the electrical energy sources. |
|  | **Information:** indicates the direction of rotation of the electric motor. |
|  | **Obligation:** indicates the hooking points for lifting of the valve concerned. |
|  | **Forbidden:** indicates it is forbidden to introduce hands into the valve. |

## 1.3 Glossary and terminology

**Operator:** person appropriately trained and authorized by the Production Manager for setting up the valve concerned and carrying out routine maintenance.

**Installer:** organization with specialized technicians and appropriate equipment for carrying out risk-free installation and extraordinary maintenance.

**Specialist technician:** person responsible for and authorized by the Manufacturer, owner or installer to act on the valve; must have specific technical skills depending on the sector concerned (electrical, mechanical etc.). The specialist technician, in addition to being familiar with the working of the valve concerned, must be familiar with the working of the plant or equipment on which the valve concerned is installed.

**Routine maintenance:** includes all the actions necessary to keep the valve in good working conditions, to ensure greater operating durability and to keep the safety requisites constant.

**Extraordinary maintenance:** all the actions meant to keep the valve in perfect working order.

**Setting in safety conditions: all the precautions the authorized personnel must adopt before acting on the valve concerned.**

**The precautions are listed below.**

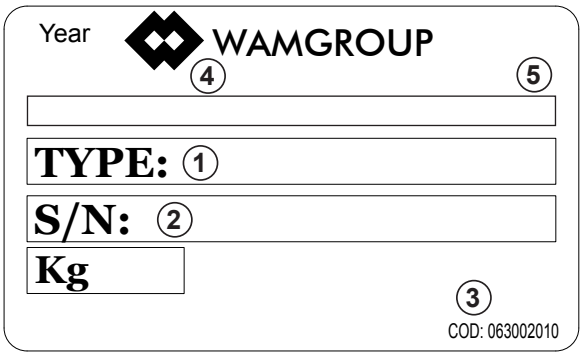
- **Ensure that the valve concerned is disconnected from all the mains and appropriate devices are used to prevent these from being reconnected accidentally.**
- **Ensure that all the moving parts of the valve have come to a complete stop.**
- **Ensure the temperature of the valve concerned is such that it does not burn.**
- **Provide appropriate lighting in the area around the operations.**
- **Wait for the material to be handled inside the valve concerned to settle down completely.**

## 1.4 Manufacturer's data and identification of the valve

**Important**

**Do not change the data on the identification plate.**
**Keep the ID plates clean, intact and legible as regards the data they contain.**
**If the ID plate is damaged or is no longer legible (even just one informative element on it) contact the Manufacturer for a new ID plate and replace it.**

The ID plates shown identify the valve concerned and its main components.
The plates show the reference necessary for operating safety.




**1)** Type of valve
**2)** Serial No.
**3)** Label code
**4)** Manufacturer's logo
**5)** Manufacturer's name and address

## 1.5 Request for assistance

For all technical assistance, contact the Manufacturer's service network.
For all requests, provide the valve identification data, the type of problem encountered and all other information which could be useful for identifying the problem.

## 1.6 Warranty

The conditions for validity and applicability of the warranty are specified in the sales contract.

## 1.7 Exclusion of responsibility

The valve is delivered according to the specifications indicated by the Buyer in the order and the conditions valid at the time of purchase.

The Manufacturer shall not accept responsibility for safety of persons or objects and operation failure of the valve if the loading/unloading operations from trucks, transport, positioning at the site, use, repairs, maintenance etc. have not been carried out in compliance with the warnings described in this Manual, and in accordance with the national legislation in force.

Likewise, the Manufacturer shall not accept any responsibility if the valve concerned is used:
- improperly;
- by unauthorized persons and/or persons not sufficiently trained for installation, operation and maintenance;
- with modifications made to the original configuration without the Manufacturer's permission;
- with spare parts that are not original or are not specific for the model;
- without maintenance;
- non-pursuant to the regulatory standards and national or local legislation on the matter of occupational safety;
- non-pursuant to the recommendations in this Manual or on the warning and danger plates applied on the valve.

## 2.1 General safety prescriptions

**Read the Instruction Manual carefully and strictly follow the instructions it includes, especially those regarding safety.**

**Most accidents at the workplace are caused by negligence, failure to follow the most elementary safety regulations and incorrect or improper use of tools and equipment.**

**Accidents can be prevented and avoided by taking due care, using suitable equipment and adopting adequate preventive measures.**

**Apply and comply with the standards in force regarding workplace hygiene and safety.**

**The personnel trained for and authorized for the operations has to have the psychological/physical requisites, experience in the sector concerned and the necessary technical skills for carrying out the operations assigned to them.**

**All workers involved in any kind of operation must be prepared, trained and informed as regards the risks and the behaviour to be adopted.**

**Pay attention to the meaning of the notices applied on the valve, keep these legible and respect the information indicated.**

**Use instruments, equipment and tools that have been approved and are intrinsically safe, and cannot alter the safety level of the operations or damage the valve during installation, use and maintenance.**

**Modifications to the valve components should not be made for any reason whatsoever, without the Manufacturer's permission.**

## 2.2 Safety prescriptions for transport and handling

**Carry out all the handling and transport operations in accordance with the procedures and instructions shown on the packaging and in the Manual supplied.**

**All the operations must be performed by qualified authorized personnel.**

**Those authorized to carry out the handling operations must have the capabilities and experience required to adopt all the necessary measures to guarantee one's safety and the safety of persons directly involved in the operations.**

**The chosen features of the lifting and handling means (crane, bridge crane, forklift truck etc.) must take into account the weight to be handled, the dimensions and the gripping points.**

**During lifting use only accessories such as eyebolts, hooks, shackles, spring hooks, belts, slings, chains, ropes etc., that have been certified and are suitable for the weight to be lifted.**

**During handling respect the prescriptions applicable for handling loads.**

**Keep the position of the valve concerned and the loose components horizontal, keep the load low and make all the necessary movements gently.**

**Avoid sudden manoeuvres, dangerous oscillations and rotations, accompanying the movements manually and place the load gently on the ground.**

## 2.3 Safety prescriptions for installation

**Before starting with installation, a "Safety Plan" must be implemented to safeguard the personnel directly involved and those who carry out operations in the surrounding area.**

**All the laws must be strictly applied, especially those concerning workplace safety.**

**Before proceeding with installation operations, mark off the work area to prevent access by unauthorized persons.**

**The electrical connections must be made in compliance with the standards and laws in force.**

**The person in charge of making the electrical connections has to ensure that the required standards and laws are respected before testing.**

## 2.4 Safety prescriptions for use and operation

**Do not tamper with the valve concerned by using any kind of device to obtain performances different from those designed.**
**All unauthorized changes can affect the health of people and the integrity of the valve.**

**The operators have to exclusively wear protective clothing and have to be equipped with appropriate individual protection devices for carrying out the operations and as required by the safety and work accident prevention standards.**

**Before use, ensure that all the safety devices are installed and that they are working properly.**

**During operations, prevent access to the work area by unauthorized persons.**

**Remove all obstacles or sources of danger from the work area.**

**It is strictly forbidden placing any improper load on the valve.**

## 2.5 Safety prescriptions for maintenance and replacement of components

**Danger - Warning**

**Before carrying out any operation on the valve concerned, ensure it is switched off and disconnected from all mains and use suitable devices to prevent the possibility of the power sources being activated accidentally.**

**Maintain the valve concerned in the conditions of utmost efficiency compliant with the maintenance plan provided by the Manufacturer.**

**Good maintenance apart from preserving the functional features and essential safety features over time, will also allow extending the working life of the valve concerned and achieving the best possible performance.**

**Strictly follow the procedures indicated in the Manual, especially those concerning safety.**

**Ensure that all the safety devices are active and working properly.**
**Mark off the work area in such a manner as to prevent the access of unauthorized persons.**

**Replace the worn and damaged components exclusively with original spare parts, whose safety, reliability and interchangeability have been undoubtedly established.**

**Apart from invalidation of the warranty, the Manufacturer declines all responsibility for damage to objects and harm to persons deriving from the use of non-original spare parts or due to modifications made during repairs without express written authorization.**

**Use the oil and lubricants recommended by the Manufacturer.**

**Do not dump polluting material (oil, grease, paint, plastic etc.) in the environment, but carry out waste separation disposal depending on the chemical composition of the various products in compliance with the legislation in force.**

**On completion of maintenance or replacement operations, before resuming production, check that no foreign bodies (rags, tools etc.) have been left inside the valve concerned.**

## 3.1 General description of the valve

"**VFS**" Butterfly Valves are used in all types of bulk solids processing plants where interception of gravity-fed or pneumatically conveyed dry powders or granules is required. "**VFS**" Butterfly Valves can be fitted beneath hoppers, bins, silos, screw or other type conveyors, or for material interception in pneumatic conveying ducts. Due to their special design and to the engineering materials used, they represent a particularly economic yet most efficient solution.

"**VFS**" Butterfly Valves consist of two high-pressure die-cast semi-bodies manufactured from aluminium alloy, a swivel disc in **SINT**® polymer composite or cast iron, and a pre-stressed elastomer seal.

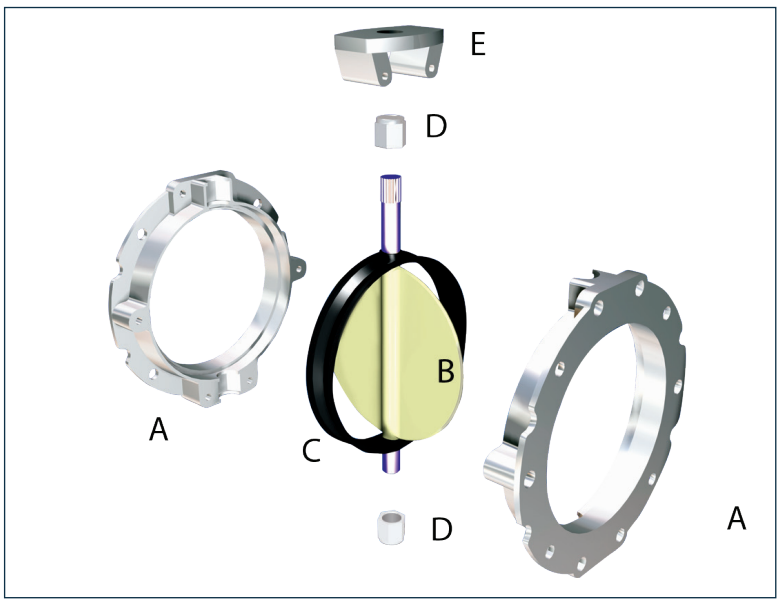
For the food industry a version with stainless steel disc and integral FDA-approved seal is available.

While **V1FS** comes with a top flange and a bottom section suitable for the attachment of a flexible sleeve, **V2FS** has an identical top and bottom flange. "**VFS**" valves can be fitted with a manual lever or a pneumatic or gear motor actuator. All the actuator systems are interchangeable (see ACTUATOR catalogue).

**Important**

**The terms "equipment" and "valve" used in this manual refer to the same machine.**
**As components meant for installation in a plant, the valves - not fully provided with safety means - have to be considered "partly completed machinery". Therefore, they do not bear an EC marking.**
**It is forbidden to start the valve unless the machine/plant in which it is to be installed has been declared compliant with the Directive 2006/42/EC and further modifications.**

## 3.2 Main components




**A)** 2 semi bodies manufactured from aluminium alloy;
**B)** Disc;
**C)** Disc seal;
**D)** 2 antifriction bushes;
**E)** Support bracket.

## 3.3 Operating principle

Disc rotation allows to open, close, or intercept the flow of material from the equipment upstream of the valve.

## 3.4 Permitted use

The "**VFS**" valves may be used with discontinuous operation for interception for handling powders or soft granular material (you can break with your finger).

The "**VFS**" butterfly valve is designed for applications in which interception of gravity-fed or pneumatically conveyed dry powders or granules is required.

The "**VFS**" butterfly valves may be only used with maximum internal pressure or negative pressure according to technical specification.

The "**VFS**"-type valves made from aluminium alloy are not designed to bear the weight of equipment installed below (e.g. screw feeders, belt conveyors, vibratory feeders etc.)

Every other use must be considered as improper and therefore not permitted.

The "**VFS**" butterfly valves food version (model AI), compliant to EU 1935/2004, are suitable for applications with E simulant, max. temperature of 80 ° C and 3 days constant in-contact time.

## 3.5 Improper use not permitted

Do not start operating the butterfly valve until the plant or equipment in which it is to be incorporated has been declared as conforming to the relevant national and local legislative provisions in force.

It is forbidden to use the butterfly valve in potentially inflammable or explosive atmospheres (ATEX).

It is forbidden to use the butterfly valve for granular materials (stones, sand, gravel, etc.).

It is forbidden to use the butterfly valve unless the seals are intact.

It is forbidden to use the butterfly valve as a support even if it is not working. Apart from falling, there is risk of damage to the valve.

It is forbidden to use the butterfly valve for inflammable (magnesium powder, etc.) or explosive materials.

It is forbidden to use the butterfly valve for materials which can cause radioactive contamination.

It is forbidden to close the butterfly valve when material flow is stopped.

It is forbidden to use the butterfly valve with disc in **SINT**® for hot materials with temperatures exceeding 75 °C and cold materials with temperatures below - 20 °C.

It is forbidden to use the butterfly valve with disc in stainless steel or cast iron for hot materials with temperatures exceeding 110 °C and cold materials with temperatures below - 20 °C.

## 3.6 Noise level

The no-load noise level of the "**VFS**" butterfly valve does not exceed 20 dB(A), the value measured at a distance of 1 m, in the most unfavorable position.

This may vary according to the type of material handled and the type of actuator applied.

**Danger - Warning**

**Depending on the installation site, the installer must adopt suitable systems (barriers, etc.), if necessary, to maintain the noise levels within the legally permitted limits.**

## 3.7 Environmental operating limits

Unless otherwise specified, the valve concerned may be used only within the limits indicated.

- Altitude: less than 1,000 m at sea level
- Environmental temperature: between - 20 °C and + 40 °C
- Cold climates: with temperature less than 5 °C use oil and lubricants suitable to the operating temperature.

## 3.8 Overall dimensions and technical features

For the exact identification of the valve concerned, see the identification plate.

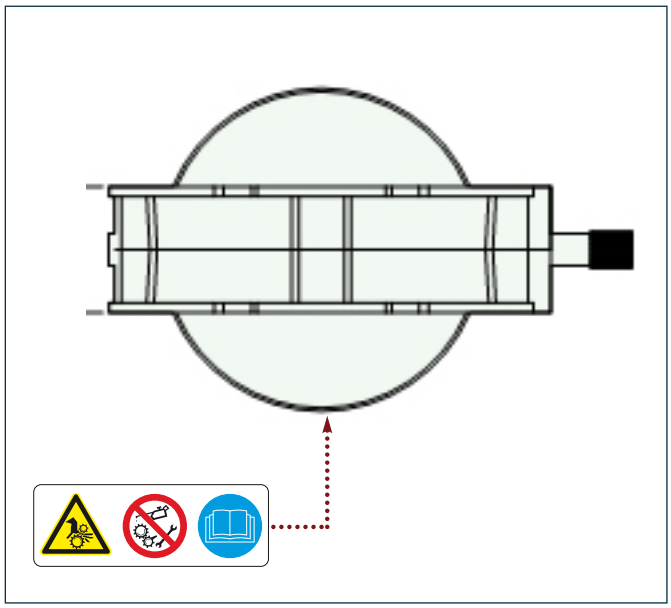
The shipping document shows the diameter of the butterfly valve in addition to the serial number and identification codes.

Information regarding the technical features of the "**VFS**" butterfly valves, such as diameter and seal and disc characteristics is given in Chapter 10.

## 3.9 Safety and information signs

**Danger - Warning**

**Follow the signs on the plates.**
**The plates have to be readable; if they are not, clean them, replace the damaged ones and place them in their original position.**



**NB**: See page 2, **1.2 Symbols**

## 3.10 Safety devices

The access to the internal parts of the valve is not necessary during operation.

Extraordinary access is provided for removing foreign bodies and accumulated material inside the valve or for extraordinary maintenance.

For accident prevention it is essential to keep the valve out of reach of personnel during operation. To this purpose, the customer has to provide suitable safety devices such as grilles, as well as protective inlet and outlet joints (either robust flexible sleeves or rigid pipe unions). However, the installer has to avoid that, even inadvertently, a person remains harmed (by employing suitable hopper, safety grilles,...).

When using movable safety devices, provide protection limit switches, which stop the valve instantaneously if the protection is opened or removed. Restarting of the valve operation must only be possible when the protection is effective again (according to EN 1088).

## 4.1 Type of packaging

The type of packaging is selected according to the type of valve supplied, the transport means used, the quantity of goods shipped and the destination.

To facilitate shipment, the valves may be divided into separate packages that are suitably protected. Nuts and bolts and gaskets necessary for the correct assembly are not included and supplied together with the valves.

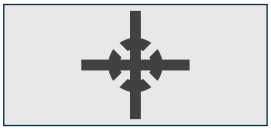
The packages can be loaded separately on the vehicle or fixed to a pallet, protected properly, or inside a container for shipment to a far destination or for sea or air transportation.

The signs for safe lifting and handling are shown on all the packages.

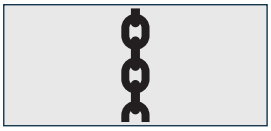
The list bellow provides the description and symbols envisaged on the packaging.

**A) Fragile:** indicates that the package must be handled and lifted carefully to avoid damage.

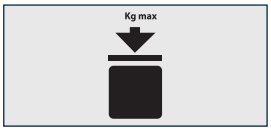
**B) Centre of gravity:** indicates the position of the centre of gravity of the package.



**C) Harness:** indicates the correct position of the harness for lifting the package.



**D) Stacking limit:** indicates the maximum stacking load of the packages.

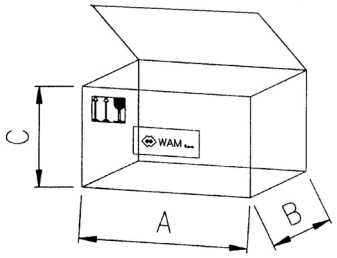



**E) Weight:** indicates the maximum weight of the package.


The packaging material has to be disposed off or recycled in compliance with the standards in force. The operation is in charge of the customer.

| Valve | Weight (kg) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Nominal width | | | | | | |
| | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
| V1FS | 5 | 6 | 7.5 | 8.5 | 10 | 24 | 30 |
| V2FS | 5 | 6 | 7.5 | 8.5 | 10 | 24 | 30 |
| Single packing included | | | | | | | |

The illustration shows the type and dimensions of the mostly used packaging for shipping by truck, sea or air.




| Valve | Nominal width | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 100 | | | 150 | | | 200 | | | 250 | | | 300 | | | 350 | | | 400 | | |
| | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| V1FS | 235 | 235 | 120 | 250 | 250 | 120 | 285 | 285 | 120 | 330 | 330 | 120 | 380 | 380 | 120 | 448 | 448 | 142 | 550 | 550 | 142 |
| V2FS | 230 | 230 | 80 | 250 | 250 | 80 | 285 | 285 | 80 | 330 | 330 | 80 | 380 | 380 | 80 | 440 | 440 | 85 | 530 | 530 | 85 |

The data indicated above do not include supplementary packaging (such as pallet or so).

The valves for food applications (model AI) with the related instructions for cleaning and sanitiziation, shall be provided individually packed in plastic bags inside the cardboard box.

## 4.2 Reception of goods

On receiving the goods, ensure that the type and quantity correspond to the data present on the acknowledgement of order.

Possible damage has to be immediately communicated in writing in the space provided to this purpose in the waybill.

The carrier is obliged to accept the complaint and leave the Customer a copy of the waybill.

If the supply is “free destination” a copy of the waybill and of the complaint shall be sent to the Manufacturer or to the forwarder.

If the damages are not claimed immediately on receipt of the goods, your request for compensation may not be accepted.

## 4.3 Lifting and unloading methods

**Danger - Warning**

**Carry out the lifting and handling operations according to the information indicated on the valve and in the Manufacturer's Operation Manual.**
**The person authorized for unloading operations has to make sure all the necessary measures are adopted to ensure his or her safety and the safety of other persons directly involved.**
**Use means and accessories (ropes, hooks, shackles etc.) suitable for the load to be lifted.**
**Pay attention in the lifting phase to balance the load to avoid uncontrolled movements which could cause work injuries to persons.**
**Do not place other weights on the packagings.**
**Do not drag or push the equipment as this will damage it.**
**Before lifting and handling the load, read the relevant information indicated in the "Information regarding safety" Chapter.**

Harness the packages according to the indications and symbols applied on them.

Unload the packages from the means of transport and place them on a flat surface which can ensure the stability.

Avoid any kind of damage to goods during unloading and handling. Always handle goods with care.

## 5.1 Recommendations for installation

**Danger - Warning**

**The installation operations have to be carried out by a technician specialised in such activities**
**Provide appropriate safety measures and use suitable equipment to prevent risk of work accident to the persons involved in the operations and to those nearby.**
**Harness and handle the valve concerned as described and shown in the "Unloading and lifting method" paragraph.**

Before starting installation, define a safety plan which complies with the laws in force regarding workplace safety.

The specialist technician, authorized by the installer or owner, has to evaluate whether the area has been prepared properly and whether the necessary installation equipment is available (crane, etc.).

Define, on the basis of the configuration of the valve concerned, the assembly method, if the gear reducer and electric motor require preassembly.

Clean the coupling surfaces thoroughly.

## 5.2 Storage or Shutdowns

**Prior to installation**

Avoid damp and salty atmospheres as far as possible. Place the valve on wooden platforms or protected from unfavourable weather conditions. The valves in the food configuration (model AI) must only be stored indoor.

**Long valve shutdowns after assembly**

Set the valve in safety condition before starting operation.

Before starting the valve, check the electrical system, pneumatic system and all parts whose operation may be affected by long shutdowns.

**Possible reuse after long shutdowns**

Avoid damp, salty atmospheres during valve shutdowns.

Place the valve on wooden platforms, or protected from unfavourable weather conditions.

Set the valve in safety status before starting operation.

Before starting the valve, check the electrical system, pneumatic system and all parts whose operation may be affected by long shutdowns.

Before starting up the valve, clean it thoroughly by following the instructions given on the product safety chart.

If the valve operates in different conditions, or uses materials different from the previous application, ensure that the use complies to the INDICATIONS FOR USE section.

## 5.3 Supply

All valves have been preassembled and tested at the factory.

## 5.4 Preparation

Remove packaging.

Mount the actuator (manual lever, hand wheel, manual chain actuator, electro-pneumatic, gear motor, hydraulic or others).

**WAMGROUP®** supplies some of the above mentioned actuators which have to be bolted on by the customer.

The customer is responsible for the installation of any other type of actuator different than those mentioned above. He will perform the mechanical analysis necessary to ensure the effective possible use.

Do not hang any heavy devices directly on the valves (screw feeder, belt conveyor, air slide, vibrating feeder, bin activator or similar).

Prior to installation the valves for food applications (model AI), shall be subjected to cleaning and sanitation by means of a woven/non-woven cloth and sanitizer spray.

## 5.5 Installation and fixing of the valve

*- Lifting the valve*

**Danger - Warning**

**Carry out the lifting and handling operations according to the information shown on the valve and in the Manufacturer's Operation Manual.**
**The specialist technician authorized for carrying out the installation must make sure all the necessary measures are adopted to ensure his own safety and that of other persons directly involved.**
**The laws regarding workplace safety must be strictly followed.**
**Use means and accessories (ropes, hooks, shackles, etc.) suitable for the load to be lifted.**
**Pay attention in the lifting phase to balance the load so as to avoid uncontrolled movements, which could cause an accident.**

Use lifting systems suitable to the weight and dimensions of the load to be lifted and the lifting distances concerned.

*- Fixing the valve*

Place the valve in position and bolt it on carefully using nuts, bolts and stud bolts respectively. Use a specific tool with a torque of 30 Nm.

Ensure the valve is mounted the right way (See assembly with actuator section).

For food valves versions (model AI) assemble the spacers according to the instructions given on the technical sheet inside the package.

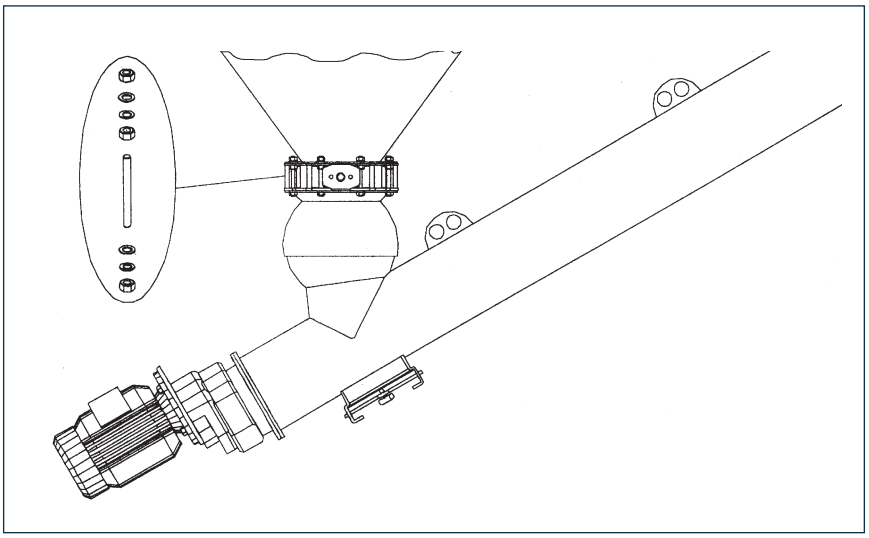
Carry out pneumatic and electrical connections in compliance with the standards in force.

**Important**

**For accident prevention it is essential to keep the valve out of reach of personnel during operation. To this purpose the customer has to provide suitable safety devices such as grilles, as well as protective inlet and outlet joints (either robust flexible sleeves or rigid pipe unions). However, the installer has to avoid that, even inadvertently, a person remains harmed (by using suitable hopper, safety grilles, etc.)**

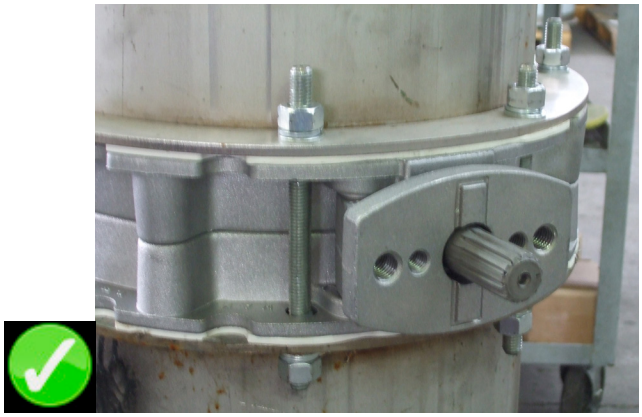
When employing movable safety devices, provide protection limit switches that stop the valve instantaneously if the protection is opened or removed. Restarting of the valve operation must only be possible when the protection is effective again (according to EN 1088).

To fix these devices to the valve, only use stud bolts that are long enough to pass through the upper connecting flange, the valve itself, as well as the lower connecting flange forming a sandwich. Otherwise the weight below would tend to pull apart the semi-bodies of the valve. Screw the nuts on according to the instructions below.



The inside nuts have no weight bearing function. They only serve to secure the valve when the downstream device is removed.

Check and remove any possible vibrations of the plant, which could affect the safe and correct working of the valve.



Apply a thin layer of liquid seal before fitting the valve to the connecting flange.

Close the valve only when material is flowing.

Clean the valve regularly with either air or water. This is particularly important if the material handled tends to compact or to solidify due to longer shutdown periods.

Before activating the specific actuator, ensure that there are no signs of rust on the ends of the splined shafts and inside the bushes and remove any rust that may be present.

Grease the shaft and splined bush with conductive lubricating pastes such as adhesive lithium grease containing micronized copper powder. These are used specifically for lubricating dynamic contacts to facilitate passage of electric current:

- NLGI Consistency: 2;
- Temperature: -35°C/+220°C.

With higher material columns it is advisable to insert a baffle plate inside the silo, above the valve.

Check for and remove any possible vibrations of the plant, which may affect the proper functioning of the valve.

It is the responsibility of the installer, and of any person using the valve, remembering:

- not to start it unless it has been fixed to the parts of the plant provided to that purpose;
- not to start if the system in which is fitted has not been certified in accordance with the laws in force;
- to install a system in place that prevents harm to persons or damage to property.

**Important**

**After carrying out the installation, check if there are any misalignments and deviations to be corrected.**

## 5.6 Assembly instruction

*Manual actuators assembly*

**- CM Type**

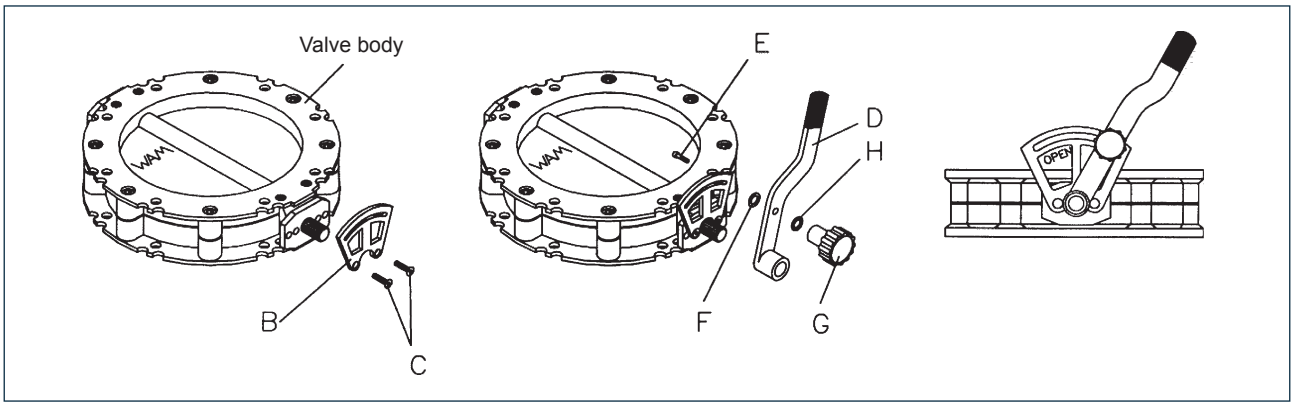



**Fig. 1** **Fig. 2** **Fig. 3**

The supply includes:

**B)** 1 lever setting mask;

**C)** 2 countersunk hexagonal socket screws;

**D)** 1 lever;

**E)** 1 knob fixing bolt;

**F)** 1 washer;

**G)** 1 lever fixing knob;

The valve disc has been preassembled on the body at the factory.

Put the valve on a flat surface.

Ensure that:

- **SINT**® disc the name **WAM**® faces upwards;
- CAST IRON disc the lower flat part of the disc faces upwards;
- STAINLESS STEEL disc the reference on the splined shaft faces the left;
- Remove protection from disc shaft;
- Lock the lever mask to the valve body using the two screws (**C**) with the wider side facing upwards as shown in Fig. 1, by applying a 36 Nm torque;
- Fit the lever (**D**) - with the bent part pointing towards the mask - onto the splined disc shaft ensuring the lever is placed in the "closed" position (Fig. 3);
- Fasten the lever using knob fixing bolt (**E**), washer (**F**) and lever fixing knob (**G**) as shown in Fig. 2.

**- CM with inductive proximity switch**

The plate (**B**) is fixed on the valve between support (**A**) and the mask (**C**) as indicated in Fig. 1.

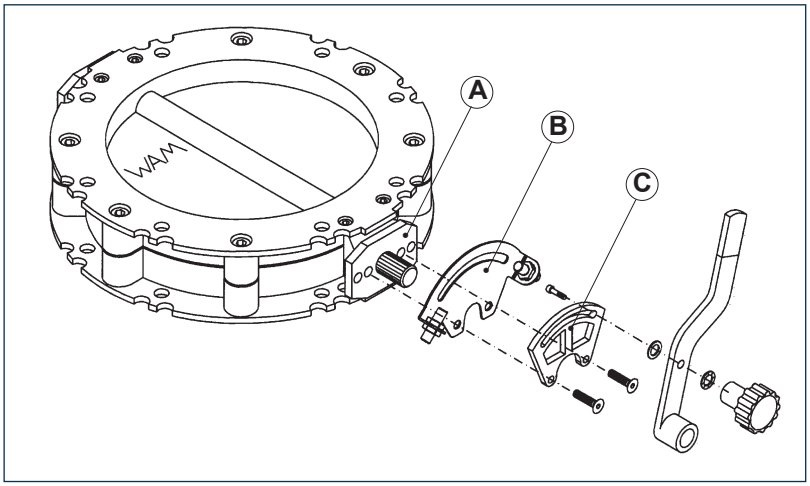



**Fig. 1**

The two proximity inductive switches, (see Fig. 2) must be fixed on the two sides of the plate (**B**) at a minimum distance of 0.8 mm from the lever.

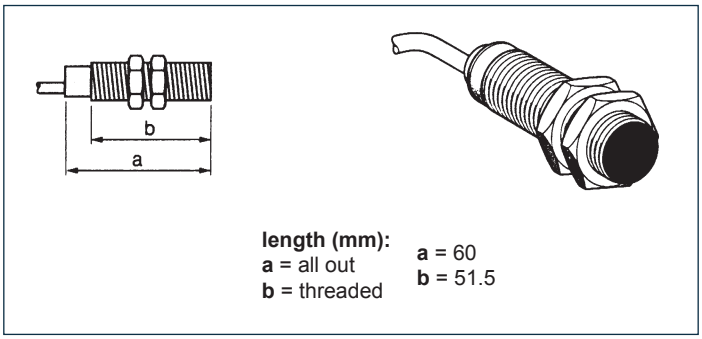
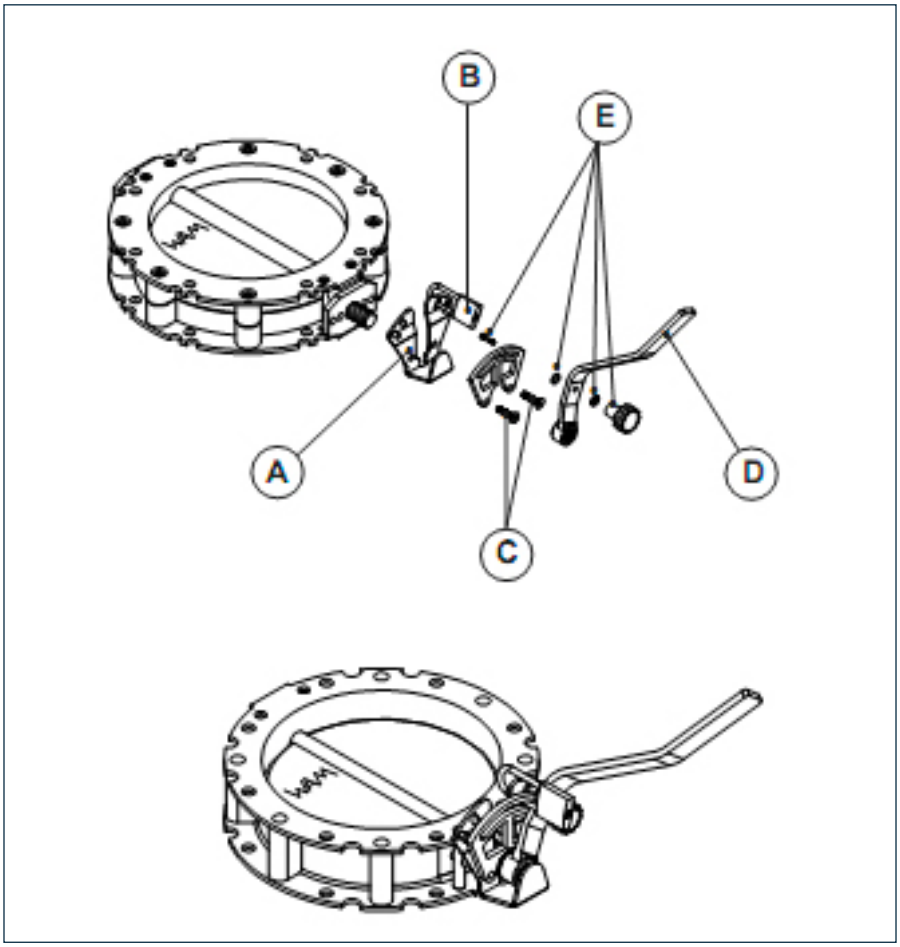



**Fig. 2**

**- KACM21 Type**




The supply includes:

**A)** Bracket;

**B)** Padlock.

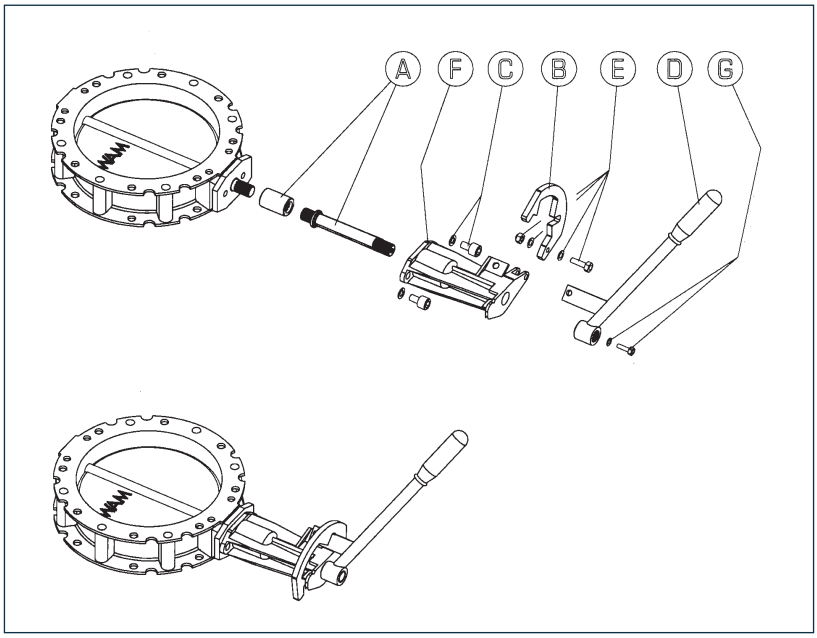
Remove the shaft cover. Then connect the manual lever actuator (**D**) a quarter of the way on the grooved shaft with the bent part towards the mask in the “closed” position.

Position bracket and stencil with the wider part upwards, then tighten the two bolts (**C**), using a 10 Nm torque.

As the bolts are being tightened, the lever will be automatically fitted on the shaft.

Fix the lever using the screw-washer-knob (**E**) assembly and the padlock (**B**) as shown in the figure.

**- CMP2 Type**




The supply includes:

**A)** Splined shaft;

**B)** 1 lever setting mask;

**C)** 2 countersunk hexagonal socket screws;

**D)** 1 lever;

**E)** 1 knob fixing bolt;

**F)** 1 extended aluminum body with hexagonal nuts;

**G)** 1 lever fixing knob;

The valve disc has been preassembled on the body at the factory.

Put the valve on a level surface.

Ensure that:

- **SINT**® disc the name **WAM**® faces upwards;
- CAST IRON disc the lower flat part of the disc faces upwards;
- STAINLESS STEEL disc the reference on the splined shaft faces the left.

Remove protection from disc shaft.

Fit the shaft with relative bushing (**A**) into extension (**F**).

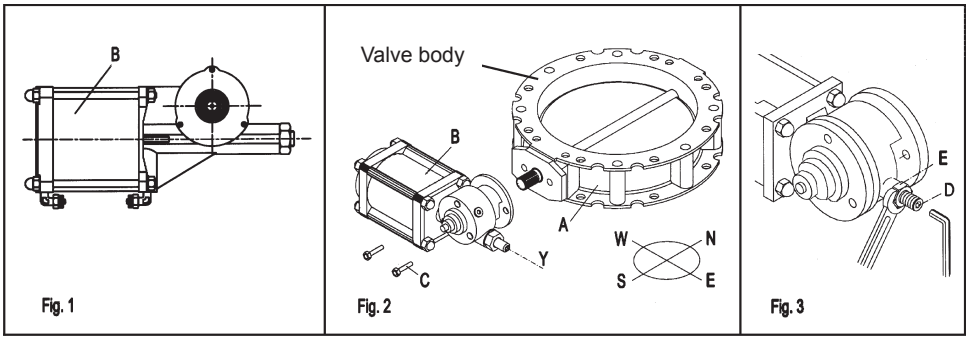
Lock extension (**F**) to the valve using the screws and spring washers (**C**) by applying a 36 Nm torque.

Fit setting mask (**B**) on extension (**F**) using the screw plus 2 washers and a self-locking nut (**E**).

Fit lever (**D**) on the splined shaft and fix it using screw plus washer (**G**).

*Pneumatic actuator assembly*

**- CP Type**




The supply includes:

- 1 electropneumatic actuator + mechanical base (not provided in case of actuator prearranged for Namur valves solenoid valves);
- 2 hexagonal bolts.
- Pneumatic connections not fitted to the actuator (Connections present on Namur versions)

Put the valve (**A**) on a level horizontal surface.

Ensure that:

- **SINT**® disc the name **WAM**® faces upwards;
- CAST IRON disc the lower flat part of the disc faces downwards;
- STAINLESS STEEL disc the reference on the splined shaft faces the right.

**Important**

**THESE INSTRUCTIONS ARE VALID ONLY DURING ASSEMBLY OF THE ACTUATOR ON THE VALVE. THE INSTRUCTIONS ARE NOT APPLICABLE ON INSTALLATION OF THE VALVE.**

Remove protection from the disc shaft.

Open the valve with disc in 90° position.

Fit the two connections to the actuator.

Before mounting the actuator, ensure that the piston is fully pushed on the back cover, by turning the shaft using a spanner clockwise until it stops (Fig.1).

Fit the pneumatic actuator (**B**) in the valve body splined shaft as shown in Fig. 2.

Insert the two bolts (**C**) into the bores provided and lock using a spanner by applying a 36 Nm torque.

Carry out the operating test.

If the valve does not completely close, although the piston is fully retracted, proceed as shown in Fig. 3:

**1)** Disconnect compressed air supply

**2)** Loosen the large nut (**E**) and socket screw (**D**) at the opposite end of the actuator

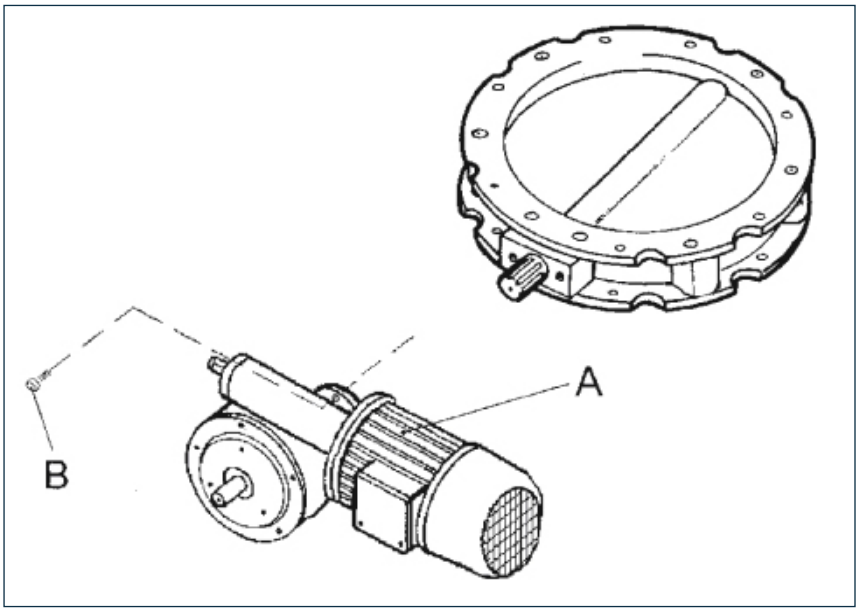
**3)** Push down the valve disc until it is fully closed

**4)** Turn the socket screw (**D**) clockwise until you feel some resistance and fasten nut (**E**) in order to block the socket screw.

For **CP126** and **CP126** Tandem sustain the actuator weight with a support bracket fixed.

*Electromechanical actuator assembly*

**- AE Type**




The supply includes:

**A)** 1 electric actuator;

**B)** 2 hexagonal bolts.

Put the valve on a level surface.

Ensure that:

- **SINT**® disc the name **WAM**® faces downwards;
- CAST IRON disc the lower flat part of the disc faces downwards;
- STAINLESS STEEL disc the reference on the splined shaft faces the right.

Remove protection from disc shaft.

Push down the valve disc until it is completely closed.

Mount the gear motor (**A**) onto the splined shaft so that the axis of the electric motor is parallel to the work surface (see Fig. 1).

Fix the gear motor using the two supplied bolts (**B**) and lock using a spanner by applying a 36 Nm torque.

It is required a mechanical or inductive limit switches system.

## 5.7 Electrical connection

**Danger - Warning**

**The equipment is not provided with an electrical system. Connection to the mains must be carried out by an electrician.**
**Provide a connection line for powering the valve in accordance with the provisions of the laws on the matter and taking into consideration the environmental safety requisites for installation and the envisaged operating conditions.**

None of the basic utilities require electrical connection.

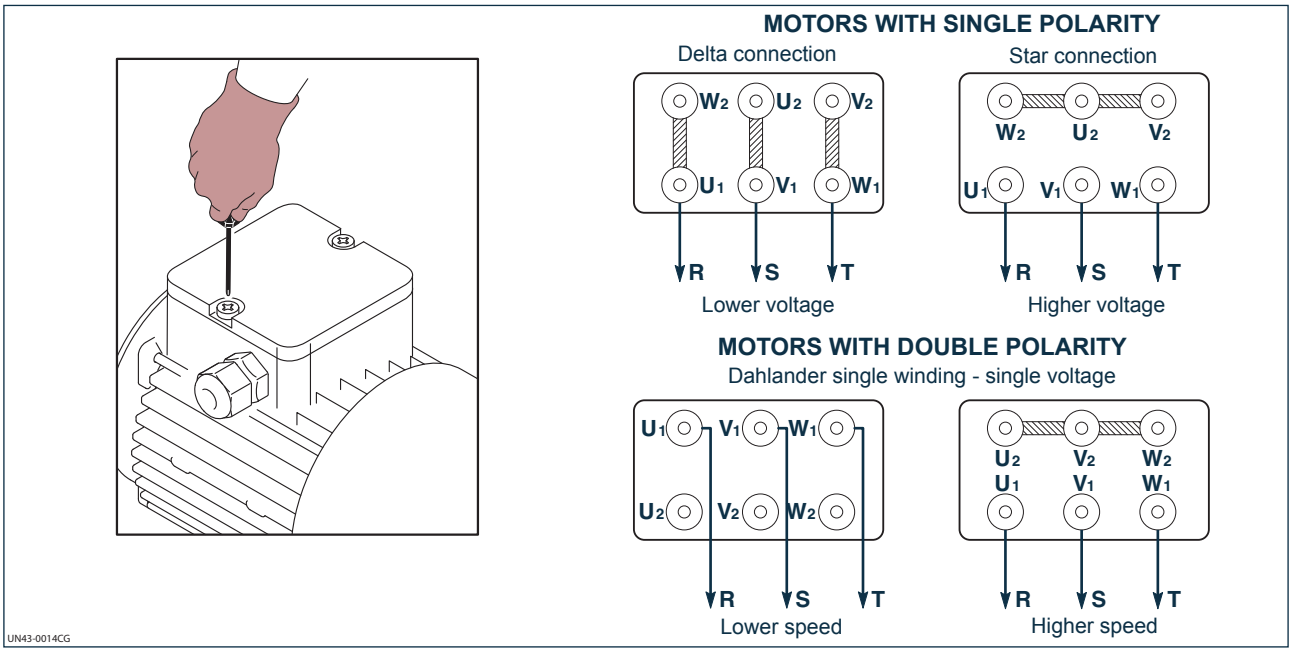
The installer must interface the valve with the necessary start/stop controls, emergency stops, reset after emergency stop, and microswitches for inspection hatches, in compliance with existing regulations.

Before making the connection, ensure that the mains voltage and frequency correspond to those indicated on the electric motor rating plate. Disconnect the power supply before carrying out any work and use suitable devices so that it cannot be accidentally reconnected.

Use electric cables having suitable cross-section for the power absorption of the motor of the valve.

The type of motor connection depends on the voltage value available to be applied; refer to the wiring diagram provided for each motor.

The illustration shows the wiring diagrams if the motor is supplied by **WAM**®. Refer to the manual on the website www.wamgroup.com



The installer will have to provide for interfacing the equipment with the necessary controls for: start/stop, emergency stop, reset after an emergency stop, in compliance with the regulatory standards in force.

In the testing phase, ensure that the motor rotation corresponds to the direction of rotation shown by the arrow applied on the motor.

If the rotation is inverse, invert the cable connections in the terminal board.

Disconnect the power supply before every intervention and use suitable devices to prevent accidental reconnection of the valve.

Before operating the valve each time, ensure the protection devices are present and working properly.

During these checks make sure the rotation of the valve disc cannot harm any person or damage the valve.

The installer must connect the valve to the earthling system of the plant.

## 5.8 Compressed air connection

None of the basic utilities require the use of compressed air.

If pneumatic actuators are used, it is the installer's responsibility to make sure the compressed air pipes are fixed properly and provide the required protection for sudden detachment of the piping.

The relative actuator operation manuals are available on the website www.wamgroup.com.

## 5.9 Inspection

**Important**

**When installation is complete, authorized personnel must carry out a general test to make sure the safety conditions have been completely satisfied.**

The authorized personnel must also check:
- That the linearity error of the valve is within the values indicated (see specific paragraph);
- That no tools or other material have been left inside the valve;
- That the fixing screws have been tightened using the prescribed torque;
- The level of oil in the actuator gear box is correct.

Before starting to operate the valve:
- Ensure that the plant in which the valve is installed complies to the Directive 2006/42/EC and the relevant directives, the safety standards in force and those specifically applicable.
- Make sure the inlet and outlet spouts of the valve are connected to the final equipment or plant in order to prevent access to hazardous areas.
- Ensure that the operating conditions are complied with.
- Make sure that the food versions (model AI) were properly cleaned and sanitized.

Start up the valve without load to ensure that the rotation of the valve disc is correct.

Operate the valve for about 1 to 3 minutes to ensure it is working correctly.

In the presence of:

- Unusual noise;
- Overheating of the motor and/or gear box;
- High friction of the disc against the inner seal;
- Not enough torque to open and close the valve.

Stop the valve and remove the cause of the malfunctioning.

**Danger - Warning**

**When sizing the valve, check for any chemical incompatibility between the material and the components of the valve.**

## 6.1 Production Start-up

Before starting up the valve the operator in charge and authorized for the production must ensure the safety devices installed are present, in working order and that the operating conditions are respected (inlet and outlet spouts connected correctly or protected,etc.).

Especially with materials which tend to harden or become sticky through longer periods of storage ensure no material or liquid is deposited on the shaft passages. In such a case clean the area thoroughly.

Start valve operation without material. If valve works correctly add material and proceed with regular operation.

**Important**

**In case of excessive noise, strong vibrations, etc. stop the valve and report the problem to the person in charge authorized to intervene to restore correct working.**
**Do not use the valve if demaged.**

*Operation*

Depending on the type of plant, the valve can be operated either manually, electropneumatically or by a gear motor. In the last two cases the valve is controlled by a remote control panel or by a local starter.

The weight of the material column must not exceed the resistance of the mobile valve parts.

Regular cleaning increases the life of the valve. This applies in particular to those application in which the materials handled either tend to harden or become sticky due to long shut-down.

**Important**

**The material weight on the disc must never be greater than its maximum static torque.**
**As it is difficult to calculate this weight exactly due to varying material proprieties, as rule of thumb, one may consider there are no problems with bulk density < 1.13 kg/dm$^3$ in standard hoppers or silos.**
**When dealing with materials with higher bulk density check with customer service.**
**With lumpy, granular or fibrous material, it is advisable to use a cast iron or 304 SS disc.**

**Important**

**Operate the valve always when material is flowing.**
**These valves are specifically provided for work with powdery or granular materials.**

## 6.2 Clearing the valve following a blockage

If, during normal operation, the valve actuator is found to be moving gradually under stress and then comes to a complete stop, it is highly probable that the problem is caused by a blockage.

**Danger - Warning**

**The authorized operator must strictly apply all the laws regarding workplace safety and adopt appropriate protective measures against work accidents.**
**Specifically, do not insert the hands into the inlet/outlet next to the valve if the disc has not been blocked safely using external means.**

**Danger - Warning**

**Disconnect the valve from all mains, electric and pneumatic, and use the appropriate means to prevent it from being reconnected accidentally.**

Proceed as described.

- Cut off the actuator power supply to the valve or block the hand lever in a fixed and safe position.
- Remove the outlet sleeve and ensure that the outlet spout is not obstructed by material or deposits and clean it using a tool, if necessary.

**Danger - Warning**

**Never insert the hands inside the valve.**

## 6.3 Shuttdown of the valve at the end of the work cycle

There is no special switch-off procedure.

The stop of the valve is made with the interruption of its actuator. It is advisable to drain the valve at the end of each working day. This is particularly important when the material transported tends to harden or get compacted if not handled for a certain period of time.

## 6.4 Long shutdowns of the valve

When the valve remains unused for long periods, proceed as described below.

**1)** Empty the valve of the product it contains to prevent it from hardening.

**2)** Clean the valve (see “Cleaning the valve”).

**3)** Grease the coupling between valve and actuator.

**4)** Grease actuator components if necessary.

**5**) Repair the damaged or worn mechanical parts, if necessary.

**6)** Block power supply.

## 6.5 Reuse

**Important**

**If the equipment is to be used in different conditions and with materials other than the previous application, ensure the "Permitted use" indications are complied with.**

Before reusing the valve after a prolonged shutdown, proceed as described below.

**1)** Check the main nuts and bolts to make sure they are tightened properly.

**2)** Set the valve in safety conditions before starting operation making sure the valve is completely empty.

**3)** Check the connections to the electrical and pneumatic supply and all parts the working of which may be affected by long shutdowns.

**4)** Clean the valve thoroughly by following the instructions given on the product safety chart.

**5)** If the valve operates in different conditions, or using materials different from the previous application, ensure this use complies the INDICATIONS FOR USE section.

**6)** Start up the valve (see "Production Start-up").

**Danger - Warning**

**Before carrying out any maintenance operation, activate all the safety devices for the safety of the persons involved in the operations and those nearby.**
**Set the valve concerned in safety condition.**
**Wear suitable personal protection devices; in this regard, consult the person in charge of safety of production activities.**

**Important**

**Failure to strictly follow the instructions can cause problems and invalidate the warranty on the valves supplied.**

### - Scheduled maintenance Table

| Component | Operation to be carried out | Daily | Weekly | Every month | Every six months | Every two years | Manual reference |
|---|---|---|---|---|---|---|---|
| Safety device | Performance check | • | | | | | |
| Valve | Remove dust residue or deposit from the outside surface | • | | | | | |
| Valve outlet | Check that the outlet is free of material residue. If this is not the case, clean it thoroughly to remove all obstruction to the flow of material | | • | | | | |
| Earth connection | Integrity of electrical connection | | | • | | | |
| Gasket | Checking wear | | | • | | | |
| Bushes | Checking wear | | | | • | | |
| Flanges | Verify fixing | | | | • | | |
| Splined coupling | Check and remove any rust | | | | | | |
| Seal and bushes | Change | | | | • | • | |
| Actuator bracket | Checking condition | | | | • | | |
| Safety and information signs | Checking the condition and legibility | | | | • | | |

**Important**

**Part replacement depends on the use of the valve and type of material handled.**

## 7.1 Cleaning the valve

Clean the outside part of the valve using a vacuum cleaner to prevent dispersal of dust in the environment and in the surrounding area; or use a moist cloth.

Do not use compressed air.

Wash the valve, after vacuuming the dust, with a low-pressure water jet.

Before start-up the valves for food applications (model AI), has to be subjected to cleaning and sanitation by means of a woven/non-woven cloth and sanitizer spray.

## 7.2 Lubrication

Lubrication operations have to be carried out (see periodic check maintenance), using conductive type grease pastes on the following parts:

- Splined shaft;
- Earth wiring contact screw.

## 8.1 Safety recommendations for replacement

**Danger - Warning**

**The replacement operations must be carried out by a specialist authorized technician with specific skills in the sector concerned (mechanical, electrical etc).**
**Before carrying out any operation, provide suitable safety measures and use the appropriate equipment to prevent risk of work injuries to persons involved in the operations and those nearby.**
**Activate all the safety devices envisaged and prevent access to controls which, if activated, could cause work injuries to the persons involved in the operations.**

## 8.2 Replacement of wear parts

The disc seal and bushes, which are the only wear parts in the "**VFS**"-valves, must be replaced after a while depending on material and application.

We suggest replacing the seals and bushes every 2 years, as you can see in the Maintenance Schedule table.

For spare part codes refer to Spare Parts section.

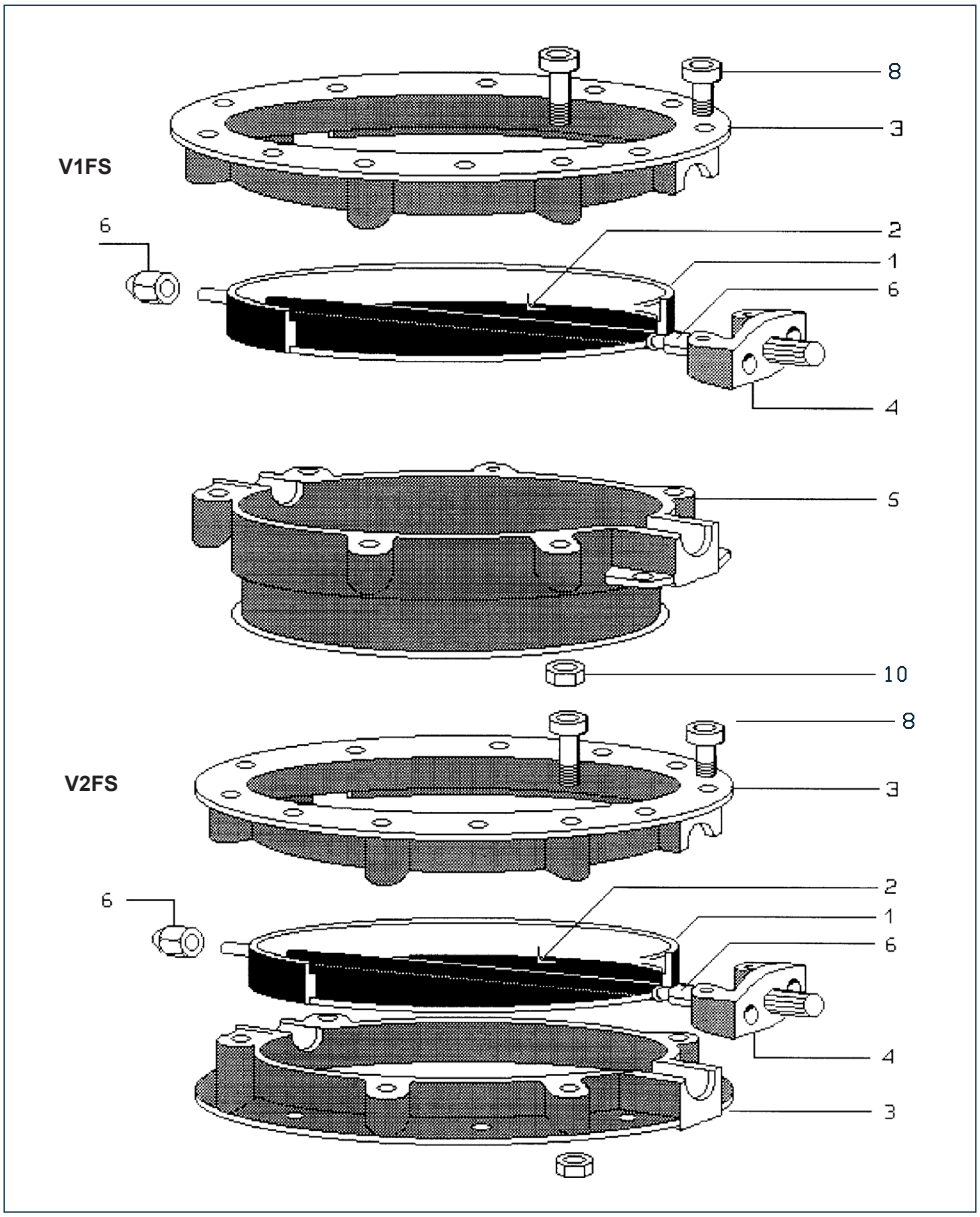
Proceed as described.

**1)** Ensure the container below which the valve is fitted is empty;

**2)** Disconnect mains and compressed air supply from the actuator;

**3)** Remove actuator;

**4)** Remove valve.



**5)** Loosen bolts (**8**) and remove them. Do not lose nuts (**10**);

**6)** Separate semi-bodies (item (**3**) and (**5**) with **V1FS**, twice item (**3**) with **V2FS**;

**7)** Separate valve disc along with seal and hexagonal bushes from the valve body;

**8)** Remove hexagonal bushes (**6**) from disc shaft;

**9)** Remove disc seal (**1**) from the two shaft ends;

**10)** Fit new seal on the two shaft ends. Ensure seal does not get damaged;

**11)** Slide the new two hexagonal bushes (**6**) over the shaft ends;

**12)** Introduce drive shaft into the bore of the actuator support bracket. Ensure the correct fit of the two hexagonal bushes (see fig. 2);

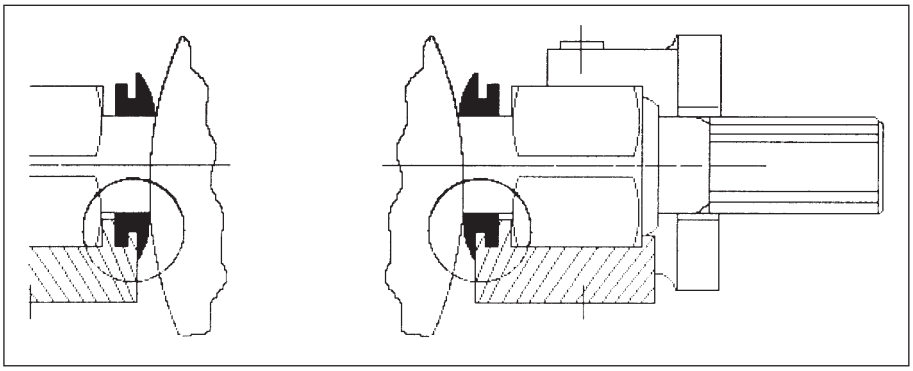


**Fig. 2**

**13)** Fit the upper valve semi-body. For the correct assembly of the disc seal the spigots in the semi-bodies must be exactly on top of each other;

**14)** Fix semi-bodies with bolts (**8**) and nuts (**10**) and tighten evenly. Screw on bolts (**8**) and tighten firmly;

**15)** Reinstall the valve according to “Installation and fixing of the valve” section.

The integral seals, fitted on food configurations (AI), shall be provided individually packed in plastic bags inside a paperboard box.

The client has to keeps trace of the seal lot reference number for an easier future traceability. The lot number of the seal is present in the Instruction for cleaning and sanitizing provide inside the package.

## 8.3 Returning the valve

When returning the valve use the original packaging if it has been preserved, otherwise fix the it on a pallet and cover it with nylon shrink-wrap, to protect it as best as possible from impact during transport. In any event, make sure there is no residue material inside the valve.

## 8.4 Dismantling and disposal

Dismantling of the valve must be entrusted to personnel specialized in these activities and equipped with adequate skills.

Dismantle the components of the valve concerned; if necessary contact the Manufacturer for further information.

The components dismantled have to be separated on the basis of the nature of the materials of which they consist, in compliance with the laws on the matter of “differential collection and disposal of wastes”.

With reference to the WEEE Directives, electrical and electronic components, marked with a special symbol, have to be disposed off in authorized collection centres meant for the purpose.

Unauthorized disposal of “Waste Electrical and Electronic Equipment” (WEEE) is punishable with fines governed by the laws concerning the matter.

## 9.1 Trouble-shooting

Minor problems can be solved without consulting a specialist.

The following Table contains a list of the most common problems, the possible causes and possible remedies.

For particularly difficult actions which are not mentioned in the Table, contact the Manufacturer's Customer Service Department.

**Danger - Warning**

**Before carrying out any operation "set the valve concerned in safety" (see "Glossary and terminology"), operate according to the indications on the "Operation and Maintenance Manual" and in accordance with and in compliance with the standards in force as regards health and safety.**

| FAULT | POSSIBLE REASON | SOLUTION |
|---|---|---|
| A) Valve does not open or stays open. | 1) Lumps formed in material. | 1) Strip down valve, clean thoroughly and reinstall. |
| | 2) Bulk density too high. | 2) Provide weight relief inside bin cone. |
| | 3) Actuator air pressure too low. | 3) Check for leakages in compressed air mains and repair. |
| | 4) Drive power too low. | 4) Check electric motor and mains supply. Then eliminate fault. |
| B) Valve leaks | 1) Valve does not close completely. | 1) See item A. |
| | 2) Disc seal worn out | 2) Replace disc seal. |

## 9.2 Check-list in case of fault

If you have been unable to solve the problem on the valve even after having carried out the operations suggested in paragraph “Trouble-shooting” please contact the plant technician/installer/or the Manufacturer.

If technical assistance is required, in addition to the valve data, the plant technician/installer or Manufacturer will also need information concerning the plant in which the valve is installed, its installation and its working, for better identification of the problem that has occurred.

Obviously many of the checking operations which are requested have already been performed in the various steps during installation, testing and start-up of the valve concerned.

**Danger - Warning**

**Before carrying out any operation “set the valve concerned in safety” (see “Glossary and terminology”), operate according to the indications on the “Operation and Maintenance Manual” and in accordance with and in compliance with the standards in force as regards health and safety.**

***1) Information necessary***

**a)** Description of problem;

**b)** Photo showing the entire valve and how it is installed;

**c)** Valve type;

**d)** Does the valve start up without any problem after long shutdowns?

**e)** Is the outlet spout free of encrustations which reduce the cross-section?

**f)** Is the vent of the weigh hopper into which the valve unloads material sized correctly; is it clean and does it work properly?

***2) Checking the silo***

**a)** What is the inclination of the cone?

**b)** How much material does the silo contain?

**c)** Is the silo equipped with a bridge-breaker bafle plate?

**d)** Is the silo provided with fluidisation/aeration?

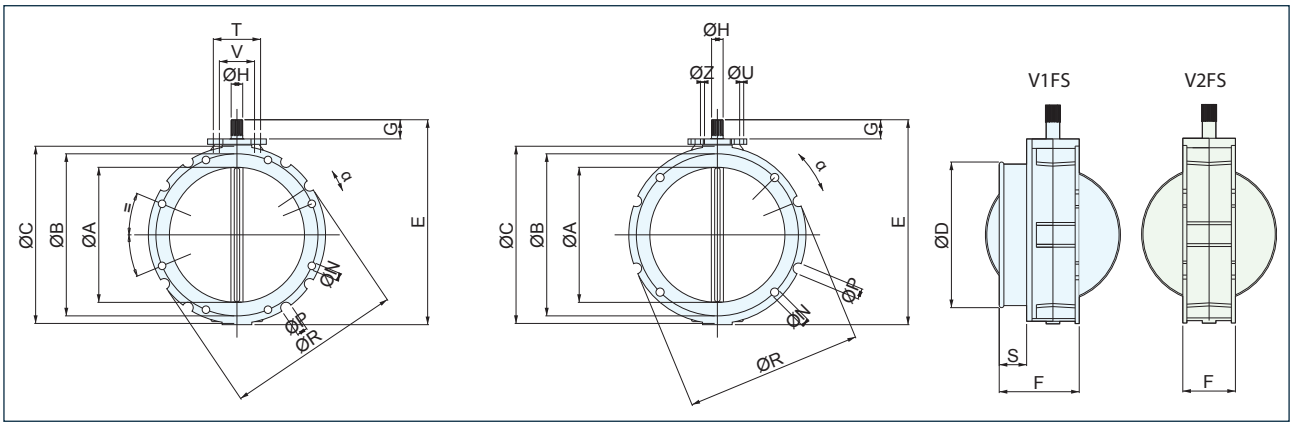
How many nozzles or aeration pads are preset on the cone, how are they arranged and what is their distance from the outlet flange of the silo?

What is the operating pressure and the operating cycle?

**e)** Is the silo provided with a vibrator or a hammering device?

What is the operating cycle?

## V1FS, V2FS




## SINGLE FLANGE BUTTERFLY VALVE FOR SLEEVE CONNECTION

| TYPE | Ø A | Ø B | Ø C | Ø D | E | F | G | ØH DIN 5482 | N Drilling | P External grooves | Ø R | α | S | T | U | V | Z | kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V1FS 100. | 95 | 180 | 220 | 105 | 250 | 115 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 220 | 22°30′ | 40 | 80 | M12 | 50 | M10 | 4 |
| V1FS 150. | 150 | 200 | 228 | 163 | 290 | 115 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 228 | 22°30′ | 40 | 80 | M12 | 50 | M10 | 5 |
| V1FS 200. | 200 | 250 | 278 | 213 | 340 | 115 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 278 | 22°30′ | 40 | 80 | M12 | 50 | M10 | 6.5 |
| V1FS 250. | 250 | 300 | 328 | 263 | 390 | 115 | 35 | 22x19 | N°8 x Ø14 | N°8 x Ø20 | 325 | 11°15′ | 40 | 80 | M12 | 50 | M10 | 7.5 |
| V1FS 300. | 300 | 350 | 378 | 313 | 440 | 115 | 35 | 22x19 | N°8 x Ø14 | N°16 x Ø20 | 375 | 5°41′ | 40 | 80 | M12 | 50 | M10 | 9 |
| V1FS 350. | 350 | 400 | 440 | 363 | 530 | 123 | 50 | 28x25 | N°8 x Ø14 | N°8 x Ø20 | 440 | 10° | 40 | 80 | M12 | - | - | 16 |
| V1FS 400. | 400 | 470 | 530 | 413 | 580 | 123 | 50 | 28x25 | N°8 x Ø14 | N°16 x Ø20 | 530 | 4°30′ | 40 | 80 | M12 | - | - | 20.5 |

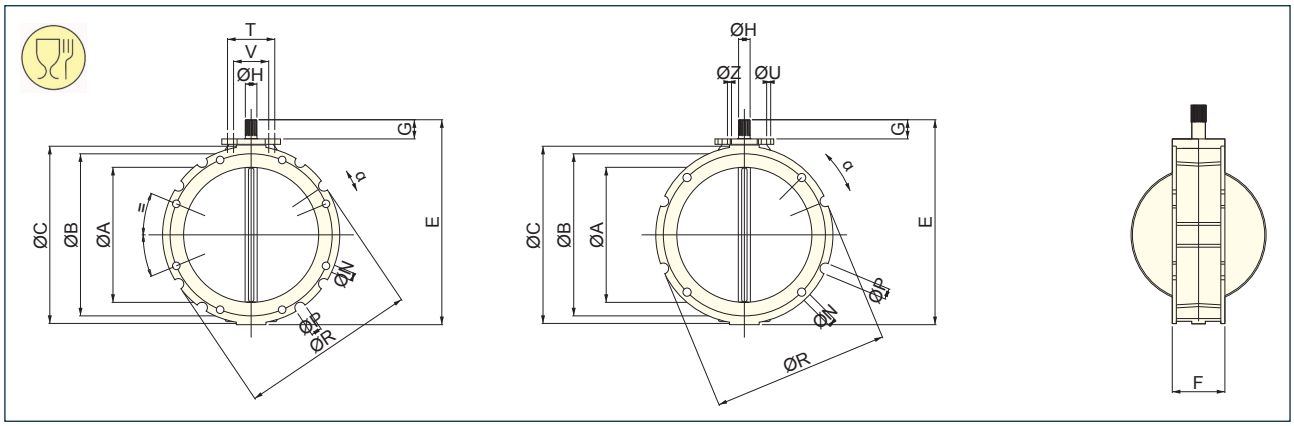
Dimensions in mm

## DOUBLE FLANGE BUTTERFLY VALVE

| TYPE | Ø A | Ø B | Ø C | E | F | G | Ø H DIN 5482 | N Drilling | P External grooves | Ø R | α | T | U | V | Z | kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V2FS 100. | 95 | 180 | 220 | 250 | 77 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 220 | 22°30′ | 80 | M12 | 50 | M10 | 4 |
| V2FS 150. | 150 | 200 | 228 | 290 | 77 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 228 | 22°30′ | 80 | M12 | 50 | M10 | 5 |
| V2FS 200. | 200 | 250 | 278 | 340 | 77 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 278 | 22°30′ | 80 | M12 | 50 | M10 | 6.5 |
| V2FS 250. | 250 | 300 | 328 | 390 | 77 | 35 | 22x19 | N°8 x Ø14 | N°8 x Ø20 | 325 | 11°15′ | 80 | M12 | 50 | M10 | 7.5 |
| V2FS 300. | 300 | 350 | 378 | 440 | 77 | 35 | 22x19 | N°8 x Ø14 | N°16 x Ø20 | 375 | 5°41′ | 80 | M12 | 50 | M10 | 9 |
| V2FS 350. | 350 | 400 | 440 | 530 | 85 | 50 | 28x25 | N°8 x Ø14 | N°8 x Ø20 | 440 | 10° | 80 | M12 | - | - | 16 |
| V2FS 400. | 400 | 470 | 530 | 580 | 85 | 50 | 28x25 | N°8 x Ø14 | N°16 x Ø20 | 530 | 4°30′ | 80 | M12 | - | - | 20.5 |

Dimensions in mm

## V2FS Al



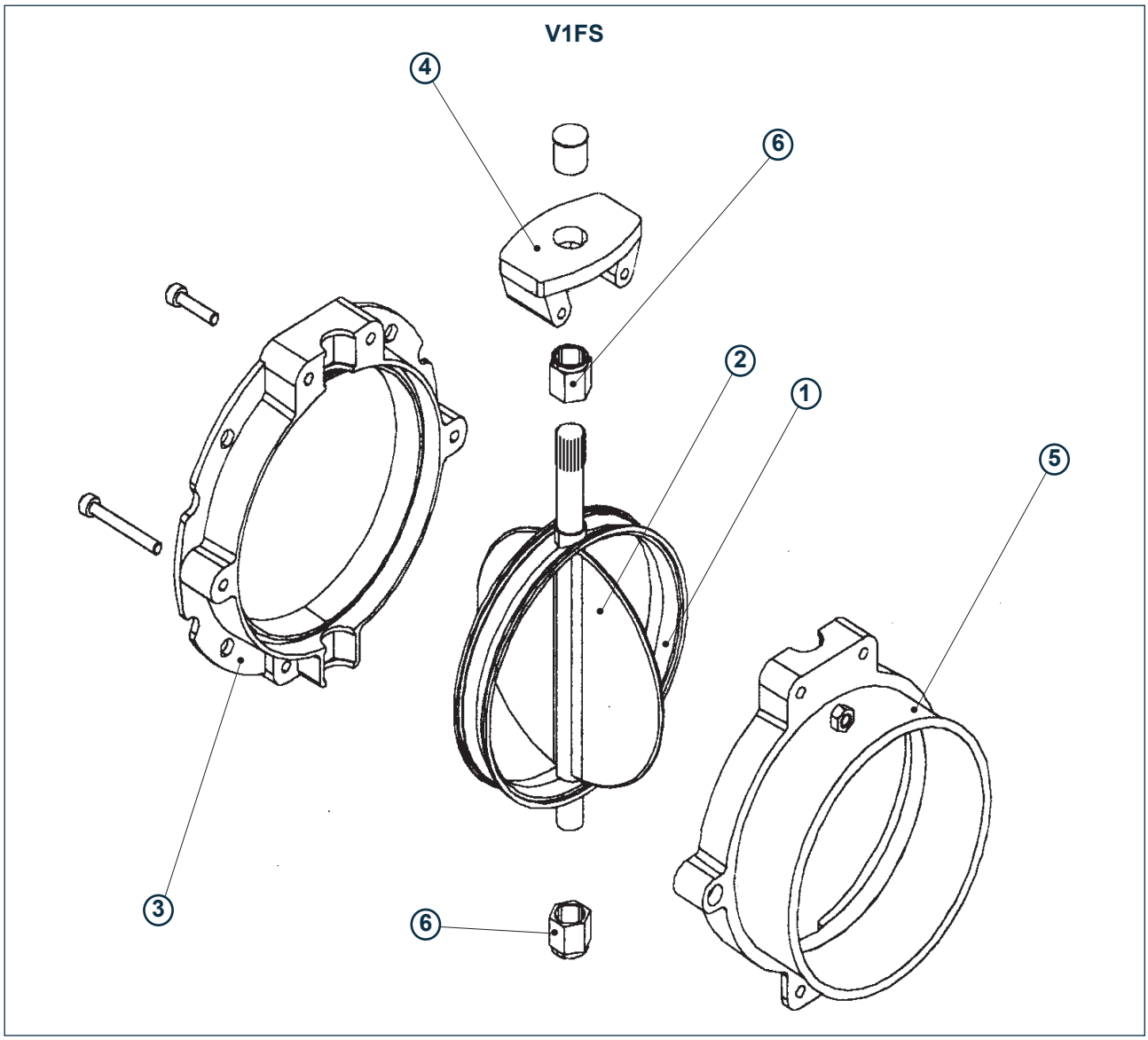

## FOOD-GRADE BUTTERFLY VALVE

| TYPE | Ø A | Ø B | Ø C | E | F | G | Ø H DIN 5482 | N Drilling | P External grooves | Ø R | α | T | U | V | Z | kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V2FS 100. | 90 | 180 | 220 | 250 | 84 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 220 | 22°30′ | 80 | M12 | 50 | M10 | 4 |
| V2FS 150. | 145 | 200 | 228 | 290 | 84 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 228 | 22°30′ | 80 | M12 | 50 | M10 | 5 |
| V2FS 200. | 195 | 250 | 278 | 340 | 84 | 35 | 22x19 | N°4 x Ø14 | N°4 x Ø20 | 278 | 22°30′ | 80 | M12 | 50 | M10 | 6.5 |
| V2FS 250. | 245 | 300 | 328 | 390 | 84 | 35 | 22x19 | N°8 x Ø14 | N°8 x Ø20 | 325 | 11°15′ | 80 | M12 | 50 | M10 | 7.5 |
| V2FS 300. | 295 | 350 | 378 | 440 | 84 | 35 | 22x19 | N°8 x Ø14 | N°16 x Ø20 | 375 | 5°41′ | 80 | M12 | 50 | M10 | 9 |

Dimensions in mm

For identification of Valve components see the drawing and tables given below.

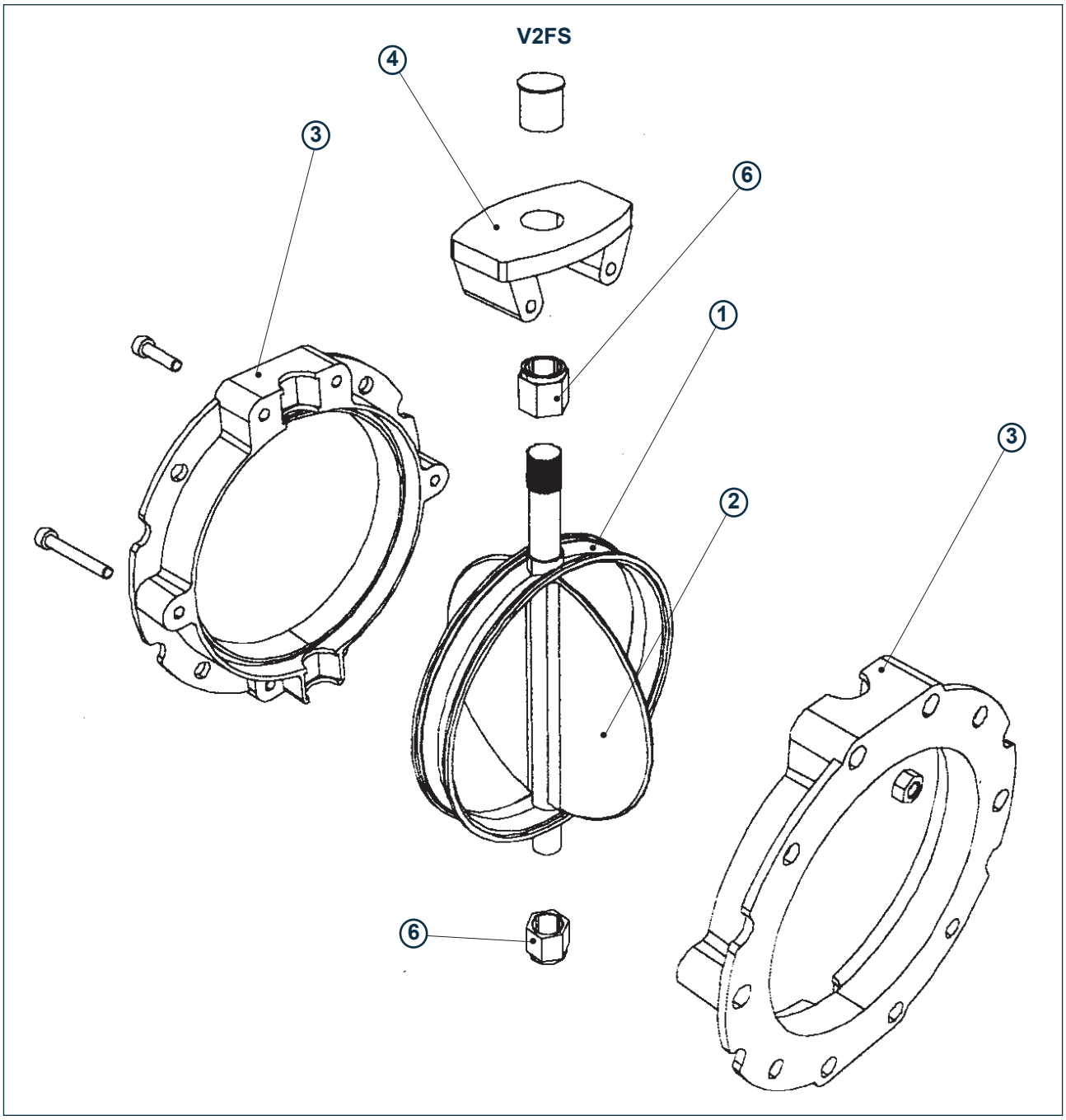
**Model V1FS....**




| ITEM | QUANTITY | DESCRIPTION | TYPE |
|---|---|---|---|
| 1 | 1 | Seal | Wear part |
| 2 | 1 | Disc | Wear part |
| 3 | 1 | Upper semi-body | Spare part |
| 4 | 1 | Support Bracket | Spare part |
| 5 | 1 | Lower semi-body | Spare part |
| 6 | 2 | Hexagonal bush | Wear part |

**Model V2FS….**

Batch:

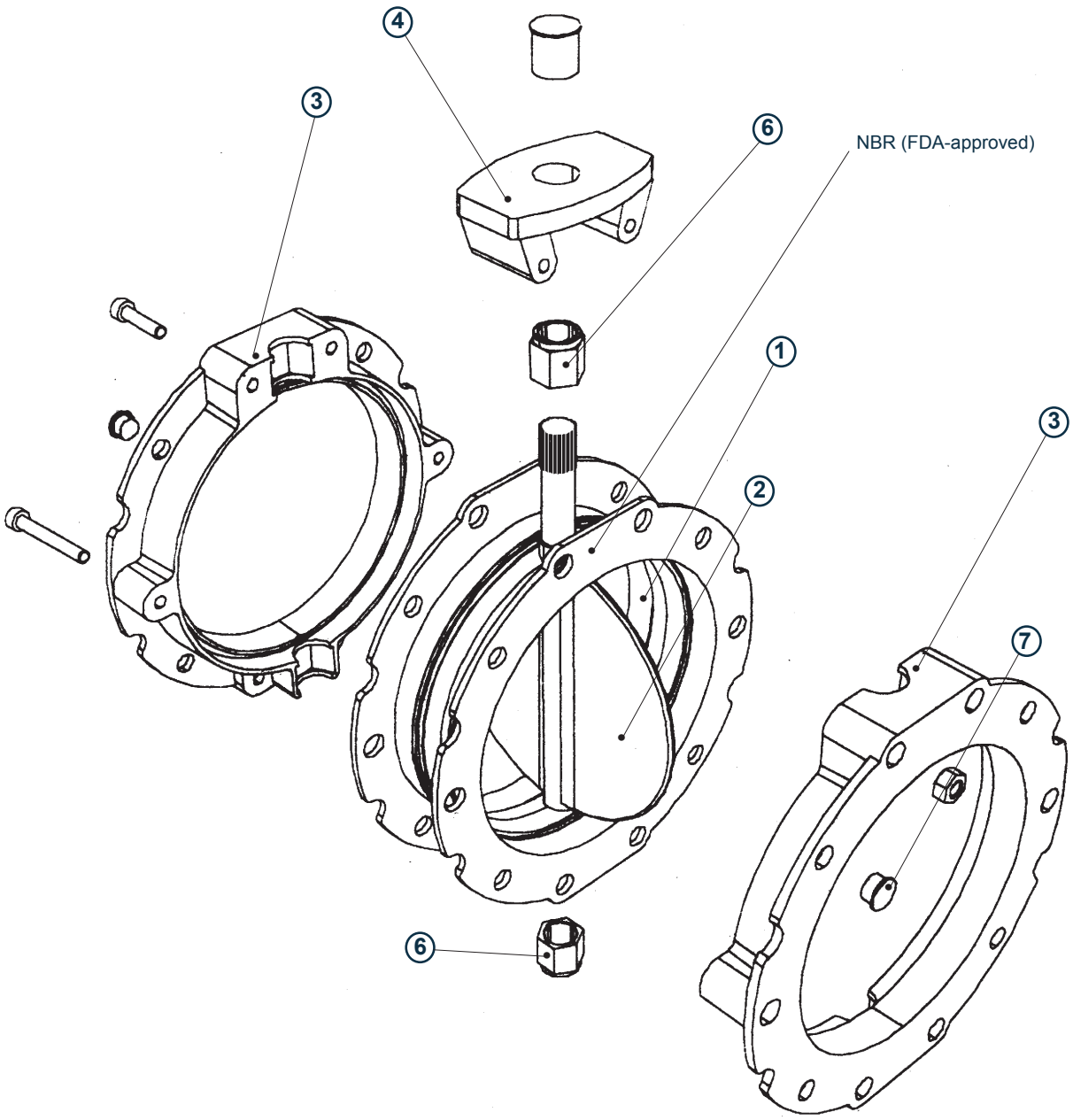



| ITEM | QUANTITY | DESCRIPTION | TYPE |
|---|---|---|---|
| 1 | 1 | Seal | Wear part |
| 2 | 1 | Disc | Wear part |
| 3 | 2 | Semi-body | Spare part |
| 4 | 1 | Support Bracket | Spare part |
| 6 | 2 | Hexagonal bush | Wear part |

**Model V2FSX…I/IT**

Batch:

**V2FS..I.**




| ITEM | QUANTITY | DESCRIPTION | TYPE |
|---|---|---|---|
| 1 | 1 | Integral Seal | Wear part |
| 2 | 1 | Disc | Wear part |
| 3 | 2 | Semi-body | Spare part |
| 4 | 1 | Support Bracket | Spare part |
| 6 | 2 | Hexagonal bush | Wear part |
| 7 | | Spacer | Spare part |

## A1 Nuts and bolts tightening torque Table

| Thread diameter | Tightening torque [Nm] | | |
|---|---|---|---|
| | Resistance Class **8.8** | Resistance Class **10.9** | Resistance Class **12.9** |
| M6 | 9.5 | 13.0 | 16.0 |
| M8 | 23.0 | 32.0 | 39.0 |
| M10 | 46.0 | 64.0 | 77.0 |
| M12 | 80.0 | 110.0 | 135.0 |
| M14 | 125.0 | 180.0 | 215.0 |
| M16 | 195.0 | 275.0 | 330.0 |
| M18 | 270.0 | 390.0 | 455.0 |
| M20 | 385.0 | 540.0 | 650.0 |
| M22 | 510.0 | 720.0 | 670.0 |
| M24 | 660.0 | 930.0 | 1100.0 |
| M27 | 980.0 | 1400.0 | 1650.0 |
| M30 | 1350.0 | 1850.0 | 2250.0 |

| | |
|---|---|
| Oil filler, drainage, venting, and level plugs in gear reducers | Tightening torque<br>16 ÷ 18 [Nm] |