EN

LBC

LUMP BREAKING FEEDER VALVE

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 device concerned.

The Manual, which is an integral part of the device concerned, must be preserved throughout the life of the device 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 device.

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

The Manual is meant for specialist technical personnel appointed and authorized by the Manufacturer, owner and installer to act on the device 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 device 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 device 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 equipment 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 equipment are exposed. Before inspecting it, disconnect the device from the power source.
	**Information:** indicates the direction of rotation of the electric motor.
	**Obligation:** indicates the hooking points for lifting each section of the equipment concerned.
	**Forbidden:** indicates it is forbidden to introduce hands into the equipment.

1.3 Glossary and terminology

Operator: person appropriately trained and authorized by the Production Manager for setting up the device 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 device; 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 device concerned, must be familiar with the working of the plant or equipment on which the device concerned is installed.

Routine maintenance: includes all the actions necessary to keep the device 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 device in perfect working order.

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

The precautions are listed below.

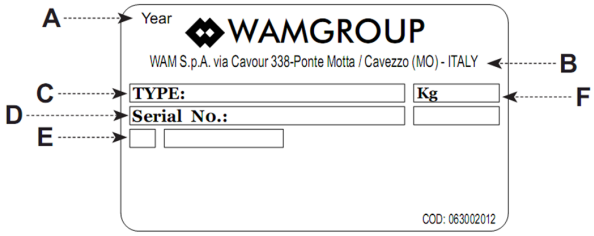
- **Ensure that the device concerned is disconnected from all the mains and appropriate devices are used to prevent these from being reconnected accidentally.**
- **Ensure that all the moving parts of the device have come to a complete stop.**
- **Ensure the temperature of the device concerned is such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

1.4 Manufacturer's data and identification of device

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 equipment concerned and its main components.
The plates show the reference necessary for operating safety.



A) Year of manufacture
B) Manufacturer's identification
C) Type of device
D) Serial No.
E) Progressive number of section (only for screw conveyors)
F) Weight of the device

1.5 Request for assistance

For all technical assistance, contact the Manufacturer's service network.

For all requests, provide the device 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 device 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 device 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 device 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 device.

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 equipment, 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 equipment during installation, use and maintenance.

Modifications to the equipment 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 equipment concerned or the sections 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 equipment 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 equipment.

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.

Do not place loads on the device.

2.5 Safety prescriptions for maintenance and replacement of components

Danger - Warning

Before carrying out any operation on the equipment 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 device 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 equipment 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 device concerned.

3.1 Description of the device

The LBC Lump Breaking Feeder Valve consists of a rotary shaft hold in position by two half-bodies. Built on the shaft, it rotates a series of blades angularly offset to each other, allowing them to compress the material lumps against the fixed grid, fastened to the lower half-bodies. The fine material falls trough the cutting grid and reaches the next device via the product outlet.

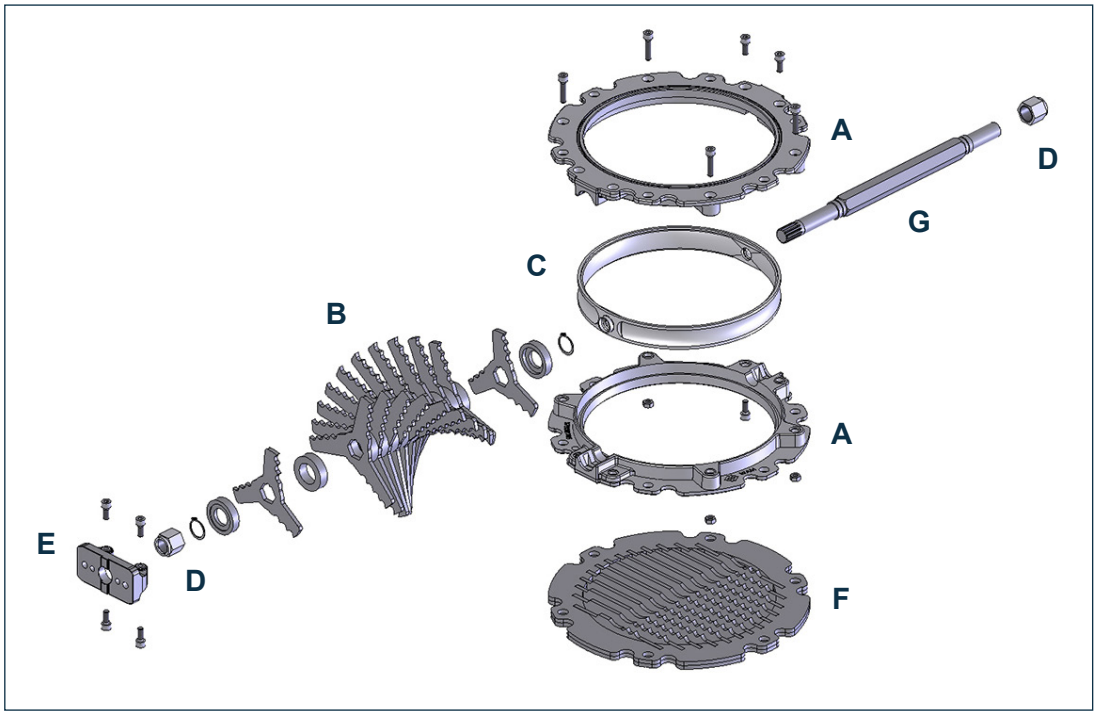
The device has been designed taking into consideration the **"Essential Safety Requirements** of the **Appendix I of the European Directive 2006/42/CE, known as the Machinery Directive"**, already adopted in the National Italian legislation **by means of the Legislative Decree no.17 of January 27th 2010.**

Important

The terms "device", "Lump Breaking Feeder Valve" used in this manual refer to the same device.
As components meant for installation in a plant, the Lump Breaking Feeder 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 Lump Breaking Feeder 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

Check the drawing and table below to identify the components of the Lump Breaking Feeder Valve.



A) Half-bodies
B) Rotary blades
C) Seal
D) Anti-friction bushing
E) Actuator fastening bracket
F) Grid
G) Hexagonal shaft

3.3 Operating principle

The rotation of the blades compresses any lumps present in the material against the fixed grid causing them to get disintegrated.

This operation preserves the machines downstream the Lump Breaking Feeder Valve from being fed material lumps that can clog it or lower its efficiency.

3.4 Permitted use

Danger - Warning

Disabling safety devices is strictly prohibited.
The plant operator must:
- **instruct operating and maintenance staff about device/component SAFETY DEVICE**
- **monitor operating and maintenance staff regarding compliance with safety measures**

Must ensure:
- **equipments are not actuated manually during operation, since hopper and devices maybe under pressure**
- **that hoppers and devices are vented before opening**
- **electrical components are protected from touching, plash water and dust and are closed at all times during operation**

The operator must not use the device/component in any way that makes unsafe
The operator must immediately report any changes to the device/componentes that could impair safety to the plan operator.

The Lump Breaking Feeder Valve has the function to adjust the product flow of the material fed from upstream, to brake any lumps caused by moisture, prolonged storage and by the nature of those materials that tend to clog.

It is a disintegrator of lumps type that can get broken manually, with no use of tools (e.g.: hammer).

The Lump Breaking Feeder Valve intended use is at the inlet of pneumatic conveying lines to avoid lumps from blocking the air flow or at the inlet of other conveyors installation.

The blades move toward one at the time against the fixed grid to disintegrate the lumps; as a consequence, the torque required to break the lumps is lower than the one required by the devices which employ all blades to simultaneously press against the lump.

Operating temperatures ranging between -20°C and +40°C.

In some versions, to lower the material residues on the fixed blades of the grid it has been provided for the blades to sharpen, which also ease the breaking of the lump.

This feature, along with the integral seal and additional bushings, ensure a low material residue is generated.

Materials that can be handled

The device should only be used in accordance with current safety regulations.

Do not make any modification or conversions. Additional add on parts require manufacturer approval.

The device **has been designed and manufactured** as **breaker of dry lumps** that can be broken manually with no need of equipment max Mohs hardness 2= lumps can be scratched with fingemail.

Max lumps size 150x150x150mm

Max material temperature 80°C

Powder can be organic or inorganic for non food or food sectors.

Important

THESE DEVICES WERE NOT DESIGNED TO MANAGE FOOD PRODUCTS ACCORDING TO EC1935/2004.

The use in installation conditions different from the original configuration, with different materials as regards shape and particle size and for operations different from the ones permitted is strictly forbidden.

It is forbidden the use of the device in case of operation abnormalities and in conditions which do not comply the use and safety recommendations hereafter.

The materials having their unit weight over 25 kg must be handled and positioned on the crates by means of appropriate means and lifting accessories and, to avoid their accidental falling, must be provided with suitable lifting points.

Permitted materials

It is strictly forbidden to use materials which do not match perfectly the technical operation features and the performances of the device or of its components.

For instance, the following materials are not permitted:

- **subject to hazardous changes of their static and/or chemical-physical configuration during the process.**
- **which, because of their chemical-physical, are classified as being hazardous (e.g.:explosive, toxic, flammable, dangerous from a bacteriological and/or viral point of view or other similar materials).**

Danger - Warning

It is forbidden to use the device with flammable and/or explosive materials.

3.5 Improper use not permitted

It is forbidden working without safeguards in the form of mechanical or electrical safety devices where quick release fixing and or quick release openings are used.

It is forbidden working without mechanical or electrical and/or electromechanical safety device(s) if the prescribed safety clearances are not to be complied with.

It is forbidden to use the device in absence of physical and psychological suitability.

it is forbidden to operate with connection to an open system without necessary safety devices (refer to Safety specific chapter).

It is forbidden to operate in absence of the appropriate personal protection devices.

It is forbidden to operate but very carefully during the manual mode handling.

It is forbidden to use the device or carry out maintenance operations in scarce visibility or lighting conditions.

It is forbidden to use the equipment in presence of voltage drop on the power supply line or in case of accidental lack of phases.

It is forbidden to carry out temporary repairs or improvised restoring which do not comply the instructions given.

It is forbidden to use non-original spare parts or spare parts which the Manufacturer has not recommended.

It is forbidden to entrust maintenance or repair operations to personnel who has not properly trained by the Manufacturer.

It is forbidden to leave the device at the end of the working shift without having set he safety conditions.

It is forbidden to carry out routine maintenance operations, inspections or repairs without having shut down the device and enabled the related procedure.

During maintenance operations it is forbidden to:
- use inappropriate means;
- lay ladders against the mobile elements, against the handling equipments or against the material handled;
- operate without the appropriate personal safety devices;
- NEVER carry out operations without having removed the materials processed first.

It is forbidden to use the device unless perfectly working.

It is forbidden to use the device out of the limit of use (see specific chapter).

It is forbidden use of the LBC in conveying lines subjects to internal or external overpressure

It is forbidden use LBC with material tat has not been confirmed in writing by the manufacturer: Max Mohs hardness 2 must not be exceeded

It is forbidden use machine with liquid and sludgy or slimly or greasy material.

It is forbidden use of product, the physical proprieties of which change during operation owing to the generation of heat in the lump breaker (e.g. material became sticky or forms threads)

3.6 Noise level

Important

The noise level depends on several factors such as dimensions, the nature of the material to be conveyed and the filling rate.
In accordance with the legal provisions in force, the client must carry out on-site measurement of the noise level, after assembly and however before commissioning the device, during operation of the device in the worst conditions, to ensure that the level of noise reverberation doesn't put into any danger the operator during the operation of the device.

The vibrations of the device doesn't represent a hazard for the personnel that operates it.

An excessive vibration could be caused by a fault that has to be immediately signalled and repaired to avoid decreasing the reliability level of the device.

Danger - Warning

Provide the necessary protection from lightning during operation and the related devices to ground any electrical discharge.

3.7 Environmental operating limits

Unless otherwise specified, the equipment 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 an exact identification of the equipment concerned, see the identification plate.

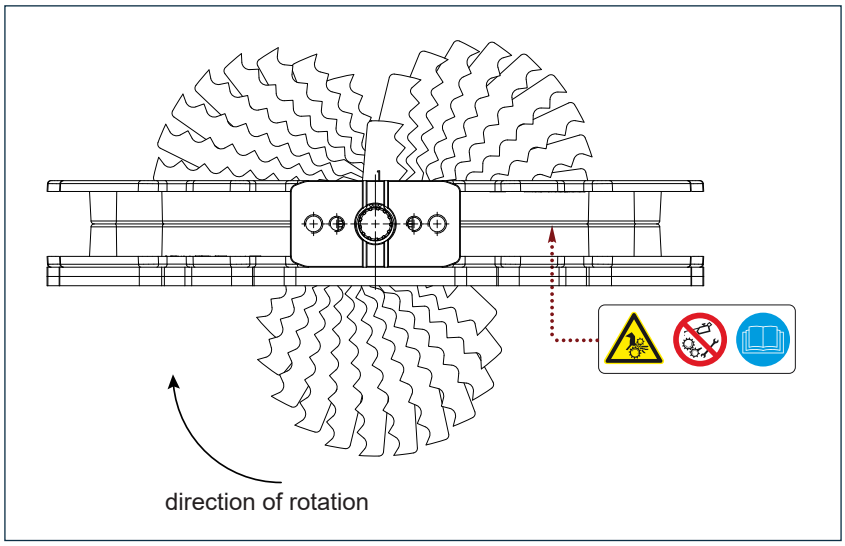
The transport documents indicate the overall dimensions of the Lump Breaking Feeder Valve in addition to the serial number and the identification code.

The information on the technical features of the **LBC** Lump Breaking Feeder Valve such as diameter, seal type and blades characteristics are available in Chapter 10.

3.9 Safety and information signs

Danger - Warning

Follow the signs on the plates.
Ensure the plates are legible; otherwise clean them and replace the damaged ones, applying them in their original position.



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

3.10 Safety devices

The access to the inner parts of the Lump Breaking Feeder Valve is not possible during operation.

Unscheduled access is envisaged to remove foreign bodies and material deposits inside the device for extraordinary maintenance.

Danger - Warning

Prior to start up the device the fixed and/or mobile guards of the device must be set in place.

To prevent accidents, it is essential to maintain the LBC Lump Breaking Feeder Valve out of the reach of the personnel during operation. To this purpose, the customer must provide suitable safety devices such as grids and inlet and outlet protection joints (sturdy joints, hoses or rigid pipes fittings). However, the installer must prevent that personnel gets injured, even accidentally (using suitable hopper, safety grids, etc.).

Danger - Warning

Shutdown procedures

• Before cleaning and maintenance work, the following shutdown procedures must be complied with:
- Disconnect the electrical system
=> Switch off the main switch
=> Check that the assembly is not live.
=> Ensure that the main switch cannot be switched on again.
- To shut down pneumatic system
=> Close the main shut off valve and secure it against being switched on
=> Ventilate lines and hoppers.
• Non-compliance will endanger the life and limb of personne

Danger - Warning

Restore and/or close back all guards temporarily opened, by observing their original position and prevent their accidental opening.
All hazardous and operational areas must be equipped with that prevent accessing them; the access to the operating area has to be blocked by guards.

4.1 Type of packaging

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

To facilitate shipment, the Lump Breaking Feeder Valve can be divided into several packages suitably protected. The nuts, bolts and seals necessary to properly install the Lump Breaking Feeder Valveare not included in the supply.

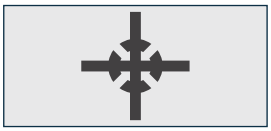
The packages can be loaded separately on the vehicle or fixed to a pallet, properly protected, or inside a container for shipment to a far destination or for sea or air transportation.

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

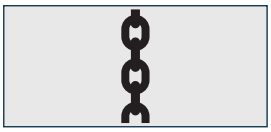
The list shows the description and symbols envisaged on the packing.

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

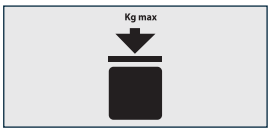
B) Centre of gravity: indicates the position of the gravity centre of the package.



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

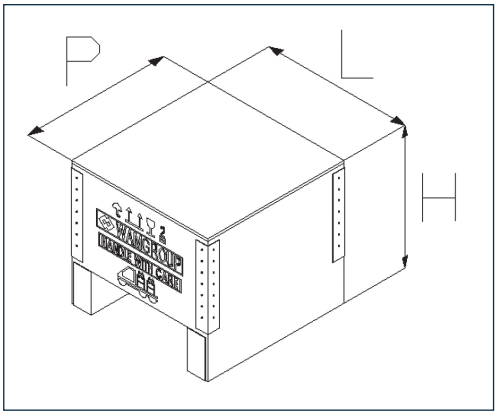


D) Stacking limit: indicates the maximum stacking load of the packages.



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. This operation is in charge of the client.



	P	L	H
LBC0150	300	300	276
LBC0200	350	350	311
LBC0250	410	410	361
LBC0300	460	460	411
LBC0350	507	507	461
LBC0400	570	570	511

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.

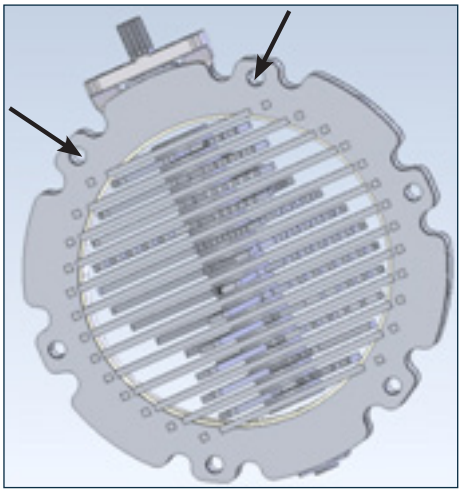
4.3 Lifting and unloading methods

Danger - Warning

Carry out the lifting and handling operations according to the information indicated on the device 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 stack the packages as they are not sized for that purpose.
Before lifting and handling the load, read the relevant information indicated in the “Information regarding safety” Chapter.

LIFTING POINTS AND MODALITY

Lift the device using suitable lifting means (forklift if a suitable pallet is provided and/or slings with lifting device).



Caution

DO NOT PUSH OR DRAG THE SECTIONS OF THE DEVICE.

All operations have to be carried out by qualified and authorized personnel.

The personnel authorized to handle the device have to possess the right skills and experience to put into effect all measures necessary to ensure his safety and the safety of the persons involved.

Important

Use lifting systems that suits the weight, dimensions and movements to be carried out.
It is forbidden the use of systems unable to ensure the necessary safety level.

Use only approved hooks, shackles for the lifting operations.

Pay attention in the lifting phase to balance the load to avoid uncontrolled movements which could cause work accidents.

5.1 Safety prescriptions for installation

Important

Currently and valid regulation regarding safety clearances must be complied with.
If the prescribed safety clearances are not to be complied with the hazard points must be mechanically, electrically and/or electro-mechanically secured.
If quick-release fitting and/or quick-release openings are used in the danger area it is essential that these sections are secured with mechanical or electrical safety devices.

Danger - Warning

The replacement operations must be carried out by a specialist authorized technician with specific skills. 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.
Harness and handle the sections of the equipment 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.

Danger - Warning

RISK OF INJURY!
A possibility of reaching into the device when the motor is running exists if the above-mentioned points are not complied with. Limbs may be severed by rotating parts.
CURRENTLY VALID REGULATIONS REGARDING SAFETY CLEARANCES MUST BE COMPLIED WITH AT ALL TIMES!

If used in the customers own equipment, a risk analysis and risk assessment must be carried out by customer and implemented accordingly.

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

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

Clean the coupling surfaces thoroughly.

5.2 Preparing the installation place (in charge of the client)

Danger - Warning

RISK OF INJURY!
Body parts could be severed by rotating components if the product infeed and/or discharge are open. FIT SAFEGUARDS TO PREVENT ANYONE REACHING INTO THE PRODUCT INFEED AND/OR DISCHARGE.
BEFORE REMOVING THE SAFETY DEVICES SWITCH OFF THE MACHINE AND ENSURE THAT THERE CAN BE NO UNAUTHORISED ACCESS.

For a proper installation, the client has to carry out the preliminary operations indicated on the purchase order confirmation such as:

- checking the suitability of the support plane and of the support structures on which the device is to be installed.
- checking of the handling space, of the paths, corridors, passageways and of the escape way around the installation area of the device.
- checking of the suitability and the proper functioning of the electrical system: supply line, plug, distribution board, safety switches that has to cut off the power short circuit current, section, power, length of the power supply cable and of the earthing system according to EN 60204 -1.

Important

Check the suitability and proper functioning of the power supply, distribution, feeding systems and other possible energy supply.

Prearrangement of the installation place so as it matches the safety provisions against work accidents as regards the safety of the power supply systems, of the products/substances and of all tools used for the installation operations, particularly the client has to ensure the proper earthing of the metallic structures and electrical devices/equipments.

Installing the suitable warning signs for assembling operations that implies moving means.

Danger - Warning

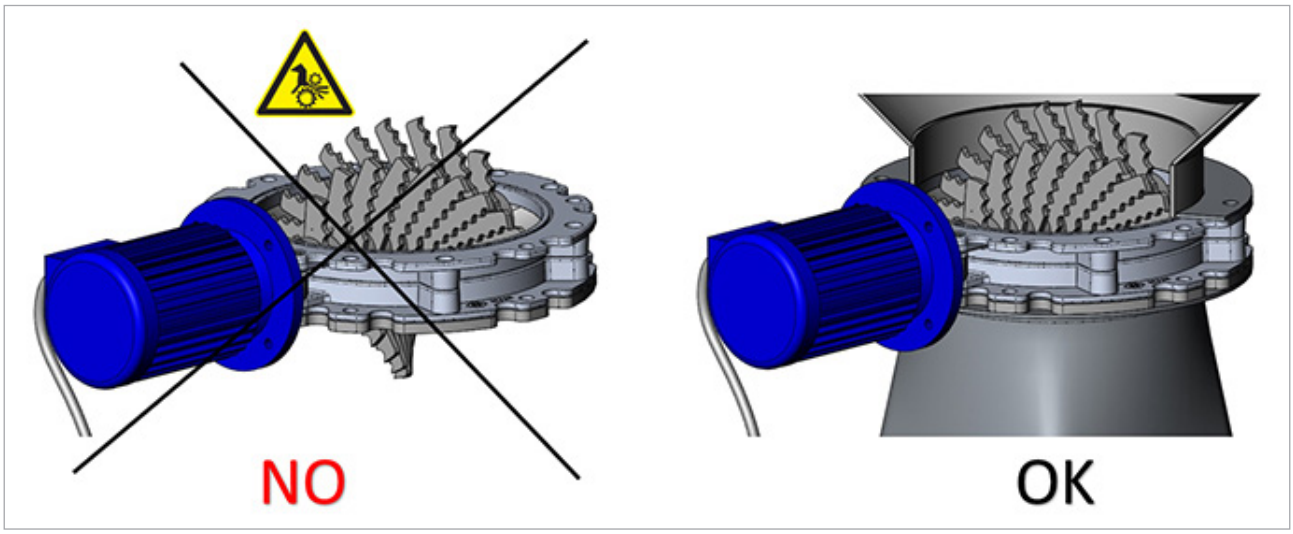
The device is supplied without a control panel.

Required space: to stop the motor overtheating, ensure that there is an uninterrupted flow of cool air to the drive.

5.3 Supply

All Lump Breaking Feeder Valves have been pre-assembled at the factory. Actuator is supplied separately.

5.4 Assembling and fastening the device



Remove the packaging.

Fit the actuator (drive unit, hydraulic or other).

1. The aluminium body of the LBC cannot be used as external support for the underlying machines (for instance you cannot hang augers, belt conveyors, channels, etc.)
2. Remove the screws that fastening the LBC to its housing.
3. By exploiting two diametrically opposite holes, securely fasten the LBC and lift it using a lifting means having suitable capacity.
4. Ensure the grid stays inside the housing and it engages the body of the LBC handled. (Risk of falling during handling)
5. Then remove manually the grid from the housing and position it on the LBC installation place, paying attention to its orientation.
6. Once the LBC grid has been fastened, insert the required number of bolts without tightening them fully.
7. Make sure there is equal spacing between the mobile and the fixed blades of the grid and that both are centred with the flange to which they are fastened.
8. Then tighten, using a suitable tool, the bolts by applying a torque of 30Nm and fastening together the flange of the plant, the grid and the lower half-body. Do not forget the OR for the NO food type.
9. Then couple the flange of the plant to the upper half-body of the LBC and tighten the bolts.
10. Rotate the shaft over 360° by applying a torque value of 30Nm with an appropriate tool to check the presence of friction or impact; if friction or impact points are found, slacken the Lump Breaking Feeder Valve and repeat the operations starting from the point 7.

11. Ensure the LBC direction of rotation is correct according indications reported.

12. The LBC must be installed beneath hoppers sufficiently deep so as to prevent reaching of the moving parts with the limbs.

13. It is forbidden to operate the device with the inlet and outlet spouts completely or partially disconnected.

14. It is forbidden to start-up de device unless the plant in which it it to be installed has been declared compliant with the provisions of Directive 2006/42/CE. The plant fitter/installer is in charge with providing and installing the devices/protections necessary to avoid damage to persons and things in case of brake-downs.

WAMGROUP® provides some of the actuators mentioned above; their assembly is in charge of the customer.

The customer is liable in case of the installation of any actuator different from those mentioned above. The customer has to perform a mechanical analysis necessary to ensure an efficient use.

Do not fit heavy devices to the Lump Breaking Feeder Valve (screw feeders, belt conveyors, vibrating feeders, bin activators or similar).

The devices for food applications must be subjected to suitable decontamination and sanitation.

A drive output of ≤ 0,75 kW is suggested.

INSTALLATION IN CLOSED SYSTEM

- The inlet and outlet are fitted directly to the upstream and downstream device in such a way that the connections can only be released with the aid of tools.

Openings at upstream and downstream devices, through which it is possible to reach the danger zone (safety distances in accordance with DIN EN ISO 13857) must be closed off in such a way that they can only be opened with the aid of tools (isolating safety device DIN EN ISO 14120).

- Manual intervention in the closed system is not possible during operation.

CONNECTION TO AN OPEN SYSTEM

- The inlet is fitted directly to the upstream and downstream device in such a way that the connection can only be released with the aid of tools.

In addition, attached devices with openings that enable access to the danger zone must be designed in such a way that the safety distances in accordance with DIN EN ISO 13857 are maintained (safety distances to prevent reaching danger areas with the upper and lower limbs).

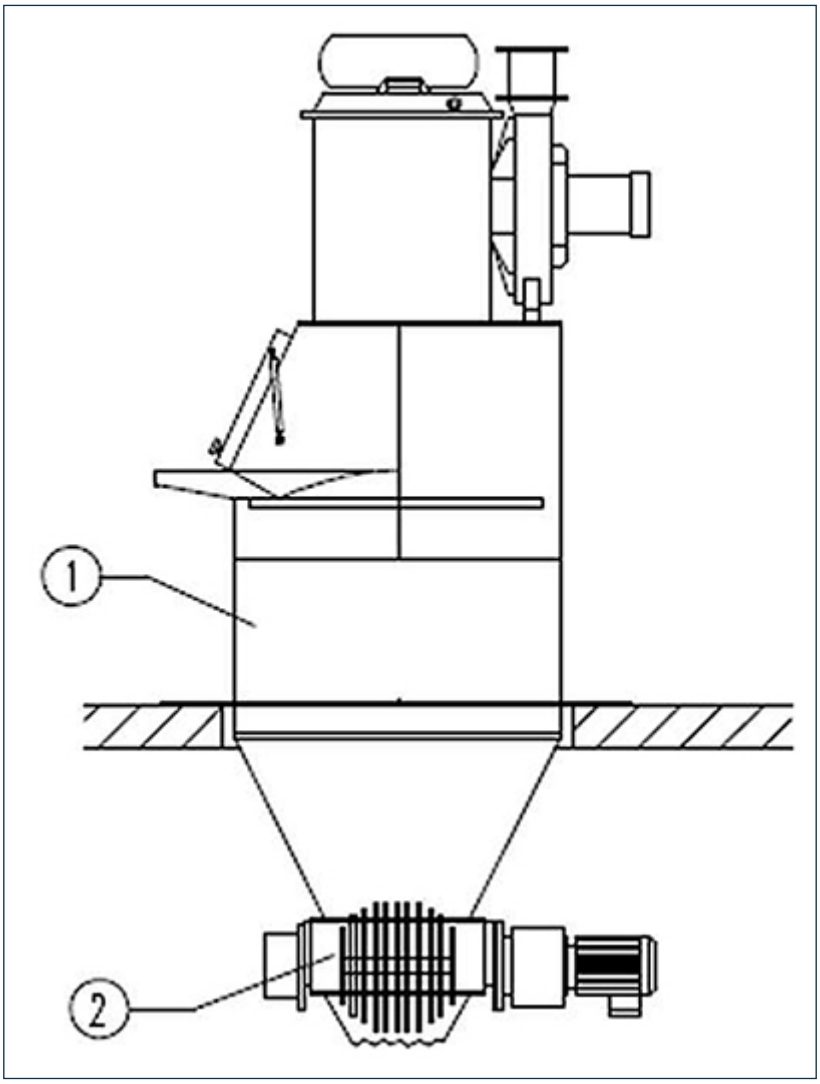
or

- Inlet and outlet are accessible without the use of tools. An isolating safety device with interlock facility (DIN EN ISO 14119) is equipped with safety switches and must be secured in accordance with DIN EN ISO 13849-1. PLr must at least be reached. This also applies to isolating safety devices with interlock function on upstream or downstream devices, through which it is possible to reach the danger zone (safety distances in accordance with DIN EN ISO 13857).

SPECIAL INSTALLATION WITH DUMPING DEVICE

Danger - Warning

RISK OF INJURY!
The currently valid regulations regarding safety clearances must be complied with.
IF THE PRESCRIBED SAFETY CLEARANCES ARE NOT TO BE COMPLIED WITH THE HAZARD POINTS MUST BE MECHANICALLY, ELECTRICALLY AND/OR ELECTRO- MECHANICALLY SECURED.
See specific safety chapter.

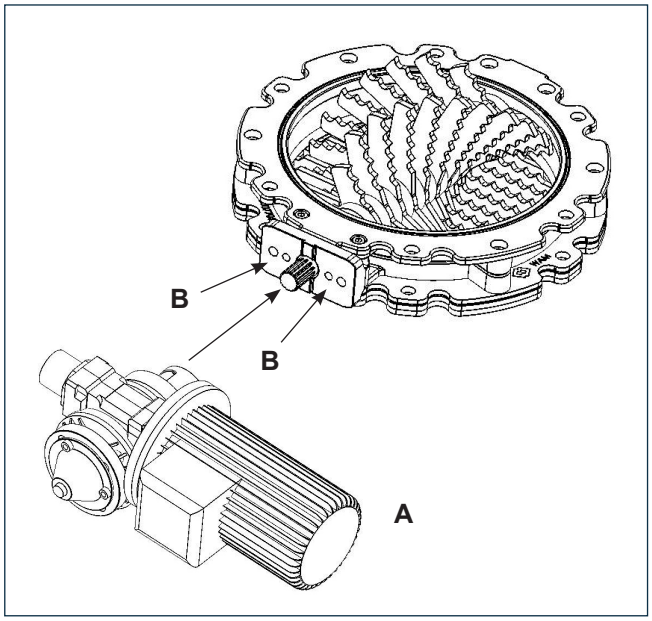


1) Feeding hoppers
2) Lump breakers

5.5 Assembling instructions

Assembling the electro-mechanical actuator

- AE Type



The supply includes:

A) 1 electrical actuator;

B) 2 hex bolts.

In order to readily assemble the mechanical actuator, remove only the walls of the package and leave the Lump Breaking Feeder Valve secured to the pallet and related base supports.

Remove the protection on the splined shaft.

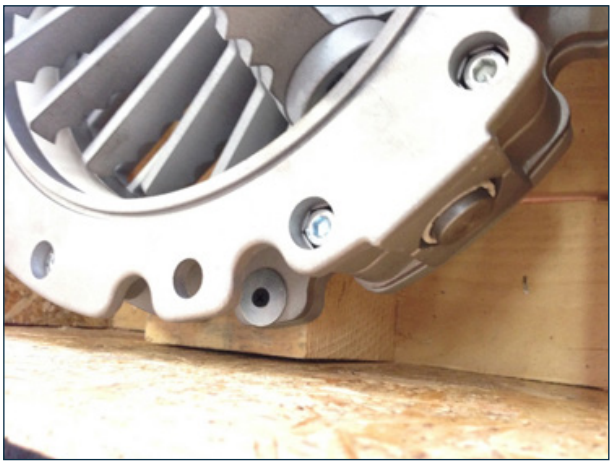
Install the gear reducer A on the splined shaft and align the anti-rotation joints.

Secure the gear reducer using two bolts and lock with a key by applying a torque of 36Nm.

LBC size	Actuator	Power	Splining	RPM
LBC0150M/P	AE070	0,75 kW	DIN5482-22x19	26
LBC0200M/P			DIN5482-22x20	26
LBC0250M/P			DIN5482-22x21	26
LBC0300M/P			DIN5482-22x22	26
LBC0350M/P			DIN5482- 28x25	26
LBC0400M/P			DIN5482- 28x26	26

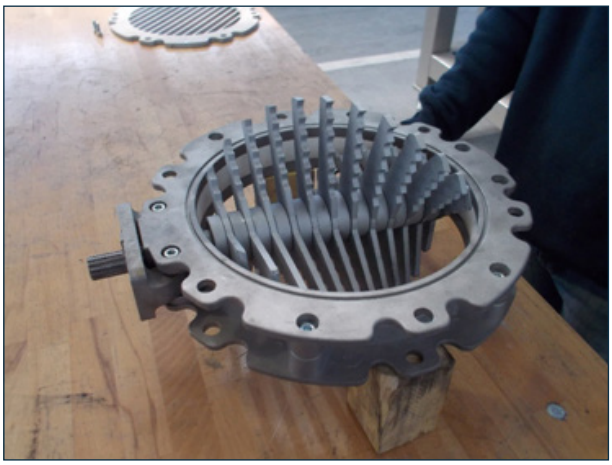
5.6 Assembling-disassembling phases

Unscrew the screws of the crate cover.

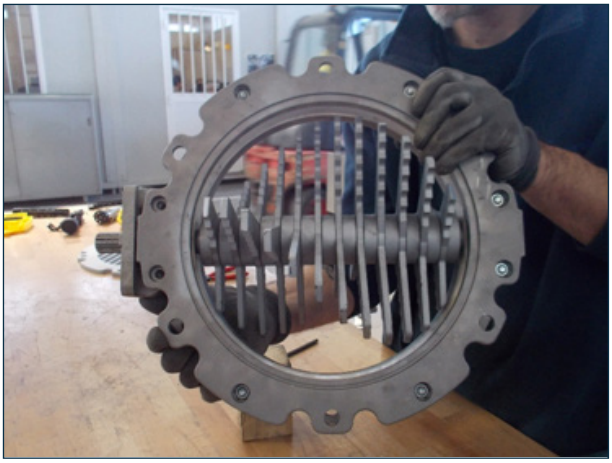


Remove the screws that secure the LBC to the packaging.

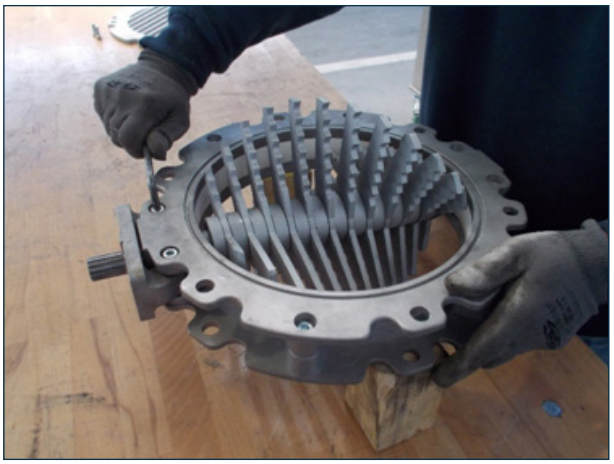
Carefully remove the LBC from the packaging paying attention to leave the grid inside the packaging.



Position the LBC on two supports so as the blades do not touch the floor and remove the fastening bolts of the holders.



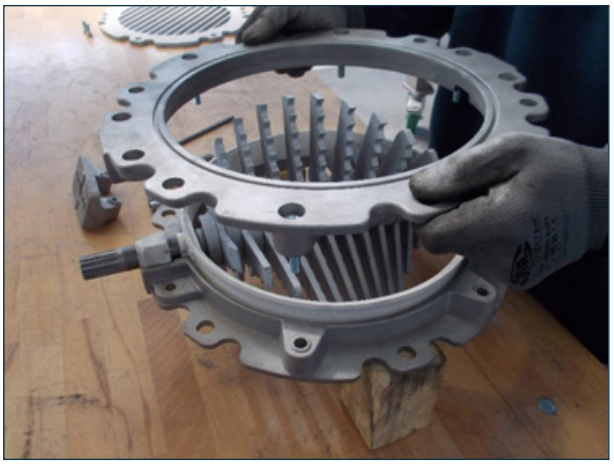
Rotate the device upside down.



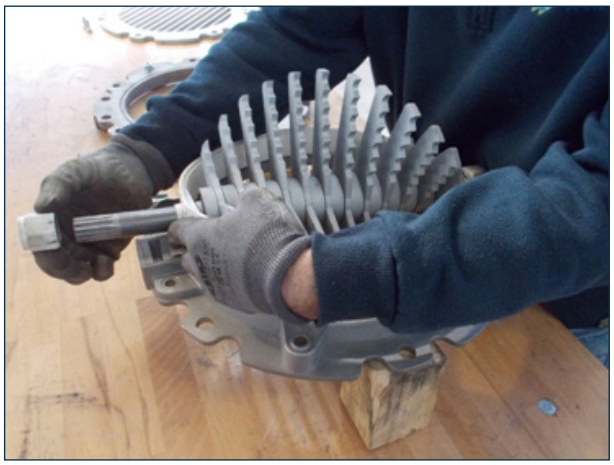
Unscrew the other 2 fastening screws of the the actuator bracket.

Unscrew the remaining screws by collecting the nut from the bottom.

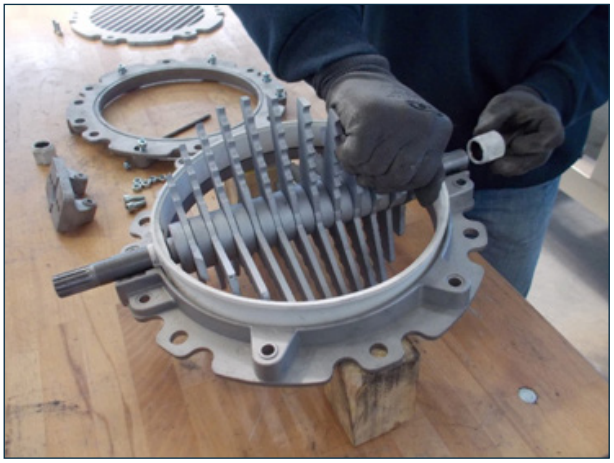
Lift the upper half -body and slide the actuator bracket attachment out.



Remove the upper half-body.



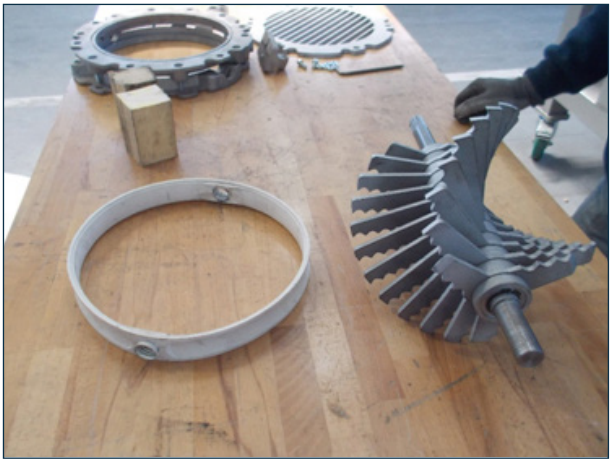
Lift the shaft and remove the anti-friction bushing from the splined side.



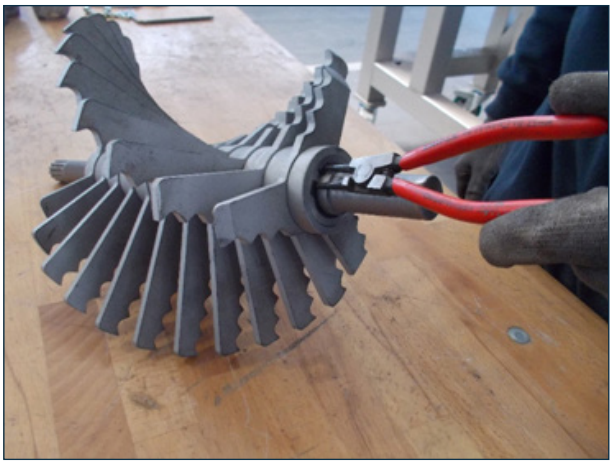
Remove the anti-friction bushing from the opposite splined side.

Remove the shaft from the lower half-body.

Remove the seal from the side which is not splined and proceed on the other side.

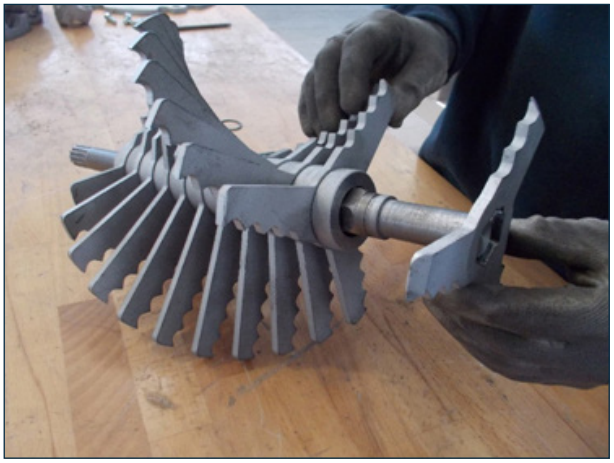


Remove the seal paying attention not to damage with the blades or the tools.



Remove the Seeger ring from the blocker on the driven shaft side.

Remove the retaining ring.



Remove the blades and spacers.

After the blades have been extracted, remove the Seeger ring and the bushing from the splined side.

Insert the bushing on the shaft from the splined side.

Fit the Seeger ring in its slot and make sure it is fully inserted.

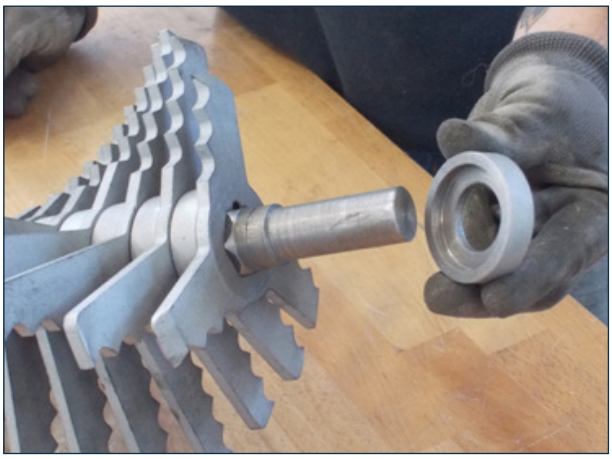
Mark with a marker one of the six sides of the hexagon as a reference for the blades alignment. Chose any of the sides.

Insert the blade number 1 on the shaft by placing the alignment mark of the blade at mark made on the shaft.

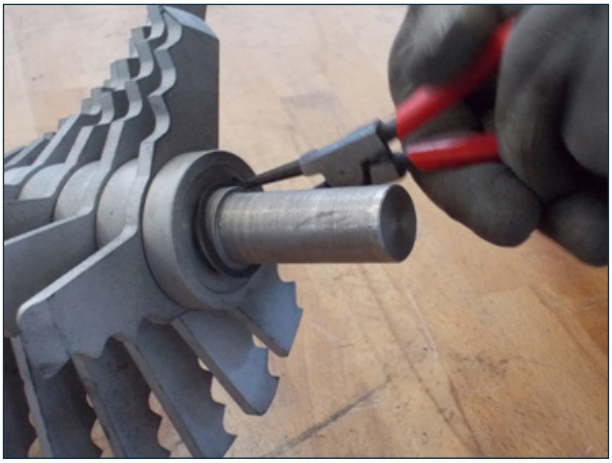
Insert a spacer on the shaft.

Insert the blade number 2 on the shaft by placing the alignment mark of the blade at mark made on the shaft.

Proceed with the remaining blades according to the numbering, by interposing always a spacer between each blade.



After all blades are fitted, insert the bushing.



Lock the retaining ring by fitting the Seeger ring in the slot and make sure it is fully inserted in its seat.

Clean thoroughly the seal and check to make sure it is not damaged.

Then insert the seal on the shaft on the splined side.

Insert the seal also in the opposite shaft end.

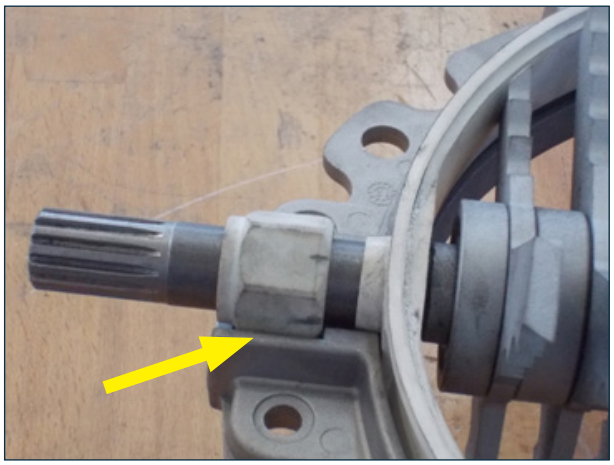
Be careful not to cut the gasket with the blades.

Check to make sure the friction bushing is not damaged and/or worn.

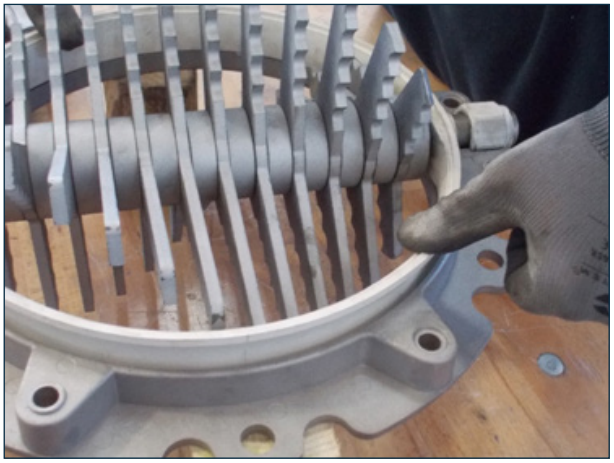
Insert it on the shaft from the splined side.

Check to make sure the friction bushing is not damaged and/or worn.

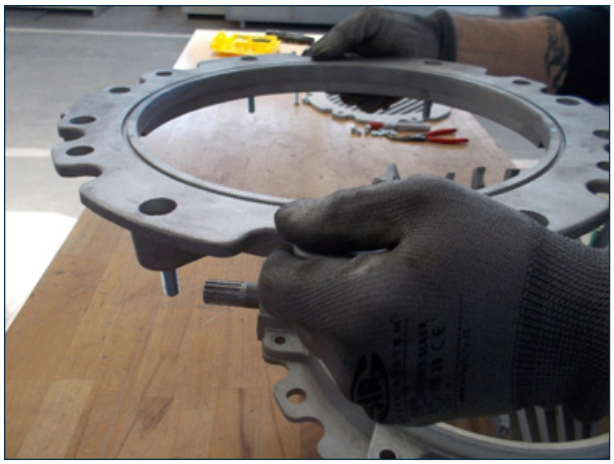
Insert it on the shaft from the driven side.



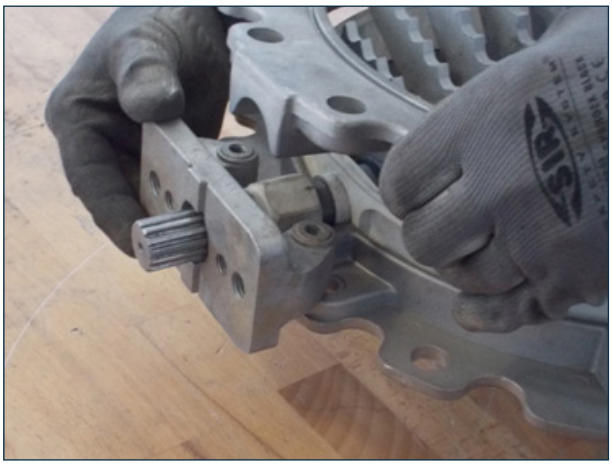
Lay the shaft so assembled on one of the half-bodies causing the bushes to enter their seats.



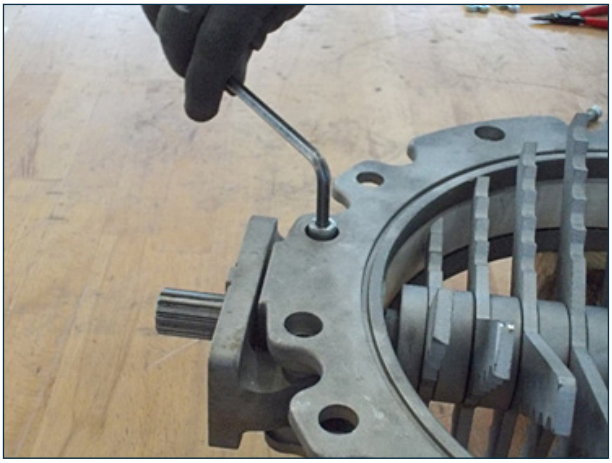
Push the seal inside its seat along the whole circumference.



After you have entered all screws in the second half-body, pair it with the rest of the LBC.



Insert the actuator fastening bracket by matching the centring cylinders.



Tighten the actuator fastening bracket screws by applying 30Nm torque.

Position the nuts inside the hexagonal seats placed in lower half-body and support it with a finger while the screw is being tighten.

All screws must be secured with a tightening torque of 30Nm

5.7 Electrical connection

Danger - Warning

The equipment is not provided with an electrical system. The equipment is not provided with an electrical system. Connection to the mains has to be carried out by an electrician.
Provide mains supply to the equipment concerned according to the compliant current legislation and take into consideration the safety measures required by the installation environment and the envisaged operating conditions.

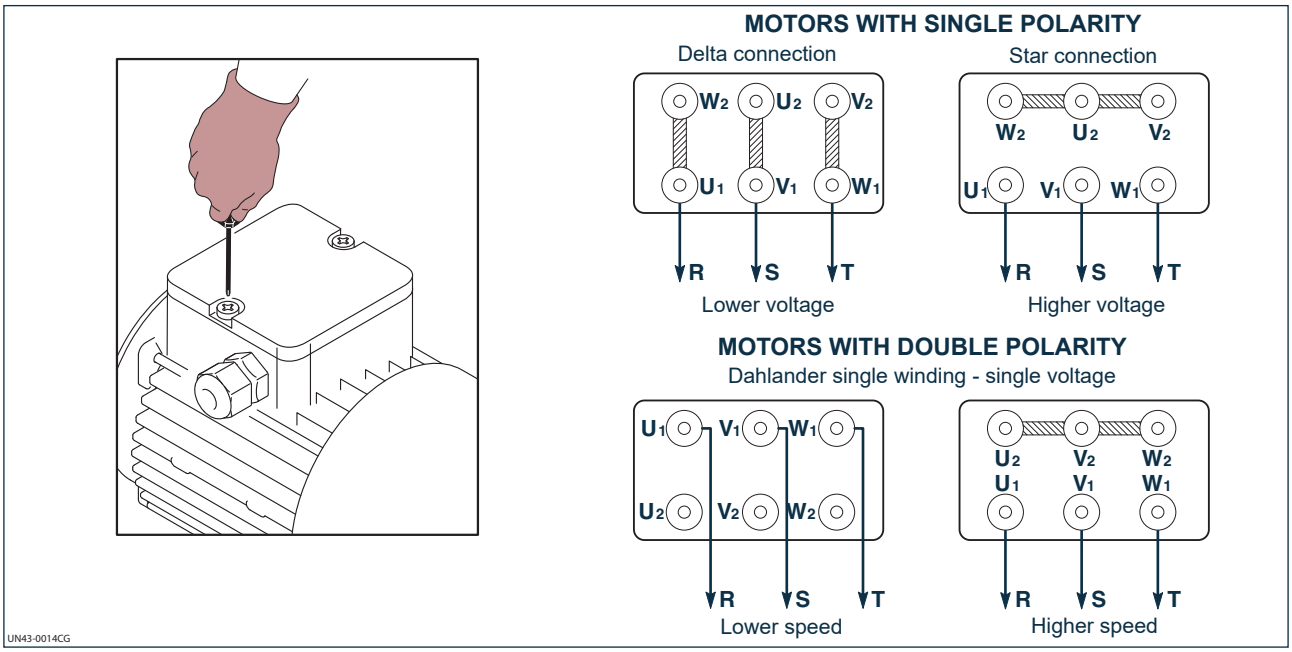
The installer must provide on the device the appropriate start/stop controls, emergency stop, reset after emergency stop, microswitches for the inspection hatches in accordance with applicable standards.

Before carrying out the connection ensure that the mains voltage and frequency correspond to those indicated on the electric motor rating plate. Disconnect from the mains before carrying out any work and use suitable devices so that there cannot be an accidental reconnection.

Use electric cables having cross section appropriate to the power absorption of the motor of the equipment concerned.

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

The illustration shows the wiring diagrams of the motor supplied by **WAM®**. Consult the manual available on www.wamgroup.com



The installer has to provide to interfacing the equipment with the necessary controls: start/stop, emergency stop, reset after an emergency stop, in compliance with the regulatory standards in force (CEI EN 60204-1, UNI EN 1037, UNI EN 1088, CEI EN 50014). Selection and installation of electrical cables in accordance with DIN EN 60204-1 or regulation in force.

Blades geometry give you indication of direction in which the motor fan must move so that drive rotates correctly; if necessary switch the phases in the cable connections in the junction box.

Disconnect from the mains before carrying out any work and use suitable devices so that the Lump Breaking Feeder Valve cannot get accidentally reconnected.

Ensure that the protection devices are present and working each time the equipment is started up.

During these checks make sure the rotation of the blades cannot damage the personnel or the equipment.

The installer must connect the equipment to the earthing system of the plant.

Do not connect the drive until:
- the lump breaker has been installed in a closed system
- if quick-release fixing are used, mechanical or electrical safety devices have also been installed

5.8 Earthing

Danger - Warning

ELECTRIC SHOCK / DANGER OF EXPLOSION!
If the machine is not correctly earthed, parts can be live.
Static charge can ignite potentially explosive atmospheres.
EARTH THE EQUIPMENT CORRECTLY.

Lump breaker: connect up and down the lump breaker with the right system components so that electricity can be conducted.

Motor: earth the motor via the connection cable. The device's earthing must be properly verified every time a conductive component is removed.

5.9 Environmental conditions for use

The device has to be placed in an environment provided with all safety measures in accordance with the standards in force that provides the best working conditions to the personnel.

The working area has to have the necessary dimensions to ensure the safety of operators and maintenance personnel.

Danger - Warning

It is strictly forbidden to operate the device in explosive atmospheres or in those cases that require the use of explosion-proof components.

5.10 Emissions into the atmosphere

The device does not releases emissions into the atmosphere.

5.11 Lighting

The device has to be placed in a properly lightened area.

Danger - Warning

In case of maintenance operations carried out in scarcely lightened areas, use additional lamps that ensure the proper safety conditions according to the legal provisions in force.

5.12 Inspection

The equipment was tested at the Manufacturer's factory to make sure it matches the operational purposes was created for. However, some testing has to be repeated by the installer when process related ones are carried out, to the purpose of ensuring that the equipment matches operation and performances in the installation place.

Important

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

The authorized personnel must also check:

- that the linearity error of the Lump Breaking Feeder Valve remains within the values indicated (see the related paragraph);
- that no tools or other material have been forgotten inside the Lump Breaking Feeder Valve;
- that the fixing screws have been tightened using the prescribed torque;
- that the oil level in the reduction unit is proper (if applicable).

Before starting to operate the Lump Breaking Feeder Valve:

- ensure that the plant in which the Lump Breaking Feeder Valve is installed is compliant to the Directive 2006/42/ CE and to the relevant directives, the safety standards in force and those specifically applicable;
- ensure that the inlet and outlet spouts are connected to the final equipment in order to prevent material leaks and access to hazardous areas;
- make sure the operation conditions have been met;
- in case of food application, make sure the device as been decontaminated and sanitised.

Start the device on empty to ensure the direction of rotation of the blades is correct.

Operate the Lump Breaking Feeder Valve for about 1/3 minutes to ensure it works properly.

In case of:
- unusual noise;
- overheating of the motor and/or gear reducer;
- friction of the blades against the inner seal;

Stop the Lump Breaking Feeder Valve and remove the causes of the malfunction.

Danger - Warning

To properly size the Lump Breaking Feeder Valve, check for possible incompatibilities between the material and the Lump Breaking Feeder Valve components.

5.13 Limits of use, technical data and operating conditions

Determine in the most appropriate manner the operation limits of the device and the conditions required to ensure its proper functioning as well as the complete correspondence to the operating conditions it has been destined for.

The device has been designed and built also for outdoor operation.

The Client is in charge with providing the installation place with all necessary utilities and devices according to legislation in force: venting, earthing, etc.

Output feed rate: depends on material.

Installation position: Rotor shaft level (material inlet at the top, matetila discharge below).

Material hardness: max Mohs hardness 2 (umps can be scratched with fingrmail).

Lump size max 150x150x150 (LxWxH).

Material Temperature: max 60 °C.

Noise Level: < 75 dB (A).

Peripheral speed of breaker tool: <1 m/s at permissible max speed.

Drive: see type plate for the drive, separate manufacturer’s documentation on specific catalogue.

External frequency converter: suitable measures must be implemented to secure the speed range if external frequency converter is used.

NOTE: The speed of the rotor and therefore of the output of the lump breaker must be coordinated with the speed of the following machine. If necessary, control operation of the lump breaker with a downstream fill level indicator.

Present Equipment is not suitable in potentially explosive areas according to (ATEX 2014/34/EU).

6.1 Production Start-up

Before starting up the Lump Breaking Feeder Valve, the operator in charge and authorized for the production must ensure the safety devices installed are working and the operating conditions are matched (hatches closed, inlet and outlet spouts connected correctly o protected, etc.).

Especially with materials which tend to harden or become sticky after long periods of storage, make sure there are no accumulations of material or liquid on the shaft. Otherwise, clean thoroughly.

At the first start-up test, run the device on empty: in case of normal operation, feed the device with material and proceed normally.

Important

In case of excessive noise, strong vibrations, etc. stop the separator and report the problem to the person in charge authorized to restore the correct working.
Do not use the equipment if damaged.

PRELIMINARY OPERATIONS

Prior to the first start-up, carry out the following operations:

Checking the suitability of the space available:
- checking the available space which has to allow a proper operation of the device;
- checking the handling space of the moving parts that doesn't have to met any obstacles.

Lubrication of mechanisms:
- make sure that gear reducers are lubricated and there are no lubricant leakages.

Checking the suitability of the electrical system:
- check that the voltage matches the one envisaged for the operation.
- check that the voltage value of the motor stays between ranges +/- 10% of the nominal value.

6.2 Operation of the device

Danger - Warning

Always use suitable safety personal protection devices (P.P.E.) during all interventions.

OPERATION MODE

On the basis of the plant type, the device operation can be controlled by a central control panel or an in-place control.

A link with different load points requires the device to be dimensioned largely enough to carry the sum of all courses.

This is particularly important when the transported material tends to harden or get compacted if not handled for a certain period of time.

The fitting of the inlets/outlets can be carried out in several manners.

However, the installer or the plant fitter have to ensure, using the suitable means, that no person remains harmed, not even accidentally.

Important

If one or more inspection hatches have been provided, provide a safety device meant to immediately shut down the Lump Breaking Feeder Valve in case the hatch is opened or removed.

The installer/plant fitter and whomever operates the device must not:
- start it up unless fastened to the silo/recipient/tube from which it is fed the material and the rest of the plant (complete installation);
- must provide all safety systems meant to avoid damages to things or harm to persons.
- material is not made available

Operators must also ensure that the above points are in order.

6.3 Shutting down the device

EMERGENCY SHUT-DOWN

There has to be provided at least one emergency stop.

The emergency stop has to be used only in case of danger conditions and therefore the equipment must be immediately shut down.

RESTART AFTER AN EMERGENCY STOP

Prior to restoring the operation after an emergency stop, it is necessary to:
- Remove the problem that caused the emergency stop;
- Unblock the emergency buttons which are of mechanical hold-in type;
- Push the reset button;
- Repeat the start up procedure.

6.4 Operation conditions

OPERATION ENVIRONMENT

Important

The device must not be employed in environments and areas:
- **that contains highly corrosive and/or abrasive vapours, gas or dust;**
- **in presence of fire and/or heat above the permitted temperatures;**
- **if there is a fire or explosion hazard and it is required the usage of sparktrap or explosion-proof components.**

Hazardous areas and people who can be exposed to it

Danger - Warning

The client must provide for suitable warning systems and signs or, possibly, enclose the dangerous areas to prevent the access of unauthorized personnel and/or who is not in charge with the operations carried out on the device according to the legal provisions in force.

Lightning of the working area

The device is not equipped with a lighting system.

Before starting up the device or other operations, the operator must always check that the lighting of the area ensures the operation of the equipment in maximum safety conditions possible in related to the use envisaged.

Danger - Warning

In case of maintenance operations that take place in areas or part of the equipment which are not sufficiently lightened, it is required to provide for a portable lighting system to avoid shadow cones which block or reduce the visibility in the working area or in the surrounding areas.

6.5 Clearing the Lump Breaking Feeder Valve after clogging

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

Danger - Warning

The operator assigned must apply rigorously all adjustments regarding safety at the workplace and take the appropriate measures against industrial accidents.
In particular, do not place your hands into the inlet / outlet spouts close to the Lump Breaking Feeder Valve if the rotor disc has not been securely locked with external means.

Danger - Warning

Disconnect the Lump Breaking Feeder Valve from all power sources and use suitable means to prevent it from getting accidentally reconnected.

Follow the indications bellow:

Remove the power supply to the Lump Breaking Feeder Valve:

- Remove the inlet side plant components and make sure that the Lump Breaking Feeder Valve is not obstructed by material residues; clean using a tool, if necessary.

Danger - Warning

It is forbidden to enter the hands in the Lump Breaking Feeder Valve.

6.6 Disabling - shutting - down the device at the end of the shift

To disable the device at the end of the work cycle follow the previsions below:

- Cut off the power by disabling the disconnecting switch and positioning the lever on "0" or on OFF.

Important

In case of serious or unknown abnormalities, shut down the device by immediately pushing the mushroom-shaped emergency red button placed on the control board and wait for the technicians in charge to intervene.
Alternatively, demand the support of the Technical Customer Service of the Manufacturer.

6.7 Long shut-downs of the device

When the Lump Breaking Feeder Valve has to remain unused for long periods, proceed as described below.

In case the device and/or its components are to be stored and preserved for a certain period of time, in a closed and dry material at room temperature of (5 -40°C) before re-commissioning them, in order to avoid damages or deterioration check that the electrical mechanisms and the structure are not damaged; avoid scratching the painted and finished parts of the equipment.

Before starting the storage operations, coat the structural parts and the surfaces using antioxidant products.

Define and signal those areas where material is being stored.

Danger - Warning

Always use suitable safety personal protection devices (P.P.E.) during all kind of operations.

6.8 Reuse after long shut-down

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 Lump Breaking Feeder Valve after a long shut-down, proceed as described below:

For all fabricated parts:

- remove lubricants or antioxidant protection;
- clear the grease from the coupling bores threading;
- clean the coupling surfaces;
- repair the possible damages the structures might have suffered (corners bent, scratched surfaces, peeled paint etc.).

As regards the mechanisms:

- check the possible lubricant leakages and replace the worn seals;
- check the proper tightening of the bolted couplings;
- remove lubricants or antioxidant protection;
- remove rust traces from the sliding accessories of the controls;
- lubricate the unpainted mechanical components;
- remove water residues that may be present inside the concave parts of the structure or mechanisms.

Danger - Warning

Before carrying out any maintenance activity, activate all the safety devices to ensure the safety of the persons involved in the operations and those nearby.
Set the equipment concerned in safety condition.
Wear suitable personal protection equipment; in this regard, refer to the person in charge of production activities safety.

QUALIFICATION OF MAINTENANCE PERSONNEL

Component	Operation to be performed	Daily	Weekly	Monthly	Six-monthly	Biannually
safety systems	check the operation	*				
seal	check the wear			*		
Bushings	check the wear				*	
Flange and pipe connection	tighten connection and good screw fitting/			*		
half-body and grid	check the fastening			*		
seal and bushings	replace					*
motor fastening	check the condition		*			
drive	general check (noise,leaks, overtheating, mounting elements loose)			*		
earthing	check and measurement earthing connection				*	

In order to have the ability in finding solutions to any machine maintenance-related problem, the personnel in charge must:
- have knowledge regarding the standards in force related to work accidents and operations carried out on devices provided with drive units and to apply them;
- have read and understood the chapter 3 "Safety and safety measures against work accident";
- be able to use the present documentation;
- be interested in the functioning of the device;
- notice operational abnormalities and take the necessary measures.

Important

Failure to follow these instructions can cause problems and void the warranty of the device.

ROUTINE AND PERIODIC MAINTENANCE PLAN

The maintenance plan includes ordinary operations that envisage inspections, checking and test carried out by the machine operator and/or by qualified personnel in charge with ordinary maintenance and replacements and adjustments carried out by technicians specially qualified through specific trainings.

Danger - Warning

When maintenance operations are carried out at a dangerous height, the personnel in charge must provide suitable means (scaffolding, platform, stairs etc.) that allows performing the activity in safety conditions.
The personnel shall also be provided with suitable personal protection devices (P.P.E.).

Every two months, check the wear condition of the blades.

NOTE: The previous indications are to be taken roughly; the wear is directly proportional to the nature of the material handled and the hours of operation.

Danger - Warning

PRIOR TO ANY OPERATION, DISCONNECT THE EQUIPMENT FROM THE MAINS!

Danger - Warning

RISK OF INJURY!
Body parts could be severed by rotating components if the product infeed and/or discharge are open. BEFORE REMOVING THE SAFETY DEVICES SWITCH OFF THE MACHINE AND ENSURE THAT THERE CAN BE NO UNAUTHORISED ACCESS.

Danger - Warning

Do not try to reuse parts or components of the device which apparently may seem still intact once they were declared non-suitable after checking and inspections made by specialized personnel.

Important

The parts replacement frequency depends on the use of the Lump Breaking Feeder Valve and on the material handled.

7.1 Maintenance activity register

As a prove of having properly carried out all checking activities and maintenance operations on the equipment, besides keeping a trace of the possible liability in regard to the activities performed, it is recommended to prepare, diligently fill and maintain during the entire life of the equipment a proper "Maintenance register".

In the Control Register, beside all activities regarding life and use of the device (replacement of parts, revisions, certain number of failure, etc.) there have to be written as well as all annual operations envisaged by the maintenance plan as indicated in the "Periodical maintenance and lubrication operations" table.

The maintenance operator in charge shall fill this register in all its parts and write the results and notes in the dedicated cells.

The name of the maintenance operator and of the operators safety representative, which has to countersign the notes and date of each inspection on the register, must to be clearly readable.

DATE	INTERVENTION DESCRIPTION	OPERATOR

7.2 Cleaning

Only trained and instructed personnel are permitted to carry out the cleaning work.

Machine Hygiene level 1 (EN ISO 14159); LBC is suitable for use with no critical dry, stable and not easily perishable foodstuffs

Clean the outside part of the equipment (the device) 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.

Only suitable for dry cleaning (the device), after vacuuming the dust.

The devices for food applications must be subjected to suitable decontamination and sanitation.

Cleaning intervals:

- Material-dependent and ay material change
- Legal requirements must be complied with
- Clean at least 1time per year
- If the product has tendency to stick, clean more regularly

CLEANING AGENTS

- The cleaning products listed are only a recommendation. Depending on the products being transported, other cleaning products may be suitable or mandatory!
- Preferably use water and brushes for cleaning purposes.
- For dry cleaning in the outside area we recommend:

- Brushes with natural or plastic bristles,
- Textile materials made from natural and chemical fibres.
- Synthetic fleeces or grinding tools

- For intertor cleaning in the product conveying areas we recommend the cleaning products listed below with textile material or synthetic fleeces as a base:

Cleaning agents	Composition	Areas of use
Neutral cleaning agent	Tenside, water	In case of contamination with grease and oil.
Alcohol cleaning agent	Tenside, alcohol, water	In case of contamination with grease and oil.
Alkaline cleaning agent (possibly containing abrasives)	Tenside, water, alkali (polishing agent, mainly precipitate chalk)	In case of contamination with grease and deposits of mineral substances.
Emulsion cleaning agent (possibly containing abrasives)	Tenside, water, mixable with water, organic solvent; often extra alkaline (polishing agent)	In the case of heavy grease contamination. Odour; good ventilation necessary; observe accident prevention regulations.
Disinfectant	Most commonly used types: Quaternary ammonium compounds with the addition of water Aldehyde, tenside and water	Products listed in the German Society of Hygiene and Microbiology (DGHM) list should be used.

7.3 Lubrication

Lubrication operations must be performed (see the periodic checks table) using conductive lubricant pastes on the following cleaned parts:

- splined shaft;
- grounding contact bolt.

Danger - Warning

POSSIBILITY OF CONTACT WITH LUBRICANT/PRODUCT!
During machine production and product processing, products may occasionally have technically unavoidable contact with lubricant, even unintentionally.
FOOD GRADE LUBRICANTS MUST THEREFORE BE USED EXCLUSIVELY (= SUITABLE FOR FOOD USE) AS SPECIFIED IN THE TECHNICAL DATA (LUBRICANTS) AND/OR THE LUBRICANT PLATE (OPT.) AS LUBRICANTS.

We strongly advise against mixing different greases Lubricants could decompose.

Store and use Lubricant according manufacturer/supplier instruction.

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.

For any replacement of components or parts consult WAMGROUP S.P.A.

SPARE PARTS AND MATERIALS SUBJECTED TO WEAR

The equipments have been designed and manufactured so as not to require normally spare parts because of **failure or breakage** if properly used and maintained according to the indications in the manual.

Use only original spare parts if replacement of damaged components is required.

Do not hesitate to replace the part and/or the component if it this doesn't ensure the necessary safety and/or a reliable operation.

Danger - Warning

Do not carry out improvised repairs!
The use of spare parts which are not original, besides cancelling the warranty, can damage the proper working of the equipment.

PERSONNEL AUTHORIZED TO INTERVENE IN CASE OF FAILURE

The personnel authorized to intervene in most of failure cases or in those cases not otherwise indicated, is represented by an expert maintenance operator or authorized and specially trained in regard to mechanical, electrical and electronic parts. Where indicated, it is necessary the intervention of specialized or specially trained personnel or technicians of the manufacturers.

8.2 Replacing the wear parts

The Lump Breaking Feeder Valve wear parts are:

- seal;
- bushings;
- rotary blades;
- fixed grid.

These components must be replaced after a certain period depending on the type of material being handled and the conditions of use of the Lump Breaking Feeder Valve.

Caution

RISK OF BURNS!
The temperature on the surface of the drive can rise to 90 [°C]. Contact with the surfaces can cause burn injunes.
AVOID TOUCHING THE HOT SURFACE OR WEAR GLOVES.

Caution

HEAVY LOAD!
The drive and the rotor together are heavy.
USE SUITABLE LIFTING GEAR FOR THE DISASSEMBLY.

It is recommended to replace the bushings every 2 years according to the Maintenance Table.

Caution

RISK OF INJURY!
After longer operating periods wear can produce sharp edges on the breaker tool.
WORN BREAKER TOOLS CAN CAUSE INJURIES.

Caution

RISK OF INJURY!
The breaker tool can drop down out of the housing after removing the rotor shaft.
PLACE THE LUMP BREAKER ON A SUITABLE SUPPORT SURFACE IN ORDER TO REMOVE THE BREAKER TOOL AND/OR SHAFT SEALS.

Follow the indications bellow:

1) Stop the Lump Breaker and make sure the container beneath with the Lump Breaking Feeder Valve has been mounted is empty;
2) Disconnect the power from the actuator and ensure taht it cannot be switched on again;
3) Loosen screw connection on the actuator bracket and remove the actuator;
4) Loosen screw connection on the flanges and remove the Lump Breaking Feeder Valve.

For the replacing of the wear parts refer to chapter 5.6 Assembling-disassembling phases.

8.3 Decommissioning

In case it is not possible to restore the proper functioning of the device after failure, proceed to its decommissioning and warn on its failure by means of a special a warning sign, then require the assistance by contacting the **WAMGROUP S.p.A.** customer service.

8.4 Returning the device

When returning the device use the original packaging if it has been preserved, place the device in a small container, to protect it as best as possible from impact during transport. In any event, make sure there is no residue material inside the device.

8.5 Dismantling and disposal

If the device or its components, in case they are broken, worn or at the end of their life envisaged are no longer usable or repairable than they have to be disposed off.

The scrapping of the device and its components has to be carried out by means of appropriate tools chosen on the basis of the material to work on (E.g.shear, blow torch, hacksaw, etc.).

All components have to be dismantled and disposed off after the were made pieces so as none of them can be reused.

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

Dismantle the components of the device 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 device 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.

ERROR	POSSIBLE CAUSE	SOLUTION
The shaft of the Lump Breaking Feeder Valve no longer rotates.	The material inside has blocked the rotation of the blades	Remove, clean and fit back
The thermal protection of the motor with trips.	The material inside has blocked the rotation of the blades	Remove, clean and fit back
	Insufficient drive unit power.	Check that the installed power is correct.
	Friction between the rotary and fixed parts	Remove and check any contact points, replace the damaged components
Excessive noise.	Friction between the rotary and fixed parts	Remove and check any contact points, replace the damaged components
Device inoperative.	No power supply	Check power supply and cables, restore power supply
	Drive defective	Replace dnve
	Electrical safety device (opt.)not activated.	Check that position of contact bow is correct. Replace safety device if necessary.
	Motor circuit breaker tnggered by overload.	Allow drive to cool, remove cause of fault, switch motor circuit breaker on again.
Lumps not broken down, machine jammed.	Breaking tools worn or broken	For replacement of breaking tools, see chapter 9.2.1
	Output of lump breaker and capacity of downstream machine not coordinated.	Adjust output of lump breaker to the capacity of downstream machine.
Lumps jammed	Lumps too big, breaker tools worn or broken	Disconnect machine from energy supply, secure it against being switched on and remove lumps by hand.
		For frequency-regulated drives, a brief reverse motion (max. 1 revolution) is possible. The correct direction of rotation should then be set once more.

9.2 Check-list in case of fault

If you have been unable to solve the problem on the device 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 device data, the plant technician/installer or Manufacturer will also need information concerning the plant in which the device 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 device concerned.

Danger - Warning

Before carrying out any operation “set the device 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 the problem;

b) Photo showing the Lump Breaking Feeder Valve and how it is installed;

c) Lump Breaking Feeder Valve type;

d) Does the Lump Breaking Feeder Valve start up without problems after long shut-downs?

e) Is the outlet free of incrustations which can reduce the passage section?

2)* Check*ing the hopper

a) Which is the cone angle?

b) Indicate the amount of material in the hopper.

c) Is the hopper provided with bridge breaking baffle?

d) Is the hopper is provided with a fluidisation / aeration system?

How many nozzles and fluidisation plates are fitted on the cone? How are they positioned and at what distance from flange silo?

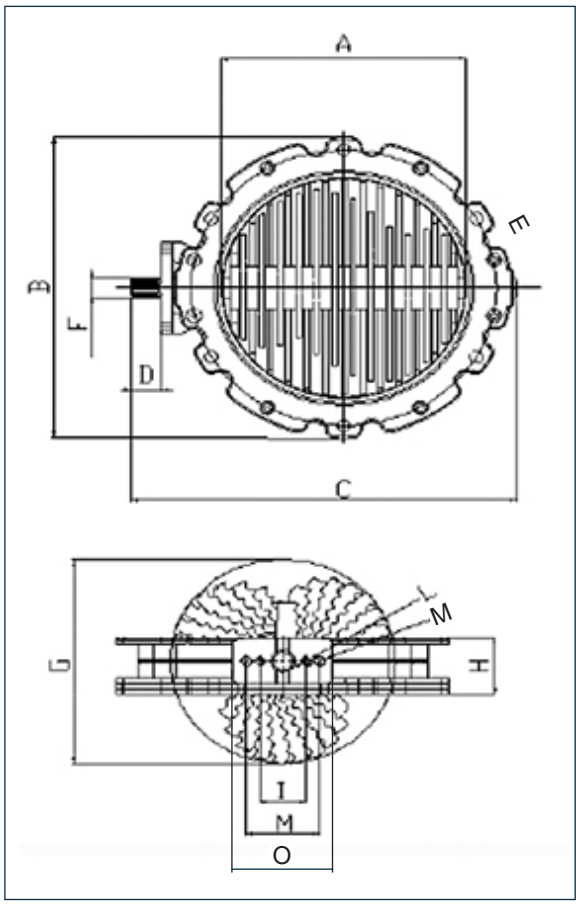
What is the operating pressure and the operating cycle?

e) Is the hopper provided with vibrator or hammer device?

What is the operating cycle?

Overall dimensions of the device

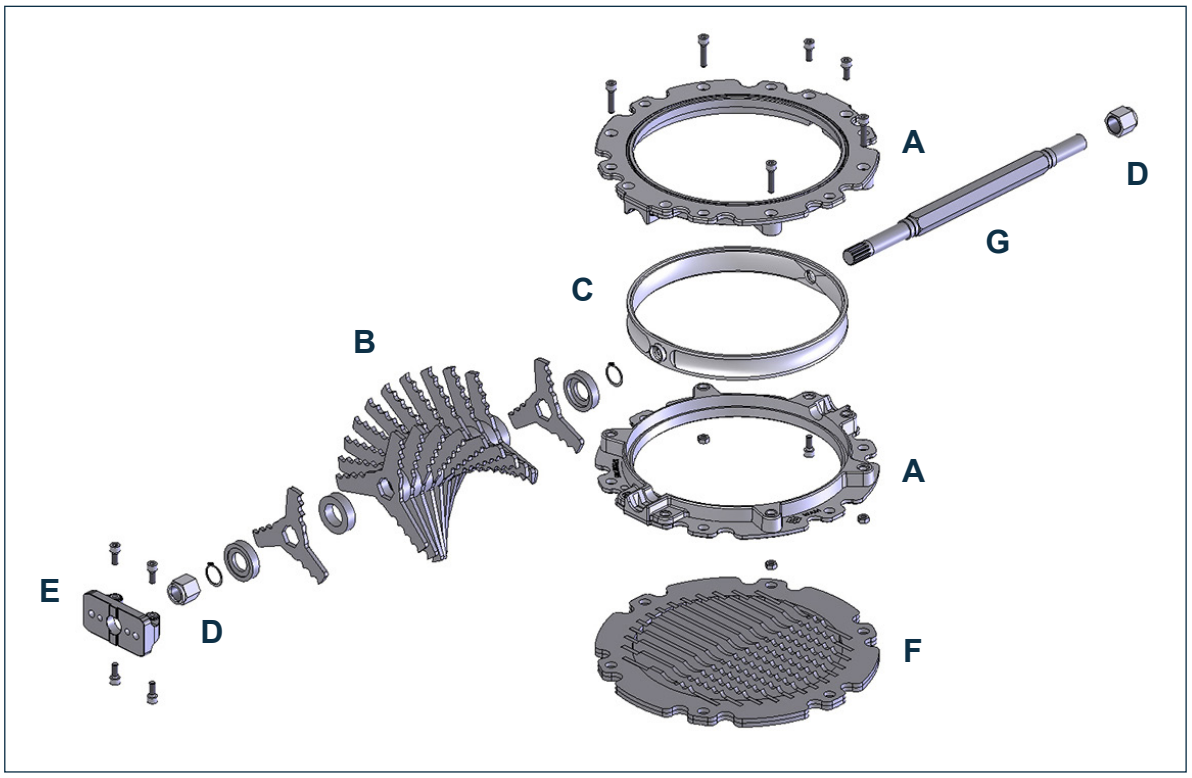
SIZE	MODEL	A	B	C	D	E	F	G	H	I	L	M	N	O	kg
LBC0150	M	164	255	306	31	225	DIN5482	146.5	66	50	2 x M10	80	2 x M12	110	9.0
	P/C								74						9.3
LBC0200	M	213	310	367	33	280	DIN5482	199	68	50	2 x M10	80	2 x M12	110	13.3
	P/C								76						13.7
LBC0250	M	267	365	422	33	335	DIN5482	248	68	50	2 x M10	80	2 x M12	110	17.5
	P/C								76						17.9
LBC0300	M	318	425	488	33	395	DIN5482	299	68	50	2 x M10	80	2 x M12	110	21.3
	P/C								76						21.8
LBC0350	M	374	475	552	48	445	DIN5482	358	80	*	*	80	2 x M12	120	34.9
	P/C								88						35.6
LBC0400	M	424	525	603	48	495	DIN5482	410	80	*	*	80	2 x M12	120	40.0
	P/C								88						40.6



Important

In case the device is shipped packed in a crate, the packaging weight has to be added to that of the device indicated above.

Check the drawing and table below to identify the components of the Lump Breaking Feeder Valve.



A) Half-bodies
B) Rotary blades
C) Seal
D) Bushings
E) Actuator fixing bracket
F) Grid
G) Hexagonal shaft

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