OMV DIVISIONE MECCANICA

GRANULATORE 900 TR-NS

GRANULATOR 900 TR-NS

❑ MATRICOLA	33-2051-70
❑ SERIAL NUMBER	33-2051-70
❑ TENSIONE E FREQUENZA	480V / 60Hz
❑ VOLTAGE AND FREQUENCY	480V / 60Hz

LUNGADIGE ATTIRAGLIO, 67 - 37025 VERONA - ITALY
TEL. (045) 8394444 - FAX (045) 8394445 - E-MAIL: OMV@OMVGROUP.COM

DICHIARAZIONE CE DI CONFORMITÀ

(Secondo l'allegato II B della Direttiva Macchine 98/37/CE)

La società TRIA Spa, Via E. Fermi 8 - 20093 Cologno Monzese, Milano, Italia
tel. 39-2-273451, fax 39-2-2542101

dichiara sotto la propria responsabilità che la macchina o impianto:

Commessa Nr. 840 510

Costituito dai seguenti gruppi :

Tipo	Q.tà	Codice	Anno
GRANULATORE 900 NS-R	1	833540093	2004
TRAINO D.210X1000	1	886000188	2004
VENTILATORE HS 56	1	805260185	2004

è CONFORME:

- alla Direttiva 98/37/CE;
- alla Direttiva 89/336/CE (e successive modifiche);
- alla Direttiva 73/23/CE (e successive modifiche).

DIVIETO DI MESSA IN SERVIZIO PRIMA CHE
LA MACCHINA IN CUI SARA INCORPORATA
SIA STATA DICHIARATA CONFORME ALLE
DISPOSIZIONI DELLA DIRETTIVA 98/37/CE

ALLEGATO II - ARTICOLO 4 - PARAGRAFO 2

Il firmatario della dichiarazione:

Cognome : ANCESCHI

Nome: MARCO

Posizione nell'organigramma: DIRETTORE TECNICO

Luogo e data: Cologno Monzese, il...4 11 04

Firma:.....

TRIA Spa
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Milano/Italia
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Tel. 39.02.273451 (15 linee r.a.)
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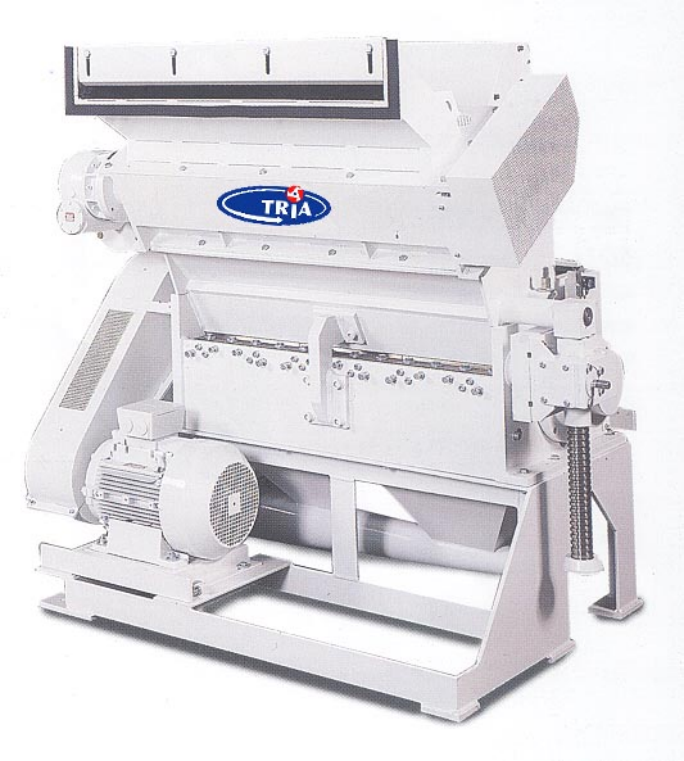
Series NS-R

USE AND MAINTENANCE MANUAL



900-1200

PLEASE NOTE

Unauthorized replacement of or tampering with one or more parts of this handbook may cause a risk of injury. The manufacturer will not be responsible for any civil or criminal liabilities.

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Fax +49.2154.9439.19
TRIA-MUEHLEN.WILLICH@t-online.de

TRIA do Brazil
Off. 4-6 CEP 13206-480 – V.
Rami – Jundaì - SP
Tel. +55.11.73977730
trialtda@terra.com.br

This handbook is based on the state of the art at the time when the machine was built and cannot be considered inadequate solely for inevitable updates due to technical progress.
The MANUFACTURER has the right to update products and their manuals without any obligation to update products or manuals already on the market, unless considered indispensable.

1 Installation and connections

The purpose of this section is to inform the customer on anything concerning handling, unloading, unpacking and installation of the system

TABLE OF CONTENTS

Introduction

TRIA S.P.A. has designed and built this machine according to the Community Directive Standards 98/37/CE.

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Furthermore, the safety equipment must be constantly kept operational. All required maintenance operations must be carried out according to specific schedules.

This handbook must be kept for the whole lifetime of the machine and must be available to operators and service engineers at all times.

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For information concerning connections, installation or any general information, see granulator handbook.

Transport and handling

This section describes the procedures required for handling, installation and startup of the system. The installation and assembly carried at the customer's facility as well as the startup of the system shall be carried out by qualified personnel, trained under the supervision of TRIA S.p.A. Customer Technical Service. (if contractually specified).

NOTE

In case of non-compliance with these specifications, TRIA S.p.A. will not be responsible for any damage to the system or subsequent performances not in compliance with the technical specifications provided.

Handling

The system and its units have been designed and built so that they could be handled safely, with vehicles (lift trucks) and with proper lifting equipment (bridge cranes, cranes, double-chain hoists). Vehicles and lifting equipment must be proportionate to the weight of the material to be handled. As far as this is concerned, the lifting capacity shall be at least 20% higher than the weight required for the crate or system unit.

PLEASE NOTE

When handling, never lift parts of the system with improper equipment, for example directly with a lift truck, but always use slings as described in the picture and figure in the next section.
If this is not observed, there may be a risk of seriously damaging the system.

Precautions

Observe precautions and warnings described in the previous sections to ensure stability and avoid unhooking, damages and hazards that may occur from handling the machine. Assign all handling and transport operations to skilled personnel (slingers, lift truck operators, crane operators, etc.).

PLEASE NOTE

Carefully check conditions of lifting equipment and its capacity.

Handling symbols

Some materials require particular identification for their handling. Therefore, the international symbols described in the following table have been used or applied on the packages.
All hazard symbols are applied on the same sides used for the marking. There must also be a barycenter indication on the cover and on the bottom of the crate.

INSTRUCTIONS	SYMBOL / MARKING
Up	
Fragile	
Protect against moisture	
Anchorage points for slings	
Barycenter	
Barycenter (loadable)	
Store indoors	
Store in places with temperature higher than 0 °C	

Table Handling and hazard symbols.

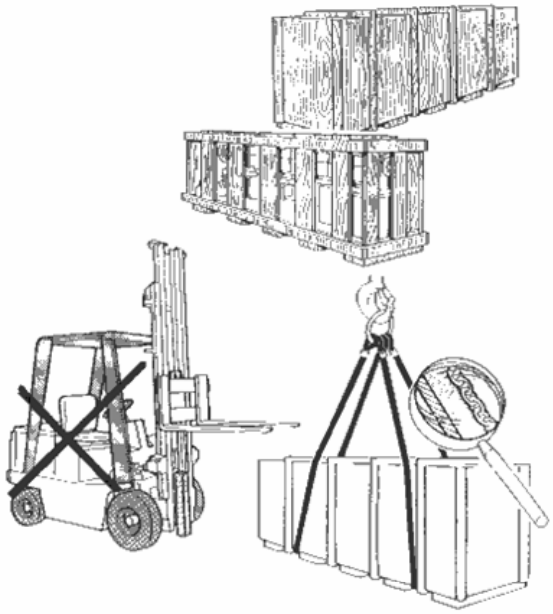
All components of the machine can be shipped in crates, boxes or loose.

HANDLING AND POSITIONING

The machine can be shipped in boxes, crates or loose, depending on its destination.
On receipt of the machine, make sure there are no damages.
On receipt of the machine, put the crate or box in a dry place.
Use suitable ropes to sling it.

CAUTION

DO NOT USE LIFT TRUCKS TO LIFT THE MACHINE: THE LOAD INSIDE COULD BE THROWN OFF BALANCE.



- With no packing on truck, properly fastened and covered.
- On plastic-protected pallets.
- On cardboard-protected pallets and boxes.
- In plastic-protected crates.
- In normal boxes with internal tar paper and plastic coating.
- In normal boxes with protective packing and vacuum barrier bag.
- In containers with internal anti-roll locking.

Boxing is carried out by painting the following data on the sides of the boxes:
- Destination – Contract No. – any required codes
- Gross weight
- Width barycenter and hoist point for slings

Item marking must be clearly visible, seawater-proof, sunlight-proof or have pre-printed tags.

In order to be properly handled separately, the list of all units included in the system (packing list) shall specify the marking, weight, size and position of the barycenter.

Packing inspection on delivery of machine

When goods are received, packing must be checked according to the following criteria:

boxes must be undamaged;
mechanical parts such as posts, guides, brackets, etc. must not be damaged.

In case of damaged goods, acceptance of hauled material is carried out with reservation as it is necessary to inspect the intactness of the goods.

If anything is found to be damaged, before taking out parts of the system from the package, immediately contact TRIA S.p.A.

Visually inspect conditions of the system inside and outside the package. Any deformation will show that the system could have been damaged during hauling. This could affect its normal operation.

In particular, check:

metal and painted surfaces;
tightening of the screws, bolts and fittings.

In case of damaged goods

Before installing the machine, check its conditions. Damages caused by hauling must be immediately communicated to TRIA S.p.A.
Any damage to the carrier – however this may happen - could harm people or things, in addition to affecting proper operation of the machine. The customer, or parties concerned, are therefore called to carry out an accurate inspection before the installation and startup.

Storage of the machine

All specifications described in this section shall be observed during temporary storage periods of the system and that may occur in the following situations:

installation of the system not immediately after its supply;
removal of the system and storage pending a relocation.

Physical features of storage areas

In the event of machine storage, appropriate traffic and maneuvering spaces are required in order to allow personnel to easily and safely sling and lift all parts.

Selecting the place and checking the requirements for the installation

The installation of the granulator should take place in a proper place, in other words, a place that will allow normal machine operating actions and routine maintenance.
The premises should therefore be:

- equipped with the required power supply lines (electricity, pneumatic and water supply, depending on the particular case)
- fairly illuminated
- equipped with proper ventilation

Before the machine is delivered, the user should set up an appropriate environment for it:
- level, anti-slip and smooth floor
- proper lighting
- prearrangement of the electric system and grounded system in compliance with EN 60364.

WARNING

Use lifting and handling equipment in perfect operating conditions to move the granulator: The supplier refuses all responsibility concerning the conditions and suitability of the handling equipment used.
The capacity of such lifting equipment shall be proportionate to the mass and shape to be handled. Handling shall be carried out slowly, with proper lighting and enough free space for proper installation.

Removing goods from the vehicle

(note: for machines with traction unit, see attached Traction Instructions)

When loading/unloading goods from the vehicle and when lifting operations are required, before removing the machine parts, it is necessary to have eyebolts (unless already available), a chain or steel wire lifting rope and soft slings (hemp rope, fiber cable, etc.).

The machine and its components must be firmly anchored so that they cannot slide, tilt or fall off the loading surface.

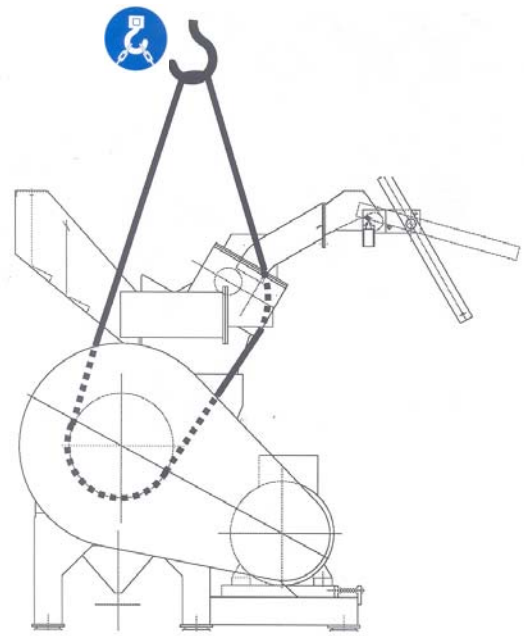
For unloading, handling and unpacking operations, proceed as follows:

Check if the packing is completely intact
The position of the packed machine must be kept in compliance with the indications shown on the signs and notes written on the outer package.

PLEASE NOTE

When unloading, at least two qualified technicians should be present (lift truck operators, crane operators).

Keep body and hands away when the machine is being lowered. Non-compliance with these instructions could result in serious injuries.



PLEASE NOTE

Personnel must not be authorized to walk under or pass by goods being loaded/unloaded. The same goes for the signaler who shall provide assistance for handling.
The selling company refuses all responsibility concerning this step which must be carried out by qualified industrial machinery handling personnel (lift truck operators, slingers), provided with the required body-protection equipment (overalls, safety shoes, work gloves, helmet, goggles).

Unpacking

1. Open the package, take the machine out and put it on the floor on top of wooden logs after loosening the straps.

2. Identify the components supplied with the selected configuration and check their intactness.

The standard machine does not include auxiliary moveable parts, hence the installation phase is particularly easy and quick.

In the case of particular configurations, some components may be supplied separately from the machine body. In this case, it will be necessary to refer to the diagram specified in the order confirmation.

NOTE

The disposal of packing material shall be carried out by the recipient who will have to eliminate it according to the current regulations of the country in which the granulator will be used.

The elimination of the packing material must be carried out as follows:
- cut the straps with shears (watch out for the ends as they could strike the operator, especially in the face)
- cut or pull off the outer wrapping or take the nails out of the box or crate (watch out for dangerous chips which could injure your hands and eyes)
- cut the internal strap (watch out for the ends as they could strike the operator, especially in the face)
- take the machine off the pallet.

NOTE

There should be no sign of tampering after removing the wrapping. If there is, call the Customer Service.
In order to protect the grinding chamber, Tria covers the machine with a layer of lubricant.
It is recommended to remove this layer with a non-corrosive detergent before starting up.

Wiring
(note: for machines with traction unit, see attached Traction Instructions)

Not supplied by Tria S.p.A.- operation is described hereinafter.

This operation must be carried out by a qualified technician (electrician).

Before connecting the machine to the power mains, it is necessary to:

- check if the voltage shown on the equipment matches the power supply voltage (permissible variation: voltage ± 10%, mains frequency: ± 2%)
- make sure the grounded system is properly connected to the outlet
- make sure the electric panel power supply line is able to supply power at least equal to the power on the machine (watch out for the motor breakaway current!)
- the machine has a connection cable (3 poles + ground) with a suitable cross section; it must be connected – in accordance with the user's country current regulations - to a suitable plug (not supplied), according to the Customer's needs.
- make sure the equipment is not crushing the power cord
- protect the power supply line from overvoltage (e.g. atmospheric discharges)
- protect the power supply line from thermal or magnetic overvoltage with appropriately coordinated devices (fuses or automatic switches)

The Neutral is not normally used with our equipment; if this is required, its use should be previously agreed with the user.

To be provided by the Customer:

- electrical prearrangement, including the protection lead usually known as "**grounding**"
- tools and expendable materials
- required lubricants for starting up the machine
- update of this handbook in case TRIA sends additional documentation thereof.

General Information

2

This section gives basic information to be used during maintenance and when using the equipment.

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Introduction

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For information concerning connections, installation or any general information, see granulator handbook.

Purpose

The purpose of this handbook is to provide the indications and operating conditions to those who will operate the machine according to its technical-design and construction aspects.
It is absolutely necessary to read the handbook although it may not replace the operating skills of the staff which should be properly trained.

This handbook must be available to the people in charge of operating the system or in any way concerned with its operation. The use of this machine is intended for professional operators. These operators shall be appropriately trained and must be familiar with all its controls.

More precisely:

- the operator using the machine;
- the people in charge of maintenance services;
- the people in charge of accident prevention and safety services.

The Customer must ensure that all people in charge have read and understood all the parts of this handbook concerning their specific jobs.

This handbook must be kept in good condition for the whole lifetime of the machine. Keep the original handbook in a safe and protected place.

The EC declaration is the document that certifies compliance of the machine with the EC Directives. It should therefore be kept and, if necessary, shown to the competent authorities on request.

In case the documentation is lost or damaged, it is possible to get a copy from the manufacturer by providing the reference number, serial number / machine serial No., year of construction.

The machine is built in compliance with the current European Community directives and with the technical standards which implement its requirements, as attested by the EC Compliance Certification released by the manufacturer and attached to this user's handbook.

This handbook is intended for operators and qualified staff in order to allow proper usage of the machine.

Inside of it, the operator can find instructions and indications to:
- correctly install the machine
- understand how the machine and all of its parts work
- carry out adjustments during setup and startup
- carry out routine and scheduled maintenance
- comply with all safety and anti-accident rules.

The operator will therefore be able to understand the problems related to the machine and to the product being processed.
To better understand this handbook, the following explains the terms used in it

DANGER ZONE:

'danger zone' refers to the loading zone (grinding chamber) where the material to be ground is fed into the machine by means of a hopper

EXPOSED PERSON:

any person wholly or partly in a danger zone

OPERATOR:

person in charge of installing, operating and adjusting the machine

SERVICE ENGINEER

person in charge of routine / scheduled maintenance as well as machine cleaning.

QUALIFIED TECHNICIAN:

skilled person, properly trained and able to carry out supplementary maintenance or repairs that require special knowledge of the machine, its operating aspects, safety and functional procedures.

LEGEND

WARNINGS:	damages could be caused to the machine and/or to its components
PRECAUTION:	further information on operations underway
NOTE:	provides useful information.

The operator and qualified technician must read and understand the contents of this handbook which must be kept intact and attached to the machine thereof for immediate reference.

Glossary

Blade granulator:

machine that cuts material inside the grinding chamber, thereby reducing its size until the product goes into the discharge area through appropriately sized screen holes.

Grinding chamber:

machine area where material is cut/reduced.

Feeding devices:

feeding may occur manually, through an opening, or automatically through devices installed on the machine or connected to it. Automatic feeding occurs through devices such as, auger screws, belts, etc. or by means of suction systems, etc. or traction units located upstream.

Discharge devices:

devices receiving granulated material or finished products. Discharge may occur by the force of gravity or devices such as auger screws, belts, etc. or through suction, blowing, etc.

Rotor:

rotary cutting device with blades installed inside the grinding chamber.

Counter blades:

fixed blades installed inside the grinding chamber.

Blade:

tool used for cutting material.

Screen:

drilled plate usually located in the grinding chamber discharge area. It is used for allowing the granulated material or appropriately sized finished product to pass through.

Working area:

A place where the operator feeds the machine.

Loading surface:

a surface used for preparing the material to be fed into the blade granulator. The person in charge of feeding the machine must not stand on this surface (If it is possible to stand on this surface, it should be considered a working surface).

Environmental operating conditions

Environmental operating conditions means the conditions in which the granulator will be operating. The following includes the main ones.

Explosive atmosphere

The granulator is not to be used in an explosive atmosphere. The user is therefore not allowed to use the granulator in an explosive or partially explosive atmosphere. (for example, due to material grinding which causes quite a lot of gas emissions, hence able to produce explosive gas pockets).

Lighting

For normal operating conditions, the machine premises must be illuminated in order to easily identify the control panel, especially the emergency button.

In case of routine maintenance, there must be adequate lighting in order to allow all operations to be carried out safely. In particular, the shearing chamber and control panel must be adequately lighted.

The user is required to comply with the current rules regarding the method to be used to supply adequate lighting.

Vibrations

The machine has been designed and built so that the risks resulting from vibrations produced by the machine are kept to a minimum, considering the technical progress and availability of the vibration reduction means, especially at the source.
However, in case of vibrations, the operator must immediately stop the machine and notify the event to the technical service.

Uses

The blade granulator must be used for granulating the specified product within the capacity limits outlined in the contract.
Using the granulator for grinding other materials or to reach higher capacity values not provided for in the regulations is considered "**misuse**".

Disabling

In order to avoid hazardous situations, remove the rotor blades and counter blades.

If the machine must be set aside, follow this procedure:

PLEASE NOTE

These operations must be performed by qualified technicians

- Disconnect it from the electric power supply mains.
- Disconnect the power cord from the power board terminals
- Clean the shearing chamber from processed product residues.
- Remove the material collecting device
- Clean the collecting device from processed product residues.
- Clean the screen.
- Put back all parts.
- Cover the feeding opening with a nylon sheet or the like
- Put it in a suitable place. Make sure it is properly fixed.
- Lubricate all machined/non-painted mechanical parts

Residues and environmental contamination

The machine is supplied with one or more hinged shutters used for obstructing the blade granulator feeding opening in order to prevent dust from coming out.

If the machine is used for grinding toxic or harmful material (for example containers used for transporting such materials), the operator should be provided with protection gloves and an appropriate mask. Furthermore, there must be an exhaust fan in the loading zone. Buyers shall be informed about their responsibility to notify operators on behavioral rules and body protection equipment which should be used when handling such materials.

Technical assistance

As regards qualified technical personnel, the Customer may directly contact the Customer Service. Service requests may be forwarded to the selling company by fax or by dialing the numbers shown on the first page of this handbook.

List of spare parts

The Customer must buy original spare parts. Assembly and disassembly must be carried out according to the manufacturer's instructions described in the "Spare parts" section.

Standards-certifications-usage limits-ergonomics-ecology

In designing and building the granulator, the following directive requirements have been observed: 98/37/CE.

Certification of the granulator and its components

In addition to the technical documentation of the machine, there is a declaration – as required by the current standards – which is consistent with the machine identification plate.

Noise

The machine has been designed and built in such a way to reduce sound emissions at the source.

The risks resulting from exposure to noise basically depend on three factors:

- **The level of acoustic pressure**
- **Exposure time**
- **Spectrum composition**

The noise value basically depends on the type of material and temperature of the material used for the grinding.

Noise values found on different types of material are available at our engineering department.

NOTE

To contain noise emitted from the machine, keep blades and counter blades sharp (see Maintenance section).

Description of machine and technical specifications

3

This section gives basic machine information to be used during maintenance and when using the equipment.

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PLEASE NOTE

If the machine is supplied with Traction unit, see also Traction Manual attached thereto; see section 3

Introduction

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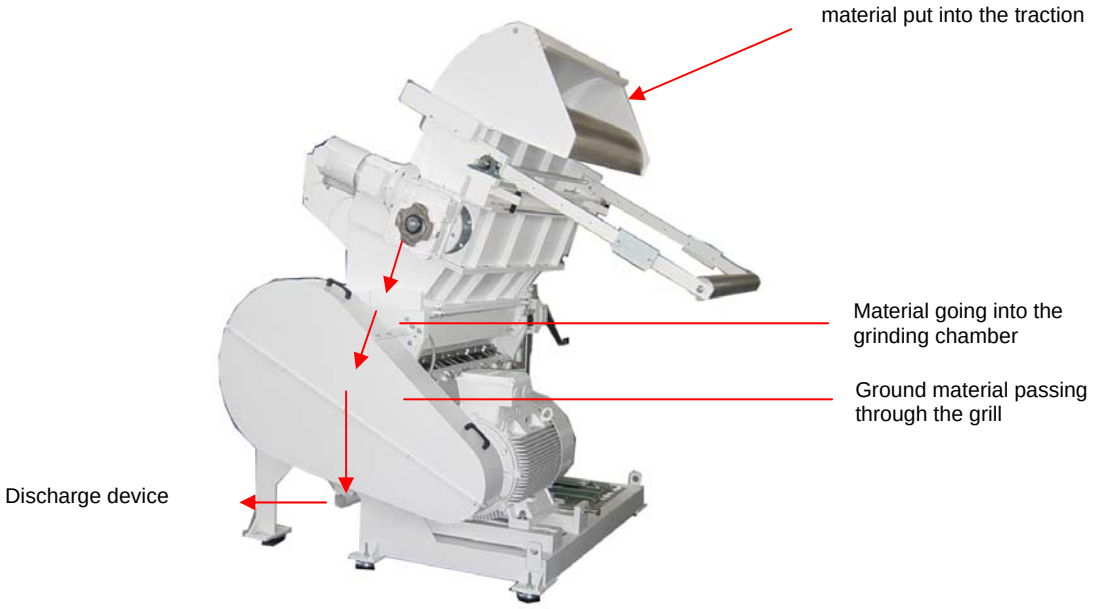
General description

The blade granulator is a machine designed to cut, granulate pieces and scrap of plastic material with minimum use of energy.
Basically, the machine includes a conveying hopper, shearing chamber and a material collecting device.
The granulated material is selected by means of a drilled screen.
The granulator walls are sound-proof. Therefore, it reduces noise pollution.

Operating

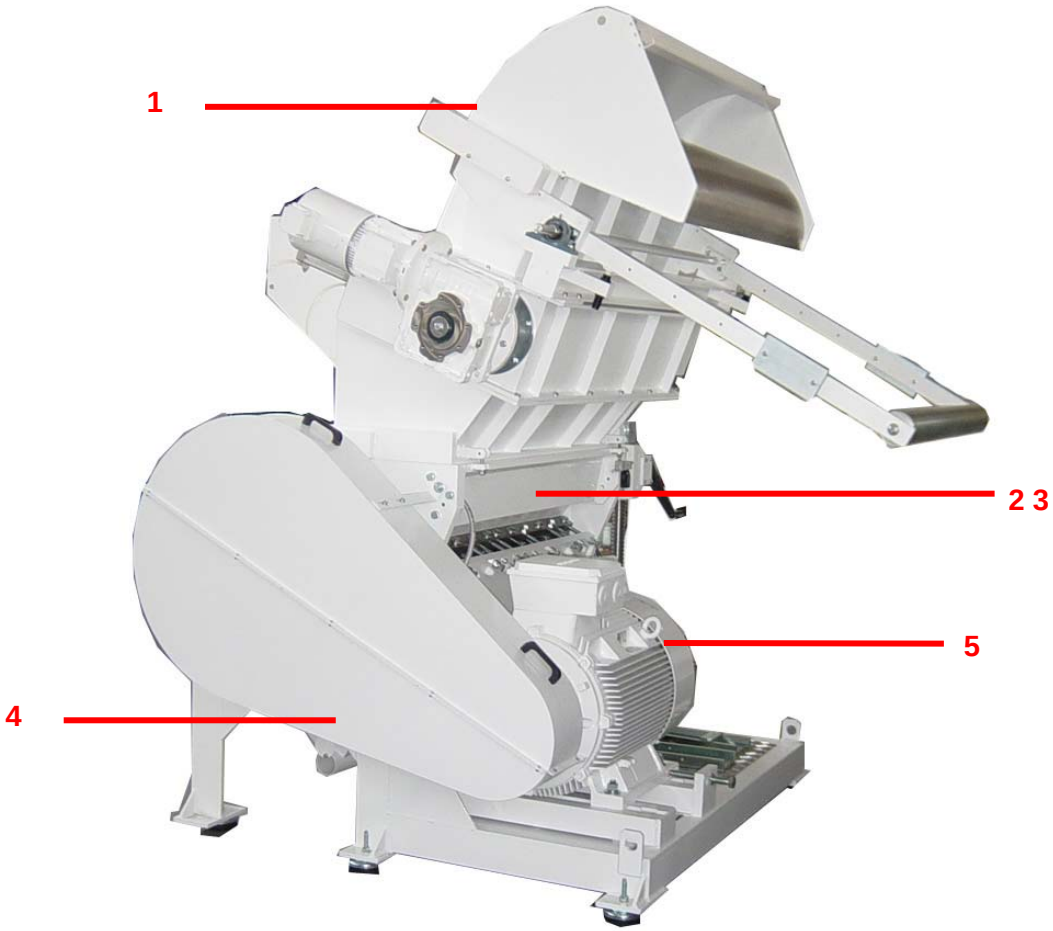
The granulating process takes place as described below.
The element to be ground, fed into the loading unit, follows the path shown by the arrows it falls into the grinding chamber, along the anti-flyback channel which is shaped so as to prevent material from coming out during the granulating phase here, it is cut by a rotor with hardened blades. The shearing action is achieved under shears, between a rotating blade and a fixed counter blade.
A drilled screen located under the rotor allows the treated material to spill into the container: the dimension of the holes in the screen determines the size of the granule.
At this point, the recycled granule is picked up by the discharge unit.



Main granulator units

The main units of the granulator are:

- feeding unit item **1**
- rotor unit and shearing chamber item **2-3**
- collecting unit and material removal item **4**
- base unit and motor drive item **5**



Technical features

The technical features of the machine are shown below (data only referred to the granulator).

NS 900

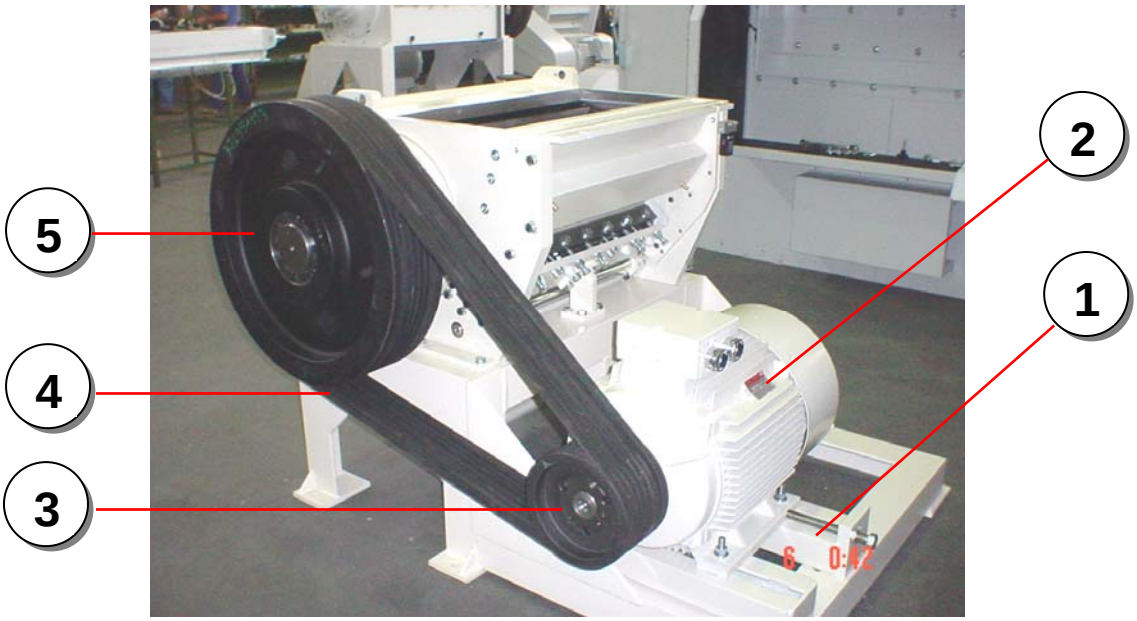
Oponing grinding body	Blades and counter blades	ø rotor	Preliminary Production (Kg/h)**)**	Motor power (kW)	Net Weight **(kg)**	Gross Weight **(kg)**
mm 1020x320	5 + 2	mm 280	~400-600	15	2500	-----

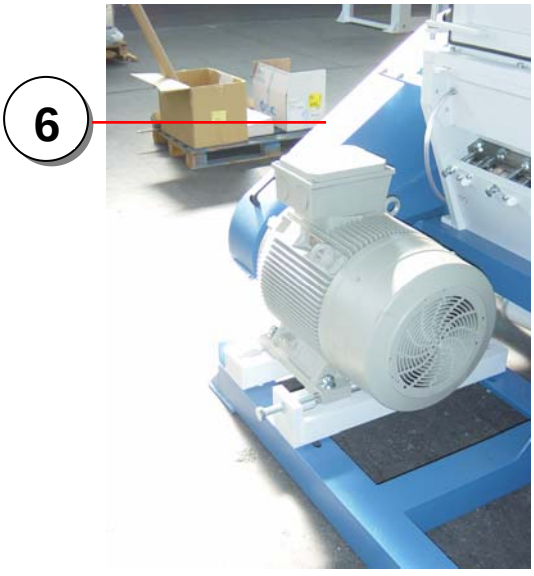
NS 1200

Oponing grinding body	Blades and counter blades	ø rotor	Preliminary Production (Kg/h)**)**	Motor power (kW)	Net Weight **(kg)**	Gross Weight **(kg)**
mm 1360x320	5 + 2	mm 2800	~600-800	18	3200	-----

Base unit and motor drive

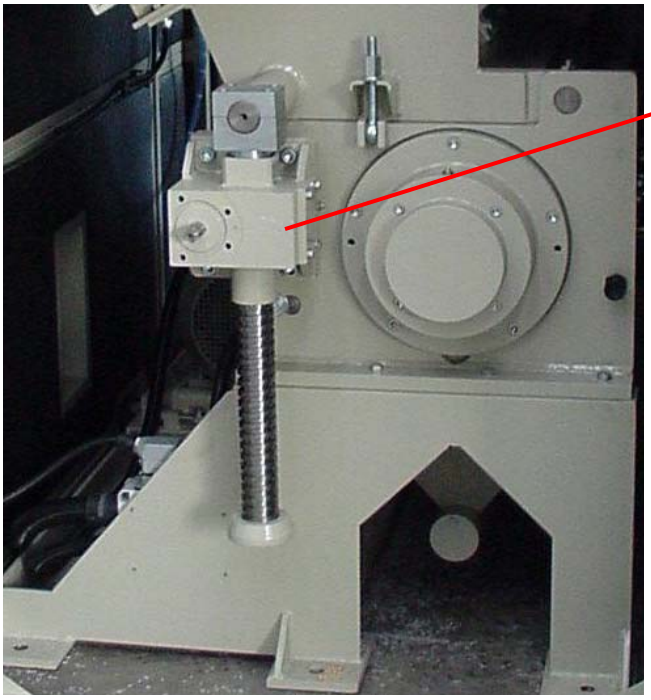
One base (item **1**) for the grinding body support. The motor drive consists of a three-phase asynchronous motor with four poles, (item **2**) sliding on the base so that it serves as a tightener (item **3** motor pulley) for V-belt drive (item **4**), which transfers power to the rotor flywheel (item **5**), carrying out a vibration damping action at the same time. A fixed casing (item **6**) covers the driving pulley, belts and flywheel pulley to ensure operator's safety.

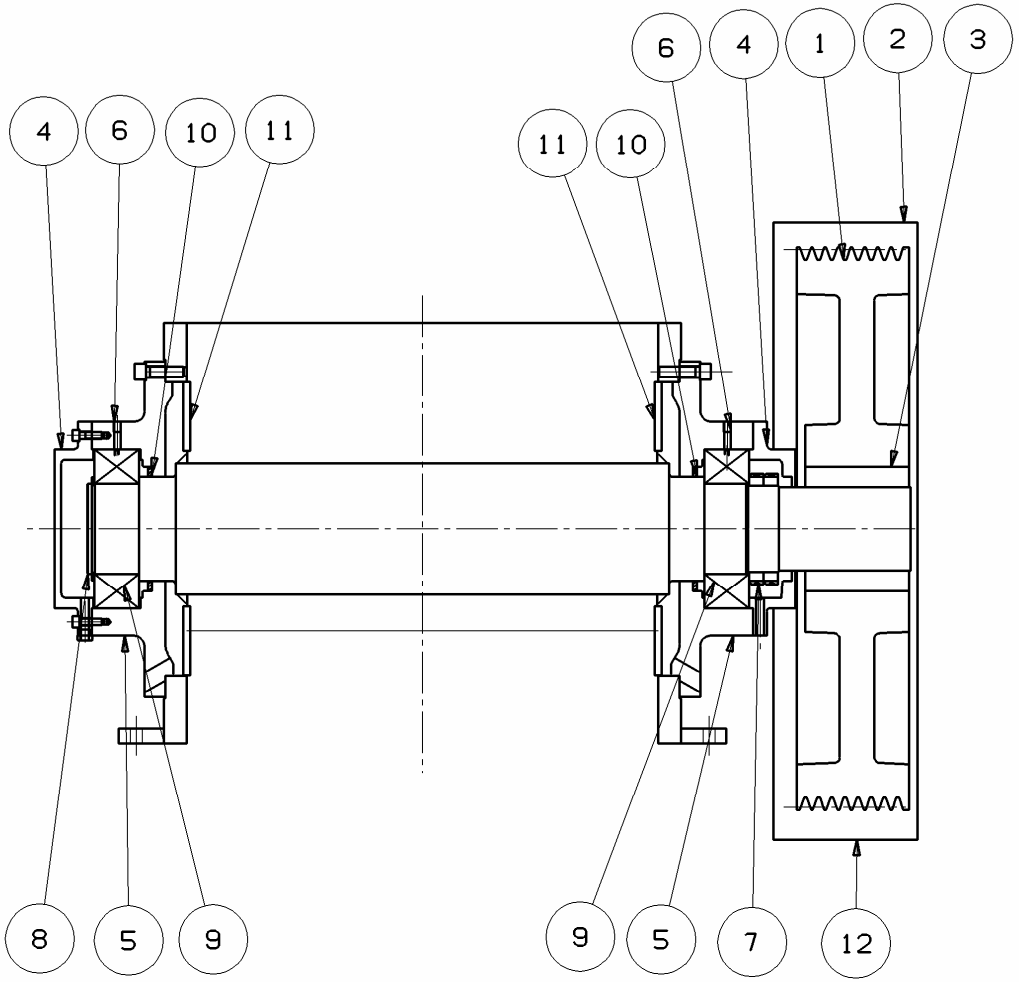




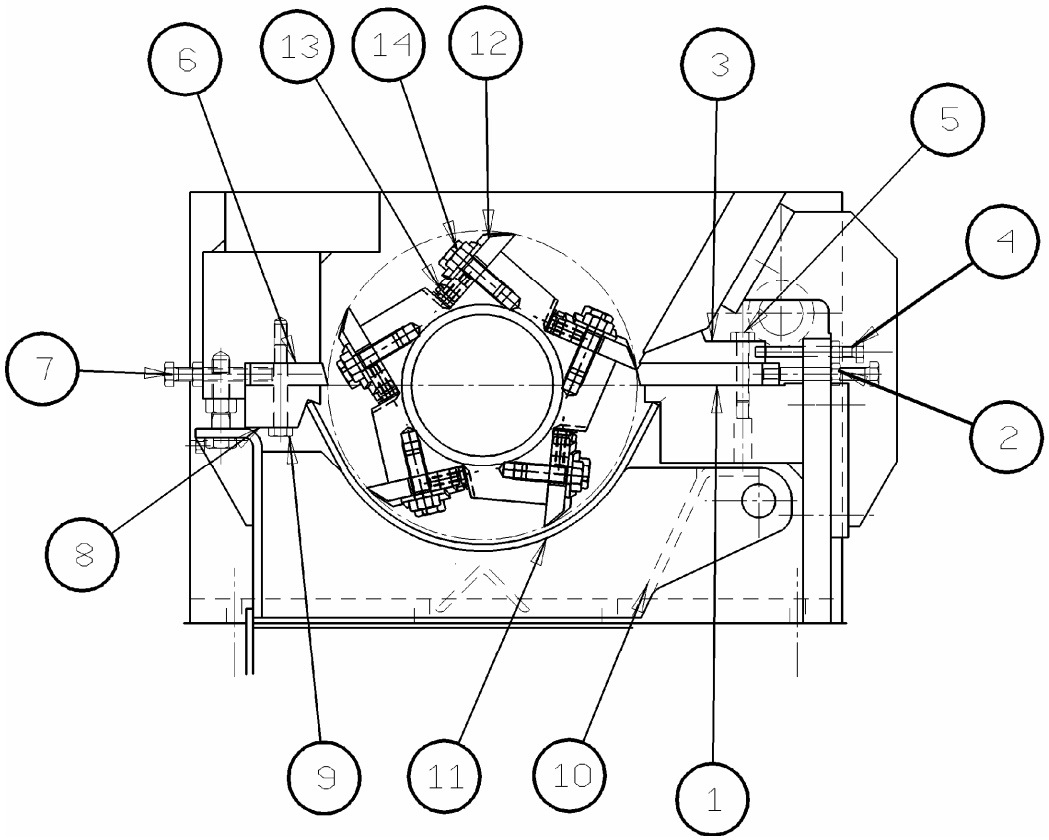
Rotor unit and grinding chamber

The grinding chamber is where the rotor cuts the material introduced by the feeding hopper.
The rotor holds the blades. Shearing takes place near the fixed counter blades which are integral with the grinding chamber.





1 Fly wheel
2 carter for belts protection
3 shaft clamping device
4 support lids
5 Support
6 greaser
7 ring nut
8 ring nut for disassembly of conic bush
9 bearing
10 conic bush
11 Support spacer
12 Cover for support discharge



1 1.st counter blade
2 Counter blade forward mov screw and nut
3 Plate for 1.st counter blade
4 Plate l forward mov screw and nut
5 Fixing plate screw and nut
6 2.nd counter blade
7 Counterblade forward mov. Screw and nut
8 Plate for 1.st counter blade
9 Fixing plate screw and nut
10 Screen holder
11 Screen
12 Blade
13 Counterblade Preregoulation Screw and nut
14 Fixing screw

Cooling system

Not available on this machine

Discharge unit

The discharge unit consists of a:

- Sorting screen
- Discharging funnel

The granulating phase goes on until the material introduced reaches the required dimension (granule size).
This is achieved by means of a drilled plate located in the grinding chamber discharge area: the only way for the granulated material to exit is through the uniformly spaced holes in the screen. Therefore, the granule size is dependent on the diameter of the holes.
The granulated material drops into the discharge funnel which lets you automatically or manually remove the product.

Control panel and wiring circuit

Not supplied by Tria S.p.A.- operation is described hereinafter.

The electric cabinet is integrated in the casing unit and contains all electromechanical components and controls required for managing power.

The wiring circuit – made with wires contained in self-extinguishing flexible sheathes – basically consists of wires connected to all facilities and of the guards control circuit

Safety and accident prevention

4

This chapter gives general safety information to be used during maintenance and when using the equipment.

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Introduction

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For information concerning connections, installation or any general information, see granulator handbook.

General information – use - areas

The employer shall provide the staff with instructions on injury risks, operator safety equipment, noise emission risks and on general accident prevention rules according to the international directives and to the legislation of the country in which the machine will be used.
The behavior of personnel, maintenance service engineers, cleaning personnel, inspectors, etc., shall, in any case, conscientiously comply with the accident prevention Standards of the country in which the machine will be used.

PLEASE NOTE

Before starting work, the operator shall be perfectly aware of the position and functioning of all controls and features of the machine;furthermore, the operator must totally read and understand this manual.
This manual only refers to the equipment described herein.

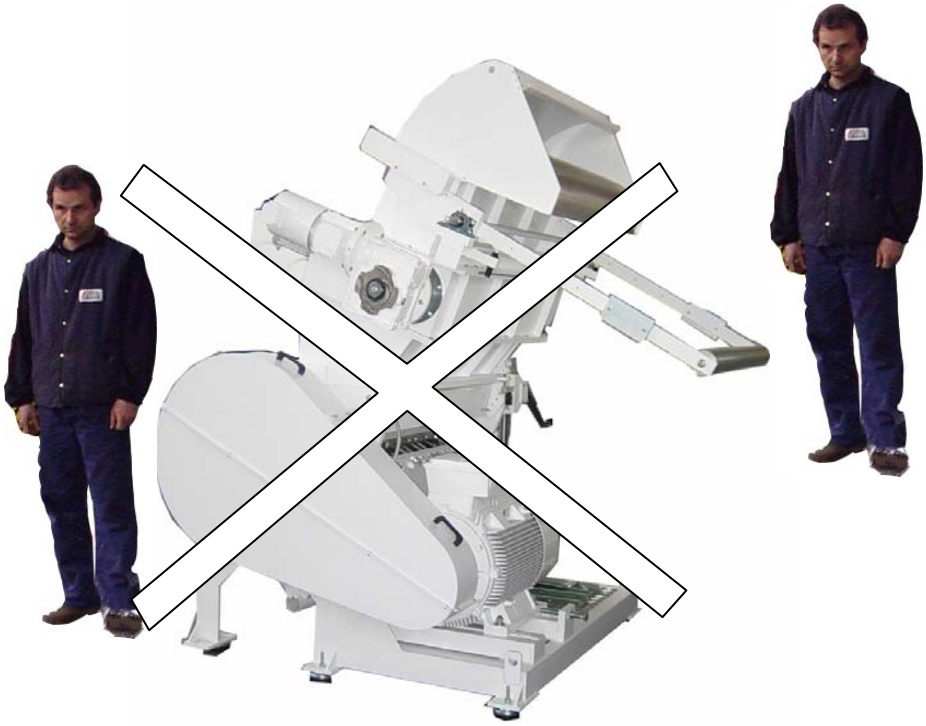
The machine must be solely used by trained operators who have wholly read and understood the instructions described in this manual.

All instructions, warnings and general accident prevention rules described in this manual must be observed. The manufacturer will not be made responsible for nonobservance of these rules.

USE SPECIAL GLOVES

4

DO NOT WEAR JEWELRY



UNAUTHORIZED PERSONNEL IS NOT
ALLOWED IN WORKING AREA

In order to avoid dangers due to inattention or negligence when carrying out tasks, access to the above-mentioned area is forbidden to persons not directly in charge of operating the machine.

Therefore, the operator in charge of the maintenance of this machine is required to keep it free from any obstruction at all times and to prohibit the access to unauthorized persons so as to achieve the best safety conditions to operate the machine.

Do not lean on the machine nor place objects on it.

Planned uses, unplanned uses and improper use of granulator

The blade granulator must be used for granulating the product specified in the contract within the capacity limits laid down: always check if the material to be ground is not contaminated (e.g. rocks, iron, dirt, etc.).

Using the blade granulator for granulating other materials or to reach higher capacity values not provided for in the regulations is considered "MISUSE". Therefore, the manufacturer refuses any responsibility concerning damages caused to things or people and will consider any type of machine warranty no longer valid.

Do not go inside the granulator or put improper objects in it.
Do not approach moving parts or parts that could start moving with any type of object.
Do not disconnect pipes when machine is in operation or in possible startup conditions (power supply connected).

PLEASE NOTE

Using the machine when not explicitly permitted by the instructions specified in the handbook is considered unplanned or improper, and therefore forbidden.

If the machine has wheels, it cannot be used as a vehicle or as a means of transport. However, it may be used only if the wheels are braked on a leveled floor.
The machine can be used only when it is in perfectly efficient conditions.

Do not use the equipment when there are:

- flames
- explosive gases
- corrosive substances
- strong vibrations
- water jets
- radiations
- high percentages of UV

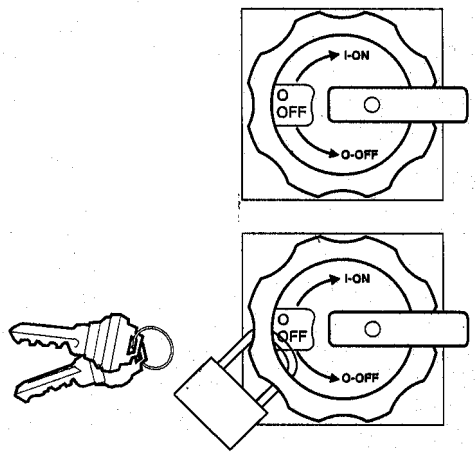
Do not use safety microswitches to stop the machine. Instead, use the stop button.
Do not carry out any maintenance or lubrication operations when the machine is running.

Working areas, controls areas, safety areas
(note: for machines with Traction unit, see attached Traction Instructions)

PLEASE NOTE

The working areas in which the operator works are those occupying the area between the machine control panel and the area used for loading the material to be ground.

The person in charge of maintenance may operate the machine only after setting up all active and passive safety devices planned by the manufacturer in order to provide safe conditions for the service engineer.



Before carrying out any adjustment or maintenance operation, the operator must turn the main switch to "0" (open position).
Put the lock (not supplied by Tria S.p.A.) in its hole.

Risks, protections and warnings

General safety

In order to ensure the health and safety of exposed persons, the machine has been equipped with the following safeties:

- Fixed guards
- Removable guards

Fixed safeties

Protective casings, insulating box, anti-flyback shutters.

Removable safeties

These concern devices and circuits that control the access to the grinding chamber and drive belt.

The accesses to the grinding chamber (normally, **hopper and/or traction unit** and **screen-holder**), which are used for normal maintenance operations, are controlled by a system designed according to the regulations concerning personnel safety.
A mechanical lockup controls the position of the guards by means of limit switches. These limit switches – appropriately connected to the auxiliary circuit - stop the electric motor if the guards are not closed. The control circuit is periodically checked after every startup in order to ensure proper operation. The motor cannot be restarted if power contactor anomalies are found.
Access to the drive area is blocked by a mechanical lock and can be opened by special keys.

PLEASE NOTE

Granulator overturning
(note: for machines with traction unit, see attached Traction Instructions)

When the hopper has been overturned, be very careful as the machine could be thrown off balance more easily. "See section on Maintenance"

Cutting edge of blades or hazardous exposure to cuts

Whenever it is necessary to approach the movable blades of the rotor, mind the cutting edge of the blades. The sharpness of these blades may cause cuts.

Although there are safety microswitches, there are no mechanical interlocks on the rotor. Therefore, when accessing the grinding chamber, mind the rotor which, even if moved manually, could cause cuts or wounds if parts of the body are unwisely interposed inside the chamber.

Marking

(note: for machines with traction unit, see attached Traction Instructions)

On the rear side of the machine there is an identification plate

Codice/Code	
Tipo/Type	
Mat./Serial N.	
Anno Year	
Volt	**Hz**
kW	**HP**

Accident prevention guards

It is absolutely forbidden to tamper with or remove guards and tags. The manufacturer refuses all responsibility concerning the safety of the machine in case of nonconformity with this prohibition.

(in the picture the warning plate is visualized)

Machine symbols

Danger and attention

High-voltage

Noise reduction opening

Danger of physical injury

Interdiction

No maintenance on moving parts

No removal of safety devices and safety guards

Miscellaneous

EC Marking

Hoist points

(see section on General Information)

Operation 5

This section describes the functions performed by the various machine controls for its operation.

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PLEASE NOTE

If the machine is supplied with Traction unit, see also Traction Manual attached thereto; see section 5

Introduction

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General Information

If all operations mentioned so far have been carried out, the machine is ready for operation.
It is now possible to start up the granulator by introducing the material only when the machine has reached its operating conditions.

WARNING

Every granulator startup should take place with machine totally empty.

Operation of the machine

This type of procedure is used to check the machine when running **idle**, in other words without material inside.
Before starting the machine with material, it is absolutely necessary to check the machine when it is running idle.

- Power the machine by turning the main switch
- Press the start button

Check correct direction of rotation of the traction unit by making sure that the direction is the one shown by the arrow on the drive guard casing.

Start cycle Condition

The following conditions are effective:

- main switch closed (panel on)
- emergency push-button inactive (released)
- guards closed
- no damage to the electromechanical components inside the electric control panel

Front Panel Controls

To refer the electrical scheme to the description of the commands machine.

The main front panel components are:

- Door-lock main switch

This acts directly on the main switch: position "0" cuts off power supply to the electric control panel in order to open the electric control panel door; position "1" connects the circuit to the power supply mains.

- Start button and stop button

Each motor in the system is controlled by start buttons (signaling pilot lamp) and a stop push-button.

The following conditions are effective:

- main switch closed (panel on)
- emergency push-button inactive (released)
- guards closed
- no damage to the electromechanical components inside the electric control panel

the motor starts and the pilot lamp lights up when the start button is pressed.
When the stop button is pressed, the motor stops. The control panel stays on.

Emergency button (red mushroom push-button with a yellow background)

If this button - which should be used only in case of danger - is pressed during normal operation, it will open the control circuit, thereby cutting off power to the motors.
To start up the machine again, after eliminating the emergency condition, reset mushroom head button and turn it counterclockwise. Then press start button.
There could be other buttons on the panel: for more information, see attached wiring diagram.

NOTE

If the button has been pressed during the grinding phase, hence with plenty of material inside the grinding chamber, clean the chamber before resetting the button.
This is carried out in order to avoid rotor blockage and belt slippage.

Inspections and operational tests of safety devices

Inspections and operational tests of the safety devices installed on the machine **must** be carried out before starting up the granulator and at least every week after starting up the machine.

- Visual intactness inspection and correct positioning of the guards.
- The test is carried out by starting the granulator with a manual sequence.

Irregular situations, emergencies and alarms

PLEASE NOTE

If any irregular functioning situations described in the troubleshooting table occur, the operator is only allowed to stop the machine. Only qualified personnel is allowed to eliminate the causes that have produced such irregular operation.

Stopping the granulator

PLEASE NOTE

In order to avoid problems with the next startup, the granulator must be stopped when the grinding chamber is empty.

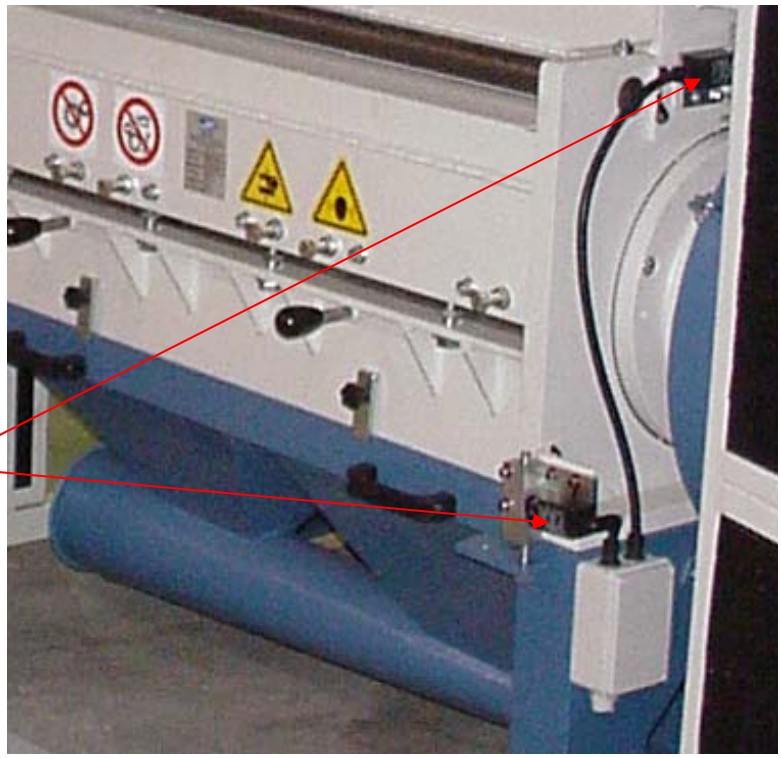
Temporary stop

- Press the motor stop button.

Resetting

Before restarting the machine, it is necessary to:

- Check hopper and discharge device lockup so that the safety limit switches can allow the start up operation (guards in correct position)
- Press the start button on the front panel to start the machine



Setup and first startup

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Introduction

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Inspections before startup

Preventive granulator cleaning

In order to protect the grinding chamber, Tria covers the machine with a layer of lubricant.
It is recommended to remove this layer with a non-corrosive detergent before starting up.

Direction of rotation of motor

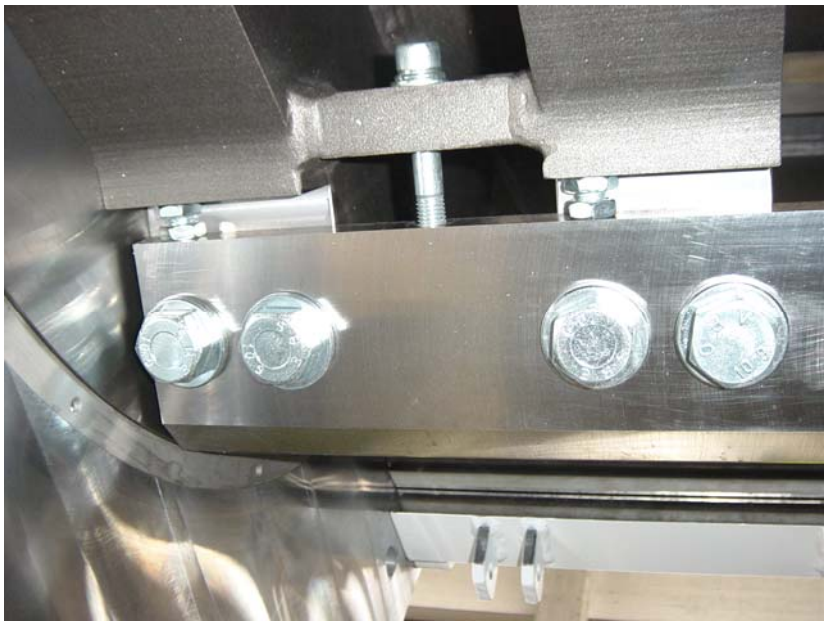
Reverse phases if the motor runs opposite the direction shown by the arrow located on the belt guard casing.

Screen

Before operating the machine, it is necessary to check if the screen is properly fixed to the support and if it is suitable for the granule size required for production (see *Maintenance* section).

Blades and counter blades

Before operating the machine, it is necessary to check if the blades are intact, properly fixed to the support and properly adjusted (see *Maintenance* section). This inspection may be left out if the installation is carried out by Tria technicians.



Maintenance

7

This chapter includes instructions concerning preventive, routine and supplementary maintenance operations. Preventive maintenance required for the various devices will outline the operational frequency

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PLEASE NOTE

If the machine is supplied with Traction unit, see also Traction Manual attached there to; see section 7

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Safety precautions

Introduction

According to **DIN 31051,** the concept of "maintenance" includes the following fields of activities:

Inspection
Inspection includes provisions aimed at recEveryzing an effective condition, or rather at identifying the reasons and methods with which the residual wear margin decreases.

Resetting
Resetting includes provisions aimed at achieving a required condition, or rather at compensating the reduction of performances and resetting the residual wear margin.

People in charge of the maintenance and behavior of the apparatus must be well trained and should have specific knowledge on accident prevention rules.
Unauthorized personnel should stay outside the working area during maintenance operations.

Accident prevention precautions shall always be strictly observed during maintenance and when the apparatus is being operated in order to avoid damage to the equipment and injuries to people.

These precautions will be cited and further specified every time a procedure concerning damage or injury risk is requested. This will be accomplished with **WARNING** and **DANGER** notes.

WARNING notes shall precede an operation which, if not properly carried out, may cause damage to the equipment.

DANGER notes shall precede an operation which, if not properly carried out, may expose the operator to hazards.

Reducing shutdown time after a breakdown

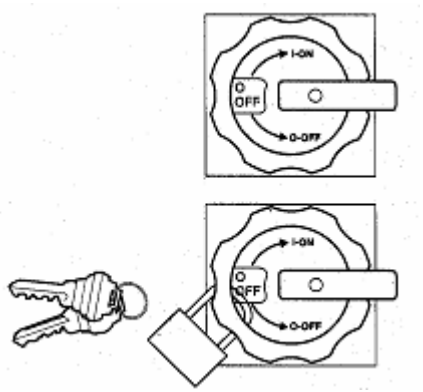
It should be noted that properly performed maintenance operations can remarkably reduce shutdown time after a breakdown. Well-timed repair operations can avoid further deterioration.
Possibly use original spare parts and properly repair broken components at your facility or send them to Tria S.p.A. for repairs.
If problems occur or if you need to order spare parts, contact Tria S.p.A. Technical Assistance Office.

Maintenance warnings

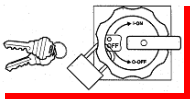
PLEASE NOTE

Make sure the system if off when carrying out maintenance operations

1. Set up clearly visible "Maintenance in progress" caution signs before carrying out maintenance operations.



When suggested on the maintenance sheets, the figure is visualized



2. Only authorized personnel is allowed to access the machine.

3. Using solvents for cleaning operations shall be carried out very carefully, paying close attention to the wires.

4. Do not change or tamper with the machine structure, operation sequence, etc. without informing Tria S.p.A. with a written notification.

5. Maintenance operations shall be entered in the tables included in this section, thereby specifying the date, type of operation and signature of the person who has carried out the operation.

6. All maintenance operations shall refer to the specifications written in this section.

Preventive-routine maintenance and scheduled maintenance

General information

Routine and supplementary maintenance operations should be carried out with different schedules, according to the type of material to be ground. Therefore, the user is generally required to carry out an assessment. This assessment should take into consideration the factors that generally give an indication on the status of the machine.
Basically, such factors concern:

- the quality of the ground material
- the amount of production per hour
- noise

Therefore, under specific conditions of use, it is necessary to assess the noise, the status of the ground material and the speed with which the machine produces material in order to determine the maintenance schedule. By the same token, if the material and environment used are not such as to consider the application crucial, routine maintenance shall be carried out as described below.

Qualification of the operator

Preventive-routine maintenance operations can be carried out by the user in safe conditions only after reading carefully and understanding all the recommendations and instructions explained in this instructions manual.

Scheduled maintenance operations can be carried out by authorized preparation / maintenance personnel in safe conditions only after reading and understanding all the recommendations and instructions explained in this instructions manual.

Safety devices

After the beginning of each shift, check the operation of the emergency push-buttons.
After starting the motor, press the emergency button: The motor must stop.

PLEASE NOTE

Do not modify any of the safety devices.

Scheduled maintenance table

GRANULATOR				
No.	**UNIT**	**ACTION**	**WHO**	**EVERY**
1	SAFETY DEVICES	Inspection	Service engineer	month
2	BLADES AND COUNTER BLADES	Disassembly	Service engineer	-------
3	BLADES AND COUNTER BLADES	Sharpening	Service engineer	-------
4	BLADES AND COUNTER BLADES	Assembly	Service engineer	-------
5	BEARINGS	Greasing	Service engineer Operator	quarter
6	DRIVE BELT	Check / Replacement	Service engineer	Half-year
7	SELF-LOCKING ELEMENT	Maintenance	Service engineer	Half-year
8	HOPPER	Maintenance	Service engineer Operator	-------
9	FUNNEL-SCREEN	Funnel and screen removal	Service engineer Operator	------
10	FUSE	Replacement	Service engineer	-------
11	---------	Grinding chamber cleaning	Service engineer Operator	
12	STRAPS	Replacement	Service engineer Operator	-------
13	WATER CIRCULATION SYSTEM	Inspection	Service engineer Operator	-------

Safety devices - Inspection

MAINTENANCE	CHART
☐ CLEANING ☐ LUBRICATION ■ INSPECTION ☐ ELECTRIC ☐ MECHANICAL ☐ PNEUMATIC	No. 1

Description:	Type NS-R		
Unit:	SAFETY DEVICES		
Operation:	INSPECTION		
Operator:	1	Every:	month

Layout :

These activities – **which must be carried out monthly** – will make it possible to identify failures before starting work activities. Electrical devices that need to be checked are: limit switches on removable guards and the emergency stop button.

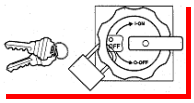
Make sure the limit switch **item 1 and 2** are fastened as the operating machine vibrations could loosen the screws.

Disassembly

MAINTENANCE	CHART
☐ CLEANING ☐ LUBRICATION ☐ INSPECTION	No. 2
☐ ELECTRIC ■ MECHANICAL ☐ PNEUMATIC	

Description:	**Type NS-R**
Unit:	**BLADES AND COUNTER BLADES**
Operation:	**DISASSEMBLY**
Operator:	**1**
Every:	**---**

Layout :



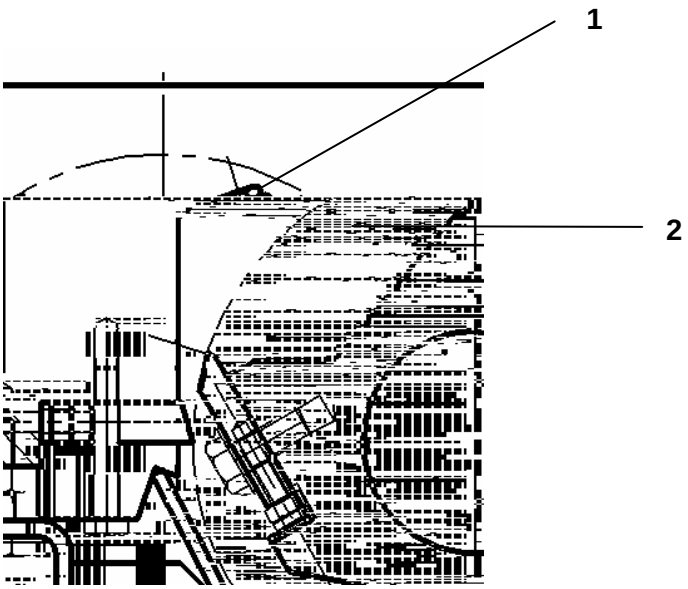
Wear proper work gloves: **do not test the cutting edge of the blades, not even with gloves on.**
When the GRANULATOR starts getting particularly noisy or when the ground material starts getting dusty, blades are no longer in good condition, thus it is time to sharpen them.
To achieve this operation, follow the steps below.

Mind the orientation of the fixed blades so that they can meet the movable blades properly.

If any metal parts accidentally go inside the granulator, thereby causing chipping to the cutting edge, the blades will have to be replaced.

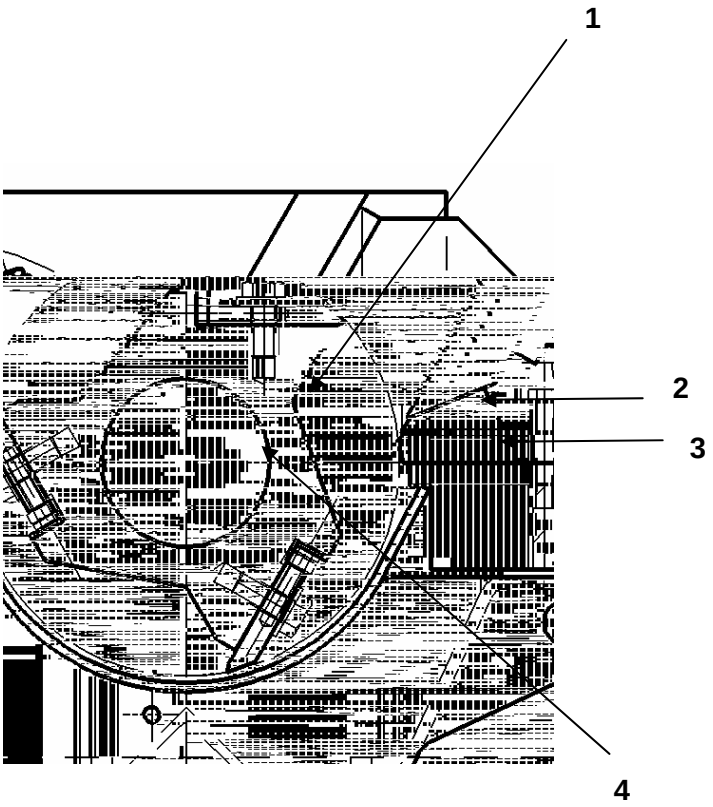
Open up the machine only when you are sure the rotor has stopped. Before removing the blades, block the rotor with a bar made of softwood.

- Loosen the fastening screws item **1**
- Remove the blade item **2**



Remember that the blades are hard and fragile: do not bump or drop them.

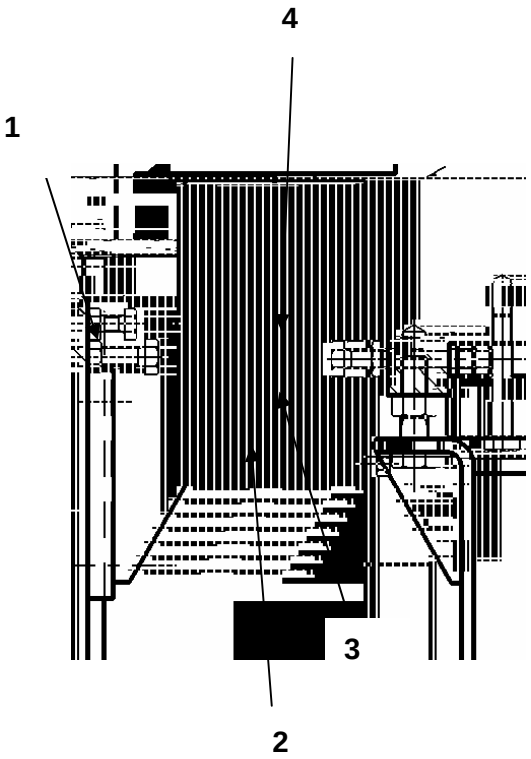
Disassembly of 1st Counterblade



- Loosen the fixing screws pos.**1**
- Withdraw plate the pushing screw pos.**2** and extract the plate
- Loosen the screw pos.**3** and extract the counterknife pos.**4**

Disassembly of 2nd Counterblade

- Loosen the second counterknife pushing screw pos. **1**
- Loosen the fixing screws pos. **2**
- Remove the plate pos. **3**. and the counterknife pos.**4**



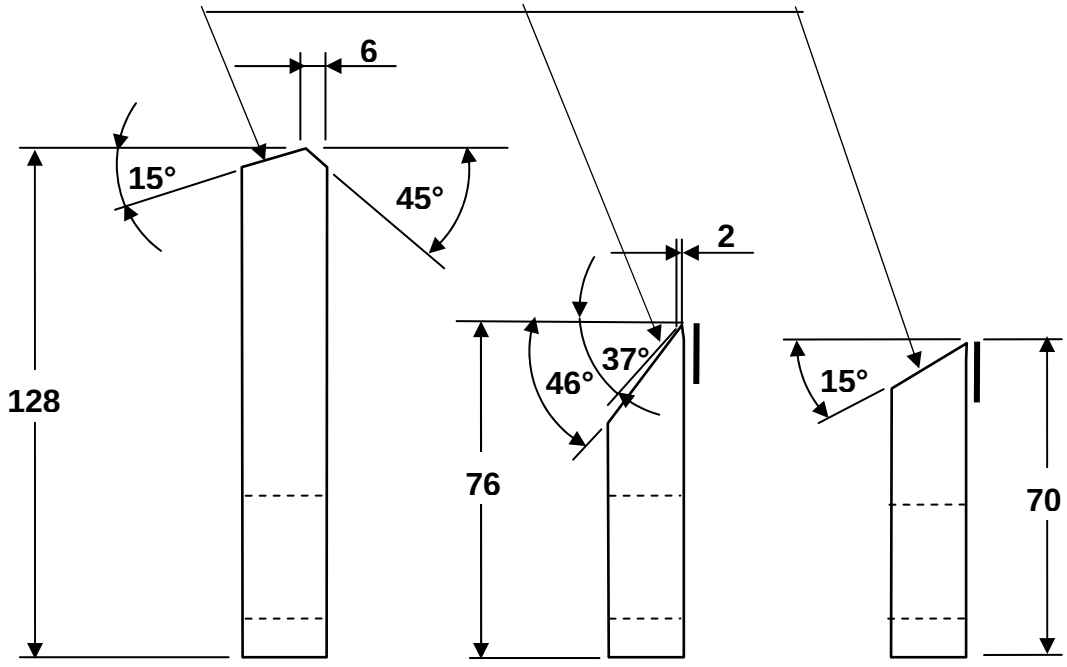
Sharpening

MAINTENANCE	CHART
☐ CLEANING ☐ LUBRICATION ☐ INSPECTION ☐ ELECTRIC ■ MECHANICAL ☐ PNEUMATIC	No. 3

Description:	Type NS-R
Unit:	BLADES AND COUNTER BLADES
Operation:	SHARPENING AND PRE-ADJUSTMENT
Operator:	1
Every:	------

Layout :

Side to be resharpened

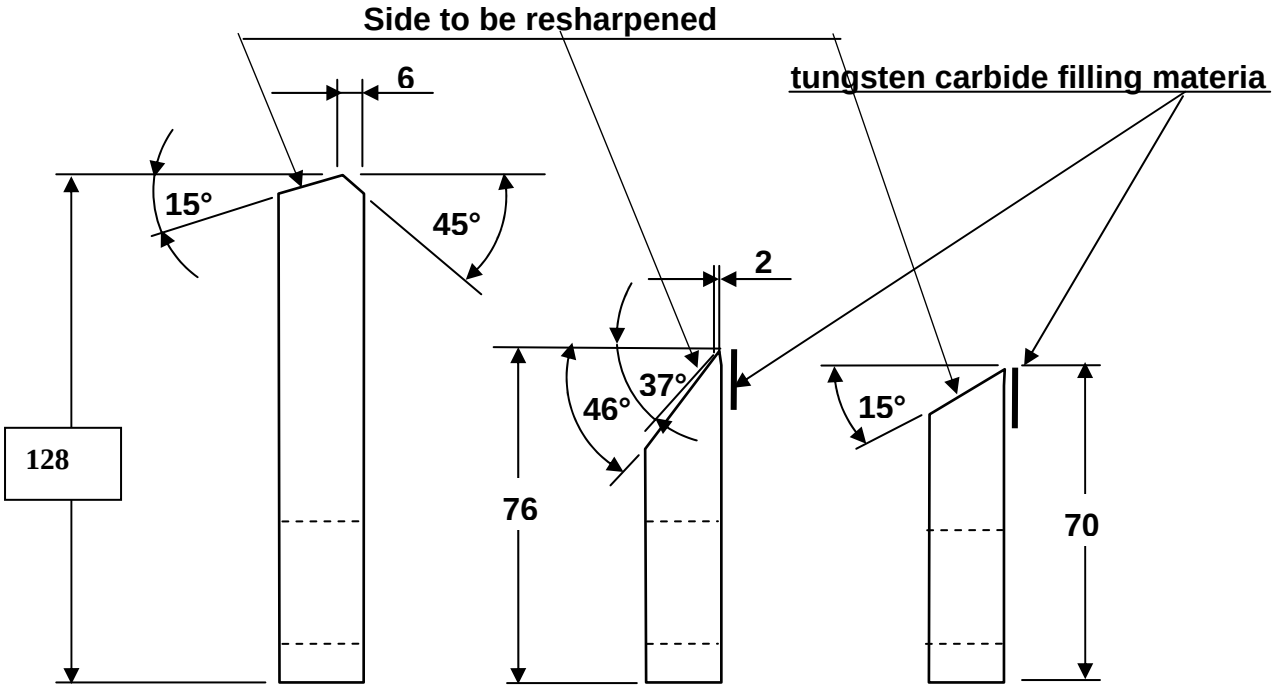


1st counterblade with double chamfer

Blade

2nd counterblade

Blades and counter-blades with tungsten carbide filling material

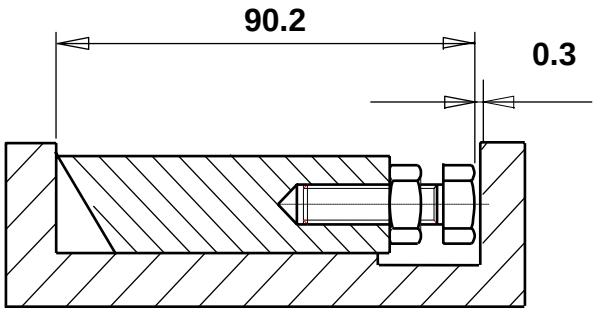


1st Counterblade with double chamfer (if planned)

Rotating blade with tungsten carbide filling material

2nd. Counterblade with tungsten carbide filling material

Do not sharpen sides having tungsten carbide coating



Template for adjusting blades: use a 0.3 mm feeler gauge to remove them after the adjustment

Wear proper work gloves: **DO NOT TEST THE CUTTING EDGE OF THE BLADES, NOT EVEN WITH GLOVES ON!**

The blades must be replaced when the height, after several sharpenings, reaches a min. of. **mm 70** or when they are cracked/chipped: in this last case, thoroughly clean the machine as the metal splinter could cause serious damage

The counter blades must be replaced when the height reaches a **min. of**. **mm 125** (counterblade with double chamfer) and **mm 62** (second counterblade) or when they are cracked/chipped: in this case, thoroughly clean the machine as the metal splinter could cause serious damage

When the GRANULATOR starts getting particularly noisy or when the ground material starts getting dusty, blades are no longer in good condition, thus it is time to sharpen them.
To achieve this operation, follow the steps below.

Mind the orientation of the fixed blades so that they can meet the movable blades properly.

If any metal parts accidentally go inside the granulator, thereby causing chipping to the cutting edge, the blades will have to be replaced.

Remember that the blades are hard and fragile: do not bump or drop them.

- Sharpen the blades according to the indications shown in the picture. The picture shows the angles required to achieve the best cutting conditions and preserve the knives rotation length.
  It should be noted that, if sharpening is not carried out according to these indications, the yield of the machine could decrease in terms of quality and productive capacity.
  In order to avoid overheating the material with subsequent loss of hardness and toughness, sharpening should be carried out with plenty of cooling.

- Important: after sharpening, all blades must have the same height.

Maintenance	Date	Signature of Service engineer

This table should be filled out by the customer if the machine has undergone maintenance.

PAGINA LASCIATA INTENZIONALMENTE VUOTA

Assembly and adjustment of clearance between the blade and counter blade

MAINTENANCE	CHART
☐ CLEANING ☐ LUBRIFICATION ■ INSPECTION ☐ ELECTRIC ■ MECHANICAL ☐ PNEUMATIC	NR. 4

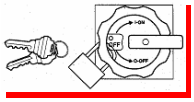
Description: **Type NS-R**

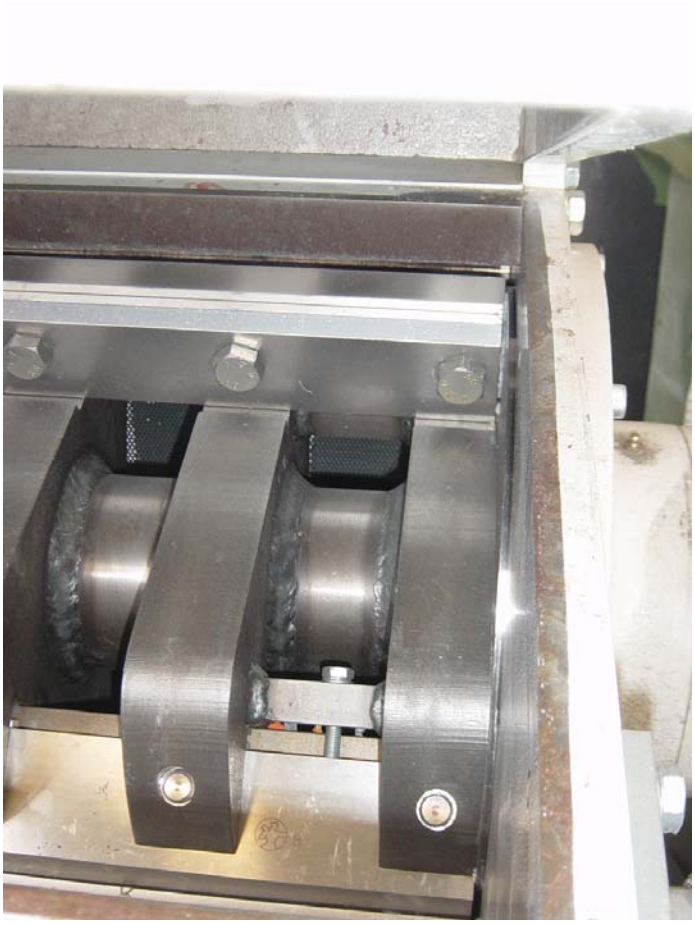
Unit : **BLADES AND COUNTER BLADES**

Operation : **ASSEMBLY AND ADJUSTMENT OF CLEARANCE BETWEEN THE BLADE AND COUNTER BLADE**

Operator : **1** **Every :** --------

Layout :

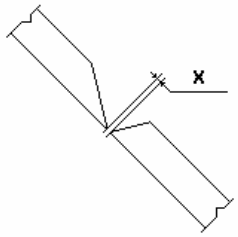




Wear proper work gloves: **DO NOT TEST THE CUTTING EDGE OF THE BLADES, NOT EVEN WITH GLOVES ON!**

Install the blades and counterblades by following the disassembly procedure, described in chart 2, in reverse order; do not tighten the screws.

The knives are pre-adjusted, the adjustment has to be made only on the counterknives. The distance between knife and counterknife must be **0.15 mm;** for a good check use a normal feeler



Tightening check

Make sure all bolts and nuts are tightened by using a torque wrench.

Movable blades are screwed to the rotor. It is important to check periodically if these screws are tight in order to prevent the rotor from blockage due to collisions between the blades and counter blades.

- Manually and slowly turn the rotor assembly to check if it is free.
- Close all the parts again and get the machine ready for operation.

BLADES AND COUNTERBLADES FASTENING SCREWS TECHNICAL FEATURES

Ms Tightening moment table and Fa axial load effects for 8.8 screws with 6 g tolerance screw thread and support under head as per UNI 5931 e 5737. Use a torque wrench to tighten the screws

COEFFICIENTE D'ATTRITO

Dim. Vite	Olio grafitato µt = 0.140						A secco µt = 0.160					
	Fa (N)	Ms (Nm)	Fa (kg)	Ms (kgm)	Fa (Lb)	Ms (Lbin)	Fa (N)	Ms (Nm)	Fa (kg)	Ms (kgm)	Fa (Lb)	(Lbin)
M10	24.600	46	2.500	4,7	5.500	408	23.800	50	2.400	5,1	5.300	440
M12	36.000	81	3.700	8,2	8.150	710	34.500	86	3.500	8,7	7.700	755
M14	50.000	128	5.100	13	11.300	1130	47.000	135	4.800	13,8	10.500	1200
M16	69.000	200	7.000	20	15.500	1740	65.500	215	6.700	22	14.800	1910
M18	83.000	275	8.500	28	18.700	2430	78.500	290	8.000	29,5	17.600	2560
M20	107.000	385	11.000	39	24.300	3390	103.000	420	10.500	43	23.000	3740
M22	133.000	520	13.500	53	30.000	4600	129.000	570	13.000	58	28.700	5040
M24	155.000	670	16.000	68	35.000	5900	149.000	730	15.000	74	33.000	6400

Fa	= Carico assiale	**Kg**	= Chilogrammo
Ms	= Momento di serraggio	**Kgm**	= Chilogrammometro
N	= Newton	**Lb**	= Libbra
Nm	= Newton metro	**Lbin**	= Libbrapollice

Maintenance	Date	Signature of Service engineer

This table should be filled out by the customer if the machine has undergone maintenance.

1

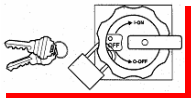
PAGINA LASCIATA INTENZIONALMENTE VUOTA

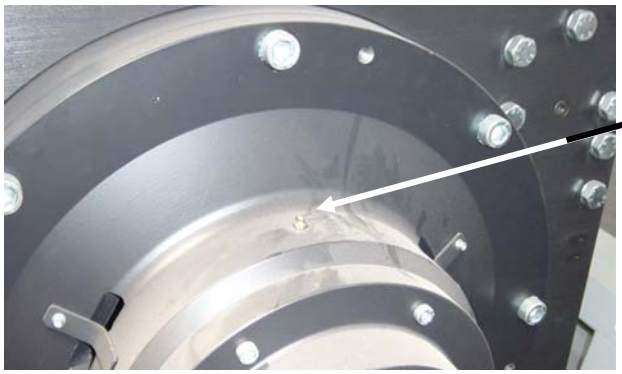
Bearing Greasing

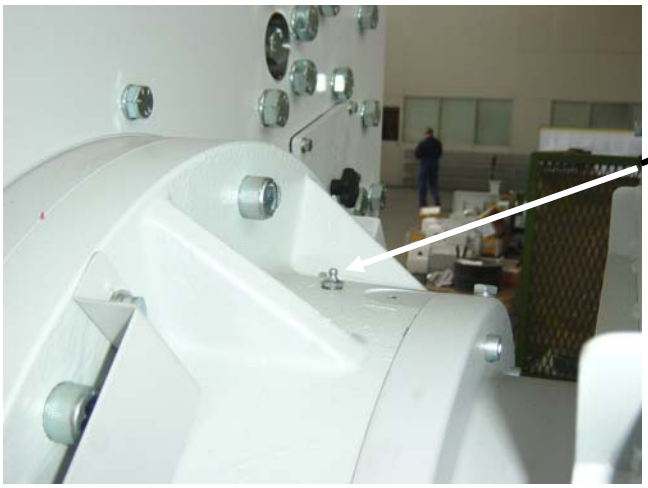
MAINTENANCE	CHART
☐ CLEANING ☐ LUBRIFICATION ■ INSPECTION	NR. 5
☐ ELECTRIC ■ MECHANICAL ☐ PNEUMATIC	

Description:	Type NS-R
Unit :	BEARINGS
Operation :	GREASING
Operator :	1
Every:	semestrale

Layout :







Read section on "SAFETY PRECAUTIONS" carefully.

In order to carry out this operation, the bearing housings have been supplied with grease fittings (item **1**)

Proceed as follows:

- Use the emergency stop switch in order to prevent the machine from starting up (due to accidental operations) when the power is switched on.

- Use the grease fittings as shown in the picture only when you are sure that the machine is not running.

- Inject the grease in the grease fittings.

  Periodically grease (every 4 – 6 months) the bearing housings with **SKF LGMT 2/50** grease or equivalent according to the features specified in the table:

Thickening agent (soap)	LITHIUM
Basic oil	mineral
Consistency (NLGI)	3
Operating temperature range	-10° - + 120° C
Rust preventer additives	
Good water resistance	

Be careful when using grease: avoid contact with eyes. Do not disperse into the environment. Please see the "Troubleshooting" section.

Never grease before the first startup (unless otherwise specified). Thoroughly clean the grease fitting before each lubrication. Gently introduce the grease. If possible, slowly turn the shaft with gloved hands.
Abundant greasing is harmful. It is preferred to grease frequently and in small quantities (about 10 gr.)
Never lubricate with oil but just grease. Do not mix different greases.

Greasing should be carried out with machine not running

- Close all the parts again and reset electrical connections.

It is recommended to use only the required amount of grease. Do not use too much grease. If necessary, remove exceeding lubricant, grease or redundant graphite with a proper cloth.
Exceeding or lack of lubricant may cause erroneous machine operation.

Use only recommended lubricants or lubricants with equivalent features. Lubricants should be qualitatively known and tested.

Grease fittings

Inject the grease in the grease fittings with a proper pump until greasing is completed.
The periodicity of greasing also depends on the operating conditions of the machine. The type of grease to be used is specified in the section on "fillings".

Ball bearings

The ISO 281 Standards rates the endurance of a rolling bearing according to the number of revolutions it can reach before any fatigue phenomena start to occur on one of its races or rolling parts.
Clearly, identical and functional bearings (both those to be tested in a lab and those used for practical purposes) used in identical conditions, may have different endurances.

Measuring is carried out by our engineering department from SKF.

Maintenance	Date	Signature of Service engineer

This table should be filled out by the customer if the machine has undergone maintenance.

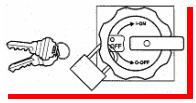
PAGINA LASCIATA INTENZIONALMENTE VUOTA

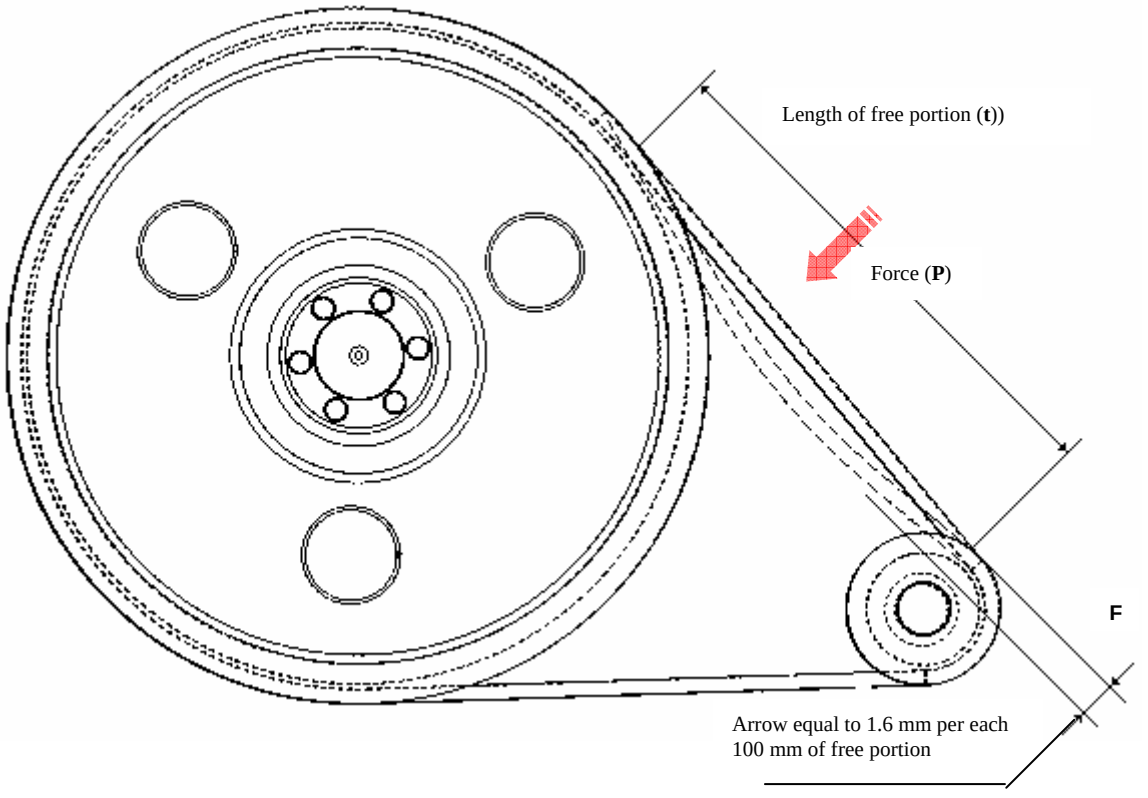
Drive Belt Inspection

MAINTENANCE			CHART
☐ CLEANING	☐ LUBRIFICATION	■ INSPECTION	NR. 6
☐ ELECTRIC	■ MECHANICAL	☐ PNEUMATIC	

Description:	Type NS-R		
Unit :	DRIVE BELT		
Operation :	INSPECTION / REPLACEMENT		
Operator :	1	Every :	-------

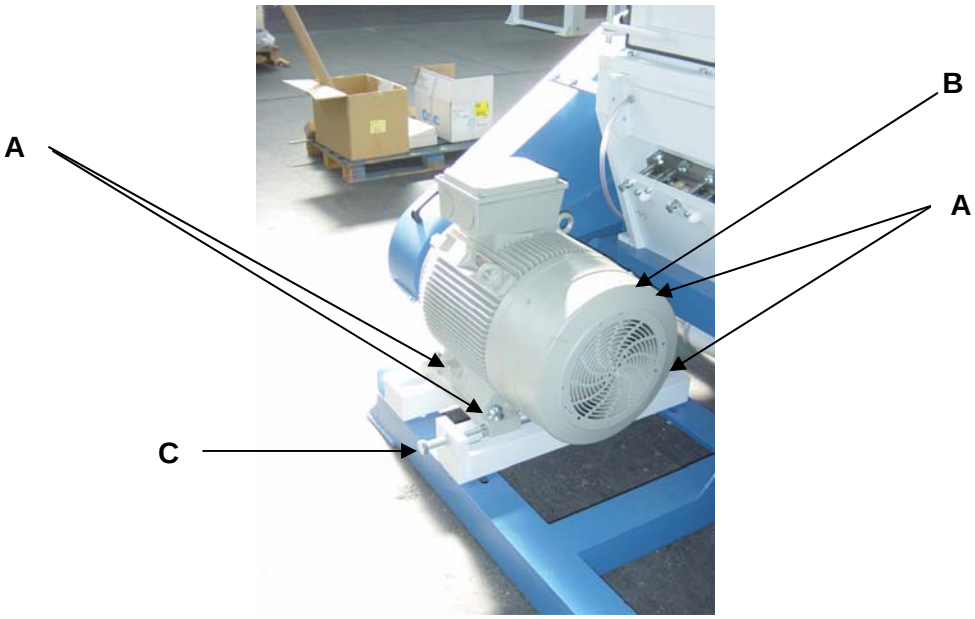
Layout :





Belts replacement

- Belts must be replaced by qualified personnel only
- Belts must be replaced only when belt drive is not running
- Make sure the electric power is off:
- Reduce the distance between the pulleys by sliding the motor and by loosenning the 4 bolts (**A**) and the counter-pressure screws (**B)** and the counter-pressure screws **C**(see figure).



- Remove belts to be replaced:
- **Always replace all belts at the same time** with belts of the same kind;
- **Always** install **all** required belts;
- Use the same belts as those supplied with the machine: if that is not possible, make sure that: the cross-section of the belt is suitable and can be used with the pulley; the belt is, to a feasible extent, as long as the original belt.

Belt installation

Before positioning the belts on the pulleys, check the following:

a) Wear of pulley grooves. If the grooves are worn out, it is highly recommended to replace them. Otherwise, the belts will quickly start to deteriorate.
b) Cleanness of the sides of the pulley grooves which could have traces of oil or sediment.

When installing, the belt should not be forced into the pulley grooves with a tool. Generally, for easy installation, just reduce the distance between the pulleys or the tension of the tightener; otherwise, it will be necessary to remove at least one of the pulleys.
To ensure proper operation and avoid an untimely rupture, the belts should be stored without any heavy creases and should not be exposed to extremely high or low temperatures or to high dampness.
Each drive should be protected to ensure the safety of persons and to prevent abrasive or improper material from damaging the drives thereof.

Install the belts by following the above-mentioned disassembly procedure in reverse order;

Drive tensioning

- Pulley alignment. Perfect alignment should be achieved in order to guarantee a long lifetime of belts.
- The best tension is the lowest. Low tension does not make the belt slip under maximum load conditions.
- Frequently check the tension during the first 24/48 running-in hours.
- Overtensioning can reduce life of the belt and of the bearing.
- keep belts free from any improper material which may cause slippage.
- Check drive periodically. Tension it when it starts slipping.

Use the following procedure to check the tension of conventional drives:

- Measure the length of the free portion (***t***)

In the middle of the free portion (***t***), apply force ***P*** (perpendicular to the free portion) just enough to bend the belt 1.6 mm per 100 mm of the free portion length. For example, bending 1000 mm of a free portion will be equal to 16 mm

PLEASE NOTE

After two weeks from the first startup, check the tension of the belts and, if needed, adjust them.

Maintenance	Date	Signature of Service engineer

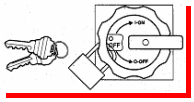
This table should be filled out by the customer if the machine has undergone maintenance.

Self-locking element

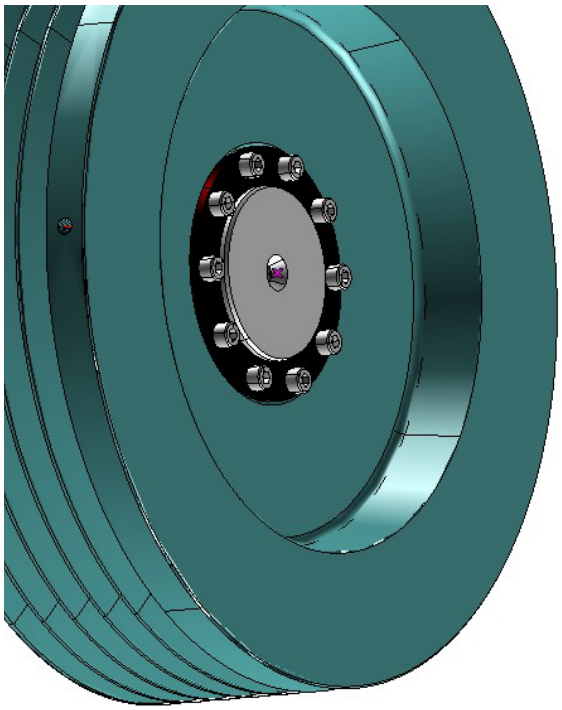
MAINTENANCE	CHART
☐ CLEANING ☐ LUBRIFICATION ■ INSPECTION	NR. 7
☐ ELECTRIC ■ MECHANICAL ☐ PNEUMATIC	

Description:	Type NS-R
Unit :	SELF-LOCKING ELEMENT
Operation :	MAINTENANCE
Operator :	1
Every :	semestrale

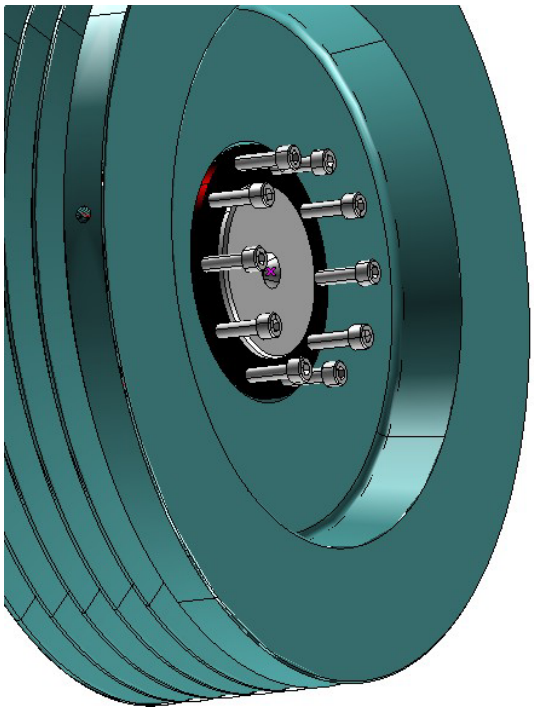
Layout :



Screw when being tightened



Loosen tightening screw



A self-locking element is a connection component that allows a driving trasmission. The granulator is equipped with a self-locking element mounted on the flywheel pulley.
This is a self-centering-self-locking element.

Disassembly Instructions

1. Loosenn and remove all tightening screws.
2. Fit the screws in the front cone removal threadings.
3. Gradually tighten the screws in a crisscross sequence until the first cone is freed.
4. Manually tighten the screws until they start to oppose resistance again.
5. Gradually tighten the screws again in a crisscross sequence until the second cone is freed, hence freeing the whole self-locking element.
6. Take the self-locking element off the shaft and off the hub.

Reusing the Self-locking element

1. Thoroughly clean the self-locking element surfaces.
2. Slightly oil the surfaces.
3. Reinstall the cones in their original position. Make sure the removal threadings match the flat reaction surface.
4. Repeat the same assembly and disassembly procedures.

Assembly instructions

1. Thoroughly clean the contact surfaces of the shaft and hub and then apply a thin film of fluid mineral oil on them.
2. Make sure the tolerances fall within the permissible range (h8/H8), and then fit the self-locking element between the shaft and hub. Make sure the adjustment of the slots of the tightening cones are opposed to the right and to the left and adjust the shell slots downwards.
3. When the hub shows a centering base, loosenn all screws before installing the element in the housing. Remove two screws and fit them in the removal threadings in order to move the two cones away as far as possible; by doing so, the assembly and disassembly operations will be easier. Before starting to tighten, remember to put the two screws back into their holes.
4. Manually tighten the screws until the cones contact the shaft and the outer ring contacts the hub.
5. Tighten the screws in a crisscross sequence by using a calibrated torque wrench. Go on until you reach 50% of the torque value specified for the screws in the table (see figure 1).
6. Repeat the same operation in a crisscross sequence and with torque wrench calibrated at 100% of the value specified in the table.

7. Check again if the torque of the screws is equal to the torque shown in the table by executing 2.5 revolutions clockwise (see figure 2).
8. When the two and a half revolutions have been executed to tighten the screws at their rated torque, the torque wrench (calibrated at 60% of the rated tightening torque value) must trigger.

No other additional action is required after this operation.

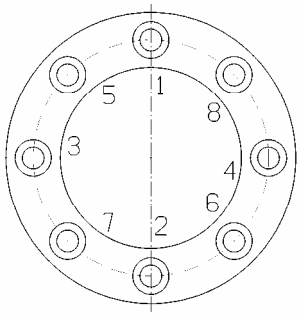


Figure 1

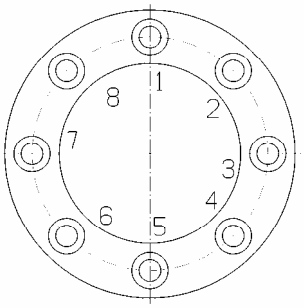


Figure 2

COARSE PITCH SCREWS CLASS 12.9		
MEAN FRICTION FACTOR μ=0.14		
Coarse pitch	**MA (Nm)**	
M 6	1.7	
M 8	4.1	
M 10	8.3	
M 12	14.5	**LEGEND:**
M 14	23.0	**MA =** (Deca-newton, Nm meters)
M 16	35.5	
M 18	48.5	**12.9 =** Class unified by screw manufacturers
M 20	69.0	according to the material resistance values
M 22	93.0	
M 24	120	
M 27	180	
M 30	240	

PAGINA LASCITA INTENZIONALMENTE VUOTA

Hopper overturn sequence

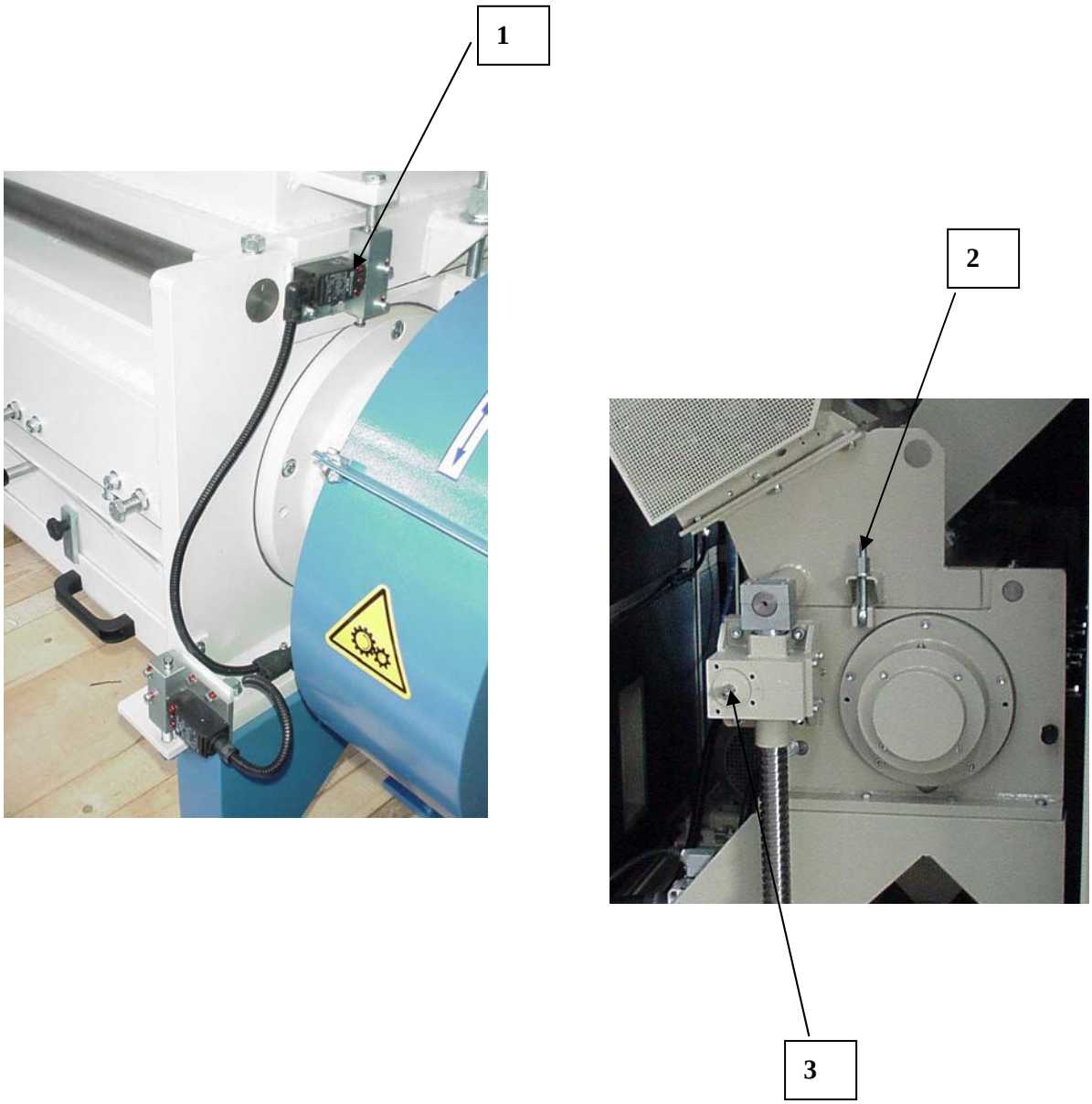
MAINTENANCE			CHART
☐ CLEANING	☐ LUBRIFICATION	■ SEQUENZA	NR. 8
☐ ELECTRIC	■ MECHANICAL	☐ PNEUMATIC	

Description:	Type NS-R
Unit :	HOPPER
Operation :	HOPPER OVERTURNING SEQUENCE
Operator :	1
Every :	---

Layout :

Perform this sequence only if the hopper is installed

- Unlock the screw of the safety microswitch for hopper opening **pos.1**
- Act on the tie-rods nuts till complete opening **pos. 2**
- Tip the hopper acting on the jack **pos. 3**



PLEASE NOTE

Please note: wait until the machine has cooled down before starting any maintenance operations.

Cover the grinding chamber in order to prevent material or tools from accidentally falling inside of it.
Clean the hopper (suck, eliminate stuck material) without striking it, deforming it or scraping it. Use a bag to collect scrap (do not disperse it).

Always make sure that the machine is stable and that when moving the hopper, it cannot strike anything or anyone.

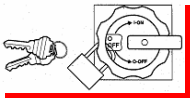
Then remove the covering on the grinding chamber and clean the chamber with an aspirator.

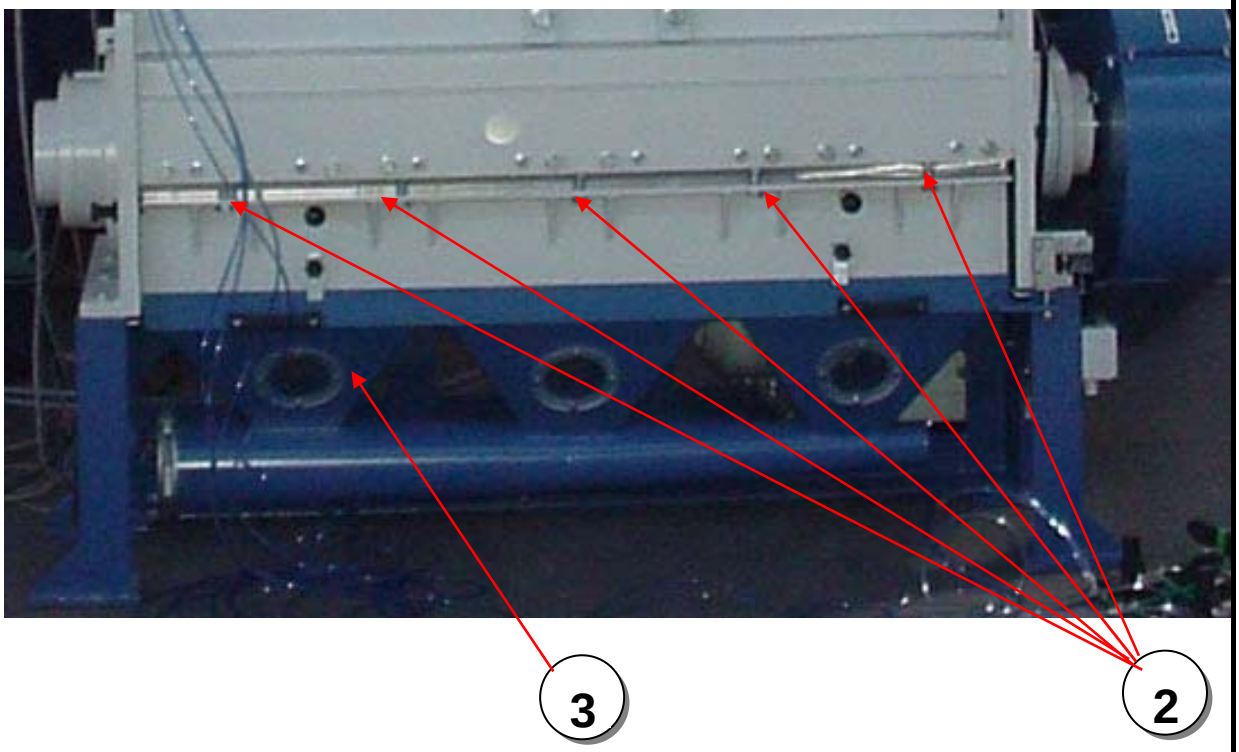
Funnel and screen removal sequence

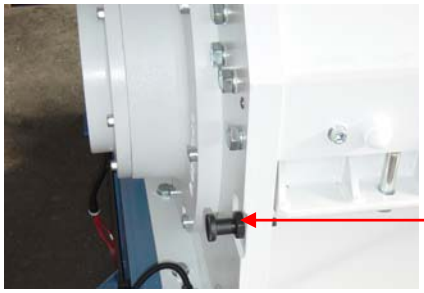
MAINTENANCE			CHART
☐ CLEANING	☐ LUBRIFICATION	■ SEQUENZA	NR. 9
☐ ELECTRIC	■ MECHANICAL	☐ PNEUMATIC	

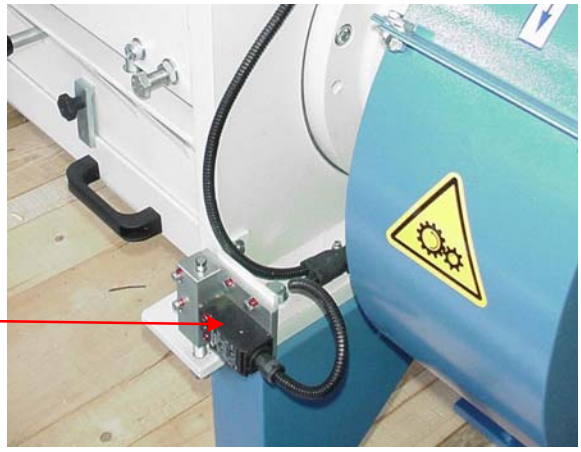
Description:	Type NS-R
Unit :	FUNNEL / SCREW
Operation :	Funnel and screen removal sequence
Operator :	1
Every :	---

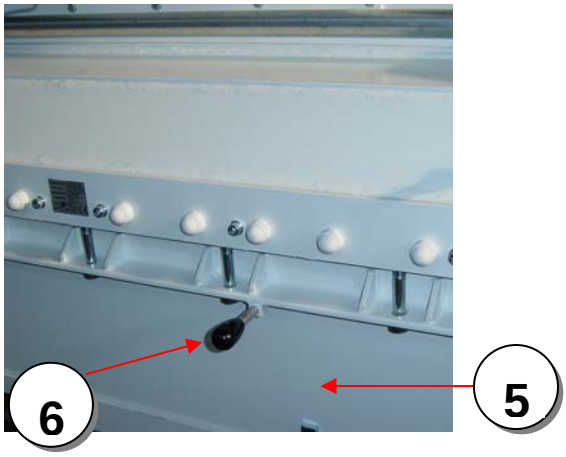
Layout :











- Release the screw (item. **1**) from the safety microswitch
- Release the locking screws, item **2**
- Pull out the collecting loader/bin funnel item. **3**
- Use lock pin item. **4** Open the screen-holder item **5** by means of the handles item **6**
- Pull out sorting screen item **7**, hook it and remove it with a hoist.

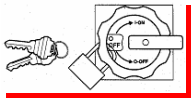
Clean the screen-holder and the screen (suck, eliminate stuck material) without striking it, deforming it or scraping it.

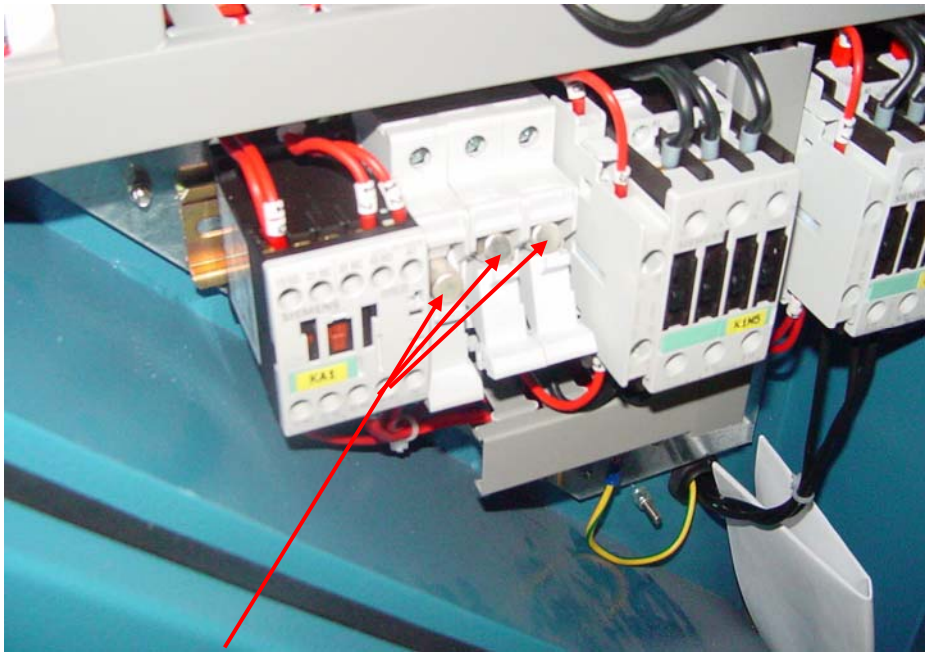
Replacing the Fuse

MAINTENANCE	CHART
☐ CLEANING ☐ LUBRIFICATION ■ INSPECTION	NR. 10
■ ELECTRIC ☐ MECHANICAL ☐ PNEUMATIC	

Description:	Type NS-R
Unit :	FUSE
Operation :	Replacing the Fuse
Operator :	1
Every :	---

Layout :





The intervention of the control circuit protective fuse means that an anomaly has occurred and has caused an excessive electric current absorption. Therefore, it is necessary to identify and solve the problem that has caused this anomaly and replace the fuse that will hence be found blown. Follow the steps below to carry out this operation:

- Use the emergency stop in order to prevent the machine from starting up (due to accidental operations) when the power is switched on.
- Open the electric control panel.
- Open the fuse holder by pulling the appropriate tongue outwards.
- Remove the fuse that must be replaced.
- Fit a new fuse of the same type.
- Close the fuse holder again.
- Put back all parts.
- Reset the stop button. Make sure the start switch is off (OFF position).

The granulator can be started only after properly removing all material residues from the grinding chamber.

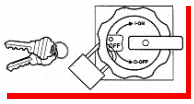
maintenance	Date	Signature

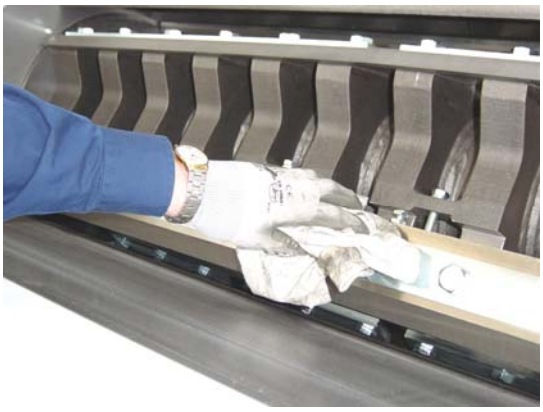
This table should be filled out by the customer if the machine has undergone maintenance.

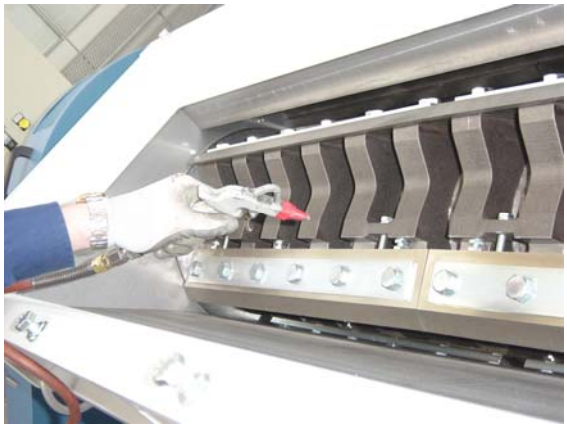
MAINTENANCE	CHART
☐ CLEANING ☐ LUBRIFICATION ■ INSPECTION ☐ ELECTRIC ☐ MECHANICAL ☐ PNEUMATIC	NR. 11

Description:	Type NS-R
Unit :	----------
Operation :	**Grinding chamber cleaning**
Operator :	1
Every :	---

Layout :







Every time different coloring material is used, thoroughly clean the screen grinding chamber as well as the discharge funnel with compressed air and/or with an aspirator.

In order to access the grinding chamber, follow the hopper overturn procedure (chart 8) and the screen/funnel disassembly procedure (chart 9).

NOTE Do not put objects in the grinding chamber: introduce only the opening of the aspirator.

Blades are sharp and fragile: keep hands and body away from the knives rotation length; turn the shaft with a softwood board.

Remove any material twisted around the ends of the shaft with pliers or tongs

Keep the shaft from accidentally turning by using a bar made of softwood.
Install the screen again (every time the blade is sharpened, turn the screen to prevent the holes from being ovalized and eventually replaced).

Close the screen-holder again.

Reposition the collecting loader/bin funnel (make sure it is empty).

Make sure that the grinding chamber is empty and that the blades are properly positioned and in good condition.

Close the hopper and make sure that its supporting surface is clean

Make sure that all guards are in place and fully efficient. Otherwise, stop and warn the foreman.

Replacing the Shutters

MAINTENANCE	CHART
☐ CLEANING ☐ LUBRIFICATION ■ INSPECTION ☐ ELECTRIC ☐ MECHANICAL ☐ PNEUMATIC	NR. 12

Description:	Type NS-R		
Unit :	SHUTTERS		
Operation :	REPLACEMENT OF SHUTTERS		
Operator :	1	Every :	---

Layout :

NOT available

PAGINA LASCITA INTENZIONALMENTE VUOTA

Cooling system

MAINTENANCE	CHART
☐ CLEANING ☐ LUBRICATION ■ INSPECTION ☐ ELECTRIC ☐ MECHANICAL ☐ PNEUMATIC	No. 13

Description:	Type NS-R	
Unit:	COOLING UNIT	---
Operation:	COOLING SYSTEM INSPECTION	
Operator:	1	**Every:**

Layout :

NOT available

Scheduled maintenance tables

This table should be filled out by the customer if the machine has undergone maintenance.

Maintenance	Date	Signature of Service engineer

PLEASE NOTE

Any type of cleaning should be carried out with machine not running and with a disconnected electric control panel.

Troubleshooting

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Introduction

TRIA S.P.A. has designed and built this machine according to the Community Directive Standards 98/37/CE.

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Furthermore, the safety equipment must be constantly kept operational. All required maintenance operations must be carried out according to specific schedules.

This handbook must be kept for the whole lifetime of the machine and must be available to operators and service engineers at all times.

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For information concerning connections, installation or any general information, see granulator handbook.

Failures and malfunctions

When trouble-shooting, maximum safety precautions must be adopted: at any rate, before starting to trouble-shoot, make sure that:

- the electric power is disconnected (see Safety and accident prevention)
- the rotor is not moving
- no unexpected startups will take place or even be carried out by other operators.

The purchaser must provide the operators with appropriate and functional tools, instruments and body-protection equipment.

When trouble-shooting, remember that replacing a clearly damaged component is often not enough as it is necessary to identify the cause before the breakdown.
The table below is a trouble-shooting guide for process, mechanical and electrical breakdowns:

Problems concerning the process

MALFUNCTIONS	PROBABLE CAUSE	CORRECTIVE ACTION
A) Rotor blockage	1) overfeeding	Reduce feeding capacity
	1a) grinding chamber clogged	Clean chamber
	2) introduction of material alien to plastic	Select the ingoing material
	3) discharge device clogged	Empty discharge device
	4) screen clogged	Remove screen, clean it and make sure it is not damaged
	5) bearings seized	Replace bearings
	6) inadequate tension of drive belts	Check belt tension, adjust belt tension and check motor slide screws
B) Abnormal dusty ground material	1) blades inadequately sharpened	Re-sharpen or replace blades
	2) blades sharpened with wrong angles	Re-sharpen or replace blades
	3) deteriorated screen	Replace screen
	4) excessive clearance between blades and counter blades	Check clearance and adjust, if necessary
	5) wrong direction of rotation of motor	Check direction of rotation and, if necessary, reconnect the electrical connections
C) Overheated material	1) see points	See points
	A3	A3
	B1 - B2 - B3	B1 - B2 - B3
	2) Screen with holes too small	Call Technical Service
D) Reduction of productivity	See points	See points
	B1 – B3 – B4	B1 – B3 – B4
E) Flyback	Shutters damaged	Replace shutters. Call Technical Service

Mechanical problems

MALFUNCTIONS	PROBABLE CAUSE	CORRECTIVE ACTION
A) Bearings overheated	1) excessive tension of belts	Check belt tension and if necessary, adjust
	2) inadequate lubrication	Lubricate housings properly
B) Cracks in the blades or breakage of blades	1) grinding of prohibited material	Call Technical Service. Replace blades
	2) sharpening mistake	Replace blades
	3) blade/counter blade mechanical interference	Replace blades
C) Blades moving from their housings	1) abnormal support of blades	Clean the supporting surface of the blades
	2) loose blade fastening screws	Tighten the screws properly
	3) yielded blade fastening screws	Replace screws with other identical screws
D) Excessive blade wear	1) grinding of prohibited material	Call Technical Service. Sharpen or replace blades
E) Screen-holder not locked	1) wrong positioning of screen	Remove and re-position screen
F) Incomplete hopper lockup	1) supporting surface not clean	Clean supporting surface
G) Excessive noise	1) worn blades	Sharpen blades and, if necessary, replace them
	2) Overfeeding	Reduce feeding capacity
	3) Shutters damaged	Replace shutters. Call Technical Service
	4) grinding of prohibited material	Call Technical Service
	5) Blades and counter blades contact	Check blade – counter blade clearance and, if necessary, adjust, sharpen or replace blades
H) Vibrations	1) blades not sharpened	Sharpen blades
	2) shaft is unbalanced	Call Technical Service
	3) bearings are worn-out or not lubricated	Call Technical Service. Lubricate housings.

Electrical problems

MALFUNCTIONS	PROBABLE CAUSE	CORRECTIVE ACTION
A) Motor does not start	1) safety microswitch	check screen-holder lockup funnel -hopper Call Technical Service
	2) electric power failure	check and, if necessary, replace fuses or reset automatic switch
	3) motor contactor not powered	check main line and auxiliary circuits safety devices
	4) emergency push-button pressed	Reset emergency push-button
	5) Thermal relay and automatic devices triggered	reset: in case of recurring triggering, check operating current and, if necessary, call Technical Service
B) excessive motor absorption	overfeeding	reduce supply

Waste disposal

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Definition of waste

Waste means any substance and/or object, which is dumped or should be dumped, resulting from human activities or from natural cycles.

Special waste

Among the others, the following is considered special waste:

- residues resulting from industrial processing, agricultural and craft activities as well as commercial and service sector activities that are not quantitatively or qualitatively declared as assimilable household waste
- deteriorated and obsolete machinery and equipment

Toxic-harmful waste

Any type of waste specified in the current regulations must be considered toxic-harmful waste.

Temporary storage

Temporary storage of toxic-harmful waste is allowed depending on its expected disposal through final treatment and/or storage. However, the user's current laws must be observed for the conservation of the environment.

Features of containers

Stationary and mobile containers, used for containing toxic and harmful waste, must have the right resistance requirements in relation to the physical and chemical properties and to the hazardous features of the waste contained therein.
Containers used for containing products, hazardous or harmful materials must have indications and symbols, as those shown in the picture, in order to give information on the nature of their content.

Record keeping obligations

Journals must be kept by all companies that receive special or toxic-harmful waste resulting from industrial and craft activities.

Disposal

Special and/or toxic-harmful waste collection shall be contractually carried out by expressly authorized companies. Any company materially transporting waste must have the required authorizations and must be chartered.

Scrapping the granulator

All regulations imposed by the law and by the inspectorate of each Country must be observed.

PLEASE NOTE

The demolition of the granulator must be carried out by qualified electricians and mechanics. Before disassembling, it is necessary to make enough room and to have a tidy area around the machine so as to allow handling without having any further risks due to the environment.

It is necessary to:

- Disconnect the machine from the mains.
- Disconnect outgoing knife-switch electric cables.
- Disconnect supply cables from the electric control panel.

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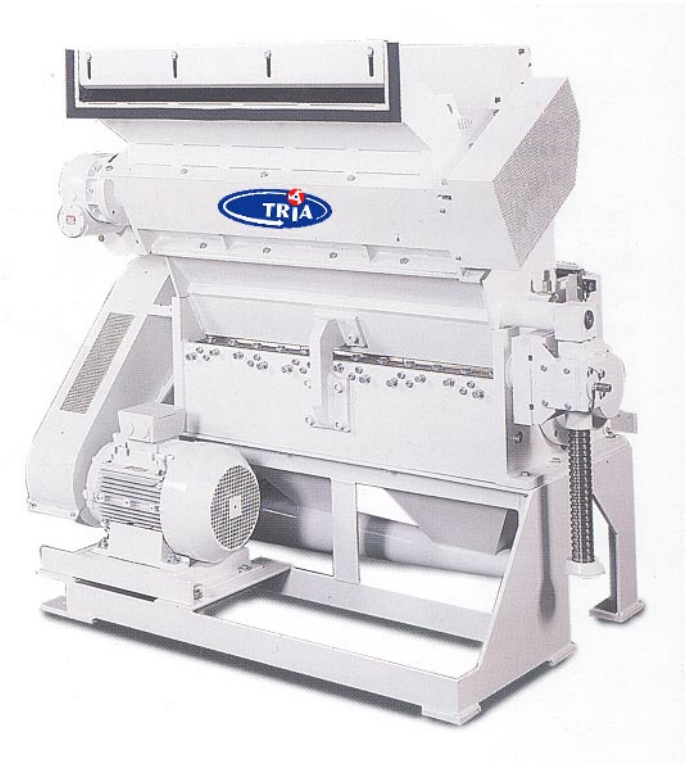
SPARE PARTS -DIAGRAMS

Type NS-R

900-1200



Spare parts - Diagrams

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PLEASE NOTE

If the machine is supplied with Traction unit, see also Traction Manual attached thereto; see "Spare parts" section

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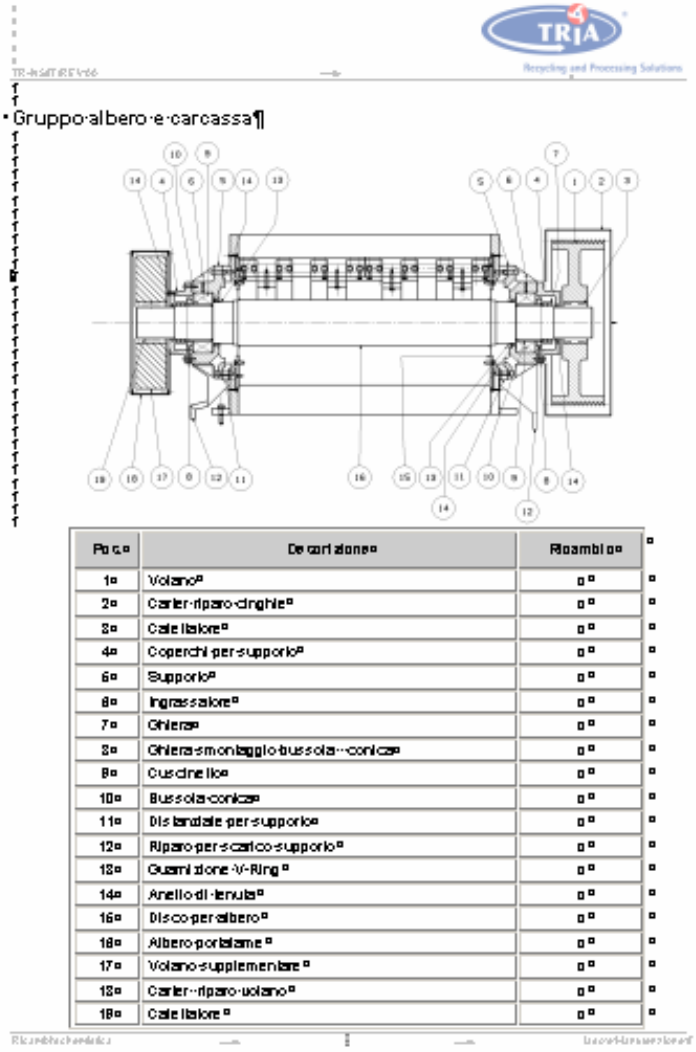
Ordering spare parts

This chapter shows and describes the structure of the JM series machine, including all its units.
If the Customer needs to send a request for spare parts, please use the following pages to order the component(s).

Ordering example:

If you need to order the blade-holder shaft:
go to the shaft assembly page;
flag the field "spare parts" related to the description;
identify the serial number described in section 4 "Marking";
fax your order



Pos.	Descrizione	Ricambio
1	Volano	
2	Carter riparo cinghie	
3	Calettatore	
4	Coperchi per supporto	
6	Supporto	
8	Ingrassatore	
7	Ghiera	
5	Ghiera smontaggio bussola conica	
9	Cuscinetto	
10	Bussola conica	
11	Distanziale per supporto	
12	Riparo per scarico supporto	
13	Guarnizione V-Ring	
14	Anello di tenuta	
16	Disco per albero	
18	Albero portalame	
17	Volano supplementare	
15	Carter riparo volano	
19	Calettatore	

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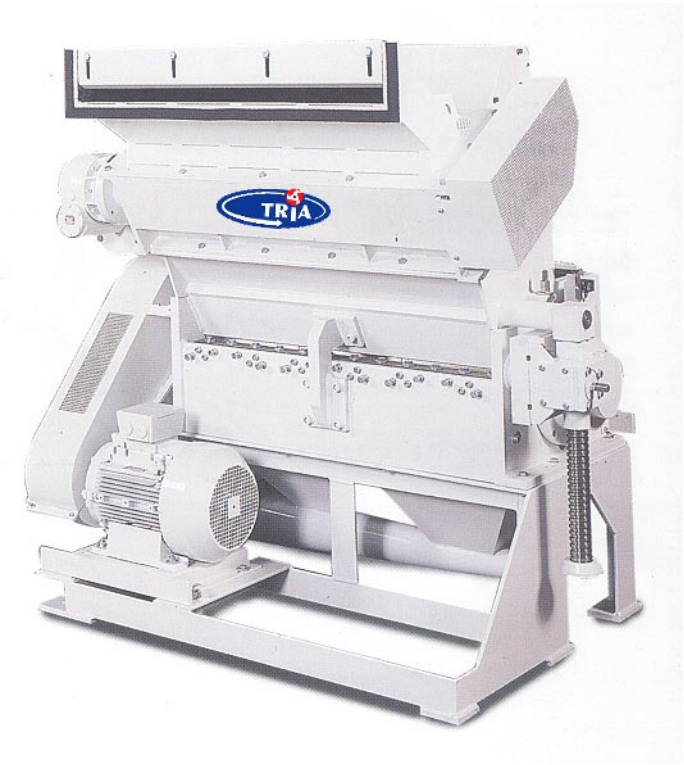
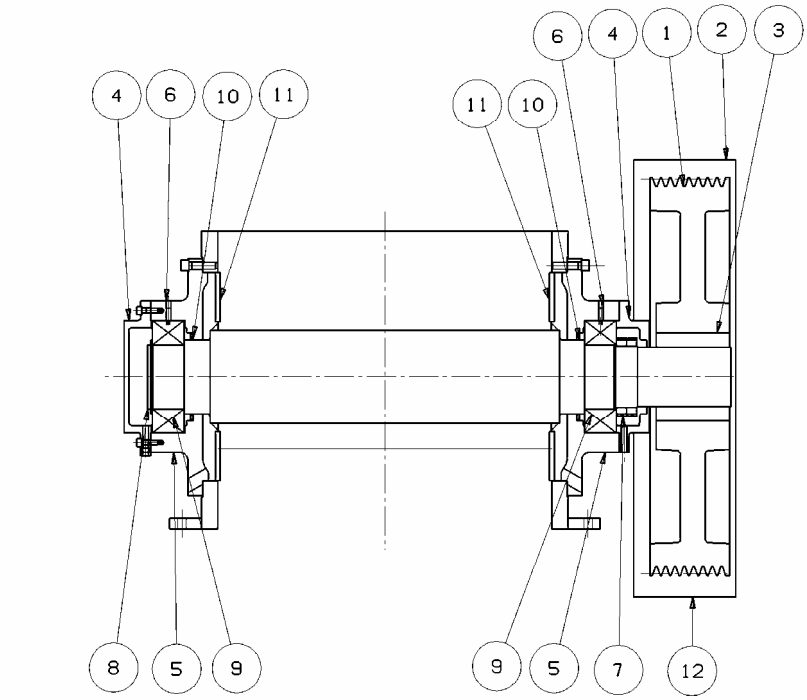
General machine assembly



Blade Holder and grinding body

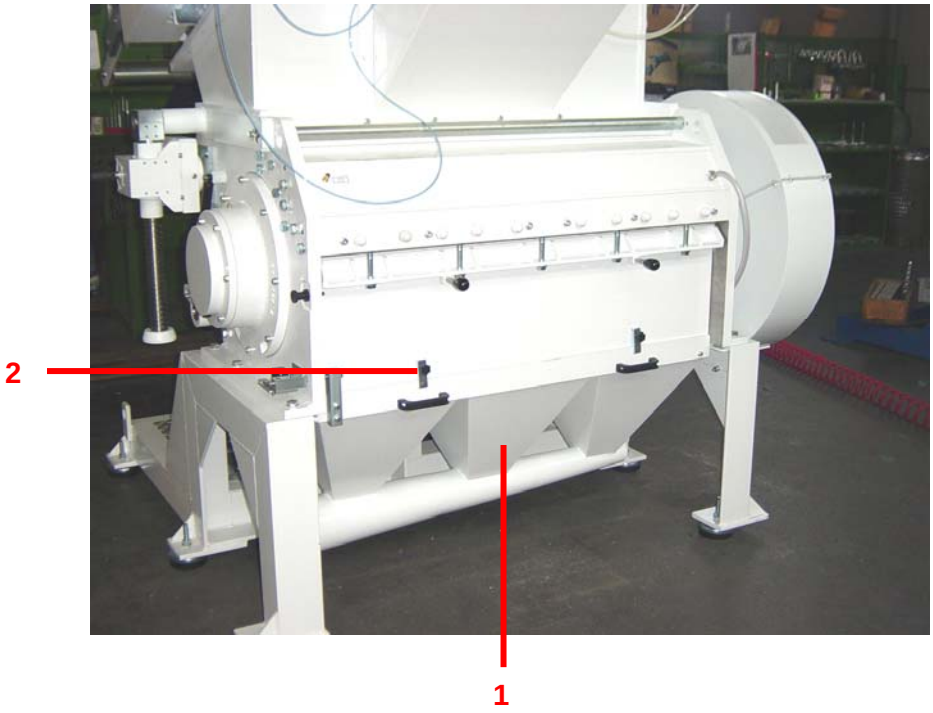


Pos.	Description	Spare-part
1	fly-wheel	□
2	carter for belts protection	□
3	shaft clamping device	□
4	support lids	□
5	support	□
6	greaser	□
7	ring nut	□
8	Shrink disk	□
9	bearing	□
10	Ring	□
11	Shaft disk	□
12		□

Blades and counter blades unit

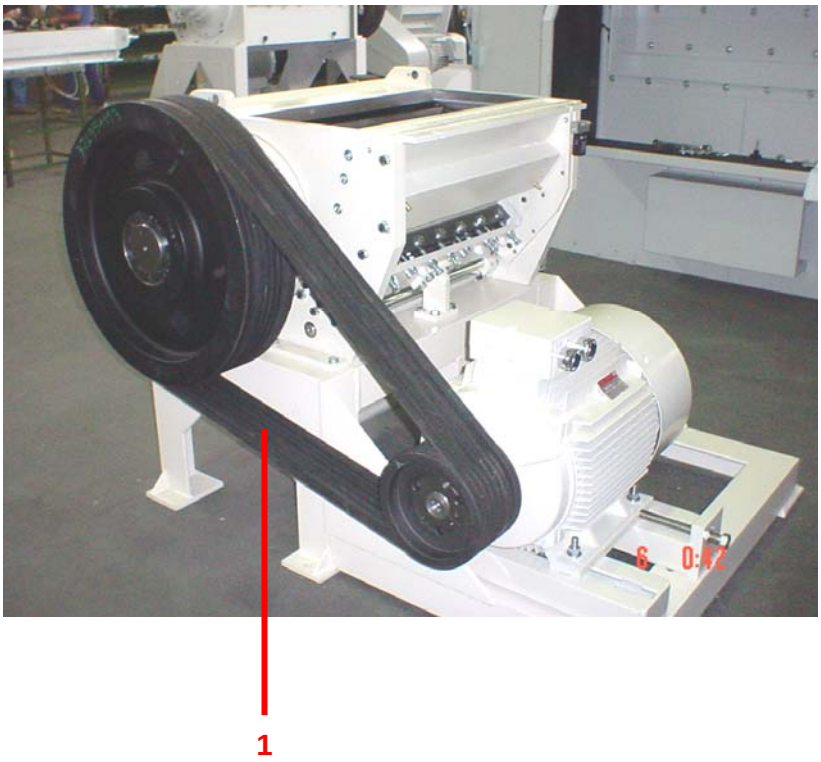
Pos.	Description	Spare-part
---	5 Blade – 2 counter blade kit (1°st counter blade double chamfer)	☐
--	5 Blade – 2 counter blade kit (1°st counter blade double chamfer) with tungsten carbide coating	

Discharging funnel unit



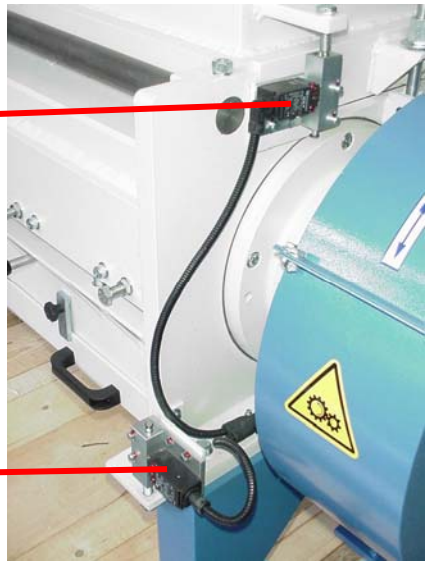
Pos.	Description	Spare-part
1	Discharging funnel	□
2	Lockup	□

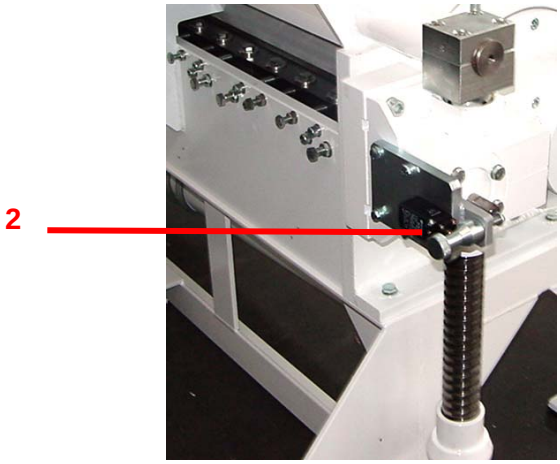
Drive unit



Pos.	Description	Spare-part
1	Belt	☐

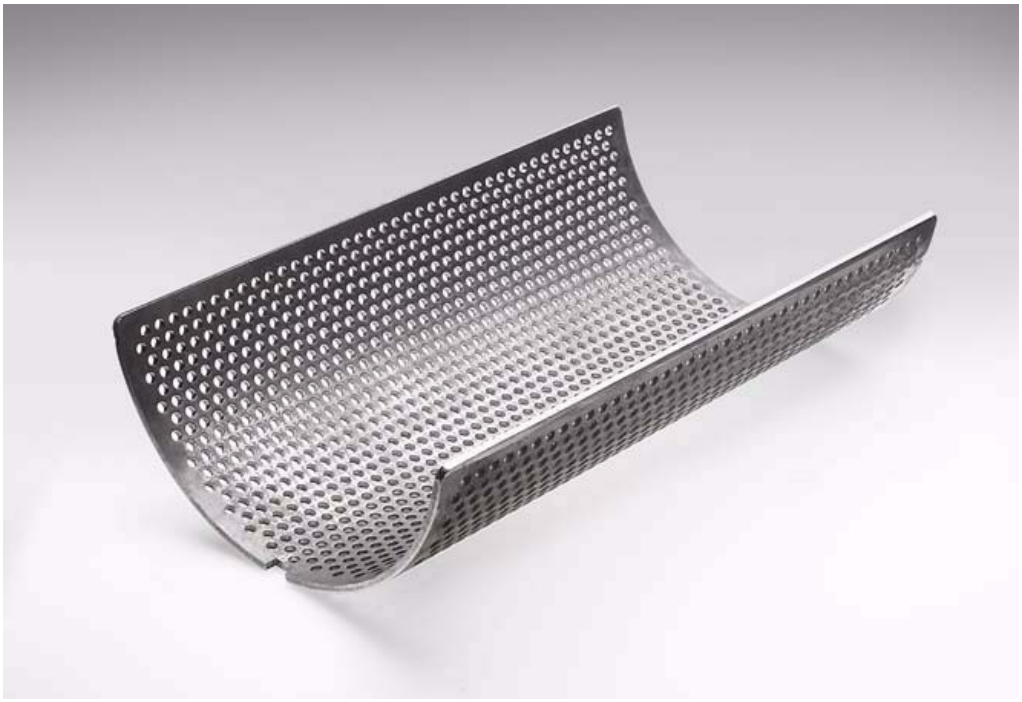
Micro application unit





Pos.	Description	Spare-part
1	Micro for funnel and hopper opening	□
2	Micro on overturning jack	□
3	Micro on doors hopperk (if foreseeni)	

Screens



Description	Diam. Fori (mm)	Materiale	Spare-part
5 mm thick Screen	5-6-7-8-9-10	Fe42	
5 mm thick Screen	5-6-7-8-9-10	S275J2G3	□

All requests for screens with diameter of holes different from the one shown in the table should be forwarded to the Technical Service Center.