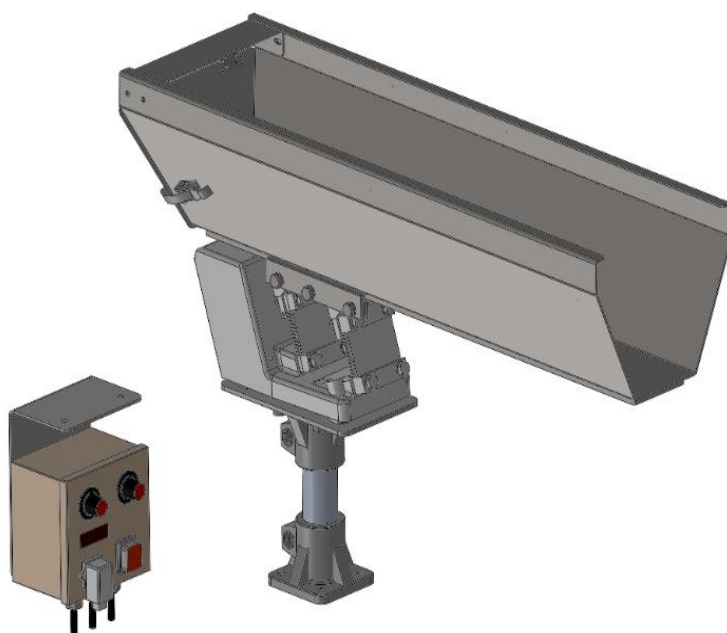


INSTRUCTIONS FOR USE AND WARNINGS

ENGLISH TRANSLATION OF THE ORIGINAL INSTRUCTIONS



Bulk Feeder

Models 1.5lt – 3lt – 5lt – 10lt – 20lt – 40lt

Year of Manufacture

2020

Revision 1.8 – Edition 08/2026



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INTRODUCTION

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EDITOR'S NOTE

This documentation is specifically intended for technicians; therefore, some of the information that can easily be understood from reading the texts and analysing the drawings might not be detailed further.

The Publisher is in no way responsible for the information and data in this manual: all of the information contained herein has been provided, checked and approved by the Manufacturer.

The Publisher is in no way liable for the consequences resulting from any incorrect operations carried out by the user.

GENERAL REMARKS

All of the operating and maintenance instructions and recommendations described in this manual must be followed. To obtain the best results, the Manufacturer recommends that the cleaning and maintenance operations be carried out regularly to keep the system in perfect working order.

It is particularly important to train personnel in charge of the machine on its use, as well as on maintenance and monitoring compliance with the operating procedures and with all of the safety regulations set forth in this manual.

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Edition: 10/2025

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1 Identification

1.1 Manufacturer's identification

Manufacturer	ARS S.r.l.
Address	Via Aretina Nord, 157 52041, Civitella in Val di Chiana (AR), Italy Tel. +390575398611 - Fax +39 0575 398620 info@arsautomation.com - www.arsautomation.com

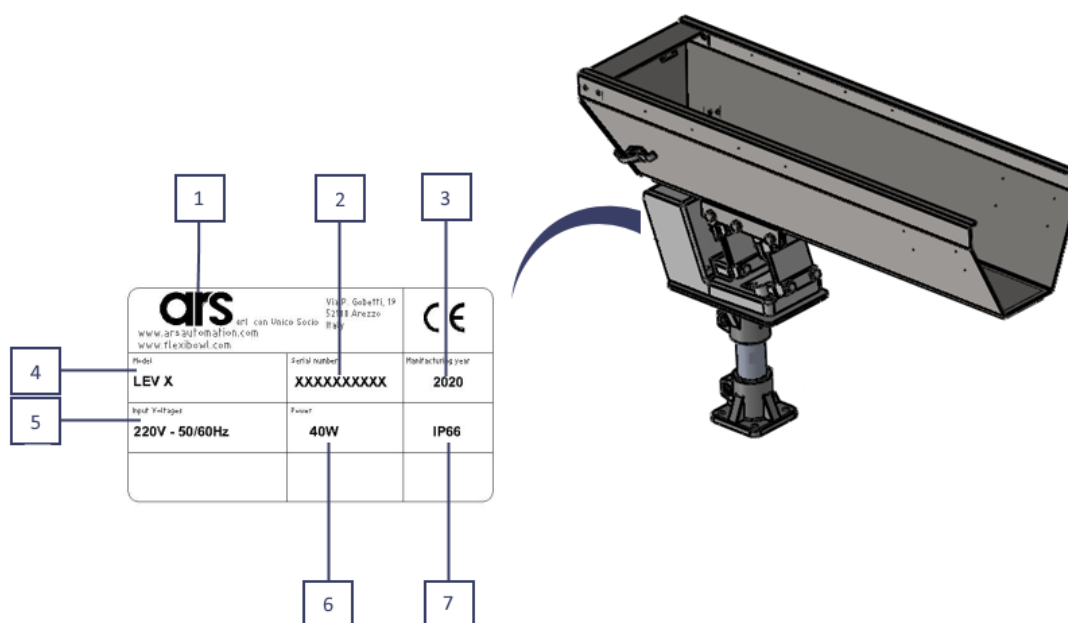
1.2 Identification of the machine

Machine	Bulk feeder
Model	1.5lt - 3lt - 5lt - 10lt - 20lt - 40lt

1.3 Identification plate

The machine has an identification plate on the vibrating base.

The plate bears the machine's identification data to be given to ARS S.r.l. in case of need.



Pos.	Item
1	Manufacturer's logo
2	Serial no.
3	Year of manufacture
4	Machine model
5	Supply voltage
6	Power
7	Protection rating (IP)



CAUTION!

It is strictly forbidden to remove the CE plate and/or replace it with another plate. If the plate is damaged or removed accidentally, the customer must inform the Manufacturer.

1.4 CE Declaration of conformity (copy)



"CE" DECLARATION OF CONFORMITY

We

ARS S.r.l.
Via G. Vico, 7
52100 Arezzo (Italy)

Declare under our exclusive responsibility that the Product:

BULK FEEDER 1.5lt / 3lt / 5lt / 10lt / 20lt / 40lt

this declaration refers to, is compliant with the following standards or with other regulations:

Italian Legislative Decree 17/2010
2006/42/EC: "Partly completed machinery"

In compliance with directive 17/2010 including the use of 2006/42/EC.

We also hereby declare that the machinery described above is intended to be incorporated into other machinery and must not be put into service until the relevant machinery into which it is to be incorporated has been declared in conformity with the essential health and safety requirements of Council Directive 2006/42/EC.

Place: Arezzo

Signature: 

Date: 01-FEB-2019

Full Name: Marco Mazzini

1.5 Reference directives

The machine supplied by **ARS S.r.l.** does not fall under one of the machine categories listed in Annex IV of the Directive; therefore, for the purpose of certifying compliance of the machine with the provisions of this Directive, **ARS S.r.l.** applies the conformity assessment procedure with internal control on the manufacture of machinery, as set forth in Annex VIII.

To certify compliance of the machine with the provisions of the Directive, before placing it on the market **ARS S.r.l.** carried out the risk assessment in order to ascertain compliance with the essential health and safety requirements of the Directive as well as the tests and inspections required by the applicable reference standards.

The technical construction file was prepared in compliance with the provisions of Annex VII of **Directive 2006/42/EC** and is available for inspection by the supervisory bodies upon a reasoned request, as required by the legal provisions in force.

ARS S.r.l. therefore places the machine on the market together with:

CE Marking	
CE Declaration of Conformity	
Instruction manual and safety warnings	(Documentation prepared according to section 1.7.4 of Machinery Directive 2006/42/EC)

it should also be noted that the machine has been designed in compliance with the following Directives:

2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility Directive

2 General Preliminary Information

2.1 Recipients

The manual is intended for operators in charge of using and controlling the machine throughout all stages of its technical life.

It contains topics that refer to correct use of the machine, in order to maintain its operating and quality features unchanged over time. It also contains all of the information and warnings needed for safe and correct use.

The manual, like the EC certificate of conformity, is an integral part of the machine and must always accompany it if it is relocated or resold. It is the responsibility of the user to keep this documentation intact so that it can be consulted throughout the machine's service life.

2.2 Supply and storage

The manual is supplied in **electronic** format.

All of the additional documentation (wiring diagrams, sub-supplier manuals) is provided attached to this manual.

Store this manual with the machine so that it can be easily consulted by the operator.

The manual is an integral part for safety purposes, therefore:

- **it must be stored intact** (in its entirety). If it is lost or damaged, immediately request another copy.
- **It must follow the machine until it is scrapped** (even if it is relocated, sold, hired, etc.);
- **The attached manuals are an inherent part of this documentation**, therefore the same recommendations/requirements contained in this manual apply to them.

The **Manufacturer** disclaims any liability for machine misuse and/or for damage caused following operations not specified in the technical documentation.

2.3 Updates

If the machine requires modifications or functional replacements, the Manufacturer is responsible for reviewing or updating the manual. The Manufacturer is in charge of delivering the updated manual.

Moreover, if this document is altered in any way by the Manufacturer, the user is responsible for ensuring that only the updated version of the manual is actually made available in the points of use.

2.4 Language

The original manual is written in **Italian**.

Any translations into additional languages must be done from the original instructions.

The Manufacturer shall be held responsible for the information in the original instructions; translations into different languages cannot be completely verified, therefore, if an inconsistency is found, please follow the text in the original language or contact our Technical Documentation Office.

2.5 Operators

In order to establish with certainty what the skills and qualifications are of the operators assigned with the various tasks (start-up, cleaning, routine maintenance), see the table below:

Qualification	Definition
Operator	User's trained personnel who are qualified to use and run the machine for production purposes for the activities it was built and supplied for. He/she must be able to perform all of the operations required for smooth operation of the machine and to safeguard himself/herself and any co-workers. He/she must have proven experience on correct use of this kind of machine and be duly trained, informed and instructed. If in doubt, he/she must report any anomalies to his/her supervisor. Note: he/she is not authorised to carry out any maintenance work.
Mechanical Maintenance Technician	Qualified technician able to carry out preventive/corrective maintenance work on all mechanical parts of the machine subject to maintenance or repairs. Qualified technician able to access all parts of the machine for visual inspections, checking equipment conditions, adjustments and calibrations. Qualified technician able to: - run the machine like an operator; - work on the mechanical parts for adjustments, maintenance and repairs; - read pneumatic and hydraulic diagrams, technical drawings and spare parts lists. In extraordinary cases, he/she is trained to operate the machine with reduced safety devices. Where necessary, he/she can give the operator instructions on how to use the machine properly for production purposes. Note: he/she is not qualified to work on live electrical systems (if any).
Electrical Maintenance Technician	Qualified technician able to carry out preventive/corrective maintenance work on all electrical parts of the machine subject to maintenance or repairs. Qualified technician able to access all parts of the machine for visual inspections, checking equipment conditions, adjustments and calibrations. Qualified technician able to: - run the machine like an operator; - work on the adjustments and electrical systems for maintenance, repairs and replacement of worn parts; - read the wiring diagrams and ensure that the operating cycle is correct. Where necessary, he/she can give the operator instructions on how to use the machine properly for production purposes. He/she can work with live voltage in the electrical panels, junction boxes, control equipment, etc. only if he/she is a person in charge of an electrical installation (SP, suitable person). (See standard EN50110-1). He/she does not program system software such as: PLC (logic or safety), and cannot change system passwords.

Expert software technician	Qualified technician able to: • carry out preventive/corrective work on all software parts of the machine; • access all parts of the machine for visual inspections, checking equipment conditions, adjustments and calibrations. Manufacturer's qualified technician with proven experience and training on systems based on: PLC/PC drives, etc. (knowledge of programming, machine functions, etc.) for complex operations such as: • changing machine data; • creating work programs; • adjustment of drive parameters, etc. as he/she knows the production, technological and construction cycle of the supplied machine. He/she can work in the electrical panels, junction boxes, control equipment, etc. with live voltage only if he/she is a person in charge of an electrical installation (i.e. suitable person – SP) (Refer to EN50110-1). The skills are electronic and/or software-based.
Manufacturer's Technician	Qualified technician employed by the Manufacturer and/or its supplier for complex operations, as he/she knows the construction production cycle of the machine. This person intervenes following requests from the user. The skills are mechanical-based.

The qualifications indicated in the table on this page obligatorily fall under a category of persons defined as “**trained person**”.

Type	Definition
Trained Person	An individual who has been informed, instructed and trained on the job and on any hazards resulting from misuse. He/she also knows the importance of the safety devices, the accident prevention regulations and the safe working conditions.

2.6 Symbols used in the manual

In order to establish with certainty what the skills and qualifications are of the operators assigned with the various tasks (start-up, cleaning, routine maintenance), see the table below:

Symbol	Definition
	Symbol used to identify important warnings for the safety of the operator and/or the machine.
	Symbol used to identify electrical hazards.
	Symbol used to identify important information in the manual. The information also concerns the safety of personnel involved in machine use.

2.7 Glossary

Technical terminology or terminology with an uncommon meaning is used in the manuals.

The terms and abbreviations used are explained below:

Term	Definition
Lifting accessories	Component or equipment not attached to the lifting machinery, allowing the load to be picked up, which is placed between the machinery and the load or on the load itself, or which is intended to become an integral part of the load and independently placed on the market. Slings and their components are also regarded as lifting accessories.
Failure	Different kinds of faults that prevent normal operation of machinery, of a system, etc.
Chains, ropes and webbing	Elements designed and built for lifting purposes as part of lifting machinery or lifting accessories.
Harm	Any negative consequence deriving from the occurrence of a hazardous event.
PPE	Personal Protective Equipment (PPE) is clothing or equipment designed to protect the worker (operator, maintenance technician, technician, etc.) wearing it or carrying it against health and safety hazards.
Machine	An assembly, fitted with or intended to be fitted with a drive system, consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application.
Malfunction	Defective or inadequate operation of a machine or its element in performing a certain function.
Hazard	Potential source of injury or damage to health.
Safeguard	Defence against what could cause harm. An element that is placed between who may be harmed and what can cause said harm due to hazards which cannot reasonably be eliminated or from the risks which cannot be sufficiently reduced by inherently safe design measures. Identified as follows: • active safeguard that the operators themselves must activate (for example emergency stops) and/or wear (PPE); • passive safeguard that intervenes without human control.
Guard	Physical barrier, designed as part of the machine to provide protection.
Risk	Combination of the probability and the degree of an injury or damage to health that can arise in a hazardous situation.
Residual risk	Risk remaining after protective and preventive measures have been implemented.
Intended use	Use of machinery in accordance with the information provided in the instructions for use.
Reasonably foreseeable misuse	Use of machinery in a way not intended by the designer, but which may result from readily predictable human behaviour.

2.8 Personal protective equipment

When working close to the machine, either for assembly operations or for maintenance and/or adjustments, it is necessary to fully comply with the general accident prevention regulations; for this reason, it is important to use the personal protective equipment (PPE) required for each operation.

Below is a full list of the **personal protective equipment (PPE)** that may be required for the different procedures:

Symbol	Description
	Obligation to wear safety or insulating gloves. Indicates a requirement for personnel to wear safety or insulating gloves.
	Obligation to wear safety glasses. Indicates a requirement for personnel to wear safety glasses to protect the eyes.
	Obligation to wear safety shoes. Indicates a requirement for personnel to wear safety shoes to protect the feet.
	Obligation to wear noise protection devices. Indicates a requirement for personnel to wear earmuffs or earplugs to protect hearing.
	Obligation to wear protective clothing. Indicates a requirement for personnel to wear specific protective clothing.
	Obligation to read the instruction manual/booklet. Indicates a requirement for personnel to read (and understand) the instructions for use and safety warnings for the machine before using it.

The clothing for operators and line maintenance technicians must comply with the essential safety requirements defined by **EU Regulation 2016/425** and the laws in force in the country of installation.

2.9 User's safe area

The zones around the machine are divided as follows:

Term	Description
Control zones	These are the areas where the user and the other operators can control the machine's cyclic functions (" operator station "), in either automatic mode or semi-automatic mode, with the control panels or to perform manual operations.
Maintenance/adjustment zones	These are the areas where the mechanical maintenance technicians can carry out maintenance work or adjustments. These areas are considered hazardous and not accessible during normal machine operation. Operators must be fully aware of the safety warnings and personal protective equipment to be worn.
Danger zones	These are any zones within (or around) the machine where there are residual risks that can cause harm to people. In these zones, access is forbidden to everyone during machine operation.

The hazards and risks in these areas are protected, as much as possible, with **guards** (casings, doors) and with **safety devices** (sensors, micro switches, light curtains) which, if activated, completely shut down the machine.

However, when the machine is running, **it is strictly forbidden to work in the danger zones as some of the risks might not have been completely eliminated.**

2.10 Warranty

The full warranty terms are included in the sales contract.

The conditions set forth in the sales contract (if different) have priority over the contents of this section.

The warranty is **subject** to the following general conditions:

- **opening of the packages** by using suitable devices and being careful not to damage the system;
- **installation and start-up** must be carried out in the presence of qualified and adequately trained technicians, according to the requirements provided herein;
- **the machine must be used within the limits declared** in the contract and specified in the technical documentation;
- **maintenance** must be carried out within the times and in the ways indicated in the manual, using original **ARS S.r.l.** spare parts and assigning the operations to qualified personnel;

The warranty shall be rendered **null and void** in the event of:

- failure to comply with the **safety regulations**;
- failure by the user to request any **authorisations required by the applicable regulations for use**;
- installation and use of the machine in **unsuitable premises**;
- **removal of or tampering with** the monitoring and safety devices (guards, photocells, sensors, micro switches, etc.);
- **removal of or tampering with** the identification plate;
- **removal of or tampering with** the safety pictograms affixed to the machine;
- **changes to the safety conditions** established by the Manufacturer in the machine control software;
- **misuse** of the machine;
- use of the machine by **untrained and/or unauthorised personnel** or failure to comply with the required skills of the various operators, as indicated in the manual;
- **modifications or repairs** made by the user without written authorisation from the Manufacturer;
- **tampering with** the machine's electrical or compressed air circuits;
- partial or total **failure** to comply with the instructions;
- **power supply faults** (electrical, compressed air, etc.);
- **failure to implement the maintenance plan** of the machine;
- **use of non-original spare parts** or incorrectly ordering them;
- disposal of the machine not in compliance with the regulations in force;
- exceptional events such as floods, fire (if not caused by the machines).



IMPORTANT!

Further details may be contained in the sales contract.

The conditions set forth in the sales contract (if different) have priority over the contents of this section.

3 Safety measures

3.1 Noise

The noise was measured in compliance with the provisions of **UNI EN 11200** and **UNI EN ISO 3746**. During the operating cycles, **staff are exposed to a noise level of 90 dB**.

The actual noise level during operation of the machine installed on site in a production process is different from the one measured because the noise is affected by a number of factors, such as:

- type and characteristics of the site;
- type of machine that the linear bulk feeder is installed on;
- other adjacent machines in operation.



OBLIGATION!

It is mandatory to use the appropriate personal protective equipment.

3.2 Vibrations

The vibrations produced by the machine, based on its operating mode, **are not dangerous** to the health of the operators.



CAUTION!

Excessive vibrations can only be caused by a mechanical breakdown that must immediately be reported and fixed, so as not to undermine the safety of the line or of the operators.

3.3 Electromagnetic compatibility

The supplied machine contains electronic components subject to the regulations on Electromagnetic Compatibility, affected by conducted and radiated emissions.

The emission values are within the regulatory requirements thanks to the use of components that comply with the Electromagnetic Compatibility directive, suitable connections and installation of filters where necessary.

Thus the machine complies with the Electromagnetic Compatibility (EMC) directive.



CAUTION!

Any non-compliant maintenance work carried out on the electrical equipment or incorrect replacement of components may undermine the efficiency of the implemented solutions.

3.4 Residual risks

The machine is designed to guarantee the essential safety requirements for the operator.

Safety has been integrated into the design and construction of the machine as much as possible; however, some risks still remain, that operators must be protected from, especially during:

- transport and installation;
- normal operation;
- adjustment and setting up;
- maintenance and cleaning;
- disassembly and dismantling.

Below is a description of every residual risk, the area or part of the machine subject to the risk (unless the whole machine is subject to the risk) and the procedural information on how to avoid it:

Risk	Description and procedural information
HAZARDS DUE TO HANDLING PICTOGRAMS: 	The handling procedures are described in the “Transport and installation” chapter in this instruction manual. Residual risk: These operations: • unloading the packaging, • opening the packaging, • handling the machine expose the operators to the risk of suspended loads and crushing. These operations must only be carried out by personnel skilled in using lifting equipment and who have been appropriately trained for this purpose.
ELECTRICAL HAZARD PICTOGRAMS: 	Maintenance operations and access to the machine expose the operators to an electrical risk. Work on live equipment must only be carried out by expert and qualified personnel. These safety measures should be followed: • pay the utmost attention to the safety pictograms related to electrical hazards; • do not carry out maintenance work before having cut off the power; • refer to the trade equipment manuals for any specific instructions; • periodically inspect the equipotential bonding circuit, making sure there are no discontinuities and tightening the connection junction screws.
HAZARD FROM DUST, FRAGMENTS, ETC. PICTOGRAMS: 	At the end of the work cycle, there may be residues of fed-in parts or dust build-up on the machine surface. Thoroughly clean the vibrating surface after every use, as described in chapter 7 of this manual.

**CAUTION!**

Do not carry out any maintenance or cleaning operations unless the energies have been de-energised.

**CAUTION!**

It is strictly forbidden to remove the safety protections installed on the machine or open the fixed guards before having disconnected the machine's electrical and air supply.

It is the responsibility of the user to:

- **analyse the risks that might occur while handling and installing at one's premises** (the analyses carried out on machine handling were made only taking into account its characteristics);
- **raise awareness and instruct the personnel involved in the operations on the work stations** and the personnel involved in running the machine;
- **affix visual safety signs around the workplace** after assessing the risks in the transit or control areas.

4 Description of the Machine

4.1 Intended use (correct)

The bulk feeder is available in four models: 1.5lt, 5lt, 10lt, 20lt and 40lt.

The machine in question is designed for industrial use for:

Operation	Permitted	Not permitted	Processing environment
HANDLING AIMED AT FEEDING:	Components of maximum variable weight and dimensions according to the machine model.	Any other component not included in the permitted range of maximum weight and dimensions.	Industrial.



IMPORTANT!

For more information on the type of components permitted, see the “Technical specifications” section in this manual.

The machine is designed to:

- meet the specific requirements indicated in the sales contract;
- be used according to the instructions and limits of use given in this manual.

The machine is designed and built to work safely if:

- it is used within the limits stated in the contract and in this manual;
- the procedures in the instruction manual are followed;
- routine maintenance is carried out within the times and in the ways indicated;
- unscheduled maintenance is promptly carried out if required;
- the safety devices are not removed and/or bypassed.

4.2 Reasonably foreseeable misuse

Reasonably foreseeable misuse is described below:

- processing liquids and fine granules;
- changing any safety-related work parameters;
- transporting people;
- using the machine as a support point;
- using the machine to obtain production values above the prescribed limits;
- changing/tampering with the machine’s electrical and compressed air connections or any of its other components;
- using the machine with a product that is not listed in the “Intended (correct) use” section;
- using the machine in a way that is not specified in the “Intended (correct) use” section.

Any other machine use that is not specified must be authorised in writing beforehand by the Manufacturer. In the absence of this written authorisation, the use is considered “misuse”; therefore, the Manufacturer disclaims any liability for damage caused to property or people and deems every type of machine warranty null and void.



IMPORTANT!

Misuse of the machine excludes any liability of the Manufacturer.

4.3 Obligations and prohibitions

4.3.1 Obligations of users

The user (contractor or employer) must:

- take into account the skills and conditions of the operators in relation to their health and safety;
- provide adequate personal protective equipment for the individual procedures;
- provide standard lifting means and procedures;
- ensure that individual workers respect the company rules and regulations on safety and on use of the collective and personal protective equipment available;
- instruct personnel on the procedures in case of an accident;
- instruct personnel on existing residual risks;
- instruct personnel on the devices set up for operator safety;
- instruct personnel on the hazards due to noise emission in the workplace;
- instruct personnel on the general accident prevention rules set forth by European directives and by the legislation in the country of destination of the machine.

Only allow personnel who have read this manual and are properly trained to work on the machine.

4.3.2 Obligations of personnel in charge (operators/maintenance technicians/technicians)

Personnel **must**:

- Only carry out maintenance work with the machines switched off. Not lubricate moving parts.
- When the machine is in operation, they must not work near it wearing necklaces, bracelets, neck ties, or other clothing that could get caught in the mechanisms.
- Operators with long hair must tie it back to prevent it from getting entangled.
- Only work on the electrical panel, on the junction boxes, on the cables and on all electrical components with the main switch turned off.
- When starting the machine, make sure there is nobody inside the danger zones.
- During operation, pay the utmost attention that nobody can directly access the moving parts.
- Use the protective devices provided by the employer properly.
- Immediately report any safety device faults to the employer, manager or supervisor.

4.3.3 Prohibitions of staff in charge (operators/maintenance technicians/technicians)

Personnel **must not**:

- use the machine improperly, i.e. for uses that are not specified in the “**Intended Use**” section;
- remove or change the safety devices or signs without authorisation;
- carry out operations or manoeuvres of their own initiative which do not fall under their responsibility or which can compromise personal safety or that of other workers;
- wear bracelets, rings, necklaces that can dangle and be dragged by moving parts, thereby creating danger for the operator;
- replace or change the speeds of the machine’s components without authorisation from a manager;
- change the machine cycle;
- change the electrical connections to exclude the internal safety devices;
- use the machine if it has not been installed in compliance with applicable regulations;
- use the machine as a support point even if it is not working (with a risk of falling and/or damaging the machine);
- use the machine outside of the permitted environmental conditions (see “**Chapter 5**”).



CAUTION!

ARS S.r.l. shall not be held liable for damage caused to property or people if:

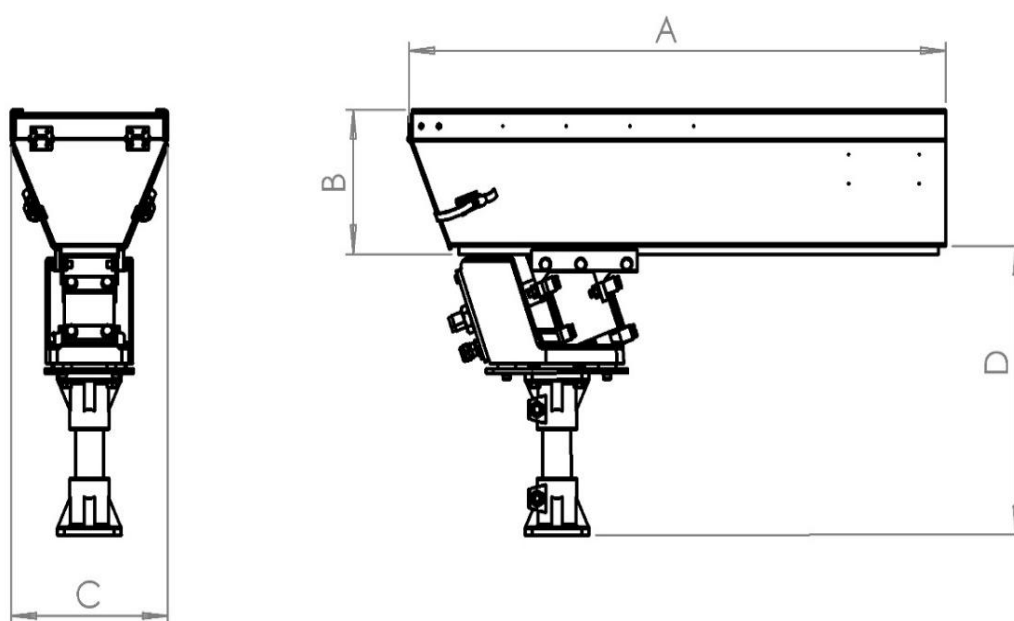
- **it is ascertained that the machine was used in one of the unpermitted environments;**
- **the obligations and prohibitions described herein have not been followed.**

4.4 Technical specifications

Power supply specifications	1.5lt	3lt	5lt	10lt	20lt	40lt
Power supply	230Vac +/- 5% (110Vac on demand)					
Frequency / Phasing	50-60 Hz / 1 Phase					
Consumption (A)	0.1	0,1	0.25	0.25	0.25	0.45

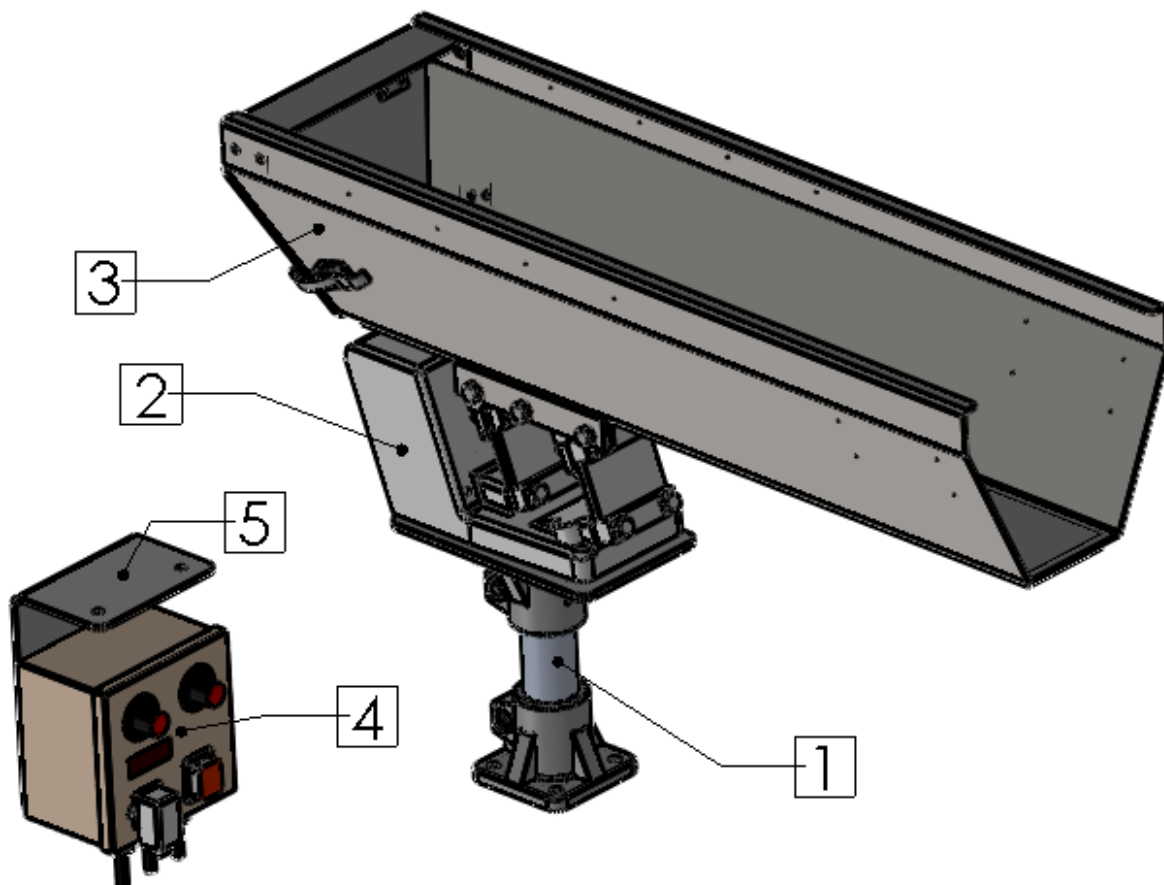
Power supply specifications	1.5lt	3lt	5lt	10lt	20lt	40lt
Net weight	11 Kg	18 Kg	22 Kg	24 Kg	27 Kg	38 Kg

4.5 Layout



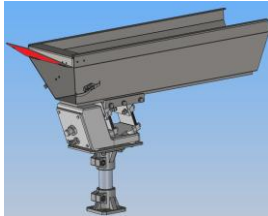
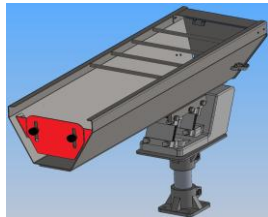
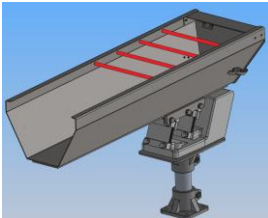
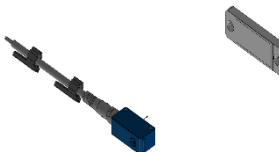
Reference	1.5lt	5lt	3lt	10lt	20lt	40lt
A	350 mm	435 mm	525 mm	630 mm	760 mm	780 mm
B	65 mm	135 mm	98 mm	135 mm	180 mm	260 mm
C	90 mm	140 mm	97 mm	140 mm	220 mm	280 mm
D	320 mm	350 mm	330 mm	350 mm	350 mm	375 mm

The machine is made up of the following essential parts:



Pos.	Item	Description
1	SUPPORT	It is the component that is clamped on the Machine and that the bulk feeder is placed on.
2	VIBRATING BASE	It is the main component of the bulk feeder and by means of an electromagnet, it vibrates, which in turn allows the pieces to advance on the tank.
3	TANK	It may be 1,5lt, 5lt, 10lt, 20lt, 40lt depending on the component to be processed. The 1.5lt tank is built-in plastic material, while the others are stainless steel.
4	CONTROLLER	It is used to adjust bulk feeder vibration
5	CONTROLLER SUPPORT	It is used to anchor the controller and can be placed on the machine.

4.6 Standard and optional components

Item	Description	Image	Standard / Optional
Emptying door	Rear discharge door for quick emptying		STANDARD (excluding 1.5lt bulk feeder)
Gate	Dispenser with barrier to regulate flow (adjustable)		OPTIONAL (excluding 1.5lt bulk feeder)
Safety guard	Hand safety guard		OPTIONAL (excluding 1.5lt bulk feeder)
Cladding	Polyurethane tank cladding		OPTIONAL (excluding 1.5lt bulk feeder)
Frontal photocell	Its function is to verify the presents of components in the front area of the bulk feeder during the feeding process. For more information, refer to Appendix A: " Frontal and Rear Photocells "		OPZIONALE (esclusa tramoggia 1,5lt)
Rear photocell	Its function is to verify the level of the feeding components in the rear part of the bulk feeder. For more information, refer to Appendix A: " Frontal and Rear Photocells "		OPZIONALE (esclusa tramoggia 1,5lt)

4.7 General description

The bulk feeders are particularly suitable for feeding and pre-dosing small, medium and large parts. They are actuated by a vibrating linear base, the model of which varies according to the size of the bulk feeder itself.

The vibrating linear base consists of two bodies joined together by leaf springs.

Operation is entrusted to an electromagnet that is integral with the fixed body, which attracts and releases the mobile body where the vibration takes place and this allows the advancement of parts inside the tank, positioned on it and secured by jaws.

To accomplish this, the vibrators need a controller that converts alternating current into pulse current, in addition to adjusting the speed of the system itself.

4.7.1 Processing cycle

A simplified description of the **processing cycle** is described below. The cycle is divided into the following phases:

Phase	Description
1	The operator manually or with an automatic loading system places the product to be processed inside the tank.
2	The bulk feeder cyclically performs vibrations (set by the operator) to allow pieces to advance, in order to constantly guarantee their presence on the feeder.

5 Transport and installation



IMPORTANT!

Lifting and handling operations must only be carried out by specialised and trained staff who are qualified for these activities.

The machine is designed to be packed, transported and assembled using a forklift truck of adequate capacity. The machine does not have any attachment points (for example, eye bolts) for lifting.

5.1 Packaging

The machine is shipped by **ARS s.r.l.** from the production factory to the Customer's premises.

Based on the distance it needs to be transported, on the specific requests from the Customer, and on how long the load will remain in the packaging, the machine will be shipped in the following ways:

- normal protective packaging for short and medium distances;
- special protective packaging for long distances.

It must be shipped using closed or curtain-sided vehicles depending on the type of load.

When the machine is received, it is mandatory for the customer to check that there is no damage caused by the mode of transport or by the personnel in charge of the specific operations.

- **If any damage is discovered**, leave the packaging in question as it was found and immediately ask the competent shipping company to assess the damage; afterwards, send a damage report to inform the transport company's insurance company and the point of sale of the discovered damage.
- **If the machine is delivered in a crate on a pallet or on wooden planks** protected by heat-shrink cellophane, first remove the packaging or the cover. To completely free the machine, remove the screws and the metal strapping. Then lift the machine with a crane or forklift truck as described in the table and remove the pallet used for transport.

5.1.1 Table of units and weights - with packaging

Follow the table below for the weights and dimensions including packaging.

Specification	1.5lt bulk feeder	3lt bulk feeder	5lt bulk feeder	10lt bulk feeder	20lt bulk feeder	40lt bulk feeder
Gross weight (with packaging)	28 kg	28 kg	39 kg	41 kg	59 Kg	70 kg
Wooden crate dimensions (mm)	700 x 700 x 500	700 x 700 x 500	700 x 700 x 500	700 x 700 x 500	1000 x 1000 x 500	1000 x 1000 x 500

5.1.2 Handling with packaging

HANDLING THE MACHINE BODY WITH PACKAGING	
Operator qualification	Lifting vehicle driver
PPE required	
Lifting vehicle	Forklift truck with capacity of at least 50 kg


CAUTION!

Only use suitable and approved lifting vehicles; compatible with the dimensions and weight of the machine.


CAUTION!

Make sure that no one is standing under or within the operating range of the lifting vehicle.

Proceed as described to **handle the machine body with packaging**:

Step	Action
1	Put the forks of the forklift truck under the wooden crate containing the machine.
2	Make sure the forks come out of the front of the load (by at least 5 cm), far enough to eliminate any risk of the transported part from overturning.
3	Lift the forks until they touch the load. Note: if necessary, fasten the load to the forks with clamps or similar devices.
4	Slowly lift the load ten centimetres or so off the floor and check its stability, making sure that the centre of the load is in the middle of the lifting forks.
5	Tilt the mast backwards (towards the driver's seat) to use the tilting moment to ensure greater stability of the load during transport.
6	Adjust the transport speed according to the floor and type of load, avoiding sudden manoeuvres.


CAUTION!

Place the forklift truck forks as shown in the figure

5.1.3 Removing the packaging

Proceed as follows to **remove the packaging**:

Step	Action
1	Put the machine in its intended place.
2	Remove the straps from the base of the wooden crate used for shipping.
3	Grasp the bulk feeder from its base, not from the tank , to lift it and remove it from the crate.



CAUTION!

2 operators are needed to manually lift the bulk feeder out of the wooden crate.

To handle the machine and/or its parts, see the “**Transport and handling**” section.

5.1.4 Disposing of the packaging

The packaging is an integral part of the supply and is not collected, hence it must be disposed of by the buyer.

Any disposal or destruction must be carried out in compliance with the regulations in force in the user's country, taking into account the nature of the materials:

- wood for the crates;
- plastic sheet to protect the machine and adhesive tape to secure the plastic;
- moisture absorber sachets;
- etc.

5.2 Transport and handling

ARS s.r.l. uses packaging and fasteners according to the mode of transport to guarantee integrity and conservation during transport.

When the machine is received, make sure no part was damaged during transport and/or handling.

If damage is found, it is mandatory to immediately inform the Manufacturer.

The handling activities described in this section must be carried out by personnel who are qualified for these operations: personnel duly trained to safely perform the loading, unloading and handling operations with lifting equipment, and who are aware of the accident prevention rules.



CAUTION!

Never lift the unit from the tank or the mobile part as in addition to losing its calibration, it could also get deformed or broken.



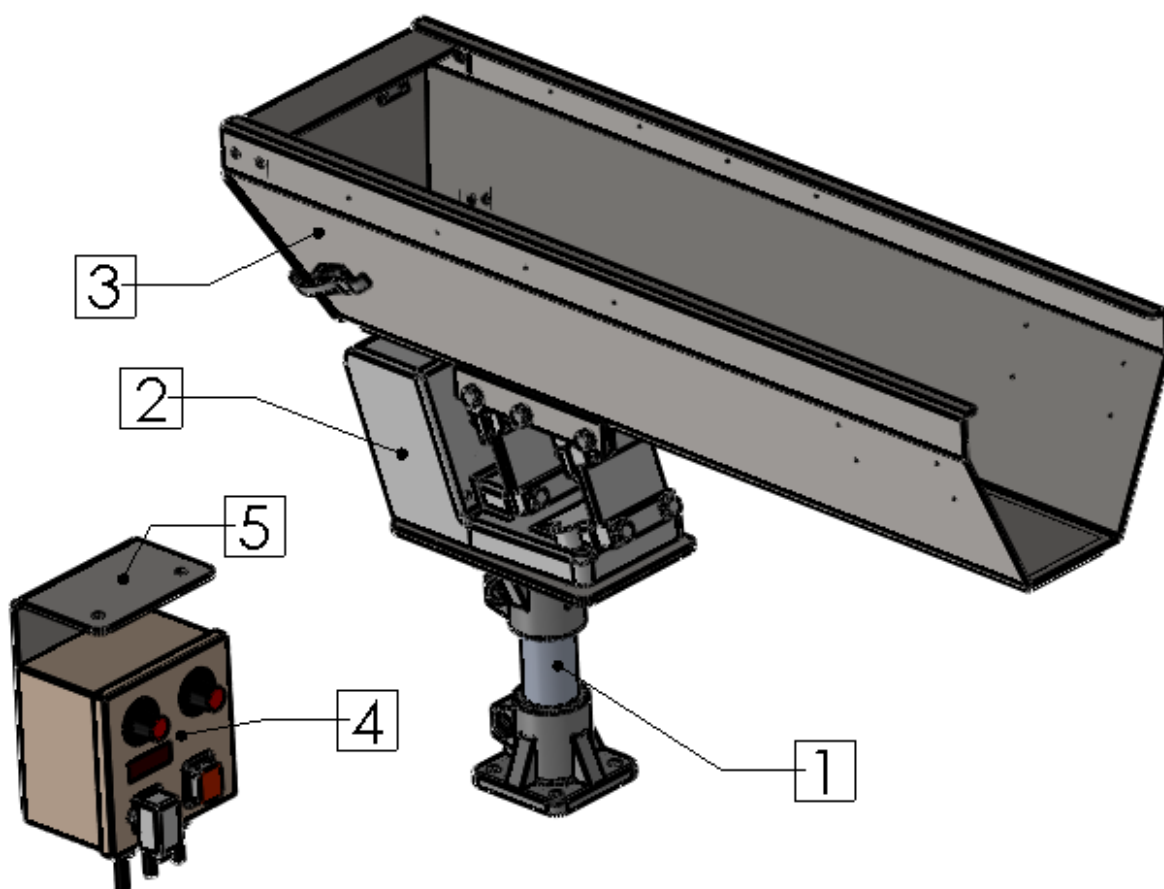
CAUTION!

ARS S.r.l. shall not be held liable for damage, to property or to people, due to accidents caused by failure to follow the instructions in this manual.

5.2.1 Assembly of units

After unpacking the machine, it is found in 3 units that are to be assembled.
Follow the procedure below to assemble the vibrating bulk feeder:

Step	Action
1	Take and place the Support unit (1) on the Machine (use M8 screws to anchor it firmly)
2	Take and place the vibrating base (2) and the tank (3) (pre-assembled unit) on the support (1) by anchoring it firmly with the screws provided.
3	Take and place the Controller (4) with its support (5) in a suitable position.



5.3 Installation

5.3.1 Preparations by the customer

Notwithstanding any contractual agreements otherwise, preparation of the following **is usually the responsibility of the Customer**:

- **rooms** (including masonry, such as foundations or ducts that may be required, lighting);
- **electrical systems** up to the machine's power points, in compliance with the regulations in force in the country of installation and/or requested by the machine Manufacturer. All technical specifications requested by the Manufacturer are in the sales contract. The Manufacturer disclaims all liability if the customer fails to guarantee the technical specifications of the electrical system required in the sales contract.
- **the power supply for the machine**, including the earthing conductor, according to the characteristics and tolerances requested and specified in this manual.
- auxiliary services adapted to the machine's requirements;
- **tools and consumables** required for assembly and installation;
- **lubricants** necessary for starting the machine;
- the **compressed air supply** for the machine adjusted as specified in the "Technical specifications" section;
- suitable lifting and handling means.

5.3.2 Permitted environmental conditions

The environment where the machine will be installed and used is indoors, protected from atmospheric agents such as: rain, hail, snow, fog, suspended dust, combustible dust, protected from aggressive agents such as corrosive vapours or sources of excessive heat and it must not be ATEX classified.

It is not permitted to use the machine, associated control systems and drive equipment under conditions other than those listed.

Namely, the environment of installation and use must not be:

- Exposed to corrosive fumes;
- Exposed to excessive humidity (above 85%) and rapid changes in relative humidity (above 0.005 p.u./h);
- Exposed to excessive dust;
- Exposed to abrasive dust;
- Exposed to oily vapours;
- Exposed to explosive mixtures of dust or gas;
- Exposed to salty air;
- Exposed to abnormal vibrations, impact or shock;
- Exposed to adverse weather outside the permitted range or dripping;
- Exposed to unusual transport or storage conditions;
- Exposed to high or quick temperature variations (above 5K/h);
- In the presence of nuclear radiation.

The machine is designed and built to work safely in the following environmental conditions:

Permitted environmental conditions	
Environmental temperature	5 – 40°C
Humidity range	5 – 90% (without condensation)
Environmental lighting	Neon lights



CAUTION!

Different environmental conditions to those specified can cause serious damage to the machine.

Positioning the machine in environments not observing the above will void the warranty for the parts to be replaced.



IMPORTANT!

The work surface must be sufficiently lit. If there are shady or uneven zones in the workplace, it is up to the user to provide suitable lighting devices.

If these requirements are not met, the Manufacturer disclaims all liability.

5.3.3 Installation area



CAUTION!

Never lift the unit by means of the mobile equipment, as the vibrator has been calibrated by the factory according to your specific needs and may be decalibrated.

The unit must not be installed where the duct can come into contact with any rigid object or adjacent surface, therefore maintain a clearance of about 3–5 cm between the vibrating part and the adjacent static parts.

The bulk feeders can bear a maximum load as shown in the table below and it is therefore important to size the support that must safely withstand the overall weight of the system subjected to a vibrating load.

Model	Maximum load allowed
1.5lt	1 Kg
3lt	1,5 Kg
5lt	6 Kg
10lt	6 Kg
20lt	6 Kg
40lt	15 Kg

The actual operating load may vary depending on the characteristics of the components being fed, such as geometry, material and behaviour during vibration. For applications with loads close to the maximum permissible limit, it is recommended to contact the manufacturer to carry out a verification test using the actual components to be fed.

The control unit must be installed as close as possible to the bulk feeder, in a dry, clean and vibration-free place

5.3.4 Bulk feeder positioning

Step	Action
1	Place the bulk feeder on a stable surface. Note: if the bulk feeder is installed on a machine platform (sensitive to vibrations), put some insulating and vibration damping material between the platform and the bulk feeder.
2	Fix the bulk feeder through the holes. Note: the bulk feeder has 4 holes for M8 screws on its base so that it can be fixed to a surface.
3	Connect as necessary (see the “ Connections ” section).



CAUTION!

Make sure the machine support surface is flat and horizontal and can withstand its weight.

5.4 Connections

To start the machine, it must be properly connected to the local networks:

- **electrical connection** (including connection to the earthing system),

It is the user's responsibility to guarantee the requested connection characteristics.



CAUTION!

The required connections must be set up by qualified and authorised personnel.

5.5 Electrical connection



CAUTION!

Before doing any electrical connections, it is important to ensure that the machine is turned off.



CAUTION!

Make sure the customer's power supply has already been disconnected.

The buyer is responsible for compliance of the connection between the machine and the earthing system.



CAUTION!

The operation must only be carried out by specialised and authorised personnel (electrical maintenance technician).

Before proceeding with the **electrical connection**, ensure that:

- the maintenance technician is fully aware of the regulations in force in the country of installation;
- the frequency and supply voltage values of the machine match the mains values;
- the cross-section of the electric cables is adequate for the power consumption;
- the power line can withstand the maximum machine power consumptions;
- earthing of the circuit complies with **EN 60204-1**;
- the materials used in the earthing system have adequate strength or adequate mechanical protection.



CAUTION!

Do not work with wet hands or objects. In case of fire, do not use water on the electrical components.

ELECTRICAL CONNECTION – AC	
Operator qualification	Electrical maintenance technician
PPE required	

Proceed as described below for **connection to the mains – AC**:

Step	Action
1	Connect the system to the power supply.
2	Make sure the earthing system is installed correctly.



IMPORTANT!
The power supply range is 115 – 230 VAC +/-5%. **CAUTION!**



CAUTION!
An incorrect power supply can cause problems to the system and stop it from working properly.

6 Controls and use

During operation, the machine does not need to be continuously manned by an operator.



CAUTION!

Using the machine for a purpose other than intended by the Manufacturer can cause serious damage to people and/or property and/or animals.

ARS S.r.l. shall not be held liable for damage caused by machine misuse.

6.1 Description of controller

The digital Controller is equipped with a microprocessor to view the frequency. It is possible to set a starting or stopping delay of the vibrator, by means of the PNP/NPN sensor or through a mechanical contact up to a maximum of 6 sec. as adjusted.

6.1.1 Controller technical data

Technical features	
Power supply	85/250V
Frequency / Phasing	50-60 Hz / 1 Phase
Consumption	1.5W max
Max current	5A (RMS)
Fuses	double 5A F 250V 5x20 H 1500A
Minimum load	50 mA (RMS)
On/Off	Potential-free contact - Signal in 0-24Vdc voltage
Vibrator Frequency Adjustment	50 - 100HZ +/- 12Hz
Sensor Inlet	NPN/PNP-mechanical contact
ON/OFF delay	0 / 6 seconds
Operating temperature	-15°C / +45°C
European Standards	EMC EC
Protection Rating	IP65 in box

6.2 Operating procedures

6.2.1 Preliminary inspections

Before starting the machine, the following checks need to be carried out.

- Check that the machine is placed on a surface that can withstand its weight.
- Make sure the safety devices are working properly.
- Make sure all opening guards are closed properly.
- Check that the space around the machine is free from obstacles and/or obstructions.
- Check that the machine is connected to the mains.
- Check that the power supply phases are correct.
- Check that the tank is free to vibrate.
- Check that the machine is not under "Maintenance".

6.2.2 Controller electrical connections and set-up



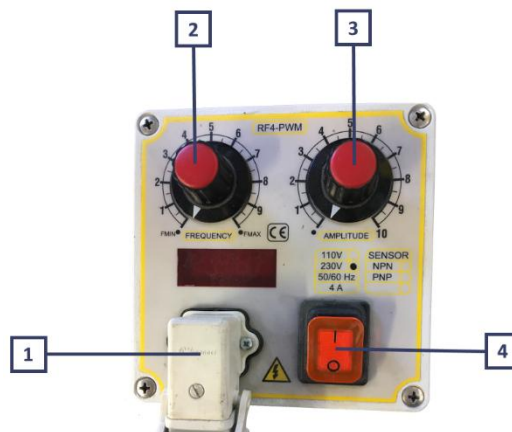
CAUTION!

Before switching the controller on, connect the Schuko plug into the socket making sure that the plant is appropriately earthed.

Proceed as described to start the machine:

Step	Action
1	Connect the cable of the linear base to the outlet connector of the controller (then connect the vibrator to the outlet connector (1))
2	Turn the frequency adjustment (2) and amplitude adjustment (3) knob of the controller to "•"
3	Turn on the controller with the ON/OFF button (button at position 1 (4)).
4	Slowly turn the adjustment knobs (2 and 3).

Before bringing vibration to maximum (Amplitude Potentiometer (3)) it is recommended to look for the maximum possible amplitude using the Frequency potentiometer (2).



So as to comply with the **EMC** standard, the circuit is equipped with filters with leakage currents to earth lower than 1mA. The circuit supplies the vibrator with a pulse width modulated control signal (**PWM**) adjustable both in **Amplitude** and **Frequency**. This signal is compensated with regards to line voltage variations.

The circuit is controlled by a **microprocessor** and the outlet current is limited by a 4A fuse (**F4**).

The protective fuses are:

- **F1** (6.3A) on the line inlet
- **F3** (250mA) on the ON/OFF inlet and limits the current available for the **NPN/ PNP** sensor and any solenoid valve
- **F4** (4A) on vibrator outlet.

There are LEDs inside the board:

- the **green LED (LD2)** on indicates that the control circuit is powered. It is off if **F1** and/or **F2** and/or **F3** are blown;
- the **red LED (LD1)** indicates high voltage on the filtering capacitors (up to beyond 300V with 230V on the line);



CAUTION!

It is forbidden to touch the circuit with the red LED on.

- The **green LED (LD3)** on indicates that the ON/OFF relay has switched in conjunction with starting/stopping of the vibrator.
- The yellow LED (**LD4**) on means that the relay switched when the piece missing time elapsed. At connectors (**CONN4** – **CONN5**) these relays can draw their exchange contact and then activate a possible module in cascade (**CONN4**) or a piece flow alarm (**CONN5**).

The entire control section is galvanically isolated from the power section. When switched on, the circuit waits a few seconds before enabling the vibrator.

The circuit is capable of compensating the line voltage variation while keeping the voltage on the vibrator constant. The following operations can be carried out:

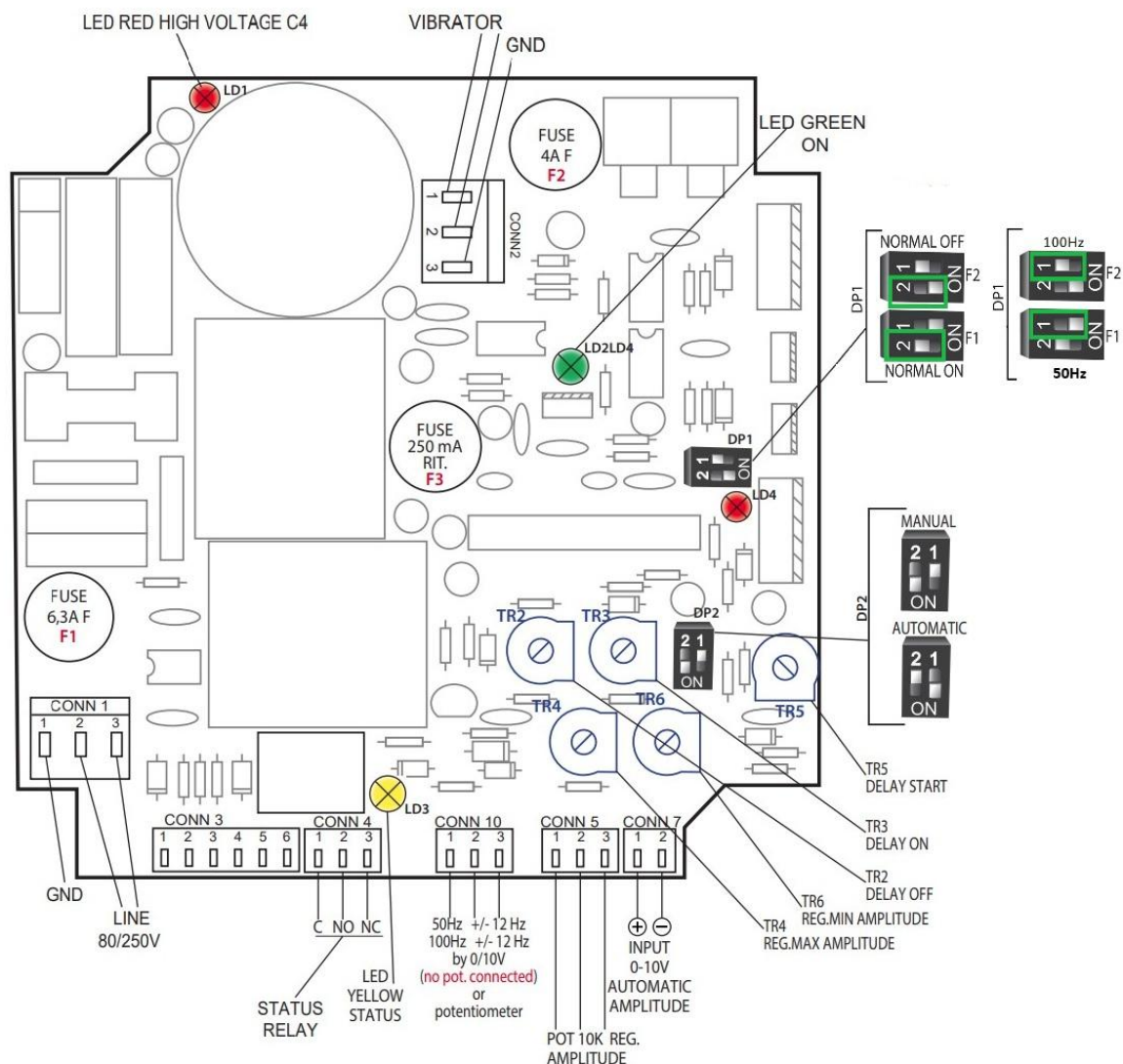
- adjust the delay time to start the vibrator with the trimmer **TR3 (0/10 sec)** or the delay time to stop the vibrator with the trimmer **TR2 (0/10sec)**.
- adjust the maximum amplitude with **TR4**.
- adjust the delay on start with **TR5**.
- adjust the minimum amplitude with **TR6**.
- stop the vibrator and switch it back on with the external control coming both from the **potential-free contact** and from the **NPN** or **PNP** sensor or from a **0/24V** outlet by inserting the delays mentioned above or not (see detail **CONN3**). And with **DPI** you may select straight or denied logic of the ON/OFF signal coming from the sensor from the contact connected to **CONN3** (see connection details **CONN3**).

The **ON/OFF Relay** (**CONN4**) switches whenever voltage is missing at the vibrator outlet. This contact also serves to pilot, in cascade, the different vibrating units in the multiple loading systems.

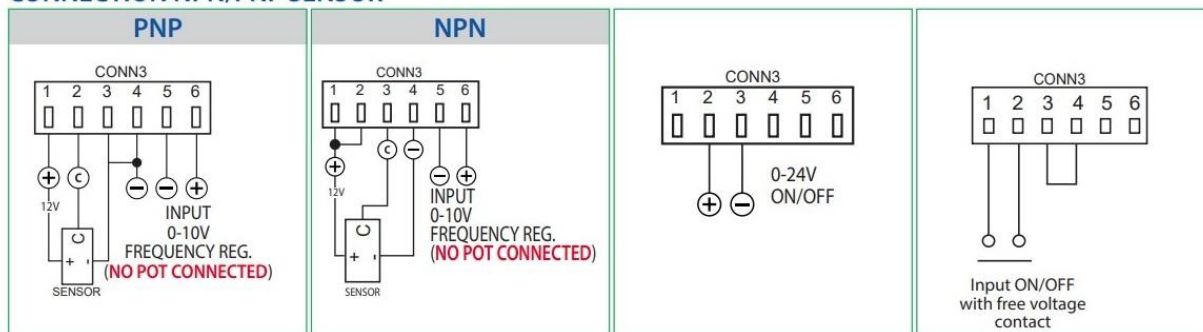
The following is the standard configuration recommended by ARS:

- **DPI:** both switches in **ON** position.
- **DP2:** switch 2 in **ON** position and switch 1 in **OFF** position.
- **TR2 e TR3:** turn the adjustment screw of the trimmer counter-clockwise until end limit.
- **CONN3:** start the hopper with a potential-free contact.

TECHNICAL DESIGN



CONNECTION NPN/PNP SENSOR



6.2.3 Analogic Controller

6.2.3.1 Controller electrical connections and set-up

Proceed as described to start the machine and refer to the picture at the end of the paragraph:

Step	Action
1	Connect the 80/250 Vac power supply to connector CONN 1
2	Connect the cable of the linear base to connector CONN 2
3	Connect the activation command on connector CONN 3
4	Connect the analogic input to connector CONN 7
5	Adjust trimmer TR1 until the frequency is 50 Hertz



So as to comply with the **EMC** standard, the circuit is equipped with filters with leakage currents to earth lower than 1mA. The circuit supplies the vibrator with a pulse width modulated control signal (**PWM**) adjustable both in **Amplitude** (through analogic signal) and **Frequency** through trimmer **TR1**. This signal is compensated with regards to line voltage variations. The circuit is controlled by a **microprocessor** and the outlet current is limited by a 4A fuse (**F4**).

The protective fuses are:

- **F1-F2** (6.3A) on the line inlet
- **F3** (250mA) on the ON/OFF inlet and limits the current available for the **NPN/ PNP** sensor and any solenoid valve
- **F4** (4A) on the vibrator outlet.

There are LEDs inside the board:

- the **green LED (LD2)** on indicates that the control circuit is powered. It is off if **F1** and/or **F2** and/or **F3** are blown;
- the **red LED (LD1)** indicates high voltage on the filtering capacitors (up to beyond 300V with 230V on the line);



CAUTION!

It is forbidden to touch the circuit with the red LED on.

- The **green LED (LD3)** on indicates that the ON/OFF relay has switched in conjunction with starting/stopping of the vibrator.
- The yellow LED (**LD4**) on means that the relay switched when the piece missing time elapsed. At connectors (**CONN4 - CONN5**) these relays can draw their exchange contact and then activate a possible module in cascade (**CONN4**) or a piece flow alarm (**CONN5**).

The entire control section is galvanically isolated from the power section. When switched on, the circuit waits a few seconds before enabling the vibrator.

The circuit is capable of compensating the line voltage variation while keeping the voltage on the vibrator constant. The following operations can be carried out:

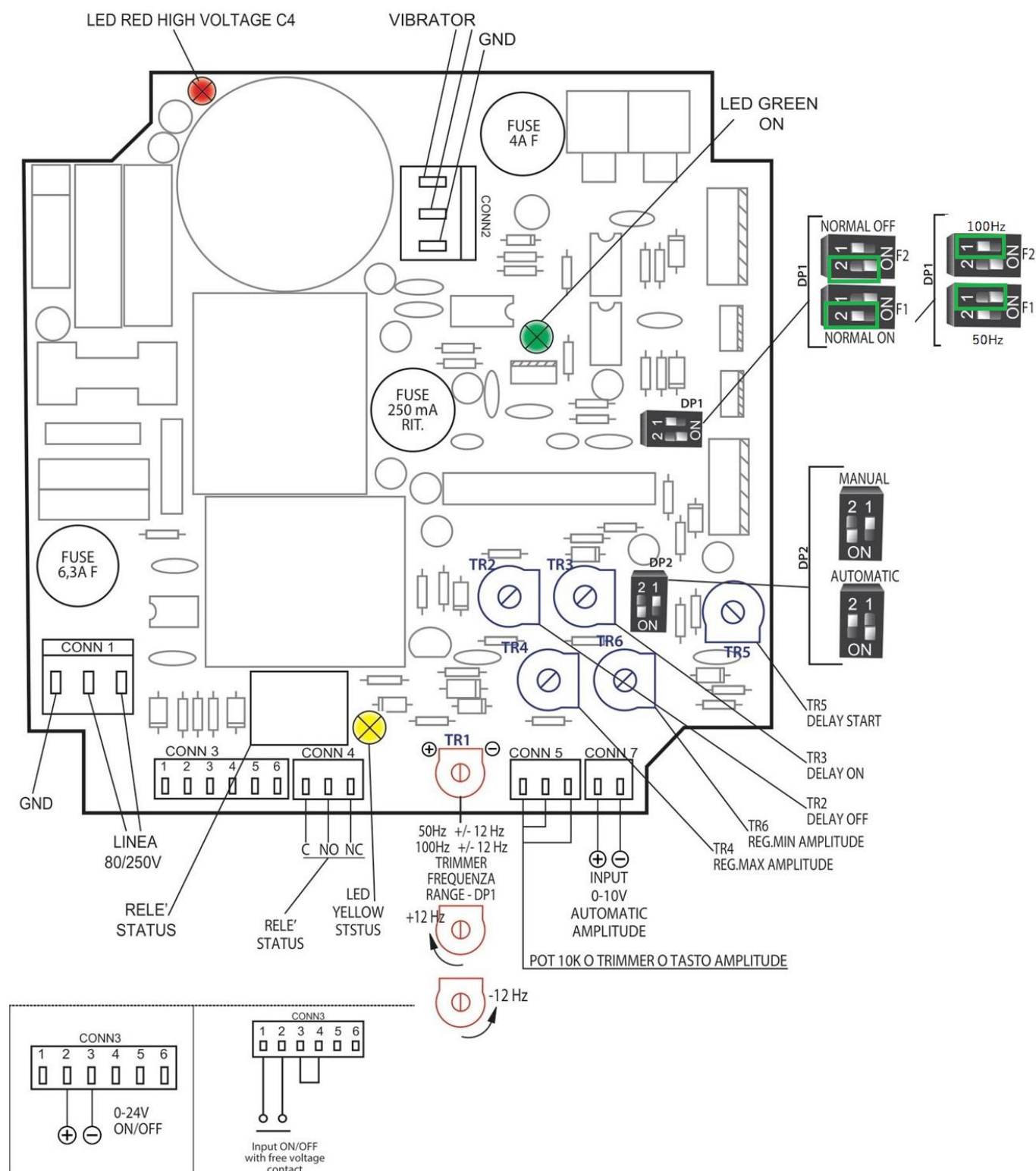
- adjust the delay time to start the vibrator with the trimmer **TR3 (0/10 sec)** or the delay time to stop the vibrator with the trimmer **TR2 (0/10sec)**.
- adjust the delay time after which the piece missing alarm triggers (0/10 sec.) with **TR4**.
- adjust the additional air blow solenoid valve activation time once the vibrator stops (0/3 sec.) with **TR5**.
- adjust the vibrator switch on-ramp (0/3 sec.) with **TR6**.

- adjust the maximum amplitude on the vibrator with **TR7**.
- stop the vibrator and switch it back on with the external control coming both from the **potential-free contact** and from the **NPN** or **PNP** sensor or from a **0/24V** outlet by inserting the delays mentioned above or not (see detail **CONN3**).
- With **DP1** you may select straight or denied logic of the ON/OFF signal coming from the sensor from the contact connected to **CONN3** (see connection details **CONN3**).
- Set the analogic tension based on the necessary vibration.

The **ON/OFF Relay** (CONN4) switches whenever voltage is missing at the vibrator outlet. This contact also serves to pilot, in cascade, the different vibrating units in the multiple loading systems.

Below is the standard configuration suggested by ARS:

- **DP1**: both switches on **ON**.
- **DP2**: switch 1 on **ON** and switch 2 on **OFF**.
- **TR2 e TR3**: turn the regulation screw in counterclockwise direction until setscrew.
- **CONN3**: start with bulk feeder on clean contact.



7 Maintenance



CAUTION!

Perform maintenance operations when the machine is turned off.



CAUTION!

Maintenance operations must be carried out by qualified and authorised personnel.

Machine maintenance includes the operations (inspections, checks, adjustments and replacements) that become necessary following normal use.

For good maintenance:

- only use original spare parts and tools that are suitable for the purpose and in good condition.
- follow the intervention frequencies indicated in the manual for scheduled maintenance (preventive and periodic). The distance (indicated in time or in work cycles) between one intervention and another is intended as the maximum acceptable; therefore it must not be exceeded, but it can be shortened.
- good preventive maintenance requires constant attention and continuous monitoring of the machine. Immediately check the cause of any anomalies, such as excessive noise, overheating, fluid leaks, etc., and fix it.
- timely removal of any causes of anomaly or malfunction prevents further damage to the equipment and ensures operator safety.

Machine maintenance staff must be well trained and have thorough knowledge of the accident prevention regulations; unauthorised staff must stay outside the work area during the operations.

Machine/system cleaning and adjustments must also be carried out only during maintenance and with the machine/system stopped and disconnected from the electrical panel, as shown in the use and maintenance manual.



IMPORTANT!

In case of doubt, it is forbidden to operate. Contact the Manufacturer for any explanations.



CAUTION!

Any repairs or maintenance work not indicated herein can only be carried out following authorisation from ARS S.r.l.

ARS S.r.l. shall not be held liable for any damage to people or property for operations other than those described or carried out in ways different than indicated.

Machine maintenance jobs, in terms of operation, are divided into two main categories:

Routine maintenance	All those operations that the operator must perform preventively to ensure smooth operation of the machine over time; routine maintenance includes inspections, checks, adjustments, cleaning and lubrication.
Unscheduled maintenance	All those operations that the operator must perform when required by the machine. Unscheduled maintenance includes inspections, repairs, restoration of nominal operating conditions or replacement of a broken, faulty or worn unit.

7.1 Safety warnings



CAUTION!

Before starting any maintenance work on the machine, disconnect and padlock all energy sources and safely block all of its moving units. Put the “Machine under maintenance – do not switch on” sign on the main switch.



CAUTION!

To stop the machine from being accidentally switched on while it is under maintenance, put signs on it saying: “CAUTION! Machine Under Maintenance”.

- Maintenance technicians must wear the necessary personal protective equipment (gloves, glasses, overalls) for the job at hand.
- During maintenance operations, unauthorised personnel must remain outside the operation area.
- If the operation requires the guards to be removed, the area of intervention must be fenced off and persons unrelated to the maintenance work must be forbidden access.

The need to put the machine in working condition and/or with the protections disabled requires adequate skill and knowledge, and extreme care by the maintenance technician who must be appropriately trained on possible and subsisting risks.

The accident prevention precautions in this section must always be strictly adhered to during machine/system maintenance, in order to prevent injury to personnel and damage to the equipment.

Before starting any maintenance work, ensure that the energy sources are disconnected (electricity, compressed air, hydraulic energy, etc.).

- Carry out the operations only with the machine/system stopped and disconnected.
- Put up specific warning signs such as: EQUIPMENT UNDER MAINTENANCE – DO NOT POWER ON, WORK IN PROGRESS – DO NOT OPERATE or **do not switch on** at the main switch and in the machine access zones.
- Carry out the operations covered by the skillset (Mechanical, Electrical, Fluid) that you are authorised for.
- Be able to use the most suitable and appropriate instrumentation for troubleshooting and know the most suitable equipment for maintenance.

7.3 Routine maintenance

When the machine is delivered to the user, it is already adjusted to work properly; however, in order to ensure smooth operation over time, periodic and preventive checks and maintenance work must be carried out.

Routine maintenance includes inspections, checks and interventions that, to prevent breakdowns, keep the following under control:

- the mechanical conditions of the machine,
- cleanliness of the machine.

The following tables list a series of checks and interventions to be carried out following a recommended timetable. The frequency of the routine maintenance operations indicated refers to normal operating conditions, i.e. that meet the intended conditions of use.

The table below lists a series of routine maintenance procedures valid for all types of machines manufactured by ARS S.r.l.

The operator must take into consideration only the procedures relating to the machine described in this manual.



IMPORTANT!

For the routine maintenance of machines from external suppliers, see the sub-supplier manuals for said machines attached hereto.



IMPORTANT!

Always use LOCTITE 243 threadlocker to ensure the screws are properly secured.

7.3.1 Checks and inspections

7.3.1.1 Routine maintenance table – checks

Operation	Frequency				
	Daily	Weekly	Monthly	Six-monthly	Yearly
Check the condition of the tank before each start-up.	◆				
Check for wear of the relays.					◆
Check that the fuses work properly.					◆
Check for wear of the leaf springs.				◆	
Check that the electromagnet works properly.				◆	
Check for wear of the polyurethane cladding (if present).			◆		

7.3.1.2 Inspection of safety devices

Perform the following checks to ensure that the safety devices work properly:

Step	Action
1	Check that the machine covers are in place and fixed properly.
2	Check that the power cable is not damaged and/or worn

7.2.3 Cleaning


CAUTION!

Cleaning operations must be carried out by qualified and authorised personnel.


CAUTION!

To clean the machine, do not use bits of sponge, damp and/or abrasive cloths, rags with loose threads, petrol or flammable solvents as detergent.


IMPORTANT!

Use neutral, non-abrasive products such as degreasers or common household soap. To remove fragments and dust, use a brush and wear safety glasses.


CAUTION!

Do not use acids or solvents to clean the bulk feeder base.

7.3.1.3 Routine maintenance table – cleaning

Operation	Frequency				
	Daily	Weekly	Monthly	Six-monthly	Yearly
Remove processing residues and waste from the tank surface.	◆				
Remove any grease or oil with neutral products or solvents.	◆				
General cleaning.		◆			

7.3.1.4 General cleaning

The machine must be kept in a good condition of cleanliness.

Proceed as described below to **give the machine a general clean**:

Step	Action
1	Disconnect the power supply of the machine.
2	Manually remove any product residues.
3	Remove the dirt with non-flammable and non-toxic commercial cleaning solvents.
4	If necessary, use a vacuum cleaner to remove any residues from the rotating surface.
5	After cleaning, restore all machine connections.


IMPORTANT!

The machine must be given a general cleaning whenever the type of component to be processed is changed, in order to remove any residues from previous processes.

7.4 Unscheduled maintenance

**CAUTION!**

Unscheduled machine maintenance and repairs shall only be carried out by qualified, trained and authorised technicians, employed by the Manufacturer or by the authorised service centre.

These interventions require thorough and specialised knowledge of the machine, of the operations required, of the risks involved and of the correct procedures to work safely.

If exceptional events occur, which require unscheduled maintenance work to be carried out, the user's routine maintenance technicians must follow these procedures:

- check the condition of the damaged or out-of-phase units;
- perform the operations described in this section;
- if the operations to be carried out are not indicated in this manual, send the report of what occurred, the result of the inspection and any observations to the Manufacturer.

The Manufacturer or the authorised service centre will evaluate the situation case by case. Then the type of work to be carried out will be agreed with the routine maintenance technicians, and the most suitable solution will be chosen from the list below:

- the Manufacturer will send an authorised, trained and qualified technician to carry out the necessary work;
- or the Manufacturer will authorise the user's routine maintenance technicians to carry out the work and send any additional instructions.

**CAUTION!**

Replacement spare parts must be ordered from ARS S.r.l.

If the customer does not use spare parts that are original or authorised in writing by the Manufacturer, the latter shall be deemed free from any liability concerning machine operation and operator safety. Authorisation and/or instructions must always be provided in writing. In the absence of written authorisation, it is forbidden to operate and the Manufacturer disclaims all liability.

**CAUTION!**

Maintenance operations must be carried out only by qualified and authorised personnel.

**CAUTION!**

Disconnect the power supply before taking the cover off.

**CAUTION!**

Disconnect the power and air supply before starting any maintenance operations.

**IMPORTANT!**

Always use LOCTITE 243 threadlocker to ensure the screws are properly secured.

7.4.1 Adjusting the air gap

The air gap is the distance between the core and the counter-core. The appropriate adjustment of the air gap is extremely important for proper operation of the vibrator. If the air gap is adjusted in such a way that the surfaces of the core and counter core are too close, they will touch during operation causing the so-called beat. If on the contrary, the air gap is adjusted so that the core and counter-core are too far apart, the vibrator current could rise to a dangerous level and cause the winding to burn and damage the box components.



CAUTION!

Do not operate the vibrator if one of the two conditions above is met.



IMPORTANT!

The air gap is adequately factory-set, therefore any adjustment will rarely be required. Adjustment may be necessary if an overvoltage is applied to the vibrator or if the air gap has been altered due to improper handling.

ADJUSTING THE AIR GAP	
Operator qualification	Mechanical maintenance technician
PPE required	
Tools to be used	Open end wrench



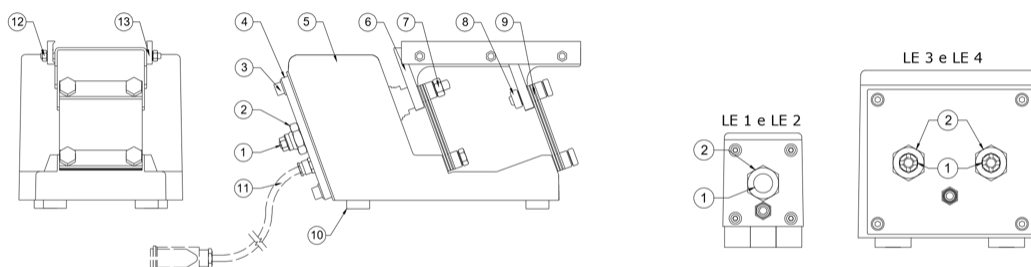
CAUTION!

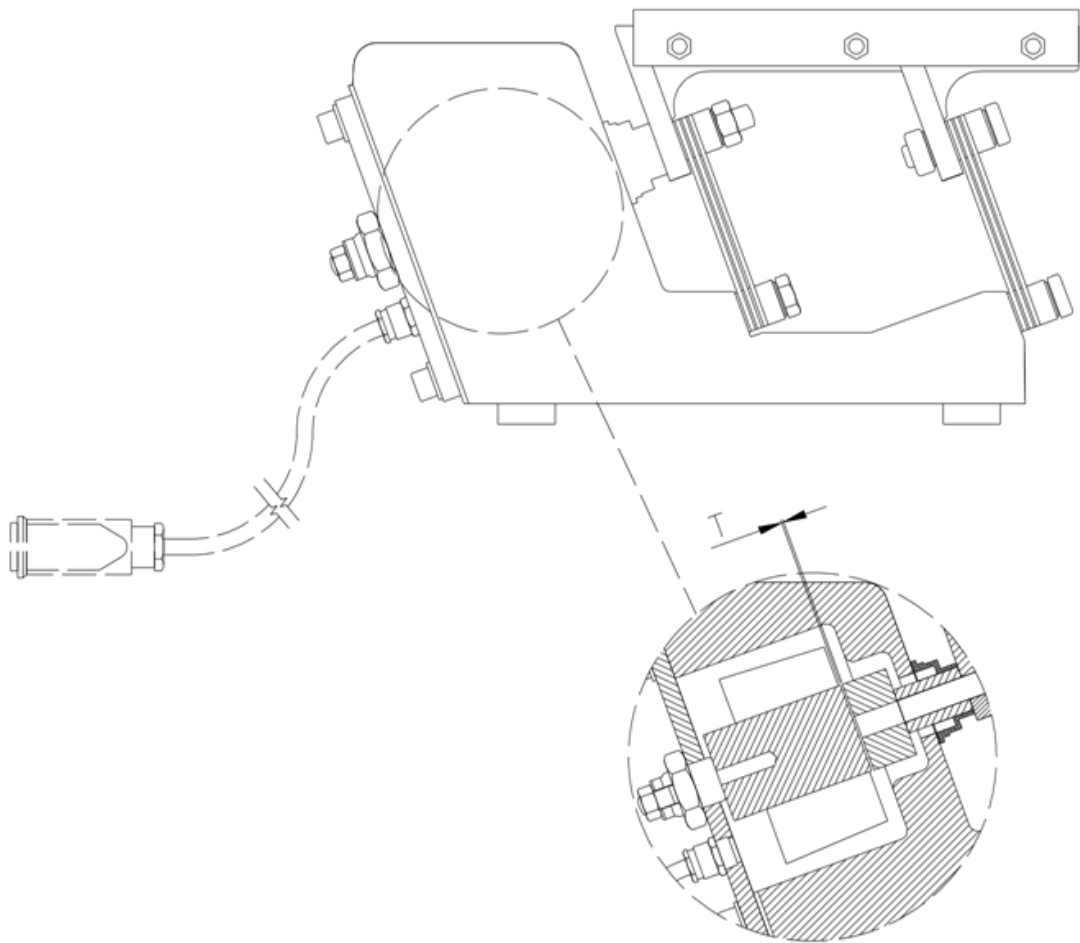
Disconnect the power supply before taking the cover off.

Proceed as follows to adjust the air gap:

Step	Action
1	Loosen nut 2
2	Tighten screw 1 by turning it clockwise until it reaches the end of its stroke and therefore, flush against the counter-core
3	Loosen screw 1 by turning it anti-clockwise and, referring to the table below, identify which is the correct air gap for your vibrator; turn screw 1 as many times as is necessary to obtain this air gap.
4	Tighten nut 2 to firmly secure adjusting screw 1

Note: Adjustment of the air gap is a rather delicate procedure and could require a bit of time so that it is ideal to your purpose





Model	Magnet dimensions	Air gap	Screw rotation
1.5lt	Ø21	1.5 mm	360°
3lt	Ø24	2 mm	480°
5lt	Ø28	3 mm	720°
10lt	Ø28	3 mm	720°
20lt	Ø28	3 mm	720°
40lt	32x30	3 mm	720°

7.4.2 Replacing the leaf springs

REPLACING THE LEAF SPRINGS	
Operator qualification	Mechanical maintenance technician
PPE required	
Tools to be used	Open end wrench



Caution!

Disconnect the power supply before intervening.

The sizing of the leaf spring assembly (number and thickness) is necessary to modify the vibrator capacity.

Proceed as follows to replace the leaf springs:

Step	Action
1	Operate on one leaf spring assembly at a time, starting from the back
2	Take note of the position and layout of each leaf spring, spacer and clamp
3	Remove the bolts that hold the leaf springs on the base and then those that hold them on the bridge fitted in the duct
4	Replace the damaged leaf spring
5	Recompose the layout of the leaf springs in the inverse order that they were removed in
6	Tighten the screws with the torque indicated in the following table

Model	Leaf Spring Dimensions	Leaf Spring Thickness	Leaf Spring Tightening Torque
1.5lt	40x48 mm	1-1.5-2 mm	7.5N/m – M5
3lt	40x48 mm	1-1.5-2 mm	7.5N/m – M5
5lt	70x82 mm	1.5-2 mm	30N/m – M8
10lt	70x82 mm	1.5-2 mm	30N/m – M8
20lt	70x82 mm	1.5-2 mm	30N/m – M8
40lt	80x91 mm	1.5-2-2.5 mm	70N/m – M10

7.4.3 Replacing the tank

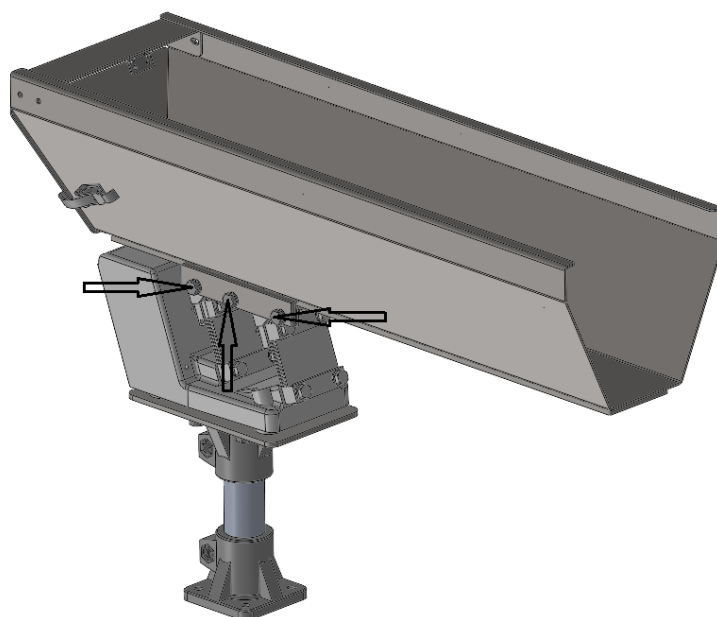
REPLACING THE TANK	
Operator qualification	Mechanical maintenance technician
PPE required	
Tools to be used	Open end wrench



Caution!
Disconnect the power supply before removing the tank.

Proceed as follows to replace the tank:

Step	Action
1	Hold the tank firmly
2	Loosen the screws indicated in the figure below
3	Remove the tank
4	Place the new tank
5	Tighten the screws



7.5 Troubleshooting



Caution!

The vibrator must function silently during normal operation; if it makes a hollow sound, caused by a beat, turn off the vibrator immediately.

Check the distance between the core and the counter-core (air gap) referring to the table in chapter 7 for any adjustment.

If the distance is too close, the core and counter-core will touch and thereby cause a beat.

Contrarily, if the core and counter-core are too far away, the vibrator current could rise to a dangerous level and cause the winding to burn and damage the controller components.

The correct distance has been factory-set, so no adjustment is generally required.

Problem	Possible causes	Solution
The vibrator works too slowly	The supply voltage is below the designated value	Increase the supply voltage up to the designated value
	The unit comes into contact with rigid objects or other surfaces	Isolate the unit
	The action of the leaf springs could be hindered	Remove and clean the leaf spring assemblies
	The leaf springs are defective	Replace them
	The duct is cracked or worn	Replace it
The vibrator works too fast	The supply voltage is above the designated value. Note: Too high voltages can cause beats	Decrease the supply voltage to the designated value
The unit makes noise but does not vibrate	The circuit board inside the box is defective	Replace it
The unit is unable to operate	There is no power to the Controller	Check for disruptions on the line
	The switch or fuse is defective	Replace them
	The circuit board inside the box is defective	Replace it
	The vibrator winding could be burnt or grounded	Replace it
	The winding is shorted	The winding is shorted.
	The rheostat winding is open	Replace it

8 Decommissioning and disposal



CAUTION!

Decommissioning and dismantling operations must be assigned to personnel specialised in such activities. Namely, only the person in charge of dismantling and disposal at the end of the service life can:

- disconnect the parts mechanically and electrically following the disassembly instructions and blueprints.
- transport the parts from the system site to the disposal centre for sorting the parts.

The machine mainly consists of the following materials:

- painted, plasticised or galvanised ferritic steel;
- 300/400 series stainless steel;
- plastic polyethylene material;
- elastomers, PTFE, graphite;
- gear oil;
- lubricating grease;
- electric motors;
- power cables with relative sheaths;
- electronic control and actuation devices.
- etc.



CAUTION!

The machine does not contain any components or hazardous substances that require special removal procedures.

8.1 Decommissioning

If the machine will not be used for a long time, it must be made safe and stored properly. Proceed as described:

Step	Action
1	Disconnect the power supply.
2	Protect electrical equipment that is particularly prone to wear over time and dust.



IMPORTANT!

When decommissioning machines from external suppliers, see the sub-supplier manuals for said machines attached hereto.

8.2 Disposal

Machine scrapping operations must be assigned to qualified staff, each for their own area of expertise. When the machine will be disposed of, make sure it is made safe.



CAUTION!

Disconnect the power and air supply of the machine.



CAUTION!

For disassembly of trade parts or sub-supply materials that are part of the machine supplied by ARS S.r.l. please see the relative supplier's manual.

Pursuant to the "WEEE" Directive 2012/19/EU, if the component/equipment purchased is marked with the following crossed-out wheelie bin, it means that at the end of its service life the product must be collected separately to other waste.



CAUTION!

It is mandatory to comply with the laws in force regarding disposal in the country of machine installation.

9 Appendices

Appendices
Appendix A: Frontal and Rear Photocells



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