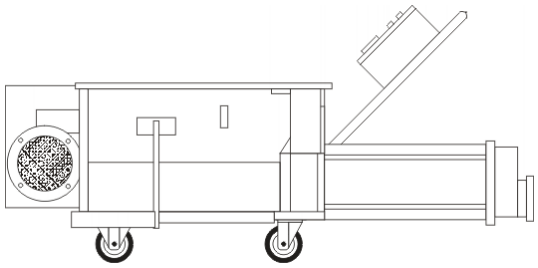
EN



# PMS pump
# Use and Maintenance Instructions

DELLA TOFFOLA

PAGINA BIANCA - BLANK PAGE


**Read all the following safety recommendations very carefully before undertaking any action whatsoever with your machine.**

# FIRST LEARN AND THEN ALWAYS FOLLOW ALL THE SAFETY RECOMMENDATIONS

Read these safety recommendations very carefully before installing and using the machine.

Also read all the explanatory and warning signs attached to the machine itself. Make sure that they are always easy to read, replacing any damaged or missing signs without delay.

Read this manual carefully before using the machine to make sure that you are thoroughly familiar with how it works and all the controls.

Never postpone learning this important information until you are already working with the machine.

Never allow any unauthorized persons unfamiliar with the equipment to come into the vicinity or operate the machine.

Always keep this manual readily available so that anyone taking action on the machine can refer to it.

If the machine is sold or transferred to third parties, it is compulsory to hand over all the related technical documentation, use and maintenance

# EXPLANATION OF THE SYMBOLS

Several symbols are used in this manual and on the machine itself to accompany hazard warnings and safety recommendations.
These warnings and recommendations serve primarily to ensure the safety of Installers, Technicians and Operators, but also to avoid the machine being damaged.

THIS SYMBOL IS USED TO DRAW YOUR ATTENTION TO THE RISK OF FATAL ACCIDENTS, SEVERE INJURIES AND EXTENSIVE DAMAGE IN THE EVENT OF THE SPECIFIED SAFETY MEASURES BEING DISREGARDED.

THIS SYMBOL DRAWS ATTENTION TO RISKS OF A GENERAL NATURE.

THIS SYMBOL IS USED TO DRAW YOUR ATTENTION TO THE RISK OF FATAL ACCIDENTS, SEVERE INJURIES AND EXTENSIVE DAMAGE IN THE EVENT OF THE SPECIFIED SAFETY MEASURES BEING DISREGARDED.

THIS SYMBOL DRAWS ATTENTION TO RISKS DERIVING FROM THE PRESENCE AND USE OF ELECTRICITY.

**IMPORTANT**
This word is used to identify paragraphs in the manual containing essential information concerning the machine. Read the related information

# DEFINITIONS

The following are definitions of the individual and legal entities involved in handling and using the machine.

**OWNWER:** In this user manual, the OWNER is the legal representative of the company or body, or the individual, that purchased the machine. The Owner is responsible for ensuring compliance with all the safety requirements specified in the present manual and in the current legislation in the country where the machine is installed. This last aspect is waived if the Owner appoints a plant MANAGER, who thus takes responsibility for implementing the safety recommendations and for compliance with the safety standards relating to the use of the machine and relations with the OPERATOR.

**INSTALLER:** In this user manual, the INSTALLER is the legal representative of the company appointed by the OWNER to install and connect the machine to the hydraulic, electrical and compressed air supply networks (etc.) at the plant. The Installer is responsible for correctly handling and installing the machine in compliance with the recommendations of this manual and with the current legal requirements in the country where the machine is used.

**OPERATOR:** In this user manual, the OPERATOR is the person authorized by the OWNER or MANAGER to take all action on the machine for its usage, adjustment, control and routine servicing, as detailed in this manual (with which Operators must strictly comply, limiting their action to the explicitly allowable procedures).

**TECHNICIAN:** In this user manual, the TECHNICIAN is the person directly authorized by the Manufacturer or, failing this (and entirely under the latter's responsibility), by the Manufacturer's Dealer in the various European Community states outside Italy, to carry out all extraordinary servicing procedures, as well as any adjustments, tests, repairs and replacements of parts proving necessary during the working life of the machine.

# GENERAL SAFETY RECOMMENDATIONS

- In unloading the machine on arrival, lifting and positioning it at the workplace, and all other handling procedures, comply scrupulously with the recommendations of the relevant section of this manual.

Pay particular attention when handling wheel-mounted machines, which have to be moved by hand once they are on the ground.
To prevent any risk of crushing, only move the machine by pushing it, never by pulling it, so that nobody can ever come to be in the path of the machine as it moves. Anyone handling the machine must be supervised by another person uninvolved in the procedure, who shall keep a constant watch to ensure that no obstacles or persons get in the machine's way and no other hazardous situations occur. This supervisor must promptly alert the person moving the machine of any hazards so that the machine can be stopped immediately.

- The surface on which the machine slides, like the surface on which it is used, must meet all the essential safety requirements: it must be perfectly horizontal and smooth, with nothing to interfere with the machine's movements. Check in advance to ensure that the whole distance to cover with the machine meets all the above-mentioned requirements. Make sure that the sliding and supporting surfaces have a load-bearing capacity sufficient to withstand the weight of the machine both empty and in use. Any discontinuity in the floor, e.g. expansion joints, grids and manholes, must meet the specified requirements.
- Never, for any reason whatsoever, lift the machine by any hoisting points other than those indicated.
- Before the machine is used, it must always be immobilized using the fixing devices provided.
- The machine must be placed in an area accessible only to the OPERATORS and TECHNICIANS; failing this, it must be protected by a barrier situated at least 2 m away from its outer edge. OPERATORS and TECHNICIANS may access the area where the machine is used providing they are adequately clothed and equipped with the personal protective equipment specified by law (safety shoes, gloves, helmet, etc.). The INSTALLER's personnel, or any visitors, must always be accompanied by an OPERATOR. Unauthorized personnel must never be allowed to remain alone in the vicinity of the machine. The place of installation must be made inaccessible to children.
- OPERATORS shall restrict themselves to taking action on the machine's controls, so they must not open any of the panels, except for the one for accessing the controls (if any).
- The INSTALLER shall restrict himself to taking action on the connections between the plant and the machine, so he must not open any panels, or operate any controls.
- In all handling, usage, servicing or repairs on the machine, it is compulsory to comply with all current safety standards in the country where the machine is used. This applies both to the equipment and to the operating methods adopted.
- Always disconnect the electric power supply before taking any action to install, service, repair or move the machine. This is of fundamental importance to prevent the risk of death, severe injury and extensive damage to the plant.
- In certain stages of normal use, some of the containers comprising the machine are under pressure (e.g. the filter vessel, plenum chamber, erosion-type dosing units, etc.). Never open such containers or remove any components connected to them before you have completely vented said pressure. Venting must be done through the valves provided on the machine specifically for this purpose.
- Never move the machine during normal working cycles.
- Before each new working cycle, make sure that any mobile electric connections (power cords, plugs, etc.) are sound and efficient. If they show any signs of damage, repairs must be made only by a specialized TECHNICIAN.
- Never take any action not mentioned in this manual under your own initiative.
- Connect the machine to the mains electric power supply according to the recommendations of this manual.
- Before starting the machine, check the efficiency of the earthing for the electric circuitry and machine frame or structure.
- Never use power cords of inadequate cross-section or provisional connections, not even briefly, and certainly not in the event of an emergency.
- Start the machine only after you have made sure of its perfectly safe connection to the systems providing the energy and anything else it needs to function properly (mains electricity and water, compressed gas supply, water drainage network, etc.).
- Keep a safe distance from any mechanical parts in motion.
- Immediately report any alarms or the tripping of any automatic machine safety devices to the TECHNICIAN.
- Never manually reset the machine after an alarm or an automatic safety device has been tripped without first identifying and dealing with the problem that caused them.
- Never remove the guards over moving parts while the machine is in operation.
- Before starting the machine, make sure all guards are correctly installed.
- Routinely perform all the scheduled servicing operations.
- Dispose of the packaging material for the machine at a suitable landfill, taking particular care over any film and plastic bags, which can expose children to the risk of suffocation.
- Never release the processing waste deriving from the working process directly into the environment.

## REGULATIONS FOR USING THE MACHINE IN THE FOODSTUFFS SECTOR

The following considerations apply only to machines used with foodstuffs, i.e. destined to come into contact with products for human consumption:

- The machine in your possession has been designed and built to make it suitable for contact with foodstuffs, and fluids in particular. If in doubt about the intended uses of your machine, refer to the relevant chapter in this manual.
- For logistic reasons related to the phases prior to its use (e.g. transport to the user's premises, storage in warehouses, etc.), it is impossible to guarantee the delivery of the machine in conditions suitable to enable its immediate use without an accurate, preliminary sanitization. This is the responsibility of the end user, who may have to comply with any established protocols, e.g. HACCP.

## DEMOLITION AND DISPOSAL OF THE MACHINE

- At the end of its working life, the machine must be demolished and disposed of.

- THE MACHINE MUST ONLY BE DEMOLISHED AND DISPOSED OF BY ADEQUATELY-TRAINED AND PROPERLY-EQUIPPED PERSONNEL IN COMPLIANCE WITH THE FOLLOWING PROCEDURE.
- 1. Divide the machine into its constituent parts, separating the materials it is made of:
  - mechanical parts (reducers, pump bodies, etc.);
  - metal parts (structure, piping, etc.)
  - electrical parts;
  - rubber parts;
  - plastic and synthetic parts.
- 2. All resulting materials must be treated and disposed of in accordance with the legal requirements in the country where the machine is used.
- 3. All components contaminated by oil and oily residues must be considered as special waste and disposed of by authorized consortiums. The same applies to the lubricants that periodically have to be changed.
- 4. In the event of the machine being placed out of commission, even only temporarily, it must be stored in an area inaccessible to children. All circuit breakers and isolators must be segregated and disconnected.
  Make a thorough check and release any built-up residual energy, e.g. liquids or gases under pressure inside containers or piping. The machine must also be checked from the static standpoint, to eliminate the risk of any single machine parts moving unexpectedly.
- THE MANUFACTURER ACCEPTS NO LIABILITY FOR DAMAGE TO PERSONS OR PROPERTY DUE TO THE RE-USE OF SINGLE MACHINE PARTS FOR ANY OTHER THAN THE ORIGINAL PURPOSES OR IN OTHER ASSEMBLY CONDITIONS.

# INSPECTION OF THE GOODS ON RECEIPT

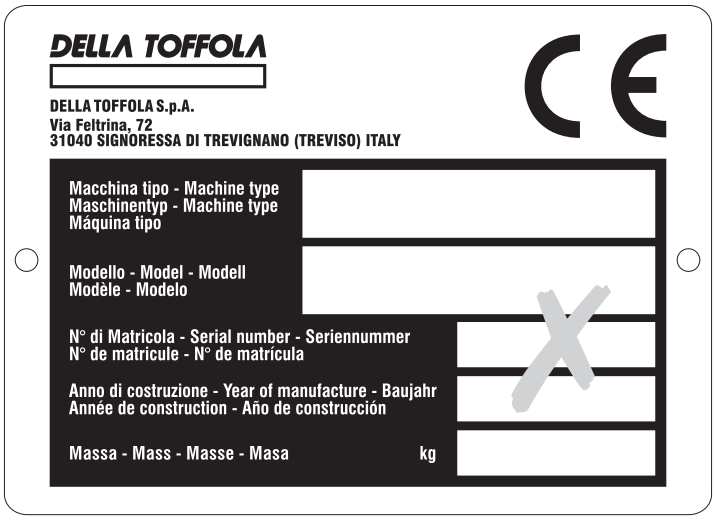
When it is delivered, the machine must be checked by the Customer to identify any signs of damage that it may have suffered in transit and ensure that the machine is complete in every part, as listed on the order form.
If there are signs of damage, make an immediate note of the anomalies detected on the transport document (delivery note or CMR), adding the wording “RECEIVED WITH RESERVE DUE TO EVIDENT DAMAGE TO THE MACHINE”. Delivery ex works includes insurance coverage for any damage in accordance with the Italian law 450 of 22.08.1985 "Compensation limit". In the event of complaints, the Customer must be able to produce an adequate photographic documentation of the most obvious damage.

# GUARANTEE

The Manufacturer guarantees the machine for the period indicated in the order form.
The GUARANTEE consists exclusively in the replacement or repair, free of charge, of any parts acknowledged as being defective.
The GUARANTEE does not cover electrical parts.
The GUARANTEE is valid only if all installation and usage instructions have been followed (not only those stated by the Manufacturer, but also those suggested by current practice).
The GUARANTEE becomes null and void in the event of any servicing procedures being undertaken by personnel not authorized by the Manufacturer. If the machine alarm sounds or one of the automatic safety devices is tripped, the machine must not be reset manually until the cause of the shutdown has been dealt with. Repeated manual resets can be sufficient reason for the Guarantee to become null and void.
The GUARANTEE is valid providing any flaws or defects are reported within eight days of their detection; moreover, the GUARANTEE takes effect providing the use of the machine was suspended immediately after the fault was discovered.

# AFTER-SALES ASSISTANCE

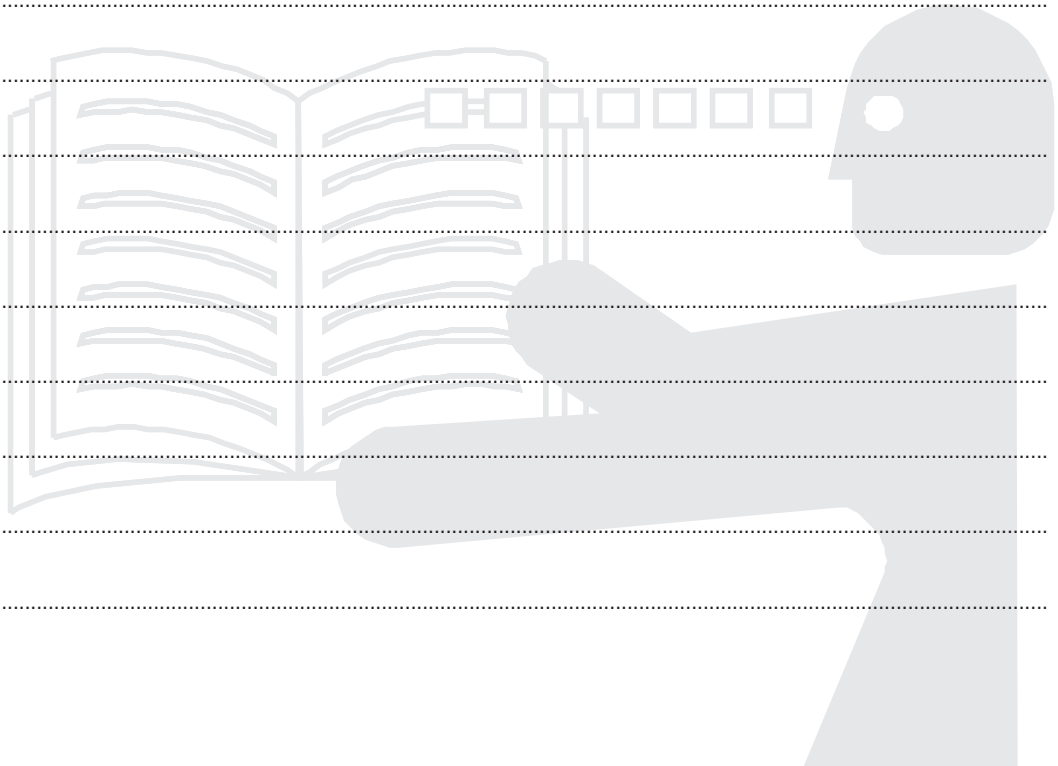
When requesting any information, servicing, or other services, it is essential to specify the SERIAL NUMBER of your machine.
It is impossible to provide accurate instructions or schedule servicing measures unless this information is provided.



## RECOMMENDATIONS FOR PROTECTION AGAINST FREEZING

If there is a danger of the ambient temperature dropping to 0°C / 32°F, be sure to empty any liquids (water or product to treat) from all of the machine's hydraulic circuits to prevent ice forming in the piping and damaging parts of the machine.

## NOTES



# CONTENTS

ENQUIRIES AND FURTHER INFORMATION:

For any enquiries or further information concerning the use of the machine or the contents of this manual, or for any technical support, please contact the Della Toffola S.p.A. Customer Support Service, using the following references:

**Della Toffola S.p.A** – Servizio Assistenza

Via Feltrina 72 - 31040, Signoressa di Trevignano (TV) (Italia)

Tel.: +39 0423 6772 Fax: +39 0423 670841

PRESERVATION:

Always keep a copy of this manual near the machine and readily available to the user, and store a spare copy in a safe place.

If the manual is lost or damaged, contact Della Toffola S.p.A. for a replacement.

This manual reflects the state of the machine as at the time when it was developed.

Bear in mind that, in accordance with current legislation, this instructions manual forms an integral part of the machine and must accompany the machine at all times.

**Della Toffola S.p.A** – Servizio Assistenza

Via Feltrina 72 - 31040, Signoressa di Trevignano (TV) (Italia)

Tel.: +39 0423 6772 Fax: +39 0423 670841

DOCUMENT ID:

| | |
|---|---|
| Title | PMS pump use and maintenance instructions |
| File code | PMS_0911R00EN.doc |
| Rev. No.: | 00 – 09.11 |

# 1. General information

This Manual applies exclusively to European standards and regulations. The client is required for any adaptations required for compliance to other standards and regulations in the nation of use of the machine.

**This manual applies to the complete standard version of the PMS pump, and for such reason may include diagrams, drawings, and reference to parts that may not be present in your machine or have been positioned in different places without compromising operation.**

## 1.1 Conservation of the documentation

The Instruction manual, the CE conformity certificate, and the test report must be conserved with care and ALWAYS accompany the machine through all its changes of ownership for the rest of its working life.
The conservation of the manual can be ensured by handling it with care and clean hands, and remembering to never leave it on dirty surfaces.
No part of the manual must be removed, torn up or arbitrarily modified.
All documentation must be filed in a room provided with protection against humidity and heat in the immediate vicinity of the machine.
Whenever requested by the user, the Manufacturer can provide additional copies of the machine Instruction manual.

## 1.2 Updating method for the instruction manual

The Manufacturer reserves the right to modify the design and improve the machine without being required to provide the client with advance notice and without updating the Manual already delivered to the user.

The Manufacturer is responsible for the descriptions provided in Italian. Given that translations into other languages cannot be checked completely, whenever any incongruence is noted, the Italian version must be taken as reference and Della Toffola must be contacted for any modifications deemed necessary.

## 1.3 Manufacturer's details

**MANUFACTURER**

**Della Toffola S.p.A**

Via Feltrina 72

31040 Signoressa di Trevignano (TV) (Italy)

**CONTACTS**

Tel.: +39 0423 6772

Fax: +39 0423 670841

e-mail: dtgroup@dellatoffola.it

## 1.4 Technical Assistance Center

**DELLA TOFFOLA S.p.A.**
Via Feltrina 72
31040 Signoressa di Trevignano (TV) (Italy)
Tel. +39 0423 6772
Fax. +39 0423 670841
E-mail dtgroup@dellatoffola.it

**The data to be transmitted to the Assistance Se vice are:**

- the machine's serial number;
- its year of manufacture;
- a description of the defects observed;
- the control operations already performed;
- the settings and modifications made to the machine with their effects and consequences;
- any other information deemed useful in solving the problem.

## 1.5 Warranty

As specified in the General Terms of Sale, this pump is covered by Warranty. Whenever during the period of coverage malfunctions occur or defects in parts of the machine covered by the Warranty are observed, after making all due inspections, the Manufacturer will proceed to the repair or replacement of the defective parts.
Please remember that modifications made by the user without the express previous written consent of the Manufacturer invalidate the Warranty and release the Manufacturer from all liability for damage caused by detective products.
This is especially true when unauthorized modifications are made on the safety devices and compromise their efficacy.
The same considerations apply to the use of non-original spare parts or parts other than those expressly indicated by the Manufacturer as "SAFETY DEVICES".
For all these reasons, we always advise our clients to always contact our Assistance Service.

# 2. Safety

## 2.1 Safety rules

The pump was constructed in compliance with the following **Harmonized Technical Standards**:

| | |
|---|---|
| **UNI EN ISO 12100-1** | Safety of machinery – Basic concepts, general principles of design (Part 1: Terms, methods) |
| **UNI EN ISO 12100-2** | Safety of machinery – Basic concepts, general principles of design (Part 2: Specifications and Technical Principles |
| **UNI EN ISO 13857** | Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs |
| **UNI EN ISO 13850** | Safety of machinery – Emergency stop – Principles for design and operation. |
| **CEI EN 60204-1** | Safety of machinery – Electrical equipment of machines. Part I: General Requirements |
| **UNI EN ISO 14121-1** | Safety of machinery – Risk assessment - Part 1: Principles. |
| **UNI EN 982** | Safety of machinery - Safety requirements for fluid power systems and their components – Hydraulics |
| **UNI EN 983** | Safety of machinery - Safety requirements for fluid power systems and their components – Pneumatics |
| **UNI EN 953** | Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards. |
| **UNI EN 349** | Safety of machinery - Minimum gaps to avoid crushing of parts of the human body. |

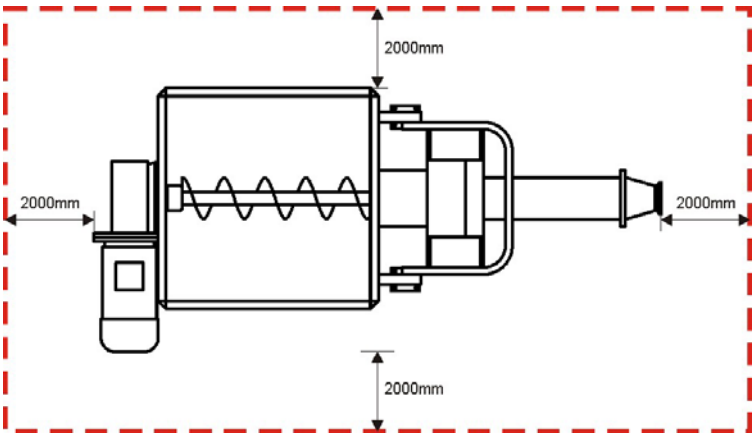
## 2.2 Definitions of terms adopted

The following terms were used in accordance with Paragraph 1.1.1 of Directive 2006/42/CE during the design of this machine.

**a) Hazard:** a potential source of injury or health damage;

**b) Hazard zone**: any zone within and/or around machinery in which a person is subject to a risk to his health or safety;

The hazard zone is enclosed by safety taping on all sides at least 2 m from the nearest part of the machine.



**c) Exposed person**: any person wholly or partially in a hazard zone

**d) Operator**: any person installing, operating, adjusting, cleaning, repairing, shifting or performing the ordinary maintenance;

**e) Risk**: the combination of the probability of occurrence of injury or health damage to persons derived from exposure to a danger situation and the seriousness of such injury or health damage;

**f) Safety guard:** element of the machine used specifically to ensure protection by means of a physical barrier;

g) **Safety device:** a device (other than a safety guard) that reduces a risk either by itself or in association with a safety guard;

h) **Intended usage:** the use of the machine in accordance with the information provided as use and maintenance instructions;

i) **Reasonably foreseeable incorrect use:** the use of the machine in ways other than those indicated in the Instruction manual that may be caused by reasonably foreseeable human behaviour.

## 2.3 Personnel safety precautions.

**Informative note:**

**The following instructions contain important information for the safe and efficient use of the PMS pump.**
**All personnel assigned to operating the machine must read these instructions carefully in order to avoid creating dangerous situations and threats to health and safety.**
**These instructions must be readily available wherever the machine is used, and must also be completed by the user and his authorized personnel with the provisions derived from national and ecological accident prevention standards and regulations.**

**In addition to the following Operation and Maintenance instructions and the accident-prevention rules in force in the nation of use of the pump and the worksite, the more specific provisions regarding safety and the qualifications of personnel assigned to the tasks assigned must also be respected.**

The following operation instructions contain elementary warnings that must be heeded during the installation, operation, and maintenance of our products, and therefore these instructions musty absolutely be read by the assembly man and the competent technical personnel.

**1. Qualifications and training of personnel:**
Personnel assigned to the control, maintenance, inspection and assembly of our pumps must be possess the qualifications necessary for these tasks. Whenever such personnel are not in possession of the same, they must be provided with adequate information and training.

**2. Shipping:**
Personnel assigned to shipping must be familiar with the use of lifting equipment and slinging techniques in compliance with the accident-prevention rules in force.

**3. System installation, starting, operation, and maintenance:**
The respective manager must be familiar with the constructive and operating features of the system in which the pump will be installed. Personnel assigned to the operation of the system must be instructed in the characteristics of use of our product.

**4. Risks posed by the failure to respect safety warnings:**

The failure to respect safety warnings can pose serious risks to personnel, the environment, and the machine.
Beyond that, the failure to respect safety warnings can lead to the loss of rights for reimbursement of damages.
All the safety warnings indicated in these instructions, those contained in the national accident-prevention regulations in force, and the others contained in the system user's own work, service, and safety rules must therefore be respected.
Wherever hot or cold machine surfaces pose risks, the client must provide protection against accidental contact.
Protections against accidental contact with moving parts (see Joint, or Drive shaft) must never be removed or absent when the machine is running.

**5. Safety warnings for maintenance, inspection, and assembly.**

The client must ensure that all maintenance, inspection, and assembly operations are performed only by qualified specialized personnel who have also been sufficiently informed of the pump's characteristics.
Operations are usually performed on machines when stationary, after all pressure has been discharged and all surfaces have been allowed to cool down.

**6. Transformation and unauthorized production of spare parts**

The transformation or modification of the machine is permitted only following previous agreement with its Manufacturer. Original spare parts and the accessories authorized by the Manufacturer ensure both greater personnel safety and optimum pump output. The use of non-original spare parts invalidates liability for damages incurred.

**7. Impermissible operating modes:**

The safe operation of the machine supplied is guaranteed only if the machine is used correctly and in compliance with the standards and regulations in force.

Careful attention must be given to the clothing of anyone who works on the machine:

- Avoid wearing loose, flowing clothes that might get caught up in or on parts of the machine;
- Avoid wearing ties or any other form of loose, flowing apparel;
- Avoid wearing bulky rings or bracelets that might get the hands caught on parts of the machine.

Our machine has been designed on the basis of clearly established conditions of use. The instructions listed under Work Conditions must never be exceeded under any circumstances. Use PMS pumps only in compliance with the use for which they have been designed and sold.

If you intend to modify or change the product, contact your supplier or our headquarters directly in order to make sure that the pump is compatible with the new parameters you require. This is especially true when intending to use corrosive, poisonous, or dangerous materials.

Specific criteria for the correct operation of the pump are as follows:

1. the compatibility of the pump's constructive materials with the material to be pumped.
2. the seal ensured by the sealing liner, especially the liners on the shaft.
3. the strength of the pump's parts compared to the delivery product temperature and pressure.

Bear in mind that the PMS is a volumetric pump, and as such is capable of producing a **theoretically infinite pressure**. Whenever the delivery line pipes are closed (by clogging or the accidental closing of a valve, for example), the pressure created by the pump can reach **a multiple of the system's maximum permissible pressure.** This can trigger the bursting of a pipe, for example – an event that must never be allowed to happen, especially when harmful fluids are conveyed.
The installation of adequate safety devices such as pressure-switches or breaking disks with return piping is often recommended.

## 8. Bear the following in mind during pump maintenance and repair:

1. During the entire repair cycle, make sure that the pump motor is never accidentally or unexpectedly started.
2. When opening the pump, respect all the rules linked to the handling of the product pumped (wear protective clothing, refrain from smoking, etc.).
3. Before starting the pump, make sure that all the safety devices, mechanical or otherwise have been duly applied.
4. Pay close attention when manually cleaning the machine with water. Never forget to disconnect the electric power supply and **never direct sprays of water in the direction of the electric control panels.**

Whenever performing maneuvers, maintenance or repairs, always give priority to your safety and therefore always respect the overall European machine safety directives ratified into national laws, specific accident-prevention rules, instructions from the mining authorities, and scrupulously respect the pertinent technical rules.

## 9. Warnings regarding inspection/repair orders:

Legislation for the safeguarding of workers and the workplace requires industrial companies to provide adequate protection for their workers, sub-contractor personnel and the environment against the effects of harmful substances.

The inspection/repair of the machines and their parts can be performed only after the following safety measures have been taken:

1. thoroughly drain the machine prior to shipping.
2. learn whether the machine has been used to feed substances that are harmful to human health or the water supply.
3. indicate any particular safety measures required to prevent harm to human health or the water in which the machine comes into contact during the further manipulation of the pump.

## 10. Use of harmful materials:

This section provides information on the handling and storage of the pumps and the materials used in the same that may sometimes pose risks to health.
Always keep the Department Manager informed of the progress of operations.
Whenever operators accidentally inhale or come into contact with harmful substances, immediately follow the instructions below:

**Skin:** wash with fresh water and soap.

**Inhalation:** go outdoors and breathe clean air immediately

**Eyes:** rinse with fresh water, immediately seek a physician.

The table below indicates the harmful substances contained in the pump and the safety measures to take during maintenance:

| **WHERE** | **LIQUID** | **DANGER:** |
|---|---|---|
| Bearings | Anti-seizing liquid | Inhalation (emission of fumes) |
| Stator-rotor | Grease – vaseline | Hands and skin |
| Sealing liners– motorization units | Lubricant oil | Eyes and skin |
| Pump surfaces | Paint | At high temperatures, harmful fumes are emitted. |

# 3. General pump description

The PMS pump is a member of the Rotary Positive Displacement pump family.

The main parts of the pumping system are:

- the stator, which is usually produced in rubber.
- the rotor, which is generally produced in metal.

The rotor is a screw with a round screw thread and a high pitch (high height of the thread and a low diameter of the depth).
The stator is double-threaded and twice the pitch of the rotor; this creates delivery chambers between the stator and the rotor. When the rotor turns inside the stator, the delivery chambers move from the inlet side to the outlet side. The flow is not pulsing because the volume container in the chambers is always the same.

The operational concept of the PMS pumps combines the positive characteristics of other types of pump:

- Like diaphragm and peristaltic pumps, the PMS pump can transfer any type of inhomogeneous products containing gases and abrasives, even products containing solid and fibrous substances up to a no longer smooth consistency.
- Like centrifugal pumps, the PMS pump supply a uniform flow proportional to its rpm.
- Like gear pumps or screw pumps, the PMS pump can pump even products with the highest viscosity.
- Like piston pumps, membrane or screw pumps, the PMS pump can perform metering.

In addition, thanks to its simple mechanics, the PMS pump:

- produces no particular damage to the product when pumping sensitive or delicate liquids;
- is self-priming;
- requires low torque even at its highest performance levels;
- is vibration-free with low operating noise;
- automatically adjusts the eccentricity of the rotor even when under pressure.

## 3.1 Sound pressure level

| | |
|---|---|
| Livello pressione sonora* / Sound pressure level* / Schalldruckpegel* Niveau de pression sonore* / Nivel de presión acústica* | **74** dB (A) |

* Livello di pressione sonora media ad 1 metro di distanza / Average sound pressure level at 1-meter distance / Mittlerer Schalldruckpegel auf einem Meter Distanz / Niveau de pression sonore moyenne à 1 mètre de distance / Nivel de presión acústica mediana a 1 metro de distancia

# 4. Packaging, shipping, and storage.

## 4.1 Packaging and shipping:

The pumps are shipped in boxes, on pallets or in crates except when the client prefers other methods.
We recommend checking for signs of damage caused by shipping immediately upon receiving the goods and immediately notifying the shipper if necessary.
Also check:

- the packing list/delivery note and compare it with the order.
- Whenever a pump with a control unit has been ordered (motor-reduction unit-speed variator), make sure that all the respective parts are al present. Submit requests/claims to the parties involved immediately whenever they are not.

We recommend keeping the pumps packed all the way to the installation site whenever possible, and then keeping them packed until the moment of use.

**THE SHIPPING, UNLOADING, AND ASSEMBLY OF THE MACHINE MUST BE PERFORMED ONLY BY AUTHORIZED SPECIALIZED PERSONNEL.**

After the packaging has been removed, horizontal axis pumps can be lifted by lifting the base.

Absolutely avoid lifting the pump by using the lifting lugs on the motor or the reduction unit. These lugs have been provided to lift the motor or the reduction unit alone.
Given the differences between pump models and versions, this manual provides information of general nature only, which is usually sufficient to permit shipping and assembly by personnel however. In case of doubt, contact the supplier for detailed instructions regarding the model or version in question.

**Moving wheeled pumps:**

- Make sure that the motor has stopped and that it cannot be accidentally started.
- Move the assembly slowly and carefully, especially over uneven or inclined terrain.
- Make sure that the position is secure in the new installation place and then lock all the locking devices on all the wheels in order to prevent undesired motion.
- Watch for any movements of the pump caused by strain from the suction and delivery pipes.

## 4.2 Storage:

Unless agreed otherwise, the pumps are protected for shipping.
Whenever the pump must be stored for an extended period prior to assembly, proceed as follows:

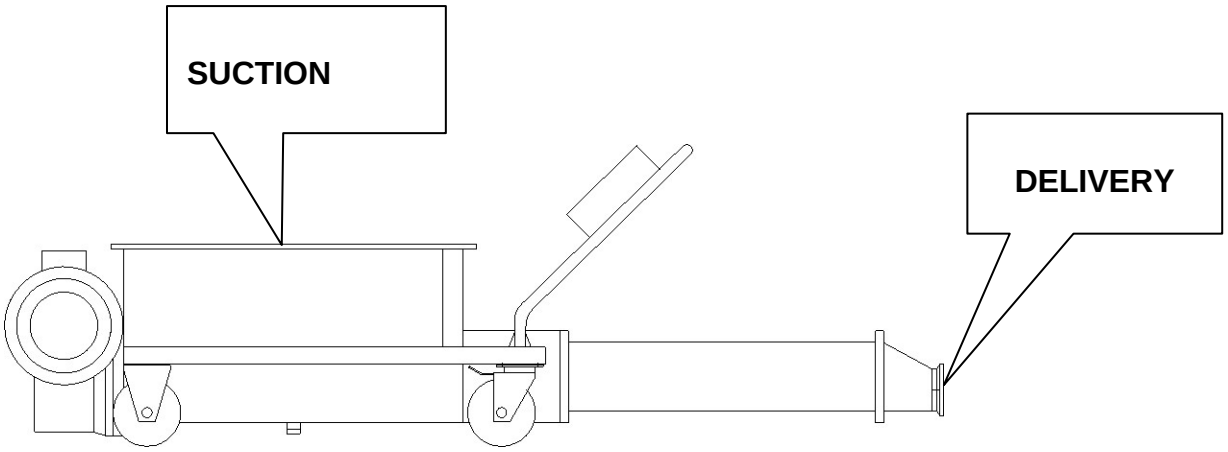
**Stator:**
- In case of extended period of inactivity, the rotor can permanently deform the contact surfaces of the stator. For this reason, disassemble the stator, provide it with packaging against the light and air, and keep it a cool, dry place.

**Rotor:**
- Place the rotor on wooden blocks and cover it for protection against mechanical damage.

# 5. Installation and assembly

## 5.1 Rotation direction:

The pump's rotation direction is shown by the arrow on the casing and/or the pump's stator. The rotation direction determines the direction of flow (for floating stator models, there is only one rotation direction; for fixed stator pumps instead, the direction can be inverted – for more information, contact Della Toffola).
Other situations must be agreed with the supplier and confirmed by the same.
The pump must be installed in horizontal position, and a certain space (which depends on the model of the pump and the stator's length in particular) around the pump itself. This space (which must be at least equal to the stator's length) will be very useful when maintenance is performed, and especially whenever a worn-out stator must be changed.




We recommend making sure that the pipes are the same diameter as the pump suction and delivery mouths
Installing spacer joints on the delivery and suction lines is also a good idea.
Whenever a water column >15 m on the delivery line is envisioned, we recommend installing a non-return valve in order to avoid overloading the mechanical seal and raising the risk of the leakage of liquids when the pump stops.
Whenever any delivery device is assembled, we recommend installing a safety valve that prevents the pump from running when dry and/or in overpressure.
Whenever the pump has not been fastened to the floor, we recommend installing a vibration dampener.

## 5.2 Pressure:

If it has not been expressly indicated on the order confirmation, the maximum pressure inside the pump casing is 4 Bar.
Fixed stator pumps have variable maximum permissible pressure that depends on the model selected. The maximum permissible pressure must therefore be agreed in advance with Della Toffola.

The maximum permissible pressure for the end gate depends on its type:

- Flange: not above the nominal pressure.
- Feminine threading: no more than 25 Bar

- Male threading for bathroom fixtures to DIN 11851, up to DN 100: for single-stage and double-stage pumps, no more than 8 Bar.
- Other versions: not above the permissible pressure for the pump itself.

### 5.3 Piping:

Position the inlet and outlet piping in such way that when the pump is stopped , the presence of fluid upstream from the pump is ensured. A sufficient quantity of fluid must always remain inside the pump to guarantee the lubrication of the stator during starting.

Clean and rinse the piping before connecting the pump.
Connect the piping in such way as to avoid impermissible external loads on pump attachments.

We recommend installing compensators between the pump and the piping in such way as to:

- prevent the piping from being laid on top of the pump and breaking its casing.
- Neutralize the vibration of the piping and prevent vibration from being transmitted to the pump casing with risk of breakage.

### 5.4 Electric system connections:

All work on the electric system must be performed by authorized specialized personnel in compliance with the regulations in force.

## 6. Starting

Bearing in mind the pump's construction, always respect the following points:

- **The pump must never be allowed to run dry! Even only a few turns without fluid inside can damage the stator!**
- If the pump has remained in the warehouse with the rotor greased, before assembling the stator, degrease and clean the rotor in order to avoid potential incompatibility with the stator's constructive material and the product to be pumped.
- When the pump must be operated for the first time, fill the pump casing with the fluid to be pumped.
  If the fluid is highly viscous, first add a smoother, more flowing fluid.
  This first filling is absolutely necessary for the lubrication of rubber stators.
  Whenever the pump must turn counter-clockwise, the pump casing must be filled and then the pipe on the suction side.
- Make sure that the suction and delivery piping has been connected correctly.
- Start the pump and run it for a few turns to make sure that the rotation direction is correct and matches the arrow on the pump.
- Whenever the pump turns in the wrong direction, qualified personnel must check the direction and modify the motor's electric connections accordingly.
- As has already been stated, the pump is a volumetric type and in theory can produce an infinitely high pressure and break the tanks or delivery line piping.
- The pump must never be allowed to run with the suction and delivery valves closed because the pump's rotating elements that transmit power (the shaft, connecting rod, joints, rotor) are subjected to excessive strain and may have been partially or completely damaged. Beyond that, it is also possible that the pressure limit may have been exceeded in parts of the casing and the joints, which may subsequently break as a result.
- Open these valves before starting the pump.
- Check motor rotation direction by briefly switching on the motor.

# 7. Temporarily placing the pump out of operation.

Whenever the pump must be temporarily placed out of operation, the first thing to do is drain it completely and wash it if:

a) there is any risk that the fluid pumped may freeze at the ambient temperature, especially when the pump is installed outside in a cold climate;
b) the possibility if the fluid's solidification exists;
c) encrustation has been observed to form on the mechanical sealing liner.

**- Stator:**
Whenever a prolonged period of inactivity is foreseen, the rotor can permanently deform the contact surfaces of the stator.
This will then require a higher breakaway starting current when re-starting.
We therefore recommend disassembling the pump's stator, packaging it for protection against the entry of air and light, and store it in a cool dry place.

**- Rotor:**
After disassembling the stator, position the rotor on blocks of wood and cover it to avoid damage.
Before assembling the stator, degrease and clean the rotor in order to avoid potential incompatibility with the stator's constructive material and the product to be pumped.

**- Stand-by pumps:**
The stand-by pumps that serve as back-ups for the main pump must be placed into operation from time to time.
Following a prolonged period of inactivity, the pump may jam during starting (due to the permanent deformation of the stator's rotor contact surfaces of the stator).

# 8. Maintenance.

All maintenance operations MUST be performed only by qualified personnel.
Thanks to its constructive simplicity, the pump does not require much maintenance or servicing, and for such reason these operations are performed rapidly.

## 8.1 Preliminary operations:

- Disconnect power supply from the control unit.
- Wait for the temperature of the liquid to drop to an acceptable level.
- Check the pressure remaining in the suction and/or delivery lines by checking the respective pressure-switches.
- Close the valves on all pipes.
- Disconnect the pipes from the pump connections slowly.

## 8.2 Cleaning and washing:

Prior to performing any pump cleaning or maintenance operations, disconnect the electric power supply in order to eliminate the risk of accidental starting and/or electrocution.
Never for any reason direct sprays of water against the motor or electric components.

During the period of use, wash and/or clean the pump at regular intervals in order to keep it clean and prevent deposits that may lead to the formation of bacteria.

Establish an adequate interval between one cleaning and the next on the basis of the type of product treated in order to prevent the deposit of hard-to-remove encrustation.

The pump can be washed simply by spraying water or the appropriate detergents for the type of product treated through the loading hopper.

Before and after an extended period of pump inactivity, perform a thorough sanitization washing followed by careful rinsing whenever the machine is used for food products.

# 9. Trouble-shooting

The following table lists the potential problems and their solution:

| THE PUMP FAILS TO START | |
|---|---|
| **POSSIBLE CAUSE** | **SOLUTION** |
| Motor voltage inadequate to local mains voltage. | Check the motor and local mains voltage data |
| There is some foreign body inside the pump. | Partially disassemble the pump, check the inside, and remove any foreign bodies present. |
| The stator does not offer sufficient resistance against the liquid pumped | Check the initial order and the data it contains. |
| The liquid deposits and dries. | Clean the pump after every medium-long stopping. |
| Temperature is too high; the stator stops the rotor. | Lower the temperature of the liquid. Contact our Assistance service whenever this proves impossible. |

| THE PUMP FAILS TO SUCK | |
|---|---|
| **POSSIBLE CAUSE** | **SOLUTION** |
| Openings in the pipes | Check all the sealing liners and tighten all the screws. |
| Worn-out stator | Change the stator. |
| Worn-out rotor | Change the rotor as described in this manual. Check to see if the wear is caused by abrasion or corrosion. Change material of stator if necessary. |
| The mechanical sealing liner leaks. | Change the sealing liner after first checking to see what type of wear is involved. |

| SUB-STANDARD PERFORMANCE | |
|---|---|
| **POSSIBLE CAUSE** | **SOLUTION** |
| The control unit does not correspond to the order. | Check the data in the order. |
| Delivery pressure is too high. | Check the pressure using a pressure-switch and reduce line pressure if necessary. |
| Air bubbles are present in the piping. | Check and tighten all screws and nuts. |
| The mechanical sealing liner leaks. | Change sealing liner and the type of wear. |
| The pump occasionally runs when dry. | Fill the pump casing with liquid. Install a safety device. |
| Worn-our stator | Change the stator. |
| Worn-out rotor | Change the rotor. |
| Suction height too high. | Reduce the load losses by increasing the diameter of the piping. Reduce the geodetic height difference. |

| NOISY OPERATION | |
|---|---|
| **POSSIBLE CAUSE** | **SOLUTION** |
| Worn-out stator | Change the stator. |
| Worn-out rotor | Change the rotor. |
| Disconnected joint. | Check for signs of breakage and change the joint. |
| Air bubbles are present in the piping. | Increase the level of liquid on the suction side. |

| PREMATURE WEAR OF PUMPING ELEMENTS | |
|---|---|
| **POSSIBLE CAUSE** | **SOLUTION** |
| The pressure is too high. | Install a pressure-switch in the line and keep the pressure under control. |
| The temperature of the liquid is too high. | Lower the temperature of the liquid. Contact our Assistance service whenever this proves impossible. |
| The pumped liquid deposits inside the pump. | Open the pump and clean after every medium-long stopping. |
| The pump is running dry. | Fill the pump for first starting. Install a safety device. |

# 10. Recommended spare parts.

All the spare parts required are usually available in our warehouse.
For particular cases and whenever even the shortest delivery times are unacceptable, we advise keeping a stock of the parts below for each pump for storage nearby.

Recommended spare parts:

- Stator (305)
- Sealing ring (507)

Additional spare parts:

- Rotor (199)
- Screw conveyor/connecting rod (172)
- piston pin (407)
- Level probe (620)
- Key (987)
- O-ring (701)
- Sealing housing (084)

We keep a stock of every component of our pump in the warehouse for quick delivery whenever required.

In order to avoid errors in supply, identify the parts desired using the Position number in the enclosed PMS Pump Assembly drawing.

# 11. Waste demolition and scrapping

Machine demotion and scrapping operations must be assigned only to adequately trained personnel in possession of the necessary equipment.
a) Disassemble the machine's plastic components, electric motors, piping/hosing, steel and other materials and group them separately.
b) Waste must be eliminated in compliance with the regulations in force for the respective types of product.
c) All components contaminated by oil or acid must be considered hazardous wastes and as such must be eliminated solely by authorized parties.

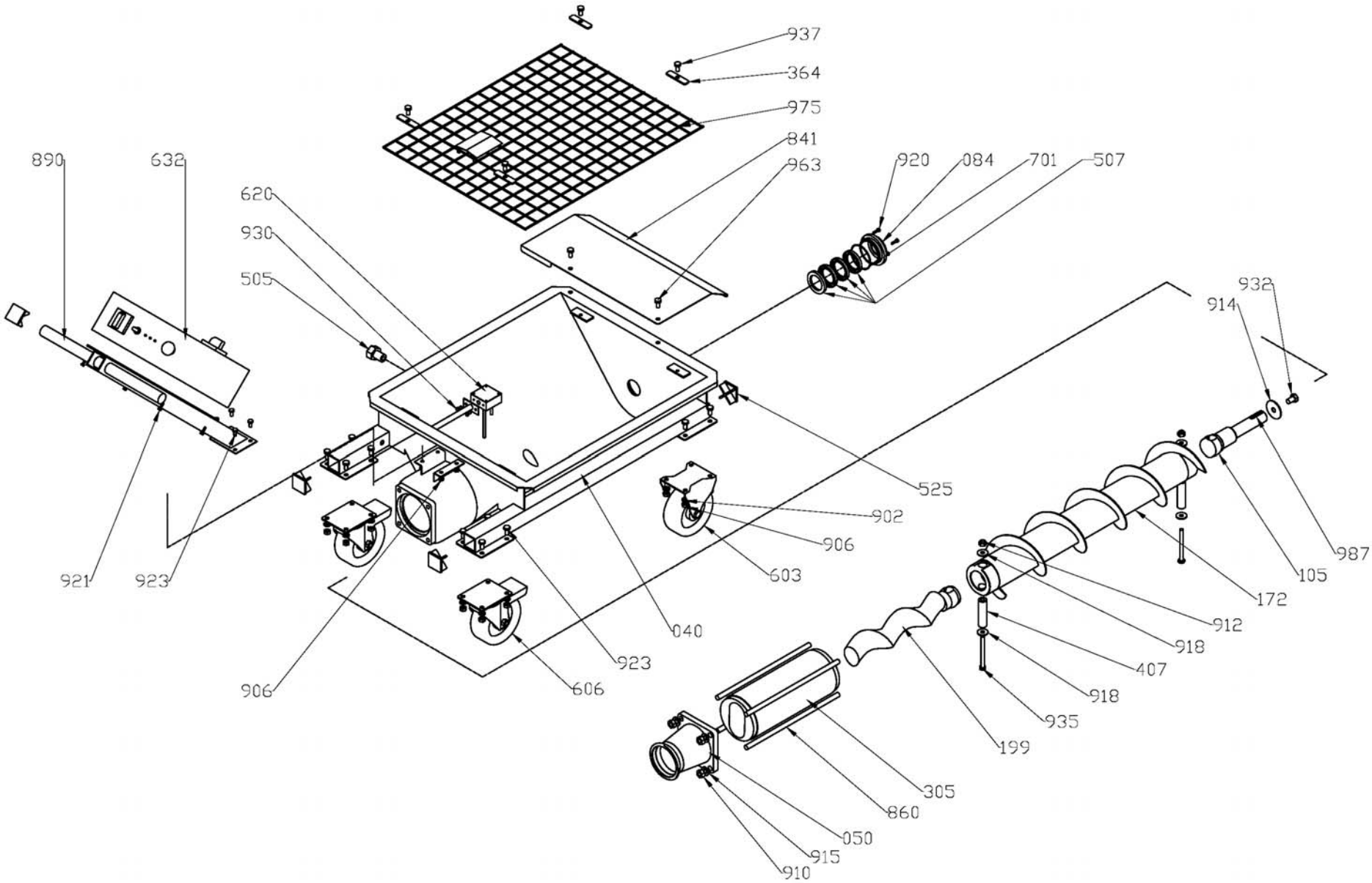
Della Toffola S.p.A. declines all liability for damage or injury caused by the failure to comply with the above-mentioned regulations and recommendations.
No responsibility will be assumed for damage or injury caused by the re-use of single parts of the machine for functions or assembly situations other than those originally intended.

# 12. Key to parts

| POS | DESCRIPTION | PMS10 | PMS20 | PMS30 | PMS50 |
|---|---|---|---|---|---|
| 040 | HOPPER | ● | ● | ● | ● |
| 050 | DELIVERY JUNCTION | ● | ● | ● | ● |
| 084 | MECHANICAL SEAL HOUSING | ● | ● | ● | ● |
| 105 | SHAFT | ● | ● | ● | ● |
| 172 | CONNECTING ROD WITH SCREW CONVEYOR | ● | ● | ● | ● |
| 199 | ROTOR | ● | ● | ● | ● |
| 305 | STATOR | ● | ● | ● | ● |
| 354 | FLANGE | | | ● | ● |
| 364 | GRID LOCK | ● | ● | ● | ● |
| 382 | JOINT | | | ● | ● |
| 407 | PISTON PIN | ● | ● | ● | ● |
| 505 | DRAINAGE PLUG | ● | ● | ● | ● |
| 507 | MECHANICAL SEAL | ● | ● | ● | ● |
| 525 | PLUG | ● | ● | ● | ● |
| 600 | FOOT | | | ● | ● |
| 603 | FIXED RING | ● | ● | ● | ● |
| 606 | MOVING WHEEL WITH BRAKE | ● | ● | ● | ● |
| 620 | LEVEL PROBE | ● | ● | ● | ● |
| 632 | ELECTRIC CONTROL PANEL | ● | ● | ● | ● |
| 701 | O' RING | ● | ● | ● | ● |
| 841 | MOTOR PROTECTION | ● | ● | ● | ● |
| 860 | BRACES | ● | ● | ● | ● |
| 890 | HANDLE | ● | ● | ● | ● |
| 900 | WASHER | | | | ● |
| 901 | NUT | | | ● | ● |
| 902 | WASHER | ● | ● | ● | ● |
| 906 | NUT | ● | ● | ● | ● |
| 910 | NUT | ● | ● | ● | ● |
| 912 | NUT | ● | ● | ● | ● |
| 914 | SHAFT WASHER | ● | ● | ● | ● |
| 915 | WASHER | ● | ● | ● | ● |
| 918 | WASHER | ● | ● | ● | ● |
| 920 | SCREW | ● | ● | ● | ● |
| 921 | SCREW | ● | ● | ● | ● |
| 922 | SCREW | | | ● | ● |
| 923 | SCREW | ● | ● | ● | ● |
| 930 | SCREW | ● | ● | ● | ● |
| 932 | SCREW | ● | ● | ● | ● |
| 935 | SCREW | ● | ● | ● | ● |
| 937 | SCREW | ● | ● | ● | ● |
| 963 | SCREW | ● | ● | ● | ● |
| 975 | PROTECTION SCREEN | ● | ● | ● | ● |
| 987 | KEY | ● | ● | ● | ● |

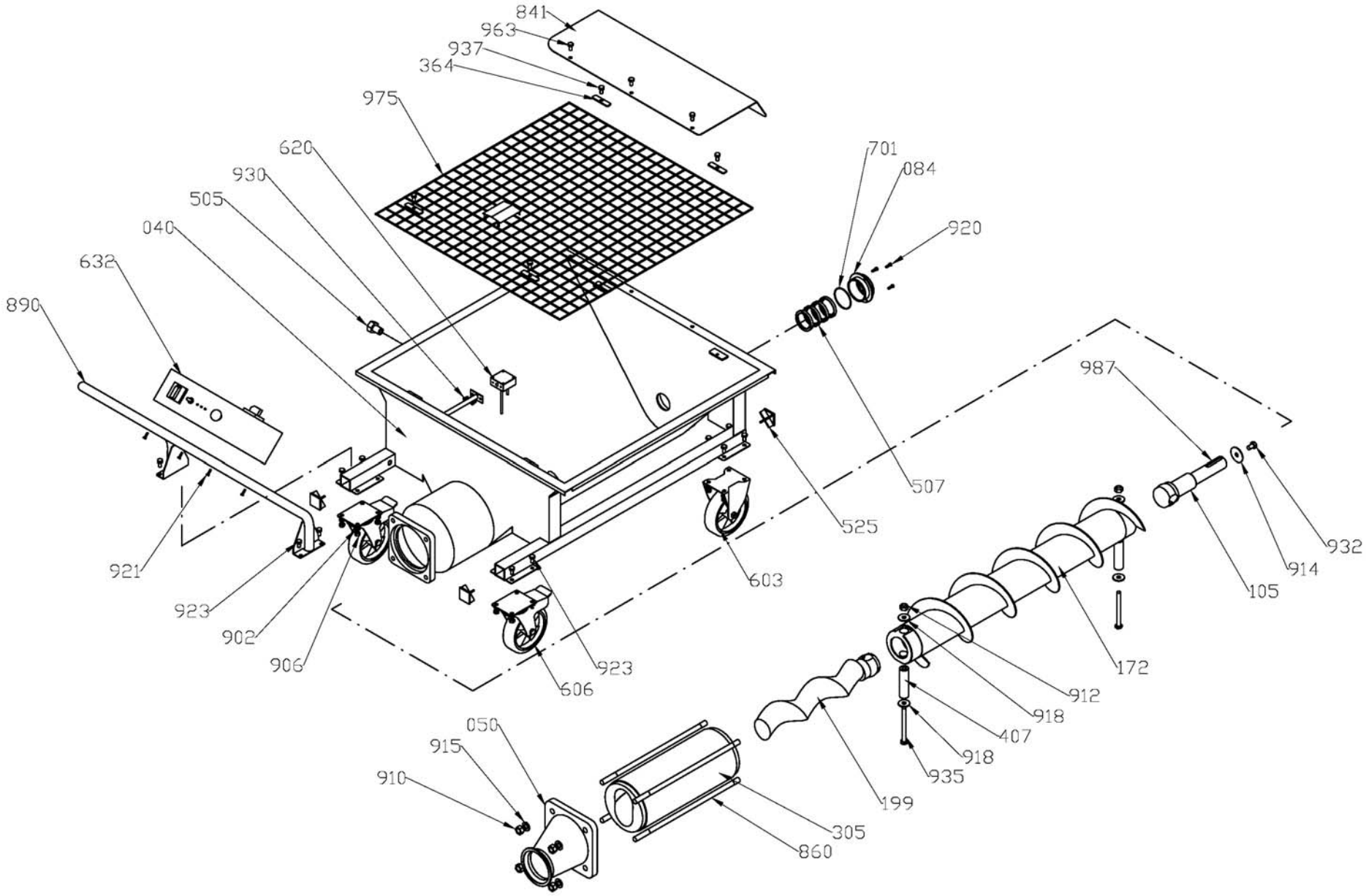
PAGINA BIANCA - BLANK PAGE

# 13. PMS 10 pump assembly drawing



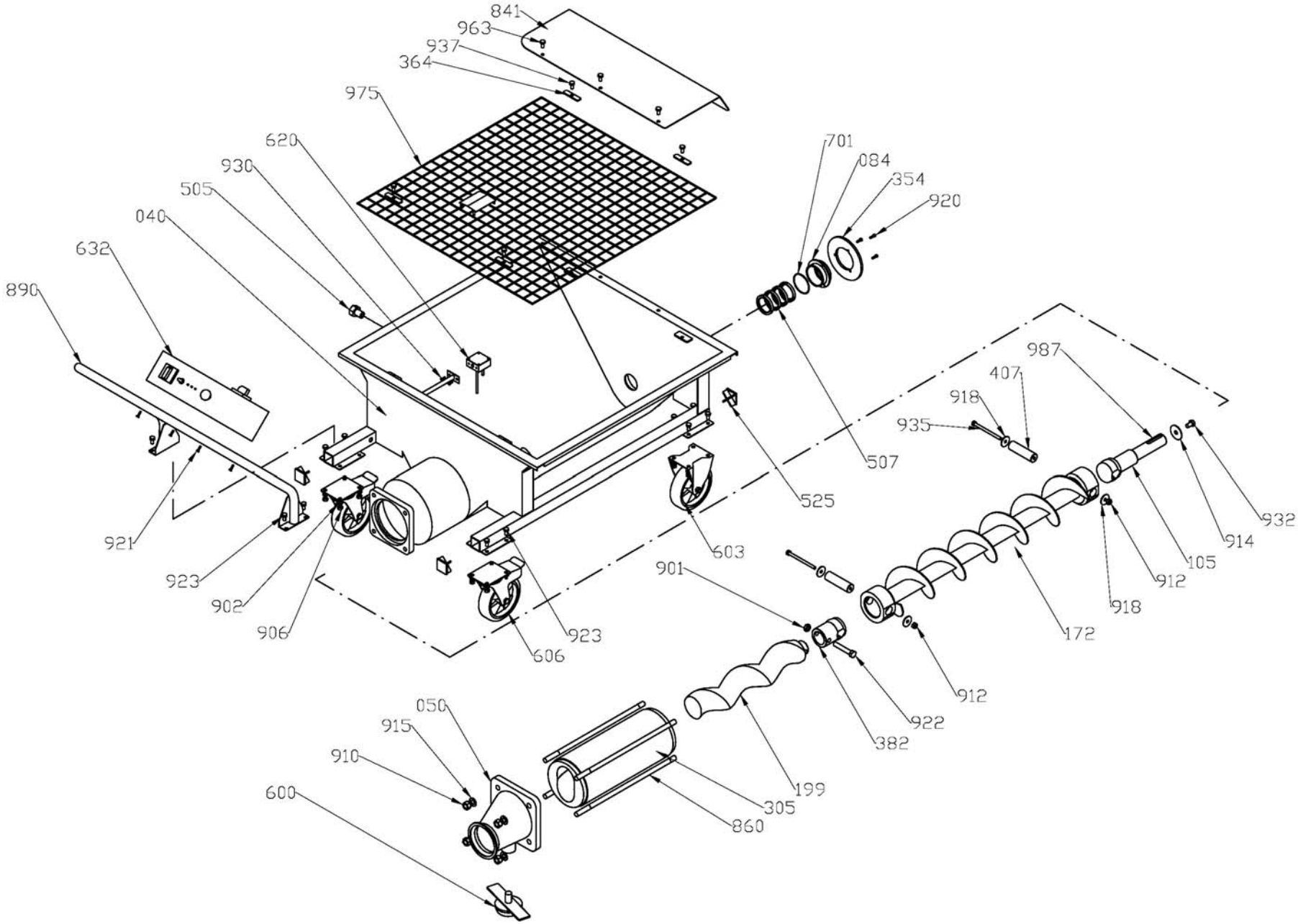
PAGINA BIANCA - BLANK PAGE

# 14.PMS 20 pump assembly drawing



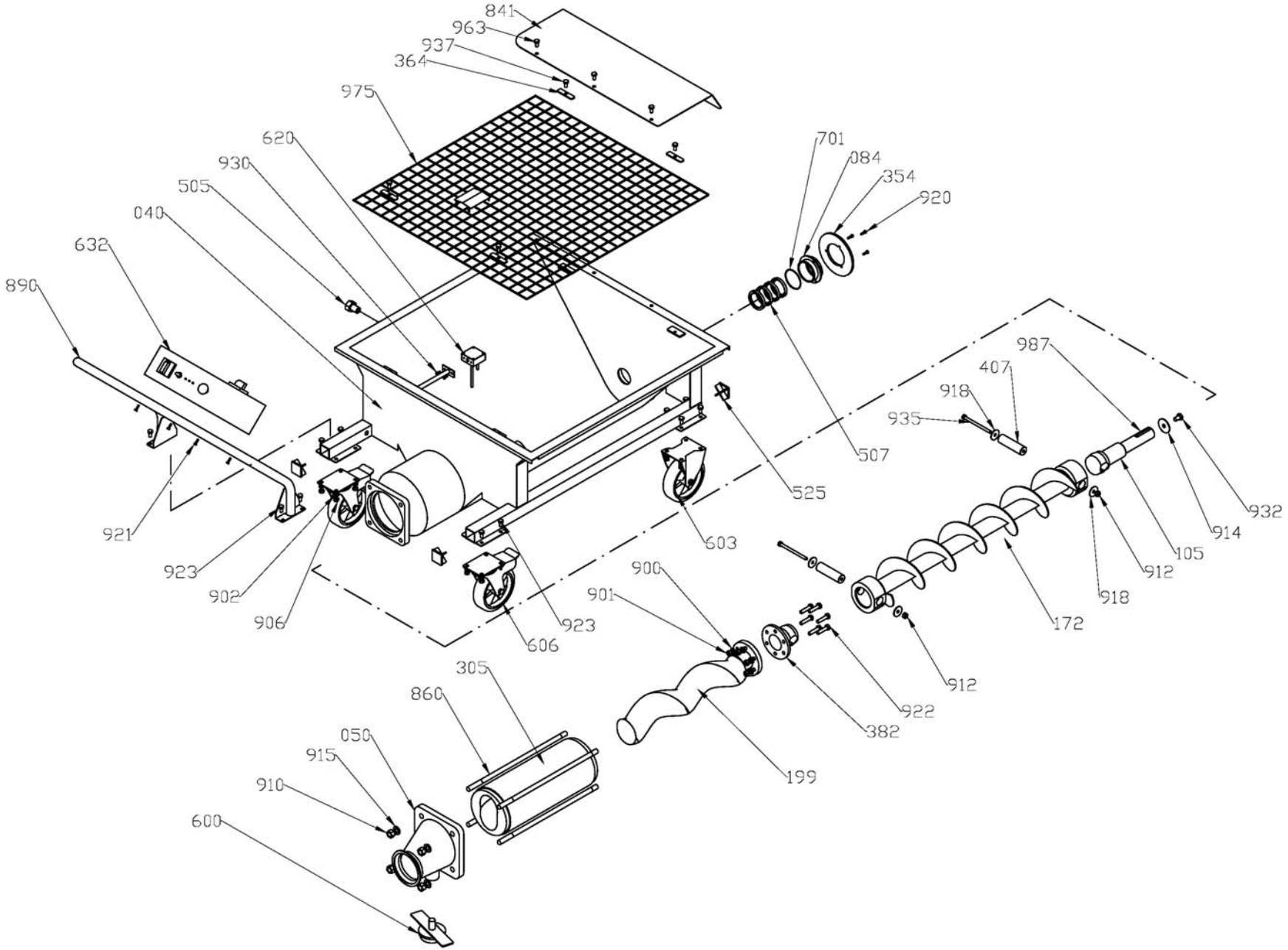
PAGINA BIANCA - BLANK PAGE

# 15.PMS 30 pump assembly drawing



PAGINA BIANCA - BLANK PAGE

# 16.PMS 50 pump assembly drawing



PAGINA BIANCA - BLANK PAGE

# Attachments

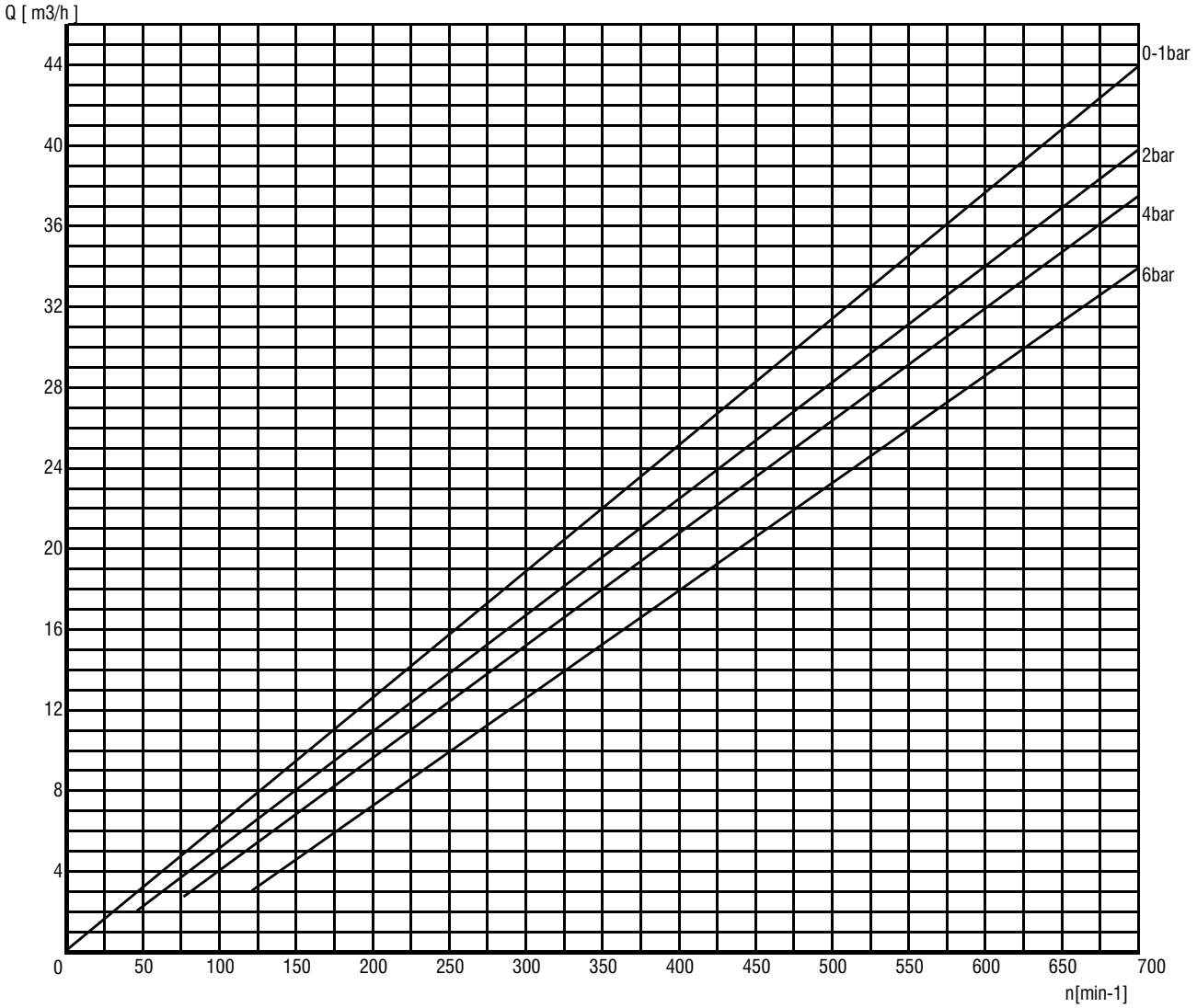
Performance curve

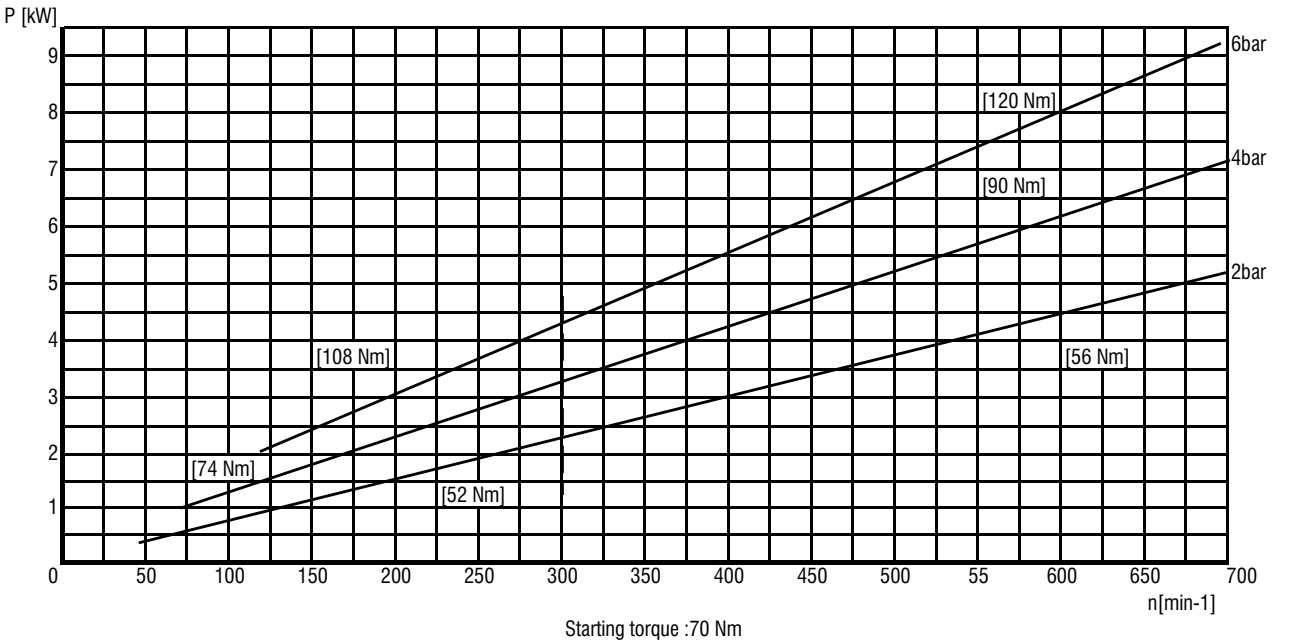
Wiring diagram

Assorted attachments
Information on the motor, reduction unit/speed variator, and all other components mounted on the pump.

PAGINA BIANCA - BLANK PAGE

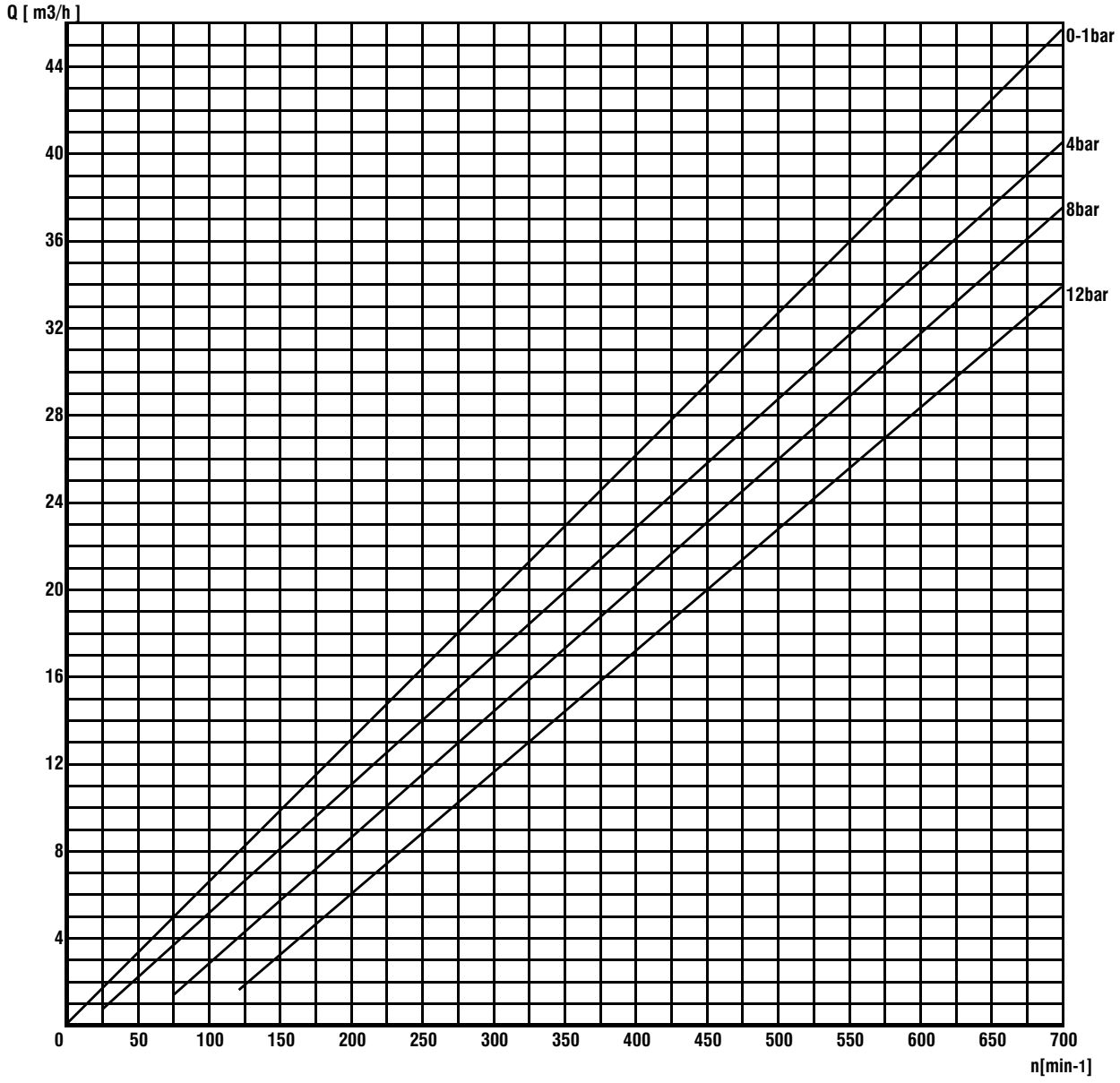
# PMS 10 - 1S

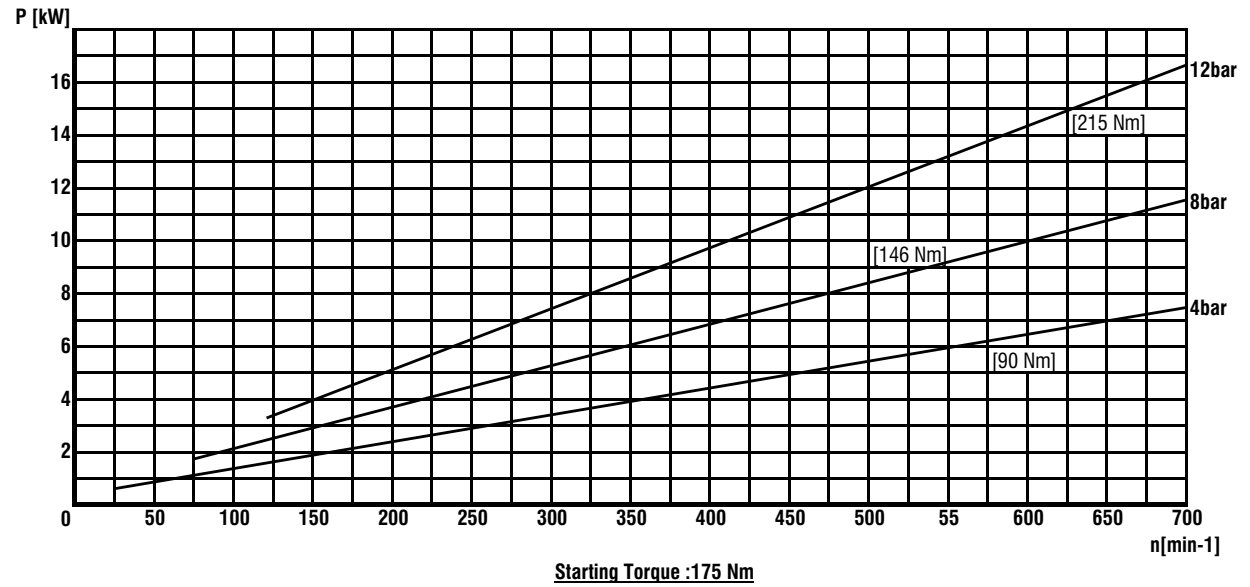



Starting torque :70 Nm

# PMS 10 - 2S

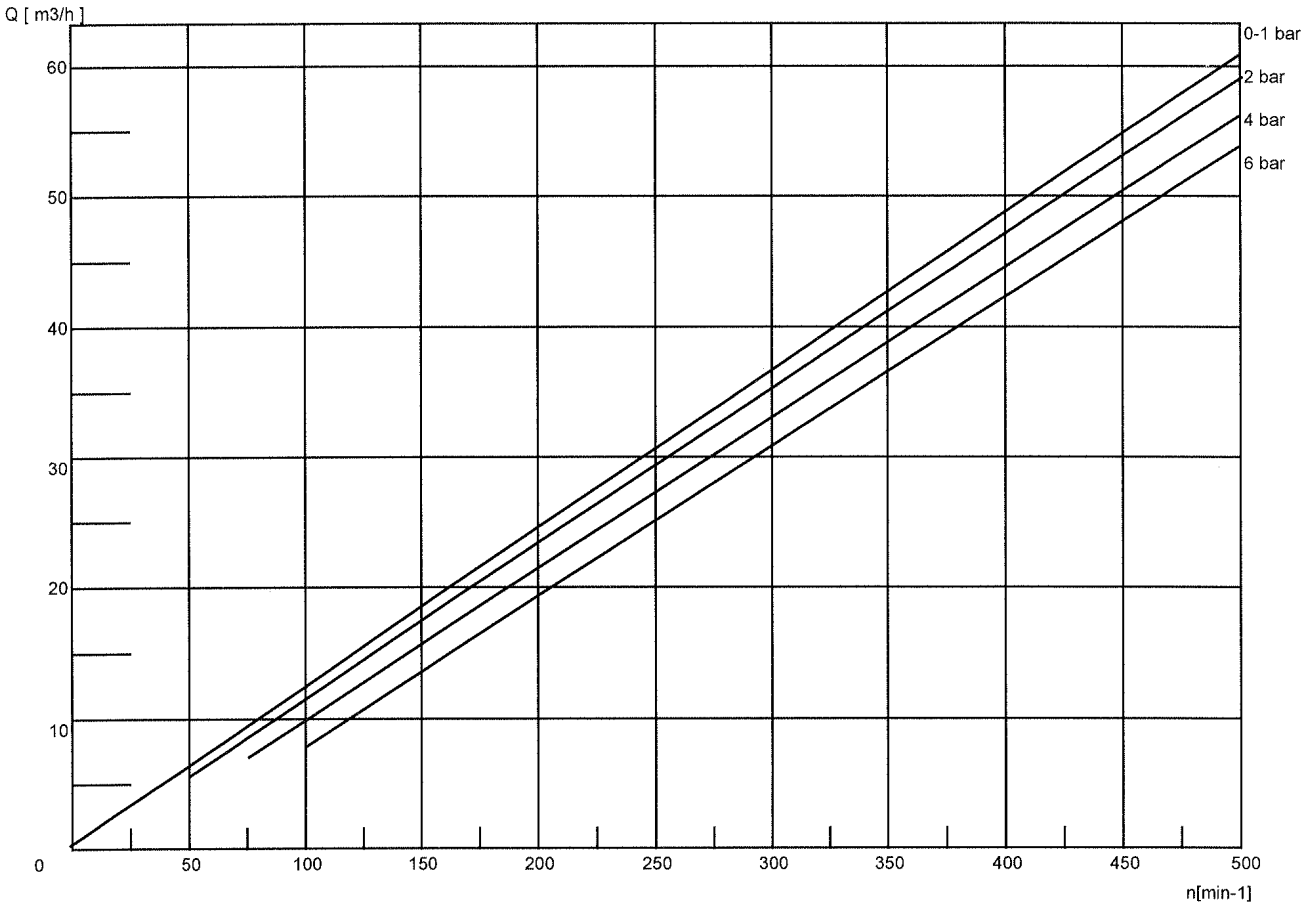


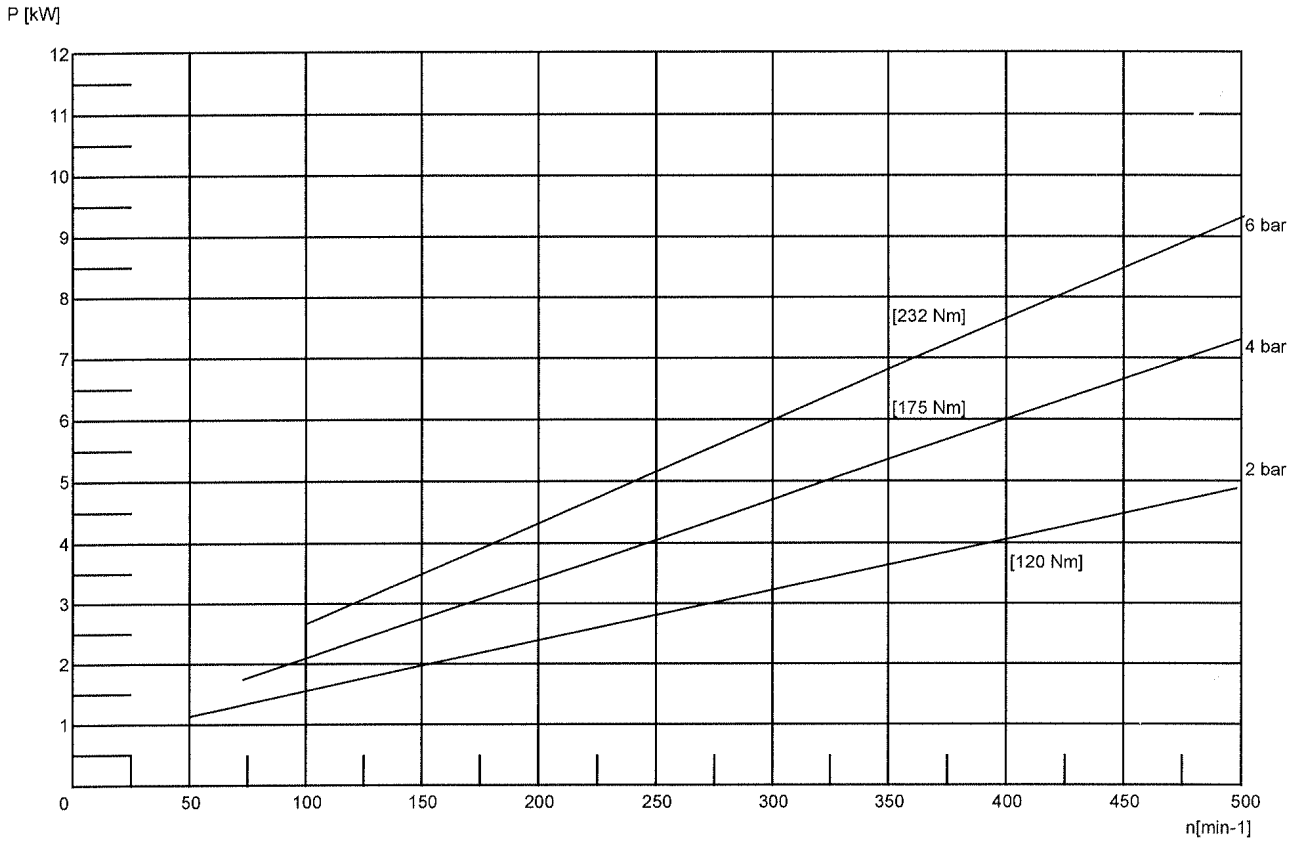




**Starting Torque :175 Nm**

# PMS 20

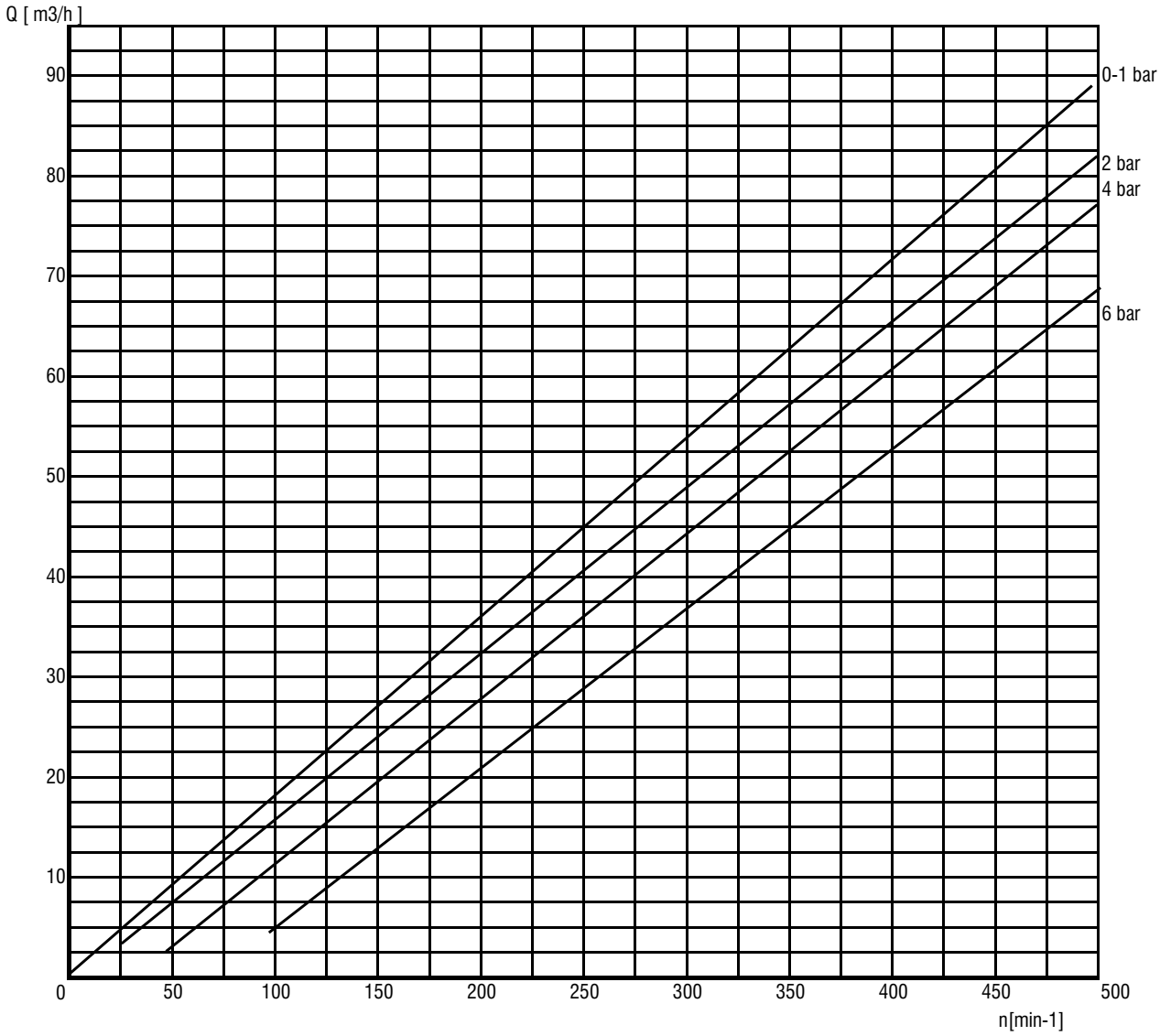
Test produced with water at 20°C

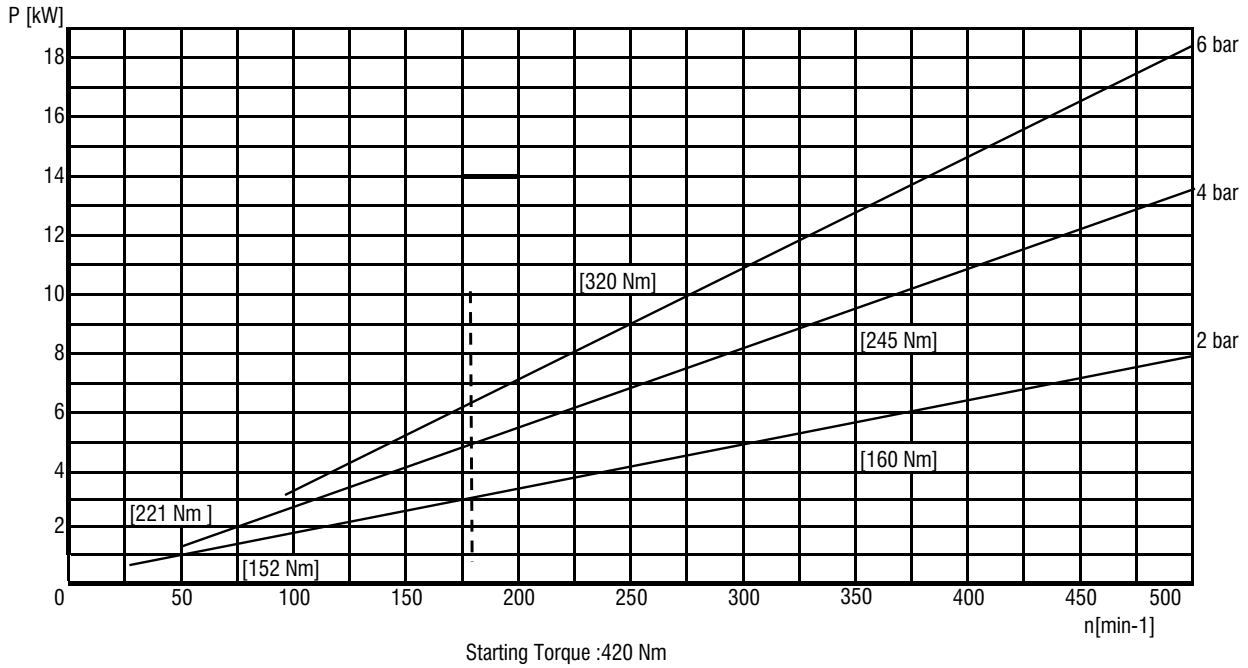



Starting Torque :296 Nm

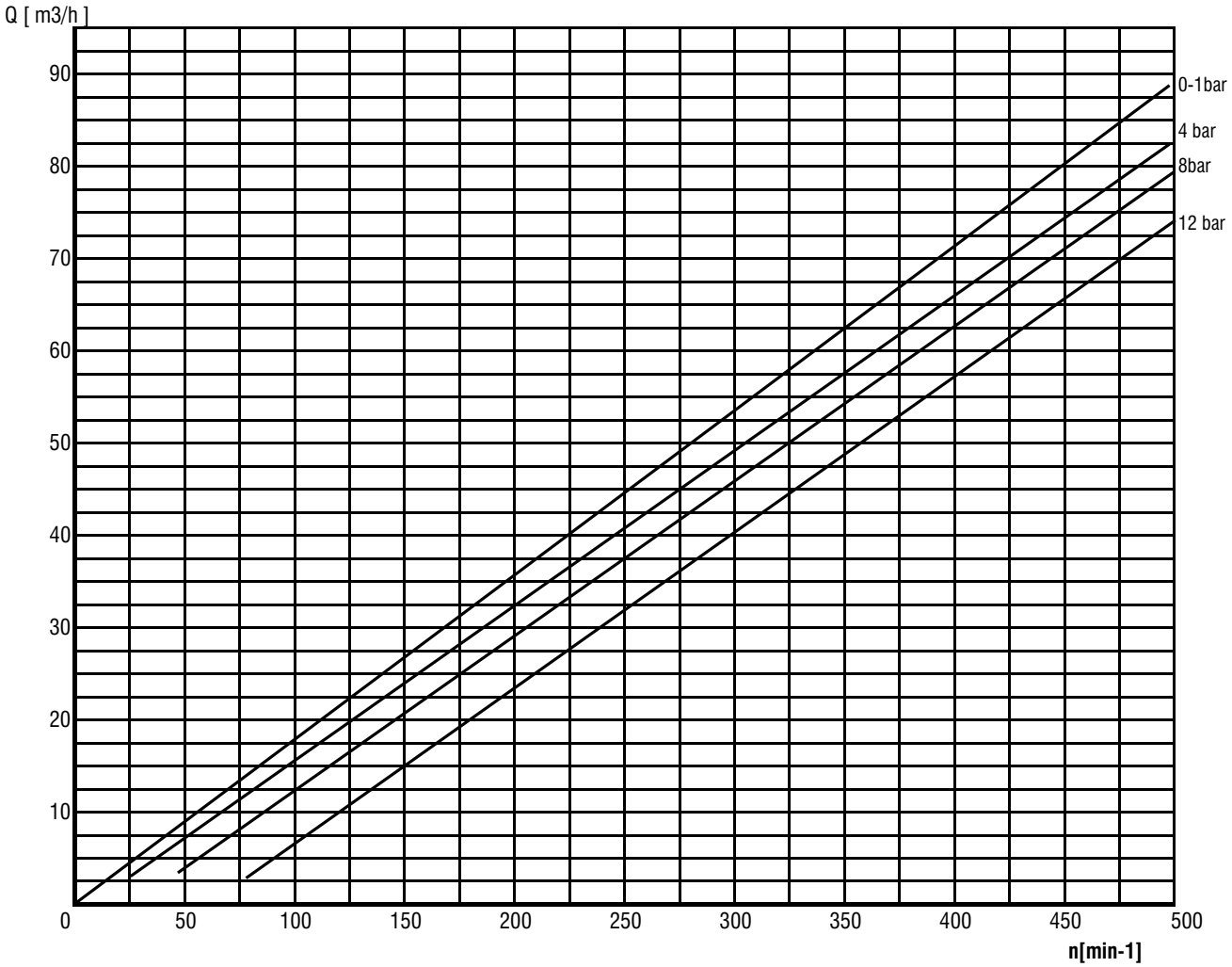
# PMS 30 - 1S

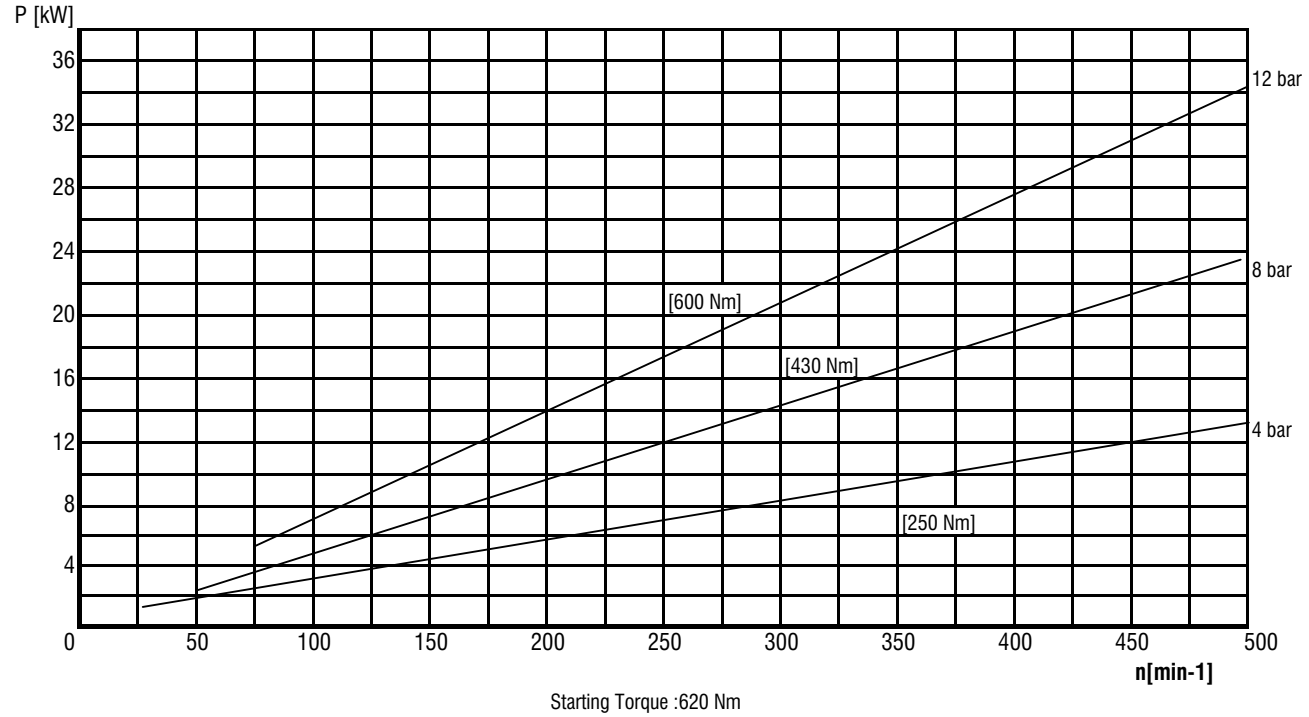



Starting Torque :420 Nm

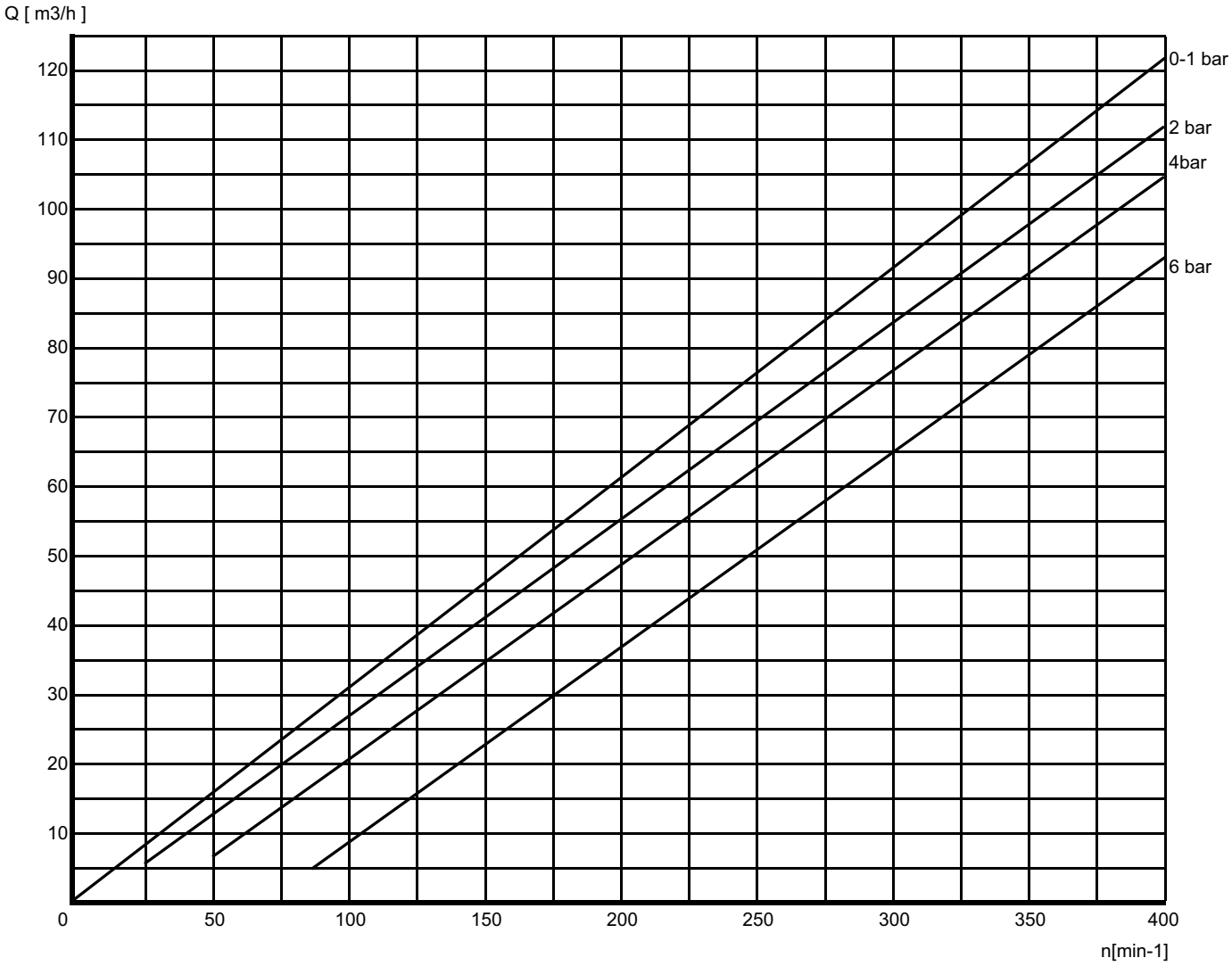
# PMS 30 - 2S

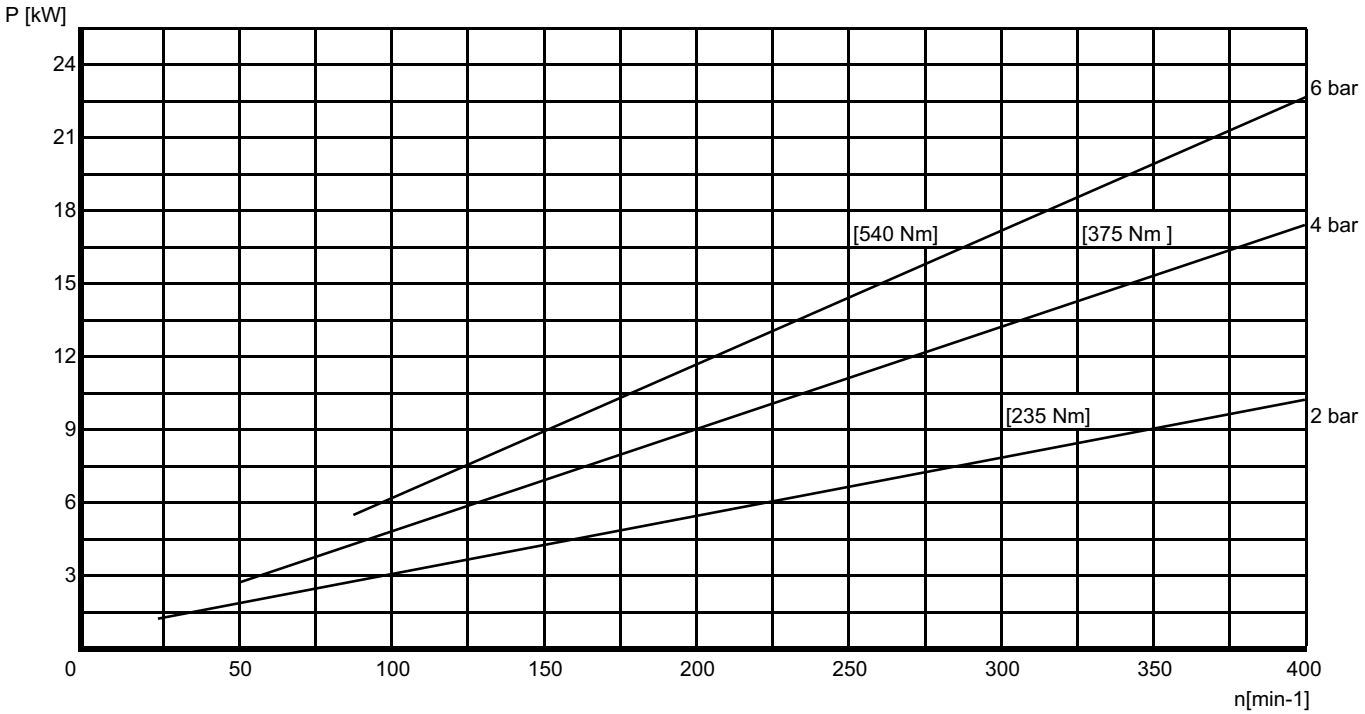



Starting Torque :620 Nm

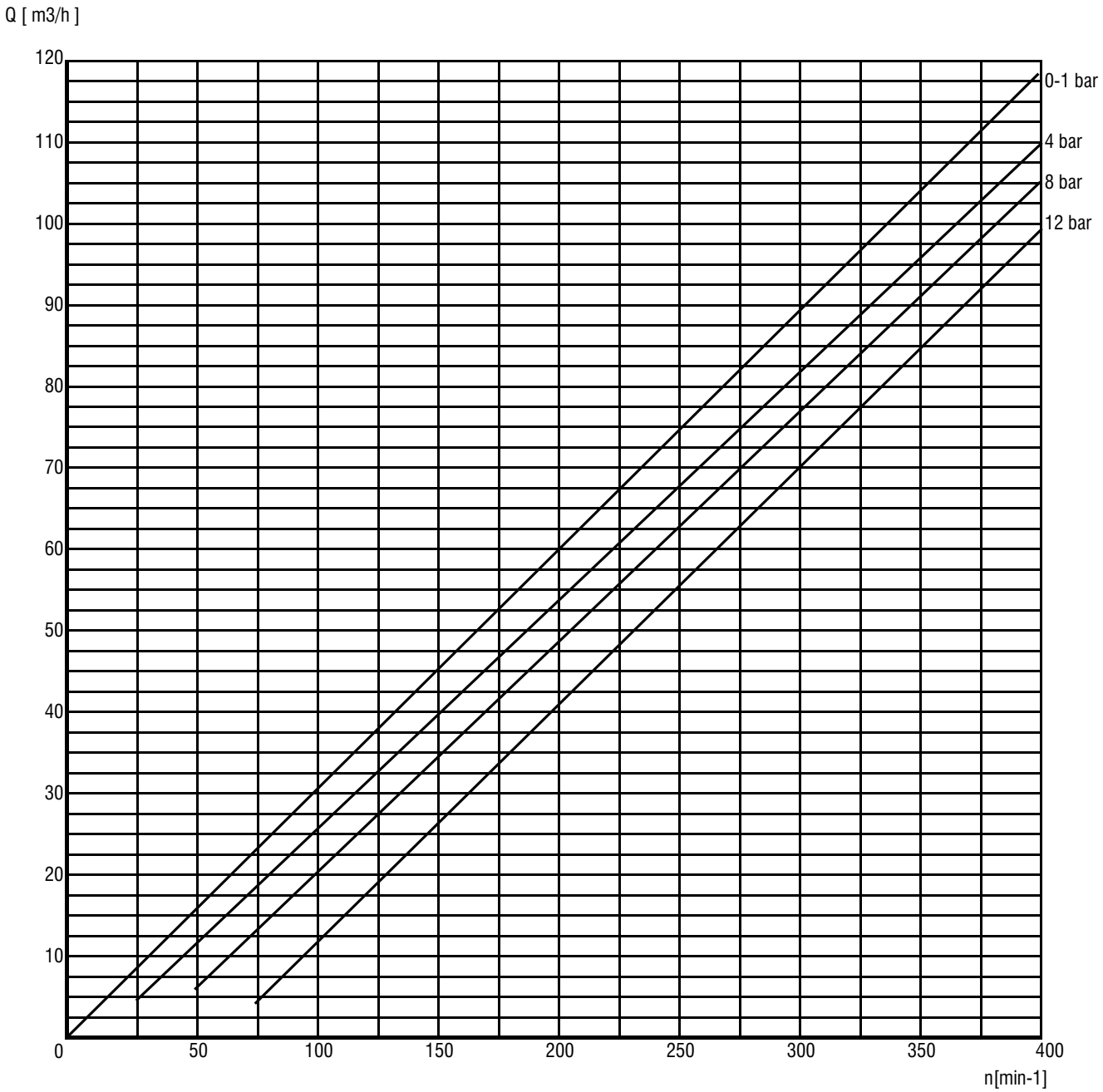
# PMS 50 - 1S

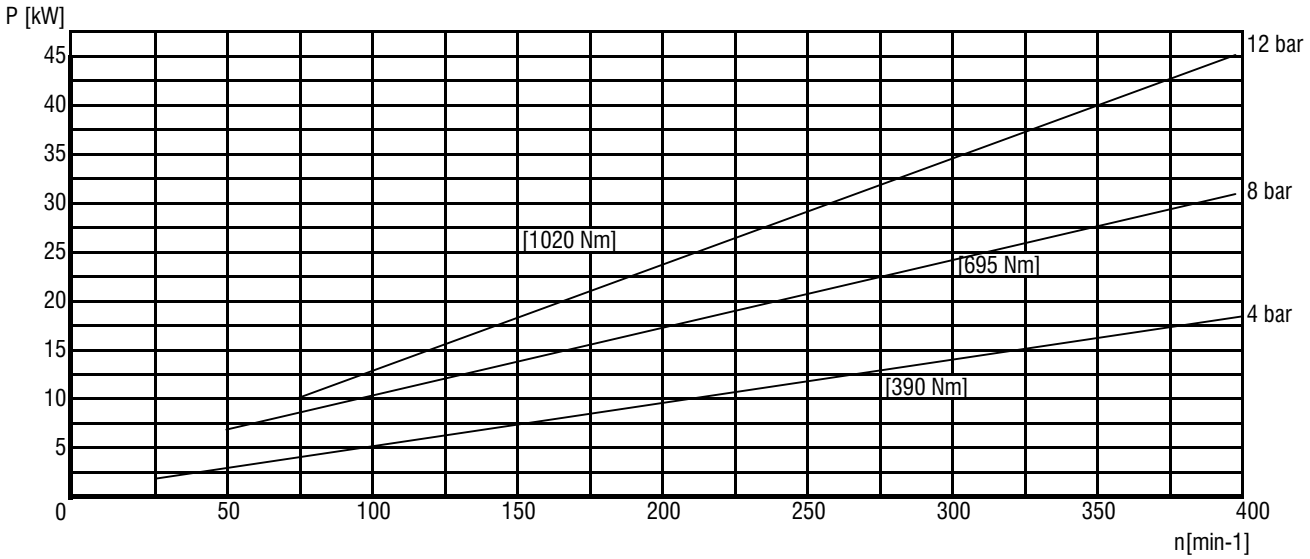



Starting Torque :542 Nm

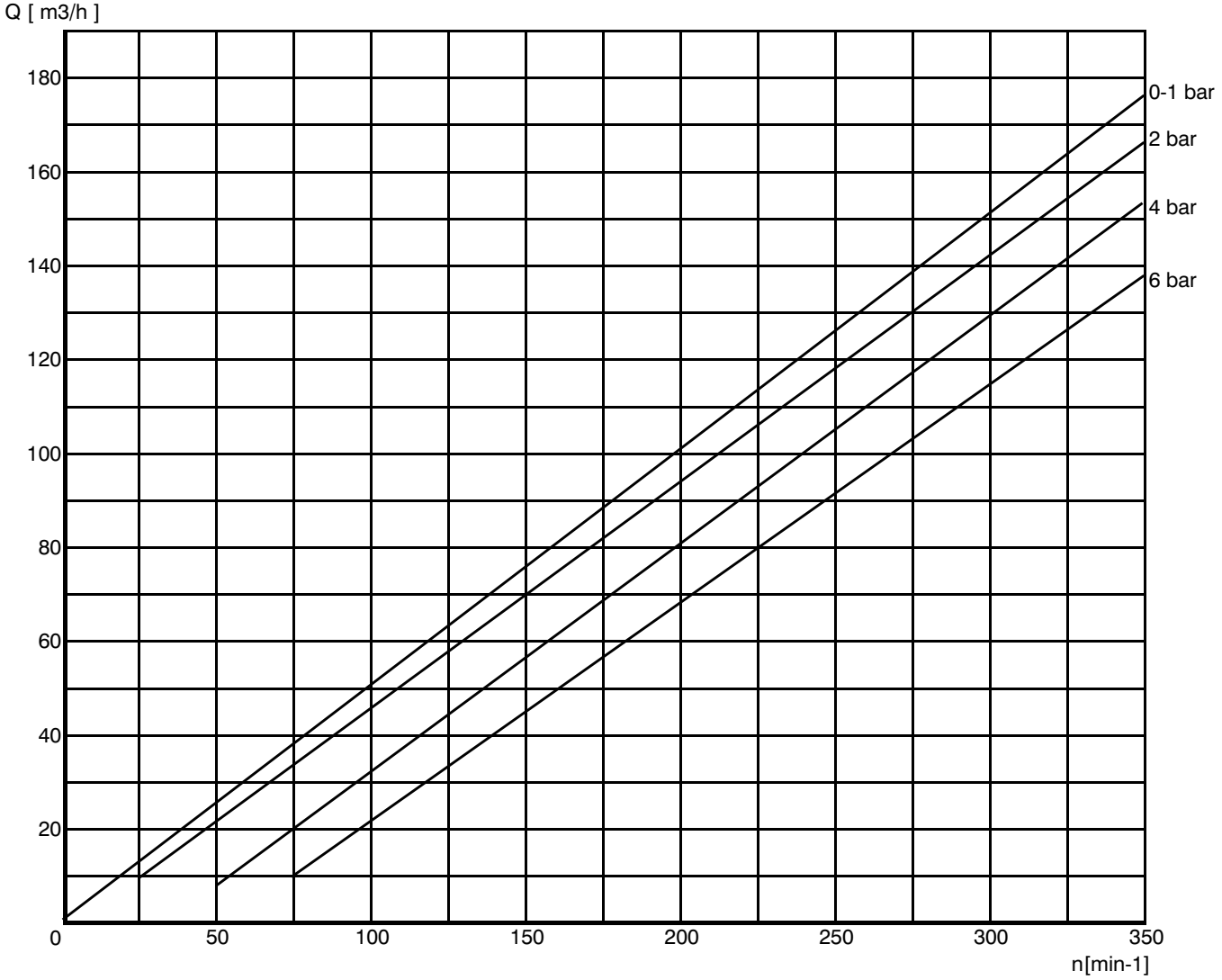
# PMS 50 - 2S

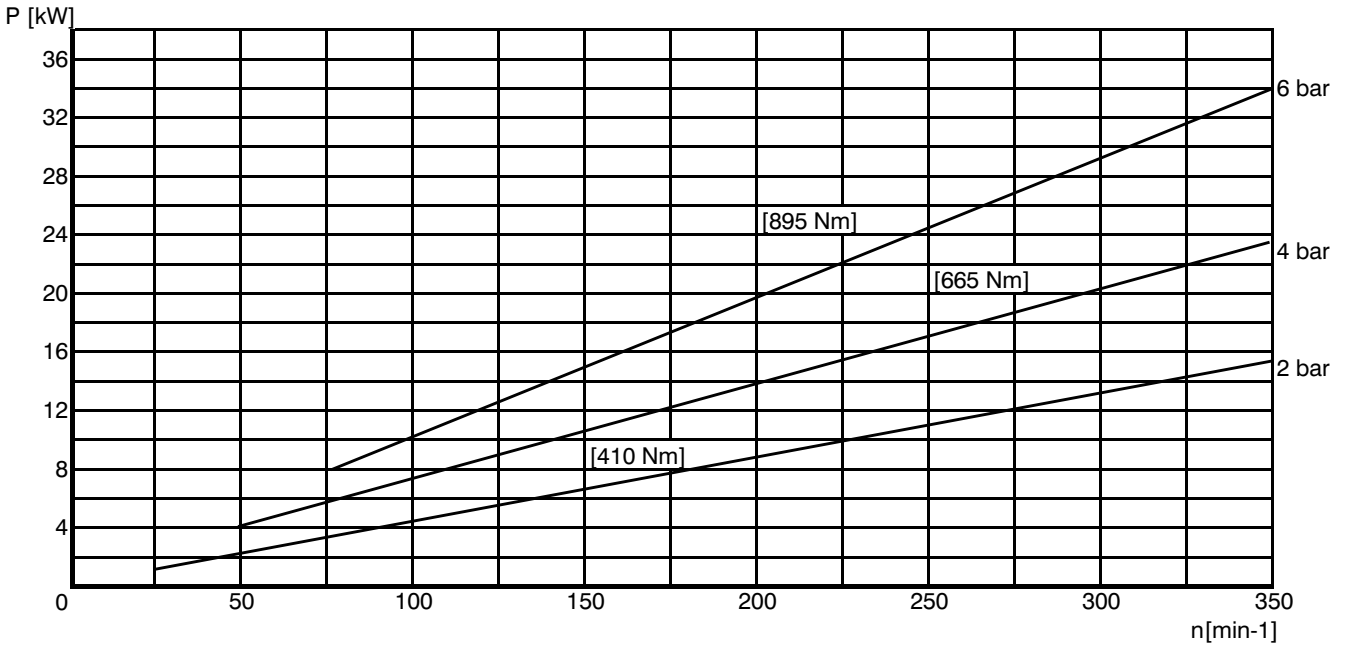



Starting Torque :1270 Nm

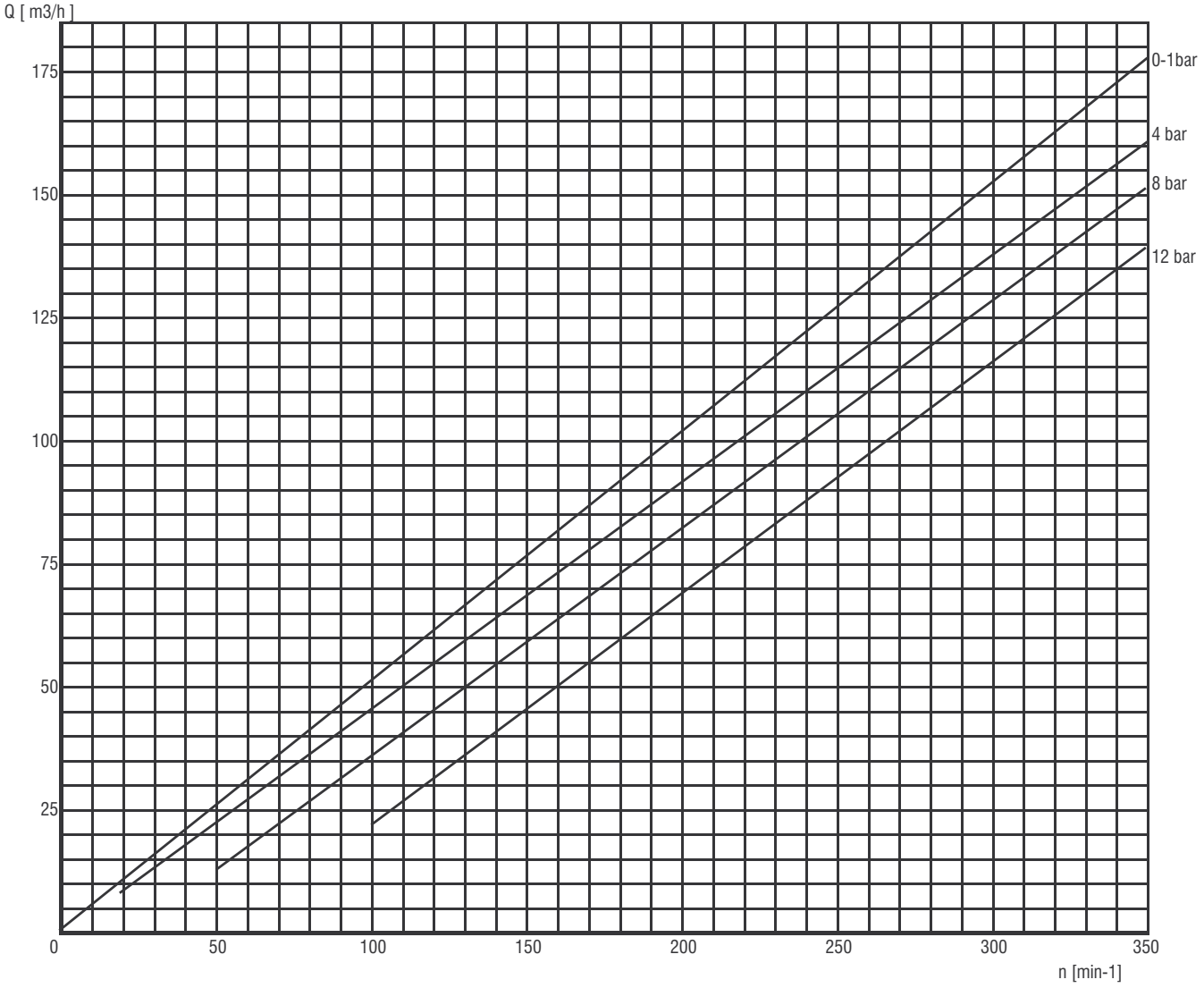
# PMS 80 - 1S

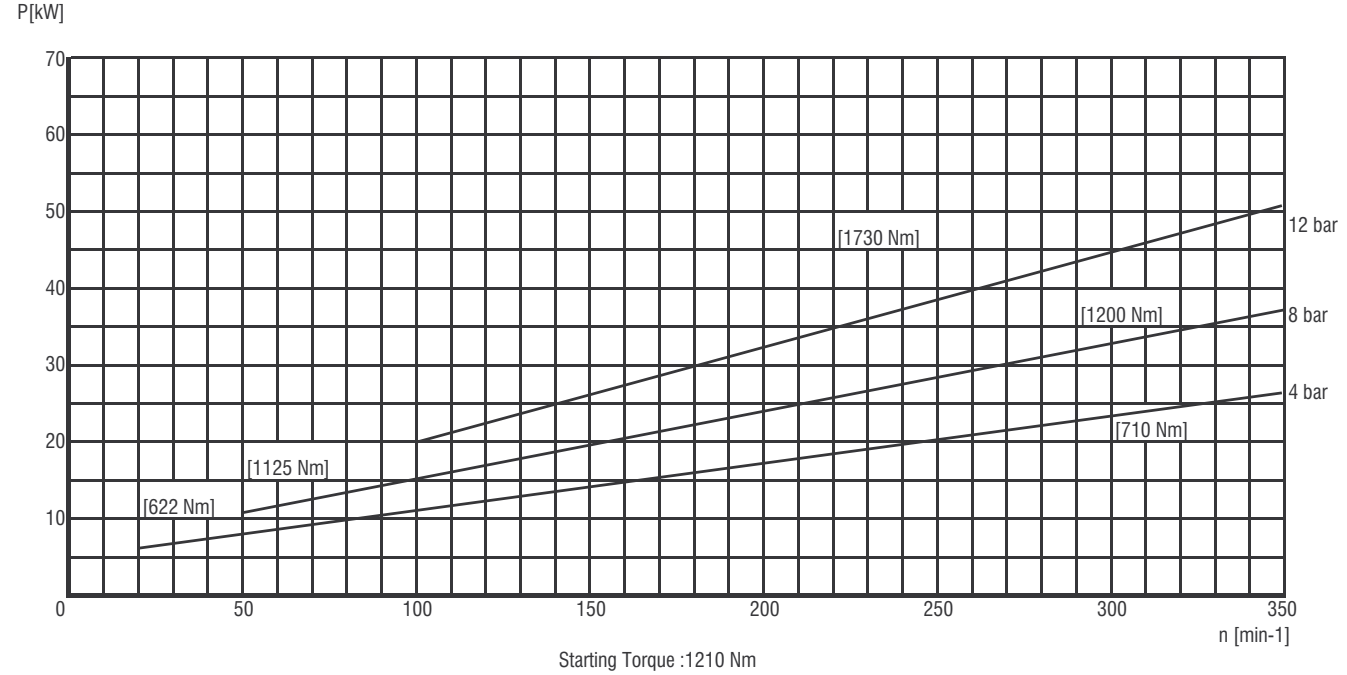



Starting Torque :760 Nm

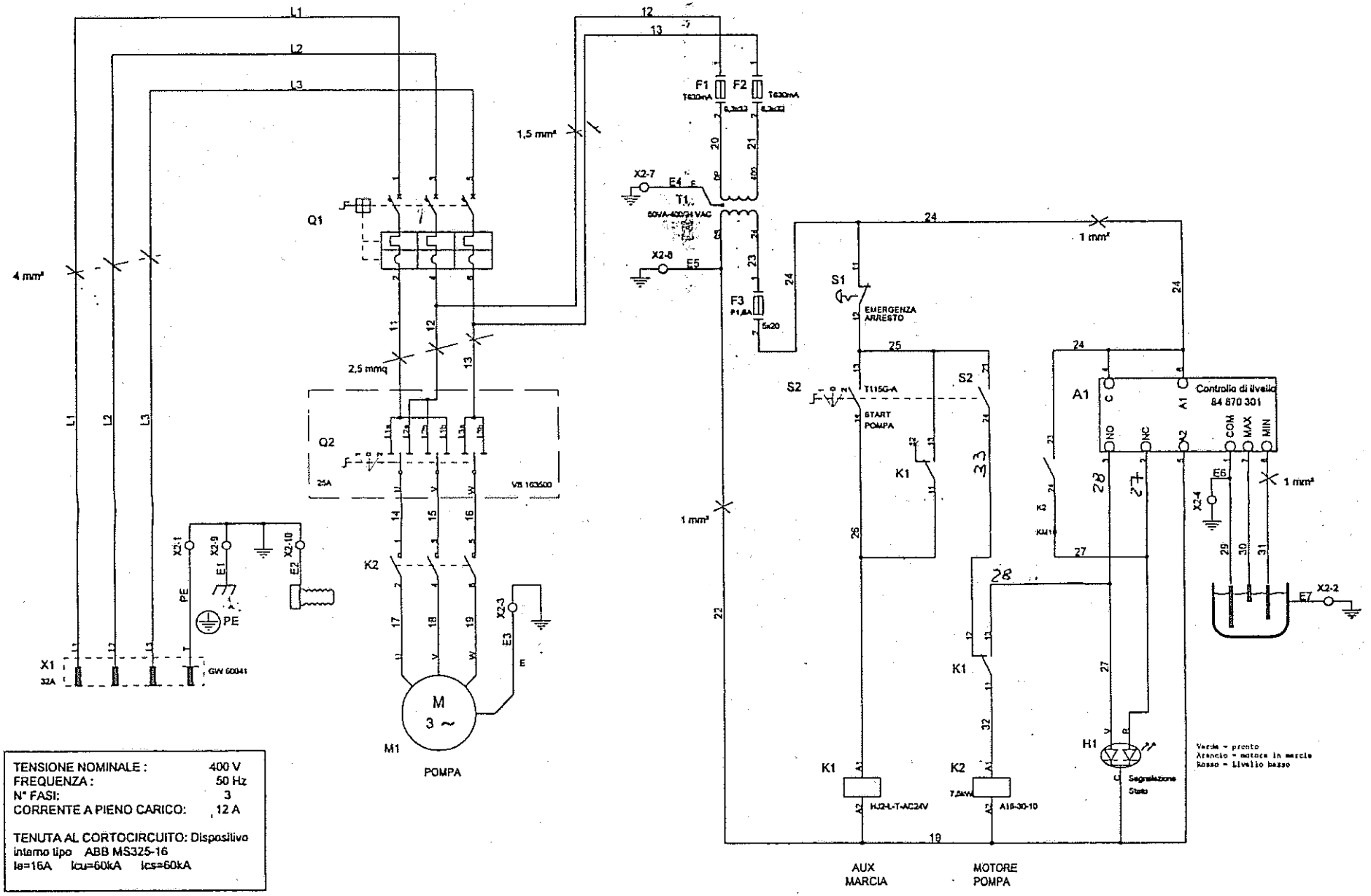
# PMS 80 - 2S




Starting Torque :1210 Nm

PAGINA BIANCA - BLANK PAGE




| | |
|---|---|
| TENSIONE NOMINALE : | 400 V |
| FREQUENZA : | 50 Hz |
| N° FASI: | 3 |
| CORRENTE A PIENO CARICO: | 12 A |

TENUTA AL CORTOCIRCUITO: Dispositivo interno tipo ABB MS325-16
Ie=16A Icu=60kA Ics=60kA

ATTENZIONE: MONTAGGIO OBBLIGATORIO A CURA DELL'UTILIZZATORE !

I conduttori di alimentazione dell'apparecchiatura, devono essere protetti nel punto in cui sono collegati all'alimentazione, con interruttore automatico.

Assicurarsi inoltre, che in serie a tale linea, sia inserito un interruttore differenziale con una sensibilità di 0,03A.

Numeri disponibili:
Ultimo numero: 31

| Revisione | Data |
|---|---|
| | |

DELLA TOFFOLA

Drawing: M. B.
Design create date: Tuesday, March 16, 2005
Title: CIRCUITI DI POTENZA
CIRCUITI DI COMANDO

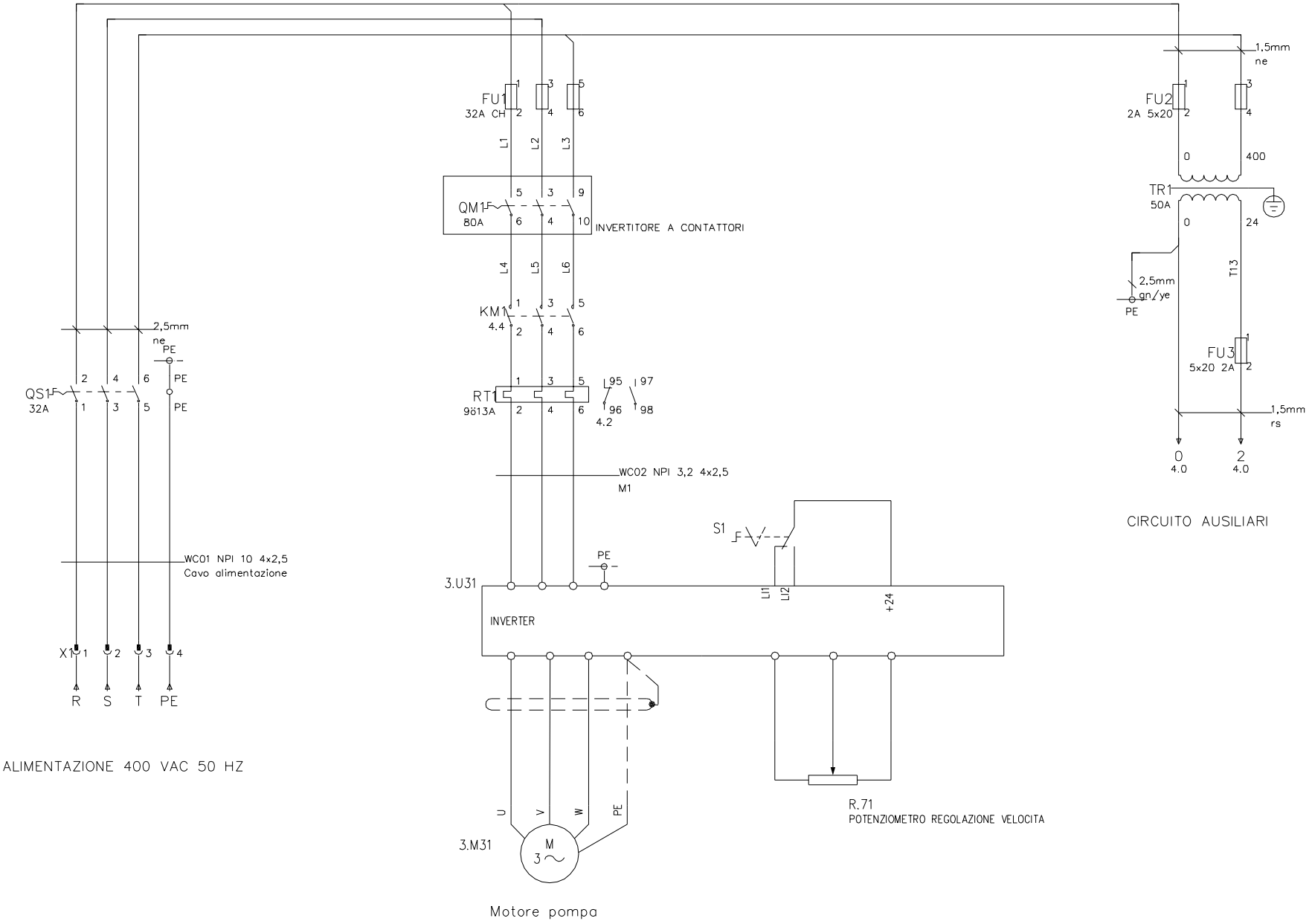
Project: QUADRO ALIMENTAZIONE POMPA
Size: A3 | Document Number: 00303D-DW-01 | Rev: 1.0
Page modify date: Thursday, March 24, 2005 | Sheet 1 Next /

PAGINA BIANCA - BLANK PAGE

| |
|---|
| TENSIONE NOMINALE/rated voltage/bemessungsspannung/tension nominale/tension nominal:<br>Vn (Volt) = 400V |
| N.FASI/n.phases/anzahl phasen/n.phases/n.fases:<br>n.= 3 |
| FREQUENZA/frequency/bemessungfrequenz/frequence/frecuencia:<br>f (Hz)= 50 |
| POTENZA INSTALLATA/installed power/installierte leistung/puissance installee/potencia instalada:<br>Pn (kW) = 4KW / 5,5KW |
| CORRENTE A PIENO CARICO/full load current/vollaststrom/courant a pleine charge/corriente a carga maxima:<br>* In (A) = 9A / 12A |
| GRADO DI PROTEZIONE/protection grade/mindestschutzgrad/degre protection/grado de proteccion:<br>IP55 |

* *SI TIENE CONTO ANCHE DELLA POTENZIALE CORRENTE ASSORBITA DA POSSIBILI CARICHI APPLICATI ALLE PRESE ALIMENTATE DALL'IMPIANTO.*
*THE POTENTIAL CURRENT ABSORBED BY POSSIBLE LOADS APPLIED TO POWERED SOCKETS OF THE SYSTEM ARE ALSO TAKEN INTO CONSIDERATION.*
*ES IST GGF. AUCH DIE STROMAUFNAHME VON DEN LASTEN ZU BERUECKSICHTIGEN, DIE AN DIE VON DER ANLAGE GESPEISTEN STECKDOSEN ANGESCHLOSSENEN SIND.*
*ON TIENT COMPTE AUSSI DU COURANT POTENTIEL ABSORBE PAR DE POSSIBLES CHARGES APPLIQUEES AUX PRISES ALIMENTEES PAR L'INSTALLATION.*
*SE TOMA EN CUENTA TAMBIEN LA CORRIENTE POTENCIAL ABSORBIDA POR LAS POSIBLES CARGAS APLICADAS A LAS TOMAS ALIMENTADAS POR EL SISTEMA.*

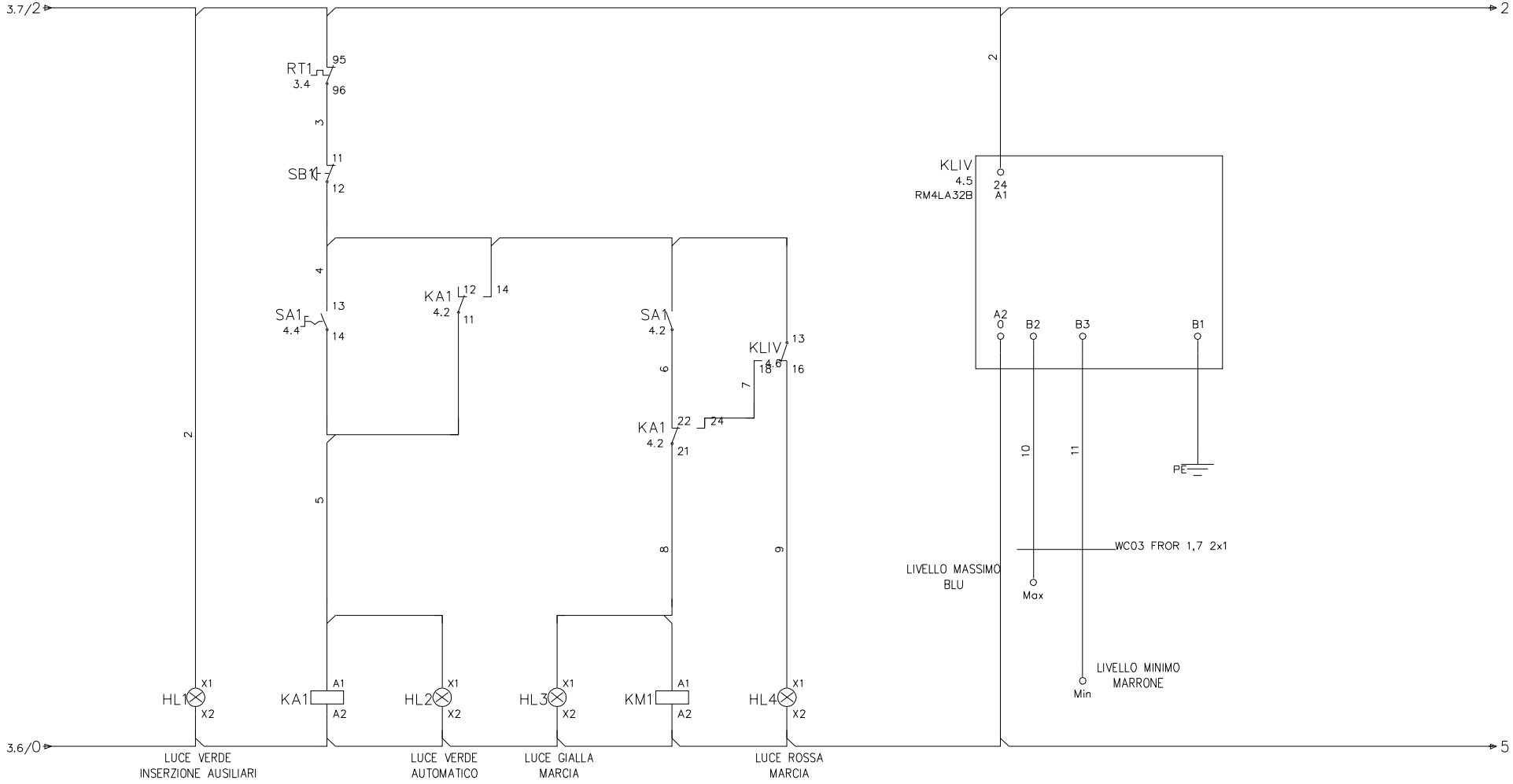
| | | | | |
|---|---|---|---|---|
| SCALA/scale: 1:1 mm | SL: | Cliente: | Ordine: | Commessa: |
| DELLA TOFFOLA<br>Signoressa di Trevignano (TV) ITALY | ESEGUITO/made by: | CONTROLLATO/checked: | APPROVATO/approved: | |
| | DATA/date: 03/11/2010 | DATA/date: 03/11/2010 | DATA/date: 03/11/2010 | |
| OGGETTO/object: PMS | DESCRIZIONE/description: AVVIAMENTO MOTORE POMPA CON INVERTER | | | |
| DATA/date: 03/11/2010 | CODICE/codice: IE001450_0 | | | |




| REV. | DATA | OGGETTO MODIFICA | FIRMA |
|---|---|---|---|
| | | | |

DELLA TOFFOLA
Signoressa di Trevignano (TV) ITALY

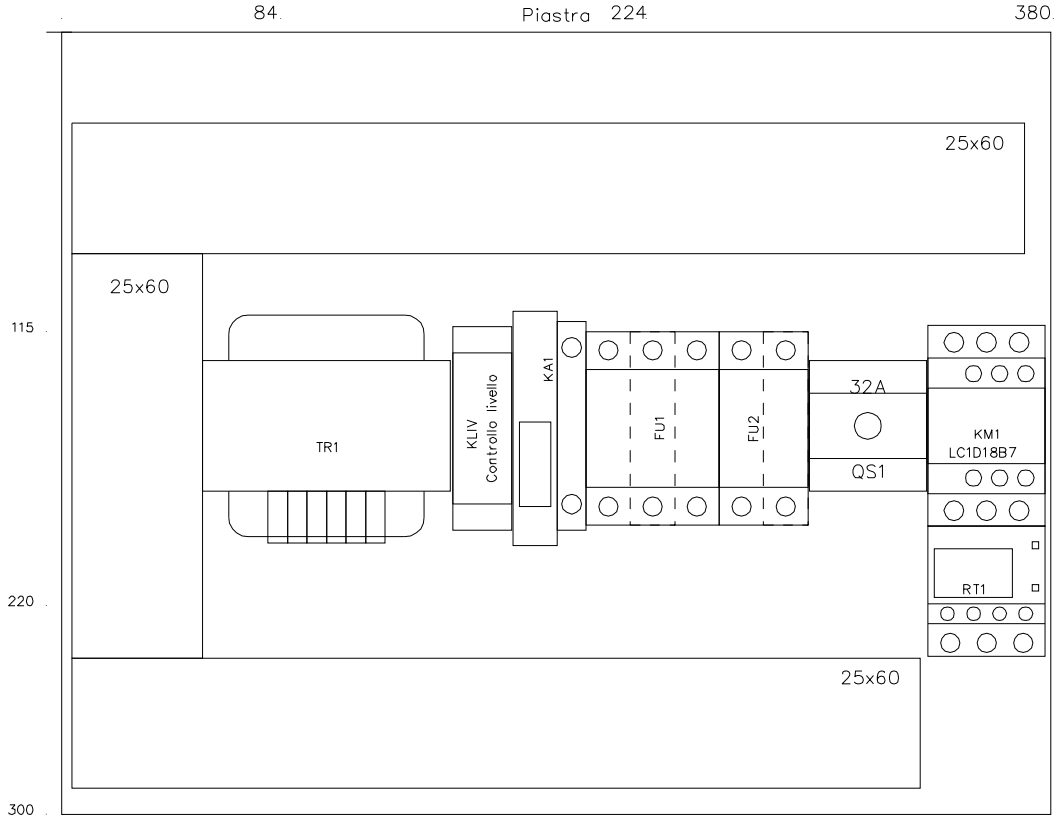
| | | | | | |
|---|---|---|---|---|---|
| DESCRIONE IMPIANTO: AVVIAMENTO MOTORE POMPA CON INVERTER | | DISEGNATORE: DT | DISTINTA: | FOGLIO: 3 | SEGUE: 4 |
| DATA: 03/11/2010 | RIF.CLIENTE: | FIRMA: | SCHEMA: IE001450_0 | TOT. FOGLI: 6 | |




| REV. | DATA | OGGETTO MODIFICA | FIRMA |
|---|---|---|---|
| | | | |

DELLA TOFFOLA
Signoressa di Trevignano (TV) ITALY

| | | | | | | |
|---|---|---|---|---|---|---|
| DESCRIONE IMPIANTO: AVVIAMENTO MOTORE POMPA CON INVERTER | | DISEGNATORE: DT | DISTINTA: | FOGLIO: 4 | SEGUE: 5 | |
| DATA: 03/11/2010 | RIF.CLIENTE: | FIRMA: | SCHEMA: IE001450_0 | TOT. FOGLI: 6 | | |




| REV. | DATA | OGGETTO MODIFICA | FIRMA |
|---|---|---|---|
| | | | |

DELLA TOFFOLA
Signoressa di Trevignano (TV) ITALY

| | | | | | | |
|---|---|---|---|---|---|---|
| DESCRIONE IMPIANTO: AVVIAMENTO MOTORE POMPA CON INVERTER | | DISEGNATORE: DT | DISTINTA: | FOGLIO: 5 | SEGUE: 6 |
| DATA: 03/11/2010 | RIF.CLIENTE: | FIRMA: | SCHEMA: IE001450_0 | TOT. FOGLI: 6 | |

ELENCO CAVI

| Nome cavo | Sorgente da | Destinazione fino | Tipo cavo | Cond. totale | Cond. utilizzato | Sezione mmý | Lungh. m | Annotazione | Grafica – Pagina |
|---|---|---|---|---|---|---|---|---|---|
| WC01 | X1 | QS1 | NPI | 4/PE | 4/PE | 2.5 | 10 | CAVO ALIMENTAZIONE | 11 |
| WC02 | M1 | RT1 | NPI | 4/PE | 3 | 2.5 | 3.2 | CAVO MOTORE POMPA | 12 |
| WC03 | | | FROR | 3 | 2 | 1 | 1.7 | CAVO CONTROLLO LIVELLO | 13 |
| | KLIV | Max | | 3 | 1 | 1 | | CAVO CONTROLLO LIVELLO | 13 |
| | KLIV | Min | | 3 | 1 | 1 | | CAVO CONTROLLO LIVELLO | 13 |

| REV. | DATA | OGGETTO MODIFICA | FIRMA |
|---|---|---|---|
| | | | |

DELLA TOFFOLA
Signoressa di Trevignano (TV) ITALY

| | | | | | |
|---|---|---|---|---|---|
| DESCRIONE IMPIANTO: AVVIAMENTO MOTORE POMPA CON INVERTER | | DISEGNATORE: DT | DISTINTA: | FOGLIO: 6 | SEGUE: 7 |
| DATA: 03/11/2010 | RIF.CLIENTE: | FIRMA: | SCHEMA: IE001450_0 | TOT. FOGLI: 6 | |

IDEA R. 2009

# Distinta base

WUP0004 22.10.2003

| Codice elemento funz. | page/path | Q.ta' | Descrizione | Sigla commerciale | Fornitore | Cod.ordine |
|---|---|---|---|---|---|---|
| FU1 | 3. 3 | 3 | Fusibile WEBER CH 10x38 am 32A | 1422032 | MEB S.r.l. | |
| FU1 | 3. 3 | 1 | Portafusibili tripolare 10x38 32A | DF103 | Schneider Electric S.p.A. | |
| FU2 | 3. 6 | 1 | Portafusibili bipolare 10x38 32A | DF102 | Schneider Electric S.p.A. | |
| FU2 | 3. 6 | 2 | Fusibile WEBER CH 10x38 gl 2A | 1421002 | MEB S.r.l. | |
| FU3 | 3. 7 | 1 | Morsetto portafusibile 5x20 da 4mmq | AB1FUSE435U5X | Schneider Electric S.p.A. | |
| FU3 | 3. 7 | 1 | Fusibile WEBER 5x20 2A | 0102002 | MEB S.r.l. | |
| HL1 | 4. 1 | 1 | Led verde con ghiera | LED VERDE | Electronic Assistance | |
| HL2 | 4. 2 | 1 | Led verde con ghiera | LED VERDE | Electronic Assistance | |
| HL3 | 4. 3 | 1 | Led giallo con ghiera | LED GIALLO | Electronic Assistance | |
| HL4 | 4. 5 | 1 | Led rosso con ghiera | LED VERDE | Electronic Assistance | |
| KA1 | 4. 2 | 1 | RelŠ 2 contatti in scambio 5A - 24Vac | G2R-2SN24AC | Omron S.p.A. | |
| KA1 | 4. 2 | 1 | Zoccolo per relŠ G2R-2 contatti a molla | P2RF08SBYOMZ | Omron S.p.A. | |
| KA1 | 4. 2 | 1 | Accessorio fissaggio per relŠ G2R | P2CMSBYOMZ | Omron S.p.A. | |
| KLIV | 4. 6 | 1 | RelŠ controllo livello 24Vac 2NO/NC | RM4LA32B | Schneider Electric S.p.A. | |
| KM1 | 4. 4 | 1 | Contattore a vite Tesys 18A 3p 24V | LC1D18B7 | Schneider Electric S.p.A. | |
| QM1 | 3. 3 | 1 | Invertitore marcia 3P 690V 16-20A | K2E003WLH | Schneider Electric S.p.A. | |
| QS1 | 3. 0 | 1 | Sezionatore 32A 3P | SE323003B | Giovenzana Internation B.V. | |
| QS1 | 3. 0 | 1 | Manovra G.R. per sezionatore 32A | 064/0001 | Giovenzana Internation B.V. | |
| RT1 | 3. 3 | 1 | RelŠ termico Tesys LRD16 ( 9 ö 13 ) | LRD16 | Schneider Electric S.p.A. | |
| SA1 | 4. 2 | 1 | Deviatore Ter. Faston MAT T115D-A | MAT T115D-A | MEB S.r.l. | |
| SA1 | 4. 2 | 1 | Protezione stagna deviatore MATT115D-A | MAT WD1911 | MEB S.r.l. | |
| SB1 | 4. 2 | 1 | Testa metallica a fungo rosso | ZB4BS844 | Schneider Electric S.p.A. | |
| SB1 | 4. 2 | 1 | Corpo metallico + contatto N.C. | ZB4BZ102 | Schneider Electric S.p.A. | |
| SB1 | 4. 2 | 1 | Etichetta circolare Arresto Emergenza d.60 | ZBY9630 | Schneider Electric S.p.A. | |
| TR1 | 3. 6 | 1 | Tra. monofase 100VA 230-400/24V | TM100VA 230-400/24 | F.M.T. | |
| WC01 | 3. 0 | 1 | Cavo tondo FROR 4x2,5mm | FROR 4X2V5 | MEB S.r.l. | |
| WC02 | 3. 3 | 1 | Cavo tondo FROR 4x2,5mm | FROR 4X2V5 | MEB S.r.l. | |
| WC03 | 4. 6 | 1 | Cavo tondo FROR 2x1mm | FROR 2X1 | MEB S.r.l. | |

| REV. | DATA | OGGETTO MODIFICA | FIRMA |
|---|---|---|---|
| | | | |

DELLA TOFFOLA
Signoressa di Trevignano (TV) ITALY

| | | | | | |
|---|---|---|---|---|---|
| DESCRIONE IMPIANTO: AVVIAMENTO MOTORE POMPA CON INVERTER | | DISEGNATORE: DT | DISTINTA: | FOGLIO: 7 | SEGUE |
| DATA: 03/11/2010 | RIF.CLIENTE: | FIRMA: | SCHEMA: IE001450_0 | TOT. FOGLI: 6 | |

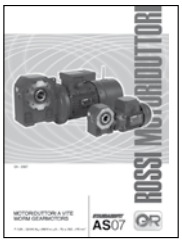
IDEA R. 2009

VIA EMILIA OVEST 915/A - MODENA - I
✉ C.P. 310 - 41100 MODENA
☎ 059 33 02 88
Fax 059 82 77 74
info@rossi-group.com
www.rossi-group.com

# INSTALLATION AND MAINTENANCE INSTRUCTIONS UT. D 156 rev. 0
# WORM GEARMOTORS STANDARDFIT (Catalogue AS07)

## Index






**Waste disposal:** (follow the existing provisions and laws in matter of waste and environmental protection):
– exhausted oils must be recycled and treated according to the existing dispositions;
– metal materials must be wasted as scraps and parted in categories: cast iron (gear reducer casing and covers), steel (shafts, worm and bearings), bronze (worm-wheel), alluminium (name plate);
– non-ferrous materials (seal rings) must be correctly wasted.

The paragraphs marked with present symbol contain dispositions to be strictly respected in order to assure personal **safety** and to avoid any **heavy damages** to the machine or to the system (e.g.: works on live parts, on lifting machines, etc.); the responsible for the installation or maintenance must scrupulously **follow all instructions contained in present handbook.**

## 1 - General safety instructions

Gearmotors present dangerous parts because they may be:
– live;
– at temperature higher than +50 °C;
– rotating during the operation;
– eventually noisy.

An incorrect installation, an improper use, the removing or disconnection of protection devices, the lack of inspections and maintenance, improper connections may cause severe personal injury or property damage. Therefore the component must be moved, installed, commissioned, handled, controlled, serviced and repaired **exclusively by responsible qualified personnel** i.e. people who, in relation to their training and knowlegde about existing standards, provisions, accident prevention measures and running conditions, have been authorized, by the person responsible for plant safety, to follow the required operations and are able to recognize and to avoid the possible connected danger (definition to IEC 364).

It is recommended to pay attention to all instructions of present handbook, all instructions relevant to the system, all existing safety laws and standards concerning correct installation.

**Attention!** Components in non-standard design or with constructive variations (identified by the initials stated in the proper field of the name plate, see fig. 1) may differ in the details from the ones described here following and may require additional information.

**Attention!** For the installation, use and maintenance of the electric motor (standard, brake or non-standard motor) and/or the electric supply device (frequency inverter, soft-start, etc.) and accessories, if any consult the attached specific documentation. If necessary, require it or visit our web-site «*www.rossi-group.com*».

**Attention!** For any clarification and/or additional information consult Rossi and specify all name plate data.

Gearmotors of present handbook are normally suitable for installations in industrial areas: **additional protection measures,** if necessary for different employs, must be adopted and assured by the person responsible for the installation.

**IMPORTANT**: the components supplied by Rossi must be incorporated into machinery and **should not be commissioned before the machinery in which the components have been incorporated conforms to:**
– **Machinery directive 98/37/EEC; in particular, possible safety guards for shaft ends not being used and for eventually accessible fan cover passages (or other) are the Buyer's responsibility;**
– **«Electromagnetic compatibility (EMC)» directive 89/336/EEC and subsequent updatings.**

When operating on gearmotor or on components connected to it **the machine must be at rest:** disconnect motor (including auxiliary equipments) from power supply, gear reducer from load, be sure that safety systems are on against any accidental starting and, if necessary, pre-arrange mechanical locking devices (to be removed before commissioning).

If deviations from normal operation occur (temperature increase, unusual noise, etc.) immediately switch off the machine.

The products relevant to this handbook correspond to the technical level reached at the moment the handbook is printed. Rossi reserves the right to introduce, without notice, the necessary changes for the increase of product performances.

## 2 - Operating conditions

Gear reducers are designed for industrial applications according to name plate data, at ambient temperature 0 ÷ +40 °C (with peaks at -20 °C and +50 °C), maximum altitude 1 000 m.

Not allowed running conditions: application in aggressive environments having explosion danger, etc. Ambient conditions must comply with specifications stated on name plate.

## 3 - How supplied

### 3.1 - Receipt

At receipt verify that the unit corresponds to the one ordered and has not been damaged during the transport, in case of damages, report them immediately to the courier.

Avoid commissioning gearmotors, that are even if slightly damaged.

### 3.2 - Name plate

Every gear reducer presents a name plate in anodised aluminium containing main technical information relevant to operating and constructive specifications and defining, according to contractual agreements, the application limits (see fig. 1); the name plate must not be removed and must be kept integral and readable. All name plate data must be specified on eventual spare part orders.

### 3.3 - Painting

Gearmotors are externally coated with epoxy powder paint (pre-painted) blue RAL 5010 DIN 1843 appropriate for resistance to normal industrial environments and suitable for application of further

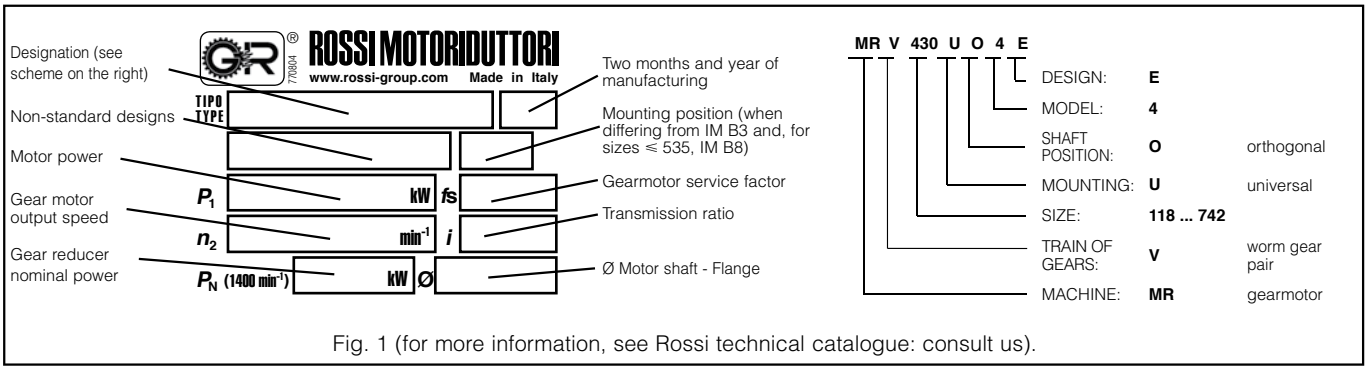



Fig. 1 (for more information, see Rossi technical catalogue: consult us).

coats of synthetic paint. Machined parts remain unpainted and are protected with an easily removable anti-rust oil (remove the protective oil before painting and, in any case, remove it from mating surfaces before assembly to the driven machine).

Gear case inner parts are protected with epoxy powder paint (prepainted).

### 3.4 - Protections and packing

Overhanging free shaft ends and hollow shafts are treated with protective anti-rust long life oil and protected with a plastic (polyethylene) cap.

Unless otherwise agreed in the order, products are adequately packed: in carton pallet, wound with adhesive tape and strap or for small dimensions and quantities in carton boxes wound with tape. If necessary, gear reducers are conveniently separated by means of anti-shock foam cells or of filling cardboard.

Do not stock packed products on top of each other.

## 4 - Storing

Surroundings should be sufficiently clean, dry and free from excessive vibrations ($v_{eff}$ ⩽ 0,2 mm/s) to avoid damage to bearings (excessive vibration should also be guarded during transit, even if within wider range) and ambient storage temperature should be 0 ÷ +40 °C: peaks of 10 °C above and below are acceptable.

Every six months rotate the shafts (some revolutions are sufficient) to prevent damage to bearings and seal rings.

Assuming normal surroundings and the provision of adequate protection during transit, the unit is protected for storage up to 1 year.

For a 2 year storing period in normal surroundings it is necessary to generously grease the sealings, the shafts and the unpainted machined surfaces.

For storages longer than 2 years or in aggressive surroundings or outdoors, consult Rossi.

## 5 - Installation

### 5.1 - General

Before the installation, verify that:

– there were no damages during the storing or the transport;
– design is suitable to the environment (temperature, atmosphere, etc.);
– electrical connection (power supply, etc.) corresponds to motor name plate data;
– used mounting position corresponds to the one stated in name plate (see ch. 6.2).

**Attention!** When lifting and transporting the gearmotor use the through holes or tapped holes of the gear reducer casing (sizes 118 ... 325) or the eyebolt supplied with the gear reducer (sizes 430 ... 742) and not the one, if present, supplied with the motor. Be sure that load is properly balanced and provide lifting and hooking systems, and cables of adequate section. Approximatively, the gearmotor max. mass is shown in the following table, according to the motor size.

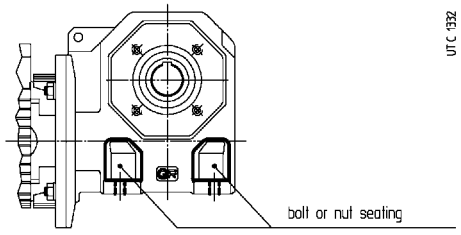
| Gear reducer size | Gearmotor max mass [kg] Motor size | | | | | | |
|---|---|---|---|---|---|---|---|
| | **63** | **71** | **80** | **90** | **100** | **112** | **132** |
| **118** | 9 | 13 | – | – | – | – | – |
| **225** | 10 | 14 | – | – | – | – | – |
| **325** | – | 16 | 21 | – | – | – | – |
| **430** | – | – | 27 | 35 | – | – | – |
| **535** | – | – | 36 | 44 | 53 | 67 | – |
| **742** | – | – | – | 53 | 63 | 77 | 107 |

Be sure that the structure on which gearmotor is fitted is plane (max flatness error ⩽ 0,1 mm), levelled and sufficiently dimensioned in order to assure fitting stability and vibration absence (vibration speed $v_{eff}$ ⩽ 3,5 mm/s are acceptable), keeping in mind all transmitted forces due to the masses, to the torque, to the radial and axial loads.

The max dimensions of fixing screws of gear reducer feet and the depth of tapped holes are stated in the next table (see fig. 2). Apply bolts and screws class 8.8 or higher (for tightening torques see table on page 10).

Carefully select the length of fixing screws when using tapped holes for gear reducer fitting, in order to assure a sufficient meshing thread length for the correct gear reducer fitting to the machine without breaking down the threading seat.

Fig. 2




| Gear reducer size | Bolt UNI 5737-88 | B14 flange holes n. 4 holes each side |
|---|---|---|
| **118** | M 6 x 18 | M 5 x 10 |
| **225** | M 6 x 25 | M 5 x 10 |
| **325** | M 8 x 35 | M 6 x 9,5 |
| **430** | M 8 x 40 | M 6 x 9,5 |
| **535** | M10 x 50 | M 8 x 16 |
| **742** | M12 x 60 | M10 x 20 |

**Attention! Bearing life and good shaft and coupling running depend on alignment precision between the shafts.** Carefully align the gearmotor with the driven machine (with the aid of shims if need be), interposing flexible couplings whenever possible.

**Incorrect alignment** may cause **breakdown of shafts and/or bearings** (which may cause overheatings) which may represent **heavy danger for people**.

Position the gearmotor so as to allow a free passage of air for cooling both gear reducer and motor (especially at motor fan side).

Avoid: any obstruction to the air flow; heat sources near the gear reducer that might affect the temperature of cooling air and of gear reducer (for radiation); insufficient air recycle and applications hindering the steady dissipation of heat.

Mount the gearmotor so as not to receive vibrations.

Mating surfaces (of gear reducer and machine) must be clean: remove by a scraper or solvent the eventual paint of gear reducer coupling surfaces.

When external loads are present use pins or locking blocks, if necessary.

When fitting gearmotor and machine and/or gearmotor and the accessories, if any, **Flange B5** and **Torque arm** it is recommended to use locking adhesives on the fastening screws and on flange mating surfaces.

Before wiring-up the gearmotor make sure that motor voltage corresponds to input voltage. If direction of rotation is not as desired, invert two phases at the terminals.

If overloads are imposed for long periods or if shocks or danger of jamming are envisaged, then motor-protection, electronic torque limiters, safety couplings, control units or other similar devices should be fitted.

**Usually protect the motor with a thermal cut-out**; however, where duty cycles involve a high number of on-load starts, it is necessary to utilise **thermal probes** for motor protection (fitted on the wiring); magnetothermic breaker is unsuitable since its threshold must be set higher than the motor nominal current of rating.

**Connect thermal probes, if any, to auxiliary safety circuits**.

Use varistors and/or RC filters to limit voltage peaks due to contactors.

Whenever a leakage of lubricant could cause heavy damages, increase the frequency of inspections and/or envisage appropriate control devices.

In polluting surroundings, take suitable precautions against lubricant contamination through seal rings or other.

For outdoor installation or in a hostile environment, protect gearmotor with an anticorrosion paint; added protection may be afforded by applying water-proof grease (around the rotary seating of seal rings).

Gearmotors for outdoor installation should be protected whenever possible and by appropriate means from solar radiation and extremes of weather; protection **becomes essential** when high or low speed shaft are vertically disposed.

For ambient temperature greater than +40 °C or less than 0 °C, consult Rossi.

### 5.2 - Fitting of components to shaft ends

It is recommended that the holes of parts keyed onto shaft ends should be machined to **K7** tolerance (H7 if load is uniform and light).

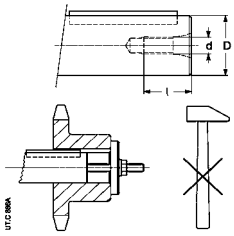
Before mounting, thoroughly clean mating surfaces and lubricate against seizure and fretting corrosion.

**Attention!** Installing and removal operations should be carried out with the aid of **jacking screws** and **pullers** using the tapped hole at the shaft butt-end (see table in fig. 3) taking care to avoid impacts and shocks which may **irremediably damage bearings, circlips** and other parts.

The couplings having a tip speed on external diameter up to 20 m/s must be statically balanced; for higher tip speeds they must be dynamically balanced.

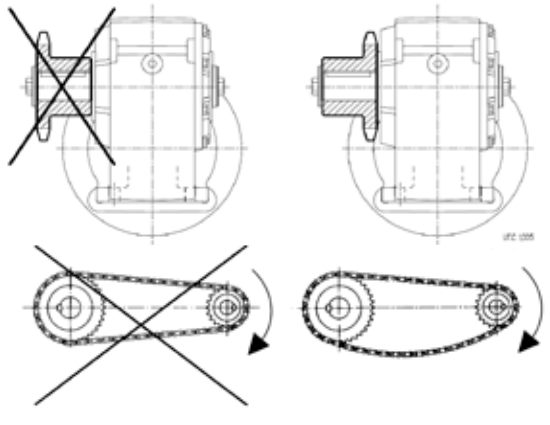
Fig. 3

| Gear reducer size | Shaft end | |
|---|---|---|
| | Ø **D** | Ø **d** x **l** |
| **118** | 18 h7 | M 6 x 20 |
| **225** | 25 h7 | M 8 x 25 |
| **325** | 25 h7 | M 8 x 25 |
| **430** | 30 h7 | M 10 x 30 |
| **535** | 35 h7 | M 10 x 30 |
| **742** | 42 h7 | M 12 x 40 |




Where the transmission link between gearmotor and machine generates shaft end loads, (see fig. 4), ensure that:
– loads do not rise above catalogue values;
– transmission overhang is kept to a minimum;
– gear-type transmissions must guarantee a minimum of backlash on all mating flanks;
– drive-chains should not be tensioned (if necessary – alternating loads and/or motion – foresee suitable chain tighteners);
– drive-belts should not be over-tensioned.

Fig. 4




### 5.3 - Shaft mounting

When shaft mounted, the gearmotor must be supported both axially and radially (also for mounting positions B3 ... B8) by the machine shaft end, as well as anchored against rotation only, by means of a reaction having **freedom of axial movement** and sufficient **clearance in its couplings** to permit minor oscillations always in evidence without provoking dangerous overloading on the gear reducer.

Lubricate with proper products the hinges and the parts subject to sliding; when mounting the screws it is recommended to apply locking adhesives such as LOCTITE 601.

Concerning the reaction system, follow the project indications stated in the technical catalogues Rossi. Whenever personal injury or property damage may occur due to falling down or projecting parts of gearmotor, **foresee adequate supplementary protection devices** against:
– rotation or unthreading of the gearmotor from shaft end of driven machine following to accidental breakage of the reaction arrangement;
– accidental breakage of shaft end of driven machine.

### 5.4 - Shaft end of driven machine

For the shaft end of machines where the hollow shaft of the gear reducer is to be keyed, j6 or k6 tolerances are recommended, according to requirements (it is advised to machine a segment of machine shaft end, input side, to h6 or j6 tolerance, in order to facilitate the assembly).

Important! The diameter of the shaft end of the driven machine abutting with the gear reducer must be at least 1,18 ÷ 1,25 time the internal hollow shaft diameter.

## 6 - Lubrication

### 6.1 - General

Worm gear pairs and bearings are oil-bath lubricated; worm-wheel bearings are lubricated with grease – assuming pollution-free surroundings – «**for life**» (bearings with low-friction rubber seals).

All sizes are envisaged with synthetic oil lubrication (synthetic oils can withstand operating temperatures up to **95 ÷ 110 °C**).

Gearmotors are supplied **FILLED WITH** synthetic **OIL** (AGIP Blasia S 320, KLÜBER Klübersynth GH 6-320, MOBIL Glygoyle HE 320, SHELL Tivela S 320), providing «**long life**» lubrication, assuming pollution-free surroundings.

Ambient temperature **0 ÷ 40** °C with peaks of -20 °C and +50 °C.

An overall guide to **oil-change interval**, is given in the table, and assumes pollution-free surroundings. Where heavy overloads are present, halve the value.

In any case, should there be either a possibility of lubricant contamination or a very heavy duty-cycle, it is good policy to check on the state of the lubricant every year or 2 years and, in any case, provide for lubricant replacement every 2 or 4 years.

Never mix different makes of synthetic oil; if oil-change involves switching to a type different from that used hitherto, then give the gear reducer a thorough clean-out (see ch. 8).

| Oil temperature [°C] | Oil-change interval [h] - Synthetic oil |
|---|---|
| ⩽ **65** | 18 000 |
| **65 ÷ 80** | 12 500 |
| **80 ÷ 95** | 9 000 |
| **95 ÷ 110** | 6 300 |

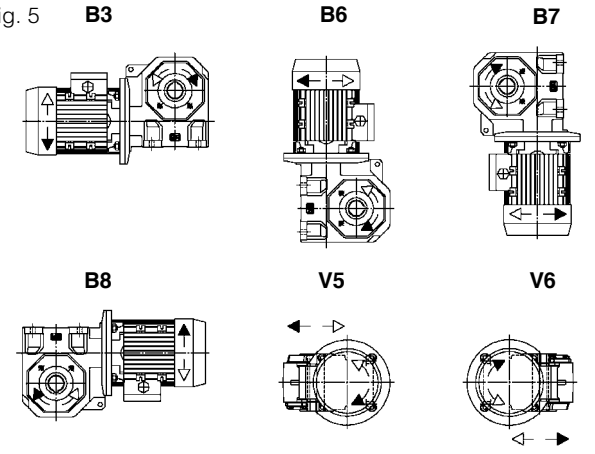
### 6.2 - Mounting positions (and direction of rotation)

Unless otherwise stated, geamotors are supplied in mounting position **B3** (**B3** or **B8** for sizes ⩽ 535; see fig. 5) which, being standard, is **omitted** from the designation and from the name plate.

The mounting position ordered affects the quantity of lubricant which the gear reducer is filled with before delivering.

**Important:** be sure that the gearmotor is installed as per mounting position ordered and stated on the name plate. If the gearmotor is

Fig. 5




| **Gear reducer. size** | Oil quantities [l] | |
|---|---|---|
| | **B3** | **B6, B7, B8, V5, V6** |
| **118** | 0,1 | 0,2 |
| **225** | 0,13 | 0,23 |
| **325** | 0,18 | 0,35 |
| **430** | 0,31 | 0,75 |
| **535** | 0,46 | 1,4 |
| **742** | 0,95 | 2,8 |

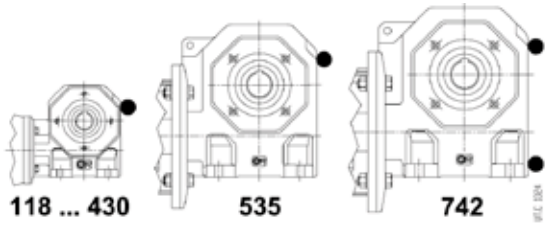
installed in a **different mounting position** verify, according to the values given in the table of fig. 5, that the **oil quantity does not change**, if so, adjust it consequently.

### 6.3 - Plug position

Gearmotors are provided with 1 plug (2 plugs for size 742) positioned as per figure below. No level plug is supplied.

**Attention!** Before loosening the plugs wait until gear reducer has become cold (see ch. 8).

Fig. 6




| | 118 ... 430 | 535 | 742 |
|---|---|---|---|
| thread | G 1/4" | 16 MB | G 1/2" |
| tightening torque | 7 N m | 14 N m | 14 N m |

## 7 - Commissioning

Carry out an overall check, making particularly sure that the gear reducer is filled with lubricant.

**Running-in:** a period of about 200 ÷ 800 h is advisable, by which time the gear pair will have reached maximum efficiency; oil temperature during this phase is likely to reach higher levels than would normally be the case. After that period it is advisable to verify the tightening torque of the gearmotor and possible accessories (Flange B5 or Torque arm) fastening bolts.

Note: worm gear reducer efficiency is lower in the **first running hours** (about 50) and at every cold starting (efficiency will be better with oil temperature increasing).

For further information consult Rossi technical catalogues.

## 8 - Maintenance

### 8.1 - General

**At machine rest**, verify at regular intervals (more or less frequently according to environment and use):

a) all external surfaces are clean and air passages to the gearmotor are free, in order that cooling remains fully effective;
b) oil deterioration degree (check with cold gear reducer at rest);
c) the correct fastening screws tightening.

**During the operation** check:

— noise level;
— vibrations;
— seals;
— etc.

**Attention!** After a running period, gear reducer is subject to a light internal overpressure which may cause burning liquid discharge. Therefore, before loosening plugs wait until gear reducer has become cold; if not possible, take the necessary protection measures against burning due to warm oil contact. In all cases, always proceed with great care.

In case of oil replacement it's recommended to clean gear reducer internal parts using the same kind of oil that will be used for the new filling. It's possible to use again the cleaning oil after previous filtering by means of 60 μm oil filter.

When dismounting the cover reset the sealing with adhesive on cleaned and degreased mating surfaces.

Tighten cover screws and plugs with the torques stated in the table at page 10.

### 8.2 - Seal rings

Duration depends on several factors such as dragging speed, temperature, ambient conditions, ect.; as a rough guide, it can vary from 3 150 to 12 500 h.

It is always recommended that the seal rings are replaced with new ones when they are removed or during periodic checks of gear reducer; in this case, the new ring should be generously greased and positioned so that the seal line does not work on the same point of sliding contact as the previous ring.

Oil seals must be protected against heat radiation, also during the shrink fitting of parts, if applicable.

### 8.3 - Motor mounting or replacement

For motor mounting simply observe the following instructions:

– ensure that the mating surfaces are machined under «standard» rating (IEC 72.1; UNEL 13501-69; DIN 42955) at least;
– clean surfaces to be fitted, thoroughly;
– check and, if necessary, lower the parallel key so as to leave a clearance of 0,1 ÷ 0,2 mm between its tip and the bottom of the keyway of the hole; when shaft keyway is without end, lock the key with a pin;
– when a lowered key is needed (see table below), replace the key on the motor shaft with the one supplied together with the gear reducer; if necessry, adjust it accordingly to the motor shaft keyway length.

| Gear reducer size | Motor sizes | A shape key b x h x l |
|---|---|---|
| **325** | 71 B14, 80 B14R | 5 x 4 x 25 |
| **430** | 80 B5, 90 B5R | 6 x 5 x 32 |
| **535** | 90 B5, 100 B5R, 112 B5R | 8 x 5 x 40 |
| **742** | 100 B5, 112 B5, 132 B5R | 8 x 5,3 x 45 |

– check, if necessary, that the fit-tolerance of bore-and-shaft end (plug-fit) is G6/j6;
– ensure that the reinforcement ring is fitted onto the wormshaft, where fereseen (see specific literature; consult us);
– lubricate surfaces to be fitted against fritting corrosion.

In most cases, the standard motor foreseen in the catalogue is an IEC standardized motor. However, some gearmotors present motors that have coupling dimensions of the smaller size («**B5R**», «**B14R**») or that have a **different** or **higher power** in comparison with the standard one.

In the present circumstance, if a motor with the same features is not available, if necessary and accepting a reduced machine duty cycle, it is possible to adopt an IEC standardized motor with lower power and, in case, smaller size, with respect to the coupling dimensions as stated in the table.

**Main motor mating dimensions** (IEC 72.2):
**shaft end** Ø D x E **- flange** Ø P

| Motor size | Motor mounting position[1] | | | |
|---|---|---|---|---|
| | **B14** | **B14R** | **B5** | **B5R** |
| **63** | **11×23- 90** | – | – | – |
| **71** | **14×30-105** | 11×23- 90 | – | – |
| **80** | – | 14×30-105 | **19×40-200** | – |
| **90** | – | – | **24×50-200** | 19×40-200 |
| **100,112** | – | – | **28×60-250** | 24×50-200 |
| **132** | – | – | – | 28×60-250 |

1) Stated in designation (see ch.3) and in motor name plate.

### 8.4 - Bearings

Since there are different types of bearings in a gear reducer (ball, taper roller bearing) and each bearing works with different loads and speeds depending on the input speed, the nature of the load of the driven machine, the transmission ratio, etc., and with different lubricants (oil bath, oil splash, grease), it is not possible to define any periodical maintenance and replacement of bearings in advance.

If a precautionally maintenance is required, **undertake periodical checks to verify noise level and vibration with the help of appropiate diagnostic equipment and instruments**. If the measured values worsen even slightly it is necessary to stop gearmotor and after having inspected inside the unit replace the bearings which are subject to breakdown.

## 9 - Sound levels

The standard levels of sound power emission $L_{WA}$ relevant to the gearmotors of this catalogue, running at nominal load and speed, fulfil the limits settled by VDI 2159 for gear reducers and EN 60034 for motors.

## **Table of tightening torques for fastening screws and bolts** (foot, flange and covers)

| Bolt | *M* [N m] UNI 5737 - 88 | |
|---|---|---|
| | class 8.8 | class 10.9 |
| **M 5** | 6 | 8,5 |
| **M 6** | 11 | 15 |
| **M 8** | 25 | 35 |
| **M10** | 50 | 71 |
| **M12** | 85 | 120 |

**Note**

- Class 8.8 is usually sufficient (gearmotors are supplied with screws and bolts class.8.8).
- Before tightening the bolts be sure that the centering of flanges are inserted properly
- The bolts are to be diagonally tightened with the maximum tightening torque.

## Gear reducer troubles: causes and corrective actions

| Trouble | Possible causes | Corrective actions |
|---|---|---|
| Excessive oil temperature | Inadeguate lubrication:<br>— excessive or insufficient oil quantity<br>— unsuitable lubricant (different type, too viscous, exhausted, ecc.) | Check:<br>– oil level (gear reducer at rest) or quantity<br>– lubricant type and/or state; replace if necessary |
| | Wrong mounting position | Change mounting position |
| | Too tightened taper roller bearings | Consult Rossi |
| | Excessive load during running-in | Reduce the load |
| | Excessive ambient temperature | Increase the cooling or correct the ambient temperature |
| | Obstructed passage of air | Eliminate obstructive material |
| | Slow or missing air recycle | Arrange auxiliary ventilation |
| | Radiance | Screen gearmotors |
| | Worn, faulty or badly lubricated bearings | Consult Rossi |
| Anomalous noise | One or more teeth with:<br>— dents or spallings<br>— excessive flanks roughness | Consult Rossi |
| | Worn, faulty or badly lubricated bearings | |
| | Taper roller bearings with excessive clearance | |
| | Vibrations | Check the fastening and the bearings |
| Lubricant leaking from seal rings | Seal ring with worn, bakelized, damaged or false mounted seal lip | Replace seal ring |
| | Damaged raceway surface (scoring, rust, dent, ect.) | Restore the raceway |
| | Mounting position differs from the one stated on the name plate | Position the gear reducer correctly |
| | Too much oil | Check oil quantity and adjust it |
| Low speed shaft not rotating even with high speed shaft/motor running | Broken key | Consult Rossi |
| | Completely worn gear pairs | |
| Lubricant leaking from covers | Defective oil seal | Consult Rossi |

Motor: see specific instructions.

**NOTE**

When consulting Rossi state:
— all data of gearmotor name plate;
— nature and duration of failure;
— when and under which conditions the failure occured (regularly or rarely);
— during the warranty period, in order not to loose validity, do not disassemble nor tamper the gearmotor without approval by Rossi.

PAGINA BIANCA - BLANK PAGE

IT

I dati contenuti in questa pubblicazione sono forniti a titolo indicativo ed espressi in forma sintetica.
La Della Toffola S.p.A potrà apportarvi in qualunque momento eventuali modifiche motivate dalle normali pratiche di sviluppo tecnologico e commerciale, senza peraltro alterare le caratteristiche essenziali del prodotto.
Le istruzioni vengono redatte in lingua Italiana e quindi tradotte nella lingua richiesta dal Cliente.
Tali traduzioni vengono eseguite con la dovuta diligenza, e fornite poi al Cliente con le riserve di prassi.
La Della Toffola S.p.A. non fornisce alcuna garanzia sulle traduzioni realizzate da essa stessa o per suo conto.
Viene riconosciuta come ufficiale la versione aggiornata della pubblicazione in lingua Italiana.
Per eventuali informazioni il Cliente può contattare la Rete di Assistenza o direttamente la Della Toffola S.p.A.


EN

The information contained in this publication is provided for use solely as a guideline, and is intended as a brief summary. Della Toffola S.p.A. may make changes at any time based on normal technological and commercial development, without thereby altering the essential features of the product.
The instructions are originally written in Italia and then translated into the language requested by the customer. These translations are carried out with due diligence and supplied to the customer with all due reservations.
Della Toffola S.p.A. does not offer any guarantee on the translations performed in-house or on its behalf.
The updated version of the publication in Italian shall be considered the official document.
For any further information, the customer may contact the Service network or Della Toffola S.p.A. Directly.


DE

Die in der vorliegenden Veröffentlichung enthaltenen Daten sind unverbindlich und in gekürzter Form wiedergegeben. Die Firma Della Toffola S.p.A. behält sich das Recht vor, diese Daten jederzeit im Zuge der technischen Weiterentwicklung oder aus kommerziellen Gründen zu modifizieren, ohne allerdings die wesentlichen Eigenschaften des Produkts zu verändern.
Die Anleitungen werden in italienischer Sprache verfaßt und anschließend in die vom Kunden gewünschte Sprache übersetzt. Diese Übersetzungen werden mit der gebührenden Sorgfalt ausgeführt und dem Kunden mit den üblichen Vorbehalten zur Verfügung gestellt.
Die Firma Della Toffola S.p.A. haftet nicht für die im eigenen Haus oder in ihrem Auftrag ausgeführten Übersetzungen.
Offizielle Gültigkeit hat die überarbeitete Version der Veröffentlichung in italienischer Sprache.
Für weitere Informationen wenden Sie sich bitte an eine Kundendienststelle oder direkt an Della Toffola S.p.A.


FR

Les données figurant dans cette publication sont fournies à titre indicatif et exprimé es en forme synthétique. Della Toffola S.p.A. pourra en tout moment apporter des modifications éventuelles suite au développement technologique et commercial, sans pour cela altérer les caractéristiques essentielles du produit.
Les instructions sont rédigées en langue italienne et ensuite traduites dans la langue demandée par le Client. Les traductions sont effectuées avec diligence et fournies au Client sous toutes réserves.
Della Toffola S.p.A. ne fournit aucune garantie sur les traductions effectuées à son intérieur ou pour son compte.
La version mise à jour de la publication en langue italienne est considérée la version officielle.
Pour tout renseignement, le Client peut contacter le Réseau de Service après-vente ou directement la société Della Toffola S.p.A.


ES

Los datos contenidos en esta publicación son sólo indicativos y están expresados de una forma sintética, Della Toffola S.p.A. podrá modificarlos en cualquier momento, debido a normales prácticas de desarrollo tecnológico y comercial, sin que ello altere las características esenciales del producto.
Las instrucciones se redactan en italiano y luego se traducen al idioma pedido por el Cliente.
Las traducciones se efectúan con el máximo esmero, pero son entregadas al Cliente con las normales reservas de estos casos.
Della Toffola S.p.A. no presta ninguna garantía sobre las traducciones realizadas por la empresa misma o por su cuenta.
Se reconoce como oficial la versión actualizada de la publicación en italiano.
Para más información, el Cliente puede dirigirse a la Red de Asistencia o directamente a Della Toffola S.pA.

N° di Matricola - Serial Number
Seriennummer - N° de Matricule
N° de Matrícula

## SERVIZIO ASSISTENZA

Per qualunque richiesta di informazioni, interventi etc. è sempre necessario comunicare il NUMERO DI MATRICOLA della macchina.
Non è possibile fornire istruzioni precise o programmare interventi senza che sia fornito questo dato.
Il numero di matricola è anche stampigliato su una apposita targhetta fissata sulla macchina.

## ASSISTANCE SERVICE

For any request regarding information, service, etc., it is always necessary to indicate the SERIAL NUMBER of the machine.
It is not possible to provide precise instructions or schedule servicing unless this information is communicated.
The serial number is printed on the plate fixed to the machine, too.

## KUNDENDIENST

Bei allen Anfragen um Informationen, Eingriffe usw. stets die SERIENNUMMER der Maschine angeben.
Ohne diese Angabe können keine exakten Informationen geliefert und keine Eingriffe geplant werden.
Die Seriennummer ist auch dem Typenschild auf der Maschine zu entnehmen.

## SERVICE ASSISTANCE

Pour toute demande d'informations, d'interventions, etc., il faut toujours indiquer le NUMERO DE MATRICULE de la machine.
Il est impossible de fournir des instructions précises ou de programmer des interventions sans cette donnée.
Le numéro de matricule est estampillé aussi sur la plaquette fixée sur la machine.

## SERVICIO DE ASISTENCIA

Para cualquier solicitud de información, de intervenciones u otros servicios, indicar siempre el NÚMERO DE MATRÍCULA de la máquina.
Es imposible suministrar indicaciones precisas o programar intervenciones sin este dato.
El número de matrícula se encuentra impreso también en una placa especial aplicada a la máquina.


DELLA TOFFOLA

Numero Verde
800-803276

DELLA TOFFOLA S.p.A.
Via Feltrina, 72
31040 SIGNORESSA DI TREVIGNANO
(TREVISO) ITALY
Tel. +39 0423 6772
Internet: www.dellatoffola.it
e-mail: dtgroup@dellatoffola.it

Fax
+39 0423 670 841
Direzione - Uffici Commerciali
Ufficio Amministrazione
+39 0423 679 196
Ufficio Tecnico
+39 0423 670 491
Ufficio Acquisti