GEA Niro Soavi - Instruction manual

Model: One7TS
S.N.: 8066
Revision: 00

Translation of the original instructions

Revision Index

REV.	DESCRIPTION	DATE	SIGN
00	First issue	10/06/2015	BL
….	…… ……	……	……
….	…… ……	……	……
….	…… ……	……	……

Introduction

Dear Customer,

we wish to thank you for selecting our product and ensure you our best assistance in order to enable you to make the most of your machine.

Also, we remind you that a good understanding of the contents of this manual - through careful reading of all sections - is essential for the correct, safe use and operation of the machine you have purchased.

No one should operate or perform maintenance on this machine without first having read and understood the following Instructions for Use & Maintenance.

Yours faithfully,

For any further support or information, you may contact us at the below listed address.

GEA Mechanical Equipment Italia S.p.A.
Via A. M. da Erba Edoari 29, 43123 Parma - Italia
Tel. +39 0521 965411
Fax +39 0521 242819
e-mail: info.geanirosoavi@gea.com
Internet: http://www.niro-soavi.com

1. General information

Index

1.1. Declaration of Conformity

What follows is the **"Declaration of conformity"** FACSIMILE. The official copy will be filled in and supplied with the machine.

GEA Niro Soavi
DECLARATION OF CONFORMITY

CE

MACHINE: /

Model: /
Serial Number: /
Max Press. (MPa): /
Rated Flow (dm³/h): /
Year: /

The undersigned

DECLARES

under his own responsibility that the above mentioned Machine, object of this declaration,

IS IN CONFORMITY

with the precepts of the following EC directives and standard norms:

- *2006/42/CE*
- *2006/95/CE*
- *2004/108/CE*
- *EN 12100-1 & EN 12100-2*
- *EN 60204-1*
- *EN 13849-1*

Name and address of the person authorised to compile the technical file:
Manuel Delgado - Via A.M. Da Erba Edoari 29 - 43123 PARMA - ITALY

The above identified Machine has successfully passed all the trials and tests to which it has been submitted.

PARMA, /

GEA Mechanical Equipment Italia S.p.A.
MANUEL DELGADO
Managing Director

GEA Mechanical Equipment Italia S.p.A.

Via A.M. Da Erba Edoari 29 - 43123 PARMA - ITALY
Tel +39 0521 965411 - Fax +39 0521 242819
e-mail: info.geanirosoavi@gea.com

MP10M50 _C Rev.1

In addition to this, **GEA Niro Soavi** is certified according to UNI EN ISO 9001 for Design, Manufacture and Servicing of Homogenisers and high pressure piston pumps, therefore your machine has been engineered and produced according to the approved quality procedures.
See the following figure for the UNI EN ISO 9001 Quality System Certificate FACSIMILE.

DNV

DET NORSKE VERITAS

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. ***CERT-05477-99-AQ-BOL-SINCERT***

Si attesta che / This certifies that

Il sistema di gestione per la qualità di / the quality management system of

GEA Mechanical Equipment Italia S.p.A.

Via Angelo Maria Da Erba Edoari, 29 - 43100 Parma (PR) - Italy

È conforme ai requisiti della norma per i sistemi di gestione per la qualità
Conforms to the quality management systems standard

UNI EN ISO 9001:2008 (ISO 9001:2008)

Questa certificazione è valida per il seguente campo applicativo:
This certificate is valid for the following products or services:

(Ulteriori chiarimenti riguardanti lo scopo e l'applicabilità dei requisiti della normativa si possono ottenere consultando l'organizzazione certificata)
(Further clarifications regarding the scope and the applicability of the requirements of the standard(s) may be obtained by consulting the certified organization)

Progettazione, produzione e assistenza di omogenizzatori e pompe volumetriche ad alta pressione

Design, manufacture and servicing of homogenisers and high pressure pumps

Data Prima Emissione
First Issue Date
1999-12-28

Data di scadenza
Expiry Date
2014-12-10

Luogo e data
Place and date
Agrate Brianza, (MB) 2011-12-27

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

SGQ N°003 A PRD N°003 B
SGA N°003 D SSI N°002 G
SCR N°004 F FSM N°001 I

Membro di MLA EA per gli schemi di accreditamento SGQ, SGA, PRD, PRS, ISP e LAB,di MLA IAF per gli schemi di accreditamento SGQ, SGA, SSI, FSM e PRD e di MRA ILAC per gli schemi di accreditamento LAB

per l'Organismo di Certificazione
for the Accredited Unit
DET NORSKE VERITAS ITALIA S.R.L.

Settore EA: 18

Francesco Spaggiari
Lead Auditor

Zeno Beltrami
Management Representative

La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale
The validity of this certificate is subject to periodical audits (every 6, 9 or 12 months) and the complete re-assessment of the system every three years
Le aziende in possesso di un certificato valido sono presenti nella banca dati sul sito **www.dnv.it** *e sul sito Accredia (***www.accredia.it***) All the companies with a valid certificate are online at the following addresses:* **www.dnv.it** *and* **www.accredia.it**

1.2. Introduction

This manual is aimed at operators and specialised personnel to allow correct use of the machine.

Inside the manual, the operator will find the instructions and indications for:

- correct installation of the machine;
- functional description of the machine and each of its parts;
- performing adjustments in the set-up and start-up phases;
- correct scheduled maintenance;
- pay attention to the most elementary safety and accident prevention rules;

In this way the operator will be able to understand the problems related to the machine and the product being processed.

In order to facilitate understanding of the content of this manual, we provide a list of terms used in it:

- **DANGER ZONE:**
  Any zone within or around the machine in which an exposed person is subject to a risk to their health and safety.

- **EXPOSED PERSON:**
  Any person who is wholly or partially in a danger zone.

- **OPERATOR:**
  Person in charge of installing, operating, adjusting, servicing and cleaning the machine.

- **QUALIFIED TECHNICIAN:**
  This is a skilled technician specially trained to carry out special maintenance or repairs that require knowledge of the machine, its functioning, proper safety measures and work procedures.

 **WARNING:** **Accident prevention regulations for the operator.**

 **WARNING:** **It can damage the machine and/or its components.**

 **PRECAUTION:** **Further information about the operation in progress.**

NOTE: **Useful information provided.**

1.3. Warranty and testing

If not specified otherwise in the order confirmation, the terms and conditions of the warranty are as follows:

1.3.1 Warranty

GEA Niro Soavi guarantees the good quality and construction of its machines, and agrees to repair and replace, at their own expense, any part that breaks or show signs of early wear due to the bad quality of the materials used, manufacturing errors or incorrect assembly during the specified warranty period.
The warranty does not cover parts that break or wear due to:

- user negligence related to level checking, filter cleaning, auxiliary services, insufficient feed pressure of the machine;
- use of the machine with operating values exceeding the ones specified in the contract, especially with respect to maximum pressure, flow, product treated, operating and cleaning temperatures, feed pressure, specifications of required utilities;
- use of incorrect tools for ordinary and extraordinary maintenance;
- lack of or incorrect maintenance;
- alterations or modifications carried out - whether directly or indirectly - without specific written authorization from **GEA Niro Soavi**;
- failure to comply with the INSTRUCTIONS FOR USE & MAINTENANCE;
- incorrect machine use, incorrect operating procedures and conditions;
- incorrect machine installation or incorrect layout of feed line;
- use of unsuitable components upstream or downstream from the machine, and in particular use of inadequate feed pump.

For this reason, we strongly recommend that the instructions contained in this Manual are understood and followed, as a pre-condition for the correct and safe use of the machine.
Using the machine and reading the INSTRUCTIONS FOR USE & MAINTENANCE imply integral acceptance of Warranty conditions.
For further information about application of the Warranty, see General Terms of Sale.

1.3.1.1 Warranty duration

The warranty shall last for 12 MONTHS from the date of delivery of the machine, unless otherwise specified in the Order Confirmation.
Such period shall remain unchanged even in the event that spare parts replacements or repairs are carried out during the 12-month period.

1.3.1.2. Application mode

As a condition of the applied warranty, any parts claimed to be defective by the customer must be provided to **GEA Niro Soavi** to establish the cause.
The cost of shipping of materials shall always be charged to the customer.
Any work required for replacement/repair under warranty shall be executed - according to **GEA Niro Soavi**, on the manufacturer's premises, on thirds party's or directly on the spot.
The cost of shipping materials to the customer's premises shall always be charged to the customer, especially in the case of urgent and specials shipments of material or spare parts.
For any work carried out locally, the customer shall provide and pay for the necessary utilities, extraordinary equipment, auxiliary personnel that may be required and the costs of travel, board and accommodation of **GEA Niro Soavi** technicians.

1.3.1.3 Exceptions and limitations

The warranty shall not cover the materials and parts subject to normal wear and tear such as, but not limited to, all the gaskets used in the machine, V-belts, pumping piston gaskets and related packing and support washers, safety valve seat, filters, etc., as well as those parts whose life can not be estimated beforehand - such as lamps, fuses, plungers - together with any coating, pumping valve and their seats, homogenizing valve, pressure gauges.
For the components and accessories bought from independent Vendors, the warranty shall be the one granted to **GEA Niro Soavi** by such Vendors.

1.3.1.4 Material efficiency

Before returning to **GEA Niro Soavi** any part for which a replacement/repair under warranty is claimed, the necessary approval shall be obtained from Customer Service.

Reported below is the correct procedure for material efficiency:

1. Complete the authorization module (see document below) before the material efficiency.
2. Send the complete module to the e-mail address: returns.geanirosoavi@geagroup.com.
3. Wait for confirmation from **GEA Niro Soavi**
4. After receiving the confirmation: print the module and attach it to the material to send together with the shipping documents.

ID returns

Area to be completed by GEA NS

Code (*)	Description	Qty	Serial Number (machine)	Reason for return (fill in the column on the right, choosing the related cause)	X	GEANS order confirm.	Description of the fault/ problem (***)	ID_claim (if present) Area to be completed by GEA NS
				Repair on warranty				
				Repair under payment				
				Inspection				
				Replacement (*)				
				Credit without restocking charge (**)				
				Credit with restocking charge (***)				
				Calibration				
\	\	\	Serial Number	Reason for return (fill in the column on the right, choosing the related cause)	X	GEANS order confirm.	\	ID_claim (In case of wrong order caused by GEANSOA mistake)
\(**)				Wrong order				
Authorization (acronym)	Acronym:			Note:				

All parts shall be properly packed to avoid any damage in transit, and accompanied by:

- reference to the purchase order;
- machine serial number;
- part code number;
- detailed description of the defect and how it was discovered;
- authorization module to the document completed and approved.

All parts recognized to be under guarantee are delivered ex works; replaced parts are the property of **GEA Niro Soavi** and shall be returned ex works.

1.3.2 Testing

Before shipment all of our machines are accurately tested at **GEA Niro Soavi** premises by qualified personnel through operational tests which simulate the normal working conditions.
Through the operational tests - run with cold water - it is possible to verify the actual performance of the machine against the design data, the calibration of safety, control and check devices, the conditions of any seals, as well as the noise and vibration-free operation of the machine and the parameters introduced in any programmable instruments or equipment that might be used.
To test the performance of the machine (flow rate with the maximum operating pressure allowed, noise level, electric absorption) the machine is run with water at a temperature of approximately 20 °C, so it is possible to verify the deviation of the machine's actual flow rate compared to the rated value ± 5% with product, according to the different temperatures and viscosity of the product treated.

1.4. Introduction

The employer must provide information to the personnel about the following topics concerning safe use of the machine:

- Risk of accidents.
- Operator safety devices.
- General or foreseen accident prevention measures by international directives and by the legislation of the Country where the machine is installed.

The operator, the maintenance and cleaning personnel, etc. must strictly adhere to the accident prevention standards of the Country the where machine is installed.

WARNING:

Before starting the operation, the operator should know the arrangement and the functioning of the controls and the characteristics of the machine, and should have completely read this manual.

Instructions, warnings, general accident prevention measures contained in this manual must be strictly observed.

The possible change or replacement of parts of the machines, not authorized by GEA Niro Soavi, can result in a risk of accident and releases GEA Niro Soavi from any civil or penal liability.

1.5. How to use the manual

This manual is easy to consult since on the first page there is an index page that allows immediate localization of the topics of interest. Chapters are organized in a hierarchical structure that facilitates desired information research. Each chapter is always preceded by the index.

As regards maintenance information, it is structured in charts and divided by topics, this allows the operator a:

- comfortable consultation;
- possibility to group the necessary information to the intervention to be carried out.

1.6 Reproduction and copyright terms

1.7. Revisions

Further revisions of the manual, if any, follows the operation changes or replacements of the machine and are managed and supplied to the customer by **GEA Niro Soavi**.

1.8. User manual storage

Storage obligation

Keep this manual and all the attached literature in a readily accessible place, near the machine and known to all the users (operators and maintenance personnel).
The operators and the maintenance persons must be able to quickly find and consult the manual and the annexes in any situation.

WARNING:
The manual is an integral part of the machine for safety purposes.
Therefore it:

- **should be kept completely (in all its parts)**
- **should accompany the machine up to its destruction (also in case of shipping, sales, hiring, lease, etc.);**
- **the possible changes entered should be kept updated and informed.**

1.9. Customer in charge of the prearrangement

The Customer (user) should prearrange, by themselves, the installation place and the whole electric and pneumatic supply necessary for the machine functioning as described below:

- Prearrangement of the rooms.
- Prearrangement of the electric-power supply, up to the power supply connection of the machine according to the regulations in force.
- Prearrangement of the auxiliary services appropriate for the machine needs (such as air network).
- Eventual safety devices upstream and downstream from the power supply line (i.e. switch, differential, earth connection, etc.) as stated by the law in force.
- Suitable lifting equipment to move the machine.

WARNING:
All the above listed prearrangements, unless otherwise indicated, should be performed in compliance with the regulations in force in the country of installation.

1.10. Instructions for request actions

Request for interventions by Customer Technical Service should be sent via fax to the following address: **GEA Niro Soavi** Via Da Erba Edoari, 29 - 43123 - PARMA (Italy) - Telephone +39 0521 965411, Fax +39 0521 242819, e-mail: info.geanirosoavi@geagroup.com, http//www.niro-soavi.com:

- type of machine, serial number, installation year;
- fault detected;
- exact address of the premises where the machine is installed.

1.11 Instruction for ordering spare parts

For the method of ordering spare parts, see chapter 10, points 10.1 and 10.2.

1.12 Operator characteristics and language used

To understand the instructions (text and figures) the machine operator must have (or acquire, by proper education and training) at least the following characteristics:

- Enough general knowledge and technique to read and understand the manual content in the parts of their concern and to correctly interpret the layout and diagrams.
- Ability to understand and interpret the symbols, pictograms and video messages.
- Knowledge of the main hygienic, accident prevention and technology standards.

WARNING:

The responsible person of the safety in the Customer premises must:

- **check that the knowledge possessed is in fact sufficient for reading and full understanding of the manual;**
- **performing proper practical training and ensuring, even by a test, that the operators have the capacity to operate the machine correctly and safely, both in normal operation and emergency situations.**

WARNING:

The operators must not carry out operations reserved for maintenance persons or qualified technicians.

The manufacturer is not liable for damages deriving from the failure to adhere to this prohibition.

2. Description of the machine, technical data

Contents

2.1 General description

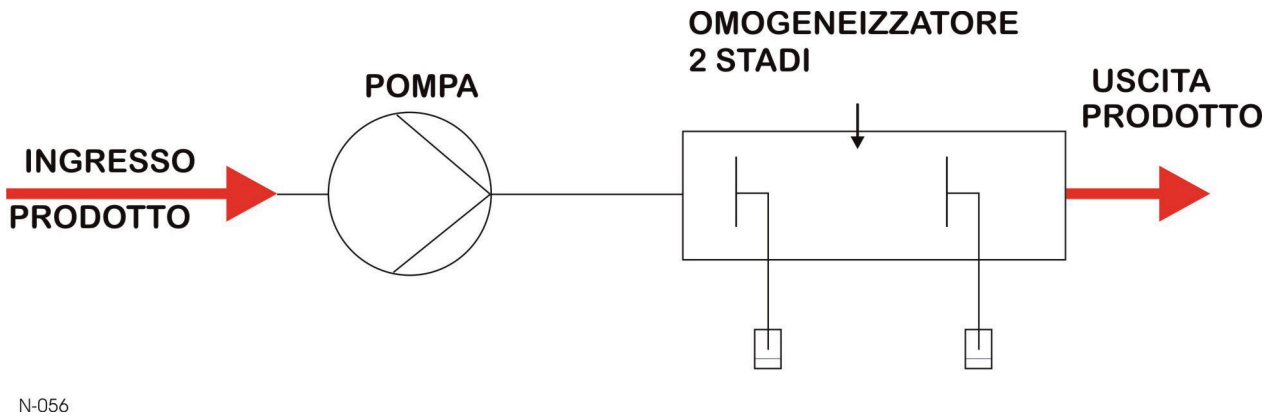
The **GEA Niro Soavi** homogenizer consists of a positive-displacement piston pump provided with automatic valves with suction and delivery spring, connected to a homogenizing section where the product undergoes the process of high-pressure micronization to reduce the size of the solid particles suspended in the fluids and achieve homogeneous dimensional distribution.
This process can be applied to a wide range of products of varying viscosities, and yields more stable suspensions by micronizing and dispersing the particles, depending on the pressure.

For the specific configuration of the machine, model, technical data, accessories and optional equipment, refer to the TECHNICAL SPECIFICATIONS enclosed with Chapter 11 of this manual.

CAUTION
The machine may not be utilised for any other purpose than that given in Chapter 3.1 of this manual. The manufacturer is not liable for damage or injury resulting from improper use.

2.1.1 Operating principle

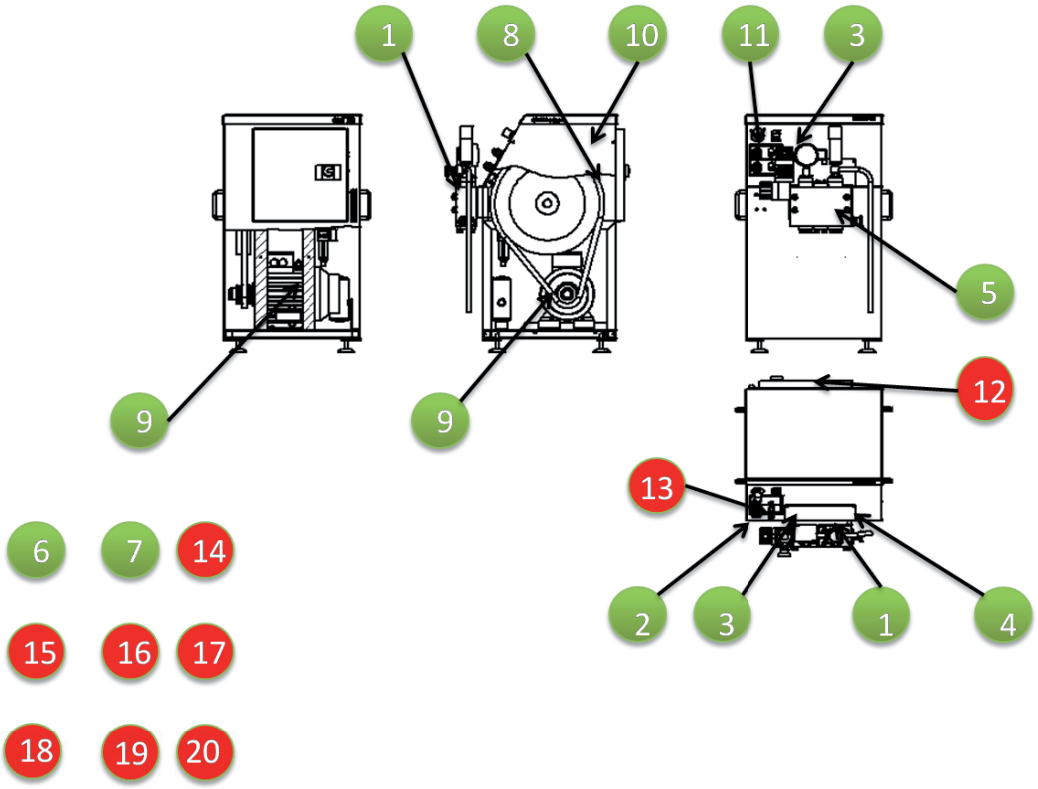
The machine's operating principle is shown schematically in the following figure.



OPERATING PRINCIPLE
FIG. 2.1

2.2 Main components of the machine

The main components of the machine are shown in the following figures, for a “**Homogenizing unit”** machine (standard and optional versions)



COMPONENTS OF THE HOMOGENIZING UNIT MACHINE (STANDARD / GREEN - OPTIONAL VERSION / RED)
FIG. 2- 2

NOTE: The asterisk (*) in this figure indicates some of the components in the standard and optional versions, which are not shown on the drawing

Legend, Figure 2.2, Components of the machine (Homogenizing unit)

	STANDARD CONFORMATION	
	Group	**HOMOGENIZING UNIT**
1)	Compression head	std
2)	Stage 1 Homogenizing Unit	std
3)	Stage 1 Head Pressure Gauge	std
4)	Head safety valve	std
5)	Manifold group	std
6)	Water system	std
7)	Pneumatic system	std
8)	Transmission assembly	std
9)	Drive	std
10)	Housing	std
11)	Control panel	std
	OPTIONS	
12)	On-board electrical equipment	opt
13)	Stage 2 homogenizing unit	opt
14)	Suction pressure gauge	opt
15)	Suction pulsation damper	opt
16)	Delivery pulsation damper	opt
17)	Head transmitter	opt
18)	Tri-clamp connections	opt
19)	Lube water circuit ON/OFF SV.	opt
20)	Pneum. circuit air inlet ON/OFF SV.	opt

2.2.1 Monoblock compression head

The Head **(1)** is the machine's principal assembly, where the product is pumped at high pressure, first sucked in and then driven by the pistons, themselves driven by the crank gear system with con-rods and crankshaft.
The product enters the compression chamber of the Head, impelled by a special external pump, initially at a low pressure of 5/6 Bar, which, depending on the operating pressure for which the machine has been designed, is gradually increased to reach up to 250 bar. In the first stage of processing, the product enters the compression chamber as the specific suction valves **(2)** in the head open and subsequently the pressure generated by the action of the piston **(6)** pushes the product so that the suction valves close, while the delivery valves **(3)** open, so as to release the product towards the Homogenizing Unit.

The head is also fitted with a pressure gauge whose function is to measure the pressure in the Head.

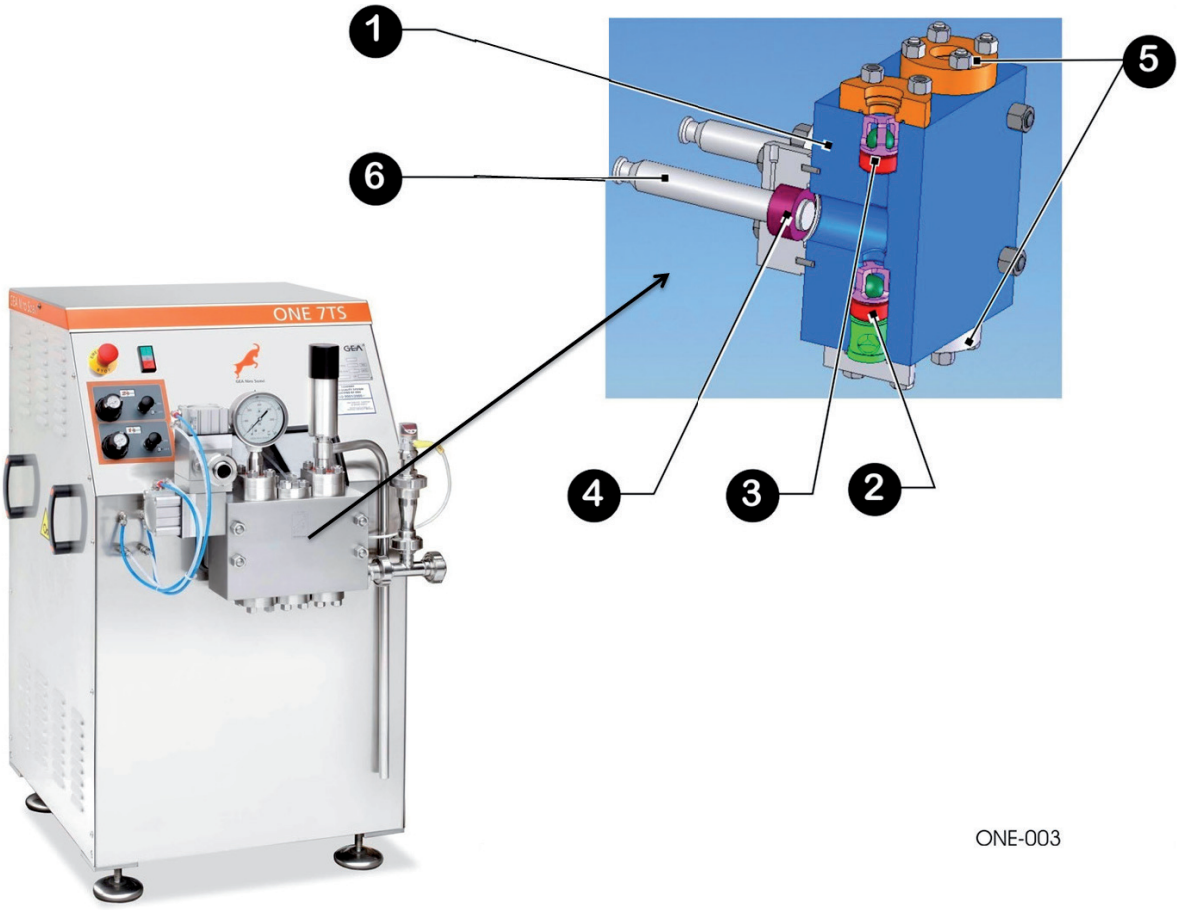


FIG. 2.3

1) Forged solid block – cross section
2) Suction pump valve unit
3) Delivery pump valve unit
4) Pumping piston gasket
5) Upper and lower removable flanges
6) Pumping pistons

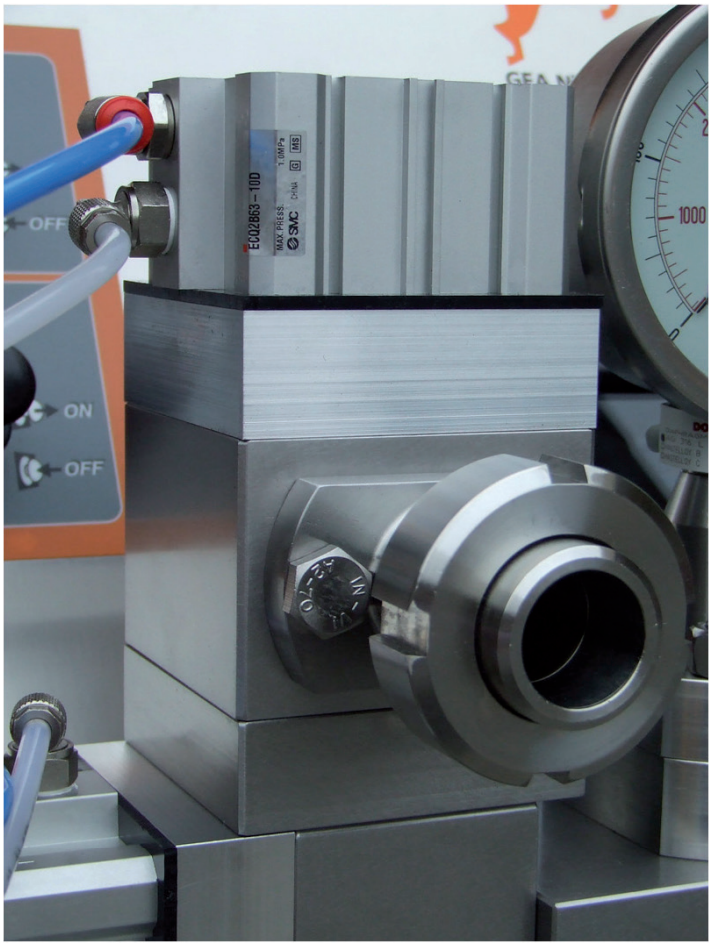
2.2.2 Homogenising unit

The function of the Homogenising Unit is to homogenise the product, i.e. to reduce the size of the particles, through high pressure applied by a specific valve.

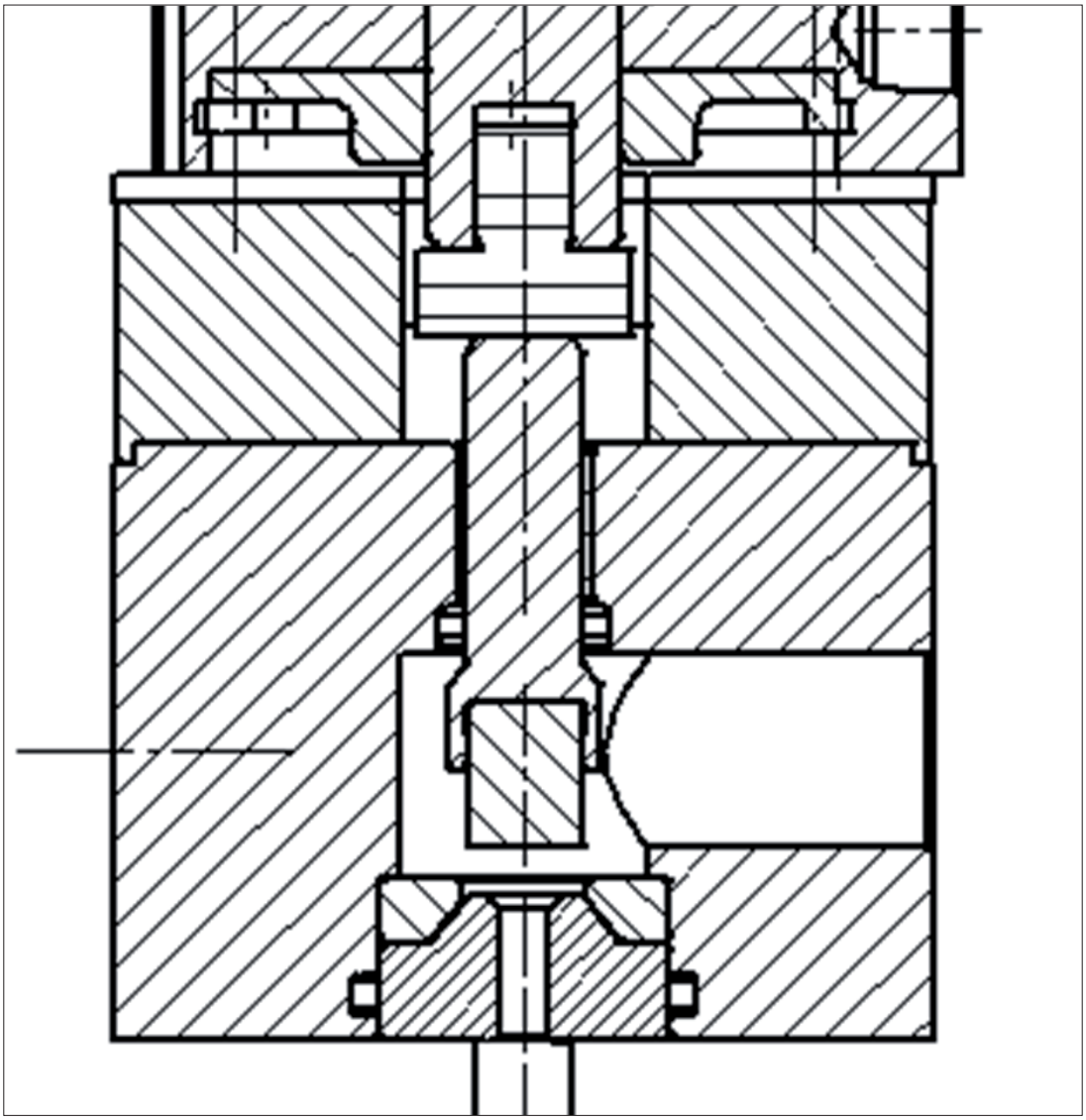
The homogenising valve represents the fulcrum of the process. Thanks to this high pressure adjustable valve, the liquid product is transformed by means of the combination of the following effects:
- turbulence
- local cavitation
- cutting stress
- high speed

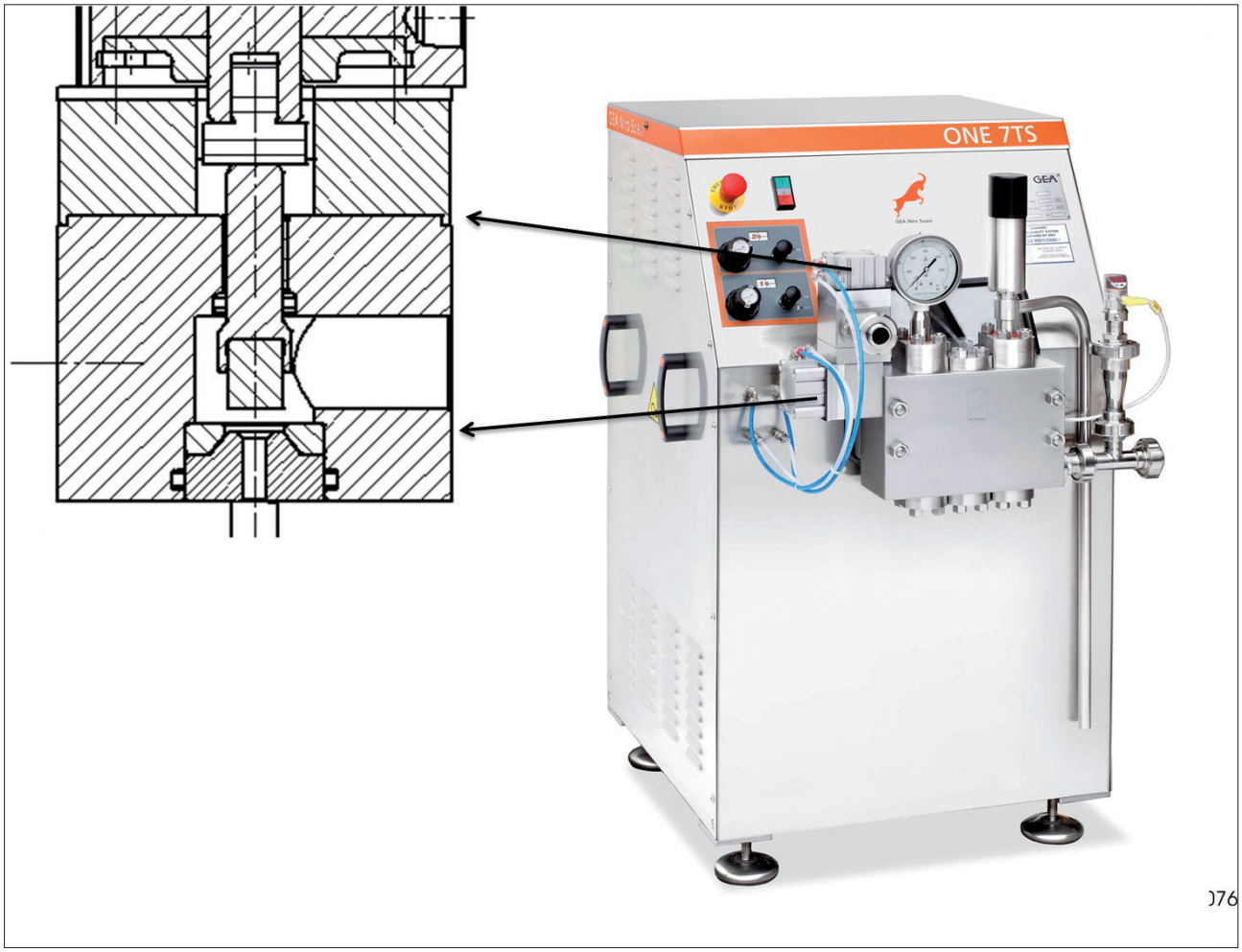
This guarantees the homogeneous granulometric distribution of the micronised particles thanks to high pressure in continuous dynamic conditions.
To create the pressure, it is necessary to apply a force "F" in order to partially close the passage of the flow of liquid through the homogenizing valve. The valve is never completely closed, but there is always a gap to allow flow: in the same conditions of flow, the greater the pressure, the smaller the gap will be.

NOTE: The type of valve installed on the machine described in this manual is specified in detail in the technical information sheet attached to chapter 11.



HOMOGENISING UNITS
FIG. 2- 4





2.2.3 Pressure Gauge

The pressure gauge installed on the machine is a critical component inasmuch as it measures the machine's operating pressure and hence its operation.
A defective or inoperative pressure gauge means the machine cannot operate at the required pressure; make sure to keep a spare pressure gauge on hand in case of need.
The type of pressure gauge depends on the model of machine or optional configurations.
The standard pressure gauge is the analogue type with a Bourdon spring, with an aseptic design diaphragm separator, with specific design and dimensions for **GEA Niro Soavi**; it is also equipped with a separator with the function of filtering the normal pulsations of the piston machine to allow a stable reading of the operating pressure.
Never separate the pressure gauge from its separator.
Other versions of pressure gauges or pressure meters are available as an alternative:

- analogue pressure gauge with signal transmitter: equipped with a 4-20 mA output for remote transmission of the pressure signal

FIRST STAGE HEAD PRESSURE GAUGE
FIG. 2.5

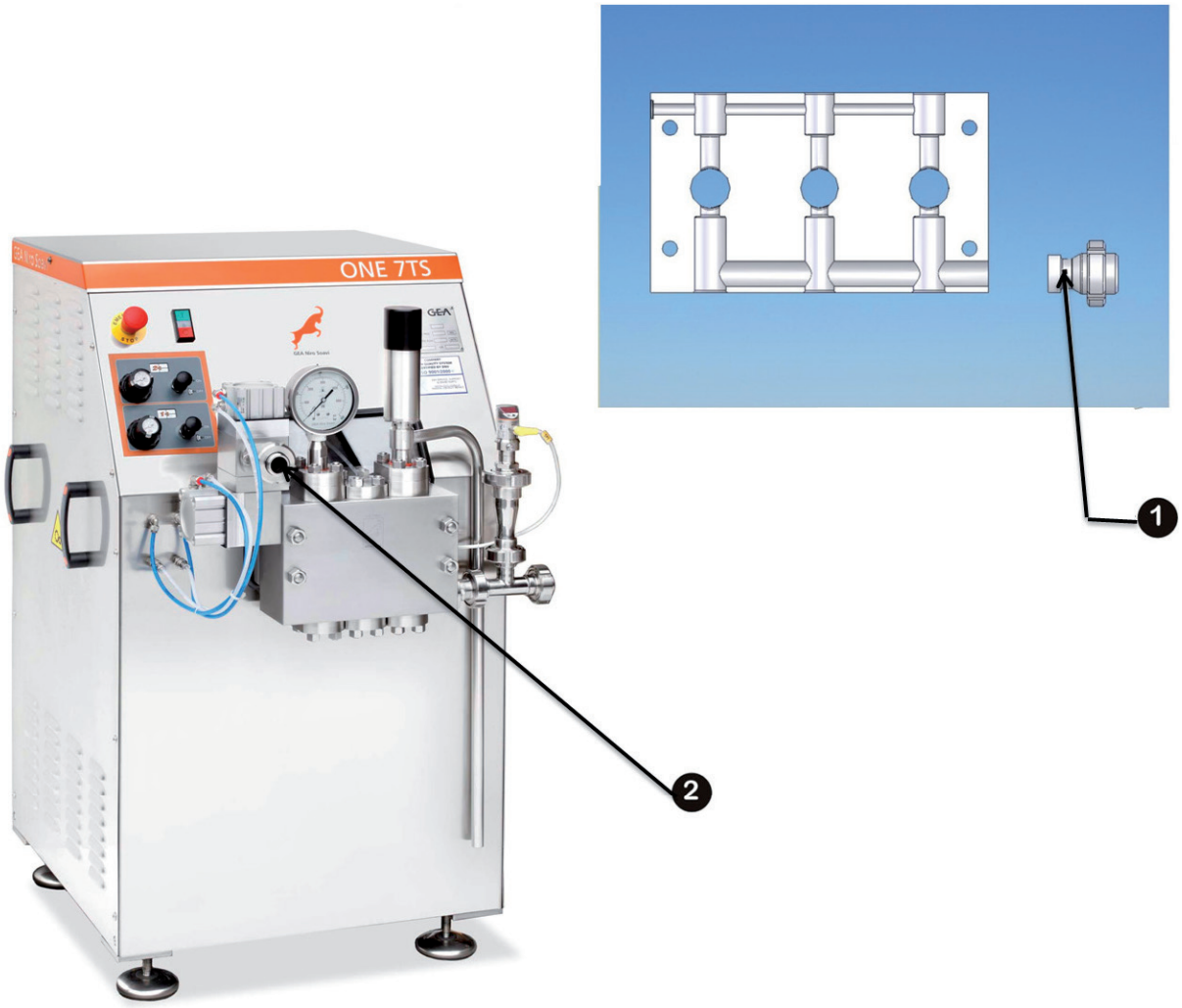
2.2.4 Compression head safety valve

The safety valve **(1)** is installed on the compression head to protect the machine and its operators against accidental excess pressures that can cause hazardous situations.

SAFETY VALVE
FIG. 2.6

2.2.5 Manifold Groups

The term "manifold groups" refers to the set of pipes and flanges intended to receive the product in the inlet side **(1)** and send it through the outlet flange **(2)** to the production line.



MANIFOLD GROUP
FIG. 2- 7

1) Inlet flange
2) Outlet flange

2.2.6 Water plant for sanitised machine

The Water plant has the function of lubricating the pistons of the Compression Head. In this sense, the water is conveyed to the back of the Head and sprayed onto the pistons, to keep their surface wet and cool, so as not to damage the piston gaskets inside the Head.

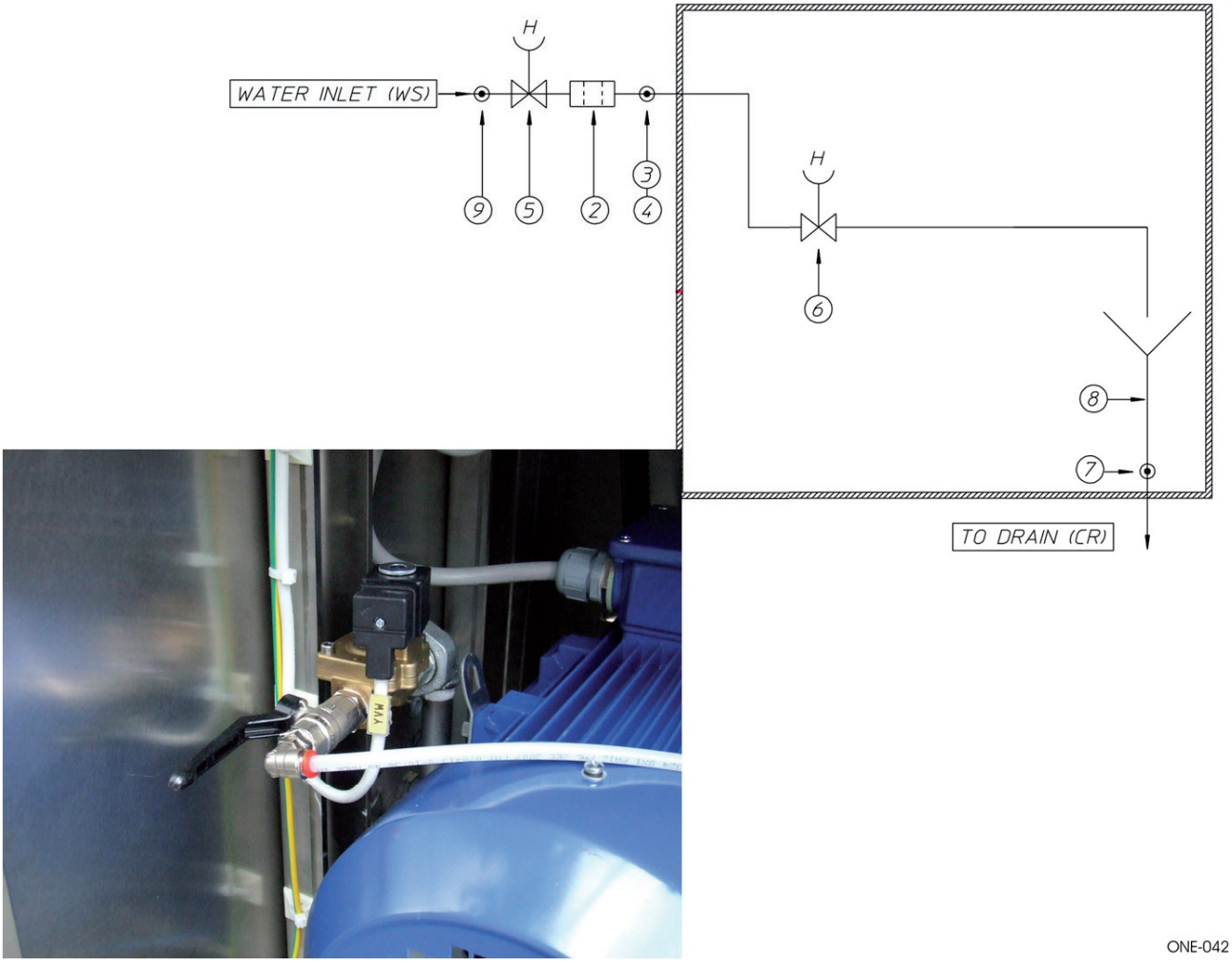


FIG. 2.8

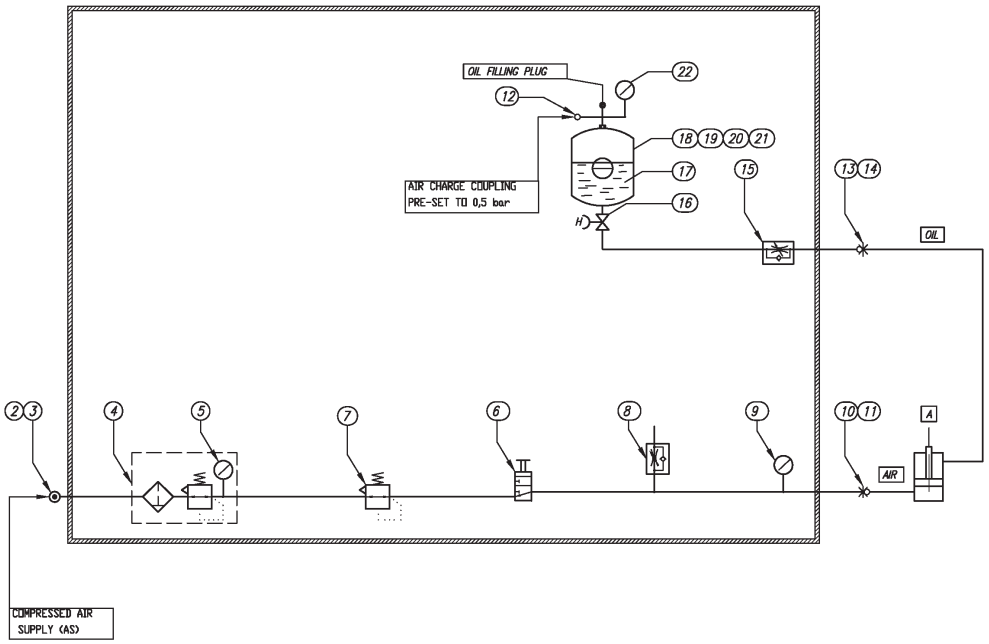
2.2.7 Pneumatic plant

The pneumatic plant pneumatically drives the machine's homogenizing units, STAGE I and II (if present) by controlling their air pressure.
Machines equipped with pneumatic control of the homogenizing unit have a system with an oil pulsation damper.

The actuation force required to close the homogenizing valve and achieve the operating pressure is applied by a pneumatic cylinder with compressed air in the upper chamber; the lower section of the pneumatic cylinder is connected to the pressurised oil pulsation damper circuit.

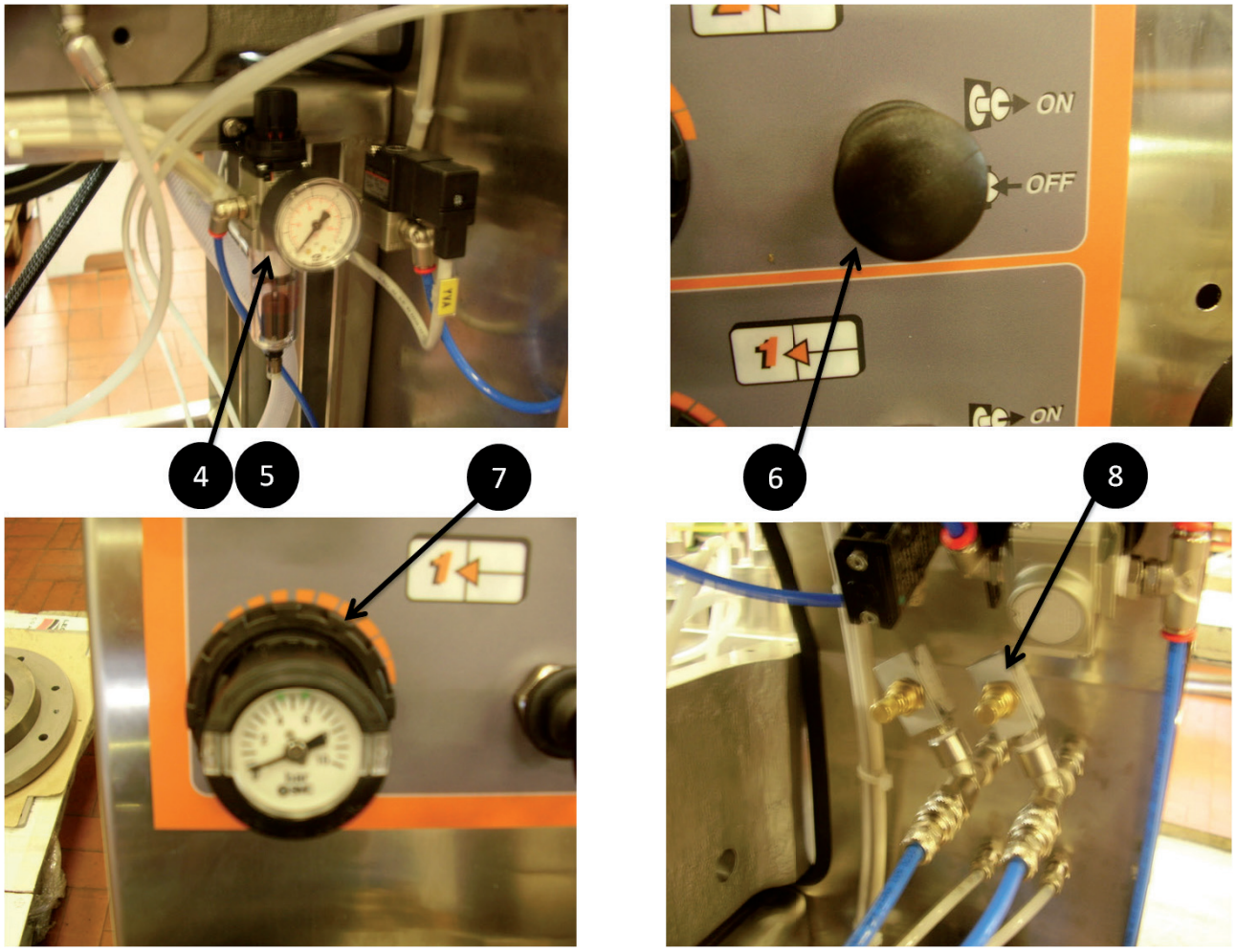
The actuator does not require regular maintenance, but should be protected against high temperatures (which can damage its gaskets) and corrosive fluids, since it is made in aluminium and stainless materials.
Replace the actuator immediately if it fails.

The following figure is a schematic diagram with one pneumatic stage with manual adjustment on the machine's control panel.
The configuration of the system actually present on the machine is enclosed with Chapter 11 of this manual



PNEUMATIC DIAGRAM
FIG. 2.9

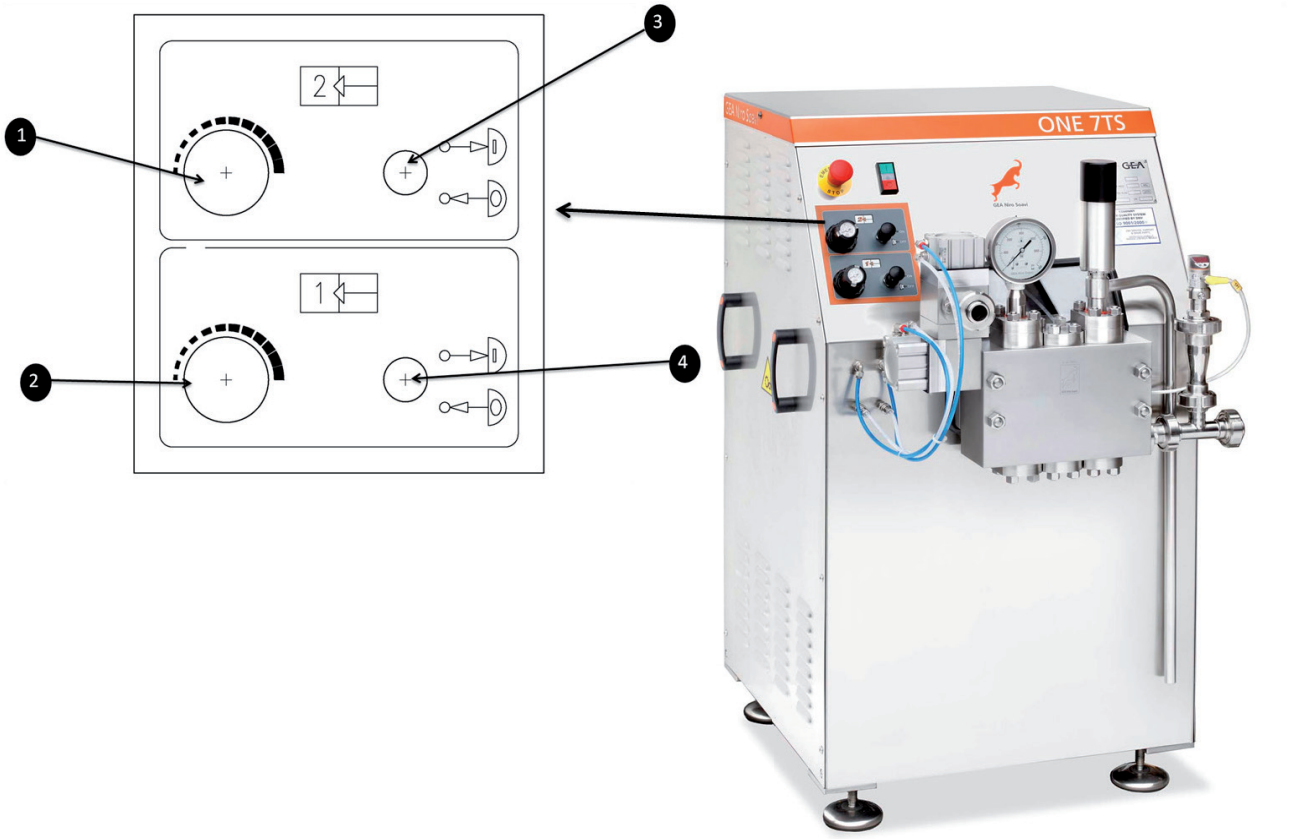
With reference to Figure 2-9, the following are present:
- an air treatment and shut off unit **(4)** with pressure gauge **(5)**;
- a manual control valve **(6)** to pressurize the actuator;
- a manual pressure regulator **(7)**;
- one-way reducers **(8)** which give sensitive but stable operation of the system and adjust the homogenizing pressure ramp;
- a tank containing air and oil



Damping of the vibrations, induced on the homogenizing valve due to the normal pulsations caused by the alternating motion of the pumping pistons, is ensured by an oil/air pressure accumulator connected with the lower chamber of the actuator of the homogenizing unit.
The accumulator is pre-loaded with air at 0.5 bar.
The pressure gauge enables checking the pre-load pressure and the quick coupler enables bringing the pressure back to its correct value.
Frequently checking the damping system enables preventing the onset of vibrations and resonance that, besides producing annoying noise, are harmful both for the machine and for the homogenization efficiency.

Pneumatic plant with local manual adjustment

The pneumatic plant with local manual adjustment enables regulating the homogenizing pressure from the machine's front control panel with two pneumatic regulators **(1)** and **(2)** and two pneumatic switches **(3)** and **(4)**. No maintenance is required on these components and in the event of malfunctioning it is advisable to replace them.



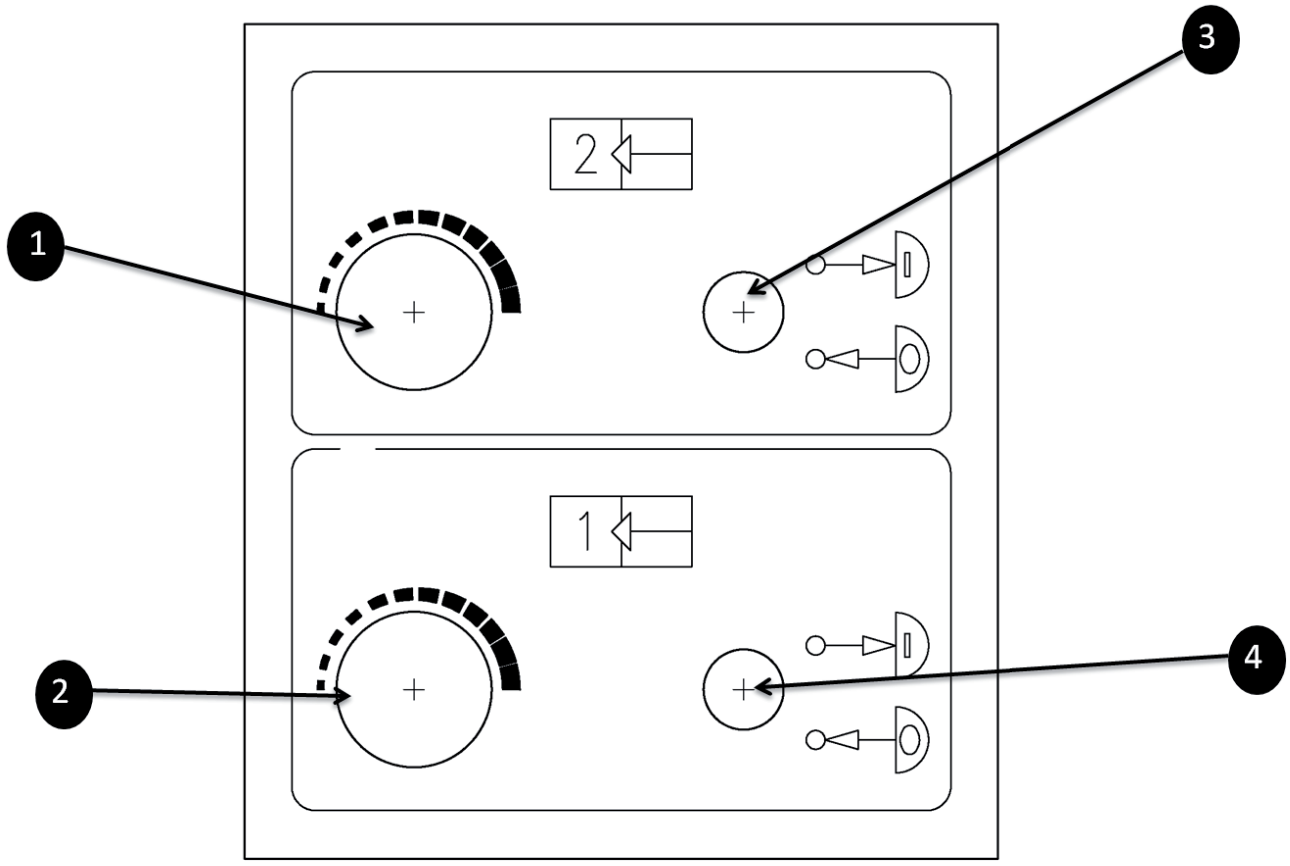


FIG. 2.10

NOTE: The image shows a typical standard panel, the configuration of which will depend on its interior components.

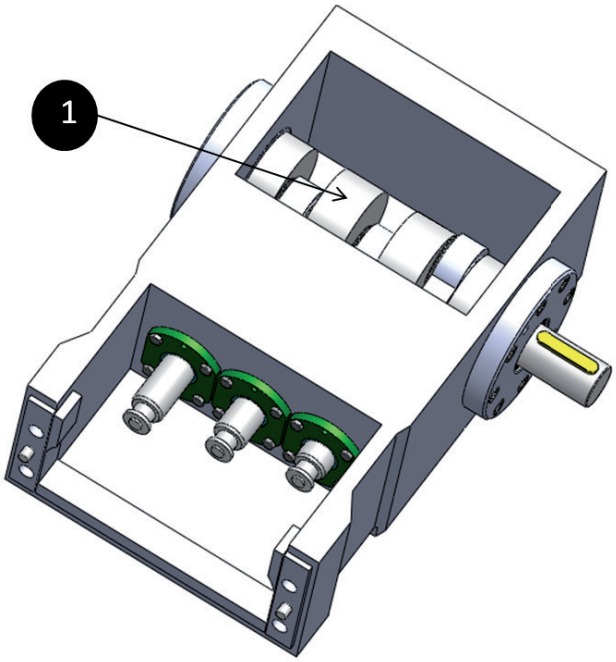
2.2.8 Transmission assembly

The Transmission Assembly contains the crankshaft **(1),** con-rods and crank mechanism and transforms the rotary motion of the crankshaft into the alternating motion of the pistons.

The figure shows a typical system.

The type of construction, high quality materials employed and assembly by our highly specialised staff ensure long and reliable service.
Proper lubrication is critical to the long life of the transmission assembly and its components: make sure you observe the specified change intervals, along with the fluid levels and lubricant types.

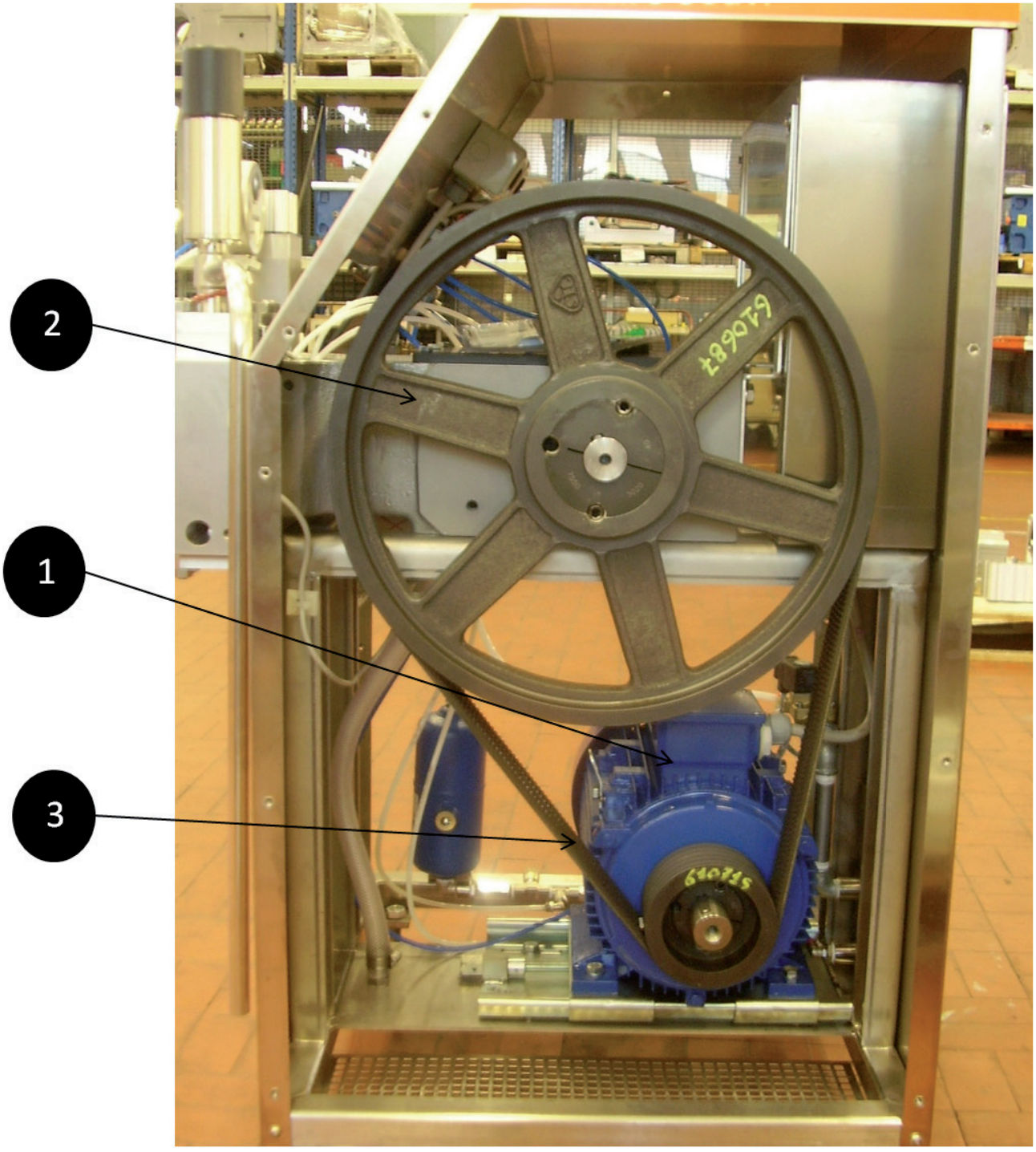
In normal conditions, the crank gear system requires no maintenance. If you encounter abnormal noise or uneven operation of the machine, or the lubrication oil pressure is low and the pressure switch trips, contact the **GEA Niro Soavi** service department for technical assistance.



TRANSMISSION ASSEMBLY
FIG. 2.11

2.2.9 Drive

This part of the machine includes the main electric motor **(1),** pulleys **(2)** and drive belts **(3)** which convert the motor output speed to the crankshaft speed.



DRIVE
FIG. 2.12

2.2.10 Housing

The Housing is composed of the machine frame and the protective panelling **(1)** of the internal parts, equipped with the handles **(2)**, and it has the function of containing all the transmission assembly and the various systems interlocked with the main units, as shown in the following figure.

At the bottom there are 4 adjustable feet **(3)** supporting it.

HOUSING
FIG. 2.13

2.2.11 Operator control panel

The control panel **(1)**, with which it is possible to start up in local / manual mode or adjust the homogenizing pressure via the relevant pneumatic control devices, is located at the front of the machine.
(For more details, on its operation and use, please refer to Chapter 6 in this manual).

OPERATOR CONTROL PANEL
FIG. 2.14

2.2.12 Electrical equipment

The machines are supplied in a standard execution without an electrical enclosure, which is designed and fabricated in relation to the machine's specifications as an optional accessory; in any case, on the back of the machine there is a terminal block which connects the on-board electrical equipment, excluding the motors, and a local control panel **(2)** (fig. 2-15).

If the enclosure is supplied, it is contained in the stainless steel electrical housing, **(1)** in figure 2-15, on the back of the machine.
It is recommended to locate the machine in a place that is as clean and dry as possible, ventilated, well away from fumes, airborne dust, corrosive fumes, and in any case its characteristics of protection from external agents must be suitable for the installation environment.

In addition, it is necessary to keep away from sources of heat so as to cause no local overheating and to permit appropriate cooling of the electrical equipment.

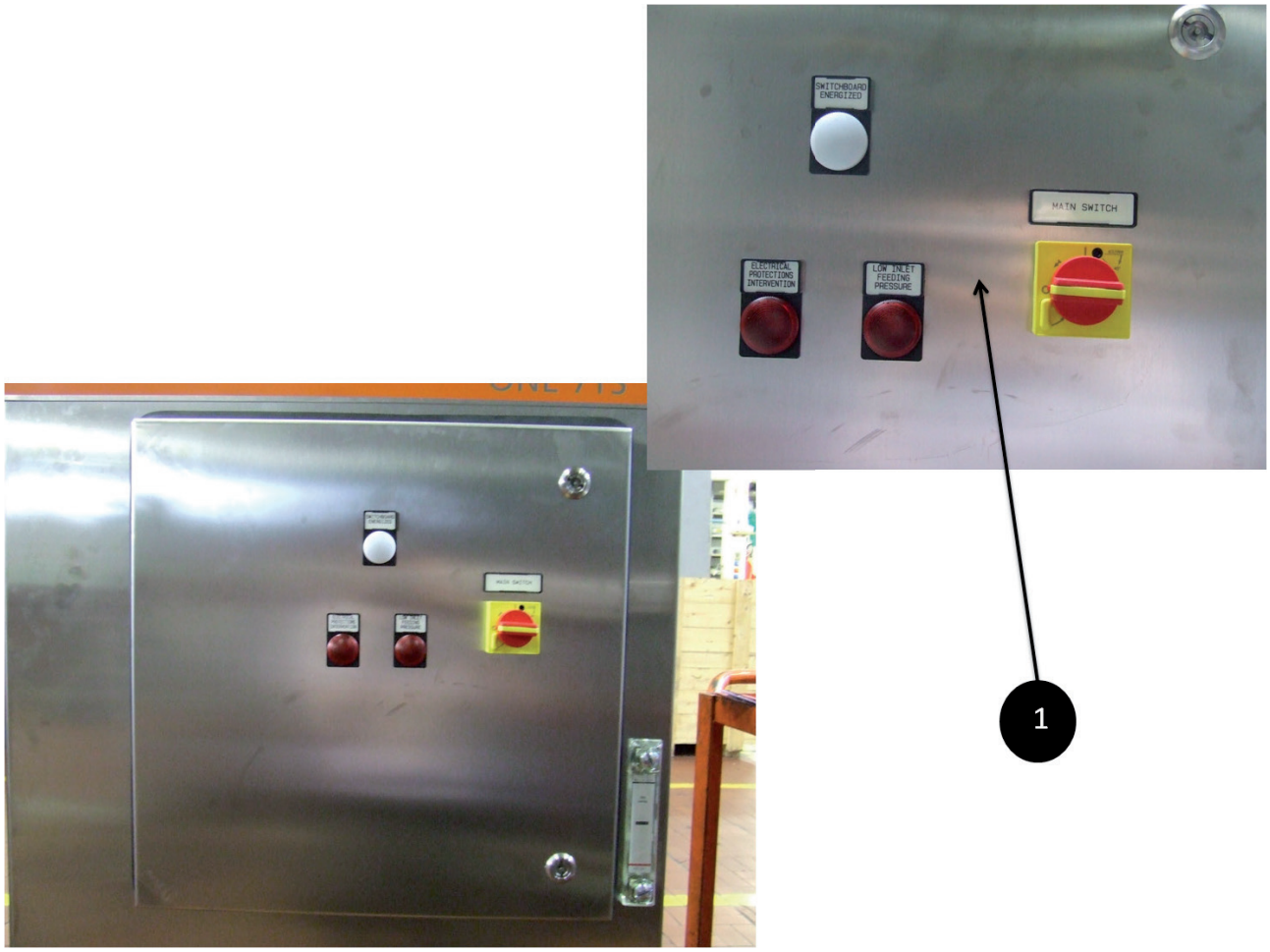
With regard to the type, overall dimensions, weight and installation requirements of the electrical enclosure, if supplied by **GEA Niro Soavi**, refer to the TECHNICAL SPECIFICATIONS enclosed with Chapter 11 of this manual.

The enclosure's power line must be sized according to the length, type of installation, ambient temperature, nature of the load and in any case in compliance with the regulations in force in the country of installation.

Unless otherwise agreed in writing with **GEA Niro Soavi**, the user is responsible for rating the power line and earthing system to the electrical enclosure's terminal block, as well as selecting the short circuit and contact voltage protection equipment.

If **GEA Niro Soavi** supplies the electrical enclosure, we also supply a list of cables rated for a length of 50 metres, routed in closed ducting with three-pole cable and ambient temperature 40°C.

With regard to the machine's power supply rating and connection diagrams, refer to the electrical specifications and WIRING DIAGRAMS given in the enclosed Technical Specifications Dossier.



ELECTRICAL SYSTEM
FIG. 2.15

2.3 Standards, certifications, limits of use, ergonomics, environmental issues

2.3.1 Applicable technical standards

The machine falls within the scope of Directive 98/37/EEC and subsequent amendments (Chapter I Article 1), implemented in Italy by Presidential Decree D.P.R. 459 dated 24/7/1996.
The essential health and safety requirements in relation to the design and fabrication of the machine contained in Annex I of the Directive thus apply to the machine.
So far the machine has not been listed in Annex IV of the Machinery Directive; it is thus subject only to the requirement of the Manufacturer's Declaration of Conformity (article 8).
The numbering used in the following paragraphs is that of the relevant "Machinery Directive" annexes.
The conformities and any non-conformities, where possible, have been expressed in relation to European legislation, draft standards, national standards or working group documents.
We give below the bibliography of applicable standards.

Community standards

Reference	Title
2006/42/EC	Machinery Directive
2006/95/EC	Low Voltage Directive
2004/108/EC	Electromagnetic Compatibility Directive

Harmonised standards and draft standards, national technical standards

Reference	Title
EN 12100	Safety of machinery – Basic concepts; general design principles
EN 60204-1	Safety of machinery – Electrical equipment of machines
EN 13849-1	Safety of machinery – Safety related parts of control systems, General principles for design

2.4 Ambient operating conditions

The machine does not require special ambient conditions.

It must be installed inside a suitably large industrial building which is lit, ventilated and equipped with a level, solid floor rated to bear the concentrated weight of the machine.

Temperatures: + 5° to + 40°C.
Relative humidity: 30% - max. 90% non-condensing
Max altitude 1000 m asl

NOTE: Unless otherwise indicated in the technical data sheet.

2.5 Atmospheres with risk of explosion/fire

CAUTION:
The machine is not designed to operate in a potentially explosive atmosphere. Do not operate the machine in a fully or partially potentially explosive atmosphere.

2.6 Illumination

The worksite must be adequately lit with natural light and equipped with sufficient artificial lighting to guarantee the health and safety of the workers.

The lighting must comply with local legislation and must be even and provide good visibility of all parts of the machine without hazardous reflections, and enable clear legibility of the control panel and view of the emergency stop button.

2.7 Vibration

In proper use, as explained in this manual, any vibrations are non-hazardous.

However, the operator must stop the machine immediately in case of hazardous vibration and notify **GEA Niro Soavi** accordingly.

2.8 Noise

The equivalent continuous A-weighted sound pressure level at the position occupied by the operator (at a distance of 1 m and a height of 1.69 m) is greater than **70db**, measured while testing the machine.

2.9 Residue and environmental contamination

The machine does not emit oil residue in the waste water, which must be disposed in accordance with local legislation.

2.10 Scrapping and disposal of materials

The materials must be disposed of in accordance with local legislation and regulations in the country of destination.

CAUTION:
The machine must be scrapped by specialised staff. Before disassembling the machine, provide sufficient clear and tidy space around it for all work to proceed without further hazards from the surroundings.

Proceed as follows:
- drain the lubricant and hydraulic oil for sorted disposal;
- disassemble the electrical equipment (components, cables and sheathing) and all plastic parts for sorted disposal.

The machine has been constructed with variable amounts of the following materials:
- stainless steels;
- construction and alloy steels;
- aluminium;

CAUTION:
Make sure to dispose of these materials in accordance with the local legislation in force at the time of scrapping.

CAUTION:
Scrupulously observe all safety regulations during the scrapping process.

2.11 Disposal

The machine's materials must be disposed of according to their type. We list the materials used in the various parts of the machine to facilitate disposal in accordance with local legislation.

1. **The machine has been constructed with variable amounts of the following materials:**
   - Aluminium – parts.
   - Stainless steel – parts and frame.
   - Rubber and plastics – components.

2. **Other materials present in smaller quantities:**
   - Tempered materials – pinions, shafts.
   - Steel – nuts and bolts.
   - Alloys.
   - Cast iron
   - Copper (electrical cables).

3. **The machine contains lubricating oil:**
   Drain them off for sorted disposal

4. **Electrical components:**
   Disassemble the electrical equipment (devices, cables, sheathing, tubes, etc.) for sorted disposal.

5. **Plastic components:**
   Separate all plastic parts for sorted disposal.

CAUTION:
All these materials must be disposed of in accordance with local legislation in the country in which the disposal is being done.
For sites and procedures, contact the local authorities.

3. Safety and accident prevention

Contents

3.1 Applications, intended use

The **GEA Niro Soavi** homogenizer consists of a positive-displacement piston pump provided with automatic valves with suction and delivery spring, connected to a homogenizing section where the product undergoes the process of high-pressure micronization to reduce the size of the solid particles suspended in the fluids and achieve homogeneous dimensional distribution.
This process can be applied to a wide range of products of varying viscosities, and yields more stable suspensions by micronizing and dispersing the particles, depending on the pressure.

For the specific configuration of the machine, model, technical data, accessories and optional equipment, refer to the Technical Specifications enclosed with Chapter 11 of this manual.

3.2 Intended, improper and permitted uses

WARNING:
Any use other than that for which the machine is designed and described in this manual is non-conforming, and GEA Niro Soavi is not liable for any consequences thereof.

CAUTION:
- **The machine is not designed for use in explosive atmospheres.**

3.3 Work area, control area, danger zones

In order to facilitate comprehension of the matters handled in this paragraph, the following definitions of Machinery Directive 98/37/EEC apply:

- **“Work areas”**
  areas in which the operators may stay during startup and normal operation.
  These areas also enable them to take prompt action in case of need or emergency, within the limits of their job descriptions and established procedures.
  The work areas are located around the system in the areas to which access is permitted during operation.

- **“Control areas”**
  areas in which operators may control, monitor and adjust the system, using the provided control panels.

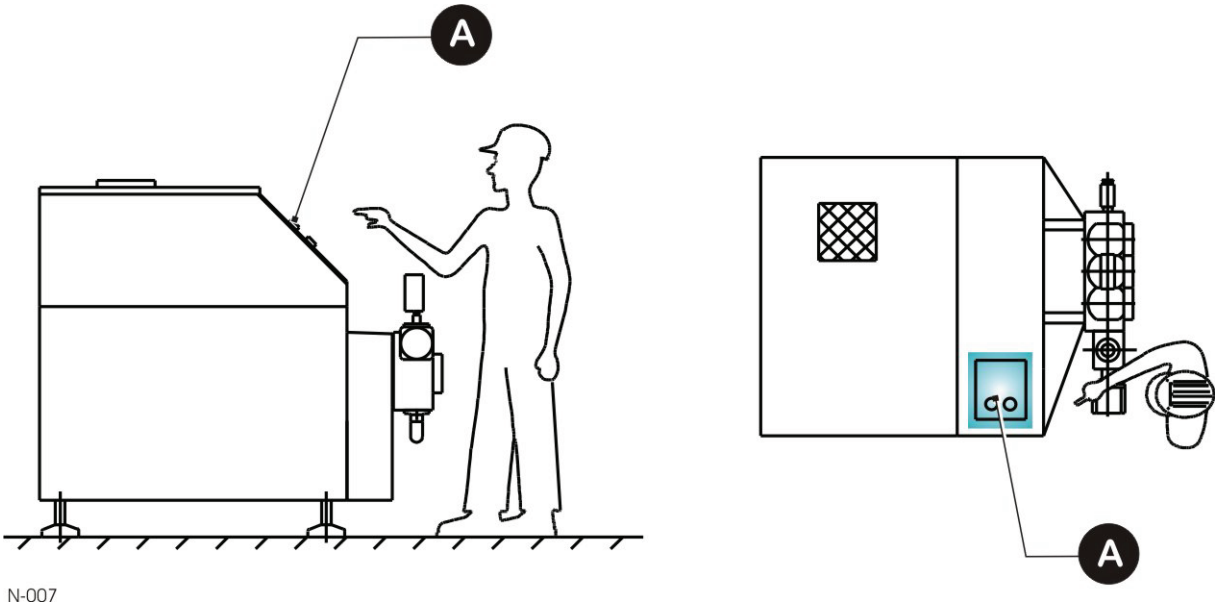
- **“Danger zones”**
  any zone inside or in the vicinity of the machine, in which the presence of an exposed person constitutes a hazard for the health and safety of the person in question.
  The danger zones are located around the system.

- **“Exposed person”**
  any person entirely or partly in a danger zone.

- **“Operator”**
  a person charged with installing, operating, adjusting or servicing, cleaning, repairing and handling the system.

CAUTION:
The machine may be operated and monitored in normal working conditions only from the designated control area.

The control, work and danger areas are shown in the figure on the next page.



CONTROL, WORK AREAS
FIG. 3.1

A) CONTROL AND WORK AREA

The following points give some important warnings in relation to the above.

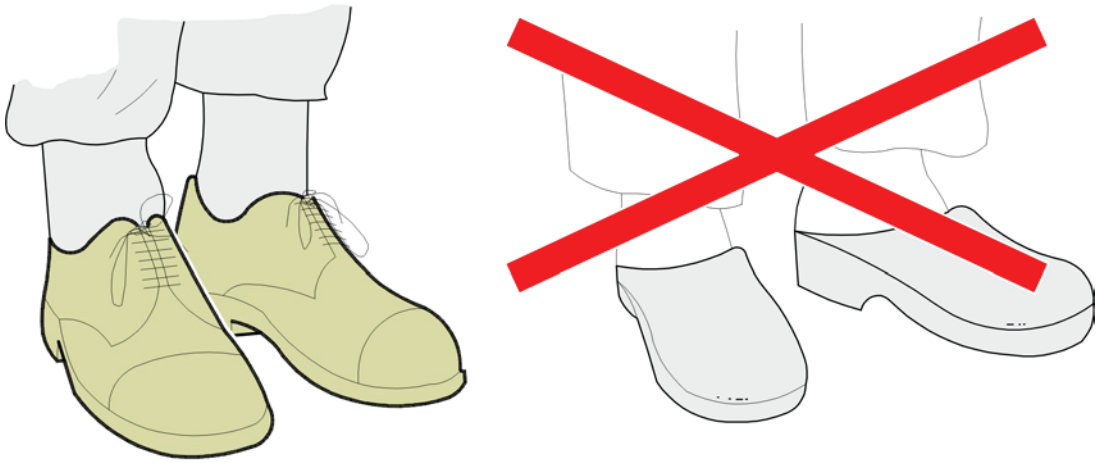
CAUTION:
Before starting the work process, the operator must be fully familiar with:
- the position, function and use of all electrical and pneumatic controls;
- the position, function and use of all safety equipment;
- the characteristics of the machine;
- this manual and its use.

He must furthermore:
- **have been properly trained on site by the manufacturer's or authorised service centre's technicians;**
- **have completed operating tests under the supervision of GEA Niro Soavi technicians.**

NOTE for the operator
The operator must instruct all assistants regarding their exact jobs as well as any regulations in relation to clothing as shown in the figures on the following pages.

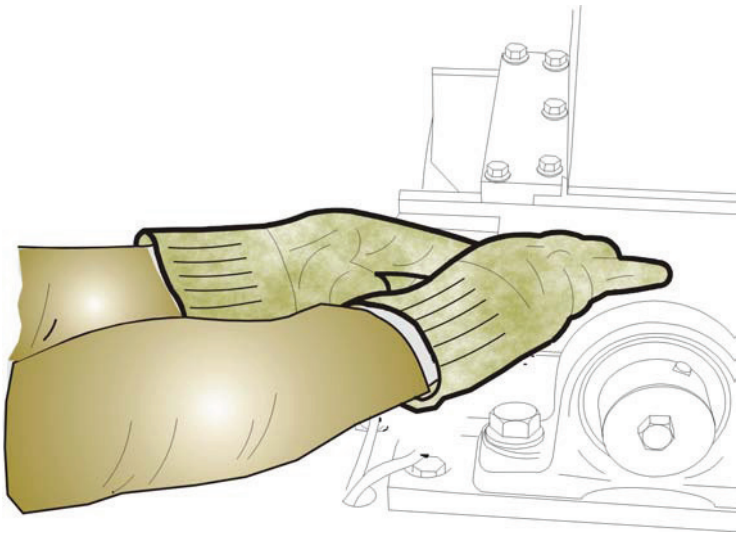
CAUTION:
CLOTHING
Operators assigned to operation and maintenance must wear work clothes (with closely fitting sleeves), personal protective equipment (gloves, eyewear) in conformity with the current legislation and safety regulations.

The following figures show the recommended individual safety clothing for maintenance staff charged with entering danger zones.



CAL-015

USE SAFETY FOOTWEAR
FIG. 3.2

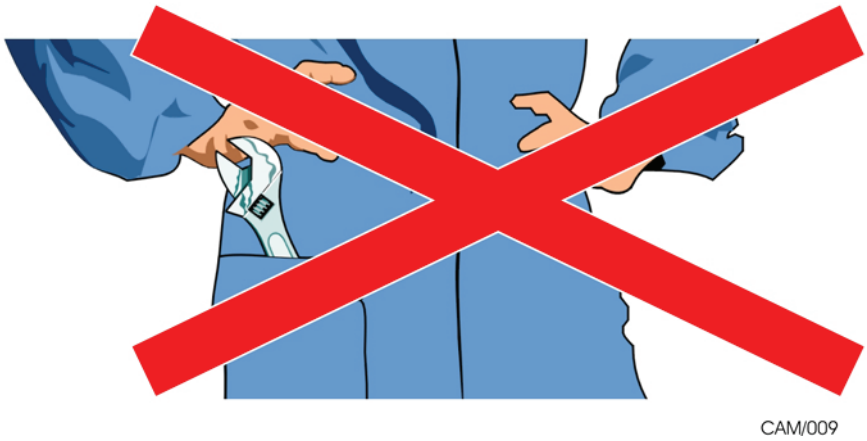


USE PROTECTIVE GLOVES

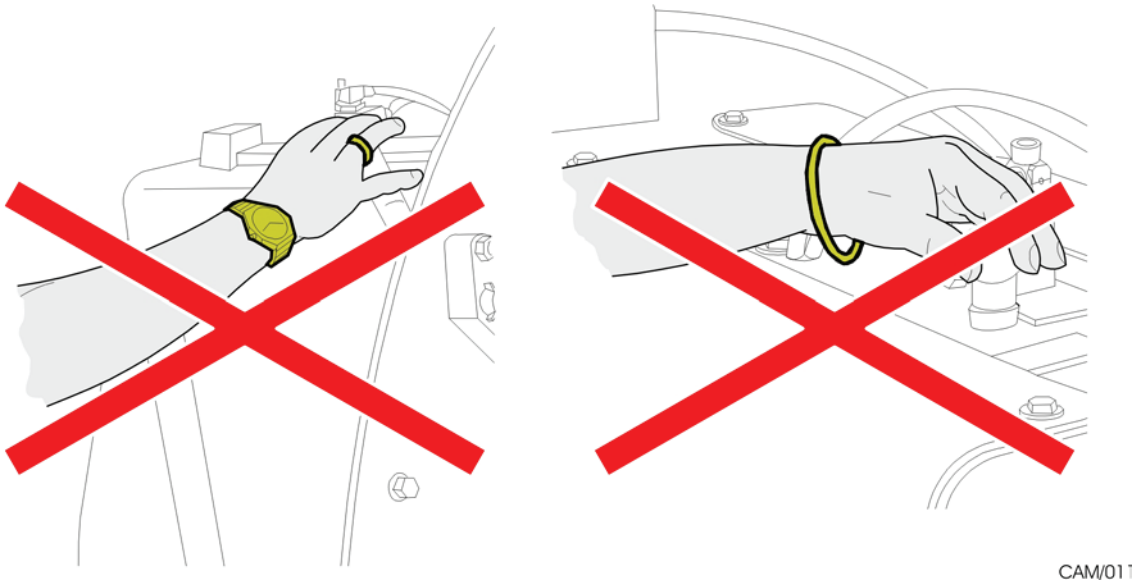
Fig. 3.3

CAUTION:
It is mandatory to wear suitable protective gloves in areas at high temperatures, such as the compression head

WEAR OVERALLS IN GOOD CONDITION
FIG. 3.4

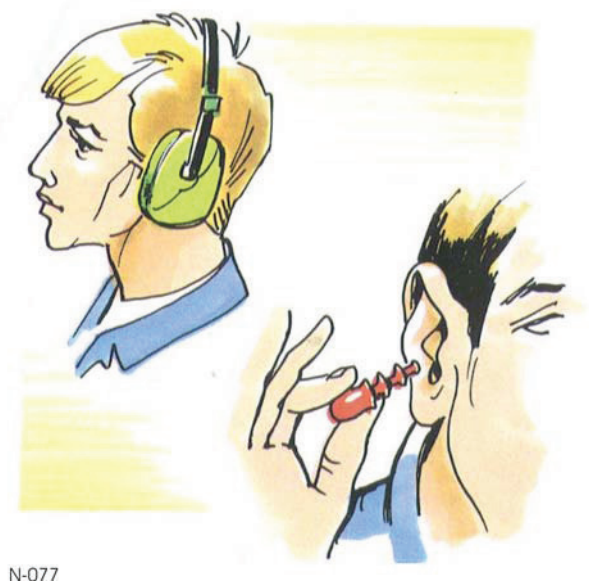


DO NOT ALLOW ANY OBJECTS TO PROTRUDE FROM YOUR POCKETS
FIG. 3.5



DO NOT WEAR JEWELLERY
FIG. 3.6

CAUTION:
NEVER leave tools or other obstacles in the work area. Do not allow anything to impede the freedom of movement of the operators.
In case of emergency, staff must have free and quick access to the line. The operators must observe the instructions and report any violations to their superiors.



WEAR EAR DEFENDERS/PLUGS
FIG. 3.7

WORK AREA - NO ACCESS FOR UNAUTHORISED PERSONS
FIG. 3.8

CAUTION:
Unauthorised persons may not stay in the work areas while the machine is operating. Maintenance staff may work around and inside the machine only when it is in "maintenance" (safety shutdown).

The line maintenance shutdown procedure is implemented by following the instructions given in chapter 7 "maintenance" further on in this manual.

3.4 Risks, dangers and residual risks in the area

3.4.1 General safety

Obligatory information and training

This manual does not describe the general safety issues which must already have been dealt with in the factory in observance of established safety legislation.
However, we recall the main points to prevent their being neglected in the manual and in the factory safety plan.

CAUTION:
“Protection against risks starts with information and training”.

Informing the workforce

The employer must make sure that all employees are informed regarding:

- health and safety risks connected with the company's processes in general;
- protection and prevention measures and procedures in force;
- specific risks to which they are exposed as a result of the processes, and general and company safety regulations in their regard;
- first aid procedures, fire regulations and evacuation procedures.

Training the workforce

The employer, in relation to their job descriptions and responsibilities, must make sure that operators and maintenance staff receive adequate training in health and safety matters with special reference to their work places and tasks.

3.4.2 Residual risks and hazards on the machine

The machine presents the following residual risks:

- Noise (wear suitable personal protective equipment (PPE), such as ear plugs and gloves)
- Risk of burns from hot parts of the machine (it is mandatory to wear protective gloves) in areas at high temperatures such as the compression head.

3.5 Safety equipment used

The machine is equipped with safety equipment which prevents critical conditions arising which may result in unexpected mechanical failures which endanger the users.
Intrinsic safety is provided by the design of the machine which is rated with a large safety margin, in consideration of the high pressures which may result from incorrect operation by the users or faults on the line of which the machine is part.
The main safety devices present on the machine, described below, are a safety valve on the compression head, electrical protection equipment on the main motor and an emergency stop button.

WARNING:
If the machine is equipped with a disconnectable electrical enclosure, the lockable switch is located on the front door.
If the machine is supplied without an electrical enclosure, the user must provide a lockable safety switch on the power supply line.

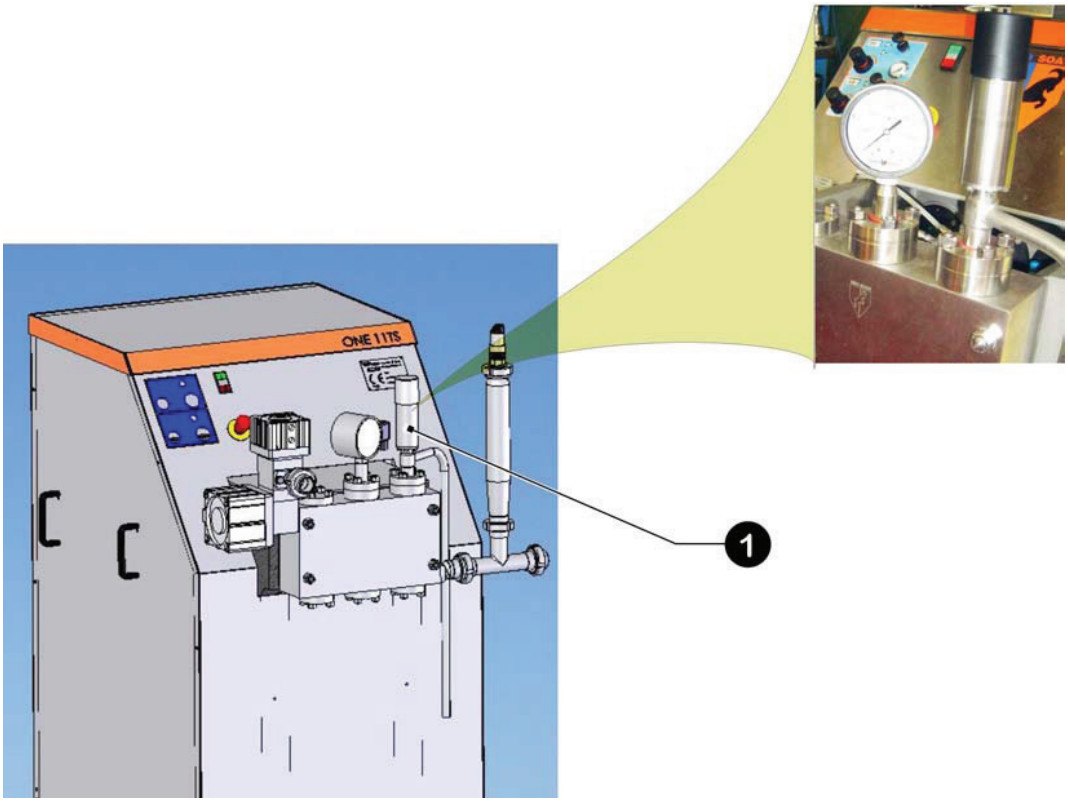
3.5.1 Pressure relief valve

The pressure relief valve **(1)** has been designed by **GEA Niro Soavi** to protect the machine from the possibility of overpressure which might be produced inside the compression head as a consequence of the pumping action of the machine.

CAUTION:
The safety valve is intended to protect the machine; only a line safety valve will protect the pipes down line of the machine itself.

CAUTION:
The valve protects only the high pressure areas on which it is installed.

It has the following advantages:
- reduced maintenance;
- it closes automatically in case the overpressure is released to allow the immediate resumption of production;
- accurate calibration and repeatable actuation.
- designed to 3A standards, suitable for C.I.P. (Cleaning in Place)



PRESSURE RELIEF VALVE LOCATION
FIG. 3.9

Operation

The valve is composed of a ball held in position in its seating by a spring which allows it to open only when the load on it exceeds its factory setting.
The spring loading should not be changed as this would modify the valve opening value and cause the immediate forfeiture of the safety conditions established by **GEA Niro Soavi** and the guarantee. Therefore a seal has been applied to the spring preload adjustment nut.
In the event the calibration setting is exceeded, the valve opens automatically and lets the product flow out of the discharge pipe; it closes again when pressure reduces below the opening value. Therefore it is necessary to use the pressure regulating device to decrease the pressure in the compression head until the valve closes, or reducing the pump speed in case of piston pumps.
Once the pressure relief valve has closed again, normal operating pressure can be re-established, provided the machine has not been damaged such as to cause an immediate stop.

CAUTION:
The discharge pipe must ALWAYS be directed downwards to avoid harming the operator; the Customer shall be responsible to install a funnel to collect the outcoming product and carry it to the drainage system

CAUTION:
Dispose of ejected product properly according to local legislation.

CAUTION:
The valve seat of the pressure relief valve is damaged to some extent each and every time the valve blows. This will lower the pressure setpoint of the safety valve. Therefore it is periodically necessary to replace the seat and ball to recover the original setpoint conditions.

Washing

The part in contact with the product is normally cleaned during machine washing (C.I.P.).

CAUTION:
It is ALWAYS necessary to disassemble the valve from the compression head and clean it manually after any overpressure relief valve discharge.

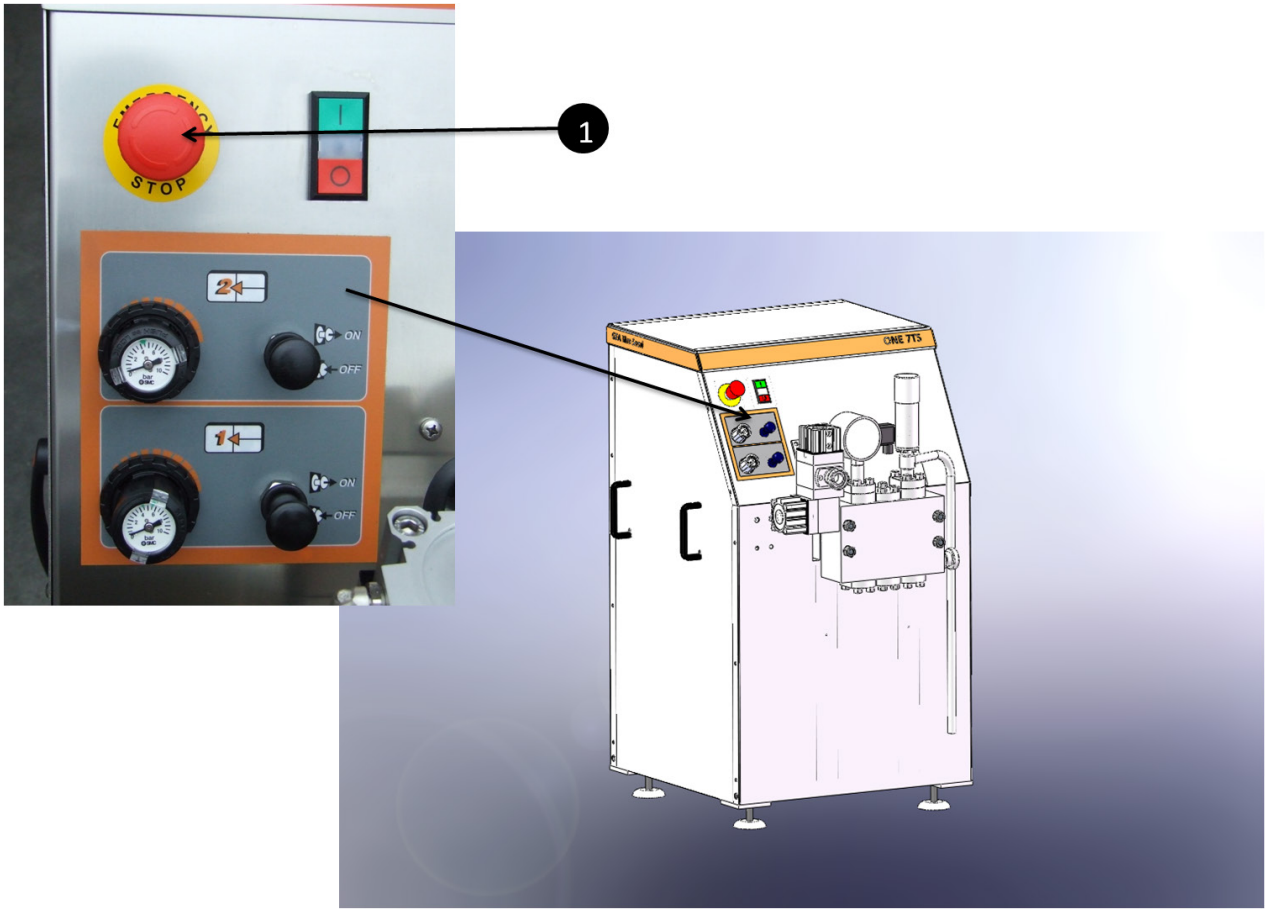
CAUTION:
Do not disassemble the valve body nor remove its plastic cap. Changes to the safety valve setting are not allowed and shall invalidate the guarantee and affect protection of the machine, of its components and of the operators, unless a written authorization has been obtained from GEA Niro Soavi.

3.5.2 Protections on the main motor

The machine is equipped with electrical protection equipment rated for the motor power, starting type and operating conditions, consisting of thermal cutouts, quick acting fuses and circuit breakers against short circuits, circuit breakers and the inverter itself for protection against overheating.

3.5.3 Emergency stop button

On the front panel of the machine there is installed an emergency stop push-button **(1)** of the colour prescribed by the safety standards in force.
Pressing this button immediately stops the machine in danger situations, including: malfunctions, anomalous noise, failure of mechanical parts.



EMERGENCY BUTTON
FIG. 3.10

In case of danger, the master power switch **(2)** on the electrical enclosure can also be used as an emergency stop, as shown in the following figure.

MAIN SWITCH
FIG. 3.11

CAUTION:
When positioning the machine and making the connections with the production line, allow enough space to reach the emergency stop push-button of the machine quickly and without obstacles.

3.5.4 Housing

The machine is equipped with a housing **(1)** in stainless steel sheeting which:
- protects internal parts from dirt, water and soiling by the product;
- allows for external cleaning;
- protects the operators from moving parts, live parts and hot parts which may be hazardous to staff as required by established EC standards and local safety legislation.

CAUTION:
The machine must ONLY operate with its housing or guards completely closed in order to avoid the hazard of operator accidents. Therefore, these guards must never be opened while the machine is running.

The panels can be removed for maintenance and installations.
The side panels are fitted with handles **(2)** and screws for access to the machine's interior for maintenance.

CAUTION:
Make sure that ALL locks are shut before starting the machine to guard against accidents; use only the provided handles when moving the panels. Depending on the size of the panels, two persons may be required to remove or fit them.

CAUTION:
Before removing the protective panels the personnel in charge of installation and maintenance must cut off the machine's power line with the disconnecting device, locking it with a padlock.

HOUSING
FIG. 3.12

3.6 Safety notices

The machine is fitted with a set of danger notices as reminders to the operator and exposed persons.

WARNING:
The warnings and signs on the machine perform an important safety function; the operator and the skilled maintenance technician must follow the instructions provided by these notices.

The safety notices are located on the machine as shown in the figure on the following page.

CAUTION:
Do not remove the safety notices.
Failure to enforce this regulation voids the warranty and relieves the manufacturer of any liability. The user must replace any notices which have been removed unintentionally or have fallen off.

LOCATION OF SOME SAFETY NOTICES ON THE MACHINE
FIG. 3.13

1 	NO ACCESS NOTICE • No access to the work area for unauthorised persons
2 	DANGER NOTICE • Voltage present
3 	INSTRUCTION NOTICE • Wear ear defenders
4 	DANGER NOTICE • Danger of burns or scalds due to the high temperature of the compression head

4. Installation

Contents

4.1 Shipping

GEA Niro Soavi provides packaging, in agreement with the client and in relation to the type of shipping, designed to protect the machine during transport.

WARNING:
Packaging, shipping and storage.
Any packaging, lifting, handling, shipping and unpacking may be done only by expert staff (load harnessing, crane operation, lift truck operation, etc.) assisted by persons familiar with the machine itself.

CAUTION:
During such work, staff must wear individual safety equipment: gloves, safety boots, work overalls.

CAUTION:
Staff must observe the following general rules:

- keep away from loads before lifting and lowering;
- do not stand under suspended loads;
- keep unauthorised persons away from the handling area

If the load must be guided during lifting, use appropriate equipment to maintain the safety distance from the suspended load.

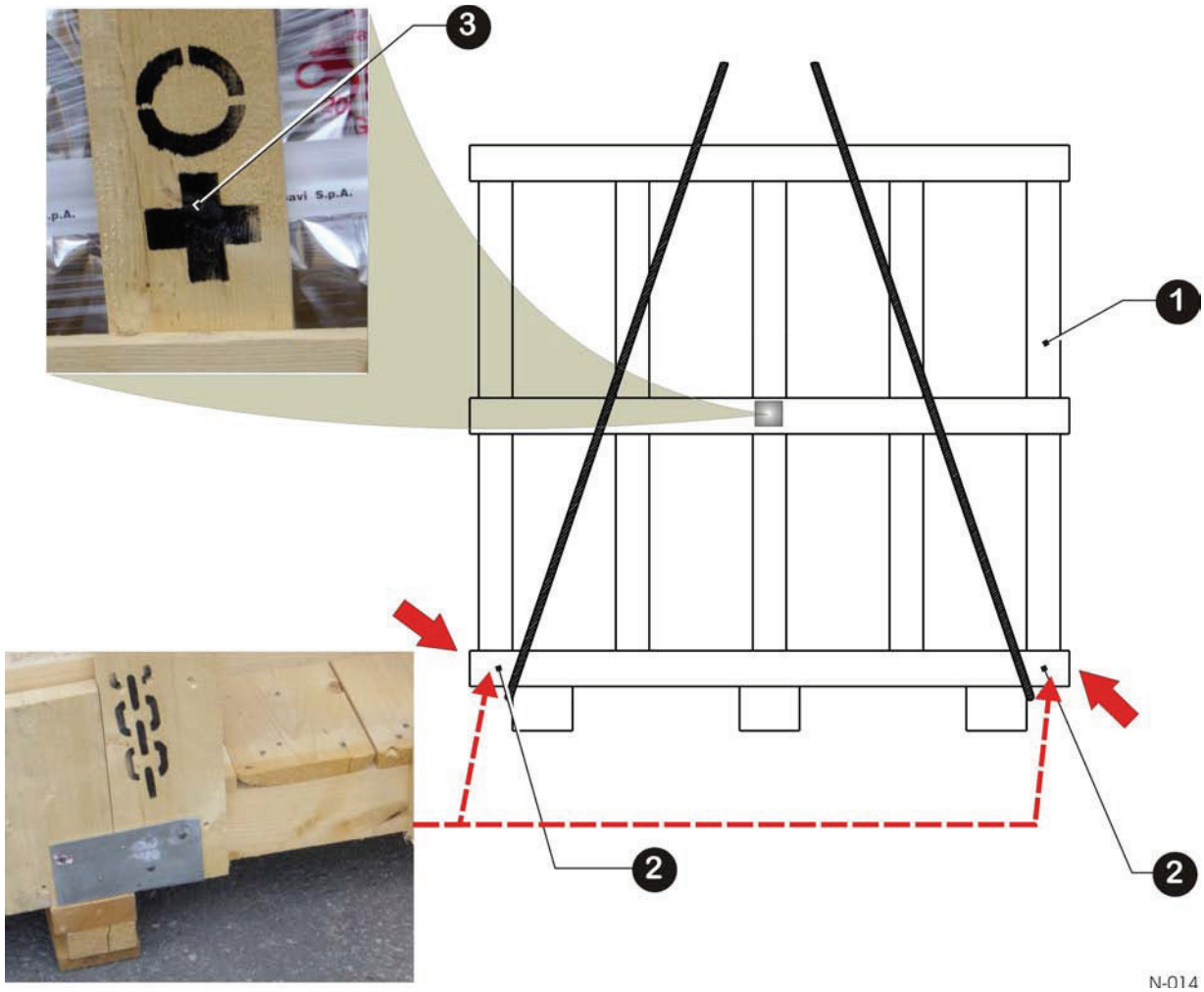
CAUTION:
Failure to observe these rules can cause serious damage and injury.

Shipping must also be done by qualified staff who will be precisely instructed about the loading of the machine on the vehicle.
The machine must be secured with straps or other equipment onto the vehicle's load bed to prevent it tipping over.
The machine will be shipped as follows, depending on the destination:

4.1.1 Shipping by ground over medium to long distances

CAUTION:
Inform all staff involved in shipping and installing the machine.

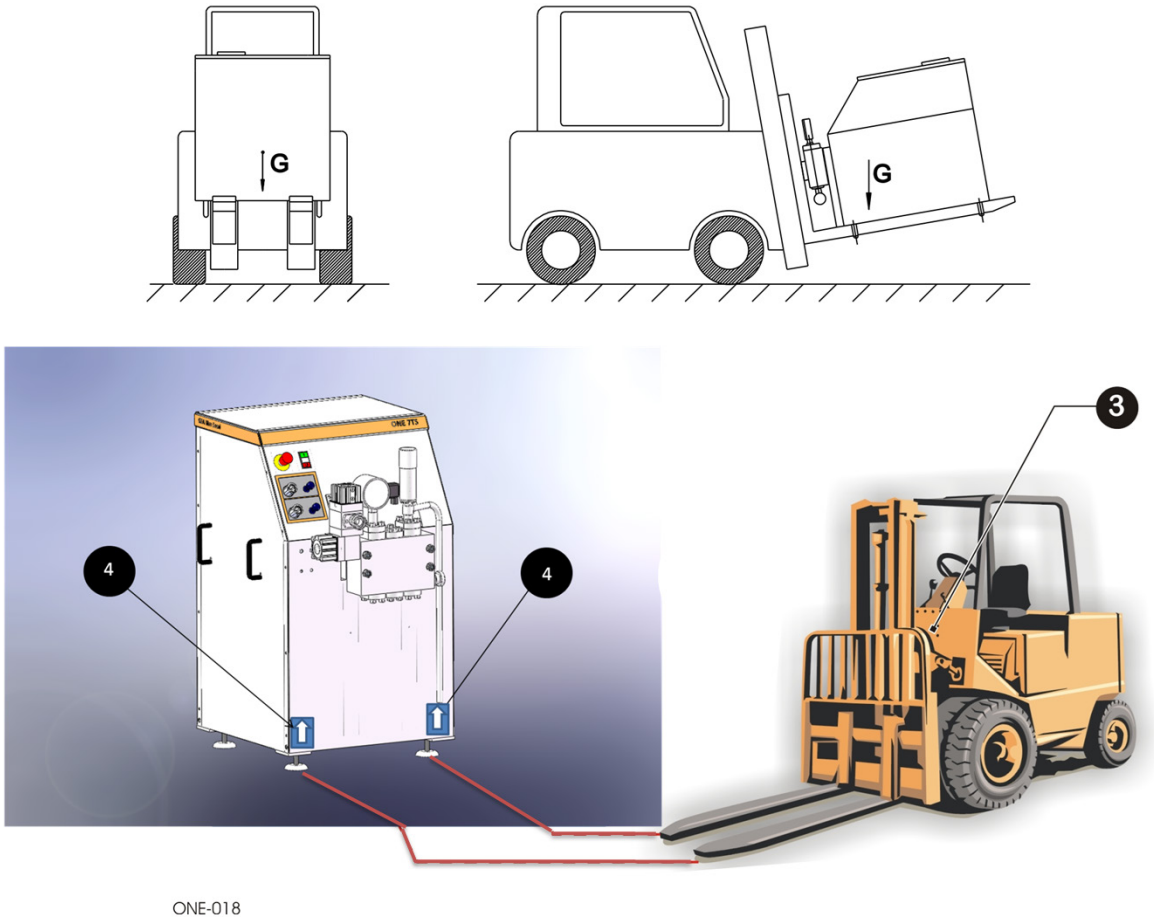
The machine is normally shipped to the client in a wooden crate **(1)** wrapped in plastic sheeting, unless otherwise specified in the order confirmation.
The crate is designed to allow handling with a lift truck, crane or bridge crane, the latter by passing steel ropes under the crate as shown **(2)** on the packaging, where symbol **(3)** indicates the centre of gravity of the load.



PACKING CRATE
FIG. 4.1

If the machine is shipped without any packing, it must be handled with forklifts **(3)** or transpallets, so that the head is on the operator's side; the forks must be spaced apart at the pictograms **(4)** and be of such a length as to support the entire base of the frame so as not to cause any damage to the machine's structure or the panelling.

The side panels can be removed during transport to prevent damaging them.



HANDLING WITH A FORKLIFT TRUCK
FIG. 4.2

CAUTION:
All handling movements must be done slowly by expert staff, to prevent the load overbalancing, which can cause damage and injury; personnel must use the appropriate protective equipment and follow the safety rules.

CAUTION:
Before moving the machine, make sure the route and installation area are free of obstacles.

CAUTION:
Use only controlled lifting equipment, rated for the load in question. The weight is shown on the installation drawing in the enclosed Technical Specifications Dossier.

CAUTION:
The floor must be rated to support at least 150% of the machine's weight.
The weight is shown on the installation drawing in the enclosed Technical Specifications Dossier.

4.2 Receiving and checking

On delivery, check the following:
- that the Packing List corresponds to the actual contents of the packages;
- that the packaging is in good condition, without signs of damage;

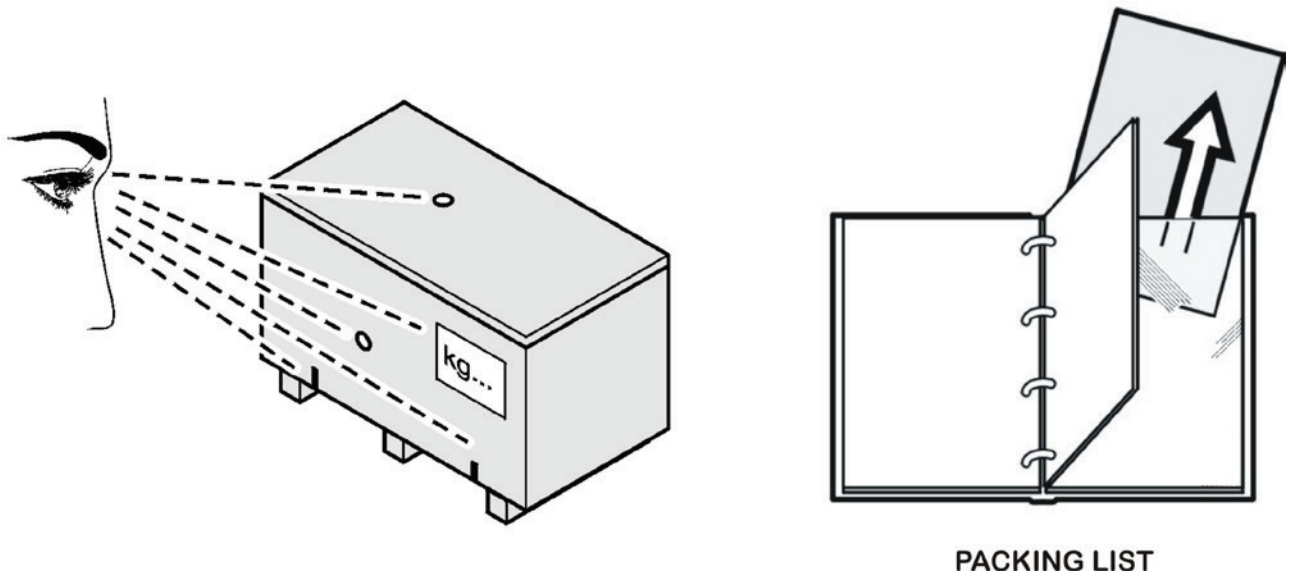


FIG. 4.3

4.3 Storage

4.3.1 Storage prior to installation

Before installation, the machine and its equipment must be stored in a dry area indoors to prevent damage and functional degradation.

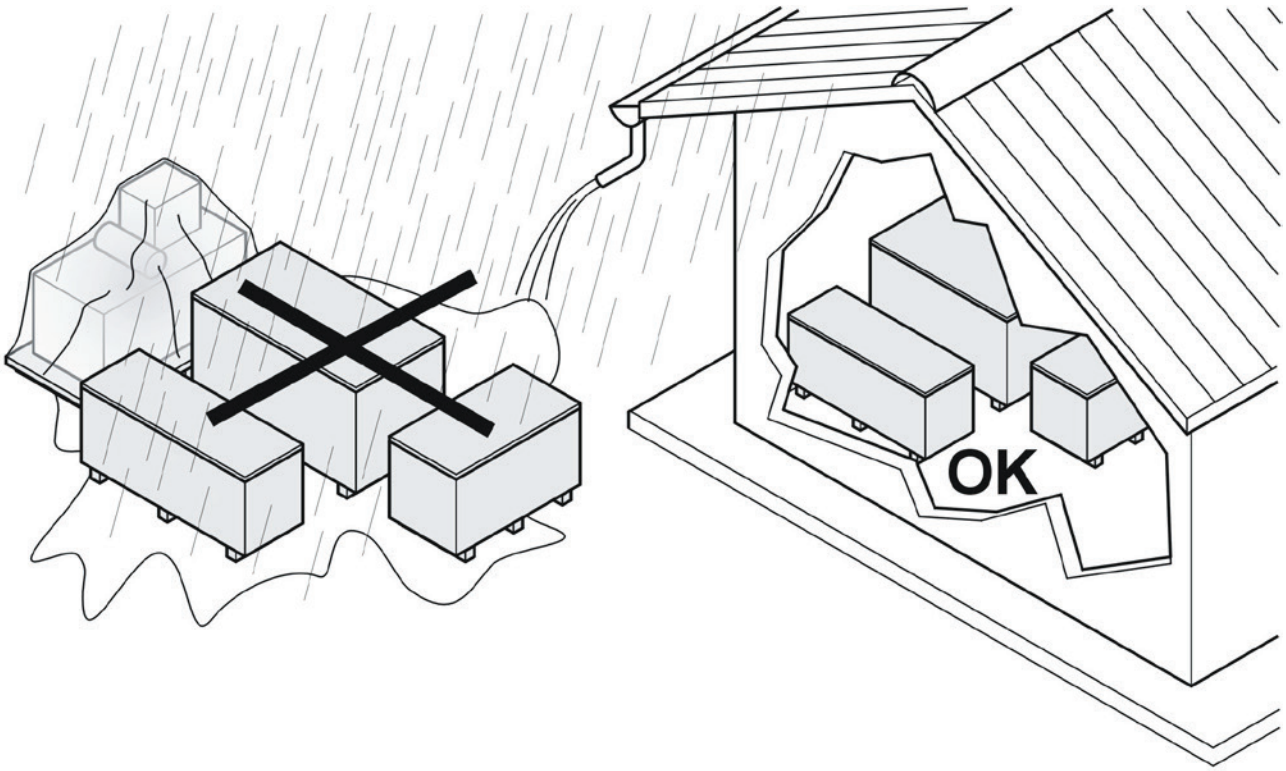


FIG. 4.4

If the machine must be stored outdoors, take measures to prevent dust, humidity and rain coming into direct contact with the machine, and cover it with a waterproof tarpaulin.
Take special care with the electrical enclosures and electronic equipment, which are sensitive to low temperature and humidity.
If packaged separately, we recommend storing the latter indoors, and in any case use humidity absorbers.

4.3.2 Storage for longer than 6 months

If the machine must be stored prior to installation for more than 6 months, keep it indoors, away from atmospheric agents, dust and corrosive vapours, as indicted above, with special attention to the electrical equipment.

If the machine is to be stored without being used for any longer than 6 months, contact **GEA Niro Soavi** customer service for the operations of checking, restoration and special maintenance prior to starting.

FIG. 4.5

4.4 Setting up the installation site

The client must provide a suitable installation site in accordance with European Directives related to safety in the workplace.

The site must be:
- equipped with emergency exits;
- easy to clean to assure good hygiene;
- well aerated (good circulation of air);
- equipped with natural and artificial lighting sufficient to assure the safety, health and wellbeing of the operators, in compliance with EN 60204-1
- equipped with a regulatory grounding system.

FIG. 4.6

WARNING:
During installation and scrapping, the client must provide the technical equipment and individual safety equipment required to ensure the safety of his staff, property and the environment.

The user must be sure that the installation site (rooms) comply with established safety requirements. They must be adequately ventilated.

The installation must be done in an area clear of obstacles so as to permit normal operation (insertion of parts, on-board adjustments) and maintenance of the machine in complete safety, and with easily accessible entrances and emergency exits.

CAUTION:
The installation site must be clear of flammable substances including petrol and solvents and slippery substances including oil and grease.

WARNING:
The work described in this paragraph must be done by qualified staff.

4.5 Hookup and cabling

4.5.1 Hookup

The machine is normally connected to the product line with fittings of the type, size and position specified on the drawing of the enclosed Technical Specifications Dossier.

There are also:
- water connection for lubrication of packings and cooling (max hardness 8 °dH / 15 °fH; recommended chlorides < 25 mg/litre, max 200 mg/litre);
- water drain;
- compressed air connection (when needed);
- steam connection (when needed);
- condensate drain from lubrication circuit (inside the machine – lubrication circuit);
- cooling air outlet/grille.

For the needs of each machine, the type of connections and the characteristics of the mediums please refer to the technical information sheet and the installation drawing in the enclosed Technical Specifications Dossier.
As regards the service fittings, we recommend providing upstream solenoid valves for the user machine (if not already provided on the machine itself) which open at startup.
In particular, the manual water circuit cocks must always be open, at a setting which provides sufficient water flow for lubrication or condensation production (aseptic version).

Note that excessive lubrication water flow will flood the machine's water sump, which risks water entering the transmission section and contaminating the lubrication oil; the condensation or water in the lubrication circuit must therefore be drained regularly, as described in Chapter 7 “MAINTENANCE”.

⚠ CAUTION:
Comply with local legislation in relation to the treatment of waste and cooling water. The waste water may contain traces of lubrication oil and product.

The cooling air is discharged through grilles located on the side of the machine.

⚠ CAUTION:
Do not install anything that can close the delivery pipe partly or wholly, as this can lead to dangerous overpressure.

The machine is rated for outlet backpressures no greater than those given in Chapter 2 of this manual, but since it is a volumetric pump, it can create hazardous overpressures due to backpressure in the downstream lines when they are closed.

⚠ CAUTION:
For reasons of safety, it is ALWAYS best to install a safety valve downstream of the machine to protect the line and user equipment. It is also essential that all downstream valves are of the NORMALLY OPEN type, to prevent them closing when the machine stops unintentionally or in case of power failure. The machine has a certain operational inertia, so that it continues pumping even when the main motor has been shut down.

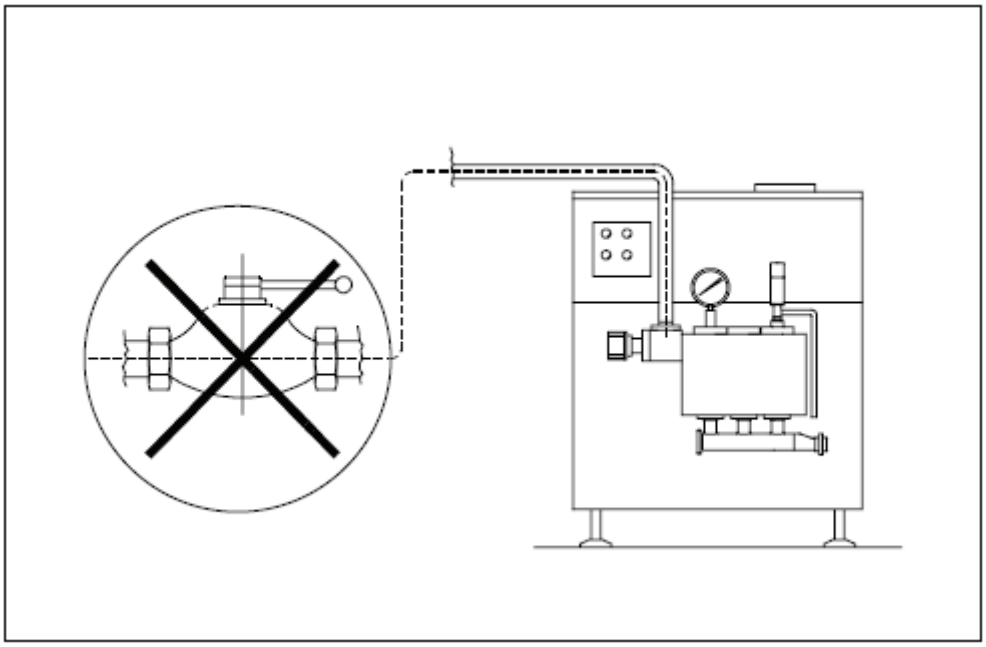


FIG. 4.7

4.5.2 Electrical hookup

The enclosure's power line must be sized according to the length, type of installation, ambient temperature, nature of the load and in any case in compliance with the regulations in force in the country of installation.
Unless otherwise agreed in writing with **GEA Niro Soavi**, the user is responsible for rating the power line and earthing system to the electrical enclosure's terminal block, as well as selecting the short circuit and contact voltage protection equipment.

If **GEA Niro Soavi** supplies the electrical enclosure, we also supply a list of cables rated for a length of 50 metres, routed in closed ducting with three-pole cable and ambient temperature 40 °C.

With regard to the machine's power supply rating and connection diagrams, refer to the electrical specifications and wiring diagrams given in the enclosed Technical Specifications Dossier.

CAUTION:
The specifications for the cables assume standard routing and environmental conditions; they are only illustrative and must ALWAYS be checked by the user against the actual operating conditions.

The electrical connections between the machine and electrical enclosure and electrical enclosure and main power line are to be done by the Client, who is also responsible for ensuring that they are made properly and in compliance with the diagrams before the machine is started up.

GEA Niro Soavi is not liable for damage or injury resulting from incorrect connection of electrical equipment; the electrical connections must always be checked over by qualified electricians.

In case of doubt, contact **GEA Niro Soavi** Service Department.

WARNING:
The power supply must be rated for the machine's maximum draw, as given in the Wiring Diagrams in the enclosed Technical Specifications Dossier.

4.5.3 Grounding system (provided by client)

The machine's metal components and structures must be grounded by the client.
The exact characteristics are defined by the **CEI 1713/1 and CEI 44/5** standards.
The standards require that in every user system, the grounding system for the entire system and all circuit and user equipment grounding systems must be grounded by a single circuit.

Make sure that the materials used in the grounding system are robust and mechanically protected.
The connection to the main grounding system must be as short as possible, and the cables may not be mechanically stressed or subject to corrosion.

4.6 Installation and assembly

4.6.1 Installation instructions

The following instructions regard the installation and proper use of the machine and its parts for a long and efficient service life, as well as preventing operator hazards.

- A high pressure volumetric pump or homogenizer ALWAYS require a minimum operating pressure to work properly without cavitation, which may damage the machine itself. Scrupulously enforce the minimum values given in the enclosed Technical Specifications Dossier; in any case, depending on the process temperature and viscosity, you must always ensure a constant supply pressure sufficient to prevent cavitation or under-feeding the machine.
  For explanations and special requirements, ALWAYS contact **GEA Niro Soavi**
- To feed the machine use a supply pump, provided by the Client, sized for a flow rate of 1.2 times the rated flow rate for a machine with 3 or more pistons, and at least 1.5 times. The pump's flow must be calculated at least at the minimum supply pressure
- If a volumetric or positive displacement pump (lobes, single-screw, etc.) or a diaphragm pump is used, it is necessary to have a suitable by-pass pipe regulated with a modulating valve on the feed pump and/or a suitable system for changing the speed of the feed pump, in order to allow feeding the machine correctly
- If the treated products have very different viscosities or it is necessary to use a volumetric pump for viscous products and for the wash water, it is necessary to use a system for regulating the pump speed regulated by the feed pressure so as to be able to supply the machine correctly under all conditions, even in the transitory phases of production
- A supply pump must be used for each machine; do not install two or more machine in parallel on a single supply pump, as this can cause hazardous pulsation
- The supply line between the supply pump and homogenizer must be direct, preferably without bends, of section greater than or equal to that of the homogenizer/piston pump itself, of constant section, to limit pressure drops; the radius of any bends must be as wide a possible to prevent pressure drops (especially in supply) or noise (in delivery)
- It is always advisable to install a pressure gauge near the product infeed to the homogenizing unit to control the feed pressure; this pressure gauge can be supplied as an option by **GEA Niro Soavi** and be the simple type, with a minimum contact or with a continuous analogue signal for remote control
- Should it be necessary to install filters on the feed line, it is necessary to have a clear flow area of at least 3 times that of the pipe used; in addition, it is necessary to install a pressure gauge downstream from the filter to control the actual feed pressure and prevent any clogging of the filters and hazards of cavitation of the machine. For cleaning, it is advised to install filters in parallel to be used alternately
- Each homogenizing unit features pulsating operation: for this reason, depending on the type of system and the flow rate of the machine, it is advisable to install a pulsation damper on both the inflow and outflow (up to at most 20 bar of backpressure on the line)
- The pulsation damper on the suction side must be installed as close as possible to the machine's intake, and on the delivery side on a horizontal section of pipe at a minimum distance of around 1 metre away from any bends. For the technical rating and installation information, contact **GEA Niro Soavi**
- The pulsation damper must be installed in a vertical position; do not install the pulsation damper with the flow entering it directly, to prevent it rapidly filling with fluid and this losing its efficiency due to the lack of air trapped inside it
- If the supply pump is connected to a tank, make sure the suction port cannot suck in air due to

vortex formation by using internal flow deviation barriers; the suction port must always be under head
- It is always recommended to install a suitable pressure relief valve, downstream from the homogenizing unit, to protect the system from any overpressure caused by incompetence or incorrect operations on the system downstream from the machine; the pressure relief valve installed on the machine is used to protect the machine and not the system to which it is connected from any dangerous overpressure
- Never use the machine to drain a supply tank completely, in order to prevent a sudden lack of product during pressure mode, but have at least a level sensor to cut off the pressure (in the case of a homogenizing unit) and stop the machine before product stops being supplied
- The treated product must contain no air or gas, as this can lead to cavitation. If the product contains air due its elevated viscosity or upstream processes, it must be de-aerated with special equipment before entering the machine
- If the process temperature is greater than 90°C, the supply must be increased due to the increased steam pressure, which can result in cavitation.

The supply pressure must therefore be increased by 1 bar every 5°C of temperature in excess of 90°C over the minimum supply pressure specified in the enclosed Technical Specifications Dossier. This value must be doubled if the product's viscosity is in excess of 500 cP.
For special products and process temperatures, contact **GEA Niro Soavi.**

The machine is equipped with automatic spring-loaded pumping valves, whose load is set in relation to the product type. This means that if the machine is stopped or stops, and the supply line is open and under pressure, the product may continue to flow through the machine. To be sure that no product flows through the machine when its is stopped, the user must provide a check valve on the supply line upstream of the machine

4.6.2 Positioning

Positioning the machine properly on the client's production line allows it operate optimally as well as ensuring good access for routine maintenance.
For this reason, in relation to its size, you must maintain a free area around the machine for maintenance, as shown in the figure given below.

In particular, we recommend keeping enough space for replacing the main motor using lifting equipment (bridge crane or lift truck).

The front end and head need routine maintenance; keep enough free space for completely removing the head.
It is also good to keep any sources of heat which may affect its cooling away from the machine, and make sure there are no obstacles to the free flow of air.

You must also provide drainage for the waste water to avoid flooding which may affect the machine, and make sure no jets of water can enter the machine via its ventilation openings.

CAUTION:
The floor must be rated to support at least 150% of the machine's weight.
The weight is shown on the installation drawing in the enclosed Technical Specifications Dossier.

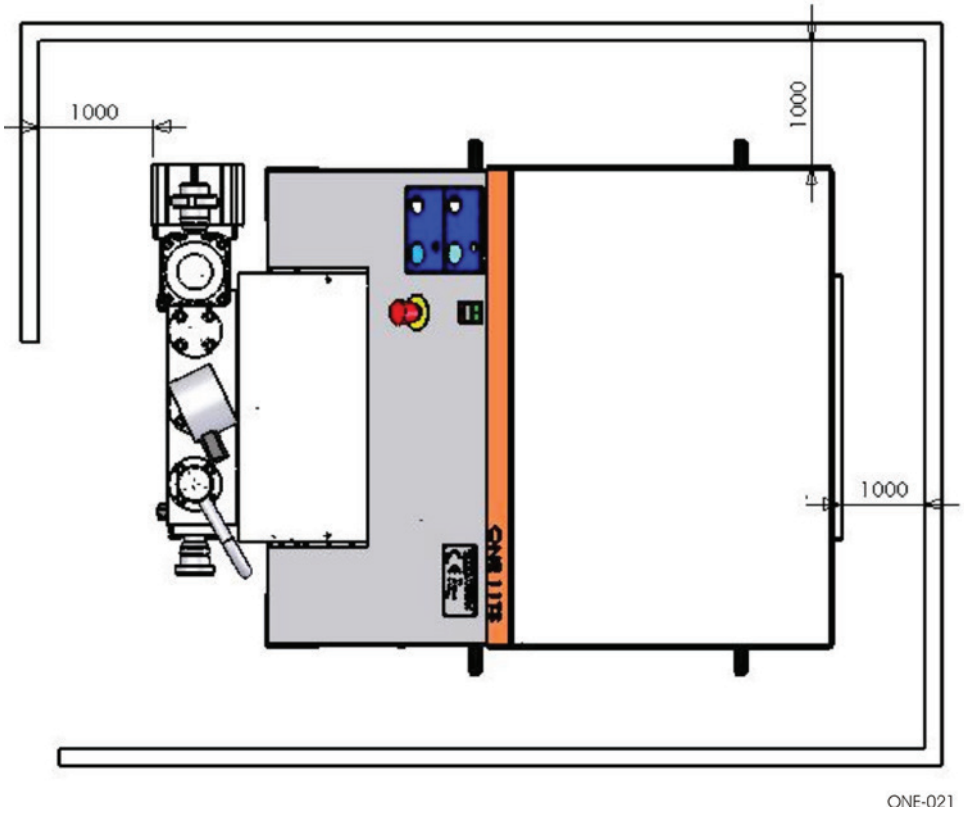


FIG. 4.8

4.6.3 Levelling the machine

To allow the machine to operate properly without excess vibration, it must be levelled and all feet must be in good contact with the floor.

The machine features height-adjustable feet.

To level the machine, proceed as follows:
- raise the machine
- adjust its height off the ground by screwing the adjustable feet in/out, using the machined surface of the head as a level reference;
- make sure that the machine's weight is resting on all the feet;
- lock the feet with the nut **(1)**.

If you wish to prevent vibrations moving the machine and thus stressing the pipes, you can mount steel rings to the floor to restrain the feet.

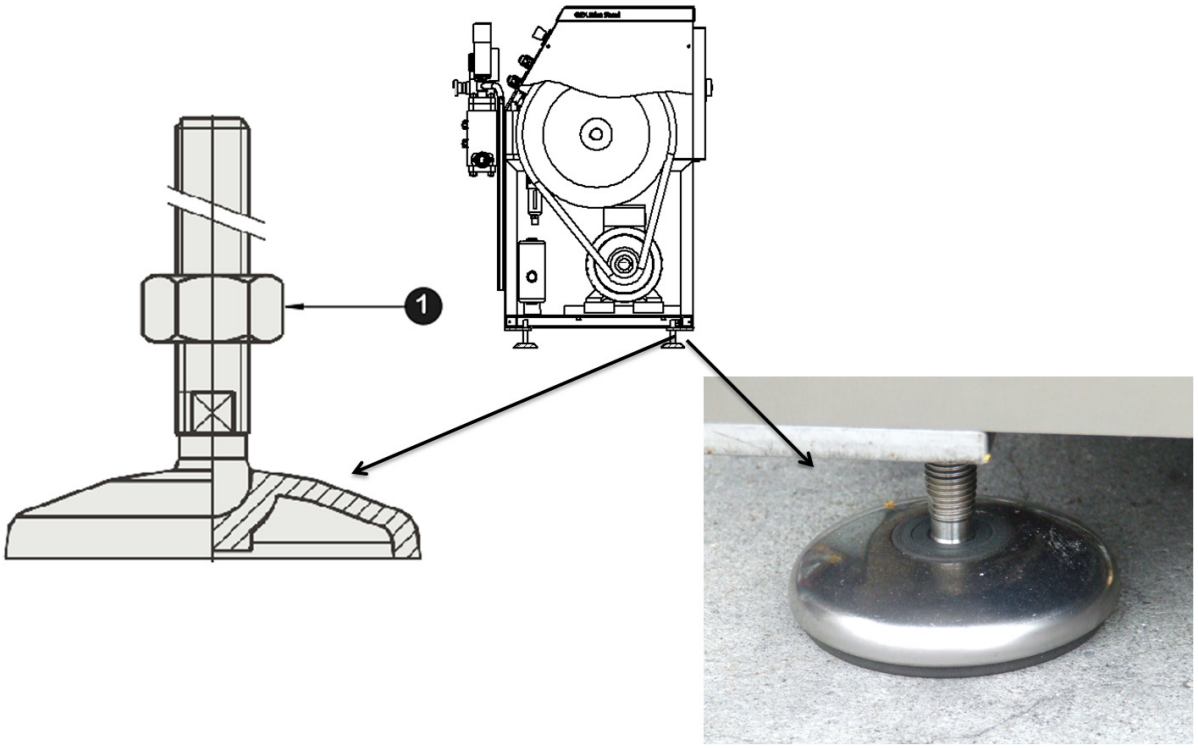


FIG. 4.9

4.6.4 Positioning the electrical equipment

The machines are supplied in a standard execution without electrical enclosure, which is designed and fabricated in relation to the machine's specifications as an optional accessory; however the machine is equipped with a terminal block which connects the on-board electrical equipment, excluding the motors.

If an electrical enclosure is supplied, and in any case as a general suggestion, the cabinet containing the electrical control and power equipment, if separate from the machine, must be located in a room that is as clean and dry as possible, ventilated, far away from steam, dust in suspension, corrosive fumes, and in any case its characteristics of protection against external factors must be adequate for the installation room, whose specifications must be evaluated by the Customer before ordering.

In addition, it is necessary to keep away from sources of heat so as to cause no local overheating and to permit appropriate cooling of the electrical equipment.

With regard to the type, overall dimensions, weight and installation requirements of the electrical enclosure, if supplied by **GEA Niro Soavi**, refer to the wiring diagrams and Technical Specifications enclosed with Chapter 11 of this manual.

WARNING:
If the electrical enclosure is provided by the client, it will be the client's responsibility to include the lockable disconnecting device between the machine and the power line.

5. Commissioning and first startup

Contents

5.1 Procedure

Before starting up the machine, run the following checks and controls.

CAUTION:
Any work requiring removal of the protective panels must be done with the MACHINE STOPPED, with power cut off with the circuit breaker (1) padlocked so as to prevent anyone powering up the system unexpectedly.

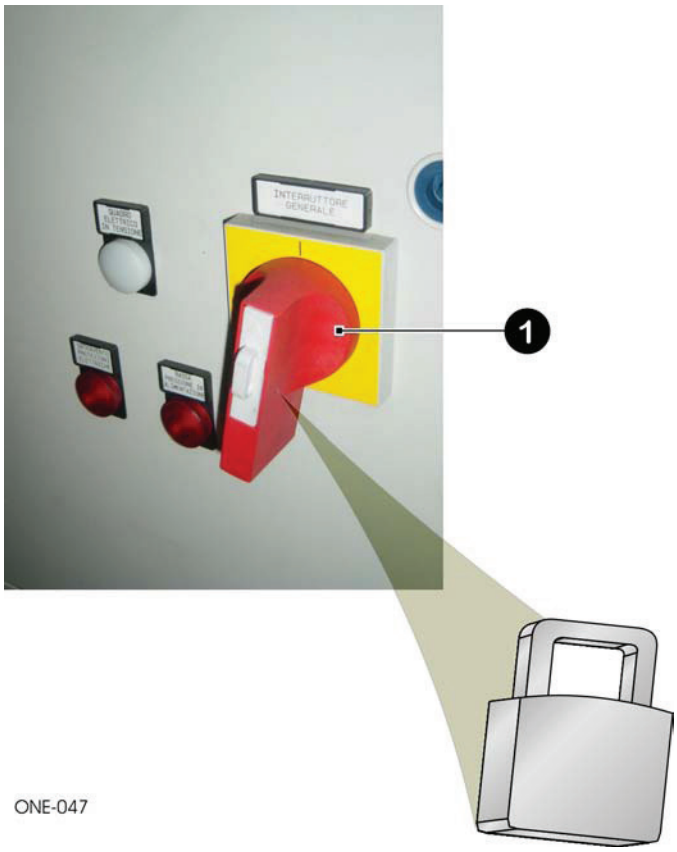


FIG. 5.2

The machine develops very high pressure; we recommend running careful checks to avoid damage and injury.
The controls described below table refer to first startup or to situations where the machine is not in continuous use.

- Check the connections with the ancillary services and product line referring to the Technical Specifications Dossier.
- Check that the pipes upstream and downstream from the machine are clean and free from scaling or welding residues which may seriously damage the machine.

CAUTION:
Do not use the machine to drain impurities from the up/downstream pipes!

a) Check the belt transmission **(2)**. For the belt alignment and tension checks, refer to Chapter 7 - MAINTENANCE.

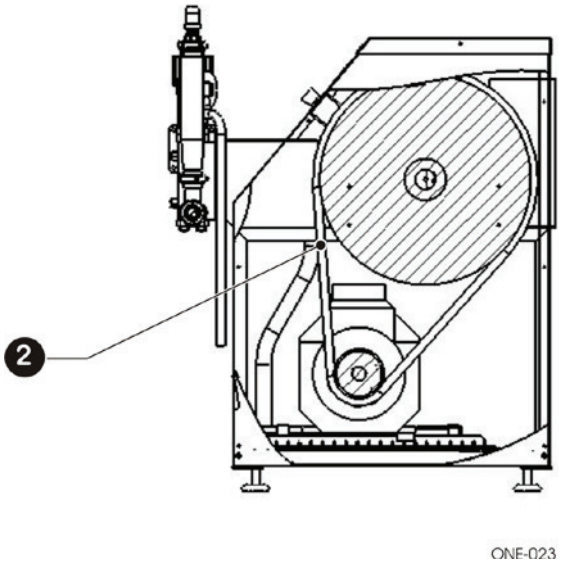


FIG. 5.3

b) Check the lubrication oil level via the sight glass, which must be covered up to 3/4, or on the visual indicator. This should be done only with the machine stopped, since starting the machine lowers the level as the circuits fill. For topping up the level, use only the type of oil indicated in Chapter 7 - MAINTENANCE.

CAUTION:
For reasons of safety during shipping, the machine is shipped WITHOUT LUBRICATION OIL in the transmission casing. Before anything else, fill the machine with oil as indicated in Chapter 7 "MAINTENANCE", Sheet F "Lubrication circuit".

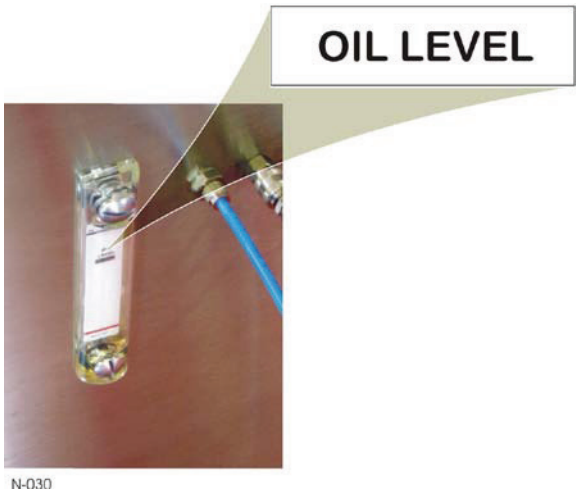


FIG. 5.4

c) Check that the high pressure flanges, fittings and all nuts of the compression head **(3)** are torqued to the values given in the "Tightening torques" table in Chapter 7 in this manual (sheet 00[C]).

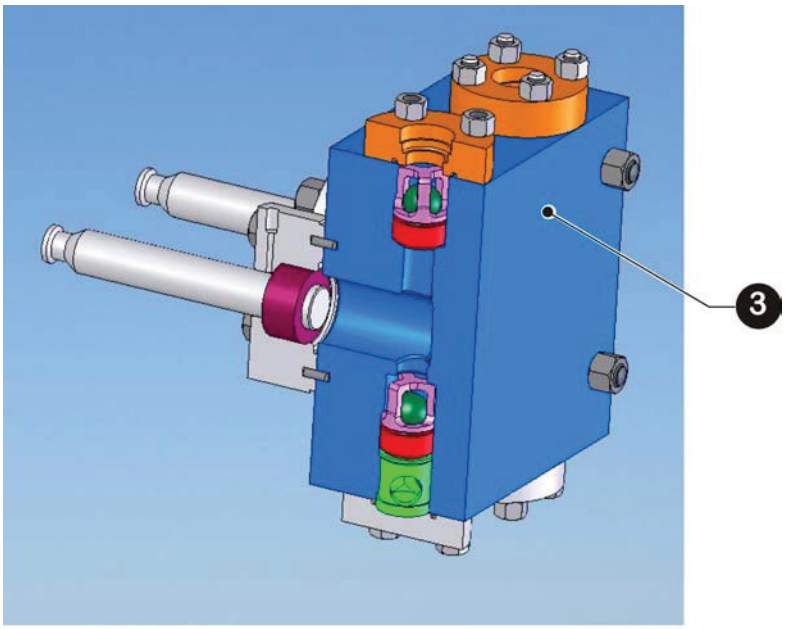


FIG. 5.5

d) Check the tightness of the pumping pistons **(4)** and that the seal packs are present, if they were removed because the machine was stopped or stored for more than 3 months.

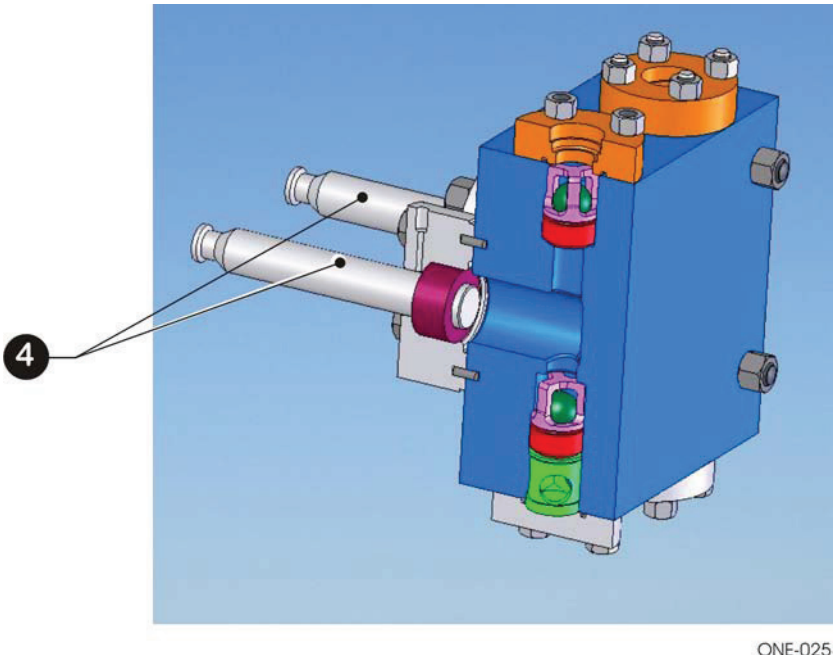


FIG. 5.6

e) Check the rotation of the motor **(5)** as follows:

CAUTION:
Check the direction of rotation by running the motor IN JOG MODE ONLY.
Observe all safety regulations, and do not come close to the moving parts inside the machine.
Remove ONLY the LH side panels.
ALWAYS fit the guards on the right (transmission side) before starting the machine.
The direction of rotation is indicated by adhesive arrows on the motor and pulleys.

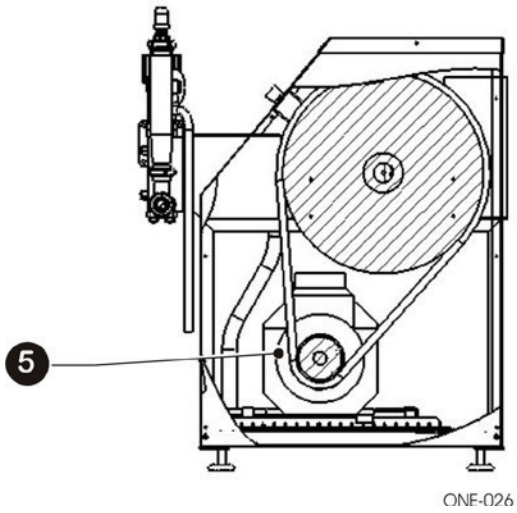


FIG. 5.7

f) Check that all housing panels **(6)** are in place and securely fixed.

FIG. 5.8

CAUTION:
failure to observe this latter instruction may result in serious injury for persons in the vicinity of moving and rotating parts when the machine is started up.

g) Check that the homogenizing pressure control devices on the panel on the machine (pneumatic switch **A** and reducer **B** STAGE 1 and switch **C** and reducer **D** STAGE 2) are completely slackened or turned OFF.

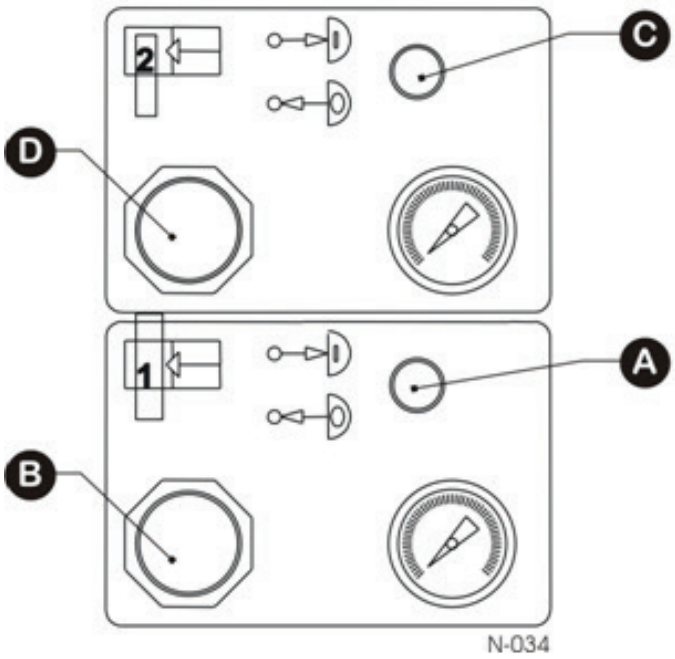


FIG. 5.9

h) Check that all safety and protection equipment is present and operational.

i) Make sure that any valves and parts of the system downstream from the homogenizer are open to prevent overpressure in pipes when the homogenizer is started.

6. Operation and use

Contents

6.1 Operator's responsibilities

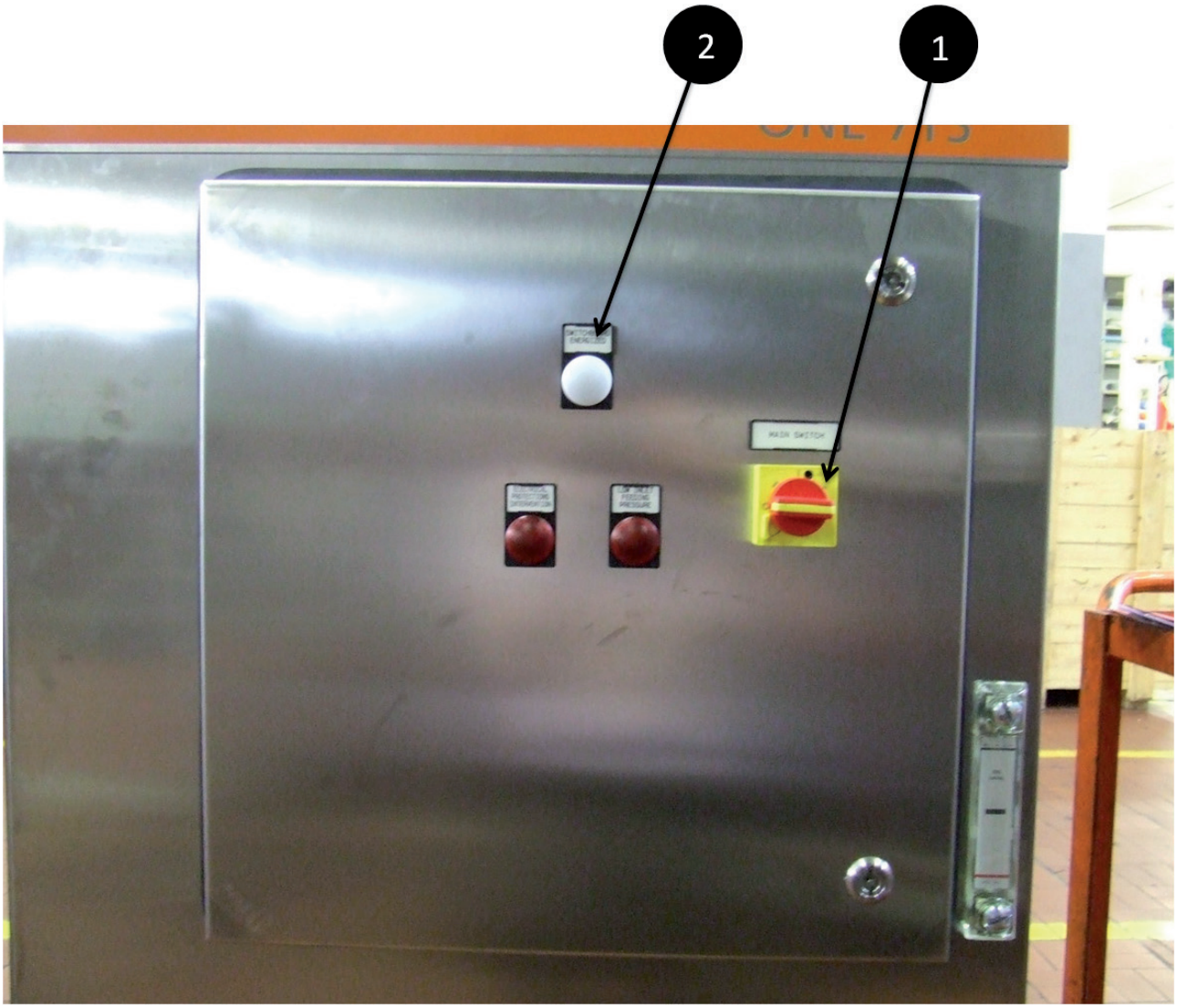
While the machine is working, the operator must:

A) Operate the machine in compliance with the provided safety equipment. Checking:
- the position of the safety equipment;
- observance of individual safety regulations.

B) Check that the work cycle is perfectly efficient, for maximum productivity. Checking:
- the condition and operation of the machine's major assemblies;
- that the work parameters are optimal;
- that all material prepared for the work is uniform.

6.2 Electrical enclosure and control panel

The machine may be fitted with an electrical enclosure supplied by **GEA Niro Soavi S.p.A.** or provided by the Client.
To know the real structure of the machine please refer to the TECHNICAL INFO SHEETS attached to Chapter 11 of this manual.
If the electrical enclosure is supplied by **GEA Niro Soavi S.p.A.** it will be shown in the wiring diagrams, which are also enclosed with chapter 11.
In either case, the electrical enclosure is equipped with two important devices which enable the operator to run the Startup or set the machine in Maintenance mode.
These devices are represented in the example figure shown below.



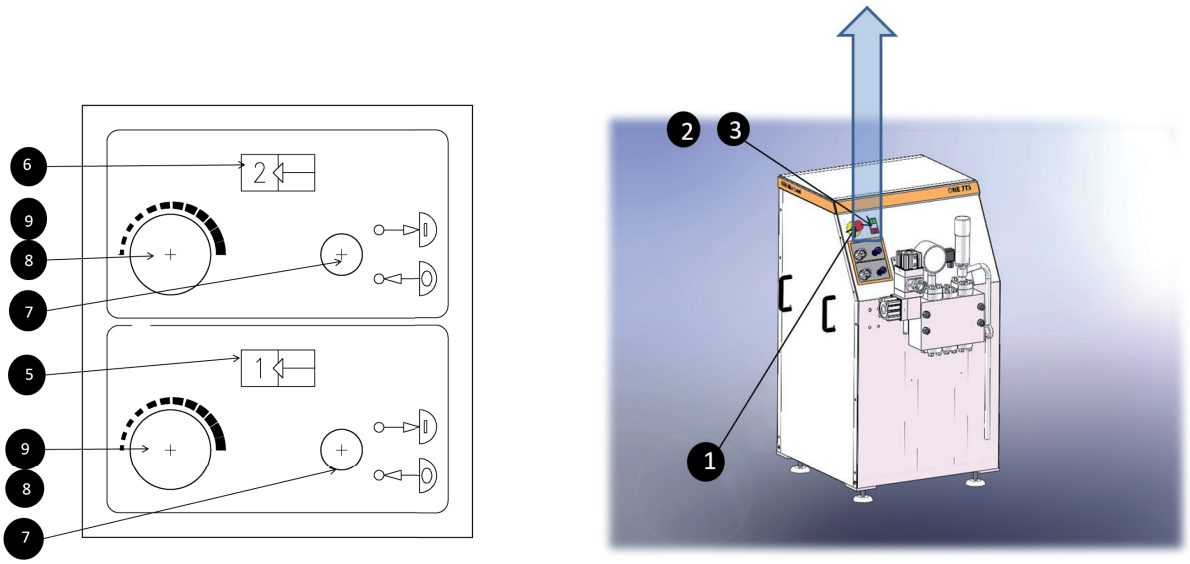
CONTROL ELECTRICAL ENCLOSURE (EXAMPLE)
FIG. 6.1

Pos.	Description	Function
1 (QF)	Master power switch	Turns on power to the machine
2 (HL-L)	Indicator lamp	Indicates that the electrical enclosure is live

6.2.1 Control Panel on the machine

The control panel is on the front of the machine.
There is just one panel for the various languages and it bears the symbols and instruments for controlling the machine (see fig. 6-2), specifically:

- Emergency Stop button **(1)** to stop the machine immediately in an emergency
- Start **(2)** and Stop **(3)** buttons.
- Pneumatic controls for adjusting the stage 1 and 2 homogenization pressure (pos. **(5)** in the first case, pos. **(6)** in the second case), comprising a pneumatic switch for turning the pressure on or off **(7)** and an associated pneumatic regulator **(8)** with the function of increasing or decreasing the pressure.
- Pressure gauges to control the pressure of the air **(9)** sent to the pneumatic head to reach the homogenizing pressure.



CONTROL PANEL
FIG. 6.2

6.3 Startup procedure

6.3.1 Position of operator

To operate the machine safely, the operator must stay in the position shown below when starting up and adjusting the machine.
The control panel **(1)** is on the front of the machine and is configured to the client's specifications; the EMERGENCY STOP BUTTON is always present.

CAUTION:
Scrupulously stay in the area in front of the machine to permit immediate access to the emergency stop button and any start/stop/adjustment controls.

Before starting the startup procedure, run the following checks:
1. Check that all guards on moving parts are closed
2. Check that the emergency stop button is released

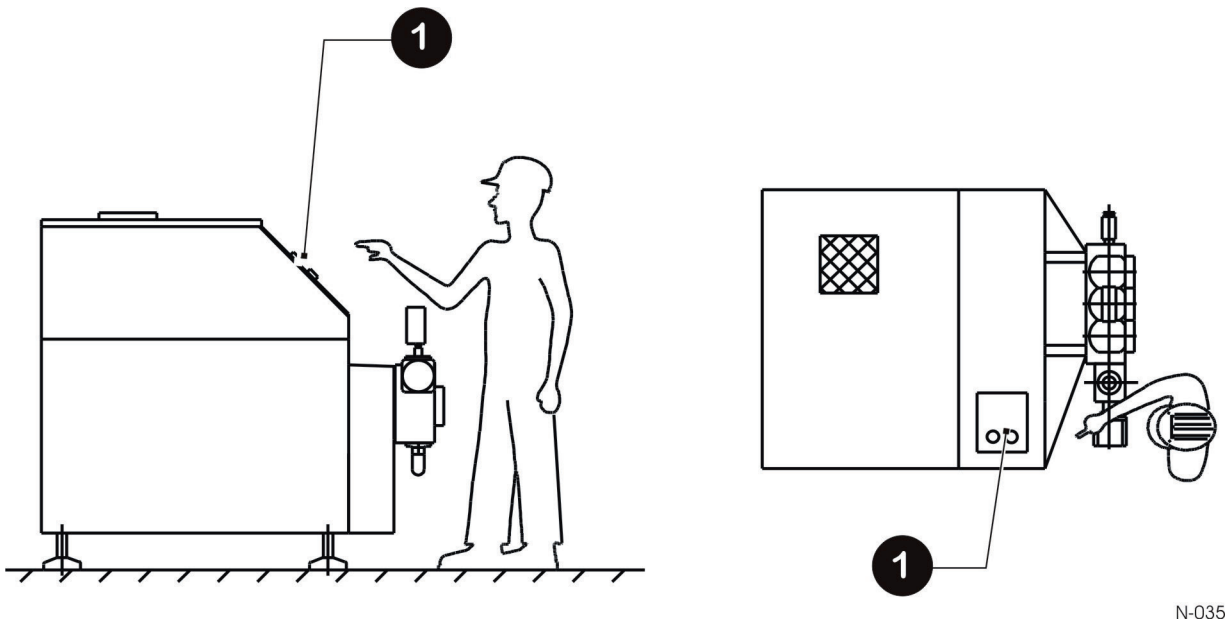


FIG. 6.3

6.3.2 Startup

CAUTION:
The lubrication oil indicated in the specifications is suited to operating temperatures in the range +5°C to +40°C: DO NOT START THE MACHINE UP if the ambient temperature is lower than +5°C, as this can lead to failure of the lubrication system.
Contact the GEA Niro Soavi S.p.A. Service Department who will provide the correct lubricant for your operating conditions.

CAUTION:
Do not start the machine up if the ambient temperature is less than +5°C before checking the condition of the piston lubrication water circuit and the water heat exchangers (if present).

Once all preliminary checks have been completed, the machine can be started as follows:

1) Open all auxiliary service check valves (water, air, steam) and adjust the flow rates if necessary (such adjustments are normally done at the factory when testing the machine)

CAUTION:
NEVER start the machine with no pumping piston lubrication water or the seal packs and the pistons will be seriously damaged.

CAUTION:
Excess cooling water can flood the sump or spurt onto the guide pistons, thus allowing water to enter the transmission casing. It is therefore important to keep the water flow under control after adjusting it to an approximate flow rate of at least 30 l/h per piston. Regularly drain the lubrication circuit to drain out any water in the oil.

2) Feed the machine with product observing the flow rate and pressure stated in the TECHNICAL SPECIFICATIONS enclosed with chapter 11 of this manual.

CAUTION:
Feeding product at a pressure lower than that specified can cause CAVITATION which makes an unmistakable noise in the compression head and can seriously damage the entire machine. GEA Niro Soavi S.p.A. shall not be liable for any breakage, malfunction or damage to the machine caused by CAVITATION even if this occurs during the 12 month warranty period.

3) Power up using the main switch on the electrical enclosure.

4) Press the start button. If the electrical enclosure is supplied by **GEA Niro Soavi S.p.A.**, this starts the machine in the right sequence for the machine in question and optional equipment present:
   - open service solenoid valves (optional);
   - start main motor.

If the electrical enclosure is provided by the client, the correct starting sequence is specified (see TECHNICAL DATASHEETS enclosed with Chapter 11 of this manual) and must be scrupulously followed.

6.3.3 Operation and adjustment

Once the machine has been started, without increasing the homogenizing pressure, check that the machine itself is operating normally, with particular attention paid to the feed pressure, establishing it is stable and within the limits as prescribed in the TECHNICAL SPECIFICATIONS enclosed with chapter 11 of this manual.
It is now possible to use the adjustment controls to obtain the desired homogenizing pressure via the control system.
Check there is the second homogenization stage, consulting the TECHNICAL SPECIFICATIONS attached to Chapter 11 of this manual.

6.3.3.1 Regulating the homogenizing pressure - 1 stage

This type of adjustment uses a servo-system that, via a pneumatic cylinder, acts on the position of the homogenizing valve to determine the homogenizing pressure.
On the front panel of the machine (see figure 6-4 below) there is a pneumatic switch (A) and a pressure reducer (B).
The adjustment operations are as follows:

- check that the pressure reducer (B) is completely slackened
- pull the pneumatic switch onto ON;
- turn the reducer knob to obtain the desired homogenizing pressure that can be detected with the pressure gauge located on the head.

CAUTION:
Slowly turn the pressure regulator checking the homogenizing pressure actually increases up to the working value.

CAUTION:
Check the increase in air pressure on the pneumatic head with the pressure gauge installed on the control panel; this enables verifying the slow increase in the homogenizing pressure. In addition, it is possible to use the air pressure gauge as a reference should the pressure gauge of the head not work correctly.

Once the homogenizing pressure has been set on the desired value it is possible to lock the reducer knob (B) by pressing it.

If the set pressure is normally used in production, it is possible to cut homogenizing pressure in and out using ONLY the pneumatic selector switch (A), leaving the reducer locked in the adjustment position.

CAUTION:
This procedure is permitted ONLY for machines with an operating pressure of up to 250 bar, to avoid over-straining the machine and increasing the pressure too quickly, which can cause the pressure relief valve to open.

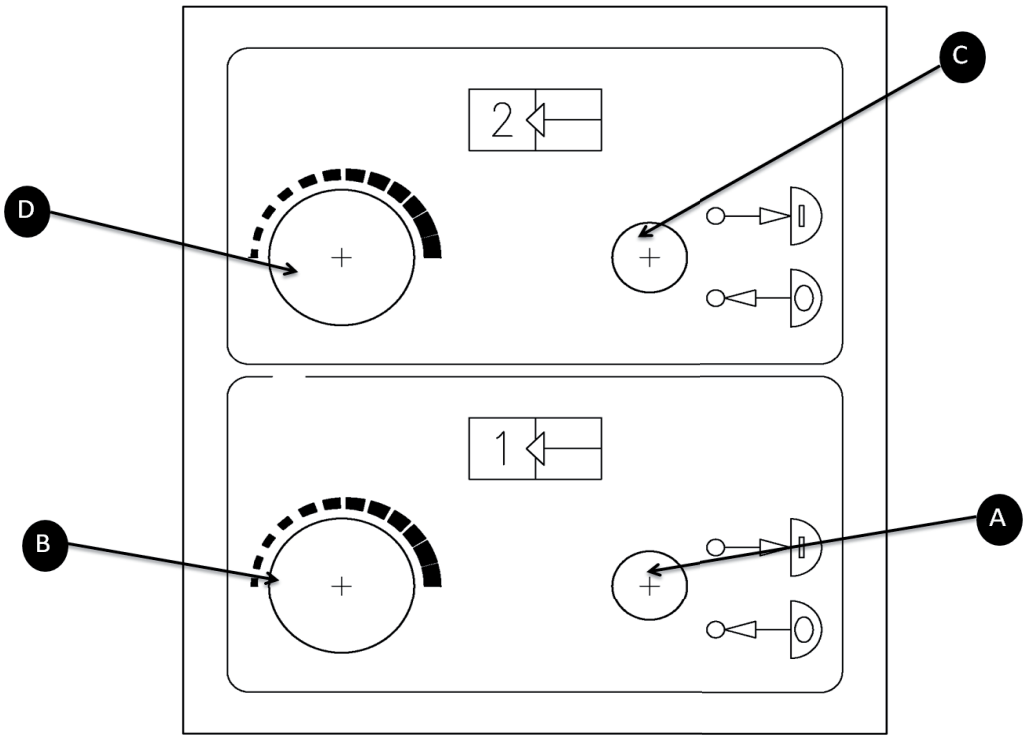


FIG. 6.4

FIG. 6.5

6.3.3.2 Regulating the homogenizing pressure - 2 stages

Nevertheless, for the adjustment procedure you must read paragraph 6.3.3.1, especially the warnings.

The pressure to be applied via the second stage corresponds to 1/10 of the maximum homogenization pressure.

CAUTION:
The intended homogenizing pressure value must be set FIRST on stage 2, THEN on stage 1 to reach the total desired pressure.
A different operating sequence may result in SERIOUS RISK because the machine may inadvertently and suddenly reach higher pressure values than those for which the machine is designed.

The adjustment operations are as follows:
- check that the pressure reducer **(B, D)** is completely slackened
- pull the pneumatic switch of the second stage **(C)** onto ON;
- turn the reducer knob of the second stage **(D)** to obtain the desired homogenizing pressure that can be detected with the pressure gauge.
- pull the pneumatic switch of the first stage **(A)** onto ON;
- turn the reducer knob of the first stage **(B)** to obtain the desired homogenizing pressure that can be detected with the pressure gauge.

CAUTION:
The pneumatic adjustment system on purpose has a certain inertia in order to allow increasing the pressure slowly and gradually.
Slowly turn the pressure regulator checking the homogenizing pressure actually increases up to the working value.

Once the homogenizing pressure has been set on the desired value it is possible to lock the reducer knob (B) by pressing it.
If the set pressure is normally used in production, it is possible to cut homogenizing pressure in and out using ONLY the pneumatic selector switch **(A)**, leaving the reducer locked in the adjustment position.

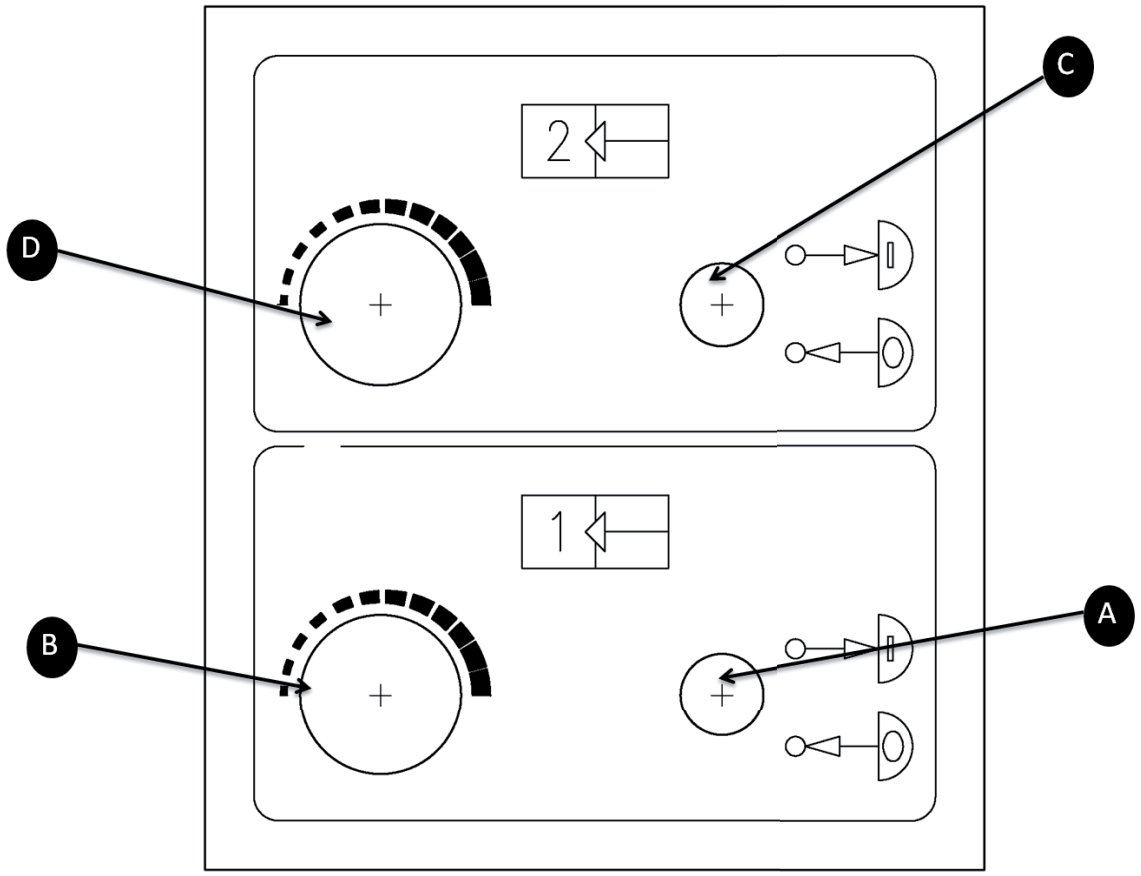


FIG. 6.5

CAUTION:
This procedure is permitted ONLY for machines with an operating pressure of up to 250 bar, to avoid over-straining the machine and increasing the pressure too quickly.

CAUTION:
To release homogenizing pressure in a two-stage system you need to reverse the procedure used to add pressure.
Therefore first release pressure from the 1st stage and then from the 2nd stage.

6.4 Stopping the machine

In order to ensure safety for the operator, the electrical system is designed to handle NORMAL and EMERGENCY STOPS.

6.4.1 Normal stop

The machine is stopped as follows:
- cut off the homogenizing pressure with the pneumatic switch, turning it OFF;
- press the stop button (if present on the machine's control panel) or produce a stop signal with the control and command system. For machines with electrical enclosure supplied by **GEA Niro Soavi S.p.A.** this stops the auxiliary motors (if present) and main motor in the right sequence, which is given in the TECHNICAL DATASHEETS enclosed with Chapter 11 of this manual for the client's use in building his own electrical cabinet if not supplied by **GEA Niro Soavi S.p.A.**;
- shut off power with the master power switch.

6.4.2 Emergency stop

In cases of danger or serious malfunction, you can stop the machine immediately by pressing the emergency stop button on the front panel (see figure below).
Then shut off the pressure as described above.

CAUTION:
Before restoring the machine's operability, eliminate the cause of the emergency stop.

CAUTION:
Resetting the emergency stop button does not start the machine, but enables it for starting in the normal manner.

EMERGENCY STOP
FIG. 6.6

6.5 Washing

Proper washing keeps the machine clean, sanitary or aseptic as required to prevent degradation and contamination which may damage the product itself.
Parts in contact with the product are designed for ease of washing and cleaning (C.I.P.) with a minimum number of stagnation points.
However, we recommend the following:

- Wash the machine IMMEDIATELY after production, not allowing the product to remain stationary inside the machine, nor leaving it empty but unrinsed, as this will allow a film to deposit on its internal walls;
- Depending on the product, the wash may require hot water or acid/base solutions, of the types and compositions indicated in the table on the next page;
- The final rinse must be abundant, so as to completely neutralise any trace of chemical solution;
- If the solutions are obtained from concentrated or powder products, prepare them separately and make sure they dissolve completely to prevent lumps or solid particles remaining in the preparation.

Run the wash in a closed cycle (C.I.P.), with the machine running and homogenization pressure zero. This prevents wasting electrical power and damaging the homogenization valve.

CAUTION:
For machines with variable or multiple flow rates, run the wash at the maximum allowed speed, but no greater than 20% over the maximum operating speed (see Section 1 – TECHNICAL SPECIFICATIONS).

CAUTION:
ONLY use solutions of the following products.
Even trace amounts of CHLORINE and IODINE ions, at high temperatures and pressures, can be very damaging to the materials used to build the machine, since they can result in stress corrosion which leads the entire structure to fail unexpectedly in a very short time.

PRODUCT	max concentr. (%)	max temp. (°C)
Caustic soda (NaOH)	3	90
Nitric acid (HNO_3)	1	70
Phosphoric acid (H_3PO_4)	3	85
Boiling water	-	90
Superheated water/steam	-	150

CAUTION:
Dispose of washing waste product and rinsing water properly according to local legislation.

6.6 Checks after starting up the machine

After the first day's work, run a general check on the machine.

- Check that the machine does not make any abnormal noise such as scraping metal or vibration.
- Check that after the first processing there is no slackening of the screws due to settling in.

7. Maintenance

Contents

7.1 General Information

7.1.1 Definition of STAFF RESPONSIBILITIES

It is mandatory to assign maintenance tasks in compliance with the duties described below.

The manufacturer declines all responsibility in the event that these instructions are disregarded.

RESPONSIBILITIES of the operator assigned to running the machine  **(operator)**

The operator is authorised solely to use the controls and instruments mounted on the instrument panel and control panel.
The operator must not carry out any other operations on the mechanical and electrical equipment.
In particular it is prohibited to:

- remove the mechanical components and access the internal parts
- open the electrical enclosures and access the equipment installed in them
- remove the protections of live parts installed on the machine, such as: terminal block covers on junction boxes, etc., valve covers and local electrical enclosures.

All these operations are the responsibility of the maintenance technicians and electricians.

RESPONSIBILITIES OF THE ELECTRICIAN AND MAINTENANCE TECHNICIAN  

The technician has adequate training and specific experience, and is involved in the maintenance of the machine and of the electrical system. He/she is responsible for the key that provides access to live parts.
The maintenance technician is responsible for resetting devices and safeguarding and also carrying out repairs on the machine within the limits and according to the procedures prescribed in the manual.

 **CAUTION:**
New components replacing faulty ones must have the same technical characteristics and the same performance; if there are safety components, they must be certified and belong to the same class as the original replaced components.

The setting of new components must be carried out adopting the same values already used in setting the replaced component.

Any changes to the machine and complex repairs must be agreed with **GEA Niro Soavi S.p.A. CUSTOMER SERVICE.**

The manufacturer declines all responsibility in the event that these instructions are disregarded.

7.2. Directions for correct maintenance

7.2.1 For proper maintenance:

Use only original spare parts, with tools fit for the purpose and in good condition.

Adhere to the job frequencies outlined in the manual for preventive and periodic maintenance; the interval (indicated in time or in work cycles) between one job and another is to be construed as the maximum and must not be exceeded. If required, this interval can be shortened.

Correct preventive maintenance requires constant attention and continuous supervision of the machine. Promptly verify the cause of any abnormalities such as excessive noise, overheating, fluid leaks, etc. and remedy it.

If in doubt, consult the manufacturer.

To carry out maintenance correctly, refer to the documents provided in the Appendix such as:

1) - Functional diagrams of the electrical and subsidiary equipment, with details of power connections.

2) - List of possible cases of failure and recommended solutions (Chapter 8 of the manual).

7.2.2 Maintenance plan

From a construction point of view, jobs relate to mechanical, electrical, (fluidic) parts.
For practical reasons, planned jobs are grouped according to criteria of time and complexity. Each job or group of jobs can then deal with mechanical, electrical, (fluidic) aspects.

Routine maintenance is divided into two categories:

- **planned routine maintenance** (or preventive maintenance).
- **condition-based routine maintenance**.

Planned routine maintenance (also called periodic or preventive maintenance) includes inspections, checks and jobs to prevent stoppages and faults by keeping under systematic control:
- the lubrication state of the machine
- the state of parts subject to wear.

Condition-based routine maintenance instead relates to machine components that are not subject to periodic checks and wear classifiable a priori. They must be checked or replaced according to their state.

CAUTION:
All jobs must however be assigned to qualified technicians and always require maintenance shutdown of the machine, that is with the **MACHINE STOPPED** and the disconnecting switch **LOCKED** (with a padlock) **OFF**, for the safety of staff.

CAUTION:
Personnel who are unaware of the information contained in this manual, which should be

distributed to all operators, must not be allowed to use the machine, access its internal parts or carry out maintenance on it.

CAUTION:
The only operations allowed are those described in these INSTRUCTIONS; for other reactive maintenance operations contact the GEA Niro Soavi S.p.A. Service Department.

In the following points the lists of jobs are indicated first, divided by category.
These are followed by descriptions and illustrations of the jobs, with all corresponding warnings.

7.3 Safety, precautions and maintenance shutdown

7.3.1 General safety warnings

The safety of the machine and of the operator is also dependent on regular maintenance performed according to the instructions in this manual.

Scheduled and reactive maintenance work must be assigned exclusively to skilled technicians,   qualified in accordance with the criteria set out in the introduction to this instruction manual.

CAUTION

- **ELECTRIC SHOCK RISK by direct contact with the electrical enclosure and the machine power cable. It is prohibited to open the enclosure when the system is live;**

- **AFTER EVERY MAINTENANCE JOB IT IS ALWAYS NECESSARY TO REFIT AND REACTIVATE PROTECTIONS that have been removed or disabled in order to carry out the job.**

CAUTION
All maintenance operations must be undertaken in accordance with the procedures described in Section 7.3.3, "maintenance shutdown".

7.3.2 Safety symbols

The symbols listed below indicate the warnings that maintenance technicians MUST adhere to during maintenance operations.

Restrictions


Access restriction for unauthorised persons.


The use of naked flames is prohibited


Lubrication, repairs or adjustments are prohibited while in motion


Removal of safety devices is prohibited


Smoking is prohibited.


Extinguishing with water is prohibited.

Types of inspection and job


Visual inspection.


Lubrication with oil.


Audible inspection.


Lubrication with grease.


Working with tools.

Personal protective equipment


Protective helmet must be worn.


Overalls must be worn.


Protective gloves must be worn.


Ear defenders must be worn.


Protective goggles must be worn.


Protective face mask must be worn.


Safety boots must be worn.

7.3.3 Maintenance shutdown

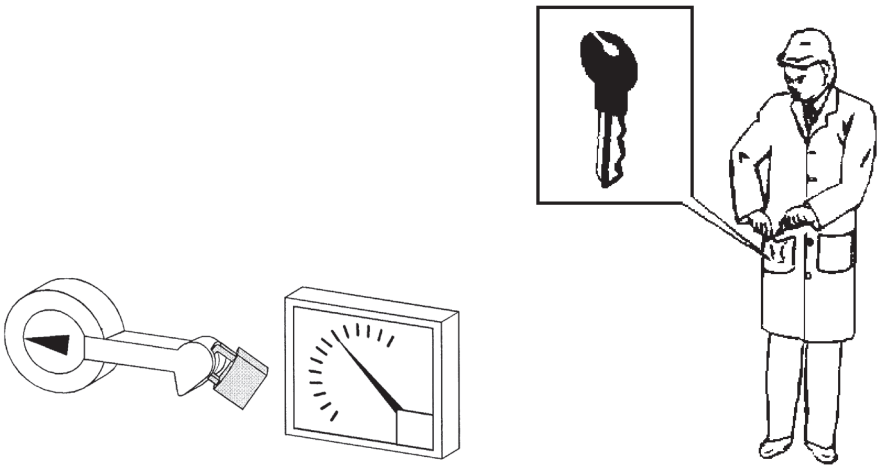
Before performing any maintenance operation, the machine must first be disconnected from the power line, taking the necessary measures to avoid the risk of accidental starting and/or electric shock.
This condition is achieved by the procedure for maintenance shutdown.

WARNING:
For this procedure, in the event that GEA Niro Soavi S.p.A. does not provide the electrical cabinet, refer to the customer's instructions.

PROCEDURE FOR MAINTENANCE SHUTDOWN

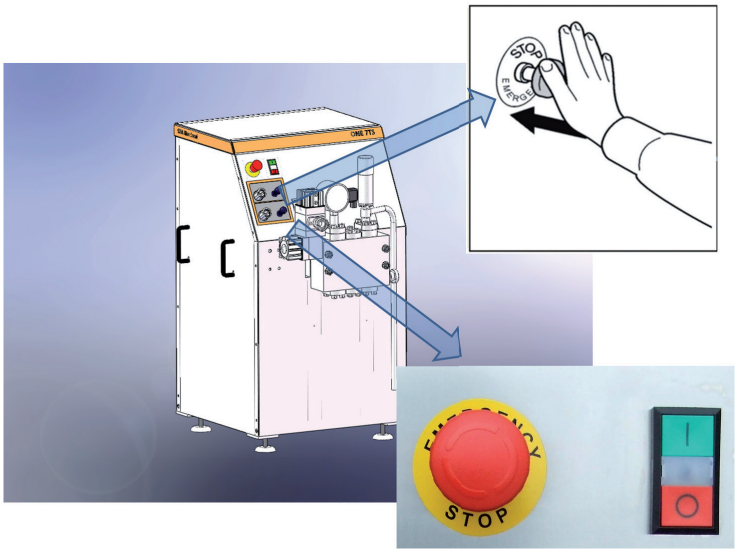
Maintenance shutdown must be carried out by a Qualified Technician according to the following procedure:

- The mains switch on the electrical cabinet must be set to position “0” (OPEN); it must then be locked in that position using the padlock.
- The key to the padlock is removed and kept by the responsible maintenance technician for the entire duration of the job.



PUT THE PADLOCK ON THE MAIN SWITCH AND
FIG. 7-1

- The emergency button on the control push-button panel must be pressed as shown in the figure



PRESS THE EMERGENCY STOP BUTTON
FIG. 7-2

HANG A WARNING SIGN ON THE MACHINE INDICATING THE STATUS OF THE MACHINE

FIG. 7-3

WARNING
Remove the sign at the end of work

7.4 Maintenance during running-in period

The machine has been tested and checked on the manufacturer's premises, therefore it is deemed to be ready for commissioning.

However, on the Customer's premises, all of the following running-in activities must be carried out:

Sheet No.	Maintenance frequency	Job location	Activity
00-[a] **00-[b]**	After 50 hours of the running-in period	**Machine in general**	- Check for presence of abnormal noise and vibrations - Check protections and safety devices
F [a]	**After 500 hours of the running-in period**	**Lubrication system**	- Check and top up the oil level if needed
L [a]	**After 200 hours of the running-in period**	**Drive**	- Check belt tension

7.5 Planned routine maintenance during operation

7.5.1 General Information

Below are the tables and descriptions of periodic maintenance activities that should be carried out to ensure the efficient and safe maintenance of the machine.
The values apply to normal use of the machine; heavy-duty operating conditions or particularly abrasive/aggressive products may significantly reduce the service life of certain parts, which therefore require more frequent checking.
In the event of malfunction of the machine or abnormal noise, it is advisable to identify the components that may be the cause of the noise and ensure that they are correctly installed and suitably tightened, replacing any worn parts as needed.

WARNING:
The following Periodic Maintenance tables refer to normal operating conditions but in no way constitute a guarantee as to the minimum life of the consumable components mentioned, only an indication of the average life.
Special conditions, such as high operating pressures, steam sterilisation and frequent washing, as well as incorrect operating procedures, can significantly affect the life of the machine and its components, therefore the intervals for maintenance of the compression head components vary considerably.
Routine maintenance is normally performed at the following intervals:

Daily inspection (every 8 hours)
Daily inspection of the machine is intended to identify any abnormalities. It may be performed by a maintenance technician or delegated to the operator.

Check (every 40 hours)
Check (every 160 hours)
Check (every 1500 hours) (*)
Check (every 3000 hours) (*)
Check (every 4500 hours) (*)
Check (every 5000 hours) (*)
Check (every 6000 hours) (*)
Check (every 7500 hours) (*)
Check (every 9000 hours) (*)
Check (every 10500 hours) (*)
Check (every 12000 hours) (*)
Check (every 13500 hours) (*)
Check (every 15000 hours) (*)

(*) These general checks on the mechanical parts must be performed during the "**Planned**" stoppage of the machine to allow the checking and any overhaul and cleaning and/or replacement of the components.

The symbols in this manual include the following information:
- job frequency;
- resources and tools required;
- estimated time required to perform the job;

7.6 Frequency of maintenance work

SHEET	Job location	After running in	Each start-up	After each maintenance job	In the event of failure or malfunctioning	Every 40 hours	Every 100 hours	Every 200 hours	Every 500 hours	Every 1500 hours	Every 3000 hours	Every 5000 hours
00	**Machine in general**											
00-[a]	Checking for noise and vibrations		•									
00-[b]	Checking protections and safety devices		•									
00-[c]	Tightening nuts and stud bolts	•		•				•				
A	Compression head											
A[a]	Visually check for seal and gasket leakage		•									
A[b]	Replace pumping piston gaskets				•							
A[c]	Check on tightness of pumping piston nuts	•		•				•				
A[d]	Check wear and if necessary renew the pumping pistons									•		
A[e]	Check and if necessary renew the pumping valves									•		
A[f]	Renew the pumping valves		•									
A[g]	Visually check for leakage from the packings and from the gaskets of the head									•		
B	**Stage 1 Homogenizing Unit**											

SHEET	Job location	After running in	Each start-up	After each maintenance job	In the event of failure or malfunctioning	Every 40 hours	Every 100 hours	Every 200 hours	Every 500 hours	Every 1500 hours	Every 3000 hours	Every 5000 hours
B[a]	Check / renew homogenizing valves								•			
C	**Head pressure gauge**											
C[a]	Check state and operation									•		

SHEET	Job location	After running in	Each start-up	After each maintenance job	In the event of failure or malfunctioning	Every 40 hours	Every 100 hours	Every 200 hours	Every 500 hours	Every 1500 hours	Every 3000 hours	Every 5000 hours
D	**Head safety valve**											
D[a]	Check operation				•							
D[b]	Calibrate											•
E	**Manifold unit**											
E[a]	Check gaskets									•		
F	**Lubrication system**											
F[a]	Change oil	500								•		
F[b]	Check and top up oil level		•									
	top up oil level											
G	**Water system**											
G[a]	Clean/replace filters									•		

SHEET	Job location	After running in	Each start-up	After each maintenance job	In the event of failure or malfunctioning	Every 40 hours	Every 100 hours	Every 200 hours	Every 500 hours	Every 1500 hours	Every 3000 hours	Every 5000 hours
G[b]	Check the piston lubrication water pipes and check the water flow rate		•									
H	**Pneumatic plant**											
H[a]	Clean/replace filters				•							
I	**Transmission body**											
I[a]	General check of components				•							
L	**Drive**											
L[a]	Check tension and service belts					•					•	
L[b]	Check tightness of the transmission elements										•	
L[c]	Check belt wear and tension and renew if necessary				•						•	

SHEET	Job location	After running in	Each start-up	After each maintenance job	In the event of failure or malfunctioning	Every 40 hours	Every 100 hours	Every 200 hours	Every 500 hours	Every 1500 hours	Every 3000 hours	Every 5000 hours
L[d]	Checking pulley alignment			•								
M	**Housing**											
M[a]	General visual check											•
N	**Electrical system on the machine**											
N[a]	Checking the electrical system on the machine										•	

When (hours)	*Description of the maintenance tasks performed*	*Mach. hrs.*	*Operator*	*Date*

7.7 Maintenance sheets

The sheets attached below are instructions for Operators concerning proper and timely machine maintenance.

They provide the Operator  and the Maintenance technicians   with procedures and suggestions for keeping the machine **efficient and productive** at all times.

 **CAUTION:**
The maintenance sheets and the description of the various maintenance activities contain instructions relating to **"SAFETY"** requirements that each Operator **MUST COMPLY WITH.**

SHEETS INDEX	
SHEET	**Job location**
00	**Machine in general**
00-[a]	Checking for noise and vibrations
00-[b]	Checking protections and safety devices
00-[c]	Tightening nuts and stud bolts

SHEET 00[a]
GENERAL MACHINE - **Check noise and vibration**

RESOURCES AND TOOLS  **: OPERATOR/MAINTENANCE TECHNICIAN**

JOB FREQUENCY : BEFORE EACH START-UP

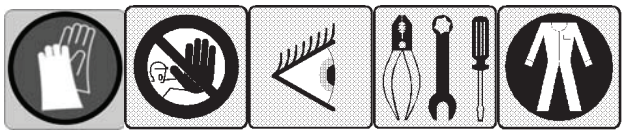
TIME REQUIRED : 5 MINUTES

DESCRIPTION:

In the event of malfunction of the machine or abnormal noise, it is advisable to identify the components that may be the cause of the noise and ensure that they are correctly installed and suitably tightened, replacing any worn parts as needed.
If the problem persists despite the work done by the maintenance technician, contact the **GEA Niro Soavi S.p.A.** Service Department.

FIG. 7-4

SHEET 00[b]
GENERAL MACHINE - **Check protections and safety devices**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS : **OPERATOR**

JOB FREQUENCY : **BEFORE EACH START-UP**

TIME REQUIRED : **5 MINUTES**

DESCRIPTION:
Carefully check that the protections and accident-prevention devices are correctly installed and in good working order.

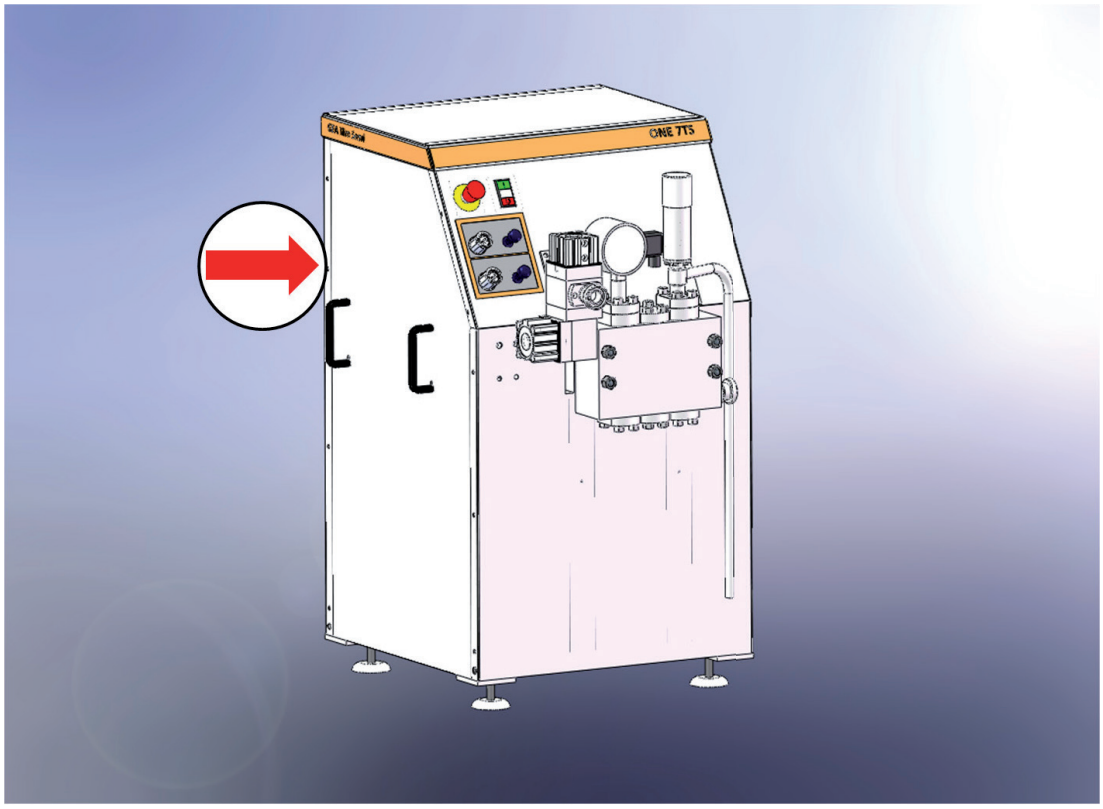
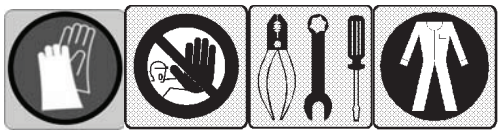


FIG. 7-5

SHEET 00[c]
GENERAL MACHINE - **Tighten nuts and stud bolts**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS : **OPERATOR/MAINTENANCE TECHNICIAN**

JOB FREQUENCY : **BEFORE THE INITIAL START-UP + EVERY 200 HOURS + AFTER EACH MAINTENANCE JOB**

TIME REQUIRED : **30 MINUTES**

DESCRIPTION:

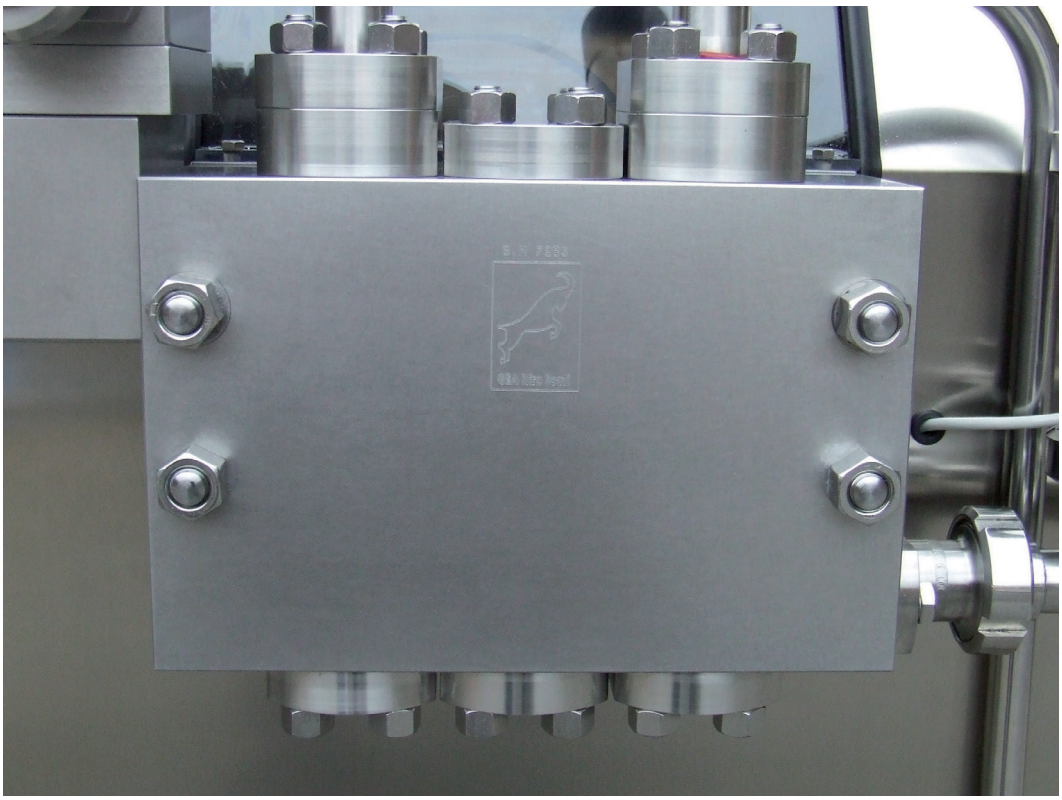
CAUTION:
For safety reasons it is absolutely forbidden to replace the stud bolts in the high pressure head with non original spare parts, which might not be suitable for the stress applied and could cause severe risks for persons.

As indicate in the table "FREQUENCY OF MAINTENANCE WORK" in paragraph 7.6, check the tightness of screws and bolts, bearing in mind that all the stud bolts on the compression head are subject to pulsating fatigue stress and so, as well as being made of special high-resistance materials and with an accurate processing cycle, they require specific tightening of the nuts according to the values shown in the following Table.
It is also necessary to check the tightness of screws and bolts frequently to avoid their working loose.
GEA Niro Soavi S.p.A. supplies all the wrenches necessary for the nuts fitted on the machine in the Maintenance Kit.
It is suggested to use a torque wrench (not supplied) to check the tightening torques as specified in the table.

stud bolt dimensions	Type of wrench	tightening torque (n*m)	tightening torque (lb.*ft.)
M 8	WRENCH 13	8 ÷ 10	6 ÷ 8
M 10	WRENCH 17	15 ÷ 20	11 ÷ 15
M 12	WRENCH 19	25 ÷ 30	19 ÷ 22
M 16	WRENCH 24	60 ÷ 70	44 ÷ 52
M 20	WRENCH 30	120 ÷ 140	89 ÷ 104
M 24	WRENCH 36	210 ÷ 230	155 ÷ 170
M24x2	WRENCH 36	235 ÷ 260	174 ÷ 192
M 27	WRENCH 41	310 ÷ 340	229 ÷ 251
M27x2	WRENCH 41	350 ÷ 390	258 ÷ 288
M 30	WRENCH 46	410 ÷ 450	304 ÷ 332
M 33	WRENCH 50	560 ÷ 600	413 ÷ 445
M33x2	WRENCH 50	635 ÷ 680	469 ÷ 502
M39	WRENCH 60	880 ÷ 960	650 ÷ 709

TABLE 00.1

SHEETS INDEX	
SHEET	**Job location**
A	**Compression head**
A[a]	Visually check for seal and gasket leakage
A[b]	Replace pumping piston gaskets
A[c]	Check tightness of pumping pistons and nuts
A[d]	Check wear and if necessary renew the pumping pistons
A[e]	Check and if necessary renew the pumping valves
A[f]	Visually check for leakage from the packings and from the gaskets of the head
A[g]	Check and if necessary renew the pumping valve seats



SHEET A
COMPRESSION HEAD

GENERAL INFORMATION

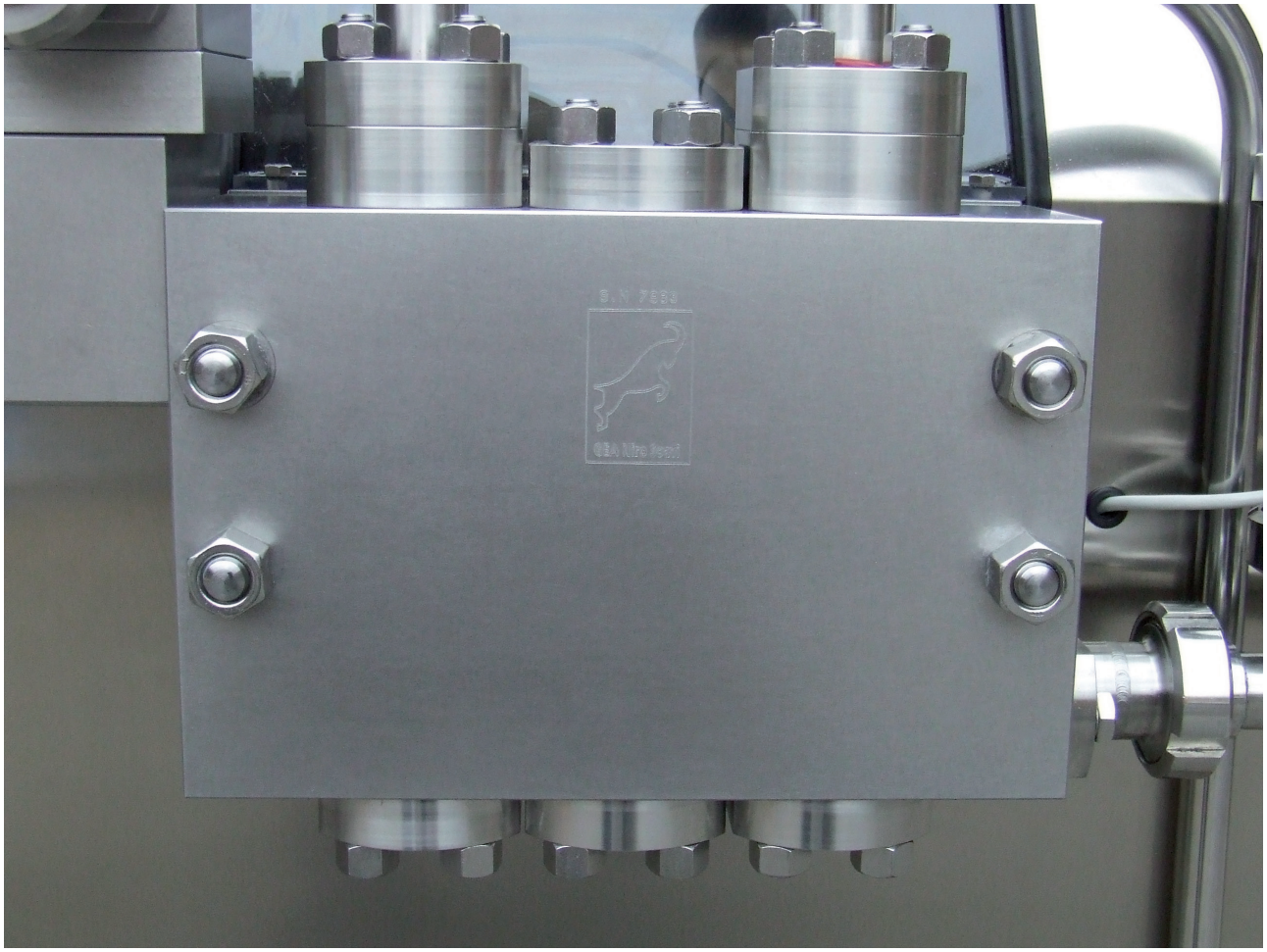
CAUTION:
All maintenance on the compression head should be carried out after maintenance shutdown of the machine as described in paragraph 7.3.3 of this manual.

CAUTION:
Maintenance operations on the head require the disassembly of components secured by means of studs and nuts.
After refitting the disassembled components the studs and nuts must be tightened to the torque values indicated in SHEET 00[c], to prevent abnormal stresses that limit their strength.

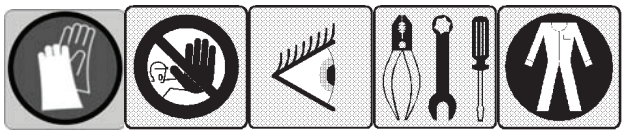
Before giving a description of compression head maintenance operations, it is important to remember that couplings in high pressure seal areas are made with O-rings, made of synthetic material, suitable for contact with the products handled and capable of withstanding the temperatures reached by the machine.

It is good practice to replace seals not only in the case of obvious leakage or damage, but also whenever performing maintenance that requires them to be removed.
Gaskets must be fitted after lubricating them with food-grade petroleum jelly or another suitable lubricant, without using sharp tools that may damage them. Forced or incorrect fitting may shorten the life of the gaskets and damage the seal.

For identification and positioning of gaskets see the drawings for disassembly of the compression head and its components, and the component lists contained in the SPARE PARTS CATALOGUE attached to chapter 10 of these instructions.



SHEET A[a]
COMPRESSION HEAD - **Visually check for seal and gasket leakage**



CAUTION:
These activities should be carried out while the machine is in operation. Exercise extreme caution

RESOURCES AND TOOLS **: OPERATOR**

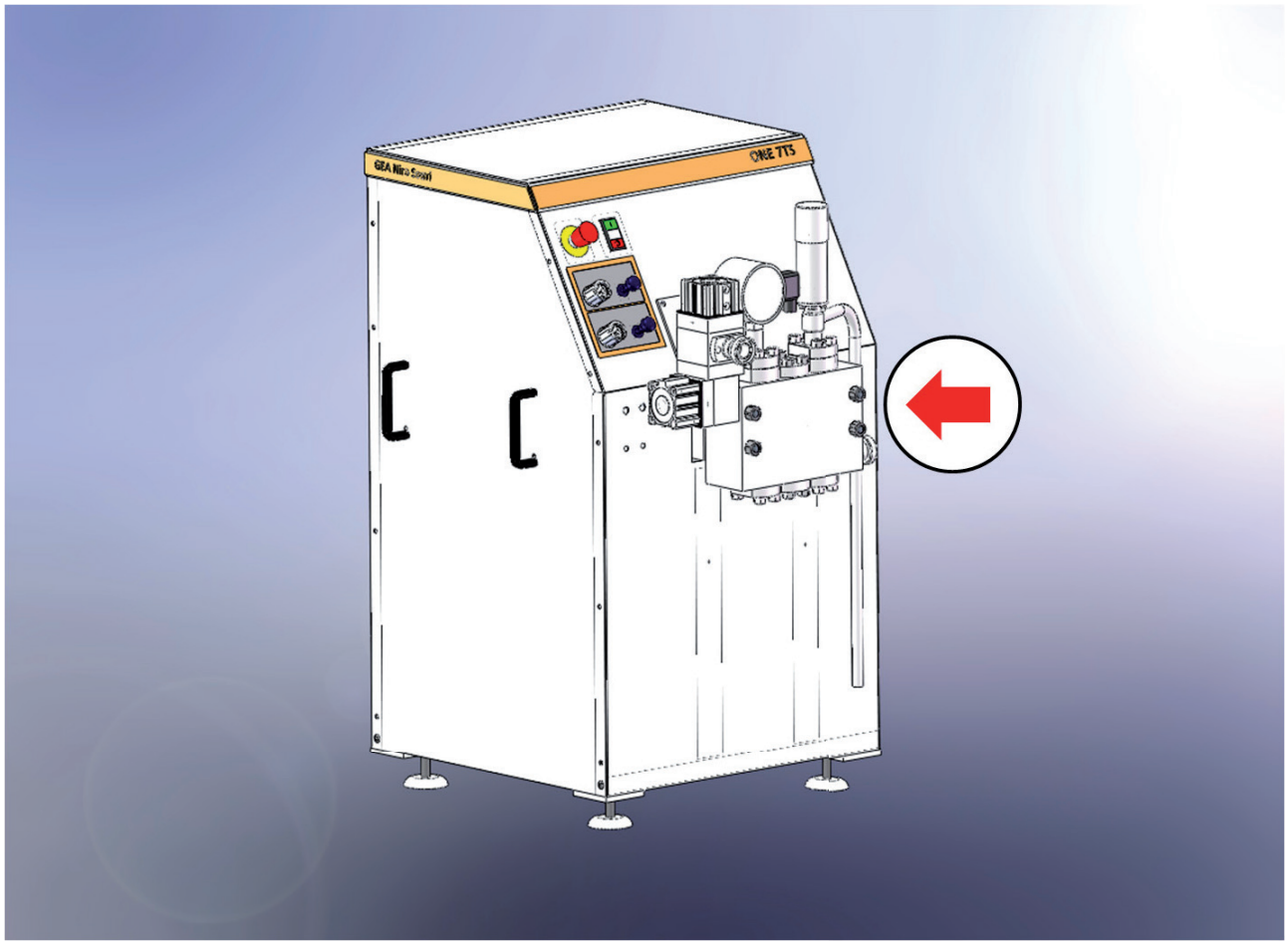
JOB FREQUENCY **: AT EACH START-UP**

TIME REQUIRED **: 5 MINUTES**

DESCRIPTION: **VISUAL CHECK**

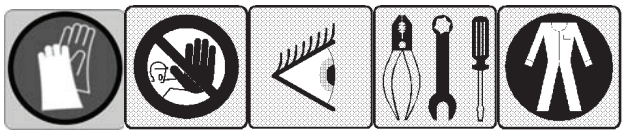
To visually check for leakage from seals and gaskets proceed as follows:

- while the machine is in operation, check that no product is present/leaking in the contact zones between the various head components



LOCATION OF THE WORK
FIG. 7-6

SHEET A[b]
COMPRESSION HEAD - **Replace pumping piston gaskets**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS	**: MAINTENANCE ENGINEER**
JOB FREQUENCY	**: IN THE EVENT OF DAMAGE**
TIME REQUIRED	**: 60 MINUTES**
DESCRIPTION:	**: /**

General Information
The durability of the components of the compression head depends on the following factors:

- surface condition of the pumping pistons;
- process temperature;
- type of product;
- under-feeding the machine (low feed pressure), (see the relevant **technical sheet** enclosed with chapter 11 of this manual);

Some of these factors, such as the wear of the piston coating and the machine underfeeding cause early deterioration of the gaskets.
Replacement must be made when you notice product leaking into the sump; production can in any case be concluded with no danger of pollution if the machine is fed correctly.

CAUTION:
To avoid situations where production has to be stopped due to missing plunger gaskets, we suggest you schedule preventive replacement on the basis of their expected mean life.

CAUTION:
Before you begin with maintenance and gasket replacement make sure all the necessary spare parts and tools are available.

To visually check the state of the pumping piston gaskets, proceed as follows:

Instructions for disassembling the pumping pistons

- Referring to Figure 7-7, unscrew the closing clamp **(1)** joining the pumping piston **(2)** and guide piston **(3)** with the wrench provided (14x14) and move the pumping piston away from the piston guide, manually turning the flywheel mounted on the shaft, bringing the piston guide to the outermost point.

N.B.:
To simplify disassembly, always start from the central piston.

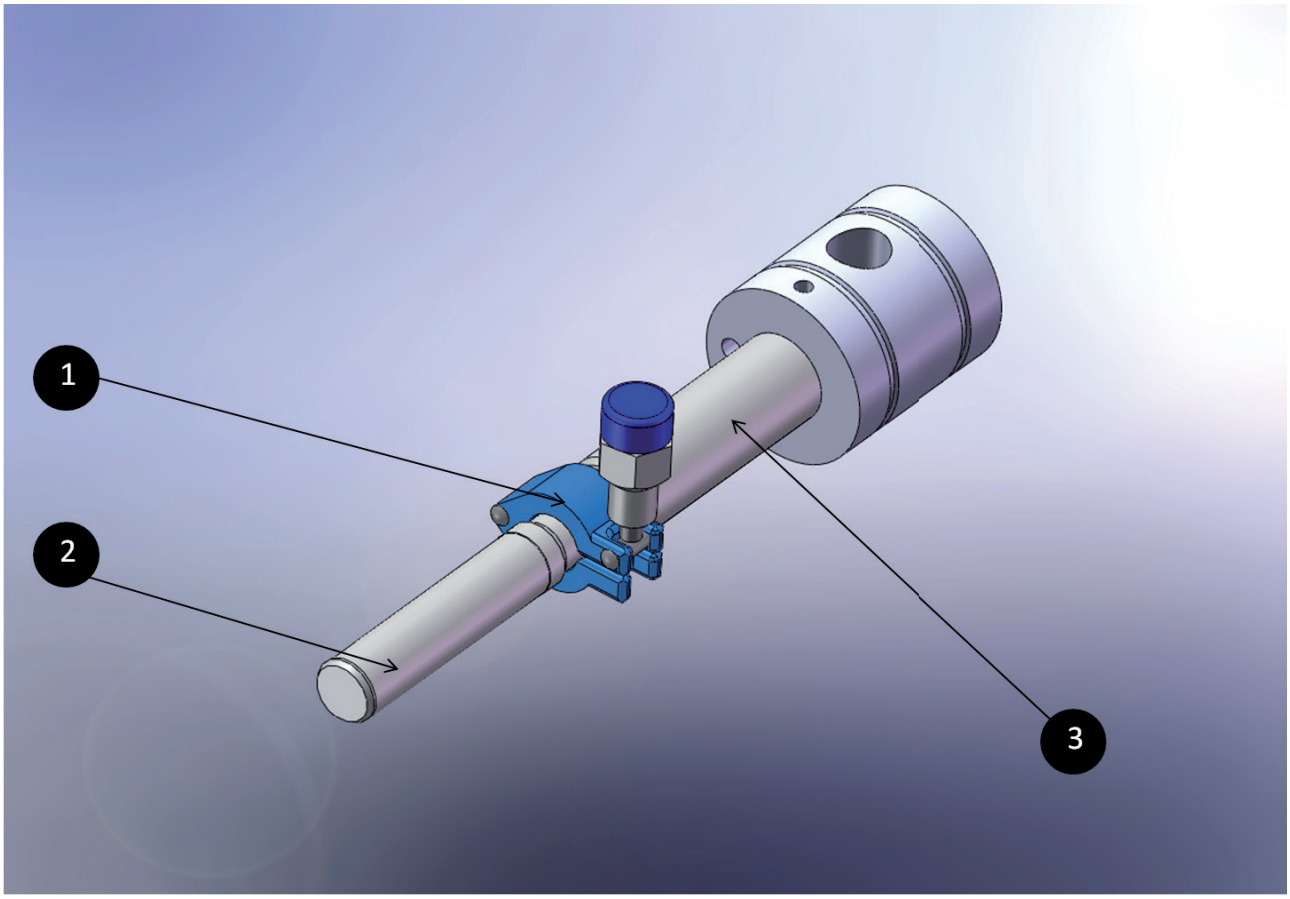
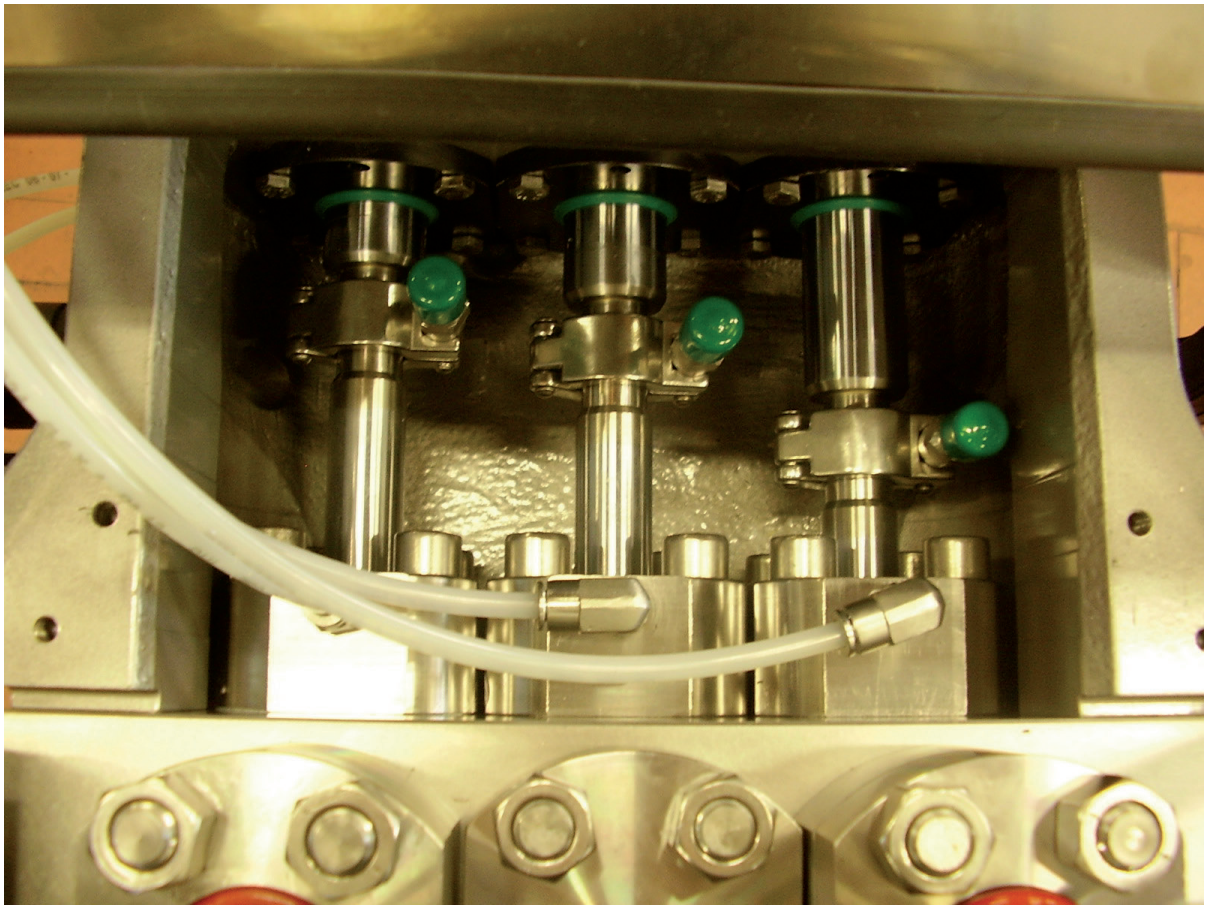


FIG. 7-7



- Referring to Figure 7-8, unscrew the nuts **(1)** and remove the packing container flanges **(2)** together with the piston **(3)** paying attention to the centring grub screws between the head **(4)** and the flange **(2)**;

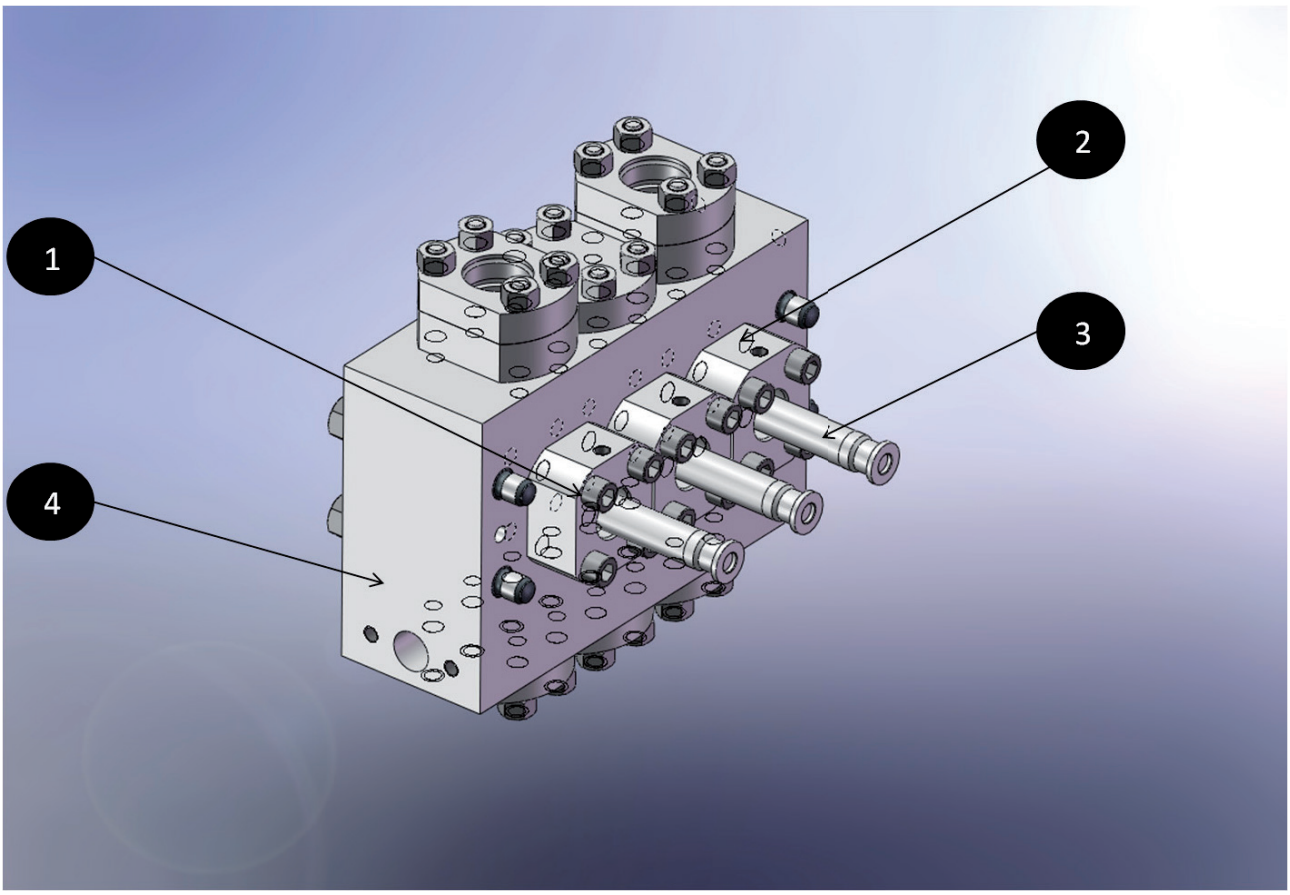


FIG. 7-8

Then slide the piston out from the packing container flange.

Instructions for fitting the pistons

Before installing the piston pump first mount the gaskets of the pumping pistons as described below.

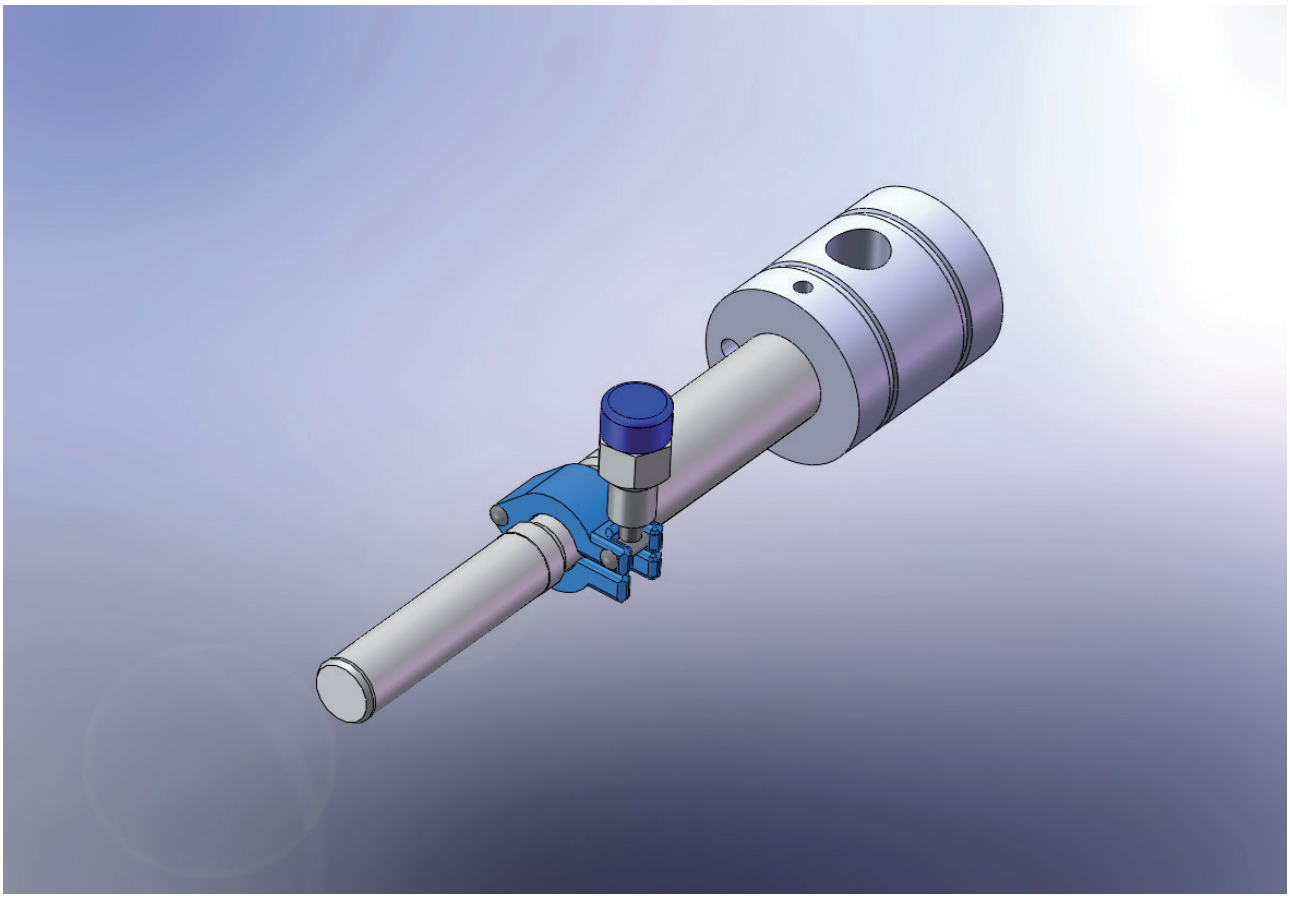


FIG. 7-9

- Referring to Figure 7-10, insert the piston **(1)** into the packing container flange **(2)** with the packing already fitted and secure it with the centring grub screws and nuts **(3)** to the head **(4)**.

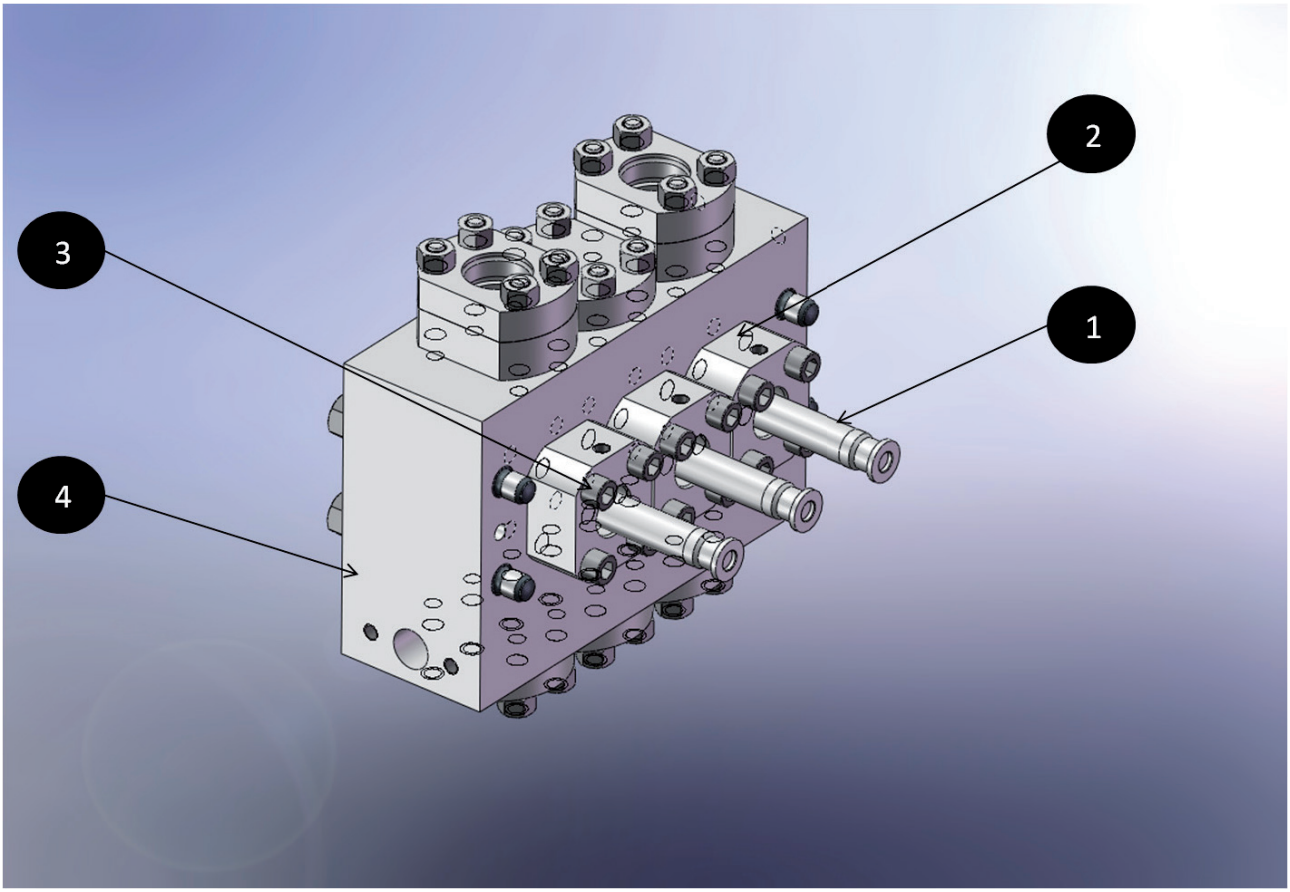


FIG. 7-10

To fit the packing, follow the instructions below

- Secure the pumping piston to the guide piston with the clamp taking care to abut the pumping piston and the guide piston with the tooth.

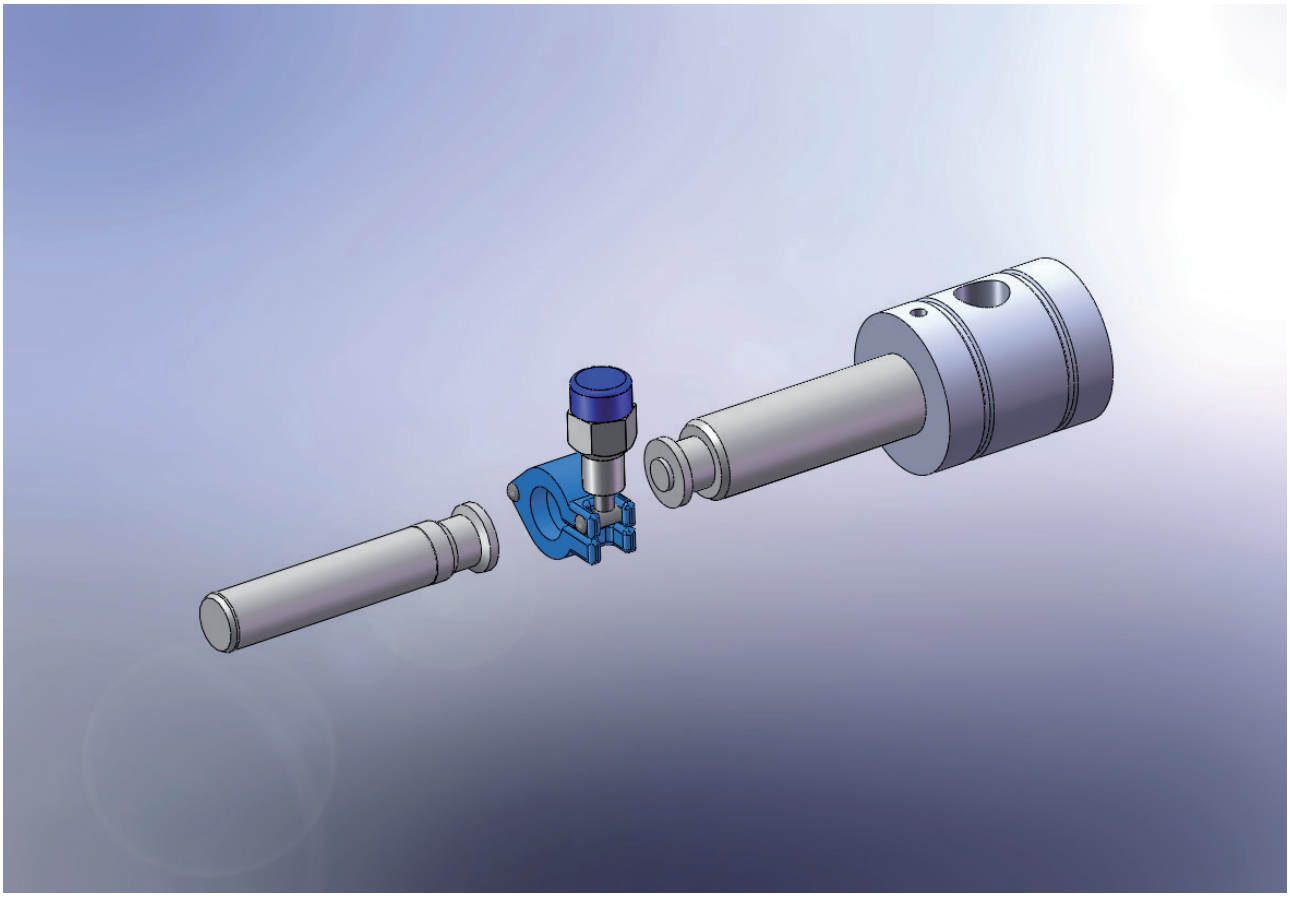


FIG. 7-11

N.B.
During assembly make sure that the piston and clamp are fixed in the correct position, and that the various clamps do not interfere with one another during alternating piston movements. We therefore suggest hand-turning the transmission race pulley to check the correct movement of the pumping pistons.

Instructions for disassembling the packing

Referring to Fig. 7-12, after having removed the pistons **(1)**, user the extractor supplied to extract the packing **(2)**, in accordance with the following procedure:
- insert the extractor into the packing container flange **(3)**.
- turn it to widen the expander
- extract the packing **(2)**.

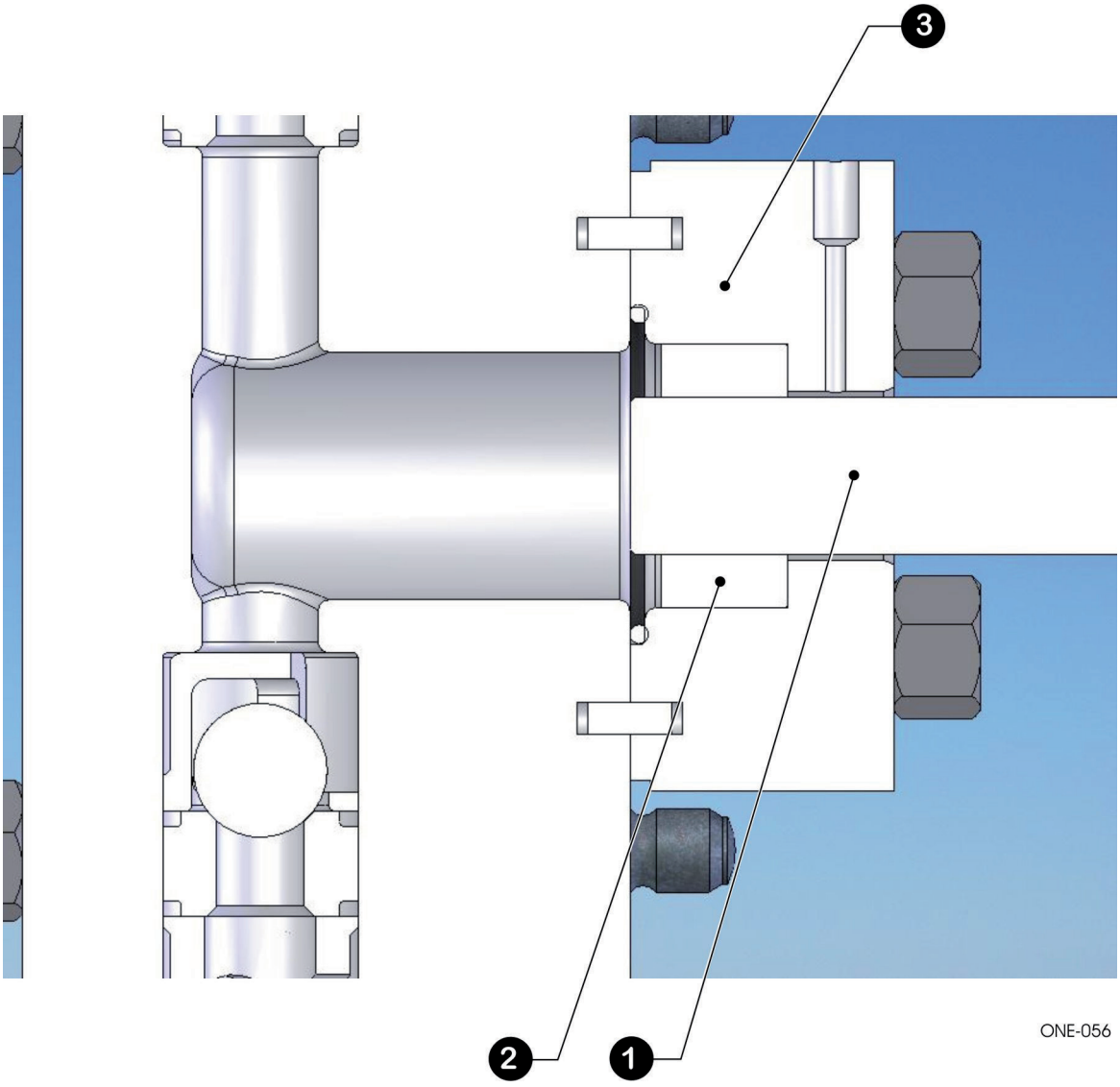


FIG. 7-12

Instructions for fitting the packing

To fit the gaskets of the pumping pistons (packings) it is then necessary to proceed as described below with reference to Figure 7-13:

- set the packing flange **(1)** on the bench
- First install the support ring **(2)** in the flange.
  The energizing ring **(4)**, assembled on the gasket body **(3)** will later be installed in the direction shown. It is recommended to use "FOOD GRADE" lubricant to install the gasket correctly and easily.
- set the packing in position using the special insertion tool (with the aid of a plastic mallet when necessary).
- be careful not to damage or deform the packing during assembly

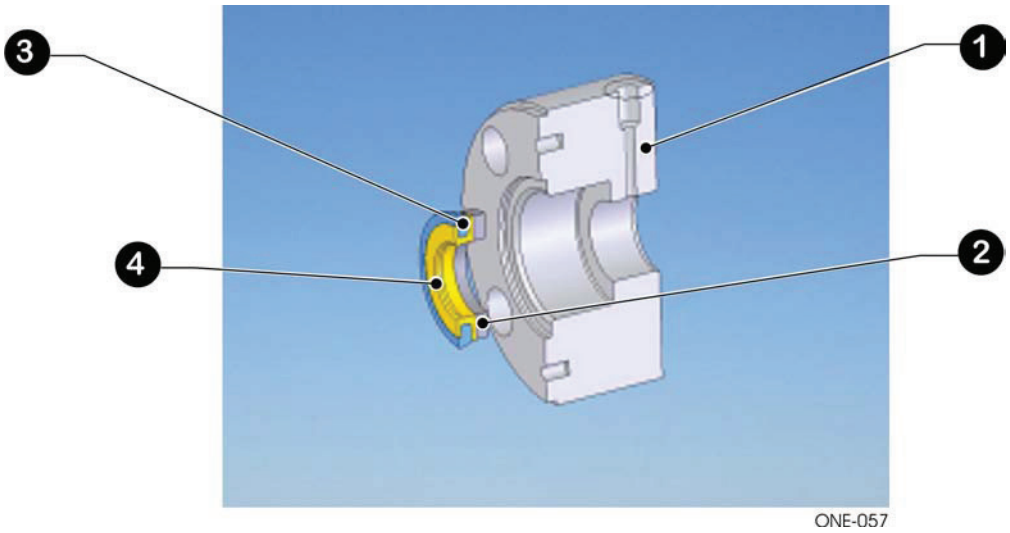
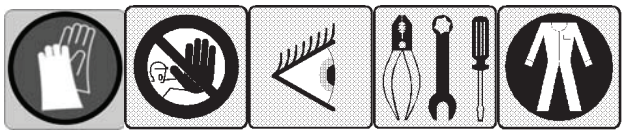


FIG. 7-13

SHEET A[c]
COMPRESSION HEAD - **Check tightness of pumping pistons and nuts**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS : **MAINTENANCE ENGINEER**

JOB FREQUENCY : **BEFORE THE INITIAL START-UP + EVERY 200 HOURS + AFTER EACH MAINTENANCE JOB**

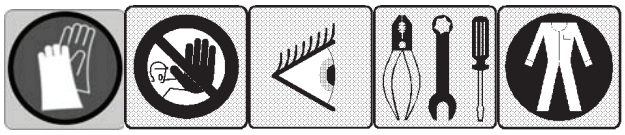
TIME REQUIRED : **20 MINUTES**

DESCRIPTION:

To check the tightness of the nuts and pumping pistons, proceed as follows:

- Do the check by tightening the nuts on the compression head with a torque wrench, referring to the tightening torques stated in TABLE 00.1
- Do the check by tightening the nuts on the piston clamps with the special wrench.

SHEET A[d]
COMPRESSION HEAD - **Check wear and if necessary renew the pumping pistons**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EVERY 1500 HOURS**

TIME REQUIRED **: 30 MINUTES**

DESCRIPTION: **VISUAL CHECK**

GENERAL INFORMATION

The pumping pistons are subject to normal wear, which however may be accentuated by certain operating conditions, such as:
- lubricating water insufficient or absent;
- washes carried out with unsuitable solutions;
- imperfect alignment caused by loosening of the connection with the guide piston.

The type of piston fitted on the machine is indicated in the TECHNICAL SHEET attached to chapter 11 of this manual.

The chrome-plated pistons must be replaced when their surface is deeply scored or flakes off as this does not provide an optimal seal on the packings and it causes early wear.

- Make absolutely sure that the pistons are not operated without liquid even for a short period of time; the temperature generated on the surface of the piston due to friction can result in the piston breaking once the cooling water is opened
- Avoid changing quickly from a hot liquid to a cold liquid even inside the compression head, where the plunger moves alternately
- The water temperature must be within the specified range (+10 to +25°C).– TECHNICAL SPECIFICATIONS enclosed with chapter 11 of this manual.
- Temperature variation over time must be 70 °C in 15 minutes (approximately 5 °C per minute).

Using unsuitable wash solutions or incorrect concentrations and temperatures can cause corrosion of the piston coatings and as a result cause early wear of the packings.
A piston coating damaged by corrosion is not covered by **GEA Niro Soavi S.p.A.** warranty.
In the event of heavy wear and/or breakage of the pumping pistons, they must be renewed as follows:

Instructions for disassembling the pistons

- Referring to Figure 7-14, unscrew the closing clamp **(1)** joining the pumping piston **(2)** and guide piston **(3)** with the wrench provided (14x14) and move the pumping piston away from the piston guide, manually turning the flywheel mounted on the shaft, bringing the piston guide to the outermost point.

N.B.:
To simplify disassembly, always start from the central piston.

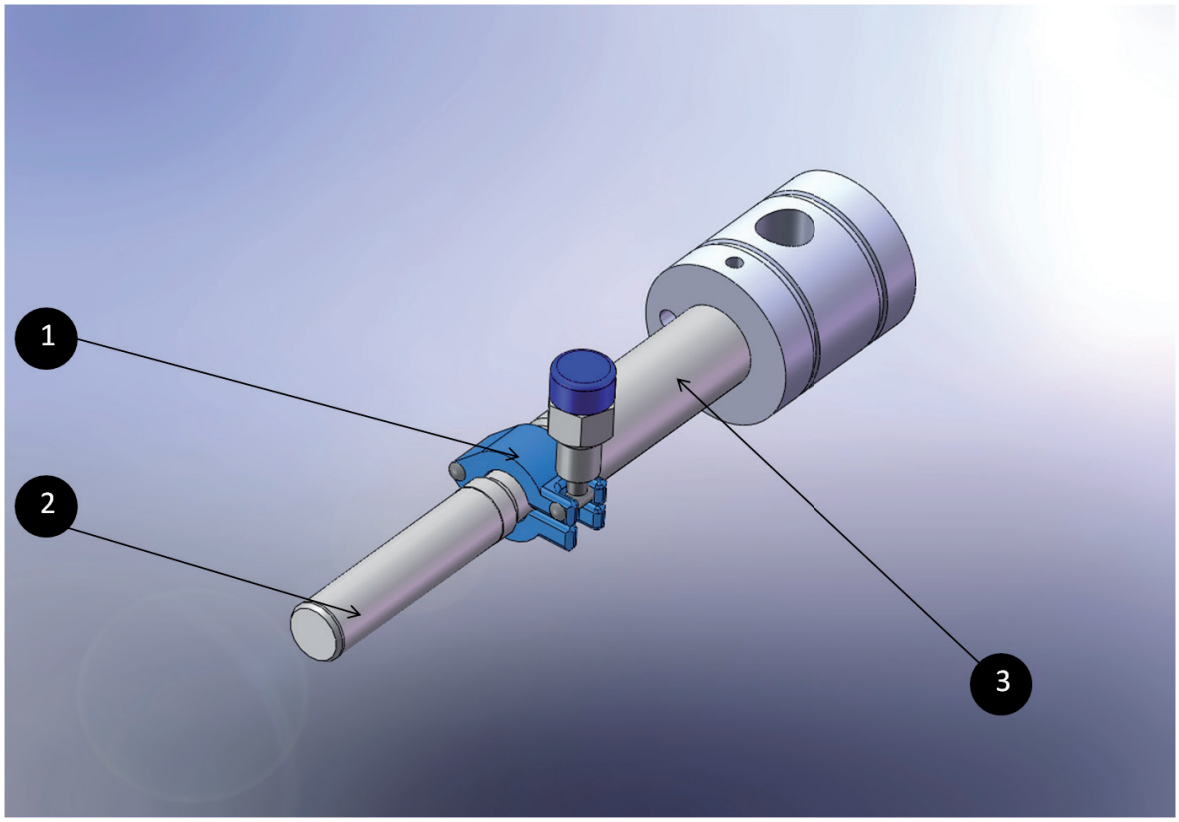


FIG. 7-14

- Referring to Figure 7-15, unscrew the nuts **(1)** and remove the packing container flanges **(2)** together with the piston **(3)** paying attention to the centring grub screws between the head **(4)** and the flange **(2)**;

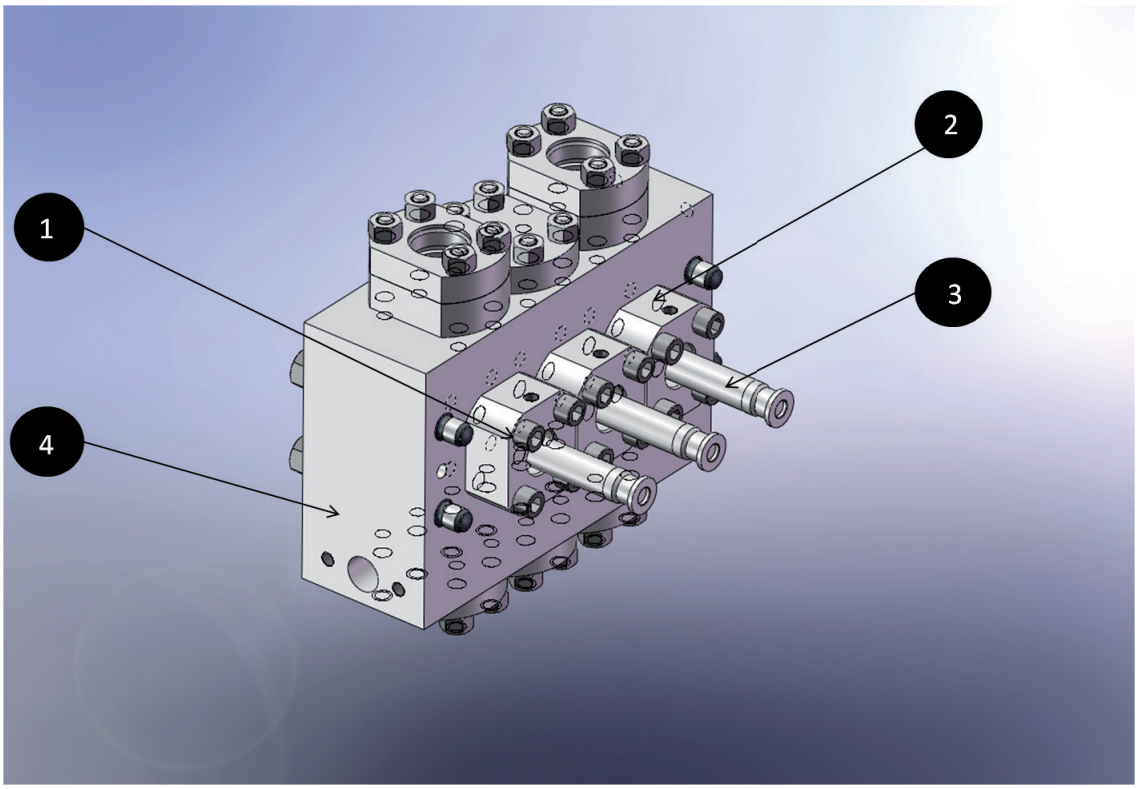


FIG. 7-15

Then slide the piston out from the packing container flange.

Instructions for fitting the pistons

Before installing the piston pump you need to mount the gaskets of the pumping pistons as described below.

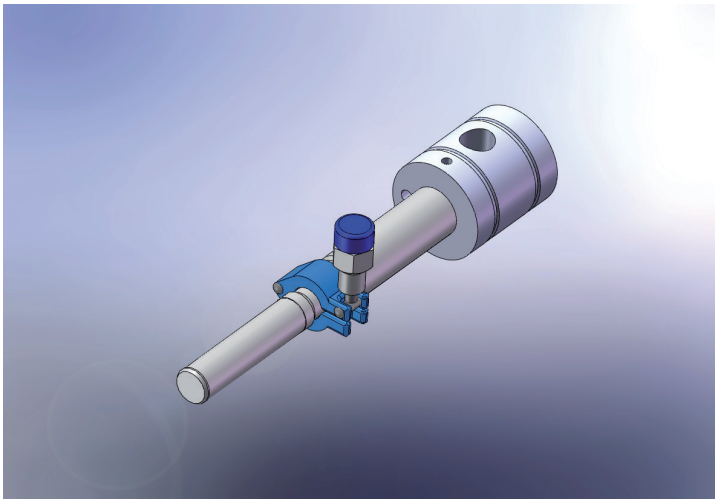


FIG. 7-16

- Referring to Figure 7-17, insert the piston **(1)** into the packing container flange **(2)** with the packing already fitted and secure it with the centring grub screws and nuts **(3)** to the head **(4)**.

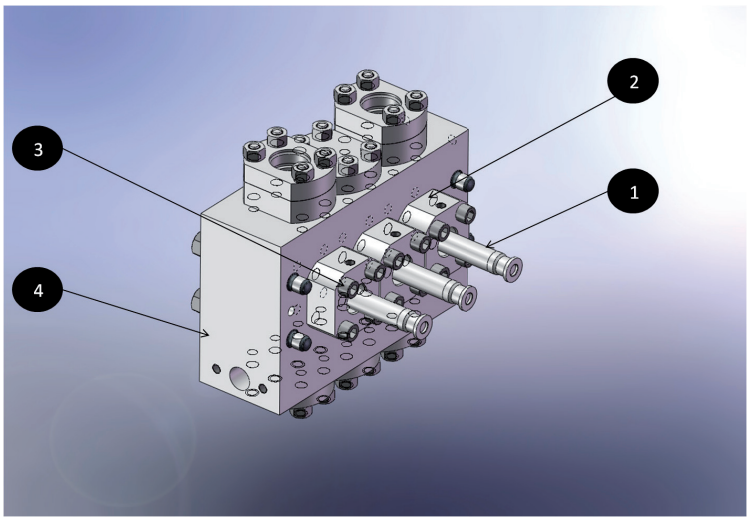


FIG. 7-17

To fit the packing, follow the instructions below

- Secure the pumping piston to the guide piston with the clamp taking care to abut the pumping piston and the guide piston with the tooth.

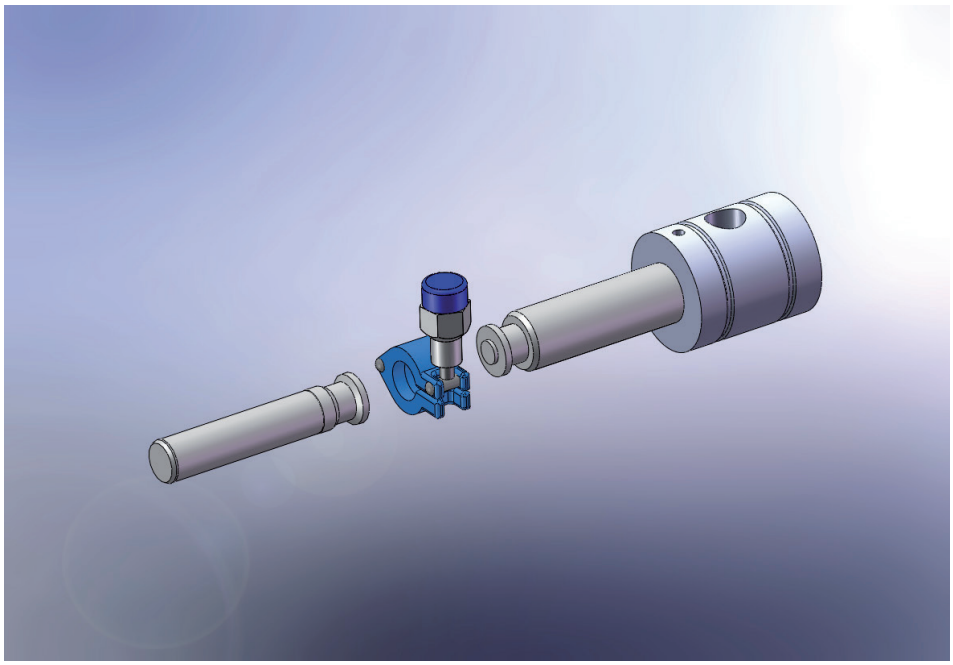
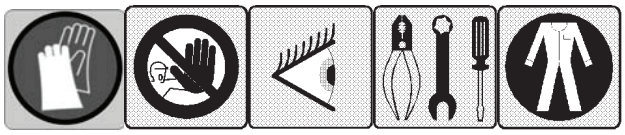


FIG. 7-18

N.B.
During assembly make sure that the piston and clamp are fixed in the correct position, and that the various clamps do not interfere with one another during alternating piston movements. We therefore suggest hand-turning the transmission race pulley to check the correct movement of the pumping pistons.

WARNING:
Periodically and regularly check the tightness of the pistons to avoid them getting unscrewed or disconnected during machine operation.

SHEET A[e]
COMPRESSION HEAD - **Check and if necessary renew the pumping valves**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EVERY 1500 HOURS**

TIME REQUIRED **: 20 MINUTES**

DESCRIPTION:

GENERAL INFORMATION

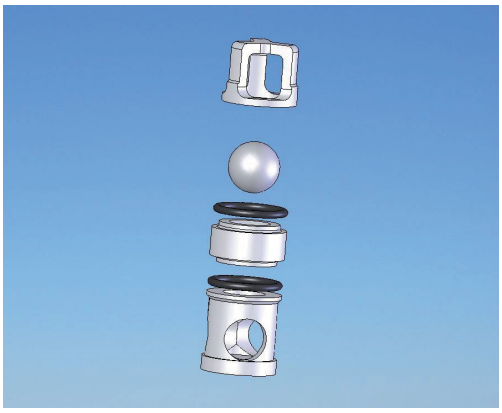
The good condition of the suction and delivery valves is necessary for the machine to function correctly, since imperfect sealing of these valves causes backflow of product as well as pressure and flow rate instability.

The valve unit is composed of a ball shutter, a valve cover and the seat.

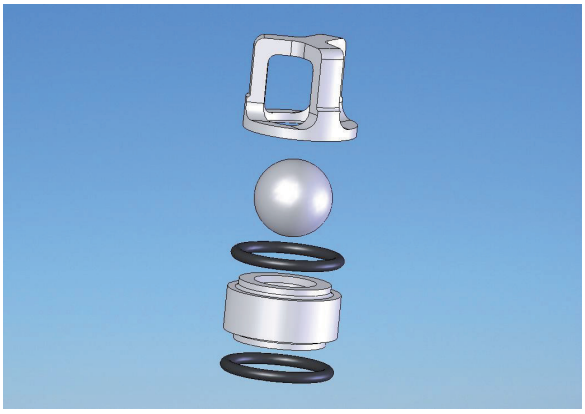
The shutter needs renewing when it has cuts or dents on the sealing surface.

The suction valve unit has a spacer at the bottom.

The procedure for renewing the valve unit is as follows:



Suction valve unit



Delivery valve unit

FIG. 7-19

Instructions for disassembly

With reference to figure 7-20, proceed as follows:

- Unscrew the nuts **(5)** and remove the upper **(6)** and lower **(7)** flanges, the gasket normally remains on the flange.
- For the delivery valves, from the top of the head, extract the valve cover **(1),** ball **(2)**, and valve seat **(3)** with the gaskets.
- For the suction valves, first remove the spacer **(4)**, then, in sequence, the valve seat **(3)**, ball **(2)** and cap **(1)**.

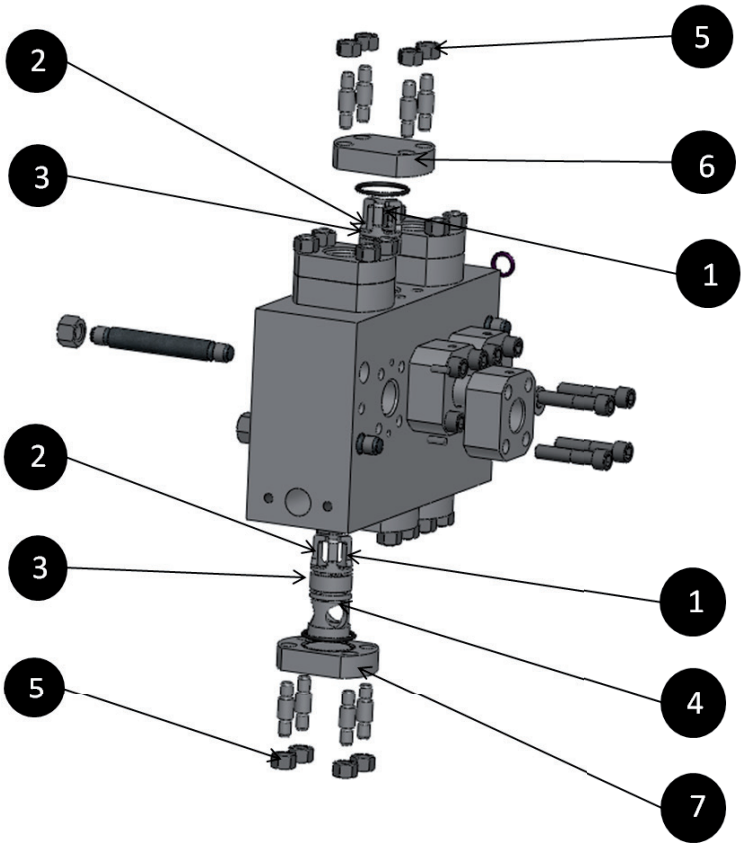
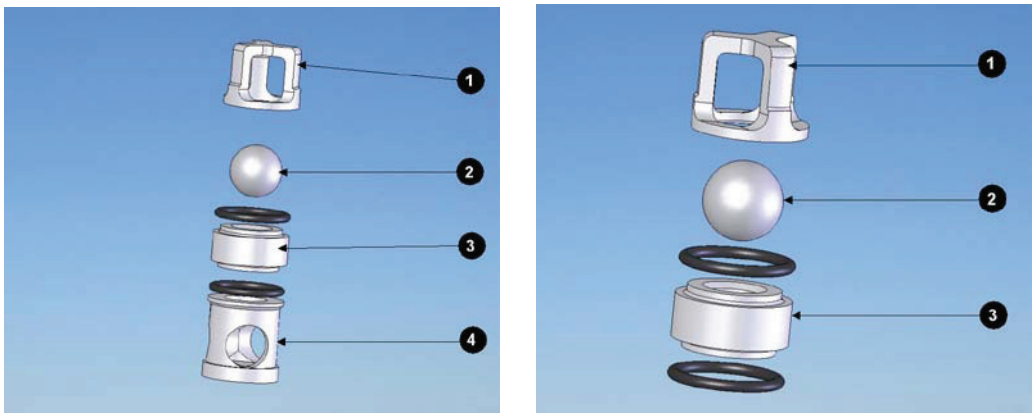


FIG. 7-20

Assembly

After making the replacement, refit the valve units (making reference to figure 7-21):

- insert the valve seat **(3)** with its gaskets, the ball **(2)** and the cap **(1)**, in sequence for the delivery assembly. For the suction assembly, mount in succession the cap, ball, seat with gasket and spacer **(4)**.
- Refit the flanges, tighten the nuts crossways, as shown in Table 001.



Suction valve unit Delivery valve unit

FIG. 7-21

WARNING:
The nuts on the head must be tightened to the torques indicated in TABLE 00.1 using a torque wrench (not supplied).

SHEET A[f]
COMPRESSION HEAD - **Visually check for leakage from the packings and from the gaskets of the head**

CAUTION:
These activities should be carried out while the machine is in operation. Exercise extreme caution

RESOURCES AND TOOLS : **OPERATOR**

JOB FREQUENCY : **AT EACH START-UP**

TIME REQUIRED : **5 MINUTES**

DESCRIPTION:

To visually check for leakage from the **gaskets** of the head, proceed as follows:

- Observe any product leakage from the mating surfaces between the flanges and the compression head.

To visually check for leakage from the **packings**, proceed as follows:

- Check for any product leakage from the packing container flanges towards the sump area (the area behind the compression head).

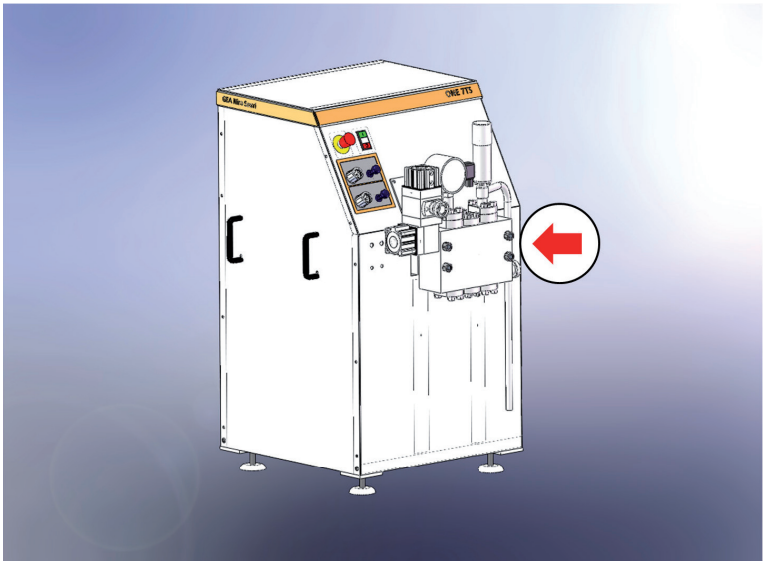
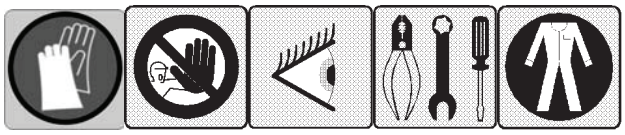


FIG. 7-22

SHEET A[g]
COMPRESSION HEAD - **Check and if necessary renew the pumping valve seats**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS  **: MAINTENANCE ENGINEER**

JOB FREQUENCY : EVERY 1500 HOURS

TIME REQUIRED : 20 MINUTES

DESCRIPTION:

GENERAL INFORMATION

The valve seats are the filled type and are made of stainless steel to ensure wear resistance and a long life.
Possible light marking by pricks on seat surface does not affect the valve sealing and functionality.
The durability of the seats depends on the type of product and the operating conditions of the machine.
For very abrasive products it is wise, when necessary, to grind the seats or renew them.

N.B.:
The valve seats are reversible. Before renewing them it is therefore wise to use them in both directions.

Instructions for disassembly

N.B.:
The tools used to disassemble the valve seats are NOT supplied in the maintenance kit. The nuts on the head must be tightened to the torques indicated in SHEET 00[c] using a torque wrench (not supplied).

To remove the suction seats, simply remove the lower flanges.

To remove the delivery seats, you can use the extractor supplied.

Alternatively, for disassembling the delivery seats, suitable equipment must be prepared (this may be supplied on request by **GEA Niro Soavi S.p.A.**) to carry out the work as specified below, referring to Figure 7-23:

- remove the upper and lower flanges
- move the pumping piston back to bottom dead centre
- remove the seat of the suction valve **(6)**
- to remove the seat of the delivery valve **(1)** use a rod made of soft metal, such as bronze or aluminium: insert the rod in the head through the orifice in the suction valve; the rod diameter must be as large as possible, and to improve its contact with the seat it is possible to make a conical support as the bottom part of the seat
- tap on the rod with a hammer until the seat is removed

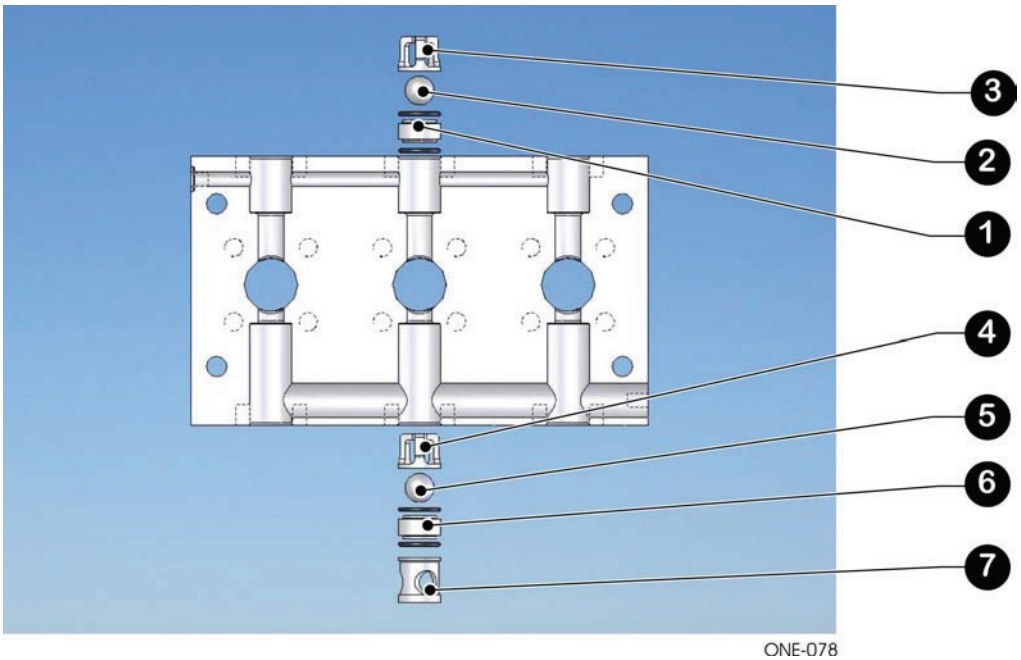


FIG. 7-23

Instructions for assembly

To reassemble, proceed as follows, referring again to Figure 7-23:

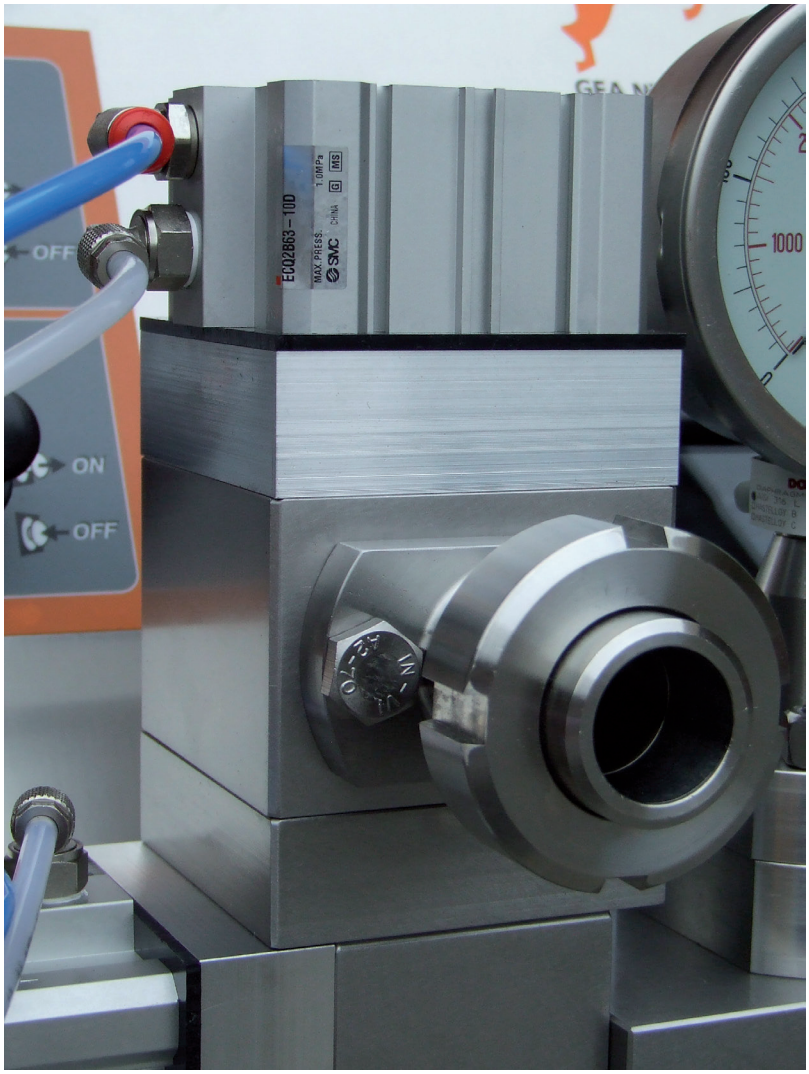
Delivery valve assembly

- insert the seat **(1)** in position, complete with gaskets
- first insert the ball **(2)** then the cap **(3)**.
- add the flanges and tighten the nuts crossways, as shown in Table 001.

Suction valve assembly

- Insert the valve cover **(4)**, ball **(5)**, seat **(6)** with gaskets, spacer **(7)** all of which already positioned on each other.
- close from beneath with lower flanges.

SHEETS INDEX	
SHEET	**Job location**
B	**Stage 1 Homogenizing Unit**
B[a]	Check / renew homogenizing valves



SHEET B
HOMOGENIZING UNIT

GENERAL INFORMATION

The homogenizing valve is made up of 3 parts (with reference to 7-24):

- passage head **(1)**
- impact head **(2)**
- impact ring **(3)**.

Homogenization occurs during the flow between the facing surfaces of the 2 heads, which takes place at very high speed and is completed by the impact with the outer ring.

The fluid dynamics at very high pressure occurring inside the homogenizing valve are complex; generally we can describe the micronization of the particles contained in the liquid phase as a combination of effects of turbulence, shearing, local cavitation and impact.

The three parts of the homogenizing valve, made of high hardness materials with high resistance to abrasion, are normally subject to wear at a rate that depends on the type of product processed; therefore, different effects related to these phenomena can be observed on the surface:
- radial furrowing extending from the internal diameter **(4)**;
- small craters close to the external diameter **(5)**;
- large craters and wear close to the internal diameter **(6)**.

When the furrowing due to wear becomes marked and reaches the outside diameter, the homogenization efficiency is reduced.

It is therefore necessary to replace the components when the furrowing reaches approximately 3/4 of the useful size and in any case when a reduction in homogenization efficiency is noticed.
In some cases, due to component wear, it is no longer possible to reach the desired working pressure, so the homogenizing valve must be replaced.

Local cavitation phenomena can create craters and marked furrows on the surfaces of the valve; in this case, too, it is necessary to replace the worn components.
As regards the impact ring **(3)**, it has the twofold function of completing homogenization by impact and protecting the body of the homogenizing unit from erosion.

Wear causes a furrow **(7)** to form on its inner surface that impairs the homogenization.
It is recommended to renew the ring when the furrow reaches a depth of approx. 1 mm.

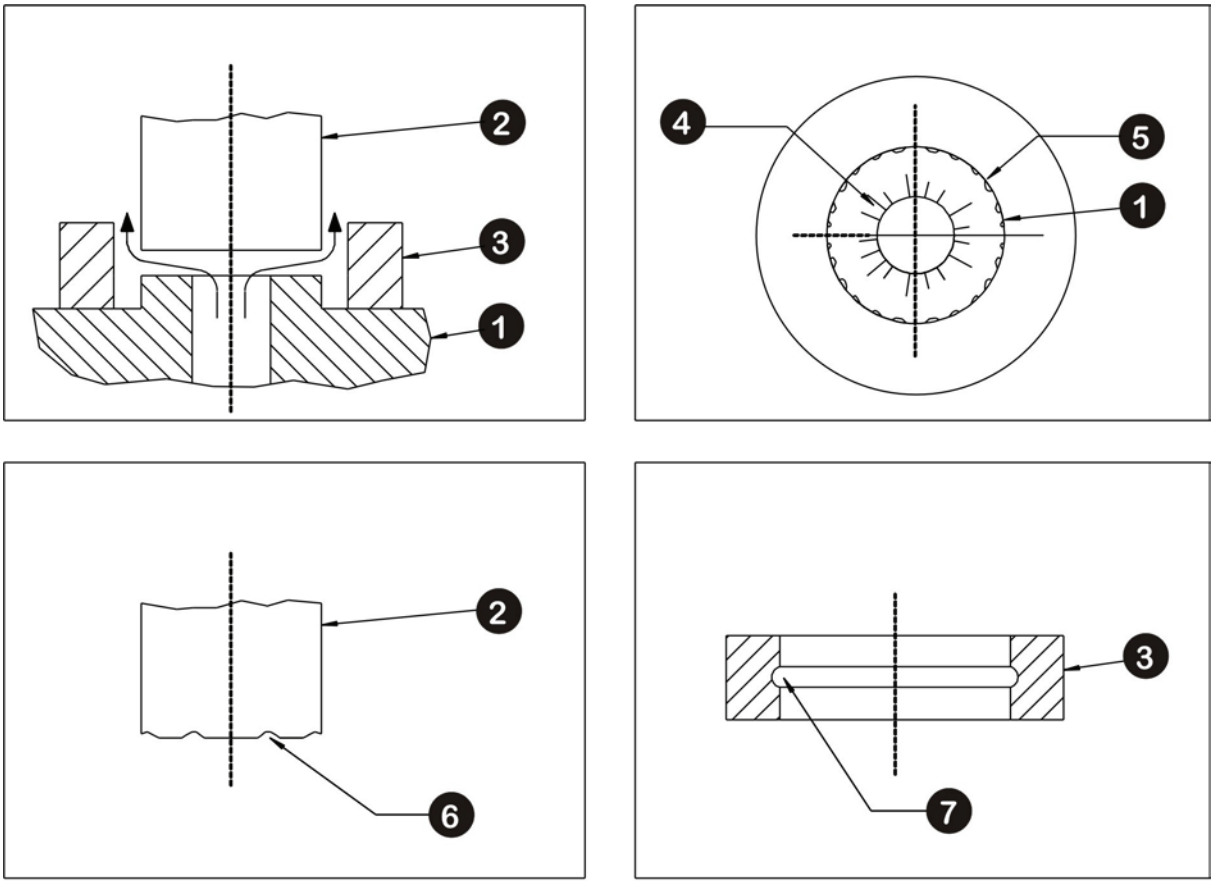
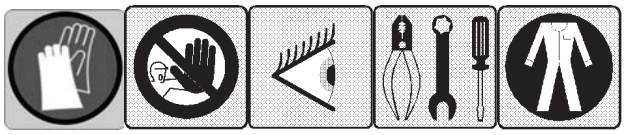


FIG. 7-24

WARNING:
The impact and passage heads are made of high hardness material for prolonged resistance against the abrasive action of the treated product.
When signs of wear appear that compromise homogenisation efficiency, the working surfaces can be ground removing max. 1 mm of material: this can be done either by GEA Niro Soavi S.p.A. or in properly equipped workshops.

WARNING:
The above-mentioned indications refer to normal conditions and are general guidelines for scheduled and preventive maintenance.
It should be noted that the wear of the homogenizing valve components is NORMAL and depends on phenomena occurring inside the valve itself.
In the event that the valve's rate of deterioration is excessively fast, please contact GEA Niro Soavi S.p.A for advice and alternative solutions.

SHEET B[a]
HOMOGENIZING UNIT - **Checking/renewing homogenizing valves**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EVERY 500 HOURS (CHECK)**

TIME REQUIRED **: 20 MINUTES**

DESCRIPTION:

Instructions for disassembly

For the maintenance operations of the pneumatically controlled homogenizing unit, proceed as follows (referring to Figure 7-25):

- disconnect the connections for the pneumatic drive of the piston on the machine's front panel

CAUTION:
The homogenizing unit is heavy!
When removing, handling and positioning, use both hands and appropriate personal protective equipment in order to prevent injury.

- Remove the pneumatic drive unit **(2)**, joined with screws **(4)** to the supporting flange **(3)**
- Unscrew the nuts of the stud bolts joining the supporting flange **(3)** and homogenising chamber.
- To extract the impact head assembly **(6)**, first remove the passage head **(10)**, gasket **(9)** and impact ring **(5)**.
- If the vibration is too great, it is necessary to check the surface of the spindle of the impact head **(6)** and, if necessary, replace the guide bushings **(7)** made of self-lubricating plastic
- Remove the homogenising unit assembly **(8)** and rest on a work surface.

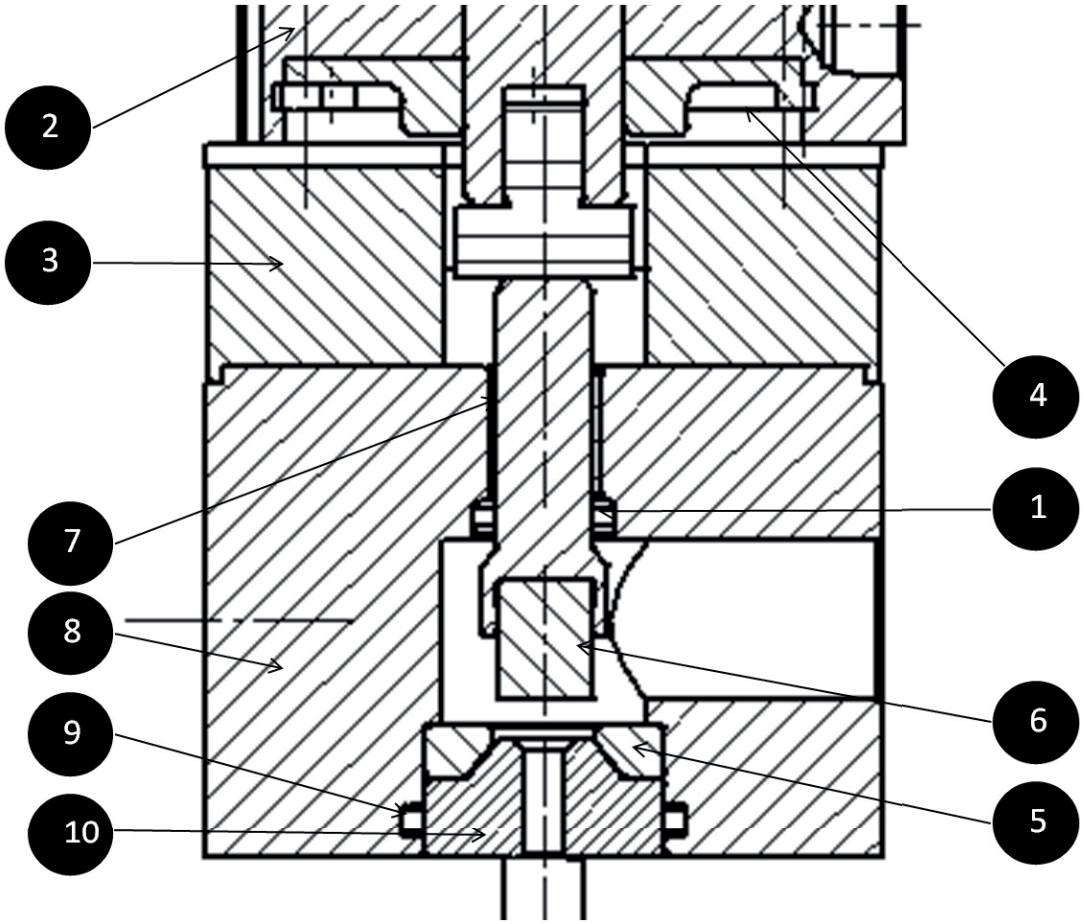


FIG. 7-25

N.B.:
The homogenising unit is normally subjected to high pressures and temperatures which expose the sealing gaskets to considerable stress.
To ensure correct operation and to avoid loss or contamination of product it is essential that all gaskets are changed whenever the unit is disassembled.

Instructions for assembly

N.B.:
To facilitate the assembly of the gaskets, it is advised to grease them with food oil.

With reference to figure 7-26

- Insert the guide bushing **(7)** from the top into the homogenising chamber.
- Insert the gasket into the groove **(1)** in the homogenising chamber
- Set the homogenising chamber on one side and, in sequence, insert the impact head **(6)**, impact ring **(5)**, gasket **(9)**, and passage head **(10)**.
- Check that the impact head slides freely in the guide.
- Insert the homogenizing chamber on the stud bolts and move it near to the head
- Position the gasket in the seat obtained in the head and rest the assembly on the head itself.

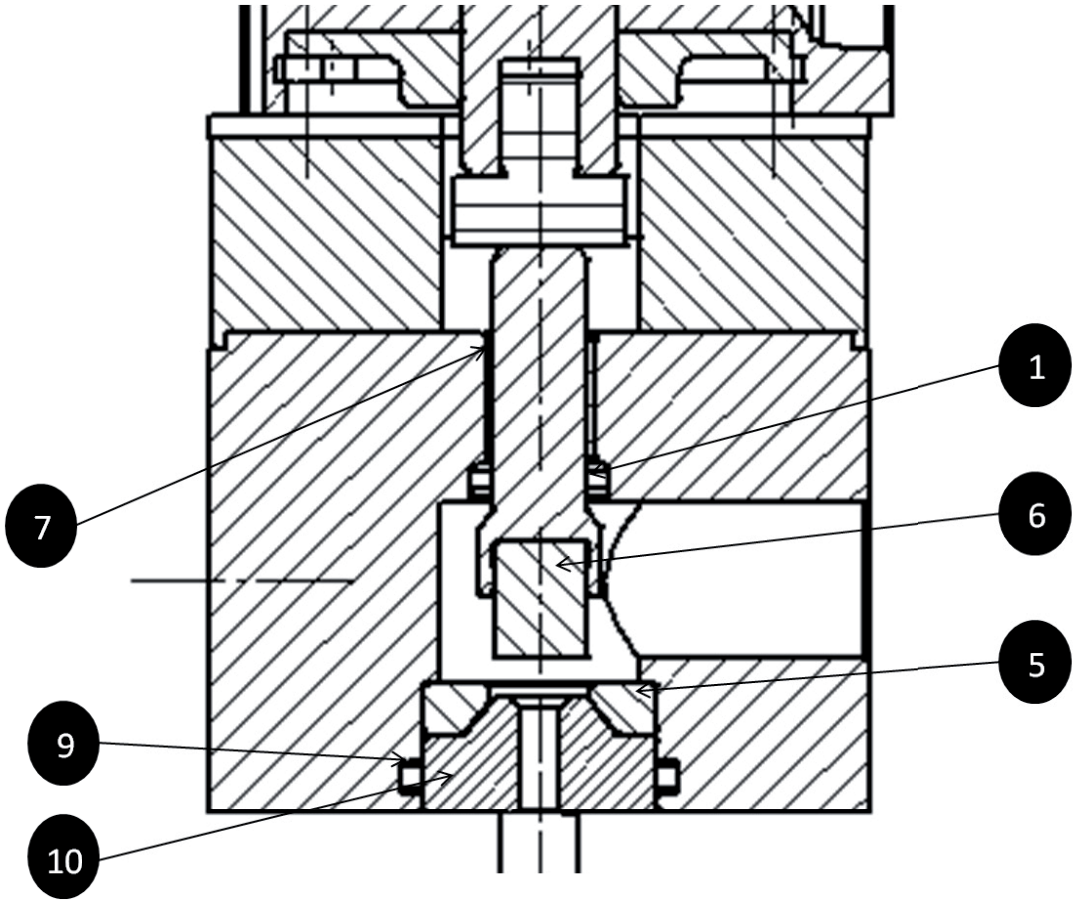


FIG. 7-26

Then, referring to figure 7-27, go ahead and assemble the pneumatic drive unit:

- Mount the flange **(3)** on the homogenising chamber **(8)**
- Fully tighten the nuts
- Screw the head shaft extension **(11)** into the pneumatic drive unit **(2)**.
- Connect the pipes for operating the pneumatic drive system
- Join the pneumatic drive unit **(2)** to the supporting flange **(3)** with the 4 screws **(4)**.

The above instructions apply to both homogenizing stages, for machines equipped with a second stage (optional).

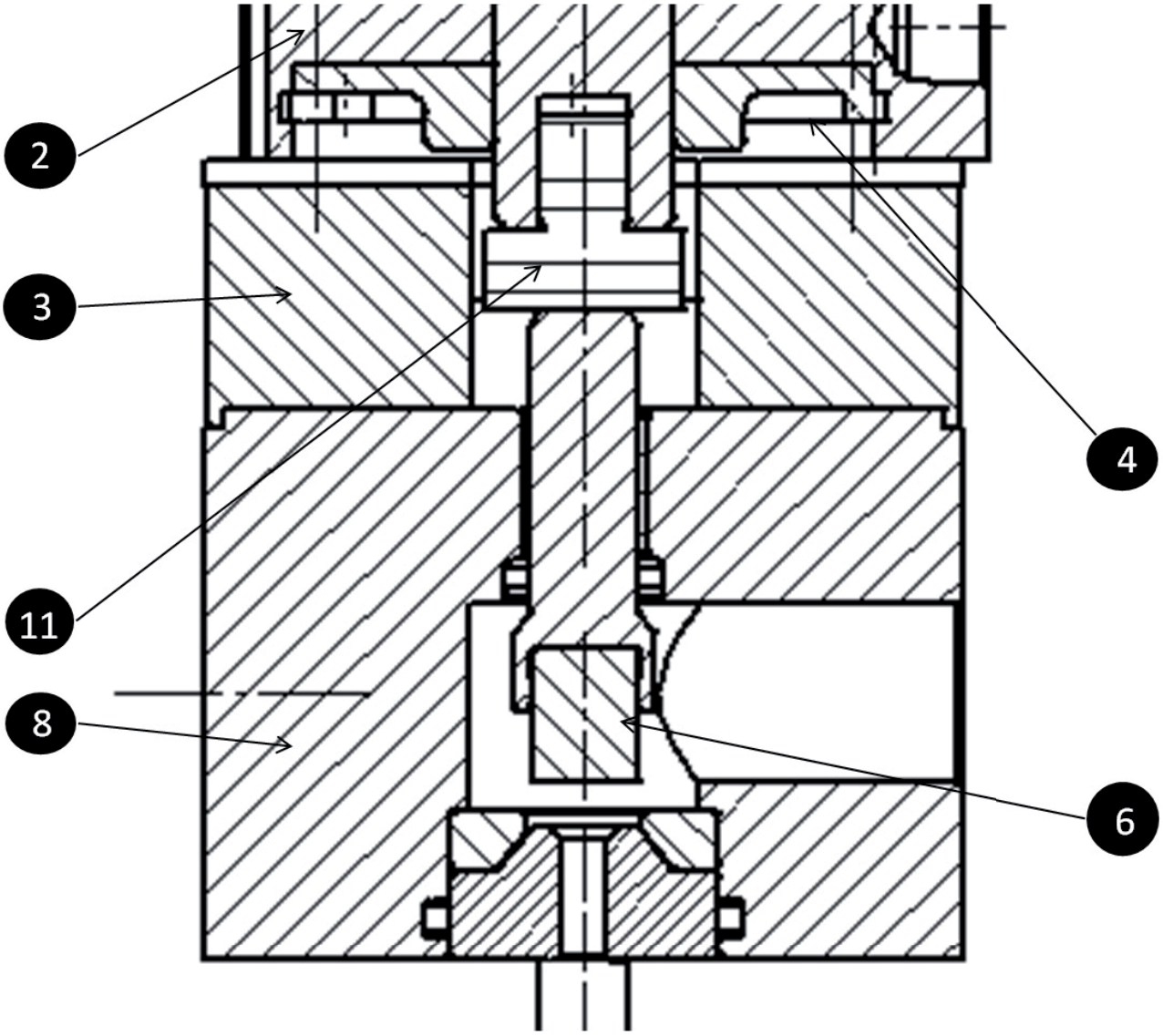
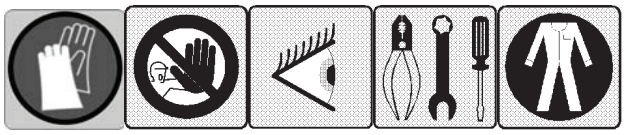


FIG. 7-27

SHEETS INDEX	
SHEET	**Job location**
C	**Stage 1 head pressure gauge**
C[a]	Check state and operation

SHEET C[a]
PRESSURE GAUGE - **Check state and operation**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: OPERATOR**

JOB FREQUENCY **: EVERY 1500 HOURS**

TIME REQUIRED **: 5 MINUTES**

DESCRIPTION:

GENERAL INFORMATION

The pressure gauge installed on the machine is a critical component inasmuch as it measures the machine's operating pressure and hence its operation.
A defective or inoperative pressure gauge means the machine cannot operate at the required pressure; make sure to keep a spare pressure gauge on hand in case of need.
The type of pressure gauge depends on the model of machine or optional configurations.
The standard pressure gauge is the analogue type with a Bourdon spring, with an aseptic design diaphragm and a connection with specific design and dimensions for **GEA Niro Soavi S.p.A.**; it is also equipped with a separator with the function of filtering the normal pulsations of the piston machine to allow a stable reading of the operating pressure.
Never separate the pressure gauge from its separator.
Other versions of pressure gauges or pressure meters are available as an alternative:

- analogue pressure gauge with signal transmitter: equipped with a 4-20 mA output for remote transmission of the pressure signal

The pressure gauge does not normally require any maintenance, but it should be checked periodically as follows:

- check the condition of the diaphragm in contact with the product; if any holes or damage to the diaphragm are found, the pressure gauge must be replaced
- for analogue pressure gauges, check there is glycerine inside the dial; if necessary, fill up to 3/4 of the dial with 99.5% pure glycerine
- replace the gasket between the pressure gauge and head

For instruments with an electric connection, refer to the respective wiring diagram, which also shows the setting range of the instrument.

Instructions for disassembly

For disassembling the pressure gauge (or pressure gauge with transmitter, or pressure transducer) proceed as follows, referring to Figure 7-28:

- Unscrew the nuts **(7)** and take out the pressure gauge complete with flange **(6)**.
- The pressure gauge **(1)** and the flange **(6)** can be separated once the half-rings have been removed **(4)**.

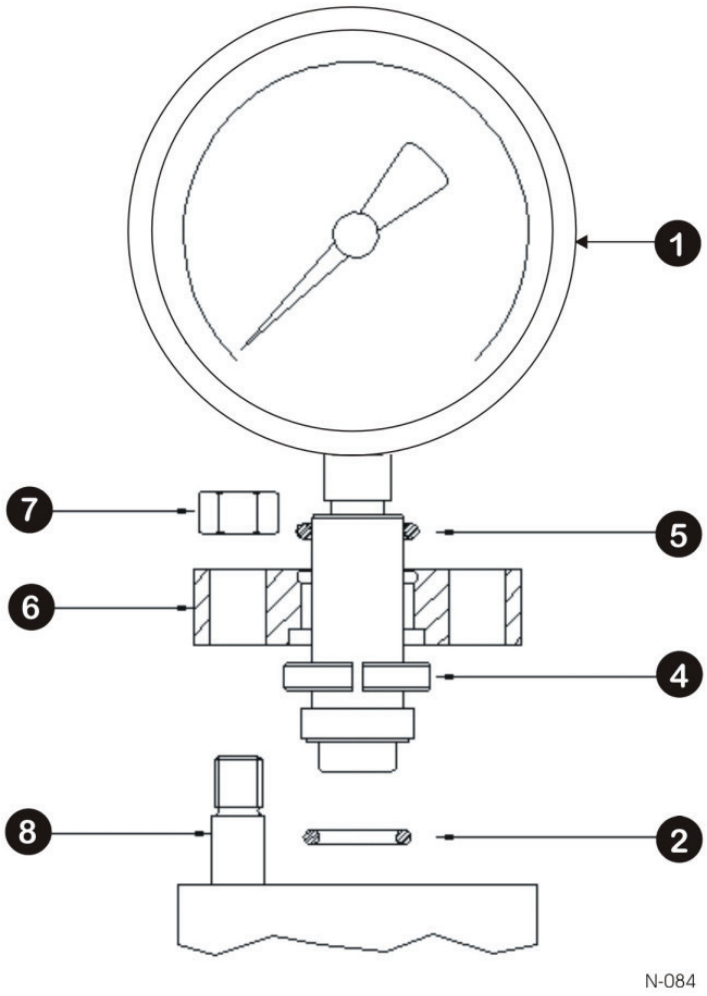


FIG. 7-28

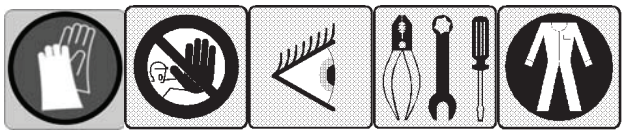
Instructions for assembly

For assembly, proceed as follows, referring again to Figure 7-28 as follows:

- fit the gasket **(5)** onto the rod of the pressure gauge (it is only for protection against dirt)
- insert the gasket **(2)** in its housing in the flange or in the head; it is recommended to use food-grade Vaseline or a suitable lubricant to facilitate assembly operations
- fit the flange **(6)** on the body of the pressure gauge **(1)** and position the two half-rings **(4)** to hold the flange in place
- insert the pressure gauge thus prepared in its housing and position the flange **(6)** on the studs **(8)**
- screw on the nuts **(7)** by hand before fully tightening them.

SHEETS INDEX	
SHEET	**Job location**
D	**Head safety valve**
D[a]	Check operation

SHEET D[a]
HEAD SAFETY VALVE - **Check operation**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS : **MAINTENANCE ENGINEER**

JOB FREQUENCY : **ONLY IF THE VALVE OPENS**

TIME REQUIRED : **10 MINUTES**

DESCRIPTION:

GENERAL INFORMATION

The safety valve is normally installed on the compression head to protect the machine and its operators against accidental excess pressures that can cause hazardous situations.

Maintenance concerns only checking and when necessary renewing the seal gaskets **(7)** and **(8)**, ball **(5)** and gasket seat **(6)**.
Refer to figure 7-29.

Instructions for disassembly

To dismantle the valve from its working position
- Unscrew the nuts **(1)** and extract the complete valve **(2)** and the flange **(3)**, which can be separated after having removed the half-rings **(4)**.
- Then remove the O-Ring **(8)**, the seat **(6)** containing the ball **(5)** and the O-Ring **(7)**.
- Pay particular attention not to lose the ball **(5)**, because the valve cannot work without it; it is recommended always to have a spare seat and ball available in case of necessity.

Valve maintenance DOES NOT require the replacement of the spring.
- Accurately clean the seat **(6)** removing any product residue, taking care not to damage the seal area.
- If the seal area between the seat **(6)** and the ball **(5)** is damaged or worn, you may notice product leakage and valve intervention at a pressure lower than the value for which the valve is set, so it is recommended to replace the seat and if necessary the ball too.

Instructions for assembly

For assembly proceed as follows:
- insert the gasket **(7)** in its housing in the flange or in the head; it is recommended to use food-grade Vaseline or a suitable lubricant to facilitate assembly operations
- prepare the seat **(6)** for assembly, with inside it the ball **(5)** and with the O-Ring **(8)**
- fit the flange **(3)** on the valve body **(2)** and position the two half-rings **(4)** to hold the flange in place
- insert the seat **(6)** already prepared on the valve body and, holding it in position with your fingers, fit the whole valve onto the housing flange
- insert the flange **(3)** on the studs and screw on the nuts **(1)** by hand so as to block the valve correctly, fitting the seat **(6)** onto the O-Ring **(7)**
- when the valve is in a stable position, before tightening the nuts **(1)**, correctly position the discharge pipe. For safety reasons the discharge pipe must always be open and pointing downwards
- fully tighten the nuts **(1)**.

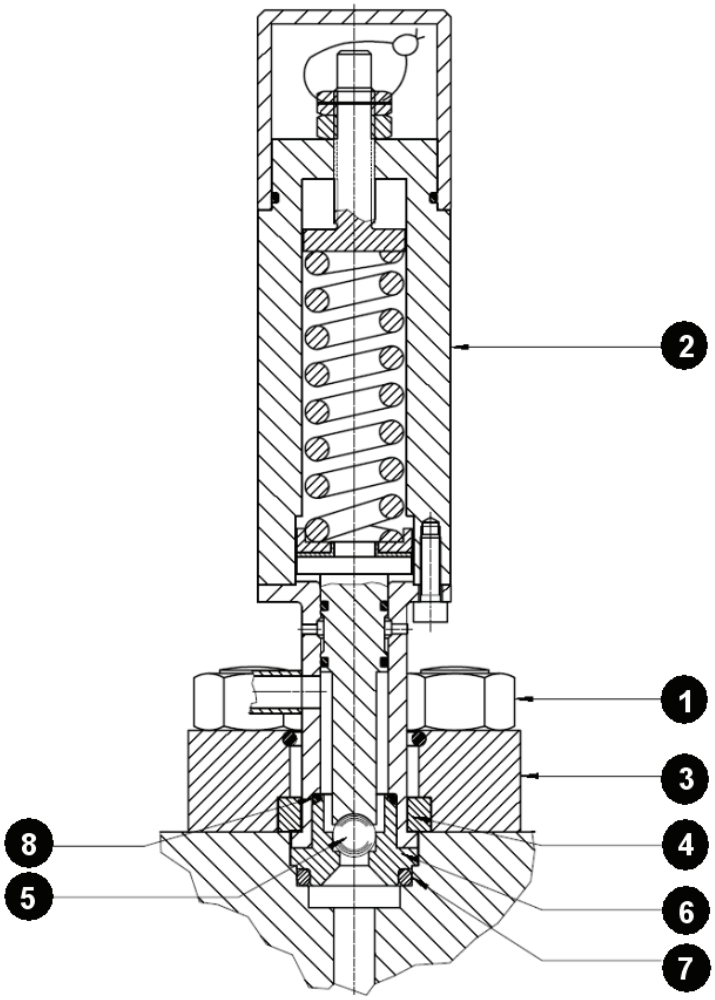


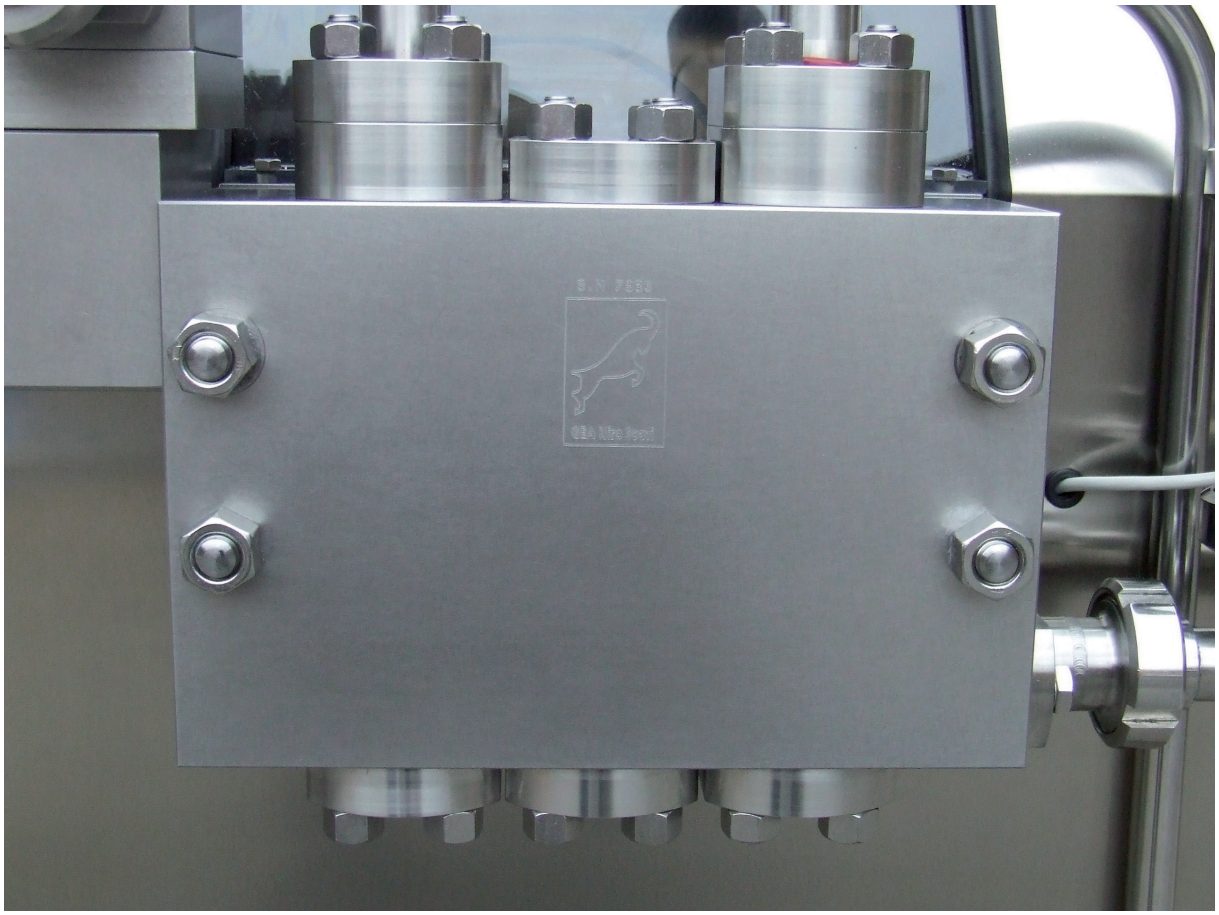
FIG. 7-29

CAUTION:
It is absolutely FORBIDDEN to change the setting of the pressure relief valve and to break the warranty seal, unless authorised to do so in writing by GEA Niro Soavi S.p.A.
Unauthorised tampering with the valve leads to the immediate forfeiture of the warranty and to risks for personal safety, since the safety valve is a fundamental component for machine safety in conformity with CE regulations.

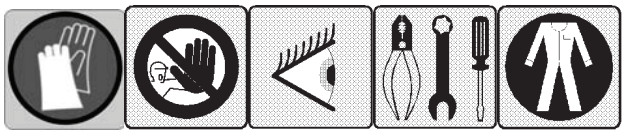
CAUTION:
It is absolutely FORBIDDEN to close the discharge pipe of the safety valve with a valve. The valve discharge must always be free and pointing downwards.

CAUTION:
The safety valve is a key component for protecting the machine against overpressure. It is therefore advisable to recalibrate the valve every 5000 hours.
For this operation you must contact GEA Niro Soavi S.p.A. personnel.

SHEETS INDEX	
SHEET	**Job location**
E	**Manifold unit**
E[a]	Check gaskets



SHEET E[a]
MANIFOLD GROUP - **Check gaskets**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EVERY 1500 HOURS**

TIME REQUIRED **: 10 MINUTES**

DESCRIPTION: **VISUAL CHECK**

For disassembling the manifold group, proceed as follows (referring to Figure 7-30):

- Unscrew the nuts located under the lower flanges **(1)** and the screws of the suction flange **(2)**
- Remove the gaskets indicated by the arrow in order to verify their integrity

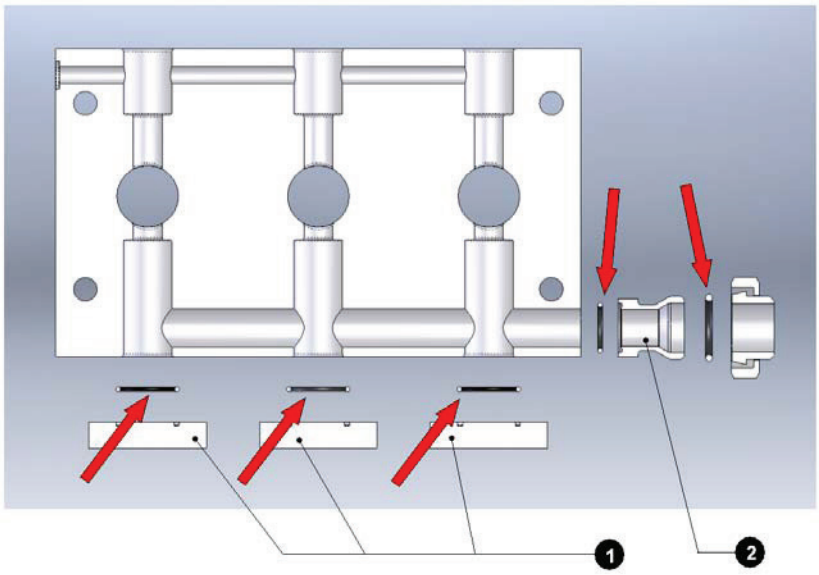


FIG. 7-30

SHEETS INDEX	
SHEET	**Job location**
F	**Lubrication system**
F[a]	Change oil
F[b]	Check and top up oil level

SHEET F
LUBRICATION SYSTEM

GENERAL INFORMATION

Correct machine lubrication is an essential requirement for its good operation.
For this reason it is absolutely necessary to respect the job intervals described below.

The lubrication system is the SPLASHING type.

CAUTION:
Old oil is highly polluting. Do not dump it in the environment, but collect it in special containers for disposal.

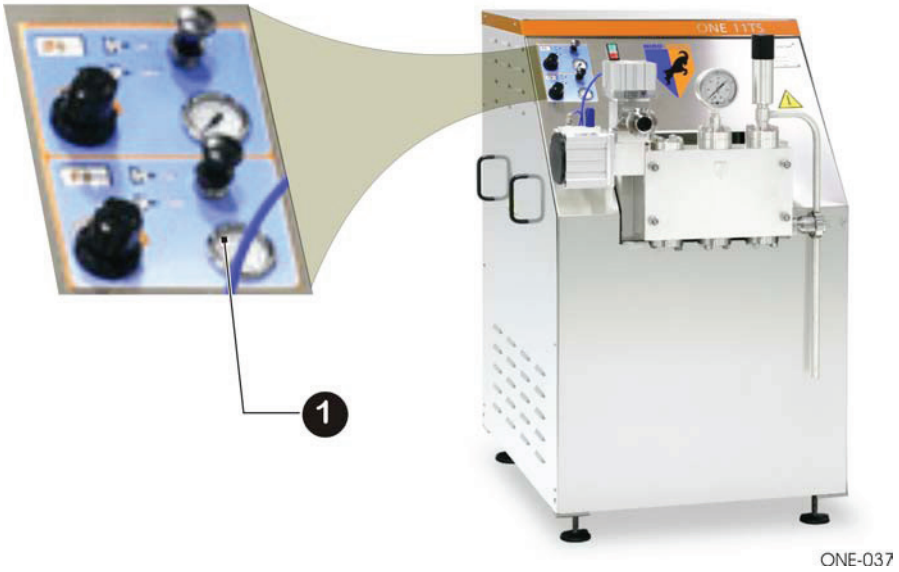
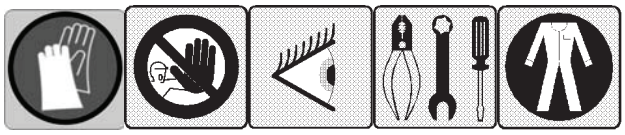


FIG. 7-31

SHEET F[a]
LUBRICATION SYSTEM - **Change oil**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: AT 500 + EVERY 1500 HOURS**

TIME REQUIRED **: 30 MINUTES**

DESCRIPTION:

To change the oil, proceed as follows:

Changing the oil

The oil changing frequency is indicated in paragraph 7.6 "FREQUENCY OF MAINTENANCE WORK"

Use exclusively oil of the type indicated in **SHEET F[a]** referring to the figure below:
- prepare a collecting basin with suitable dimensions to hold the oil
- open the filling cap on the body cover
- open the valve and the plug and let the required oil drain off
- after draining completely, close the valve and the plug and add fresh oil through the filler;
- check the oil level via the visual level or sight glass.

The oil must be changed using one of the oils indicated in the table below.

Class:	**ISO VG 150**
	DIN 51524-2-HLP

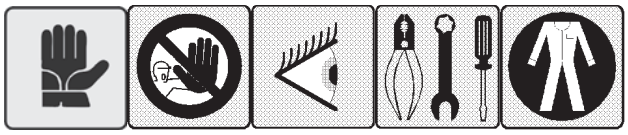
MAKE	TYPE		MAKE	TYPE
Agip	Oso 150		Texaco	Rando oil HD 150
IP	Hydrus Oil 150		Gulf	Harmony 150 AW
BP	Energol HLP-HM 150		Amoco	American industrial oil 150
Mobil	DTE 19M		Total	Azolla ZS 150
Mobil	DTE Extra Heavy		Fina	Hyidran 150
Chevron	AIO ISO 150		Api	Cis 150
Castrol	Hyspin AWS 150		Kuwait Petr. Int.	Q8 haidn 150
Esso/Exxon	Nuto H 150		ELF	Olna DS 150
Shell	MORLINA Oil 150		ARAL	Degol CL 150T

CAUTION:
The lubricating oil is suitable for operating temperatures between +5°C and +40°C:
If the temperatures are outside this range, contact the GEA Niro Soavi S.p.A. Service Department **for the type of lubricant suitable for the specific local conditions.**

CAUTION:
It is important to periodically check the absence of a whitish water/oil emulsion due to ingress of water into the body caused by worn guide piston gaskets.

CAUTION:
Old oil is highly polluting. Do not dump it in the environment, but collect it in special containers for disposal.

SHEET F[b]
LUBRICATION SYSTEM - **Check and top up oil level**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS : MAINTENANCE ENGINEER

JOB FREQUENCY : BEFORE EACH START-UP

TIME REQUIRED : 2 MINUTES

DESCRIPTION:

It must be done daily while the machine is stopped, before starting, ensuring that the oil comes up to the mark ("OIL LEVEL") on the sight glass on the machine's rear panel.

N.B.
The oil level must be checked when the machine has been stopped for at least 15 minutes.
Refer to figure 7-32.

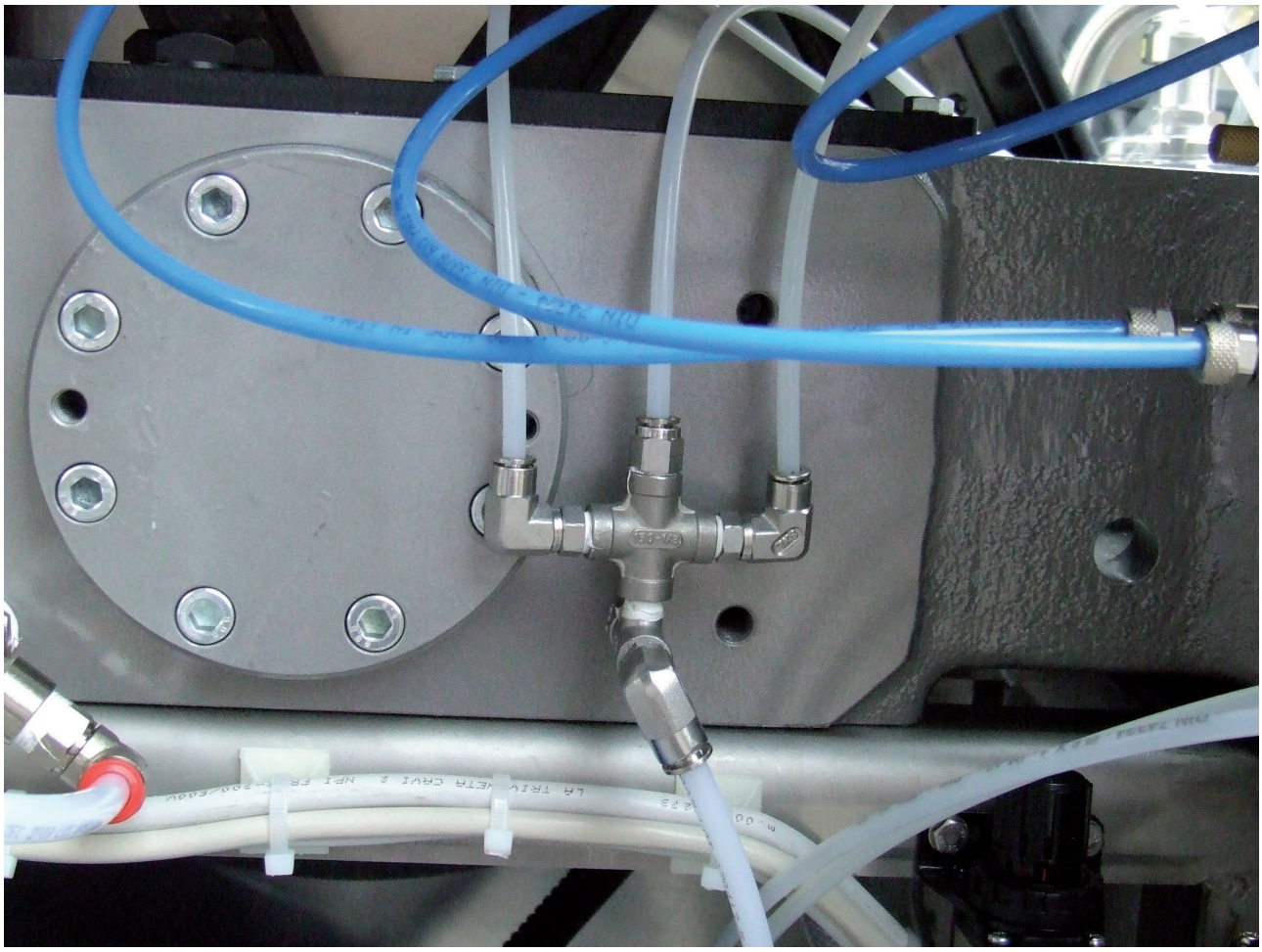
FIG. 7-32

N.B.
Starting the machine causes filling of the circuits, so it is normal for the level to be lower during operation.

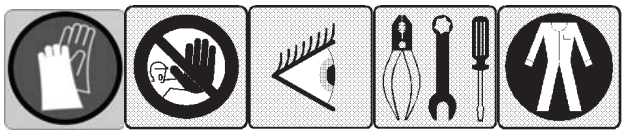
If the level is lower than prescribed, top up through the orange filling inlet located inside the machine on the body cover.
To access the filler it is necessary to remove the machine's side panel.

N.B.
In the absence of oil or if the level is low, topping up must be done IMMEDIATELY in order to restore correct operating conditions

SHEETS INDEX	
SHEET	**Job location**
G	**Water system**
G[a]	Cleaning and/or replacing the filters
G[b]	Check the piston lubrication water pipes and check the water flow rate



SHEET G[a]
WATER SYSTEM - **Clean and/or renew filters**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EVERY 1500 HOURS**

TIME REQUIRED **: 15 MINUTES**

DESCRIPTION:

To clean and replace the filters proceed as follows:

Disassemble the water filter using the wrench (see Figure 7-33).

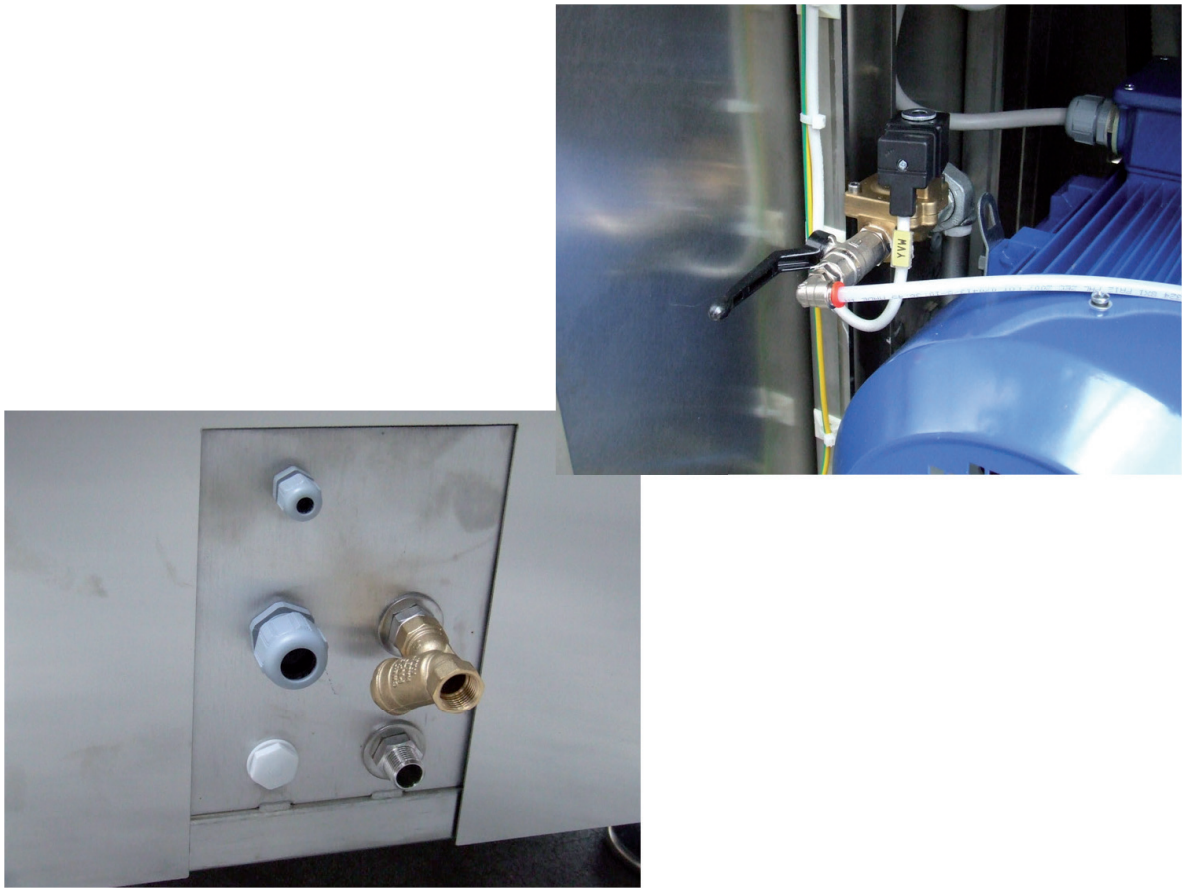
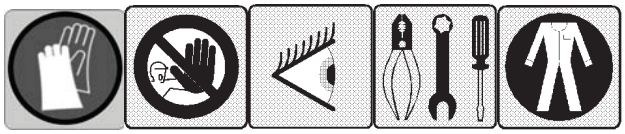


FIG. 7-33

SHEET G[b]
WATER SYSTEM - **Check:**
piston lubrication water pipes
check water flow rate



CAUTION:
These activities should be carried out while the machine is in operation. Exercise extreme caution.

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EACH START-UP**

TIME REQUIRED **: 1 MINUTE**

DESCRIPTION: **VISUAL CHECK**

To check the cooling water pipes as follows:

a) To check for leaks in the piston lubrication water circuit carefully look for dripping under the bottom of the machine.

FIG. 7-34

b) To check the water flow, proceed as follows:
observe that a suitable jet of water comes out from each packing container flange located behind the compression head (refer to Figure 7-35).

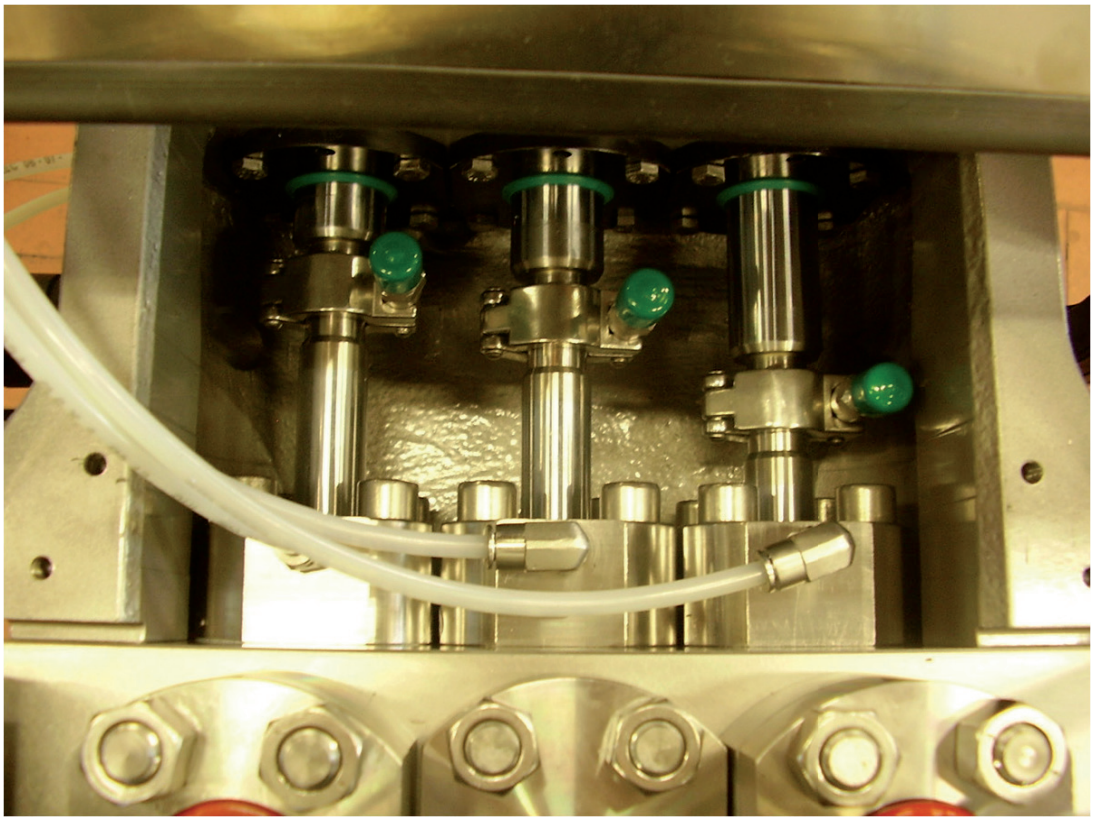
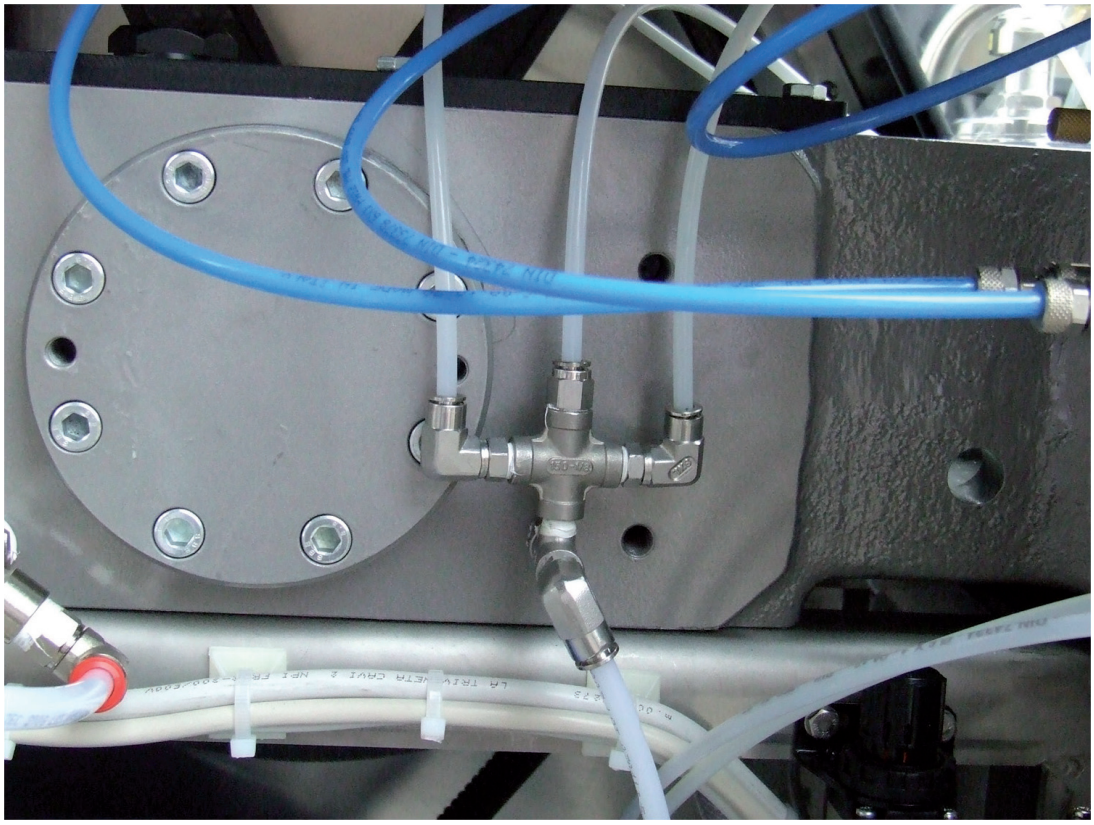


FIG. 7-35



SHEETS INDEX	
SHEET	**Job location**
H	**Pneumatic plant**
H[a]	Clean/replace filters

SHEET H
PNEUMATIC PLANT

GENERAL INFORMATION

The actuation force required to close the homogenizing valve and achieve the operating pressure is applied by a pneumatic cylinder with compressed air in the upper chamber.

The actuator does not require regular maintenance, but should be protected against high temperatures (which can damage its gaskets) and corrosive fluids, since it is made in aluminium and stainless materials.
Should the actuator malfunction it is advisable to replace it; in any case there is a gaskets kit available as a spare part, supplied on request by directly contacting the Spare Parts Department of **GEA Niro Soavi S.p.A**.

The figure shows a schematic diagram with one stage with local manual adjustment on the machine's control panel.

A diagram of the system actually installed on the machine is enclosed with chapter 11 "SPARE PARTS CATALOGUE"; refer also to the flow-sheet (P&ID) also enclosed with chapter 11 of this manual.

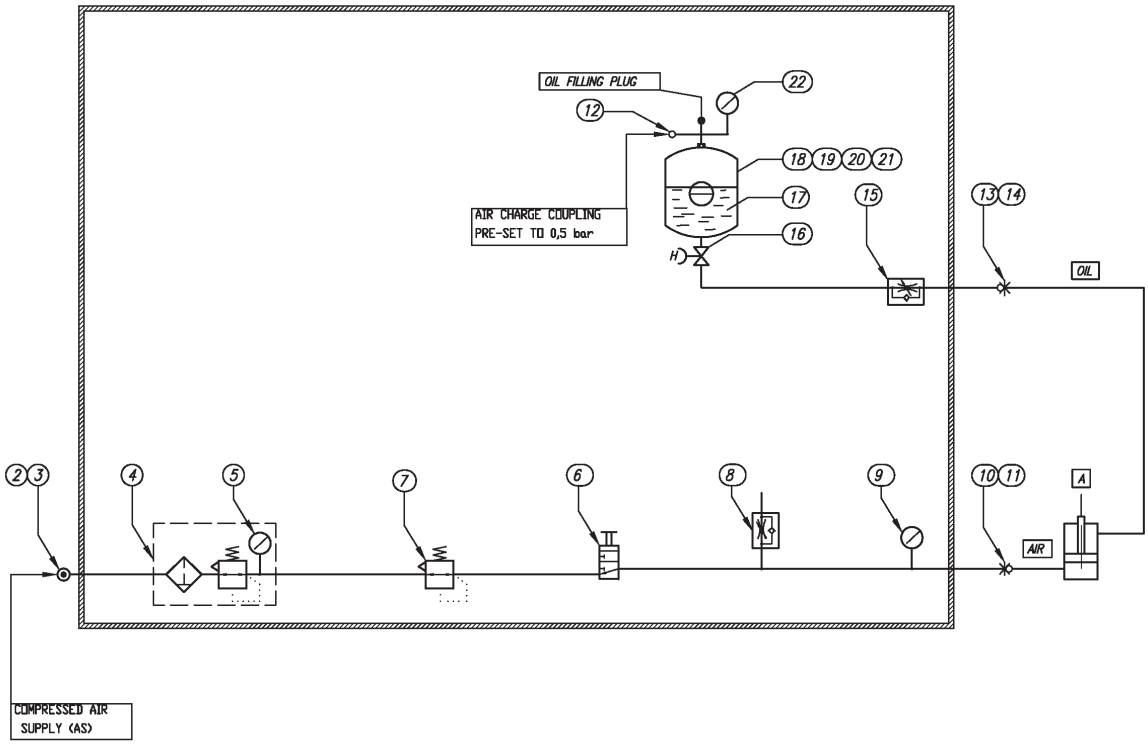
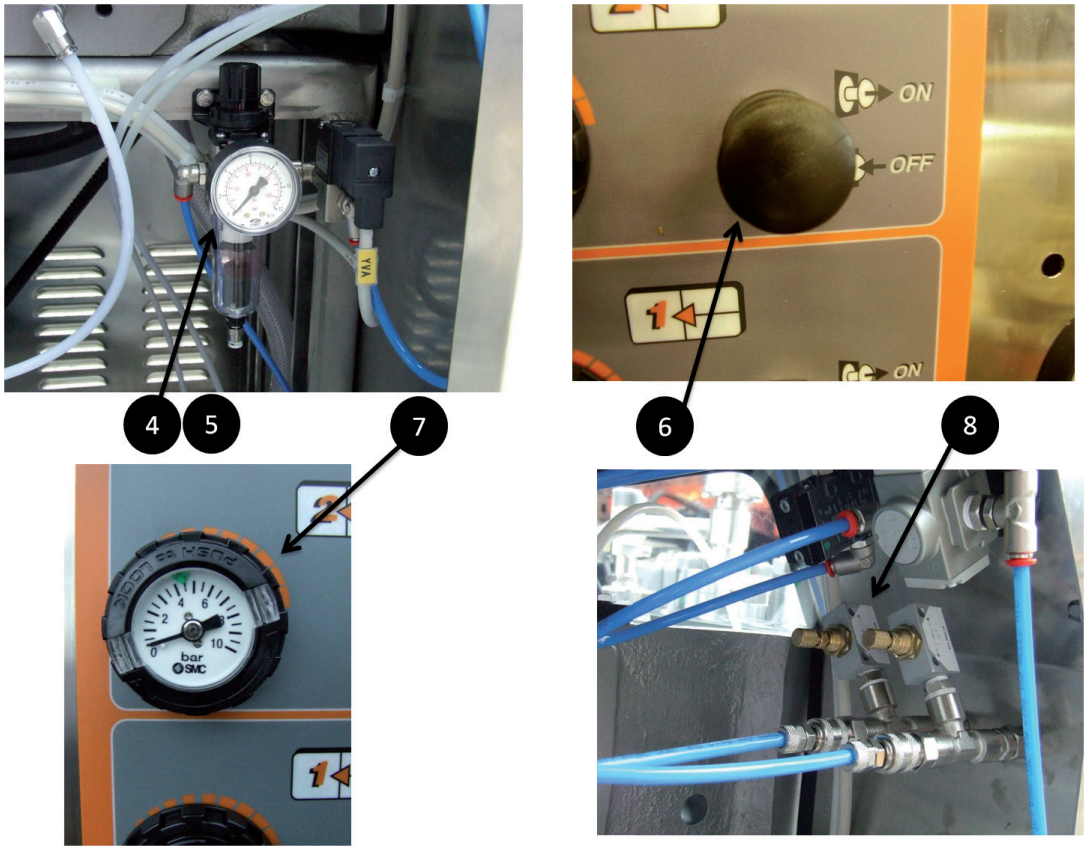


FIG. 7-36

With reference to Figure 7-36, the following are present:
- an air treatment and shut off unit **(4)** with pressure gauge **(5)**;
- a manual control valve **(6)** to pressurize the actuator
- a manual pressure regulator **(7)**;
- one-way reducers **(8)** which give sensitive but stable operation of the system and adjust the homogenizing pressure ramp;
- a tank containing air and oil.

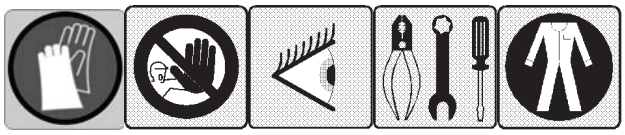


Regulating the choke valve on the circuit **(8)** enables regulating the homogenization pressure cut-in speed.
The calibration is normally done in the machine testing phase so as to avoid too fast an increase in pressure that can cause the pressure relief valve to open.
Before modifying the calibration value, mark the indication on the graduated scale to be able to restore it should the change not be effective.
Closing the valve **(8)** causes the rise in pressure to slow down, opening it makes for a faster adjustment.

The pneumatic plant with local manual adjustment features a pneumatic regulator and a pneumatic switch on the machine's front control panel.
No maintenance is required on these components and in the event of malfunctioning it is advisable to replace them.

Damping of the vibrations, induced on the homogenizing valve due to the normal pulsations caused by the alternating motion of the pumping pistons, is ensured by an oil/air pressure accumulator connected with the lower chamber of the actuator of the homogenizing unit.
The accumulator is pre-loaded with air at 0.5 bar.
The pressure gauge enables checking the pre-load pressure and the quick coupler enables bringing the pressure back to its correct value.
Frequently checking the damping system enables preventing the onset of vibrations and resonance that, besides producing annoying noise, are harmful both for the machine and for the homogenization efficiency.

SHEET H[a]
PNEUMATIC PLANT - **Clean and/or renew filters**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS : **MAINTENANCE ENGINEER**

JOB FREQUENCY : **IN THE EVENT OF MALFUNCTIONING**

TIME REQUIRED : **10 MINUTES**

DESCRIPTION:

To change the filters, proceed as follows:

a) If the pneumatic plant is working correctly there is no need for any maintenance on the Reduction gear-Filter group.

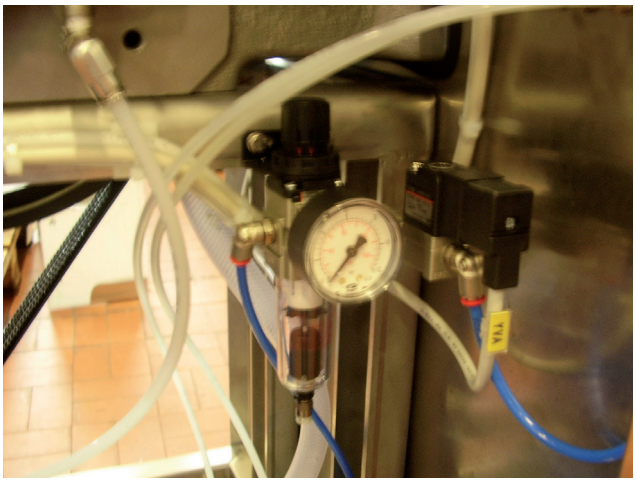


FIG. 7-37

b) If there is any trouble associated with filter clogging, replace the entire Reduction gear-Filter group as follows:
   - Unscrew the ring nut
   - Disconnect the air inlet and outlet pipes
   - Renew the Reduction gear-Filter group.

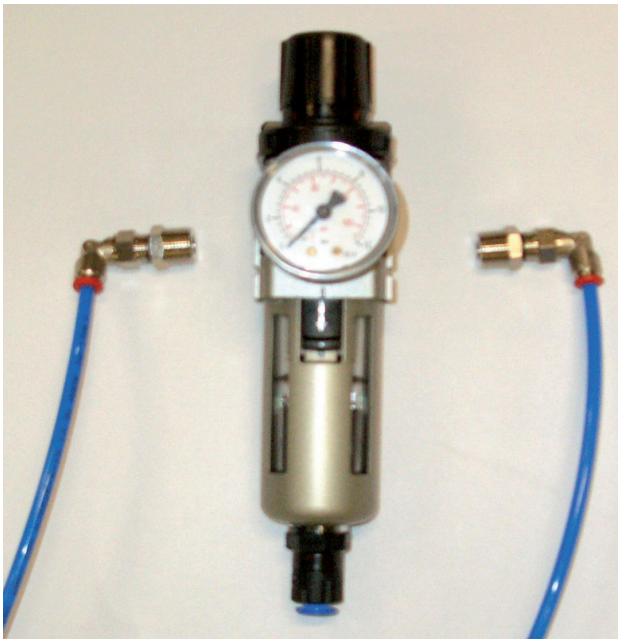
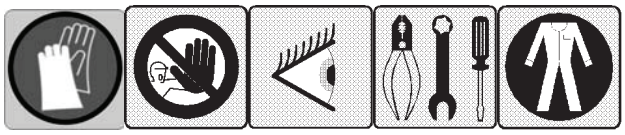


FIG. 7-38

SHEETS INDEX	
SHEET No.	**Job location**
I	**Body and crank gear system**
I[a]	General components check

SHEET I [a]
BODY AND CRANK MECHANISM - **General check of components**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: IN THE EVENT OF FAILURE**

TIME REQUIRED **: depends on the actual state of the gasket renewal components: 50-75 MINUTES**

DESCRIPTION:

If any abnormality is found it is recommended to consult the **GEA Niro Soavi S.p.A.** Service Department.

GENERAL INFORMATION

The alternative linear movement of the pumping pistons is achieved by means of a crank gear system (crankshaft, connecting rod, cross head) of strong construction and oversized.
The system is represented in the (general) figure shown below.

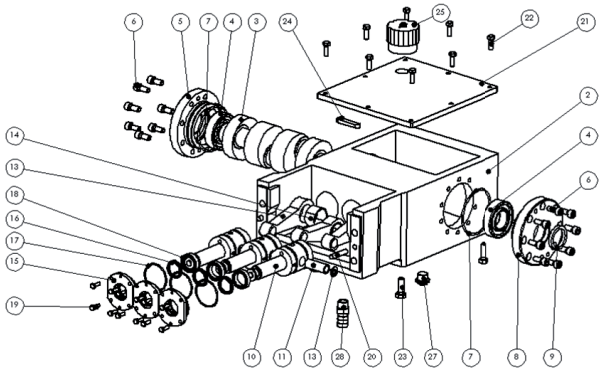


FIG. 7-39

The type of construction, the high quality materials used and the care taken in assembly by highly skilled personnel guarantee great reliability and a long duration.
Proper lubrication is critical to the long life of the transmission assembly and its components: make sure you observe the specified change intervals, along with the fluid levels and lubricant types.
In normal conditions, the crank gear system requires no maintenance. If you encounter abnormal noise or uneven operation of the machine, contact the **GEA Niro Soavi S.p.A.** Service Department for technical assistance.
Under normal conditions of operation and with no faults, with reference to Figure 7-39, it is recommended to check the bushes of the crank gear system **(14)**, of the pin **(11)** and of the relevant bush on the connecting rod **(13)** at least every approximately 10,000 hours of operation, and of the roller bearings **(4)** of the crankshaft at least every approximately 20,000 hours of operation. These operations must be done by skilled personnel, so it is recommended to contact the Technical Service Department at **GEA Niro Soavi S.p.A.** for information and support. The only scheduled maintenance operations concern the replacement of the guide piston gaskets **(16)** and **(18),** if any leaks of lubricating oil are noticed in the sump.
If the surface of the guide piston where the gasket runs is very scored, the guide pistons must be replaced.
This operation must be done by skilled personnel, so it is recommended to contact the Technical Service Department at **GEA Niro Soavi S.p.A.** for information and support.

CAUTION:
Lubricating oil is highly polluting. Do not dump it in the environment or in drains, but collect it in special containers for disposal.

At least partially drain off the oil in the body to prevent it accidentally coming out

To replace the gasket proceed as follows with reference to Figure 7-40:

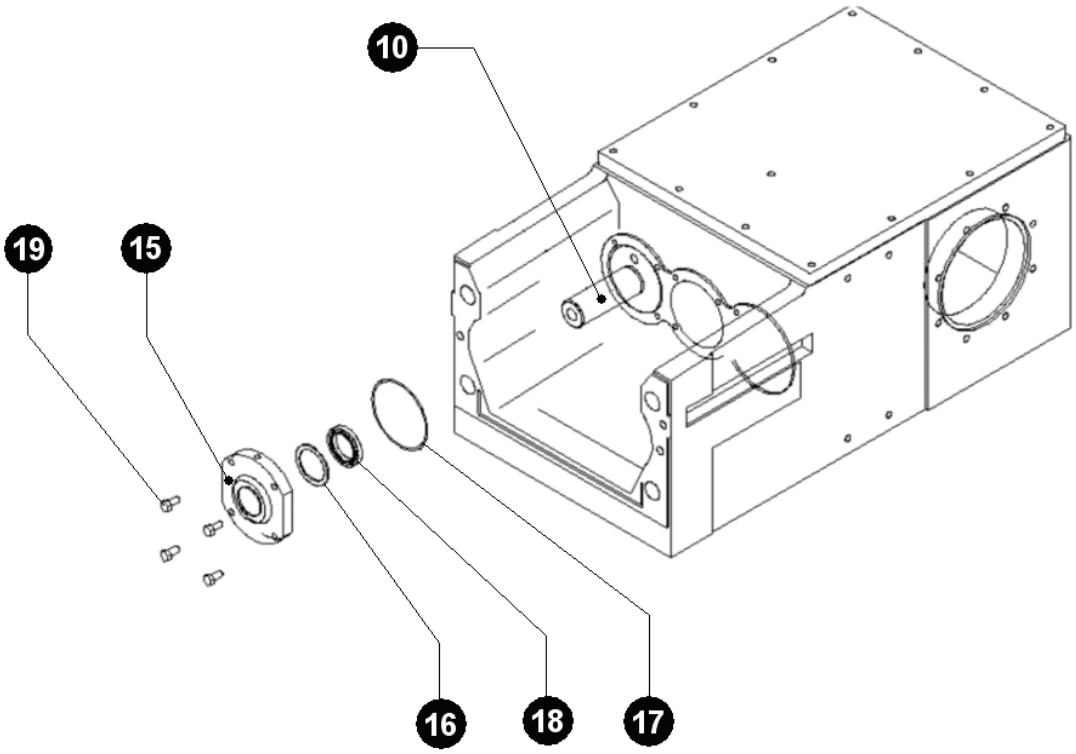


FIG. 7-40

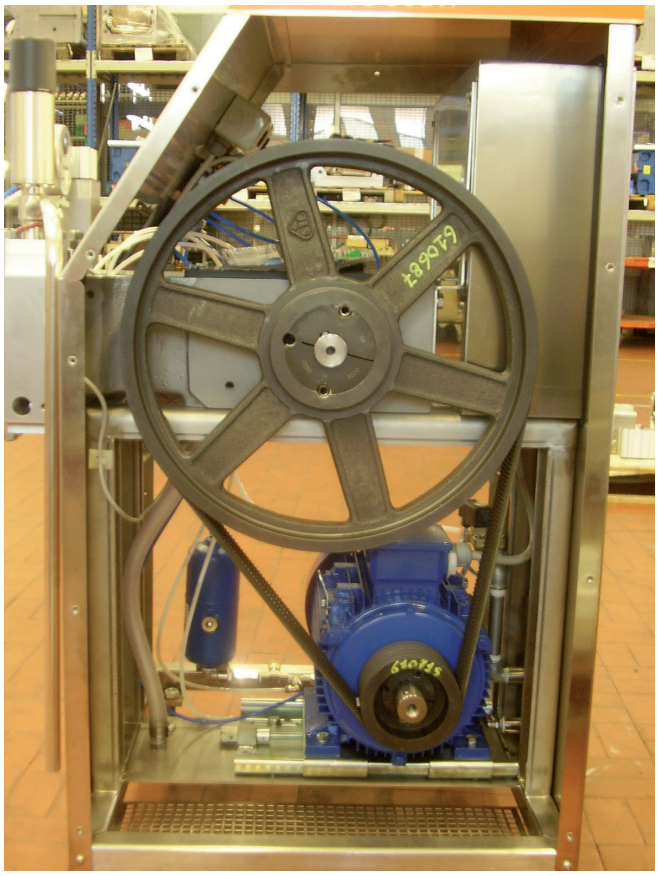
Instructions for disassembly

- remove the pumping piston in accordance with the procedure described on sheet A[d]
- unscrew the bolts **(19)** and extract the flange **(15)** from the guide piston **(10)**
- extract the wiper seal **(16)** and the seal gasket **(18)**

Instructions for assembly

To refit the disassembled components, proceed as follows:
- fit the wiper seal **(16)** and the gasket **(18)** in the seat inside the flange **(15)**
- check and clean the stem of the piston; if its surface is badly scored or the chromium coating is damaged the piston assembly must be replaced. The stem of the guide piston cannot be supplied separately as a spare part
- fit the flange complete with O-Ring **(17)** all the way onto the guide piston **(10)**; during assembly take care not to damage the lip of the seal gaskets, using lubricating grease in order to facilitate assembly
- tighten the screws **(19)**.

SHEETS INDEX	
SHEET	**Job location**
L	**Drive**
L[a]	Check tension and service belts
L[b]	Check tightness of the transmission elements
L[c]	Check V-belt wear and renew if necessary
L[d]	Checking pulley alignment



SHEET L
DRIVE

GENERAL INFORMATION

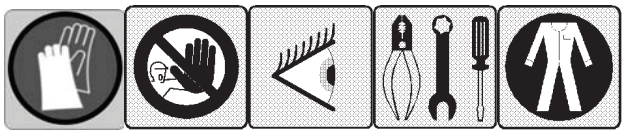
The machine is equipped with a transmission system consisting of a V-belt drive and pulleys between the main motor and the crankshaft of the machine.

The transmission members generally require only a visual check, made with the machine stationary, looking for any lubricating oil leakage and above all any loosening of nuts, bolts and belt tensioning components.
Any excessive movement of the transmission components, due to slackening of the locking members caused by vibration, can create play in the couplings and as a result break the parts when the machine is operating.

CAUTION:
It is recommended to always check the tightness of the nuts and bolts of the pulleys and belt tensioning system regularly. Any abnormal vibration due to incorrect machine operation or conditions of cavitation can cause these components to become loose and the transmission to get damaged.

The instructions for maintenance of the transmission components are in the sheets listed below.

SHEET L[a]
DRIVE - **Check tension and service belts**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: AFTER 40 HOURS + EVERY 1500 HOURS**

TIME REQUIRED **: 30 MINUTES**
50 MINUTES (if renewing pulleys)

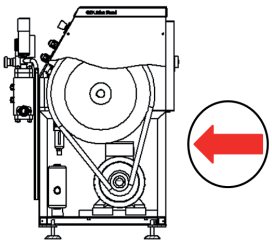


FIG. 7-41

GENERAL INFORMATION

Belt transmissions are an efficient and reliable method of power transmission.
Indicated below are some simple directions to help guarantee the reliability and long life of the system.

Visually check for oil or grease on the belts as this could cause them to deteriorate too quickly; too much oil on the supports and bearings can foul the belts, while a lack of oil can increase the friction and thereby burn the belts due to overloading.
Listen to the noises coming from the transmission.
If screeching is heard during motor accelerations or when working at full load, it means that the belt tension is insufficient.

Once the correct tension has been restored, if the noise persists, try and locate a transmission overload (due to wear, seizure, insufficient lubrication....).
The presence of a constant creaking noise, like that of an insufficiently lubricated bearing, does not cause any particular damage to the transmission and may be due to the presence of dirt.
Do not try to eliminate this noise by greasing the belts.
Dirt and dust can accelerate belt and pulley wear and impair traction.
It is therefore necessary to clean the transmission system regularly to avoid foreign matter getting caught between the belts and pulleys.
Overloading shortens the life of the belts.
Check that operation takes place under the initial design conditions, that there is no overloading due to wear or slipping and surface burns.
The transmission must always be protected by an appropriate housing that, besides preventing injuries, ensures protection from dust or dirt and contact with foreign bodies that could severely damage the system.
Check the state of the belt, watching out for cuts and cracks which indicate heavy wear and the need for replacement.
Check and maintain the correct belt tension, preventing abnormal vibration.
Ensure that the belts are not exposed to sources of heat; exposure to temperatures higher than 60°C shortens their life.
Check the state of the sides of the belt: abnormal wear may mean slipping or excessive wear of the pulley races.

Instructions for belt tensioning

Check that the V-belt is tensioned properly; improve the tension where appropriate.

CAUTION: The belt transmission can cause a crushing or trapping hazard. Always use the appropriate fixed guards and remove them only after checking that the machine is at a complete standstill.

The ideal tension is the lowest at which the belts do not slip under the maximum load.
During the first 24/48 hours of running in it is necessary to check the tension frequently; remember that excessive tensioning shortens the life of the belts and transmission support bearings.
It is necessary to do the tensioning as soon as a slip occurs.

Any slipping of the belts can cause them to overheat and as a result create hazardous situations especially if the machine is fitted out for working in danger zones.

By using the sliders on which the motor is positioned, as shown in figure 7-42, you can vary the centre distance between the lower pulley and the flywheel of the crankshaft, allowing drive belt tensioning.

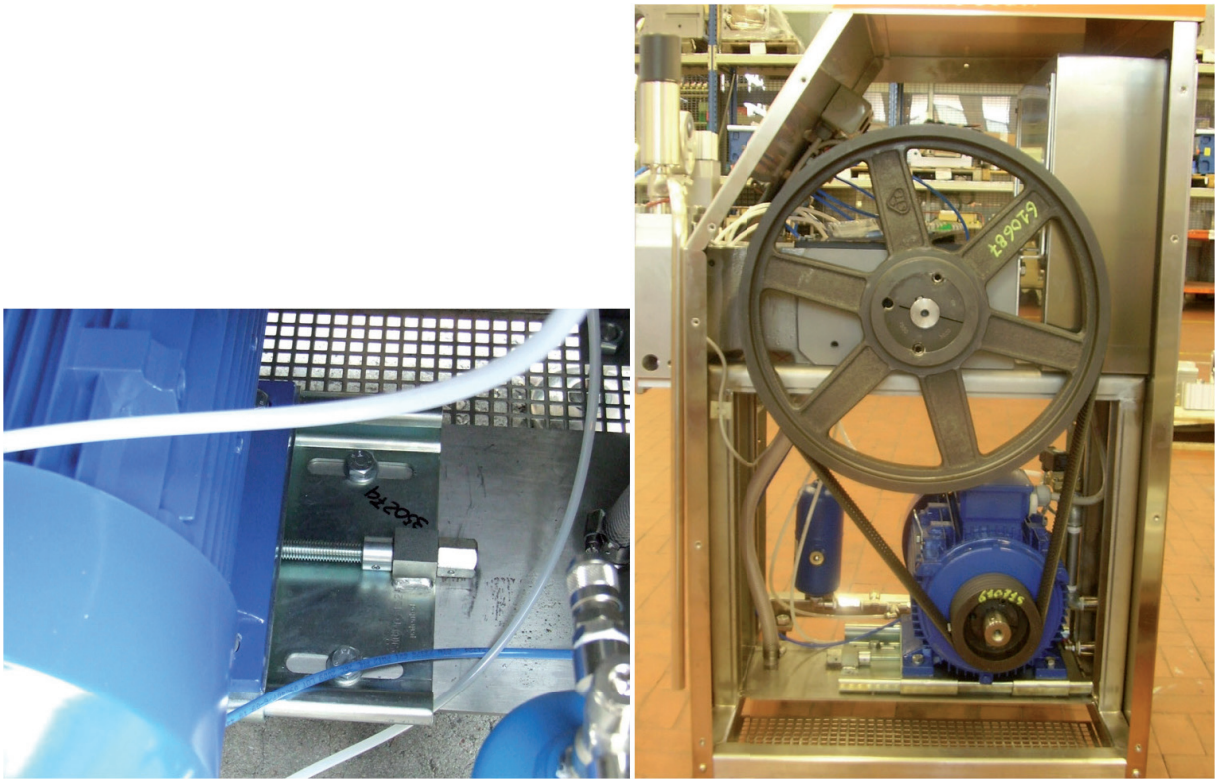


FIG. 7-42

Instructions for belt maintenance

During installation and disassembly, the belts must never be forced with a tool into the races of the pulley, so as not to run the risk of ruining both with a consequent reduction in the life of the transmission.
It is sufficient to decrease the centre distance of the pulleys to aid this operation.

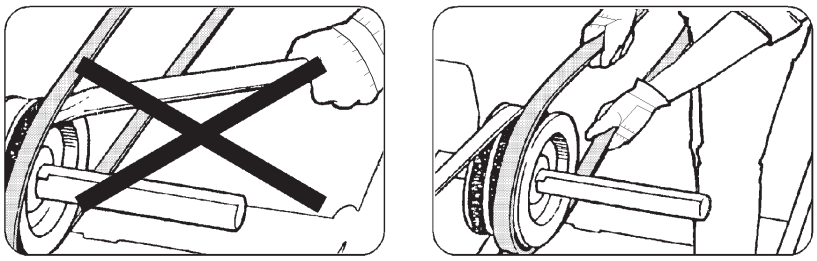


FIG. 7-43

Check that the races of the belt pulleys are not worn. The correct positioning of the belt is shown in the figure below.

If the races are worn, the pulley must be replaced.

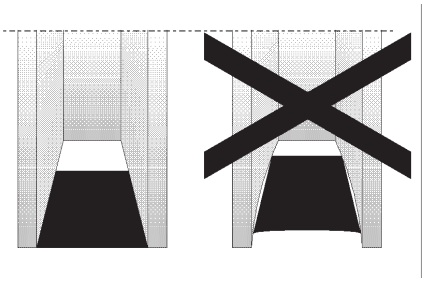
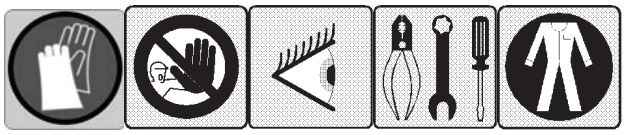


FIG. 7-44

SHEET L[b]
DRIVE - **Check tightness of the transmission elements**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

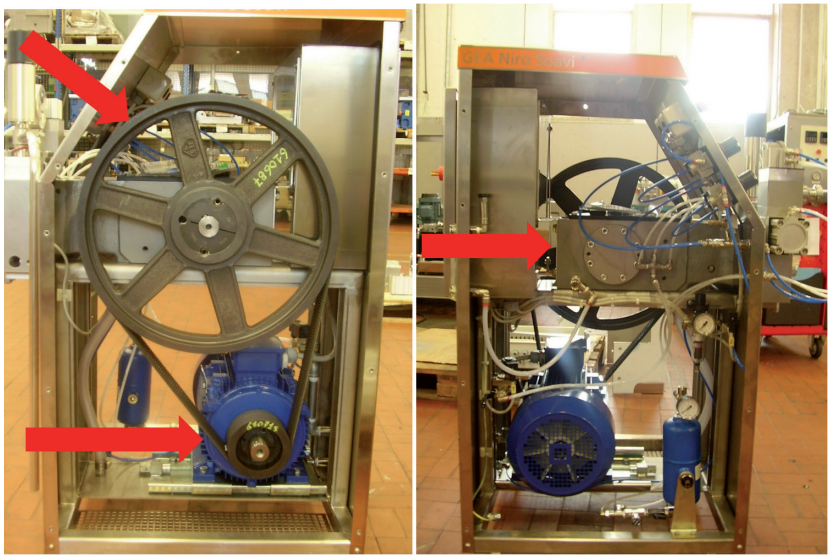
JOB FREQUENCY **: EVERY 1500 HOURS**

TIME REQUIRED **: 10 MINUTES**

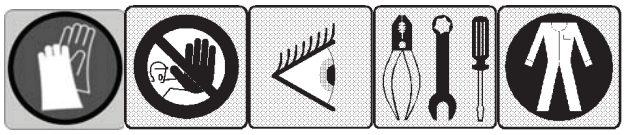
DESCRIPTION:

To check the tightness of the transmission elements, proceed as follows:

Carry out the check by tightening the nuts and bolts using the appropriate tools.
This type of check must be carried out on the:
- Pulleys and bushings
- Body flanges



SHEET L[c]
DRIVE - **Check V-belt wear and renew if necessary**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EVERY 1500 HOURS** (check) **+ IN THE EVENT OF DAMAGE** (renewal)

TIME REQUIRED **: 30 MINUTES**

GENERAL INFORMATION

Worn pulleys considerably reduce the service life of the belts, which can get to touch the bottom of the groove causing slipping that produces wear and surface burns.

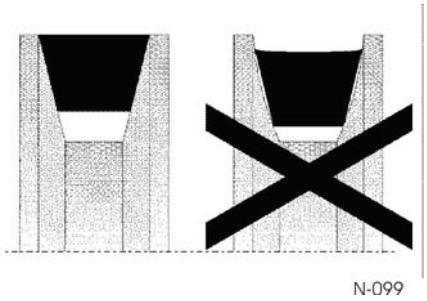


FIG. 7-45

If the sides of the groove are recessed there is no longer uniform contact between the side of the belt and the pulley, whose bottom causes wear of the bottom edge of the belt causing it to break early. It is therefore necessary to check the state of wear of the pulleys and remove any rust, grease or oil that there may be.

Check that the V-belt has no fraying.

When there is any fraying, renew it immediately.

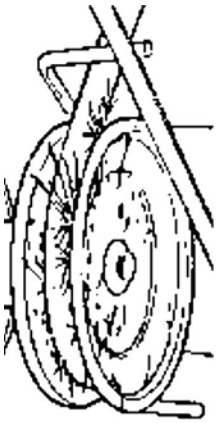
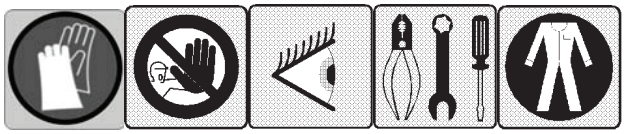


FIG. 7-46

If any fixed guards or covers are removed, put them back on at the end of the maintenance operations.

SHEET L[d]
DRIVE - **Check pulley alignment**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: AFTER EACH MAINTENANCE JOB**

TIME REQUIRED **: 5 MINUTES**

DESCRIPTION:

Correct alignment is vital for the durability of the drive belts.
This operation is carried out during assembly by skilled personnel, however it is advisable to check the alignment, placing a metal rule over the 2 pulleys as shown in figure 7-47.

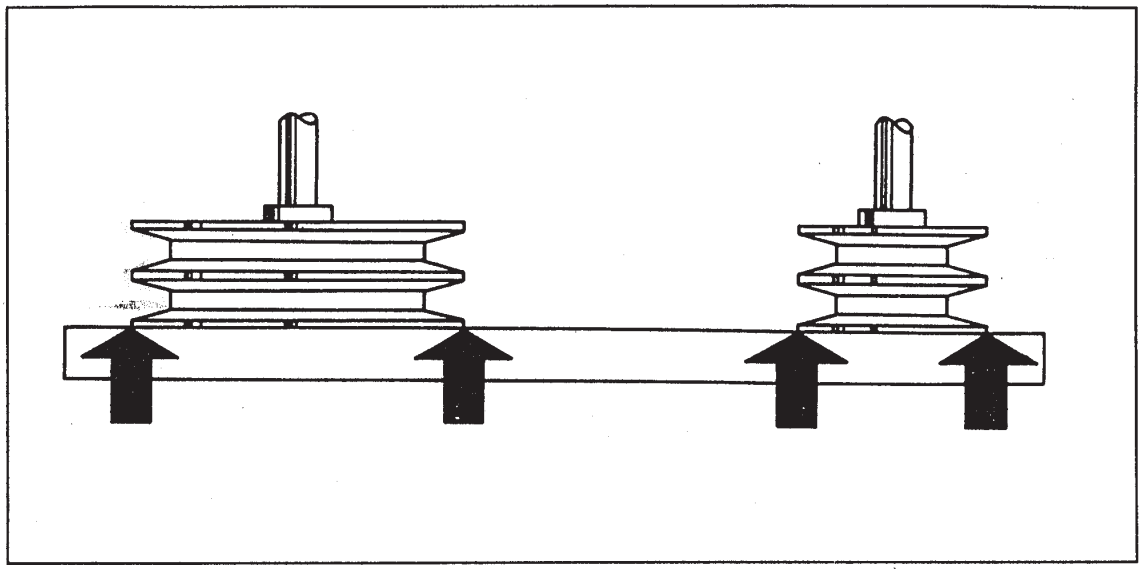


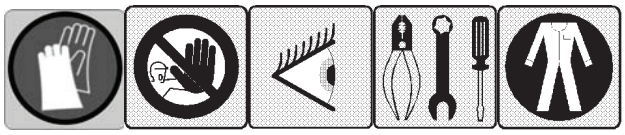
FIG. 7-47

If necessary, it is possible to correct the alignment by loosening the bolts locking the taper bushing and move the driven pulley slightly (a few mm.) into an optimal position.
To do this it is useful to also loosen the motor lock nuts.
Then lock the bushing and if necessary the motor.

CAUTION:
Matching the belts
At the same time use belts of the same make, the same type and from the same batch, as they might present differences in both dimensions and performance.
It is also indispensable not to mix new belts with others that have already been used, due to different stretching, adaptation to the pulley races, and differences in performance which would appreciably influence the duration of the transmission train.
To ensure regular operation and avoid early breakage, the belts must be stored without any marked folds and they must not be exposed to temperatures that are too high or too low, nor to high humidity.

SHEETS INDEX	
SHEET	**Job location**
M	**Housing**
M[a]	General visual check

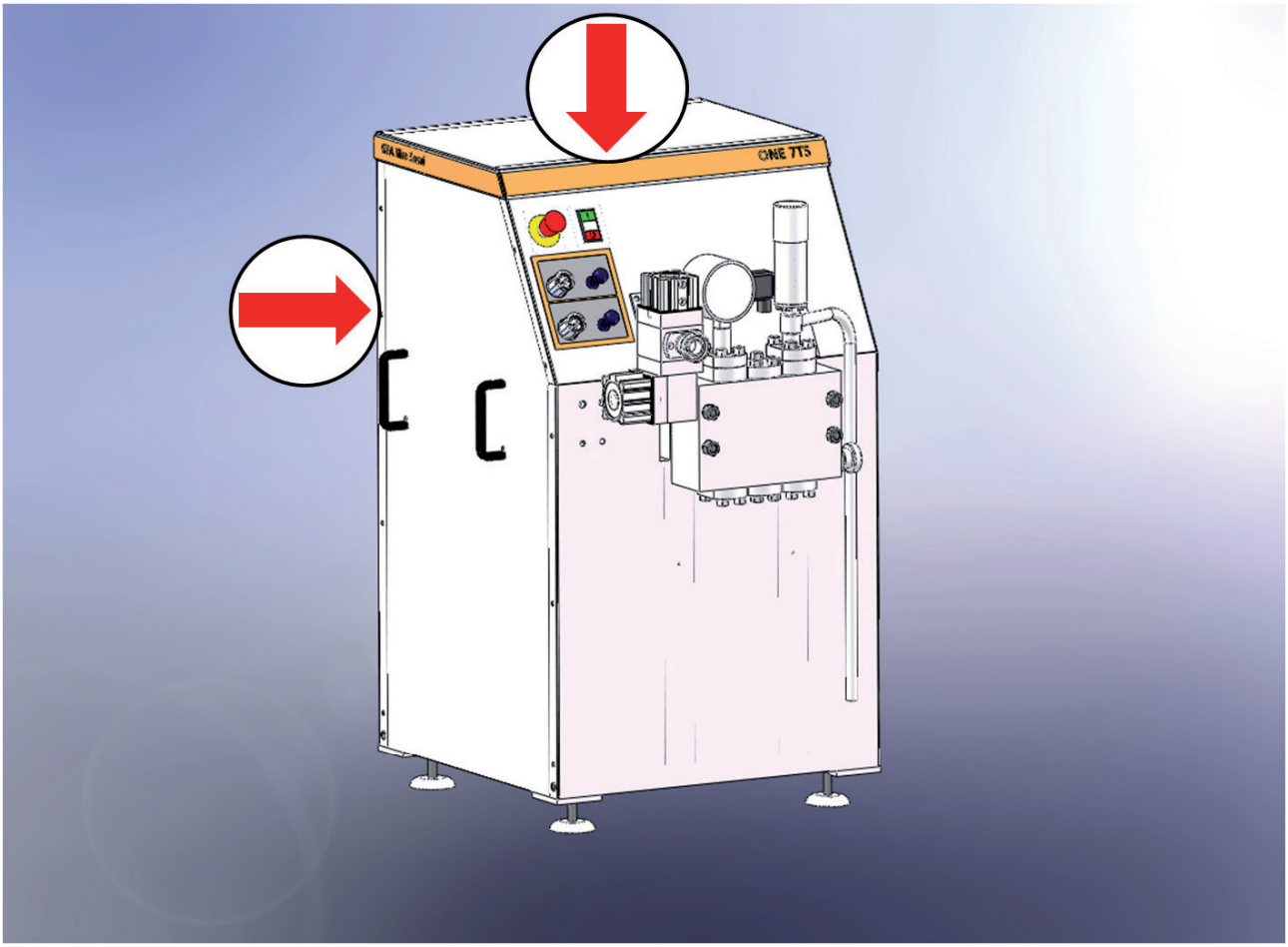
SHEET M[a]
HOUSING - **General visual check**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

RESOURCES AND TOOLS	**: MAINTENANCE ENGINEER**
JOB FREQUENCY	**: EVERY 5000 HOURS**
TIME REQUIRED	**: 1 MINUTE**
DESCRIPTION:	**VISUAL CHECK**

To visually check the state of the housing, proceed as follows:

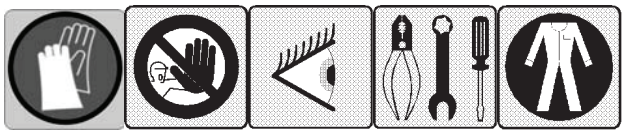


LOCATION OF THE WORK
FIG. 7-48

a) Carefully observe the state of the panelling that encloses the transmission and systems of the machine.
b) In the case of visible dents that compromise inlet safety, contact the Service Department at **GEA Niro Soavi S.p.A.**

SHEETS INDEX	
SHEET	**Job location**
N	**Electrical system on the machine**
N[a]	Checking the electrical system on the machine

SHEET N[a]
ELECTRICAL SYSTEM ON THE MACHINE - **Check the electrical system on the machine**



CAUTION:
Activities to be carried out after maintenance shutdown of the machine (see paragraph 7.3.3)

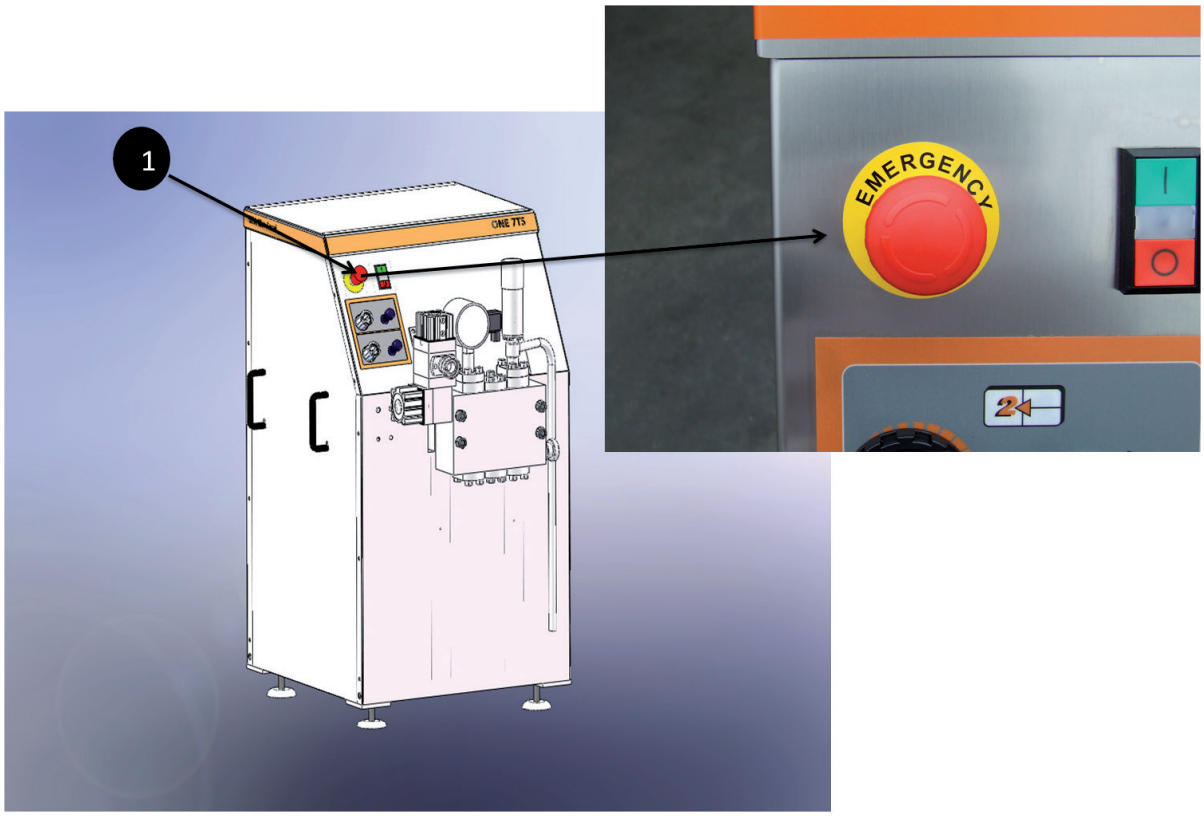
RESOURCES AND TOOLS **: MAINTENANCE ENGINEER**

JOB FREQUENCY **: EVERY 3000 HOURS**

TIME REQUIRED **: 10 MINUTES**

DESCRIPTION:

The electrical system on the machine does not require any particular scheduled maintenance. However it is recommended periodically to perform operating tests on the individual safety devices and on the EMERGENCY STOP button **(1).**



8. Troubleshooting

Contents

8.1 Troubleshooting

This chapter lists the most frequent malfunctions, the possible causes and any remedies to restore normal machine operating conditions.
If the fault persists or does not fall within the cases presented here, the **GEA Niro Soavi** Service Department will be at your disposal to supply all the necessary indications and the means for obtaining the best results.
The following charts indicate the "FAULTS", possible "CAUSES" and "REMEDIES".

FAULT	POSSIBLE CAUSE	REMEDY
1. The machine does not run	• Main motor does not start	• Check the electrical wiring, fuses, circuit breakers
	• The drive belts are broken or loose	• Replace or tighten
2. There is no flow	• No feed (flow and/or pressure) to the machine	• Provide a correct feed (see Technical Specifications Dossier)
	• Feeding pipe clogged	• Clean the pipeline and filters properly
	• Bypass valve (if any) opened	• Close the bypass valve
3. Reduced flow rate	• Not enough feeding	• Feed the machine properly
	• Incorrect operation of suction / delivery valves	• Eliminate traces of dirt or foreign bodies between valve and seat (See chapter 7 "MAINTENANCE") • Check the state of wear of the valve contact surfaces and replace if necessary
3. Reduced flow rate	• Slipping belts	• Tighten (See chapter 7 "MAINTENANCE")
	• Low main motor speed	• Verify the correct speed (see Technical Specifications Dossier)
	• Leakage on pumping piston packings	• Replace (See chapter 7 "MAINTENANCE")
	• Air incorporated in the product to be treated	• Eliminate incorporated air

FAULT	POSSIBLE CAUSE	REMEDY
4. Compression head noisy	• Not enough or too high feeding pressure	• Feed the machine properly
	• Worn valves	• Replace (See chapter 7 "MAINTENANCE")
	• Valves not working properly	• Check for dirt or foreign bodies and clean
	• Air in the product	• Eliminate
5. Transmission body noisy	• Wear of bearings	• Check, lubricate and replace if necessary
	• Loose piston	• Tighten (See chapter 7 "MAINTENANCE")
	• Not enough feeding pressure	• Feed the machine properly
6. Screeching transmission	• Slipping belts	• Tighten correctly (See chapter 7 "MAINTENANCE")
7. Machine vibrations	• Not all the feet are supporting the weight	• Level the machine, regulating the height of the feet
	• Not enough feeding pressure	• Provide a correct feed (see Technical Specifications Dossier)
	• Pulsations at suction or delivery	• Install suitable pulsation damper (contact **GEA Niro Soavi**)
8. No cooling water for pumping pistons	• Shut-off valve on water plant closed	• Open
	• Water filter clogged	• Disassemble and clean
	• No pressure in the water circuit	• Check the required water supply conditions in the table (see Technical Specifications Dossier)
9. Pulsating delivery pressure	• Not enough feeding pressure	• Feed the machine properly
	• Damaged valves	• Replace (See chapter 7 "MAINTENANCE")
	• Unsteady backpressure	• Provide stable backpressure

FAULT	POSSIBLE CAUSE	REMEDY
10. Total lack of homogenization pressure	• Reduced flow rate	• See fault 3
	• Damaged homogenizing valve	• Clean or replace (See chapter 7 "MAINTENANCE")
	• No air pressure in pneumatic circuit	• Check efficiency and functionality of the pneumatic system (See chapter 7 "MAINTENANCE")
	• Defective pneumatic cylinder	• Replace
11. Homogenization pressure is not reached	• Not enough feeding	• Feed the machine properly
	• Blocked homogenizing valve	• Dismantle, clean (See chapter 7 "MAINTENANCE")
	• Worn homogenizing valve	• Replace (See chapter 7 MAINTENANCE)
	• Faulty pressure gauge	• Replace (See chapter 7 "MAINTENANCE")
	• Damaged homogenising unit shaft	• Replace (See chapter 7 "MAINTENANCE")
12. Oscillating homogenizing pressure	• Air or bubbles in the product	• Eliminate
	• Air in the compression head	• Release pressure, then apply pressure again
	• Not enough or unsteady feeding pressure	• Feed the machine properly
	• Incorrect operation of the suction or delivery valves	• Clean or replace (See chapter 7 "MAINTENANCE")
	• Incorrect operation of the pneumatic control	• Check pneumatic system (See chapter 7 "MAINTENANCE")
	• Unsteady backpressure	• Provide stable backpressure
13. Excessive noise of the homogenizing unit	• Worn homogenizing valve	• Replace (See chapter 7 "MAINTENANCE")
	• Resonance in the plant	• Modify the backpressure; install pulsation damper downstream; move the existing damper further downstream; contact **GEA Niro Soavi**

FAULT	POSSIBLE CAUSE	REMEDY
14. Oil level drops quickly	• Leakage from the body	• Check the plant and look for leakage, replace gaskets, tighten joints;
15. Formation of whitish foam in the oil	• Presence of condensate in an emulsion with the oil	• Stop the machine, wait about 1 hour and discharge the condensate from the oil (See chapter 7 "MAINTENANCE")
	• Excess piston lubrication water	• Adjust the flow of piston lubrication water to avoid excessive splashes and flooding of the sump
16. Oil overheats and darkens	• Machine overload	• Eliminate overload
17. Excessive absorption of electric motor	• Too high homogenizing pressure	• Reduce pressure to nominal value
	• Wear and friction on mechanical parts	• Check the state of wear and contact **GEA Niro Soavi**
	• Belts too tight	• Check belts tension
	• Faulty electric motor	• Check or replace
18. Presence of lubricating oil in the sump and in the cooling water	• Leaking gaskets on guide pistons	• Replace gaskets (See chapter 7 "MAINTENANCE")
	• Guide pistons scored or worn	• Replace (contact **GEA Niro Soavi**)

9. Waste disposal

Index

9.1 Definition of waste

Waste means any substance and object deriving from human activity or natural cycles, which is abandoned or destined to be abandoned.

9.1.1 Special waste

The following can be considered special waste:

- residues deriving from industrial processes, agricultural, artisan, commercial and service related activities which, because of the quality or quantity, cannot be included in municipal waste;
- deteriorated, obsolete machinery and equipment;
- motor vehicles and discarded parts.

9.1.2 Toxic-harmful waste

Toxic-harmful waste is all the waste that contains or is contaminated by the substances indicated in the annex to Pr. Decree 915/52 implementing directives 75/442/CEE, 76/403/CEE and 768/319/CEE and/or laws or regulations in force in the country where the machine is installed.

FIG. 9.1

9.2 Temporary storage

Temporary storage of toxic and harmful waste is allowed prior to planned disposal by means of treatment and/or final storage. In any case environmental protection laws in force in the user's country must be adhered to.

9.3 Characteristics of the containers

All fixed and movable containers destined to contain toxic and harmful waste must have adequate resistance characteristics depending on the chemical-physical properties and the hazardousness of the waste contained.
All containers holding dangerous or harmful products or substances must bear indications and signs designed to reveal the nature of their content.

9.4 Required registration

For the disposal of used oil, we recommend the use of in/out registers for special waste or toxic-harmful waste deriving from machine processes.

9.5 Disposal

Any refuse materials product must be disposed of in accordance with the laws in force in the country where the system is installed.

The substances produced during maintenance and/or machine demolition procedures are:

- used lubricants;
- recovery materials (coating, electric cables, etc.);
- plastic and rubber materials, (pipes, gaskets, couplings, etc.);
- ferrous materials (couplings, bearings, gears, etc.).

Any polluting product must be disposed of in compliance with the provisions contained in the laws of the country where the machine is installed.

10. Spare parts

Index

10.1 Recommended spare parts

In order to limit the number of shutdowns during production, and the time required for maintenance and restoration of the machine functions, it is advisable to stock a set of spare parts to replace elements that are normally subject to wear.

However, the number of spare parts will depend on the production needs and on how important it is to avoid long shutdowns due to the unavailability of the spare parts.
In specific, in case of homogenizing valves, the replacement at the due time allows the keeping of the homogenization efficiency and consequently the quality of the treated product.

GEA Niro Soavi cannot guarantee that a given spare part will be in stock either at their central warehouse or at Dealers' due to problems with material availability or the special requirement for dispatch.
Therefore, shipping is not guarantee of successful delivery and that delays may occur due to customs problems or loss.
In any case, **GEA Niro Soavi** shall not be responsible for delays arising from the shipping of the spare parts.

The following is a list of spare parts which, in our experience, is important to have in stock:

- a complete set of gaskets, two sets in case of VHP high-pressure compression heads;
- two sets of packing, including packing washers and anti-extrusion rings
- one or two pumping pistons, if ceramic plungers are used;
- a homogenizing valve set for each stage (for homogenizers);
- a set of balls and valve seats, for VHP high-pressure heads;
- a set of seats and pumping valves, of the machine is used with abrasive products;
- a set of pumping valve springs;
- a pressure gauge for the head;
- seat and ball for safety valve;
- oil filters;
- a set of guide piston gaskets;
- crankshaft oil seal.

10.2 How to order the spare parts

Each request regarding the spare parts should be sent in writing via fax to the following address:

GEA Niro Soavi Via Da Erba Edoari, 29 - 43123 - PARMA (Italy)
Telephone +39 0521 965411, Fax +39 0521 242819, e-mail: info.geanirosoavi@geagroup.com, http//www.niro-soavi.com

For quicker and safer identification of spare parts always indicate the following:
- machine type and serial number;
- part description;
- part code;
- desired quantity.

If ordering electrical spare parts, include:
- No. of the wiring diagram;
- voltage in Volt;
- Frequency in Hz.

It is also important to indicate if it is an executive order of parts request, request of delivery, shipping and billing address and any shipping instructions.
Give the name, phone and fax of the responsible person, also for the future, of all the issues about the supply of the spare parts.

When receiving the order, **GEA Niro Soavi** will send the order confirmation with an indication of the prices, definite delivery date and the supply conditions.

ATTENTION:
We remind that the Customer must purchase original spare parts.
The use of non-original spare parts and the faulty or incorrect assembling release the manufacturer from any liability.

ATTENTION:
It is particularly recommended in the replacement of the safety components (sensor, photocell, etc.) to respect the safety class of the original part and the any requested calibration.

ATTENTION:
The assembly and disassembly operations of the spare parts must be the responsibility of skilled technicians and must be carried out following the procedures and taking ALL THE SAFETY PRECAUTIONS indicated in chapter 7 “Maintenance” and in chapter 3 “Safety”.
In particular, it is necessary to put the machine into a maintenance state with functions completely locked in order to avoid unintentional start-up during interventions.

10.3 Safety warnings

In order to preserve functional and quality characteristics of **GEA Niro Soavi** machines, it is necessary to exclusively use original spare parts.

Using non-original spare parts causes the warranty to automatically decline.

Find in this catalogue the indications for spare parts ordering, selecting the parts from the attached tables and the specific codes tables.

Spare parts can be ordered directly from **GEA Niro Soavi**, Service Department, or through your local **GEA Niro Soavi** agent or Authorized Dealer, who can provide useful advice and forward the request immediately.

When placing an order, the Customer must specify.

- machine SERIAL NUMBER;
- requested spare part code;
- if necessary, a brief description of the component for easier identification;
- the required quantity;
- if necessary, the reference number on the assembly drawing in the SPARE PARTS CATALOGUE;
- the means of transport or dispatch requested; if this is not specified, **GEA Niro Soavi** will arrange suitable transport at their discretion;
- shipment urgency, as this may affect the cost;
- exact address and name of contact person.

To order spare parts or request quotations for spare parts, copy the standard request form below and send it by fax.

Technical specification

Model: One7TS
S.N.: 8066
Revision: 00

Translation of the original instructions

Technical Specification Issue

1.1 EC Declaration

GEA Niro Soavi
DECLARATION OF CONFORMITY

CE

MACHINE:		*LABORATORY HOMOGENIZER*
	Model:	*ONE 7TS*
	Serial Number:	*8066*
	Max Press. (MPa):	*23*
	Rated Flow (dm³/h):	*800*
	Year:	*2015*

The undersigned

DECLARES

under his own responsibility that the above mentioned Machine, object of this declaration,

IS IN CONFORMITY

with the precepts of the following EC directives and standard norms:

- *2006/42/CE*
- *2006/95/CE*
- *2004/108/CE*
- *EN 12100-1 & EN 12100-2*
- *EN 60204-1*
- *EN 13849-1*

Name and address of the person authorised to compile the technical file:
Manuel Delgado - Via A.M. Da Erba Edoari 29 - 43123 PARMA - ITALY

The above identified Machine has successfully passed all the trials and tests to which it has been submitted.

PARMA, 11/06/2015

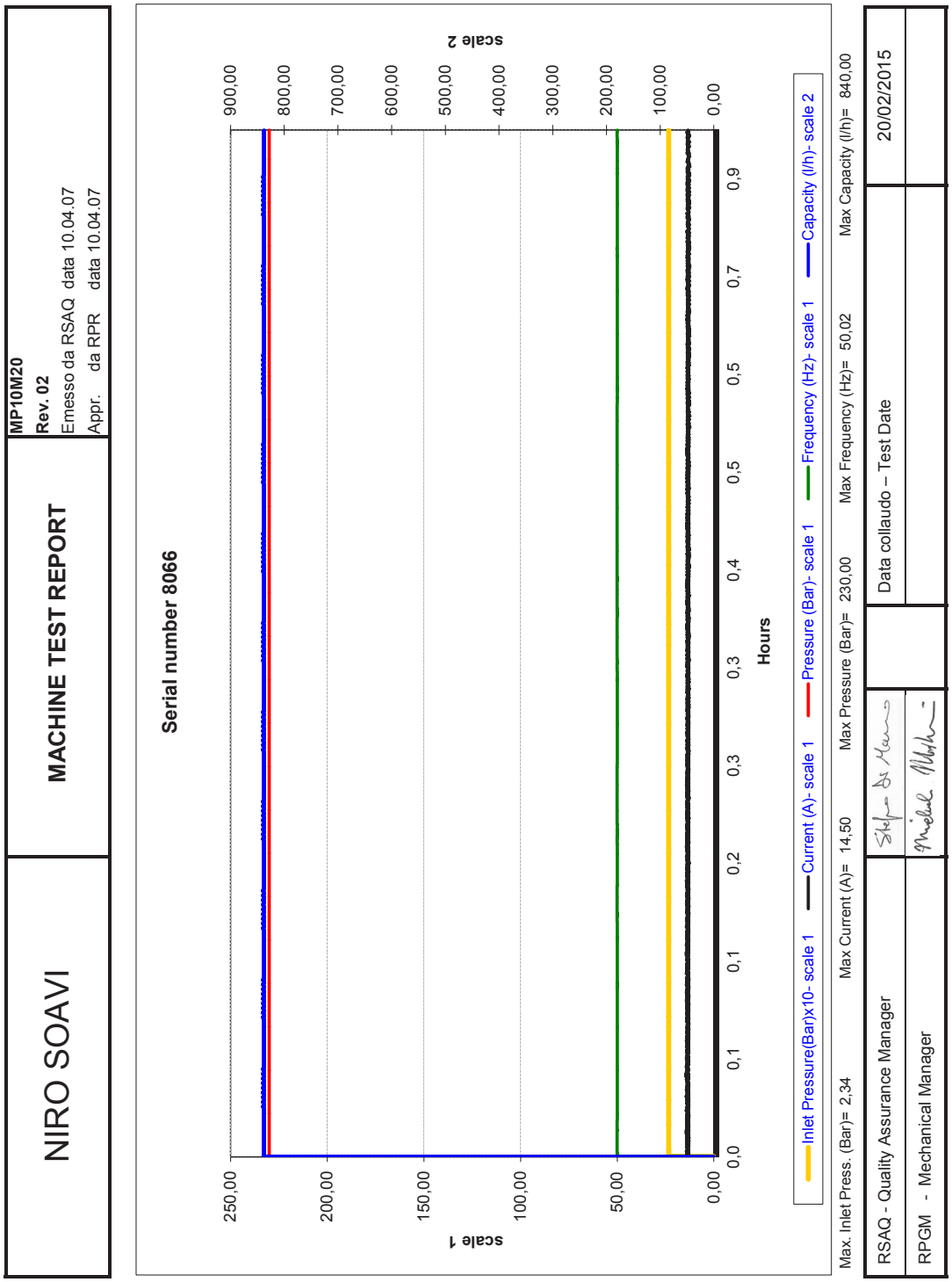
GEA Mechanical Equipment Italia S.p.A.
MANUEL DELGADO
Managing Director

GEA Mechanical Equipment Italia S.p.A.

Via A.M. Da Erba Edoari 29 - 43123 PARMA - ITALY
Tel +39 0521 965411 - Fax +39 0521 242819
e-mail: info.geanirosoavi@gea.com

MP10M50 _C Rev.1

1.2 Final test data report (MP10M20)



1.3 Technical specifications

GEA Niro Soavi S.p.A. **01/10/2005 - Rev. 2.2**

GEA NIRO SOAVI	MACHINE TECHNICAL DATASHEET	TT-0120C

1	GENERAL SPECIFICATIONS	
1.1	Type of Machine	HOMOGENIZER
1.2	Model	ONE 7TS
1.3	Version	ARIETE
1.4	Serial Number	8066
1.5	Execution	SANITARY
1.6	Special Features	/
1.7	Revision Index	4
1.8	Date	13/02/15

2	WORKING CONDITIONS	
2.1	Product	ICE CREAM MIX
2.2	MAX Viscosity	<500 cP
2.3	MAX Working Pressure	230 bar
2.4	Flow Rate Type	F F = Fixed; V = Variable; M = Multi
2.5	MIN Flow Rate	/ L/h @ / Hz
2.6	MAX Flow Rate	800 L/h @ / Hz
2.7	MIN Feed Pressure	3-4 bar
2.8	MAX Backpressure	5 bar
2.9	MAX Product Temperature	<90 °C
2.10	MAX CIP / SIP Temperature	<140 °C
2.11	Ambient Conditions	40°C MAX; R.H. 40%; 1000 m above sea level

3	TECH FEATURES - COMPRESSION HEAD	
3.1	Type	MONOBLOCK
3.2	Material	SAF 2205
3.3	No. of Plungers	3
3.4	Plunger Material	AISI316+CR
3.5	Plunger Diameter	25 mm
3.6	Plunger Stroke	40 mm
3.7	Pumping Valve Type	PVB 1"
3.8	Pumping Valve Material	AISI 316L
3.9	Pumping Valve Seat Material	AISI 316L
3.10	Overpressure Valve Type	NSSRLV
3.11	Overpressure Valve Setpoint	280
3.12	Packing Material	HDD
3.13	Gaskets Material	NITRILE
3.14	Overpress. Valve Type / IN LINE	/
3.15	Overpr. Valve Setpoint / IN LINE	/ bar

PAGE 1 / 2

GEA Niro Soavi S.p.A. **01/10/2005 - Rev. 2.2**

GEA NIRO SOAVI	MACHINE TECHNICAL DATASHEET	TT-0120C

4	TECH FEATURES - CONNECTIONS & ACCESSORIES	
4.1	Connection INLET	DN25 (DIN 11851)
4.2	Connection OUTLET	DN25 (DIN 11851)
4.3	Pulsation Dampener INLET	/
4.4	Pulsation Dampener OUTLET	/
4.5	Feeding Pump	/

5	TECH FEATURES - PRESSURE GAUGES	
5.1	Pressure Gauge Inlet	TRASD.IFM 0-10BAR
5.2	Pressure Gauge Compr. Head	MANO. D100 0-400BAR
5.3	Pressure Gauge second Stage	/
5.4	Pressure Gauge Outlet	/

6	TECH FEATURES - HOMOGENIZING VALVES	
6.1	No. of Stages	2
6.2	Type of Control	PNEUMATIC
6.3	Homogenizing Valve Type	D11.9-30 ONE11TS
6.4	Homogenizing Valve Material	C9M

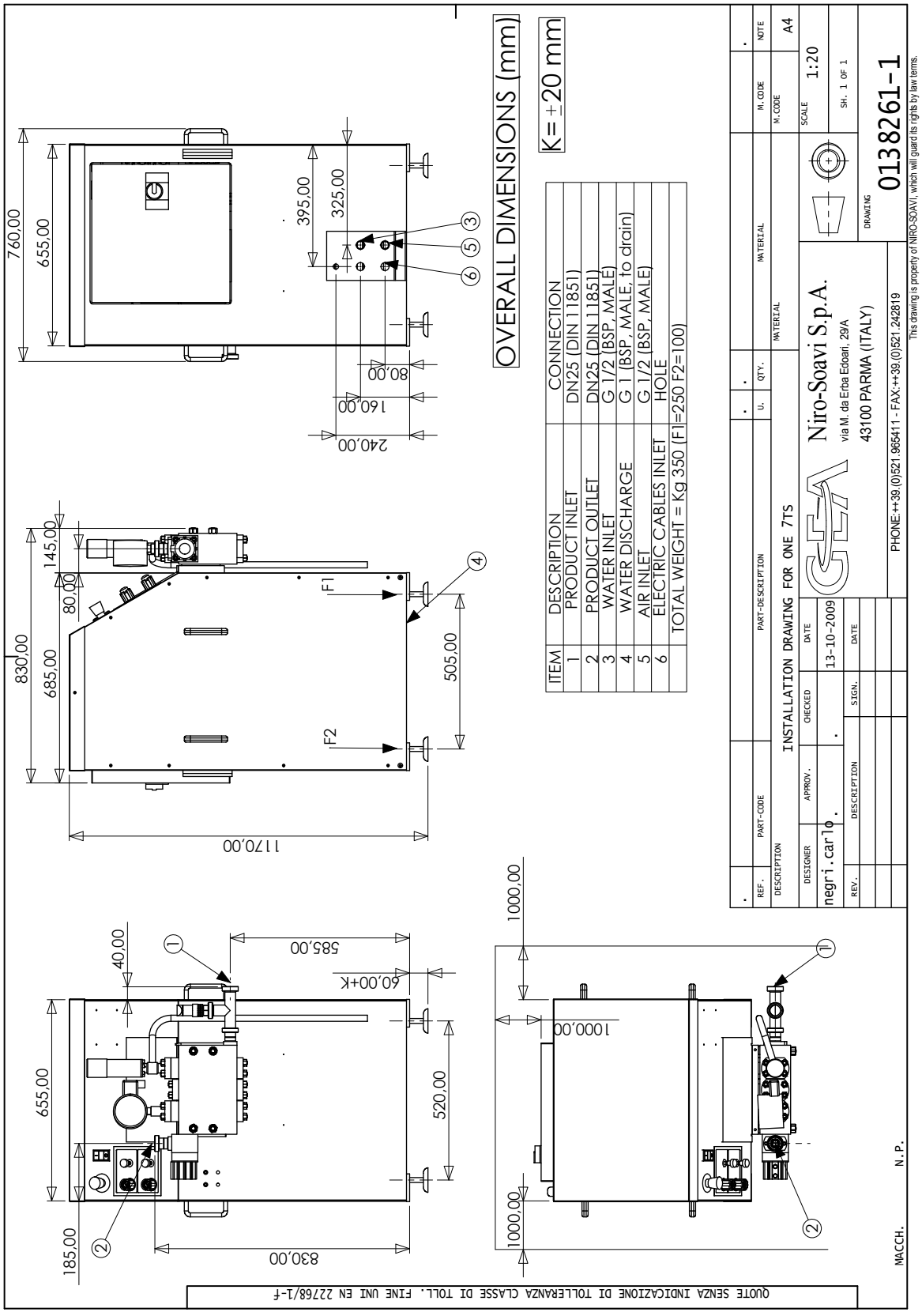
7	TECH FEATURES - DRIVE END	
7.1	RPM Crankshaft MIN	/
7.2	RPM Crankshaft MAX	249
7.3	Stroke	40 mm
7.4	Drive Type	DIRECT BELT
7.5	Gearbox Speed Reduction Ratio	/
7.6	Main Motor (frame/type)	132M/4P
7.7	Main Motor Power	7.5 kW

8	TECH FEATURES - LUBRICATION	
8.1	Type	SPLASH SYSTEM
8.2	Lubricating System	/
8.3	Oil Cooling System	/

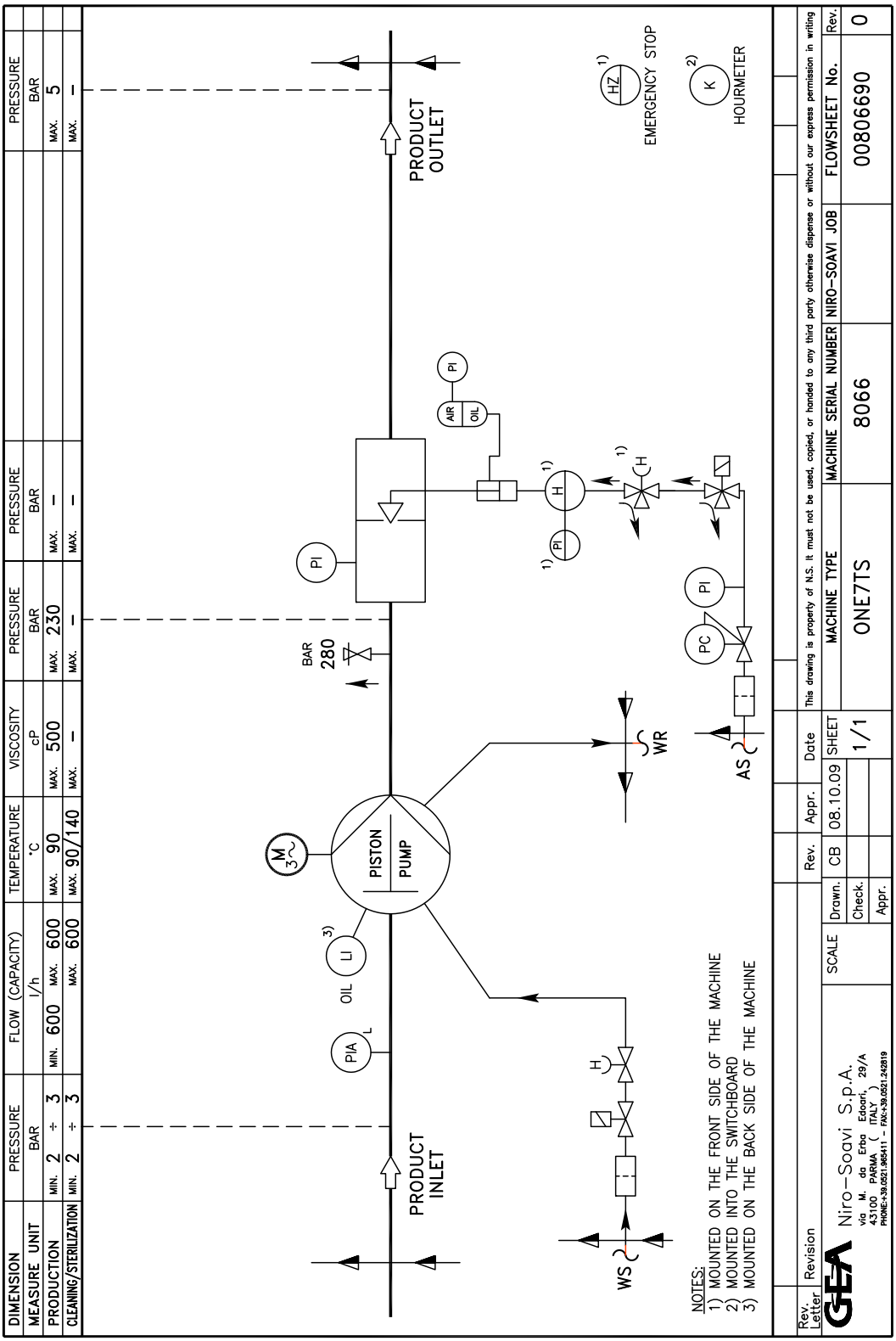
9	TECH FEATURES - ELECTRICAL SUPPLY	
9.1	No. of Phases - MAIN	3
9.2	Voltage - MAIN	400 V
9.3	Frequency - MAIN	50 Hz
9.4	Voltage - AUX	24DC V
9.5	Frequency - AUX	/ Hz

1.4 Layouts and diagrams

1.4.1 Installation Drawing



1.4.2 Flow sheet and key



Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE : +39.0521.965411 - FAX : +39.0521.242819

LEGEND
TO CONCEPT FLOW SHEET

SPEC - 102 C

DATE | REV. 0

SIG.

1. INSTRUMENT SYMBOLS

- LOCAL
- IN MAIN PANEL
- LIMIT VALUE
  H: HIGH OR OPEN
  L: LOW OR CLOSED
- T — POINT OF MEASUREMENT WITHOUT INSTRUMENTATION

2. PROCESS LINES

- PRIMARY FLOW LINE, GENERAL
- SECONDARY FLOW LINE, GENERAL
- MECHANICAL CONNECTION
- N.S. / CUSTOMER — SUPPLY LIMIT MARKER

3. INSTRUMENT SIGNAL LINES

- GENERAL
- ELECTRICAL
- PNEUMATIC
- HYDRAULIC
- CAPILLARY

4. FLOW LINE ABBREVIATIONS

AS	AIR SUPPLY
CIP	CLEANING IN PLACE
CS	CONDENSATE SUPPLY
CWS	CHILLED WATER SUPPLY
ES	ELECTRIC SUPPLY
GS	GAS SUPPLY
NS	NITROGEN SUPPLY
OS	OIL SUPPLY
SS	STEAM SUPPLY
WS	WATER SUPPLY
R	RETURN

5. MACHINERY AND EQUIPMENT

- AUTOMATIC ACTUATOR FOR REMOTE CONTROL, GENERAL
- MANUAL ACTUATOR NOT FOR REMOTE CONTROL
- AUTOMATIC ACTUATOR WITH INTEGRATED MANUAL CONTROL FACILITY
- DIAPHRAGM ACTUATOR
- SOLENOID ACTUATOR
- PISTON ACTUATOR
- ELECTRIC AC MOTOR
- ADJUSTABLE SPEED CONTROL
- COMPRESSOR OR VACUUM PUMP, GENERAL
- FAN
- PUMP FOR LIQUIDS GENERAL
- CENTRIFUGAL PUMP
- HIGH PRESSURE PUMP
- 1-STEP HOMOGENIZER
- 2-STEP HOMOGENIZER
- FILTER, GENERAL
- HEAT EXCHANGER WITHOUT CROSS FLOW e.g. ELECTRIC HEATER
- LIGHT SOURCE
- VALVE CLOSES (FC)
- VALVE OPENS (FO)
- VALVE RETAINS POSITION
- FAIL-OPEN INDICATION FOR A 3-WAY VALVE

Niro-Soavi S.p.A. Specialty Products Division via M. da Erba Edoari, 29/A 43100 PARMA (ITALY) PHONE : +39.0521.965411 - FAX : +39.0521.242819	LEGEND TO CONCEPT FLOW SHEETS	SPEC - 102 C 29/01/2003 (DATE) REV. Page 2 of 2 ALB (SIG.) 0

6. LETTER CODE FOR IDENTIFICATION OF INSTRUMENT FUNCTIONS

	FIRST LETTER MEASURED OR INITIATING VARIABLE		MODIFIER	SUCCEEDING LETTER (1) DISPLAY OR OUTPUT FUNCTION	
A				ALARM	
B				DISPLAY OF STATE	(2)
C				CONTROLLING	(4)
D	DENSITY		DIFFERENCE		
E	ALL ELECTRICAL VARIABLES	(5)		SENSING ELEMENT	
F	FLOW RATE		RATIO		
G	GAUGING, POSITION OR LENGTH				
H	HAND (MANUALLY INITIATED) OPERATED				
I				INDICATING	(3)
J			SCAN		
K	TIME OR PROGRAMMED TIME				
L	LEVEL				
M	MOISTURE OR HUMIDITY				
N	USER'S CHOICE			USER'S CHOICE	
O	USER'S CHOICE				
P	PRESSURE OR VACUUM			TEST-POINT CONNECTION	
Q	QUALITY	(5)	INTEGRATE OR TOTALIZE	INTEGRATING OR SUMMATING	
R	NUCLEAR RADIATION			RECORDING	
S	SPEED OR FREQUENCY			SWITCHING	(2)
T	TEMPERATURE			TRANSMITTING	
U	MULTIVARIABLE			MULTIFUNCTION UNIT	
V	VISCOSITY			VALVE, DAMPER, ACTU, ELEMENT	
W	WEIGHT OR FORCE				
X	UNSPECIFIED	(5)		UNCLASSIFIED FUNCTIONS	
Y	VIBRATION			COMPUTING RELAY, RELAY	
Z				EMERG. / SAFETY ACTING	(2)

EXAMPLE : PDIRC — DIFFERENTIAL PRESSURE INDICATION, RECORDING AND CONTROL
FIRST LETTER P, MODIFIER D, SUCCEEDING LETTERS I,R,C

1) NORMAL SEQUENCE OF SUCCEEDING LETTERS : B.I.R.C.T.Q.S.Z.A.
2) SIGNAL TYPE : ON/OFF
3) SIGNAL TYPE : CONTINUOUS
4) SIGNAL TYPE : NORMALLY CONTINUOUS. IF ON-OFF, S IS ADDED

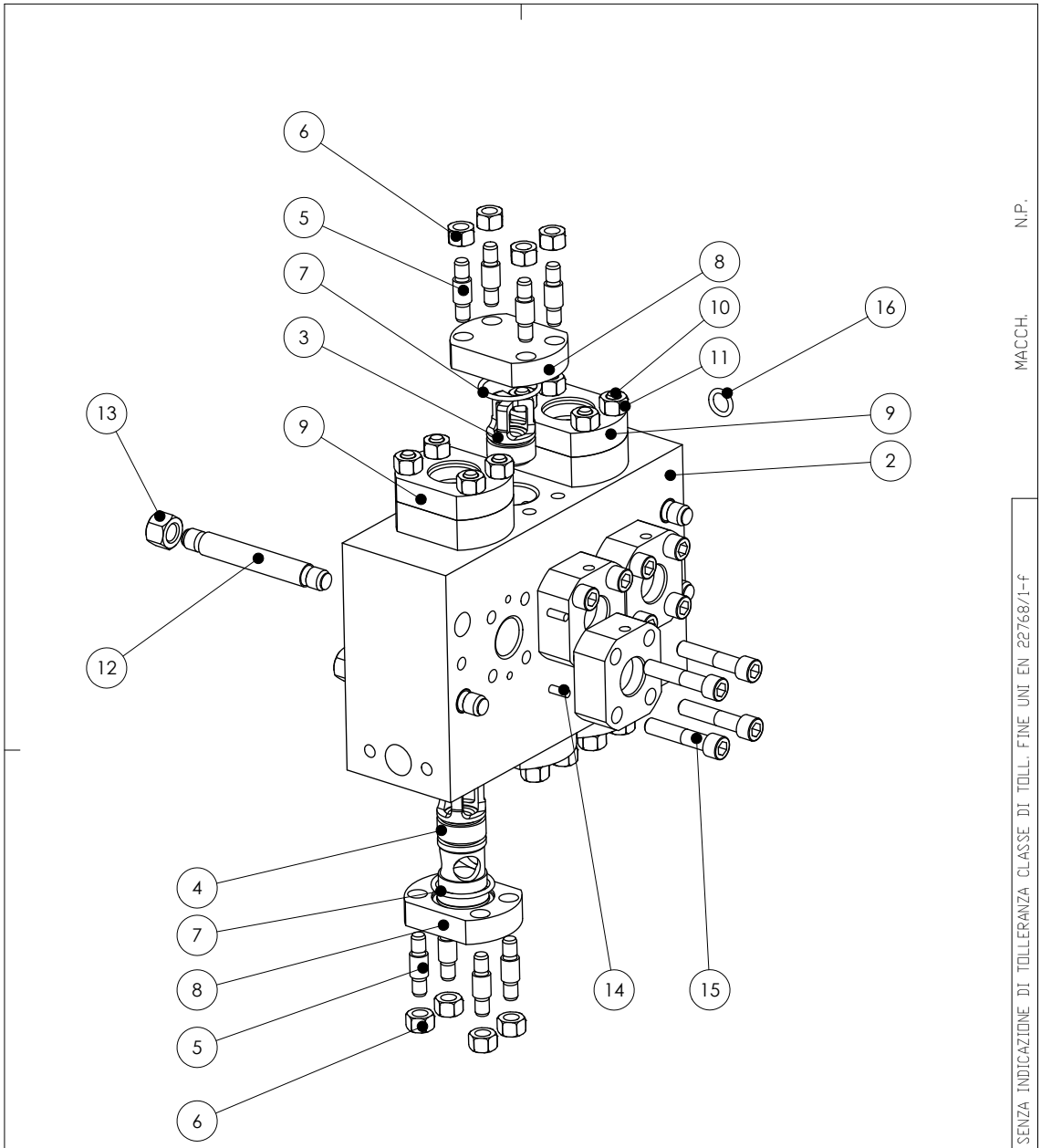
5) A NOTE SPECIFIES THE MEASURED PROPERTY. E.g. FOR LETTER E, I, U, P OR F

1.4.3 Spare parts list and assembly designs

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0138021
2	TESTATA	COMPRESSION HEAD	1	0137820
3	ASSIEME	ASSEMBLY DRAWING	1	0129111-15
4	ASSIEME	ASSEMBLY DRAWING	1	0129111-16
5	PRIGIONIERO	STUD	16	0136867
6	DADO	NUT	16	760004
7	ORING	ORING	6	140209
8	FLANGIA	FLANGE	4	0137830
9	FLANGIA	FLANGE	2	0137894
10	PRIGIONIERO	STUD	8	0136869
11	DADO	NUT	8	760004
12	PRIGIONIERO	STUD	4	0137984
13	DADO	NUT	4	760006
14	SPINA	PIN	6	990015
15	VITE	SCREW	12	70TCE12X50
16	ORING	ORING	1	140031

SPARES_8066_REV_3.xls COMPRESSION HEAD



REF.	PART-CODE	PART-DESCRIPTION	U.	QTY.	MATERIAL	M.CODE	NOTE
.			.	.			.

DESCRIPTION	MATERIAL	M.CODE	
ESPL. TEST. BASSA PRESSIONE ONE 7TS			A4

DESIGNER	APPROV.	CHECKED	DATE
CN	.	.	09-03-2009

REV.	DESCRIPTION	SIGN.	DATE

Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:++39.(0)521.965411 - FAX:++39.(0)521.242819

SCALE 1:10

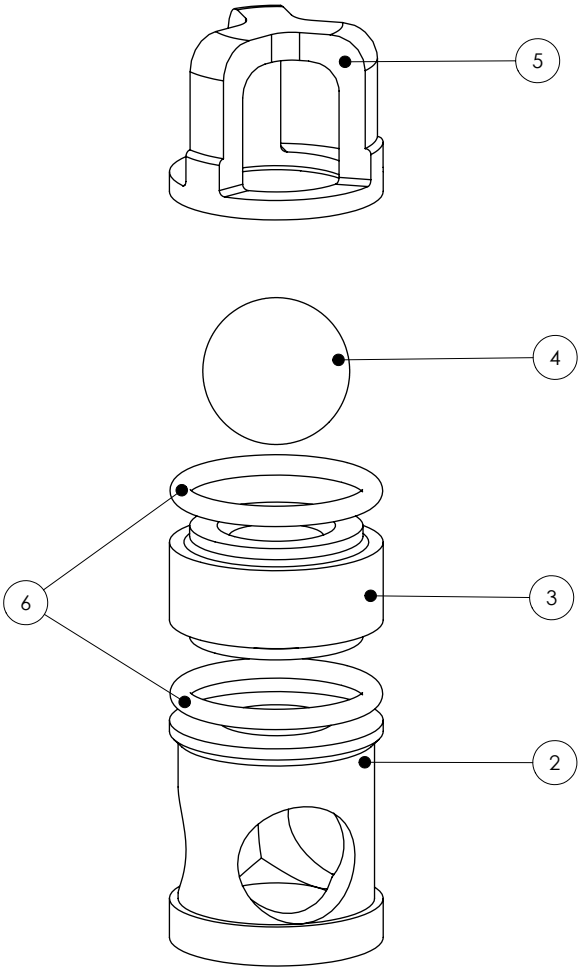
SH. 1 OF 1

DRAWING 0138021

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME VALVOLA ASPIRAZIONE	SUCTION VALVE ASS.DRW.	1	0129111-15
2	COPERCHIO VALVOLA	VALVE COVER	3	0137979
3	SEDE VALVOLA	VALVE SEAT	3	0136832
4	SFERA	BALL	3	190029
5	COPERCHIO VALVOLA	VALVE COVER	3	0136833
6	ORING	ORING	6	140029
1	ASSIEME VALVOLA MANDATA	DELIVERY VALVE ASS.DRW.	1	0129111-16
2	SEDE VALVOLA	VALVE SEAT	3	0136832
3	SFERA	BALL	3	190029
4	COPERCHIO VALVOLA	VALVE COVER	3	0136833
5	ORING	ORING	6	140029

SPARES_8066_REV_3.xls VALVE GROUP



N.P.

MACCH.

QUOTE SENZA INDICAZIONE DI TOLLERANZA CLASSE DI TOLL. FINE UNI EN 22768/1-f

CONFIGURAZIONE VALVOLA DI ASPIRAZIONE

REF.	PART-CODE	PART-DESCRIPTION	U.	QTY.	MATERIAL	M.CODE	NOTE
.			.	.			.

DESCRIPTION	MATERIAL	M.CODE	
ESPL.GR.VALV.PVB 1" ASP. 11 TS LBM			A4

DESIGNER	APPROV.	CHECKED	DATE
CN	.	.	04-12-2006

REV.	DESCRIPTION	SIGN.	DATE

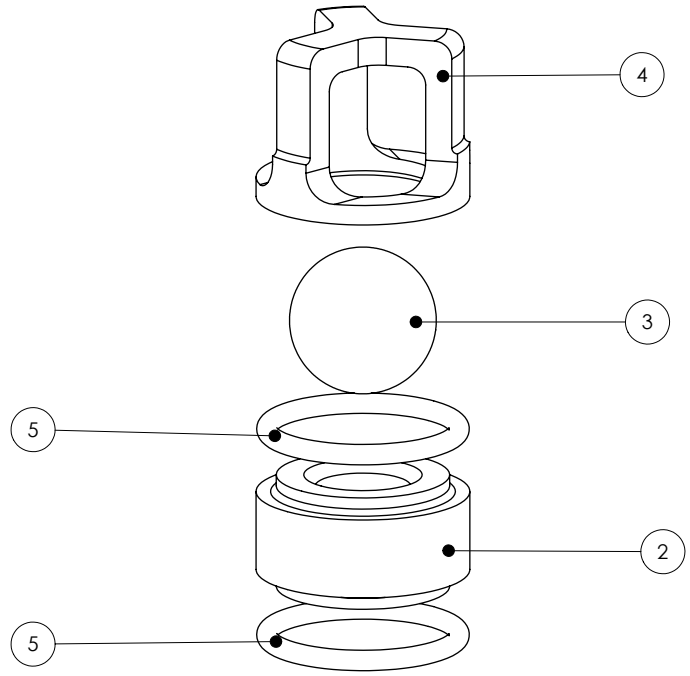
Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:++39.(0)521.965411 - FAX:++39.(0)521.242819

SCALE 1:2

SH. 1 OF 1

DRAWING 0129111-15

SPT_C_8066



N.P.

MACCH.

QUOTE SENZA INDICAZIONE DI TOLLERANZA CLASSE DI TOLL. FINE UNI EN 22768/1-f

REF.	PART-CODE	PART-DESCRIPTION	U.	QTY.	MATERIAL	M.CODE	NOTE
.			.	.			.

DESCRIPTION	MATERIAL	M.CODE	
ESPL.GR.VALV.PVB 1" MAND. 11TS LBM			A4

DESIGNER	APPROV.	CHECKED	DATE
CN	.	.	04-12-2006

REV.	DESCRIPTION	SIGN.	DATE

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via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:++39.(0)521.965411 - FAX:++39.(0)521.242819

SCALE 1:2

SH. 1 OF 1

DRAWING

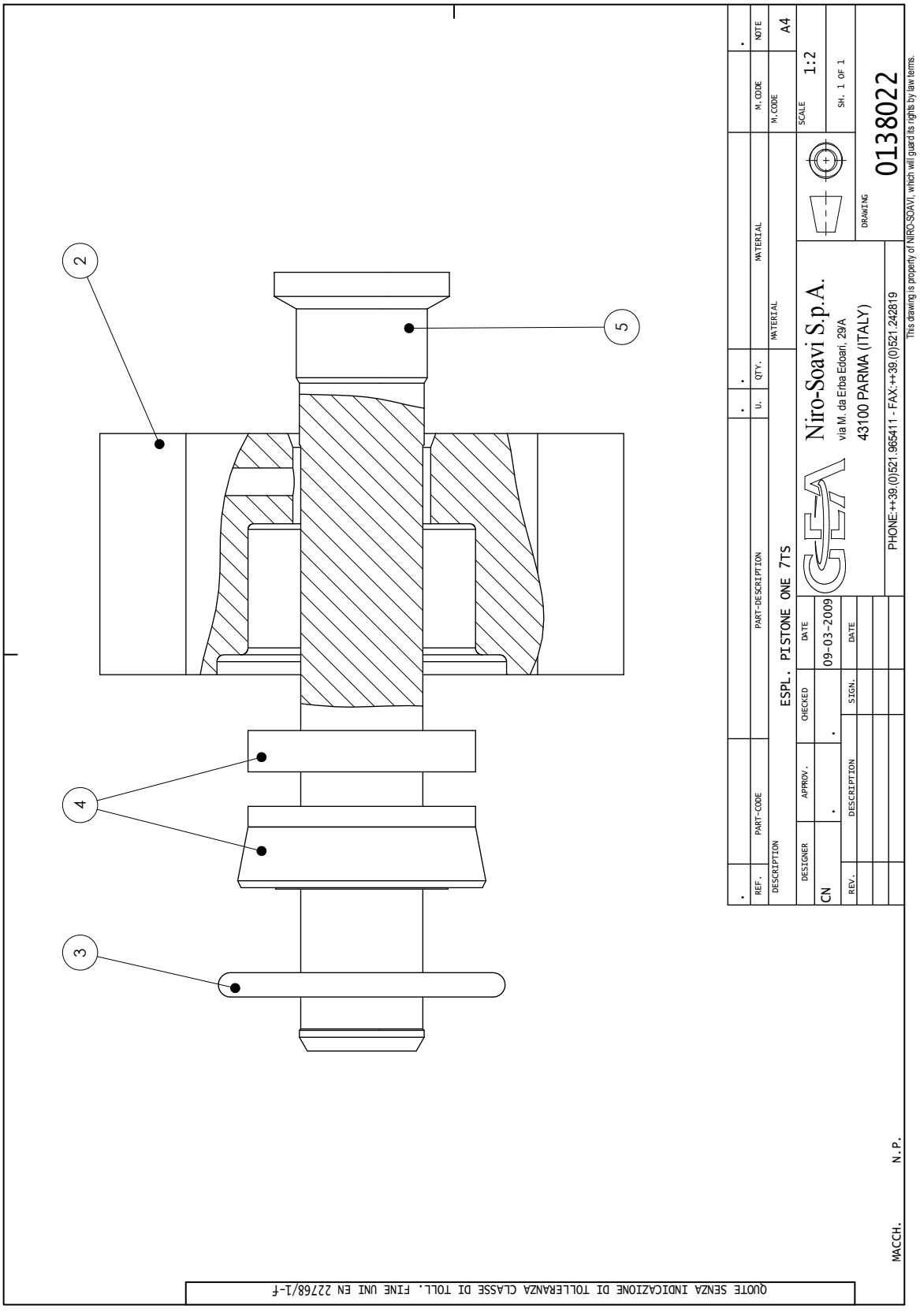
0129111-16

SPT_C_8066

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0138022
2	FLANGIA	FLANGE	3	0137973
3	ORING	ORING	3	140041
4	PACCHETTO	PACKING	3	41513F9252
5	PISTONE	PLUNGER	3	0137975

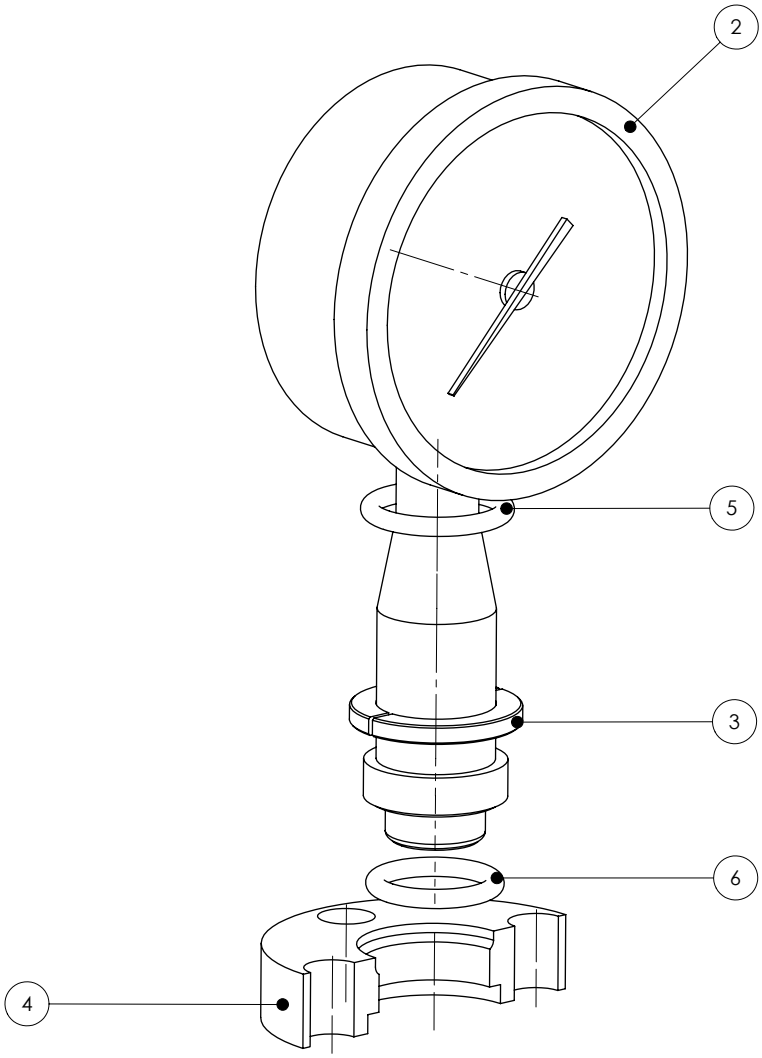
SPARES_8066_REV_3.xls PLUNGER



GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0133854
2	MANOMETRO	PRESSURE GAUGE	1	320241
3	RONDELLA	WASHER	1	0100036
4	FLANGIA	FLANGE	1	0138006
5	ORING	ORING	1	130031S
6	ORING	ORING	1	130027

SPARES_8066_REV_3.xls PRESSURE GAUGE



N.P.

MACCH.

QUOTE SENZA INDICAZIONE DI TOLLERANZA CLASSE DI TOLL. FINE UNI EN 22768/1-f

REF.	PART-CODE	PART-DESCRIPTION	U.	QTY.	MATERIAL	M.CODE	NOTE
.			.	.			.

DESCRIPTION	MATERIAL	M.CODE	
ESPL. CONTR. PRESS. MANOM. NS3015			A4

DESIGNER	APPROV.	CHECKED	DATE
CN	.	.	10-01-2007

REV.	DESCRIPTION	SIGN.	DATE

Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:++39.(0)521.965411 - FAX:++39.(0)521.242819

SCALE 1:5

SH. 1 OF 1

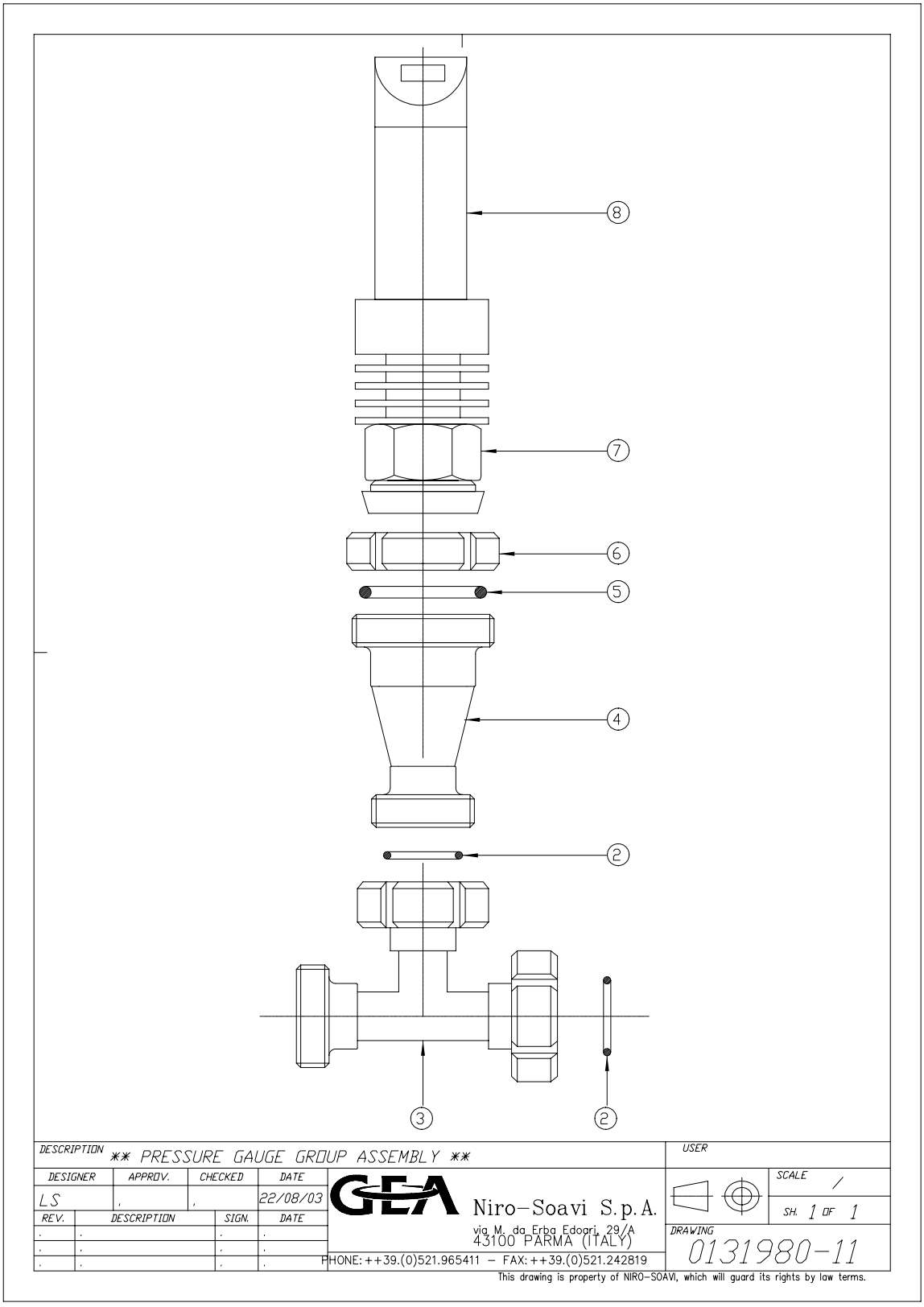
DRAWING 0133854

SPT_C_8066

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0131980-11
2	ORING	ORING	2	130031
3	RACCORDO A T	TEE CONNECTION	1	110278
4	RIDUZIONE	REDUCTION	1	110433
5	ORING	ORING	1	140045
6	GIRELLA	NUT	1	110013
7	RIDUZIONE	REDUCTION	1	110495
8	TRASDUTTORE	TRANSDUCER	1	BNI010

SPARES_8066_REV_3.xls TRANSDUCER

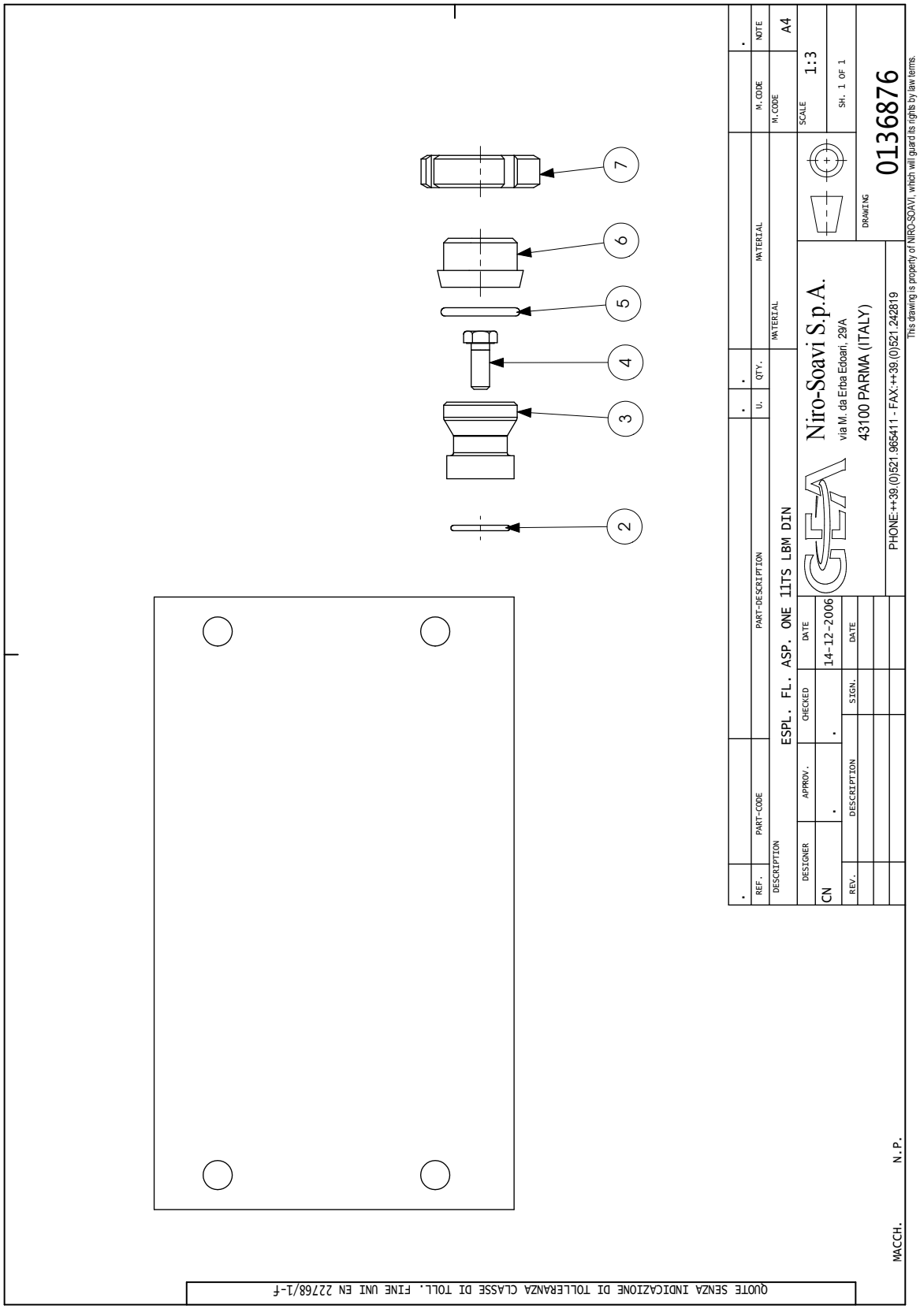


SPT_C_8066

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0136876
2	ORING	ORING	1	140314
3	FLANGIA	FLANGE	1	0137978
4	VITE	SCREW	2	69TE10X25
5	ORING	ORING	1	130031
6	BOCCHETTONE	FITTING MALE	1	110905
7	GIRELLA	NUT	1	110011

SPARES_8066_REV_3.xls MANIFOLD



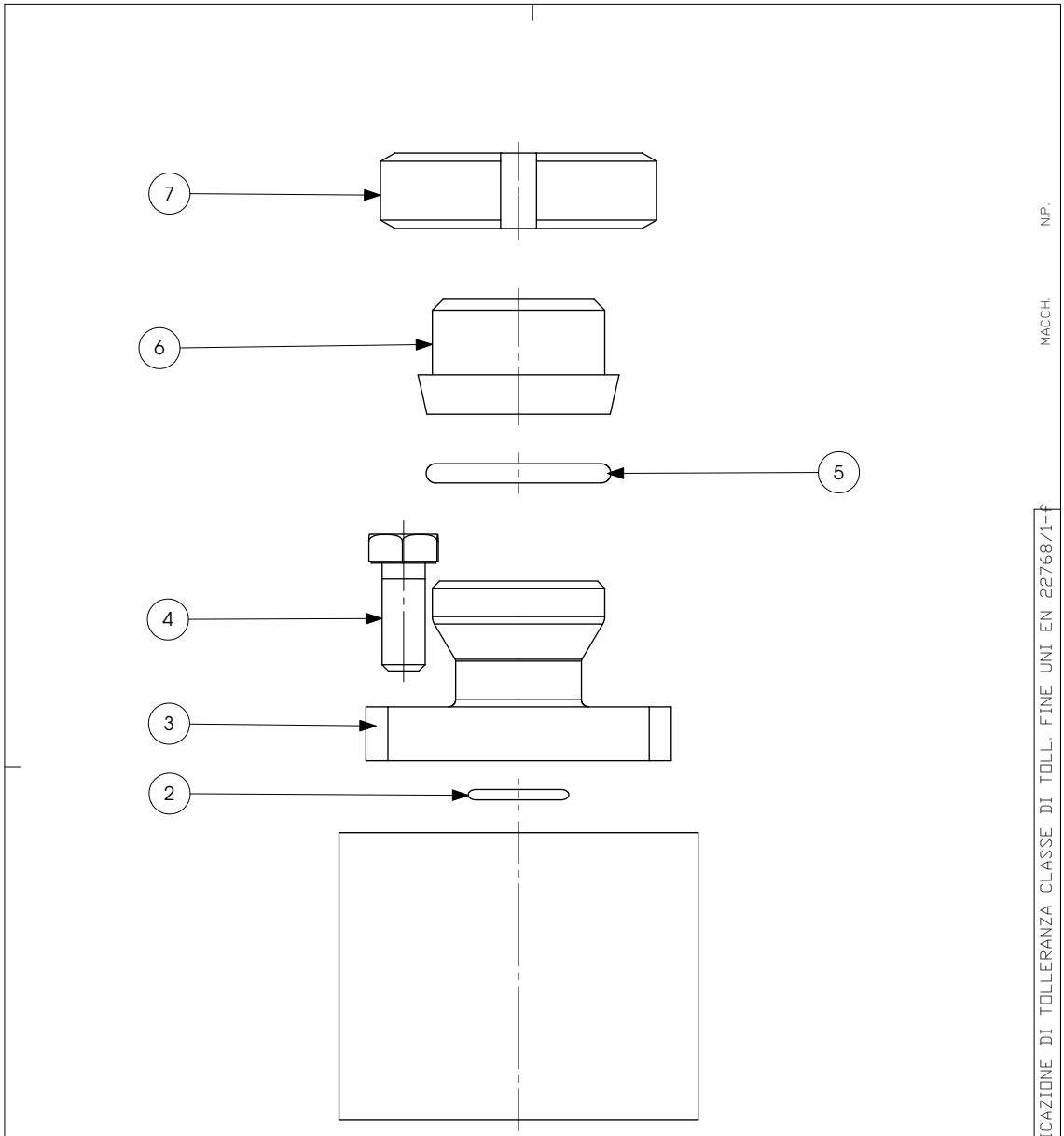
SPT_C_8066

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0136878
2	ORING	ORING	1	140314
3	FLANGIA	FLANGE	1	0137978
4	VITE	SCREW	2	69TE10X25
5	ORING	ORING	1	130031
6	BOCCHETTONE	FITTING MALE	1	110905
7	GIRELLA	NUT	1	110011

SPARES_8066_REV_3.xls

OUTLET FLANGE GROUP



.			.	.			.
REF.	PART-CODE	PART-DESCRIPTION	U.	QTY.	MATERIAL	M.CODE	NOTE
DESCRIPTION	ESPL.FL.USC. ONE 11TS LBM DIN				MATERIAL	M.CODE	A4

DESIGNER	APPROV.	CHECKED	DATE
CN	.	.	14-12-2006

REV.	DESCRIPTION	SIGN.	DATE

Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:++39.(0)521.965411 - FAX:++39.(0)521.242819

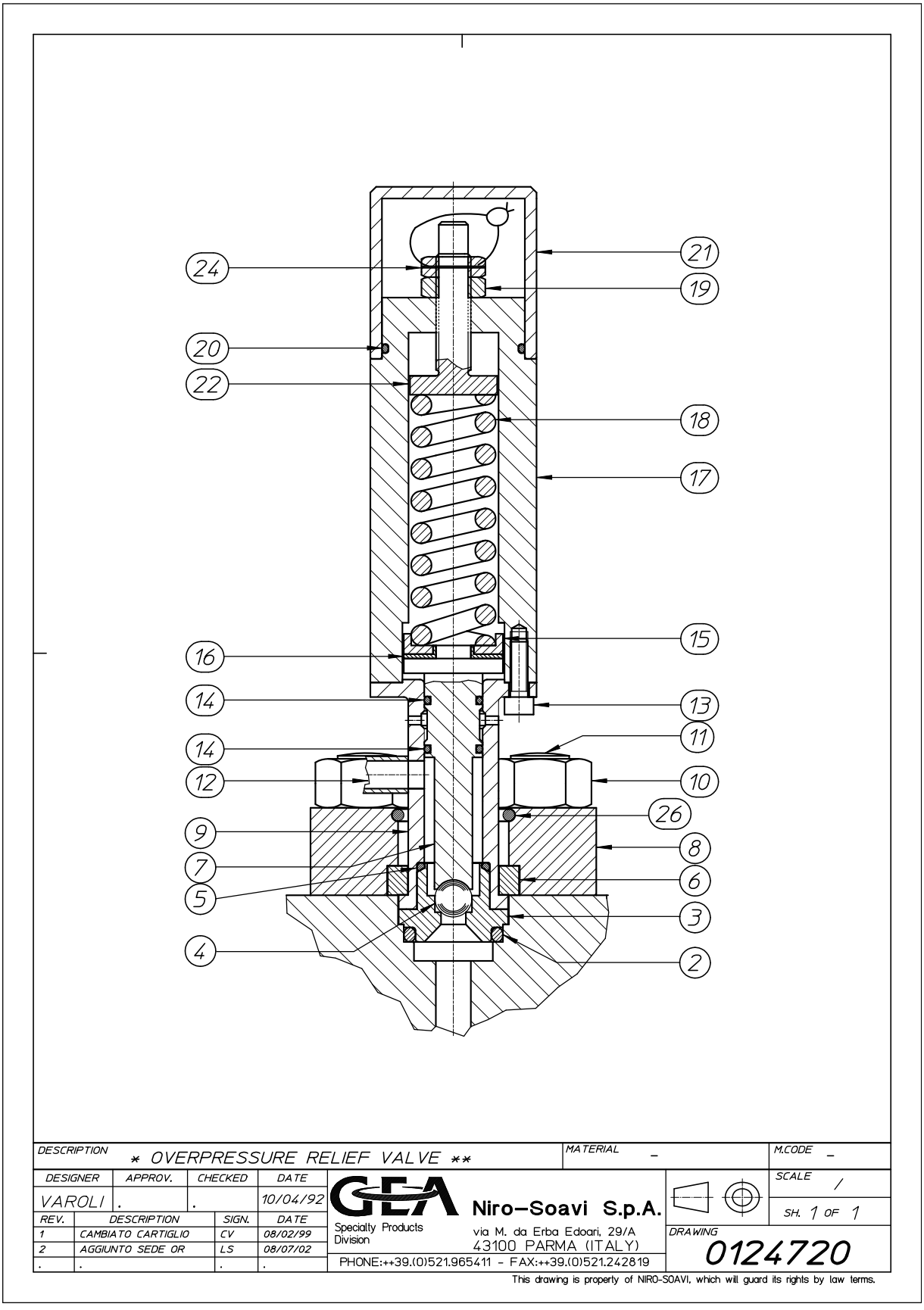
SCALE 1:1.5
SH. 1 OF 1
DRAWING 0136878

SPT_C_8066

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0124720
2	ORING	ORING	1	130027
3	SEDE VALVOLA	VALVE SEAT	1	0123695
4	SFERA	BALL	1	190044-1
5	ORING	ORING	1	140017
6	RONDELLA	WASHER	1	0100036
7	ALBERINO	SHAFT	1	0126123-3
8	FLANGIA	FLANGE	1	0138006
9	CORPO	BODY	1	0126124-3
10	DADO	NUT	4	760004
11	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
12	TUBAZIONE	PIPE	1	0125932
13	VITE	SCREW	6	69TE6X15
14	ORING	ORING	2	140011
15	RONDELLA	WASHER	1	0124713
16	BRONZINA	BRONZE BEARING	1	0124714
17	CONTENITORE MOLLA	SPRING HOUSING	1	0124712
18	MOLLA	SPRING	1	0124716
19	DADO	NUT	1	0124943
20	ORING	ORING	1	140188
21	COPERCHIO VALVOLA	VALVE COVER	1	0126615
22	VITE	SCREW	1	0124711
23	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
24	DADO	NUT	1	0124943
26	ORING	ORING	1	130031S

SPARES_8066_REV_3.xls SAFETY VALVE



DESCRIPTION	* OVERPRESSURE RELIEF VALVE **	MATERIAL	–	M.CODE	–

DESIGNER	APPROV.	CHECKED	DATE
VAROLI	.	.	10/04/92

REV.	DESCRIPTION	SIGN.	DATE
1	CAMBIATO CARTIGLIO	CV	08/02/99
2	AGGIUNTO SEDE OR	LS	08/07/02
.	.	.	.

GEA Specialty Products Division

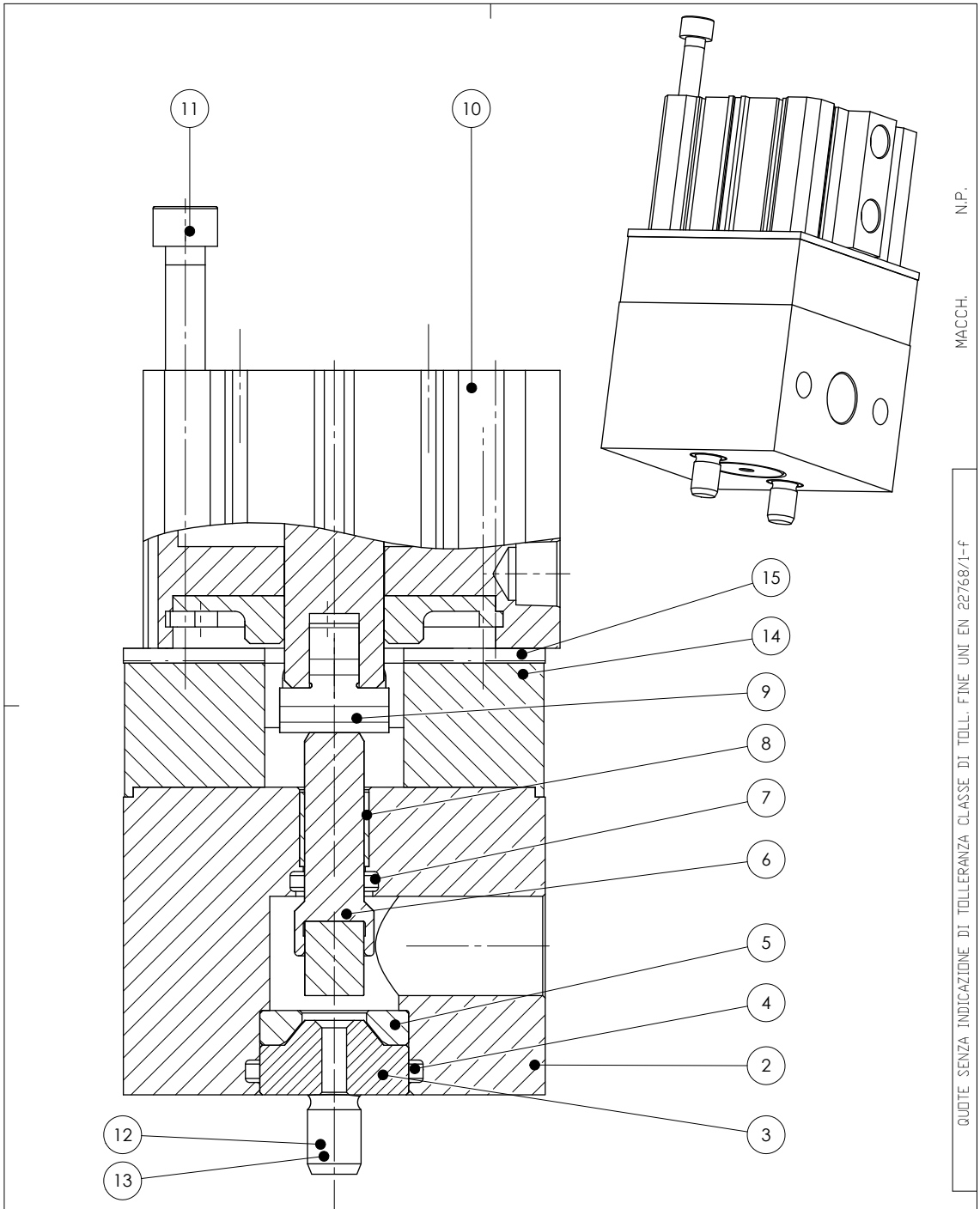
Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:++39.(0)521.965411 - FAX:++39.(0)521.242819

SCALE /
SH. 1 OF 1
DRAWING 0124720

SPT_C_8066

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	9513-8024-000
2	CAMERA OMOGENEIZZANTE	HOMOGENIZING CHAMBER	1	9513-7989-000
3	TESTINA DI PASSAGGIO	PASSAGE HEAD	1	9512-5012-000
4	ORING	O-RING	1	9531-4029-595
5	ANELLO DI URTO	IMPACT RING	1	9512-6322-000
6	TESTINA D'URTO	IMPACT HEAD	1	9513-7992-000
7	ORING	O-RING	1	9531-4330-595
8	BOCCOLA	BUSHING	1	9532-6358-000
9	PROLUNGA	EXTENSION	1	9513-7996-000
10	CILINDRO PNEUMATICO	PNEUMATIC ACTUATOR	1	9533-5145-000
11	VITE	SCREW	4	9536-9208-050
12	PRIGIONIERO	STUD	2	9513-8111-000
13	DADO	NUT	2	9537-6003-000
14	FLANGIA	FLANGE	1	9513-7995-000
15	SUPPORTO	SPACER	1	9513-8003-000
16	RACCORDO	CONNECTION	1	9532-6119-000
17	RACCORDO	CONNECTION	1	9532-7214-000
18	DISTANZIERE	SPACER	1	9513-8002-000
19	ORING	O-RING	1	9531-4205-595
20	ORING	O-RING	1	9531-4031-595
21	VITE	SCREW	2	9536-9210-025



REF.	PART-CODE	PART-DESCRIPTION	U.	QTY.	MATERIAL	M.CODE	NOTE
			.	.			.

DESCRIPTION: ESPL. GR. REG. PRES. SAN. 11.9-30 ONE 7TS

MATERIAL | M.CODE | A4

DESIGNER	APPROV.	CHECKED	DATE
CN	.	.	10-03-2009

REV.	DESCRIPTION	SIGN.	DATE

Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:++39.(0)521.965411 - FAX:++39.(0)521.242819

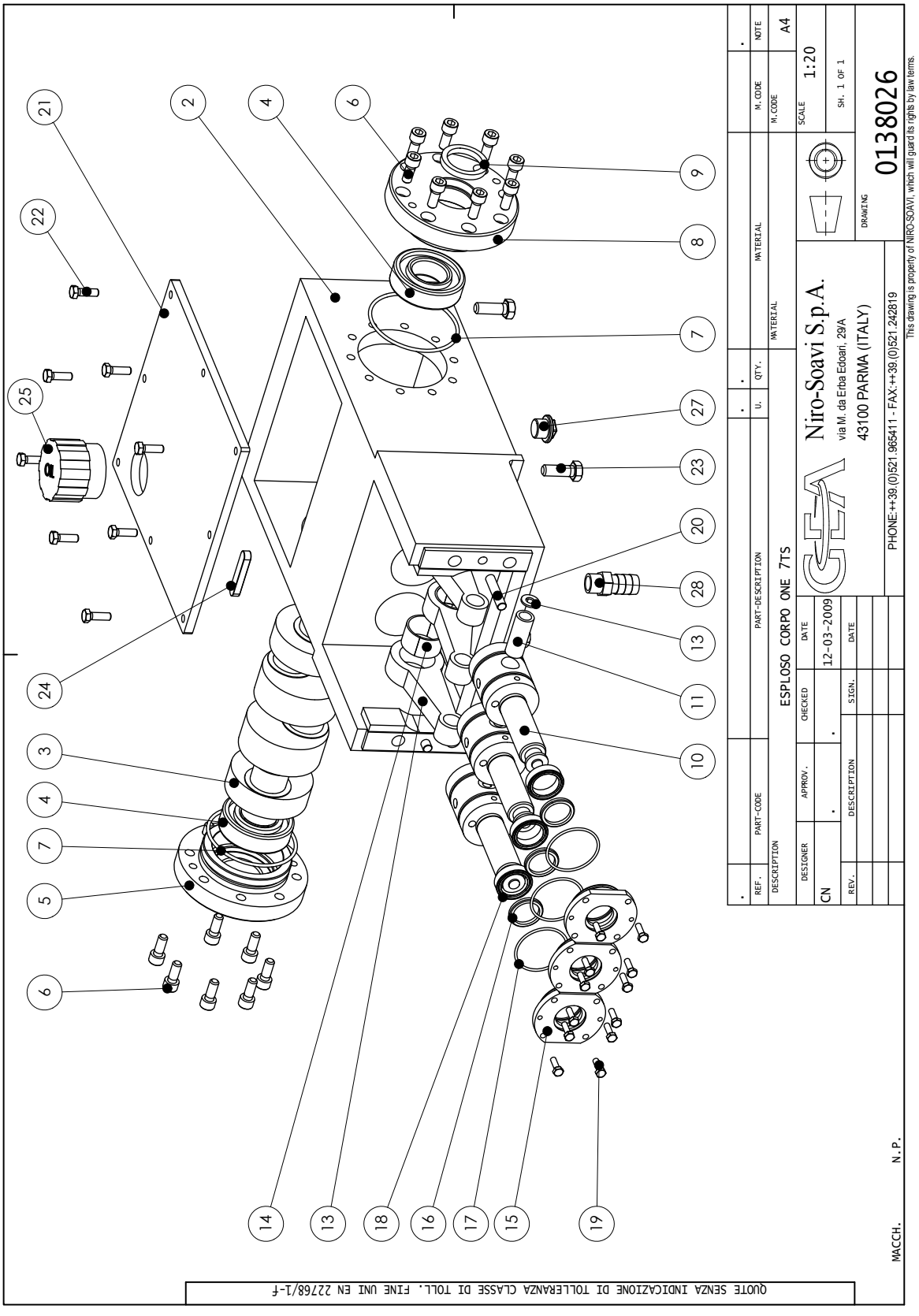
SCALE 1:2

SH. 1 OF 1

DRAWING 0138024

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0138026
2	CORPO DI TRASMISSIONE	TRANSMISSION BODY	1	0131400
3	ALBERO A GOMITI	CRANKSHAFT	1	0127073
4	CUSCINETTO	BEARING	2	220306
5	FLANGIA	FLANGE	1	0108927
6	VITE	SCREW	16	70TCE10X25
7	ORING	ORING	2	140109
8	FLANGIA	FLANGE	1	0120222
9	GUARNIZIONE	GASKET	1	180051
10	PISTONE DI GUIDA	GUIDING PLUNGER	3	0137812
11	SPINOTTO	WHRIST PIN	3	250006
12	RONDELLA	WASHER	6	0100119
13	BIELLA	CONROD	3	0109680
14	BRONZINA	BRONZE BEARING	3	0113175
15	FLANGIA	FLANGE	3	0134474-9
16	ANELLO RASCHIATORE	ROD SCRAPER	3	160138
17	ORING	ORING	3	140194
18	GUARNIZIONE	GASKET	3	160137
19	VITE	SCREW	12	70TE6X25
20	SPINA	PIN	2	990019
21	COPERCHIO	COVER	1	0137817
22	VITE	SCREW	8	70TE8X25
23	VITE	SCREW	4	70TE12X35
24	LINGUETTA	FEATHER KEY	1	810868
25	TAPPO	PLUG	1	170001
26	GUARNIZIONE	GASKET	1	630005
27	TAPPO	PLUG	1	120919
28	PORTAGOMMA	HOSE COUPLING	1	260010
29	MORSETTO	CLAMP	3	350903
30	LIVELLO OLIO	OIL LEVEL	1	170052
31	RUBINETTO	BALL TAP	1	580012
32	TAPPO	PLUG	1	260904
33	CONVOGLIATORE OLIO	OIL CONVEIOR	2	0100155

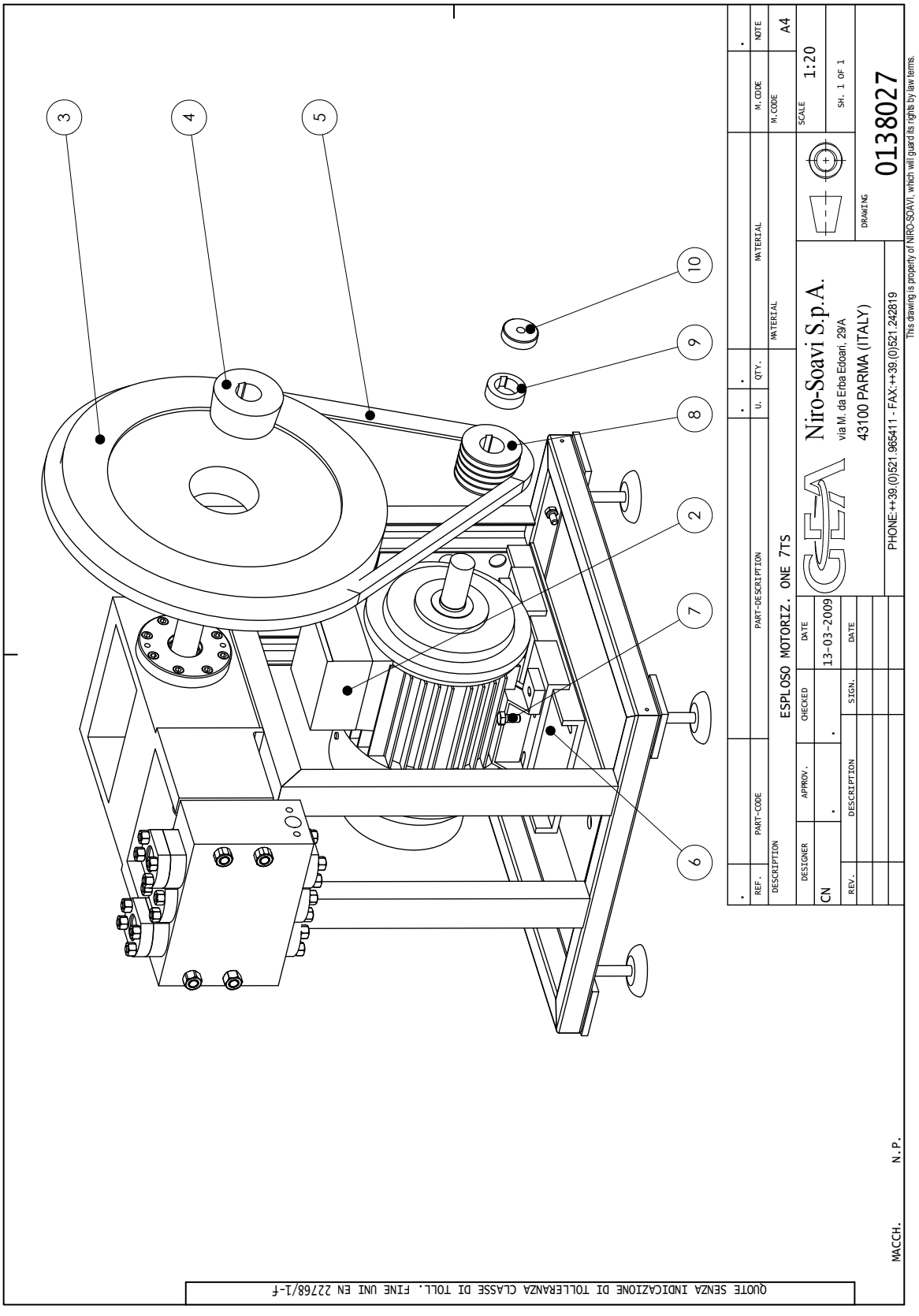


GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0138027
2	MOTORE	MOTOR	1	MB4113A1/F
3	PULEGGIA	PULLEY	1	610687
4	BUSSOLA	BUSHING	1	610694
5	CINGHIA	BELT	5	40SPZ1900X
6	SLITTA MOTORE	MOTOR SLIDE	1	350274
7	VITE	SCREW	4	69TE12X25
8	PULEGGIA	PULLEY	1	0121680-001
9	BUSSOLA	BUSHING	1	0121433
10	RONDELLA	WASHER	1	0122157

SPARES_8066_REV_3.xls

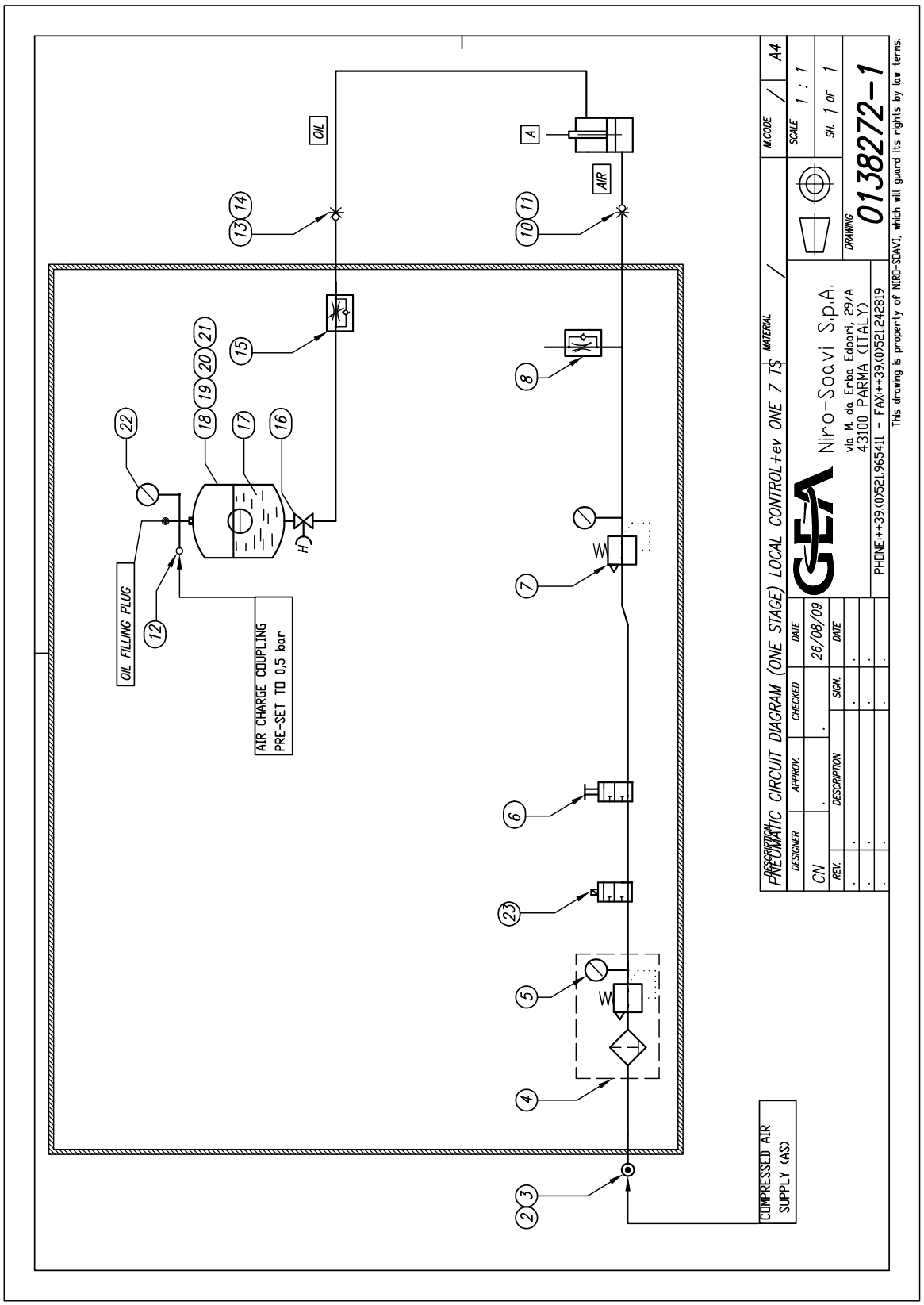
DRIVE END



GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	SCHEMA IMPIANTO	PLANT SCHEME	1	0138272-1
2	NIPPLO	NIPPLE	1	260162
3	RONDELLA	WASHER	1	680045
4	RIDUTTORE PRESSIONE	PRESSURE REDUCER	1	390298
5	MANOMETRO	PRESSURE GAUGE	1	320381
6	INTERRUTTORE PNEUMATICO	PNEUMATIC SWITCH	1	390088
7	RIDUTTORE PRESSIONE	PRESSURE REDUCER	1	390301
8	DOSATORE	FLOW BATCHER	1	390046
9	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
10	GIUNTO	COUPLING	1	260313
11	GIUNTO	COUPLING	1	260310
12	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
13	GIUNTO	COUPLING	1	260310
14	GIUNTO	COUPLING	1	260314
15	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
16	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
17	OLIO	OIL	2	530006
18	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
19	SERBATOIO	TANK	1	880008
20	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
21	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
22	CODICE NON PRESENTE	NOT EXISTING CODE	-	-
23	ELETTROVALVOLA	ELECTROVALVE	1	390263

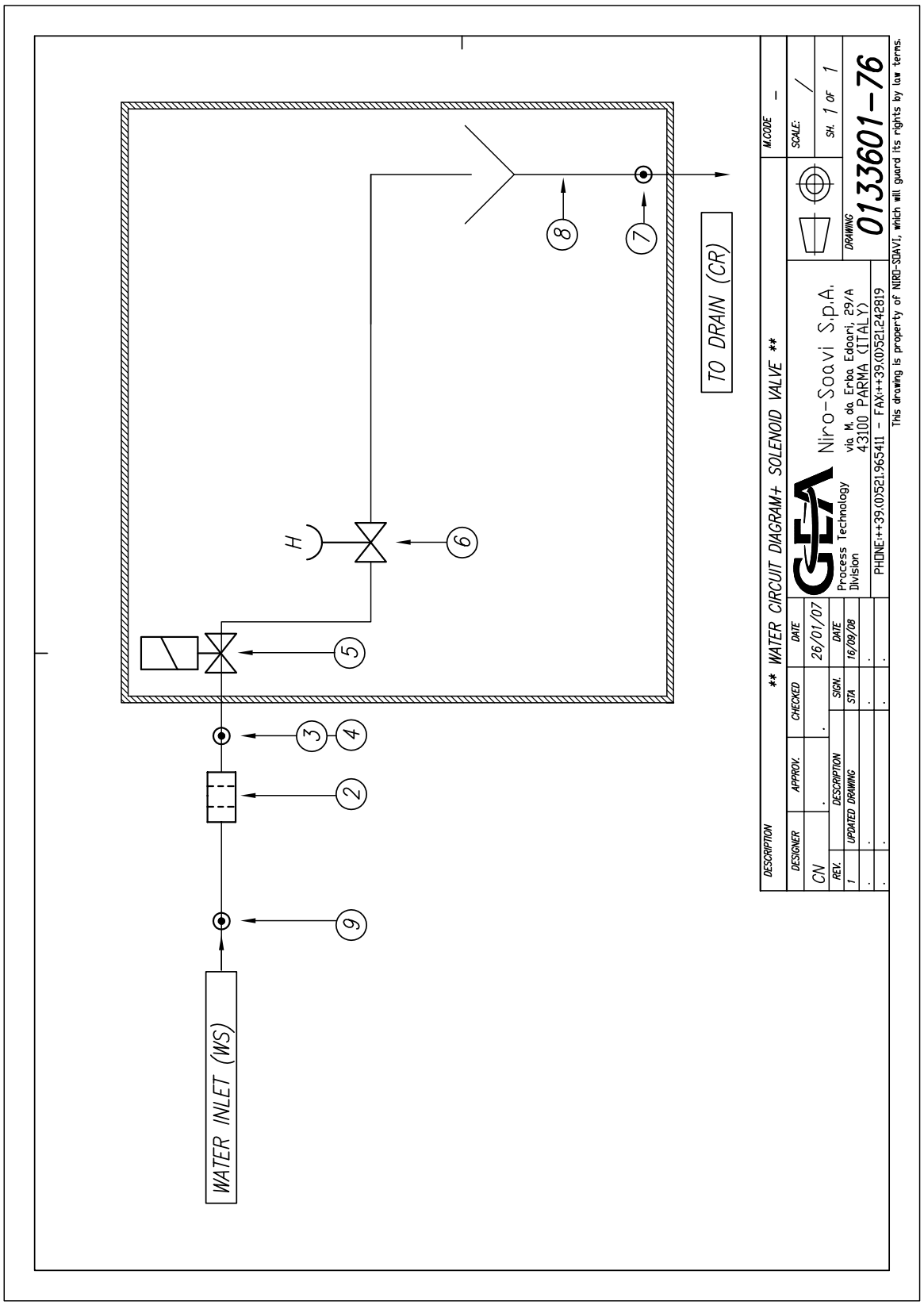
SPARES_8066_REV_3.xls PNEUMATIC PLANT



GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
1	ASSIEME	ASSEMBLY DRAWING	1	0133601-76
2	FILTRO	FILTER	1	230014
3	RONDELLA	WASHER	1	680045
4	NIPPLO	NIPPLE	1	260162
5	ELETTROVALVOLA	ELECTROVALVE	1	390193
6	RUBINETTO	BALL TAP	1	580010
7	PORTAGOMMA	HOSE COUPLING	1	260010
8	TUBAZIONE	PIPE	1	790002
9	NIPPLO	NIPPLE	1	260162
10	RACCORDO	CONNECTION	1	260484
11	RACCORDO	CONNECTION	1	260490
12	NIPPLO	NIPPLE	1	261149
13	RACCORDO	CONNECTION	5	260488
14	RACCORDO	CONNECTION	1	260489
15	RACCORDO A T	TEE CONNECTION	1	260474

SPARES_8066_REV_3.xls WATER PLANT



1.4.4 Tools and spare parts list supplied with maintenance box

GEA Niro Soavi S.p.A.

Item	Description	Description	Qty	Part Code
-	ATTREZZO	TOOL	1	880010
-	ESPANSORE	EXPANDER	1	810520
-	INTRODUTTORE PACCHETTO	PACKING INTRODUCER	1	0114674
-	MANICO	HANDLE	1	0104613
-	ATTREZZO	TOOL	1	0120860
-	MANIGLIA	HANDLE	1	0105615
-	ORING	ORING	3	140041
-	PACCHETTO	PACKING	3	41513F9252
-	ORING	ORING	2	130027
-	ORING	ORING	2	130031S
-	ORING	ORING	1	140017
-	ORING	ORING	1	140031
-	ORING	ORING	13	140029
-	ORING	ORING	2	140314
-	ORING	ORING	6	140209
-	ORING	ORING	1	140229
-	ORING	ORING	2	130031
-	ORING	ORING	2	140011
-	ORING	ORING	1	140188
-	CHIAVE 10	WRENCH 10	1	810210
-	CHIAVE 14	WRENCH 14	1	810214
-	CHIAVE 19	WRENCH 19	1	810219
-	CHIAVE 24	WRENCH 24	1	810224
-	VITE	SCREW	1	69TE12X60
-	CHIAVE	WRENCH	1	810308
-	PINZA CURVA	PINCERS	1	810003
-	CHIAVE	WRENCH	1	810306
-	ESPANSORE	EXPANDER	1	810516
-	VITE	SCREW	1	69TE10X60
-	CHIAVE	WRENCH	1	810419
-	LEVA GOMME	PRY BAR	1	810612
-	GIRAVITE A CROCE	SCREWDRIVER	1	810010
-	ESTRATTORE	EXTRACTOR	1	810853
-	CHIAVE	WRENCH	1	810310
-	CHIAVE	WRENCH	1	810420
-	CHIAVE	WRENCH	1	810717
-	CHIAVE 14	CHIAVE 14	1	810214
-	BUSTA PORTA ATTREZZI	BAG FOR TOOLS	1	350467

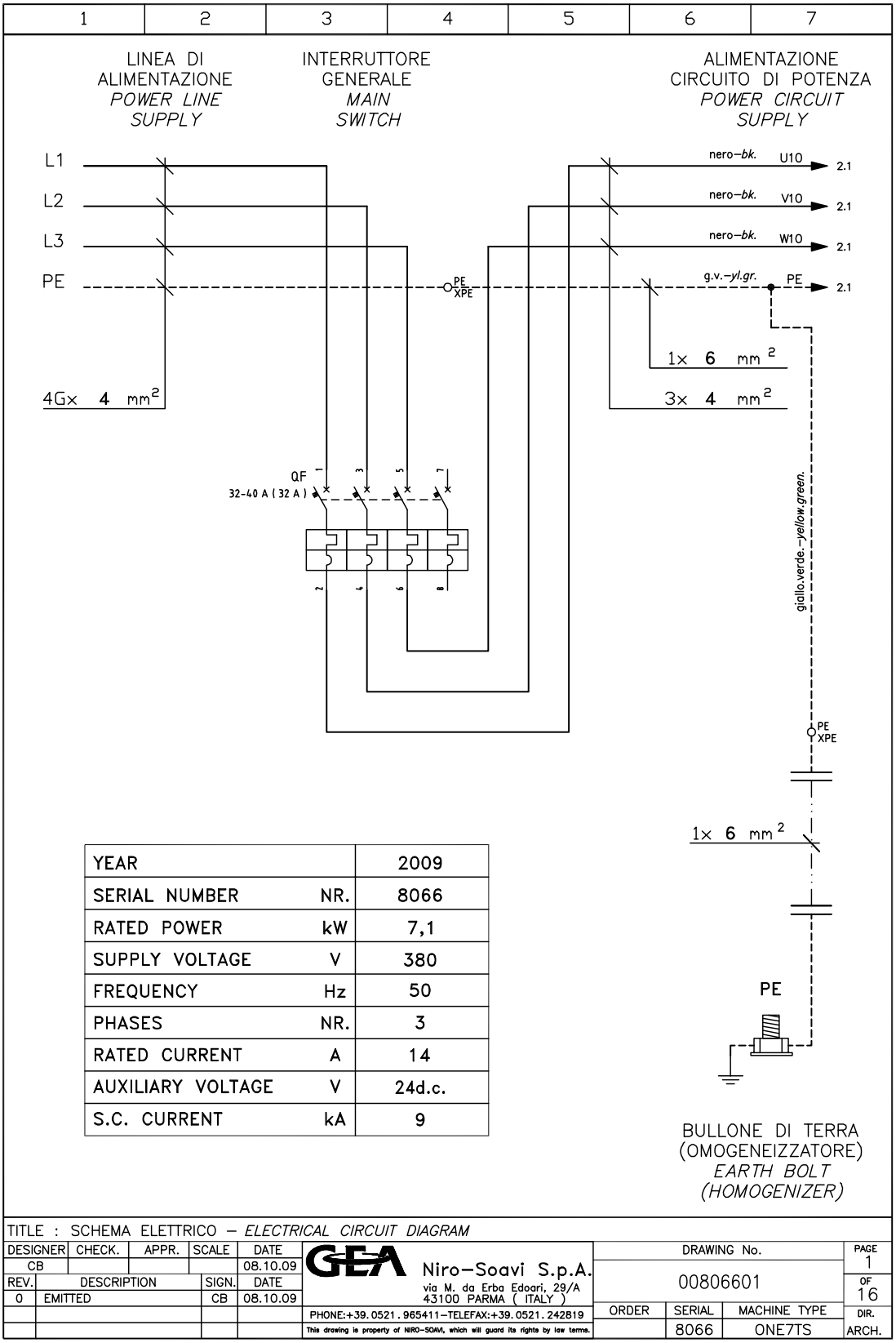
TOOLS_8066.xls 1/1

1.4.5 Electrical documents (diagrams and lists)

Niro-Soavi S.p.A.

SCHEMA ELETTRICO
ELECTRICAL CIRCUIT DIAGRAM

TIPO MACCHINA : *MACHINE TYPE :*	ONE7TS
NUMERO DI SERIE : *SERIAL NUMBER :*	8066
Codice NS : *NS code :*	
DATA : *DATE :*	08.10.2009



YEAR		2009
SERIAL NUMBER	NR.	8066
RATED POWER	kW	7,1
SUPPLY VOLTAGE	V	380
FREQUENCY	Hz	50
PHASES	NR.	3
RATED CURRENT	A	14
AUXILIARY VOLTAGE	V	24d.c.
S.C. CURRENT	kA	9

TITLE : SCHEMA ELETTRICO – *ELECTRICAL CIRCUIT DIAGRAM*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB				08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

GEA Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39. 0521 . 965411–TELEFAX:+39. 0521. 242819
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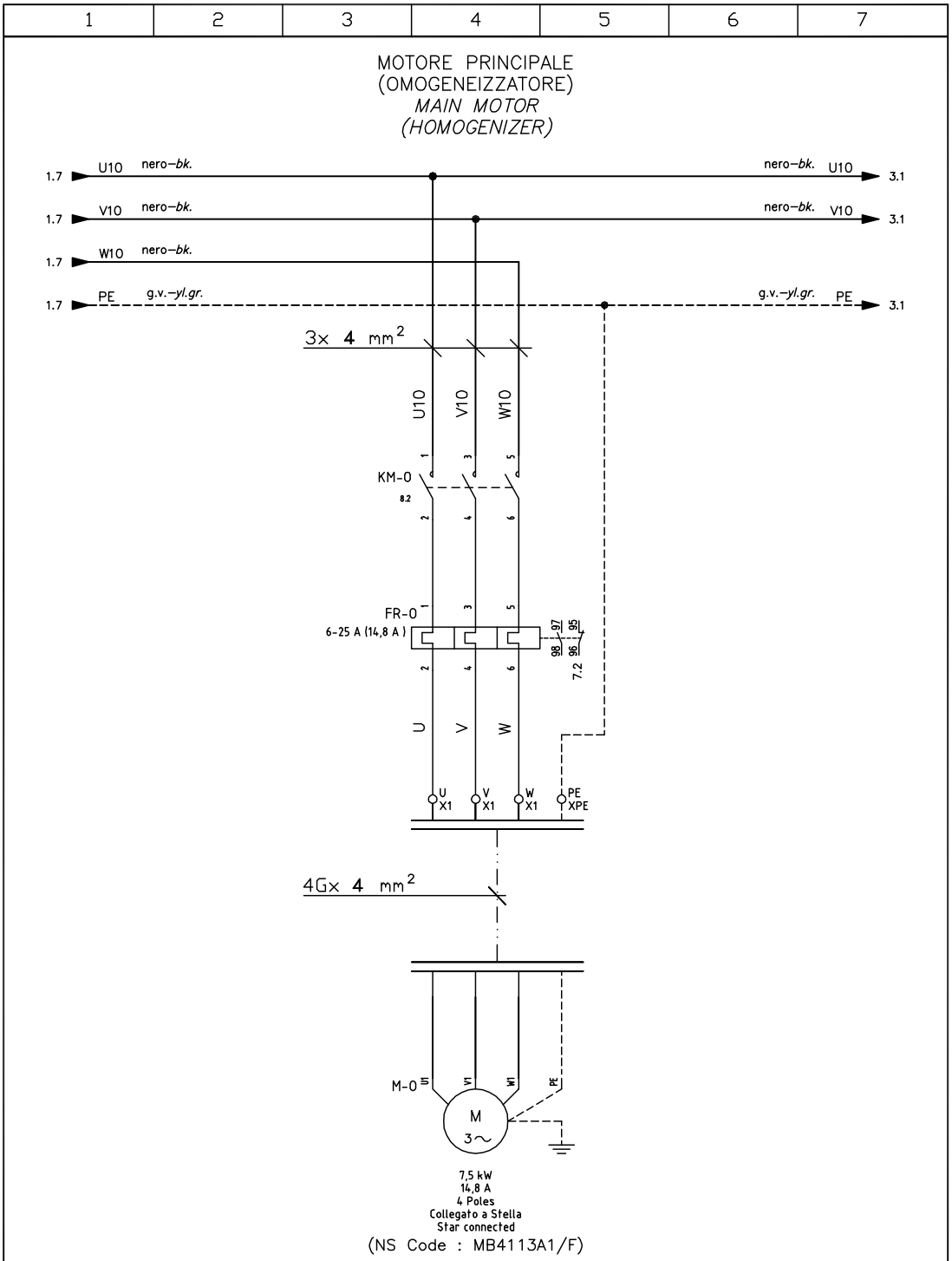
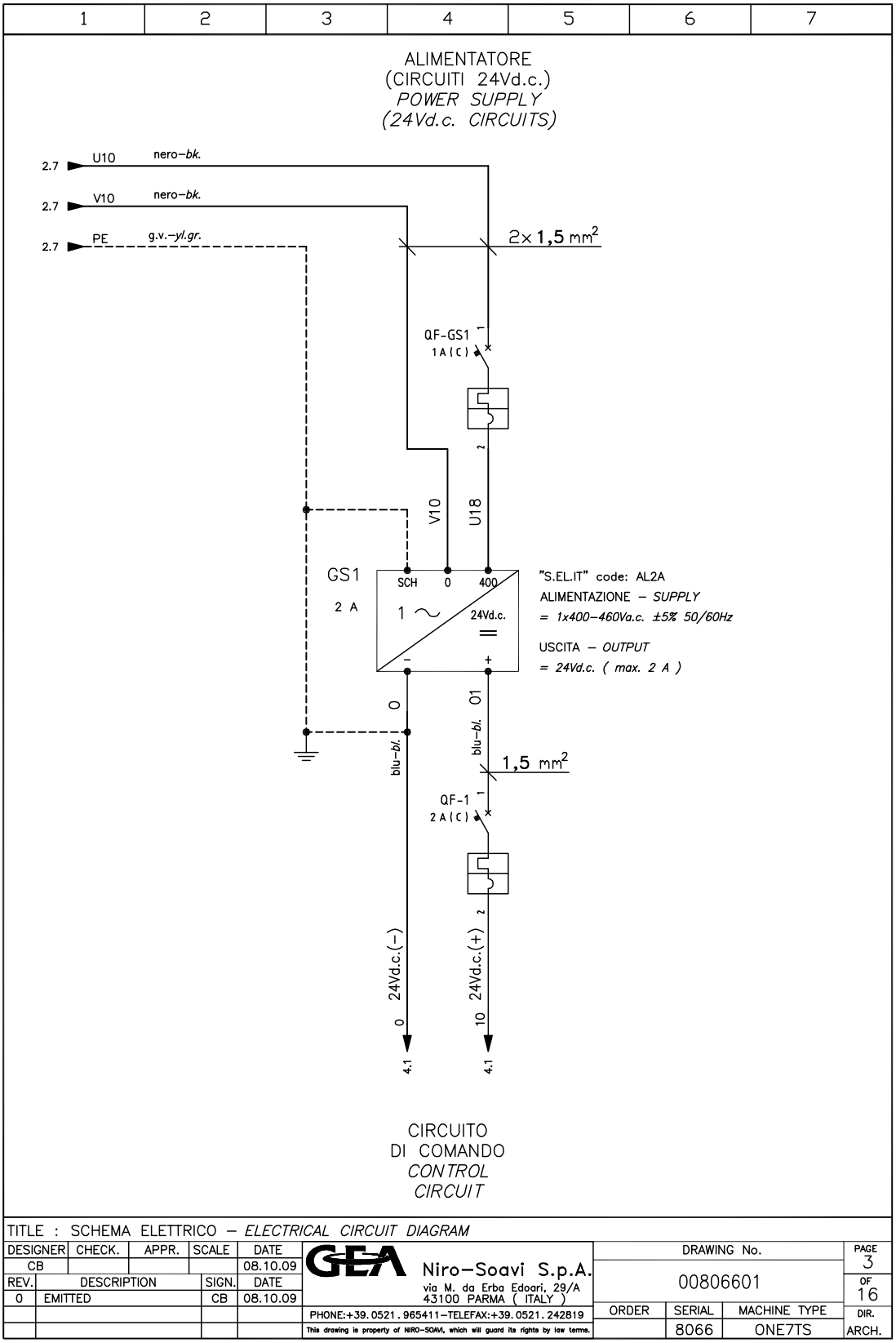
DRAWING No. 00806601

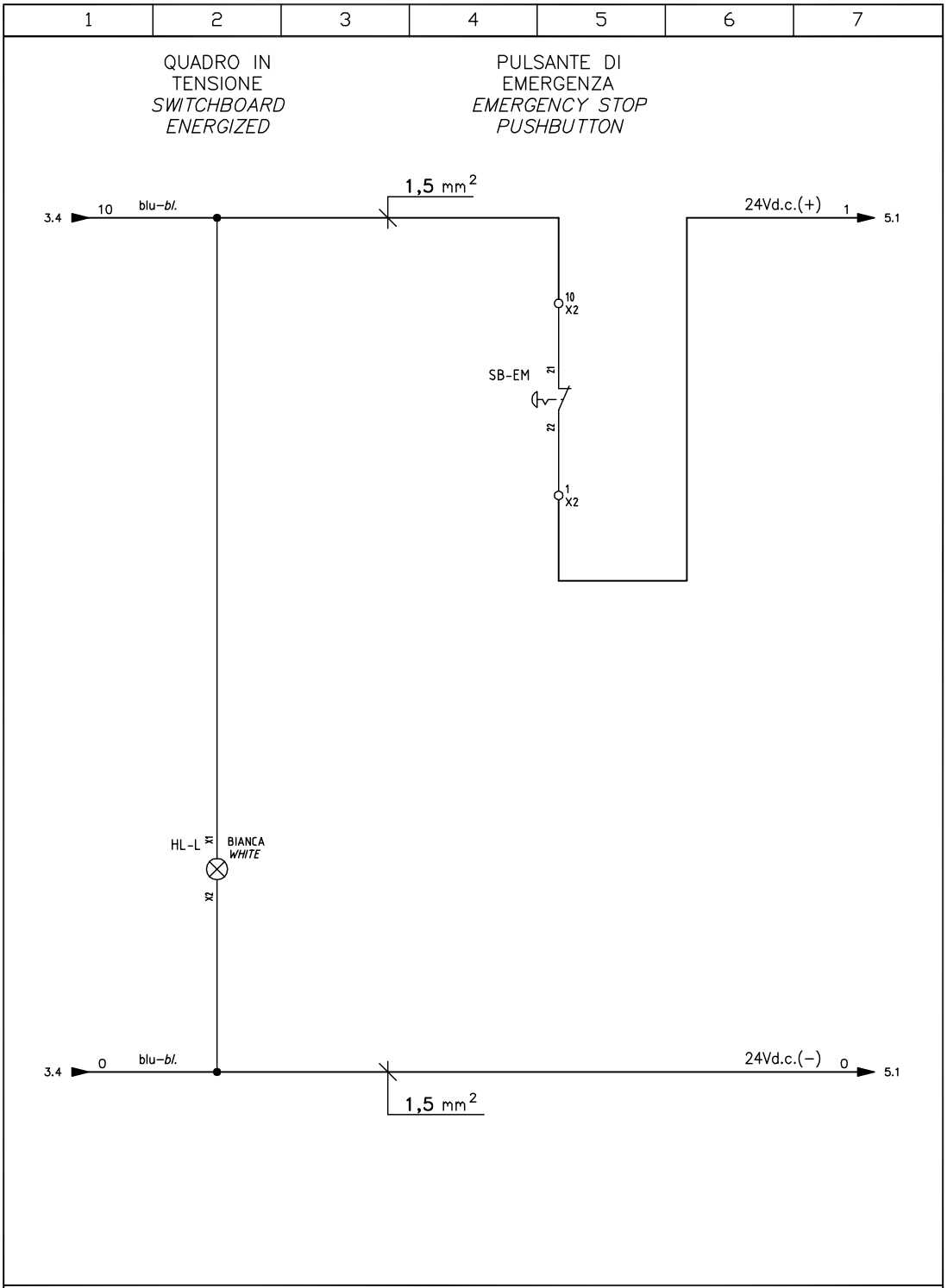
ORDER	SERIAL	MACHINE TYPE
	8066	ONE7TS

PAGE 1 OF 16
DIR. ARCH.



SPT_C_8066





TITLE : SCHEMA ELETTRICO – *ELECTRICAL CIRCUIT DIAGRAM*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB				08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

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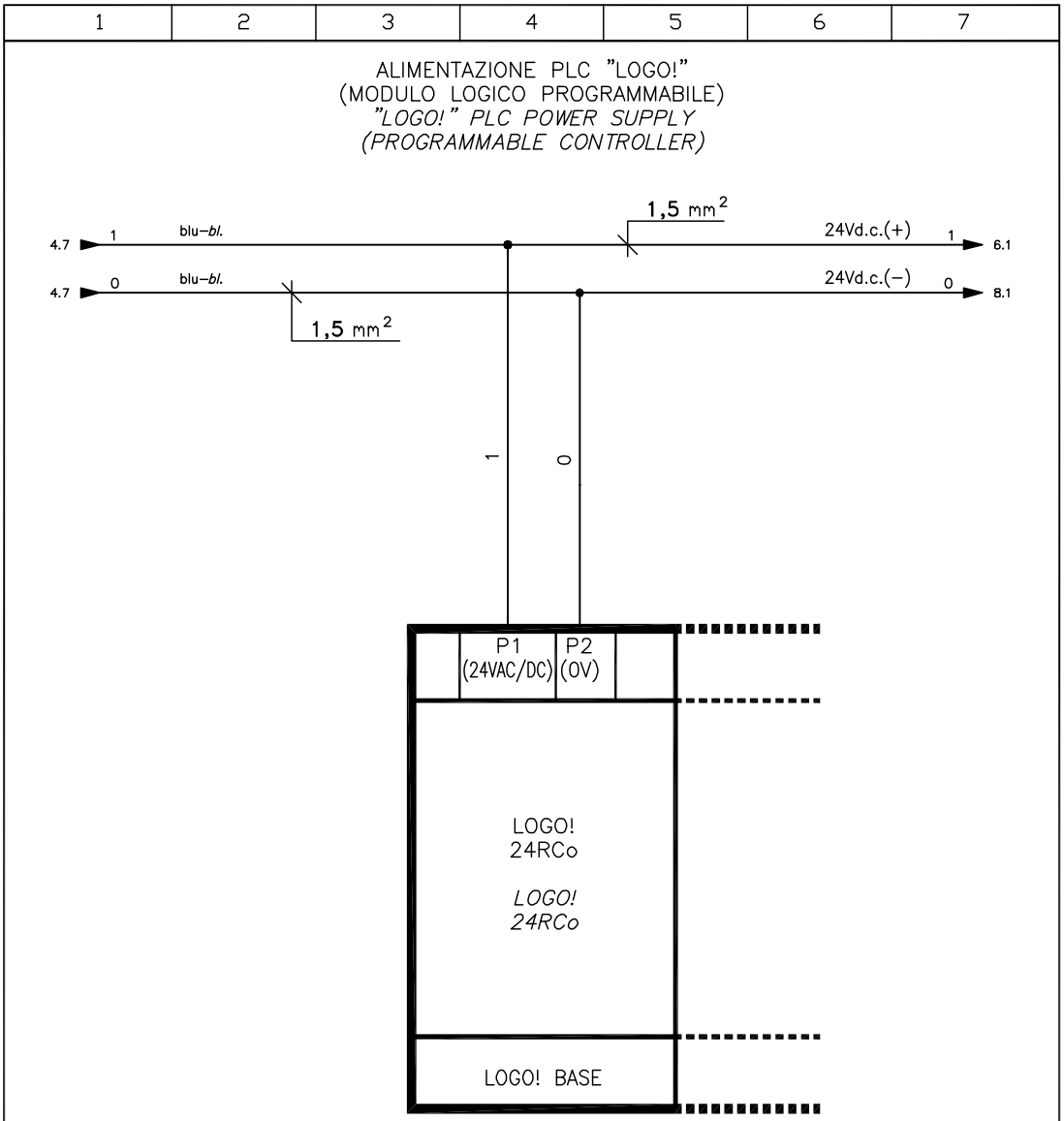
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39. 0521 . 965411–TELEFAX:+39. 0521. 242819

DRAWING No. 00806601

ORDER	SERIAL	MACHINE TYPE
	8066	ONE7TS

PAGE 4 OF 16
DIR. ARCH.



TITLE : SCHEMA ELETTRICO – *ELECTRICAL CIRCUIT DIAGRAM*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB				08.10.09

REV.	DESCRIPTION	SIGN.	DATE
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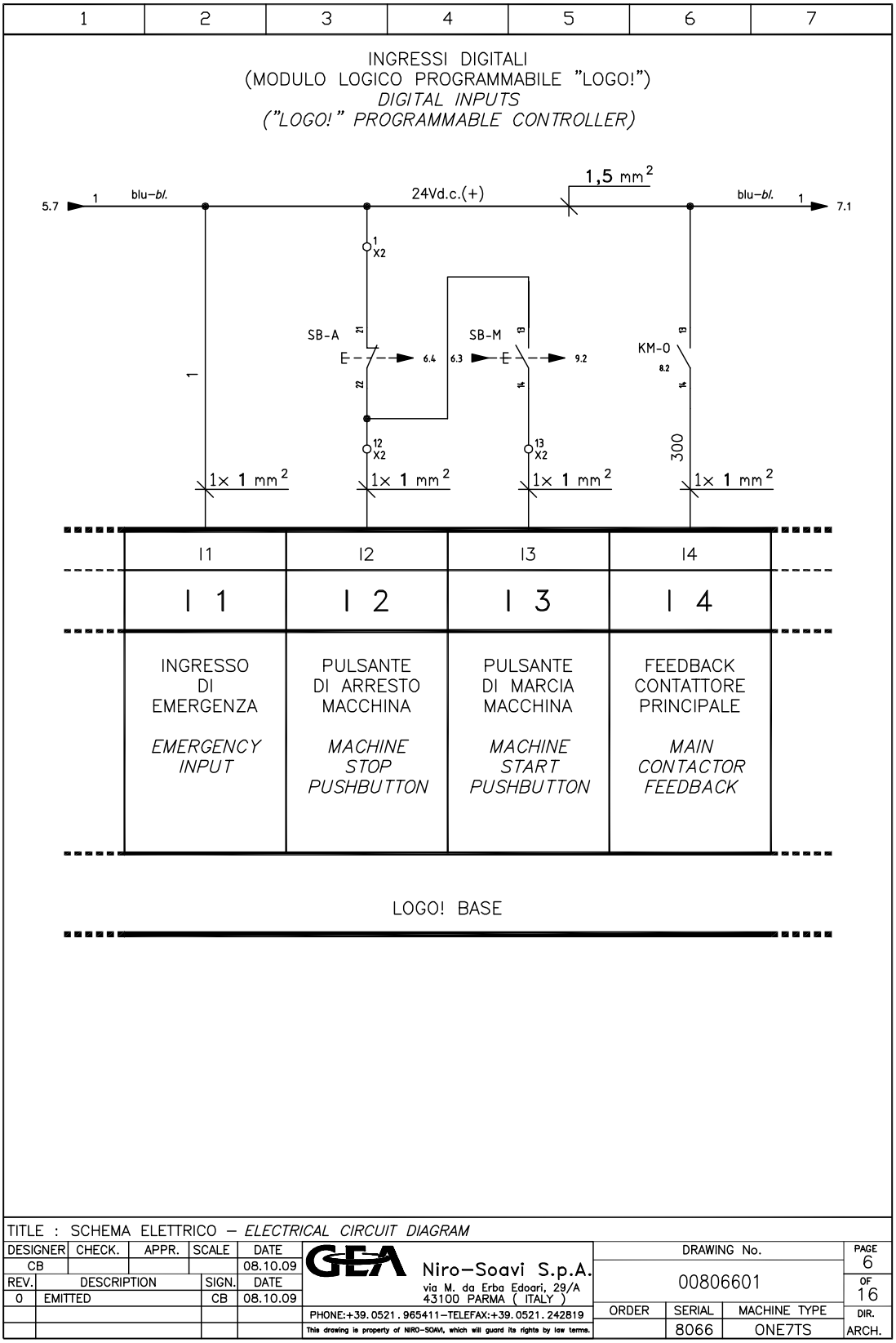
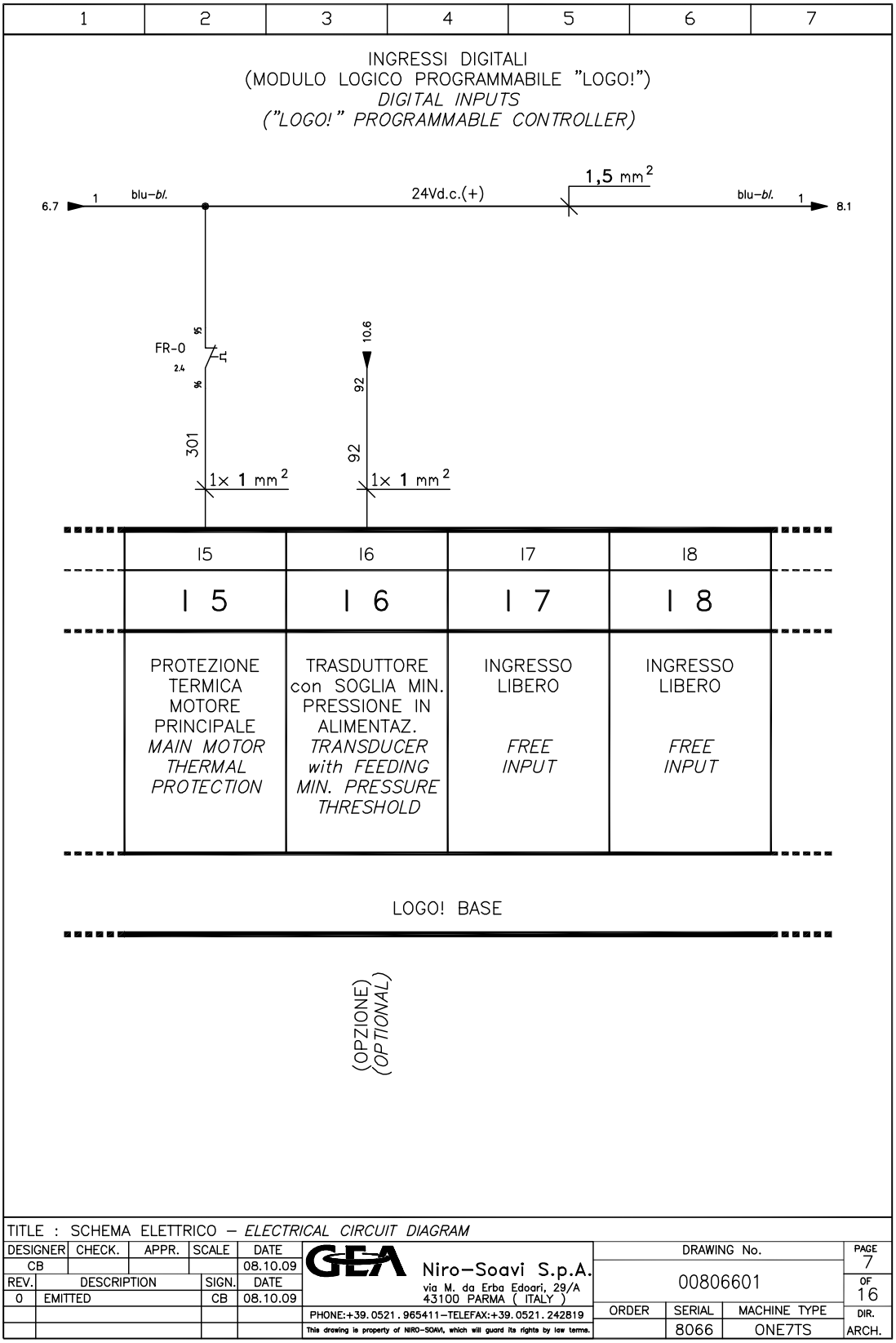
43100 PARMA (ITALY)
PHONE:+39. 0521 . 965411–TELEFAX:+39. 0521. 242819

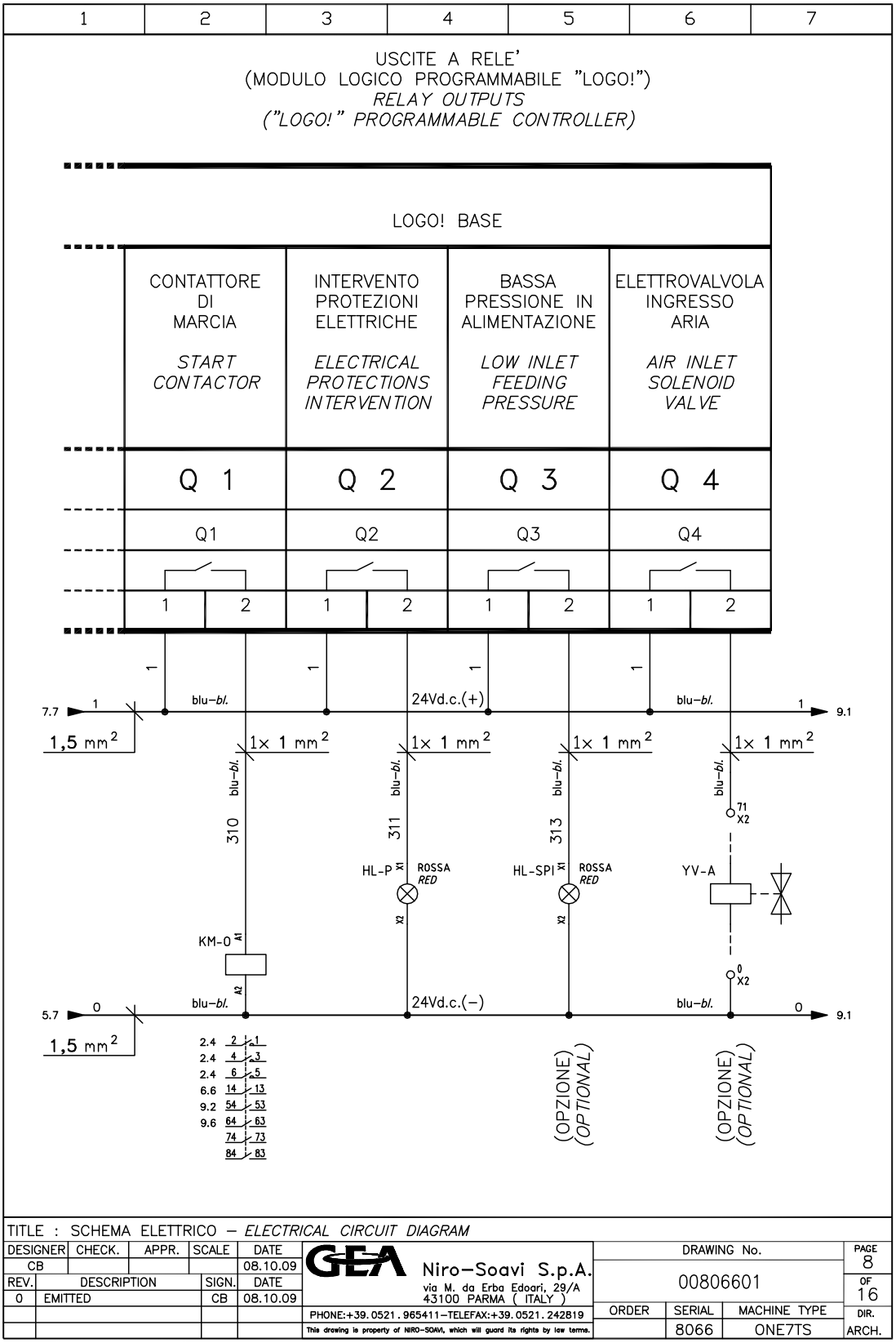
DRAWING No. 00806601

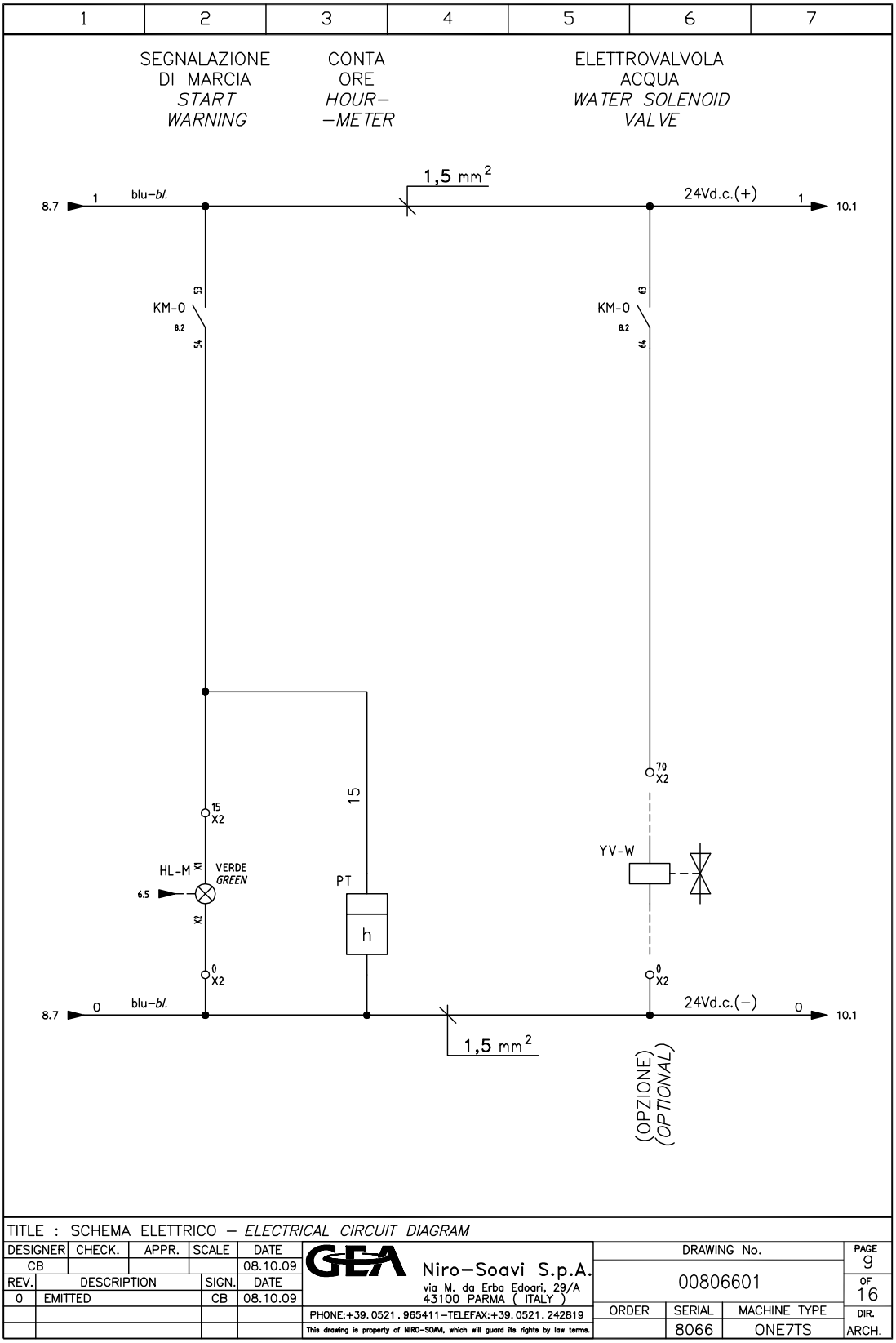
ORDER	SERIAL	MACHINE TYPE
	8066	ONE7TS

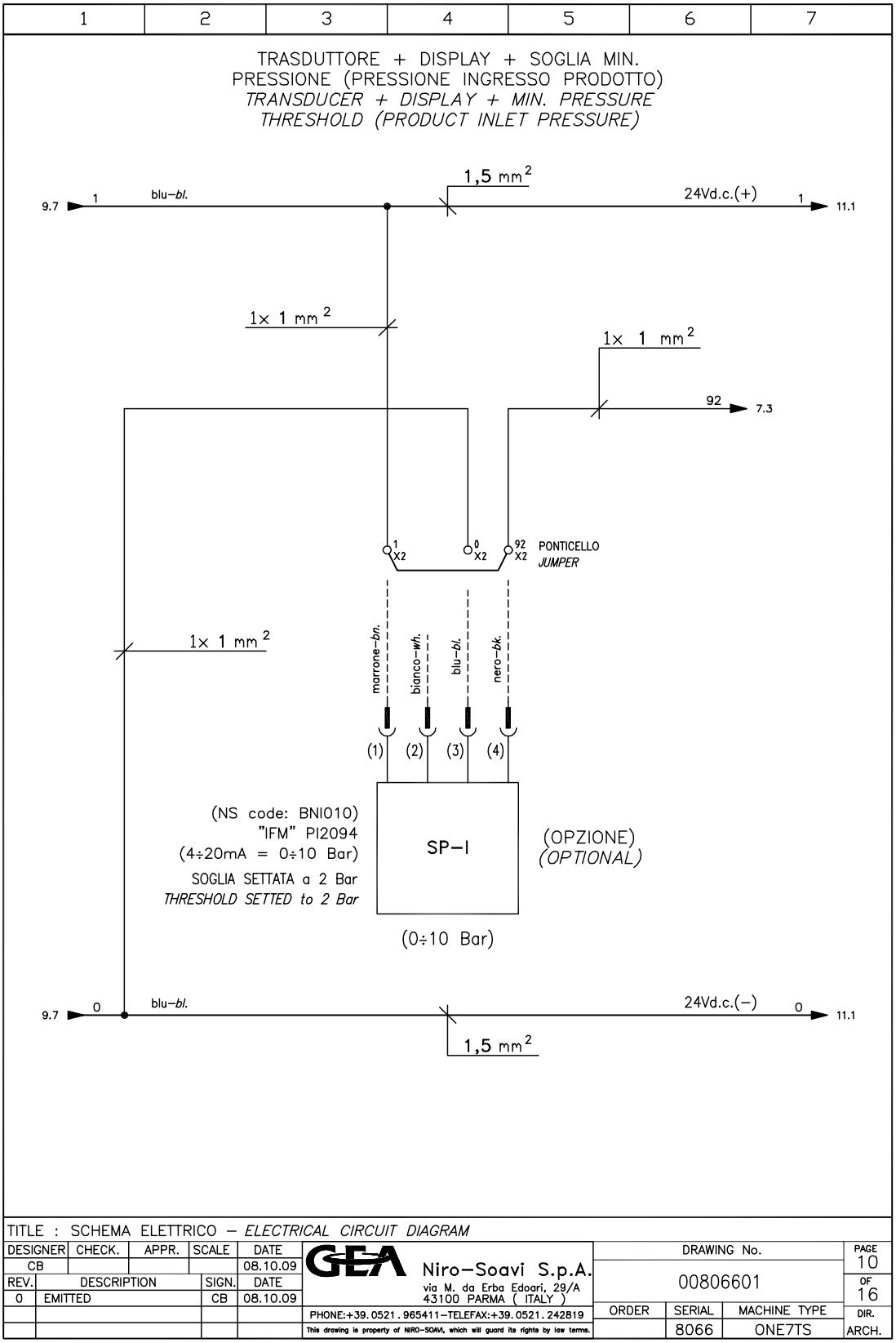
PAGE 5 OF 16
DIR. ARCH.

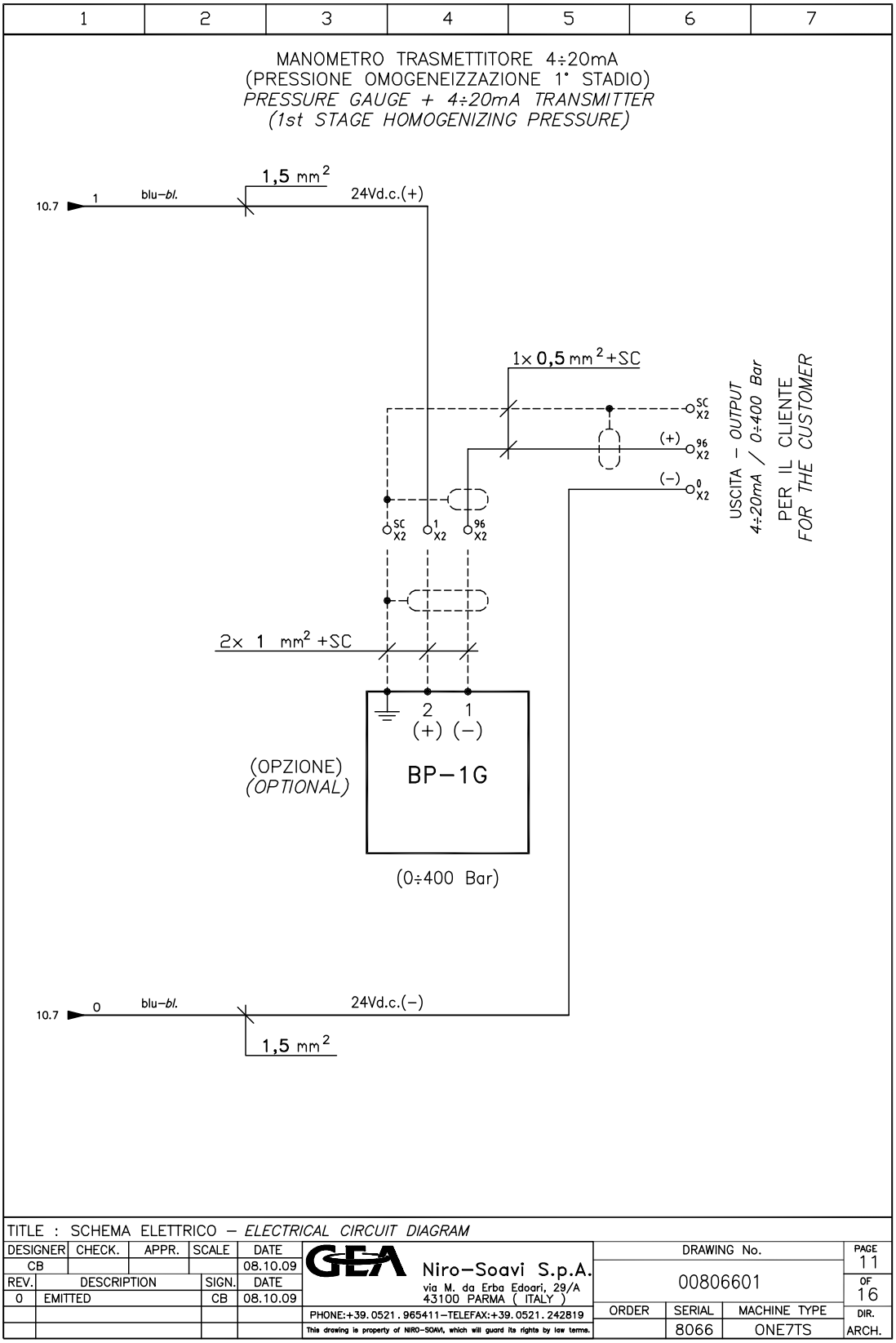








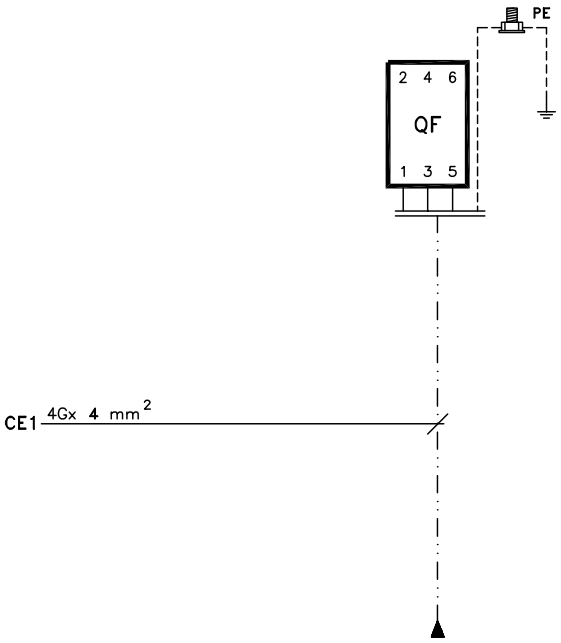




SPT_C_8066

1	2	3	4	5	6	7

QF= INTERRUTTORE GENERALE (QUADRO ELETTRICO NIRO–SOAVI)
XPE= BARRA DI TERRA (QUADRO ELETTRICO NIRO–SOAVI)
QF= MAIN SWITCH (NIRO–SOAVI SWITCHBOARD)
XPE= EARTH BAR (NIRO–SOAVI SWITCHBOARD)



LINEA DI ALIMENTAZIONE
(DAL CLIENTE)
POWER LINE SUPPLY
(FROM THE CUSTOMER)

ATTENZIONE – *WARNING*

LA SEZIONE DEI CAVI E' VALIDA FINO AD UNA LUNGHEZZA DI 50 METRI.
THE CABLES SECTIONS ARE CORRECT UNTIL 50 METERS DISTANCE.

TITLE : SCHEMA ELETTRICO – *ELECTRICAL CIRCUIT DIAGRAM*

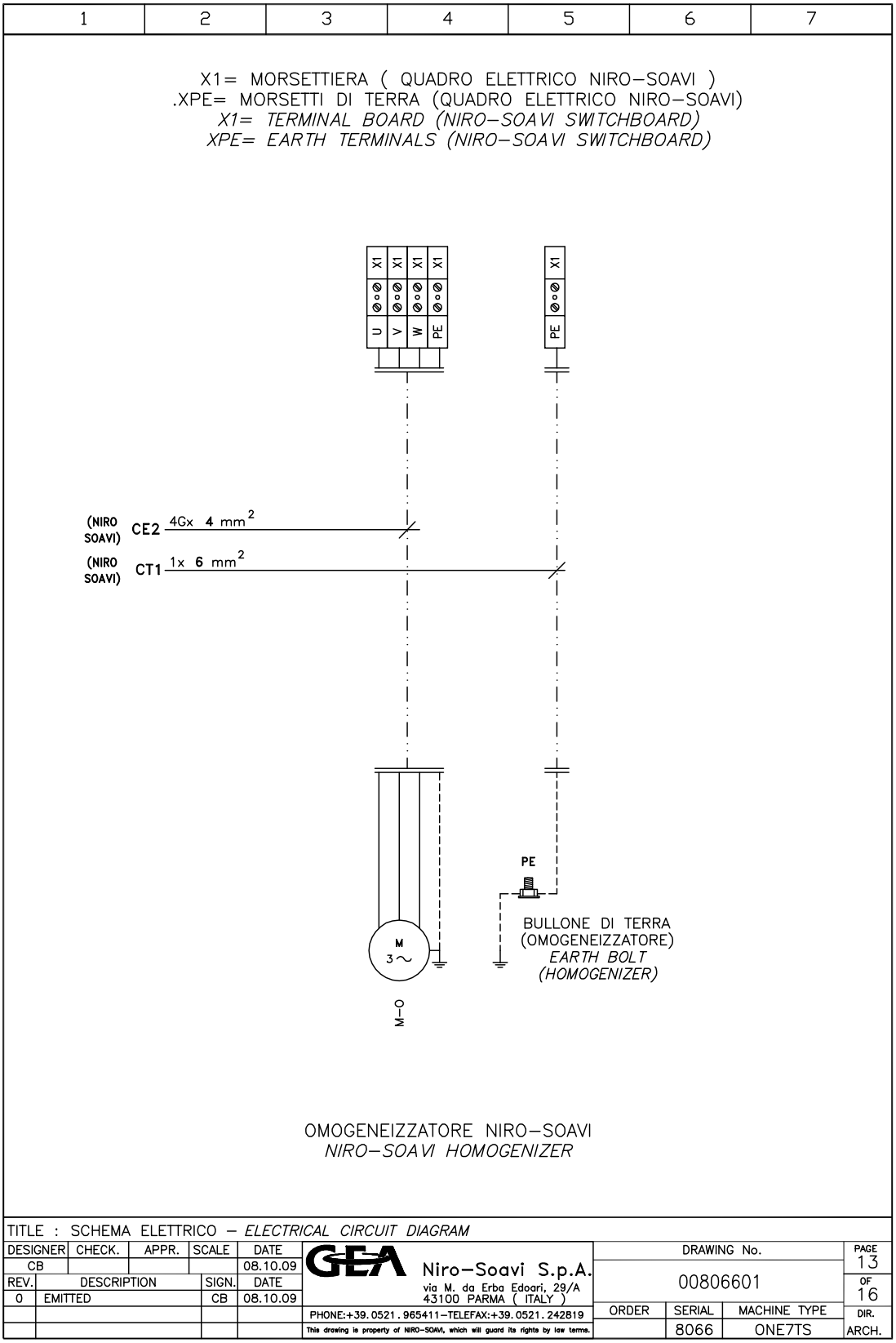
DESIGNER	CHECK.	APPR.	SCALE	DATE
CB				08.10.09

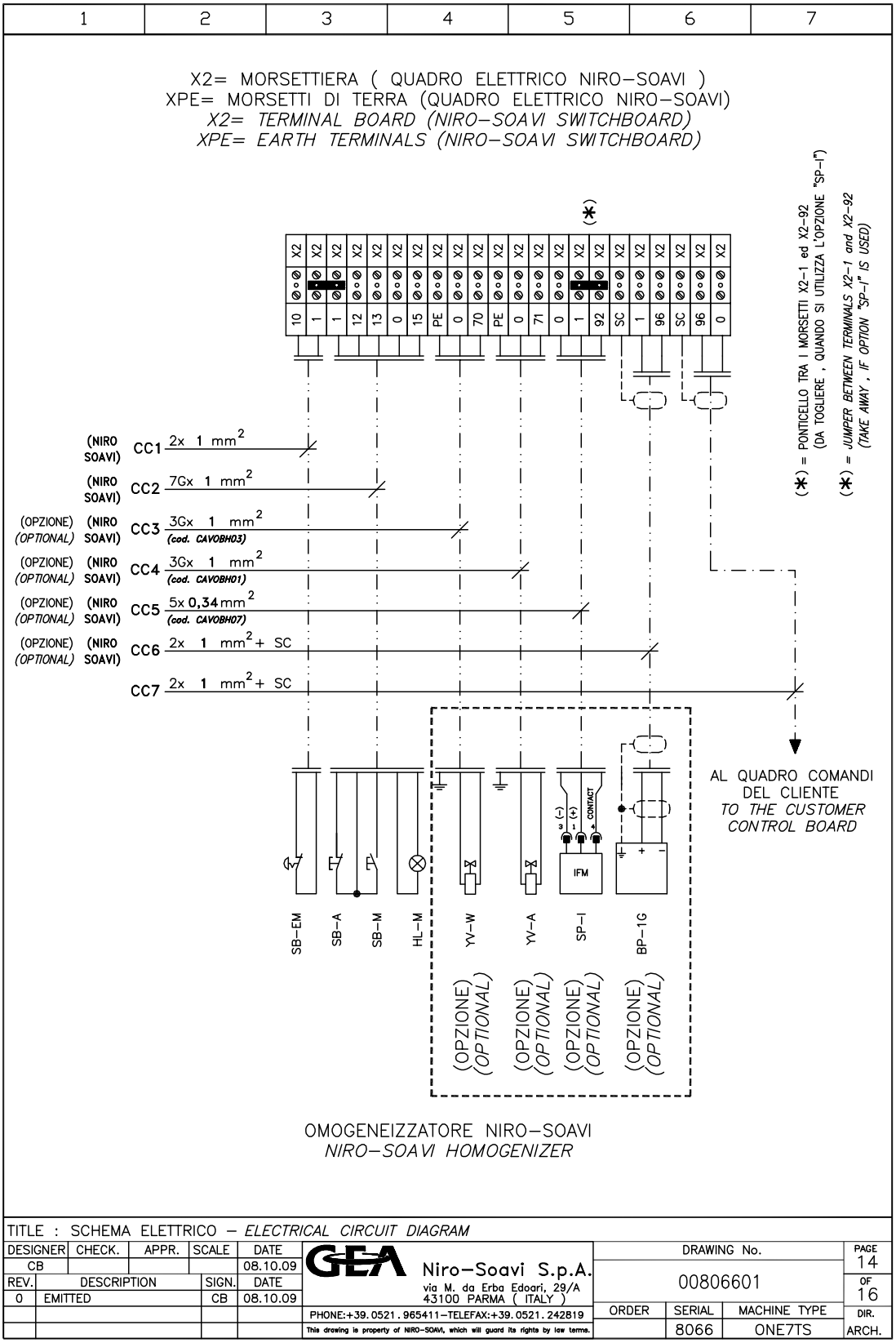
REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39.0521.965411–TELEFAX:+39.0521.242819

DRAWING No.	PAGE
00806601	12 OF 16

ORDER	SERIAL	MACHINE TYPE	DIR.
	8066	ONE7TS	ARCH.



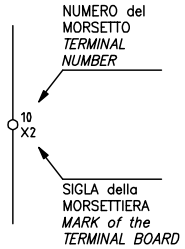


SPT_C_8066

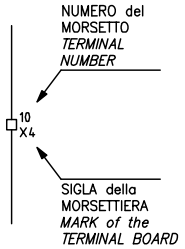
1	2	3	4	5	6	7

LEGENDA PER SCHEMI ELETTRICI
LEGEND TO CONCEPT ELECTRICAL DIAGRAMS

MORSETTIERE – *TERMINAL BOARDS*



MORSETTI nella MORSETTIERA
del QUADRO ELETTRICO
TERMINALS in the
SWITCHBOARD TERMINAL BOARD



MORSETTI nella MORSETTIERA
della MACCHINA
TERMINALS in the
MACHINE TERMINAL BOARD

X1 : MORSETTIERA dei CIRCUITI DI POTENZA (Nel QUADRO ELETTRICO)
TERMINAL BOARD of the POWER CIRCUITS (Into the SWITCHBOARD)

X2 : MORSETTIERA dei CIRCUITI DI COMANDO (Nel QUADRO ELETTRICO)
TERMINAL BOARD of the CONTROL CIRCUITS (Into the SWITCHBOARD)

X3 : MORSETTIERA dei CONTATTI PER IL CLIENTE (Nel QUADRO ELETTRICO)
TERMINAL BOARD of the CONTACTS TO CUSTOMER (Into the SWITCHBOARD)

X4 : MORSETTIERA dei CIRCUITI DI POTENZA e COMANDO (Nella MACCHINA)
TERMINAL BOARD of the POWER and CONTROL CIRCUITS (Into the MACHINE)

TITLE : SCHEMA ELETTRICO – *ELECTRICAL CIRCUIT DIAGRAM*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB				08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

GEA Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
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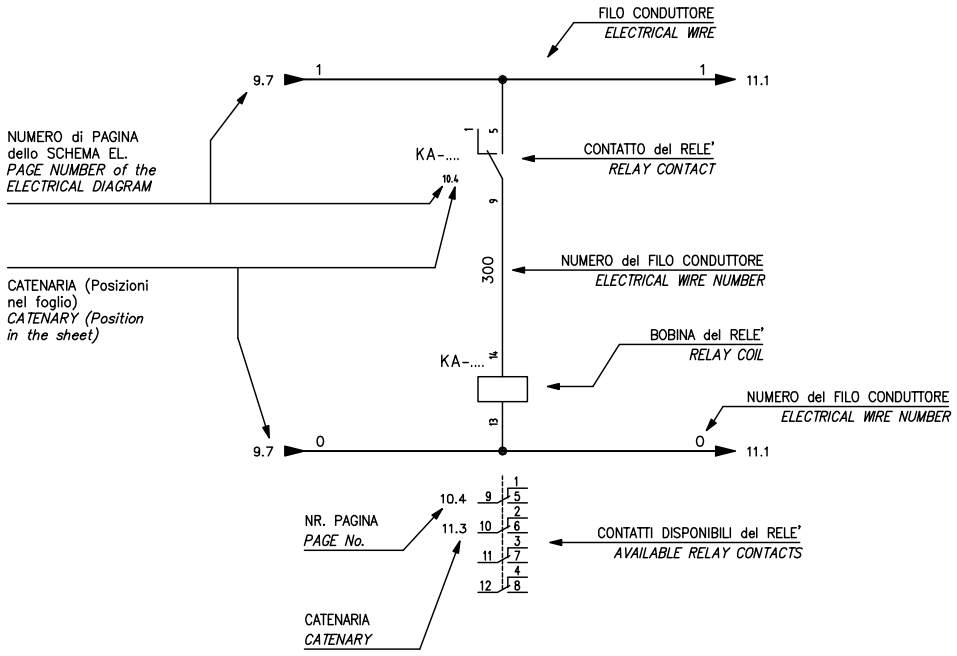
DRAWING No.			PAGE
00806601			15 OF 16
ORDER	SERIAL	MACHINE TYPE	DIR.
	8066	ONE7TS	ARCH.

1	2	3	4	5	6	7

COME INTERPRETARE LO SCHEMA ELETTRICO
HOW TO READ THE ELECTRICAL DIAGRAM

CATENARIA (Posizioni nel foglio) – *CATENARY (Position in the sheet)*

1	2	3	4	5	6	7



COLORE DEI FILI – *ELECTRICAL WIRES COLORS*

nero–*bk.* : NERO *BLACK*	giallo–*yl.* : GIALLO *YELLOW.*	arancio–*or.* : ARANCIO *ORANGE*
rosso–*rd.* : ROSSO *RED.*	verde–*gr.* : VERDE *GREEN*	bianco–*wh.* : BIANCO *WHITE.*
blu–*bl.* : BLU *BLUE*	marrone–*bn.* : MARRONE *BROWN*	

TITLE : SCHEMA ELETTRICO – *ELECTRICAL CIRCUIT DIAGRAM*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB				08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

GEA Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39. 0521 . 965411–TELEFAX:+39. 0521. 242819
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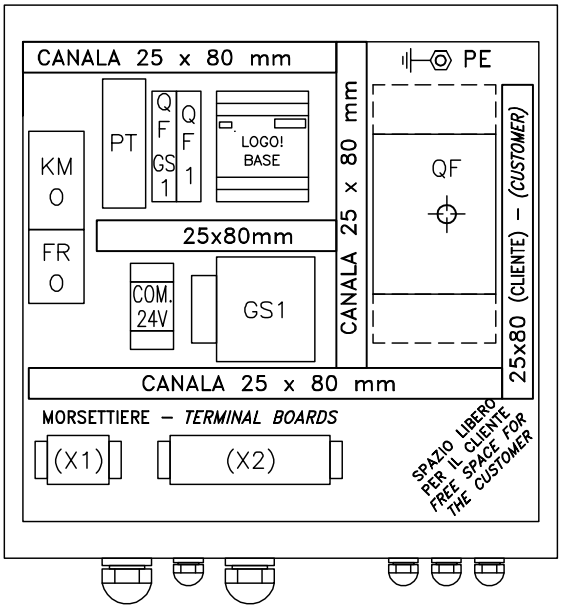
DRAWING No.	PAGE
00806601	16 OF 16

ORDER	SERIAL	MACHINE TYPE	DIR.
	8066	ONE7TS	ARCH.

1	2	3	4	5	6	7



ENTRATA / USCITA CAVI
CABLES INLET / OUTLET

TITLE : DISPOSIZIONE TOPOGRAFICA INTERNA – *ELECTRICAL LAYOUT EQUIPMENT*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB			1:5	08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

GEA Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39. 0521. 965411–TELEFAX:+39. 0521. 242819

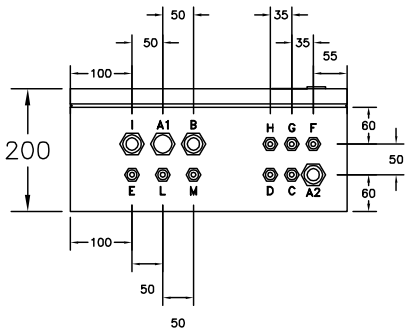
DRAWING No. 00806602

PAGE 1 OF 1

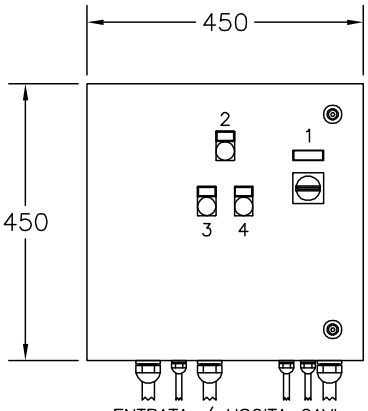
ORDER	SERIAL	MACHINE TYPE	DIR.
	8066	ONE7TS	ARCH.

1	2	3	4	5	6	7

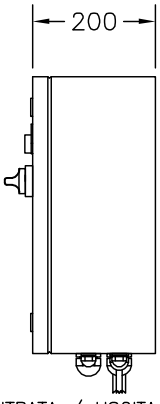
VISTA DAL BASSO
BOTTOM VIEW



VISTA FRONTALE
FRONT SIDE VIEW



VISTA LATO DESTRO
RIGHT SIDE VIEW



(#) *NOTA: CAVI GIA' COLLEGATI AL QUADRO ELETTRICO E GIA' SERRATI NEI PRESSACAVI*

ENTRATA / USCITA CAVI
CABLES INLET / OUTLET

ENTRATA / USCITA CAVI
CABLES INLET / OUTLET

	CAVO *CABLE*	PRESSACAVO *CABLE GLAND*	LUNGHEZZA DEL CAVO *CABLE LENGHT*	TIPO DI CAVO *CABLE TYPE*	SEZIONE DEL CAVO *CABLE SECTION*	FORNITO DA: *SUPPLIED BY:*
A1=	/	(**)	/	/	/	/
A2=	CE1	(M25)	/	FG70R 0,6/1kV	4Gx 4 mm^2	(CLIENTE) – *(CUSTOMER)*
(#) B=	CE2	(M25)	1 mt.	FG70R 0,6/1kV	4Gx 4 mm^2	(NIRO SOAVI)
(#) C=	CT1	(M16)	1 mt.	N07V-K	1x 6 mm^2	(NIRO SOAVI)
(#) D=	CC1	(M16)	2 mt.	FROR 300/500V	2x 1 mm^2	(NIRO SOAVI)
(#) E=	CC2	(M20)	2 mt.	FROR 300/500V	7Gx 1 mm^2	(NIRO SOAVI)
F=	CC3	(*)	/	/	/	/
G=	CC4	(*)	/	/	/	/
H=	CC5	(*)	/	/	/	/
L=	CC6	(*)	/	/	/	/
M=	CC7	(M16)	/	FR20HR 300/300V	2x 1 mm^2+SC	(CLIENTE) – *(CUSTOMER)*

(*)= (M16) TAPPO – *PLUG*
(**)= M25) TAPPO – *PLUG*

LEGENDA – *DESCRIPTION*

1(QF)= INTERRUTTORE GENERALE – *.MAIN SWITCH*
2(HL-L)= SEGNALAZIONE QUADRO IN TENSIONE – *SWITCHBOARD ENERGIZED WARNING*
3(HL-P)= SEGNALAZIONE INTERVENTO PROTEZIONI ELETTRICHE – *ELECTRICAL PROTECTIONS INTERVENTION WARNING*
4(HL-SPI)= SEGNALAZIONE BASSA PRESSIONE IN ALIMENTAZIONE – *LOW INLET FEEDING PRESSURE WARNING*

TITLE : QUADRO ELETTRICO IN ACCIAIO INOX – *STAINLESS STEEL SWITCHBOARD*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB			1:10	08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

GEA Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39. 0521. 965411-TELEFAX:+39. 0521. 242819
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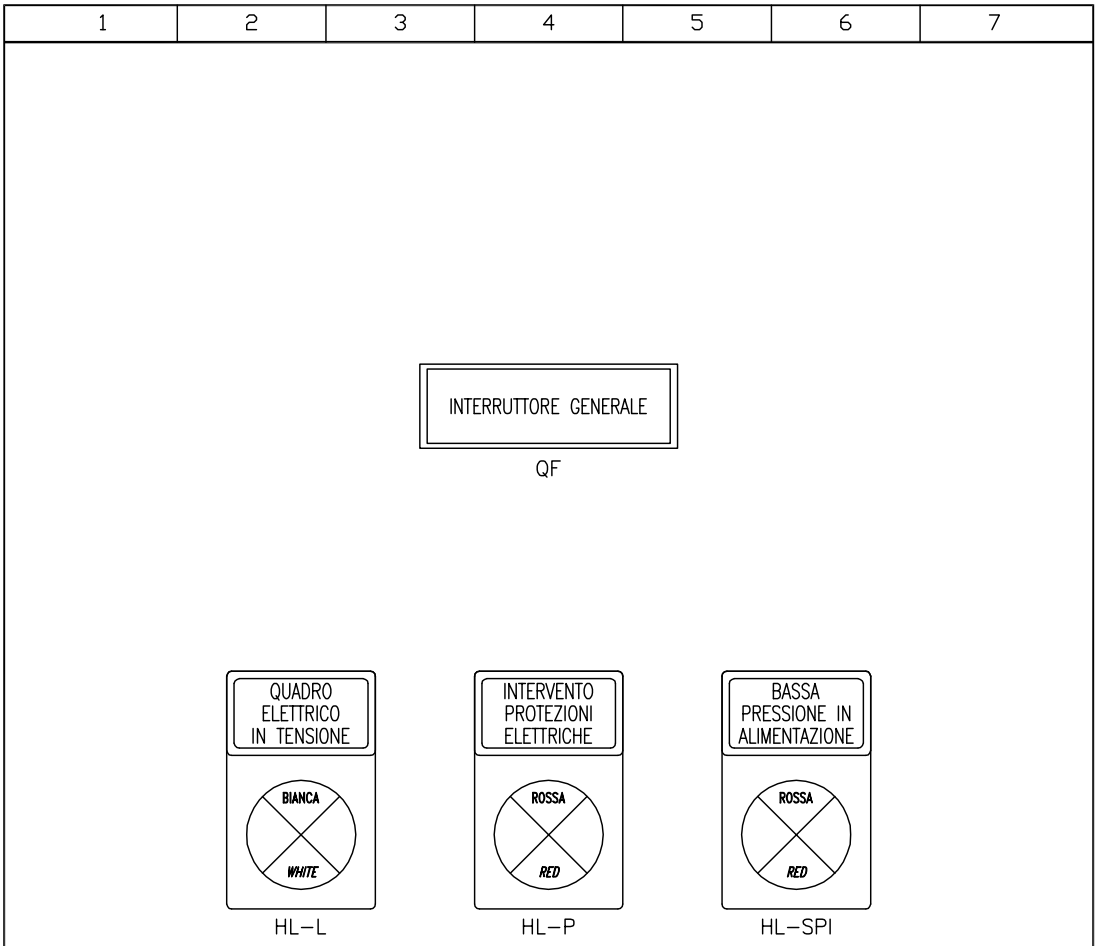
DRAWING No. 00806603

PAGE 1 OF 1

ORDER	SERIAL	MACHINE TYPE	DIR.
	8066	ONE7TS	ARCH.



ELENCO TARGHETTE SUL QUADRO ELETTRICO
PLATES LIST ON SWITCHBOARD FRONT

TITLE : ELENCO TARGHETTE – *PLATES LIST*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB				08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

GEA Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39.0521.965411–TELEFAX:+39.0521.242819
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DRAWING No. 00806604

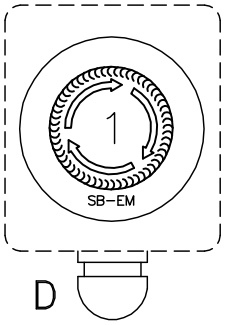
ORDER	SERIAL	MACHINE TYPE
	8066	ONE7TS

PAGE 1 OF 1 DIR. ARCH.

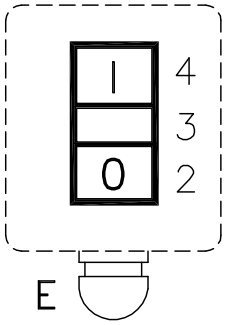
1	2	3	4	5	6	7

PANNELLO FRONTALE PULSANTIERA
(OMOGENEIZZATORE NIRO–SOAVI)
PUSHBUTTONS FRONT PANEL
(NIRO–SOAVI HOMOGENIZER)

(Scatola Gewiss GW27101,
cod. FC0040)



(Scatola Gewiss GW27101,
cod. FC0040)



	CAVO *CABLE*	PRESSACAVO *CABLE GLAND*	TIPO DI CAVO *CABLE TYPE*	SEZIONE DEL CAVO *CABLE SECTION*
D=	CC1	(M16)	FROR 300/500V	2x 1 mm^2
E=	CC2	(M20)	FROR 300/500V	7Gx 1 mm^2

LEGENDA – *DESCRIPTION*

1(SB–EM)= PULSANTE DI EMERGENZA –
EMERGENCY STOP PUSHBUTTON

2(SB–A)= PULSANTE DI ARRESTO MACCHINA –
MACHINE STOP PUSHBUTTON

3(HL–M)= SEGNALAZIONE MACCHINA IN MARCIA –
MACHINE RUNNING WARNING

4(SB–M)= PULSANTE DI MARCIA MACCHINA –
MACHINE START PUSHBUTTON

TITLE : PANNELLO COMANDI BORDO MACCHINA – *CONTROL PANEL ON THE MACHINE FRONT*

DESIGNER	CHECK.	APPR.	SCALE	DATE
CB			1:2	08.10.09

REV.	DESCRIPTION	SIGN.	DATE
0	EMITTED	CB	08.10.09

GEA Niro–Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE:+39. 0521. 965411–TELEFAX:+39. 0521. 242819

DRAWING No. 00806606

PAGE 1 OF 1

ORDER	SERIAL	MACHINE TYPE	DIR.
	8066	ONE7TS	ARCH.

SPT_C_8066

Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE : +39.0521.965411 - FAX : +39.0521.242819

DISTINTA MATERIALE ELETTRICO

ELECTRICAL EQUIPMENT LIST

SPEC-DE

	ONE 7 TS400	8066	CB		08.10.09	0
COMMESSA *JOB*	MODELLO MACCHINA *MACHINE MODEL*	N° DI SERIE *SERIAL No.*	SIG. *SIG.*		DATA *DATE*	REV. *REV.*

Sigla *Item*	N.ro *Q.ty*	Descrizione *Denomination*	Codice *Code*	Marca *Brand*	Tipo *Type*	Caratteristiche *Characteristics*
QF	1	INTERRUTTORE AUTOMATICO GENERALE TRIPOLARE		SIEMENS	3VT1704-2EJ46-0AA0	32÷40 A ; 4 POLI
		THREE-POLES AUTOMATIC MAIN SWITCH				*32÷40 A ; 4 POLI*
	1	MANIGLIA BLOCCOPORTA		SIEMENS	3V9100-3HB20 + 3VT9100-3HF20 + 3VT9100-3HH20	Esecuzione di emergenza
		DOORBLOCK HANDLE				*Emergency model*
	1	ALBERO DI PROLUNGA		SIEMENS	3VT9100-3HJ10	
		EXTENSION SHAFT				
	2	CALOTTA COPRIMORSETTO		SIEMENS	3VT9100-8CA30	In plastica
		PROTECTION FOR TERMINAL				*Of plastic*
KM-O	1	CONTATTORE DI LINEA		SIEMENS	3RT1026-1BB40	24Vc.c. ; 11kW ; S0
		LINE CONTACTOR				*24Vd.c. ; 11kW ; S0*
FR-O	1	RELÉ TERMICO DI LINEA		SIEMENS	3RB2026-1QB0	6 ÷ 25 A ; S0
		LINE THERMAL RELAY				*6 ÷ 25 A ; S0*
	1	BLOCCO di CONTATTI AUSILIARI		SIEMENS	3RH1921-4FA40	Contatti 4 N.A.
		AUXILIARY CONTACTS MODULE				*4 N.O. Contacts*
GS1	1	ALIMENTATORE MONOFASE		S.EL.IT	AL2A (speciale)	Ingr.=0-400-460V ±5% 50/60Hz ; Usc.=24Vc.c. ; 2A
		SINGLE-PHASE POWER SUPPLY				*In.=0-400-460V ±5% 50/60Hz ;* *Out.=24Vd.c. ; 2A*
QF-GS1	1	INTERRUTTORE AUTOMATICO UNIPOLARE		SIEMENS	5SY6101-7	1 A ; Caratteristica "C"
		SINGLE-POLE AUTOMATIC SWITCH				*1 A ; "C" characteristic*
QF-1	1	INTERRUTTORE AUTOMATICO UNIPOLARE		SIEMENS	5SY6102-7	2 A ; Caratteristica "C"
		SINGLE-POLE AUTOMATIC SWITCH				*2 A ; "C" characteristic*

Sigla *Item*	N.ro *Q.ty*	Descrizione *Denomination*	Codice *Code*	Marca *Brand*	Tipo *Type*	Caratteristiche *Characteristics*
LOGO!	1	MODULO BASE LOGICO PROGRAMMABILE		SIEMENS	LOGO! 24RC0 6ED1052-2HB00-0BA5	24Vc.c. ; Ingr.= 8 ; Usc.= 4 ; NO DISPLAY
		PROGRAMMABLE LOGIC CONTROLLER BASIC UNIT				*24Vd.c. ; In.= 8 ; Out.= 4 ; NO DISPLAY*
PT	1	CONTAORE ELETTRICO		MULLER	BG 7089-12÷48Vcc	12÷48Vc.c.
		HOUR METER				*12÷48Vd.c.*
HL-L	1	SEGNALAZIONE LUMINOSA		SIEMENS	3SB3644-6BA60	BIANCA ; 24Vc.a./c.c. ; LED
		LIGHT WARNING				*WHITE ; 24Va.c./d.c. ; LED*
HL-P	1	SEGNALAZIONE LUMINOSA		SIEMENS	3SB3644-6BA20	ROSSA ; 24Vc.a./c.c. ; LED
		LIGHT WARNING				*RED ; 24Va.c./d.c. ; LED*
HL-SPI	1	SEGNALAZIONE LUMINOSA		SIEMENS	3SB3644-6BA20	ROSSA ; 24Vc.a./c.c. ; LED
		LIGHT WARNING				*RED ; 24Va.c./d.c. ; LED*
	1	TARGHETTA INSERIBILE BIANCA		MODERNOTECNICA	T 1549 B	49x15mm
		INSERTABLE WHITE TAG				*49x15mm*
	1	VETRINO DI PROTEZIONE per targhette		MODERNOTECNICA	T 1549 V	49x15mm
		PROTECTIVE SLIDE for tags				*49x15mm*
	1	PORTA-TARGHETTE		MODERNOTECNICA	P 1752 A	52x17mm ; Adesiva
		TAGS HOLDER				*52x17mm ; Adhesive*
	3	TARGHETTA INSERIBILE BIANCA		MODERNOTECNICA	T 1527 B	27x15mm
		INSERTABLE WHITE TAG				*27x15mm*
	3	VETRINO DI PROTEZIONE per targhette		MODERNOTECNICA	T 1527 V	27x15mm
		PROTECTIVE SLIDE for tags				*27x15mm*
	3	PORTA-TARGHETTE		MODERNOTECNICA	P TAR 22	48x30mm ; diametro= 22,5mm
		TAGS HOLDER				*48x30mm ; diameter= 22,5mm*

Sigla *Item*	N.ro *Q.ty*	Descrizione *Denomination*	Codice *Code*	Marca *Brand*	Tipo *Type*	Caratteristiche *Characteristics*
	3	MORSETTI (per X1)		SIEMENS	8WA1 011-1DH11	6 mmq ; BEIGE
		TERMINALS (for X1)				*6 mmq ; BEIGE*
	22	MORSETTI (per X2)		SIEMENS	8WA1 011-1DF11	2,5 mmq ; BEIGE
		TERMINALS (for X2)				*2,5 mmq ; BEIGE*
	2	MORSETTI DI TERRA (per X1)		SIEMENS	8WA1011-1PH00	6 mmq ; GIALLO-VERDE
		EARTH TERMINALS (for X1)				6 mmq ; YELLOW-GREEN
	2	MORSETTI DI TERRA (per X2)		SIEMENS	8WA1011-1PF00	2,5 mmq ; GIALLO-VERDE
		EARTH TERMINALS (for X2)				2,5 mmq ; YELLOW-GREEN
	1	ARMADIO in ACCIAIO INOX		ILINOX	QL 44/304	450 x 450 x 200 mm
		STAINLESS STEEL SWITCHBOARD				*450 x 450 x 200 mm*
	2	PRESSACAVO + GUARNIZIONE + GHIERA IN METALLO		LEGRAND	84372 + 86503AF + 386633	Filetto= M 25x1,5mm ; 9÷17 mm
		CABLE GLAND + GASKET + METAL THREADED RING				*Thread= M 25x1,5mm ; 9÷17 mm*
	1	PRESSACAVO + GUARNIZIONE + GHIERA IN METALLO		LEGRAND	84371 + 86502AF + 386632	Filetto= M 20x1,5mm ; 7÷13 mm
		CABLE GLAND + GASKET + METAL THREADED RING				*Thread= M 20x1,5mm ; 7÷13 mm*
	3	PRESSACAVO + GUARNIZIONE + GHIERA IN METALLO		LEGRAND	84370 + 86501AF + 386631	Filetto= M 16x1,5mm ; 4,5÷10 mm
		CABLE GLAND + GASKET + METAL THREADED RING				*Thread= M 16x1,5mm ; 4,5÷10 mm*
	4	TAPPO DI CHIUSURA + GUARNIZIONE + GHIERA IN METALLO		LEGRAND	86471 + 86501AF + 386631	Filetto= M 16x1,5mm
		CLOSING STOPPER + GASKET + METAL THREADED RING				*Thread= M 16x1,5mm*
CE2	mt. 1,3	CAVO per il MOTORE PRINCIPALE			FG7OR 0,6/1kV	4G x 4 mmq
		CABLE for MAIN MOTOR				*4G x 4 mmq*
CT1	mt. 1,3	CORDINA UNIFILARE di TERRA MACCHINA			N07V-K	1 x 6 mmq ; GIALLO-VERDE
		SINGLE WIRE for MACHINE EARTH				*1 x 6 mmq ; YELLOW-GREEN*
CC1	mt. 2,3	CAVO MULTIFILARE			FROR 300/500 V	2 x 1 mmq
		MULTIPOLAR CABLE				*2 x 1 mmq*
CC2	mt. 2,3	CAVO MULTIFILARE			FROR 300/500 V	7G x 1 mmq
		MULTIPOLAR CABLE				*7G x 1 mmq*
#						

Niro–Soavi S.p.A.

PROGRAMMA P.L.C.
P.L.C. SOFTWARE

TIPO P.L.C. : *P.L.C. TYPE :*	LOGO! 24RCo
LINGUAGGIO : *LANGUAGE :*	FUP
TIPO MACCHINA : *MACHINE TYPE :*	ONE7TS
NUMERO DI SERIE : *SERIAL NUMBER :*	8066
DATA : *DATE :*	08.10.2009

(Password : NIROSOAVI)

GEA Niro-Soavi S.p.A.
via M. da Erba Edoari, 29/A
43100 PARMA (ITALY)
PHONE : +39.0521.965411 - FAX : +39.0521.242819

INGRESSI - USCITE PLC *PLC INLET - OUTLET*					SPEC-IO
	ONE7TS	**8066**	**CB**	**08.10.09**	**0**
COMMESSA *JOB*	MODELLO MACCHINA *MACHINE MODEL*	N° DI SERIE *SERIAL No.*	SIG. *SIG.*	DATA *DATE*	REV. *REV.*

Ingresso ***Inlet***	**Sigla** ***Item***	**Descrizione Ingresso** ***Input description***
I1	EM	INGRESSO DI EMERGENZA *EMERGENCY INPUT*
I2	SB-A	PULSANTE DI ARRESTO *STOP PUSHBUTTON*
I3	SB-M	PULSANTE DI MARCIA *START PUSHBUTTON*
I4	KM-O	FEEDBACK CONTATTORE PRINCIPALE *MAIN CONTACTOR FEEDBACK*
I5	FR-O	PROTEZIONE TERMICA MOTORE PRINCIPALE *MAIN MOTOR THERMAL PROTECTION*
I6	SP-I	TRASDUTTORE con SOGLIA DI MINIMA PRESSIONE IN ALIMENTAZIONE *TRANSDUCER with FEEDING MINIMUM PRESSURE THRESHOLD*
I7		INGRESSO LIBERO *FREE INPUT*
I8		INGRESSO LIBERO *FREE INPUT*

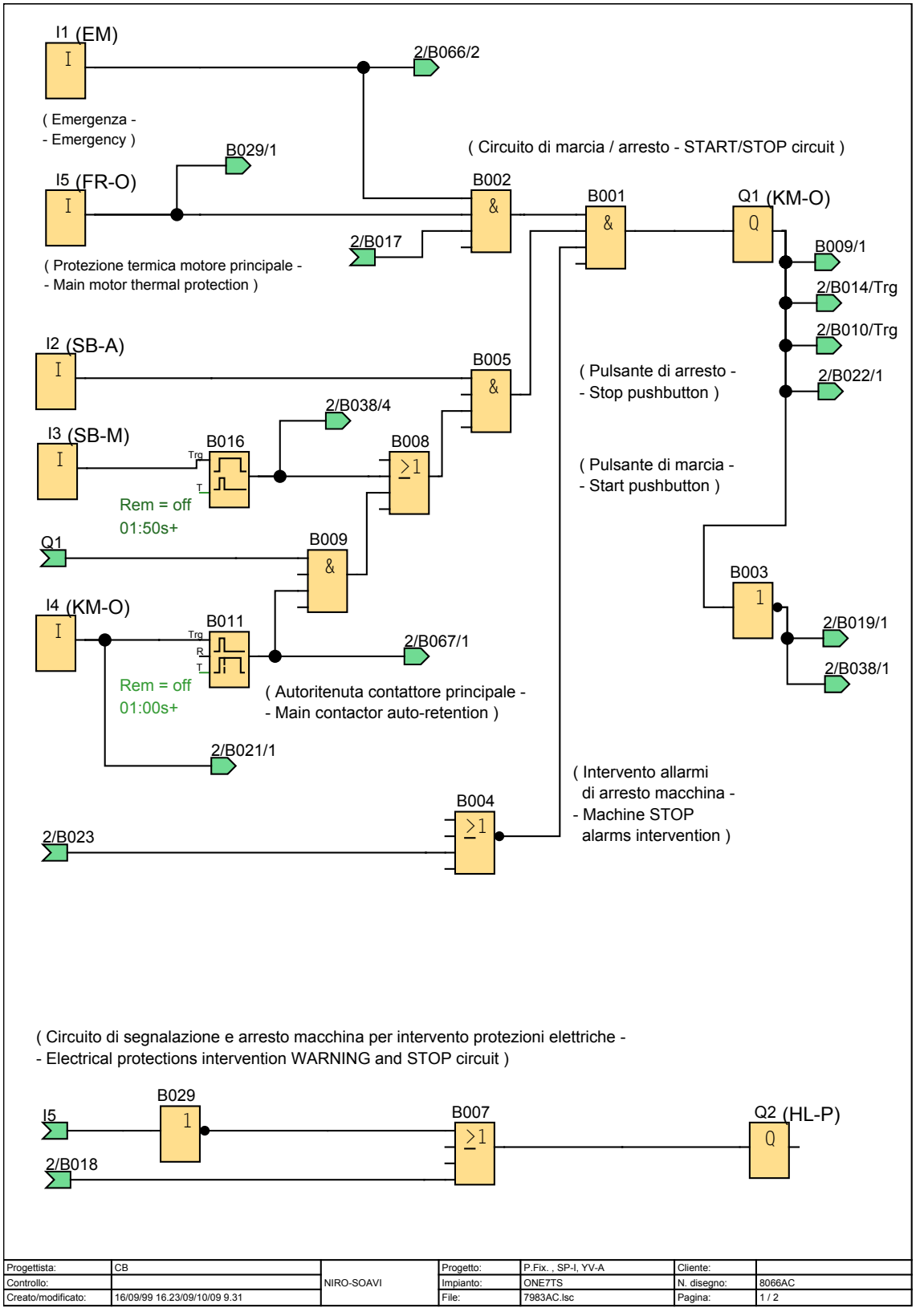
IO8066_C.xls 1 / 2

Niro-Soavi S.p.A. via M. da Erba Edoari, 29/A 43100 PARMA (ITALY) PHONE : +39.0521.965411 - FAX : +39.0521.242819	INGRESSI - USCITE PLC *PLC INLET - OUTLET*	SPEC-IO

	ONE7TS	8066	CB	08.10.09	0
COMMESSA *JOB*	MODELLO MACCHINA *MACHINE MODEL*	N° DI SERIE *SERIAL No.*	SIG. *SIG.*	DATA *DATE*	REV. *REV.*

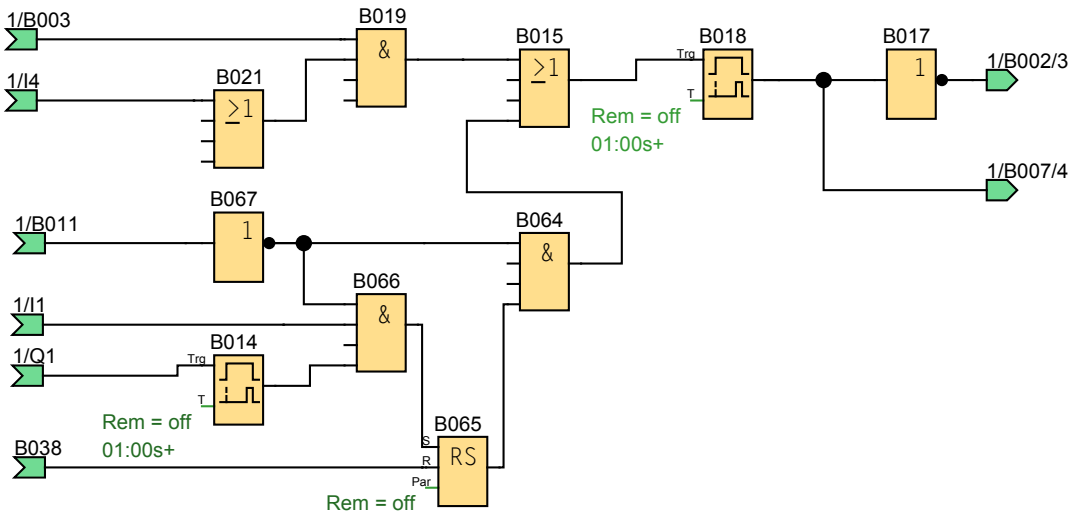
Uscita ***Outlet***	**Sigla** ***Item***	**Descrizione Uscita** ***Output description***
Q1	KM-O	CONTATTORE PRINCIPALE
		MAIN CONTACTOR
Q2	HL-P	INTERVENTO PROTEZIONI ELETTRICHE
		ELECTRICAL PROTECTIONS INTERVENTION
Q3	HL-SPI	BASSA PRESSIONE IN ALIMENTAZIONE
		LOW INLET FEEDING PRESSURE
Q4	YV-A	ELETTROVALVOLA INGRESSO ARIA
		AIR INLET SOLENOID VALVE
#		

IO8066_C.xls 2 / 2

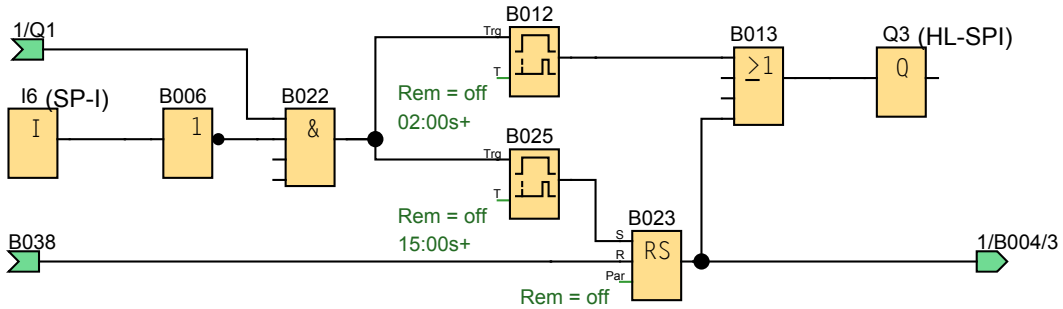


Progettista:	CB		Progetto:	P.Fix. , SP-I, YV-A	Cliente:	
Controllo:		NIRO-SOAVI	Impianto:	ONE7TS	N. disegno:	8066AC
Creato/modificato:	16/09/99 16.23/09/10/09 9.31		File:	7983AC.lsc	Pagina:	1 / 2

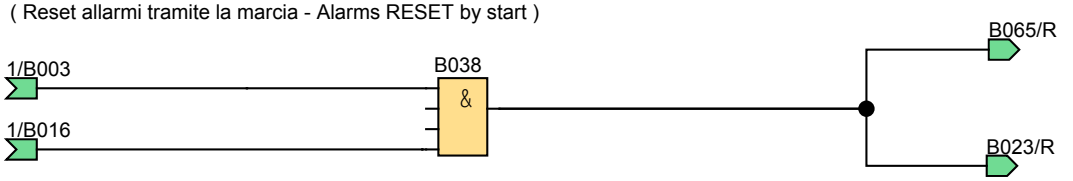
(Circuito di arresto macchina per errato inserimento contattore principale -
- Incorrect main contactor insertion STOP circuit)



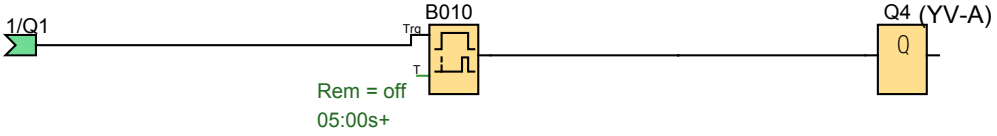
(Circuito di segnalazione e arresto macchina per mancanza prodotto in ingresso -
- Low inlet feeding pressure WARNING and STOP circuit)



(Reset allarmi tramite la marcia - Alarms RESET by start)



(Elettrovalvola di ingresso aria - Air inlet solenoid valve)



Progettista:	CB		Progetto:	P.Fix. , SP-I, YV-A	Cliente:	
Controllo:		NIRO-SOAVI	Impianto:	ONE7TS	N. disegno:	8066AC
Creato/modificato:	16/09/99 16.23/09/10/09 9.31		File:	7983AC.lsc	Pagina:	2 / 2

Numero di blocco(tipo)	Parametri
B010(Accensione ritardata) :	Rem = off 05:00s+
B011(Spegnimento ritardato) :	Rem = off 01:00s+
B012(Accensione ritardata) :	Rem = off 02:00s+
B014(Accensione ritardata) :	Rem = off 01:00s+
B016(Relè ad intermittenza/emissione di impulso) :	Rem = off 01:50s+
B018(Accensione ritardata) :	Rem = off 01:00s+
B023(Relè a ritenzione) :	Rem = off
B025(Accensione ritardata) :	Rem = off 15:00s+
B065(Relè a ritenzione) :	Rem = off

Progettista:	CB	NIRO-SOAVI	Progetto:	P.Fix. , SP-I, YV-A	Cliente:	
Controllo:			Impianto:	ONE7TS	N. disegno:	8066AC
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Connessione	Etichetta
I1	EM
I2	SB-A
I3	SB-M
I4	KM-O
I5	FR-O
I6	SP-I
I7	Available input
I8	Available input
I9	
I10	
I11	
I12	
I13	
I14	
I15	
I16	
I17	
I18	
I19	
I20	
I21	
I22	
I23	
I24	
C1▲	
C2▼	
C3◀	
C4▶	
S1	
S2	
S3	
S4	
S5	
S6	
S7	
S8	

Progettista:	CB		Progetto:	P.Fix. , SP-I, YV-A	Cliente:	
Controllo:		NIRO-SOAVI	Impianto:	ONE7TS	N. disegno:	8066AC
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Connessione	Etichetta
AI1	
AI2	
AI3	
AI4	
AI5	
AI6	
AI7	
AI8	
Q1	KM-O
Q2	HL-P
Q3	HL-SPI
Q4	YV-A
Q5	
Q6	
Q7	
Q8	
Q9	
Q10	
Q11	
Q12	
Q13	
Q14	
Q15	
Q16	
AQ1	
AQ2	
X1	
X2	
X3	
X4	
X5	
X6	
X7	
X8	
X9	
X10	

Progettista:	CB		Progetto:	P.Fix. , SP-I, YV-A	Cliente:	
Controllo:		NIRO-SOAVI	Impianto:	ONE7TS	N. disegno:	8066AC
Creato/modificato:	16/09/99 16.23/09/10/09 9.31		File:	7983AC.lsc	Pagina:	5

Connessione	Etichetta
X11	
X12	
X13	
X14	
X15	
X16	

Progettista:	CB	NIRO-SOAVI	Progetto:	P.Fix. , SP-I, YV-A	Cliente:	
Controllo:			Impianto:	ONE7TS	N. disegno:	8066AC
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GEA Niro Soavi

Via A. M. Da Erba Edoari, 29 · 43123 Parma (Italy)
Phone + 39 0521 965411 · Fax +39 0521 242819
info.geanirosoavi@geagroup.com · www.niro-soavi.com