

USE AND MAINTENANCE INSTRUCTION MANUAL



LIGHTWEIGHT PNEUMATIC MAST



OFFICIAL TRANSLATION OF THE ORIGINAL INSTRUCTIONS

Model/Serial number:

See APPENDIX A

Production year:

See APPENDIX A

REVISION MATRIX OF THE MANUAL AND ITS PARTS

Edition	Revision No.	Date	Description
Fireco Lightweight	00	11/02/2020	First version

WARNING!

If the present document undergoes any changes made by the manufacturer, it will be the customer's responsibility to ensure that only the updated versions of the manual are available at the site of operation.

WARNING!

THE OFFICIAL LANGUAGE CHOSEN BY THE MANUFACTURER IS **ITALIAN**.
We do not assume any liability for translations in other languages that do not correspond to the original meaning.

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FIRECO S.r.l.

- declares that the information contained in this manual is congruent with the technical and safety specifications of the product to which it refers.
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The customer may not modify, alter or intervene in any way on the product which this manual refers to, unless this is expressly provided by this manual; proceeding otherwise will make every form of warranty and support claims invalid.

0 PREFACE

1 PURPOSE OF THE USE AND MAINTENANCE INSTRUCTION MANUAL

This manual has been realised to provide the user with a general knowledge of the machine and to allow for its use under safe conditions.

This instruction manual is an integral part of the machine and has the purpose of providing all the necessary information for:

- the manipulation of the machine, packed and unpacked, under safe conditions.
- the correct installation of the machine.
- the knowledge of the machine's technical specifications.
- extensive knowledge of its functioning and its limits.
- information about the qualifications and the specific training required by the operators and the maintainers of the machine.
- extensive knowledge of the intended, non-intended and prohibited uses.
- its proper use under safe conditions.
- conduct maintenance and repair work in a correct and safe manner.
- technical support and the spare parts management.
- the disposal of waste produced by the machine.
 - the disposal of the machine under safe conditions and in compliance with the applicable regulations for the worker's health and safety and for environmental protection.

This document assumes that, in installations where this machine is intended to be used, the current safety and hygiene standards will be observed.



WARNING



In accordance with the rules in force, the qualified person responsible is obliged to carefully read the content of this Instruction Manual and to have the operating and maintenance personnel read the parts that are part of their area of responsibility.

The instructions, documentation and drawings contained in this manual are of a confidential technical character, therefore they are the sole and exclusive property of the manufacturer. Any reproduction of the whole or any parts of this manual or of its format, which does not comply with the purposes it was produced for, can only be done with the manufacturer's previous consent.

2 INTENDED AUDIENCE

This Instruction Manual is intended for:

- the **installer** (qualified technical staff) in charge of the telescopic mast's installation and assembly.
- the **operator** in charge of the telescopic mast's use, with particular attention to the steps of opening and closing the same.
- the **maintainer** (qualified technical staff) in charge of taking care of the telescopic mast's maintenance.
- the **operator** in charge of the product disposal at the end of its life cycle.
- in general, for all the qualified staff responsible for the use and maintenance of the machine.

The machine must be used only by qualified staff, by people who:

- are adults.
- are physically and mentally capable of performing particularly difficult technical work.
- have been instructed to the use and maintenance of the machine.
- have been judged suitable by the employer to carry out the task with which they have been entrusted.
- can understand and interpret the operator's manual and the safety requirements.
- know the emergency procedures and their implementation.
- understand the operational procedures defined by the manufacturer of the machine.



WARNING



With the term QUALIFIED/SPECIALISED STAFF we intend staff that, because of training and professional experience, was expressly authorised to perform the installation, use and maintenance of the machine.

3 STORING THIS INSTRUCTIONS MANUAL

The Instruction Manual must be stored carefully and must accompany the machine in all the transfers of property that it may have in its life cycle.

The storing must be done handling this manual with care, with clean hands and avoiding dirty surfaces.

Removing, tearing out or arbitrarily changing any of its parts is strictly forbidden.

The manual should be stored in an environment protected from humidity and heat and very close to the machine it relates to.

4 INSTRUCTION MANUAL UPDATE

The manufacturer is responsible only for the instructions issued and validated by the same (Original Instructions).

Any translation **MUST** always be accompanied by the original instructions, to be able to verify the correctness of the translation. In any case, the manufacturer is not to be held responsible for translations that are not approved by the manufacturer themselves; therefore, if an inconsistency is detected, it will be necessary to pay attention to the original language and possibly to contact the manufacturer's sales office which will carry out the necessary modifications.

The manufacturer reserves the right for themselves to make changes to the project, variations/improvements to the machine and to update the Instruction Manual without providing any notice to the customers.

However, in the case of modifications to the machine installed at the customer's site, agreed with the manufacturer and involving the adaptation of one or more chapters of the instruction manual, the manufacturer will be responsible for sending parts of the manual that were affected by the changes along with the new global revision model of the same to the customer. It will be the Customer's responsibility, following the instructions that come with the updated documentation, to replace in all the copies that he has the parts which are no longer valid.

5 HOW TO READ THE INSTRUCTION MANUAL

The manual is divided into chapters, each of which is dedicated to a specific information category and therefore regards the operators for whom the relevant skills have been defined.

NUMBERING OF FIGURES

Each figure is numbered consecutively. The numbering works as follows:

Example "Figure 0.1.2"

Figure	0	-	1	.	2
	↓		↓		↓
	Chapter	-	Paragraph	.	Consecutive number

The consecutive numbers start from 1 in each new paragraph.

NUMBERING OF TABLES

Each table is numbered consecutively. The numbering works as follows:

Example "Table 0-1.2"

Table	0	-	1	.	2
	↓		↓		↓
	Chapter	-	Paragraph	.	Consecutive number

The consecutive numbers start from 1 in each new paragraph.

6 DEFINITIONS

MACHINERY DIRECTIVE 2006/42/EC (ARTICLE 2 DEFINITIONS)

MANUFACTURER Natural or legal person who designs and/or manufactures machinery or partly completed machinery covered by this Directive and is responsible for the conformity of the machinery or the partly completed machinery with this Directive with a view to its being placed on the market, under his own name or trademark or for his own use. In the absence of a manufacturer as defined above, any natural or legal person who places on the market or puts into service machinery or partly completed machinery covered by this Directive shall be considered a manufacturer.

PLACING ON THE MARKET Making available for the first time in the Community machinery or partly completed machinery or partly completed machinery with a view of distribution or use, whether for reward or free of charge

PUTTING INTO SERVICE The first use, for its intended purpose, in the Community, of machinery covered by this Directive.

SAFETY COMPONENT Component

- which serves to fulfil a safety function,
- which is independently placed on the market,
- the failure and/or malfunction of which endangers the safety of persons, and
- which is not necessary in order for the machinery to function, or for which normal components may be substituted in order for the machinery to function.

ANNEX I – MACHINERY DIRECTIVE 2006/42/CE (P. 1.1.1 DEFINITIONS)

HAZARD A potential source of injury or damage to health.

DANGER ZONE Any zone within and/or around machinery in which a person is subject to a risk to his health or safety.

EXPOSED PERSON Any person wholly or partially in a danger zone.

OPERATOR The person or persons installing, operating, adjusting, maintaining, cleaning, repairing or moving machinery.

RISK Combination of the probability and the degree of an injury or damage to health that can arise in a hazardous situation.

GUARD Part of the machinery used specifically to provide protection by means of a physical barrier.

PROTECTION DEVICE Device (other than a guard) which reduces the risk, either alone or in conjunction with a guard.

INTENDED USE The use of machinery in accordance with the information provided in the instructions for use.

REASONABLY FORESEEABLE MISUSE The use of machinery in a way not intended in the instructions for use, but which may result from readily predictable human behaviour.

RESIDUAL RISKS Risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted.

OTHER DEFINITIONS

ORDINARY MAINTENANCE Type of maintenance actions in the course of the life cycle, with the purpose of

- keeping the original integrity of the product;
- maintaining or restoring the efficiency of the product;
- limiting the normal degradation;
- ensuring the useful life of the product;
- coping with accidental events.

EXTRAORDINARY MAINTENANCE Type of non-recurring servicing actions that are quite costly in comparison to the value of the replacement of the item and the annual costs of its ordinary maintenance.

OPERATOR QUALIFICATIONS

SYMBOL	DESCRIPTION
	Generic unskilled worker
	1 st level machine operator
	2 nd level machine operator
	Operator of lifting and handling means
	Mechanical maintainer
	Electrical maintainer
	Technician of the manufacturing company

1 GENERAL INFORMATION

1 MANUFACTURER'S IDENTIFICATION DATA

MANUFACTURER	FIRECO Srl
LEGAL ADMINISTRATIVE SEAT	Via Enrico Fermi 56 – 25064 Gussago (Bs) – ITALY
TELEPHONE	(+39) 030 37 33 916
FAX	(+39) 030 37 33 762
E-MAIL	info@fireco.eu
SPARE PARTS AFTER-SALES SERVICE	
CALL CENTER	
CONTACTS	

2 CE MARKING OF THE MACHINE

Each mast is identified by a CE mark and shows indelible reference data of the same (serial number). The serial number and model number are always placed on the main tube.

For any communication with the manufacturer or service centres always quote these references.

3 DECLARATIONS

The machine is realised in accordance with the relevant Community Directives that are applicable at the time of its placing on the market. The Declaration of Conformity is included in the present manual as APPENDIX B.

PROHIBITION OF PUTTING INTO SERVICE

The machine may not be put into service after having undergone constructive modifications or additions of other components not included in the ordinary or extraordinary maintenance without the machine being re-declared compliant with the requirements of Directive 2006/42/EC and of applicable Directives EC/EU.

Place, date

Gussago, 11/02/2020

The manufacturer

FIRECO Srl - Legal Representative

Christian Baribbi

 	I - DICHIARAZIONE DI CONFORMITÀ	(Allegato II - 1A - Direttiva Macchine 2006/42/CE)
	UK - DECLARATION OF CONFORMITY	(Annex II - 1A - Machinery Directive 2006/42/CE)
	F - DÉCLARATION DE CONFORMITÉ	(Annexe II - 1A - Directive Machines 2006/42/CE)
	D - KONFORMITÄTSERKLÄRUNG	(Anhang II - 1A - Maschinenrichtlinie 2006/42/CE)
	NL - VERKLARING VAN OVEREENSTEMMING	(Bijlage II - 1A - Machinerichtlijn 2006/42/CE)
	E - DECLARACIÓN DE CONFORMIDAD	(Anexo II - 1A - Directiva Máquinas 2006/42/CE)
	P - DECLARAÇÃO DE CONFORMIDADE	(Anexo II - 1A - Directiva Máquinas 2006/42/CE)
COLONNA LEGGERE CON POMPA MANUALE		
I - Ragione sociale e indirizzo completo del fabbricante: UK - Business name and full address of the manufacturer: F - Raison sociale et adresse complète du fabricant: D - Firmenbezeichnung und vollständige Anschrift des Herstellers: NL - Firmaaam en volledig adres van de fabrikant: E - Razón social y dirección completa del fabricante: P - Firma e endereço completo do fabricante:		
FIRECO SRL via E. Fermi 56 25064 Gussago (BS) - Italia TEL. (+39) 030 37 33 916 FAX. (+39) 030 37 33 762 info@fireco.eu		
I - Persona autorizzata a costituire il fascicolo tecnico: UK - Person authorised to compile the technical file: F - Personne autorisée à constituer le dossier technique: D - Person, die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen: NL - Persoon die gemachtigd is het technisch dossier samen te stellen: E - Persona facultada para elaborar el expediente técnico: P - Pessoa autorizada a compilar o processo técnico:		
FIRECO SRL via E. Fermi 56 25064 Gussago (BS) - Italia		
I - DICHIARA CHE LA MACCHINA UK - DECLARES THAT THE MACHINERY F - DÉCLARE QUE LA MACHINE D - ERKLÄRT, DASS DIE MASCHINE NL - VERKLAART DAT DE MACHINE E - DECLARA QUE LA MÁQUINA P - DECLARA QUE A MÁQUINA		
I - Denominazione commerciale e funzione: UK - Commercial denomination and function: F - Dénomination commerciale et fonction: D - Handelsname und Funktion: NL - Handelsnaam en functie: E - Denominación comercial y función: P - Nome comercial e função:		
I - COLONNA PNEUMATICA UK - PNEUMATIC MAST F - MÂT PNEUMATIQUE D - PNEUMATISCHER MAST NL - PNEUMATISCHE MAST E - MÁSTIL NEUMÁTICO P - MASTRO PNEUMÁTICO		
I - Modello: UK - Model: F - Modèle: D - Modell: NL - Model: E - Modelo: P - Modelo:		
I - Matricola / Anno: UK - Serial number / Year: F - Numéro de série / Année: D - Seriennummer / Jahr: NL - Seriennummer / Jaar: E - Número de serie / Año: P - Número de série / Ano:		
I - è conforme a tutte le disposizioni pertinenti delle seguenti direttive e norme armonizzate: UK - fulfils all the relevant provisions of the following directives and harmonised standards: F - satisfait à l'ensemble des dispositions pertinentes de les directives, dispositions pertinentes et normes harmonisées suivantes: D - allen einschlägigen Bestimmungen der folgenden Richtlinien und harmonisierten Normen entspricht: NL - voldoet aan alle toepasselijke bepalingen van de volgende richtlijnen en geharmoniseerde normen: E - cumple con todas las disposiciones aplicables de las siguientes directivas y normas armonizadas: P - cumpre todas as disposições relevantes das seguintes diretivas e normas harmonizadas:		
- 2006/42/CE - UNI EN ISO 12100: 2010 - UNI EN ISO 4414: 2012		
I - Luogo / UK - Place / F - Lieu / D - Ort / NL - Plaats / E - Lugar / P - Local: Gussago (BS) I - Data / UK - Date / F - Date / D - Datum / NL - Datum / E - Fecha / P - Data:		
I - Persona autorizzata a redigere la dichiarazione: UK - Person empowered to draw up the declaration: F - Personne ayant reçu pouvoir pour rédiger cette déclaration: D - Person autorisiert die Erklärung auszuarbeiten: NL - Persoon die gemachtigd is om de verklaring op te stellen: E - Persona apoderada para redactar esta declaración: P - Pessoa habilitada a redigir esta declaração:		
I - Firma: UK - Signature: F - Signature: D - Unterschrift: NL - Signatuur: E - Firma: P - Assinatura:		
CHRISTIAN BARIBBI		

Fig. 1-3.1 Sample of a declaration of conformity

4 SAFETY STANDARDS

The machine was built in accordance with the technical standards listed below.

STANDARD	Title
UNI EN ISO 12100	Safety of machinery – General principles for design – Risk assessment and risk reduction
UNI EN ISO 4414	Pneumatic fluid power – General rules and safety requirements for systems and their components

5 INFORMATION ON TECHNICAL ASSISTANCE

Together with the product FIRECO S.r.l. provides a Warranty Certificate that shall be valid for 24 months from the date of dispatch, as specified in the general conditions of sale.

Figure 1 shows a sample of the certificate that is to be found in the packaging.



FIRECO
TELESCOPIC MASTS & FIRE EQUIPMENT

CERTIFICATO D'ORIGINE E GARANZIA
 CERTIFICATE OF ORIGIN AND WARRANTY
 CERTIFICAT D'ORIGINE ET GARANTIE
 URSPRUNG - UND GARANTIEZEUGNIS
 CERTIFICADO DE ORIGEN Y GARANTÍA
 CERTIFICADO DE ORIGEM E GARANTIA

Prodotto	Cod./matricola
Product	Code/serial n°
Produit	Code/matricule
Produkt	Artikelnr./Seriennr.
Producto	Referencia/n° de serie
Produto	Cód./Numero serie

Si dichiara che il suddetto prodotto a marchio FIRECO, è stato costruito negli stabilimenti FIRECO ed è nuovo di fabbrica. La garanzia dura 24 mesi dalla consegna.

We declare that the above-mentioned FIRECO product has been manufactured in FIRECO plant and is brand-new. FIRECO guarantees the product 24 months from delivery.

Nous déclarons que le produit mentionné ci-dessus a été fabriqué dans les établissements FIRECO et est neuf. Fireco garantit ce produit 24 mois à partir de la date de livraison.

Hiermit erklären wir, dass das oben genannte Produkt der Marke FIRECO im FIRECO-Werk gebaut worden und fabrikneu ist. Die Garantiezeit beträgt 24 Monate ab Lieferdatum.

Nosotros declaramos que el anteriormente mencionado producto FIRECO ha sido manufacturado en la fábrica de FIRECO y que es totalmente nuevo. FIRECO garantiza el producto durante los 24 meses siguientes a la entrega.

Nós declaramos que o produto acima mencionado foi fabricado pela Fireco na fábrica Fireco e é totalmente novo. Fireco garante o produto por 24 meses após da entrega.

Gussago **FIRECO**

Data/Date/Date/Datum/Fecha/Data 

Fig. 1-5.1 Sample of a warranty certificate

If warrantable malfunctions or failures arise in parts of the machine during the warranty period, the manufacturer will repair or replace the defective parts after the appropriate checks on the machine.

It is of uttermost importance to keep in mind that without the explicit written permission of the manufacturer any modification made by the user will render void the warranty and relieve the manufacturer of all liability for any damage caused by a defective product.

This applies when the above-mentioned modifications are performed on safety devices, thereby degrading their effectiveness. The same considerations apply when using non-original parts or parts different from those explicitly designated by the manufacturer as "safety devices".

We therefore recommend contacting our Service before carrying out any of the interventions on the machine.

Defects which are clearly and visibly present at the time of the product delivery (aesthetic defects on visible parts, cracks, dents, operating defects, missing parts, etc.) must be immediately reported to the company.

The original Warranty Certificate of the mast is located at the end of this manual, as APPENDIX C.

**WARNING**

The manufacturer is not liable for defects that are not reported by the customer immediately upon delivery.

6 WARRANTY INFORMATION

The following warranty conditions shall apply:

- All repair operations will be performed at the Fireco S.r.l. headquarters.
- Before being delivered to Fireco S.r.l., the product that needs repairing or replacing must have already been dismantled from the means on which it was installed and must be in the same configuration as when it was supplied.
- The transport costs for the delivery of the faulty product to Fireco S.r.l. are at the customer's charge.
- The transport costs for the return are at Fireco S.r.l.'s charge if the product has been subject to repair or replacement actions under warranty.
- The transport costs for the return are at the customer's charge if the product has been subject to repair or replacement actions not under warranty.

**WARNING**

FIRECO is not responsible for any damage or malfunctions caused by:

- Tampering and/or unauthorised repairs performed by the customer or by third parties
- Improper installation
- Improper storage and lack of adequate maintenance
- Negligence and/or misuse
- Improper use

Such behaviours shall render void every warranty obligation at the expense of Fireco S.r.l.

7 PREARRANGEMENTS UNDER CUSTOMER'S RESPONSIBILITY

Except for different contractual arrangements, the customer will have to take care of:

- The arrangements for the installation, including supports, bases or channellings, if required.
- The sources of energy supply required for the functioning of the machine, in accordance with the rules in force in the country of use.

2 SAFETY

1 GENERAL SAFETY WARNINGS



WARNING

Before operating the machine, carefully read the instructions contained in this manual and carefully follow the steps reported.



GENERAL WARNINGS

The manufacturer has put the maximum commitment into designing a machine that is as SAFE as possible.

With this assumption, the machine is equipped with all guards and safety devices that were considered necessary and accompanied by the sufficient information to be used safely and correctly.

To this end, for whichever human-machine interaction might be necessary, we recommend considering the following information:

- minimum qualification of the operator.
- required number of operators.
- state of the machine.
- residual risks.
- necessary or recommended personal protective equipment.
- prevention of human errors.
- prohibitions/obligations related to reasonably foreseeable misuses.

The manufacturer considers themselves free from any responsibility for any damage caused by the machine to persons, animals or property in the case of:

- use of the machine by staff that is not adequately trained.
- improper use of the machine.
- power supply defects.
- incorrect installation.
- shortcomings in the planned maintenance.
- unauthorised changes or modifications.
- use of non-genuine parts or parts that are not compatible with the model.
- failure to comply with all or part of the instructions.
- use contrary to specific national safety regulations.
- disasters and exceptional events.

SAFETY INSTRUCTIONS

The mobile elements must always be used in accordance with the manufacturer's recommendations, as indicated in this manual which must always be available to the operator at the workplace.

All safety elements placed on the moving parts of the machine to avoid accidents and to safeguard the security may not be changed nor removed but must be adequately preserved.

The user must immediately inform the employer or his immediate superior about any defects or anomalies to be found on the moving parts.

It is however essential to diligently follow the following safety instructions:

- It is absolutely forbidden to tamper any part of the machine and inhibit the safety devices installed on the machine.
- It is absolutely forbidden to modify the originally designated use of the machine without explicit authorisation from the manufacturer or without assuming full responsibility as imposed by the Machinery Directive 2006/42/EC.
- It is absolutely forbidden to use the machine if it is working but not in full efficiency.
- Cleaning operations must be carried out with the machine being disconnected from its electrical and pneumatic supply sources.
- Do not change for any reason parts of the machine; in case of malfunction due to a failure to comply with the above, the manufacturer is not liable for the consequences. It is recommended to directly contact the manufacturer for any changes.
- Place the machine according to the schemes provided by the manufacturer, otherwise the manufacturer shall not be considered liable for any inconveniences.
- Do not install accessories on the fixed (main) tube that might cause an ovalisation of this tube and thus lead to a malfunctioning of the mast.
- Avoid the use of loose clothing which can hook to parts of the machine.
- Avoid using ties or other loose parts of clothing.
- Avoid wearing bulky rings or bracelets that could cause hands getting stuck in components of the machine.

To guarantee maximum safety in the use of the machine it is also FORBIDDEN

- to leave the mobile parts unattended.
- to move the mobile parts with manual operations in the case of an absence of energy.

Moreover, wherever necessary, the manual also includes further information for the user with respect to preventive measures, personal protective equipment, the possible prevention of human errors and prohibitions related to reasonably foreseeable misuses.

However, the user can integrate the information supplied by the manufacturer with additional working instructions to contribute to the safe use of the machine, if these instructions are not in contrast with what is reported in this Instruction Manual, obviously.

2 INTENDED USE

The pneumatic mast's intended use is to lift a load of a given weight and size to a predetermined maximum height, according to the indications from the catalogue or the manufacturer's specifications.



WARNING

The use of products/materials different from those specified by the manufacturer, which can cause damage to the machine and dangerous situations for the operator and/or people close to the machine, is considered wrong and inappropriate.

PRODUCT USE LIMITATIONS

The most important product use limitations to be thoroughly checked are:

- MAXIMUM LIFTABLE PAYLOAD
- WIND LOAD in relation to the exposed surface
- VERTICALITY OF THE MAST DURING USE
- ENVIRONMENTAL CONDITIONS OF USE

The information mentioned above can be found by consulting this manual and Appendix A.

The '**maximum liftable payload**' defines the maximum weight of the item that can be installed on top of the mast.



WARNING

To ensure the safe use of the mast, do not install accessories that have a weight greater than the maximum liftable payload indicated by the manufacturer.



WARNING

Any use of the product with a load that exceeds the maximum liftable payload for the model you purchased is dangerous and will immediately render void any form of warranty.



WARNING

In the event of snowfall, the total weight supported by the mast may increase significantly.

The '**wind load**' defines the maximum load resulting from the wind forces acting on the mast and on the equipment installed on its top. Please refer to Appendix A for further details.



WARNING

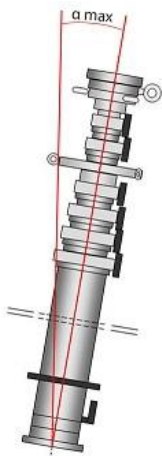
To ensure the safe use of the mast, do not install accessories that might cause wind loads that exceed the limits indicated by the manufacturer or in the catalogue. In the case of an increased surface area the allowable wind load might, in fact, diminish significantly. Contact the manufacturer, if the expected maximum surface area of the equipment to be installed exceeds the initially projected values.



WARNING

The manufacturer shall not be liable for any damages that may result from the use of the mast with wind conditions worse than those shown in the catalogue or declared by the manufacturer.

As regards the machine's **verticality**, it is important to verify that the operating position of the mast protects the mast itself and the vehicles on which it might be installed from the risk of overturning.



Upon installation, the axis of the mast must form a **90° angle** with the horizontal axis.

If necessary, use a levelling system to support the machine.

If, for reasons associated with its use, the mast must be installed on a slope, for example, contact the manufacturer and specify all relevant information about the equipment that you intend to install on top of the mast (weight, size, centre of gravity, etc.). In this way it will be possible to ask for a verification of the maximum permissible tilting angle for the mast installation.

CLARIFICATION ON THE PRODUCT USE LIMITATIONS

The given limits of use are directly correlated with the purchased model and its characteristics. The two values of utmost importance to be checked with accuracy are the **MAXIMUM LIFTABLE PAYLOAD** and the **WIND LOAD** in relation to the exposed surface.

The value of the maximum liftable payload refers to the maximum weight of the item that can be installed on top of the mast and used under safe conditions. Each load condition which exceeds the intended limits should be considered dangerous and will immediately render void any form of warranty.

Equivalent attention should be paid to the 'wind load' resulting from the wind force, both on the mast and, much more importantly, on the equipment installed on top of it. Also, in this case the manufacturer defines limit values to be respected.

Keep in mind that if adverse weather conditions are forecasted or about to arrive, it is necessary to retract the mast to prevent dangerous situations; in case the event was imminent, give highest priority to all operations necessary for a mast recovery or, if this should not be possible anymore, isolate the installation area of the mast. This latter precaution should always be adopted in the case of long-lasting installations and in the case in which supervising personnel was not permanently present.

**WARNING**

The verification of the product use limitations must be carried out by the user, by applying the data reported in this manual and with reference to the table set out in Appendix A of this manual.

3 CONTRAINDICATIONS FOR THE PRODUCT USE

The machine must not be used:

- for uses other than those established by the manufacturer, different or not mentioned in the present manual.
- in environments that could be explosive, corrosive or with high concentrations of powders or oily substances suspended in the air.
- in environments with fire risk.
- in environments exposed to weather conditions that exceed the limits imposed.
- with safety devices excluded or out of order.
- with means which exclude uses/parts of the machine itself.

4 REASONABLY FORESEEABLE MISUSE

In the following paragraphs you will find an outline of various incorrect, but reasonably foreseeable uses of the machine.

INCORRECT BEHAVIOURS

The following are incorrect behaviours caused by neglect or lack of attention rather than intentionally:

- leaving the machine unattended during the movement of the sections.
- using the machine without having correctly checked the correct functioning of the control, check and safety systems.
- using the machine without carrying out periodic maintenance.
- using the machine without using appropriate PPE; this behaviour can cause harm to the operator.
- using the machine without sufficient space required; this behaviour may cause accidents as the operator, acting in tight spaces, may stumble or incur in impacts.
- using the machine without having taken care of the work location and the surrounding spaces; this behaviour can cause damage to the operator by creating potential causes of stumbling or simply cause the operators to work in dangerous conditions.
- using the machine with lack of concentration or neglect; this behaviour can cause serious accidents.
- using the machine with hasty behaviour resulting from pressure to keep the machine running in all circumstances; this behaviour can create potentially non-compliant working conditions.

INSTINCTIVE REACTIONS

Whenever a defect or an anomaly occurs during the operations of the machine, the operator must be able to judge if the solution of the problem pertains to his fields of competence and skills or if the assistance of specialised personnel will be needed.

For details about the maintenance operations and the failure analysis and troubleshooting procedures please refer to Chapter 6.

5 OPERATOR'S POSITION

The operator is normally located in the area adjacent to the mast, close to the control systems which govern the machine functioning.

For the correct controlling of the mast, the side of the operator corresponds to the front of the mast, from which it is possible to use the rings locking system.

6 HAZARDOUS AREAS

The immediate surroundings of the mast are to be considered a hazardous area.



WARNING



During the preparation and the use of the mast, unpredictable residual risks might persist. To preserve health and safety, restrict the area surrounding the mast to keep unauthorised staff off.

7 SIGNS

GENERAL INFORMATION

The labels must be applied in areas where they are easily visible and readable by whoever approaches and at a point such that the person is able to react promptly to take the necessary measures to avoid the danger.

When possible, they must be applied in areas protected from the risk of damage, abrasion, chemical aggression, dust or anything that could alter their visibility and readability. The operating temperature range goes from -40°C to +60°C, unless there is an uneven distribution of the temperatures, which may adversely affect the thermal expansion of the material.

The surfaces on which the labels are applied must be clean, smooth and free from grease, oils or chemical products which reduce the adhesion.

The safety labels should be regularly checked and cleaned to ensure a good readability at a safe distance. When the products are subject to extreme environmental conditions or when the safety pictograms no longer satisfy the required conditions of visibility, they must be replaced.

The mast must be installed so that the labels applied appear in areas where they are easily visible and readable from whoever approaches and at a point such that the person is able to react promptly to take the necessary measures to avoid the danger.

When possible, they must be displayed in areas protected from the risk of damage, abrasion, chemical aggression, dust or anything that could alter their visibility and readability.

The signs in this manual, and/or the signs that should be installed near the machine and the working area of the same, are the following.

HAZARD PICTOGRAMS

SIGN	DESCRIPTION
	General danger
	Danger caused by electricity
	Danger caused by suspended loads
	Hand crushing hazard, limb crushing hazard
	Overturning hazard
	Electric shock danger due to contact or proximity of the end of the mast to high or medium voltage lines

PROHIBITION PICTOGRAMS

SIGN	DESCRIPTION
	Generic prohibition
	Prohibition to remove the guards and protection and safety devices
	Prohibition to operate on moving elements
	Prohibition of access to unauthorised personnel

OBLIGATION PICTOGRAMS

SIGN	DESCRIPTION
	Obligation to read the instructions for the use
	Obligation to wear a safety helmet
	Obligation to wear safety footwear
	Obligation to wear safety gloves
	Obligation to verify the security systems efficiency

8 SAFETY SYSTEMS

The machine has various **safety systems**, which were selected after a careful analysis conducted in accordance with the applicable harmonised standards.

The main safety systems are the following:

- Locking levers of the single sections
- Release valve
- Guying ropes and pickets (if provided)

See paragraph 3-2 for further details.

9 RESIDUAL RISKS

It is necessary to pay attention to the following residual risks, which are present whenever the machine is used, and which cannot be eliminated entirely.

	WARNING: DANGEROUS MOVEMENTS
 	WARNING: DEFECTIVE SAFETY DEVICE
	WARNING: UNINTENDED STARTS

People not in charge of operating the machine should not be standing in its surroundings. In the case of presence of other persons, stop operations immediately and keep them off.

Do not use the machine whenever any safety device is not working properly. Put the machine immediately out of service by setting and locking the supply disconnecting devices to the "insulated circuit" position. Reactivate the machine only when all safety devices have regained full working efficiency.

Before carrying out any maintenance action the operator must ensure that the machine cannot be inadvertently started by sectioning all supply sources; the sectioning of the machine supply sources must be carried out with personal locking means - for example padlocks - and with the unlocking keys at hand. In this way, the power supplies can be restored only after all operators have removed the personal locking means or only after all operators have completed their respective actions. This is to avoid that an operator starts the machine without being aware of the presence of another operator in the proximity of dangerous elements.


WARNING: PERSONAL PROTECTIVE EQUIPMENT

Before executing service or adjustment actions, the operator shall have at his disposal and use the personal protective equipment indicated by the respective safety regulations and suitable for the type of maintenance that is to be carried out, such as gloves, glasses, helmets, non-skid shoes, etc.


WARNING: PROTECTIONS REMOVED

If the protections are removed - for example to carry out maintenance operations - do not start the machine for any reason before all protections are in put back into their place and properly fixed.


WARNING: OVERTURNING HAZARD

The hazard of an overturning of the extended mast can derive from:

- the action of the wind, if it has not been adequately realised or hindered
- incorrect installation of the mast
- incorrect positioning of the vehicle on which the mast is installed.

To ensure the safe use of the mast with respect to the overturning hazard,

- please follow the instructions provided by the manufacturer in this document.
- limit access to the area surrounding the mast


WARNING: COLLISION HAZARD

This risk refers to the possibility of the mast touching suspended structures, like balconies, bridges, etc. while being extended. This might occur if the staff in charge of operating the mast has not carried out a proper assessment of the area.

To guarantee the safe use of the mast with respect to the collision hazard, before lifting the mast,

- check thoroughly for the possible presence of suspended structures.
- in the case of presence of suspended structures, set the mast at a suitable distance.

**WARNING: DANGER OF SUDDEN VERTICAL DESCENT**

The danger of sudden vertical descent refers to the possibility of a vertical descent of the mast, together with the equipment installed on top of it.

To ensure the safe use of the mast with respect to the sudden vertical descent hazard, before extending or retracting the mast

- thoroughly verify the integrity of all the mast components, considering all the manufacturer's recommendations regarding the maintenance of the product.
- restore the internal air pressure on the mast to the maximum allowed value (value indicated by Fireco S.r.l.) before opening the locking mechanisms of the single sections during the extension/retraction procedures.

**WARNING: DANGER OF LIMB CRUSHING**

The danger of limb crushing refers to the possibility that a part of the operator's body (typically a hand or an arm) may be crushed between the collars of the sections during the ordinary closing operations of the mast or in the case of a failure causing the sudden vertical descent of the latter.

To ensure the safe use of the mast with respect to the limb crushing hazard,

- be constantly present during the machine use yet remaining at a suitable distance.
- Do not carry out any kind of actions on the mast during the extension/retraction procedures with the only exception being the operations of opening and closing the lockings on the section rings.

**WARNING: SUSPENDED LOADS**

During hauling and installation, the risks related to the movements of the loads can be summarised as follows:

- Risk of falling,
- Risk of collision,
- Risk of overturning due to load handling.

These risks may cause:

- Impacts,
- Mashing,
- Crushing,

to operators in the surroundings of the pieces to be moved.

These risks can be eliminated only by the ability of the operator to perform the load hooking adequately.

Once the piece has been hooked, the operator must make sure that it is stable and balanced.

The operator must also check that the movement area of the load is vacant (no persons or other impediments are present).

In the case of areas with poor visibility, the operators must provide devices that offer a clear view even in areas that are not well visible from the control station of the lifting means.

During the movement of the load, the operator must warn about the beginning of this phase by means of an acoustic signal.

He must also make sure that these signals have been clearly heard by the other operators and that these have been able to recognise, without any ambiguity, the true source of the signals themselves.

The acoustic signal must be operated even when you notice people on the handling trajectory. In case the people did not leave the area, stop every manoeuvre.

**WARNING: ELECTROCUTION HAZARD**

Electrocution hazard refers to:

- The possibility that the mast, while extending, touches high voltage wires, because the staff in charge of operating the mast has not carried out a proper assessment of the area.
- The use of electrical power supply for the mast itself and/or the accessories mounted on its top.
- The use during bad weather conditions/thunderstorms.

Before extending the mast:

- Check thoroughly for the possible presence of high voltage wires.
- In the case of presence of high voltage wires set the mast at a suitable distance.
- During all phases of the mast's installation the equipment to be mounted on its top must be cut off from any electrical supply.

3 DESCRIPTION OF THE MACHINE

1 FUNCTIONING PRINCIPLE

The telescopic mast allows the users to take the equipment mounted on its top to great elevations without using cumbersome fixed structures and especially without exposing the staff to the risk of falling during the installation of the equipment.

The LIGHTWEIGHT TELESCOPIC MAST can be installed:

- on a field structure.
- on a dedicated transport vehicle with suitable interface supports,
- on a masonry structure with suitable interface supports.

Once the system has been installed, it will use the pneumatic energy provided by a manual pump (provided) for the mast extension, and therefore for the lifting of the equipment, thus preventing the operator from having to reach the same height.

The operator **MUST** work directly from the ground near the mast or at a distance suitable for the mast to be completely visible.

2 MAIN COMPONENTS

The LIGHTWEIGHT TELESCOPIC MAST is made with components that are guaranteed by the **Quality Control** activities carried out by Fireco Srl.

It is provided with the solutions and the equipment described in the following paragraphs.

TUBULAR TELESCOPIC STRUCTURE

The tubular telescopic structure supports the device/load installed on the mast and is composed of concentric anodised aluminium tubes (mast sections). The standard colour of anodization is silver-grey. Other colours are available on request.

Each mast with n sections is composed of a fixed or main tube (tube with the largest diameter) and $n-1$ mobile tubes (see Fig. 3-2.1). Of these $n-1$ tubes, the one with the smallest diameter is called first mobile tube or top section, while the one with the largest diameter is called last mobile tube or $(n-1)^{\text{th}}$ mobile tube. As the name indicates, the first mobile tube is the first tube to be extended during the extension of the mast, and so forth up to the last mobile tube, which will be the last to be extended.

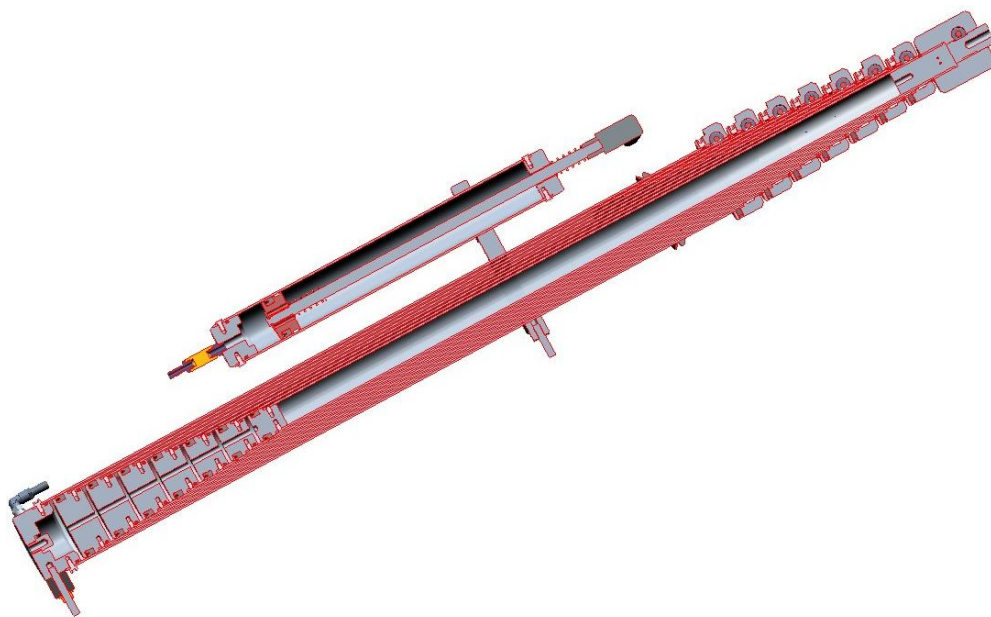


Fig. 3-2.1: Tubular telescopic structure – Example of a mast with 8 sections

The portfolio of available tubes ranges from the diameter Ø101mm to the diameter Ø31mm. In Table 3-2.1 one can find an overview of the various tube diameters and thicknesses. Only some of the tubes present in this table are used as fixed or main tubes.

Diameter [mm]	101	94	87	80	73	66	59	52	45	38	31
Thickness [mm]	2										

Tab. 3-2.1: Tube diameters and thicknesses

The masts are classified, regarding the telescopic tubular structure, according to the diameter of the fixed or main tube and the presence or not of the internal spiral cable (see Table 3-2.2).

Main tube diameter [mm]	101	80	66
Name	Maxi Primo	Super Primo, or Super Entry (*)	Primo, Star, or Entry (*)
(*) The Super Primo, Primo, and Star masts come without an internal spiral cable. The Super Entry and Entry masts are equipped with an internal spiral cable.			

Tab. 3-2.2: Mast classification

LOCKING OF THE SECTIONS

The masts' section locking system is based on a mechanical locking system with captive screws operated by means of locking knobs.

Each ring has its own knob that can lock or unlock the extension of the next tube located above.

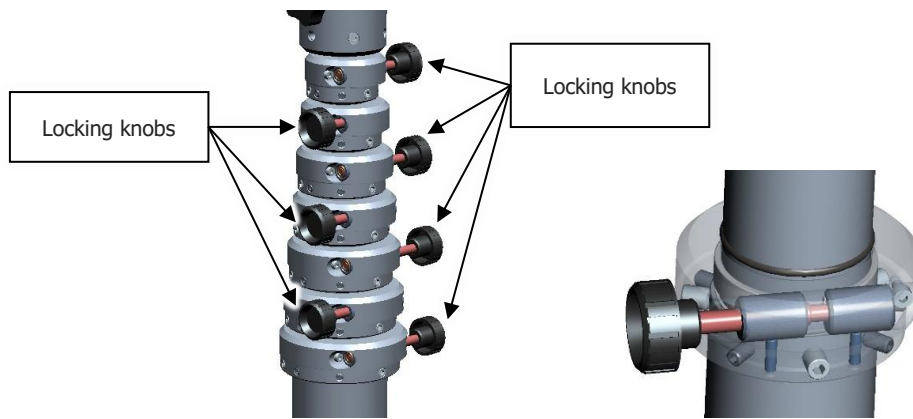


Fig. 3-2.2: Section locking system with detailed image of the captive-screw locking system

Thanks to the locking system, it is possible to keep the mast extended for a very long time without having to check the air pressure inside the mast.

MOUNTING INTERFACE HEAD

The mounting interface head (or simply "head") is fastened to the upper end of the top section and gives the customer the possibility to mount equipment on top of the mast.

Unless otherwise agreed upon when placing the order, the standard head has a central hole ($\varnothing$ 24 mm) for inserting a 24x50 PIN.

A 24/30 DIN PIN adapter (optional) can be provided on request.

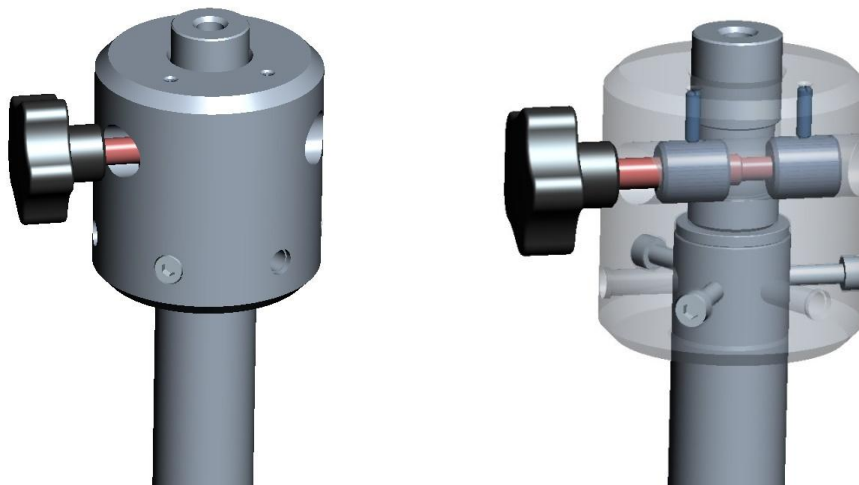


Fig. 3-2.3: Standard mounting interface head

Please refer to paragraph 4-5 for further details related to the installation of equipment on top of the mast.

PNEUMATIC COMPONENTS

The main pneumatic components on the machine are:

- release valve
- pneumatic hand pump

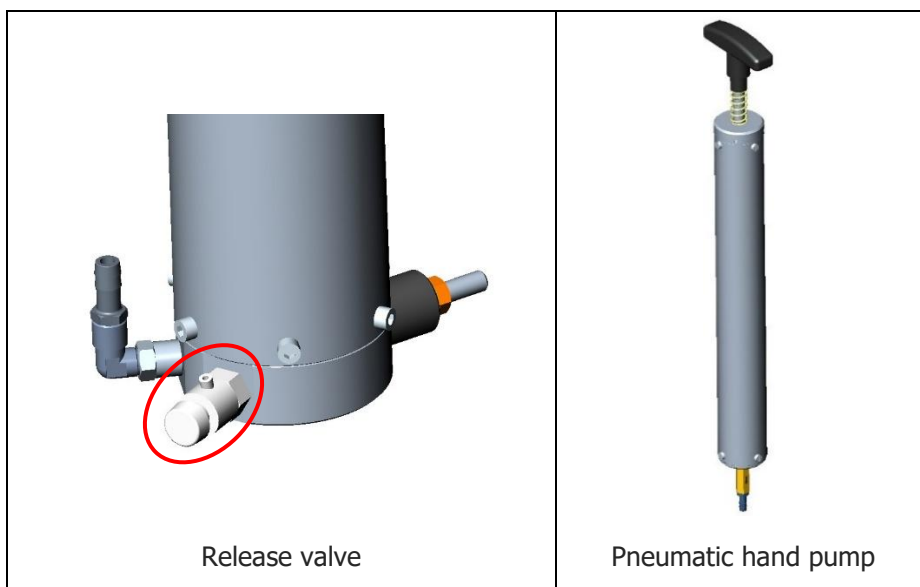


Fig. 3-2.4: The main pneumatic components

Please see paragraph 3-2 to learn more about the pneumatic components.

BASE

At the lower end of the main tube one can find the mast base. This is the part of the mast that must be firmly secured to the support structure beneath.

Depending on the purchased product configuration, the base of the mast may be provided with the following base types:

- base with flange
- base without flange
- base with ball joint



Fig. 3-2.5: Different base types

GUYING ROPES

If needed, the mast performance can be improved, for example for it to achieve greater resistance in the case of high wind speeds. Polyester guying ropes may be used to this end.

Each guying line has two carabiner hooks at its ends for a quick and safe connection: one to the ground anchoring and the other to the eyebolt placed on the mast's head or on one of the collars.

On each guying rope you will also find a device that facilitates the rope tensioning.

Please refer to the instructions provided by FIRECO S.r.l. and to the guying scheme for the correct positioning of the ropes.



Fig. 3-2.6: Guying rope (polyester)

PICKETS

Depending on the purchased configuration, several types of pickets may be supplied:

- pickets for guying ropes
- pickets for stabilising the tripod/quadpod legs

The pickets allow the guying ropes to be firmly anchored to the soil (see Fig. 3-2.7).

Please refer to the instructions provided by FIRECO S.r.l. or to the guying scheme for the correct positioning of the pickets around the mast.

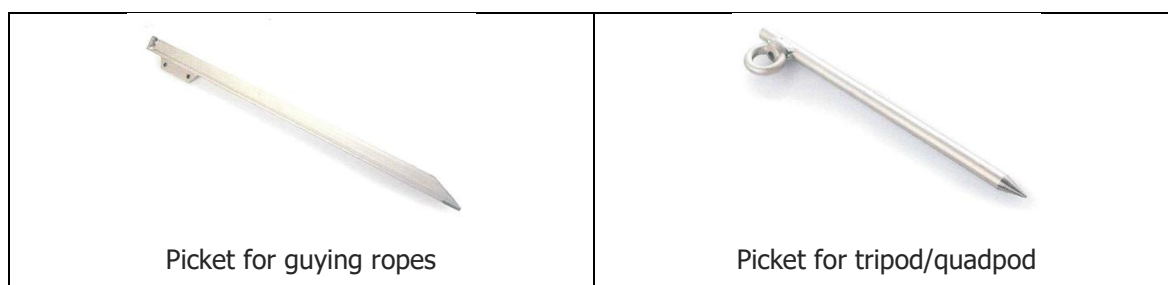


Fig. 3-2.7: Pickets that can be supplied

3 ENVIRONMENTAL CONDITIONS

The machine is suitable to operate in environments that:

- are at an altitude not exceeding 1500m a.s.l.

- have a temperature between - 40°C and + 60°C.
- have a relative humidity between 30% and 95%, not higher than 50% at 40° C, not higher than 90% at 20° C.

It is prohibited to use the machine:

- in dusty environments.
- in corrosive environments.
- in environments that present fire risk.
- in environments with explosive atmosphere

WARNING!

The machine is not suitable for operations in explosive/corrosive/dusty environments.

4 TECHNICAL DATA

The technical characteristics are shown in APPENDIX A in the appendix of this manual.

WARNING!

Since the characteristics may vary for each mast model, it is necessary to verify the correspondence of the serial number found on the mast with the one reported on the manual.

5 STANDARD SUPPLY

The machine is supplied complete, ready for installation.

FIRECO provides a kit which includes:

- Use and maintenance instruction manual
- The CE Declaration of conformity

4 INSTALLATION

The installation of the machine must be carried out by qualified and trained technical staff and in compliance with the following instructions.

Should any deviation from the described installation conditions be necessary, contact the manufacturer.



WARNING

During the installation delimit the area surrounding the mast and keep unassigned staff off.

1 TRANSPORT AND HANDLING

The machine can be hauled by a normal means capable of bearing its weight and size. It is recommended that the operators always use means capable of withstanding the weight and size of the machine in such a way as to avoid damage to the machine and to persons or things around.

During the hauling, the machine and its components must be packed and suitably locked to the means of transport to avoid damage or loss of stability.

If requested, it is possible to provide transport bags for the handling of masts in the field.



Fig. 4-1.1: Example of a Fireco transport bag

Objects with a mass of less than 15 kg can be moved by hand by a single operator, while objects with a mass of more than 15 kg can be moved by hand using several operators or by means of a lifting device.

Always comply with the limits required by applicable laws for hand lifting of loads.



WARNING!

FIRECO S.r.l. does not account for failures or any malfunction of the product resulting from poor transport conditions that do not comply with the guidance provided in this paragraph.

Failure to comply with the instructions contained in the manual will result in the decay of the product warranty.

WARNING!


FIRECO S.r.l. is not liable for damage caused to persons, animals and goods for the use of lifting systems different from those indicated.



Make sure you have fully understood the indications in this paragraph.

WARNING!


During the transport of the mast mounted on the vehicle, movements or displacements of the equipment located on the mast may cause damage to the vehicle.

Block or remove the equipment before you move the vehicle.

To preserve the health and safety of workers in charge of handling the package:

It is recommended that they use the following P.P.E.:

- Protective Gloves
- Safety footwear
- Body protections
- Safety helmet


ITEM INSPECTION UPON DELIVERY

Upon receipt of the machine, check:

- That the packaging and the parts of the machine are intact.
- The supply corresponds to the order specifications.
- There is no visible and immediately recognizable damage.

In case of damage, defects or other general problems immediately inform FIRECO Srl.

TRANSPORT WITH THE ORIGINAL PACKAGING

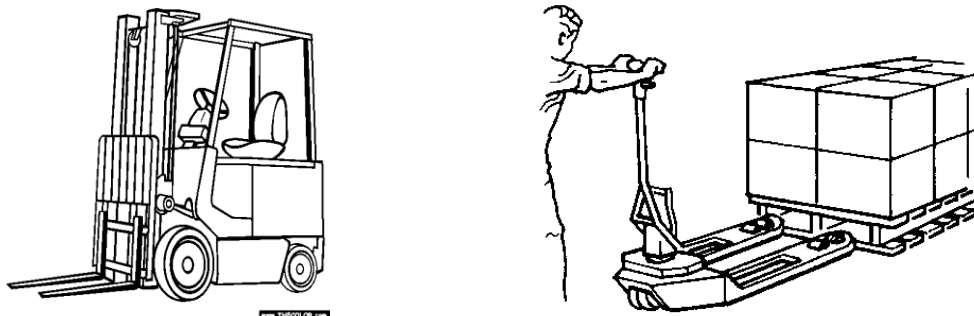

If you intend to transport the product by land vehicles and aircraft, the packaging of the product itself is made of cardboard with pallets.



If you intend to transport the product by ship, the packaging of the product itself will be made of wood.

If the overall weight of the product and its original packaging **does not allow hauling the product by hand**, proceed to cargo handling using suitable mechanical lifting tools.

Lift the crate or the packaging with a pallet truck or a forklift equipped with two forks to support the package from two sides; always check the balance of the weight of the machine to prevent unexpected movement or the fall of the load.


WARNING!


Always use a lifting means with suitable capacity. Do not overload the lifting means.

Check the mast and the packing weight values declared by the manufacturer.

TRANSPORT WITHOUT THE ORIGINAL PACKAGING

If the overall weight of the product without its original packaging **does not allow hauling the product by hand**, proceed to cargo handling using suitable mechanical lifting tools.

Lift the mast by means of a winch or flag crane with adequate capacity or by means of a lift truck equipped with two forks.

Regardless of the lifting modes, when the mast is lifted horizontally always support the load in two points (as shown in Fig. 4-1.2) and always check the weight balance of the machine, in order to prevent unexpected movements or the fall of the load.

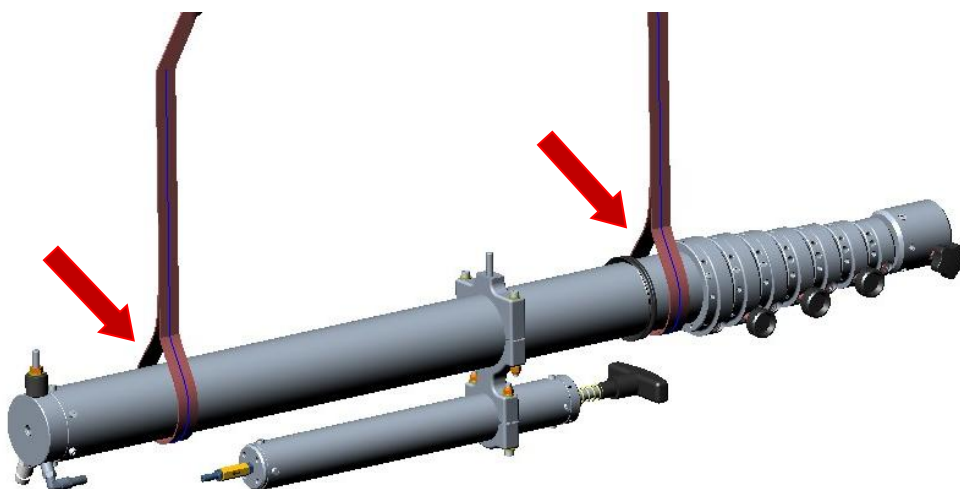


Fig. 4-1.2: grip points of the mast – horizontal position

For vertical lifting, fix the straps or lifting equipment under the fixed collar, as shown in Fig. 4-1.3.



Fig. 4-1.3: grip points of the mast – vertical position



WARNING!

The mast should **NEVER** be raised fixing components to the mobile sections nor to the mobile collars nor to the head.



WARNING!

Always use a lifting means with suitable capacity. Do not overload the lifting means.

Check the weight of the mast before the operations.



WARNING!

Be sure to always haul the mast in its closed position.

2 STORAGE

In the case of inactivity, the machine must be stored with the following precautions:

- Store the machine in a closed place.
- Protect the machine from impacts and stresses.
- Protect the machine from humidity.
- Ensure that the machine is not exposed to extreme temperatures and protect it from serious thermal excursions.
- Prevent the machine from being in contact with corrosive substances.

3 PREARRANGEMENTS

PREARRANGEMENTS FOR THE INSTALLATION

For the installation, it is necessary to prepare a manoeuvring area that is adequate for the mast size and for the chosen lifting means.

The arrangement of the machine must be carried out in such a way as to achieve the best ergonomics and safety in the workplace: leave sufficient room for the operations of maintenance and adjustment around the machine.

ELECTRICAL PREARRANGEMENTS (GROUNDING)

It is the installer's responsibility and obligation to provide the installation site with a grounding system in compliance with the provisions in force in their own country or in the country of destination. This provision should be performed by qualified and specialised personnel and comprise at least:

- a grounding system in accordance with the provisions of the user's country.
- what is necessary for the correct and perfect installation in accordance with the laws and technical safety standards for workplaces and electrical installations.

WARNING!



These prearrangements are always at the expense of the user and they are also under the user's full responsibility.

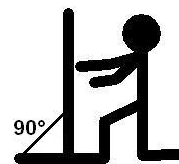
WARNING!



The manufacturer shall not be held responsible for damages to persons, animals and goods, caused by the failure to comply with this provision.

4 PLACING

To guarantee a correct positioning, it is recommended that you perform the mounting operations on a horizontal surface and check, with the appropriate measuring instruments, the uprightness of the mast at the end of the mounting operations.



The maximum permitted deviation with respect to the vertical axis, in absence of wind, must not be **greater than the limit angle** indicated by the manufacturer (90°).

Please see paragraph 2-2 for further details.

WARNING!



During the mast extension operations, contact with electrical wires and/or suspended structures might be possible, with consequent danger for the operators.



Check THOROUGHLY for the possible presence of power lines and/or suspended structures around the mast installation area.

DO NOT INSTALL THE MAST DIRECTLY BELOW THE POWER LINES, EVEN IF THEY SEEM TOO HIGH TO BE REACHED BY THE MAST.

5 MOUNTING

WARNING!



Before proceeding with the assembly and installation of the mast, **the customer must make sure** that the packaging includes all the components listed below:

A LIGHT telescopic mast

Supports for the fixing of the mast

Any accessories for the mounting and the guying

Manual pneumatic pump

FIRECO S.r.l. **does not provide** washers, screws and bolts for the fixing of the mast.



WARNING!



The assembly and installation operations of the product shall be the customer's responsibility, who will take care of these activities, using qualified and adequately trained technical personnel.



The customer has to make sure that anyone in charge of mounting and installing the product has the necessary information and the proper training, to preserve their own and others' safety.

Before commencing the product installation, the operator must have read this publication carefully and have acquired solid knowledge of it.

WARNING!



FIRECO S.r.l. does not account for failures or any malfunction of the product resulting from incorrect assembly and installation.

Failure to comply with the instructions contained in the manual will result in the decay of the product warranty.

To preserve the health and safety of the workers in charge of handling the package: it is recommended that they use the following P.P.E.:

- protective gloves
- safety footwear
- body protections
- safety helmet



WARNING!



To preserve the operators' health and safety, delimit the area surrounding the mast by keeping unassigned staff off.

The assembly and installation of the product must take place in an environment that is adequately equipped and lit.

PRELIMINARY INSTRUCTIONS FOR THE MAST ASSEMBLY

For the proper functioning of the mast, it must be mounted by specialised personnel using appropriate and well-kept equipment.

WARNING!



Preferably use the supporting structures provided by FIRECO S.r.l., fixing them on an appropriate and stable structure. Please contact the manufacturer if different fasteners are used for the necessary checks and authorisations.

Failure to follow these instructions could result in a malfunction of the product and put at risk the safety of the staff in charge of its use.

WARNING!



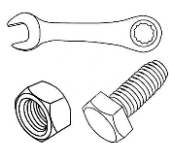
Make sure that the structures designated to the anchoring of the mast are solid enough to safely bear the loads listed in the catalogue or the ones defined by the manufacturer.

Depending on the type of configuration purchased, the mast provides **at least one or two fixing points**, for a correct fixing of the mast to the support structure (fixed structure, truck, field structure).

Masts equipped with a tripod, a quadpod or a roof tilt system only require **fixing to the ground**. Masts equipped with a base with flange, a base without flange or a base with ball joint (which must be combined with base flanges, support brackets, collars, roof flanges, etc.) require **at least two fixing points** (one below the base of the mast and one above).

It is the installer's responsibility to provide appropriate regulating and error recovery devices upon installation. Once installed, the mast **must be compliant with the max. verticality** allowed for the mast (90°), also considering the maximum slope of the chosen site due to the very installation or to the vehicle limitations.

Depending on the installation options chosen and applicable to your configuration, please refer to the following paragraphs.



It is recommended that the customer uses hardware equipped with locking systems, such as self-locking nuts, double nuts, thread locking fluids etc.

We recommend using STAINLESS STEEL A2/A4 screws with tensile strength equal to or greater than 700 MPa (N/mm²) - A2 - 70 or A4 - 70 according to UNI EN ISO 3506.

We recommend using STAINLESS STEEL A2/A4 nuts with tensile strength equal to or greater than 700 MPa (N/mm²) - A2 - 70 or A4 - 70 according to UNI EN ISO 3506.

Tighten the bolts with the appropriate torque, which depends on the class, size and on the possible anti-corrosion treatments on the screws, making sure you follow a tightening sequence such as to not compromise the structural tightness of the flange or of the mounting surface (examples in Fig. 4-5.1).

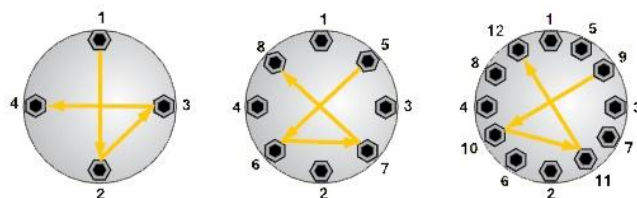


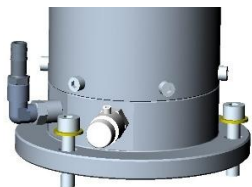
Figure 4-5.1: examples of tightening sequences

Do not install on the main tube accessories that may cause the tube to be ovalised, resulting in a failure of the mast.

To improve the stability of the mast, it is recommended that you arrange a ballast (typically sandbags) at the base of the mast.

LOWER FIXING WITH BASE FLANGE

1.



Fix the mast's base flange onto a suitable surface.

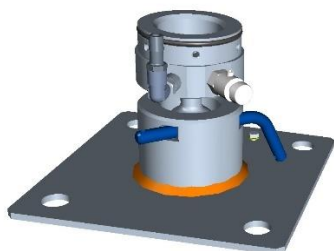
The support surface must be flat and provided with holes whose quantity and size are appropriate for the coupling.

Fix the base flange to the mounting surface using the screws.

As for the number and the size of the screws, please refer to the attached drawings.

LOWER FIXING WITH FLANGE WITH BALL JOINT

1.



The support surface must be flat and provided with holes whose quantity and size are appropriate for the coupling.

Attach the ball joint flange to a proper fixing surface by using screws.

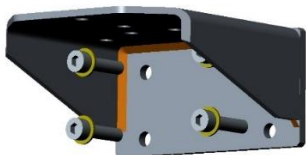
As for the number and the size of the screws, please refer to the attached drawings.

Insert the mast with the ball joint inside the flange.

Lock the mast into the desired position by inserting the locking pin.

LOWER FIXING WITH SUPPORT BRACKET

1.



The shelves differ according to the type of base flange of the mast (see examples in the figures on the left).

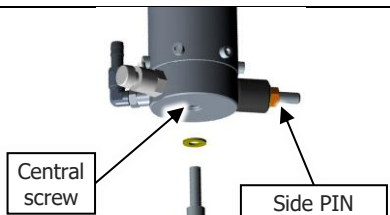
Fix the lower bracket onto a suitable vertical surface.

The support surface must be flat and provided with holes whose quantity and size are appropriate for the coupling.



Fix the lower flange to the mounting surface using the screws; as for the number and size of the screws, please refer to the attached drawings.

FIXING WITH CENTRAL SCREW AND SIDE PIN

- 

Fix the mast by means of the central screw (which is located under the base of the mast) and the side pin. This fixing solution is only provided for masts with a main tube diameter of 66 or 80 mm.

UPPER FIXING WITH WALL COLLAR

The type of collar changes slightly depending on the type of set-up purchased. In fact, depending on the height of the mast, the upper collar may or may not be combined with the manual pump support.

However, the installation procedures remain the same.

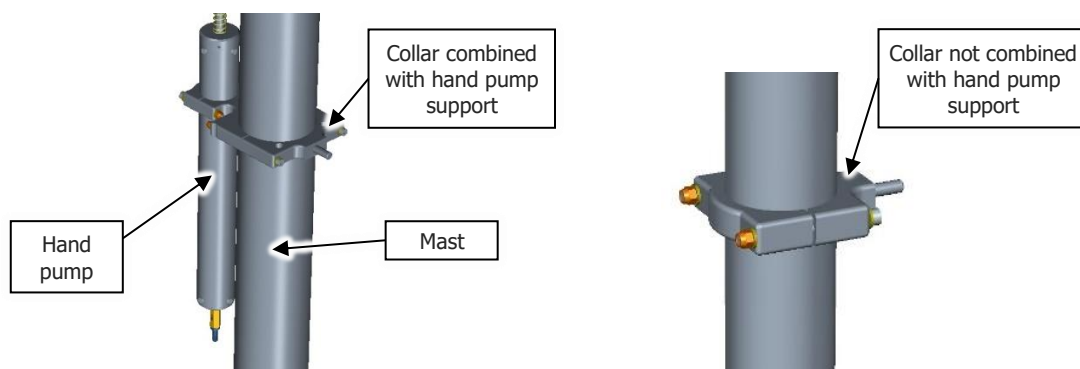
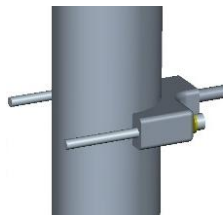
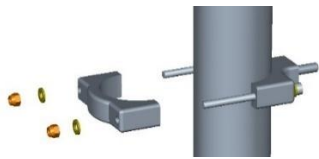


Figure 4-5.2: Example of a collar combined and not combined with the hand pump support

- 

Fix the back of the collar to a suitable vertical surface and by means of a screw. The support surface must be flat and provided with holes whose quantity and size are appropriate for the coupling.

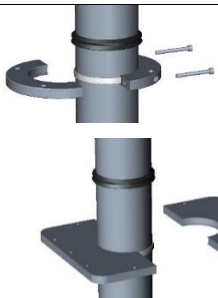
As for the number and the size of the screws, please refer to the attached drawings.

WARNING! The upper and lower fixing elements must be aligned to respect the allowed max. verticality of the mast (90°).
- 

Place the mast and install the front part of the collar inserting the plastic band between the mast and the collar. The appropriate seat is in the inner part of the collar.

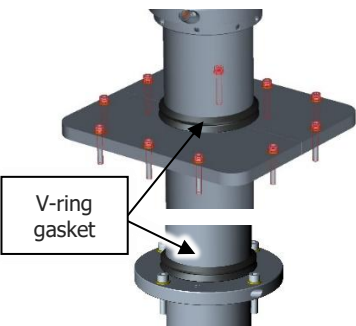
Tighten the two parts of the collar using the nuts provided.

UPPER FIXING WITH ROOF BRACKET

- 

Mount the two parts of the roof bracket onto the main tube of the mast, putting the plastic strip in between the tube and the bracket; the proper slot is on the inner side of the roof bracket.

Tighten the two parts of the brackets using the screws provided.

- 

Fix the roof bracket onto the horizontal surface by using proper screws. As for the number and the size of the screws, please refer to the attached drawings.

WARNING! The insulation between the vehicle roof and the bracket must be done by the client or the installer.

WARNING! The upper and lower fixing elements must be aligned to respect the allowed max. verticality of the mast (90°).

Lower the V-ring gasket until it reaches the roof bracket.

MOUNTING THE MAST ON A QUADPOD

Depending on the set-up purchased, the mast installed on a quadpod has a flanged base to be combined with a base plate with handle or a base plate with ball joint and side slit.

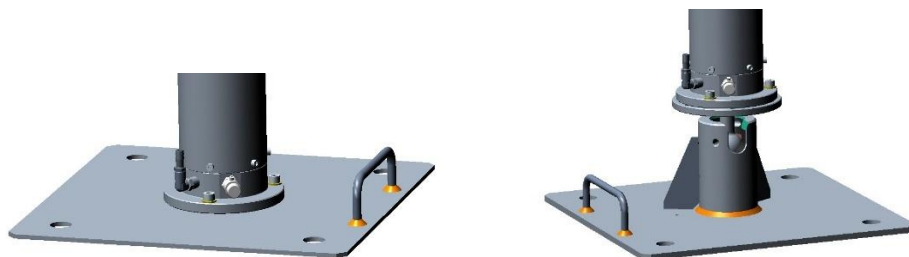
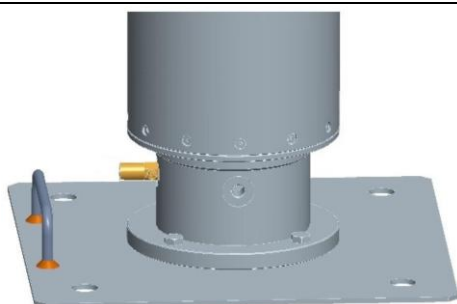
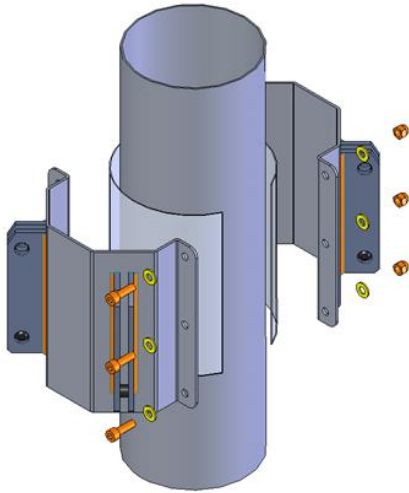


Figure 4-5.3: Base plate with handle (to the left) and base plate with ball joint and side slit (to the right)

- 

Install the mast onto the base plate as indicated in the paragraph on the mounting with base flange.

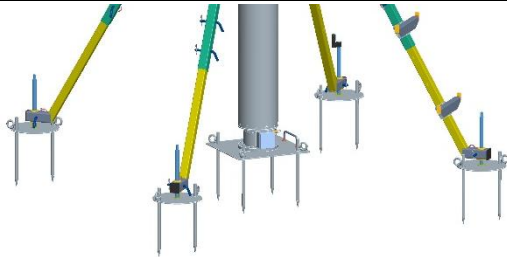
2.



In the case it was explicitly requested upon ordering, the mast is prepared for being mounted on a quadpod and the upper collar is already installed.

Otherwise, refer to the quadpod's manual for the procedure of fitting the quadpod to the mast collar.

3.



Secure both the base plate and the assembly legs' feet to the ground by using the proper pickets supplied by FIRECO S.r.l.

Tighten the bolts with the appropriate torque, which depends on the class, size and on the possible anti-corrosion treatments on the screws, making sure you follow a tightening sequence such as to not compromise the structural tightness of the flange or of the mounting surface (examples in Fig. 3-5.2).

WARNING!



For a correct installation of the mast to the quadpod, please refer to the instructions in the quadpod manual.

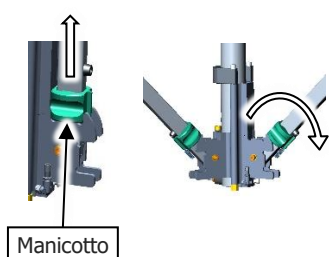
MOUNTING THE MAST ON A TRIPOD

NOTE: If the mast is equipped with a tripod, the tripod is already pre-mounted on the mast, with its legs fixed to the central body.

1. Place the mast vertically in the desired location.



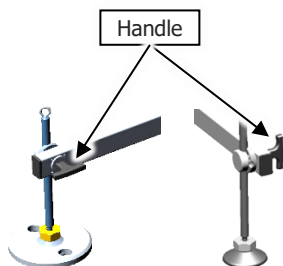
2. Release each leg from the main body by pulling and holding the spring sleeve until the legs are fully lowered.



3. Lower all 3 legs.
NOTE:
The base of the mast must always rest on the ground.

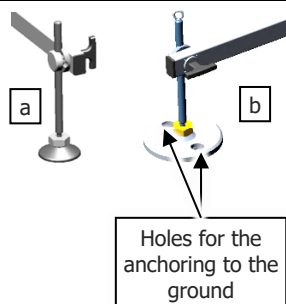


4. Turn the feet downward and adjust their height to adjust the tilt of the mast until you get the correct verticality:



- unlock the foot by loosening the handle
- set the desired position (both rotating and height)
- lock the foot by tightening the handle

5. Plastic feet (a) do not need to be anchored to the ground. Aluminium feet (b) with a diameter of 80 mm, 150 mm or 250 mm must be anchored to the ground by inserting 2 pickets into the available holes.



NOTE: In the case of mounting the mast on a tripod it is possible to fix possible guying ropes directly onto the feet (rather than to the ground), to avoid constraining the position of the mast to the ground (see figure below).

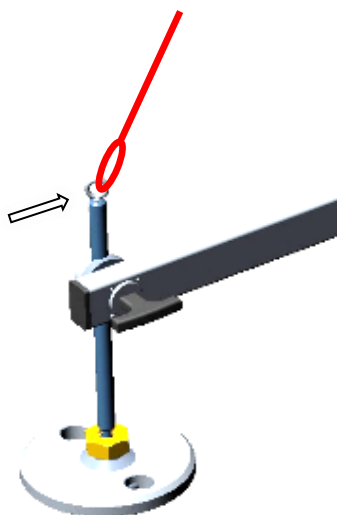
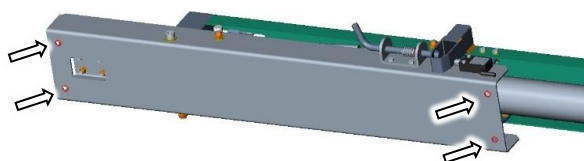


Figure 4-5.4: Alternative fixing point for the guying rope on the tripod foot

MOUNTING THE MAST WITH A ROOF TILT SYSTEM

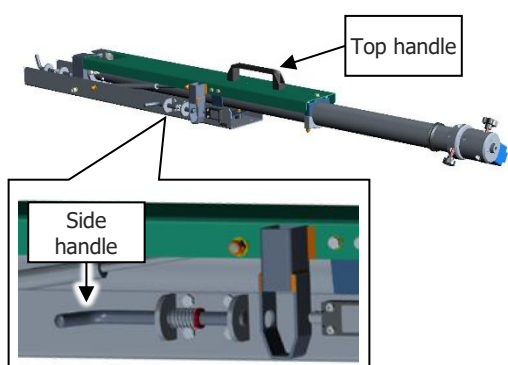
1.



A mast equipped with a roof tilt system must be fixed on a fixing surface by means of 4 M10 screws.

Contact Fireco to get the specific fixing hole scheme for the mast purchased.

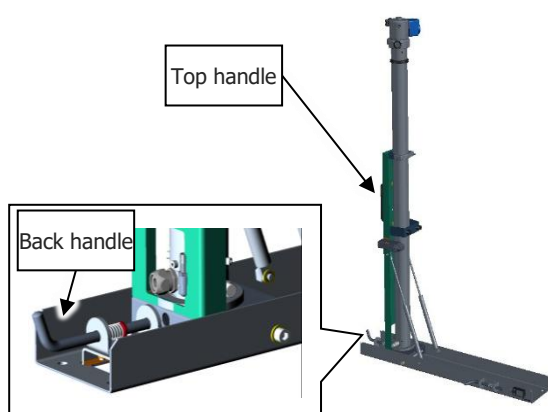
2



Put the mast in the upright position: Pull the side handle while lifting the mast by grabbing it from the top handle.

Once the vertical position is reached, the mast automatically locks.

3



To close the mast: Pull the back handle and at the same time lower the mast by holding it from the top handle.

Once the horizontal position is reached, the mast automatically locks.

FIXING THE EQUIPMENT ON TOP OF THE MAST

The equipment mounted on the mast is not part of the machine referred to in this manual. Its installation is the customer's responsibility, with respect to what is reported inside the relative manual, to which the user should refer to for the operational details. Anyway, the equipment shall have weight and size characteristics not exceeding the limit values defined by FIRECO S.r.l.

WARNING!



For a correct installation of the equipment on the top please refer to the instructions contained in the manual of the equipment itself.

The masts can be equipped with an internal electrical cable (optional) to bring signals and/or electrical power to the equipment placed on top of the mast (if provided). There are several types of cables available, according to the customer's needs.



Figure 4-5.5: Coiled electrical cable (optional)

The electric cable is pre-shaped in the shape of a spiral, to be able to fit in the mast when it is closed and to reach the necessary length when the mast is extended.

In case the mast is supplied with an internal electrical cable, at the top end of the mast you can find an electric box or a Schuko socket for connecting the equipment on top to the internal spiral cable.

At the base of the mast is the opposite end of the spiral cable. The cable at this point is coming out of a 3/8" cable gland with capped wires, ready for the electrical connection to the power supply source.

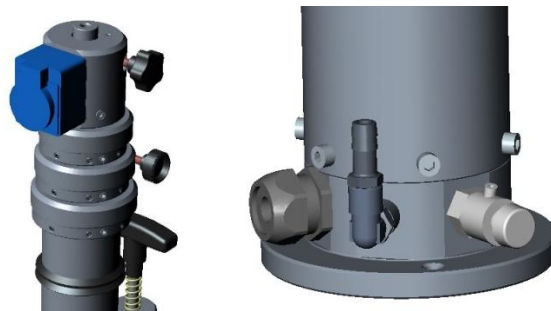


Figure 4-5.6: Entry and exit of the (optional) coiled electrical cable from the mast

As an alternative to the internal spiral cable, the mast may be provided with a cable guide system, to safely bring signals and/or power supply to the equipment located on top of the mast. The cable guides can be of two types: helicoidal or rubber rings.



Figure 4-5.7: Helicoidal cable guides (to the left) and simple guiding rings made of rubber (to the right)

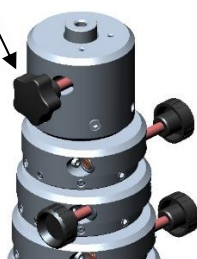
WARNING!



Check that there are no obstructions that may push the external electrical cable against the mast causing its crushing during the closing operations.

1.

Star knob for the locking of the equipment on top of the mast



Unless otherwise agreed upon when placing the order, the fixing head has a central hole (ø 24 mm) for inserting a 24x50 type PIN.

A 24/30 DIN PIN adapter can be provided on request.

Insert the equipment PIN into the central hole.

Lock the equipment by tightening the star knob.

6 CONNECTIONS

The internal connections of the machine are under the customer's responsibility and must be carried out by qualified staff.

PNEUMATIC CONNECTIONS

The mast is supplied with a pneumatic hand pump, so no further pneumatic connections are required.



Figure 4-6.1: Pneumatic hand pump

GROUNDING

The grounding of the machine must be carried out using the spiral cable (if provided) and by connecting a grounding cable to one of the lower connection points indicated below.

- If the mast has an internal spiral cable, there is a threaded hole on the head to connect a grounding cable for the equipment at the top.
- For masts without a tripod, quadpod or roof tilt system:
 - o If the mast has a base with flange, the grounding connection point must be at one of the lower fixing screws, as shown in the figure.

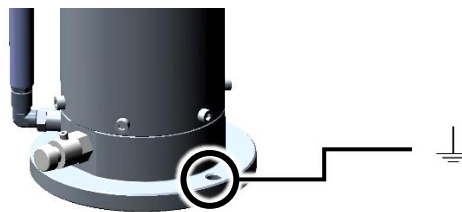


Figure 4-6.2: Grounding – mast base with flange

- o If the mast has a base without flange, the grounding connection point is located at one of the lower fixing screws, as shown in the figure.

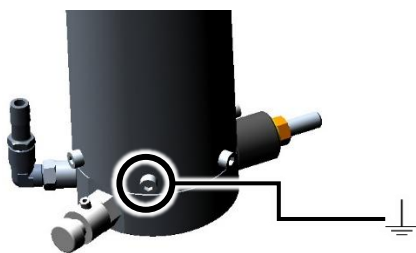


Figure 4-6.3: Grounding – mast base without flange

- If the mast has a base with a ball joint, the grounding connection point is located at one of the lower fixing screws, as shown in the figure.

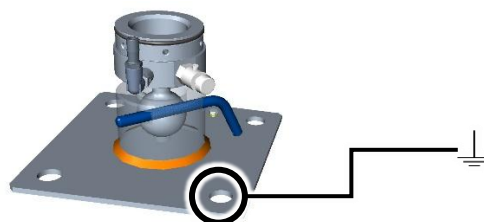


Figure 4-6.4: Grounding – mast base with ball joint

- If the mast has a roof tilt system, the grounding connection point is located at one of the base fastening screws, as shown in the figure.

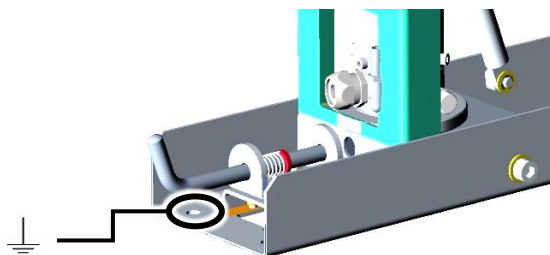


Figure 4-6.5: Grounding – mast with roof tilt system

- If the mast is supplied with a tripod, especially one with plastic feet, the grounding connection point is located at one of the fixing screws of the central base pin, as shown in the figure.

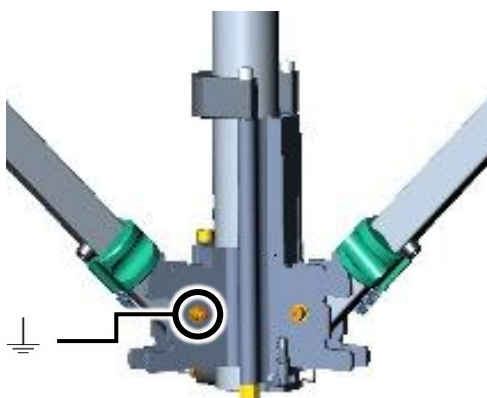


Figure 4-6.6: Grounding – mast installed on a tripod

NOTE: If the mast is installed on a quadripod or tripod with aluminum feet, there is no need to connect a grounding clamp as fixing pickets to be inserted directly into the ground are already present.

7 PRELIMINARY CHECKS / PUTTING INTO SERVICE

Before starting the machine, it is necessary to perform a series of checks and inspections to prevent errors and accidents:

- check all security systems.
- check the signs.
- verify that the pneumatic connections are tight enough so as not to cause dangerous leaks.
- verify that the machine has not suffered any damage upon assembly.
- check thoroughly for the integrity of the operator panels, the cables and the hoses.
- verify the free movement and free rotation of all the moving parts.

Please refer to chapter 5 for further operational details.

5 THE USE OF THE MACHINE

1 WARNING

WARNING!

Before using the machine, it is essential to have read and understood all the instructions in this manual.

To preserve the workers' health and safety, we recommend using the following P.P.E.:

- protective gloves
- safety footwear
- body protections
- safety helmet

**WARNING!**

Do not move the mast during its extension or retraction phases.

WARNING!

During the preparation and the use of the mast, unpredictable residual risks might persist. To preserve health and safety, restrict the area surrounding the mast to keep unauthorised staff off.

WARNING!

If you experience an unusual sliding of the sections (intermittent or non-regular movements), immediately stop the mast operation.

Check for the absence of any obstacles or any tangled cables that may prevent the mast from working properly. If the problem persists, see paragraph 6-7.

WARNING!

During the mast extension operations, contact with electrical wires and/or suspended structures might be possible, with consequent danger for the operators.



Check THOROUGHLY for the possible presence of power lines and/or suspended structures around the mast installation area.

DO NOT OPERATE THE MAST DIRECTLY BELOW THE POWER LINES, EVEN IF THEY SEEM TOO HIGH TO BE REACHED BY THE MAST.

WARNING!

Mast extension and closing operations may cause limb crushing.

Supervise the mast during the operations of extension/retraction.

Keep at a proper distance and do not touch the mast during its extension or retraction.

WARNING!

Because of the load installed on the mast or the weather conditions in which it operates, the mast could turn over.

It is mandatory to position the mast in a way so that it has a tilt angle to the vertical axis that is not greater than the maximum angle declared by the manufacturer (90°).

For further guidance refer to the limitations of use listed in paragraph 2-2.

2 CONTROL SYSTEM

The mast only works in manual mode by means of the following control devices:

- pneumatic hand pump
- release valve
- section locking knobs

PNEUMATIC HAND PUMP

With the pneumatic hand pump, it is only possible to control the mast extension (extension of the tubes).



Figure 5-2.1: Use of the pneumatic hand pump

RELEASE VALVE

With the release valve it is only possible to control the mast retraction (retraction of the tubes).

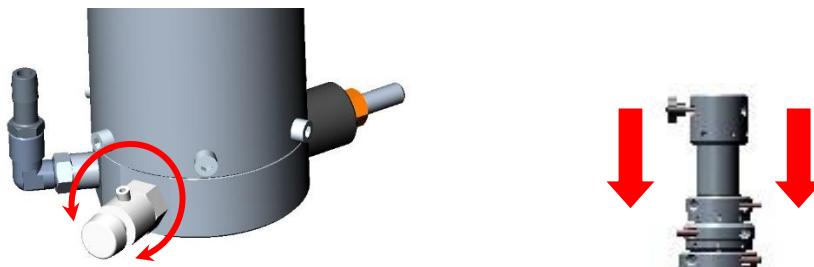


Figure 5-2.2: Use of the release valve

The valve can be operated manually by loosening or tightening it.

When the mast is open, to release the air from the mast (and retract the tubes) slowly loosen the valve.

While retracting the tubes, loosen or tighten the valve further to adjust the lowering speed.

SECTION LOCKING KNOBS

Each ring has its own knob that can lock or unlock the extension of the next tube above.

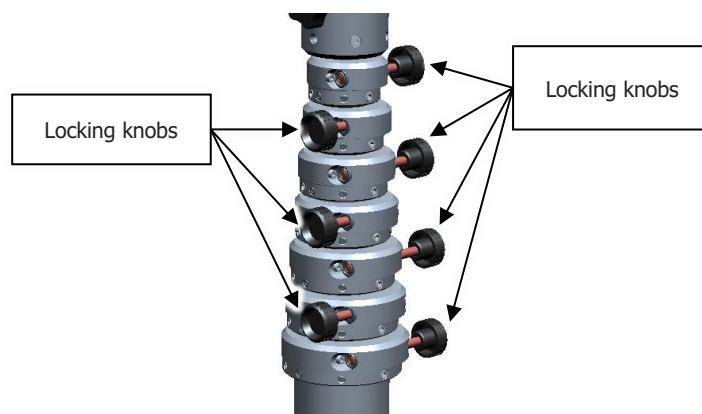


Figure 5-2.3: Section locking knobs

Each locking knob allows locking the section at any height position, depending on the configuration of the mast that the customers intend to set up.

To improve the mechanical resistance and the stability performance, we recommend that you arrive at the desired height position by extending the tubes with the greater diameters, thus leaving the tubes with smaller diameters retracted.

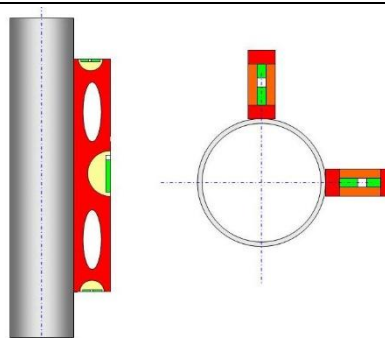
3 STARTING

Having placed and installed the mast, carry out a visual inspection of the entire installation and make sure that there are no objects inadvertently left on it and/or people who or materials that would obstacle its normal functioning.

- 1 After having fixed the mast to a support structure and having fully retracted it vertically, place and fix the equipment onto the mast top.



- 2 Verify that the support structure is horizontal and that the mast is vertical.
Should the angle formed by the horizontal axis and the mast axis exceed the default maximum installation angle (90°), you may need to level off the ground for the values to satisfy the requirements.



- 3 Once the levelling has been verified and the lockings are inserted correctly, it is necessary to make sure that no structures, electrical lines or other obstacles hinder the mast extension before proceeding on to the next phases.



- 4 Verify that all the safety devices of the machine have been enabled. Otherwise provide for their enabling.

The following procedures describe the case of a complete extension or retraction of the mast. Follow the described steps also, if you intend to extend or retract a mast only partially.

4 EXTENDING/DEPLOYING THE MAST

The following procedure is valid in the case of complete extension of the mast.

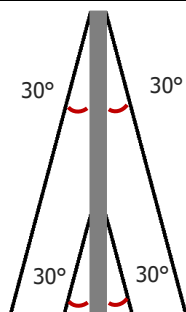
Depending on the respective needs, it is possible to leave some sections unextended or partially extended.

Follow the operational procedures listed below for each section you intend to extend.

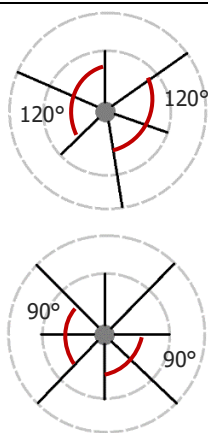
If you intend to guy the mast, follow the instructions below.

Contact the manufacturer to find out:

- the tensioning force, which depends on the type of rope used
- the number of guying levels and the ropes to be used



The ropes must form an angle of 30° with respect to the vertical axis.



For each guying level, the number of ropes can be:

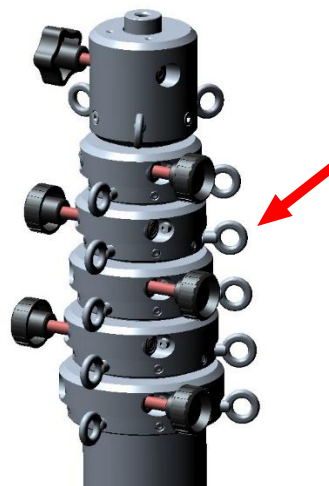
- 3 if arranged at intervals of 120°, or
- 4 if arranged at intervals of 90°

The guying force must be uniformly distributed on all the ropes which are arranged on the same guying level.

- 1 If you intend to guy the mast, connect the carabiner hooks of the ropes to the eyelet screws on the mast head and on the locking collars.



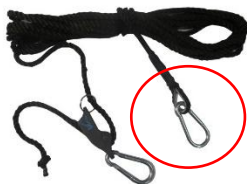
NOTE: The picture to the right shows an example of a mast with eyelet screw on all section collars. The supplied configuration may have eyelet screws only on some section collars (2 or 3, for example).



- 2 Insert the pickets into the ground with an angle of about 30° with respect to the vertical.



- 3 Fix to each picket or to each equivalent ground anchoring (e.g. on the tripod legs, if provided) the carabiner hook of the guying rope.

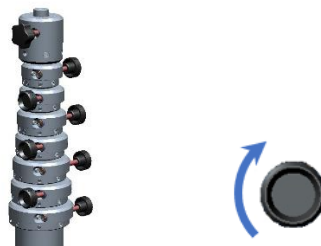


- 4 To adjust the rope length, release the top end of the rope from the clamping device and pull the rope.
Once the desired length has been reached, insert the rope into the clamping device again.



NOTE: If, while extending the mast, you notice that the ropes are too short or if, after extending the mast, the sections tend to retract, it means that the guying ropes are too short. Stop the mast extension and proceed with the lengthening of the ropes in the manner described above under point 4.

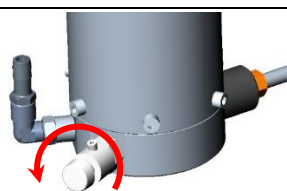
- 5 Lock all mast sections by turning **all the locking knobs** clockwise.



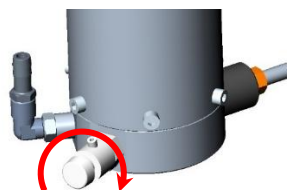
WARNING!

As the first step, it is of utmost importance to ensure that there is no pressure inside the mast before starting its deployment.

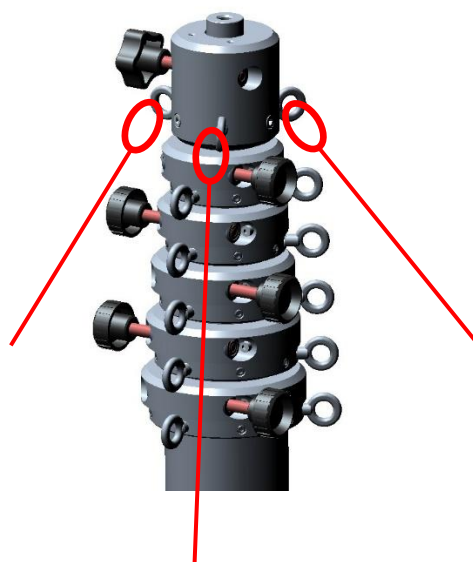
- 6 Make sure that there is no compressed air in the mast: to do this, open the release valve to release the air.



After this operation **close the release valve** at the mast base again.



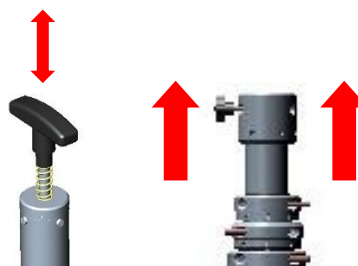
- 7 If you intend to guy the mast, while extending it will be necessary to keep each guying rope on the highest level (head level) slightly tensioned by the operators (3 to 4, depending on the number of ropes on the highest level). This is required to keep the mast vertical during its extension and to prevent it from being deformed by the force of the present wind.



- 8 Loosen the first section (the highest one) by turning the locking knob counterclockwise.



- 9 Verify that all the pneumatic connections are in good working order. Operate the manual pneumatic pump until the first moving element is fully extended.



- 10 Once the section has been extended, tighten the previously loosened black knob again.

CAUTION: Weak tightening could lead the section to close again, while excessive tightening may damage or break the locking mechanism.



Repeat the steps from 8 to 10 on all the other locking rings: from the highest to the last/lowest one.

You will then reach the fully extended configuration of the mast.

NOTE:

If, while extending the mast, you notice that the ropes are too short or if, after extending the mast, the sections tend to retract, it means that the guying ropes are too short. Stop the mast extension and proceed with the lengthening of the ropes in the manner described above under point 4

5 RETRACTING THE MAST

The following procedure is valid in the case of complete retraction of the mast.

Depending on the respective needs, it is possible to leave some sections extended or partially retracted.

Follow the operational procedures listed below for each section you intend to retract.

WARNING!



It is of utmost importance to restore the pressure inside the mast, setting it back to the maximum value allowed before you start to retract the mast.

WARNING!



While retracting the mast, verify thoroughly that nothing hinders its movement and that there are no structures nearby with which the mast could possibly collide.

Phase

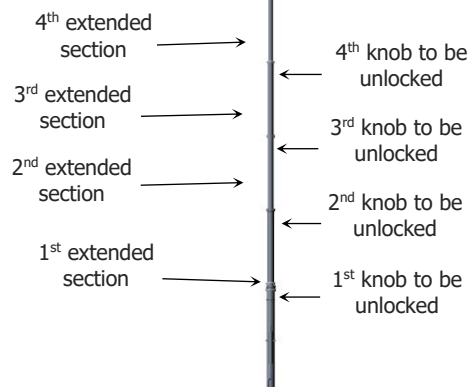
- 1 Before closing the mast, you need to restore the pressure inside the mast. Use the manual pneumatic pump until it is hard to move.



NOTE:

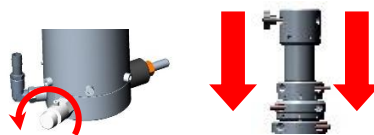
Begin retracting the sections starting from the lowest extended section.

- 2 Loosen the locking knob that matches the lowest extended section, by turning it counterclockwise.

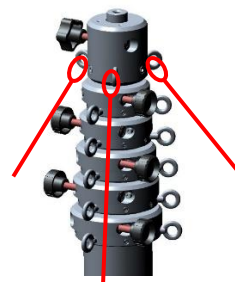


- 3 **Slowly loosen the release valve** to start retracting the section.

WARNING: The sudden opening of the valve causes a sudden retraction of the section, which could cause shocks or crushing with the moving parts.



If the mast is guyed, while retracting it it will be necessary to keep each guying rope on the highest level (head level) slightly tensioned by the operators (3 to 4, depending on the number of ropes on the highest level).



- 4 Tighten the release valve.



- 5 Lock the section that has just been closed, by turning the previously unlocked black knob clockwise.



- 6 Repeat steps from 2 to 5 on all the other locking rings: always act on the lowest extended section. You will then reach the fully retracted configuration of the mast.

- 7 Open the release valve and leave it open until the next use. In this way a possible accumulation of water or moist can also be discharged from the mast.



WARNING!

It is important to keep the release valve open for as long as the mast is left idle, especially when hauling on a vehicle and/or when moving or transporting it.

6 MANUALLY ROTATING THE MAST

If necessary, you can rotate the mast around its vertical axis to orient the mast as needed.

On request, the mast can also be supplied with turnable rings inserted between the locking rings.

On these rings eyelet screws for the anchoring of the guying ropes will be provided.

The turnable rings would allow the operator to rotate the mast around its vertical axis (following the procedure below) without removing the guying ropes.

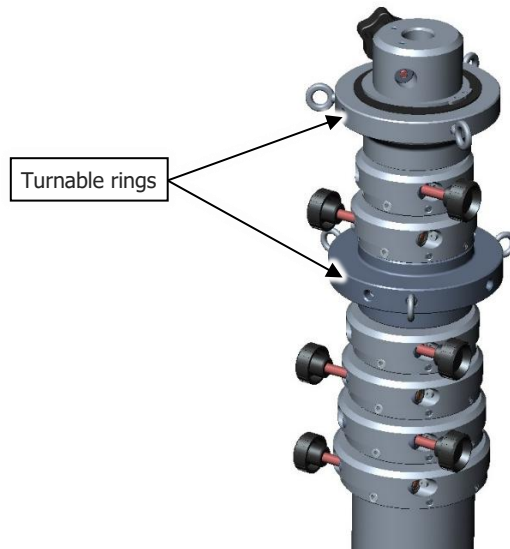


Fig. 5-6.1: Turnable rings

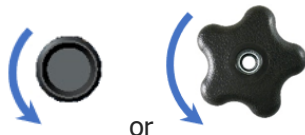


WARNING!

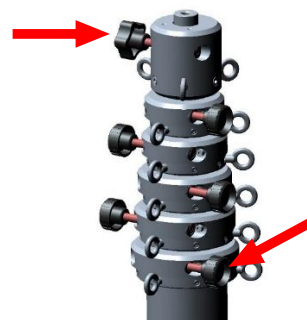
If the mast is not provided with turnable rings, to turn the mast around its axis it will be necessary to temporarily remove the ground anchors of the guying ropes.

Follow the procedure below; once the rotation of the mast is complete, anchor the guying ropes back to the ground again.

- 1 Loosen the knob matching the lowest ring or the star knob that fixes the equipment on top.



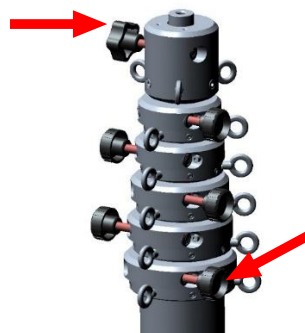
or



- 2 Rotate the mast by grabbing it by its upper part.



- 3 Once the rotation is complete, tighten the previously loosened knob again.



6 MAINTENANCE

1 WARNINGS

The following statements are related to the inspection and maintenance operations to be carried out by the customer and represent the fundamental rules to always keep the machine perfectly efficient.

All other maintenance operations must be carried out by the manufacturer or by indicated technical personnel; if done otherwise, any warranty condition will be void.

The scheduled routine maintenance comprises inspections, checks and interventions that, to prevent interruptions and breakdowns, consistently check the machine's state of lubrication and the state of the parts that are subject to wear.

These operations, albeit simple, must be performed by qualified personnel to avoid compromising the equipment's functionality and the safety of the operators and the workers who use the product.

The machine has been designed to reduce the ordinary maintenance; yet it is the operator's responsibility to judge its state and its suitability for use.

However, we recommend that you stop the machine and start maintenance operations as soon as you notice any malfunctioning issues: this will guarantee for constant maximum efficiency.

In case of failures that require extraordinary maintenance, please contact FIRECO S.r.l., referring to the contact details shown in paragraph 1-1.

Any extraordinary maintenance operation performed by the customer, or by personnel that has not been authorised by FIRECO S.r.l., will result in the immediate revocation of any form of warranty.

Always use the appropriate P.P.E. - Personal Protective Equipment:

- gloves.
- non-slip footwear.
- suitable clothing.



2 SPECIAL PRECAUTIONS

While carrying out maintenance operations, thoroughly follow the instructions below:

- before starting work, place a sign indicating "MACHINE MAINTENANCE" in a visible position.
- make sure that the area used for maintenance operations is only accessible by authorised personnel.
- do not use solvents and flammable materials.
- be careful not to disperse in the environment potentially polluting substances.
- any intervention of personnel at a height, which will require the use of lifting means (not supplied), must take place in accordance with the safety standards in force; the lifting means must be adequate, correctly positioned and made stable by taking all the necessary precautions; likewise, also the operator's behaviour must be appropriate to the circumstances and to the working height;
- use adequate lifting means for moving the parts with a weight greater than 15kg.
- do not climb on the components of the machine, as they were not designed to support people.
- upon work completion, restore and properly secure all the protections and guards that had been removed, opened and disabled.

WARNING!



The manufacturer is not responsible for the customer's failure to comply with the above recommendations and for any other use different from or not mentioned in these instructions.

WARNING!



Any maintenance operation carried out on the product described in this manual must be performed by qualified technicians and/or trained staff to avoid compromising the equipment's functionality and the operators' safety.

WARNING!



The solvents used to clean the various parts of the product are potentially dangerous and flammable.



Make sure that the staff knows and follows the safety recommendations provided by the solvent manufacturer.

3 ISOLATION FROM SOURCES OF ENERGY AND DISSIPATION OF RESIDUAL ENERGIES

Routine maintenance can be carried out while the machine is on and functioning, in compliance with the procedures indicated in this chapter.

In the event of disassembly or extraordinary maintenance, it is necessary to:

- set the mast to its completely lowered position.
- lock all the sections by acting on the locking devices available on the machine.
- remove the equipment placed on top of the mast.
- open the release valve at the base of the mast to make sure that there is no pressure inside.
- isolate the machine from its energy source (for example closing the valve of the compressed-air supply line, or by removing the pneumatic connection, etc.).

4 USEFUL LIFE

Under normal conditions of use, the machine's useful life is estimated to be approximately **10 years**.

At the end of the machine's useful life, it must be thoroughly overhauled and inspected to verify the wear and general operation state.

The inspection and verification activities must be carried out by the technicians entrusted by the manufacturer.

5 SCHEDULED ROUTINE MAINTENANCE

WARNING!



The customer will have to

keep track of all routine maintenance performed on the product by noting:

- date of the intervention.
 - name of the person in charge of carrying out the operation.
 - operation carried out.
-

The following table summarises the ordinary inspection and maintenance operations carried out on the machine. See the dedicated paragraphs for further operational details.

Unless otherwise specified, in case you encounter problems or unusual issues, please contact the manufacturer's Technical Support.

SCHEDULED MAINTENANCE TABLE:

	TIMING	TYPE OF SERVICE
1	Before each use and at least weekly	Check the tightening torque of the fixing elements
2	Before each use and at least monthly	General check and inspection
3	Before each closing of the mast, or whenever needed	Cleaning
4	Before each closing of the mast and at least every 3 months	Check the release valve
5	Before each use, especially in the fall/winter period	Discharge possible accumulations of water from the mast by opening the drain valve on the mast base.
6	In sea environments or other environments with a high concentration of saltiness, every 15 days or whenever necessary	Thoroughly clean the mast with fresh water and check the intactness of its components.
7	In sea environments or other environments with a high concentration of saltiness, every 180 days	Grease the metal parts on the mast (except for the aluminium parts) with Interflon Film WB.

Tab. 6-6.1: Scheduled Maintenance Table

WARNING!



Failure to comply with what is required will relieve the manufacturer of any liability with respect to the warranty.

1. Check the tightening torque of the fixing elements

Make sure no screws or nuts are loose or missing. Pay special attention to the elements that fix the mast to the site.

Restore the missing threaded connections and tighten the loose ones.

2. General check and inspection

Verify the absence of damage due to failures or deformations.

Visually inspect the coating conditions, which must be in good condition and should not have exposed parts.

Make sure there is no rust on the components of the mast and on threaded connections. Contact the manufacturer.

Also check that there are no air leaks.

Check that there are no obstructions or foreign materials. Otherwise, proceed with the cleaning as indicated in the following paragraph.

3. Cleaning

Visually inspect the outer surfaces of the mast to verify that there are no deposits or foreign bodies.

Thoroughly clean the sections, using a damp cloth to cleanse and remove dust from the parts indicated.

Clean:

- the metal surfaces using denatured alcohol.
- the rubber and plastic materials using water.
- the outer surfaces of the tubes using soap and water.

To clean a mast after it has been extended, start from the lowest part of the section and proceed by hand going as far as you can, without the aid of any lifting means (such as ladders, lifting platforms, etc.).

In compliance with the procedures set out in paragraph 5, close the section of the mast that has just been cleaned, to reach a new part of the section or a new section.

Proceed likewise gradually cleaning all the sections until the complete closing of the mast.

4. Check the release valve

Verify the correct functioning of the release valve in the following manner:

- the locking devices of the sections must all be closed.
- insert air into the mast by operating the hand pump until the pump is hard to move.
- open the release valve and check if the air is flowing out.
- close the release valve.

6 EXTRAORDINARY MAINTENANCE

Since the extraordinary maintenance operation is necessary when a fault occurs, you cannot predict the timings or the frequency.

For extraordinary maintenance contact FIRECO S.r.l. directly, which will provide for the intervention directly or via trusty authorised workshops.

WARNING!



It is important that you do not alter, even minimally, the equipment characteristics due to incorrect installation or to the use of a non-original parts.

7 DIAGNOSTICS AND TROUBLESHOOTING

In the case of malfunction, entrust fault research only to specialised personnel or ask the manufacturer for technical assistance.

WARNING!



Any maintenance operation carried out on the product described in this manual must be performed by qualified technicians and/or trained staff to avoid compromising the equipment's functionality and the operators' safety.

WARNING!



In the event of a malfunction, it is recommended that you carefully read the tables in the following paragraphs.

Failure to comply with the guidance provided in this chapter, which may lead to compromise the product's functionality, shall give rise to the revocation of any form of warranty on the product itself.

Some of the problems that might arise may not be resolvable through fast and simple operations but may be determined by faults that require extraordinary maintenance operations, causing the product to be inoperative for a long time.

For defects and/or malfunctions of the machine not described in this manual please turn to the manufacturer.

THE MAST DOES NOT EXTEND/RETRACT OR EXTENDS/RETRACTS ONLY PARTIALLY

POSSIBLE CAUSE	SOLUTION
1. Occlusion or narrowing of the hoses	Remove the causes of the occlusion or throttling of the pneumatic hose that connects the pneumatic hand pump to the mast.
2. Blocked locking knobs	Extend or retract the mast according to the procedure reported in chapter 5.
3. Seizure of the mast elements or seal failure	Contact the manufacturer for an extraordinary maintenance operation.
4. Air leak on the mast or in the pneumatic circuit	Contact the manufacturer for an extraordinary maintenance operation.
5. The supply cable of the equipment on top of the mast is tangled or hooked up somewhere	Check that the cables of the equipment on top of the mast do not interfere with the mast movement or get tangled in any obstacle. In the case of cable crushing, check their integrity.
6. In conditions of very low temperature, ice may form inside or on the surface of the mast	As for the ice formed on the outside of the mast, clean the mast with alcohol, as shown in paragraph 6-5. In the case ice formed on the inside of the mast, wait until the temperature has risen sufficiently and only then retract the mast completely.
7. Permanent deformation of the mast due to overload, damage following an impact or other causes	Contact the manufacturer for an extraordinary maintenance operation.

THE EXTENDED SECTIONS LOSE HEIGHT/RETRACT BY THEMSELVES

POSSIBLE CAUSE	SOLUTION
1. The locking knobs are not tightened enough.	Verify the correct operation of the knobs. Restore the desired elevation as shown in chapter 5 and apply a suitable tightening torque by means of the locking knobs. WARNING: Excessive tightening may damage or even break the locking cable.
2. Wear or tear of the section locking system	Contact the manufacturer for an extraordinary maintenance operation.
3. Guying ropes too short or overstretched	If, while extending the mast, you notice that the ropes are too short or if, after extending the mast, the sections tend to retract, it means that the guying ropes are too short. Stop the mast extension and proceed with the lengthening of the ropes in the manner described in chapter 5.

7 ACCESSORIES AND SPARE PARTS

1 SERVICE

For any other type of information related to the machine installation, use and maintenance, please always contact the manufacturer.

The customer should always ask questions in clear terms, with references to this manual and to the instructions listed.

2 SPARE PARTS

**WARNING!**

ALWAYS USE ORIGINAL SPARE PARTS.

FOR ANY SPARE PART CONTACT THE MANUFACTURER.

All spare parts must be original parts provided by Fireco S.r.l.

All defective parts must be replaced with products having the same code.

We do not recommend the use of non-original parts: contrary cases will render void the warranty conditions (if still existing) and the manufacturer will no longer be responsible for the machine use and for any damage to people and/or things.

For each repair operation or spare part request, always mention the serial number shown on the mast or on the Conformity Declaration.

8 ADDITIONAL INSTRUCTIONS

1 TAKING OUT OF SERVICE AND DISMANTLING

Before performing any type of intervention, it is necessary to:

- set the mast to its completely lowered position.
- remove the equipment placed on top of the mast.
- isolate the machine from its energy source.
- open the release valve at the base of the mast to make sure that there is no pressure inside.
- remove the mast from the installation site.
- move the machine or its parts according to the instructions given in chapter 4.

2 WASTE DISPOSAL

It is the user's responsibility, according to the laws in force in their own country, to verify the correct disposal of the waste that the machine produces during its entire life cycle.

Upon dismantling, it is necessary to separate the plastic, the metal parts and the electrical components, which must be collected in separate environments in compliance with the regulations in force.

As far as the metal mass of the machine is concerned, the user will just need to separate the ferrous parts from those made of other metals or alloys, for a proper submission to fusion recycling.

The product shown in this manual is composed of various elements made of different materials:

- Aluminium
- Steel
- Copper
- Plastic

The packaging of the product itself may be composed of different materials:

- Cardboard
- Wood
- Plastic

9 DRAWINGS AND DIAGRAMS

1 TECHNICAL DRAWINGS

2 PNEUMATIC DIAGRAMS

10 APPENDIX A

11 APPENDIX B

12 APPENDIX C