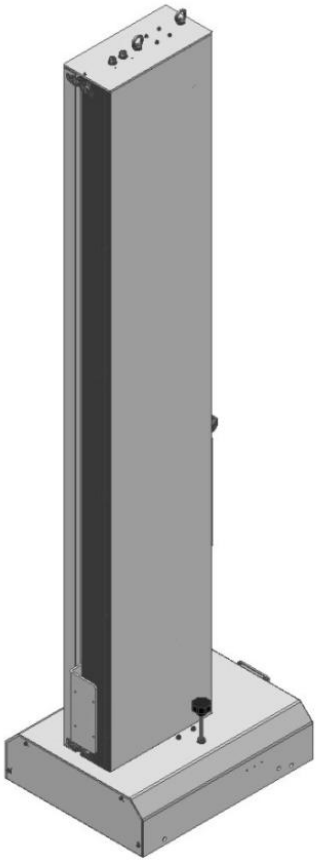
Reciprocator
HF30 V4 / HF80 V4

Customer Product Manual 7179770_04
Released 04/2016

Nordson Deutschland GmbH – Erkrath - Germany



NOTE: descriptions and illustrations in this publication are simplified.

For eventual technical reasons ***Nordson*** reserves the right to modify their product data or features without any prior notice.

TITLE OF THE DOCUMENT : **OPERATING AND MAINTENANCE MANUAL**	NO.:
	RELEASE NO.: **04**

CUSTOMER :	JOB ORDER NO.:
SERIAL NO.:	DATE :

REL. NO.	**DATE**	**DESCRIPTION**
03	11/11/2014	Page 43 - picture 6 + description
03	11/11/2014	Page 44 - picture 7
03	11/11/2014	Page 49 - picture 16 + description & picture 17
03	11/11/2014	Page 57 - picture 32 + description
03	11/11/2014	Page 58 - picture 35 + description
03	11/11/2014	Page 66 - picture 48
03	11/11/2014	Page 68 - table with P/N - 7034432
03	11/11/2014	Page 71 - picture 06 + description
03	11/11/2014	Page 72 - picture 07
03	11/11/2014	Page 77 - picture 16 + description and picture 17
03	11/11/2014	Page 88 - picture 36 + description
03	11/11/2014	Page 112 - table with P/N 7034430 & 7034431
03	11/11/2014	Page 137 - table with P/N - 7034432
04	20/04/2016	Page 123 CE Declaration

Prepared	Controlled	Approved	

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0.0 INTRODUCTION

0.1 Document identification

The operating and maintenance manual is a document issued by ***Nordson*** for the chosen reciprocators and it is an integral part of the machine.
The document is generic so it's advisable to make a note of your machines serial number as a reference should you ever require technical support for the machine, in order to permit tracing and identification.

0.2 Object of the document

This manual sets out:

- To provide technicians, workers and maintenance people with instructions, information and advice on how to work in the best safety conditions.
- To put the worker in a position to use the machine correctly and safely and to maintain it in a good and efficient condition.
- To be able to prove, through the provided information, the compliance of the machine with the directives in force regarding industrial safety standards.

0.3 General conditions

During the drawing up of this document the following directives have been considered:

- UNI EN ISO 12100-1:2010, Safety of machinery – General principles for design – Risk assessment and risk reduction
- UNI EN ISO 13849-1:2008, Safety of machinery – Safety-related parts of control systems - Part 1: General principles for design
- UNI EN ISO 13857:2008, Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
- UNI EN 349:2008, Safety of machinery – Minimum gaps to avoid crushing of parts of the human body
- UNI EN ISO 13850:2008, Safety of machinery – Emergency stop - Principles for design
- CEI EN 60204-1, Safety of machinery – Electrical equipment of machines

ATTENTION : If this machine is an integral part of a plant , it is forbidden to start it unless the whole plant is in compliance with the **"Machine directive"2006/42/CE** and those that follow.

0.4 Identification data of the manufacturer

The identification of ***Nordson*** as machine manufacturer, is in compliance with the legislation in force through these certificates:

- **Declaration of conformity** (see attachments)
- **CE plate**
- **Operation and maintenance manual**

A special identification plate, applied to the machine, permanently carries information regarding CE mark. The copies of the identification plates **"CE MARK"**, applied on each single machine, and the relevant **"DECLARATION OF CONFORMITY"** are attached.

The machine has been supplied by:

NORDSON CORPORATION

0.5 Nordson International

	COUNTRY		PHONE	FAX
Europe	**Austria**		43-1-707 5521	43-1-707 5517
	Belgium		31-13-511 8700	31-13-511 3995
	Czech Republic		4205-4159 2411	4205-4124 4971
	Denmark		45-43-66 0123	45-43-64 1101
	Finland		358-9-530 8080	358-9-530 80850
	France		33-1-6412 1400	33-1-6412 1401
	Germany	*Erkrath*	49-211-92050	49-211-254 658
		Lüneburg	49-4131-8940	49-4131-894 149
	Italy		39-02-904 691	39-02-9078 2485
	Netherlands		31-13-511 8700	31-13-511 3995
	Norway	*Hot Melt*	47-23 03 6160	47-22 68 3636
		Finishing	47-22-65 6100	47-22-65 8858
	Poland		48-22-836 4495	48-22-836 7042
	Portugal		351-22-961 9400	351-22-961 9409
	Russia		7-812-11 86 263	7-812-11 86 263
	Slovak Republic		4205-4159 2411	4205-4124 4971
	Spain		34-96-313 2090	34-96-313 2244
	Sweden	*Hot melt*	46-40-680 1700	46-40-932 882
		Finishing	46 (0) 303 66950	46 (0) 303 66959
	Switzerland		41-61-411 3838	41-61-411 3818
	United Kingdom	*Hot Melt*	44-1296-610-140	44-1296-610-175
		Finishing	44-161-498-1500	44-161-498-1501
		EFD	44-1582-666-334	44-1582-664-227
Distributors in Eastern & Southern Europe	**DED, Germany**		49-211-92050	49-211-254 658

Outside Europe

For Your nearest ***Nordson*** office outside Europe contact the Nordson offices below for detailed information

	CONTACT NORDSON		PHONE	FAX
Africa/Middle East	**DED, Germany**		49-211-92050	49-211-254 658
Asia/Australia/ Latin America	**Pacific South Division, USA**		1-440-985-4000	1-440-985-1096
Japan	**Japan**		81-3-5762-2700	81-3-5762 2701
North America	**Canada**		1-905-475-6730	1-905-475-8821
	USA	*Finishing*	1-440-892-1580	1-440-985-1417

0.6 Symbols used in the manuals

To make the reading and the understanding of this manual easier and immediate, the following symbols have been used:

"Conductor": qualified and authorized person that has been instructed to start the machine with the necessary protections in place via the use of the commands on the push-button panel.

Mechanical maintenance person: a technician, qualified and authorized to install, repair and carry out special maintenance that is exclusively mechanical.

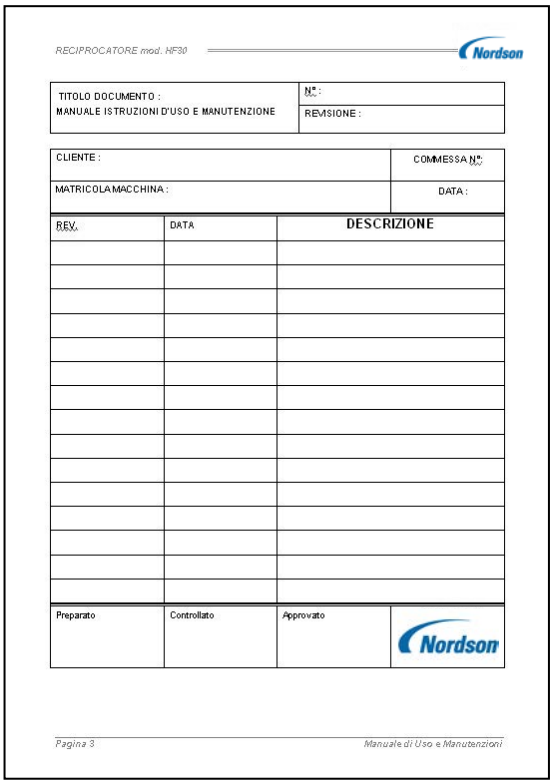
Electrical maintenance person: a technician, qualified and authorized to install, repair and carry out special maintenance exclusively electrical.

Manufacturer's technician with mechanical competences: for complex and/or special operations.

Manufacturer's technician with electrical or electronic competences: for complex and/or special operations.

0.7 Machine updates

In the case of technical changes made by ***Nordson*** during the operating life of the machine an appropriate revision of the document itself will be supplied with the essential data specified on the page "**DOCUMENT IDENTIFICATION**".



RECIPROCATORE mod. HF30

TITOLO DOCUMENTO : MANUALE ISTRUZIONI D'USO E MANUTENZIONE	N° : REVISIONE :

CLIENTE :	COMMESSA N°:
MATRICOLA MACCHINA :	DATA :

REV.	DATA	DESCRIZIONE

Preparato	Controllato	Approvato	
			Nordson

Pagina 3 Manuale di Uso e Manutenzioni

In the case that ***Nordson*** submits a copy of the document with revisions, the costumer should see to the elimination of the parts concerned and to the replacement.

0.8 How to ask for further copies

Further copies should be ordered from ***Nordson*** offices (see tables at pages 8 and 9):

0.9 Responsibilities

This manual reflects the technical state of the machine at the moment of sale and it is open to changes, depending on the firm opinion of the manufacturer.

In case of manual changes the manufacturer is not obliged to update those manuals that accompany machines already sold.

The manufacturer is released from any responsibility in any case of improper or incorrect use such as, for example:

- the use of the machine by not trained staff;
- use without following the regulations in force;
- incorrect installation;
- mains supply defects;
- serious lack of maintenance;
- unauthorized modifications to the machine;
- the use of spare parts not supplied or approved by ***Nordson***
- failure to follow the "operating and maintenance manual";

It must be remembered that any total or partial reproduction of this manual is forbidden unless authorised by ***Nordson.***

1.0 TECHNICAL ASSISTANCE

For any technical or commercial requirements, please contact the relevant ***Nordson*** office from the list on page 9/10 in this manual.

2.0 GENERAL SAFETY INSTRUCTIONS

Each interaction between the worker and the machine has been carefully studied and analysed during the planning stages.
The choice in construction, the technical features of the machine and the indications reported in this document are intended to guarantee the greatest safety level to the operator.
According to the **"Machinery directive" 2006/42/CE** it is useful to remember the following definitions:

“Dangerous zones”: every zone inside and/or in proximity to a machine where the presence of an exposed person is a danger to safety and health.

“Exposed person”: any person situated entirely or partially in a dangerous zone.

“Worker”: a person/operator instructed to operate, regulate and carry out ordinary maintenance and/or clean the machine.

To better define the limit of operation and relevant qualifications of the **"worker”** and to help them understand the manual easier, the following classifications have been used:

Conductor:

qualified and authorized person that has been instructed to start the machine with the necessary protections in place via the use of the commands on the push-button panel.

Mechanical maintenance person:

a technician, qualified and authorized to install, repair and carry out special maintenance that is exclusively mechanical.

Electrical maintenance person:

a technician, qualified and authorized to install, repair and carry out special maintenance exclusively electrical.

Manufacturer's technician with mechanical competences:

for complex and/or special operations.

Manufacturer's technician with electrical or electronic competences:

for complex and/or special operations.

The employer should provide the necessary training to the staff regarding the risks of accidents, and safety devices to protect the worker, and must also insist on the observance of rules and company instructions about safety and protection measures.

The worker has to respect the instructions given by the employer or other authorised people and particularly:

- Use the machine as intended by design, equipment, tools and safety devices
- Use correctly the individual protective devices
- Notify immediately, any dangerous conditions
- Must not remove or modify safety devices or control signal
- Follow scrupulously the indications in this manual

The unauthorised tampering and substitution of one or more parts or groups of the machine, the use of equipment or normal wear material other than that indicated by ***Nordson***, can pose a risk of accidents and hence release the manufacturer from civil or penal responsibilities.

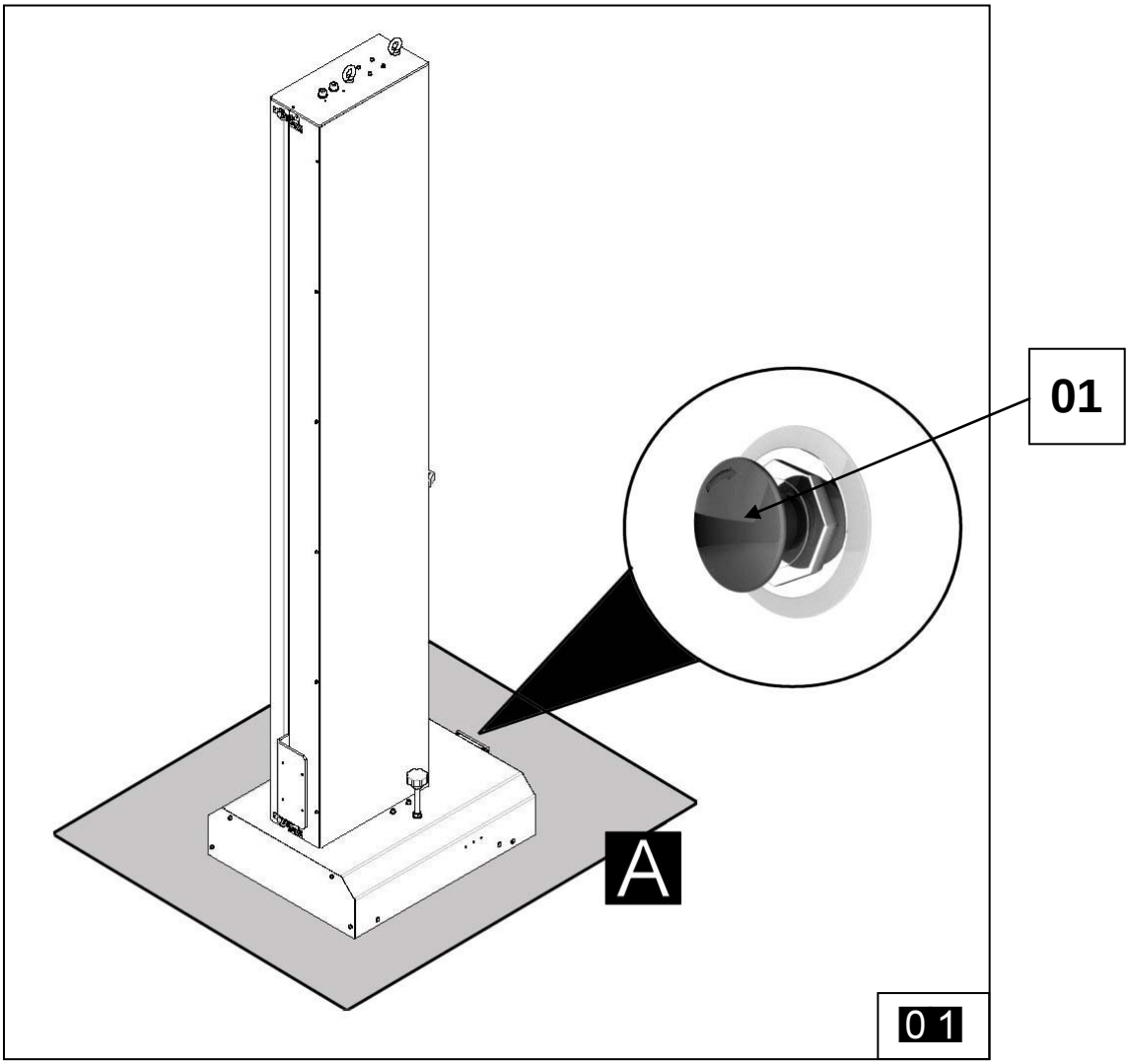
ATTENTION : Before starting up the machine and carrying out working operations, electric boards, control panels, and all protections, must be closed and the working area must be free and clean.

ATTENTION : If this machine is an integral part of a plant, it is forbidden to start it unless the whole plant is in compliance with the **"Machine directive" 2006/42/CE** and those that follow.

2.1 Dangerous areas and placing of safety devices

- Due to the structural typology of the machine that is integrated in painting plants, it is necessary to determine and fence an area 0 1 A where the operator must not enter when the plant is in function.

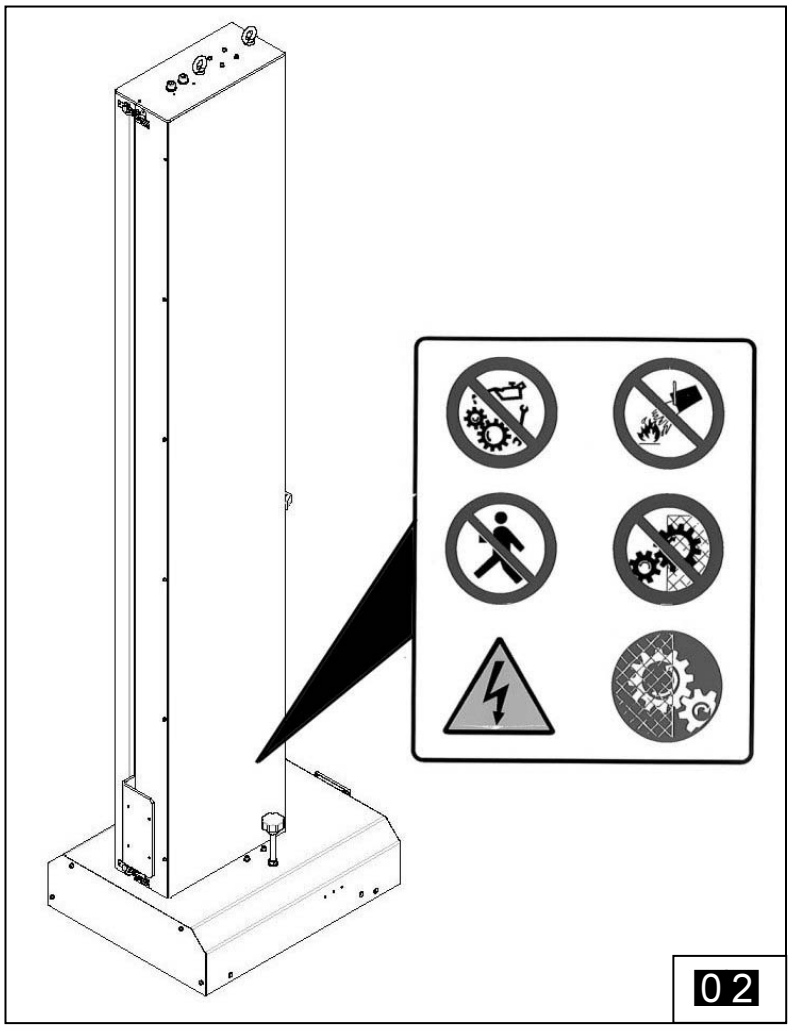
- Emergency stop: the position of the emergency/stop button 0 1 **(01)** depends on the type of control module connected to the machine and it has to be integrated to the emergency circuit of the general plant (see the attached wiring diagrams)



2.2 Position of warning labels

The warning labels that are clearly visible and attached to the machine are additional and not alternative measures to the already foreseen protections.

Such labels further improve the operator's safety, in that they give correct information regarding requirements and cautions.



2.3 General prohibitions


Do not remove safety devices and protections.


Temporary removal of protections - protections and safety devices of the machine must NOT be removed during maintenance; it is necessary to adopt immediately measures to reduce risks, under the supervision of authorised people.


It is forbidden for any person, except the conductor, to access to the operating area of the machine.


Do not clear or lubricate while the machine is running.


It is forbidden to use water to put out fires.

2.4 General obligations


Switch off at the mains supply before unplugging electrical devices.


Check the effectiveness of protections and precautionary measures.


Notify immediately faults and lack of protections and precautionary measures and any dangerous situation.

2.5 Danger


High voltage.

2.6 Advice about lighting

The machine is not provided with an autonomous lighting system, because a normal working environment condition, that is at least 300 lux, is sufficient.

The customer should supply a similar lighting value, to carry out the normal working operations.

For maintenance work a portable lamp is recommended.

3.0 DESCRIPTION OF THE MACHINE

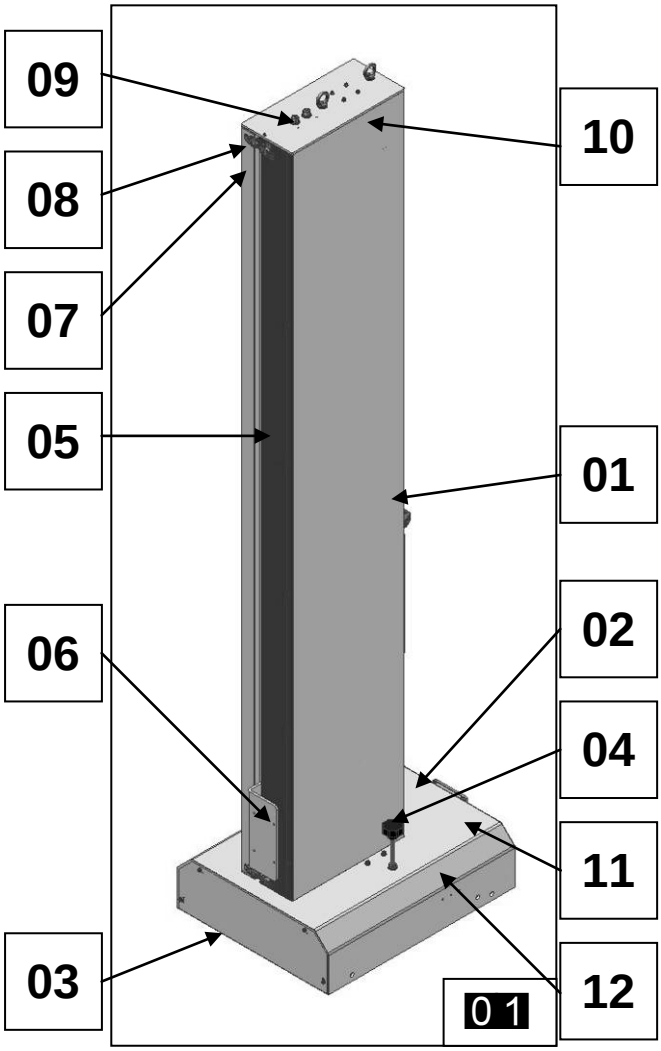
The ever-increasing need to produce automatically and to optimise the production cycles of spray-coating systems has led in these years to the development of reciprocators, that, replacing the operator during the most repetitive phases of working processes, eliminate errors caused by carelessness and inexperience.

The new generation of reciprocators by ***Nordson*** has been studied in order to increase the requirements of productions and, beginning from the simplest model, technical advanced solutions are used, that eliminate manual works carried out from the edge of machine, previously essential. In fact all adjustments are achieved directly from the control board via simple and immediate commands.

The **Reciprocators mod. HF** are the most efficient solution in automated systems; they have been studied to support loads to 30 Kg (**HF30**) up to 80Kg (**HF80**); they allow a great versatility in use, because they can be used individually as well as in integrated automation systems and automation systems with computerized control.

Description

The reciprocator mod. HF is a self-supporting structure 01**(01)**, which includes a basement 01**(02)** which assures total stability.
In order to help the positioning, the base is equipped with rotating wheels 01**(03)** while in order to achieve a correct levelling of the machine, also on uneven floors, adjustment blocks are provided 01**(04)**.
A special guide 01**(05)** which is fixed to the inner part of the structure, allows a trolley to slide via two pairs of wheels or sliding blocks (for the HF80 version) 01**(06)**.
A second guide 01**(07)** is placed near the counterweight 01**(08)** in order to guide it in its movements; in this way noises and vibrations are reduced to the minimum.
The movement occurs via a pulleys system 01**(09)** and a toothed belt 01**(10)** and the stroke width is controlled by an encoder (if required) 01**(11)**.
The movement is guaranteed by a strong gearmotor 01**(12)** located under the basement.

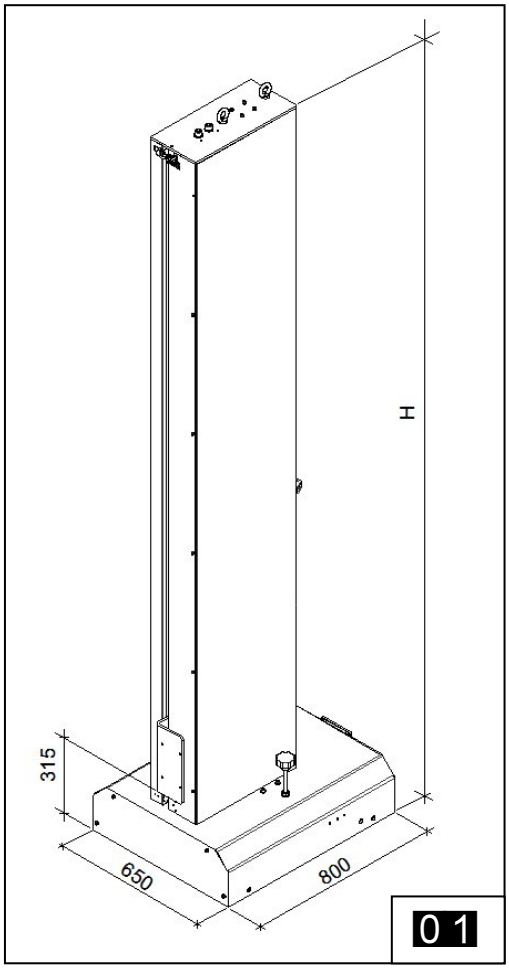


3.1 Terminology used

- **TROLLEY:** used to move the arm of the spray-gun in a vertical motion.
- **ARM:** part of the machine for fitting the spray gun.
- **GUN:** apparatus also supplied by ***Nordson*** suitable for the spraying of various powder and liquid coatings.

4.0 TECHNICAL DATA

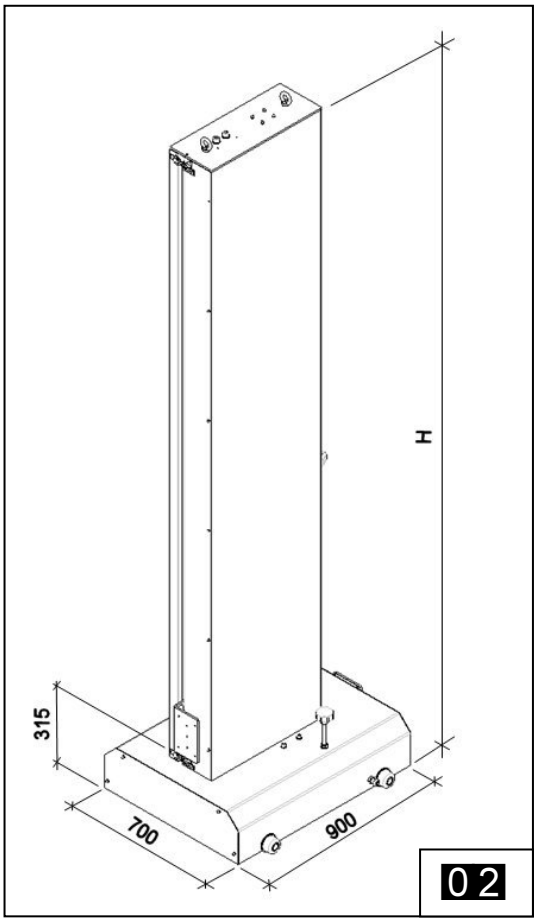
4.1 Weights and overall dimensions HF30



ATTENTION: It is forbidden to use the machine in the presence of explosive atmosphere.

STANDARD VERSIONS	HF30 170	HF30 220	HF30 270	HF30 320
TOTAL HEIGHT "H"	2.500 mm	3.000 mm	3.500 mm	4.000 mm
USEFUL STROKE	1.700 mm	2.200 mm	2.700 mm	3.200 mm
DISTANCE FROM THE GROUND	315 mm	315 mm	315 mm	315 mm
MIN SPEED	10 m/min	10 m/min	10 m/min	10 m/min
MAX SPEED	50 m/min	50 m/min	50 m/min	50 m/min
CAPACITY (referred to the column)	30 Kg	30 Kg	30 Kg	30 Kg
TOTAL WEIGHT	200 Kg	220 Kg	240 Kg	260 Kg
NOISE	< 70 dB			
RATED POWER	0,5 Kw			
POWER SUPPLY	230 VAC +/- 10% 3F 50 Hz			

4.2 Weights and overall dimensions HF80



ATTENTION: It is forbidden to use the machine in the presence of explosive atmosphere.

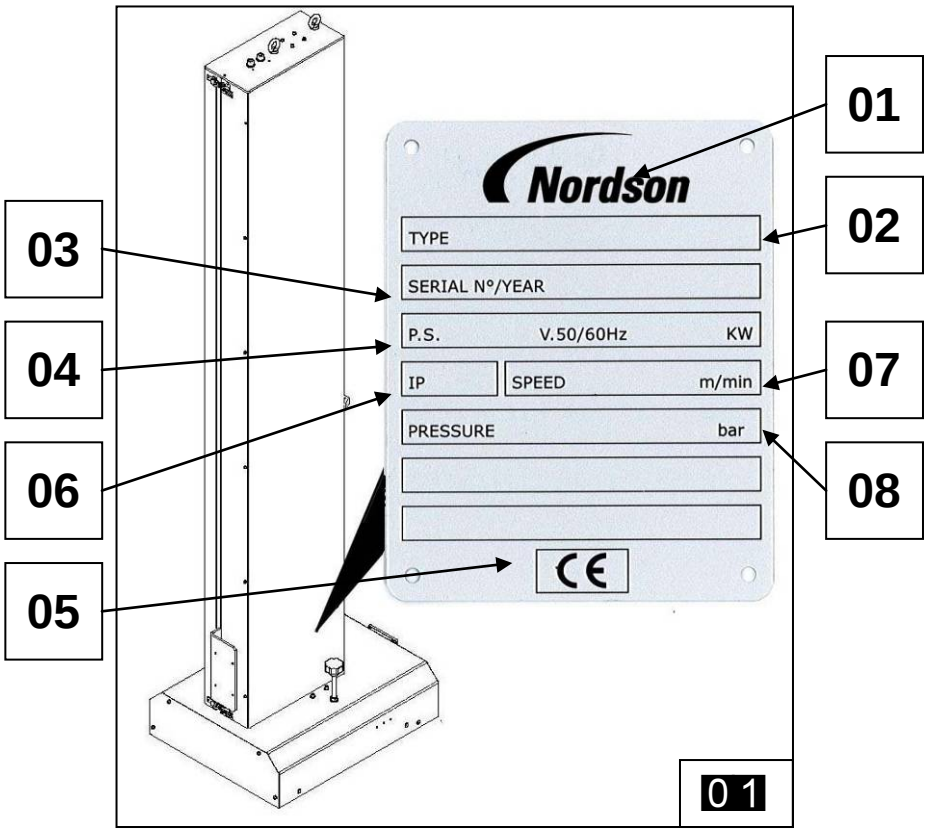
STANDARD VERSIONS	HF80 170	HF80 220	HF80 270	HF80 320
TOTAL HEIGHT "H"	2.500 mm	3.000 mm	3.500 mm	4.000 mm
USEFUL STROKE	1.700 mm	2.200 mm	2.700 mm	3.200 mm
DISTANCE FROM THE GROUND	315 mm	315 mm	315 mm	315 mm
MIN SPEED	10 m/min	10 m/min	10 m/min	10 m/min
MAX SPEED	50 m/min	50 m/min	50 m/min	50 m/min
CAPACITY (referred to the column)	80 Kg	80 Kg	80 Kg	80 Kg
TOTAL WEIGHT	275 Kg	300 Kg	325 Kg	350 Kg
NOISE	< 70 Db			
RATED POWER	0,75 Kw			
POWER SUPPLY	230 VAC +/- 10% 3F 50 Hz			

5.0 IDENTIFICATION OF THE MACHINE

5.0.1 - This manual contains the operating and maintenance instructions for the machine manufactured by ***Nordson.***
The figure 01 shows the location of the identification plate of the machine that specifies the following information:

- 01**(01)** Name of the manufacturer/Address
- 01**(02)** Type
- 01**(03)** Serial number and Year of manufacture
- 01**(04)** Power supply
- 01**(05)** Certification mark
- 01**(06)** Protection level
- 01**(07)** Speed
- 01**(08)** Pressure (only for pneumatic releases)

ATTENZIONE: the serial no. 01 **(03)** on the plate must be mentioned whenever contacting the Manufacturer for information or spare parts.



5.0.2 - Copies of the plates **"CE MARK"**, applied to each machine, and the relevant **"DECLARATION OF CONFORMITY"** are attached.

5.0.3 - If the plate **CE MARKING** is accidentally damaged, removed from the machine or simply the manufacturer mark is removed, the customer must inform ***Nordson*.**

6.0 FORESEEN AND UNFORESEEN USE OF THE MACHINE

The use of the **Reciprocator mod. HF** is foreseen **exclusively** for automatic systems of spray-coating with various powders or paints. Contact **Nordson** for more information.
It has been planned for automatic guns that perform vertical and horizontal movements.

ATTENTION : If this machine is an integral part of a plant , it is forbidden to start it unless the whole plant is in compliance with the **"Machine directive" 2006/42/CE** and those that follow.

The use of the machine must be carried out **exclusively** by staff that knows its work and have acknowledged all that is described on this manual.

It is absolutely forbidden to use the machine for any use other than that for what it is intended unless a specific request has been made to ***Nordson***.

The incorrect use of the machine could cause risks both to the operator and to the machine itself.

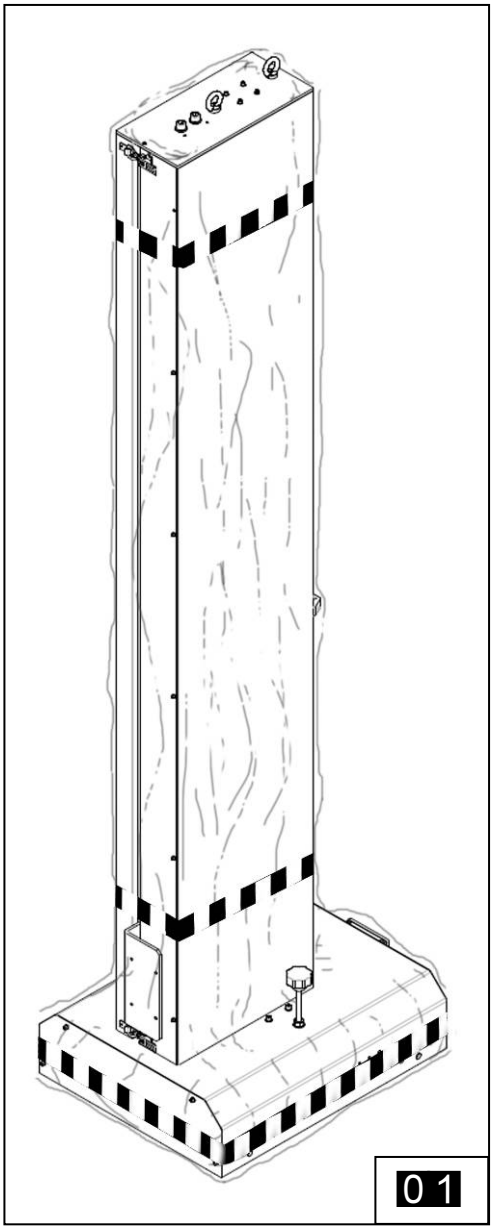
6.1 Additional risks

The normal automatic modality of the machine does not foreseen risks, on condition that the whole plant, where the machine is integrated, is in compliance with the **"Machine directive" 2006/42/CE.**

The only residual risk is the possibility to reach the movable sliding vertical parts with the upper limbs.
This risk can occur only during the maintenance operations where the operator is in close contact with the machine.
In any case the risk has been limited by using special protections and safety plates that inform and make the reaching of the dangerous zone difficult.

7.0 MOVING AND TRANSPORT

The machine is normally sent completely wrapped up with Pluriball, but depending on distance and type of contractual agreements it may be also secured to a pallet or in a crate. 0 1



7.1 Staff qualification

During the movement and unloading from the means of transport qualified staff for the use of fork lift trucks, cranes or hoists should be used.

7.2 Equipment and means to use

ATTENTION: Before carrying out any moving operations of the machine, make sure there is nobody in the proximity.

Use chains and ropes and make sure that their characteristics are compatible with the weight and the overall dimension of the machine to move and in accordance with the regulations in force.

ADVICE

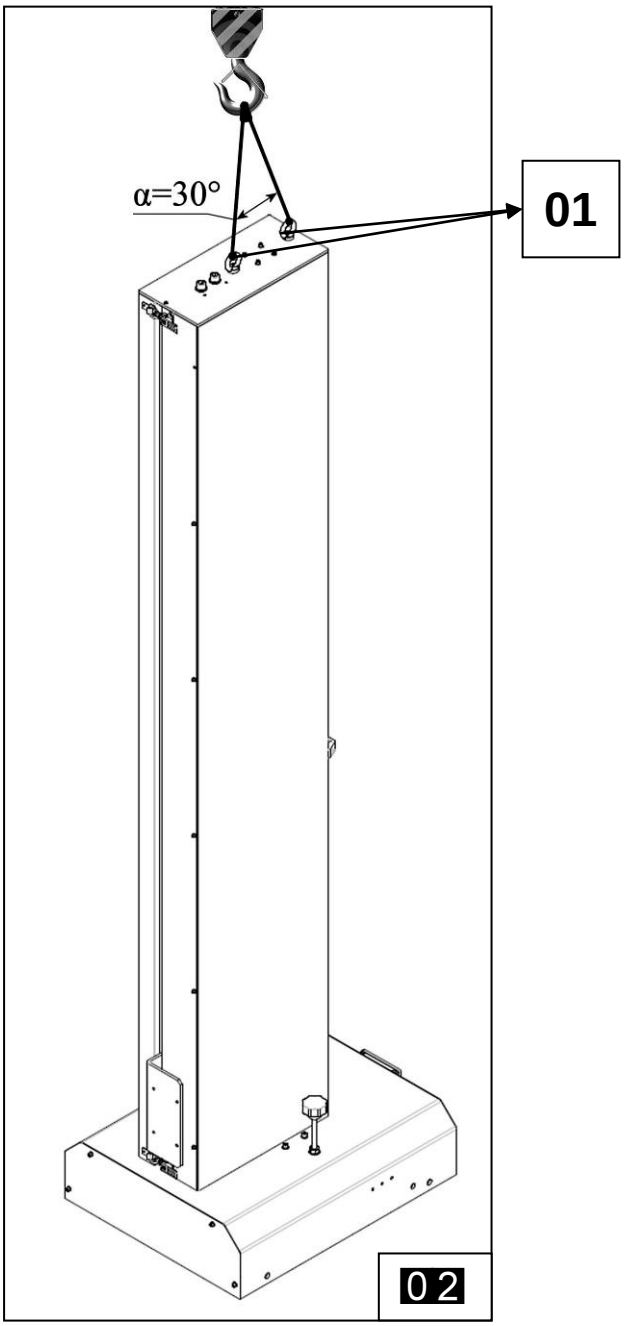
- Slings must be in accordance with the regulations ISO 4878 - ISO 9351.
- Only use slings, if the label, indicating all manufacturer's data, is attached and the capacity is clearly shown.
- Check slings before each lifting.
- Do not used in case of damage, cuts or wear.
- Follow the load factors indicated for each standard configuration.
- Use suitable protections to lift loads with sharp corners.
- Do not twist or knot the belt.
- Follow the instructions for use indicated by the supplier.
- Hook the other ends of the slings on to the hook of the lifting machineries.

7.3 Advice about lifting

Depending on transport conditions, the reciprocator by ***Nordson*** can be moved by lifting with ropes or fork lift trucks.

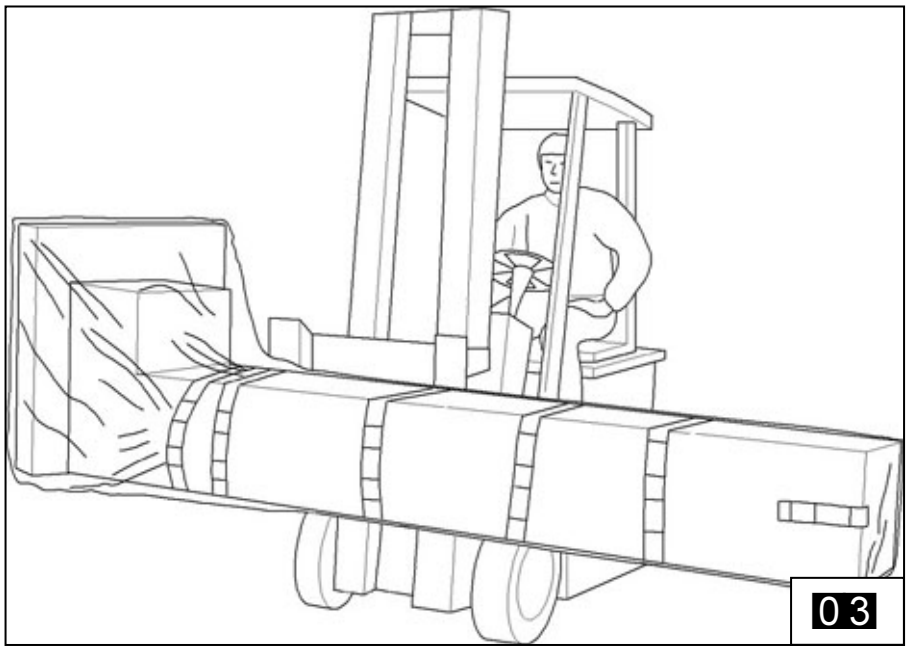
7.3.1 Lifting with ropes

Place the special lifting eyebolts 02 **(01)** in the special hooking points as indicated in figure 02 using two ropes, with maximum corner a equal to 30° and rope characteristics adapted to the lifting of loads indicated.



7.3.2 Lifting with machines

If the reciprocator by ***Nordson*** is moved horizontally, it is necessary to lay it down on the forks of the forklift truck paying attention to position the spray coupler facing down as in figure 03.



7.4 Storage conditions

If the machine has already been installed and a storage period, during which the machine will not be used, is necessary, all precautions must be taken to avoid contact with dust dirt, humidity and all moving mechanical parts that are prone to rust must be covered with a layer of grease. If the machine has to be moved, wrap it up with Pluriball and follow the previous procedures in order to move it.

7.5 Checking the machine

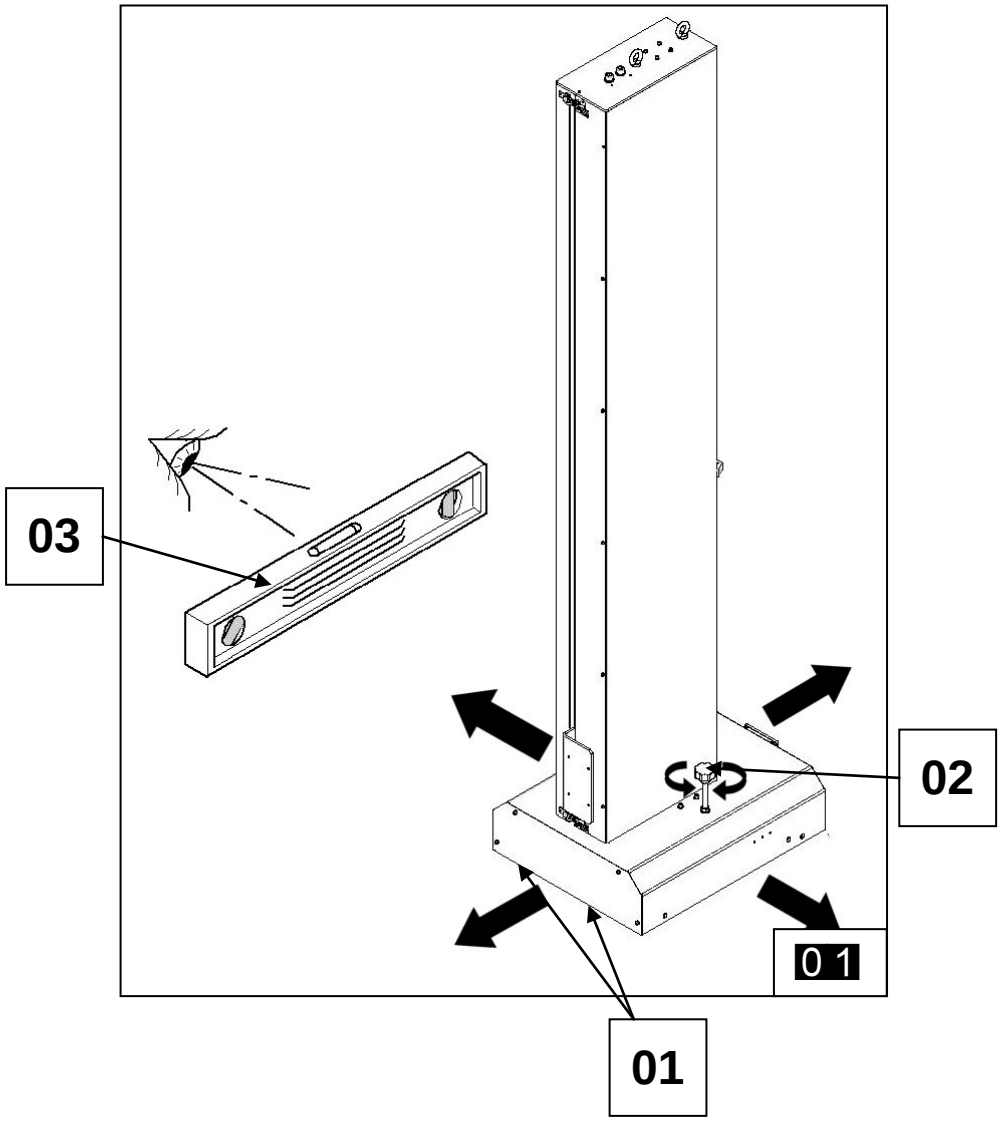
When unpacking the machine, check immediately that during transport none of the parts have been damaged.

Any damage to the machine, loss of additional or supplied parts must be communicated immediately to ***Nordson.***

8.0 MACHINE INSTALLATION

There is no particular advice or precautions to take during the installation of the machine that can be placed on a normal floor, suitably levelled.

To place the machine in a paint plant, it is sufficient to let it slide on the wheels 0 1**(01)**, under the basement, up to the required position.
Turn the special gradual knobs 0 1**(02)** to level the machine and block the safety lock nut 0 1**(03)**.
NOTE: check the correct vertical position of the machine 0 1**(04).**



8.1 Environmental conditions

The machine can work with the following environmental and climatic conditions:

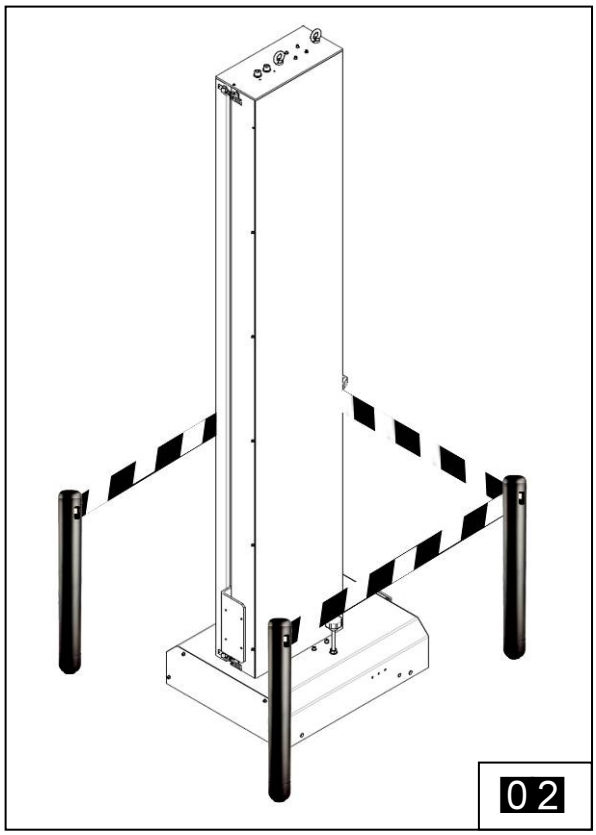
- Environmental luminosity **min.300 Lux.**
- Environmental temperature **+5°/+40° C**
- Relative humidity maximum **50%** to **40° C**
- Relative humidity maximum **90%** to **20° C**

ATTENTION: It is forbidden to use the machine in explosive atmospheres.

ATTENTION : In case of use in explosive atmospheres, it is possible to supply the version according to the ATEX directive (to advise during the order).

8.2 Need of free spaces

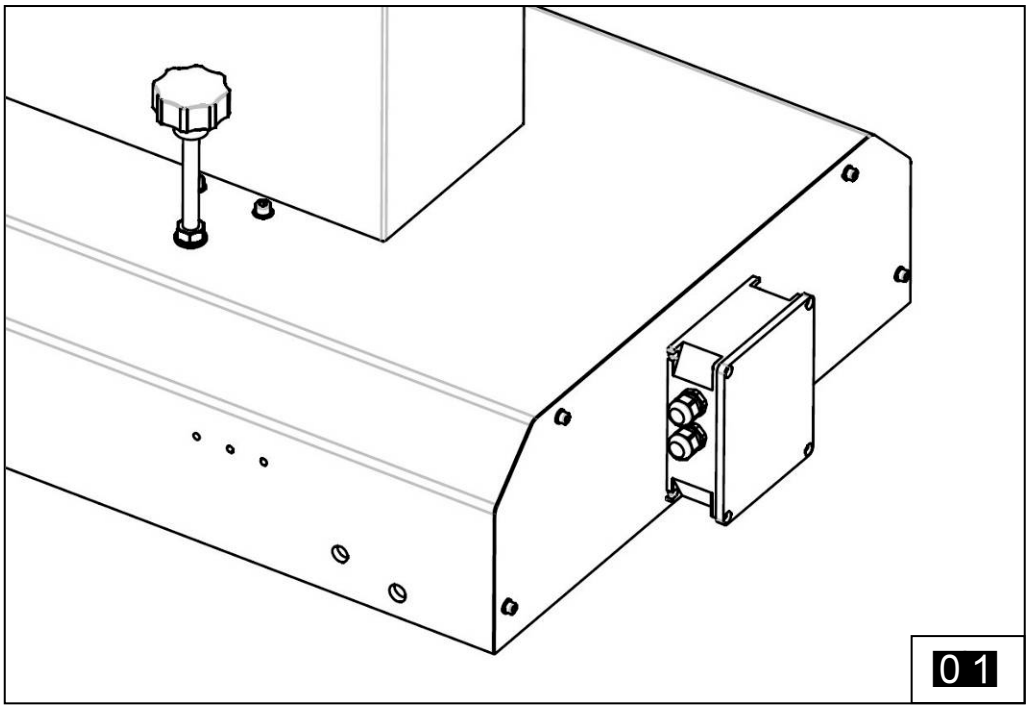
ATTENTION : When the reciprocator is positioned, it is necessary to define the area, where the moving parts (gun supporting arm) have their range, according to the EEC laws regarding the security on working stations. 0 2



9.0 SETTING UP THE MACHINE

9.1 Connection of the reciprocator to the control module

Connect the machine with the control module, by using the cables already connected to the junction box. 0 1



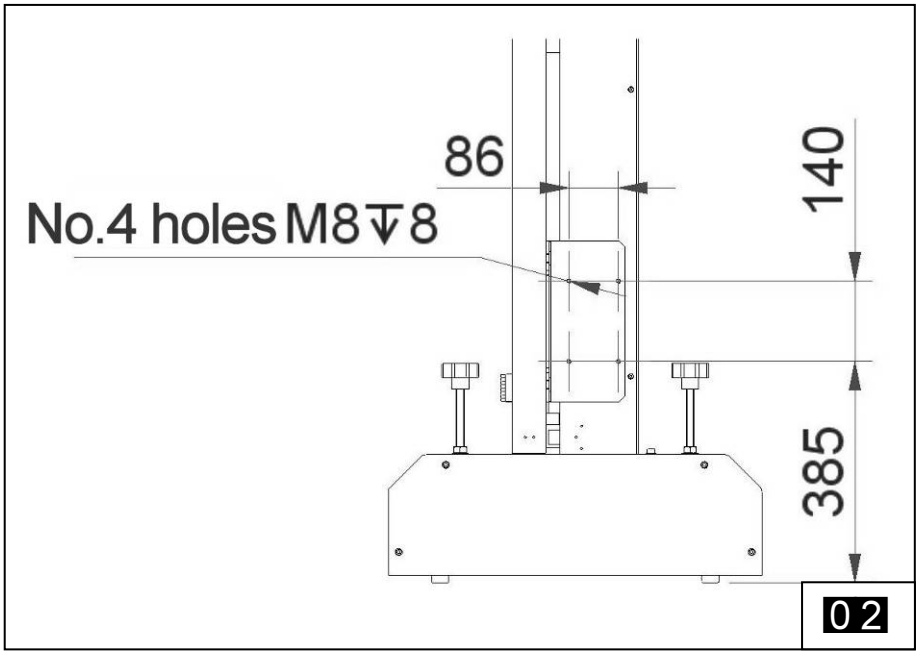
ATTENTION: The reciprocator mod. HF is projected to be connected to control modules series HQ; for any other kind of connections, contact the ***Nordson*** technical office in advance.

NOTE: for the electrical connections, see the wiring diagram attached.

9.2 Assembly of guns supports

An attachment is located on the reciprocator for fitting the gun supporting-arm.

Here below, the drawing with the dimensions of the holes available on the standard plate of the reciprocator. 0 2



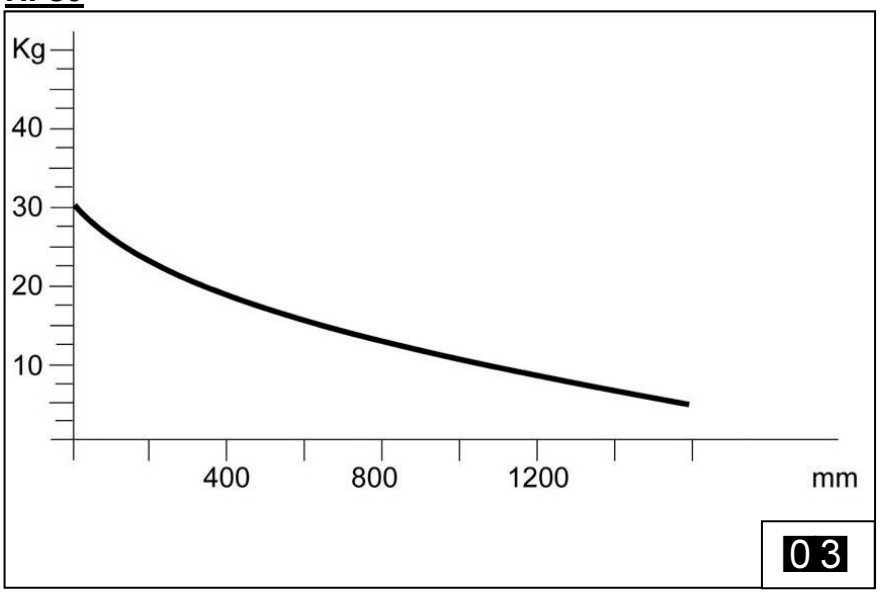
ATTENTION: The reciprocator HF30 has a maximum capacity of 30 kg and the reciprocator HF80 has a maximum capacity of 80 Kg; this value reduces depending on the position of the centre of the load. To determine the correct position see **Chapter 9.3** “Machine balancing”.

ATTENTION: the arms must be grounded.

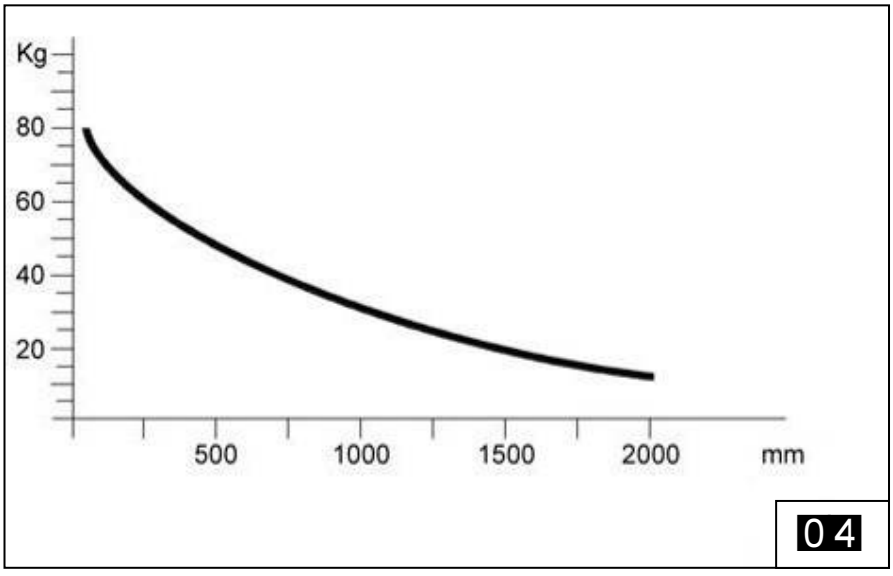
9.3 Machine balancing

The reciprocator HF by ***Nordson*** can support a maximum capacity of 30 or 80kg; this value reduces depending on the position of the gun supports as indicated in the graph in fig. 03
The machine is supplied, if agreed in the order, already balanced.
In case of no specification, the standard configuration is composed of 12 steel counterweights (with a total weight of 32 Kg) for the HF30 and 30 steel counterweights (with a total weight of 72 Kg) for the HF80; further additions can be agreed upon with ***Nordson.***

HF30



HF80



10.0 BEFORE START UP

When starting the machine no particular preparatory procedures are necessary because the machine is tested and adjusted in all its functions by ***Nordson.***

10.1 Staff qualification

The operator of the machine, before carrying out any kind of productive cycle, must know all the information, shown in this technical manual about the machine.

10.2 Foreseen control positions

The machine has been projected to be commanded and controlled in all its functions by one operator only.

The foreseen working position is in front of the control panel, integrated in the control system of the plant, from where the operator can verify the correct working of the plant.

10.3 Control modules

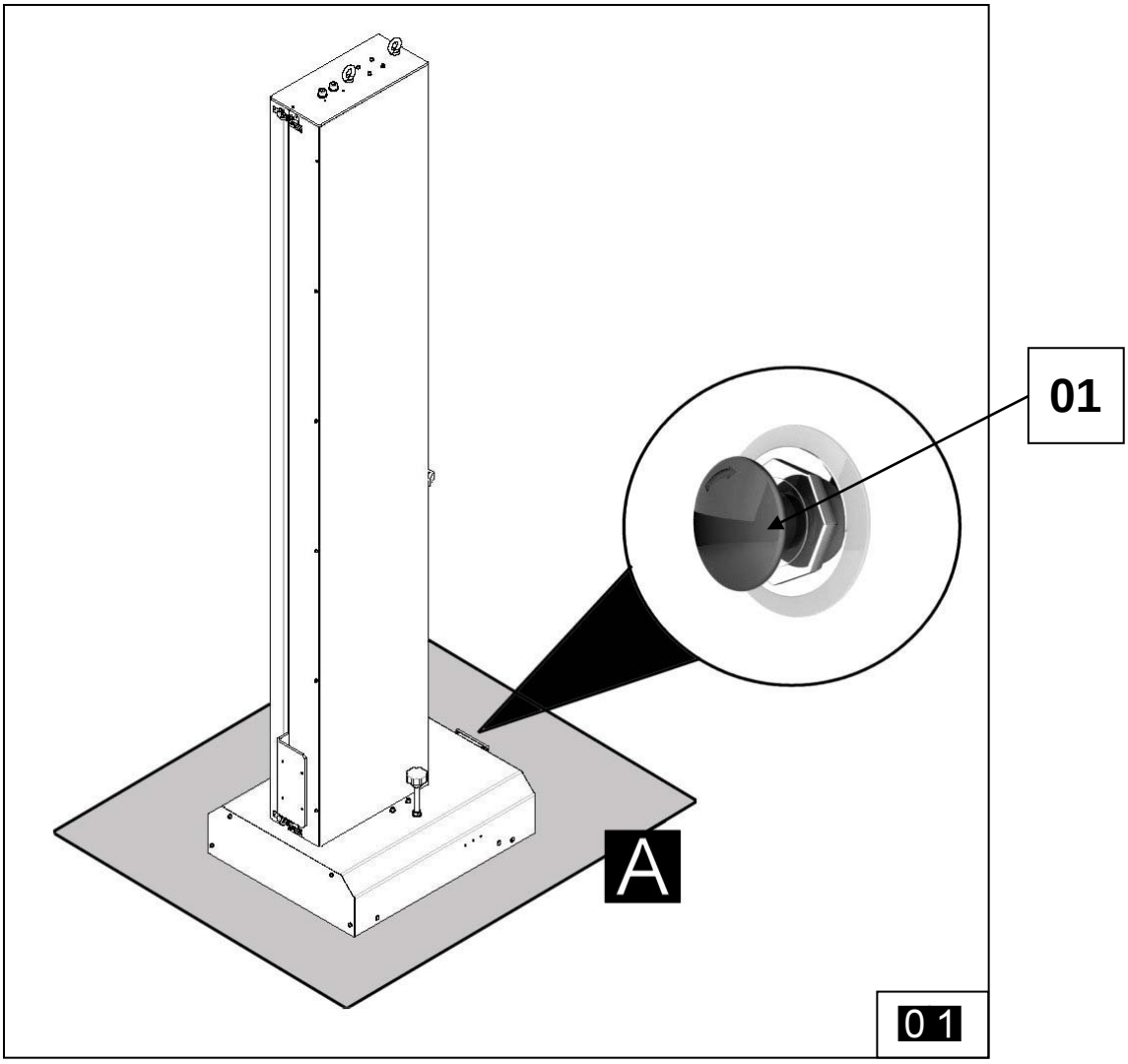
The ***Nordson*** **HF Reciprocator** is design to be operated by control module series HQ, however, they can also be used with the Nordson iControl – Application Control System.

For the descriptions of modules refer to the operating manual supplied.

10.4 Emergency buttons and their placing

In case of danger, failure or any emergencies it is necessary to press the **EMERGENCY STOP** push button **01 (01)** common to the whole plant.

To reset press the **EMERGENCY** push button, with rotating it.



NOTE: all Nordson controllers are equipped with an emergency push-button, which can be connected to the rest of the plant.

11.0 USE OF THE MACHINE

For a correct use and programming, see the operating manual of the control module.

12.0 MAINTENANCE FOR HF30

In order to have a safe, efficient and reliable machine, careful and constant maintenance is essential.

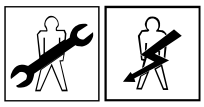
12.1 General safety advice

It is compulsory, before any maintenance to turn off the power and use any protective devices necessary during all intervention phases.

12.2 Technical competence

There are three kinds of maintenance interventions:

INTERVENTIONS THAT REQUIRE SPECIFIC TECHNICAL COMPETENCE
Can be carried out by not specific staff and usually regard cleaning duties.



INTERVENTIONS THAT REQUIRE SPECIFIC TECHNICAL COMPETENCE
Can only be carried out by staff qualified by customer and regard ordinary maintenance. Mechanical or electric competences may be required.

INTERVENTIONS THAT REQUIRE PARTICULAR TECHNICAL COMPETENCE
Can only be carried out by ***Nordson*** qualified mechanical or electrical technicians***.***

At the beginning of each paragraph, referring to the various maintenance subjects, the relative symbol referring to the necessary qualification of the operator is indicated.

12.3 Periodical maintenance table

PERIODICAL MAINTENANCE TABLE									
NOTE									
BIENNIAL									
ANNUAL									
SEMIANNUAL									
TRIMESTRIAL									
MONTHLY									
SEMIWEEKLY									
WEEKLY									
DAILY									
Check belt tension						▯			The 1st time after one week
Check trolley adjustment						▯			
Guide cleaning				▯					

12.4 Summery table of suggested spare parts

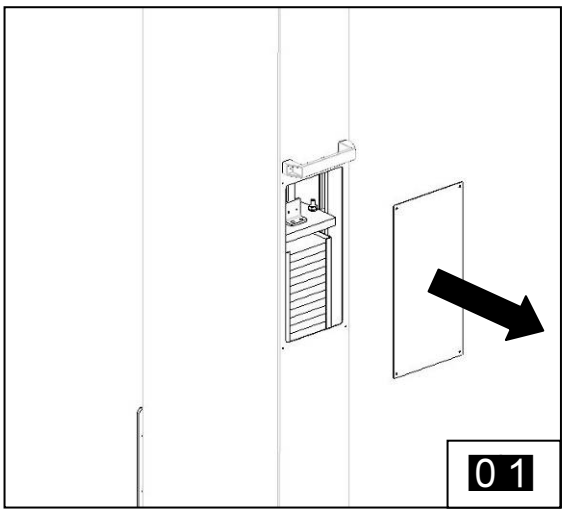
The following components are subject to wear and so a suitable stock should be kept for spare parts.

Part Number	Description
7034334	Toothed belt, HF30 17
7034335	Toothed belt, HF30 22
7034336	Toothed belt, HF30 27
7034337	Toothed belt, HF30 32
7034372	Kit,protection strip,HF30/80 1.7M
7034373	Kit,protection strip,HF30/80 2.2M
7034374	Kit,protection strip,HF30/80 2.7M
7034375	Kit,protection strip,HF30/80 3.2M
736339	Sensor,inductive,PNP,NC 12mm DIA
736296	KIT,2*CONCENTRIC,2*ECCEN WHEELS
7034353	Encoder, HF series (if present)
736828	Sensor,inductive,PNP,NO 12mm DIA (if present)
736358	Coupling,sensor encoder,recip
7034320	Gearmotor assy,HF30
7034326	Kit, 2 counterweight guide,HF30

12.5 Replacement of the gearmotor

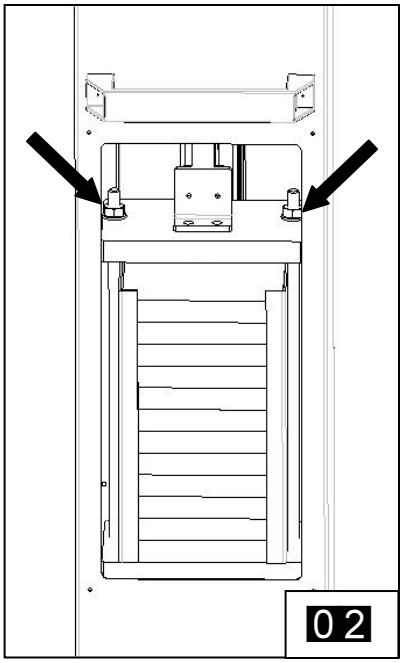
To replace the gearmotor do as follows:

- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the rear door, lift the trolley by hand so as to allow the counterweight to go down to the opening. 0 1.



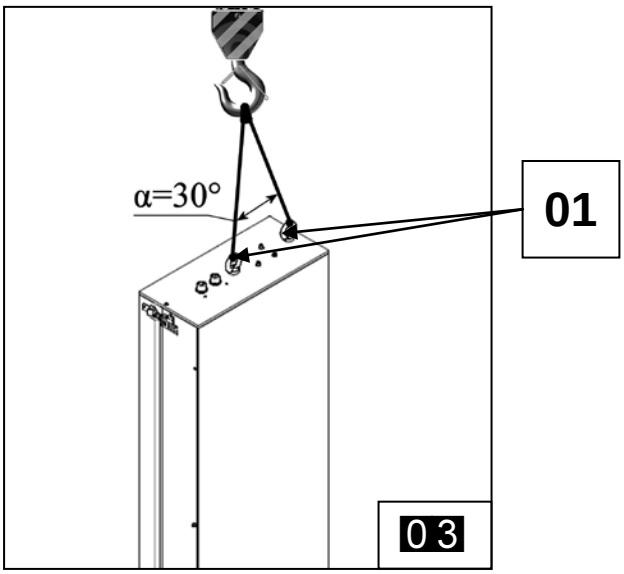
ATTENTION: To make the work easier and for safety reasons, it is better that the following operations are carried out by two operators.

- Unscrew the two nuts of the rod, with a suitable wrench, so as to slacken the belt and remove it from the pulley. 0 2

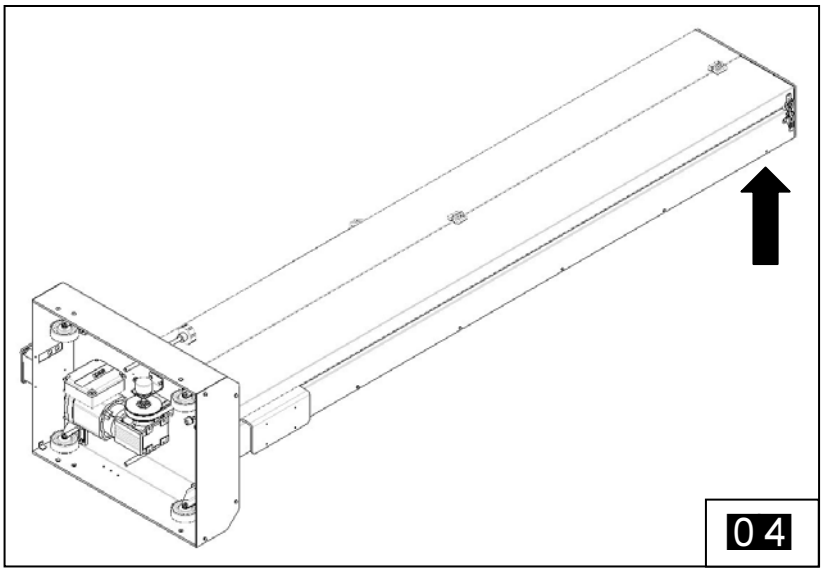


ATTENTION: do not remove the screws completely so as to avoid that the counterweight and the trolley fall.

- Place the suitable eyebolts 03 **(01)** into the holes on top of the reciprocator as in picture 03 using two ropes, with maximum corner equal to 30° and rope characteristics adapted to the lifting of loads indicated.

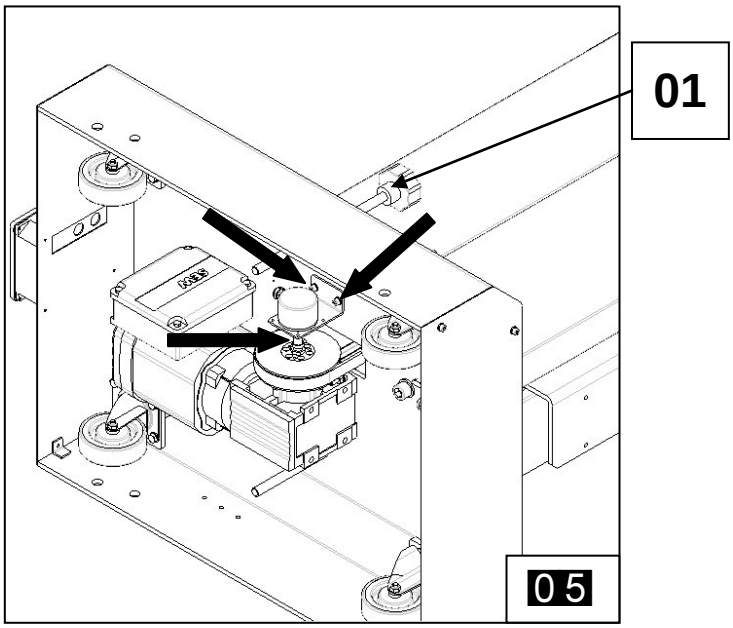


- If necessary, via a forklift truck and operating in a safety condition, lie down the reciprocator to the ground as in the picture. 04

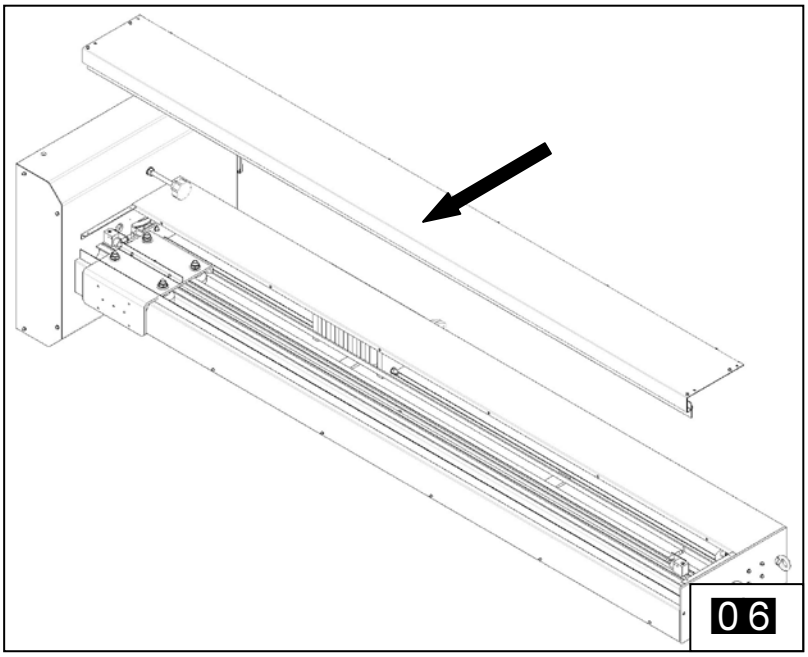


- Place some spacers at the top of the column (as indicated with the arrow in picture 04) so that the reciprocator is horizontally levelled.

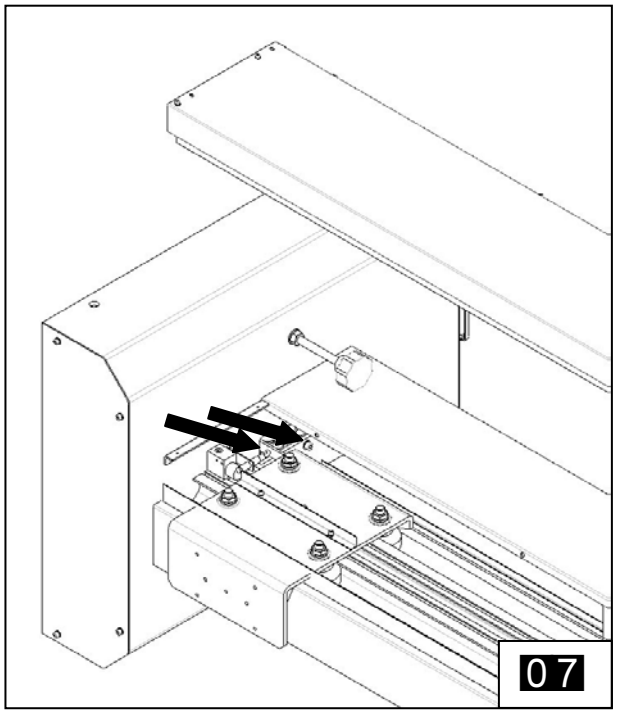
- Loose the encoder shaft by loosing the relative clamp. Remove the encoder by unscrewing its support. 05
- Remove the levelling knob. 05 **(01)**



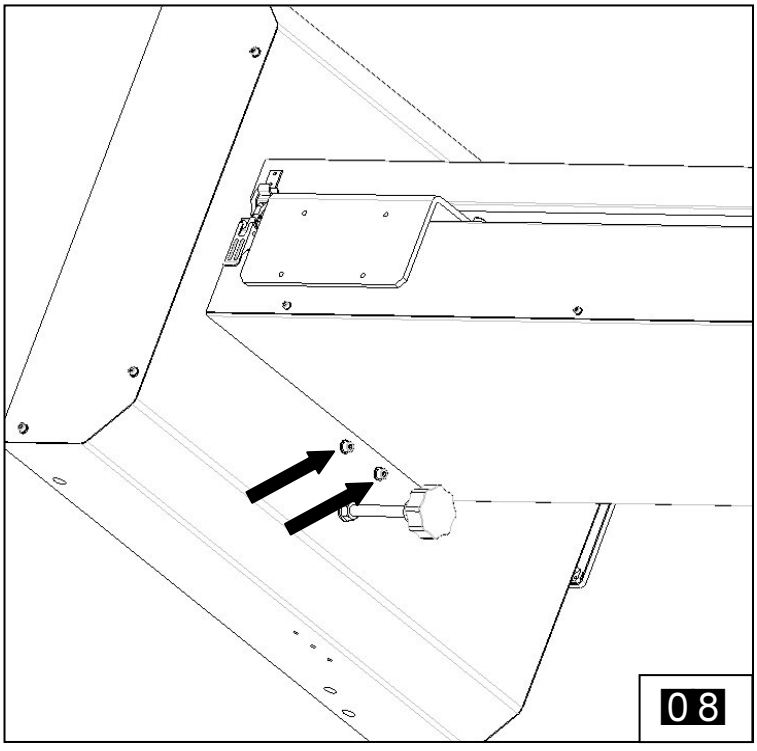
- Open completely the main inspection panel. 06



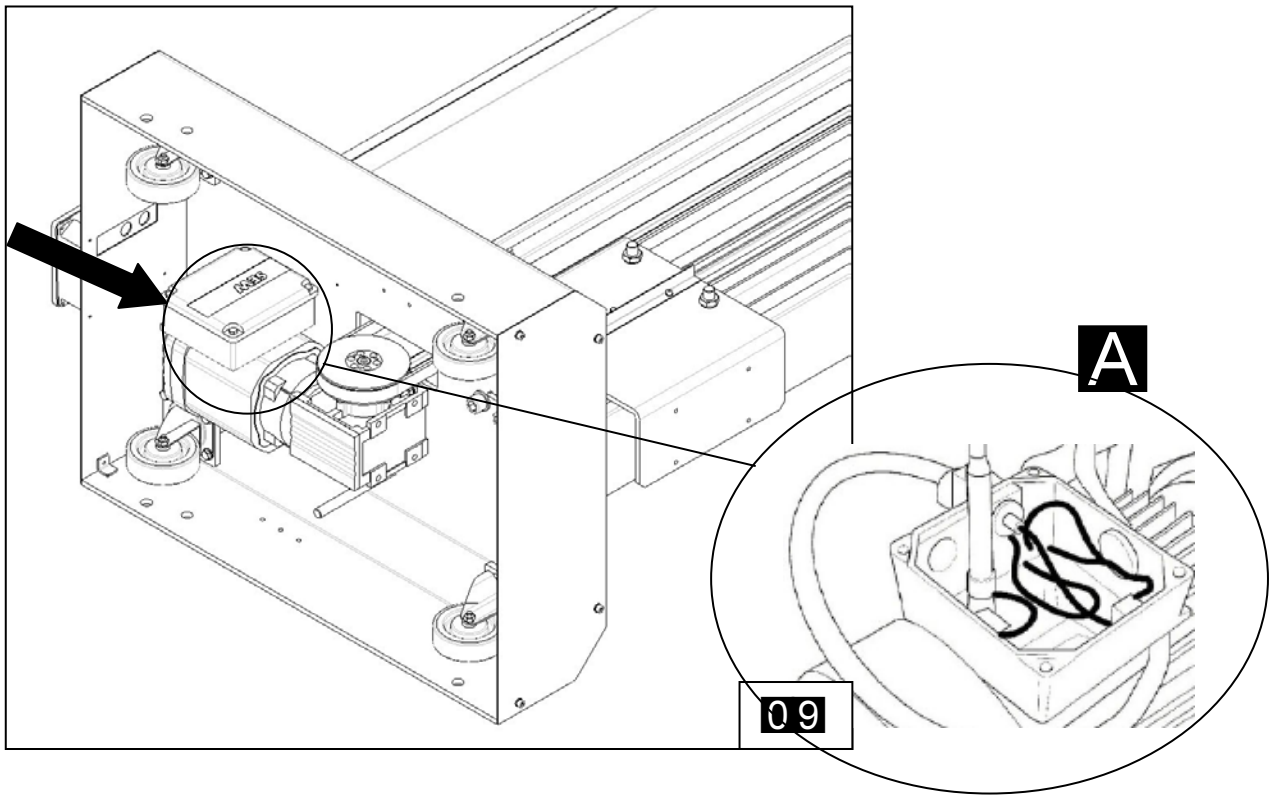
- Loosen the 2 screws inside the column which fix the gearmotor to the column. Do not remove it completely to avoid that the gearmotor falls down. 07



- Loosen the 2 external screws which fix the gearmotor to the column. Do not remove it completely to avoid that the gearmotor falls down. 08



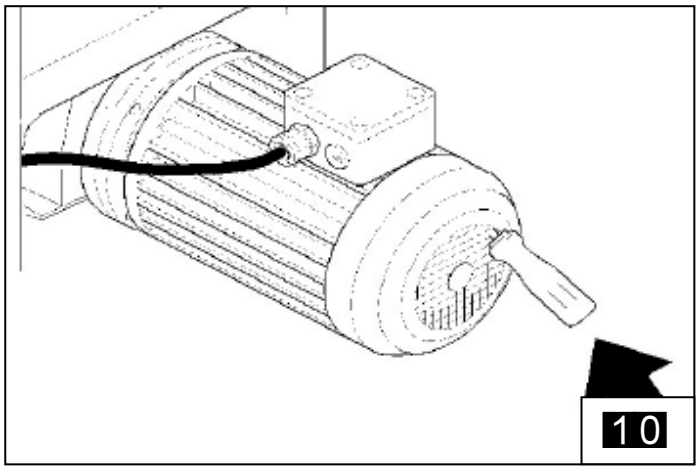
- Using a suitable wrench, open the electric box, located next to the gearmotor 09
- When the box is open, loosen the clamps and remove the cable of the gearmotor. 09□A



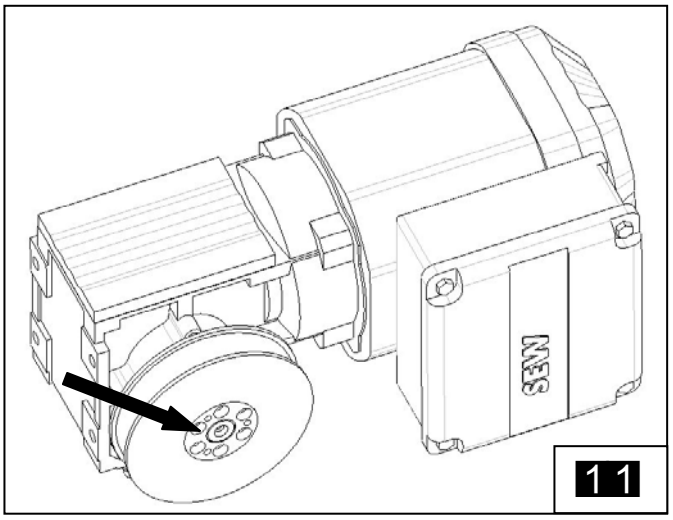
- With the help of another operator, remove the screws that support the gearmotor and remove it. Place it on a working desk before carrying out the next operations.

ATTENTION: by removing the supporting screws of the gearmotor, if not hold properly by a second operator, it can fall down causing crashing danger for the operator or damages to the machine itself.

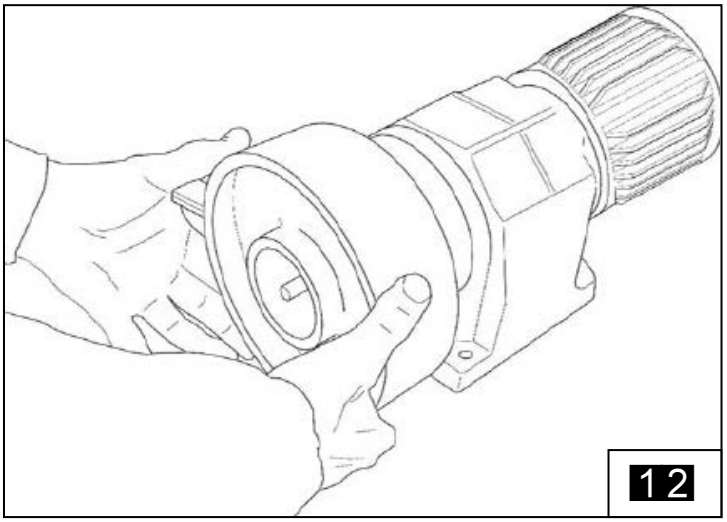
- Block the electric motor by inserting a screwdriver into the inner cooling fan. 10



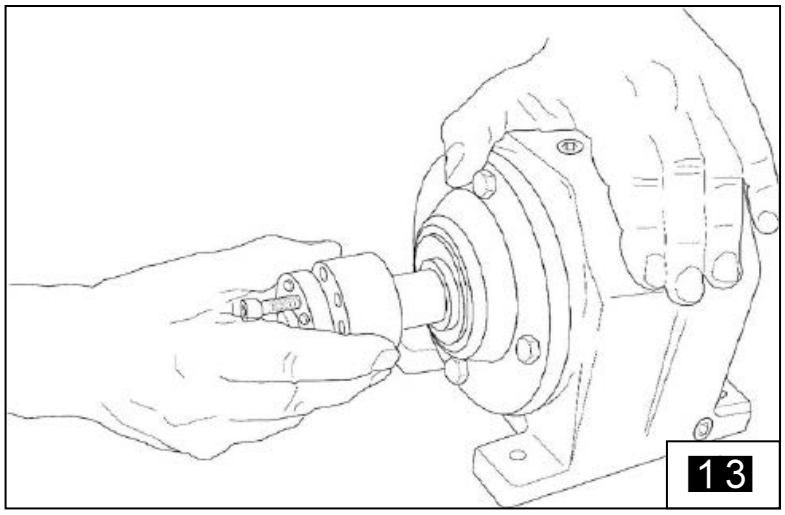
- Unscrew the screws of the ring block that fix the pulley, using a suitable wrench. 11



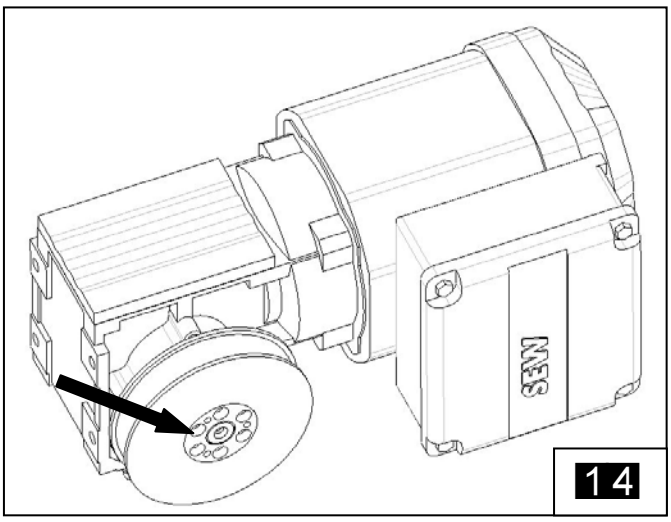
- Insert the screws, removed previously, into the special dismantle holes and screw them to remove the pulley. 12



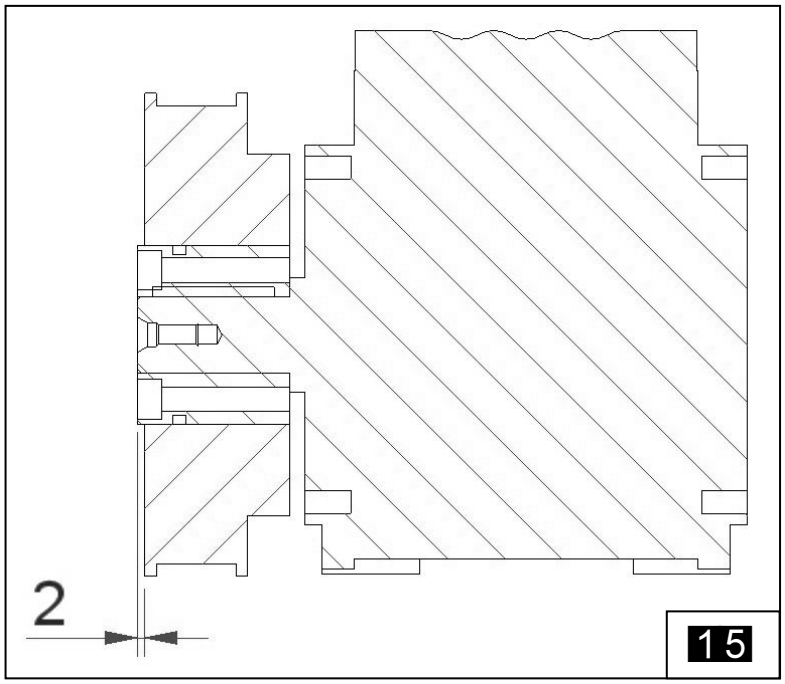
- Remove the ring block from the shaft. 13



- Clean the ring block with a cloth.
- Assemble the ring block on the new gearmotor, without closing the screws.
- Place the pulley on the driving shaft, tighten the clamping screws of the ring block, cross ways, to avoid friction. 14



- To insert correctly the pulley on the ring block assembled on the driving shaft, refer to the following drawing. 15



- Carry out the reverse operations to assemble completely the gearmotor and start up the machine.

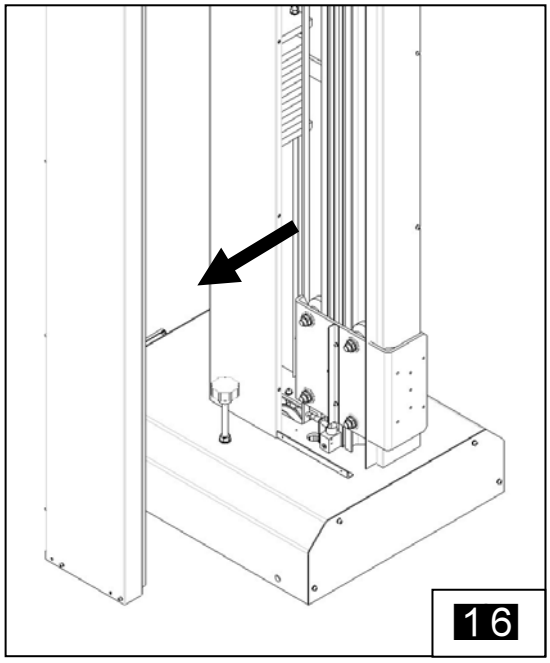
NOTE: Refer to **Chapter 9** to tighten the belt correctly.

ATTENTION: After the connection of the gearmotor, check its correct direction of rotation.

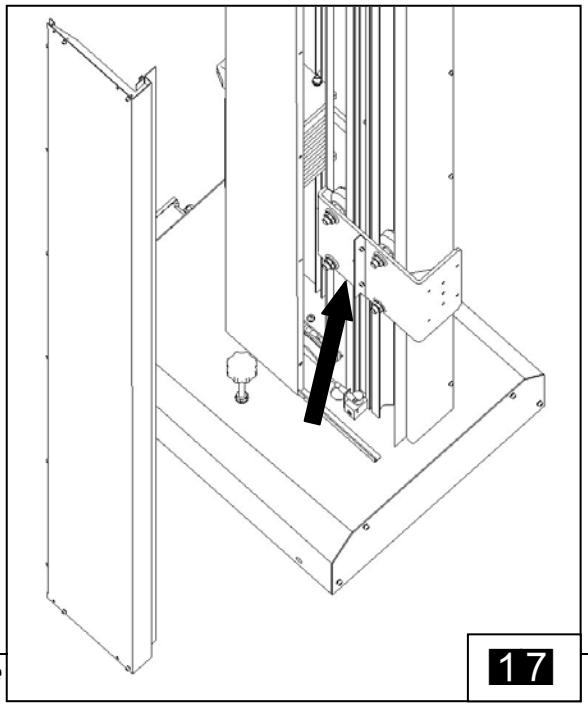
12.6 Adjustment of the trolley wheels

To adjust the trolley wheels, do as follows:

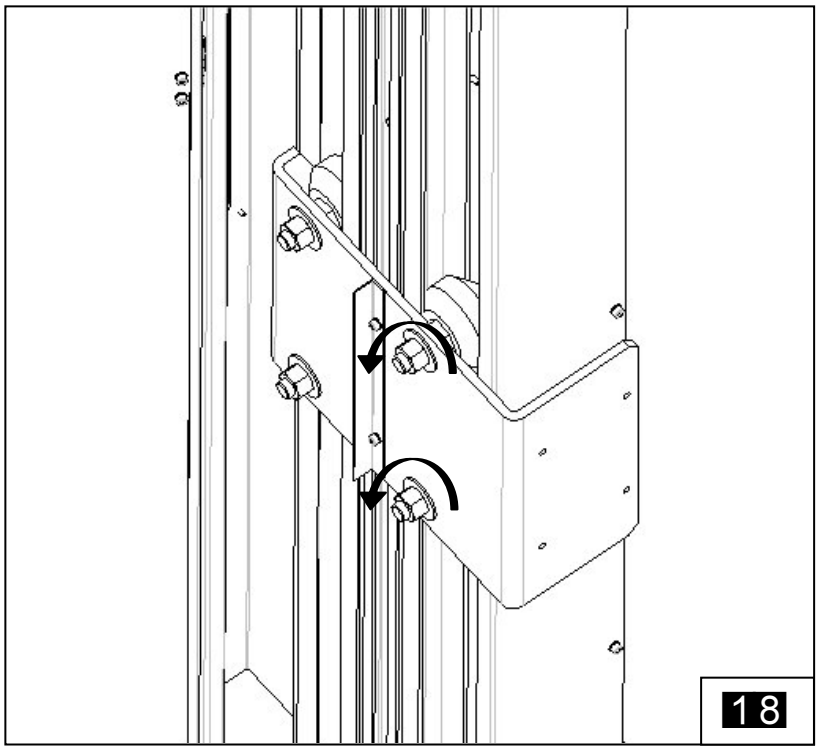
- Turn off the power supply to the machine and remove the guns supporting-arms
- Remove the main panel by unscrewing the screws that fix it to the main structure 16



- Balance the machine so that the trolley is in a useful position for the operator 17
  See **Chapter 12.8** to balance the machine.

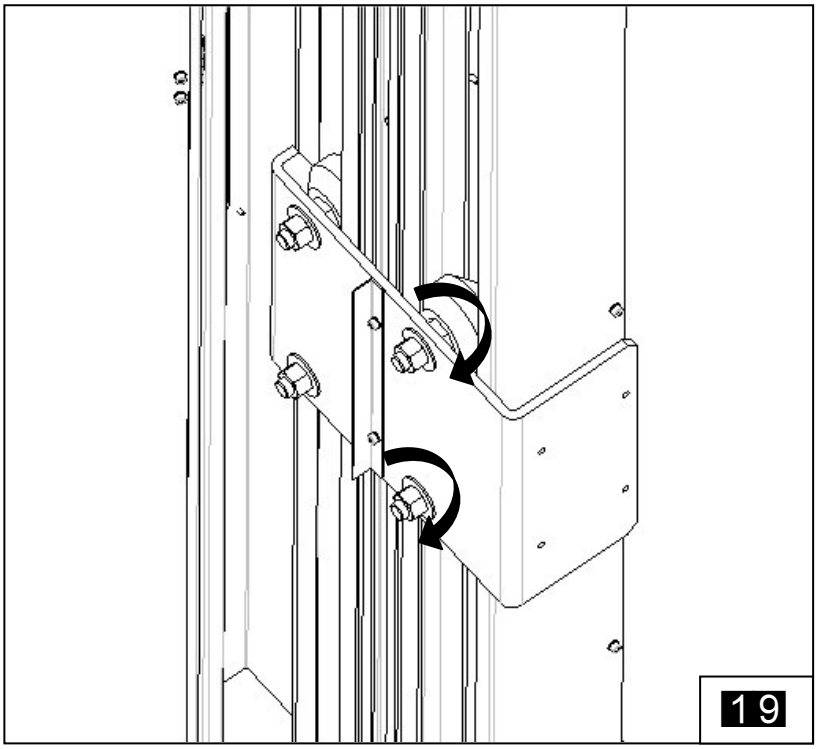


- Loosen the nut that blocks the eccentric hubs of the wheels (see picture 21 to check the correct disposition of the wheels) 18



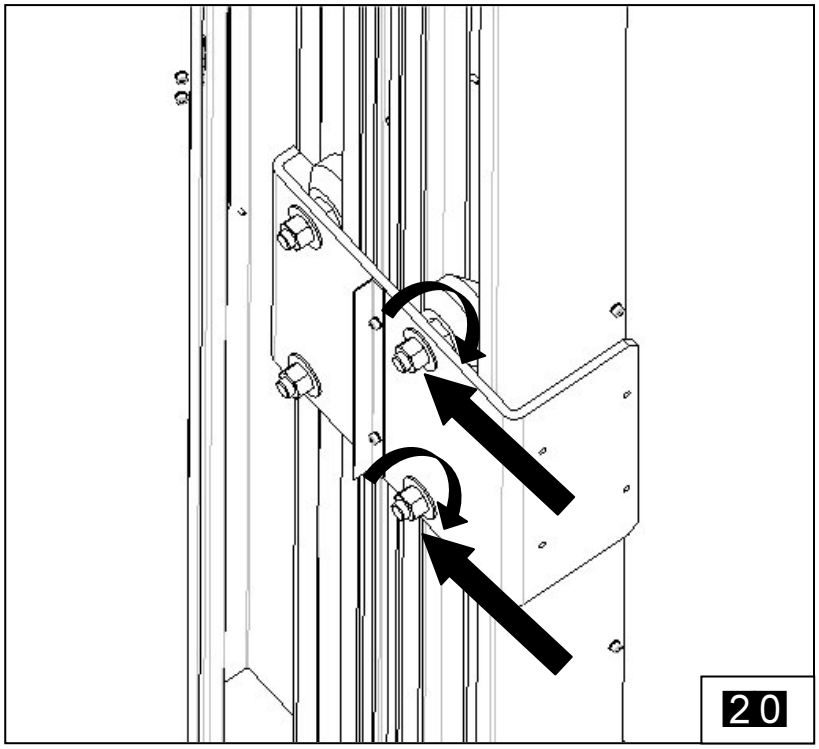
- With a suitable wrench, turn the eccentric hub until the wheel is in contact with the guide. 19

NOTE: When finished, the wheel must turn easily by hand but create a certain friction on the guide.

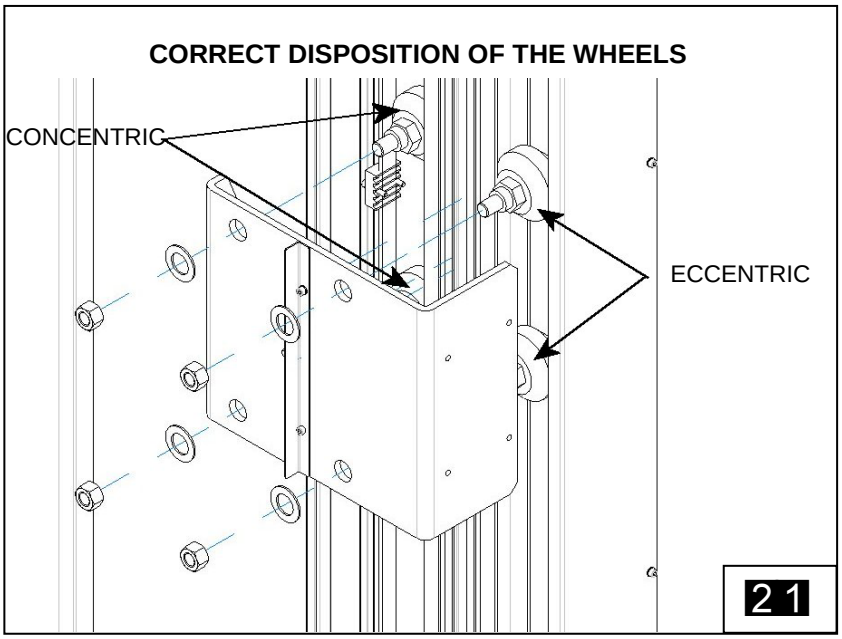


ATTENTION: it is important that there is no play between the wheel and the guide but at the same time the wheel must not be blocked.

- Holding the hub, tighten the lock nut with a suitable wrench. 20

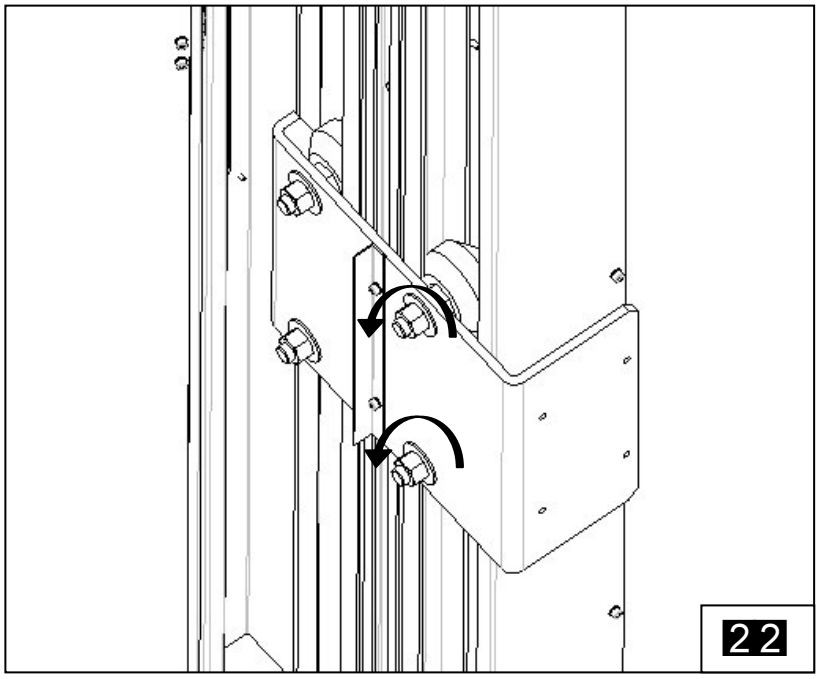


ATTENTION: Avoid excessive loads on the wheels so as to damage the surface.

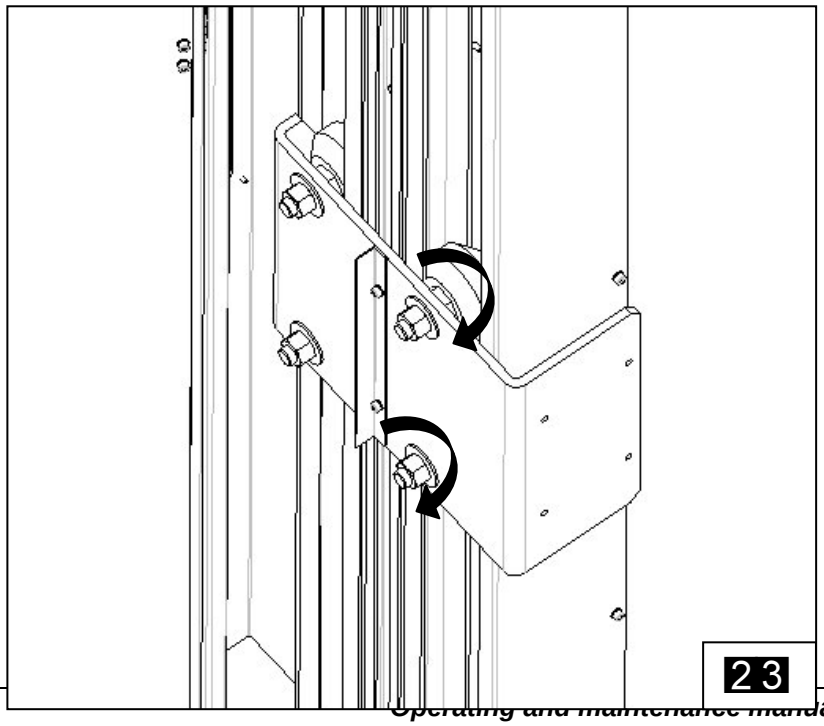


12.7 Replacement of trolley wheels

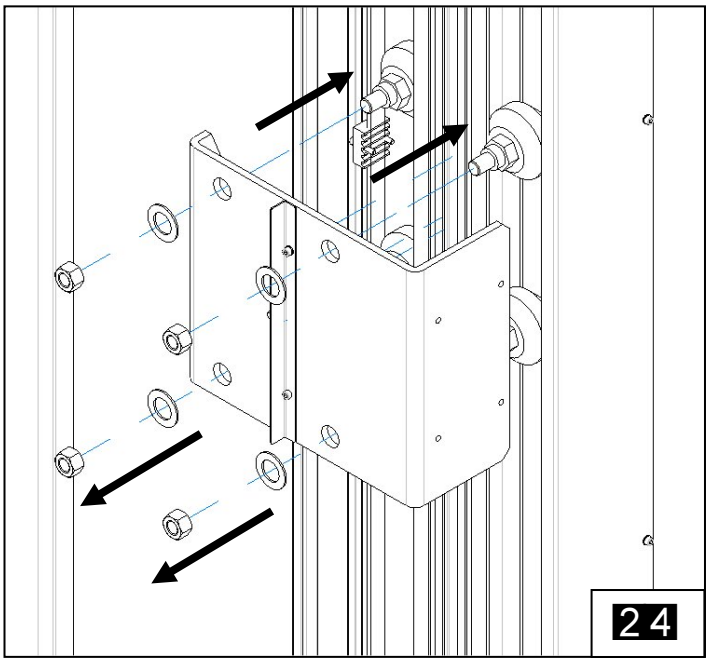
- To replace the wheels of the trolley, follow the operations described in the previous paragraph up to loosen the 4 nuts that block the hubs of the wheels, using a suitable wrench. 22. See picture 21 to check the correct disposition of the wheels.



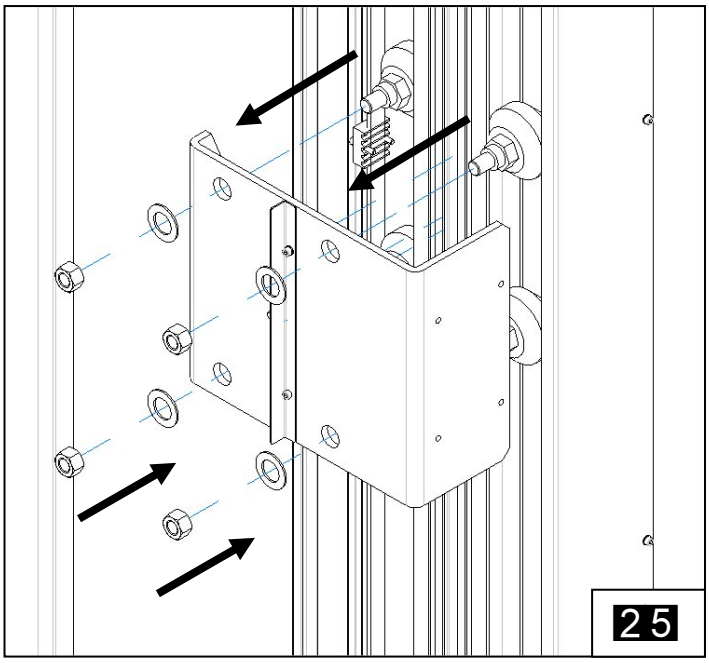
- Turn the eccentric hub with a suitable wrench, so as to increase the play between the wheel and the guide. 23



- Remove the 4 wheels (2 eccentric + 2 concentric). 24



- Assemble the 4 new wheels (2 eccentric + 2 concentric), keeping the same positions. 25

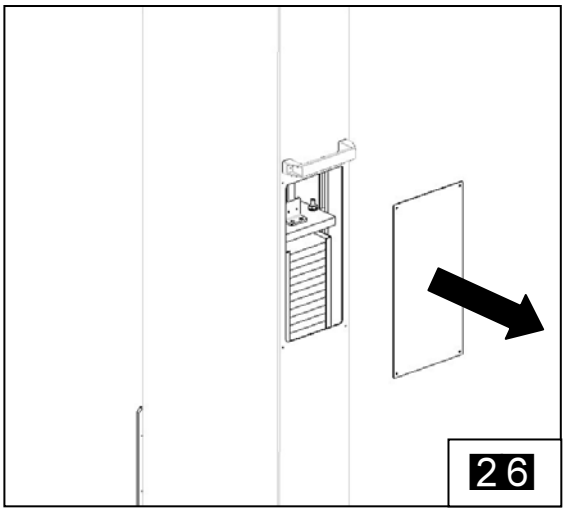


- Adjust the wheels, following the operations described in the previous paragraph.
- Do the reverse operations for the reassembling.

12.8 Adjustment of the counterweight

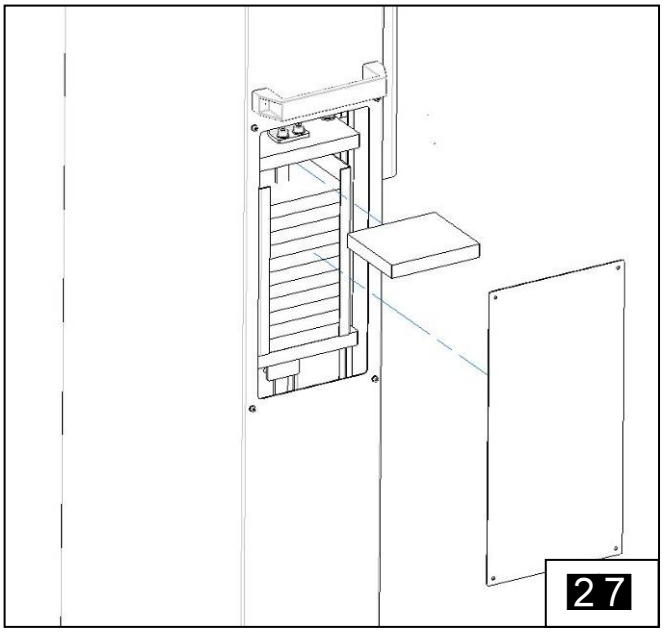
To adjust the counterweight, do as follows:

- Turn off the power supply to the machine.
- Remove the rear door and move the trolley so that the counterweight slides up/down up the reach the opening. 26



ATTENTION: to make the work easier and for safety reasons, it is better that the following operations are carried out by two operators.

- Add or remove the plates of the counterweight, as indicated in the picture 27, to balance the machine.

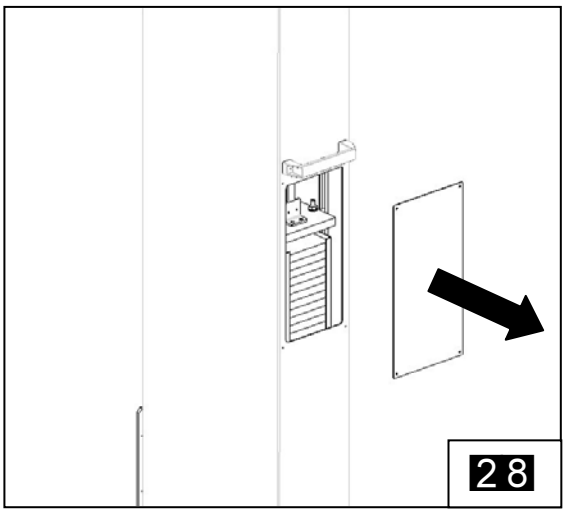


- Assemble the rear door.

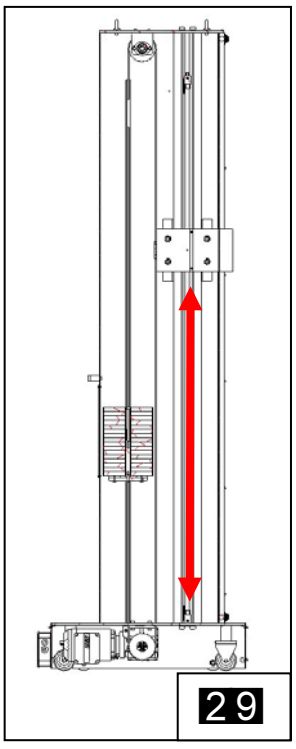
12.9 Replacement of the counterweight sliding guides

To replace the counterweights sliding guides do as follows:

- Turn off the power supply to the machine.
- Remove the rear door. 28,

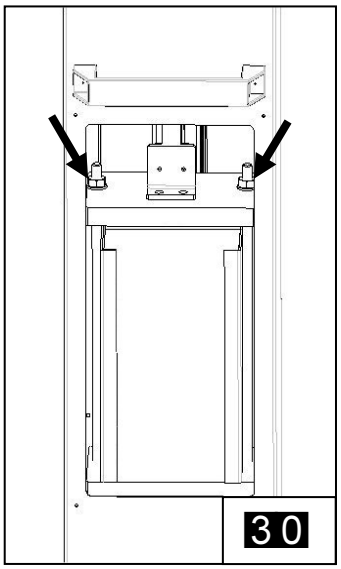


- Position and block the gun supporting-arm so as the counterweight is in line with the opening. 29,



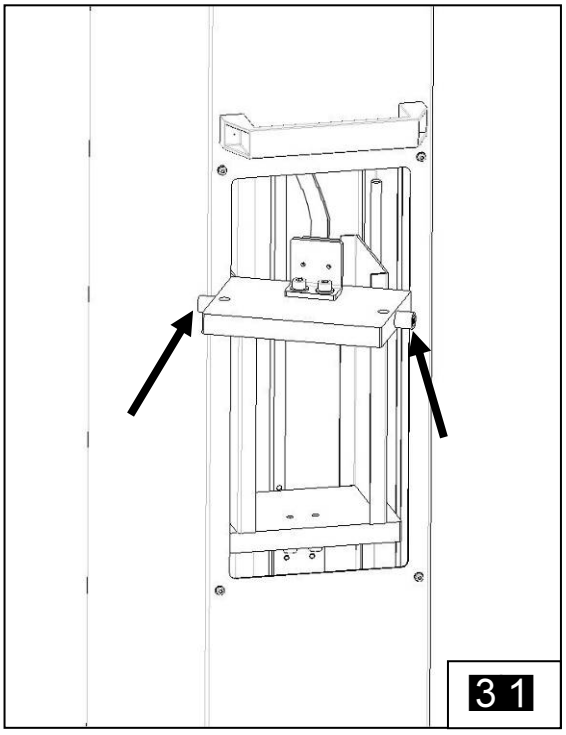
- Refer to **Chapter 12.8** to remove all the counterweight plates.

- Operate on the nuts, indicated in the picture 30, to slacken the belt.



- Tilt sideways the counterweight plate, shown in the figure, so as to remove the sliding guides from its seats with a suitable wrench. 31

ATTENTION: it is necessary to hold the counterweight structure so as to avoid that it falls down. Hence a second operator is required for safety reason.

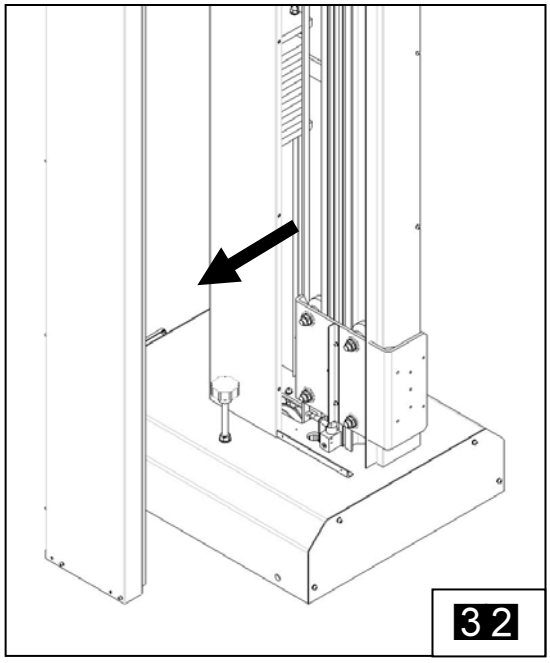


- Replace them with new counterweight guides.
- Adjust the belt tension (see the relative Chapter).
- Close the rear door and remove the backstop to the gun supporting-arm.

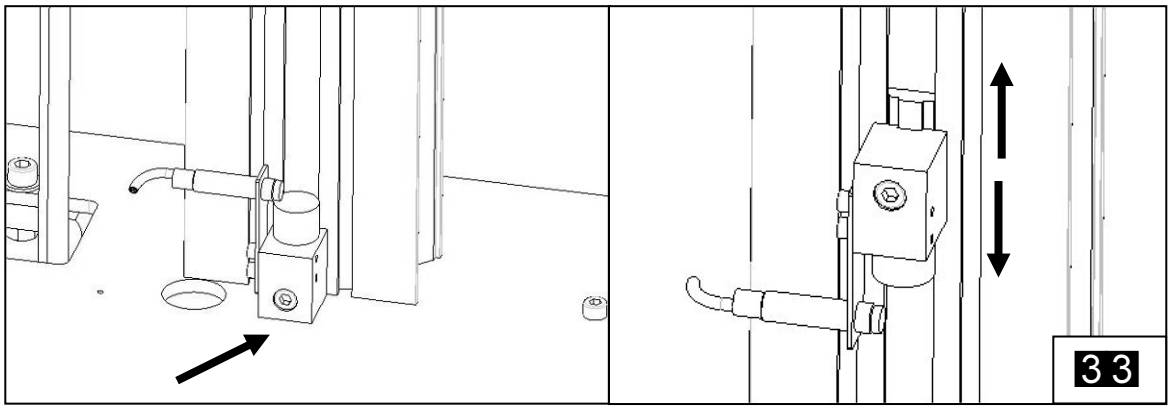
12.10 Adjustment of the hardware limit of the stroke

If not different defined in the order, the machine is supplied with stops and limit switches positioned at maximum stroke. In case of necessary changes, do as follows:

- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the main panel by unscrewing the screws that fix it to the main structure 32



- Unscrew the screw that fix the limit switch group and slide it up to the required position. 33

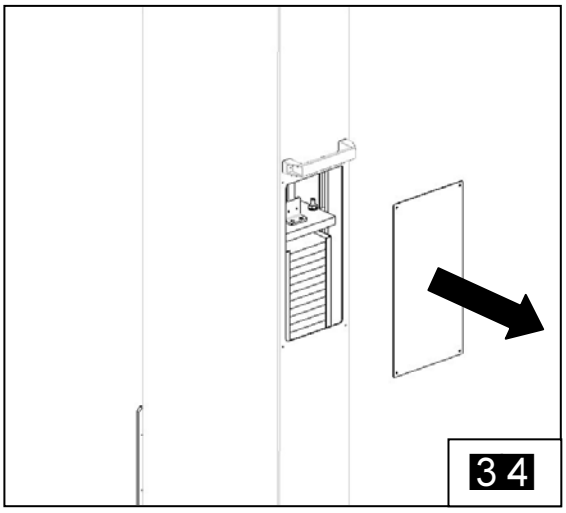


ATTENTION: make sure that the electrical cable is correctly positioned.

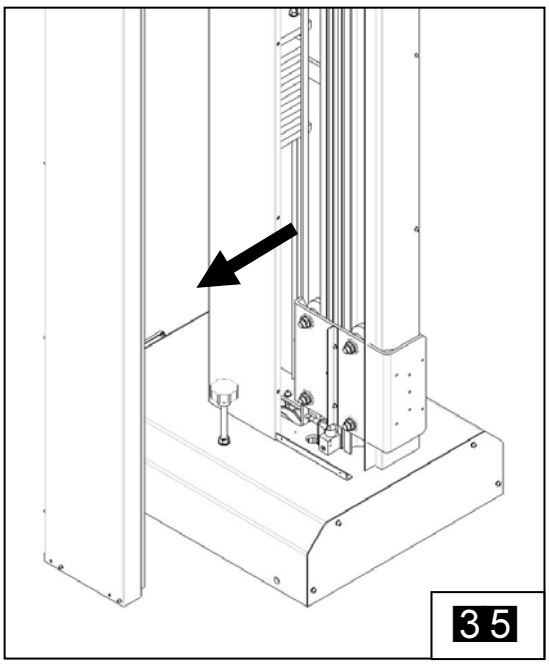
12.11 Replacement of the belt

ATTENTION: to perform this maintenance two persons are necessary.

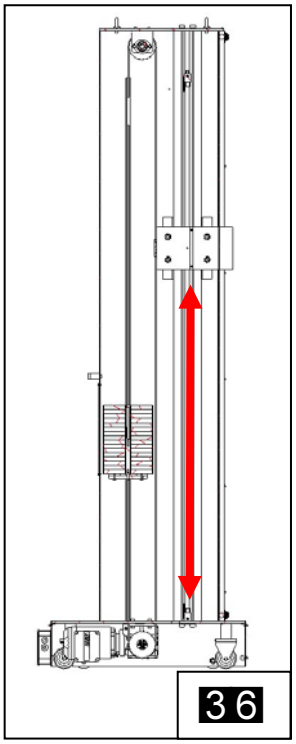
- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the rear door. 34



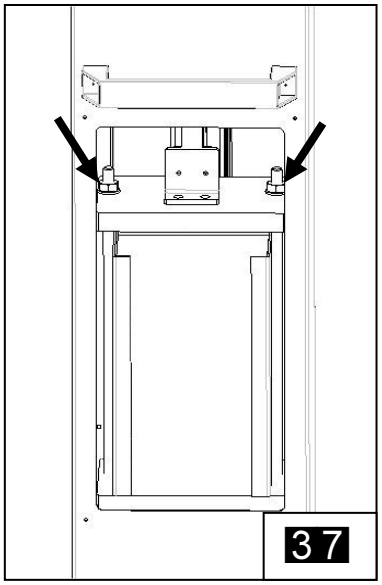
- Remove the main panel by unscrewing the screws that fix it to the main structure 35



- Position and block the gun supporting-arm so as the counterweight is in line with the opening. 36,

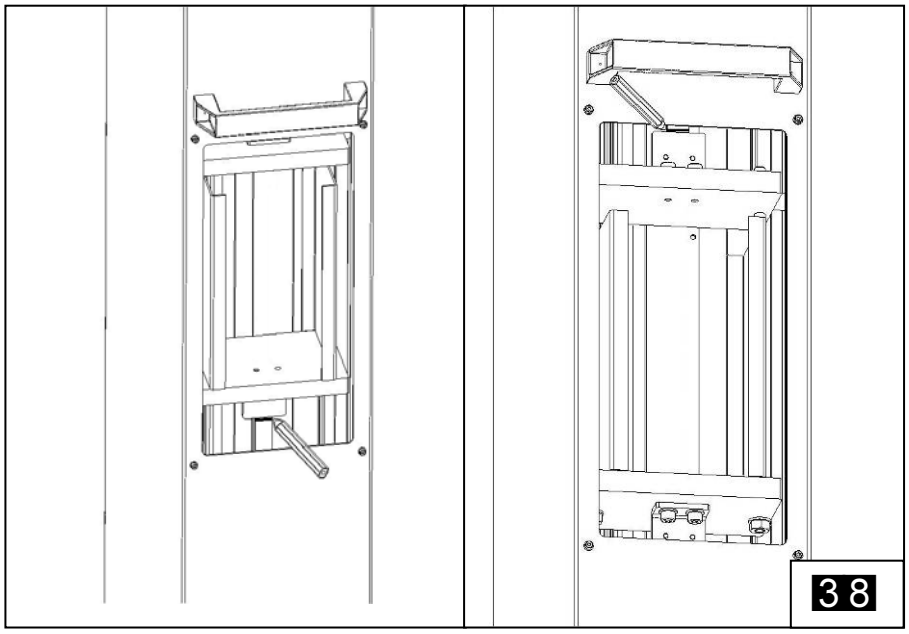


- Operate on the nuts, indicated in the picture 37, to slacken or tension the belt.

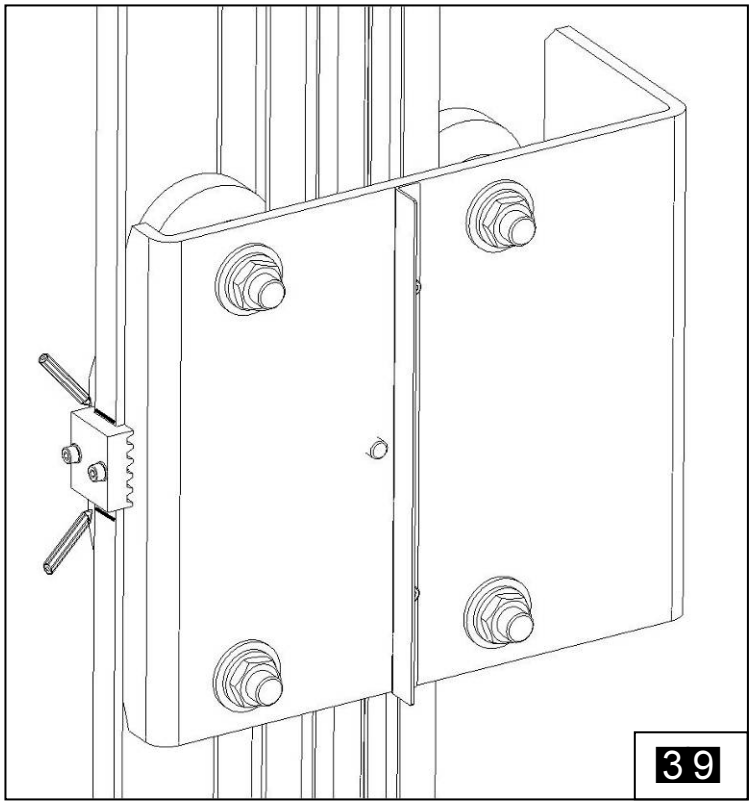


- Refer to **Chapter 12.8** to remove all the counterweight plates.

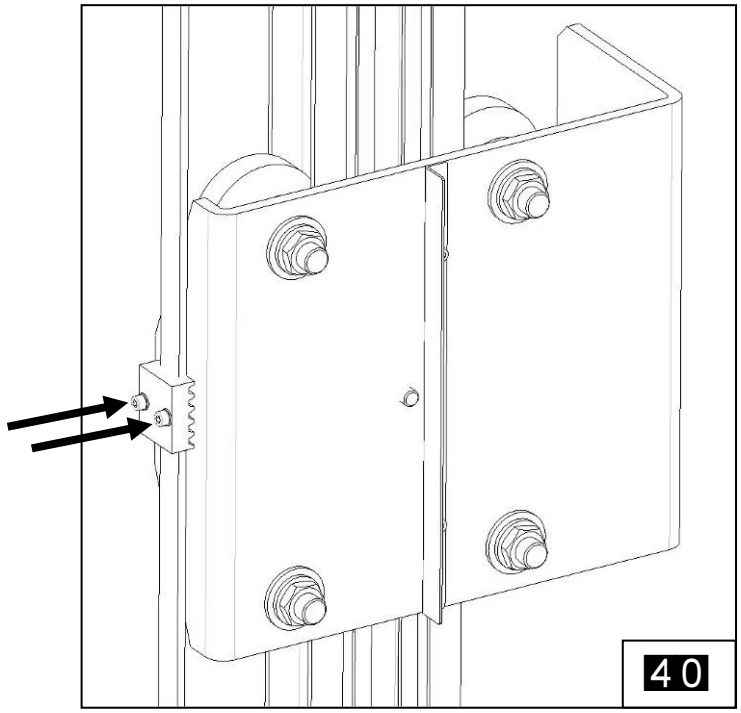
- Mark the belt (up and down) in order to locate the assembly position. 38



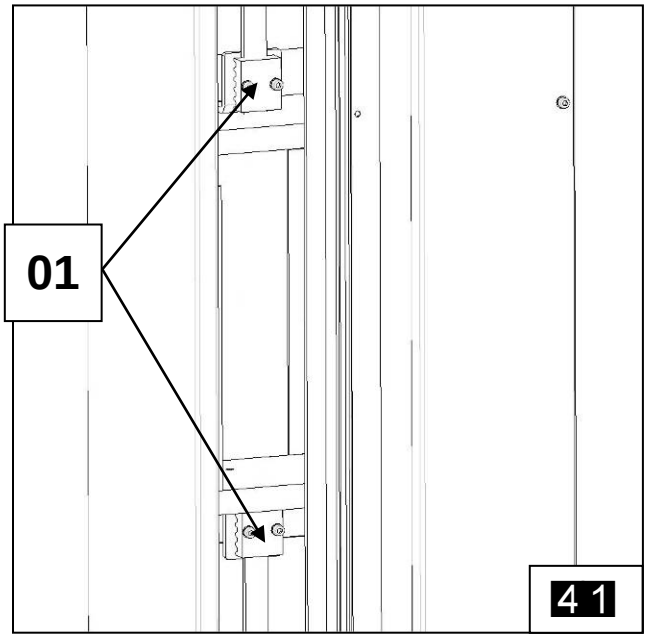
- Mark the belt in correspondence to the toothed plate that fix the belt to the trolley. 39



- Using a suitable wrench extract the two screws to remove the belt from the trolley, taking care to hold it and put in to the lower limit switch. 40

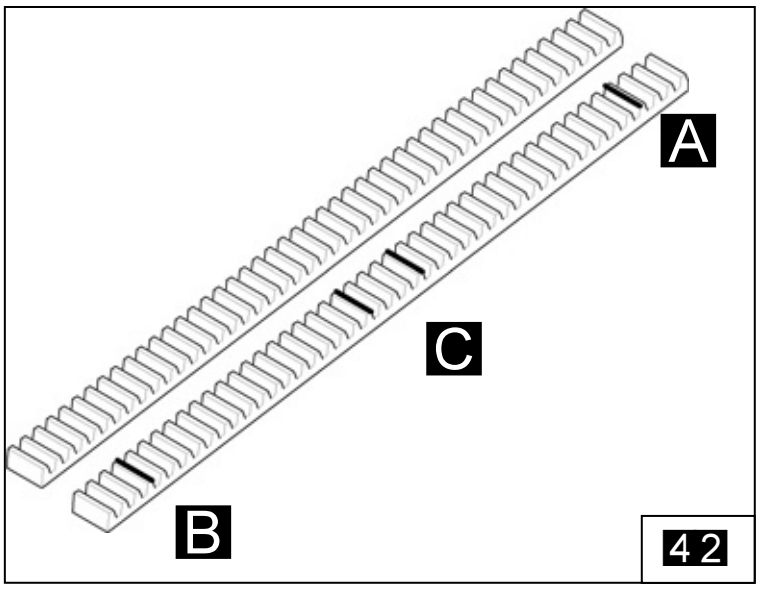


- Remove the toothed belt from the counterweight group unscrewing the two screws that fix it to them through the toothed plates **(01)**. 41



- The belt is now free to be removed completely from the reciprocator.

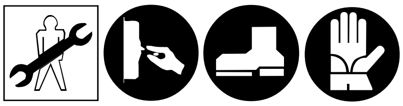
- Lay down the toothed belt to replace on the ground near the old one, then report the marks from the old belt to the new one.



- **Pos. 42A)** - Assembly position of upper counterweight
  Pos. 42B) - Assembly position of lower counterweight
  Pos. 42C) - Fixing position of the trolley

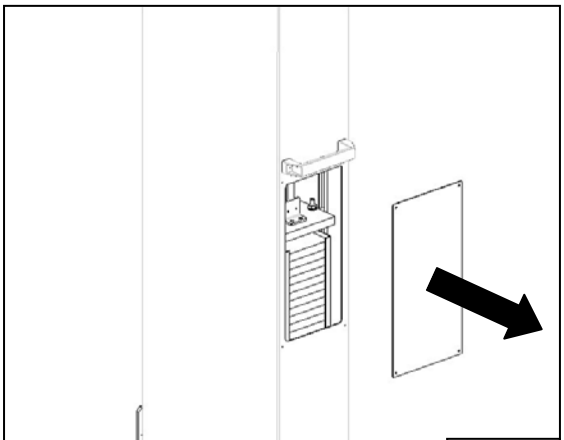
- Replace the belt by carrying out the reverse procedure.
- Tension the belt correctly following the instructions described in **Chapter 12.12**.
- Close the rear panel and remove the backstop and reassemble the gun supporting-arm.

12.12 Adjustment of the belt tension



To adjust the tension of the belt, do as follows:

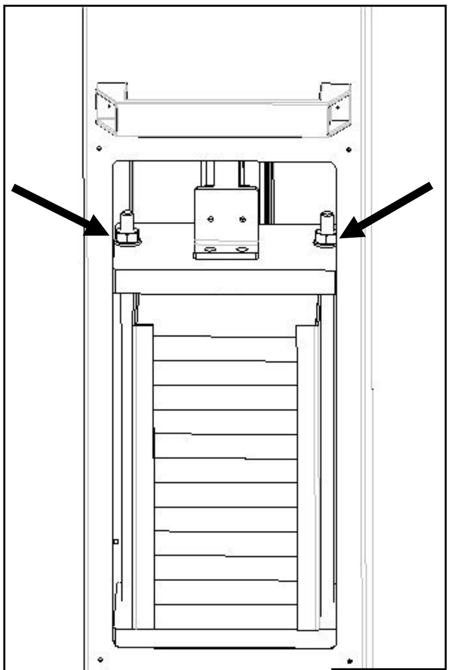
- Turn off the power supply to the machine.
- Remove the rear door and move the trolley so that the counterweight slides up/down up the reach the opening. 43



43

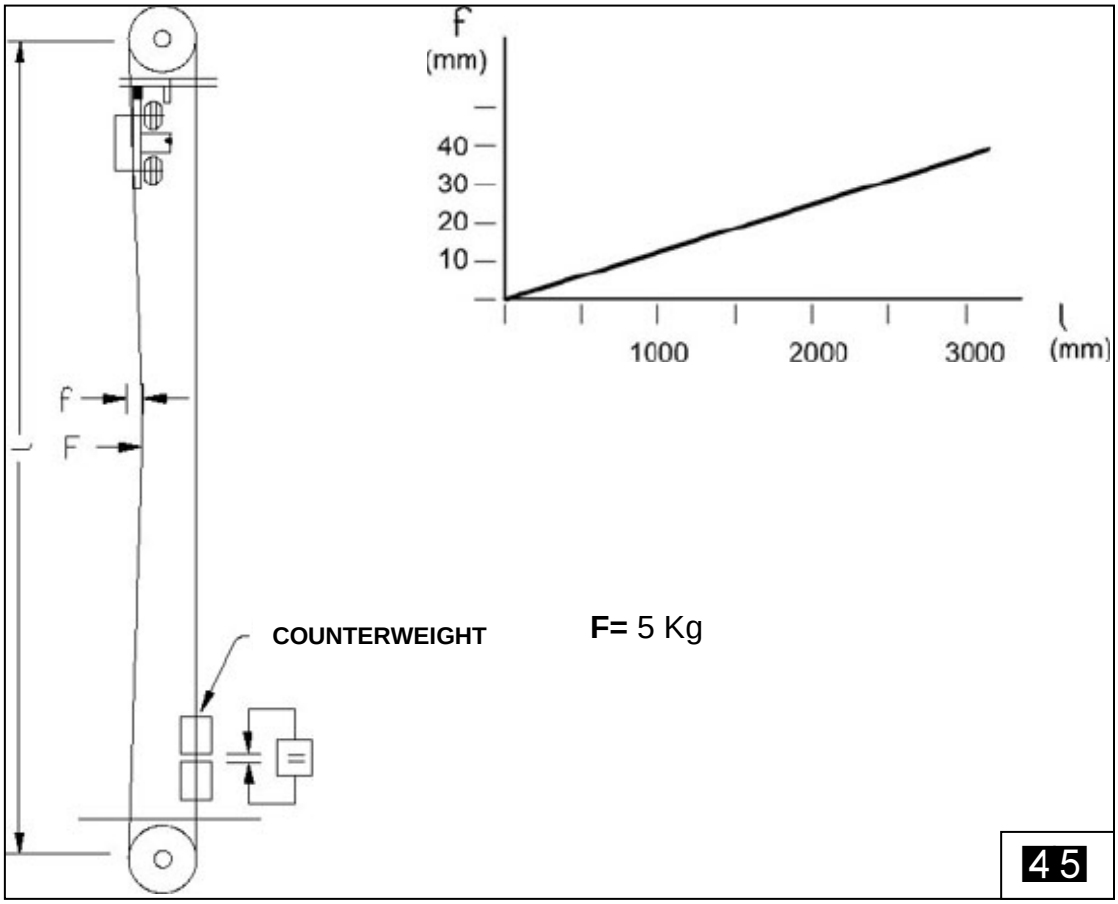
- Operate on the nuts, indicated in the picture 44, to slacken or tension the belt.

NOTE: Once finished, check the plates are parallel that clamp the belt.



44

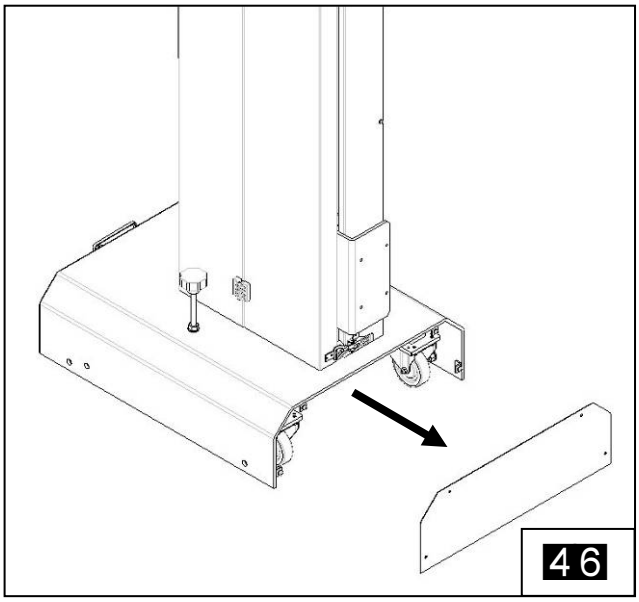
For the correct belt tension, see the diagram below. 4 5



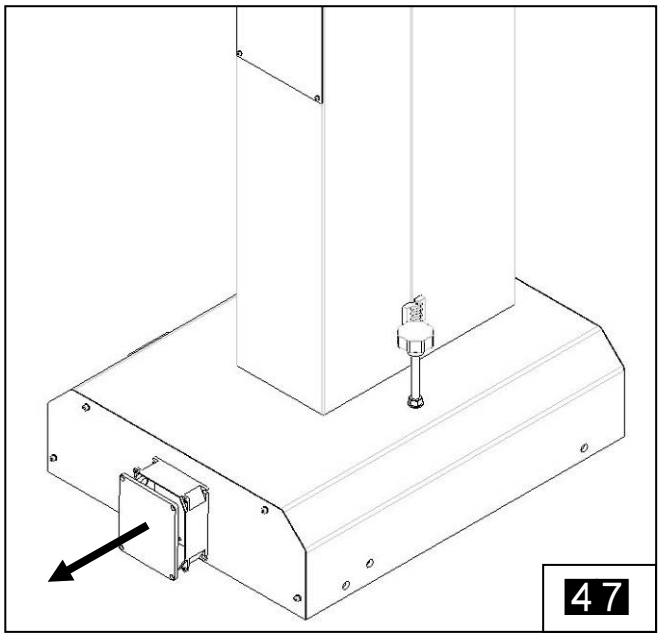
- Assemble the read door.

12.13 Replacement of the encoder (if present)

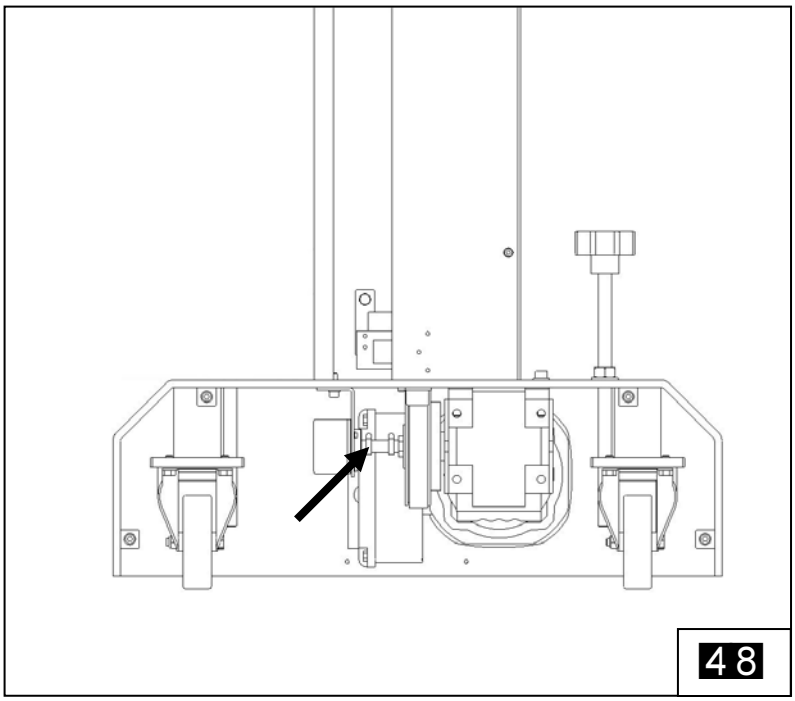
- Turn off the power supply to the machine.
- Remove the front safety guard as indicated in the picture. 46



- Open the junction box and disconnect the encoder. 47



- Loosen the joint clamp near the encoder and unscrew the screws that fix it. 48



48

- Assemble the new encoder on the support, taking care to insert the shaft into the hose of the joint and block it with the relative clamp.
- Connect the encoder to the junction box (see wiring diagrams).
- Close the junction box and the front safety guard of the machine.

12.0 MAINTENANCE FOR HF80

12.1 General safety advice

*See **Chapter 12.1** "Maintenance for HF30"*

12.2 Technical competence

*See **Chapter 12.2** "Maintenance for HF30"*

12.3 Periodical maintenance table

*See **Chapter 12.3** "Maintenance for HF30"*

12.4 Summery table of suggested spare parts

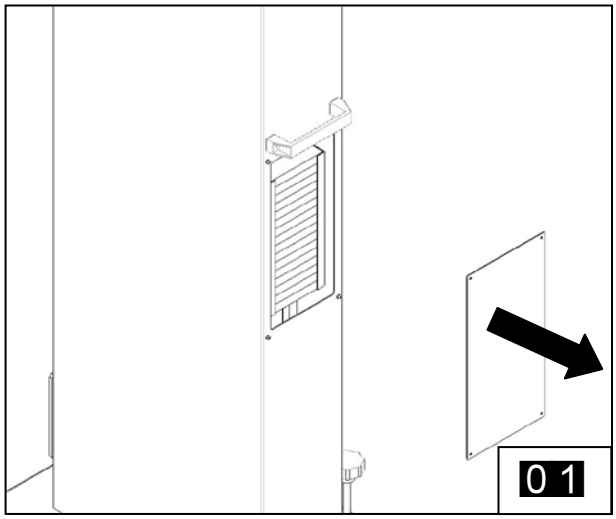
The following components are subject to wear and so a suitable stock should be kept for spare parts.

Part Number	Description
7034345	Toothed belt, HF80 17
7034346	Toothed belt, HF80 22
7034347	Toothed belt, HF80 27
7034348	Toothed belt, HF80 32
7034372	Kit,protection strip,HF30/80 1.7M
7034373	Kit,protection strip,HF30/80 2.2M
7034374	Kit,protection strip,HF30/80 2.7M
7034375	Kit,protection strip,HF30/80 3.2M
736339	Sensor,inductive,PNP,NC 12mm DIA
7034432	Kit sliding blocks (1 concentric block + 1 eccentric block)
7034353	Encoder, HF series
736358	Coupling,sensor encoder,recip
7034339	Gearmotor assy,HF80
7034350	Kit, 2 counterweight guide,HF30

12.5 Replacement of the gearmotor

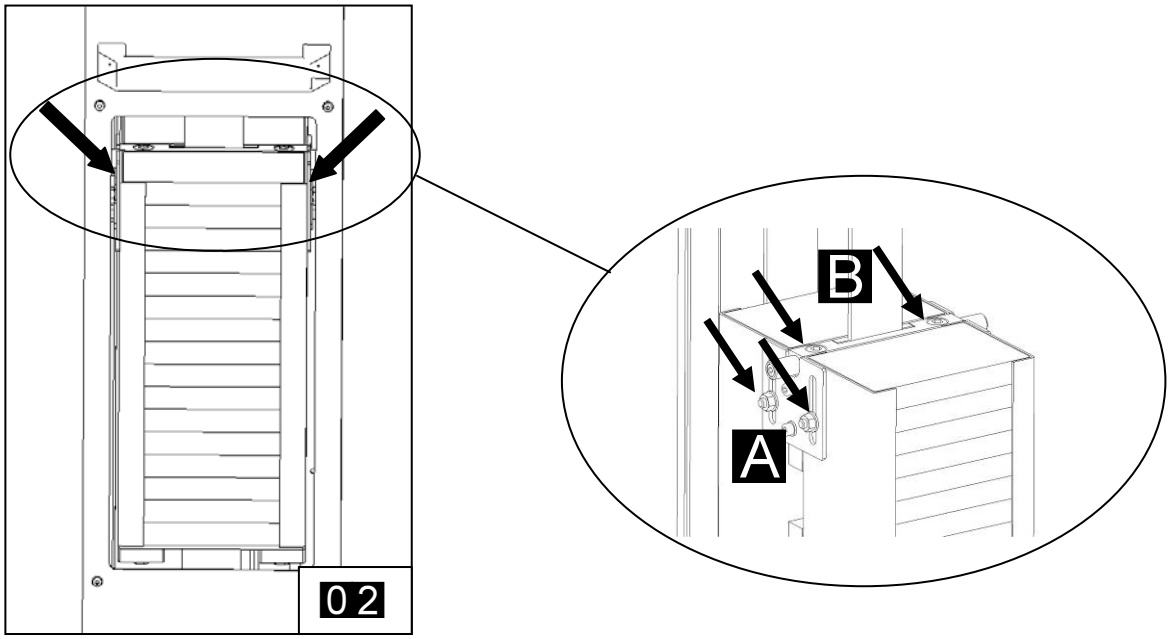
To replace the gearmotor do as follows:

- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the rear door, lift the trolley by hand so as to allow the counterweight to go down to the opening. 0 1



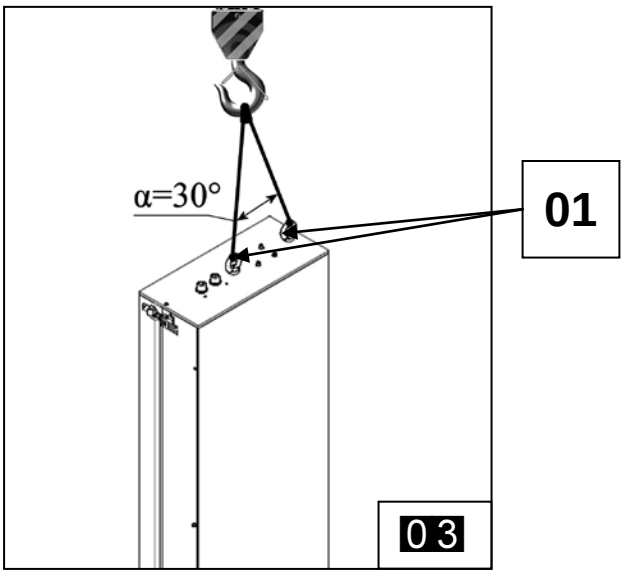
ATTENTION: To make the work easier and for safety reasons, it is better that the following operations are carried out by two operators.

- Unscrew the two+two nuts A of the rod and the two upper screws B, with a suitable wrench, so as to slacken the belt and remove it from the pulley. 0 2

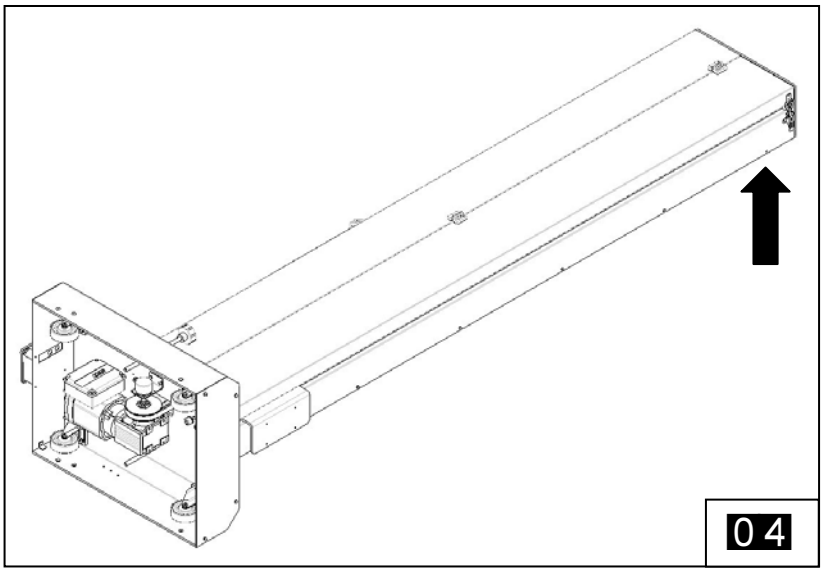


ATTENTION: do not remove the screws completely so as to avoid that the counterweight and the trolley fall.

- Place the suitable eyebolts 03**01)** into the holes on top of the reciprocator as in picture 03 using two ropes, with maximum corner equal to 30° and rope characteristics adapted to the lifting of loads indicated.

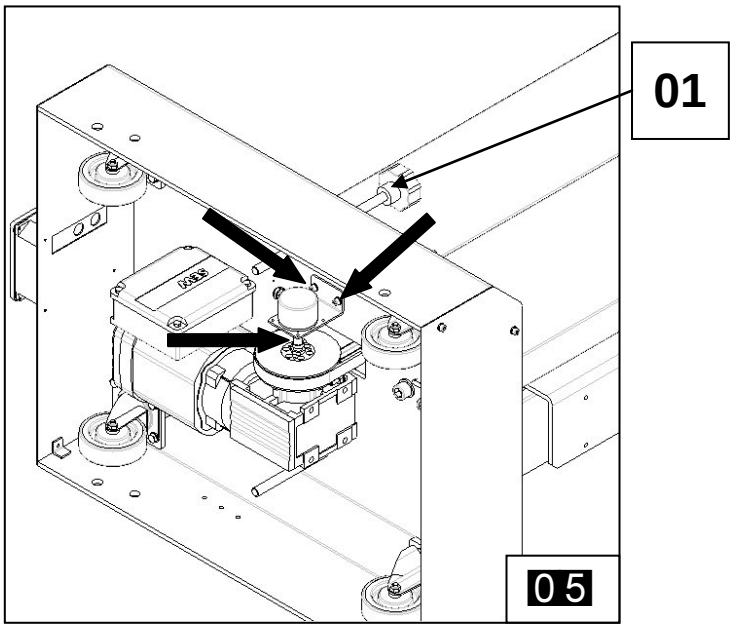


- If necessary, via a forklift truck and operating in a safety condition, lie down the reciprocator to the ground as in the picture. 04

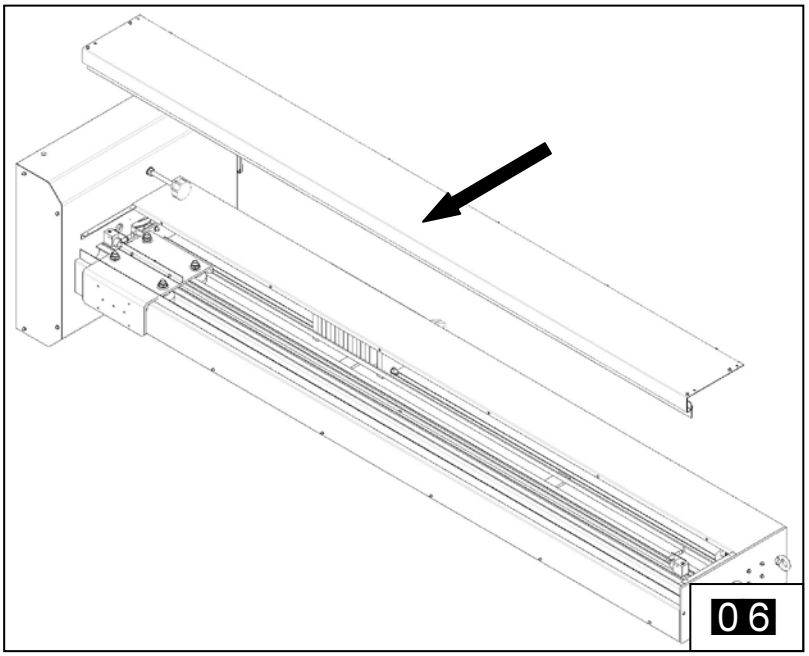


- Place some spacers at the top of the column (as indicated with the arrow in picture 04) so that the reciprocator is horizontally levelled.

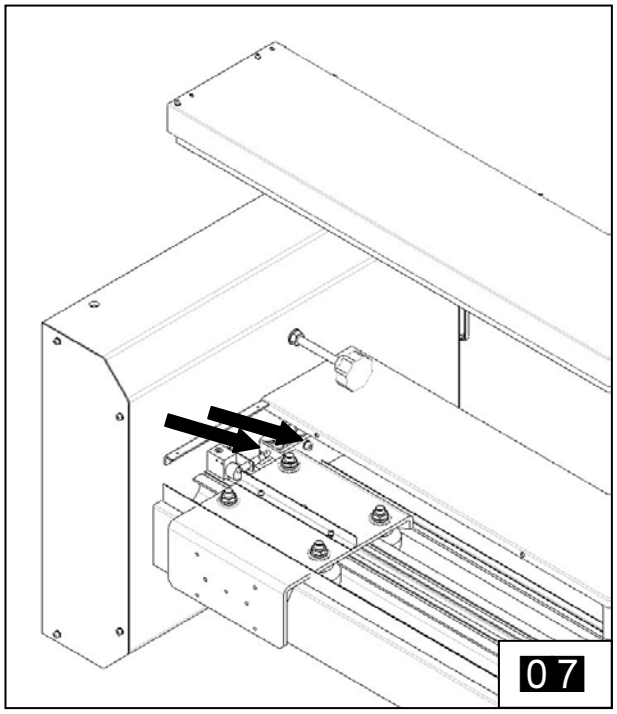
- Loose the encoder shaft by loosing the relative clamp. Remove the encoder by unscrewing its support. 05
- Remove the levelling knob. 05 **01)**



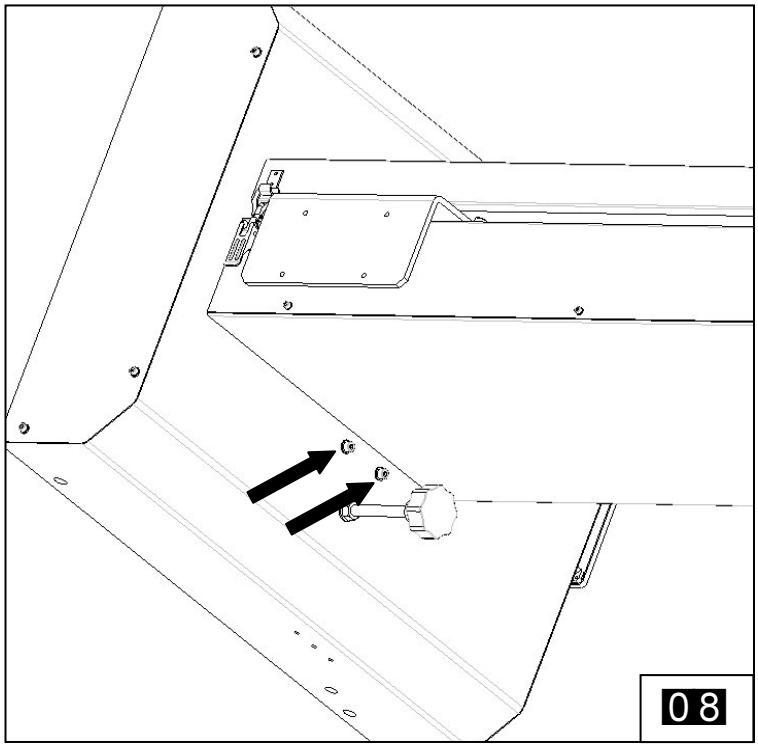
- Open completely the main inspection panel. 06



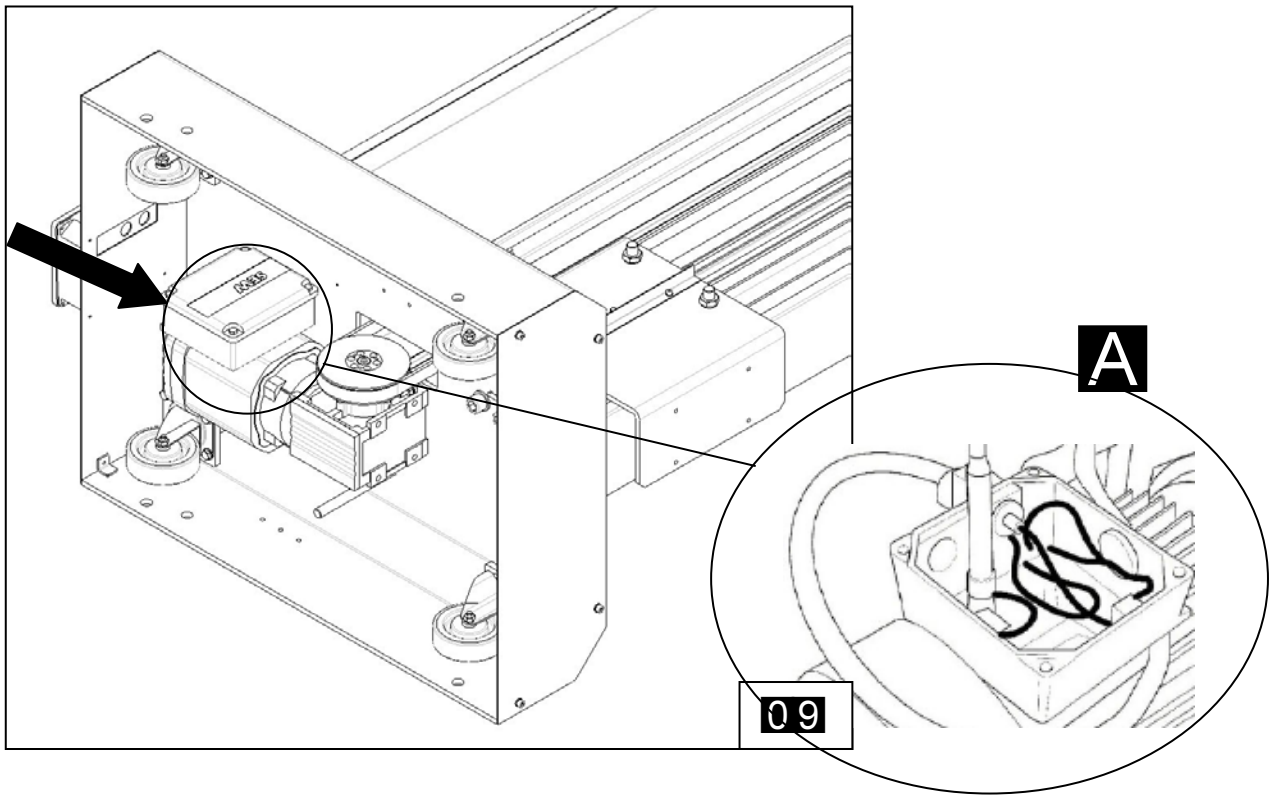
- Loosen the screw inside the column which fixes the gearmotor to the basement. Do not remove it completely to avoid that the gearmotor falls down. 07



- Loosen the 2 external screws which fix the gearmotor to the basement. Do not remove it completely to avoid that the gearmotor falls down. 08



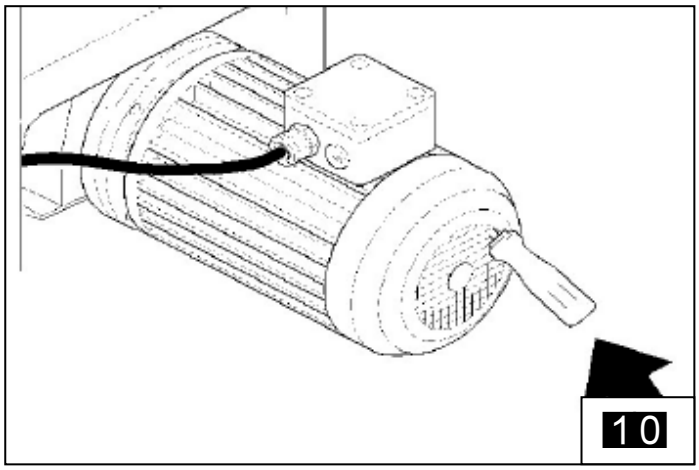
- Using a suitable wrench, open the electric box, located next to the gearmotor 09
- When the box is open, loosen the clamps and remove the cable of the gearmotor. 09□A



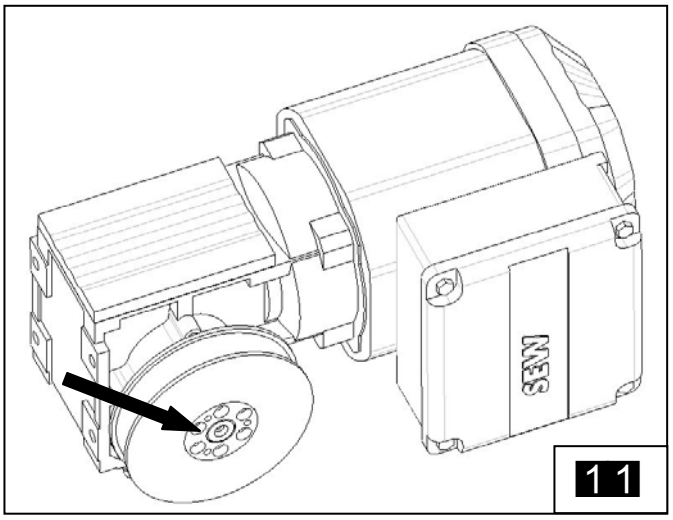
- With the help of another operator, remove the screws that support the gearmotor and remove it. Place it on a working desk before carrying out the next operations.

ATTENTION: by removing the supporting screws of the gearmotor, if not hold properly by a second operator, it can fall down causing crashing danger for the operator or damages to the machine itself.

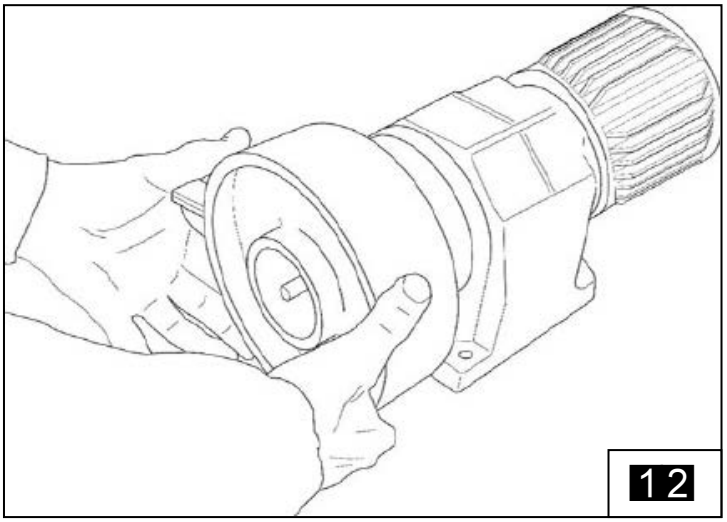
- Block the electric motor by inserting a screwdriver into the inner cooling fan. 10



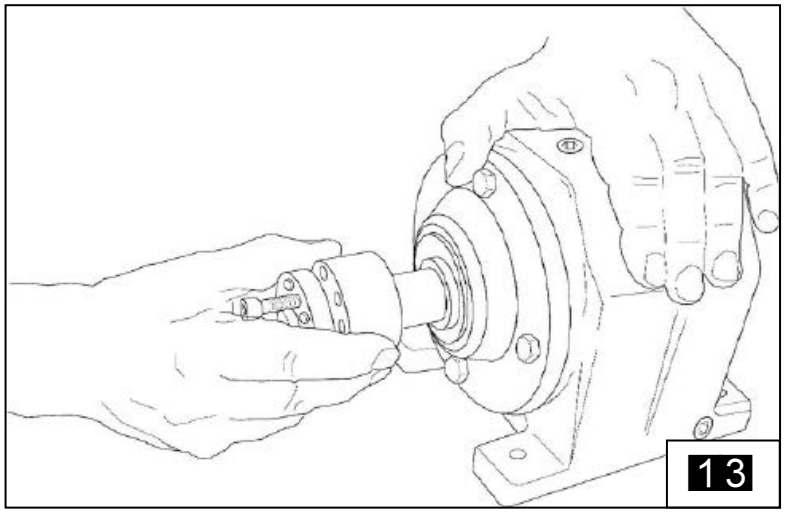
- Unscrew the screws of the ring block that fix the pulley, using a suitable wrench. 11



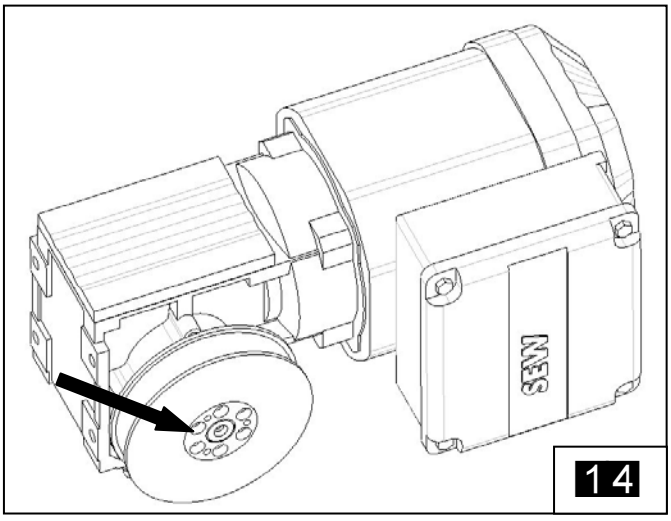
- Insert the screws, removed previously, into the special dismantle holes and screw them to remove the pulley. 12



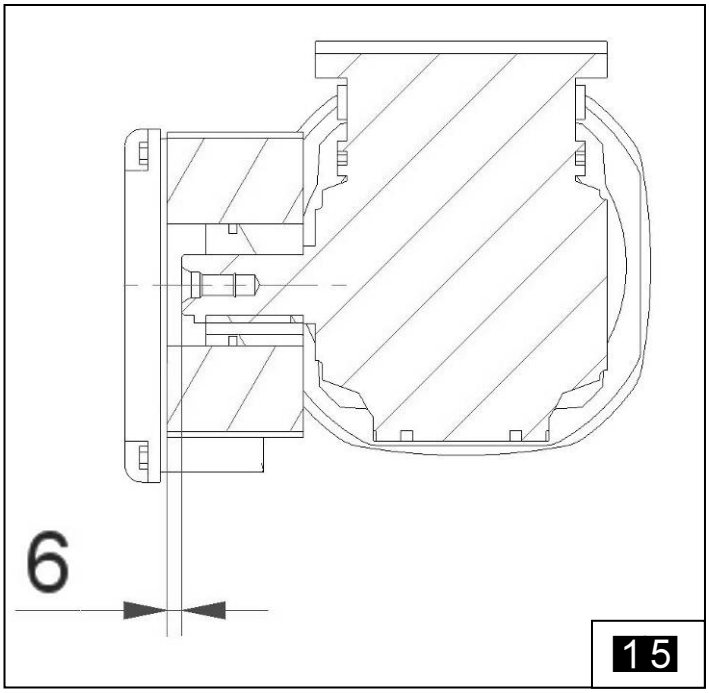
- Remove the ring block from the shaft. 13



- Clean the ring block with a cloth.
- Assemble the ring block on the new gearmotor, without closing the screws.
- Place the pulley on the driving shaft, tighten the clamping screws of the ring block, cross ways, to avoid friction. 14



- To insert correctly the pulley on the ring block assembled on the driving shaft, refer to the following drawing. 15



- Carry out the reverse operations to assemble completely the gearmotor and start up the machine.

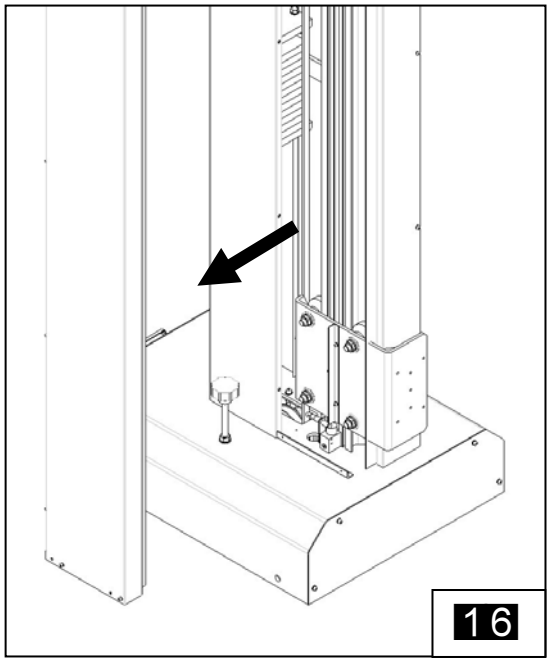
NOTE: Refer to **Chapter 12.12** to tighten the belt correctly.

ATTENTION: After the connection of the gearmotor, check its correct direction of rotation.

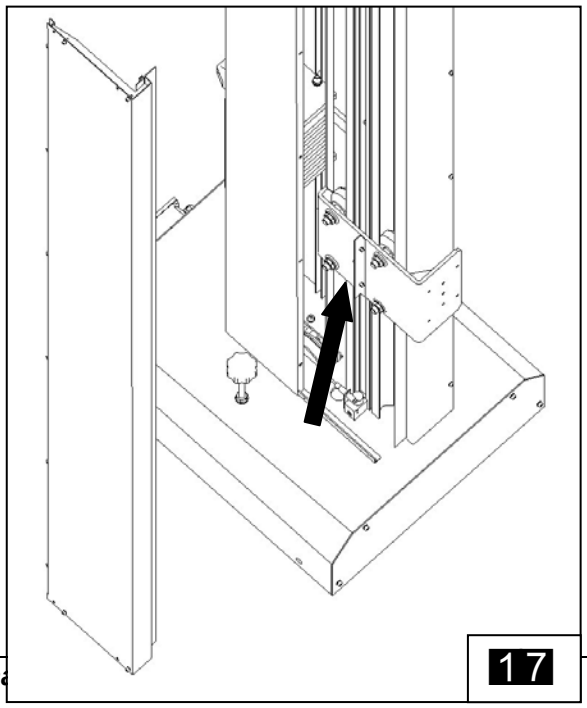
12.6 Adjustment of the trolley sliding blocks

To adjust the trolley sliding blocks, do as follows:

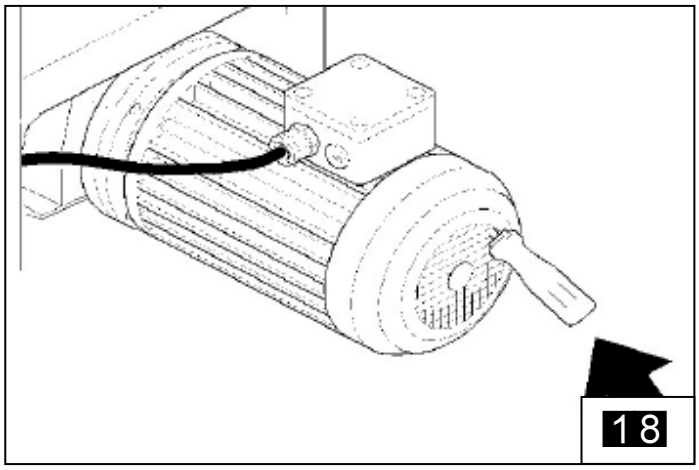
- Turn off the power supply to the machine and remove the guns supporting-arms
- Remove the main panel by unscrewing the screws that fix it to the main structure 16



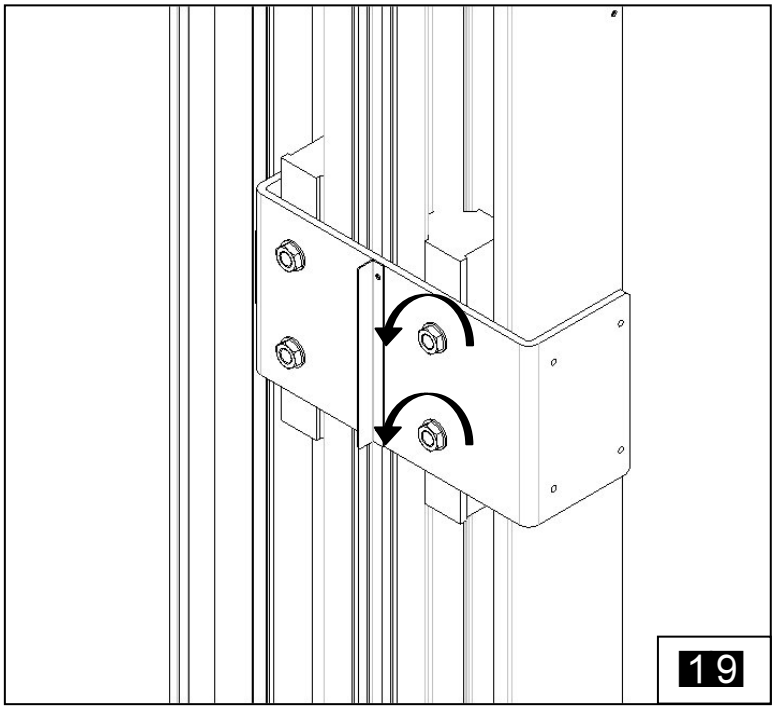
- Balance the machine so that the trolley is in a useful position for the operator 17
  See **Chapter 12.8** to balance the machine.



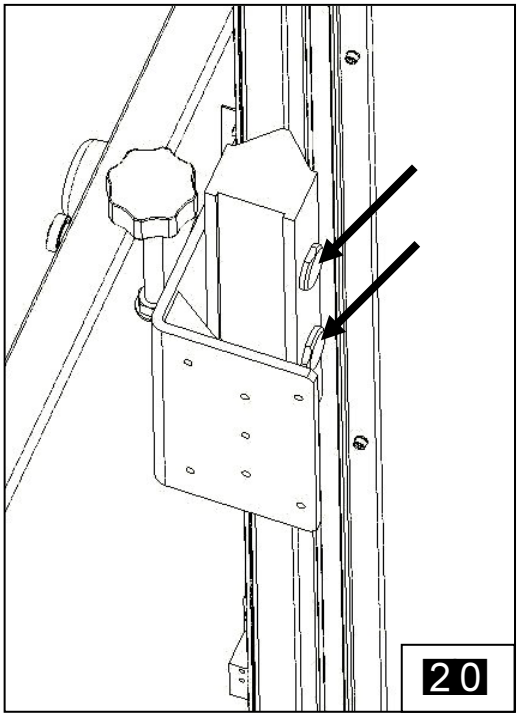
- Block the electric motor by inserting a screwdriver into the inner cooling fan. 18



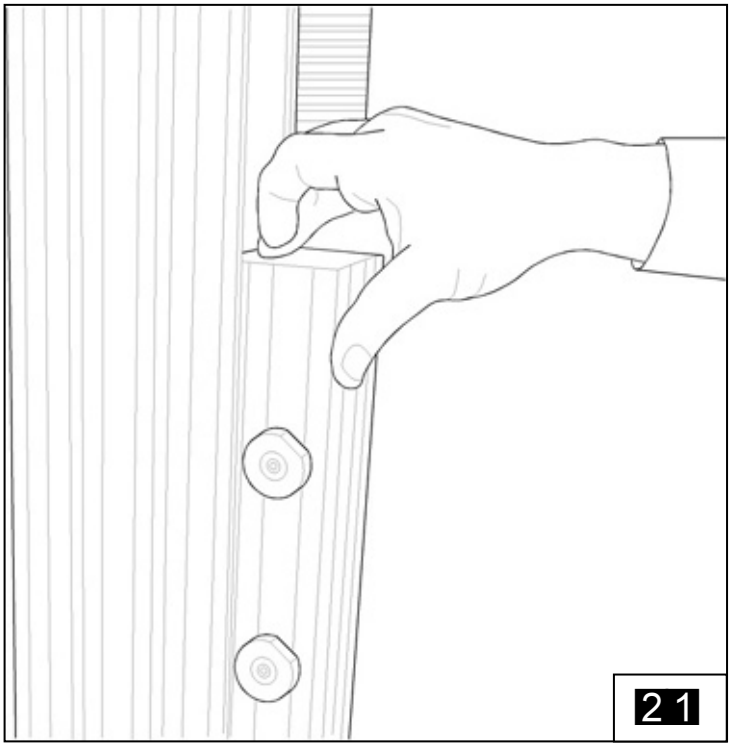
- Loosen the nuts, not completely and leaving a certain pressure on the thread, that block the eccentric hubs of the sliding blocks. 19



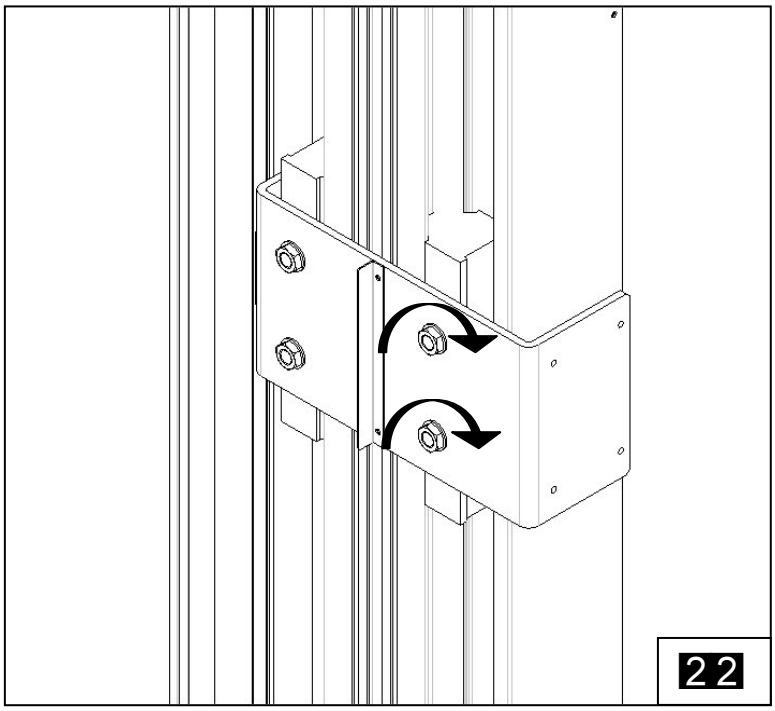
- Adjust, using a suitable wrench, the eccentric hub, shown in the picture, till the sliding block and the guide are in contact. Adjust, in the same way, the second hub. 20



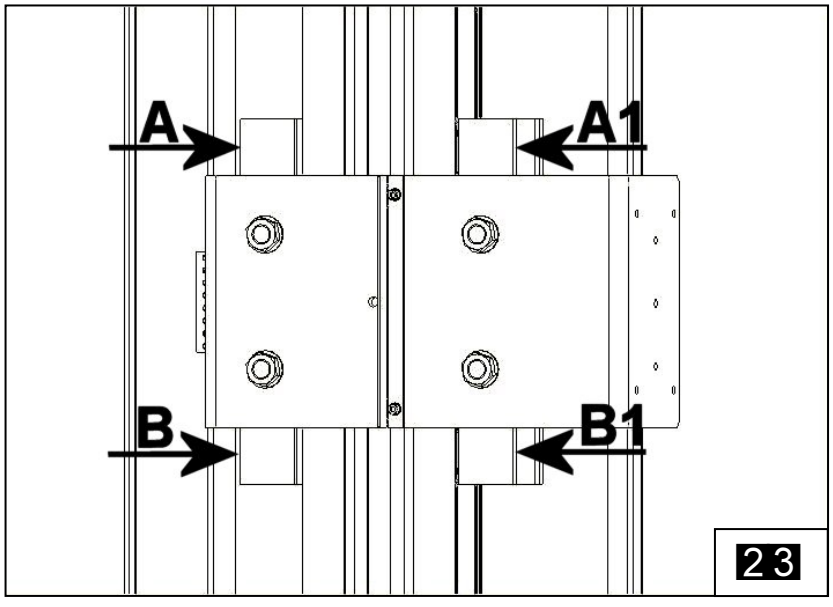
- Repeat the two aforesaid operations in order to have a better adjustment. In a correct condition, the sliding blocks should easily slide on the guide by hand. 21



- When finished, block the eccentric nuts. 22



- Check, using a sliding gauge, the parallelism between the sliding blocks. The distance between **A (concentric)** and **A1 (eccentric)** must be the same as the distance between **B (concentric)** and **B1 (eccentric)** 23

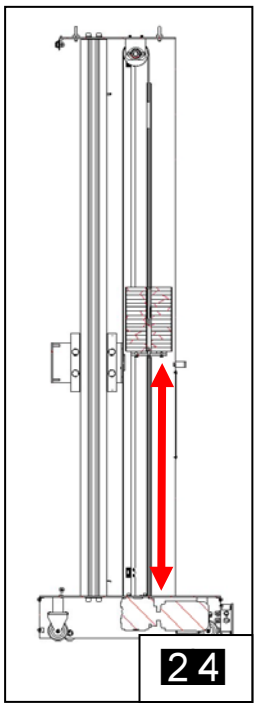


ATTENTION: Avoid excessive loads on the wheels so as to damage the surface.

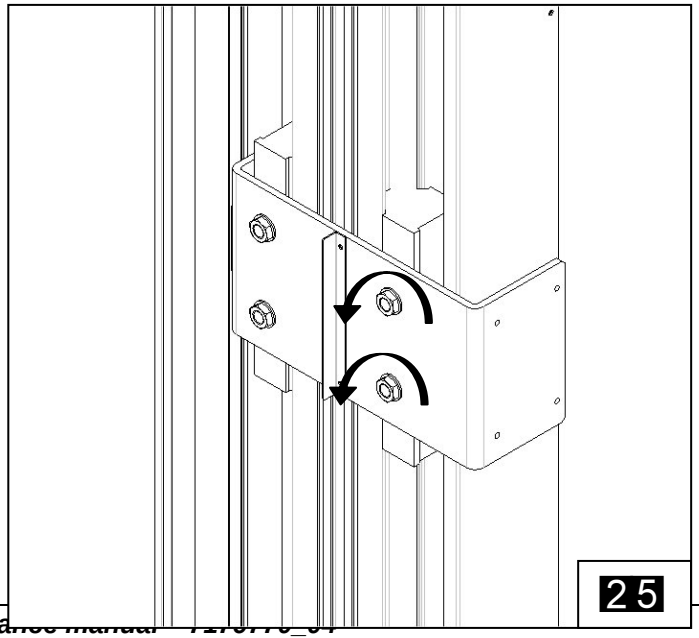
- Close the main door and remove the screwdriver from the fan of the gearmotor.

12.7 Replacement of the trolley sliding blocks

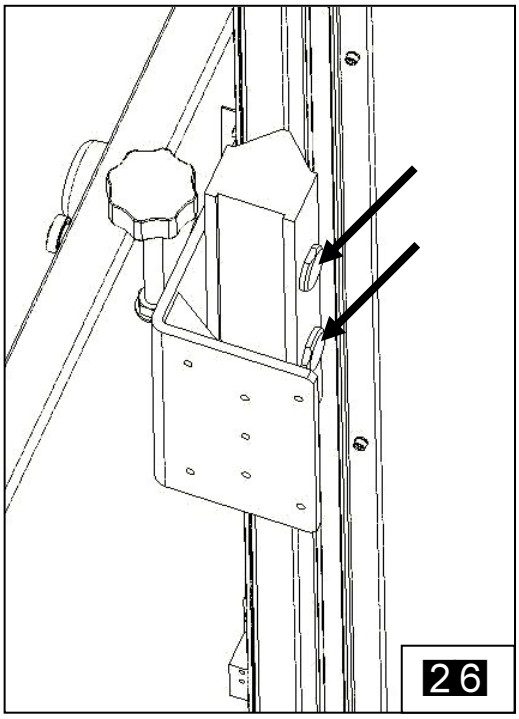
- To replace the sliding blocks of the trolley, follow the operations described in the previous paragraph up to place the trolley to a useful position to operate.
- Block the counterweight stroke with a staff (or other suitable means) to avoid its fall. 24



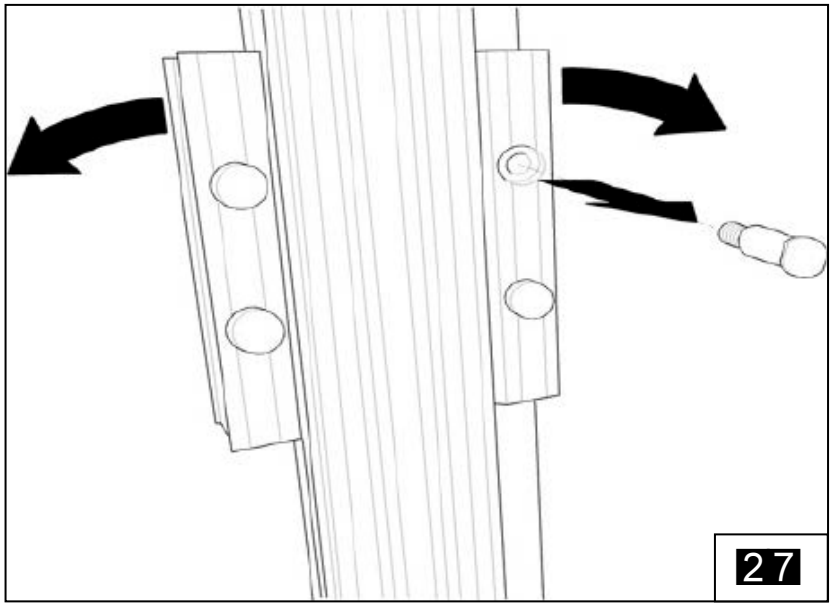
- Rotate the eccentric pivots till the blocks unloosen. 25



- Turn the eccentric hub with a suitable wrench, so as to increase the play between the rollers and the guide. 26

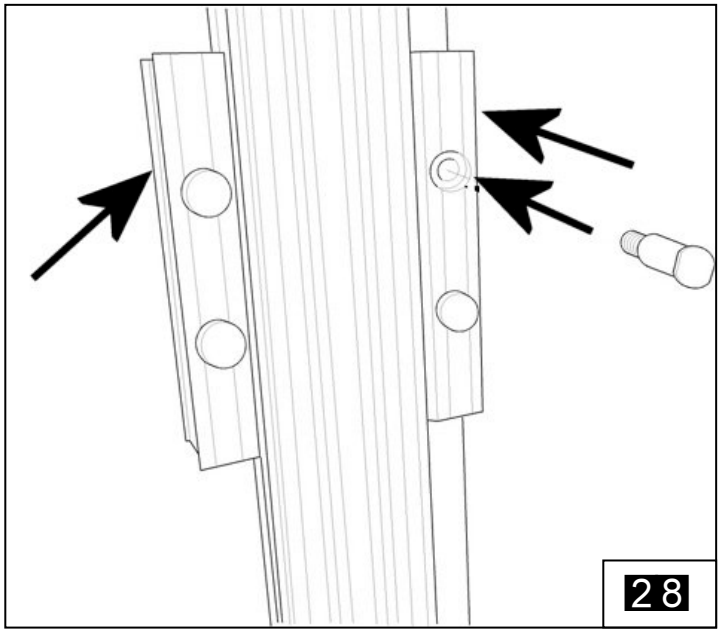


- Remove the hubs from the trolley, removing one sliding block at a time. 27



ATTENTION: If the counterweight is not blocked by an iron staff, it will slide up to the lower end of stroke and consequently the trolley will be lift up to the upper limit switch.

- Assemble the new sliding block with hub, screwing it to the rear plate. 28

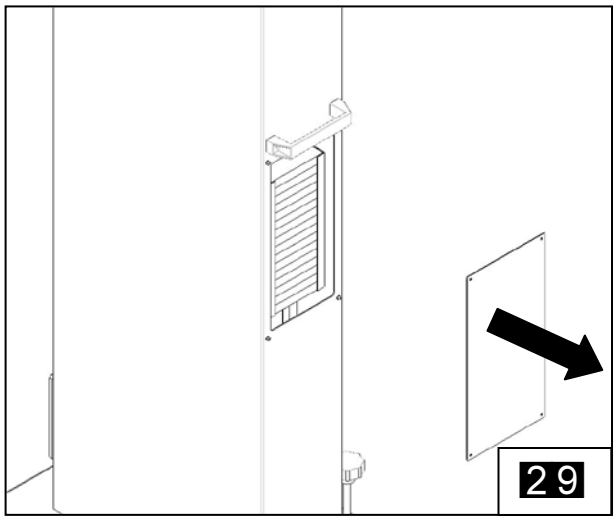


- Do the reverse operations for the reassembling.
- See **Chapter 12.6** to adjust the sliding blocks.

12.8 Adjustment of the counterweight

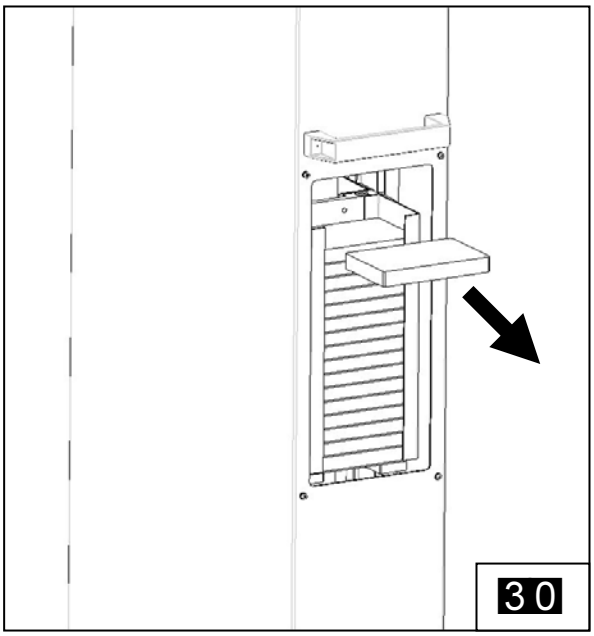
To adjust the counterweight, do as follows:

- Turn off the power supply to the machine.
- Remove the rear door and move the trolley so that the counterweight slides up/down up to reach the opening. 29



ATTENTION: to make the work easier and for safety reasons, it is better that the following operations are carried out by two operators.

- Add or remove the plates of the counterweight, as indicated in the picture 30, to balance the machine.

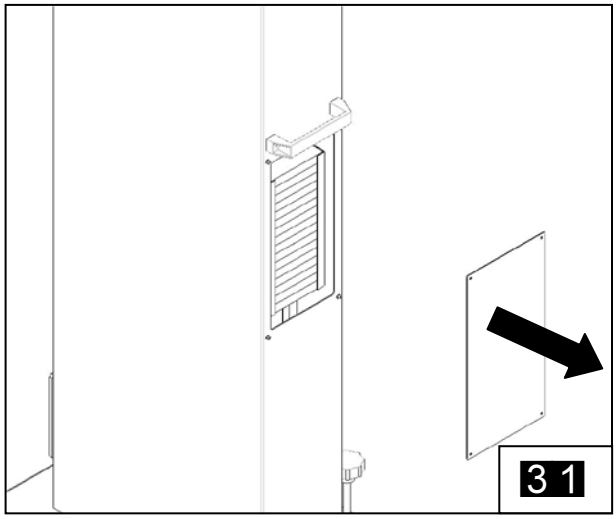


- Assemble the rear door.

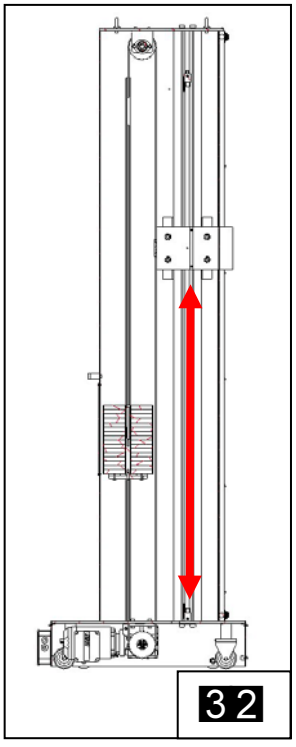
12.9 Replacement of the counterweight sliding guides

To replace the counterweights sliding guides do as follows:

- Turn off the power supply to the machine.
- Remove the rear door 3 1,

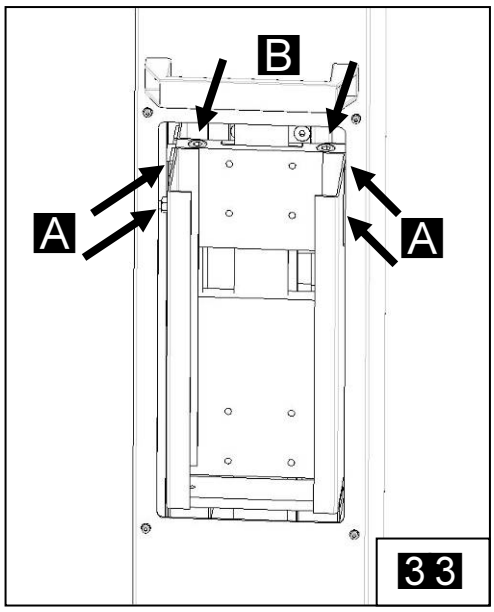


- Position and block the gun supporting-arm so as the counterweight is in line with the opening. 3 2,



- Refer to **Chapter 12.8** to remove all the counterweight plates.

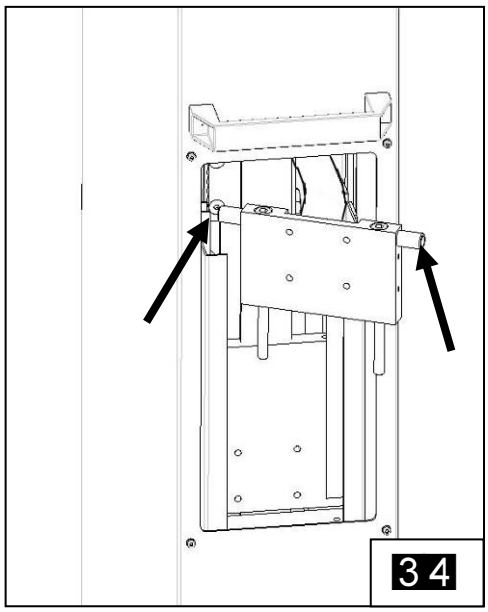
- Unscrew the two+two nuts A of the rod and the two upper screws B, with a suitable wrench, so as to slacken the belt and remove it from the pulley. 33



ATTENTION: do not remove the screws completely so as to avoid that the counterweight and the trolley fall.

- Tilt sideways the counterweight plate, shown in the figure, so as to remove the sliding guides from its seats with a suitable wrench. 34

ATTENTION: it is necessary to hold the counterweight structure so as to avoid that it falls down. Hence a second operator is required for safety reason.



- Replace them with new counterweight guides. 34

- Adjust the belt tension (see the relative paragraph).
- Close the rear door and remove the backstop to the gun supporting-arm.

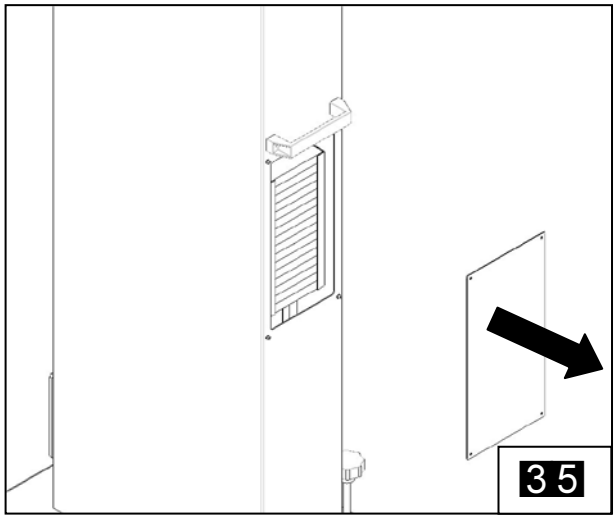
12.10 Adjustment of the hardware limit of the stroke

*See **Chapter 12.10** of "Maintenance for HF30*

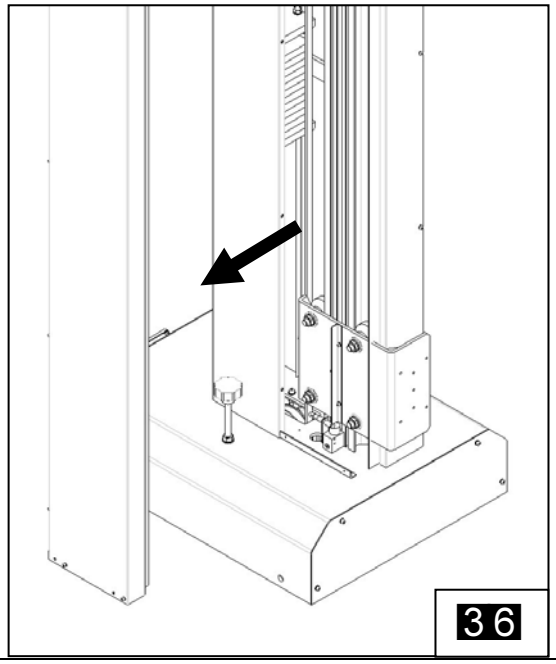
12.11 Replacement of the belt

ATTENTION: to perform this maintenance two persons are necessary.

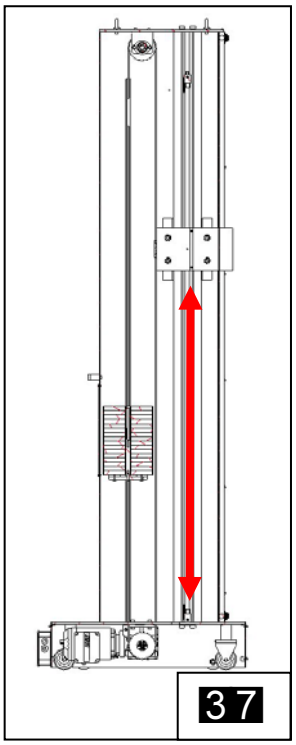
- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the rear door. 35,



- Remove the main panel by unscrewing the screws that fix it to the main structure 36

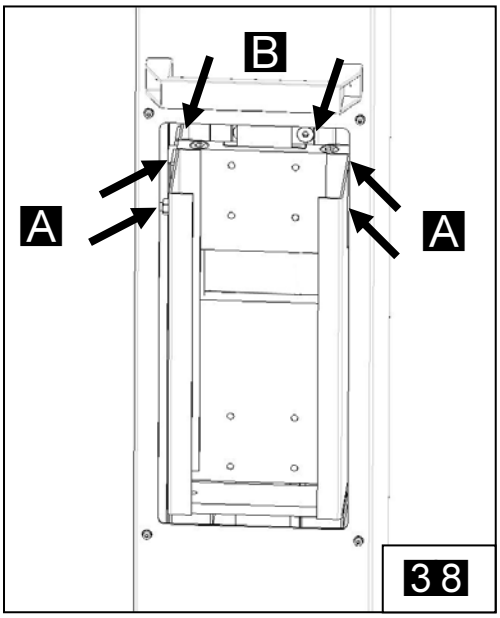


- Position and block the gun supporting-arm so as the counterweight is in line with the opening. 37,



37

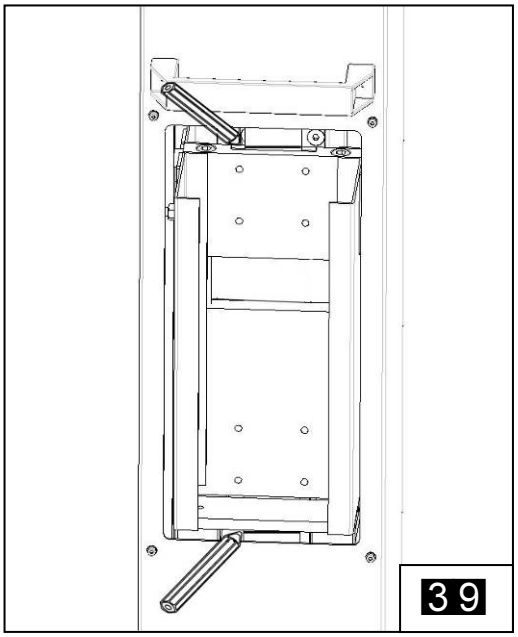
- Unscrew the two+two nuts A of the rod and the two upper screws B, with a suitable wrench, so as to slacken the belt and remove it from the pulley. 38



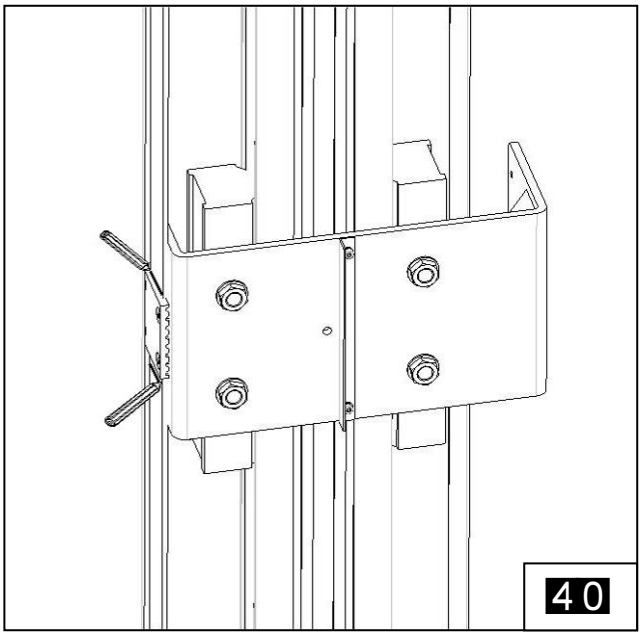
38

- Refer to **Chapter 12.8** to remove all the counterweight plates.

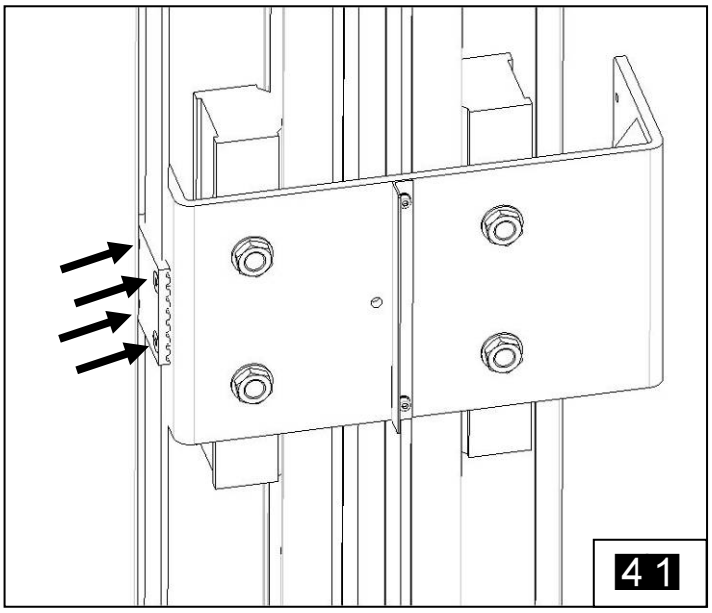
- Mark the belt (up and down) in order to locate the assembly position. 39



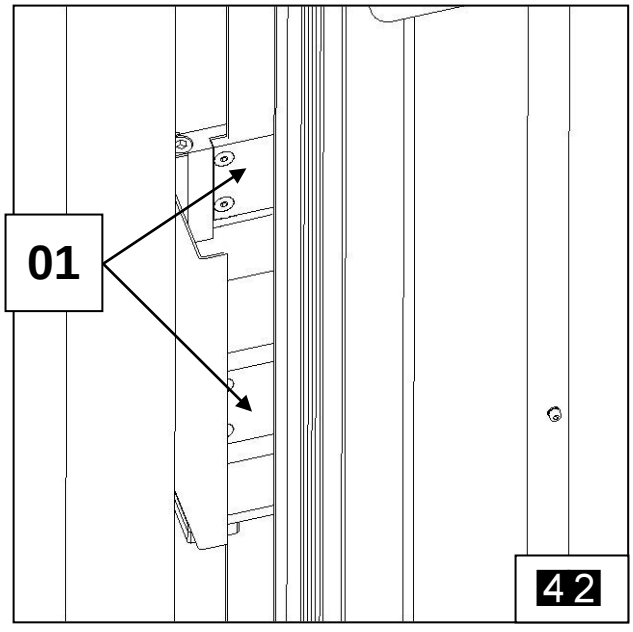
- Mark the belt in correspondence to the toothed plate that fix the belt to the trolley. 40



- Using a suitable wrench extract the four screws to remove the belt from the trolley, taking care to hold it and put in to the lower limit switch. 4 1

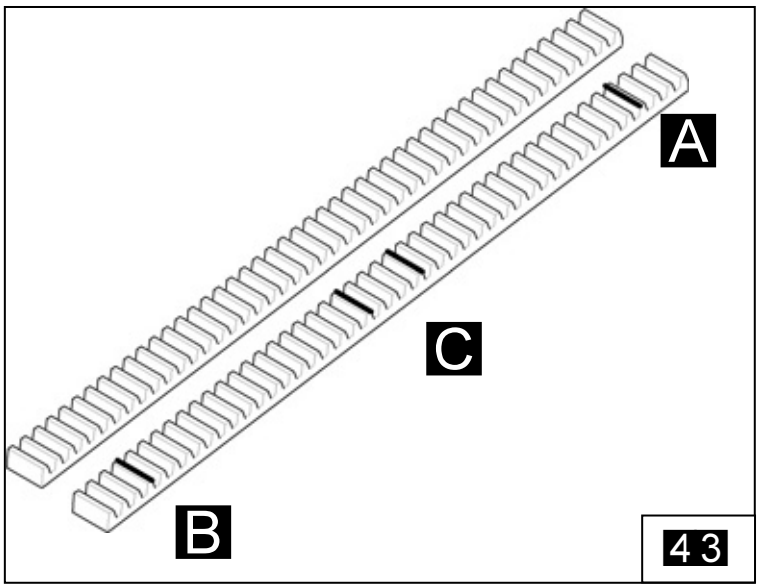


- Remove the toothed belt from the counterweight group unscrewing the four screws that fix it to them through the toothed plates **(01)**. 4 2



- The belt is now free to be removed completely from the reciprocator.

- Lay down the toothed belt to replace on the ground near the old one, then report the marks from the old belt to the new one.



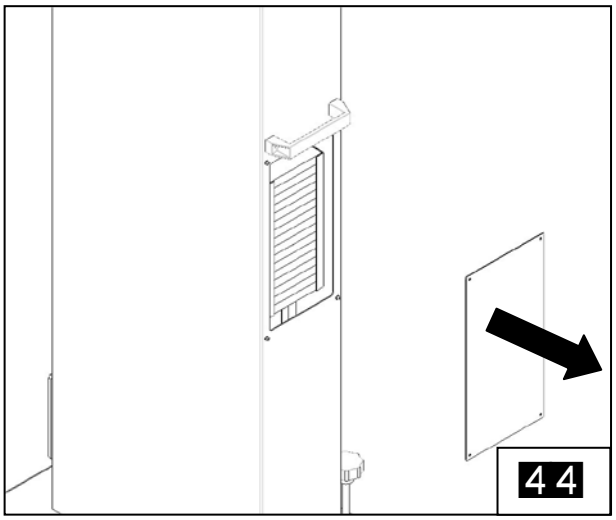
- **Pos. 43(A)** - Assembly position of upper counterweight
  Pos. 43(B) - Assembly position of lower counterweight
  Pos. 43(C) - Fixing position of the trolley

- Replace the belt by carrying out the reverse procedure.
- Tension correctly the belt following the instructions described in **Chapter 12.12**.
- Close the rear door and remove the backstop and reassemble the gun supporting-arm.

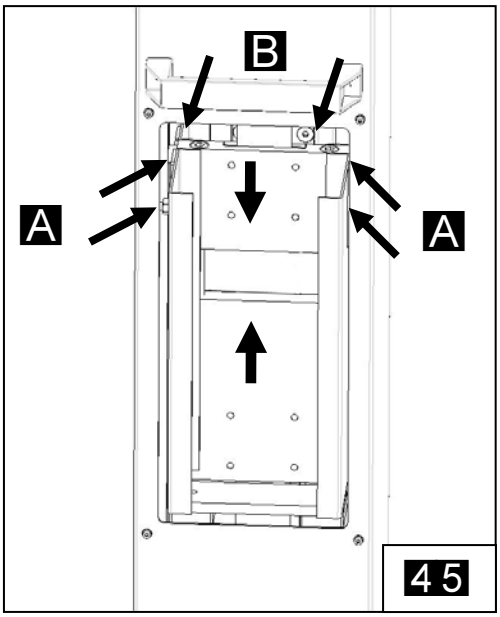
12.12 Adjustment of the belt tension

To adjust the tension of the belt, do as follows:

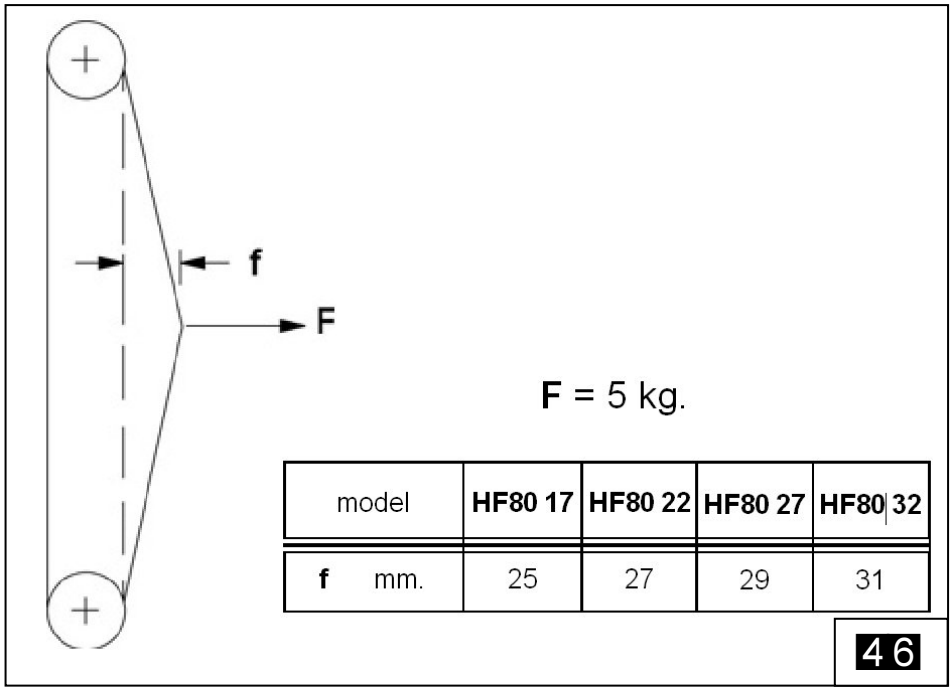
- Turn off the power supply to the machine.
- Remove the rear door and move the trolley so that the counterweight slides up/down up the reach the opening. 44



- Unscrew the two+two nuts A of the rod and the two upper screws B, with a suitable wrench, so as to tension or slacken the belt (see values on table 46). 45



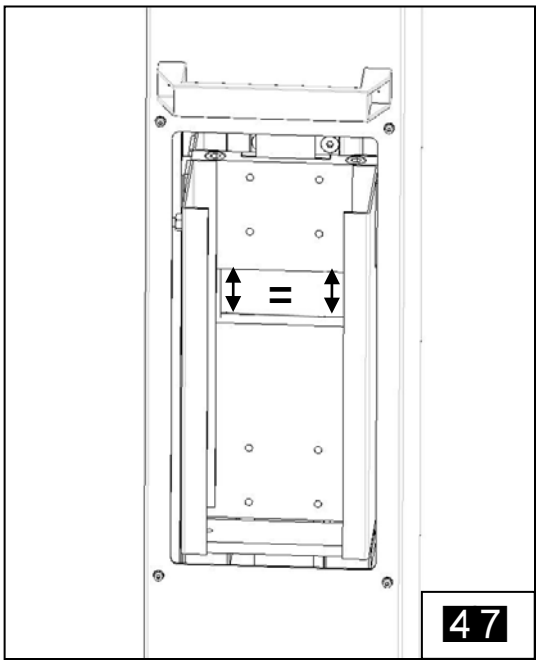
For the correct belt tension, see the diagram below. 46



model	HF80 17	HF80 22	HF80 27	HF80 32
f mm.	25	27	29	31

46

- Check the parallelism between the upper and the lower counterweight plates. 47



47

- Assemble the read door.

12.13 Replacement of the encoder

*See **Chapter 12.13** of "Maintenance for HF30*

13.0 ALARMS

ANOMALY	CAUSE	REMEDY
NOISE AND VIBRATIONS DURING THE STROKE	■ Wrong adjustment of the trolley ■ Worn out wheels/sliding blocks of the trolley	■ Adjust the trolley ■ Replace the wheels/sliding blocks
STRONG HITS DURING THE MOVEMENT	■ Belt tension insufficient	■ Adjust belt tension
NOISE AT THE REVERSAL POINTS	■ Clearance of the gearmotor	■ Replace the gearmotor
LOSS OF STROKE REFERENCES	■ Breaking of the encoder	■ Replace the encoder
ELECTRIC ANOMALIES		■ See the wiring diagrams

14.0 SPARE PARTS

14.1 General advice

- In order to optimise and address correctly the demand of spare parts and/or technical assistance, it is necessary to refer to ***Nordson.***

- If the customer uses, above all during the period of contractual guarantee of the machine, not original ***Nordson***, spare parts, the guarantees about functional performances and above all accident prevention safeties are no more valid. Therefore ***Nordson*** declines each possible responsibilities direct, indirect or consequential, about accidents occurred to staff, or about possible restrictions of productive performances of the machine.

- The safety and reliability of ***Nordson*** HF Reciprocator is only guaranteed with the proper use of correct ***Nordson*** spare parts.

- Before removing any components of the machine and replacing them with spare parts, it is necessary to look it up in the "**OPERATING AND MAINTENANCE MANUAL**" attached.
  This is necessary to identify all information to adopt to guarantee safety during the interventions (safety and accident prevention measures).

14.2 How to order spare parts

To order spare parts see the data on the CE plate.
The order will have to contain the following elements:

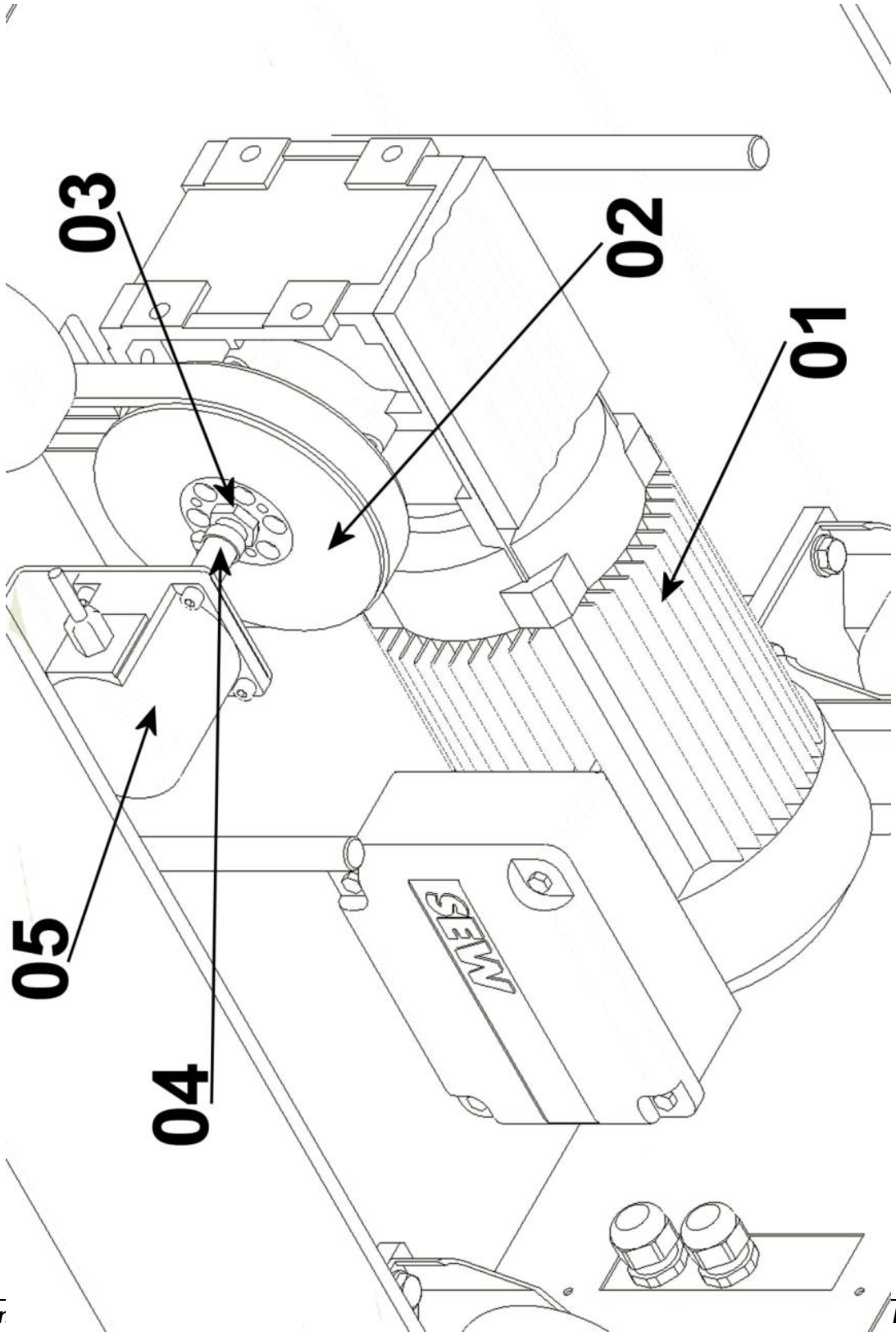
- Model/Type of machine
- Serial No.
- Description of the group
- Position no. of the spare parts
- Description of the spare parts
- Code of the spare part
- Quantity

Example:

- Reciprocator HF30 170
- Serial No. 99999
- Trolley group
- Position 02
- Concentric wheel
- Part Number
- No. 2 Pcs

14.3 List of spare parts for HF30

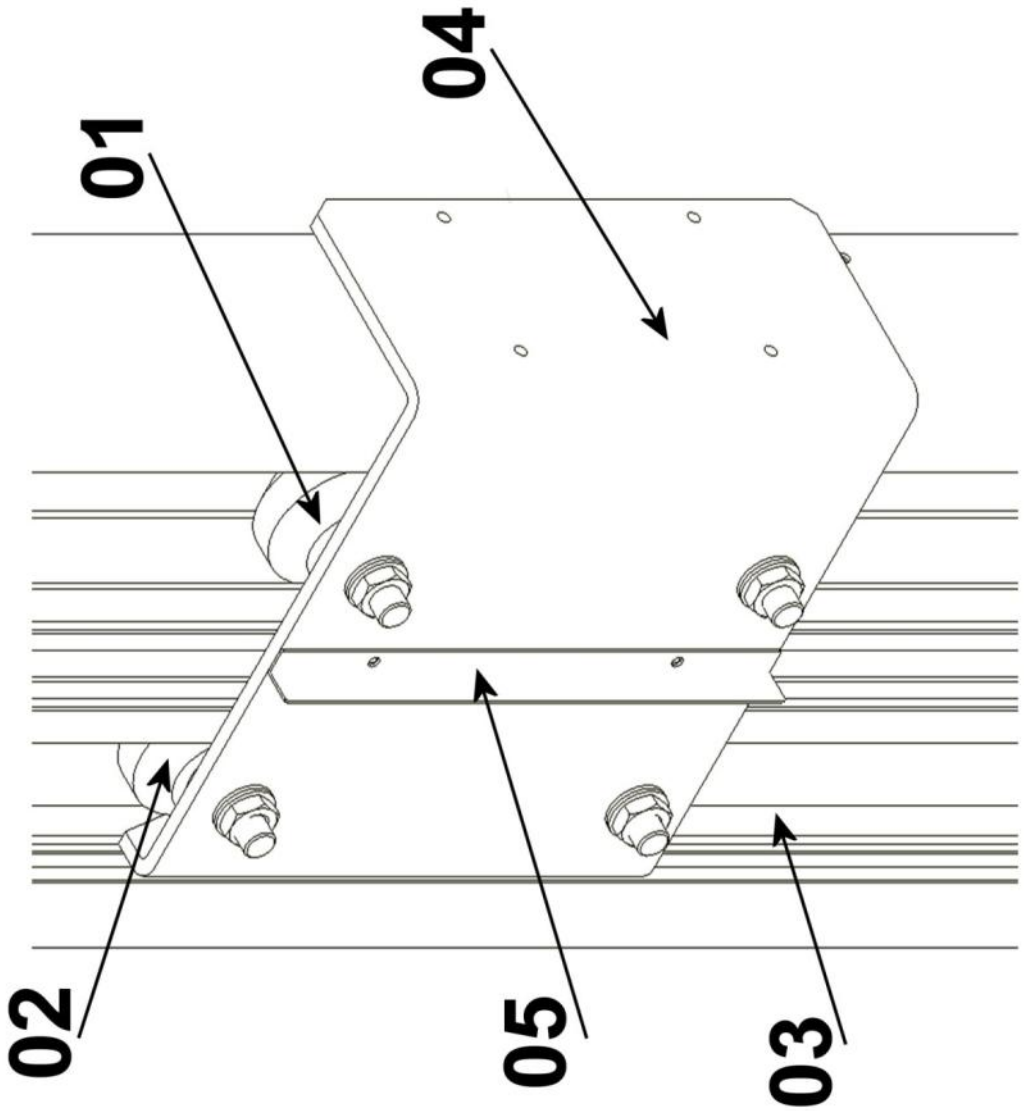
GEARMOTOR GROUP



GEARMOTOR GROUP

Pos.	Part Number	Description	Qty
1	7034320	Gearmotor assy,HF30	1
2	7034321	Pulley,drive,HF30	1
3	7034322	Bush,taperlock,HF30	1
4	736358	Coupling, sensor encoder, recip	1
5	7034353	Encoder, HF series (if present)	1

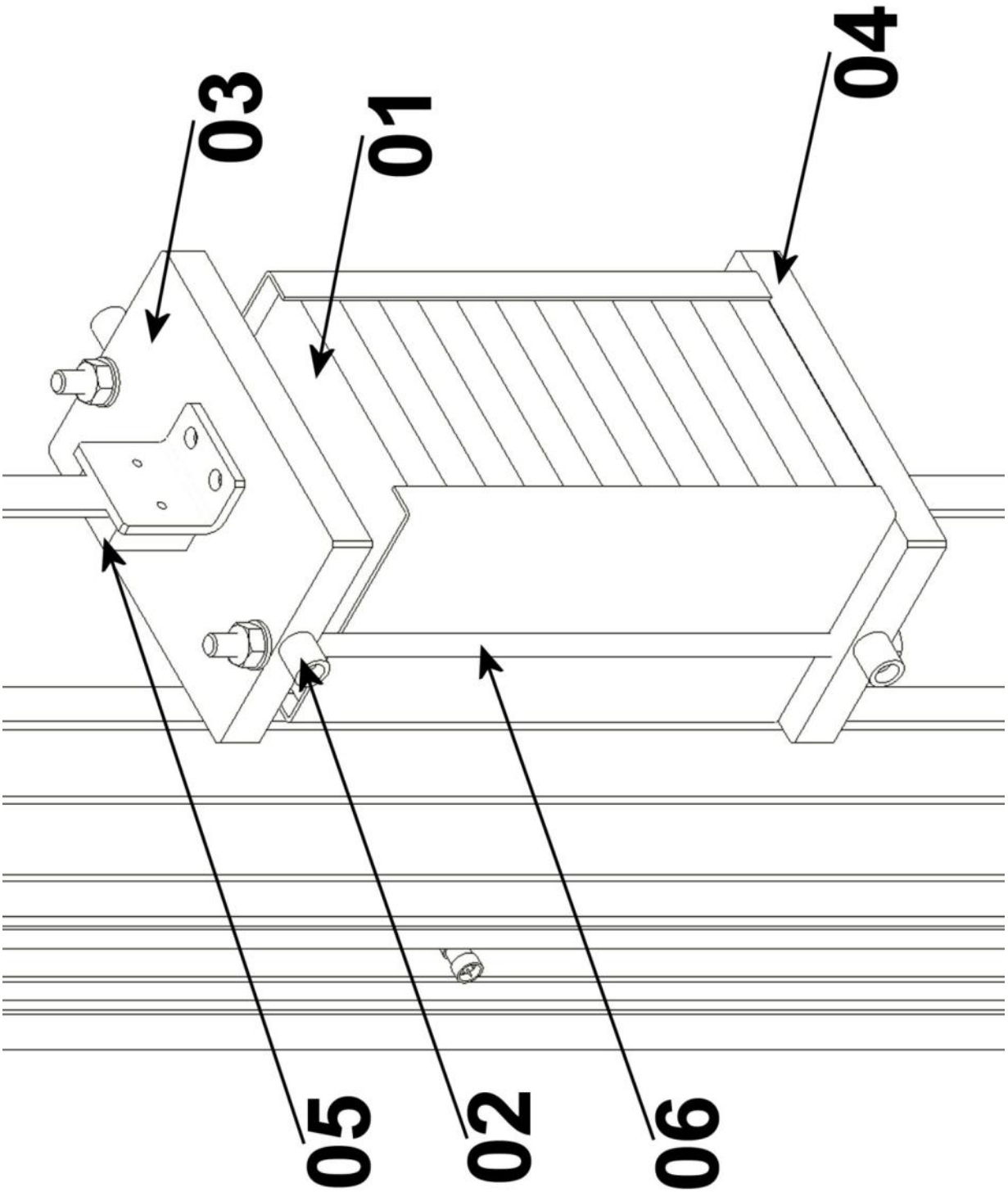
TROLLEY GROUP



TROLLEY GROUP

Pos.	Part Number	Description	Qty
1	736411	Eccentric wheel	2
2	736410	Concentric wheel	2
3	70343xx	Toothed belt, HF30*	1
4	7034324	Carriage plate,HF30	1
5	-	Cam sensor reader	1
		*see page 41 to order the correct length	

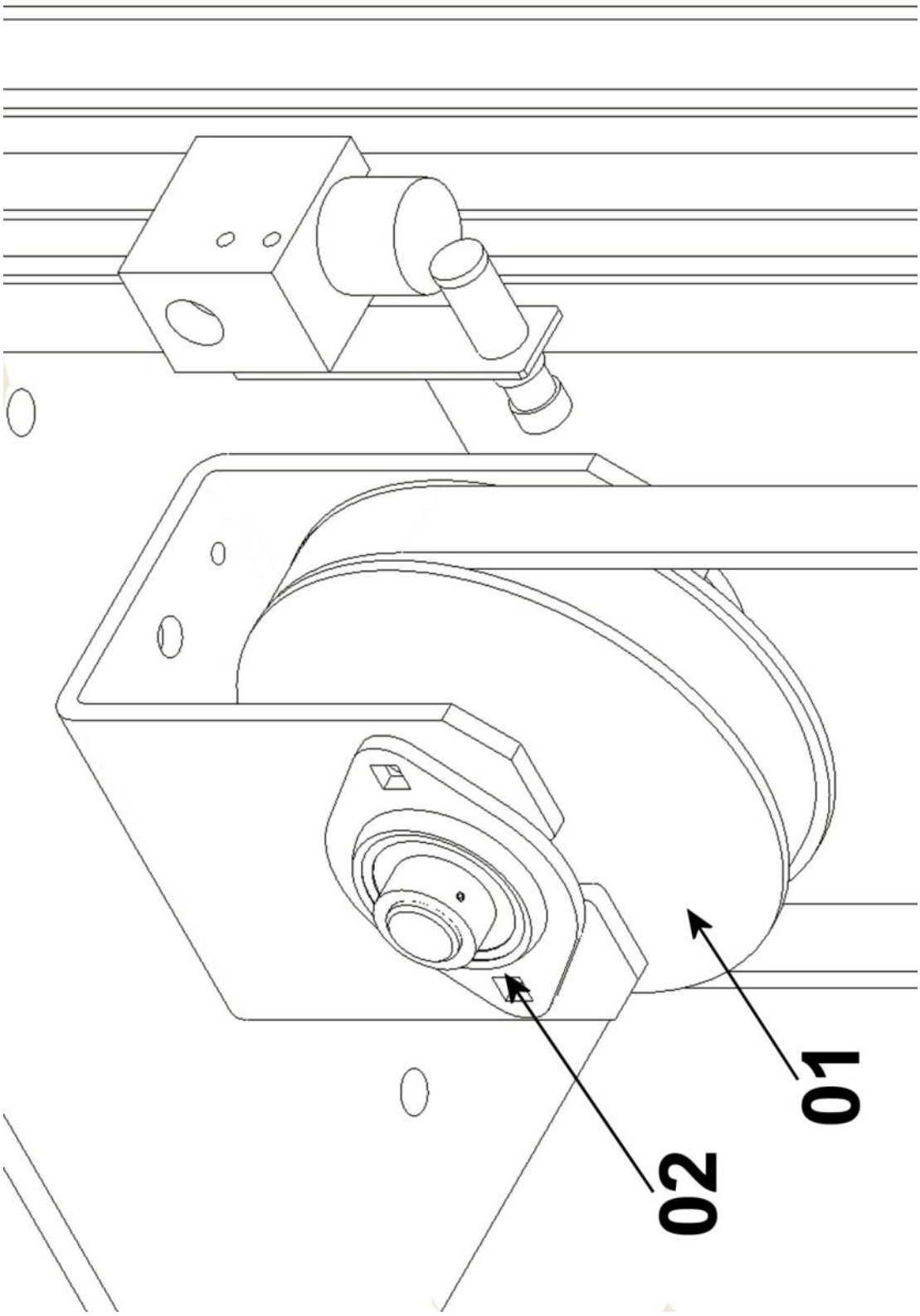
COUNTERWEIGHT GROUP



COUNTERWEIGHT GROUP

Pos.	Part Number	Description	Qty
1	7034338	Kit,counterweight,HF30 (2 pcs)	12
2	7034326	Kit,2*counterweight guide,HF30	2
3	7034327	Upper counterweight plate	1
4	7034328	Lower counterweight plate	1
5	7034329	Fixing plate,toothed belt,HF30	1
6	7034330	Counterweight stay bolt	1

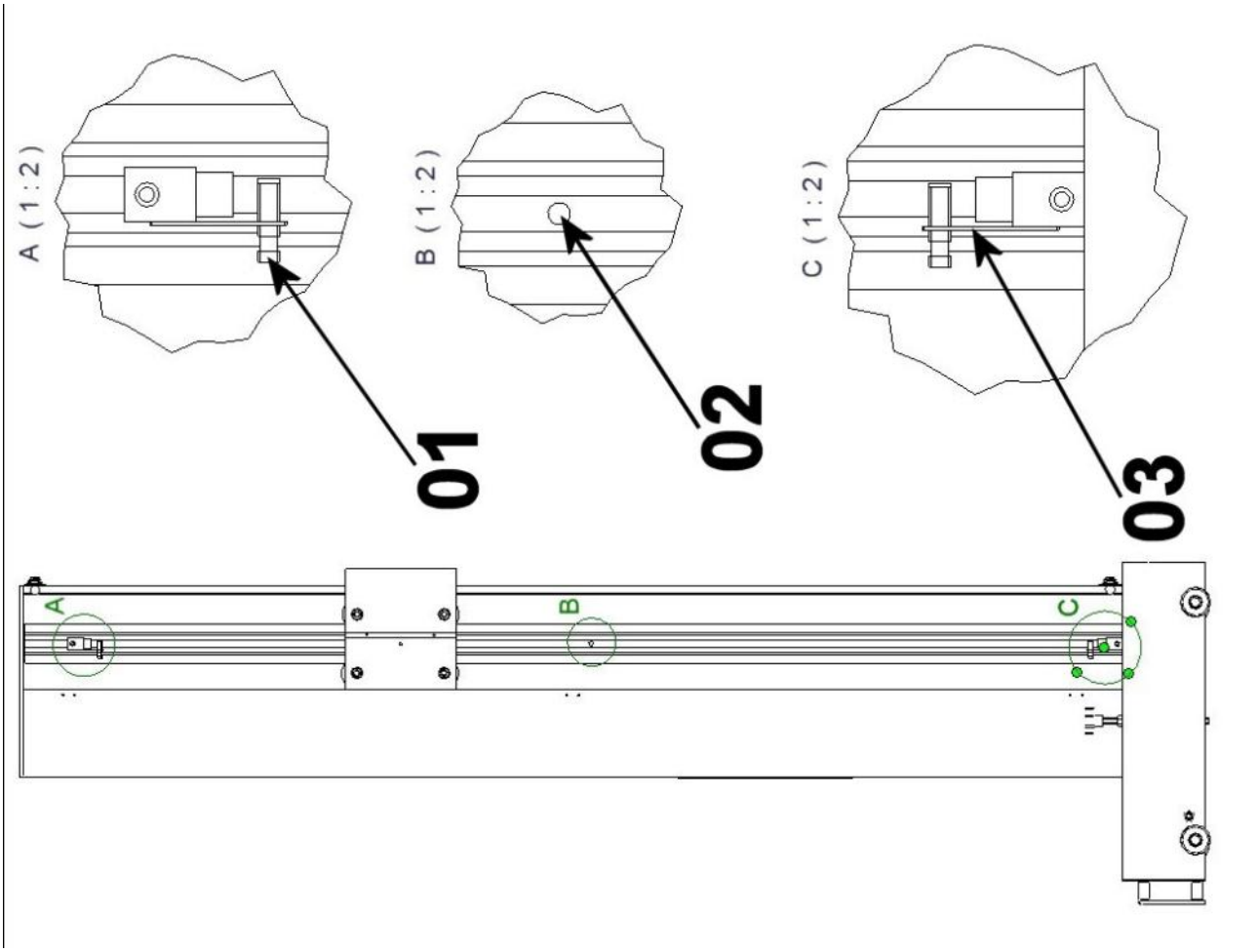
DRIVEN GROUP



DRIVEN GROUP

Pos.	Part Number	Description	Qty
1	7034331	Pulley.top,HF30	1
2	7034332	Kit,2 * bearing, top pulley	2

LIMIT SWITCH GROUP

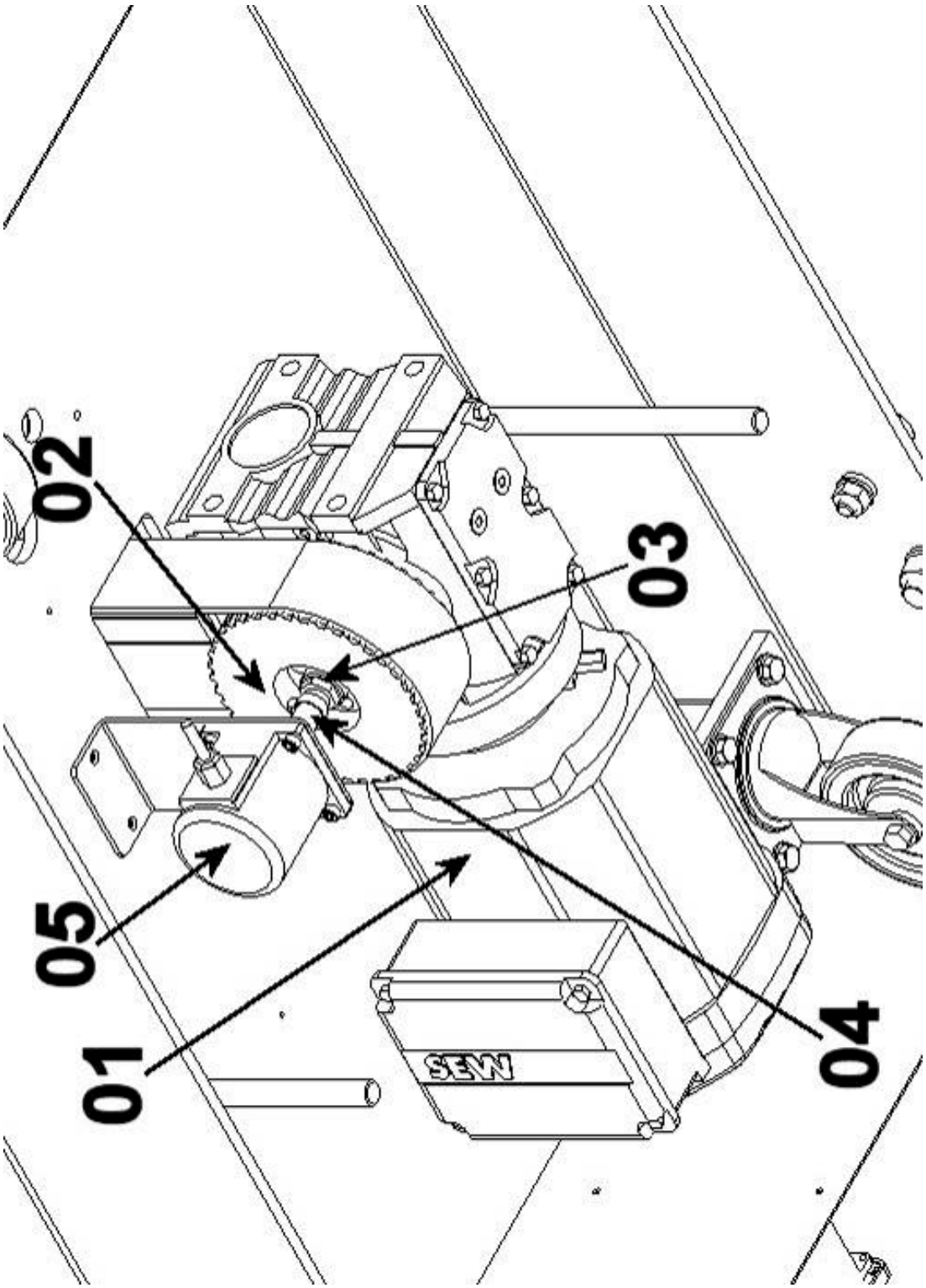


LIMIT SWITCH GROUP

Pos.	Part Number	Description	Qty
1	736339	Sensor,inductive,PNP,NC 12mm	2
2	736828	Sensor,inductive,PNP,NO 12mm (if present)	1
3	7034333	Bracket,top&bottom sensor	2

14.4 List of spare parts for HF80

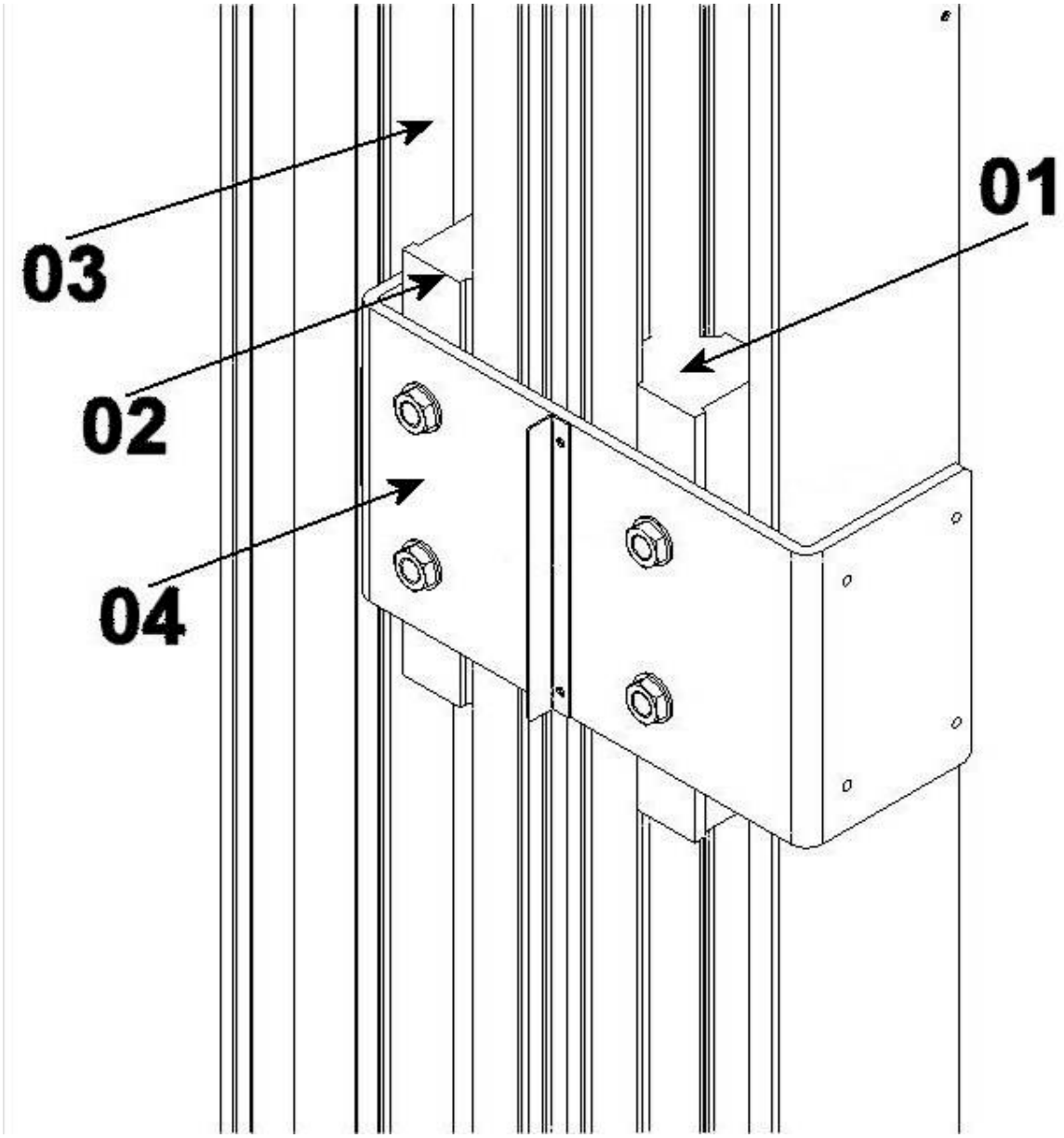
GEARMOTOR GROUP



GEARMOTOR GROUP

Pos.	Part Number	Description	Qty
1	7034339	Gearmotor assy,HF80	1
2	7034340	Pulley,drive,HF80	1
3	7034341	Bush,taperlock,HF80	1
4	736358	Coupling, sensor encoder, recip	1
5	7034353	Encoder, HF series	1

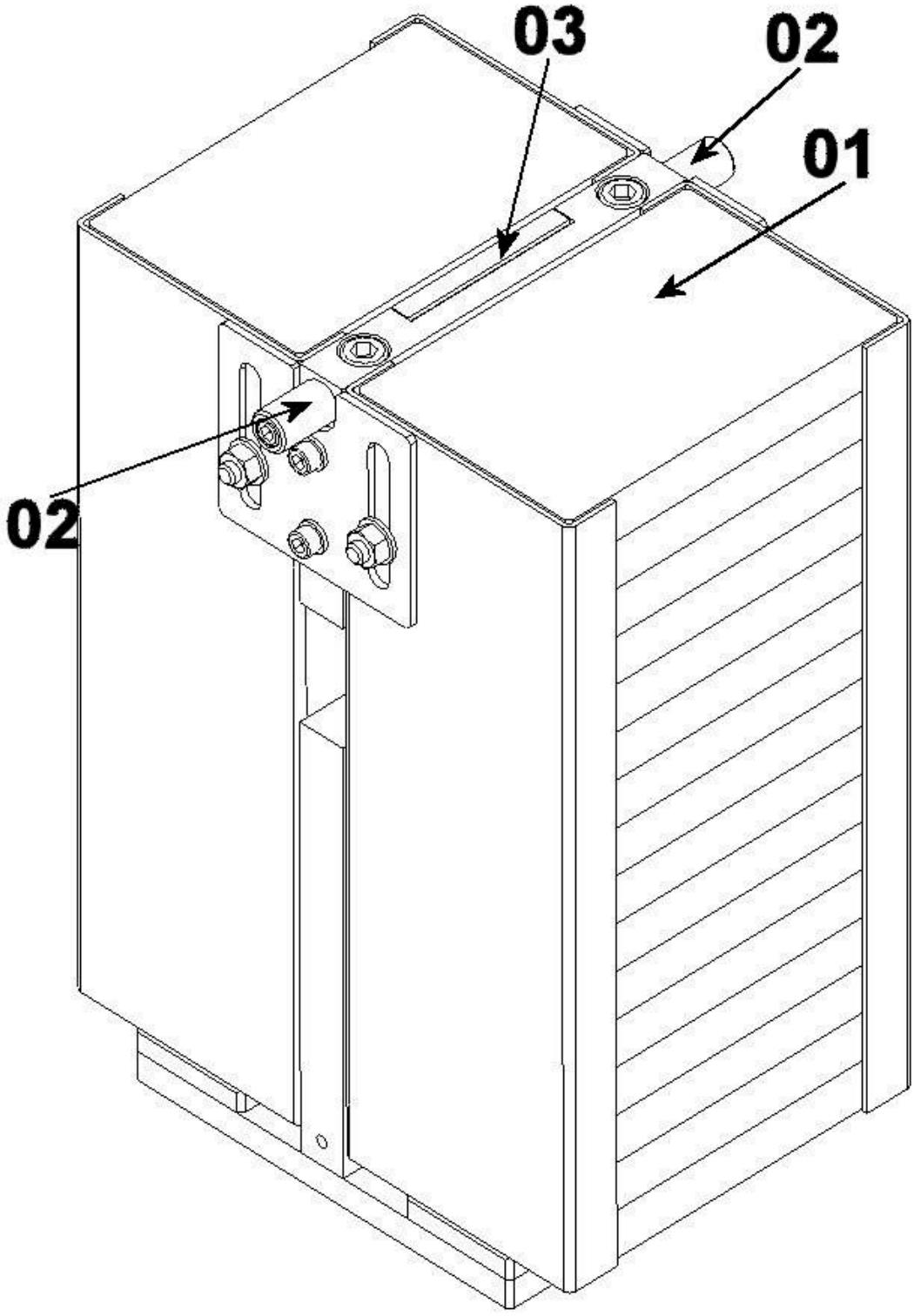
TROLLEY GROUP



TROLLEY GROUP

Pos.	Part Number	Description	Qty
1	7034431	Eccentric sliding block	1
2	7034430	Concentric sliding block	1
3	70343xx	Toothed belt, HF80*	1
4	7034344	Carriage plate,HF80	1
		*see page 69 to order the correct length	

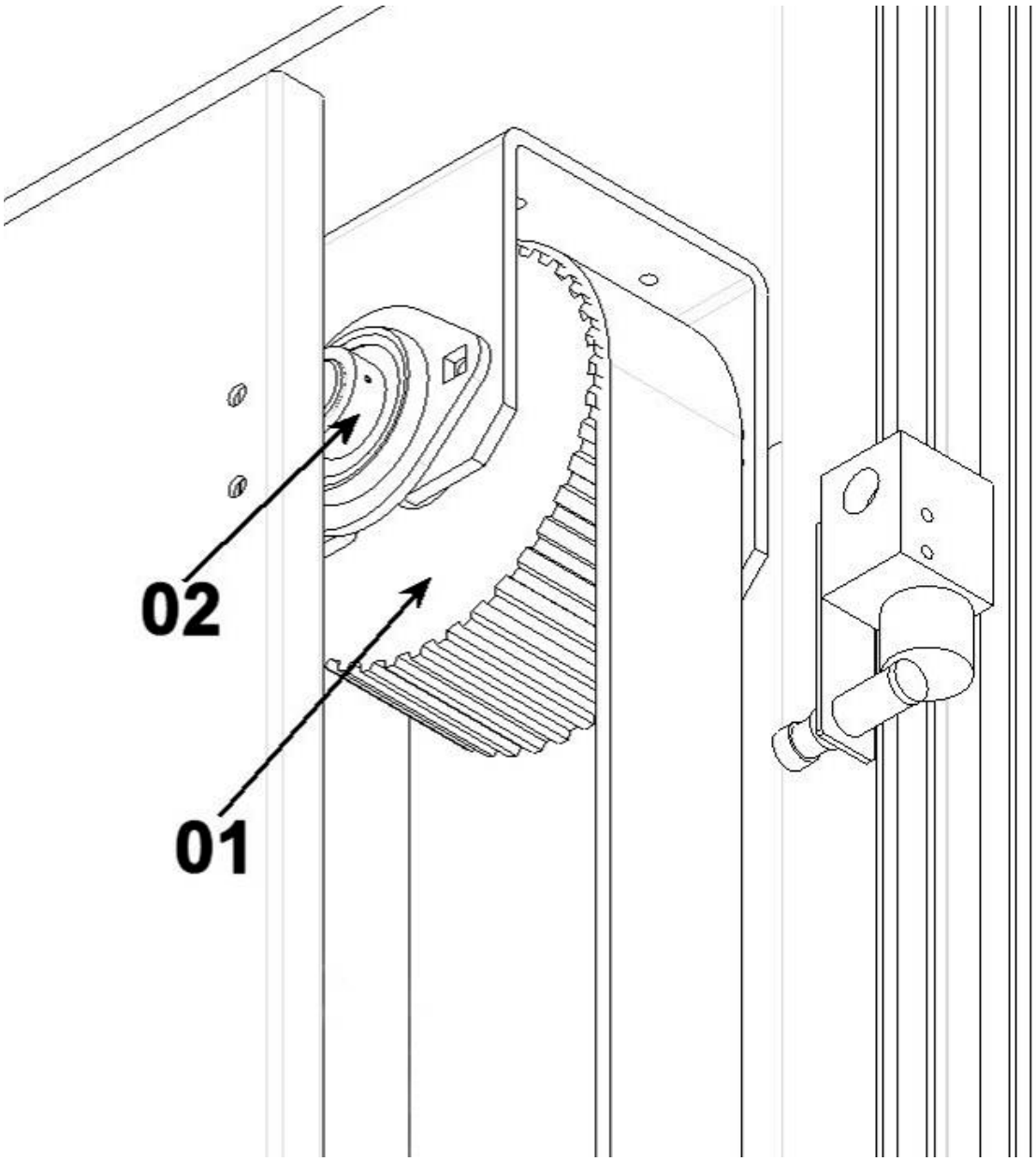
COUNTERWEIGHT GROUP



COUNTERWEIGHT GROUP

Pos.	Part Number	Description	Qty
1	7034352	Kit,counterweight plate,HF80 (2 pcs)	30
2	7034350	Kit,2*counterweight guide,HF80	2
3	7034351	Fixing plate, toothed belt, HF80	2

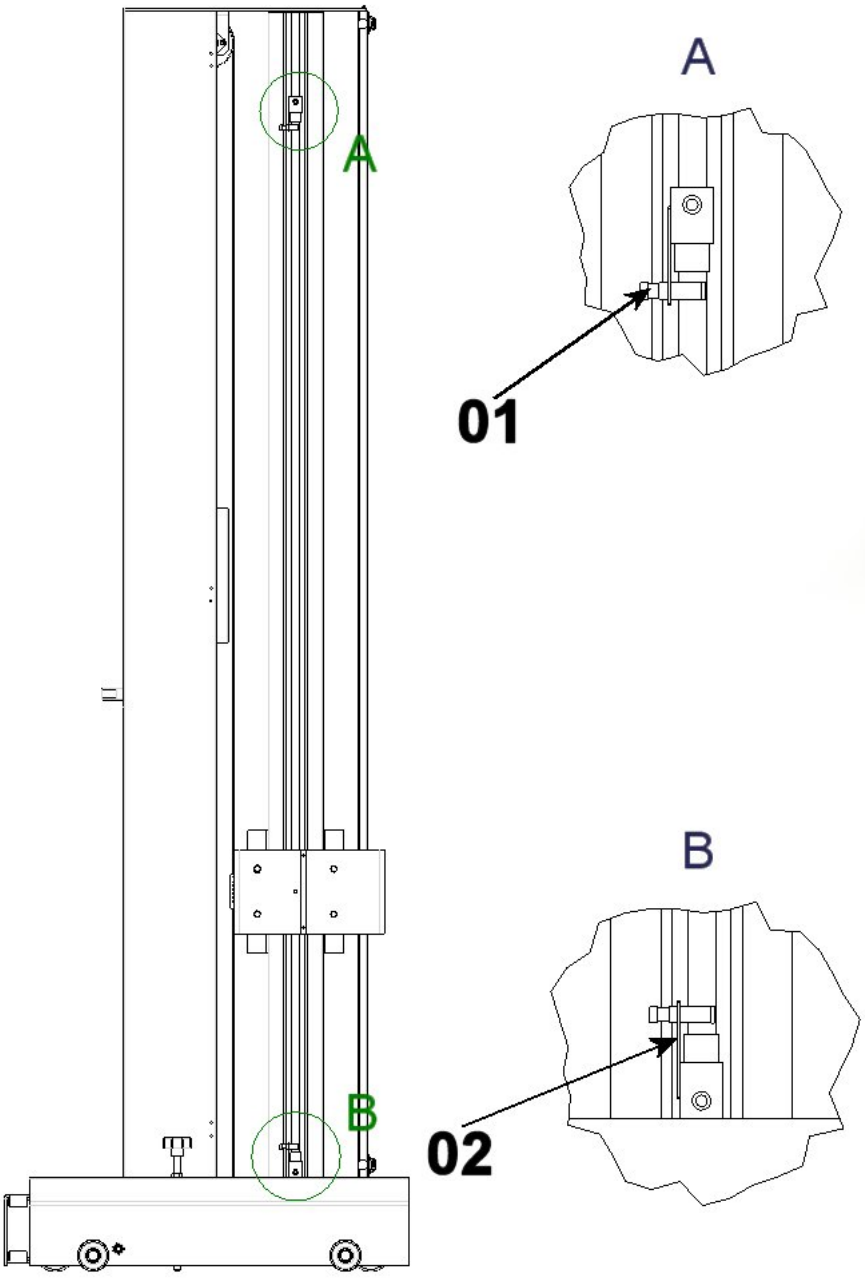
DRIVEN GROUP



DRIVEN GROUP

Pos.	Part Number	Description	Qty
1	7034354	Pulley.top,HF80	1
2	7034355	Kit,2 * bearing, top pulley, HF80	2

LIMIT SWITCH GROUP



LIMIT SWITCH GROUP

Pos.	Part Number	Description	Qty
1	736339	Sensor,inductive,PNP,NC 12mm	2
2	7034333	Bracket,top & bottom sensor	2

15.0 DRAINING OF HARMFUL SUBSTANCES AND DISMANTLING OF THE MACHINE

The user must remember that the harmful substances used, see lubricating oil, grease etc., must be drained in accordance with the local laws in force.

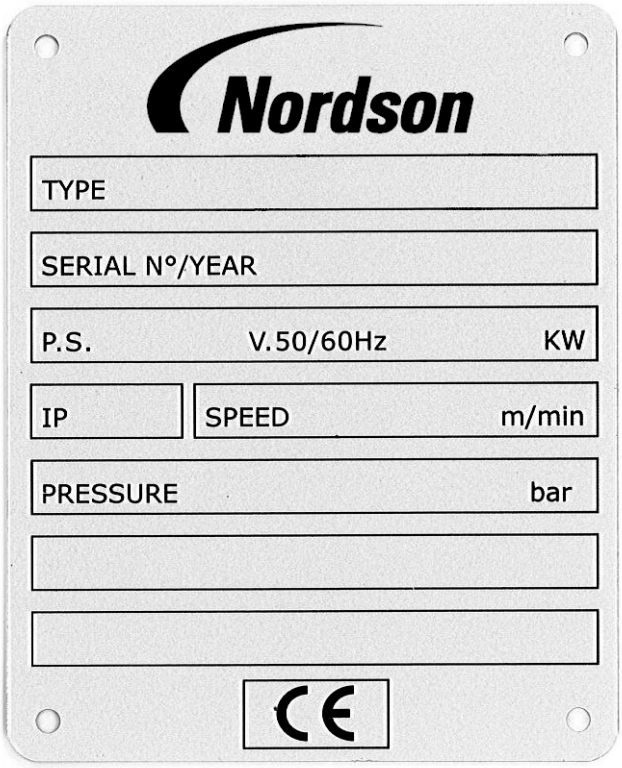
The dismantling of the machine and the removal of its components must be carried out according with the local laws or directives.

The machine is prevalently composed by:

- ferrous materials (structure and mechanical parts)
- materials derived from copper (electric wires and electric motor winding)
- Aluminium materials (mechanical parts)

16.0 ATTACHMENTS

CE PLATE


Nordson
TYPE
SERIAL N°/YEAR
P.S.
V.50/60Hz
KW
IP
SPEED
m/min
PRESSURE
bar
CE

CE DECLARATION

EC DECLARATION OF CONFORMITY

ACCORDING TO CE DIRECTIVE 2006/42/CE

DESCRIPTION	Reciprocator HF Series
FAMILY/MODELS	All - for powder coating applications
APPLICABLE DIRECTIVES	Machinery Directive 2006/42/CE Electromagnetic Compatibility Directive 2014/30/EU Directive 2014/34/EU ATEX zone II 3D referred to equipment and protection systems which are used in the presence of explosive atmosphere
STANDARDS USED TO VERIFY COMPLIANCE:	UNI EN ISO 12100:2010
MARKING OF PRODUCT:	CE

The equipment delivered is generally intended to be part of a powder coating system, and can be operated on its own or in conjunction with other equipment.
In order to be in full compliance with the CE machinery directive and its amendments, the customer is obliged to respect the applicable regulations for his powder coating system upon incorporation of the equipment in the powder coating plant and before starting operation.

We hereby declare that the product specified conforms to the directives and standards described above and that it has been provided with a CE label. Provided the product is installed and operated in line with the Nordson manuals, its operation is safe.

Kai Flockenhaus
Manager Procurement & Process,
ICS Europe (Industrial Coating Systems)
Nordson Deutschland GmbH

Date: 23rd May 2016

EC DECLARATION OF CONFORMITY

ACCORDING TO CE DIRECTIVE 2006/42/EC ANNEX II A

DESCRIPTION	Reciprocator HF Series
FAMILY/MODELS	All – for liquid coating applications
APPLICABLE DIRECTIVES	Machinery Directive 2006/42/CE Electromagnetic Compatibility Directive 2014/30/EU Directive 2014/34/EU ATEX zone II 2G t3 referred to equipment and protection systems which are used in the presence of explosive atmosphere
STANDARDS USED TO VERIFY COMPLIANCE:	UNI EN ISO 12100:2010
MARKING OF PRODUCT:	CE

The equipment delivered is generally intended to be part of a powder coating system, and can be operated on its own or in conjunction with other equipment.
In order to be in full compliance with the CE machinery directive and its amendments, the customer is obliged to respect the applicable regulations for his powder coating system upon incorporation of the equipment in the powder coating plant and before starting operation.

We hereby declare that the product specified conforms to the directives and standards described above and that it has been provided with a CE label. Provided the product is installed and operated in line with the Nordson manuals, its operation is safe.

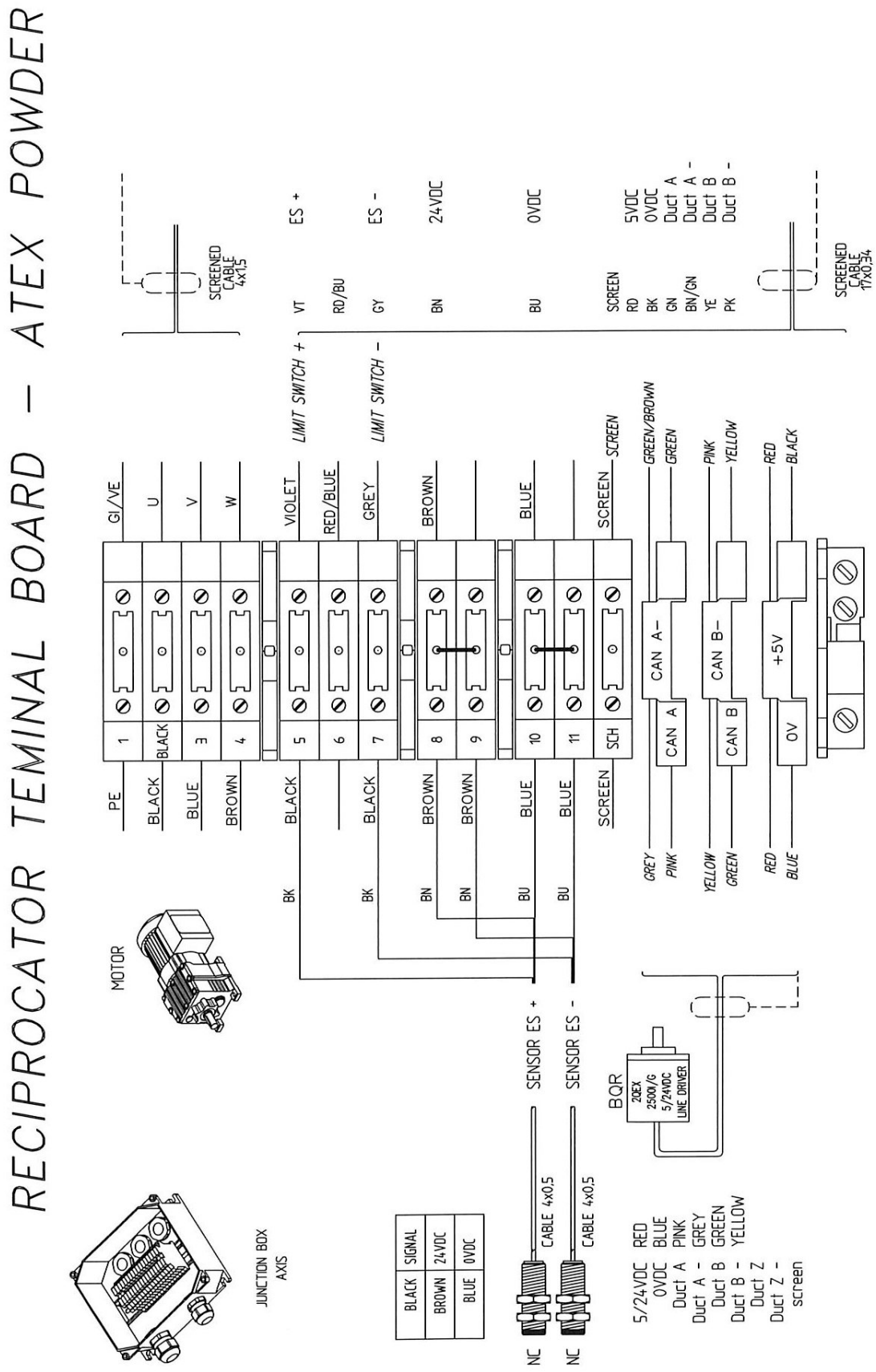
Kai Flockenhaus
Manager Procurement & Process,
ICS Europe (Industrial Coating Systems)
Nordson Deutschland GmbH

Date: 23rd May 2016

Reciprocator mod. HF (EX)
Issued 05/16

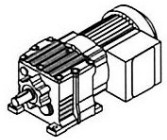
P/N 7179770-03

WIRING DIAGRAMS

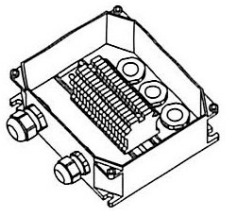

RECIPROCATOR TEMINAL BOARD – ATEX POWDER
SCREENED CABLE 4x1,5
SCREENED CABLE 17x0,34
LIMIT SWITCH +
LIMIT SWITCH –
ES +
ES –
24VDC
0VDC
5VDC
0VDC
Duct A
Duct A –
Duct B
Duct B –
GI/VE
U
V
W
VIOLET
RED/BLUE
GREY
BROWN
BLUE
SCREEN
PE
BLACK
BLUE
BROWN
BLACK
BLACK
BROWN
BROWN
BLUE
BLUE
SCREEN
SCREEN
GREEN/BROWN
GREEN
PINK
YELLOW
RED
BLACK
CAN A–
CAN A
CAN B–
CAN B
+5V
0V
MOTOR
JUNCTION BOX AXIS
SENSOR ES +
SENSOR ES –
CABLE 4x0,5
CABLE 4x0,5
BQR
20EX 2500/G 5/24VDC LINE DRIVER
BLACK SIGNAL
BROWN 24VDC
BLUE 0VDC
5/24VDC RED
0VDC BLUE
Duct A PINK
Duct A – GREY
Duct B GREEN
Duct B – YELLOW
Duct Z
Duct Z – screen

RECIPROCATOR EXTENSION CABLE

MOTOR



JUNCTION BOX
RECIPROCATOR

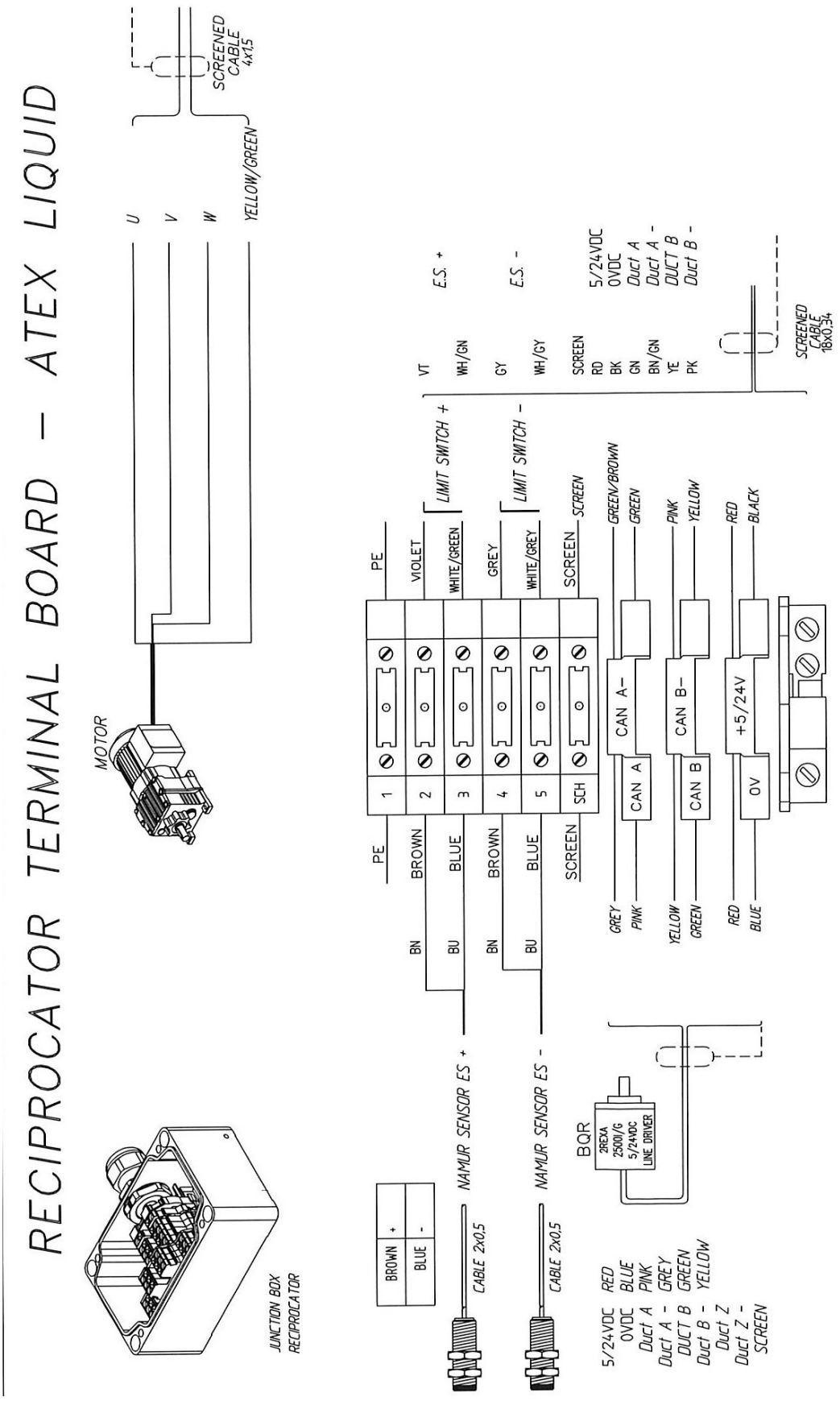


SCREENED CABLE
4 POLES
WIRE COLOUR

U	U	SCREENED CABLE 4x1,5
V	V	
W	W	
YE/GR	YE/GR	

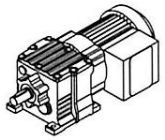
SCREENED CABLE
18 POLES
WIRE COLOUR

BROWN	24VDC	SCREENED CABLE 18x0,35
BLUE	0VDC	
VIOLET	ES+	
GREY	ES−	
GREEN	DUCT A	
BROWN/GREEN	DUCT A−	
YELLOW	DUCT B	
PINK	DUCT B−	
SCREEN		
GREY/PINK		
WHITE/GREEN		
WHITE/GREY		
YELLOW/BROWN		
BLUE/RED	STOCK	
RED	+V ENCODER	
BLACK	−V ENCODER	
WHITE		
GREY/BROWN		
WHITE/YELLOW		

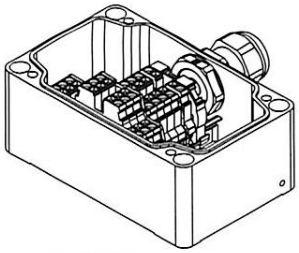

RECIPROCATOR TERMINAL BOARD – ATEX LIQUID
MOTOR
U
V
W
YELLOW/GREEN
SCREENED CABLE 4x1,5
JUNCTION BOX RECIPROCATOR
BROWN +
BLUE -
CABLE 2x0,5
NAMUR SENSOR ES +
CABLE 2x0,5
NAMUR SENSOR ES -
BQR
2REXA 2500I/G 5/24VDC LINE DRIVER
5/24VDC RED
0VDC BLUE
Duct A PINK
Duct A - GREY
DUCT B GREEN
Duct B - YELLOW
Duct Z
Duct Z -
SCREEN
PE
BROWN
BLUE
SCREEN
PE
VIOLET
WHITE/GREEN
GREY
WHITE/GREY
SCREEN
1
2
3
4
5
SCH
LIMIT SWITCH +
LIMIT SWITCH -
CAN A
CAN A-
CAN B
CAN B-
+5/24V
0V
GREY
PINK
YELLOW
GREEN
RED
BLUE
GREEN/BROWN
GREEN
PINK
YELLOW
RED
BLACK
VT
WH/GN
GY
WH/GY
SCREEN
RD
BK
GN
BN/GN
YE
PK
E.S. +
E.S. -
5/24VDC
0VDC
Duct A
Duct A -
DUCT B
Duct B -
SCREENED CABLE 16x0,34

RECIPROCATOR EXTENSION CABLES

MOTOR



JUNCTION BOX
RECIPROCATOR



SCREENED CABLE 4 POLES WIRE COLOUR		
U	U	SCREENED CABLE 4x1,5
V	V	
W	W	
YE/GR	YE/GR	

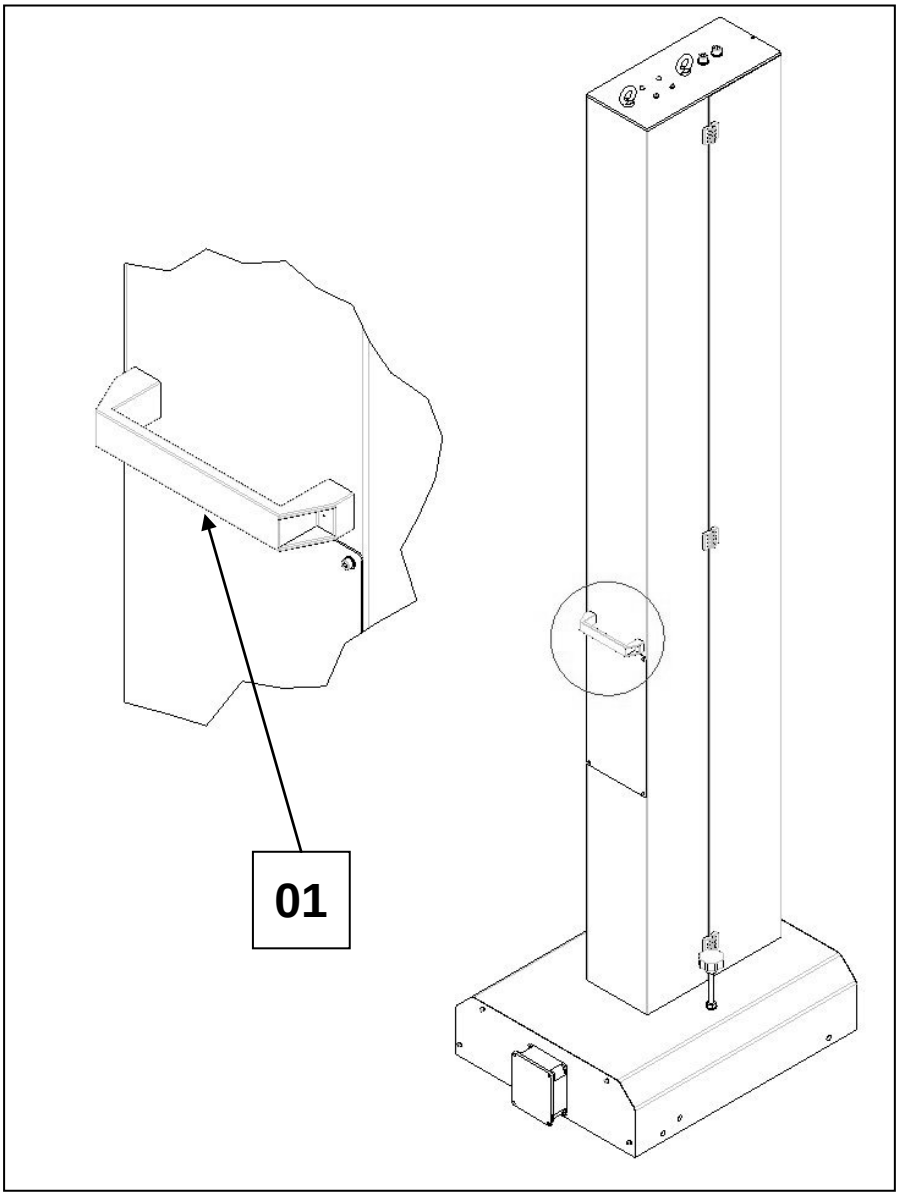
SCREENED CABLE 18 POLES WIRE COLOUR		
BROWN		
BLUE		
VIOLET	ES+	
GREY	ES−	
GREEN	Duct A	
BROWN/GREEN	DUCT A−	
YELLOW	DUCT B	
PINK	DUCT B−	
SCREEN		
GREY/PINK		
WHITE/GREEN	ES+	
WHITE/GREY	ES−	
YELLOW/BROWN		
BLUE/RED	STOCK	SCREENED CABLE 18x0,35
RED	+V ENCODER	
BLACK	−V ENCODER	
WHITE		
GREY/BROWN		
WHITE/YELLOW		

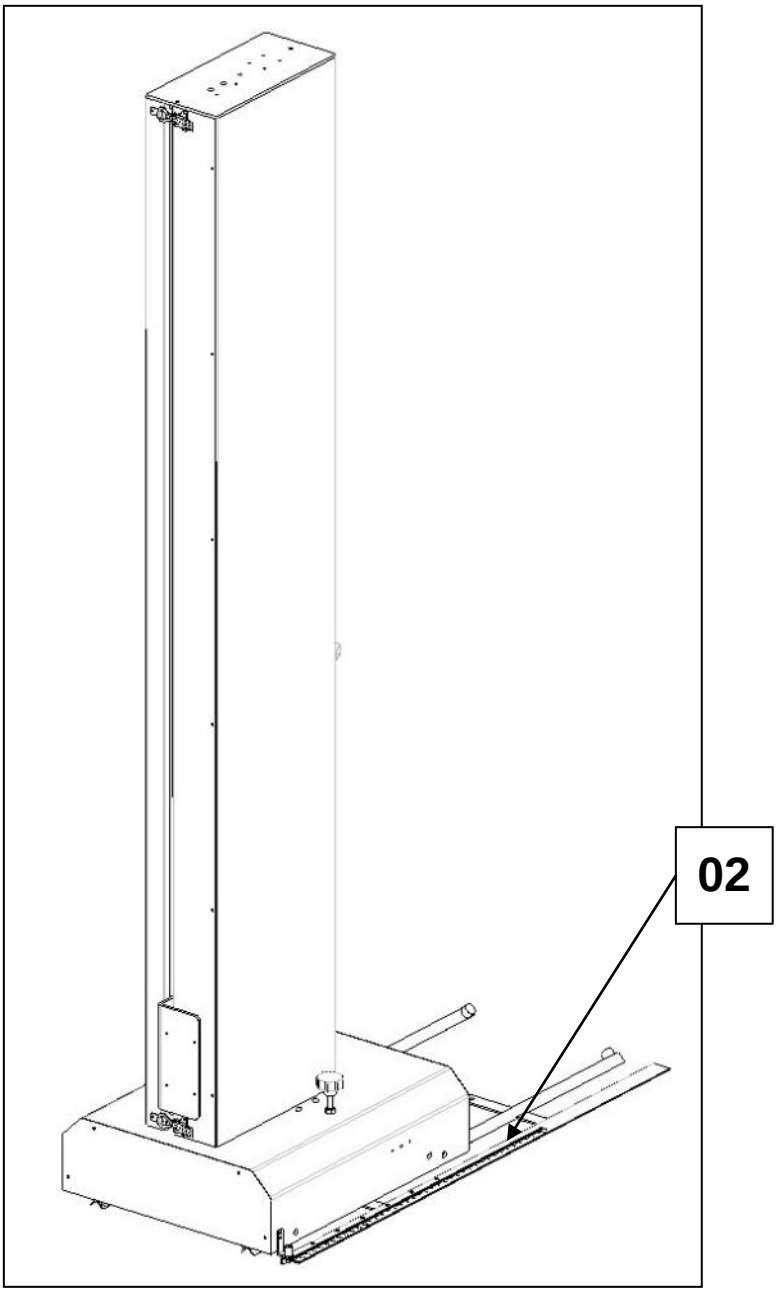
RECOMMENDED OILS

	6) °C -50 0 +50 +100	DIN (ISO)	ISO,NLGI	Mobil®	Shell	KLÜBER LUBRICATION	TEXACO	Castrol Tribol	Castrol Optimol	FUCHS	TOTAL
R... K... F...	Standard -20 +60	CLP HC	VG 220	Mobil SHC 630	Shell Omala S4 GX 220	Klübersynth GEM 4-220 N	Pinnacle EP 220	Tribol 1510/220	Optigear Synthetic X 220	Renolin Unisyn CLP 220	
	4) -40 +40	CLP HC	VG 150	Mobil SHC 629	Shell Omala S4 GX 150	Klübersynth GEM 4-150 N	Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	4) -40 +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68					Renolin Unisyn CLP 68	
	4) -40 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32	Cetus PAO 46		Optileb HY 32	Renolin Unisyn OL 32	Dacnis SH 32
S...(HS...)	Standard -20 +60	CLP HC	VG 460	Mobil SHC 634	Shell Omala S4 GX 460	Klübersynth GEM 4-460 N	Pinnacle EP 460		Optigear Synthetic X 460	Renolin Unisyn CLP 460	
	4) -40 +30	CLP HC	VG 150	Mobil SHC 629	Shell Omala S4 GX 150	Klübersynth GEM 4-150 N	Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	4) -40 +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68					Renolin Unisyn CLP 68	
	4) -40 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32	Cetus PAO 46		Optileb HY 32	Renolin Unisyn OL 32	Dacnis SH 32
R...,K...(HK...), F...,S...(HS...)	Standard -10 +40	CLP HC NSF H1	VG 460			Klüberoil 4UH1-460 N			Optileb GT 460	Cassida Fluid GL 460	
	-20 +30		VG 220			Klüberoil 4UH1-220 N			Optileb GT 220	Cassida Fluid GL 220	
	4) -40 0		VG 68			Klüberoil 4UH1-68 N			Optileb HY 68	Cassida Fluid HF 68	
	-20 +40	E	VG 460		Shell Naturelle Gear Fluid EP 460	Klüberbio CA2-460				Plantogear 460S	
W...(HW...)	Standard -20 +40	SEW PG	VG 460 1)			Klüber SEW HT-460-5					
	-40 +10	API GL5	SAE 75W90 (~VG 100)	Mobil Synth Gear Oil 75 W90							
	-20 +60	CLP PG NSF H1	VG 460 2)			Klübersynth UH1 6-460					
PS.F..	Standard -20 +80	CLP PG	VG 220			Klübersynth GH-6-220					
	-20 +60	CLP PG NSF H1	VG 460 2) 3)			Klübersynth UH1 6-460					
	4) -40 0	CLP HC	VG 32	Mobil SHC 624							
BS.F..	4) Standard -20 +60	CLP PG	VG 220			Klübersynth GH 6-220					
	-20 +60	CLP PG 460 NSF H1	VG 460 2) 3)			Klübersynth UH1 6-460					

17.0 PERSONALISATION/SPECIAL EXECUTIONS

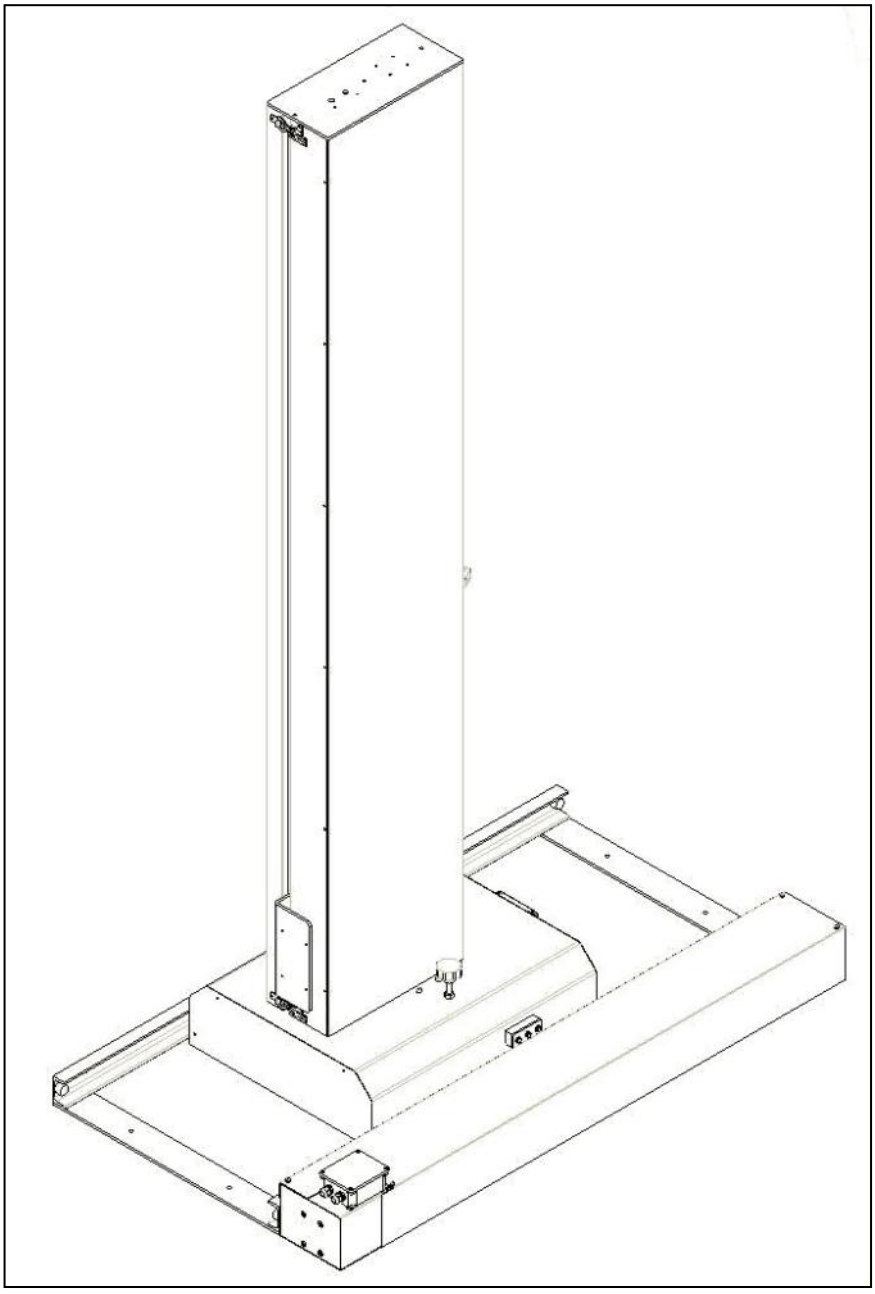
17.1 Kit handle for manual movement

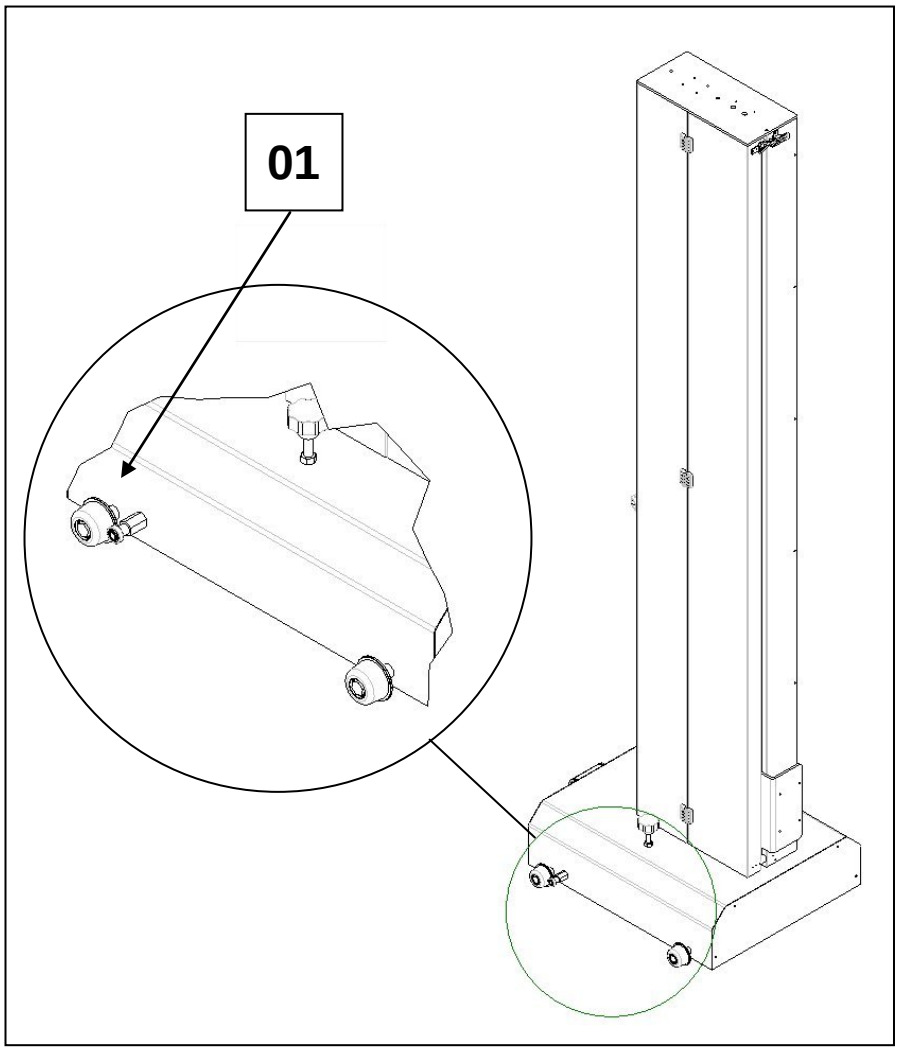




Pos.	Part Number	Description	Qty
01	-	Kit handle for manual moving	1
02	-	Kit rails for manual movement L= 1500 mm	1

17.2 Reciprocator mod. HF30 on z-axis mod. HBF





Pos.	Part Number	Description	Qty
01	-	Kit wheels for z-axis mod. HBF	1

17.3 Spare parts for HF30 ATEX zone 1-II 2 G t3

Part Number	Description
7034334	Toothed belt, HF30 17 (120.1902.17)
7034335	Toothed belt, HF30 22 (120.1902.22)
7034336	Toothed belt, HF30 27 (120.1902.27)
7034337	Toothed belt, HF30 32 (120.1902.32)
7034372	Kit,protection strip,HF30/80 1.7M (500.3006.17)
7034373	Kit,protection strip,HF30/80 2.2M (500.3006.17)
7034374	Kit,protection strip,HF30/80 2.7M (500.3006.17)
7034375	Kit,protection strip,HF30/80 3.2M (500.3006.17)
736178	Limit switch sensor (310.8276)
736296	KIT,2*CONCENTRIC,2*ECCEN WHEELS (500.0001)
7033103	Encoder (if present) (310.8065.01)
736178	Central sensor (if present) (310.8276)
736358	Coupling,sensor encoder,recip (120.0002)
7034320	Gearmotor assy,HF30 (400.0102.01)
7034326	Kit, 2 counterweight guide,HF30 (500.3002)

17.4 Spare parts for HF80 ATEX zone 1-II 2 G t3

Part Number	Description
7034345	Toothed belt, HF80 17 (120.1904.17)
7034346	Toothed belt, HF80 22 (120.1904.22)
7034347	Toothed belt, HF80 27 (120.1904.27)
7034348	Toothed belt, HF80 32 (120.1904.32)
7034372	Kit,protection strip,HF30/80 1.7M (500.3006.17)
7034373	Kit,protection strip,HF30/80 2.2M (500.3006.17)
7034374	Kit,protection strip,HF30/80 2.7M (500.3006.17)
7034375	Kit,protection strip,HF30/80 3.2M (500.3006.17)
736178	Limit switch sensor (310.8276)
7034432	Kit sliding blocks (1 concentric block + 1 eccentric block) (500.0019)
7033103	Encoder (310.8065.01)
736358	Coupling,sensor encoder,recip (120.0002)
7034339	Gearmotor assy,HF80 (400.0108)
7034350	Kit, 2 counterweight guide,HF80 (500.3003)