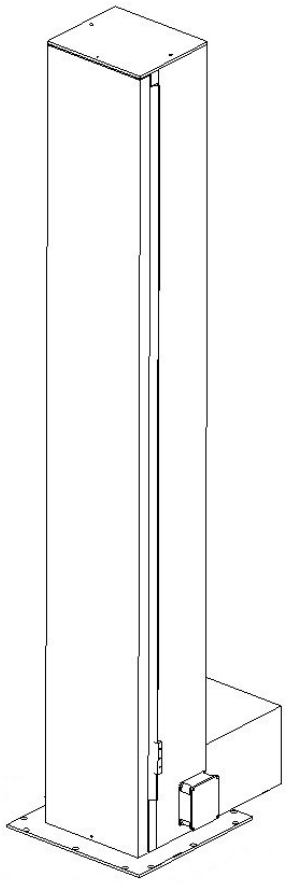
Reciprocator
HL

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.

CE

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

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

ISSUE NO.	DATE	DESCRIPTION

Prepared	Controlled	Approved	Nordson

CONTENTS

0.0 INTRODUCTION

0.1 Document identification

The operating and maintenance manual is a document issued by ***Nordson*** against a specific job order and it is an integral part of the machine.
Such a document is marked with a serial number that corresponds to that of the machine, in order to permit tracing and identification.

0.2 Object of the document

The 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 12100:2010, Safety of machinery – General principles for design – Risk assessment and risk reduction
- UNI EN ISO 13849-1:2016, 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 13850:2015, 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 attached)
- CE **plate**
- **Operating 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 manual

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.

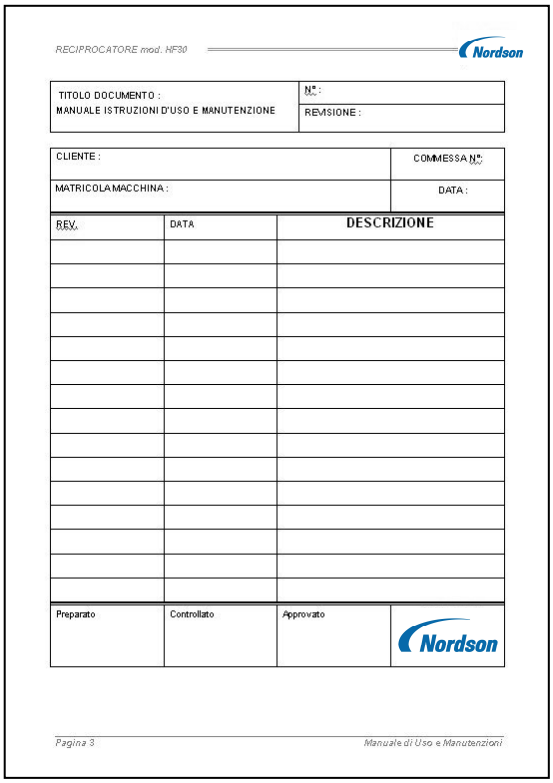
Electrical maintenance person: a technician qualified and authorized to install, repair and carry out special maintenance exclusively electrical.

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 9 and 10):

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 exposed people and the worker.
According to the **"Machine 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 instructed to operate, regulate and carry out ordinary maintenance and/or clean the machine.

To better define the limit of operation, the relevant qualifications of the **"worker"** and to make the immediate reading and the understanding of 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 correctly the machine, equipment, tools, and safety's 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.

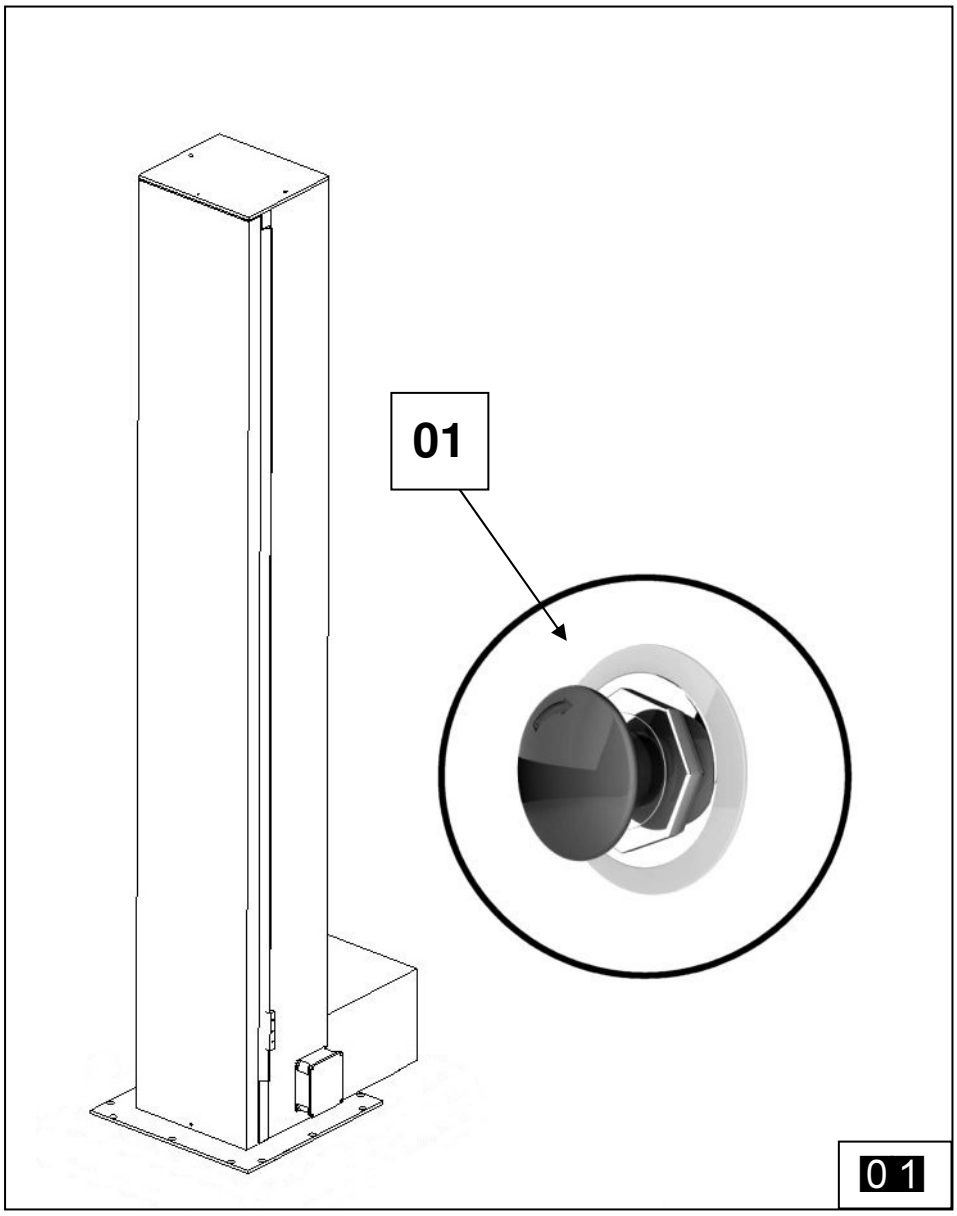
ATTENTION: Before starting up the machine and carrying out working operations, electric boards, control panels, and all protections, must be closed and the working area must be free and clean.

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 where the operator must not enter when the plant is in function.

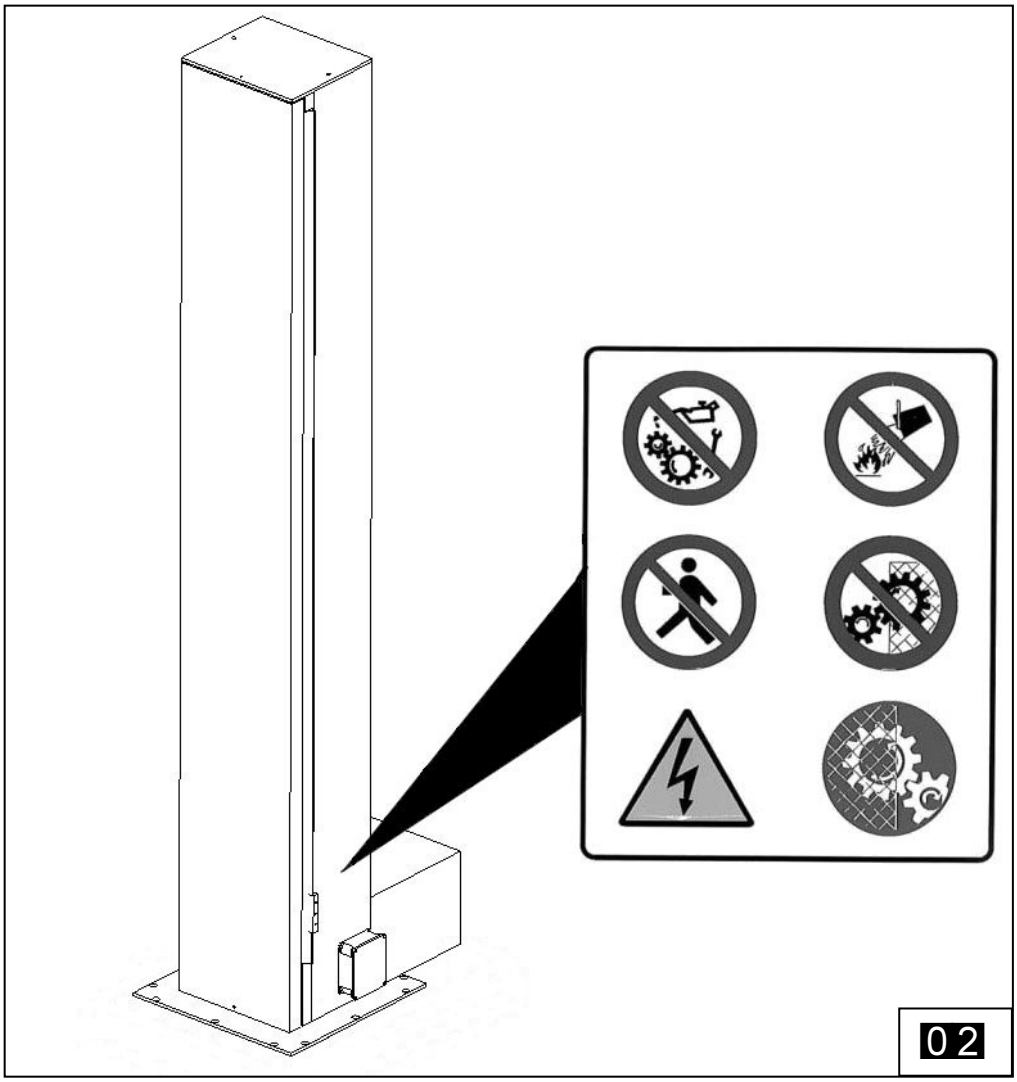
- Emergency stop: the position of the emergency/stop button 0 1 **(01)** depends on the type of control module connected to the machine and it has to be integrated to the emergency circuit of the general plant (see the attached wiring diagrams).



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 Dangers

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

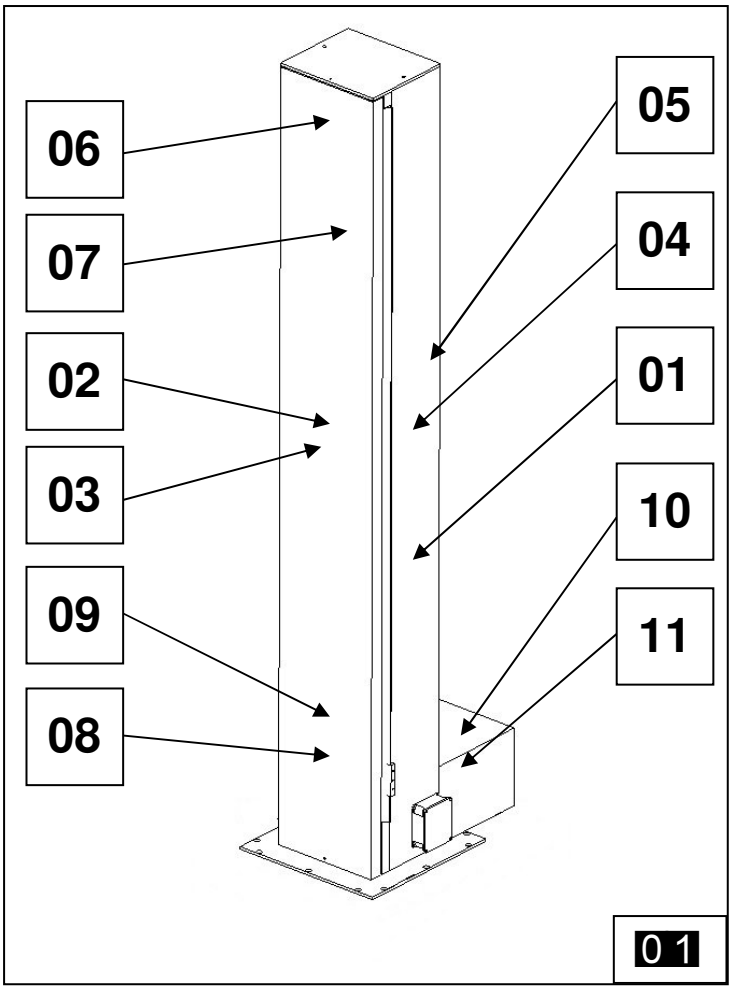
The ever-increasing need to produce automatically and to optimise the production cycles of spray-coating systems has led in these years to the development of reciprocators, that, replacing the operator during the most repetitive phases of working processes, eliminate errors caused by carelessness and 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. HL** are the most recent solution in automated systems; they have been studied to support heavy loads (up to 100 Kg.); 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 HL is a self-supporting structure 0 1**(01)**, which needs to be fixed on the floor.
A special guide 0 1**(02)** which is fixed to the inner part of the structure, allows a trolley to slide via special blocks 0 1**(03)**.
A second guide 0 1**(04)** is placed near the counterweight 0 1**(05)** 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 0 1**(06)** and a toothed belt 0 1**(07)** and the stroke width is controlled by an encoder 0 1**(08)**.
The movement is guaranteed by a strong gear 0 1**(09)** driven by an electric motor 0 1**(10)** suitably protected by a safety guard 0 1**(11)**.

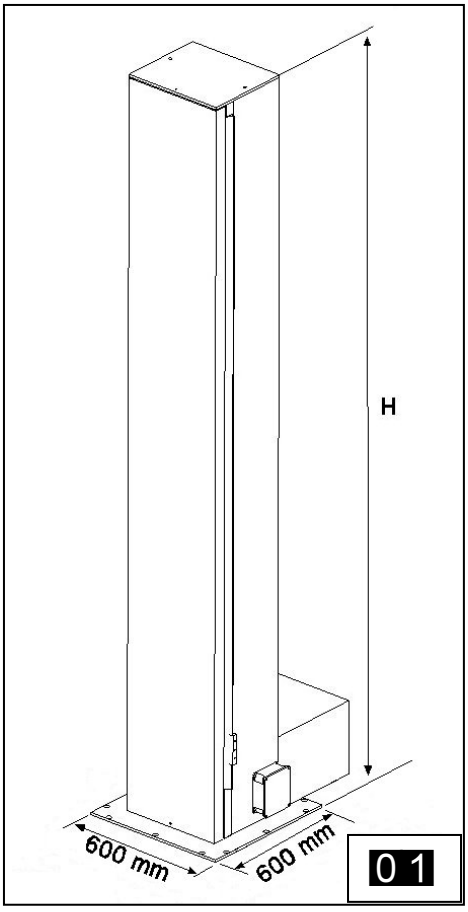


3.1 Terminology used

- **TROLLEY:** used to move the arm of the spray-gun.
- **ARM:** part of the reciprocator for fitting the spray gun.
- **GUN:** apparatus suitable for the spraying of epoxidic powders or paints.

4.0 TECHNICAL DATA

4.1 Weights and overall dimensions



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

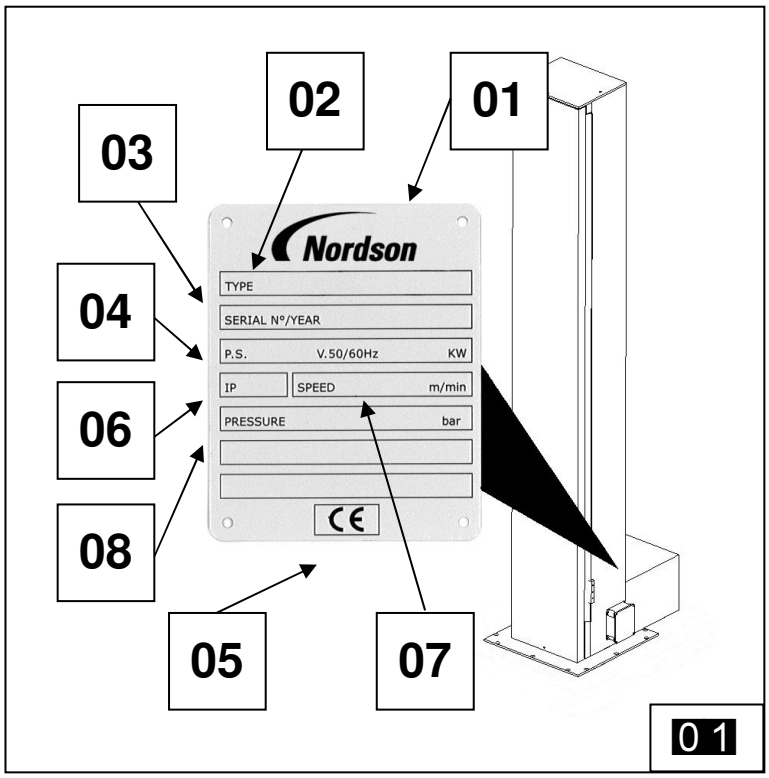
STANDARD VERSION	m.u.	HL 170	HL 220	HL 270	HL 320	HL _ _
TOTAL HEIGHT "H"	mm	2.970	3.470	3.970	4.470	Stroke +1.270
USEFUL STROKE	mm	1.700	2.200	2.700	3.200	max 9.000
DISTANCE FROM THE GROUND	mm	450	450	450	450	450
MIN SPEED	m/1'	10	10	10	10	10
MAX SPEED	m/1'	60	60	60	60	60
CAPACITY	Kg	100	100	100	100	100
TOTAL WEIGHT	Kg	380	400	420	440	_ _
NOISE	dB	< 70				
RATED POWER	kW	0,75				
POWER SUPPLY		230 VAC +/- 10% 3F 50 Hz (others on demand)				

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 **0 1** shows the location of the identification plate of the machine that specifies the following information:

- **0 1(01)** Name of the manufacturer/Address
- **0 1(02)** Type
- **0 1(03)** Serial number. and year of manufacture
- **0 1(04)** Power supply
- **0 1(05)** Certification mark
- **0 1(06)** Protection level
- **0 1(07)** Speed
- **0 1(08)** Pressure (only for pneumatic releases)

ATTENTION: the serial number **0 1** **(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. HL** is foreseen **exclusively** in automatic systems of spray-coating with thermosetting powders or paints.
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.

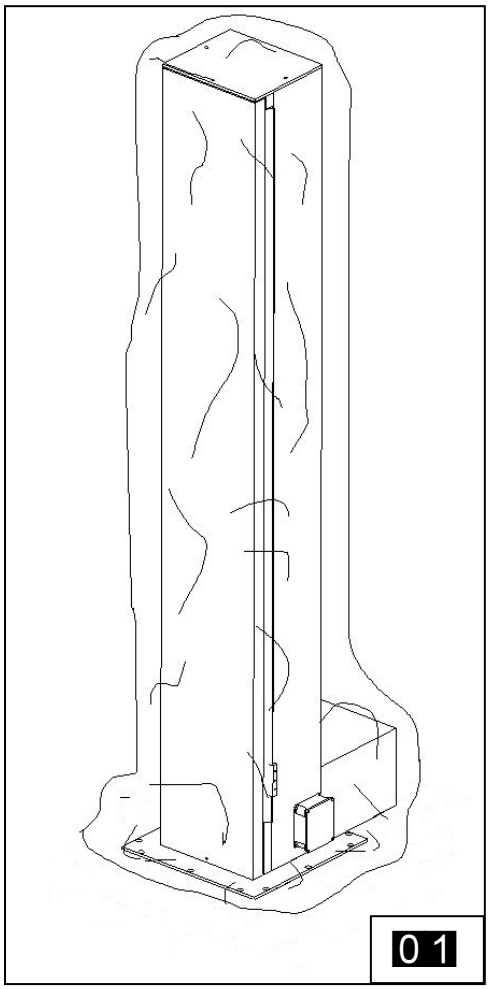
6.1 Residual risks

The normal automatic modality of the machine does not foresee 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 horizontal parts with the upper limbs.
This risk can occur only during the maintenance operations where the operator is 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 blocked 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.

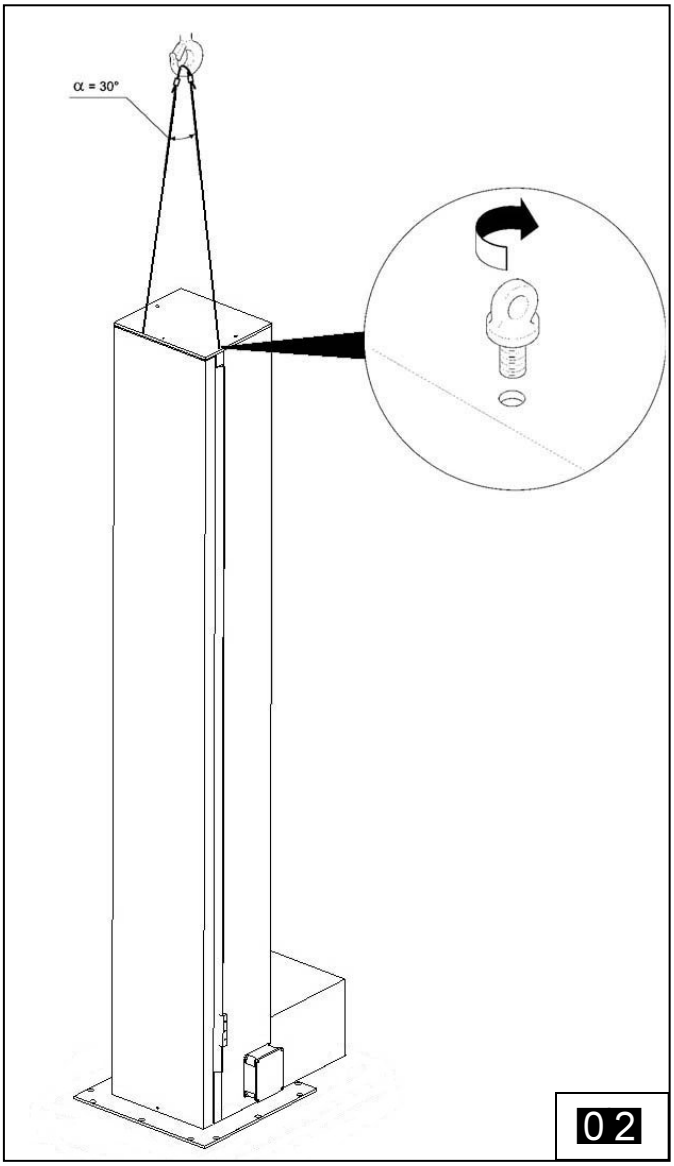
7.3 Advice about lifting

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

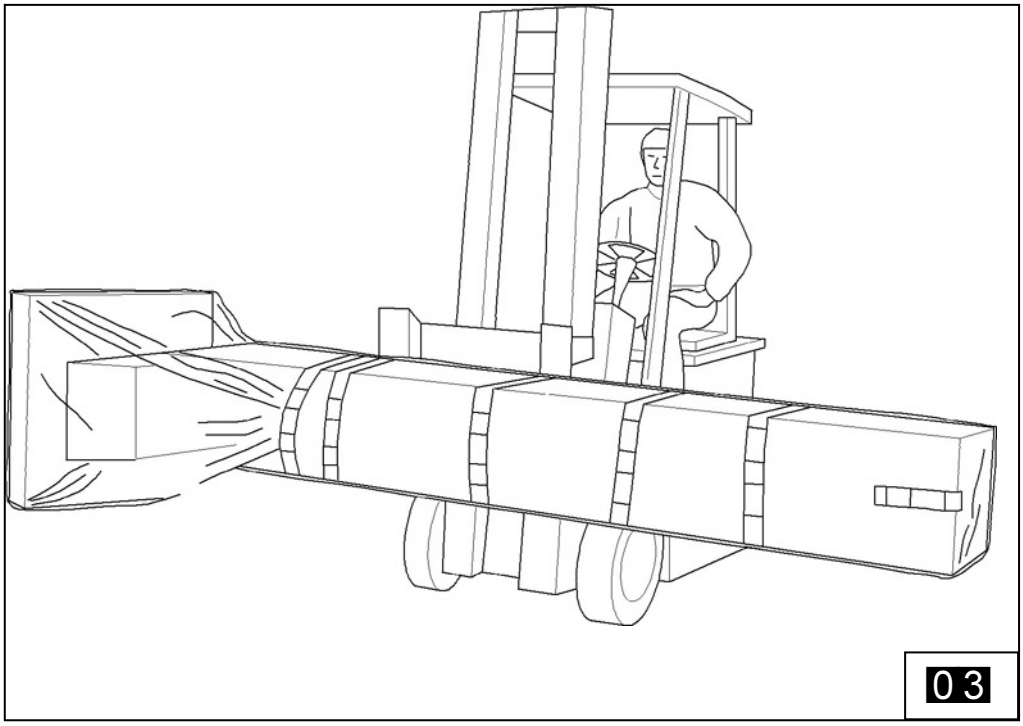
Place the special lifting eyebolts **02(01)** in the special hooking points using two ropes, with maximum corner equal to 30° and rope characteristics adapted to the lifting of loads indicated.

ATTENTION: take care to position the ropes, in order to avoid that they move during the machine lifting.



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, paying attention to position the spray coupler facing down as in figure 03.



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.

8.1 Environmental conditions

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

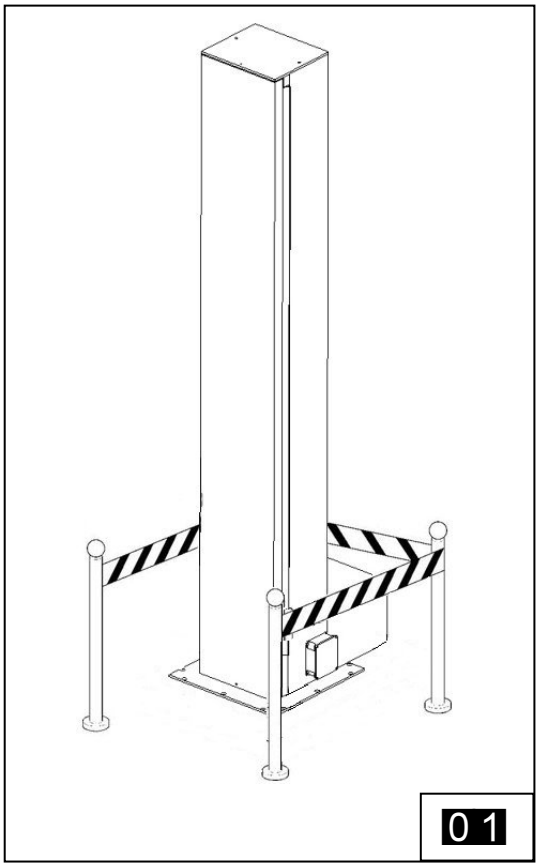
- Environmental luminosity **min.300 Lux.**
- Environmental temperature **+5°/+40° C**
- Relative humidity maximum **50%** at **40° C**
- Relative humidity maximum **90%** at **20° C**

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 specify during the order).

8.2 Need of free spaces

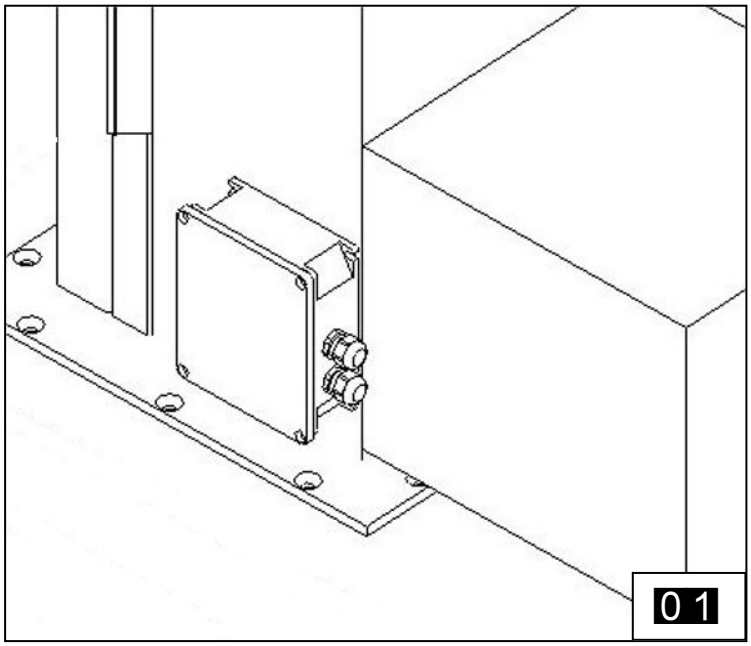
ATTENTION: When the z-axis is positioned, it is necessary to define the area, where the moving parts (gun supporting arm) have their range, according to the EEC laws regarding the security on working stations. 0 1



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 located on the side of the motor gear. 0 1



The emergency push button is inserted in the control keyboard.

In case of special executions, see the wiring diagrams of the plant.

ATTENTION: on the grounds of the plant features, the reciprocator mod. HL is predisposed to be connected to modules series HQ or it can also be used with the Nordson iControl – Application Control System. For further explanations about connections, contact in advance ***Nordson*** technical office.

N.B.: for the electrical connections, see the wiring diagram attached.

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 boards

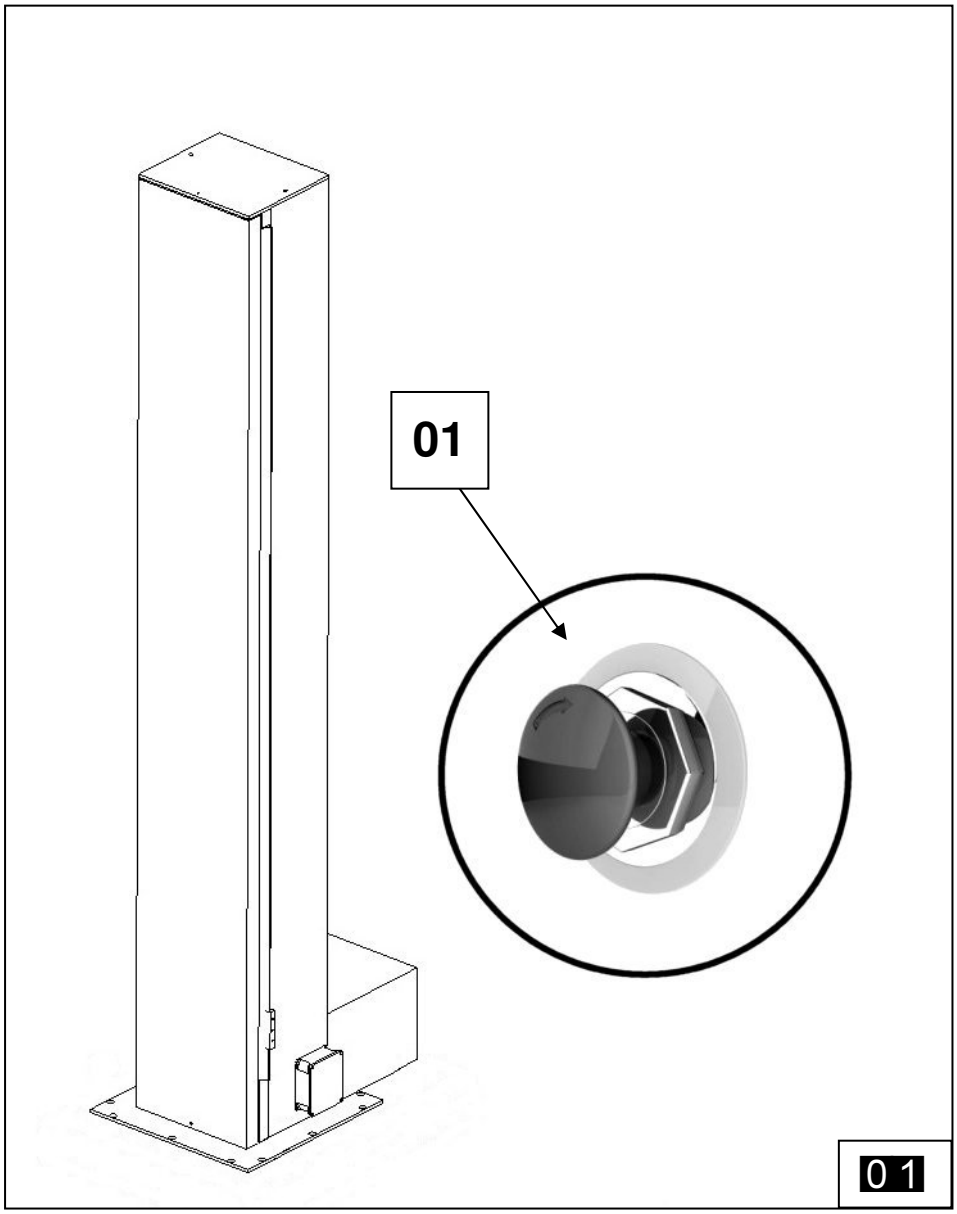
The **Reciprocator mod. HL** by ***Nordson*** is design to be operated by control module series HQ, however, they can also be used with the Nordson iControl – Application Control System.

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

10.4 Stop-commands and their placing

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

ATTENTION: to reset press the **EMERGENCY** push button, with rotating it.



NOTE: the emergency/stop push button is not located on the machine, but on the general panel 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

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

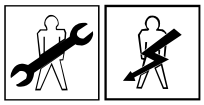
12.1 General safety advice

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

12.2 Technical competences

There are three kinds of maintenance interventions:

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



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

INTERVENTIONS THAT REQUIRE PARTICULAR TECHNICAL COMPETENCES
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.

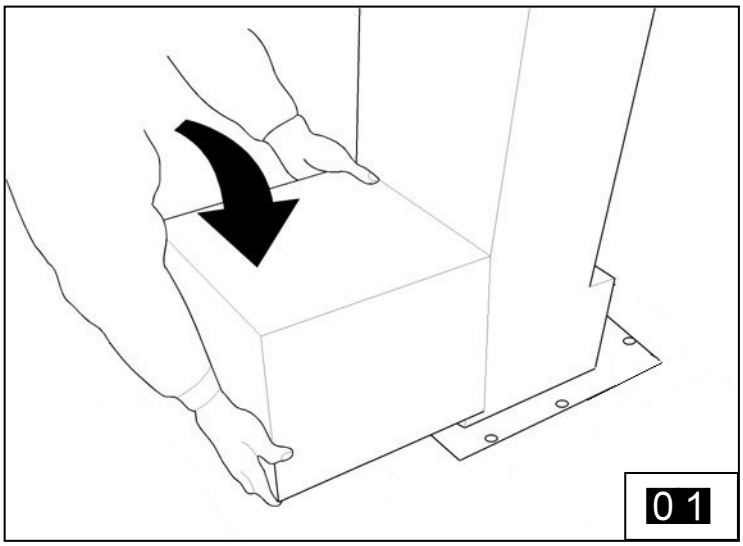
Part Number	Description
7035332	Toothed belt for HL 320*
7035333	Protective strip for HL 170
7035334	Protective strip for HL 220
7035335	Protective strip for HL 270
7035336	Protective strip for HL 320
736339	Limit switch
7035338	Kit sliding block + inner guide for HL 170
7035339	Kit sliding block + inner guide for HL 220
7035340	Kit sliding block + inner guide for HL 270
7035341	Kit sliding block + inner guide for HL 320
7035337	Gearmotor
7034353	Encoder
-	Driving pulley
-	Snub pulley
-	Kit 2*counterweight guide
-	Kit 3*counterweight couterguide

*Note: this belt may require cutting to length depending on the height of the machine

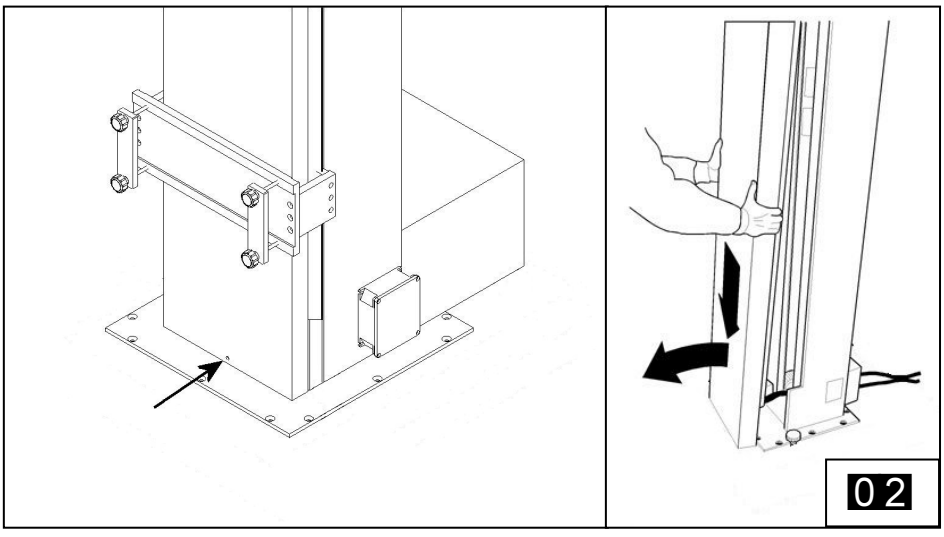
12.5 Replacement of the gearmotor

To replace the gearmotor, do as follows:

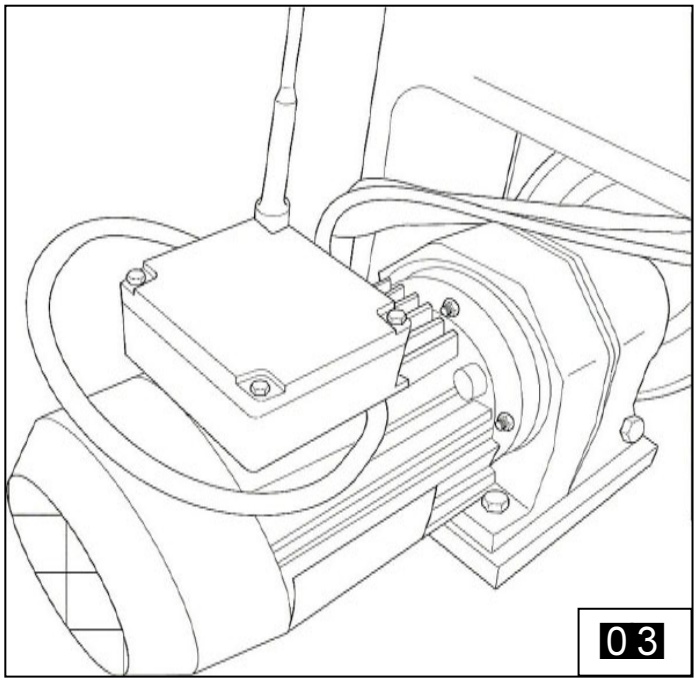
- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the safety guard of the motor, lifting it as in figure 0 1



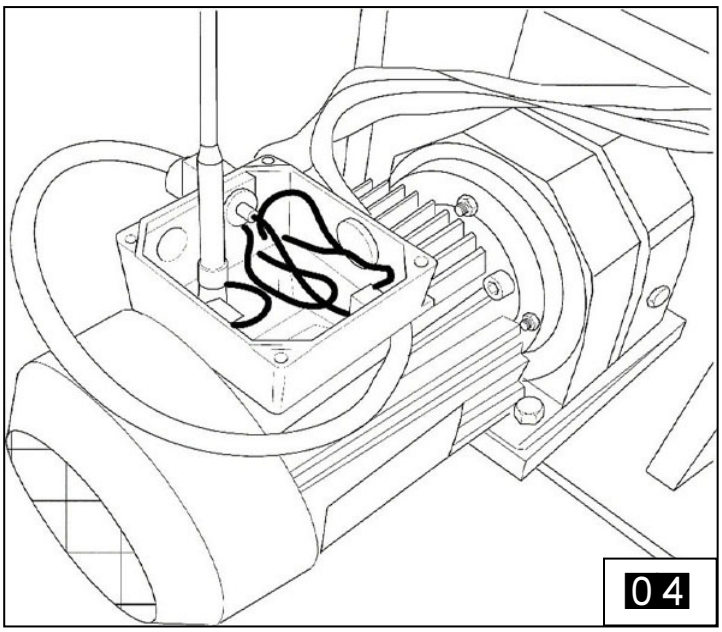
- Remove the upper safety guard using a setscrew wrench taking care to remove it first at the base and then lifting it. 0 2



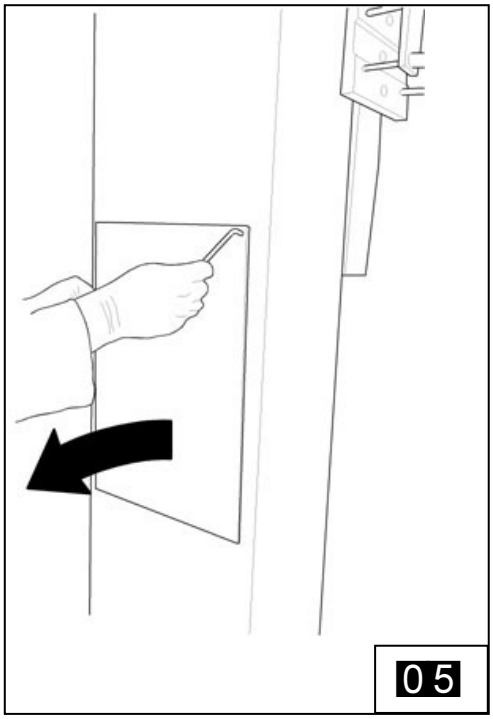
■ Using a socket spanner No. 8 open the electric box located on the motor. 03



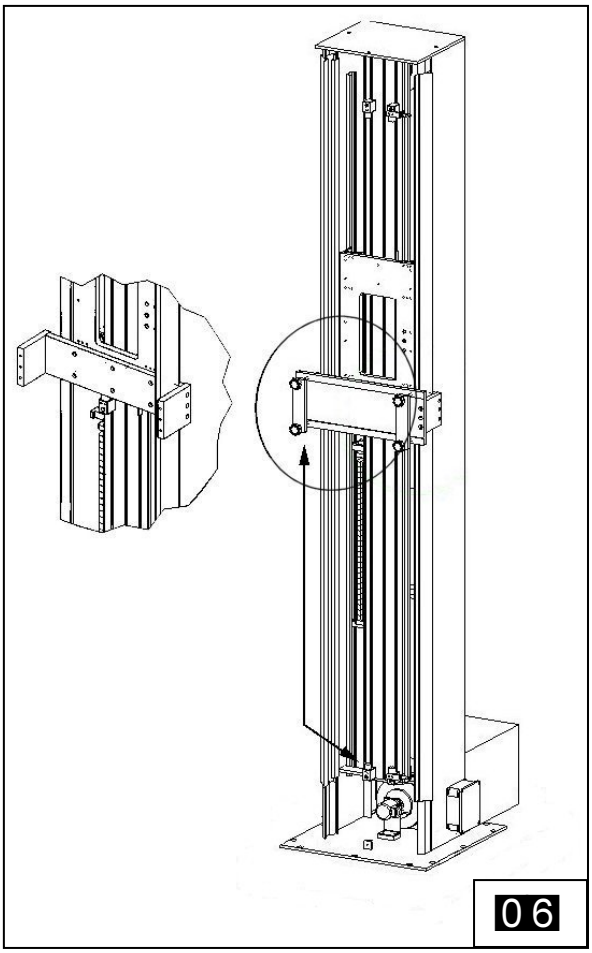
■ When the box is open, loosen the clamps with a socket spanner and remove the electric cable from the motor. 04



- Remove the cover of the rear window. 05

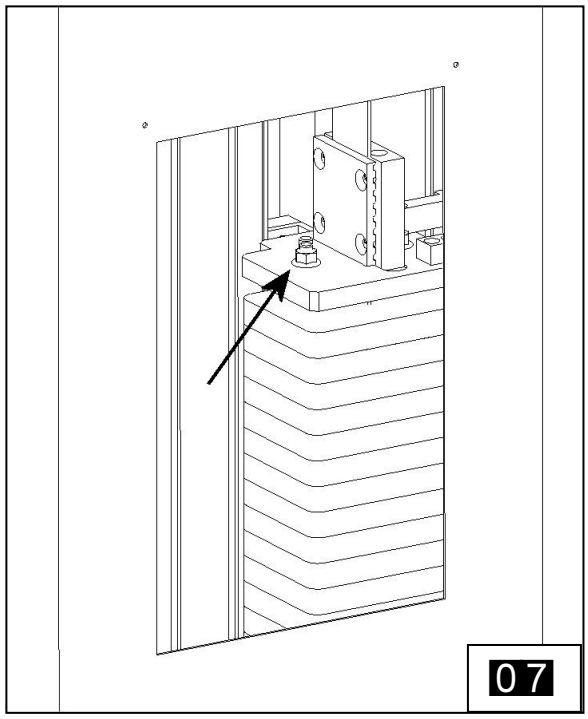


- Lift the trolley by hand till the plates of the counterweight are in line with the rear door, then block it with a staff. 06

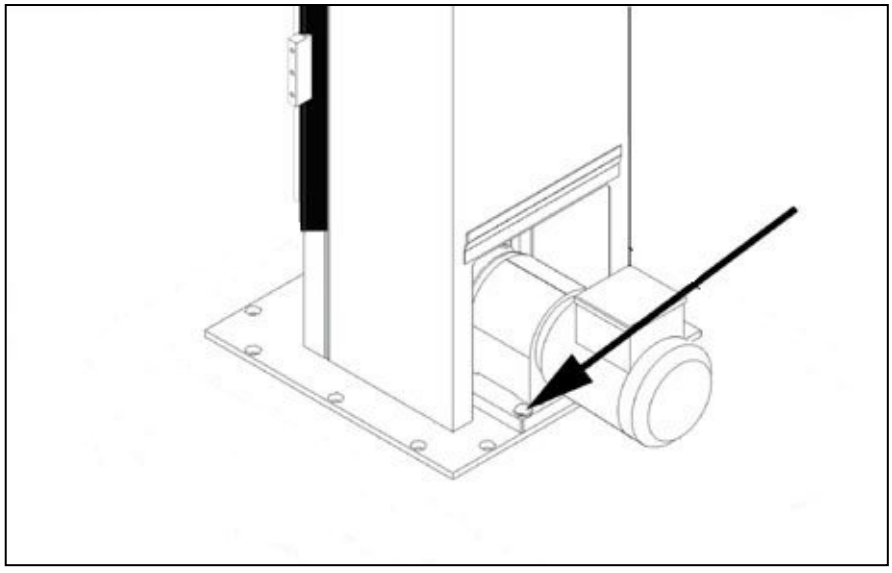


- Unscrew the two nuts of the stay bolt counterweight using a spanner, so as to slacken the belt and extract it from the pulley. 07

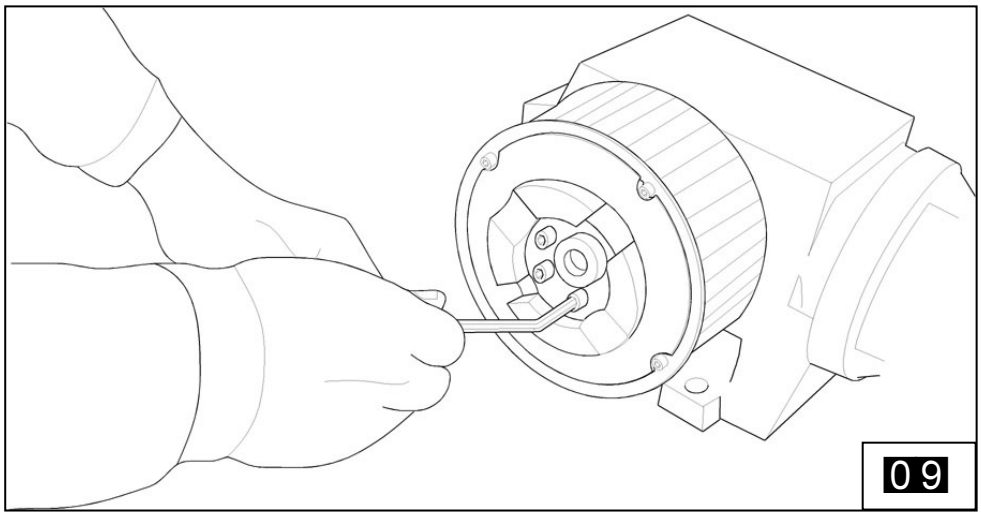
ATTENTION: do not remove the screws completely so as to avoid that the counterweight and the trolley fall.



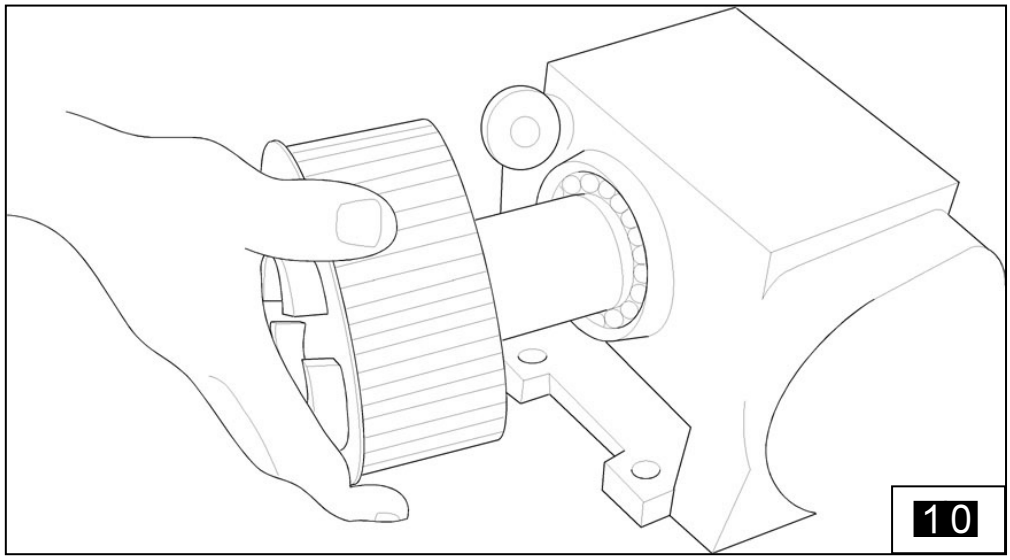
- Unscrew the fixing screws of the motor-gear then remove the motor-gear. 08



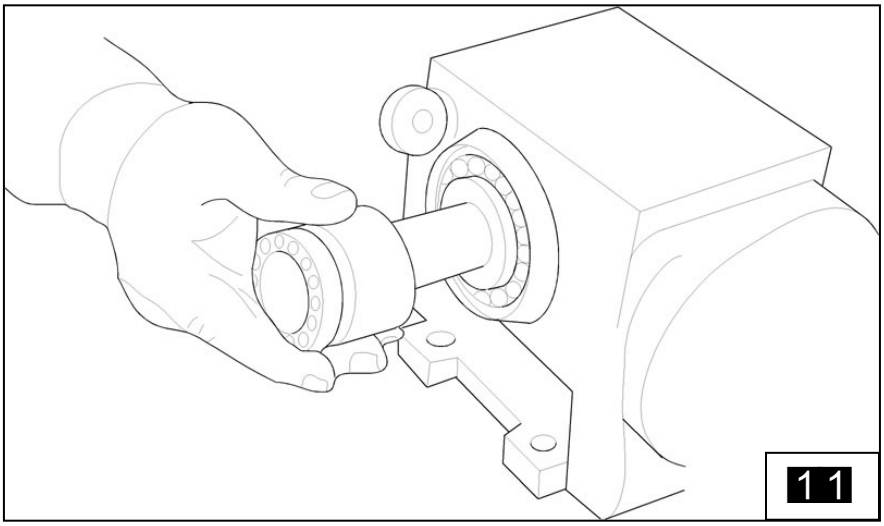
- Unscrew the fixing screws of the pulley using a setscrew wrench. 09



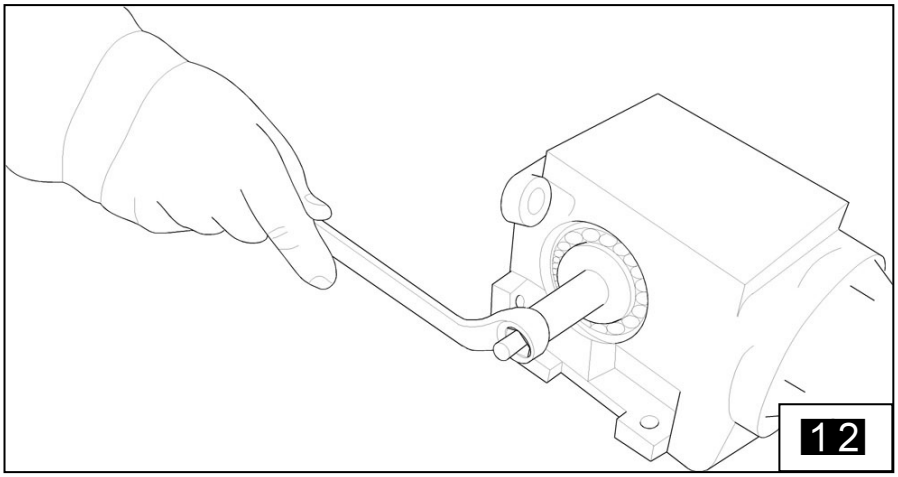
- Insert the screws, removed previously, into the special dismantle holes and screw them in to remove the pulley. 10



- Remove the ring-block from the driving shaft. 11



- Using a box wrench remove the pivot of the driving shaft joint. 12



- Replace the motor-gear.
- Repeat the reverse operations to reassemble the new motor gear.
- For the correct positioning of the pulley see chapter 12.6.
- For the correct belt tension see chapter 12.9.

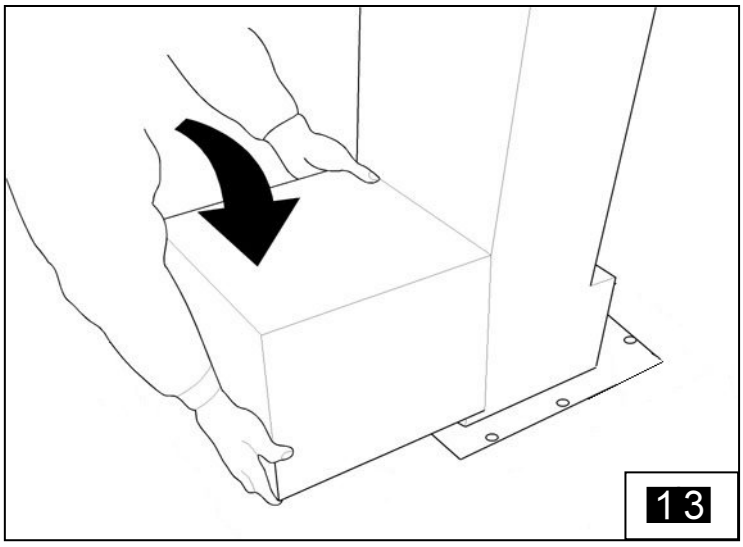
ATTENTION: Once the belt has been tensioned, apply Loctite to the adjusting screws.

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

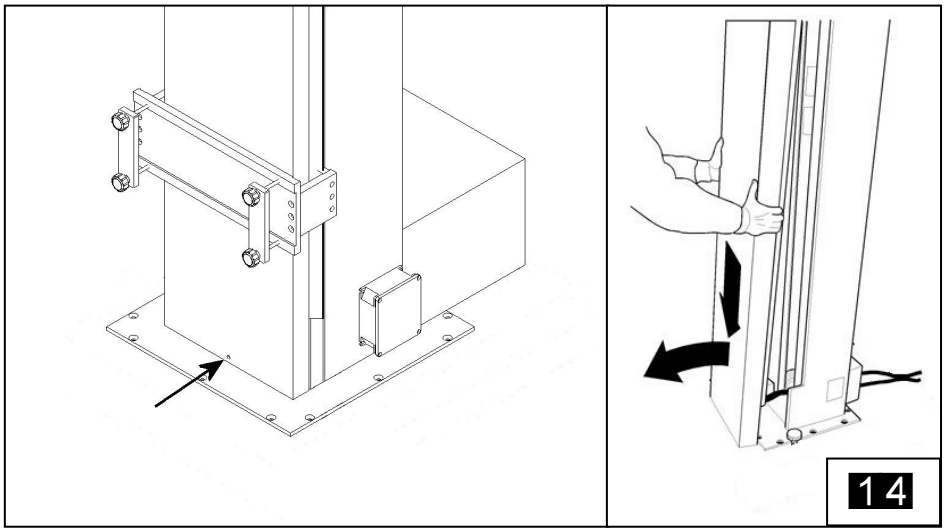
12.6 Replacement of the pulley

To replace the driving pulley do as follows:

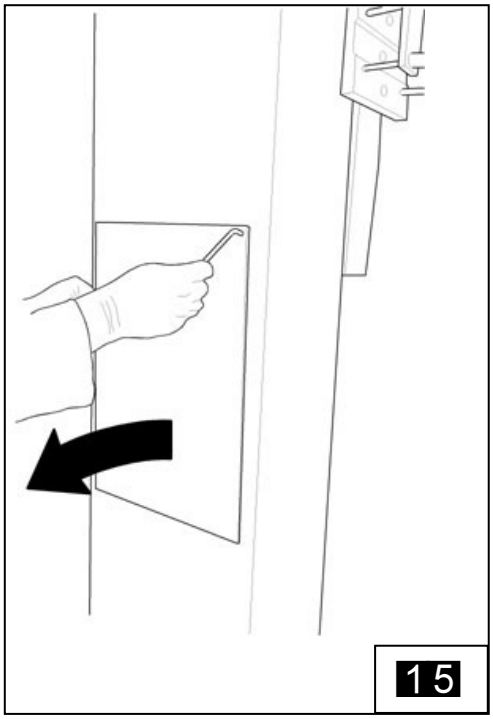
- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the safety guard of the motor, lifting it as in figure 13



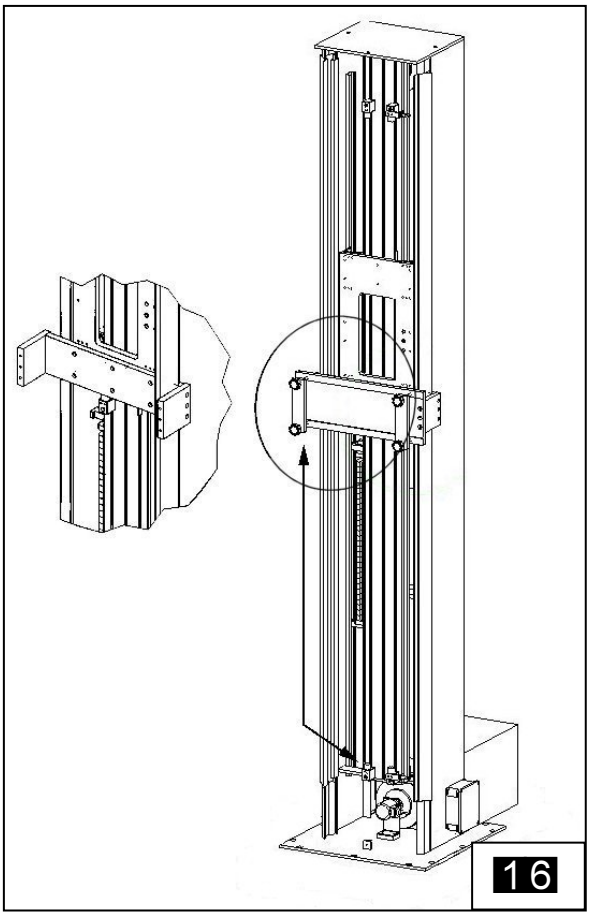
- Remove the upper safety guard using a setscrew wrench taking care to remove it first at the base and then lifting it. 14



- Remove the cover of the rear window. 15

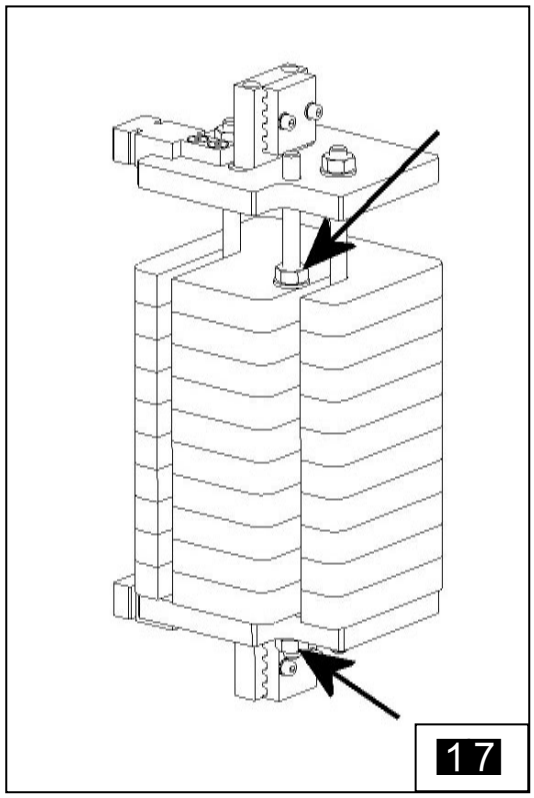


- Lift the trolley by hand till the plates of the counterweight are in line with the rear door, then block it with a staff. 16

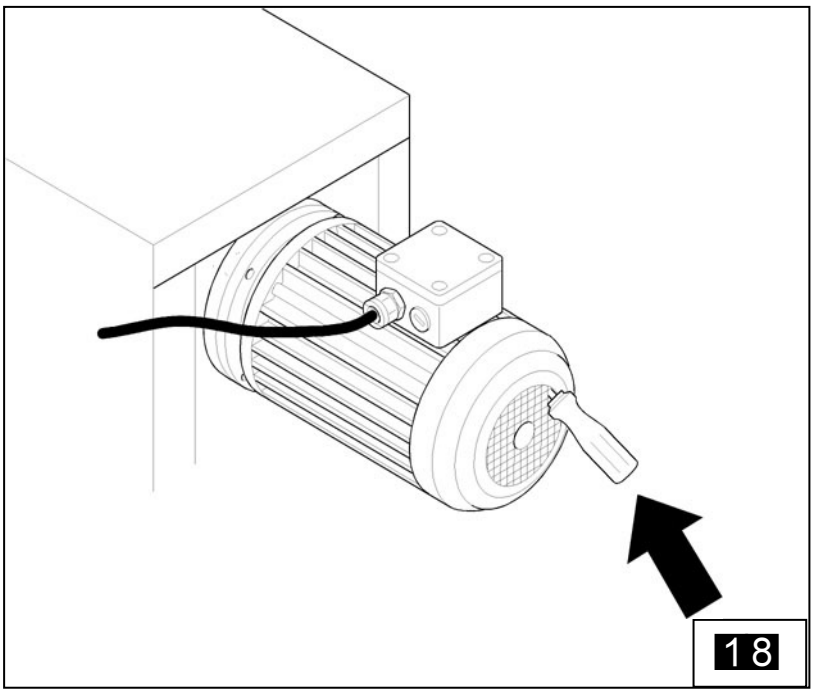


- Using a setscrew wrench, slacken the belt unscrewing the screws of the counterweight. 17

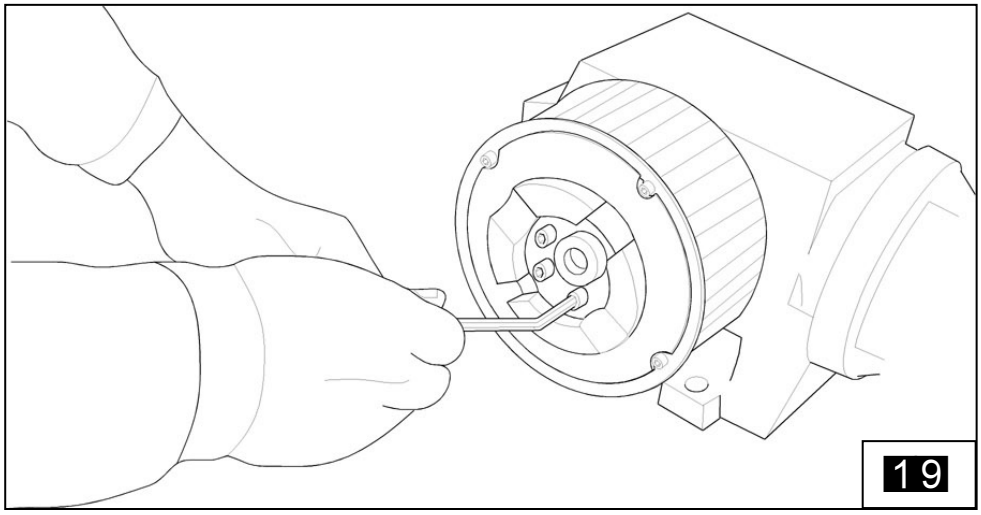
ATTENTION: Do not remove the screws completely so as to avoid that the counterweight and the trolley fall.



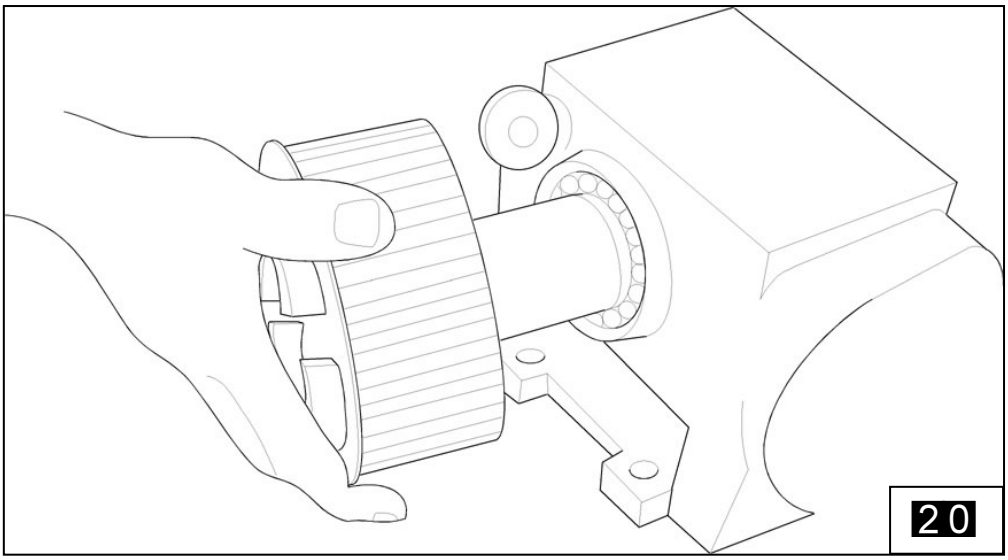
- Block the electric motor by inserting a screwdriver into the inner cooling fan. 18



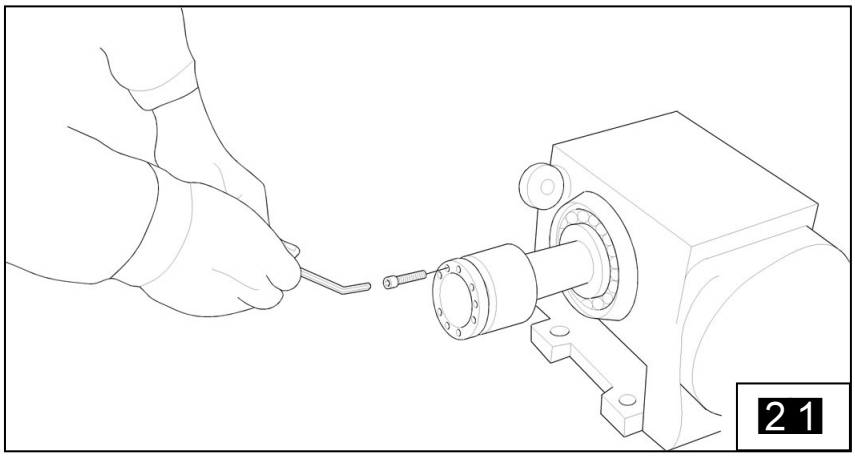
- Unscrew the fixing screws of the pulley using a setscrew wrench. 19



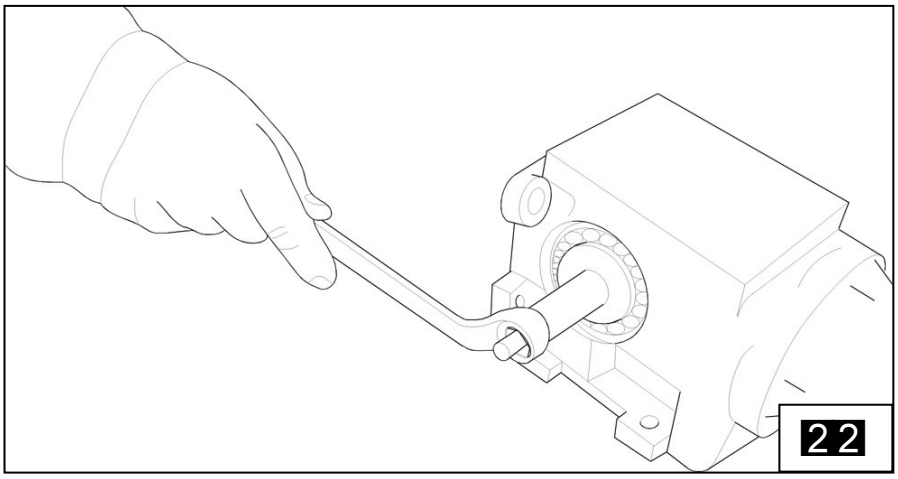
- Insert the screws, removed previously, into the special dismantle holes and screw them in to remove the pulley. 20



- Remove the screws from the threated holes of the ring block. 21



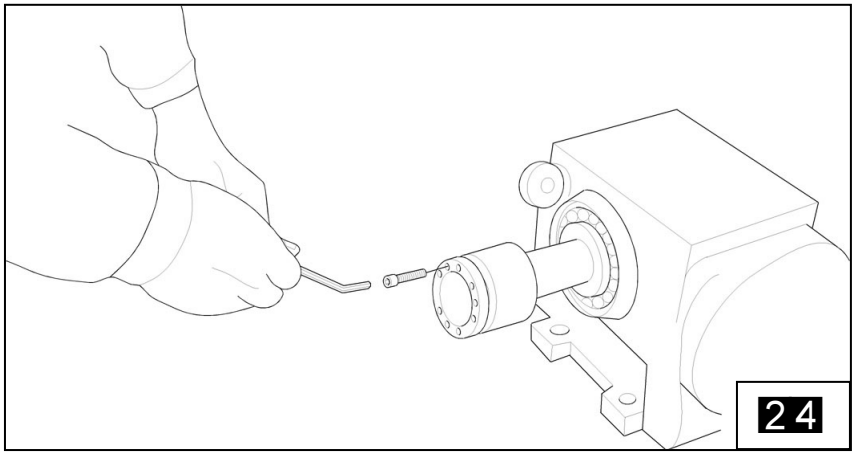
- Using a box wrench remove the pivot of the driving shaft joint. 22



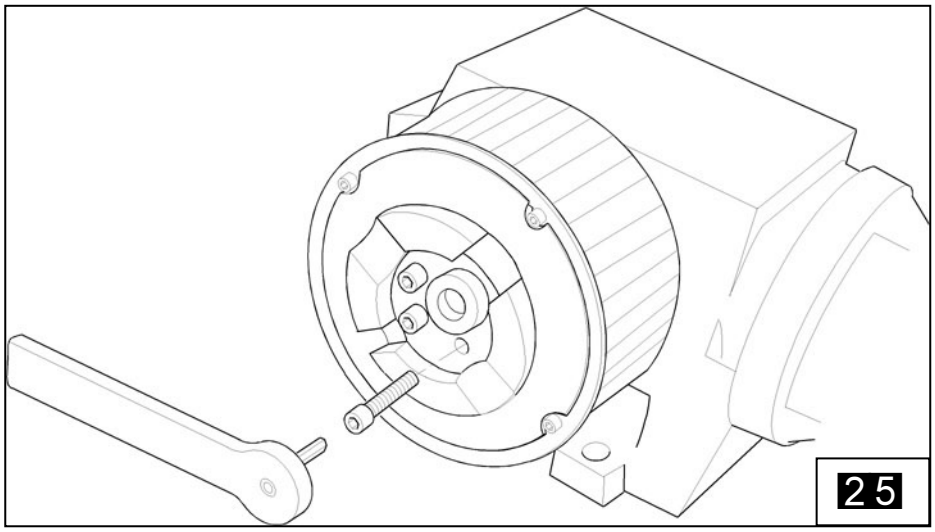
N.B. - The pivot is fixed with Loctite. It is therefore necessary to use a greater force to unblock it.

- To avoid friction, clean the ring block with a cloth. 23

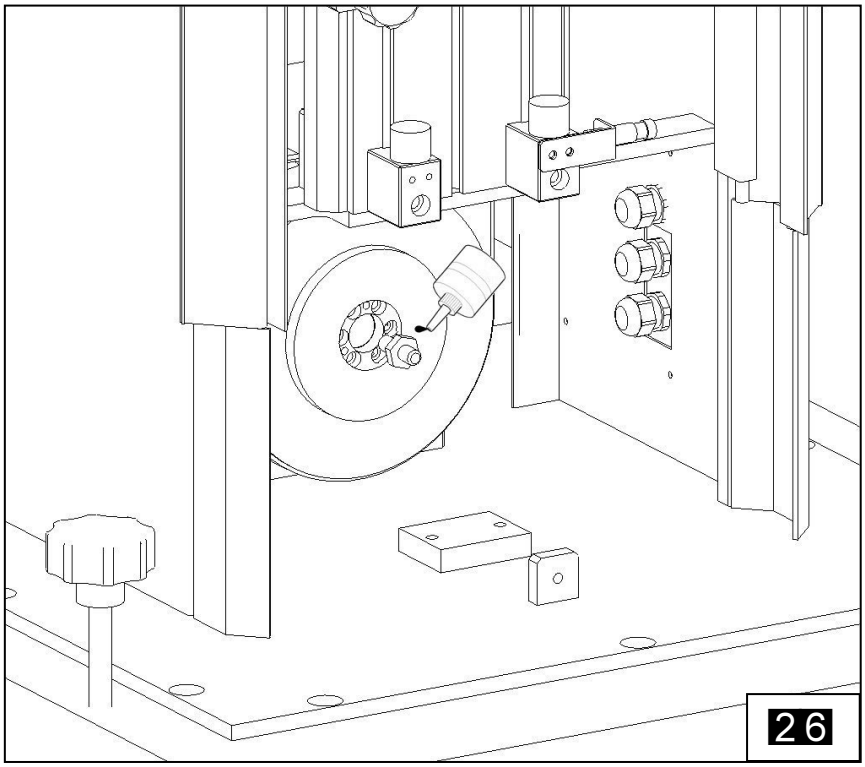
- Retighten, without closing, the screws in the first position. 24



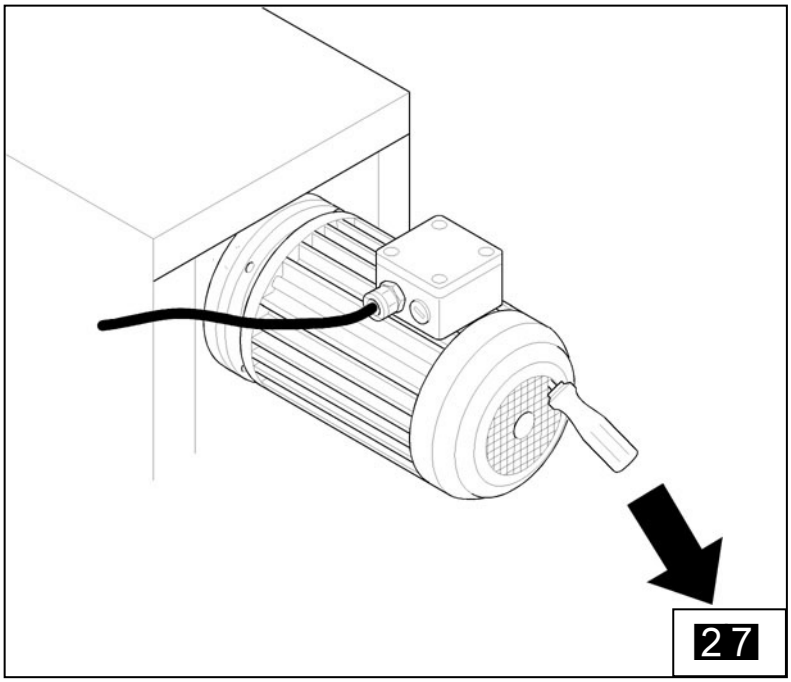
- Place the pulley on the driving shaft, then tighten the clamping screws of the ring block, cross ways. The screws should be tightened to 1,7 Kg. 25



- Add Loctite on the thread of joint pivot and tighten it on the driving shaft with a box wrench. 26



- Remove the screwdriver from the motor fan. 27

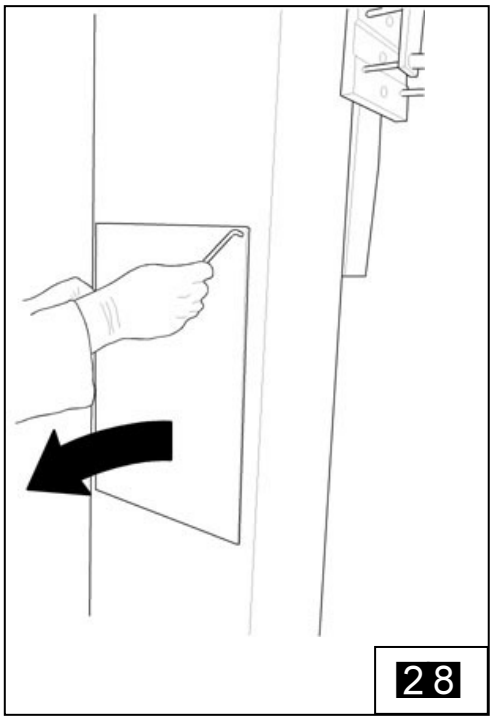


- Tension the toothed belt, see chapter 12.9.
- Close the front safety guard and the rear window.
- Reassemble the safety guard and the gun-supporting arm.

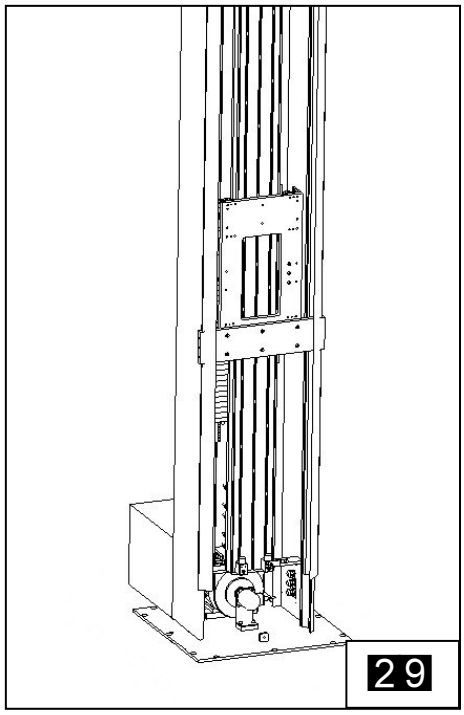
12.7 Adjustment of trolley sliding blocks

To adjust the trolley sliding blocks, do as follows:

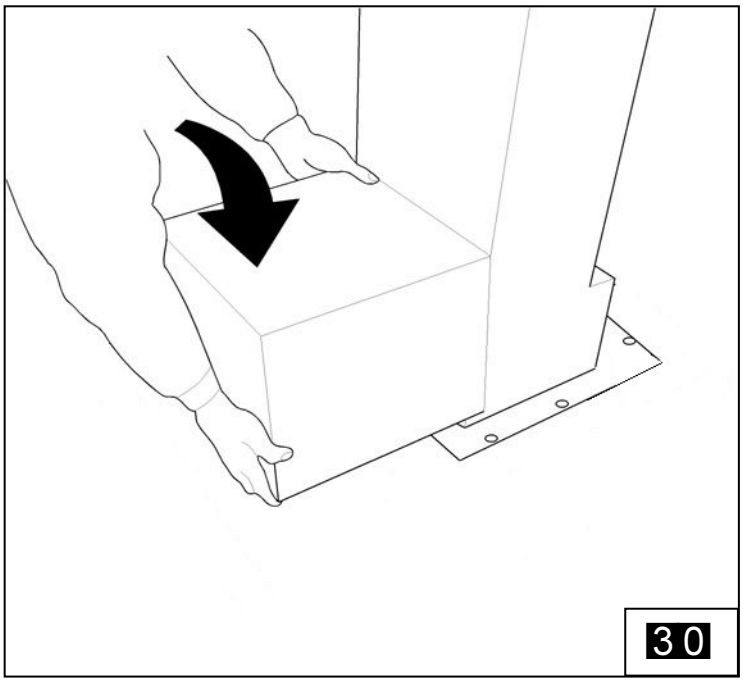
- Turn off the power supply to the machine.
- Remove the rear window 28 using a setscrew wrench.



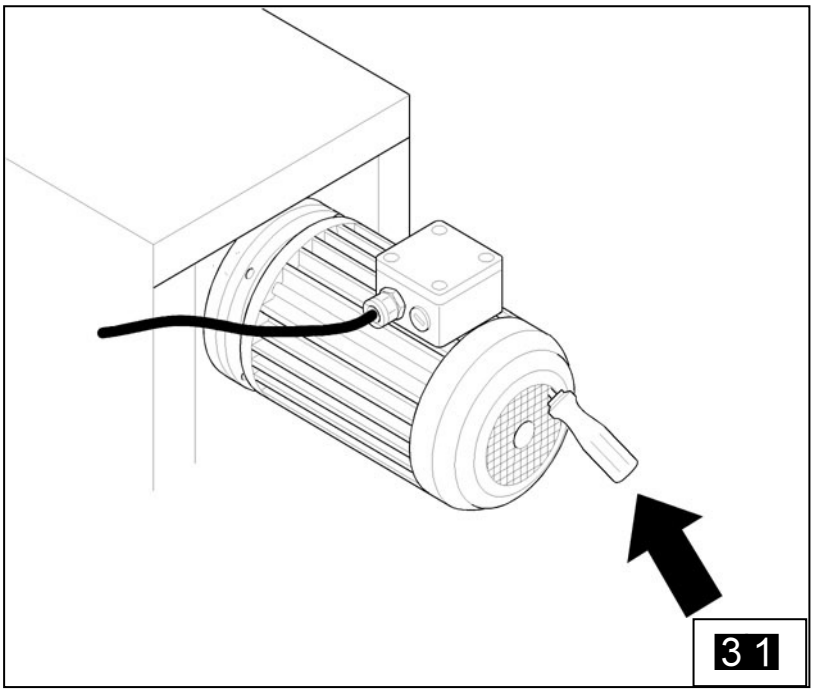
- Position the trolley to a position useful to operate. 29



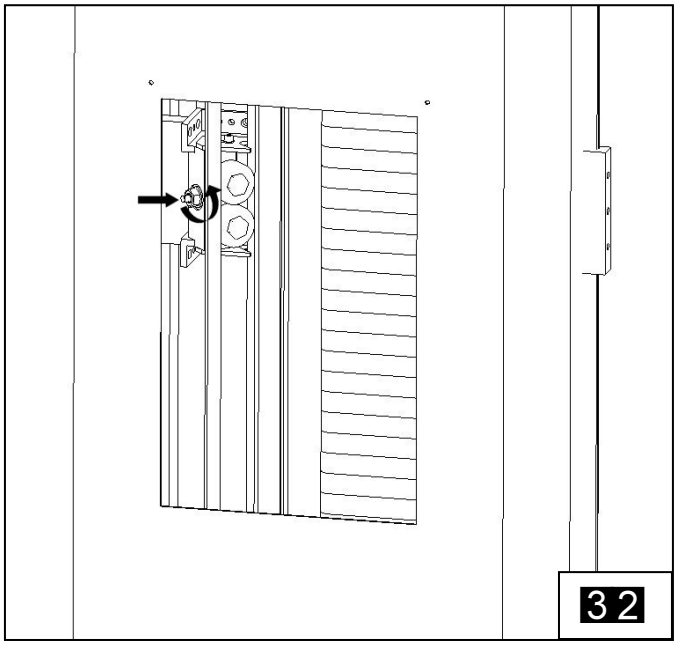
- Remove the safety guard of the motor, lifting it as in figure 30



- Block the electric motor by inserting a screwdriver into the inner cooling fan. 31



- Loosen the nut. Check the contact between the concentric rollers and the sliding guide. Adjust plays operating on the eccentric pivots, by using a key. 32



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

- Block the eccentric pivots.

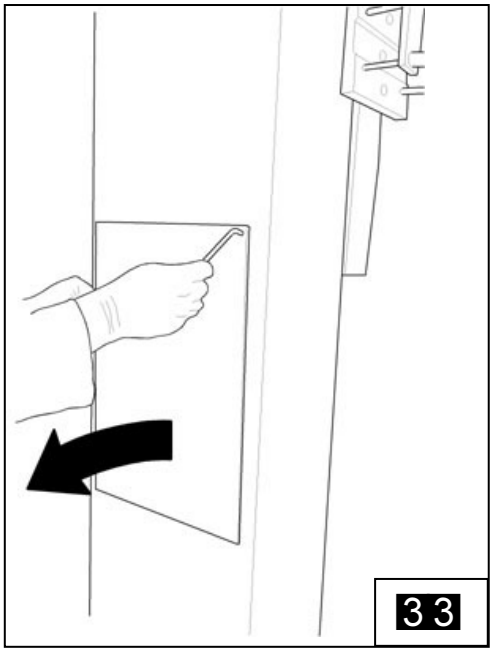
ATTENTION: Do not remove the screws completely so as to avoid that the counterweight and the trolley fall.

- Remove the screwdriver from the fan of the motor, then reassemble the safety guard.

12.8 Adjustment of counterweight

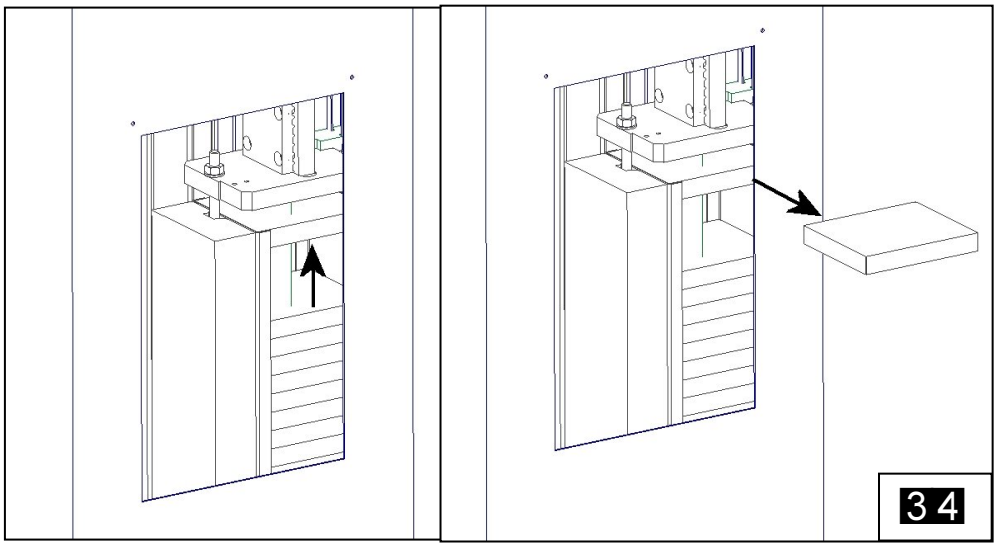
To adjust the counterweight, do as follows:

- Turn off the power supply to the machine.
- Remove the rear window and move the arm so that the counterweight slides up to the rear window. 3 3

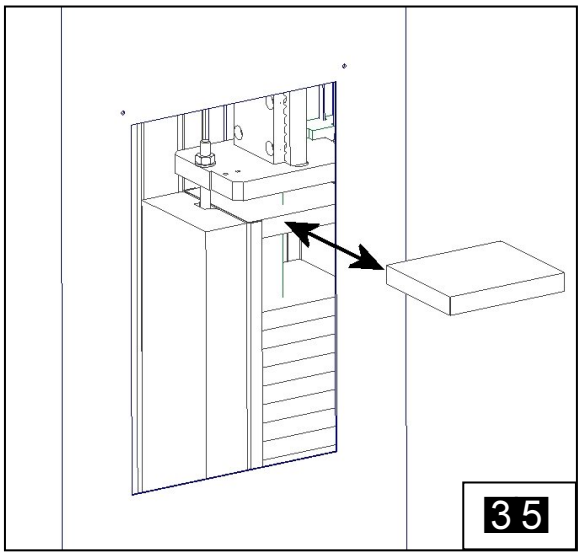


ATTENTION: To make the work easier and for safety reasons, it is better that the following operations are carried out by two operators.

- Lift the plate of the counterweight and remove it from the top opening. Do the reverse operation to add additional plates. 3 4



- Add or remove the plates of the counterweight so as to balance the arm. 35

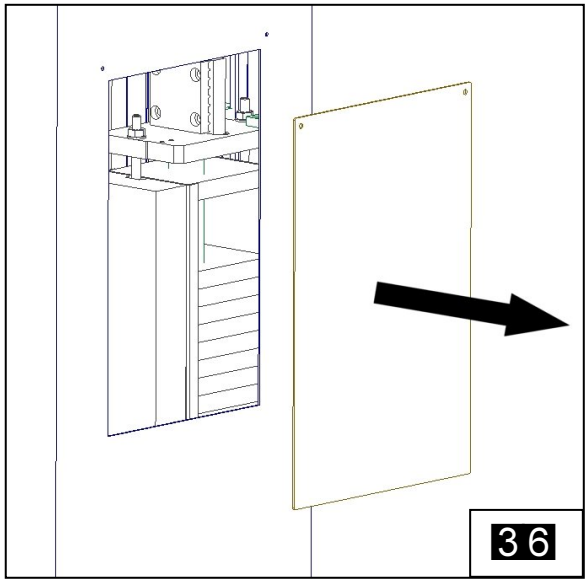


- Assemble the rear door.

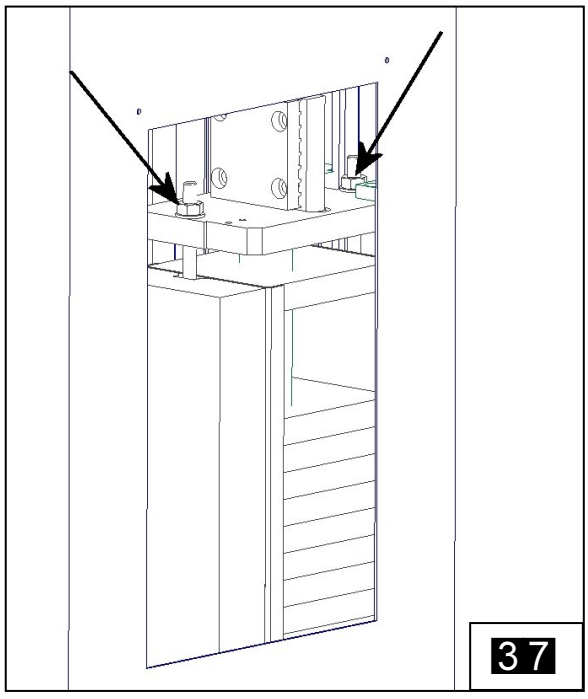
12.9 Adjustment of the belt tension

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

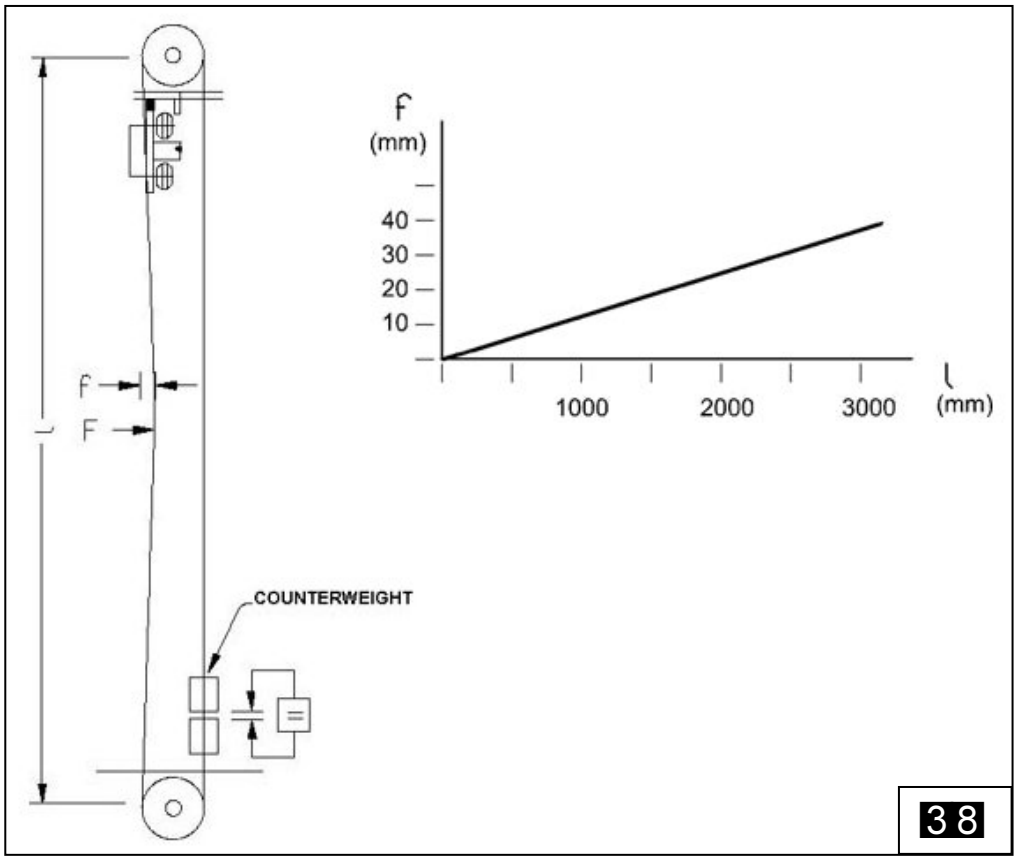
- Turn off the power supply to the machine.
- Remove the rear door and shift the arm so as the trolley is in line with the rear window. 36



- Operate on the upper nuts so as to slacken or tension the belt. 37



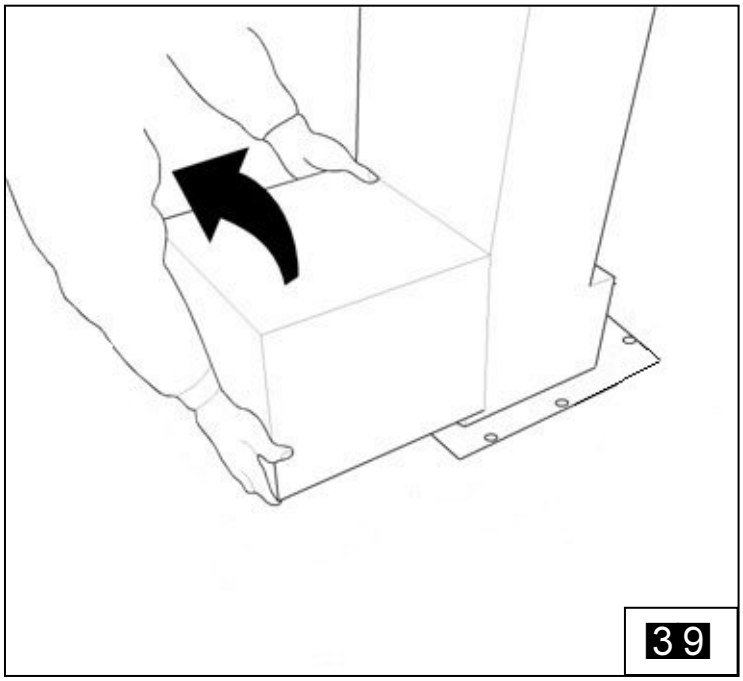
- For the correct belt tension see the diagram below. 38



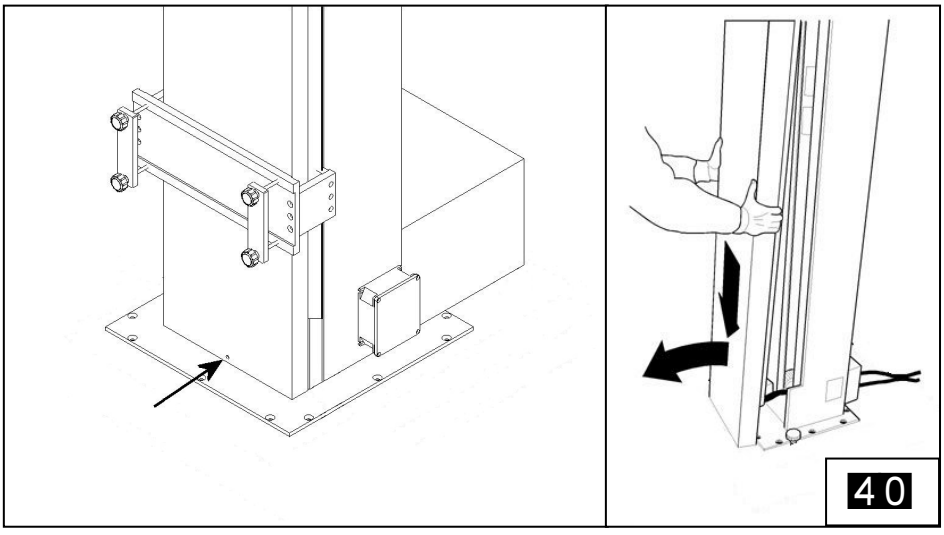
12.10 Replacement of the encoder

To replace the encoder, do as follows:

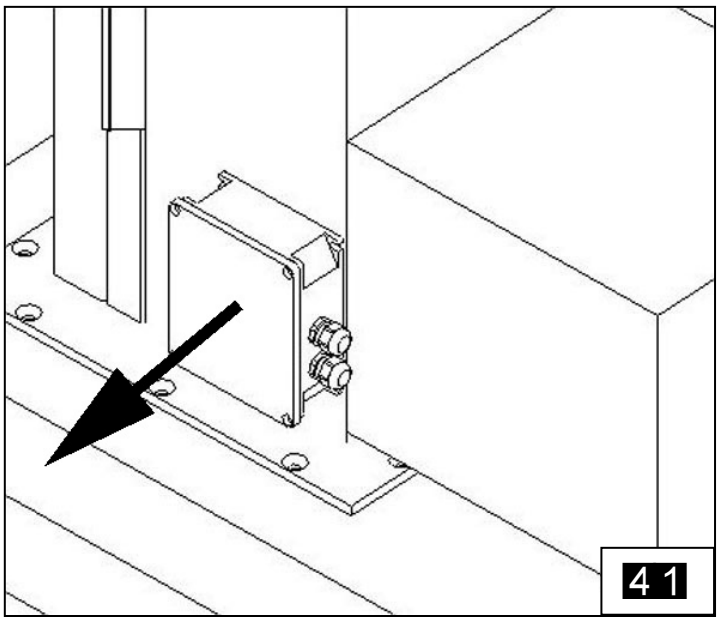
- Turn off the power supply to the machine.
- Remove the gun supporting-arm.
- Remove the safety guard of the motor, lifting it as in figure 39



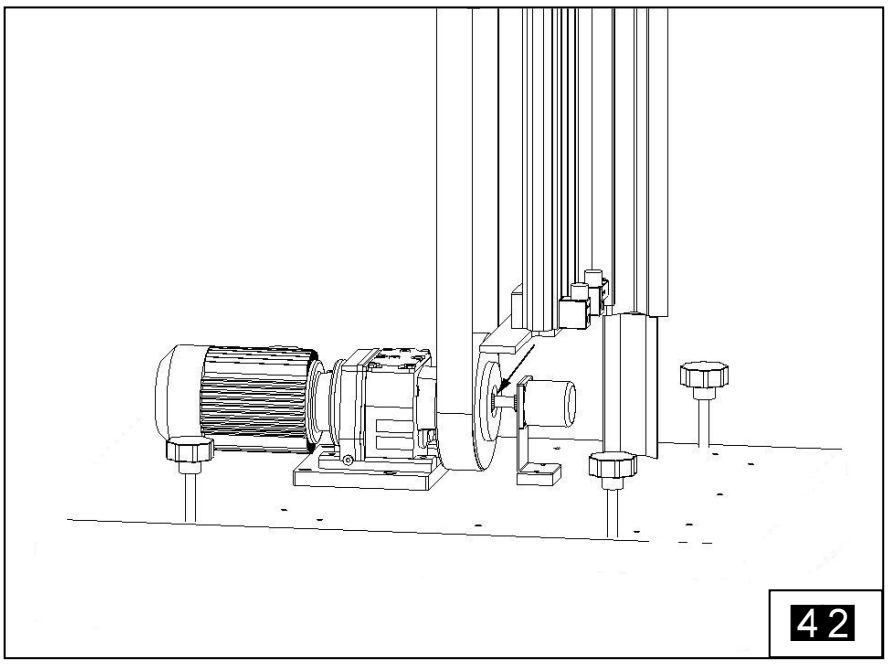
- Remove the upper safety guard using a setscrew wrench taking care to remove it first at the base and then lifting it. 40



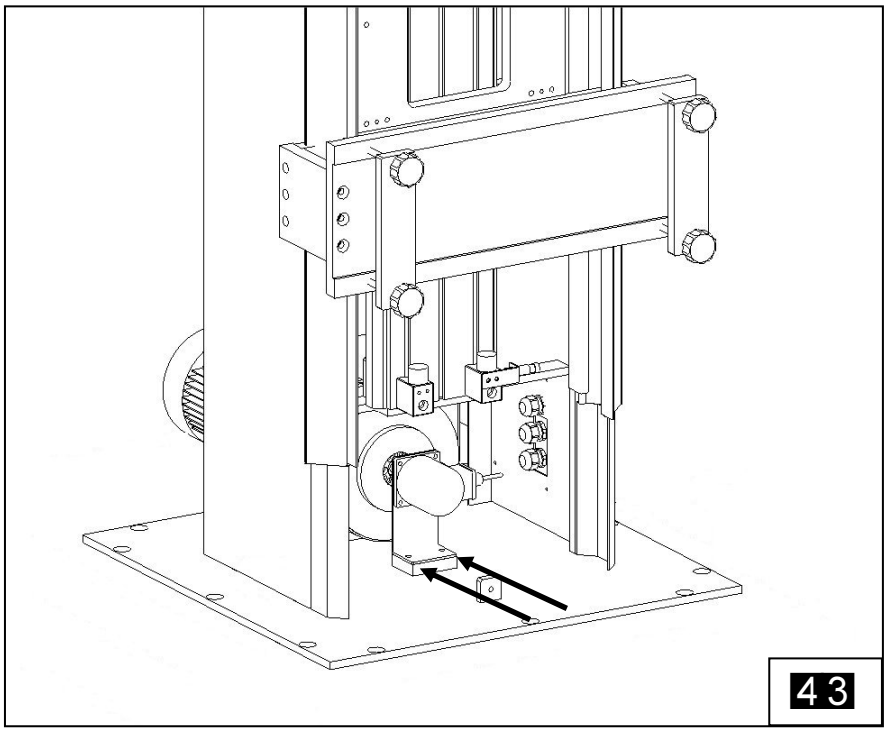
- Open the junction box and disconnect the encoder. 41



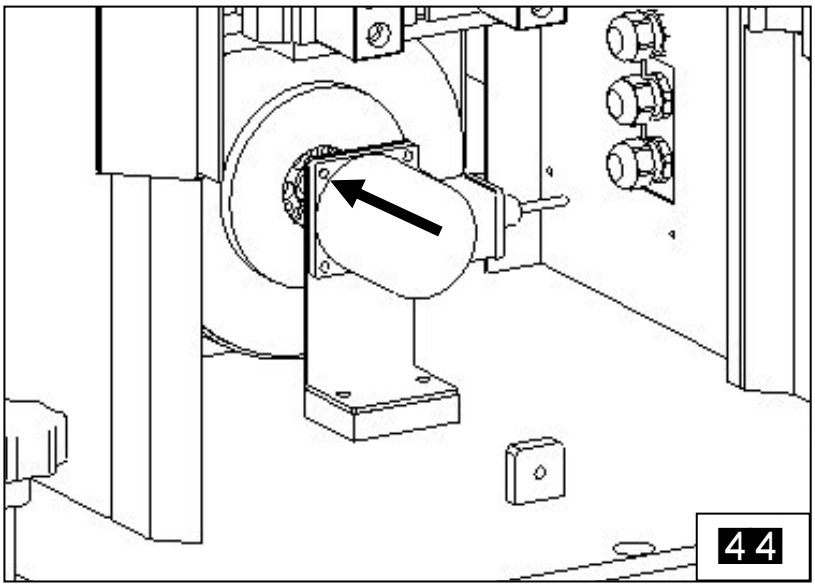
- Unloosen the hose clamp of the joint near the pulley using a screwdriver 42 then remove the encoder.



- Using a setscrew wrench unscrew the support screws of the sensor support and extract it 43.



- Unscrew the fixing screws of the sensor using a setscrew wrench and replace it. 44.



- Repeat the reverse operations to reassemble the new encoder.

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 limit switches ■ Braking of the encoder	■ Replace the limit switches ■ 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 longer valid. Therefore, ***Nordson*** declines each possible responsibility directly, indirectly or consequentially, about accidents occurred to operators, or about possible restrictions of productive performances of the machine.

- The safety and reliability of ***Nordson*** equipment 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 and guarantee safety during the interventions (safety and accident prevention measures).

14.2 How to order spare parts

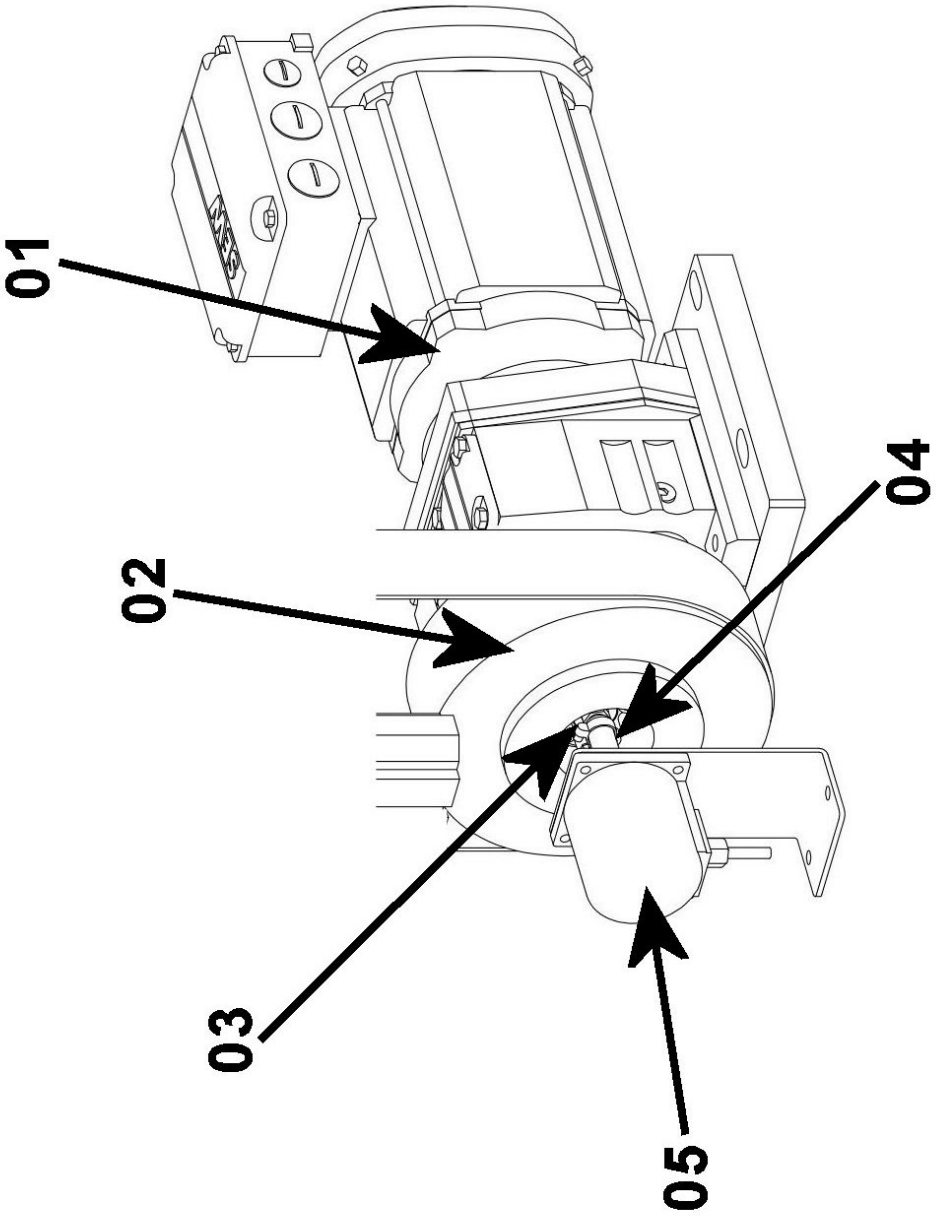
To order spare parts see the data on the CE plate.
The order will have to contain the following elements:

- 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:

- Z-axis mod. HBF
- Serial No. 99999
- Gearmotor group
- Position 01
- Gearmotor
- 7034376
- No. 2 Pcs.

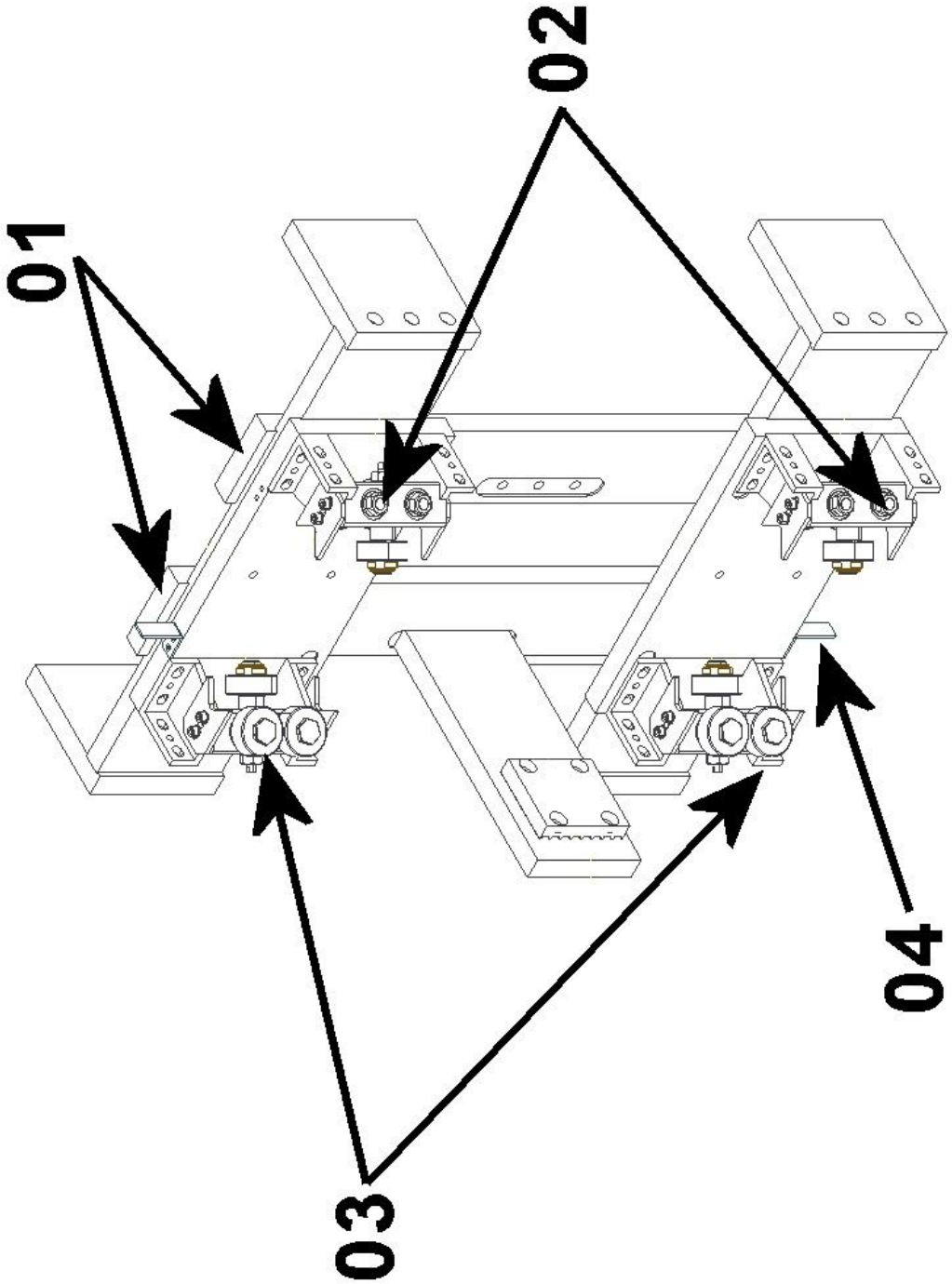
GEARMOTOR GROUP



GEARMOTOR GROUP

Pos.	Part Number	Qty	Description
1	7035337	1	Gearmotor, HL Recip
2	-	1	Driving pulley
3	-	1	Bush taper lock
4	736358	1	Coupling, sensor encoder, recip
5	7034353	1	Encoder, HF Series

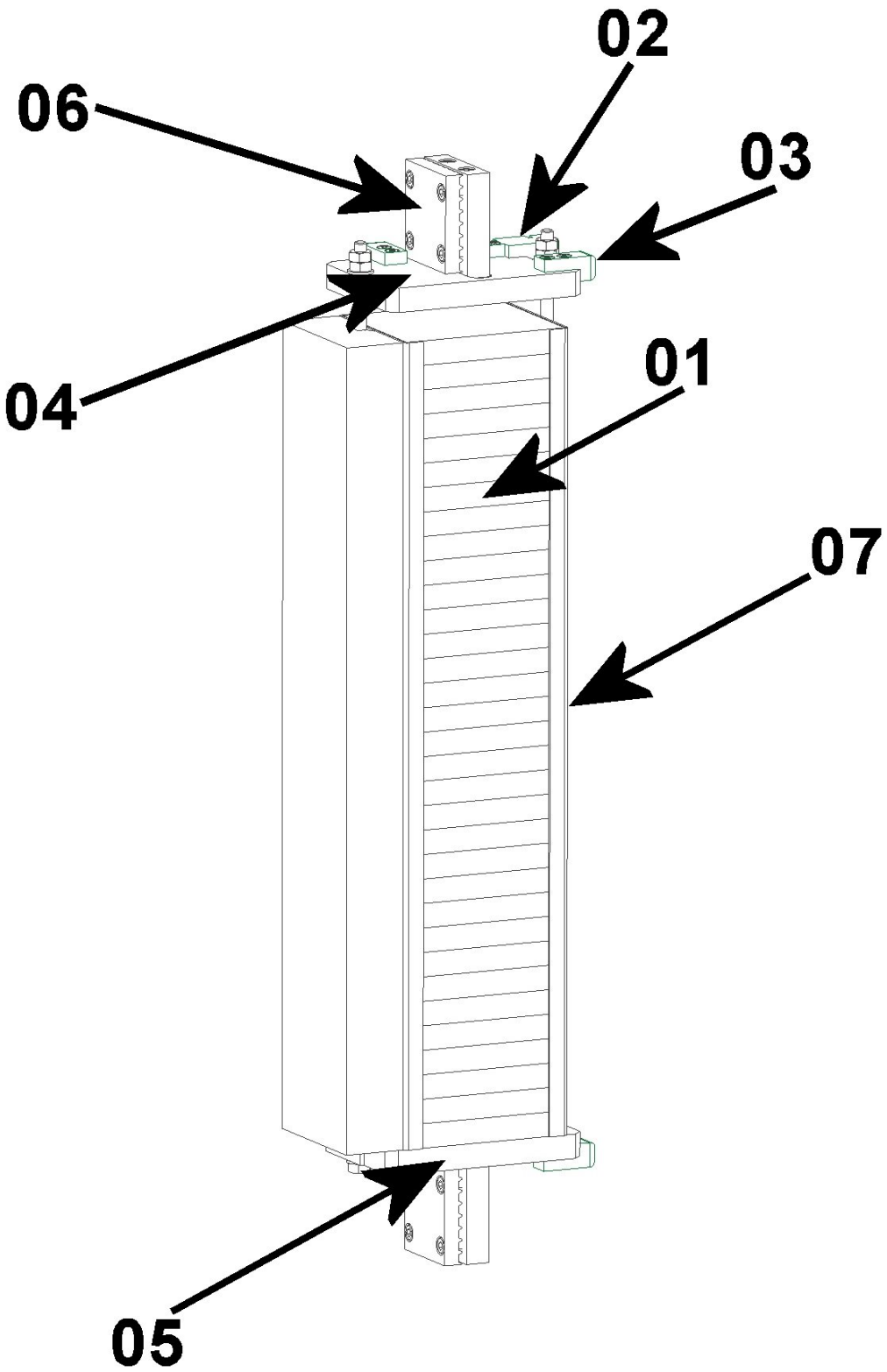
TROLLEY GROUP



TROLLEY GROUP

Pos.	Part Number	Qty	Description
1	-	2	Connection plates
2	-	2	Eccentric rollers
3	-	2	Concentric rollers
4	-	2	Cam sensor reader

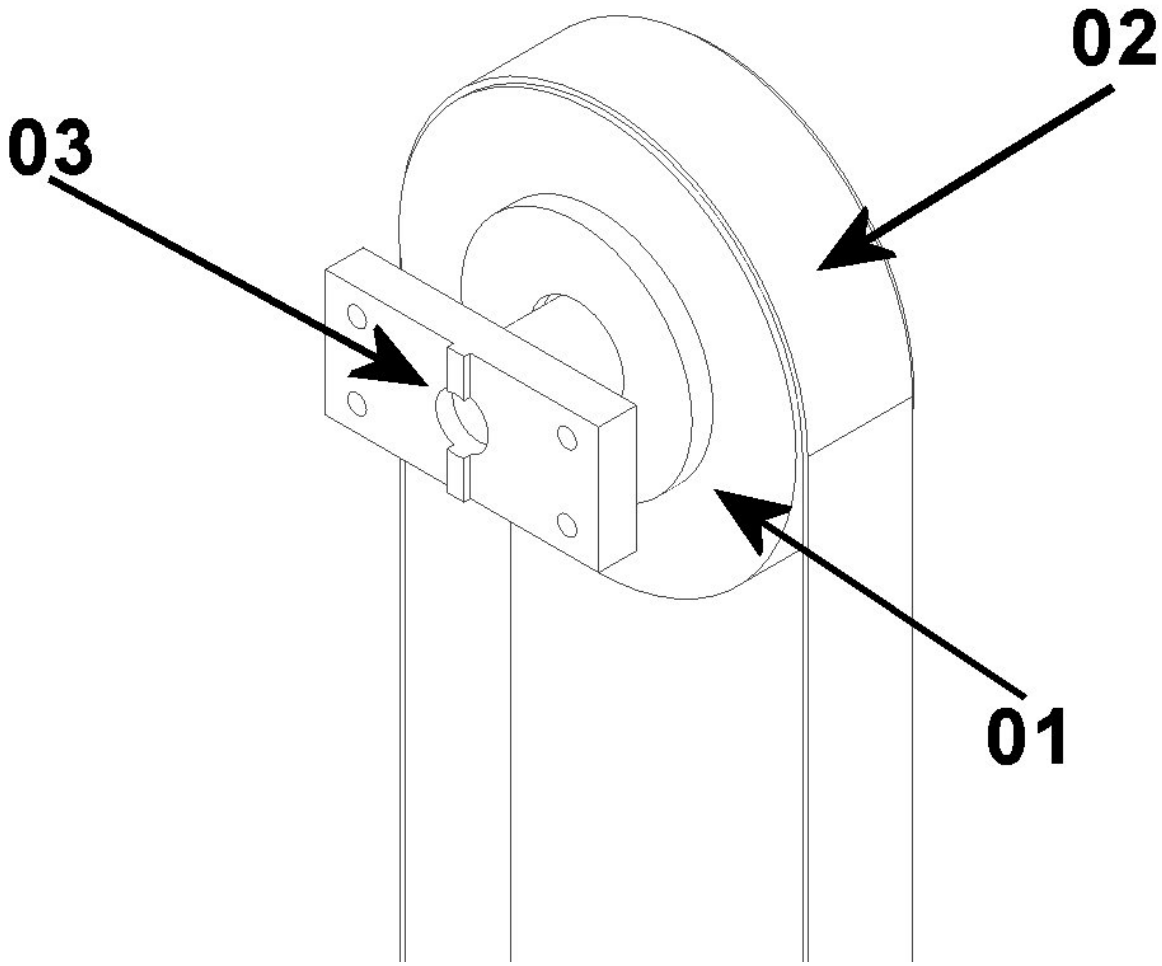
COUNTERWEIGHT GROUP



TROLLEY GROUP

Pos.	Part Number	Qty	Description
1	-	33	Counterweight plates
2	-	1	Kit 2*counterweight guide
3	-	1	Kit 3*counterweight couterguide
4	-	1	Upper counterweight plate
5	-	1	Lower counterweight plate
6	-	2	Fixing plate toothed belt
7	-	2	Counterweight stay bolt

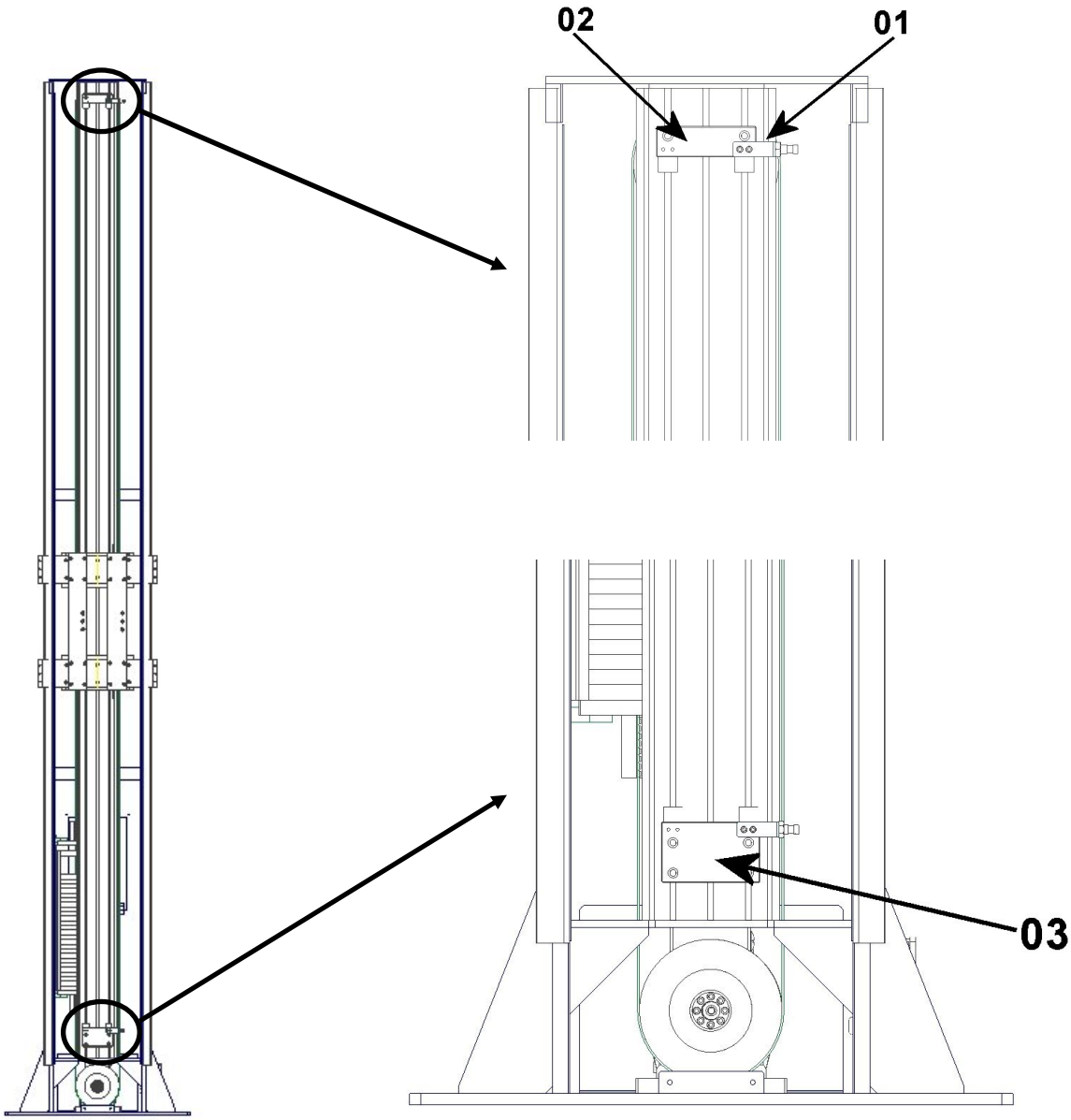
DRIVEN GROUP



LIMIT SWITCH GROUP

Pos.	Part Number	Qty	Description
1	-	1	Snub pulley
2	7035332	1	Toothed belt
3	-	1	Supporting plate

LIMIT SWITCH GROUP



LIMIT SWITCH GROUP

Pos.	Part Number	Qty	Description
1	736339	2	Sensor, inductive, PNP, NC 12mm
2	-	1	Bracket for top sensor
3	-	1	Bracket for bottom sensor

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.

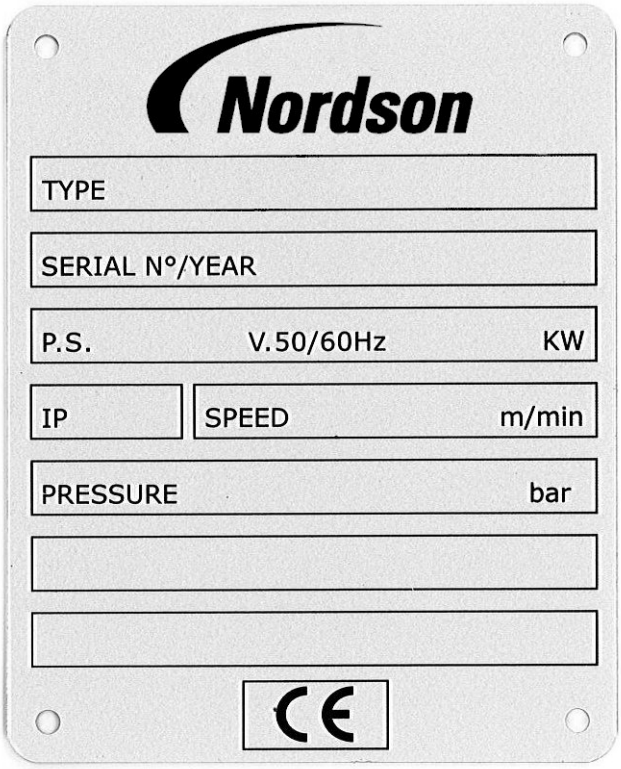
The dismantling of the machine and the removal of its components must be carried out according with the local laws or directives.

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

Nordson

EC DECLARATION OF CONFORMITY

ACCORDING TO MACHINE DIRECTIVE 2006/42/EC ANNEX II PART 1 SECTION A

DESCRIPTION: Reciprocator HL Series

FAMILY/MODELS: All variants, models and components for powder coating applications

APPLICABLE DIRECTIVES & STANDARDS USED TO VERIFY COMPLIANCE:

2006/42/EC (Machinery Directive)
2014/34/EU (Explosive Atmosphere)
2014/30/EU (Electromagnetic Compatibility)
EN60204 (Electrical Equipment of Machine Parts)
EN ISO 12100 (Safety of machinery - Basic concepts, general principles for design)

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.

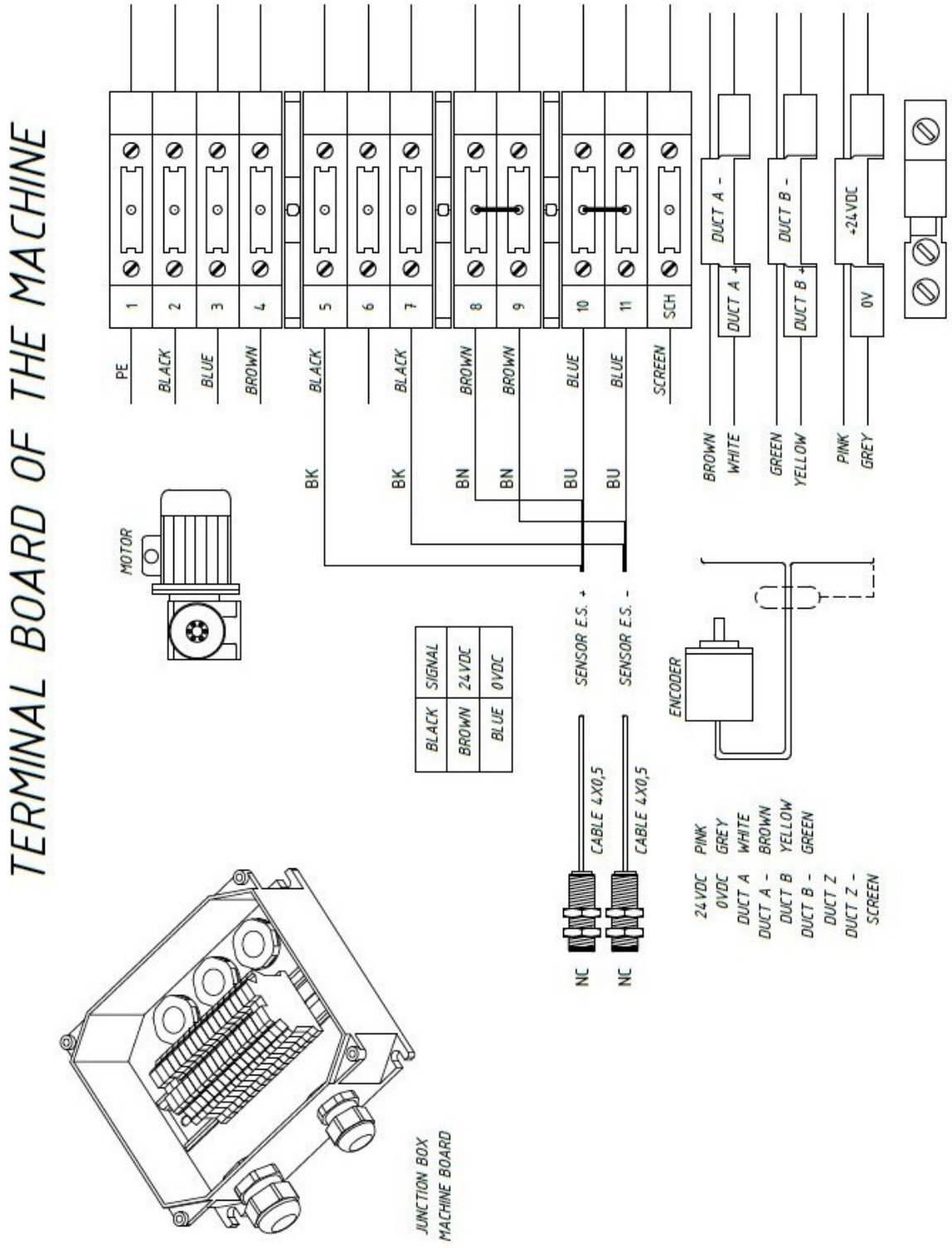
We hereby declare that the product specified conforms to the directives and standards described above and that it has been provided with a CE label. Provided the product is installed and operated in line with the Nordson manuals, its operation is safe.

Name and address of the responsible person authorized to compile the technical file

Kai Flockenhaus
Manager Procurement & Process,
ICS Europe (Industrial Coating Systems)
Nordson Deutschland GmbH -40699 Erkrath

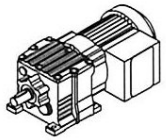
Date: 26/02/2020

WIRING DIAGRAMS


TERMINAL BOARD OF THE MACHINE
1
2
3
4
5
6
7
8
9
10
11
SCH
PE
BLACK
BLUE
BROWN
BLACK
BLACK
BROWN
BROWN
BLUE
BLUE
SCREEN
BK
BK
BN
BN
BU
BU
DUCT A -
DUCT A +
DUCT B -
DUCT B +
+24VDC
0V
BROWN
WHITE
GREEN
YELLOW
PINK
GREY
MOTOR
BLACK SIGNAL
BROWN 24VDC
BLUE 0VDC
SENSOR E.S. +
SENSOR E.S. -
ENCODER
CABLE 4X0,5
CABLE 4X0,5
NC
NC
24VDC PINK
0VDC GREY
DUCT A WHITE
DUCT A - BROWN
DUCT B YELLOW
DUCT B - GREEN
DUCT Z
DUCT Z -
SCREEN
JUNCTION BOX
MACHINE BOARD

RECIPROCATOR EXTENSION CABLE

MOTOR

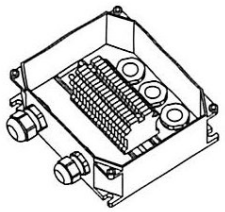


SCREENED CABLE
4 POLES
WIRE COLOUR

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

SCREENED CABLE
18 POLES
WIRE COLOUR

BROWN	24VDC	
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	SCREENED CABLE 18x0,35
RED	+V ENCODER	
BLACK	−V ENCODER	
WHITE		
GREY/BROWN		
WHITE/YELLOW		



JUNCTION BOX
RECIPROCATOR

RECOMMENDED OILS

	6) °C -50 0 +50 +100	DIN (ISO)	ISO,NLGI	Mobil® Mobil	Shell Shell	KLÜBER LUBRICATION Klüber	TEXACO TEXACO	Castrol Tribol	Castrol Optimol	FUCHS FUCHS	TOTAL 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) -20 Standard +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 PERSONALIZATION/SPECIAL EXECUTIONS

Available on request. Please contact Nordson technical office.

17.1 Spare parts for ATEX zone 1-II 2 G t3

Available on request. Please contact Nordson technical office.