

CUTTING MACHINE

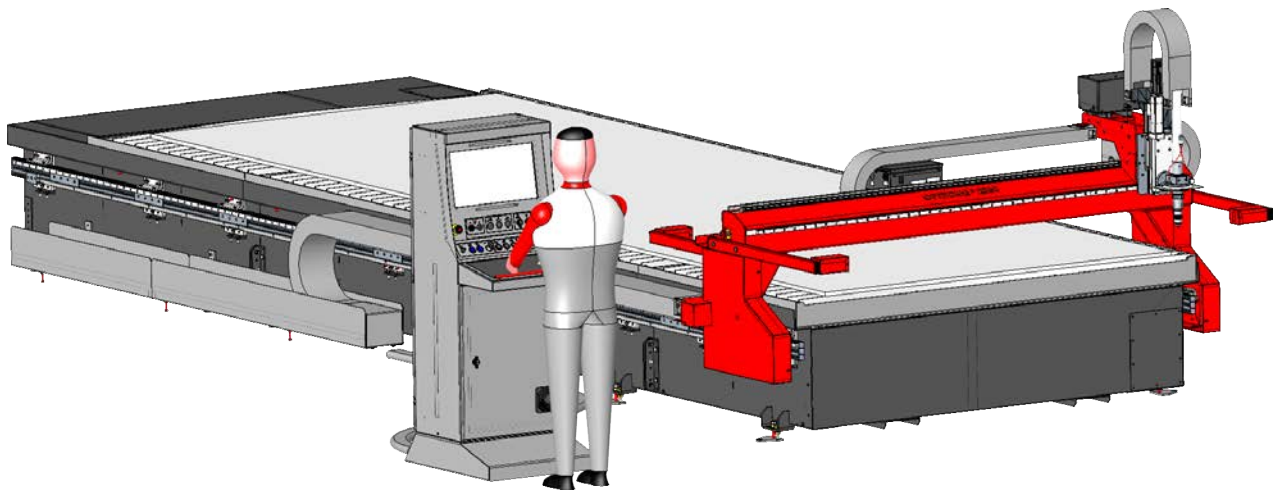
OPTITOME²

HPC III

SAFETY INSTRUCTIONS FOR OPERATING AND MAINTENANCE

No

P07005015NG ; P07005035NG ; P07005045NG ; P07005065NG
AS-CM-OPT2D1530FL1 ; AS-CM-OPT2D1530FL3



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Instruction manual

REF : 8695 4791

Original instructions

LINCOLN[®]
ELECTRIC

Thank you very much for the trust you have shown by choosing this piece of equipment. It will give you trouble-free service if it is used and maintained as recommended.

Its design, component specifications and manufacturing are in accordance with applicable European directives.

Please refer to the CE declaration enclosed to identify the directives applicable to it.

The manufacturer shall not be liable for any combination of parts not recommended by it.

For your safety, please follow the non-limitative list of recommendations and obligations, a large part of which are included in the Labour Code.

Please inform your supplier if you find any error in this instruction manual.

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INFORMATION

This technical literature is intended for the following machines or products:

- P07005015NG → OPTITOME² HPC III 2010
- P07005035NG → OPTITOME² HPC III 1530
- P07005045NG → OPTITOME² HPC III 2040
- P07005065NG → OPTITOME² HPC III 2060
- AS-CM-OPT2D1530FL1 → OPTITOME² HPC III 1530 FINELINE 170
- AS-CM-OPT2D1530FL3 → OPTITOME² HPC III 1530 FINELINE 300



These instructions and the product covered by them refer to the applicable standards.



Use of the equipment:

Please read this manual before you start handling, installing or using the machine. Keep the manual safe in a place known to the machine user and maintenance personnel until the machine is finally destroyed.

This manual explains how to transport, install, use and maintain the machine. It cannot in any event replace the experience of the user for operations of varying difficulty.

Before the machine is used by a new user, make sure that they have read this manual and understood all the explanations provided.

For any further information, please feel free to contact the technical staff of **Lincoln Electric**.



This document must follow the machine described if there is a change in ownership of the machine and accompany it up to demolition.



Display and pressure gauge:

Measurement instruments or displays of voltage, intensity, speed, accuracy etc. are to be considered as indicators, whether they are analogue or digital.



For operating instructions, adjustments, troubleshooting and spare parts, please refer to the specific safety, operating and maintenance instructions.



PLEASE CHECK THE BOX AND EQUIPMENT IMMEDIATELY FOR DAMAGE

When the equipment is shipped, ownership is transferred to the buyer as soon as it is received by the carrier. As a result, any complaints relating to damage during shipment must be made to the carrier's company when the equipment is received.































Assistance:

Lincoln Electric is at your disposal for any work on your equipment. Please send any requests to the technical department.

HOT LINE (+33) 825 132 132

MEANING OF SYMBOLS

	Reading the manual/instructions for use is mandatory.		Indicates a hazard.
	Mandatory use of safety shoes.		Warning of an electricity risk or hazard.
	Mandatory use of hearing protection.		Warning of a risk or hazard due to an obstacle on the floor.
	Mandatory use of a safety helmet.		Warning of a risk or hazard of falling with a level change.
	Mandatory use of safety gloves.		Warning of a risk or hazard due to suspended loads.
	Mandatory use of safety glasses.		Warning of a risk or hazard due to a hot surface.
	Mandatory use of a safety visor.		Warning of a risk or hazard due to moving mechanical parts.
	Mandatory use of safety clothing.		Warning of a risk or hazard due to a closing movement of mechanical parts of a machine.
	Make sure you clean the working zone.		Warning of a risk or hazard due to laser radiation.
	Mandatory use of breathing protection.		Warning of a risk or hazard due to an obstacle at a height.
	Visual inspection required.		Warning of a risk or hazard due to the presence of a pointed part.
	Indicates a lubrication operation.		Warns of an explosion hazard
	Requires maintenance action.		Warns of a fire hazard
	Wearers of pacemakers may not be admitted in the designated area.		No climbing/stepping.

REVISIONS

REVISION : B DATE : 03/22

DESCRIPTION	PAGE
Created in English	

REVISION : C DATE : 06/23

DESCRIPTION	PAGE
Update	

REVISION : D DATE : 01/24

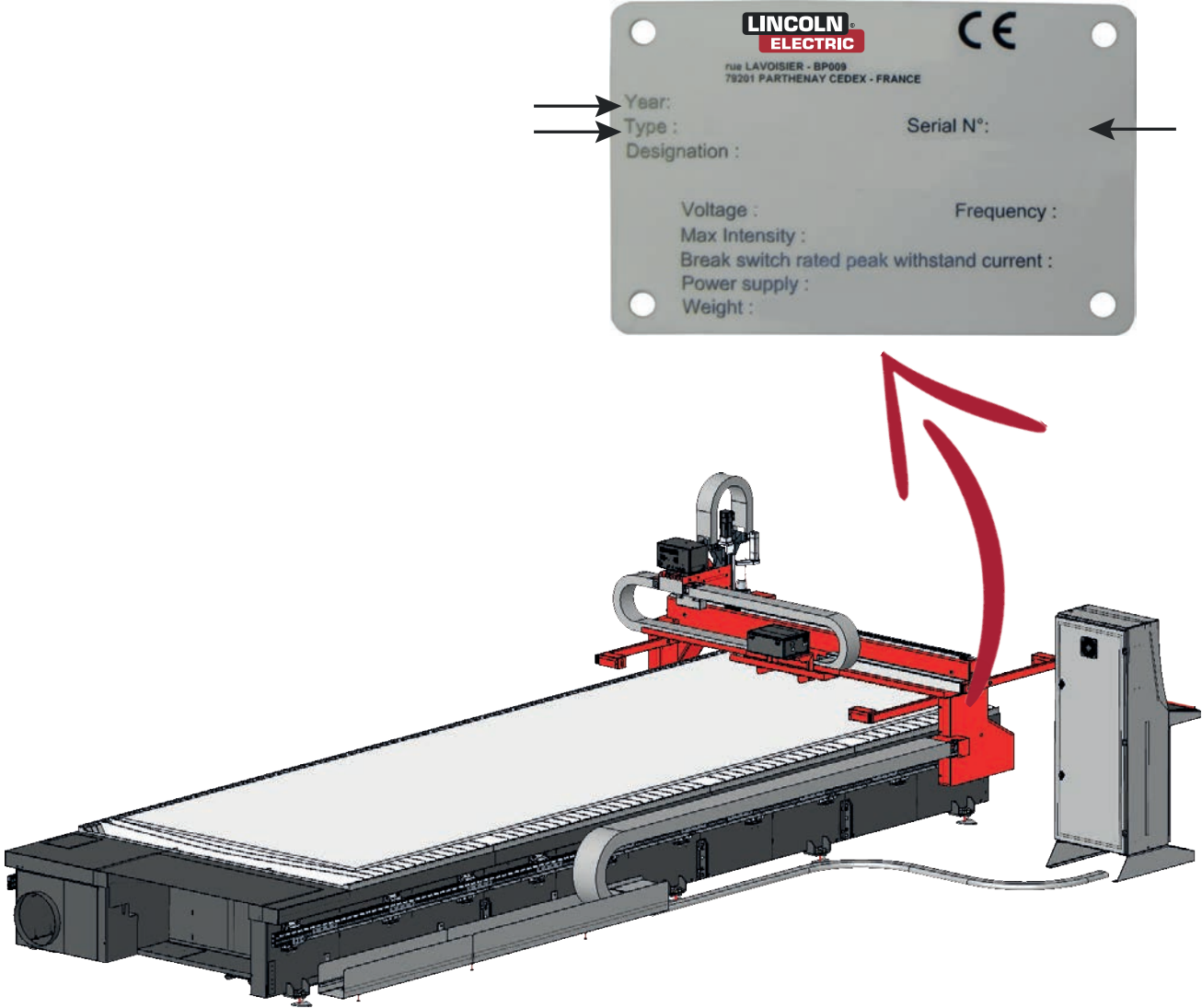
DESCRIPTION	PAGE
Disconnecting valve added	

REVISION : E DATE : 08/24

DESCRIPTION	PAGE
Cutting table changed	

A - IDENTIFICATION

The information below should be provided in all correspondence.



B - SAFETY INSTRUCTIONS



For general safety instructions, please refer to the specific manual supplied with the equipment.



AIRBORNE NOISE:

Refer to the special instructions 8695 7050 supplied with the equipment.



In spite of all the measures applied, invisible residual risks may still remain. Residual risks can be reduced if the safety instructions are observed, the machine is used as recommended and general service instructions are followed.

1 - Limits of use of the machine or the installation



The limits of use of the machine (or installation) are provided in the different documents; please review them carefully before starting to use the machine (or installation).

The machine (or installation) is designed for professional use.

The machine (or installation) may only be used cutting applications; any other use of the machine is forbidden.

The machine (or installation) is designed for indoor use.
It may not be used outdoors.

For safety reasons, and in the light of our current knowledge of customer processes, the working area may be occupied only by one individual.

The machine (or installation) may only be operated by a single person above the age of 18 and trained in operating and use-related risks.

The table has an extraction system to extract fumes and carry away the heat resulting from cutting. The machine is designed for outdoor discharge.

If the fumes are discharged indoors (not recommended), the workshop in which fumes are discharged must be ventilated so as to not reach the professional exposure limit value of pollutants (fumes and gases).

The workshop must be adequately lit and ventilated.

Mechanical or electrostatic filtration systems are effective for the filtration of solid particles, but not gaseous particles.

Before use, the operator must make sure that there is no risk of collision with personnel.

The energy supply must imperatively comply with recommendations.

The table is designed for dry cutting.

The machine may not be used in an explosive atmosphere (not Atex certified).

The operator does not need to climb on the table. Climbing on the table is thus forbidden.

The maximum exterior temperature is 40°.

The maximum usage time of the machine is twice 8 hours every day.

The maximum thickness of the plate to cut is 50mm.

The maximum dimensions of the plate to cut are:

- 1500*3000 => OPTITOME² 1530
- 2000*4000 => OPTITOME² 2040
- 2000*1000 => OPTITOME² 2010
- 2000*6000 => OPTITOME² 2060

Before using the machine. Make sure that the guard covers of the electrical and mechanical parts are in place before starting up the equipment.
All guard covers must be screwed in.

No climbing on the structure of the machine.

To access equipment at heights, the user must use accessing means in accordance with the regulations, such as a safe mobile gangway, an aerial lift etc.”.

Never modify the machine.

The machine is not designed for anchoring handling equipment.

The use of Personal Protective Equipment (PPE) and work clothing covering the body is mandatory in the work area. Do not wear a tie and keep your hair tied back securely.



For any extended absence, the operator must shut off the supply of utilities (electricity and fluids).

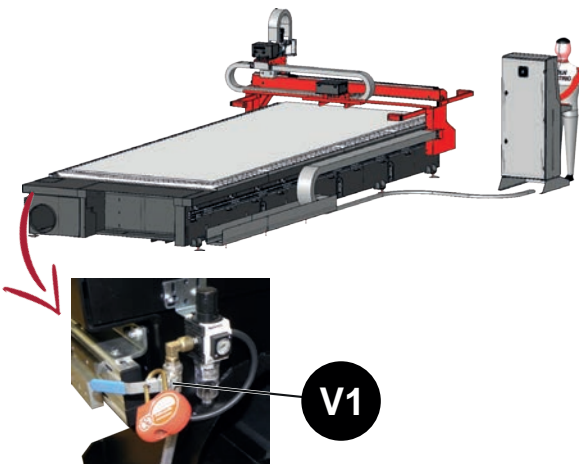
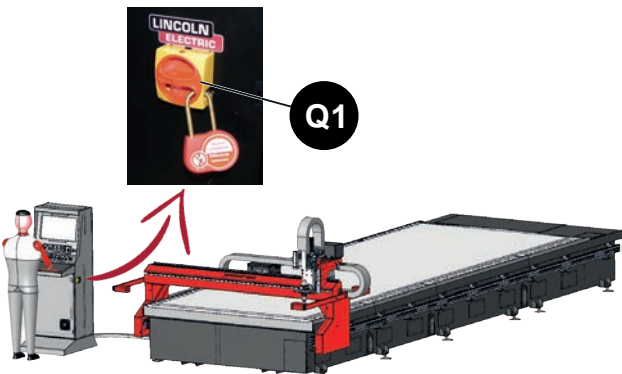
Maintenance may only be carried out by experienced personnel who are trained in machine-related risks.

Access to the machine (or installation) must be left free for maintenance (e.g. no workpiece etc.).

The frequency of such maintenance is indicated for production in one work shift per day (i.e. 8 hours a day).

Machine maintenance must be carried out with all the energy supplies switched off.

The disconnection and padlocking of all energy sources is mandatory.

Pneumatic locking out	Electrical locking out
Pneumatic locking out is achieved by means of the disconnecting valve V1 .	Electrical locking out is achieved by means of the disconnecter Q1 .
	

Consumables must be changed based on their wear and tear.

Visually inspect the overall condition of the installation and the working area twice a shift, or with every change of production.

Clean the working area from time to time.

The maintenance schedule must absolutely be followed.

We recommend putting in place a traced system for tracking all your maintenance operations.

All maintenance must be carried out by specialised personnel who have read and understood these instructions.

Electricity technician

Qualified operator with the ability to work in normal conditions on electrical parts for regulation, maintenance and repair.

Mechanical technician

Specialised technician authorised to carry out complex and exceptional mechanical operations.

Any change in the machine location must be made by Lincoln Electric or authorised personnel.

2 - Residual risks

Based on the results of the risk assessment, a few elements have emerged where there was no “technical” solution for eliminating risk or making it negligible.

In spite of all the care that has gone into the designing of our machines (or installations), some risk areas remain. To control these risks, the customer must pay particular attention to them, ensure that the instructions are applied and define any additional measures that may be necessary in view of its own internal operating procedures.

Therefore, you will find below a guidance list of residual risks.

Training of operators in safety and in the use of the machine from their operating position will better address these residual risks.

We recommend putting place workstation instructions that remind users of the presence or otherwise of residual risks in the working area.

2.1 - Residual risks - General

☛ **Environment risk - slipping and/or falling**



The working and safety area must be clear of all obstacles.

The working area must be kept clean and cleaned regularly (dust, dross, coolant etc.).

The machine must undergo periodic maintenance, with the power switched off (see maintenance instructions of each piece of equipment). In particular, cutting or grinding dust around the machine must be cleaned.

Waste consumables must be cleaned.

The operator must pay special attention to cables and rolling tracks on the ground.

The operator must use the necessary personal protective equipment (helmet, gloves, safety shoes, mask and work clothing).

While unpacking the machine, the area around the **OPTITOME² HPCIII** must be sufficiently large and clear, in order to avoid falls. A cluttered area increases the risk of tripping and slipping.

While installing the machine, follow the recommendations for installation provided in the layout drawing, particularly the absence of workers and obstacles in the area around the machine marked on the floor.

The lighting on the control panel must be at least 500 lux (measured at the control panel), to avoid fatigue and falls.

The machine is only designed for dry cutting, in a sheltered area. The table is not designed for handling large quantities of water or lubricant, as these may create risks of leaks, slipping and falling.

To avoid tripping on cables, all cables must be placed in cable channels or gutters provided for that purpose. Passage areas must be demarcated.

At the end of the installation process, dispose of any packaging waste appropriately based on its type.

Falling from heights:

In order to be protected from falling from heights and for access to high parts, the operator or technician must use access means that comply with applicable standards (e.g. during the assembly, disassembly or maintenance of ducts).

For all work at heights, the use of personal protective equipment (helmet, gloves, safety shoes, mask, ear muffs and harness) is indispensable.

For all work at heights, the operator must be trained in the use of means for accessing high locations.

Do not climb on cutting tables when the machine is operating and/or when parts are being handled. The cutting table dimensions allow the collection of parts without climbing on the machine.

☛ **Mechanical risk - Impacts, shearing, crushing**



The operator may not wear loose clothing or a tie, must have their hair tied back and use personal protective equipment (helmet, gloves, safety shoes, mask and work clothing).

The **OPTITOME² HPCIII** may not be operated without all its guarding components. The operator must make sure that all the machine guards are in place before using it.

IMPORTANT: "Do not remove the Nylstop nuts from the fastening screws of the guards: they keep them captive"

Before any work on a part of the **OPTITOME² HPCIII** (electrical or other), the machine must necessarily first be disconnected using the disconnecting switch.

The operator's working position is before the control console.

The machine safety areas must not be crossed. The machine and the area marked on the floor around the machine (500mm minimum around the machine) must be free from obstacles or workers.

The operator must be trained in the use of the machine, and all personnel must be aware of residual risks.

The operator must use personal protective equipment, (helmet, gloves, safety shoes, mask and work clothing).

The operator must make sure nobody is present in the machine working area or safety area before using it.

While handling the machine, the operation must be carried out by an individual trained in the use of mechanical handling equipment.

Anchoring failure of handling equipment

The machine may not be modified.

The machine is not designed for anchoring lifting equipment.

☛ **Mechanical risk - Puncturing or piercing**



The use of personal protective equipment (helmet, gloves, safety shoes, mask, ear muffs) is indispensable, particularly while installing fume ducts (sharp parts).

The operator must be trained in the use of the machine and all personnel must be aware of residual risks.

While opening machine packages, use appropriate tools to avoid cuts and wear appropriate personal protective equipment (work clothing, gloves).

The machine has expendable plates that are sharp and abrasive. To limit risks, the use of personal protective equipment is mandatory, as it can mitigate potential impacts (work clothing, safety gloves and shoes, possibly a helmet).

☛ **Noise risk - Fatigue**



Process noise

The use of personal protective equipment (helmet, gloves, safety shoes, mask, ear muffs) is indispensable.

The operator must be trained in the use of the machine and all personnel must be aware of residual risks.

☛ Explosion hazard



Any explosive gases that may be emitted by the process are collected by the extraction system. That is why the working of the filter and extraction hatches must be verified from time to time. The machine must necessarily be located in a non-Atex area. The cutting table is designed for cutting ferrous materials only. The table may not be used for grinding or sanding (risk of emission of potentially explosive dust).

☛ Fire hazard



The working area must be cleaned regularly. Remove any flammable substances or unnecessary combustible material in and around the cutting area. Do not dispose of waste in the containers: fire hazard. In case of fire, press the emergency stop to stop the machine and the extraction system.

2.2 - Residual risks during operation or simple maintenance

☛ Electrical risk - Electric shock or electrocution



Contact with electrical parts

Access to the electrical cabinet must be restricted to authorised personnel.

Before any work on a part of the **OPTITOME² HPCIII** (electrical or other), the machine must necessarily first be disconnected using the disconnecting switch.

All the utility supplies (electricity, air, gas) must necessarily be disconnected, padlocked and purged. Contact with electrical parts, including after the machine has been switched off, could lead to serious injury. After the machine has been switched off, wait for 5 minutes before starting to work on the variable drive (residual voltage above several hundred volts may be present for several minutes).

From time to time, check that the machinery and its electrical accessories - connectors, flexible cables and extension cords - are correctly insulated and connected.

Work for maintaining and repairing insulating ducts and enclosures may not be carried out in a haphazard manner.

- All repairs are to be carried out by specialists, or better yet, defective accessories should be replaced.
- Regularly check that the electrical connections are tight, with no heating.

The use of personal protective equipment (helmet, gloves, safety shoes, mask, ear muffs, fire-resistant work clothing) is indispensable.

The operator must be trained in the use of the machine, and all personnel must be aware of residual risks.

Access to active parts in the electrical cabinet

Only authorised personnel may access electrical cabinets. The cabinet is protected by a lock.

Access to unprotected active parts

Only authorised personnel may access electrical components. Machine maintenance must be carried out with all the energy supplies switched off.

Access to parts that could be live accidentally

Cables must be placed in protected cable channels on the floor (themselves connected to the earth) or protected in a technical gutter.

Cables and connectors must be inspected from time to time and replaced with identical parts if they are damaged.

Electrical cabinet connected to an outside element

There could be an outside power supply in the electrical cabinet that is not switched off with the main disconnecter for the machine.

In that case, the outside power supply must be identifiable by orange wires and terminals.

☛ Ergonomics risk - Fatigue



Process noise

The noise level is indicated in the manual relating to the process used. The use of hearing protection is mandatory for the processes carried out by this machine.

Machine noise

The use of hearing protection, which is mandatory for the processes carried out by this machine, addresses the risks relating to the noise emitted by the machine.

☛ Material and product risks - Poisoning



Emission of fumes/dust

The use of personal protective equipment (helmet, gloves, safety shoes, mask, ear muffs, work clothing) is indispensable.

The operator must be trained in the use of the machine, and all personnel must be aware of residual risks.

☛ Mechanical risk - Puncturing or piercing



Contact with a part of the pneumatic circuit that is under pressure

Before any work on the pneumatic circuit, the pneumatic supply must be switched off and the circuit must be purged to avoid any accidental lashing of the hoses.

The use of personal protective equipment (helmet, gloves, safety shoes, mask, ear muffs) is indispensable.

The operator must be trained in the use of the machine and all personnel must be aware of residual risks.

Changing/emptying containers

The operator must use appropriate handling means.

The operator must be trained in the use of the machine, and all personnel must be aware of residual risks.

☛ Thermal risk - Burns



Part of the body in contact with a hot part (torch- workpiece etc.)

The use of personal protective equipment (helmet, gloves, safety shoes, mask, ear muffs) is indispensable.

The operator must be trained in the use of the machine and all personnel must be aware of residual risks.

Cut parts and the torch may remain hot for a certain length of time after cutting.

The user must protect the area around the machine (emission of dross).

Strikes should be turned towards a non-hazardous area.

The use of an extraction system is mandatory during cutting, as it will remove dross, fumes and hot gases and thus remove heat.

☛ Electrical - fire hazard



The machine is protected by fuses.

Replace used fuses with fuses of the same type and rating. Risk of damage to property and fire.

☛ **Illness - pollution hazard**



Check the working of the hatches from time to time, generally as soon as fume emissions appear to be too great. (see maintenance section). Risk of emission of carcinogenic fumes.

Residue and dust (recovered while cleaning containers) must be treated in accordance with local laws and regulations.

For cleaning the containers, see the particular safety instructions in the Maintenance section.

The filtration equipment, which is exclusively used for extracted air, must be fitted with appropriate filters, offer the recommended flow rate and undergo inspection from time to time.

The table and filter are rated for a sufficient flow rate with half the table covered.

3 - Layout



The operator station is located before the control console.

The machine you have purchased can be hazardous if you do not take certain precautions for use.

Make sure that no part of the machine can come within less than 500 mm from an obstacle.

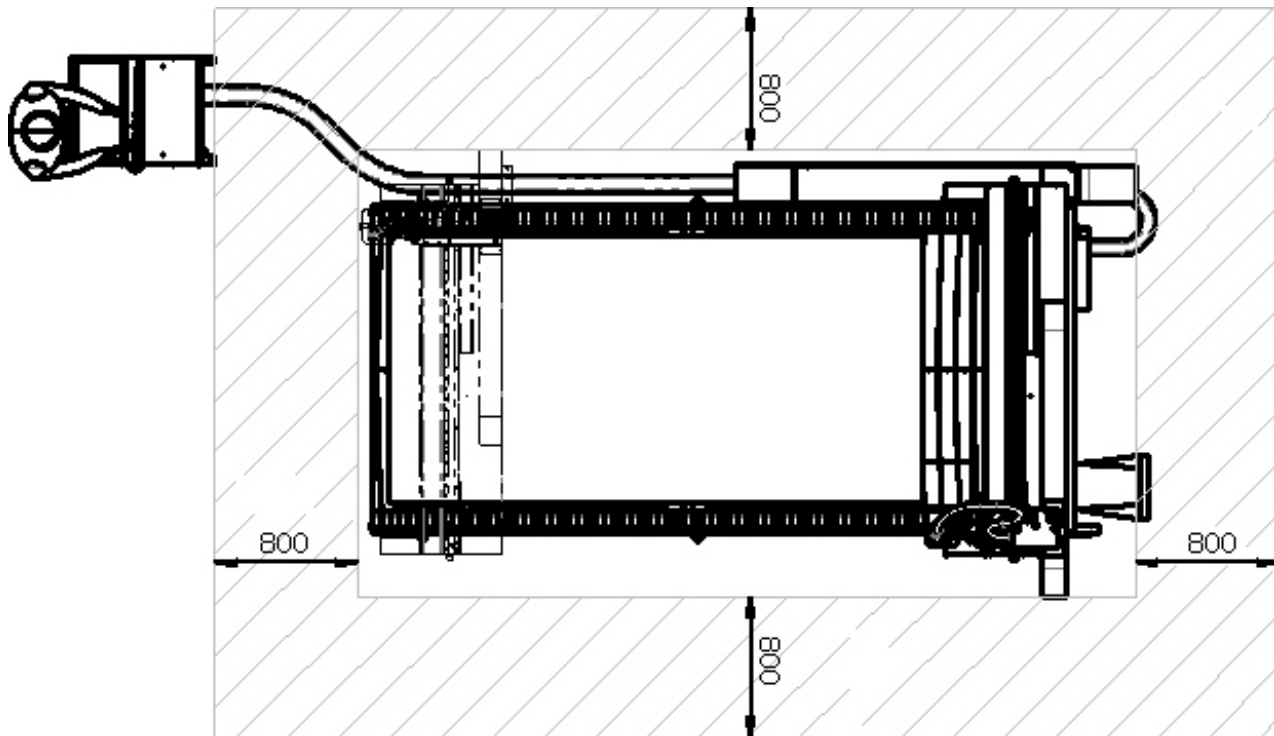
Important: the operator passage way must absolutely be clear over a minimum width of 800 mm according to safety standards. The floor should be marked out as shown in the enclosed drawing.

While accessing the marked area, a worker could be hit by the machine or the cable drag chain.

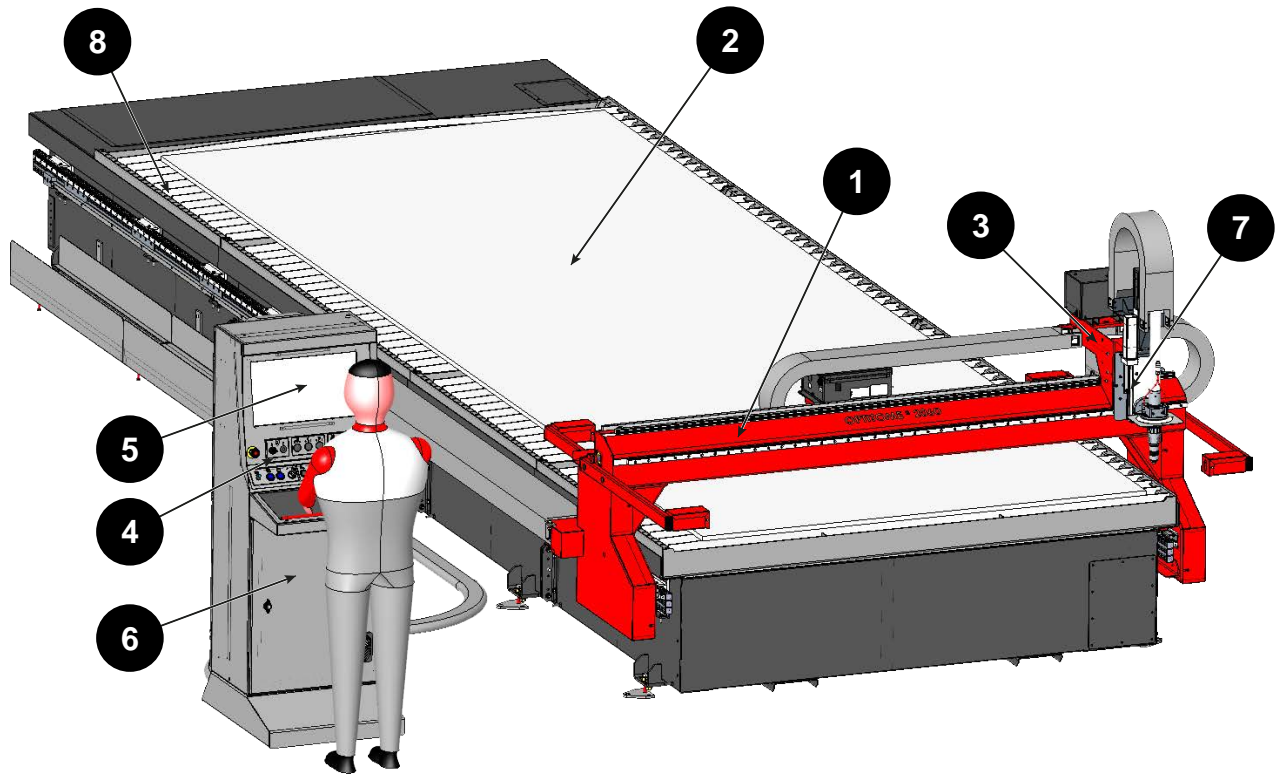


Refer to the following:

- supplied layout drawing



1 - Description



1	Beam
2	Cutting table with guide rails
3	Tool carriage
4	Control panel
5	HPC DIGITAL PROCESS Process III CNC control
6	Electrical power system
7	Tool holder
8	Cutting table

2 - General

This is a numerically controlled single-piece plasma cutting machine that is particularly suited to industries that use steel, stainless steel and aluminium for plates measuring:

- 1500*3000 => **OPTITOME² 1530**
- 2000*4000 => **OPTITOME² 2040**
- 2000*1000 => **OPTITOME² 2010**
- 2000*6000 => **OPTITOME² 2060**

The main intended applications are those of iron workers, metal workers, air processing, air-conditioning, ventilation, refractory industries, workshops producing in small and medium runs or support production.

It is managed by a CNC control of the **HPC III DIGITAL PROCESS HPI** type.

This machine uses:

- all dry plasma cutting processes,
- optional flame cutting to allow the occasional cutting of black steels, maximum thickness 50mm,
- optional WEN marking or FELT marking.

The control console supports the operating approach.

The incorporation of a down-draft table (included in the basic offer) that can be connected to any extraction and/or filtration system and is fitted with dross recovery containers allows its use in optimum health and safety conditions. The plate frame is removable, allowing easy access for cleaning the containers, or for replacing it to make it easier to load and unload cut pieces.

The frame is 800mm high and has been designed to allow access so that the distance between the edge of the rails and the side ends of the table is as short as possible.

Single-beam cells:

Single-beam cells are installed with **OPTITOME² 2040** and **OPTITOME² 2060**.
The movements and process are stopped when the cells are crossed.

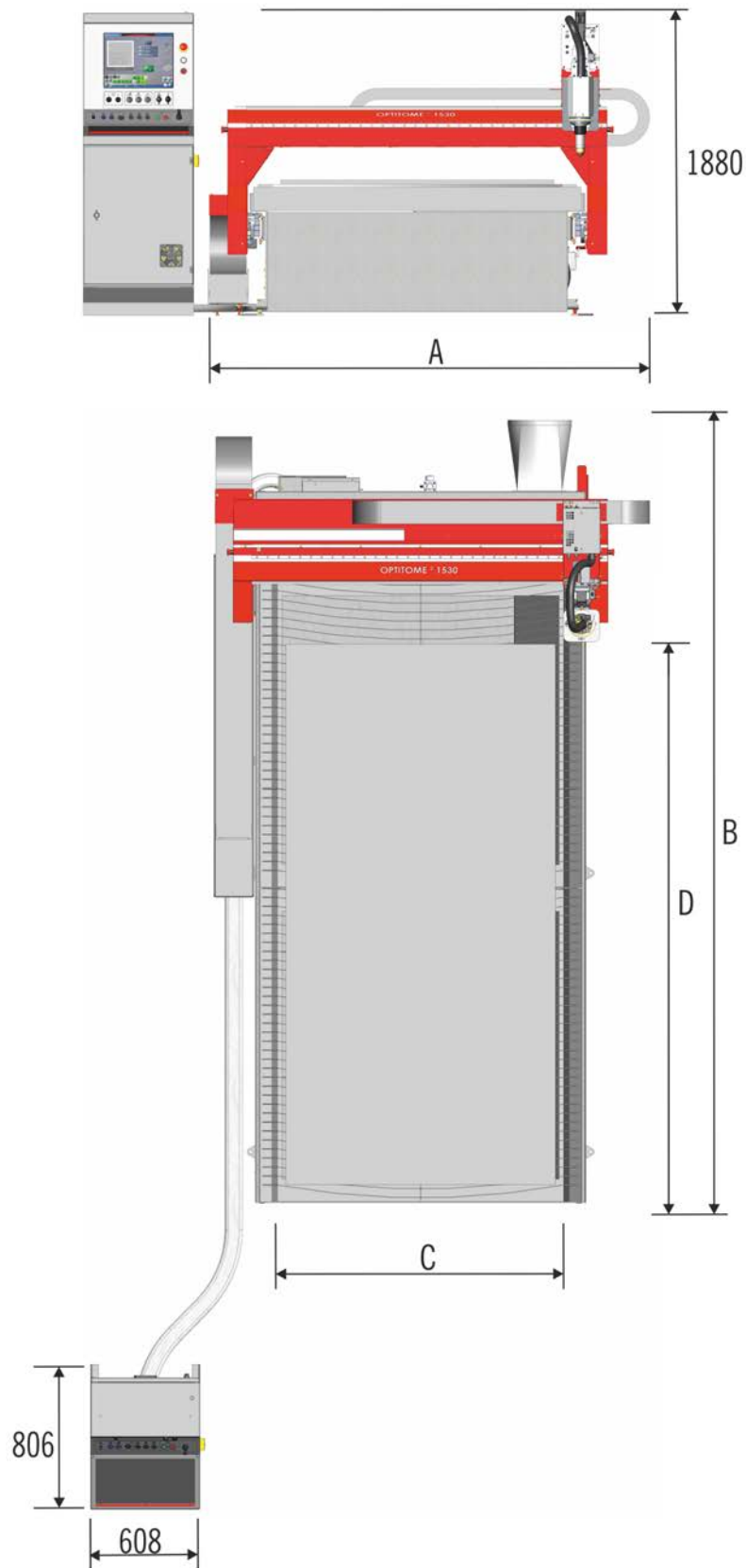
3 - Mechanical system

This is a single-piece machine made up of a mechanically welded cutting table, with, on each side, a guide rail with ball slides and a rack to guide and move the beam.

Two guide rails with ball slides and a rack are fixed to the beam, to guide and move the tool carriage.

The high feed speed is 15m/min.

A console cabinet to be fastened to the floor contains all the electrical and electronic equipment that is required for control and operator dialogue.



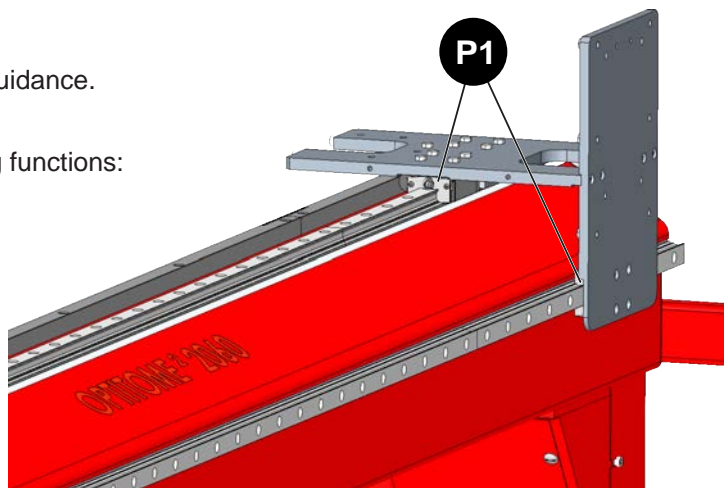
Size	A (mm)	B (mm)	C (mm)	D (mm)
1530	2550	4375	1500	3000
2010	3050	2550	2000	1000
2040	3050	5325	2000	4000
2060	3050	7380	2000	6000

4 - Transverse carriage

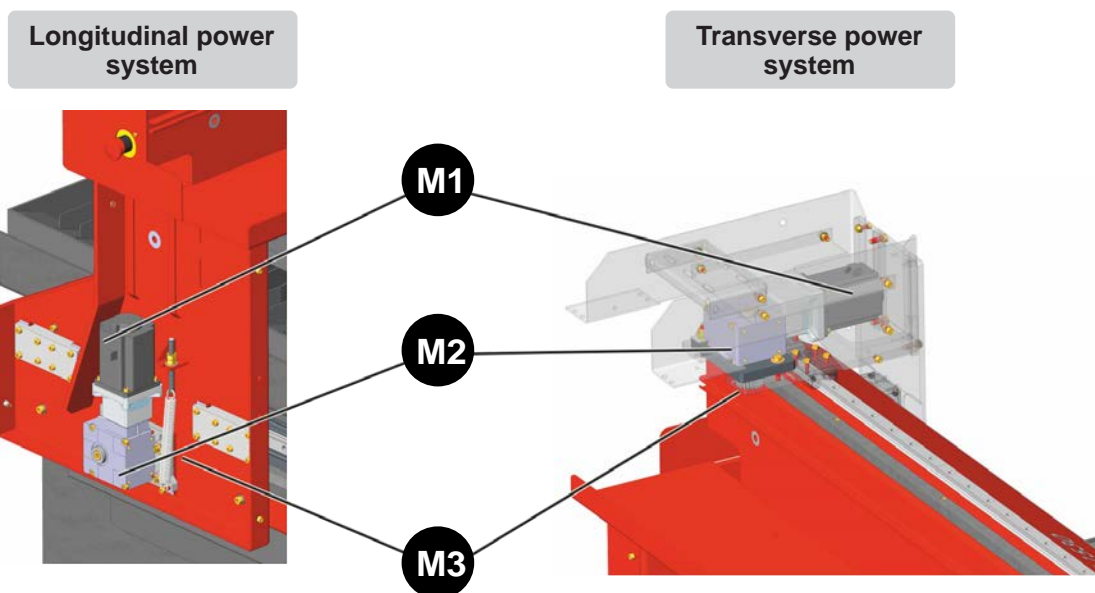
This carriage has 4 ball slides **P1** for optimum guidance.

The transverse carriage carries out the following functions:

- Support for transverse power system
- Support for cutting tool.

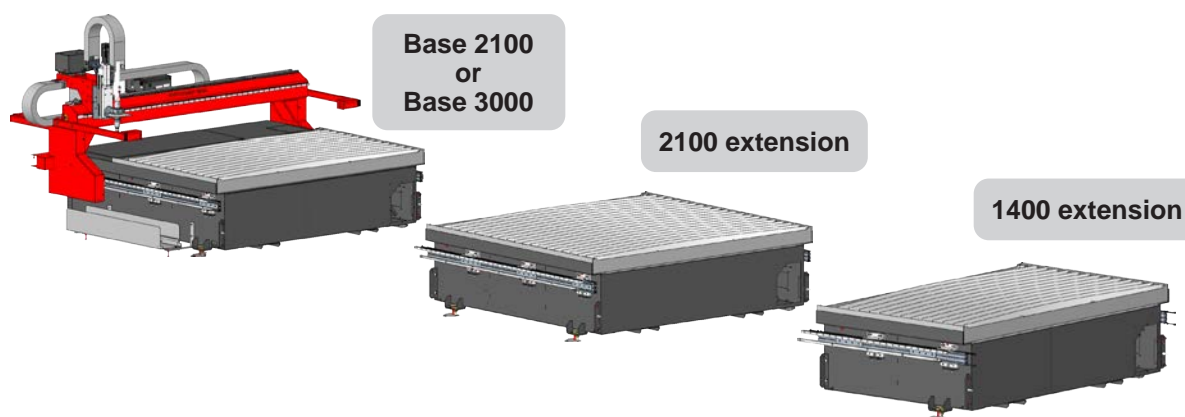


5 - Power systems



M1	Brushless 750W 3000 rpm power motor
M2	1/19.5 reduction gear
M3	M2 20-tooth pinion

6 - Cutting table

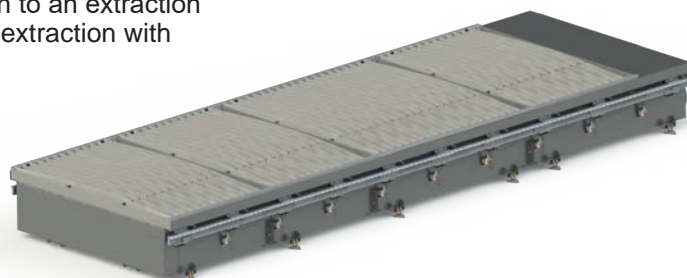


OPTITOME² 1530 HPCIII	1 x 3000 mm long base
OPTITOME² 2010 HPCIII	1 x 2100 mm long base
OPTITOME² 2040 HPCIII	1 x 2100 mm long base + 2 x 1400 mm long extensions
OPTITOME² 2060 HPCIII	1 x 2100 mm long base + 2 x 1400 mm long extensions 1 x 2100 mm long extension

It is made up of several mechanically welded boxes fastened to the floor and has a Ø350 mm outlet for connection to an extraction system. For this table, we recommend the use of extraction with filtration that is suited to machine performance.

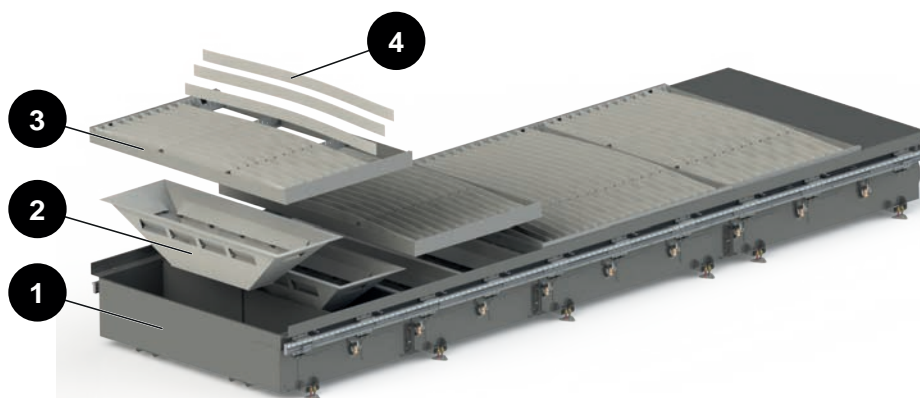
A removable support frame for the piece to cut, made of expendable plates for plasma cutting, is placed on the box.

The bottom contains dross collectors that are easily removable for cleaning.



On each side, aluminium beams with longitudinal guide rails can be fastened and adjusted.

The cutting table is made up of several components.



Base (ref: 1): It is made up of several stable boxes that support the load, and is divided into independent extraction compartments. These compartments are connected to an extraction tunnel, and opening is via hatches with pneumatic cylinders.

The cylinders are controlled by the movement of the beam, via pneumatic valves.

Containers (ref: 2): cutting dross recovery containers, which are also used for channelling the extraction flow.

Support frame (ref: 3): Frames that are used for holding the expendable plates; they are easily manipulated to give access to the dross containers during cleaning.

Expendable plate (ref: 4): The expendable plates support the cut plate, and can be replaced easily when they are damaged by cutting.

7 - Console

The control console of the **OPTITOME²** provides the operator with the **HPC DIGITAL PROCESS III** CNC control, along with all the controls required for starting up the machine and operating the cutting cycle.

The most used controls are located outside, in buttons on the front to make the machine and process easier to control.



Refer to the following:

- technical literature of the **HPC DIGITAL PROCESS III**: 86954995



8 - Limit of supply

The products AS-CM-OPT2D1530FL1 and AS-CM-OPT2D1530FL3 are delivered with:

- 1 400V 16A male connector for supplying power to the machine.
- 1 400V 125A male connector for supplying power to the power source.

To be paired with a female connector of the same type, offering adequate protection (data on the power supply drawing).

The 125A connector has a pilot wire for switching off the upstream supply if the connector is disconnected. That pilot wire must be wired to a contactor that controls the power supply to this connector.

1 - Installation conditions



The machine must be located in accordance with safety standards to keep personnel safe.



The following conditions must be fulfilled before the equipment is installed.



Refer to the following:

- supplied electrical diagram
- supplied feed diagram
- supplied layout drawing



Arrangement of cables and hoses

The customer must provide a means to support and protect cables and flexible hoses from mechanical, chemical or thermal damage.

Tools required for installing a machine on the site:

- Level offering accuracy of 1/10 per metre
- Hammer drill for concrete, for Ø16 bit
- Tape measure
- Chalk line
- Vacuum cleaner
- 24-mm open-ended spanner
- 24 mm ring spanner

2 - Floor preparation



Refer to the following:

- supplied feed diagram
- supplied layout drawing

The floor does not need any particular preparation for installing the machine; however, we recommend a concrete floor for the machine to be satisfactorily stable.

- Continuous concrete slab (200 mm thick) made at least 21 days previously,
- Flatness over the entire area ± 10 mm,
- 30 mm level difference of screed (5 mm/m max.)



The thickness of the slab and its reinforcement are provided for guidance and must be adapted to the characteristics of the floor.

3 - Slingsing



While handling the machine with a truck or crane, the operation must be carried out by an individual trained in the use of mechanical handling equipment.



Make sure you have enough space while unpacking the **OPTITOME² HPC III**. A cluttered area increases the risk of tripping and slipping. Dispose of packaging waste based on its type.



CAUTION: Protect sensitive parts while slingsing.
☛ Use the webbing supplied and positioned with the machine.



During any handling operations, the use of appropriate PPE (Personal Protective Equipment) is **mandatory**.



The components of the installation may only be transported using the slingsing points provided, with appropriate slingsing equipment.

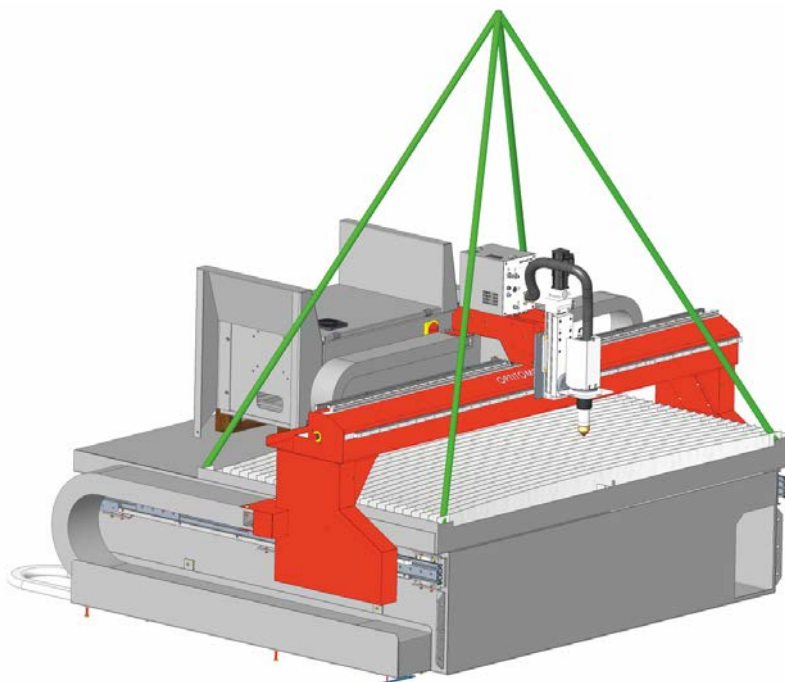


Operator protection:
Helmet - Gloves - Safety shoes

160 daN



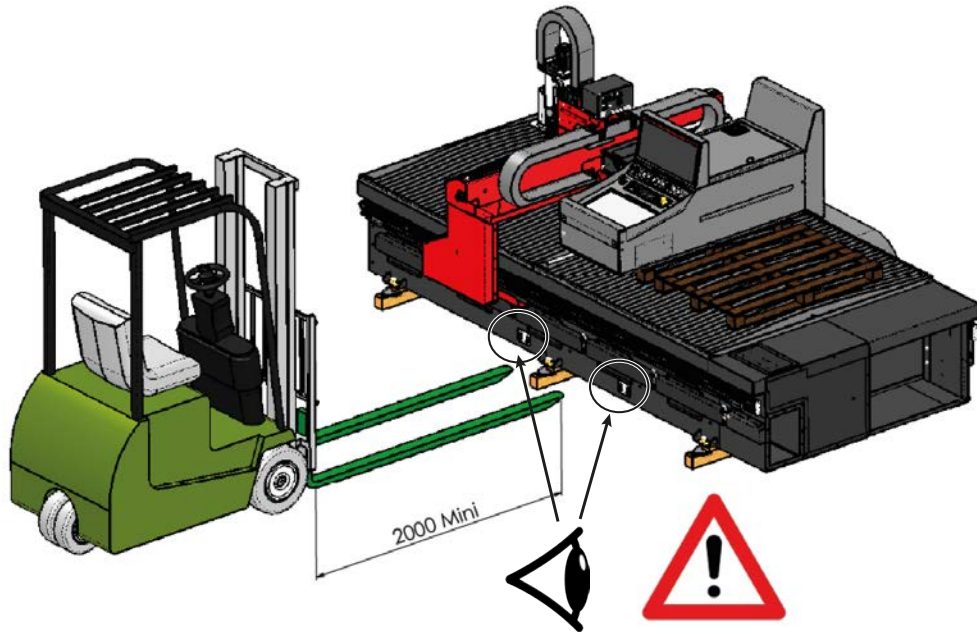
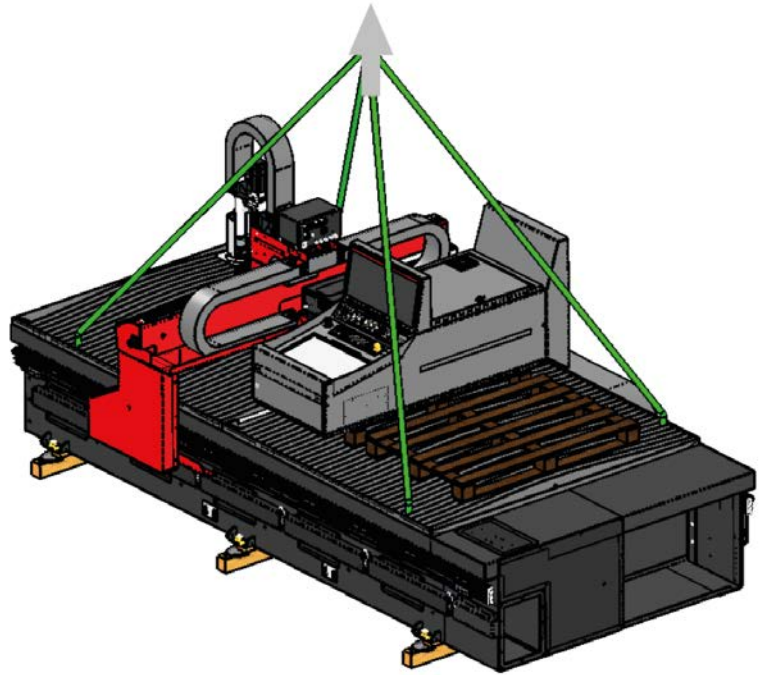
OPTITOME² 2010 HPCIII: 1800 daN



160 daN



OPTITOME² 1530 HPCIII: 2800 daN



4 - Putting in place the OPTITOME² HPCIII



NB: In no event is there any need to disengage the power systems.

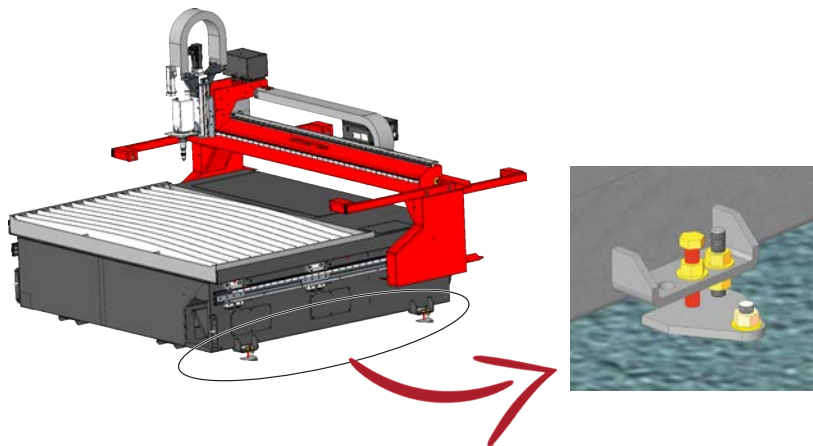
4.1 Positioning the base

- Check the flatness of the floor with an optical level and identify the high point.
- Place the first part of the table in the location provided,

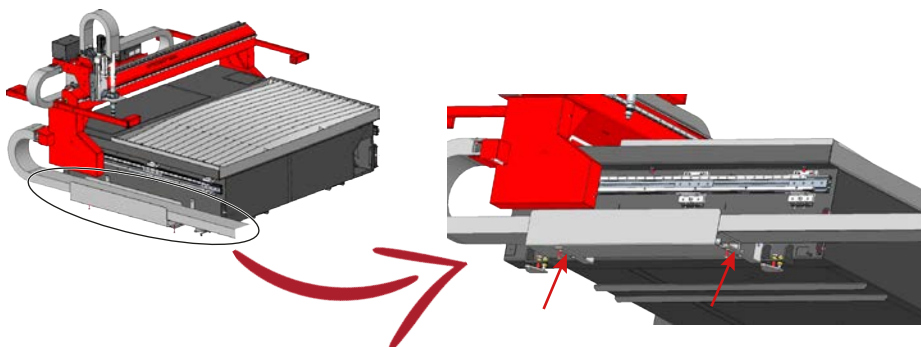


IMPORTANT: The use of adjustable chains with four strands with highly recommended.

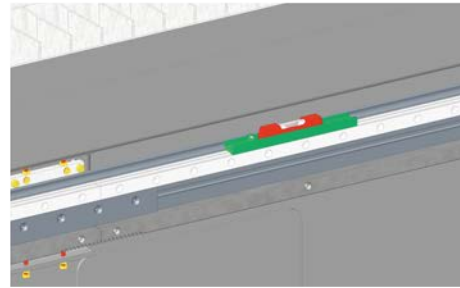
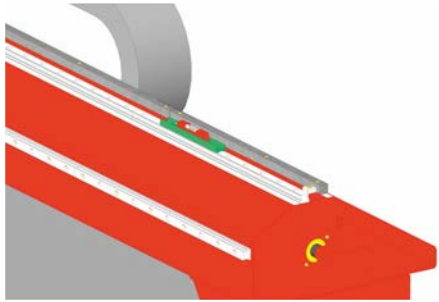
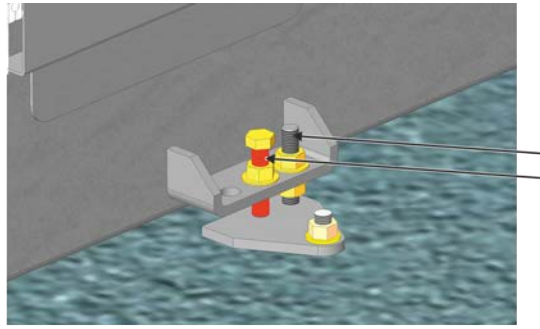
- Unload the console and the bundle pallet (60 daN),
- Pre-adjust the level using the adjustment screws,
- Anchor the table to the floor at the four corners with the dowels supplied (15x145/23 anchor studs).



- On the left-hand side, loosen the two duct transport screws to slightly move away the duct and access the fastening plates (mind the cables and pipes),



- Adjust the machine horizontally with the adjustment screws in the two planes, placing the level on the guide rails

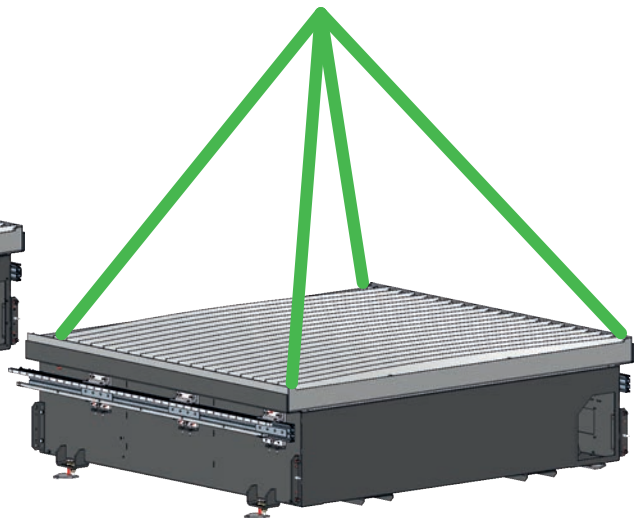
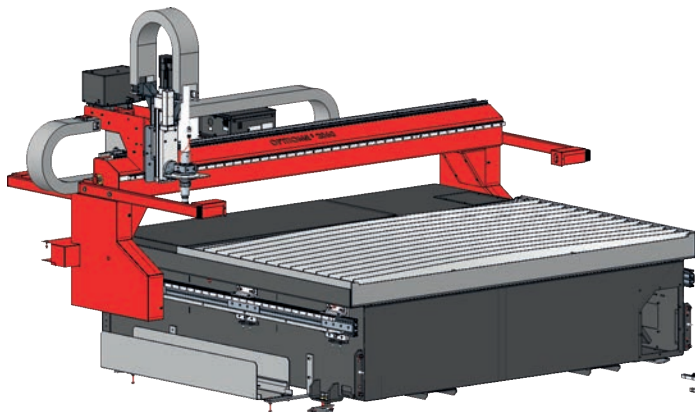


- Block the lock nuts of the adjustment screws,

4.2 Extension assembly

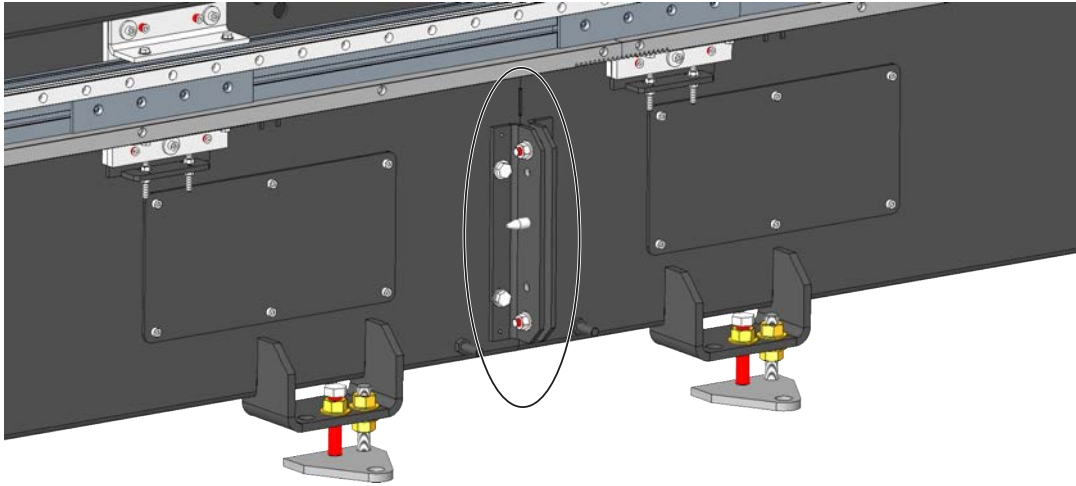
- Sling the second part of the table,

3000 base: 1100 daN
 2100 base: 700 daN
 2100 extension: 780 daN
 1400 extension: 550 daN

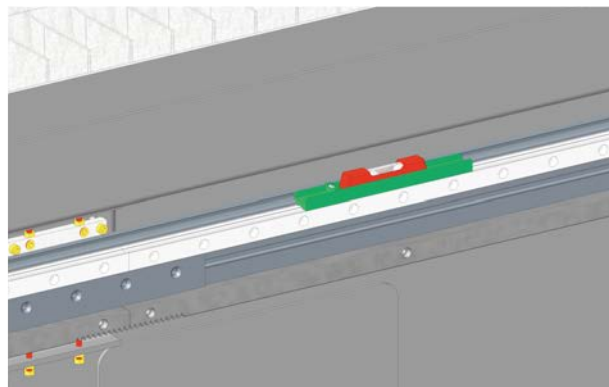
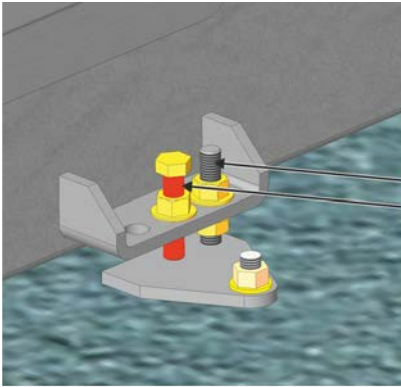


Operator protection:
Helmet - Gloves - Safety shoes

- Set the table against the first part, using the two centring pins as a guide,
- Bolt the two parts of the table,



- Pre-adjust this part of the table horizontally using the adjustment screws, by placing the level on the guiding rails,



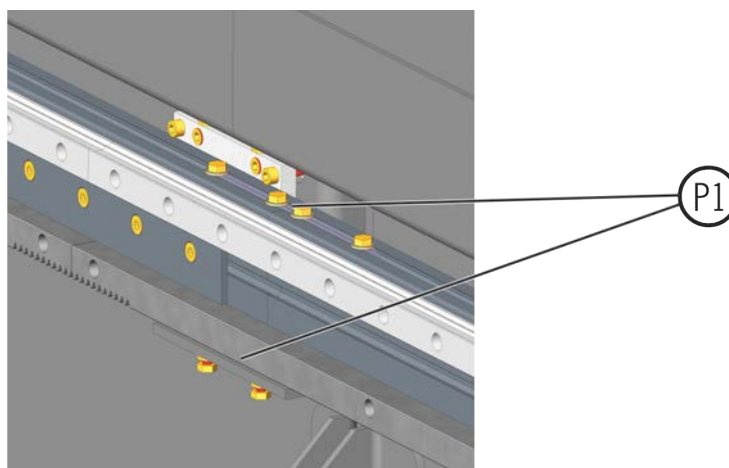
- Block the lock nuts of the adjustment screws.

4.3 Setting up the rails and racks

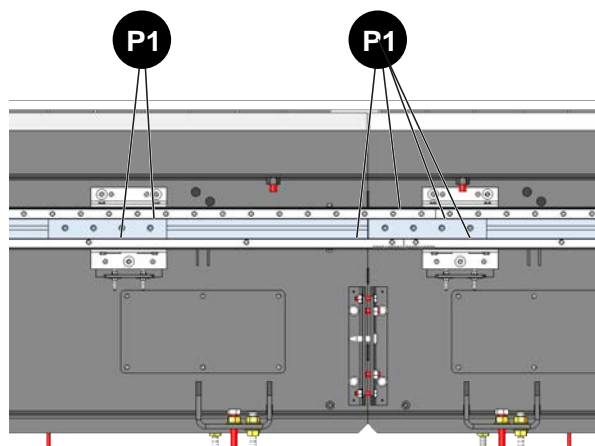


IMPORTANT: Do not move the guide rails and racks of the first part of the table.

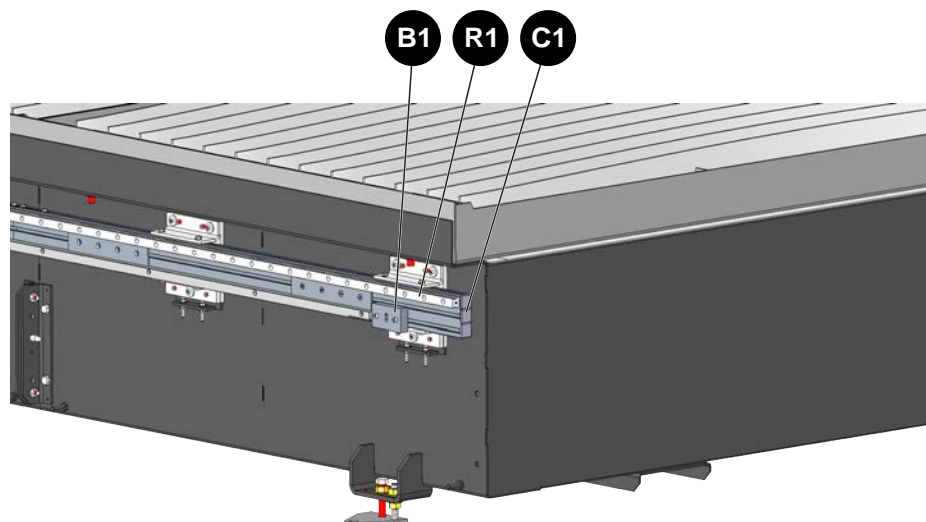
- Join the ends of the aluminium sections to each other with the joining irons **P1**, without locking them,



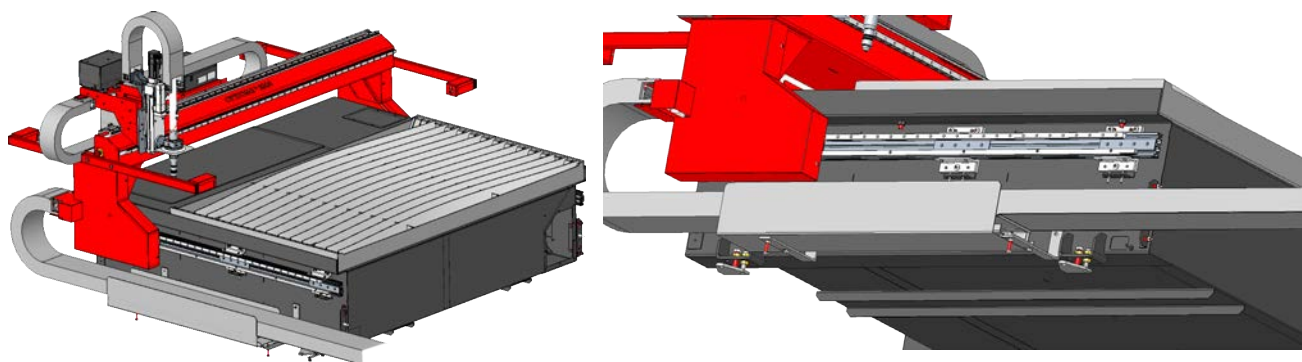
- Loosen the guide rails and racks and put them in contact **C1** with those of the first part,
- Lock them, making sure they are in close contact with the support irons that act as the positioning reference,
- Also lock the section joining irons,



- Fasten this part of the table to the floor and adjust it horizontally using the adjustment screws, by placing the level on the guiding rails,
- Proceed similarly with the third part of the table,
- Add the 180mm guide rail **R1** on each side and the mechanical stop **B1** to the left,
- Put the covers **C1** at the end of the aluminium sections,



- Fasten the chain duct in the two supports, taking support from the floor with the two outer screws.



5 - Connecting the energy supplies



Refer to the following:

- supplied electrical diagram,
- supplied feed diagram,
- supplied layout drawing,
- technical literature relating to the cutting process.

5.1 Connection to the mains



All the operations relating to the installation, such as those for assembly, putting into service and maintenance, are to be carried out by qualified personnel under the control of a responsible technician.

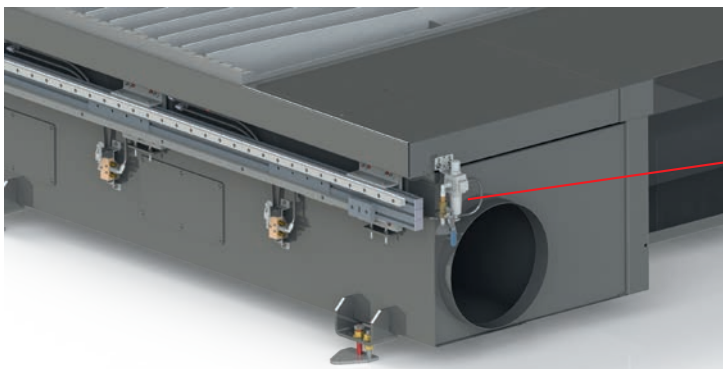


The **OPTITOME² HPCIII** must **NECESSARILY** be isolated from all utility supplies while it is being connected.
The disconnection and padlocking of all energy sources is **mandatory**.

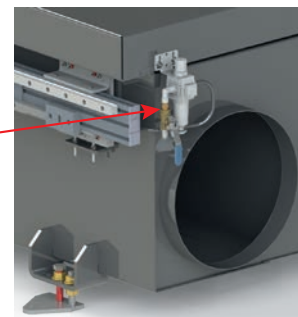
5.2 Connection to the pneumatic system



The compressed air must be dry, free from impurities or humidity.
For all other information, please contact the technical staff of **LINCOLN ELECTRC**.



6 bar - 5m³/h



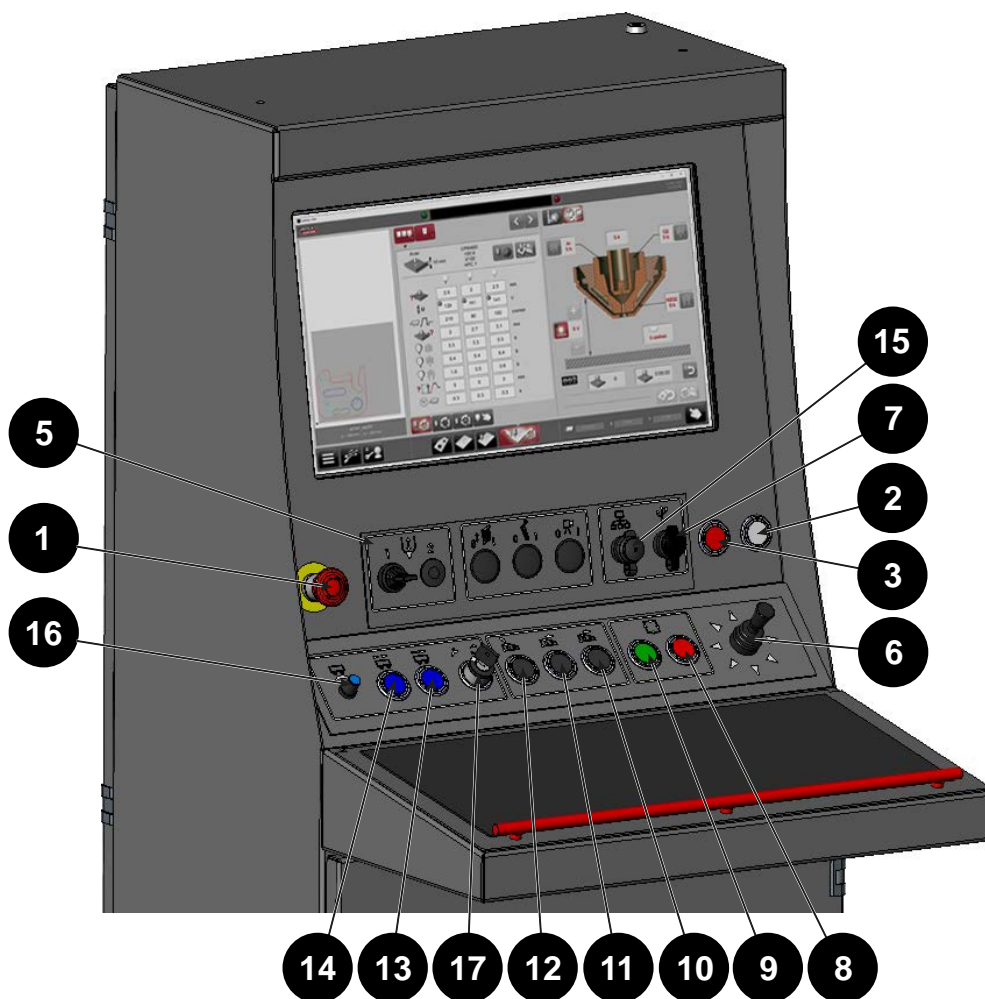
5.3 Gas connections



Refer to the following:

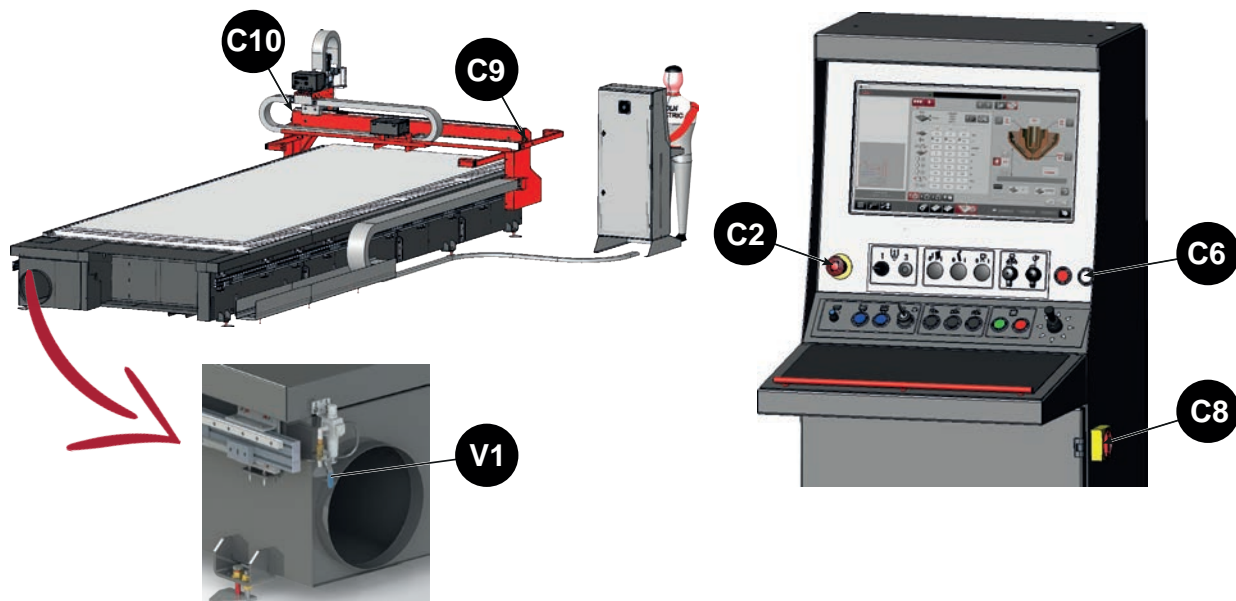
- technical literature relating to the cutting process.

1 - Description of controls



1	Emergency stop panic button
2	Power up button
3	Power down button
5	Plasma tool holder up/down button
6	Central locking eight-way joystick
7	USB connector
8	Cycle stop/Fault indicator button
9	Cycle start button
10	Forward button
11	Backward button
12	Return button
13	Hold jog button
14	High speed button
15	RJ45 connector
16	Speed adjustment button
17	Cycle/maintenance key button

2 - Starting up and shutting down



2.1 Starting up

- Open the compressed air valve **V1**.
- Power up the machine by setting the switch **C8** to I; the indicator **C6** will flash.
- Check that all the emergency stops **C2 - C9 - C10** are unlocked.

This machine operates with an **HPC DIGITAL PROCESS III HPI** CNC control with a touch screen.

When powered up, the **HPC DIGITAL PROCESS III HPI** CNC control is initialised. (approximately 1 min).

At the end of the initialisation process, the screen shows

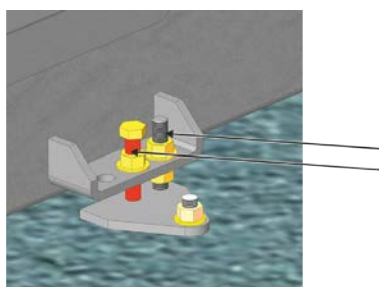


- Press the button **C6** to start up the machine. The button **C6** will stay on and steady.
- When it is put into service, the **HPC DIGITAL PROCESS III HPI** indicates any faults relating to the starting up of the plasma machine.

The machine is now ready to operate.



IMPORTANT: After switching on the power to the machine for the first time, check the whole machine with an optical level, setting the sight on the ends of the beam guide rail and moving the machine electrically; if necessary, readjust with the help of the adjustment screws and the fastening plates.



The **HPC DIGITAL PROCESS III** automatically manages cutting parameters depending on the equipment and the material to cut, associated with part programs..

The workpiece programs are taken from standard shapes or imported from a CAD system

The association of a part program and cutting parameters constitutes a job, which can be saved.

Each program and each job can be copied, edited or exported. There are several ways to cut a part:

- Select a job to make a part that has already been made
- Select a program, then the material and cutting performance
- Select a standard shape, enter its dimensions and then the material and cutting efficiency

(for a new part).

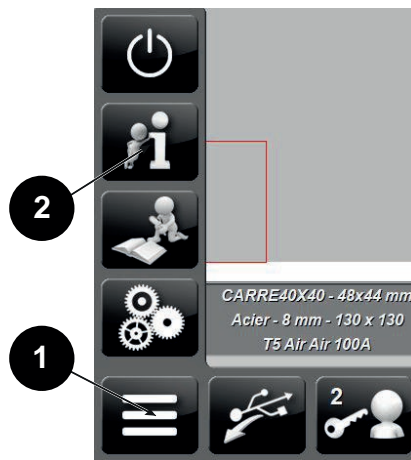


Refer to the following:

- technical literature of the **HPC DIGITAL PROCESS III**: 86954995

You can access document 86954995 of the **HPC DIGITAL PROCESS III** on the HMI (Human Machine Interface) of the machine.

The documentation is accessible on level 2 and level 1 depending on the settings.



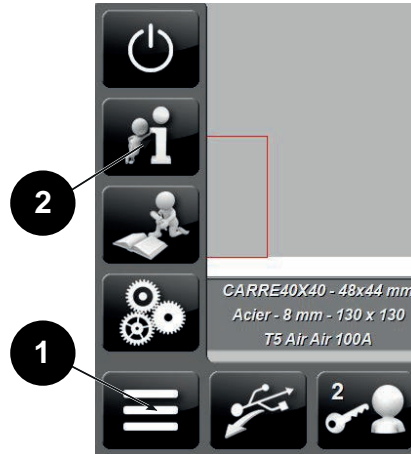
To access the documentation, press **button (1)**, then **button (2)**. Close the PDF file to go back to the HMI screen.

2.2 Shutting down



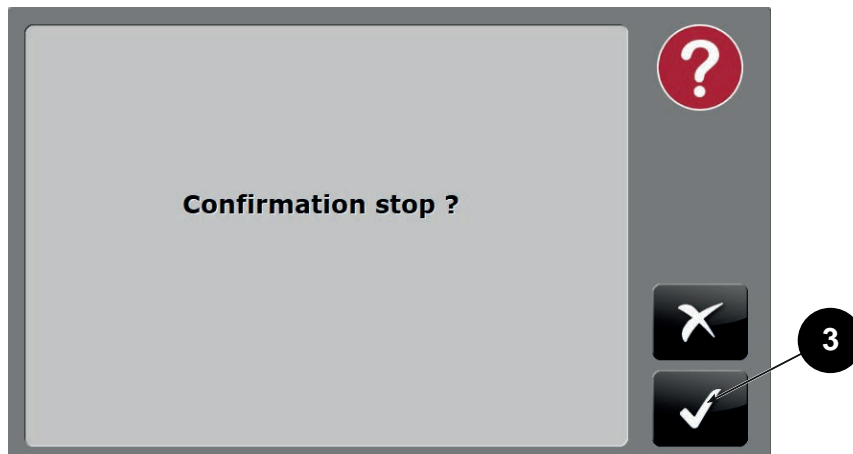
Before switching off the power supply to the machine it is absolutely necessary to stop the HPC DIGITAL PROCESS III.

First press the emergency stop.



- Press **button (1)** then **button (2)**.

The window below opens



- Press **button (3)** to confirm.
- Wait for the NC system to shut down (black screen).
- Power down the machine by setting the switch **C8** to **O**.
- Switch off all the energy supplies (electricity, air, gas etc.)

1 - Care

For a long and trouble-free life, the machine requires a minimum level of care and maintenance.

The frequency of such maintenance is indicated for production in one work shift per day. For higher production rates, increase the maintenance frequencies accordingly.

Your maintenance department could photocopy these pages to track maintenance frequencies and times and the operations completed (tick the appropriate box).



Please read the manual carefully before you start any servicing work. Maintenance operations may only be carried out by specialised and qualified individuals. Behaviour that does not comply with the safety instructions provided could lead to major hazards for personnel and damage to property and/or the surroundings.



Electricity technician:
Qualified operator with the ability to work in normal conditions on electrical parts for regulation, maintenance and repair.



Mechanical technician:
Specialised technician authorised to carry out complex and exceptional mechanical operations.



For operating instructions, adjustments, troubleshooting and spare parts, please refer to the special instructions for safe operating and maintenance.



CAUTION: All work at heights (maintenance, troubleshooting etc.) must be carried out with appropriate personnel lifting equipment.



- CAUTION:**
BEFORE ANY MAINTENANCE OPERATION, REMEMBER TO:
- Switch off and lock out the electricity supply.
 - Switch off, flush and lock out the gas and compressed air supplies.



CAUTION: All work at heights (maintenance, troubleshooting etc.) on the machine must be carried out with appropriate personnel lifting equipment.



IMPORTANT: "Do not remove the Nylstop nuts from the fastening screws of the guards: they keep them captive"



CAUTION: While handling sheets, take the necessary precautions to avoid impacts on the machine and the rolling tracks. Impacts on any of the elements can lead to squareness faults or the malfunctioning of the electrical shaft and therefore incorrect cutting of the workpieces.



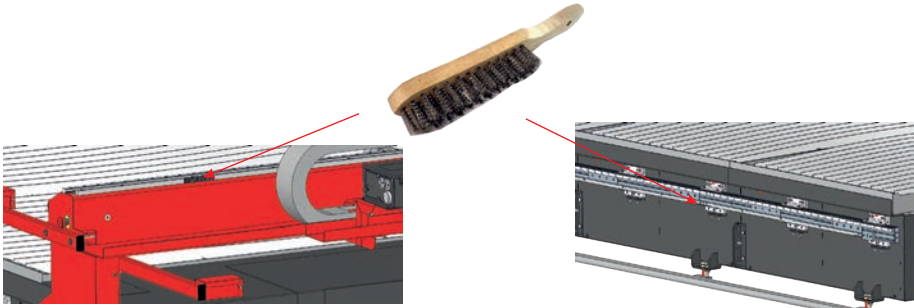
Before starting up the machine, make sure that the replaced parts are perfectly installed and that the tools used are removed from the machine. Make sure that each safety device is in good condition and legible.

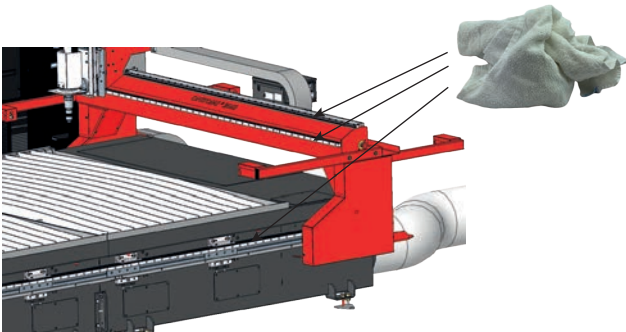
1.1 Maintenance schedule

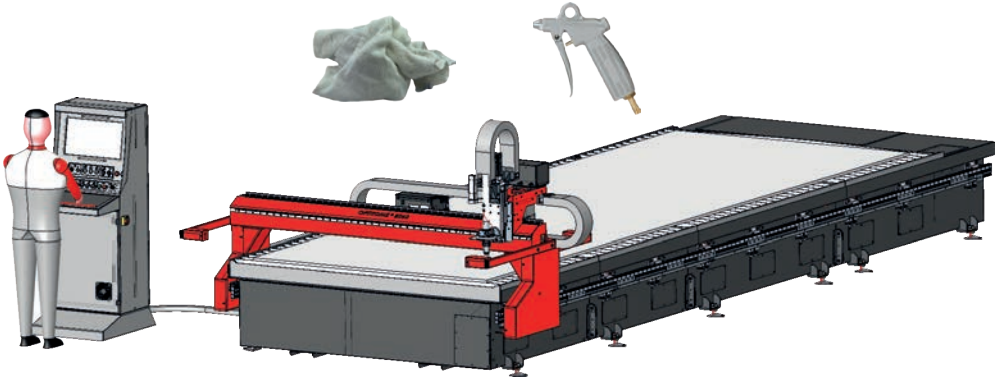


This schedule must **absolutely** be followed.
We recommend putting in place a traced system for tracking all your maintenance operations.

Sub-assembly	Component	Type of inspection	Action	Frequency			Step
				1 week	1 month	1 year	
Guiding	Rack		Cleaning	X			A
Guiding	Rail		Cleaning	X			B
OPTITOME² HPCIII			Cleaning	X			C
Control	HPC DIGITAL PROCESS III		Cleaning	X			D
Electrical	Bundle	Visual			X		E
Guiding	Rail	Lubrication	Lubrication		X		F
Table			Cleaning		X		G

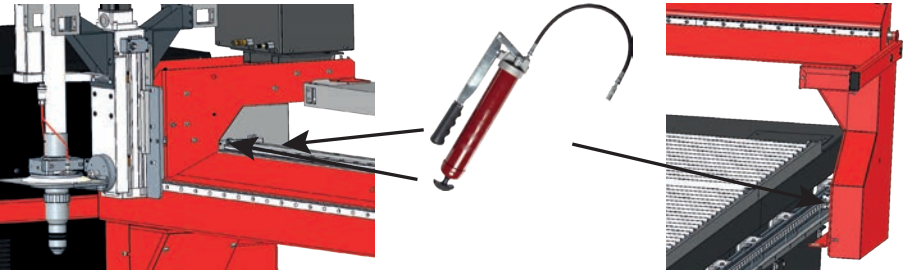
Step	Operation	OK	NOK
A	<p><i>Rack guidance</i></p> <ul style="list-style-type: none"> Brush the racks to remove any adhering material. (If needed, spray Molykote 3402 C coating (Dow Corning) on the sides of the racks.) 	✓	✗
			

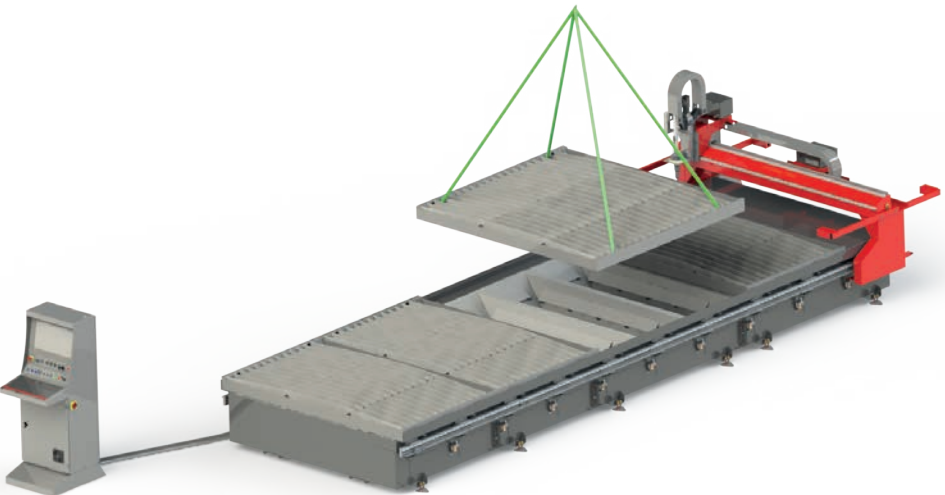
Step	Operation	OK	NOK
B	<p><i>Guide rail guidance</i></p> <ul style="list-style-type: none"> Regular cleaning of all the guide rails of the beam and the cutting table. Clean with a dry cloth or a cloth moistened with solvent, such as solvent naphtha or white spirit. 	✓	✗
			

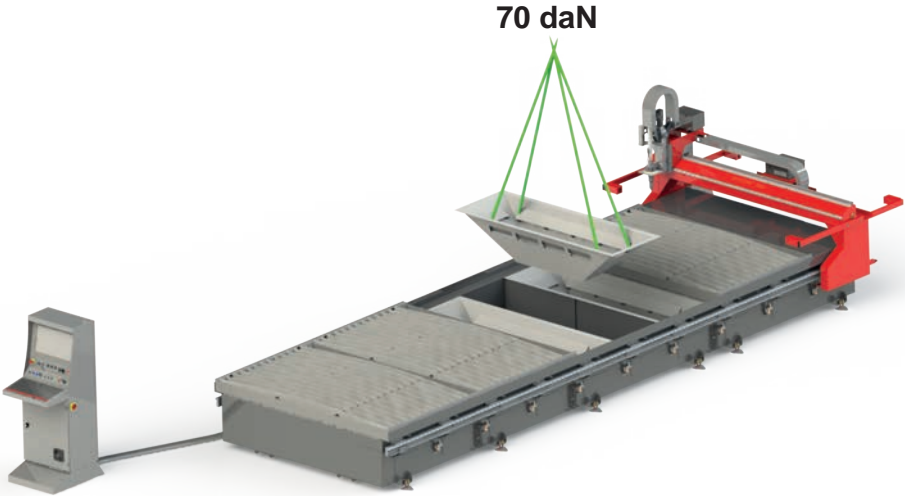
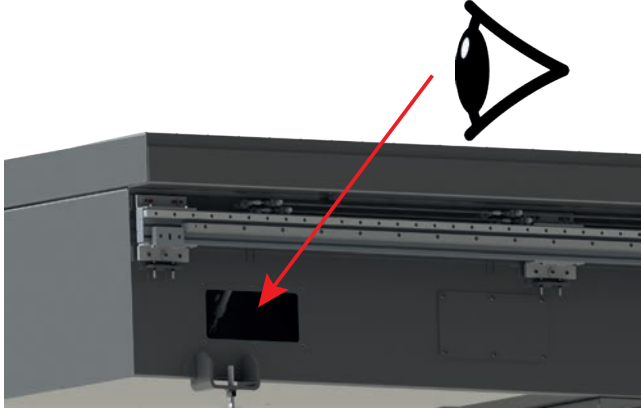

Step	Operation	OK	NOK
C	<u>OPTITOME² HPCIII</u>	✓	✗
	<ul style="list-style-type: none"> • Overall cleaning of the machine to eliminate cutting dust 		

Step	Operation	OK	NOK
D	HPC DIGITAL PROCESS III control	✓	✗
	<ul style="list-style-type: none"> • Cleaning the screen: <ul style="list-style-type: none"> * Switch off the power to the machine * Use window cleaner applied on a clean cloth or sponge. * Never apply cleaner directly on the touch screen. * Do not use alcohol (methyl, alcohol or isopropyl alcohol) or thinner, benzene or other strong solvent. * Do not clean the screen with a cloth or a sponge which may scratch the surface 		

Step	Operation	OK	NOK
E	Electrical bundle	✓	✗
	<ul style="list-style-type: none"> • Check the condition of all the electrical cables, particularly close to the cutting tools and in the cable drag chain (change them if required). 		

Step	Operation	OK	NOK
F	Rail guidance	✓	✗
	<ul style="list-style-type: none"> Lubricate the ball slides on each axis (4 on the transverse carriage and 4 on the machine X axis). We recommend the use of NLGI grade 2 lithium soap grease (e.g. Wynn's type HPG, Hafa type Mouwan Grease) Lubricate each ball slide at the operating temperature by moving it. It is better to lubricate several times with small quantities of lubricant. 		

Step	Operation	OK	NOK
G	Cutting table	✓	✗
	<ul style="list-style-type: none"> Cleaning the cutting table For these operations, the use of lifting chains with hooks with safety locks is strongly recommended. The frequency of these operations may vary depending on the use of the machine Empty the containers before they are too full. The dross must not obstruct extraction. * Move the machine to the rear position Take off the 4 M16 screws (24-mm spanner) holding the frame. Lift the frame with the expendable plates by fastening the 4-leg chain to the 4 lifting eyes (take off the expendable plates if necessary). <p style="text-align: center;">300 daN</p> 		

Step	Operation	OK	NOK
G	Cutting table	✓	✗
	<p data-bbox="304 185 1214 304">* Lift the containers (70 daN when empty) one after the other to empty them. Check the conditions of the extraction hatches. Check the closing and opening of these hatches by manually operating the pneumatic directional control valves.</p> <div data-bbox="300 331 1209 824">  </div> <p data-bbox="304 913 1198 976">* Take off the lateral inspection ports to check the condition of the cylinders and air pipes.</p> <div data-bbox="395 999 1038 1406">  </div> <div data-bbox="220 1458 1219 1574" style="border: 1px solid red; padding: 5px;">  <p data-bbox="368 1487 1203 1547">Mind the risk of catching while adjusting the table hatches. Readjusting the flow limiters could result in a sudden movement.</p> </div>		

2 - Change in consumables

- If the machine does not have single-beam cells:
 - ➔ Apply the machine emergency stop.
- If the machine has single-beam cells:
 - ➔ Go to the jog setting in the area where the consumable is changed or the process is set
 - ➔ Switch the key button **17** to the maintenance position. This mode immobilises the X and Y motors makes it possible to manually set the process (without stopping the process via the safety light curtains)
 - ➔ Once the operation is complete, switch to cutting position with the button **17**



3 - Troubleshooting

Refer to the following:

- Electrical diagram
- Instructions of **HPCIII DIGITAL PROCESS HPI** (8695 4995) or,
- Instructions of the different options.



Reminder: all work is to be carried out by approved and trained personnel.

4 - HMI alarm

List of most common alarms relating to the machine displayed on the HMI:

Fault	Probable causes	Possible remedies
29: An axis limit has been reached	A position in the program has overrun the software limits defined for the machine.	Modify the program or the part program zero point.
64: Lag error axis (X, Y or W). Lag exceeds the limit!	The axis position is different from its control in an excessively large value (due to an impact, for instance)	Set the gantry straight (power off) and set the zero point once again.
98: Risk of collision: negative radius or change in direction in block no. xx	Kerf compensation is greater than the radius of the part	Correct the program or the kerf compensation.
199: NC block incorrect. NC address error (X or Y) Only a reset is possible	A standard program has been started without defining its zero point.	Define the program zero point (see instructions 8695 4995)
207: Collision hazard, change in direction at block no.	Kerf compensation is greater than the space between cuts	Correct the program or the kerf compensation.
288: No tool has been selected	The program is a standard shape and requires tool selection by the HMI	Select the tool before starting the program
960: Axis (X or Y): Variable drive alert - Axis at positive limit!	The + electrical limit switch has been reached	Jog away the axis in the opposite direction, and clear the alarm.
961: Axis (X or Y): Variable drive alert - Axis at negative limit!	The - electrical limit switch has been reached	Jog away the axis in the opposite direction, and clear the alarm.
1001: The emergency stop is active!	An emergency stop has been engaged	Re-engage the emergency stop buttons and put back into service.
1003: The CNC has been stopped by an emergency stop	The numerical control has experienced a serious error during operation	Check for additional errors and put back into service
1004, 1005, 1006: The variable drive of axis xx is not ready "DRIVEON"	The power supply of the variable drive is missing EtherCAT problem	Check the fuse F2 and enabling of KM2 upon starting up. Check the condition of the LEDs on the variable drive. (on LM and T variable drive: 2 flashing green LEDs, on LE variable drive: 1 flashing green LED.)
1011: Cycle stop for head collision. Jog in limited speed	Torch impact (plasma) or probe impact (oxy cutting)	Jog away the tool, restart the program
1012: Please apply a machine emergency stop before exiting this application	The emergency stop must be enabled when the NC is switched off	Enable the emergency stop and switch off the machine
1014: Please apply a machine emergency stop	The emergency stop must be enabled when the machine setup is validated.	Apply the emergency stop before validating the setup, validate the setup and put the machine back into service
1015: Job change error	A job change error is requested while a program is active.	Reset the program before asking for a job change.
1022: Air supply fault	Air pressure low on the machine (not related to process gas).	Check that the disconnecting valve is open. Adjust the air pressure to the required pressure. Possibly adjust the air pressure switch.

1023: Door open fault alarm	Case of Alphasome: the door for accessing the process has been left open.	Close the door.
1040: Wait for the cycle start to set the zero point	The machine has a machine zero point setting, activated by a cycle start	Press the Cycle start button
1041: Zero point setting in progress	The zero point cycle is in progress.	Wait for the zero point cycle to be completed.
1042: Zero point completed	The machine zero point cycle is complete	Clear the warning
1053 to 1068: The selected tool does not exist	The part program is asking for a process not defined in the setup	Correct the part program (code S)
1069: Request for a undefined process	The part program is asking for an unknown process	Correct the part program (code S)
1071: No operating feedback from the filter	There is no operating feedback from the filter since more than 30 seconds, but a cut has been requested. Process stopped	Start up the extraction system and check if it is working correctly. Restart the program
01072: Standing by for extraction feedback	There is no operating feedback from the filter, but a cut has been requested. Program paused (if not started) or stopped at the next cut.	Start up the extraction system and check if it is working correctly.
01073: Key in process adjustment mode, movements forbidden	The process key is in adjustment mode.	Turn the key to cycle mode to allow movements.
01074: Safety light curtain crossed, movements forbidden	Something has cut one of the safety light curtains.	Check that there is no risk. Put the safety light curtains back in service (blue button on the console) to allow movements.
1151: Standing by for cycle start for new job	The job change request must be followed by a cycle start	Press the Cycle start button
1152: Standing by for cycle start for RUSH program	The RUSH request must be followed by a cycle start	Press the Cycle start button
1154: Standing by for cycle start for movement	The movement request (positioning laser, for example) must be followed by a cycle start	Press the Cycle start button

5 - Spare parts

Ordering procedure:

Almost all the parts of a machine or installation are referenced in the photographs and sketches.

The descriptive tables contain three types of item:

- items normally held in stock: ✓
- items not held in stock: ✗
- articles upon request: no reference

(For such parts, please complete the list of parts page and send us a copy. In the Order column, state the number of parts required and indicate the type and number of your equipment.)


For items referenced in the photographs or sketches but not included in the tables, please send us a copy of the relevant page and highlight the relevant reference.

Example:

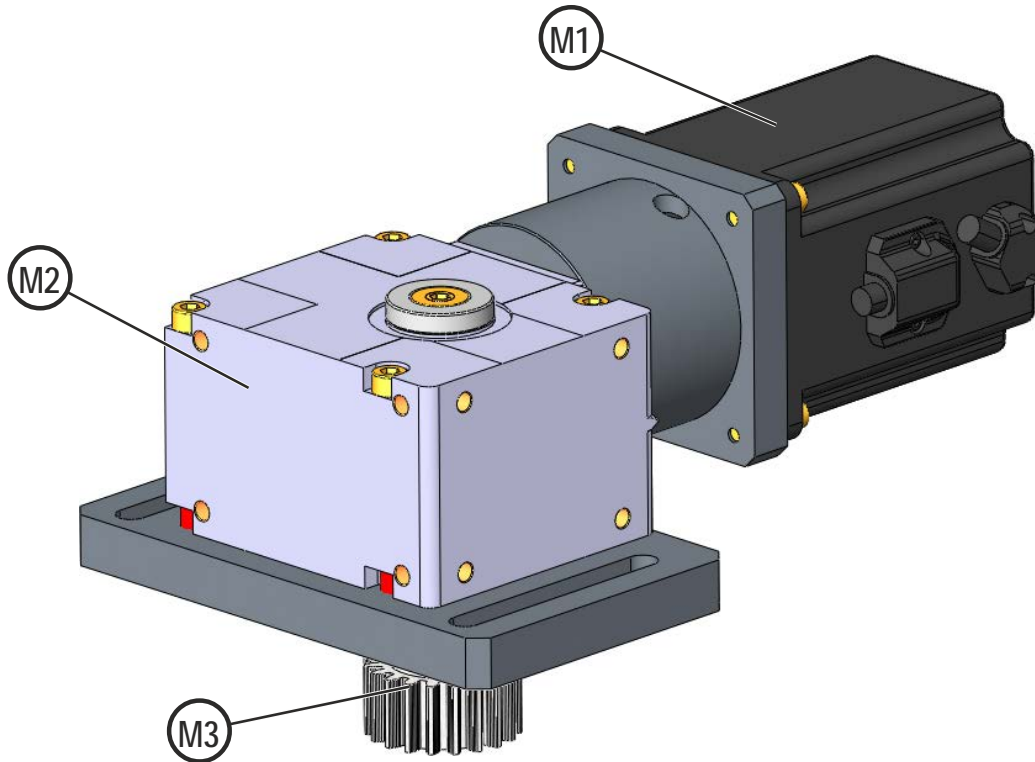
✓	normally held in stock.
✗	not in stock
	upon request.

Ref.	Part no	Stock	Order	Description
E1	W000XXXXXX	✓		Machine interface board
G2	W000XXXXXX	✗		Flow meter
A3	P9357XXXX			Printed front plates

- While ordering parts, please indicate the quantity and note the number of your machine in the box above.

 Type <input type="text"/> Matricule <input type="text"/>	→	TYPE:
	→	Number:

5.1 Longitudinal and transverse power systems



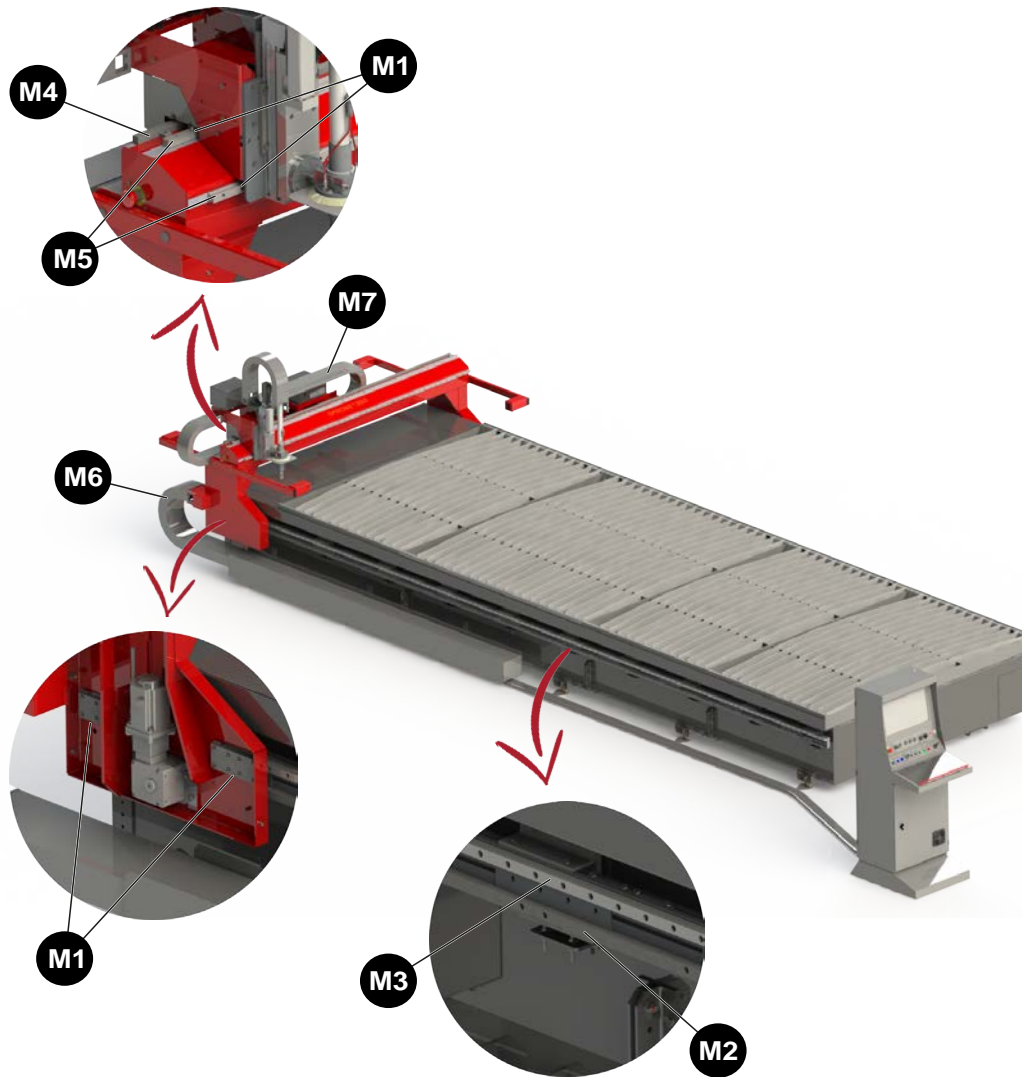
✓	normally held in stock.
✗	not in stock
	upon request.

Ref.	Part no	Stock	Order	Description
M1	W000402582	✓		SANYO R2AA 750W ABS motor <i>Sanyo Denki part no: R2AA08075FXR00M</i>
M2	AS-CS-07004221			Reduction gear I19.5 <i>Atlanta Neugart part no: E SERVO A32</i>
M3	P07004229			Z=20 - M2 shaft pinion

- While ordering parts, please indicate the quantity and note the number of your machine in the box above.

	TYPE:
	Number:


5.2 Rails and racks



✓	normally held in stock.
✗	not in stock upon request.

Ref.	Part no	Stock	Order	Description
M1	W000270653	✓		Ball slide, KWVE25 For OPTITOME² 1530 HPCIII
M2	W000366563	✗		Longitudinal rack (length: 2000 mm)
	P07004138			Longitudinal rack (length: 1432 mm)
M3	P07032207			Rail for longitudinal ball slide (length: 3940 mm)
M4	W000366563	✗		Transverse rack (length: 2000 mm)
M5	P07004118			Rail for transverse ball slide (length: 1380 mm)
	P07004123			Rail for transverse ball slide (length: 600 mm)


- While ordering parts, please indicate the quantity and note the number of your machine in the box above.

 Type <input type="text"/> Matricule <input type="text"/>	TYPE:
	Number:

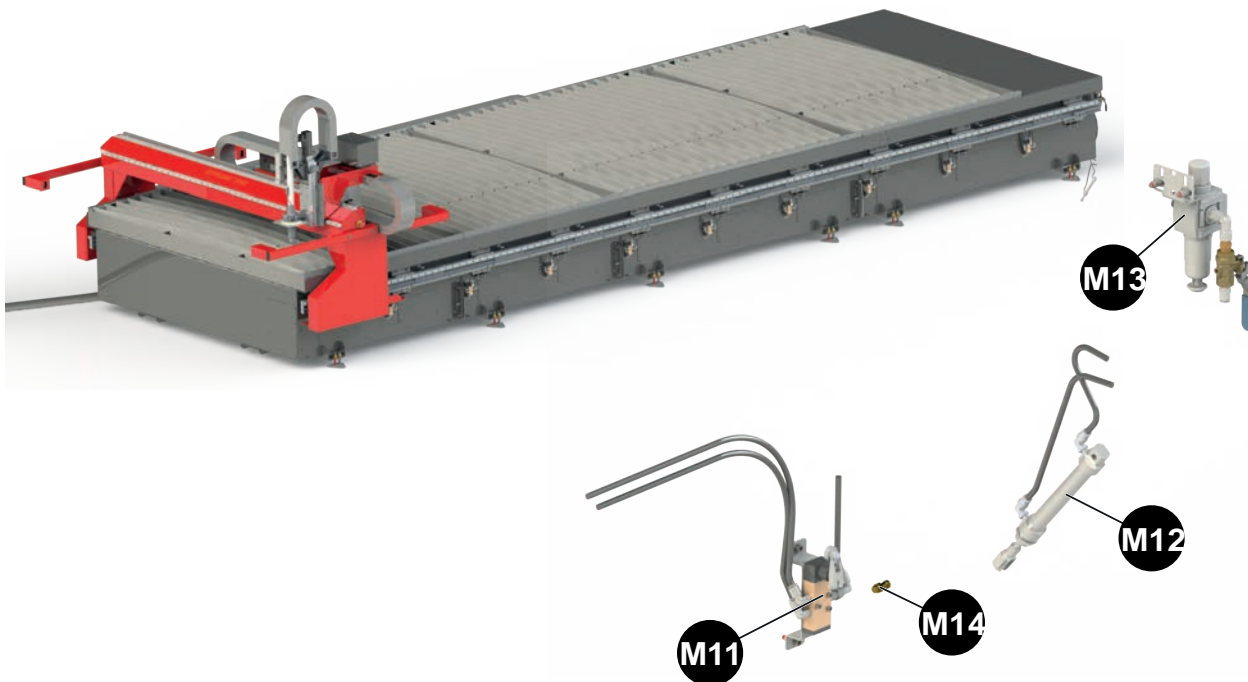
✓	normally held in stock.
✗	not in stock
	upon request.

Ref.	Part no	Stock	Order	Description
For OPTITOME² 2010 HPCIII				
M2	W000366557	✗		Longitudinal rack (length: 1780 mm)
M3	P07004122			Rail for longitudinal ball slide (length: 1920 mm)
	P07004144			Rail for longitudinal ball slide (length: 180 mm)
M4	W000366563	✗		Transverse rack (length: 2000 mm)
	P07004124			Transverse rack (length: 834 mm)
M5	P07004122			Rail for transverse ball slide (length: 1920 mm)
	P07004123			Rail for transverse ball slide (length: 600 mm)
For OPTITOME² 2040 HPCIII				
M2	P07004147			Longitudinal rack (length: 1690 mm)
	P07004146			Longitudinal rack (length: 1363 mm)
	P07004145			Longitudinal rack (length: 1344 mm)
M3	P07004122			Rail for longitudinal ball slide (length: 1920 mm)
	P07004118			Rail for longitudinal ball slide (length: 1380 mm)
	P07004144			Rail for longitudinal ball slide (length: 180 mm)
M4	W000366563	✗		Transverse rack (length: 2000 mm)
	P07004124			Transverse rack (length: 834 mm)
M5	P07004122			Rail for transverse ball slide (length: 1920 mm)
	P07004123			Rail for transverse ball slide (length: 600 mm)
For OPTITOME² 2060 HPCIII				
M2	P0700 4166			Longitudinal rack (length: 1357 mm)
	P0700 4167			Longitudinal rack (length: 1771 mm)
	W000366563	✗		Longitudinal rack (length: 2000 mm)
M3	P07004122			Rail for longitudinal ball slide (length: 1920 mm)
	P07004118			Rail for longitudinal ball slide (length: 1380 mm)
	P07004144			Rail for longitudinal ball slide (length: 180 mm)
	P07004163			Rail for longitudinal ball slide (length: 2100 mm)
M4	W000366563	✗		Transverse rack (length: 2000 mm)
	P07004124			Transverse rack (length: 834 mm)
M5	P07004122			Rail for transverse ball slide (length: 1920 mm)
	P07004123			Rail for transverse ball slide (length: 600 mm)
M6	P07050650			1 metre of longitudinal chain with divider
	P07050654			Chain attachment assembly
M7	PC6203522			1 metre of transverse chain
	PC6203515			Vertical divider
	PC6203520			Horizontal divider
	PC6203518			Chain attachment assembly

- While ordering parts, please indicate the quantity and note the number of your machine in the box above.

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5.3 Cutting table



✓	normally held in stock.
✗	not in stock
	upon request.

Ref.	Part no	Stock	Order	Description
M11	PC5900197			5/2 two-way roller lever valves <i>Pneumax part no: 228.52.4.1</i>
M12	AS-CS-C5904157	✗		1 equipped cylinder - Ø20 - Course:100 <i>ASCO JOUCOMATIC, part no: R480323147</i>
M13	AS-CS-C5902425	✓		1 regulator filter with pressure gauge - Ø8 - 10000 nl/min <i>ASCO JOUCOMATIC, part no: R480323147</i>
M14	PC5902105			1 flow limiter, G1/8 <i>Pneumax part no: 06/03/18</i>
	AS-CS-C6101168	✗		Anti-spark tubing Ø6x8 black - 15 metres <i>PARKER part no: 1025P08V01</i>

• While ordering parts, please indicate the quantity and note the number of your machine in the box above.

	TYPE:
	Number:


5.4 Electrical components



✓	normally held in stock.
✗	not in stock
	upon request.

Ref.	Part no	Stock	Order	Description
E1	W000140748	✓		Sectioning switch, 3P 25A <i>Rexel part no: LEG022102</i>
E2	PC5701726			Relay, 24VAC/DC - 1RT - 6A <i>Weidmüller part no: 1122890000</i>
E4	P07083295			Equipped front encoder
E5	PC5608042			1A electrical filter <i>Direct SA part no: FN2020106</i>
E6	PC5608039			15A electrical filter <i>Elec System part no: RF1015DLC</i>
E7	W000383980	✓		30A brushless variable drive
E8	PC5706056			Transformer, 230V-400V / 220V+24V - 1650VA
E20	PC5702581			Safety module - FLEXI SOFT controller <i>Sick part no: 1043783</i>
	PC5702582			Safety module - FLEXI SOFT power supply + memory <i>Sick part no: 1043700</i>
	PC5702583			Safety module - FLEXI SOFT, 8 inputs 4 outputs <i>Sick part no: 1044125</i>
	PC5702584			Safety module - 6 inputs 6 outputs <i>Sick part no: 1061778</i>
E21	W000365963			Relay, 24VAC/DC - 6A - 1RT
E22	W000383699	✗		Contacteur, LC1D12BD <i>Schneider Electric part no: LC1D12BD</i>
E23	W000385169	✓		Power supply, 230V/24VDC/10A <i>Weidmüller part no: 1469490000</i>
E24	W000400307	✗		Emitting photocell Receiving photocell
	W000400640	✗		Cell alignment laser
E25	AS-CS-C5703329	✗		GL10 power supply module <i>Inovance Technology part no: 01440196</i>
E26	AS-CS-C5703330	✗		GL10 EtherCAT module <i>Inovance Technology part no: 01440194</i>
E27	AS-CS-C5703324	✗		GL10 16 digital inputs module <i>Inovance Technology part no: 01440198</i>
E28	AS-CS-C5703325	✗		GL10 16 digital outputs module <i>Inovance Technology part no: 01440199</i>
E29	AS-CS-07087071	✗		PA9000 CNC CPU + standard dongle
E30	AS-CS-C5703732	✗		16/9 touch screen + power supply <i>Eurocomposant part no: E327914</i>

- While ordering parts, please indicate the quantity and note the number of your machine in the box above.

 Type <input type="text"/> Matricule <input type="text"/>	TYPE:
	Number:

