

CONTROL UNIT

# MASTER BOX ESSENTIAL

SAFETY INSTRUCTIONS FOR OPERATING AND MAINTENANCE

No W000376084



ISSUE : EN  
REVISION : D  
DATE : 09 - 2024

Instructions

REF: 8695 8001

Original instructions

**LINCOLN**<sup>®</sup>  
**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.**

# Table of contents

<b>A - GENERAL SAFETY INSTRUCTIONS .....</b>	<b>1</b>
1 - Electrical safety-----	1
2 - Personal protection -----	1
3 - Filtration of fumes and dust-----	2
<b>C - DESCRIPTION .....</b>	<b>3</b>
1 - Description of the equipment-----	3
2 - Technical data-----	4
<b>D - INSTALLATION .....</b>	<b>5</b>
1 - Transformer connection -----	5
2 - Thermal magnetic protection wiring-----	6
2.1 Motor protection selection table -----	6
3 - Wiring the motor -----	6
4 - Operating principle-----	7
5 - Example of system automation -----	8
6 - Automation with current sensor RI -----	9
7 - Automation with external contact -----	10
8 - Optional LED lighting and automatic starting - LTA and LFA arms -----	11
9 - Optional LED lighting and manual starting - Polyarticulated 160 & Ecoflex arms---	12
10 - Optional light sensor - Polyarticulated 160 and Ecoflex arms -----	13
<b>E - MAINTENANCE.....</b>	<b>14</b>
1 - Electrical diagram-----	14
2 - Spare parts-----	20
<b>PERSONAL NOTES .....</b>	<b>22</b>

# REVISIONS

REVISION : B DATE : 10/20

DESCRIPTION	PAGE
Created in English	

REVISION : C DATE : 05/21

DESCRIPTION	PAGE
Update	9 - 12 - 16

REVISION : D DATE : 09/24

DESCRIPTION	PAGE
Update	

# INFORMATION

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

- **MASTER BOX ESSENTIAL** → W000376084



### **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 filter. It cannot in any event replace the experience of the user for operations of varying difficulty.

Before the filter 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 departments of **Lincoln Electric**.



### **Machine guarantee:**

This machine is guaranteed for 12 months from the date of purchase.

During the first 12 months of use, defective parts shall be replaced free of charge providing the damage is not the result of improper use of the machine.

The machine guarantee shall cease automatically when the machine is no longer the property of the original buyer.

The terms of validity of the guarantee shall be subject to verification and acceptance by our sales department.

Any nonconforming use that could damage the machine shall not be covered by the guarantee. For the guarantee to operate, the equipment must be inspected by our technical department.



### **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**



### **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.



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.




























This manual and the product with which it is associated refer to the applicable standards in force.



Please read this document carefully before you install, use or maintain the machine. Keep this document in a safe place for future reference. This document must follow the machine described if there is a change in ownership of the machine and accompany it up to demolition.

# MEANING OF SYMBOLS

To make this document easier to understand, it contains pictograms with the meanings given below:

	Reading the manual/instructions 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.		Wearers of pacemakers may not be admitted in the designated area.
	Requires maintenance action.		

# DECLARATION OF CONFORMITY



LINCOLN ELECTRIC FRANCE SAS  
Avenue Franklin Roosevelt  
76120 – LE GRAND QUEVILLY

## MASTER BOX ESSENTIAL

### CE DECLARATION OF CONFORMITY

#### 1) CE/EU DECLARATION OF CONFORMITY

Dear customer,

This CE/EU declaration of conformity certifies that the supplied equipment complies with applicable laws and regulations when used in accordance with the enclosed instructions. Any other assembly or modification would void our certification. That is why you are asked to call in the manufacturer for any modifications you wish to make. Failing that, the company responsible for the modification must repeat the certification process. In that case, we would not be liable for the new certificate in any way. Please hand this document over to your technical department or purchasing department for filing.

**DESCRIPTION:** MASTER BOX ESSENTIAL

**TYPE:** W000376084

**NUMBER:** See name plate

2) This equipment complies with European directives.

**2006/42/EC**

**2011/65/EU**

**2014/30/EU**

3) Based on the following harmonised standards:

- EN ISO 12100: 2010
- EN ISO 12100-2:2008
- EN ISO 60204-1:2008
- EN 60204-1/2006/AC:2010

4) Air Treatment Products Manager, authorised to compile the technical manufacturing document.

Mr Patrick DEGROOTE  
LINCOLN ELECTRIC FRANCE SAS  
Avenue Franklin Roosevelt  
76120 – LE GRAND QUEVILLY

5) The Manufacturer.

LINCOLN ELECTRIC FRANCE SAS  
Avenue Franklin Roosevelt  
76120 – LE GRAND QUEVILLY

CERGY, 01/06/2017





### 1 - Electrical safety

---

#### Connection to the mains:

Before you connect your machine, please make sure that.

- The meter, the overintensity protection system and the electrical installation are compatible with its maximum power rating and its supply voltage.
- It can be connected, in a single-phase or three-phase with earth system, to a socket compatible with the plug on its power cord (mobile equipment).
- If the cable is connected to a fixed point, the earth connection, if there is one, may never be cut off by the system offering protection from electric shocks.
- The switch, if there is one, is set to OFF.

#### Operating position:

Arc welding and cutting requires strict compliance with safety requirements in respect of electrical currents.

#### Working on the machine:

Before any internal inspection or repairs, make sure that the machine has been disconnected from the electrical system by locking it out:

- Accidental connection of the cable of a fixed system has been made impossible,
- Switching off by means of a fixed connection device relates to all poles (phase and neutral. It must be in the Off position, with no possibility of being put into service by mistake.

Some machines have an HV/HF arc ignition circuit (indicated by a plate). Never work inside such a box. Any work on electrical installations must be carried out by individuals qualified for that purpose.

#### Maintenance:

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.

Any fans placed in a circuit in which the air is laden with dust must be cleaned from time to time. That is because the turbine may be fouled and become unbalanced, leading to increased noise and premature wear and tear of bearings. Maintenance is required at least after every six months, depending on the type of dust treated.

The fan is an essential element of your extraction system.

Incorrect operating or inadequate maintenance could make the operator less safe. That is why the fan must be maintained in perfect condition.

Your installation has been selected for a specific application. The turbine is characterised by an operating point based on extraction speed (speed of air in the piping) and head loss.

In accordance with the regulations of CARSAT and INRS, the system must be inspected from time to time to make sure that it continues to comply with its reference values.

### 2 - Personal protection

---

#### **Risks of external injury relating to welding operations**

##### Whole body:

- The operator must be clothed and protected to suit the requirements of the job.
- Make sure that no part of the bodies of operators and helpers can come in contact with metal pieces or parts that are live or are liable to become live accidentally.
- Do not wind electricity cables around the body.
- Keep safety guards and panels in place
- The operator must always wear insulating personal protective equipment.
- The protection must be kept dry to prevent electric shocks if it is wet, or ignition in the presence of oil.

Personal protective equipment worn by operators and their helpers - gloves, aprons, safety shoes - offer the added benefit of protecting them from burns due to hot parts, splatter and slag.

Make sure the PPE is in good condition and replace it before it ceases to offer protection.

### **Face and eyes:**

It is indispensable to protect the following:

- Eyes, from arc flash injury (dazzling due to visible light from the arc, and infrared and ultraviolet radiation).
- Hair, face and eyes from welding splatter and projection of slag during weld cooling.

The welding mask, when used under or without a helmet, must always be equipped with a protective filter, the shade of which depends on the intensity of the welding arc current.

The coloured filter may be protected from impacts and splatter by a transparent glass located on the front of the mask.

If the filter is replaced, use another one with the same part number (shade number).

Individuals in the vicinity of the operator, especially any helpers, must be protected by means of suitable screens, anti-UV goggles or, if needed, masks with suitable protective filters.

### **Specific case of chlorine solvents in welding:** (used for cleaning or degreasing)

- The fumes from these solvents can be changed into toxic gases when subjected to arc radiation, including from a distance.
- Such solvents may therefore not be used in locations where electric arcs occur, if the solvents are not in a sealed enclosure.

### **Work in confined spaces**

#### **Examples:**

- Mine roads
- Piping and pipelines
- Ship docks, pits, manholes, cellars
- Tanks
- Ballast tanks
- Silos
- Reactors

Special precautions must be taken before undertaking welding operations in such enclosures, where suffocating and poisoning and fire and explosion risks are very great.

A work permit procedure setting out all the safety measures must systematically be set up.

Make sure that ventilation is appropriate, paying special attention to:

- under-oxygenation
- over-oxygenation
- excess fuel gas

## **3 - Filtration of fumes and dust**

---

### **Important:**

Mechanical or electrostatic filtration systems are effective for the filtration of solid but not gaseous particles (outdoor discharge).

If recycling is effective (not recommended), make sure the workplace where the machine or machines are placed is properly ventilated, so as to not reach the OELV (occupational exposure limit values) for the specific gaseous pollutants generated by the process (welding, cutting).

### **Field of use**

#### **Filtration of solid particles and dry dust, non-flammable gas, with no risk of explosion.**

- Zinc, paper, flour, plant leaves, graphite, aluminium and other such dust is to be excluded, because electrostatic discharge or welding splatter would present a risk for those using the filter.
- The air flow through the filter medium must not be at a temperature above 80 °C.
- This machine is not designed for extracting chemicals.
- The choice of equipment is made to suit the pollutants to treat. Extraction at source of the pollutant is only effective if the machine is operating at its nominal power (air flow at the nozzle).

#### **Take particular care to:**

- Not obstruct the air outlet of the machine.
- Not introduce external elements into the filter (paper, cloths, cigarette butts etc.)
- Replace the filter medium with new original **Lincoln Electric** medium, which alone can guarantee the filtration characteristics.
- Replace the hoses if they are pierced.
- Regularly clean the metal pre-filter on those machines that have one.

### 1 - Description of the equipment



For your safety and optimum performance, please read this manual carefully before using the filter.



The **Master Box Essential** controls a fan manually or automatically. It helps reduce the power consumption, noise and volume of air extracted while working, thus reducing heating costs.

- The **Master Box Essential** is an automated control unit for a fan with a maximum power rating of 5.5 kW.
- The **Master Box Essential** is CE compliant and has a padlockable disconnecter.
- This **Master Box Essential** manually or automatically controls a fan to which it is connected; when there is a mechanical filter or a down-draft table, it can manage an alarm that reports saturation of the filter element.
- The **Master Box Essential** must be supplemented with thermal magnetic protection (sold separately) to keep the motor and the equipment with which it is used safe.



That is why it is indispensable to select the thermal magnetic protection based on the electrical specifications of the motor with which it will be used.

#### **Benefits:**

- The **Master Box Essential** is suitable for automating all arm models, **AZUR** or **LFA**, and all the arms in the 160mm and 200mm range.
- Manual/automatic mode selection switch
- Automatic starting via a current or light sensor, or an external normally open contact.
- In automatic mode, fan stopping is delayed in relation to the stop control (delay adjustable from 2s to 9min).
- Fan operation indicator light.
- Integrated 24VAC power supply for LED lighting of arms or other accessories.
- Possibility to put two sensors in parallel if used with two arms and only one fan.

## 2 - Technical data

---

Description	Specifications
Power supply	230V - Single phase
	230V/400V - Three phase
Fan power	0.37 KW to 5.5 KW
Auxiliary power supply,	24VAC for accessories
Dimensions (H x L x D)	340 x 230 x 180 mm

## D - INSTALLATION



Please refer to electrical diagram 95570500



Any work on the box may only be carried out by approved personnel, after the power to the box has been switched off.



The **Master Box Essential** is delivered without a thermal magnetic circuit breaker. You must buy the motor circuit breaker that is suitable for the power rating of your motor as a supplement.



Before you connect the **Master Box Essential** to the mains, you must first **IMPERATIVELY** wire the thermal magnetic circuit breaker **Q2** according to the supplied electrical diagram.

### 1 - Transformer connection



Depending on the supply voltage, the transformer primary must be connected correctly.

400 V power supply



230 V power supply



## 2 - Thermal magnetic protection wiring



Please refer to the corresponding electrical diagram.



The thermal magnetic protection **must NECESSARILY be isolated from all utility supplies** while it is being wired.  
The disconnection and padlocking of all energy sources is **mandatory**.

### 2.1 Motor protection selection table

Power Motor	230V Single phase	230V Three phase	400V Three phase
0.37 kW	C4/32T-4	C4/32T-2.5	C4/32T-1.6
0.55 kW	C4/32T-6	C4/32T-2.5	C4/32T-1.6
0.75 kW	C4/32T-6	C4/32T-4	C4/32T-2.5
1.1 kW	C4/32T-10	C4/32T-4	C4/32T-4
2.2 kW		C4/32T-10	C4/32T-6
3 kW		C4/32T-10	C4/32T-10
4 kW		C4/32T-17	C4/32T-10
5.5 kW		C4/32T-22	C4/32T-13

## 3 - Wiring the motor



Please refer to the corresponding electrical diagram.



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

The three phases of the motor must be wired to the motor switch **KM1**



**NB: If the motor does not turn in the right direction, reverse the two phases at the motor switch.**

## 4 - Operating principle

The unit is powered up using the disconnecting switch (1) located on the front.

The front control panel has two luminous indicators:

- A white indicator (2) showing the network connection of the unit.
- A green indicator (3) showing that the fan is operating.

The manual or automatic mode is selected with the help of the **Auto/Manual** switch (4).



### **MANUAL:**

The fan operates continuously.



### **AUTOMATIC:**

As soon as the arc is struck, the extraction system starts up; after the arc stops, the fan stops (stopping timer settable from 2 sec to 9 min; factory setting 45 sec).

Automatic starting up uses a current sensor placed on the welding cable, light detection or a normally-open external contact.

Further, an in-service signal (normally-open make dry contact output) is also available.

That information, which is an image of the operating of the extraction unit, can be used for automating the extraction system

The fan is stopped by bringing the selection switch (4) to the "Stop" position and then switching the main switch (1) to "0"



**NB: In automatic mode, selecting the "Stop" position does not stop the fan immediately, but sets off a stopping timer that can be set (factory setting 45 sec)**



1	Padlockable disconnecting switch
2	White power on indicator
3	Green fan operating indicator
4	Manual/Stop/Auto switch



## 5 - Example of system automation

### Simple system with fan

One arm with fan



Table with its fan

IR sensor



Master Box Essential



Thermal magnetic circuit breaker adapted to the fan

### Extraction system with several arms

X arm with 1 fan in network



X IR sensor



Master Box Essential



Thermal magnetic circuit breaker adapted to the fan



## 6 - Automation with current sensor RI

Automatic starting up is achieved by the current sensor that is first fixed to the earth cable of the welding or cutting machine.

In automatic mode, the stopping of the fan is delayed in relation to the disappearance of the command signal, thus avoiding excessively frequent starting and stopping, for instance during tack welding.

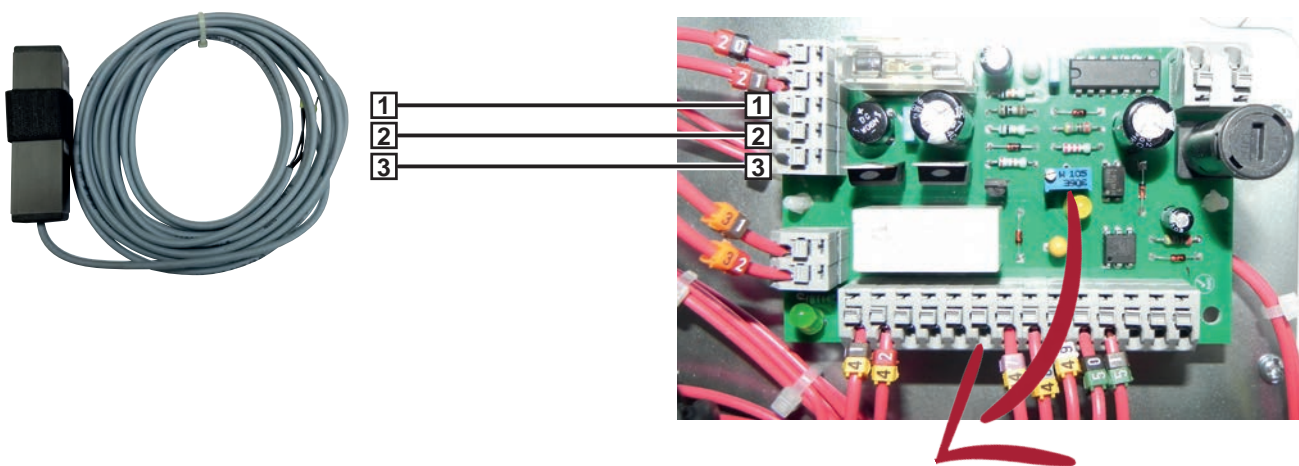
The delay is factory set to 45 seconds and is adjustable from 2 seconds to 9 minutes.



**Current sensor (W000379696)**

It detects the starting up and stopping of the welding current, alternating and direct (AC-DC).

The current sensor at 1/2/3 must be wired to the printed circuit board at 1/2/3.



In automatic mode, the **Master Box Essential** is supplied with a stopping time that is deferred to 45 seconds after the stopping of the electric arc.

That time can be increased (anticlockwise) or decreased (clockwise) from 2 seconds to 9 minutes.



## 7 - Automation with external contact

---

Automatic starting up is by an external normally open contact.

- dry contact sensor
- contact type torch rest
- IR return from the welding or cutting power source
- PLC/robot output...

In automatic mode, the stopping of the fan is delayed in relation to the disappearance of the command signal, thus avoiding excessively frequent starting and stopping, for instance during tack welding



### Gas saver sensor (W000380549) - Limit switch (W000380551)

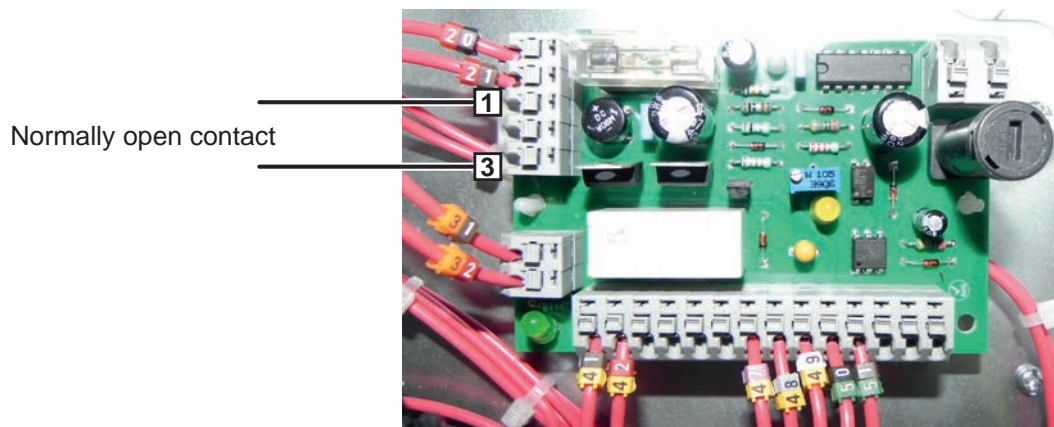
It detects the presence of the torch on the support  
Starts the fan or the associated power-operated shutter.



### Contact type torch rest (W000279767)

It senses the presence of a torch on the support.  
Starts the fan or the associated power-operated shutter.

The external contact must be wired to the printed circuit board at 1 and 3.



## 8 - Optional LED lighting and automatic starting - LTA and LFA arms

The **LTA** and **LFA** arms may optionally be fitted with LED lighting and an automatic extraction on-off control.

That option is made up of:

- a working LED lamp and a light-sensitive cell mounted in the arm hood,
- an 11-metre cable fixed inside the arm.

Automatic starting up is by the light-sensitive cell which is mounted directly in the nozzle of the arm or by the forced operating switch.

In automatic mode, the stopping of the fan is delayed in relation to the disappearance of the command signal, thus avoiding excessively frequent starting and stopping, for instance during tack welding.

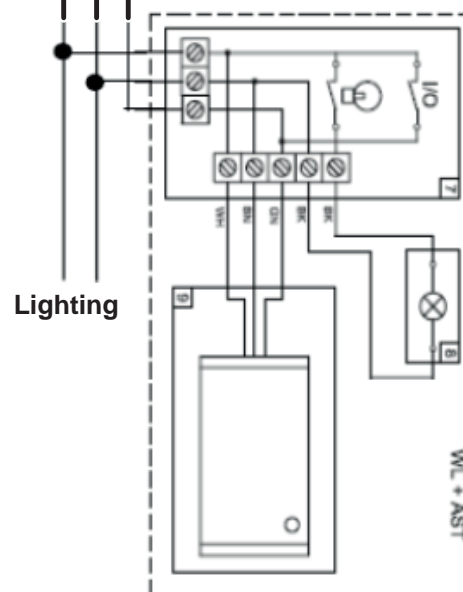
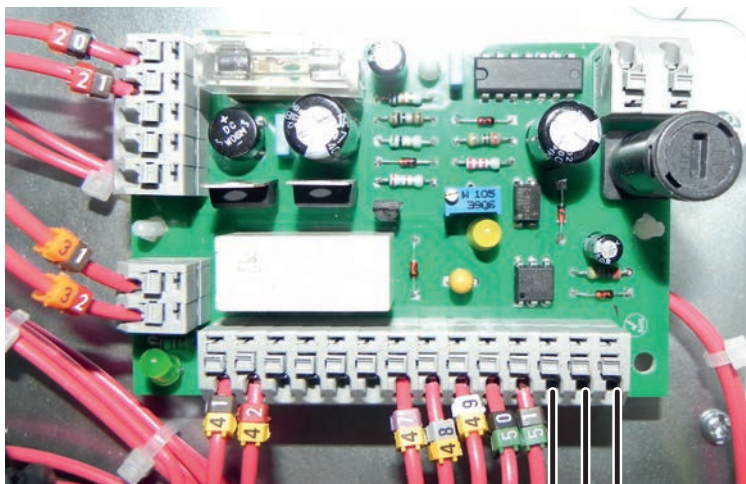


### LED lighting and automatic starting/stopping (EM7900010190) NCW-11 connecting cable (EM9850031050)

It lights the working area and makes the fan start under the control of the welding current.

The control switch is supplied as standard and is fixed to the nozzle of the arm:

- Used for controlling the lamp,
- Used for manual or automatic fan control by photoelectric sensing.
- Not suitable for TIG welding.



## 9 - Optional LED lighting and manual starting - Polyarticulated 160 & Ecoflex arms

**Polyarticulated 160** and **Ecoflex 160** arms may optionally be fitted with LED lighting and an automatic extraction on-off control.

That option is made up of:

- a working LED lamp and a manual control unit,
- a cable fixed outside the arm.

### **NB:**

The arm lighting is functional in manual or automatic position.

The starting of the fan from the arm is only functional in automatic mode.



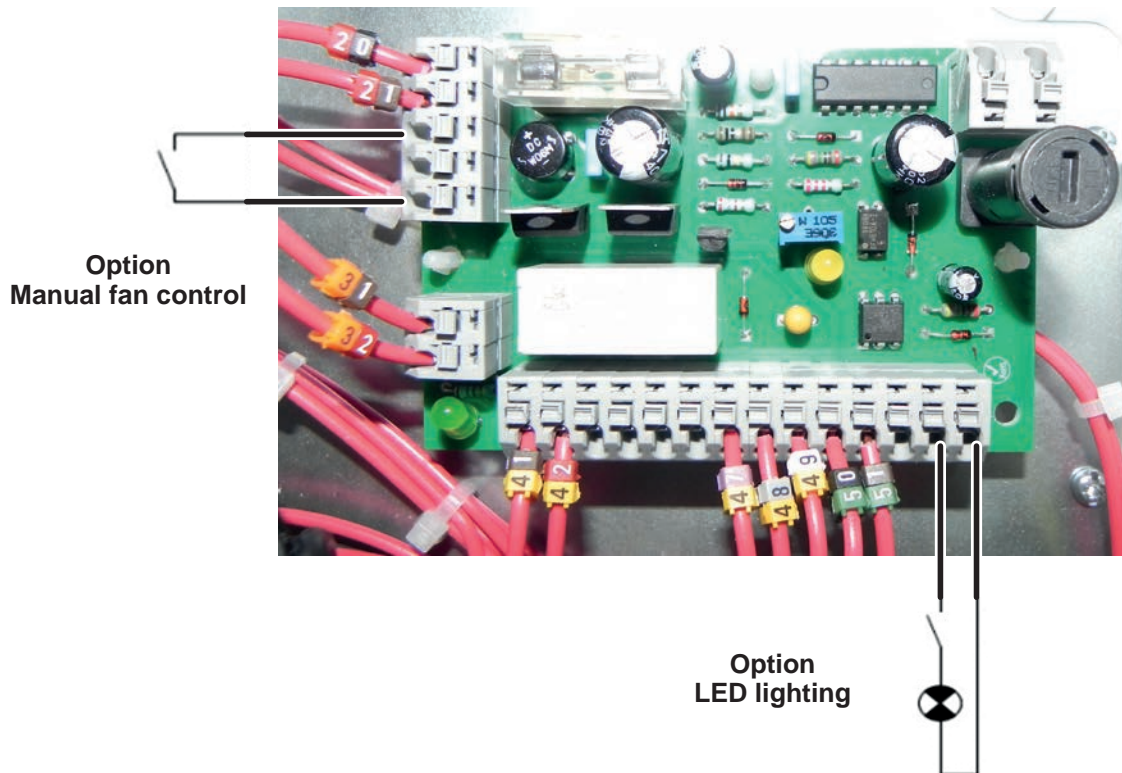
**24-volt LED lighting (W000342209)**

**Spiral cord for telescopic arm (W000272054)**

It lights the working area.

The double switch is supplied as standard and is fixed to the nozzle of the arm.

- Controls the LED lamp,
- Controls the fan manually if used along with a **Master Box Essential**.



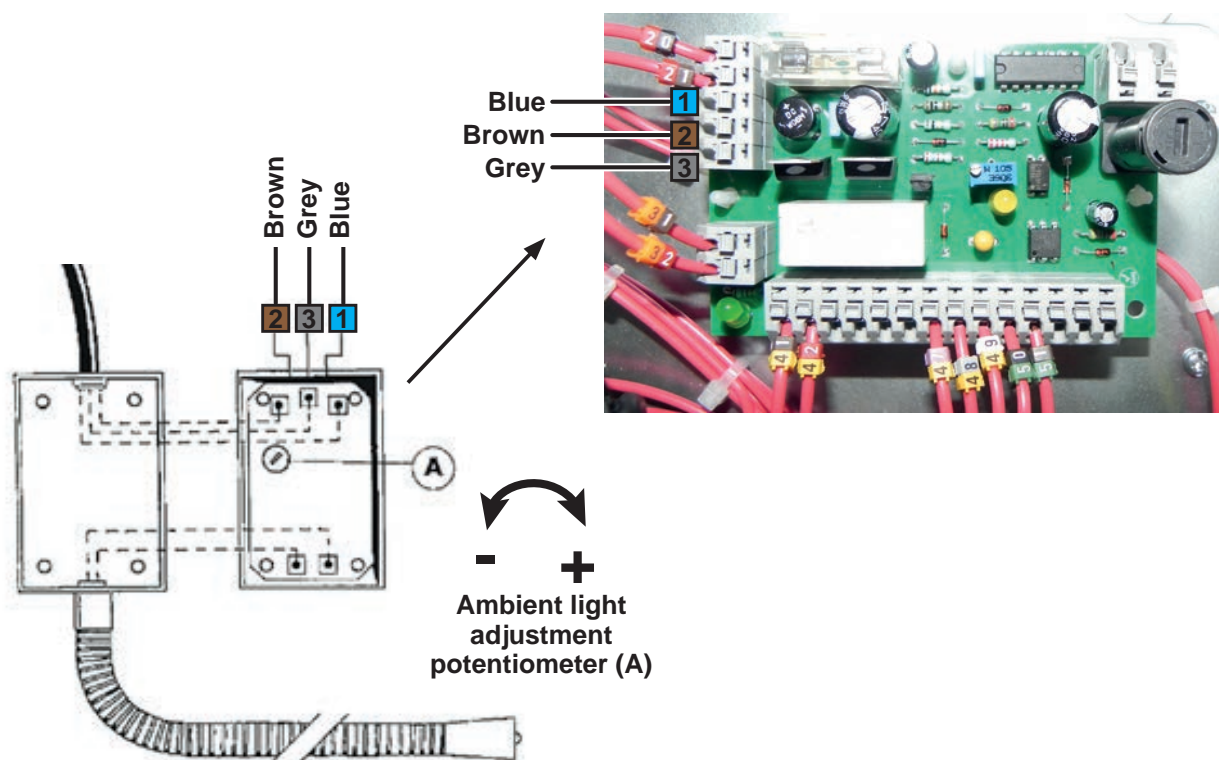
## 10 - Optional light sensor - Polyarticulated 160 and Ecoflex arms



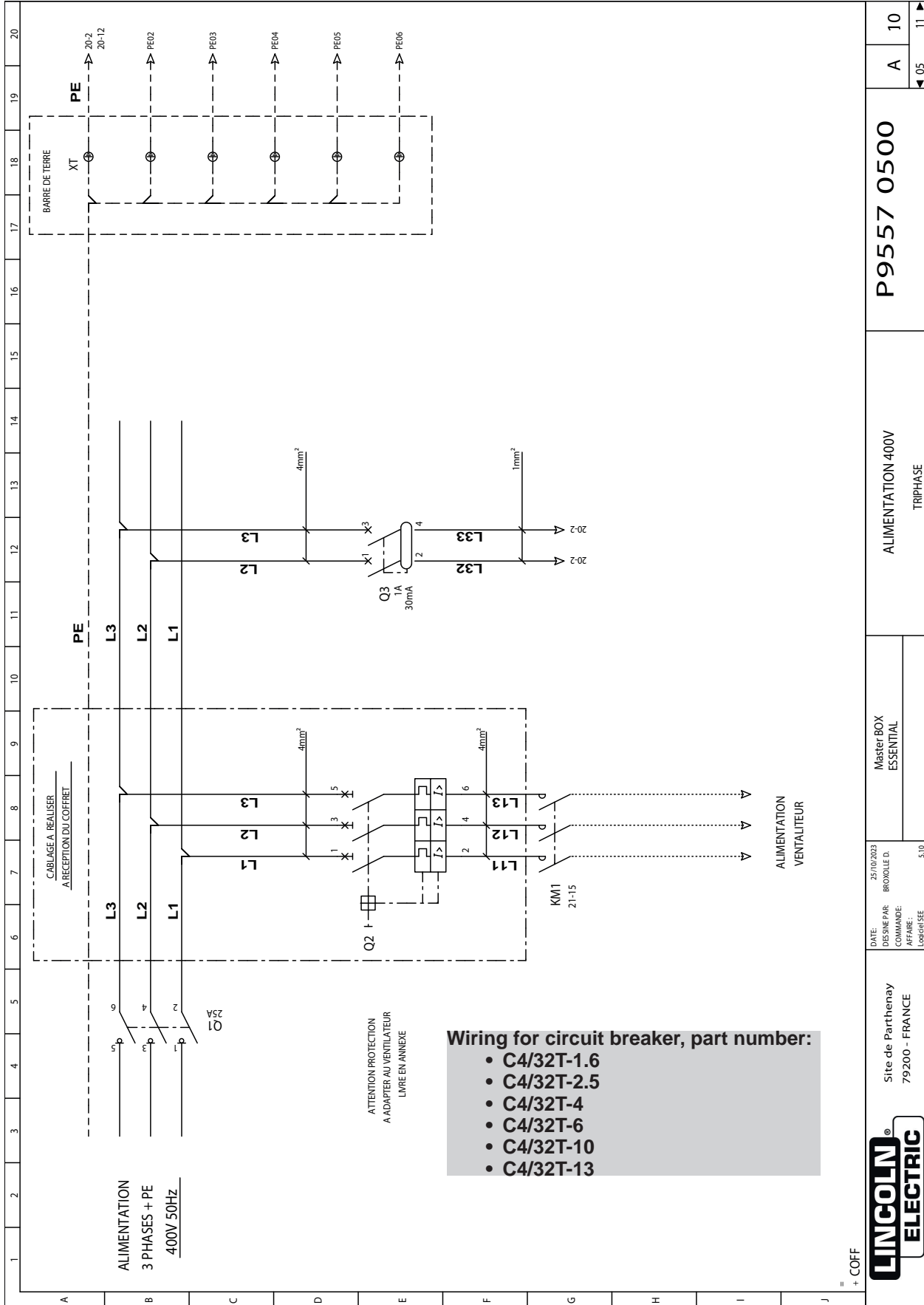
Light sensor (Ø 160 arm) (W000342208)

It senses the light from the welding arc or the torch flame.

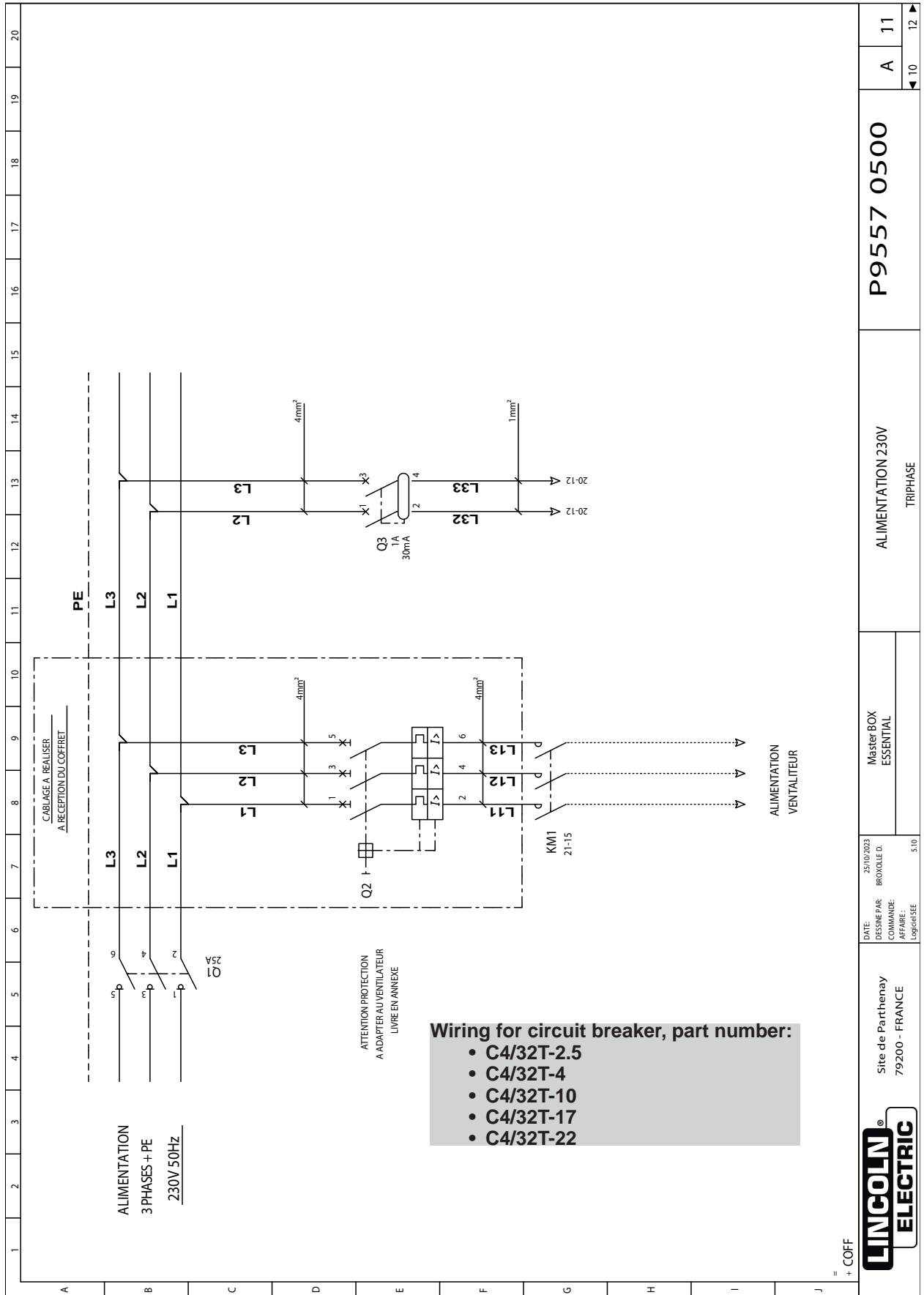
- It is used when the welding current cannot be sensed.
- Must be used along with a **Damper Box** or **Master Box Essential**.



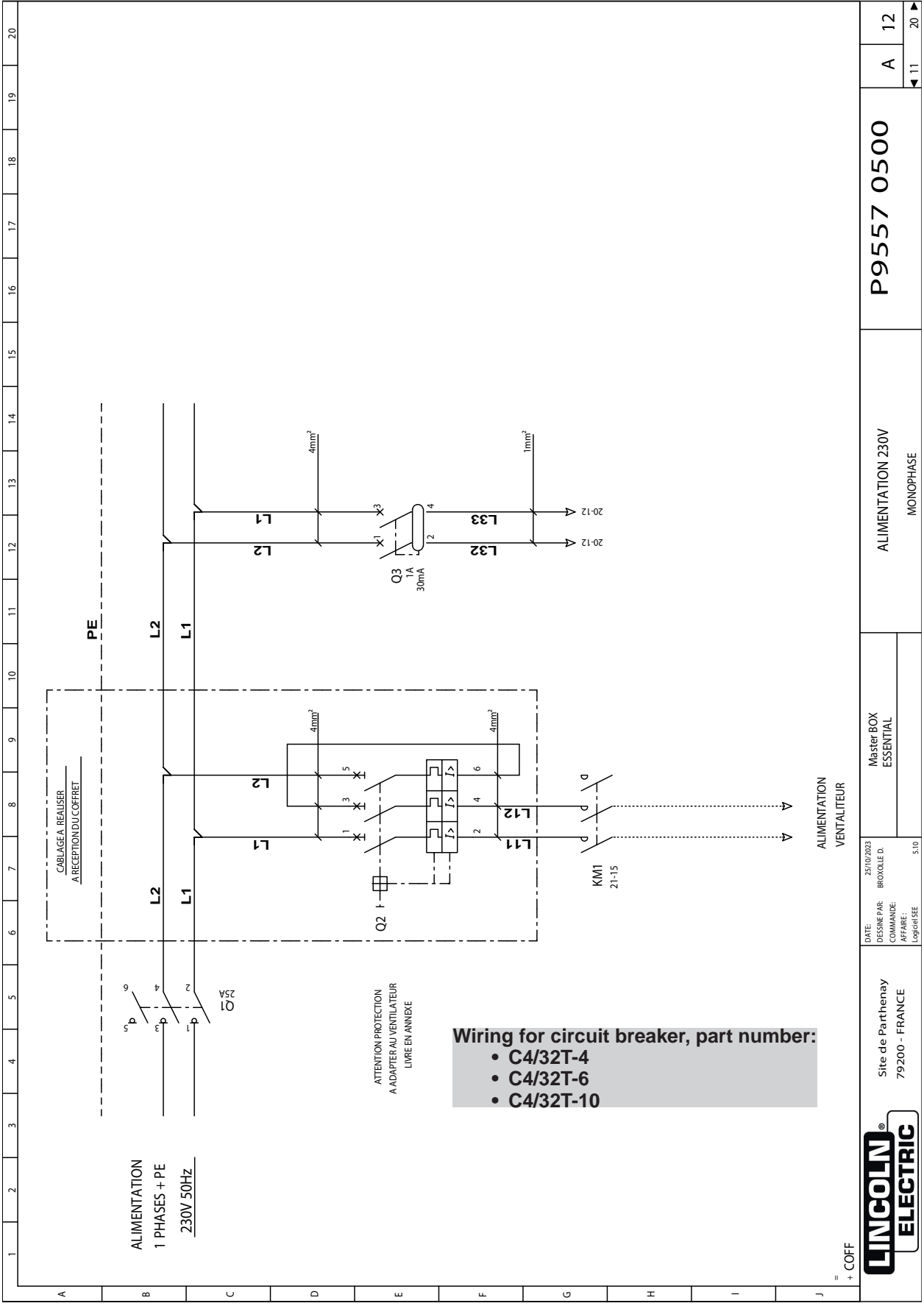
1 - Electrical diagram





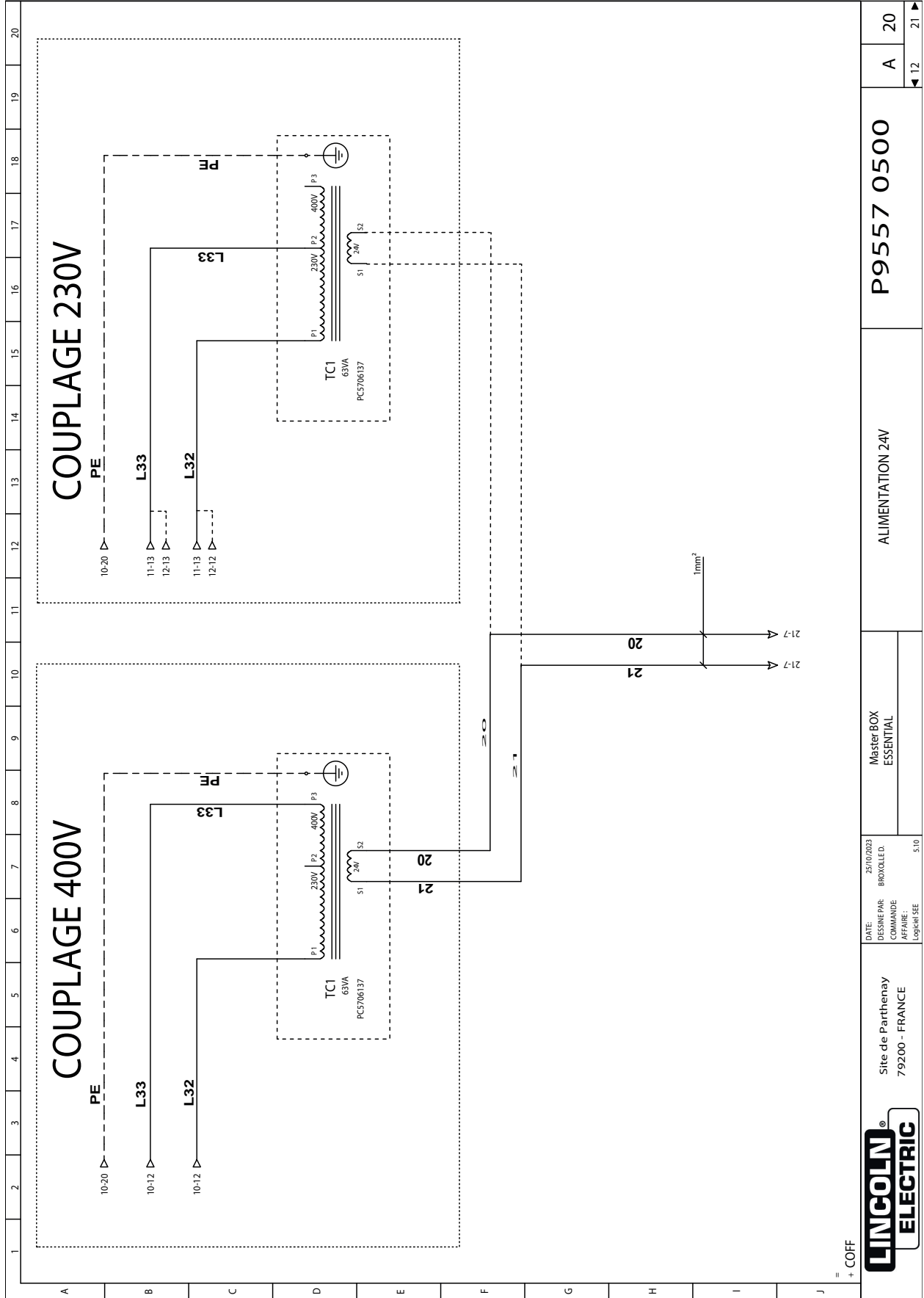


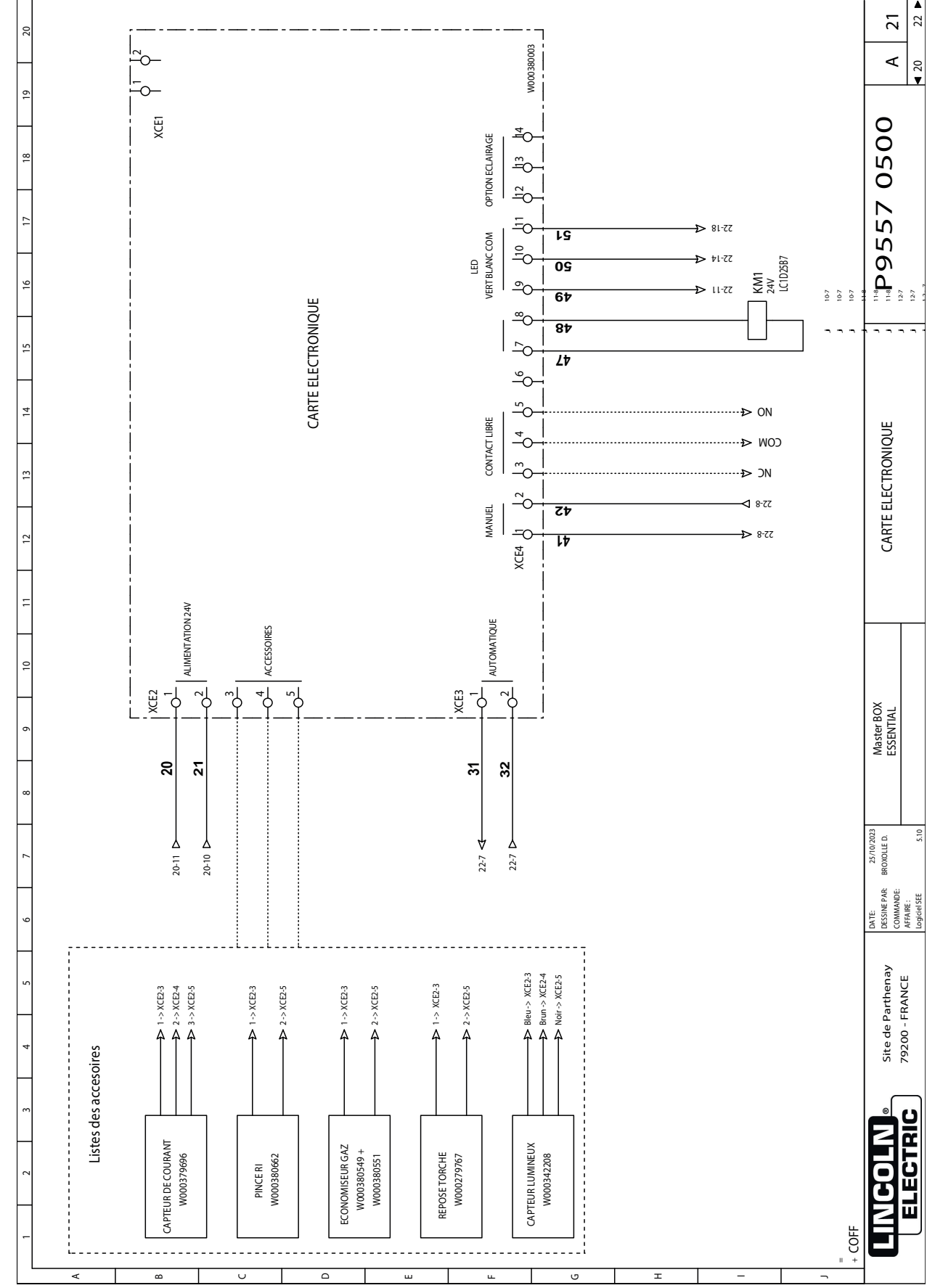
Site de Parthenay  
79200 - FRANCE



P9557 0500		A 12
ALIMENTATION 230V MONOPHASE		11 20
DATE: 25/10/2023	Master BOX ESSENTIAL	
DESSINE PAR: BROXVALLE D.		
COMMANDE:		
AFFAIRE: Logiciel SEE		5,10
Site de Parthenay 79200 - FRANCE		

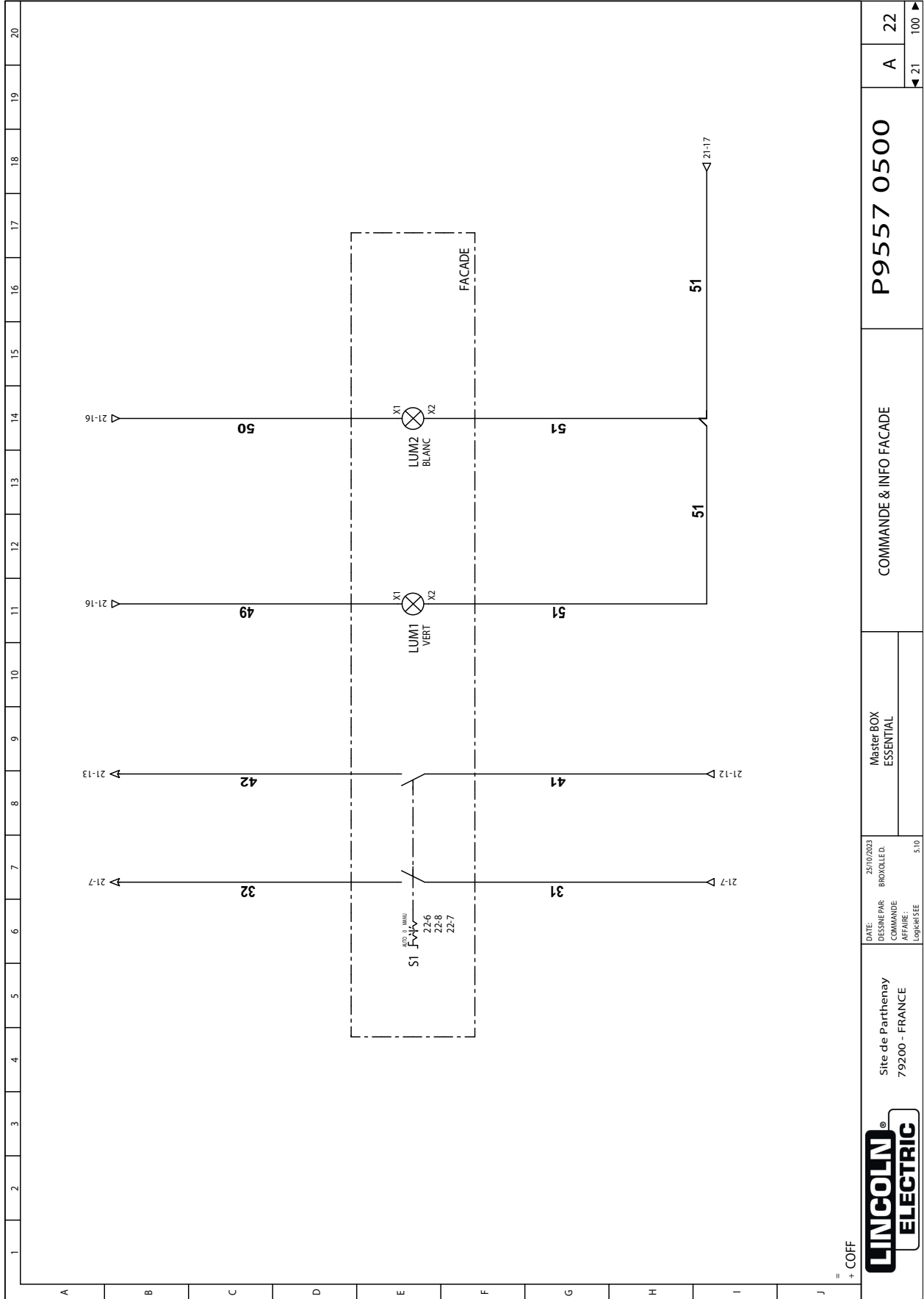


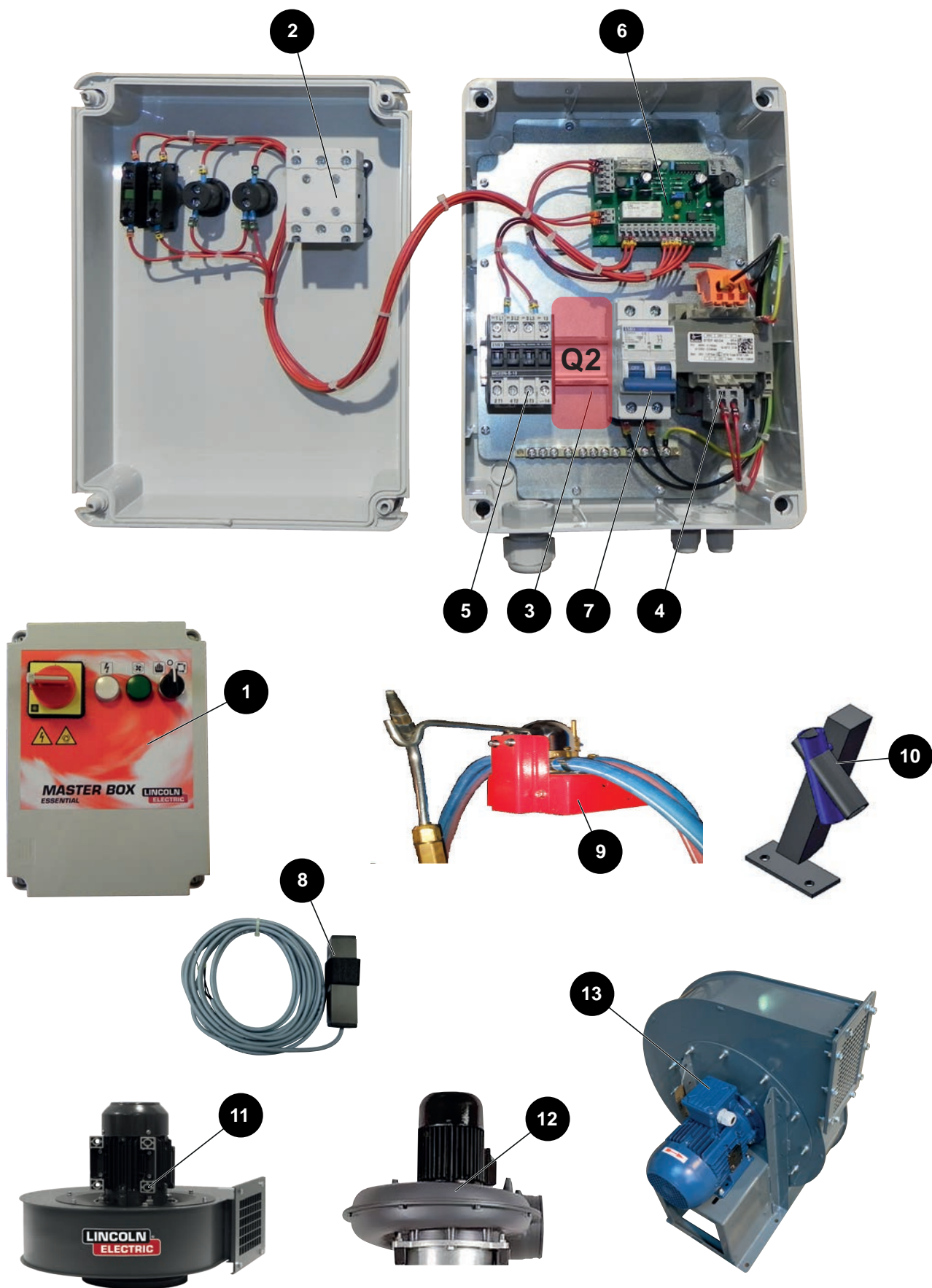




+ COFF

<b>DATE:</b> 25/10/2023 <b>DESSINE PAR:</b> BROXOLLE D. <b>COMMANDE:</b> <b>AFFAIRE:</b> Logiciel SEE 5.10		<b>Master BOX ESSENTIAL</b>		<b>CARTE ELECTRONIQUE</b>		<b>P9557 0500</b>		<b>A 21</b>	
								107 107 107 110 110 127 127	





Reference	Description		Part number LINCOLN ELECTRIC
1		<b>Master Box Essential</b>	W000376084
2	<b>INTER</b>	Disconnecter switch, 3P- 32A <i>IMO JEAMBRUN AUTOMATION: PM69-3032-RY64</i>	PC5702588
4	<b>TC1</b>	Transformer, COM 230+400V / 230+24V - 63VA <i>ELEC SYSTEM: BLOSTEF40/24</i>	PC5706137
5	<b>KM1</b>	Contactor, PU.3C 10 - 24VAC - 22A <i>IMO JEAMBRUN AUTOMATION: MC22N-S-1024AC</i>	PC5701753
6		Printed circuit board	P94000000
7	<b>Q3</b>	Circuit breaker, 2P - 1A - D 10KA <i>IMO JEAMBRUN AUTOMATION: B10D2001A</i>	PC5705220

**Options:**

Reference	Description		Part number LINCOLN ELECTRIC
3	Q2	Thermal magnetic circuit breaker - 3P - 1.6-2.5 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-2.5</i>	PC5704411
		Thermal magnetic circuit breaker - 3P - 2.5-4 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-4</i>	PC5704412
		Thermal magnetic circuit breaker - 3P - 4-6 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-6</i>	PC5704413
		Thermal magnetic circuit breaker - 3P - 6-10 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-10</i>	PC5704414
		Thermal magnetic circuit breaker - 3P - 9-13 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-13</i>	PC5704415
		Thermal magnetic circuit breaker - 3P - 11-17 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-17</i>	PC5704416
		Thermal magnetic circuit breaker - 3P - 14-22 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-22</i>	PC5704417
		Thermal magnetic circuit breaker - 3P - 18-26 A <i>IMO JEAMBRUN AUTOMATION: C4/32T-26</i>	PC5704418
8		Current sensor, L5M CA CC	W000379696
9		Gas saver bracket	W000380549
		Limit switch	W000380551
10		Contact type torch rest	W000279767
11		Fan, 1.8 - 230V/400V - 3Ph - 0.55KW	W000379138
		Fan, 2.1 - 230V/400V - 3Ph - 0.75KW	W000342132
12		Fan, 28 - 230 V - 1 Ph - 0.75 KW	EM7905220710
		Fan, 28 - 230V - 3Ph - 0.75KW	EM7905220750
		Fan, 28 - 400V - 3Ph - 0.75KW	EM7905220740
13		Fan, 42 - 230V/400V - 3Ph - 1.5KW	W000378253



The thermal magnetic circuit breaker (Q2) is supplied with its wiring.

