

CONTROL UNIT

# MASTER BOX ESSENTIAL

SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE

No W000376084



EDITION : EN  
REVISION : C  
DATE : 05-2021

Instructions for use

REF : 8695 8001

*Original instructions*

**LINCOLN**<sup>®</sup>  
**ELECTRIC**

**Thank for the trust you have expressed by purchasing this equipment, which will give you full satisfaction if you follow its instructions for use and maintenance.**

**Its design, component specifications and workmanship comply with applicable European directives.**

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

**The manufacturer will not be held responsible where items not recommended by themselves are associated with this product.**

**For your safety, there follows a non-restrictive list of recommendations or requirements, many of which appear in the employment code.**

**Finally we would ask you kindly to inform your supplier of any error which you may find in this instruction manual.**

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## REVISIONS

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	<b>LINCOLN ELECTRIC FRANCE SAS</b> Avenue Franklin Roosevelt 76120 – LE GRAND QUEVILLY
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## **CE DECLARATION OF CONFORMITY**

The Manufacturer LINCOLN ELECTRIC France,  
Avenue Franklin Roosevelt 76120 – LE GRAND QUEVILLY,

declares under its responsibility that the equipment :

Description	<b>MASTER BOX ESSENTIAL</b>
Type no	<b>Part no : W000376084</b>
Number	<i>See name plate</i>

**Meets all the relevant provisions of European Directives :**

**2006/42/EC**

**2011/65/UE**

**2014/30/UE**

**Based on the following harmonised standards:**

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

**The equipment complies with the aforementioned Directives providing it is installed, used and maintained in accordance with the instructions in the supplied documentation, applicable laws and standards and good industry practices.**

**Any other use and/or modification would void this declaration.**

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**Patrick Degroote**  
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CERGY, le 01/06/2017





# A - INTRODUCTION

## USING THE MANUAL

Please read this manual before you start handling, installing or using the machine. Keep the manual safe in a place known to the user of the machine 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**

## DESCRIPTION OF PICTOGRAMS

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



**DANGER:** indication used when failure to follow the instructions could lead to a serious hazard for personnel.



**WARNING:** indication used when failure to follow the instructions could lead to damage to the machine, associated elements or the surroundings.



This symbol shows that the description is intended for specialised personnel.

# B - GENERAL SAFETY INSTRUCTIONS

## 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.

### Workstation

Arc welding and cutting requires strict compliance with safety requirements in respect of electrical currents (Order of 14 December 1988).

### Working on the machine

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

- Accidental connection of the cable of a fixed installation has been made impossible
- Cutting 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 persons qualified for that purpose (Decree 88-1056 of 14 November 1988, Section VI, Art 46).

### 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 enclosures and ducts may not be carried out in a haphazard manner (Section VI, Art. 47 Decree 88-1056 of 14 November 1988).

- 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 operating position 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 a duty point based on extraction speed (speed of air in the piping) and head loss.

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

## 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 personal insulating protection (Order of 14 December 1988, Section III).
- 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 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 (Standards NF S77-104 A 88-221 A88-222).

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).

Persons 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 (EN 139).

**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

## FILTRATION OF FUMES AND DUST

### **Important**

Mechanical or electrostatic filtration systems are effective for the filtration of solid but not gaseous particles (exterior 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) of gaseous pollutants relating to the specific pollution 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 machine 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

## C - OVERALL DESCRIPTION



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

### DESCRIPTION OF EQUIPMENT

The **MASTER BOX** 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.
- That **MASTER BOX ESSENTIAL** unit 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** unit 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.

## TECHNICAL DATA

DESCRIPTION	CHARACTERISTICS
Power supply	230V - 1Ph
	230V / 400V - 3Ph
Fan power	0.37KW to 5.5KW
Auxiliary power supply,	24V AC for accessories
Dimensions (H x L x D)	340 x 230 x 180 mm

## MOTOR PROTECTION SELECTION TABLE

MOTOR POWER	230V 1Ph	230V 3Ph	400V 3Ph
0,37kW	GV2ME08	GV2ME07	GV2ME06
0,55kW	GV2ME10	GV2ME07	GV2ME06
0,75kW	GV2ME10	GV2ME08	GV2ME07
1,1kW	GV2ME14	GV2ME08	GV2ME08
2,2kW		GV2ME14	GV2ME10
3kW		GV2ME14	GV2ME14
4kW		GV2ME20	GV2ME14
5,5kW		GV2ME21	GV2ME16

## D - INSTALLATION

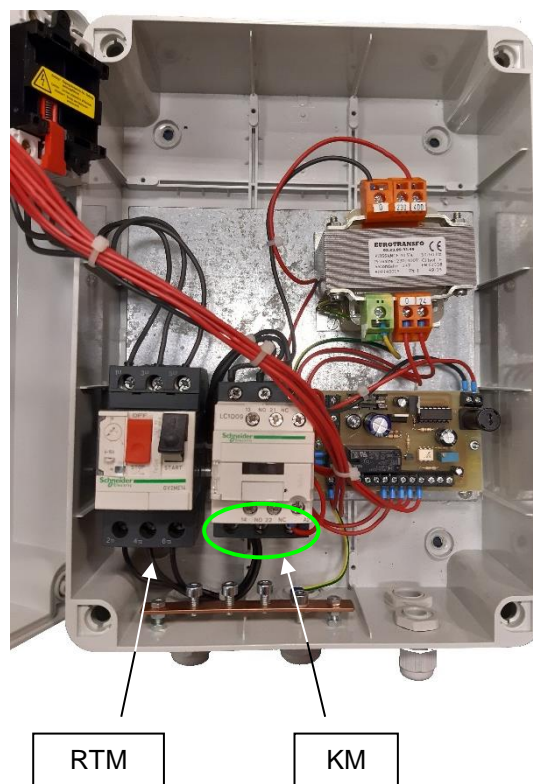
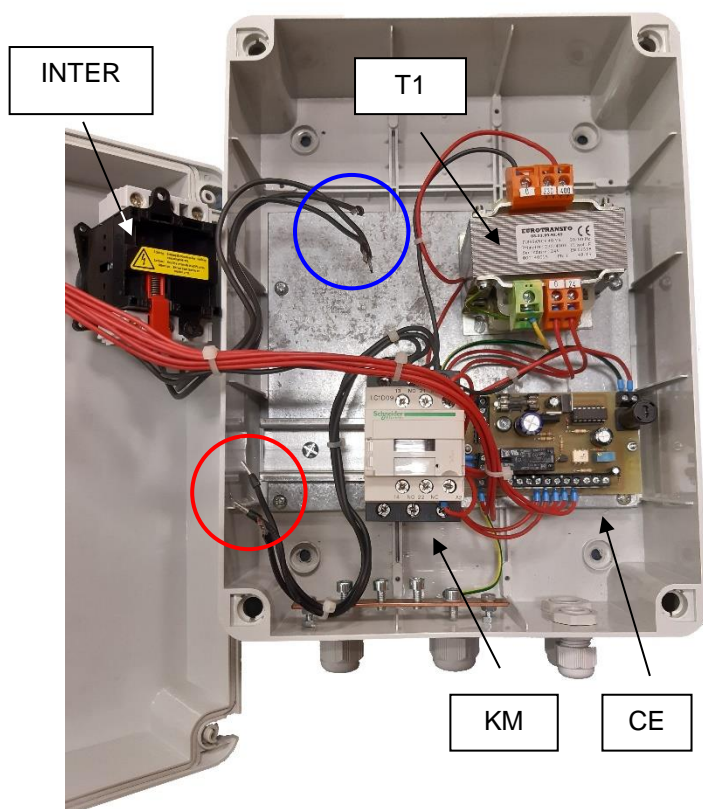


Before you connect the **MASTER BOX ESSENTIAL** to the mains, you must first wire the RTM thermal magnetic circuit breaker that you have bought additionally, suited to the power rating of your motor.

### THERMAL MAGNETIC SAFETY WIRING

The RTM thermal magnetic circuit breaker must be wired,

- upstream, to the INTER disconnecting switch, **blue**
- downstream, to the KM motor switch, **red**



### MOTOR WIRING

The three phases of the M1 motor must be wired to the KM motor switch **green**

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

## 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”

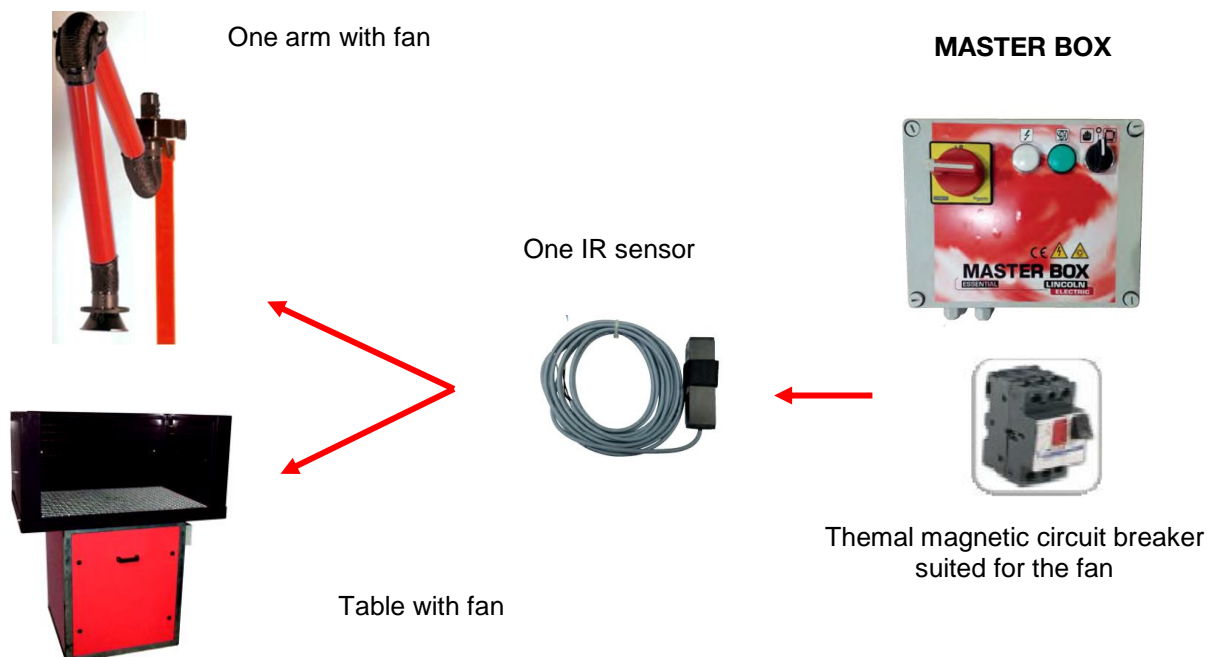
NB: In automatic mode, selecting the “Stop” position does not stop the fan immediately, but sets off a stopping timer that can be set (factory setting 45 sec)



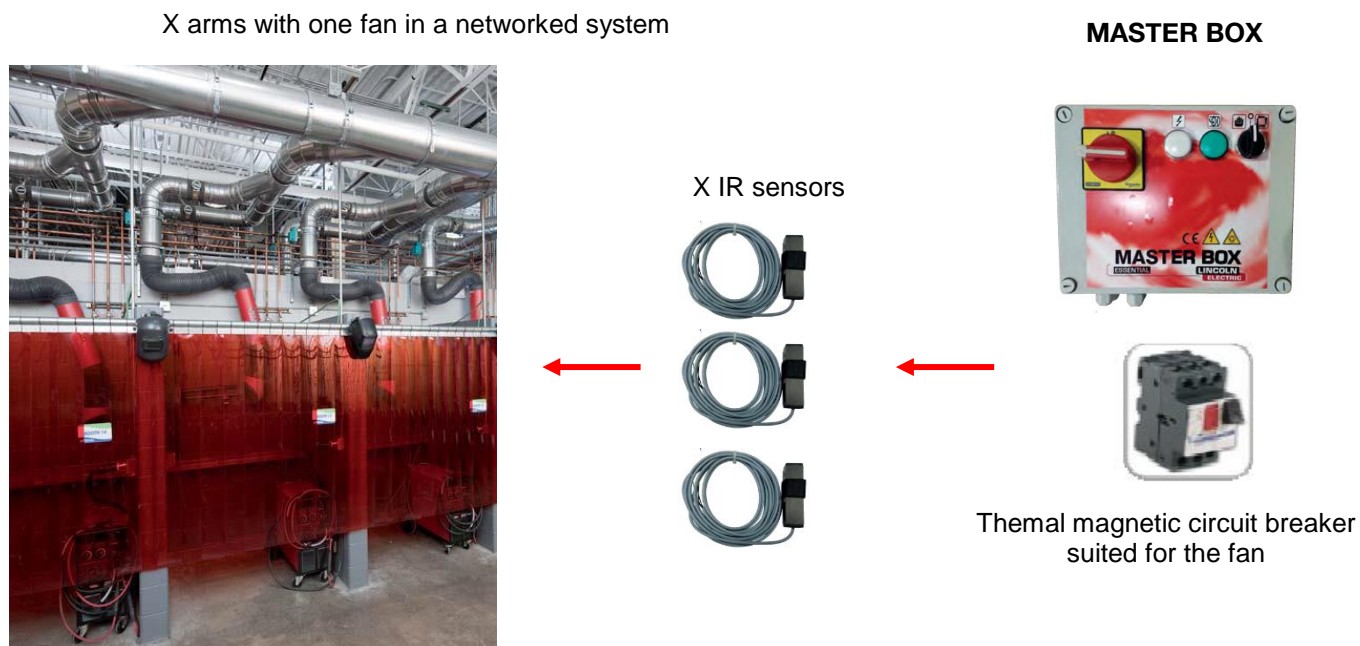
- 1) Padlockable disconnecting switch
- 2) White power on indicator
- 3) Green fan operating indicator
- 4) Manual/Stop/Auto switch

## EXAMPLE OF SYSTEM AUTOMATION

### Simple system with fan



### Extraction system with several arms.



## AUTOMATION WITH IR CURRENT SENSOR

- 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

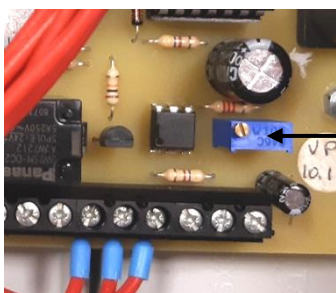
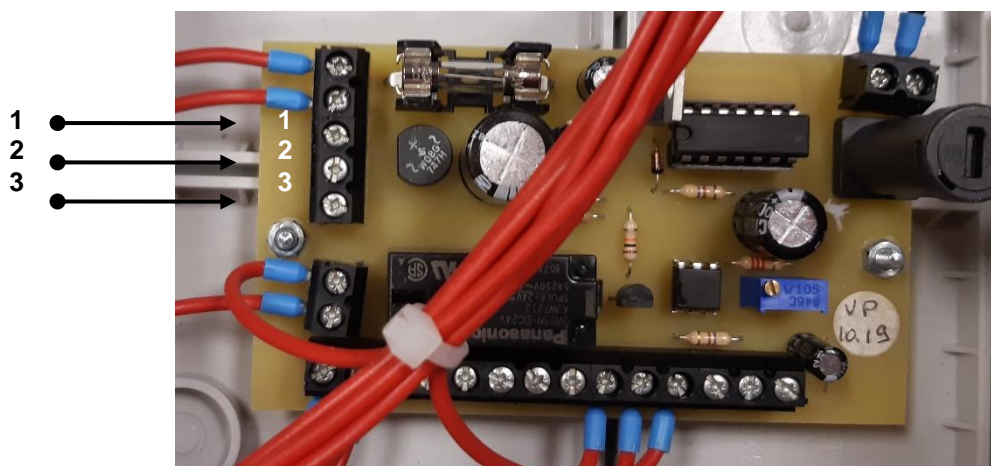
It detects the starting of the alternating and direct (AC-DC) welding current



#### Ordering:

Description	Part no
Current sensor	W000379696

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** is supplied with a stopping delay of 45 seconds after the electric arc is switched off.

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

## AUTOMATION WITH AN 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

It detects the presence of the torch on its support.

Starts the associated powered shutter or fan.



#### Ordering:

Description	Part no
Gas saver support	W000380549
Limit switch	W000380551

### Contact type torch rest

It detects the presence of the torch on the rest.

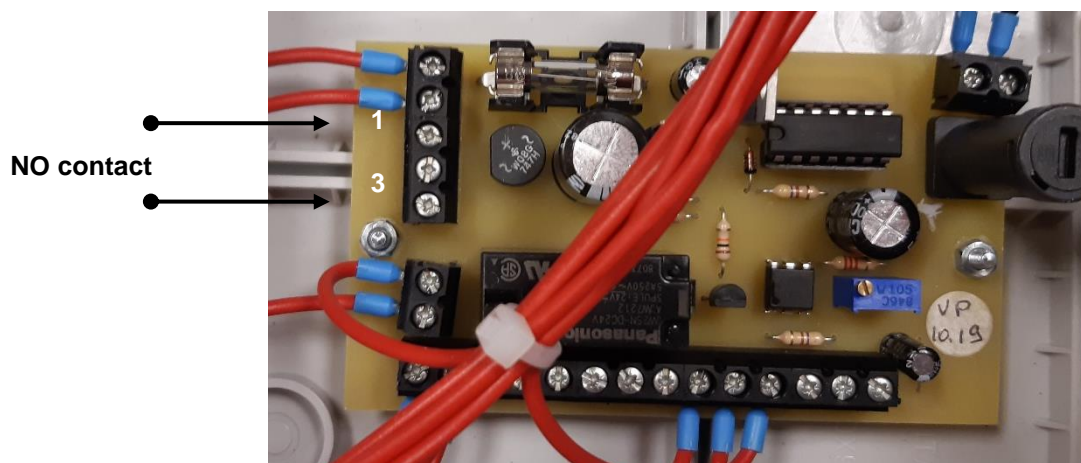
Starts the associated powered shutter or fan.



#### Ordering:

Description	Part no
Contact type torch rest	W000279767

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



## OPTIONAL LED LIGHTING AND AUTOMATIC STARTING - LTA & LFA ARMS

**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 start/stop

It lights up the working area and puts the starting of the fan under the control of the welding current.

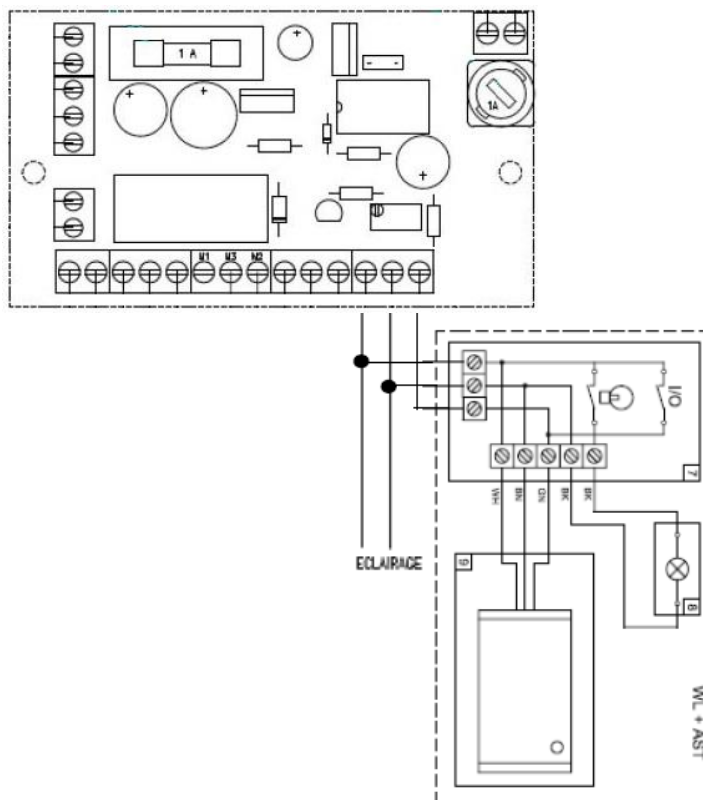
The control switch is supplied as standard and is fixed to the nozzle of the arm.

- Controls the lamp
- Manual/automatic fan control by photo-electric detection
- Not suitable for TIG welding



#### Ordering:

Description	Part no
LED lamp + auto starting	EM7900010190
NCW-11 connecting cable	EM9850031050



## 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
- an 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.

### LED lighting

It lights the working area.

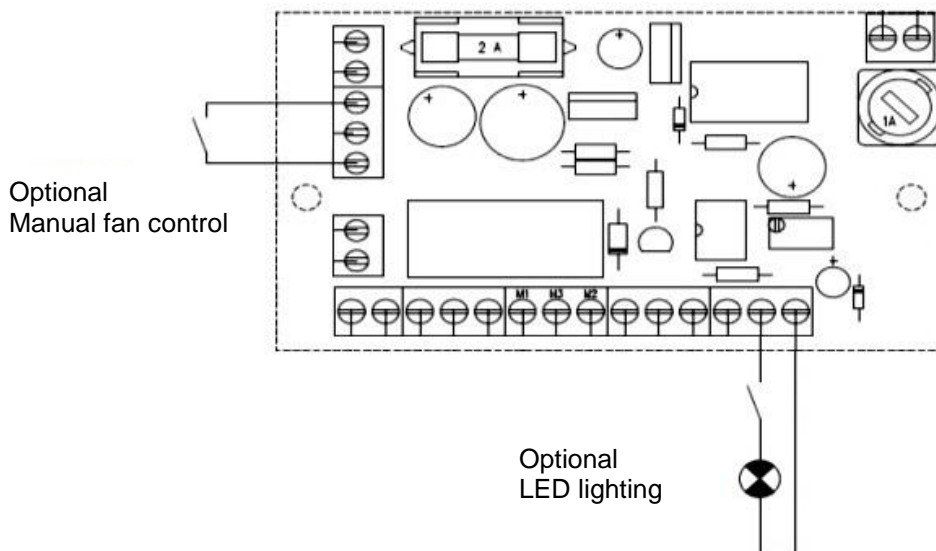
The double control switch is supplied as standard and fixed to the nozzle of the arm.

- Controls the LED lamp.
- Controls the fan manually if used along with a **MASTER BOX**



#### Ordering:

Description	Part no
LED lighting - 24V	W000342209
Spiral cord for telescopic arm	W000272054



## OPTIONAL LIGHT DETECTOR - POLYARTICULATED 160 & ECOFLEX ARMS

### Light detector (for arm Ø 160)

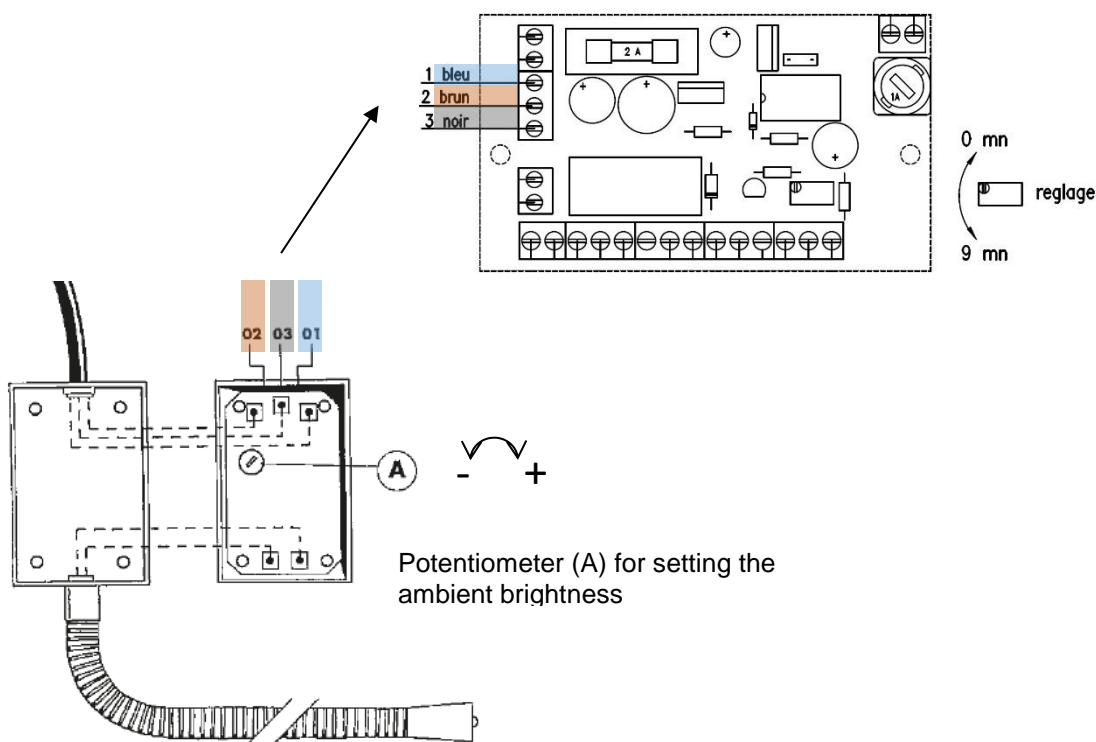
It detects the light of the welding arc or the torch flame.

- It is used when detecting the welding current is not possible.
- Must be used along with a **DAMPER BOX** or **MASTER BOX**



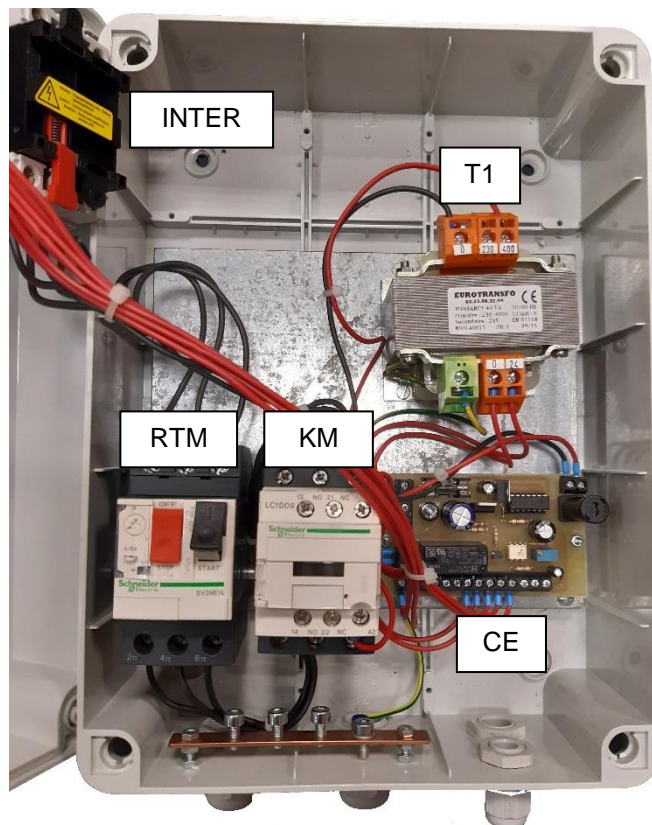
#### Ordering:


Description	Part no
Light sensor	W000342208





## SPARE PARTS



SPARE PARTS	REFERENCE	REFERENCES	
<b>MASTER BOX ESSENTIAL UNIT</b>		W000376084	
DISCONNECTING SWITCH	INTER	Please enquire	
THERMAL MAGNETIC CIRCUIT BREAKER 	RTM	GV2ME06	W000374601
		GV2ME07	W000374602
		GV2ME08	W000374603
		GV2ME10	W000374604
		GV2ME14	W000374606
		GV2ME16	W000374607
		GV2ME20	W000374608
		GV2ME21	W000374609
TRANSFORMER 230V/400V/24V	T1	W000403084	
MOTOR SWITCH	KM	W000148729	
PRINTED CIRCUIT BOARD	CE	W000380003	

SUPPLEMENTS	REFERENCE	REFERENCES	
AC/DC CURRENT SENSOR		W000379696	
GAS SAVER SENSOR		W000380549 + W000380551	
CONTACT TYPE TORCH REST		W000279767	
FAN, 1.8 - 230V/400V - 3Ph - 0.55KW		W000379138	
FAN, 2.1 - 230V/400V - 3Ph - 0.75KW		W000342132	
FAN, 28 - 230V - 1Ph - 0.75KW		EM7905220710	
FAN, 28 - 230V - 3Ph - 0.75KW		EM7905220750	
FAN, 28 - 230V - 3Ph - 0.75KW		EM7905220740	
FAN, 42 - 230V/400V - 3Ph - 1.5KW		W000378253	

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