

# OPERATING INSTRUCTIONS

**Release “J” – 3x 200/240V – 50/60 Hz**

27/04/2010

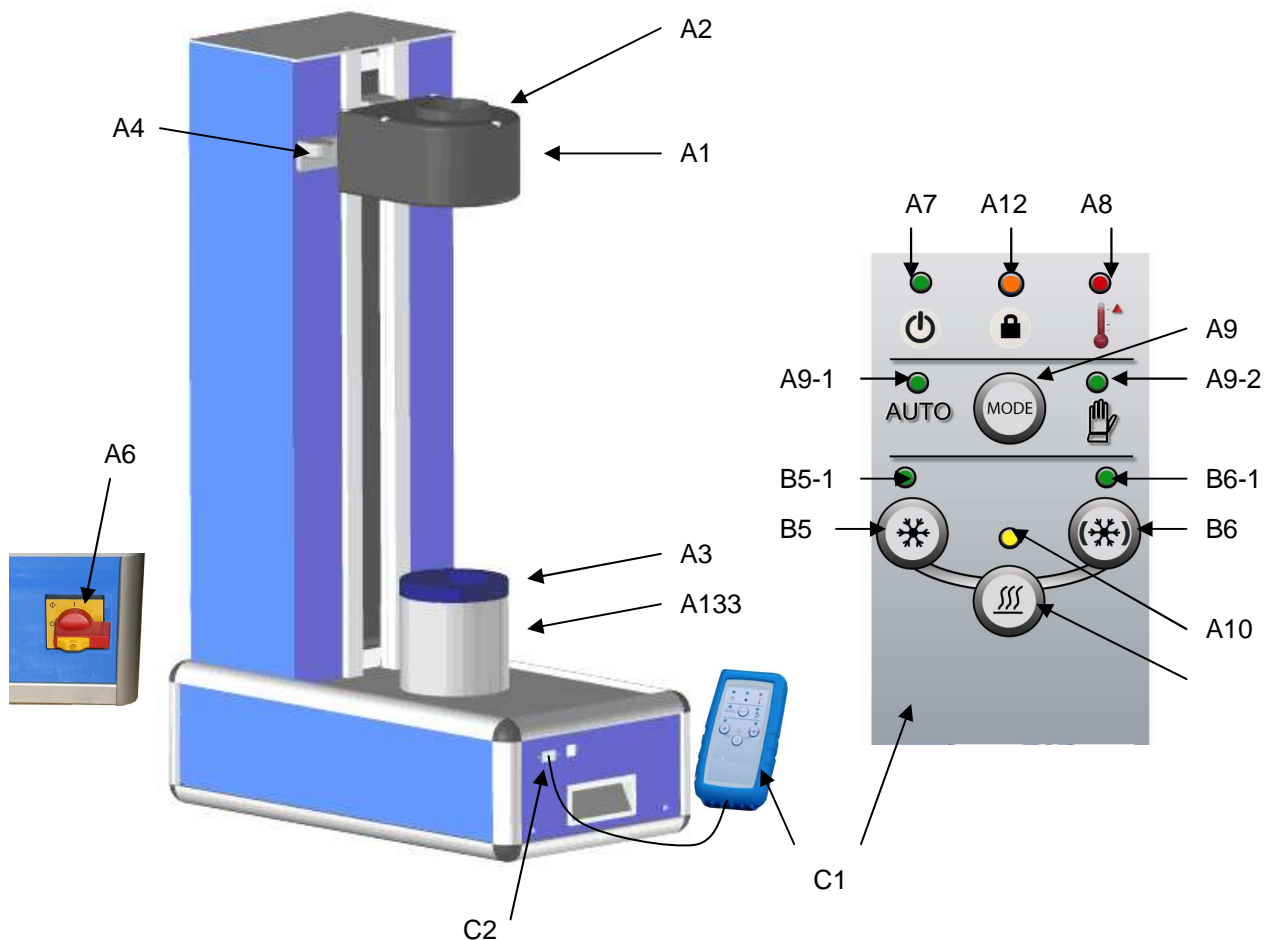
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# 1 – DESCRIPTIVE

## 1.1 Nomenclature

The shrink fit unit Start.2 is composed of an induction generator, an inductor, and a separate remote control.



Mark	Designation
A1	Inductor
A2	Inductor stop
A3	Chuck holder
A4	Inductor handle
A5	Inductor switch
A6	Main switch
A7	« Ready » green light
A8	« Default » red light
A9	Selector
A10	« Inductor » yellow light
A12	« blocking » orange light
A13	Strutting piece for the chuck holder

Mark	Designation
B5	Optional cooling switch
B5-1	Optional « cooling » green light
B6	Optional « cooling » switch
B6-1	Optional « cooling » green light
C1	Separate remote control
C2	Sub-D plug
	Jack 3.5 output – 24Vcc – 0.2A

## 1.2 Separate remote control

All controls are brought together on a separate remote control ; only the data transmission wire links the box with the shrink fit unit.

The shrink fit unit can be used both by a right-handed user and a left-handed one, with the same ergonomics.

On this remote control :



« **Default** » and « **Control** » lights (see §6.2 dysfunctionings) ; in condition of normal use of the shrink fit unit, only the green light should be on.



**Selector** (see §5.5): the « automatic » mode is activated by default ;

By pushing the « MODE » button, the « manual » mode is activated ;

By pushing again the « MODE » button, the « automatic » mode is activated again.



**Induction button** : the induction works (yellow light) only if you press this button ; if you stop pressing this button, the heating stops.

If you heat until the induction stops, the shrink fit unit will be blocked and unusable for 30 seconds.



**The cooling button** : When you press this button, the cooling (if option) begins. There is no need to keep pressing this button. During the cooling, the green light is on.

After 2 minutes, the light flashes, then it is possible to stop the cooling by pressing again this button.

After 15 minutes, if the operator has not stopped the cooling, it will stop automatically.

The second cooling button activates the second optional cooling unit ; its modus operandi is identical to the one described previously and independent.

## 2 – SECURITY

### 2.1 Risks

The shrink fit unit has been designed in the traditional way, especially regarding security.

Nevertheless, despite all the devices used, using some techniques can be a risk:

- Cut : handling cutting tools may cause cuts in case of unfortunate movements. You are advised to wear gloves.

- Burn: Because of the shrinking principle, which is heating an attachment in order to insert or remove a cutting tool, some parts, even localized, can reach very high temperatures and generate very serious burns. The user must be conscious that he is using hot tools in his working environment. Wearing gloves is compulsory.

- Induction : the heating technique adopted is the induction one. Its principle is based on the electromagnetic fields generation created by high frequency currents. Despite an inductor conception limiting the leaks of electromagnetic fields, the unit shall not be used by people with a pace maker or any other active implants. In order to avoid any risk, these persons should not come near the unit at least of a meter.

The user must make sure that no metal part (ring and jewels for instance) is near the inductor, which could create serious burns. You are strongly recommended not to put hands or any other body part in the inductor when the unit is switched on.

- inflammation : tools and attachments can reach very high temperatures. Some materials (magnesium for instance), if they happened to be in contact with those hot parts, could catch fire. Make sure that the unit is kept away from any sensitive materials and generally anything useless in order to have a free working space.

- explosion : because of the presence of hot zones, installation and use of the shrink fit unit are forbidden in ATEX areas (explosive atmosphere).

- electricity : make sure that the unit is properly switched on with an adequate plug on a protected network able to feed with 3x200V/240V-50Hz/60Hz, 32A and equipped with a circuit-breaker 32A curve C and with a differential 30mA

In case of deterioration of the inductor, switch the unit off and disconnect it.

In any case, before pulling the electronic rack out, switch the unit off and disconnect it.

The unit shall never be opened without any written authorisation of the manufacturer and in any case, it must be switch off from the electric network before any intervention.

In general, if any dysfunction is noticed or any tool damaged, the unit is to be stopped, unplugged from the electric network, and must be mentioned to the manufacturer after-sales department before restarting.

## 2.2 Pictograms

The following pictograms are used in order to prevent the following risks :



people with a pace maker or active implant are not allowed to use the unit ; passive implants are not concerned.



ISM unit (scientific and medical industrial units) group II class A according to EN55011, output frequency 19kHz-30kHz. Don't install near equipment sensitive to electromagnetics fields



Burns can be provoked, presence of hot tools



Wearing gloves is compulsory, presence of hot and cutting tools

## 2.3 Information to operators

The unit shall only be used for the purpose of its conception, which is shrinking and unshrinking steel and carbide cutting tools into steel attachments dedicated to that operation and recommended by the manufacturer.

Any other use can present some risks and will not be guaranteed by the manufacturer. Every user must read carefully this instruction in order to know the unit functioning, the shrinking and unshrinking modus operandi as well as the security instructions.

Any intervention on the unit by persons other than the manufacturer, during the warranty time is forbidden. Any intervention, even partly, will put an end to the manufacturer's warranty. Possible interventions on the unit by the manufacturer will be charged to the user.

## **3 – TRANSPORTATION AND PACKAGING**

### **3.1 Transportation**

The manufacturer has done whatever is necessary concerning the packaging so that the transportation does not have any consequences on the unit.

If any irregularities are noticed at the delivery, it is up to the receptionist to make the remarks and reservations on the delivery note so that the carrier's responsibility is involved.

In no case the responsibility of the manufacturer should be involved.

### **3.2 Unpacking**

Take the unit out of its packaging and check if the goods are in accordance with the delivery note.

## **4 – STARTING UP**

### **4.1 Setting the unit up**

The setting up and starting up of the unit can only be done by a manufacturer's technician and this will confirm the beginning of the warranty period.

The unit must be installed on a steady and horizontal work surface, capable to withstand its weight.

### **4.2 Installing the unit**

#### **Separate remote control plugging :**

Unpack the remote control and plug the sub-D connector into the plug located on the front of the shrink fit unit and lock the screws.

It is essential that when you connect or disconnect the remote control, the unit is switched off.



**Unlock the column:**

Take off the transportation pieces, located under the inductor, in front face.

**Electric connection :**

Connect the unit to the three-phase network 3x 200V/240V alternating 50/60Hz + ground/earth (neutral is not used, no order in phases).

The electric line must be connected to a circuit-breaker 32A curve C and protected by a 30mA differential.

**4.3 Moving the unit**

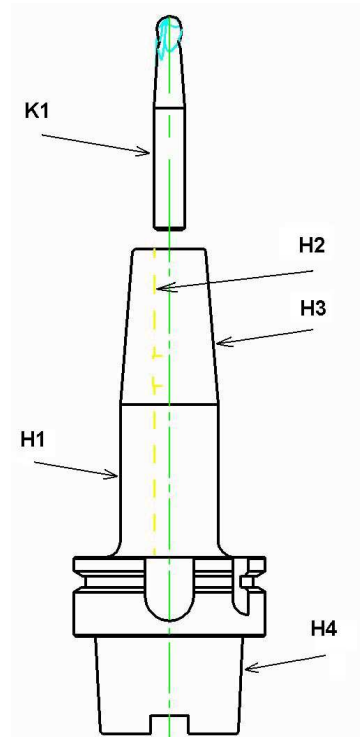
For all moving of the unit, switch the unit and compressed air off.

The unit and the central column must remain upright. The unit must be moved with the usual precautions, taking it under its structures. Make sure that nothing can fall and hurt somebody.

In case of moving the unit with horizontal column, replace the transportation pieces in order to lock the inductor.

## 5 – OPERATING

### 5.1 Principle of functioning



The shrinking (or unshrinking) principle consists in heating an attachment (H1) in order to expand a chuck bore (H2) and to insert (or remove) the tool's shank (K1), then cooling the whole of it in order to get an almost cast solid structure. The heating is realized by the induction technique. Electromagnetic fields created by induction generate Foucault currents around the attachment, making it going up to a high temperature in a few seconds. Because of a very quick warming, only the attachment is hot, the tool remains at room temperature.

The shrink fit unit needs tools shanks at least equal to h6 quality wise.

### 5.2 Switching the unit on

Switch the unit on, using the main switch (A6) and bring it to position 1.

### 5.3 Installation of the chuck holders

The shrink fit unit is compatible with all the unit chucks (H4) on the market.

This compatibility is possible because the chuck holders are peculiar to each chuck.

You can easily recognize them because of their colour:

HSK	= blue
ISO/BT	= green

Depending on the chuck to be shrunk or unshrunk, put the corresponding chuck holder (A3) in its lodging.

### 5.4 Installation of the inductor stops

The inductor (A1) is equipped with an inductor stop (A2).

Its function is to position correctly the inductor on to the attachment, but also to concentrate the electromagnetic fields towards the attachment and avoid leaks and dispersals outside.

Several inductor stops are available according to the tool shank diameter (K1) to be shrunk or unshrunk.

Ø3 to 5      Ø6 to 12      Ø14 à 20      Ø25 à 32      Ø40 possibly

Its setting is quick and simple because of a quarter turn system.

Special inductor stops can be used for tools of which the cutting diameter is superior to the shank diameter. The utilisation is identical.

### 5.5 Adjustment of selector

By default, the "AUTO" mode is selected.

In this position, the shrink fit unit adapts automatically its heating power and its heating period, according to the type of attachment, in order to preserve the chuck (the induction stops itself automatically).

The position "Manual" corresponds to a heating time longer, the power is always self-regulated. That position has to be used only in case of impossibility to unshrink in "AUTO" being aware of the risks of deterioration of the tool-holder by overheating.

In case of dysfunction, the induction stops itself automatically after the heating period, and the unit becomes then out of order for 30 seconds ; Do not switch off the unit or do not unplug the electric network during this time.

Never restart a heating cycle after an induction cut without a complete cooling of the tool holder.

Never restart a heating cycle after having depressed the induction button without a complete cooling of the tool holder.

**If you do not respect these instructions, this could destroy the tool holder completely and damages seriously the unit.**

## 5.6 Shrinking modus operandi

In order to avoid burns and cuts, all the handlings must be done with Kevlar gloves supplied with the unit.

- 1- After having beforehand set the appropriate chuck holder (A3) and the inductor stop (A2), put the shrinking tool holder (H1) into the chuck holder. Make sure that the tool holder is clean, especially the boring (H2) which will receive the tool shank, and free of any liquid, especially cutting oil.
- 2- Take the inductor handle (A4) possibly with both hands and bring the inductor (A1) down until the top of the attachment (H3) contacts the inductor stop (A2)
- 3- Take the tool for shrinking (K1) with one hand and bring it to the end of the boring (H2)
- 4- Press the induction button (A5) (yellow) with the other hand (A4), until you can introduce the tool into the boring. During that operation, the yellow light (A10) lights on. As soon as the tool goes down, release immediately the induction button.
- 5- Bring the inductor back up with the handle

In case of disorder, the induction will switch off automatically. Cool completely the tool holder and check that the diameter of the tool shank and the attachment match and check also the position of the selector before repeating the operation.

## 5.7 Unshrinking modus operandi

In order to avoid burns and cuts, all the handlings must be done with Kevlar gloves supplied with the unit.

- 1- After having beforehand set the adequate chuck holder (A3) and the inductor stop (A2), put the tool and the tool holder (H1/K1) for unshrinking into the chuck holder. Make sure that it is free of dirt, especially cutting oil.
- 2- Take the inductor handle (A4) possibly with both hands and bring the inductor (A1) down until the top of the attachment (H3) contacts the inductor stop (A2).
- 3- Take the tool (K1) in one hand and pull slightly upwards.
- 4- Press the induction button (A5) (yellow) with the other hand, until you can extract the tool from the attachment. During this operation, the yellow light (A10), lights on. As soon as the tool comes out, release immediately the induction button.
- 5- Bring the inductor back up with the handle.

In case of disorder, the induction will switch off automatically. Cool completely the tool holder and check the inductor stop corresponding to the diameter of tools shank to be unshrunk as well as the position of the selector before renewing the operation.

## 5.8 Unshrinking modus operandi for a broken tool in the tool holder

If a tool is broken in the tool holder, it becomes impossible to extract the shank of the tool. To solve this problem, the inductor can be moved upside down :

- 1- Move the inductor (A1) 180° in order that the inductor stop (A2) comes underneath the inductor
- 2- Then place the attachment (H1), chuck side (H4) upwards, into the inductor by putting it on the inductor stop and by holding it in one hand (you are reminded that you must wear gloves)
- 3- Press the induction button (A5) until the tool shank falls (K1) because of the gravity
- 4- Cool the tool holder and put the inductor (A1) back in its normal position.

## **5.9 Switching the unit off**

Switch the unit off from the main switch (A6) bringing it to position 0

If you are not using the unit for a while, switch the unit and the accessories off from the electric network.

## **6 – SERVICING AND MAINTENANCE**

### **6.1 Cleaning the unit**

That operation shall be realised after a complete stop of the unit. The unit must be regularly cleaned with a dry cloth. Never use detergent or abrasives.

## 6.2 Dysfunctions

The main dysfunctions are indicated by position lights :



Light "**Status of the shrink fit unit**" :

Switched off : The shrink fit unit is switched off

- Check that the main switch (A6) is in position 1
- Check that the unit is connected to the electric network and is receiving power

fixed : The shrink fit unit is switched on

flashing : There is a default of voltage, at least one phase is not receiving power

- Check the connection of the socket
- Check the fuses of the electric network



Light « **Blocking of the shrink fit unit** »

fixed : The maximum time allowed for heating or the maximum temperature of the tool holder has been reached :

- The unit is unusable for 30 seconds
- Cooling completely the tool holder before any further attempt.



light « **default** »

fixed : The electronic card is overheating

flashing : The inductor is overheating

- Switch the unit off (main switch (A6) on position "0") for 60 minutes.

This default may be due to intensive use or misuse of the shrink fit unit (use not in compliance with the instructions).

Fast flashing : The heating cycles are too close (normal use is one cycle every 30 seconds)



light « **induction** »

Switched off : no power, the inductor is not heating

fixed : The inductor heats the attachment (see §2 safety)

flashing : « default »

- Check that the tool holder is made of material compatible with the shrink fit unit



light « **cooling** »

Switched off : cooling is not operating, or was stopped automatically after having operated for 15 minutes

fixed : cooling is operating since less than 2 minutes ; it is not possible to stop it

flashing : cooling is operating since more than 2 minutes ; it is possible to stop it



All the lights are flashing : it is a problem between the generator and the remote control

- Switch the unit off, check the connection of the sub-D plug and if the screws are well tightened.

For any other dysfunction not mentioned in this document, please contact the manufacturer's after-sales service.

**In any case, NEVER OPEN THE UNIT without being sure that the unit is switched off (disconnected from electrical power) : DANGEROUS VOLTAGE.**



### 6.3 Maintenance

The only thing to be done by the user is a regular cleaning of the unit.

**Fuses** : The electronic card is equipped with fuses. If a fuse blows, you must determine the reason. In any case, fuses must be replaced by others which have exactly the same characteristics (3 fuses 10x38 690V-30A gRB Very high and fast cutoff power - FS-A070gRB30T13-M330015).

If you do not respect this instruction, this could damage seriously the unit

#### **Intervention :**

In case of deterioration of the inductor, switch off the unit.

Before removing the electronic rack, switch off the unit.

Never open the unit without the manufacturer's written authorization, and in any case, before any intervention, the shrink fit unit must be disconnected from the electric network.

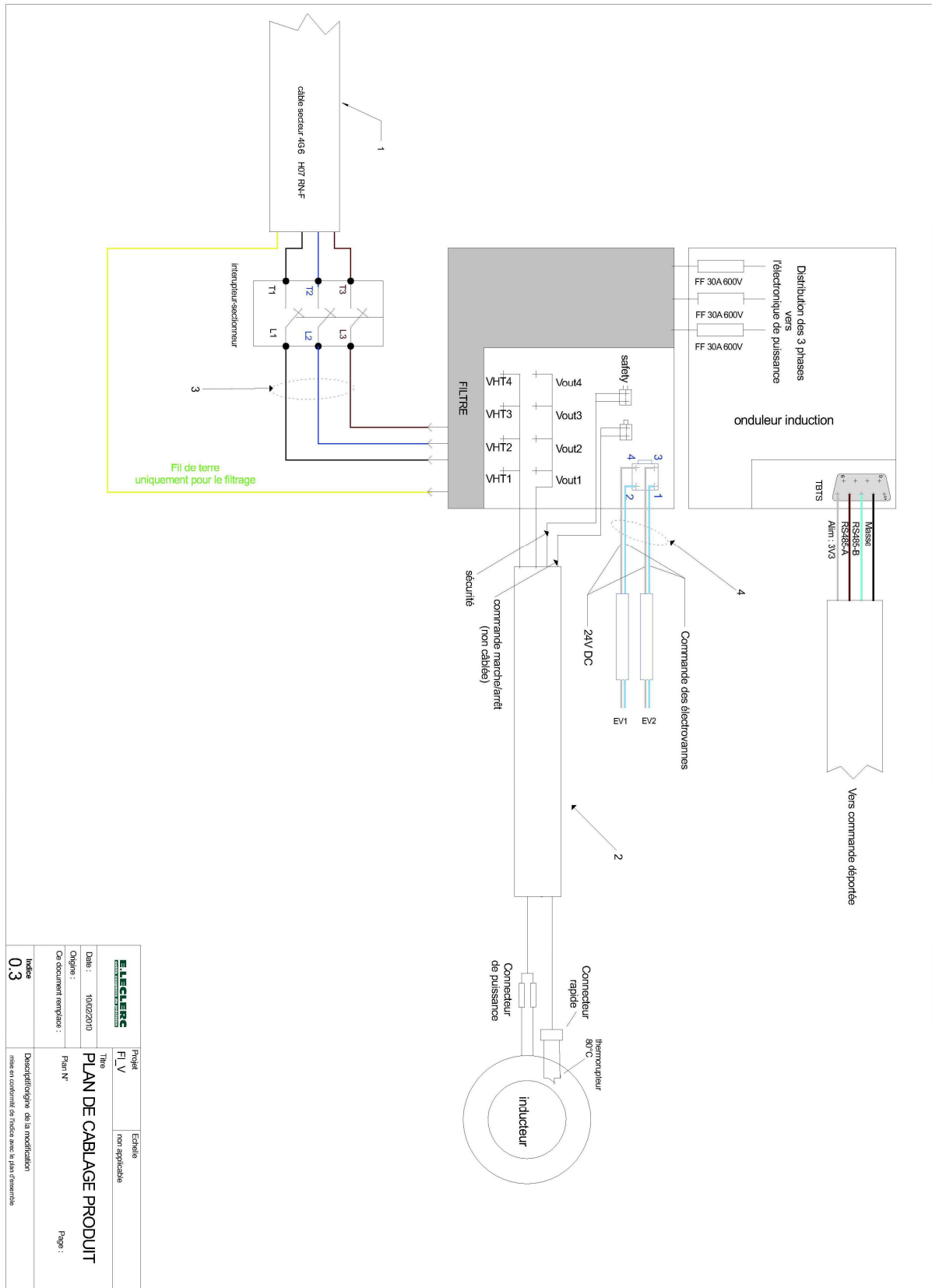
Overall, any malfunction detected or any damaged part requires stopping the unit, disconnecting it from the electric network, and needs to be reported to the manufacturer's after-sales service before re-operating the unit.

## 7 – TECHNICAL DATAS

#### Shrink fit unit :

Voltage	3 x 200 V / 240 V	50 Hz / 60 Hz
Power	14 kW	
Dimensions	255 x 482 x 755 mm	
Weight	20 kg	

# 8 – ELECTRICAL DIAGRAM



		Projet	Echelle
Date : 10/02/2010 Origine : Car document remplacé :		FLV	non applicable
Titre <b>PLAN DE CABLAGE PRODUIT</b>			
Page N° Page :			
Indice <b>03</b>		Description de la modification mise en conformité de l'indice avec le plan d'ensemble	

## 9 – EC CERTIFICATE

	<b>EC DECLARATION OF CONFORMITY</b>	rue Colbert F - 35300 FOUGERES
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E.LECLERC company, rue Colbert, 35300 FOUGERES, France, is confirming that the shrink fit unit ELCO Start.2 :

1) has been built according to the requirements of instructions CEM 2004/108/CE of 15/12/2004 and with indication of the following standards :

- > **EN 61000-6-2 of 2005**
- > **EN 55011 of 2007 + amendment A2 of 2007**

2) has been built according to the requirements of low voltage instruction 2006/95/CE of 12/12/2006 and with indication of the following standards :

- > **EN 61010-1 of june 2001**

This declaration is only valid for the units sold by ourselves and being made use of according to the stipulated services conditions and without having suffered from any alterations

Fougères 27th april 2010

Olivier LECLERC  
C.E.C.

