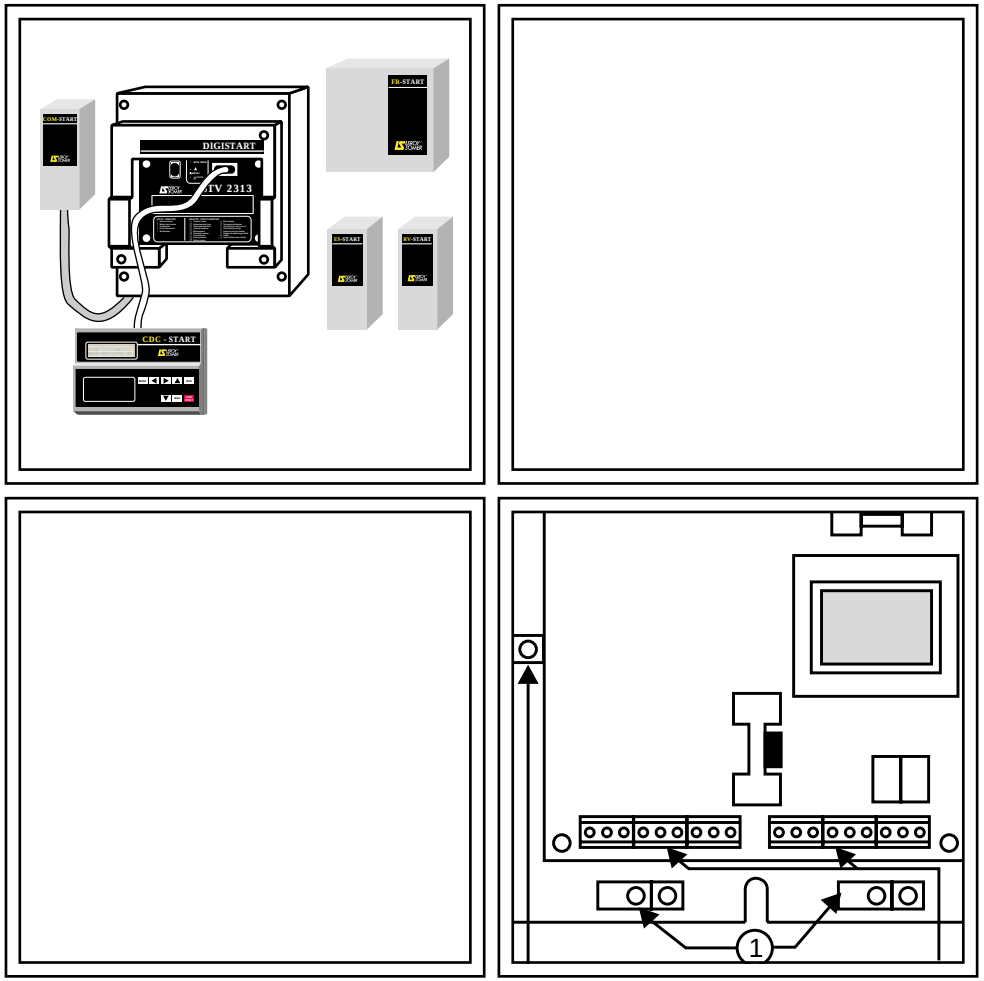
MOTEURS LEROY-SOMER 16015 ANGOULEME CEDEX-FRANCE

PLEASE CONTACT US AT :

Imprimerie MOTEURS LEROY-SOMER
RC ANGOULEME B 671 820 223

Réf. 1989 - O33 / a - 2.95



START OPTIONS

Options for DIGISTART STV 2313

Installation

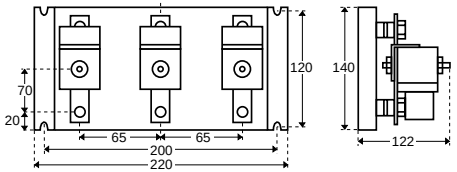
Other OPTIONS

1 - UR - START

Although the electronic's response times are very fast, the DIGISTART cannot protect the thyristors against short-circuits. Only the installation of fast-blow fuses sized according to the thermal characteristics of the thyristors and the operating cycle can prevent the power bridge being damaged when this type of fault occurs.

DIGISTART units ≥ 365A are supplied as standard, mounted with fast-blow fuses. However for models ≤ 250A, they are optional, in the form of a complete kit which includes : fuses, the fuse carrier and screws. The **UR - START** option has to be installed separate from the DIGISTART.

Dimensions and weight



The mounting and connection instructions are given in the installation manual supplied with the **UR - START** kit.

2 - IP20 - START

The **IP20 - START** kit is designed to increase the index of protection of DIGISTART STV 2313 electronic starters to IP20.

DIGISTART STV 2313 rating	IP 20 - START reference
37	1
60 and 86	2
145 to 250	3

There is no IP20 kit for ratings ≥ 365A, which are IP20 on 5 sides (but not the underside).

Dimensions and weight

IP 20 - START Reference	Height added to the STV 2313 (mm)	Weight (kg)	
		Net	Packed
1	100	1.2	1.70
2	100	1.6	2.15
3	130	1.6	2.15

Mounting instructions are given in the installation manual supplied with the **IP20 - START** kit.

NOTE

LEROY-SOMER reserves the right to modify its product characteristics at any time to incorporate the latest technological developments. The information contained in this document may therefore be changed without prior warning.
L**EROY-SOMER** gives no contractual guarantee whatsoever concerning the information published in this document and cannot be held responsible for any errors it may contain, nor for any damage arising from its use.

CAUTION

For the safety of personnel and equipment, LEROY-SOMER prohibits the use of the DIGISTART STV 2313 for hoisting applications.

For the user's own safety, the STV 2313 starter must be connected to an approved earth (B terminal).

Power electronic equipment such as speed controllers, soft starters and inverters cannot be used as circuit-breaking or isolating devices as specified in standard EN 60204 - 1 (1992), section 5.

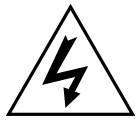
If an accidental start of the installation represents a risk for personnel or the machinery to be driven, it is imperative to supply the equipment via an isolating device and a circuit-breaking device (power contactor) controllable by an external safety system (emergency stop, fault detector).

The electronic starter is fitted with safety devices which can, in the case of certain faults, stop the starter and the motor. The motor can itself be jammed by mechanical means. Finally, voltage fluctuations, and particularly power cuts, can also cause the starter to switch off.
The removal of the cause of the shutdown can lead to restarting, with consequent hazard for certain machines or installations.

In such cases, it is essential that the user takes appropriate precautions against restarting when the motor makes an unscheduled stop.

Although this equipment complies with current construction standards, it may cause interference. The user must then take any necessary steps to eliminate it.

LEROY-SOMER declines all responsibility in the event of the above recommendations not being observed.



DANGER

IMPORTANT

BEFORE ANY INTERVENTION, WHETHER TO DO WITH THE ELECTRICS OR THE MECHANICS OF THE INSTALLATION OR MACHINE :
- ensure that the power to the starter has been switched off (fused isolator or circuit-breaker) and locked manually,
- wait 1 minute before any intervention.

3.4 - Connecting the power supply

3.4.1 - FR - START 86 module

As the **FR - START** 86 module has no forced ventilation unit, it is not necessary to provide an external 230V or 400V power supply.

3.4.2 - FR - START modules 250 to 900

FR - START modules 250 to 900 have forced ventilation units. They must therefore have an external power supply

3.4.3 - Description of the terminal block

The terminal block comprises 5 screw terminals which take multicore cables of maximum diameter 2.5 mm^2.

Ref.	Function	Elect. char.
N/L	Supply used with 230V or 400V	
230V	Supply used with N/L	Single phase 230V, 50/60Hz
400V	Supply used with N/L	Single phase 400V, 50/60Hz
-	Not used	Volt-free
ST1 ST2	**FR - START *** thermal protection	16A at 250V

*** Must be wired in series in the remote control of the security system which links terminals 10 and 11 of the STV.**

Note : If the module is supplied with 230V, the plastic plug in the 230V terminal must be removed.
Do not forget to connect the power supply earth wire to the B terminal.

3.4.4 - Cable diameter

Use twisted cable, 1.5mm^2 diameter.

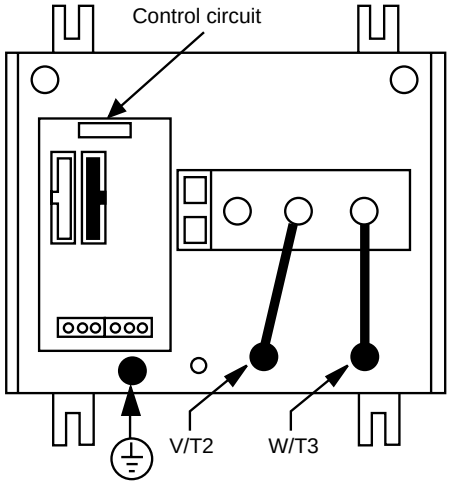
CONTENTS

3 - CONNECTION

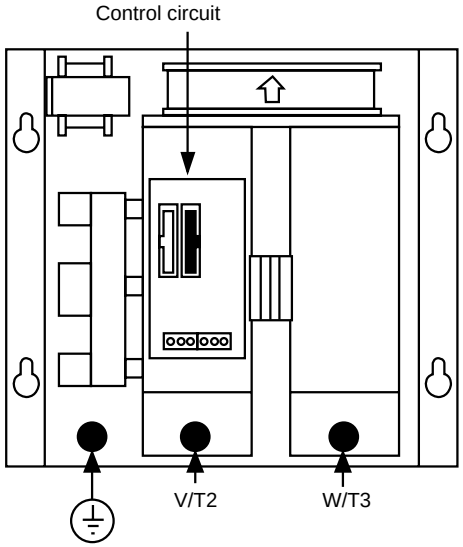
3.1 - Location of terminal blocks

• Power terminal blocks

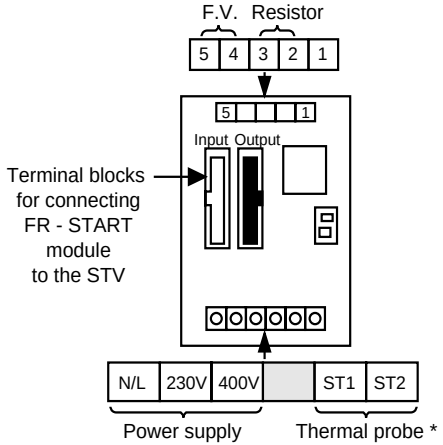
- **FR - START** 86 to 250



- **FR - START** 530 and 900

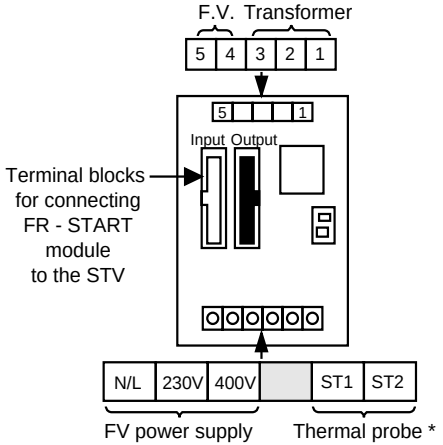


• Control terminal blocks (**FR - START** 86 and 250)



* The thermal probe must be wired in series in the remote control of the security system which links terminals 10 and 11 of the STV.

• Control terminal blocks (**FR - START** 530 and 900)



* The thermal probe must be wired in series in the remote control of the security system which links terminals 10 and 11 of the STV.

1 - GENERAL INFORMATION

1.1 - Operating principle

The **CDC - START** console, which has 8 keys, 1 LED and 1 LCD with 32 characters, is designed for use with starters in the STV 2313 range.

When connected to the basic model, it can be used to :

• simplify programming, diagnostics and display of parameters,

• achieve more precise settings,

• access the following additional functions :

- assigning the K1 relay,
- memorizing a set of parameters,
- limiting the number of starts,
- setting the hysteresis of the over and underload thresholds,
- setting time delays for tripping on overload/underload faults,
- setting the over/underload alarm thresholds,
- copying and transferring the parameters of one STV 2313 to another,

• to make use of data concerning the operation of the motor :

- absorbed current,
- power consumption,
- power factor cos φ,
- number of motor operation hours,
- last 5 faults,
- the current operating phase of the motor.

• set up the other options associated with the STV 2313 :

- FR - START : D.C. injection module which is used for braking, drying or heating the motor,
- RV - START : speed feedback module which provides gradual and repeated starts and deceleration, whatever the load.
- ES - START : inputs/outputs module which is used to control :
- 2 logic inputs (multiple settings),
- 1 analogue input,
- 2 analogue outputs,
- 2 relay logic outputs,
- 6 PTC sensors.

The parameters linked to the options are masked and only become visible when the options are connected.

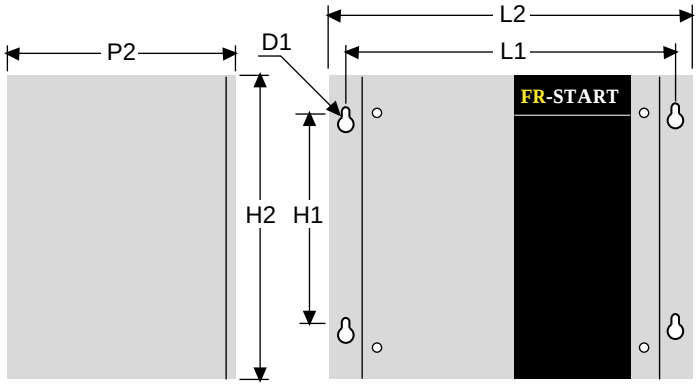
All parameters relating to a function which is not validated are masked so as to simplify programming by only providing access to active parameters.

Messages are available in 5 languages (English, French, German, Italian and Spanish). The language is selected during programming.

1.2 - General description

There is only one programming and copying console, which is called the **CDC–START**.

1.4.2 - Dimensions of FR - START 530 and 900



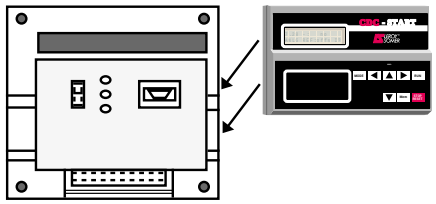
1.4.3 - Table of dimensions and weights

FR - START	rating	86	250	530	900
Mounting points (mm)	H1	150	150	200	200
	L1	168	168	335	335
	D1	6	6	10	10
Overall dimensions	H2	170	210	320	320
	P2	100	120	320	320
	L2	209	209	370	370
Weight	(kg)	2	3	10	10

2.3 - Installation

In all cases, it is preferable to install and/or connect the console when the STV 2313 is switched off.

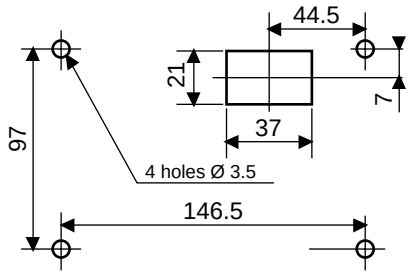
2.3.1 - Installation on the STV 2313



• A slot is provided on the STV 2313 control module for connecting the **CDC - START** console.
• The SubD9 connector on the console is plugged directly into the STV 2313 control module connector.
• The mechanical fixing is provided mainly by the magnet on the back of the console. However, if the installation is permanent, it is recommended that the console is screwed in place as follows :
- remove the protective cover of the STV 2313 control module,
- screw the console to the back of the cover using the 4 M3 x 12 screws supplied for this purpose,
- replace the control module cover.
• To remove the console, unscrew the 4 fixing screws if necessary, and use the strap above the display to pull the console out.

2.3.2 - Remote installation

The **CDC - START** console can also be installed remotely (on the front of a cubicle for example). In order to do this, please consult LEROY-SOMER who will supply a screened connection cable (1.5m, 3m or 5m in length) and follow the procedure described below.
• Drill holes in the surface chosen for the installation, according to the diagram below.



• Position the **CDC - START** console on this surface and fix it using the 4 screws supplied for this purpose.
• Use the screened connection cable (CD – CORD 1.5 (1.5m), CD - CORD 3.0 (3m) or CD - CORD 5.0 (5m)) to connect the **CDC - START** console to the STV 2313 control module.

3 - CONNECTION

Power supply : provided by the STV 2313 to which the console is connected.
Remote installation : max. length 5 m.

4 - COMMISSIONING

Refer to the **CDC - START** manual, ref. 1814.

FR - START module

1 - GENERAL INFORMATION

1.1 - Operating principle

When connected to the DIGISTART STV 2313 the **FR - START** module enables D.C. injection between 2 motor phases and thus provides access to the following additional functions.

1.1.1 - Braking before starting

In certain appications the rotor may be backdriven when the motor is not powered up. When a start command is given, this function brakes the free wheeling motor to a stop before commencing the starting phase.

- Maximum braking torque : 2.5 rated torque, can be adjusted by programming.
- Applications : ventilation units, deep well pumps, etc.

1.1.2 - Braking during deceleration

In the case of high inertia applications, this function shortens the natural stopping time. As soon as the stop command is given, the STV injects a D.C. current between 2 motor phases, producing a braking torque.

- Maximum braking torque : 2.5 rated torque, can be adjusted by programming.
- Applications : crushers, saws, grinding machines, etc.

1.1.3 - Motor anti-condensation

Keeps the motor free of condensation while it is stopped by circulating D.C. current between 2 phases.

- Start of injection with delay time after stopping.
- End of injection as soon as the command is given to restart the motor.
- Adjustable current level.

1.1.4 - Drying the motor

Dries the motor after it has been stopped for a long period, by circulating D.C. current between 2 phases.

- Manual start and stop of injection.
- Adjustable current level.

1.1.5 - Recommendations for use

CAUTION : D.C. injection causes the temperature of the motor to rise, which means that certain precautions must be taken.

• The level of D.C. current depends mainly on the motor characteristics. After making the necessary adjustments, it is **essential** to check, using a clamp ammeter, that the current in phases V or W does not exceed the values given below.

• If the D.C. injection is intermittent (braking), do not exceed 4 times the motor rated current.

In this extreme case, set the maximum injection period to 20 seconds and limit the number of starts, or size the motor accordingly, consider that in terms of heating, braking is equivalent to 2 starts.

• If the braking current is below 4 times the rated current, the maximum injection period can be increased in proportion to the square of the currents.

• If the injection is continuous (heating or drying), do not exceed 0.6 times the motor rated current.

• In view of the temperature rises caused by D.C. injection, it is advisable to use motors with temperature probes so that the STV will trip if the admissible motor temperature is exceeded.

RV - START module

1 - GENERAL INFORMATION

1.1 - Operating principle

When connected to the DIGISTART STV 2313, the **RV - START** module provides speed feedback data so that gradual and repeated starts are possible, whatever the load on the driven machine.

It is particularly well-suited for equipment whose load may vary widely from one start to the next.

Applications :

Starting conveyors, elevators, mixers, ball mills, pelleting machines, roll mills, etc.

In addition, the **RV - START** module has a logic input which is used for setting dual parameters on the STV if a 2-speed motor is used.

Open contact on input :
start and protect speed 1.
Closed contact on input :
start and protect speed 2.

The following three types of speed feedback can be chosen for the **RV - START** module :

1.1.1 - D.C. or A.C. tachometer

- A.C. or D.C. voltage signal.
- Can be installed anywhere on the machine as long as the signal is proportional to the speed of the motor.
- When the motor is at rated speed, the signal should be between 20 and 220V.

1.1.2 - Proximity sensor

- Use a 3-wire PNP or programmable inductive sensor.
- The sensor is supplied by the **RV – START** module.
- Can be installed anywhere on the machine as long as the number of pulses is proportional to the speed of the motor.
- For selection and installation of the sensor, refer to the manufacturer's instructions.
- When the motor is at rated speed, the number of pulses per minute should be between 3000 and 30000.

Note :

- The best results are obtained when the number of pulses is above 5000 per minute.

- Only salient elements can be counted.

1.1.3 - 4-20mA signal

- Use a 4-20mA signal proportional to the speed of the motor.
- 4 mA should correspond to zero motor speed and 20 mA to the rated speed.

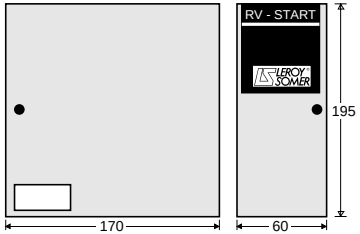
1.2 - General description

There is only one model, which is called the **RV - START**.

1.3 - General characteristics

Power supply :
230V (- 20% + 5%) 50/60 Hz ± 5%.
or
400V (- 15% + 10%) 50/60 Hz ± 5%.
Consumption : 10 VA.

1.4 - Dimensions and weight



Weight : 1 kg.

3.5 - Connecting the Inputs / Outputs

3.5.1 - Description of the terminal block

This has 18 screw terminals which will take multicore cables up to 2.5 mm^2 diameter.

3.5.2 - Description of the terminals

No.	Ref.	Description	Functions / Characteristics
1 2	EA1 0V	4-20mA or 0-10V analogue input	The type of signal is selected by programming
3 4 5 6 7	} CTP1 } CTP2 } CTP3 } CTP4	Connection of PTC probes *	The **ES - START** module is supplied with terminals 3 and 7 linked together. - For 1 PTC probe (or 1 set) : connect between terminals 3 and 7, having removed the link between them. - For several probes (or several sets) : wire them in series between terminals 3, 4, 5, 6 and 7.
8 9 10	SA1 0V SA2	Analogue outputs 1 and 2: 4-20mA or 0-10V, 0V : common terminal	The type of output signal is selected by programming.
11 12 13	EL1 0V EL2	Logic inputs 1 and 2 assigned by programming, 0V : common terminal	Use volt-free contacts according to the intended use.
14 15	SL1 SL1	Output relay K3 assigned by programming	Normally open contacts Max. voltage 250V AC1 Breaking capacity 3 A
16 17	SL2 SL2	Output relay K4 assigned by programming	
18	NOT USED		

* If the circuit is open between terminals 3 and 7, the display will indicate "FAULT PTC SENSORS".

4 - COMMISSIONING

4.1 - Access to parameter setting

The CDC - START console must be used for setting the parameters of a DIGISTART fitted with the **ES - START** option.

To access the settings, follow the procedure described in section 3.3.4 of the CDC - START console manual.

4.2 - Setting the parameters of the DIGISTART

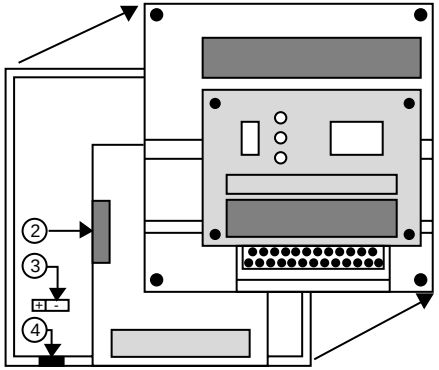
- Connecting the **ES - START** module automatically provides access, via the CDC - START console, to the various menus linked with this option.

- Do not connect or disconnect the 34-pin screened cable when powered up.
- Set the parameters with the motor stopped.

3.3 - Connecting the RV - START module to the STV 2313

3.3.1 - STV with no options :

- Use the screened cable (34-pin) supplied for this purpose.
- Switch off the power supply to the basic STV to which the option is to be connected.
- Remove the cover of the basic STV control module.



- Snap out the cable passage (4).
- Connect the screened cable (34-pin), whose end is fitted with a cable clamp, to the connector (2) on the basic STV control board.
- Connect the screen by screwing the cable clamp onto the earth terminal (3).
- Connect the other end of the screened cable (34-pin) to the Input connector of the **RV - START** module (do not connect the screen at this end).
- Replace the STV control module cover.

3.3.2 - STV with an option already connected

- As the connector (2) on the STV control card is already in use, connect the end of the screened cable (34-pin), which is fitted with a cable clamp, to the Output connector on the option module which has already been connected to the STV (after removing the plastic plug from the Output connector).

Connect the screen by screwing the cable clamp onto the earth terminal inside the casing.

- Connect the other end of the screened cable to the Input connector on the **RV - START** module (do not connect the screen at this end).

3.4 - Connecting the power supply

3.4.1 - Description of the terminal block

Comprises 3 screw terminals which take multicore cables of maximum diameter 2.5mm^2.

Ref.	Function	Elect. char.
N/L - 230V	Power supply for **RV-START**	Single phase 230V - 50/60Hz
N/L - 400V		Single phase 400V - 50/60Hz

Note : If the module is supplied with 230V, the plastic plug must be removed from the 230V terminal.

IMPORTANT : The STV 2313 and the RV - START module must have the same power supply and they must be powered up simultaneously.

Do not forget to connect the power supply earth wire to the ʙ terminal.

3.4.2 - Cable diameter

Use twisted cable, diameter 1.5mm^2.

2 - MECHANICAL INSTALLATION

2.1 - Inspection on receipt

On receipt of the **ES - START** module, check that it has not been damaged in transit. In the event of any problems, contact the carrier.

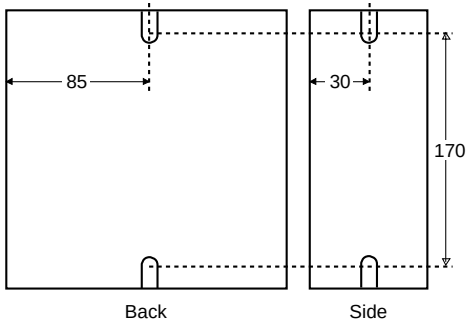
2.2 - Installation precautions

To avoid any risk of interference it is strongly recommended that :

- the **ES - START** module is fixed on a metal frame which is correctly earthed,
- the **ES - START** module is not installed more than 1.5 m from the basic STV,
- the connection lead is well away from all power cables.

2.3 - Installation

The fixing holes inside the casing of the **ES - START** module are designed so that it can be installed via the back plate (flat) or via the side plate. As the connection block is across the whole width of the module, access is easier if it is installed flat.

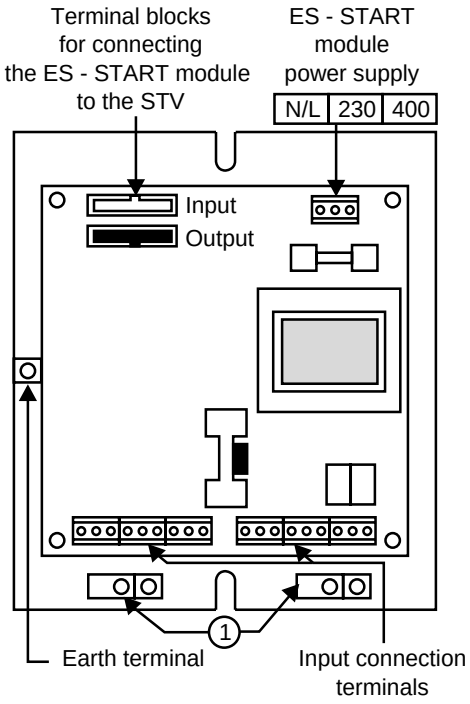


3 - CONNECTION

3.1 - General recommendations

- Connect the control terminals using screened twisted cable with the screen connected to the earth of the casing. To do this, strip the screened cable back 15 mm, unscrew the cable clamp (1), close the cable clamp on the cable screen and screw the cable clamp back in place.
- Install RC circuits on the coils of the relays or contactors controlled by the STV.
- Avoid running wires connected to the control terminal block near to power cables.

3.2 - Location of terminal blocks



ES - START module

CONTENTS

1 - GENERAL INFORMATION

1.1 - Operating principle

When connected to the DIGISTART STV 2313 the **ES - START** module provides access to the following Inputs / Outputs :

1.1.1 - Two logic inputs

Volt-free contact input assigned to the management of external trips and / or multi-setting of the STV.

• External trips

Tripping and disabling of the STV when the contact connected to the input is open.
Management by the STV of external safety devices (PTO temperature probes, pressure sensors, limit switches, etc).

• Multi-setting

Ability to use 2 sets of preset parameters by closing a contact on one of the logic inputs, or 4 sets of preset parameters by combining 2 contacts on the 2 logic inputs.
Applications :
- Cascaded starting of several motors of differing powers or requiring different starting parameters.
- Starting and protection of a 2-speed motor :
parameter set 1 : low speed,
parameter set 2 : high speed.
- Machines which generally start without load but which may occasionally start under load.
Parameter set 1 : no-load start.
Parameter set 2 : start under load.

• Possible configurations for the two inputs

1/ Inputs EL1 and EL2 are assigned to separate management of 2 trips external to the STV.

2/ One of the two inputs (EL1 or EL2) is assigned to external trip management, and the other is used to access a second set of parameters.

EL1 or EL2	Selection
O	Parameter 1
C	Parameter 2

O : terminal not connected to 0V.
C : terminal connected to 0V.

3/ The 2 inputs are assigned to multi-setting.
Ability to use 4 sets of parameters.

EL1	EL2	Selection
O	O	Parameter 1
C	O	Parameter 2
O	C	Parameter 3
C	C	Parameter 4

O : terminal not connected to 0V.
C : terminal connected to 0V.

1.1.2 - Two logic outputs

These 2 additional relays, together with the 2 relays mounted on the basic STV, increase the number of relays which can be assigned to 4.
The characteristics and functions available, are identical to those of the basic product.

ES - START module

1.1.3 - One analogue input

Allows the STV to manage a 4-20mA or 0-10V external analogue signal.
- Trip :
Ability to trip and disable the STV if the analogue input exceeds an adjustable upper threshold and/or falls below an adjustable lower threshold (adjustable trip time delay).
- Threshold relay :
Closing of an STV relay (K1 to K4) if the analogue input exceeds an upper level (adjustable) and opening if the analogue input falls below a lower level (adjustable).
Applications : alarm, Start/Stop command at adjustable levels. Ability to use several relays to indicate different levels.

1.1.4 - PTC input

Allows the STV to manage one or more PTC probes (up to 6 in series).

1.1.5 - Analogue outputs

Ability to obtain a 4-20mA or 0-10V signal proportional to :
- the current drawn by the motor,
- and / or the power consumed by the motor.
Applications : load monitoring, regulation as a function of the load, display.
- and / or the analogue input.
Application : display.

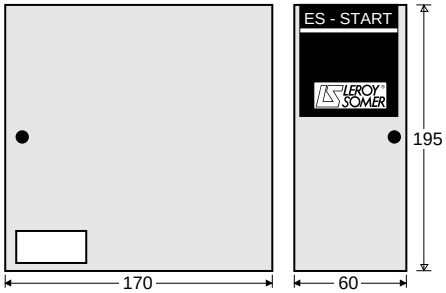
1.2 - General description

There is only one model, which is called the **ES - START.**

1.3 - General characteristics

Power supply :
230V (- 20% + 5%) 50/60 Hz ± 5%.
or
400V (- 15% + 10%) 50/60 Hz ± 5%.
Consumption : 10 VA.

1.4 - Dimensions and weight



Weight : 1 kg.

3.5 - Connecting the inputs

3.5.1 - Description of the terminal block

This has 9 screw terminals which will take multicore cables up to 2.5 mm^2 diameter.

3.5.2 - Description of the terminals

No.	Ref.	Description	Functions/Characteristics
1 2 3	Bk (E) Br (+) Bl (-)	Inductive sensor black wire Inductive sensor brown wire Inductive sensor blue wire	Connection of a 3-wire PNP or programmable inductive sensor.
4 5	CT1 CT2	Input for A.C. or D.C. tachometer	Signal between : 20V and 220V D.C. or A.C.
6 7	0V CA	Input of an analogue signal proportional to the motor speed	4-20mA signal
8 9	2V1 2V2	Validation of the logic input Terminals 8 & 9 not connected : Sp. 1 Terminals 8 & 9 connected : Sp. 2	Enables connection of a volt-free contact when using a 2-speed motor.

4 - COMMISSIONING

4.1 - Access to parameter setting

The CDC - START console must be used for setting the parameters of a DIGISTART fitted with the **RV - START** option.

To access the settings, follow the procedure described in section 3.3.4 of the CDC - START console manual.

4.2 - Setting the parameters of the DIGISTART

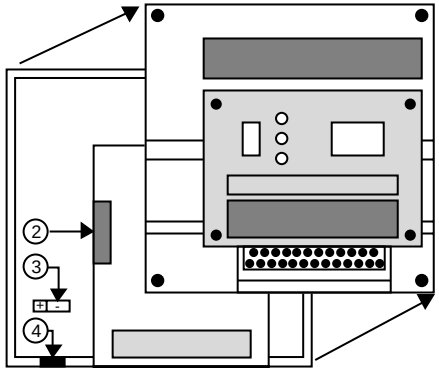
- Connecting the **RV - START** module automatically provides access, via the CDC - START console, to the various menus linked with this option.

- Do not connect or disconnect the 34-pin screened cable when powered up.
- Set the parameters with the motor stopped.

3.3 - Connecting the ES - START module to the STV 2313

3.3.1 - STV with no options :

- Use the screened cable (34-pin) supplied for this purpose.
- Switch off the power supply to the basic STV to which the option is to be connected.
- Remove the cover of the basic STV control module.



- Snap out the cable passage (4).
- Connect the screened cable (34-pin), whose end is fitted with a cable clamp, to the connector (2) on the basic STV control board.
- Connect the screen by screwing the cable clamp onto the earth terminal (3).
- Connect the other end of the screened cable (34-pin) to the Input connector of the **ES - START** module (do not connect the screen at this end).
- Replace the STV control module cover.

3.3.2 - STV with an option already connected

- As the connector (2) on the STV control board is already in use, connect the end of the screened cable (34 pin), which is fitted with a cable clamp, to the Output connector on the option module which has already been connected to the STV (after removing the plastic plug from the Output connector).
- Connect the screen by screwing the cable clamp onto the earth terminal inside the casing.
- Connect the other end of the screened cable to the Input connector on the **ES - START** module (do not connect the screen at this end).

3.4 - Connecting the power supply

3.4.1 - Description of the terminal block

Comprises 3 screw terminals which take multicore cables of maximum diameter 2.5mm^2.

Ref.	Function	Elect. char.
N/L - 230V	Power supply for **ES - START**	Single phase 230V 50/60Hz
N/L - 400V		Single phase 400V 50/60Hz

Note : If the module is supplied with 230V, the plastic plug must be removed from the 230V terminal.

IMPORTANT : The STV 2313 and the ES - START module must have the same power supply and they must be powered up simultaneously.
Do not forget to connect the power supply earth wire to the B terminal.

3.4.2 - Cable diameter

Use twisted cable, diameter 1.5mm^2.

2 - MECHANICAL INSTALLATION

2.1 - Inspection on receipt

On receipt of the **RV - START** module, check that it has not been damaged in transit. In the event of any problems, contact the carrier.

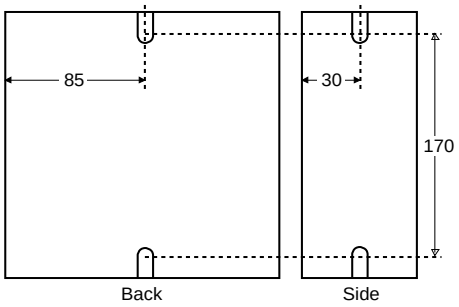
2.2 - Installation precautions

To avoid any risk of interference it is strongly recommended that :

- the **RV - START** module is fixed on a metal frame which is correctly earthed,
- the **RV - START** module is not installed more than 1.5 m from the basic STV,
- the connection lead is well away from all power cables.

2.3 - Installation

The fixing holes inside the casing of the **RV - START** module are designed so that it can be installed via the back plate (flat) or via the side plate. As the connection block is across the whole width of the module, access is easier if it is installed flat.

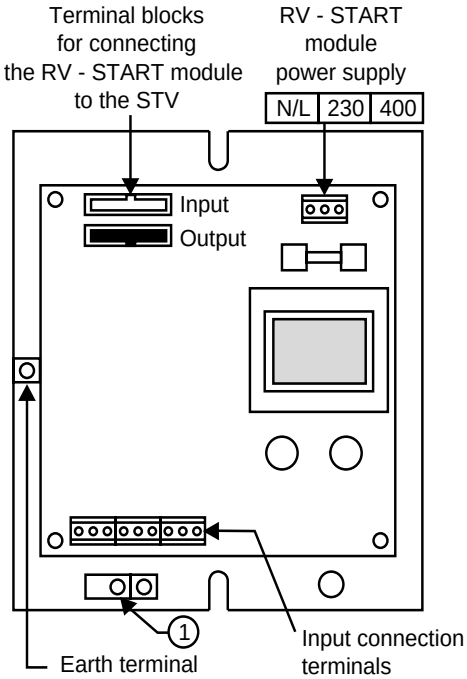


3 - CONNECTION

3.1 - General recommendations

- Connect the control terminals using screened twisted cable with the screen connected to the earth of the casing. To do this, strip the screened cable back 15 mm, unscrew the cable clamp (1), close the cable clamp around the cable screen and screw the cable clamp back in place.
- Install RC circuits on the coils of the relays or contactors controlled by the STV.
- Avoid running wires connected to the control terminal block near to power cables.

3.2 - Location of the terminal blocks



CONTENTS

CONTENTS

1.2 - General description

Example : **FR - START 14 - 86**

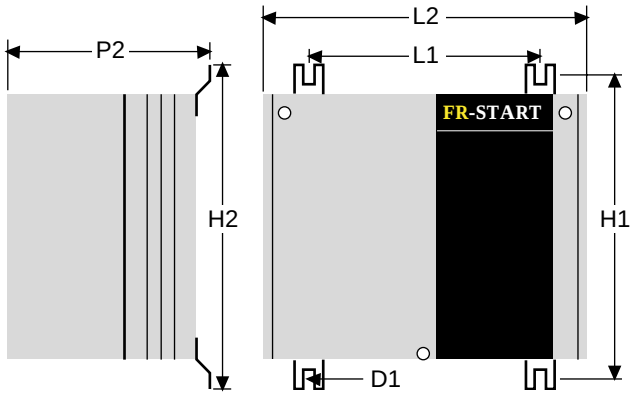
- **FR - START** : D.C. injection option module.
- **14** : supply voltage code
  14 : 208 V to 500 V.
  16 : 500 V to 690 V.
- **86** : Maximum STV 2313 rating to which the module can be connected
  86 : used with DIGISTART STV 2313 - 37, 60, 86.
  250 : used with DIGISTART STV 2313 - 145, 211 and 250.
  530 : used with DIGISTART STV 2313 - 365 and 530.
  900 : used with DIGISTART STV 2313 - 700 and 900.

1.3 - General characteristics

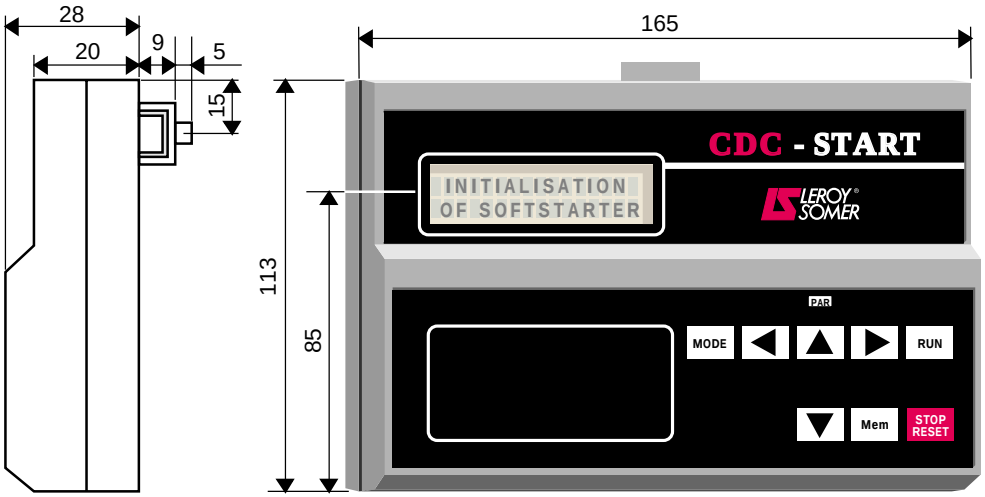
STV 2313 rating	**30**	**60**	**86**	**145**	**211**	**250**	**365**	**530**	**700**	**900**
FR - START size	**86**			**250**			**530**		**900**	
Control supply Voltage Frequency	No supply			230V (-20%, +5%) or 400V (-15%, +10%) 50/60 Hz ±5%						
Maximum current	Depending on injection period : see tables in section 4.2									
Consumption	0VA			20VA			40VA			
Operating conditions	0°C to 40°C									
Protection index	IP 00									

1.4 - Dimensions and weight

1.4.1 - Dimensions of FR - START 86 and 250



1.3 - Dimensions and weight



Weight : 0.3 kg.

2 - MECHANICAL INSTALLATION

2.1 - Inspection on receipt

On receipt of the **CDC - START** module, check that it has not been damaged in transit. In the event of any problems, contact the carrier.

2.2 - Installation precautions

To avoid any risk of interference when the **CDC - START** console is installed remotely, it is strongly recommended that :

- the console is placed well away from any power source which could be a source of radiation (transformer, busbar system, etc),
- the console is not installed more than 5m away from the STV 2313 control module,
- the connection lead is well away from all power cables.

2 - MECHANICAL INSTALLATION

2.1 - Inspection on receipt

On receipt of the **FR - START** module, check that :

- it has not been damaged in transit (in the event of any problems, contact the carrier).
- that the information on the identification plate of the **FR - START** is compatible with the STV.

2.2 - Installation recommendations

The **FR - START** is wall-mounted. It should be installed vertically and the following precautions taken :

• When the **FR - START** is mounted in a cubicle, it is important to take into account the renewal of air required for cooling the unit. To do this, space should be left around the **FR - START**, in particular around the air intakes and outlets. Leave at least 10 cm above and below the unit.

• Provide sufficient space around the **FR - START** for easy access to connections.

• When the **FR - START** is installed in a cubicle, check that the ventilation is adequate to evacuate the heat.

FR - START rating	86	250	530	900
Max. losses (W)	60	140	440	750
Forced vent. rate (l/s)	0	21	117	117

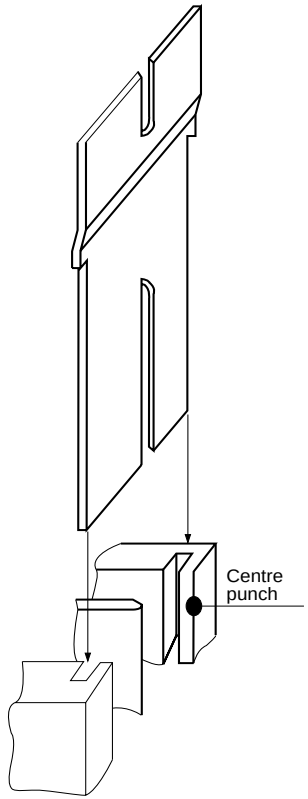
• To avoid any risk of interference it is strongly recommended that :

- the **FR - START** module is fixed on a metal frame which is correctly earthed,
- the **FR - START** module is not installed more than 1.5 m from the basic STV,
- the 34-pin screened cable is well away from all power cables,
- RC circuits are installed on the coils of the relays and contactors.

2.3 - Mounting

A set of fixing feet for mounting is supplied with the **FR - START** 86 and 250 ratings. Slide the foot into the groove provided for it in the heat sink. It may be necessary to use a centre punch in order to keep it in place and make handling easier when mounting the **FR - START** in the cubicle.

Note : For the 250 rating, locate the longest fixing feet on the ventilation unit side.

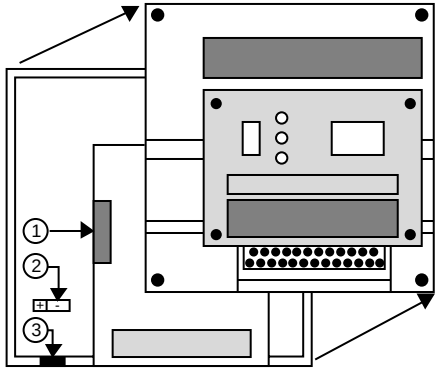


CONTENTS

3.2 - Connecting the control of the FR - START to the STV 2313

3.2.1 - STV with no options :

- Use the screened cable (34-pin) supplied for this purpose.
- Switch off the power supply to the basic STV to which the option is to be connected.
- Remove the cover of the basic STV control module.



- Snap out the cable passage (3).
- Connect the screened cable (34-pin), whose end is fitted with a cable clamp, to the connector (1) on the basic STV control board.
- Connect the screen by screwing the cable clamp onto the earth terminal (2).
- Connect the other end of the screened cable (34-pin) to the Input connector of the **FR - START** module (do not connect the screen at this end).
- Replace the STV control module cover.

3.2.2 - STV with an option already connected

- As the connector (1) on the STV control board is already in use, connect the end of the screened cable (34-pin), which is fitted with a cable clamp, to the Output connector on the option module which has already been connected to the STV (after removing the plastic plug from the Output connector).
- Connect the screen by screwing the cable clamp onto the earth terminal provided.
- Connect the other end of the screened cable to the Input connector on the **FR – START** module (do not connect the screen at this end).
- The **FR - START** module should always be the last module to be connected.

3.3 - Connecting the power terminals between the FR - START and the STV

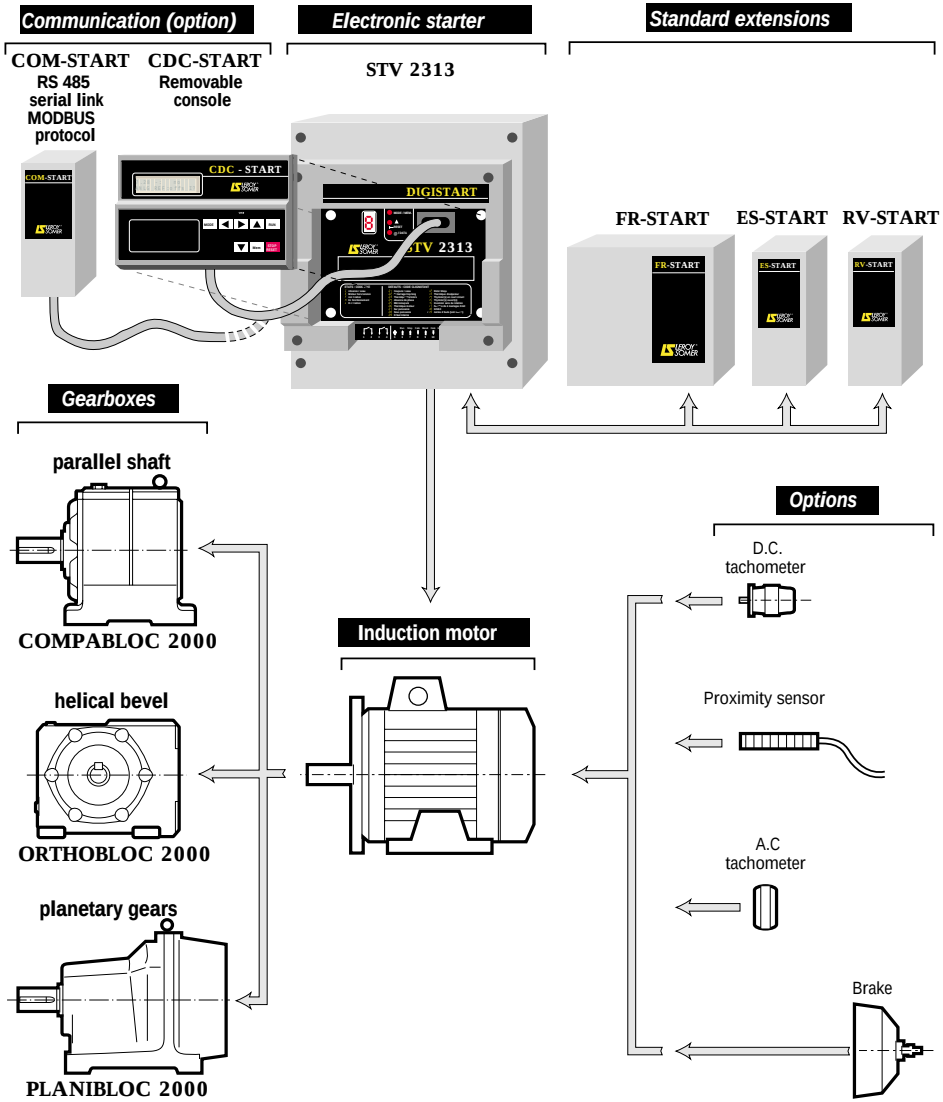
- Use the following power cables.

FR - START rating	Diameter (mm^2)	Length (mm)
86	16	500
250	50	700
530	120	1000
900	2 x 120	1000

Note : FR - START 86 and 250 ratings are supplied complete with power cables.
Connect terminals V/T2 and W/T3 on the **FR – START** module to STV terminals V/T2, W/T3 respectively.

PREFACE

This manual describes how to install and connect the main options for the STV 2313 electronic starter.



4 - COMMISSIONING

4.1 - Access to parameter setting

The CDC - START console must be used for setting the parameters of a DIGISTART fitted with the **FR - START** option.
To access the settings, follow the procedure described in section 3.3.4 of the CDC - START console manual.

4.2 - Setting the parameters of the DIGISTART

- Connecting the **FR - START** module automatically provides access, via the CDC - START console, to the various menus linked with this option.
- Do not connect or disconnect the 34-pin screened cable when powered up.
- Set the parameters with the motor stopped.
- The maximum current level depends on how long injection lasts. The limits are given in the table below.

Maximum D.C. current injected as a function of the injection period

FR - START 86	Injection period (s)					
	0.1 to 10	10.1 to 20	20.1 to 30	30.1 to 40	40.1 to 50	50.1 to 60
Maximum current (A)	170	170	155	150	140	140

FR - START 250	Injection period (s)					
	0.1 to 10	10.1 to 20	20.1 to 30	30.1 to 40	40.1 to 50	50.1 to 60
Maximum current (A)	300	300	285	270	265	260

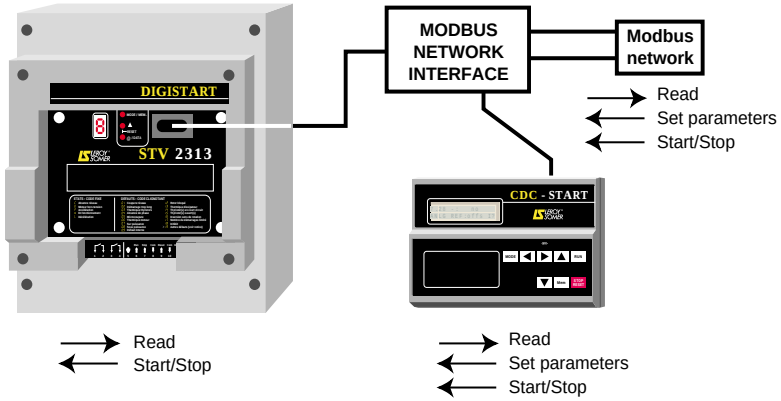
FR - START 530	Injection period (s)					
	0.1 to 10	10.1 to 20	20.1 to 30	30.1 to 40	40.1 to 50	50.1 to 60
Maximum current (A)	820	820	765	735	690	660

FR - START 900	Injection period (s)					
	0.1 to 10	1.1 to 20	20.1 to 30	30.1 to 40	40.1 to 50	50.1 to 60
Maximum current (A)	1400	1400	1300	1245	1220	1200

Note :
- The maximum current is the D.C. current measured in the V and W phases of the **FR - START**.
- The currents shown in the above tables are defined for 1 braking operation every 10 min. For more severe operating cycles please consult LEROY-SOMER.

3 - COM - START

The MODBUS network interface used with starters in the DIGISTART STV 2313 range, extends the communication capabilities of the basic product, using the settings mode to configure and control the DIGISTART, and the read mode to access all the DIGISTART's data.



A short description of the MODBUS protocol, and the mounting and connection instructions are given in the installation manual supplied with **COM - START** units, or on request.

4 - DER - START

The **DER - START** kit is designed to enable connection of a bypass contactor to the DIGISTART STV 2313 thyristor terminals (365 to 900 ratings). System losses are thus decreased while maintaining all monitoring, protection and recording of the DIGISTART STV 2313 faults.

DIGISTART STV 2313 rating	DER - START reference
365 and 530	1
700 and 900	2