

# FACT

## Controller

S/W Ver. 1.50

## User and Maintenance Manual

Original text translation

## Warranty Information

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## 1. INTRODUCTION

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This *User and Maintenance Manual* refers to **FACT controller**. You can find additional copies and newer revisions of this document from our website <http://www.dropsa.com>. Alternatively contact one of our Sale Offices.

Please read this manual carefully, as it contains important information on health safety issues: a copy of this manual should remain with the user of the product.

## 2. GENERAL DESCRIPTION

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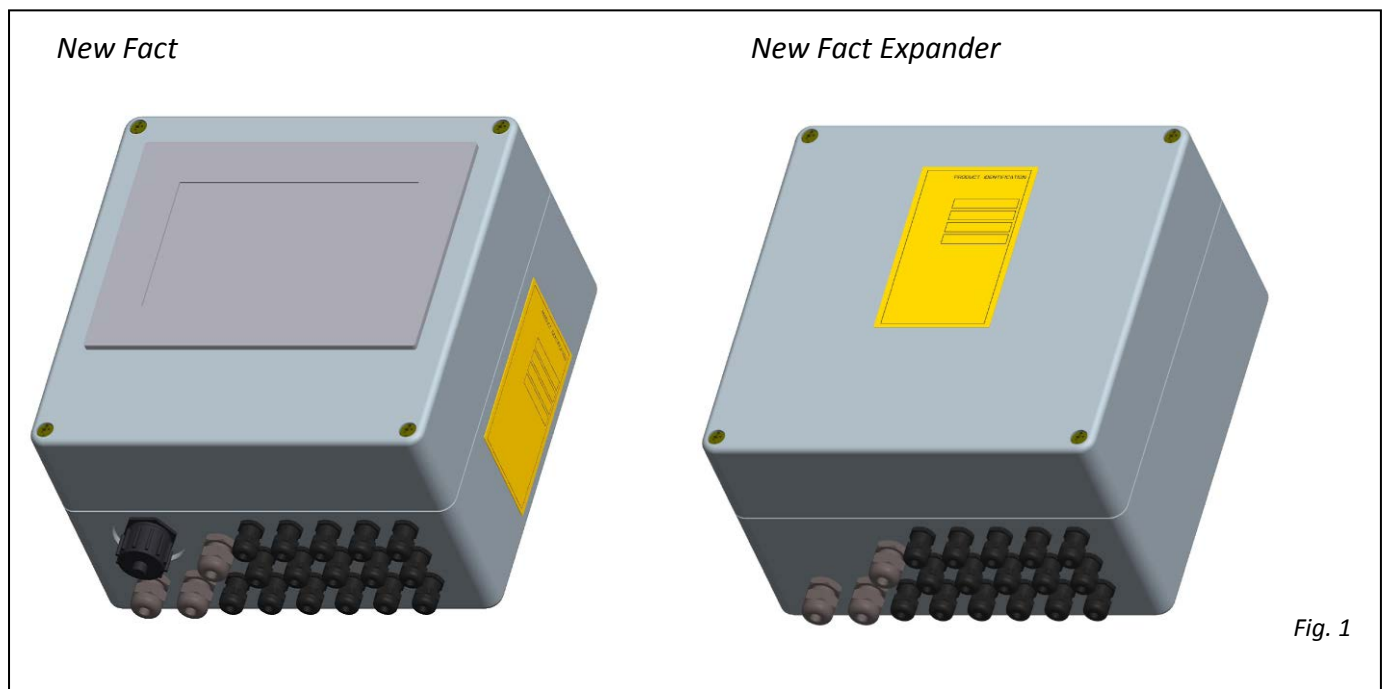
### 2.1 GENERAL CHARACTERISTICS

In medium/large lubrication systems it is often necessary to independently monitor and control the flow of each of the lubrication points. FACT CONTROLLER has been designed to monitor and control (via motorized Flowmasters) lubricant flow. This controller is particularly suitable for medium/large lubrication systems. Each FACT can monitor and control up to 16 Flowmasters. Its modular structure allows expansion of the lubrication system without having to change the controller.

### 2.2 ACCESSORIES

You can expand the number of flow monitored by the FACT by connecting to FACT EXPANDER that can manages an additional 16 flow meters. Up to seven FACT REMOTE EXPANDER MODULES can be connected to a single FACT enabling the control of up to 128 Flow switches.

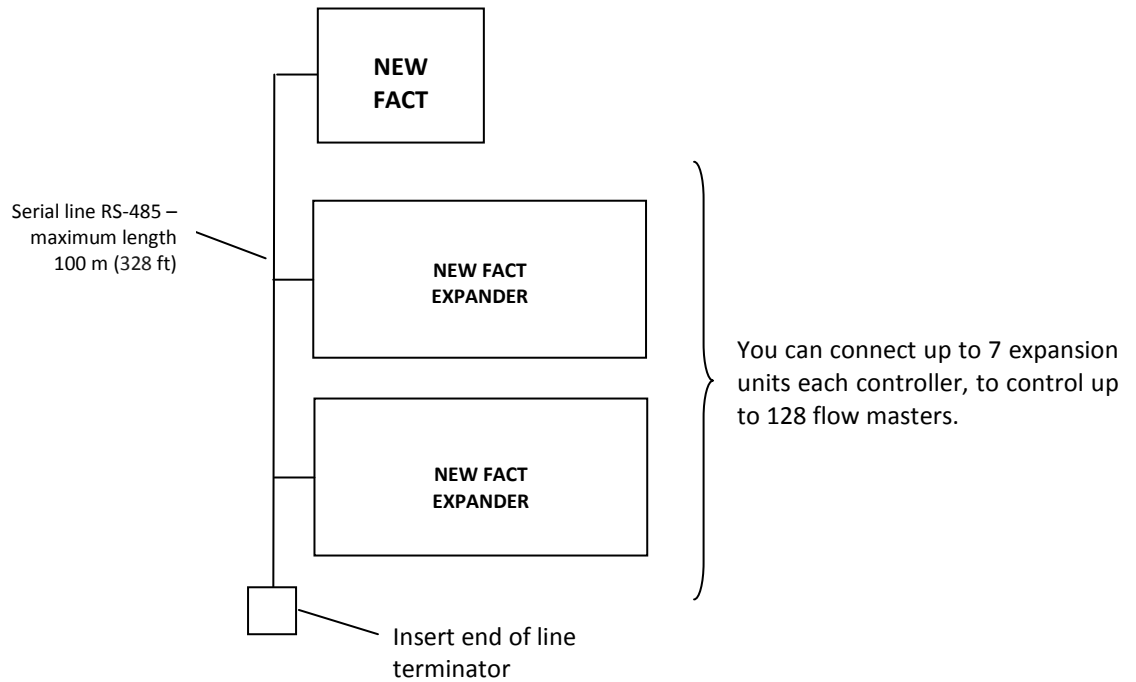
With an interface board it is also possible to connect FACT with the previous generation of FACT REMOTE EXPANDER MODULE. In this case maximum number of controllable flow switches is 128. The interface board can be housed inside the FACT EXPANDER box.



## 2.3 CONNECTION EXAMPLE

Below is an example of connection explained before.

### FACT \ FACT EXPANDER CONNECTION



## 2.4 BASIC APPLICATIONS

FACT is used to manage flowmaster flow measurement and regulation devices (see DROPSA "Flowmaster" product) used primarily in oil recirculating systems. The FACT and Flowmaster products can be used in any applications that requires accurate point-for-point monitoring and control of lubricant flow in oil-recirculation systems

## 3. MACHINE IDENTIFICATION

Product identification label is located on the side of the controller and contains product serial number, voltage and basic technical characteristics.

## 4. TECHNICAL CHARACTERISTICS

PARAMETER	FACT & FACT EXPANDER
Power supply	Automatic range : 85÷260 VAC – 50/60 Hz
Power absorption	30 W
Input signals	Flow meters 24 V DC TIPO NPN/PNP
Output signals	⇒ Remote alarm 250 V 1A (switch)
Max Distance between <i>FACT</i> and <i>FACT-Expander</i> and between <i>FACT</i> and <i>FACT-EXPANDER</i>	100 m (328 ft)
Operating temperature	- 5°C ÷ + 55°C (-41°F ÷ +131°F)
Storage temperature	-20°C ÷ +65°C (-68°F ÷ +149°F)
Operating humidity	90% max
Mechanic protection grade	IP64



**ATTENTION:** All electrical equipment must be installed by adequately qualified personnel and in compliance with above specifications and good electrical practice.

## 5. EQUIPMENT

FACT has a touch screen LCD display that allows users to interface and set the operations of controller. A tree structure Sub-menu allows access to all the parameters. You will see the pages linked from the main display menu listed on in par.9. The panel is installed in a sealed IP64 box seal. Inside the box the controller contains a control PCB where the terminal strip is located to allow for all necessary connections (see par.8.3). The cables come into the device through cable glands.



FACT Controller

Fig. 2

## 6. FLOWMASTER

FLOWMASTER is a volumetric flow meter that allows flow measurement of lubricant independently of temperature and viscosity.

It's equipped by a common base manifold for all types of flowmaster modules. Different modules provide different flow range.

The following table summarizes the flow rates measurable using three types of module available.

METERING MODULE SIZE		CAPACITY	
cm <sup>3</sup> /rev	cu.in./rev	lt/min.	gals/min.
5	0,30	0,20 ÷ 5	0,044 ÷ 1,1
10	0,61	0,50 ÷ 10	0,11 ÷ 2,2
20	1,22	1 ÷ 20	0,22 ÷ 4,4

The metering module monitors flow with reliability thanks to a satellite, pushed by the lubricant and rotating with an orbital movement and an inductive sensor which can be connected to *FACT-2000*. As satellite rotation speed increases or decreases depending on flow, sensor sends a signal to the controller at each satellite revolution.

The measuring module is connected to the base by four screws, so that any kind of intervention can be carried out without disassembling main or branch piping.

Key advantages of the system:

- System modularity ;
- Flow visual monitoring via transparent cover;
- Flow delivery always guaranteed (even if satellite stops, flow goes on);
- Accurate monitoring of the flow;
- Easy maintenance.

More detailed information related to this product are described in the product manual that can be downloaded from our website <http://www.dropsa.com>.



## 7. UNPACKING AND INSTALLING

### 7.1 UNPACKING

Once a suitable location has been found to install the unit remove the equipment from the packaging. No particular disposal procedures are necessary; however packing should be disposed of in accordance with regulations that may be in force in your area or state.

### 7.2 INSTALLING

Provide adequate space for the installation, leaving minimum 100 mm (3.93 in.) around the controller. Mount the controller at comfortable height to avoid unnatural posture or the possibility of sustaining impacts. For the installation use the four fixing holes (see dimensions in ch. 14). Do not install the controller in particularly aggressive or explosive/flammable environments, if not preventively disposed by the manufacturer.

## 7.3 ELECTRIC CONNECTIONS

### 7.3.1 FACT CPU BOARD



**ATTENTION:** Before opening the equipment disconnects power and wait 5 minutes.

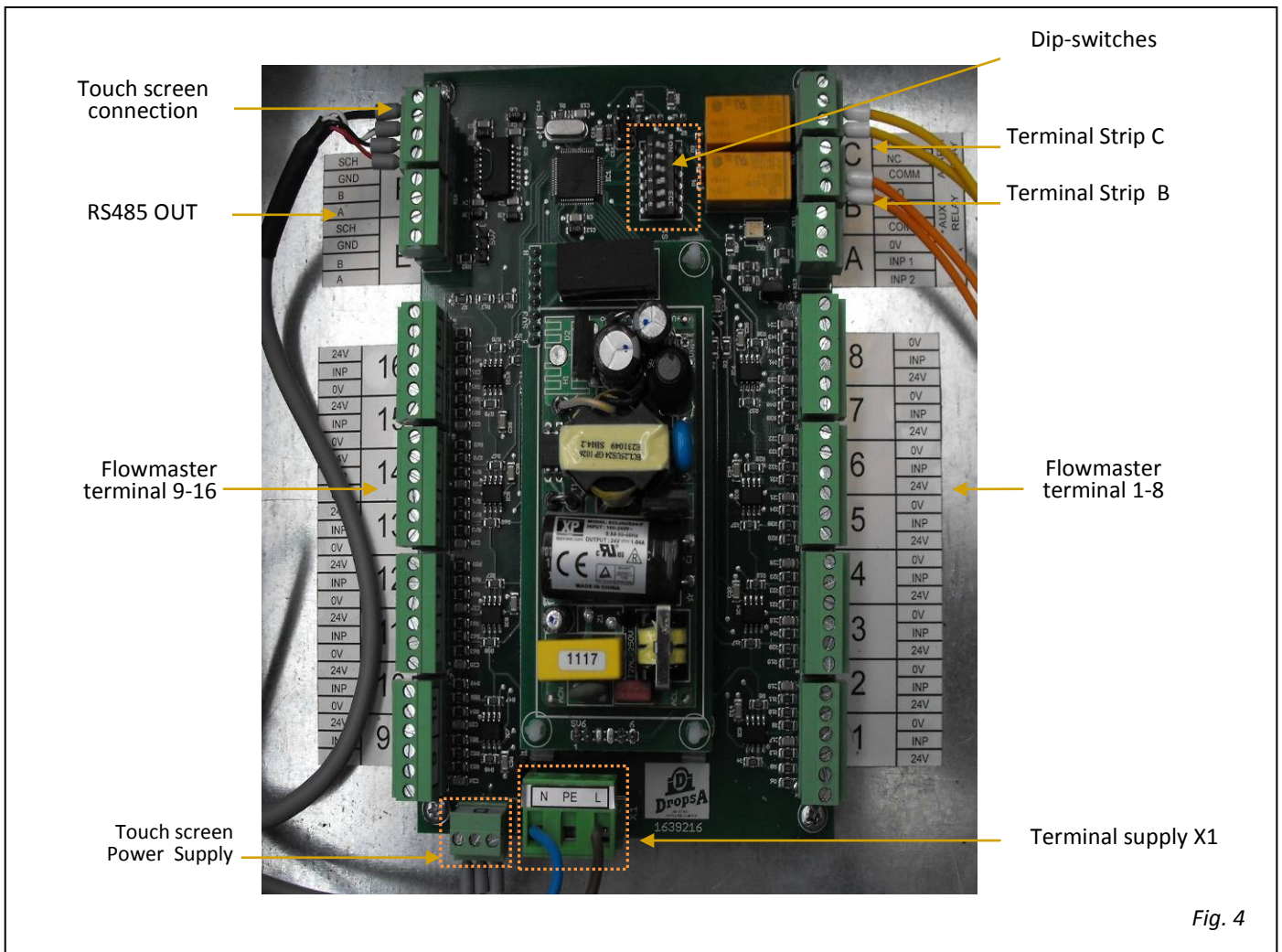


Fig. 4

Connect power supply to Terminal X1 (A ferrite must be tightened around the power supply cable).

Connect the flowmaster devices on terminals 1 to 16.

For remote alarm connections various voltage-free contact relays can be used.

Use the following connection for monitoring.

Remote Low Flow Alarm can be connected to Terminal Strip C.

Remote Alarm – user settable based on operating parameter Use Terminal Strip B.

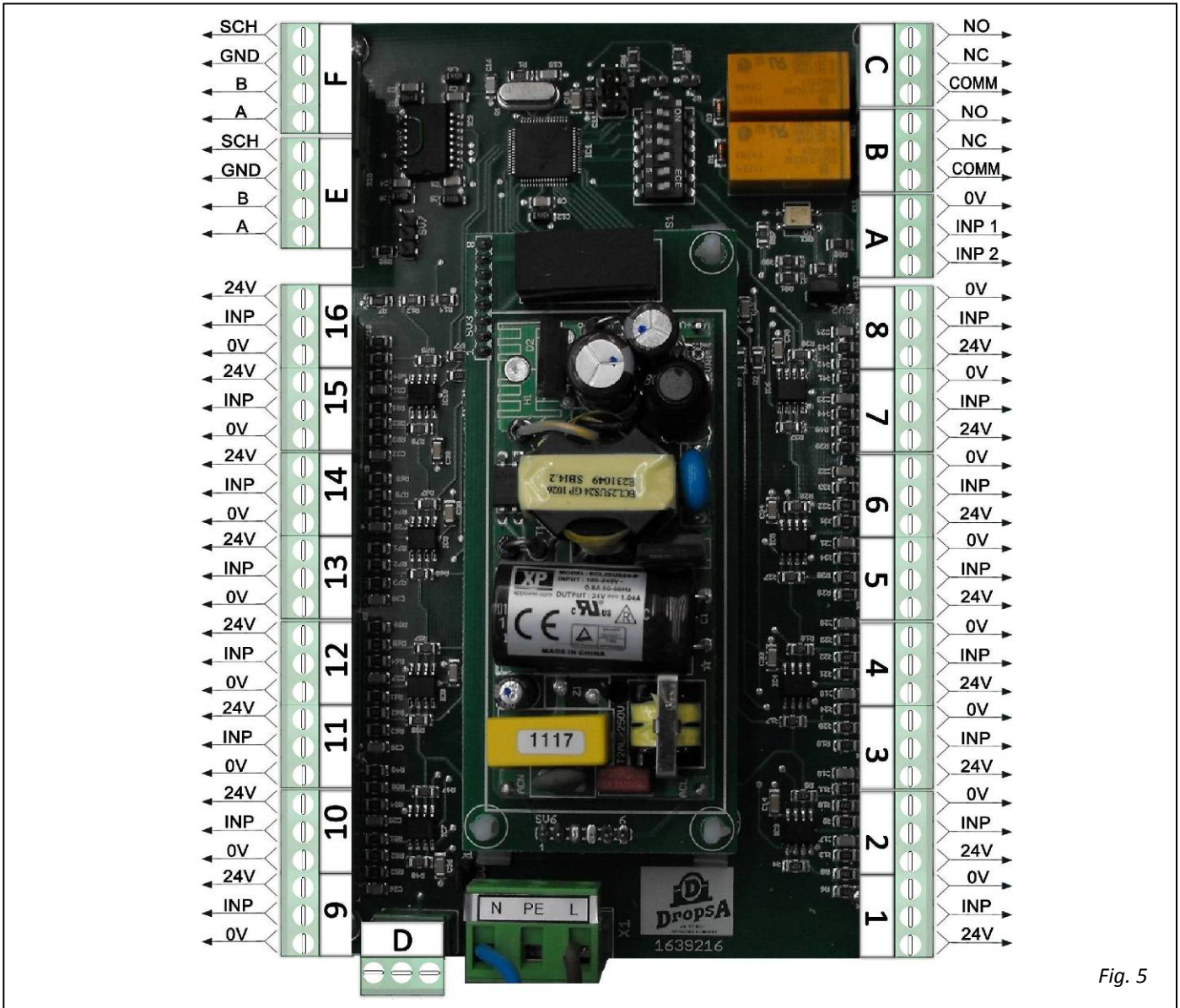
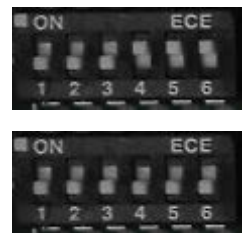


Fig. 5

Set the DIP switches as follows depending on if you are using NPN or PNP inputs:

- 1-2-3 off / 4-5-6 ON to set input signals as "N" signals (for NPN inputs)
- 1-2-3-4-5-6 OFF to set input signals as "P" signals (for PNP inputs)
- 



### 7.3.2 SOFTWARE VERSION

The software version of FACT can be checked on "CHANGE PARAMETERS" menu and it is visible only after logging in with a user with minimum level 4 access rights.

### 7.3.3 FACT EXPANDER

The EXPANDER is the same of FACT. Therefore the electrical connections are identical to FACT (section 7.3.1). There are only two settings more to do: the setting of RS485 terminating tensile strength (through a termination jumper) and the position of dip-switches.

To set terminating tensile strength you must put the jumper between pins 2-3. The jumper is placed between pins 1-2. If the board in question is not the last of the line and you are linking a series of more fact expander.

The dip-switches is divided into 2 parts: from 1 to 3 sets the number of FACT EXPANDER, and from 4 to 6 sets if the Flowmaster signal is "P" or "N".

To set the FACT-EXPANDER number, that must be included from 1 to 7 and in sequential order, use the following table.

N° FACT EXPANDER	DIP-SWITCH 1	DIP-SWITCH 2	DIP-SWITCH 3
1	ON	OFF	OFF
2	OFF	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	ON
5	ON	OFF	ON
6	OFF	ON	ON
7	ON	ON	ON

To set the signals from Flowmaster you must set the 3 dip-switches from 4 to 6 ON to configure input signals as signals "P", or set OFF to configure the input signals as signals "N".

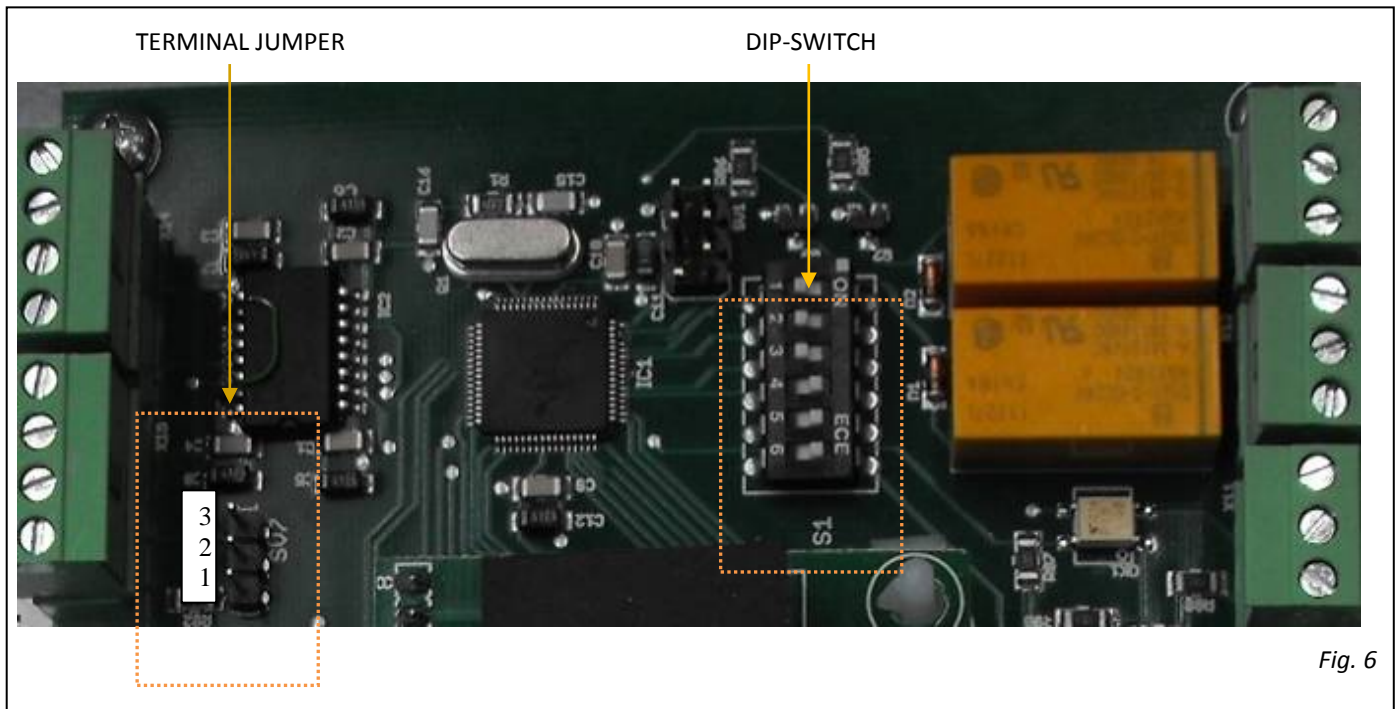


Fig. 6

## 8. OPERATING INSTRUCTIONS

Before operating the system:

- ⇒ Verify the unit is intact.
- ⇒ Check electrical connections have been correctly carried out.

When the system is started for the first time:

- ⇒ Set the main operating parameters of FACT (see par. 8.6 CONFIGURATION and par. 8.7 SYSTEM CONFIGURATION).

The following paragraphs contain information on system configuration, flow settings, default parameters, monitoring and controlling lubrication system. In case the system is modified (type/ number of flowmasters), all parameters must be set again.

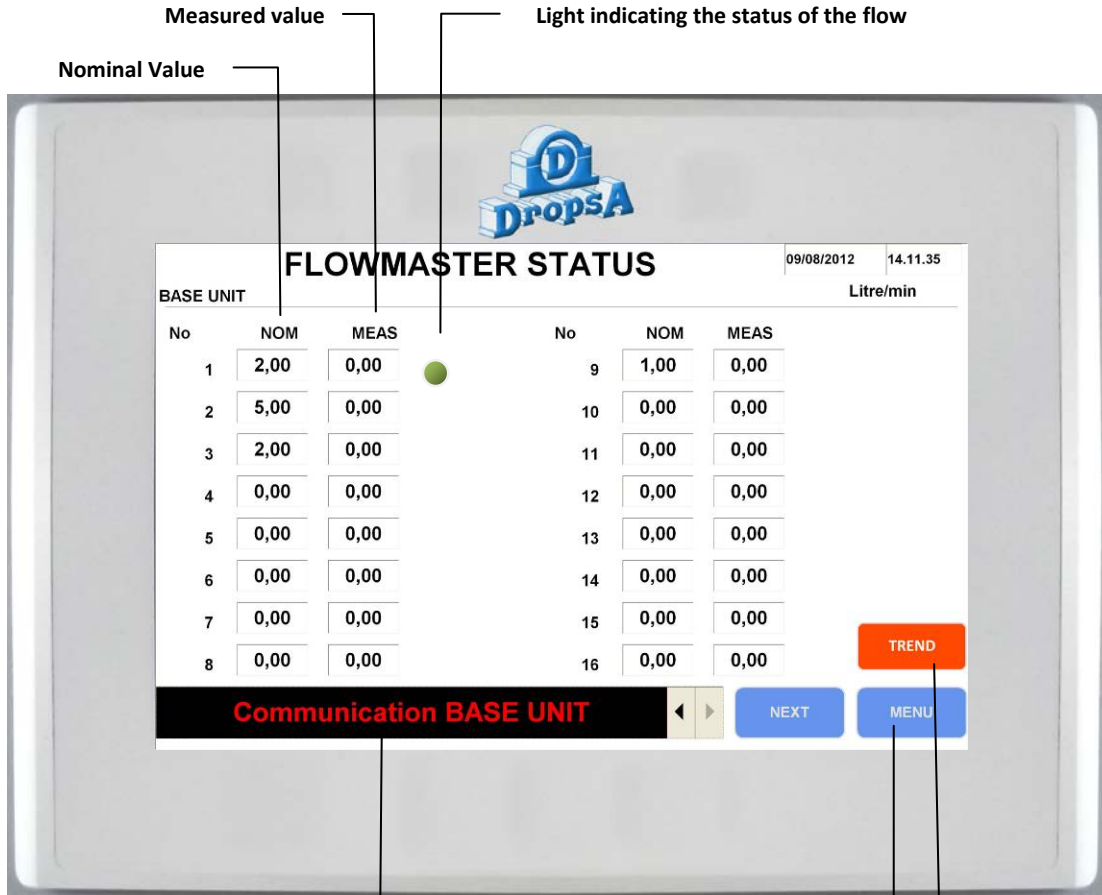


### 8.1 MONITOR

When turned on, the display shows the Flowmaster status. On the screen displays the nominal value of flow rate setted and value measured for each Flowmaster installed.

A light indicates that flow behaviour in relation to min and max thresholds, high and low settable (see par.8.3) precisely:

- Green = measured value between low value and high value
- Yellow = measured value between the minimum value and low value, or between high value and maximum
- Red = value lower than minimum value or value greater than maximum value,
- No colour = no pulses from Flowmaster

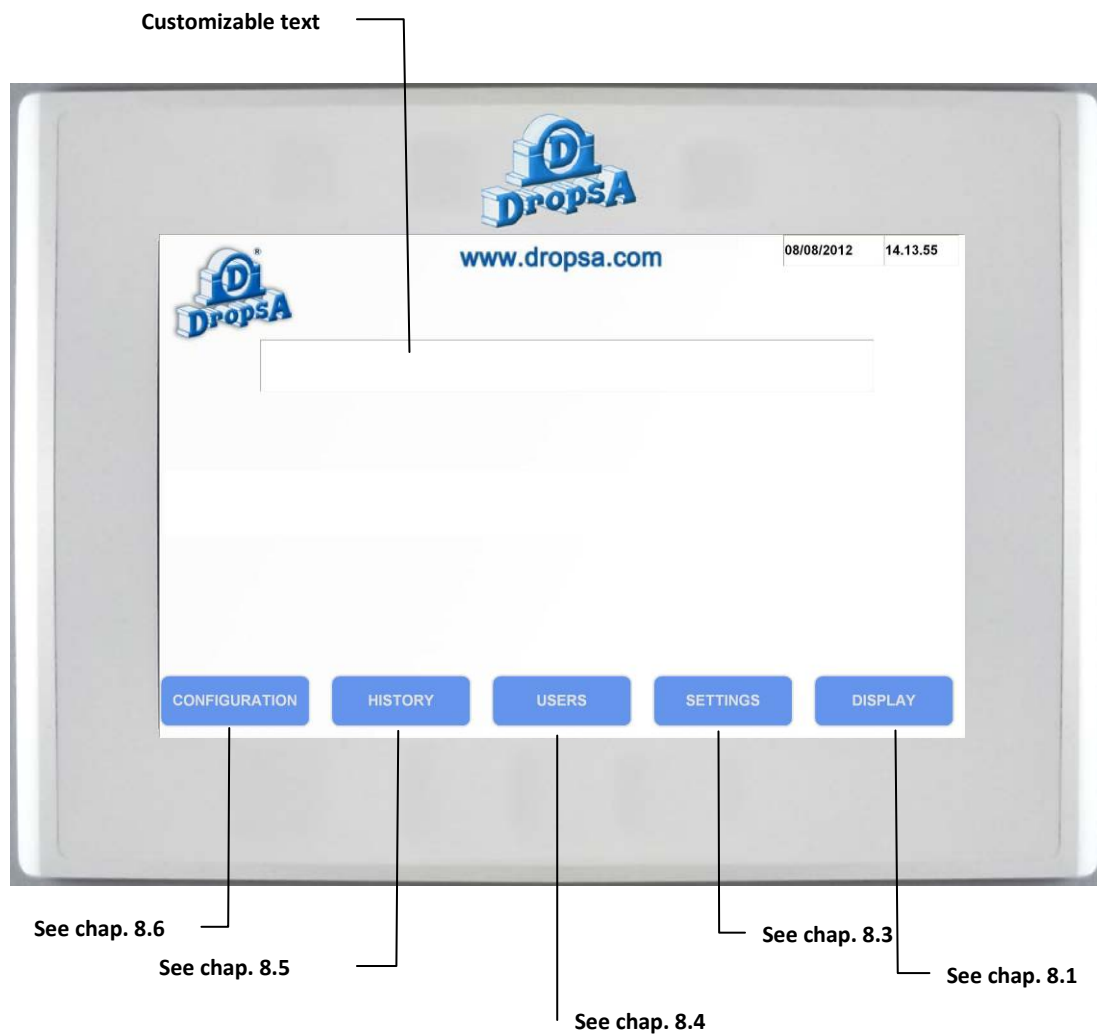


See chap. 8.8

See chap. 8.2

## 8.2 MENU

From the main page by going to the menu screen appears as in the image below. From this dynamic page (the keys appear depending on the type of access that has) can access the various configurations of the FACT. **For the password contact Dropsa offices.**



### 8.3 SETTINGS

This page shows types of Flowmaster installed. You can set the nominal values of minimum, low, high and maximum value of each flow.

Once set the nominal flow rate (through a touch on the box), you can choose whether to insert other values automatically, using the auto set button and selecting flow meter number, or entering values by manually respecting following steps:

- Enter value (flow) Rated  
Enter value (flow) LOW that will have as value a number less than nominal value  
Enter value (range) minimum that will have as value a number less than low value  
Enter value (range) HIGH that will have as value a number higher than face value  
Enter value (range) MAX that will have as value higher than highest number

If you have several same type of Flowmaster and you want to use same settings for another Flowmaster, you can use the copy button and press the first time on number of Flowmaster to copy and the second time on number of Flowmaster where copy.



### 8.4 DATA CHANGE

This dynamic page (buttons show up according to access type you have) you can choose the languages, see the level of access and log-in.

The screenshot shows the 'USERS' interface with the following elements and annotations:

- Language Selection:** ITALIANO and ENGLISH buttons (yellow).
- User Level Selection:** ADMINISTRATOR (5 Level) and SERVICE (4 Level) buttons (blue).
- Active User:** Service (text input).
- Level:** 5 (text input).
- Logout:** LOGOUT button (red).
- System:** SYSTEM button (red).
- Navigation:** INSTALLATION, CONFIGURATION, and MENU buttons (blue).
- Version:** Vers. 1.10 (text).
- Annotations:**
  - 'Only visible after logging and a level greater than 4' points to the ADMINISTRATOR and SERVICE buttons.
  - 'Only visible after logging and a level greater than 4 (out of the project and display windows)' points to the SYSTEM button.
  - 'Only visible after logging and a level greater than 4 Program version' points to the Vers. 1.10 text.
  - 'Only visible after logging and a level greater than 4 See chap. 8.6' points to the CONFIGURATION button.
  - 'Only visible after logging and a level greater than 4 See chap. 8.7' points to the MENU button.

### 8.5 HISTORIAN

This page shows all alarm in the last week, in addition thanks to a USB connector on FACT you can save this data in an USB key.

The screenshot shows the 'HISTORY' interface with the following data:

Testo evento	Duration	Date Time
•Communication BASE UNIT	0	08/08/2012 13.59.39
•Comunicazione UNITA' BASE	0	08/08/2012 12.43.12
•Comunicazione UNITA' BASE	4045489	08/08/2012 12.42.55

Buttons: SaveData (red), MENU (blue).

## 8.6 CONFIGURATION

This page allows setting:

- A start-up time (time that the system does not give any type of alarm)
- A delayed alarm (system doesn't take into consideration an alarm shorter than this time)
- Measurement unit
- The percentages that the system uses to create the value of auto set Flowmaster
- Auxiliary relay mode (must intervene with low value / high / max of Flowmaster, see cap.8.3, or with an external alarm from a Fact-expander/New Fact-expander).

**SYSTEM CONFIGURATION** 09/08/2012 14.12.12

START TIME 0 · 1 hh.mm

ALARM DELAY 0 · 5 mm.ss

ALARMS and WARNINGS %

AUTOSET LOW VALUE - 10 %

AUTOSET HIGH VALUE + 10 %

AUTOSET MIN VALUE - 50 %

AUTOSET MAX VALUE + 50 %

AUXI RELAY CONTROLLED BY

LOW VALUE

HIGH VALUE

MAX ALARM

EXT

UNITS

LITRE/MIN

GALLON/MIN

PINT/MIN

MENU

## 8.7 INSTALLATION

You can set how many fact-expanders are installed \ managed and set the types of Flowmaster installed throughout the system. Set the number of expansions by a touch on the appropriate box and enter the base unit and any installed expansion Flowmaster its connected (always through a touch on the boxes).

**INSTALLATION** 09/08/2012 14.24.56

EXTENSIONS CONNECTED 5

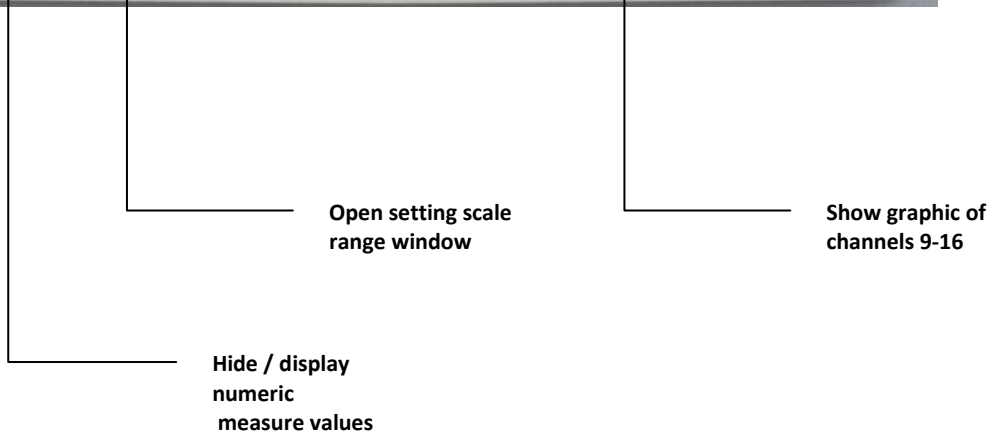
	BASE UNIT		EXTENSION -A-		EXTENSION -B-	
1	5	10	10	5	0	0
2	5	20	0	5	0	0
3	5	10	0	0	0	0
4	5	5	0	0	0	0
5	5	10	0	0	0	0
6	5	0	0	0	0	0
7	5	0	0	0	0	0
8	5	10	0	5	0	0

NEXT MENU

### 8.8 TREND

Trend page shows a graphic of flow measurement. Total period of graphic is 8 hours and it's possible to set the scale range of measure value for each flow channel. It's possible to hide or display a measure channel.

The measure graphic is active and memorize only when the page is showed, when the page is closed all data are cleared.



## 9. TROUBLESHOOTING

The following diagnostic table indicates the main anomalies which may be encountered, the probable causes and possible solutions. If you cannot solve the problem, do not attempt to disassemble parts of the machine but contact the **Eng. Dept. of DROPSA S.p.A.**

PROBLEM	PROBABLE CAUSE	SOLUTION
No flow reading	Lack of lubricant in the system	Check the system. Refill lubricant, if required.
The controller does not switch ON. (Display is lighted out)	Incorrect flowmaster connections	Verify electric connections  Switch OFF the controller, disconnect FACT expanders (where provided) and verify controller functioning (microprocessor initialisation). Switch OFF the controller and connect expansions again.
Communication error	Incorrect setting jumpers	Check that jumpers on all devices is set correctly

## 10. MAINTENANCE PROCEDURE

*FACT* ordinary maintenance:

- Clean *FACT-2000* box with a damp cloth. Do not use solvents.
- Check cable glands are tightened.

The electronic system does not require any maintenance.

## 11. DISPOSAL

During maintenance or disposal of the machine care should be taken to properly dispose of environmentally sensitive items. Refer to local regulations in force in your area.

When disposing of this unit, it is important to ensure that the identification label and all the other relative documents are also destroyed.

## 12. ORDERING INFORMATION

### *NEW FACT AND NEW FACT EXPANDER*

DESCRIPTION	PART NUMBER
FACT	1643150
FACT EXPANDER	1643155

### *RICAMBI NEW FACT AND NEW FACT EXPANDER*

DESCRIPTION	PART NUMBER
Touch screen operator panel	1639217
electronic board	1639216
USB connection	0039332
USB connector cover	0039333
PG9 gland	0038605
PG7 gland	3167122

**FLOWMASTER COMPLETE MODULE**

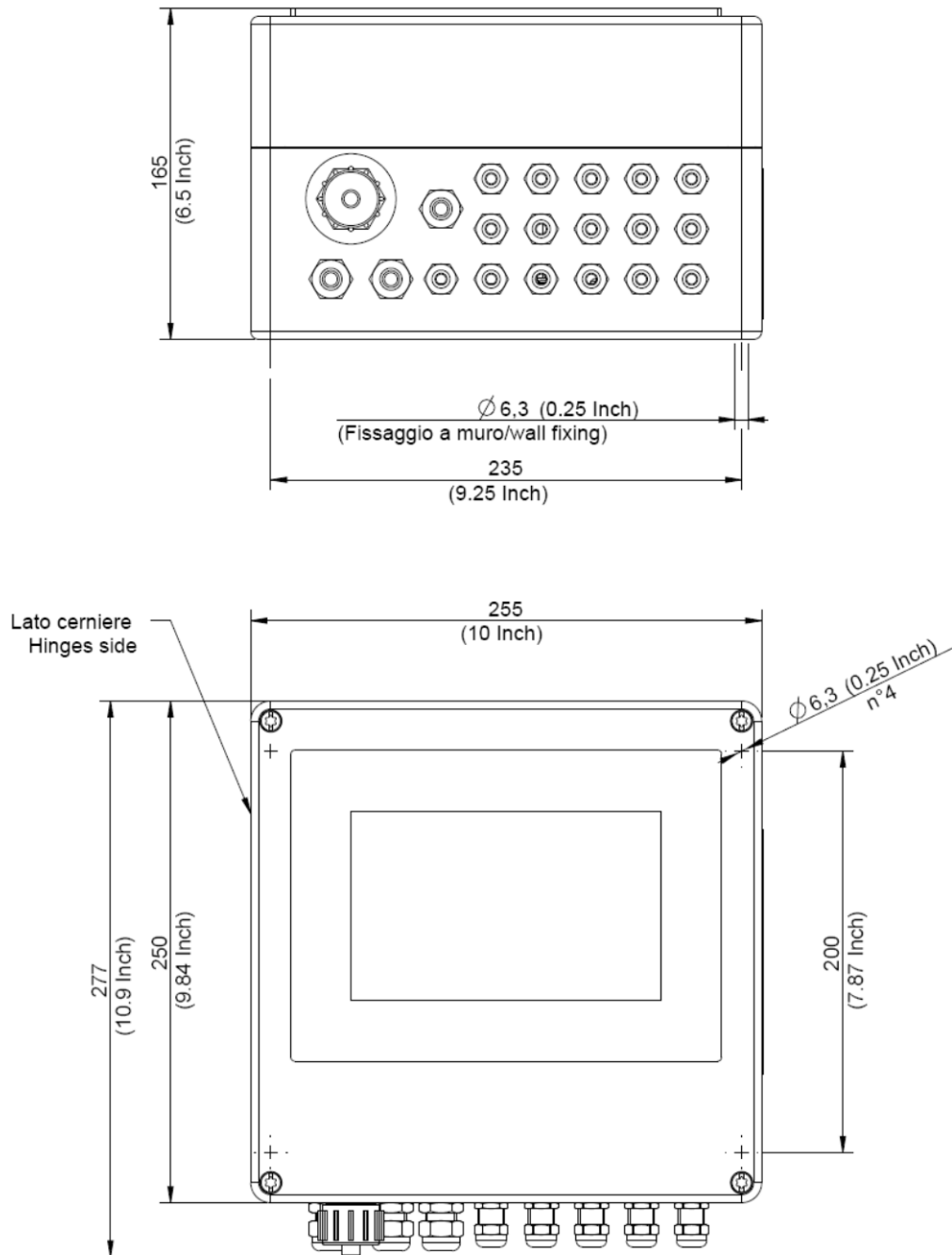
PART NUMBER	Flow r/min		Sensor type	Material
	cm <sup>3</sup>	cu. in.		
1523730	5	0,30	NPN	AISI 316
1523740	10	0,61		
1523750	20	1,22		
1523870	5	0,30	PNP	
1523880	10	0,61		
1523890	20	1,22		
1523732	5	0,30	NPN	Aluminium
1523742	10	0,61		
1523752	20	1,22		
1523872	5	0,30	PNP	
1523882	10	0,61		
1523892	20	1,22		

**FLOWMASTER SPARE PARTS**

PART NUMBER	DESCRIPTION
1523330	MODULAR BASE FOR 1523730/740/750/870/880/890
1523332	MODULAR BASE FOR 1523732/742/752/872/882/892
1523734	FORM MEASURING FOR 1523730
1523735	FORM MEASURING FOR 1523732
1523744	FORM MEASURING FOR 1523740
1523745	FORM MEASURING FOR 1523742
1523754	FORM MEASURING FOR 1523750
1523755	FORM MEASURING FOR 1523752
1523874	FORM MEASURING FOR 1523870
1523875	FORM MEASURING FOR 1523872
1523884	FORM MEASURING FOR 1523880
1523885	FORM MEASURING FOR 1523882
1523894	FORM MEASURING FOR 1523890
1523895	FORM MEASURING FOR 1523892



## 13. DIMENSIONS



FACT and FACT EXPANDER have the same overall dimensions and fixing.

## 14. HANDLING AND TRANSPORTATION

**FACT** controllers are packed and dispatched in cardboard containers. During transportation and storage always maintain the unit the right way up as indicated on the box. On receipt check that the packaging has not been damaged and store the **FACT** in a dry place. **Due to equipment small dimensions, it is not necessary the use of material handling equipment.**

## 15. PRECAUTIONS

It is necessary to read and understand the possible hazards and risks involved when using a **FACT-2000** controller. The operator must fully understand the hazards explained in this manual.



**ATTENTION:** Any type of intervention must not be carried out without having unplugged the equipment from power supply. Make sure that no one can start it up again during the intervention. All the installed electric and electronic equipment and basic components must be grounded.