FACT - 2000

Controller

S/W Ver. 2.42

User and Maintenance Manual

Warranty Information

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CE

http://www.dropsa.com

Manual drawn in accordance with CE Directive 98/37 Att. I, paragraph 1.7.4

C2024IE - WK 15/04

1. INTRODUCTION

This *User and Maintenance Manual* refers to *FACT-2000* 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

2.1 GENERAL CHARACTERISTICS

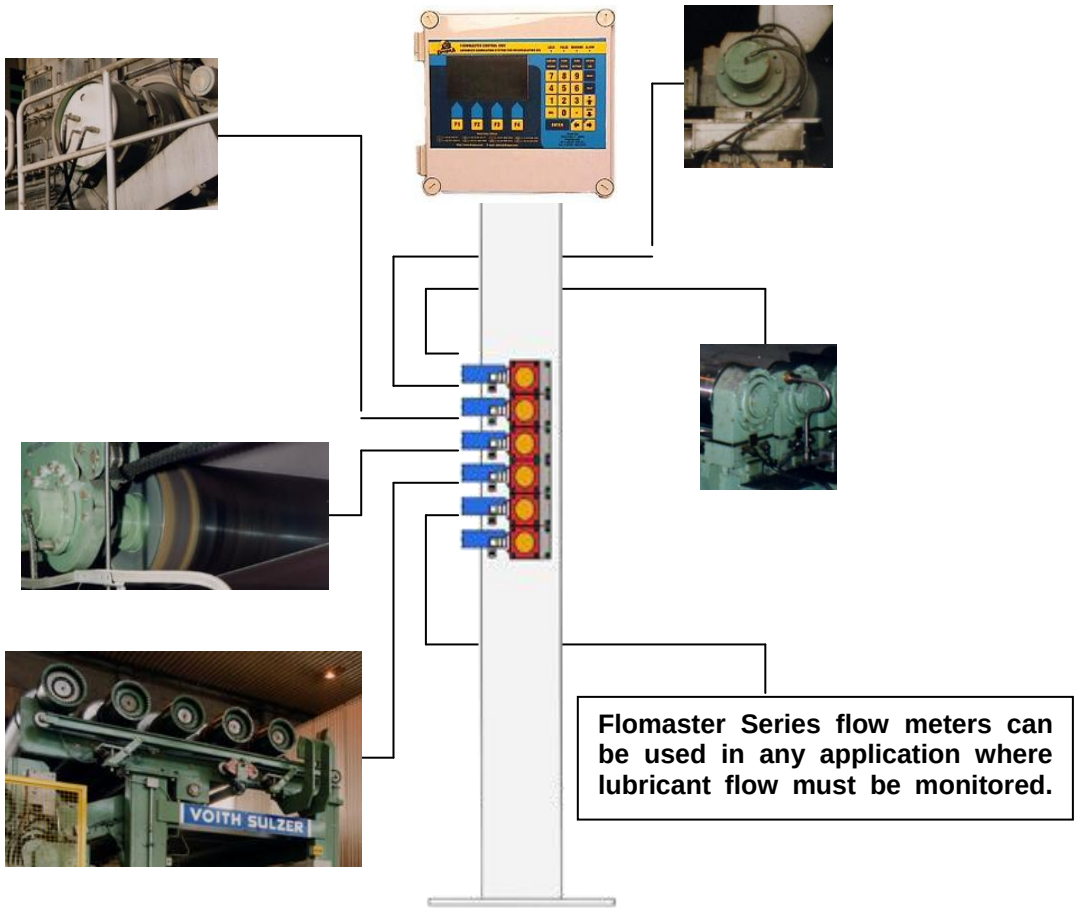
In medium/large lubrication systems it is often necessary to independently monitor and control the flow of each of the lubrication points. *FACT-2000* has been designed to monitor and control (via motorized Flowmasters) lubricant flow. This controller is particularly suitable for medium/large lubrication systems. System modularity allows system expansion without replacing the controller. Each *FACT-2000* can monitor and control up to 16 Flowmasters ,both manual and/or motorized.

2.2 ACCESSORIES

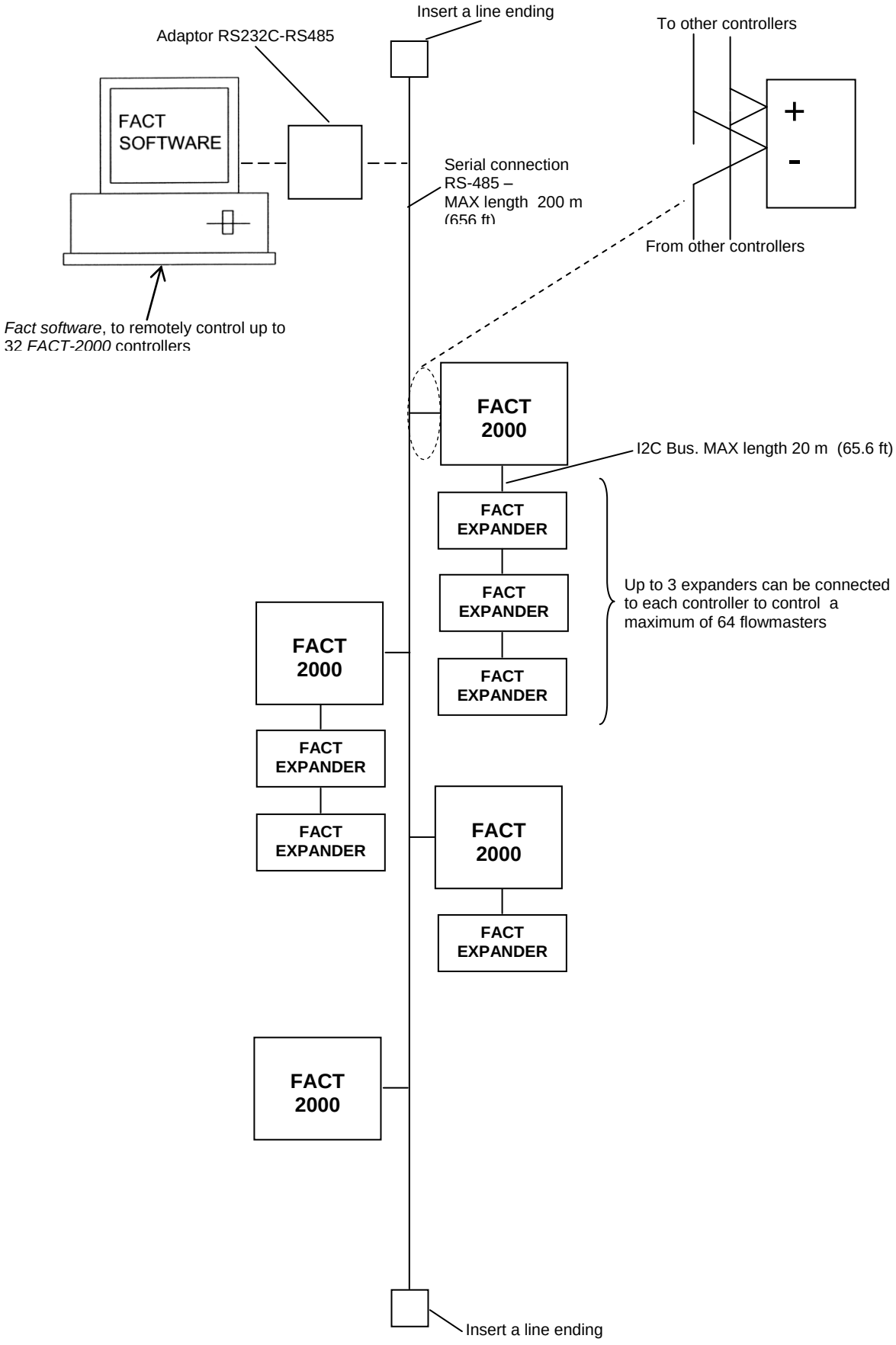
The following accessories extend *FACT-2000* monitoring and control power:

- ***Fact Expander****:* expansion to be connected to central unit. It can control further 16 *Flowmasters*. Controller can be connected to other 3 expansion units, reaching a whole capacity of control of 64 *Flowmasters*. *Fact Expanders* can be connected to *FACT-2000* in cascade and are automatically configured.
- ***FACT software***: a software to remotely control (by serial line RS-485) up to 32 controllers: so a PC, remotely holding 32 controllers (each controller connected to 3 expansions in cascade), can control up to 2048 flowmasters.

2.3 BASIC APPLICATIONS



2.4 EXAMPLES OF CONNECTIONS



3. PRODUCT - MACHINE IDENTIFICATION

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

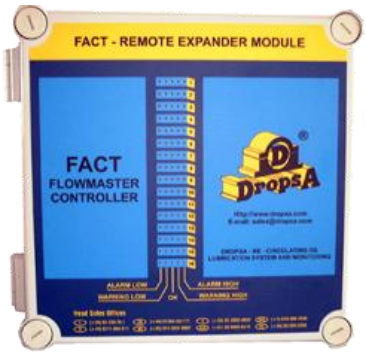
4. TECHNICAL CHARACTERISTICS

PARAMETER	*FACT–2000* & *FACT EXPANDER*
Power supply	Automatic range 85÷260VAC – 50/60 Hz
Power absorption	30 W
Input signals	Flow meters 24 V DC
Output signals	⇒ Servo Motors control for motorized Flowmaster 12 VDC ⇒ Remote alarm 250 V 1A (switch)
Max Distance between FACT-2000 and FACT-Expander	20 m (55 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	IP-55

NOTICE: FACT-2000 works only with NPN proximity sensors.

WARNING: Operate the equipment only with the voltage indicated on the product label and within the specific operating parameters.

5. EQUIPMENT

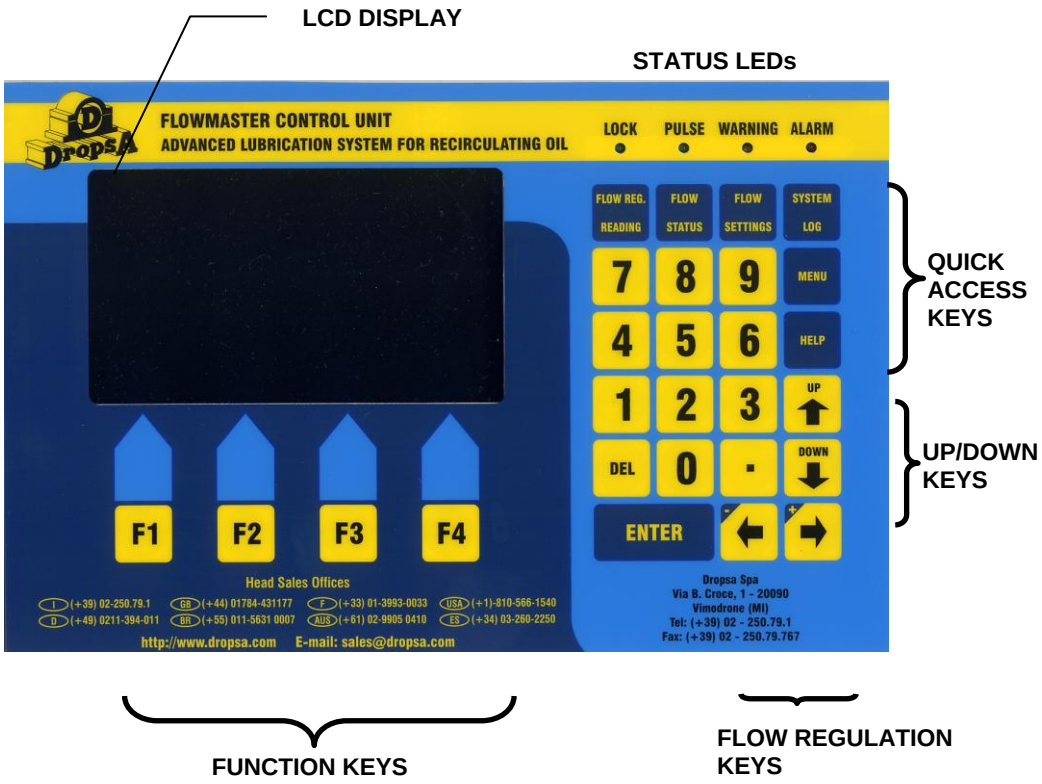


FACT Expander

FACT 2000

FLOW MASTER

6. FACT 2000 CONTROL PANEL



6.1 LCD DISPLAY

A wide screen allows the user to manage controller functions. According to the current sub-menu (top line of display) **F1**, **F2**, **F3**, **F4** functions will be also displayed.

WARNING: In serial line, verify ID number (top line on the left) is unique for each controller.

6.2 KEYPAD

	DESCRIPTION	KEYS
QUICK ACCESS KEYS	⇒ To call configuration/display menus	- **FLOW REG. READING** - **FLOW STATUS** - **FLOW SETTING** - **SYSTEM LOG** - **MENU**
UP/DOWN KEYS	⇒ To scroll menu options ⇒ To enter new values	- **UP** - **DOWN** - **Numeric keypad+ENTER+UP/DOWN**
FUNCTION KEYS	⇒ To call special functions (see legend on display)	- **F1** - **F2** - **F3** - **F4**
-/+ KEYS	⇒ To manually regulate lubricant flow	- **-** - **+**

6.3 STATUS LEDs

	DESCRIPTION
LOCK	It lights on when keypad is locked (except QUICK ACCESS KEYS). In this condition, parameters cannot be changed. To unlock the keypad see par. *10.1 MAIN MENU*.
PULSE	It flashes at each pulse coming from the proximity sensor of the selected flowmaster. It allows to monitor proximity sensor correct operation.
WARNING*	It lights on when flow of one (or many) metering module is under/above the pre-set "-"/"+" (MIN/MAX) warning level.
ALARM*	It lights on flow of one (or many) metering module is under/above the pre-set "-"/"+" (MIN/MAX) alarm level.

***To view warning/alarm information, press SYSTEM LOG**

7. FLOW MASTER FLOW METERING MODULES

Description:
Flowmasters use a modular construction consisting of a base and a metering module. Bases are assembled in a single block, and are the same for any size of metering module:

METERING MODULE SIZE		CAPACITY	
cm³/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
- Ease of regulation, even in the manual model.
- Auto-regulation through FACT-2000 (remote auto-regulation too)
- Easy maintenance.

Automatic Flow regulation via base built-in servo-motor:
Flow is regulated through a motor which acts on *FLOWMASTER* regulation valve. The metering module sensor, which reads any satellite revolution, sends a message to FACT-2000 controller and even to a PC (if connected). If flow is higher or lower than the set parameters, servo-motor starts opening or closing flow regulation valve up to the required value.
All *Flowmaster*s are supplied with a G 1/2" BSP inlet and a G 3/8" BSP outlet. Available in Stainless steel 316 or Aluminium.

8. UNPACKING AND INSTALLALLING THE EQUIPMENT

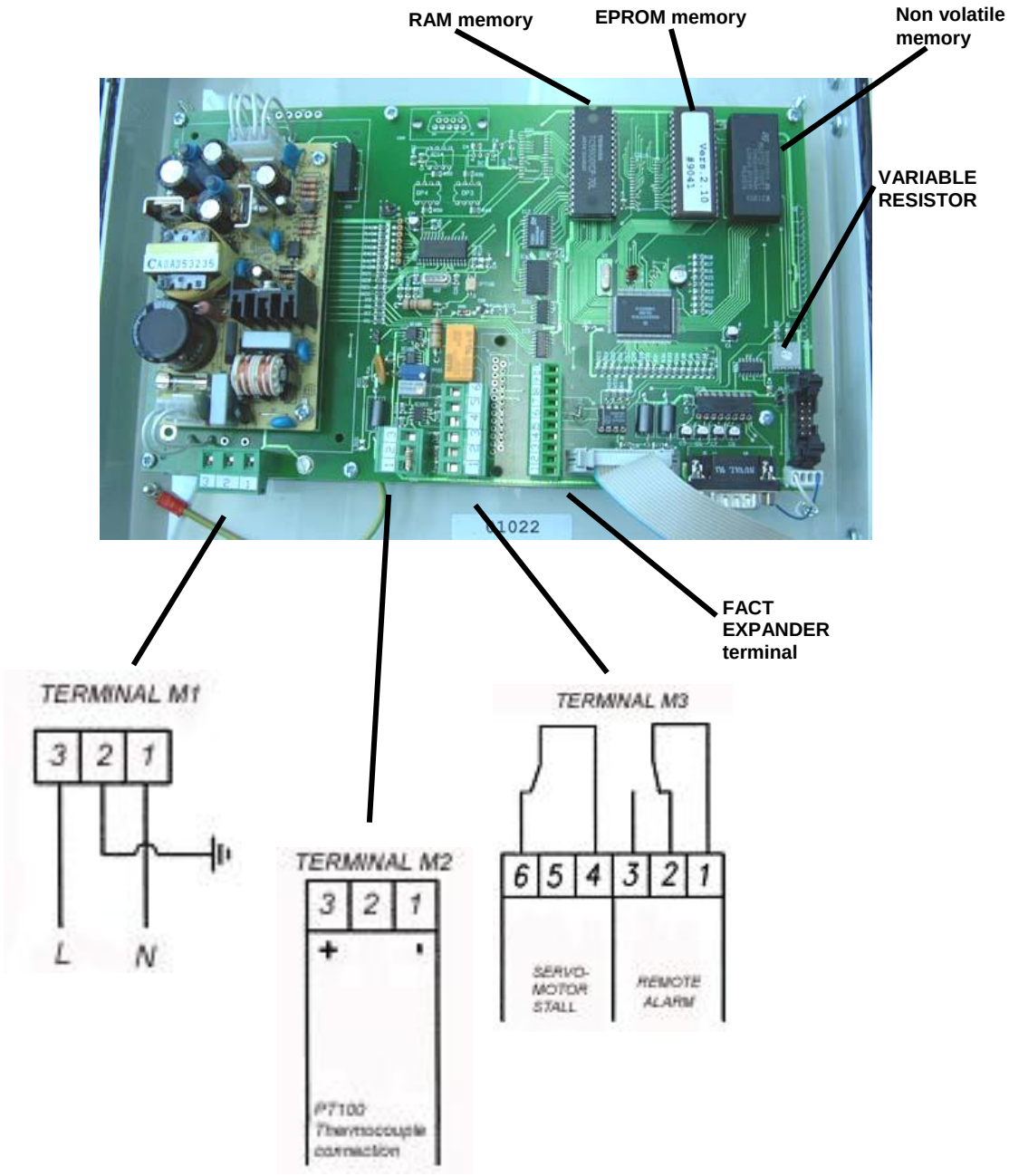
8.1 UNPACKING
Once a suitable location has been found to install the unit remove the equipment from the packaging. No particular disposal procedures are necessary, however packing should be disposed of in accordance with regulations that may be in force in your area or state.

8.2 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.

8.3 *FACT-2000* ELECTRIC CONNECTIONS

8.3.1 *FACT-2000* CPU BOARD

FACT-2000 CPU board is located under the controller cover.



Connect power supply to Terminal M1 (see voltage on product label). ***WARNING: A ferrite must be tightened around the power supply cable.***

Where provided, connect PT 100 thermo-couple to Terminal M2. ***WARNING: before connecting PT100, remove the resistor from the terminal.***

On terminal M3: connect remote alarm signal (optional) to connecting terminals 1-2-3 and servo-motor stall to 4 and 6 connecting terminals. Regulation flow motor stall will stop automatic flow correction. Such operation is necessary to prevent flow system unbalancing and servo-motor failure when running to the end of stroke.

To adjust display brightness, act on the *variable resistor*:

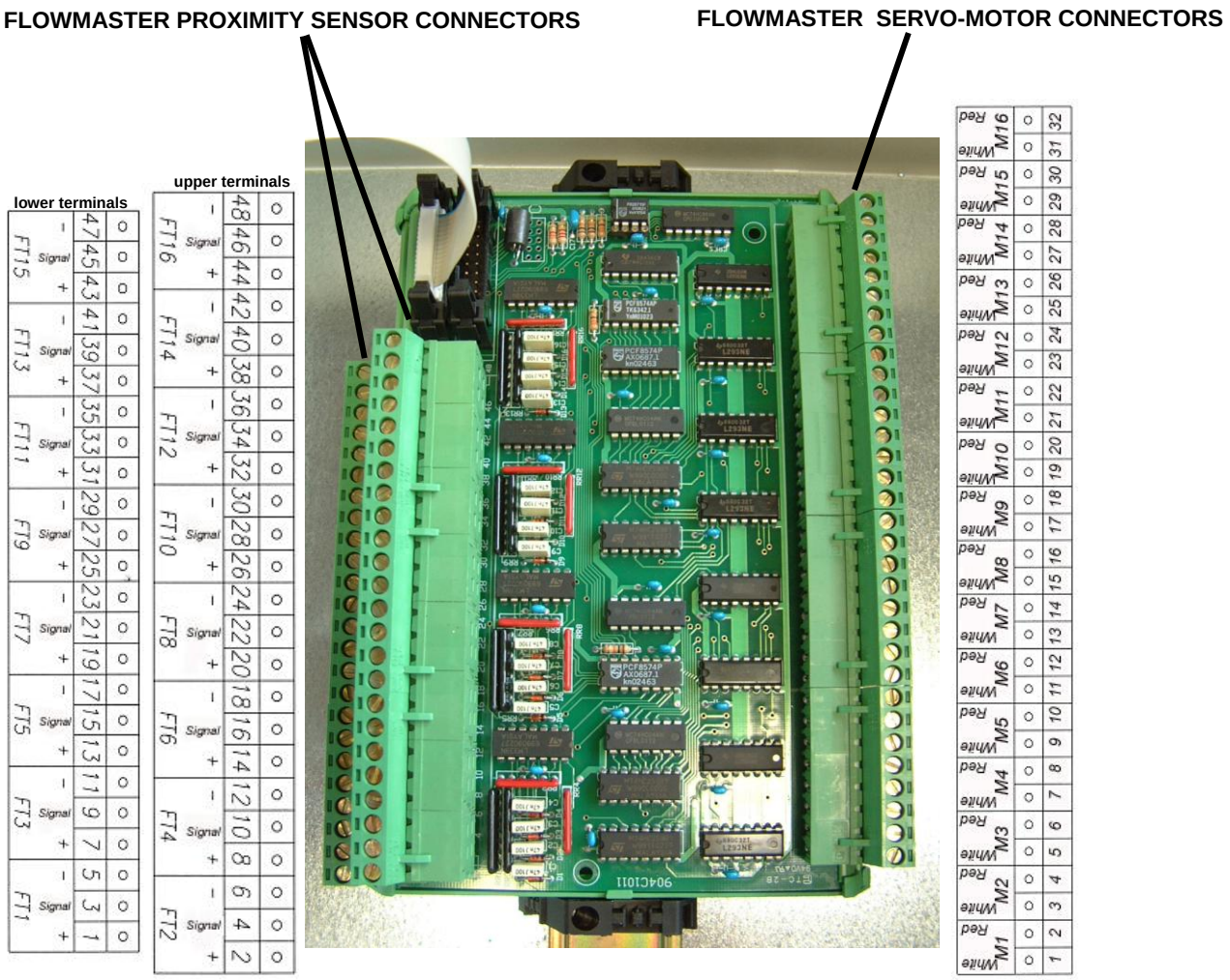
8.3.2 FIRMWARE REVISION

FACT-2000 firmware revision number is located on the EPROM label (EPROM is installed on the circuit under the equipment cover).

8.3.3 *FACT-2000* MOTOR-DRIVING BOARD

FACT-2000 motor-driving board is located in the controller box.

WARNING: In order to prevent equipment failure, it is recommended not to exchange flow meters and motors wires round.



*** To connect proximity sensors, remove lower terminals (FT1–FT15) before the upper terminals (FT2–FT16).**

8.4 FACT EXPANDER ELECTRIC CONNECTIONS

FACT Expander is similar to *FACT-2000*, except for the control panel. Connection to central unit is made by a flat LAN cable (Ethernet type) CAT. 5) with a pit-to-pin connection.

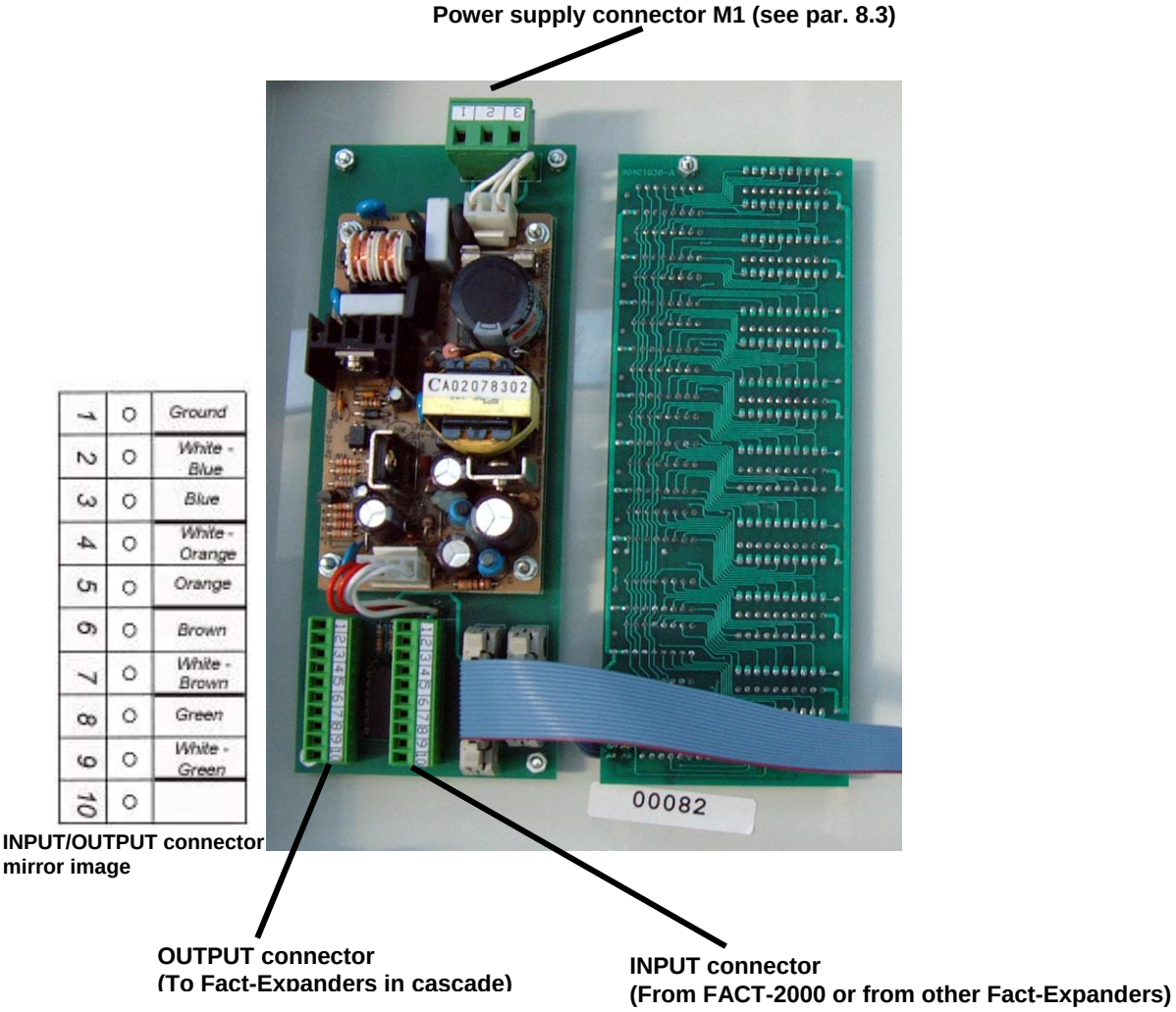
WARNING: Use only pins from 2 to 9. Never connect pins 1 and 10.

As *FACT Expander* is automatically configured, no switch setting is needed inside the equipment. Transmission line maximum length between *FACT-2000* and *FACT-EXPANDER* (or two *FACT-EXPANDER*) is 20 m (55 ft).

8.4.1 *FACT EXPANDER* CPU BOARD

FACT Expander CPU board is located under the expander cover.

WARNING: A ferrite must be tightened around the power supply cable.



8.4.2 FACT EXPANDER MOTOR-DRIVING BOARD

FACT Expander motor-driving board is located in the expander box.
For the electric connections, please refer to ***paragraph 8.3.3.***

8.5 REMOTE CONTROL: CONNECTION TO SERIAL LINE (VIA DROPSA SOFTWARE)

FACT-2000 controllers can be held by DROPSA software. All controllers are connected to a serial line RS-485, using a cable CAT. 5. Serial line connector is located on the board under the cover. Serial line length can be maximum 200 m (656 ft.). Line endings must be inserted at the end of each line. To prevent control conflicts or controllers failure, on top line of controller display verify ID number is not the same for two controllers (ie: FACT 20 means controller ID number 20).

9. 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 *FACT-2000* main operating parameters (see par. 10.2 SYSTEM CONFIGURATION)

⇒ Reset the system

⇒ Switch On the system again.

A System test is carried out any time the controller is switched ON.

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.

9.1 MAIN MENU

After *System Test*, *MAIN MENU* is displayed:

DATE 10/10/99 TIME 12:15	MAIN MENU	FACT 1
1 FLOW READING 2 FLOW STATUS 3 FLOW SETTING 4 SYSTEM LOG DISPLAY 5 UNLOCK KEYBOARD 7 SPECIAL FUNCTION 8 AUTOSET CONFIGURATION 9 SYSTEM CONFIGURATION		
Select OR press number		
SELECT	UP	DOWN

This is the extended *MAIN MENU*.

NOTICE: to display and to access the additional system configuration menus 7, 8 and 9 (SPECIAL FUNCTION, AUTOSET CONFIGURATION and SYSTEM CONFIGURATION), **KEYBOARD MUST BE UNLOCKED**.

9.1.1 UNLOCK KEYBOARD

1. Select **5 UNLOCK KEYBOARD**;
2. Enter ***password*** (released by DROPSA to customer's System Manager);
3. Press **ENTER**. LOCK LED is lighted out and the display will show the extended MENU.

9.1.2 LOCK KEYBOARD

From **MAIN MENU**:

1. Select **5 UNLOCK KEYBOARD**;
2. Press **F1**. LOCK LED will light up and configuration menus 7, 8 and 9 will be hidden.

9.2 SYSTEM CONFIGURATION

System configuration must be carried out :

⇒ **When lubrication system is started-up for the first time;**

⇒ **Any time lubrication system is modified.**

From **MAIN MENU**:

1. Select **9 SYSTEM CONFIGURATION**

WARNING: Reset FACT-2000 (unplug power supply), after system configuration has been carried out.

9.2.1 SYSTEM CONFIGURATION – PAGE 1 OF 3

SYSTEM CONFIGURATION PAGE 1 of 3	FACT 1
MIN. RPM	11
STARTUP TIME	24.00 hh.mm
REGULATION DURING START UP	None
ALARM DURING STARTUP. . .	No
REGULATE DELAY	1.0 m.ss
ALARM DELAY	0.10 m.ss
AUTO REGULATE	Enable
TEMPERATURE REG	Disabled
MIN. REGULATE TEMPERATURE	50 °C
Select one	
EXIT SELECT pgUP pgDOWN	

PARAMETER	DESCRIPTION	RANGE	DROPSA SETTING
MIN. RPM	Value for rev/min under which the controller consider flow = 0	1-50	**1**
STARTUP TIME	Time for system start-up	0-24 h	**24.00**
REGULATION DURING STARTUP	It defines the kind of automatic regulation (for motorized flowmasters) during START-UP	**FULL**: flow is regulated both upward and downward **NONE**: no flow regulation **UPWARD**: Flow is regulated only upward **DOWNWARD**: Flow is regulated only downward	**DOWNWARD**
ALARM DURING STARTUP	It defines the kind of alarm status during start-up	**YES – NO - ALWAYS**	**YES**
REGULATE DELAY	Delay time before automatic regulation	**00m01s ÷ 09m59s**	**1 minute**
ALARM DELAY	Delay time to activate an alarm condition	**1 second to 9m59s**	**10 seconds**
AUTO REGULATE	Enable/Disable auto- regulation	**ENABLE/DISABLE**	**Enable**
TEMPERATURE REG.	MAX temperature at which auto-regulation stops	**Enable – Disable**	**Disable**
MIN. REGULATE TEMPERATURE	MIN temperature at which auto-regulation does not starts	**40°C÷ 90°C** (104°F÷194°F)	**50°C** (122°F)

9.2.2 SYSTEM CONFIGURATION – PAGE 2 OF 3

SYSTEM CONFIGURATION PAGE 2 of 3	FACT 1
NO REGULATION INTERVAL	5%
MOTOR PULSE B	300 msec
MOTOR PULSE S	30 msec
STEP LIMIT	1000
LOG DETAILS	All
FACT ID	1
NETWORK	No
PARAMETER TRANSFER	Disabled
UNITS	RPM
EXIT SELECT pgUP pgDOWN	

PARAMETER	DESCRIPTION	RANGE	DROPSASETTING
NO REGULATION INTERVAL	% of no auto-regulation	**5-95%**	**15%**
MOTOR PULSE B	Pulse duration for coarse regulation	**100-500 msec**	**300 msec**
MOTOR PULSE S	Pulse duration for fine regulation	**10-50 msec**	**30 msec**
STEP LIMIT	Max number of regulation attempts before generating motor fault alarm	**10-1000**	**100**
LOG DETAILS	It defines the alarms to be memorized in SYSTEM LOG	**All**: Alarms+Warnings+Events **Alarm + Warn**: Alarm+Warning **Alarm**: Alarm only. **Trace**: Disabled function. DO NOT SELECT	**All**
FACT ID	FACT ID number. In a serial line, each controller must have a unique ID number in order to be seen from the central computer	**1-32**	**1**
NETWORK	Enable network interface	**Yes – No**	**No**
PARAMETER TRANSFER	Enable/Disable remote parameter control	**Yes – No**	**No**
UNITS	It defines measure units on the display. Use F1, F2, F3, F4 to select.	**Rpm**: Rev/min **Lpm**: Litres per min **Gpm**: Gallons per min **Ppm**: Pints per min	**RPM**

9.2.3 SYSTEM CONFIGURATION – PAGE 3 OF 3

SYSTEM CONFIGURATION PAGE 3 of 3	FACT 1
TEMPERATURE SENSOR	0
PRESSURE SENSOR	0
WATER SENSOR	0
PUMP MODULE	0
UNIT FAILURE TIME OUT	60 SEC
ADMINISTRATOR PASSWORD	1234
OPERATOR PASSWORD	4321
Select one	
EXIT SELECT pgUP pgDOWN	

PARAMETER	DESCRIPTION	RANGE	DROPSA SETTING
TEMPERATURE SENSOR	**Inactive function. DO NOT SELECT**		**0**
PRESSURE SENSOR	**Inactive function. DO NOT SELECT**		**0**
WATER SENSOR	**Inactive function. DO NOT SELECT**		**0**
PUMP MODULE	**Inactive function. DO NOT SELECT**		**0**
UNIT FAILURE TIME OUT	Delay time before an alarm signal generated because of servo-motor fault	**0-60 sec**	**60 sec**
ADMINISTRATOR PASSWORD	To modify password to enter configuration menu	**0-9 (4 digits)**	**1234**
OPERATOR PASSWORD	To modify password to access motorized flowmaster manual control	**0-9 (4 digits)**	**4321**

9.3 AUTOSET CONFIGURATION

Once system configuration has been carried out, it is necessary to access **AUTOSET CONFIGURATION**.
This function allows the user to configure flowmaster settings.

WARNING: before carrying out this procedure, check flow meters output (see ch.6)

From **MAIN MENU**:

1. Select **8 AUTOSET CONFIGURATION**

AUTOSET CONFIGURATION			FACT 1	
REG.	Yes		No Reg.	15%
MIN.	60%		LOW	30%
HIGH	20%		MAX	40%
			DefCC 5	
REV 1	500		CC1	5
REV 2	200		CC2	10
REV 3	100		CC3	20
REV 4	50		CC4	50
Select OR press number				
EXIT	SET	NEXT PAR	PREV PAR	

PARAMETER	DESCRIPTION	RANGE	DEFAULT SETTING
REG.	Enable/disable flow auto-regulation.	**Yes – No**	**Yes**
MIN	Value below the nominal at which an Alarm condition is generated	**5 – 95%**	**60 %**
LOW	Value below the nominal at which a Warning condition is generated	**5 – 95%**	**30 %**
HIGH	Value above the nominal at which a Warning condition is generated	**5 – 95%**	**20 %**
MAX	Value above the nominal at which an Alarm condition is generated	**5 – 95%**	**40 %**
REV 1 - 4	**DROPSA SETTING. DO NOT CHANGE**	**-**	**5/10/20/50**

9.4 FLOW SETTING

This function allows the user to configure flow setting for each flowmaster.
There are two ways to enter this function:

1. From the **MAIN MENU**:
   ⇒ Select **3 FLOW SETTING**
2. Press **FLOW SETTINGS** quick access key

Special functions:

⇒ **AUTOSET**: when you enter flowmaster nominal value, *FACT-2000* will automatically set all the other parameters according to the percentage values previously set in AUTOSET CONFIGURATION (see par. 9.4).

⇒ **COPY PREV**: to copy previous line.

PARAMETERS FLOW SETTINGS UNIT: LPM					FACT 1		
No	NOM	MIN	LOW	HIGH	MAX	CC	Reg
1	0.80	0.32	0.56	0.96	1.12	5	Yes
2	0.80	0.32	0.56	0.96	1.12	5	Yes
3	0.80	0.32	0.56	0.96	1.12	5	Yes
4	0.80	0.32	0.56	0.96	1.12	5	Yes
5	0.80	0.32	0.56	0.96	1.12	5	Yes
6	0.80	0.32	0.56	0.96	1.12	5	Yes
7	0.80	0.32	0.56	0.96	1.12	5	Yes
8	0.80	0.32	0.56	0.96	1.12	5	Yes
Use UP / DOWN to select unit							
SET NOM	EXIT		AUTO SET		COPY PREV		

1. Select a Flowmaster using the **UP/DOWN+F1** keys;
2. Digit the nominal value (**NOM**);
3. Press **ENTER** to confirm the new data and go to the next parameter. (Use AUTOSET for quick configuration). ***WARNING: Do not use F1 key to go to next parameter: data will be not saved.***
4. When flow settings have been carried out, press **EXIT** (**F2**).

9.5 FLOW READING

This function displays current flow readings and status (warning and /or alarms/and or ok) of 16 units simultaneously.
There are two ways to enter this function:

1. From **MAIN MENU**:
   ⇒ Select **1 FLOW READING**
2. Press **FLOW SETTINGS** quick access key

Use **PgUP** (previous page: **F3**) **PgDOWN** (next page: **F4**) to scroll pages

DATE 15/10/99 TIME 12:15			FLOW READINGS	FACT 1			
No	NOM	ACT	ST	No	NOM	ACT	ST
1	0.80	0.74	ok	9	0.80	0.80	ok
2	0.80	0.80	ok	10	0.80	0.79	ok
3	0.80	0.81	ok	11	0.80	0.83	ok
4	0.80	0.79	ok	12	0.80	0.79	ok
5	0.80	0.78	ok	13	0.80	0.82	ok
6	0.80	0.83	ok	14	0.80	0.81	ok
7	0.80	0.85	ok	15	0.80	0.75	ok
8	0.80	0.79	ok	16	0.80	0.86	ok
				UNITS: LPM			
EXIT		UNITS		PAGE UP		PAGE DOWN	

ENTRY	DESCRIPTION	STATUS
No.	Flowmaster ID Number	Display of controller ID
NOM	Nominal flow value	Display of nominal flow
ACT	Actual reading (current flow)	Display of current flow
ST	Flow Status	**Ok:** normal operation **LO:** Low Flow Warning **AL:** Low Flow Alarm **HI:** High Flow Warning **AH:** High Flow Alarm

9.6 FLOW STATUS

This function displays flowmaster status. There are two ways to enter this function:

1. From **MAIN MENU**:
   ⇒ Select **2 FLOW STATUS**
2. Press **FLOW STATUS** quick access key

DATE 15/10/99 TIME 12:15				FLOW READINGS				FACT 1			
ID	S	ID	S	ID	S	ID	S	ID	S	ID	S
1	0	9	0	17		25		33		41		49		57	
2	0	10	0	18		26		34		42		50		58	
3	0	11	0	19		27		35		43		51		59	
4	0	12	0	20		28		36		44		52		60	
5	0	13	0	21		29		37		45		53		61	
6	0	14	0	22		30		38		46		54		62	
7	0	15	0	23		31		39		47		55		63	
8	0	16	0	24		32		40		48		56		64	
0 OK		X OFF		+ HIGH		- LOW		F FAULT		H ALARM +		L ALARM -			

ENTRY	DESCRIPTION	STATUS
Id	Flowmaster ID Number	Display of flowmaster ID
S	Flowmaster status	**0:** normal operation **X:** deactivated flowmaster **+:** High Flow Warning **-:** Low Flow Warning **F:** Regulation fault **H:** High Flow Alarm **L:** Low Flow Alarm

9.7 SPECIAL FUNCTION

This menu allows the configuration of some special functions.

From **MAIN MENU**:

⇒ Select **7 SPECIAL FUNCTION**

SPECIAL FUNCTION			FACT 1
1 SKIP STARTUP 2 CLOSE FLOWMETERS 3 CLEAR LOG MEMORY 4 STAND BY 5 SET DATE & TIME 6 LANGUAGE SETTING			
Select OR press number			
SELECT	SELECT	UP	DOWN

Option	Description	Range	Dropsa setting
SKIP STARTUP	Enable/disable START-UP	Enable/Disable	Disable
CLOSE FLOWMASTERS	**Inactive function. DO NOT SELECT**	-	
CLEAR LOG MEMORY	Deletes System log content (memory can hold up to 100 error messages)	Enable/Disable	
STAND BY	With motorized flowmasters, it deactivates automatic regulation and alarms. ***Only flow display is activated.***	Enable – Disable	Enable
SET DATE & TIME	Date and Time setting.		
LANGUAGE SETTING	**Inactive function. DO NOT SELECT**	-	

9.8 SYSTEM LOG

This function displays system logs which contain information about key events, warnings or alarms with the relative description and time-stamp. There are two ways to enter this function:

1. From **MAIN MENU**:
   ⇒ Select **4 SYSTEM LOG DISPLAY**
2. Press **SYSTEM LOG** quick access key

DATE 15/10/99 TIME 12:15		SYSTEM LOG		FACT 1
TYPE	N°	Date	Time	Description
	REPORT LEV: All			UP DOWN

10. 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
Automatic flow regulation fault (only for motorised flowmasters)	Incorrect flow settings	Verify and correct settings
	Servomotor is faulty	Check flowmaster. Replace it, if necessary.
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
	Controller failure	Switch OFF the controller, disconnect FACT expanders (where provided) and verify controller functioning (microprocessor initialisation). Switch OFF the controller and connect expansions again.
Both red LEDs light up on *FACT EXPANDER*	Servomotor did not manage to adjust flow within the pre-set time	Check servo-motor functioning

11. MAINTENANCE PROCEDURE

FACT-2000 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.

12. 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.

13. ORDERING INFORMATION

SERIAL N°	DESCRIPTION
1643100	*FACT-2000*
1643110	*FACT Expander*

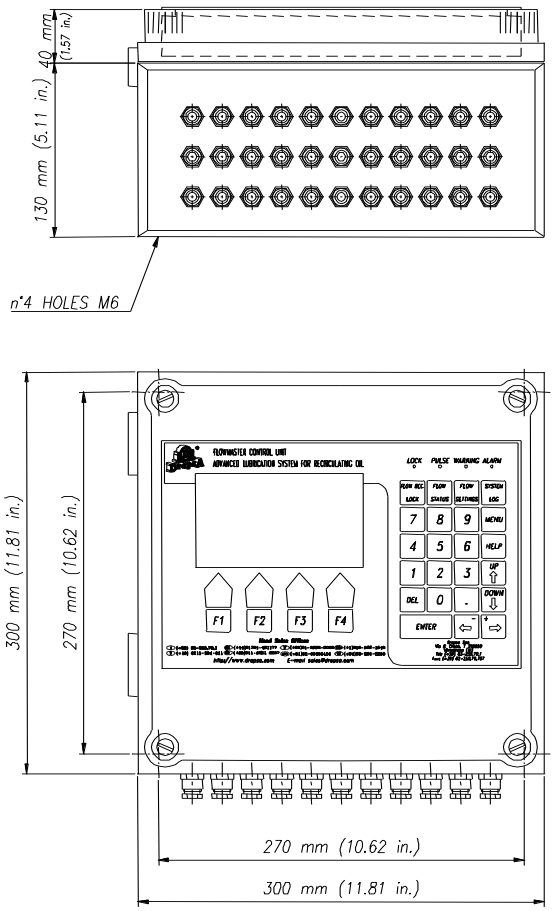
FLOWMASTER **COMPLETE MODULE**

Servo-motor Version	Manual Version	Flow rev/min		Material
		cm³	cu. in.	
1523650	1523600	5	0.30	AISI 316
1523660	1523610	10	0.61	
1523670	1523620	20	1.22	
1523652	1523602	5	0.30	Aluminium
1523662	1523612	10	0.61	
1523672	1523622	20	1.22	

FLOWMASTER **PARTS**

Mounting Base only, (motorised version)		Measuring Module	Flow rev/min		Material
			cm³	cu. in.	
1523630	1523330	1523604	5	0.30	AISI 316
		1523614	10	0.61	
		1523624	20	1.22	
1523632	1523332	1523605	5	0.30	Aluminium
		1523615	10	0.61	
		1523625	20	1.22	

14. DIMENSIONS



15. HANDLING AND TRANSPORTATION

FACT-2000 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-2000* in a dry place.
Due to equipment small dimensions, it is not necessary the use of material handling equipment.

16. 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.

Power supply
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.

17. WARRANTY INFORMATION

All products manufactured and marketed by Dropsa are warranted to be free of defects in material or workmanship for a period of at least 12 months from date of delivery. Extended warranty coverage applies as follows:

Complete system installation by Dropsa: 24 Months

All other components: 12 months from date of installation; if installed 6 months or more after ship date, warranty shall be maximum of 18 months from ship date.

If a fault develops, notify us giving a complete description of the alleged malfunction. Include the part number(s), test record number where available (format xxxxxx-xxxxxx), date of delivery and installation and operating conditions of subject product(s). We will subsequently review this information and, at our option, supply you with either servicing data or shipping instruction and returned materials authorization (RMA) which will have instructions on how to prepare the product for return. Upon prepaid receipt of subject product to an authorized Dropsa Sales & Service location, we will then either repair or replace such product(s), at out option, and if determined to be a warranted defect, we will perform such necessary product repairs or replace such product(s) at our expense.

Dropsa reserves to right to charge an administration fee if the product(s) returned are found to be not defective.

This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.

Consumables and perishable products are excluded from this or any other warranty.

No other extended liabilities are states or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

The use of Dropsa product(s) implies the acceptance of our warranty conditions. Modifications to our standard warranty must be in made in writing and approved by Dropsa.

18. DECLARATION OF COMPLIANCE WITH CE STANDARDS

Manufacturer:

DROPSA SpA

Via B. Croce, 1 - 20090 Vimodrone (MI)
Address
02 – 250.791
Telephone

Certifies that:

The machine: ***FACT- 2000*** **Controller**

- Has been manufacturer in conformance with the European Community Directive relating to the harmonised standards of the member states relating to machine safety, EMC (89/336/EEC) and BT (73/23/EEC)

TECHNICAL DIRECTOR — W. Divisi

Name

DROPSA SpA

Company

January 2000

Signature **Date**

19. DROPSA LOCATIONS

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