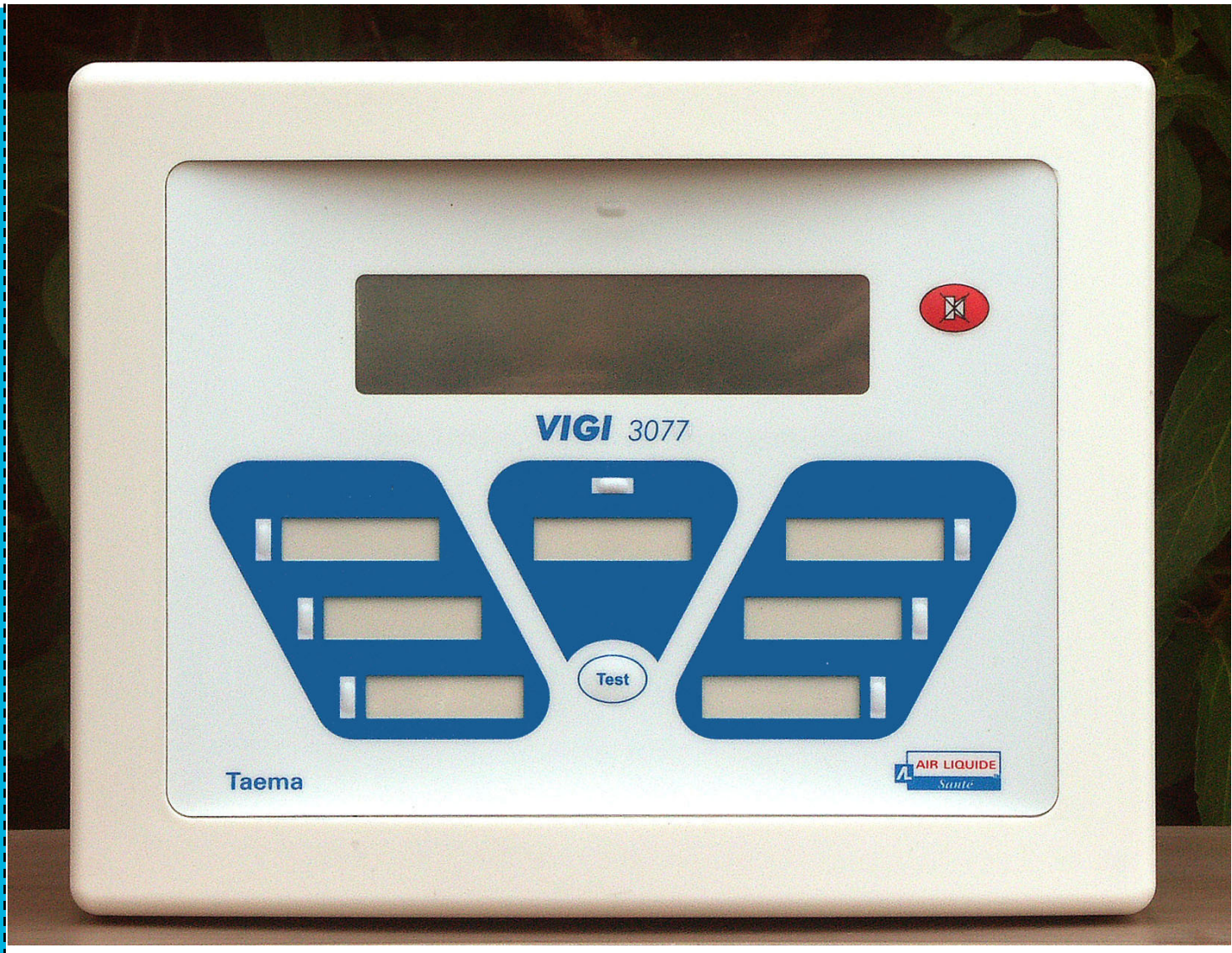
Taema

VIGI SÉRIE 3000

VIGI 3033 - VIGI 3055 - VIGI 3077



Installation and User Manual

EN

Software version V3.0x

YL041800 / Rev 2.0 / 01/2007

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AIR LIQUIDE

CONTENTS

This is an installation and user manual for VIGI 3033, VIGI 3055 and VIGI 3077.

1 GENERAL SAFETY REQUIREMENTS

Oxygen Use

• Avoid sources of incandescence in the vicinity of the equipment.
• There should be no greasy substances in the vicinity of the equipment.
• Precautions in case of oxygen leakage:
  - Do not smoke
  - Avoid flames and sparks
  - Close oxygen tap
  - Ventilate room during leakage and at least 20 minutes after leakage.
  - Ventilate clothes worn.

Power supply

• Check that plug voltage corresponds to electrical characteristics of the equipment as given on the manufacturer's plate on the front face and Selector S2.

Commissioning of equipment

• Check that the sound and visual alarms (red indicators) are working and conduct all annexed verifications before start-up.

Electromagnetic Compatibility

• This equipment is certified as conforming protection requirements of the 93/42/CEE directive.
• The presence of such equipment as diathermy units, high frequency electro-surgical equipment, defibrillators and cellular telephones or of electromagnetic interferences exceeding EN 60 601-1-2. norm levels in its vicinity may interfere with the normal functioning of the equipment.

Use and maintenance of equipment

According to EN 60 601-1 standards (See Appendix A, Section 6.8.2.b):

"The manufacturer, assembler, installer and importer shall assume responsibility for the security and reliability of product components only if:

• Its assembly, extensions, settings, modifications and repairs have been performed by authorised personnel,
• All electrical installations on the premises conform to IEC specifications,
• The equipment is used according to utilization instructions.

If spare parts used during routine maintenance by authorised technicians do not conform to the manufacturer's specifications, the latter shall assume no responsibility for accidents.

• Do not open equipment while operational.

• Do not use ***VIGI 3000 Series*** in a magnetic environment (such as MRI, etc).

• All equipment connected to ***VIGI 3000 Series*** should conform to IEC 950 standards.

• This manual should be read and understood before using the equipment.

It is the responsibility of the user to assign personnel capable of using the equipment.

• In case of breakdown, consult alarm messages (see Section 8.5) and inform the technical department of your company.

• The *VIGI 3000 Series* sound alarm is intended for personnel placed in the vicinity of the equipment. The distance and sound level of the alarm should be adjusted accordingly.

Cleaning and maintenance of equipment

• Do not use abrasive powders, alcohol, acetone or any other inflammable solvents.

• ***VIGI 3000 Series*** should be regularly checked. To plan and keep a record of all maintenance operations, refer to the annexed maintenance release.

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• Miscellaneous information:

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• Governing Law and Court of Competent Jurisdiction:

In case of litigation, the Court of Paris alone shall be deemed competent to adjudicate. The present agreement shall be interpreted according to French law.

3 PRODUCT DESCRIPTION

The ***VIGI 3000 Series*** is used to monitor a medical gas supply and/or distribution network with the help of analogue sensors.

The system may be used for the simultaneous or separate supervision of:

- ***VIGI 3033***: 3 lines consisting of 1 gas distribution network (primary and secondary) and 1 vacuum system for instance.
- ***VIGI 3055***: 5 lines consisting of 2 gas distribution networks (primary and secondary) and 1 vacuum system for instance.

  Other example: This unit can be used to monitor a HP system with pre-programmed names : manifold 1, manifold 2, emergency manifold, back-up switch, pipe pressure.
- ***VIGI 3077***: 7 lines consisting of 3 gas distribution networks (primary and secondary) and 1 vacuum system for instance.

Sensor information is transmitted and visualised on the ***VIGI*** unit which provides a status report on each network. A sound and visual alarm is set off if any anomaly is detected. These alarms may be redirected to one or more V***IGI 3001*** alarm remote units.

A keyboard tool is used to set the parameters of the main units at the time of installation.

4 SYSTEM COMPOSITION

This signalling device includes the following elements:

1. The main unit:
   VIGI 3033, 3 lines, analog or dry contact.
   VIGI 3055, 5 lines, analog or dry contact.
   VIGI 3077, 7 lines, analog or dry contact.
   These units may be configured as a mirror unit with a switch (see Section 5.2).

2. One or more (with a maximum of 10) ***VIGI 3002*** alarm remote units, 4 lines (see Section 5.3). The system is also compatible with ***VIGI 3001*** remote units.

3. Analogue sensors:
   4/20 mA, 0 to 16 bar sensor for gas networks with M10 x 100 threading
   4/20 mA, 0 to –1000 mbar or (0 to –900 mbar) sensor for vacuum systems, with M10 x 100 threading
   4/20 mA, 0 to 250 bar sensor for monitoring gas supply source, ¼ gas threading
   High Pressure switch, max 240 bar, 6-15 bar setting range, pressure loss detection, ¼ gaz

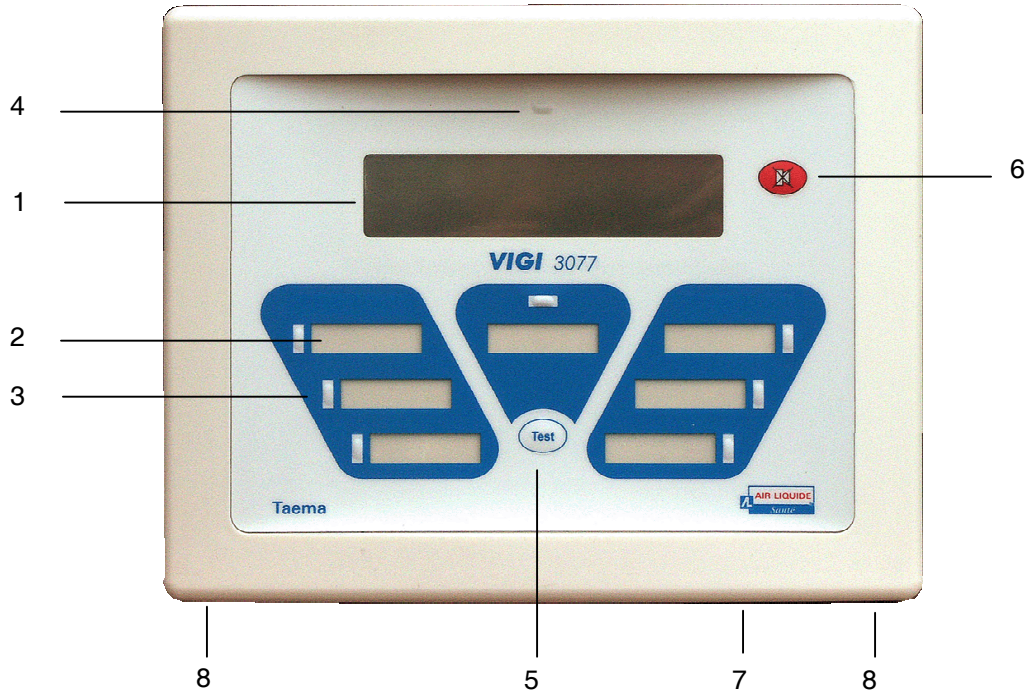
4. A configuration keyboard for programming the main unit.

5 DESCRIPTION

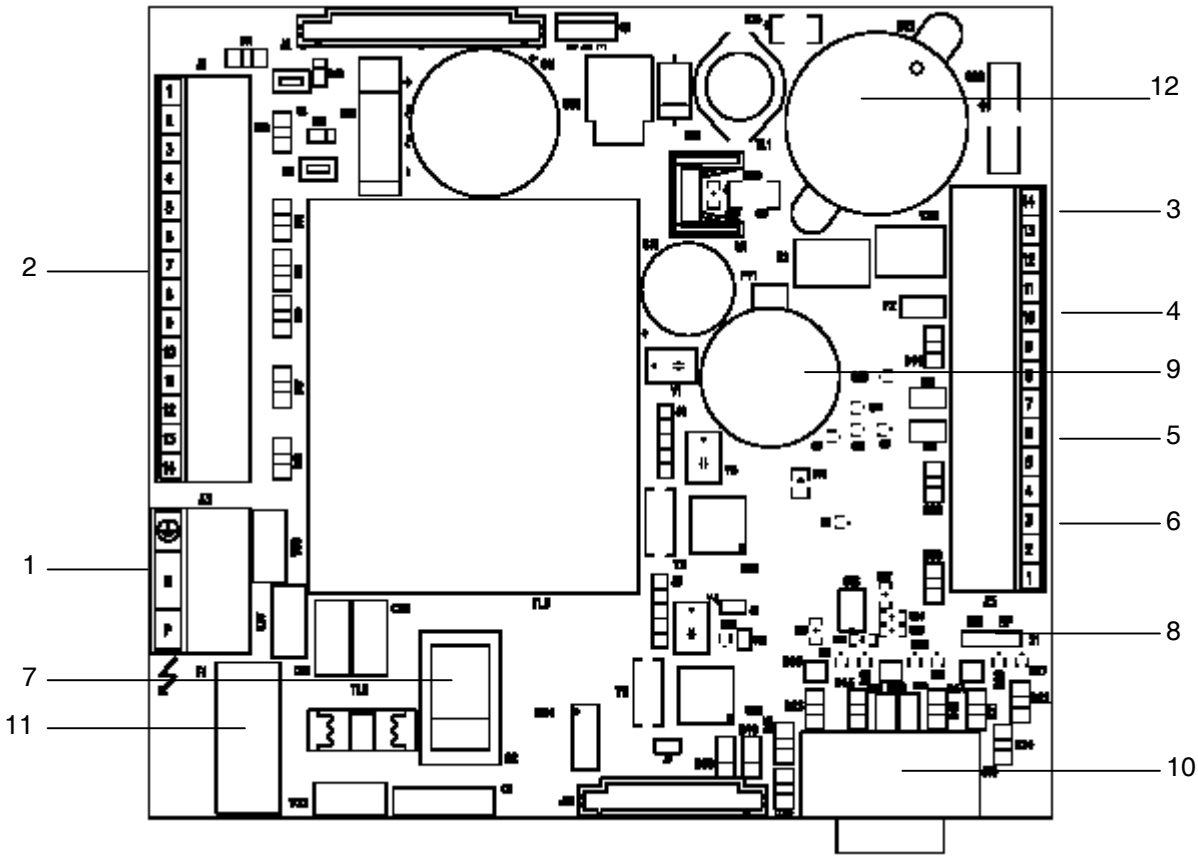
5.1 Main unit

The main unit has the following functions:

1. Monitoring of 3, 5 and 7 analogue inputs from pressure sensors with 4-20 mA type outputs or from dry contact.
2. Displaying sensor information from the 3, 5 and 7 inputs.
3. Emitting a cancellable sound and visual signal when threshold values on sensors are exceeded or when dry contacts are opened.
4. Transmitting sensor information to the mirror unit
5. Redirecting threshold exceedance to the remote and mirror units,
6. Verifying internal functioning
7. Fault storage (black box function)
8. Dialoguing with the centralised technical management system



1. Backlit graphics liquid crystal display that shows all line values and alarms.
2. Outlet labels for line identification
3. Red indicator on alarm that flashes in case of a line malfunction
4. Green indicator light that remains steady in case of proper functioning.
5. Test button for testing the functioning of the LCD screen, red indicators, the sound alarm and transmission to mirror and remote units.
6. Acknowledgement button for temporary alarm inhibition
7. RS 232 connection for programming OR connection to computer or configuration keyboard
8. Box closing knob



Main unit Electronic Board

1. Terminal block (J3) for area supply Phase + Neutral + Earth.
2. Terminal block (J1) for sensor or dry contacts connections.
3. Terminal block (J5) for remote alarm connections (terminals 13 and 14)
4. Terminal block (J5) for remote unit connections (terminals 9 to 12)
5. Terminal block (J5) for mirror unit connections (terminals 5 to 8)
6. Terminal block (J5) for centralised management system connection (terminals 1 to 4)
7. Selector (S2) 115V/230V
8. Mirror unit (BM) / Main unit (BP) Switch (S1)
9. Save button battery (PY1)
10. Connection plug (J10) for configuration keyboard and RS232
11. Fuse (F1)
12. Buzzer (BZ1)

5.2 Mirror unit

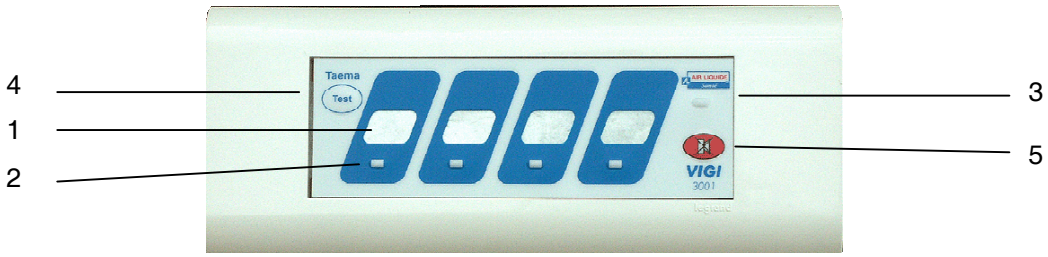
The mirror unit is identical to the main unit.
The mirror unit is configured using the S1 switch (position BM).

The mirror unit displays the same information and alarms as the main unit. It can be used, for example, for remote signalling of a gas supply source.

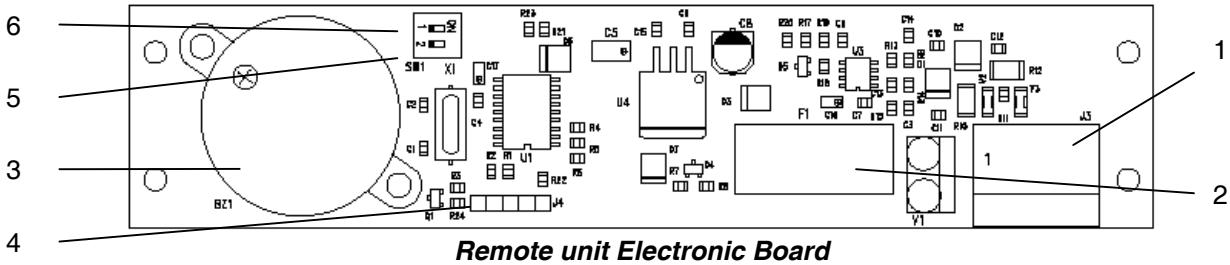
5.3 Alarm remote unit

The alarm remote unit performs the following tasks:

It emits cancellable sound and visual alarms from the main and mirror units in case of threshold exceedance.
It verifies internal functioning.



1. Port label for network identification.
2. Red alarm indicator that flashes in case of alarms on the line
3. Green indicator that remains steady in case of proper functioning.
4. Test button for testing the functioning of the red indicators and the sound alarm.
5. Acknowledgement button for temporary sound alarm inhibition(default setting: 15 min).



Remote unit Electronic Board

1. Main or mirror unit connection Terminal block
2. Fuse F1
3. Buzzer
4. Programming interface
5. Remote 1/Remote 2 switch (***VIGI 3002*** only)
6. 3001/3002 switch (***VIGI 3002*** only).

VIGI 3001:
The redirecting of alarms from the main unit (or mirror unit) to ***VIGI 3001*** units is a factory setting and is not modifiable (see Section 7.3).

VIGI 3002*:
The redirecting of alarms from the main unit (or mirror unit) to ***VIGI 3002*** units can be configured in the main unit (see Section 7). Each line of the main unit can be redirected independently or coupled to the ***VIGI 3002*** unit.
To redirect more than 4 lines independently, ***VIGI 3002*** units can be coupled. The switch (5) is used to distinguish remote unit 1 (lines 1 to 4) from remote unit 2 (lines 5 to 8; see diagrams Section 6.1).
The ***3001/3002*** switch is used to operate the ***VIGI 3002*** like a ***VIGI 3001*** unit so that it can be integrated into an installation equipped with a ***VIGI 3001*** unit (for example, in the case of a replacement or extension).

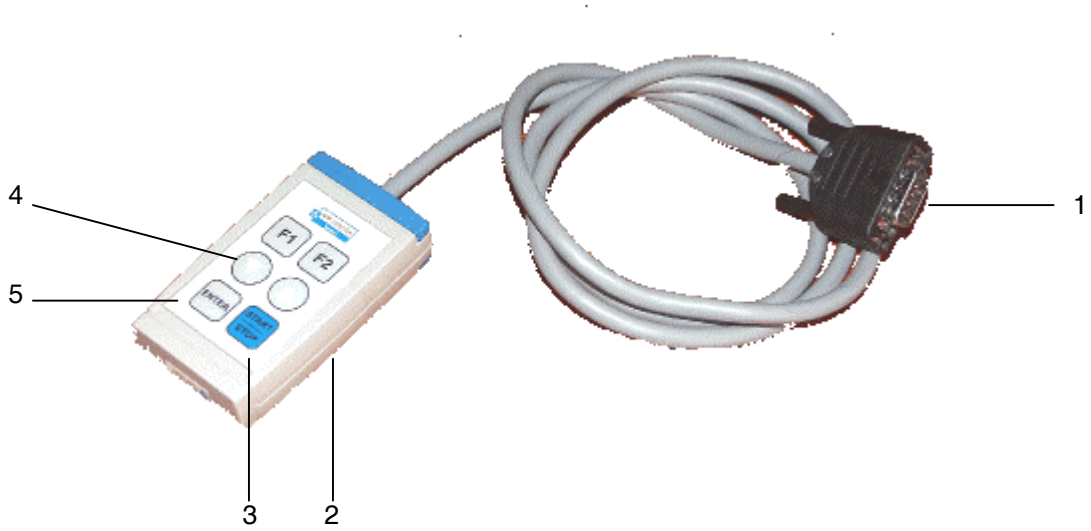
Important note:
After switching between 3001 and 3002, disconnect and then reconnect the mains power supply. The switchover will then be applied to the operation of the unit.

Warning:
VIGI 3001 units cannot be used on the same installation as ***VIGI 3002*** units unless the switch on the ***VIGI 3002*** units is set to ***3001. Otherwise, the redirecting of the audible and visual alarms will not operate correctly.***

** **VIGI 3002** units will be available from the second quarter of 2007.*

5.4 Configuration keyboard

The keyboard is used to configure the main unit via the maintenance menu. It may be visualised on the main unit screen.



Ref. AF022500

1. Plug
2. Keyboard
3. Start/Stop keys for entering the maintenance menu and returning to the preceding menu.
4. UP and DOWN: keys for scrolling menus to the top or the bottom.
5. ENTER key for entering a menu or validating input

5.5 Analogue sensors

The 0-16 bar, 0 to –1000 mbar and 0 to -900 bar sensors have a pneumatic connection with M10 X 100 threading and a aluminium Ø10 X 5 X 1 seal like that of a pressure gauge.

The sensors 0-250 bar have a pneumatic connection with a ¼ gas threading and a Ø11x 6 X 2 copper seal.

The cable consists of a red (+) and a blue wire (-).

The sensors carry the following reference numbers:

- AF003000: 0-16 bar pressure sensors (medical gases, Air, O_2, N_2O, CO_2, He).
- AF013000: set of 6 0-16 bar pressure sensors (medical gases, Air, O_2, N_2O, CO_2, He)
- AF003300: 0 to -1000 mbar Vacuum sensor (medical vacuum).
- AF013300: set of 6 Vacuum sensors 0 - 1000mbar (medical vacuum)
- AF003100: 0 to -900 mbar Vacuum sensor (medical vacuum).
- AF013100: set of 6 Vacuum sensors 0 - 900mbar (medical vacuum).
- AF013200: set of 6 0-250 bar pressure sensors (medical gases, Air, O_2, N_2O, CO_2, He).

5.6 Dry contacts

The high pressure switch is used in the HP central unit. It commands an electrical control circuit when the pressure drops to a pre-set level.

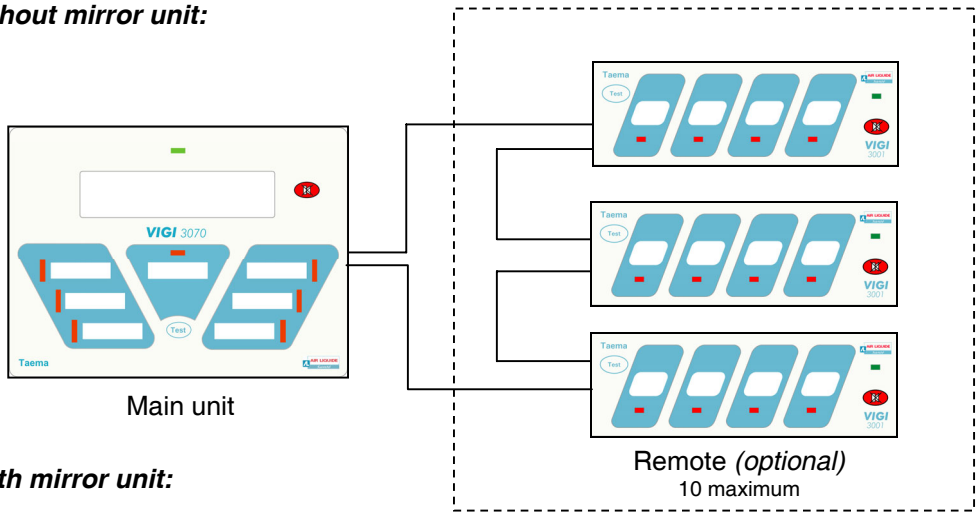
AF070600 : HP switch, 2 wire, 240 bar, 6-15 bar setting range, ¼ gaz connection

6 INSTALLATION - ASSEMBLY

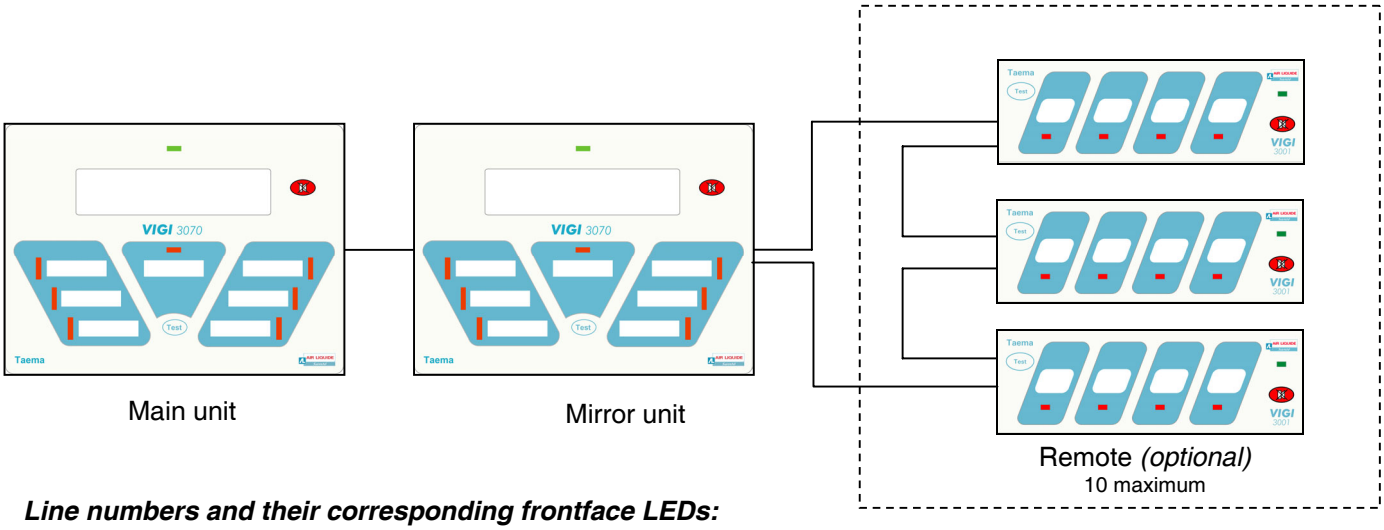
6.1 Diagrams and installation instructions

Two installation configurations are possible.

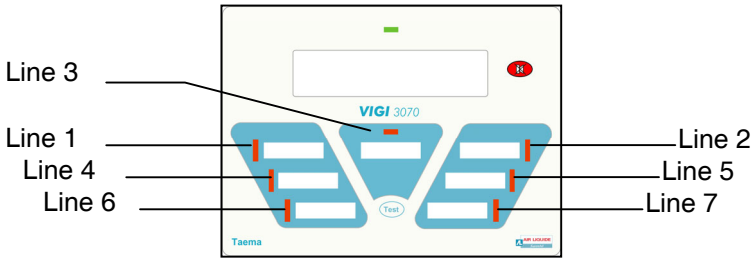
Installation without mirror unit:



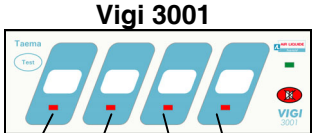
Installation with mirror unit:



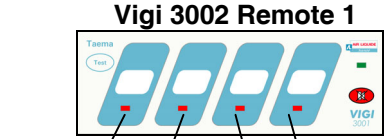
Line numbers and their corresponding frontface LEDs:



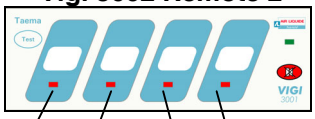
Vigi 3001



Vigi 3002 Remote 1



Vigi 3002 Remote 2



Installation Instructions:

These devices are not suitable for use within a distance of 25 cm of the presence of a flammable anaesthetic mixture with air or in an explosive environment.

According to the EN 737 standards (art 6.1), the installation and the location of these units should be done according to risks analysis in conformity with EN 14971 standards (distance from heat sources, visibility of LEDs and messages, accessibility to keys, alarm audibility, installation of mirror unit, etc.).

The system installer and technical director of the establishment shall ensure that the bipolar circuit breaker is near the main and mirror signal boxes (in conformity to the 601-1 medical standards), so that power supply (both phase and neutral) to the device may be cut at the same time when handling the equipment.

The alarm indicator panels for verifying emergency functions should be installed at the same sites as the supply HP systems.

The signal panels for medical emergency signals should be installed near the zoning valves of the area concerned.

The pressure sensor or switch should not be insulated from the network to which it is connected. If a valve is used for maintenance, it should be opened by inserting a sensor or a switch.

The monitoring and alarm systems should be connected to the normal electric power supply as well as the emergency supply.

For external installations, *VIGI 3000 Series* units should be protected by watertight boxes. Note that the sound level will fall according to the type of box used and the surrounding noise levels.

The installation and startup of the *VIGI 3000 Series* system should be carried out by trained and able personnel.

6.2 Main unit

6.2.1 Installation

- Separate the box lid from the base
  - Press on the 2 box closing knobs (8, section 5.2)
  - Undo the lid from the bottom and then lift it from above
  - If necessary, the cables may be disconnected for better accessibility during installation (make sure that the cables are in the right direction and that none are twisted).
- Check the position of the voltage selector (7) for the mains supply.
- Place the (8) mirror unit (BM)/main unit (BP) switch at the main unit (BP) position
- Check the F1 fuse calibre (500 mA in 230 VAC or 115VAC), and replace it if necessary.
- The supply cable runs, sensors and the links may be embedded or ducted.
  - Embedded cable runs are placed at the bottom of the unit.
  - For ducted cable runs, place the pre-cut opening below the unit (make sure that the duct and the cut out opening fit)
- Fix the base to the wall with 4 dowel screws (ø 4 mm) depending on the type of material.
- Connect the area supply, sensors, switch, mirror and remote units (see following sections).
- Place the appropriate Gas/Vacuum labels. Note that the openings are located inside the lid
- Close the unit by putting back the front face, attach it from the top and then screw in the bottom.
- Power on only after installation is complete (connections to area supply, sensors, installation and mirror and remote unit connections, see following sections).

Never perform connections while the equipment is operational.

- Use the keyboard to set the Date, Time, etc. (see section 7)

6.2.2 Connection to the area supply

The main unit should be connected to the electric network via a bipolar circuit breaker.

The system installer and technical director of the establishment shall ensure that the bipolar circuit breaker is near the main and mirror signal boxes (in conformity to the 601-1 medical standards), so that power supply (both phase and neutral) to the device may be cut at the same time during device handling

Connectors should be 3-conductor cables with a minimum cross section of 0.75 mm^2 in conformity with IEC 227 and 245 directives. The neutral conductor should be light blue. The maximum conductor cross-section is 2.5 mm^2. Striping length: 6 mm.

An earthed connection is compulsory.

Wires	⏚	N	P
Terminal block (J3)	Earth	Neutral	Phase

Area Connection

Warning:

Power on only after installation has been completed.

6.2.3 Sensor Installation

6.2.3.1 Sensor Installation on distribution network

Sensors should be installed after the drains are cleaned and soldered.

Sensors or switches must be placed out of reach of untrained persons, in a cupboard, locked box or any other inaccessible place.

Caution:

Make sure that sensors do not receive any physical shocks and that the wires are not damaged.
Take out the sensors from their packaging only at the time of their installation.

6.2.3.2 Connection to main unit

All lines should be made of 2-conductor twisted armoured cables with a diameter ranging from 0.6 to 0.9 mm. Striping length: 6 mm.

Warning:

Connect only one sensor or switch to each line.
Do not to put in contact wire of sensors or switches at the mass or the ground (risk of deterioration of the alarm unit).
Serious malfunctions could result from non compliance.

Line	**1**		**2**		**3**		**4**		**5**		**6**		**7**	
Terminal block (J1)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
+/-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Analog sensors: red wire **+** / blue wire **-**														
Dry contacts: indifferent connection of wires on **+** or **-** blocks														

Sensor or dry contacts connections

Note:

The lines are configured in sensor range or in dry contact range in the MAINTENANCE menu (see Section 7).

6.2.4 Connection to the centralised management system by MODBUS link.

A centralised technical management system may be connected to the main unit.
This connection should be bidirectional; the master equipment being the centralised technical management system.
They communicate in MODBUS protocol via an RS485 electric connection at a speed of 9600 bps.
A maximum of 32 units can be connected to the same line. Installation of a 120-ohm line-end impedance between + and - is recommended. Use 1 or 2 twisted pair cables for this connection. They should be screened if possible, with capacitance between the conductors not exceeding 100 pF/m. The maximum conductor cross-section is 1.5 mm^2. Stripping length: 6 mm.

Use terminals 1 to 4 of the J5 terminal block for this type of connection. For a 2 wire connection, connect terminal 1 to terminal 4 and terminal 2 to terminal 3.

	+		-	
Type of connection	+Rx	+Tx	-Rx	-Tx
4 wires	1	4	2	3
2 wires	1-4		2-3	

MODBUS Connection

The list of available information and their addresses is given in the annexed table.

6.2.5 Connection to synthetic alarm

An external alarm may be connected to the main unit. Connection characteristics:

- "positive safety" contact (NF, normally closed) : circuit opened in case of alarm or main supply shut-off.
- dry contact supplying with a current, 0.5 A / 60 VDC or 125 VAC maximum.

Use a one-pair twisted cable for the connection. The maximum conductor cross-section is 1.5 mm^2. Stripping length: approximately 6 mm.

	Terminals	
Main unit (terminal block J5)	13	14

Synthetic alarm connection

Note:

VIGI 3000 units (3033, 3055, 3077) can be used in synthetic alarm system by configuring lines in contactor range (see Section 7).

6.3 Mirror Units

Mirror unit installation and area connections are identical to those of the main unit (see Sections 6.2.1 and 6.2.2).

- Place the BP/ BM switch (8) on the mirror unit (BM) position
- Connect point to point terminals 5 to 8 of the mirror unit to terminals 5 to 8 of the main unit according to the following table:

	Terminals			
Main unit (terminal block J5)	5	6	7	8
Mirror unit (terminal block J5)	8	7	6	5

Mirror Unit Connection

Use a two-pair twisted cable for the connection. The maximum conductor cross-section is 1.5 mm^2. Stripping length: approximately 6 mm.

A single mirror unit may be connected to a main unit.

6.4 Alarm remote system

6.4.1 Installation

A Mosaïc Legrand box is used for the alarm remote unit. It may be flush-mounted or surface-mounted.

- In case of surface-mounted units fix the unit to the wall or seal in the flush-mounted unit.
- Set the switch (5) to 1-4 or 5-8 (see Sections 5.3 and 6.1).
- Set the switch (6) to 3002 or 3001 (see Section 5.3).
- Connect the main unit to the mirror unit. (see Section 6.4.2).
- Place the appropriate Gas/Vacuum labels. Note that the opening is located under the electronic board.
.
- Screw the casing onto the unit.
- Clip on the plate to the front of the equipment.

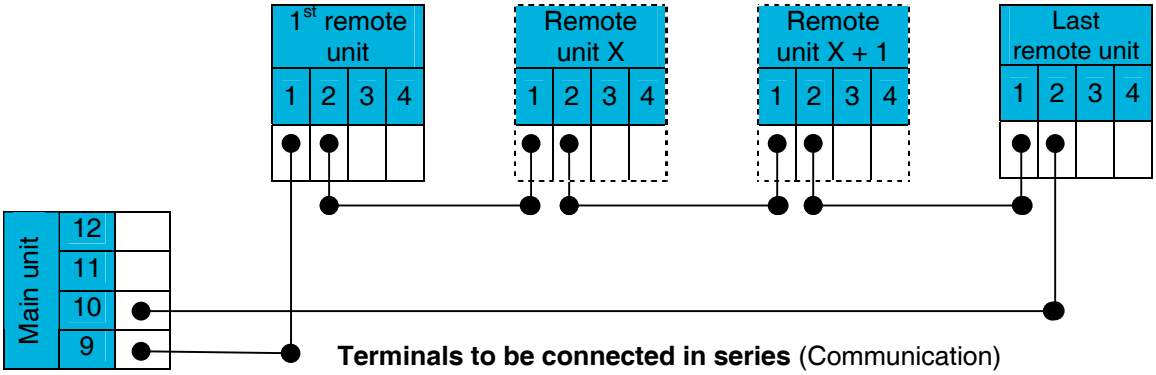
6.4.2 Connections to the main or mirror unit

A maximum of 10 remote units may be connected onto the main unit and the mirror unit (see Section 6.1). The connection mode is independent of the type of remote unit (***VIGI 3001, VIGI 3002*** remote 1 or 2).

If a mirror unit is installed, the remote units are connected only to the mirror unit.

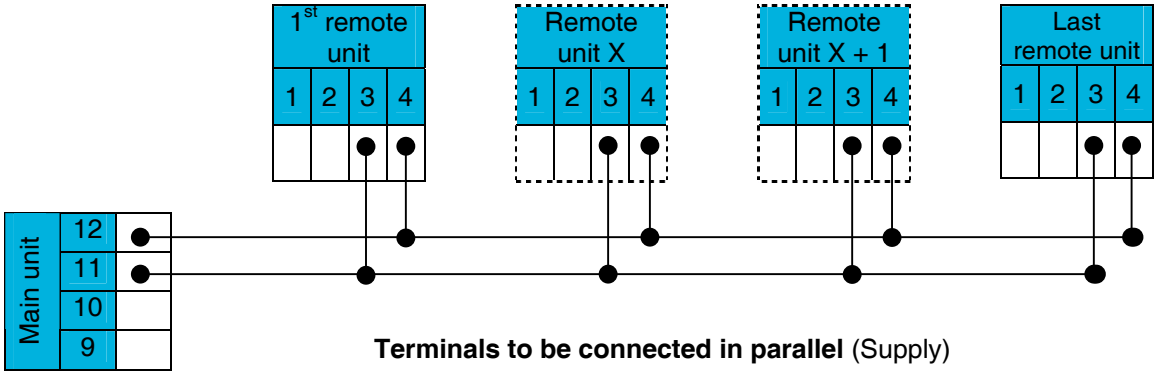
Use a 2 pair twisted cable with a maximum length of 1000 m for the connection. The maximum conductor cross-section is 1.5 mm^2. Stripping length: approximately 6 mm.

- Connect ***VIGI 3001/3002*** terminals 1 to 2 to terminals 9 to 10 of the main or mirror unit according to the following diagrams:



Terminals to be connected in series (Communication)

- Then connect ***VIGI 3001/3002*** terminals 3 to 4 to terminals 11 to 12 of the main or mirror unit according to the following diagrams:



Terminals to be connected in parallel (Supply)

6.5 Line and alarm startup

Lines are factory pre-programmed (see Section 7.9).

The configuration can be changed if required (see Section 7).

6.6 Verification

Check line parameter settings using the “line visualization” option in the maintenance menu (see Section 7.5).

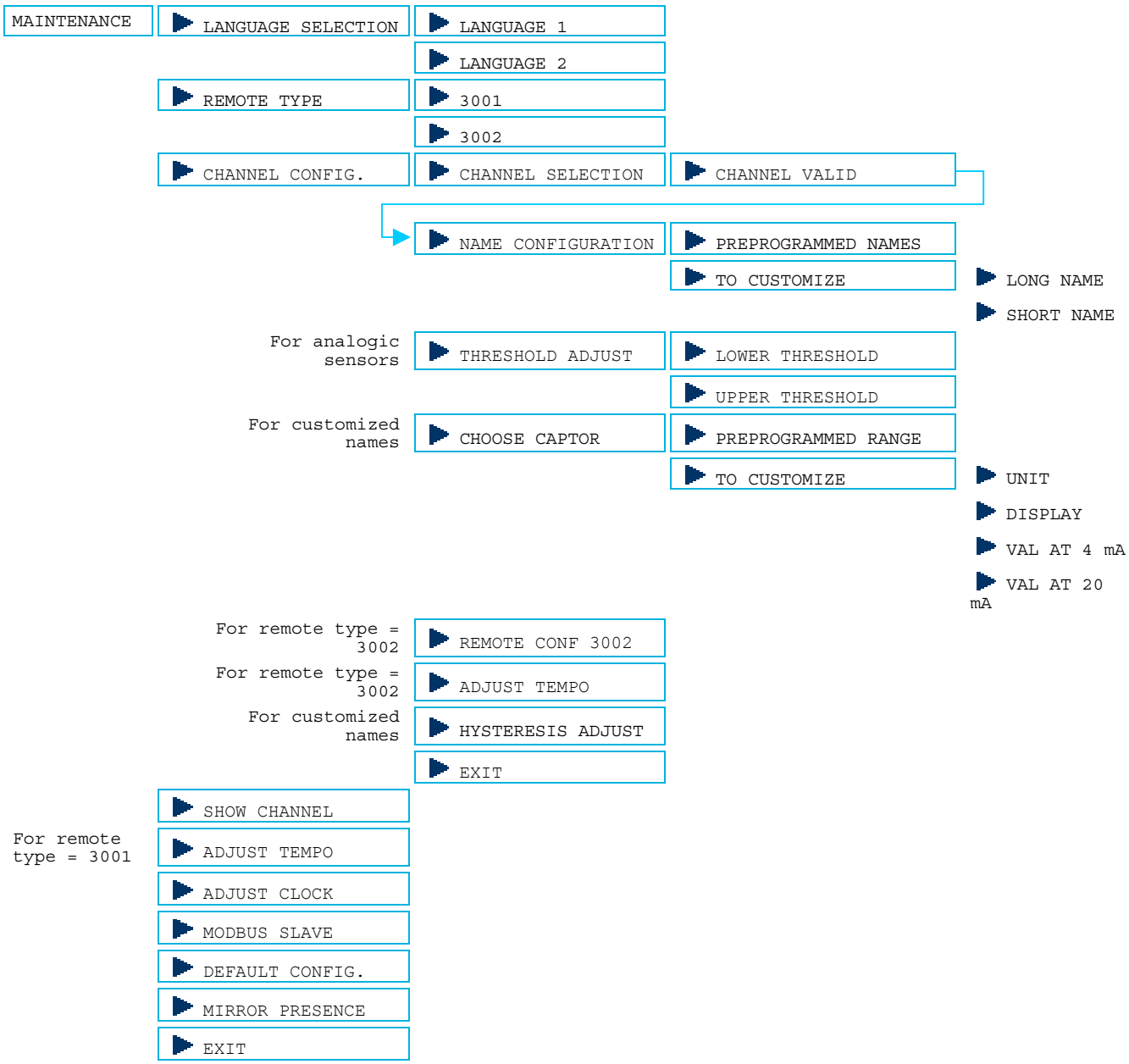
7 CONFIGURATION PROGRAMMING

The maintenance menu and the configuration keyboard may be used to carry out the following operations:

- Change language
- Configure Lines
- Configure remote unit, VIGI 3002
- View Lines
- Adjust alarm inhibition
- Configure ***VIGI 3002*** remote unit
- Adjust clock
- Adjust MODBUS slave address
- Set default configuration
- Configure installation with and without mirror unit

After each programming, check whether the unit has been properly configured with the "SHOW CHANNEL" option and adjust the clock.

The VIGI 3000 SERIES system programming must be carried out by trained and able personnel.



7.1 Access and use of maintenance menu

Connect the configuration keyboard to the RS232 connector located under the main unit.

- The START/STOP key may be used to:
  - enter the maintenance menu by pressing for 3 seconds
  - return to the preceding menu without changing values.
- The ▲ et ▼ keys are used to select sub-menus and adjust numerical values (thresholds, date, etc.)
- The ENTER key is used to validate a selection.
- The F1 and F2 keys may be used for functions to be created later.

To exit the maintenance menu, select EXIT and validate by keying ENTER. Exit from the maintenance menu is automatic at the end of 5 minutes without the use of the keyboard.

7.2 Choice of language

The `LANGUAGE SELECTION` option is used to choose a language from two available languages.

7.3 Choice of remote type

The `REMOTE TYPE` menu lets you select the type of remote unit to be used: ***VIGI 3001*** or ***VIGI 3002***.

The default line remote configurations are as follows:

Line	Remote type	
	3002	3001
1	LED 1 remote 1	LED 1
2	LED 2 remote 1	
3	LED 3 remote 1	LED 2
4	LED 4 remote 1	LED 3
5	LED 5 remote 2	
6	LED 6 remote 2	LED 4
7	LED 7 remote 2	

Type 3002 configuration can be modified via the line configuration menu (see Section 7.4).
Type 3001 configuration is not modifiable.

7.4 Line Configuration

This menu may be used to:

- validate or invalidate a line (`CHANNEL VALID ?`)
- configure line name (`NAME CONFIGURATION`)
- set upper and lower thresholds (`LOWER THRESHOLD =`; `UPPER THRESHOLD =`)
- choose sensor range (in case of personalised lines)
- select the associated LED on the ***VIGI 3002*** remote units (if ***VIGI 3002*** is used)
- adjust the inhibition time per line (except if ***VIGI 3001*** is used).

7.4.1 Pre-programmed names

Channel names are pre-programmed with the sensor ranges and threshold values. Threshold values may however be changed if required in the THRESHOLD ADJUST menu.

A threshold value may be inhibited by adjusting ---.

PRE-PROGRAMMED NAMES FOR ANALOG SENSORS					
Long name	**Short name**	**Lower threshold**	**Upper threshold**	**Upper threshold**	**Inhibition time**
PRIM O2	P O2	6.3 bar	10.8 bar	0-16 bar	15 min
SECOND O2	S O2	3.8 bar	5.8 bar	0-16 bar	15 min
MEDICAL VACUUM	MED VAC	-400 mbar		0 / -1000mbar	15 min
MEDICAL VACUUM	MED VAC	-400 mbar		0 / -900mbar	15 min
PRIM MED AIR	P ME AIR	6.3 bar	10.8 bar	0-16 bar	15 min
SECOND MED AIR	S ME AIR	3.6 bar	5.4 bar	0-16 bar	15 min
PRIM N2O	P N2O	6.3 bar	10.8 bar	0-16 bar	15 min
SECOND N2O	S N2O	3.4 bar	5.0 bar	0-16 bar	15 min
PRIM AIR MOTOR	P AIR MO	6.3 bar	10.8 bar	0-16 bar	15 min
SECOND AIR MOTOR	S AIR MO	6.4 bar	9.6 bar	0-16 bar	15 min
PRIM AGSS AIR	P AGSS	6.3 bar	10.8 bar	0-16 bar	15 min
SECOND AGSS AIR	S AGSS	4.0 bar	6.0 bar	0-16 bar	15 min
MANIFOLD 1	MANIFOLD 1	17 bar		0-250 bar	15 min
MANIFOLD 2	MANIFOLD 2	17 bar		0-250 bar	15 min
BACK UP MANIFOLD	B UP MAN	130 bar		0-250 bar	15 min
BACK UP SWITCH	B UP SWI	8.0 bar		0-16 bar	15 min
PIPE PRESSURE	PIPE PR	6.3 bar	10.8 bar	0-16 bar	15 min

PRE-PROGRAMMED NAMES FOR NC DRY CONTACTS			
Long name	**Short name**	**Range**	**Inhibition time**
SOURCE 1	SOURCE 1	CONTACTOR	15 min
SOURCE 2	SOURCE 2	CONTACTOR	15 min
SOURCE 3	SOURCE 3	CONTACTOR	15 min
LINES	LINES	CONTACTOR	15 min
PUMPS	PUMPS	CONTACTOR	15 min
CAPACITY	CAPACITY	CONTACTOR	15 min
FILTER PRESSURE	FILTER P	CONTACTOR	15 min

Pre-programming of line names

7.4.2 Customized names

The TO CUSTOMIZE option in NAME CONFIGURATION can be used to customize a line name :

- LONG NAME: write a long name of 16 characters maximum (the long name appears on the display when there is no alarm).
- SHORT NAME: write a long name of 7 characters maximum (the short name appears on the display when there is an alarm).
- CHOOSE CAPTOR: choose the sensor range or the contactor range (0-16 bar by default). The analogical sensor range can customized (see Section 7.4.3).
- HYST. ADJUST: adjust hysteresis value (see Section 8.2).
- THRESHOLD ADJUST: adjust the alarm threshold, LOWER THRESHOLD and UPPER THRESHOLD.

7.4.3 Customized sensor range

This menu allows to configure a channel with a 4-20 mA customized analogic sensor range, different from the pre-programmed range (0-16 bar, 0-250 bar, 0/-900 mbar, 0/-1000 mbar). The treatment is linear.

- CHOOSE CAPTOR: choose TO CUSTOMIZE (see Section 7.4.2),
- SENSOR UNIT: enter the unit of the measured value (4 characters maximum)
- DISPLAY: enter display format according to minimum and maximum measured values.
  - XXXX: for measured values from –999 to 9999
  - X.XX: for measured values from 0 to 9.99
  - XX.X: for measured values from -9.9 to 99.9
- VAL AT 4 mA: enter the value at 4 mA.
- VAL AT 20 mA: enter the value at 20 mA.

7.5 Line display

This menu is used to view the following information for each line:

- the long and short names of the line (CHANNEL N°:)
- validity of the line (CHANNEL VALID / NON VALID)
- the sensor range programmed (RANGE:)
- the hysteresis value (HYSTERESIS =)
- the upper and lower thresholds values (UPPER THRESHOLD =; LOWER THRESHOLD =) for analogic sensor ranges.
- the associated LED on the ***VIGI 3002*** remote units (when type ***3002*** remote units are used)
- the inhibition time per line (except if type ***3001*** remote units are used)
- pressure value of the line (=.... BAR) for analogic sensor ranges.
- The line state (OK / ALARM) for contactor range

7.6 Setting alarm inhibition

This menu is used to adjust the time in minutes between 2 consecutive signals from the sound alarm (ADJSUT TEMPO) after pressing the acknowledgement button.

This sound alarm inhibition time can be adjusted on a line-by-line basis (see Section 7.4) except when type ***3001*** remote units are used (in this case, all lines have the same inhibition time).

The maximum duration adjustable is 0 to 120 hours (3002), 0 to 3 hours (3001). **To conform to EN 737-3 standards, alarm inhibition for emergency alarms should be lower than or equal to 15 minutes.**

Note: selecting --- disables the sound alarm and the flash function of the red LEDs. In case of alarm, the red LEDs are switched on but do not flash.

7.7 Adjusting the clock

This menu is used to set the time (TIME =) and the date (DATE =).

Time and date settings remain in software memory even in case of power cuts.

7.8 Adjusting the MODBUS slave address

This menu is used to set the MODBUS address for connections to the centralised management system. This address can reach 1 to 247.

7.9 Setting default configurations

This menu is used to set default line configurations.

Line	Long name	Short name	Lower threshold	Upper threshold	Sensor Range	Inhibition time	Remote type
							3002
1	PRIM O2	P O2	6.3 bar	10.8 bar	0-16 bar	15 min	LED 1 remote 1
2	SECOND O2	S O2	3.8 bar	5.8 bar	0-16 bar	15 min	LED 2 remote 1
3	MEDICAL VACUUM	MED VAC		-400 mbar	0 to -1000 mbar	15 min	LED 3 remote 1
4	PRIM MED AIR	P ME AIR	6.3 bar	10.8 bar	0-16 bar	15 min	LED 4 remote 1
5	SECOND MED AIR	S ME AIR	3.6 bar	5.4 bar	0-16 bar	15 min	LED 5 remote 2
6	PRIM N2O	P N2O	6.3 bar	10.8 bar	0-16 bar	15 min	LED 6 remote 2
7	SECOND N2O	S N2O	3.4 bar	5.0 bar	0-16 bar	15 min	LED 7 remote 2
Mirror presence deactivated							

Default line programming

7.10 Mirror Unit Presence

The `MIRROR PRESENCE` option is used to choose the type of installation required (with or without mirror unit).

8 OPERATION

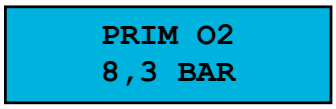
The gas distribution is monitored by measuring the pressure of the various gases. Sensor data are processed by the main unit.
In case the programmed thresholds are exceeded, a sound and visual alarm is set off.
In case of a dry contact use, the alarm is set off by the opening the circuit.
These alarms are transmitted to the remote unit which also sets off an sound and visual alarm.

In mirror unit configurations, the main unit redirects sensor information to the mirror unit which then retransmits the alarms to the remote units.

In order to use this product, it is necessary to have read and understood this manual. The proprietor shall instruct its personnel in the proper use of this system.

8.1 Normal gas distribution (without alarm)

The pressure values from sensors or contactor states are displayed cyclically on main and mirror unit screens. Each display remains on screen for 2 seconds.



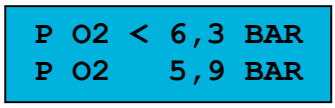
The line indicators are switched off.

The operating indicator (green) is switched on.

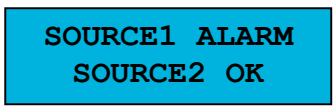
8.2 In case of a distribution system malfunction

If the threshold values are exceeded at one or several lines:

- The red indicators of the lines in question start flashing in all the units
- The discontinuous sound alarm of all the units is set off.
- For a line configured in analogic sensor range:
  - Names of malfunctioning lines and thresholds exceeded are displayed on the first line of the main unit screen.
  - The pressure values for all lines (both malfunctioning and operational) are displayed on the second line.



- For a line configured in contactor range:
  - Names of malfunctioning lines on the first line of the main unit screen.
  - The state for all lines (both malfunctioning and operational) are displayed on the second line.



Hysteresis

To prevent repetitive alarms, the alarms are monitored using hysteresis:

- Functional alarms are set off and black box recordings begin as soon as threshold values are exceeded.
- The alarm stops if the value falls below the set threshold minus the hysteresis value for the upper threshold or if the value rises above the set threshold plus the hysteresis value for the lower threshold.

The hysteresis values are set at:

- 0.3 bar for the 0-16 bar sensor range;
- 50 mbar for the 0 to –1000 mbar and 0 to -900 mbar sensor range
- 5 bar for the 0-250 bar sensor range
- 3 % of the maximum value for customized sensor range

These value are fixed for pre-programmed names and adjustable for customized names (see 7.4.2)

8.3 Alarm acknowledgement

The acknowledgement button is used to inhibit the sound alarm for a pre-programmed period of 15 minutes. The alarm inhibition period may be modified on the main and the mirror units (see Section 7). In that case the red indicators remain lit steady.

The main, remote and mirror unit alarms require separate acknowledgements.

If malfunctioning persists beyond the alarm inhibition period, the sound alarm is set off and the red indicators start flashing again.

If the malfunctioning disappears after acknowledgement, the red indicator is switched off.

If the malfunctioning disappears even when the alarm is not acknowledged, the red indicator remains lit steady. It may then be switched off by pressing the acknowledgement button.

8.4 Supply malfunction

A supply malfunction activates the main and mirror unit buzzers for 10 minutes at least.

8.5 Alarm specifications

Unit	Sound alarm	Green LED	Red LED	Message	Functioning of the *VIGI 3000 Series* system	Malfunction
MAIN / MIRROR UNIT	yes	Off			INOPERATIVE	Lack of supply in area
	yes	Off			OPERATIONAL	Internal voltage malfunction
	no	Off			INOPERATIVE	micro-controller malfunction
	no	Flashing		ERR MIRROR COMM.	OPERATIONAL	Communication malfunction between main and mirror units
	no	Off			OPERATIONAL	Clock malfunction
	no	Off			OPERATIONAL	Configuration keyboard malfunction
	yes		Flashing	Line name> or < threshold	OPERATIONAL	Line threshold values exceeded.
	yes		Flashing	Line name ALARM	OPERATIONAL	Opening of a contactor line circuit.
	yes		Flashing	Line name ERR01	OPERATIONAL	Sensor or line malfunction (short circuit or current > 20 mA)
	yes		Flashing	Line name ERR02	OPERATIONAL	Sensor or line malfunction (disconnection or current < 4mA)
	yes	Off	On		INOPERATIVE	Test alarm malfunction
	no	Off			OPERATIONAL	Acknowledgement alarm malfunction
REMOTE UNIT	no	Off			INOPERATIVE	Supply malfunction
	no	Off			INOPERATIVE	Micro-controller malfunction
	no	Off			OPERATIONAL	Buzzer malfunction
	no	Flashing			OPERATIONAL	Main unit connection malfunction
	yes	Off	On		INOPERATIVE	Test alarm malfunction
	no	Off			OPERATIONAL	Acknowledgement alarm malfunction

Alarm specifications

Unit	Message	Signification	Solution
MAIN UNIT / MIRROR UNIT	ERR 01	Sensor or line malfunction (short circuit or current > 20 mA)	1. Check sensor connection. 2. Check the sensor or contactor range. 3. Change the sensor. 4. Contact the technical department.
	ERR 02	Sensor or line malfunction (disconnection or current < 4 mA)	1. Check sensor connection. 2. Change the sensor. 3. Contact the technical department.
	ERR MIRROR COMM.	Communication malfunction between main and mirror units	1. Check mirror unit connection. 2. Contact the technical department.
	ERR 12 V SENSOR	Malfunction on sensor acquisition stage 12 V	1.Check sensors 2.Contact the technical department.
	ERR CAPA BUZZER	Capacitor buzzer malfunction	1.Check C20 capacitor isn't in short circuit. 2.Contact the technical department.
	ERR ACT. BUZZER	Command buzzer malfunction	Contact the technical department.
	ERR TEST BUTTON	Permanent support on test button	1. Check keyboard connection.. 2. Contact the technical department.
	ERR ACKNOW BUT	Permanent support on acknowledgement button	1. Check keyboard connection. 2. Contact the technical department.
	ERR ADC	Malfunction in analogue to digital conversion stage. Measurements and alarms are not reliable.	Contact the technical department.
MAIN UNIT	ERR CONF KEYBOARD	Keyboard connection malfunction	1. Check keyboard connection. 2. Contact the technical department.
	ERR CLOCK	Clock malfunction	Contact the technical department.

Malfunction messages

8.6 Storing of faults

The main unit is equipped with a "black box" function that may be used to save the following events in memory:

- Alarm setting off
- Alarm acknowledgement with the acknowledgement button

In order to date these events, the main unit is equipped with a real time clock, functioning even in case of power cuts in the main unit. Only the last 55 events and the last event of each malfunction are stored.

To prevent black box saturation with the same repetitive malfunctioning, hysteresis is used to control recorded threshold exceedance alarms (see Section 8.2).

The black box may be viewed and transferred via a PC equipped with a specific maintenance software.

8.7 Verification of the functioning of the main unit and connections

The following tools are used to check the functioning of the main unit:

- A green indicator located on the front face of the equipment to indicate proper functioning
- A "TEST" button located on the front face of the main unit.

On pressing the "TEST" button:

- The sound alarm is set off
- The red indicators for each line begin to flash
- A "`TEST MODE`" is displayed on the main unit screen which may be used to check all displays.
- The software version is displayed.

On pressing the main unit TEST button, test functions on all units are activated. If the remote unit TEST button is pressed only the remote unit test functions are activated.

9 TECHNICAL INSPECTIONS AND MAINTENANCE

9.1 Sensors Verification

This test is carried out by checking the coherence between the indicated pressure on ***VIGI 3000 Series*** and the current given by an ammeter. Current measurement with a precise ammeter allows checking the proper functioning of the ***VIGI 3000 Series*** unit and the pressure sensors (**Theoretical values at 20°C**).

The relation between the pressures values and the current in mA as indicated by the sensors is given by the following 2 equations:

X: Value of the current in mA

0-16 bar (4-20 mA) Sensor:	Pressure = X – 4
0-250 bar (4-20 mA) Sensor:	Pressure = (X – 4) x 250 / 16
0 to -1000 mbar (4-20 mA) Sensor:	Pressure = - (X – 4) x 1000 / 16
0 to -900 mbar (4-20 mA) Sensor:	Pressure = - (X – 4) x 900 / 16

E.g. with the 0 to -1000 mbar sensor if the milliammeter value is 15 mA, the corresponding pressure should be: (15 - 4) X 1000/16 = 688 mbar.

The value indicated by the pressure sensors should correspond to the theoretical value ±2 % of the full scale.

9.2 Maintenance and routine verifications

Routine verifications by user (every week if possible):

- Press the TEST button to check whether all units are functioning properly: all the red indicators and the sound alarm should work.

Annual check by a trained technician:

- Press the TEST button to check whether all units are functioning properly: all the red indicators and the sound alarm should work.
- Check the pressure of each line with a reference pressure gauge connected to the unit when inoperative.
- Check the functioning of each contactor range line.
- Check alarm threshold settings for each line using the `SHOW CHANNEL` option.
- Check that the inhibition period of the sound signal is less than 15 minutes.
- Check whether the internal clock is functioning properly using the `ADJUST CLOCK` option.
- Set off at least one alarm on each line to check the proper functioning of main, mirror and remote unit alarms.
- Change the back-up battery every 10 years.

Any anomalies or malfunctions should be repaired by trained personnel only.

The software version of the main and the mirror units appears in the second line on screen when the TEST button is pressed.

Supply source monitoring
When changing cylinders or cylinders frames, check that the values on the ***VIGI 3000 Series*** unit correspond to the values indicated by the installation pressure gauges.

In case of accidents, the manufacturer shall assume no responsibility for installations that do not conform to the manufacturer's instructions, if non-approved components are used or if the equipment is manipulated by unauthorised or untrained persons.

10 CLEANING AND DISINFECTION

Caution:

Never use abrasive powders, acetone or other powerful solvents.
When using products containing formaldehyde for aerosolisation, conditions of usage prescribed by the product manufacturer should be strictly adhered to, especially as regards the amount to be used and the time of contact. The equipment should be covered for protection .

• **Cleaning**: the unit may be cleaned with a piece of linen lightly soaked in soap water and dried. Wipe dry with a rag or wipe with a rag dipped in aqueous alcohol solution.

• **Disinfection**: use a spray e.g. Surfanios (manufactured by Anios) to disinfect the equipment. Scrupulously observe the manufacturer's instructions regarding the quantity of product to be used or use a rag dipped in an alcohol-based disinfecting solution.

11 TECHNICAL CHARACTERISTICS

Dimensions:
- Main Unit: 210 x 165 x 60
- Remote Unit: 205 x 80 x 50
- Configuration keyboard: 80 x 45 x 20

Mass:
- Main Unit: 1200 g
- Remote Unit: 220 g

Electrical class: class 1
Protection Index: IP31

Operating and storage temperature:
Main Unit: -20°C to +60°C
Remote Unit and Configuration keyboard: 0°C to +60°C
1mn/month Clock drift from 0°C to+50°C

Relative humidity during Use and storage: 45% to 75%
Atmospheric pressure during use and storage: 860 hPa to 1060 hPa

Power supply: Mono 115VAC / 230VAC (±10%)

Power Consumption: 30 VA

Buzzer Noise level:
Main Unit: 59.5 dBA
Remote Unit: 66.2 dBA

Protection Fuses:
Main Unit: 500 mA (230VAC OU 115VAC)
Remote Unit: 100mA

Battery: Lithium 3V CR2032

Degree of precision of measurements: ± 4%

Factory-programmed alarm thresholds:

Line No.	Gas	Lower threshold	Upper threshold
1	Primary O_2	6.3 bar	10.8 bar
2	Secondary O_2	3.8 bar	5.8 bar
3	Vacuum	--- mbar	-400 mbar
4	Primary Medical Air	6.3 bar	10.8 bar
5	Secondary Medical Air	3.6 bar	5.4 bar
6	Primary N_2O	6.3 bar	10.8 bar
7	Secondary N_2O	3.4 bar	5 bar

Factory programmed alarm thresholds

12 REGULATIONS

12.1 Standards

Directive 93/42/EEC

Directive 2002/96/EEC (WEEE)

EN 737-3 (2000) Medical gas pipeline systems - Part 3: Pipelines for compressed medical gases and vacuum

EN 60601-1 (1991 / A1-1993 / A2-1999): Medical electrical equipment. Part 1: General requirements for safety

IEC 60601-1-2 (2001) Medical electrical equipment. Electromagnetic compatibility – requirements and tests

EN 475 (1995): Medical devices. Electrically generated alarm signals

12.2 Symbols on equipment

CE 0459: according to the Council directive 93/42/EEC relating to medical devices (Identification No. of Notified Body: 0459 - LNE/G-MED).

 : Note, consult the accompanying literature

SN-XX-AA-ZZZZ: Equipment serial number - LLL = type (BRA/BPM) - YY = year

 : This equipment must not be disposed of with ordinary household waste; it requires appropriate end-of-life processing. This device was manufactured after 13 August 2005.

12.3 How to dispose of device and batteries

In order to protect the environment and respect regulations in force, the equipment and batteries should be disposed of according to hospital regulations.
In order to be able to keep track of the device (compulsory for all devices with the CE, mark), the **Taema** technical department should be informed of the serial number of the device disposed of.

13 MODBUS APPENDIX

Address List on the MODBUS link:

MODBUS Address	Data	Read / Write	Format	Comments
1 to 21	**CHANNEL 1**			
1	Long name	RW	Word	Characters 1 and 2
2	Long name	RW	Word	Characters 3 and 4
3	Long name	RW	Word	Characters 5 and 6
4	Long name	RW	Word	Characters 7 and 8
5	Long name	RW	Word	Characters 9 and10
6	Long name	RW	Word	Characters 11 and 12
7	Long name	RW	Word	Characters 13 and 14
8	Long name	RW	Word	Characters 15 and 16
9	Short name	RW	Word	Characters 1 and 2
10	Short name	RW	Word	Characters 3 and 4
11	Short name	RW	Word	Characters 5 and 6
12	Short name	RW	Word	Characters 7 and 8
13	Upper Threshold	RW	Word	Value (see note 1)
14	Lower Threshold	RW	Word	Value (see note 1)
15	Type of Sensor	RW	Word	0: no sensor 1: analogue sensor without decimal point 2: analogue sensor, 1 decimal place 3: analogue sensor, 2 decimal places 4: dry contact
16	Unit	RW	Word	Characters 1 and 2 [3]
17	Unit	RW	Word	Characters 3 and 4 [3]
18	Range min.	RW	Word	Value[1]
19	Range max.	RW	Word	Value[1]
20	Hysteresis	RW	Word	Value[1]
21 to 40	**CHANNEL 2** same as channel 1			
41 to 60	**CHANNEL 3** same as channel 1			
61 to 80	**CHANNEL 4** same as channel 1			
81 to 100	**CHANNEL 5** same as channel 1			
101 to 120	**CHANNEL 6** same as channel 1			
121 to 140	**CHANNEL 7** same as channel 1			
	MEASUREMENTS			
141	Current value channel 1	**R**	Word	Value[2]
142	Current value channel 2	**R**	Word	Value[2]
143	Current value channel 3	**R**	Word	Value[2]
144	Current value channel 4	**R**	Word	Value[2]
145	Current value channel 5	**R**	Word	Value[2]
146	Current value channel 6	**R**	Word	Value[2]
147	Current value channel 7	R	Word	Value[2]
GENERAL INFORMATION				
150	Year	RW	Word	LSB: year (from 00 to 99) - MSB: not used
151	Month	RW	Word	LSB: year (from 1 to 12) - MSB: not used
152	Day	RW	Word	LSB: year (from 1 to 31) - MSB: not used
153	Hour	RW	Word	LSB: year (from 0 to 23) - MSB: not used
154	Minute	RW	Word	LSB: year (from 0 to 59) - MSB: not used
155	Second	RW	Word	LSB: year (from 0 to 59) - MSB: not used
156	Software version AB.CD	R	Word	First 2 alphanumeric characters: AB
157	Software version AB.CD	R	Word	Last 2 alphanumeric characters: CD

MODBUS Address	Data	Read / Write	Format	Comments
158	Internal malfunctions	R	Word	*1: fault present* Bit 15: Buzzer control malfunction Bit 14: Clock malfunction Bit 13: Keyboard malfunction Bit 12: Inhibit button malfunction Bit 11: Test button malfunction Bit 10: Power supply malfunction Bit 9: ADC malfunction Bit 8: Buzzer capacity malfunction Bit 7: Communication malfunction with mirror unit (4-20 mA loop) Bit 6: Communication malfunction with mirror unit (timeout) Bit 5 to 0: Not used
159	Overshoots	R	Word	*1: overshoot* Bit 15: Not used Bit 14: Lower Threshold Overshoot Channel 7 Bit 13: Lower Threshold Overshoot Channel 6 Bit 12: Lower Threshold Overshoot Channel 5 Bit 11: Lower Threshold Overshoot Channel 4 Bit 10: Lower Threshold Overshoot Channel 3 Bit 9: Lower Threshold Overshoot Channel 2 Bit 8: Lower Threshold Overshoot Channel 1 Bit 7: Not used Bit 6: Upper Threshold Overshoot Channel 7 Bit 5: Upper Threshold Overshoot Channel 6 Bit 4: Upper Threshold Overshoot Channel 5 Bit 3: Upper Threshold Overshoot Channel 4 Bit 2: Upper Threshold Overshoot Channel 3 Bit 1: Upper Threshold Overshoot Channel 2 Bit 0: Upper Threshold Overshoot Channel 1
	On/off contacts: Threshold overshoot is never shown. Lower threshold overshoot indicates that the contact is open (alarm).			
160	Alarms	R	Word	*1: alarm* Bit 6: Alarm on channel 7 Bit 5: Alarm on channel 6 Bit 4: Alarm on channel 5 Bit 3: Alarm on channel 4 Bit 2: Alarm on channel 3 Bit 1: Alarm on channel 2 Bit 0: Alarm on channel 1
161	Validity of channel	R	Word	*1: valid channel* Bit 6: Validity of channel 7 Bit 5: Validity of channel 6 Bit 4: Validity of channel 5 Bit 3: Validity of channel 4 Bit 2: Validity of channel 3 Bit 1: Validity of channel 2 Bit 0: Validity of channel 1
162	Modes	RW	Word	Bit 3: With (1) / without (0) mirror mode
		R	Word	Bit 2: Maintenance mode Bit 1: Test mode Bit 0: Inhibition mode
163	Remote type	R	Word	0: type 3001 operation 1: type 3002 operation

MODBUS Address	Data	Read / Write	Format	Comments
170	Programmed inhibition delay time channel 1	RW	Word	(seconds) *This is the common delay time for all channels in type 3001 operation.*
171	Programmed inhibition delay time channel 2	RW	Word	(minutes)
172	Programmed inhibition delay time channel 3	RW	Word	(minutes)
173	Programmed inhibition delay time channel 4	RW	Word	(minutes)
174	Programmed inhibition delay time channel 5	RW	Word	(minutes)
175	Programmed inhibition delay time channel 6	RW	Word	(minutes)
176	Programmed inhibition delay time channel 7	RW	Word	(minutes)
177	Remaining inhibition delay time	RW	Word	(minutes)
10000	Special	W	Word	Taema use only – do not modify
65280	Special	W	Word	Taema use only – do not modify

Note 1: The value is expressed without the point, e.g.: 16.5 ➠ 165. In the case of the CONTACTOR range these values are not significant.
Note 2 : the value is expressed without the point ; in the case of the CONTACTOR range, O means open contact, 1 means closed contact.
Note 3: Not significant for the contactor range.

Characteristics of MODBUS communication:
Data rate: 9600 baud
No parity, 8 data bits, 1 stop bit
Minimum timeout: 400 ms
Maximum recommended query frequency: 1 frame every 2 seconds.
Frames sent by ***VIGI 3000*** are limited to 20 bytes.
A maximum of 32 units can be connected to the same line. Installation of a 120-ohm line-end impedance between + and - is recommended.

Frame format:

The communication mode is RTU (Remote Terminal Unit): data coded into hexadecimal, use of a CRC (Cyclical Redundancy Check). The ***VIGI 3000*** unit is the slave and has an address (fixed by default at 1) which can be modified in maintenance mode.

Address	Function	Data	CRC check
8 bits	8 bits	N x 8 bits	16 bits

Functions transmitted to VIGI 3000 unit:

Function code (hex)	Name	Meaning
03	Read Holding Registers	Ask reading of the contents of consecutive registers. The data will include the read start register number followed by the number of registers to be read.
06	Preset Single Register	Fix the content of one register. The data will include the number of the register followed by the value to be written.
10	Preset Multiple Registers	Fix the content of consecutive registers. The data will include the number of the start register followed by the number of registers to be written and then the data.

Functions returned by VIGI 3000 unit:

Function code (hex)	Name	Meaning
03	Read Holding Registers	Return requested values. The data will include the size of the data supplied (in bytes) following by the data (in the form of words).
06	Preset Single Register	Acknowledge requested operation. The data will include the register number followed by the value to be written.
10	Preset Multiple Registers	Acknowledge requested operation. The data will include the number of the start register followed by the number of registers modified.
Code + bit 7 = 1	Non acknowledgement	The requested function has not been carried out. A code (8 bits) gives the cause: 06 Slave busy 01 Illegal function 02 Illegal data address 03 Illegal value data

INSTALLATION CHECK-LIST

Servicing done ..... by .....
Company ..... Service .....

	VIGI 3033	VIGI 3055	VIGI 3077	Gas Sensor	Vacuum Sensor
Number					
No.					

VIGI 3002/3001	Number	No.	No.	No.	No.	No.
		No.	**No.**	**No.**	**No.**	**No.**

Channel	1	2	3	4	5	6	7
In operation							
Out of service							
Upper threshold							
Lower threshold							

Note EN 737-3: primary network -20%/+30% of nominal pressure, secondary network ± 20% of nominal pressure, inhibition period less than 15 minutes.

Before each start-up, do the following checks:

	Done	Not done
• Check whether labels agree	☐	☐
• Check whether the area supply corresponds to that supported by the equipment.	☐	☐
• Check whether F1 fuses are in working condition and verify fuse values (500 mA for main and mirror units and 100 mA for the remote unit)	☐	☐
• Check alarm thresholds	☐	☐
• Test whether the alarms work at their minimum as well as maximum levels by varying the pressure and check the following points for each line:		
▪ Whether the discontinuous sound signal is working.	☐	☐
▪ Whether the flash function of the corresponding red indicator is working.	☐	☐
▪ Whether the sound signal ceases on pressing the acknowledgement key.	☐	☐
▪ Whether the fixed red indicator is automatically switched on.	☐	☐
• For each line, wait for the alarm to go off again before returning to preceding state and note the inhibition period (duration: .....≤ 15 min).	☐	☐
• Disconnect sensor and check:		
▪ Whether the red indicator of the line in question is flashing	☐	☐
▪ Whether the uninterrupted sound signal is working	☐	☐
▪ Whether the sound signal ceases on pressing the acknowledgement button	☐	☐
▪ Whether the fixed red indicator light is automatically switched on	☐	☐
▪ Whether the screen displays “ERR02” and " XXX”.	☐	☐
• Short-circuit sensor terminals and check:		
▪ Whether the red indicator of the line in question is flashing	☐	☐
▪ Whether the uninterrupted sound signal is working	☐	☐
▪ Whether the sound signal ceases on pressing the acknowledgement button	☐	☐
▪ Whether the fixed red indicator light is automatically switched on	☐	☐
▪ Whether the screen displays “ERR01” and " XXX”.	☐	☐

1 year

Date:.....

Technician name:
.....

Signature and stamp:

2 years

Date:.....

Technician name:
.....

Signature and stamp:

3 years

Date:.....

Technician name:
.....

Signature and stamp:

4 years

Date:.....

Technician name:
.....

Signature and stamp:

5 years

Date:.....

Technician name:
.....

Signature and stamp:

6 years

Date:.....

Technician name:
.....

Signature and stamp:

7 years

Date:.....

Technician name:
.....

Signature and stamp:

8 years

Date:.....

Technician name:
.....

Signature and stamp:

9 years

Date:.....

Technician name:
.....

Signature and stamp:

10 years

Date:.....

Technician name:
.....

Signature and stamp:

MAINTENANCE SHEET

***VIGI 3000 Series* No.:** .....

Installation date: .....

Maintenance Service done by: .....
.....

Name of your distributor: .....

Address: .....
.....
.....
.....

Telephone:.....

Preventive equipment maintenance should be carried out according to the manufacturer's recommendations as given in the maintenance manual and updates.
Maintenance operations should be carried out by trained technicians.
Use only authorised spare parts.
The supplier shall provide on demand circuit diagrams, component lists, technical descriptions and all other information likely to be of use to qualified technical staff for the repair of parts deemed reparable by the manufacturer.

Taema

AIR LIQUIDE

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