Operation and Maintenance Instructions

Area Valve Box

Part number 2212020895

Revision 3

02/AUG/2018

BeaconMedæs®

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0. Safety Precautions

This section gives safety, storage and handling information for the BeaconMedæs Area Valve Box only. Component parts lists and descriptions are available on request.

Operators should have carefully read and become familiar with the contents of this manual before maintaining the Area Valve Box

Operators are expected to use common sense safety precautions, good workmanship practices and follow any related local safety regulations.

0.1 Identification of symbols

The following symbols apply to this product and are used in these instructions and on the product in question. The meanings of these symbols are as specified below: -

	Read instructions
	Ambient temperature range
	Ambient humidity range
	Ambient pressure range
	Date of manufacture
	Do not dispose of in general waste

0.2 Environmental Transport and Storage Conditions

Ambient temperature: -20°C to 60°C
Relative humidity (non-condensing): 10%-95%

0.3 Environmental Operating Conditions

Ambient temperature: 10°C to 40°C
Relative humidity (non-condensing): 40%-80%

0.4 Environmental Protection

Discard the unit and/or components in any standard refuse facility. The unit does not contain and hazardous substances.

0.5 Electromagnetic Interference

Not applicable

0.6 Cleaning

The exterior of the Valve Box should be wiped over with a damp cloth frequently to remove any dust or foreign substances

0.7 Safety Notice

Persons undertaking any installation and/or maintenance must be fully trained in specialist work of this nature.

Oil, grease and jointing compounds **must not** be used.

Do not attempt to prove the pressure relief valve, under any circumstances, by altering the regulator. Pressure relief valves must be removed and tested off site by a registered test centre and a certificate of conformity issued.

1. General Information

1.1 Warnings

Read the following instructions carefully before using

1. If you do not understand completely the information contained in this manual, DO NOT USE the device and contact BeaconMedaes in order to obtain any necessary information
2. This device is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of appropriate experience and knowledge
3. Remove the device from its packaging immediately before installation to avoid contamination
4. Check that no part of the device is visibly damaged, that each part is perfectly clean and especially free of lubricants
5. Do not oil or grease the device: this may cause fires and/or explosions
6. Do not use solvents, disinfectants or other substances not compatible with medical gases
7. The installation shall be carried out by competent and qualified technicians; BeaconMedaes is not responsible for installations carried out by non-competent and non-certified personnel
8. The use of the device is permitted only by persons who have received proper instructions and trained on the risks associated with oxygen and other medical gases in pressure
9. Maintenance shall be carried out exclusively by BeaconMedaes or by technicians authorized, trained and qualified by BeaconMedaes; BeaconMedaes is not

responsible

10. for any maintenance carried out by personnel not expressly authorised, trained and qualified by BeaconMedaes
11. Use appropriate personal protective equipment
12. The tools used shall be appropriate and they do not damage the device
13. Do not use adapters and / or extension not suitable for oxygen and / or other medical gases in high pressure
14. Check the gaskets, they have to be genuine and intact
15. Handle the device with extreme caution
16. Do not smoke near the device
17. Do not approach with open flames
18. Do not tamper with the device
19. Place the device away from heat sources or flammable materials
20. Do not expose the device to environmental conditions different from those specified
21. During the opening of the valves, do not remain in front edge of gas
22. During operations wear appropriate protection goggles
23. Always open valves VERY SLOWLY and in particular the valve of the cylinder (when used for emergency / maintenance supply), ignition might occur due to oxygen pressure shocks
24. In order to prevent accidental fall of the cylinders, use adequate protection means in accordance with current regulations
25. Spare parts shall be original; BeaconMedaes is not responsible in case of use of any non-original spare parts
26. Always make sure that the device is not under pressure before its maintenance / replacement
27. At the end of the cycle of life, dispose of the device according to the current regulations
28. Do not remove any labels from the device
28. The vibrations due to long transport could slightly loosen the connections and cause small leaks, look for these leaks exclusively with proper liquid
29. Do not over tighten the threaded components
30. The entire pipeline system shall comply with all project requirements provided by current rules in order to ensure continuity of supply to the patients; the device alone can not guarantee the continuity of supply but it need additional components and procedures as required by current regulations
31. Check that any other components used with the device comply with current regulations and are perfectly clean and degreased in accordance with ISO 15001 standard
32. Once the installation is completed and before its commissioning, the device shall be tested according to the test procedures required by the relevant standards for medical gas pipeline systems
33. In order to prevent catastrophic damage, pay particular attention to the locations where the device is installed and in case of building works. In
34. addition, make sure that the locations are always accessible to authorized personnel
35. All electrical wiring and grounding shall comply with relevant current regulations
36. BeaconMedaes is not responsible for failure to follow the instructions provided in this document, for the use of non-genuine spare parts and/or of work performed by non-authorised technicians

1.2 Intended Use

The device is intended to be installed in medical gas distribution systems to intercept the areas of healthcare facility floors, as required by the pipeline system design in accordance with ISO 7396-1, for maintenance and emergency purposes. The device is normally intended to be installed downstream of line pressure regulators.
When used for emergency purposes, the device must be included in the emergency management plan of the healthcare facility.

1.3 Manufacturer

DeltaP.
Via Thansau, 4 – 20088 Rosate (MI) - Italy

1.4 Technical Data

The device comes in two versions: VERTICAL [V] and HORIZONTAL [H].

The V version is intended to be installed vertically inside its box, while the H version is intended to be installed horizontally.

The main functions of the device are the follows:

1. Allow a physical isolation of the pipeline when modifications are carried out to the systems downstream (upstream for vacuum) the valve;
2. Provide an emergency and maintenance inlet point;
3. Ensure quick access to the distribution line to shut off it in case of emergency (e.g. fire or big losses).

1.5 Technical Characteristics, use and Maintenace Information

Technical Characteristics		
Process Gas / Vacuum and Inlet Pressure		
Process Gas	**Max Inlet Pressure (BAR)**	**Min Inlet Pressure (BAR)**
Oxygen - O_2	10	0
Medical Air - Air	10	0
Nitrous Oxide - N_2O	10	0
Carbon Dioxide - CO_2	10	0
Surgical Air - AIR 800	20	0
Vacuum - VAC	5[1]	-1

[1] To avoid damage, before entering positive pressure in the device for vacuum is necessary to disconnect the vacuum gauge and vacuum switch, closing with a cap their connections

Technical Data	
Nominal pressure [P[2]]	4 ¸ 5 bar [O2, Air, N2O, CO2] 7 ¸ 10 bar [Air 800] -1 ¸ -0,4 bar [Vac]
Setting pressure sensors (if present) [S[2]]	min 3.6 bar / MAX 5.4 bar [O2, Air, N2O, CO2] min 6.4 bar / MAX 9.6 bar [Air 800] -0.5 bar [Vac]
Pressure drop for compressed gases [kPa]	<0.01 bar@30 Nm3/h 0.02 bar@40 Nm3/h 0.04 bar@50 Nm3/h
Pressure drop for vacuum [kPa]	0.06 bar@30 Nm3/h (maximum flow rate for vacuum)
Flow rate emergency and maintenance inlet point AFNOR [Nm3/h]	25 at 4 bar
Flow rate emergency and maintenance inlet point AFNOR [Nm3/h]	32 at 4 bar
Storage temperature	-20 ÷ +60 °C
Storage humidity	10% ÷ 95%
Operating temperature	+10 ÷ +40 °C
Operating humidity	40% ÷ 80%
Inlet/outlet connections	Ø 22 Welding pipe connector
Pressure indicator connection	G1/8 F
Pressure sensors connection	G1/8 F
Overall dimensions W x H x D (mm)	100x260x85 [V] 540x100x85 [H]
Weight (kg)	2,8 (inlet and outlet pipe included)
Main relevant standards	ISO 7396-1 ISO 15001

[2] Unless otherwise specified, all references to numbers and letters refer to the figures in 4.5

The direction to open and to close the valves is indicated respectively with “ON” and “OFF” (see figures in 4.5)

Only the vacuum (NIST) has a cap [6] is present: unscrew it before starting with operations; re-screw it at the end of operations

2. Installation Information

2.1 Location

The location and the extent of the area served by the device shall be determined by the manufacturer of the pipeline system together with the healthcare facility management, using risk analysis procedures in accordance with ISO 14971. The risk assessment shall also take into account the hazards arising from the possible rupture of low-pressure hose assemblies fitted within any medical supply units.
The device shall be located on the same floor as the terminal units they serve.

2.2 Identification

Before putting in service the device, it shall be identified by metal tag, stencilling, stamping or adhesive marker showing:

a) process gas or vacuum (name or symbol);
b) area intercepted.
The identification shall be secured to the device, to its box or to the inlet/outlet pipeline and shall be readily visible.

2.3 Installation Procedure

2.3.1 Housing in Box
The device shall be housed in suitable box that meets the following requirements:

1. equipped with door or cover which can be secured in the closed position and that allow quick access in case of emergency

2. labelled with the following or similar wording: “CAUTION — Do not close valve(s) except in emergency”

3. vented to the room to prevent accumulation of gas

4. visible and accessible at all times

5. located within normal hand height

2.3.2 Procedure for proper housing in the box:

1. Remove the device from the packaging only immediately prior to installing it
2. Make sure that the box is attached to a solid masonry wall, compact or perforated, or on another solid support
3. Check the correct positioning of the device within the box according to the version (H - Horizontal or V - Vertical),
4. Pay particular attention to the correct pipe which connects the device and the proper position of its inlet and outlet; for this purpose, the process gas / vacuum is indicated on the device, together with an arrow indicating the correct flow direction

Make sure that the inlet and outlet pipes are connected to the line containing the same gas / vacuum which the device is intended

5. Fix the device in the set position using the proper screws [A]

2.4 Connection to the line

To prevent damage to the device, the brazing shall be carried out considering the proper distance between the brazing point and the device
Make sure that the device is connected to the line in accordance with the flow direction shown in the figures (see 4.5)

Braze the nuts of inlet [In] and outlet [Out] pipes to the pipeline, using high-grade alloy of silver, cadmium free, flushing nitrogen or CO2
Thoroughly clean the inlet and outlet pipes and the brazed connections.

2.5 Connection of Pressure Sensors

The device is equipped with a threaded connection [4] which allows the connection of pressure sensors to control the pressure downstream the valve (upstream for vacuum). Upon request, BeaconMedaes can provide various pressure sensors suitable to
control the pressure by connection to the threaded connection [4]. In particular, the pressure switches are double-threshold (single for vacuum) and are pre-calibrated.

If the connection [4] is not used, it is closed with a proper plug [T].

2.6 Electrical Wiring of Pressure Sensors

The pressure and vacuum switches provided by BeaconMedaes are equipped with electrical terminals intended to be connected to an alarm system.
The information for correct connection of the terminals to the alarm system are listed below and in the figures (see 5.3).

Vacuum Switch	
MAX VOLTAGE	48V AC-DC
CURRENT	0,5(0,2)A
ELECTRICAL TERMINAL	FASTON 6,3X0,8
SET POINT	-0,5BAR ±4%
CONTACT STATE (WITHOUT PRESSURE)	N.O.
Pressure Switch - 4 Bar	
MAX VOLTAGE	250V AC
CURRENT FOR EACH CIRCUIT	SPDT 16(4)A
ELECTRICAL TERMINAL	FASTON 6,3X0,8
SET POINT MIN (MINIMUM PRESSURE)	3,6BAR ±4%
SET POINT MIN (MAXIMUM PRESSURE)	5,4BAR ±4%
REFER TEMPERATURE FOR CALIBRATION	20°C
THERMIC DRIFT	±0,04 BAR /10°C
Pressure Switch - 8 Bar	
MAX VOLTAGE	250V AC
CURRENT FOR EACH CIRCUIT	SPDT 16(4)A
ELECTRICAL TERMINAL	FASTON 6,3X0,8
SET POINT MIN (MINIMUM PRESSURE)	6,4BAR ±4%
SET POINT MIN (MAXIMUM PRESSURE)	9,6BAR ±4%
REFER TEMPERATURE FOR CALIBRATION	20°C
THERMIC DRIFT	±0,04 BAR /10°C

To avoid damage, before entering positive pressure in the device for vacuum is necessary to disconnect the vacuum gauge and vacuum switch, closing with a cap their connections

To avoid changes from the settings, before entering pressures greater than 12 bar in the device for Air-800 is recommended to disconnect the pressure switch, closing with a cap its connection

Upon request, BeaconMedaes can provide various alarms suitable to control the pressure by connection to the pressure/vacuum switches. For further information please contact BeaconMedaes.

2.7 Checks, Inspection and Tests

2.7.1 Warnings:

1. In case of checks, inspections and tests carried out on the unit in service supplying gas/vacuum to the pipeline system, it is necessary to verify and ensure that no risks for patients are present neither before or during or after the activities
2. Can operate on this device only competent and trained personnel authorized by healthcare facility
3. If necessary, supply the area by the proper gas-specific inlet point

2.7.2 Leak Test

To avoid damage, before entering positive pressure in the device for vacuum is necessary to disconnect the vacuum gauge and vacuum switch, closing with a cap their connections

1. When all connections have been made, pressurize gradually the device from its inlet, keeping closed the valve [1]
2. Check with a suitable leak-detecting liquid for any leakage in correspondence of inlet connection [R-In]. If any leakage are found replace the inlet gasket checking that the connection is clean
3. Open valves [1] SLOWLY and check that pressure indicator [2] shows a nominal inlet pressure value within the range indicated in 1.5 depending to the device
4. Check with a suitable leak-detecting liquid for any leakage in correspondence of connections of the valve [1], pressure indicator [2], physical isolation device [3], emergency and maintenance gas-specific inlet point [5], outlet connection [R-Out]. If any leakage are found replace the seal material (e.g. gasket) checking that the connection is clean.

2.7.3 Check the Shut-off Valve

Check that the valve [1] is easily operable by the operator, by its opening and closing several times.

2.7.4 Check the Pressure Indicator

The pressure indicator [2] can consist either of a pressure gauge (for compressed gases) or in a vacuum gauge (for vacuum). Check that pressure gauge [2] shows a nominal inlet pressure value within the range indicated in 1.5 depending to the device.

To verify the accuracy of the value shown, connect to the emergency and maintenance gas-specific inlet point [5] a suitable certified pressure measuring instrument with accuracy class equal or better to the class of accuracy of pressure indicator [2].

If the difference between the pressure indicator [2] and the certified instrument is greater than the maximum variation allowed for the class of accuracy of pressure indicator [2] (the precision class is marked on the dial) it is necessary the replacement of pressure indicator [2].

2.7.5 Check of emergency and maintenance inlet point

1. Obtain a gas-specific probe/nipple suitable to the emergency and maintenance inlet point [5] of the device; this point, depending from the model, can be a socket in accordance with French standard NF S 90-116 or consists in a NIST connector (Non-Interchangeable Screw-Threaded)
2. Check that the emergency and maintenance inlet point [5] of the device accept the appropriate probe/nipple and that a mechanical connection is made. Check that the probes/ nipples for all other gases and vacuum do not fit the point [5].

2.7.6 Check of physical isolation device

1. Close the valve [1]
2. Safely discharge the gas/vacuum from the emergency and maintenance gas-specific inlet point [5]
3. Unscrew SLOWLY the physical isolation device [3] with suitable singlesize tools and make sure that it is completely depressurised
4. Rescrew it on the contrary at its connection, with the part [3A] inside the body [C] and the part [3B] which remains outside
5. Re-open the valve [1]
6. Check that there is no passage of gas downstream of physical isolation device [3]; in case of gas passage, do not use the device and contact BeaconMedaes.

Before putting in service of medical gas distribution system, it is necessary carry out all the tests required by current regulations, including tests for area valves in order to verify their perfect seal

7. Close the valve [1]
8. Unscrew SLOWLY the physical isolation device [3] with suitable singlesize tools and make sure that it is completely depressurised
9. Re-screw it on the contrary at its connection, in the original position, with the part [3B] inside the body [C] and the part [3A] which remains outside
10. Re-open valves [1] SLOWLY and check that pressure indicator [2] shows a nominal inlet pressure value within the range indicated in 1.5 depending to the device.

2.7.7 Check Alarm System

To check the proper functioning of alarm system (if the pressure sensors are present):

1. Check that pressure indicator [2] shows a nominal inlet pressure value within the range indicated in 1.5 depending to the device
2. Close the valve [1]
3. Safely discharge the gas/vacuum from the emergency and maintenance gas-specific inlet point [5]
4. Check that the pressure switch [P] (for compressed gases) and the vacuum switch [V] (for vacuum) and its related alarm (to be installed by the customer) give the proper alarm signals according to the setting values [S] indicated in 1.5 depending on the device

5. Re-open SLOWLY the valve [1] and increase the inlet pressure up to the setting value [S] MAX specified in 1.5 depending on the device
6. Check that the pressure switch [P] (for compressed gases) and the vacuum switch [V] (for vacuum) and its related alarm (to be installed by the customer) give the proper alarm signals according to the setting values [S] indicated in 1.5 depending on the device
7. Decrease the inlet pressure and check that pressure gauge [2] shows a nominal inlet pressure value within the range indicated in 1.5 depending to the device
8. Check that the pressure switch [P] (for compressed gases) and the vacuum switch [V] (for vacuum) and its related alarm (to be installed by the customer) are restored.

3. Information concerning use

In order to meet the safety requirements provided by relevant current regulations, the device can only be used in medical gas distribution systems in accordance with ISO 7396-1

Pressurization of the area with process gas/ vacuum must be carried out by SLOWLY opening the shut-off valves until the complete filling of the line downstream (upstream for vacuum)

1. Make sure that the valve [1] is closed
2. Open SLOWLY the valve [1]
3. Check that pressure indicator [2] shows a nominal inlet pressure value within the range indicated in 4.1.2 depending to the device
4. Then make sure that valve [1] is fully open

3.1 Use

Once the area is completely pressurized, the device is ready to use in order to deliver, intercept and control the gas / vacuum for the area.

3.2 Use of physical isolation device

A closed valve shall not be considered an adequate physical isolation when modifications are carried out to existing systems.

The physical isolation device [3] allows to create a physical interruption of the pipeline, preventing dangerous passage of gas during brazing operations on the pipeline of the area.

When necessary, proceed as follows:

1. Close the valve [1]
2. Safely discharge the gas/vacuum from the emergency and maintenance gas-specific inlet point [5]
3. Unscrew SLOWLY the physical isolation device [3] with suitable singlesize tools and make sure that it is completely depressurised
4. Rescrew it on the contrary at its connection, with the part [3A] inside the body [C] and the part [3B] which remains outside
5. Re-open the valve [1]
6. Check that there is no passage of gas downstream of physical isolation device [3]; in case of gas passage, do not proceed and contact BeaconMedaes
7. Re-close the valve [1]
8. Carry out the operations requiring the physical isolation of the pipeline At the end of such operations, carry out all tests, checks and inspections in accordance with current applicable regulations, in order to re-put in service the area safely
9. Unscrew SLOWLY the physical isolation device [3] with suitable singlesize tools and make sure that it is completely depressurised
10. Re-screw it on the contrary at its connection, in the original position, with the part [3B] inside the body [C] and the part [3A] which remains outside
11. Re-open valves [1] SLOWLY and check that pressure indicator [2] shows a nominal inlet pressure value within the range indicated in 4.1.2 depending to the device
12. If necessary, complete all tests, checks and inspections in accordance with current applicable regulations, in order to re-put in service the area safely

3.3 Use in case of emergency

Do not close valve [1] except in emergency. Typical emergency situation are fires and sudden big losses

When used for emergency purposes, the device must be included in the emergency management plan of the healthcare facility. It is important to ensure quick access to the device in case of emergency

The use in emergency situations is permitted only to trained and authorized personnel in accordance with emergency procedures of the healthcare facility. According with such procedures, the valve [1] can be closed only after verification of patient safety of controlled area

3.4 Emergency and maintenance inlet point

Use only equipment (cylinders, vacuum pumps, flexible hoses, pressure regulators, fittings, connectors) comply with relevant standards

The device comes equipped with an emergency and maintenance gasspecific inlet point [5] which allows the area served to be supplied in the absence of supplying from the main line

When necessary, for use of the emergency and maintenance gas-specific inlet point [5], proceed as follows:

1. Obtain a pressure regulator for cylinder connected to a cylinder with the same process gas as the device (for compressed gases) or a portable vacuum pump (for vacuum)
2. Connect the pressure regulator for cylinder (for compressed gases) or aportable vacuum pump (for vacuum) to the emergency and maintenance gas-specific inlet point [5] by proper flexible hose; this point, depending from the model, can be a socket in accordance with French standard NF S 90-116 or consists in a NIST connector (Non-Interchangeable Screw-Threaded)
3. Close the valve [1]
4. Adjust pressure regulator for cylinder (for compressed gases) or the regulation systems for portable vacuum pump (for vacuum) at the required pressure and supply the area
5. At the end, re-open valves [1] SLOWLY
6. Disconnect the temporary supply systems from the emergency and maintenance gas-specific inlet point [5], checking continuously that pressure indicator [2] shows a nominal inlet pressure value within the range indicated in 4.1.2 depending to the device.

4. Information concerning maintenance

4.1 Warnings

1. Carry out maintenance with suitable tools and single-size spanners
2. All tools used for maintenance shall be cleaned and degreased
3. Before working on pressurized parts of the device, make sure that such parts are completely depressurised while at the same time ensuring patient safety
4. Any maintenance activities must be performed with the assurance that there are no risks for patients, operators or third parties
5. The management of the device shall be carried out in accordance with ISO 7396-1, annex G.

NOTE It is recommended to maintain a maintenance log updated with all activities performed by authorised technicians on the device.

In 6 is shows a sample of maintenance log that consists of two sections: section A and section B. Section A should be compiled after installation and kept in archive. Section B should be photocopied and filled out at each subsequent maintenance activity, then kept in archive with Section A.

The full set of compiled sheets constitutes the device's maintenance log. The log shall be made available to all technicians authorised to carry out works on the device.

4.2 Quarterly Checks

At least once every three months, it is necessary to check that:

1. The components are in the state indicated in the section “State of components under normal operating conditions”
2. The pressure indicator [2] shows a nominal inlet pressure value within the range indicated in section 2. depending to the device
3. Using suitable leak-detecting liquid, there are no leaks in correspondence of connections of the) inlet connection [R-In], valve [1], pressure indicator [2], physical isolation device [3], emergency and maintenance gasspecific inlet point [5], outlet connection [R-Out]. If any leakage are found replace the seal material (e.g. gasket) checking that the connection is clean
4. The O-ring on physical isolation device [3], located on the outside [3A], is present, intact and not degraded (if not, request a new item from BeaconMedaes and replace it)

4.3 Half-Yearly Checks

In addition to the quarterly checks, at least once every six months is necessary to verify:

1. The shut-off valve [1] in accordance with the requirements in 2.7.3
2. The pressure indicator [2] in accordance with the requirements in 2.7.4
3. The emergency and maintenance inlet point [5] in accordance with the requirements in 2.7.5
4. The physical isolation device [3] in accordance with the requirements in 2.7.6
5. The alarm system in accordance with the requirements in 2.7.7
6. That when all checks and operations are complete, that the components are in the state indicated in the section “State of components under normal operating conditions”.

4.4 Preventive maintenance

There is no scheduled replacement of parts during the lifetime of the device.

At least once every six months is necessary to thoroughly clean all exterior surfaces of the device with a soft cotton cloth. Do not use alcohol or solvents.

4.5 Corrective maintenance

Parts of the device can be replaced in case of failure or damage. For this purpose it is advisable to keep a stock of spare parts recommended in order to use them immediately in case of need.

Recommended Spares	
P/N	**Description**
2212020941	PRESSURE GAUGE 10 BAR O2, AIR, N2O, CO2
2212020942	PRESSURE GAUGE 25 BAR AIR 800
2212020943	VACUUM GAUGE -1/0 BAR
2212020944	PRESSURE SWITCH 3.6-5.4 BAR O2, AIR, N2O, CO2
2212020945	PRESSURE SWITCH 6.4- 9.6 BAR AIR 800
2212020946	VACUUM SWITCH
2212020947	Display Alarm Unit
2212021020	PROTECTIVE CAP VACUUM NIST
2212021021	O-RING FOR PROTECTIVE CAP VACUUM NIST
2212021022	PHYSICAL ISOLATION DEVICE
2212021023	O-RING FOR PHYSICAL ISOLATION DEVICE
2212021024	NIST CONNECTION FOR O2
2212021025	NIST CONNECTION FOR N2O
2212021026	NIST CONNECTION FOR AIR
2212021027	NIST CONNECTION FOR VACUUM
2212021028	NIST CONNECTION FOR CO2
2212021029	NIST CONNECTION FOR AIR-800

BeaconMedaes sells probes/nipples for connection to the emergency and maintenance inlet point [5]. For further information please contact BeaconMedaes.

4.6 Replacement of pressure indicator

To replace the pressure indicator [2] (pressure gauge for compressed gases or vacuum gauge for vacuum), proceed as follows:

1. Close the valve [1]
2. Safely discharge the gas/vacuum from the emergency and maintenance gas-specific inlet point [5]
3. Unscrew SLOWLY the pressure indicator [2] to be replaced with suitable single-size tools and make sure that it is completely depressurised
4. Rescrew at the same connection the new pressure indicator [2]
5. Re-open the valve [1]
6. Carry out the inspections specified in 2.7.2 and 2.4.7

4.7 Replacement of pressure sensor

To replace the pressure sensor connected to the connection [4] (e.g. pressure switch for compressed gases or vacuum switch for vacuum), proceed as follows:

1. Close the valve [1]
2. Safely discharge the gas/vacuum from the emergency and maintenance gas-specific inlet point [5]
3. Unscrew SLOWLY the pressure sensor to be replaced connected from connection [4] with suitable single-size tools and make sure that it is completely depressurised
4. Rescrew at the same connection the new pressure sensor [4]
5. Re-open the valve [1]
6. Carry out the inspections specified in 2.7.2 and 2.7.7.

4.8 Replacement of physical isolation device

To replace the physical isolation device [3], proceed as follows:

1. Close the valve [1]
2. Safely discharge the gas/vacuum from the emergency and maintenance gas-specific inlet point [5]
3. Unscrew SLOWLY the physical isolation device [3] from its connection with suitable single-size tools and make sure that it is completely depressurised
4. Rescrew at the same connection the new physical isolation device [3], paying attention to the right direction, with the side [3A] which remains outside, make sure the presence of O-ring seal on the side [3A] and that it is undamaged and not degraded
5. Re-open the valve [1]
6. Carry out the inspections specified in 2.7.2 and 2.7.6.

4.9 Protective cap (only for vacuum NIST)

The emergency and maintenance inlet point for vacuum NIST is equipped with protective cap.

If damaged, replace it proceeding as follows:

Close the valve [1]

Unscrew SLOWLY the protective cap [6] with suitable single-size tools, safely discharge the vacuum from the emergency and maintenance gasspecific inlet point [5] and make sure that it is completely depressurised

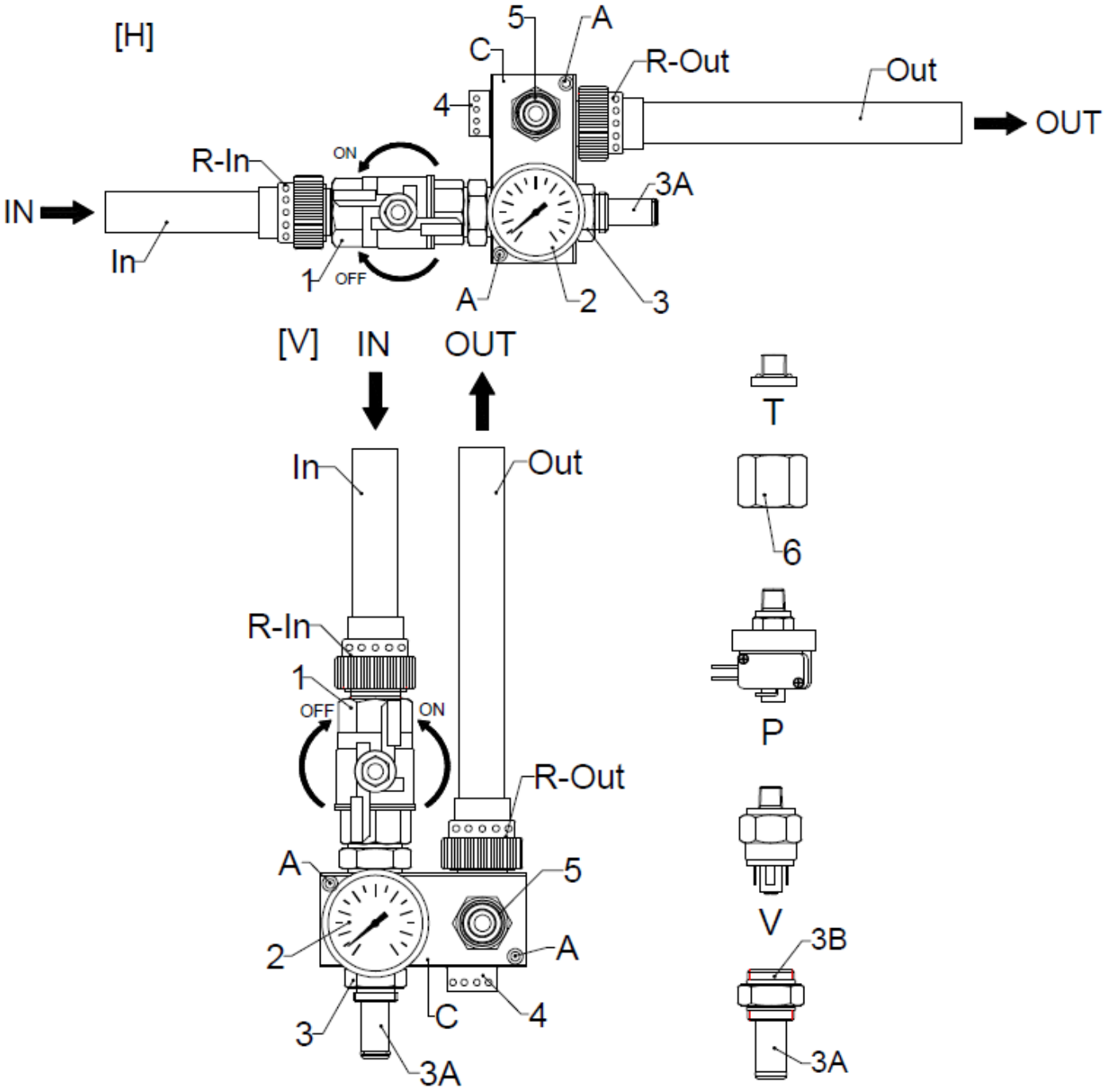
Rescrew at the emergency and maintenance gas-specific inlet point [5] for vacuum the new protective cap [6]

Re-open the valve [1]

Carry out the inspections specified in 2.7.2 and 2.7.5.

5. Figures / Diagrams

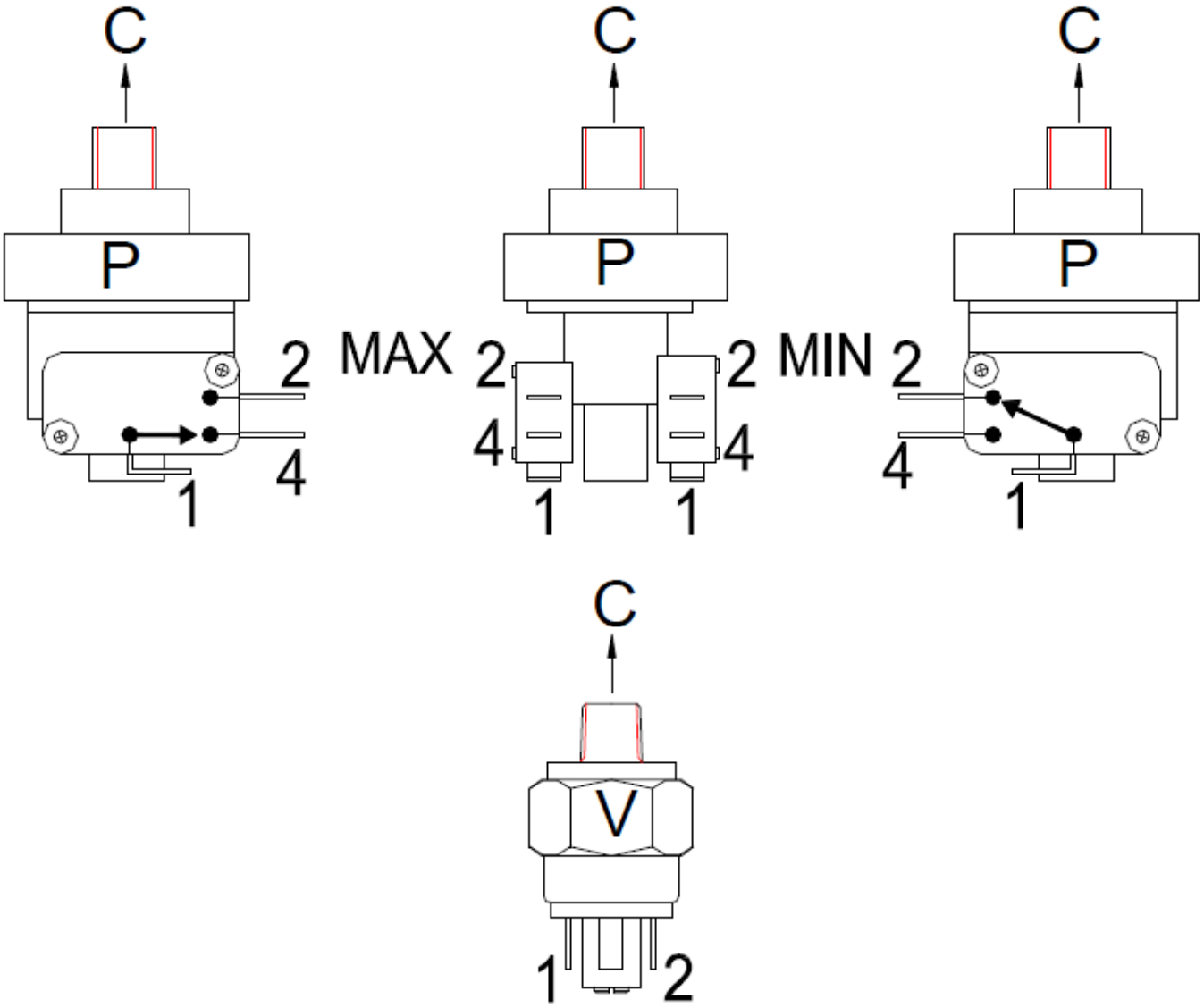
5.1 Area Shut-off Unit - Drawing



5.2 Area Shut-off Unit - Parts Lits

Symbol	Description
[H]	Horizontal Version
[V]	Vertical Version
IN	Connection to the line
In	Inlet tube
R-In	Inlet tube connection
1	Shut-off valve
2	Pressure indicator
3	Physical isolation device
3A	External side of physical isolation device
3B	Internal side of physical isolation device
4	Pressure sensor connection
5	Emergency and maintenance inlet point
6	Protective cap (only for vacuum NIST)
R-Out	Outlet tube connection
Out	Outlet tube
A	Shut-off area valves mounting crews
C	Shut-off area valves body
T	Cap for pressure sensor connection
P	Pressure switch
V	Vacuum switch
OUT	Connection to the line

5.3 Pressure Sensor - Drawing



5.4 Pressure Sensor - Parts Lits

Symbol	Description
1, 2, 4	Electrical Terminal Connections
MAX	Maximum Pressure Alarm Connection
MIN	Minimum Pressure Alarm Connection
C	Connection to Pressure Sensor [4]
p	Pressure Switch
V	Vacuum Switch

6. State of components under normal operating conditions

Ref	State
1	OPEN (with throttle positioned parallel to the longitudinal axis of the valve)
2	SHOWS the nominal inlet pressure value
3	SIDE [3A] external with presence of O-Ring
P,V	NO alarm sensor activated
6	PRESENT (only for vacuum NIST)

6.1 Troubleshooting guide

POTENTIAL PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
The pressure sensor fails to signal the empty gas/low vacuum level The pressure sensor fails to signal the excessive gas pressure The pressure sensor is activated under normal operating conditions	The electrical wiring of pressure sensor is not correct	Verify the correct electrical wiring of pressure sensor
	The pressure sensor is not set correctly The pressure sensor has been exposed to mechanical shocks The pressure sensor has been exposed to pressure shocks The pressure sensor has been exposed to excessive or inadequate pressure (eg positive rather than negative)	Replace the pressure sensor
The pressure indicator (pressure / vacuum gauge) does not indicate the correct pressure	The pressure indicator has been exposed to mechanical shocks The pressure indicator has been exposed to pressure shocks The pressure indicator has been exposed to excessive or inadequate pressure (eg positive rather than negative)	Replace the pressure indicator

For any other problems or if problem persists, contact BeaconMedaes

7. Alarm Installation and Operation

7.1. Main Features

Control module and alarm for medical gas plants with 16 digital inputs opt-isolated.

This system monitors and displays the status of inputs and of any other alarm condition It has a green LED lighted when there isn't alarm conditions; this green LED turns off and the red LED starts to flashing when happens an alarm condition. It is equipped with a relay output to report the status or control external units.

This equipment is supplied in a modular external case DIN 43380 of 6 units to fit on DIN 50022 and

READ CAREFULLY ALL THE INSTRUCTIONS CONTAINED IN THIS MANUAL BEFORE INSTALLING AND USING THIS SYSTEM

can be installed into an external or wall embedded electric box.

7.1.2. General information

We are grateful for your purchase.
This product follows the security requirements of the present laws and it is designed and tested to ensure its security.

The compliance of this manual is necessary to install and use securely this product.

It is recalled, referring to D.L. n° 626 of 19th September 1994 and subsequent amendments, that the employer is obliged to ensure that the work equipment are installed and used in accordance with the manufacturer's instructions.

We disclaim therefore any liability for damages caused by non-compliance with the directions on this manual of instructions and so not covered therein.
It also recalls that the medical equipment for gas must be made in compliance with specific rules; malfunction of this device should not affect the supply of gas to the outlets of the plant.

We decline, therefore any civil or criminal liability of any kind to persons or property.

7.2. Product identification

7.2.1. Package contents

- Alarm device 11055T-2025M in modular box

- this manual

7.2.2. Product identification

Denomination: LCD display alarm
Model: 11055T-2025M

7.2.3. Labelling

On the device are present this information:
- Producer brand
- Serial number (progressive number), for the device identification and to ensure a better assistance
- Numbering to identify terminals
- "DO NOT REMOVE" label
- Power supply label
- CE mark
- Label pursuant d.lgs 151/2005 , annex 4.

7.2.4. Front label

LED's and pushbuttons which are on the frontal have the following meaning:

- LCD display 16 x 2 characters
- Ringing
- green and red LED
- F1 button : during normal operation tacit the alarm.
- F2 button: during normal operation shows a screen information; when there are alarms shows the following warning message.
- F3 button: during normal operation, tests lamps and system reset.

7.3. Target purpose

This device is distributed by Delta p Srl as alarm module with LCD display for department or for medical gases distribution networks.

It's strictly prohibited the use of the alarm for purposes other than those for which it was produced and not contained in this manual

7.4. Advertisements and precautions

Attention: make connections when the device is NOT powered.

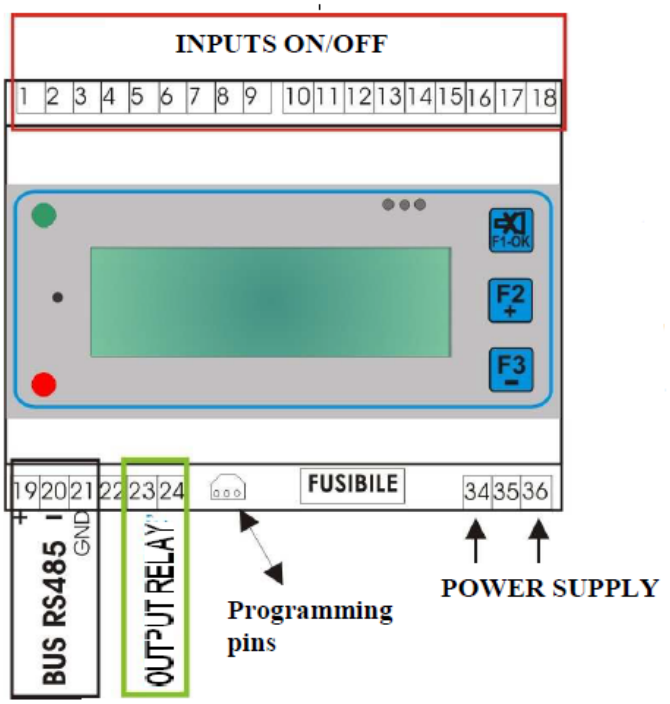
Before powering on the device, be sure that all connections are made correctly.

We aren't guilty in the event of damages due to carelessness.

The device must be connected also to the emergency power net.

7.5. Installation

7.5.1. Cable connections



ATTENTION:

THE RELAY VOLTAGE MUST NOT EXCEED 30V AC/DC, IN CASE OF HIGHER TENSIONS SYSTEM COULD BE DAMAGED.

Legend	
Clamp	**Description**
1	*ON/OFF input 1*
2	*ON/OFF input 2*
3	*ON/OFF input 3*
4	*ON/OFF input 4*
5	*ON/OFF input 5*
6	*ON/OFF input 6*
7	*ON/OFF input 7*
8	*ON/OFF input 8*
9	*ON/OFF input 9*
10	*ON/OFF input 10*
11	*ON/OFF input 11*
12	*ON/OFF input 12*

Legend	
Clamp	**Description**
13	ON/OFF input 13
14	ON/OFF input 14
15	ON/OFF input 15
16	ON/OFF input 16
17	Mass
18	Positive exit (+12V)
19	BUS RS 485 (+)
20	BUS RS 485 (-)
21	BUS RS 485 (GND)
22	Endings
23-24	Relay exit
34-36	Power supply*

* power supply is 230VAC or 24VAC depending on the model, pay attention to the label on the device.

7.5.2. ALARM REPEAT – MASTER/ SLAVE SYSTEM

When it is necessary to report the alarm signals to another module, 11055T-2025M can be connected to another device 11055T-2025M using an only a single twisted cable for all alarms. In this case is possible to use the MASTER/SLAVE configuration.

Before everything it's necessary to set the MODBUS address of the MASTER module 255 and of the SLAVE module 0.

To get a perfect repetition of alarm is also necessary that the parameters of the two modules are equal, except MODBUS address.

Finally connect terminals of the two modules as follows

11055T-2025M		
MASTER (n. clamp)	_____	**SLAVE (n. clamp)**
19 --- 19 (RS485 +)		
20 --- 20 (RS485 -)		

To have more than one SLAVE module, it's necessary connect cascaded to the first SLAVE module and etc. Warning : Master/Slave configuration works only between modules having the same firmware (es: 2.x)

7.5.3. BUS RS485 configuration for remote management

11055T-2025M module is prepared for the connection to a remote system Through a MODBUS-RTU protocol (clamps 19 e 20).

7.5.4. Configuration

The operational parameters of the system are completely customizable through the appropriate buttons or through a PC. In particular, you can set the following parameters.

a) ON/OFF inputs For each ON / OFF input, you can set the following parameters:

- Set the alarm message (max 16 characters)
- Choose whether input is a normally opened or normally closed
- Choose whether the alarm should remain active until the press F1 by an operator or be
- temporary (active only until there is a situation of alarm) or if it's to be turned off.
- Set the ringtone (monotone or medical EN475) and if it has to be reset automatically
- Chose if activate relay in presence of alarm

b) Relay settings

It's possible to set if the relay must be normally opened or normally closed.

c) OK messages

It's possible to set an OK message (max 16 characters and 2 lines), that are displayed when there are no alarms.

d) Ringtone recovery

It's possible to set the time after which the ringtone must be restored if you pressed the silence button F1.

e) Rotation time

It's possible to set the rotation time of alarm messages.

f) MODBUS address

It is possible to assign the module MODBUS address in case you want to use a tele-control system on bus RS485.

To use the MASTER/SLAVE function set addresses as follows:
MASTER 255
SLAVE 0

Pressing simultaneously keys F1 and F3 for 10 seconds it is possible to enter in the configuration menu.

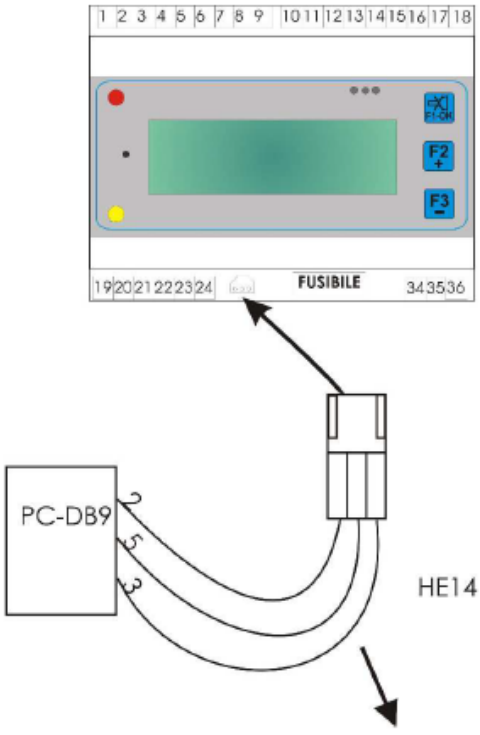
Menu presents the following choices:

1. LINK RS 232
2. SET ALARMS
3. SET MSG OK 1 LINE
4. SET MSG OK 2 LINE
5. TIME ALARM SHIFT
6. RINGER RES TIME
7. RELAY MASK
8. MODBUS ADD
9. LOAD DEFAULT
10. TEST HARDWARE
11. OUT

Use F1 to esc, F2 to go to the next menu and F3 to select.

7.5.4.1. LINK RS 232- PC configuration

If you want to program module by PC, it's necessary to install the dedicated software (see software manual).
Connect the device to the serial port (COM) of your PC through a DB9 connector, as shown in figure.



After configured the device, restart the syste During the configuration the module doesn't work.

7.5.4.2. SET ALARMS – Inputs configuration

In this menu is possible to set parameters related to 16 inputs on/off.
The screen is shown as follows:

The significance of this screen is:
AL#01 is the input number, press F2 to switch to the next input and F3 to modify the current input.

N-CL is the normally closed input (N-CL), press F2 to switch into normally opened (N-OP), press F3 to switch to next item.

MEMOR is the alarm with memory, the system is active until the pressure of F1; press F2 to switch to NO-ME: the system will reset automatically when the alert condition stop to be present; press F3 to switch to the next item.

MD-R set what kind of ringtone has to be activated in an alarm situation. (MED or MD = medical; MON or MN = monotone); it also decide if the ringtone has to be restarted automatically after a prefixed time (R) or no; press F2 to modify, press F3 to switch to the next item.

REL indicates whether in alert situation alarm relays needs to be activated (REL) or not (NO-RL), press F3 to pass to the message alarm settings.

To write the alarm message press buttons as follows: F2 and F3 select the letter or move the cursor on right or left

F1 briefly pressed switch from insert mode to cursor mode; press for 2 seconds to esc.

Once set input, press F1 to exit the menu.

7.5.4.3. SET MSG OK 1 LINE – OK message settings

In this menu is possible to set the message of the first line when no alarms are active. F2 and F3 select the letter or move the cursor on right or left
F1 briefly pressed switch from insert mode to cursor mode; press for 2 seconds to esc.
Once set input, press F1 to exit the menu.

7.5.4.4. SET MSG OK 2 LINE – OK message settings

In this menu is possible to set the message of the second line when no alarms are active
F2 and F3 select the letter or move the cursor on right or left

F1 briefly pressed switch from insert mode to cursor mode; press for 2 seconds to esc.

Once set input, press F1 to exit the menu.

7.5.4.5. TIME ALARM SHIFT– alarm messages rotation

In this menu is possible to set the automatic rotation of the alarm messages

7.5.4.6. RINGER RES TIME – recovery time ringtone

In this menu is possible to set the duration after which the ringtone is restored if stopped in advance.

7.5.4.7. RELAY MASK – relay settings

It's possible to set relay as normally closed or opened.

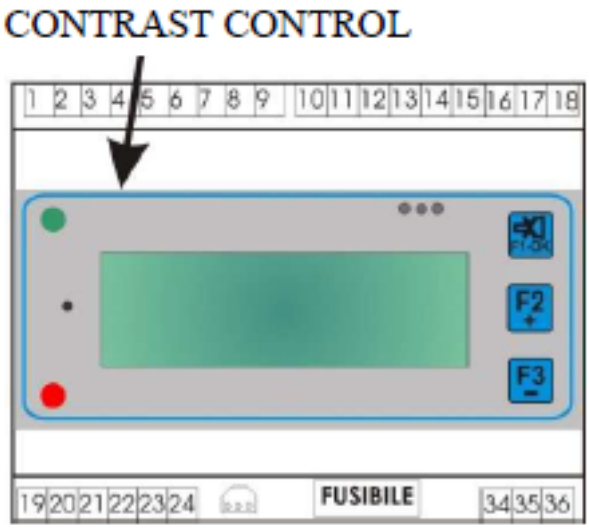
7.5.4.8. MODBUS ADD – MODBUS address

It's possible to set the module's MODBUS address (values between 1 and 245) Set 255 if module is used as SLAVE or 0 as MASTER.

7.6. Device functioning

7.6.1. First installation

When all the connections are made and the device is powered, pursue the following steps:
- Verify that display is turned on;
- Adjust display' s contrast by the little hole on the side of the module (see figure)
- Configure module;
- Test the device with working tests to verify if connections and settings are correct.



7.6.2. Normal work of the system

11055T-2025M device is a LCD display alarm. During normal working the display shows some messages.

If there is no alarm, OK message is shown and the green LED is tuned ON; if there is an alarm condition, some messages will be shown, the red LED and ringtone will be activated, the green LED is turns off.

It is possible to switch from an alarm to the next pressing F3.

Pushing F1 it is possible to stop the ringtone; it will be automatically reset after the recovery time and if the alarm condition is still present.

7.6.3. Maintenance

Any modification which isn't authorized by the producer is forbidden.

Maintenance operation must be made by qualified personnel, following the instructions of this manual.

It is forbidden to substitute any parts of the device.

Please, verify periodically the correct work of ringtone, LEDs and LCD display. Contact the producer in any case of malfunctioning.

7.6.4. Cleaning

To clean the device use a delicate cloth.
Do not use cleaning solvent, oil, abrasive or flammable substance.

7.6.5. Disposal

When the device has to be demolished, split plastic from other material and recycle it. Electric material has be dispose off in compliance to present law. (In particular we refer to the WAEE directive).

Particularly it remember that the RAEE (electric and electronic waste) must not be disposal like a urban waste and must be dispose as separate collection; it possible to returned to the producer the devices used when buying a new devices. The presence of dangerous substance in the devices or an improper use of these may be harmful for environment and human health.

The mark show that the device is made after 13th August 2005 and it must be separated before disposing it. It remember that the failure to observe of existing decrees will be punished with penalties provided by law.

7.7. Reference laws

The device is in compliance with CE standards directive:

EN 50081-1: Electromagnetic compatibility - Generic emission regulation.

EN 50082-1: Electromagnetic compatibility – Generic immunity regulation.

EN 61000-3-2: Electromagnetic compatibility (EMC) Part 3: Limits.

EN 61000-4-3: Electromagnetic compatibility (EMC); Parts 4-3: Technical and measurement test

Immunity test to radiofrequency and irradiated electromagnetic fields.

EN 61000-4-4: Fast transient immunity

EN 61000-4-2: Electrostatic discharge immunity

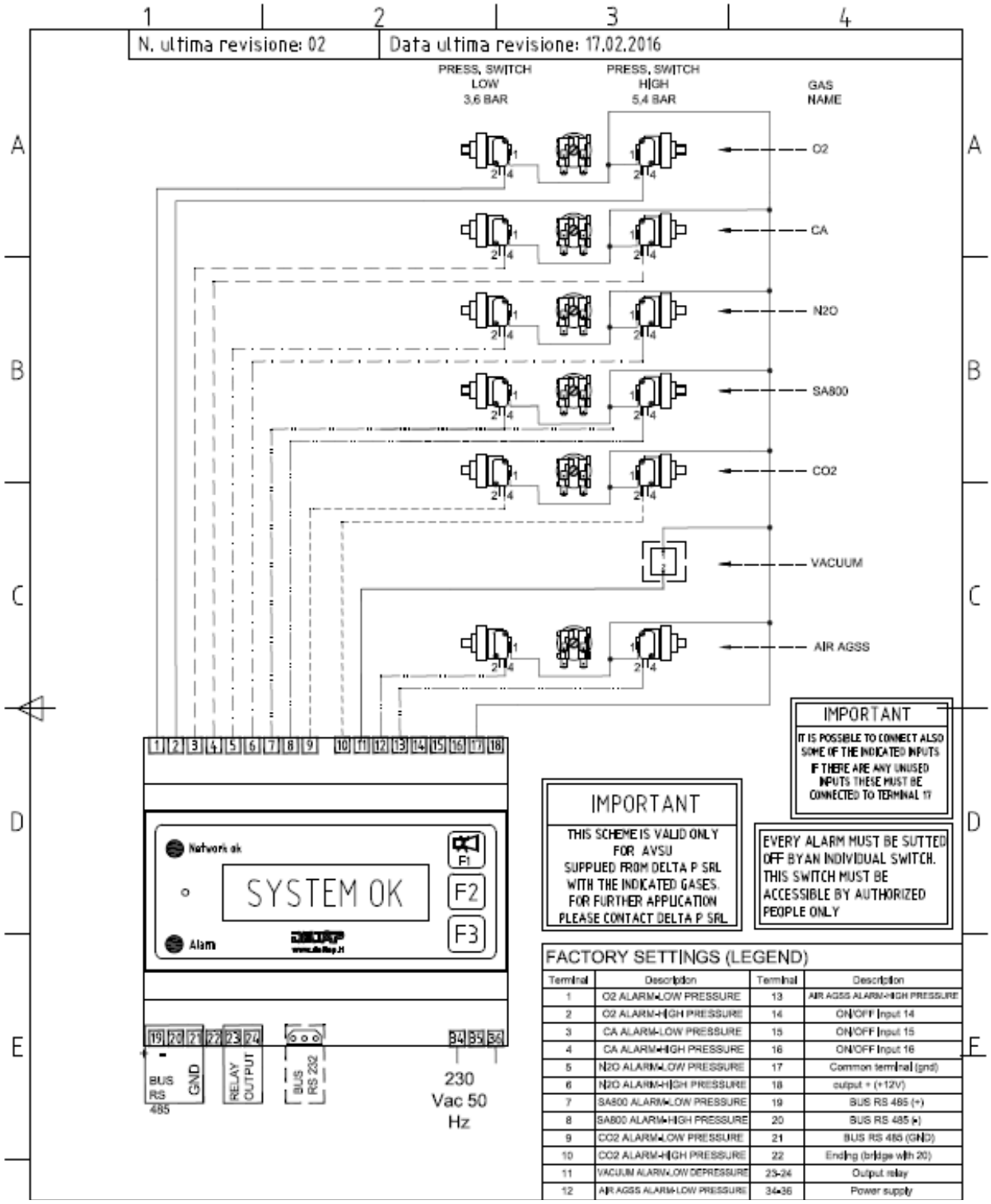
EN 60601-1: Medical devices – Generic security regulation.

EN60601-1-2 : Medical devices – Electromagnetic compatibility

EN60601-1-8 : Alarm system for medical devices

EN14971 : Application of risk management to medical devices

UNI EN 7396-1: Medical compressed gases and vacuum plants



FACTORY SETTINGS (LEGEND)

Terminal	Description	Terminal	Description
1	O2 ALARM-LOW PRESSURE	13	AIR AGSS ALARM-HIGH PRESSURE
2	O2 ALARM-HIGH PRESSURE	14	ON/OFF Input 14
3	CA ALARM-LOW PRESSURE	15	ON/OFF Input 15
4	CA ALARM-HIGH PRESSURE	16	ON/OFF Input 16
5	N2O ALARM-LOW PRESSURE	17	Common terminal (gnd)
6	N2O ALARM-HIGH PRESSURE	18	output + (+12V)
7	SA800 ALARM-LOW PRESSURE	19	BUS RS 485 (+)
8	SA800 ALARM-HIGH PRESSURE	20	BUS RS 485 (-)
9	CO2 ALARM-LOW PRESSURE	21	BUS RS 485 (GND)
10	CO2 ALARM-HIGH PRESSURE	22	Ending (bridge with 20)
11	VACUUM ALARM-LOW DEPRESSURE	23-24	Output relay
12	AIR AGSS ALARM-LOW PRESSURE	34-36	Power supply

Notes:

BeaconMedæs®

Manufacturer: DeltaP s.r.l. via Thansau, 4 Rosate (MI) - Italy

CE 0476