PEGORARO
GAS INNOVATIVE TECHNOLOGIES

Products certified CE according to PED 97/23/CEE
- Filter for gas
- Assemblies for gas (pressure reducing unit)
- Vaporizers for LPG
- LPG refuelling unit for vehicles (skid)
- Heat exchange for natural gas

LPG VAPORIZERS "VAPEG"

s.n. VV343

Original document

made for

FERRARI SRL

Vaporgas Equipment LTD - New Zeland

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N. 046/08

DICHIARAZIONE DI CONFORMITA'

DECLARATION OF CONFORMITY

in accordo all'allegato VII della direttiva 97/23/CE

in accordance to annex VII of directive 97/23/EC

Dichiariamo sotto la ns. responsabilità che la progettazione, la fabbricazione, i controlli e le prove delle attrezzature a pressione sotto specificate sono conformi alle disposizioni applicabili della direttiva 97/23/CE.

We declare under our responsability that the design, manufacturing, inspection and tests of the pressure equipment listed below meet the applicable requirements of the Directive 97/23/EC.

Descrizione attrezzature: **VAPORIZZATORE GPL "VAPEG VP 1500"**
Equipment description *LPG VAPORIZERS "VAPEG VP 1500"*

Famiglia/tipo *Family/type*	VP3	**N. fabbrica** *Serial no.*	VV343
Press. max ammissibile PS *Max allowable pressure PS*	M=20 bar T=8 bar	**Capacità** *Volume*	M= 33,5 L T= 21,5 L
Temp. min/max TS	-40/+120°C		
Altri dati significativi: *Other important data*	Valvola di sicurezza "Nuova Comet" lotto n.30-02 Ente CE n.497, tarata a 18 bar		

Procedure di valutazione della conformità utilizzate: **Moduli B+D**
Conformity assessment procedures used

Ente notificato: CERMET (n.0476), Via Cadriano n. 23 - 40057 Cadriano di Granarolo (BO)
Notified body

Modulo B **certificato n.** PED033AT005 (ITALCERT)
Modulo D **certificato n.** PED00003-IT (CERMET)

Norme tecniche utilizzate: VSR-M-S- ISPESL Ed.99 Adeguate alla direttiva 97/23/ce e integrate da EN13445-5; ASME VIII Div.1 - Ed. 2001
Technical standards used

Altre direttive applicate: Direttiva europea 94/9/CE ATEX Eex II 3 G T5
Other directives applied Direttiva macchine 98/37/CE

Luogo e data Vicenza 04/06/08
Location and date

Pegoraro Gas Technologies Srl
Luca Poncato
(Responsabilite Qualità)

"VAPEG" HOT WATER VAPORIZER

"VAPEG" HOT WATER VAPORIZER WITH ELECTRIC PREHEATING

INDEX

1.1 FOREWORD

1.1.1 Important warnings

To ensure operator safety and to avoid possible damage to the product, before carrying out any operation on the vaporizer it is indispensable to have made oneself familiar with the whole instructions manual.

This manual must be intact and legible in all of its parts; each operator using the vaporizer, or in charge of its maintenance or adjustment operations, must know where it is kept and be able to consult it at any time.

Pegoraro S.r.l. declines all responsibility for any damage to things or persons caused by installation or maintenance of the equipment by non-qualified personnel.

The description and the illustrations provided in this publication are not binding.
PEGORARO GAS TECHNOLOGIES Srl reserves the right to make any modifications deemed necessary.

This manual has been drafted according to the requirements of the following regulations:

- Directive 97/23/EC - PED
- PrEN 764 - 6 (April - 2001).

1.2 HOW TO CONSULT THE MANUAL

1.2.1 Description of the pictograms

The following symbols will be used in the manual to highlight particularly important indications and warnings:

ATTENTION:
This symbol indicates accident-prevention rules for the operator and/or for any exposed persons.

WARNING:
This symbol indicates that there is the possibility of causing damage to the product and/or to its components.

NOTE: This symbol marks useful information.

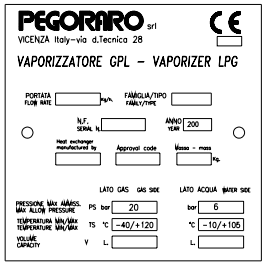
1.2 Intended use of the vaporizer

The Vaporizer model VAPEG is a heat exchanger specially designed so that LPG (Liquid Propane Gas) enters as a liquid and comes out as a gas, ready for use in civil, industrial and commercial plants.

1.3 Labelling of the vaporizer

The plate (ref. A) marked with the vaporizer data is applied in the area (ref. B), riveted onto the space provided on the structure as shown in figure 1-1.

Fig. 1-1



1.4 Data and technical characteristics

The data are given on the plate.

The tables and figures given below illustrate the technical characteristics of the vaporizer model VAPEG.

Tab. 1-1

TYPE	WEIGHT (kg)	VOLUME l.	
		H_2O	GAS
FO-100	47	2.2	4.3
FO-200	55	3.0	6.0
FO-300	70	4.8	9.3
FO-500	140	8.9	15.7
FO-1000	180	16.0	24.8
FO-1500	230	21.5	33.5
FO-2000	270	26.0	40.5

Tab. 1-2

TYPE	FLOW RATE Kg/h	A	B	C	D	E	F	G	H	L	M	N	P	Q	T	INPUT LPG DNe	OUTPUT GAS DNu	WATER CONN. Øe/Øi
FO-100	100	150	470	430	141	60	360	160	225	620	237	317	190	111	126	15	25	1°1/4
FO-200	200	150	670	442	141	60	560	160	225	820	249	329	190	111	138	25	25	1°1/4
FO-300	300	300	1070	442	141	60	800	160	225	1220	249	329	190	111	138	25	40	1°1/4
FO-500	500	170	1290	488	168	60	1000	160	225	1460	295	375	204	124	184	50	50	1°1/4
FO-1000	1000	175	1240	558	219	70	900	220	270	1420	343	423	340	150	232	50	80	2°
FO-1500	1500	175	1735	558	219	70	1390	220	270	1910	343	423	340	150	232	50	80	2°
FO-2000	2000	175	2135	558	219	70	1790	220	270	2310	343	423	340	150	232	50	80	2°

Tab. 1-3

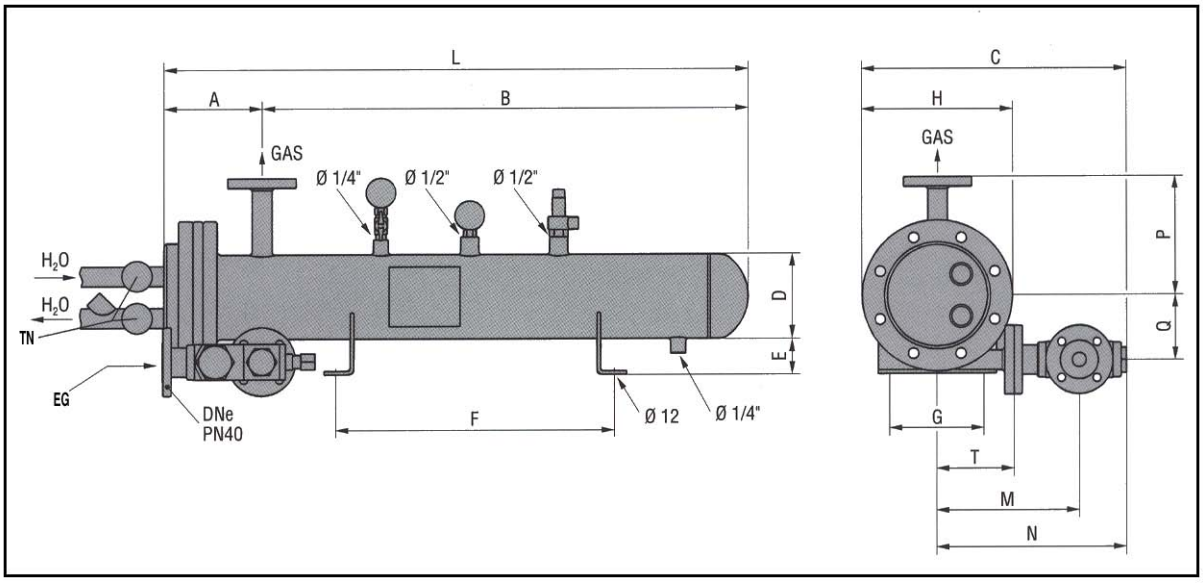


Fig. 1-2

2. TRANSPORT AND HANDLING

2.1 TRANSPORT AND HANDLING

Transport and handling of the vaporizer type VAPEG must be carried out as follows:

ATTENTION

It is good practice to use lifting equipment with sufficient lifting capacity to hold the weight of the vaporizer increased by about 20%.

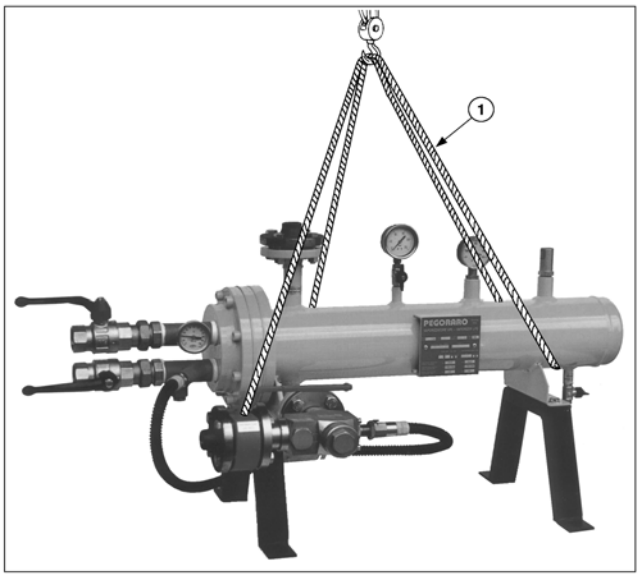


Fig. 2-1

To handle this type of vaporizer, cables or belts 1 must be used, having a lifting capacity suitable for the weight to be supported, which must be positioned around the structure of the vaporizer so as to sling it, exploiting its structural configuration, a shown in the figure.

2.2 STORAGE

Before using the vaporizer, or if the vaporizer is not used for long periods, it must be kept in a closed environment protected from rain, humidity and dust, in order to guarantee its integrity and perfect operation.

WARNING

The vaporizer is supplied painted. However, accidental knocks during installation could cause loss of efficiency of the paint, triggering a slow process of oxidation (rust), so it is recommended to protect it against inclement weather with a canopy or to enclose it in a special cabinet.

2.3 INSTALLATION AND ASSEMBLY OF THE HOT WATER VAPORIZER

2.3.1 General and safety warnings

The system must be made by connecting an ordinary heating boiler to the hot water vaporizer.

WARNING

The boiler flow rate must be such as to cover the amount of calories required by the declared flow rate of the vaporizer, as indicated on the plate on the vaporizer, necessary to supply hot water at a temperature of 75°C.

For the connecting pipes it is necessary to respect the couplings of the respective exchangers.
If you respect these points, as well as the others illustrated, you will have the maximum capacity of the heat exchanger at your disposal.

WARNING

Failure to satisfy these requirements causes a notable and appreciable drop in the total flow rate of the heat exchanger, and may give rise to problems in starting up and in normal operation.

ATTENTION

The temperature of the water circuit could cause injury to personnel if they remain in contact with the hot parts, so protection is recommended (insulation).

WARNING

The vaporizer has been designed to supply the adequate flow rate in normal operating conditions. However, it if is located in sites with a low ambient temperature, heat loss could cause a fall in yield.

To avoid situations of this kind it is possible to install the vaporizer in an optional special insulated cabinet, which can house both the vaporizer and the reduction unit.

ATTENTION

The vaporizer and the boiler must be installed by skilled personnel.

2.3.2 Assembly and connections

The VAPEG vaporizer must be installed and assembly exclusively by qualified personnel. Proceed as follows.

ATTENTION

PEGORARO S.r.l. declines all responsibility for any damage to things or persons caused by installation or maintenance of the equipment by non-qualified personnel.

ATTENTION

For correct and safe use an adequate earth connection must be provided.

2.3.3 Filling the water circuit

WARNING

The heating circuit must be fed with a solution of water and glycol (60% water, 40% glycol), able to resist temperatures ranging from about -35°C to 40°C.

Use only antifreeze of the type "INHIBITED ETHYLENE GLYCOL", as it guarantees complete WATER-SOLUBILITY (commercial code GLIC02455000), available from the best dealers. The use of ordinary antifreeze is not advised as it is aggressive for the circuit itself and favours the phenomenon of stratification in the case of plant stoppage. This means that it will be quite difficult for the heating circuit to start working when the plant is switched on again.

Proceed as follows.

- Remove the cap that closes the filling pipe on the vaporizer, labelled "Water Inlet".
- Pour the aqueous solution into the inlet provided in the boiler until it comes out of the filling pipe.
- Replace the closing cap on the filling pipe.
- Check for any air present in the water circuit by slightly opening the closing cap of the filling pipe or installing the special automatic air discharging device. The water will be topped up with the supply from the boiler.
- Maintain the desired water temperature by regulating the boiler thermostat, set at 70 - 75°C.
- It is recommended to allow for the possible heat loss of the water in its course from the boiler to the vaporizer, which could cause a fall in the total yield. It is recommended to insulate the pipes. Good insulation of the pipes guarantees the maximum yield of the heat exchanger.

2.4 INSTALLATION AND ASSEMBLY OF THE HOT WATER VAPORIZER WITH ELECTRIC PREHEATING

2.4.1 General and safety warnings

The plant must be realised by fitting the transformation kit only the hot water vaporizer; this kit comprises an electric preheater which consists of en electric resistance with an anti-explosive casing (EExdIICT4) approved by CESI and with degree of protection IP55. Incorporated in the casing are 1 regulating thermostat "TR" and 1 safety thermostat "TS" set at about 95°C, with manual reset.

2.4.2 Assembly and connections

The VAPEG vaporizer must be installed and assembled exclusively by qualified personnel. Proceed as follows.

ATTENTION

PEGORARO GAS TECHNOLOGIES Srl declines all responsibility for any damage to things or persons caused by installation or maintenance of the equipment by non-qualified personnel.

ATTENTION

For correct and safe use an adequate earth connection must be provided.

The connections may be made with:

a) cable with an appropriate section passing through a metal pipe;

b) AD-PE flexible cables;

c) cables in mineral insulation type Pirotenax.

ATTENTION

The characteristics of the cables and their respective protections must comply with the requirements of the specific standards concerning plants made in areas where there is a risk of explosion or fire.

The cable section varies according to the power installed and the distance from the vaporizer to the electric panel. For example, see the table below.

Note

The calculated section is indicative and refers to multicore cables with a voltage drop of ≤2% for three-phase and ≤4% for single-phase. The current intensity indicated refers to the single phase.

Tab. 2-1

Sizes of the electric cables connecting the vaporizer to the electric panel								
LPG flow rate Kg/h	Power KW	Type of connection	Voltage Volt	Intensity Amperes	Cable section in mm²			
					Distance 30 mt.	Distance 60 mt.	Distance 100 mt.	Distance 150 mt.
100	16	Three-phase	380/400	24	6	10	16	25
200	32	Three-phase	380/400	49	10	25	35	50
300	48	Three-phase	380/400	73	16	25	50	70
500	80	Three-phase	380/400	122	35	50	70	120
1000	160	Three-phase	380/400	243	95	95	150	--
1500								
2000								

2.4.3 Eexd Connections

Make the connection between the electric panel and the electric resistances as follows.

- The terminals of the electric resistances are located in the special housing, in the casing and under the thermostats. To access the terminals you must:
  - Unscrew the cover of the casing;
  - Unscrew the two nuts that secure the bracket holding the thermostats;
  - Extract the thermostats from their sheath;
- make the necessary electrical connections, then repeat the above operations in inverse order.

Make the connection between the electric panel and the thermostats as follows.

- The thermostats are fitted in the anti-explosive casing of the electric resistances;
- The connections must be made referring to the indications given in the wiring diagrams enclosed in this documentation;
- There are two inputs in the casing for the resistances:
  - the larger one for feeding the resistances;
  - the smaller one for feeding the thermostats.

Make the connection between the electric panel and the pump as follows.

- The pump terminals are located in their housing. To access the terminals you must:
  - Unscrew the cover of the casing;
  - Connect the electric cable to the 3 terminals + Earth;
- The connections must be made referring to the indications given in the wiring diagrams enclosed in this documentation;
- Once the connection has been made, repeat the above operations in inverse order.

2.4.4 Aqueous solution electromagnetic level switch (optional)

It is possible to install an electromagnetic level switch for the aqueous solution, with a float and "Reed" contact, complete with a steel casing and Exxd watertight connection.

WARNING

If the level is not Eexd version, the location of level must be more than 5 cm from the upper heating limit of the electric resistances.

2.4.5 Connection IP-55

If the vaporizer is provided with a "Level switch" (OPTIONAL), make the connection with electric cables suitable for that type of connection. Follow the instructions concerning the connection details illustrated above.

2.4.5 Filling the water circuit

WARNING

The heating circuit must be fed with a solution of water and glycol (60% water, 40% glycol), able to resist temperatures ranging from about -35°C to 40°C.

Use only antifreeze of the type "INHIBITED ETHYLENE GLYCOL", as it guarantees complete WATER-SOLUBILITY (commercial code GLIC02455000), available from the best dealers. The use of ordinary antifreeze is not advised as it is aggressive for the circuit itself and favours the phenomenon of stratification in the case of plant stoppage. This means that it will be quite difficult for the heating circuit to start working when the plant is switched on again.

Proceed as follows.

- Remove the filling cap on the top of the vaporizer, labelled "Water Inlet".
- Pour in the aqueous solution.
- Any excess of aqueous solution must be discharged, turning the RED test knob on the safety valve in a clockwise direction.
- Replace the filling cap.

3. COMMISSIONING

3.1 COMMISSIONING

3.1.1 General warnings for correct operation of the vaporizer

A) Once the vaporizer has been put into operation, switch it off only in the case of maintenance operations or for long periods of inactivity of the plant.

It is advisable to leave it on overnight or at the weekend, because consumption is negligible, and it avoids having to repeat the switch-on procedures.

B) When switching off the plant, always close the interception valve on the vaporizer inlet, located on the liquid gas inlet side.

C) Before starting up the plant again it is indispensable to discharge the liquid gas downstream from the vaporizer, which has formed by new condensation after the phase of changing into gaseous form.

D) The filter on the inlet of the vaporizer avoids the entry of impurities which could settle on the seat of the valve (causing leaks of liquid gas), so it must be cleaned frequently also depending on the type of gas used. In the presence of large impurities it is recommended to install an additional filter.

NOTE

The label shown in Fig. 3-1, giving the instructions "FOR CORRECT OPERATION OF THE VAPORIZER" is applied on the vaporizer itself.

PER UN CORRETTO FUNZIONAMENTO DEL VAPORIZZATORE:

A) Dopo la messa in funzione del vaporizzatore, spegnere solo nel caso di manutenzione o per lunghi periodi di inattività dell'impianto. Si consiglia di lasciarlo acceso durante la notte o il fine settimana evitando cosi' il ripetersi delle operazioni di accensione sopraripportate

B) In fase di spegnimento dell'impianto chiudere sempre la valvola di intercettazione posta in entrata del vaporizzatore, lato gas liquido

C) In fase di riaccensione dell'impianto, prima è indispensabile scaricare il gas liquido a valle del vaporizzatore formatesi per la ricondensa della fase gassosa

D) Il filtro in entrata, presente sul vaporizzatore, evita che le impurità si inseriscono e si fermino sulla sede valvola (causa di trafilamenti di gas liquido) per cui deve essere pulito frequentemente anche in funzione del tipo di gas usato. In presenza di grosse impurità si consiglia di installare un filtro supplementare (cod.040064/65 della Ferrari srl)

E) In luoghi particolarmente freddi si può diluire nell'acqua con antigelo nella misura max del 10%. Si raccomanda l'impiego come anticongelante esclusivamente "GLICOLE ETILENICO INIBITO" in quanto garantisce la completa IDROSULUBILITÀ' codice commerciale GLIC02455000 ed acquistabile nei più qualificati rivenditori. Sconsigliamo l'impiego di antigelo comune in quanto presenta aggressività per il circuito stesso e in caso di fermata dell'impianto favorisce il fenomeno della stratificazione. Questo significa che alla riaccensione dell'impianto l'acqua stenta a muoversi

TO OBTAIN A CORRECT FUNCTIONING OF THE VAPORIZER:

A) After the starting-up of the Vaporizer, It is essential to shut it off only in case of maintenance purposes or for a long period the Vaporizer is destined at no use. Please note, it is convenient to maintain in operating conditions the Vaporiser during short period of unused final utilizer e.g. Saturday, Sunday and Nights in order to save at each time the re-start up costs

B) Before the Vaporizer is shut off , it is imperative to close the brass valve on the inlet line of the liquid gas

C) Before the Vaporizer's restart, empty the liquid gas contained in the down stream line

D) The gas filter located on the Vaporizer's inlet line, has to be often cleaned, depending on how pure is the LPG mixture used. In case of high gas dirtiness it is important and strongly suggested to install an additional bigger filter (see codes 040064/65 by Ferrari srl)

E) In particular weather conditions, such as cold surroundings, it is suggested to dilute the water with HINIBITED GLYCOL ETHYLENIC antifreezing in the max percentage of 10% .This special antifreezing can be purchased in qualified supplier shops. Commercial code: GLIC02455000. We do strongly advise against purchasing common antifreezing, since it can stratify not favouring the good water circulation.

Fig. 3-1

3.1.2 Commissioning the hot water vaporizer

Proceed as follows.

- start up the boiler;
- ensure that the valves on the inlet of the liquid gas to the vaporizer and the one on the outlet of the gaseous phase, upstream from the regulator, are closed;
- ensure that the aqueous solution circuit has been correctly filled;
- wait for the temperature of the aqueous solution measured by the thermometer on the vaporizer body to reach 70-75°C;
- If it does not reach the above temperature, alter the setting of the regulating thermostat on the boiler, turning the knob clockwise (the difference in temperature between the boiler thermostat and the value shown by the thermometer is due to the distance between the two appliances);
- check that there are no leaks from the gaskets of the aqueous solution circuit.

ATTENTION

At this point, open the liquid gas input valve very slowly. Opening this valve too quickly may cause irreversible damage to the vaporizer. So take great care during this operation. Opening the LPG supply valve too quickly may cause freezing and consequent breakage of the exchange group.

ATTENTION

If too fast, both the input and the discharge of liquid gas cause a sudden fall in temperature, which may result in the formation of ice. As is known, ice can cause burst pipes, with consequent transfer of liquid gas into the water circuit. This situation would potentially be very dangerous, causing the risk of explosion.

- At this point the liquid gas automatically enters the vaporizer.
- Check that there are no leaks from the gaskets of the gas circuit.
- Very slowly open the valve downstream towards the pressure reducers.
- At this point it is possible for the utility to start using gas.

ATTENTION

For the first hours of operation it is recommended to increase the withdrawal of gas very gradually, so as to allow the activation of the movement of the aqueous solution in the circuit, and to allow the regulating system to adapt to the working conditions.

3.1.2.1 Checks and controls

Check the temperature of the aqueous solution, because the flow rate of the gas in the vaporizer self-adjusts according to the difference in temperature of the aqueous solution between the top and the bottom of the vaporizer. If the temperature of the aqueous solution in the bottom of the vaporizer falls below 50°C, the “thermostatic regulating valve" closes.

3.1.3 Commissioning the hot water vaporizer with electric preheating

Proceed as follows.

- ensure that the valves on the inlet of the liquid gas to the vaporizer and the one on the outlet of the gaseous phase, upstream from the regulator, are closed;
- ensure that the aqueous solution circuit has been correctly filled;
- ensure that the electrical connections of the resistances and of the thermostats have been made correctly;
- unscrew the casing of the resistances and set the regulating thermostat TR at 70-75°C.
- switch on the power in the electric panel;
- wait for the temperature of the aqueous solution measured by the thermometer on the vaporizer body to reach 70-75°C;
- If it does not reach the above temperature, alter the setting of the regulating thermostat TR, turning the knob clockwise (the difference in temperature between the thermostat TR and the value shown by the thermometer is due to the distance between the respective probes);
- close the casing of the resistances and tighten the safety screw (with an allen wrench),
- check that there are no leaks from the gaskets of the aqueous solution circuit.

⚠ ***ATTENTION***

When starting up for the first time the aqueous solution takes about 40/60 minutes to complete circulation.

After this phase, open the liquid gas input valve very slowly. Opening this valve too quickly may cause irreversible damage to the vaporizer. So take great care during this operation. Opening the LPG supply valve too quickly may cause freezing and consequent breakage of the exchange group.

⚠ ***ATTENTION***

If too fast, both the input and the discharge of liquid gas cause a sudden fall in temperature, which may result in the formation of ice. As is known, ice can cause burst pipes, with consequent transfer of liquid gas into the water circuit. This situation would potentially be very dangerous, causing the risk of explosion.

- At this point the liquid gas automatically enters the vaporizer.
- Check that there are no leaks from the gaskets of the gas circuit.
- Very slowly open the valve downstream towards the pressure reducers.
- At this point it is possible for the utility to start using gas.

⚠ ***ATTENTION***

For the first hours of operation it is recommended to increase the withdrawal of gas very gradually, so as to allow the activation of the movement of the aqueous solution in the circuit, and to allow the regulating system to adapt to the working conditions.

3.1.3.1 Checks and controls

Check the temperature of the aqueous solution, because the flow rate of the gas in the vaporizer self-adjusts according to the difference in temperature of the aqueous solution between the top and the bottom of the vaporizer. If the temperature of the aqueous solution in the bottom of the vaporizer falls below 50°C, the “thermostatic regulating valve" closes.

The aqueous solution is kept at the desired temperature by the regulation of a thermostat TR set at 70-75°C which activates or deactivates the operation of the electric resistance.

In the event of breakage of the thermostat TR, a second thermostat TS, set fixed at about 95°C, intervenes and deactivates the operation of the electric resistance; this thermostat is manually reset (it is reset, after having checked the causes of intervention, by pressing the button provided).

The increase in pressure due to the increase in temperature of the aqueous solution is limited to a maximum of 3.5 bar, from a closed type expansion vessel. The expansion vessel is external and is preloaded.

4. MAINTENANCE

4.1 PERIODIC MAINTENANCE

If the flow rate of the vaporizer decreases it is necessary to carry out maintenance on the following groups:

ATTENTION

During the maintenance described below, absolutely avoid smoking or using naked flames: risk of explosion.

A) FILTER (on inlet);
B) EXCHANGER (for model without electric preheating)

A) FILTER (on inlet):
- ensure that the LPG inlet and outlet valves, located upstream and downstream from the vaporizer, are in closed position;
- prepare a hose of a suitable length to connect to the vent C of the discharge valve D and take it outside the area in which the vaporizer is installed (outdoors);
- open the discharge valve D to eliminate all the residual gas;
- unscrew and remove the cap 1;
- take out the stainless steel filter cartridge;
- clean it with compressed air or solvents;
- replace the filter cartridge;
- fit and tighten the cap 1 again;
- close the valve D again and disconnect the hose applied to the vent C.

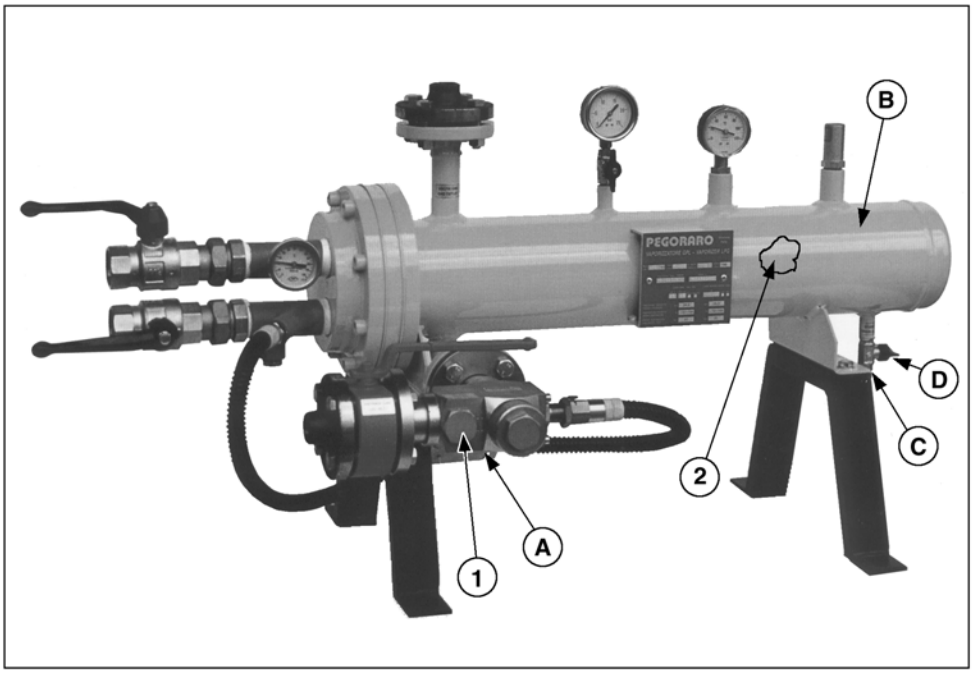


Fig.4-1

ATTENTION

At this point, open the liquid gas input valve very slowly. Opening this valve too quickly may cause irreversible damage to the vaporizer. So take great care during this operation. Opening the LPG supply valve too quickly may cause freezing and consequent breakage of the exchange group.

ATTENTION

If too fast, both the input and the discharge of liquid gas cause a sudden fall in temperature, which may result in the formation of ice. As is known, ice can cause burst pipes, with consequent transfer of liquid gas into the water circuit. This situation would potentially be very dangerous, causing the risk of explosion.

- At this point the liquid gas automatically enters the vaporizer.
- Check that there are no leaks from the gaskets of the gas circuit.
- Very slowly open the valve downstream towards the pressure reducers.

B) EXCHANGER (for model without electric preheating)

- ensure that the LPG inlet and outlet valves, located upstream and downstream from the vaporizer, are in closed position;
- prepare a hose of a suitable length to connect to the vent C of the discharge valve D and take it outside the area in which the vaporizer is installed (outdoors);
- open the discharge valve D to eliminate all the residual gas;
- disconnect the aqueous solution inlet and outlet pipes from the three-piece unions;
- unscrew the head screws;
- take out the tube nest 2, taking care not to damage the TWO sealing gaskets;
- clean the tube nest 2 with ordinary solvents;

- reassemble the tube nest 2, taking care not to shift the internal bulkheads;
- insert it again and tighten the head screws;
- reattach the aqueous solution inlet and outlet pipes to the three-piece unions;
- close the valve D again and disconnect the hose applied to the vent C.

ATTENTION

At this point, open the liquid gas input valve very slowly. Opening this valve too quickly may cause irreversible damage to the vaporizer. So take great care during this operation. Opening the LPG supply valve too quickly may cause freezing and consequent breakage of the exchange group.

ATTENTION

If too fast, both the input and the discharge of liquid gas cause a sudden fall in temperature, which may result in the formation of ice. As is known, ice can cause burst pipes, with consequent transfer of liquid gas into the water circuit. This situation would potentially be very dangerous, causing the risk of explosion.

- At this point the liquid gas automatically enters the vaporizer.
- Check that there are no leaks from the gaskets of the gas circuit.
- Very slowly open the valve downstream towards the pressure reducers.

WARNING

The dimensions of the heat exchanger are calculated for an inlet temperature of 75°C.

With a water temperature of 65°C at the vaporizer inlet (and 55°C at outlet) the rated potential of the exchanger is reduced by about 20%.

4.2 FAULTS/REPAIRS

If the gas is correctly filtered the thermostatic regulating valve generally does not need any maintenance.
In the event of faulty operation or of breakdown of the equipment, block the vaporization group immediately by closing the interception valve on the vaporizer inlet and discharge any liquid left in the appliance with all due care.

ATTENTION

Have the appliance and connections checked by expert, qualified personnel.

In the event of accidental breakage of the thermostatic valve it must be replaced.

ATTENTION

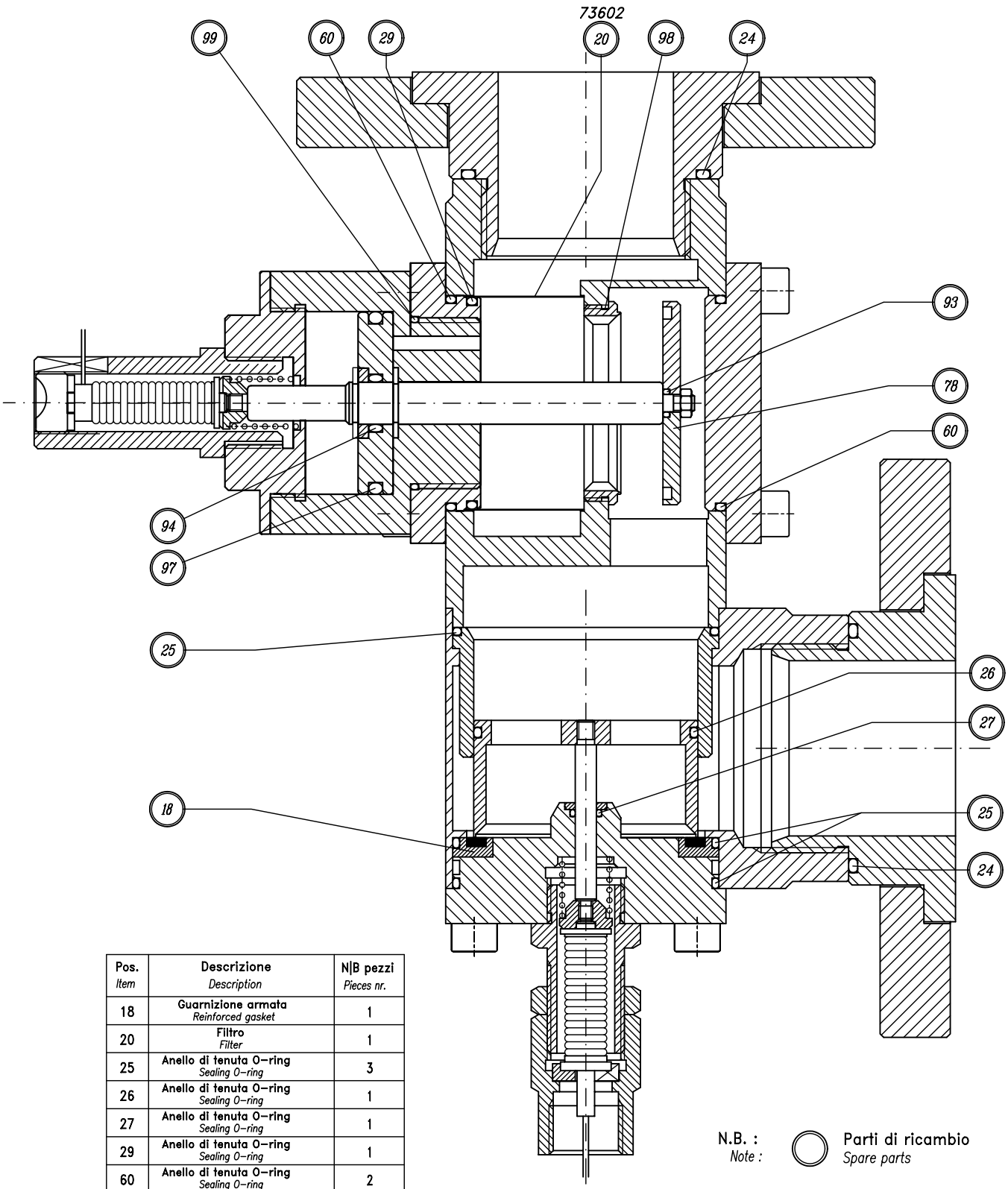
NEVER attempt to repair or restart the appliance by yourself.

PEGORARO S.r.l. declines all responsibility for any damage to things or persons caused by inadequate repair of the equipment by non-qualified personnel.

4.3 ENCLOSED DOCUMENTATION

List of enclosures

- Electric resistance diagram (for model with electric preheating);
- Electric resistance wiring diagram (for model with electric preheating);
- Electric resistance declaration of conformity (for model with electric preheating);
- Pump declaration of conformity (for model with electric preheating);



Pos. *Item*	Descrizione *Description*	N|B pezzi *Pieces nr.*
18	Guarnizione armata *Reinforced gasket*	1
20	Filtro *Filter*	1
25	Anello di tenuta O-ring *Sealing O-ring*	3
26	Anello di tenuta O-ring *Sealing O-ring*	1
27	Anello di tenuta O-ring *Sealing O-ring*	1
29	Anello di tenuta O-ring *Sealing O-ring*	1
60	Anello di tenuta O-ring *Sealing O-ring*	2
78	Otturatore *Obturator*	1
93	Anello di tenuta O-ring *Sealing O-ring*	1
94	Anello di tenuta O-ring *Sealing O-ring*	1
97	Anello di tenuta O-ring *Sealing O-ring*	1
98	Anello di tenuta O-ring *Sealing O-ring*	1
99	Anello di tenuta O-ring *Sealing O-ring*	1
24	Anello di tenuta O-ring *Sealing O-ring* NOT INCLUDED	2

N.B. : *Note :* ◯ Parti di ricambio *Spare parts*

PEGORARO SRL vicenza (italy)
Apparecchiature e Impianti Gas

DESCRIZIONE THERMOSTATIC VALVE DN25 WITH DOUBLE SCHUTTER

TRATTAMENTO

Rev.	Modifiche	Data	Firma	Verif.
B	Modificato secondo otturatore (bilanciato)	03.06.04		
A	Revisione generale	06.11.98		

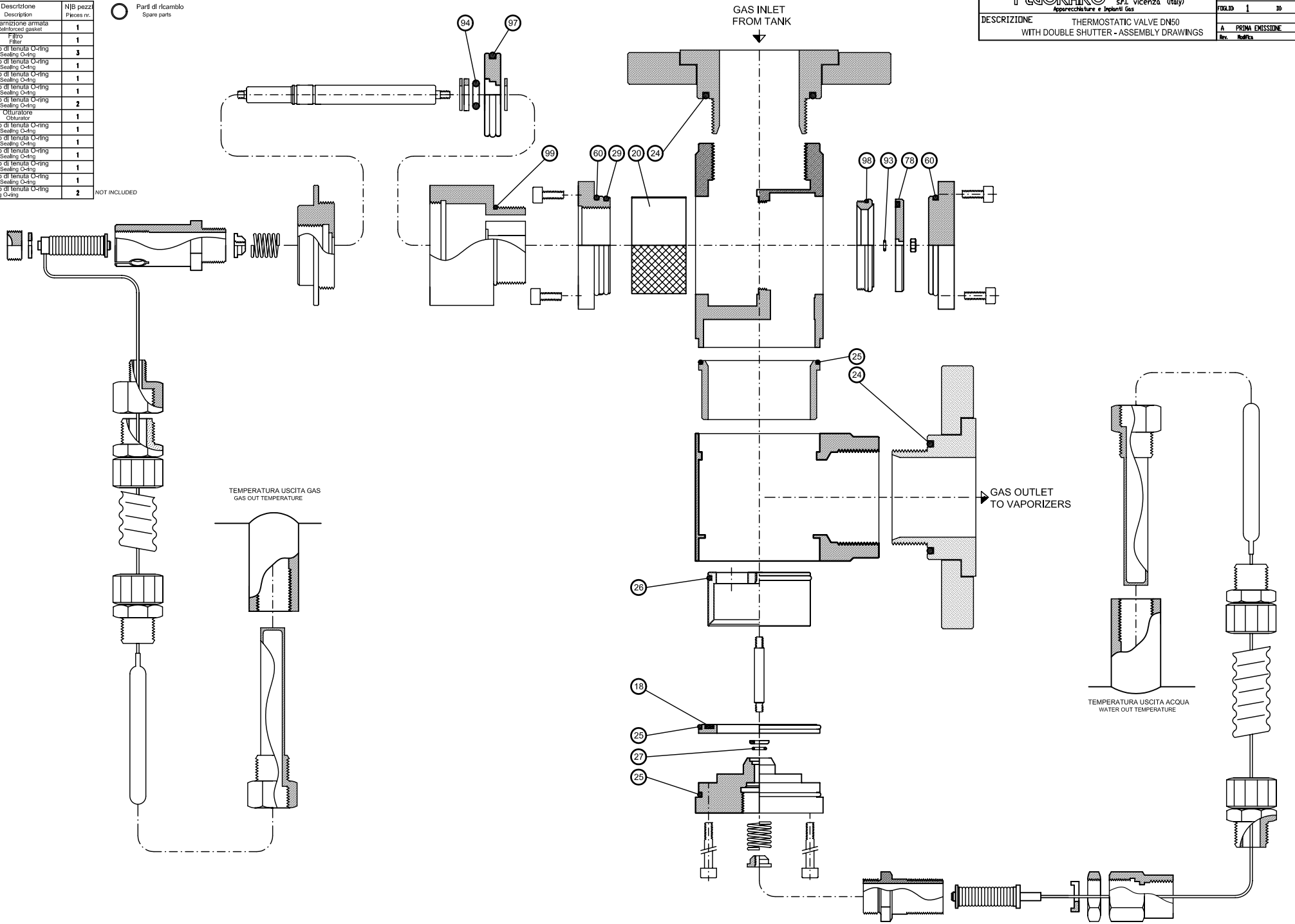
DATA : 20/05/98 SCALA : 1:1
DISEGNATORE: P.G.
CONTROLLATO: PEGORARO
QUALITY ACC.: PONCATO
SOSTITUISCE IL N°:
SOSTITUITO DAL N°:
N°. ORDINE :
DISEGNO N°: 70931
REV.: A B C D E F G H I L
FOGLIO: 1 DI: 1

Pos. Item	Descrizione Description	N|B pezzi Pieces nr.
18	Guarnizione armata Reinforced gasket	1
20	Filtro Filter	1
25	Anello di tenuta O-ring Sealing O-ring	3
26	Anello di tenuta O-ring Sealing O-ring	1
27	Anello di tenuta O-ring Sealing O-ring	1
29	Anello di tenuta O-ring Sealing O-ring	1
60	Anello di tenuta O-ring Sealing O-ring	2
78	Otturatore Obturator	1
93	Anello di tenuta O-ring Sealing O-ring	1
94	Anello di tenuta O-ring Sealing O-ring	1
97	Anello di tenuta O-ring Sealing O-ring	1
98	Anello di tenuta O-ring Sealing O-ring	1
99	Anello di tenuta O-ring Sealing O-ring	1
24	Anello di tenuta O-ring Sealing O-ring	2 NOT INCLUDED

Parti di ricambio
Spare parts

PEGORARO s.r.l. vicenza (Italy)
Apparecchiature e Impianti Gas

DISEGNO N°	70931-MON
FOGLIO	1 di 1
DESCRIZIONE	THERMOSTATIC VALVE DN50 WITH DOUBLE SHUTTER - ASSEMBLY DRAWINGS
A	PRIMA EMISSIONE 18.09.04
Rev.	Modifica Data

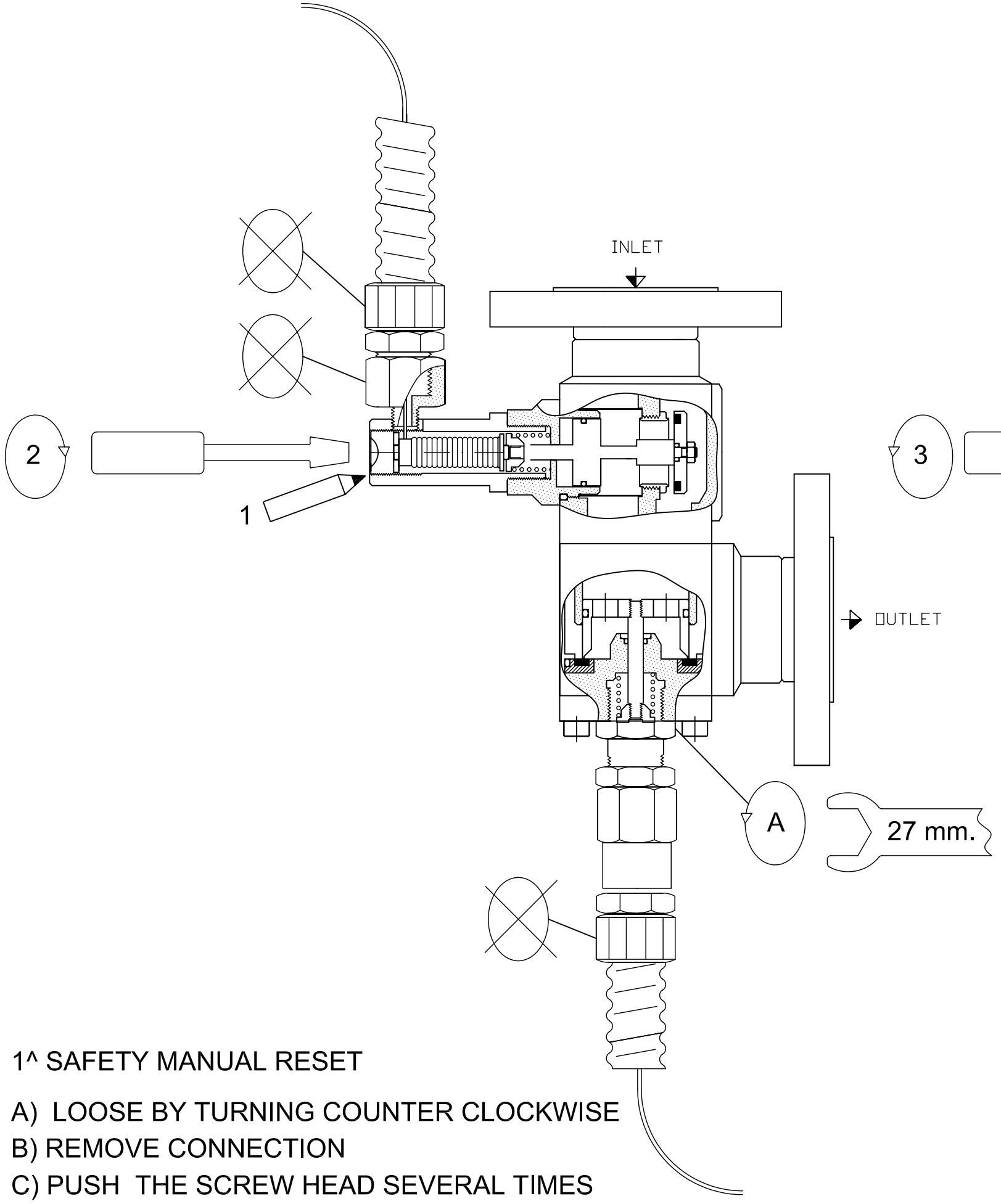


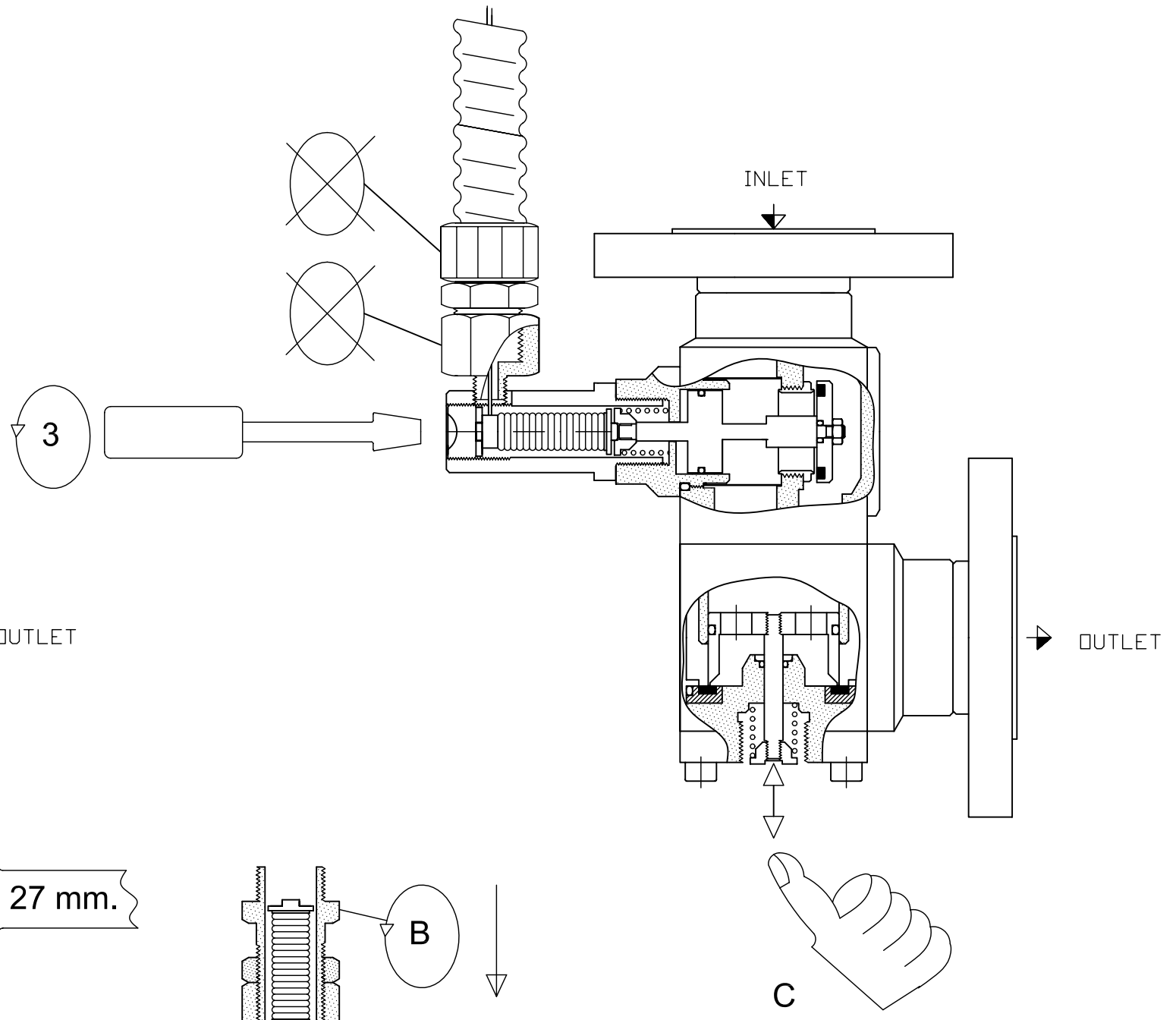
PEGORARO s.r.l. vicenza (italy)
Apparecchiature e Impianti Gas

DISEGNO N°:	70922-MON
FOGLIO: 1	DI: 1

DESCRIZIONE THERMOSTATIC VALVE DN25-50
WITH DOUBLE SCHUTTER - UNLOOK SCHUTTER

Rev.	Modifica	Data
A	PRIMA EMISSIONE	08.04.03





1^ SAFETY MANUAL RESET

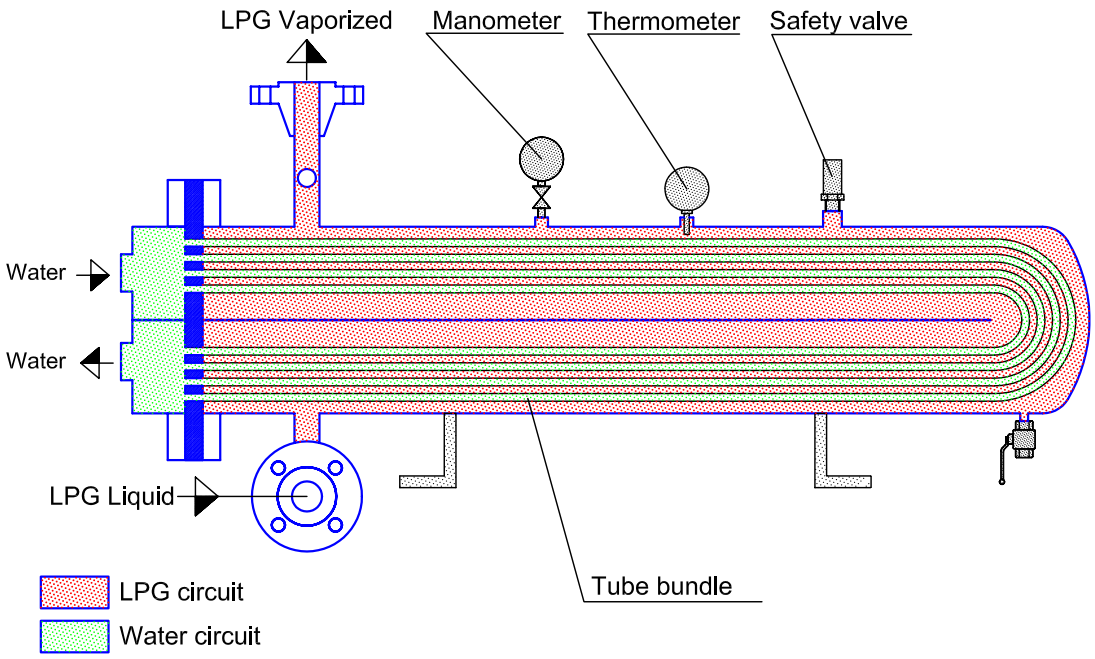
A) LOOSE BY TURNING COUNTER CLOCKWISE
B) REMOVE CONNECTION
C) PUSH THE SCREW HEAD SEVERAL TIMES
D) FAST THE SCREW BY TURNING CLOCKWISE

2ND SAFETY MANUAL RESET

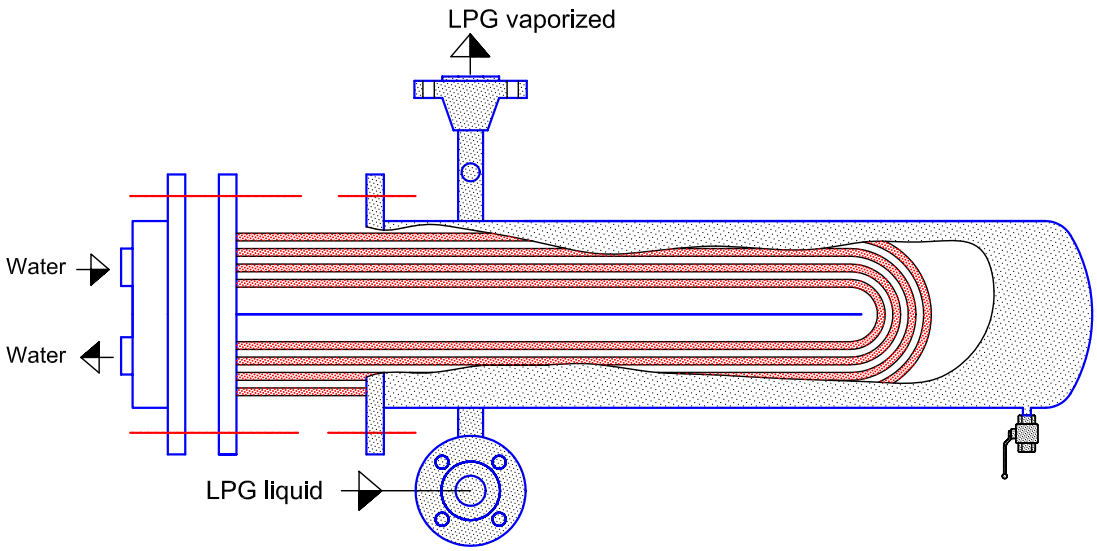
1) MARK A REFERENCE POINT
2) FAST THE SCREW BY TURNING CLOCKWISE
3) LOOSE THE SCREW UP TO STARTING POINT
(SEE POINT 1 REFERENCE POINT)

FUNCTIONING

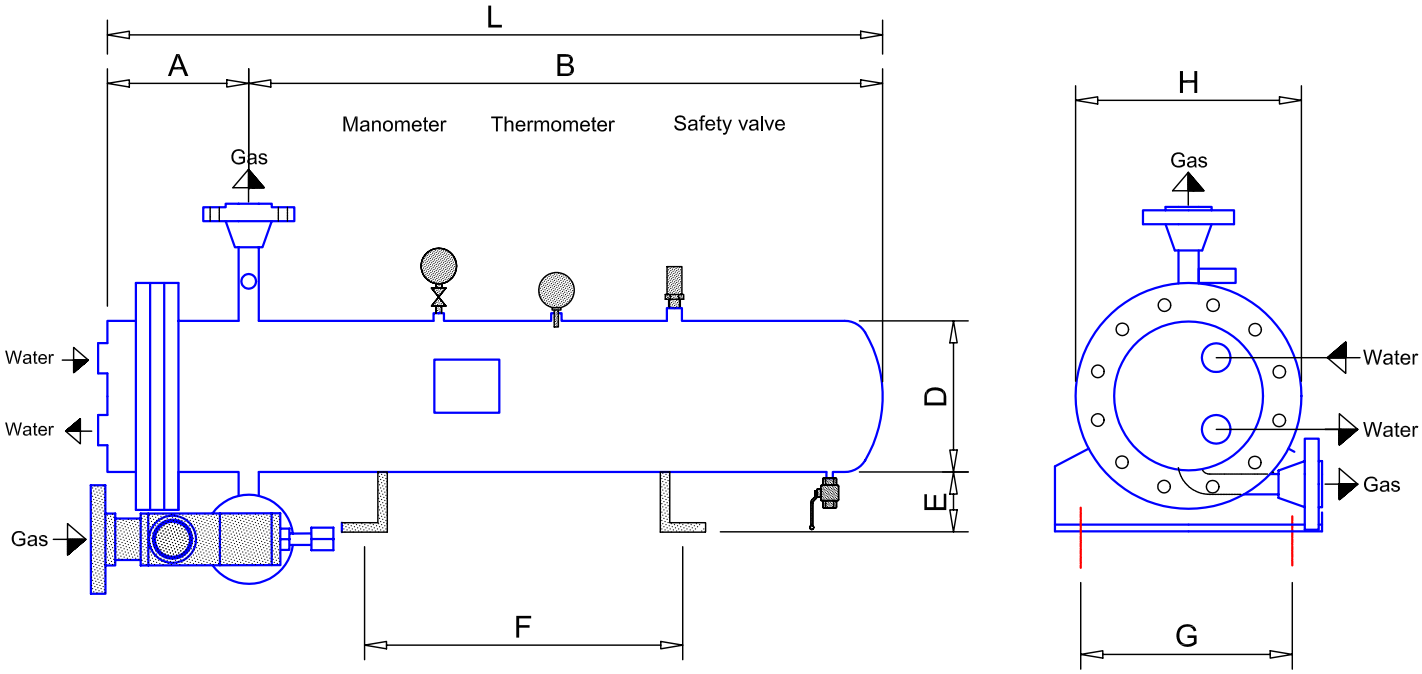
LPG is feeded in liquid phase
When it get in contact with tube bundle it is vaporized and move to outlet in gas phase



REMOVABLE TUBE BUNDLE = EASY MAINTENANCE



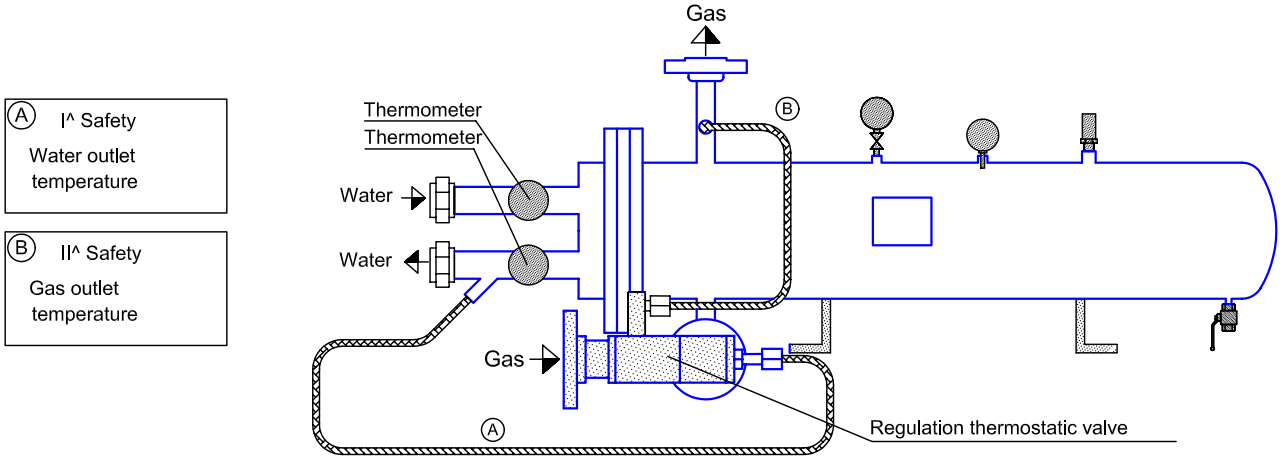
FEATURES



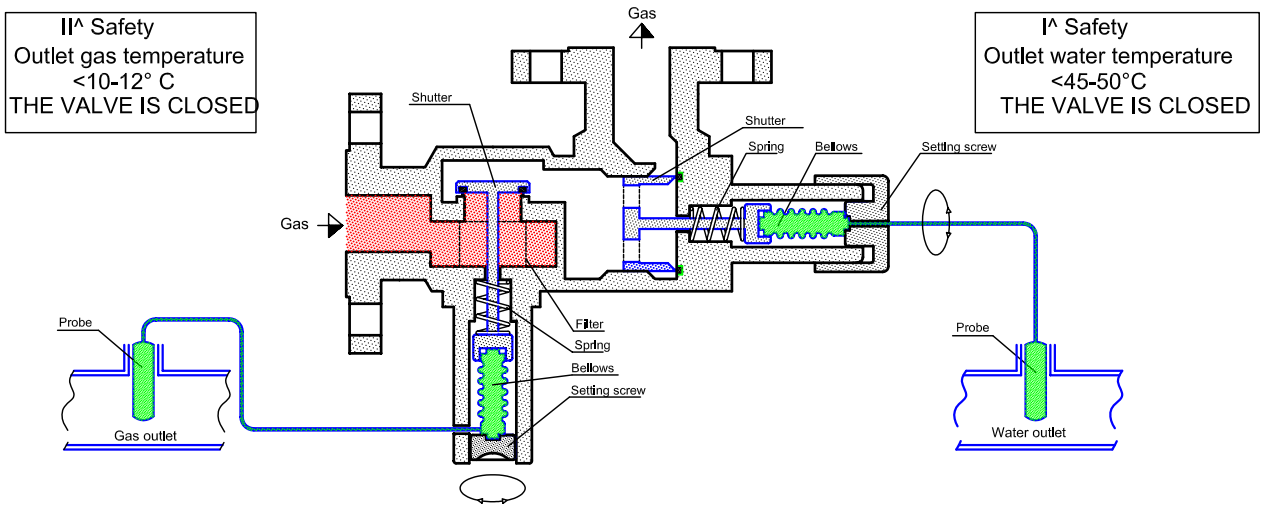
	VAPEG 100	VAPEG 200	VAPEG 300	VAPEG 500	VAPEG 1000	VAPEG 1500	VAPEG 2000
A	150	150	150	170	175	175	175
B	470	670	1070	1290	1240	1735	2135
D	141	141	141	168	219	219	219
E	60	60	60	60	70	70	70
F	200	400	800	1000	900	1390	1790
G	160	160	160	160	220	220	220
H	225	225	225	225	270	270	270
L	620	820	1220	1460	1420	1910	2310
DN E gas	15	25	25	50	50	50	50
DN U gas	25	25	40	50	80	80	80
DN E/U water	1"1/4	1"1/4	1"1/4	1"1/4	2"	2"	2"
El. Consumption KW	16	32	48	80	160	-	-
Gas volume lt.	4.3	6.0	9.3	15.7	24.8	33.5	40.5
Water volume lt.	2.2	3	4.8	8.9	16	21.5	26
Indicative weight Kos.	47	55	70	90	140	160	180

Vaporizer data	Gas side	Water side
PS (bar)	20	8
TS (°C)	-40 ÷ 120	-20 ÷ 105
Norms	Dir.Europea 97/23/CE del 29-05-97 (P.E.D.)	ISPESL VSR Ed.1999 rev.95
	Racc. M-S-E - ASME	

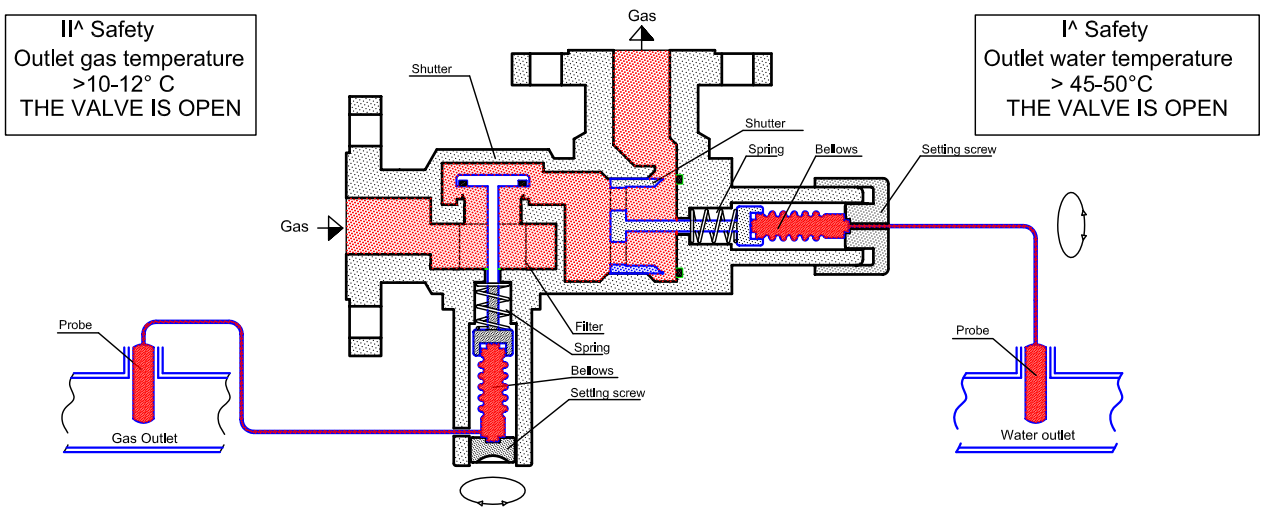
REGULATION THERMOSTATIC VALVE



CASE 1



CASE 2



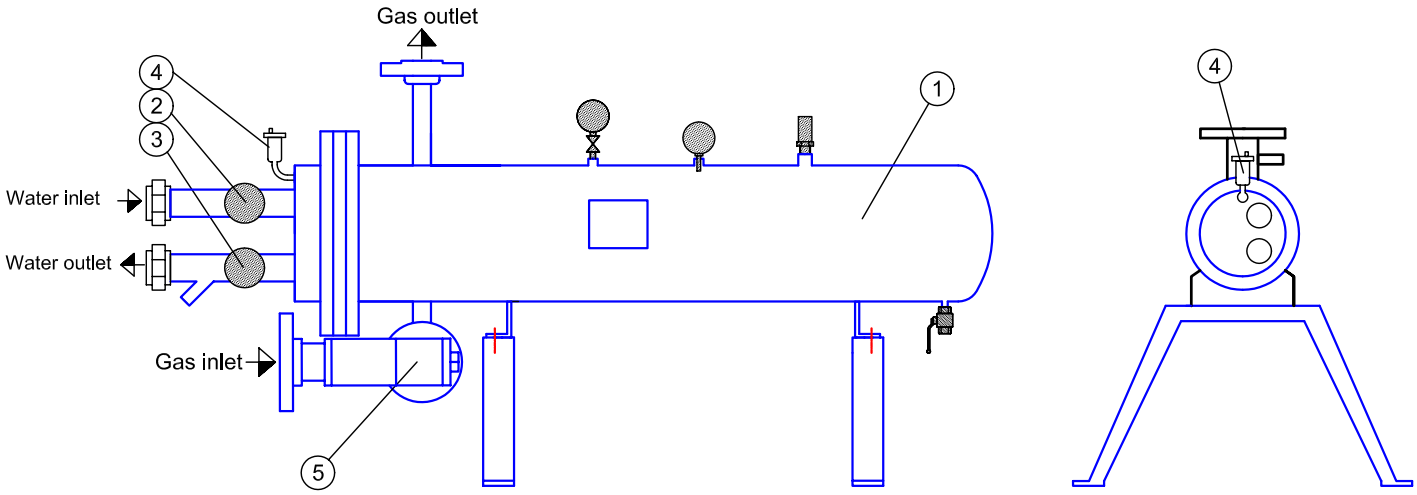
HOT WATER VAPORIZER

Hot water is supplied by an external boiler.

Water temperature is constantly maintained at the setted temperature by boiler's thermostat regulator.

Air presence in the water circuit is automatically eliminated with a airvent.

Water circuit pressure increasing, due to water temperature increasing is controlled by the boiler safety valve.



Pos.	Q.ty	Description
1	1	Vaporizer
2	1	Water inlet thermometer
3	1	Water outlet thermometer
4	1	Airvent
5	1	Thermostatic valve

ELECTRIC HOT WATER VAPORIZER

It has been made, coupling a vapeg technology vaporizer with a EExdIICT4 electric resistence with Atex certification, with one temperature setting thermostat and a safety thermostat setted at 85°C. The two thermostats are located in the resistance head pos. (2) (see example drawing "ELECTRIC CONN. SWITCHBOARD" and picture (A)).

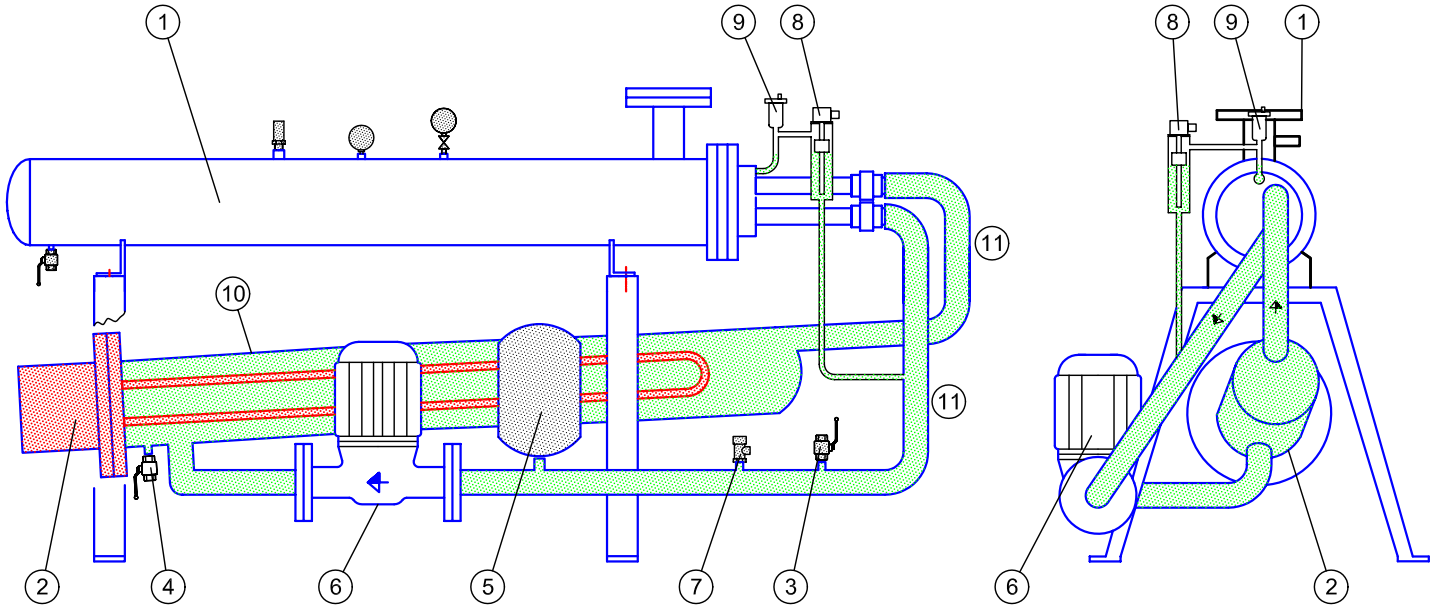
Water circulation is supported by AD-PE electric circulation pump.

Water temperature is maintened constant thanks to a thermostat located in the resistance head (2) that switches on/off the electric resistance.

A second safety thermostat located in the resistance head (2) that is setted at 85°C switches off the resistance in case of over-heating

Water over pressure, due to water temperature, is controlled by an expansion tank and by a safety valve.

OPTION
In case the water level decrease due to a water leavage or evaporation, a level-meter automatically switches-off the resistance.



Pos.	Q.ty	Description
1	1	Vaporizer heat exchanger
2	1	Electric resistance
3	1	Water feeding valve
4	1	Water unlooding valve
5	1	Expansion tank
6	1	Water electric circulation pump
7	1	Water safety valve
8	1	Level meter
9	1	Air drop vent
10	1	Electric boiler
11	1	Water pipe