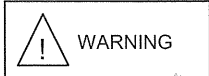


2. GENERAL SAFETY REQUIREMENTS

All users must comply fully with all national or local laws, rules or regulations in force. Anyone using this product must be thoroughly familiar with these instructions and other applicable product instructions and manuals.



This PRODUCT is a component part designed for use with medical gas therapeutic installations. The final manufacturer is responsible for preparing appropriate and adequate instructions and warnings for the ultimate product user.

The maintenance instructions outlined below should be incorporated into any product's user manual or instruction label.

Failure to follow any instruction or warning within this instruction manual or on any product label may result in a serious accident involving either personal injury, property damage or both.

This reducer is supplied with the CE marking, signifying :

- conformance with this technical information
- the customer must ensure the traceability of the products after assembly
- the customer must inform us about any incidents and supply us with any defective valve for checking and analysis

3. TECHNICAL DATA

| | |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximal inlet pressure | 200 bar (2900 psig) |
| Outlet pressure (Preset) | 3.5bar (50psig) |
| External and Internal leakage | 10 ⁻⁴ mbar.l.s ⁻¹ He |
| Outflow | HCR25 for BL and BI : 10 fixed flow-rates available, between 0.3 and 15 liters per minute depending on model, including a 0 l/min HCR25 for FL : 1 single fixed flow available between 4 and 15 l/min depending on model HCR25 for VL15 : adjustable flow between 3 and 15 l/min The MAXI flow capacity is specified on the instruction label of the regulator |
| Stability and accuracy of flow | ± 20% of reading or ± 30% for rates to ≤1.5 l/min while the pressure supply decreases from 200bar to 10 bar, in accordance with ISO 10524-1 |
| Operating temperature | From -20°C to +60°C (from -4°F to 140°F) |
| Storage temperature | Between -40°C and +70°C (between -40°F and 158°F) |
| Inlet connector | Varies depending on model and standard of the country |
| Outlet connector | Hose tail according EN 13544-2 |
| Security device | This device includes an integrated safety valve in compliance with ISO 10524-1 |
| Upstream filter | 2 sintered filters are incorporated to the regulator inlet HCR25 for BL, FL VL : 2 bronze filters HCR25 for BI : 1 bronze filter and 1 stainless steel filter The cleanliness of the first of these 2 filters, the most upstream, can easily be checked because this filter is removable. |
| Downstream Filter | The material after the regulator should include a removable filter (porosity <100 m) to avoid pollution rising to it. |
| Compatible gases | depending on version, specified on the instruction label of the regulator: <ul style="list-style-type: none"> ▪ O₂, CO₂, N₂O, He, Xe, Air or any mixture of these gases for versions brass HCR25 BL, FL and VL. ▪ mixtures NO/N₂ (with NO≤1000 µl/l) requiring the use of stainless steel version HCR25 BI |

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reserves the possibility at any time to change technical contents without previous consent

| FAILURE | CAUSE | ACTION |
|-------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------|
| Gas flow inadequate or non-existent | Valve closed or insufficiently opened | Open the valve |
| | Cylinder not full or insufficiently filled | Change the cylinder |
| | Valve does not function | Change the cylinder |
| | Gas regulator does not function | Call S.M.T. |
| | Downstream equipment does not function | Change the downstream equipment |
| Connection not possible | Wrong selected flow | Turn the handwheel of flow regulator |
| | Connections incompatible | Check gas compatibility |
| Gas exits from vent holes | Connections damaged | Call S.M.T. |
| | Leak on seat | Close the valve cylinder - Call S.M.T. |
| Icing phenomena | Operating temperature too low | Close the valve cylinder, close the flow regulator – put the installation at ambient temperature |

5. MAINTENANCE

5.1 Cleanness

This product is not a sterile product but keep its cleanliness level by :

- Cleaning the outside of the flow regulator with a medical cotton tissue and medical cleaning alcohol (all others cleaning processes are forbidden).
- Lens of gauge could show incompatibility with isopropyl alcohol. For cleaning of its, used ethyl alcohol (ethanol).
- The inside of the regulator should not be cleaned. Nevertheless, we recommend you to purge the flow regulator with medical oxygen, except for BI versions when using nitrogen, before first use or after a long storage
- Check regularly the cleanliness of the inlet filter. If the filter is too dirty, call your gas supplier or change the bottle.

5.2 Checks

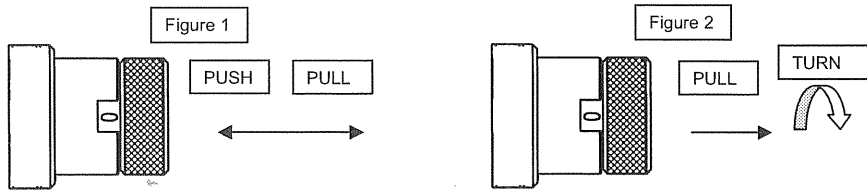
Each time the cylinder is changed :

- Check that the regulator valve shows no visible signs of damage
- Clean the regulator valve using the procedure described above
- After each assembly, check that the functions of the of the regulator are correct

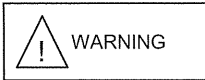
If you use a regulator with flow selector, check if it presents none of the following symptoms :

- Hose tail or outlet union unscrewed or damaged.
- Leakage at the position « 0 » (closed).
- Leakage between the hose tail or outlet connector and the body of the flow selector.
- Leakage between the hose tail and the tail (check hose conditions and assembling).
- Flow inadequate or non-existent (check each position of the flow selector).
- Difficulty to turn the handwheel.
- The flow selector is unlocked from the valve body (the flow selector can turn, leakage between the valve body and the flow selector).
- Axial loose at the handwheel when pulling and pushing it as described in figure 1.
- No index positions at the handwheel when pulling and turning it as described in figure 2.

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- The warranty foreseen in our general conditions of sale does not cover the following :
- Repair or replacement due to normal wear or damage during routine maintenance.
 - Damage to components whose fragility is for technical reasons unavoidable and determined by product design.
 - Damage from not following recommended maintenance and procedures, as outlined in this instruction manual.
 - Damage arising from modifications not included in the procedures in this instruction manual.
 - Damage resulting from the use of an unauthorised part, supplied, manufactured or modified by procedures not included in this instruction manual.



WARNING Failure to follow the installation instructions and handling instructions may cause an accident or personal injury, for which SMT declines any responsibility.

Maintenance, repairs and reconditioning of the PRODUCT are under the responsibility of the user or the operator. Anyone attempting to maintain, repair or conditioning the PRODUCT must be thoroughly familiar with Standard **CGA E4**, issued by the "COMPRESSED GAS ASSOCIATION" and all other standards and regulations referenced therein.

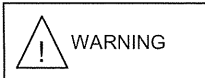
In case of incident or complaint, the user has to send back the supposed defective product to the manufacturer SMT securely packed. In order to preserve the warranty, the user will not execute any intervention on the product (disassembling, repair, modification...) without our written agreement.

All repairs must be carried out by SMT technicians to guarantee the product's safety and performance.

6. GENERAL CONDITIONS

Because of a policy of continuous product improvement, SMT reserves the right to change designs and materials as well as specifications and product informations without notice. SMT preserves completely the intellectual property of their projects, studies and in general on all documents forwarded to their customers : it is not permitted to communicate, to execute or to use these documents in any way without their written authorisation. The product is intended for use within EU countries. Without a previous and written notification from S.M.T. the product is not to be used in other countries.

This instruction manual is a part of the sales contract and is subject to the general terms of sale.

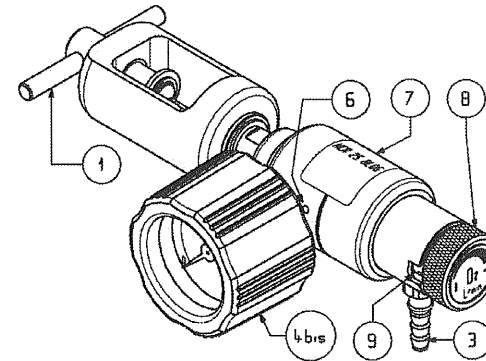


WARNING Although these valves are very robust, they need to be regularly checked. This work requires a certain number of precautions to be taken, and must be carried out by us.

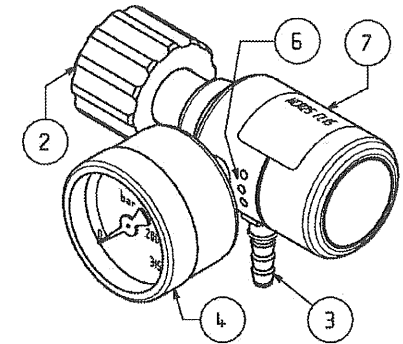
The frequency of this check is essentially dependent on the use of the equipment (intensive, normal, occasional); it must be assessed by the sales manager in agreement with the user. It shall on no account exceed 5 years.

This product is intended and approved for a therapeutic medical gas installation. This PRODUCT is not intended for any other installation or purpose. If the PRODUCT user has any question regarding the proper application or purpose of this PRODUCT, the product user should call (33) 03.80.47.61.00. Any non-approved use or application and/or modification of the PRODUCT may result in a serious accident or personal injury for which SMT will not be responsible..

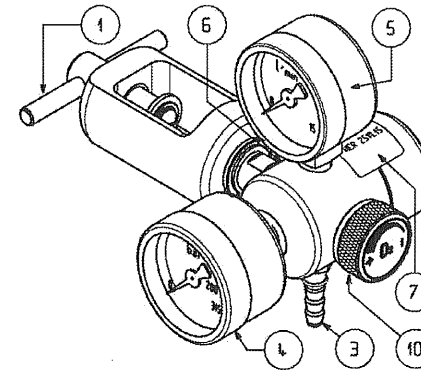
Draw



REGULATOR WITH FLOW SELECTOR
 Version « B »



REGULATOR FIXED RATE
 Version « F »



REGULATOR WITH SET VALVE
 Version « V »

| REP | DESCRIPTION |
|-------|------------------------------------------------------------|
| 1 | Yoke screw (inlet connection) |
| 2 | Nut inlet connection |
| 3 | Hose tail (outlet connection) |
| 4 | Indicator of inlet gas pressure |
| 4 bis | Indicator of inlet gas pressure with windscreen (optional) |
| 5 | Flow rate indicator |
| 6 | Venthole of the integrated relief valve |
| 7 | Instruction label |
| 8 | Flow selector handwheel |
| 9 | window indicating of the flow rate |
| 10 | Handwheel of the flow control valve |

4.2 Routine Checks

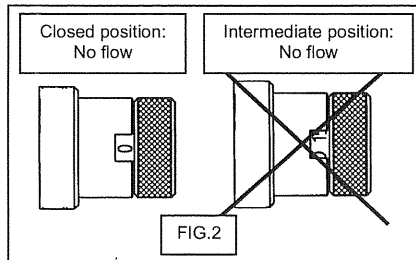
- Before installing the reducer, check the visual presence of all elements, the suitable connections and function of the pressure indicator and the handwheel
- The reducer must not be exposed to any violent shock : a deformed or damaged valve must not be used. In such a case, send it back for overhaul
- Use only material in perfect condition and compatible with the type of gas used, in accordance to the specified operating pressure and the desired flow rates. If necessary, choose a hose adapted with the hose tail (in accordance with hose manufacturer)
- Pay attention to constant cleanliness of the valve. Keep it and its connections clean to assure that no particles are mixed with the gas
- This reducer must be connected to accessories. Connection and disconnection operation must be carried out by a trained person

4.3 Installation of the regulator


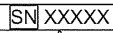

- Keep hands clean before manipulating the pressure reducer
- Place the cylinder in a secure position.
- Unscrew the safety hood from the cylinder.
- Unpack the pressure regulator and put the pressure reducer (with its inlet connection if necessary) on the cylinder valve (be sure the valve is closed). Do not screw hardily. Do not use tools. Check beforehand that the seal in the bottle connector is present
- Connect the hose to the hose tail (without using any tools).
- Open the cylinder valve slowly – check pressure indication by pressure indicator
- Set a gas flow which is always less than or equal to the maximum flow-rate indicated on the specification label, and check that there is gas at the outlet of the installation (when you use a flow selector, control flow on each position except « 0 »)
- Check there is no leak and more especially on connections
- Close the cylinder valve – ensure there is no gas on the outlet – then close the flow selector
- Gauges have no leverage function and should not be used to detach the regulator of the bottle.

4.4 Utilization of the regulator

- Open the cylinder valve slowly
 - Check pressure indication by pressure indicator
 - If the needle indicates a level below 50 bar, gas supply can be guaranteed only for a limited time. In this case, the bottle must be changed as soon as possible.
 - To obtain the desired flow, turn the flow selector handwheel
 - Check there is gas on the outlet
- NOTE :** There's thrust on any flow selector that can be damaged by a too strong operating torque.
- Realise the therapy on the patient
 - Take the mask away from the patient
 - After use, close the valve cylinder, ensure there is no gas on the outlet then close the flow selector (fig. 2).

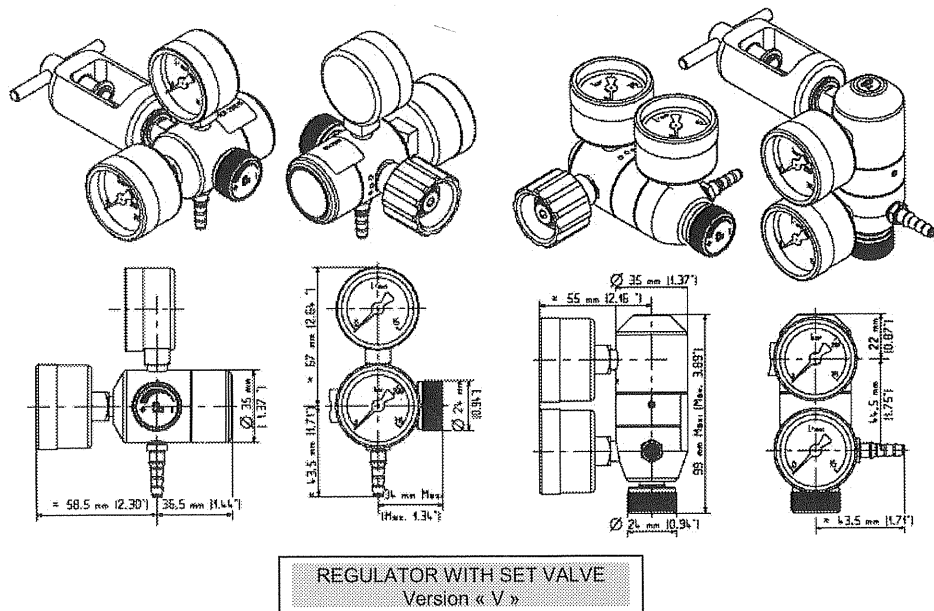
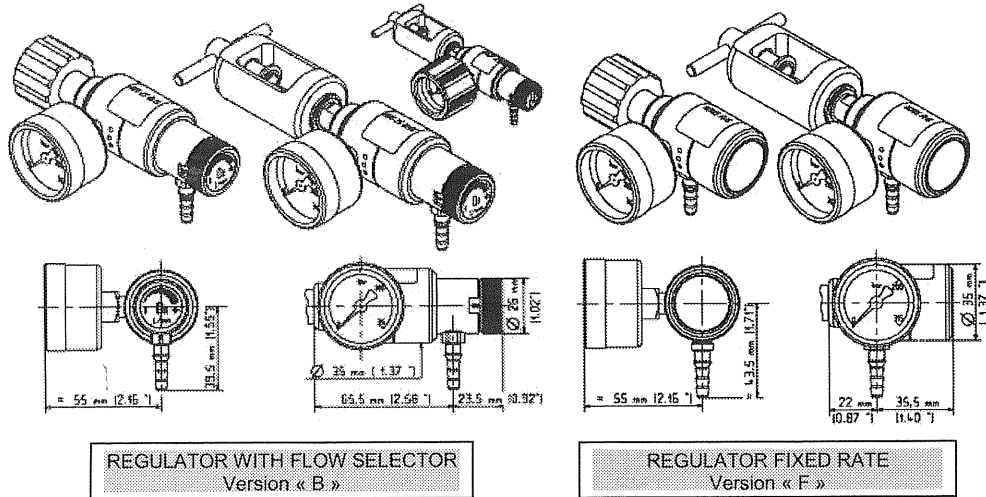


WARNING : Do not use the « off » position of the handwheel to close the regulator for a long time.

| | |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials in contact with the gas non-metallic: | HCR25 for BL, FL and VL : Polyurethane (PU), Delrin (for version VL), EPDM, silicone oil base |
| metallic: | HCR25 for BI : PTFCE, FPM, silicone oil base HCR25 for BL, FL and VL : brass, chrome-plated brass, bronze, stainless steel AISI303 and AISI304, nickel HCR25 for BI : Stainless steel AISI304 and AISI316L, bronze (1 filter), nickel |
| Marking : depending on model | |
| Crossed oilcan | Use no oil ! Do not grease product |
|  | Logo Rotarex Group, Société de Mécanique des Tilles |
| SMT F-21110 Genlis | Manufacturer : S.M.T. 5, rue de Labergement F-21110 Genlis |
| L/min or l/min | Gas flow in liters per minute corrected at 15°C and 1013bar (59°F and 14.7psig) in accordance with ISO 10524-1 |
| Max Inlet P1 | Maximal inlet pressure |
| Max Outlet Q1 | Max outlet nominal flow |
| O ₂ | Oxygen |
| CO ₂ | Carbon dioxide |
| N ₂ O | Nitrous oxide |
| He | Helium |
| Xe | Xenon |
| NO/N ₂ | A mixture of nitric oxide (nitric oxide) and nitrogen to less than 1000 ppm (µl/l) NO |
| HP | High pressure |
| « yyyy \ mm » | Year \ month of production |
| - → + | Increased flow direction |
| P/N : | Part Number (12 figures) |
| CE XXXX | European mandatory marking |
|  XXXXX | Serial Number (5 figures) |
|  | Temperature range storage |
| Type of equipment, e.g. " HCR25 BL03 " | name = HCR25 then version = BL or BI or FL or VL + MAXI outflow rate = 3 l/min in this example |
| Weight | 0.5 kg (1.1 lb) to 0.8 kilograms (1.8 pounds) depending on model |
| bar or psig | Pressure: 1 bar = 100 kPa and 1 psig = 6.9 kPa |

Subject with modification without preliminary opinion.

General Description



4. INSTALLATION AND HANDLING INSTRUCTIONS

4.1 Transport, storage handling

- All transport, storage and handling operations shall be carried out by qualified personnel, using appropriate facilities
- The discharge valves shall be transported and stored in their original packages; any deterioration of the package can lead to incorrect operation or affect the safety of the product
- The discharge valves must be stored in a room which is protected from dust and humidity, at temperatures between -40°C and +70°C (-40°F and +158°F); do not subject the unprotected discharge valve to bad weather conditions
- Valve and pressure reducer must not be used as a carrying handle for the cylinder
- Always remove the regulator from the cylinder when you transport it
- Never work on the equipment when it is under pressure (risk of projection of the equipment)
- Maintain the fluid-tightness of the system
- Maintain and use the hose in hose tail axis (fig.1)
- Never turn the body of the outlet connection. Immobilise it with a wrench when screwing a connection onto it or when unscrewing a connection from it.
- Never use tools; operate the equipment by hand
- Never lubricate the equipment or its accessories (explosion risks)
- Open the cylinder valve slowly (adiabatic compression, hammering phenomenon)
- Do not cover or obstruct the hole of the pressure relief on the regulator body (risk of projection)
- Do not smoke near the discharge valve (explosion risks)
- Do not heat the discharge valve, or bring a flame near it (explosion risk, possible damage to the equipment)
- Never back-feed discharge valve (allow fluid to enter through the outlet): you are liable to contaminate it and damage it.
- Do not use the exit flow for the training of a medical equipment
- Never leave cylinders filled with oxygen out in the sun or next to a heating source !
- Do not use foreign parts, e. g. plasters, for tightening the inlet or outlet.
- Always store the oxygen cylinder in a way it will not fall.
- Do not use oil or grease to clean the product, do not wear oil or grease stained clothing – explosion danger!
- Always make sure that the breathing mask hose is not bent.
- Since the device is partly made of metal, take care of magnetic effects.
- Heat strengthens the existing pressure. Pay attention to the maximum operational pressure. Avoid great heat - Danger of explosion!
- The pressure regulator must be stored absolutely free of oil and grease. Before the cylinders are exchanged, wash hands and do not use hand cream.
- Before manipulating the pressure reducer, check your hands are clean, free of hands lotions, vaseline or similar product.
- Keep the equipment out of the reach of children

