

7. Shut-down

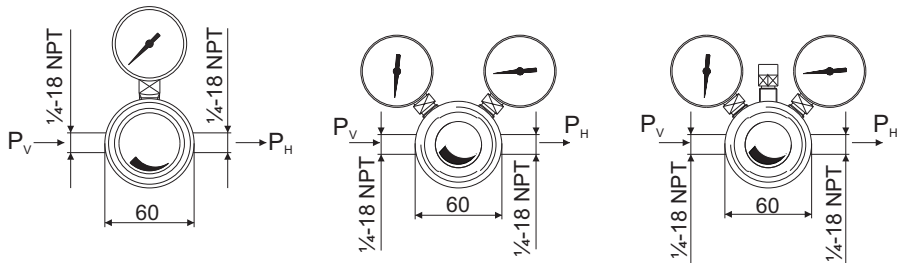
- 7.1 For short-term interruption of work
Close the shut-off valve at the consumer unit.
- 7.2 For longer interruptions or at the end of the work:
Close the gas cylinder valve (1) and the shut-off valve at the consumer unit.
- ⚠ 7.3 Before disassembly pay attention that pressure gauges (3) and (5) indicate zero.

8. Repair

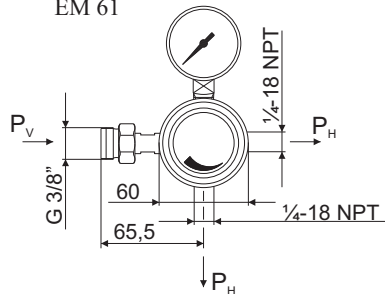
- 8.1 Repairs may only be carried out in authorized workshops by expert persons.
- 8.2 Only original spare parts may be used. The materials have been adapted to the gas type in each instance. So always specify the gas type.
- 8.3 In case of unauthorized repairs or use of non-original spare parts, any form of liability for resulting damages will expire as well as the manufacturer's warranty.
- 8.4 After being repaired, the pressure regulator must be checked with respect to proper function, leak-tightness and cleanliness of the gas-wetted surfaces.

9. Versions

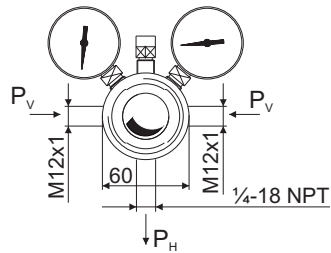
LM 61



EM 61



BM 61



Instructions for use

M61

Pressure regulator

spectrolab

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1. Application

1.1 Designated use

Use the pressure regulator for gases dissolved under pressure, compressed gases or liquified gases. The pressure regulator M61 reduces an inlet pressure to an as constant as possible outlet pressure.

1.2 Non-designated use



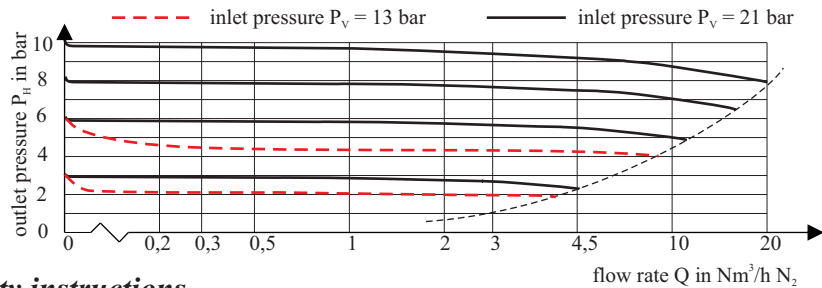
- Do not use the pressure regulator for gases in the liquid phase.
- Do not use unsuitable gas types or caustic gases.

The system has to be used according to this operating instructions and especially the safety instructions!

1.3 Technical data

Inlet pressure P_v:	max. 300 bar ¹⁾	Materials:	
Max. Outlet pressure P_n:	10/20/50/100 bar	Body:	chrome-plated brass
Flow rate Q:	see flow curves	Diaphragms:	SS 1.4310 (SS 301)
Connectors:	1/4"-18 NPT-F	Valve seat:	PA11 or EPDM resp.
Relief valve connector:	1/8"-27 NPT-F	Piston ($P_n > 20$ bar):	brass
Leak rate:	10^{-8} mbarl/s He	Weight:	1,8 kg

¹⁾ for use with oxygen max. 40 bar



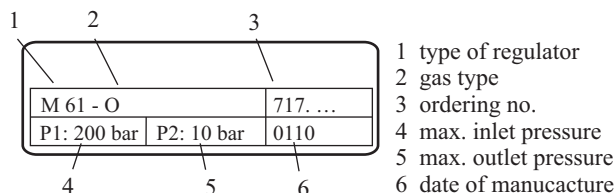
2. Safety instructions

- All items of information marked with **▲** are important safety instructions.
- This pressure regulator correspond to state-of-the-art technology and to the demands of the existing standards and regulations.
- Changes or modifications are not allowed to be made to the pressure regulator without the prior consent of the manufacturer.
- Pressure regulators must be operated by suitable trained personnel.
- Improper handling and use can evolve risks for the user and other persons as well as damage to the device.
- Attention has to be paid to the country specific laws, regulations procedures concerning the use of this equipment.
- All parts coming in contact with oxygen must be kept in oil-free and grease-free condition.

Fire or explosion hazard!

- ▲** Smoking or open fire in the vicinity of your gas supply system is strictly prohibited!
- ▲** **Fire or explosion hazard!**
- The gas cylinder valve has always to be opened slowly!
- ▲** Only for gases, which are indicated in the labelling at the pressure regulator for gas cylinder (see Item 3, Labelling).
- ▲** The pressure regulator must not be exposed to ambient temperatures below -30°C and above $+60^{\circ}\text{C}$.

3. Labelling



- type of regulator
- gas type
- ordering no.
- max. inlet pressure
- max. outlet pressure
- date of manufacture

gas type	ld. mark
oxygen	O
hydrogen, mixtures	H
compressed air	D
Nitrogen, noble gas	N

4. Installation

- Before starting read the specifications of this instruction for use and observe it while working
- Check, that the shut-off valve connections are without any damage (blow through if necessary).
- ▲** In case of a damage, the pressure regulator must not be connected.
- When installing the pressure regulator in a pipe-line it is essential to ensure that the pipe axes coincide with the connection axes of the regulator.
- Before mounting, check that the threads and the connection seals are in perfect condition.
- A shut-off valve should be arranged in the supply line of the pressure regulator, so that the pressure gauge of the regulator can be observed when opening the shut-off valve.
- A shut-off valve is required in the line between the regulator and the outlet when there is no facility for shutting off the line on the tapping point. The distance between the regulator and the shut-off valves must be $20 \times$ nom. diameters of the pipe.
For NPT fittings, wind teflon tape (PTFE) clockwise around 1/4-18 NPT thread (wind around 5 to 10 times) leaving the first thread turn free. Screw the parts together, ensuring a gas tight seal.
- Hoses which are attached to hose coupling nipples must be secured with hose clips. Check their suitability for the application (rated pressure). Mounted pipes must be in a clean and dry condition. The sealing caps have to remove immediately before mounting.
- Pipe mounting in a compression ring fitting:
Plug-in the burr-free pipe into the screwed connection. Tighten the union nut with a suitable spanner $1 \frac{1}{4}$ turns while holding the counterpart in position with a second spanner.

5. Start-up

The high pressure and the low pressure shut-off valves must be closed before unscrewing the adjusting spindle as far as possible. Then screw it approximately halfway back.
Then open the high pressure shut-off valve slightly (only a fraction of a turn for small flow rates), so that the inlet pressure of the regulator rises slowly to its full value and the outlet pressure to approx. half of the maximum value. After this filling procedure is completed, open the high pressure shut-off valve fully.
Adjust the outlet pressure with the hand knob. Open the low pressure shut-off valve and, when the required flow rate has been reached, readjust the outlet pressure with the hand knob.

6. Operation and maintenance

- Pressure regulators are always to be protected against damage (visual inspections in regular intervals).
- Pay attention to a perfect status of seals, sealing surfaces and pressure gauges.
- ▲** In case of malfunctions, e. g. an increase in the outlet pressure during the supply, or in case of leakage versus atmosphere or a defective pressure gauge, shut down the upstream gas supply and take the pressure regulator out of operation.