6. Spare parts

6.1 Complete Article No.:

SPECTRON	FL M 32	FL E 32
calibration pressure [bar]	brass / nickel plated	SS 316 L
1,4	717.05879	717.05880
4	717.06608	717.06610

6.2 Spare parts: measuring glas (all types): 717.05811
shell with rubber bung: 717.03578

7. Repair

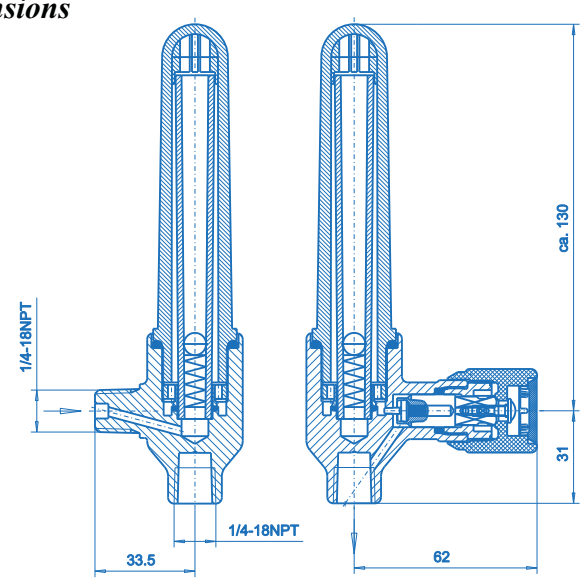
7.1 Repairs may only be carried out in authorized repair workshops by expert persons.

7.2 Only original spare parts must be used. The materials have been adapted to the gas type in each instance. So always specifiy the gas type

7.3 In case of independent repairs, the use of non-original spare parts or changes on the side of the user or a third party without the approval of the manufacturer, any form of liability for resulting damages will expire as well as the manufacturers warranty.

7.4 After being repaired, the pressure regulator must be checked with respect to proper function, leak-tightness and cleanliness of the gas-wetted surfaces.When the system is used again, a sufficient purging operation must be carried out first.

8. Dimensions



spectron

Instructions for use
FLM 32 / FLE 32
Flowmeter for high purity gases

spectrolab

Contents

1. Application

1.1 Designated use
Adjust the flow rate with the flow meter FLM 32/ FLE 32. This flow meter is used in combination with pressure regulators for high purity gases up to a quality of 6.0.

1.2 Non-designated use
⚠ Do not use the flow meter for gases in the liquid phase.
⚠ Do not use unsuitable or corrosive gases.
⚠ Do not use at temperatures below -30°C or above +60°C.

The system has to be used according to these instructions of use and especially the safety instructions!

spectron

1.3 Technical data:

SPECTRON	FL M 32	FL E 32
Pressure: according reading	1,4 / 4 bar	
Materials:		
Body:	Brass / Nickel plated	SS 316 L
Elastomer:	Viton (FKM)	
Graduated measuring glass:	Glas	
Control spindle:	Stainless steel	
Shell:	Polycarbonate	
O-rings:	8 x 2 > NBR	
	22 x 3 > NBR	
	10 x 2,5 > EPDM	
Supply in- und outlet	1/4 - 18 NPT inside	
Operating temperature:	-30°C up to +60°C	
Leak rate: (against atm.)	1 x 10-6mbar l/s He	
Weight:	1,8 kg	
Suitable with pressure regulator FM 61/ FE 61 male connector 717.06605 (brass/nickel plated) or 0.291.077 (stainless steel).		

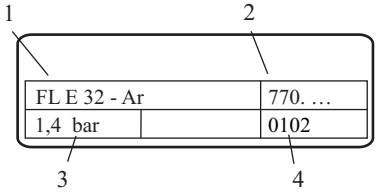
2. Safety instructions

2.1 All items of information marked with ⚠ are valid as special safety instructions.
2.2 This flow meter adheres to state-of-the-art technology and to the demands of the exsiting standards and regulations.
2.3 Changes or modifications are not allowed to be made to the flow meter without the prior consent of the manufacturer.
2.4 The result of improper handling and improper use as intended can involve risks for the user and other persons as well as damage to the device.
2.5 The equipment must be operated by suitable trained personnel only.
2.6 Regulations to be adhered to:
- BGV A1 (VBG 1), “General specifications”
- BGV B6 (VBG 15), “Welding, cutting and related procedures"
- BGV B7 (VBG 62), “Oxygen”
- TRAC 207
- Technical rules for liquid gas.

⚠ **Special attention has to be paid to the country specific laws, regulations and procedures concerning the use of this type of equipment.**

⚠ 2.7 Use only for gas types the flow meter is labelled for (see item 3).
2.8 Do not use at temperatures below -30°C or above +60°C.
⚠ 2.9 The valve has always to be opened slowly!
⚠ 2.10 All parts coming into contact with oxygen must be kept in oil-free and grease-free condition.
Fire or explosion hazard!
⚠ 2.11 Smoking or open fire (e.g. candles) in the vicinity of the gas supply system is strictly prohibited.
Fire and explosion hazard!

3. Labelling



1 Type
2 Article No.
3 Calibration pressure
4 Date of manufacture

4. Installation

⚠ 4.1 Examinate the gas type.
Check that the screwed pipe connection is without any damage.
4.2 Wrap the NPT-thread with PTFE-Band 0321422.

5. Operation and maintenance

⚠ 5.1 Do not use a flow meter as a shut-off valve. This could injure the dosage quality of the valve or damage the flow meter.
⚠ 5.2 The flow rate index is needed to convert the % scale to l/h.

Flow rate index % scale 1,4 bar and 4 bar / flow at 100 %
blue numbers: 1,4 bar

Inlet pressure (gauge pressure) [bar]	Nitrogen		Synth. air		Argon		CO2		Helium		Hydrogen		Methan	
	l/h													
0,5	164	180	177	194	137	150	130	143	431	473	615	675	216	238
1	190	240	205	259	159	200	150	190	500	631	713	900	251	317
1,5	212	300	229	324	177	251	168	238	558	789	795	1125	280	396
2	232		250		194		184		610		870		306	
2,5	251		271		210		199		660		941		331	
3	268		289		224		212		705		1005		354	
3,5	285		308		239		226		750		1069		376	
4	300		324		251		238		489		1125		396	

$Q = f_1 \times Q_{END}$

$f_1 = \sqrt{\frac{P\ soll}{P\ max.}}$ (N_2)

P ➡ absolute

for other gas types
$Q = f_2 \times Q_{N2}$

f_2
Synth. air
Argon
CO_2
Hydrogen
Methan
Helium

Example: gas type: nitrogen
When the adjusted pressure on the pressure regulator is 1.4 bar (4.0 bar), open the valve until the upper edge of the ball reaches 100 %. In this position the flow rate is 300 l/h N_2.
When the ball reaches 50 %, the flow rate is 150 l/h N_2.
The adjusting must not fall below 10 %.