What is a gas?

- A substance which is <u>gaseous</u> at atmospheric pressure (approx. 1 bar) and a temperature of 15°C

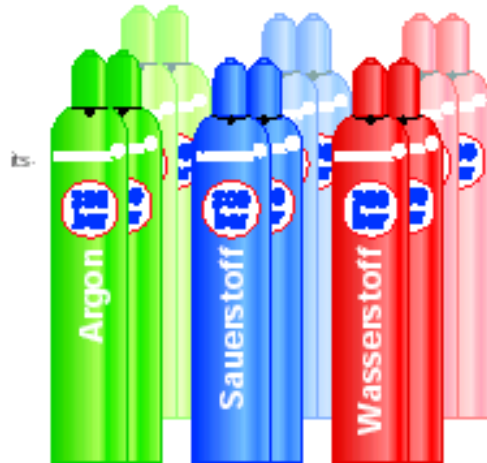สมาคมมาตรวิทยาแห่งประเทศไทย
METROLOGY SOCIETY OF THAILAND

196 ถนนพหลโยธิน แขวงลาดยาว เขตจตุจักร กรุงเทพฯ 10900 โทร : (662) 940-6943 โทรสาร : (662) 940-6949
196 Phahonyothin Rd., Bangkok 10900 Tel : (662) 940-6943 Fax : (662) 940-6949 E-mail : met@mst.or.th

Delivery Forms

- Compressed gas
- Liquefied gas
- Dissolved gas
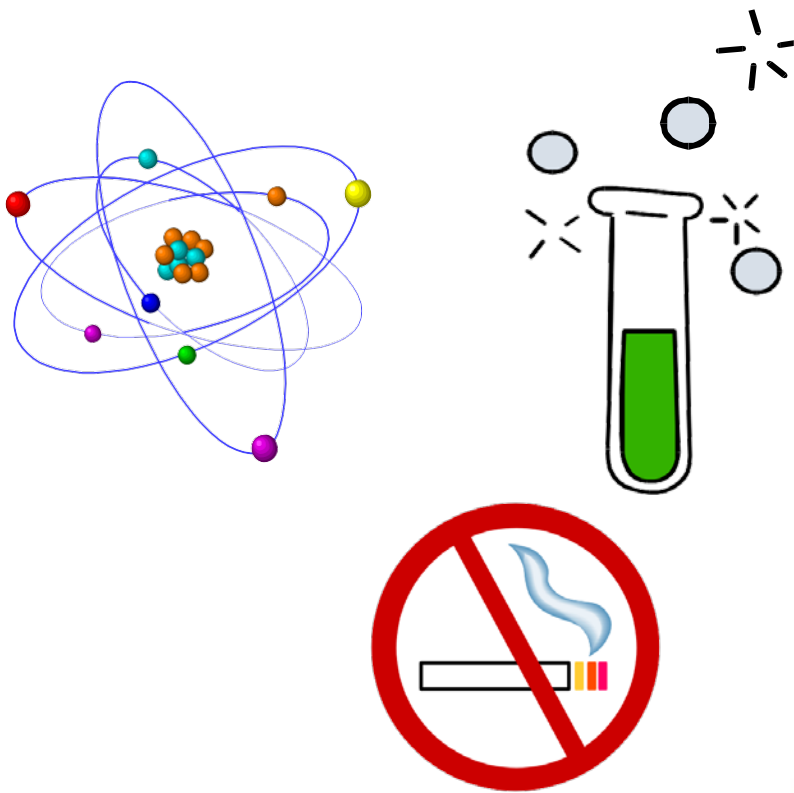
Gas Property

- Flammable
- Oxidizing
- Toxic
- Corrosive
- Auto igniting

Gas Property

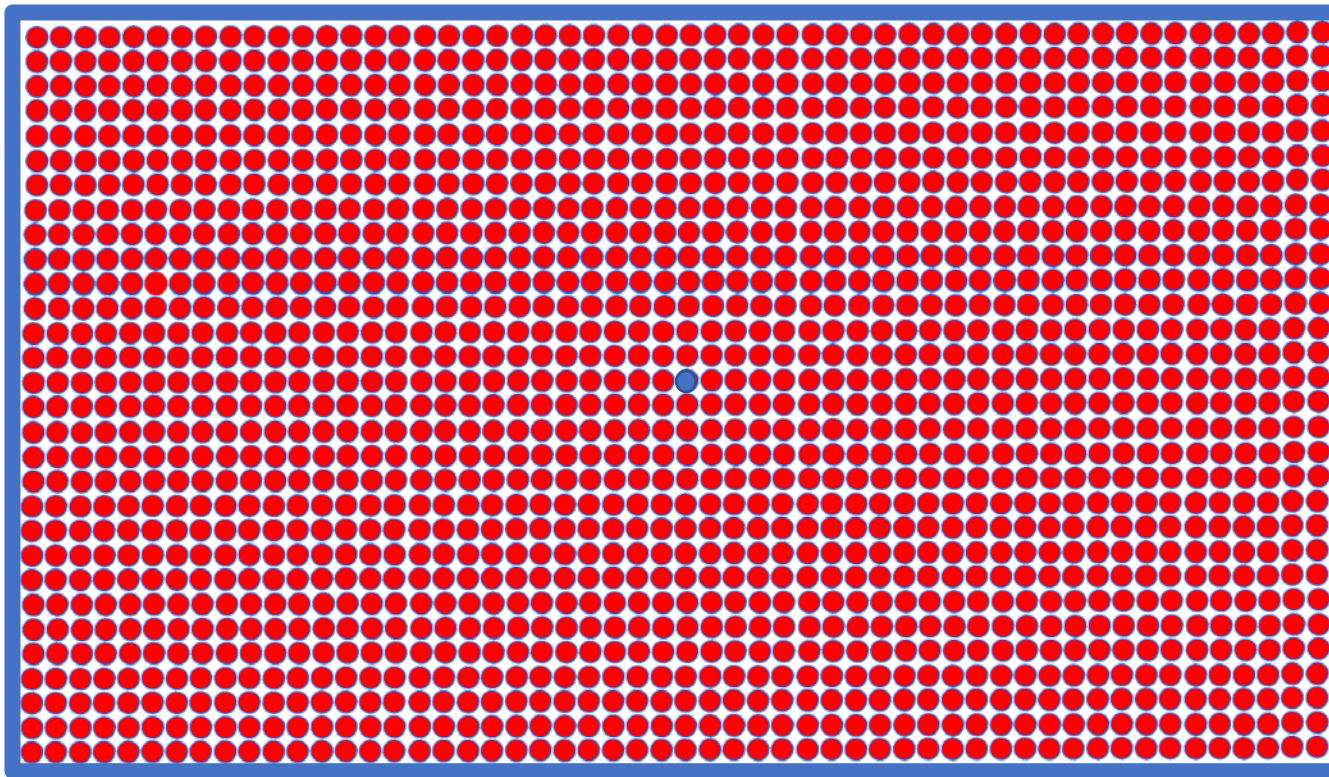| Gas	Value
Wasserstoff	0,07
Methan	0,55
Ammoniak	0,59
Acetylen	0,90
Kohlen-monoxid	0,97
Schwefelwasserstoff	1,19
Propan	1,56
Alkohol	1,59
Butan	2,05
Ether	2,55
Schwefelkohlenst.	2,65
Benzol	2,70
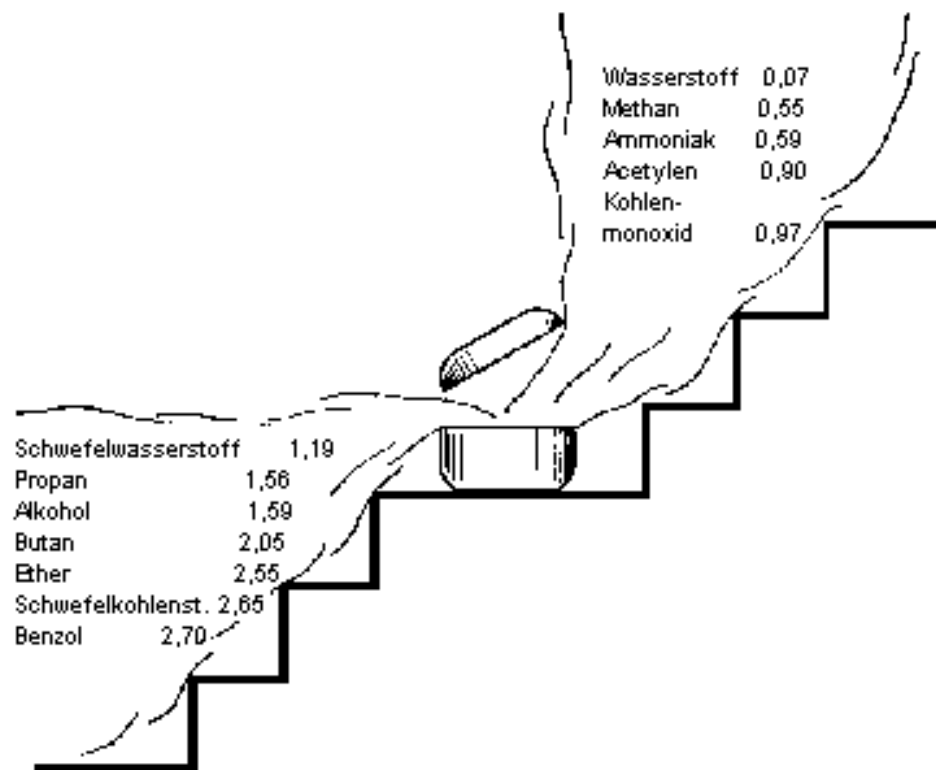
„Heavy" Gase flow like liquids!

Gas purity

- **999,999 red plastic balls and 1 blue steel ball**
- **The blue ball weighs the same as all 999.999 red balls**
- **The concentration of the blue ball is:Volume: 1 vpm or Weight: 50% = 500.000 ppm**

Gas Purity

Gas	Purity	Impurity	
		Vol %	vpm
2.5	99.5%	0.5%	5,000
3.0	99.90%	0.1%	1,000
4.6	99.996%	0.04%	40
5.0	99.9%	0.001%	10
6.0	99.90%	0.0001%	1
7.0	99.90%	0.00001%	0.1
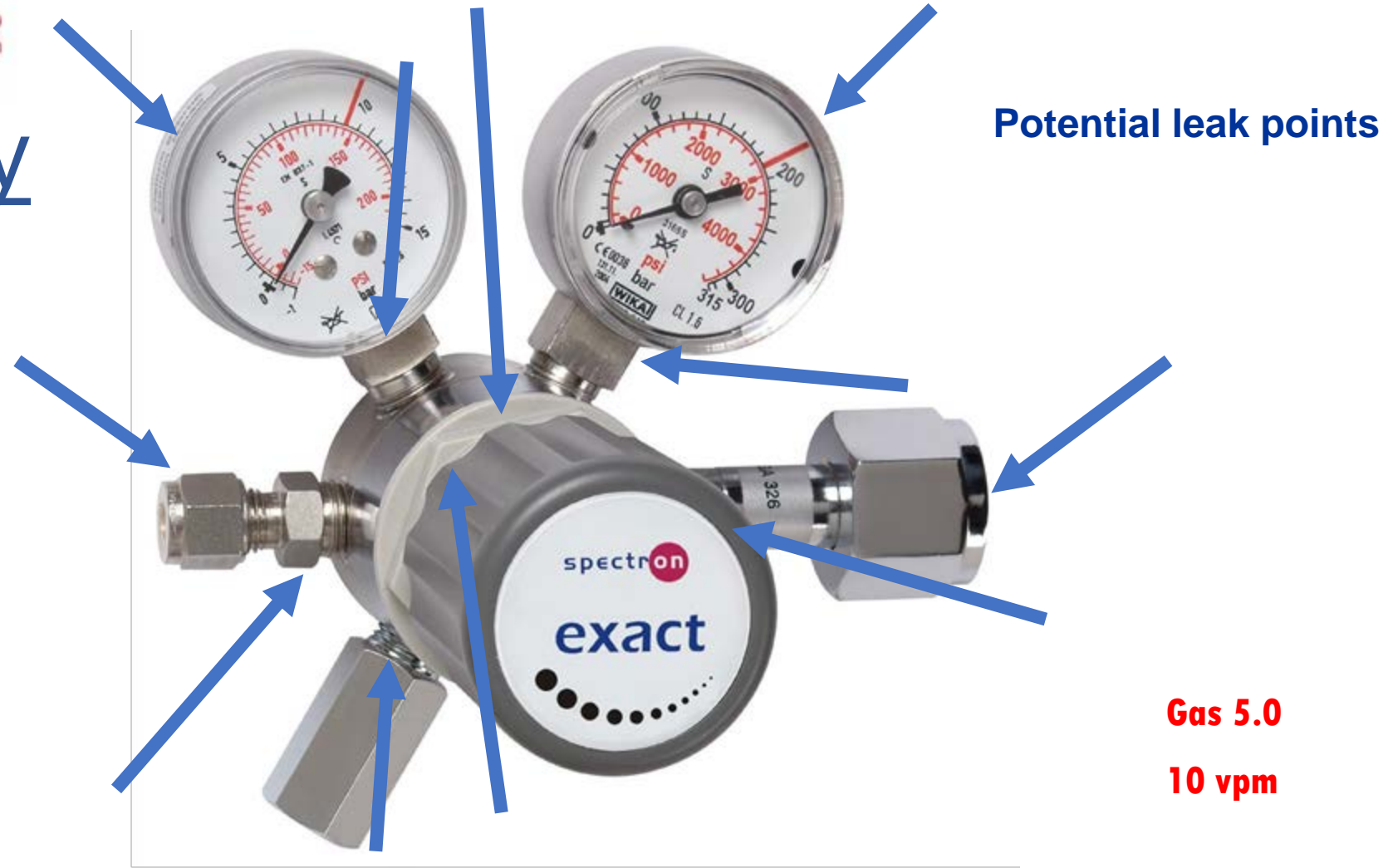
Gas Purity

Potential leak points

Gas 5.0

10 vpm

Pressure Regulator Function

Pressure Regulator Function

Inlet pressure P_1

Nozzle

Outlet pressure P2

Pressure Regulator Function

Loading mechanism

Sensing element

Control element

Main Components

Loading mechanism

Sensing element

Control element

P_2

P_1
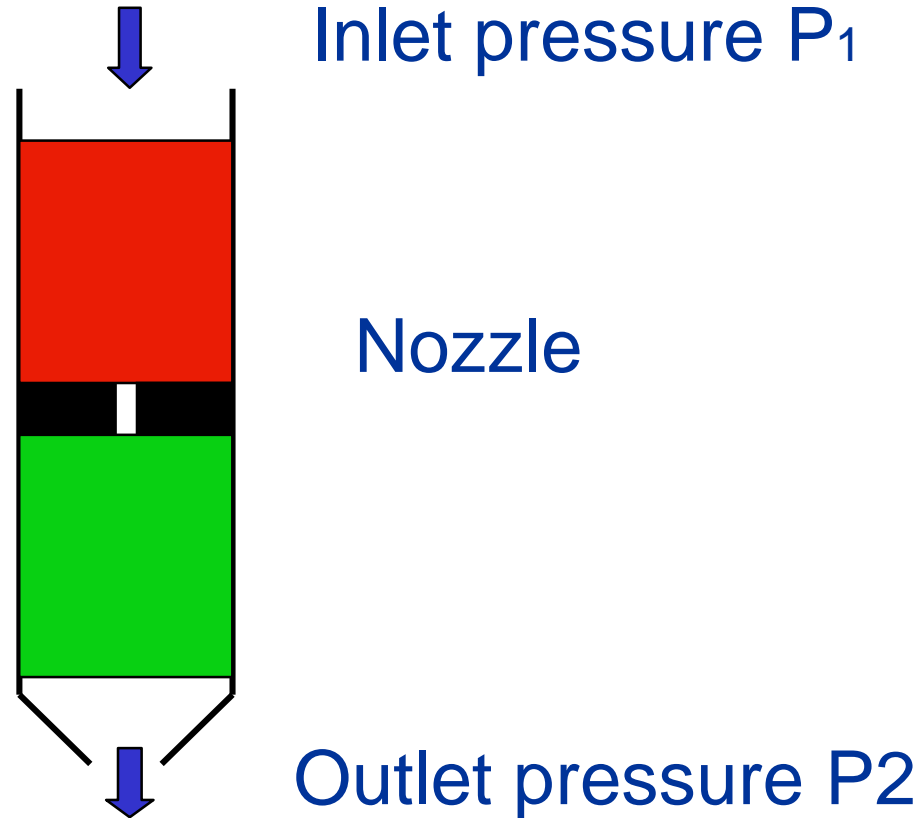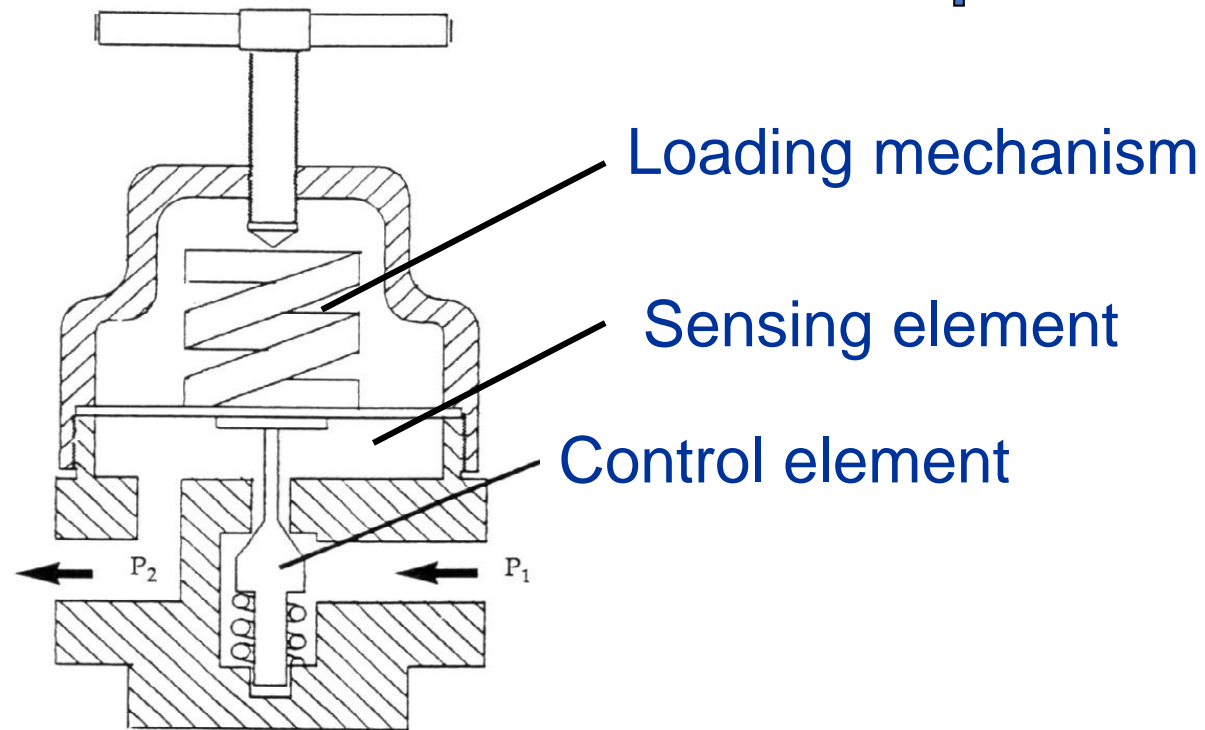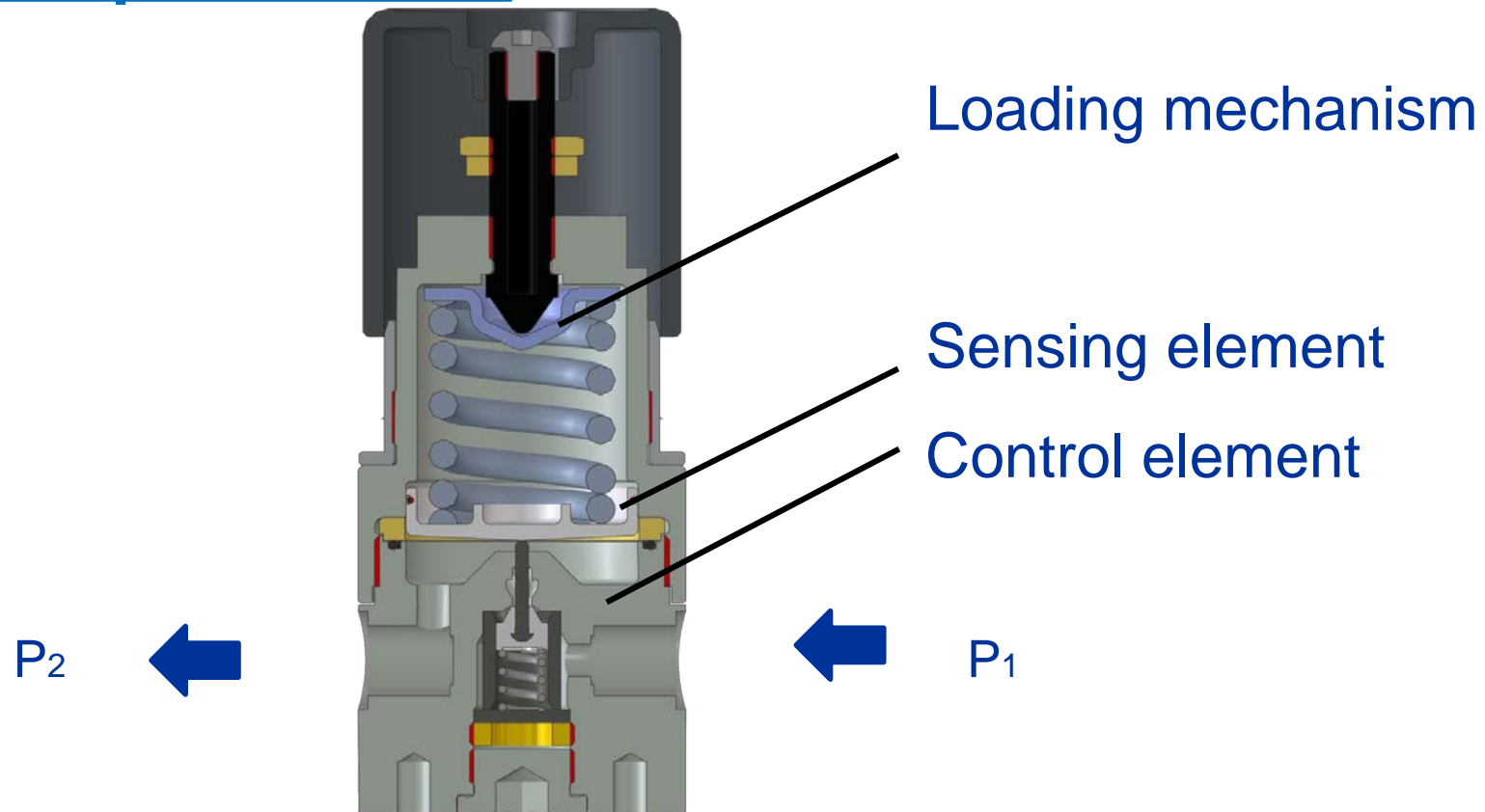
Loading Mechanism
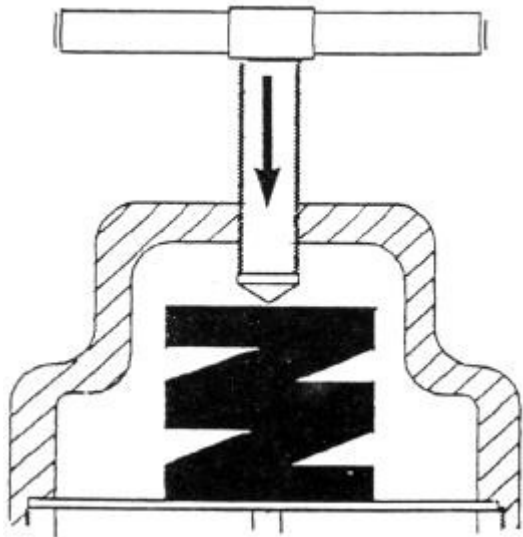
Spring loaded
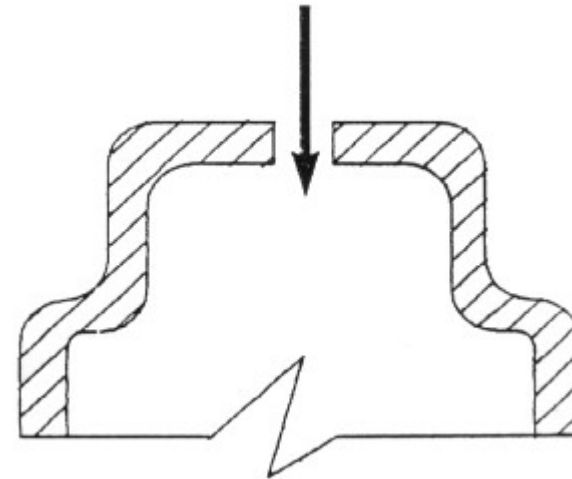
Dome loaded
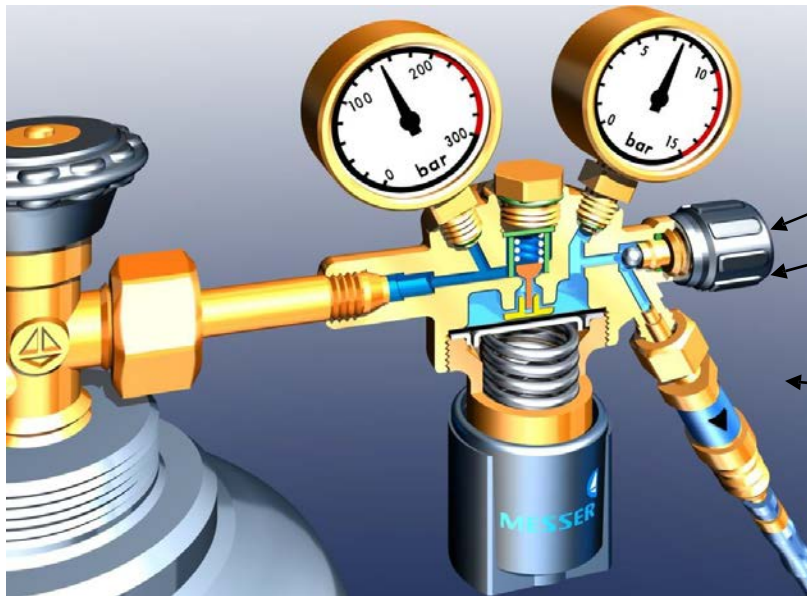
Sensing Elements
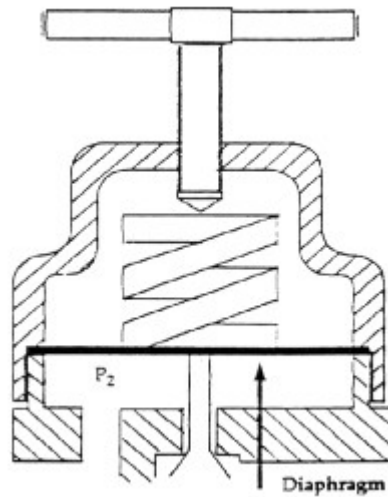
Diaphragm
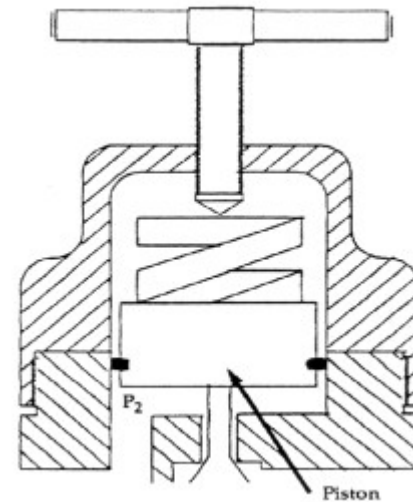
Piston

Single-Stage Pressure Regulator

Valve spring

Valve cone

Diaphragm

Load spring

Adjusting knob

Rising outlet pressure with falling inlet pressure!!!

2-Stage Pressure Regulator

Valve spring
Valve cone
Diaphragm
Load spring
Adjusting knob

Piston

Compensated Main Valve
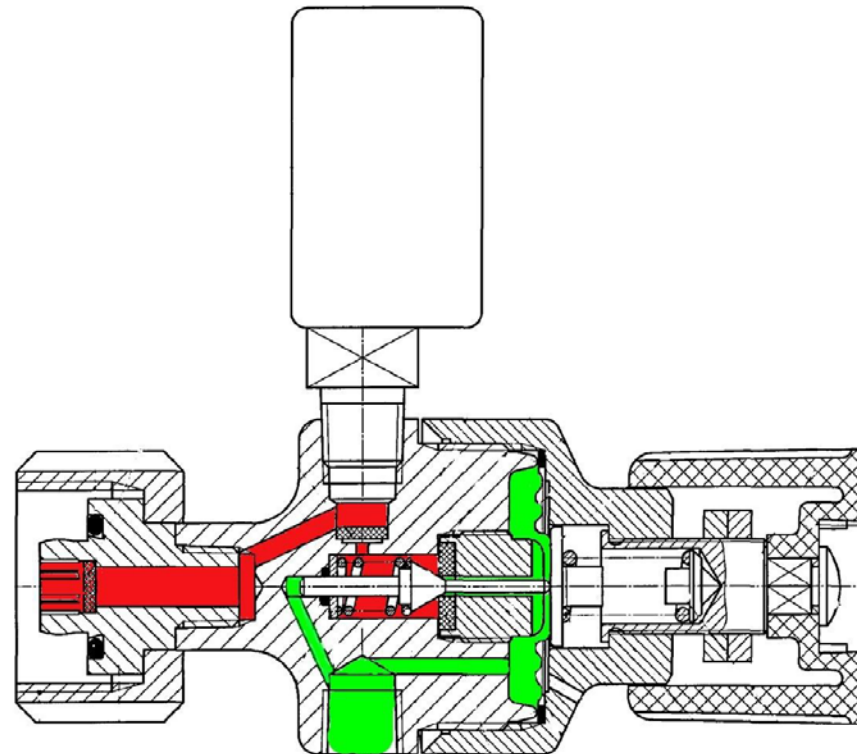
Single-Stage vs Double Stage Pressure Regulator

Single-stage

Double-stage

200 bar	100 bar	20 bar
Full	Half full	Empty
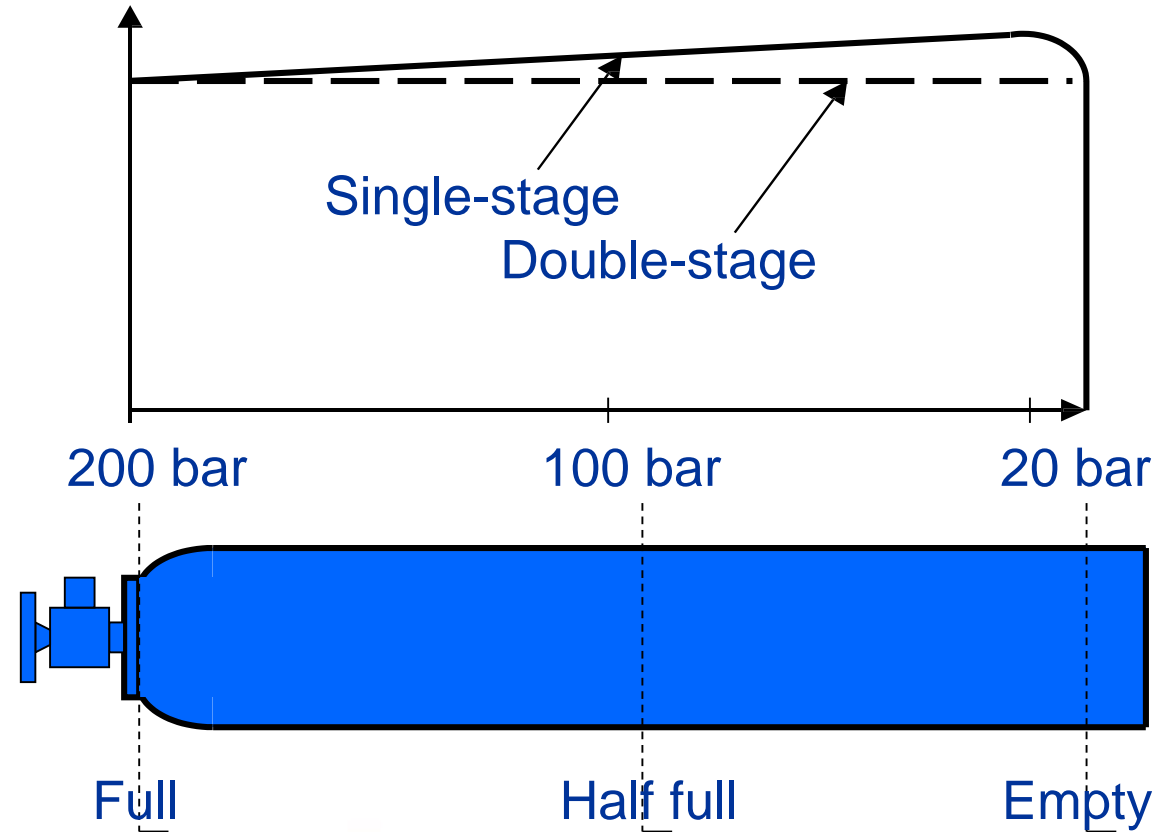
Selection of Pressure Regulators

Needed Information

- Type of gas
- Quality of gas
- Maximum + minimum inlet pressure P_1
- Maximum + minimum outlet pressure P_2
- Maximum flow