

PROCESS GAS SUPPLY SYSTEMS: DESIGN • ENGINEERING • PRODUCTION • INSTALLATION • CERTIFICATION

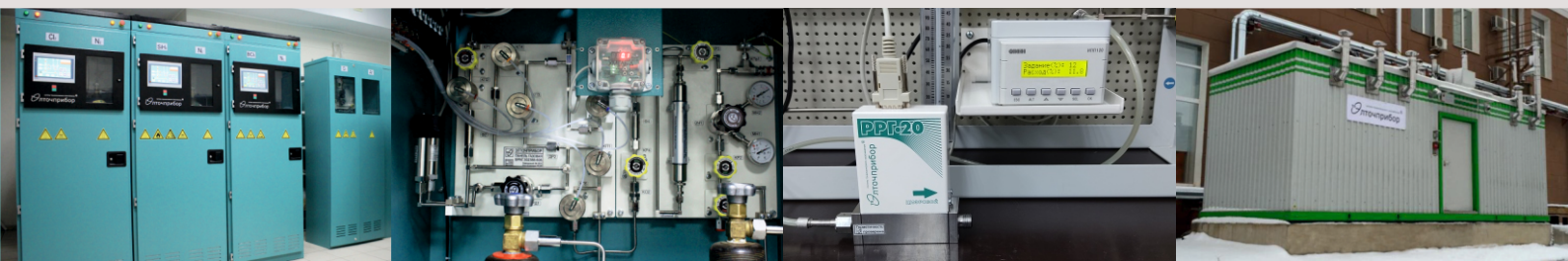
Catalog 2021.03K

PROCESS GAS SUPPLY SYSTEMS

FOR INDUSTRIAL
UHP & HP APPLICATIONS

- *Complete solutions: from engineering to commissioning*
- *Gas equipment*
- *Devices and control valves*

PURE GASES • CLEAN TUBES • QUALITY COMPONENTS • TECHNICAL INSPECTION



Catalogue 2021. PROCESS GAS SUPPLY SYSTEMS

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ABOUT US



ELTOCHPRIBOR – is the expert in the field of technological gas supply.

The company was founded in 2000. Initially, it was engaged in the production of mass flow controllers for high purity and ultra high purity gases.

Now Eltochpribor develops gas equipment and valves, which are used in gas supply systems of microelectronic enterprises and research centers in Russia and neighboring countries. The company performs a complex of works on the creation of technological gas supply systems.

SERVICES

- Engineering
- Design
- Manufacturing
- Installation
- Certification
- Service and repair



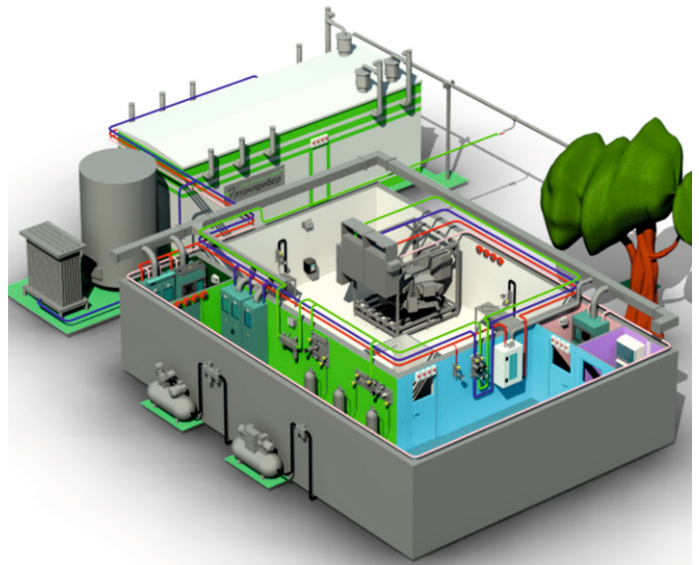
ОБОРУДОВАНИЕ

- Gas cabinets SHGB
- Gas cabinet stations SGB
- Gas ramps
- Gas scrubbers
- Valve manifold panels (VMP) and boxes (VMB)
- Mass flow controllers MFC
- Readout and power supply units
- Gas mixing controllers KGS
- Gas pressure regulators RDM
- Diaphragm valves
- Pneumatically actuated valves
- Fittings

PROCESS GAS SUPPLY SYSTEMS

DESIGN

- Engineering solutions for process gas supply
- Optimal configurations of equipment and pipelines
- Minimization of operating and repair costs
- Experienced team of engineers and constructors
- Design, as-built documentation and CAD-drawings in accordance with GOST, SEMI
- Field supervision
- Support in expert bodies
- SRO license



MOUNTING

- Professional field engineering
- Process equipment hook-up
- Modern technologies and tools:
 - ↳ orbital welding
 - ↳ helium leak detection
- Compliance with the work schedule
- Step-by-step control
- 100% NDE weld
- Functional testing

CERTIFICATION

- Company standart STO 72803006.1-2013
- Visual examination
- Technical inspection
 - ↳ concentration and size of pollution particles
 - ↳ water content
 - ↳ oxygen content
 - ↳ total hydrocarbons
 - ↳ leakage detection using vacuum method
 - ↳ leakage detection using probe
 - ↳ non-destructive testing
 - ↳ strength test
- Registration of protocols based on the results of certification



GAS CABINETS



GAS CABINETS SHGB are intended for placement of gas cylinders and preparation of gases for supply to technological equipment or mains.

COMPOSITION

- Gas cabinet for one cylinder with panel purging from an external source of inert gas
- Gas cabinet for two cylinders:
 - 2 process gas cylinders
 - 1 process gas cylinders, 1 purge gas cylinder

GAS PANELS

- For neutral gases
- For corrosive and ultra high purity gases with cycle purging
- For toxic and hazardous gases: with automatic cutoff
- For saturated vapors: with heating
- With automatic change of cylinders

OPTIONS

- Purging and evacuating the gas panel in manual or automatic modes
- Fully automatic control system with touchscreen display
- Automatic changeover of gas cylinders (up to 5 cylinders in each branch)
- Cylinder weight indication
- Gas system heating
- Leak detection
- Gas supply emergency shutdown system
- Grounding

GAS CABINETS

SHGB-2A

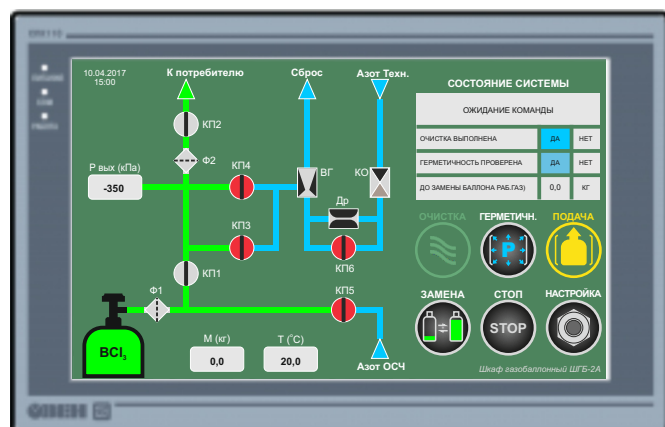
FULLY AUTOMATIC 2 CYLINDER, 1 CHANNEL GAS CABINET

Application

- For hazardous, toxic and ultra high purity gases

Specification

- **1 gas supply channel**
- **2 cylinders:**
 - 1 process gas cylinder, 1 purge gas cylinder
- Fully automatic control system with touchscreen display:
 - cycle purging
 - programable cylinder pressure or weight for automatic changeover
 - shutdown of gas supply in emergency situations
- Max. flow rate **1800 l/h**
- Leak integrity **$1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$**
- Dimensions **810x610x2190 mm**
- Weight **160 kg**

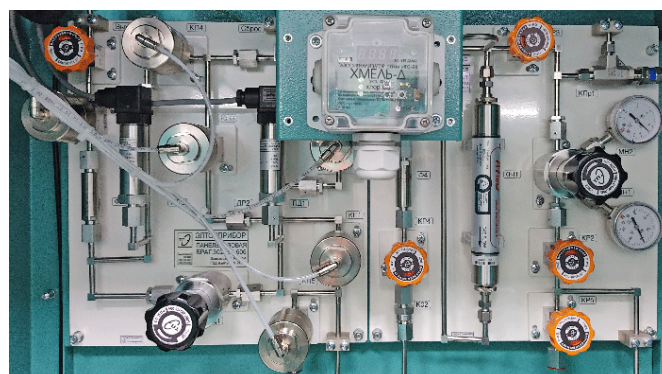


CONTROL PANEL WITH THE TOUCH SCREEN DISPLAY

- Opening and closing of valves
- Purging the gas system of the cabinet
- Leakage test
- Gas supply / stop
- System parameter setting:
 - inlet/outlet pressure
 - residual cylinder pressure
 - residual cylinder weight

GAS PANELS

- High purity stainless steel 316L
- Inlet surface: electropolished up to Ra 0.25 μm
- Every valve and connection is tested with 100% helium
- Compact internal vacuum generator
- Quality fittings
- Orbital welding
- Helium leak detection



GAS CABINETS

SHGB-1A

FULLY AUTOMATIC 1 CYLINDER, 1 CHANNEL GAS CABINET

**Application**

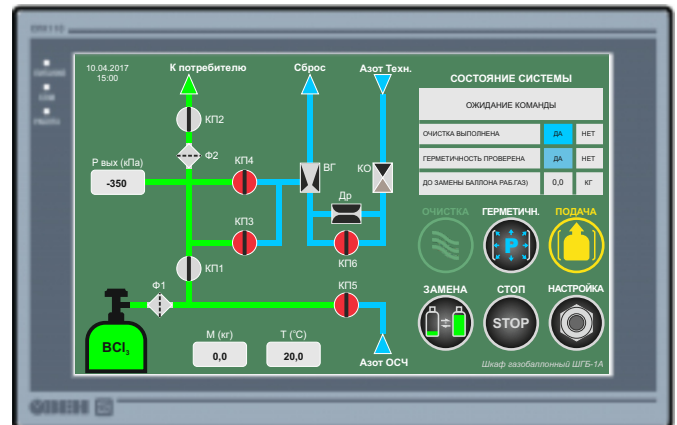
- For hazardous, toxic and ultra high purity gases

Specification

- **1 gas supply channel**
- **1 process gas cylinder**
 - Purging from an external inert gas source
- Fully automatic control system with touchscreen display:
 - cycle purging
 - programable cylinder pressure or weight for changeover
 - shutdown of gas supply in emergency situations
- Gas pressure reduction
- Max. flow rate **1800 l/h**
- Leak integrity **$1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$**
- Dimensions **454x687x2060 mm**
- Weight **120 kg**

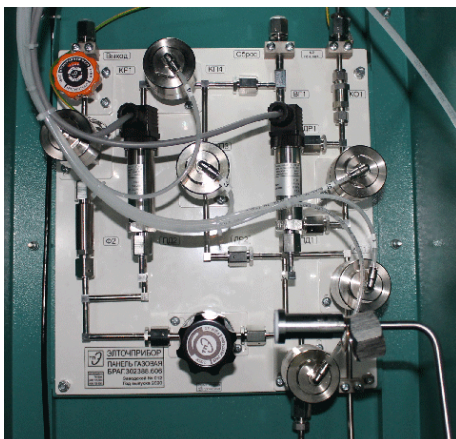
CONTROL PANEL WITH THE TOUCHSCREEN DISPLAY

- Gas supply to equipment
- Automatic purging of the gas system
- Leakage test
- Gas supply on/ off
- System parameter setting:
 - inlet/outlet pressure
 - residual cylinder pressure and residual cylinder weight
 - emergency stop pressure



GAS PANEL

- High purity stainless steel 316L
- Inlet surface: electropolished up to $Ra\ 0.25\ \mu\text{m}$
- Air actuated diaphragm valves
- Micron in-line filter
- Pressure transducers
- Quality fittings
- Orbital welding
- Helium leak detection



GAS CABINETS

SHGB-2P

2 CYLINDER, 1 CHANNEL GAS CABINET WITH AUTOMATIC CHANGEOVER

**Application**

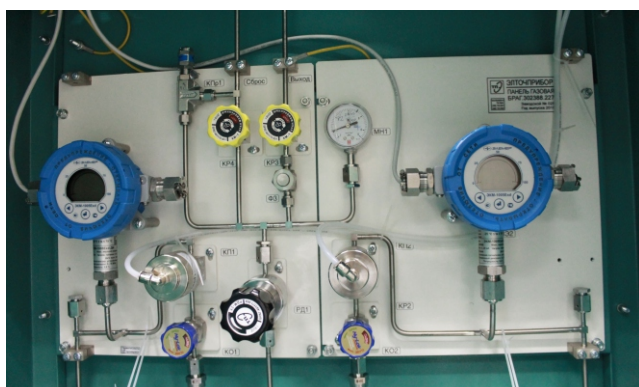
- For inert and neutral gases

Specification

- **1 gas supply channel**
- **2 process gas cylinders**
- Extending the line up to **10 cylinders**
- Feed control and stopping of gas supply in manual mode
- Gas pressure reduction
- Continuous gas supply to the pipeline
- Max. flow rate **1800 l/h**
- Leak integrity **$1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$**
- Dimensions **808x469x2168 mm**
- Weight **125 kg**

CONTROL UNIT

- Gas supply on/off
- System status indication:
 - On
 - Change the cylinder

**GAS PANEL**

- High purity stainless steel 316L
- Inlet surface: electropolished up to Ra 0.25 μm
- Air actuated diaphragm valves
- Micron in-line filter
- Electronic pressure gauges
- Quality fittings
- Orbital welding
- Helium leak detection

GAS CABINETS

SHGB-2AP

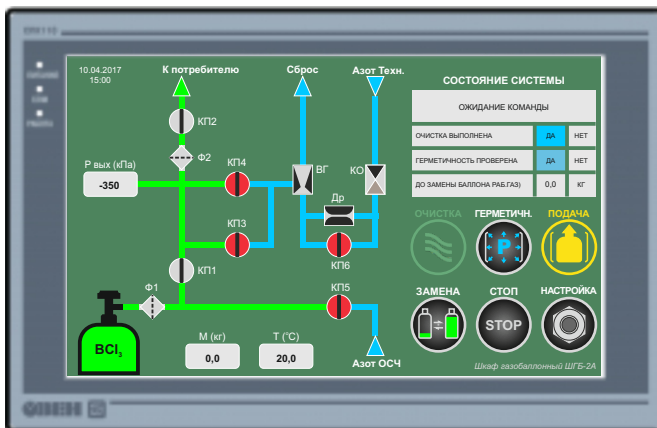
2 CYLINDER CABINET WITH FULLY AUTOMATIC CHANGEOVER

Application

- For hazardous, toxic and ultra high purity gases

Specification

- **1 gas supply channel**
- **2 process gas cylinders**
- Purging from an external inert gas source
- Fully automatic control system with touchscreen display:
 - cycle purging
 - cylinder changeover
 - shutdown gas supply in emergency situations
- Continuous gas supply to the pipeline
- Max. flow rate **1800 l/h**
- Leak integrity **$1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$**
- Dimensions **804x621x2013 mm**
- Weight **125 kg**



CONTROL PANEL WITH THE TOUCHSCREEN DISPLAY

- Opening and closing of valves
- Purging the gas system of the cabinet
- Leakage test
- Gas supply on/ off
- System parameter setting:
 - inlet/outlet pressure
 - residual cylinder pressure
 - residual cylinder weight

GAS PANELS

- High purity stainless steel 316L
- Inlet surface: electropolished up to $Ra\ 0.25\ \mu\text{m}$
- Every valve and connection is tested with 100% helium
- Pressure transducers
- Compact internal vacuum generators
- Quality fittings
- Orbital welding
- Helium leak detection



GAS CABINETS

SHGB-2

2 CYLINDER, 1 OR 2 CHANNELS CABINET WITH MANUAL CONTROL

Application

- For inert and neutral gases

Specification

- **1 or 2 channels** for gas supply
- **2 gas cylinders:**
 - ↳ 2 process gas cylinders
 - ↳ 1 process gas cylinder, 1 purge gas cylinder
- Manual control:
 - ↳ purging and evacuation of gas panels
 - ↳ gas supply on/ off
- Automatic cutoff unit
- Max. flow rate **1800 l/h**
- Leak integrity **$1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$**
- Dimensions **800x450x2166 mm**
- Weight **120 kg**

**CUTOFF UNIT**

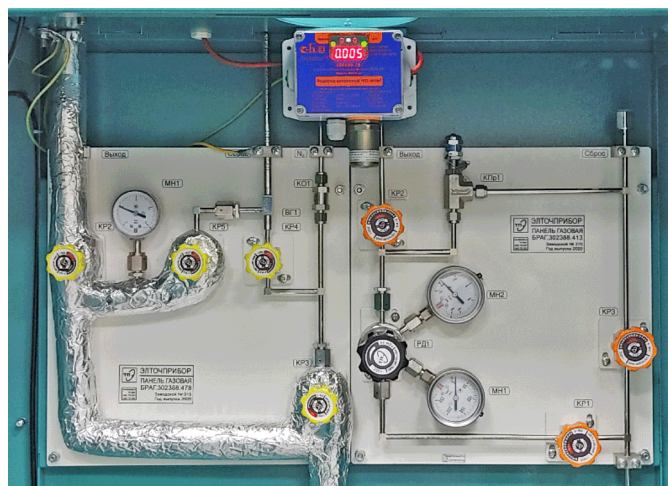
- System status indication:
 - ↳ On
 - ↳ Alarm
- Gas supply on/off

LEAK DETECTION

- Gas analyzers for monitoring gas concentration in the environment
- Alarm signaling when MAC is exceeded

HEATING OF THE GAS SYSTEM

- Heating of pipelines up to **35-40 °C**
- Prevention of gas condensation
- Is used for: BCl_3 , SiH_2Cl_2 and other gases that are condensable in normal conditions



GAS CABINETS

SHGB-1

1 CYLINDER, 1 CHANNEL CABINET WITH MANUAL CONTROL



Application

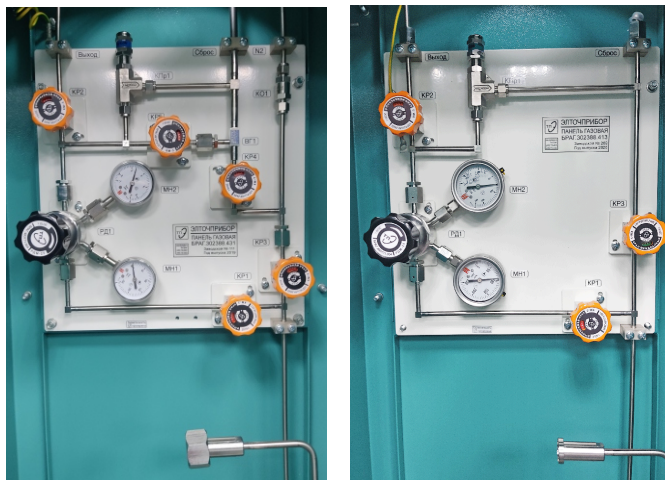
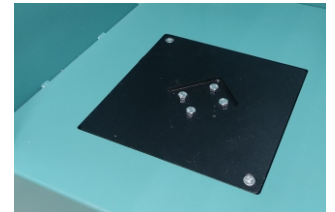
- For inert and neutral gases

Specification

- 1 gas supply channel
- 1 process gas cylinder:
 - Purging from an external inert gas source
 - Feed control and stopping of gas supply in manual mode
 - Manual purge control
 - Gas pressure reduction
 - Max. flow rate **1800 l/h**
 - Leak integrity $1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$
 - Dimensions **454x451x2166 mm**
 - Weight **80 kg**

WEIGHT SENSOR

- Weighing platform at the bottom
- Continuous cylinder weighing
- Electronic cylinder weight indicator
- Reset readings after changing the cylinder



GAS PANELS

- With purge and evacuation function for hazardous gases (pictured on the left)
- For inert and neutral gases (pictured on the right)
- Filter element in cylinder fitting
- Tested valves
- Quality fittings
- Orbital welding
- Helium leak detection

GAS CYLINDER STATION

SGB
 GAS CYLINDER STATION


It is used for outdoor accommodation of gas cabinets. The station is manufactured on the basis of a container unit according to dimensions and technical requirements of a customer.

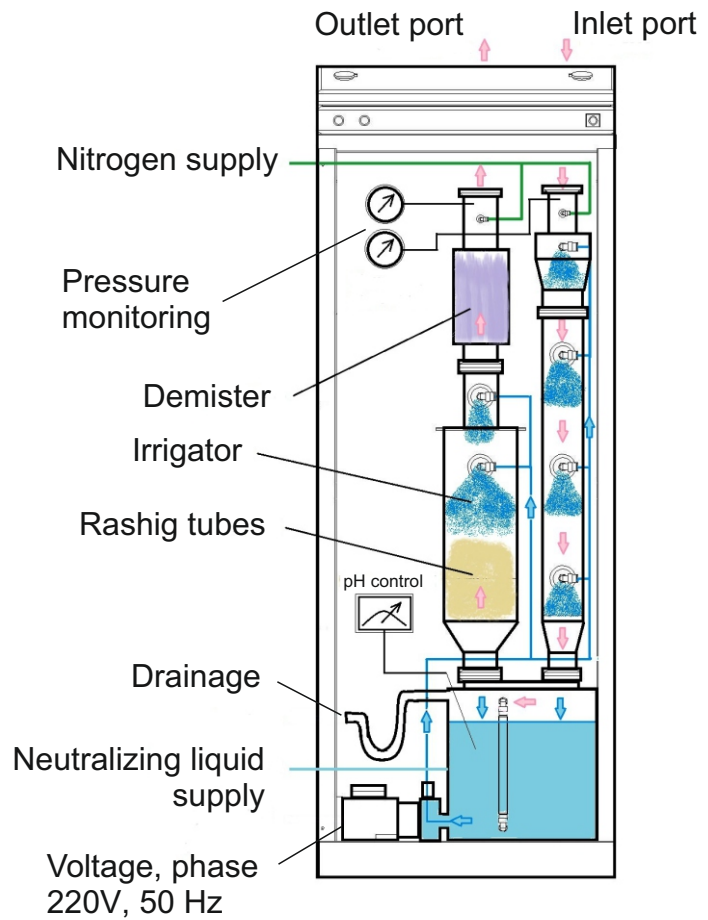
BASIC SYSTEMS

- gas delivery system
- hazardous gas leak detection system
- alarm system
- exhaust gas cleaning system
- automatic cut-off units
- ventilation system
- heating system
- air conditioning
- electricity system
- sprinkler system
- access control
- grounding
- automated control and dispatching



GAS SCRUBBER

SGJ WET SCRUBBER



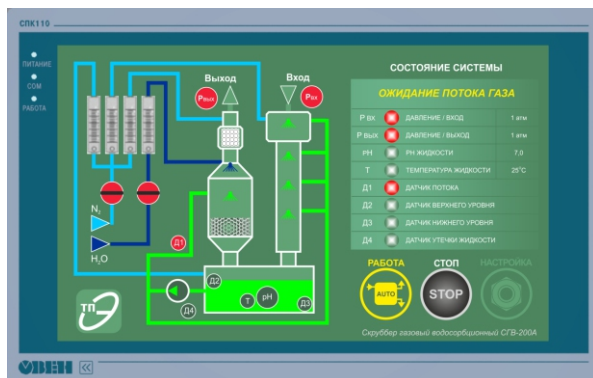
It is used for cleaning exhaust gases after technological processes. It is based on the principle of trapping water-soluble gases with an absorber and neutralizing the liquid with an alkaline solution.

Functions

- pH level control
- Gas neutralization with water in case of failure of the circulation pump
- Monitoring the level of neutralizing liquid
- Alarm system

Specification

- Capacity 200 l/h
- Inlet pressure of purified gases - 500 Pa
- Fully automatic control panel with touchscreen display
- Reducing operate costs
- Does not require special ventilation and sewerage
- Gas inlet - NW 40, 2 channels
- Gas outlet - NW 50, 1 channel
- Power - 1,5 kW
- Dimensions 820x600x1900 mm
- Weight 200 kg



GAS DISTRIBUTION PANELS

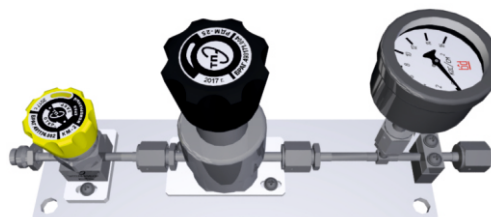
PG (VMP)

VALVE MANIFOLD PANELS

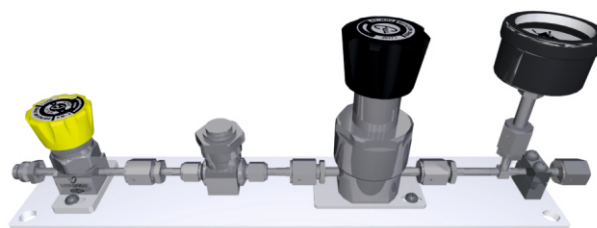
Multichannel gas distribution panels are formed from base panels that differ from each other in composition and application.

BASE PANEL № 1

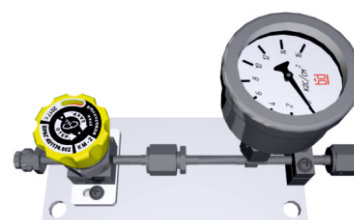
- Panel type: shutoff-reducing
- Panel composition:
 - ↘ diaphragm valve
 - ↘ pressure regulator
 - ↘ axial pressure gauge
 - ↘ fixtures

**BASE PANEL № 2**

- Panel type: shutoff-reducing
- Panel composition:
 - ↘ diaphragm valve
 - ↘ filter
 - ↘ pressure regulator
 - ↘ axial pressure gauge
 - ↘ fixtures

**BASE PANEL № 3**

- Panel type: shutoff
- Состав панели:
 - ↘ diaphragm valve
 - ↘ axial pressure gauge
 - ↘ fixtures



GAS DISTRIBUTION BOXES

BG (VMB)

VALVE MANIFOLD BOX

It is a steel cabinet with gas panels.

On the front side there is a door with an observation window.

Equipped with a branch pipe for connection to ventilation and a gas leak detector.
Protection degree IP20 according to GOST14254-2015 (IEC 60529: 2013)

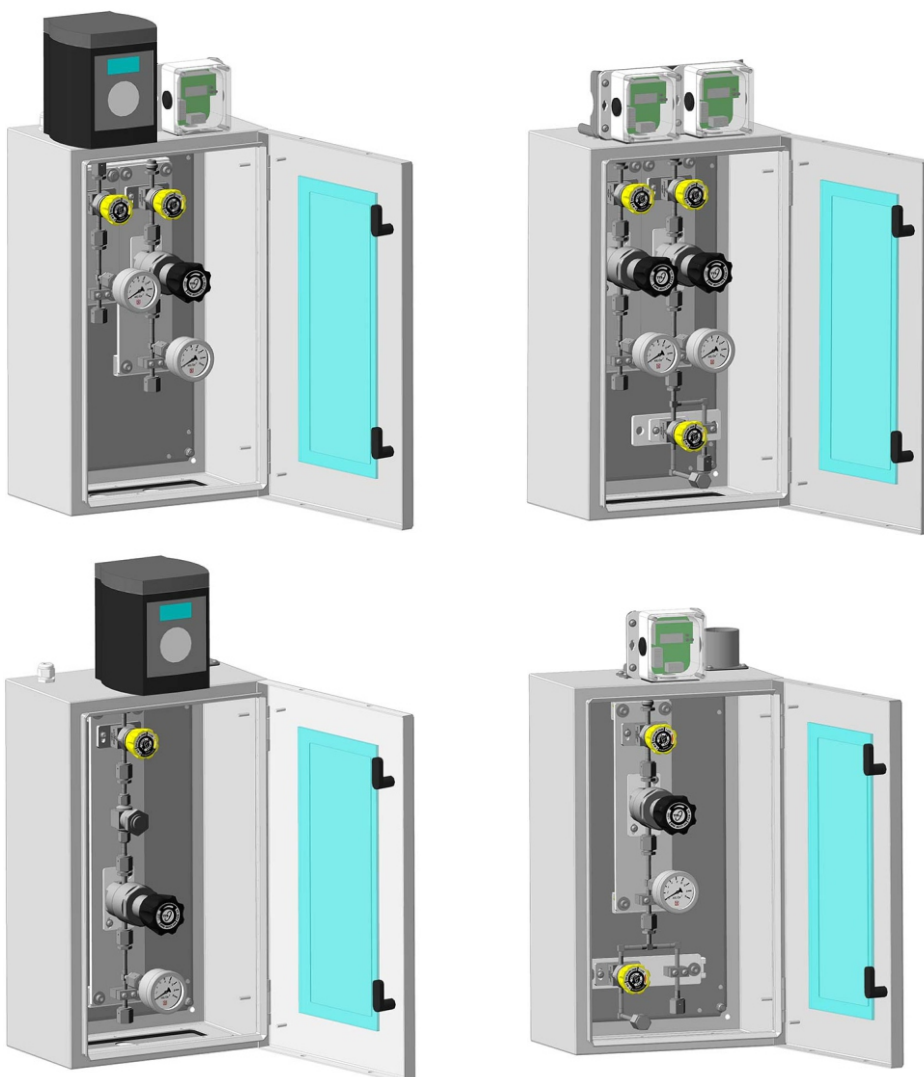
Functions

- Gas supply to one or several consumers
- System purging
- Safety provision

Application

- For toxic, corrosive, explosive and flammable gases
- For coaxial pipelines

EXAMPLES OF GAS BOXES



GAS MIXING CONTROLLER

KGS-3

GAS MIXING CONTROLLER

**Functions**

- Creation of gas mixtures
- Gas mixture supply to equipment
- Maintaining the concentration of the mixture

The controller operates of three digital controllers MFC-12 or MFC-20, using which a mixture is created.

Specification

- Up to 3 channels
- Concentration range of gas mixture components: 0,2 - 100%
- Ready mix flow: up to 1800 l/h
- Control touchpad
- Digital interface: RS-485, MODBUS RTU
- Inputs:
 - 2 analog 0-10 V
 - 8 digital
- Outputs:
 - 6 channels 24 V / 0,4A for switching of electric valves
 - 3 channels 15 V for MFC power supply



MODIFICATIONS

KGS-3.2

- Operation modes:
 - Manual - independent control of MFC
 - Auto - automatic maintenance of the specified concentration of mixtures
- Dimensions 188x300x250 mm, 6 kg

KGS-3.D

- Operation modes:
 - Manual
 - Auto
 - Auto PC - computer control
 - Auto plus - maintaining the pressure in the working chamber according to the signal from the pressure sensor
- Dimensions 480x440x250 mm, 12 kg



MASS FLOW CONTROLLERS

MFC-20

DIGITAL MASS FLOW CONTROLLER



Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Specification

- DN 4 mm
- Flow rates, Qul, l/h:
 ↘ 0.36 ↘ 0.9 ↘ 3.6 ↘ 9 ↘ 18 ↘ 36 ↘ 90 ↘ 180 ↘ 360 ↘ 720 ↘ 900 ↘ 1800
- Pressure rating 0.3 - 3 bar
- Basic accuracy 1 % Qul
- Individual thermal correction
- Software adjustable step response time
- Absence of transient overshoot
- Digital interface **RS 485, Modbus RTU**
- Voltage **15 ±3% V**
- Leak integrity **1x10⁻⁹ m³*Pa/s**
- Dimensions **124x32x126 mm**
- Weight **1 kg**

Control

- Digital
 - ↘ PC (Software supplied with the controller)
 - ↘ BUIP-C

MASS FLOW CONTROLLERS

MFC-12

DIGITAL /ANALOG MASS FLOW CONTROLLER

**Application**

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Specification

- **DN 4 mm**
- Flow rates, Qul, l/h:
 - ↘ **0.36** ↘ **0.9** ↘ **3.6** ↘ **9** ↘ **18** ↘ **36** ↘ **90** ↘ **180** ↘ **360** ↘ **720** ↘ **900** ↘ **1800**
- Pressure rating **0.3 - 3 bar**
- Basic accuracy **1.2 % Qul**
- Analog input/ output signals **0...5/ 0... 10 V**
- Digital interface **RS 485, RS 232, Modbus RTU** and **Eltochpribor 10M** protocols.
- Voltage **15 ±3% V**
- Leak integrity **1x10⁻⁹ m³*Pa/s**
- Dimensions **124x32x126 mm**
- Weight **1 kg**

Control

- Digital
 - ↘ PC (Software supplied with the controller)
 - ↘ BUIP-C
 - ↘ RRG-K
- Analog
 - ↘ BUIP-1M
 - ↘ BUIP-3

MASS FLOW CONTROLLERS

MFC-15

DIGITAL/ANALOG MASS FLOW CONTROLLER AND PRESSURE REGULATOR



Functions

- Maintaining a constant gas flow
- Maintaining constant pressure at the inlet (upstream) by exhausting excess gas

Specification

- DN 4 mm
- Flow rates, Q_{ul}, l/h: ↘ 36 ↘ 360 ↘ 900
- Pressure rating 0.3 - 7 bar
- Basic accuracy of flow control 1.2 % Q_{ul}
- Basic accuracy of pressure control 2.5 % P_{ul}
- Analog input/ output signals 0...5/ 0...10 V
- Digital interface RS 485, RS 232, Modbus RTU and Eltochpribor 10M protocols.
- Voltage 15 ±3% V
- Leak integrity 1x10⁻⁹ m³*Pa/s
- Dimensions 161x32x126 mm
- Weight 1.3 kg

Control

- Digital
 - ↘ PC (Software supplied with the controller)
 - ↘ BUIP-C
 - ↘ RRG-K
- Analog
 - ↘ BUIP-1M
 - ↘ BUIP-3

MASS FLOW CONTROLLERS

MFC-10

ANALOG MASS FLOW CONTROLLER

**Application**

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Характеристики

- DN 4 mm
- Flow rates, Qul, l/h:
 - ↘ 0.36 ↘ 0.9 ↘ 3.6 ↘ 9 ↘ 18 ↘ 36 ↘ 90
 - ↘ 180 ↘ 360 ↘ 720 ↘ 900 ↘ 1800
- Pressure rating 0.3 - 3 bar
- Basic accuracy 1.5 % Qul

Control

- Analog
 - ↘ BUIP-1M
 - ↘ BUIP-3

- Analog input/ output signals 0...5/ 0...10 V
- Adjustment range 2-100 %
- Fast response < 2 s
- Protection degree IP 40
- Voltage 15 ±3% V
- Leak integrity $1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$
- Dimensions 124x32x126 mm
- Weight 1 kg

Ordering information

MFC-10 - **36** - **5** - **TM.4 - TM.4** - **N₂**

MFC-10 - model of MFC

36 - max.flow rate, Qul, l/h

5 - analog output signal: 5 or 10 V

TM.4 - TM.4 - inlet/ outlet connection

N₂ - gas type

* Types of connections are presented in the Fittings section, pages 35 -36

READOUT AND OPERATOR MODULS

RRG-K

MFC OPERATOR MODULE

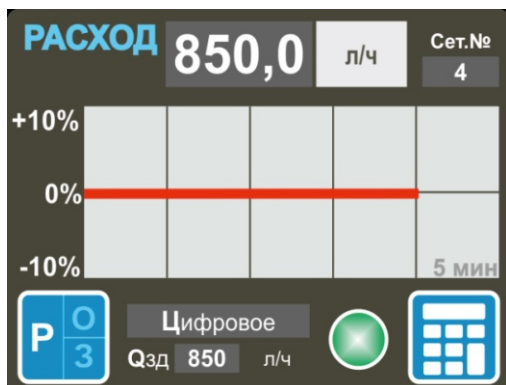


Application

- Controlling the operation of single mass flow controller in digital mode
- Compatible with regulators **MFC-12**, **MFC-15**

Functions

- Setting the preset value of flow rate
- Valve forced open/ close
- Flow rate unit select:
 - l/h, l/min, ml/min, SCCM, %
- Graph of the difference between the flow rate and the setpoint
- Power supply of MFC



Technical data

- 2,8" touch screen display
- mini-USB connector
- Digital interface **RS 232**, UART
- Protection degree **IP 20**
- Power consumption **6 W**
- Voltage, phase **220 V**, **50 Hz**
- Dimensions **66x90x20 mm**
- Weight **0,15 kg**

READOUT AND OPERATOR MODULS

BUIP-C

CONTROL, INDICATION AND POWER SUPPLY UNIT FOR MFC

**Application**

- Controlling the operation of 3 mass flow controllers in digital mode
- Compatible with regulators **MFC-20, MFC-12, MFC-15**

Functions

- Setting the preset value of flow rate
- Valve forced open/ close
- Flow rate unit select:
 - ↳ l/h, l/min, ml/min, SCCM, %
- Power supply of MFC

Technical data

- Protection degree **IP 40**
- Voltage, phase **220 V, 50 Hz**
- Power consumption **20 W**
- Dimensions **85x115x113 mm**
- Weight **0,5 kg**

**Peculiarities**

- Setting the reference and indication of flow rate in relative and absolute units of measurement at the user's choice
- Control of transient process of MFC-20
- **30** types of gases and conversion factors in the memory of the unit
- **18** flow ranges in the memory
- Simultaneous control of up to three MFC via the **RS485** (Modbus RTU) interface
- Ability to connect an external PC
- Saving settings after power off

READOUT AND OPERATOR MODULS

BUIP-1M

SINGLE-CHANNEL CONTROL, INDICATION AND POWER SUPPLY UNIT FOR MFC



Functions

- Controlling the operation of 1 mass flow controller in digital mode
- Setting the preset value of flow rate
- Valve forced open/ close
- Flow rate unit select:
 - ↳ V
 - ↳ l/h
 - ↳ ml/min
- Power supply of **MFC-10, MFC-12, MFC-15**

Technical data

- Monochrome **OLED** display
- **1 DB-9F channel** for connecting the MFC
- Regulator stabilized supply voltage **15 ±3% V**
- Protection degree **IP 40**
- Voltage, phase **220 V, 50 Hz**
- Dimensions **200x160x58 mm**
- Weight **0,5 kg**



Peculiarities

- Setting the reference and indication of flow rate in various units of measurement at the user's choice
- **13** flow ranges in the memory
- Ability to connect an external PC
- Saving settings after power off

READOUT AND OPERATOR MODULS

BUIP-3

THREE-CHANNEL CONTROL, INDICATION AND POWER SUPPLY UNIT FOR MFC

**Functions**

- Controlling the operation of 3 mass flow controllers in digital mode
- Setting the preset value of flow rate
- Valve forced open/ close
- Indication of flow rate:
 - ↳ V
- Power supply of **MFC-10, MFC-12, MFC-15**

Technical data

- Monochrome **7-segment LED** display
- **3 DB-9F channels** for connecting the MFC
- Regulator stabilized supply voltage **15 ±3% V**
- Protection degree **IP 40**
- Voltage, phase **220 V, 50 Hz**
- Dimensions **200x160x58 mm**
- Weight **0,5 kg**

Peculiarities

- Setting the reference and indication of flow rate in volts
- **13** flow ranges in the memory
- Ability to connect an external PC
- Saving settings after power off



GAS PRESSURE REGULATORS

RDM-25

DIAPHRAGM PRESSURE REGULATOR



Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Модели

- RDM-25L:
 - ↳ inlet pressure **10 - 40** bar
 - ↳ outlet pressure **0.2 - 10** bar
- RDM-25S:
 - ↳ inlet pressure **10 - 160** bar
 - ↳ outlet pressure **2 - 10** bar



FACE SEAL FITTINGS



CYLINDER CONNECTION

Specification

- DN **4** mm
- Max. flow rate **1800** l/h
- Leak integrity **1×10^{-9}** m³*Pa/s
- Leakage across seat **1×10^{-6}** m³*Pa/s
- Temperature range is from **10 to 50** °C
- Diaphragm - SS 316L
- Seat - PTFE
- Dimensions without fittings **132x56x46** mm
- Weight without pressure gauges **1** kg

GAS PRESSURE REGULATORS

RDM-32

DIAPHRAGM PRESSURE REGULATOR



Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Specification

- DN 10 mm
- Inlet pressure 10 - 16 bar
- Outlet pressure 0.2 - 8 bar
- Max. flow rate 20 000 l/h
- Leak integrity 1×10^{-9} m³Pa/s
- Leakage across seat 1×10^{-6} m³Pa/s
- Temperature range is from 10 to 50 °C
- Diaphragm - SS 316L
- Seat - PTFE
- Dimensions without fittings 110,5x54x44 mm
- Weight without pressure gauges 2 kg



GAS PRESSURE REGULATORS

RDM-24

DIAPHRAGM PRESSURE REGULATOR



Application

- For high purity and ultra high purity gases
- For inert and slightly corrosive gases

Specification

- DN 4 mm
- Inlet pressure 3 - 6 bar
- Outlet pressure 0.2 - 2 bar
- Max. flow rate 1800 l/h
- Leak integrity $1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$
- Leakage across seat $1 \times 10^{-6} \text{ m}^3 \cdot \text{Pa/s}$
- Temperature range is from 10 to 50 °C
- Diaphragm - FPM / EPDM
- Seat - FPM / EPDM
- Dimensions without fittings 110,5x54x44 mm
- Weight without pressure gauges 0,8 kg



GAS PRESSURE REGULATORS

RDM-23

DIAPHRAGM PRESSURE REGULATOR WITH RELIEF VALVE

**Application**

- For high purity and ultra high purity gases
- For inert and slightly corrosive gases

Specification

- **DN 4 mm**
- Inlet pressure **10 - 160 bar**
- Outlet pressure **0.2 - 3 bar**
- Relief valve actuation pressure **5 - 6 bar**
- Max. flow rate **1800 l/h**
- Leak integrity **$1 \times 10^{-9} \text{ m}^3 \cdot \text{Pa/s}$**
- Leakage across seat **$1 \times 10^{-6} \text{ m}^3 \cdot \text{Pa/s}$**
- Temperature range is from **10 to 50 °C**
- Diaphragm - **FPM / EPDM**
- Seat - **FPM / EPDM**
- Dimensions without fittings **110,5x113,5x45 mm**
- Weight without pressure gauges **0,8 kg**



GAS PRESSURE REGULATORS

RDM-21

DIAPHRAGM PRESSURE REGULATOR



Application

- For high purity and ultra high purity gases
- For corrosive gases such as HCl, Hbr, etc.

Specification

- **DN 4 mm**
- Inlet pressure **5 - 16 bar**
- Outlet pressure **0.2 - 2 bar**
- Max. flow rate **1800 l/h**
- Leak integrity **1×10^{-9} m³*Pa/s**
- Leakage across seat **1×10^{-6} m³*Pa/s**
- Temperature range is from **10 to 50 °C**
- Diaphragm - **SS 316L**
- Seat - **PTFE**
- Dimensions without fittings **106x108x143,5 mm**
- Weight **2,3 kg**



GAS PRESSURE REGULATORS

Models and modifications

Model	CONNECTION DIAGRAMS - TOP VIEW					Cylinder connection
RDM-25L	●	●	●	●	●	■
RDM-25S	●	●	●	●	●	■
RDM-32	●	●	●	●	●	
RDM-24	●	●	●			
RDM-23	●	●	●			
RDM-21	●					

Ordering information

RDM-25L - IV - B.G3/4.G - TM.4 - TRM - N₂

RDM-25L - regulator model

IV - connection diagram

B.G3/4.G - inlet fitting*

TM.4 - outlet fitting

TRM - connection with a pressure gauge:

- TM.V.4 - metal gasket face seal, pressure gauge type VCR
- TRM - with FPM sealing ring, M12x1,5

N₂ - gas type

* B.G3/4.G - for cylinder connection.

Types of connections are presented in the Fittings section, pages 35-36

SHUT-OFF VALVES

KM-1

DIAPHRAGM VALVE

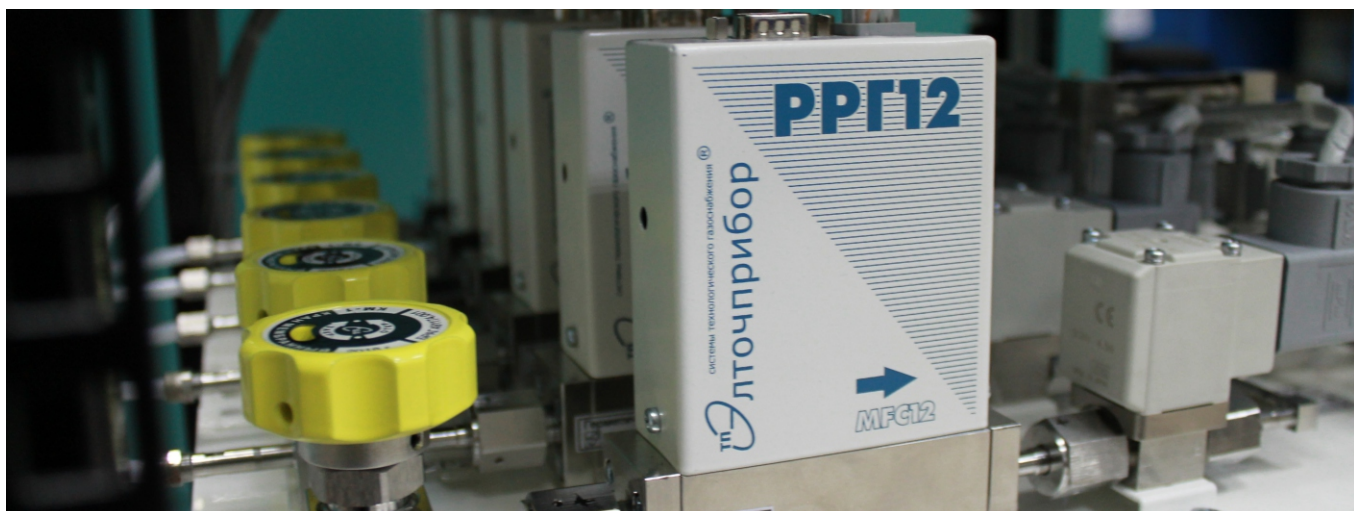


Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Specification

- DN 4 mm
- Max. operating pressure **16 bar**
- Max. flow rate **1800 l/h**
- Handle turning angle **180°**
- Leak integrity **1×10^{-9} Pa·m³/s**
- Leakage across seat **$1,3 \times 10^{-9}$ Pa·m³/s**
- Temperature range is from **10 to 50 °C**
- Diaphragm - Elgiloy
- Seat - PTFE
- Dimensions (for welding) **44,2x48x63 mm**
- Weight **0,3 kg**



SHUT-OFF VALVES

KM-2 DIAPHRAGM VALVE



Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Specification

- DN 4 mm
- Max. operating pressure **16 bar**
- Max. flow rate **1800 l/h**
- Handle turning angle **90°**
- Leak integrity **1×10^{-9} Pa·m³/s**
- Leakage across seat **1.3×10^{-9} Pa·m³/s**
- Temperature range is from **10 to 50 °C**
- Diaphragm - Elgiloy
- Seat - PTFE
- Dimensions (for welding) **50x42x70.5 mm**
- Weight **0.3 kg**



SHUT-OFF VALVES

KM-3 DIAPHRAGM VALVE

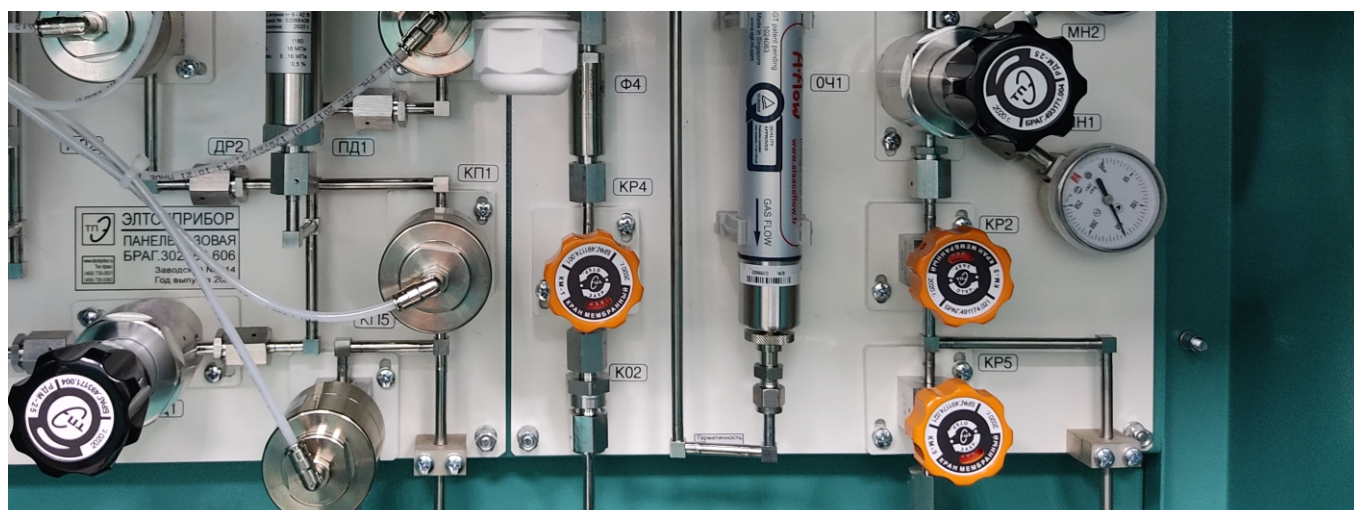


Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Specification

- DN 4 mm
- Max. operating pressure **160 bar**
- Max. flow rate **1800 l/h**
- Handle turning angle **180°**
- Leak integrity **1×10^{-9} Pa·m³/s**
- Leakage across seat **1.3×10^{-9} Pa·m³/s**
- Temperature range is from **10 to 50 °C**
- Diaphragm - Elgiloy
- Seat - PTFE
- Dimensions (for welding) **44.2x48x63 mm**
- Weight **0.3 kg**



SHUT-OFF VALVES

KM-22 DIAPHRAGM VALVE



Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Specification

- DN 10 mm
- Max. operating pressure 16 bar
- Max. flow rate 20 000 l/h
- Handle turning angle 180°
- Leak integrity 1×10^{-9} Pa·m³/s
- Leakage across seat 1.3×10^{-9} Pa·m³/s
- Temperature range is from 10 to 50 °C
- Diaphragm - Elgiloy
- Seat - PTFE
- Dimensions (for welding) 91x99x52 mm
- Weight 0.6 kg



SHUT-OFF VALVES

KMP-1

PNEUMATIC ACTUATED DIAPHRAGM VALVES



Models

- KMP-1NO
- ↳ normally open
- ↳ dimensions **50x50x101 mm**

Specification

- DN 4 mm
- Max operating pressure **16 bar**
- Max. flow rate **1800 l/h**
- Actuation pressure (air, nitrogen) **5 - 8 bar**
- Leak integrity $1,3 \times 10^{-9} \text{ Pa} \cdot \text{m}^3/\text{s}$
- Leakage across seat $1,3 \times 10^{-9} \text{ Pa} \cdot \text{m}^3/\text{s}$
- Temperature range is from **10 to 50 °C**
- Diaphragm - Elgiloy
- Seat - PTFE
- Weight **0,8 kg**

- KMP-1NC
- ↳ normally closed
- ↳ dimensions **50x50x115 mm**

Application

- For high purity and ultra high purity gases
- For neutral, toxic, explosive and flammable gases

Ordering information

KM-3 - **TM.4 - TM.4** - **H₂**

KM-3 - valve model

TM.4 - TM.4 - input / output connection *

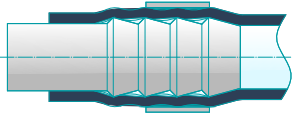
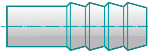
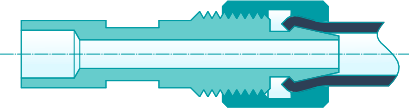

H₂ - gas type





*Types of connections are presented in the Fittings section, pages 35 -36

TUBE CONNECTIONS

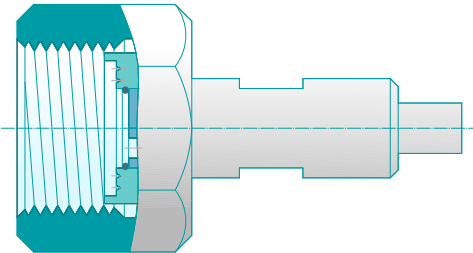
Plastic tube adapters

CONNECTION TYPE	ORDERING CODE	UNION	TUBE	THREAD
«PH» Hose connector 	PH.6/4		Ø6x4 mm	–
	PH.8/6		Ø8x6 mm	–
	PH.10/8		Ø10x8 mm	–
	PH.12/10		Ø12x10 mm	–
«PG» Cone and thread fittings adapter 	PH.6/4		Ø6x4 mm	M8x0,75
	PH.8/6		Ø8x6 mm	M10x1
	PH.10/8		Ø10x8 mm	M14x1
	PH.12/10		Ø12x10 mm	M16x1

Weld joints

CONNECTION TYPE	ORDERING CODE	UNION	DN
«CA» и «CR» Weld joints: ➤ «CA» – for orbital welding ➤ «CR» – for manual welding	CA.4		4
	CA.8		10
	CR.4		4
	CR.8		10

Connection with a cylinder

CONNECTION TYPE	ORDERING CODE	THREAD*	
«B» Gas cylinder connection – face seal with a female nut. The type of fitting and material of the seal are selected according to the properties of the gas. The body material is stainless steel. 	B.Sp21.8L.G	DIN477 №1	W21,8 x 1/4" left
	B.W1L.G	DIN477 №5	W1"x1/8" left
	B.Sp21.8.G	DIN477 №6	W21,8 x 1/4"
	B.G5/8.G	DIN477 №7	G5/8"
	B.W1.G	DIN477 №8	W1" x 1/8"
	B.G3/4.G	DIN477 №9	G3/4"
	B.G3/8.G	DIN477 №11	G3/8"
	B.G1/2.G	BS341 №10	G1/2" external

* Other thread types on request

FLOW RATE UNITS

	cm ³ /min	cm ³ /s	dm ³ /h	dm ³ /min	dm ³ /s	m ³ /h	m ³ /min	ft ³ /h	ft ³ /min
cm ³ /min	1	0,0167	0,06	0,001	0,0000167	0,00006	0,000001	0,0021	0,0000353
1 cm ³ /s	60	1	3,6	0,06	0,001	0,0036	0,00006	0,1271	0,0021
1 dm ³ /h	16,6667	0,2778	1	0,0167	0,0003	0,001	0,0000167	0,0353	0,0006
1 dm ³ /min	1000	16,6667	60	1	0,0167	0,06	0,001	2,1189	0,0353
1 dm ³ /s	60000	1000	3600	60	1	3,6	0,06	127,1328	2,1189
1 m ³ /h	16666,6667	277,7778	1000	16,6667	0,2778	1	0,0167	35,3147	0,5886
1 m ³ /min	1000000	16666,6667	60000	1000	16,6667	60	1	2118,88	35,3147
1 ft ³ /h	471,9474	7,8658	28,3168	0,4719	0,0079	0,0283	0,0005	1	0,0167
1 ft ³ /min	28316,8466	471,9474	1699,0108	28,3168	0,4719	1,699	0,0283	60	1

PRESSURE UNITS

	mPa	KPa	Pa	atm	kg/cm ²	bar	mbar	psi	mm Hg	cm of water
1 MPa	1	1000	1000000	9,8692	10,1972	10	10000	145,0238	7500,6	10215
1 KPa	0,001	1	1000	0,0098692	0,0101972	0,01	10	0,145038	7,5006	10,215
1 Pa	0,000001	0,001	1	9,896x10 ⁻⁶	1,0197x10 ⁻⁵	0,00001	0,01	1,45x10 ⁻⁴	7,5x10 ⁻⁴	0,010215
1 atm	0,101325	101,325	101325	1	1,033227	1,01325	1013,25	14,6965	760	1035,08
1 kg/cm ²	0,0980665	98,0665	98066,5	0,967842	1	0,980665	980,665	14,2233	735,559	1001,8
1 bar	0,1	100	100000	0,986923	1,019716	1	1000	14,5038	750,06	1021,5
1 mbar	0,0001	0,1	100	9,869x10 ⁻⁴	0,0010197	0,001	1	0,0145038	0,75006	1,0215
1 psi	6,895x10 ⁻³	6,89476	6894,76	0,0680460	0,0703069	0,0680460	68,9476	1	51,7149	70,433
1 mm Hg	1,333x10 ⁻⁴	0,133322	133,322	0,0013158	0,0013595	0,0133322	1,33322	0,0193368	1	1,3619
1 cm of water	9,789x10 ⁻⁵	0,097891	97,891	9,661x10 ⁻⁴	9,982x10 ⁻⁴	9,789x10 ⁻⁴	0,97891	0,014198	0,73424	1

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