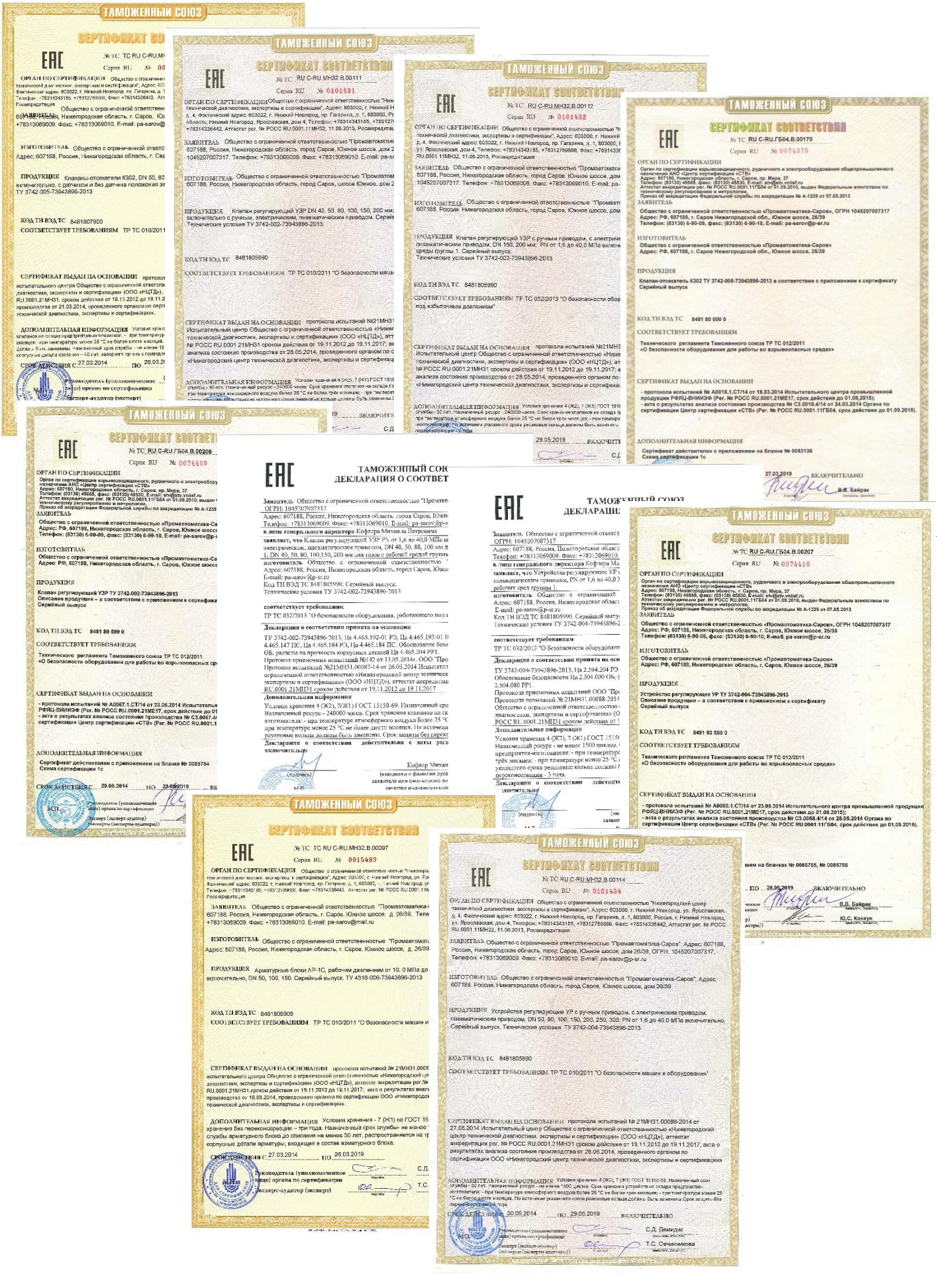
ПРОМАВТОМАТИКА-САРОВ

PROMAVTOMATIKA-SAROV

# Product catalogue

## Gas industry valves
## Chemical injection systems
## Separators



ТАМОЖЕННЫЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ТС RU C-RU.МН32.В.00111

Серия RU № 0101431

ОРГАН ПО СЕРТИФИКАЦИИ Общество с ограниченной ответственностью "Нижегородский центр технической диагностики, экспертизы и сертификации", Адрес: 603000, г. Нижний Новгород, ул. Ярославская, д. 4, Фактический адрес: 603022, г. Нижний Новгород, пр. Гагарина, д. 1, 603000, Россия, г. Нижний Новгород, ул. Ярославская, дом 4, Телефон: +78314343185, +78312789666, Факс: +78314336442, Аттестат рег. № РОСС RU.0001.11МН32, 11.06.2013, Росаккредитация

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ИЗГОТОВИТЕЛЬ Общество с ограниченной ответственностью "Промавтоматика-Саров", 607188, Россия, Нижегородская область, город Саров, шоссе Южное, дом 26/39

ПРОДУКЦИЯ Клапан регулирующий УЗР DN 40, 50, 80, 100, 150, 200 мм; включительно с ручным, электрическим, пневматическим приводом. Серийный выпуск. Технические условия ТУ 3742-002-73943896-2013.

КОД ТН ВЭД ТС 8481805990

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ ТР ТС 010/2011 "О безопасности машин и оборудования"

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ протокола испытаний №21МН31.00087-14 от 26.05.2014 Испытательный центр Общество с ограниченной ответственностью «Нижегородский центр технической диагностики, экспертизы и сертификации» (ООО «НЦТД»), аттестат аккредитации рег.№ РОСС RU.0001.21МН31 сроком действия от 19.11.2012 до 19.11.2017; акта о результатах анализа состояния производства от 28.05.2014, проведенного органом по сертификации ООО «Нижегородский центр технической диагностики, экспертизы и сертификации»

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Условия хранения 4 (Ж2), 7 (Ж1) ГОСТ 15150-69. Назначенный ресурс - не менее 1500 циклов. Срок хранения устройств не складе предприятия-изготовителя: - при температуре атмосферного воздуха более 25 °С не более трех месяцев; - при температуре ниже 25 °С не более шести месяцев. По истечении указанного срока резиновые кольца должны быть заменены. Срок защиты без переконсервации - 3 года.

СРОК ДЕЙСТВИЯ С 30.05.2014 ПО 29.05.2019 ВКЛЮЧИТЕЛЬНО

Руководитель (уполномоченное лицо) органа по сертификации — С.Д. Лемдин

Эксперт (эксперт-аудитор) — Т.С. Овчинникова

## Contents

# Pre-assembled pipeline units

**PN 100, 160, 250, 500**
**DN 100, 150**

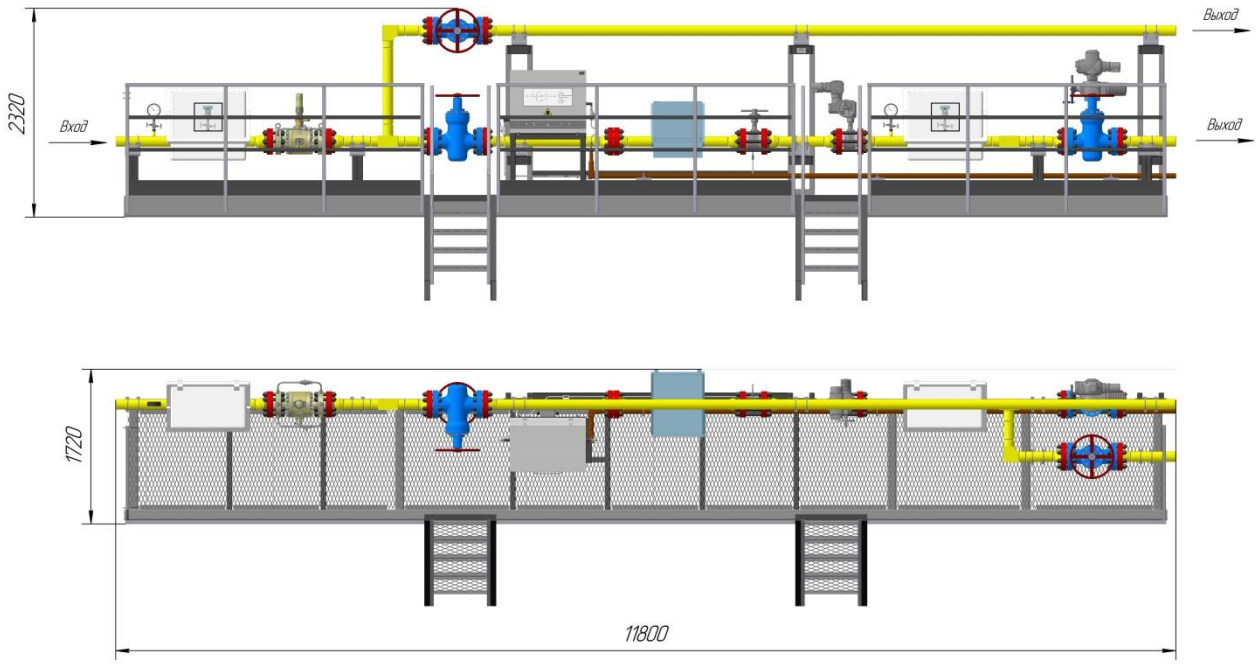
Manufacturer quality class TU 4318-006-73943896-2013

Pre-assembled pipeline units (PPU) are designed to be installed in a downstream from a natural gas wellhead to provide the following:

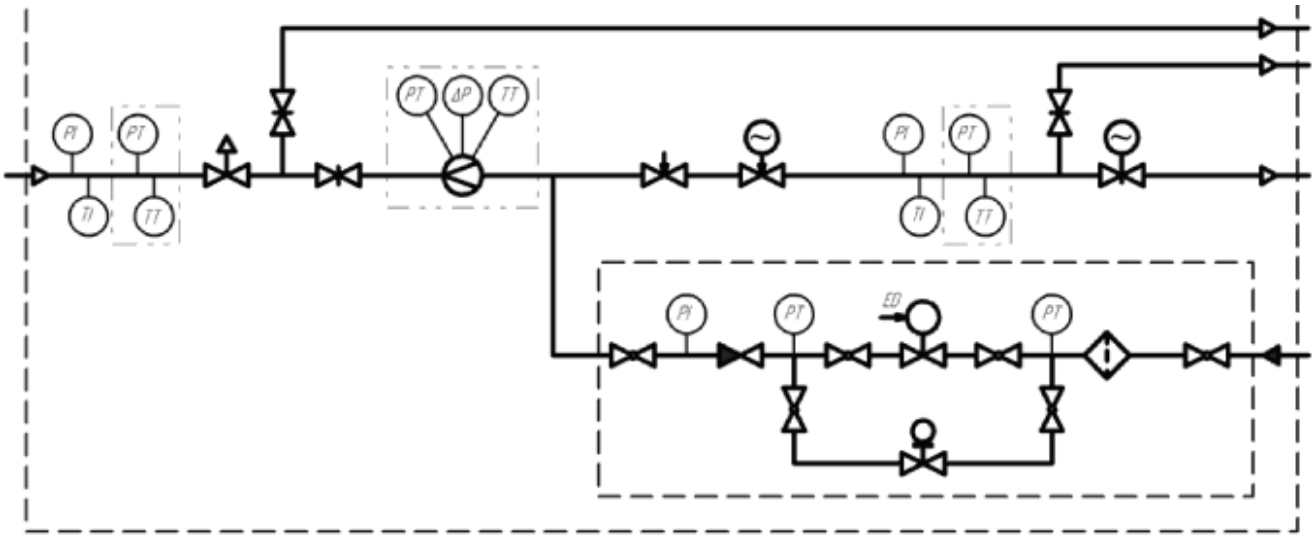
- flow rate control;
- flow rate, pressure and temperature monitoring;
- redirecting the flow to a flare system or inspection station/separator;
- methanol injection control;
- pipeline safety shut off in case of media pressure drop or buildup;
- manual or remote controlled shutdown of a pipeline.

All PPUs may be designed to meet specific application, depending on wellhead construction and media condition. Modifications may include installed process control unit/operator station.

**Exterior view of PN 250, DN 100 PPU**

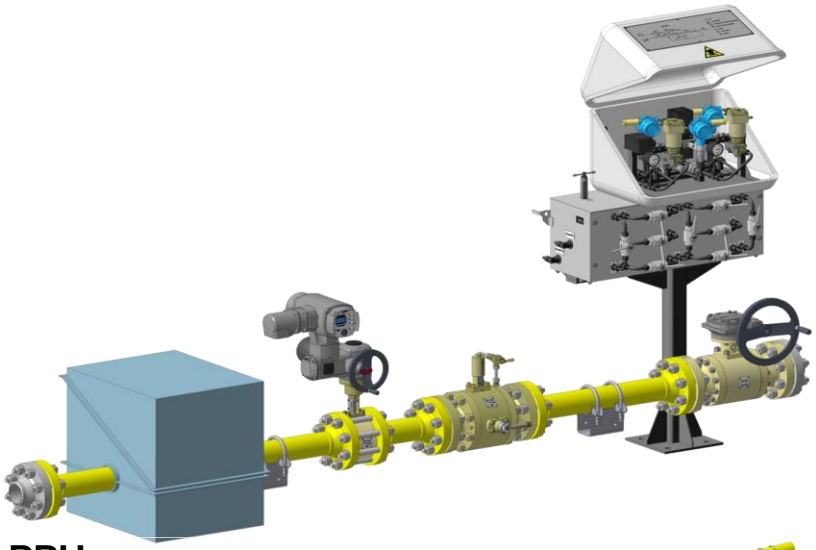



**Schematic diagram of the example above**

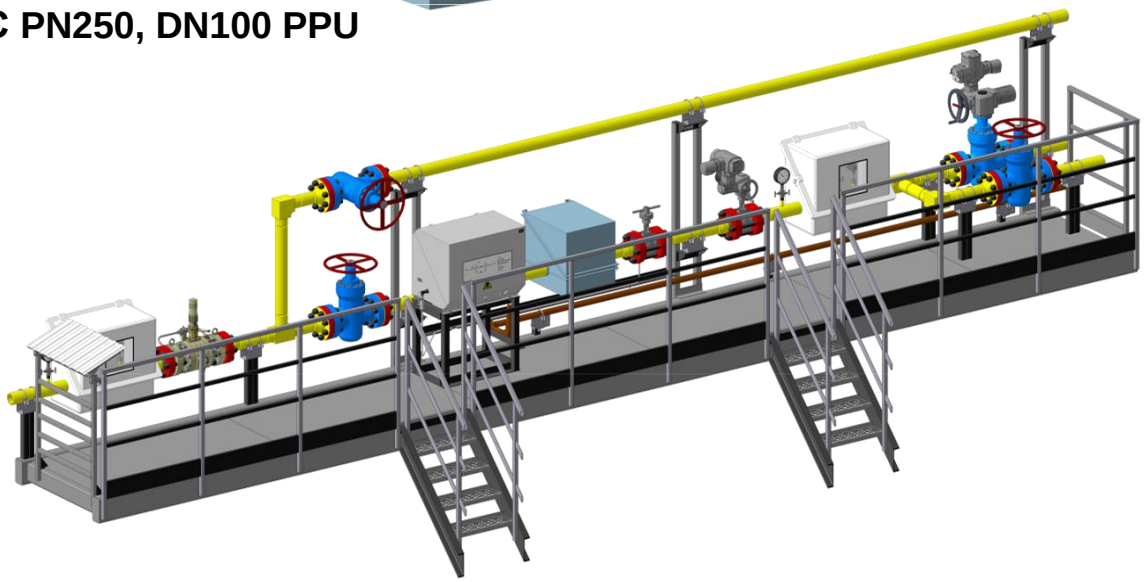


**Examples of specific application PPUs**

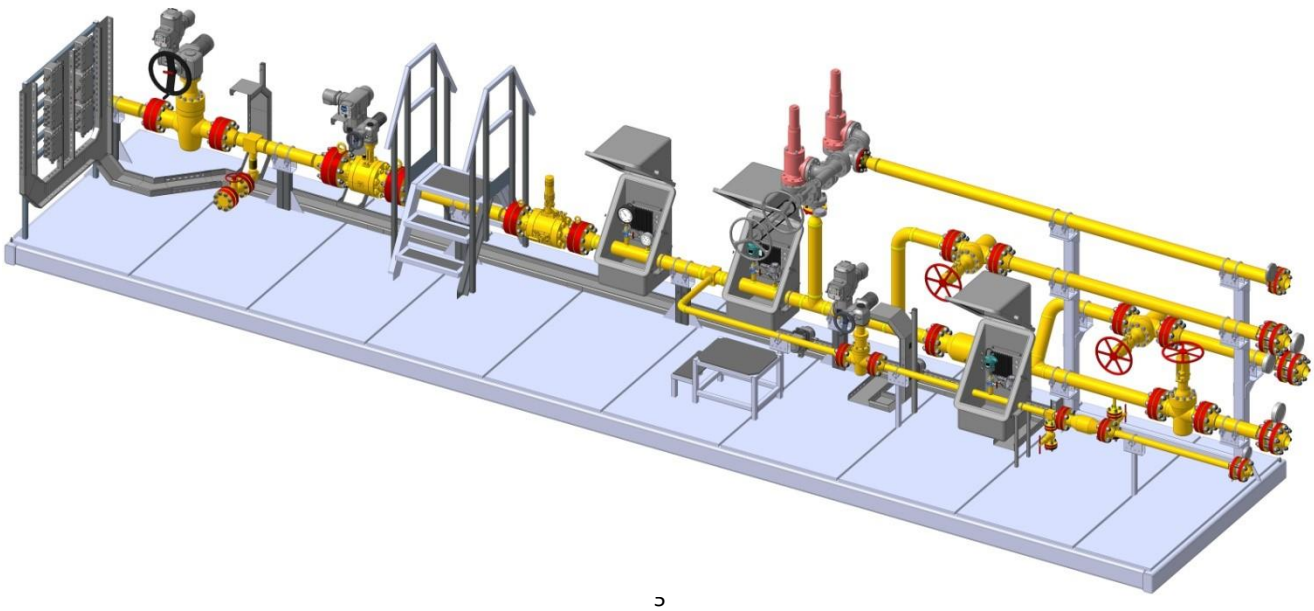
## PN160, DN100 PPU



## AP-1C PN250, DN100 PPU



## AP-1C  PN500/160 , DN80/100 PPU



# K302 safety shut off valve

**PN 40, 63, 100, 160, 210, 320, 500**
**DN 50, 65, 80, 100, 150**

Manufacturer quality class TU4318-006-73943896-2013

K302 are medium operated safety shut-off valves (SSV), designed to automatically shut off the flow of the media in a pipeline. The valve shuts off the flow in case of emergency pressure change, as set by its actuator settings.
The valve may be optionally equipped with a shut off sensor.

Suitable media: natural gas containing liquid hydrocarbons, carbon dioxide, methanol, water and solid impurities.

Media temperature range: -50 °C to 80 °C.
Ambient temperature range: -60 °C to 45 °C.
Seat leakage:  similar to class “VI” ANSI FCI 70-2.

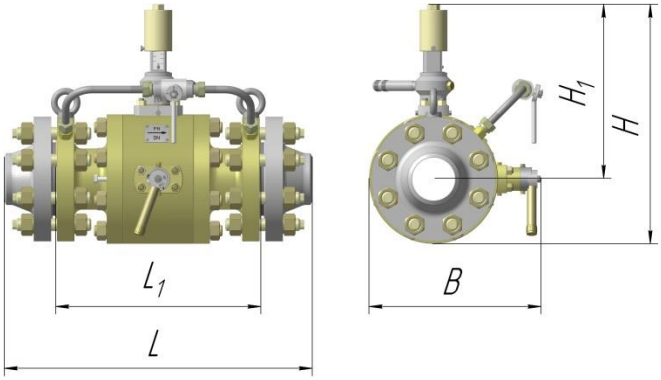



Fig. 1

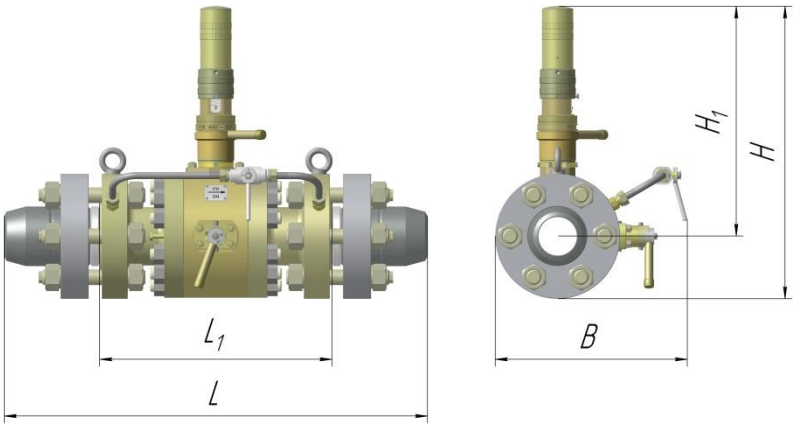



Fig. 2

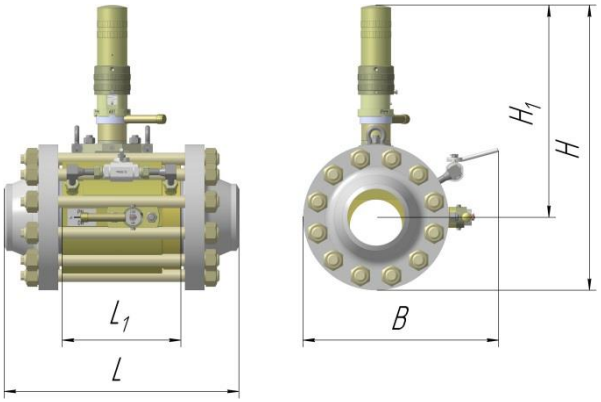



Fig. 3

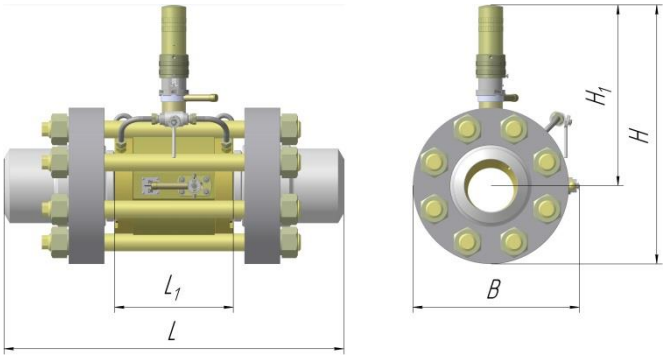



Fig. 4

## Operating parameters

| Code | DN, mm | PN, MPa | Activating pressure difference, MPa | | Shutoff pressure precision, MPa | Dimensions, mm | | | | | Body weight, kg | Weight with flanged ends, kg | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Pressure drop sensitivity range | Pressure increase sensitivity range | | L | $L_1$ | B | H | $H_1$ | | | |
| 2.504.183 | 50 | 16 | 2—8 | — | 0,5 | 525 | 340 | 340 | 375 | 265 | 50 | 69 | 1 |
| 2.504.203 | 65 | 70 | 2—8 | 10—20 | | 1030 | 570 | 325 | 620 | 480 | 145 | 240 | |
| 4.465.178 | 80 | 6,3 | 0,8—3,2 | 3,6—6 | | 655 | 420 | 355 | 657 | 525 | 100 | 138 | |
| 2.504.182 | | | 2—5 | — | | 570 | 370 | 400 | 420 | 295 | 75 | 101 | |
| 2.504.086 | | 16 | 2—8 | | | 635 | 400 | | | 365 | 87 | 124 | |
| 2.504.250 | | | 1—4 | | | 600 | | 350 | 495 | | 88 | 123 | |
| 2.504.224 | | 21 | 2—8 | 10—20 | | 753 | 492 | 380 | 680 | | 140 | 180 | |
| 2.504.126 | | 50 | 2—8 | 10—20 | | 875 | 600 | 360 | 630 | | 179 | 242 | |
| 2.504.172 | 100 | 4 | 0,2—0,8 | 1,0—2,0 | 0,05 | 525 | 390 | 350 | 620 | 490 | 77 | 97 | |
| 2.504.219 | | | | — | | | | | 500 | 365 | 74 | 95 | |
| 2.504.238 | | | 0,3—2,5 | | | | | | | | | | |
| 2.504.226 | | 6,3 | 2—6 | | 0,5 | 587 | 430 | 367 | 505 | | 98 | 131 | |
| 4.465.173 | | 10 | 1—4 | 4—8 | | 680 | 438 | 385 | 670 | 530 | 115 | 164 | |
| 4.465.173-01 | | | | | | 650 | | | | | | 160 | |
| 4.465.191 | | | 0,2—0,8 | 1,0—2,0 | 0,05 | | | | | | | | |
| 2.504.085 | | 16 | 2—8 | — | 0,5 | 657 | | 367 | 505 | 365 | 108 | 158 | |
| 2.504.249 | | | 0,4—1,0 | | | | | 405 | 440 | 300 | 106 | 158 | |
| 4.465.188 | | | 2—8 | 10—16 | | 657 | | 385 | 667 | 530 | 116 | 166 | |
| 4.465.078 | | 32 | | 10—20 | | 985 | 540 | 425 | 680 | | 163 | 270 | 2 |
| 4.465.078-02 | | | | — | | | | 445 | 515 | 540 | 156 | 256 | |
| 4.465.078-04 | | | 1—4 | 4—8 | | | | 425 | 680 | 530 | 163 | 270 | |
| 2.504.207 | | 63 | 2—8 | 10—20 | | 1238 | 800 | 390 | 655 | 505 | 272 | 405 | |
| 2.504.188 | 150 | 16 | 2—8 | 10—16 | | 565 | 285 | 470 | 685 | 510 | 86 | 194 | 3 |
| **Gradual shut-off valves (hydraulic blast preventive)** | | | | | | | | | | | | | |
| 2.504.179* | 100 | 32 | 2—8 | 10—20 | 0,5 | 985 | 540 | 575 | 680 | 500 | 163 | 270 | 2 |
| 2.504.191* | 150 | | 2—8 | 10—20 | | 1000 | 350 | 490 | 770 | 520 | 145 | 550 | 4 |
| **For a media containing up to 6% of $H_2S$ and $CO_2$** | | | | | | | | | | | | | |
| 2.504.126-01 | 80 | 50 | 2—8 | 10—20 | 0,5 | 875 | 600 | 360 | 630 | 490 | 179 | 242 | 2 |
| 4.465.078-01 | 100 | 32 | 2—8 | 10—20 | | 985 | 540 | 430 | 687 | 540 | 179 | 276 | |

| | |
|---|---|
| Order code: | K302 SSV PN____ , DN_____ Code _____<br>Bundled with butt weld counter-flanges<br>to a pipe (_____×_____), steel grade_____<br>diameter thickness |

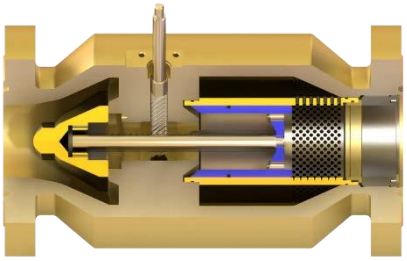
# Full bore axial symmetry control valve.

**PN 160, 250, 500**
**DN 40, 80, 100, 200**

Manufacturer quality class: TU 3742-007-10126009-2005

The UR-type valve is a manually or remote operated control valve, designed to control the pressure and flow rate of media in a pipeline, and shutting the flow off.

Suitable media: natural gas containing liquid hydrocarbons, carbon dioxide, methanol, water and solid impurities.
Media temperature range: -50 °C to 80 °C.
Seat leakage: class IV acc. to GOST P 54808-2011.



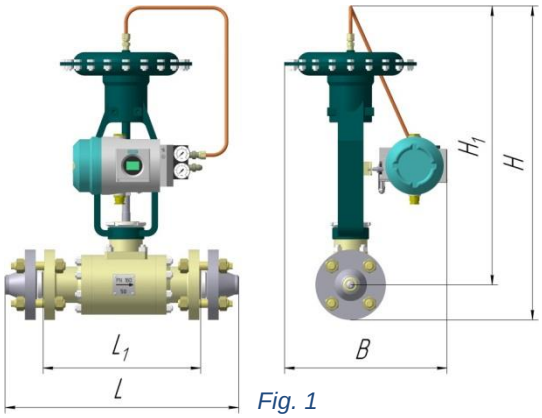
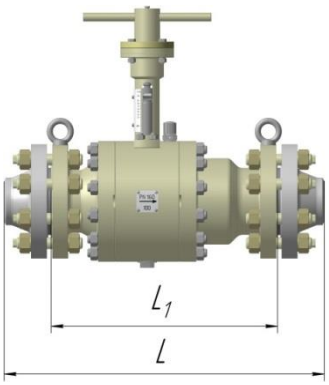



Fig. 1



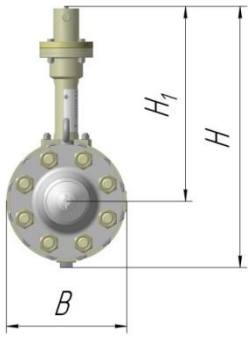
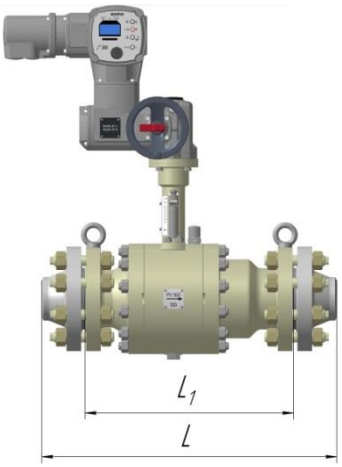




Fig.2



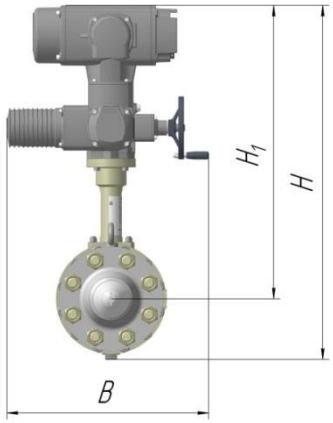




Fig. 3

## Operating parameters

| Code | DN, mm | PN, MPa | Pressure drop, MPa | Orifice size, mm | Kv, m3/h | Dimensions, mm | | | | | Weight, kg | Weight with flanged ends, kg | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L | $L_1$ | B | H | $H_1$ | | | |
| 4.465.147 | 40 | 16 | 10 | 0—37 | 40 | 550 | 370 | 310 | 738 | 655 | 51 | 68 | 1 |
| 4.465.147-01 | | | | 0—20 | 12 | | | | | | | | |
| 4.465.184 | 100 | | 16 | 0—90 | 185 | 750 | 530 | 295 | 600 | 455 | 153 | 201 | 2 |
| 4.465.192 | | | | | | | | 512 | 890 | 745 | 180 | 228 | 3 |
| 4.465.212 | 80 | 50 | 46 | 0—60 | 154 | 1020 | 600 | 517 | 896 | 730 | 255 | 374 | 3 |
| 4.465.236-01 | 100 | 25 | 25 | 0—90 | 185 | 750 | 610 | 512 | 890 | 745 | 180 | 228 | 3 |
| 4.465.206-01 | 200 | 16 | 16 | 0—175 | 730 | 1060 | 750 | 430 | 1100 | 885 | 452 | 627 | 2 |

| | |
|---|---|
| Order code: | UZR CV PN____ , DN_____ Code _____<br>Bundled with butt weld counter-flanges<br>to a pipe (_____×_____), steel grade_____<br>diameter thickness |

# Control valves for underground natural gas storage facilities

**PN 160**
**DN 100**

Manufacturer quality class TU 3742-001-00230378-99

The valve is designed to be used at underground natural gas storage facilities. Its purpose is to control the flow of natural gas from an underground reservoir, allowing a free backflow when the reservoir is being filled up.

Suitable media: natural gas containing liquid hydrocarbons, carbon dioxide, methanol, water and solid impurities.
Media temperature range: -50 °C to 80 °C.
Ambient temperature range: -60 °C to 45 °C.

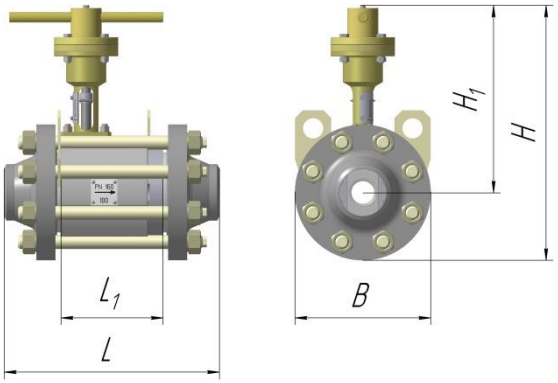



Fig 1

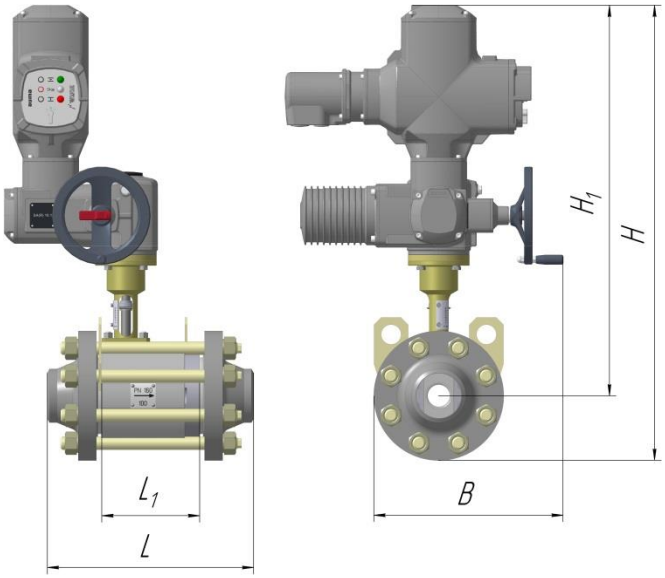



Fig 2

## Operating parameters

| Code | DN, mm | PN MPa | Pressure drop, MPa | Orifice size, mm | Kv, m3/h | Backflow orifice size, mm | Dimensions, mm | | | | | Weight, kg | Weight with flanged ends, kg | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | $L_1$ | B | H | $H_1$ | | | |
| 2.504.180 | 100 | 16 | 10 | 20—45 | 60 | 90 | 420 | 200 | 265 | 500 | 365 | 39 | 87 | 1 |
| 2.504.204 | | | 10 | 20—45 | 60 | 90 | | | 570 | 930 | 800 | 74 | 122 | 2 |

| | |
|---|---|
| Order code: | UR CV PN____ , DN_____ Code _____<br>Bundled with butt weld counter-flanges<br>to a pipe (_____×_____), steel grade_____<br>diameter thickness |

# Manual control valves

**PN 16, 63, 160, 200, 250, 320**
**DN 50, 80, 100, 150, 200, 250, 300**

Manufacturer quality class: TU 3742-004-73943896-2013, TU 3742-009-73943896-2015

The UR-type valve is a manually operated control valve, designed to control the pressure and flow rate of media in a pipeline.

Suitable media: natural gas containing liquid hydrocarbons, carbon dioxide, methanol, water and solid impurities.
Media temperature range:  -50 °C to 80 °C.

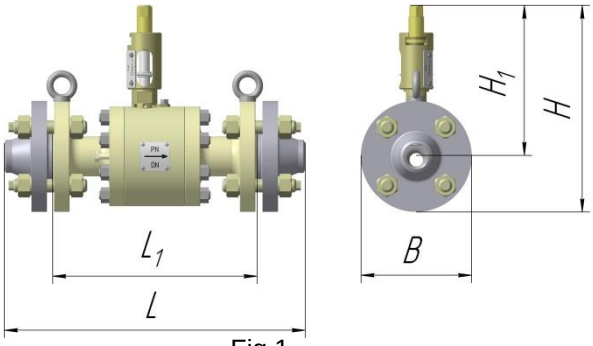


Fig 1

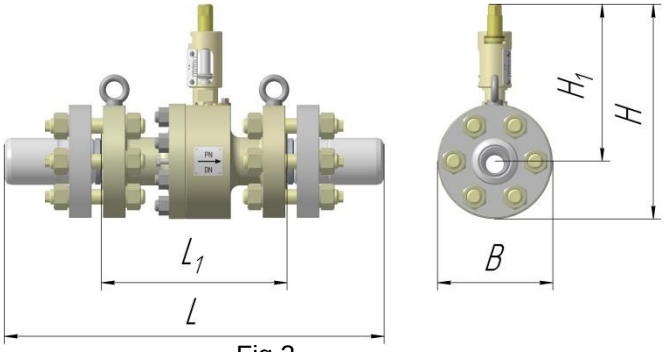


Fig 2

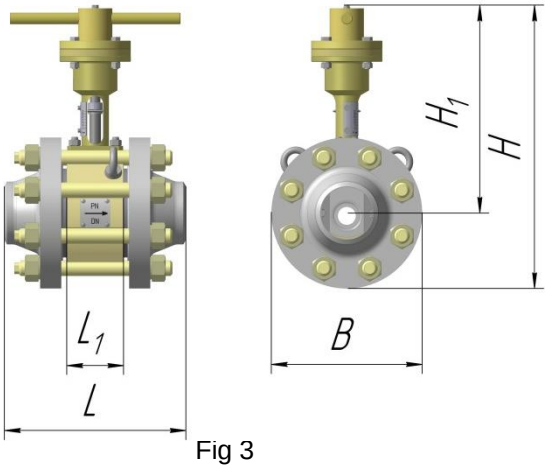


Fig 3

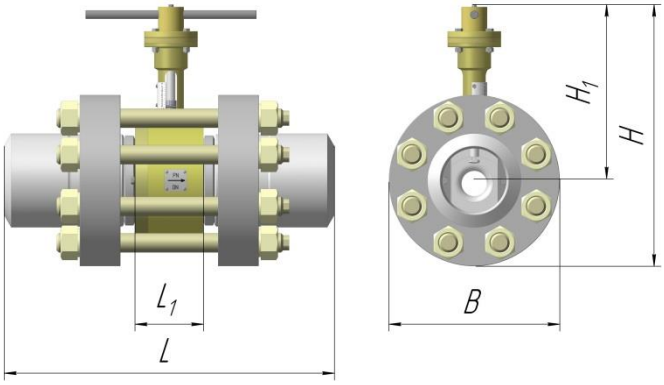


Fig 4

## Operating parameters

| Code | DN, mm | PN, MPa | Pressure drop, MPa<br>Standard parts (accessory parts) | Orifice size, mm | Kv, $m^3/h$ | Dimensions, mm | | | | | Weight, kg | Weight with flanged ends, kg | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L | $L_1$ | B | H | $H_1$ | | | |
| 2.504.177 | 50 | 1,6 | 1,6 | 0—32 | 28 | 350 | 260 | 202 | 380 | 280 | 30 | 36 | 1 |
| 2.504.127 | | 6,3 | 6,3 | 0—24 | 17 | 514 | 360 | 178 | 355 | 270 | 39 | 53 | |
| 2.504.128 | | 16 | 10 | | | 530 | 360 | 197 | 365 | | 43 | 63 | |
| 2.504.171 | | 25 | | 0—32 | 28 | 675 | 330 | 210 | 385 | 280 | 46 | 83 | 2 |
| 2.504.130 | 80 | 6,3 | 6,3 | | | 524 | 360 | | 383 | | 50 | 71 | 1 |
| 2.504.131 | | 16 | 10 | | | 560 | | 230 | 392 | | 55 | 89 | |
| 2.504.076 | 100 | | 10 (6) | 4—32 (20—45) | 40 (110) | 320 | 100 | 265 | 495 | 365 | 25 | 73 | 3 |
| 2.504.080 | | 32 | | | | 563 | 120 | 290 | 510 | | 28 | 120 | 4 |
| 2.504.186 | 150 | 16 | 6 | 10—60 (60—90) | 110 (230) | 430 | 150 | 350 | 585 | 410 | 48 | 155 | 3 |
| 2.504.187 | | 25 | | | | 770 | 160 | 400 | 610 | 420 | 58 | 340 | 4 |
| 2.504.230 | 200 | 16 | | 0—66 | 110 | 500 | 140 | 700 | 430 | 480 | 70 | 250 | 3 |
| 2.504.104 | | 20 | | 30—90 | 230 | 720 | 195 | 535 | 835 | 550 | 150 | 627 | |
| 2.504.102 | | 25 | | 10—60 (60—90) | 110 (230) | 860 | 130 | 460 | 720 | 490 | 73 | 483 | 4 |
| 2.504.237 | 250 | 16 | | 11—85 (80—125) | 190 (450) | 510 | 160 | 500 | 770 | 520 | 105 | 347 | 3 |
| 2.504.117-03 | 300 | | | 0—90 (50—125) | 230 (450) | 715 | 230 | 585 | 1090 | 750 | 225 | 680 | |
| Valves for a medium containing up to 6% of $H_2S$ and $CO_2$ | | | | | | | | | | | | | |
| 2.504.177-01 | 50 | 16 | 1,6 | 0—32 | 28 | 350 | 260 | 202 | 380 | 280 | 30 | 36 | **1** |
| 2.504.127-01 | | 63 | 6,3 | 0—24 | 17 | 514 | 360 | 178 | 355 | 270 | 39 | 53 | |
| 2.504.128-01 | | 160 | 10 | | | 530 | 360 | 197 | 365 | | 43 | 63 | |
| 2.504.130-01 | 80 | 63 | 6,3 | 0—32 | 28 | 524 | 360 | 210 | 383 | 280 | 50 | 71 | |
| 2.504.131-01 | | 160 | 10 | | | 560 | | 230 | 392 | | 55 | 89 | |

| | |
|---|---|
| Order code: | UR CV PN____ , DN_____ Code _____<br>Bundled with butt weld counter-flanges<br>to a pipe (_____×_____), steel grade_____<br>diameter thickness |

# Control valves with electric or pneumatic actuator

**PN 63, 160, 200, 250, 320, 500**
**DN 50, 100, 150, 200, 250, 300**

Manufacturer quality class: TU 3742-001-00230378-99

The UR-type valve is a remote operated valve with an electric or pneumatic actuator, designed to control the flow rate of media in a pipeline.

Suitable media: natural gas, hydrocarbons, water.
Media temperature range: -50 °C to 80 °C.
Ambient temperature range: -60 °C to 45 °C.

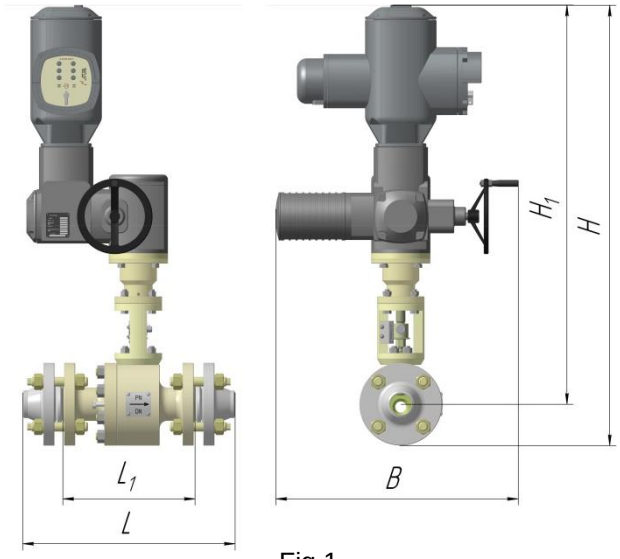



Fig 1

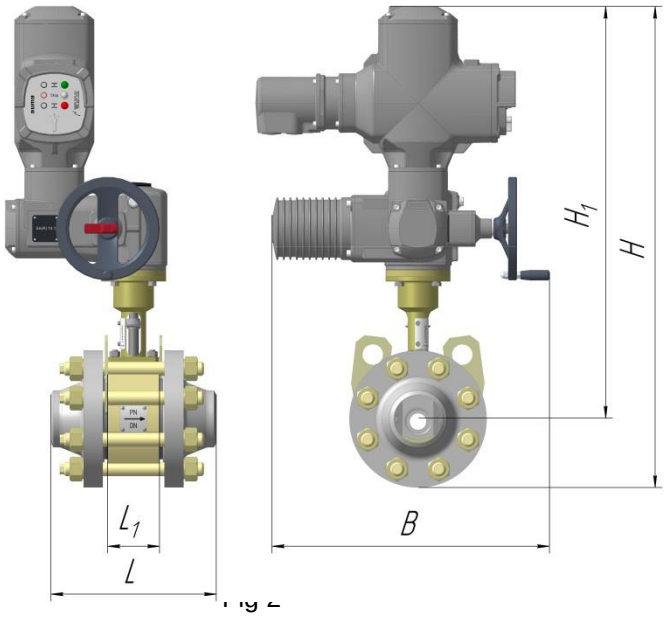



Fig 2

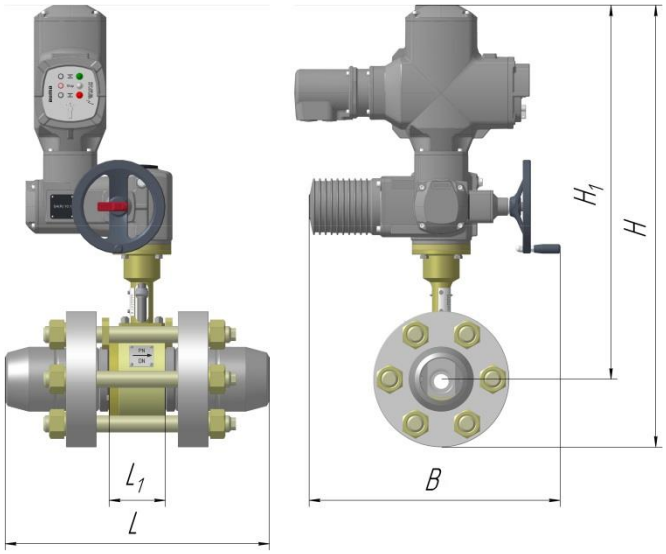



Fig 3

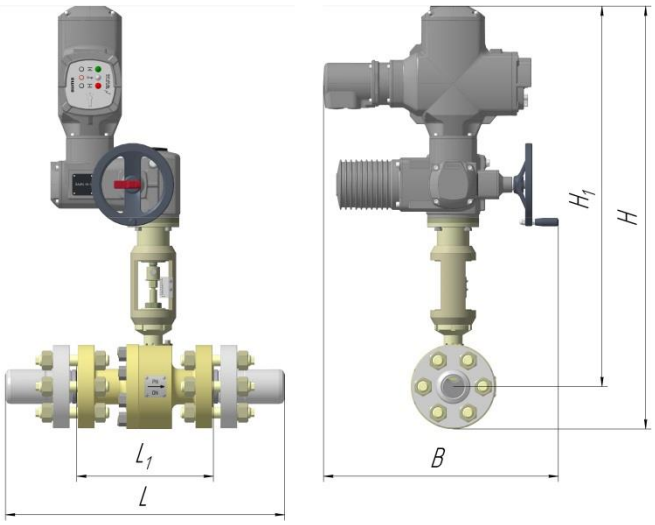



Fig 4

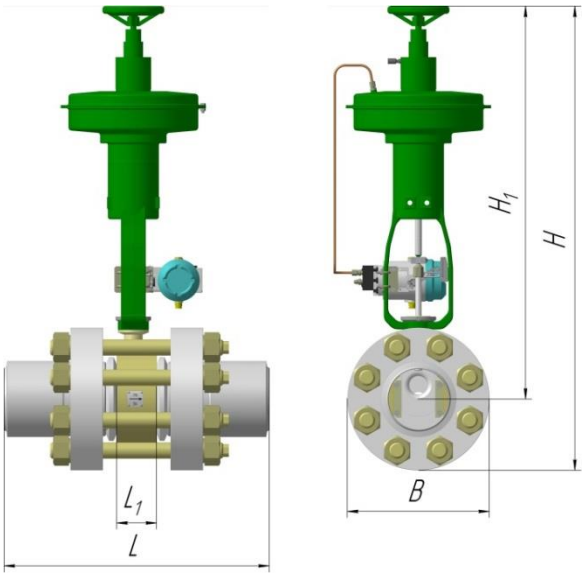



Fig 5

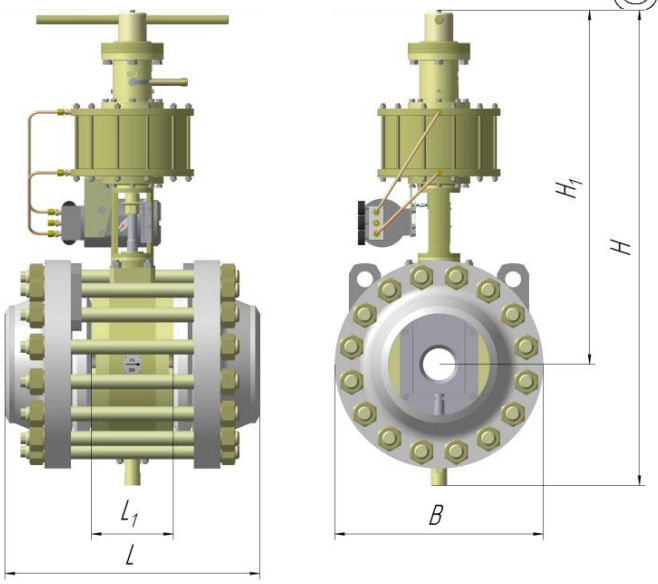



Fig 6

## Operating parameters

| Code | DN, mm | PN, MPa | Pressure drop, MPa / Standard parts (accessory parts) | Orifice size, mm | Kv, m3/h | Dimensions, mm L | L1 | B | H | H1 | Weight, kg | Weight with flanged ends, kg | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.504.215 | 50 | 6,3 | 6,3 | 0—24 | 17 | 450 | 280 | 325 | 935 | 850 | 46 | 60 | 1 |
| 2.504.202 | | 25 | 10 | 0—32 | 28 | 675 | 330 | 350 | 1018 | 915 | 84 | 120 | 4 |
| 2.504.202-01 | | | | 20—45 | 60 | | | | | | | | |
| 2.504.121 | 100 | 16 | 10 (6) | 4—32 (20—45) | 40 (110) | 320 | 100 | 535 | 930 | 800 | 60 | 108 | 2 |
| 2.504.119 | | 32 | | | | 563 | 120 | | 940 | | 64 | 156 | 3 |
| 2.504.211 | 150 | 25 | 6 | 10—60 (60—90) | 110 (230) | 770 | 160 | 570 | 1040 | 845 | 95 | 378 | |
| 2.504.104-01 | 200 | 20 | | 30—90 | 230 | 720 | 195 | 715 | 1285 | 1000 | 205 | 685 | 2 |
| 2.504.102-01 | | 25 | | 10—60 (60—90) | 110 (230) | 860 | 130 | | 1165 | 935 | 129 | 540 | 3 |
| 2.504.102-02 | 200 | 25 | | | | | | 510 | 1500 | 1270 | 100 | 510 | 5 |
| 2.504.237-01 | 250 | 16 | | 11—85 (80—125) | 190 (450) | 510 | 160 | 570 | 1180 | 810 | 140 | 382 | 2 |
| 2.504.117-01 | 300 | | | 0—90 (50—125) | 230 (450) | 715 | 230 | 720 | 1530 | 1200 | 280 | 735 | |
| 2.504.117 | | | | | | | | 585 | 1335 | 1995 | 285 | 740 | 6 |
| 2.504.117-02 | | | | | | | | | | | | | |

| | |
|---|---|
| Order code: | UR CV PN____ , DN_____ Code _____<br>Bundled with butt weld counter-flanges<br>to a pipe (_____×_____), steel grade_____<br>diameter thickness |

# PASAR control valve

**PN 40, 63, 100, 160**
**DN 25, 32, 40, 50, 80, 100;**

Manufacturer quality class TU 3742-013-73943896-2015

The valve is designed to be used in petroleum and petrochemical industry to control and shutoff the media flowrate in a pipeline during extraction, transport, storage and treatment processes. The valve can be operated locally, remotely or in automatic mode.

Suitable media: liquids or gases including flammable, natural gas containing liquid hydrocarbons, carbon dioxide, methanol, water and solid impurities.

Media temperature range: -50 °C to 200 °C.
Ambient temperature range: -60 °C to 45 °C.
Seat leakage:  similar to class “VI” ANSI FCI 70-2 (GOST R 54808-2011).

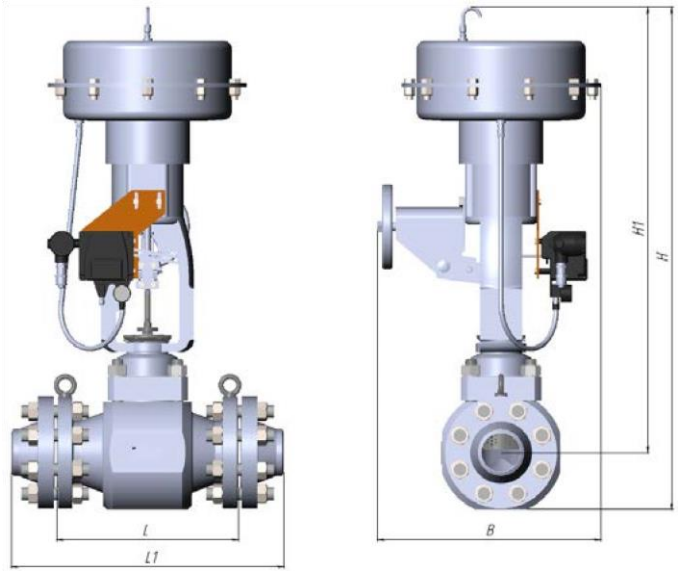



Fig. 1

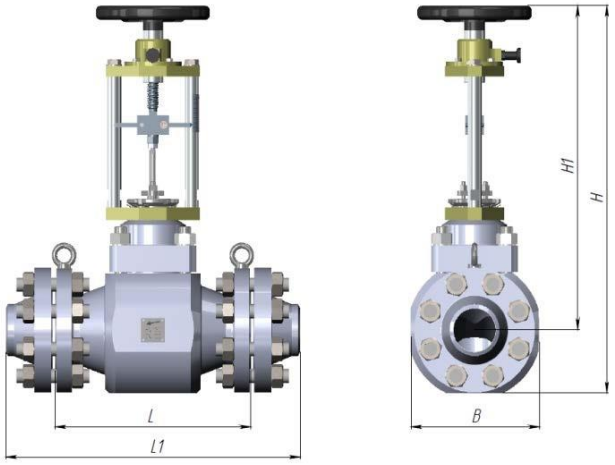



Fig. 2

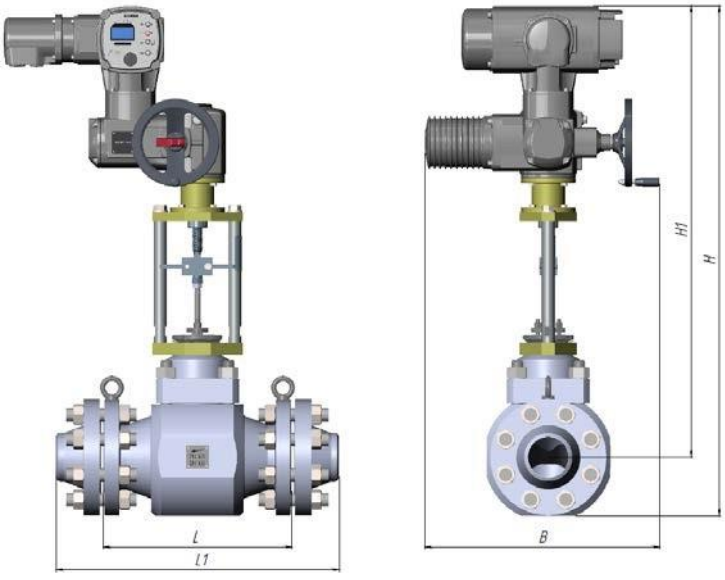



Fig. 3

## Operating parameters

| Code | DN, mm | PN kg/cm² | Maximum pressure difference cm² | Bore size | Volumetric flow rate for water, m³/hour | Bore characteristic (L – linear, EP – equal percentage) | Dimensions, mm | | | | | Weght, kg | Weight with flanged ends, kg | Fig |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | $L_1$ | B | H | $H_1$ | | | |
| 4.465.222-XX | 100 | 160 | 120 | 0…90 | 147,5 | L, EP | 430 | 648 | 530 | 1190 | 105 | 175 | 193 | 1 |
| 4.465.257-XX | | | 160 | | | | | | 284 | 830 | 688 | 151 | 169 | 2 |
| 4.465.258-XX | | | | | | | | | 540 | 1165 | 103 | 169 | 183 | 3 |
| 4.465.306-XX | | 100 | 100 | | | | | 642 | 530 | 1190 | 105 | 175 | 220 | 1 |
| 4.465.309-XX | | | | | | | | | 284 | 830 | 688 | 151 | 196 | 2 |
| 4.465.283-XX | | | | | | | | | 540 | 1165 | 103 | 169 | 214 | 3 |
| 4.465.291-XX | | 63 | 63 | | | | | 602 | 530 | 1182 | 105 | 170 | 203 | 1 |
| 4.465.294-XX | | | | | | | | | 284 | 822 | 688 | 146 | 179 | 2 |
| 4.465.290-XX | | | | | | | | | 540 | 1157 | 103 | 164 | 197 | 3 |
| 4.465.223-XX | 80 | 160 | 140 | 0…75 | 90,1 | | 380 | 576 | 530 | 980 | 865 | 127 | 141 | 1 |
| 4.465.259-XX | | | 160 | | | | | | 250 | 730 | 615 | 108 | 122 | 2 |
| 4.465.260-XX | | | | | | | | | 538 | 1070 | 955 | 125 | 139 | 3 |
| 4.465.307-XX | | 100 | 100 | | | | | 570 | 530 | 980 | 865 | 127 | 156 | 1 |
| 4.465.310-XX | | | | | | | | | 250 | 730 | 615 | 108 | 137 | 2 |
| 4.465.311-XX | | | | | | | | | 538 | 1070 | 955 | 125 | 154 | 3 |
| 4.465.292-XX | | 63 | 63 | | | | | 540 | 530 | 970 | 865 | 125 | 147 | 1 |
| 4.465.295-XX | | | | | | | | | 250 | 720 | 615 | 106 | 128 | 2 |
| 4.465.296-XX | | | | | | | | | 538 | 1060 | 955 | 123 | 145 | 3 |
| 4.465.224-XX | 50 | 160 | 160 | 0…45 | 42,1 | | 300 | 465 | 430 | 785 | 687 | 71 | 82 | 1 |
| 4.465.263-XX | | | | | | | | | 200 | 585 | 488 | 55 | 66 | 2 |
| 4.465.264-XX | | | | | | | | | 515 | 830 | 925 | 69 | 80 | 3 |
| 4.465.308-XX | | 100 | 100 | | | | | 451 | 430 | 785 | 687 | 71 | 89 | 1 |
| 4.465.287-XX | | | | | | | | | 200 | 585 | 488 | 55 | 73 | 2 |
| 4.465.282-XX | | | | | | | | | 515 | 925 | 830 | 69 | 87 | 3 |
| 4.465.293-XX | | 63 | 63 | | | | | 449 | 430 | 775 | 687 | 70 | 83 | 1 |
| 4.465.297-XX | | | | | | | | | 200 | 575 | 488 | 54 | 67 | 2 |
| 4.465.288-XX | | | | | | | | | 515 | 915 | 830 | 68 | 81 | 3 |
| 4.465.265-XX | 40 | 160 | 160 | 0…36 | 33,1 | | 260 | 418 | 554 | 755 | 672 | 56 | 65 | 1 |
| 4.465.266-XX | | | | | | | | | 165 | 344 | 261 | 31 | 40 | 2 |
| 4.465.267-XX | | | | | | | | | 515 | 900 | 818 | 56 | 65 | 3 |
| 4.465.312-XX | | 100 | 100 | | | | | 408 | 554 | 755 | 672 | 56 | 68 | 1 |
| 4.465.313-XX | | | | | | | | | 165 | 344 | 261 | 31 | 43 | 2 |
| 4.465.314-XX | | | | | | | | | 515 | 900 | 818 | 56 | 68 | 3 |
| 4.465.298-XX | | 63 | 63 | | | | | 404 | 554 | 755 | 672 | 56 | 67 | 1 |
| 4.465.299-XX | | | | | | | | | 165 | 344 | 261 | 31 | 42 | 2 |
| 4.465.300-XX | | | | | | | | | 515 | 900 | 818 | 56 | 67 | 3 |
| 4.465.268-XX | 32 | 160 | 160 | 0…30 | 24,5 | | | 400 | 410 | 573 | 498 | 33 | 40 | 1 |
| 4.465.269-XX | | | | | | | | | 110 | 377 | 322 | 23 | 30 | 2 |
| 4.465.270-XX | | | | | | | | | 515 | 880 | 805 | 48 | 55 | 3 |
| 4.465.315-XX | | 100 | 100 | | | | | 390 | 410 | 573 | 498 | 33 | 43 | 1 |
| 4.465.316-XX | | | | | | | | | 110 | 377 | 322 | 23 | 33 | 2 |
| 4.465.317-XX | | | | | | | | | 515 | 880 | 805 | 48 | 58 | 3 |
| 4.465.301-XX | | 63 | 63 | | | | | | 410 | 573 | 498 | 33 | 43 | 1 |
| 4.465.302-XX | | | | | | | | | 110 | 377 | 322 | 23 | 33 | 2 |
| 4.465.303-XX | | | | | | | | | 515 | 880 | 805 | 48 | 58 | 3 |
| 4.465.271-XX | 25 | 160 | 160 | 0…23 | 13,5 | | 230 | 352 | 410 | 540 | 473 | 32 | 38 | 1 |
| 4.465.272-XX | | | | | | | | | 135 | 287 | 220 | 13 | 19 | 2 |
| 4.465.273-XX | | | | | | | | | 515 | 865 | 798 | 38 | 44 | 3 |
| 4.465.318-XX | | 100 | 100 | | | | | | 410 | 540 | 473 | 32 | 39 | 1 |
| 4.465.319-XX | | | | | | | | | 135 | 287 | 220 | 13 | 20 | 2 |
| 4.465.320-XX | | | | | | | | | 515 | 865 | 798 | 38 | 45 | 3 |
| 4.465.304-XX | | 63 | 63 | | | | | | 410 | 540 | 473 | 32 | 39 | 1 |
| 4.465.305-XX | | | | | | | | | 135 | 287 | 220 | 13 | 20 | 2 |
| 4.465.289-XX | | | | | | | | | 515 | 865 | 798 | 38 | 45 | 3 |

**..- XX additional code assigned to specific order parameters (flow rate, bore characteristic)**

| | |
|---|---|
| Order code: | PASAR PN____ , DN_____ Code _____<br>Bundled with butt weld counter-flanges<br>to a pipe (_____×_____), steel grade_____<br>diameter thickness |

# K203 ball valve

**PN 16, 63, 160, 320**
**DN 20, 40, 50**

Manufacturer quality class: TU 25-1565.001-82

The valve's purpose is to shut down a flow in a pipeline, either manually or by remote controlled actuating mechanism.

Suitable media: natural gas, hydrocarbons, water, methanol.
Seat leakage: similar to class "VI" ANSI FCI 70-2.

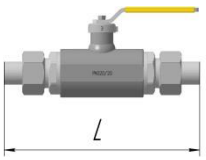



Fig. 1

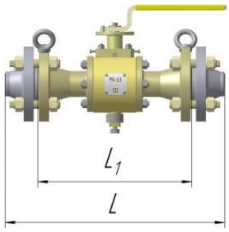



Fig. 2

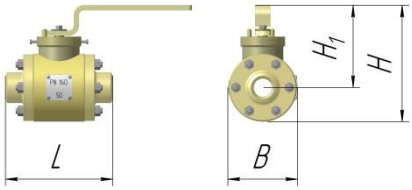



Fig. 3

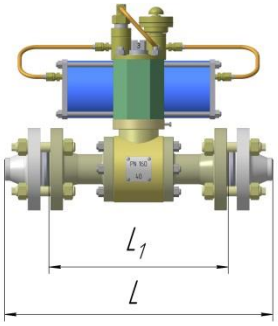



Fig. 4

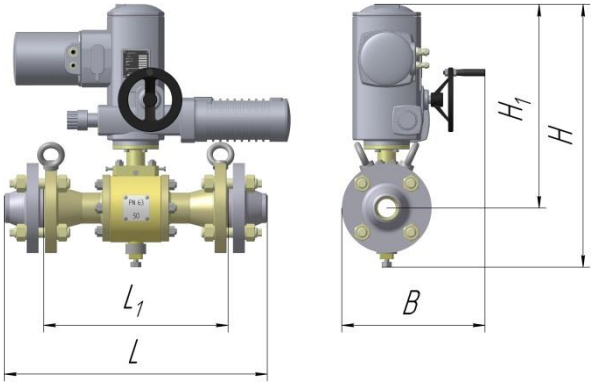



Fig. 5

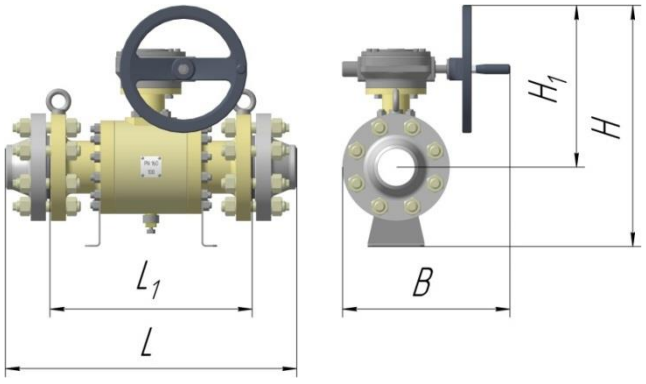



Fig. 6

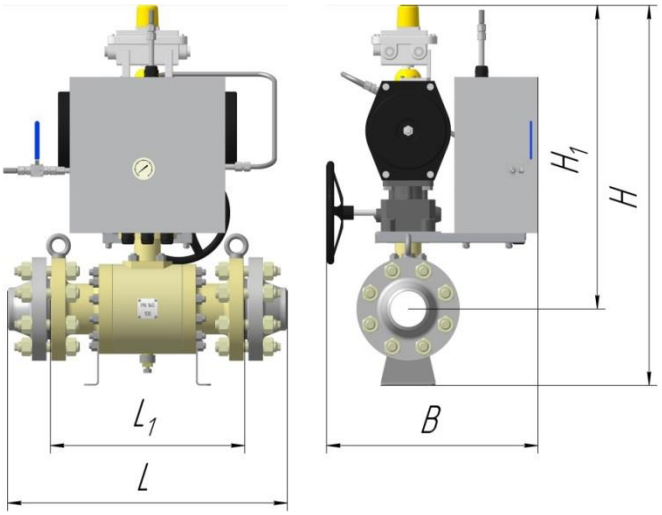



Fig. 7

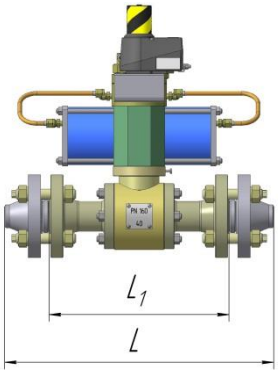



Fig. 8

**Operating parameters**

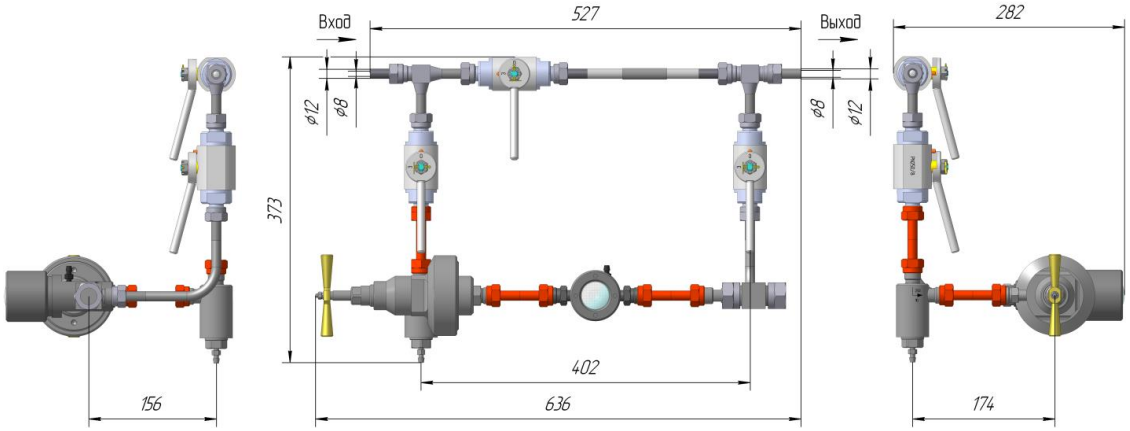
| Code | DN, mm | PN, kg/cm² | Dimensions, mm | | | | | Body weight, kg | Weight with flanged ends, kg | Actuator type | Environmental conditions | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | $L_1$ | B | H | $H_1$ | | | | | |
| 2.954.084 | 20 | 320 | 258 | 180 | 60 | 118 | 85 | 3,4 | 4 | Manual | -60°C and above | 1 |
| 2.954.031 | 40 | 160 | 540 | 360 | 300 | 410 | 420 | 52 | 65 | Piston pneumatic | -40°C and above | 4 |
| 2.954.031-01 | | | | | | 505 | | 55 | 68 | Piston pneumatic with position indication | -40°C and above | 5 |
| 2.954.056 | 50 | 16 | 350 | 260 | 160 | 300 | 185 | 20 | 26 | Manual | -60°C and above | 2 |
| 2.954.057 | | | | | 272 | 510 | 400 | 34 | 40 | Electric | -60°C and above | 5 |
| 2.954.047 | | 63 | 513 | 360 | 175 | 300 | 185 | 26 | | Manual | -60°C and above | 2 |
| 2.954.049 | | | | | 280 | 510 | 400 | 42 | 60 | Electric | -60°C and above | 5 |
| 2.954.078 | | 160 | 530 | | 195 | 300 | 185 | 31 | 50 | Manual | -60°C and above | 2 |
| 2.954.046 | | | | | 290 | 510 | 400 | 46 | 65 | Electric | -60°C and above | 5 |
| 2.954.063 | | | 210 | — | 137 | 230 | 160 | 17 | — | Manual | -60°C and above | 3 |
| 2.954.055 | | | 545 | 360 | 315 | 425 | 185 | 56 | 76 | Piston pneumatic | -40°C and above | 4 |
| 2.954.055-02 | | | | | | 537 | 400 | 59 | 79 | Piston pneumatic with position indication | -40°C and above | 8 |
| 2.954.050 | 80 | 63 | 630 | 430 | 325 | 580 | 435 | 90 | 115 | Electric | -60°C and above | 5 |
| 2.954.051 | | 160 | 665 | | 335 | 590 | | 93 | 130 | | | |
| 2.954.080 | 100 | 63 | 673 | 500 | 550 | 600 | 470 | 130 | 165 | | | |
| 2.954.080-01 | | | 657 | | | | | 125 | 160 | | | |
| 2.954.083 | | 160 | 720 | 500 | 540 | 975 | 780 | 163 | 213 | Piston pneumatic | -60°C and above | 7 |
| 2.954.081 | | | | | 415 | 535 | 400 | 120 | 170 | Manual (Reduction drive) | -60°C and above | 6 |
| 2.954.081-01 | | | 750 | | | | | | 173 | | | |
| 2.954.045 | | | | | 365 | 640 | 510 | 133 | 184 | Electric | -60°C and above | 5 |
| 2.954.045-01 | | | 720 | | | | | | 181 | | | |
| **Valves for a medium containing up to 0.3% of $H_2S$ and 3% CO2, methanol, water and mechanical impurities with temperature from -40°C to +50°C** | | | | | | | | | | | | |
| 2.954.086-02 | 40 | 160 | 520 | 360 | 200 | 545 | 430 | 32 | 44 | Piston pneumatic with position indication | -40°C and above | 8 |
| 2.954.056-01 | 50 | 16 | 350 | 260 | 160 | 300 | 185 | 20 | 26 | Manual | -40°C and above | 2 |
| 2.954.057-01 | | | | | 272 | 510 | 400 | 34 | 40 | Electric | -40°C and above | 3 |
| 2.954.047-01 | | 63 | 513 | 360 | 175 | 300 | 185 | 26 | | Manual | -40°C and above | 2 |
| 2.954.049-01 | | | | | 280 | 510 | 400 | 42 | 60 | Electric | -40°C and above | 3 |
| 2.954.078-01 | | 160 | 530 | | 195 | 300 | 185 | 31 | 50 | Manual | -40°C and above | 2 |
| 2.954.046-01 | | | | | 290 | 510 | 400 | 46 | 65 | Electric | -40°C and above | 3 |
| 2.954.055-01 | | | 545 | | 315 | 425 | 325 | 56 | 76 | Piston pneumatic | -40°C and above | 4 |
| 2.954.055-03 | | | | | | 537 | 420 | 59 | 79 | Piston pneumatic with position indication | -40°C and above | 8 |

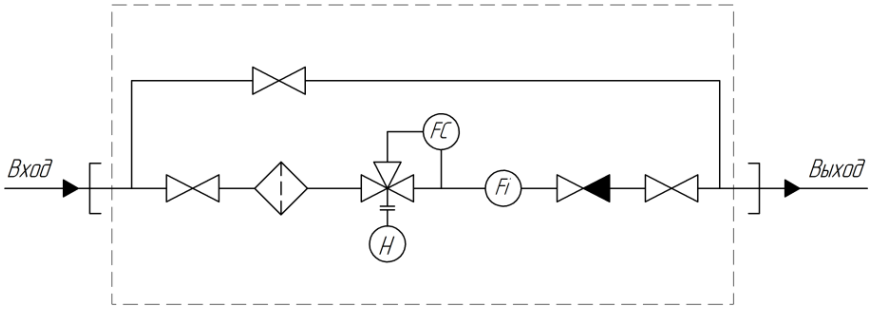
| | |
|---|---|
| Order code: | K203 BV PN____ , DN_____ Code _____<br>Bundled with butt weld counter-flanges<br>to a pipe (_____×_____), steel grade_____<br>diameter thickness |

# BRM1 3.620.065, BRM2 3.620.065-01
# Chemical injection systems

**PN 250**
**DN 8**

The system maintains a constant flow rate of methanol to an injection point.




## Operating parameters

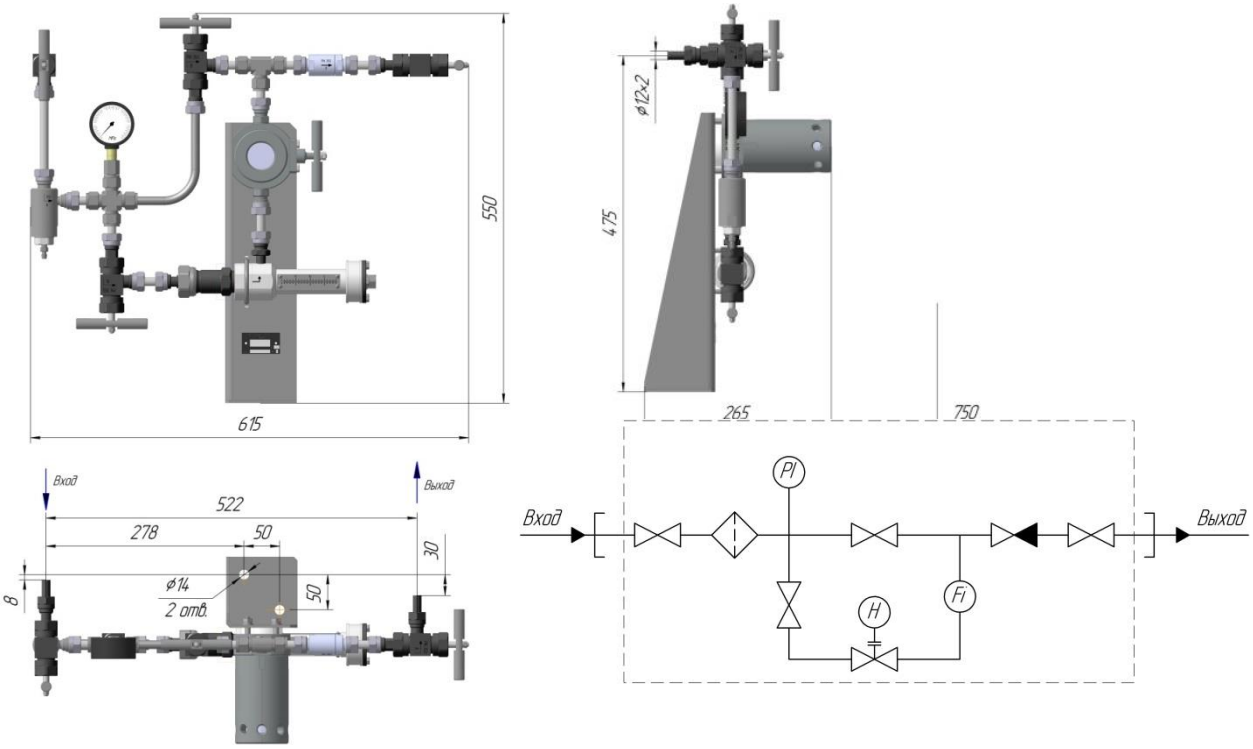
| | | | |
|---|---|---|---|
| PN, MPa | | 25 | |
| DN, mm | | 8 | |
| ΔP, MPa | | 6 or less | |
| Flow rate precision, % | | ± 6 | |
| | | BRM1 3.620.065 | BRM2 3.620.065-01 |
| Flow rate, l/hour, w/choke size: | Ø 1,5 mm | | |
| | Ø 2,5 mm | 10 - 70 | 30 - 200 |
| Control valve | | Normally open | Normally closed |
| Weight, kg | | 10,4 | 11 |
| Flow rate monitoring | | Visual | |
| Operating media | | Methanol | |
| Media temperature range | | -50 to +50 °C | |
| Ambient temperature range | | -60 to +50 °C | |
| Control type | | Manual | |

| | |
|---|---|
| Order codes: | BRM1 (PN 250, DN 8) 3.620.065 |
| | BRM2 (PN 250, DN 8) 3.620.065-01 |

# BRM5 2.390.904 chemical injection system

**PN 250**
**DN 8**

BRM5 is a manual flow rate control system for methanol injection lines.




## Operating parameters

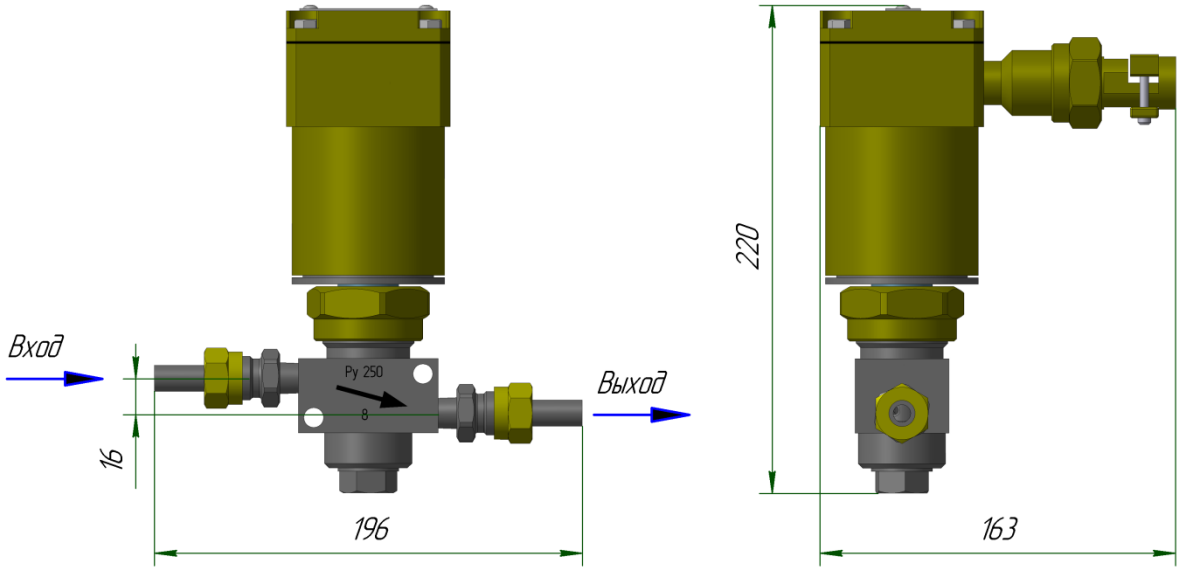
| | | |
|---|---|---|
| PN, MPa | 25 | |
| DN, mm | 8 | |
| ΔP, MPa | 2,5 or less | |
| Flow rate monitoring | Visual | |
| Flow rate precision, % | ± 6 | |
| | flow rate with ΔP =0,5 MPa, l/hour | flow rate with ΔP =2,5 MPa, l/hour |
| BRM 5 2. 390.904 | 22 – 75 | 42 – 170 |
| BRM 5 2. 390.904-01 | 42 – 170 | 90 – 380 |
| BRM 5 2. 390.904-02 | 72 – 300 | 155 – 675 |
| BRM 5 2. 390.904-03 | 15 – 50 | 30 – 110 |
| Control type | Manual | |
| Operating media | Methanol | |
| Media temperature range, °C | -50 to +50 °C | |
| Ambient temperature range, °C | -60 to +50 °C | |
| Weight, kg | 12 | |

| | |
|---|---|
| Order code: | BRM5 (PN 250, DN 8) 2.390.904 |

# KC 2501 4.465.128 solenoid valve

**PN 275**
**DN 8**

The valve controls methanol flow rate by on/off method.
Explosion-proof class 1ExdIIBT4.




## Operating parameters

| | | | |
|---|---|---|---|
| PN, MPa | 27,5 | | |
| DN, mm | 8 | | |
| ΔP, MPa | 2,5 | | |
| Choke size, mm | Standard | Accessory | |
| | 1,5 | 2,0 | 2,5 |
| Kv, l/hour | 61,2 | 110 | 170 |
| Control input | Discrete DC 24V signal, 0,8 A | | |
| Operating media | methanol | | |
| Media temperature range | -50 to +50 °C | | |
| Ambient temperature range | -50 to +50 °C | | |
| Weight, kg | 4,5 | | |

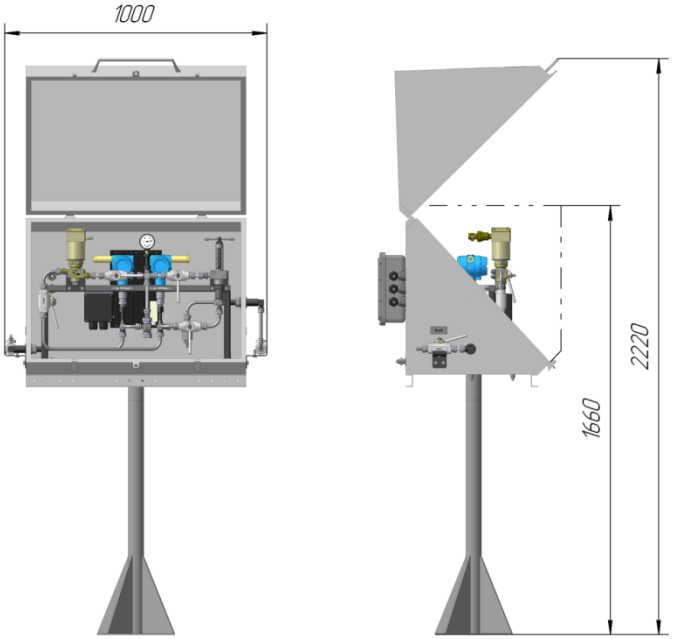
The valve comes with standard (installed) choke and accessory chokes. Mounting parts are included.

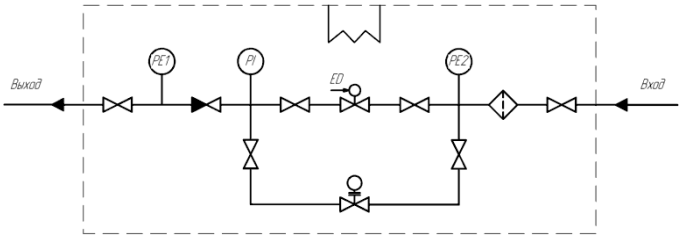
| | |
|---|---|
| Order code: | KC2501 (PN 275, DN 8) 4.465.128 solenoid valve |

# BRM4 2.391.110 chemical injection system

**PN 250**
**DN 8**

BRM4 is an automatic and manual flow rate control system for methanol injection lines, featuring a thermo-insulated cabinet with electric heating.




## Operating parameters

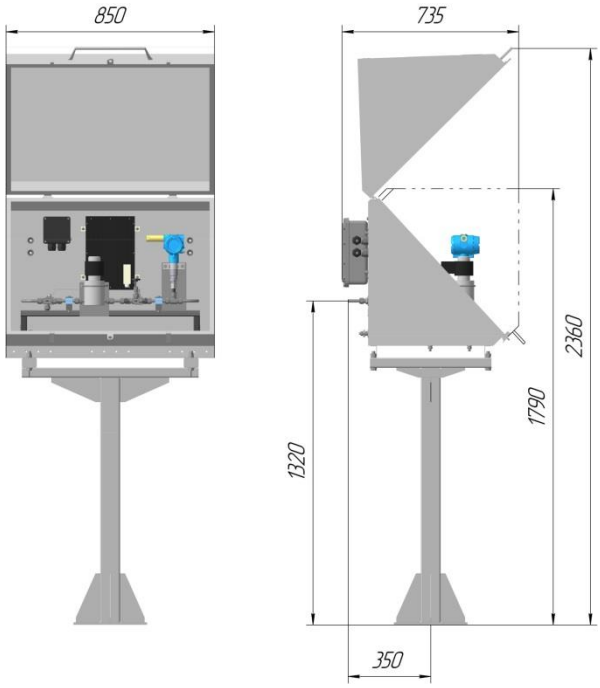
| | |
|---|---|
| PN, MPa | 25 |
| DN, mm | 8 |
| ΔP, MPa | 0,5 to 2,5 MPa |
| Kv, l/hour | 61,2 |
| Flow rate, automatic control | 1 to 300 l/hour |
| Flow rate, manual control | 15—160 l/hour |
| Operating media | Methanol |
| Media temperature range | -50 to +50 °C |
| Ambient temperature range | -60 to +50 °C |
| Control valve<br>- automatic<br>- manual | <br>KC2501 solenoid valve (1ExdIIBT4)<br>Set of chokes |
| Control input | Discrete DC 24V signal, 0,8 A |
| Electric heater | AC 220V; 0,3 kW; 50 Hz |
| Weight, kg | 120 |

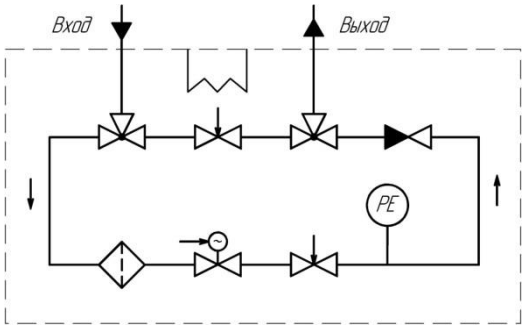
Equipped with METRAN pressure gauges: 150TG54 (0…16 MPa) 2 G 2 1 A EM LT K14 PA, output: 4—20 mA.

| | |
|---|---|
| Order code: | BRM4 (PN 250, DN 8) 2.391.110 |

# BUUM 2.390.905-01 chemical injection system

**PN 320**
**DN 8**




## Operating parameters

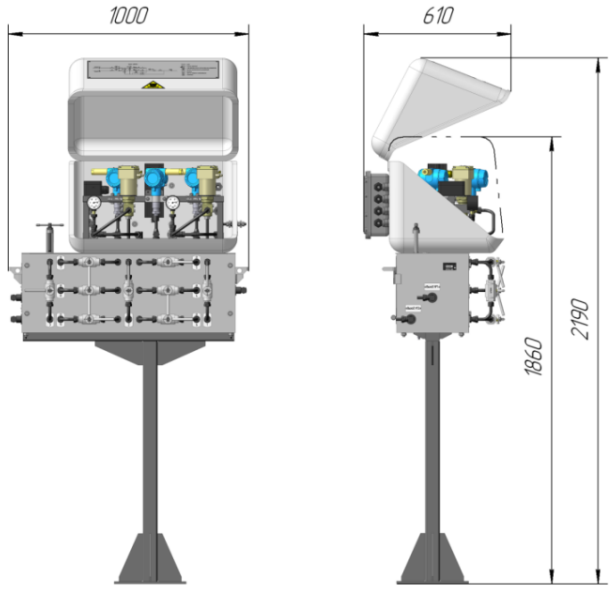
| | | |
|---|---|---|
| PN, MPa | 32 | |
| DN, mm | 8 | |
| Kv, м³ /ч | 0,035 | |
| ΔP, MPa | 32 | |
| Operating media | Methanol | |
| Number of injection points | 1 | |
| Control valve | GSR solenoid valve (Ex II 2G Ex e mb II T4) | |
| | Precision choke | |
| Control input | Discrete DC 24V signal | |
| | Cabinet | Cabinet with pedestal |
| Weight, kg | 86 | 120 |
| Media temperature range | -50 to +50 °C | |
| Ambient temperature range | -60 to +50 °C | |
| Electric heater | AC 220V, 50 Hz, 0,3 kW | |

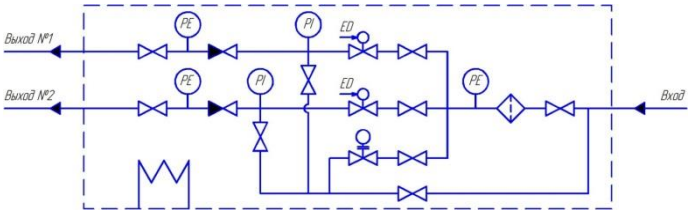
| | |
|---|---|
| Order code: | BUUM (PN 320, DN 8) 2.390.905-01 |

# BRM4 2.391.081 chemical injection system

**PN 250**
**DN 8**

BRM4 is an automatic and manual flow rate control system for methanol injection lines.




## Operating parameters

| | | |
|---|---|---|
| PN, MPa | 25 | |
| DN, mm | 8 | |
| Number of injection points | 2 | |
| ΔP, MPa | 0,5 to 2,5 | |
| Kv, l/hour | 61,2 | |
| Flow rate, automatic control | 1 to 300 l/hour | |
| Flow rate, manual control | 15 to 160 l/hour | |
| Operating media | Methanol | |
| Media temperature, °C | -50 to +50 °C | |
| Ambient temperature range, °C | -60 to +50 °C | |
| Control valve:<br>- automatic<br>- manual | <br>KC2501 solenoid valve (1ExdIIBT4)<br>Set of chokes | |
| Control input | Discrete DC 24V signal, 0,8 A | |
| Electric heater power | AC 220V; 0,3 kW; 50 Hz | |
| | Cabinet | Cabinet with pedestal |
| Weight, kg | 110 | 130 |

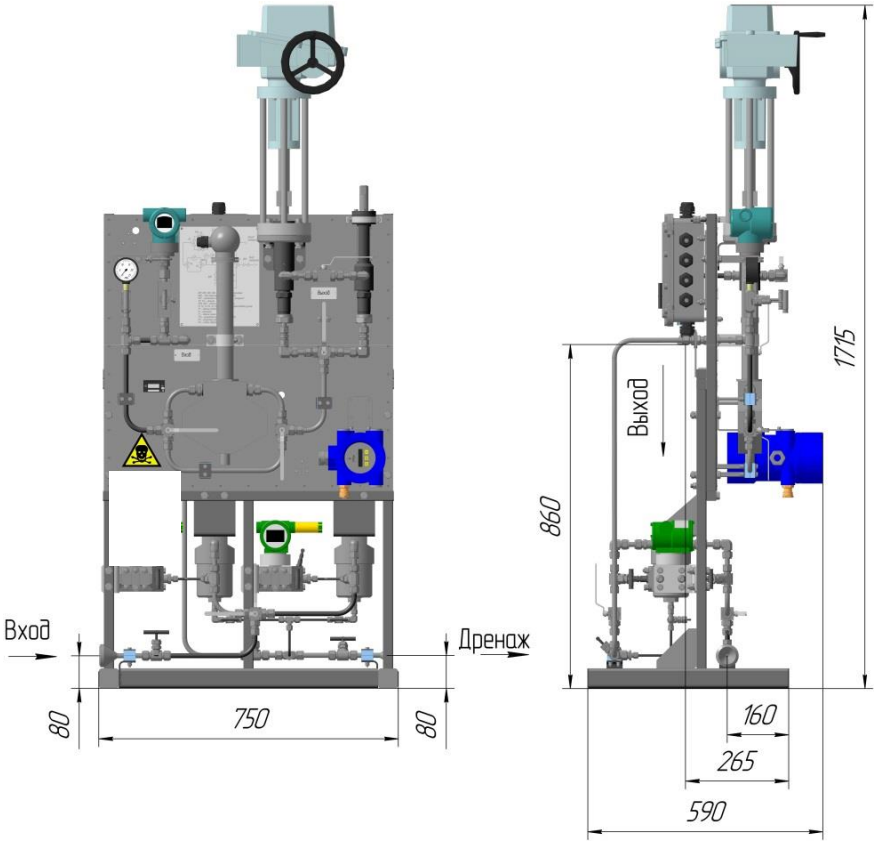
Equipped with METRAN pressure gauges 150TG54 (0…16 MPa) 2 G 2 1 A EM LT K14 PA, output 4—20 mA

| | |
|---|---|
| Order code: | BRM4 (PN 250, DN 8) 2.391.081 |

# BRM4 2.391.158 chemical injection system

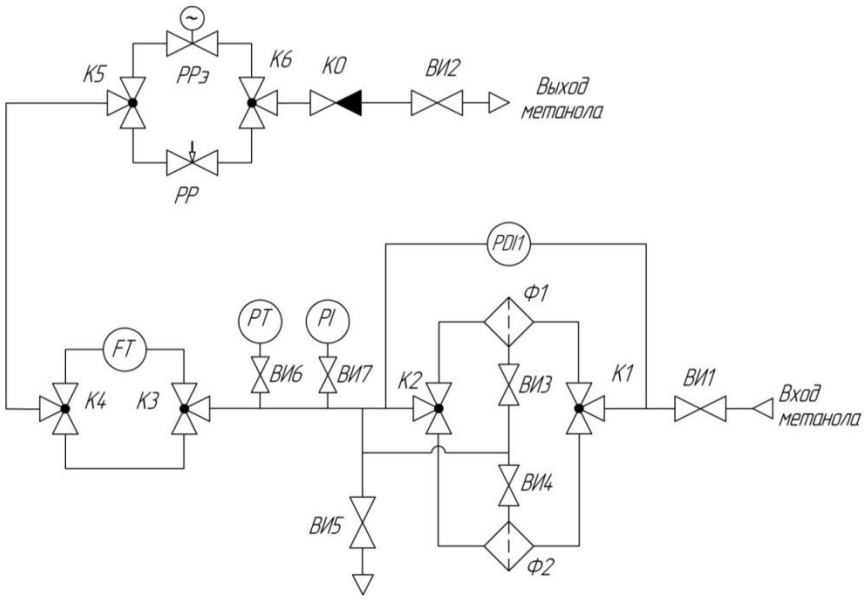
**PN 250**
**DN 8**

BRM4 is an automatic and manual flow rate control system for methanol injection lines.




## Operating parameters

| | |
|---|---|
| PN, MPa | 25 |
| DN, mm | 8 |
| Flow rate, l/hour | On demand |
| ΔP, MPa | 0,5 – 3,0 |
| Operating media | Methanol |
| Environment temperature | -40 to +45 °C |
| Media temperature, °C | -50 to +45 °C |
| Control valve | Set of chokes with ST1-Ex REGADA 411 electric actuator |
| Flow meter | Coriolis-type |
| Gauges power | DC 24V |
| Actuator power | AC 220V, 50 Hz |
| Dimensions, mm | 800×527×1714 |
| Weight, kg | 100 |



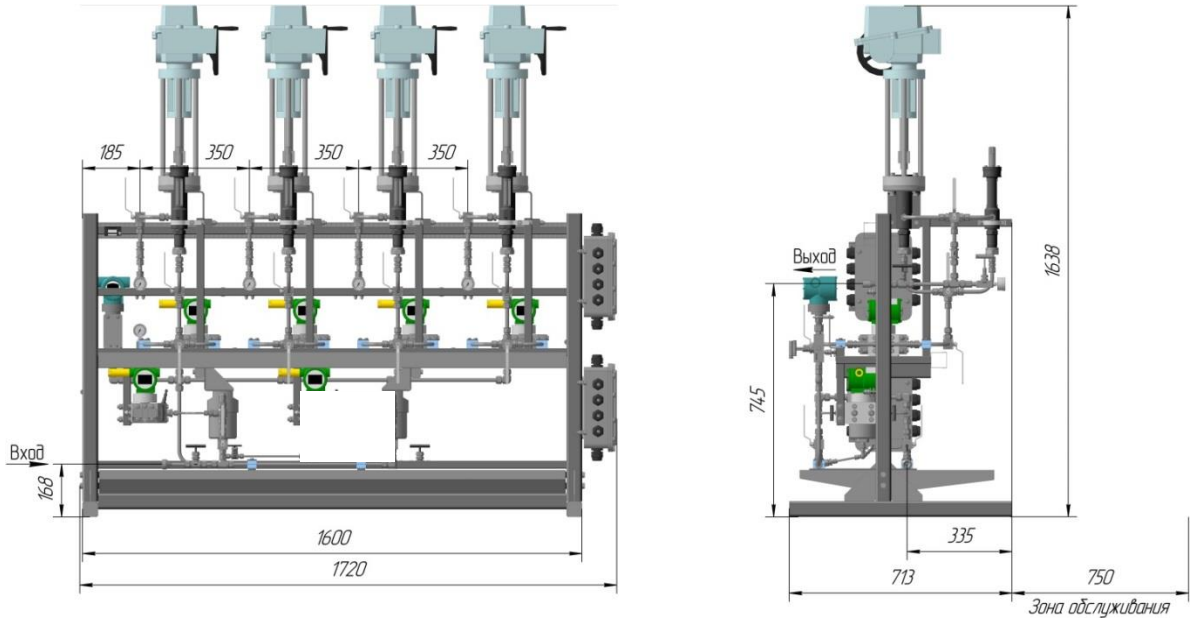

| Code | Description | Qty |
|---|---|---|
| ВИ1, ВИ2, ВИ5 | Isolation valve | 3 |
| ВИ3, ВИ4, | Isolation valve | 2 |
| ВИ6 | Excess pressure gauge isolation valve | 1 |
| ВИ7 | Manometer isolation valve | 1 |
| К1…К6 | 3-Way Valve | 6 |
| КО | Check valve | 1 |
| РР | Manual control valve | 1 |
| РРэ | Automatic control valve | 1 |
| Ф1, Ф2 | Filter | 2 |
| PDI1 | Pressure drop gauge | 1 |
| PT | Excess pressure gauge | 1 |
| FT | Coriolis-type flow meter | 1 |
| PI | Manometer | 1 |

| | |
|---|---|
| Order code: | BRM4 (PN 250, DN 8) 2.391.158 |

# ING5 2.391.159 chemical injection system

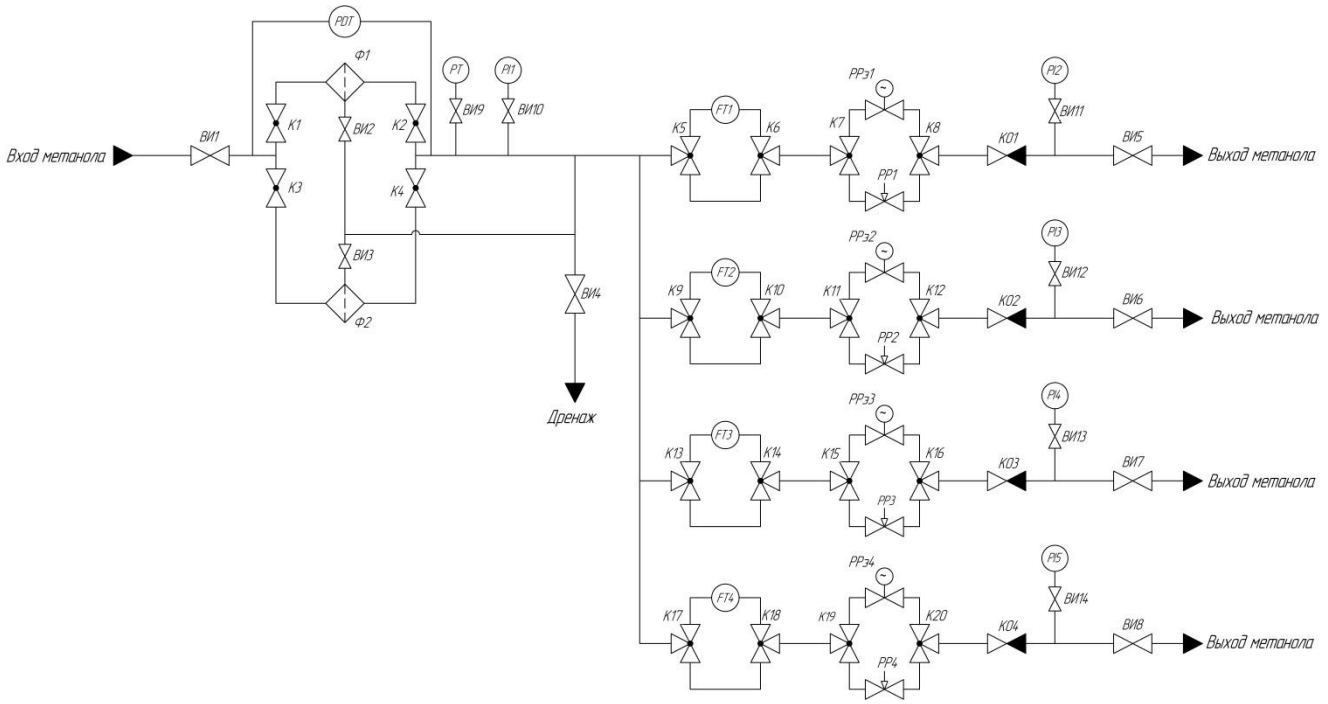
**PN 160**
**DN 8**

ING5 is an automatic flow rate control system for methanol injection lines




## Operating parameters

| | |
|---|---|
| PN, MPa | 16 |
| DN, mm | 8 |
| Hydraulic test MAX pressure, MPa | 16 |
| Flow rate, l/hour | on demand |
| Number of injection points | 4 |
| ΔP, MPa | 0,5 - 3,0 |
| Operating media | methanol |
| Environment temperature range | -40 to +45°C |
| Media temperature range | -40 to +45°C |
| Control valve | Set of chokes with ST1-Ex REGADA 411 electric actuator |
| Flow meter | EJX115A |
| Gauges power | DC 24V |
| Actuator power | AC 220V, 50 Hz |
| Dimensions, mm | 1720×714×1638 |
| Weight, kg | 238 |



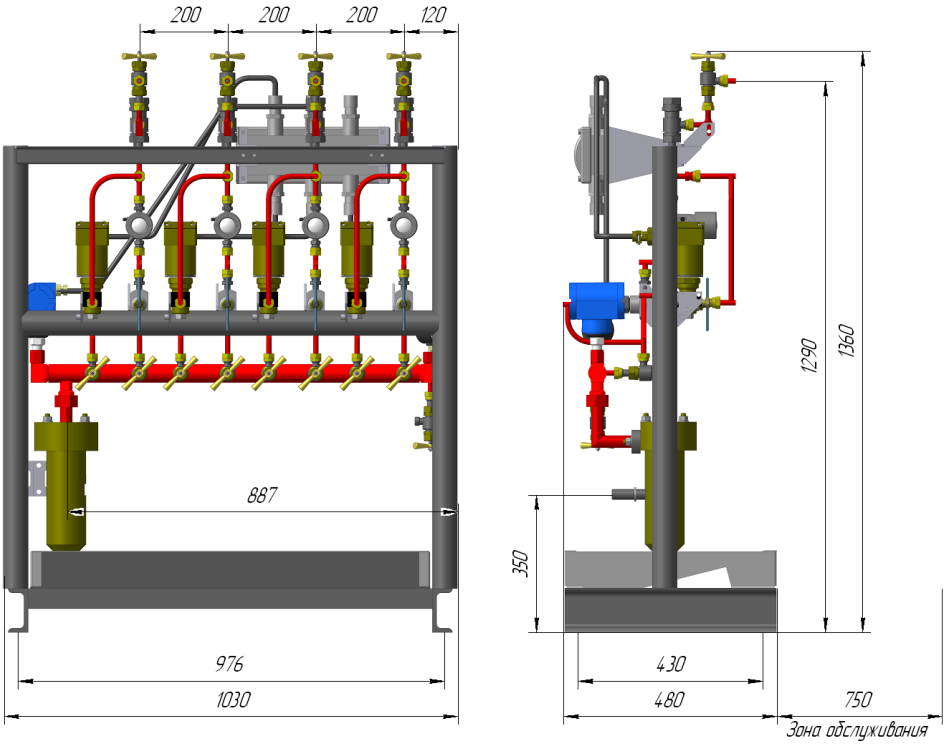

| Code | Description | Qty |
|---|---|---|
| ВИ1, ВИ4 | Isolation valve | 2 |
| ВИ2, ВИ3 | Isolation valve | 2 |
| ВИ5…ВИ8 | Isolation valve | 4 |
| ВИ9 | Pressure gauge isolation valve | 1 |
| ВИ10…ВИ14 | Manometer isolation valve | 5 |
| К1…К4 | Ball valve | 4 |
| К5…К20 | 3-way valve | 16 |
| КО1…КО4 | Check valve | 4 |
| РР1…РР4 | Manual control valve | 4 |
| РРэ1…РРэ4 | Automatic control valve | 4 |
| Ф1, Ф2 | Filter | 2 |
| РОТ1 | Pressure drop gauge | 1 |
| РТ | Excess pressure gauge | 1 |
| FT1…FT4 | Flow meter EJX115A | 4 |
| РІ 1…РІ 5 | Manometer DM-3-40-T (0-250) kgs/cm2 , KL.1,5 1/4NPT | 5 |

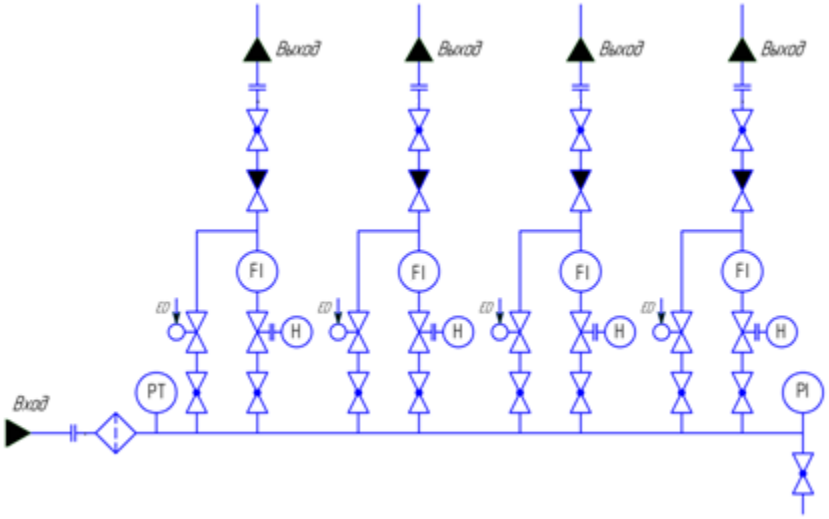
| | |
|---|---|
| Order code: | ING5 (PN 160, DN 8) 2.391.159 |

# ING5A 2.390.989 chemical injection system

**PN 250**
**DN 8**

ING5 is an automatic flow rate control system for methanol injection lines. The initial flow rate of the inhibitor is to be set manually, while automatic control circuit increases the flow rate by opening solenoid valves.



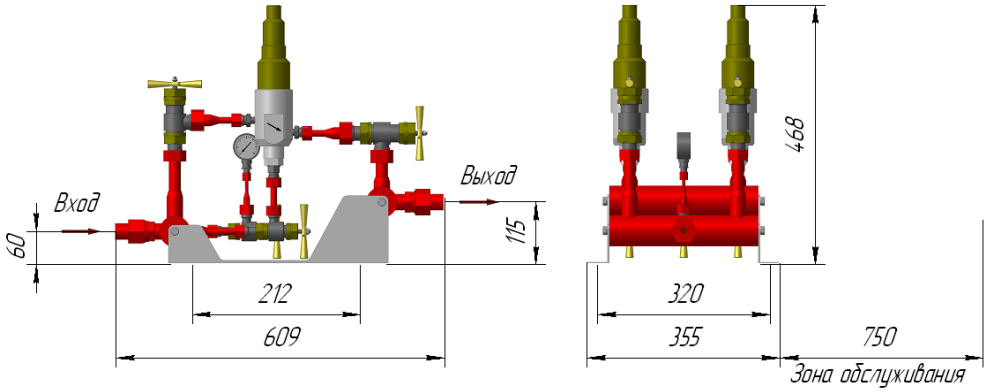
## Operating parameters

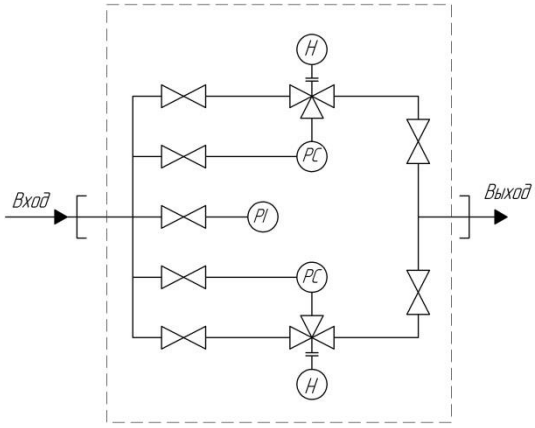
| | | |
|---|---|---|
| PN: | | 25 MPa |
| DN, inlet<br>DN, outlet | | 20 mm<br>8 mm |
| ΔP | | 2,5 MPa |
| Flow rate, manual control | | 10…70 l/hour |
| Flow rate, automatic control | | 1-300 l/hour |
| Flow rate monitoring | Remote | Calculated |
| | Local | Flow meter |
| Pressure gauge | | Metran 150TG5 (0…25 MPa), output 4—20 mA |
| Number of injection points: | | 4 |
| Valve control | | Discrete DC 24V; 0,8 A |
| Operating media: | | Methanol |
| Media temperature range: | | −50…+50 °C |
| Ambient temperature range: | | −50…+50 °C |
| Weight: | | 90 kg |

| | |
|---|---|
| Order code: | ING5A 2.390.989 |

# BRDD (-1, -2) 2.359.002 (-01, -02) pressure control module

The unit is a back-pressure valve module, designed to maintain a constant upstream pressure.




## Operating parameters

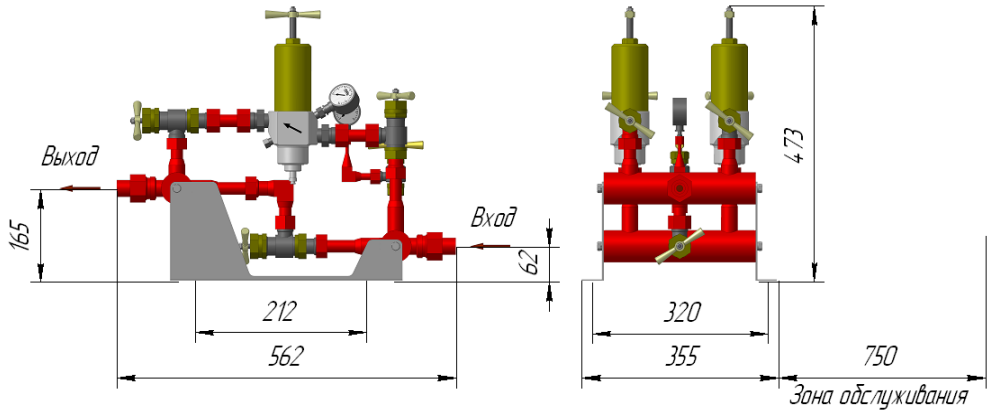
| | BRDD 2.359.002 | BRDD 2.359.002-01 | BRDD 2.359.002-02 |
|---|---|---|---|
| PN, MPa | 32 | 16 | 10 |
| Controlled pressure range, MPa | 5 to 32 | 2 to 16 | 0,5 to 10 |
| Pressure control precision | 10% | | |
| Operating media | Methanol | | |
| Flow rate, l/hour | 2500 | | |
| Media temperature range | -50 to +50 °C | | |
| Ambient temperature range | -50 to +50 °C | | |
| Weight, kg | 16 | | |

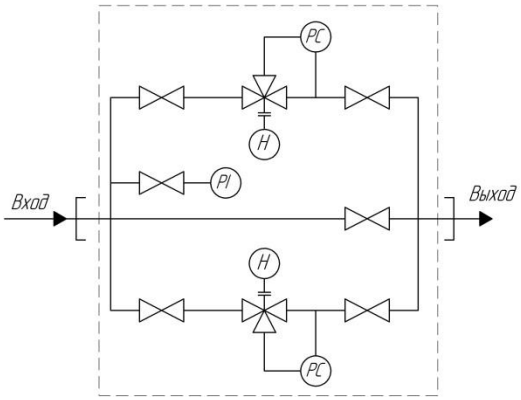
| | |
|---|---|
| Order codes: | BRDD (PN 320, DN 25) 2.359.002 |
| | BRDD-1 (PN 160, DN 25) 2.359.002-01 |
| | BRDD-2 (PN 100, DN 25) 2.359.002-02 |

# BRDP (-1, -2) 2.359.003 (-01, -02) pressure control module

### DN25

The unit is a pressure-reducing valve module, designed to maintain a constant downstream pressure.



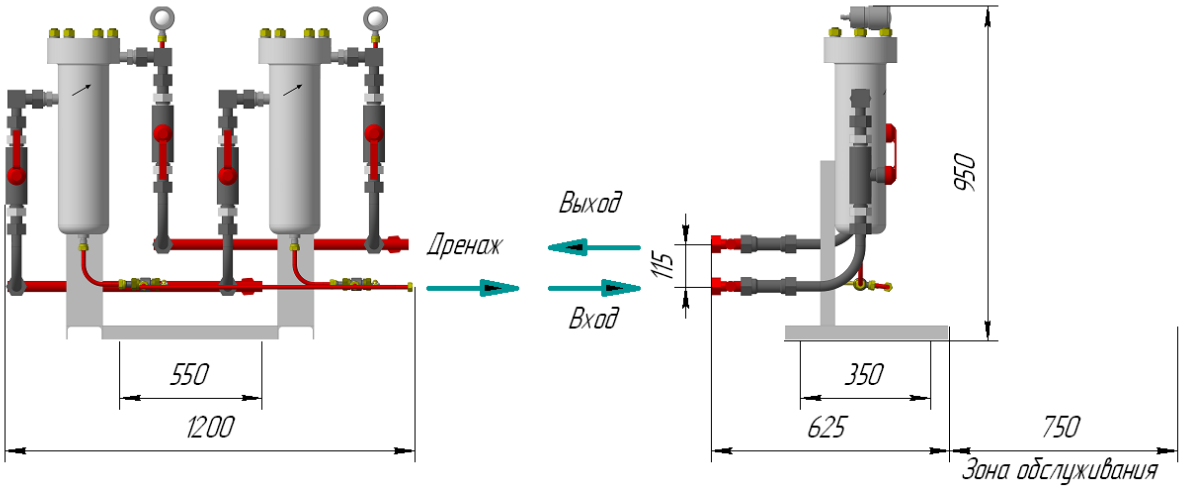

## Operating parameters

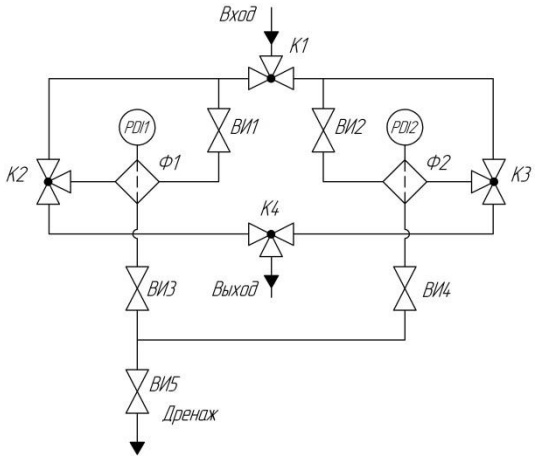
| | BRDP 2.359.003 | BRDP 2.359.003-01 | BRDP 2.359.003-02 |
|---|---|---|---|
| PN, MPa | 32 | 16 | 10 |
| Controlled pressure range, MPa | 5 to 32 | 2 to 16 | 0,5 to 10 |
| Pressure control precision | 10% | | |
| Operating media: | Methanol | | |
| Flow rate, l/hour | 2500 | | |
| Media temperature range | -50 to +50 °C | | |
| Ambient temperature range | -50 to +50 °C | | |
| Weight, kg | 18 | | |
| Junction type | Weld end tube Ø30x5mm | | |

| | |
|---|---|
| Order codes: | BRDP (PN 320, DN 25) 2.359.003 |
| | BRDP-1 (PN 160, DN 25) 2.359.003-01 |
| | BRDP-2 (PN 100, DN 25) 2.359.003-02 |

# BF methanol filter module 2.966.032

**PN 320**
**DN 20**




## Operating parameters

| | |
|---|---|
| PN | 32 MPa |
| DN | 20 mm |
| Number of filters | 2 |
| Operating media | methanol |
| Nominal filtration rating | 30 µm |
| Filer maintenance | Water washable |
| Media temperature range | -50 to +50 °C |
| Ambient temperature range | -60 to +50 °C |
| Weight, kg | 240 |

| | |
|---|---|
| Order code: | BF (PN 320, DN 20) 2.966.032 |

# CSM compact cyclonic separator

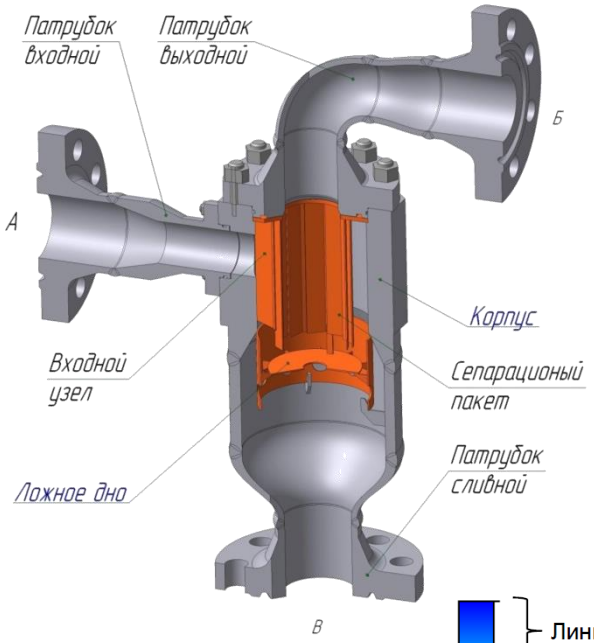
CSM is a relatively compact cyclonic (centrifugal) separator, featuring:

- high quality separation of liquids and solids from natural gas;
- high productivity with a compact design;
- water surge withstand capability (up to 100% of water at inlet);
- ability to be installed inside a building or under a roof;
- low pressure drop: 0.01 to 0.02 MPa.

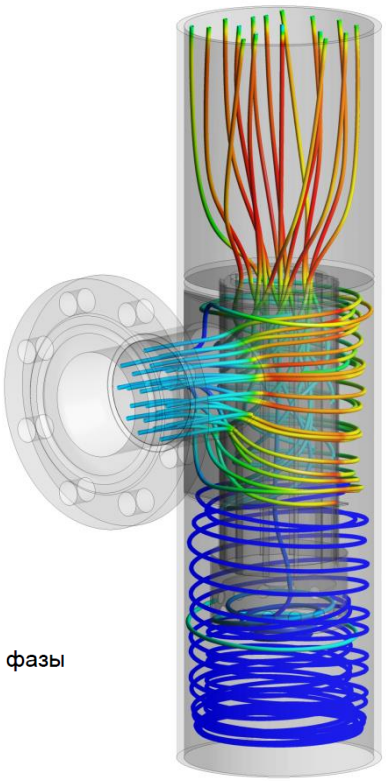
## Operating parameters

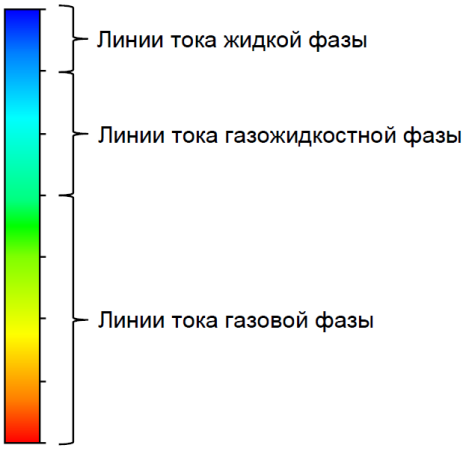
| | |
|---|---|
| PN: | Up to 16 MPa |
| Operating media: | Gas contaminated with fluid and solid impurities |
| Nominal productivity (as demanded): | 1 000 to 10 000 000 $Sm^3$/day |
| Effective separation in range: | 35 to 290 % of nominal productivity |
| Media temperature range: | −50…+50 °C |
| Environment temperature range: | −60…+40 °C |
| Amount of liquid at outlet | Less than 8 mg/$Sm^3$ |
| ΔP: | 0,02 MPa or less |

## Schematic view

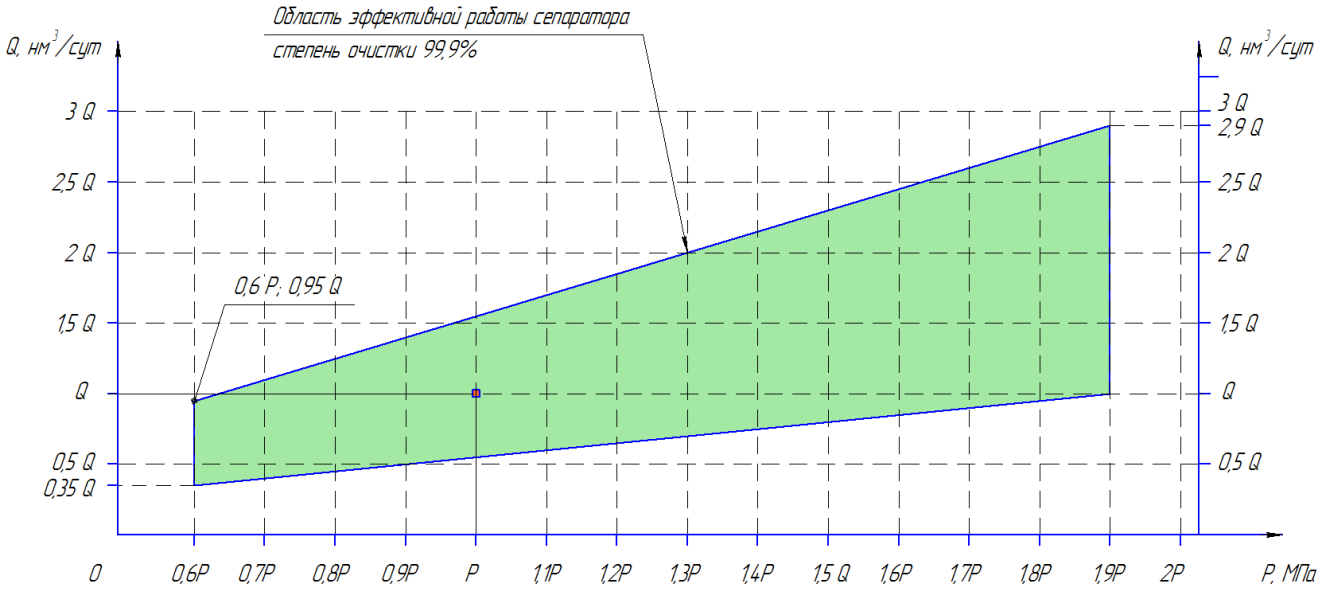



## Phases distribution






## Effective separation area




*P – рабочее давление процесса на входе в сепаратор, МПа;*

*Q – рабочий объемный расход на входе в сепаратор, нм³/сут.;*

We have successfully shipped our separators to:

- East-Tarkosalinskoye gas field (September 2011);
- Samburg oil and gas-condensate field (August 2012);
- Zapolyarnoye oil and gas-condensate field (September 2012);
- Zapolyarnoye oil and gas-condensate field (October 2012);

We can offer a CSM separator with any type of additional equipment, such as water tank, pipelines, control valves and gauges.

To order a CSM, please fill an input form in addendum.

# Addendum

«___»_____20____

OOO «Promavtomatika-Sarov»
607188, Nizhegorodskaya obl.
Sarov, Yuzhnoe shosse, 26/39
Phone: (83130) 6-90-09, fax (83130) 6-90-10
(861) 279-48-00

## Pre-assembled pipeline unit data input form №_____

### 1. General information

| | |
|---|---|
| Name | |
| Company | |
| Gas field or facility of application | |
| Project company | |
| Contacts | |

### 2. PPU requirements

| Required options | Value | | | |
|---|---|---|---|---|
| Outlet for a flare system | yes | ☐ | no | ☐ |
| Remote shut down possibility | | | | |
| Chemical injection to an annulus | | | | |
| Flow meter bypass | | | | |
| Drainage | | | | |
| Pipe material | | | | |

### 3. Gas wells characteristics (please fill several tables with yearly data for better engineering calculations).

| Parameter | Well 1 | Well 2 | Well 3 | Well 4 | Well 5 | Well 6 | Well 7 |
|---|---|---|---|---|---|---|---|
| Static pressure, MPa | | | | | | | |
| Wellhead working pressure, MPa | | | | | | | |
| Daily averaged produced volumes, $nm^3$x1000 | | | | | | | |
| Water cut, % | | | | | | | |
| Solid contaminants, $mg/m^3$ | | | | | | | |
| Gas temperature, °C | | | | | | | |
| Annular gas temperature, °C | | | | | | | |
| Flowing tubing pressure, MPa | | | | | | | |

### 4. Environmental conditions

| Parameter | Value |
|---|---|
| Environment temperature, °C | |
| − minimal | |
| − lowest 5-day average | |
| Average humidity, % | |
| − in January | |
| − in July | |
| Required seismic performance, $M_L$ | |
| Average yearly precipitation, mm | |

### 5. Data measurement and display

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Electric power available at wells | yes | ☐ | | | no | ☐ | | |
| Flow meter required (Flow meter type) | yes | ☐ | | | no | ☐ | | |
| **Required measurements** | | | | | | | | |
| **Measurements** | **Upstream** | | | | **Downstream** | | | |
| Pressure by local gauge | yes | ☐ | no | ☐ | yes | ☐ | no | ☐ |
| Pressure by remote gauge/display | yes | ☐ | no | ☐ | yes | ☐ | no | ☐ |
| Temperature by local gauge | yes | ☐ | no | ☐ | yes | ☐ | no | ☐ |
| Temperature by remote gauge/display | yes | ☐ | no | ☐ | yes | ☐ | no | ☐ |
| Flow meter data remote display | yes | ☐ | no | ☐ | yes | ☐ | no | ☐ |

## 6. Gas components

| № | Component | % (by molar mass) |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |
| 16 | | |
| 17 | | |
| 18 | | |
| Gas density (kg/Sm³) | | |

## 7. Additional information:

Filled by

(name) (signature) (job title)

«___»_____20____г.

ООО «Promavtomatika-Sarov»
607188, Nizhegorodskaya obl.
Sarov, Yuzhnoe shosse, 26/39
Phone: (83130) 6-90-09, fax (83130) 6-90-10
(861) 279-48-00

## Separator data input form №_____

### 1. General information

| | |
|---|---|
| Name | |
| Site or facility of application | |
| Company | |
| Contacts | |

### 2. Environmental conditions

| | | | |
|---|---|---|---|
| 1 | Environment temperature variation | Diurnal (daily) | |
| | | Seasonal (yearly) | |
| 2 | Required seismic performance, $M_L$ | | |
| 3 | Wind loads zone | | |
| 4 | Corrosion rate, mm/y | | |

### 3. Requirements

| | | | |
|---|---|---|---|
| 5 | Number of separators required | | |
| 6 | Installation site | | |
| 7 | Working pressure variation, MPa | | |
| 8 | Gas components, % | | |
| 9 | Daily media temperature variation | | |
| 10 | Well productivity variation | | |
| 11 | Water cut variation, % | | |
| 12 | Gas phase density | | |
| 13 | Liquid phase density | | |
| 14 | Solid contaminants presence, grain size and concentration at separator inlet | | |
| 15 | Required life cycle, years | | |
| 16 | Acceptable effectiveness of separation in a plug flow mode, % | | |
| 17 | Vessel for separated liquid is required | yes | ☐ |
| | | no | ☐ |
| 18 | Separated liquid monitoring and disposal | manual | ☐ |
| | | automatic | ☐ |
| 19 | Acceptable liquid disposal rate, times/hour | | |
| 20 | Pressure in liquids disposal pipeline | | |
| 21 | Electric power available at the site of installation (_____V, _____Hz) | yes | ☐ |
| | | no | ☐ |

| | | | |
|---|---|---|---|
| 22 | Compressed air available at the site of installation | yes | ☐ |
| | | no | ☐ |
| 23 | Separator duty cycles | periodic | ☐ |
| | | continuous | ☐ |
| 24 | Separator heating or cooling is required | | |
| 25 | Electric heating/cooling mode | manual | ☐ |
| | | automatic | ☐ |
| 26 | Electric heating/cooling triggers by | media temperature | ☐ |
| | | ambient temperature | ☐ |
| 27 | Control station distance from a separator, m | | |
| 28 | Control cabinet mounting | wall-mounted | ☐ |
| | | floor-mounted | ☐ |
| 29 | Requirement to transfer control cabinet inputs to a higher level control station (ACS). (indicate signal types and quantity) | yes | ☐ |
| | | no | ☐ |
| 30 | Required explosion protection | | |
| 31 | Counter flanges are required | yes | ☐ |
| | | no | ☐ |
| 32 | Ladders and service platforms are required | yes | ☐ |
| | | no | ☐ |
| 33 | Safety relief valve is required | yes | ☐ |
| | (if “yes”, indicate safe pressure value) | no | ☐ |
| 34 | A set of blind flanges is requires (to perform a hydraulic test) | yes | ☐ |
| | | no | ☐ |

### 4. Additional information:

Filled by

(name) (signature) (job title)

## Contacts

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| | |
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