

# Accumulator stations

## Type ABSBG

**RE 50136**

Edition: 2019-01

Replaces: 2016-08



- Component series 2X
- With bladder-type accumulator according to data sheet 50171

### Features

- Accumulator station with shut-off block
- Bladder-type accumulator
- Shut-off block with integrated shut-off valve, safety valve (type-examination tested) and drain valve
- Drain valve can be operated manually or electrically
- Glycerin-filled pressure gauge with red indication of the maximum admissible operating pressure on the dial
- Console for weld or screw connection
- Assembly prepared for external equipotential bonding

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**Ordering code**

|       |    |    |    |    |    |    |    |    |    |    |    |     |    |    |  |   |  |  |
|-------|----|----|----|----|----|----|----|----|----|----|----|-----|----|----|--|---|--|--|
| 01    | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13  | 14 | 15 |  |   |  |  |
| ABSBG | -  | 2X | /  | B  |    | N  | -  |    | /  |    |    | G24 | V  | /  |  | 6 |  |  |

|    |                     |              |
|----|---------------------|--------------|
| 01 | Accumulator station | <b>ABSBG</b> |
|----|---------------------|--------------|

|    |                                                                                          |           |
|----|------------------------------------------------------------------------------------------|-----------|
| 02 | Component series 20 ... 29 (20 ... 29: unchanged installation and connection dimensions) | <b>2X</b> |
|----|------------------------------------------------------------------------------------------|-----------|

**Hydraulic accumulator, design**

|    |                                                        |          |
|----|--------------------------------------------------------|----------|
| 03 | Bladder-type accumulator according to data sheet 50171 | <b>B</b> |
|----|--------------------------------------------------------|----------|

**Accumulator volume in liters**

|    |             |             |
|----|-------------|-------------|
| 04 | 1.0 liter   | <b>1.0</b>  |
|    | 2.5 liters  | <b>2.5</b>  |
|    | 4.0 liters  | <b>4.0</b>  |
|    | 6.0 liters  | <b>6.0</b>  |
|    | 10.0 liters | <b>10.0</b> |
|    | 20.0 liters | <b>20.0</b> |
|    | 24.0 liters | <b>24.0</b> |
|    | 32.0 liters | <b>32.0</b> |
|    | 50.0 liters | <b>50.0</b> |

**Bladder material**

|    |                                           |          |
|----|-------------------------------------------|----------|
| 05 | e.g. acrylonitrile butadiene rubber (NBR) | <b>N</b> |
|----|-------------------------------------------|----------|

**Country acceptance for hydraulic accumulator**

|    |                                                                                                  |            |
|----|--------------------------------------------------------------------------------------------------|------------|
| 06 | Short symbol for country acceptance in Europe, Russia and China from the manufacturer's type key |            |
|    | Acceptance according to 2014/68/EU                                                               | <b>CE</b>  |
|    | Acceptance according to SELO (China)                                                             | <b>534</b> |
|    | Acceptance according to EAC (Russia)                                                             | <b>EAC</b> |
|    | Operating instructions                                                                           | <b>BA</b>  |

**Accumulator shut-off block according to data sheet 50131**

|    |                                         |           |
|----|-----------------------------------------|-----------|
| 07 | ABZSS 10 pressure relief valve 6E       | <b>10</b> |
|    | ABZSS 20 pressure relief valve 10E      | <b>20</b> |
|    | ABZSS 30 pressure relief valve 20E      | <b>30</b> |
|    | ABZSS 30 SO30 pressure relief valve 30E | <b>31</b> |

**Accumulator shut-off block - Unloading**

|    |                             |          |
|----|-----------------------------|----------|
| 08 | Manual and electro-magnetic | <b>E</b> |
|    | Manual                      | <b>M</b> |

**Accumulator shut-off block - Set pressure at the pressure relief valve**

|    |         |            |
|----|---------|------------|
| 09 | 100 bar | <b>100</b> |
|    | 140 bar | <b>140</b> |
|    | 210 bar | <b>210</b> |
|    | 315 bar | <b>315</b> |
|    | 330 bar | <b>330</b> |

**Accumulator shut-off block - Voltage type**

|    |                     |            |
|----|---------------------|------------|
| 10 | Direct voltage 24 V | <b>G24</b> |
|----|---------------------|------------|

**Accumulator shut-off block - Seal material**

|    |     |          |
|----|-----|----------|
| 11 | FKM | <b>V</b> |
|----|-----|----------|

**Mounting construction kit**

|    |                                                                         |          |
|----|-------------------------------------------------------------------------|----------|
| 12 | Mounting <b>with</b> assembly kit A according to DCCS 10060 (console C) | <b>A</b> |
|    | Mounting <b>with</b> clamp according to DCCS 10060                      | <b>B</b> |

**Ordering code**

|       |    |    |    |    |    |    |    |    |    |    |    |    |     |    |   |  |   |  |  |
|-------|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|---|--|---|--|--|
| 01    | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14  | 15 |   |  |   |  |  |
| ABSBG | -  | 2X | /  | B  |    | N  | -  |    | /  |    |    |    | G24 | V  | / |  | 6 |  |  |

**ABZMM pressure gauge according to data sheet 50205**

|    |       |          |
|----|-------|----------|
| 13 | DN 63 | <b>6</b> |
|----|-------|----------|

**Pressure gauge scale**

|    |         |          |
|----|---------|----------|
| 14 | bar/MPa | <b>M</b> |
|    | bar/psi | <b>P</b> |

**Accumulator manufacturer**

|    |                 |           |
|----|-----------------|-----------|
| 15 | Bosch Rexroth   | <b>DC</b> |
|    | Roth Hydraulics | <b>RH</b> |

**Order example:****ABSBG-2X/B32,0N-CE/30E315G24V/A6MDC**

**Technical data**

(for applications outside these values, please consult us!)

| <b>Accumulators</b>                                        |        |                                                                  |
|------------------------------------------------------------|--------|------------------------------------------------------------------|
| Design                                                     |        | Bladder-type accumulator                                         |
| Installation position                                      |        | Any, preferably with the fluid connection socket at the bottom   |
| Ambient temperature range                                  | °C     | –15 ... +65                                                      |
| Line connection                                            |        | Screw-in thread                                                  |
| Hydraulic fluid                                            |        | Hydraulic oil according to DIN 51524; other liquids on request   |
| Hydraulic fluid temperature range<br>(others upon request) | °C     | –15 ... +80 (NBR bladder)<br>–32 ... +80 (ECO bladder)           |
| Acceptance specification for the accumulator               | CE/BA  | Acceptance according to 2014/68/EU or the operating instructions |
|                                                            | China  | SELO                                                             |
|                                                            | Russia | EAC                                                              |

| <b>Hydraulic, bladder-type accumulator</b> |                  |       |     |     |     |     |     |      |      |      |      |
|--------------------------------------------|------------------|-------|-----|-----|-----|-----|-----|------|------|------|------|
| Nominal volume                             | $V_{rated}$      | l     | 1   | 2.5 | 4.0 | 6.0 | 10  | 20   | 24   | 32   | 50   |
| Effective gas volume                       | $V_{eff}$        | l     | 1.0 | 2.4 | 3.7 | 5.9 | 9.2 | 18.1 | 24.5 | 33.4 | 48.7 |
| Maximum flow                               | $q_{max}$        | l/min | 240 | 450 | 450 | 450 | 900 | 900  | 900  | 900  | 900  |
| Maximum operating pressure                 | $p_{max}$        | bar   | 350 | 350 | 350 | 350 | 330 | 330  | 330  | 330  | 330  |
| Max. adm. pressure fluctuation range       | $\Delta p_{dyn}$ | bar   | 200 | 200 | 200 | 200 | 125 | 125  | 125  | 125  | 125  |

| Pneumatic            |                |     |                                                                |
|----------------------|----------------|-----|----------------------------------------------------------------|
| Charging gas         |                |     | Nitrogen, cleanliness class 4.0, N <sub>2</sub> = 99.99 vol. % |
| Gas filling pressure | p <sub>0</sub> | bar | CE, BA, EAC: 0                                                 |
|                      | p <sub>0</sub> | bar | China: >30 l: 2-5                                              |

| <b>Shut-off block</b>                                                                                            |     |                                                                   |
|------------------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------|
| Seal material                                                                                                    |     | FKM seals (NBR seals on request)                                  |
| Operating temperature range                                                                                      | °C  | –15 ... +80                                                       |
| Maximum operating pressure                                                                                       | bar | 350                                                               |
| Block material                                                                                                   |     | Steel                                                             |
| Direct-operated pressure relief valve                                                                            |     | DBDS...K1X/...VB or DBDS...K1X/...E according to data sheet 25402 |
| Cartridge seat valve                                                                                             |     | KSDER1PB/HN9V according to data sheet 18136-20                    |
| Protection class according to VDE 0470-1 – type "K4"<br>(DIN EN 60529), DIN 40050-9                              |     | IP 65 with mating connector mounted and locked                    |
| Voltage type                                                                                                     | V   | 24 (in case of electro-magnetic unloading "E")                    |
| Maximum admissible degree of contamination of the hydraulic fluid<br>Cleanliness class according to ISO 4406 (C) |     | Class 20/18/15                                                    |

| <b>Hydraulic fluid</b> |                      | <b>Classification</b> | <b>Suitable sealing materials</b> | <b>Standards</b> |
|------------------------|----------------------|-----------------------|-----------------------------------|------------------|
| Mineral oils           |                      | HL, HLP               | NBR, FKM                          | DIN 51524        |
| Bio-degradable         | ► Insoluble in water | HETG                  | NBR, FKM                          | VDMA 24568       |
|                        |                      | HEES                  | FKM                               |                  |
|                        | ► Soluble in water   | HEPG                  | FKM                               | VDMA 24568       |

 **Important notices on hydraulic fluids:**

- For further information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us!
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.)!
- The flash point of the hydraulic fluid used must be 40 K higher than the maximum solenoid surface temperature.

- **Flame-resistant – containing water:** The maximum pressure differential per control edge is 50 bar. Pressure pre-loading at the tank port > 20% of the pressure differential; otherwise, increased cavitation. The pressure peaks should not exceed the maximum operating pressures!
- **Bio-degradable:** When using bio-degradable hydraulic fluids that are zinc-soluble, zinc may accumulate in the fluid (700 mg zinc per pole tube).

**Technical data**

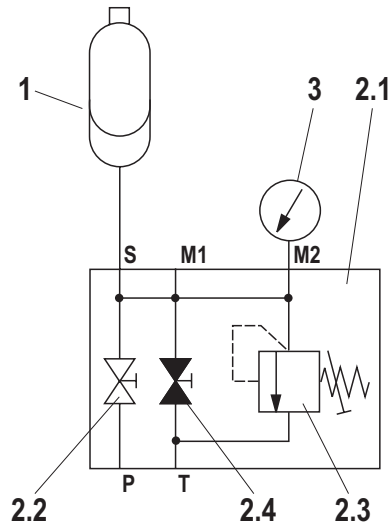
(for applications outside these values, please consult us!)

| Pressure gauge |     |          |
|----------------|-----|----------|
| Size           | bar | 63       |
| Pressure gauge |     | Glycerin |
| Double scale   |     | bar/MPa  |

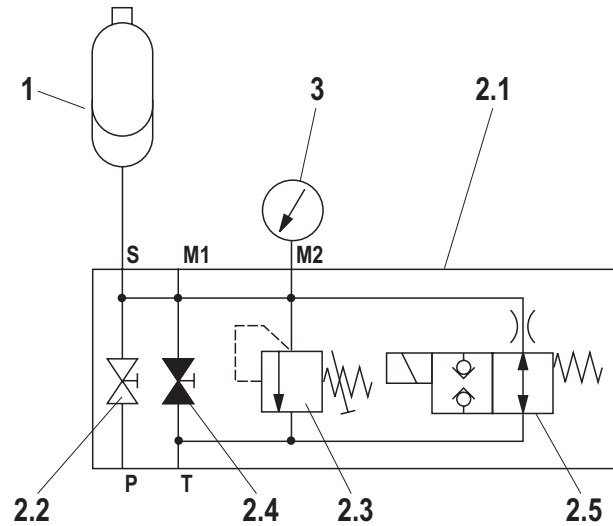
| Surface treatment                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All steel components and components without protective coating are coated prior to installation (minimum corrosion protection time of 12 h in salt spray test). Then, the devices, components and the piping are installed. All components, assemblies, controls, pipes, fittings and standard parts keep the supplied surface protection and are not additionally coated. The corrosion protection is determined by the least protected element in the assembly. |

## Symbols

**Accumulator station with manually operated drain valve**



**Accumulator station with electro-mechanically operated drain valve**



- 1** Hydraulic accumulator
- 2.1** Accumulator shut-off block with:
- 2.2** System shut-off cock
- 2.3** Pressure relief valve (type-examination tested)
- 2.4** Manual unloading
- 2.5** Electro-magnetic unloading (only version E)
- 3** Pressure gauge with red indication of the maximum admissible operating pressure

## Spare parts and accessories

- Bladder-type accumulator according to data sheet 50171
- Shut-off block manually/electrically according to data sheet 50131
- Pressure gauge according to data sheet 50205
- Warning sign according to RNI 17506-001

Consoles contained in the assembly kit are intended for mounting by means of screws and nuts or for welding to suitable frames or design components.

**Standard program including preferred types: Accumulator stations****Standard program including preferred types with manually operated drain valve** (other versions on request)

| Accumulator type         | Nominal volume in liters | Relief pressure in bar | Shut-off block DN | Q <sub>Vmax</sub> DBDS in l/min | Acceptance CE/BA                    |                   |              |                   | Type of mounting | Acceptance China  |                   | Acceptance Russia |                   |
|--------------------------|--------------------------|------------------------|-------------------|---------------------------------|-------------------------------------|-------------------|--------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|
|                          |                          |                        |                   |                                 | Denomination                        | Material no.      | Weight in kg | MKZ <sup>1)</sup> |                  | Material no.      | MKZ <sup>1)</sup> | Material no.      | MKZ <sup>1)</sup> |
| Bladder-type accumulator | 1.0                      | 100                    | 10                | 25                              | ABSBG-2X/B 1,0N-BA /10M100 V/B6M DC | <b>R901450000</b> | 14           | <b>A3</b>         | B                | <b>R901450000</b> | <b>A3</b>         | <b>R901488461</b> | <b>A3</b>         |
|                          |                          | 140                    | 10                | 52                              | ABSBG-2X/B 1,0N-BA /10M140 V/B6M DC | <b>R901450001</b> | 14           | <b>A3</b>         |                  | <b>R901450001</b> | <b>A3</b>         | <b>R901488462</b> | <b>A3</b>         |
|                          |                          | 210                    | 10                | 52                              | ABSBG-2X/B 1,0N-BA /10M210 V/B6M DC | <b>R901450002</b> | 14           | <b>A3</b>         |                  | <b>R901450002</b> | <b>A3</b>         | <b>R901488463</b> | <b>A3</b>         |
|                          |                          | 330                    | 10                | 52                              | ABSBG-2X/B 1,0N-BA /10M330 V/B6M DC | <b>R901450003</b> | 14           | <b>A2</b>         |                  | <b>R901450003</b> | <b>A2</b>         | <b>R901488464</b> | <b>A3</b>         |
|                          | 2.5                      | 100                    | 10                | 25                              | ABSBG-2X/B 2,5N-CE /10M100 V/B6M DC | <b>R901450004</b> | 18           | <b>A3</b>         | B                | <b>R901450004</b> | <b>A3</b>         | <b>R901488465</b> | <b>A3</b>         |
|                          |                          | 140                    | 10                | 52                              | ABSBG-2X/B 2,5N-CE /10M140 V/B6M DC | <b>R901450005</b> | 18           | <b>A3</b>         |                  | <b>R901450005</b> | <b>A3</b>         | <b>R901488466</b> | <b>A3</b>         |
|                          |                          | 210                    | 10                | 52                              | ABSBG-2X/B 2,5N-CE /10M210 V/B6M DC | <b>R901450006</b> | 18           | <b>A3</b>         |                  | <b>R901450006</b> | <b>A3</b>         | <b>R901488467</b> | <b>A3</b>         |
|                          |                          | 330                    | 10                | 52                              | ABSBG-2X/B 2,5N-CE /10M330 V/B6M DC | <b>R901450007</b> | 18           | <b>A2</b>         |                  | <b>R901450007</b> | <b>A2</b>         | <b>R901488468</b> | <b>A3</b>         |
|                          | 4.0                      | 100                    | 10                | 25                              | ABSBG-2X/B 4,0N-CE /10M100 V/A6M DC | <b>R901450008</b> | 28           | <b>A3</b>         | A                | <b>R901450008</b> | <b>A3</b>         | <b>R901488469</b> | <b>A3</b>         |
|                          |                          | 140                    | 10                | 52                              | ABSBG-2X/B 4,0N-CE /10M140 V/A6M DC | <b>R901450009</b> | 28           | <b>A3</b>         |                  | <b>R901450009</b> | <b>A3</b>         | <b>R901488470</b> | <b>A3</b>         |
|                          |                          | 210                    | 10                | 52                              | ABSBG-2X/B 4,0N-CE /10M210 V/A6M DC | <b>R901450010</b> | 28           | <b>A3</b>         |                  | <b>R901450010</b> | <b>A3</b>         | <b>R901488471</b> | <b>A3</b>         |
|                          |                          | 330                    | 10                | 52                              | ABSBG-2X/B 4,0N-CE /10M330 V/A6M DC | <b>R901450011</b> | 28           | <b>A2</b>         |                  | <b>R901450011</b> | <b>A2</b>         | <b>R901488472</b> | <b>A3</b>         |
|                          | 6.0                      | 330                    | 10                | 52                              | ABSBG-2X/B 6,0N-CE /10M330 V/A6M DC | <b>R901454612</b> | 31           | <b>A2</b>         | A                | <b>R901454612</b> | <b>A2</b>         | <b>R901488391</b> | <b>A3</b>         |
|                          | 10.0                     | 210                    | 20                | 140                             | ABSBG-2X/B10,0N-CE /20M210 V/A6M DC | <b>R901450012</b> | 49           | <b>A3</b>         | A                | <b>R901450012</b> | <b>A3</b>         | <b>R901488473</b> | <b>A3</b>         |
|                          |                          | 330                    | 20                | 140                             | ABSBG-2X/B10,0N-CE /20M330 V/A6M DC | <b>R901450013</b> | 49           | <b>A2</b>         |                  | <b>R901450013</b> | <b>A2</b>         | <b>R901488474</b> | <b>A3</b>         |
|                          | 20.0                     | 210                    | 20                | 140                             | ABSBG-2X/B20,0N-CE /20M210 V/A6M DC | <b>R901450014</b> | 75           | <b>A3</b>         | A                | <b>R901450014</b> | <b>A3</b>         | <b>R901488475</b> | <b>A3</b>         |
|                          |                          | 330                    | 20                | 140                             | ABSBG-2X/B20,0N-CE /20M330 V/A6M DC | <b>R901450015</b> | 75           | <b>A2</b>         |                  | <b>R901450015</b> | <b>A2</b>         | <b>R901488476</b> | <b>A3</b>         |
|                          | 24.0                     | 210                    | 20.0              | 140                             | ABSBG-2X/B24,0N-CE /20M210 V/A6M DC | <b>R901450115</b> | 83           | <b>A3</b>         | A                | <b>R901450115</b> | <b>A3</b>         | <b>R901488479</b> | <b>A3</b>         |
|                          |                          | 330                    | 20.0              | 140                             | ABSBG-2X/B24,0N-CE /20M330 V/A6M DC | <b>R901450116</b> | 83           | <b>A2</b>         |                  | <b>R901450116</b> | <b>A2</b>         | <b>R901488480</b> | <b>A3</b>         |
|                          | 32.0                     | 315                    | 30                | 165                             | ABSBG-2X/B32,0N-CE /30M315 V/A6M DC | <b>R901450016</b> | 132          | <b>A2</b>         | A                | <b>R901450034</b> | <b>A3</b>         | <b>R901488477</b> | <b>A3</b>         |
|                          | 50.0                     | 315                    | 30                | 165                             | ABSBG-2X/B50,0N-CE /30M315 V/A6M DC | <b>R901450017</b> | 170          | <b>A2</b>         | A                | <b>R901450035</b> | <b>A3</b>         | <b>R901488478</b> | <b>A3</b>         |

<sup>1)</sup> MKZ = Material mark: A2 = preferred delivery range; A3 = standard delivery range

**Standard program including preferred types: Accumulator stations****Standard program including preferred types with electrically operated drain valve** (other versions on request)

| Accumulator type         | Nominal volume in liters | Relief pressure in bar | Shut-off block DN | $\approx Q_{Vmax}$ DBDS in l/min | Acceptance CE/BA                       |                   |              |                   | Type of mounting | Acceptance China  |                   | Acceptance Russia |                   |
|--------------------------|--------------------------|------------------------|-------------------|----------------------------------|----------------------------------------|-------------------|--------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|
|                          |                          |                        |                   |                                  | Denomination                           | Material no.      | Weight in kg | MKZ <sup>1)</sup> |                  | Material no.      | MKZ <sup>1)</sup> | Material no.      | MKZ <sup>1)</sup> |
| Bladder-type accumulator | 1.0                      | 100                    | 10                | 25                               | ABSBG-2X/B 1,0N-BA /10E100G 24V/B6M DC | <b>R901450054</b> | 14           | <b>A3</b>         | B                | <b>R901450054</b> | <b>A3</b>         | <b>R901488364</b> | <b>A3</b>         |
|                          |                          | 140                    | 10                | 52                               | ABSBG-2X/B 1,0N-BA /10E140G 24V/B6M DC | <b>R901450055</b> | 14           | <b>A3</b>         |                  | <b>R901450055</b> | <b>A3</b>         | <b>R901488365</b> | <b>A3</b>         |
|                          |                          | 210                    | 10                | 52                               | ABSBG-2X/B 1,0N-BA /10E210G 24V/B6M DC | <b>R901450056</b> | 14           | <b>A3</b>         |                  | <b>R901450056</b> | <b>A3</b>         | <b>R901488366</b> | <b>A3</b>         |
|                          |                          | 330                    | 10                | 52                               | ABSBG-2X/B 1,0N-BA /10E330G 24V/B6M DC | <b>R901450057</b> | 14           | <b>A2</b>         |                  | <b>R901450057</b> | <b>A2</b>         | <b>R901488368</b> | <b>A3</b>         |
|                          | 2.5                      | 100                    | 10                | 25                               | ABSBG-2X/B 2,5N-CE /10E100G 24V/B6M DC | <b>R901450058</b> | 18           | <b>A3</b>         | B                | <b>R901450058</b> | <b>A3</b>         | <b>R901488369</b> | <b>A3</b>         |
|                          |                          | 140                    | 10                | 52                               | ABSBG-2X/B 2,5N-CE /10E140G 24V/B6M DC | <b>R901450059</b> | 18           | <b>A3</b>         |                  | <b>R901450059</b> | <b>A3</b>         | <b>R901488370</b> | <b>A3</b>         |
|                          |                          | 210                    | 10                | 52                               | ABSBG-2X/B 2,5N-CE /10E210G 24V/B6M DC | <b>R901450060</b> | 18           | <b>A3</b>         |                  | <b>R901450060</b> | <b>A3</b>         | <b>R901488371</b> | <b>A3</b>         |
|                          |                          | 330                    | 10                | 52                               | ABSBG-2X/B 2,5N-CE /10E330G 24V/B6M DC | <b>R901450061</b> | 18           | <b>A2</b>         |                  | <b>R901450061</b> | <b>A2</b>         | <b>R901488372</b> | <b>A3</b>         |
|                          | 4.0                      | 100                    | 10                | 25                               | ABSBG-2X/B 4,0N-CE /10E100G 24V/A6M DC | <b>R901450062</b> | 28           | <b>A3</b>         | A                | <b>R901450062</b> | <b>A3</b>         | <b>R901488374</b> | <b>A3</b>         |
|                          |                          | 140                    | 10                | 52                               | ABSBG-2X/B 4,0N-CE /10E140G 24V/A6M DC | <b>R901450063</b> | 28           | <b>A3</b>         |                  | <b>R901450063</b> | <b>A3</b>         | <b>R901488375</b> | <b>A3</b>         |
|                          |                          | 210                    | 10                | 52                               | ABSBG-2X/B 4,0N-CE /10E210G 24V/A6M DC | <b>R901450064</b> | 28           | <b>A3</b>         |                  | <b>R901450064</b> | <b>A3</b>         | <b>R901488376</b> | <b>A3</b>         |
|                          |                          | 330                    | 10                | 52                               | ABSBG-2X/B 4,0N-CE /10E330G 24V/A6M DC | <b>R901450065</b> | 28           | <b>A2</b>         |                  | <b>R901450065</b> | <b>A2</b>         | <b>R901488377</b> | <b>A3</b>         |
|                          | 6.0                      | 330                    | 10                | 52                               | ABSBG-2X/B 6,0N-CE /10E330G 24V/A6M DC | <b>R901467840</b> | 31           | <b>A2</b>         | A                | <b>R901467840</b> | <b>A2</b>         | <b>R901488390</b> | <b>A3</b>         |
|                          | 10.0                     | 210                    | 20                | 140                              | ABSBG-2X/B10,0N-CE /20E210G 24V/A6M DC | <b>R901450066</b> | 49           | <b>A3</b>         | A                | <b>R901450066</b> | <b>A3</b>         | <b>R901488378</b> | <b>A3</b>         |
|                          |                          | 330                    | 20                | 140                              | ABSBG-2X/B10,0N-CE /20E330G 24V/A6M DC | <b>R901450067</b> | 49           | <b>A2</b>         |                  | <b>R901450067</b> | <b>A2</b>         | <b>R901488379</b> | <b>A3</b>         |
|                          | 20.0                     | 210                    | 20                | 140                              | ABSBG-2X/B20,0N-CE /20E210G 24V/A6M DC | <b>R901450068</b> | 75           | <b>A3</b>         | A                | <b>R901450068</b> | <b>A3</b>         | <b>R901488380</b> | <b>A3</b>         |
|                          |                          | 330                    | 20                | 140                              | ABSBG-2X/B20,0N-CE /20E330G 24V/A6M DC | <b>R901450069</b> | 75           | <b>A2</b>         |                  | <b>R901450069</b> | <b>A2</b>         | <b>R901488381</b> | <b>A3</b>         |
|                          | 24.0                     | 210                    | 20.0              | 140                              | ABSBG-2X/B24,0N-CE /20E210G 24V/A6M DC | <b>R901450121</b> | 83           | <b>A3</b>         | A                | <b>R901450121</b> | <b>A3</b>         | <b>R901488384</b> | <b>A3</b>         |
|                          |                          | 330                    | 20.0              | 140                              | ABSBG-2X/B24,0N-CE /20E330G 24V/A6M DC | <b>R901450122</b> | 83           | <b>A2</b>         |                  | <b>R901450122</b> | <b>A2</b>         | <b>R901488385</b> | <b>A3</b>         |
|                          | 32.0                     | 315                    | 30                | 165                              | ABSBG-2X/B32,0N-CE /30E315G 24V/A6M DC | <b>R901450070</b> | 132          | <b>A2</b>         | A                | <b>R901450088</b> | <b>A3</b>         | <b>R901488382</b> | <b>A3</b>         |
|                          | 50.0                     | 315                    | 30                | 165                              | ABSBG-2X/B50,0N-CE /30E315G 24V/A6M DC | <b>R901450071</b> | 170          | <b>A2</b>         | A                | <b>R901450089</b> | <b>A3</b>         | <b>R901488383</b> | <b>A3</b>         |

<sup>1)</sup> MKZ = Material mark: A2 = preferred delivery range; A3 = standard delivery range



## Accumulator stations for advanced flows

Standard program including preferred types with manually operated drain valve (other versions on request)

| Accumulator type         | Nominal volume in liters | Relief pressure in bar | Shut-off block DN | ~ Q <sub>Vmax</sub> DBDS in l/min | Acceptance CE/BA                    |              |              |                   |                  |              | Acceptance China  |              | Acceptance Russia |  |
|--------------------------|--------------------------|------------------------|-------------------|-----------------------------------|-------------------------------------|--------------|--------------|-------------------|------------------|--------------|-------------------|--------------|-------------------|--|
|                          |                          |                        |                   |                                   | Denomination                        | Material no. | Weight in kg | MKZ <sup>1)</sup> | Type of mounting | Material no. | MKZ <sup>1)</sup> | Material no. | MKZ <sup>1)</sup> |  |
| Bladder-type accumulator | 1.0                      | 330                    | 20                | 140                               | ABSBG-2X/B 1,0N-BA /20M330 V/B6M DC | R901448603   | 17           | A3                | B                | R901448603   | A3                | -            | -                 |  |
|                          | 2.5                      | 330                    | 20                | 140                               | ABSBG-2X/B 2,5N-CE /20M330 V/B6M DC | R901448605   | 21           | A3                | B                | R901448605   | A3                | -            | -                 |  |
|                          | 4.0                      | 330                    | 20                | 140                               | ABSBG-2X/B 4,0N-CE /20M330 V/A6M DC | R901448607   | 31           | A3                | A                | R901448607   | A3                | -            | -                 |  |
|                          | 6.0                      | 330                    | 20                | 140                               | ABSBG-2X/B 6,0N-CE /20M330 V/A6M DC | R901495532   | 40           | A3                | A                | R901495532   | A3                |              |                   |  |
|                          | 10.0                     | 315                    | 30                | 165                               | ABSBG-2X/B10,0N-CE /30M315 V/A6M DC | R901448609   | 63           | A3                | A                | R901448609   | A3                | -            | -                 |  |
|                          |                          | 315                    | 31                | 165                               | ABSBG-2X/B10,0N-CE /31M315 V/A6M DC | R901448612   | 71           | A3                | A                | R901448612   | A3                | -            | -                 |  |
|                          | 20.0                     | 315                    | 30                | 165                               | ABSBG-2X/B20,0N-CE /30M315 V/A6M DC | R901448615   | 89           | A3                | A                | R901448615   | A3                | -            | -                 |  |
|                          |                          | 315                    | 31                | 300                               | ABSBG-2X/B20,0N-CE /31M315 V/A6M DC | R901448617   | 97           | A3                | A                | R901448617   | A3                | -            | -                 |  |
|                          | 32.0                     | 315                    | 31                | 300                               | ABSBG-2X/B32,0N-CE /31M315 V/A6M DC | R901448619   | 141          | A3                | A                | R901448619   | A3                | R901488723   | A3                |  |
|                          | 50.0                     | 315                    | 31                | 300                               | ABSBG-2X/B50,0N-CE /31M315 V/A6M DC | R901448621   | 179          | A3                | A                | R901448624   | A3                | R901488721   | A3                |  |

<sup>1)</sup> MKZ = Material mark: A2 = preferred delivery range; A3 = standard delivery range

## Accumulator stations for advanced flows

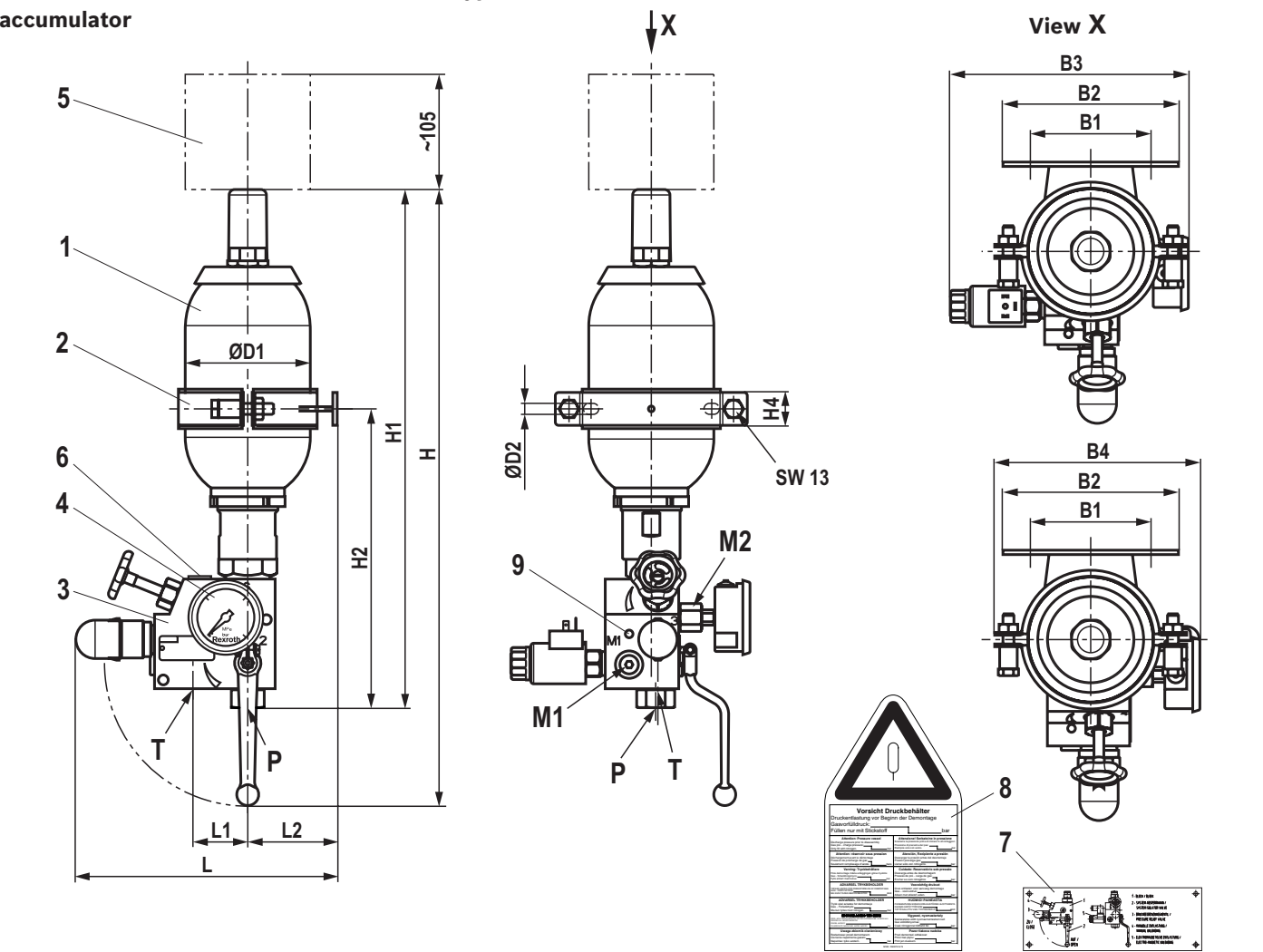
Standard program including preferred types with electrically operated drain valve (other versions on request)

| Accumulator type         | Nominal volume in liters | Relief pressure in bar | Shut-off block DN | ~ Q <sub>Vmax</sub> DBDS in l/min | Acceptance CE/BA                       |              |              |                   |                  | Acceptance China |                   | Acceptance Russia |                   |
|--------------------------|--------------------------|------------------------|-------------------|-----------------------------------|----------------------------------------|--------------|--------------|-------------------|------------------|------------------|-------------------|-------------------|-------------------|
|                          |                          |                        |                   |                                   | Denomination                           | Material no. | Weight in kg | MKZ <sup>1)</sup> | Type of mounting | Material no.     | MKZ <sup>1)</sup> | Material no.      | MKZ <sup>1)</sup> |
| Bladder-type accumulator | 1.0                      | 330                    | 20                | 140                               | ABSBG-2X/B 1,0N-BA /20E330G 24V/B6M DC | R901448604   | 14           | A3                | B                | R901448604       | A3                | -                 | -                 |
|                          | 2.5                      | 330                    | 20                | 140                               | ABSBG-2X/B 2,5N-CE /20E330G 24V/B6M DC | R901448606   | 21           | A3                | B                | R901448606       | A3                | -                 | -                 |
|                          | 4.0                      | 330                    | 20                | 140                               | ABSBG-2X/B 4,0N-CE /20E330G 24V/A6M DC | R901448608   | 31           | A3                | A                | R901448608       | A3                | -                 | -                 |
|                          | 6.0                      | 330                    | 20                | 140                               | ABSBG-2X/B 6,0N-CE /20E330G 24V/A6M DC | R901495533   | 41           | A3                | A                | R901495533       | A3                | -                 | -                 |
|                          | 10.0                     | 315                    | 30                | 165                               | ABSBG-2X/B10,0N-CE /30E315G 24V/A6M DC | R901448611   | 63           | A3                | A                | R901448611       | A3                | -                 | -                 |
|                          |                          | 315                    | 31                | 165                               | ABSBG-2X/B10,0N-CE /31E315G 24V/A6M DC | R901448613   | 71           | A3                | A                | R901448613       | A3                | -                 | -                 |
|                          | 20.0                     | 315                    | 30                | 165                               | ABSBG-2X/B20,0N-CE /30E315G 24V/A6M DC | R901448616   | 89           | A3                | A                | R901448616       | A3                | -                 | -                 |
|                          |                          | 315                    | 31                | 300                               | ABSBG-2X/B20,0N-CE /31E315G 24V/A6M DC | R901448618   | 97           | A3                | A                | R901448618       | A3                | -                 | -                 |
|                          | 32.0                     | 315                    | 31                | 300                               | ABSBG-2X/B32,0N-CE /31E315G 24V/A6M DC | R901448620   | 141          | A3                | A                | R901488718       | A3                | R901488716        | A3                |
|                          | 50.0                     | 315                    | 31                | 300                               | ABSBG-2X/B50,0N-CE /31E315G 24V/A6M DC | R901448622   | 179          | A3                | A                | R901488722       | A3                | R901488720        | A3                |

<sup>1)</sup> MKZ = Material mark: A2 = preferred delivery range; A3 = standard delivery range

**Dimensions:** Mounting B with clamp  
(dimensions in mm)

**Accumulator station with 1.0 liter bladder-type accumulator**



Connection designations:

|           |                           |          |
|-----------|---------------------------|----------|
| <b>M1</b> | Measuring port            | G1/4     |
| <b>M2</b> | Pressure gauge connection | G1/4     |
| <b>P</b>  | Pump port                 | s. table |
| <b>T</b>  | Tank port                 | s. table |

Gas filling pressure of the accumulators upon delivery:

|              |             |
|--------------|-------------|
| BA/CE        | 0 bar       |
| EAC          | 0 bar       |
| China > 30 l | 2 ... 5 bar |

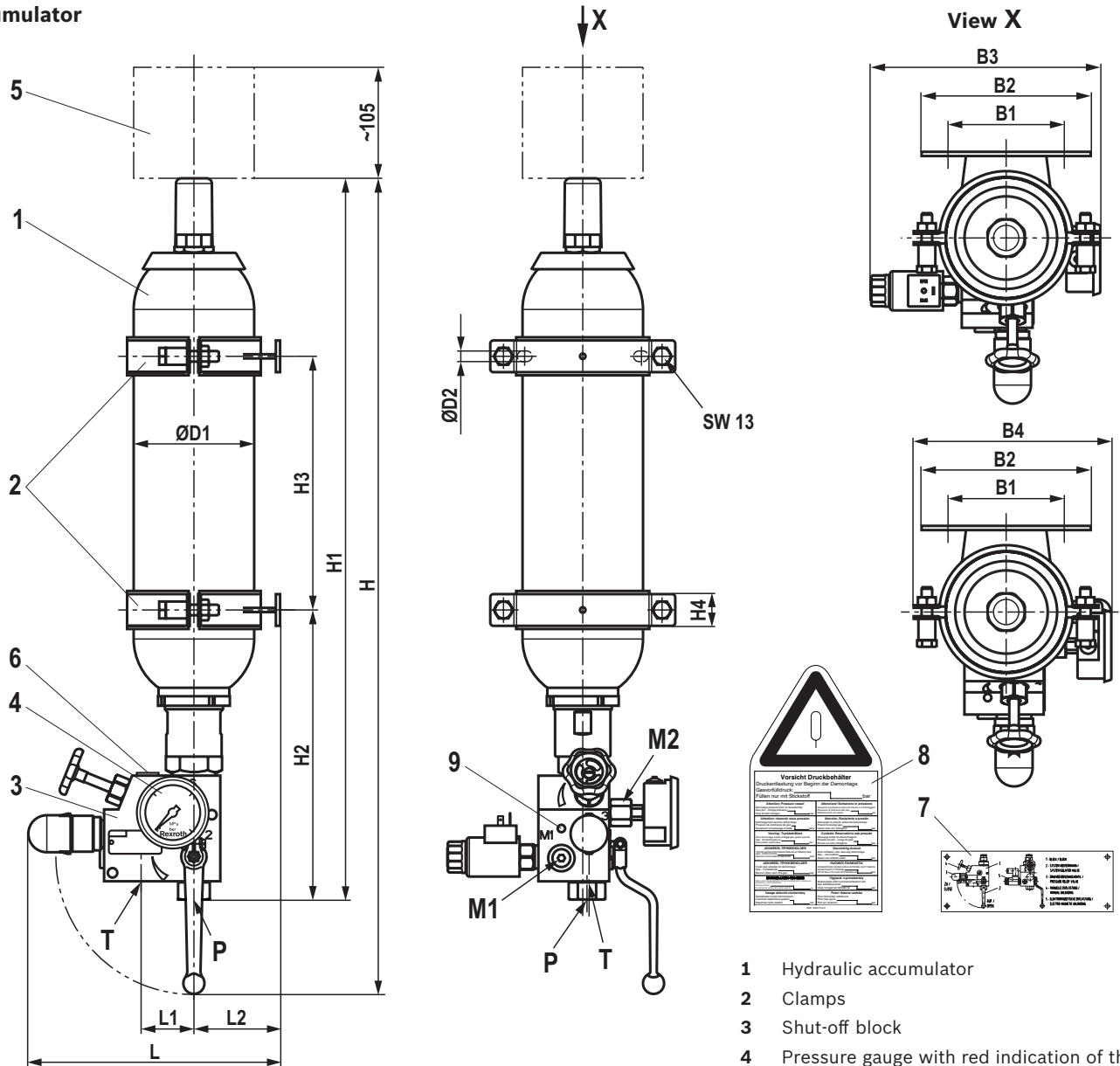
- 1** Hydraulic accumulator
- 2** Clamp
- 3** Shut-off block
- 4** Pressure gauge with red indication of the maximum admissible operating pressure
- 5** Space required for filling device
- 6** Name plate of the accumulator station
- 7** Functional sign (loose)
- 8** Warning sign (loose)
- 9** Threaded connection M8 for equipotential bonding

| Assembly kit<br>ABSBG-... | ØD1 <sub>max</sub> | ØD2 | B1  | B2  | B3  | B4  | H1  | H2  | H4 | H <sub>max</sub> | L1 | L2 | L   | P    | T    |
|---------------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|----|------------------|----|----|-----|------|------|
| <b>B 1.0.../10M</b>       | 116                | 10  | 110 | 160 | –   | 178 | 490 | 275 | 30 | 557              | 50 | 82 | 239 | G1/2 | G3/8 |
| <b>B 1.0.../10E</b>       | 116                | 10  | 110 | 160 | 223 | –   | 490 | 275 | 30 | 557              | 50 | 82 | 239 | G1/2 | G3/8 |
| <b>B 1.0.../20M</b>       | 116                | 10  | 110 | 160 | –   | 191 | 516 | 301 | 30 | 631              | 56 | 82 | 253 | G1   | G1/2 |
| <b>B 1.0.../20E</b>       | 116                | 10  | 110 | 160 | 234 | –   | 516 | 301 | 30 | 631              | 56 | 82 | 253 | G1   | G1/2 |

approx. dimensions - for precise dimensions, please refer to the dimensional drawings

**Dimensions:** Mounting B with clamps  
(dimensions in mm)

**Accumulator station with 2.5 liters bladder-type accumulator**



Connection designations:

|                                     |          |
|-------------------------------------|----------|
| <b>M1</b> Measuring port            | G1/4     |
| <b>M2</b> Pressure gauge connection | G1/4     |
| <b>P</b> Pump port                  | s. table |
| <b>T</b> Tank port                  | s. table |

Gas filling pressure of the accumulators upon delivery:

|              |             |
|--------------|-------------|
| BA/CE        | 0 bar       |
| EAC          | 0 bar       |
| China > 30 l | 2 ... 5 bar |

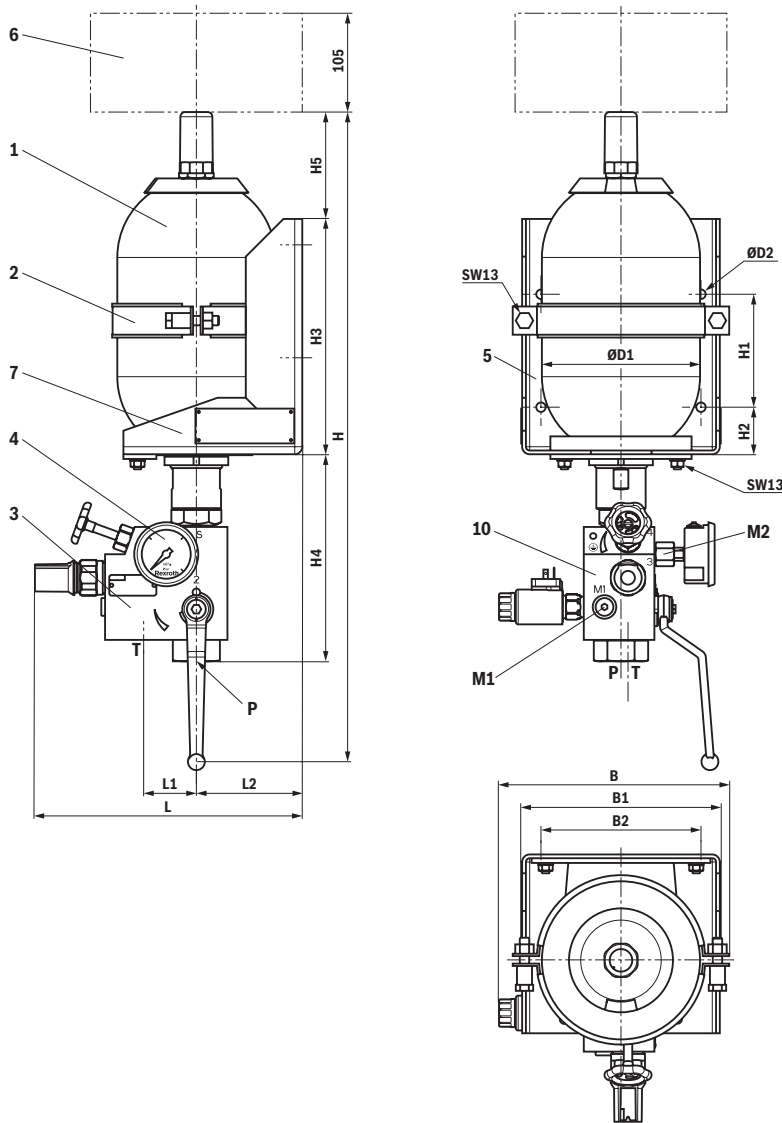
- 1 Hydraulic accumulator
- 2 Clamps
- 3 Shut-off block
- 4 Pressure gauge with red indication of the maximum admissible operating pressure
- 5 Space required for filling device
- 6 Name plate of the accumulator station
- 7 Functional sign (loose)
- 8 Warning sign (loose)
- 9 Threaded connection M8 for equipotential bonding

| Assembly kit<br>ABSBG-... | ØD1 <sub>max</sub> | ØD2 | B1  | B2  | B3  | B4  | H1  | H2  | H3  | H4 | H <sub>max</sub> | L1 | L2 | L   | P    | T    |
|---------------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|------------------|----|----|-----|------|------|
| <b>B 2.5.../10M...</b>    | 116                | 10  | 110 | 160 | –   | 178 | 699 | 276 | 240 | 30 | 766              | 50 | 82 | 239 | G1/2 | G3/8 |
| <b>B 2.5.../10E...</b>    | 116                | 10  | 110 | 160 | 223 | –   | 699 | 276 | 240 | 30 | 766              | 50 | 82 | 239 | G1/2 | G3/8 |
| <b>B 2.5.../20M...</b>    | 116                | 10  | 110 | 160 | –   | 191 | 725 | 302 | 240 | 30 | 840              | 56 | 82 | 253 | G1   | G1/2 |
| <b>B 2.5.../20E...</b>    | 116                | 10  | 110 | 160 | 234 | –   | 725 | 302 | 240 | 30 | 840              | 56 | 82 | 253 | G1   | G1/2 |

approx. dimensions - for precise dimensions, please refer to the dimensional drawings

## Dimensions: Mounting A in console (dimensions in mm)

### Accumulator station with 4.0 ... 50.0 liters bladder-type accumulator



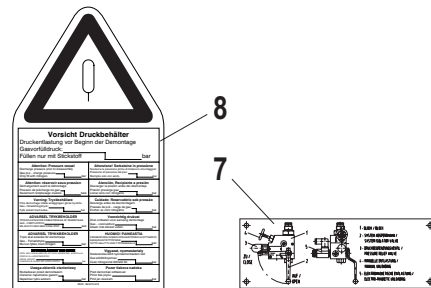
- 1 Hydraulic accumulator
- 2 Clamp
- 3 Shut-off block
- 4 Pressure gauge with red indication of the maximum admissible operating pressure
- 5 Console
- 6 Space required for filling device
- 7 Name plate of accumulator station
- 8 Functional sign (loose)
- 9 Warning sign (loose)
- 10 Threaded connection M8 for equipotential bonding

#### Connection designations:

|           |                           |          |
|-----------|---------------------------|----------|
| <b>M1</b> | Measuring port            | G1/4     |
| <b>M2</b> | Pressure gauge connection | G1/4     |
| <b>P</b>  | Pump port                 | s. table |
| <b>T</b>  | Tank port                 | s. table |

#### Gas filling pressure of the accumulators upon delivery:

|             |             |
|-------------|-------------|
| BA/CE       | 0 bar       |
| EAC         | 0 bar       |
| China >30 l | 2 ... 5 bar |



**Dimensions:** Mounting A in console  
(dimensions in mm)

| Assembly kit<br>ABSBG-... | ØD1 <sub>max</sub> | ØD2 | B1  | B2  | B   | H1  | H2  | H3   | H4±10 | H5  | H <sub>max</sub> | L1  | L2  | L   | P      | T      |
|---------------------------|--------------------|-----|-----|-----|-----|-----|-----|------|-------|-----|------------------|-----|-----|-----|--------|--------|
| <b>B 4.0.../10M...</b>    | 170                | 10  | 212 | 170 | 230 | 120 | 50  | 250  | 200   | 112 | 640              | 50  | 113 | 277 | G1/2   | G3/8   |
| <b>B 4.0.../10E...</b>    | 170                | 10  | 212 | 170 | 243 | 120 | 50  | 250  | 200   | 112 | 640              | 50  | 113 | 277 | G1/2   | G3/8   |
| <b>B 4.0.../20M...</b>    | 170                | 10  | 212 | 170 | 230 | 120 | 50  | 250  | 220   | 114 | 700              | 56  | 113 | 284 | G1     | G1/2   |
| <b>B 4.0.../20E...</b>    | 170                | 10  | 212 | 170 | 245 | 120 | 50  | 250  | 220   | 114 | 700              | 56  | 113 | 284 | G1     | G1/2   |
| <b>B 6.0.../10M...</b>    | 170                | 10  | 212 | 170 | 230 | 120 | 50  | 250  | 200   | 240 | 776              | 50  | 113 | 278 | G1/2   | G3/8   |
| <b>B 6.0.../10E...</b>    | 170                | 10  | 212 | 170 | 243 | 120 | 50  | 250  | 200   | 240 | 776              | 50  | 113 | 278 | G1/2   | G3/8   |
| <b>B 6.0.../20M...</b>    | 170                | 10  | 212 | 170 | 230 | 120 | 50  | 250  | 220   | 243 | 830              | 56  | 113 | 284 | G1     | G1/2   |
| <b>B 6.0.../20E...</b>    | 170                | 10  | 212 | 170 | 245 | 120 | 50  | 250  | 220   | 243 | 830              | 56  | 113 | 284 | G1     | G1/2   |
| <b>B10.0.../20...</b>     | 221                | 10  | 288 | 250 | -   | 130 | 75  | 280  | 269   | 208 | 872              | 56  | 113 | 284 | G1     | G1/2   |
| <b>B10.0.../30...</b>     | 221                | 10  | 288 | 250 | -   | 130 | 75  | 280  | 314   | 208 | 972              | 80  | 128 | 361 | G1 1/2 | G1/2   |
| <b>B10.0.../31...</b>     | 221                | 10  | 288 | 250 | -   | 130 | 75  | 280  | 336   | 208 | 994              | 111 | 128 | 361 | G1 1/2 | G1 1/2 |
| <b>B20.0.../20...</b>     | 221                | 10  | 288 | 250 | -   | 360 | 100 | 560  | 269   | 238 | 1182             | 56  | 126 | 297 | G1     | G1/2   |
| <b>B20.0.../30...</b>     | 221                | 10  | 288 | 250 | -   | 360 | 100 | 560  | 314   | 238 | 1282             | 80  | 126 | 359 | G1 1/2 | G1/2   |
| <b>B20.0.../31...</b>     | 221                | 10  | 288 | 250 | -   | 360 | 100 | 560  | 336   | 238 | 1304             | 111 | 126 | 359 | G1 1/2 | G1 1/2 |
| <b>B24.0.../20...</b>     | 221                | 10  | 288 | 250 | -   | 360 | 100 | 560  | 269   | 373 | 1317             | 56  | 126 | 297 | G1     | G1/2   |
| <b>B32.0.../30...</b>     | 221                | 12  | 288 | 250 | -   | 820 | 150 | 1120 | 314   | 198 | 1802             | 80  | 127 | 360 | G1 1/2 | G1/2   |
| <b>B32.0.../31...</b>     | 221                | 12  | 288 | 250 | -   | 820 | 150 | 1120 | 336   | 198 | 1824             | 111 | 127 | 360 | G1 1/2 | G1 1/2 |
| <b>B50.0.../30...</b>     | 221                | 12  | 288 | 250 | -   | 820 | 150 | 1120 | 314   | 713 | 2317             | 80  | 127 | 360 | G1 1/2 | G1/2   |
| <b>B50.0.../31...</b>     | 221                | 12  | 288 | 250 | -   | 820 | 150 | 1120 | 336   | 713 | 2339             | 111 | 127 | 360 | G1 1/2 | G1 1/2 |

approx. dimensions - for precise dimensions, please refer to the dimensional drawings

## Commissioning, maintenance and operating instructions

### General Information

- ▶ Observe the documentation for the machinery.
- ▶ Also observe the documentation pertaining to the other components, assemblies and partly completed machinery, which form part of the complete machinery.
- ▶ Observe the generally applicable, legal or otherwise binding European and national regulations as well as the relevant legislation for your country pertaining to the prevention of accidents and protection of the environment.
- ▶ Operating instructions according to the data sheet of the accumulator
- ▶ Depending on the country of installation, national pressure vessel regulations need to be complied with.
- ▶ In the standard, the country acceptance is effected according to BA, CE as well as for China and Russia. Other acceptances on request.
- ▶ Please indicate the country of installation in the order.
- ▶ Keep all documents included in the delivery in a safe place; they will be required by the expert in recurring tests.
- ▶ The machine end-user will have sole responsibility for complying with existing provisions.
- ▶ The accumulator stations in this edition are assemblies in the sense of directive 2014/68/EU, article 2, section 6 (Pressure Equipment Directive). However, they are not intended for exclusive commissioning. They are installed as a component of a larger assembly or system.
- ▶ The accumulator stations described here contain the entire equipment which is required for safety reasons according to DIN EN ISO 4413.
- ▶ The accumulator stations must not be modified; otherwise, the operating license according to directive 2014/68/EU will be lost and the dealer and/or manufacturer warranty will be forfeited.
- ▶ The accumulator stations may only be operated within the admissible limit values.
- ▶ Repair works may only be carried out by the manufacturer or their authorized dealers and agencies. Repair works performed by third parties invalidate the approval and release the manufacturer from all claims resulting from an unauthorized intervention.
- ▶ Assembly and maintenance must be implemented by authorized, instructed persons only.

## Commissioning, maintenance and operating instructions

- The accumulator stations are provided with signs: **1**

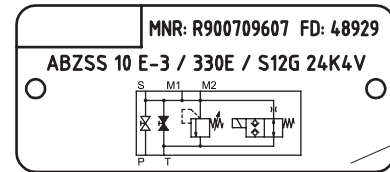
- 1. Name plate** specifying the pressure rating, identifies the device
- 2. Functional sign** identifies the components and elementary lever positions
- 3. Warning sign** has to be clearly visible and attached at the device or next to it, however not at the pressure vessel itself.

Usually, the warning sign is in the languages according to the country acceptance. Further languages at request.

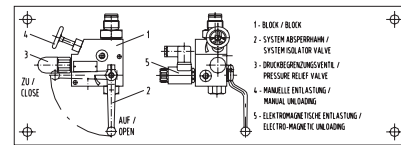
For hydraulic systems with one or several hydraulic accumulators whose warning signs are not visible after installation into the machine, an additional warning sign has to be attached visibly to the system, stating:

**"CAUTION -- system contains hydraulic accumulators."**

The circuit diagram has to contain the same notice. With mounting "B" and "K", the warning signs and functional signs are supplied loosely and must be attached to or close to the accumulator station in a clearly visible position. The attachment of the signs must already be considered in the design.



Example



## Commissioning, maintenance and operating instructions

### Commissioning - Operating instructions according to the data sheet of the accumulator!

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>DANGER</b><br/>Do not charge hydraulic accumulators with oxygen or air. Explosion hazard!</p> <ul style="list-style-type: none"> <li>▶ Prior to the initial commissioning, the hydraulic accumulator must be filled with nitrogen of class 4.0, pure (N<sub>2</sub> content 99.99 vol. %).<br/>The preset gas pressure necessary for the operation is indicated in the circuit diagrams and operating instructions.</li> <li>▶ Only use suitable filling and testing devices for filling.<br/>We recommend using the charging and test devices by Bosch Rexroth according to data sheet 50150.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                     |
|  | <p><b>WARNING</b></p> <ul style="list-style-type: none"> <li>▶ Risk of injury caused by improper assembly.</li> <li>▶ Hydraulic accumulators are energy stores. They may supply the energy for uncontrolled movements to actuators.</li> <li>▶ Before beginning any repairs, the system must be depressurized on the oil and gas side and protected against unauthorized re-start.</li> <li>▶ Do not carry out welding and soldering works or any mechanical processing on the accumulator tank!<br/>Any kind of processing at the product invalidates the declaration of conformity and the operating license!             <ul style="list-style-type: none"> <li>– Explosion hazard due to welding and soldering works!</li> <li>– Danger of bursting during and after mechanical processing.</li> </ul> </li> <li>▶ A warning sign is enclosed to the accumulator station. It is to be attached to or close to the accumulator station in a clearly visible position.</li> </ul> |

### Maintenance

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|  | <p><b>Attention</b></p> <ul style="list-style-type: none"> <li>▶ In case of damage at the accumulator bladder or diaphragm, the accumulator will lose its function immediately.</li> <li>▶ Loss of the initial gas tension will lead to damage at the accumulator bladder or the accumulator diaphragm if operation of the system is continued nevertheless.</li> <li>▶ Check the initial gas tension in regular intervals.</li> </ul> |
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### Legal provisions

- ▶ Hydraulic accumulators are pressure vessels and subject to the application of national provisions and/or regulations valid at the place of installation.
- ▶ In Germany, the Ordinance on Industrial Safety and Health (BetrSichV) applies.
- ▶ As a standard, country acceptances are effected according to BA, CE as well as for China and Russia. Other acceptances on request.
- ▶ Special regulations are to be observed in shipbuilding, aircraft construction, mining, etc.
- ▶ Design, production and testing are effected according to the data sheets according to AD 2000. Installation, equipment and operation are regulated by the "Technical rules for pressure vessels" (TRB).

### Notes pursuant to the EC Machinery

#### **Directive 2006/42/EC, according to annex II part 1, section A, manufacturer's declaration:**

- ▶ The assemblies were manufactured in accordance with the harmonized standards DIN EN ISO 4413, DIN EN ISO 12100, EN 983, and EN 60204-1.
- ▶ Commissioning is prohibited until it was confirmed that the machine into which the assemblies are to be integrated complies with the regulations laid down in the EC Directives.