**PNEUMATIC PARTS - CATALOGUE**

**Components, Sets of Components and Units for Pneumatically Controlled Smoke and Heat Exhaust Ventilation Systems (SHEVS)**

Effective October 1st, 2017

Please note that this catalogue uses a comma as decimal marker in numbers!

The data contained in this catalogue have been compiled with utmost care. However, no liability is assumed for possible consequences of using this information. Subject to modifications.
Summary

Pneumatic

1. Cylinder
   - Single-stroke cylinders
   - Double-stroke cylinders
   - Gas-pressure spring

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   - BF mounting
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   - Dimensional sheet of mountings
Pxxx 32

- Double-acting compressed-air cylinder with 32mm piston diameter
- Cylinder barrel made of anodized aluminium (E6C0)
- Piston rod dia. 12mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended operating pressure 6 - 10bar
- Maximum static operating pressure 60bar
- Theoretical lifting force at 6bar = 480N (approx. 15% frictional losses to be considered)
- Mounting and air supply through swivel screw fittings, at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 70mm when mounted at upper end. For increase in mounting dimension please inquire
- For further installation sizes and dimensions, please see drawing and dimensions table of pneumatic cylinders Type P
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -25 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 6.500N
- Manual unlocking is possible
- Stroke length can be freely selected as per price list. For extra lengths, please inquire
- VdS approval no. G 500008 (up to 1.400mm stroke)
- Including eyebolt AS M8x40-Ø8, and 2 swivel screw fittings SV 6-12-1/8 (for 6mm OD pipes, collar diameter 12mm)

Types:

PODV 32/12-xxxx-8-12/6:
Standard version, mounting at upper end, both end positions locked (double locking)

PUDV 32/12-xxxx-8-12/6:
Version with mounting at lower end, both end positions locked (double locking)

PMDV 32/12-xxxx-8-12/6:
Version with centre mounting position, both end positions locked (double locking), 2 swivel screw fittings SVPM 6-12-32

POAV 32/12-xxxx-8-12/6:
Version with mounting at upper end, upper end position locked (locked when extended)

PUAV 32/12-xxxx-8-12/6:
Version with mounting at lower end, upper end position locked (locked when extended)

PMAV 32/12-xxxx-8-12/6:
Version with centre mounting position, upper end position locked (locked when extended), 2 swivel screw fittings SVPM 6-12-32
The following variants can be supplied upon request:

- Different types of eyebolts or swivel screw fittings. (see screw fittings)
- Pneumatic cylinder up to 280mm stroke, with protective bellows for piston rod
- Pneumatic cylinder with male thread at end of piston rod for fastening clevises. (see mounting kits for pneumatic cylinders)
**Pxxx 40**

- Double-acting compressed-air cylinder with 40mm piston diameter
- Cylinder barrel made of anodized aluminium (E6C0)
- Piston rod dia. 12 or 16mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended operating pressure 6 - 10bar
- Maximum static operating pressure 60bar
- Theoretical lifting force at 6bar = 750N (approx. 15% frictional losses to be considered)
- Mounting and air supply through swivel screw fittings, at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 70mm when mounted at upper end. For increase in mounting dimension please inquire
- For further installation sizes and dimensions, please see drawing and dimensions table of pneumatic cylinders Type P
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -25 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 6.500N
- Manual unlocking is possible
- Stroke length can be freely selected as per price list. For extra lengths, please inquire
- VdS approval no. G 500009 (Piston rod dia. 12mm up to 1.100mm stroke and 16mm up to 1.800mm stroke)
- Including eyebolt AS M6x40-Ø8 for piston rods up to 12mm dia. or AS M10x60-Ø8 for piston rods up to 16mm dia., and 2 swivel screw fittings SV 6-12-1/8 (for 6mm OD pipes, collar diameter 12mm)

**Types:**

**PODV 40/xx-xxxx-8-12/6:**
Standard version, mounting at upper end, both end positions locked (double locking)

**PUDV 40/xx-xxxx-8-12/6:**
Version with mounting at lower end, both end positions locked (double locking)

**PMDV 40/xx-xxxx-8-12/6:**
Version with centre mounting position, both end positions locked (double locking), 2 swivel screw fittings SVPM 6-12-40

**POAV 40/xx-xxxx-8-12/6:**
Version with mounting at upper end, upper end position locked (locked when extended)

**PUAV 40/xx-xxxx-8-12/6:**
Version with mounting at lower end, upper end position locked (locked when extended)

**PMAV 40/xx-xxxx-8-12/6:**
Version with centre mounting position, upper end position locked (locked when extended), 2 swivel screw fittings SVPM 6-12-40
The following variants can be supplied upon request:

- Different types of eyebolts or swivel screw fittings. (see screw fittings)
- Pneumatic cylinder up to 280mm stroke, with protective bellows for piston rod
- Pneumatic cylinder with male thread at end of piston rod for fastening clevises. (see mounting kits for pneumatic cylinders)
Pxxx 50

- Double-acting compressed-air cylinder with 32mm piston diameter
- Cylinder barrel made of anodized aluminium (E6C0)
- Piston rod dia. 12, 16 or 20mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended operating pressure 6 - 10bar
- Maximum static operating pressure 60bar
- Theoretical lifting force at 6bar = 1.170N (approx. 15% frictional losses to be considered)
- Mounting and air supply through swivel screw fittings, at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 70mm when mounted at upper end. For increase in mounting dimension please inquire
- For further installation sizes and dimensions, please see drawing and dimensions table of pneumatic cylinders Type P
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -25 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 6.500N
- Manual unlocking is possible
- Stroke length can be freely selected as per price list. For extra lengths, please inquire
- VdS approval no. G 500010 (piston rod dia. 12mm up to 900mm stroke, 16mm up to 1.600mm stroke and 20mm up to 2.000mm stroke)
- Including eyebolt AS M8x40-Ø8 for piston rods up to 12mm dia. or AS M10x60-Ø8 for piston rods up to 16mm and 20mm dia., and 2 swivel screw fittings SV 6-12-1/8 (for 6mm OD pipes, collar diameter 12mm)

**Types:**

PODV 50/xx-xxxx-8-12/6:
Standard version, mounting at upper end, both end positions locked (double locking)

PUDV 50/xx-xxxx-8-12/6:
Version with mounting at lower end, both end positions locked (double locking)

PMDV 50/xx-xxxx-8-12/6:
Version with centre mounting position, both end positions locked (double locking), 2 swivel screw fittings SVPM 6-12-50

POAV 50/xx-xxxx-8-12/6:
Version with mounting at upper end, upper end position locked (locked when extended)

PUAV 50/xx-xxxx-8-12/6:
Version with mounting at lower end, upper end position locked (locked when extended)

PMAV 50/xx-xxxx-8-12/6:
Version with centre mounting position, upper end position locked (locked when extended), 2 swivel screw fittings SVPM 6-12-50
The following variants can be supplied upon request:

- Different types of eyebolts or swivel screw fittings. (see screw fittings)
- Pneumatic cylinder up to 280mm stroke, with protective bellows for piston rod
- Pneumatic cylinder with male thread at end of piston rod for fastening clevises. (see mounting kits for pneumatic cylinders)
Pxxx 63

- Double-acting compressed-air cylinder with 63mm piston diameter
- Cylinder barrel made of anodized aluminium (E6C0)
- Piston rod dia. 12, 16, 20 or 25mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended operating pressure 6 - 10bar
- Maximum static operating pressure 60bar
- Theoretical lifting force at 6bar = 1.870N (approx. 15% frictional losses to be considered)
- Mounting and air supply through swivel screw fittings, at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 70mm when mounted at upper end (piston rod dia. 25mm: 80mm). For increase in mounting dimension please inquire
- For further installation sizes and dimensions, please see drawing and dimensions table of pneumatic cylinders Type P
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -25 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 6,500N
- Manual unlocking is possible
- Stroke length can be freely selected as per price list. For extra lengths, please inquire
- VdS approval no. G 500011
  - piston rod dia. 12mm up to 700mm stroke,
  - piston rod dia. 16mm up to 1,300mm stroke and
  - piston rod dia. 20/25mm up to 2,000mm stroke
- Including eyebolt AS M8x40-Ø8 for piston rods up to 12mm dia. or AS M10x60-Ø8 for piston rods up to 16mm, 20mm and 25mm dia., and 2 swivel screw fittings SV 6-12-1/8 (for 6mm OD pipes, collar diameter 12mm)

Types:

PODV 63/xx-xxxx-8-12/6:
Standard version, mounting at upper end, both end positions locked (double locking)

PUDV 63/xx-xxxx-8-12/6:
Version with mounting at lower end, both end positions locked (double locking)

PMDV 63/xx-xxxx-8-12/6:
Version with centre mounting position, both end positions locked (double locking), 2 swivel screw fittings SVPM 6-12-63

POAV 63/xx-xxxx-8-12/6:
Version with mounting at upper end, upper end position locked (locked when extended)

PUAV 63/xx-xxxx-8-12/6:
Version with mounting at lower end, upper end position locked (locked when extended)

PMAV 63/xx-xxxx-8-12/6:
Version with centre mounting position, upper end position locked (locked when extended), 2 swivel screw fittings SVPM 6-12-63
Pneumatic cylinder
Single-stroke cylinder

The following variants can be supplied upon request:

- Different types of eyebolts or swivel screw fittings. (see screw fittings)
- Pneumatic cylinder up to 280mm stroke, with protective bellows for piston rod
- Pneumatic cylinder with male thread at end of piston rod for fastening clevises. (see mounting kits for pneumatic cylinders)
Pxxx 80

- Double-acting compressed-air cylinder with 32mm piston diameter
- Cylinder barrel made of anodized aluminium (E6C0)
- Piston rod dia. 20 or 25mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended operating pressure 6 - 10bar
- Maximum static operating pressure 60bar
- Theoretical lifting force at 6bar = 3000 (approx. 15% frictional losses to be considered)
- Mounting and air supply through swivel screw fittings, at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 70mm when mounted at upper end (piston rod dia. 25mm: 80mm). For increase in mounting dimension please inquire
- For further installation sizes and dimensions, please see drawing and dimensions table of pneumatic cylinders Type P
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -25 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 6,500N
- Manual unlocking is possible
- Stroke length can be freely selected as per price list. For extra lengths, please inquire
- VdS approval no. G 507006
  - piston rod dia. 20mm up to 1,500mm stroke,
  - piston rod dia. 25mm up to 2,000mm stroke
- Including eyebolt AS M10x60-Ø8, and 2 swivel screw fittings SVP 6-18-1/4 (for 6mm OD pipes, collar diameter 12mm)

**Types:**

**PODV 80/xx-xxxx-8-18/6:**
Standard version, mounting at upper end, both end positions locked (double locking)

**PUDV 80/xx-xxxx-8-18/6:**
Version with mounting at lower end, both end positions locked (double locking)

**PMDV 80/xx-xxxx-8-12/6:**
Version with centre mounting position, both end positions locked (double locking), 2 swivel screw fittings SVPM 6-12-80 (collar diameter 12mm)

**POAV 80/xx-xxxx-8-18/6:**
Version with mounting at upper end, upper end position locked (locked when extended)

**PUAV 80/xx-xxxx-8-18/6:**
Version with mounting at lower end, upper end position locked (locked when extended)

**PMAV 80/xx-xxxx-8-12/6:**
Version with centre mounting position, upper end position locked (locked when extended), 2 swivel screw fittings SVPM 6-12-80 (collar diameter 12mm)
The following variants can be supplied upon request:

- Different types of eyebolts or swivel screw fittings. (see screw fittings)
- Pneumatic cylinder up to 280mm stroke, with protective bellows for piston rod
- Pneumatic cylinder with male thread at end of piston rod for fastening clevises.
  (see mounting kits for pneumatic cylinders)
Commissioning:

Before commissioning make sure that:
- The cylinder can be easily moved.
- Check if the pneumatic cylinder drives its complete stroke without collision with other plant components. During this, also control on deformations at max. load and max. pressurisation.
- Check the end position locking (if exist).
- Check if the piston rod and the unlocking screws are rust-free.
- Check if the piston rod is damaged.
- The atmosphere in which the pneumatic cylinder is mounted must not be corrosive.

Maintenance:

The maintenance must be carry out through a for this trained maintenance staff once a year. It must be checked following points:
- Check if the unlocking screws are rust-free.
- Check the seal ring of the unlocking screw on wear, damage and sealing to the housing.
- Check if the piston rod is rust-free, not damaged and not dirty (clean if necessary).
- Check the dirt wiper on wear and sealing to the piston rod.
- Test all cylinder components for leaks (it is absolutely necessary, to check the cylinder in each stroke positions and control directions (OPEN or CLOSE)).
- Check for dust-free (clean if necessary).

Technical data:

- **max. operating pressure**: stroke-, mounting- and installation position dependent (see table: 02.027.T0.*, 02.027.T1.*, 02.027.T2.*) but max. 30bar
- **max. static housing pressure**: 600N
- **max. pulling force of locking**: 6500N
- **ambient temperature range**: -25 °C - +60 °C to VdS 2159 for 2hrs up to +110 °C
- **air quality**: filtered and unoiled
- **VdS approval no.**:
  - Ø32 ... G500008
  - Ø40 ... G500009
  - Ø50 ... G500010
  - Ø63 ... G500011
  - Ø80 ... G507006

Setting range eye bolt:

(For the size B1-B5, EBO, EBU, EBM and EBM1)
- Eye bolt M8x40: +10mm/-4mm (for piston rod Ø12)
- Eye bolt M10x60: +30mm/-4mm (for piston rod Ø16, Ø20 and Ø25)

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Commissioning:
Befor commissioning make sure that:
- The cylinder can be easily moved.
- Check if the pneumatic cylinder drives its complete stroke without collision with other plant components. During this, also control on deformations at max. load and max. pressurisation.
- Check the end position locking (if exist).
- Check if the piston rod and the unlocking screws are rost-free.
- The atmosphere in which the pneumatic cylinder is mounted must not be corrosive.

Maintenance:
The maintenance must be carry out through a for this trained maintenance staff once a year. It must be checked following points:
- Check if the unlocking screws are rost-free.
- Check the seal ring of the unlocking screw on wear, damage and sealing to the housing.
- Check if the piston rod is rost-free, not damaged and not dirty (clean if necessary).
- Check the dirt wiper on wear and sealing to the piston rod.
- Test all cylinder components for leaks (it is absolutely necessary, to check the cylinder in each stroke positions and control directions (OPEN or CLOSE)).
- Check for dust-free (clean if necessary).

Technical data:
max. operating pressure: stroke-, mounting- and installation position dependent (see table: 02.027.T0.*, 02.027.T1.*, 02.027.T2.*) but max. 30bar
max. static housing pressure: 60bar
max. pulling force of locking: 6500N
ambient temperature range: -25°C - +60°C to VdS 2159 for 2hrs up to +110°C
air quality: filtered and unoiled
VdS approval no.: Ø32 ... G500008
Ø40 ... G500009
Ø50 ... G500010
Ø63 ... G500011
Ø80 ... G507006

Setting range eye bolt:
(for the size B1-B5, EBO, EBU, EBM and EBM1)
eye bolt M8x40: +10mm/-4mm (for piston rod Ø12)
eye bolt M10x60: +30mm/-4mm (for piston rod Ø16, Ø20 and Ø25)

Tolerance
Created Simetzberger 1/2 A3 Overview of types for pneumatic cylinders series PxDV and PxAV
Approved HA 27.07.2012
Valid

Grasl Pneumatic Mechanik GmbH
Dxxx 40

- Double-acting two-stage compressed-air cylinder for controlling the ventilation and SHE functions with a single cylinder. When charged with a pressure of < 7bar, cylinder travels into ventilation position (small stroke); at a pressure of > 10bar, cylinder travels into SHE position (total stroke).
- Cylinder with 40mm piston diameter, threaded design, made of anodized aluminium (E6C0)
- Piston rod dia. 16mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended ventilation pressure 6bar
- Maximum static operating pressure 60bar
- Admissible lifting force at 6bar = 480N
- Mounting and air supply through swivel screw fittings at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 73mm when mounted at upper end, 142mm + stroke when at lower end. Installation size can be varied from -5 to +5mm by adjusting the eyebolt. For greater installation dimensions, please inquire
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -20 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 8,000N. Ventilating position cannot be locked.
- Total stroke can be freely selected from 201mm to 1.300mm.
- Including eyebolt AS M8x40-Ø8, and 2 swivel screw fittings SV 6-12-1/8 (for 6mm OD pipes, collar diameter 12mm)

Types:

DODV 40/16-xxxx/yyyy-8-12/6: Version with mounting at upper end, both end positions locked (double locking),

DOAV 40/16-xxxx/yyyy-8-12/6: Version with mounting at upper end, upper end position locked (locked when extended)

DMDV 40/16-xxxx/yyyy-8-12/6: Version with centre mounting position, both end positions locked (double locking)

DMAV 40/16-xxxx/yyyy-8-12/6: Version with centre mounting position, upper end position locked (locked when extended)

DUDV 40/16-xxxx/yyyy-8-12/6: Version with mounting at lower end, both end positions locked (double locking)

DUAV 40/16-xxxx/yyyy-8-12/6: Version with mounting at lower end, upper end position locked (locked when extended)

For special types, please inquire
**Dxxx 50**

- Double-acting two-stage compressed-air cylinder for controlling the ventilation and SHE functions with a single cylinder. When charged with a pressure of < 7bar, cylinder travels into ventilation position (small stroke); at a pressure of > 10bar, cylinder travels into SHE position (total stroke)
- Cylinder with 50mm piston diameter, threaded design, made of anodized aluminium (E6C0)
- Piston rod dia. 20mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended ventilation pressure 6bar
- Maximum static operating pressure 60bar
- Admissible lifting force at 6bar = 950N
- Mounting and air supply through swivel screw fittings at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 73mm when mounted at upper end, 142mm + stroke when at lower end. Installation size can be varied from -5 to +5mm by adjusting the eyebolt. For greater installation dimensions, please inquire
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -20 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 8.000N. Ventilating position cannot be locked.
- Total stroke can be freely selected from 201mm to 1.300mm.
- VdS approval no. G 505008 (up to 1.800 mm stroke)
- Including eyebolt AS M8x40-Ø8, and 2 swivel screw fittings SV 6-12-1/8 (for 6mm OD pipes, collar diameter 12mm)

**Types:**

DODV 50/20-xxxx/yyyy-8-12/6: Version with mounting at upper end, both end positions locked (double locking),

DOAV 50/20-xxxx/yyyy-8-12/6: Version with mounting at upper end, upper end position locked (locked when extended)

DMDV 50/20-xxxx/yyyy-8-12/6: Version with centre mounting position, both end positions locked (double locking)

DMAV 50/20-xxxx/yyyy-8-12/6: Version with centre mounting position, upper end position locked (locked when extended)

DUDV 50/20-xxxx/yyyy-8-12/6: Version with mounting at lower end, both end positions locked (double locking)

DUAV 50/20-xxxx/yyyy-8-12/6: Version with mounting at lower end, upper end position locked (locked when extended)

For special types, please inquire

![Diagram](image-url)
Dxxx 63

- Double-acting two-stage compressed-air cylinder for controlling the ventilation and RWA functions with a single cylinder. When charged with a pressure of < 7bar, cylinder travels into ventilation position (small stroke); at a pressure of > 10bar, cylinder travels into RWA position (total stroke)
- Cylinder with 63mm piston diameter, threaded design, made of anodized aluminium (E6C0)
- Piston rod dia. 20 or 25mm, stainless steel 1.4104 with female thread M8 and dirt wiper
- Recommended ventilation pressure 6bar
- Maximum static operating pressure 60bar
- Admissible lifting force at 6bar = 1580N
- Mounting and air supply through swivel screw fittings at upper or lower end or at centre, as required by design
- Standard installation size (eyebolt-to-mount spacing) 73mm when mounted at upper end, 142mm + stroke when at lower end. Installation size can be varied from -5 to +5mm by adjusting the eyebolt. For greater installation dimensions, please inquire
- Continuous adjustability in mounting ensured by clamping element (upon request)
- Ambient temperature range -20 to +60°C, to VdS 2159 for 2hrs up to +110°C
- Maximum locking force 8.000N. Ventilating position cannot be locked.
- Total stroke can be freely selected from 201mm to 1.300mm.
- VdS approval no. G 505008 (up to 1.800 mm stroke)
- Including eyebolt AS M8x40-Ø8, and 2 swivel screw fittings SV 6-12-1/8 (for 6mm OD pipes, collar diameter 12mm)

Types:

DODV 63/20-xxxx/yyy-8-12/6: Version with mounting at upper end, both end positions locked (double locking),

DOAV 63/20-xxxx/yyy-8-12/6: Version with mounting at upper end, upper end position locked (locked when extended)

DMDV 63/20-xxxx/yyy-8-12/6: Version with centre mounting position, both end positions locked (double locking)

DMAV 63/20-xxxx/yyy-8-12/6: Version with centre mounting position, upper end position locked (locked when extended)

DUDV 63/20-xxxx/yyy-8-12/6: Version with mounting at lower end, both end positions locked (double locking)

DUAV 63/20-xxxx/yyy-8-12/6: Version with mounting at lower end, upper end position locked (locked when extended)

For special types, please inquire

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<th>Stroke / vent. stroke</th>
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<td>Piston dia.</td>
<td>Eye dia. of eyebolt</td>
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| DODV 63-1-KE.doc | SK | Rev. 1/09 | Jul. 23, 2009 | Page 1 |
Double-stroke cylinder
DOAV
mounted at UPPER end
locked when extended

Double-stroke cylinder
DOOV
mounted at UPPER end
without locking

Double-stroke cylinder
DMAV
CENTRE mounted
locked when extended

Double-stroke cylinder
DMOV
CENTRE mounted
without locking

1) only available for connecting piece!
2) connecting piece rotated through 180°

Technical data:
- max. operating pressure: stroke-, mounting- and mounting position dependent (see table: 02.027.T32.*, 02.027.T33.*), but max. 30bar
- max. static housing pressure: 60bar
- max. pulling force of locking: 8500N
- ambient temperature range: -25 - +60°C to VdTÜV 2159 for 2hrs up to +110°C
- VdTÜV approval no.: G505008

Setting range eye bolt:
(for the size B1-B3, EBO, EBM, EBM1 and EBM2)
- eye bolt M10x60: +30mm/-4mm (for piston diameter Ø20 and Ø25)

Tolerance

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Double-stroke cylinder

**DODV**
- Mounted at UPPER end
- Locked at both ends

**DOEV**
- Mounted at UPPER end
- Locked when retracted

**DMDV**
- CENTRE mounted
- Locked at both ends

**DMEV**
- CENTRE mounted
- Locked when retracted

**DUDV**
- Mounted at LOWER end
- Locked at both ends

**DUEV**
- Mounted at LOWER end
- Locked when retracted

### Technical data:

- **max. operating pressure**
  - Stroke-, mounting- and mounting position dependent (see table: 02.027.T32.*, 02.027.T33.*
  - but max. 30bar

- **max. static housing pressure** 60bar

- **max. pulling force of locking** 6500N

- **ambient temperature range** -25 - +60°C to VdS 2159 for 2hrs up to +110°C

- **VdS approval no.** G505008 (no approval for Ø40)

### Setting range eye bolt:

- (for the size B1-B3, EBO, EBU, EBM and EBM1)
- Eye bolt M10x60: +30mm/-4mm (for piston diameter Ø16, Ø20 and Ø25)

### Tolerance

<table>
<thead>
<tr>
<th>Tolerance</th>
<th>Scale</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3:10</td>
<td></td>
</tr>
</tbody>
</table>

1) only available for connecting piece!
2) connecting piece rotated through 180°
Gas-pressure spring **GDF**

- Cushioned gas-pressure spring with knuckle joint and knuckle eye, e.g. for automatically opening side windows
- Opens automatically after unlocking by Combination Window Catch (EFR or PFR - please refer to locking elements)
- Maximum static load capacity 1.000N
- Ambient temperature range: -30 to +80°C
- Required accessories for each gas-pressure spring: 1 mounting bracket MK GDF, 1 window bracket MK F-1
- Admissible sizes and weights of the windows are limited by the given position of hinges and arrangement of mountings. **Safe execution of the opening function has to be verified by trials.**

**GDF 22-300-100:** Gas-pressure spring with 300mm stroke, pushing force 100N. Installation size (knuckle joint -to- eye spacing) 414mm

**MK-GDF1:** Mounting bracket for gas-pressure spring for holding the knuckle eye including bolt dia. 8mm

**MK F-1:** Window bracket (see mounting brackets; no pin required)

**For special types, please inquire**
**Mounting brackets MK**

Mounting brackets of galvanized sheet steel for mounting pneumatic cylinders

**Mounting brackets for pneumatic cylinders Pxxx 32, Pxxx 40, Dxxx 40:**

**MK 47-1:** 47mm inner width, Type 1

**MK 47-2:** 47mm inner width, Type 2
Mounting brackets for pneumatic cylinders Pxxx 32, Pxxx 40, Dxxx 40:

**MK 47-3**: 47mm inner width, Type 3

**MK 47-4**: 47mm inner width, Type 4
Mounting brackets for pneumatic cylinders Pxxx 50, Dxxx 50:

**MK 56-1**: 56mm inner width, Type 1

**MK 56-2**: 56mm inner width, Type 2
Mounting brackets for pneumatic cylinders Pxxx 50, Dxxx 50:

**MK 56-3**: 56mm inner width, Type 3

Mounting brackets for pneumatic cylinders Pxxx 63 und Dxxx 63:

**MK 70-1**: 70mm inner width, Type 1

Mounting brackets for pneumatic cylinders Pxxx 80:

(sheet aluminium)

**MK 93-1**: 93mm inner width, Type 1
Mounting brackets for pneumatic cylinders Type P and Type D; variable mounting with clamping element KST:

**MK 102-1:** 102mm inner width, Type 1

**MK 102-2:** as above, but mount for swivel screw fittings is not 12.5mm but 18.5mm. 102mm inner width, Type 2

Mounting brackets for pneumatic cylinders FO 110:

**MK 125-1:** 125mm inner width, Type 1
Window bracket for mounting pneumatic cylinders or gas-pressure springs on pivot-hung windows:

**MK F-1**: Window bracket Type 1

**MK F-B6**: Fastening bolt as a link between window bracket and eyebolt. For 6 mm eye dia. of eyebolt

**MK F-B8**: Fastening bolt as a link between window bracket and eyebolt. For 8 mm eye dia. of eyebolt

Angle bracket for fitting mounting brackets MK 47 and MK 56 rotated through 90° (to be bored for MK 47-3 and MK 56-1):

**MK W-1**: Angle bracket Type 1

For special brackets please inquire
Clamping elements KST

- Clamping elements for continuous adjustability in mounting pneumatic cylinders Series P and D.
  - For connection of pipe to the clamping elements KST 32, KST 40 und KST 50, 2 straight connectors (e.g. B1-6-1/8) and 2 elbow connectors (e.g. B5-6-1/8) will be required additionally.
  - For connection of pipe to the clamping elements KST 63, 2 double swivel screw fittings (e.g. DSVPM 6-12-63) and 2 elbow connectors (e.g. B5-6-1/8) will be required additionally.
  - Clamping elements cannot be used for cylinders with factory-made centre mounting arrangement (Type PMxx)
  - Including fastening bolts M8

Types:

**KST 32:** Clamping element for continuous adjustability in mounting pneumatic cylinders Type POxx-32 / PUxx-32

**KST 40:** Clamping element for continuous adjustability in mounting pneumatic cylinders Type POxx-40 / PUxx-40 / DOxx-40 / DUxx-40

**KST 50:** Clamping element for continuous adjustability in mounting pneumatic cylinders Type POxx-50 / PUxx-50 / DOxx-50 / DUxx-50

<table>
<thead>
<tr>
<th>Type</th>
<th>A</th>
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<th>C</th>
<th>D</th>
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<tr>
<td>KST 32</td>
<td>Ø 36,0mm</td>
<td>50mm</td>
<td>21mm</td>
<td>10mm</td>
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<tr>
<td>KST 40</td>
<td>Ø 44,5mm</td>
<td>60mm</td>
<td>15,75mm</td>
<td>20mm</td>
</tr>
<tr>
<td>KST 50</td>
<td>Ø 55,5mm</td>
<td>60mm</td>
<td>Ø 10,5mm</td>
<td>20mm</td>
</tr>
</tbody>
</table>
**KST 63:** Clamping element for continuous adjustability in mounting pneumatic cylinders Type POxx-63 / PUxx-63 / DOxx-63 / DUxx-63

For special types, please inquire
**Coupling brackets KB**

Coupling brackets for flange-mouting the pneumatic cylinders on dome lights, casements etc.

**Types:**

**KB-F6:** Coupling bracket with spring bolt dia. 6mm

**KB-KBB 6:** Coupling bracket with bolt dia. 6mm (including washer and cotter pin)
**KB-KBB 8**: Coupling bracket with bolt dia. 8mm
(including washer and cotter pin)

![Diagram of KB-KBB 8 coupling bracket]
Eyebolts AS

Eyebolts of galvanized steel, including locknut

**Types:**

AS M8x40-Ø6: Eyebolt M8 x 40, eye dia. 6mm
AS M8x40-Ø8: Eyebolt M8 x 40, eye dia. 8mm
AS M8x40-Ø10: Eyebolt M8 x 40, eye dia. 10mm

AS M8x60-Ø8: Eyebolt M8 x 60, eye dia. 8mm
AS M8x60-Ø10: Eyebolt M8 x 60, eye dia. 10mm

AS M8x80-Ø8: Eyebolt M8 x 80, eye dia. 8mm
AS M8x80-Ø10: Eyebolt M8 x 80, eye dia. 10mm

AS M10x60-Ø8: Eyebolt M10 x 60, eye dia. 8mm
AS M10x60-Ø10: Eyebolt M10 x 60, eye dia. 10mm

AS M10x90-Ø8: Eyebolt M10 x 90, eye dia. 8mm
AS M10x90-Ø10: Eyebolt M10 x 90, eye dia. 10mm

For special types, please inquire
Clevises GK

- Clevis for flange-mounting the pneumatic cylinders, e.g. on louvre operating levers
- The pneumatic cylinders are available ex works with male thread at the end of the piston rod for fastening of clevis. Clevis can also be fastened to the pneumatic cylinders by means of suitable threaded rods instead of eyebolts.
- Including pin secured by clip

**Types:**

**GK 6/12:** Clevis with female thread M6, pin diameter 6mm, yoke size 12mm

**GK 6/24:** Clevis with female thread M6, pin diameter 6mm, yoke size 24mm

**GK 8/16:** Clevis with female thread M8, pin diameter 8mm, yoke size 16mm

**GK 8/32:** Clevis with female thread M8, pin diameter 8mm, yoke size 32mm

**GK 10/20:** Clevis with female thread M10, pin diameter 10mm, yoke size 20mm

**GK 10/40:** Clevis with female thread M10, pin diameter 10mm, yoke size 40mm

**For special types, please inquire**

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<tr>
<th>dim. in mm</th>
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<th>C</th>
<th>D</th>
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Swivel screw fittings SV / SVP / DSV

All swivel screw fittings will be assembled with a 6mm Allen key.

Swivel screw fittings for mounting of, and air supply to, pneumatic cylinders Type POxx und PUxx. Pipe connection with compression type screw fitting:

**SV 6-12-1/8:** connection thread 1/8"
**SV 6-12-1/8-L:** connection thread 1/8"
**SV 6-12-1/8-XL:** connection thread 1/8"
**SV 8-12-1/8:** connection thread 1/8"
**SV 8-12-1/8-L:** connection thread 1/8"

**SVP 6-18-1/8:** connection thread 1/8"
**SVP 6-18-1/8-L:** connection thread 1/8"
**SVP 6-18-1/4:** connection thread 1/4"
**SVP 6-18-1/4-L:** connection thread 1/4"

**SV 8-12-1/8:** connection thread 1/8"
**SV 8-12-1/8-L:** connection thread 1/8"
**SVP 8-18-1/8:** connection thread 1/8"
**SVP 8-18-1/8-L:** connection thread 1/8"
**SVP 8-18-1/4:** connection thread 1/4"
**SVP 8-18-1/4-L:** connection thread 1/4"

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<tr>
<td><strong>SVP 8-18-1/4-L</strong></td>
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<td>16</td>
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<td>39</td>
<td>R 1/4&quot;</td>
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</tbody>
</table>
Pneumatic cylinder
Accessories for mounting

Swivel screw fittings for mounting of, and air supply to, pneumatic cylinders Type PMxx.
Pipe connection with compression type fitting:

SVPM 6-12-32: connection thread M12 x 1,5
SVPM 6-12-40: connection thread M12 x 1,5
SVPM 6-12-50: connection thread M12 x 1,5
SVPM 6-12-63: connection thread M12 x 1,5
SVPM 6-12-80: connection thread M12 x 1,5

SVPM 8-12-32: connection thread M12 x 1,5
SVPM 8-12-40: connection thread M12 x 1,5
SVPM 8-12-50: connection thread M12 x 1,5
SVPM 8-12-63: connection thread M12 x 1,5
SVPM 8-12-80: connection thread M12 x 1,5

Swivel screw fittings for mounting of, and air supply to, pneumatic cylinders Type FO, FO2 und DH.
Pipe connection with compression type fitting:

SV 6-12-1/8: connection thread 1/8"
SV 6-12-1/8-L: connection thread 1/8"
SV 6-12-1/8-XL: connection thread 1/8"
SV 8-12-1/8: connection thread 1/8"
SV 8-12-1/8-L: connection thread 1/8"

SV 6-18-1/8: connection thread 1/8"
SV 6-18-1/8-L: connection thread 1/8"
SV 6-18-1/4: connection thread 1/4"
SV 6-18-1/4-L: connection thread 1/4"
SV 8-18-1/8: connection thread 1/8"
SV 8-18-1/8-L: connection thread 1/8"
SV 8-18-1/4: connection thread 1/4"
SV 8-18-1/4-L: connection thread 1/4"
Swivel screw fittings for mounting of, and air supply to, pneumatic cylinders Type FO, FO2 und DH.
2 pipe connections with compression type fittings:

DSV 6-12-1/8: connection thread 1/8"
DSV 6-12-1/8-L: connection thread 1/8"
DSV 8-12-1/8: connection thread 1/8"
DSV 8-12-1/8-L: connection thread 1/8"

DSV 6-18-1/8: connection thread 1/8"
DSV 6-18-1/8-L: connection thread 1/8"
DSV 6-18-1/4: connection thread 1/4"
DSV 6-18-1/4-L: connection thread 1/4"
DSV 8-18-1/8: connection thread 1/8"
DSV 8-18-1/8-L: connection thread 1/8"
DSV 8-18-1/4: connection thread 1/4"
DSV 8-18-1/4-L: connection thread 1/4"

Swivel screw fittings for use as pivots in mounting fulcrums.
2 pipe connections with compression type fittings:

DSV 6-18-M12: Double swivel screw fitting for pipes OD 6mm, collar diameter 18mm, thread M12, including washer and nut

DSV 8-18-M12: Double swivel screw fitting for pipes OD 8mm, collar diameter 18mm, thread M12, including washer and nut

For special types, please inquire
Fixing plugs ST

- Fixing plug with vent bore for supporting pneumatic cylinders and mountings in their fulcrums. Plugs do not supply air.
- All fixing plugs will be assembled with a 6mm Allen key.

Types:

ST 12-1/8: Fixing plug dia. 12mm, connection thread 1/8"

STP 18-1/8: Fixing plug dia. 18mm, connection thread 1/8" for cylinder Type P, D

STP 18-1/4: Fixing plug dia. 18mm, connection thread 1/4" for cylinder Type P, D

ST 18-1/8: Fixing plug dia. 18mm, connection thread 1/8" for cylinder Type FO, FO2 und DH

ST 18-1/4: Fixing plug dia. 18mm, connection thread 1/4" for cylinder Type FO, FO2 und DH

ST 18-M12: Fixing plug dia. 18mm without vent bore, connection thread M12, including washer and nut

For special types, please inquire.

<table>
<thead>
<tr>
<th>dim. in mm</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>M</th>
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<td>ST 18-1/8</td>
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<td>ST 18-1/4</td>
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<td>ST 18-M12</td>
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<td>7.5</td>
<td>6.5</td>
<td>M12</td>
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</table>
MHV-3

- Mechanical hook locking device for use with SHEVS opening mountings
- When SHE unit is closed or indoor ventilation mode is on, the locking hook engages with the bolt fitted to the mounting bracket / ventilation actuator, and is arrested by spring action
- When SHEVS mounting is opened by the SHEVS actuator, the locking hook automatically disengages from the bolt
- When SHEVS mounting closes, locking hook automatically reengages with the bolt
- Manual unlocking is possible by cable passing through bores provided in the locking hook
- Integrated guide for direct inclusion of the Set-L3 of a ventilation actuator.
- Ambient temperature range: -25 to +110°C
- VdS approval no. G 592011

- Maximum locking force 4.000N

**Types:**

MHV-3: Maximum locking force 5.000N; actuating bolt Ø10mm
MHV-3.01: Maximum locking force 5.000N, actuating bolt Ø10mm; for use in mountings type BG 1 and BG 2 with 24V spindle actuator and function SHE OPEN/CLOSE pneumatically

**Accessories:**

EVB 3-M12: Adjustable locking bolt to be fitted to RWA mountings without additional ventilating function. Retrofitting of the ventilating function is possible by exchanging the adjustable locking bolt for a ventilation actuator with Set-L3 (see below)
Extension sets: Extension sets to be fitted to RWA mountings for coupling an additional ventilation actuator. In ventilation mode, the RWA cylinder will follow idle

Set-L3-M8: Screw M8 with cross pin dia. 12mm, to be screwed into the ventilation actuator

Set-L3 M8 / ST 12-1/8: This set is required for use in electric ventilation actuators of the type E series. Additionally includes 2 plugs ST 12-1/8

Set-L3-M6: Screw M6 with cross pin dia. 12mm, to be screwed into the ventilation actuator

Set-L3-M6 / ST 12-1/8: Set additionally includes 2 plugs ST 12-1/8

For special types, please inquire
Operating description:
Mechanical hook locking device for use with opening systems (BF, GB, BG, usw.), in connection with adjustable locking bolt EVB3 or extension set for ventilation set L/3.

Operating:
Unlocking by applying a force in unlocking direction. The unlocking force depends on the unlocking angle and the particular locking force.

Installing:
Variable mounting position. But be careful about the correct unlocking angle.

Technical data:
- max. locking force: 5000N
- VdS approval no.: G 592011
- ambient temperature range: -25°C - +110°C

Release force:
Depending on the MHV-type - see table

<table>
<thead>
<tr>
<th>MHV-type</th>
<th>min. release force</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHV-3</td>
<td>430N</td>
</tr>
<tr>
<td>MHV-3.01</td>
<td>285N</td>
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<td>MHV-3.02</td>
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<tbody>
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</table>
MHV-4

- Mechanical hook locking device for use with SHEVS opening mountings
- When SHE unit is closed or indoor ventilation mode is on, the locking hook engages with the bolt fitted to the mounting bracket / ventilation actuator, and is arrested by spring action
- When SHEVS mounting is opened by the SHEVS actuator, the locking hook automatically disengages from the bolt
- When SHEVS mounting closes, locking hook automatically reengages with the bolt
- Manual unlocking is possible by cable passing through bores provided in the locking hook
- Integrated guide for direct inclusion of the Set-L3 of a ventilation actuator.
- Ambient temperature range: -25 to +110°C
- VdT approval no. G 592011

- Maximum locking force 4.000N

**Types:**

MHV-4.1: Maximum locking force 6.600N; actuating bolt Ø10mm
MHV-4.2: Maximum locking force 6.600N, actuating bolt Ø12mm

**Accessories:**

EVB 3-M12: Adjustable locking bolt to be fitted to RWA mountings without additional ventilating function. Retrofitting of the ventilating function is possible by exchanging the adjustable locking bolt for a ventilation actuator with Set-L3 (see below)
Extension sets: Extension sets to be fitted to RWA mountings for coupling an additional ventilation actuator. In ventilation mode, the RWA cylinder will follow idle

**Set-L3-M8:** Screw M8 with cross pin dia. 12mm, to be screwed into the ventilation actuator

**Set-L3 M8 / ST 12-1/8:** This set is required for use in electric ventilation actuators of the type E series. Additionally includes 2 plugs ST 12-1/8

**Set-L3-M6:** Screw M6 with cross pin dia. 12mm, to be screwed into the ventilation actuator

**Set-L3-M6 / ST 12-1/8:** Set additionally includes 2 plugs ST 12-1/8

For special types, please inquire
Operating description:
Mechanical hook locking device for use with opening systems (BF, GB, BG, usw.), in connection with adjustable locking bolt EVB3 or extension set for ventilation set-L/3.

Operating:
Unlocking by applying a force in unlocking direction. The unlocking force depends on the unlocking angle and the particular locking force.

Installing:
Variable mounting position. But be careful about the correct unlocking angle.

Technical data:
- max. locking force: 8600N
- VdS approval no.: G 92011
- ambient temperature range: -25°C to +110°C

*) used bolt for locking force test see drawing no.: 03.012.011.01.00

Release force:
Depending on the MHV-type - see table

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<tr>
<td>Mechanical hook locking device MHV-4.1</td>
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</table>

© 2002 KWB
Operating description:
Mechanical hook locking device for use with opening systems (BF, GB, BG, usw.), in connection with adjustable locking bolt EVB3 or extension set for ventilation set-L/3.

Operating:
Unlocking by applying a force in unlocking direction. The unlocking force depends on the unlocking angle and the particular locking force.

Installing:
Variable mounting position. But be carefull about the correct unlocking angle.

Technical data:
max. locking force 6600N *)
VdS approval no. G 392011
ambient temperature range -25°C - +110°C
*) used bolt for locking force test see drawing no.: 03.012.011.01.00

Release force:
Depending on the MHV-type - see table

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<tr>
<th>MHV-type</th>
<th>min. release force</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHV-4.2</td>
<td>450N</td>
</tr>
<tr>
<td>MHV-4.21</td>
<td>285N</td>
</tr>
<tr>
<td>MHV-4.22</td>
<td>650N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MHV-4.2</th>
<th>03.012.DAT.04.03-E</th>
</tr>
</thead>
</table>

Release by applying force in releasing direction. The releasing force depends on the releasing angle and the particular releasing force.

Installing:
Variable releasing position. But be carefull about the correct releasing angle.

Technical data:
max. releasing force 3500N *)
ambient temperature range -25°C - +110°C

*) used bolt for releasing force test see drawing no.: 03.012.011.01.00

Release force:
Depending on the MHV-type - see table

<table>
<thead>
<tr>
<th>MHV-type</th>
<th>min. release force</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHV-4.2</td>
<td>450N</td>
</tr>
<tr>
<td>MHV-4.21</td>
<td>285N</td>
</tr>
<tr>
<td>MHV-4.22</td>
<td>650N</td>
</tr>
</tbody>
</table>
EFR

♦ The electronic window catch is a locking element, which in case of „OPEN“ control disengages the locking hook and releases the locking bolt.
♦ Suitable for temperature range of -20°C to 60°C
♦ Rated voltage 24VDC
♦ Protection for electronic components and actuator IP53
♦ Protection for enclosure of locking elements IP20
♦ Rated current (speed at full load/no load speed) 1.0A/0.5A
♦ Electronic disconnection at both end positions
♦ Opening speed under full load abt. 5 sec.
♦ Locking force 1x750N
♦ Connection: light grey silicon-supply lead (length 2.5m)
♦ Delivery without screw fittings and locking bolts

Versions:

EFR 1.11: casement opening inwards; simple locking
EFR 2.11: casement opening inwards; double locking
EFR 1.12: casement opening outwards; simple locking
EFR 2.12: casement opening outwards; double locking
EFR 1.21: casement opening inwards; simple locking with trap in closed condition
EFR 2.21: casement opening inwards; double locking with trap in closed condition
EFR 1.22: encasement opening outwards; simple locking with trap in closed condition
EFR 2.22: encasement opening outwards; double locking with trap in closed condition

Accessories:

Locking bolt for EFR x.x1/ PFR x.0: 1 piece adjustable locking bolt
Locking bolt for EFR x.x2/ PFR x.1: 1 piece adjustable locking bolt
**Description of function:**
The electric window locking device is a locking device, which opens the locking hook and releases the locking bolt by control "open". After control "close" the locking bolt can snap in into the locking device again. An additional voltage supply for locking isn’t necessary.

**Technical data:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static locking force</td>
<td>1250N</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>24V CD</td>
</tr>
<tr>
<td>No-load current</td>
<td>0.5A</td>
</tr>
<tr>
<td>Max. breaking current (overload cut-off)</td>
<td>1.1A</td>
</tr>
<tr>
<td>Protection class according to DIN EN 60 529</td>
<td>IP42</td>
</tr>
<tr>
<td>Opening time under full load</td>
<td>ca. 5sék</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-20°C - +60°C</td>
</tr>
<tr>
<td>Connection</td>
<td>Light grey silicone connection cable (length 2.5m)</td>
</tr>
</tbody>
</table>

**Technical information:**
Take care that the upstream control has a OPEN-CLOSE function. If the window locking device is used in connection with an electric 24V-actuator, an extra follow-up control type FGS shall be provided. Take also care, that the upstream control has a Auto-CLOSE function (specifically in connection with devices without ventilation function).

**Rated current:**
The rated current depends on the locking force - see table

<table>
<thead>
<tr>
<th>Locking Force</th>
<th>Rated Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250N</td>
<td>0.8A</td>
</tr>
<tr>
<td>1000N</td>
<td>0.7A</td>
</tr>
<tr>
<td>750N</td>
<td>0.6A</td>
</tr>
<tr>
<td>500N</td>
<td>0.6A</td>
</tr>
</tbody>
</table>

**Scope of supply:**
The locking bolt is NOT included in the scope of supply and must be ordered separately!

**Circuit diagram:**

- **Technical information:**
  Take care that the upstream control has a OPEN-CLOSE function. If the window locking device is used in connection with an electric 24V-actuator, an extra follow-up control type FGS shall be provided. Take also care, that the upstream control has a Auto-CLOSE function (specifically in connection with devices without ventilation function).

**Rated current:**
The rated current depends on the locking force - see table

<table>
<thead>
<tr>
<th>Locking Force</th>
<th>Rated Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250N</td>
<td>0.8A</td>
</tr>
<tr>
<td>1000N</td>
<td>0.7A</td>
</tr>
<tr>
<td>750N</td>
<td>0.6A</td>
</tr>
<tr>
<td>500N</td>
<td>0.6A</td>
</tr>
</tbody>
</table>

**Scope of supply:**
The locking bolt is NOT included in the scope of supply and must be ordered separately!

**Circuit diagram:**

- The locking bolt is part of the electric window locking device EFR 1.21 for inward opening windows.
Description of function:
The electric window locking device is a locking device, which opens the locking hook and releases the locking bolt by control "open". After control "close" the locking bolt can snap in into the locking device again. A additional voltage supply for locking isn't necessary.

Technical data:
- static locking force: 2x1250N
- rated voltage: 24VCD
- no-load current: 0,5A
- max. breaking current (overload cut-off): 1,1A
- opening time under full load: ca. 5sek
- ambient temperature range: -20°C - +60°C
- connection: light grey silicone connection cable (length 2,5m)

Technical information:
Take care that the upstream control has a OPEN-CLOSE function. If the window locking device is used in connection with an electric 24V-actuator, an extra follow-up control type FGS shall be provided. Take also care, that the upstream control has a Auto-CLOSE function (specifically in connection with devices without ventilation function).

Rated current:
The rated current depends on the locking force - see table

<table>
<thead>
<tr>
<th>locking force</th>
<th>rated current</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250N</td>
<td>0,9A</td>
</tr>
<tr>
<td>1000N</td>
<td>0,8A</td>
</tr>
<tr>
<td>750N</td>
<td>0,6A</td>
</tr>
<tr>
<td>500N</td>
<td>0,5A</td>
</tr>
</tbody>
</table>

Scope of supply:
The locking bolt is NOT included in the scope of supply and must be ordered separately!

Circuit diagram:

- brown + open
- blue + close
- brown + closed

GRASL
Preuwickel-Handel GmbH
2-3456 Petting, Europastrasse 1

Data sheet:
Electric window locking device EFR 2.21 for inward opening windows

EFR 03.008.DAT.06.04-E

CIRCO DATE: 25.02.2002

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is prohibited!
Description of function:
The electric window locking device is a locking device, which opens the locking hook and releases the locking bolt by control "open". After control "close" the locking bolt can snap in into the locking device again. A additional voltage supply for locking isn't necessary.

Technical data:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static locking force</td>
<td>1250N</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>24VCD</td>
</tr>
<tr>
<td>No-load current</td>
<td>0,5A</td>
</tr>
<tr>
<td>Max. breaking current</td>
<td>1,1A</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP44</td>
</tr>
<tr>
<td>Opening time under full load</td>
<td>ca. 5sec</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-20°C - +60°C</td>
</tr>
<tr>
<td>Connection</td>
<td>Light grey silicone connection cable (length 2,5m)</td>
</tr>
</tbody>
</table>

Technical information:
The electric window locking device has an OPEN-CLOSE function. If the window locking device is used in connection with an electric 24V-actuator, an extra follow-up control type FGS shall be provided. Take also care, that the upstream control has a Auto-CLOSE function (specifically in connection with devices without ventilation function).

Rated current:
The rated current depends on the locking force - see table.

<table>
<thead>
<tr>
<th>Locking force</th>
<th>Rated current</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250N</td>
<td>0,8A</td>
</tr>
<tr>
<td>1000N</td>
<td>0,7A</td>
</tr>
<tr>
<td>750N</td>
<td>0,6A</td>
</tr>
<tr>
<td>500N</td>
<td>0,6A</td>
</tr>
</tbody>
</table>

Scope of supply:
The locking bolt is NOT included in the scope of supply and must be ordered separately.

Circuit diagram:

GRASL
Pneumatics + Technik GmbH
Pallstrasse 1
36414 Raddings

Data sheet:
Electric window locking device EFR 122
for outward opening windows

EFR

03.008.DAT.03.04-E

Technical information:
Take care that the upstream control has a OPEN-CLOSE function. If the window locking device is used in connection with an electric 24V-actuator, an extra follow-up control type FGS shall be provided. Take also care, that the upstream control has a Auto-CLOSE function (specifically in connection with devices without ventilation function).

Rated current:
The rated current depends on the locking force - see table.

<table>
<thead>
<tr>
<th>Locking force</th>
<th>Rated current</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250N</td>
<td>0,8A</td>
</tr>
<tr>
<td>1000N</td>
<td>0,7A</td>
</tr>
<tr>
<td>750N</td>
<td>0,6A</td>
</tr>
<tr>
<td>500N</td>
<td>0,6A</td>
</tr>
</tbody>
</table>
The pneumatic window catch is a locking element which disengages the locking bolt when the entry is charged with the minimum operating pressure. When exhausting the inlet, the window catch closes and the locking bolt snaps into the locking element.

- Suitable for temperature range of -25°C to 110°C
- Min. operating pressure: 6bar
- Max. operating pressure: 60bar
- Locking force 750N
- Thread for screw fittings 1/8"
- Delivery without screw fittings and locking bolts

**Versions:**

PFR 1.0: casement opening inwards; simple locking
PFR 2.0: casement opening inwards: double locking
PFR 1.1: casement opening outwards; simple locking
PFR 2.1: casement opening outwards; double locking

**Accessories:**

- Locking bolt for EFR x.x1/ PFR x.0: 1 piece adjustable locking bolt
- Locking bolt for EFR x.x2/ PFR x.1: 1 piece adjustable locking bolt
Description of function:
The pneumatic window locking device is a locking device, which unlocks the locking bolt after applying the minimum release pressure to the input P. When exhaust the input P, the window locking device closes and the locking bolt can snap into the locking device.

Technical data:
- Maximum operating pressure: 60 bar
- Static holding force: 1250 N
- Connection thread remote control: G1/8"
- Ambient temperature range: -25°C to 110°C

Connections:
P ... remote control

Release pressure:
Depending on the locking force - see table

<table>
<thead>
<tr>
<th>Locking Force</th>
<th>Min. Release Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250 N</td>
<td>4.7 bar</td>
</tr>
<tr>
<td>1000 N</td>
<td>3.6 bar</td>
</tr>
<tr>
<td>750 N</td>
<td>3.1 bar</td>
</tr>
<tr>
<td>500 N</td>
<td>2.3 bar</td>
</tr>
</tbody>
</table>

Scope of supply:
Screw connection and locking bolt are NOT included in the scope of supply and must be ordered separately!

Diagram of the pneumatic window locking device.
Description of function:
The pneumatic window locking device is a locking device, which unlocks the locking bolt after applying the min. release pressure to the input P.
When exhaust the input P, the window locking device close and the locking bolt can snap into the locking device.

Technical data:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum operating pressure</td>
<td>60 bar</td>
</tr>
<tr>
<td>Static holding force</td>
<td>2x 1250 N</td>
</tr>
<tr>
<td>Connection thread remote control P</td>
<td>G1/8&quot;</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-25°C - 110°C</td>
</tr>
</tbody>
</table>

Connections:
P ... remote control

Release pressure:
Depending on the locking force - see table

<table>
<thead>
<tr>
<th>Locking force</th>
<th>Min. release pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250 N</td>
<td>7.8 bar</td>
</tr>
<tr>
<td>1000 N</td>
<td>5.8 bar</td>
</tr>
<tr>
<td>750 N</td>
<td>4.0 bar</td>
</tr>
<tr>
<td>500 N</td>
<td>3.6 bar</td>
</tr>
</tbody>
</table>

Scope of supply:
Screw connection and locking bolt are NOT included in the scope of supply and must be ordered separately!

Connections:
P ... remote control

Diagram of the pneumatic window locking device with dimensions and technical specifications.

---

This document is a technical specification for a pneumatic window locking device. The device features a locking mechanism that operates under specific release pressures, determined by the locking force applied. Technical data includes the maximum operating pressure, static holding force, connection thread specifications, and ambient temperature range. The scope of supply does not include the locking bolt, which must be ordered separately.

Diagram shows the device assembly with key components labeled, including the locking bolt and the window locking device, with dimension annotations indicating the precise engineering details.
**PMET**

- Pneumatically operated motor unlocking device for use in SHE units with ventilation function
- When SHE unit is closed and ventilation mode is on, the PMET bolt remains latched in the PMET. In ventilation mode, the SHEVS cylinder will follow idle
- When the SHE mounting is opened by the SHE cylinder, the bolt automatically disengages from the PMET unit
- When SHE mounting closes, the bolt automatically reengages with the PMET unit
- To ensure safe PMET unlocking in the case of SHE release, be sure piping of the SHEVS system is in the following order: point of CO₂ release, PMET unit, SHE cylinder
- Manual unlocking is possible
- Minimum operating pressure 4bar
- Maximum operating pressure 60bar
- Maximum locking force 2.500N
- Ambient temperature range: -25 to +110°C
- Connection threads for screw fittings 1/8"
- VdS approval no. G 589049

**Accessories:**

- **PMET-M6:** PMET bolt M6 x 40mm, including locknut
- **PMET-M8:** PMET bolt M8 x 40mm, including locknut
- **PMET-M10:** PMET bolt M10 x 40mm, including locknut

For special types, please inquire

**PFET**

- Pneumatically operated window unlocking device for use in SHE sidewall units
- When SHE unit is closed, locking hook is arrested in the PFET unit
- When PFET is released, the locking hook disengages, allowing the window to open, e.g. by means of gas-pressure springs
- After a release action, closing is effected manually
- Minimum unlocking pressure 10bar
- Maximum operating pressure 60bar
- Maximum locking force 2.000N
- Connection thread for screw fittings 1/8"
- Ambient temperature range: -10 to +110°C
- Comes with locking hook
- For pipe connection of the valve, 1 male connector (e.g. B1-6-1/8) will be additionally required

For special types, please inquire
Technical description:
- To unlock ventilation cylinder or actuator in case of SHEV
- Mountable at the ventilation frame
- Operation: Pneumatic or by hand
- No additional compressed air supply necessary
- Air quality: The compressed air must be filtered by an usual filter element at least.

Connections:
E ... Input
A ... Output (e.g.: to further PMET-valves)

Technical data:
- Maximum operating pressure: 60 bar
- Minimum operating pressure: 4 bar
- Rated locking force: 2500 N
- Ambient temperature range: -25°C - +110°C
- VdS approval no.: G588049

Min. release pressure:

<table>
<thead>
<tr>
<th>Pulling force [N]</th>
<th>Min. release pressure [bar]</th>
</tr>
</thead>
<tbody>
<tr>
<td>650</td>
<td>5.8</td>
</tr>
<tr>
<td>1800</td>
<td>14.3</td>
</tr>
<tr>
<td>2500</td>
<td>17.0</td>
</tr>
</tbody>
</table>

Data sheet:
Pneumatic motor unlocking device
PMET-E-A

PMET 03.011.DAT.00.06-E
Description of function:
The pneumatic window unlocking device is a locking device, which unlock the locking hook after applying the min. release pressure to the input P. The window opening took place for example by gas-pressure springs. After releasing the closing took place by hand. When exhaust the input P, the window locking device close and the locking hook can snap into the locking device.

Connections:
P ... remote control

Mounting:
PREFERABLY mount the locking hook on casement and the valve cage on window frame. Join connection P.

Technical data:
- min. unlocking pressure: 10 bar
- max. operation pressure: 60 bar
- max. locking force: 2000N
- ambient temperature range: -25° to +110°C

Scope of supply:
Screw connections are NOT included in the scope of supply and must be ordered separately!
**TAVE 2:**

- **VdS approved** thermal release valve with single pipe priority valve for automatic thermal release of a one-way CO₂ bottle with ½" UNF thread (see accessories)
- Suitable thermo bulbs: F5-RWA-68 and F5-RWA-93 (see accessories)
- Integrated priority valve for venting the pipe or for connecting an upstream actuation element (e.g. alarm or ventilation valve)
- Maximum operating pressure 80bar
- Nominal bore (free cross section) of valve 2mm
- Nominal bore of piercing needle 2mm
- No tool required for tensioning of piercing needle and thermo bulb
- Ambient temperature range: -20°C to +110°C
- CO₂ bottle and thermo bulb are not included in our supply
- VdS approval no. G 597018
- For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- Drawings see data sheet TAVE2
- Design of the SHEVS may require reliable venting of the piping.

**Additional types:**

**TAVE 2.1:**
Thermal release valve with single pipe priority valve as above with integrated quick action exhaust valve.

**TAVZ 2:**

- **VdS approved** thermal release valve with double pipe priority valve for automatic thermal release of a one-way CO₂ bottle with ½" UNF thread (see accessories)
- Suitable thermo bulbs: F5-RWA-68 and F5-RWA-93 (see accessories)
- Integrated priority valve for connecting an upstream actuation element (e.g. alarm or ventilation valve)
- Maximum operating pressure 80bar
- Nominal bore (free cross section) of valve 2mm
- Nominal bore of piercing needle 2mm
- No tool required for tensioning of piercing needle and thermo bulb
- Ambient temperature range: -20°C to +110°C
- CO₂ bottle and thermo bulb are not included in our supply
- VdS approval no. G 597018
- For pipe connection of the valve, 4 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- Drawings see data sheet TAVE2
- Design of the SHEVS may require reliable venting of the piping.

**Additional types:**

**TAVZ 2.1:**
Thermal release valve with double pipe priority valve as above with integrated quick action exhaust valve.
**Description of function:**

The temperature valve TAVE is a release valve, which, on the bursting of a thermo bulb, taps a CO₂-bottle and allows the CO₂ to flow to the outlet C.

In the non-release position there is a connection between the input VA and the outlet CA e.g. to enable unhindered ventilation operation.

**Releasing:**

1) Thermal releasing via bursting of the thermo bulb
2) Option: Pneumatic releasing via pneumatic drive piston PTK 1.01 (must be specified with order)
3) Option: Electric releasing via electric drive piston ETK 1.0 (must be specified with order)

**Mounting:**

1) Join connections as follows:
   - CA .............cylinder OPEN
   - VA ............. vent line or CO₂ line OPEN
   - PTK ...........join PTK connection with external releasing device (option)
   - ETK ...........join electric connection with external releasing device (option)
2) When using a CO₂ one-way bottle the TAVE must be installed as drawn adhering to the inflow direction (bottle screwed in from the top).
3) For our G1/8" connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.
4) We recommend using CO₂ one-way bottles according to drawing No. 03.023.00.* and point out that the VdS-recognition is valid only with these bottles.

**Commissioning:**

1) Fully unscrew knurled nut.
2) If Option "Pneumatic/electric drive piston" is available, check if PTK/ETK tappet is fully retracted via spring resetting (PTK/ETK-connection must be pressureless/de-energized).
3) Insert thermo bulb so that the tip points in the direction of the tension screw.
4) Tighten knurled nut while at the end of the clamping travel (noticeable resistance) the knurled nut has to be turned in approximately 1/2 a turn in addition.
5) Fully tighten knurled nut.
6) Check if the piercing needle is positioned behind the piercing surface of the bottle screw-in thread.
7) Lightly grease the O-ring in the bottle screw-in thread.
8) Check if the reset button is in the correct position.
9) Screw in CO₂-bottle.
10) After releasing, repeat process

**CAUTION:**

- After thermo valve release, it is absolutely necessary, to unscrew the knurled nut first and CO₂ bottle after.
- Check the compatibility of the thermo bulb and CO₂ bottle.
- Dirt is built up by common use of the thermo valve. Therefore it must be cleaned free of deposits (dirt, fragments, etc.) in the thermo bulb holder and in the bottle thread.

**Technical data:**

- max. static housing pressure: 80 bar
- max. dynamic operating pressure: 80 bar
- nominal width of valve: 2 mm
- nominal width of piercing needle: 2 mm
- ambient temperature range: -20°C - +110°C
- releasing pressure PTK (Option): 10 bar
- VdS approval: no. G 597018

**Scope of supply:**

Screw connections, thermo bulb and CO₂-bottle are NOT included in the scope of supply.
Only use certified CO2-bottles!

Description of function:
The temperature valve TAVE 2.1 is a release valve, which, on the bursting of a therma bulb, taps a CO2-bottle and allows the CO2 to flow to the outlet CA. The therma bulb bursts at the specified rated temperature with a tolerance of -3°C/+8°C.

In the non-release position the outlet CA is ventilated by the integrated quick release valve. If there is pressure on the input VA (by ventilation- or alarmbox), the input will be connect to the output CA.

Releasing:
1) Thermal releasing via bursting of the therma bulb
2) Option: Pneumatic releasing via pneumatic drive piston PTK 1.01 (must be specified with order)
3) Option: Electric releasing via electric drive piston ETK 1.0 (must be specified with order)

Mounting:
1) Join connections as follows:
   - CA: cylinder OPEN
   - VA: vent line or CO2 line OPEN
   - PTK: Join PTA connection with external releasing device (option)
   - ETK: Join electric connection with external releasing device (option)
2) When using a CO2 one-way bottle the TAVE must be installed as drawn adhering to the inflow direction (bottle screwed in from the top)
3) For our 1/8" connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.
4) We recommend using CO2 one-way bottles according to drawing No. 03.023.00." and point out that the VdS-recognition is valid only with these bottles.

Commissioning:
1) Fully unscrew knurled nut.
2) If Option "Pneumatic/electric drive piston" is available, check if PTK /ETK tappet is fully retracted via spring resetting (PTK/ETK-connection must be pressureless/de-energized).
3) Insert therma bulb so that the tension screw.
4) Tighten knurled nut while at the end of the clamping travel (noticeable resistance) the knurled nut has to be turned in approximately 1/2 a turn in addition.
5) Fully tighten knurled nut.
6) Check if the piercing needle is positioned behind the piercing surface of the bottle screw-in thread.
7) Lightly grease the O-ring in the bottle screw-in thread.
8) Check if the reset button is in the correct position.
9) Screw in CO2-bottle.
10) After releasing, repeat process.

Caution:
- After therma valve release, it is absolutely necessary, to unscrew the knurled nut first and CO2 bottle after.
- Check the compatibility of the therma bulb and CO2 bottle.
- Dirt is built up by common use of the therma valve. Therefore it must be cleaned free of deposits (dirt, fragments, etc.) in the therma bulb holder and in the bottle thread.

Technical data:
- max. static housing pressure: 80 bar
- max. dynamic operating pressure: 80 bar
- nominal width of valve: 2 mm
- nominal width of piercing needle: 2 mm
- ambient temperature range: -25°C - +110°C
- releasing pressure PTK (option): 10 bar
- VdS approval no.: G 597018

Scope of supply:
Screw connections, therma bulb and CO2-bottle are NOT included in the scope of supply.

Diagram without PTK 1.01:
Diagram with PTK 1.01:
The temperature valve TAVZ is a releasing valve, which, on the bursting of a thermo bulb, taps a CO₂-bottle, allows the CO₂ to flow to outlet CA and vents the outlet CZ. The thermo bulb bursts at the specified rated temperature with a tolerance of -3°C / +8°C.

In the non-release position there is a connection between the inputs VA resp. VZ and the outlets CA resp. CZ e.g. to enable unhindered ventilation operation.

**Releasing:**
1) Thermal releasing via bursting of the thermo bulb
2) Option: Pneumatic releasing via pneumatic drive piston PTK 1.01 (must be specified with order)
3) Option: Electric releasing via electric drive piston ETK 1.0 (must be specified with order)

**Mounting:**
1) Join connections as follows:
   - CA ........ cylinder OPEN
   - VA ....... vent line or CO₂ line OPEN
   - CZ .......... cylinder CLOSE
   - VZ ......... vent line or CO₂ line CLOSE
   - PTK ........ join PTK connection with external releasing device (option)
   - ETK ......... join electric connection with external releasing device (option)
2) When using a CO₂ one-way bottle the TAVZ must be installed as drawn adhering to the inflow direction (bottle screwed in from the top).
3) For our G1/8" connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.
4) We recommend using CO₂ one-way bottles according to drawing No. 03.023.00.* and point out that the VdS-recognition is valid only with these bottles.

**Commissioning:**
1) Fully unscrew knurled nut.
2) If Option "Pneumatic/electric drive piston" is available, check if PTK/ETK tappet is fully retracted via spring resetting (PTK/ETK-connection must be pressureless/de-energized).
3) Insert thermo bulb so that the tip points in the direction of the tension screw.
4) Tighten knurled nut while at the end of the clamping travel (noticeable resistance) the knurled nut has to be turned in approximately 1/2 a turn in addition.
5) Fully tighten knurled nut.
6) Check if the piercing needle is positioned behind the piercing surface of the bottle screw-in thread.
7) Lightly grease the O-ring in the bottle screw-in thread.
8) Check if the reset button is in the correct position.
9) Screw in CO₂-bottle
10) After releasing, repeat process

**Caution:**
- After thermo valve release, it is absolutely necessary, to unscrew the knurled nut first and CO₂ bottle after.
- Check the compatibility of the thermo bulb and CO₂ bottle.
- Dirt is built up by common use of the thermo valve. Therefore it must be cleaned free of deposits (dirt, fragments, etc.) in the thermo bulb holder and in the bottle thread.

**Technical data:**
- max. static housing pressure: 80 bar
- max. dynamic operating pressure: 80 bar
- nominal width of valve: 2 mm
- nominal width of piercing needle: 2 mm
- ambient temperature range: -20°C - +110°C
- releasing pressure PTK (Option): 10 bar
- VdS approval no.: G 597018

**Scope of supply:**
Screw connections, thermo bulb and CO₂-bottle are NOT included in the scope of supply.

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**Diagram:**
- Diagram without PTK 1.01
- Diagram with PTK 1.01

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**Data sheet**
*Thermal release valve (double pipe) TAVZ 2*

**Types:**
- TAVZ 2
- TAVZ 2.4
- TAVZ 2.5
- TAVZ 2-K
- TAVZ 2-P.TK
- TAVZ 2-PTK

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**GRASL Pneumatik-Techm GmbH & Co. KG**

**Diagram:**
- Diagram without PTK 1.01
- Diagram with PTK 1.01
**Description of function:**

The temperature valve TAVZ 2.1 is a release valve, which, on the bursting of a thermo bulb, taps a CO₂ bottle, allows the CO₂ to flow to the outlet CA and the outlet CZ will be ventilated by an integrated quick release valve. The thermo bulb bursts at the specified rated temperature with a tolerance of -3°C/+8°C.

In the non-release position the outlets CA and CZ are ventilated by an integrated quick release valve. If there is pressure on the input VA or VZ (by ventilation or alarmbox), the input will be connected to the outlet CA or CZ.

**Releasing:**

1) Thermal releasing via bursting of the thermo bulb (all versions)
2) Option: Pneumatic releasing via pneumatic drive piston PTK 1.01 (must be specified with order)
3) Option: Electric releasing via electric drive piston ETK 1.0 (must be specified with order)

**Mounting:**

1) Join connections as follows:
   - CA .......... cylinder OPEN
   - VZ .......... vent line or CO₂ line OPEN
   - VA .......... vent line or CO₂ line OPEN
   - CZ .......... cylinder CLOSE
2) When using a CO₂ one-way bottle the TAVZ must be installed as shown with the inflow direction (bottle screwed in from the top)
3) For our 1/8" connection threads we recommend using screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243).
4) We recommend using CO₂ one-way bottles according to drawing No. 03.023.00.* and point out that the VdS-recognition is valid only with these bottles.

**Comissioning:**

1) Fully unscrew knurled nut.
2) If Option "Pneumatic/electric drive piston" is available, check if PTK/ETK tappet is fully retracted via spring resetting (PTK/ETK-connection must be pressureless/de-energized).
3) Insert thermo bulb so that the tip points in the direction of the tension screw.
4) Tightly grease the G-ring in the bottle screw-in thread.
5) Check if the reset button is in the correct position.
6) Screw in CO₂-bottle.
10) After releasing, repeat process.

**Caution:**

- After thermo valve release, it is absolutely necessary, to unscrew the knurled nut first and CO₂ bottle after.
- Check the compatibility of the thermo bulb and CO₂ bottle.
- Dirt is built up by common use of the thermo valve. Therefore it must be cleaned free of deposits (dirt, fragments, etc.) in the thermo bulb holder and in the bottle thread.

**Technical data:**

- max. static housing pressure: 80 bar
- max. dynamic operating pressure: 80 bar
- nominal width of valve: 2 mm
- nominal width of piercing needle: 2 mm
- ambient temperature range: -25°C - +110°C
- releasing pressure PTK (Option): 10 bar
- VdS approval no.: G 597018

**Scope of supply:**

- Screw connections, thermo bulb and CO₂-bottle are NOT included in the scope of supply.

**Diagram:**

- Diagram without PTK 1.01
**TAVE 2.x**

- Combination release valve for automatic thermal release action, combined with another control method.
  - Release of one CO₂ one-way bottle with ½" UNF thread (see accessories)
  - Suitable thermo bulbs: G5-RWA-68 and G5-RWA-93 (see accessories)
  - Maximum operating pressure 80bar
  - Nominal bore (free cross section) of valve 4mm
  - Nominal bore of piercing needle 2mm
  - No destruction of thermo bulb by combination of several control methods
  - No tool required for tensioning piercing needle and thermo bulb
  - Ambient temperature range: -25°C to +110°C
  - CO₂ bottle and thermo bulbs are not included in our supply
  - Drawings see data sheet TAVE2.x
  - Design of the SHEVS may require reliable venting of the piping.

**Types:**

**TAVE 2.2**

Thermal/electrical release valve OPEN
- Thermal release by thermo bulb and electrical remote release of the OPEN function by attached solenoid, 24VDC / 7W, operating mode S1 to DIN VDE 0580 (100% duty cycle). Can be tripped e.g. by the SHE impulse control IS 2 (see Electrical Parts Catalogue, controls)
- For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- VdS approval G597018

**TAVE 2.3**

Thermal/electrical release valve OPEN with ventilation
- Thermal release by thermo bulb and electrical remote release of the OPEN function by attached solenoid, 24VDC / 7W, operating mode S1 to DIN VDE 0580 (100% duty cycle). Can be tripped e.g. by the SHE impulse control IS 2 (see Electrical Parts Catalogue, controls)
- Integrated priority valve for venting the pipes or connecting an upstream actuation element (e.g. alarm or ventilation valve)
- For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- VdS approval G597018

**TAVE 2.4**

Thermal/pneumatical release valve OPEN
- Thermal release by thermo bulb and pneumatical remote release of the OPEN function by attached pneumatically operated release unit, minimum release pressure 2bar, maximum operating pressure 80bar
- Integrated priority valve for connecting an upstream actuation element (e.g. alarm or ventilation valve)
- For pipe connection of the valve, 3 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
Valves
Automatic release

TAVE 2.5
Thermal/pneumatical release valve OPEN with ventilation
◆ Thermal release by thermo bulb and pneumatical remote release of the OPEN function by attached pneumatically operated release unit, minimum release pressure 2bar, maximum operating pressure 80bar
◆ Integrated priority valve for venting the pipes or connecting an up-stream actuation element (e.g. alarm or ventilation valve)
◆ For pipe connection of the valve, 3 male connectors 1/8” (e.g. B1-6-1/8) will be required additionally

Options:

F (Française): designed for CO₂ bottles with W21,8 x 1/14" thread.
Version for the French market

M18 x 1,5: design for CO₂ bottles with M18 x 1,5 thread

For special types please inquire.
**Description of function:**

The temperature valve TAVE is a releasing valve, which, on the bursting of a thermo bulb or control of the electric releasing (TAVE 2.2, TAVE 2.3) or the pneumatic releasing (TAVE 2.4, TAVE 2.5) taps a CO₂-bottle and allows the CO₂ to flow to the outlet CA. The thermo bulb bursts at the specified rated temperature with a tolerance of -3°C/+8°C.

In the non-release position the outlet CA is ventilated by the integrated quick release valve. If there is pressure on the input VA (by ventilation- or alarmbox), the input will be connect to the output CA.

**Releasing:**

1) Thermal releasing via bursting of the thermo bulb (all versions)
2) Electric releasing via electromagnet (TAVE 2.2, TAVE 2.3)
3) Pneumatic releasing: Applying the minimum release pressure on PA (TAVE 2.4, TAVE 2.5) / no VdS-certificate

**Mounting:**

1) Join connections as follows:
   - CA...cylinder OPEN
   - VA...vent line or CO₂ line OPEN
2) When using a CO₂ one-way bottle the TAVE must be installed as drawn adhering to the inflow direction (screwed in from the top)
3) For our 1/8” connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243).
4) We recommend using CO₂ one-way bottles according to drawing No. 03.023.00.* and point out that the VdS-recognition is valid only with these bottles.

**Commissioning:**

1) Fully unscrew knurled nut.
2) Insert thermo bulb so that the tip points in the direction of the tension screw (if a thermo bulb is insert, loosen the bulb through the tension screw and afterwards replace it).
3) Tighten knurled nut while at the end of the clamping travel (noticeable resistance) the knurled nut has to be turned in approximately 1/2 a turn in addition.
4) Fully tighten knurled nut.
5) Check if the piercing needle is positioned behind the piercing surface of the bottle screw-in thread.
6) Lightly grease the O-ring in the bottle screw-in thread.
7) Check if the reset button is in the correct position.
8) Screw in CO₂-bottle.

**Caution:**

- After thermo valve release, it is absolutely necessary, to unscrew the knurled nut first and CO₂-bottle after.
- Check the compatibility of the thermo bulb and CO₂ bottle.
- Dirt is built up by common use of the thermo valve. Therefore it must be cleaned free of deposits (dirt, fragments, etc.) in the thermo bulb holder and in the bottle thread.

**Technical data:**

- max. static housing pressure: 80 bar
- max. dynamic operating pressure: 80 bar
- nominal width of valve: 2mm
- nominal width of piercing needle: 2mm
- ambient temperature range: -25°C - +110°C
- rated voltage: 24V (+30% bis -20%) (electric releasing)
- current drain at rated voltage: 0.29 A (electric releasing)
- releasing pressure: min. 6 bar (pneumatic releasing)
- VdS approval no. (only by TAVE 2.2/2.3): G 597018

**Types:**

- TAVE 2.2
- TAVE 2.2-M18x1.5
- TAVE 2.2-F W21.8x1/4" no eletric no VdS-certificate
- TAVE 2.3
- TAVE 2.3-M18x1.5
- TAVE 2.3-F W21.8x1/4" yes pneumatic no VdS-certificate
- TAVE 2.4
- TAVE 2.4-M18x1.5
- TAVE 2.4-F W21.8x1/4" no pneumatic no VdS-certificate
- TAVE 2.5
- TAVE 2.5-M18x1.5
- TAVE 2.5-F W21.8x1/4" yes pneumatic no VdS-certificate

**Scope of supply:**

 Screw connections, thermo bulb and CO₂ bottle are NOT included in the scope of supply.

**Circuit diagrams:**

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**Notes:**

- Only use certified CO₂-bottles!
TAVZ 2.x

- Combination release valve for automatic thermal release action, combined with another control method.
- Release of one CO₂ one-way bottle with ½" UNF thread (see accessories)
- Suitable thermo bulbs: G5-RWA-68 and G5-RWA-93 (see accessories)
- Maximum operating pressure 80bar
- Nominal bore (free cross section) of valve 4mm
- Nominal bore of piercing needle 2mm
- No destruction of thermo bulb by combination of several control methods
- No tool required for tensioning piercing needle and thermo bulb
- Ambient temperature range: -25°C to +110°C
- CO₂ bottle and thermo bulbs are not included in our supply
- Drawings see data sheet TAVZ2.x
- Design of the SHEVS may require reliable venting of the piping.

Types:

TAVZ 2.2
Thermal/electrical release valve OPEN
- Thermal release by thermo bulb and electrical remote release of the OPEN function by attached solenoid, 24VDC / 7W, operating mode S1 to DIN VDE 0580 (100% duty cycle). Can be tripped e.g. by the SHE impulse control IS 2 (see Electrical Parts Catalogue, controls)
- For pipe connection of the valve, 4 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- VdS approval G597018

TAVZ 2.3
Thermal/electrical release valve OPEN with ventilation
- Thermal release by thermo bulb and electrical remote release of the OPEN function by attached solenoid, 24VDC / 7W, operating mode S1 to DIN VDE 0580 (100% duty cycle). Can be tripped e.g. by the SHE impulse control IS 2 (see Electrical Parts Catalogue, controls)
- Integrated priority valve for venting the pipes or connecting an upstream actuation element (e.g. alarm or ventilation valve)
- For pipe connection of the valve, 4 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- VdS approval G597018

TAVZ 2.4
Thermal/pneumatical release valve OPEN
- Thermal release by thermo bulb and pneumatical remote release of the OPEN function by attached pneumatically operated release unit, minimum release pressure 2bar, maximum operating pressure 80bar
- Integrated priority valve for connecting an upstream actuation element (e.g. alarm or ventilation valve)
- For pipe connection of the valve, 5 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
TAVZ 2.5
Thermal/pneumatical release valve OPEN with ventilation
♦ Thermal release by thermo bulb and pneumatical remote release of the OPEN function by attached pneumatically operated release unit, minimum release pressure 2bar, maximum operating pressure 80bar
♦ Integrated priority valve for venting the pipes or connecting an up-stream actuation element (e.g. alarm or ventilation valve)
For pipe connection of the valve, 5 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

Options:

F (Française): designed for CO₂ bottles with W21,8 x 1/14" thread. Version for the French market

M18 x 1,5: design for CO₂ bottles with M18 x 1,5 thread

For special types please inquire.
The temperature valve TAVZ is a release valve, which, on the bursting of a thermo bulb or control of the electric releasing (TAVZ 2.2, TAVZ 2.3) or the pneumatic releasing (TAVZ 2.4, TAVZ 2.5) taps a CO2-bottle, allows the CO2 to flow to the outlet CA and the outlet CZ will be ventilated by an integrated quick release valve. The thermo bulb bursts at the specified rated temperature with a tolerance of -3°C/+8°C. In the non-release position the outlets CA and CZ are ventilated by the integrated quick release valves. If there is pressure on the input VA or VZ (by ventilation- or alarmbox), the input will be connect to the outlet CA or CZ.

Releasing:
1) Thermal releasing via bursting of the thermo bulb (all versions)
2) Electric releasing via the electromagnet (TAVZ 2.2, TAVZ 2.3)
3) Pneumatic releasing: Applying the minimum release pressure of 49 bar to PA. (TAVZ 2.4, TAVZ 2.5 / no VdS-certificate)

Mounting:
1) Fully unscrew knurled nut.
2) Insert the thermo bulb so that the tip points in the direction of the tension screw (if a thermo bulb is inserted, loosen the bulb through the tension screw and afterwards replace it).
3) Tighten knurled nut while at the end of the clamping travel (noticeable resistance) the knurled nut has to be turned in approximately 1/2 a turn in addition.
4) Fully tighten knurled nut.
5) Check if the piercing needle is positioned behind the piercing surface of the bottle-screw-in thread.
6) Lightly grease the O-ring in the bottle-screw-in thread.
7) Check if the reset button is in the correct position.
8) Screw in CO2-bottle.
9) After releasing, repeat process.

Caution:
- After thermo valve release, it is absolutely necessary, to unscrew the knurled nut first and CO2 bottle after.
- After thermo valve release, check the compatibility of the thermo bulb and CO2 bottle.
- Dirt is built up by common use of the thermo valve. Therefore it must be cleaned free of deposits (dirt, fragments, etc.) in the thermo bulb holder and in the bottle thread.

Scope of supply:
Screw connections, thermo bulb and CO2-bottle are NOT included in the scope of supply.

Circuit diagrams:

Technical data:
- max. static housing pressure: 71 bar
- max. dynamic operating pressure: 71 bar
- nominal width of valve: 3 mm
- nominal width of piercing needs: 2 mm
- ambient temperature range: -25°C - +110°C
- rated voltage: 24V (+30% bis -20%) (electric releasing)
- current drain at rated voltage: 0.29 A (electric releasing)
- releasing pressure: min. 6 bar (pneumatic releasing)
- VdS approval no. (only by TAVZ 2.2/2.3) G 597018

Types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Bottle screw-in threads A</th>
<th>Quick release valve</th>
<th>Remote control</th>
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</tr>
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<td>TAVZ 2.2-F</td>
<td>M18x1.5 T (adapter)</td>
<td>no</td>
<td>electric</td>
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<td>W21.8x1/14&quot;</td>
<td>no</td>
<td>electric</td>
</tr>
<tr>
<td>TAVZ 2.4</td>
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<td>pneumatic</td>
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<tr>
<td>TAVZ 2.5-F</td>
<td>W21.8x1/14&quot;</td>
<td>no</td>
<td>pneumatic</td>
</tr>
</tbody>
</table>

Scope of supply:
Screw connections, thermo bulb and CO2-bottle are NOT included in the scope of supply.
Release RTC - OPEN only

- Valve for manual release of one CO₂ one-way bottle
- Optional:
  - Electrical remote release by solenoid
  - Pneumatical remote release by attached pneumatically operated release
- Maximum operating pressure
- Nominal bore (free cross section) of valve 4mm
- Nominal bore of piercing needle 2mm
- Ambient temperature range: -25°C - +75°C

Types:

Hand release OPEN only
RTC-HA: for CO₂ bottles up to 1500gr
RTC 2.0-HA-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HA-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Hand- / electrical release OPEN only
RTC-HEA: for CO₂ bottles up to 1500gr
RTC 2.0-HEA-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEA-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Hand- / pneumatical release OPEN only
RTC-HPA: for CO₂ bottles up to 1500gr
RTC 2.0-HPA-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HPA-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Hand- / electrical/ pneumatical release OPEN only
RTC-HEPA: for CO₂ bottles up to 1500gr
RTC 2.0-HEPA-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEPA-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Options:

RTC with spare glass sheet for use in alarm boxes
NFM: For CO₂ bottles with M15x1,25 thread. Version for the French market
M18x1,5: Type for CO₂ bottles with M18x1,5 thread
M18x1,5-SR: Type for CO₂ dip tube bottle with M18x1,5 thread

Accessories:

Tensioning device for RTC
Tensioning device for RTC-NFM
Tensioning device for RTC-M18x1,5
spare glass sheet RT-E
Description of function:
The release valve RTC is a valve which taps a CO2 bottle by pushing the release button, or control of the electromagnet, or the pneumatic release, and so the CO2 can flow to the outlet CA (G1/8”).

Releasing:
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pneumatic releasing: Applying the minimum release pressure on PA. (only at HPA and HPA-HZ).

Technical data:
- max. operating pressure: 80 bar
- min. control pressure by PA: 6 bar
- nominal width of valve: 4 mm
- nominal width of piercing needle: 2 mm
- rated voltage electromagnet: 24 V DC
- rated current electromagnet: 0.29 A DC
- duty cycle electromagnet: 100%
- ambient temperature range: -5°C - +55°C
Commissioning the OPEN-release:
1) Hook clamping angle into the recess provided (see picture 1).
2) Place clamping bolt onto the piercing bolt in the valve.
3) Press clamping angle down fully until the piercing bolt engages.
4) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
5) Check position of the view indicator. View indicator must be on green, if not, press view indicator angle to the valve until view indicator is green (see picture 2)!
6) Screw in new CO2 bottle.
7) Following releasing, remove empty CO2 bottle (Caution: Residual pressure may be present) and repeat the process.

Commissioning the close-release:
1) Carry out Points 1-4 of the commissioning of the OPEN release accordingly.
2) Check position of the priority slide. Both slides must be in the basic position! (see picture 3)
3) Screw in new CO2 bottle and close box.
4) Following a releasing, remove empty CO2 bottle. (Caution: Residual pressure may be present) and repeat operation.

Installation:
- When using CO2-multi-trip bottles (without ascending-tube) CO2 one-way bottles, mount the valve as per drawing (bottle screwed in from the top)
- CAUTION: No dismounting of the valve from the mounting bracket.

Ordering designation:
RTC x.y - aaa - bb - M18x1,5 - R - S1
option S1: additional connection thread
option R: bracket for spare bottle
multi-trip bottle with screw-in thread M18x1,5
HA ... manual OPEN
HEA ... manual electric OPEN
HPA ... manual pneumatic OPEN
HA-HZ ... manual OPEN - manual CLOSE
HEA-HZ ... manual electric OPEN - manual CLOSE
HPA-HZ ... manual pneumatic OPEN - manual CLOSE
0 ... front plate
1 ... glass sheet for bottle until 750g
2 ... glass sheet for bottle until 1500g
1 ... mounting angle without spare bottle attachment
2 ... mounting angle for spare bottle until 750g
3 ... mounting angle for spare bottle until 1500g

Connections:
CA ... cylinder OPEN
CZ ... cylinder CLOSE
PA ... pneumatic remote control

Standard connections:
screw-in thread for CO2-bottle (M18x1,5)
CZ (G1/8") CA (G1/8")
screw-in thread for CO2-bottle (M18x1,5)

Connection HPA/HPA-HZ-M18x1,5:
PA (G1/8")

Option S1:
additional connections at the underside of valve
CZ (G1/8") CA (G1/8")
screw-in thread for CO2-bottle (M18x1,5)

Connecting diagramm electromagnet:
1
2
+ PE
-
Description of function:
The release valve RTC is a valve which taps a CO2 bottle by pushing the release button, or control of the electromagnet, or the pneumatic release, and so the CO2 can flow to the outlet CA (G1/8”).

Releasing:
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pneumatic releasing: Applying the minimum release pressure on PA. (only at HPA and HPA-HZ).

Technical data:
- max. operating pressure: 80bar
- min. control pressure by PA: 6bar
- nominal width of valve: 4mm
- nominal width of piercing needle: 2mm
- rated voltage electromagnet: 24VDC
- rated current electromagnet: 0.29ADC
- duty cycle electromagnet: 100%
- ambient temperature range: -5°C - +55°C

Tolerance | Scale | 1:2.5 | Material
---|---|---|---
Simetzberger | Sheet | Format | Title
Created | 1/3 | A3 | Manual release RTC-SR
Approved | HA | Issue Date | 18.06.2015
Grasl | | | Pneumatic Mechanik GmbH
Commissioning the OPEN-release:
1) Hook clamping angle into the recess provided (see picture 1).
2) Place clamping bolt onto the piercing bolt in the valve.
3) Press clamping angle up fully until the piercing bolt engages.
4) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread.
5) Check position of the view indicator. View indicator must be on green, if not, press view indicator angle to the valve until view indicator is green (see picture 2)!
6) Screw in new CO2 bottle.
7) Following releasing, remove empty CO2 bottle (Caution: Residual pressure may be present) and repeat the process.

Commissioning the close-release:
1) Carry out Points 1-4 of the commissioning of the OPEN release accordingly.
2) Check position of the priority slide. Both slides must be in the basic position! (see picture 3)
3) Screw in new CO2 bottle and close box.
4) Following a releasing, remove empty CO2 bottle. (Caution: Residual pressure may be present) and repeat operation.

Installation:
- When using CO2-multi-trip bottles (ascending-tube), mount the valve as per drawing (bottle screwed in from the bottom)
- CAUTION: No dismounting of the valve from the mounting bracket.

Ordering designation:
RTC x.y - aaa - bb - SR - R - S1
option S1: additional connection thread
option R: bracket for spare bottle
ascending-tube bottle with screw-in thread M18x1,5
HA ... manual OPEN
HEA ... manual electric OPEN
HPA ... manual pneumatic OPEN
HA-HZ ... manual OPEN - manual CLOSE
HEA-HZ ... manual electric OPEN - manual CLOSE
HPA-HZ ... manual pneumatic OPEN - manual CLOSE
0 ... front plate
1 ... glass sheet for bottle until 750g
2 ... glass sheet for bottle until 1500g
1 ... mounting angle without spare bottle attachment
2 ... mounting angle for spare bottle until 750g
3 ... mounting angle for spare bottle until 1500g
Release RTC - OPEN/CLOSE

- Valve for manual release of two CO₂ one-way bottles
  SHE OPEN (1st bottle) and SHE CLOSE (2nd bottle)
- Optional:
  - Electrical remote release by solenoid
  - Pneumatical remote release by attached pneumatically operated release
- Maximum operating pressure
- Nominal bore (free cross section) of valve 4mm
- Nominal bore of piercing needle 2mm
- Ambient temperature range: -25°C - +75°C

Types:

Hand release OPEN/CLOSE
RTC-HA-HZ: for CO₂ bottles up to 1500gr
RTC 2.0-HA-HZ-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HA-HZ-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Hand-/ electrical release OPEN/CLOSE
RTC-HEA-HZ: for CO₂ bottles up to 1500gr
RTC 2.0-HEA-HZ-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEA-HZ-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Hand-/ pneumatical release OPEN/CLOSE
RTC-HPA-HZ: for CO₂ bottles up to 1500gr
RTC 2.0-HPA-HZ-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HPA-HZ-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Hand-/ electrical/ pneumatical release OPEN only, Hand release CLOSE
RTC-HEPA-HZ: for CO₂ bottles up to 1500gr
RTC 2.0-HEPA-HZ-R: for CO₂ bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEPA-HZ-R: for CO₂ bottles up to 1500gr.; spare bottle holder

Options:

RTC with spare glass sheet for use in alarm boxes
NFM: For CO₂ bottles with M15x1,25 thread. Version for the French market
M18x1,5: Type for CO₂ bottles with M18x1,5 thread
M18x1,5-SR: Type for CO₂ dip tube bottle with M18x1,5 thread

Accessories:

Tensioning device for RTC
Tensioning device for RTC-NFM
Tensioning device for RTC-M18x1,5
spare glass sheet RT-E
Description of function:
The release valve RTC is a valve which taps a CO2 bottle by pushing the release button, or control of the electromagnet, or the pneumatic release, and so the CO2 can flow to the outlet CA (G1/8”).

Releasing:
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pneumatic releasing: Applying the minimum release pressure on PA. (only at HPA and HPA-HZ).

Technical data:
- max. operating pressure: 80bar
- min. control pressure by PA: 6bar
- nominal width of valve: 4mm
- nominal width of piercing needle: 2mm
- rated voltage electromagnet: 24VDC
- rated current electromagnet: 0.29ADC
- duty cycle electromagnet: 100%
- ambient temperature range: -5°C - +55°C
Commissioning the OPEN-release:
1) Hook clamping angle into the recess provided (see picture 1).
2) Place clamping bolt onto the piercing bolt in the valve.
3) Press clamping angle up fully until the piercing bolt engages.
4) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
5) Check position of the view indicator. View indicator must be on green, if not, press view indicator angle to the valve until view indicator is green (see picture 2)!
6) Screw in new CO₂ bottle.
7) Following releasing, remove empty CO₂ bottle (Caution: Residual pressure may be present) and repeat the process.

Commissioning the close-release:
1) Carry out Points 1-4 of the commissioning of the OPEN release accordingly.
2) Check position of the priority slide. Both slides must be in the basic position! (see picture 3)
3) Screw in new CO₂ bottle and close box.
4) Following a releasing, remove empty CO₂ bottle. (Caution: Residual pressure may be present) and repeat operation.

Installation:
- When using CO₂-multi-trip bottles (ascending-tube), mount the valve as per drawing (bottle screwed in from the bottom)
- CAUTION: No dismounting of the valve from the mounting bracket.

Ordering designation:
RTC x.y - aaa - bb - SR - R - S1
option S1: additional connection thread
option R: bracket for spare bottle
ascending-tube bottle with screw-in thread M18x1,5
HA ... manual OPEN
HEA ... manual electric OPEN
HPA ... manual pneumatic OPEN
HA-HZ ... manual OPEN - manual CLOSE
HEA-HZ ... manual electric OPEN - manual CLOSE
HPA-HZ ... manual pneumatic OPEN - manual CLOSE
0 ... front plate
1 ... glass sheet for bottle until 750g
2 ... glass sheet for bottle until 1500g
1 ... mounting angle without spare bottle attachment
2 ... mounting angle for spare bottle until 750g
3 ... mounting angle for spare bottle until 1500g
Description of function:
The release valve RTC is a valve which taps a CO2 bottle by pushing the release button, or control of the electromagnet, or the pneumatic release, and so the CO2 can flow to the outlet CA (G1/8”).

Releasing:
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pneumatic releasing: Applying the minimum release pressure on PA. (only at HPA and HPA-HZ).

Technical data:
- max. operating pressure: 80 bar
- min. control pressure by PA: 6 bar
- nominal width of valve: 4 mm
- nominal width of piercing needle: 2 mm
- rated voltage electromagnet: 24 VDC
- rated current electromagnet: 0.29 ADC
- duty cycle electromagnet: 100%
- ambient temperature range: -5°C - +55°C

Tolerance: 1:2.5

Document State

Document Number 04.011.DAT.36.00-E
Commissioning the OPEN-release:
1) Hook clamping angle into the recess provided (see picture 1).
2) Place clamping bolt onto the piercing bolt in the valve.
3) Press clamping angle down fully until the piercing bolt engages.
4) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
5) Check position of the view indicator. View indicator must be on green, if not, press view indicator angle to the valve until view indicator is green (see picture 2)!
6) Screw in new CO2 bottle.
7) Following releasing, remove empty CO2 bottle (Caution: Residual pressure may be present) and repeat the process.

Commissioning the close-release:
1) Carry out Points 1-4 of the commissioning of the OPEN release accordingly.
2) Check position of the priority slide. Both slides must be in the basic position! (see picture 3)
3) Screw in new CO2 bottle and close box.
4) Following a releasing, remove empty CO2 bottle. (Caution: Residual pressure may be present) and repeat operation.

Installation:
- When using CO2-multi-trip bottles (without ascending-tube) CO2 one-way bottles, mount the valve as per drawing (bottle screwed in from the top)
- CAUTION: No dismounting of the valve from the mounting bracket.

Ordering designation:
RTC x.y - aaa - bb - M18x1,5 - R - S1
option S1: additional connection thread
option R: bracket for spare bottle
multi-trip bottle with screw-in thread M18x1,5
HA ... manual OPEN
HEA ... manual electric OPEN
HPA ... manual pneumatic OPEN
HPA-HZ ... manual OPEN - manual CLOSE
HEA-HZ ... manual electric OPEN - manual CLOSE
HPA-HZ ... manual pneumatic OPEN - manual CLOSE
0 ... front plate
1 ... glass sheet for bottle until 750g
2 ... glass sheet for bottle until 1500g
3 ... mounting angle for spare bottle until 750g
4 ... mounting angle for spare bottle until 1500g

Standard connections:
- Connection HPA/HPA-HZ-M18x1,5:
  - CA (G1/8")
  - CZ (G1/8")
  - PA (G1/8")
  - screw-in thread for CO2-bottle (M18x1,5)

Option S1:
- additional connections at the underside of valve
  - CA (G1/8")
  - CZ (G1/8")

Connections:
- CA ... cylinder OPEN
- CZ ... cylinder CLOSE
- PA ... pneumatic remote control
**CA - RA - PA (series connection)**

- Combination release valve for releasing CO₂ one-way bottles with ½" UNF thread by different methods of actuation
- Piercing valve of series connection type, for interconnecting the CO₂ outlet ports of several piercing valves. CO₂ outlets are mechanically connected through integrated mounting block, hence no additional pipes required for the outlet end
- Valve inlets to be connected with pipes as required
- By interconnecting the CA-RA valves, up to 10 CO₂ bottles within a group can be pierced at the same time. Using the valve blocks described in the following, it is also possible to combine several groups into one mechanical unit
- Minimum release pressure 8bar
- Maximum operating pressure 80bar
- Nominal bore (free cross section) of valve 4mm
- Nominal bore of piercing needle 2mm
- No tool required for tensioning the piercing needle
- Ambient temperature range: -20°C to +110°C
- CO₂ bottles are not included in our supply (see valves, accessories)

The series CA-RA-PA valves are available in 4 versions that may be combined as necessary. Required for mounting: 2 threaded rods M4, 4 nuts M4 with washer

1. **CA-RA-PA-A (head block):**
   - CO₂ group outlet with 1/4" thread
   - Intermediate or end block (see below) can be mounted on right-hand side
   - For releasing, types HA / EA (manual / electrical release action) additionally require a CO₂ pilot bottle
   - For pipe connection of the valve, 1 male connector 1/4" (e.g. B1-8-1/4) and 1 male T-connector 1/8" (e.g. B9-6-1/8) will be required additionally

2. **CA-RA-PA-M (intermediate block):**
   - Intermediate or end block (see below) can be mounted on right-hand side
   - Including sealing ring for connection to the preceding block
   - For pipe connection of the valve, 1 T-connector 1/8" (e.g. B7-6-1/8) will be required additionally

3. **CA-RA-PA-E (end block):**
   - Head block of following group can be mounted on right-hand side
   - Including sealing ring for connection to the preceding block
   - For pipe connection of the valve, 1 male elbow union 1/8" (e.g. B5-6-1/8) will be required additionally

4. **CA-RA-PA-S (single block):**
   - For releasing a single CO₂ bottle. Piercing valve can be mechanically connected with groups of other piercing valves
   - Head block or single block can be mounted on the right-hand side
   - CO₂ group outlet 1/4" thread
   - For pipe connection of the valve, 1 male connector 1/4" (e.g. B1-8-1/4) and 1 male connector 1/8" (e.g. B5-6-1/8) will be required additionally
Example of interconnection

1. **CA-RA-PA-3-2**: Combination release of series connection type, for pneumatically releasing

   3 CO₂ bottles in the 1<sup>st</sup> group and
   2 CO₂ bottles in the 2<sup>nd</sup> group.

Valve is mounted as follows (CA-RA-...):
1<sup>st</sup> group: PA-A + PA-M + PA-E,
2<sup>nd</sup> group: PA-A + PA-E.
HH5/2: Hand lever valve 5/2 ways

- 5/2 ways hand lever valve for manual OPEN / CLOSE - control of SHE- or ventilation cylinders
- Maximum operating pressure 70bar, when using electric add-on components 10bar
- Ambient temperature range: -25°C bis +50°C
- Possibilities of extension provided by modular design
- Nominal bore (free cross section) of valve 4mm
- For pipe connection of the valve, 3 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

Other types:

HH5/2-VVZ: Hand lever valve 5/2 ways as described above, with additional double-pipe priority valve

- Integrated priority valve for connecting an upstream actuation element (e.g. alarm or ventilation valve)
- For pipe connection of the valve, 4 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

HH5/2-VVAZ: Hand lever valve 5/2 ways as described above, with additional OPEN/CLOSE priority valve

- Integrated priority valve for connecting an upstream actuation element (e.g. alarm or ventilation valve)
- For pipe connection of the valve, 5 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

For special types, please inquire
**HH5/2:**

**Can be extended by the following add-on components:**

**Maximum operating pressure when using the add-on components is 10bar!**

**EA** (electrical OPEN): Electrical OPEN control by attached solenoid 230VAC, 50/60Hz, 5W, operating mode S1 to DIN VDE 0580 (100% duty cycle). Minimum operating pressure 3bar

**EAV** (electrical OPEN priority): See above. When EAV and EZ add-on components (EZ see below) for the OPEN and CLOSE functions are activated at the same time, execution of the OPEN function will have priority. Minimum operating pressure 2bar

**EA24 / EAV24:** As above, but with attached solenoid 24VDC / 5W, 100% duty cycle

**EZ** (electrical CLOSE): Electrical CLOSE control by attached solenoid 230VAC, 50/60Hz, 5W, operating mode S1 to DIN VDE 0580 (100% duty cycle). Minimum operating pressure 3bar

**EZV** (electrical CLOSE priority): See above. When EAV and EZ add-on components for the OPEN and CLOSE functions are activated at the same time, execution of the CLOSE function will have priority. Minimum operating pressure 2bar

**EZ24 / EZV24:** As above, but with attached solenoid 24VDC / 5W, 100% duty cycle

**PA** (Pneumatic OPEN): Controls OPEN action by attached pneumatic release. Release pressure min. 3bar, 1 additional 1/8" male connector is required

**PAV** (Pneumatic OPEN priority): See above. Minimum release pressure 2bar. When PAV and PZ add-on components (PZ see below) for the OPEN and CLOSE functions are activated at the same time, execution of the OPEN function with same control pressure will have priority

**PZ** (Pneumatic CLOSE): Controls CLOSE action by attached pneumatic release. Release pressure min. 3bar, 1 additional 1/8" male connector is required

**PZV** (Pneumatic CLOSE priority): See above. Minimum release pressure 2bar. When PA and PZV add-on components for the OPEN and CLOSE functions are activated at the same time, execution of the CLOSE function with same control pressure will have priority

**LFZ** (Air spring CLOSE): Provides additional safety against failure of the supply mains, in conjunction with electric add-on component EA, for the wind and rain induced CLOSE function. In normal operating conditions, the hand lever valve can be actuated as usual. If a wind or rain signal is present, or in the case of mains failure, the valve automatically goes into CLOSE condition. Maximum operating pressure of add-on component EA is 10bar!
**Description of function:**
The hand lever valve HH5/2 is a 5/2 way piston slide valve for manual controlling the RWA- or ventilation cylinder OPEN / CLOSE.

**Operation:**
1.) Manual operation by using the hand lever.
   - hand lever up = OPEN
   - hand lever down = CLOSE

**Installation:**
1.) Variable mounting position
2.) Join connections as follows:
   - P ... Compressed air
   - A ... Pneumatic cylinder OPEN
   - B ... Pneumatic cylinder CLOSE

**Technical data:**
- max. operating pressure: 60 bar
- nominal width of valve: 4 mm
- ambient temperature range: -25°C - +50°C
- VdS approval no.: G 589052

**Pneumatic symbol:**

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**Diagram:**

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**Notes:**
- This drawing is the property of Grasl GmbH & Co. KG, Europastraße 1.
- Further use or reproduction of this drawing is prohibited without the written permission of the owner.
Description of function:
The hand lever valve HH5/2 is a 5/2 way piston slide valve for manual controlling the RWA- or ventilation cylinder OPEN / CLOSE. The valve can be controlled electric CLOSE by an electro add-on component (e.g. by a wind and rain control). There is no manual operating possible as long as the add-on component is activated.

Operation:
1.) Manual operation by using the hand lever.
   hand lever up = OPEN
   hand lever down = CLOSE
2.) Electric operation by applying the rated voltage to the electromagnet of the add-on component.

Installation:
1.) Variable mounting position
2.) Join connections as follows:
P ... Compressed air
A ... Pneumatic cylinder OPEN
B ... Pneumatic cylinder CLOSE

Technical data:
- max. operating pressure: 10 bar
- min. operating pressure by EZ: 2 bar
- nominal width of valve: 40 mm
- ambient temperature range: -25°C to +50°C
- VDS approval no.: G 589052

Electro add-on components:
- EZ24: electric CLOSE 24 VDC
- EZ230: electric CLOSE 230 V

Pneumatic symbol:

Connecting diagram electromagnet:

Ordering example:
HHS/2 - EZ230
**Description of function:**
The hand lever valve HH5/2 is a 5/2 way piston slide valve for manual controlling the RWA- or ventilation cylinder OPEN / CLOSE. The valve can be controlled electric OPEN / CLOSE by electro add-on-components (EA / EZ), whereby a add-on component can have optionally also priority over the other (EAV / EZV). There is no manual operating possible as long as a add-on component is activated.

**Operation:**
1. Manual operation by using the hand lever.  
   hand lever up = OPEN  
   hand lever down = CLOSE  
2. Electric operation by applying the rated voltage to the electromagnet of the add-on component.

**Installation:**
1.) Variable mounting position  
2.) Join connenctions as follows:  
P ... Compressed air  
A ... Pneumatic cylinder OPEN  
B ... Pneumatic cylinder CLOSE

**Technical data:**
- max. operating pressure: 10 bar  
- min. operating pressure by EA/EZ: 3 bar  
- min. operating pressure by EAV/EZV: 2 bar  
- ambient temperature range: -25°C - +50°C  
- nominal width of valve: 4 mm  
- power input - attracting - DC: 9 VA  
- power input - holding - DC: 6 VA  
- power input - attracting - AC: 9 VA  
- power input - holding - AC: 6 VA

**Electro add-on components:**
- EA24 ............ electric OPEN 24VDC  
- EAV24 ............ electric PRIORITY OPEN 24VDC  
- EA230 .......... electric OPEN 230V  
- EAV230 .......... electric PRIORITY OPEN 230V  
- EZ24 ............ electric CLOSE 24VDC  
- EZV230 .......... electric PRIORITY CLOSE 230V  
- EZ230 .......... electric CLOSE 230V

**Technical data:**
- max. operating pressure: 10 bar  
- min. operating pressure by EA/EZ: 3 bar  
- min. operating pressure by EAV/EZV: 2 bar  
- ambient temperature range: -25°C - +50°C  
- power input - attracting - DC: 9 VA  
- power input - holding - DC: 6 VA  
- power input - attracting - AC: 9 VA  
- power input - holding - AC: 6 VA

**Ordering example:**
HH5/2 - EAV24 - EZ230
**Description of function:**
The hand lever valve HH5/2 is a 5/2 way piston slide valve for manual controlling the RWA- or ventilation cylinder OPEN / CLOSE. The valve can be controlled electric CLOSE by an electro add-on component (EA). There is no manual operating possible as long as the add-on component isn't activated.

**Operation:**
1.) Manual operation by using the hand lever.
   - hand lever up = OPEN
   - hand lever down = CLOSE
2.) Electric operation by dropping the rated voltage to the electromagnet of the add-on component.

**Montage:**
1.) Variable mounting position
2.) Join connections as follows:
   - P ... Compressed air
   - A ... Pneumatic cylinder OPEN
   - B ... Pneumatic cylinder CLOSE

**Technical data:**
- max. operating pressure: 10 bar
- min. operating pressure by EA: 2 bar
- nominal width of valve: 4 mm
- ambient temperature range: -25°C - +50°C
- VDS approval no.: G 589052

**Electro add-on components:**
- EA24 ............ electric OPEN 24 VDC
- EA230 ............ electric OPEN 230 V

**Pneumatic symbol:**

**Connecting diagram electromagnet:**

**Ordering example:**
HH5/2 - EA230 - LFZ
Description of function:
The hand lever valve HH5/2 is a 5/2 way piston slide valve for manual controlling the RWA- or ventilation cylinder OPEN / CLOSE. The valve can be controlled pneumatic OPEN / CLOSE by pneumatic add-on components (PA / PZ), whereby a add-on component can have optionally also priority over the other (PAV / PZV). There is no manual operating possible as long as a add-on component is activated.

Operation:
1.) Manual operation by using the hand lever.
   hand lever up = OPEN
   hand lever down = CLOSE
2.) Pneumatic operation by applying the min. release pressure on PA(PAV) / PZ(PZV).

Installation:
1.) Variable mounting position
2.) Join connections as follows:
   P ......................... Compressed air
   A ......................... Pneumatic cylinder OPEN
   B ......................... Pneumatic cylinder CLOSE
   PA / PAV .............. Pneumatic remote control: VENTILATION OPEN
   PZ / PZV .............. Pneumatic remote control: VENTILATION CLOSE

Technical data:
- max. operating pressure: 60bar
- min. release pressure by PA/PZ: 3bar
- min. release pressure by PAV/PZV: 2bar
- nominal width of valve: 4mm
- ambient temperature range: -25°C - +50°C
- VGS approval no.: G 589052

Pneumatic symbol:

Ordering example:
HH5/2 - PA - PZ
Description of function:
The hand lever valve HH5/2 is a 5/2 way piston slide valve with mounted priority valve VVZ for manual controlling
the RWA- or ventilation cylinder OPEN / CLOSE.
If there is a pressure on the connection CO2 which is higher than the min. release pressure, the priority valve VVZ
switch, connect the input CO2 with the output CA and exhaust the connection CZ at the same time.
All ventilation operations are disable as long as the connection CO2 isn’t exhausted and the priority valve will be
reseted with the reset button.

Operation:
1.) Manual operation by using the hand lever.
   hand lever up = OPEN
   hand lever down = CLOSE
2.) Pneumatic operation PRIORITY OPEN by applying the minimum release pressure on CO2.

Installation:
1.) Variable mounting position
2.) Join connections as follows:
   P .......Compressed air
   CA .....Pneumatic cylinder OPEN
   CZ .....Pneumatic cylinder CLOSE
   CO2 ...Pneumatic remote control: PRIORITY OPEN

Technical data:
max. operating pressure 60bar
min. release pressure by CO2 4bar
nominal width of valve 4mm
ambient temperature range -25°C - +50°C
VdS approval no. G 589052

Pneumatic symbol:

Ordering example:
HH5/2 - VVZ
Description of function:
The hand lever valve HH5/2 is a 5/2 way piston slide valve with mounted priority valve VVAZ for manual controlling the RWA- or ventilation cylinder OPEN / CLOSE.

If there is a pressure on the connection CO2-A which is higher than the min. release pressure, the priority valve VVAZ switch, connect the input CO2-A with the output CA and exhaust the connection CZ at the same time.

If there is a pressure on the connection CO2-Z which is higher than the min. release pressure, the priority valve VVAZ switch, connect the input CO2-Z with the output CZ and exhaust the connection CA at the same time.

All ventilation operations are disable as long as the connections CO2-A and CO2-Z aren’t exhausted and the priority valve will be reseted with both reset buttons.

Operation:
1.) Manual operation by using the hand lever:
   - hand lever up = OPEN
   - hand lever down = CLOSE

2.) Pneumatic operation PRIORITY OPEN / CLOSE by applying the minimum release pressure on CO2-A / CO2-Z.

Installation:
1.) Variable mounting position
2.) Join connections as follows:
   - P .................. Compressed air
   - CA .................. Pneumatic cylinder OPEN
   - CZ .................. Pneumatic cylinder CLOSE
   - CO2-A ............ Pneumatic remote control: PRIORITY OPEN
   - CO2-Z ............ Pneumatic remote control: PRIORITY CLOSE

Technical data:
- max. operating pressure: 60 bar
- min. release pressure by CO2: 4 bar
- nominal width of valve: 4 mm
- ambient temperature range: -25°C - +50°C
- VdS approval no.: G 589052

Pneumatic symbol:

Ordering example:
HH5/2 - VVAZ

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Pneumatische Teile 1:1

Hand lever valve HH 5/2 - VVAZ

Data sheet

04.007.DAT.10.01-E
**VVE (Priority valve single-pipe):**

- 3/2 way priority valve for the connection of two CO₂ lines, or of one compressed air and one CO₂ line
- In normal state, inlet VA is connected to outlet CA. When pressure is admitted to the CO₂ inlet, the valve reverses, connecting the CO₂ inlet to outlet CA. Inlet VA will be closed off
- Control pressure for CO₂ inlet min. 4bar
- Maximum operating pressure 80bar
- Ambient temperature range: -25°C to +110°C
- Nominal bore (free cross section) of valve 4mm
- VdS approval no. G 590014
- For pipe connection of the valve, 3 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- Design of the SHEVS may require reliable venting of the piping.

**VVZ (Priority valve double-pipe):**

- 6/2 way priority valve for use in OPEN/CLOSE controls. Valve connects two CO₂ OPEN lines, or one compressed air and one CO₂ OPEN line. The CLOSE line of the RWA unit exhausts automatically
- In normal state, inlet VA is connected to outlet CA, and inlet VZ to outlet CZ. When pressure is admitted to the CO₂ inlet, the valve reverses, connecting the CO₂ inlet to outlet CA. Inlets VA and VZ will be closed off. The RWA return line connected to outlet CZ exhausts at the same time
- Control pressure for CO₂ inlet min. 4bar
- Maximum operating pressure 80bar
- Ambient temperature range: -25°C to +110°C
- Nominal bore (free cross section) of valve 4mm
- VdS approval no. G 590014
- For pipe connection of the valve, 5 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
- Design of the SHEVS may require reliable venting of the piping.

**Kit VVZ / VVAZ:**

- Kit for mounting a VVZ or VVAZ on an HH5/2 (see hand lever valves)
- Comprising 2 O-rings and 2 fixing bolts
VVAZ (OPEN/CLOSE priority valve, nominal bore 4mm):

◆ Priority valve for use in OPEN/CLOSE controls. Valve connects two CO₂ OPEN lines, or one compressed air and one CO₂ OPEN line. Furthermore, two CO₂ CLOSE lines, or one compressed air and one CO₂ CLOSE line are interconnected. Reciprocal venting must take place in the control valves for the OPEN/CLOSE function.
◆ In normal state, inlet VA is connected to outlet CA, and inlet VZ to outlet CZ. When pressure is admitted to the CO₂A inlet, the valve reverses, connecting the CO₂A inlet to outlet CA, and the CO₂Z inlet to outlet CZ. Inlets VA and VZ will be closed off. The same applies when pressure is admitted to the CO₂Z inlet.
◆ Control of the CO₂ inlets by OPEN/CLOSE combination release valves e.g. RTC-HA-HZ, see non-automatic release), of inlets VA / VZ e.g. by hand lever valve HH5/2 (see hand lever valves).
◆ Control pressure for CO₂ inlets min. 4bar
◆ Maximum operating pressure 60bar
◆ Ambient temperature range: -25°C to +110°C
◆ Nominal bore (free cross section) of valve 4mm
◆ For pipe connection of the valve, 6 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
◆ Design of the SHEVS may require reliable venting of the piping.

Kit VVZ / VVAZ:

◆ Kit for mounting a VVZ or a VVAZ on an HH5/2
◆ Comprising 2 O-rings and 2 fixing bolts
Description of function:
In normal state (view indicator angle and reset button in drawn position (i.e. "ZU" is visibly)) is a connecting between VA and CA. When control the priority valve single-pipe over the CO2-input, the connections CO2 and CA are connected. The connection VA will be closed off and the view indicator angle shows "AUF". CO2 has always priority compared to the connection VA.

Releasing:
Pneumatic releasing via applying the min. control pressure at connection CO2

Mounting:
1) Connections:
   CA .......... outlet OPEN
   VA .......... input OPEN
   CO2 .......... priority connection OPEN
2) Variable mounting position. Make sure that the required place for the control slider is available.
3) For our 1/8" connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.

Commissioning:
1) Deeply press reset button in the correct position. In normal state the reset button stick out approx. 1mm of the housing (resp. 8mm with view indicator angle)
2) After releasing, repeat process

Technical data:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. operating pressure (connections CO2-A, CO2-Z, CA, CZ)</td>
<td>60bar</td>
</tr>
<tr>
<td>max. operating pressure (connections VA, VZ)</td>
<td>16bar</td>
</tr>
<tr>
<td>min. control pressure for CO2-connection</td>
<td>4bar</td>
</tr>
<tr>
<td>nominal width of valve</td>
<td>4mm</td>
</tr>
<tr>
<td>ambient temperature range</td>
<td>-25°C - +80°C (2h 110°C)</td>
</tr>
<tr>
<td>VdS approval no.</td>
<td>G590014</td>
</tr>
</tbody>
</table>

Scope of supply:
Screw connections are NOT included in the scope of supply!

Circuit diagramm:

Ordering versions:
- VVE CO2-Eingang oben
- VVE-SA CO2-Eingang oben
- VVE CO2-Eingang seitlich
- VVE-SA CO2-Eingang seitlich
Description of function:
In normal state (view indicator angle and reset button in drawn position (i.e. "ZU" is visibly)) is a connecting between VA and CA as well between VZ and CZ. When control the priority valve double-pipe over the CO2-input, the connections CO2 and CA are connected and the connection CZ is exhaust. The connections VA and VZ will be closed off and the view indicator angle shows "AUF". CO2 has always priority compared to the connections VA and VZ.

Releasing:
Pneumatic releasing via applying the min. control pressure at connection CO2.

Mounting:
1) Connections:
   - CA ............... outlet OPEN
   - CZ ............... outlet CLOSE
   - VA ............... input OPEN
   - VZ ............... input ZU
   - CO2 ............... priority connection OPEN
2) Variable mounting position. Make sure that the required place for the control slider is available.
3) For our 1/8" connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.

Commissioning:
1) Deeply press reset button in the correct position. In normal state the reset button stick out approx. 1mm of the housing (resp. 8mm with view indicator angle).
2) After releasing, repeat process.

Technical data:
- max. operating pressure (connections CO2, CA, CZ) 60bar
- max. operating pressure (connections VA, VZ) 16bar
- min. control pressure for CO2-connection 4bar
- nominal width of valve 4mm
- ambient temperature range -25°C - +80°C (2h 110°C)
- VdS approval no. G590014

Scope of supply:
Screw connections are NOT included in the scope of supply!

Circuit diagramm:

Ordering versions:
- VVZ CO2-Eingang oben
- VVZ-SA CO2-Eingang oben
- VVZ CO2-Eingang seitlich
- VVZ-SA CO2-Eingang seitlich

Tolerance | Scale | Material | Created | Sheet | Format | Approved | Issue Date | Title | Data sheet | Document State | Document Number
---|---|---|---|---|---|---|---|---|---|---|---
| | | | Simetzberger | 1/2 | A3 | Grasl | 09.12.2015 | Priority valve double-pipe VVZ / VVZ-SA | | Valid | 04.020.DAT.00.02-E

Pneumatic Mechanik GmbH
Description of function:
In normal state (reset buttons in drawn position) is a connecting between VA and CA as well between VZ and CZ.
When control the priority valve-OPEN-CLOSE over the CO2-input CO2-A or CO2-Z, the connection CO2-A is connected with CA and the connection CO2-Z is connected with CZ. The connections VA and VZ will be closed off. CO2 has always priority compared to the connections VA and VZ.

Releasing:
Pneumatic releasing via applying the min. control pressure at connection CO2-A or CO2-Z

Mounting:
1) Connections:
   CA .......... outlet OPEN
   CZ .......... outlet CLOSE
   VA .......... input OPEN
   VZ .......... input ZU
   CO2-A .... priority connection OPEN
   CO2-Z .... priority connection CLOSE
2) Variable mounting position. Make sure that the required place for the control slider is available.
3) For our 1/8" connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.

Commissioning:
1) Deeply press both reset buttons in the correct position. In normal state the reset buttons stick out approx. 11mm of the housing.
2) After releasing, repeat process.

Technical data:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>max. operating pressure (CO2-A, CO2-Z, CA, CZ)</td>
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</tr>
<tr>
<td>max. operating pressure (VA, VZ)</td>
<td>16bar</td>
</tr>
<tr>
<td>min. control pressure for CO2-connection</td>
<td>4bar</td>
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<tr>
<td>nominal width of valve</td>
<td>4mm</td>
</tr>
<tr>
<td>ambient temperature range</td>
<td>-25°C to +80°C (2h 110°C)</td>
</tr>
<tr>
<td>VdS approval no.</td>
<td>G590014</td>
</tr>
</tbody>
</table>

Scope of supply:
Screw connections are NOT included in the scope of supply!

Circuit diagram:
**ZSV (Sequence valve):**

- Sequence valve for pressure-dependent control of an SHEVS cylinder
- At a pressure up to 6 bar the valve remains safely closed. When pressure rises above 10 bar, the valve will switch, connecting inlet E to outlet A
- Nominal pressure 7 bar and 8 bar.
- Maximum operating pressure 60 bar
- Ambient temperature range: -25°C to +110°C
- Nominal bore (free cross section) of 1 mm
- VdS approval no. G 503011

- For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

**Types:**

**ZSV (7 bar)**
Nominal pressure 7 bar/ Minimum switching pressure 10,2 bar

**ZSV (8 bar)**
Nominal pressure 8 bar/ Minimum switching pressure 11,6 bar

For other nominal pressures please inquire.

**BVE (Pressurising valve single-pipe):**

- VdS approved pressurising valve for air supply to an SHEVS cylinder following idle
- In normal condition, outlet CA has exhausted (SHEVS cylinder can be pulled along by a ventilation drive). When pressure is admitted to the CO₂ inlet, the valve reverses, connecting the CO₂ inlet to outlet CA. After system exhaust, the valve will automatically reset
- Maximum operating pressure 80 bar
- Ambient temperature range: -25°C to +110°C
- Nominal bore (free cross section) of valve 4 mm
- VdS approval no. G 598002

- For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
**ZSV-BVE (Sequence valve with pressurising valve, single-pipe):**

- Sequence valve for pressure-dependent control of one SHEVS cylinder, with pressurising valve for supplying air to the RWA cylinder while following idle
- In normal position (pressure < 6bar) outlet CA has exhausted (SHEVS cylinder can be pulled along by a ventilation drive). When the CO₂ inlet is charged with a pressure > 10bar, valve reverses, connecting the CO₂ inlet to outlet CA. After system exhaust, valve will automatically reset
- Nominal switching pressure 7bar. For different switching pressures, please inquire
- Maximum operating pressure 60bar
- Ambient temperature range: -25°C to +110°C
- Nominal bore (free cross section) of valve 0,8mm, of exhaust 4mm
- VdTÜV approval no. G 503011

- For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

ZSV-BVE with male connector
**Description of function:**

The valve ZSV-3.10 is a pressure-dependent sequence valve. There is no connection between the valve input CO2 and the output CA as long as the pressure on CO2 is lower than the rated pressure. The valve switch over and connect the input CO2 and the output CA, when the input pressure is higher than the minimum release pressure. Resetting the valve, the input CO2 must be completely exhaust.

Depending on the system size (pipeline length), the complete exhaust of the system and thereby the reset of the ZSV-3.10 need some time.

**Operation:**

Pneumatic operation by applying the minimum release pressure at the input CO2.

**Mounting:**

1) Variable mounting position
2) Join connections as follows:
   - CO2 ......... valve input
   - CA .......... valve output

**Technical data:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tr>
<td>Rated pressure</td>
<td>7.3</td>
<td>8.7</td>
<td>10.2</td>
<td>11.6</td>
<td></td>
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<tr>
<td>Minimum release pressure</td>
<td>7.3</td>
<td>8.7</td>
<td>10.2</td>
<td>11.6</td>
<td>bar</td>
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<tr>
<td>Max. operating pressure</td>
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<td></td>
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</tr>
<tr>
<td>Connections</td>
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<td></td>
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<tr>
<td>Nominal width</td>
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<td></td>
</tr>
<tr>
<td>Ambient temperature range</td>
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</tr>
<tr>
<td>VdS approval no.</td>
<td>G 503011</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application:**

The sequence valve ZSV-3.10 is used for controlling specific system- and equipment components, depending on the pressure (e.g. flaps with ventilation- and RWA-cylinder, where the valve ZSV-3.10 connect to the RWA-cylinder in the RWA-case).

**Pneumatic symbol:**

![Pneumatic symbol](image)

**Ordering example:**

ZSV-3.10 (rated pressure)
**Description of function:**
The pressurising valve BVE is used when a RWA-cylinder will be towed for daily ventilation through ventilation actuator or pneumatic ventilation cylinder (own line for ventilation cylinder). The BVE will be mounted into line to the RWA-cylinder and effects that the RWA-cylinder is exhaust during ventilation operations. So there is also a pressure compensation in the lines of the RWA-cylinder to avoid an unintended opening caused of a pressure rise through temperature fluctuation. If the pressure at CO2 input is higher than the min. pressure, the BVE interconnects from input CO2 to outlet CA. If the pressure is lower than the min. pressure, the BVE switch back through spring force in home position and ventilates the on CA connected line.

**Mounting:**
1) Join connections as follows:
   - CA .......... RWA-cylinder
   - CO2 .......... Input CO2
2) Variable mounting position. Make sure that the required place for the control slider is available.
3) For our 1/8” connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.

**Technical Data:**
- max. static housing pressure: 80bar
- max. dynamic operating pressure: 80bar
- nominal width of valve: 4mm
- min. pressure of CO2 input: 5bar
- ambient temperature range: -25°C - +80°C (2h 110°C)

**Circuit diagram:**

**Ordering versions:**
- BVE CO2-Eingang oben
- BVE CO2-Eingang seitlich
Description of function:
The valve ZSV-BVE is a pressure-dependent sequence valve with mounted pressurising valve. The outlet CA is ventilated as long as the pressure on CO2 is lower than the rated pressure. This means that the cylinder can be towed (e.g. through a ventilation actuator). These ventilation also compensate pressure fluctuation, which result from temperature fluctuation, inside the cylinder (to avoid unintended opening of the hook locking device). The valve switch over and connect the input CO2 and the output CA, when the input pressure is higher than the minimum release pressure.
Resetting the valve, takes place by completely exhausting the CO2 input.
Depending on the system size (pipeline length), the complete exhaust of the system and thereby the reset of the ZSV need some time.

Operation:
Pneumatic operation by applying of minimum release pressure at the input CO2.

Mounting:
1) Connections:
   CO2 .......... valve input
   CA .......... valve outlet

2) Variable mounting position. Make sure that the required place for the control slider is available.

3) For our 1/8" connection threads we recommend to use screw connections with taper thread and to seal these in position using a liquid sealant (e.g. Loctite 243). It must be ensured that the liquid sealant is applied to the external thread.

Technical Data:
- rated pressure: 5, 6, 7, 8 bar
- min. release pressure: 7.3, 8.7, 10.2, 11.6 bar
- max. operating pressure: 60 bar
- nominal width of valve (exhaust): 4 mm
- nominal width of valve (interconnect): 1 mm
- ambient temperature range: -25°C - +80°C (2h 110°C)
- VdS approval no.: G 50011

Circuit diagramm:

Ordering example:
ZSV-BVE (rated pressure)
SEV (Quick-action exhaust valve):

♦ Quick action exhaust valve for increasing opening and closing speed of pneumatic cylinders in systems of great pipe lengths
♦ The pressureless line of a pneumatic cylinder exhausts directly through the SEV
♦ Max. operating pressure 10 bar
♦ Ambient temperature range: -5°C to +70°C

Types:

♦ SEV-1/8: Connection thread 1/8”
  For pipe connection of the valve, 2 male connectors 1/8” (e.g. B1-6-1/8) will be required additionally

♦ SEV-1/4: Connection thread 1/4”
  For pipe connection of the valve, 2 male connectors 1/4” (e.g. B1-6-1/4) will be required additionally
DEV-SA (Double exhaust valve with visual OPEN/CLOSED display):

- Double exhaust valve for connecting several CO₂ OPEN / CLOSE controls
- When pressure is admitted to the OPEN end of the valve, the CLOSE end will automatically exhaust. The same applies when the CLOSE end is charged
- Maximum operating pressure 80bar
- Ambient temperature range: -20°C to +110°C
- Nominal bore (free cross section) of valve 2mm
- For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) and 2 male connectors 1/4" (e.g. B1-6-1/4) will be required additionally

DEV-SA with male connectors
WV-1/8 (Shuttle valve - 1/8"):

- Shuttle valve for connecting two compressed air lines
- The inlet with higher pressure is connected to the outlet, while the other inlet is closed off
- Maximum operating pressure 10bar
- Ambient temperature range: -20°C to +50°C
- Nominal bore (free cross section) of valve 4mm

- For pipe connection of the valve, 3 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

RV-1/8 (Non-return valve - 1/8"):

- Non-return valve for closing off the flow of air in one direction
- Maximum operating pressure 60bar
- Ambient temperature range: -20°C to +50°C
- Nominal bore (free cross section) of valve 4mm

For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally
**CO₂ one-way bottles for use in thermal releases**

- Only for use in our thermal releases. Nominal temperature of the used thermo bulb must not be higher than the CO₂ bottle temperature rating!
- Available in packing units (PU) only

**Types:**

**CO₂ bottles, ½” UNF thread:**

- **20g**: dia. 26 x 115mm, nominal temperature 93°C, filling factor 0.54g/ml, 1 packing unit = 162 pieces
- **24g**: dia. 26 x 115mm, nominal temperature 68°C, filling factor 0.65g/ml, 1 packing unit = 162 pieces
- **38g**: dia. 30 x 144mm, nominal temperature 93°C, filling factor 0.58g/ml, 1 packing unit = 100 pieces
- **40g**: dia. 30 x 144mm, nominal temperature 68°C, filling factor 0.62g/ml, 1 packing unit = 100 pieces
- **55g**: dia. 35 x 159mm, nominal temperature 93°C, filling factor 0.58g/ml, 1 packing unit = 70 pieces
- **80g**: dia. 35 x 217mm, nominal temperature 93°C, filling factor 0.57g/ml, 1 packing unit = 50 pieces
- **120g**: dia. 50 x 178mm, nominal temperature 93°C, filling factor 0.56g/ml, 1 packing unit = 30 pieces
- **150g**: dia. 50 x 178mm, nominal temperature 68°C, filling factor 0.70g/ml, 1 packing unit = 30

**CO₂ bottles, W21,8 x 1/14” thread (F):**

(in conformity with NFS 61-939)

- **25g**: dia. 30 x 150mm, nominal temperature 93°C, 1 packing unit = 100 pieces
- **40g**: dia. 30 x 211mm, nominal temperature 93°C, 1 packing unit = 70 pieces
- **80g**: dia. 50 x 184mm, nominal temperature 93°C, 1 packing unit = 30 pieces
- **120g**: dia. 50 x 239mm, nominal temperature 93°C, 1 packing unit = 15 pieces

**For special purpose bottles, please inquire**
Thermo bulbs:

- When using thermo bulbs (glass tubes) in VdS approved valves, be sure no bulbs are used other than those tested together with the appropriate valve (see valves)
- Some types available in packing units (PU) only

Types:

**G5-RWA-68** (red):
Thermo bulb dia. 5mm, nominal temperature 68°C

**G5-RWA-93** (green):
Thermo bulb dia. 5mm, nominal temperature 93°C

**G5-RWA-110** (green):
Thermo bulb dia. 5mm, nominal temperature 110°C

**G5-RWA-141** (blue):
Thermo bulb dia. 5mm, nominal temperature 141°C

**G8-RWA-68** (red):
Thermophiole Ø8mm, nominal temperature 68°C, 1 VE = 200 pcs

**G8-RWA-93** (green):
Thermo bulb dia. 8mm, nominal temperature 93°C, 1 VE = 200 pcs

**G8-RWA-110** (green):
Thermo bulb dia. 8mm, nominal temperature 110°C, 1 VE = 200 pcs

**G8-RWA-141** (blue):
Thermo bulb dia. 8mm, nominal temperature 141°C, 1 VE = 200 pcs

For special Thermo bulbs, please inquire

Ejector for taped thermo bulbs:

- Manually operated ejector for dia. 5mm taped thermo bulbs. Please order required taped thermo bulbs in packing units of 1.000, 1.500, 2.000 or 2.500 pieces
- By actuation of the ejecting lever, one thermo bulb will be ejected at a time

For automatic ejector, please inquire
**CO₂ one-way bottles for use in non-automatic releases**

- Available in packing units (PU) only

**Types:**

**CO₂ bottles, ½" UNF thread:**

- **20g**: dia. 26 x 115mm, nominal temperature 93°C, filling factor 0.54g/ml, 1 packing unit = 162 pieces
- **24g**: dia. 26 x 115mm, nominal temperature 68°C, filling factor 0.65g/ml, 1 packing unit = 162 pieces
- **38g**: dia. 30 x 144mm, nominal temperature 93°C, filling factor 0.58g/ml, 1 packing unit = 100 pieces
- **40g**: dia. 30 x 144mm, nominal temperature 68°C, filling factor 0.62g/ml, 1 packing unit = 100 pieces
- **55g**: dia. 35 x 159mm, nominal temperature 93°C, filling factor 0.58g/ml, 1 packing unit = 70 pieces
- **75**: dia. 30 x 205mm, nominal temperature 50°C, filling factor 0.74g/ml, 1 packing unit = 75 pieces
- **80g**: dia. 35 x 217mm, nominal temperature 93°C, filling factor 0.57g/ml, 1 packing unit = 50 pieces
- **120g**: dia. 50 x 178mm, nominal temperature 93°C, filling factor 0.56g/ml, 1 packing unit = 30 pieces
- **150g**: dia. 50 x 178mm, nominal temperature 68°C, filling factor 0.70g/ml, 1 packing unit = 30 pieces
- **300g**: dia. 50 x 315mm, nominal temperature 50°C, filling factor 0.71g/ml, 1 packing unit = 15 pieces
- **500g**: dia. 60 x 342mm, nominal temperature 50°C, filling factor 0.75g/ml, 1 packing unit = 10 pieces
- **750g**: dia. 60 x 490mm, nominal temperature 50°C, filling factor 0.71g/ml, 1 packing unit = 10 pieces
- **1000g**: dia. 80 x 382mm, nominal temperature 50°C, filling factor 0.71g/ml, 1 packing unit = 6 pieces
- **1500g**: dia. 80 x 525mm, nominal temperature 50°C, filling factor 0.75g/ml, 1 packing unit = 6 pieces
**CO₂ bottles, M15 x 1.25 thread (NFM):**
(conforms to NFS 61-939)

25g: dia. 30 x 150mm, nominal temperature 93°C,
1 packing unit = 100 pieces

40g: dia. 30 x 211mm, nominal temperature 93°C,
1 packing unit = 70 pieces

120g: dia. 50 x 239mm, nominal temperature 93°C,
1 packing unit = 15 pieces

300g: dia. 50 x 315mm, nominal temperature 50°C,
1 packing unit = 15 pieces

500g: dia. 60 x 342mm, nominal temperature 50°C,
1 packing unit = 10 pieces

750g: dia. 60 x 496mm, nominal temperature 50°C,
1 packing unit = 10 pieces

For special purpose bottles, please inquire
DS-S-42 (Pressure switch, normally open contact, 42V):

- Pressure switch in galvanised steel enclosure, for electrically monitoring a compressed-air line
- Pressure switch operates when factory-set threshold of 5bar is exceeded
- Switching pressure can be factory-set within a range of 1 - 10bar if requested
- Switching tolerance ±0,5bar
- Safe against overpressure up to 300bar
- Normally open contact, switching capacity 42V / 100VA
- Ambient temperature range: -30°C to +120°C
- Protection IP65, terminals IP00
- Screw terminals for supply lead 0,5 - 1,5mm²
- Connection thread 1/4", enclosure wrench size 24
- Also available as normally closed contact if requested

**Protection cap for DS-S-42:**

- Protection cap with central cable entry
- Cable diameter 1,5 to 5mm
- Protection cap is also available for entry of two single conductors 1,7 to 2,2mm if requested

DS-W-230 (Pressure switch, two-way contact, 230V):

- Pressure switch in galvanised steel enclosure, for electrically monitoring a compressed air line
- Pressure switch operates when factory-set threshold of 5bar is exceeded
- Response pressure can be set at factory within a range of 1 - 10bar if requested
- Response tolerance ±0,5bar
- Safe against overpressure up to 300bar
- Change over contact, switching capacity 4A / 230VAC, 2A / 50 V-
- Ambient temperature range: -30°C to +120°C
- Protection IP65, terminals IP00
- Plug terminals 6,3 x 0,8mm
- Connection thread 1/4", enclosure wrench size 27

**Angle connector for DS-W-230:**

- Protection cap with central cable entry PG9 and screw-type seal
- Screw terminals for supply leads 0,5 - 1,5mm²
Pressure hoses DRS

- Pressure hose, e.g. for connecting thermo valves and pneumatic cylinders. Flexible hose can be directly connected to the cylinder inlet by means of compression-type fittings, requiring no pipe with swivel screw fitting for connection
- Hose with stainless steel (1.4301) braiding, ferrules made of steel (1.4305)
- 2 pipe stubs of nickel-plated brass, OD 6mm
- Hose material: polytetrafluorethylene
- Nominal bore (free cross section) 3mm
- Max. operating pressure at 24°C 160bar
- Ambient temperature range: -20 to +250°C

Types:

- DRS-300: total length 300mm
- DRS-400: total length 400mm
- DRS-500: total length 500mm
- DRS-600: total length 600mm
- DRS-700: total length 700mm
- DRS-1100: total length 1.100mm
- DRS-1300: total length 1.300mm
- DRS-1600: total length 1.600mm
- DRS-1800: total length 1.800mm
- DRS-2100: total length 2.100mm
- DRS-2600: total length 2.600mm
- DRS-2800: total length 2.800mm

For extra lengths between 100 and 6.000mm, please inquire
**Compression type fittings**

- Compression type fittings with brass body
- Captive cutting ring integrated in union nut
- Maximum operating pressure 60 bar
- Available in packing units (PU) only

**Straight connector type B1** (male thread)

B1-6-1/8: pipe OD 6 mm, thread 1/8", 1 packing unit = 100 pieces
B1-8-1/8: pipe OD 8 mm, thread 1/8", 1 packing unit = 100 pieces
B1-6-1/4: pipe OD 6 mm, thread 1/4", 1 packing unit = 100 pieces
B1-8-1/4: pipe OD 8 mm, thread 1/4", 1 packing unit = 50 pieces

**Straight connector type B2** (female thread)

B2-6-1/8: pipe OD 6 mm, thread 1/8", 1 packing unit = 100 pieces
B2-8-1/8: pipe OD 8 mm, thread 1/8", 1 packing unit = 50 pieces
B2-6-1/4: pipe OD 6 mm, thread 1/4", 1 packing unit = 100 pieces
B2-8-1/4: pipe OD 8 mm, thread 1/4", 1 packing unit = 100 pieces

**Union type B3**

B3-6: pipe OD 6 mm, 1 packing unit = 50 pieces
B3-8: pipe OD 8 mm, 1 packing unit = 50 pieces

**Bulkhead fitting type B4**

B4-6: pipe OD 6 mm, 1 packing unit = 50 pieces
B4-8: pipe OD 8 mm, 1 packing unit = 50 pieces

**Elbow connector type B5** (90° connector)

B5-6-1/8: pipe OD 6 mm, thread 1/8", 1 packing unit = 100 pieces
B5-8-1/8: pipe OD 8 mm, thread 1/8", 1 packing unit = 50 pieces
B5-6-1/4: pipe OD 6 mm, thread 1/4", 1 packing unit = 50 pieces
B5-8-1/4: pipe OD 8 mm, thread 1/4", 1 packing unit = 100 pieces
Elbow union type B6 (90° union)

B6-6: pipe OD 6 mm, 1 packing unit = 50 pieces
B6-8: pipe OD 8 mm, 1 packing unit = 50 pieces

T-connector, axial, type B7

B7-6-1/8: pipe OD 6 mm, thread 1/8", 1 packing unit = 100 pieces
B7-8-1/8: pipe OD 8 mm, thread 1/8", 1 packing unit = 50 pieces
B7-6-1/4: pipe OD 6 mm, thread 1/4", 1 packing unit = 50 pieces
B7-8-1/4: pipe OD 8 mm, thread 1/4", 1 packing unit = 50 pieces

T-connector, 90°, type B8

B8-6-1/8: pipe OD 6 mm, thread 1/8", 1 packing unit = 100 pieces
B8-8-1/8: pipe OD 8 mm, thread 1/8", 1 packing unit = 50 pieces
B8-6-1/4: pipe OD 6 mm, thread 1/4", 1 packing unit = 50 pieces
B8-8-1/4: pipe OD 8 mm, thread 1/4", 1 packing unit = 50 pieces

T-union type B9

B9-6: pipe OD 6 mm, 1 packing unit = 50 pieces
B9-8: pipe OD 8 mm, 1 packing unit = 50 pieces

Union nut type B10 (with cutting ring)

B10-6: pipe OD 6 mm, 1 packing unit = 100 pieces
B10-8: pipe OD 8 mm, 1 packing unit = 100 pieces
**Screw fittings**

**Liner sleeve type B12**
for use in plastic hose with compression type fittings

B12-6: hose 6 x 1 mm (OD 6 mm, ID 4 mm), 1 packing unit = 100 pieces
B12-8: hose 8 x 1 mm (OD 8 mm, ID 6 mm), 1 packing unit = 100 pieces

**Other screw fittings**

**Connector type R6**
with rubber seal made of NBR

R6-6-1/8: OD 6 mm, thread 1/8”, 1 packing unit = 50 pieces
R6-8-1/8: OD 8 mm, thread 1/8”, 1 packing unit = 50 pieces
R6-6-1/4: OD 6 mm, thread 1/4”, 1 packing unit = 50 pieces
R6-8-1/4: OD 8 mm, thread 1/4”, 1 packing unit = 50 pieces

**Coupling type A3**
A-3-1/4: thread 1/4”, 1 packing unit = 50 pieces

For other types, please inquire

**Sealing plugs**

- Sealing plugs with brass body
- Maximum operating pressure 60 bar
- Available in packing units (PU) only

**Sealing plug with male thread type A7**
with rubber seal made of NBR

A7-1/8: thread 1/8“, hexagon socket 3 mm, 1 packing unit = 100 pieces
A7-1/4: thread 1/4“, hexagon socket 6 mm, 1 packing unit = 100 pieces
Screw fittings

Sealing cap with female thread type A8

A8-1/8: thread 1/8", wrench size 14 mm, 1 packing unit = 100 pieces
A8-1/4: thread 1/4", wrench size 17 mm, 1 packing unit = 100 pieces

Sealing pin type R9
for compression type fittings

R9-6: OD 6 mm, 1 packing unit = 50 pieces
R9-8: OD 8 mm, 1 packing unit = 50 pieces

For other types, please inquire

Mufflers

- Mufflers of sintered brass, with male thread
- Available in packing units (PU) only

Muffler type S1

S1-1/8: connecting thread 1/8", 1 packing unit = 10 pieces
S1-1/4: connecting thread 1/4", 1 packing unit = 10 pieces

For other types, please inquire
Hand release OPEN

- **VdS-approved** Alarm box of aluminium section, with sheet steel covers. Cut out area in front plate with glass sheet on the inside. So installed pneumatic valve HA (Hand OPEN) is visible and can be operated in the case of an alarm by smashing the glass.
- Valve for manually releasing a one-way CO₂ bottle with ½” UNF thread. CO₂ bottle is not included in our supply (for CO₂ bottles, see valves -> accessories)
- Pipes connected with bulkhead fitting for 6 mm OD pipe. Also available with bulkhead fitting for 8 mm OD pipe.
- **Visual OPEN/CLOSED indication**
- Maximum operating pressure 80 bar
- Temperature range: -25 °C to +55 °C
- Drilled holes for fastening a lead seal
- **Dimensions:**
  - AK 6: 110 x 500 x 100 mm (WxHxD)
  - AK 7: 110 x 300 x 100 mm (WxHxD)
- Colour RAL 2011 (orange)
- VdS approval no. **G 504001**
- **Important:** it is not possible to connect several alarm boxes in series or in parallel without additional circuitry elements. Please inquire for various options

**Types:**

**AK 6-OR-HA:** max. 500 g CO₂ (orange) VdS-approved
**AK 6-RT-HA:** max. 500 g CO₂ (flame red)

Alarm box as described above, but with additionally fitted **BVE** (single-pipe pressurising valve, see valves)

**AK 6-OR-HA-BVE:** max. 500 g CO₂ (orange) VdS-approved
**AK 6-RT-HA-BVE:** max. 500 g CO₂ (flame red)

**AK 7-OR-HA:** max. 55 g CO₂ (orange) VdS-approved
**AK 7-RT-HA:** max. 55 g CO₂ (flame red)

Alarm box as described above, but with additionally fitted **BVE** (single-pipe pressurising valve, see valves)

**AK 7-OR-HA-BVE:** max. 55 g CO₂ (orange) VdS-approved
**AK 7-RT-HA-BVE:** max. 55 g CO₂ (flame red)

**Spare glass sheet:**

**AK 6 / AK 7:** 105 x 195 x 1 mm
Assembly of the box:
1) Join the respective connections.
2) When using CO2 one-way bottles, mount the valve as per drawing (bottle screwed in from the top, i.e. liquid gas discharge).
3) We recommend using CO2 bottles according to Drawing No.: 03.023.01.x and point out that the VdS approval is only valid with these bottles.

Connections:
CA ... cylinder "OPEN"

Description of function:
The releasing command results in that the gas contained in the CO2 bottle is released. The releasing result by pushing down the release lever.

Releasing:

Commissioning:
1) Unlock the release lever and press it up
2) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
3) Lightly grease O-ring in the bottle screw-in thread
4) Screw in new CO2 bottle, replace glass pane and close the box.
5) Following releasing, remove empty CO2 bottle (Caution: Residual pressure may be present) and repeat the process.

Technical data:
- max. operating pressure: 80 bar
- nominal width of valve: 1.8 mm
- nominal width of piercing needle: 2 mm
- ambient temperature range: -25°C - +55°C
- VdS approval no.: G 504001

Pneumatic symbol:

Types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Thread</th>
<th>Size A</th>
</tr>
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<tr>
<td>AK6-HA</td>
<td>1/2&quot; UNF</td>
<td>500</td>
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<tr>
<td>AK6-HA-M18x1,5</td>
<td>M18x1,5</td>
<td>500</td>
</tr>
<tr>
<td>AK7-HA</td>
<td>1/2&quot; UNF</td>
<td>300</td>
</tr>
<tr>
<td>AK7-HA-M18x1,5</td>
<td>M18x1,5</td>
<td>300</td>
</tr>
</tbody>
</table>

Only use certified CO2 bottles!
**AK10.x - Hand release OPEN**

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of a CO₂ bottle. CO₂ bottle is not included in our supply (for CO₂ bottles, please refer to valves -> accessories).
- Sheet steel alarm box with lockable cover. Two keys included (lock characteristics 60-001, special lock design upon request). Cut out section in cover is covered with a glass sheet on the inside. Control elements are visible and can be operated in the case of an alarm by smashing the glass (Paint finish RAL 2011 (orange); VdS approval No. G507003).
- Spare bottle holder
- Pipes connected with bulkhead fitting for 6 mm OD pipe.
  Also available with bulkhead fitting for 8 mm OD pipe.
- Visual indications Operation ŌK and Malfunction Œ
- Maximum operating pressure 80 bar
- Temperature range: -5 °C to +55 °C
- Additional technical data and drawings see data sheet AK 10.x
- **Important:** it is not possible to connect several alarm boxes in series or in parallel without additional circuitry elements. Please inquire for various options.

**Types:**

Alarm box for CO₂ one-way bottles with ½“ UNF thread:
AK 10.3-OR-HA-R: max. 150 g, 200x350x130 mm (WxHxD) (VdS-approved)
AK 10.5-OR-HA-R: max. 500 g, 200x500x130 mm (WxHxD) (VdS-approved)
AK 10.7-OR-HA-R: max. 750 g, 200x650x130 mm (WxHxD) (VdS-approved)
AK 10.9-OR-HA-R: max. 1500 g, 220x700x170 mm (WxHxD)

Alarm box for CO₂ bottles with dip tube; M18x1,5 thread:
AK 10.5-OR-HA-SR-R: max. 500 g, 300x530x130 mm (WxHxD)
AK 10.9-OR-HA-SR-R: max. 1500 g, 320x680x170 mm (WxHxD)

**Options:**

AK 10.x-RT-HA: Paint finish RAL 3000 (red).
Ø8: all connections for pipe diameter 8 mm

**Accessories:**

Spare glass sheet for AK 10.x: RT-E-Blanko
AK 10.x - Manual / electrical release OPEN

- Alarm box with integrated release valve RTC (see hand release valves) for manual and electrical release of a CO₂ bottle. CO₂ bottle is not included in our supply (for CO₂ bottles, please refer to valves -> accessories).
- Electrical release by attached solenoid 24 V-/7 W, operating mode S1 (100% duty cycle). Can be tripped e.g. by SHEVS solenoid control IS 2 (see electric catalogue -> controls) in combination with electrical ventilation buttons.
- Sheet steel alarm box with lockable cover. Two keys included (lock characteristics 60-001, special lock design upon request). Cut out section in cover is covered with a glass sheet on the inside. Control elements are visible and can be operated in the case of an alarm by smashing the glass (paint finish RAL 2011 (orange); VdS approval No. G507003).
- Spare bottle holder
- Pipes connected with bulkhead fitting for 6 mm OD pipe. Also available with bulkhead fitting for 8 mm OD pipe.
- Visual indications Operation ✅ and Malfunction ❌
- Maximum operating pressure 80 bar
- Temperature range: -5 °C to +55 °C
- Additional technical data and drawings see data sheet AK 10.x
- Important: it is not possible to connect several alarm boxes in series or in parallel without additional circuitry elements. Please inquire for various options.

**Types:**

**Alarm box for CO₂ one-way bottles with ½“ UNF thread:**
- AK 10.3-OR-HEA-R: max. 150 g, 200x350x130 mm (WxHxD) (VdS-approved)
- AK 10.5-OR-HEA-R: max. 500 g, 200x500x130 mm (WxHxD) (VdS-approved)
- AK 10.7-OR-HEA-R: max. 750 g, 200x650x130 mm (WxHxD) (up to 500 g VdS-approved)
- AK 10.9-OR-HEA-R: max. 1500 g, 220x700x170 mm (WxHxD)

**Alarm box for CO₂ bottles with dip tube; M18x1,5 thread:**
- AK 10.5-OR-HEA-SR-R: max. 500 g, 300x530x130 mm (WxHxD)
- AK 10.9-OR-HEA-SR-R: max. 1500 g, 320x680x170 mm (WxHxD)

**Options:**

AK 10.x-RT-HEA: Paint finish RAL 3000 (red).
Ø8: all connections for pipe diameter 8 mm

**Accessories:**

Spare glass sheet for AK 10.x: RT-E-Blanko
AK 10.x - Manual / pneumatical release OPEN

- Alarm box with integrated release valve RTC (see hand release valves) for manual and pneumatical release of a CO₂ bottle. CO₂ bottle is not included in our supply (for CO₂ bottles, please refer to valves -> accessories).
- Pneumatic release by attached pneumatic release. Minimum release pressure 5bar.
- Sheet steel alarm box with lockable cover. Two keys included (lock characteristics 60-001, special lock design upon request). Cut out section in cover is covered with a glass sheet on the inside. Control elements are visible and can be operated in the case of an alarm by smashing the glass (Paint finish RAL 2011 (orange)).
- Spare bottle holder
- Pipes connected with bulkhead fitting for 6mm OD pipe. Also available with bulkhead fitting for 8mm OD pipe.
- Visual indications Operation and Malfunction
- Maximum operating pressure 80bar
- Temperature range: -5°C to +55°C
- Additional technical data and drawings see data sheet AK 10.x

Important: it is not possible to connect several alarm boxes in series or in parallel without additional circuitry elements. Please inquire for various options.

Types:

Alarm box for CO₂ one-way bottles with ½“ UNF thread:
AK 10.3-OR-HPA-R: max. 150g, 200x350x130 (WxHxD)
AK 10.5-OR-HPA-R: max. 500g, 200x500x130 (WxHxD)
AK 10.7-OR-HPA-R: max. 750g, 200x650x130 (WxHxD)
AK 10.9-OR-HPA-R: max. 1500g, 220x700x170 (WxHxD)

Alarm box for CO₂ bottles with dip tube; M18x1,5 thread:
AK 10.5-OR-HPA-SR-R: max. 500g, 300x530x130 (WxHxD)
AK 10.9-OR-HPA-SR-R: max. 1500g, 320x680x170 (WxHxD)

Options:
AK 10.x-RT-HPA: Paint finish RAL 3000 (red).
Ø8: all connections for pipe diameter 8mm

Accessories:
Spare glass sheet for AK 10.x: RT-E-Blanko
Assembly of the box:
1) Join the respective connections.
2) When using CO2 one-way bottles, mount the valve as per drawing (bottle screwed in from the top, i.e. liquid gas discharge).
3) We recommend using CO2 bottles according to Drawing No.: 03.023.01.x and point out that the VdS recognition is only valid with these bottles.

Connections:
CA ... cylinder OPEN
PA ... Pneumatic triggering (only with Option HPA / HEPA)

Description of operation:
The triggering command results in that the gas contained in the CO2 bottle is released.
Types of triggering:
1) Manual triggering by pressing the black button
2) Electric triggering by applying the rated voltage to the solenoid (only with Option HEA / HEPA)
3) Pneumatic triggering by applying the triggering pressure to the connection PA (only with Option HPA / HEPA)

Triggering:
1) Manual triggering: deeply press black button
2) Electric triggering via the solenoid
3) Pneumatic triggering via pneumatic attachment part

Commissioning:
1) Remove clamping angle from the bracket in the box.
2) Hook clamping angle into the recess provided (see Picture A).
3) Place clamping bolt onto the piercing bolt in the valve.
4) Press clamping angle down fully until the piercing bolt engages.
5) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
6) Lightly grease O-ring in the bottle screw-in thread.
7) Check position of the view indicator. View indicator must be on green, if not, press view indicator angle to the valve until view indicator is green (see Picture B).
8) Screw in new CO2 bottle, replace glass pane and close the box.
9) Following triggering, remove empty CO2 bottle (Caution: Residual pressure may be present) and repeat the process.
### Technical data:

- **max. operating pressure**: 80 bar
- **rated voltage solenoid**: 24 VDC
- **nominal width of valve**: NW = 4 mm
- **rated current solenoid**: 0.25 A DC
- **nominal width of piercing needle**: NW = 2 mm
- **duty cycle solenoid**: 100%
- **for use in temperature range**: -25°C - +60°C
- **min. release pressure HPA/HEPA**: 5 bar

### Ordering designation:

- AK 10.8 x - yy - ... - SR - R
- Bracket for spare bottles
- Version for ascenting tube
- HA-HZ = manual OPEN
- HEA-HZ = manual electric OPEN
- HPA-HZ = manual pneumatic OPEN
- HEPA-HZ = manual electric pneumatic OPEN
- Colour (RT = red, OR = orange)
- Box height
- Number CO2 bottles CLOSE
- Number CO2 bottles OPEN
- Alarm box

### Connection diagram solenoid:

- Connection only with option HEPA
- Connection only with option HPA

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**GRASIL**

Pneumatics GmbH
A-3454 Reiling, Europastraße 1

Diese Zeichnung ist Eigentum der Fa. Grasili GmbH A-3454 Reiling, Europastraße 1

Die Weiterverwendung oder Vervielfältigung ohne unser schriftliches Einverständnis ist verboten!

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**Formell geprüft am**
29.5.2002 KW

**Fertiggestellt am**
29.5.2002 KW
Assembly of the box:
1) Join the respective connections.
2) When using CO2 ascending-tube bottles, mount the valve as per drawing
   (bottle screwed in from the below, i.e. liquid gas discharge about ascending-tube).

Connections:
CA ... cylinder OPEN
PA ... Pneumatic triggering (only with Option HPA / HEPA)

Description of operation:
The triggering command results in that the gas contained in the CO2 bottle is released.
Types of triggering:
1) Manual triggering by pressing the black button
2) Electric triggering by applying the rated voltage to the solenoid (only with Option HEA / HEPA)
3) Pneumatic triggering by applying the triggering pressure to the connection PA (only with Option HPA / HEPA)

Triggering:
1) Manual triggering: deeply press black button
2) Electric triggering via the solenoid
3) Pneumatic triggering via pneumatic attachment part

Commissioning:
1) Remove clamping angle from the bracket in the box.
2) Hook clamping angle into the recess provided (see Picture A).
3) Place clamping bolt onto the piercing bolt in the valve.
4) Press clamping angle up fully until the piercing bolt engages.
5) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
6) Check position of the view indicator. View indicator must be on green, if not, press view indicator angle
to the valve until view indicator is green! (see Picture B).
7) Screw in new CO2 bottle, replace glass pane and close the box.
8) Following triggering, remove empty CO2 bottle (Caution: Residual pressure may be present) and
   repeat the process.

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GRASL
Pneumatische Technik GmbH
A-3454 Redling, Europastrasse 1

Diese Zeichnung ist Eigentum der
Fa. Grasl GmbH A-3454 Redling, Europastrasse 1
Die Weiterverwendung der dargestellten Einrü
stzeugen ist  verboten!

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Datum (Datum): 29.5.2002 KW
Datum (Datum): 29.5.2002 KW
**AK x0.y - Pneumatical release OPEN**

- Alarm box with integrated pneumatic valve CA-PA-RA-x (combination release - series connection - pneumatically OPEN; see valves -> non automatic release) for pneumatic release of 2-3 CO₂ bottles with ½” UNF thread. CO₂ bottles are not included in our supply (see valves, accessories).
- This alarm box permits to release up to 4.5 kg (3 x 1500 g) of CO₂ from one or more points of operation with small CO₂ "pilot bottle" (e.g. AK 10.3-RT-HA-R).
- Sheet steel alarm box with lockable cover. Two keys included (lock characteristics 60-001, special lock design upon request).
- Pipes connected with bulkhead fitting for 6 mm OD pipe. Also available with bulkhead fitting for 8 mm OD pipe. (Paint finish RAL 2011 (orange)).
- Maximum operating pressure 80 bar
- Nominal bore (free cross section) of valve 4 mm
- Nominal bore of piercing needle 2 mm
- Minimum release pressure 5 bar
- Temperature range: -5 °C to +55 °C
- Additional technical data and drawings see data sheet AK x0.y-PA-R

**Types:**

AK 20.7-OR-PA-R: max. 2 x 750 g, 300x650x130 mm (WxHxD)
AK 30.7-OR-PA-R: max. 3 x 750 g, 300x650x130 mm (WxHxD)

AK 20.9-OR-PA-R: max. 2 x 1500 g, 320x670x170 mm (WxHxD)
AK 30.9-OR-PA-R: max. 3 x 1500 g, 320x670x170 mm (WxHxD)

**Options:**

AK x0.y-RT-PA-R: colour RAL 3000 (red)
Ø8: all connections for pipe diameter dia. 8 mm
Mounting of the box:
1) Join the respective connections.
2) When using CO2 one-way bottles, mount the valve as per drawing (bottle screwed in from the top, i.e. liquid gas discharge).
3) We recommend using CO2 one-way bottles according to drawing No.: 03.023.01.x

Connections:
CA ... cylinder OPEN
PA ... pneumatic releasing

Description of function:
Applying the release pressure to connection PA will result in the gas contained in the CO2-bottles being discharged.

Releasing:
Pneumatic releasing via external valve.

Commissioning:
1) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
2) Lightly grease O-ring in the bottle screw-in thread.
3) Screw in new CO2-bottle, replace glass pane and close the box.
4) Following releasing, remove empty CO2-bottle (Caution: Residual pressure may be present) and repeat the process.

Ordering designation:
AK x 0.7 - yy - PA - R

Technical data:
- max. operating pressure: 80bar
- nominal width of valve: 4mm
- nominal width of piercing needle: 2mm
- min. release pressure: 8bar
- ambient temperature range: -25°C to +50°C
Assembly of the box:
1) Join the respective connections.
2) When using CO2 one-way bottles, mount the valve as per drawing (bottle screwed in from the top, i.e. liquid gas discharge).
3) We recommend using CO2 bottles according to Drawing No.: 03.023.01.x

Connections:
CA ... cylinder OPEN
PA ... pneumatic triggering

Description of operation:
Applying the release pressure to connection PA will result in the gas contained in the CO2 bottles being discharged.

Triggering:
Pneumatic triggering via external valve.

Commissioning:
1) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
2) Lightly grease O-ring in the bottle screw-in thread.
3) Screw in new CO2 bottle, replace glass pane and close the box.
4) Following triggering, remove empty CO2 bottle (Caution: Residual pressure may be present) and repeat the process.

Ordering designation:
AK x 0.9 - yy - PA - R
Bracket for spare bottles
Pneumatic OPEN
Colour (RT=red, OR=orange)
Box height
Number CO2 bottles
Alarm box

Technical data:
- max. operating pressure: 80 bar
- nominal width of valve: 4 mm
- nominal width of piercing needle: 2 mm
- min. release pressure: 8 bar
- for use in temperature range: -25°C - +60°C

<table>
<thead>
<tr>
<th>GRASL</th>
<th>Freiberg-Techpark GbR</th>
<th>AK 30.9</th>
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<td>Alarm box</td>
<td>AK x 0.9 - yy - PA - R</td>
<td>29.5.2002 KW</td>
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</tbody>
</table>
AK 11.x - Hand release OPEN/CLOSE

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of two CO₂ bottles. SHEVS OPEN (1st bottle) and SHEVS CLOSE (2nd bottle). CO₂ bottles are not included in our supply (for CO₂ bottles, please refer to valves -> accessories).
- After releasing the OPEN action, the CLOSE function can be released immediately due to the OPEN side automatically exhausting. For this process, the pierced bottle at the OPEN side need not be removed. The same applies to release actions in reverse order.
- Sheet steel alarm box with lockable cover. Two keys included (lock characteristics 60-001, special lock design upon request). Cut out section in cover is covered with a glass sheet on the inside. Control elements are visible and can be operated in the case of an alarm by smashing the glass (paint finish RAL 2011 (orange); VdS approval No. G507003).
- Spare bottle holder
- Pipes connected with bulkhead fitting for 6 mm OD pipe. Also available with bulkhead fitting for 8 mm OD pipe.
- Visual indications Operation OK and Malfunction 
- Maximum operating pressure 80 bar
- Temperature range: -5 °C to +55 °C
- Additional technical data and drawings see data sheet AK 11.x
- It is not possible to connect several alarm boxes in series or in parallel without additional circuitry elements. Please inquire for various options.

Types:

Alarm box for CO₂ one-way bottles with ½“ UNF thread:
AK 11.3-OR-HA-HZ-R: max. 150 g, 300x350x130 mm (WxHxD) (VdS-approved)
AK 11.5-OR-HA-HZ-R: max. 500 g, 300x500x130 mm (WxHxD) (VdS-approved)
AK 11.7-OR-HA-HZ-R: max. 750 g, 300x650x130 mm (WxHxD) (up to 500g VdS-approved)
AK 11.9-OR-HA-HZ-R: max. 1500 g, 320x700x170 mm (WxHxD)

Alarm box for CO₂ bottles with dip tube; M18x1,5 thread:
AK 11.5-OR-HA-HZ-SR-R: max. 500 g, 300x530x130 mm (WxHxD)
AK 11.9-OR-HA-HZ-SR-R: max. 1500 g, 320x680x170 mm (WxHxD)

Options:

AK 11.x-RT-HA-HZ: Paint finish RAL 3000 (red)
Ø8: all connections for pipe diameter 8 mm

Accessories:

Spare glass sheet for AK 11.x: RT-E-Blanko
Alarm boxes SHEVS OPEN/CLOSE

AK 11.x - Hand / electrical release OPEN, hand release CLOSE

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of two CO₂ bottles. SHEVS OPEN (1st bottle manual and electrical release) and SHEVS CLOSE (2nd bottle manual removed). CO₂ bottles are not included in our supply (for CO₂ bottles, please refer to valves -> accessories).
- After releasing the OPEN action, the CLOSE function can be released immediately due to the OPEN side automatically exhausting. For this process, the pierced bottle at the OPEN side need not be removed. The same applies to release actions in reverse order.
- Electrical release by attached solenoid 24 V- / 7 W, operating mode S1 (100% duty cycle). Can be tripped e.g. by SHEVS solenoid control IS 2 (see electric catalogue -> controls) in combination with electrical ventilation buttons.
- Sheet steel alarm box with lockable cover. Two keys included (lock characteristics 60-001, special lock design upon request). Cut out section in cover is covered with a glass sheet on the inside. Control elements are visible and can be operated in the case of an alarm by smashing the glass (Paint finish RAL 2011 (orange); VdS approval No. G507003).
- Spare bottle holder
- Pipes connected with bulkhead fitting for 6 mm OD pipe.
- Also available with bulkhead fitting for 8 mm OD pipe.
- Visual indications Operation OK and Malfunction ↗
- Maximum operating pressure 80 bar
- Temperature range: -5 °C to +55 °C
- Additional technical data and drawings see data sheet AK 11.x
- **Important:** it is not possible to connect several alarm boxes in series or in parallel without additional circuitry elements. Please inquire for various options.

**Types:**

**Alarm box for CO₂ one-way bottles with ½“ UNF thread:**
AK 11.3-OR-HEA-HZ-R: max. 150 g, 300x350x130 mm (WxHxD) (VdS-approved)
AK 11.5-OR-HEA-HZ-R: max. 500 g, 300x500x130 mm (WxHxD) (VdS-approved)
AK 11.7-OR-HEA-HZ-R: max. 750 g, 300x650x130 mm (WxHxD) (up to 500 g VdS-approved)
AK 11.9-OR-HEA-HZ-R: max. 1500 g, 320x700x170 mm (WxHxD)

**Alarm box for CO₂ bottles with dip tube; M18x1.5 thread:**
AK 11.5-OR-HEA-HZ-SR-R: max. 500 g, 300x530x130 mm (WxHxD)
AK 11.9-OR-HEA-HZ-SR-R: max. 1500 g, 320x680x170 mm (WxHxD)

**Options:**

AK 11.x-RT-HEA-HZ-R: Paint finish RAL 3000 (red)
Ø8: all connections for pipe diameter 8 mm

**Accessories:**

Spare glass sheet for AK 11.x: RT-E-Blanko
AK 11.x - Hand / pneumatical release OPEN, hand release CLOSE

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of two CO₂ bottles. SHEVS OPEN (1st bottle manual and pneumatical release) and SHEVS CLOSE (2nd bottle manual release only). CO₂ bottles are not included in our supply (for CO₂ bottles, please refer to valves -> accessories).
- Pneumatical release by attached pneumatic release. Minimum release pressure 5 bar.
- After releasing the OPEN action, the CLOSE function can be released immediately due to the OPEN side automatically exhausting. For this process, the pierced bottle at the OPEN side need not be re-moved. The same applies to release actions in reverse order.
- Sheet steel alarm box with lockable cover. Two keys included (lock characteristics 60-001, special lock design upon request). Cut out section in cover is covered with a glass sheet on the inside. Control elements are visible and can be operated in the case of an alarm by smashing the glass (paint finish RAL 2011 (orange)).
- Spare bottle holder
- Pipes connected with bulkhead fitting for 6 mm OD pipe. Also available with bulkhead fitting for 8 mm OD pipe.
- Visual indications Operation and Malfunction
- Maximum operating pressure 80 bar
- Temperature range: -5 °C to +55 °C
- Additional technical data and drawings see data sheet AK 11.x
- Important: it is not possible to connect several alarm boxes in series or in parallel

Alarm box for CO₂ one-way bottles without dip tube

Types:

Alarm box for CO₂ one-way bottles with ½“ UNF thread:
AK 11.3-OR-HPA-HZ-R: max. 150 g, 200x350x130 mm (WxHxD)
AK 11.5-OR-HPA-HZ-R: max. 500 g, 200x500x130 mm (WxHxD)
AK 11.7-OR-HPA-HZ-R: max. 750 g, 200x650x130 mm (WxHxD)
AK 11.9-OR-HPA-HZ-R: max. 1500 g, 220x700x170 mm (WxHxD)

Alarm box for CO₂ bottles with dip tube; M18x1,5 thread:
AK 11.5-OR-HPA-HZ-SR-R: max. 500 g, 300x530x130 mm (WxHxD)
AK 11.9-OR-HPA-HZ-SR-R: max. 1500 g, 320x680x170 mm (WxHxD)

Options:

AK 11.x-RT-HPA-HZ-R: Paint finish RAL 3000 (red)
Ø8: all connections for pipe diameter 8 mm

Accessories:

Spare glass sheet for AK 10.x: RT-E-Blanko
Technical data:
- **max. operating pressure**: 90 bar
- **rated voltage solenoid**: 24VDC
- **nominal width of valve**: NW = 4mm
- **rated current solenoid**: 0.29 ADC
- **nominal width of piercing needle**: NW = 2mm
- **duty cycle solenoid**: 100%
- **for use in temperature range**: -25°C to +50°C
- **min. release pressure HPA/HEPA**: 3 bar
- **VdS recognition number**: G507003 (only in orange version; no recognition for version HPA-HZ and HEPA-HZ)
- **VdS recognition for AK11.9**: In progress

Ordering designation:
- AK 11.x - yy - ... - ... - R
  - Bracket for spare bottles
  - HA-HZ = manual OPEN - manual CLOSE
  - HEA-HZ = manual electric OPEN - manual CLOSE
  - HPA-HZ = manual pneumatic OPEN - manual CLOSE
  - HEPA-HZ = manual electric pneumatic OPEN - manual CLOSE
  - Colour (RT=red, OR=orange)

Connection diagram solenoid:
- +
- PE
- -
- Possibility to close from outside (lockable)
- Number CO2 bottles OPEN
- Number CO2 bottles CLOSE
- Alarm box

Type | A | B | C | max. CO2-bottle size
---|---|---|---|---
AK 11.3 | 350mm | 300mm | 130mm | 150g
AK 11.5 | 500mm | 300mm | 130mm | 500g
AK 11.7 | 650mm | 300mm | 130mm | 750g
AK 11.9 | 700mm | 320mm | 170mm | 1500g

---

**Technical data:**
- **max. operating pressure**: 90 bar
- **rated voltage solenoid**: 24VDC
- **nominal width of valve**: NW = 4mm
- **rated current solenoid**: 0.29 ADC
- **nominal width of piercing needle**: NW = 2mm
- **duty cycle solenoid**: 100%
- **for use in temperature range**: -25°C to +50°C
- **min. release pressure HPA/HEPA**: 3 bar
- **VdS recognition number**: G507003 (only in orange version; no recognition for version HPA-HZ and HEPA-HZ)
- **VdS recognition for AK11.9**: In progress

**Ordering designation:**
- AK 11.x - yy - ... - ... - R
  - Bracket for spare bottles
  - HA-HZ = manual OPEN - manual CLOSE
  - HEA-HZ = manual electric OPEN - manual CLOSE
  - HPA-HZ = manual pneumatic OPEN - manual CLOSE
  - HEPA-HZ = manual electric pneumatic OPEN - manual CLOSE
  - Colour (RT=red, OR=orange)

**Connection diagram solenoid:**
- +
- PE
- -
- Possibility to close from outside (lockable)
- Number CO2 bottles OPEN
- Number CO2 bottles CLOSE
- Alarm box

**Type | A | B | C | max. CO2-bottle size**
---|---|---|---|---
AK 11.3 | 350mm | 300mm | 130mm | 150g
AK 11.5 | 500mm | 300mm | 130mm | 500g
AK 11.7 | 650mm | 300mm | 130mm | 750g
AK 11.9 | 700mm | 320mm | 170mm | 1500g
Assembly of the box:
1) Join the respective connections.
2) When using CO2 one-way bottles, mount the valve as per drawing (bottle screwed in from the top, i.e. liquid gas discharge).
3) We recommend using CO2 bottles according to Drawing No.: 03.023.01.x and point out that the VdS recognition is only valid with these bottles.

Connections:
CA ... cylinder OPEN
CZ ... cylinder CLOSE
PA ... Pneumatic triggering (only with Option HPA / HEPA)

Description of operation:
The triggering command results in that the gas contained in the CO2 bottle is released.

Types of triggering:
1) Manual triggering by pressing the black button
2) Electric triggering by applying the rated voltage to the solenoid (only with Option HEA / HEPA)
3) Pneumatic triggering by applying the triggering pressure to the connection PA (only with Option HPA / HEPA)

Triggering:
1) Manual triggering: deeply press black button
2) Electric triggering via the solenoid
3) Pneumatic triggering via pneumatic attachment part

Commissioning:
1) Remove clamping angle from the bracket in the box.
2) Hook clamping angle into the recess provided (see Picture A).
3) Place clamping bolt onto the piercing bolt in the valve.
4) Press clamping angle down fully until the piercing bolt engages.
5) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
6) Lightly grease O-ring in the bottle screw-in thread.
7) Check position of the view indicator. View indicator must be on green, if not, press view indicator angle to the valve until view indicator is green! (see Picture B).
8) Screw in new CO2 bottle, replace glass pane and close the box.
9) Following triggering, remove empty CO2 bottle (Caution: Residual pressure may be present) and repeat the process.

Commissioning of the closed trigger:
1) Carry out Points 1-6 of the commissioning of the OPEN trigger accordingly.
2) Check position of the priority slide. Both slides must be in the basic position! (see Picture C)
3) Screw in new CO2 bottle and close box.
4) Following a triggering, remove empty CO2 bottle. (Caution: Residual pressure may be present) and repeat operation.
HA-HZ

Clamping angle

HEA-HZ

Clamping angle

HPA-HZ

Clamping angle

HEPA-HZ

Clamping angle

Technical data:

- Max. operating pressure: 80 bar
- Rated voltage solenoid: 24 VDC
- Nominal width of valve: NW = 4 mm
- Rated current solenoid: 0.29 A DC
- Nominal width of piercing needle: NW = 2 mm
- Duty cycle solenoid: 100%
- For use in temperature range: -25°C to +50°C
- Min. release pressure HPA/HEPA: 5 bar

Ordering designation:

AK 11.1, x - yy - ... - SR - R

Bracket for spare bottles
Version for ascending-lube
HA-HZ = manual OPEN - manual CLOSE
HEA-HZ = manual electric OPEN manual CLOSE
HPA-HZ = manual pneumatic OPEN - manual CLOSE
HEPA-HZ = manual electric pneumatic OPEN - manual CLOSE
Colour (RT = red, OR = orange)
Box height
Number CO2 bottles CLOSE
Number CO2 bottles OPEN
Alarm box

Connection diagram solenoid:

GRASL
Pneumatische Maßnahme GmbH
A-3454 Redling, Europastraße 1

Type | X | Y | Z
--- | --- | --- | ---
AK 11.5 | 530 mm | 300 mm | 130 mm
AK 11.9 | 680 mm | 320 mm | 170 mm

Diese Zeichnung ist Eigentum der
Fa. Grasli GmbH, A-3454 Redling, Europastraße 1
Die Weiterverwendung oder Veröffentlichung ohne unser schriftliches Einver-standnis ist verboten!

Formell geprüft am
29.5.2002 RW

Technisch geprüft am
25.5.2002 KW
Assembly of the box:
1) Join the respective connections.
2) When using CO2 ascending-tube bottles, mount the valve as per drawing
   (bottle screwed in from the below, i.e. liquid gas discharge about ascending-tube).

Connections:
CA ... cylinder OPEN
CZ ... cylinder CLOSE
PA ... Pneumatic triggering (only with Option HPA / HEPA)

Description of operation:
The triggering command results in that the gas contained in the CO2 bottle is released.

Types of triggering:
1) Manual triggering by pressing the black button
2) Electric triggering by applying the rated voltage to the solenoid (only with Option
   HEA / HEPA)
3) Pneumatic triggering by applying the triggering pressure to the connection PA (only with Option HPA /
   HEPA)

Triggering:
1) Manual triggering: deeply press black button
2) Electric triggering via the solenoid
3) Pneumatic triggering via pneumatic attachment part

Commissioning:
1) Remove clamping angle from the bracket in the box.
2) Hook clamping angle into the recess provided (see Picture A).
3) Place clamping bolt onto the piercing bolt in the valve.
4) Press clamping angle down fully until the piercing bolt engages.
5) Check if the piercing needle is located behind the piercing surface of the bottle screw-in thread!
6) Lightly grease O-ring in the bottle screw-in thread.
7) Check position of the view indicator. View Indicator must be on green. If not, press view indicator angle
to the valve until view indicator is green! (see Picture B).
8) Screw in new CO2 bottle, replace glass pane and close the box.
9) Following triggering, remove empty CO2 bottle (Caution: Residual pressure may be present) and
   repeat the process.

Commissioning of the closed trigger:
1) Carry out Points 1-6 of the commissioning of the OPEN trigger accordingly.
2) Check position of the priority slide. Both slides must be in the basic position! (see Picture C)
3) Screw in new CO2 bottle and close box.
4) Following a triggering, remove empty CO2 bottle. (Caution: Residual pressure may be present) and
   repeat operation.
PLZ - manual operation OPEN/CLOSE

- Ventilation control centre with integrated pneumatic valve HH5/2-FR (hand lever valve 5/2 ways - filter pressure reducer) for manual operation OPEN/CLOSE
- Ventilation will be released by operating the hand lever
- Sheet steel ventilation box with lockable door opening downward (colour RAL 5012 (light blue)). Two keys included (lock characteristics 60-001, special lock design upon request)
- Valve for manual operation OPEN/CLOSE of ventilation cylinders. Nominal bore (free cross section) of valve 4mm
- Adjustable filter pressure reducer with operating pressure gauge, water separator and condensed water drain plug
- Hoses connected with bulkhead fittings for 6mm OD hose or pipe.
- Max. operating pressure 10bar
- Temperature range: -20°C to +60°C (one ventilation group)
- -25°C to +50°C (two ventilation groups)

Types:

Ventilation only:
PLZ 10.0.1: 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
PLZ 10.0.2: 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

Ventilation and SHE OPEN:
PLZ 20.1.1: 1 SHE group (OPEN only), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
PLZ 20.1.2: 1 SHE group (OPEN only), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
PLZ 20.2.2: 2 SHE groups (OPEN only), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

Ventilation and SHE OPEN/CLOSE:
PLZ 30.1.1: 1 SHE group (OPEN/CLOSE), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
PLZ 30.1.2: 1 SHE group (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
PLZ 30.2.2: 2 SHE groups (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

Options:

PLZ x1.y.z: internal operation
OFR: without filter pressure reducer
Ø8: all connections for pipe diameter Ø8mm
RAL 3000: paint finish RAL 3000 (red)
RAL 7035: paint finish RAL 7035 (grey)

Please inquire for various options.
**Smoke ventilation control centres**

**Pneumatically operated control centre PLZ**

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**PLZ - manual/electrical operation OPEN/CLOSE**

- Ventilation control centre with integrated pneumatic valve HH5/2 (hand lever valve 5/2 ways) for manual operation OPEN/CLOSE and with integrated electric add-on component for electrical OPEN/CLOSE.
- Sheet steel ventilation box with lockable door opening downward (colour RAL 5012 (light blue)). Two keys included (lock characteristics 60-001, special lock design upon request).
- Valve for manual operation OPEN/CLOSE of ventilation cylinders.
- Nominal bore (free cross section) of valve 4mm
- Electrical OPEN/CLOSE - control by attached solenoid 230V~, 50/60Hz, 5W, operating mode S1 to DIN VDE 0580 (100% duty cycle).
  - Can be tripped e.g. by Wind and Rain Control **WRS** (see electric catalogue -> ventilation control systems) in combination with electrical ventilation buttons.
- Adjustable filter pressure reducer with operating pressure gauge, water separator and condensed water drain plug.
- Hoses connected with bulkhead fittings for 6mm OD hose or pipe.
- Max. operating pressure 10bar
- Temperature range: -20°C to +60°C (one ventilation group)
  -25°C to +50°C (two ventilation groups)

---

**Types:**

**Ventilation only:**

- **PLZ 10.0.1-EA230-EZ230:** 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
- **PLZ 10.0.2-EA230-EZ230:** 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

**Ventilation and SHE OPEN:**

- **PLZ 20.1.1-EA230-EZ230:** 1 SHE group (OPEN only), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
- **PLZ 20.1.2-EA230-EZ230:** 1 SHE group (OPEN only), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
- **PLZ 20.2.2-EA230-EZ230:** 2 SHE groups (OPEN only, 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

**Ventilation and SHE OPEN/CLOSE:**

- **PLZ 30.1.1-EA230-EZ230:** 1 SHE group (OPEN/CLOSE), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
- **PLZ 30.1.2-EA230-EZ230:** 1 SHE group (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
- **PLZ 30.2.2-EA230-EZ230:** 2 SHE groups (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
Smoke ventilation control centres
Pneumatically operated control centre PLZ

Options:

PLZ x1.y.z-EA230-EZ230: internal operation
OFR: without filter pressure reducer
Ø8: all connections for pipe diameter Ø8mm
EA24: electric add-on component OPEN 24V-
EZ24: electric add-on component CLOSE 24V-
RAL 3000: paint finish RAL 3000 (red)
RAL 7035: paint finish RAL 7035 (grey)

Please inquire for various options.
PLZ - manual operation OPEN/CLOSE / electrical operation CLOSE

- Ventilation control centre with integrated pneumatic valve HHS/2 (hand lever valve 5/2 ways) for manual operation OPEN/CLOSE and with integrated electric add-on component for electrical CLOSE.
- Sheet steel ventilation box with lockable door opening downward (colour RAL 5012 (light blue)). Two keys included (lock characteristics 60-001, special lock design upon request).
- Valve for manual operation OPEN/CLOSE of ventilation cylinders.
- Nominal bore (free cross section) of valve 4mm
- Electrical CLOSE - control by attached solenoid 230V~, 50/60Hz, 5W, operating mode S1 to DIN VDE 0580 (100% duty cycle).
  Can be tripped e.g. by Wind and Rain Control WRS
  (see electric catalogue -> ventilation control systems) in combination with electrical ventilation buttons
- Adjustable filter pressure reducer with operating pressure gauge, water separator and condensed water drain plug
- Hoses connected with bulkhead fittings for 6mm OD hose or pipe.
- Max. operating pressure 10bar
- Temperature range: -20°C to +60°C (one ventilation group)
  -25°C to +50°C (two ventilation groups)

**Types:**

**Ventilation only:**

- PLZ 10.0.1-EZ230: 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
- PLZ 10.0.2-EZ230: 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

**Ventilation and SHE OPEN:**

- PLZ 20.1.1-EZ230: 1 SHE group (OPEN only), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
- PLZ 20.1.2-EZ230: 1 SHE group (OPEN only), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
- PLZ 20.2.2-EZ230: 2 SHE groups (OPEN only, 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

**Ventilation and SHE OPEN/CLOSE:**

- PLZ 30.1.1-EZ230: 1 SHE group (OPEN/CLOSE), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
- PLZ 30.1.2-EZ230: 1 SHE group (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
- PLZ 30.2.2-EZ230: 2 SHE groups (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
Options:

PLZ x1.y.z-EZ230: internal operation
OFR: without filter pressure reducer
Ø8: all connections for pipe diameter Ø8mm
EZS230: electric add-on component 230V~ (CLOSES when deenergized)
EZ24: electric add-on component CLOSE 24V-
EZS24: electric add-on component 24V- (CLOSES when deenergized)
RAL 3000: paint finish RAL 3000 (red)
RAL 7035: paint finish RAL 7035 (grey)

Please inquire for various options.
PLZ - manual/pneumatical operation OPEN/CLOSE

- Ventilation control centre with integrated pneumatic valve HH5/2 (hand lever valve 5/2 ways) for manual operation OPEN/CLOSE and with integrated pneumatic add-on component for pneumatical OPEN/CLOSE.
- Sheet steel ventilation box with lockable door opening downward (colour RAL 5012 (light blue)). Two keys included (lock characteristics 60-001, special lock design upon request)
- Valve for manual operation OPEN/CLOSE of ventilation cylinders.
- Nominal bore (free cross section) of valve 4mm
- Pneumatic OPEN/CLOSE - control by attached pneumatic release. release pressure min. 3bar.
- Adjustable filter pressure reducer with operating pressure gauge, water separator and condensed water drain plug
- Hoses connected with bulkhead fittings for 6mm OD hose or pipe.
- Optional:
  Pneumatic remote control by add-on component for OPEN and/or CLOSE (PA/PZ)
- Max. operating pressure 10bar
- Temperature range: -20°C to +60°C (one ventilation group)
  -25°C to +50°C (two ventilation groups)

Types:

Ventilation only:
PLZ 10.0.1-PA-PZ: 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
PLZ 10.0.2-PA-PZ: 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

Ventilation and SHE OPEN:
PLZ 20.1.1-PA-PZ: 1 SHE group (OPEN only), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
PLZ 20.1.2-PA-PZ: 1 SHE group (OPEN only), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
PLZ 20.2.2-PA-PZ: 2 SHE groups (OPEN only), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)

Ventilation and SHE OPEN/CLOSE:
PLZ 30.1.1-PA-PZ: 1 SHE group (OPEN/CLOSE), 1 ventilation group (type with external operation and filter pressure reducer; dimensions: 300x200x80mm)
PLZ 30.1.2-PA-PZ: 1 SHE group (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
PLZ 30.2.2-PA-PZ: 2 SHE groups (OPEN/CLOSE), 2 ventilation groups (type with two external operations and filter pressure reducer; dimensions: 300x270x100mm)
**Options:**

PLZ x1.y.z- PA-PZ: internal operation  
OFR: without filter pressure reducer  
Ø8: all connections for pipe diameter Ø8mm  
PAV230: pneumatic add-on component priority OPEN  
PZV230: pneumatic add-on component priority CLOSE  
RAL 3000: paint finish RAL 3000 (red)  
RAL 7035: paint finish RAL 7035 (grey)

Please inquire for various options.
Installation:
For installation, be sure condensate drain shows downward.

Connections:
P ... compressed air available at the assembly site
CA ... cylinder OPEN
CZ ... cylinder CLOSE

Description of function:
Ventilation is ensured by use of the hand lever.
With add-on components for OPEN and/ or CLOSE is also an electrical or pneumatic remote control possible (see options).

Technical data:
max. operating pressure 10 bar
ambient temperature range -20°C - +60°C
pipe connections Ø6/4

Options:
EZ230 Electrical CLOSE 230V
EZ24 Electrical CLOSE 24VDC
EZ5230 Electrical CLOSE 230V (deenergized)
EZ524 Electrical CLOSE 24VDC (deenergized)
EZV230 Electrical CLOSE PRIORITY 230V
EZV24 Electrical CLOSE PRIORITY 24VDC
EA230 Electrical OPEN 230V
EA24 Electrical OPEN 24VDC
EA230 Electrical OPEN PRIORITY 230V
EA24 Electrical OPEN PRIORITY 24VDC
PA Pneumatic OPEN
PZ Pneumatic CLOSE
PAV Pneumatic OPEN PRIORITY
PZV Pneumatic CLOSE PRIORITY
Ø8 All pipe connections for Ø8mm
OFR Without filter pressure reducer

Ordering code:
PLZ xx.x.x - Optionen

Ordering example:
PLZ 10.0.1 - EA230 - EZ230

GRASL
Pneumatic-Mechanik GmbH
A-3434 Reutte
Europastr. 1

Pneumatic ventilation control centre
PLZ 1.0.1-options

Data sheet

<table>
<thead>
<tr>
<th>No.</th>
<th>Bezeichnung</th>
</tr>
</thead>
<tbody>
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<td>01</td>
<td>PLZ 06.002 DAT 02.01-E</td>
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</tbody>
</table>

Formell geprüft am 29.5.2002 KW
Installation:
For installation, be sure condensate drain shows downward.

Connections:
P ....... compressed air available at the assembly site
CA .... cylinder OPEN
CZ .... cylinder CLOSE

Description of function:
Ventilation is ensured by use of the hand lever.
With add-on components for OPEN and/or CLOSE is also an electrical or pneumatic remote control possible (see options).

Technical data:
- max. operating pressure: 10 bar
- ambient temperature range: -25°C - +50°C
- pipe connections: Ø6/4

Options:
- EZ230: Electrical CLOSE 230V
- EZ24: Electrical CLOSE 24VDC
- EZS230: Electrical CLOSE 230V (deenergized)
- EZS24: Electrical CLOSE 24VDC (deenergized)
- EZV230: Electrical PRIORITY CLOSE 230V
- EZV24: Electrical PRIORITY CLOSE 24VDC
- EA230: Electrical OPEN 230V
- EA24: Electrical OPEN 24VDC
- EAV230: Electrical PRIORITY OPEN 230V
- EAV24: Electrical PRIORITY OPEN 24VDC
- PA: Pneumatic OPEN
- PZ: Pneumatic CLOSE
- PAV: Pneumatic PRIORITY OPEN
- PZV: Pneumatic PRIORITY CLOSE
- Ø8: All pipe connections for Ø8mm
- OFR: Without filter pressure reducer

Ordering code:
- PLZ xx.x.x - Optionen

Ordering example:
- PLZ 10.0.2 - EA230 - EZ230

Standard type, externally operated, with filter pressure reducer

Internally operated type, without filter pressure reducer
Assembly:
For assembly, be sure condensate drain shows downward.

Connections:
- P ................. Compressed air available at the assembly site
- CA .............. Cylinder OPEN
- CZ .............. Cylinder CLOSE
- CO2 ............ CO2 inlet port

Description of function:
1) Ventilation function:
   - Ventilation is ensured by use of the hand lever.
   - With add-on components for OPEN and/ or CLOSE is also an electrical or pneumatic remote control possible (see options).
2) Alarm function:
   - Inlet port CO2 when controlled e.g. by a CO2 alarm box, will be connected with outlet port CA, and outlet port CZ will exhaust.
   - Ventilation function is deactivated.
3) Reset after release of alarm:
   - Fully press in reset button (will protrude approx. 1mm)
   - Only then the ventilation function will be active again.

Technical Data:
- max. operating pressure: 10 bar
- for use in temperature range: -20°C - +60°C
- pipe connections: Ø6/4

Options:
- EZ230 Electrical CLOSE 230V
- EZ24 Electrical CLOSE 24VDC
- EZS230 Electrical CLOSE 230V (deenergized)
- EZS24 Electrical CLOSE 24VDC (deenergized)
- EZV230 Electrical PRIORITY CLOSE 230V
- EZV24 Electrical PRIORITY CLOSE 24V
- EA230 Electrical OPEN 230V
- EA24 Electrical OPEN 24VDC
- EAV230 Electrical PRIORITY OPEN 230V
- EAV24 Electrical PRIORITY OPEN 24V
- PA Pneumatic OPEN
- PZ Pneumatic CLOSE
- PAV Pneumatic PRIORITY OPEN
- PZV Pneumatic PRIORITY CLOSE
- Ø8 All pipe connections for Ø8mm
- OFR Without filter pressure reducer

Ordering code:
- PLZ xx.x.x - Optionen

Ordering example:
- PLZ 20.1.1 - EA230 - EZ230

Circuit diagram solenoids:

Options:
- Power input - attracting -DC
- Power input - attracting -AC 9VA
- Power input - holding - DC 5W
- Power input - holding - AC 8VA

Technical Data:
- max. operating pressure: 10 bar
- for use in temperature range: -20°C - +60°C
- pipe connections: Ø6/4

Options:
- EZ230 Electrical CLOSE 230V
- EZ24 Electrical CLOSE 24VDC
- EZS230 Electrical CLOSE 230V (deenergized)
- EZS24 Electrical CLOSE 24VDC (deenergized)
- EZV230 Electrical PRIORITY CLOSE 230V
- EZV24 Electrical PRIORITY CLOSE 24V
- EA230 Electrical OPEN 230V
- EA24 Electrical OPEN 24VDC
- EAV230 Electrical PRIORITY OPEN 230V
- EAV24 Electrical PRIORITY OPEN 24V
- PA Pneumatic OPEN
- PZ Pneumatic CLOSE
- PAV Pneumatic PRIORITY OPEN
- PZV Pneumatic PRIORITY CLOSE
- Ø8 All pipe connections for Ø8mm
- OFR Without filter pressure reducer

Ordering code:
- PLZ xx.x.x - Optionen

Ordering example:
- PLZ 20.1.1 - EA230 - EZ230
Installation:
For installation, be sure condensate drain shows downward.

Connections:
P .................compressed air available at the assembly site
CA .............. cylinder OPEN
CZ .............. cylinder CLOSE
CO2 ............inlet port CO2-OPEN

Description of function:
1) Ventilation function:
   Ventilation is ensured by use of the hand lever.
   With add-on components for OPEN and/or CLOSE is also an electrical or pneumatic remote control possible
   (see options).
2) Alarm function:
   Inlet port CO2 when controlled e.g. by a CO2 alarm box, will be connected with outlet
   port CA, and outlet port CZ will exhaust.
   Ventilation function is deactivated.
3) Reset after release of alarm:
   Fully press in reset button (will protrude approx. 1mm)
   Only then the ventilation function will be active again.

Technical data:
max. operating pressure 10 bar
ambient temperature range -25°C - +50°C
pipe connections Ø6/4

Options:
EZ230 Electrical CLOSE 230V
EZS230 Electrical CLOSE 230V (deenergized)
EZ24 Electrical CLOSE 24VDC
EZS24 Electrical CLOSE 24VDC (deenergized)
EZV230 Electrical PRIORITY CLOSE 230V
EZV24 Electrical PRIORITY CLOSE 24VDC
EA230 Electrical OPEN 230V
EA24 Electrical OPEN 24VDC
EAV230 Electrical PRIORITY OPEN 230V
EAV24 Electrical PRIORITY OPEN 24VDC
PA Pneumatic OPEN
PZ Pneumatic CLOSE
PAV Pneumatic PRIORITY OPEN
PZV Pneumatic PRIORITY CLOSE
Ø8 All pipe connections for Ø8mm
OFR Without filter pressure reducer

Ordering code:
PLZ xx.x.x - Optionen

Ordering example:
PLZ 20.2.2 - EA230 - EZ230
Assembly:
For assembly, be sure condensate drain shows downward.

Connections:
P................. Compressed air available at the assembly site
CA .............. Cylinder OPEN
CZ .............. Cylinder CLOSE
CO2-A .......... CO2 inlet port OPEN
CO2-Z .......... CO2 inlet port CLOSE

Description of function:
1) Ventilation function:
   Ventilation is ensured by use of the hand lever.
   With add-on components for OPEN and/ or CLOSE is also an electrical or pneumatic remote control possible
   (see options).
2) Alarm function:
   Inlet prot CO2-A, when controlled e.g. by a CO2 alarm box, will be connected with
   outlet prot CA, and outlet prot CZ will exhaust.
   Ventilation function is deactivated.
3) Reset after release of alarm:
   Fully press in reset buttons (cap screw and washer will protrude).
   Only then teh ventilation function will be active again.

Specifications:
max. operating pressure 10 bar
for use in temperature range -20°C - +60°C
pipe connections Ø6/4

Options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZ230 Electrical CLOSE 230V</td>
<td>Electrical add-on component</td>
</tr>
<tr>
<td>EZ24 Electrical CLOSE 24VD</td>
<td>Pneumatic add-on component</td>
</tr>
<tr>
<td>EZS230 Electrical CLOSE 230V (deenergized)</td>
<td>Power input - holding - DC 5V</td>
</tr>
<tr>
<td>EZS24 Electrical CLOSE 24VDC (deenergized)</td>
<td>Power input - holding - AC 6V</td>
</tr>
<tr>
<td>EZV230 Electrical PRIORITY CLOSE 230V</td>
<td>Power input - attracting - AC 5V/LCD</td>
</tr>
<tr>
<td>EZV24 Electrical PRIORITY CLOSE 24VDC</td>
<td>Power input - holding - AC 6V</td>
</tr>
<tr>
<td>EA230 Electrical OPEN 230V</td>
<td>Power input - attracting - AC 5V/LCD</td>
</tr>
<tr>
<td>EA24 Electrical OPEN 24VDC</td>
<td>Power input - holding - DC 5V</td>
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<td>EAV230 Electrical PRIORITY OPEN 230V</td>
<td>Power input - attracting - AC 5V/LCD</td>
</tr>
<tr>
<td>EAV24 Electrical PRIORITY OPEN 24VDC</td>
<td>Power input - holding - AC 6V</td>
</tr>
<tr>
<td>PA Pneumatic OPEN</td>
<td>Cable or hose pass-through arrangement for EA/EZ, PA/PZ</td>
</tr>
<tr>
<td>PZ Pneumatic CLOSE</td>
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</tr>
<tr>
<td>PAV Pneumatic PRIORITY OPEN</td>
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</tr>
<tr>
<td>PZV Pneumatic PRIORITY CLOSE</td>
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</tr>
<tr>
<td>Ø6 All pipe connections for Ø6mm</td>
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</tr>
<tr>
<td>OFR Without filter pressure reducer</td>
<td></td>
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</table>

Ordering code:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>Pneumatic add-on component</td>
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<tr>
<td>EZS230</td>
<td>Electrical add-on component (deenergized)</td>
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<td>EZS24</td>
<td>Pneumatic add-on component (deenergized)</td>
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<td>EZV230</td>
<td>Pneumatic add-on component (deenergized)</td>
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<td>EZV24</td>
<td>Pneumatic add-on component (deenergized)</td>
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<td>EA230</td>
<td>Power input - holding - DC 5V</td>
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<tr>
<td>EA24</td>
<td>Power input - holding - AC 6V</td>
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<td>EAV230</td>
<td>Power input - attracting - AC 5V/LCD</td>
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<td>EAV24</td>
<td>Power input - attracting - AC 5V/LCD</td>
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<tr>
<td>PA</td>
<td>Cable or hose pass-through arrangement for EA/EZ, PA/PZ</td>
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<tr>
<td>PZ</td>
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<tr>
<td>Ø6</td>
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<tr>
<td>OFR</td>
<td></td>
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Ordering example:
PLZ 30.1.1 - EZ230 - EZ240

Dateiname: G155108
Datum: 05.10.02
Zeichenformat: A3 quer/1
Installation:
For installation, be sure condensate drain shows downward.

Connections:
P ................. compressed air available at the assembly site
CA .............. cylinder OPENCZ .............. cylinder CLOSE
CO2-A ........ inlet port CO2-OPEN
CO2-Z ........ inlet port CO2-CLOSE

Description of function:
1) Ventilation function:
Ventilation is ensured by use of the hand lever.
With add-on components for OPEN and/ or CLOSE is also an electrical or pneumatic remote control possible
(see options).
2) Alarm function:
Inlet port CO2 when controlled e.g. by a CO2 alarm box, will be connected with outlet port CA, and outlet port CZ will exhaust.
Ventilation function is deactivated.
3) Reset after release of alarm:
Fully press in reset button (will protrude approx. 1mm)
Only then the ventilation function will be active again.

Technical data:
max. operating pressure 10 bar
ambient temperature range -25°C - +50°C
pipe connections ø6/4

Options:
EZ230 Electrical CLOSE 230V
EZ24 Electrical CLOSE 24VDC
EZS230 Electrical CLOSE 230V (deenergized)
EZV230 Electrical PRIORITY CLOSE 230V
EZV24 Electrical PRIORITY CLOSE 24VDC
EA230 Electrical OPEN 230V
EA24 Electrical OPEN 24VDC
EAV230 Electrical PRIORITY OPEN 230V
EAV24 Electrical PRIORITY OPEN 24VDC
PA Pneumatic OPEN
PZ Pneumatic CLOSE
PAV Pneumatic PRIORITY OPEN
PZV Pneumatic PRIORITY CLOSE
OFR Without filter pressure reducer

Ordering code:
Ordering example
PLZ xx.x.x - Optionen

Ordering example
PLZ 30.2.2 - EA230 - EZ230

---

GRASL
Pneumatic-Mechanik GmbH
A-3454 Redling, Europastraße 1

Datum: 05.05.2011
Schnellfräsen nach DIN 79045

Bezeichnung: PLZ

Pneumatic ventilation control centre (CO2 OPEN/CLOSE)

PLZ 3x2-Options

Pneumatic

Schnellfräsen

06 002 DA 05 01 – E

Kunststoff

PLZ

05.05.2011
Ventilation control centres

Accessories

Filter pressure reducer - 1/4" (FR-1/4):

- Adjustable filter pressure reducer with pressure gauge, water separator and condensed water drain plug
- Outlet pressure infinitely variable from 0 - 10bar
- Maximum inlet pressure 16bar
- Ambient temperature range: -20°C to +50°C

- For pipe connection of the filter pressure reducer, 2 male connectors 1/4" (e.g. B5-6-1/4) will be required additionally

Design of the SHEVS may require reliable venting of the piping.

Mounting bracket for filter pressure reducer (MK-FR):

- Angle sheet iron with bore holes for mounting the filter pressure reducer (e.g. in ventilation control centre)
**BF mounting - standard version**

- Pneumatically operated mounting for installation in domelights etc.
- Opening angle 105°
- Opening mounting is factory adjustable to suit any domelight or continuous roof light (from approx. 780mm to 2.500mm inner width of curb or frame / continuous roof light opening)
- Due to cross beam design, only small forces are introduced into the curb and domelight frame
- Space-saving due to flat design
- Ease of assembly by hanging the mounting from above into the curb or frame
- Preassembled and adapted to specific building conditions.
- Available in six sizes with different pneumatic cylinders Type P (for selection of size, see drawing/table below)
- As cylinder locks automatically in open position, unintentional closing is not possible
- Available in the versions “OPEN-CLOSE” and “OPEN only” (“OPEN only”: SHEU has to be unlatched and closed by hand)
- Domelight locked in closed position by mechanical hook locking device MHV and adjustable locking bolt EVB 3-M12 or extension set for ventilation Set-L3 (accessories, see next page)
- Upper cross beams including preassembled hook locking device MHV (see upper cross beams)
- Standard connection for 6mm pipe
- Can be provided with additional electric or pneumatic ventilation function
- When ordering, please complete the dimensional sheet, indicating inner width and hinge dimensions

**Accessories:**

- **Accessories for mountings without ventilation function:**
  - Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).
  - **EVB 3-M12:** Adjustable locking bolt

- **Accessories for equipping mountings with ventilation function:**
  - Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).
  - **Electrically operated ventilation with rack actuator:**
    - **Set-L3-M8 / ST 12-1/8:** Screw M8 with cross pin dia.12mm, including 2 fixing plugs ST 12-1/8" for actuators Type E
    - **Rack actuator Type E:** 500 / 250N (push / pull force), (see Electric Parts Catalogue -> actuators)
    - **E-300-230:** 300mm stroke, 230V~ / 0,1A
    - **E-500-230:** 500mm stroke, 230V~ / 0,1A
  - **Pneumatically operated ventilation with cylinder Type PODV:**
    - **Set-L3-M8:** Screw M8 with cross pin dia.12mm
    - **Cylinder** with 32 or 40mm piston rod diameter, including swivel screw fitting (see cylinder),
    - **PODV 32/12-300-12/6L:** 300mm stroke
    - **PODV 32/12-500-12/6L:** 500mm stroke
    - **PODV 40/12-300-12/6:** 300mm stroke
    - **PODV 40/12-500-12/6:** 500mm stroke

For special types please inquire
**BF mounting - standard version**

<table>
<thead>
<tr>
<th>Type</th>
<th>Lmin-Lmax</th>
<th>Size A</th>
<th>Size B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF1</td>
<td>842-1041</td>
<td>50-102</td>
<td>75D</td>
</tr>
<tr>
<td>BF2</td>
<td>1042-1341</td>
<td>50-132</td>
<td>95D</td>
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<tr>
<td>BF3</td>
<td>1342-1641</td>
<td>50-232</td>
<td>125D</td>
</tr>
<tr>
<td>BF4</td>
<td>1642-1891</td>
<td>50-232</td>
<td>155D</td>
</tr>
<tr>
<td>BF5</td>
<td>1992-2341</td>
<td>50-232</td>
<td>1900</td>
</tr>
<tr>
<td>BF6</td>
<td>2342-2692</td>
<td>50-232</td>
<td>225D</td>
</tr>
</tbody>
</table>

(Size L = inner width LV + size of hinge A)

*without ventilation*

*with ventilation*

**electrical**

**pneumtical**
BF-mounting - Version with double stroke cylinder

- Pneumatically operated mounting for installation in domelights etc.
- Opening angle 105°
- Opening mounting is factory adjustable to suit any domelight or continuous roof light (from approx. 780mm to 2.500mm inner width of curb or frame / continuous roof light opening)
- Due to cross beam design, only small forces are introduced into the curb and domelight frame
- Space-saving due to flat design
- Ease of assembly by hanging the mounting from above into the curb or frame
- Preassembled and adapted to specific building conditions.
- Available in six sizes with different pneumatic cylinders Type D (for selection of size, see drawing/table on page 2)
- As cylinder locks automatically in open position, unintentional closing is not possible
- Ventilation mode: At a pressure of up to 6bar, mounting opens to ventilation position (approx. 300mm opening width)
- SHE mode: At a pressure of >10bar, cylinder completes a full stroke, and mounting opens to SHE position.
- Domelight locked in closed position by mechanical hook locking device MHV and adjustable locking bolt EVB 3-M12 (see locking elements)
- Upper cross beams including preassembled hook locking device MHV (see upper cross beams)
- Standard connection for 6mm pipe
- When ordering, please complete the dimensional sheet, indicating inner width and hinge dimensions.

Accessories:

- Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).
- EVB 3-M12: Adjustable locking bolt

For special types please inquire
**BF-mounting - Version with double stroke cylinder**

![Diagram of BF-mounting](image_url)

<table>
<thead>
<tr>
<th>Type</th>
<th>( L_{\text{min}} - L_{\text{max}} )</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF1</td>
<td>842 - 1041</td>
<td>50 - 102</td>
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<td>950</td>
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<td>BF3</td>
<td>1342 - 1641</td>
<td>50 - 232</td>
<td>1250</td>
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<td>BF4</td>
<td>1642 - 1991</td>
<td>50 - 232</td>
<td>1550</td>
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<tr>
<td>BF5</td>
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</tr>
<tr>
<td>BF6</td>
<td>2342 - 2692</td>
<td>50 - 232</td>
<td>2250</td>
</tr>
</tbody>
</table>

(Size \( L = \text{inner width} \ LW + \text{size of hinge} \ A \))
BG mounting - fixed type

- Pneumatically operated mounting for installation in domelights etc.
- Opening angle 140° or 165°
- Fixed cross beam type for domelights with 800, 1,000, 1,300 and 1,600mm inner width of curb and a hinge size of 65 to 70mm
- Ideally suited for domelights: Inner width = nominal width - 200mm
- Due to cross beam design, only small forces are introduced into the curb and domelight frame
- Space-saving due to flat design
- Ease of assembly by hanging the mounting from above into the curb or frame
- Available in 4 sizes with different pneumatic cylinders Type P (for selection of size, see drawing/table on page 2)
- As cylinder locks automatically in open position, unintentional closing is not possible
- Available in the versions “OPEN-CLOSE” and “OPEN only” (“OPEN only”: SHEU has to be unlatched and closed by hand)
- Domelight locked in closed position by mechanical hook locking device MHV and adjustable locking bolt EVB 3-M12 or extension set for ventilation Set-L3 (see locking elements)
- Upper cross beams including preassembled hook locking device MHV (see upper cross beams)
- Standard connection for 6mm pipe
- Can be provided with additional electric or pneumatic ventilation function
- When ordering, please complete the dimensional sheet, and specify inner width

Accessories:

- Accessories for mountings without ventilation function:
  - Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).
  - EVB 3-M12: Adjustable locking bolt

- Accessories for equipping mountings with ventilation function:
  - Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).

  Electrically operated ventilation with rack actuator:
  - Set-L3-M8 / ST 12-1/8: Screw M8 with cross pin dia.12mm, including 2 fixing plugs ST 12-1/8” for actuators Type E
  - Rack actuator Type E: 500 / 250N (push / pull force), (see Electric Parts Catalogue -> actuators)
  - E-300-230: 300mm stroke, 230V~ / 0,1A
  - E-500-230: 500mm stroke, 230V~ / 0,1A

  Pneumatically operated ventilation with cylinder Type PODV:
  - Set-L3-M8: Screw M8 with cross pin dia.12mm
  - Cylinder with 32 or 40mm piston rod diameter, including swivel screw fitting (see cylinder),
  - PODV 32/12-300-12/6L: 300mm stroke
  - PODV 32/12-500-12/6L: 500mm stroke
  - PODV 40/12-300-12/6: 300mm stroke
  - PODV 40/12-500-12/6: 500mm stroke

  For special types please inquire
**BG mounting - fixed type**

<table>
<thead>
<tr>
<th>Type</th>
<th>NW</th>
<th>LW</th>
<th>Size</th>
<th>A</th>
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<td>900</td>
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<td>1003</td>
<td>1000</td>
<td>900</td>
<td>963</td>
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<tr>
<td>1004</td>
<td>1000</td>
<td>900</td>
<td>1163</td>
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</tr>
</tbody>
</table>

**Without ventilation**

**With ventilation**

electrical  pneumatical
**BG mounting - fixed type with double stroke cylinder**

Pneumatically operated mounting for installation in domelights etc.
Opening angle 140° or 165°
Fixed cross beam type for domelights with 800, 1,000, 1,300 and 1,600mm inner width of curb and a hinge size of 65 to 70mm
Ideally suited for domelights: Inner width = nominal width - 200mm
Due to cross beam design, only small forces are introduced into the curb and domelight frame
Space-saving due to flat design
Ease of assembly by hanging the mounting from above into the curb or frame
Available in 4 sizes with different pneumatic cylinders Type D (for selection of size, see drawing/table on page 2)
As cylinder locks automatically in open position, unintentional closing is not possible
Ventilation mode: At a pressure of up to 6bar, mounting opens to ventilation position (approx. 300mm opening width)
SHE mode: At a pressure of >10bar, cylinder completes a full stroke, and mounting opens to SHE-position. Domelight locked in closed position by mechanical hook locking device MHV and adjustable locking bolt EVB 3-M12 (see locking elements)
Upper cross beams including preassembled hook locking device MHV (upper cross beams)
Standard connection for 6mm pipe
When ordering, please complete the dimensional sheet, and specify inner width

**Accessories:**

- **Upper cross beams:** Upper cross beams including preassembled hook locking device MHV (see upper cross beams).
- **EVB 3-M12:** Adjustable locking bolt

For special types please inquire
BG mounting - fixed type with double stroke cylinder

<table>
<thead>
<tr>
<th>Type</th>
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<th>Inner width LW</th>
<th>A</th>
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</thead>
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<td>1000</td>
<td>800</td>
<td>765</td>
</tr>
<tr>
<td>BG2.11</td>
<td>1200</td>
<td>1000</td>
<td>965</td>
</tr>
<tr>
<td>BG3.11</td>
<td>1500</td>
<td>1300</td>
<td>1250</td>
</tr>
<tr>
<td>BG4.11</td>
<td>1800</td>
<td>1600</td>
<td>1550</td>
</tr>
</tbody>
</table>
**BG mounting - adjustable type**

- Pneumatically operated mounting for installation in domelights etc.
- Opening angle 140° or 165°. For special opening angles, please inquire
- Opening mounting is factory adjustable to suit any domelight or continuous roof light (from approx. 780mm to 2.500mm inner width of curb or frame / continuous roof light opening)
- Due to cross beam design, only small forces are introduced into the curb and domelight frame
- Space-saving due to flat design
- Ease of assembly by hanging the mounting from above into the curb or frame
- Preassembled and adapted to specific building conditions.
- Available in six sizes with different pneumatic cylinders Type P (for selection of size, see drawing/table on page 2)
- As cylinder locks automatically in open position, unintentional closing is not possible
- Available in the versions “OPEN-CLOSE” and “OPEN only” (“OPEN only”: SHEU has to be unlatched and closed by hand)
- Domelight locked in closed position by mechanical hook locking device MHV and adjustable locking bolt EVB 3-M12 or extension set for ventilation Set-L3 (accessories, see next page)
- Upper cross beams including preassembled hook locking device MHV (see upper cross beams)
- Standard connection for 6mm pipe
- Can be provided with additional electric or pneumatic ventilation function
- When ordering, please complete the dimensional sheet, specifying inner width and hinge dimensions

**Accessories:**

- **Accessories for mountings without ventilation function:**
  - Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).
  - EVB 3-M12: Adjustable locking bolt

- **Accessories for equipping mountings with ventilation function:**
  - Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).

**Electrically operated ventilation with rack actuator:**
Set-L3-M8 / ST 12-1/8: Screw M8 with cross pin dia.12mm, including 2 fixing plugs ST 12-1/8" for actuators Type E
Rack actuator Type E: 500 / 250N (push / pull force), (see Electric Parts Catalogue -> actuators)
E-300-230: 300mm stroke, 230V~/ /0,1A
E-500-230: 500mm stroke, 230V~/ /0,1A

**Pneumatically operated ventilation with cylinder PODV:**
Set-L3-M8: Screw M8 with cross pin dia.12mm
Cylinder with 32 or 40mm piston rod diameter, including swivel screw fitting (see cylinder).

PODV 32/12-300-12/6L: 300mm stroke
PODV 32/12-500-12/6L: 500mm stroke

PODV 40/12-300-12/6: 300mm stroke
PODV 40/12-500-12/6: 500mm stroke

For special types please inquire
BG mounting - adjustable type

without ventilation

<table>
<thead>
<tr>
<th>type</th>
<th>Lmin - Lmax</th>
<th>Size A (mm)</th>
<th>Size B (mm)</th>
</tr>
</thead>
<tbody>
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<td>643 - 7042</td>
<td>50 - 200</td>
<td>765</td>
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<td>662.12</td>
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<td>1543 - 1642</td>
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<td>664.12</td>
<td>1643 - 1942</td>
<td>50 - 250</td>
<td>1390</td>
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<td>665.12</td>
<td>1793 - 2042</td>
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<tr>
<td>666.12</td>
<td>2343 - 2634</td>
<td>50 - 250</td>
<td>2250</td>
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</tbody>
</table>

(Size L = inner width - size of rings A)
BG mounting - adjustable type with double stroke cylinder

- Pneumatically operated mounting for installation in domelights etc.
- Opening angle 140° or 165°. For special opening angles, please inquire
- Opening mounting is factory adjustable to suit any domelight or continuous roof light (from approx. 780mm to 2,500mm inner width of curb or frame / continuous roof light opening)
- Due to cross beam design, only small forces are introduced into the curb and domelight frame
- Space-saving due to flat design
- Ease of assembly by hanging the mounting from above into the curb or frame
- Preassembled and adapted to specific building conditions.
- Available in six sizes with different pneumatic cylinders Type D (for selection of size, see drawing/table on page 2)
- As cylinder locks automatically in open position, unintentional closing is not possible
- Ventilation mode: At a pressure of up to 6bar, mounting opens to ventilation position (approx. 300mm opening width)
- SHE mode: At a pressure of >10bar, cylinder completes a full stroke, and mounting opens to SHE-position.
- Domelight locked in closed position by mechanical hook locking device MHV and adjustable locking bolt EVB 3-M12 (see locking elements)
- Upper cross beams including preassembled hook locking device MHV (see upper cross beams)
- Standard connection for 6mm pipe
- Can be provided with additional electric or pneumatic ventilation function
- When ordering, please complete the dimensional sheet, specifying inner width and hinge dimensions

Accessories:

- Upper cross beams: Upper cross beams including preassembled hook locking device MHV (see upper cross beams).
- EVB 3-M12: Adjustable locking bolt

For special types please inquire
BG mounting - adjustable type with double stroke cylinder
Typ OT 1.04:

- Upper cross beam to be mounted at site
- Extruded aluminium section 40x40
- Mechanical hook locking device MHV preassembled
- Available up to 1.950mm length

OT 1.04-xxxx-yyyy:
(xxxx ... inner width of domelight frame)
/yyyy ... position of MHV)

Typ OT 5.04:

- Upper crossbeam to be mounted with preassembled end plates
- Extruded aluminium section 40x40
- Mechanical hook locking device MHV preassembled
- Available up to 1.950mm length

OT 5.04-xxxx-yyyy:
(xxxx ... inner width of domelight frame)
/yyyy ... position of MHV)

Typ OT 9.04:

- Upper crossbeam to be mounted with preassembled end plates
- Extruded aluminium section 80x40
- Mechanical hook locking device MHV preassembled
- Available up to 2.250mm length

OT 9.04-xxxx-yyyy:
(xxxx ... inner width of domelight frame)
/yyyy ... position of MHV)

For special types, please inquire
SHE mountings
Dimensional sheet for mountings

A = ____ mm  
Size of hinge

B = ____ mm  
Inside width of curb

C = ____ mm  
Inside width of vent frame

D = ____ mm  
Nominal spacing (width)

E = ____ mm  
Nominal spacing (length)

F = ____ mm  
Height of vent frame

α = ____ °  
Opening angle

(S = Hinge)