Smoke and Heat Ventilation
Pneumatic - Electronic
Control Systems

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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!

1. Cylinder

- Single-stroke cylinders
- Double-stroke cylinders
- Gas-pressure spring

2. Locking elements

- Mechanical hook locking device
- Pneumatic unlocking device
- Electronic window-catch
- Pneumatic window-catch

3. Valves

- Automatic release
- Non-automatic release
- Ventilation valves
- Priority valves
- Other valves
- Accessories

4. Screw fittings

- Compression type fittings
- Sealing plugs
- Mufflers

5. Alarm boxes for SHEVS controls

- SHE OPEN only
- SHE OPEN-CLOSE

6. Pneumatically operated Smoke Ventilation Control Centre

- Manual operation
- Manual / electrical operation
- Manual / pneumatical operation
- Accessories

7. SHE mountings

- BF mounting
- BG mounting
- Upper cross beams
- 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)

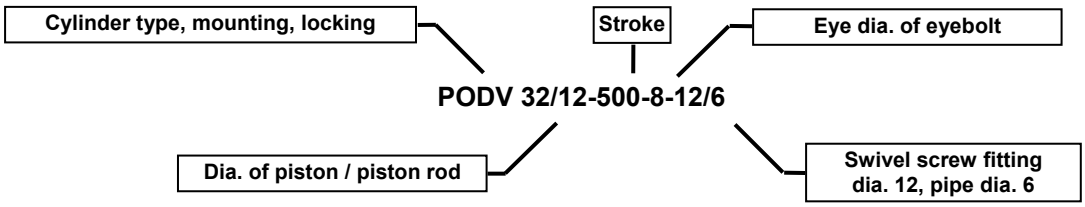
PUDV 32/12-xxxx-8-12/6:
Version with mounting at lower end, both end positions locked (double locking)

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 M8x40-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)

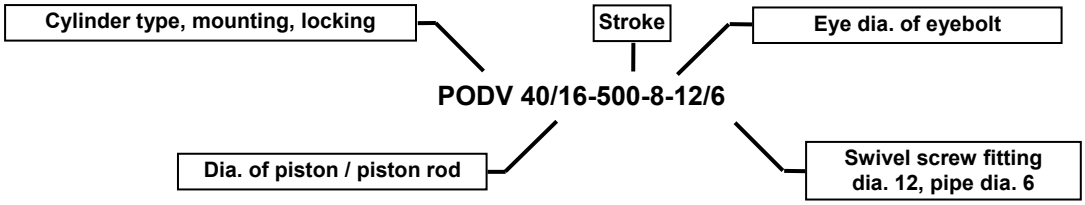
PUDV 40/xx-xxxx-8-12/6:
Version with mounting at lower end, both end positions locked (double locking)

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)

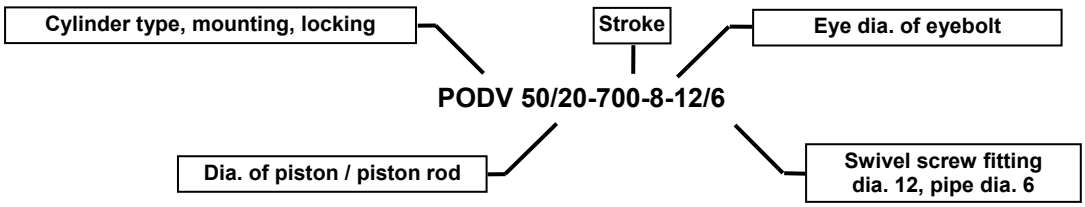
PUDV 50/xx-xxxx-8-12/6:
Version with mounting at lower end, both end positions locked (double locking)

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)

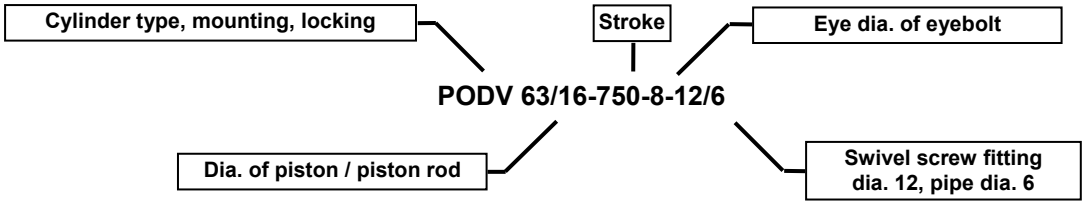
PUDV 63/xx-xxxx-8-12/6:
Version with mounting at lower end, both end positions locked (double locking)

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



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)

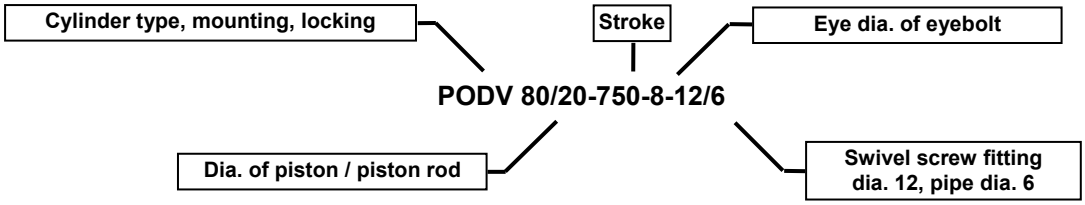
PUDV 80/xx-xxxx-8-18/6:
Version with mounting at lower end, both end positions locked (double locking)

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)

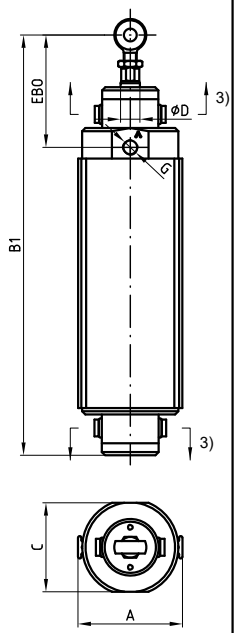
PMAV 80/xx-xxxx-8-12/6:
Version with centre mounting position, upper end position locked (locked
when extended), 2 swivel screw fittings SVPM 6-12-80 (collar diameter 12mm)



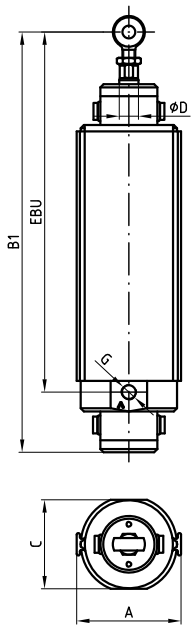
The following variants can be supplied upon request:

- 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)

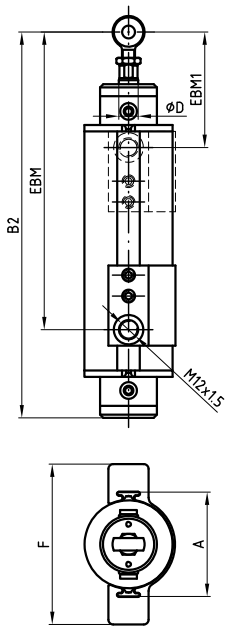
Pneumatic cylinder
PODV
mounted at UPPER end [4]
locked at both ends [5]



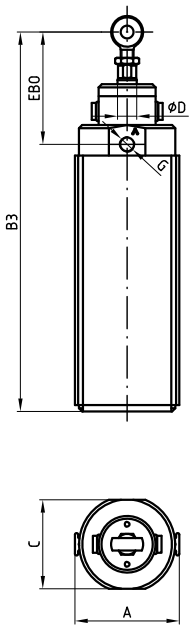
Pneumatic cylinder
PUDV
mounted at LOWER end [4]
locked at both ends [5]



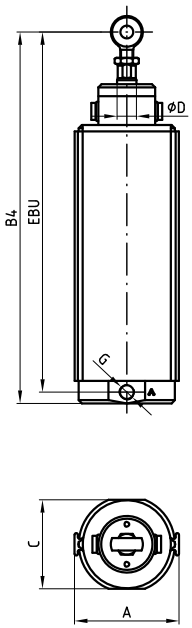
Pneumatic cylinder
PMDV
CENTRE mounted [4]
locked at both ends [5]



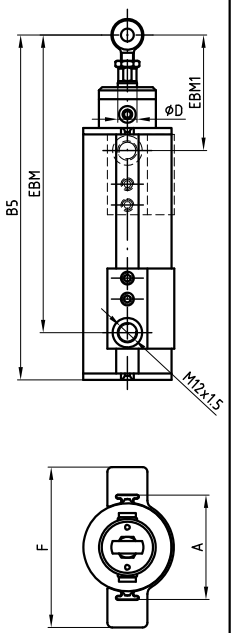
Pneumatic cylinder
POAV
mounted at UPPER end [4]
locked when extended [5]



Pneumatic cylinder
PUAV
mounted at LOWER end [4]
locked when extended [5]



Pneumatic cylinder
PMAV
CENTRE mounted [4]
locked when extended [5]



Piston-Ø	Ø32	Ø40		Ø50		Ø63			Ø80	
Pipe external-Ø	Ø36	Ø44		Ø55		Ø69			Ø88	
Size A	44	54		65		79			100	
Size B1	162+stroke							172+stroke	180+stroke	190+stroke
Size B2	143.5+stroke	153.5+stroke	143.5+stroke	153.5+stroke	143.5+stroke	153.5+stroke	164.5+stroke		168.5+stroke	178.5+stroke
Size B3	136.5+stroke						146.5+stroke		154.5+stroke	164.5+stroke
Size B4	131.5+stroke						141.5+stroke		153+stroke	163+stroke
Size B5	118+stroke	128+stroke	118+stroke	128+stroke	118+stroke	128+stroke	139+stroke		143+stroke	153+stroke
Size C	37	45		55.5		69.5			88	
Size D	Ø12	Ø16	Ø12	Ø16/Ø20	Ø12	Ø16/Ø20	Ø25		Ø20	Ø25
Size EBO	70						80		70	80
Size EBU	124.5+stroke						134.5+stroke		143.5+stroke	153.5+stroke
Size EBM[1]	105 to stroke+104	115 to stroke+114	105 to stroke+104	115 to stroke+114	105 to stroke+104	115 to stroke+114	125 to stroke+125		115 to stroke+129	125 to stroke+139
Size EBM1[1)2)]	75	85	75	85	75	85	85		85	95
Size F	100								130	
Size G	G1/8"								G1/4"	
Theoretical lifting force at 6bar	480N	750N		1180N		1870N			3015N	

1) only available for connection part!
2) connection part rotated through 180°
3) Unlocking the extended position through pulling both unlocking screws in draw positions.
4) O ... mounted at UPPER end, U ... mounted at LOWER end, M ... CENTRE mounted
5) DV ... locked at both ends, AV ... locked when extended
6) Type approval test to VdS 2579:2012-05 and VdS 2583:2012-05.

Technical instructions see 02.001.DAT.04.00-E:
- Please observe all safety instructions!

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.
- 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 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 leacks (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).

Ordering desigantion
PUDV 40/12-250-8
- 8 — eye-bolt diameter [mm]
- 250 — stroke [mm]
- 12 — piston rod diameter [mm]
- 40 — piston diameter [mm]
- locking [5]
- mounting [4]
- PUDV — cylinder series P

Technical data:

max. operating pressure	stroke-, mounting- and installation position dependent, but max. 30bar (see table: 02.027.T0.*, 02.027.T1.*, 02.027.T2.*)
min. operating pressure	4bar
max. static housing pressure	60bar
testing pressure [6]	90bar
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, B3, B4, EBO, EBU)
eye bolt M8x40: +10mm/-4mm (for piston rod Ø12)
eye bolt M10x60: +30mm/-4mm (for piston rod Ø16, Ø20 and Ø25)

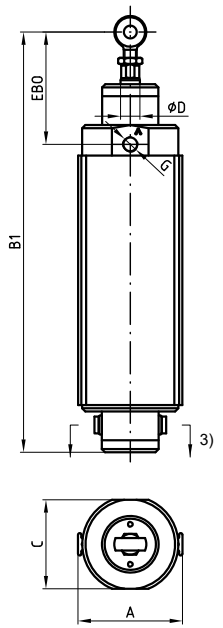
Setting range eye bolt: (for the size B2, B5, EBM, EBM1)
eye bolt M8x40: +/-7mm (for piston rod Ø12)
eye bolt M10x60: +/-17mm (for piston rod Ø16, Ø20 and Ø25)

Required CO2 amount at 10bar [g]:
$M = \frac{d*d*\pi}{4}*(h+20)*k*10^{-6}$ d ... piston-Ø [mm]; h ... stroke [mm]; k ... 26 [g/ltr]

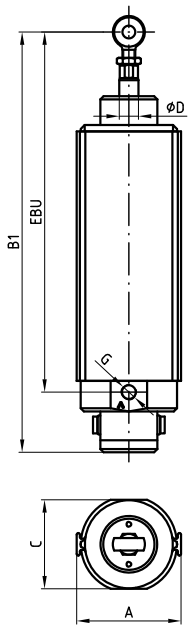
Tolerance Scale 3:10 Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Overview of types for pneumatic cylinders series PxDV and PxAV	Document Style: Data sheet
Approved: HA	Issue Date: 25.01.2022			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 02.001.DAT.00.06-E

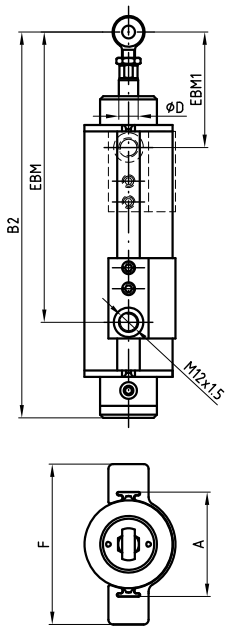
Pneumatic cylinder
POEV
mounted at UPPER end [4]
locked when retracted [5]



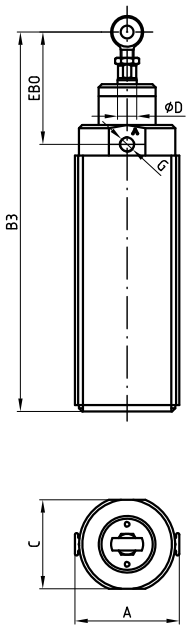
Pneumatic cylinder
PUEV
mounted at LOWER end [4]
locked when retracted [5]



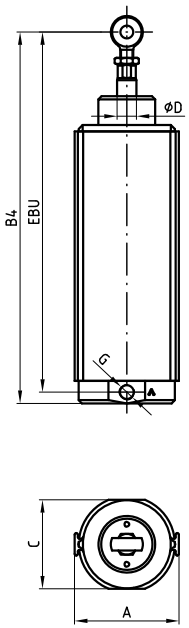
Pneumatic cylinder
PMEV
CENTRE mounted [4]
locked when retracted [5]



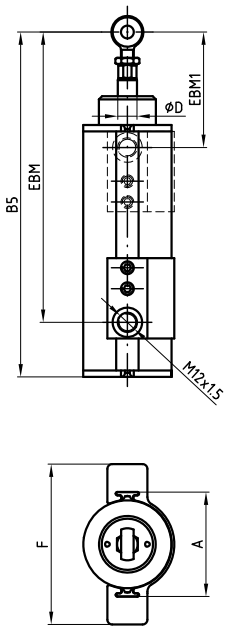
Pneumatic cylinder
POOV
mounted at UPPER end [4]
without locking [5]



Pneumatic cylinder
PUOV
mounted at LOWER end [4]
without locking [5]



Pneumatic cylinder
PMOV
CENTRE mounted [4]
without locking [5]



Piston-Ø	Ø32	Ø40		Ø50		Ø63		Ø80		
Pipe external-Ø	Ø36	Ø44		Ø55		Ø69		Ø88		
Size A	44	54		65		79		100		
Size B1	162+stroke							180+stroke		
Size B2	143.5+stroke	153.5+stroke	143.5+stroke	153.5+stroke	143.5+stroke	153.5+stroke		168.5+stroke	178.5+stroke	
Size B3	136.5+stroke						146.5+stroke	154.5+stroke	164.5+stroke	
Size B4	131.5+stroke							153+stroke		
Size B5	118+stroke	128+stroke	118+stroke	128+stroke	118+stroke	128+stroke		143+stroke	153+stroke	
Size C	37	45		55.5		69.5		88		
Size D	Ø12	Ø16	Ø12	Ø16/Ø20	Ø12	Ø16/Ø20	Ø25	Ø20	Ø25	
Size EBO	70						80	70.5	80.5	
Size EBU	124.5+stroke							143.5+stroke		
Size EBM[1]	105 to stroke+104	115 to stroke+114	105 to stroke+104	115 to stroke+114	105 to stroke+104	115 to stroke+114		115 to stroke+129	125 to stroke+139	
Size EBM1[1)2)]	75	85	75	85	75	85		85	95	
Size F	100							130		
Size G	G1/8"							G1/4"		
Theoretical lifting force at 6bar	480N	750N		1180N		1870N		3015N		

1) only available for connection part!
2) connection part rotated through 180°
3) Unlocking the extended position through pulling both unlocking screws in draw positions.
4) O ... mounted at UPPER end, U ... mounted at LOWER end, M ... CENTRE mounted
5) EV ... locked when retracted, OV ... without locking
6) Type approval test to VdS 2579:2012-05 and VdS 2583:2012-05.

Technical instructions see 02.001.DAT.04.00-E:

- Please observe all safety instructions!

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.
- 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 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 leacks (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).

Ordering desigantion

PUEV 40/12-250-8
- 8 — eye-bolt diameter [mm]
- 250 — stroke [mm]
- 12 — piston rod diameter [mm]
- 40 — piston diameter [mm]
- PUEV — locking [5], mounting [4], cylinder series P

Technical data:

max. operating pressure	stroke-, mounting- and installation position dependent, but max. 30bar (see table: 02.027.T0.*, 02.027.T1.*, 02.027.T2.*)
min. operating pressure	4bar
max. static housing pressure	60bar
testing pressure [6]	90bar
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, B3, B4, EBO, EBU)
eye bolt M8x40: +10mm/-4mm (for piston rod Ø12)
eye bolt M10x60: +30mm/-4mm (for piston rod Ø16, Ø20 and Ø25)

Setting range eye bolt: (for the size B2, B5, EBM, EBM1)
eye bolt M8x40: +/-7mm (for piston rod Ø12)
eye bolt M10x60: +/-17mm (for piston rod Ø16, Ø20 and Ø25)

Required CO2 amount at 10bar [g]:

$$M = \frac{d*d*\pi}{4}*(h+20)*k*10^{-6}$$

d ... piston-Ø [mm]; h ... stroke [mm]; k ... 26 [g/ltr]

Tolerance | Scale 3:10 | Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Overview of types for pneumatic cylinders series PxEV and PxOV	Document Style: Data sheet
Approved: HA	Issue Date: 25.01.2022			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 02.001.DAT.01.06-E

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)
- Ventilation stroke maximum 300mm
  In case of total stroke ≤ 750mm, the permissible maximum ventilation stroke is 1/3 of the 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) 70mm when mounted at upper end, 124,5mm + stroke when mounted at lower end. Installation size can be varied from -4 to +30mm by adjusting the eyebolt M10x60. For greater installation dimensions, please inquire
- For further installation dimensions and dimensions see drawings and dimension table of pneumatic cylinder type D
- 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 8.000N. Ventilating position cannot be locked.
- Total stroke can be freely selected from 201mm to 1.300mm. Special lengths upon request
- 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/yyy-8-12/6: Version with mounting at upper end, both end positions locked (double locking),

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

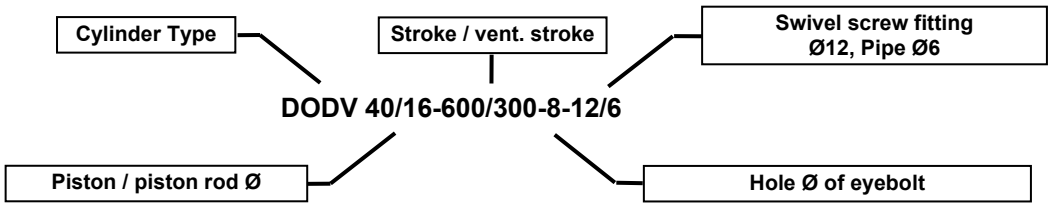
DMDV 40/16-xxxx/yyy-8-12/6: Version with centre mounting position, both end positions locked (double locking)

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

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

DUAV 40/16-xxxx/yyy-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)
- Ventilation stroke maximum 300mm
  In case of total stroke ≤ 750mm, the permissible maximum ventilation stroke is 1/3 of the 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) 70mm when mounted at upper end, 124,5mm + stroke when mounted at lower end. Installation size can be varied from -4 to +30mm by adjusting the eyebolt M10x60. For greater installation dimensions, please inquire
- For further installation dimensions and dimensions see drawings and dimension table of pneumatic cylinder type D
- 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 8.000N. Ventilating position cannot be locked.
- Total stroke can be freely selected from 201mm to 1.300mm. Special lengths upon request
- 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/yyy-8-12/6: Version with mounting at upper end, both end positions locked (double locking),

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

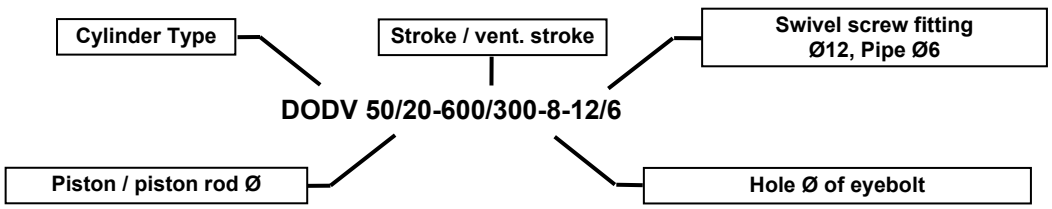
DMDV 50/20-xxxx/yyy-8-12/6: Version with centre mounting position, both end positions locked (double locking)

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

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

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

For special types, please inquire



Dxxx 63

- 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)
- Ventilation stroke maximum 300mm
  In case of total stroke ≤ 750mm, the permissible maximum ventilation stroke is 1/3 of the total stroke
- Cylinder with 63mm piston diameter, threaded design, made of anodized aluminium (E6C0)
- Piston rod dia. 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) 70mm when mounted at upper end, 124,5mm + stroke when mounted at lower end. Installation size can be varied from -4 to +30mm by adjusting the eyebolt M10x60. For greater installation dimensions, please inquire
- For further installation dimensions and dimensions see drawings and dimension table of pneumatic cylinder type D
- 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 8.000N. Ventilating position cannot be locked.
- Total stroke can be freely selected from 201mm to 1.300mm. Special lengths upon request
- Number of VdS certification **G 505008** (up to max. stroke of 2000mm)
- 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)

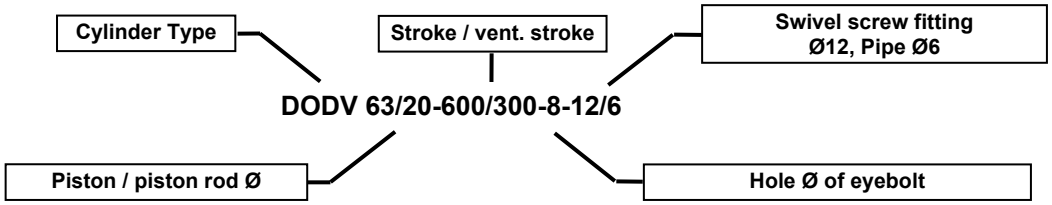
DMDV 63/20-xxxx/yyy-8-12/6: Version with centre mounting position, both end positions locked (double locking)

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

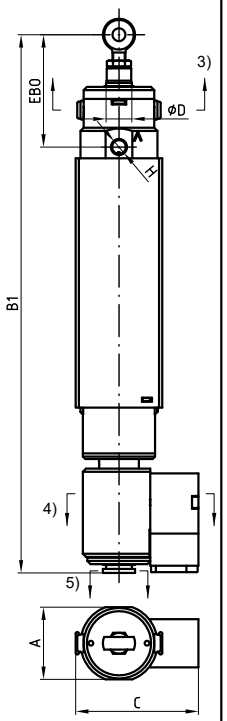
DUDV 63/20-xxxx/yyy-8-12/6: Version with mounting at lower end, both end positions locked (double locking)

DUAV 63/20-xxxx/yyy-8-12/6: Version with mounting at lower end, upper end position locked (locked when extended)
All types are also available with piston rod Ø25mm.

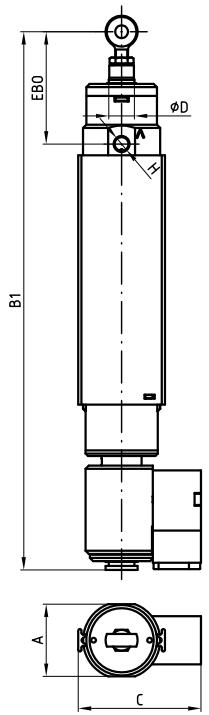
For special types, please inquire



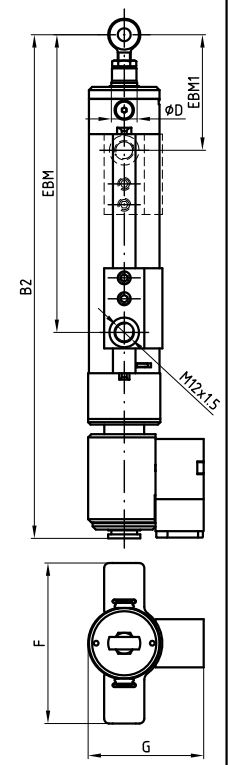
Double-stroke cylinder
DODV
mounted at UPPER end
locked at both ends



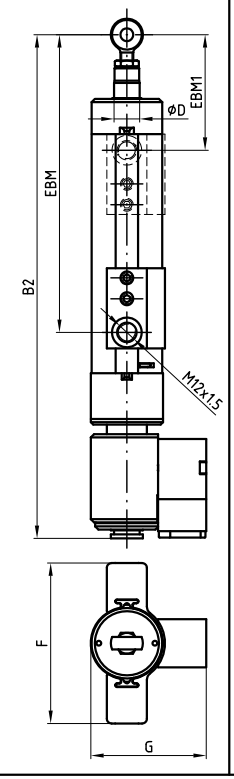
Double-stroke cylinder
DOEV
mounted at UPPER end
locked when retracted



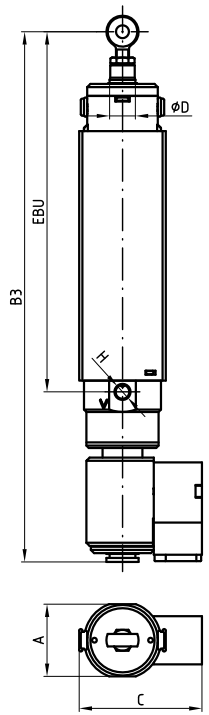
Double-stroke cylinder
DMDV
CENTRE mounted
locked at both ends



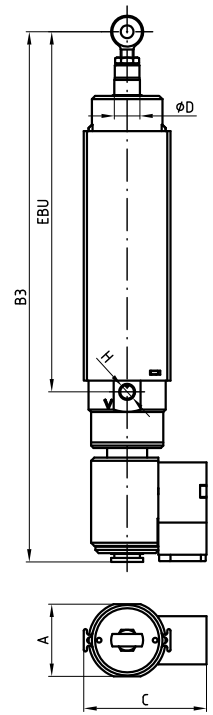
Double-stroke cylinder
DMEV
CENTRE mounted
locked when retracted



Double-stroke cylinder
DUDV
mounted at LOWER end
locked at both ends



Double-stroke cylinder
DUEV
mounted at LOWER end
locked when retracted



Piston Ø	Ø40	Ø50	Ø63	
Pipe external-Ø	Ø44	Ø55	Ø69	
Size A	45	55.5	69.5	
Size B1	235.5+stroke	230.5+stroke		240.5+stroke
Size B2	214+stroke	209+stroke		219+stroke
Size B3	230.5+stroke			240.5+stroke
Size C	76.5	82	86.5	
Size D	Ø16	Ø20	Ø20	Ø25
Size EBO	70			80
Size EBU	124.5+stroke			134.5+stroke
Size EBM[1)]	102 bis 101+stroke			112 bis 111+stroke
Size EBM1[1)2)]	72			82
Size F	100			
Size G	72	77	84	
Size H	G1/8"			

1) only available for connection part!
2) connection part rotated through 180°
3) Unlocking the extended position through pulling both unlocking screws in draw positions.
4) Unlocking the retracted position.
5) Unlocking out of lifting stroke.

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.
- 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 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 leacks (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.T32.*, 02.027.T33.*) 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.	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 Scale 3:10 Material

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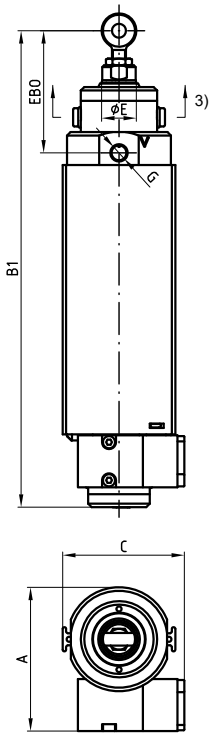
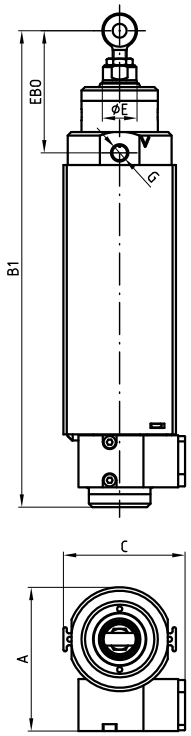
Approved HA	Issue Date 27.07.2012			Document State Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number 02.001.DAT.02.03-E

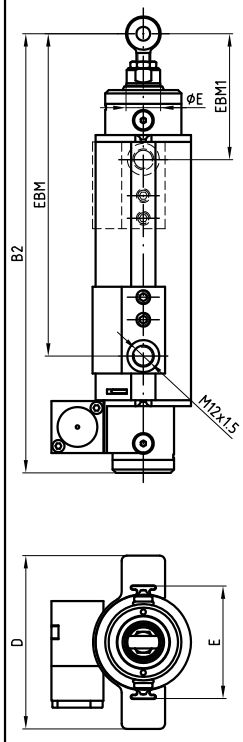
Double-stroke cylinder
DOAV
mounted at UPPER end
locked when extended



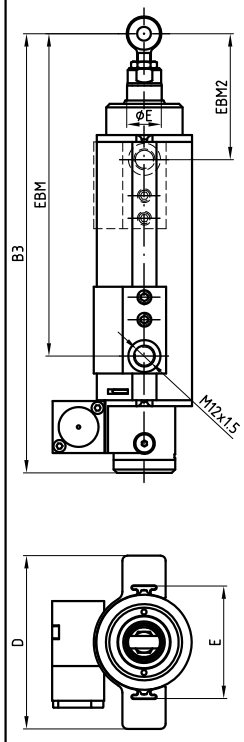
Double-stroke cylinder
DOOV
mounted at UPPER end
without locking



Double-stroke cylinder
DMAV
CENTRE mounted
locked when extended



Double-stroke cylinder
DMOV
CENTRE mounted
without locking



Piston-Ø	Ø50	Ø63	
Pipe external-Ø	Ø55	Ø69	
Size A	83	97	
Size B1	175+stroke		185+stroke
Size B2	153.5+stroke		163.5+stroke
Size B3	153.5+stroke		153.5+stroke
Size C	70	77.5	
Size D	100		
Size E	Ø20	Ø20	Ø25
Size EBO	70		80
Size EBM[1)]	102 bis 101+stroke		112 bis 111+stroke
Size EBM1[1) 2)]	72		82
Size EBM2[1) 2)]	72		

1) only available for connection part!
2) connection part rotated through 180°
3) Unlocking the extended position through pulling both unlocking screws in draw positions.

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.
- 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 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 leacks (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.T32.*, 02.027.T33.*) 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.	G505008

Setting range eye bolt:

(for the size B1-B3, EBO, EBM, EBM1 and EBM2)

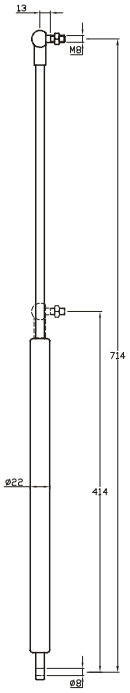
eye bolt M10x60: +30mm/-4mm (for piston diameter Ø20 and Ø25)

Tolerance Scale 3:10 Material

Created Simetzberger	Sheet 1/2	Format A3	Title Overview of types for double-stroke cylinders series DxAV and DxOV	Document Style Data sheet
Approved HA	Issue Date 27.07.2012			Document State Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number 02.001.DAT.03.03-E

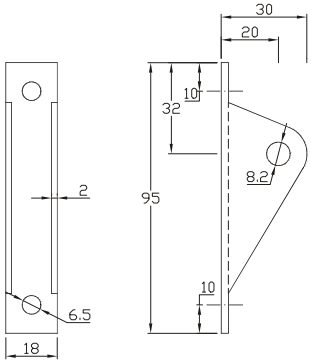
Gas-pressure spring GDF

- 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.**

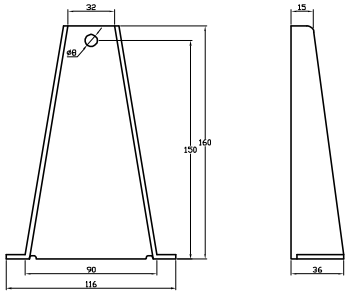


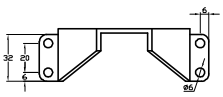
GDF 22-300-100: Gas-pressure spring with 300mm stroke, pushing force 100N. Installation size (knuckle joint -to- eye spacing) 414mm

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

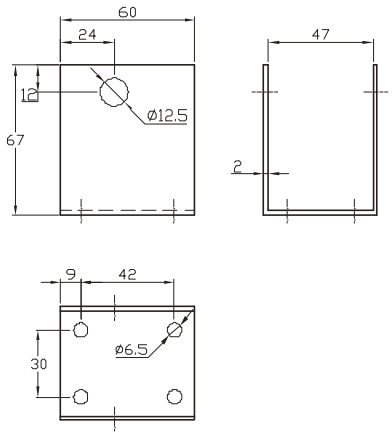
Mounting brackets MK

Mounting brackets of galvanized sheet steel for mounting pneumatic cylinders

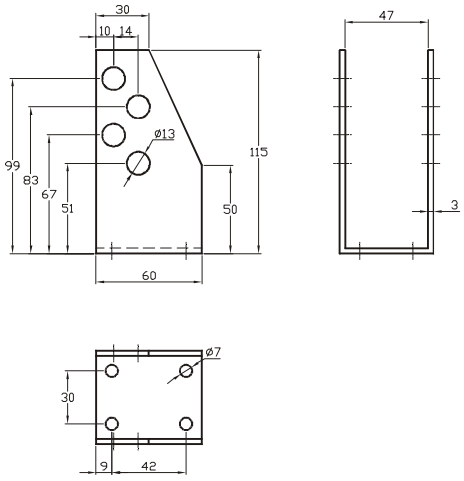
MK 47-2

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

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

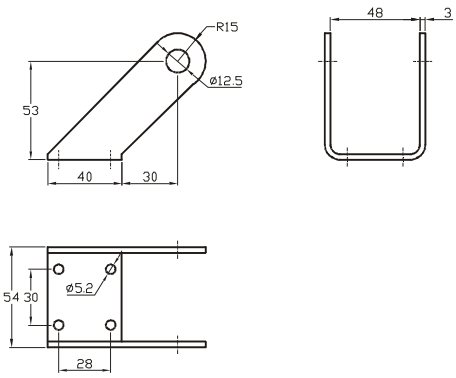


MK 47-2: 47mm inner width, Type 2

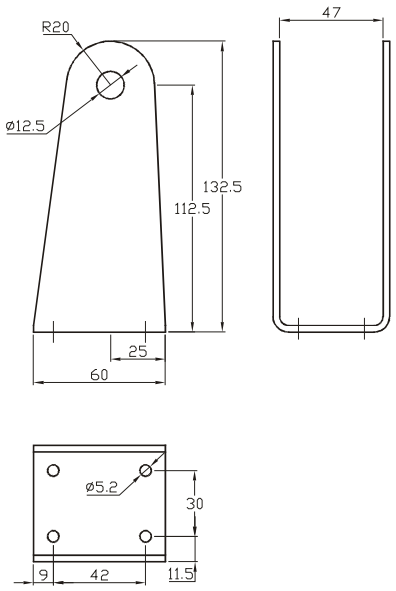


Mounting brackets for pneumatic cylinders Pxxx 32, Pxxx 40, Dxxx 40:

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

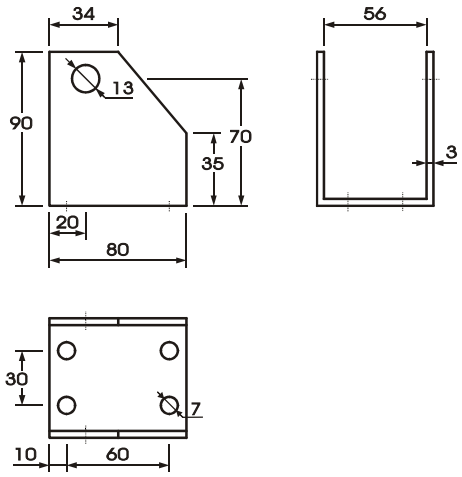


MK 47-4: 47mm inner width, Type 4

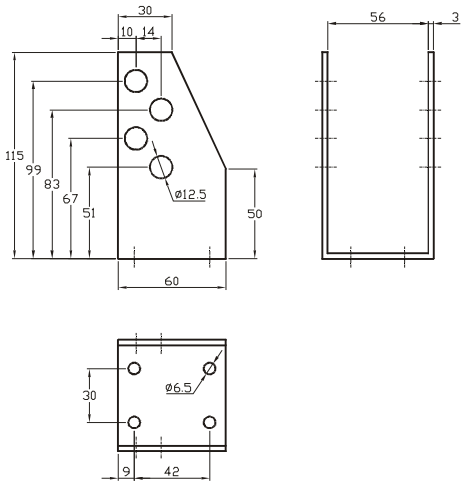


Mounting brackets for pneumatic cylinders Pxxx 50, Dxxx 50:

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

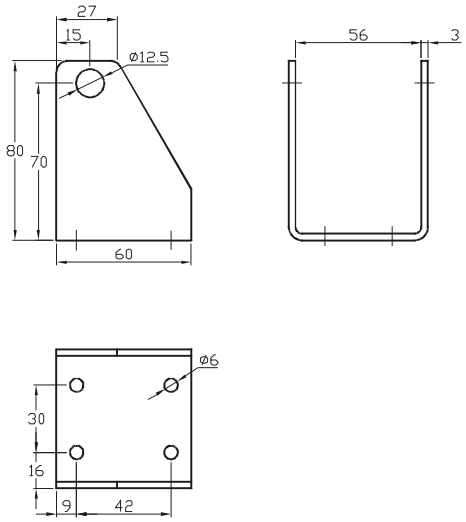


MK 56-2: 56mm inner width, Type 2



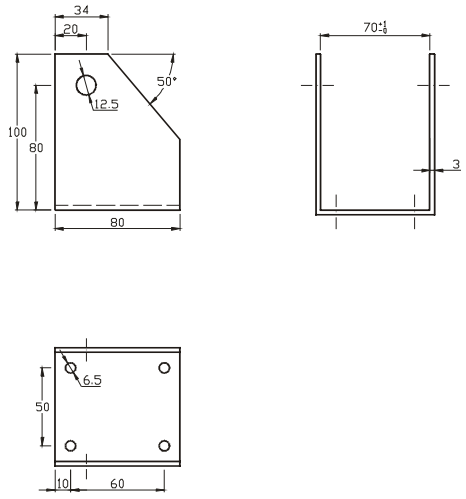
Mounting brackets for pneumatic cylinders Pxxx 50, Dxxx 50:

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



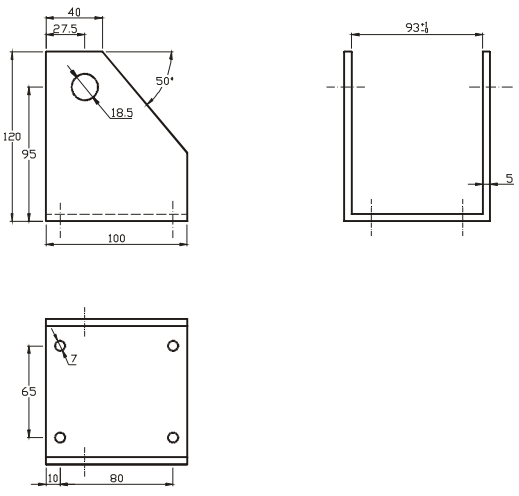
Mounting brackets for pneumatic cylinders Pxxx 63 und Dxxx 63:

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



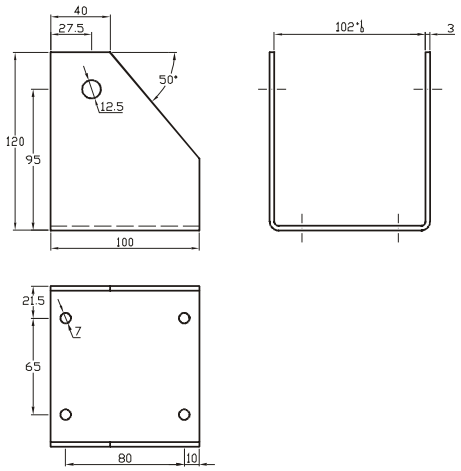
Mounting brackets for pneumatic cylinders Pxxx 80:
(sheet aluminium)

MK 93-1: 93mm inner width, Type 1



Mounting brackets for pneumatic cylinders Type P and Type D; variable mounting with clamping element KST:

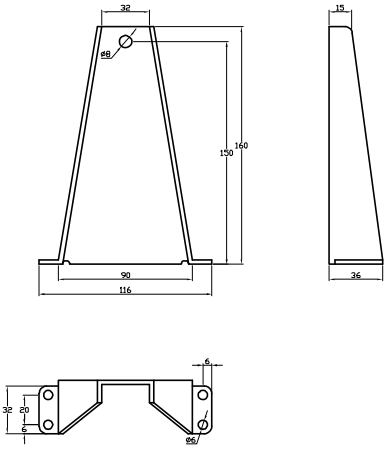
MK 102-1: 102mm inner width, Type 1



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

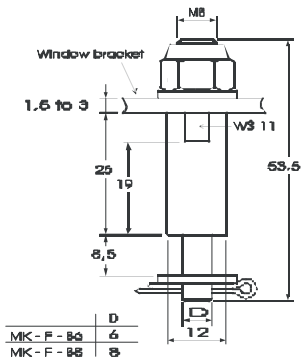
Window bracket for mounting pneumatic cylinders or gas-pressure springs on pivot-hung windows:

MK F-1: Window bracket Type 1



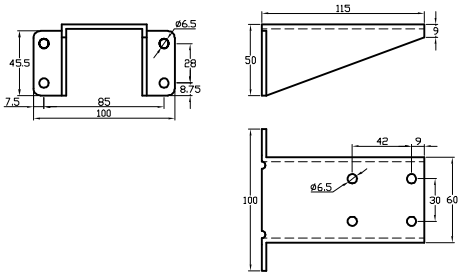
MK F-B6: Fastening bolt as a link between window bracket and eyebolt. For 6 mm eye dia. of eyebolt

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

KST 32

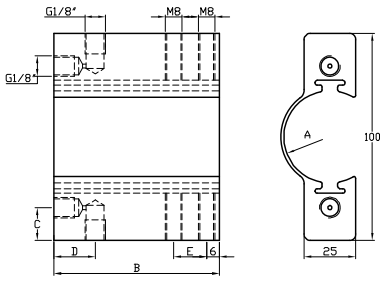
- Clamping elements for continuous adjustability in mounting pneumatic cylinders Series P and D.
  For connection of pipe to the clamping elements KST 32, KST 40 und KST 50, 2 straight connectors (e.g. B1-6-1/8) and 2 elbow connectors (e.g. B5-6-1/8) will be required additionally.
- For connection of 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:

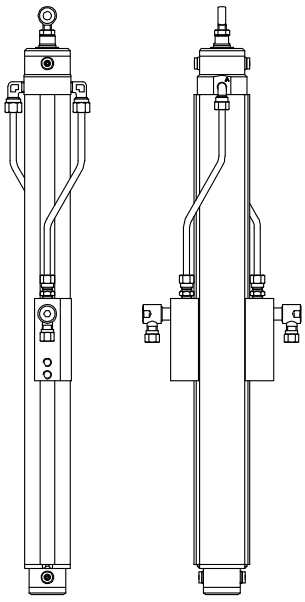
KST 32: Clamping element for continuous adjustability in mounting pneumatic cylinders Type POxx-32 / PUxx-32

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

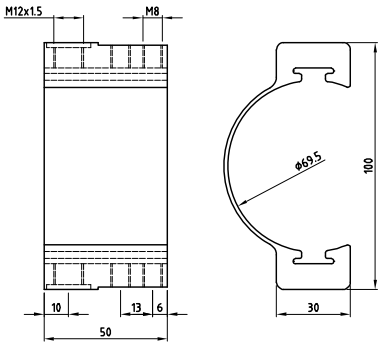
KST 50: Clamping element for continuous adjustability in mounting pneumatic cylinders Type POxx-50 / PUxx-50 / DOxx-50 / DUxx-50

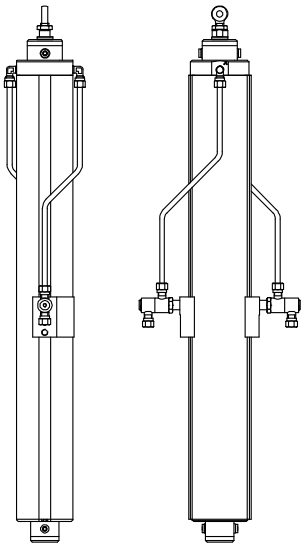


	A	B	C	D
KST 32	Ø 36,0mm	50mm	21mm	10mm
KST 40	Ø 44,5mm	60mm	15,75mm	20mm
KST 50	Ø 55,5mm	60mm	Ø 10,5mm	20mm



KST 63: Clamping element for continuous adjustability in mounting pneumatic cylinders Type POxx-63 / PUxx-63 / DOxx-63 / DUxx-63





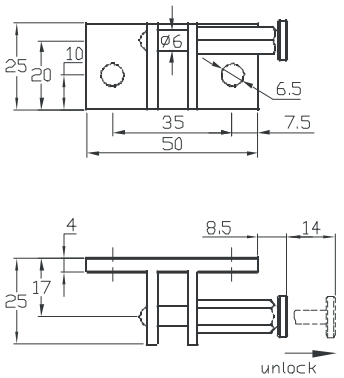
For special types, please inquire

Coupling brackets KB

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

Types:

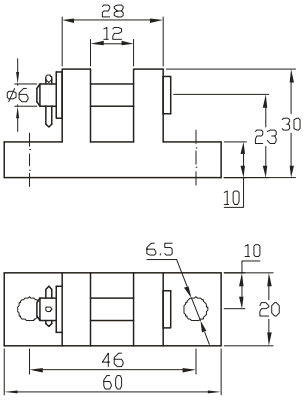
KB-F6: Coupling bracket with spring bolt dia. 6mm



KB-F6

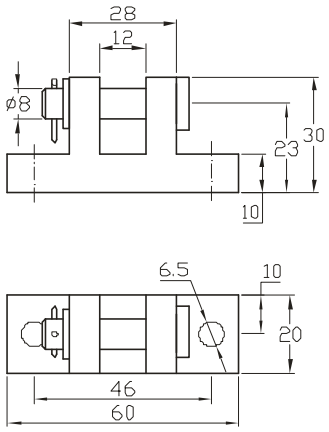
KB-KBB 6: Coupling bracket with bolt dia. 6mm
(including washer and cotter pin)

KB-KBB 6



KB-KBB6

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



KB-KBB 8

Eyebolts AS

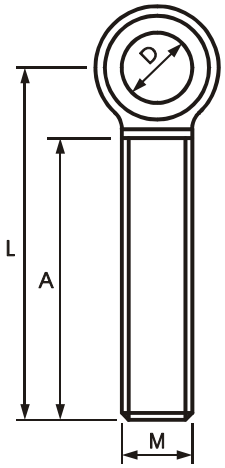
Eyebolts of galvanized steel, including locknut

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

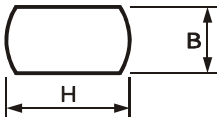
AS M8x60-Ø10: Eyebolt M8 x 60, eye dia. 10mm

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

dim. in mm	A	B	D	H	L	M
AS M8x40-Ø6	30	7,5	6,1	18	40	M8
AS M8x40-Ø8	30	7,5	8,1	18	40	M8
AS M8x40-Ø10	30	7,5	10,1	18	40	M8
AS M8x60-Ø8	50	7,5	8,1	18	60	M8
AS M8x60-Ø10	50	7,5	10,1	18	60	M8
AS M8x80-Ø8	40	7,5	8,1	18	80	M8
AS M8x80-Ø10	40	7,5	10,1	18	80	M8
AS M10x60-Ø8	50	7,7	8,1	20	60	M10
AS M10x60-Ø10	50	7,7	10,1	20	60	M10
AS M10x90-Ø8	50	7,7	8,1	20	90	M10
AS M10x90-Ø10	50	7,7	10,1	20	90	M10

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

GK 8/16

Types:

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

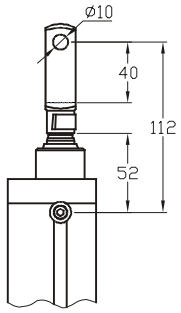
GK 6/24: Clevis with female thread M6, pin diameter 6mm, yoke size 24mm

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

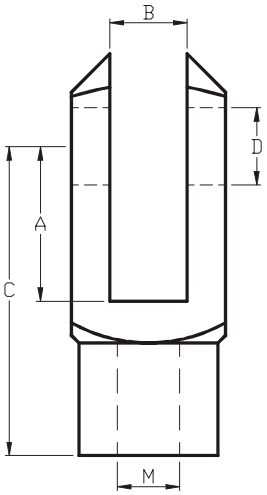
GK 8/32: Clevis with female thread M8, pin diameter 8mm, yoke size 32mm

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



GK 10/40



dim. in mm	A	B	C	D	M
GK 6/12	12	6,1	24	6	M6
GK6/24	24	6,1	36	6	M6
GK 8/16	16	8,1	32	8	M8
GK 8/32	32	8,1	48	8	M8
GK 10/20	20	10,1	40	10	M10
GK10/40	40	10,1	60	10	M10

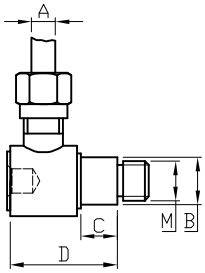
For special types, please inquire

Swivel screw fittings SV / SVP / DSV

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

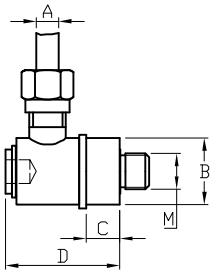
Swivel screw fittings for mounting of, and air supply to, pneumatic cylinders Type POxx und PUxx. Pipe connection with compression type screw fitting:

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"



SV Fig. 1

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"
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"



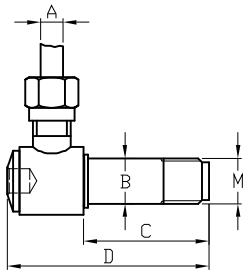
SV Fig. 2

dim. in mm	A	B	C	D	M	Fig.
SV 6-12-1/8	6	12	9	27,3	R 1/8"	1
SV 6-12-1/8-L	6	12	13	31,3	R 1/8"	1
SV 6-12-1/8-XL	6	12	18	36,3	R 1/8"	1
SVP 6-18-1/8	6	18	9	32	R 1/8"	2
SVP 6-18-1/8-L	6	18	13	38	R 1/8"	2
SVP 6-18-1/4	6	18	9	34	R 1/4"	2
SVP 6-18-1/4-L	6	18	14	39	R 1/4"	2
SV 8-12-1/8	8	12	9	27,3	R 1/8"	1
SV 8-12-1/8-L	8	12	13	31,3	R 1/8"	1
SVP 8-18-1/8	8	18	9	32	R 1/8"	2
SVP 8-18-1/8-L	8	18	13	38	R 1/8"	2
SVP 8-18-1/4	8	18	9	34	R 1/4"	2
SVP 8-18-1/4-L	8	18	14	39	R 1/4"	2

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

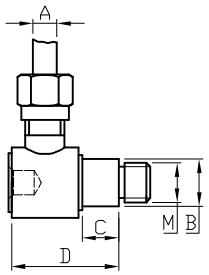


SVPM

dim. in mm	A	B	C	D	M	Cylinder
SVPM 6-12-32	6	12	33	56,5	12	PMxx 32
SVPM 6-12-40	6	12	28	51,5	12	PMxx 40
SVPM 6-12-50	6	12	23	46,5	12	PMxx 50
SVPM 6-12-63	6	12	16	39,5	12	PMxx 63
SVPM 6-12-80	6	12	24	45,5	12	PMxx 80
SVPM 8-12-32	8	12	33	56,5	12	PMxx 32
SVPM 8-12-40	8	12	28	51,5	12	PMxx 40
SVPM 8-12-50	8	12	23	46,5	12	PMxx 50
SVPM 8-12-63	8	12	16	39,5	12	PMxx 63
SVPM 8-12-80	8	12	24	45,5	12	PMxx 80

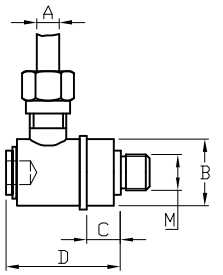
Swivel screw fittings for mounting of, and air supply to, pneumatic cylinders Type FO, FO2 und DH.
Pipe connection with compression type fitting:

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 Fig. 1

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"



SV Fig. 2

dim. in mm	A	B	C	D	M	Fig.
SV 6-12-1/8	6	12	9	27,3	R 1/8"	1
SV 6-12-1/8-L	6	12	13	31,3	R 1/8"	1
SV 6-12-1/8-XL	6	12	18	36,3	R 1/8"	1
SV 6-18-1/8	6	18	9	32	R 1/8"	2
SV 6-18-1/8-L	6	18	13	38	R 1/8"	2
SV 6-18-1/4	6	18	9	34	R 1/4"	2
SV 6-18-1/4-L	6	18	14	39	R 1/4"	2
SV 8-12-1/8	8	12	9	27,3	R 1/8"	1
SV 8-12-1/8-L	8	12	13	31,3	R 1/8"	1
SV 8-18-1/8	8	18	9	32	R 1/8"	2
SV 8-18-1/8-L	8	18	13	38	R 1/8"	2
SV 8-18-1/4	8	18	9	34	R 1/4"	2
SV 8-18-1/4-L	8	18	14	39	R 1/4"	2

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"

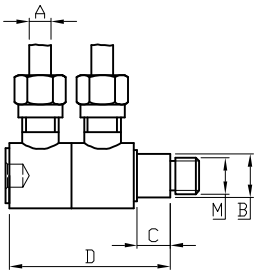
DSV 6-18-1/8

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

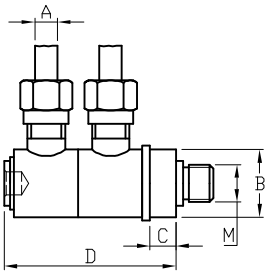
DSV 6-18-M12: Double swivel screw fitting for pipes OD 6mm, collar diameter 18mm, thread M12, including washer and nut

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

DSV 6-18-M12



DSV Fig. 1



DSV Fig. 2

dim. in mm	A	B	C	D	M	Fig.
DSV 6-12-1/8	6	12	9	44,5	R 1/8"	1
DSV 6-12-1/8-L	6	12	13	48,5	R 1/8"	1
DSV 6-18-1/8	6	18	7	46	R 1/8"	2
DSV 6-18-1/8-L	6	18	13	52	R 1/8"	2
DSV 6-18-1/4	6	18	9	48	R 1/4"	2
DSV 6-18-1/4-L	6	18	14	53	R 1/4"	2
DSV 8-12-1/8	8	12	9	44,5	R 1/8"	1
DSV 8-12-1/8-L	8	12	13	48,5	R 1/8"	1
DSV 8-18-1/8	8	18	7	46	R 1/8"	2
DSV 8-18-1/8-L	8	18	13	52	R 1/8"	2
DSV 8-18-1/4	8	18	9	48	R 1/4"	2
DSV 8-18-1/4-L	8	18	14	53	R 1/4"	2
DSV 6-18-M12	6	18	7,5	52	M12	2
DSV 8-18-M12	8	18	7,5	52	M12	2

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"

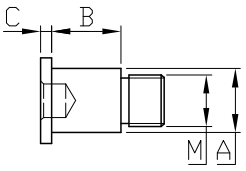


Fig. 1

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**

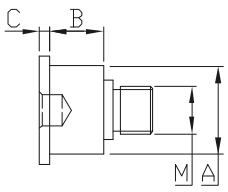


Fig. 2

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

dim. in mm	A	B	C	M	SW
ST 12-1/8	12	13	4	R 1/8"	17
ST 18-1/8	18	7	5	R 1/8"	19
ST 18-1/4	18	9	6	R 1/8"	19
ST 18-M12	18	7,5	6,5	M12	22

For special types, please inquire

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**

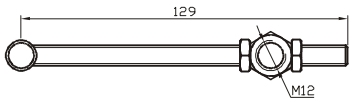
- Maximum locking force 4.000N

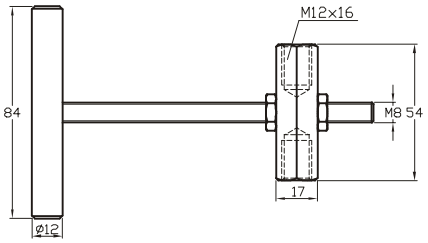
Types:

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

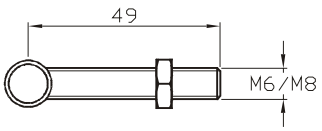
Accessories:

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)



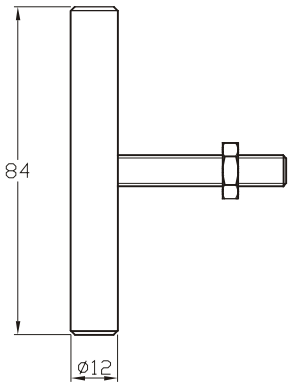


Extension sets: Extension sets to be fitted to RWA mountings for coupling an additional ventilation actuator. In ventilation mode, the RWA cylinder will follow idle



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

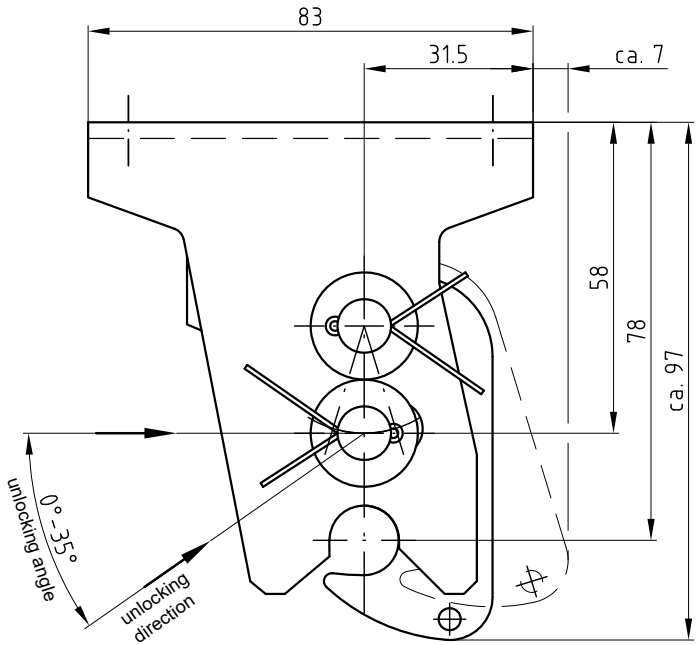


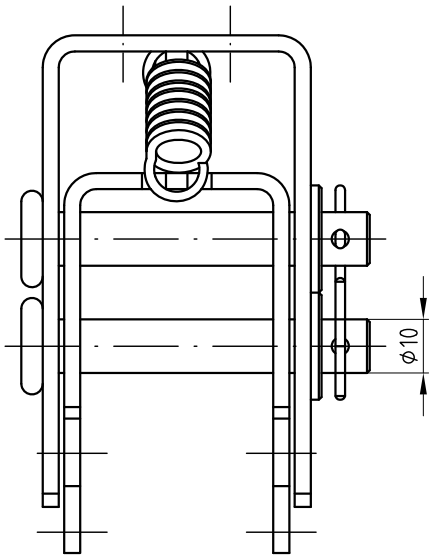
Set-L3-M6: Screw M6 with cross pin dia. 12mm, to be screwed into the ventilation actuator

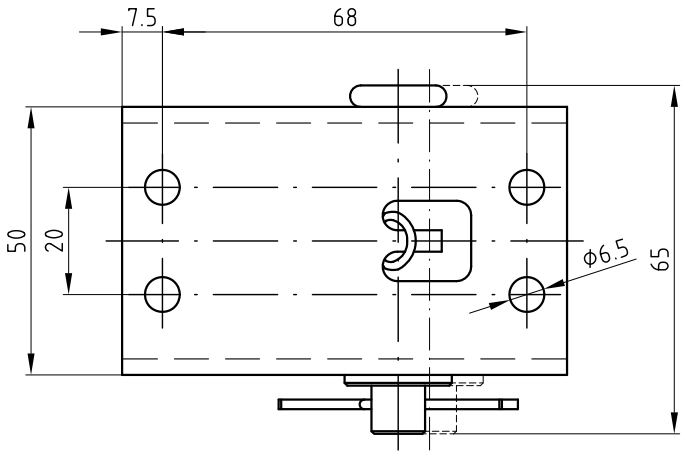
Set-L3-M6 / ST 12-1/8: Set additionally includes 2 plugs ST 12-1/8

For special types, please inquire

Dateiname: Qf0510B







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 depents 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	5000N
VdS approval no.	G 592011
ambient temperature range	-25°C - +110°C

Release force:

Depending on the MHV-type - see table

MHV-type	min. release force
MHV-3	430N
MHV-3.01	285N
MHV-3.02	650N

GRASL
Pneumatic-Mechanik GmbH
A-3454 Reidling
Europastraße 1

Freimaßtoleranz nach DIN 7168:

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

	Datum	Name
Bear.	08.09.2009	Simetzberger
Gepr.	16.02.2012	KW
Norm		

Bezeichnung:

Data sheet
Mechanical hook locking device MHV-3

Zus.	Änderung	Datum	Name
04	Version Italienisch	15.02.2012	SA
03	Text	15.06.2010	SA
02	Text	17.05.2010	SA
01	Tabelle Auslösekraft	15.03.2010	SA

Type: MHV-3

Zeichnung Nr.: 03.012.DAT.00.04-E

Blatt: BL.

(Urspr.) (Ers.f.:) 03.012.DAT.00.03 (Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

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
- VdS approval no. **G 592011**

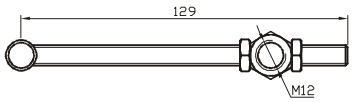
- Maximum locking force 4.000N

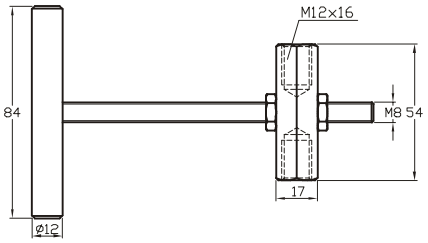
Types:

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

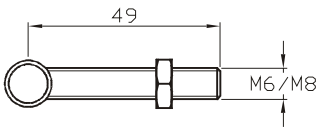
Accessories:

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)



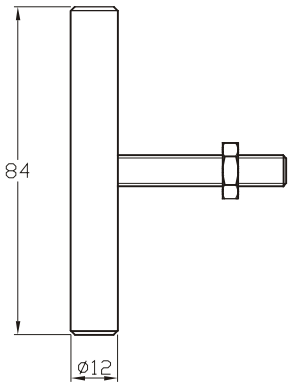


Extension sets: Extension sets to be fitted to RWA mountings for coupling an additional ventilation actuator. In ventilation mode, the RWA cylinder will follow idle



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

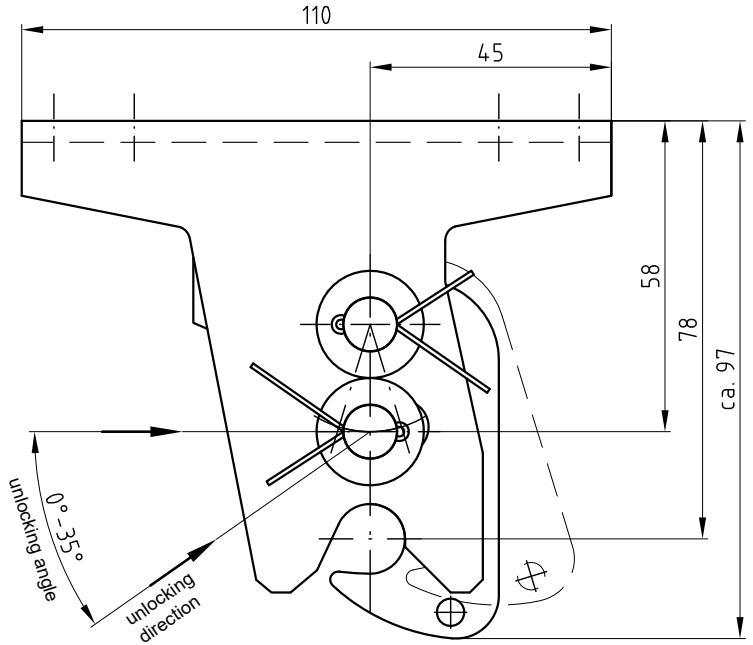


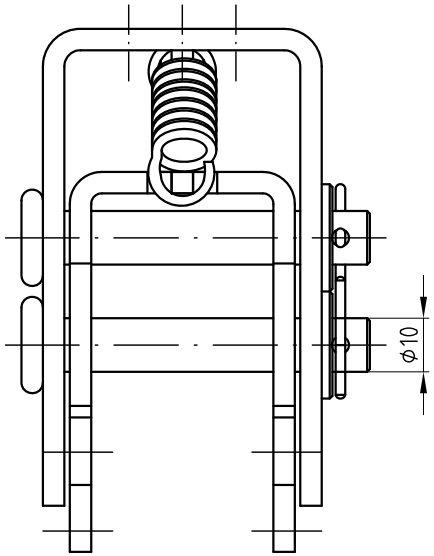
Set-L3-M6: Screw M6 with cross pin dia. 12mm, to be screwed into the ventilation actuator

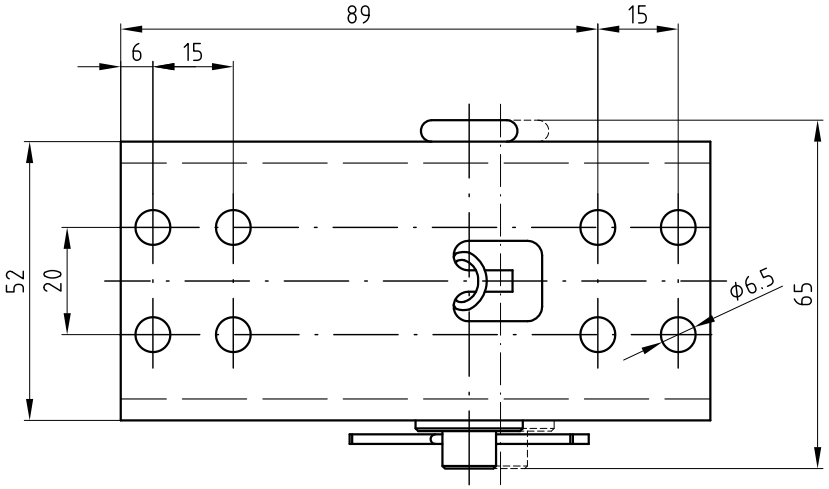
Set-L3-M6 / ST 12-1/8: Set additionally includes 2 plugs ST 12-1/8

For special types, please inquire

Dateiname: Qf0510B







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 depents 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 592011
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

MHV-type	min. release force
MHV-4.1	430N
MHV-4.11	285N
MHV-4.12	650N

GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff:
						ID - Nr.:
					Datum	Name
				Bear.	08.09.2009	Simetzberger
				Gepr.	16.02.2012	KW
				Norm		
03	Version Italienisch	15.02.2012	SA	Type: MHV-4.1		Zeichnung Nr.: 03.012.DAT.03.03-E / Blatt BL.
02	Text	17.05.2010	SA			
01	Tabelle Auslösekraft	15.03.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 03.012.DAT.03.02 (Ers.d.:)

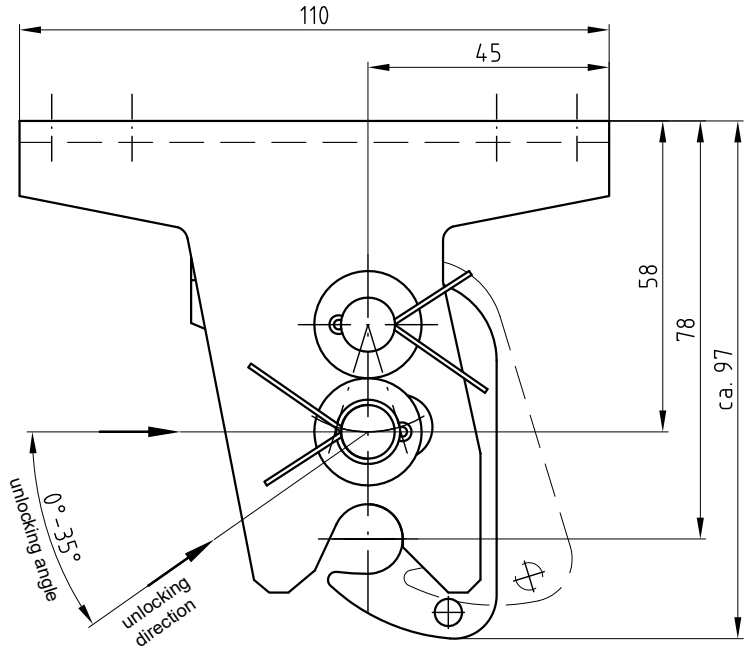
Bezeichnung:
Data sheet
Mechanical hook locking device MHV-4.1

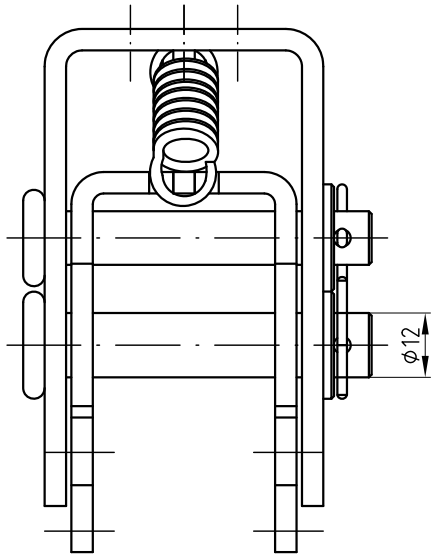
erstellt am
28.5.2002 ER

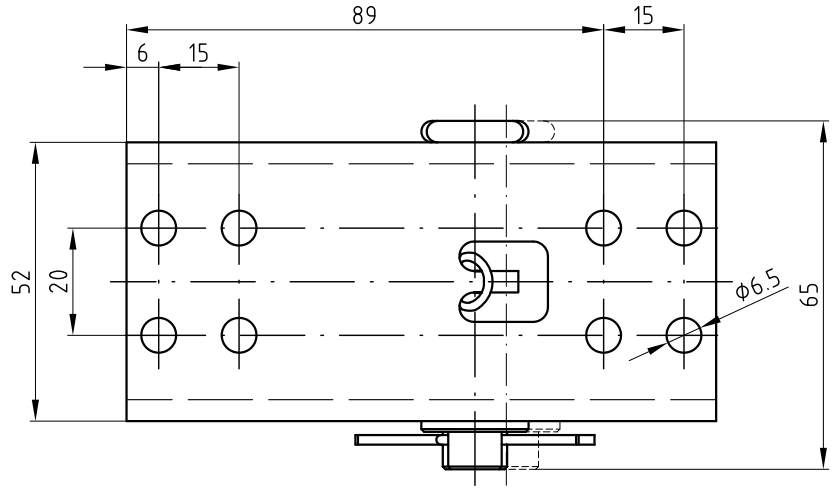
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B







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 depents 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 592011
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

MHV-type	min. release force
MHV-4.2	430N
MHV-4.21	285N
MHV-4.22	650N

GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff:
						ID - Nr.:
					Datum	Name
				Bear.	08.09.2009	Simetzberger
				Gepr.	16.02.2012	KW
				Norm		
03	Version Italienisch	15.02.2012	SA	Type: MHV-4.2		Zeichnung Nr.: 03.012.DAT.04.03-E / Blatt BL.
02	Text	17.05.2010	SA			
01	Tabelle Auslösekraft	15.03.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 03.012.DAT.04.02 (Ers.d.:)

Bezeichnung:
Data sheet
Mechanical hook locking device MHV-4.2

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28.5.2002 ER

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29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

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

Dateiname: Qf0510B

Description of function:

The electric window locking device is a locking device, which open the locking hook and release 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	1250N
rated voltage	24VCD
no-load current	0,5A
max. breaking current (overload cut-off)	1,1A
protection class according to DIN EN 60 529	IP42
opening time under full load	ca. 5sek
ambient temperature range	-20°C - +60°C
connection	light grey silicone connection cable (lenght 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 a 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:

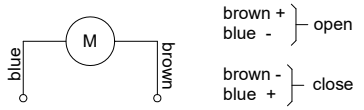
The rated current depends on the locking force - see table

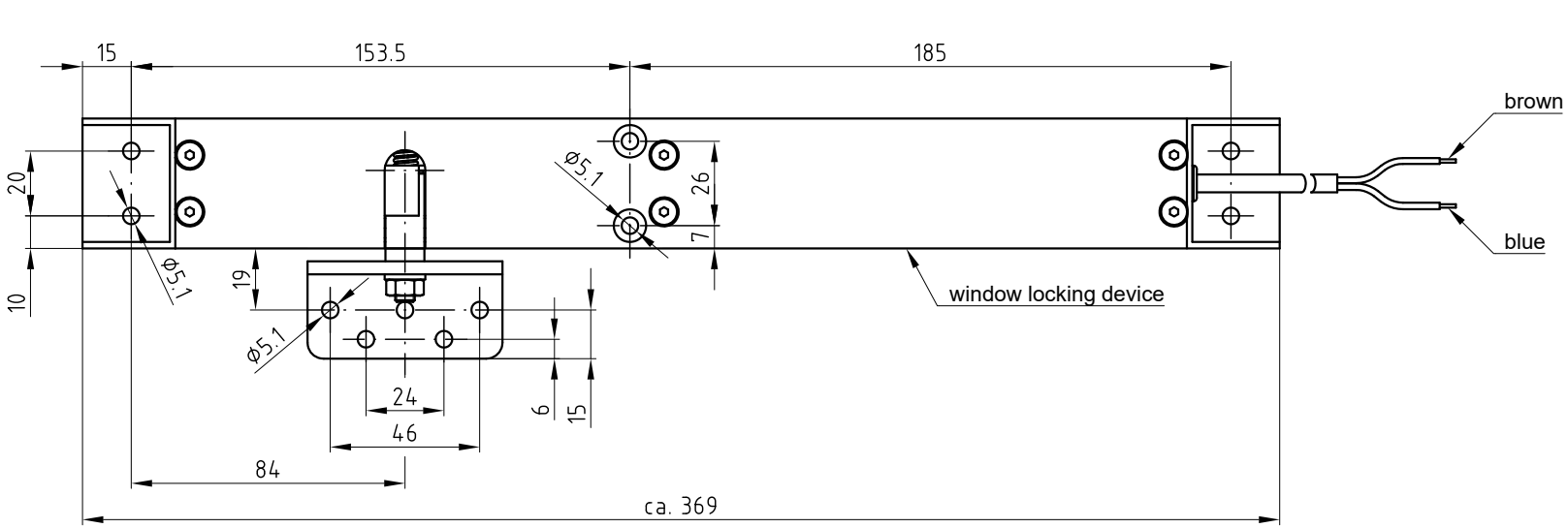
locking force	rated current
1250N	0,8A
1000N	0,7A
750N	0,6A
500N	0,6A

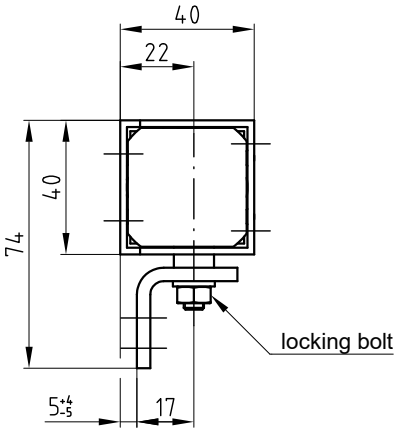
Scope of supply:

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

Circuid diagramm:







GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		
					Datum	Name
				Bear.	07.04.2009	Simetzberger
				Gepr.	26.08.2011	KW
				Norm		
04	Technische Hinweise	18.08.2011	SA			
03	Schutzart	04.11.2010	SA	Type:		
02	Text, Englisch	09.07.2010	SA		EFR	
01	Diverse Änderungen	01.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		

Maßstab: 1:1	Werkstoff:
ID - Nr.:	
Bezeichnung: **Data sheet** Electric window locking device EFR 1.21 for inward opening windows	
Zeichnung Nr.: 03.008.DAT.02.04-E	Blatt BL.
(Ers.f.:) 03.008.DAT.02.03	(Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Description of function:

The electric window locking device is a locking device, which open the locking hook and release 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
protection class according to DIN EN 60 529	IP42
opening time under full load	ca. 5sek
ambient temperature range	-20°C - +60°C
connection	light grey silicone connection cable (lenght 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 a 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:

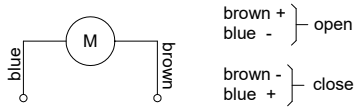
The rated current depends on the locking force - see table

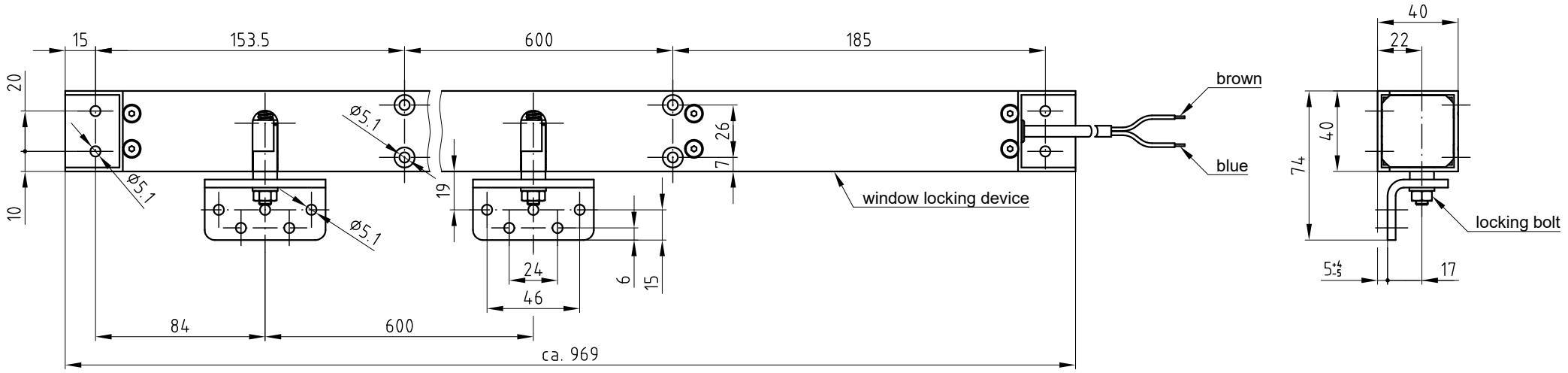
locking force	rated current
1250N	0,9A
1000N	0,8A
750N	0,6A
500N	0,6A

Scope of supply:

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

Circuid diagramm:





GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		
					Datum	Name
				Bear.	07.04.2009	Simetzberger
				Gepr.	26.08.2011	KW
				Norm		
04	Technische Hinweise	18.08.2011	SA			
03	Schutzart	04.11.2010	SA	Type:		
02	Text, Englisch	09.07.2010	SA	EFR		
01	Diverse Änderungen	01.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

Bezeichnung:

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

Zeichnung Nr.: 03.008.DAT.06.04-E | Blatt BL.

(Ers.f.:) 03.008.DAT.06.03 | (Ers.d.:)

erstellt am
28.5.2002 ER

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29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B

Description of function:

The electric window locking device is a locking device, which open the locking hook and release 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	1250N
rated voltage	24VCD
no-load current	0,5A
max. breaking current (overload cut-off)	1,1A
protection class according to DIN EN 60 529	IP42
opening time under full load	ca. 5sek
ambient temperature range	-20°C - +60°C
connection	light grey silicone connection cable (lenght 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 a 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:

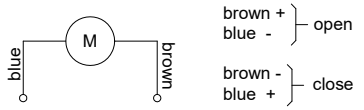
The rated current depends on the locking force - see table

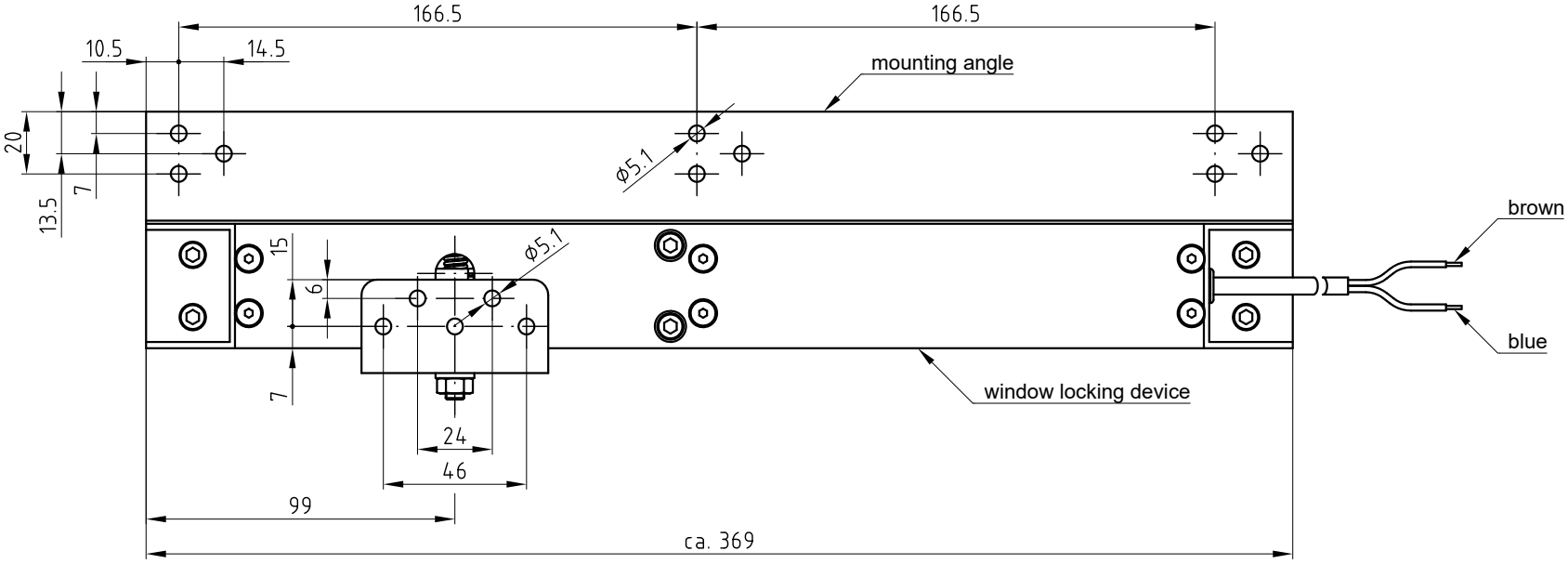
locking force	rated current
1250N	0,8A
1000N	0,7A
750N	0,6A
500N	0,6A

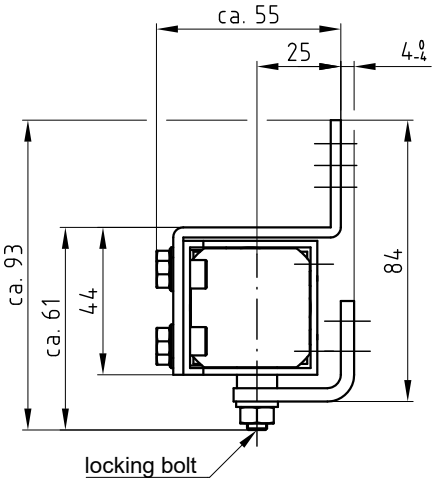
Scope of supply:

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

Circuid diagramm:







GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff:
					Datum	Name
				Bear.	07.04.2009	Simetzberger
				Gepr.	26.08.2011	KW
				Norm		
04	Technische Hinweise	18.08.2011	SA			
03	Schutzart	04.11.2010	SA	Type: EFR		Zeichnung Nr.: 03.008.DAT.03.04-E / Blatt BL.
02	Text, Englisch	09.07.2010	SA			
01	Diverse Änderungen	01.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 03.008.DAT.03.03 (Ers.d.:)

Bezeichnung:
Data sheet
Electric window locking device EFR 1.22
for outward opening windows

ID - Nr.:

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

PFR

- 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

Dateiname: Qf0510B

Description of function:

The pneumatic window locking device is a locking device, which unlock 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:

maximum operating pressure	60bar
static holding force	1250N
connection thread remote control P	G1/8"
ambient temperature range	-25°C - 110°C

Connections:

P ... remote control

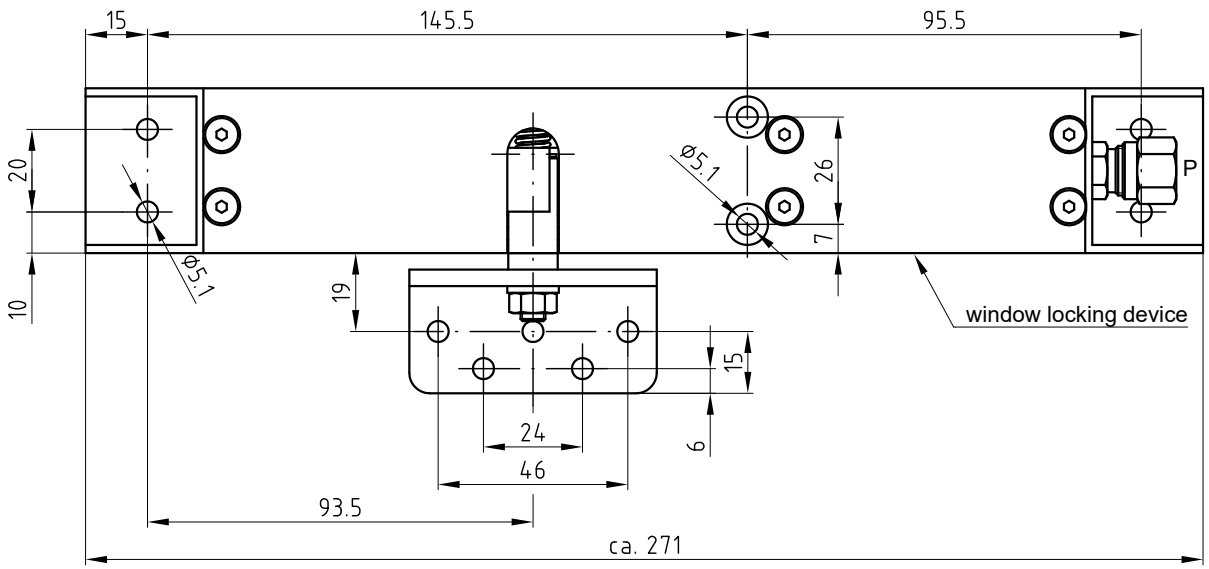
Release pressure:

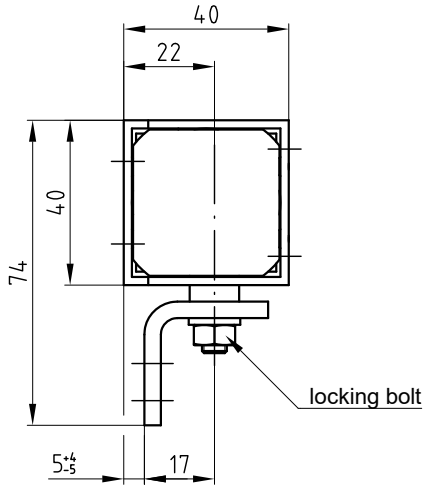
Depending on the locking force - see table

locking force	min. release pressure
1250N	4,7bar
1000N	3,9bar
750N	3,1bar
500N	2,3bar

Scope of supply:

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





GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1		Werkstoff:
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					Datum	Name	Bezeichnung:		
				Bear.	13.11.2008	GöschlS	**Data sheet**		
				Gepr.	19.03.2010	ER	Pneumatic window locking device PFR 1.0		
				Norm					
							Type:	Zeichnung Nr.:	Blatt
							PFR	03.014.DAT.00.01-E	BL.
01	Diverse Änderungen	21.01.2010	SA						
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 03.014.DAT.00.00	(Ers.d.:)	

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B

Description of function:

The pneumatic window locking device is a locking device, which unlock 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:

maximum operating pressure	60bar
static holding force	2x 1250N
connection thread remote control P	G1/8"
ambient temperature range	-25°C - 110°C

Connections:

P ... remote control

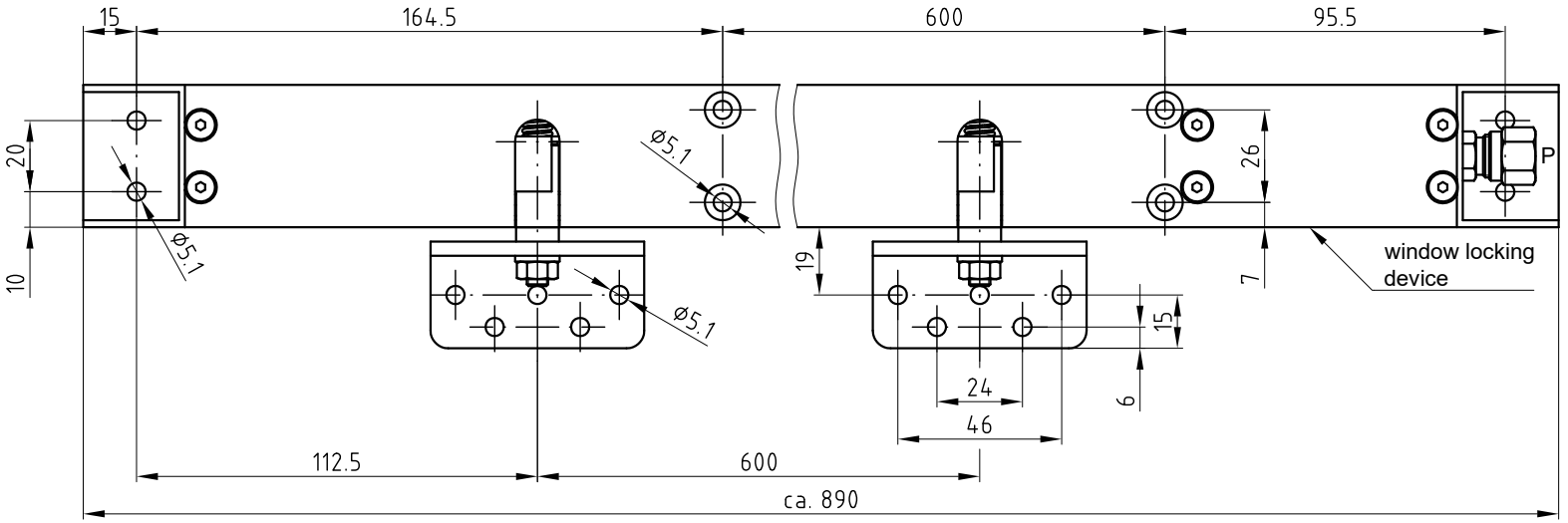
Release pressure:

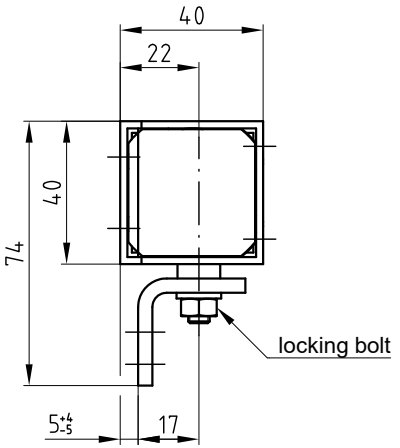
Depending on the locking force - see table

locking force	min. release pressure
1250N	7,8bar
1000N	5,9bar
750N	4,0bar
500N	3,6bar

Scope of supply:

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





GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff:
						ID - Nr.:
					Datum / Name	Bezeichnung: **Data sheet** Pneumatic window locking device PFR 2.0
				Bear.	13.11.2008 GöschlS	
				Gepr.	19.03.2010 ER	
				Norm		
				Type: PFR		Zeichnung Nr.: 03.014.DAT.02.01-E / Blatt BL.
01	Diverse Änderungen	21.01.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 03.014.DAT.02.00 / (Ers.d.:)

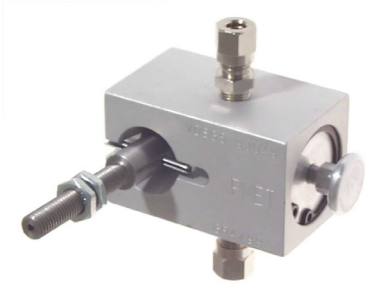
erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

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 CO_2 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**



PMET with bolt M8 and male connectors

Accessories:

PMET-M6: PMET bolt M6 x 40mm, including locknut

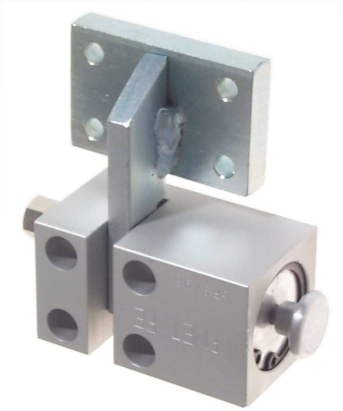
PMET-M8: PMET bolt M8 x 40mm, including locknut

PMET-M10: PMET bolt M10 x 40mm, including locknut

For special types, please inquire

PFET

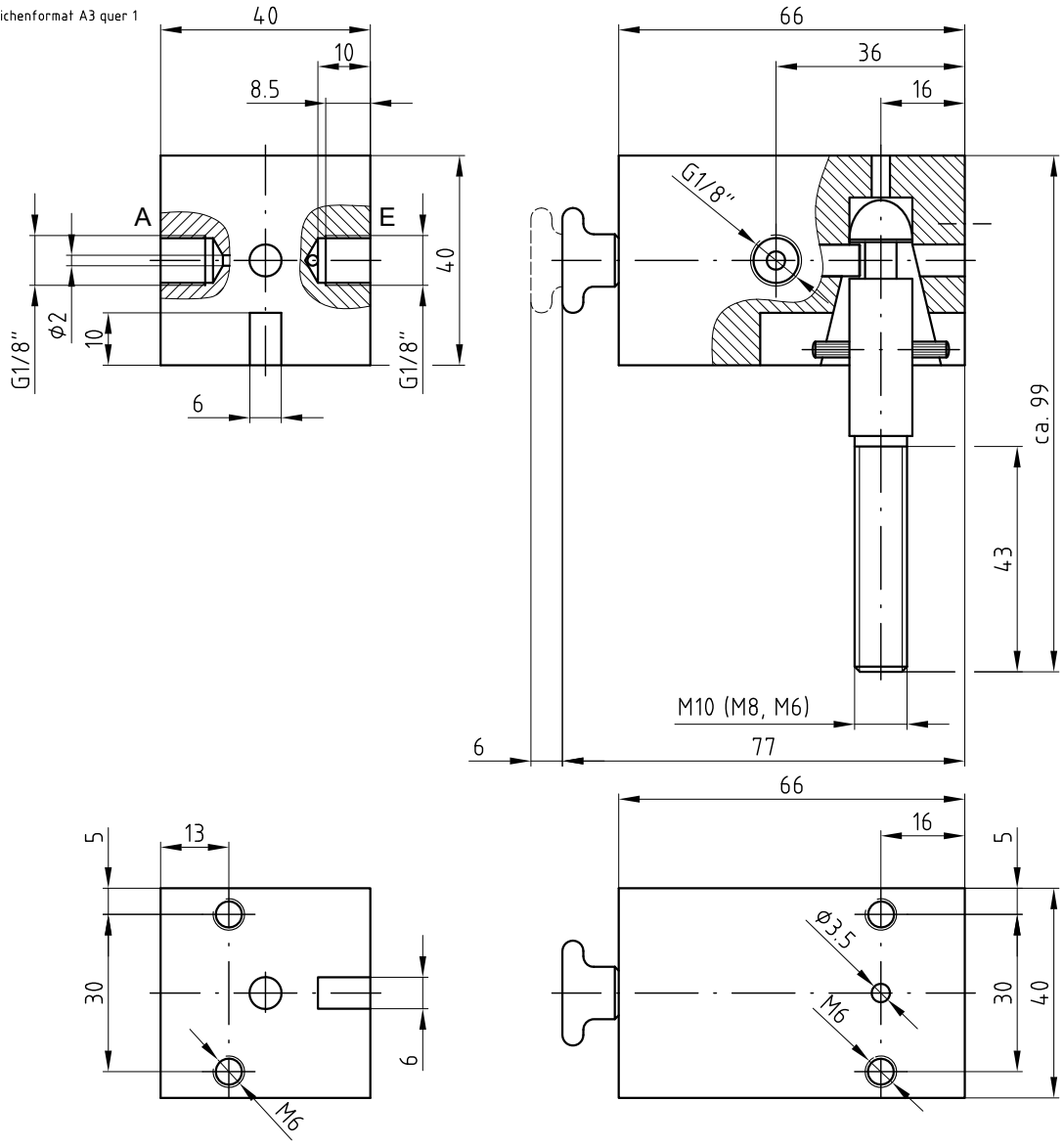
- Pneumatically operated window unlocking device for use in SHE sidewall units
- When SHE unit is closed, locking hook is arrested in the PFET unit
- When PFET is released, the locking hook disengages, allowing the window to open, e.g. by means of gas-pressure springs
- After a release action, closing 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



PFET with male connector

For special types, please inquire

Dateiname: Qf0510B



Technical description:

- To unlock ventilation cylinder or - actuators 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	60bar
minimum operating pressure	4bar
rated locking force	2500N
ambient temperature range	-25°C - +110°C
VdS approval no.	G589049

Min. release pressure:

pulling force [N]	min. release pressure [bar]
650	5,9
1800	14,3
2500	17,9

GRASL
Pneumatic-Mechanik GmbH
A-3454 Reidling
Europastraße 1

Freimaßtoleranz nach DIN 7168:

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

					Datum	Name
				Bear.	05.11.2009	Simetzberger
06	Version Italienisch	15.02.2012	SA	Gepr.	16.02.2012	KW
05	Aktualisierung	27.09.2011	GS	Norm		
04	Werte in Tabelle	10.08.2011	GS			
03	Fasen auf Kolben	12.01.2011	GS	Type:		
02	Aktualisierung	11.06.2010	SA		PMET	
01	Nennhaltekraft	16.03.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		

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

Zeichnung Nr.: 03.011.DAT.00.06-E | Blatt BL.

(Ers.f.:) 03.011.DAT.00.05 (Ers.d.:)

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28.5.2002 ER

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29.5.2002 KW

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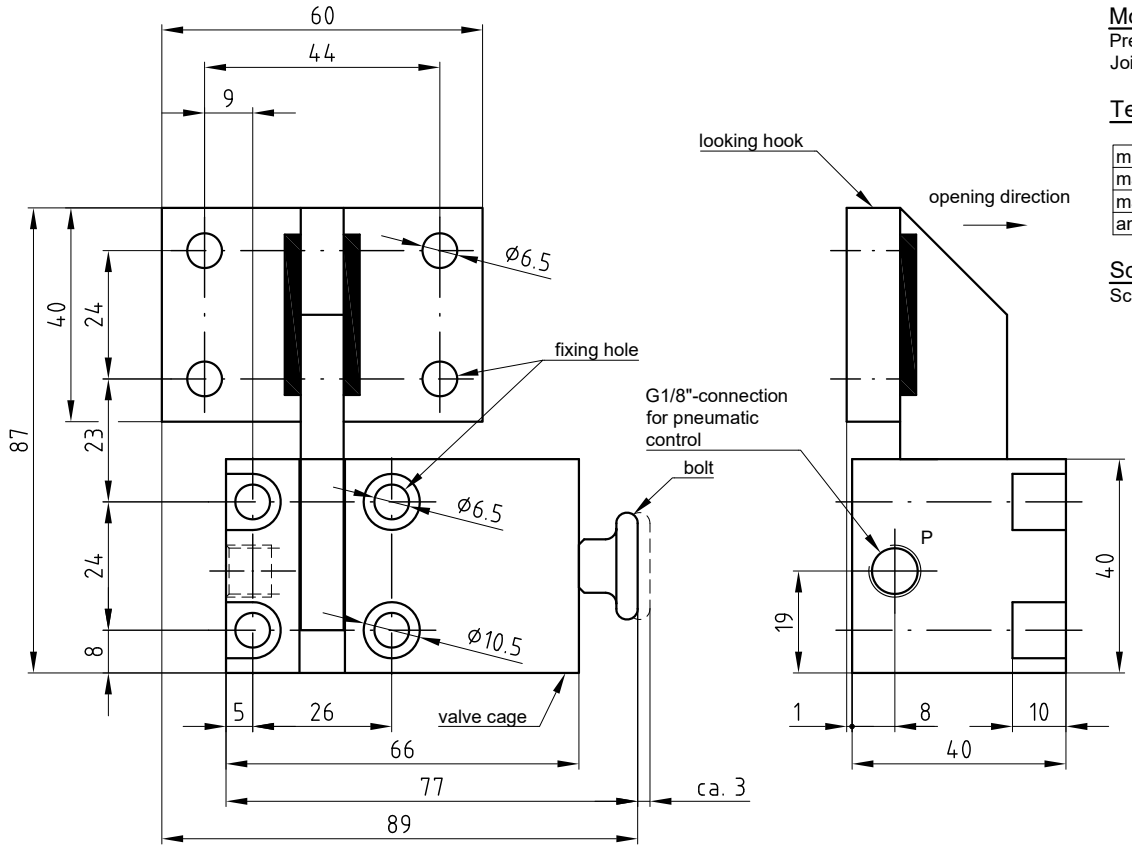
29.5.2002 KW



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

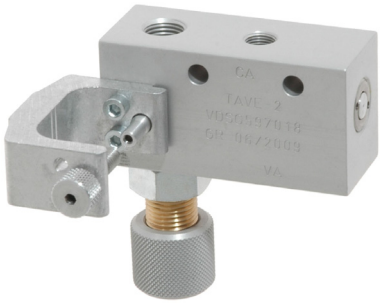
Scope of supply:

Screw connections are NOT included in the scope of supply and must be ordered separately!

Tolerance | Scale 1:1 | Material

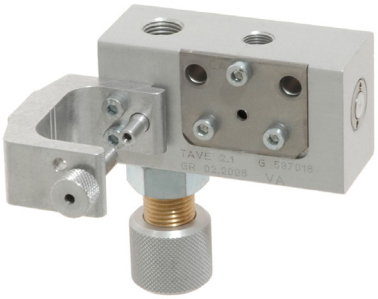
Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Pneumatic window unlocking device PFET	Document Style: Data sheet
Approved: KW	Issue Date: 16.02.2012			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 03.011.DAT.03.02-E

TAVE 2:



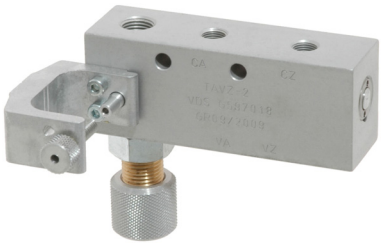
- **VdS approved** thermal release valve with single pipe priority valve for automatic thermal release of a one-way CO_2 bottle with ½" UNF thread (see accessories)
- Suitable thermo bulbs: F5-RWA-68 and F5-RWA-93 (see accessories)
- Integrated priority valve for venting the pipe or for connecting an up-stream 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
- CO_2 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.

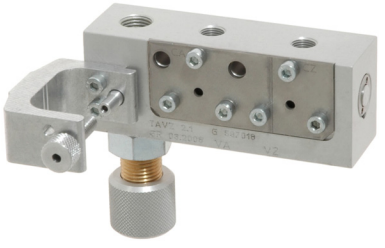
TAVZ 2:



- **VdS approved** thermal release valve with double pipe priority valve for automatic thermal release of a one-way CO_2 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
- CO_2 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

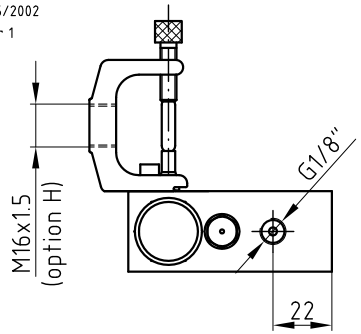
- Design of the SHEVS may require reliable venting of the piping.

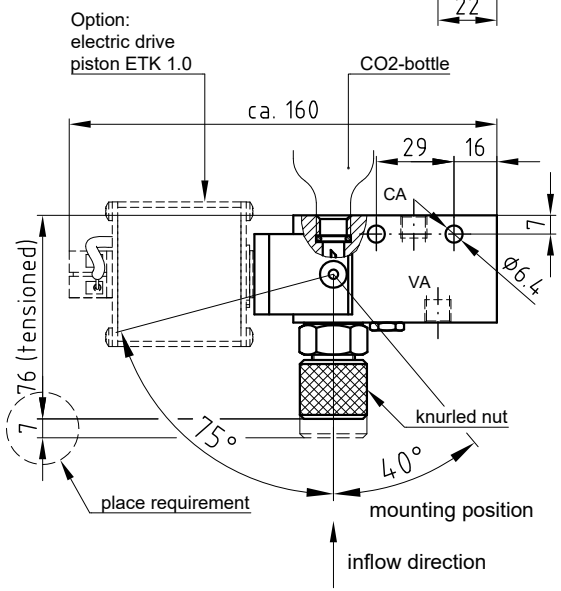
Additional types:

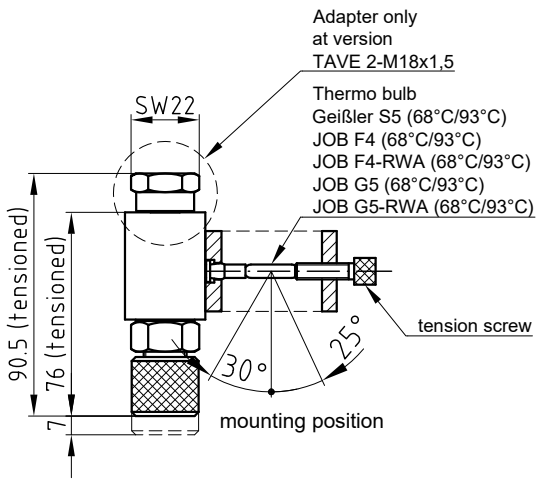


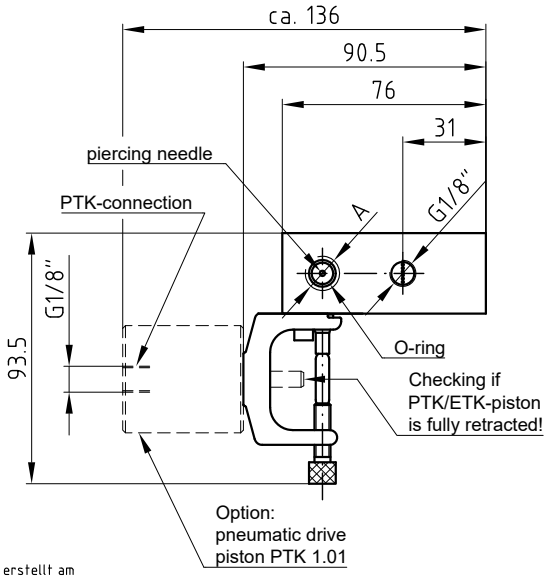
TAVZ 2.1:
Thermal release valve with double pipe priority valve as above with integrated quick action exhaust valve.

Dateiname: Qf0510B









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 CA
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 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.

Types:

Type	Bottle srew-in thread A	Identical number
TAVE 2	1/2" UNF (standard)	402000001010
TAVE 2-M	M18x1.5 (adapter)	402000011010
TAVE 2-F	W21.8x1/14"	402000021010
Option		
TAVE 2-PTK	1/2" UNF (standard)	40200000K010
TAVE 2-M-PTK	M18x1.5 (adapter)	40200001K010
TAVE 2-F-PTK	W21.8x1/14"	40200002K010

Diagram without PTK 1.01:

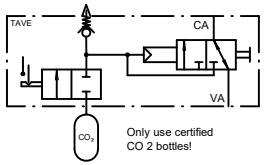
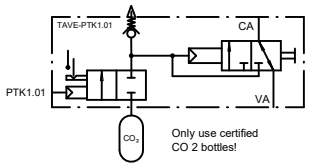


Diagram with PTK 1.01:



GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff: / ID - Nr.:
					Datum	Name
				Bear.	10.12.2008	Göschl
				Gepr.	24.08.2017	HA
				Norm		
02	Text, ETK	04.07.2017	SA	Type: TAVE 2		Zeichnung Nr.: 04.016.DAT.02.02-E / Blatt / BL.
01	Diverse Änderungen	16.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 04.016.DAT.02.01 (Ers.d.:)

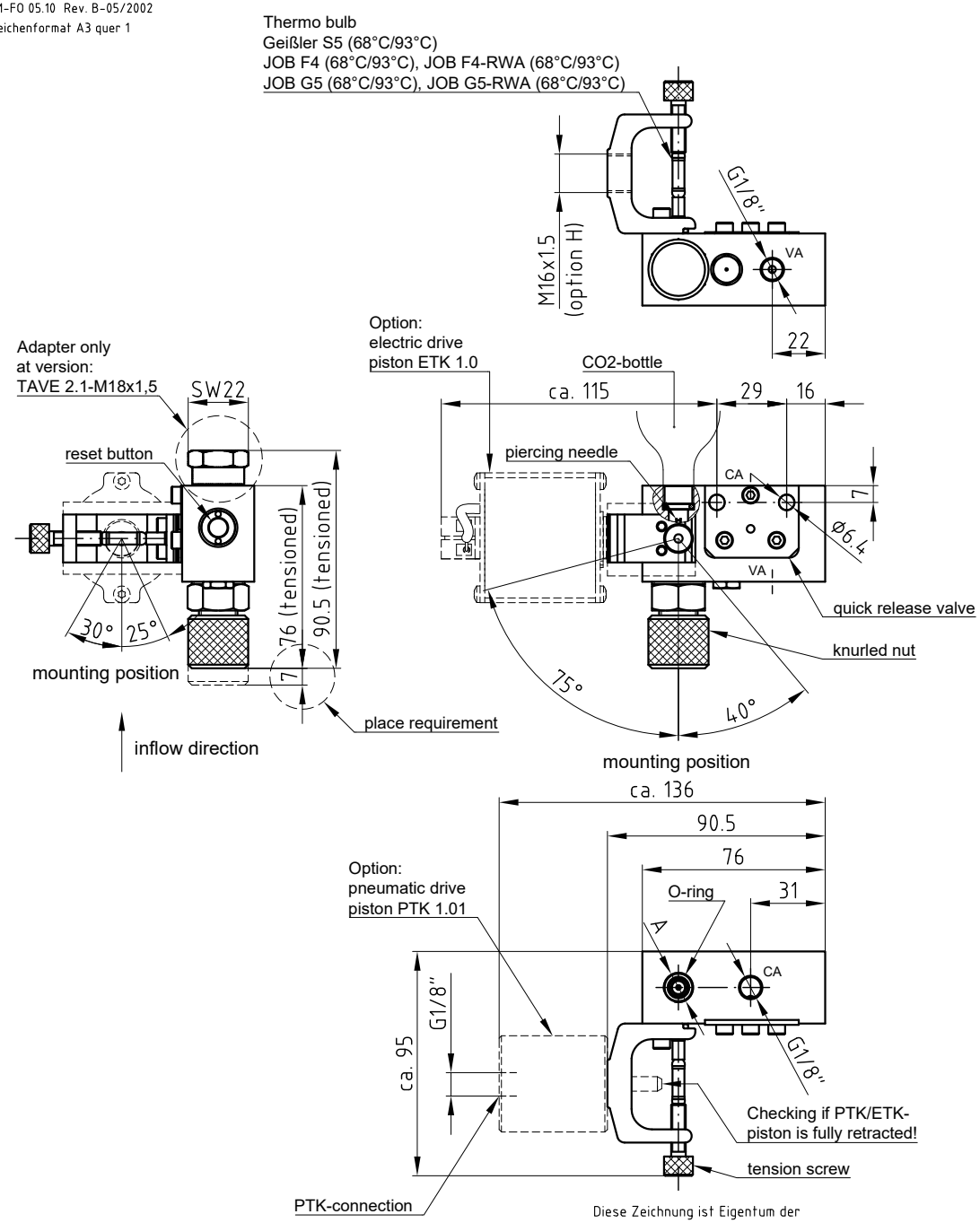
Bezeichnung:
Data sheet
Thermal release valve (single pipe)
TAVE 2

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B



Description of function:

The temperature valve TAVE 2.1 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 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
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 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 resitance) 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	80bar
max. dynamic operating pressure	80bar
nominal width of valve	2mm
nominal width of piercing needle	2mm
ambient temperature range	-25°C - +110°C
releasing pressure PTK (Option)	10 bar
VdS approval no.	G 597018

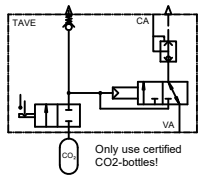
Scope of supply:

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

Types:

Type	Bottle screw-in threads A	
TAVE 2.1	1/2" UNF (standard)	
TAVE 2.1-M	M18x1.5 (adapter)	no VdS-certificate
TAVE 2.1-F	W21.8x1/14"	
Option		
TAVE 2.1-PTK	1/2" UNF (standard)	
TAVE 2.1-M-PTK	M18x1.5 (adapter)	no VdS-certificate
TAVE 2.1-F-PTK	W21.8x1/14"	

Diagram without PTK 1.01:



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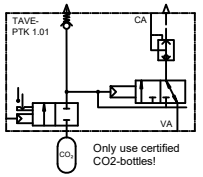


GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff: / ID - Nr.:
					Datum	Name
				Bear.	19.11.2008	Tiefenacher
				Gepr.	24.08.2017	HA
				Norm		
02	Text, ETK	04.07.2017	SA	Type: TAVE 2		Zeichnung Nr.: 04.016.DAT.00.02-E / Blatt / BL.
01	Diverse Änderungen	16.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 04.016.DAT.00.01 (Ers.d.:)

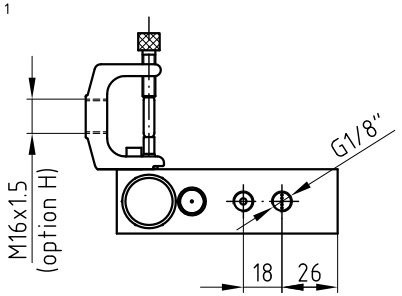
Bezeichnung:
Data sheet
Thermal release valve (single pipe)
TAVE 2.1

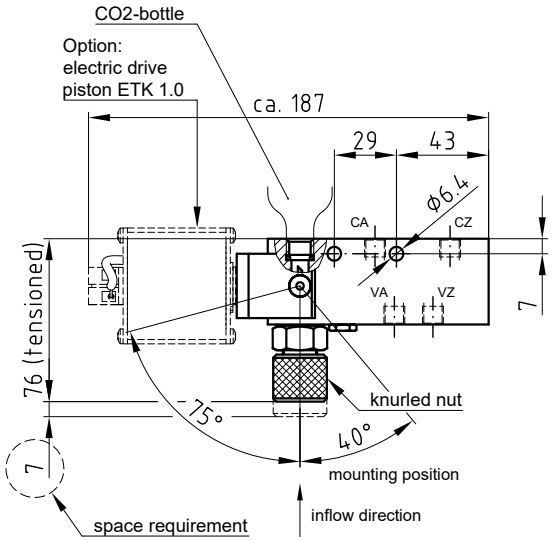
erstellt am
28.5.2002 ER

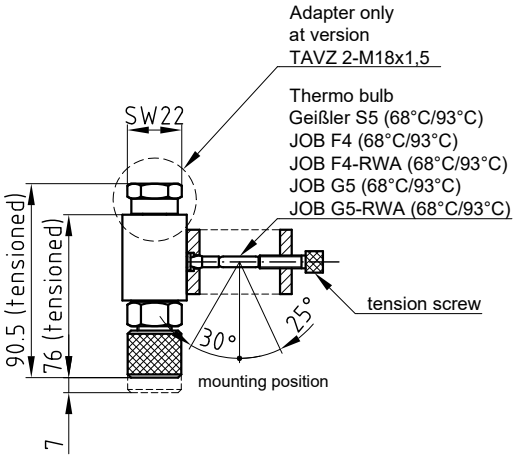
formell geprüft am
29.5.2002 KW

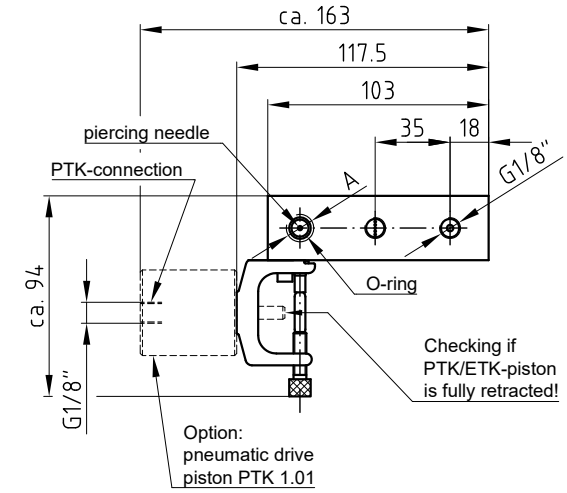
fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B









Description of function:

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, themo bulb and CO2-bottle are NOT included in the scope of supply.

Types:

Type	Bottle srew-in thread A	Identical number
TAVZ 2	1/2" UNF (standard)	402000001030
TAVZ 2-M	M18x1.5 (adapter)	402000011030
TAVZ 2-F	W21.8x1/14"	402000021030
Option		
TAVZ 2-PTK	1/2" UNF (standard)	40200000K030
TAVZ 2-M-PTK	M18x1.5 (adapter)	40200001K030
TAVZ 2-F-PTK	W21.8x1/14"	40200002K030

Diagram without PTK 1.01:

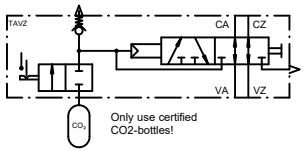
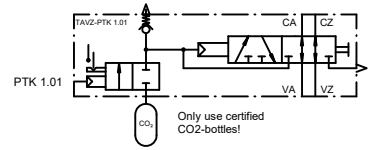


Diagram with PTK 1.01:



GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		
					Datum	Name
				Bear.	10.12.2008	Göschl
				Gepr.	24.08.2017	HA
				Norm		
03	Text, ETK	04.07.2017	SA	Type: TAVZ 2		
02	Version Französisch	06.06.2011	SA			
01	Diverse Änderungen	16.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		

Maßstab: 1:1 | Werkstoff:
ID - Nr.:

Bezeichnung:
Data sheet
Thermal release valve (double pipe)
TAVZ 2

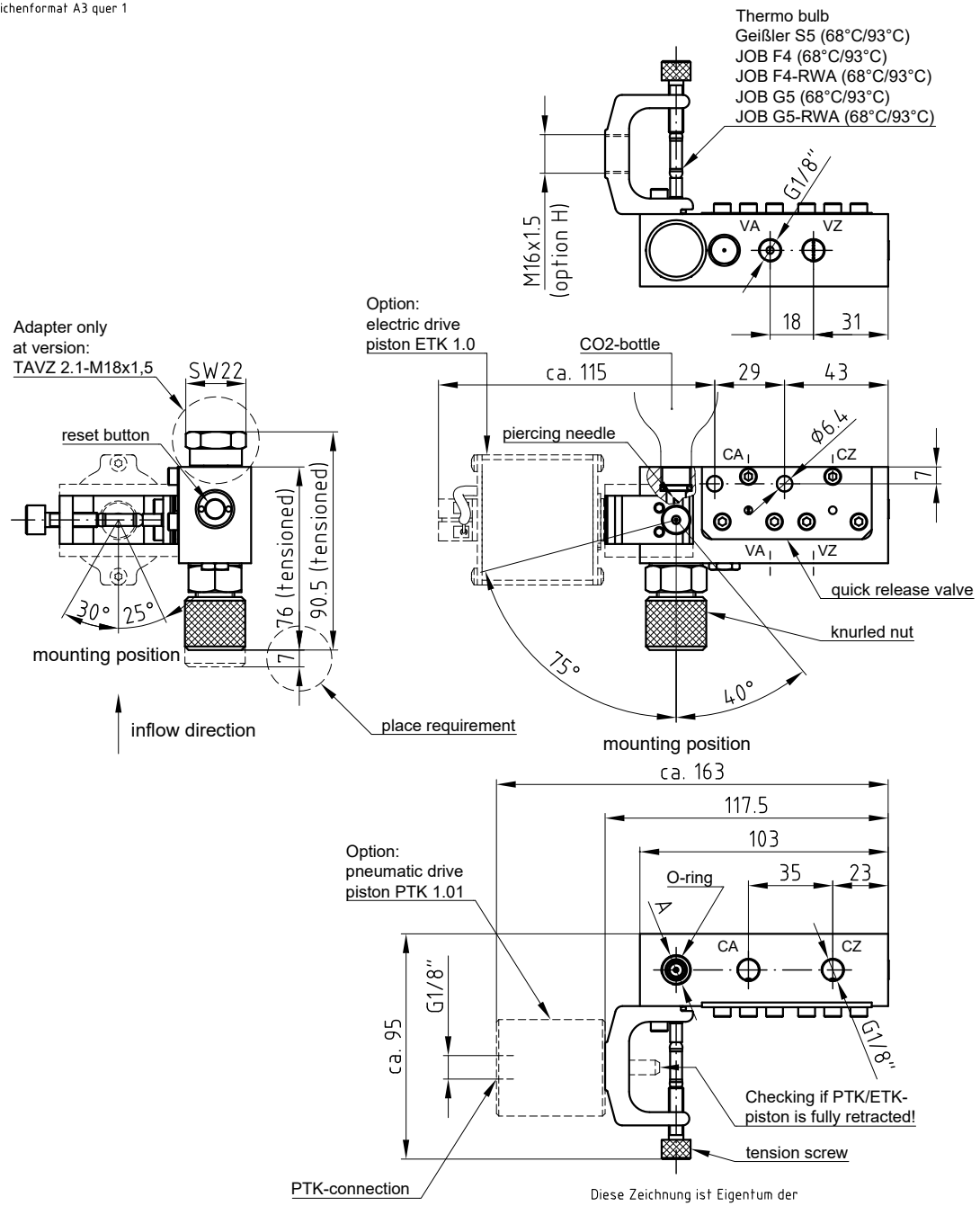
Zeichnung Nr.: 04.015.DAT.02.03-E | Blatt BL.
(Ers.f.:) 04.015.DAT.02.02 | (Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B



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 a 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) 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 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 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 resitance) 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	80bar
max. dynamic operating pressure	80bar
nominal width of valve	2mm
nominal width of piercing needle	2mm
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.

Types:

Type	Bottle screw-in threads A	
TAVZ 2.1	1/2" UNF (standard)	
TAVZ 2.1-M	M18x1.5 (adapter)	no VdS-certificate
TAVZ 2.1-F	W21.8x1/14"	
Option		
TAVZ 2.1-PTK	1/2" UNF (standard)	
TAVZ 2.1-M-PTK	M18x1.5 (adapter)	no VdS-certificate
TAVZ 2.1-F-PTK	W21.8x1/14"	

Diagram without PTK 1.01:

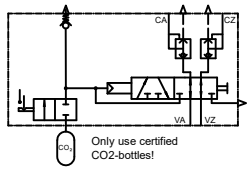
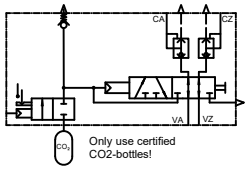


Diagram with PTK 1.01:



GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		
					Datum	Name
				Bear.	19.11.2008	Tiefenbacher
				Gepr.	24.08.2017	HA
				Norm		
02	Text, ETK	04.07.2017	SA	Type: TAVZ 2		
01	Diverse Änderungen	16.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		

Maßstab: 1:1 — Werkstoff:
ID - Nr.:
Bezeichnung:
Data sheet
Thermal release valve (double pipe)
TAVZ 2.1
Zeichnung Nr.: 04.015.DAT.00.02-E — Blatt — BL.
(Ers.f.:) 04.015.DAT.00.01 — (Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

TAVE 2.x

- Combination release valve for automatic thermal release action, combined with another control method.
  Release of one CO_2 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
- CO_2 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 up-stream 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

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

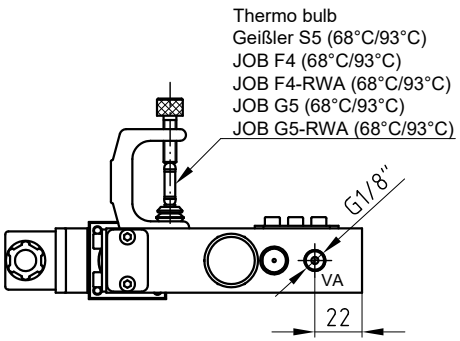
Options:

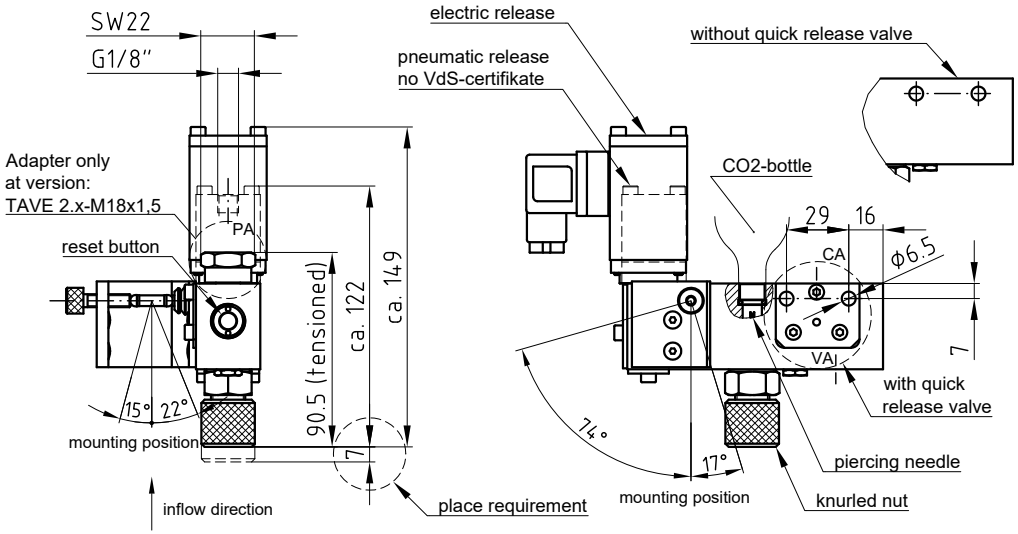
F (**F**rançaise): designed for CO_2 bottles with W21,8 x 1/14" thread.
Version for the French market

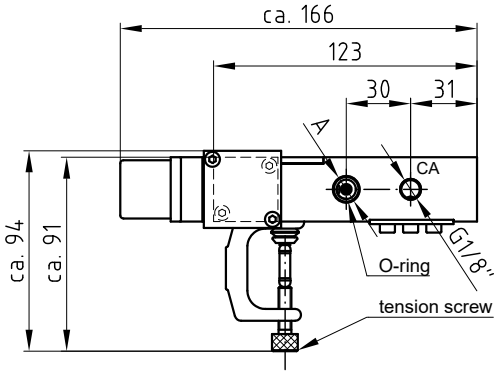
M18 x 1,5: design for CO_2 bottles with M18 x 1,5 thread

For special types please inquire.

Dateiname: Qf0510B







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). It mus 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) 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 resitance) the knurled nut has to be turned in approximately 1/2 a turn in addition.
3) Fully tighten knurled nut.
4) Check if the piercing needle is positioned behind the piercing surface of the bottle screw-in thread.
5) Lightly grease the O-ring in the bottle screw-in thread.
6) Check if the reset button is in the correct position.
7) Screw in CO2-bottle.
8) 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	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

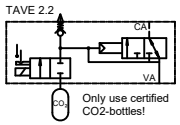
Types:

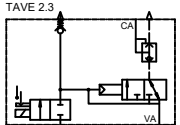
Type	Bottle screw-in threads A	Quick release valve	Remote control	
TAVE 2.2	1/2" UNF (standard)	no	eletric	
TAVE 2.2-M18x1,5	M18x1.5 (adapter)	no	eletric	no VdS-certificate
TAVE 2.2-F	W21.8x1/14"	no	eletric	
TAVE 2.3	1/2" UNF (standard)	yes	eletric	
TAVE 2.3-M18x1,5	M18x1.5 (adapter)	yes	eletric	no VdS-certificate
TAVE 2.3-F	W21.8x1/14"	yes	eletric	
TAVE 2.4	1/2" UNF (standard)	no	pneumatic	no VdS-certificate
TAVE 2.4-M18x1,5	M18x1.5 (adapter)	no	pneumatic	no VdS-certificate
TAVE 2.4-F	W21.8x1/14"	no	pneumatic	no VdS-certificate
TAVE 2.5	1/2" UNF (standard)	yes	pneumatic	no VdS-certificate
TAVE 2.5-M18x1,5	M18x1.5 (adapter)	yes	pneumatic	no VdS-certificate
TAVE 2.5-F	W21.8x1/14"	yes	pneumatic	no VdS-certificate

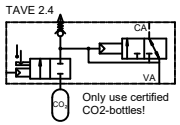
Scope of supply:

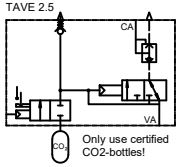
Screw connections, thermo bulb and CO2-bottle are NOT included in the scope of supply.

Circuit diagramms:









GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff: / ID - Nr.:
					Datum	Name
				Bear.	24.02.2009	Tiefenbacher
				Gepr.	24.08.2017	HA
				Norm		
03	Text, Magnet	04.07.2017	SA	Type: TAVE 2		Zeichnung Nr.: 04.016.DAT.01.03-E / Blatt / BL.
02	Inbetriebnahme	29.09.2011	SA			
01	Diverse Änderungen	16.02.2010	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 04.016.DAT.01.02 (Ers.d.:)

Bezeichnung:
Data sheet
Thermal release valve (single pipe)
TAVE 2.2, TAVE 2.3, TAVE 2.4, TAVE 2.5

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

TAVZ 2.x

- Combination release valve for automatic thermal release action, combined with another control method.
  Release of one CO_2 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
- CO_2 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 up-stream 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

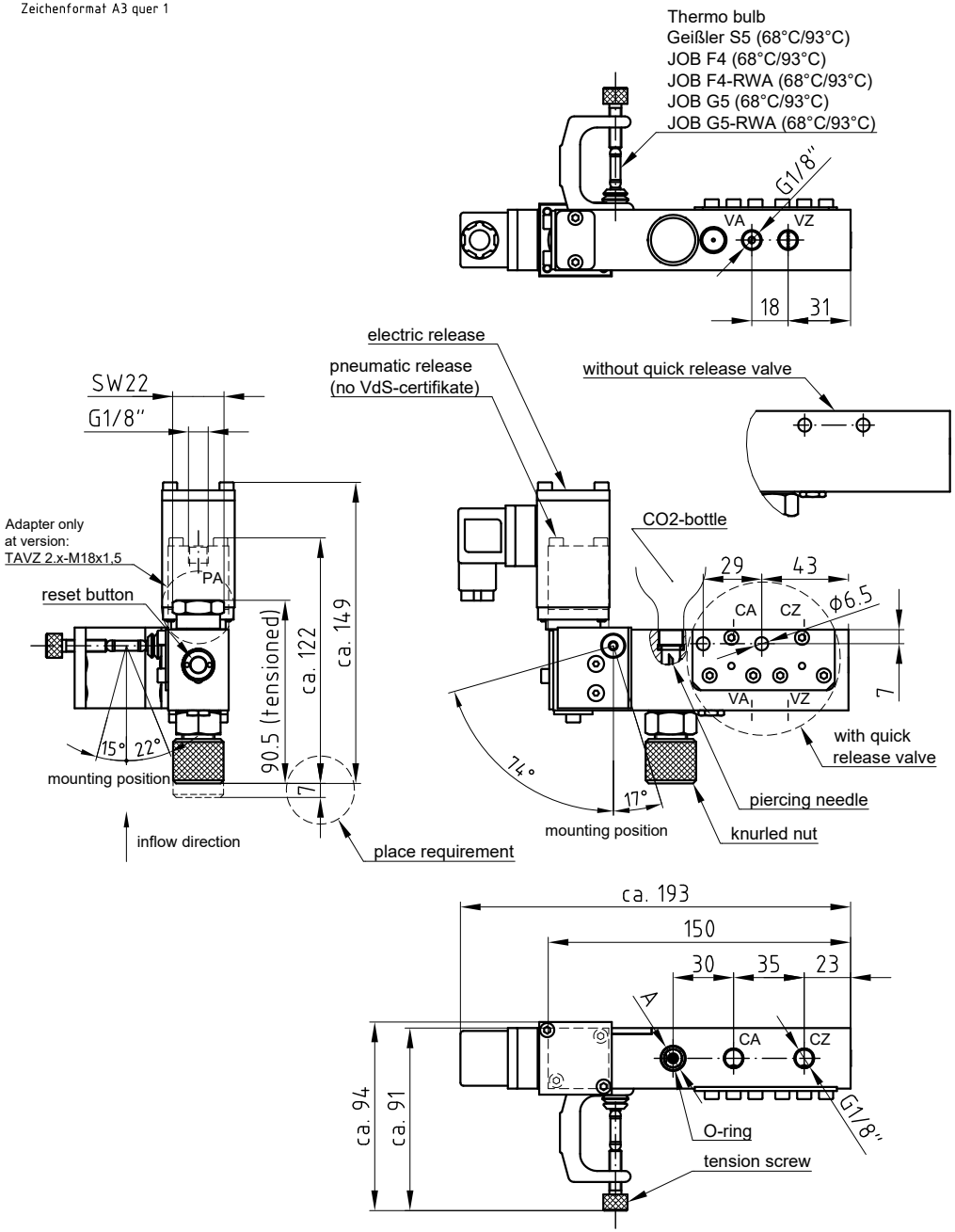
Options:

F (**F**rançaise): designed for CO_2 bottles with W21,8 x 1/14" thread. Version for the French market

M18 x 1,5: design for CO_2 bottles with M18 x 1,5 thread

For special types please inquire.

Dateiname: Qf0510B



Description of function:

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 a 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 qui 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 on PA. (TAVZ 2.4, TAVZ 2.5 / no VdS-certificate)

Mounting:

1) Join connections as follows:
   CA ... cylinder OPEN, **CZ** ... cylinder CLOSE, **VA** ... vent line or CO2 line OPEN, **VZ** ... vent line or CO2 line CLOSE
2) When using a CO2 one-way bottle the temperature valve 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) Insert the 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 resitance) 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.
- 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	80bar
max. dynamic operating pressure	80bar
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 TAVZ 2.2/2.3)	G 597018

Types:

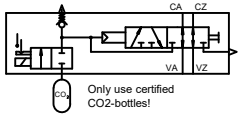
Type	Bottle screw-in threads A	Quick release valve	Remote control	
TAVZ 2.2	1/2" UNF (standard)	no	eletric	
TAVZ 2.2-M18x1,5	M18x1.5 (adapter)	no	eletric	no VdS-certificate
TAVZ 2.2-F	W21.8x1/14"	no	eletric	
TAVZ 2.3	1/2" UNF (standard)	yes	eletric	
TAVZ 2.3-M18x1,5	M18x1.5 (adapter)	yes	eletric	no VdS-certificate
TAVZ 2.3-F	W21.8x1/14"	yes	eletric	
TAVZ 2.4	1/2" UNF (standard)	no	pneumatic	no VdS-certificate
TAVZ 2.4-M18x1,5	M18x1.5 (adapter)	no	pneumatic	no VdS-certificate
TAVZ 2.4-F	W21.8x1/14"	no	pneumatic	no VdS-certificate
TAVZ 2.5	1/2" UNF (standard)	yes	pneumatic	no VdS-certificate
TAVZ 2.5-M18x1,5	M18x1.5 (adapter)	yes	pneumatic	no VdS-certificate
TAVZ 2.5-F	W21.8x1/14"	yes	pneumatic	no VdS-certificate

Scope of supply:

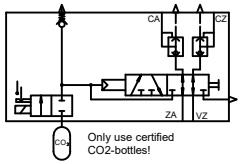
Screw connections, thermo bulb and CO2-bottle are NOT included in the scope of supply.

Circuit diagramms:

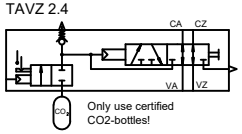
TAVZ 2.2



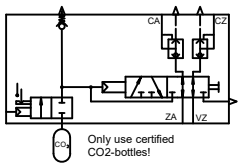
TAVZ 2.3



TAVZ 2.4



TAVZ 2.5



GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		
					Datum	Name
				Bear.	10.12.2008	Göschl
				Gepr.	24.08.2017	HA
				Norm		
04	Text, Magnet	04.07.2017	SA			
03	Inbetriebnahme	29.09.2011	SA			
02	Diverse Änderungen	16.02.2010	SA			
01	Englisch	16.03.2009	TI			
Zus.	Änderung	Datum	Name			

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

Bezeichnung:

Data sheet

Thermal release valve (double pipe)
TAVZ 2.2, TAVZ 2.3, TAVZ 2.4, TAVZ 2.5

Type: TAVZ 2

Zeichnung Nr.: 04.015.DAT.01.04-E

Blatt: BL.

(Urspr.) (Ers.f.:) 04.015.DAT.01.03 (Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Release RTC - OPEN only

- Valve for manual release of one CO_2 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 CO_2 bottles up to 1500gr
RTC 2.0-HA-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HA-R: for CO_2 bottles up to 1500gr.; spare bottle holder

Hand- / electrical release OPEN only
RTC-HEA: for CO_2 bottles up to 1500gr
RTC 2.0-HEA-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEA-R: for CO_2 bottles up to 1500gr.; spare bottle holder

Hand- / pneumatical release OPEN only
RTC-HPA: for CO_2 bottles up to 1500gr
RTC 2.0-HPA-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HPA-R: for CO_2 bottles up to 1500gr.; spare bottle holder

Hand- / electrical/ pneumatical release OPEN only
RTC-HEPA: for CO_2 bottles up to 1500gr
RTC 2.0-HEPA-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEPA-R: for CO_2 bottles up to 1500gr.; spare bottle holder

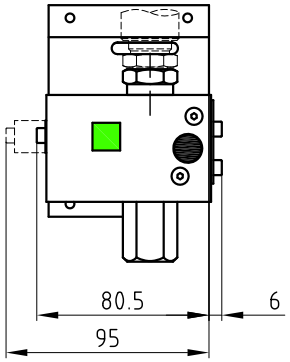
Options:

RTC with spare glass sheet for use in alarm boxes
NFM: For CO_2 bottles with M15x1,25 thread. Version for the French market
M18x1,5: Type for CO_2 bottles with M18x1,5 thread
M18x1,5-SR: Type for CO_2 dip tube bottle with M18x1,5 thread

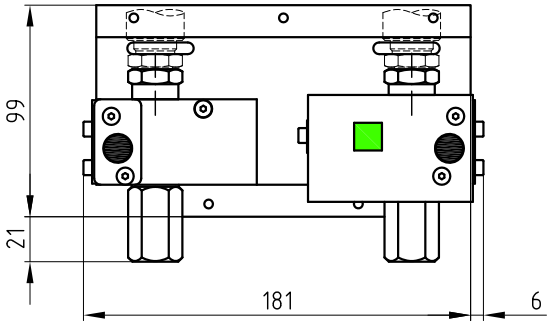
Accessories:

Tensioning device for RTC
Tensioning device for RTC-NFM
Tensioning device for RTC-M18x1,5
spare glass sheet RT-E

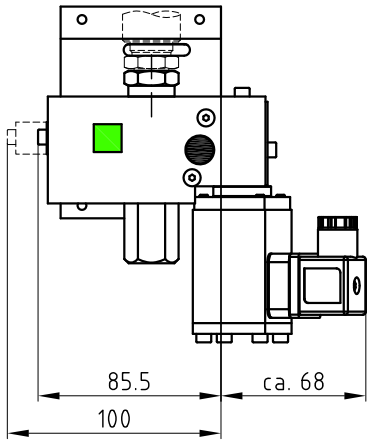
RTC x.y-HA-M18x1,5:



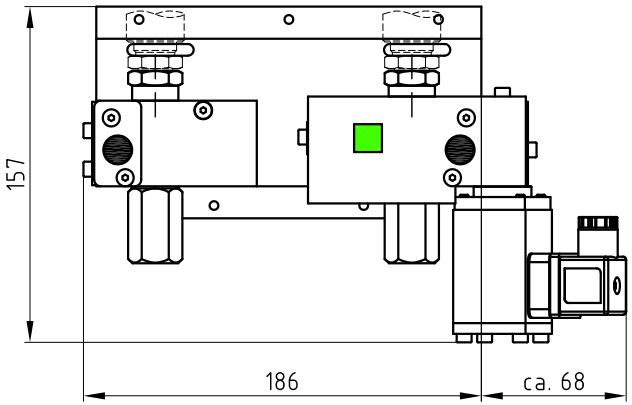
RTC x.y-HA-HZ-M18x1,5:



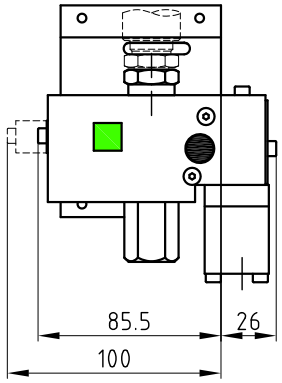
RTC x.y-HEA-M18x1,5:



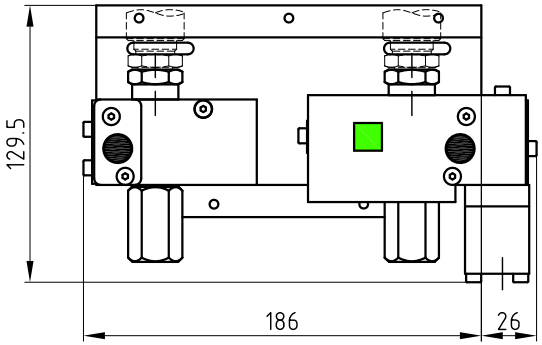
RTC x.y-HEA-HZ-M18x1,5:



RTC x.y-HPA-M18x1,5:

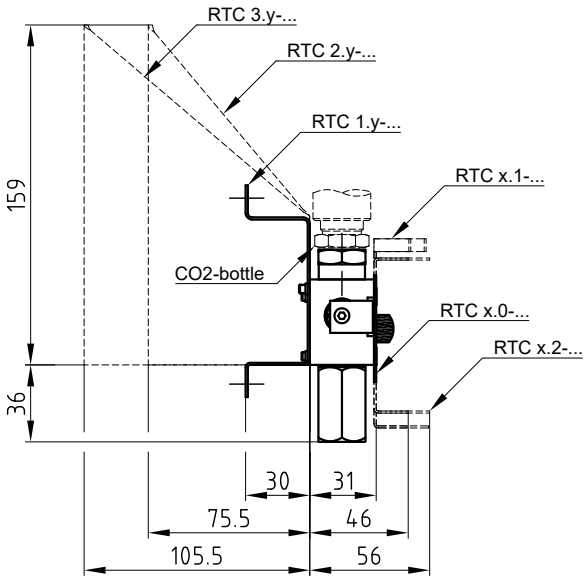


RTC x.y-HPA-HZ-M18x1,5:



RTC x.y-...-M18x1,5:

x ... version mounting angle
y ... version front plate/glass sheet
(variants see ordering designation)



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:

1) Manual releasing: Deeply press black button.
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pnematic releasing: Applying the minimum release pressure on PA. (only at HPA and HPA-HZ).

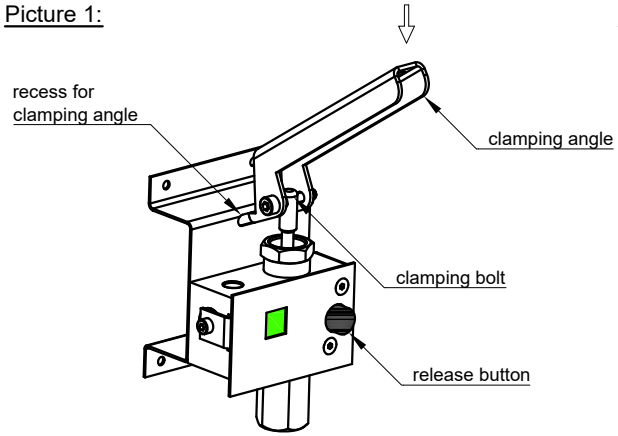
Technical data:

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

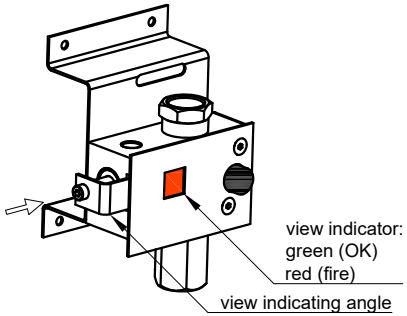
Tolerance Scale 1:2.5 Material

Created Simetzberger	Sheet 1/4	Format A3	Title Manual release RTC-M18x1,5	Document Style Data sheet
Approved HA	Issue Date 18.06.2015			Document State Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number 04.011.DAT.36.00-E

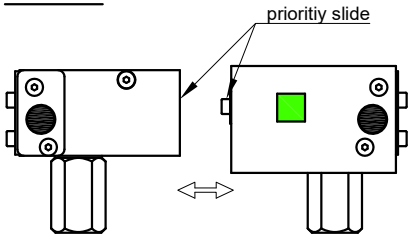
Picture 1:



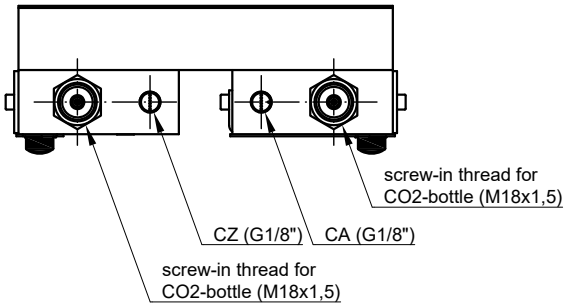
Picture 2:



Picture 3:

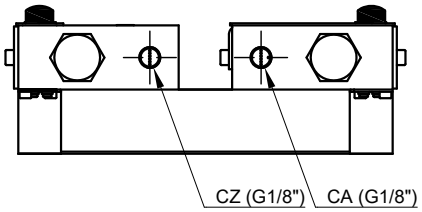


Standard connections:

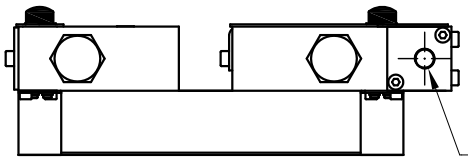


Option S1:

additional connections at the underside of valve



Connection HPA/HPA-HZ-M18x1,5:



Connections:

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

Connecting diagramm electromagnet:

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 procress.

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 desigantion:

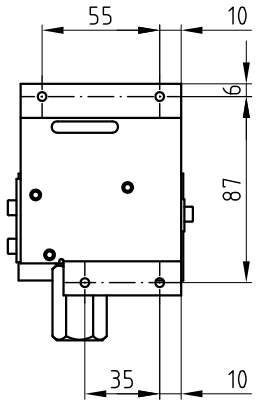
RTC x.y - aaa - bb - M18x1,5 - R - S1

- option S1: additional connection thread
- option R: bracket for spare bottle
- multi-trip bottle with screw-in thread M18x1,5
- aaa:
  - 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
- bb:
  - 0 ... front plate
  - 1 ... glass sheet for bottle until 750g
  - 2 ... glass sheet for bottle until 1500g
- x.y:
  - 1 ... mounting angle without spare bottle attachement
  - 2 ... mounting angle for spare bottle until 750g
  - 3 ... mounting angle for spare bottle until 1500g

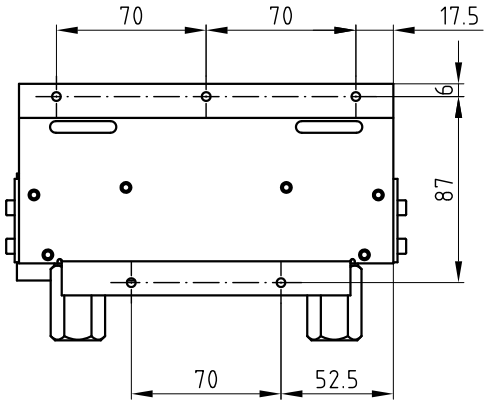
Tolerance | Scale 1:2.5 | Material

Created: Simetzberger	Sheet: 2/4	Format: A3	Title: Manual release RTC-M18x1,5	Document Style: Data sheet
Approved: HA	Issue Date: 18.06.2015			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 04.011.DAT.36.00-E

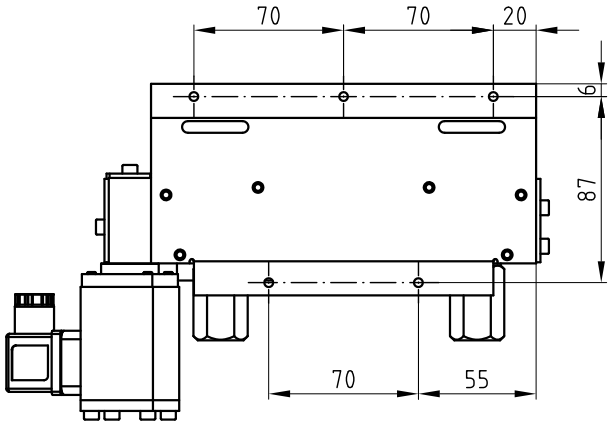
RTC 1.y-HA/HEA/HPA-M18x1,5:



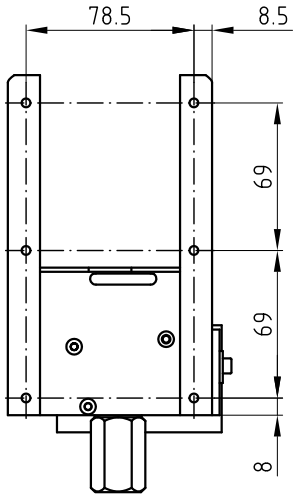
RTC 1.y-HA-HZ-M18x1,5:



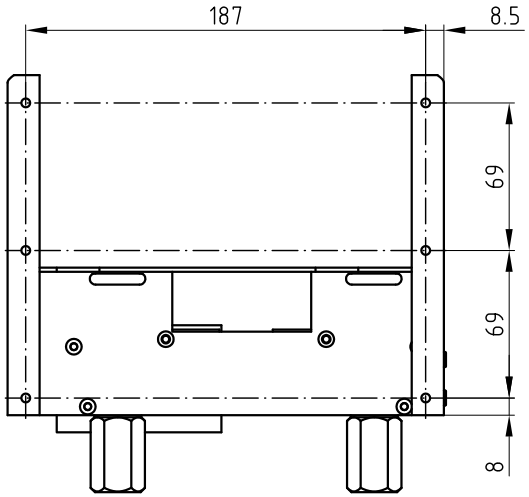
RTC 1.y-HEA/HPA-HZ-M18x1,5:



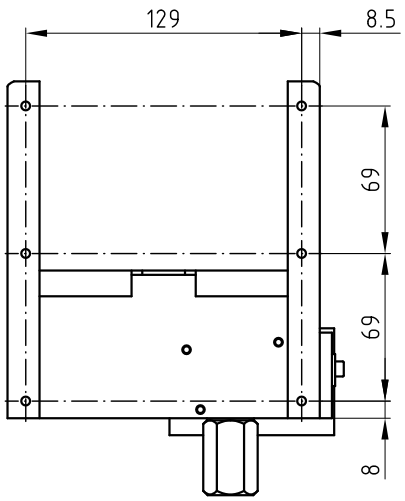
RTC 2.y-HA/HEA/HPA-M18x1,5:



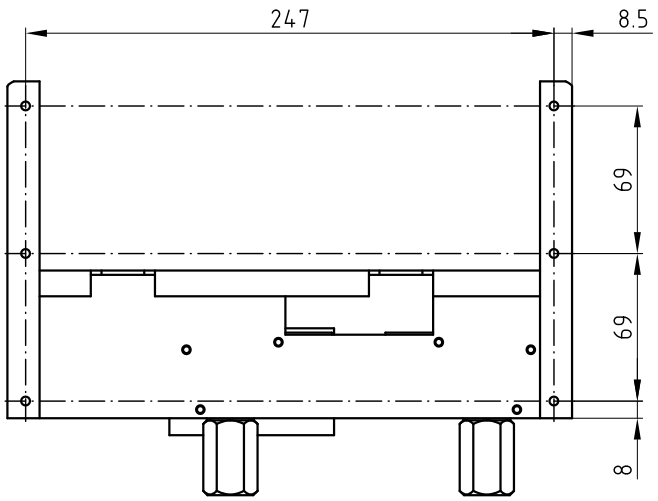
RTC 2.y-HA/HEA/HPA-HZ-M18x1,5:



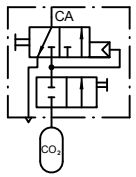
RTC 3.y-HA/HEA/HPA-M18x1,5:



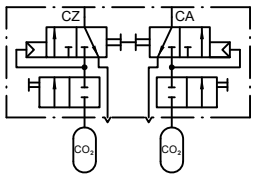
RTC 3.y-HA/HEA/HPA-HZ-M18x1,5:



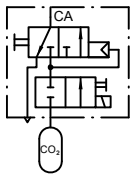
Circuit diagramm HA:



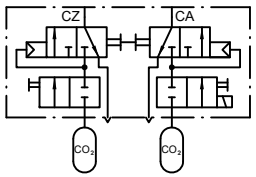
Circuit diagramm HA-HZ:



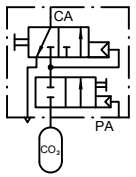
Circuit diagramm HEA:



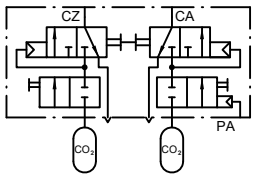
Circuit diagramm HEA-HZ:



Circuit diagramm HPA:



Circuit diagramm HPA-HZ:



Tolerance | Scale 1:2.5 | Material

Created: Simetzberger	Sheet: 3/4	Format: A3	Title: Manual release RTC-M18x1,5	Document Style: Data sheet
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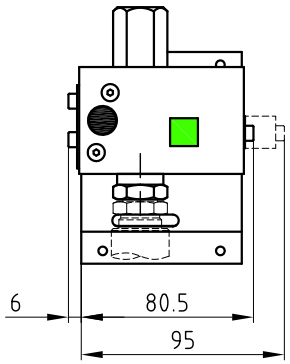
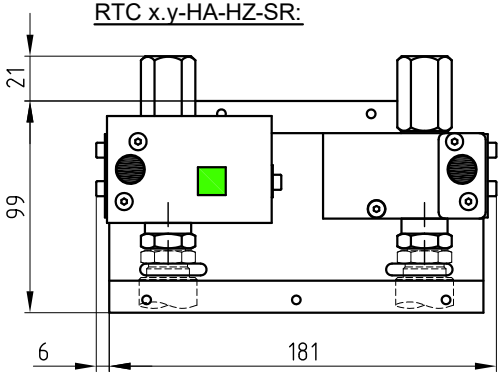
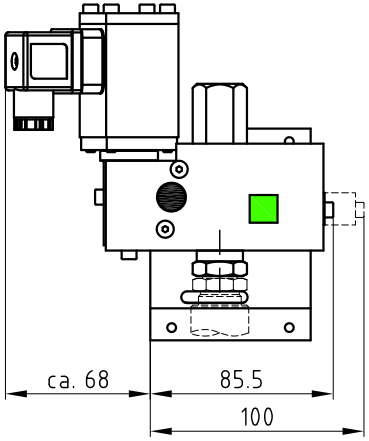
RTC x.y-HA-SR:



RTC x.y-HA-HZ-SR:



RTC x.y-HEA-SR:



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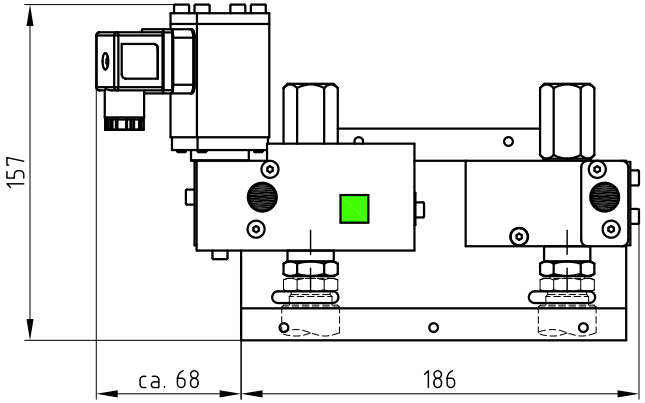
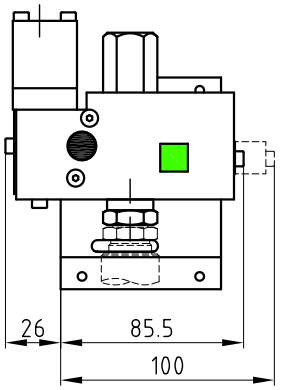
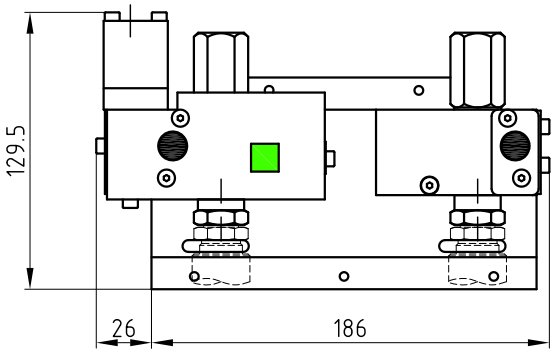


RTC x.y-HPA-SR:

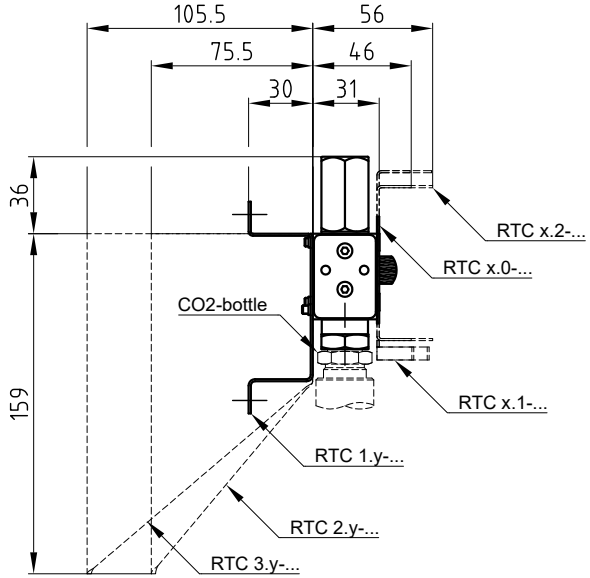


RTC x.y-HPA-HZ-SR:



RTC x.y-...-SR:

x ... version mounting angle
y ... version front plate/glass sheet
(variants see ordering designation)



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:

1) Manual releasing: Deeply press black button.
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pnematic 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

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Approved HA	Issue Date 18.06.2015			Document State Valid
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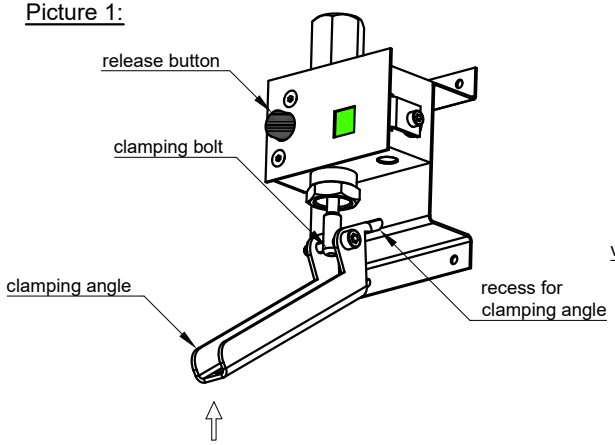
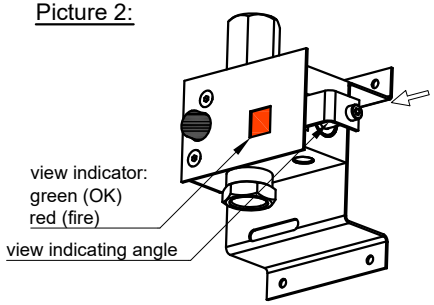
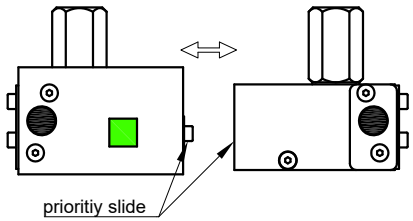
Picture 1:



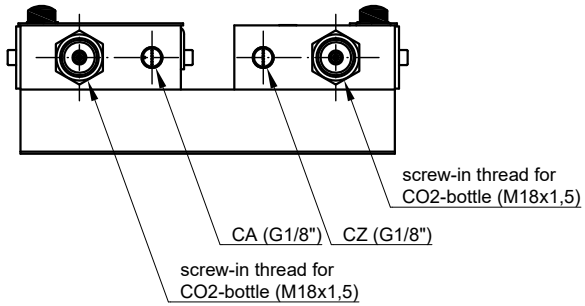
Picture 2:



Picture 3:

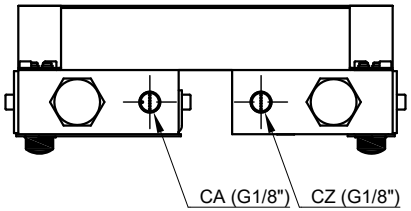


Standard connections:

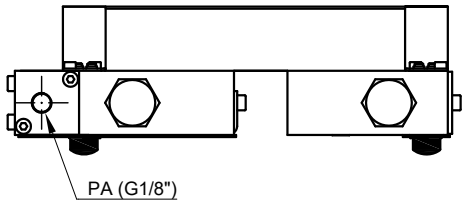


Option S1:

additional connections at the upperside of valve



Connection HPA/HPA-HZ-SR:



Connections:

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

Connecting diagramm electromagnet:

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 procress.

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 desigantion:

RTC x.y - aaa - bb - SR - R - S1

- S1: option S1: additional connection thread
- R: option R: bracket for spare bottle
- SR: ascending-tube bottle with screw-in thread M18x1,5
- aaa:
  - 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
- x:
  - 0 ... front plate
  - 1 ... glass sheet for bottle until 750g
  - 2 ... glass sheet for bottle until 1500g
- y:
  - 1 ... mounting angle without spare bottle attachement
  - 2 ... mounting angle for spare bottle until 750g
  - 3 ... mounting angle for spare bottle until 1500g

Tolerance | Scale 1:2.5 | Material

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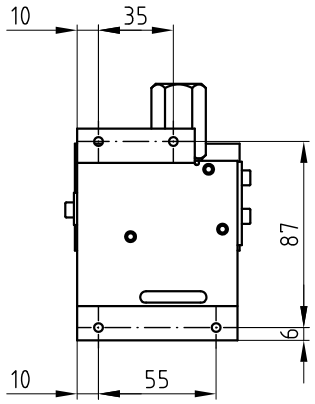
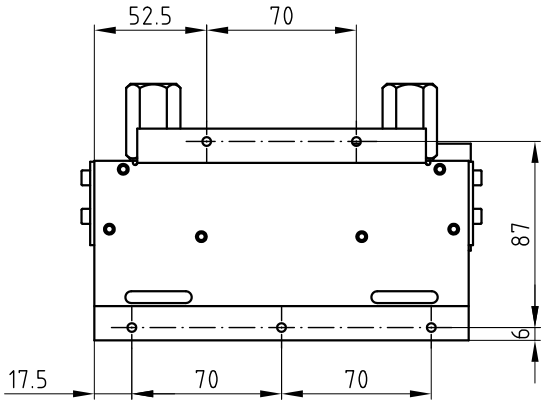
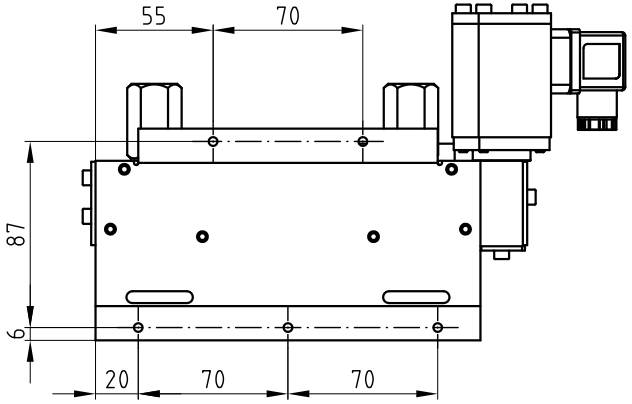
RTC 1.y-HA/HEA/HPA-SR:



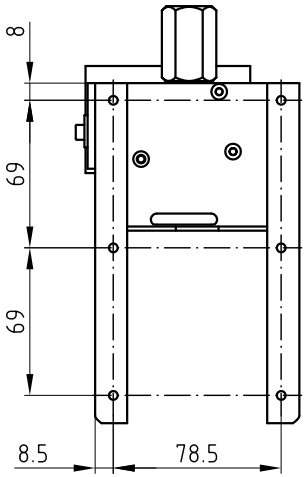
RTC 1.y-HA-HZ-SR:



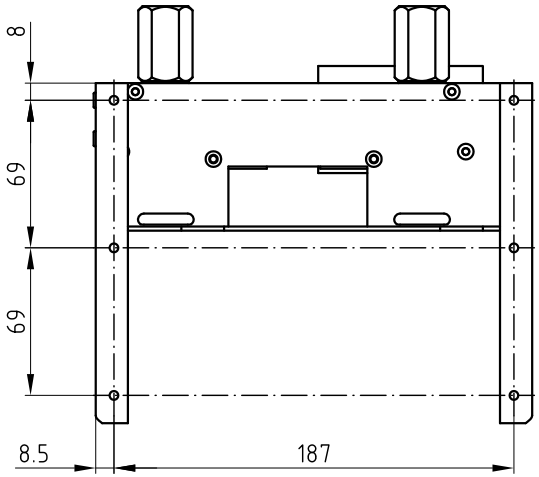
RTC 1.y-HEA/HPA-HZ-SR:



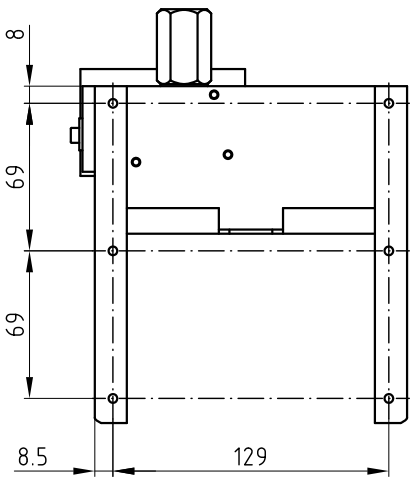
RTC 2.y-HA/HEA/HPA-SR:



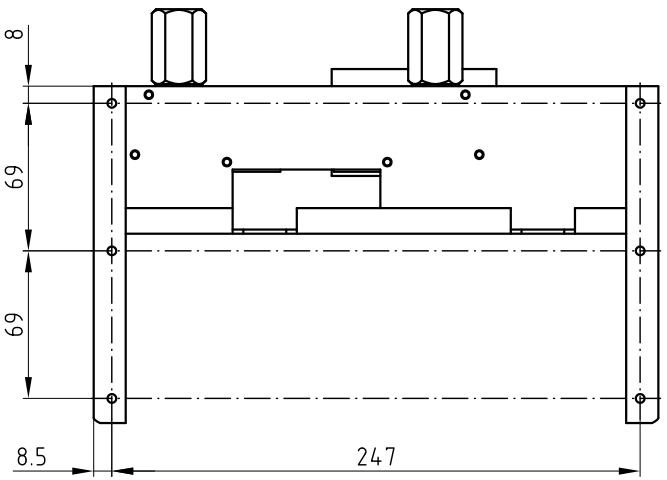
RTC 2.y-HA/HEA/HPA-HZ-SR:



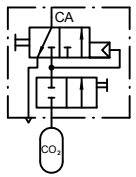
RTC 3.y-HA/HEA/HPA-SR:



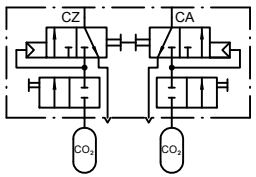
RTC 3.y-HA/HEA/HPA-HZ-SR:



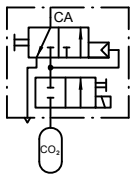
Circuit diagramm HA:



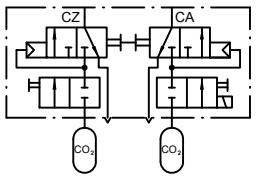
Circuit diagramm HA-HZ:



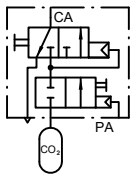
Circuit diagramm HEA:



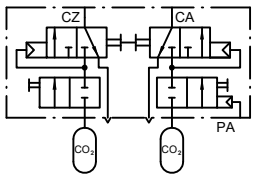
Circuit diagramm HEA-HZ:



Circuit diagramm HPA:



Circuit diagramm HPA-HZ:



Tolerance | Scale 1:2.5 | Material

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Release RTC - OPEN/CLOSE

- Valve for manual release of two CO_2 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 CO_2 bottles up to 1500gr
RTC 2.0-HA-HZ-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HA-HZ-R: for CO_2 bottles up to 1500gr.; spare bottle holder

Hand- / electrical release OPEN/CLOSE
RTC-HEA-HZ: for CO_2 bottles up to 1500gr
RTC 2.0-HEA-HZ-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEA-HZ-R: for CO_2 bottles up to 1500gr.; spare bottle holder

Hand- / pneumatical release OPEN/CLOSE
RTC-HPA-HZ: for CO_2 bottles up to 1500gr
RTC 2.0-HPA-HZ-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HPA-HZ-R: for CO_2 bottles up to 1500gr.; spare bottle holder

Hand- / electrical/ pneumatical release OPEN only, Hand release CLOSE
RTC-HEPA-HZ: for CO_2 bottles up to 1500gr
RTC 2.0-HEPA-HZ-R: for CO_2 bottles up to 750gr (500gr when M18x1,5); spare bottle holder
RTC 3.0-HEPA-HZ-R: for CO_2 bottles up to 1500gr.; spare bottle holder

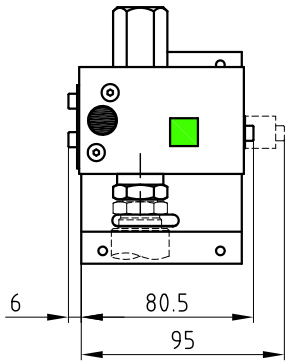
Options:

RTC with spare glass sheet for use in alarm boxes
NFM: For CO_2 bottles with M15x1,25 thread. Version for the French market
M18x1,5: Type for CO_2 bottles with M18x1,5 thread
M18x1,5-SR: Type for CO_2 dip tube bottle with M18x1,5 thread

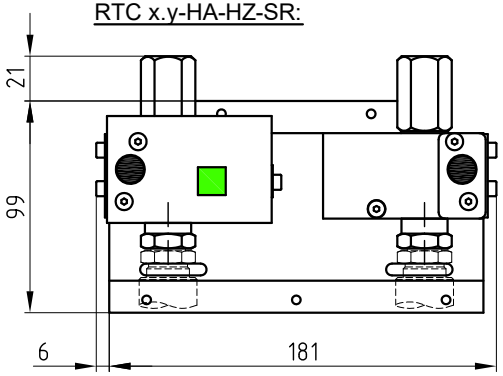
Accessories:

Tensioning device for RTC
Tensioning device for RTC-NFM
Tensioning device for RTC-M18x1,5
spare glass sheet RT-E

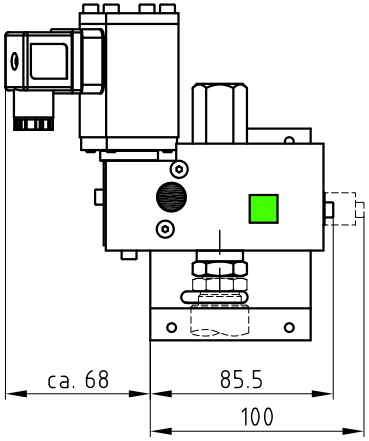
RTC x.y-HA-SR:



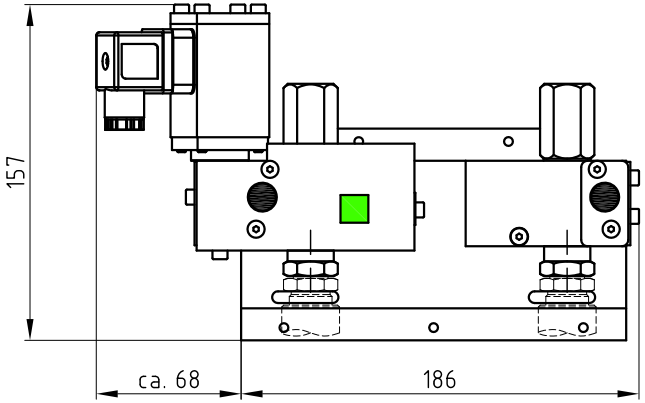
RTC x.y-HA-HZ-SR:



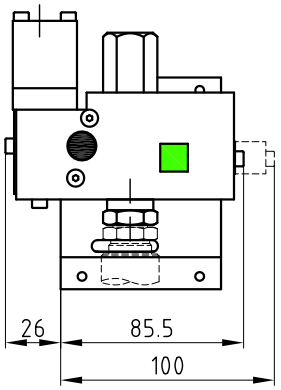
RTC x.y-HEA-SR:



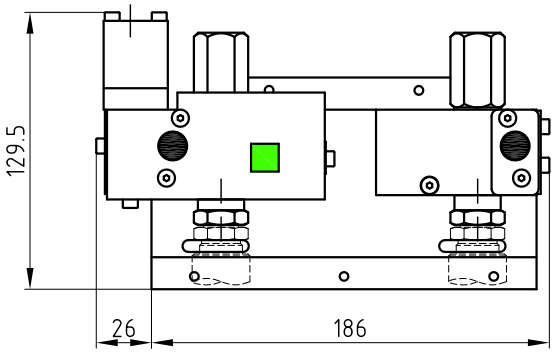
RTC x.y-HEA-HZ-SR:



RTC x.y-HPA-SR:

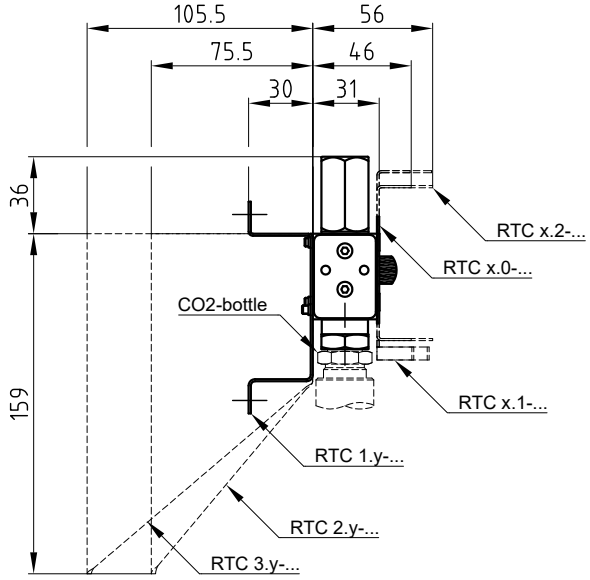


RTC x.y-HPA-HZ-SR:



RTC x.y-...-SR:

x ... version mounting angle
y ... version front plate/glass sheet
(variants see ordering designation)



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:

1) Manual releasing: Deeply press black button.
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pnematic 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

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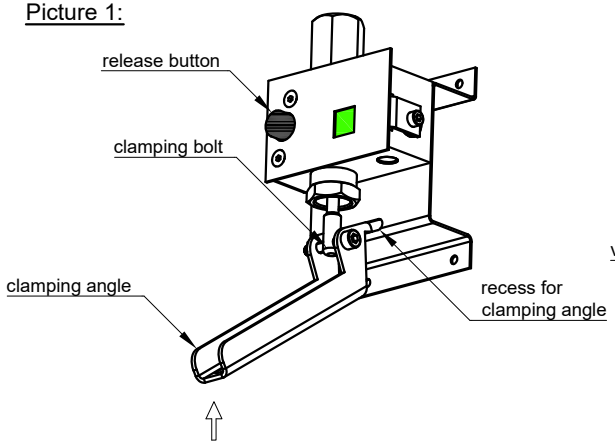
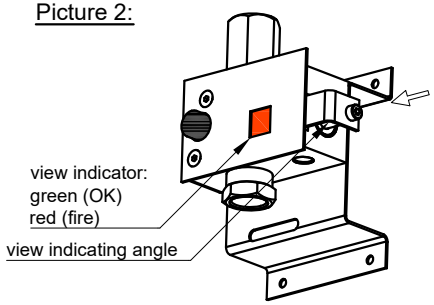
Picture 1:



Picture 2:



Connections:

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

Connecting diagramm electromagnet:

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 procress.

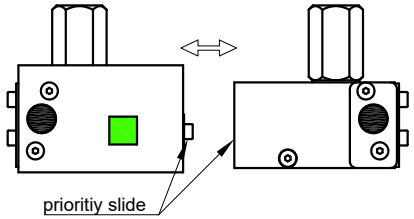
Commissioning the close-release:

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.

Picture 3:

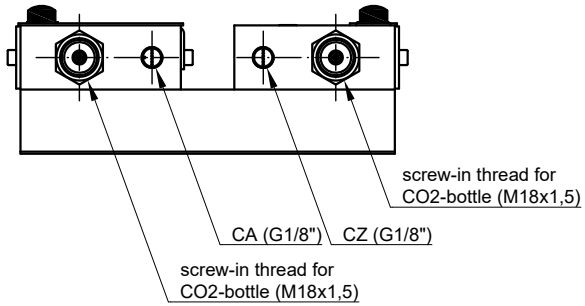


Ordering desigantion:

RTC x.y - aaa - bb - SR - R - S1

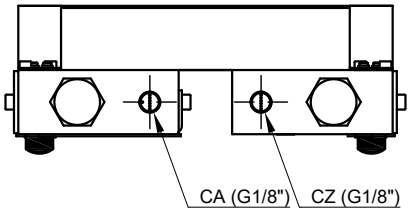
- S1: option S1: additional connection thread
- R: option R: bracket for spare bottle
- SR: ascending-tube bottle with screw-in thread M18x1,5
- aaa:
  - HA ... manual OPEN
  - HEA ... manual electric OPEN
  - HPA ... manual pneumatic OPEN
  - HA-HZ ... manual OPEN - manual CLOSE
  - HEA-HZ ... manual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

Standard connections:

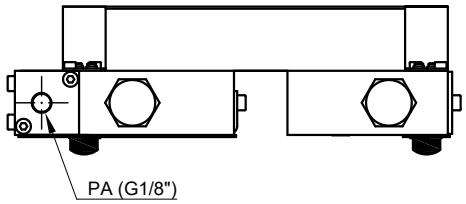


Option S1:

additional connections at the upperside of valve



Connection HPA/HPA-HZ-SR:



Tolerance | Scale 1:2.5 | Material

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Approved: HA	Issue Date: 18.06.2015			Document State: Valid
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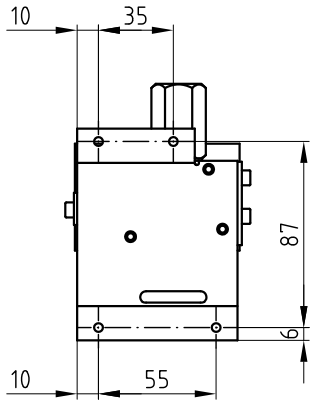
RTC 1.y-HA/HEA/HPA-SR:



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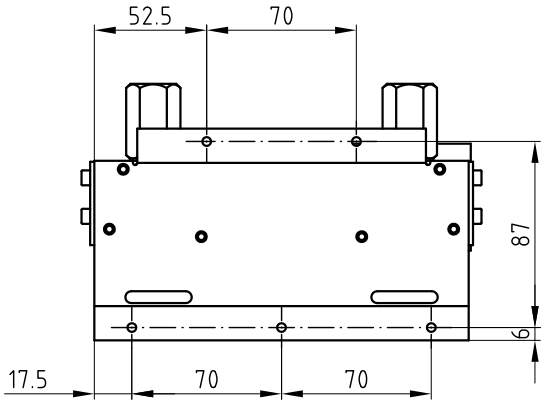
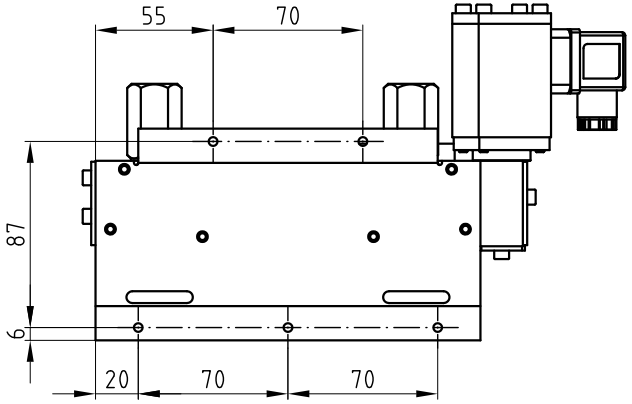
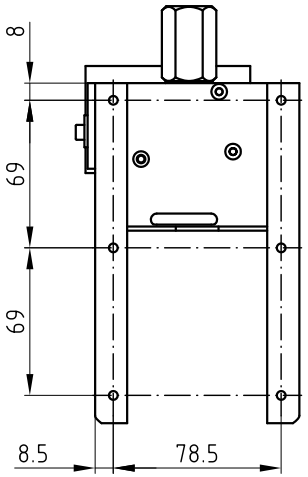


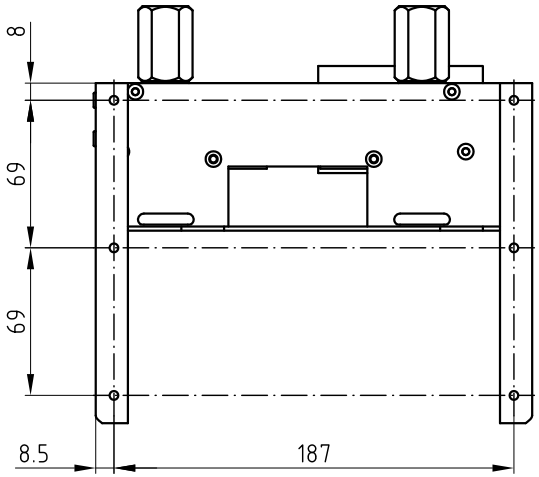
RTC 1.y-HEA/HPA-HZ-SR:



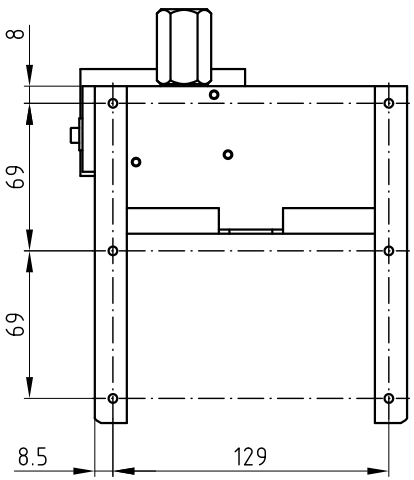
RTC 2.y-HA/HEA/HPA-SR:



RTC 2.y-HA/HEA/HPA-HZ-SR:



RTC 3.y-HA/HEA/HPA-SR:



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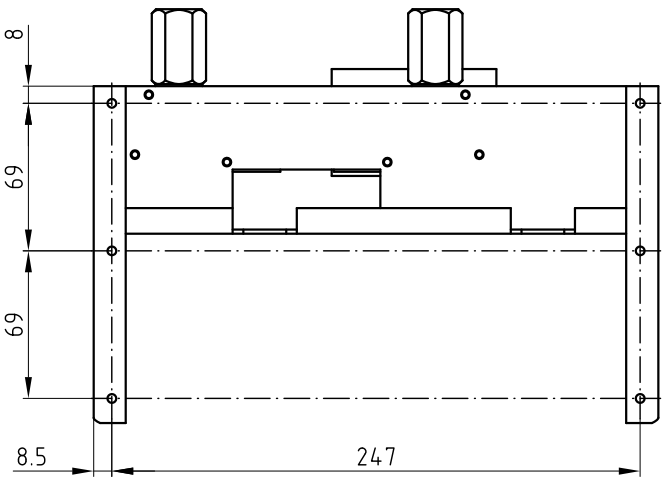
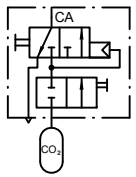
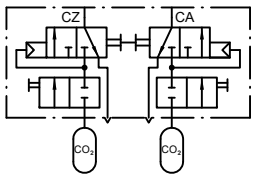


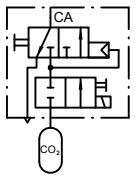
Circuit diagramm HA:



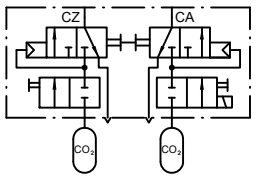
Circuit diagramm HA-HZ:



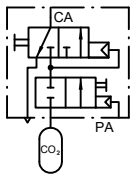
Circuit diagramm HEA:



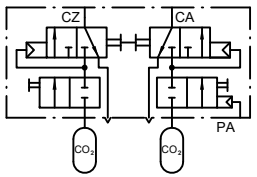
Circuit diagramm HEA-HZ:



Circuit diagramm HPA:



Circuit diagramm HPA-HZ:



Tolerance | Scale 1:2.5 | Material

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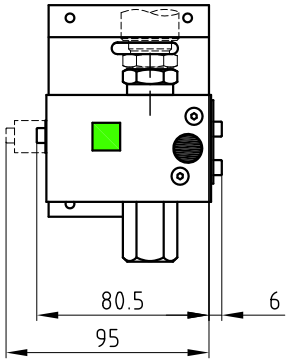
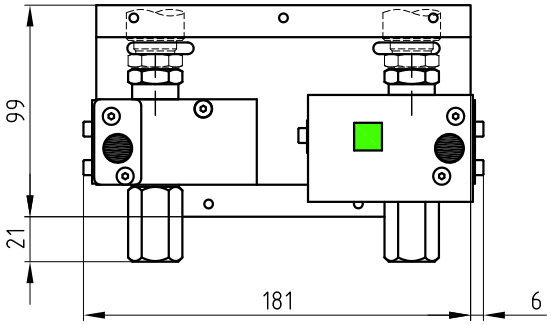
Approved: HA	Issue Date: 18.06.2015			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 04.011.DAT.37.00-E

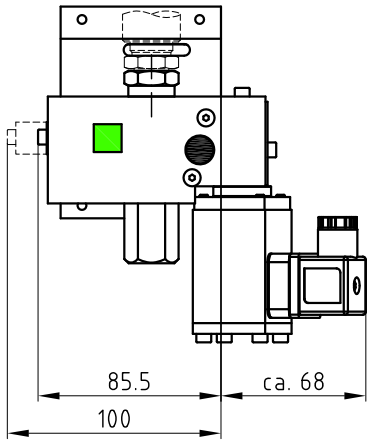
RTC x.y-HA-M18x1,5:



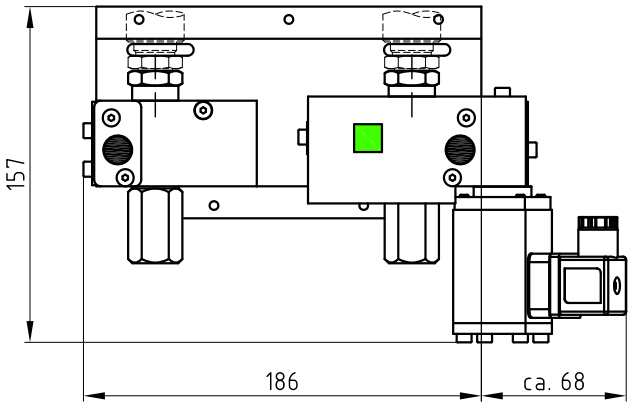
RTC x.y-HA-HZ-M18x1,5:



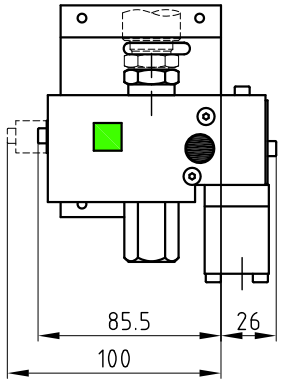
RTC x.y-HEA-M18x1,5:



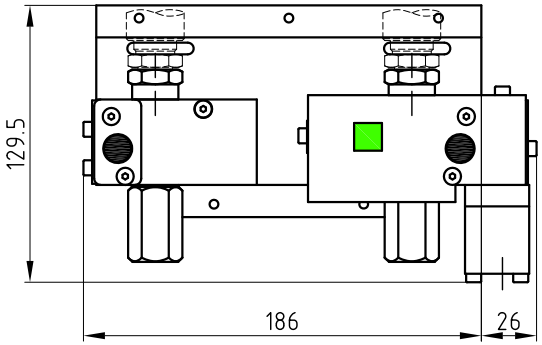
RTC x.y-HEA-HZ-M18x1,5:



RTC x.y-HPA-M18x1,5:

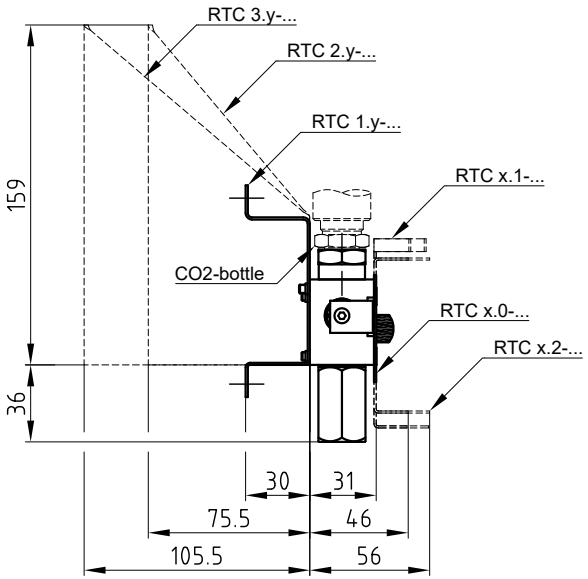


RTC x.y-HPA-HZ-M18x1,5:



RTC x.y-...-M18x1,5:

x ... version mounting angle
y ... version front plate/glass sheet
(variants see ordering designation)



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:

1) Manual releasing: Deeply press black button.
2) Electric releasing via the electromagnet. (only at HEA and HEA-HZ).
3) Pnematic 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

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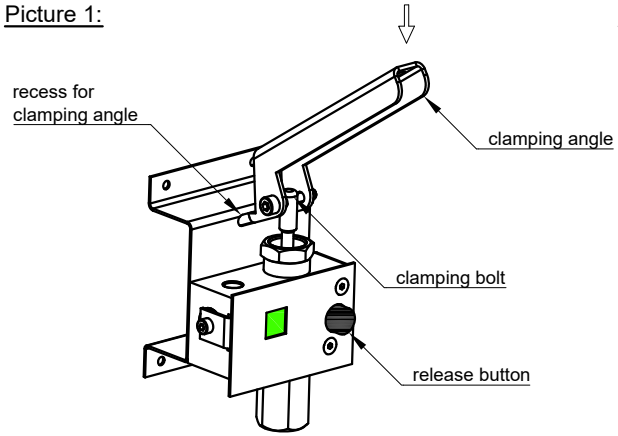
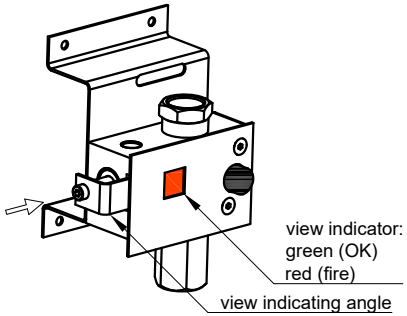
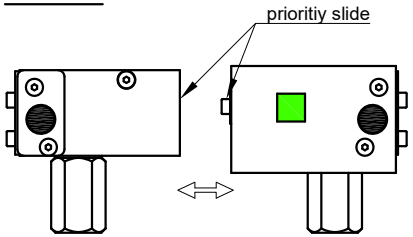
Picture 1:



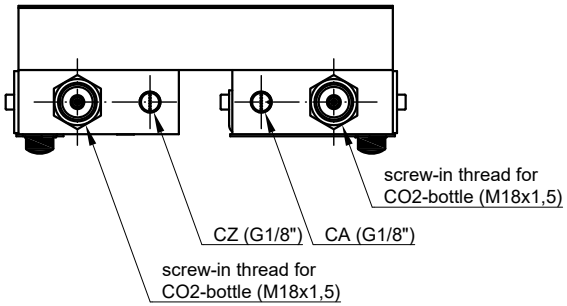
Picture 2:



Picture 3:

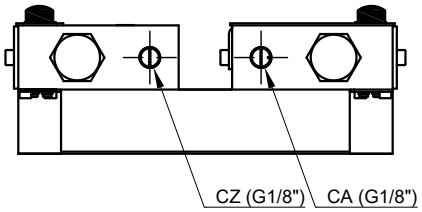


Standard connections:

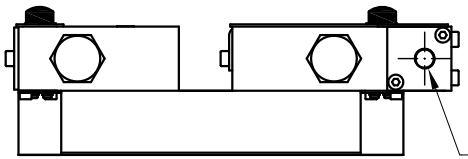


Option S1:

additional connections at the underside of valve



Connection HPA/HPA-HZ-M18x1,5:



Connections:

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

Connecting diagramm electromagnet:

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 procress.

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 desigantion:

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
- aaa:
  - 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
- x:
  - 0 ... front plate
  - 1 ... glass sheet for bottle until 750g
  - 2 ... glass sheet for bottle until 1500g
- y:
  - 1 ... mounting angle without spare bottle attachement
  - 2 ... mounting angle for spare bottle until 750g
  - 3 ... mounting angle for spare bottle until 1500g

Tolerance | Scale 1:2.5 | Material

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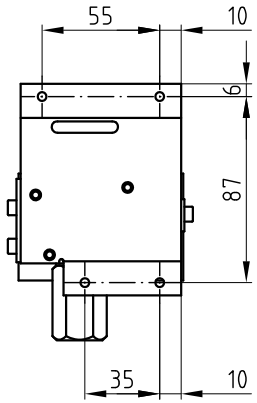
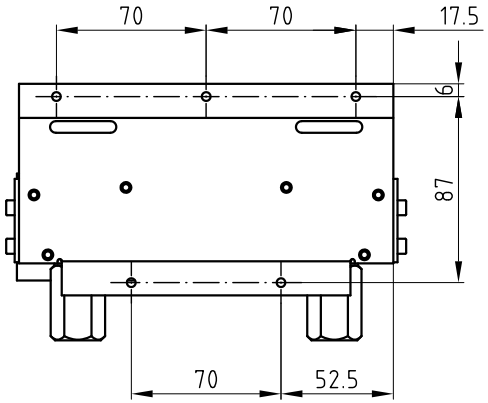
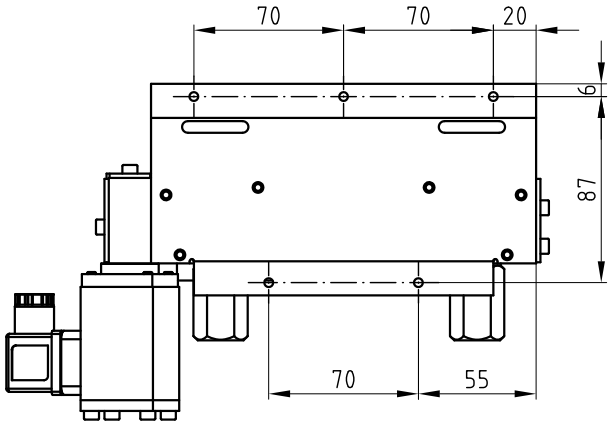
RTC 1.y-HA/HEA/HPA-M18x1,5:



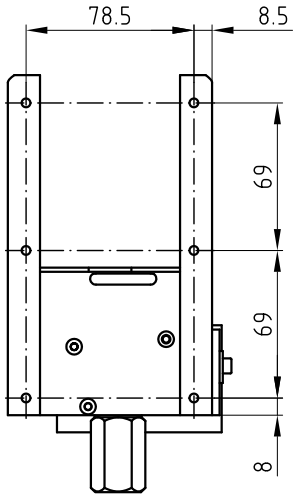
RTC 1.y-HA-HZ-M18x1,5:



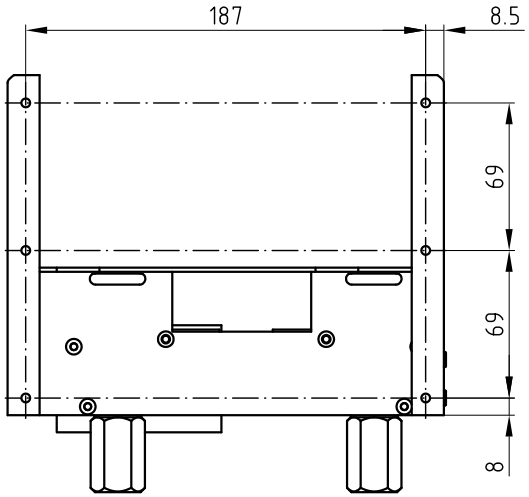
RTC 1.y-HEA/HPA-HZ-M18x1,5:



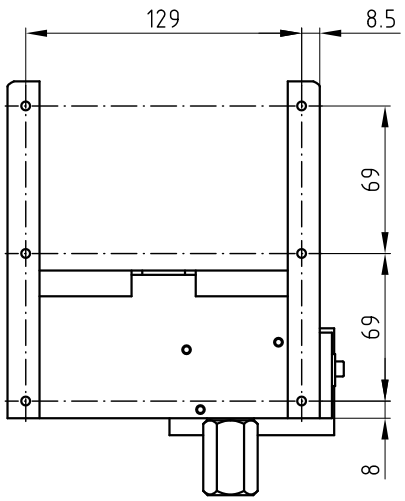
RTC 2.y-HA/HEA/HPA-M18x1,5:



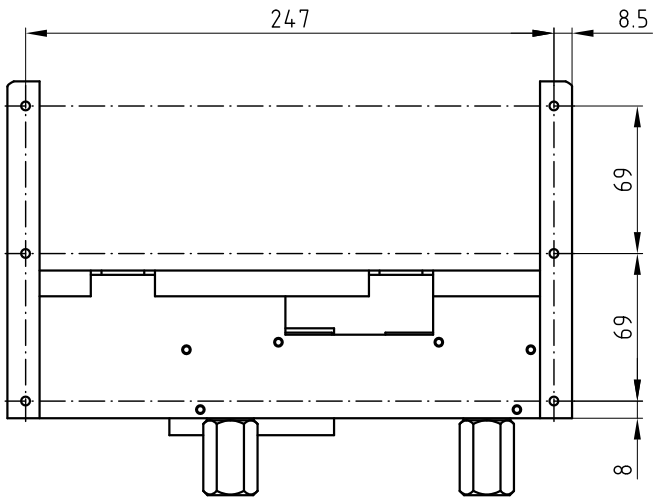
RTC 2.y-HA/HEA/HPA-HZ-M18x1,5:



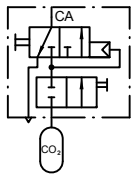
RTC 3.y-HA/HEA/HPA-M18x1,5:



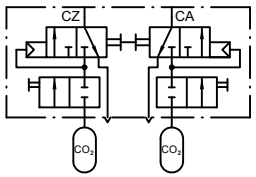
RTC 3.y-HA/HEA/HPA-HZ-M18x1,5:



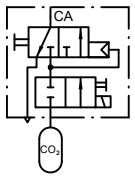
Circuit diagramm HA:



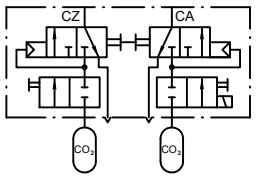
Circuit diagramm HA-HZ:



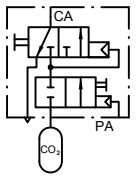
Circuit diagramm HEA:



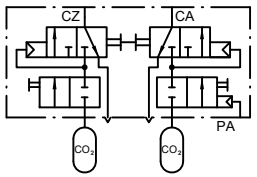
Circuit diagramm HEA-HZ:



Circuit diagramm HPA:



Circuit diagramm HPA-HZ:



Tolerance | Scale 1:2.5 | Material

Created: Simetzberger	Sheet: 3/4	Format: A3	Title: Manual release RTC-M18x1,5	Document Style: Data sheet
Approved: HA	Issue Date: 18.06.2015			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 04.011.DAT.36.00-E

CA - RA - PA (series connection)

- Combination release valve for releasing CO_2 one-way bottles with ½" UNF thread by different methods of actuation
- Piercing valve of series connection type, for interconnecting the CO_2 outlet ports of several piercing valves. CO_2 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 CO_2 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
- CO_2 bottles are not included in our supply (see valves, accessories)

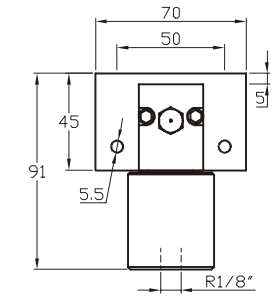
CA-RA-PA-A
with CO_2 bottle
and male connectors

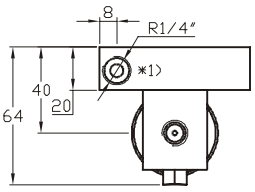
The series **CA-RA-PA** valves are available in 4 versions that may be combined as necessary. Required for mounting: 2 threaded rods M4, 4 nuts M4 with washer

1. CA-RA-PA-A (head block):
- CO_2 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 CO_2 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





CA-RA-PA-A /
CA-RA-PA-M /
CA-RA-PA-E /
CA-RA-PA-S
***1)** exists only in PA-A and PA-S

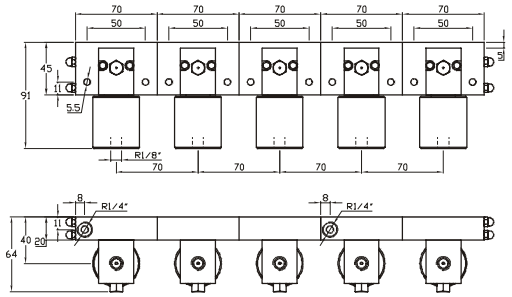
4. CA-RA-PA-S (single block):
- For releasing a single CO_2 bottle. Piercing valve can be mechanically connected with groups of other piercing valves
- Head block or single block can be mounted on the right-hand side
- CO_2 group outlet 1/4" thread
- For pipe connection of the valve, 1 male connector 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 CO_2 bottles in the 1st group and
2 CO_2 bottles in the 2nd group.

Valve is mounted as follows (CA-RA-...):
1st group: PA-A + PA-M + PA-E,
2nd group: PA-A + PA-E.



CA-RA-PA-3-2

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

HH5/2 with male connectors

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-VVZ-EA-EZ
with male connectors

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

HH5/2-VVAZ
with male connectors

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

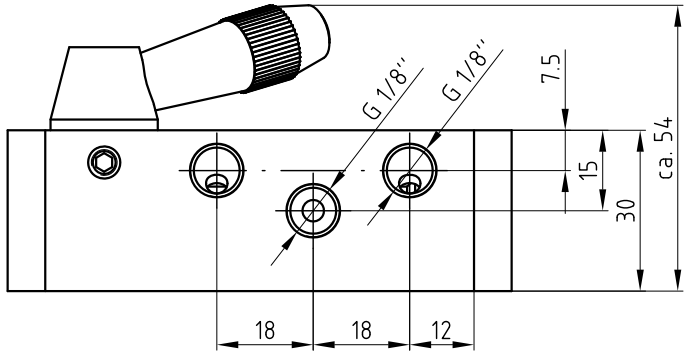
PAV (Pneumatic OPEN priority)**:** See above. Minimum release pressure 2bar. When PAV and PZ add-on components (PZ see below) for the OPEN and CLOSE functions are activated at the same time, execution of the OPEN function with same control pressure will have priority

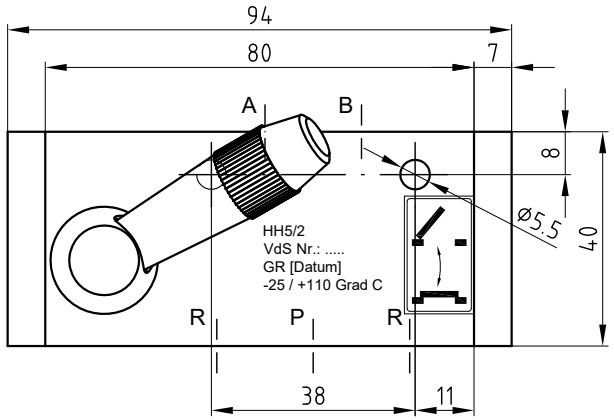
PZ (Pneumatic CLOSE)**:** Controls CLOSE action by attached pneumatic release. Release pressure min. 3bar, 1 additional 1/8" male connector is required

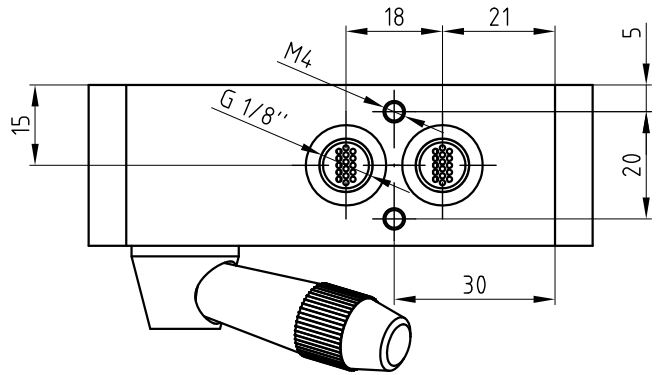
PZV (Pneumatic CLOSE priority)**:** See above. Minimum release pressure 2bar. When PA and PZV add-on components for the OPEN and CLOSE functions are activated at the same time, execution of the CLOSE function with same control pressure will have priority

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!

Dateiname: Qf0510B







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

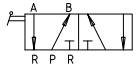
Installation:

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	60bar
nominal width of valve	4mm
ambient temperature range	-25°C - +50°C
VdS approval no.	G 589052

Pneumatic symbol:



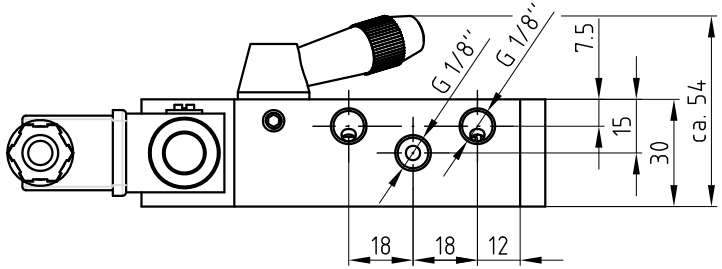
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1	Werkstoff:
							ID - Nr.:	
					Datum	Name	Bezeichnung:	
				Bear.	25.08.2009	Simetzberger	**Data sheet**	
				Gepr.	16.02.2011	KW	Hand lever valve HH 5/2	
				Norm				
				Type:			Zeichnung Nr.:	Blatt
					HH 5/2		04.007.DAT.00.01-E	BL.
01	Schriftkopf Englisch	14.02.2011	SA					
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 04.007.DAT.00.00	(Ers.d.:)

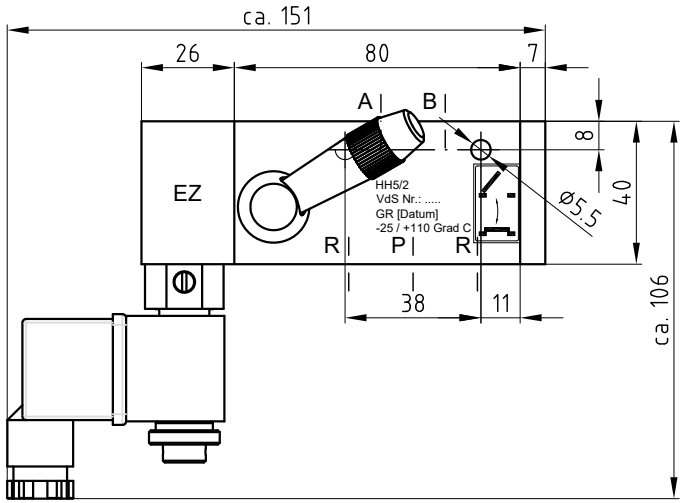
erstellt am
28.5.2002 ER

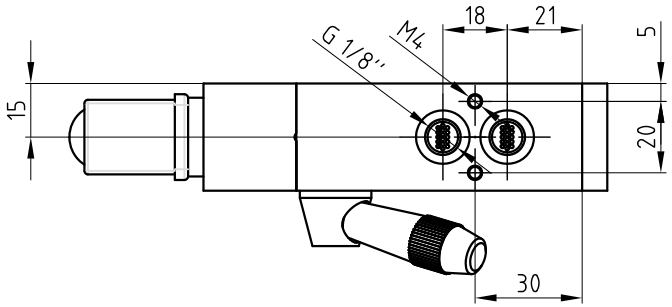
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B







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

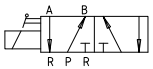
Technical data:

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

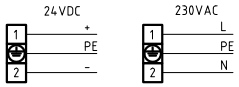
Electro add-on components:

EZ24 ..... electric CLOSE 24VDC
EZ230 ..... electric CLOSE 230V

Pneumatic symbol:



Connecting diagram electromagnet:



Power input - attracting - DC	-
Power input - attracting - AC	9 VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering example:

HH5/2 - EZ230

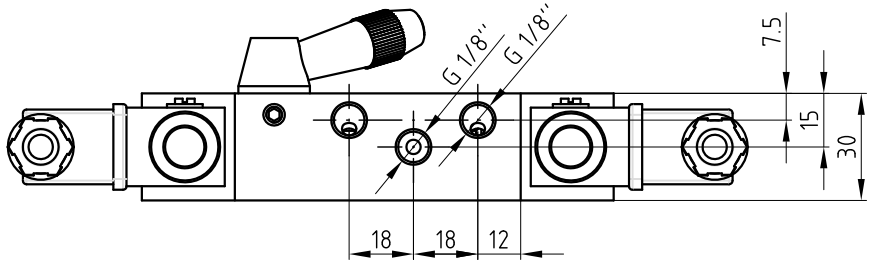
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1 / Werkstoff:
							ID - Nr.:
					Datum	Name	Bezeichnung: **Data sheet** Hand lever valve HH 5/2 with electro add-on component CLOSE
				Bear.	25.08.2009	Simetzberger	
				Gepr.	16.02.2011	KW	
				Norm			
				Type: HH 5/2			Zeichnung Nr.: 04.007.DAT.01.01-E / Blatt / BL.
01	Text	14.02.2011	SA				
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 04.007.DAT.01.00 (Ers.d.:)

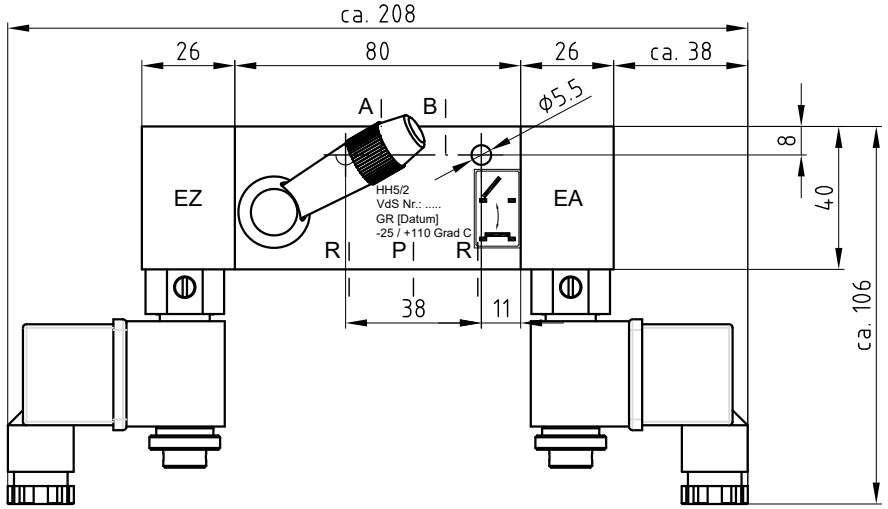
erstellt am
28.5.2002 ER

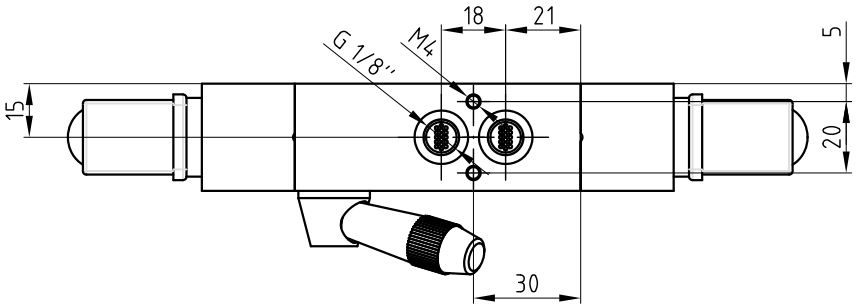
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B







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

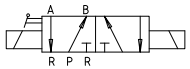
Technical data:

max. operating pressure	10bar
min. operating pressure by EA/EZ	3bar
min. operating pressure by EAV/EZV	2bar
nominal width of valve	4mm
ambient temperature range	-25°C - +50°C
VDS approval no.	G 589052

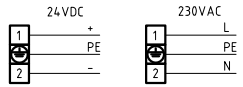
Electro add-on components:

EA24 .....electric OPEN 24VDC
EAV24 ..... electric PRIORITY OPEN 24VDC
EA230 .....electric OPEN 230V
EAV230 ..... electric PRIORITY OPEN 230V
EZ24 ..... electric CLOSE 24VDC
EZV24 ..... electric PRIORITY CLOSE 24VDC
EZ230 ..... electric CLOSE 230V
EZV230 .....electric PRIORITY CLOSE 230V

Pneumatic symbol:



Connecting diagram electromagnet:



Power input - attracting - DC	-
Power input - attracting - AC	9 VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering example:

HH5/2 - EAV24 - EZ230

GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1 / Werkstoff: / ID - Nr.:
					Datum	Name	Bezeichnung: **Data sheet** Hand lever valve HH 5/2 with electro add-on component OPEN/CLOSE
				Bear.	25.08.2009	Simetzberger	
				Gepr.	16.02.2011	KW	
				Norm			
				Type: HH 5/2			Zeichnung Nr.: 04.007.DAT.02.01-E / Blatt / BL.
01	Text	14.02.2011	SA				
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 04.007.DAT.02.00 (Ers.d.:)

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28.5.2002 ER

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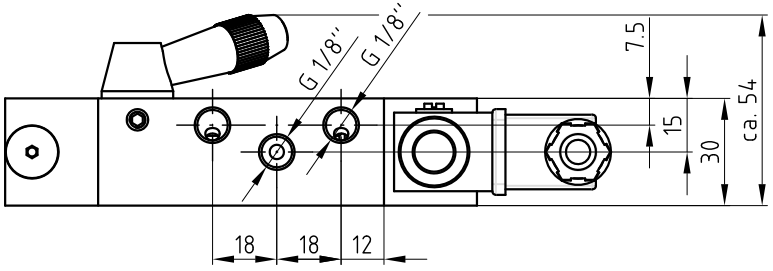
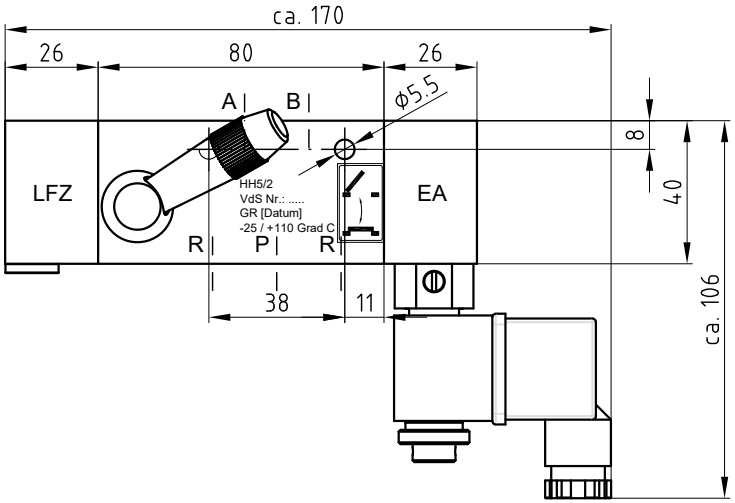
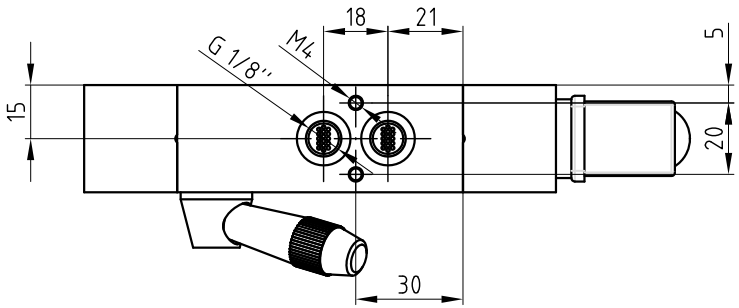
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B







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 electormagnet 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

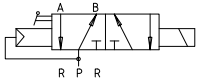
Technical data:

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

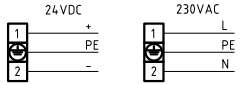
Electro add-on components:

EA24 ..... electric OPEN 24VDC
EA230 ..... electric OPEN 230V

Pneumatic symbol:



Connecting diagram electromagnet:



Power input - attracting - DC	-
Power input - attracting - AC	9 VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering example:

HH5/2 - EA230 - LFZ

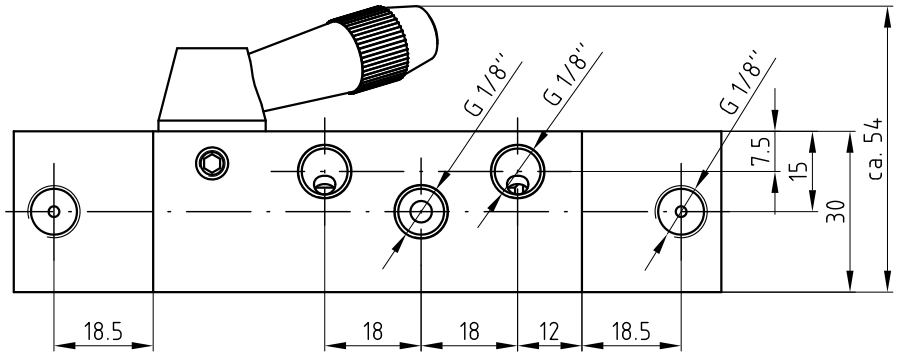
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1 / Werkstoff: / ID - Nr.:
					Datum	Name	Bezeichnung: **Data sheet** Hand lever valve HH 5/2 with electro add-on component OPEN/air spring CLOSE
				Bear.	25.08.2009	Simetzberger	
				Gepr.	16.02.2011	KW	
				Norm			
				Type: HH 5/2			Zeichnung Nr.: 04.007.DAT.03.01-E / Blatt / BL.
01	Text	14.02.2011	SA				
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 04.007.DAT.03.00 (Ers.d.:)

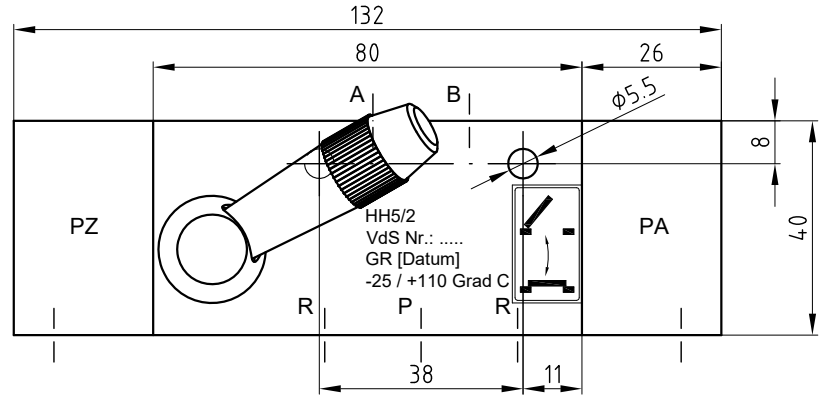
erstellt am
28.5.2002 ER

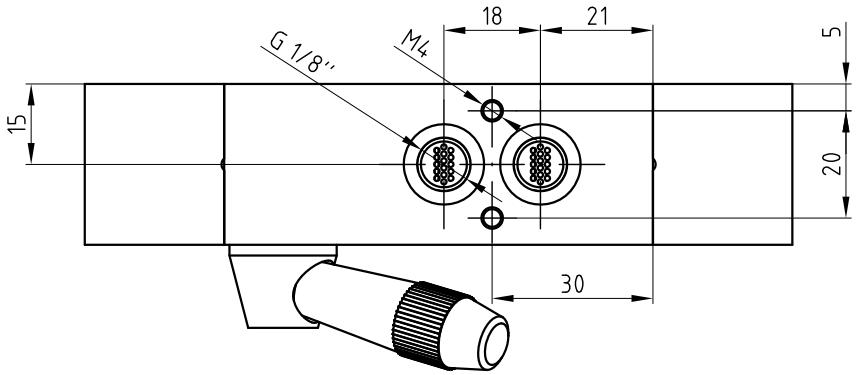
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B







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).

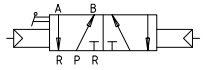
Installation:

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
VDS approval no.	G 589052

Pneumatic symbol:



Ordering example:

HH5/2 - PA - PZ

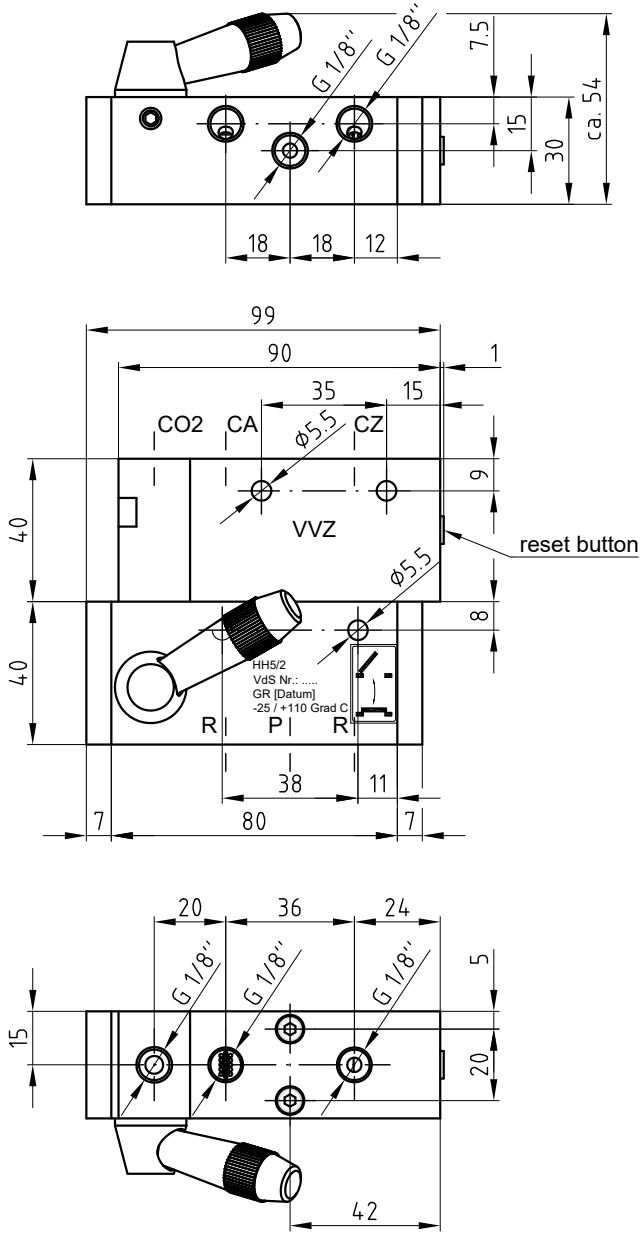
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff:
						ID - Nr.:
					Datum / Name	Bezeichnung: **Data sheet** Hand lever valve HH 5/2 with pneumatic add-on component OPEN/CLOSE
				Bear.	25.08.2009 / Simetzberger	
				Gepr.	16.02.2011 / KW	
				Norm		
				Type: HH 5/2		Zeichnung Nr.: 04.007.DAT.04.01-E / Blatt BL.
01	Text	14.02.2011	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 04.007.DAT.04.00 (Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B



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.

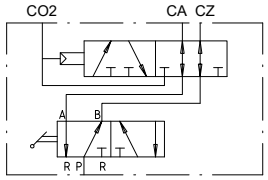
Installation:

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

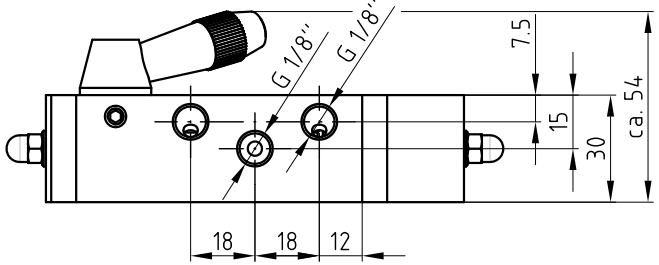
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		Maßstab: 1:1 / Werkstoff:
						ID - Nr.:
					Datum / Name	Bezeichnung: **Data sheet** Hand lever valve HH 5/2 - VVZ
				Bear.	31.08.2009 / Simetzberger	
				Gepr.	16.02.2011 / KW	
				Norm		
				Type: HH 5/2 - VVZ		Zeichnung Nr.: 04.007.DAT.05.01-E / Blatt BL.
01	Schriftkopf Englisch	14.02.2011	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		(Ers.f.:) 04.007.DAT.05.00 / (Ers.d.:)

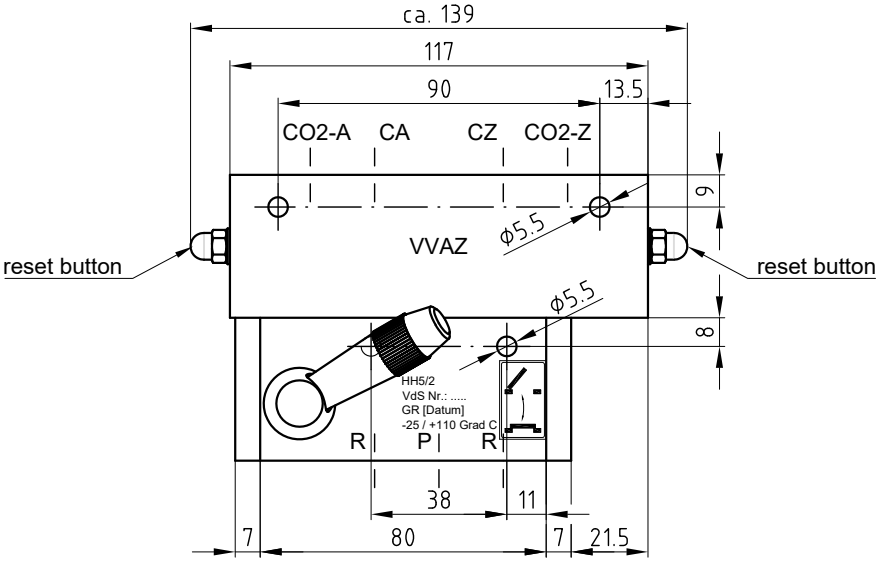
erstellt am
28.5.2002 ER

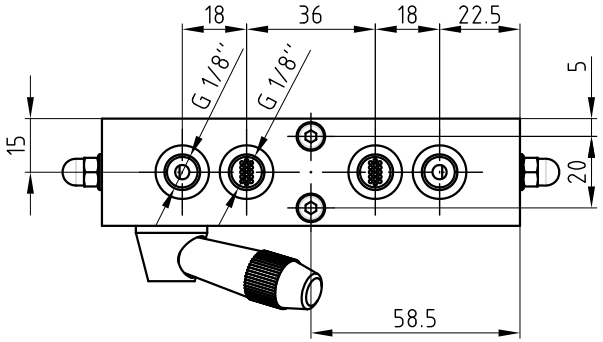
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B







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 .

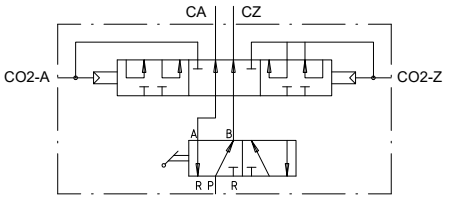
Installation:

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	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 - VVAZ

GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1 / Werkstoff: / ID - Nr.:
					Datum	Name	Bezeichnung: **Data sheet** Hand lever valve HH 5/2 - VVAZ
				Bear.	31.08.2009	Simetzberger	
				Gepr.	16.02.2011	KW	
				Norm			
				Type: HH 5/2 - VVAZ			Zeichnung Nr.: 04.007.DAT.10.01-E / Blatt BL.
01	Schriftkopf Englisch	14.02.2011	SA				
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 04.007.DAT.10.00 (Ers.d.:)

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28.5.2002 ER

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29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

VVE (Priority valve single-pipe):

- 3/2 way priority valve for the connection of two CO_2 lines, or of one compressed air and one CO_2 line
- In normal state, inlet VA is connected to outlet CA. When pressure is admitted to the CO_2 inlet, the valve reverses, connecting the CO_2 inlet to outlet CA. Inlet VA will be closed off
- Control pressure for CO_2 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.

VVE mit male connectors

VVZ (Priority valve double-pipe):

- 6/2 way priority valve for use in OPEN/CLOSE controls. Valve connects two CO_2 OPEN lines, or one compressed air and one CO_2 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 CO_2 inlet, the valve reverses, connecting the CO_2 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 CO_2 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.

VVZ with male connectors

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

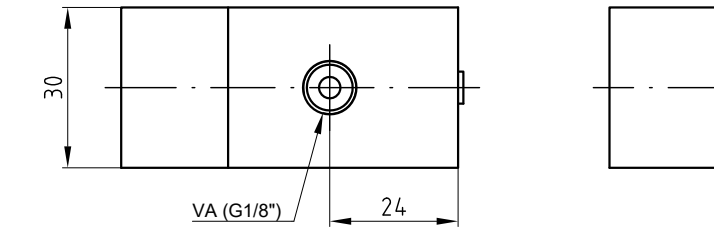
VVAZ (OPEN/CLOSE priority valve, nominal bore 4mm):

- Priority valve for use in OPEN/CLOSE controls. Valve connects two CO_2 OPEN lines, or one compressed air and one CO_2 OPEN line. Furthermore, two CO_2 CLOSE lines, or one compressed air and one CO_2 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 CO_2A inlet, the valve reverses, connecting the CO_2A inlet to outlet CA, and the CO_2Z inlet to outlet CZ. Inlets VA and VZ will be closed off. The same applies when pressure is admitted to the CO_2Z inlet
- Control of the CO_2 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 CO_2 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.

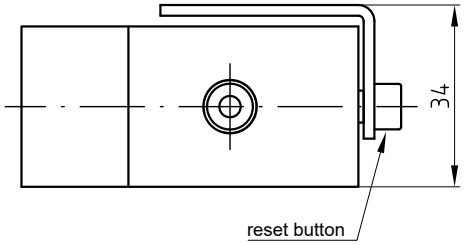
Kit VVZ / VVAZ:

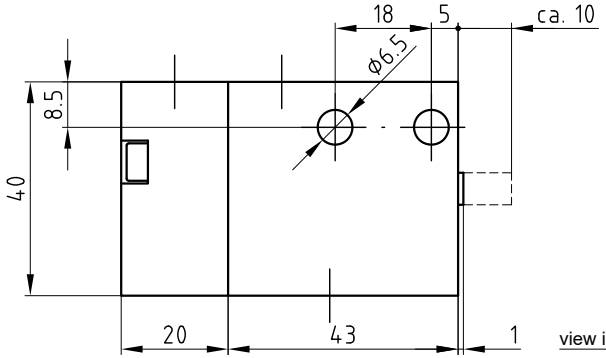
- Kit for mounting a VVZ or a VVAZ on an HH5/2
- Comprising 2 O-rings and 2 fixing bolts

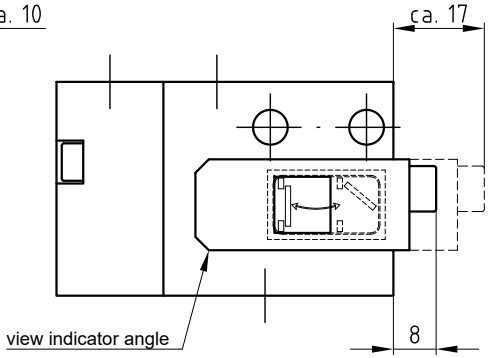
VVE CO2-input at the top:

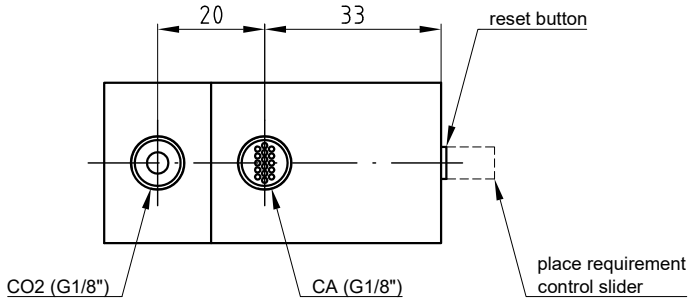


VVE CO2-input xxx - SA:

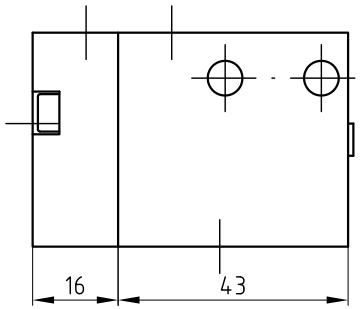


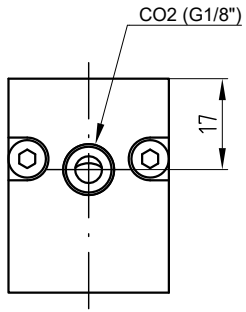






VVE CO2-input on the side:





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

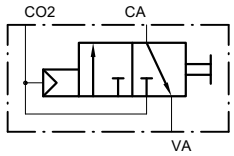
Technical data:

max. operating pressure (connections CO2-A, CO2-Z, 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:



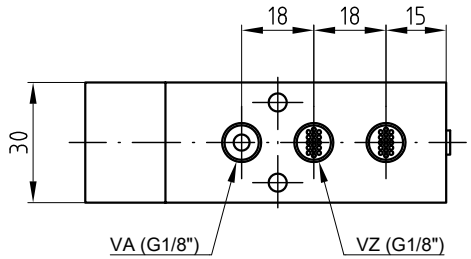
Ordering versions:

- VVE CO2-Eingang oben
- VVE-SA CO2-Eingang oben
- VVE CO2-Eingang seitlich
- VVE-SA CO2-Eingang seitlich

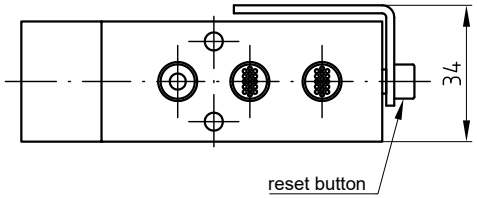
Tolerance | Scale 1:1 | Material

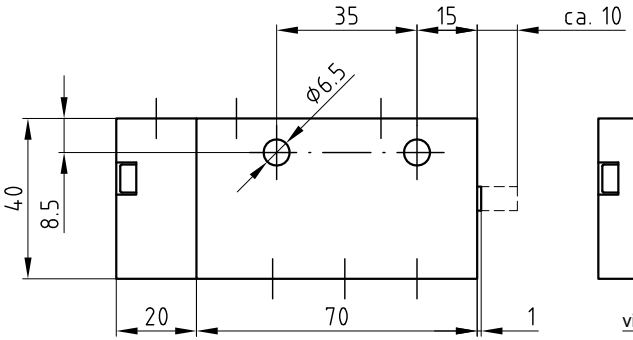
Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Priority valve single-pipe VVE / VVE-SA	Document Style: Data sheet
Approved: GH	Issue Date: 09.12.2015			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 04.026.DAT.03.02-E

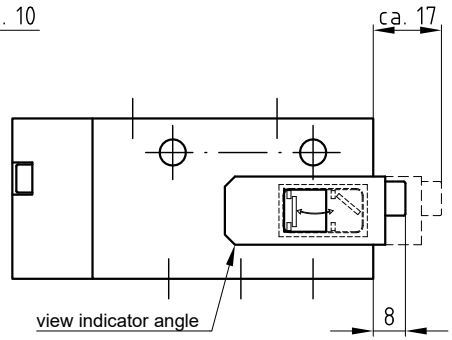
VVZ CO2-input at the top:

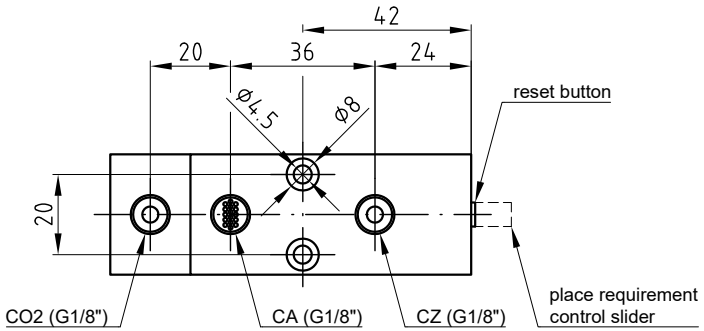


VVZ CO2-input xxx - SA:

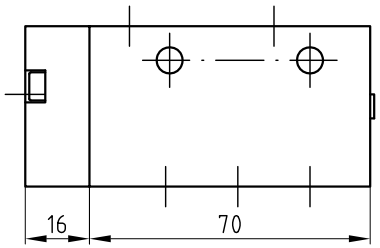


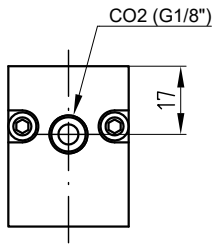






VVZ CO2-input on the side:





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.

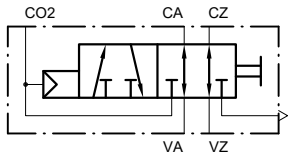
Technical data:

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:

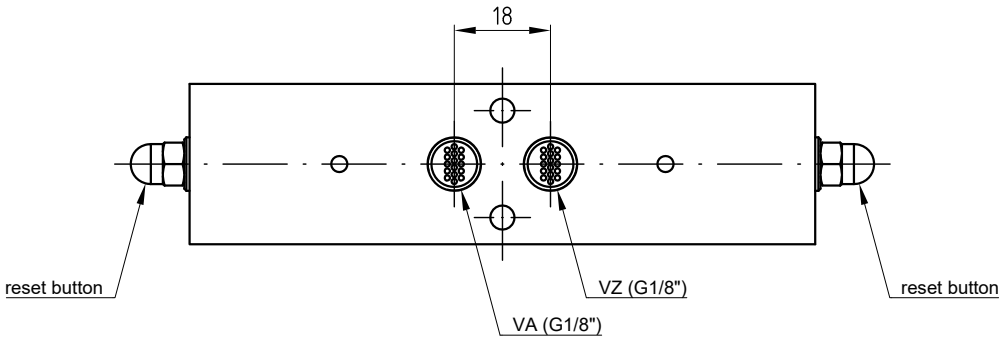


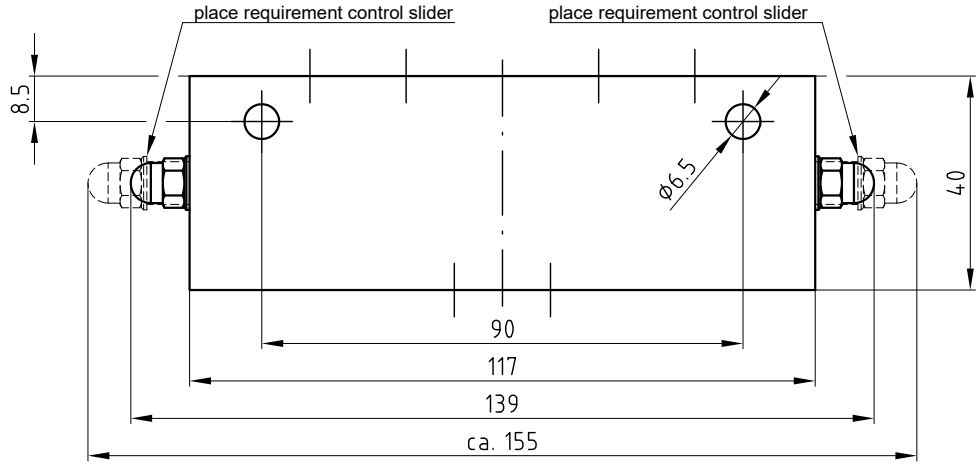
Ordering versions:

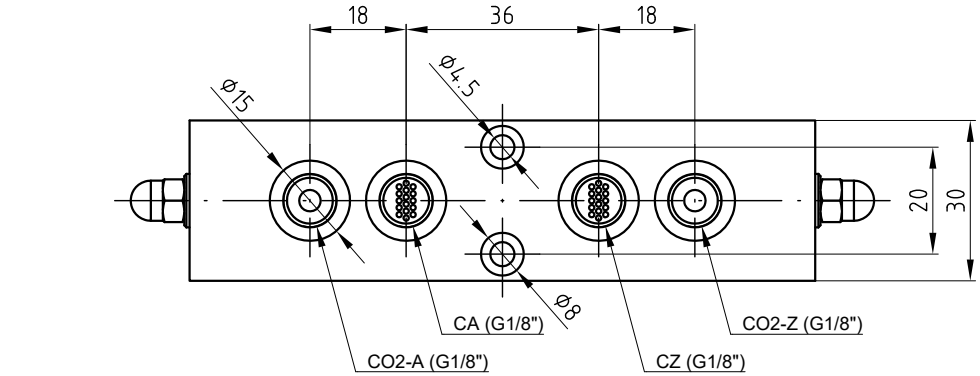
- VVZ CO2-Eingang oben
- VVZ-SA CO2-Eingang oben
- VVZ CO2-Eingang seitlich
- VVZ-SA CO2-Eingang seitlich

Tolerance | Scale 3:4 | Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Priority valve double-pipe VVZ / VVZ-SA	Document Style: Data sheet
Approved: GH	Issue Date: 09.12.2015			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 04.020.DAT.00.02-E







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.

Commisioning:

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.

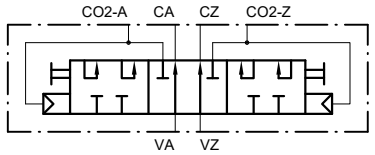
Technical data:

max. operating pressure (connections CO2-A, CO2-Z, 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:



Tolerance | Scale 1:1 | Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Priority-valve-OPEN-CLOSE VVAZ	Document Style: Data sheet
Approved: GH	Issue Date: 09.12.2015			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 04.006.DAT.00.03-E

ZSV (Sequence valve):

- Sequence valve for pressure-dependent control of an SHEVS cylinder
- At a pressure up to 6bar the valve remains safely closed. When pressure rises above 10 bar, the valve will switch, connecting inlet E to outlet A
- Nominal pressure 7bar and 8bar.
- Maximum operating pressure 60bar
- Ambient temperature range: -25°C to +110°C
- Nominal bore (free cross section) of 1mm
- 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

ZSV with male connector

Types:

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

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

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 CO_2 inlet, the valve reverses, connecting the CO_2 inlet to outlet CA. After system exhaust, the valve will automatically reset
- Maximum operating pressure 80bar
- Ambient temperature range: -25°C to +110°C
- Nominal bore (free cross section) of valve 4mm
- 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

BVE with male connector

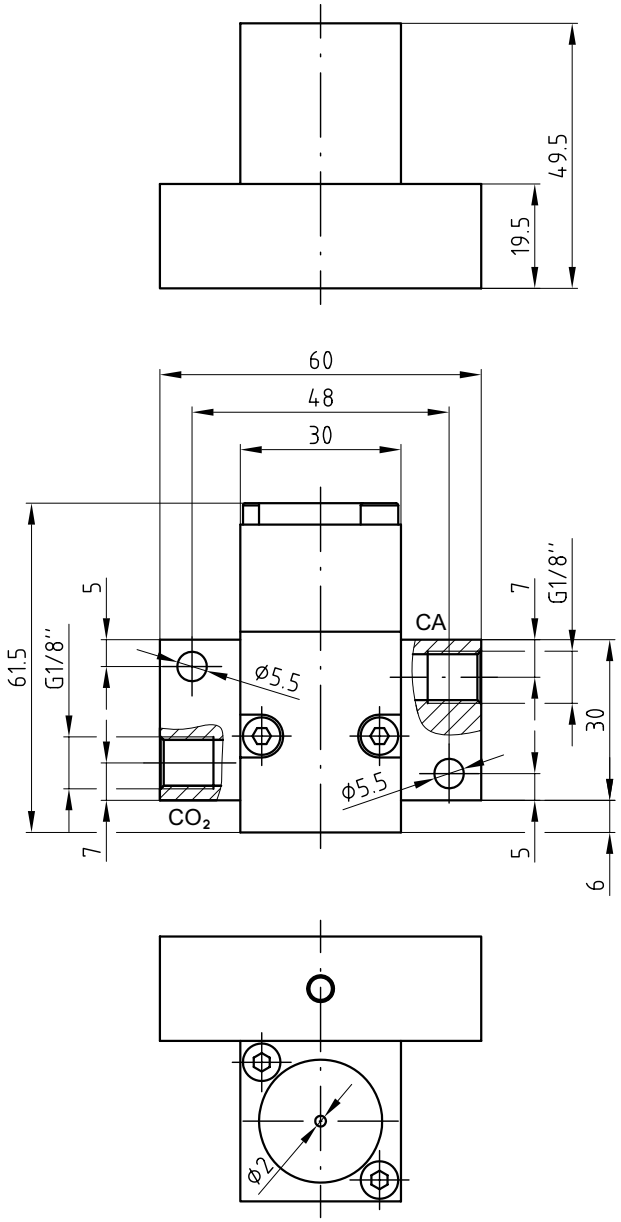
ZSV-BVE (Sequence valve with pressurising valve, single-pipe):

- 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 CO_2 inlet is charged with a pressure > 10bar, valve reverses, connecting the CO_2 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
- VdS approval no. **G 503011**

ZSV-BVE with male connector

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

Dateiname: Qf0510B



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.
Reseting the valve, the input CO2 must be completely exhaust.
Depending on the system size (pipeline lenght), 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

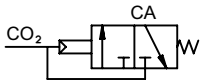
Technical data:

rated pressure	5	6	7	8	bar
minimum release pressure	7,3	8,7	10,2	11,6	bar
max. operating pressure	60bar				
connections	1/8"				
nominal width	1mm				
ambient temperature range	-25°C - +110°C				
VdS approval no.	G 503011				

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:



Ordering example:

ZSV-3.10 (rated pressure)

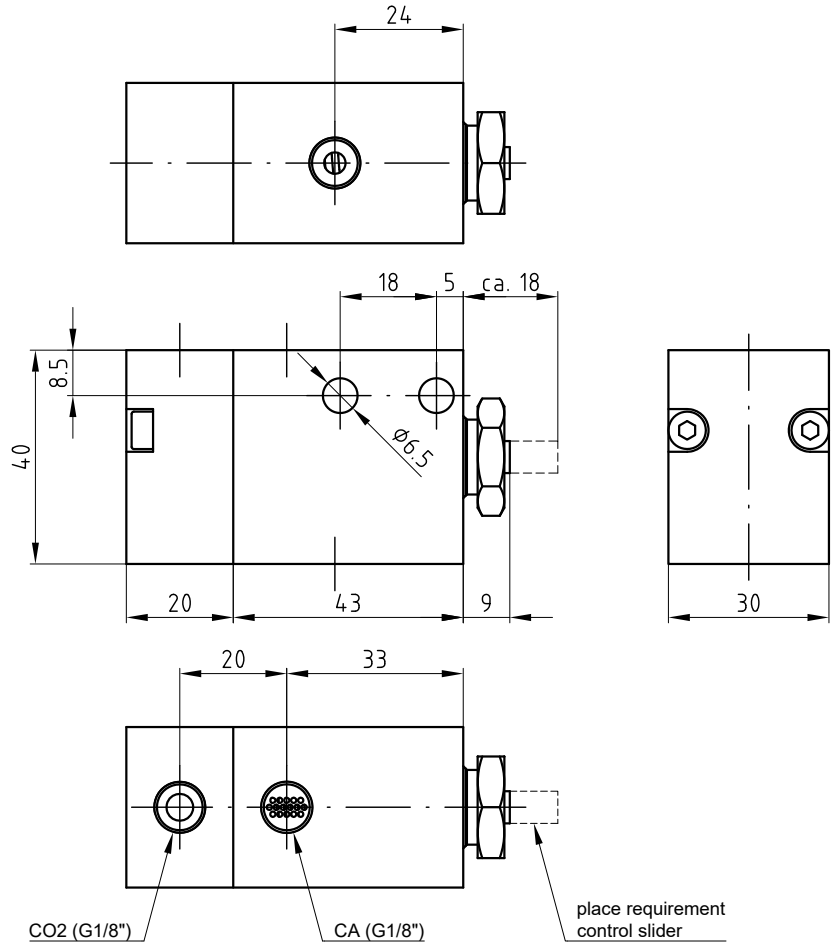
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1 / Werkstoff:
							ID - Nr.:
					Datum	Name	Bezeichnung: **Data sheet** Sequence valve ZSV-3.10
				Bear.	22.09.2009	Simetzberger	
				Gepr.	20.05.2010	KW	
				Norm			
				Type: ZSV-3.10			Zeichnung Nr.: 04.003.DAT.00.01-E / Blatt BL.
01	Text	20.05.2010	SA				
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 04.003.DAT.00.00 (Ers.d.:)

erstellt am
28.5.2002 ER

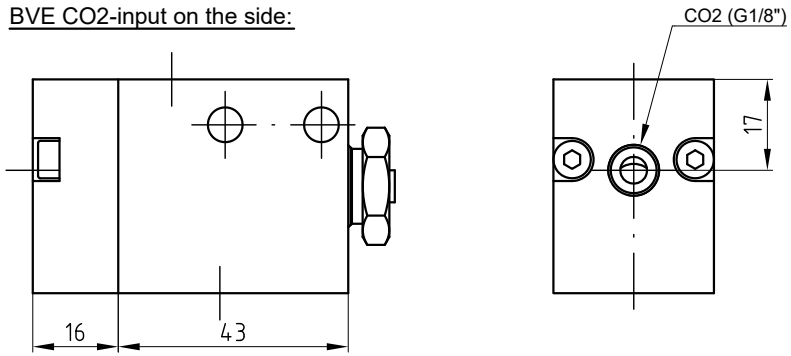
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

BVE CO2-input at the top:



BVE CO2-input on the side:



Description of function:

The pressurising valve BVE is used when a RWA-cylinder will be towed for daily ventilation through ventialtion 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.

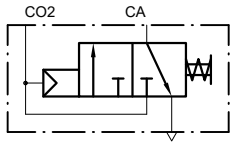
Mounting:

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 diagramm:

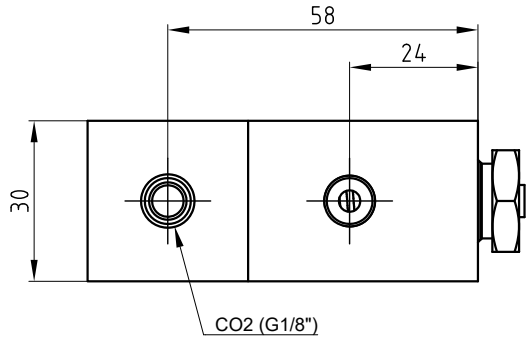


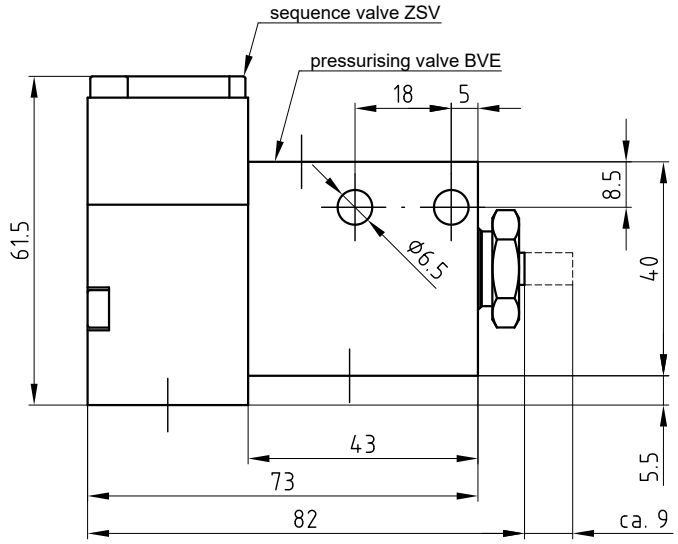
Ordering versions:

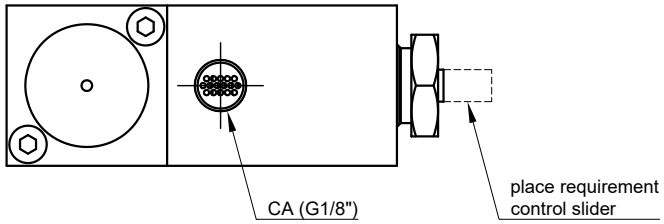
- BVE CO2-Eingang oben
- BVE CO2-Eingang seitlich

Tolerance | Scale 1:1 | Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Pressurising valve single-pipe BVE	Document Style: Data sheet
Approved: GH	Issue Date: 09.12.2015			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 04.026.DAT.01.01-E







Description of function:

The valve ZSV-BVE is a pressure-depended sequence valve with mounted pressurising valve. The oulet 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.
Reseting the valve, takes place by completely exhausting the CO2 input.
Depending on the system size (pipeline lenght), 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.

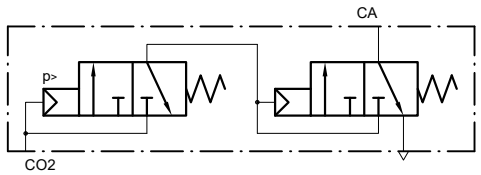
Mounting:

1) Connections:
   CO2 .....valve input
   CA ..... valve oulet
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	60bar				
nominal width of valve (exhaust)	4mm				
nominal width of valve (interconnenct)	1mm				
ambient temperature range	-25°C - +80°C (2h 110°C)				
VdS approval no.	G 503011				

Circuit diagramm:



Ordering example:

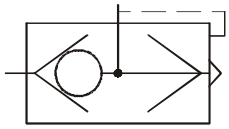
ZSV-BVE (rated pressure)

Tolerance	Scale 1:1	Material		
Created Simetzberger	Sheet 1/2	Format A3	Title Sequence valve ZSV-BVE	Document Style Data sheet
Approved GH	Issue Date 09.12.2015			Document State Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number 04.026.DAT.00.02-E

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 10bar
- Ambient temperature range: -5°C to +70°C

Types:



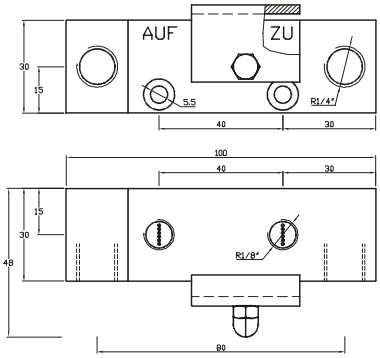
- **SEV-1/8:** Connection thread 1/8“
  For pipe connection of the valve, 2 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally

- **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

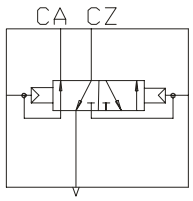
DEV-SA (Double exhaust valve with visual OPEN/CLOSED display)**:**

- Double exhaust valve for connecting several CO_2 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
  DEV-SA with male connectors
- 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



DEV-SA

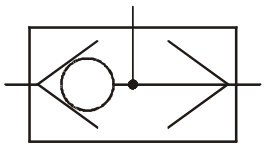


DEV

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

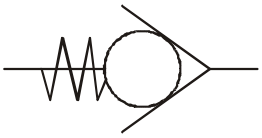
- For pipe connection of the valve, 3 male connectors 1/8" (e.g. B1-6-1/8) will be required additionally



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

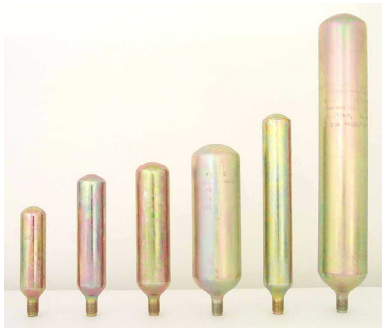


CO_2 one-way bottles for use in thermal releases

- Only for use in our thermal releases. Nominal temperature of the used thermo bulb must not be higher than the CO_2 bottle temperature rating!
- Available in packing units (PU) only

Types:

CO_2 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

CO_2 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

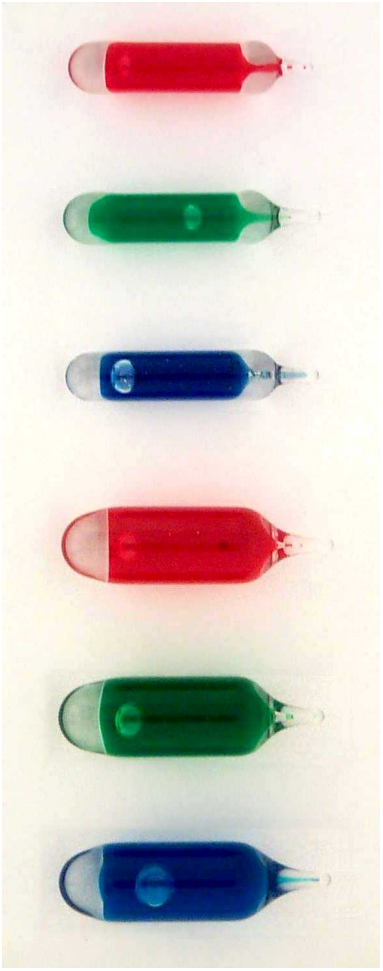
120g: dia. 50 x 239mm, nominal temperature 93°C, 1 packing unit = 15 pieces

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

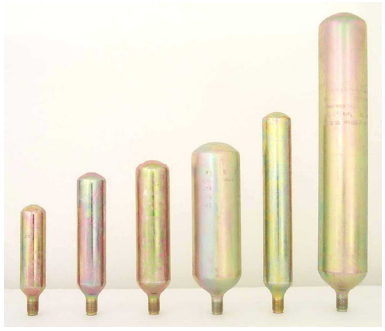
For automatic ejector, please inquire

CO_2 one-way bottles for use in non-automatic releases

- Available in packing units (PU) only

Types:

CO_2 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. 30x 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

CO_2 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

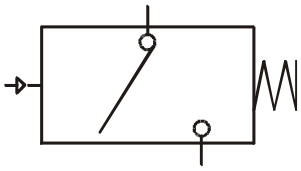
DS-S-42 (Pressure switch, normally open contact, 42V):

- 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

DS-S-42 with
protection cap

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



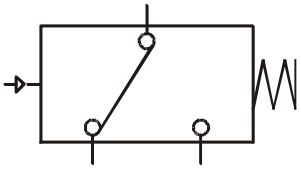
DS-W-230 (Pressure switch, two-way contact, 230V):

- 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

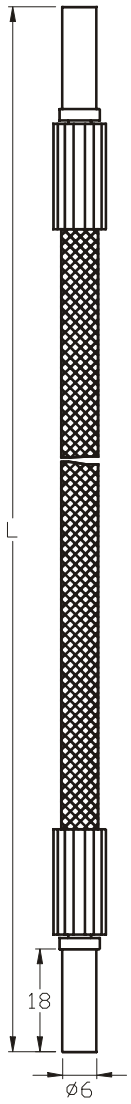
DS-W-230 with
angle connector

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

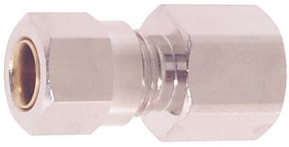
- Compression type fittings with brass body
- Captive cutting ring integrated in union nut
- Maximum operating pressure 60 bar
- Available in packing units (PU) only

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)



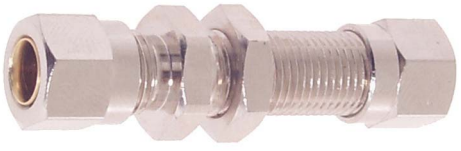
B2-6-1/8: pipe OD 6 mm, thread 1/8“, 1 packing unit = 100 pieces
B2-8-1/8: pipe OD 8 mm, thread 1/8“, 1 packing unit = 50 pieces

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

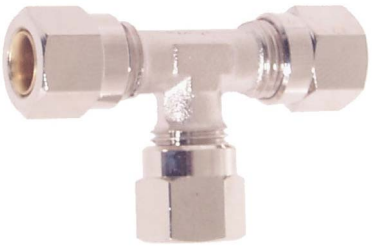
T-connector, 90°, type B8

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

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 = 50pieces

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

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 CO_2 bottle with ½“ UNF thread. CO_2 bottle is not included in our supply (for CO_2 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 CO_2 (orange) VdS-approved
AK 6-RT-HA: max. 500 g CO_2 (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 CO_2 (orange) VdS-approved
AK 6-RT-HA-BVE: max. 500 g CO_2 (flame red)

AK 7-OR-HA: max. 55 g CO_2 (orange) VdS-approved
AK 7-RT-HA: max. 55 g CO_2 (flame red)

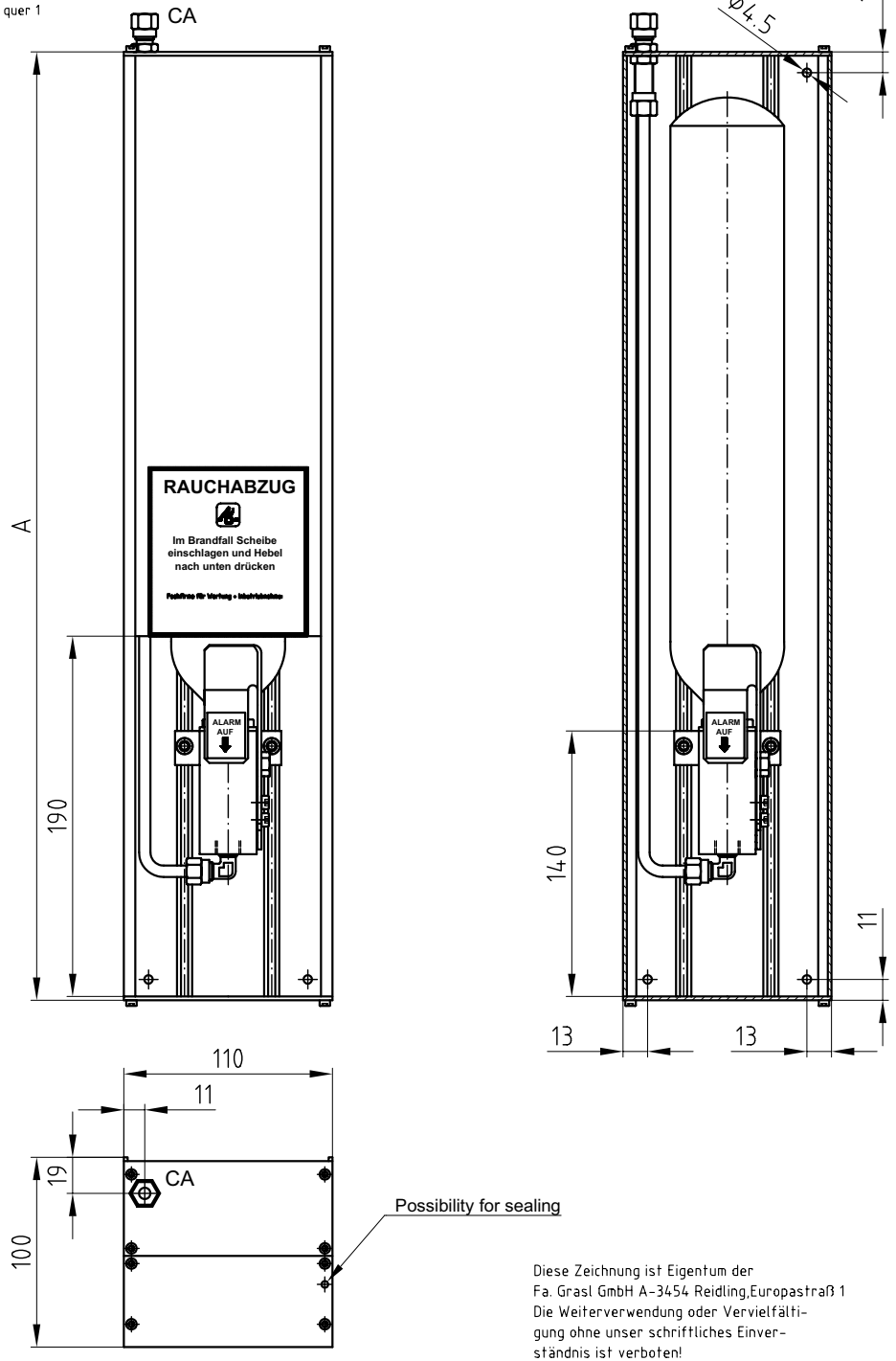
Alarm box as described above, but with additionally fitted **BVE** (single-pipe pressurising valve, see valves)

AK 7-OR-HA-BVE: max. 55 g CO_2 (orange) VdS-approved
AK 7-RT-HA-BVE: max. 55 g CO_2 (flame red)

Spare glass sheet:

AK 6 / AK 7: 105 x 195 x 1 mm

Dateiname: Qf0510B



Assemply 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:

Manual releasing: Push release lever down until it locks.

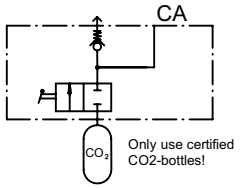
Commisioning:

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	80bar
nominal width of valve	1,8mm
nominal width of piercing needle	2mm
ambient temperature range	-25°C - +55°C
VdS approval no.	G 504001

Pneumatic symbol:



Types:

Type	Thread	Size A
AK6-HA	1/2" UNF	500
AK6-HA-M18x1,5	M18x1,5	500
AK7-HA	1/2" UNF	300
AK7-HA-M18x1,5	M18x1,5	300

GRASL
Pneumatic-Mechanik GmbH
A-3454 Reidling
Europastraße 1

Freimaßtoleranz nach DIN 7168:

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

	Datum	Name
Bear.	21.09.2009	Simetzberger
Gepr.	26.08.2010	ER
Norm		

Bezeichnung:
Alarm box
AKx-HA

Type: AKx-HA

Zeichnung Nr.: 06.003.DAT.18.01-E

Blatt

BL.

Zus.	Änderung	Datum	Name
01	VdS-Anerkennungsnr.	22.07.2010	SA

(Urspr.) (Ers.f.:) 06.003.DAT.18.00 (Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

AK10.x - Hand release OPEN

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of a CO_2 bottle. CO_2 bottle is not included in our supply (for CO_2 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 OK 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.

Alarm box for
CO_2 one-way bottles
without dip tube

Types:

Alarm box for CO_2 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 CO_2 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, 320x700x170 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 CO_2 bottle. CO_2 bottle is not included in our supply (for CO_2 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 OK 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.

Alarm box for CO_2 one-way bottles without dip tube

Types:

Alarm box for CO_2 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 CO_2 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, 320x700x170 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 CO_2 bottle. CO_2 bottle is not included in our supply (for CO_2 bottles, please refer to valves -> accessories). Pneumatical 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.

Alarm box for CO_2 one-way bottles without dip tube

Types:

Alarm box for CO_2 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 CO_2 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, 320x700x170 (WxHxD)

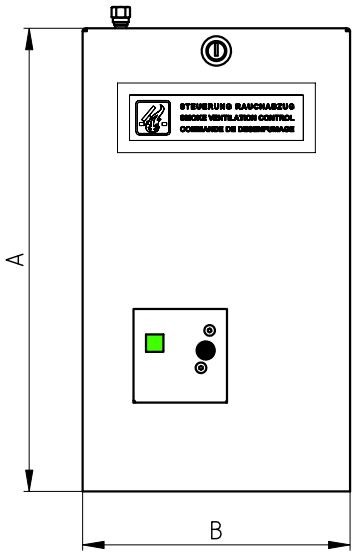
Options:

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

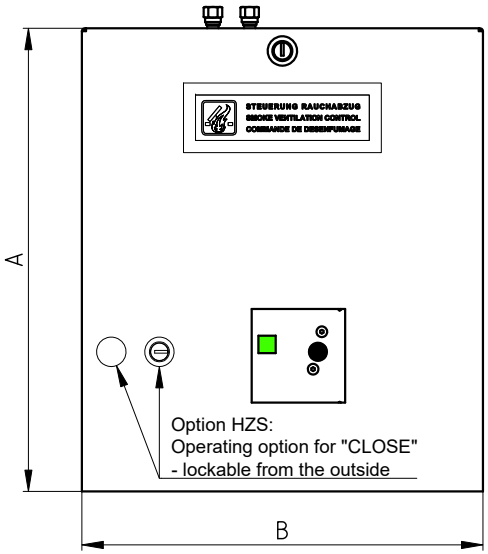
Accessories:

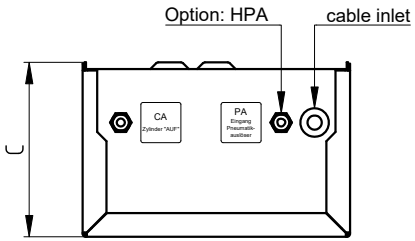
Spare glass sheet for AK 10.x: RT-E-Blanko

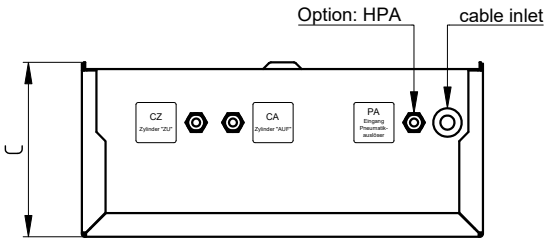
AK x0.y- ... -R



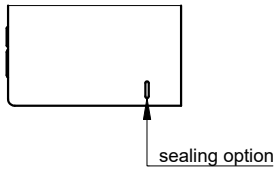
AK xx.y- ... -HZ-R



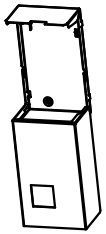




Securing function:



Holding position of cover:



Technical data:

max. operating pressure	80bar
control pressure for HPA	6bar - 30bar
nominal width of the valve / piercing needle	4mm / 2mm
rated voltage of the electrical release	24VDC +30/-20%
rated current of the electrical release	0,29ADC
duty cycle of the electrical release	100%
can be used in the temperature range	-5°C - +55°C
environmental class	I

The expected output pressure strongly depends on the connected device and the amount of CO2. The CO2 bottle must be selected in the way that the output pressure does not exceed 80bar.

Connections:

CA ... cylinder OPEN, CZ ... cylinder CLOSE, PA ... pneumatic external control connection

Order designation:

AK xx.y - aa - ... - R

- spare bottle bracket
- HA ... manual OPEN
- HA-HZ ... manual OPEN - manual CLOSE
- HEA ... manual, electrical OPEN
- HEA-HZ ... manual, electrical OPEN - manual CLOSE
- HPA ... manual, pneumatic OPEN
- HPA-HZ ... manual, pneumatic OPEN - manual CLOSE

aa: colour (OR=RAL 2011, optional: RT=RAL 3000)

xx: alarm box size

y: number of CO2 bottles CLOSE

y: number of CO2 bottles OPEN

Tolerance | Scale 1:4 | Material

Created: Simetzberger	Sheet: 1/3	Format: A3	Title: Alarm box AK xx.y- ... -R	Document Style: Data sheet
Approved: HA	Issue Date: 07.08.2023			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 06.003.DAT.00.04-E

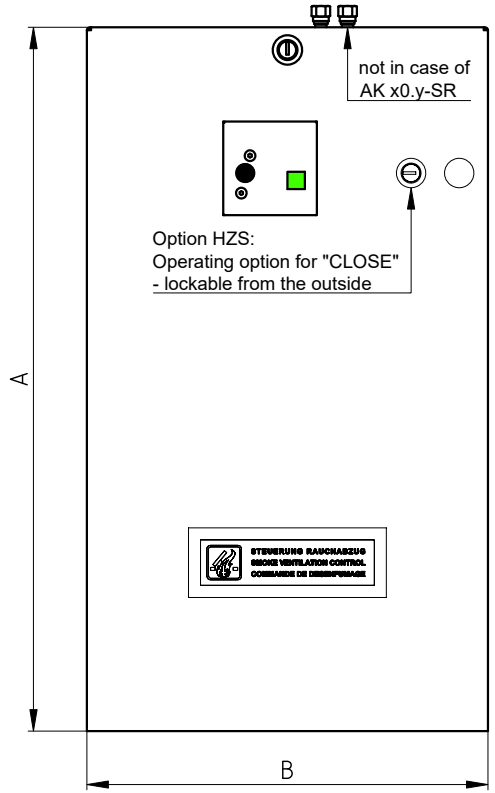
type	A [mm]	B [mm]	C [mm]	max. CO2-amount for		min. CO2-amount in RTC [g]	min. external pipe [m]	VdS *)
				open [g]	close [g]			
AK 10.3-OR- ... -R	350	200	130	1x150	---	---	---	G507003
AK 10.5-OR- ... -R	500	200	130	1x500	---	---	---	G507003
AK 10.7-OR- ... -R	650	200	130	1x750	---	---	---	---
AK 10.9-OR- ... -R	700	220	170	1x1500	---	---	---	---
AK 11.3-OR- ... -R	350	300	130	1x150	1x150	---	---	G507003
AK 11.5-OR- ... -R	500	300	130	1x500	1x500	---	---	G507003
AK 11.7-OR- ... -R	650	300	130	1x750	1x750	---	---	---
AK 11.9-OR- ... -R	700	320	170	1x1500	1x1500	---	---	---
AK 20.5-OR- ... -R	500	490	210	2x500	---	500	10	---
AK 20.9-OR- ... -R	700	490	170	2x1500	---	500	10	---
AK 21.5-OR- ... -R	500	490	210	2x500	1x500	500	10	---
AK 21.9-OR- ... -R	700	490	170	2x1500	1x1500	500	10	---
AK 22.5-OR- ... -R	500	490	210	2x500	2x500	500	10	---
AK 22.9-OR- ... -R	700	490	170	2x1500	2x1500	500	10	---
AK 30.5-OR- ... -R	500	490	210	3x500	---	500	10	---
AK 30.9-OR- ... -R	700	490	170	3x1500	---	500	10	---
AK 31.5-OR- ... -R	500	490	210	3x500	1x500	500	10	---
AK 31.9-OR- ... -R	700	490	170	3x1500	1x1500	500	10	---
AK 32.5-OR- ... -R	500	490	210	3x500	2x500	500	10	---
AK 32.9-OR- ... -R	700	670	170	3x1500	2x1500	500	10	---
AK 33.5-OR- ... -R	500	490	210	3x500	3x500	500	10	---
AK 33.9-OR- ... -R	700	670	170	3x1500	3x1500	500	10	---
AK 40.5-OR- ... -R	500	490	210	4x500	---	500	10	---
AK 40.9-OR- ... -R	700	670	170	4x1500	---	500	10	---
AK 41.5-OR- ... -R	500	490	210	4x500	1x500	500	10	---
AK 41.9-OR- ... -R	700	670	170	4x1500	1x1500	500	10	---
AK 42.5-OR- ... -R	500	490	210	4x500	2x500	500	10	---
AK 42.9-OR- ... -R	700	670	170	4x1500	2x1500	500	10	---
AK 43.5-OR- ... -R	500	490	210	4x500	3x500	500	10	---
AK 44.5-OR- ... -R	500	490	210	4x500	4x500	500	10	---
AK 50.5-OR- ... -R	500	670	210	5x500	---	500	10	---
AK 50.9-OR- ... -R	700	670	170	5x1500	---	500	10	---
AK 51.5-OR- ... -R	500	670	210	5x500	1x500	500	10	---
AK 52.5-OR- ... -R	500	670	210	5x500	2x500	500	10	---
AK 53.5-OR- ... -R	500	670	210	5x500	3x500	500	10	---
AK 54.5-OR- ... -R	500	670	210	5x500	4x500	500	10	---
AK 55.5-OR- ... -R	500	670	210	5x500	5x500	500	10	---
AK 60.5-OR- ... -R	500	670	210	6x500	---	500	10	---
AK 61.5-OR- ... -R	500	670	210	6x500	1x500	500	10	---
AK 62.5-OR- ... -R	500	670	210	6x500	2x500	500	10	---
AK 63.5-OR- ... -R	500	670	210	6x500	3x500	500	10	---
AK 64.5-OR- ... -R	500	670	210	6x500	4x500	500	10	---
AK 65.5-OR- ... -R	500	670	210	6x500	5x500	500	10	---
AK 66.5-OR- ... -R	500	670	210	6x500	6x500	500	10	---

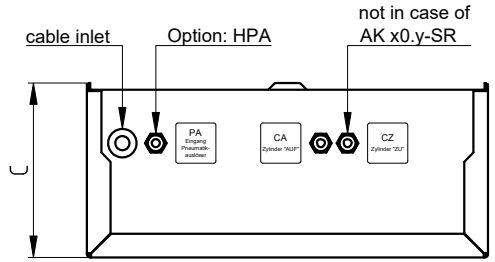
*) VdS approval only valid with colour RAL 2011 and for variants HA, HA-HZ, HEA, HEA-HZ

Tolerance Scale 1:1 Material

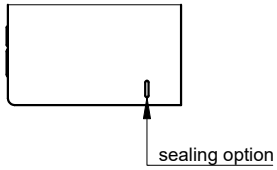
Created	Sheet	Format	Title	Document Style
Simetzberger	2/3	A4	Alarm box	Data sheet
Approved	Issue Date		AK xx.y- ... -R	Document State
HA	07.08.2023			Valid
Grasl				Document Number
Pneumatic Mechanik Gmbh QM FO 05.24.0				06.003.DAT.00.04-E

AK xx.y- ... -SR-R

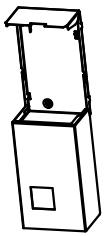




Securing function:



Holding position of cover:



Technical data:

max. operating pressure	80bar
control pressure for HPA	6bar - 30bar
nominal width of the valve / piercing needle	4mm / 8mm
rated voltage of the electrical release	24VDC +30/-20%
rated current of the electrical release	0,29ADC
duty cycle of the electrical release	100%
can be used in the temperature range	-5°C - +55°C
environmental class	I

The expected output pressure strongly depends on the connected device and the amount of CO2. The CO2 bottle must be selected in the way that the output pressure does not exceed 80bar.

Connections:

CA ... cylinder OPEN
CZ ... cylinder CLOSE
PA ... pneumatic external control connection

Order designation:

AK xx.y - aa - ... - SR - R

- spare bottle bracket
- rising pipe bottle with screw-in thread M18x1,5
- HA ... manual OPEN, HA-HZ ... manual OPEN - manual CLOSE
- HEA ... manual, electrical OPEN, HEA-HZ ... manual, electrical OPEN - manual CLOSE
- HPA ... manual, pneumatic OPEN, HPA-HZ ... manual, pneumatic OPEN - manual CLOSE
- colour (OR=RAL 2011, optional: RT=RAL 3000)
- alarm box size
- number of CO2 bottles CLOSE
- number of CO2 bottles OPEN

type	A [mm]	B [mm]	C [mm]	max. CO2 amount for		min. CO2 amount in the RTC [g]	min. external pipe [m]
				OPEN [g]	CLOSE [g]		
AK 10.5-OR- ... -SR-R	530	300	130	1x500	---	---	---
AK 10.9-OR- ... -SR-R	700	320	170	1x1500	---	---	---
AK 11.5-OR- ... -SR-R	530	300	130	1x500	1x500	---	---
AK 11.9-OR- ... -SR-R	700	320	170	1x1500	1x1500	---	---
AK 20.9-OR- ... -SR-R	700	490	170	2x1500	---	500	10
AK 21.9-OR- ... -SR-R	700	490	170	2x1500	1x1500	500	10
AK 22.9-OR- ... -SR-R	700	490	170	2x1500	2x1500	500	10
AK 30.9-OR- ... -SR-R	700	490	170	3x1500	---	500	10
AK 31.9-OR- ... -SR-R	700	490	170	3x1500	1x1500	500	10
AK 32.9-OR- ... -SR-R	700	670	170	3x1500	2x1500	500	10
AK 33.9-OR- ... -SR-R	700	670	170	3x1500	3x1500	500	10
AK 40.9-OR- ... -SR-R	700	670	170	4x1500	---	500	10
AK 41.9-OR- ... -SR-R	700	670	170	4x1500	1x1500	500	10
AK 42.9-OR- ... -SR-R	700	670	170	4x1500	2x1500	500	10
AK 50.9-OR- ... -SR-R	700	670	170	5x1500	---	500	10

Tolerance Scale 1:4 Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Alarm box AK xx.y- ... -SR-R	Document Style: Data sheet
Approved: HA	Issue Date: 31.07.2023			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 06.003.DAT.04.03-E

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 pneumaticl release of 2-3 CO_2 bottles with ½" UNF thread. CO_2 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 CO_2 from one or more points of operation with small CO_2 " 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:

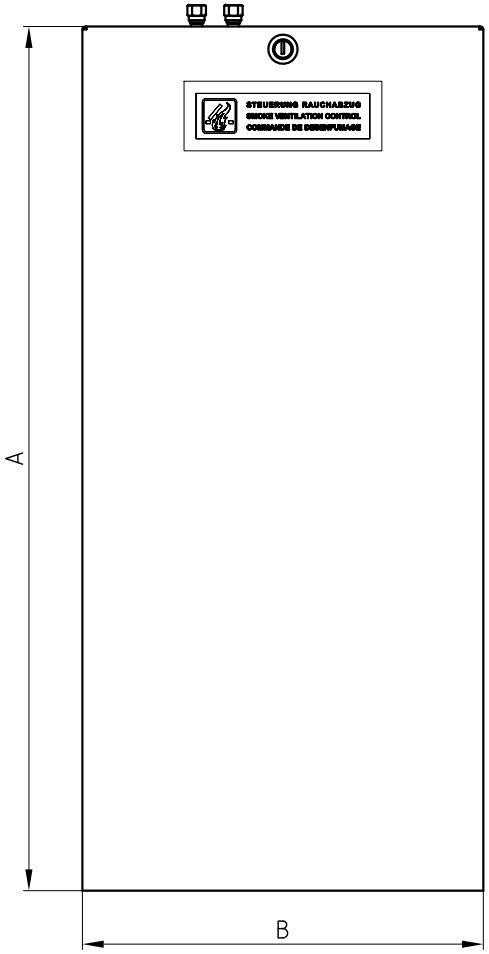
AK 20.7-OR-PA-R: max. 2 x 750 g, 300x650x130 mm (WxHxD)
AK 30.7-OR-PA-R: max. 3 x 750 g, 300x650x130 mm (WxHxD)

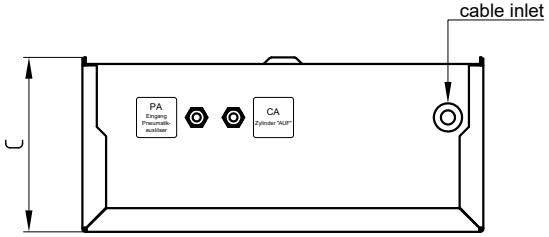
AK 20.9-OR-PA-R: max. 2 x 1500 g, 320x700x170 mm (WxHxD)
AK 30.9-OR-PA-R: max. 3 x 1500 g, 320x700x170 mm (WxHxD)

Options:

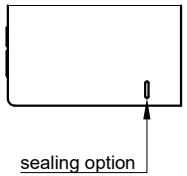
AK x0.y-RT- PA-R: colour RAL 3000 (red)
Ø8: all connections for pipe diameter dia. 8 mm

AK x0.y- ... -PA-R

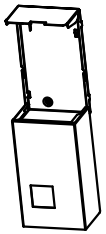




Securing function:



Holding position of cover:



Technical data:

max. operating pressure	80bar
control pressure for HPA	8bar - 30bar
nominal width of the valve / piercing needle	4mm / 2mm
can be used in the temperature range	-5°C - +55°C
environmental class	I

The expected output pressure strongly depends on the connected device and the amount of CO2. The CO2 bottle must be selected in the way that the output pressure does not exceed 80bar.

Functional description:

Controlling the pneumatic release (PA) will pierce the screwed-in CO2 bottle, and the CO2 gas will be connected to output CA (G1/8").

Release:

Pneumatic release: Apply the minimal release pressure at PA.

Connections:

CA ... cylinder OPEN
PA ... pneumatic external control connection

Order designation:

AK x0.y - aa - PA - R

- spare bottle bracket
- pneumatic OPEN
- colour (OR=RAL 2011, optional: RT=RAL 3000)
- alarm box size
- number of CO2 bottles OPEN

type	A [mm]	B [mm]	C [mm]	max. CO2-amount for	
				OPEN [g]	CLOSE [g]
AK 10.7-OR-PA-R	650	300	130	1x750	---
AK 10.9-OR-PA-R	700	320	170	1x1500	---
AK 20.7-OR-PA-R	650	300	130	2x750	---
AK 20.9-OR-PA-R	700	320	170	2x1500	---
AK 30.7-OR-PA-R	650	300	130	3x750	---
AK 30.9-OR-PA-R	700	320	170	3x1500	---

Tolerance | Scale 1:4 | Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Alarm box AK x0.y- ... -PA-R	Document Style: Data sheet
Approved: HA	Issue Date: 06.02.2020			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 06.003.DAT.07.02-E

AK 11.x - Hand release OPEN/CLOSE

Alarm box for CO_2 one-way bottles without dip tube

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of two CO_2 bottles. SHEVS OPEN (1st bottle) and SHEVS CLOSE (2nd bottle). CO_2 bottles are not included in our supply (for CO_2 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 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); 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 CO_2 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 CO_2 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, 320x700x170 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

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

Alarm box for CO_2 one-way bottles without dip tube

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of two CO_2 bottles. SHEVS OPEN (1st bottle manual and electrical release) and SHEVS CLOSE (2nd bottle manual removed). CO_2 bottles are not included in our supply (for CO_2 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 CO_2 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. 1500g, 320x700x170 mm (WxHxD)

Alarm box for CO_2 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, 320x700x170 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 for CO_2 one-way bottles without dip tube

- Alarm box with integrated release valve RTC (see hand release valves) for manual release of two CO_2 bottles. SHEVS OPEN (1st bottle manual and pneumatical release) and SHEVS CLOSE (2nd bottle manual release only). CO_2 bottles are not included in our supply (for CO_2 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 without additional circuitry elements. Please inquire for various options.

Types:

Alarm box for CO_2 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 CO_2 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, 320x700x170 mm (WxHxD)

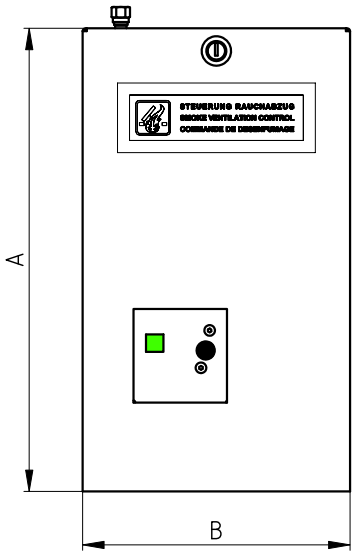
Options:

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

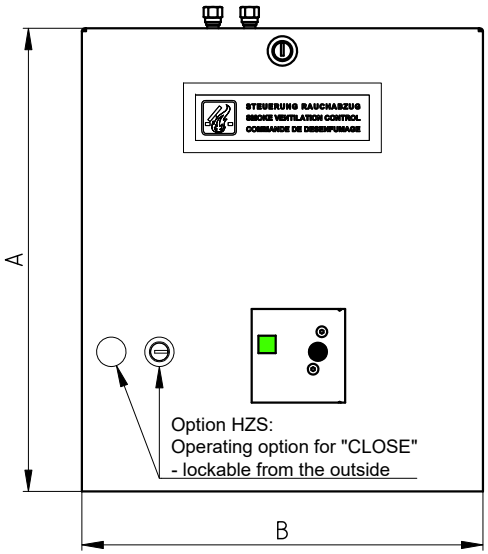
Accessories:

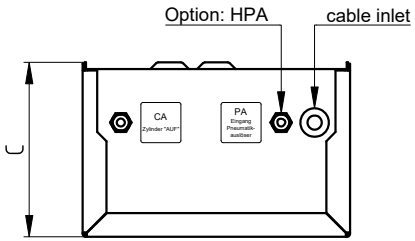
Spare glass sheet for AK 10.x: RT-E-Blanko

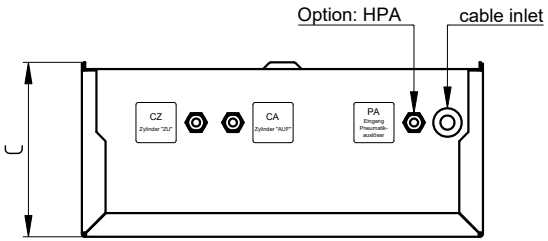
AK x0.y- ... -R



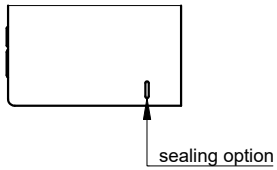
AK xx.y- ... -HZ-R



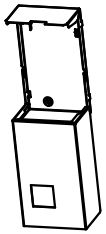




Securing function:



Holding position of cover:



Technical data:

max. operating pressure	80bar
control pressure for HPA	6bar - 30bar
nominal width of the valve / piercing needle	4mm / 2mm
rated voltage of the electrical release	24VDC +30/-20%
rated current of the electrical release	0,29ADC
duty cycle of the electrical release	100%
can be used in the temperature range	-5°C - +55°C
environmental class	I

The expected output pressure strongly depends on the connected device and the amount of CO2. The CO2 bottle must be selected in the way that the output pressure does not exceed 80bar.

Connections:

CA ... cylinder OPEN, CZ ... cylinder CLOSE, PA ... pneumatic external control connection

Order designation:

AK xx.y - aa - ... - R

- spare bottle bracket
- HA ... manual OPEN
- HA-HZ ... manual OPEN - manual CLOSE
- HEA ... manual, electrical OPEN
- HEA-HZ ... manual, electrical OPEN - manual CLOSE
- HPA ... manual, pneumatic OPEN
- HPA-HZ ... manual, pneumatic OPEN - manual CLOSE

aa: colour (OR=RAL 2011, optional: RT=RAL 3000)

xx: alarm box size

y: number of CO2 bottles CLOSE

y: number of CO2 bottles OPEN

Tolerance | Scale 1:4 | Material

Created: Simetzberger	Sheet: 1/3	Format: A3	Title: Alarm box AK xx.y- ... -R	Document Style: Data sheet
Approved: HA	Issue Date: 07.08.2023			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 06.003.DAT.00.04-E

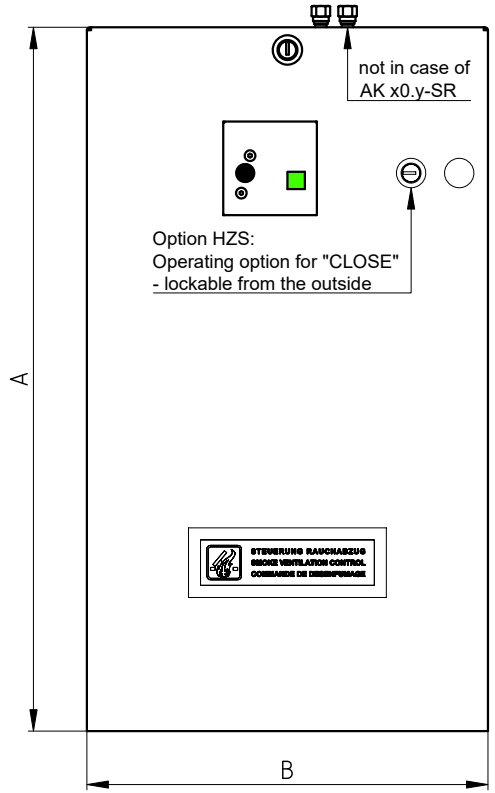
type	A [mm]	B [mm]	C [mm]	max. CO2-amount for		min. CO2-amount in RTC [g]	min. external pipe [m]	VdS *)
				open [g]	close [g]			
AK 10.3-OR- ... -R	350	200	130	1x150	---	---	---	G507003
AK 10.5-OR- ... -R	500	200	130	1x500	---	---	---	G507003
AK 10.7-OR- ... -R	650	200	130	1x750	---	---	---	---
AK 10.9-OR- ... -R	700	220	170	1x1500	---	---	---	---
AK 11.3-OR- ... -R	350	300	130	1x150	1x150	---	---	G507003
AK 11.5-OR- ... -R	500	300	130	1x500	1x500	---	---	G507003
AK 11.7-OR- ... -R	650	300	130	1x750	1x750	---	---	---
AK 11.9-OR- ... -R	700	320	170	1x1500	1x1500	---	---	---
AK 20.5-OR- ... -R	500	490	210	2x500	---	500	10	---
AK 20.9-OR- ... -R	700	490	170	2x1500	---	500	10	---
AK 21.5-OR- ... -R	500	490	210	2x500	1x500	500	10	---
AK 21.9-OR- ... -R	700	490	170	2x1500	1x1500	500	10	---
AK 22.5-OR- ... -R	500	490	210	2x500	2x500	500	10	---
AK 22.9-OR- ... -R	700	490	170	2x1500	2x1500	500	10	---
AK 30.5-OR- ... -R	500	490	210	3x500	---	500	10	---
AK 30.9-OR- ... -R	700	490	170	3x1500	---	500	10	---
AK 31.5-OR- ... -R	500	490	210	3x500	1x500	500	10	---
AK 31.9-OR- ... -R	700	490	170	3x1500	1x1500	500	10	---
AK 32.5-OR- ... -R	500	490	210	3x500	2x500	500	10	---
AK 32.9-OR- ... -R	700	670	170	3x1500	2x1500	500	10	---
AK 33.5-OR- ... -R	500	490	210	3x500	3x500	500	10	---
AK 33.9-OR- ... -R	700	670	170	3x1500	3x1500	500	10	---
AK 40.5-OR- ... -R	500	490	210	4x500	---	500	10	---
AK 40.9-OR- ... -R	700	670	170	4x1500	---	500	10	---
AK 41.5-OR- ... -R	500	490	210	4x500	1x500	500	10	---
AK 41.9-OR- ... -R	700	670	170	4x1500	1x1500	500	10	---
AK 42.5-OR- ... -R	500	490	210	4x500	2x500	500	10	---
AK 42.9-OR- ... -R	700	670	170	4x1500	2x1500	500	10	---
AK 43.5-OR- ... -R	500	490	210	4x500	3x500	500	10	---
AK 44.5-OR- ... -R	500	490	210	4x500	4x500	500	10	---
AK 50.5-OR- ... -R	500	670	210	5x500	---	500	10	---
AK 50.9-OR- ... -R	700	670	170	5x1500	---	500	10	---
AK 51.5-OR- ... -R	500	670	210	5x500	1x500	500	10	---
AK 52.5-OR- ... -R	500	670	210	5x500	2x500	500	10	---
AK 53.5-OR- ... -R	500	670	210	5x500	3x500	500	10	---
AK 54.5-OR- ... -R	500	670	210	5x500	4x500	500	10	---
AK 55.5-OR- ... -R	500	670	210	5x500	5x500	500	10	---
AK 60.5-OR- ... -R	500	670	210	6x500	---	500	10	---
AK 61.5-OR- ... -R	500	670	210	6x500	1x500	500	10	---
AK 62.5-OR- ... -R	500	670	210	6x500	2x500	500	10	---
AK 63.5-OR- ... -R	500	670	210	6x500	3x500	500	10	---
AK 64.5-OR- ... -R	500	670	210	6x500	4x500	500	10	---
AK 65.5-OR- ... -R	500	670	210	6x500	5x500	500	10	---
AK 66.5-OR- ... -R	500	670	210	6x500	6x500	500	10	---

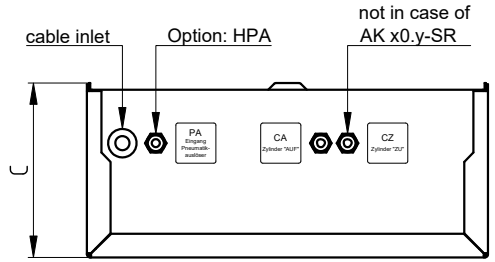
*) VdS approval only valid with colour RAL 2011 and for variants HA, HA-HZ, HEA, HEA-HZ

Tolerance Scale 1:1 Material

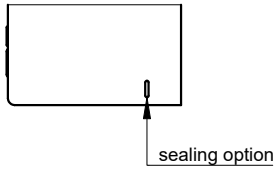
Created	Sheet	Format	Title	Document Style
Simetzberger	2/3	A4	Alarm box	Data sheet
Approved	Issue Date		AK xx.y- ... -R	Document State
HA	07.08.2023			Valid
Grasl				Document Number
Pneumatic Mechanik Gmbh QM FO 05.24.0				06.003.DAT.00.04-E

AK xx.y- ... -SR-R

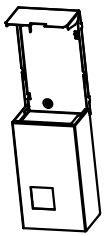




Securing function:



Holding position of cover:



Technical data:

max. operating pressure	80bar
control pressure for HPA	6bar - 30bar
nominal width of the valve / piercing needle	4mm / 8mm
rated voltage of the electrical release	24VDC +30/-20%
rated current of the electrical release	0,29ADC
duty cycle of the electrical release	100%
can be used in the temperature range	-5°C - +55°C
environmental class	I

The expected output pressure strongly depends on the connected device and the amount of CO2. The CO2 bottle must be selected in the way that the output pressure does not exceed 80bar.

Connections:

CA ... cylinder OPEN
CZ ... cylinder CLOSE
PA ... pneumatic external control connection

Order designation:

AK xx.y - aa - ... - SR - R

- spare bottle bracket
- rising pipe bottle with screw-in thread M18x1,5
- HA ... manual OPEN, HA-HZ ... manual OPEN - manual CLOSE
- HEA ... manual, electrical OPEN, HEA-HZ ... manual, electrical OPEN - manual CLOSE
- HPA ... manual, pneumatic OPEN, HPA-HZ ... manual, pneumatic OPEN - manual CLOSE
- colour (OR=RAL 2011, optional: RT=RAL 3000)
- alarm box size
- number of CO2 bottles CLOSE
- number of CO2 bottles OPEN

type	A [mm]	B [mm]	C [mm]	max. CO2 amount for		min. CO2 amount in the RTC [g]	min. external pipe [m]
				OPEN [g]	CLOSE [g]		
AK 10.5-OR- ... -SR-R	530	300	130	1x500	---	---	---
AK 10.9-OR- ... -SR-R	700	320	170	1x1500	---	---	---
AK 11.5-OR- ... -SR-R	530	300	130	1x500	1x500	---	---
AK 11.9-OR- ... -SR-R	700	320	170	1x1500	1x1500	---	---
AK 20.9-OR- ... -SR-R	700	490	170	2x1500	---	500	10
AK 21.9-OR- ... -SR-R	700	490	170	2x1500	1x1500	500	10
AK 22.9-OR- ... -SR-R	700	490	170	2x1500	2x1500	500	10
AK 30.9-OR- ... -SR-R	700	490	170	3x1500	---	500	10
AK 31.9-OR- ... -SR-R	700	490	170	3x1500	1x1500	500	10
AK 32.9-OR- ... -SR-R	700	670	170	3x1500	2x1500	500	10
AK 33.9-OR- ... -SR-R	700	670	170	3x1500	3x1500	500	10
AK 40.9-OR- ... -SR-R	700	670	170	4x1500	---	500	10
AK 41.9-OR- ... -SR-R	700	670	170	4x1500	1x1500	500	10
AK 42.9-OR- ... -SR-R	700	670	170	4x1500	2x1500	500	10
AK 50.9-OR- ... -SR-R	700	670	170	5x1500	---	500	10

Tolerance Scale 1:4 Material

Created: Simetzberger	Sheet: 1/2	Format: A3	Title: Alarm box AK xx.y- ... -SR-R	Document Style: Data sheet
Approved: HA	Issue Date: 31.07.2023			Document State: Valid
Grasl Pneumatic Mechanik Gmbh QM FO 05.24.0				Document Number: 06.003.DAT.04.03-E

Technical Instructions

Alarm box type AK

Please read these „Technical Instructions“ carefully and completely. Only technically qualified personnel may work on this device.

Meaning of symbols

Safety instructions must be observed!
Failure to observe these notes may result in personal injury and property damage.

Advice, the non-compliance with these instructions or the technical data shall lead to the loss of rights under guarantee.

Correct,
this is how it should be done.

Incorrect,
this is not how it should be done.

Correct and proper use

The alarm box is used as control (emergency control board) of smoke and heat exhaust vent system (SHEVS). By input command using a push-button or by electrical/pneumatic signal, the energy of a CO_2 bottle suited for SHEVS systems is released.

When installing SHEVS devices controlled by the alarm box below an installation height of 2,5m from the floor, or from the next access level, suitable devices must be provided to prevent danger to people (crushing and pinching hazard). Follow the corresponding guidelines, rules and norms, e.g. EN 14351 and ASR A1.6. Do not allow children to play with the device or its regulation and/or control devices, including window controls.

General notes

When using multiple alarm box release stations in one group, suitable shuttle and vent valves for the connection must be installed.

The alarm box must be freely accessible and may not be obstructed by other objects.

The alarm box is not suited for use in highly corrosive environments (e.g.: thermal spas, waste management industry, etc.).

Always close the threaded connection of the bottle and protect it against dirt and humidity.

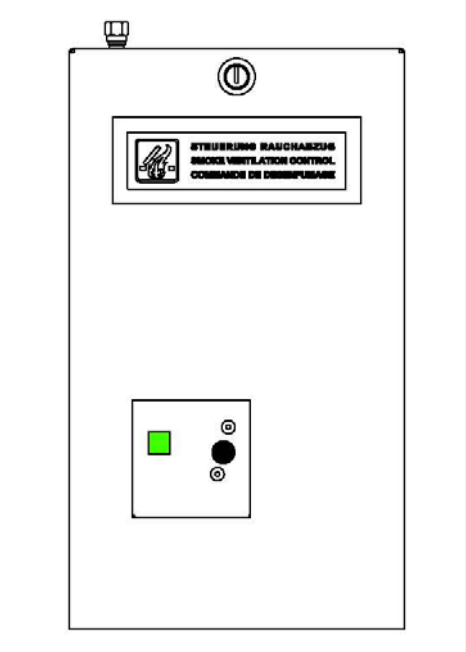


Figure 1: Alarm box (symbolically)

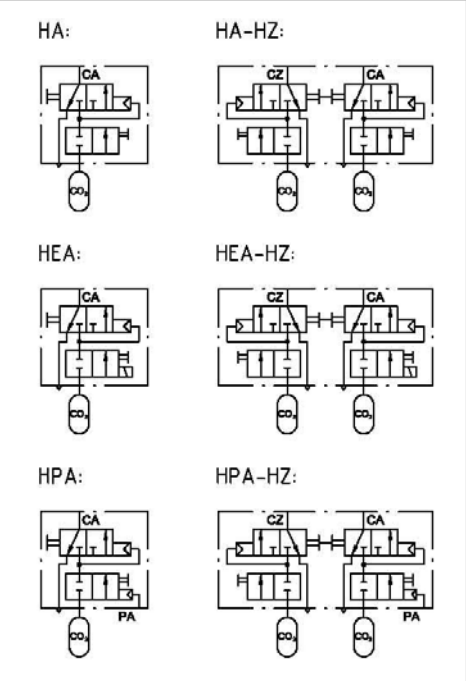


Figure 2: RTC circuit diagrams

When handling this product, always use suitable PPE – personal protective equipment (e.g. protective gloves, safety boots) as protection against sharp and pointed edges, pointed piercing needle, falling objects, and as protection against cold burns.

Pipe connection

Possible pipe connections: Ø6 and Ø8

The pipe connection at the alarm box must be >= the external pipe.
pipe connection Ø6 –> external pipe Ø6
pipe connection Ø8 –> external pipe Ø6, or Ø8

Glass plate

Only our glass plates may be used.

We can supply a hammer for breaking the glass as optional accessory part.

Installation

Observe the following before the installation:

Check that all parts of the delivery scope have been received and inspect the box for any transport damage. If any damage is visible, a complaint must be lodged immediately.

When installing the alarm box, observe the national standards and regulations. If the conditions at the installation site permit, we recommend installing the alarm box in a secure access area of the corresponding fire compartment, as the provided flaps/windows, where it will be protected from fire and smoke.
The glass cut-out (push-button) should be installed at a height of 1,4-1,6m within the area of the fire department access (normally EMERGENCY-exit), where easy access is ensured.
The alarm box may not be exposed to extreme temperatures and weather and it is not suited for outdoor storage and assembly.
The alarm box must be mounted to all provided mounting points (refer to Figure 4) using fasteners suited for the respective underground, on a level, vertical surface.
Next, interconnect the respective connections.
Ensure stress-free installation when mounting the pipes.
Once the installation is complete, mount the CO_2 bottles in the provided devices. They must not be stored outside the provided devices.

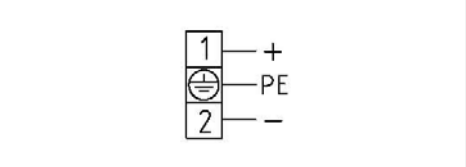


Figure 3: RTC solenoid connection

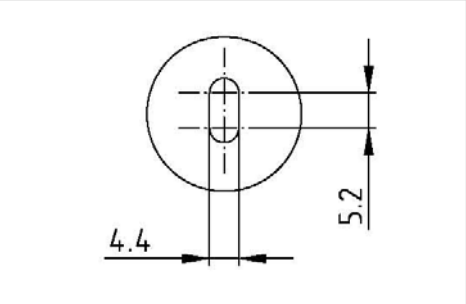


Figure 4: Attachment point

The connections must face upward.

For the installation, store the cover in a safe position away from the alarm box.

Only install the alarm box in sufficiently dimensioned and well-ventilated rooms.

Commisioning

If the CO_2 bottles are not securely fastened, there is a risk that they might catapult during piercing.

Only operate the alarm box once the SHEVS has been fully installed and is ready for operation.

Commisioning of the release lever

Before inserting the CO_2 bottle, check the position of the piercing needle (refer to number *4* in *Commisioning of the release lever*). There is a risk that the CO_2 bottle might be triggered unintentionally and, as a result, the SHEVS unit might move by accident.

1. Hook the clamping device in the provided recess (refer to Figure 5).
2. Place the clamping bolt on the piercing bolt in the valve.
3. Press the clamping device fully in clamping direction until the piercing bolt locks.
4. Make sure that the piercing needle is positioned behind the piercing face of the bottle screw-in thread!
5. Lightly grease the O-ring inside the bottle screw-in thread (consult the company Grasl regarding the type of grease to be used, which is not included in the delivery scope) and check it for possible damage (if damaged, it must be replaced).
6. Check the position of the visual indicator. The visual indicator must be positioned at „green“; if not, press the visual indicator angle towards the valve until the visual indicator is at „green“ (refer to Figure 6)!
7. Check the position of the priority slider. Both sliders must be in home position (refer to Figure 7)!
8. Fully screw in the full CO_2 bottle.
   Screw-in depth: Standard 1/2” UNF –> min. 10mm
   Optional rising pipe M18x1,5 –> min. 11mm
9. Insert glass plate and lock the box with the cover.

CO_2-bottle

Only verified CO_2 bottles authorised by us and meeting the requirements of the standards „EN 12205“ or „ADR 2003“ may be used.

Only the clamping device specified by us may be used for initial operation of the release valve.

The alarm box is not equipped with devices that provide protection against crushing at the SHEVS unit.

1) ... standard 1/2” UNF
2) ... option rising pipe M18x1,5
a ... recess for clamping device
b ... clamping bolt
c ... release button ”OPEN”
d ... clamping device
e ... clamping direction

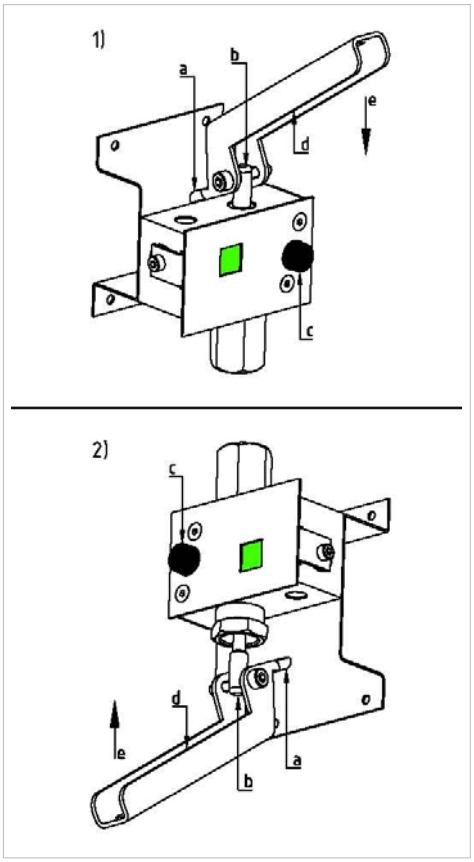


Figure 5: OPEN release RTC

Normal operation

The alarm box is ready for operation when the „green“ visual indicator is fully visible, a glass plate has been inserted, and the cover has been locked.

SHEVS release

- AK xx.y-HA (manual release): After breaking the glass plate, press the release button fully down to release the alarm box.

- AK xx.y-HEA (electric release): In addition to the manual release, remote release by applying the rated voltage is possible (refer to Technical Data).
- AK xx.y-HPA (pneumatic release): In addition to the manual release, remote release by applying the min. release pressure is also possible (refer to Technical Data).

Pressing the release button ”OPEN” will pierce the screwed-in CO_2 bottle and the CO_2 will be connected to the output. The „red“ visual indicator indicating the state „fire“ will then be visible.

SHEVS resetting (AK xx.y-...-HZ)

The alarm box is in the state „fire“ (red visual indicator). Pressing the release button ”CLOSE” will pierce the screwed-in CO_2 bottle and the CO_2 will be connected to the „CZ“ output. During this, the output „CA“ will be vented and the visual indicator will switch to an intermediate position, to the state “Malfunction” („red/green“ indicator).

Activation of the reset function

- AK xx.y-...-HZ: Use the included key to unlock the cover and arrange it in hold position. Fully press the black release push-button ”CLOSE” to release the reset function.
- AK xx.y-...-HZS (optional): Use the included key to fold away the round hole cover plate. Fully press the black release push-button ”CLOSE” arranged underneath it to release the reset function.

Restarting operation/reset

Always wear suitable PPE (protective gloves, safety boots) when handling this product.

Piercing the CO_2 bottles will significantly cool down the CO_2 bottles and all pipes and components in the nearness through which the CO_2 flows. Touching these components for extended periods might cause cold burns.

1. Unlock the alarm box cover and arrange it in hold position (refer to data sheet).
2. Slowly screw out the bottle up to the vent hole (venting noise can be heard).
3. Wait until all pressure has been released from the bottle (priority slider can be moved again).
4. Fully turn out the bottle.
5. For additional points, refer to *Commisioning of the release lever*.

Once released, the alarm box must be restarted by authorised personnel.

1) ... standard 1/2” UNF
2) ... option rising pipe M18x1,5
a ... visual indicator angle
b ... visual indicator - green (OK) / red (fire)

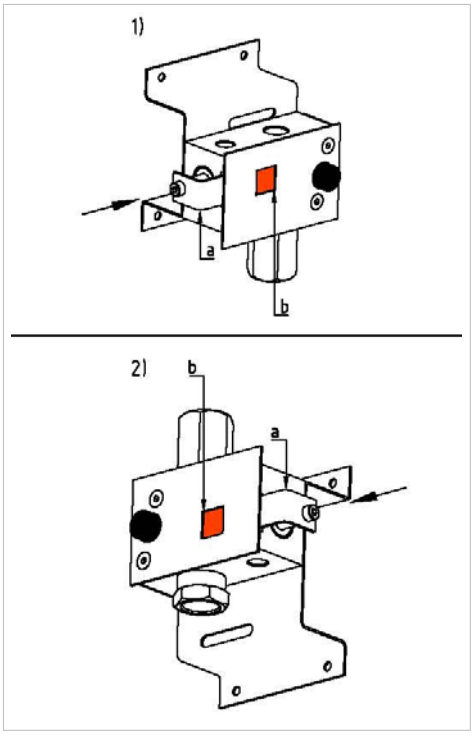


Figure 6: Position of RTC visual indicator

1) ... standard 1/2” UNF
2) ... option rising pipe M18x1,5
a ... priority slider
b ... release button ”OPEN”
c ... release button ”CLOSE”

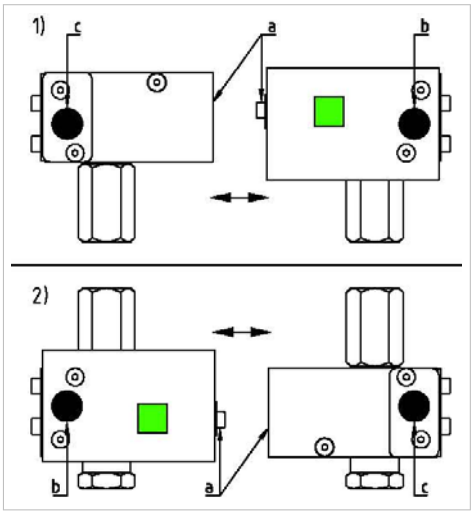


Figure 7: RTC slider position

Malfunction

A malfunction is present if:

- the alarm box cover has not been mounted or is not locked
- no glass plate has been inserted
- not all CO_2 bottles have been inserted
- the visual indicator is in intermediate position („red/green“ display)
- there is a lack of spare consumables

In the event of a malfunction, arrange for a service by a qualified company immediately.

Maintenance

If the alarm box is no longer functional, it must be replaced completely. It is not permitted to modify or remove any components of the alarm box. This would impair the safe operation of the alarm box in which case it may no longer be used.
Possible consequences may include failure to function, release of CO_2, risk of explosion of the CO_2 bottles.

Disconnect the power supply when carrying out maintenance work/troubleshooting on the SHEVS system to prevent unintended operation. This can be achieved by turning out the CO_2 bottle.

If the visual indicator is no longer in „green“ position, or if the slider is activated at the RTC-CLOSE valve (Figure 6), CO_2 might have been released into the system and all connected components might be under high pressure. Remove the CO_2 bottle as described under *Restarting operation/reset*.

Check the following as part of the annual maintenance:

- piercing needle for damage
- connection cable for damage
- function of the strain relief in the connecting plug
- secure attachment of the alarm box
- pipes and CO_2 bottles for corrosion or damage
- CO_2 bottles for falling below the engraved total weight

Disassembly

Disassembly sequence:

1. Remove CO_2 bottles.
2. Remove lines from the alarm box.
3. Remove alarm box from the wall.

1) ... standard 1/2” UNF
2) ... option rising pipe M18x1,5
a ... CO_2 bottle
b ... screw-in thread for CO_2 bottles
standard: 1/2” UNF
option rising pipe: M18x1,5

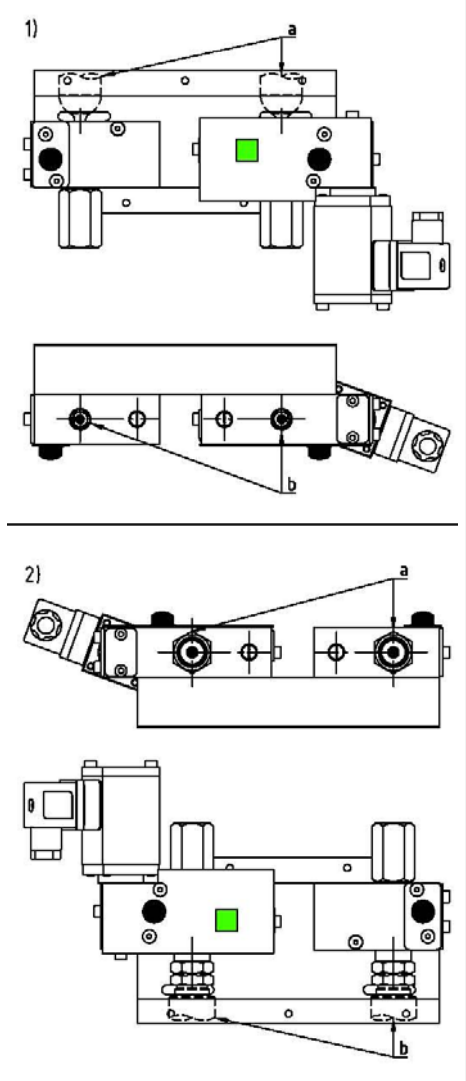


Figure 8: CO_2 screw-in thread

Disposal

This product is made of steel, aluminium, non-ferrous metals, plastic and electronic components.

Dispose of this product in observance of the national regulations.

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.

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)

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 **HH5/2** (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
- Pneumatical 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)

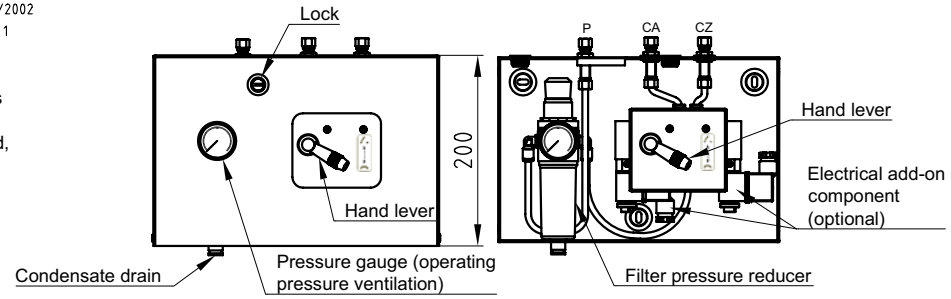
Options:

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)

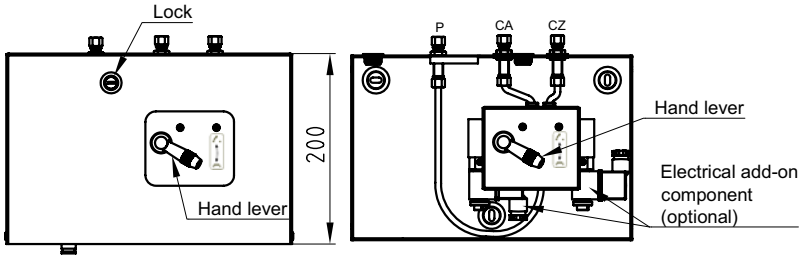
Please inquire for various options.

Dateiname: Qf0510B

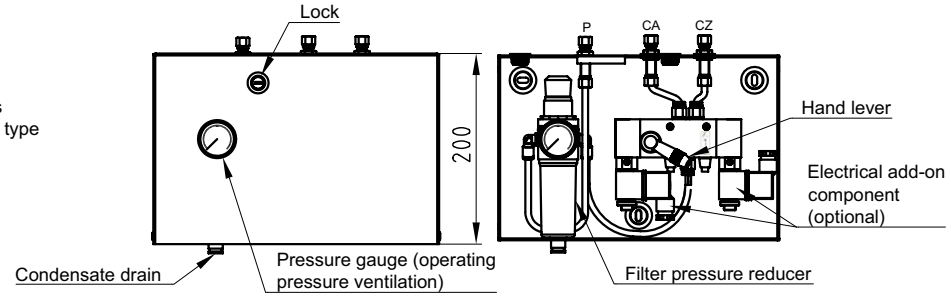
PLZ 10.0.1-options
Standard type,
externally operated,
with filter pressure
reducer



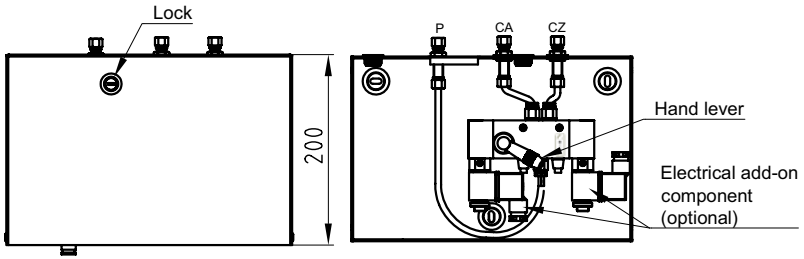
PLZ 10.0.1-OFR-options
Externally operated type
without filter pressure
reducer

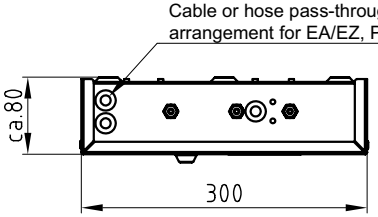


PLZ 11.0.1-options
Internally operated type
with filter pressure
reducer



PLZ 11.0.1-OFR-options
Internally operated type
without filter pressure
reducer





erstellt am
28.5.2002 ER

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).

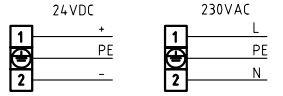
Technical data:

max. operating pressure	10 bar
ambient temperature range	-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 CLOSE PRIORITY 230V
EZV24	Electrical CLOSE PRIORITY 24VDC
EA230	Electrical OPEN 230V
EA24	Electrical OPEN 24VDC
EAV230	Electrical OPEN PRIORITY 230V
EAV24	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

Connecting diagramm electromagnet:



Power input - attracting -DC	-
Power input - attracting -AC	9VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering code:

PLZ xx.x.x - Optionen

Ordering example:

PLZ 10.0.1 - EA230 - EZ230

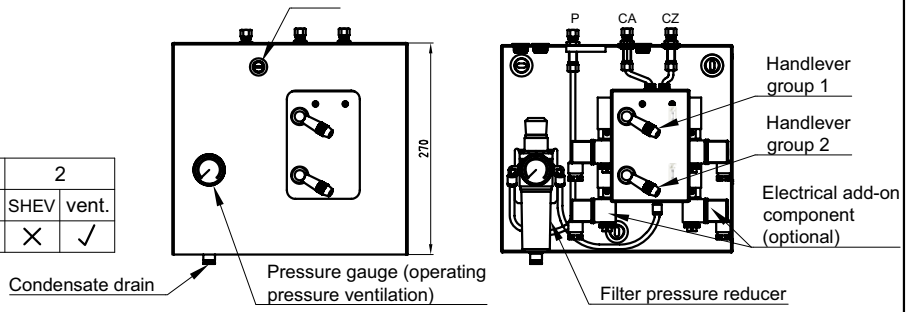
GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1 Werkstoff: ID - Nr.:
					Datum	Name	Bezeichnung: **Data sheet** Pneumatic ventilation control centre PLZ 1x.0.1-options
				Bear.	17.03.2009	GöschlS	
				Gepr.	27.01.2010	ER	
				Norm			
				Type: PLZ			Zeichnung Nr.: 06.002.DAT.02.01-E Blatt BL.
01	Diverse Änderungen	03.12.2009	SA				
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 06.002.DAT.02.00 (Ers.d.:)

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B

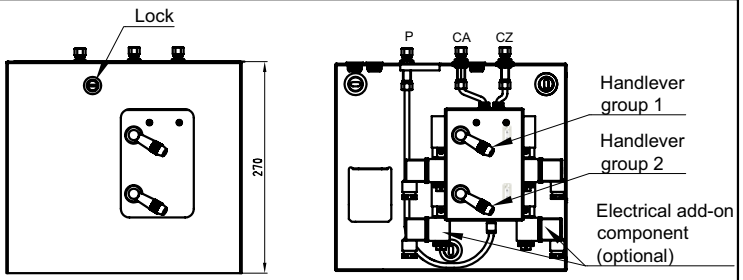
Standard type,
externally operated,
with filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 10.0.2	X	✓	X	✓



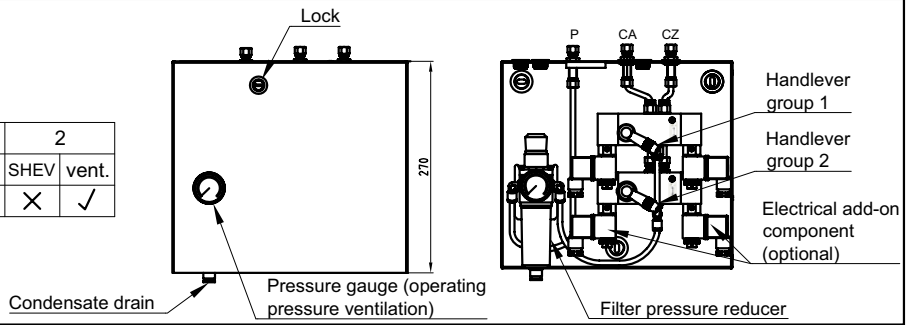
Externally operated type
without filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 10.0.2-OFR	X	✓	X	✓



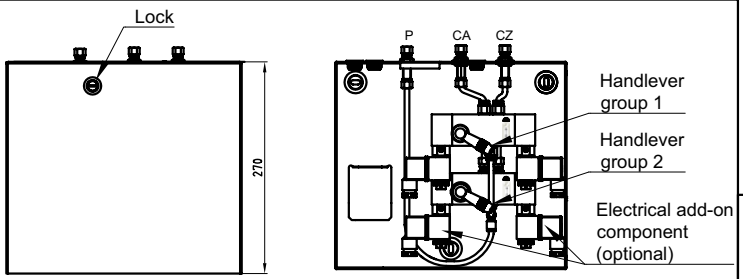
Internally operated type
with filter pressure reducer

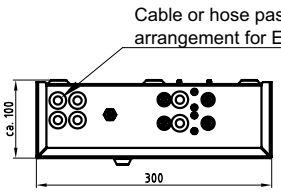
group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 11.0.2	X	✓	X	✓



Internally operated type
without filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 11.0.2-OFR	X	✓	X	✓





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).

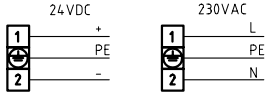
Technical data:

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

Circuit diagram solenoid:



Power input - attracting -DC	-
Power input - attracting -AC	9VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering code:
PLZ xx.x.x - Optionen

Ordering example:
PLZ 10.0.2 - EA230 - EZ230

GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:			Maßstab: 1:1 / Werkstoff: / ID - Nr.:
					Datum	Name	Bezeichnung: **Data sheet** Pneumatic ventilation control centre PLZ 1x.0.2-options
				Bear.	17.03.2009	GöschlS	
				Gepr.	27.01.2010	ER	
				Norm			
				Type: PLZ			Zeichnung Nr.: 06.002.DAT.03.01-E / Blatt / BL.
01	Diverse Änderungen	23.12.2009	SA				
Zus.	Änderung	Datum	Name	(Urspr.)			(Ers.f.:) 06.002.DAT.03.00 (Ers.d.:)

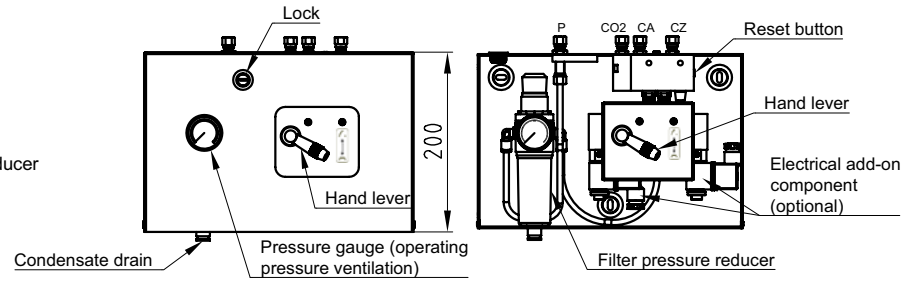
erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

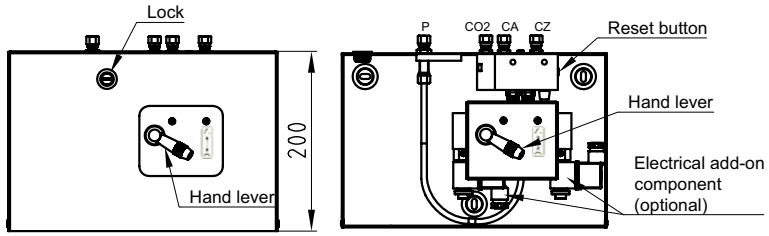
fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B

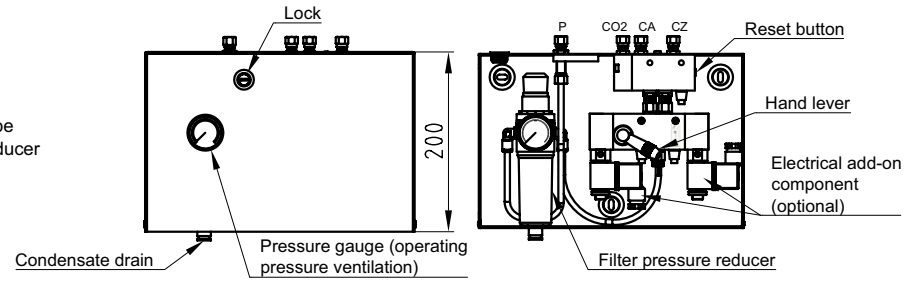
PLZ 20.1.1-options
Standard type,
externally operated,
with filter pressure reducer



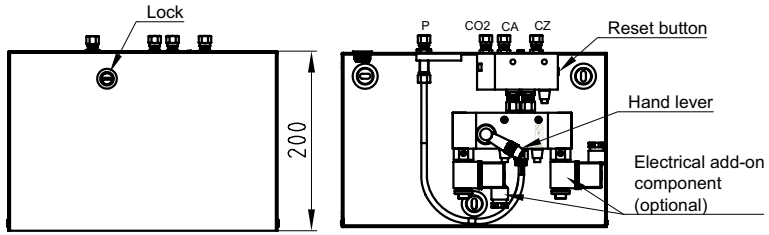
PLZ 20.1.1-OFR-options
Externally operated type
without filter pressure
reducer

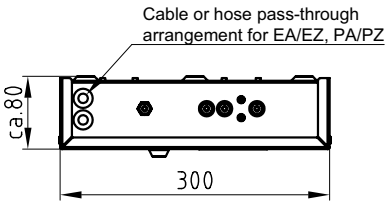


PLZ 21.1.1-options
Internally operated type
with filter pressure reducer



PLZ 21.1.1-OFR-options
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.

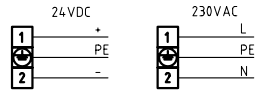
Technical Data:

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

Circuit diagram solenoid:



Power input - attracting -DC	-
Power input - attracting -AC	9VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering code:

PLZ xx.x.x - Optionen

Ordering example:

PLZ 20.1.1 - EA230 - EZ230

GRASL Pneumatic-Mechanik GmbH A-3454 Reidling Europastraße 1				Freimaßtoleranz nach DIN 7168:		
					Datum	Name
				Bear.	22.01.2009	Tiefenbacher
				Gepr.	27.01.2010	ER
				Norm		
				Type: PLZ		
01	Diverse Änderungen	22.12.2009	SA			
Zus.	Änderung	Datum	Name	(Urspr.)		

Maßstab: 1:1 | Werkstoff:
ID - Nr.:
Bezeichnung:
Data sheet
Pneumatic ventilation control centre
PLZ 2x.1.1-options
Zeichnung Nr.: 06.002.DAT.00.01-E | Blatt | BL.
(Ers.f.:) 06.002.DAT.00.00 | (Ers.d.:)

erstellt am
28.5.2002 ER

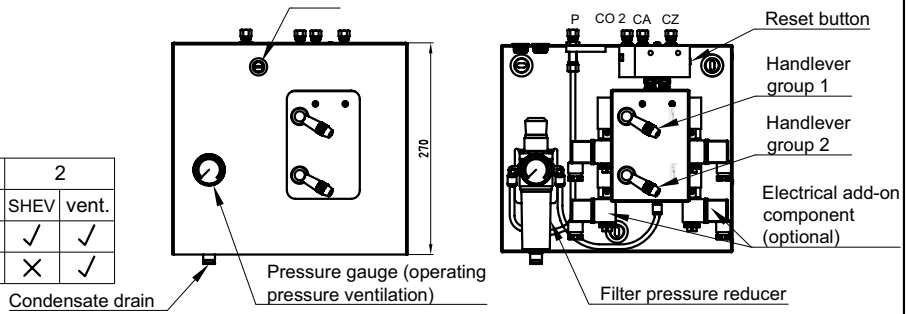
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B

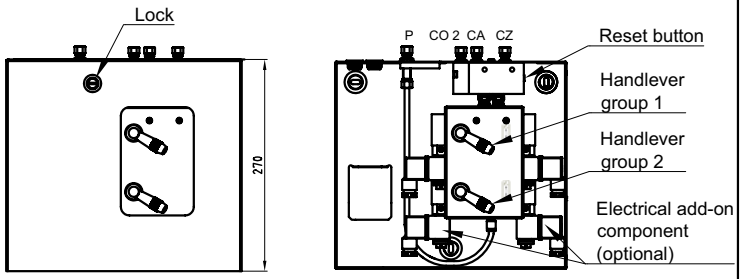
Standard type,
externally operated,
with filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 20.2.2	✓	✓	✓	✓
PLZ 20.1.2	✓	✓	✗	✓



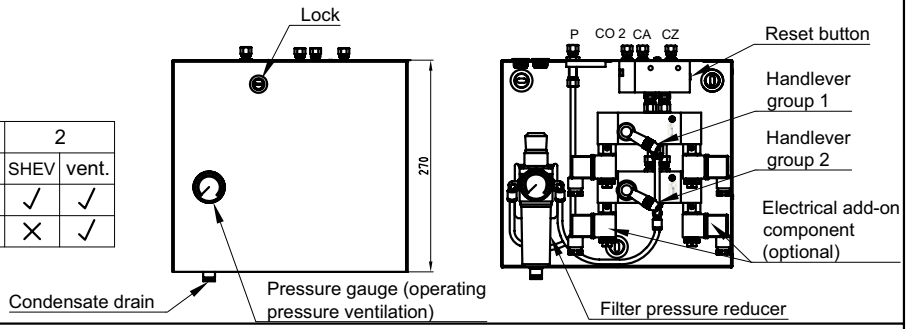
Externally operated type
without filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 20.2.2-OFR	✓	✓	✓	✓
PLZ 20.1.2-OFR	✓	✓	✗	✓



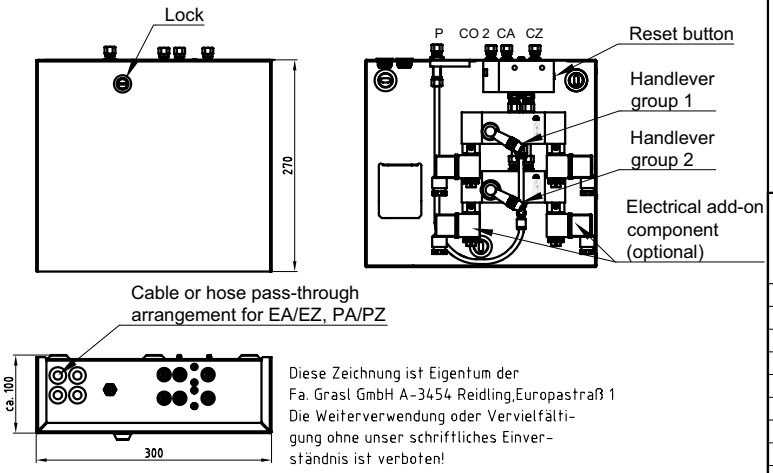
Internally operated type
with filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 21.2.2	✓	✓	✓	✓
PLZ 21.1.2	✓	✓	✗	✓



Internally operated type
without filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 21.2.2-OFR	✓	✓	✓	✓
PLZ 21.1.2-OFR	✓	✓	✗	✓



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.

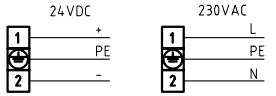
Technical data:

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

Options:

EZ230	Electrical CLOSE 230V
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

Circuit diagram solenoid:



Power input - attracting -DC	-	
Power input - attracting -AC	9VA	
Power input - holding - DC	5W	
Power input - holding - AC	6VA	

Ordering code:

PLZ xx.x.x - Optionen

Ordering example:

PLZ 20.2.2 - EA230 - EZ230

GRASL
Pneumatic-Mechanik GmbH
A-3454 Reidling
Europastraße 1

Freimaßtoleranz nach DIN 7168:

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

	Datum	Name
Bear.	17.03.2009	GöschlS
Gepr.	27.01.2010	ER
Norm		

Bezeichnung:
Data sheet
Pneumatic ventilation control centre (CO2 OPEN)
PLZ 2x.x.2-options

Type: PLZ

Zeichnung Nr.: 06.002.DAT.04.01-E

Blatt: BL.

Zus.	Änderung	Datum	Name
01	Diverse Änderungen	23.12.2009	SA

(Urspr.) (Ers.f.:) 06.002.DAT.04.00 (Ers.d.:)

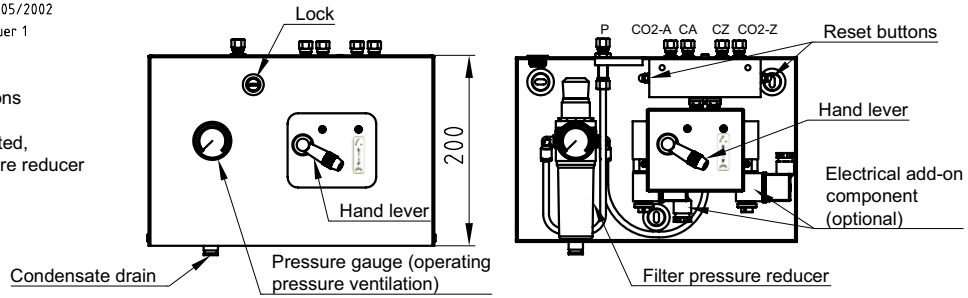
erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

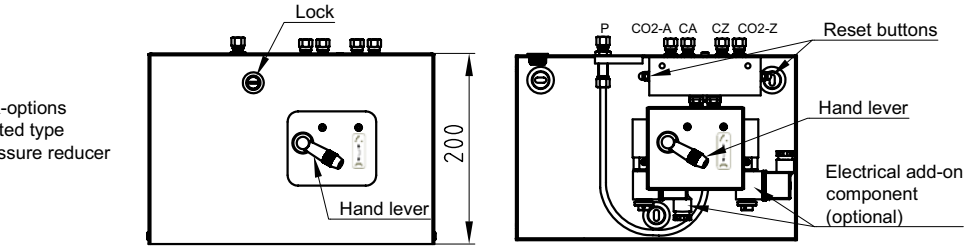
fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B

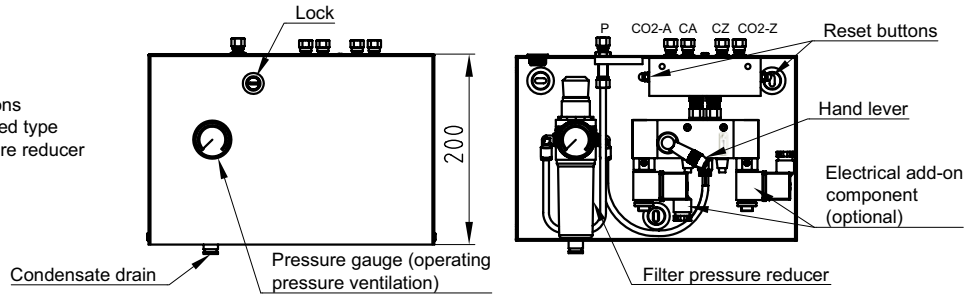
PLZ 30.1.1-options
Standard type,
externally operated,
with filter pressure reducer



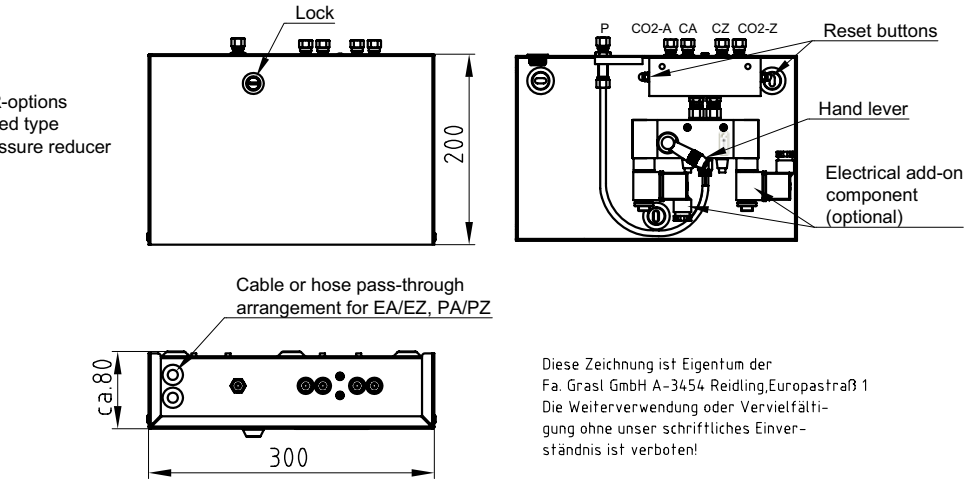
PLZ 30.1.1-OFR-options
Externally operated type
without filter pressure reducer



PLZ 31.1.1-options
Internally operated type
with filter pressure reducer



PLZ 31.1.1-OFR-options
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-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.
   Inlet prot CO2-Z, when controlled e.g. by a CO2 alarm box, will be connected with outlet prot CZ, and outlet prot CA will exhaust.
   Ventilation function is deactivated.
3) Reset after release of alarm:
   Fully press in reset buttons (cap screw and wascher will protrude).
   Only then teh ventilation function will be active again.

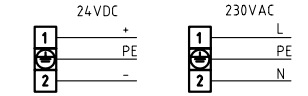
Specifications:

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

Options:

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	Pneumatc OPEN
PZ	Pneumatic CLOSE
PAV	Pneumatc PRIORITY OPEN
PZV	Pneumatic PRIORITY CLOSE
Ø8	All pipe connections for Ø8mm
OFR	Without filter pressure reduce

Circuit diagram solenoid:



Power input - attracting -DC	-
Power input - attracting -AC	9VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering code:

PLZ xx.x.x - Optionen

Ordering example:

PLZ 30.1.1 - EA230 - EZ230

GRASL
Pneumatic-Mechanik GmbH
A-3454 Reidling
Europastraße 1

Freimaßtoleranz nach DIN 7168:

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

	Datum	Name
Bear.	22.01.2009	Tiefenbacher
Gepr.	27.01.2010	ER
Norm		

Bezeichnung:
Data sheet
Pneumatic ventilation control centre
PLZ 3x.1.1-options

Type: PLZ

Zeichnung Nr.: 06.002.DAT.01.01-E

Blatt

BL.

Zus.	Änderung	Datum	Name
01	Diverse Änderungen	22.12.2009	SA

(Ursprr.) (Ers.f.:) 06.002.DAT.01.00 (Ers.d.:)

erstellt am
28.5.2002 ER

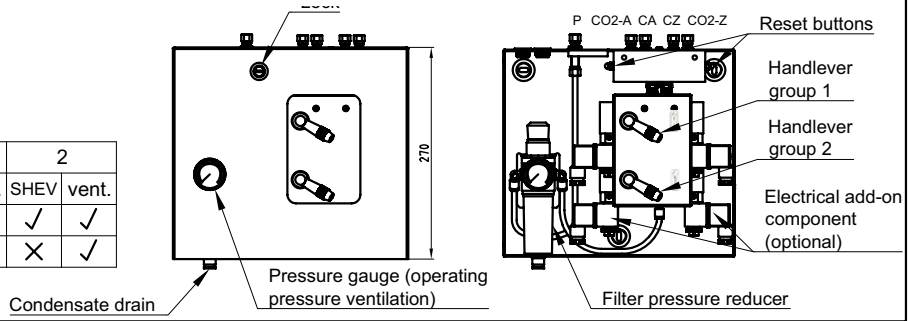
formell geprüft am
29.5.2002 KW

fachlich geprüft am
29.5.2002 KW

Dateiname: Qf0510B

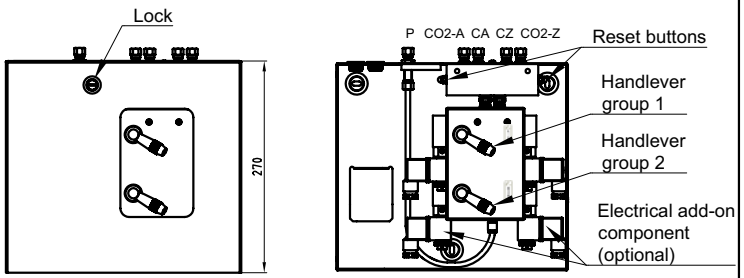
Standard type,
externally operated,
with filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 30.2.2	✓	✓	✓	✓
PLZ 30.1.2	✓	✓	✗	✓



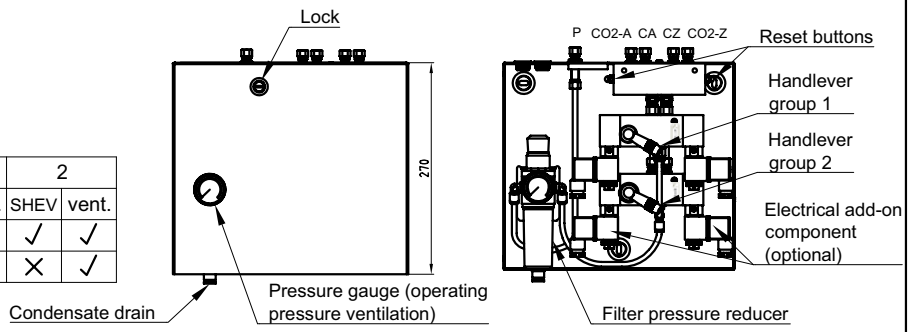
Externally operated type
without filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 30.2.2-OFR	✓	✓	✓	✓
PLZ 30.1.2-OFR	✓	✓	✗	✓



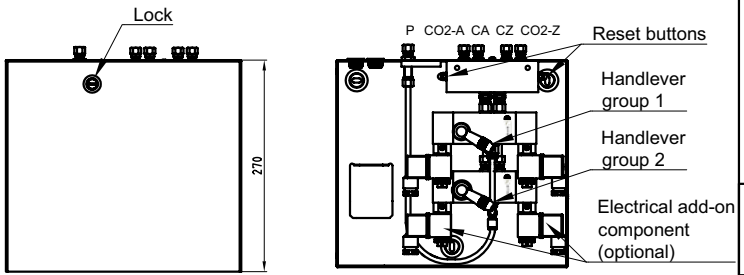
Internally operated type
with filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 31.2.2	✓	✓	✓	✓
PLZ 31.1.2	✓	✓	✗	✓

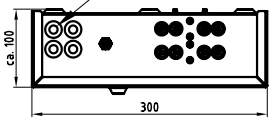


Internally operated type
without filter pressure reducer

group	1		2	
function	SHEV	vent.	SHEV	vent.
PLZ 31.2.2-OFR	✓	✓	✓	✓
PLZ 31.1.2-OFR	✓	✓	✗	✓



Cable or hose pass-through
arrangement for EA/EZ, PA/PZ



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-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.

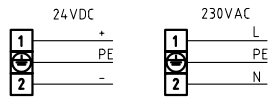
Technical data:

max. operating pressure	10 bar
ambient temperature range	-25°C - +50°C
pipe connectionse	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

Circuit diagram solenoid:



Power input - attracting -DC	-
Power input - attracting -AC	9VA
Power input - holding - DC	5W
Power input - holding - AC	6VA

Ordering code:

PLZ xx.x.x - Optionen

Ordering example:

PLZ 30.2.2 - EA230 - EZ230

GRASL
Pneumatic-Mechanik GmbH
A-3454 Reidling
Europastraße 1

Freimaßtoleranz nach DIN 7168:

Maßstab: 1:1 | Werkstoff:

ID - Nr.:

	Datum	Name
Bear.	07.03.2009	GöschlS
Gepr.	27.01.2010	ER
Norm		

Bezeichnung:
Data sheet
Pneumatic ventilation control centre (CO2 OPEN-CLOSE)
PLZ 3x.x.2-options

Type: PLZ

Zeichnung Nr.: 06.002.DAT.05.01-E

Blatt: BL.

Zus.	Änderung	Datum	Name
01	Diverse Änderungen	07.01.2010	SA

(Urspr.) (Ers.f.:) 06.002.DAT.05.00 (Ers.d.:)

erstellt am
28.5.2002 ER

formell geprüft am
29.5.2002 KW

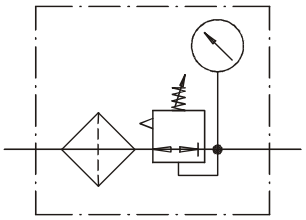
fachlich geprüft am
29.5.2002 KW

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

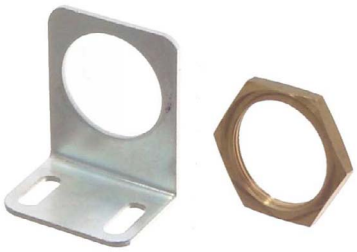
- For pipe connection of the filter pressure reducer, 2 male connectors 1/4" (e.g. B5-6-1/4) will be required additionally

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

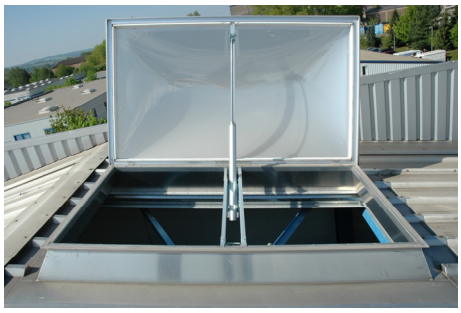


Mounting bracket for filter pressure reducer (MK-FR):

- 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

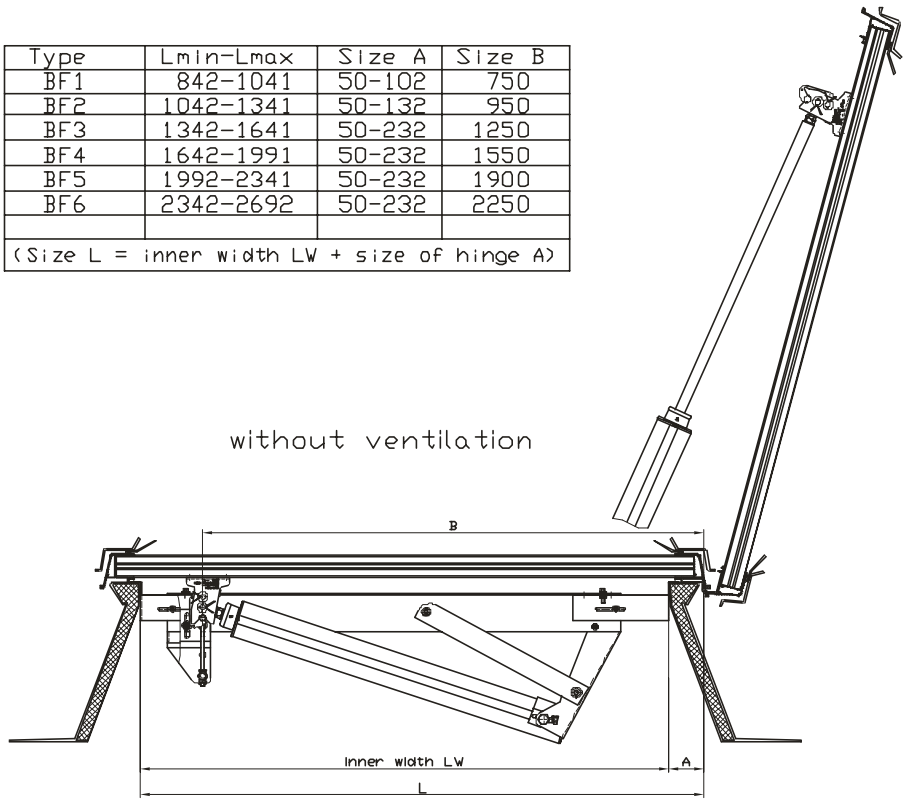
  PODV 40/12-300-12/6: 300mm stroke
  PODV 40/12-500-12/6: 500mm stroke

For special types please inquire

BF mounting - standard version

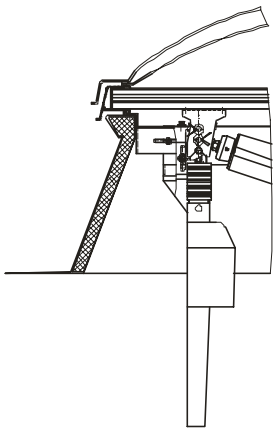
Type	Lmin-Lmax	Size A	Size B
BF1	842-1041	50-102	750
BF2	1042-1341	50-132	950
BF3	1342-1641	50-232	1250
BF4	1642-1991	50-232	1550
BF5	1992-2341	50-232	1900
BF6	2342-2692	50-232	2250
(Size L = inner width LW + size of hinge A)			

without ventilation

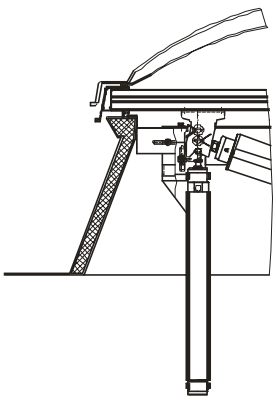


with ventilation

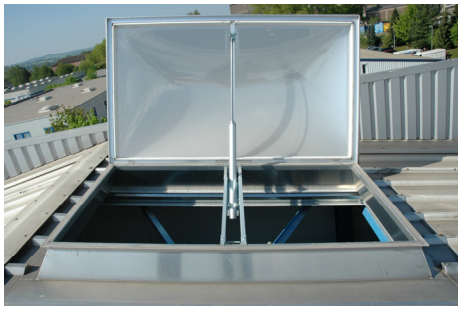
electrical



pneumatical



BF-mounting - Version with double stroke cylinder



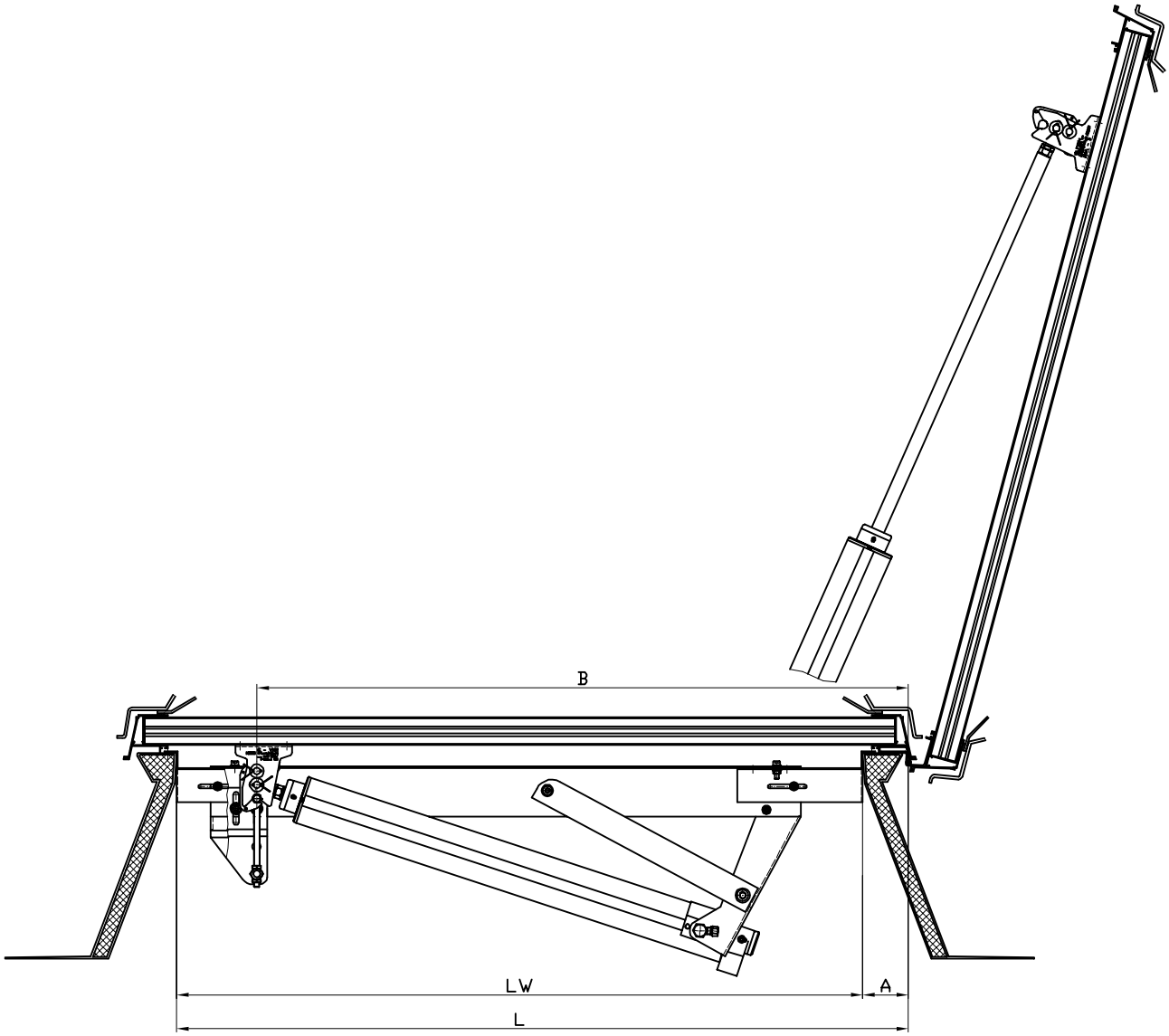
- Pneumatically operated mounting for installation in domelights etc.
- Opening angle 105°
- Opening mounting is factory adjustable to suit any domelight or continuous roof light (from approx. 780mm to 2.500mm inner width of curb or frame / continuous roof light opening)
- Due to cross beam design, only 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



Type	L_{min} - L_{max}	A	B
BF1	842 - 1041	50 - 102	750
BF2	1042 - 1341	50 - 132	950
BF3	1342 - 1641	50 - 232	1250
BF4	1642 - 1991	50 - 232	1550
BF5	1992 - 2341	50 - 232	1900
BF6	2342 - 2692	50 - 232	2250

(Size L = inner width LW + 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),

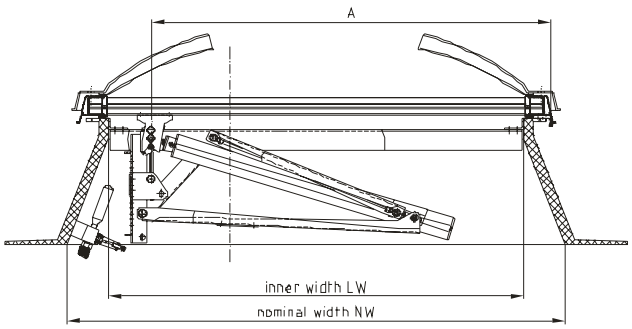
  PODV 32/12-300-12/6L: 300mm stroke
  PODV 32/12-500-12/6L: 500mm stroke

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

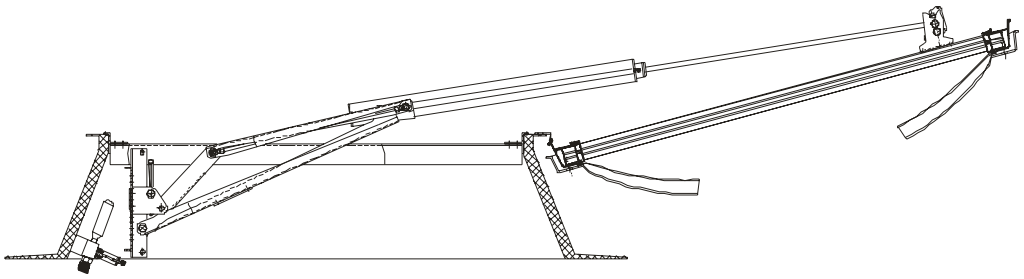
  For special types please inquire

BG mounting - fixed type

without ventilation

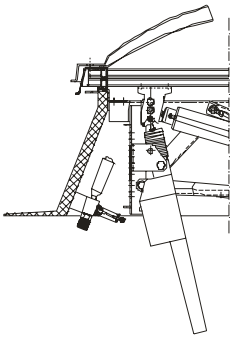


Type	NW	LW	Size A
BG1. 11	1000	800	765
BG2. 11	1200	1000	965
BG3. 11	1500	1300	1250
BG4. 11	1800	1600	1550

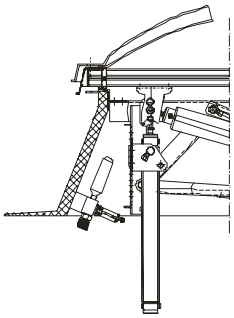


with ventilation

electrical



pneumatical



BG mounting - fixed type with double stroke cylinder

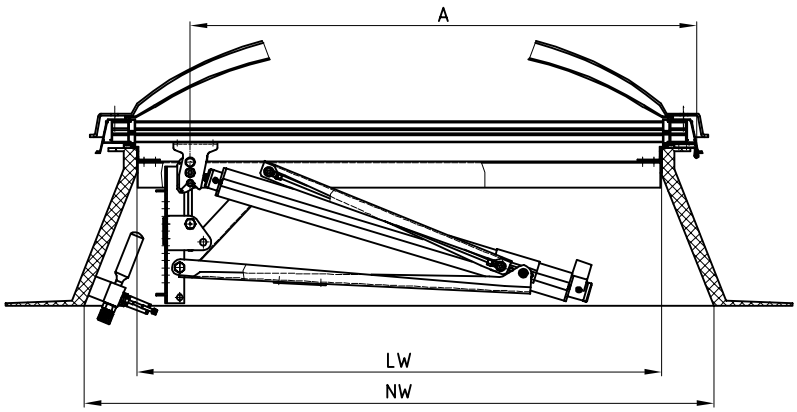
Pneumatically operated mounting for installation in domelights etc.
Opening angle 140°or 165°
Fixed cross beam type for domelights with 800, 1.000, 1.300 and 1.600mm inner width of curb and a hinge size of 65 to 70mm
Ideally suited for domelights: Inner width = nominal width - 200mm
Due to cross beam 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-postion.
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

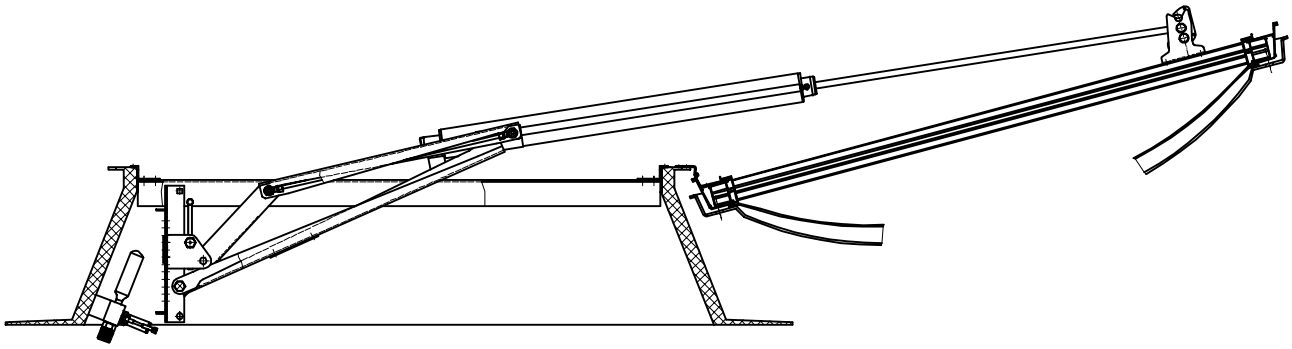
Accessories:

- **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





Type	Nominal width NW	Inner width LW	A
BG1.11	1000	800	765
BG2.11	1200	1000	965
BG3.11	1500	1300	1250
BG4.11	1800	1600	1550

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 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),

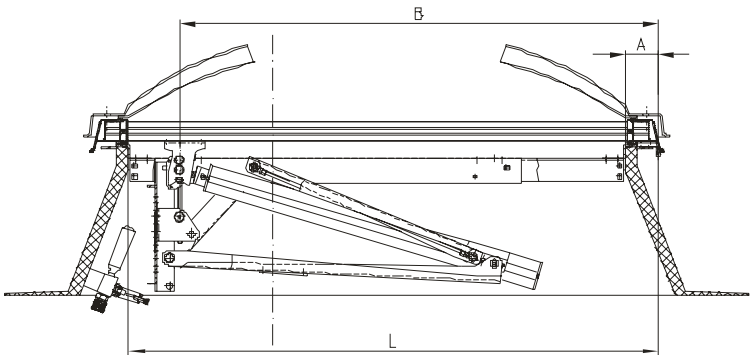
  PODV 32/12-300-12/6L: 300mm stroke
  PODV 32/12-500-12/6L: 500mm stroke

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

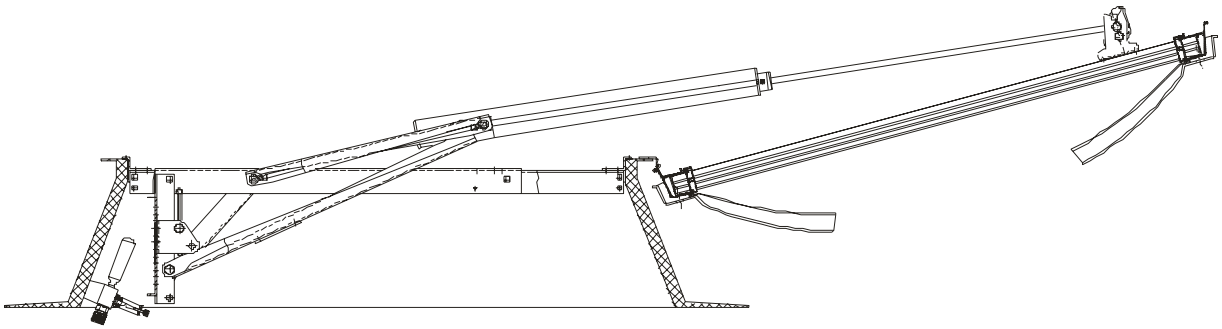
For special types please inquire

BG mounting - adjustable type

without ventilation

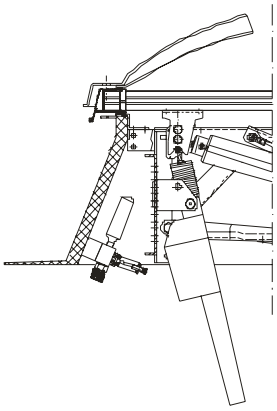


Type	Lmin. - Lmax.	Size A	Size B
BG1. 12	843 - 1042	50 - 200	765
BG2. 12	1043 - 1342	50 - 200	965
BG3. 12	1343 - 1642	50 - 250	1250
BG4. 12	1643 - 1992	50 - 250	1550
BG5. 12	1993 - 2342	50 - 250	1900
BG6. 12	2343 - 2695	50 - 250	2250
(Size L = inner width + size of hinge A)			

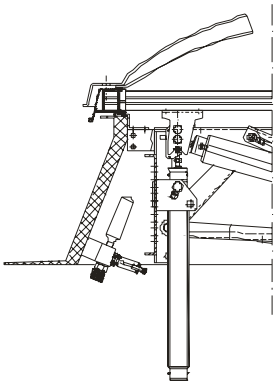


with ventilation

electrical



pneumatical



BG mounting - adjustable type with double stroke cylinder

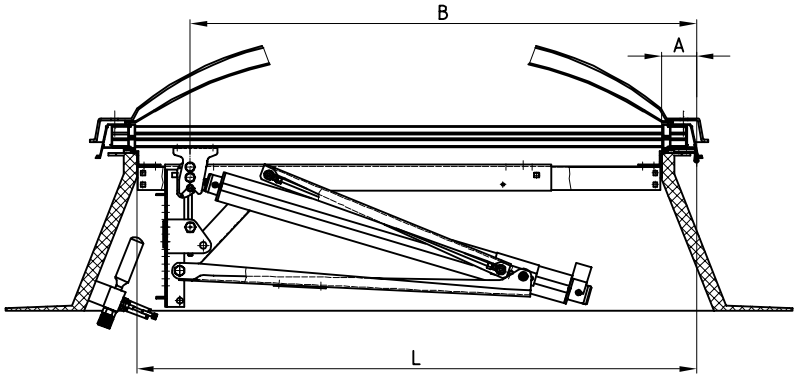
- Pneumatically operated mounting for installation in domelights etc.
- Opening angle 140°or 165°.For special opening angles, please inquire
- Opening mounting is factory adjustable to suit any domelight or continuous roof light (from approx. 780mm to 2.500mm inner width of curb or frame / continuous 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

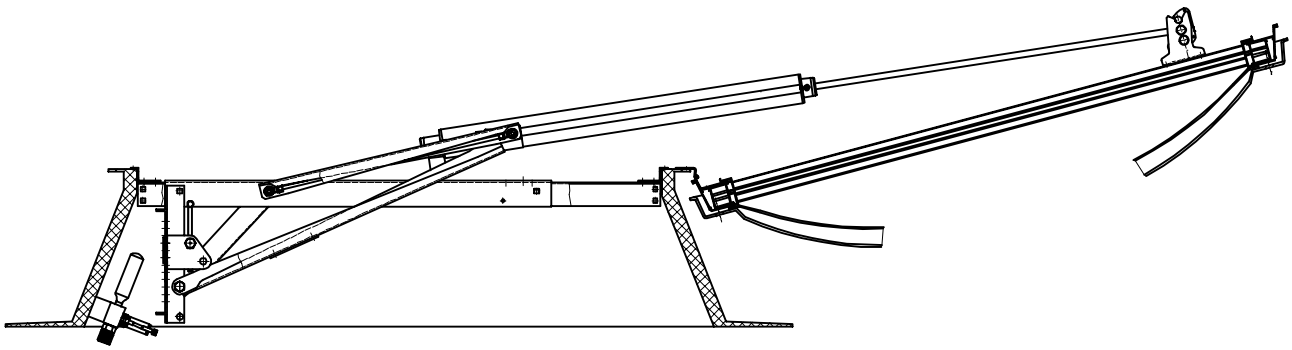
Accessories:

- **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

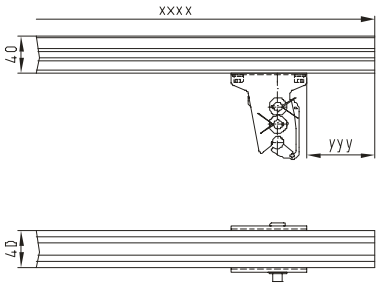




Typ OT 1.04:

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

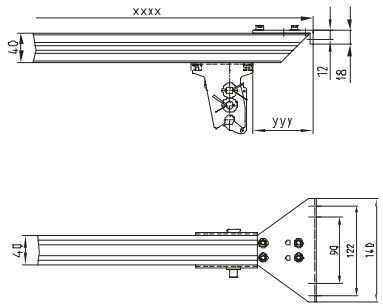
OT 1.04-xxxx-yyy:
(xxxx ... inner width of domelight frame)
(yyy ... position of MHV)



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

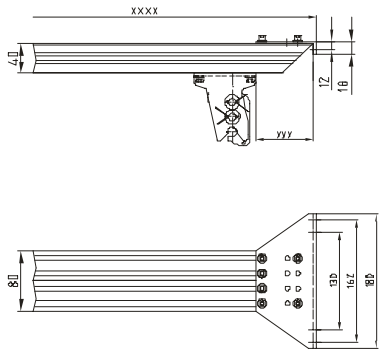
OT 5.04-xxxx-yyy:
(xxxx ... inner width of domelight frame)
(yyy ... position of MHV)



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-yyy:
(xxxx ... inner width of domelight frame)
(yyy ... position of MHV)

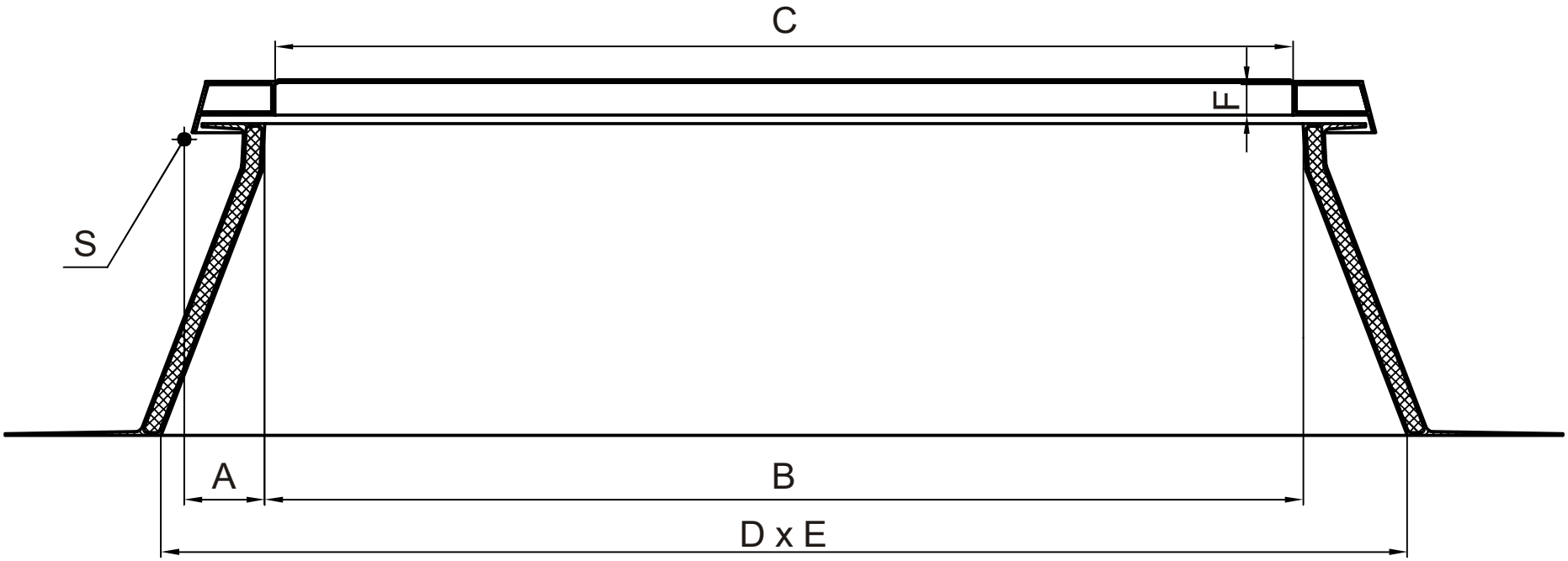


For special types, please inquire

K + G Tectronic GmbH
In der Krause 48
52249 Eschweiler (Deutschland/Germany)
http://www.kg-tectronic.de

SHE mountings
Dimensional sheet for mountings

Grasl Pneumatic-Mechanik GmbH
Europastraße 1
3454 Reidling (Österreich/Austria)
http://www.graslrwa.at



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)