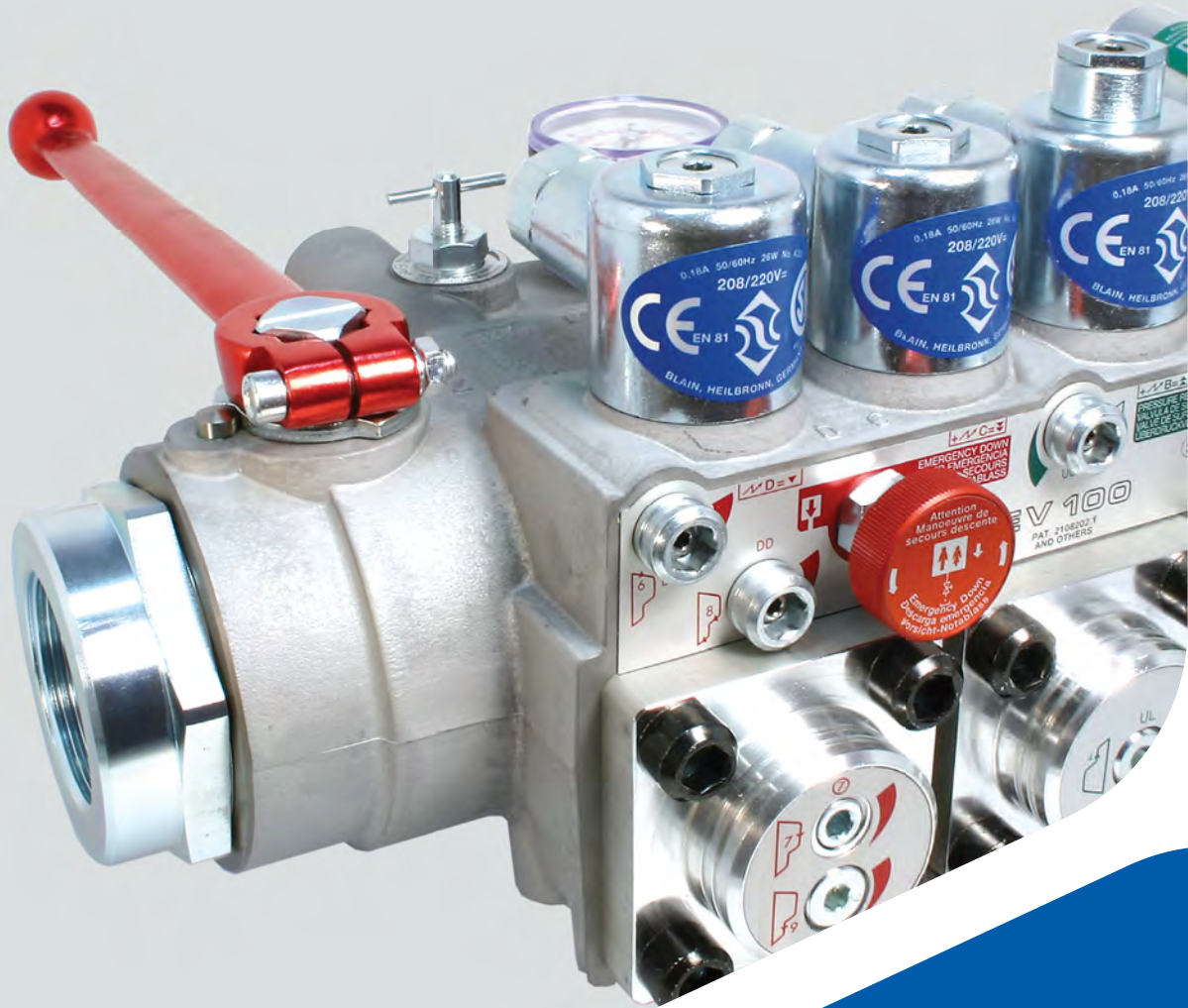


# BLAIN VALVES FOR HYDRAULIC ELEVATORS

*Excellence in Simplicity and Performance*



[www.blain.de](http://www.blain.de)

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**BLAIN HYDRAULICS** is the leading manufacturer of high quality hydraulic elevator products for five decades. Blain products have proven their safety and quality by possessing more than one third of the global market share and one million valves in operation in more than 75 countries worldwide.

**BLAIN HYDRAULICS** ist mit einem globalen Marktanteil von mehr als einem Drittel und 1 Million installierter Ventile in über 75 Ländern seit 5 Jahrzehnten der führende Hersteller von qualitativ sehr hochwertigen Produkten der Aufzugshydraulik.



Since half a century Blain Hydraulics has focused and specialized in flow control valves for hydraulic elevators. Blain is the largest supplier of elevator valves in the world with a large global footprint. At Blain safety, reliability and quality of our products are of utmost importance. As a pioneer, Blain has been building products which are above and beyond the standards. With product support in multiple languages and across different time zones, more than a million valves in operation worldwide endorse us a leading supplier of key elevator components. At Blain, flow control is in our DNA, we don't just manufacture a valve, we engineer it.

Anja Blain (Managing Director/CEO)

Seit einem halben Jahrhundert ist Blain Hydraulics spezialisiert auf die Herstellung von Steuerventilen für hydraulische Aufzüge. Blain Hydraulics ist der größte Lieferant von Hydrauliksteuerventilen mit globaler Präsenz. Wir legen größten Wert auf Sicherheit, Zuverlässigkeit und Qualität. Der Name „Blain“ steht für höchste Standards, die weit mehr als nur den Anforderungen entsprechen. Mehr als eine Million Ventile sind weltweit im Einsatz, Produktunterstützung in vielen Sprachen und über alle Zeitzonen hinweg bestätigen die Position von Blain Hydraulics als führender Hersteller von Schlüsselkomponenten für die Aufzugsindustrie.

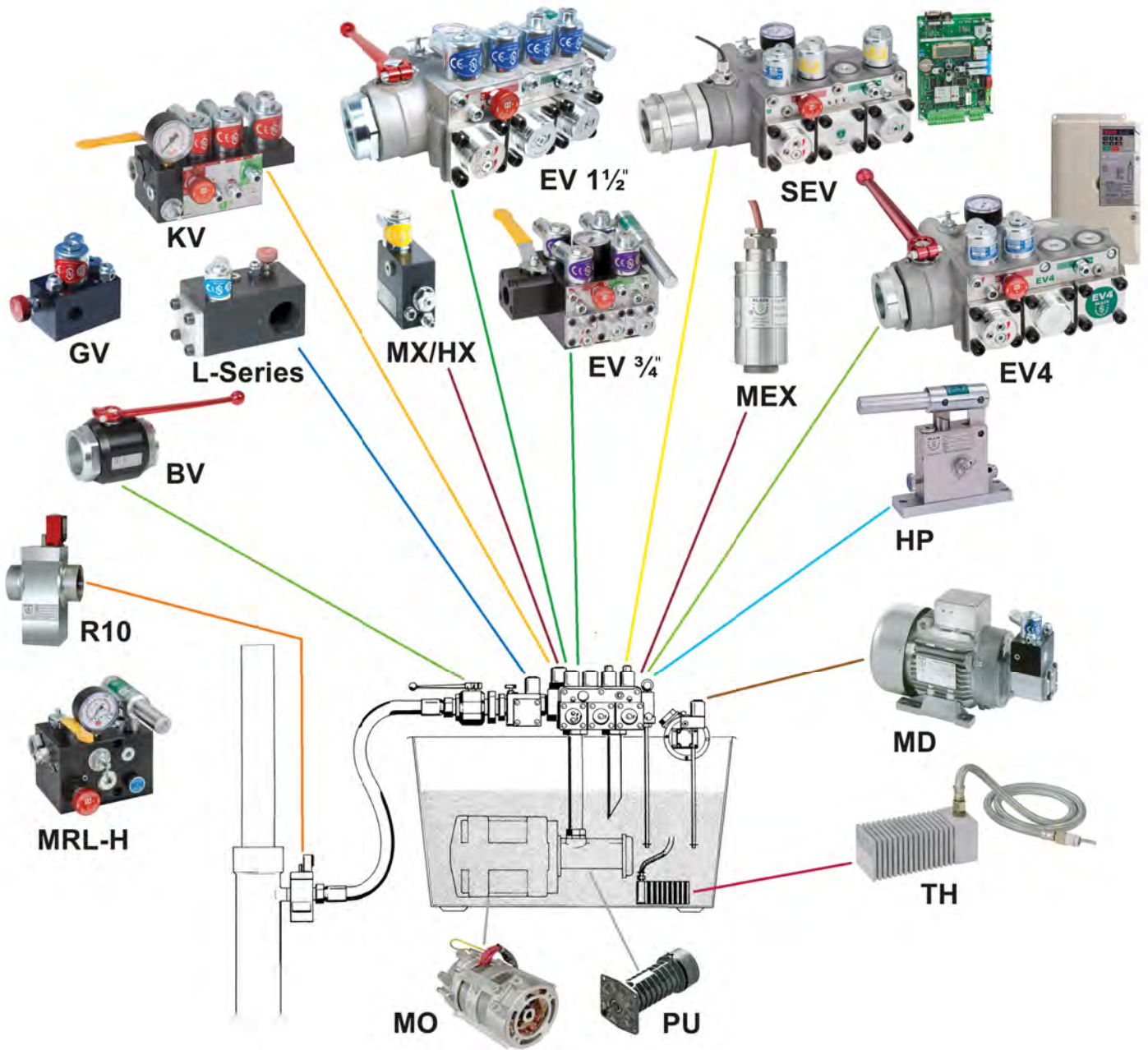
Hydraulik ist unsere Leidenschaft. Diese Leidenschaft findet sich in jedem unserer Ventile wieder.

Anja Blain (Geschäftsführerin)



EN ISO 9001

# Blain Products



## BLAIN PRODUCT RANGE

Illustrating hydraulic valves and other Blain equipment, serving to improve elevator safety and comfort, reduce travelling time and increase stopping accuracy. For additional information, please refer to descriptions and technical data sheets covering each product.



## BLAIN PRODUKTPALETTE

Zeigt hydraulische Ventile und anderes Blain Zubehör, welches dazu dient, die Aufzugssicherheit und den Fahrkomfort zu erhöhen, die Fahrzeit zu reduzieren und die Haltegenauigkeit zu verbessern. Zusätzliche Informationen entnehmen Sie bitte unseren Beschreibungen und technischen Datenblättern der einzelnen Produkte.



## PRODUITS BLAIN

La gamme des produits Blain présente des soupapes hydrauliques ainsi que de nombreux accessoires, qui permettent d'augmenter la sécurité, et le confort, des ascenseurs, de réduire le temps de trajet, et d'améliorer la précision de l'arrêt. Pour des informations supplémentaires reportez vous aux descriptifs et aux notices techniques des différents produits.



## GAMA DE PRODUCTOS BLAIN

Muestra válvulas hidráulicas y otros accesorios Blain, que sirven para aumentar la seguridad así como el confort en los ascensores, reducen el tiempo del trayecto y mejoran la precisión de parada. Para más información, consulte por favor, nuestras descripciones y las página adjuntas exponen con claridad los datos técnicos de los diferentes productos.

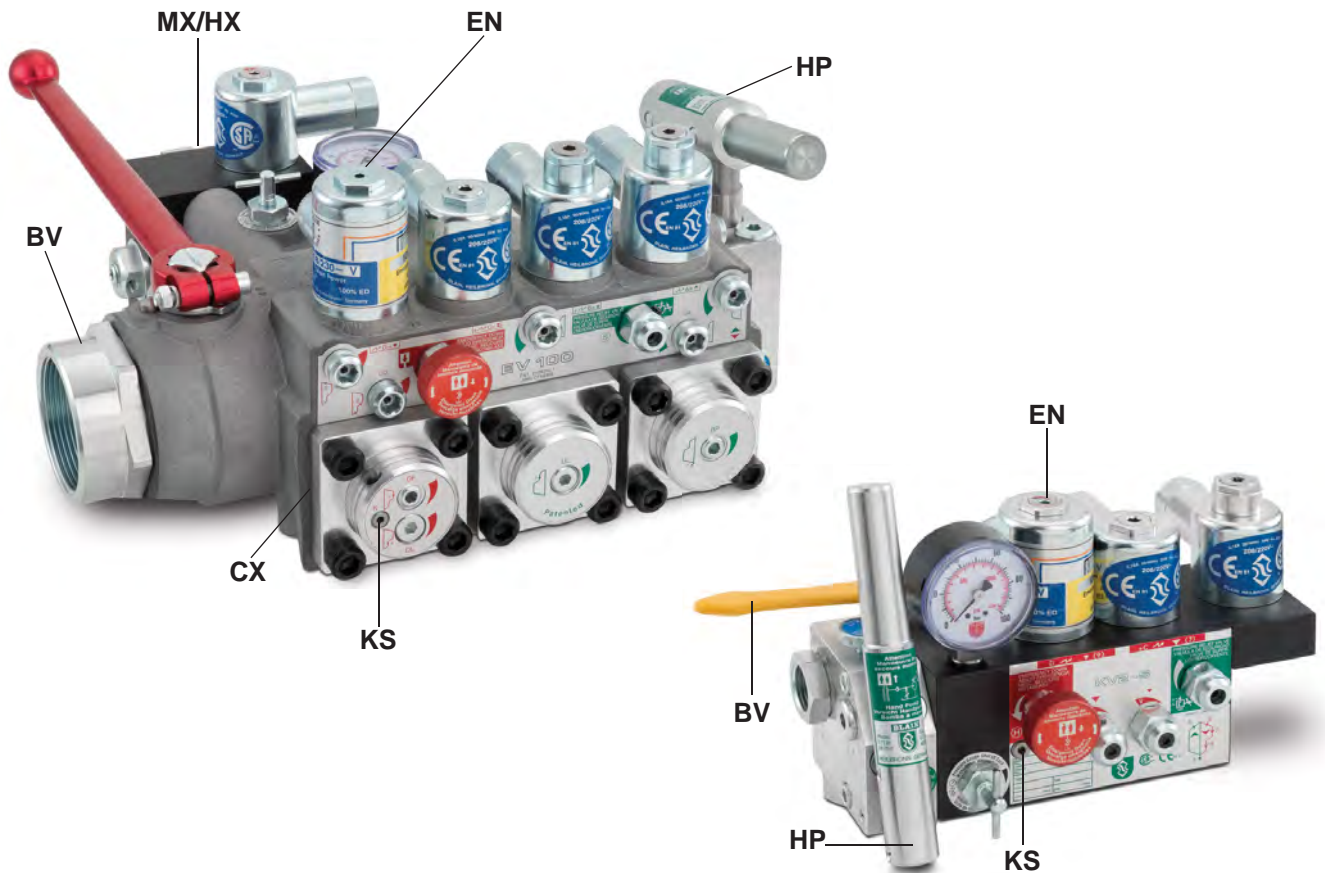


- KV - Mechanical Control Valve:** For small hydraulic elevators with speeds ranging from 0.16 m/s to 1.0 m/s (32-200 fpm), depending on the valve type.
- EV - Mechanical Control Valve:** A selection of valves with flows ranging from 10-1600 l/min (2.6-416 US gpm), from regular to highest comfort performance.
- SEV - Servo electronic valve:** A selection of valves with proportional solenoids and electronic card for easy remote monitoring and adjustment with flows ranging from 10-1150 l/min (2.6-304 US gpm), for operation in wide pressure and temperature range.
- EV4 - VVVF control valve:** A selection of valves together with inverter drive from Yaskawa for flows ranging from 10-1600 l/min (2.6-416 US gpm). EV4-vvfv program includes the widest range of vvvf solution offered to the elevator industry for high performance passenger elevators. Easy to install, EV4's are smooth, reliable and precise in operation throughout extreme load and temperature variations with in-built overload protection and different energy saving modes.
- GV - Mechanical control valve:** A selection of valve from 1-24 l/min (0.3-6.3 US gpm) for hydraulic car parking ports and material lifting platforms.
- R10 - Rupture Valve:** Decelerates the elevator in case the down speed exceeds allowable limits. Alternative connections available.
- L10 - UCM (A3) Safety Valve:** Is a pilot operated check valve which prevents down movement of the elevator should an electrical or mechanical malfunction occur in the main valve.
- MD - Micro Levelling Drive:** A drive unit consisting of a small motor, pump and valve block to provide immediate re-levelling and accurate floor stops in up and down directions.
- MRL-H - Machine room less rescue unit:** designed for servicing and rescuing operations of Machine Room-Less Hydraulic (MRL-H) elevators remotely by having easy outside access, without needing to be in the pit. MRL-H can be located up to a distance of 6 metres (19 feet) away and 5 metres (16 feet) high from the main power unit at a convenient location for easy access.
- BV - Ball Valve:** To close pressure lines. A selection of different thread connections to choose from.
- TH - Tank Heater:** Prevents the oil temperature from falling below desirable levels after a period of non-operation of hydraulic equipment.
- HP - Hand Pump:** For application with hydraulic lifting or pressing equipment and for the pressure testing of hydraulic systems in general.
- HX - Manual Down Valve:** Can be used for emergency manual lowering or in combination with the EV down valve to test the rupture valve.
- MX - Solenoid Down Valve:** For revision or inspection travel of the elevator or as an extra slow speed down valve.
- MEX - Explosion Proof Solenoids:** For use in potentially explosive atmospheres.
- PU - submersible screw pump:** SEIM screw pumps are specifically designed for immersion in oil to work with hydraulic lifts and meet the requirements of low noise level, high efficiency and low pulsation with flow up to 900 l/min.
- MO - submersible motor:** SB Motori submersible single and 3 phase motors are specifically designed for immersion in oil to work with submersible screw pumps and meet the requirements of low noise level and high efficiency in hydraulic lifts.



- KV - Steuerventil:** Für kleine hydraulische Personenaufzüge mit Geschwindigkeiten von 0,16 m/s bis 1,0 m/s (je nach Ausführung).
- EV - Steuerventil:** Mit Durchflüssen von 10-1600 l/min bieten sie eine Auswahl von Ventilen, von der Einfach- bis zur Höchst-Komfortfahrleistung.
- SEV - Servoventil:** Ventilserie mit Proportional-Magnetspulen und Elektronikschnittstelle für einfache Fernwartung und Einstellung. Geeignet für Volumenströme von 10-1150 l/min mit großem Druck- und Temperaturbereich.
- EV4 - VVVF Steuerventil:** Steuerventil mit Yaskawa Frequenz-umrichter für Volumenströme von 10-1600 l/min. Das Ventil deckt einen großen Bereich von qualitativ hochwertigen hydraulischen Personenaufzügen ab. Die einfach zu installierenden EV4 Ventile arbeiten ruhig, zuverlässig und präzise auch bei extremer Last- und Temperaturschwankung und bieten zusätzlich einen eingebauten Überlastschutz und verschiedene Energiesparmodi.
- GV - Steuerventil:** Auswahl von 1-24 l/min für Hydraulik-Autopark-Systeme oder Plattformaufzüge.
- R10 - Rohrbruchventil:** Bremst den Aufzug bei überhöhter Absenkgeschwindigkeit ab. Vielzahl von Anschlussmöglichkeiten.
- L10 - UCM (A3) Sicherheitsventil:** Vorgesteuertes Rückschlagventil, verhindert ein Absenken des Aufzuges bei elektrischen oder mechanischen Fehlfunktionen des Hauptventils.
- MD - Feinnivellierungsantrieb:** Ein Kleinmotor, Pumpe und Ventilblock sorgen für sofortiges Nachholen in Hub- und Senkrichtung sowie genaues Halten des Aufzuges.
- MRL-H-Service-Einheit für maschinenraumlose Aufzüge:** Konstruiert für Wartungs- und Rettungsaufgaben aus der Ferne bei maschinenraumlosen Hydraulikaufzügen (MRL-H). Die Serviceeinheit kann bis zu 6 Meter entfernt und in einer Höhe von bis zu 4 Metern angebracht werden und ermöglicht somit einen einfachen Zugang.
- BV - Kugelhahn:** Zur Schließung der Druckleitung. Verschiedene Anschlussgrößen lieferbar.
- TH - Tankheizung:** Verhindert nach längerem Stillstand eines Aufzuges die Absenkung der Öltemperatur unter den erwünschten Wert.
- HP - Handpumpe:** Für das Anheben von hydraulischen Aufzügen, sowie zur Druckprüfung von hydraulischen Systemen allgemein.
- HX - Handbetätigtes Senkventil:** Dient zusammen mit dem Senkventil des EV Blockes zur Überprüfung des Rohrbruchventils.
- MX - Elektrogesteuertes Senkventil:** Dient zur Revisions- oder Inspektionsfahrt eines Aufzuges oder als dritte, langsame Senkgeschwindigkeit.
- MEX - Explosionsgeschütztes Magnetventil:** Zur Verwendung in potentiell explosiver Atmosphäre.
- PU - Unteröl-Schraubenspindelpumpe:** SEIM Schraubenspindelpumpen sind speziell für den Unterölbetrieb in hydraulischen Aufzügen konstruiert. Sie erfüllen die Anforderungen an einen geräuscharmen Betrieb, hohe Effektivität und einen gleichmäßigen Volumenstrom mit bis zu 900 l/min.
- MO - Unterölmotor:** Die Wechsel- und Drehstrom-Unterölmotoren von SB Motori sind speziell für den Unterölbetrieb mit Schraubenspindelpumpen konstruiert und erfüllen die Anforderungen an einen geräuscharmen und effizienten Betrieb in hydraulischen Aufzügen.

## Option for EV and KV valves



|       |                           |
|-------|---------------------------|
| BV    | Ball Valve                |
| HP    | Hand Pump                 |
| MX/HX | Down Valve                |
| EN    | Emergency Power Coil      |
| KS    | Slack Rope Valve          |
| CX    | Pressure Compensated Down |

Pressure Line Shut Off.  
To raise car manually.  
Extra Down Valve Solenoid or manual.  
Battery lowering in case of power failure.  
Prevents slack rope condition in 2:1 systems.  
Limits down speed variation with load.



|       |                               |
|-------|-------------------------------|
| BV    | Kugelhahn                     |
| HP    | Handpumpe                     |
| MX/HX | Senkventil                    |
| EN    | Notstromspule                 |
| KS    | Kolbensicherung               |
| CX    | Druckkompensierter Senkkolben |

Absperrhahn für Druckleitung.  
Für manuelles Anheben der Kabine.  
Zusätzliches Senkventil magnetisch oder manuell.  
Absenkung durch Batterie bei Stromausfall.  
Verhindert Schlaffseitzustand bei 2:1 Systemen.  
Begrenzt die Senkgeschwindigkeitsabweichung bei Lastunterschieden.



|       |   |
|-------|---|
| BV    | Robinet à boisseau sphérique            |
| HP    | Pompe à main                            |
| MX/HX | Soupape de descente                     |
| EN    | Bobine descente de secours              |
| KS    | Sécurité de mou de câble                |
| CX    | Soupape descente compensée par pression |

Permet la fermeture de la conduite hydraulique.  
Pour la montée manuelle de la cabine.  
Soupape de descente supplémentaire magnétique ou manuelle.  
Descente sur batterie en cas de coupure du courant principal.  
Empêche un mou de câble excessif sur des systèmes 2:1.  
La vitesse de descente reste presque constante malgré de charges différentes.



|       |                                   |
|-------|-----------------------------------|
| BV    | Llave esférica                    |
| HP    | Bomba a mano                      |
| MX/HX | Válvula de bajada                 |
| EN    | Bobina de corriente de emergencia |
| KS    | Válvula aflojamiento de cables    |
| CX    | Válvula de bajada compensada      |

Tubería de presión, grifo de cierre.  
Para elevar la cabina manualmente.  
Válvula de bajada suplementaria, magnética o manual.  
El acumulador acciona la bajada automática al interrumpir la corriente eléctrica.  
Evita el aflojamiento excesivo de cables en sistemas 2:1.  
Limita la variación de velocidad de bajada con cargas diferentes.

KV 1/2" solenoid valves are designed for small hydraulic lifts operating at speeds up to 0.16 m/s (32 fpm) depending on the valve selected. The smooth and accurate ride characteristics of the KV2S valve which includes 'soft stop' in both directions, render it highly suitable for quality home lifts and lifts for the handicapped.

**Flow Range:** 5-80 l/min (1.3-21 US gpm) - see flow pressure charts

**Oil Viscosity:** 25-60 cSt. at 40°C (104°F)

**Solenoids AC:** 24 V/1.8 A, 42 V/1.0 A, 110 V/0.5 A, 230 V/0.18 A, 50/60 Hz

**Solenoids DC:** 12 V/2.1 A, 24 V/1.1 A, 42 V/0.6 A, 80 V/0.3 A, 125 V/0.25 A, 196 V/0.14 A.

**Ports:** P Pump, Z Cylinder and T Tank all G1/2"

**Insulation Class, AC and DC:** IP 68

**Pressure Range:** 8-100 bar (116-1450 psi)

**Burst Pressure:** 500 bar (7251 psi)

**Max. Oil Temperature:** 70°C (158°F)



### Speeds max. (EN code)

#### KV1P



1.8 kg

- Up** One up speed, 0.16 m/s (32 fpm) max.  
Up start has built-in damping.  
Up stop has no damping (pump stops).
- Down** One down speed, 0.16 m/s (32 fpm) max.  
Down start has adjustable damping.  
Down speed is adjustable.  
Down stop has built-in damping.

#### KV1S



2.3 kg

- Up** One up speed 0.16 m/s (32 fpm) max. with soft stop, or 0.4 m/s (80 fpm) max. with overtravel and relevelling.  
Up start has built-in damping.  
Up stop has adjustable damping (delayed pump stop required).
- Down** One down speed, 0.16 (32 fpm) max.  
Down start has adjustable damping.  
Down speed is adjustable.  
Down stop has built-in damping.

#### KV2P



2.5 kg

- Up** One up speed, 0.16 m/s (32 fpm) max.  
Up start has built-in damping.  
Up stop has no damping (pump stops).
- Down** Two down speeds, 1 m/s (200 fpm) max.  
Down start has adjustable damping.  
Fast down speed and levelling speeds are adjustable.  
Slow down and stop have built-in damping.

#### KV2S



3.2 kg

- Up** One up speed, 0.16 m/s (32 fpm) max. with soft stop, or 0.4 m/s (80 fpm) max. with overtravel and relevelling.  
Up start has built-in damping.  
Up stop has adjustable damping (delayed pump stop required).
- Down** Two down speeds, 1 m/s (200 fpm) max.  
Down start has adjustable damping.  
Fast down speed and levelling speeds are adjustable.  
Slow down and stop have built-in damping.

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GmbH

Designer and Manufacturer of the highest quality control valves & safety components for hydraulic elevators



### Control Elements

- A Solenoid 'Up Stop'
- C Solenoid 'Down Deceleration'
- D Solenoid 'Down Stop'
- U Bypass Valve
- H Manual Lowering

- V Check Valve
- X Down Valve
- Y Down Level Valve
- F Main Filter
- S Relief Valve

### Adjustments UP

- 1 Bypass
  - 5 Up Soft Stop
- Up Acceleration built-in*

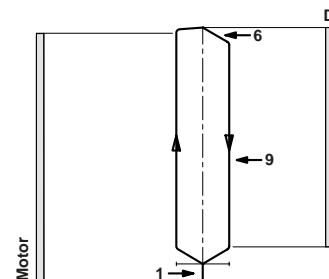
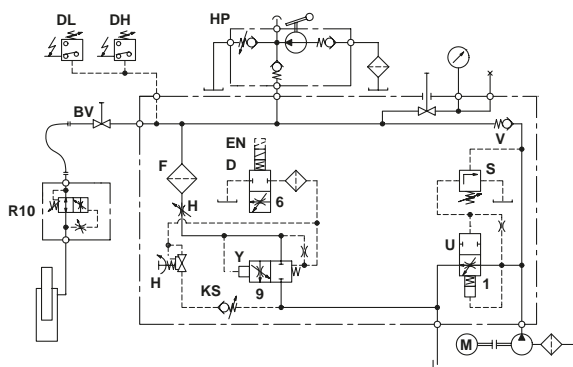
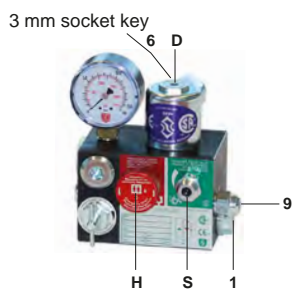
### Adjustments DOWN

- 6 Down Acceleration
  - 7 Down Full Speed
  - 9 Down Levelling Speed
- Down Deceleration built-in*

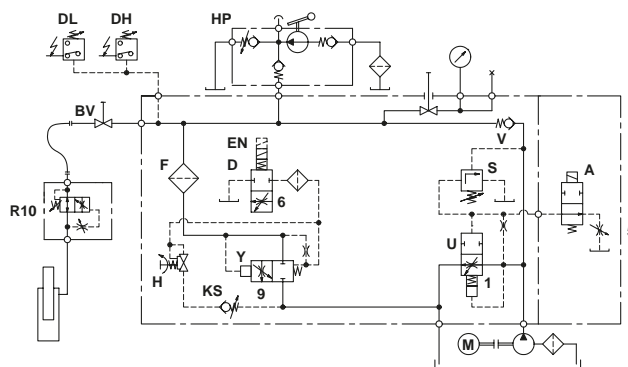
### Hydraulic Circuit

### Electrical Sequence

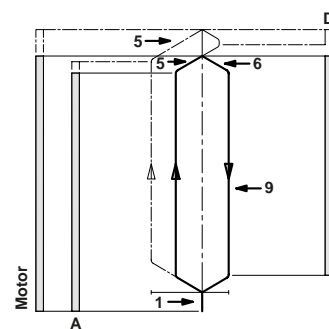
#### KV1P



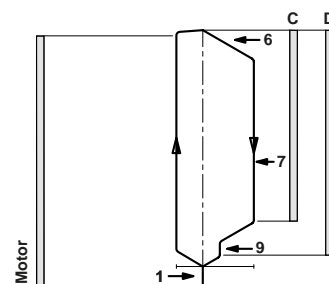
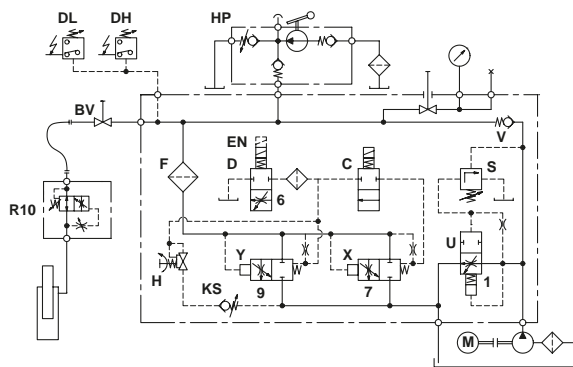
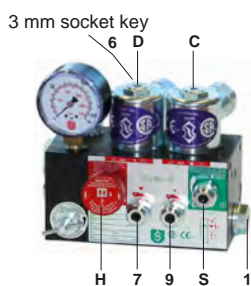
#### KV1S



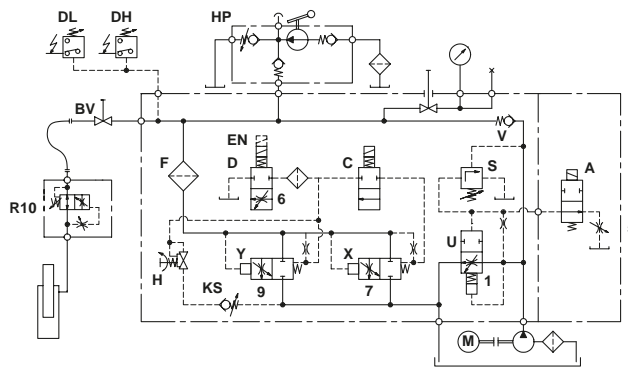
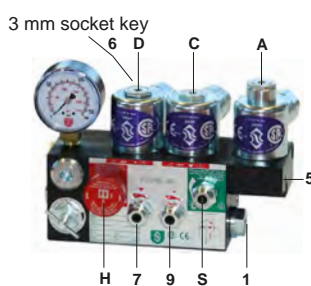
### Alternative Overtravel



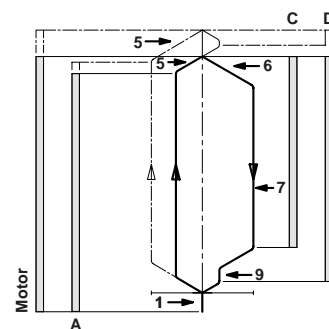
#### KV2P



#### KV2S



### Alternative Overtravel







**Warning:** Only qualified personnel should adjust or service valves. Unauthorised manipulation may result in injury, loss of life or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off, cylinder line is closed and residual pressure in the valve is reduced to zero.



## Adjustments UP

**Valves are already adjusted and tested.** Check electrical operation before changing valve settings. Test that the correct solenoid is energized, by removing the nut and raising the solenoid slightly to feel pull.

**Nominal Settings:** Adjustment **1** level with flange faces. Adjustment **5** (KV1S & KV2S) level with flange faces.

- KV1P**
- 1. Up Bypass:** When the pump is started, the unloaded car should remain stationary at the floor for a period of about 1 second before starting upwards. The length of this delay is according to the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.  
**Up Stop:** At floor level, the pump-motor is de-energized. The stop may be abrupt depending on load and speed of approach. No adjustment possible.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**

- KV1S**
- 1. Up Bypass:** When the pump is started, the unloaded car should remain stationary at the floor for a period of about 1 second before starting upwards. The length of this delay is according to the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.
  - 5. Up Stop:** At floor level solenoid **A** is de-energized. Through a time relay the pump must run approx. 1 seconds longer to allow the car to stop smoothly by valve operation according to the setting of adjustment **5**. 'In' (clockwise) provides a softer stop, 'out' (c-clockwise) a quicker stop. Pre-adjustment: With solenoid **A** disconnected and the pump running, **5** should be turned in until the car starts to move up, then slowly backed off again until the car stops.  
**Alternative Up Stop:** At relatively higher speeds and with the time relay arrangements as with 'up stop' above, the car may travel to just above floor level. In overtravelling the floor, down levelling solenoid **D** is energized, lowering the car smoothly back down to floor level where **D** is de-energized.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**

- KV2P**
- 1. Up Bypass:** When the pump is started, the unloaded car should remain stationary at the floor for a period of about 1 second before starting upwards. The length of this delay is according to the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.  
**Up Stop:** At floor level, the pump-motor is de-energized. The stop may be abrupt depending on load and speed of approach. No adjustment possible.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**

- KV2S**
- 1. Up Bypass:** When the pump is started, the unloaded car should remain stationary at the floor for a period of about 1 second before starting upwards. The length of this delay is according to the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.
  - 5. Up Stop:** At floor level solenoid **A** is de-energized. Through a time relay the pump must run approx. 1 seconds longer to allow the car to stop smoothly by valve operation according to the setting of adjustment **5**. 'In' (clockwise) provides a softer stop, 'out' (c-clockwise) a quicker stop. Pre-adjustment: With solenoid **A** disconnected and the pump running, **5** should be turned in until the car starts to move up, then slowly backed off again until the car stops.  
**Alternative Up Stop:** At relatively higher speeds and with the time relay arrangements as with 'up stop' above, the car may travel to just above floor level. In overtravelling the floor, down levelling solenoid **D** is energized, lowering the car smoothly back down to floor level where **D** is de-energized.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**



**Warning:** Only qualified personnel should adjust or service valves. Unauthorised manipulation may result in injury, loss of life or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off, cylinder line is closed and residual pressure in the valve is reduced to zero.



## Adjustments DOWN

**Valves are already tested and adjusted.** Check electrical operation before changing valves settings. Test that the correct solenoid is energized by removing nut and raising solenoid slightly to feel pull.

**KV Nominal Settings:** Adjustments **7 & 9**, screwheads level with the hexagon heads.

### KV1P / KV1S

**6. Down Acceleration:** When solenoid **D** is energized, the car will accelerate downwards according to the setting of adjustment **6**. 'In' (clockwise) provides a softer down acceleration, 'out' (c-clockwise) a quicker acceleration. Pre-adjustment: **6** should be turned all the way in and then solenoid **D** energized. Turn **6** slowly back out until the car accelerates downwards.

**9. Down Speed:** With solenoid **D** energized as above, the down speed of the car is according to the setting of adjustment **9**. 'In' (clockwise) provides a slower down speed, 'out' (c-clockwise) a faster down speed.

**Down Stop:** At floor level, solenoid **D** is de-energized causing the car to stop. No adjustment necessary.

**H Manual Lowering:** 'out' (c-clockwise) allows the car to be lowered by hand. Closes automatically on release.

### KV2P / KV2S

**6. Down Acceleration:** When solenoids **C** and **D** are energized, the car will accelerate downwards according to the setting of adjustment **6**. 'In' (clockwise) provides a softer down acceleration, 'out' (c-clockwise) a quicker acceleration. Pre-adjustment: **6** should be turned all the way in and then solenoid **C** and **D** energized. Turn **6** slowly back out until the car accelerates downwards.

**7. Down Speed:** With solenoids **C** and **D** energized as above, the down speed of the car is according to the setting of adjustment **7**. 'In' (clockwise) provides a slower down speed, 'out' (c-clockwise) a faster down speed.

**Down deceleration:** When solenoid **C** is de-energized whilst solenoid **D** remains energized, the car will decelerate according to the built-in damping. No further adjustment will be required.

**9. Down Levelling:** With solenoid **C** de-energized and solenoid **D** remaining energized, the car will travel at its down levelling speed according to the setting of adjustment **9**. 'In' (clockwise) provides a slower, 'out' (c-clockwise) a faster down levelling speed.

**Down Stop:** At floor level, solenoid **D** is de-energized causing the car to stop. No adjustment necessary.

**H Manual Lowering:** 'out' (c-clockwise) allows the car to be lowered by hand. Closes automatically on release.

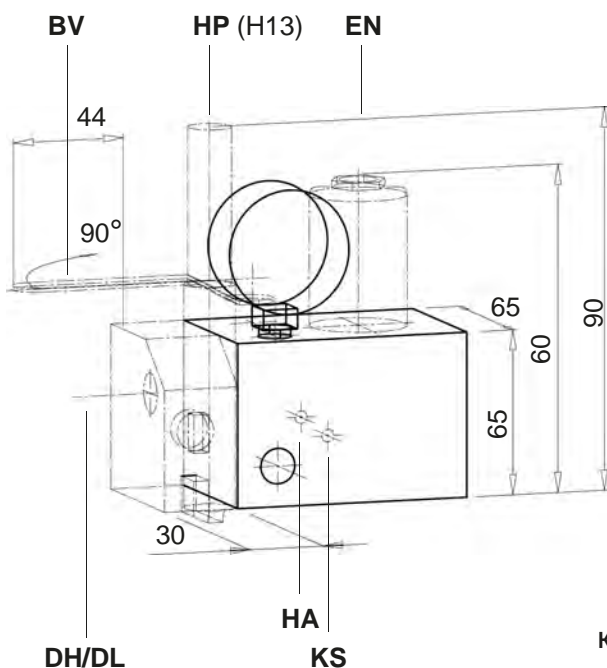
**KS Slack Rope Valve:** Solenoid **D** must be de-energised! The KS, is adjusted with a 3 mm Allan Key by turning the screw **K** 'in' for higher pressure and 'out' for lower pressure. With **K** turned all the way 'in', then half a turn back out, the unloaded car should descend when Manual Lowering **H** is opened. Should the car not descend, **K** must be backed off until the car just begins to descend, then backed off a further half turn to ensure that with cold oil, the car can be lowered as required.

## Optional

### KV Optional Equipment

- BV** Ball Valve built in
- EN** Emergency Power Solenoid
- HP** Hand Pump H 13
- KS** Slack Rope Valve
- DH** Pressure Switch 10-100 bar
- DL** Pressure Switch 1-10 bar
- CSA** CSA Solenoids
- HA** Emergency Manual Down Speed Adj.

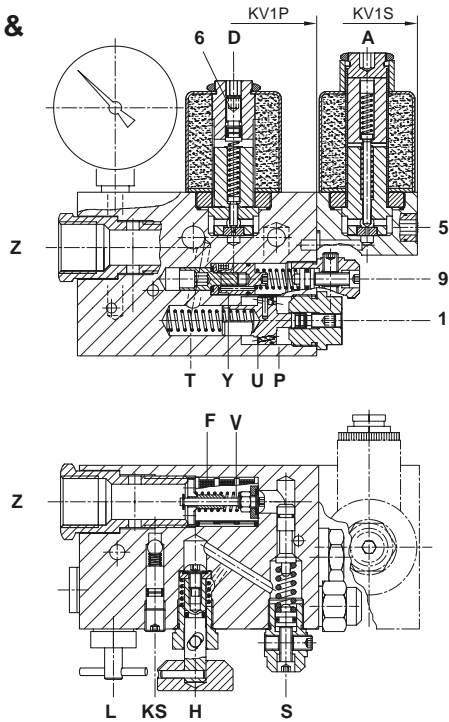
The possible options are shown with KV1P Valve.  
The same Options can be applied to all other KV Valve types.



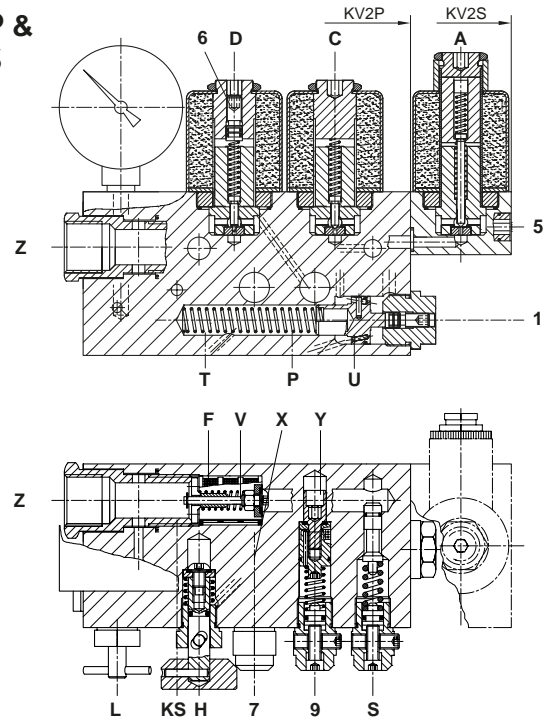
KV Example with Options



## KV1P & KV1S



## KV2P & KV2S



### Control Elements

- A Solenoid 'Up Stop'
- C Solenoid 'Down Deceleration'
- D Solenoid 'Down Stop'
- U Bypass Valve
- V Check Valve
- X Down Valve
- Y Down Levelling Valve
- H Manual Lowering
- L Gauge Shut Off Cock
- F Main Filter

### Connections

- P Pump
- T Tank - return
- Z Cylinder

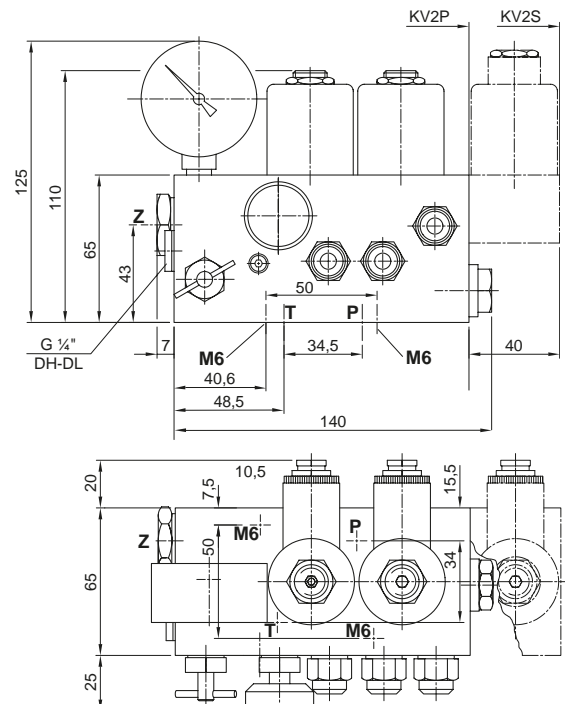
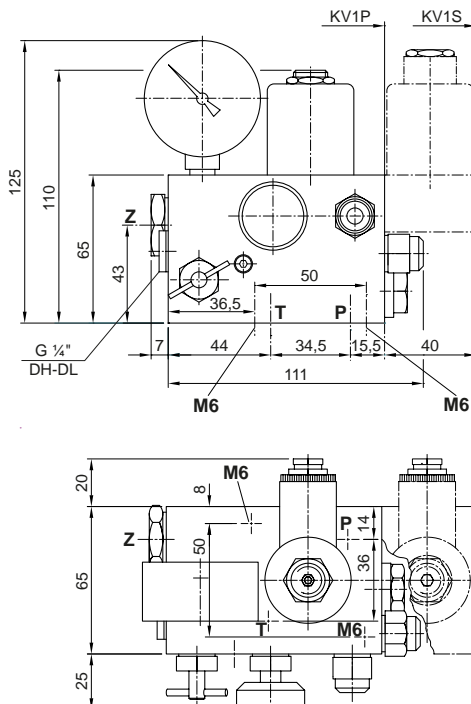
### Adjustments

- 1 Bypass
- 5 Soft Stop 'Up'
- 6 Start 'Down'
- 7 Speed 'Down'
- 9 Levelling 'Down'
- S Relief Valve



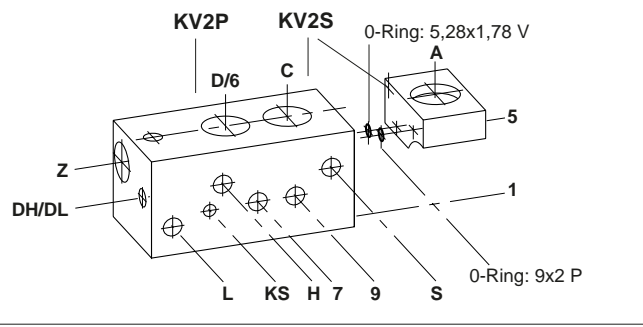
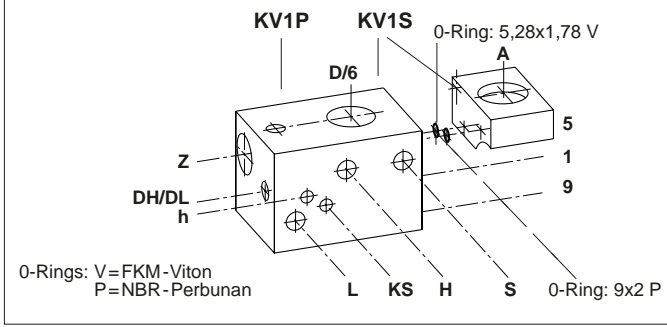
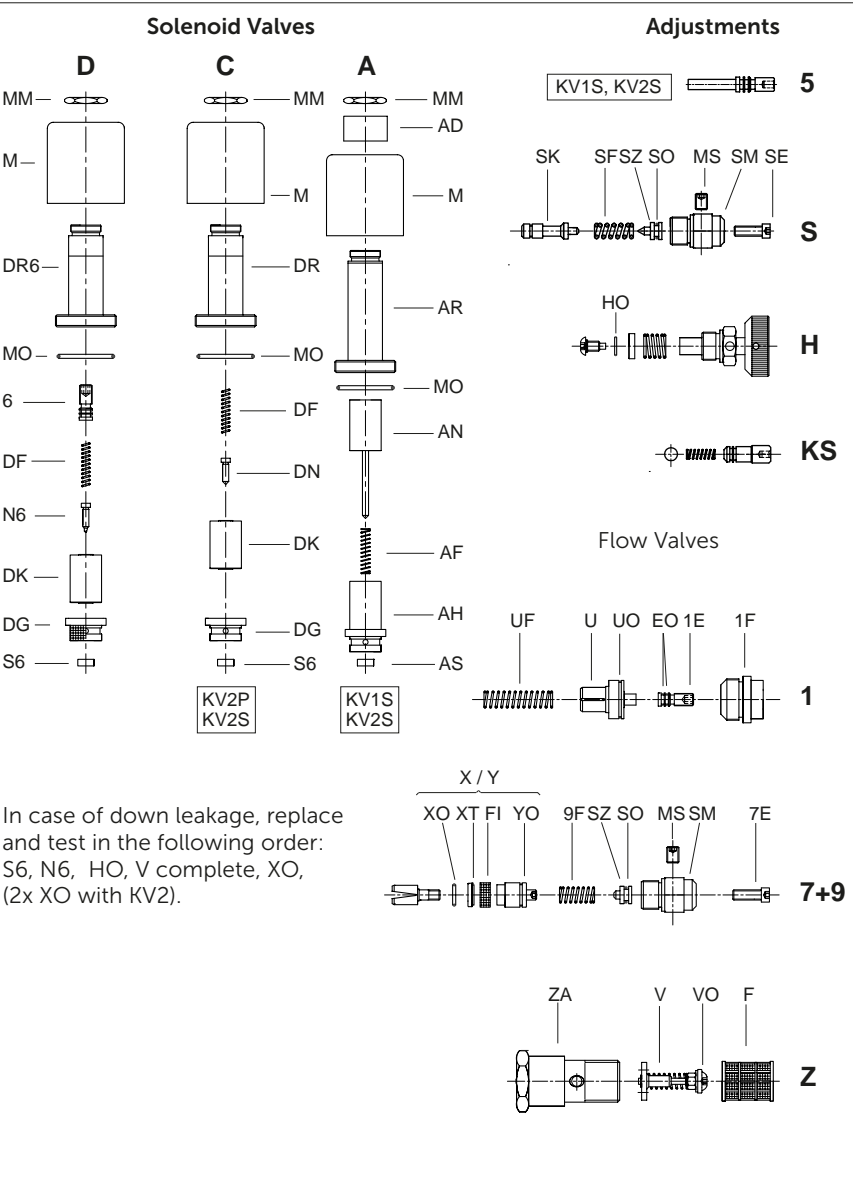
Important: Length of 1/2" thread on pipe connections should not be longer than 14 mm!

## Measurements

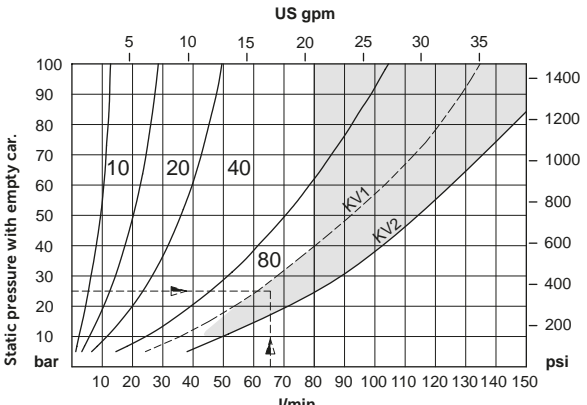




| Pos. | No.                        | Item  |
|------|----------------------------|---|
| 1    | 1F                         | Flange - Bypass                             |
|      | 1E                         | Adjustment - Bypass                         |
|      | EO                         | 0-Ring - Adjustment (3,5x1,5 - P)           |
|      | U                          | Flow Guide - Bypass                         |
|      | UO                         | 0-Ring - Bypass (17x1 - V)                  |
|      | UF                         | Spring - Bypass                             |
| 5    | 5                          | Adjustment - Up Stop                        |
| 6    | 6                          | Adjustment - Down Acceleration              |
| 7+9  | 7E                         | Adjustment - Down Valve                     |
|      | 9F                         | Spring - Down Valve                         |
|      | YO                         | 0-Ring - Flow Guide (10x1 - V)              |
|      | XO                         | Seal - Flow Guide (5.28x1.78 - V)           |
|      | XT                         | 0-Ring Disc                                 |
|      | FI                         | Filter - Down Valve                         |
|      | X                          | Down Flow Guide (Brass)                     |
|      | Y                          | Down Levelling Flow Guide (Steel) - KV2     |
|      | Y                          | Down Flow Guide (Steel) - KV1               |
|      | S                          | SE  |
| SM   |                            | Hexagonal - Relief Valve                    |
| MS   |                            | Locking Screw                               |
| SO   |                            | 0-Ring - Nipple                             |
| SZ   |                            | Nipple - Relief Valve                       |
| SF   |                            | Spring - Relief Valve                       |
| SK   |                            | Piston - Relief Valve                       |
| H    | H                          | Manual Lowering - Self Closing              |
|      | HO                         | Seal - Man. Lowering (0-Ring 5.28x1.78 - V) |
| HA   | Adjustable Manual Lowering |   |
| KS   | KS                         | Slack Rope Valve                            |
| A    | MM                         | Nut Solenoid                                |
|      | AD                         | Collar Solenoid                             |
|      | M                          | Coil Solenoid (indicate voltage)            |
|      | AR                         | Tube Solenoid 'Up'                          |
|      | MO                         | 0-Ring Solenoid                             |
|      | AN                         | Needle Solenoid 'Up'                        |
|      | AF                         | Spring Solenoid 'Up'                        |
|      | AH                         | 'Seat Housing 'Up'                          |
|      | AS                         | Seat Solenoid 'Up'                          |
|      | C+D                        | M   |
| DR   |                            | Tube - Solenoid 'Down', w/o adj. 6          |
| DR6  |                            | Tube Solenoid 'Down', with adj. 6           |
| MO   |                            | 0-Ring Solenoid                             |
| DF   |                            | Spring Solenoid 'Down'                      |
| C    |                            | DN Needle Solenoid 'Down'                   |
| D    |                            | N6 Needle Solenoid 'Down' (Nipple)          |
| C    |                            | HN Needle Solenoid 'Down'                   |
| C    |                            | DK Core Solenoid 'Down'                     |
| C    |                            | DG Seat Housing 'Down'(Solen.D with screen) |
| C    | S6 Seat Solenoid 'Down'    |   |
| C    | CO 0-Ring Seat Housing     |   |
| Z    | ZA                         | Cylinder Thread Connection                  |
|      | V                          | Check Valve                                 |
|      | VO                         | 0-Ring Check Valve (5,28x1,78 - V)          |
|      | F                          | Main Filter                                 |
| L    | L                          | Gauge Shut Off Cock                         |



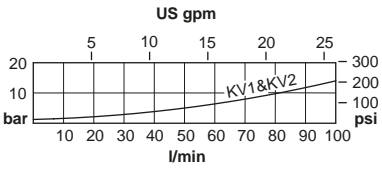
### Insert Selection and Down Flow Chart



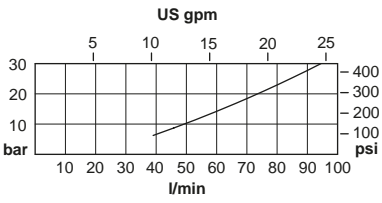
For pressure-flow condition within shaded area, use 3/4" piping to avoid unnecessary pressure loss. Pump flows above 80 l/min are not recommended

Example order  
KV2S, 65 l/min, 25 bar (empty),  
220 AC  
or: KV2S/80/220 AC

### Pressure Drop P - Z



### Lowest Relief Pressure



The BLAIN EV program includes the widest range of options offered to the elevator industry for high performance passenger service. Easy to install, EV's are smooth, reliable and precise in operation throughout extreme load and temperature variations.



### Description

Available port sizes are 3/4", 1 1/2", 2" and 2 1/2" pipe threads, depending on flow. EV's start on less than minimum load and can be used for across the line or wye-delta starting. According to customers' information, valves are factory adjusted ready for operation and very simple to readjust if so desired. The patented up levelling system combined with compensated pilot control ensure stability of elevator operation and accuracy of stopping independent of wide temperature variations.

EV valves include the following features essential to efficient installation and trouble free service:

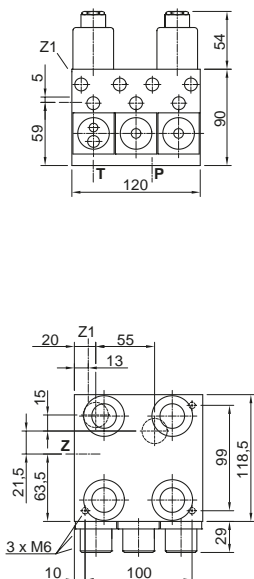


- Simple Responsive Adjustment
- Temperature and Pressure Compensation
- Solenoid with Connecting Cables
- Pressure Gauge and Shut Off Cock
- Self Closing Manual Lowering

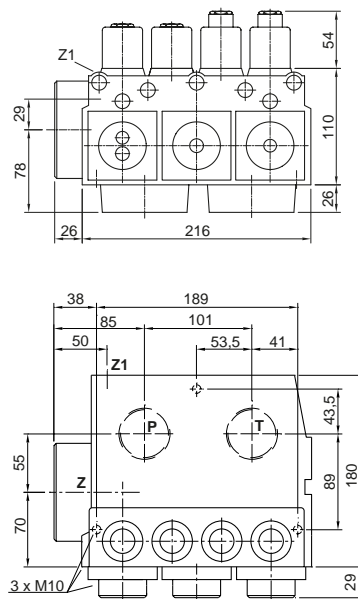
- Self Cleaning Pilot Line Filters
- Self Cleaning Main Line Filter (Z-T)
- Built-in Turbulence Suppressors
- 70 HRC Rockwell Hardened Bore Surfaces
- 100% Continuous Duty Solenoids

| Technical Data:                  |   | 3/4" EV                 | 1 1/2" & 2" EV          | 2 1/2" EV                                 |
|----------------------------------|---|-------------------------|-------------------------|---|
| <b>Flow Range:</b>               | l/min   | 10-125 (2-33 US gpm)    | 30-800 (8-211 US gpm)   | 500-1530 (132-404 US gpm)                 |
| <b>Pressure Range (valve):</b>   | bar   | 8-100 (116-1450 psi)    | 8-100 (116-1450 psi)    | 8-68 (116-986 psi)                        |
| <b>Press. Range CSA (valve):</b> | bar   | 8-100 (116-1450 psi)    | 8-70 (116-1015 psi)     | 8-47 (116-682 psi)                        |
| <b>Burst Pressure Z:</b>         | bar   | 575 (8339 psi)          | 505 (7324 psi)          | 340 (4931 psi)                            |
| <b>Pressure Drop P-Z:</b>        | bar   | 6 (87 psi) at 125 l/min | 4 (58 psi) at 800 l/min | 4 (58 psi) at 1530 l/min                  |
| <b>Weight:</b>                   | kg  | 5 (11 lbs)              | 10 (22 lbs)             | 14 (31 lbs)                               |
| <b>Oil Viscosity:</b>            | 25-60 cSt. at 40°C (104°F).   |                         |                         | <b>Max. Oil Temperature:</b> 70°C (158°F) |
| <b>Solenoids AC:</b>             | 24 V/1.8 A, 42 V/1.0 A, 110 V/0.43 A, 230 V/0.18 A, 50/60 Hz.                           |                         |                         | <b>Insulation Class, AC and DC:</b> IP 68 |
| <b>Solenoids DC:</b>             | 12 V/2.0 A, 24 V/1.1 A, 42 V/0.5 A, 48 V/0.6 A, 80 V/0.3 A, 110 V/0.25 A, 196 V/0.14 A. |                         |                         |   |

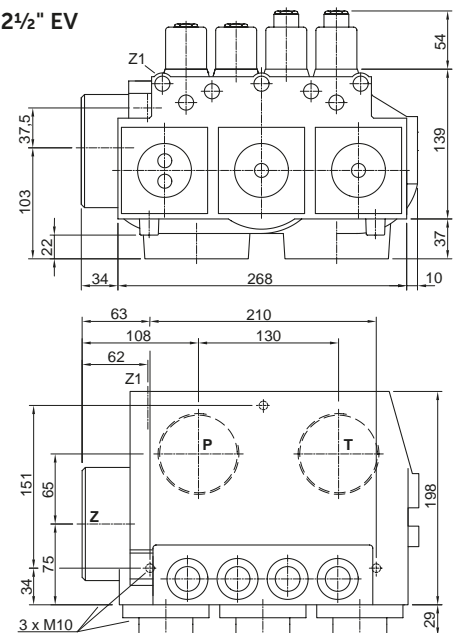
3/4" EV



1 1/2" & 2" EV



2 1/2" EV



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info@blain.de



GmbH

Designer and Manufacturer of the highest quality control valves & safety components for hydraulic elevators



## EV Control Valve Types

### Optional Equipment

|            |                          |           |                           |
|------------|--------------------------|-----------|---------------------------|
| <b>EN</b>  | Emergency Power Solenoid | <b>DH</b> | High Pressure Switch      |
| <b>CSA</b> | CSA Solenoids            | <b>DL</b> | Low Pressure Switch       |
| <b>KS</b>  | Slack Rope Valve         | <b>CX</b> | Pressure Compensated Down |
| <b>BV</b>  | Main Shut-Off Valve      | <b>MX</b> | Auxiliary Down            |
| <b>HP</b>  | Hand Pump                |           |                           |

### EV 0

3/4"

1 1/2" & 2" EV

2 1/2"



- Up** Up to 0.16 m/s (32 fpm). 1 Up Speed.  
Up Start is smooth and adjustable.  
Up Stop by de-energising the pump-motor.
- Down** Up to 1.0 m/s (200 fpm). 1 Full Speed and 1 Levelling Speed.  
All down functions are smooth and adjustable.

USA Patent No. 4,601,366  
Pats & Pats Pend: France, Germany, Italy, Japan, Switzerland & U.K.

### EV 1



- Up** Up to 0.16 m/s (32 fpm). 1 Up Speed.  
Up to 0.4 m/s (80 fpm) by overtravelling and levelling back down.  
Up Start is smooth and adjustable.  
Up Stop is smooth and exact through valve operation whereby the pump must run approx. 1 sec. longer through a time relay.
- Down** Up to 1.0 m/s (200 fpm). 1 Full Speed and 1 Levelling Speed.  
All down functions are smooth and adjustable.

USA Patent No. 4,601,366  
Pats & Pats Pend: France, Germany, Italy, Japan, Switzerland & U.K.

### EV 10



- Up** Up to 1.0 m/s (200 fpm). 1 Full Speed and 1 Levelling Speed.  
Up Start and Slow Down are smooth and adjustable.  
Up Levelling speed is adjustable.  
Up Stop is by de-energising the pump-motor.
- Down** Up to 1.0 m/s (200 fpm). 1 Full Speed and 1 Levelling Speed.  
All down functions are smooth and adjustable.

USA Patent No. 4,637,495  
Pats & Pats Pend: France, Germany, Italy, Japan, Switzerland & U.K.

### EV 100



- Up** Up to 1.0 m/s (200 fpm). 1 Full Speed and 1 Levelling Speed.  
All 'up' functions are smooth and adjustable.  
Up Levelling speed is adjustable.  
Up Stop is smooth and exact through valve operation whereby the pump must run approx. 1 sec. longer through a time relay.
- Down** Up to 1.0 m/s (200 fpm). 1 Full Speed and 1 Levelling Speed.  
All down functions are smooth and adjustable.

USA Patent No. 4,637,495  
Pats & Pats Pend: France, Germany, Italy, Japan, Switzerland & U.K.



**Warning:** Only qualified personnel should adjust or service valves. Unauthorised manipulation may result in injury, loss of life or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off, cylinder line is closed and residual pressure in the valve is reduced to zero.



## Adjustments UP

**Valves are already adjusted and tested.** Check electrical operation before changing valve settings. Test that the correct solenoid is energised, by removing nut and raising solenoid slightly to feel pull.

**Nominal Settings:** Adjustments **1 & 4** approx. level with flange faces. Up to two turns in either direction may then be necessary. Adjustments **2, 3 & 5** all the way 'in' (clockwise) then two turns 'out' (c-clockwise). A small final adjustment may be necessary.

- EV 0**
- 1. By Pass:** When the pump is started, the unloaded car should remain stationary at the floor for a period of 1 to 2 seconds before starting upwards. The length of this delay is determined by the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.
  - 2. Up Acceleration:** With the pump running, the car will accelerate according to the setting of adjustment **2**. 'In' (clockwise) provides a softer acceleration, 'out' (c-clockwise) a quicker acceleration.  
**Up Stop:** The pump-motor is de-energised. There is no adjustment.  
**Alternative Up Stop with Over-travel:** The motor is de-energised at floor level. Through the flywheelaction of the pump-motor drive the car will travel to just above floor level. In overtravelling the floor, down levelling solenoid **D** is energised, lowering the car smoothly back down to floor level where **D** is de-energised.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**

- EV 1**
- 1. By Pass:** When the pump is started and solenoid **A** energised, the unloaded car should remain stationary at the floor for a period of 1 to 2 seconds before starting upwards. The length of this delay is determined by the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.
  - 2. Up Acceleration:** With the pump running and solenoid **A** energised as in 1, the car will accelerate according to the setting of adjustment **2**. 'In' (clockwise) provides a softer acceleration, 'out' (c-clockwise) a quicker acceleration.
  - 5. Up Stop:** At floor level, solenoid **A** is de-energised. Through a time relay the pump should run approx. 1 second longer to allow the car to stop smoothly by valve operation according to the setting of adjustment **5**. 'In' (clockwise) provides a softer stop, 'out' (c-clockwise) a quicker stop.  
**Alternative Up Stop:** At relatively higher speeds, the car will travel to just above floor level. In overtravelling the floor, down levelling solenoid **D** is energised, lowering the car smoothly back down to floor level where **D** is de-energised.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**

- EV 10**
- 1. By Pass:** When the pump is started and solenoid **B** energised, the unloaded car should remain stationary at the floor for a period of 1 to 2 seconds before starting upwards. The length of this delay is determined by the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.
  - 2. Up Acceleration:** With the pump running and solenoid **B** energised as in 1, the car will accelerate according to the setting of adjustment **2**. 'In' (clockwise) provides a softer acceleration, 'out' (c-clockwise) a quicker acceleration.
  - 3. Up Deceleration:** When solenoid **B** is de-energised, the car will decelerate according to the setting of adjustment **3**. 'In' (clockwise) provides a softer deceleration, 'out' (c-clockwise) a quicker deceleration.
  - 4. Up Levelling:** With solenoid **B** de-energised as in 3, the car will proceed at its levelling speed according to the setting of adjustment **4**. 'In' (clockwise) provides a slower, 'out' (c-clockwise) a faster up levelling.  
**Up stop:** The pump-motor is de-energised. There is no adjustment.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**

- EV 100**
- 1. By Pass:** When the pump is started, and solenoids **A** and **B** energised, the unloaded car should remain stationary at the floor for a period of 1 to 2 seconds before starting upwards. The length of this delay is determined by the setting of adjustment **1**. 'In' (clockwise) shortens the delay, 'out' (c-clockwise) lengthens the delay.
  - 2. Up Acceleration:** With the pump running and solenoids **A** and **B** energised as in 1, the car will accelerate according to the setting of adjustment **2**. 'In' (clockwise) provides a softer acceleration, 'out' (c-clockwise) a quicker acceleration.
  - 3. Up Deceleration:** When solenoid **B** is de-energised, whilst solenoid **A** remains energised, the car will decelerate according to the setting of adjustment **3**. 'In' (clockwise) provides a softer deceleration, 'out' (c-clockwise) a quicker deceleration.
  - 4. Up Levelling:** With solenoid **A** energised and solenoid **B** de-energised as in 3., the car will proceed at its levelling speed according to the setting of adjustment **4**. 'In' (clockwise) provides a slower, 'out' (c-clockwise) a faster up levelling.
  - 5. Up Stop:** At floor level, solenoid **A** is de-energised with solenoid **B** remaining de-energised. Through a time relay the pump should run approx. 1 second longer to allow the car to stop smoothly by valve operation according to the setting of adjustment **5**. 'In' (clockwise) provides a softer stop, 'out' (c-clockwise) a quicker stop.
  - S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.  
**Important: When testing relief valve, close ball valve gradually.**



**Warning:** Only qualified personnel should adjust or service valves. Unauthorised manipulation may result in injury, loss of life or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off, cylinder line is closed and residual pressure in the valve is reduced to zero.



## Adjustments DOWN

**Valves are already adjusted and tested.** Check electrical operation before changing valve settings.

Test that the correct solenoid is energised, by removing nut and raising solenoid slightly to feel pull.

**Nominal Settings:** Adjustments 7 & 9 approx. level with flange face. Two turns in either direction may then be necessary. Adjustments 6 & 8 turn all the way 'in' (clockwise), then 1.5 turns 'out' (c-clockwise). One final turn in either direction may be necessary.

**6. Down Acceleration:** When solenoids C and D are energised, the car will accelerate downwards according to the setting of adjustment 6. 'In' (clockwise) provides a softer down acceleration, 'out' (c-clockwise) a quicker acceleration.

**7. Down Speed:** With solenoids C and D energised as in 6 above, the full down speed of the car is according to the setting of adjustment 7. 'In' (clockwise) provides a slower down speed, 'out' (c-clockwise) a faster down speed.

**8. Down Deceleration:** When solenoid C is de-energised whilst solenoid D remains energised, the car will decelerate according to the setting of adjustment 8. 'In' (clockwise) provides a softer deceleration, 'out' (c-clockwise) a quicker deceleration. **Attention: Do not close all the way in! Closing adjustment 8 completely (clockwise) may cause the car to fall on the buffers.**

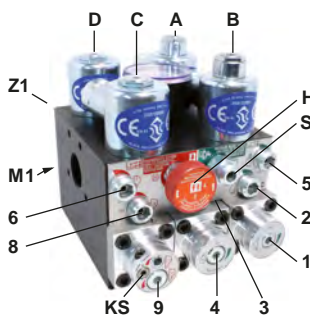
**9. Down Levelling:** With solenoid C de-energised and solenoid D energised as in 8 above, the car will proceed at its down levelling speed according to the setting of adjustment 9. 'In' (clockwise) provides a slower, 'out' (c-clockwise) a faster down levelling speed.

**Down Stop:** When solenoid D is de-energised with solenoid C remaining de-energised, the car will stop according to the setting of adjustment 8 and no further adjustment will be required.

**KS Slack Rope Valve:** Both solenoids C and D must be de-energized beforehand! Loosen the small grub screw on the top of the K on the left hand side. The KS is adjusted with a 3 mm Allen Key by turning the screw K 'in' for higher pressure and 'out' for lower pressure. With K turned all the way 'in', then half a turn back out, the unloaded car should descend when Manual Lowering H is opened. Should the car not descend, K must be backed off until the car just begins to descend, then backed off a further half turn to ensure that with cold oil, the car can be lowered as required.

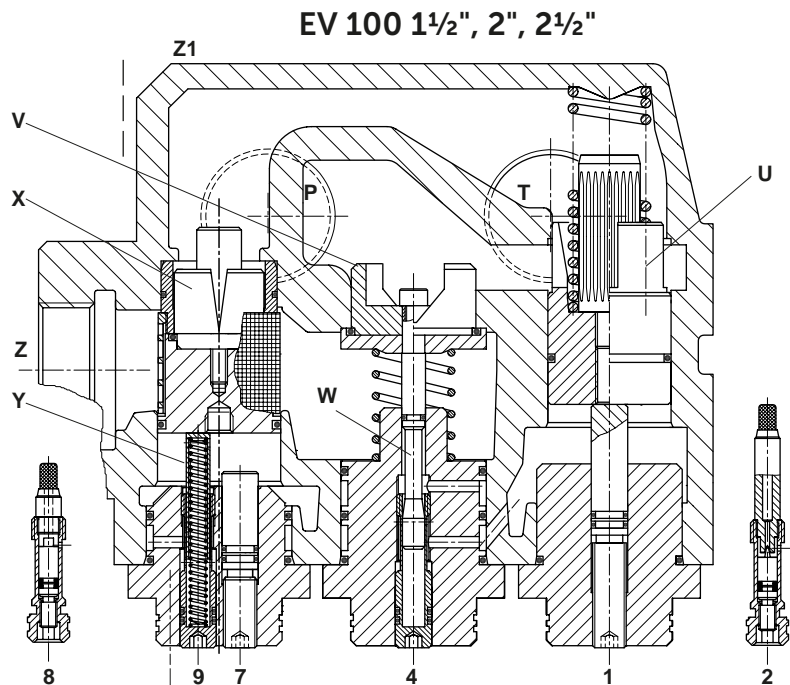
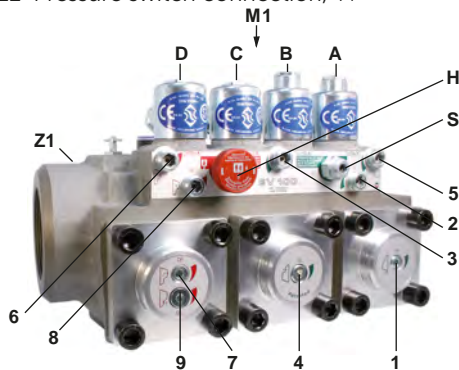
## Positions of Adjustments

**Important:** Length of 3/4" thread on pump connections should not be longer than 14 mm!

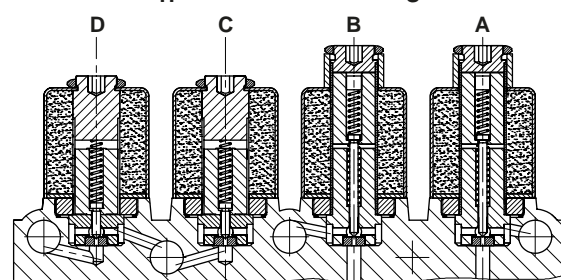
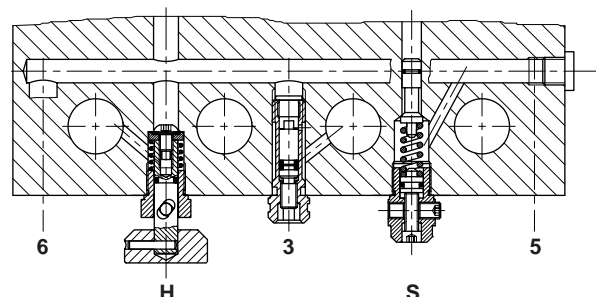


M1 Test pressure gauge connection, 1/2"

Z1 Pressure switch connection, 1/4"



### Horizontal Sections



### Vertical Section

### Adjustments UP

- 1 By Pass
- 2 Up Acceleration
- 3 Up Deceleration
- 4 Up Levelling Speed
- 5 Up Stop

### Adjustments DOWN

- 6 Down Acceleration
- 7 Down Full Speed
- 8 Down Deceleration
- 9 Down Levelling Speed

### Control Elements

- A Solenoid (Up Stop)
- B Solenoid (Up Deceleration)
- C Solenoid (Down Deceleration)
- D Solenoid (Down Stop)
- H Manual Lowering
- S Relief Valve
- U By Pass Valve
- V Check Valve
- W Levelling Valve (Up)
- X Full Speed Valve (Down)
- Y Levelling Valve (Down)

### Valve Types

- EV 0
- EV 1
- EV 10
- EV 100

### Elements Omitted

- A, B, W, 3, 4 & 5
- B, W, 3 & 4
- A & 5
- as shown





### Control Elements

- |                                       |                                  |
|---------------------------------------|----------------------------------|
| <b>A</b> Solenoid (Up Stop)           | <b>U</b> By Pass Valve           |
| <b>B</b> Solenoid (Up Deceleration)   | <b>V</b> Check Valve             |
| <b>C</b> Solenoid (Down Deceleration) | <b>W</b> Levelling Valve (Up)    |
| <b>D</b> Solenoid (Down Stop)         | <b>X</b> Full Speed Valve (Down) |
| <b>H</b> Manual Lowering              | <b>Y</b> Levelling Valve (Down)  |
| <b>S</b> Relief Valve                 | <b>F</b> Filter                  |

### Adjustments UP

- 1** By Pass
- 2** Up Acceleration
- 3** Up Deceleration
- 4** Up Levelling Speed
- 5** Up Stop

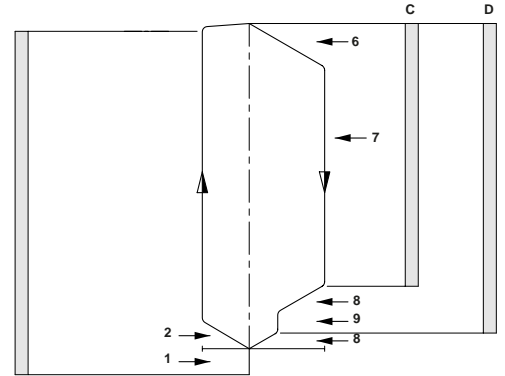
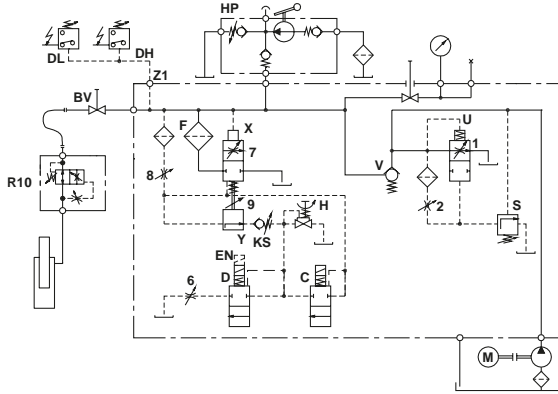
### Adjustments DOWN

- 6** Down Acceleration
- 7** Down Full Speed
- 8** Down Deceleration
- 9** Down Levelling Speed

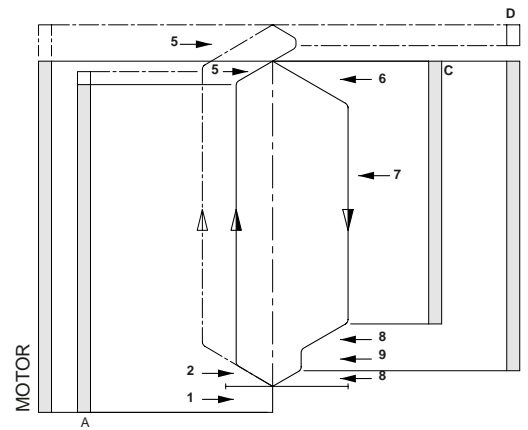
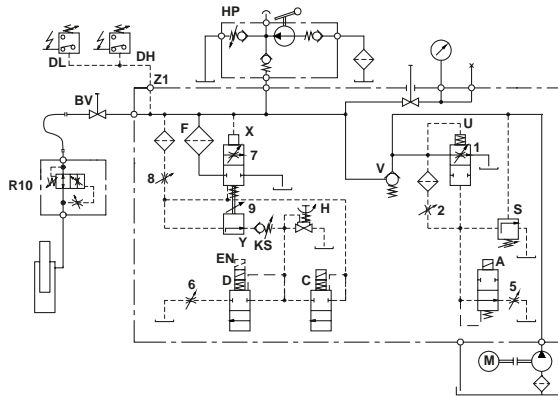
### Hydraulic Circuit

### Electrical Sequence

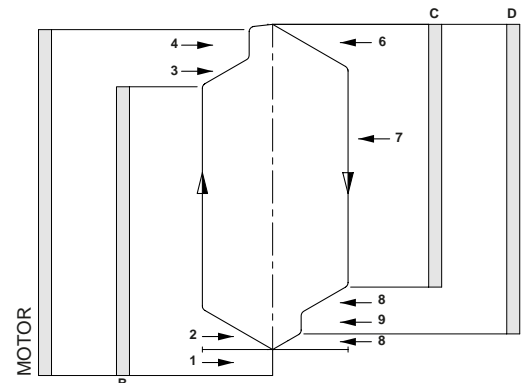
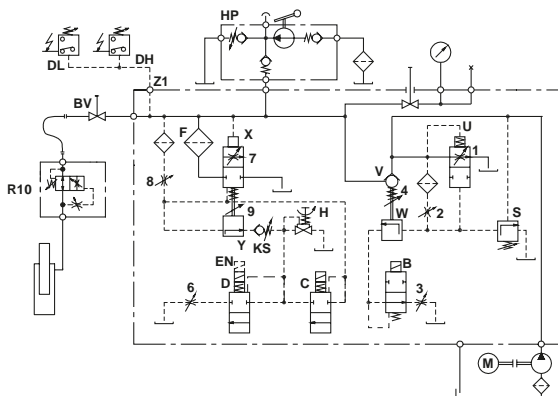
## EV 0



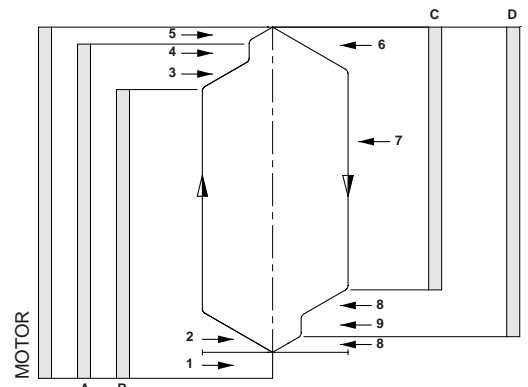
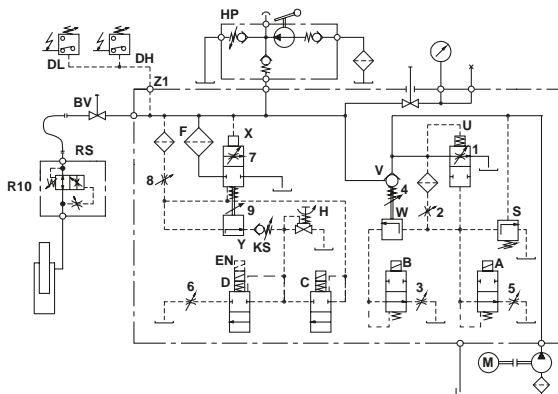
## EV 1



## EV 10



## EV 100





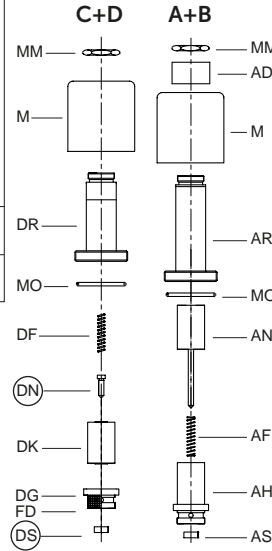
| Pos. | No.         | Item                               |
|------|-------------|------------------------------------|
| 1    | FS          | Lock Screw - Flange                |
|      | FO          | O-Ring - Flange                    |
|      | 1F          | Flange - By Pass                   |
|      | EO          | O-Ring - Adjustment                |
|      | 1E          | Adjustment - By Pass               |
|      | UO          | O-Ring - By Pass Valve             |
|      | U           | By Pass Valve                      |
|      | UD          | Noise Suppressor                   |
|      | UF          | Spring - By Pass                   |
|      | 2           | 2F                                 |
| 3    |             | Adjustment - Up Deceleration       |
| 4    | EO          | O-Ring - Adjustment                |
|      | 4E          | Adjustment - Up Levelling          |
|      | 4F          | Flange - Check Valve               |
|      | FO          | O-Ring - Flange                    |
|      | VF          | Spring - Check Valve               |
|      | W           | Up-Levelling Valve                 |
|      | WO          | O-Ring - Up Levelling Valve        |
|      | VO          | Seal - Check Valve                 |
|      | V           | Check Valve                        |
|      | W6          | Screw - Check Valve                |
| 5    | 3           | Adjustment - Up Stop               |
|      | 3           | Adjustment - Down Acceleration     |
| 7    | 7F          | Flange - Down Valve                |
|      | FO          | O-Ring - Flange                    |
|      | 7O          | O-Ring - Adjustment                |
|      | 7E          | Adjustment - Down Valve            |
|      | UO          | O-Ring - Down Valve                |
|      | XO          | Seal - Down Valve                  |
|      | X           | Down Valve                         |
|      | XD          | Noise Suppressor                   |
| F    | Main Filter |                                    |
| 8    | 8           | Adjustment - Down Deceleration     |
|      | 9E          | Adjustment - Down Levelling        |
| 9    | EO          | O-Ring - Adjustment                |
|      | 9F          | Spring - Down Valve                |
|      | Y           | Down Levelling Valve               |
| H    | H           | Manual Lowering - Self Closing     |
|      | HO          | Seal - Manual Lowering             |
| S    | SE          | Adjustment - Screw                 |
|      | SM          | Hexagonal                          |
|      | MS          | Grub Screw                         |
|      | SO          | O-Ring - Nipple                    |
|      | SZ          | Nipple                             |
|      | SF          | Spring                             |
| SK   | Piston      |                                    |
| A+B  | MM          | Nut - Solenoid                     |
|      | AD          | Collar - Solenoid                  |
|      | M           | Coil - Solenoid (indicate voltage) |
|      | AR          | Tube - Solenoid 'Up'               |
|      | MO          | O-Ring - Solenoid                  |
|      | AN          | Needle - 'Up'                      |
| C+D  | AF          | Spring - Solenoid 'Up'             |
|      | AH          | Seat Housing - 'Up'                |
|      | AS          | Seat - Solenoid 'Up'               |
|      | MM          | Nut - Solenoid                     |
|      | M           | Coil - Solenoid (indicate voltage) |
|      | DR          | Tube - Solenoid 'Down'             |
| C+D  | MO          | O-Ring - Solenoid                  |
|      | DF          | Spring - Solenoid 'Down'           |
|      | DN          | Needle - 'Down'                    |
|      | DK          | Core - Solenoid                    |
|      | DG          | Seat Housing with Screen-'Down'    |
|      | FD          | Filter Solenoid                    |
|      | DS          | Seat - Solenoid 'Down'             |

| No. | 3/4"       | O-Ring-Size | 1 1/2"     | 2 1/2" |
|-----|------------|-------------|------------|--------|
| FO  | 26x2P      | 47x2.5P     | 58x3P *    |        |
| EO  | 9x2P       | 9x2P        | 9x2P       |        |
| UO  | 26x2V      | 39.34x2.62V | 58x3V      |        |
| WO  | 5.28x1.78V | 5.28x1.78V  | 5.28x1.78V |        |
| VO  | 23x2.5V    | 42x3V       | 60x3V **   |        |
| 7O  | 5.28x1.78P | 9x2P        | 9x2P       |        |
| XO  | 13x2V      | 30x3V       | 47x3V      |        |
| HO  | 5.28x1.78V | 5.28x1.78V  | 5.28x1.78V |        |
| SO  | 5.28x1.78P | 5.28x1.78P  | 5.28x1.78P |        |
| MO  | 26x2P      | 26x2P       | 26x2P      |        |

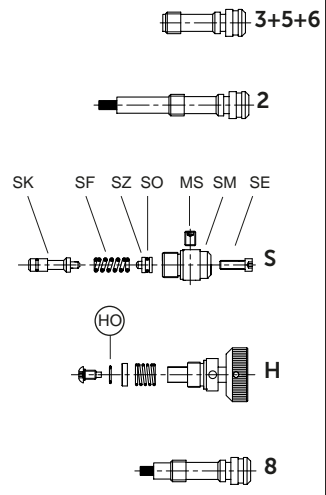
\* FO by 4F 2 1/2" is 67x2.5P  
 \*\* 90 Shore

O-ring: V = FKM - Viton  
 P = NBR - Perbunan

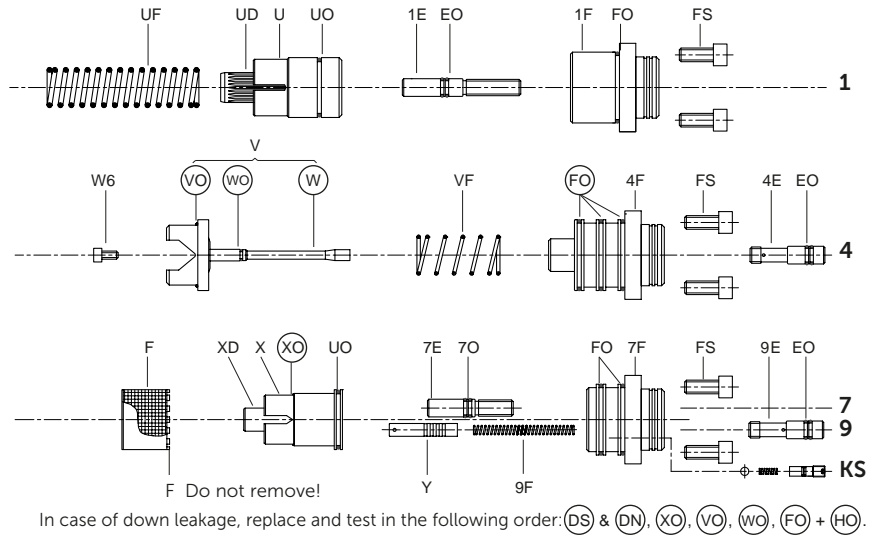
### Solenoid Valves



### Adjustments

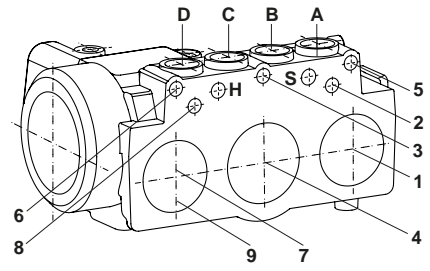
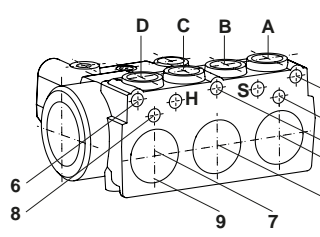
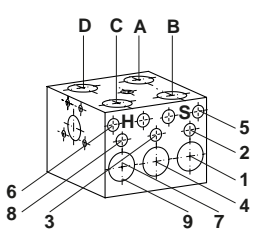


### Flow Valves

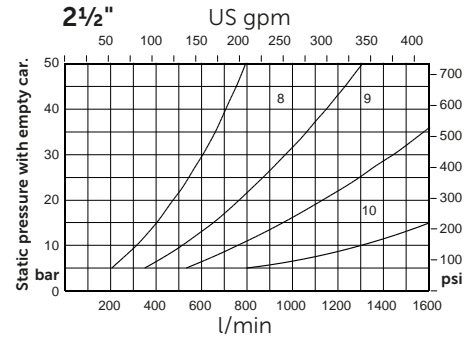
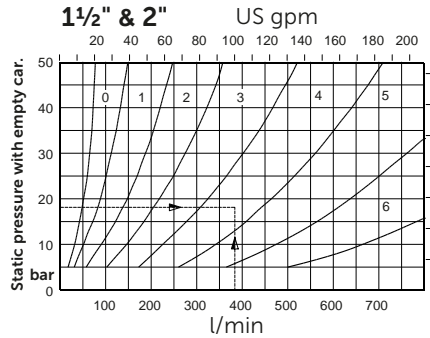
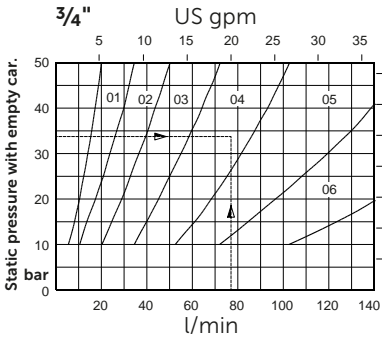


In case of down leakage, replace and test in the following order: (DS) & (DN), (XO), (VO), (WO), (FO) + (HO).

**⚠ Taper threads:** Do not exceed 8 turns of piping into the valve connections.



### Flow Guide Selection Charts for Down Direction



To order EV: Valve size (inch), valve type, state pump flow, empty car pressure (or flow guide size) and solenoid voltage.

**Example order:** 2"EV100, 380l/min, 18bar (empty), 110 AC or 2"EV100/4/110AC

The BLAIN EV4-vvuf program includes the widest range of vvuf solution offered to the elevator industry for high performance passenger elevators. Easy to install, EV4's are smooth, reliable and precise in operation throughout extreme load and temperature variations with inbuilt overload protection and different energy saving modes. The EV4 system uses the control of L1000H vvuf drive in the up travel, while down travel is managed by the EV4 valve itself. In this way, the EV4-vvuf solution offers the most cost-effective and energy-efficient solution.



### Description

Available port sizes are 3/4", 1 1/2", 2" and 2 1/2" pipe threads, depending on flow. EV4 eliminates high inrush currents and do not require wye-delta switching. According to customers' elevator data, valves are factory adjusted, ready for operation and very simple to readjust if desired. The L1000H YASKAWA drive combined with feedback systems that are designed to compensate elevator speed fluctuations regardless oil temperature and car load conditions.

Caution: The EV4 valve is to be used only together with YASKAWA L1000H inverter and not as standalone control valve. EV4 valves include the following features essential for efficient installation and trouble free service:



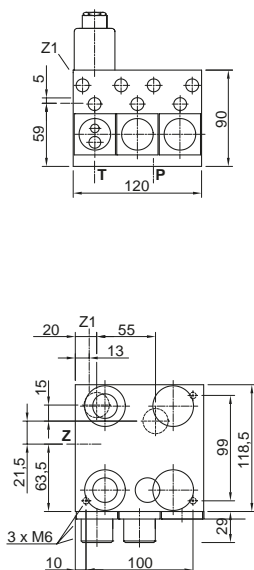
- Simple Responsive Adjustment
- Temperature and Pressure Compensations
- Pressure Gauge and Shut Off Cock
- Self Closing Manual Lowering
- Self Cleaning Pilot Line Filters

- Self Cleaning Main Line Filter (Z-T)
- Built-in Turbulence Suppressors
- 70 HRC Rockwell Hardened Bore Surfaces
- 100% Continuous Duty Solenoids
- Compact and aesthetic design

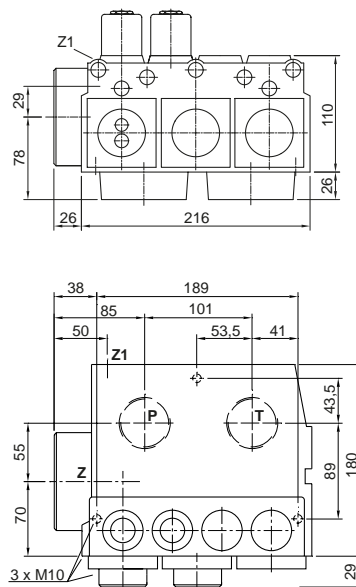
### Technical Data:

|                                |                | 3/4" EV4  | 1 1/2" & 2" EV4                           | 2 1/2" EV4           |
|--------------------------------|----------------|---|---|----------------------|
| <b>Flow Range:</b>             | l/min (US gpm) | 10-125 (2-33)   | 30-800 (8-212)                            | 500-1530 (130-405)   |
| <b>Pressure Range (valve):</b> | bar (psi)      | 8-70 (116-1015)   | 8-70 (116-1015)                           | 8-70 (116-1015)      |
| <b>Burst Pressure Z:</b>       | bar (psi)      | 575 (8340)  | 505 (7324)                                | 340 (4931)           |
| <b>Pressure Drop P-Z:</b>      | bar (psi)      | 6 (87) at 125 l/min   | 4 (58) at 800 l/min                       | 4 (58) at 1530 l/min |
| <b>Weight:</b>                 | kg (lbs)       | 5 (11)  | 10 (22)                                   | 14 (31)              |
| <b>Oil Viscosity:</b>          |                | 25-75 cSt. at 40°C (104°F).   |   |                      |
| <b>Solenoids AC:</b>           |                | 24 V/1.8 A, 42 V/1.0 A, 110 V/0.43 A, 230 V/0.18 A, 50/60 Hz.                           |   |                      |
| <b>Solenoids DC:</b>           |                | 12 V/2.0 A, 24 V/1.1 A, 42 V/0.5 A, 48 V/0.6 A, 80 V/0.3 A, 110 V/0.25 A, 196 V/0.14 A. |   |                      |
|                                |                |   | <b>Max. Oil Temperature:</b> 70°C (158°F) |                      |
|                                |                |   | <b>Insulation Class, AC and DC:</b> IP 68 |                      |

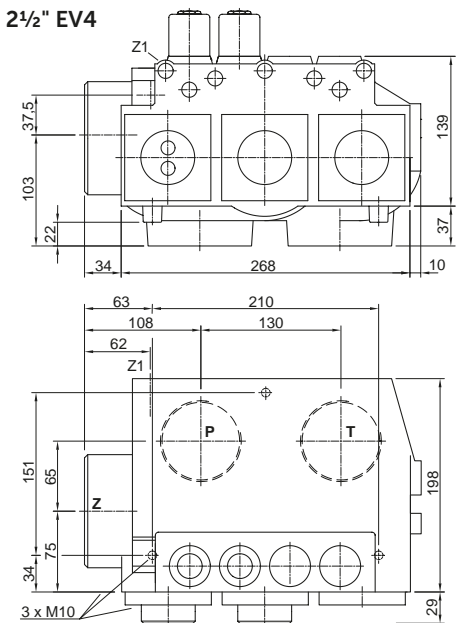
3/4" EV4



1 1/2" & 2" EV4



2 1/2" EV4



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 74078 Heilbronn  
 Germany

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 Fax +49 7131 282199  
 www.blain.de  
 info@blain.de



GmbH

Designer and Manufacturer of the highest quality control valves & safety components for hydraulic elevators



### Optional Equipment

|            |                          |           |                           |
|------------|--------------------------|-----------|---------------------------|
| <b>EN</b>  | Emergency Power Solenoid | <b>DH</b> | High Pressure Switch      |
| <b>CSA</b> | CSA Solenoids            | <b>DL</b> | Low Pressure Switch       |
| <b>KS</b>  | Slack Rope Valve         | <b>CX</b> | Pressure Compensated Down |
| <b>BV</b>  | Main Shut-Off Valve      | <b>MX</b> | Auxiliary Down            |
| <b>HP</b>  | Hand Pump                |           |                           |

### EV4

3/4"



1 1/2" & 2" EV4



2 1/2"



- Up** Up to 1 m/s (200 fpm). 3 Full Speeds and 1 Levelling Speed. Up Start, speeds, transition times and up stop are adjusted by inverter parameters.
- Down** Up to 1 m/s (200 fpm). 1 Full Speed and 1 Levelling Speed. All down functions are smooth and adjustable.

### Control Elements

- |                                       |                                  |
|---------------------------------------|----------------------------------|
| <b>C</b> Solenoid (Down Deceleration) | <b>U</b> By Pass Valve           |
| <b>D</b> Solenoid (Down Stop)         | <b>V</b> Check Valve             |
| <b>H</b> Manual Lowering              | <b>X</b> Full Speed Valve (Down) |
| <b>S</b> Relief Valve                 | <b>Y</b> Levelling Valve (Down)  |
|                                       | <b>F</b> Filter                  |

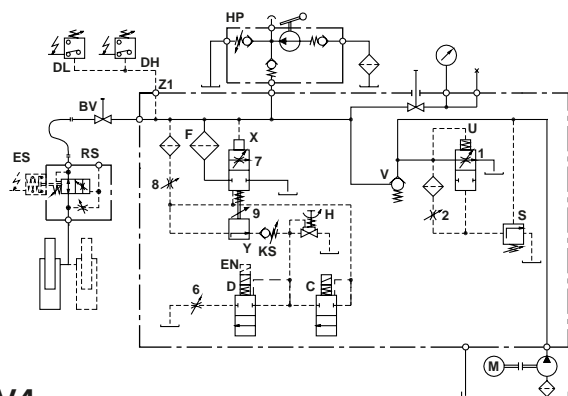
### Adjustments UP

- None  
(Fixed Orifice)

### Adjustments DOWN

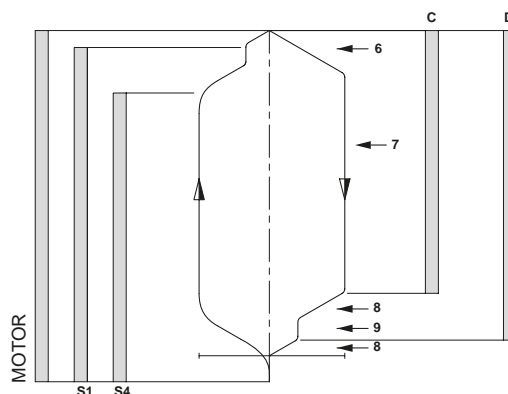
- 6** Down Acceleration  
**7** Down Full Speed  
**8** Down Deceleration  
**9** Down Levelling Speed

### Hydraulic Circuit



EV4

### Electrical Sequence



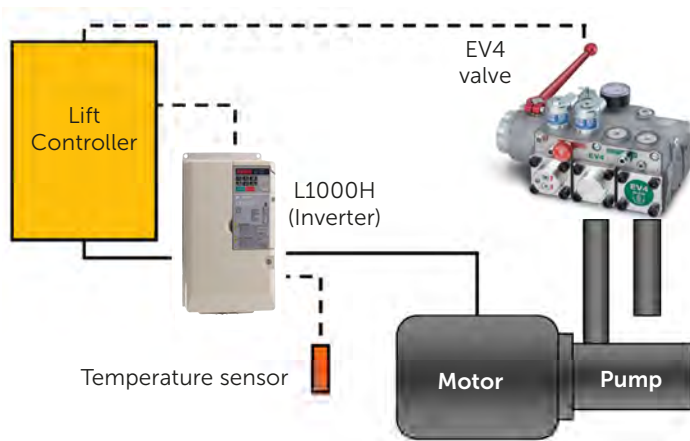
### UP direction control



**Caution:** Please refer to the detailed installation and set-up procedure of the EV4 handbook and L1000H technical manual.

The up direction control is done by the YASKAWA L1000H inverter. The inverter with the help of its software calculates the load in the car, read the current oil temperature through a temperature sensor and process oil and pump performance data in order to obtain motor speeds for the nominal, intermediate, inspection and levelling speeds.

After giving the oil type and elevator data a teach run with empty car is sufficient enough for the inverter to self-learn and configure itself fully automatic during the initial set-up.





**Warning:** Only qualified personnel should adjust or service the EV4 valve and the L1000H drive. Unauthorised manipulation may result in injury, loss of life or damage to equipment. Prior to servicing internal parts, ensure that the electrical controller is switched off, cylinder line is closed and residual pressure in the valve is reduced to zero.



## Adjustments DOWN

**Valves are already adjusted and tested.** Check electrical operation before changing valve settings. Test that the correct solenoid is energised, by removing nut and raising solenoid slightly to feel pull.

**Nominal Settings:** Adjustments **7 & 9** approx. level with flange face. Two turns in either direction may then be necessary. Adjustments **6 & 8** turn all the way 'in' (clockwise), then 1.5 turns 'out' (c-clockwise). One final turn in either direction may be necessary.

**6. Down Acceleration:** When solenoids **C** and **D** are energised, the car will accelerate downwards according to the setting of adjustment **6**. 'In' (clockwise) provides a softer down acceleration, 'out' (c-clockwise) a quicker acceleration.

**7. Down Speed:** With solenoids **C** and **D** energised as in **6** above, the full down speed of the car is according to the setting of adjustment **7**. 'In' (clockwise) provides a slower down speed, 'out' (c-clockwise) a faster down speed.

**8. Down Deceleration:** When solenoid **C** is de-energised whilst solenoid **D** remains energised, the car will decelerate according to the setting of adjustment **8**. 'In' (clockwise) provides a softer deceleration, 'out' (c-clockwise) a quicker deceleration.

**Attention: Do not close all the way in! Closing adjustment 8 completely (clockwise) may cause the car to fall on the buffers.**

**9. Down Levelling:** With solenoid **C** de-energised and solenoid **D** energised as in **8** above, the car will proceed at its down levelling speed according to the setting of adjustment **9**. 'In' (clockwise) provides a slower, 'out' (c-clockwise) a faster down levelling speed.

**Down Stop:** When solenoid **D** is de-energised with solenoid **C** remaining de-energised, the car will stop according to the setting of adjustment **8** and no further adjustment will be required.

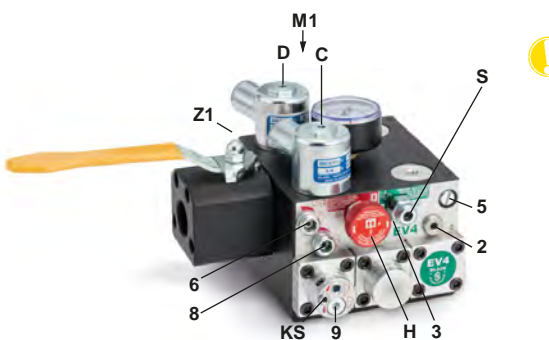
**KS Slack Rope Valve:** Both solenoids **C** and **D** must be de-energised beforehand! Loosen the small grub screw on the top of the **K** on the left hand side. The **KS** is adjusted with a 3 mm Allan Key by turning the screw **K** 'in' for higher pressure and 'out' for lower pressure. With **K** turned all the way 'in', then half a turn back out, the unloaded car should descend when Manual Lowering **H** is opened. Should the car not descend, **K** must be backed off until the car just begins to descend, then backed off a further half turn to ensure that with cold oil, the car can be lowered as required.

## Adjustments pressure relief valve

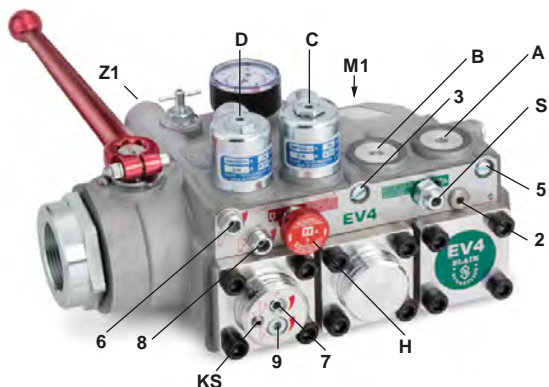
**Valves are already checked for functionality.** Check electrical operation before changing inverter settings. Please refer to the EV4 inverter manual for necessary parameter settings.

**S Relief Valve:** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting. After turning 'out', open manual lowering **H** for an instant.

**Important: When testing relief valve, close ball valve gradually.**



M1 Second pressure gauge connection, 1/2"  
Z1 Pressure switch connection, 1/4"



- Adjustments DOWN**
- 6 Down Acceleration
  - 7 Down Full Speed
  - 8 Down Deceleration
  - 9 Down Levelling Speed

**Plugs**

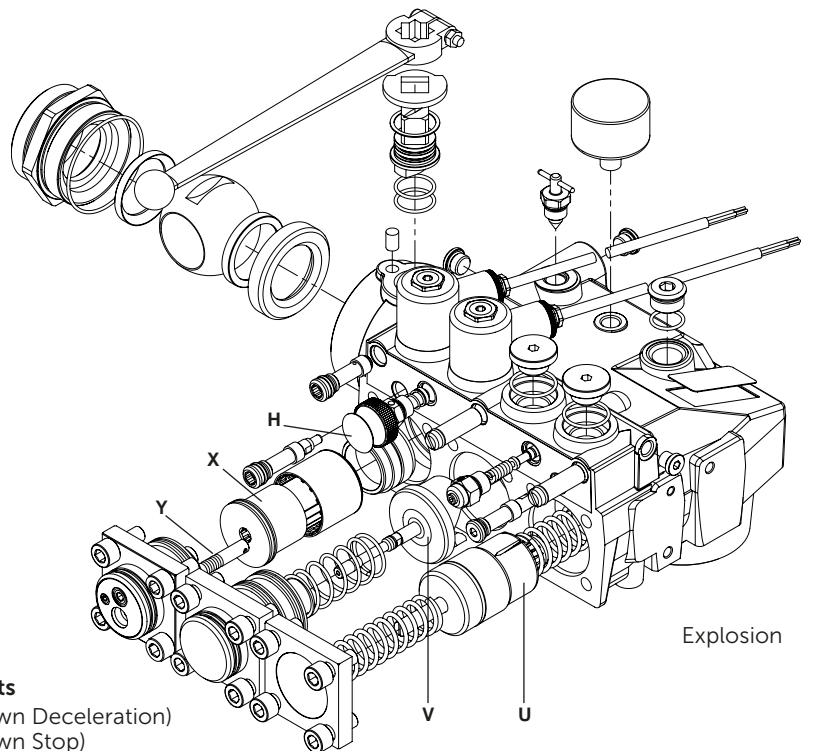
- 3
- 5
- A
- B

**Control Elements**

- C Solenoid (Down Deceleration)
- D Solenoid (Down Stop)
- H Manual Lowering
- S Relief Valve
- U By Pass Valve
- V Check Valve
- X Full Speed Valve (Down)
- Y Levelling Valve (Down)
- 2 Fix Orifice



**Important:** Length of 3/4" thread on pump connections should not be longer than 14 mm!





| Pos. No.               | Item                                 |
|------------------------|--------------------------------------|
| <b>1</b>               | FS Lock Screw - Flange               |
|                        | FO O-Ring - Flange                   |
|                        | 1F4 Flange - By Pass                 |
|                        | UO 0-Ring - By Pass Valve            |
|                        | U4 By Pass Valve                     |
|                        | UD Noise Suppressor                  |
|                        | UF1 Spring - By Pass                 |
|                        | UF2 Spring - By Pass                 |
| US Dead Stop           |                                      |
| <b>2</b>               | Fixed orifice                        |
| <b>3</b>               | Plug                                 |
| <b>4</b>               | 4F4 Flange - Check Valve             |
|                        | FO O-Ring - Flange                   |
|                        | VF Spring - Check Valve              |
|                        | VO Seal - Check Valve                |
|                        | V Check Valve                        |
|                        | W Up-Levelling Valve                 |
|                        | WO 0-Ring - Up Levelling Valve       |
| VO Seal - Check Valve  |                                      |
| W6 Screw - Check Valve |                                      |
| <b>5</b>               | Plug                                 |
| <b>6</b>               | Adjustment - Down Acceleration       |
| <b>7</b>               | 7F Flange - Down Valve               |
|                        | FO 0-Ring - Flange                   |
|                        | 7O 0-Ring - Adjustment               |
|                        | 7E Adjustment - Down Valve           |
|                        | UO 0-Ring - Down Valve               |
|                        | XO Seal - Down Valve                 |
|                        | X Down Valve                         |
| XD Noise Suppressor    |                                      |
| F Main Filter          |                                      |
| <b>8</b>               | Adjustment - Down Deceleration       |
| <b>9</b>               | EO 0-Ring - Adjustment               |
|                        | 9E Adjustment - Down Levelling       |
|                        | 9F Spring - Down Valve               |
|                        | Y Down Levelling Valve               |
|                        |                                      |
| <b>H</b>               | H Manual Lowering - Self Closing     |
|                        | HO Seal - Manual Lowering            |
| <b>S</b>               | SE Adjustment - Screw                |
|                        | SM Hexagonal                         |
|                        | MS Grub Screw                        |
|                        | SO 0-Ring - Nipple                   |
|                        | SZ Nipple                            |
|                        | SF Spring                            |
| SK Piston              |                                      |
| <b>C+D</b>             | MM Nut - Solenoid                    |
|                        | M Coil - Solenoid (indicate voltage) |
|                        | DR Tube - Solenoid 'Down'            |
|                        | MO 0-Ring - Solenoid                 |
|                        | DF Spring - Solenoid 'Down'          |
|                        | DN Needle - 'Down'                   |
|                        | DK Core - Solenoid                   |
|                        | DG Seat Housing with Screen-'Down'   |
|                        | FD Filter Solenoid                   |
|                        | DS Seat - Solenoid 'Down'            |

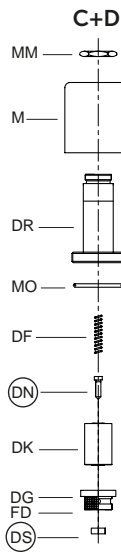
| No. | O-Ring-Size |             |            |
|-----|-------------|-------------|------------|
|     | 3/4"        | 1 1/2"      | 2 1/2"     |
| FO  | 26x2P       | 47x2.5P     | 58x3P *    |
| EO  | 9x2P        | 9x2P        | 9x2P       |
| UO  | 26x2V       | 39.34x2.62V | 58x3V      |
| WO  | 5.28x1.78V  | 5.28x1.78V  | 5.28x1.78V |
| VO  | 23x2,5V     | 42x3V       | 60x3V **   |
| 7O  | 5.28x1.78P  | 9x2P        | 9x2P       |
| XO  | 13x2V       | 30x3V       | 47x3V      |
| HO  | 5.28x1.78V  | 5.28x1.78V  | 5.28x1.78V |
| SO  | 5.28x1.78P  | 5.28x1.78P  | 5.28x1.78P |
| MO  | 26x2P       | 26x2P       | 26x2P      |

\* FO by 4F 2 1/2" is 67x2.5P  
 \*\* 90 Shore

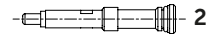
O-Ring: V = FKM - Viton  
 P = NBR - Perbunan

US is only for EV4 1 1/2" and above sizes!

## Solenoid Valves



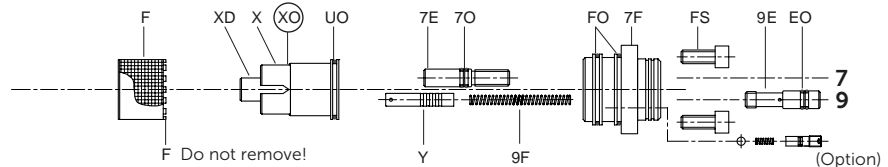
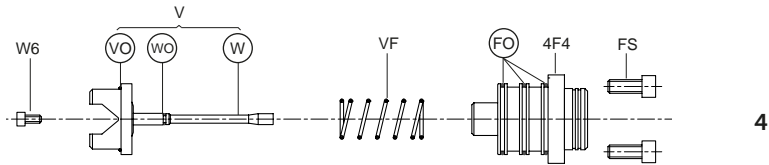
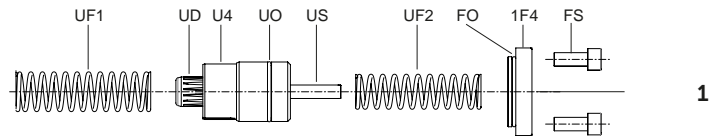
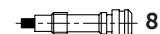
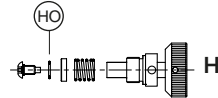
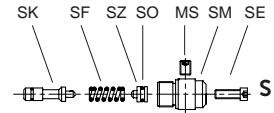
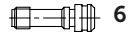
## Fix orifice



## Plug

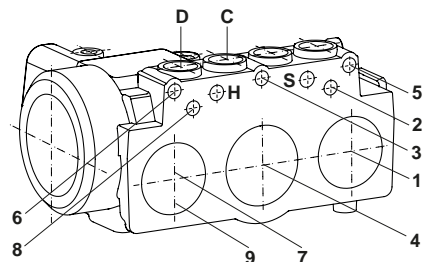
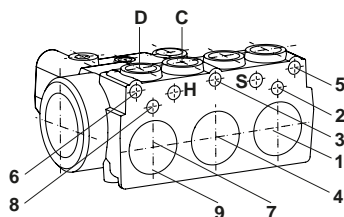
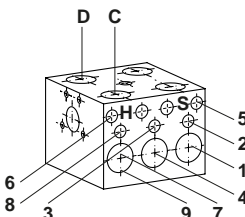


## Adjustments

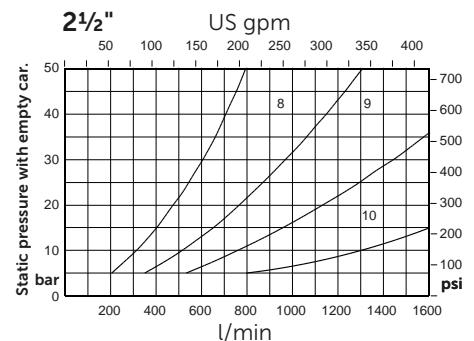
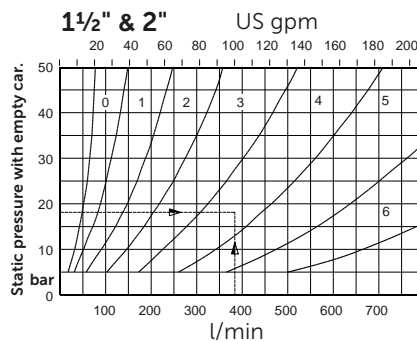
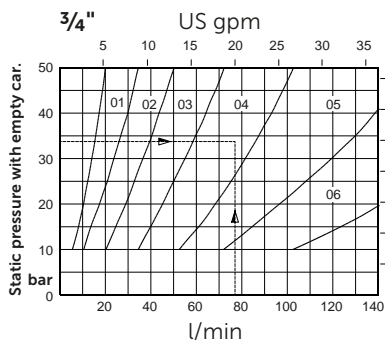


In case of down leakage, replace and test in the following order: (DS) & (DN), (XO), (VO), (WO), (FO) + (HO).

**! Taper threads:** Do not exceed 8 turns of piping into the valve connections.



## Flow Guide Selection Charts for Down Direction

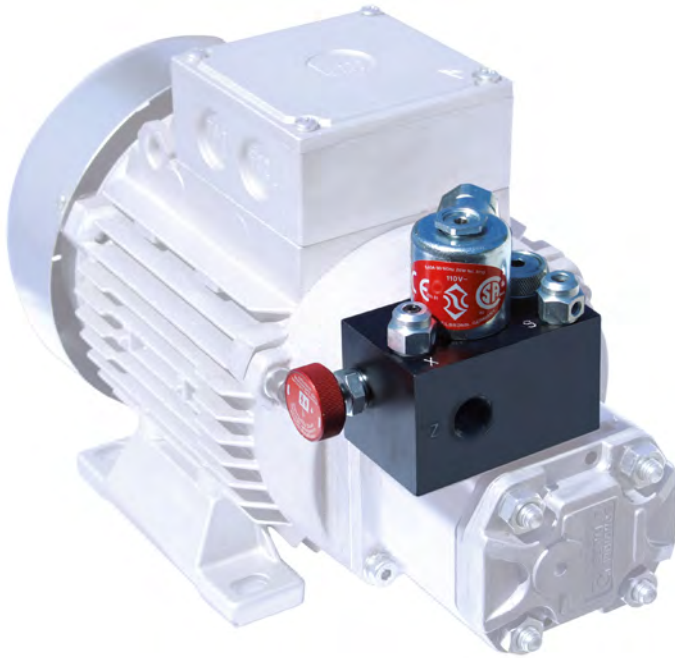


To order EV4: Size (inch), state pump flow, empty car pressure (or flow guide size) and solenoid voltage.

**Example order:** 1 1/2"EV4, 380l/min, 18bar (empty), 110AC or 1 1/2"EV4/4/110AC

**For hydraulic car-parking ports and material lifting platforms**

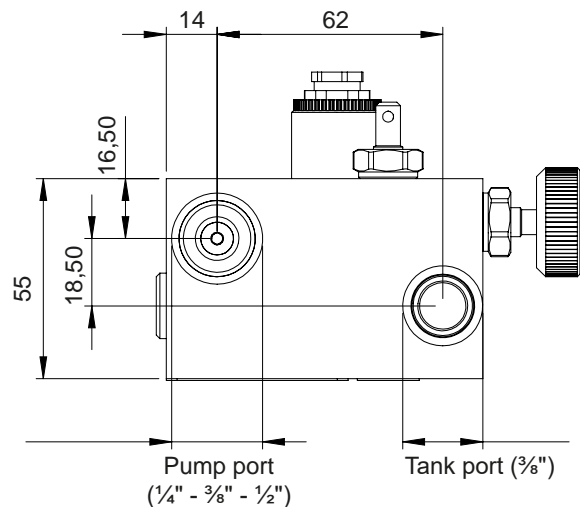
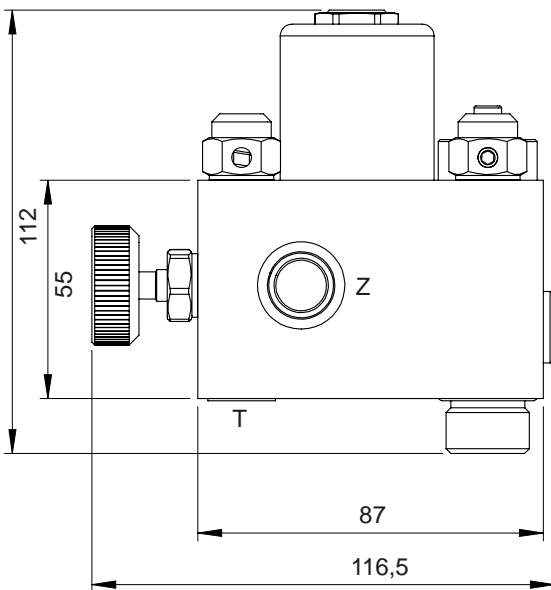
The Blain car parking platform valve can be used in car parking applications where the platform needs to be raised above the ground to accommodate another car below the port. Alternatively this valve is also ideal for lifting material, cargo and suitable for dumb-waiters and goods lifts. The valve offers single up speed and adjustable down speed.



- Flow Range:** 1-24 l/min (0.3 – 6.3 US gpm)
- Oil Viscosity:** 25-60 cSt. at 40°C (104°F)
- Solenoids AC:** 24 V/1.8 A, 42 V/1.0 A, 110 V/0.5 A, 230 V/0.18 A, 50/60 Hz
- Solenoids DC:** 12 V/2.1 A, 24 V/1.1 A, 42 V/0.6 A, 80 V/0.3 A, 125 V/0.25 A, 196 V/0.14 A

- Ports:** P Pump, Z Cylinder and T Tank
- Pressure Range:** 3-130 bar (44-1885 psi)
- Burst Pressure:** 600 bar (8702 psi)
- Insulation Class, AC and DC:** IP 68

Check valve, pressure relief valve and manual lowering are standard options which are integrated in the GV valve. Additionally a shut off valve is also provided to shut the flow of oil from the pump to cylinder and vice-versa. The valve offers a standard 3/8" cylinder and tank connection, whereas the pump connection is available in sizes 1/4", 3/8" and 1/2".



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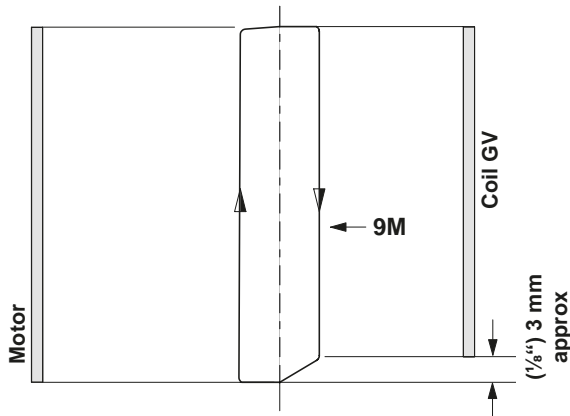


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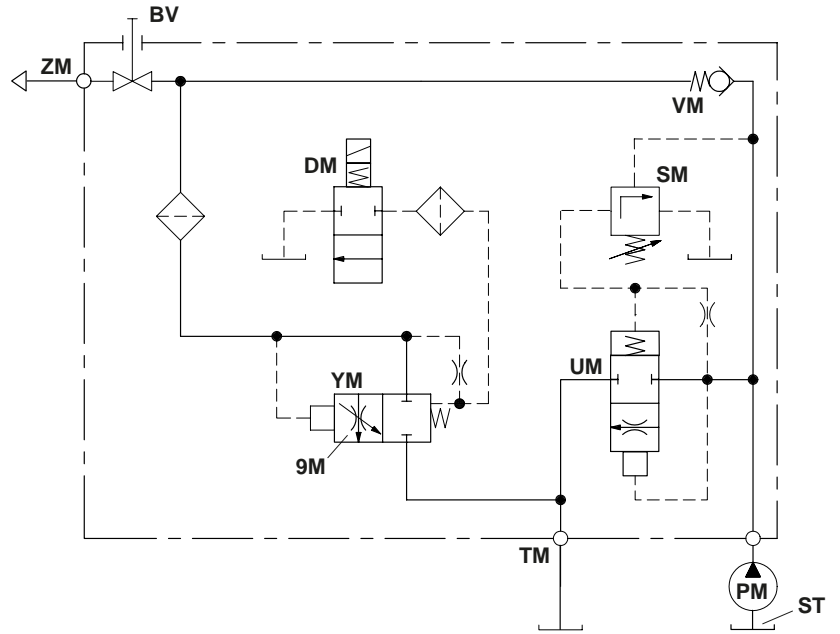
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### Electrical Sequence



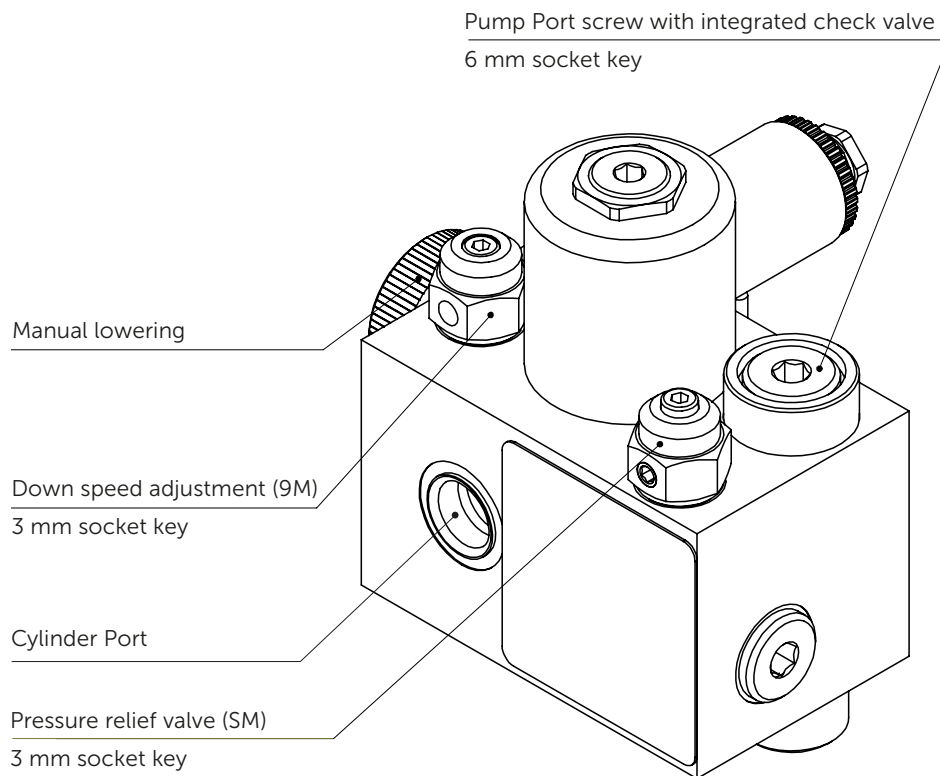
### Hydraulic Circuit



- DM** Solenoid Down
- 9M** Down Speed Adjustment
- SM** Pressure Relief Valve Adjustment
- VM** Check Valve

- BV** Shut Off Valve
- ST** Suction Tube
- ZM** Cylinder Connection
- TM** Return Connection

- UM** Pilot Operated Relief Valve
- YM** Pilot Operated Down Valve
- PM** Pump Motor



### GV Adjustments

**Up Speed** is determined by the pump output and the effective diameter of the cylinder system.

**SM Relief Valve.** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting.

**9M Down Speed.** When solenoid **DM** is energised, the car will travel downwards at a speed according to the setting of adjustment **9M**, (3 mm socket key). Turning 'in' (clockwise) provides a slower, turning 'out' (c-clockwise), a faster down speed.

### While ordering

Please specify pump flow, solenoid coil voltage and maximum operating pressure.



# R10 Elevator Rupture Valve Instruction Manual



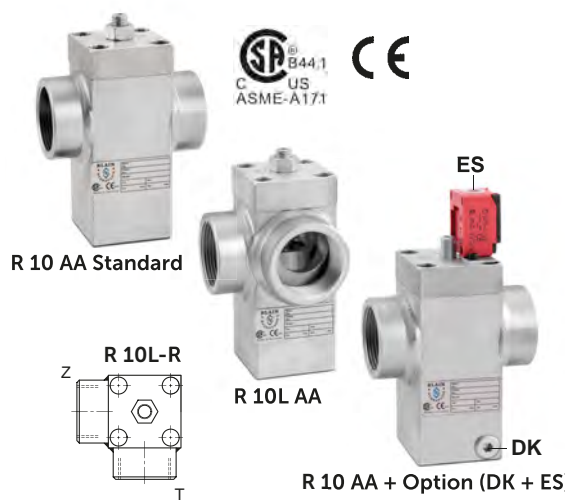
# Aufzugs-Rohrbruchventil Bedienungsanleitung



(GB)

The rupture valve **R10** can be mounted in any position directly onto the cylinder inlet connection **Z**. The 'T' port is connected to the Tank. Fitted incorrectly the R10 valve will not function. The cylinder side of the R10 can be identified by locating a small orifice behind the inside screw thread.

In the event of failure in the main cylinder line or where the down speed exceeds allowable limits, the R10 valve closes, bringing the car to a smooth stop.



(D)

Das Rohrbruchventil **R10** wird direkt am Zylinder montiert. Es ist sicherzustellen, dass die mit **Z** markierte Seite zum Zylinder, hier befindet sich eine eingeschraubte Düse im Anschluss, und die mit **T** zum Tank zeigt. Ein falscher Einbau verhindert das Schließen des R10. Eine Einbaulage ist nicht zu beachten.

Sinkt der Aufzug wegen eines Rohrbruchs in der Zylinderleitung oder sonstiger Übergeschwindigkeit ab, wird der Aufzug vom R10 durch gedämpftes Schließen zum Stillstand gebracht.

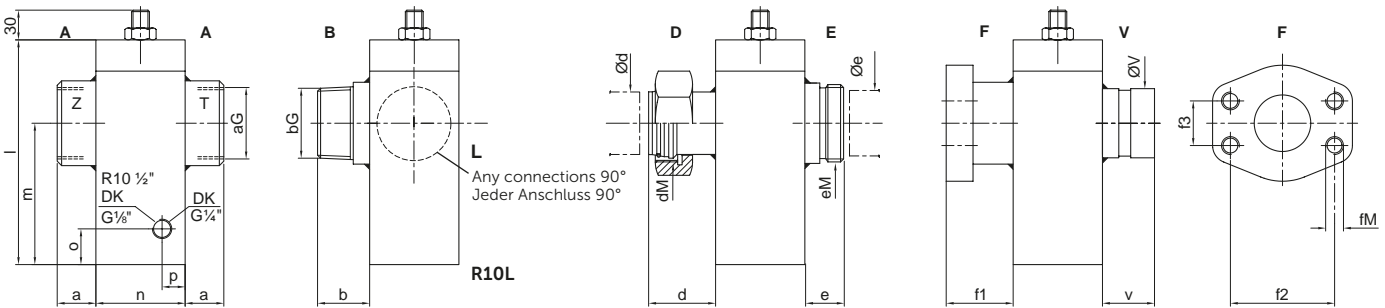


**Warning:** Only qualified personnel should service hydraulic valves. Unauthorised manipulation may result in injury or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off and residual pressure in the system is reduced to zero.



**Warnung:** Verletzungsgefahr! Neueinstellungen und Wartung dürfen nur durch qualifiziertes Aufzugspersonal durchgeführt werden. Vor der Wartung innerer Teile ist sicherzustellen, dass der elektrische Strom des Aufzuges abgeschaltet und der Druck im Ventil auf null reduziert worden ist.

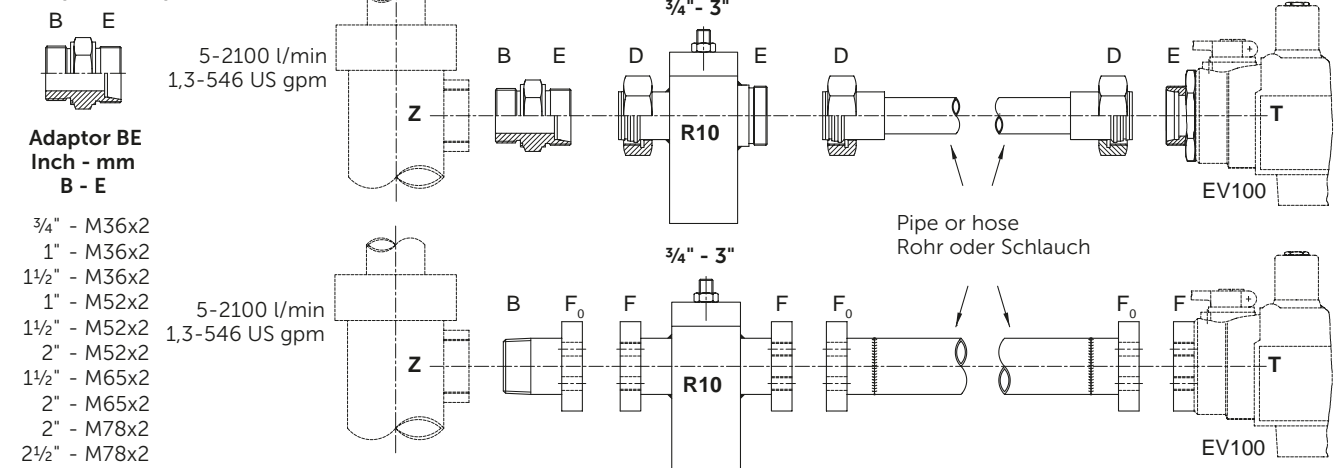
### Alternative connections • Alternative Anschlüsse



### Recommended size • Empfohlene Größe

| R10 Qc      |            | R10 P max |      | A        |    | B        |    | L 90°    |          | D  |    | E        |    | F SAE |    |      |    | V Victaulic |               | l           | m    | n   | o  | p   | DK Tube | kg   |    |    |    |     |
|-------------|------------|-----------|------|----------|----|----------|----|----------|----------|----|----|----------|----|-------|----|------|----|-------------|---------------|-------------|------|-----|----|-----|---------|------|----|----|----|-----|
| l/min       | US gpm     | bar       | psi  | G.o. NPT | a  | G.o. NPT | b  | Optional | dM       | Ød | d  | eM       | Øe | DN    | fM | f1   | f2 | f3          | ØV in / ØV mm | V in / V mm |      |     |    |     | d       | (AA) |    |    |    |     |
| 4 - 90      | 1,0 - 23,8 | 100       | 1450 | ½"       | 18 |          |    |          | M 52 x 2 | 42 | 44 | M 36 x 2 | 28 | 26    | 19 | M 10 | 36 | 47,6        | 22,2          | 1,05        | 26,7 | 1,5 | 38 | 88  | 53      | 40   | 9  | 11 | 6  | 0,9 |
| 5 - 100     | 1,3 - 26   | 100       | 1450 | ¾"       | 18 | ¾"       | 32 |          | M 52 x 2 | 42 | 44 | M 36 x 2 | 28 | 26    | 25 | M 10 | 38 | 52,4        | 26,2          | 1,31        | 33,4 | 1,5 | 38 | 105 | 62      | 50   | 11 | 11 | 6  | 1,6 |
| 50 - 175    | 13 - 46    | 100       | 1450 | 1"       | 21 | 1"       | 32 |          | M 52 x 2 | 42 | 44 | M 52 x 2 | 42 | 26    | 38 | M 12 | 44 | 70          | 35,7          | 1,90        | 48,3 | 1,5 | 38 | 105 | 62      | 50   | 11 | 11 | 6  | 1,6 |
| 100 - 425   | 26 - 112   | 100       | 1450 | 1½"      | 26 | 1½"      | 35 |          | M 52 x 2 | 42 | 44 | M 65 x 2 | 56 | 40    | 51 | M 12 | 45 | 77,8        | 42,9          | 2,37        | 60,3 | 1,5 | 38 | 143 | 94      | 60   | 11 | 11 | 6  | 3,4 |
| 250 - 800   | 66 - 211   | 100       | 1450 | 2"       | 28 | 2"       | 38 |          | M 65 x 2 | 56 | 44 | M 65 x 2 | 56 | 40    | 64 | M 12 | 50 | 89          | 50,8          | 2,87        | 73,0 | 1,5 | 38 | 167 | 108     | 80   | 20 | 17 | 8  | 7   |
| 700 - 1250  | 185 - 330  | 80        | 1160 | 2½"      | 30 | 2½"      | 45 |          | M 78 x 2 | 63 | 50 | M 78 x 2 | 63 | 40    | 64 | M 12 | 50 | 89          | 50,8          | 2,87        | 73,0 | 1,5 | 38 | 196 | 121     | 100  | 19 | 18 | 8  | 13  |
| 1200 - 2100 | 317 - 554  | 60        | 870  | 3"       | 34 | 3"       | 45 |          | M 78 x 2 | 63 | 50 | M 78 x 2 | 63 | 40    | 76 | M 16 | 50 | 106,4       | 62            | 3,50        | 88,9 | 1,5 | 38 | 240 | 149     | 120  | 22 | 21 | 10 | 21  |

### Examples • Beispiele



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**Warning:** Only qualified personnel should service hydraulic valves. Unauthorised manipulation may result in injury or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off and residual pressure in the system is reduced to zero.

## Operation

**Adjustment 1 'Closing flow' Qc.** By screwing inwards, the valve closes with increased oil flow. Screwing outwards, the valve closes with decreased oil flow. Loosening the lock nut (on the flange) before and tightened afterwards should not be forgotten in order to prevent any thread damage inside the flange. The Deceleration is less than 1g and for safety reasons this is a non-adjustable built-in feature of the R10 valve. Adjustment should only be carried out when the R10 has not been triggered (active state). The rupture valve reopens through an 'Up' command or with the use of a hand pump (if fitted) if it has closed.

**2 'Lowering Speed' (optional).** By screwing inwards, the lowering speed is increased.

## Service and Repair

Serviceing is not necessary on the R10 valve. Inspection for leakage is recommended at least once a year. Should external leakage be discovered, the O-rings on the screw of Adjustment 1 and between the flange and R10 body must be changed. If internal leakage is detected, then the complete R10 valve must be changed. For doing that the lift must be lowered up to a suitable position, secured and the oil removed from the system.

## Testing

Testing the R10 must be tested under payload conditions to ensure closing of the valve between nominal speed plus 0.3 m/s (60 fpm). When the down flow is approximately equal to the adjusted closing flow, the R10 will take several seconds to close. When the down flow is in much excess of the adjusted closing flow, the R10 will close in 1-2 seconds.

## Option

Option 2. For evacuation purpose, the adjustment '2' of the activated R10 can be turned slowly inside to lower the cabin to the bottom floor.

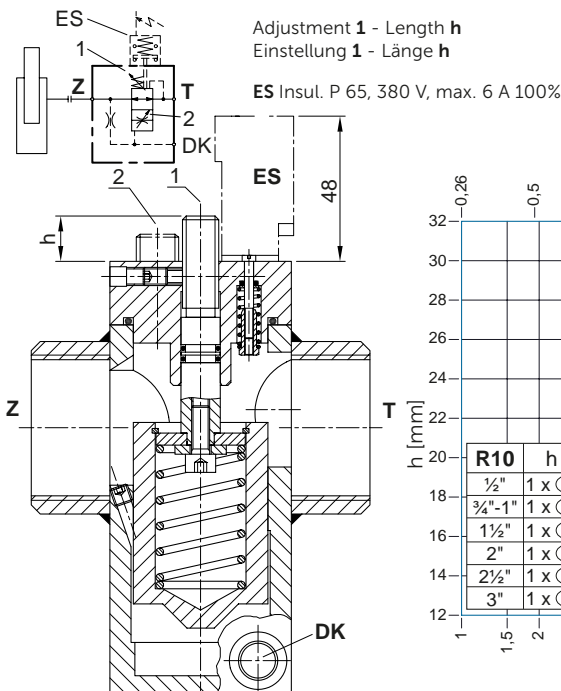
## DK

For a multiple cylinder system, the connecting of pilot ports 'DK' ensures that all R10 valves close almost simultaneously.

Please refer the table 'Recommended Size' in column 'DK Tube' for selecting the inside connecting diameters between the various R10 for different valve sizes. This connection is pressurised and should only be serviced after the line has been de-pressurised.

## ES

The rupture valve can be fitted with an electrical limit switch 'ES' which is actuated when the valve closes and serves to initiate a signal to the Lift Controller to either indicate a warning signal or to shut down the elevator.



(D)



**Warnung:** Verletzungsgefahr! Neueinstellungen und Wartung dürfen nur durch qualifiziertes Aufzugspersonal durchgeführt werden. Vor der Wartung innerer Teile ist sicherzustellen, dass der elektrische Strom des Aufzuges abgeschaltet und der Druck im Ventil auf null reduziert worden ist.

## Einstellungen

Das Hineindreihen der Stellschraube 1 bewirkt eine größere Schließmenge Qc, das Herausdrehen eine geringere. Die Kontermutter ist vorher zu lösen und anschließend wieder zu befestigen. Löst das R10 aus und schließt den Kolben, ist die Abbremsung weniger als 1 g und aus Sicherheitsgründen nicht verstellbar. Das Nachstellen der Stellschraube ist nur bei nicht aktivierten R10 durchzuführen. Durch eine Hubfahrt bzw. das Betätigen einer Handpumpe erfolgt ein Druckausgleich zwischen Zylinder- und Tank-Anschluss des R10 und es öffnet sich selbsttätig.

Bei geschlossenem R10 erlaubt die optionale Absenk-Einstellung 2 ein kontrolliertes Absinken des Aufzuges. Hineindreihen bewirkt eine schnellere Absenkgeschwindigkeit; heraus eine langsamere.

## Wartung und Reparatur

Eine Wartung des R10 ist nicht notwendig. Inspektionen zur Leckage sind in regelmäßigen Intervallen, mindestens 1x pro Jahr, durchzuführen. Bei einer festgestellten äußeren Undichtheit sind die O-Ringe am Deckel bzw. die der Stellschraube zu wechseln. Bei innerer Undichtheit muss das R10-Ventil getauscht werden. Dazu ist der Aufzug jeweils aufzuhängen und die Zylinderleitung zu entleeren.

## Prüfung

Zur Vergewisserung, dass sich das R10 Ventil zwischen der Nenngeschwindigkeit und 0,3 m/s über Nenngeschwindigkeit schließt, wird es üblicherweise mit Last geprüft. Entspricht der Durchfluss abwärts nur ungefähr der Schließmenge, schließt das R10 erst nach einigen Sekunden. Ist der Durchfluss abwärts aber weit mehr als die eingestellte Schließmenge, schließt es bereits in 1-2 Sekunden.

## Optionen

Option 2. Zur Evakuierung von Personen kann im geschlossene Zustand das R10 Ventil mittels Einstellung 2 so eingestellt werden, dass der Aufzug langsam in die unterste Haltestelle absinkt.

## DK

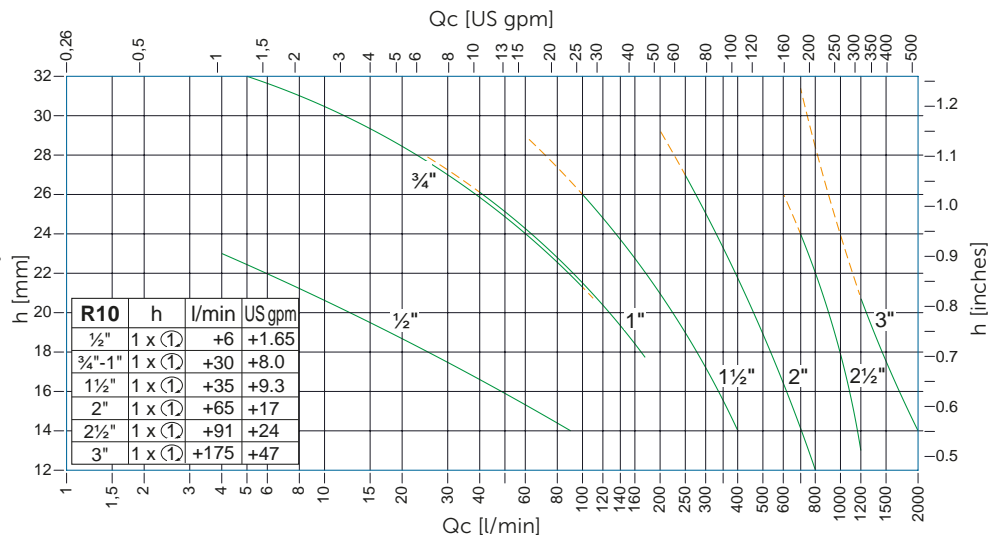
Bei Aufzügen mit mehreren parallel wirkenden Hebern sichert eine Steuerleitungsverbindung zwischen den Anschlüssen DK das fast gleichzeitige Schließen dieser Rohrbruch-Ventile. Die notwendigen Innen-Ø der Verbindungsleitung werden in der Spalte 'DK Tube' der Tabelle dargestellt. Diese Steuerleitung steht unter Druck. Wartungsarbeiten an dieser sind nur im drucklos Zustand durchzuführen.

## ES

Ein auf dem Deckel montierter elektrischer Endschalter ES wechselt beim Schließen des R10 die Schalterstellung. Diese kann zur weiteren Signalverarbeitung im Schaltschrank genutzt werden, um so ein Warnsignal auszulösen oder den Aufzug abzuschalten.

|     | Range      | Bereich     |
|-----|------------|-------------|
| --- | Adjustable | Einstellbar |
| —   | Permitted* | Zulässig*   |

\*AR 2014/33/EU





# User Manual - L10 Pressure Lock Valve (UCM/A3 Valve)

Certified by TÜV SÜD Germany



1/2"



3/4"



1 1/2"



2"



2 1/2"



**Warning:** Only qualified personnel should adjust or service valves. Unauthorised manipulation may result in injury, loss of life or damage to equipment.

Prior to servicing internal parts, ensure that the electrical power is switched off, ball valve is closed and residual pressure in the valve is reduced to zero. Very high pressure spikes could result in deformation and oil splashing, this could cause serious injuries.

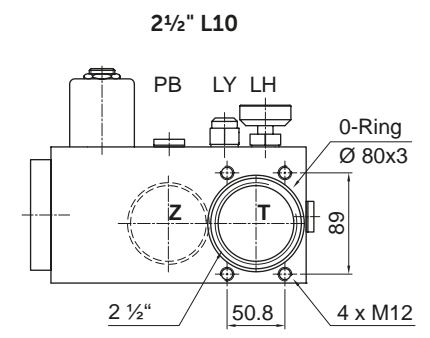
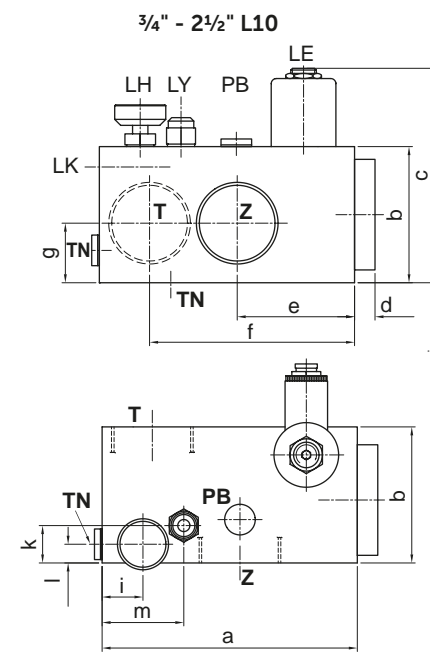
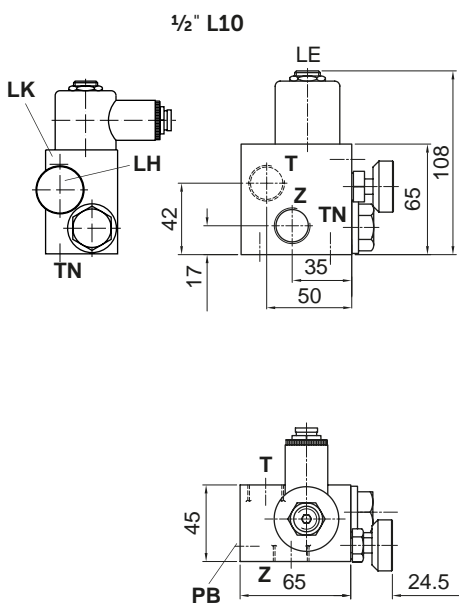
**L10 Description:** The L10 Pressure Lock Valve is a solenoid operated check valve designed for hydraulic elevators and includes a self closing manual lowering valve. Its purpose is to allow free flow of oil from the pump unit to the cylinder for upward travel and to prevent flow in the reverse direction from the cylinder to pump until an electrical signal is given to the solenoid. The L10 can be mounted in any position without causing any operational problems.

Installed in the main cylinder line directly adjacent to the main elevator control valve, the L10 can be employed as a safety back up valve to the down system of the main control valve to prevent unwanted down movement of the elevator should an electrical or mechanical malfunction occur in the main control valve (UCM case).

Another application of the L10 is to reduce the amount of bounce in a hydraulic elevator system due to the compressibility factor of oil between the cylinder and the control valve, by mounting the L10 directly onto the cylinder connection.

A Slack Rope Valve LK for roped elevators (e.g. 2:1 indirect transmission) is optional. It prevents the slack rope condition caused by the lowering of the ram when the car is suspended in the safeties or resting on the buffers.

| Technical Data:                                      | 1/2" L10   | 3/4" L10 | 1 1/2" L10 | 2" L10 | 2 1/2" L10 |
|--|------------|----------|------------|--------|------------|
| Flow Range max.:                                     | l/min 80   | 125      | 400        | 800    | 1400       |
| Operating Pressure min./max.:                        | bar 10-100 | 10-100   | 10-100     | 10-80  | 10-70      |
| Permitted operating pressure according AR 2014/33/EU | bar 10-100 | 10-100   | 10-59      | 12-59  | 10-59      |
| Burst Pressure:                                      | bar 500    | 500      | 500        | 450    | 365        |
| Tank Connection for LH                               | TN 1/4"    | 1/4"     | 1/2"       | 1/2"   | 1/2"       |
| Weight:  | kg 0,8     | 1,4      | 2,5        | 4,2    | 7,0        |
| PB Cylinder pressure port:                           | G 1/4"     | 1/4"     | 1/4"       | 1/4"   | 1/4"       |



| L10 | 3/4" | 1 1/2" | 2"  | 2 1/2" |
|-----|------|--------|-----|--------|
| a   | 110  | 150    | 175 | 210    |
| b   | 65   | 80     | 100 | 120    |
| c   | 108  | 134    | 154 | 174    |
| d   | 8    | 12     | 12  | 16     |
| e   | 60   | 69     | 75  | 89     |
| f   | 92   | 120    | 136 | 160    |
| g   | 31   | 35     | 45  | 55     |

**Attention:** For manual lowering connect port TN with tank.

T→Z Free Flow. Solenoid LE not energized.  
Z→T Flow only when Solenoid LE energized.

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**Rest Position:** When L10 is at stand-by, the solenoid **LE** de-energized and the main flow guide **LV** closed, preventing flow from cylinder to tank.

**Up Travel:** During up travel with the pump running, oil flows through port **T**, through the flow guide **LV** and out through port **Z** to the main cylinder. Solenoid **LE** is not energized.

**Down Travel:** For the car to have a down travel, the L10 should be energized approximately 0.5s earlier than the main control valve (e.g. EV100). This enables the oil to escape from the pilot chamber and allows the main piston **LV** to open. Else, the pressure between the L10 and the control valve connecting line drops considerably and to make the elevator operational, the connecting line needs to be re-pressurized again. This can be done by starting the elevator for a short time in the up direction or by pumping oil using a hand pump. Re-pressurizing may also be needed if the main control valve has an internal leakage. Opening of the **LV** allows the flow of oil from the cylinder to the tank (from **Z** to **T**) via the L10 and the main control valve.

The solenoid **LE** on the L10 valve is de-energized after the down solenoid of the main control valve (e.g. solenoid D of EV100). In this way, the piston **LV** in L10 and the down piston **X** in the main control valve closes completely.

**Pressure drop:** The pressure loss of the L10 valve depends on the size of the valve and the flow rate. The size and type of connectors used also influences the pressure losses. The pressure loss of the L10 valve should be taken into account while the main control valve empty car pressure is calculated.

**Emergency down:** The emergency manual lowering **LH** on the L10 is to be operated to bring the car down in emergency. The down speed of the car is determined by the setting of **LY**. As the **LH** is open, oil from the cylinder flows back to the tank through a return tank-line attached to the tank port **TN**. The return tank-line should not be smaller in size than the tank port **TN**, else the emergency manual lowering may not function properly.

The slack rope valve **LK** prevents the sinking of the RAM when the manual lowering **LH** is operated in a 2:1 roped elevator to prevent a tangled rope condition.

**Air-bleed:** After connecting the L10 valve or right after servicing the L10 valve needs to air-bleed to ensure its functionality. It is sufficient to operate the emergency lowering valve or loosening the solenoid tube slightly until oil is visible and tightening it again.

### Adjustments

**Manual Down Speed **LY**** (3/4", 1 1/2", 2" and 2 1/2" valves): 'In' (clockwise) provides a slower, 'out' a faster down lowering speed.

**Slack Rope Valve **LK**:** The **LK** is adjusted with a 3 mm Allan Key by turning the screw **LK** 'in' for higher pressure and 'out' for lower pressure. With **LK** turned all the way 'in', then half a turn back out, the unloaded car should descend when the **LE** solenoid is energized. Should the car not descend, **LK** must be backed off until the car just begins to descend, then backed off a further half turn to ensure that with cold oil, the car can be lowered as required.

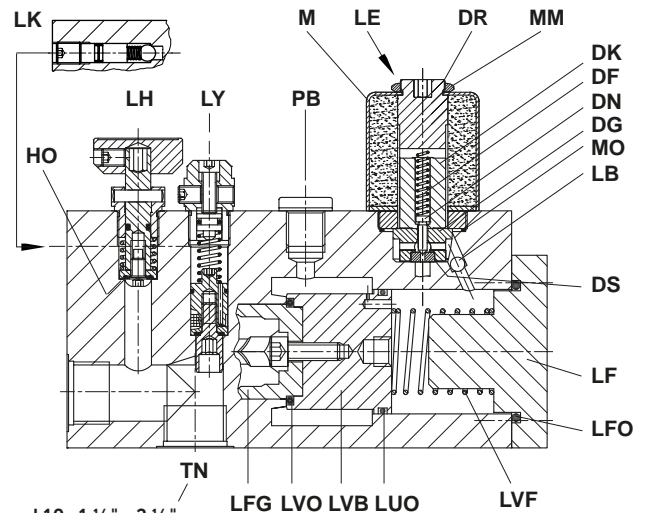
### Functional test

In order to check the functionality of the L10 pressure lock valve, the solenoid **LE** can be de-energized during down travel. Alternatively the L10 can also be tested by unscrewing the retaining nut **MM** and manually lifting the solenoid coil **M**.

**Caution!** Once the coil **M** is removed from the solenoid tube **DR**, the energized coil will begin to overheat after about 10 seconds, holding it out longer may result in burning of solenoid coil.

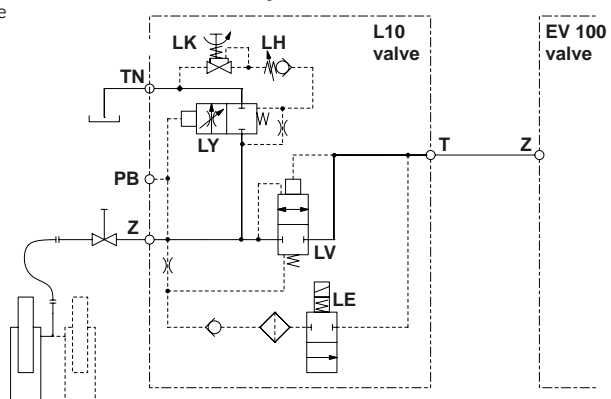
The test may result in pressure drop in the connecting line between L10 and the control valve. In order to make the elevator operational, the connecting line needs to be pressurized again. This can be done by using the handpump to move the cabin over a small distance in up direction. Pressurising the line might also be necessary in cases where the pressure loss between the L10 and control valve is high for e.g. due to internal leakage.

| Status of lift                        | Power supply to coil of L10                       |
|---------------------------------------|---|
| Up travel and releveling              | power off   |
| Down travel and releveling            | power on  |
| Stop with door closed                 | power can be switched off to save standby power   |
| Unintended up travel with open doors  | motor off once the movement sensor gets triggered |
| Unintended down travel with open door | power off once the movement sensor gets triggered |
| Emergency lowering                    | power on  |
| Emergency manual lowering             | manual actuation                                  |
| Hand pump operation                   | power off   |



**L10 1 1/2" - 2 1/2"**  
Do not reduce G 1/2" -  
Use 1/2" tubing  
(18 x 1,5)

### Hydraulic Circuit



| No. | Parts List                       |
|-----|----------------------------------|
| LF  | Flange                           |
| LFO | O-Ring- Flange                   |
| LB  | Ball                             |
| LVF | Spring - Flow Guide              |
| LFG | Flow Guide                       |
| LVO | Seal - Flow Guide                |
| LVB | Body - Flow Guide                |
| LUO | O-Ring - Flow Guide              |
| LH  | Manual Down - Self Closing       |
| LY  | Manual Down Speed Adjuster       |
| HO  | Seal - Manual Low. (5.28x1.78)   |
| MM  | Nut Solenoid                     |
| M   | Coil Solenoid (indicate voltage) |
| DR  | Tube - Solenoid                  |
| MO  | O-Ring Solenoid                  |
| DF  | Spring Solenoid                  |
| DN  | Needle Solenoid                  |
| DK  | Core Solenoid                    |
| DG  | Seat Housing (with screen)       |
| FD  | Filter Solenoid                  |
| DS  | Seat Solenoid                    |

### Maintenance

Maintenance of the L10 is not necessary. Inspection of internal leakage should be done in regular intervals, at least once a year. If internal leakage has been detected, check the parts **DN**, **DS** and **FD** of the Solenoid **LE** first. Then inspect the O-rings of **LV**, **LY** and **LH**. The pressure of the valve has to be released before.

### Control Elements

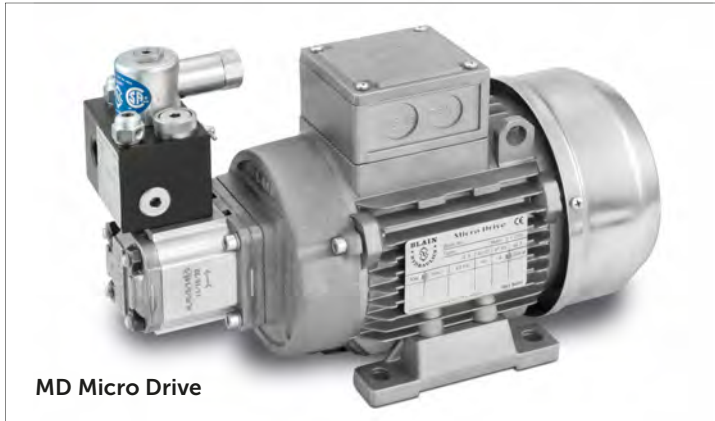
- LV** Check Valve
- LH** Manual Lowering
- LK** Slack Rope Valve (option)
- LE** Solenoid
- PB** Pressure Gauge (cylinder pressure)
- LY** Manual Down Speed Adjust. (not with 1/2" L10)

### Connections

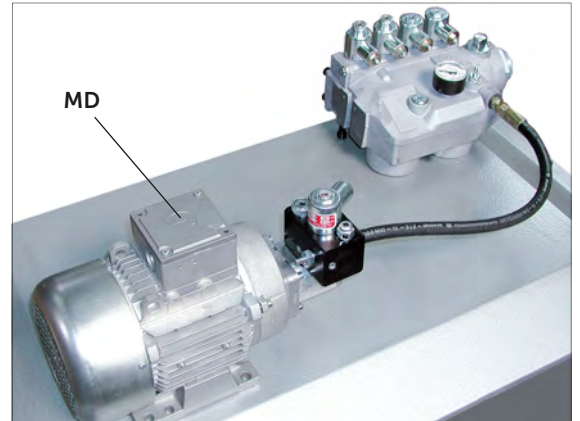
- T** Control Valve Connection
- Z** Cylinder Side Connection
- TN** Tank Return Line

**For Hydraulic Elevators**

The Blain Micro Drive for hydraulic elevators consists of a small motor, pump and valve unit in one assembly. Exact floor stops and releveling operations are achieved with low electrical power requirement, low noise levels and no unnecessary heating of the oil. The MD unit is mounted on or under the cover of the main hydraulic power unit, using the same oil source. It can also be used to slowly move the car independently of the main drive during installation or in an emergency.



MD Micro Drive



**For Traction Elevators**

The Micro Drive is equally effective as a separate unit for accurate releveling of traction elevators, where a small cylinder is integrated into the cable suspension. This eliminates the need to start the main drive when the car needs to be moved only a few centimetres.

**Micro Levelling Speeds**

Micro levelling at approximately 1 cm/s (2 fpm) is recommended at which speed positioning of the car is highly accurate and the releveling movement, usually lasting less than a second, is barely if at all noticeable by the passenger. Floor stopping accuracy of better than ± 5 mm (0.2 inch) can be expected, provided the floor switch system is correspondingly accurate. Outside of 2 cm (0.8 inch) from the floor landing, the main elevator releveling system must be activated.

**Increased safety**

Exact landing of the car eliminates the danger of passengers tripping while entering or leaving the car.

**Faster Floor to Floor Times**

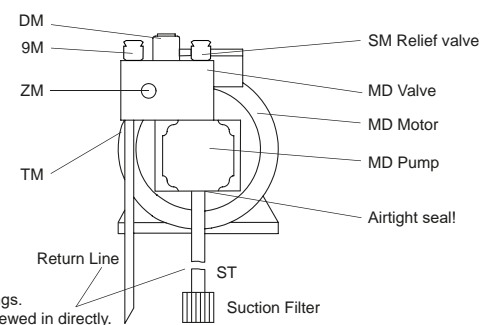
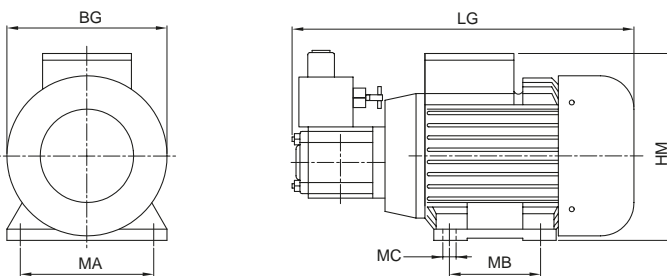
Because the Micro Drive assures final stopping accuracy, the main levelling approach speed to the floor can be increased to approximately 10 cm/s (20 fpm) to shorten travelling time.

**Quicker Releveling**

When a load is added to or removed from the car causing it to shift its position, the MD Unit releveling correction begins instantaneously and usually taking less than one second to complete. There is no unwanted delay due to bypassing of oil as it is the case with the main hydraulic drive.

**Quieter Releveling**

Since the main power unit does not need to be started, releveling with the Micro Drive unit is quiet and shorter in duration than when employing the main hydraulic drive. This is especially important in private homes or offices, where the releveling sound of the main elevator drive can be disturbing; especially at night-time.



TM & ST: Do not use hydr. fittings. Use only low pressure pipe screwed in directly.

**Measurements**

| Type    | l/min |       | KW   | max bar | max psi | Ports      |         |            | LG mm | BG mm | HM mm | MA mm | MB mm | MC mm | weight |      |
|---------|-------|-------|------|---------|---------|------------|---------|------------|-------|-------|-------|-------|-------|-------|--------|------|
|         | 50 Hz | 60 Hz |      |         |         | ST Suction | TM Tank | ZMCylinder |       |       |       |       |       |       | kg     | lbs  |
| MD 0103 | 1.0   | 0.3   | 0.37 | 130     | 1870    | 1/4"       | 3/8"    | 3/8"       | 220   | 120   | 175   | 100   | 80    | 7     | 6      | 13.5 |
| MD 0205 | 1.9   | 0.6   | 0.55 | 130     | 1870    | 3/8"       | 3/8"    | 3/8"       | 290   | 140   | 190   | 110   | 90    | 7     | 8.5    | 19   |
| MD 0411 | 4.2   | 1.3   | 1.10 | 130     | 1870    | 3/8"       | 3/8"    | 3/8"       | 325   | 160   | 200   | 120   | 100   | 10    | 10     | 22   |
| MD 0611 | 6.4   | 2.0   | 1.10 | 130     | 1870    | 3/8"       | 3/8"    | 3/8"       | 330   | 160   | 200   | 120   | 100   | 10    | 10.5   | 23   |
| MD 1022 | 10.6  | 3.3   | 2.20 | 130     | 1870    | 1/2"       | 3/8"    | 3/8"       | 355   | 175   | 215   | 140   | 125   | 10    | 16     | 35.5 |
| MD 1535 | 15.4  | 4.8   | 3.50 | 130     | 1870    | 1/2"       | 3/8"    | 3/8"       | 410   | 195   | 245   | 160   | 140   | 12    | 25     | 55   |
| MD 2450 | 24.0  | 7.5   | 5.00 | 130     | 1870    | 3/4"       | 3/8"    | 3/8"       | 450   | 220   | 265   | 190   | 140   | 14    | 32.5   | 72   |

US units

mm ÷ 25.4 = inches

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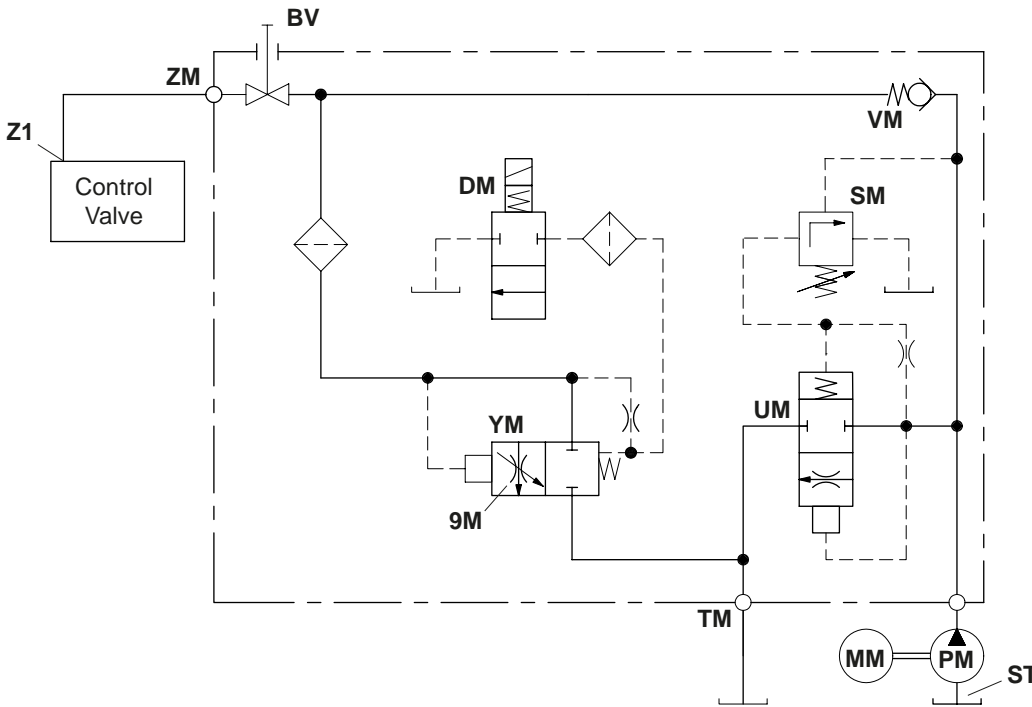


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## Hydraulic Circuit

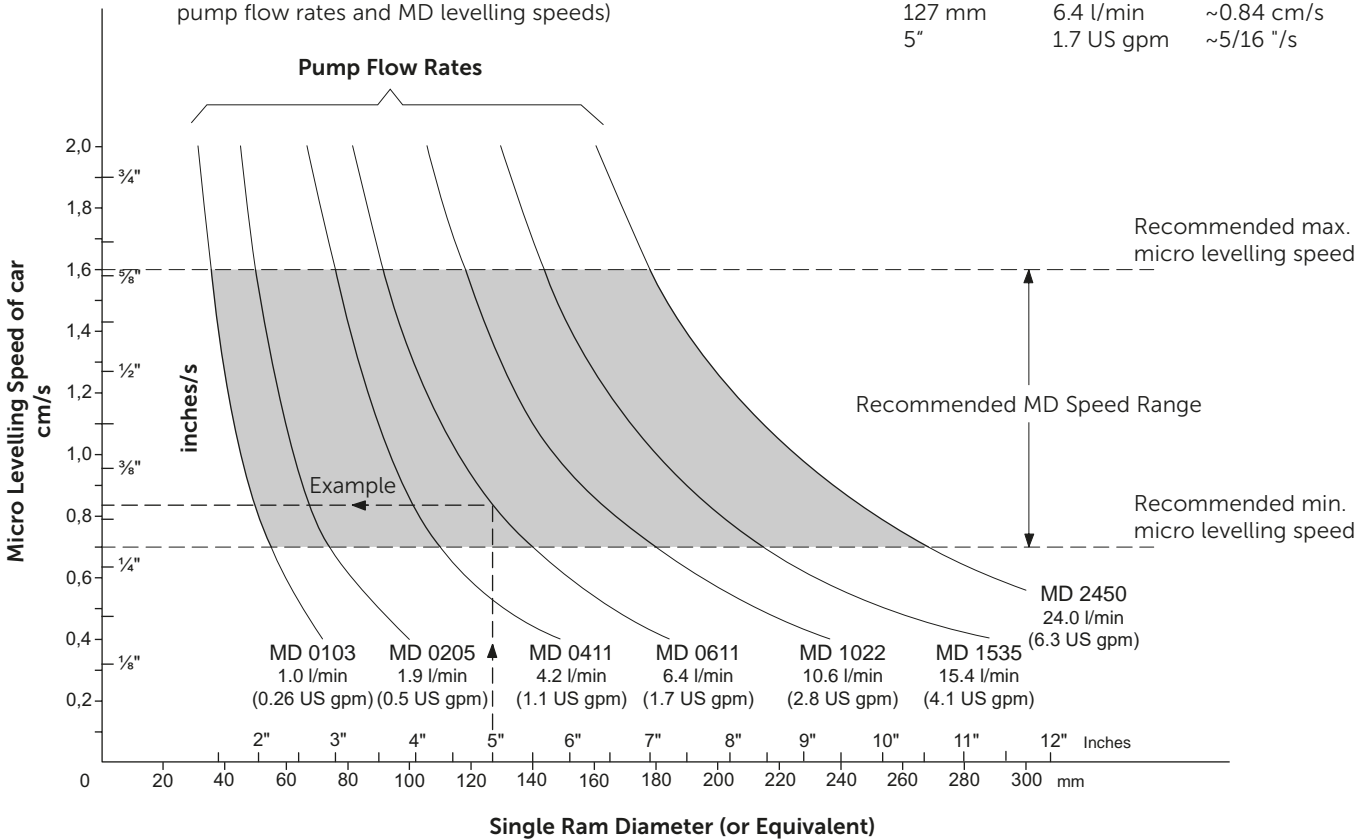


- |           |                                  |           |                     |           |                             |
|-----------|----------------------------------|-----------|---------------------|-----------|-----------------------------|
| <b>DM</b> | Solenoid Down                    | <b>BV</b> | Shut Off Valve      | <b>PM</b> | MD-Pump                     |
| <b>9M</b> | Down Speed Adjustment            | <b>ST</b> | Suction Tube        | <b>UM</b> | Pilot Operated Relief Valve |
| <b>SM</b> | Pressure Relief Valve Adjustment | <b>ZM</b> | Cylinder Connection | <b>YM</b> | Pilot Operated Down Valve   |
| <b>VM</b> | Check Valve                      | <b>TM</b> | Return Connection   |           |                             |
|           |                                  | <b>MM</b> | MD-Motor            |           |                             |

## Selection Chart

50 Hz Motors (For 60 Hz connection, add 20% to pump flow rates and MD levelling speeds)

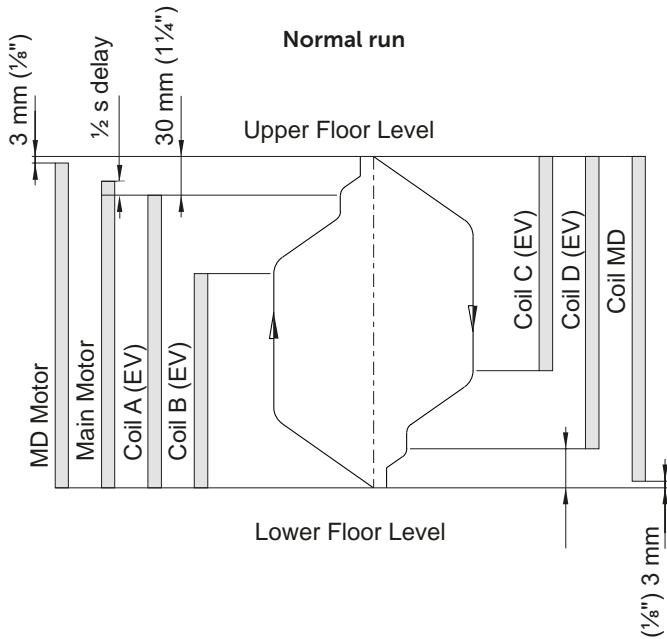
**Example:** Ram 127 mm 5" Pump 6.4 l/min 1.7 US gpm Speed ~0.84 cm/s ~5/16 "/s



The Equivalent Ram Diameter is the calculated single ram diameter which would produce the same car speed as the alternative cylinder system.



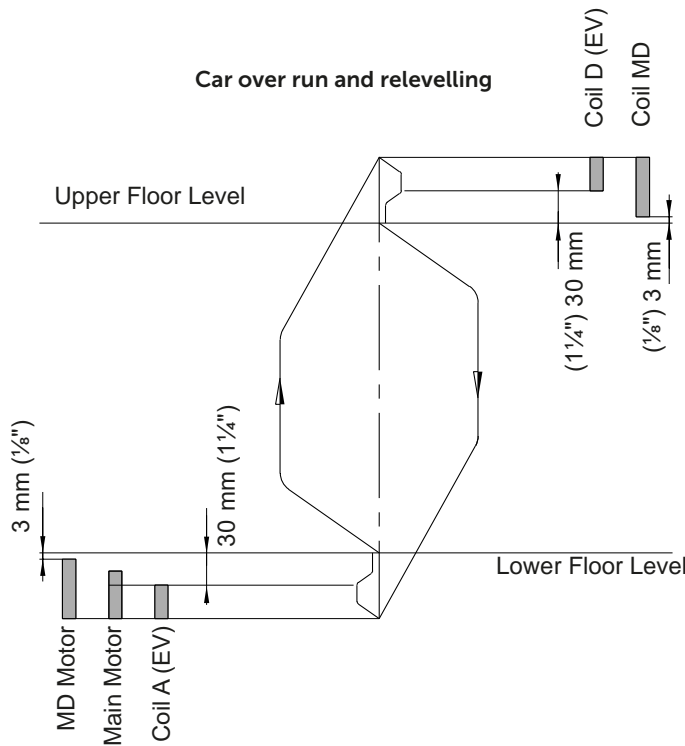
### Electrical Sequence



#### Normal Run

1. At the beginning of a normal up run, the friction of the system (stiction) is overcome by the Micro Drive. This reduces any breakaway jerk.
2. The standard control valve levelling speed no longer determines the stopping accuracy of the elevator. Therefore it can be increased to approximately 10 cm/s (20 fpm), effectively smoothing out the ride and at the same time, shortening the floor to floor travelling time.
3. The stopping accuracy of the car, determined by the Micro Drive, is improved to less than 5 mm (0,2 inch) from floor level.

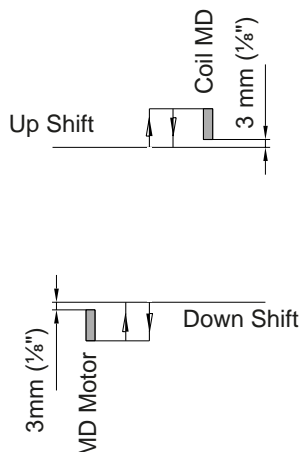
#### Car over run and releveling



#### Over Run

If the car travels past the floor level, the shaftway switches would activate to re-level the car through the MD unit, in less time than it takes the car doors to open and more accurately than with the standard levelling system. Should the MD correction not be completed within 2-3 seconds, the main levelling system automatically actuates.

#### Car shift and releveling



#### Car Shift

When the position of the car shifts away from floor level due to loading or unloading, cooling of the oil or valve leakage, the Micro Drive performs a releveling correction when the shift exceeds 3 mm.



#### Important

An accurate levelling switch installation is a precondition for satisfactory results.

All distances mentioned are for reference only and can vary from installation to installation.



## Installation and Parts List

**Warning:** Only qualified personnel should adjust or service valves. Unauthorised manipulation may result in injury, loss of life or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off and residual pressure in the valve is reduced to zero.

### MD Installation

1. Use the same oil reservoir for the **MD** unit as for the main pump drive.
2. Do not use hydraulic fittings for suction and return lines. Their smaller bores, prevent efficient oil flow. For the suction line, use low pressure, taper threaded tube, screwed directly into the suction port **ST** of the pump with airtight sealing and with the lower end including filter, submerged at **all times** under the reservoir oil level. To avoid sucking air, ensure that the thread connection into the pump is perfectly sealed.
3. For the return line to tank, also use low pressure, taper threaded tube, screwed directly into the tank port **TM** of the valve.
4. For the cylinder line connection, high pressure hose may be used to join port **ZM** of the valve to the main cylinder line.

### Electrical Installation

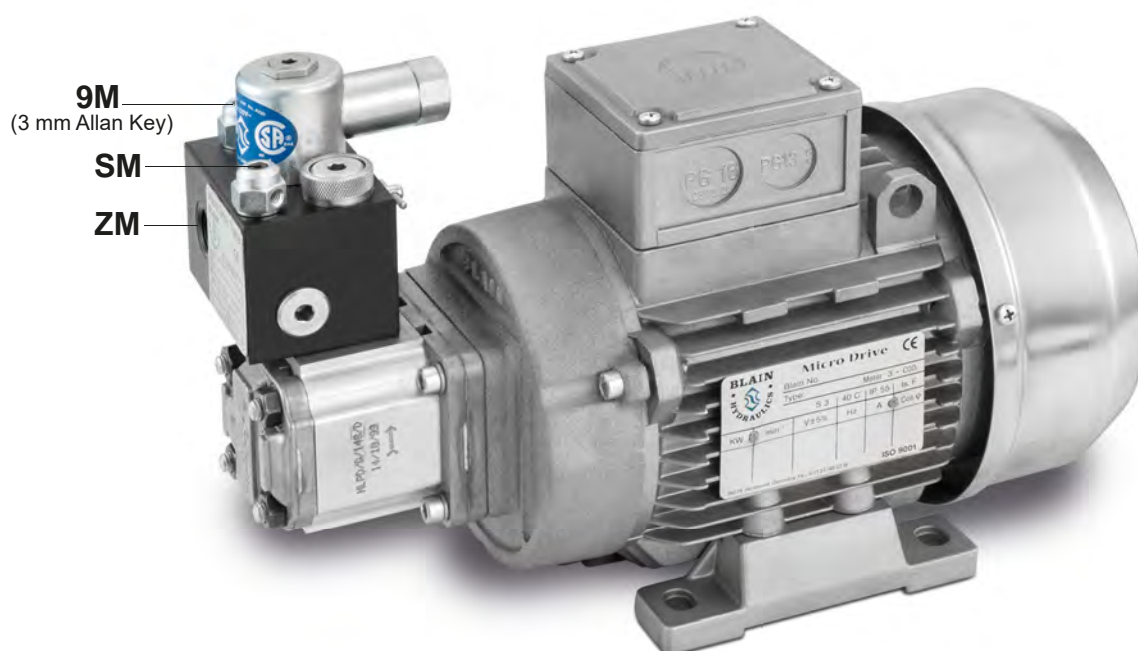
5. The existing safe operation of the elevator according to the applicable local code, must not be changed. Separate **MD** relevelling switches set to trigger **MD** relevelling at between 2.5 to 5 mm (0.1 - 0.2 inches) above and below flow level which are actuated before the main relevelling switches.
6. Electrical connections are 3 phase direct starting.

### MD Adjustments

**Up Speed** is determined by the pump output and the effective diameter of the cylinder system.

**SM Relief Valve.** 'In' (clockwise) produces a higher, 'out' (c-clockwise) a lower maximum pressure setting.

**9M Down Speed** (Micro Drives MD1022 and 2450). When solenoid **DM** is energised, the car will travel downwards at a speed according to the setting of adjustment **9M**, (3mm socket key). Turning 'in' (clockwise) provides a slower, turning 'out' (c-clockwise), a faster down speed.



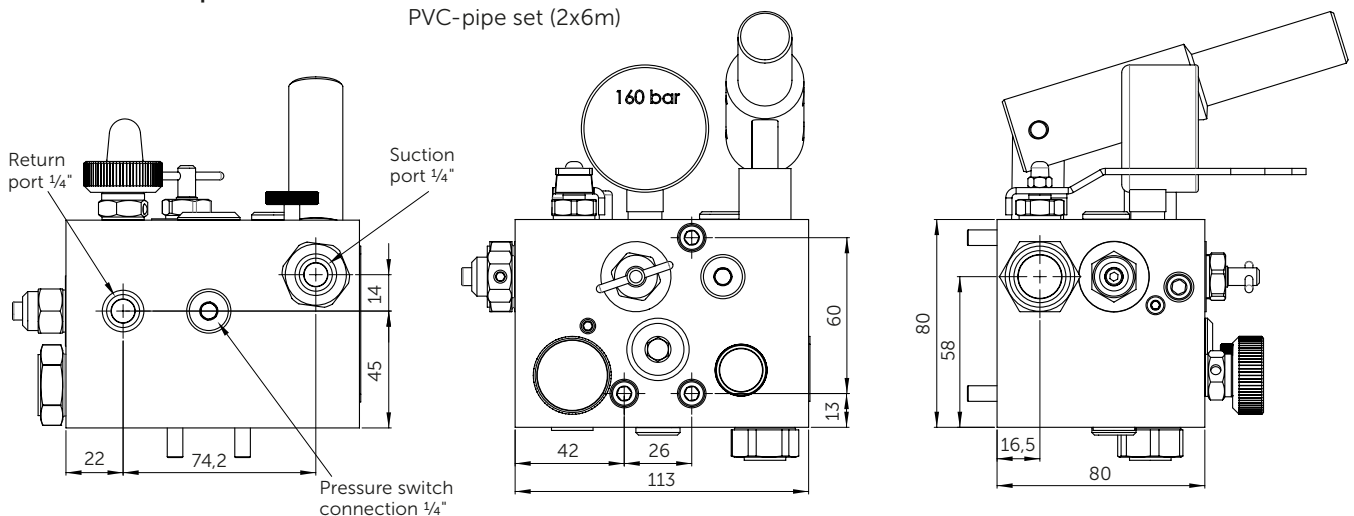
**Micro Drive Unit**  
(1.0 to 24 l/min) (0.3 to 7.5 US gpm)



The MRL-H has been designed for servicing and rescuing operations of machine roomless (MRL) hydraulic elevators remotely by having easy outside access, without needing to be in the pit. Many functional valves such as self-closing manual lowering valve, hand pump, slack rope valve, pressure relief valve, manual lowering speed adjustment, ball valve as well as a manometer have been added to a compact body. MRL-H can be located up to 6 metre (19 feet) away and 5 metre (16 feet) high from the main power unit to a convenient location for easy access. MRL-H can be optionally delivered with pipes and necessary accessories upon request.



|                             |   |  |   |
|-----------------------------|---|--|---|
| <b>Output port:</b>         | 1/2" BSP  | <b>Pressure switch port (2 times):</b> | 1/4" BSP                                    |
| <b>Suction port:</b>        | 1/4" BSP  | <b>Pressure range:</b>                 | 0-100 bar (0-1450 psi)                      |
| <b>Return port:</b>         | 1/4" BSP  | <b>Oil Viscosity:</b>                  | (25-60) cSt. bei 40°C (15-35 cSt. at 120°F) |
| <b>max. suction height:</b> | 5 m (with PVC-pipe inside-Ø6 mm);<br>check valve recommended at suction point for pipe length longer than 1 m |  |   |
| <b>Options:</b>             | check valve<br>PVC-pipe set (2x6m)  |  |   |



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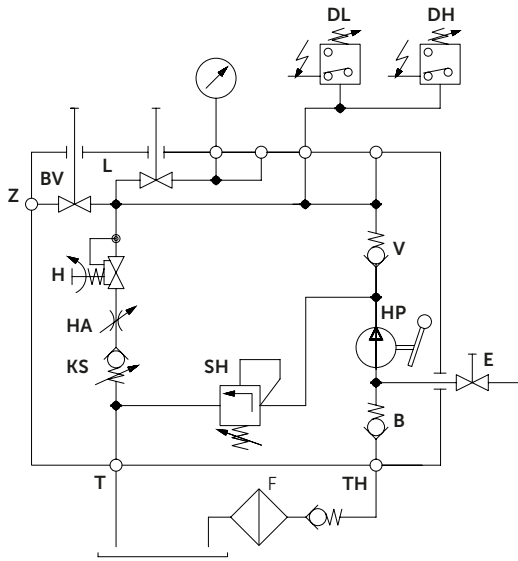


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## Hydraulic Circuit

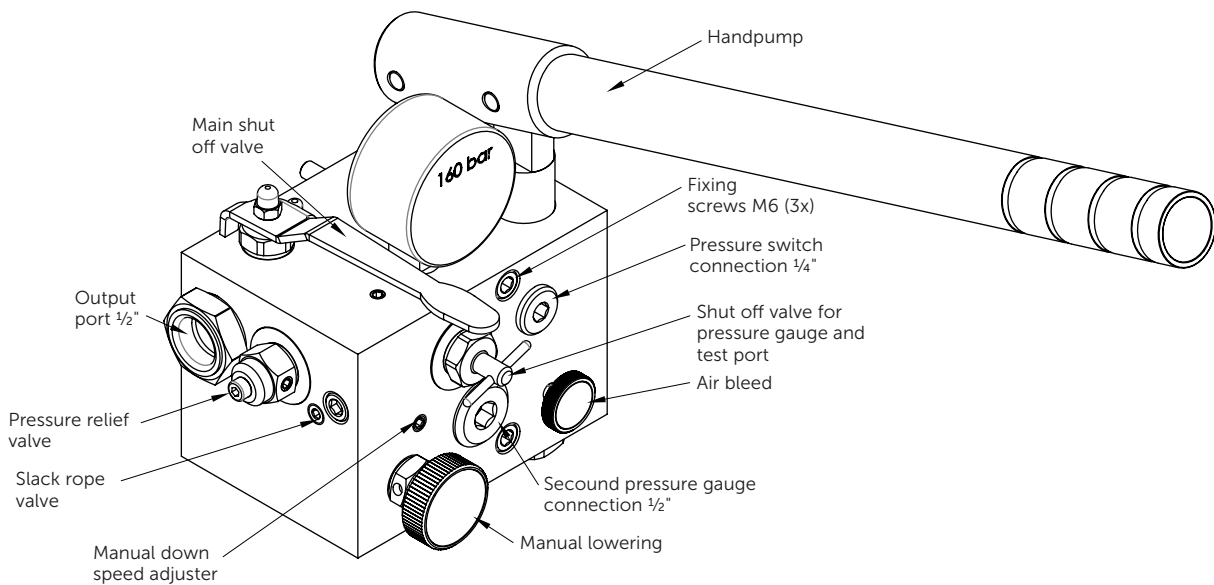


- Z Pressure port
- T Tank port
- TH Suction port
- F Filter
- B Check-Valve (suction)
- V Check-Valve (Pressure line)
- BV Main shut-off valve (built in)
- KS Slack rope valve
- H Manual lowering
- L Shut-off valve for pressure gauge and test port
- HA Manual down speed adjustment
- HP Hand pump
- E Air bleed
- SH Relief valve
- DL Pressure switch 1-10 bar
- DH Pressure switch 1-100 bar

**Connections:** The output port (1/2") connected to the cylinder line, the oil suction (1/4") and return (1/4") ports to the main tank. Use polyamide oil suction and return pipes with a inside diameter of 6 mm and a outside diameter of 8 mm minimum.

**To lower the lift:** Open the main shut off valve. Turn the manual lowering anticlockwise. If the speed is too slow adjust the speed adjuster accordingly.

**To raise the lift:** Open the main shut off valve on the MRL-H unit. To release trapped air inside the unit, open the air-bleed 1/2 or 3/4 turn and pump oil until oil appears at the bleed screw. Tighten the bleed screw and continue pumping to raise the lift.



**Main shut off valve:** Allows pressure line to be kept closed during non-service times.

**Slack rope valve:** Avoids the ram from being lowered by opening the manual lowering valve below ram pressure/weight.

**Manual lowering valve:** Descends the car to lower position manually.

**Manual lowering speed adjustment:** It allows manual lowering speed adjustment away from the main power unit.

**Pressure relief valve:** By default it is set to 100 bar (adjustable).

**Hand pump:** Allows servicing people to raise the car to the upper flow.

Type AA - Female Threads  
Typ AA - Innengewinde  
Type AA - Filet femelle  
Tipo AA - Rosca hembra

**Techn. Data**

| Typ       | Q max.                | P max.           |
|-----------|-----------------------|------------------|
| BV3 (1½") | 800 l/min 211 US gpm  | 100 bar 1450 psi |
| BV5 (2½") | 1600 l/min 423 US gpm | 70 bar 1015 psi  |

Type ED - Swivel Nut  
Typ ED - Überwurfmutter  
Type ED - Ecrou raccord  
Tipo ED - Tuerca loca

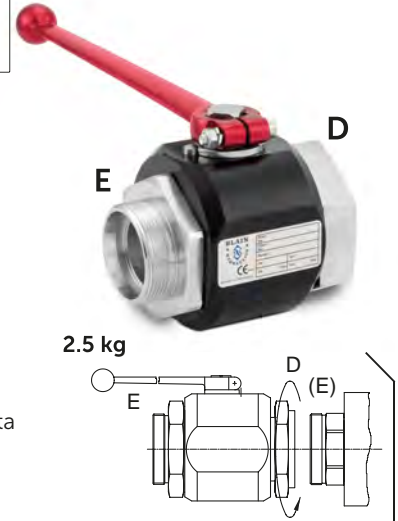


**Standard  
A - A**

Pipe Thread  
Seal Tape Required  
Rohrgewinde  
Dichtband notwendig  
Filetage au pas du gaz Bande d'étanchéité nécessaire  
Rosca para tubos  
Se necesita cinta de junta

**Option  
E - D**

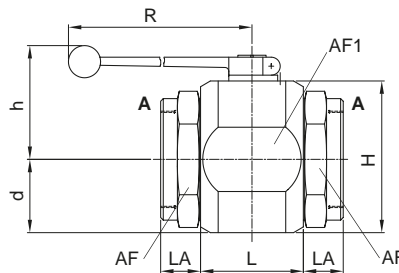
Faster Connections  
Perfect Sealing  
Schnelle Montage  
Perfekte Dichtung  
Montage rapide  
Joint parfait  
Montaje rápido  
Estanqueidad perfecta



**A**

| Typ | A   | AF* | (BSP)   |    | (NPT)   |    |
|-----|-----|-----|---------|----|---------|----|
|     |     |     | Typ No. | LA | Typ No. | LA |
| B3  | 1"  | 70  | B3G1    | 19 | B3N1    | 28 |
|     | 1¼" | 70  | B3G1.25 | 21 | B3N1.25 | 28 |
|     | 1½" | 70  | B3G1.5  | 24 | B3N1.5  | 34 |
|     | 2"  | 70  | B3G2    | 30 | B3N2    | 34 |
| B5  | 2"  | 95  | B5G2    | 31 | B5N2    | 31 |
|     | 2½" | 95  | B5G2.5  | 31 | B5N2.5  | 35 |

**Standard**



**Dimensions**

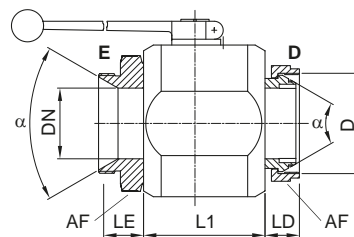
| Typ | DN | L  | H   | AF1 | d  | h  | R   |
|-----|----|----|-----|-----|----|----|-----|
| B3  | 38 | 65 | 90  | 86  | 43 | 70 | 240 |
| B5  | 55 | 80 | 118 | 114 | 57 | 82 | 280 |

DN = Ø Inside · Ø Innen  
Ø Intérieur · Ø Interior

**E**

| Typ | E     | α   | DIN 2353 (24°) |     | Typ No. |
|-----|-------|-----|----------------|-----|---------|
|     |       |     | LE             | *AF |         |
| B3  | M36x2 | 24° | 24.5           | 70  | B3E36   |
|     | M45x2 | 24° | 26.5           | 70  | B3E45   |
|     | M52x2 | 24° | 26.5           | 70  | B3E52   |
|     | M65x2 | 60° | 27             | 70  | B3E65   |
| B5  | M78x2 | 60° | 35             | 95  | B5E78   |

**Option**



**D**

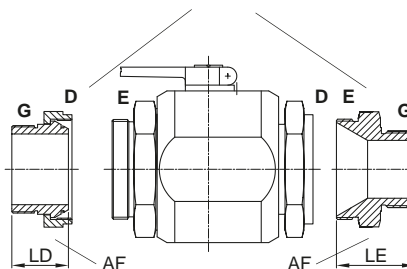
| Typ | D     | α   | DIN 2353 (24°) |    | DIN 3863 (60°) |         |
|-----|-------|-----|----------------|----|----------------|---------|
|     |       |     | L1             | LD | *AF            | Typ No. |
| B3  | M52x2 | 24° | 66             | 35 | 60             | D52     |
|     | M65x2 | 60° | 66             | 25 | 75             | D65     |
| B5  | M78x2 | 60° | 94             | 24 | 90             | D78     |

**Adaptor GD**

| Typ | D     | B        | *AF | LD | Typ No.   |
|-----|-------|----------|-----|----|-----------|
| B3  | M65x2 | G1½"     | 70  | 47 | GD65.G1.5 |
|     | M65x2 | Ø57 Weld | 70  | 45 | WD65.57   |
| B5  | M78x2 | G2"      | 90  | 48 | GD78.G2   |
|     | M78x2 | Ø70 Weld | 90  | 44 | WD78.70   |

\*AF - Across Flats  
AF - Schlüsselweite  
AF - Ouverture de clé  
AF - Ancho de llave

**Adaptors**



**Adaptor GE**

| Size | E     | B       | *AF | LE | Typ No.    |
|------|-------|---------|-----|----|------------|
| B3   | M52x2 | G1"     | 70  | 55 | GE52.G1    |
|      | M52x2 | G1 ¼"   | 70  | 54 | GE52.G1.25 |
|      | M52x2 | G1 ½"   | 70  | 52 | GE52.G1.5  |
|      | M52x2 | G2"     | 70  | 60 | GE52.G2    |
|      | M65x2 | G1 ½"   | 70  | 60 | GE65.G1.5  |
| B5   | M65x2 | G2"     | 70  | 52 | GE65.G2    |
|      | M78x2 | G2"     | 80  | 59 | GE78.G2    |
|      | M78x2 | G2 ½"   | 80  | 59 | GE78.G2.5  |
|      | M78x2 | NPT2 ½" | 80  | 63 | GE78.N2.5  |

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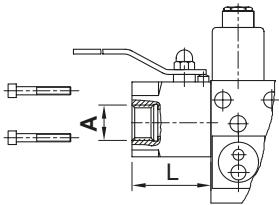
# Ball Valves Robinet à boisseau

# Kugelhähne Llaves esféricas

**BV**

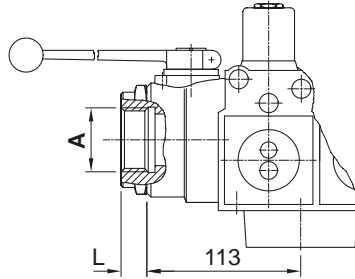


## Standard Connection A

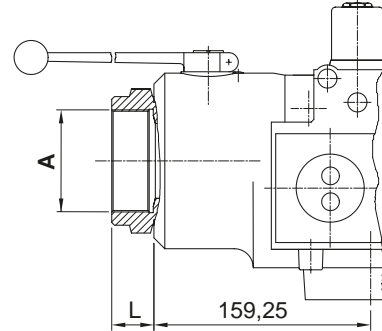


|              | A  | L | Typ No. |
|--------------|----|---|---------|
| G (BSP) 1/2" | 83 |   | BG 0.5  |
| G (BSP) 3/4" | 58 |   | BG .75  |
| G (BSP) 1"   | 58 |   | BG 1    |
| NPT 3/4"     | 58 |   | BN .75  |
| NPT 1"       | 58 |   | BN 1    |

\* Reduction

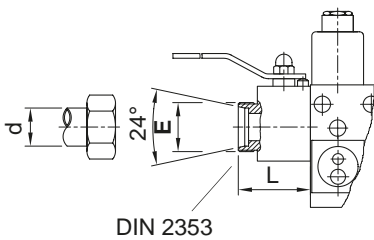


|                | A  | L | Typ No. |
|----------------|----|---|---------|
| G (BSP) 1"     | 19 |   | BG 1.0  |
| G (BSP) 1 1/4" | 21 |   | BG 1.25 |
| G (BSP) 1 1/2" | 24 |   | BG 1.5  |
| G (BSP) 2"     | 30 |   | BG 2    |
| NPT 1"         | 28 |   | BN 1    |
| NPT 1 1/4"     | 28 |   | BN 1.25 |
| NPT 1 1/2"     | 34 |   | BN 1.5  |
| NPT 2"         | 34 |   | BN 2    |



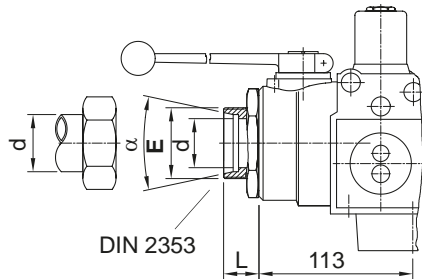
|                | A  | L | Typ No. |
|----------------|----|---|---------|
| G (BSP) 2"     | 31 |   | BG 2.0  |
| G (BSP) 2 1/2" | 31 |   | BG 2.5  |
| NPT 2"         | 31 |   | BN 2.0  |
| NPT 2 1/2"     | 35 |   | BN 2.5  |

## Optional Connection E



|          | E  | L  | d | Typ No. |
|----------|----|----|---|---------|
| M 22x1.5 | 80 | 15 |   | BM 22   |
| M 30x2   | 54 | 22 |   | BM 30   |
| M 36x2   | 54 | 28 |   | BM 36   |

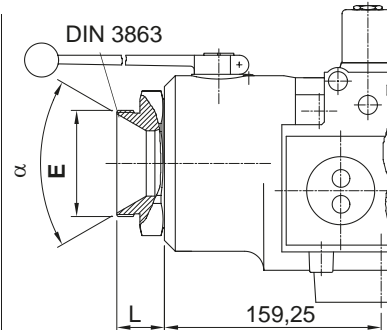
\* Reduction



|        | E  | L   | α  | d | Typ No. |
|--------|----|-----|----|---|---------|
| M 36x2 | 23 | 24° | 28 |   | BM 36.0 |
| M 45x2 | 25 | 24° | 35 |   | BM 45   |
| M 52x2 | 25 | 24° | 42 |   | BM 52   |

DIN 3863

|        | E  | L   | α | Typ No. |
|--------|----|-----|---|---------|
| M 65x2 | 26 | 60° |   | BM 65   |
| M 78x2 | 37 | 60° |   | BM 78   |



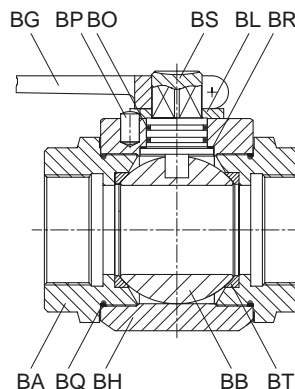
|       | E  | L   | α | Typ No. |
|-------|----|-----|---|---------|
| M78x2 | 35 | 60° |   | BM 78.0 |

### Parts List

- BG** Grip
- BP** Limit Pin
- BO** Shaft O-Ring
- BS** Shaft
- BL** Limit Disc
- BR** Bearing ring
- BA** Connection
- BQ** Connection O-Ring
- BH** Housing
- BB** Ball
- BT** POM Seal

### Stückliste

- BG** Griff
- BP** Kerbstift
- BO** O-Ring Schaltwelle
- BS** Schaltwelle
- BL** Arretierscheibe
- BR** Gleitring
- BA** Adapter
- BQ** O-Ring Adapter
- BH** Gehäuse
- BB** Kugel
- BT** POM Dichtung



### Liste des pièces

- BG** Levier
- BP** Goupille
- BO** O-Ring axe du levier
- BS** Axe du levier
- BL** Disque d'arrêt
- BR** Anneau de glissement
- BA** Connexion
- BQ** Connexion O-Ring
- BH** Cage
- BB** Boule
- BT** POM joint

### Lista de piezas

- BG** Brazo
- BP** Pasador tope
- BO** Junta eje de giro
- BS** Eje de giro
- BL** Retén
- BR** Anillo deslizante
- BA** Conexión salida
- BQ** Junta conexión salida
- BH** Cuerpo
- BB** Bola
- BT** Junta de POM

# TH

## Tank Heater Chauffage pour cuve à huile

## Tankheizung Calefacción para depósitos



Type TH  
250 Watt  
1.9 kg



100 - 130 AC Option  
200 - 240 AC Standard

20° - 25° C Standard (68° - 77° F)  
15° - 20° C Option (59° - 68° F)  
25° - 30° C Option (77° - 86° F)  
35° - 40° C Option (95° - 104° F)

### Application

(GB)

TH tank heaters are intended primarily for application in hydraulic control systems for machine tools, presses, hydraulic elevators, servo systems, etc. where overnight conditions or periods of non-operation cause the temperature of the hydraulic fluid to fall below desirable levels.

The heater is designed to maintain up to approximately 500 litres (130 US gals) of oil in an unheated room at a temperature of +20° C to +25° C (68° F to 77° F).

### Construction

Through the large heat dissipation area of the housing, the heaters surface temperature remains under +50° C (120° F) and thereby avoids oxidation or premature aging of the oil. The built-in thermostat switches the heating element on at an oil temperature of approximately +20° C (68° F) and off again when the oil temperature has risen to approximately +25° C (77° F).

Should the heater in an unsubmerged state be subject to an ambient temperature of under 20° C (68° F), it will switch on for a short period before switching off again as heat is conducted through the housing to the thermostat. Under this condition, the hottest surface temperature of the heater will not exceed 90° C (190° F).

### Application

(F)

Ce chauffage est spécialement destiné aux installations à commande oléodynamique telles que machines-outils, presses, ascenseurs oléodynamiques, etc. pour lesquelles la température de l'huile ne doit pas descendre au-dessous d'un minima donné.

Ce chauffage est conçu de manière à maintenir des cuves à l'huile d'une capacité d'environ 500 ltr à une température moyenne de +20° C à +25° C dans des locaux non chauffés.

### Construction

Pour éviter une détérioration prématurée de l'huile, le carter du chauffage présente une grande surface de radiation qui maintient la température de celui-ci au dessous de +50° C. Le thermostat incorporé assure un fonctionnement autonome. Température de mise en service +20° C, température de coupure +25° C.

Dans le cas d'une mise en service occidentale de l'appareil à air libre, la température de ce dernier étant inférieure à 20° C, il ne résulterait aucun dommage pour le chauffage, car après la coupure d'alimentation au moyen du thermostat, la température du surface du carter ne surpassera pas 90° C.

### Anwendung

(D)

TH-Tankheizungen sind für hydraulische Steueranlagen, für Werkzeugmaschinen, Pressen, hydraulische Aufzüge etc. vorgesehen, bei welchen über Nacht oder nach längerem Stillstand der Maschine die Öltemperatur des Steuersystems unter den erwünschten Wert zurückfällt.

Die Tankheizung ist so ausgelegt, dass Behälter bis ca. 500 Liter Öl-Inhalt in unbeheizten Räumen auf eine Mindesttemperatur von +20° C bis +25° C gehalten werden.

### Konstruktion

Das Gehäuse der Öltankheizung besitzt eine große Wärmeabstrahlungsfläche, so dass die Außentemperatur des Gehäuses nicht über +50° C steigt und ein Verbrennen bzw. vorzeitiges altern des Öls vermieden wird. Das eingebaute Thermostat schaltet die Heizung bei ca. +20° C ein und bei ca. +25° C Öltemperatur selbsttätig ab und erfordert keine sonstige Überwachung.

Falls sich die Heizung bei Lufttemperatur von unter 20° C in nicht eingetauchtem Zustand einschaltet, kommt es zu keinerlei Schaden, da nach automat. Wiederabschaltung des Thermostats die Gehäusefläche eine Temperatur von höchstens 90° C erreicht.

### Aplicación

(E)

Las calefacciones TH, han sido previstas para plantas hidráulicas de mando, máquinas-herramienta, prensas, ascensores hidráulicos, etc. y aplicables en aquellos casos, en los que la temperatura del aceite del sistema de mando desciende por debajo del valor deseado durante la noche, o cuando la máquina lleva parada durante mucho tiempo.

La calefacción para depósitos está diseñada de tal manera, que puede mantener a temperatura mínima de +20° C hasta +25° C, los recipientes de capacidad máx. de 500 litros de aceite en locales que no disponen de calefacción.

### Construcción

La carcasa de la calefacción para depósitos de aceite tiene una gran superficie de irradiación térmica, hasta tal punto, que la temperatura exterior de la carcasa no sube más de +50° C, con lo que así se evita que el aceite se combusione o se envejezca prematuramente. El termostato incorporado conecta la calefacción a unos +20° C y la desconecta automáticamente, sin requerir ningún otro control o vigilancia, cuando el aceite alcanza unos +25° C de temperatura.

Si la calefacción, en estado no sumergido, se pone en marcha a temperatura del aire inferior a 20° C, no se ocasionará daño alguno, porque después de la desconexión automática del termostato, la temperatura superficial de la carcasa no se elevará por encima de 90° C.

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# Tank Heater Chauffage pour cuve à huile

# Tankheizung Calefacción para depósitos

# TH

(GB)

## Installation

The heater is supplied with 2.5 metres (98 inches) of electrical cable sheathed over a length of 1.2 metres (48 inches) by an oil resistant hose. The cable outside the hose should not be submerged in the oil.

Two powerful magnets are fitted underneath the heater so that the installation in a normal sheet tank is simply a matter of placing the heater at the bottom surface of the tank. Alternatively, the heater can be mounted through means of two available M6 holes. The magnets also extract unavoidable fine metal particles from the oil thereby protecting the pump from wear.

Since the heated oil convects upwards, oil below the heater remains cold. It is therefore important to mount the heater low down in the tank.

Due to the location of the thermostat, the heater should be mounted such that the cable inlet is directed upwards (see diagram below).

(F)

## Installation

Le chauffage est équipé d'un câble électrique de 2,5 m dont la partie inférieure est protégée par un tuyau hydraulique sur une longueur de 1,2 m. La partie du câble non protégée ne doit pas être immergée.

L'installation dans la cuve s'effectue au moyen de deux aimants puissants situés sur la face inférieure du carter, de sorte qu'il suffit d'apposer le chauffage sur le fond de la cuve. Dans les cas où la cuve ne serait pas en acier ou bien s'il était nécessaire de monter différemment le chauffage, on dispose pour cela de 2 fixations filetées M6 situées sur le couvercle du carter. Les aimants attirent les fines particules métalliques se trouvant inévitablement dans l'huile, et de ce fait protègent la pompe contre l'usure.

Du fait de la convection vers le haut de la chaleur l'huile se trouvant en dessous du chauffage demeure froide. C'est pourquoi il est recommandé d'installer le chauffage aussi bas que possible dans la cuve.

Il est nécessaire, en raison de la position du thermostat, que le raccord de câble sortant du couvercle soit dirigé vers le haut.

(D)

## Installation

Die Öltankheizung wird mit 2,5 m langem Kabel ausgerüstet, wovon die unteren 1,2 m von einem hydraulischen Schlauch geschützt sind. Das Kabel außerhalb des hydraulischen Schlauches soll nicht in Öl getaucht werden.

Das Anbringen im Behälter erfolgt durch 2 unten am Gehäuse befindliche starke Magnete, so dass die Heizung lediglich an den Boden des Behälters angelegt werden muss. Falls der Behälter nicht aus Stahl ist, oder die Heizung sonst anders montiert werden soll, sind zwei M 6-Befestigungsgewinde am Deckel des Gehäuses vorhanden. Die Magnete ziehen die unvermeidbaren feinen metallischen Teile aus dem Öl und schützen somit die Pumpe vor Abnutzung.

Durch die Wärmekonvektion nach oben bleibt das Öl unterhalb der Heizung kalt. Deshalb soll die Heizung möglichst tief im Behälter montiert werden.

Der Kabelanschluss der Tankheizung muss nach oben gerichtet werden (siehe Skizze).

(E)

## Instalación

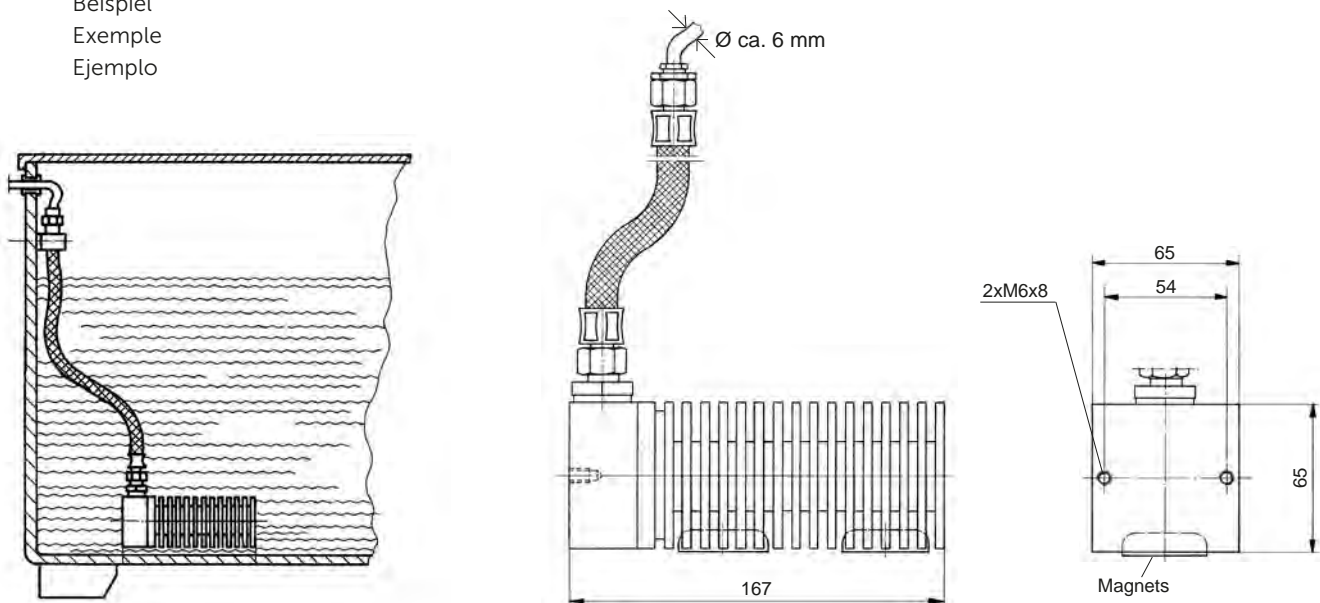
La calefacción para depósitos de aceite va equipada con un cable de conexión de 2,5 m de largo, de los que 1,2 m van protegidos por el tubo flexible hidráulico. El cable no protegido por el tubo flexible hidráulico no debe sumergirse en el aceite.

Su colocación en el depósito se hace por medio dos imanes potentes que se encuentran debajo de la carcasa, de manera que sólo hay que colocar la calefacción en el suelo del recipiente. Si el recipiente no es de acero, o si la calefacción debe ser montada en otro lugar, en estos casos, emplear las dos roscas de fijación M 6 que se encuentran en la tapa de la carcasa. Los imanes retiran del aceite las finas e inevitables partículas metálicas, al tiempo que protegen a la bomba de un prematuro desgaste.

Debido a la confección térmica que tiende hacia arriba, el aceite permanece frío debajo de la calefacción. Para evitar tal efecto se recomienda colocar la calefacción lo más profunda posible.

Por la posición del termostato, la conexión de cable que sobresale de la tapa debe dirigirse hacia arriba.

Example  
Beispiel  
Exemple  
Ejemplo



**HP****Hand pump  
Pompe à main****Handpumpe  
Bomba a mano****H 11****3/4" EV****H 11****1 1/2"-2" EV****H 11****2 1/2" EV****Description****(GB)**

H 11 and H 12 pumps are for application with hydraulic lifting or pressing equipment, for emergency operation of hydraulic elevators and for the pressure testing of hydraulic systems in general. The H 11 is constructed for side mounting. The H 12 is fitted with a base plate for separate application.

The built-in relief valve should be adjusted to prevent unintentional high pressure being applied to the system. A built-in manual valve for releasing pressure from the system is available as an option.

**Description****(F)**

Les pompes à main H 11 et H 12 sont prévues pour utilisation avec des installations hydrauliques de levage et de pression, pour la commande d'urgence des ascenseurs hydrauliques, ainsi que pour le contrôle de pression des systèmes hydrauliques en général. La pompe à main H11 est construite pour le montage latéral. La H 12, pourvue d'une plaque de montage est prévue pour l'application séparée.

Pour éviter une surpression inopinée dans le système, une soupape de surpression est incorporée. Une soupape manuelle permettant la dépressurisation du système est livrable sur demande.

**Beschreibung****(D)**

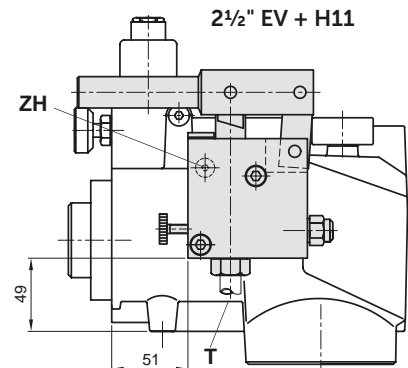
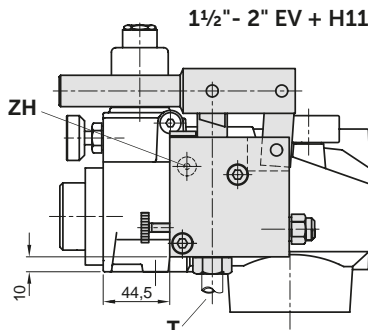
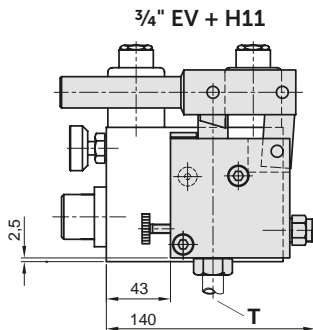
H 11 und H 12 Handpumpen sind geeignet für den Einsatz mit hydraulischen Hebe- und Pressanlagen, für die Notbetätigung von hydraulischen Aufzügen, sowie zur Druckprüfung von hydraulischen Systemen im allgemeinen. Die H 11 Handpumpe ist für die seitliche Montage konstruiert. Die H 12 Handpumpe ist mit einer Montageplatte ausgerüstet und für den separaten Einsatz vorgesehen.

Um zu verhindern, dass unbeabsichtigt ein zu hoher Druck in das System gesetzt wird, ist ein Überdruckventil eingebaut. Auf Wunsch ist auch ein eingebautes Zylinderdruck-Entlastungsventil lieferbar.

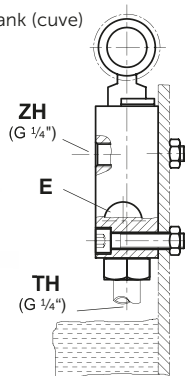
**Descripción****(E)**

Las bombas a mano H 11 y H 12 son aptas para ser empleadas en instalaciones hidráulicas de elevación y prensado, para el accionamiento de emergencia de elevadores hidráulicos, así como para comprobar la presión de sistemas hidráulicos en general. La bomba a mano H 11 está concebida para ser montada lateralmente a la electroválvula EV, mientras que la H 12 se instala sobre una placa de montaje de forma independiente.

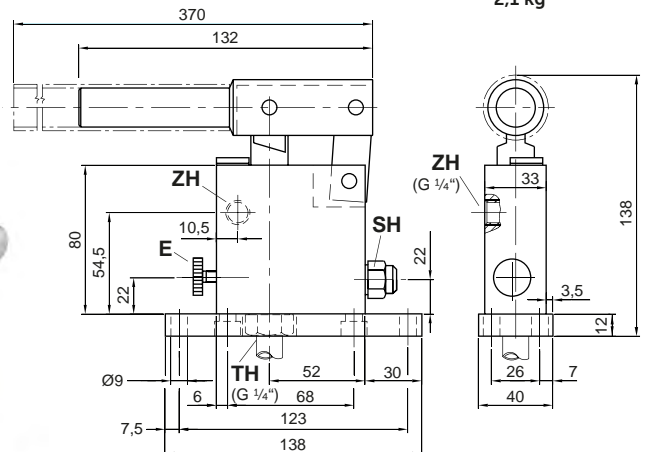
Para evitar, una presión demasiado elevada en el sistema, hay que regular convenientemente la válvula de sobrecarga incorporada. Con el fin de aligerar la presión del sistema, se puede suministrar una válvula de evacuado, sobre pedido.

*See also EV prospect.**Siehe auch EV Prospekt.**Autres dates voir prospectus EV.**Veáese también prospecto EV.***H 11T**

For mounting inside tank  
Für die Montage am Tankinneren  
Pour montage à l'intérieur du tank (cuve)  
Por montaje dentro del tank

**1,7 kg****H 12**

For separate installation  
Für die separate Montage  
Pour installation séparée  
Por instalación separado

**2,1 kg**

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# Hand pump Pompe à main

(GB)

**Warning:** Only qualified personnel should adjust or service valves. Unauthorised manipulation may result in injury, loss of life or damage to equipment. Prior to servicing internal parts, ensure that the electrical power is switched off and residual pressure in the valve is reduced to zero.



## Installation

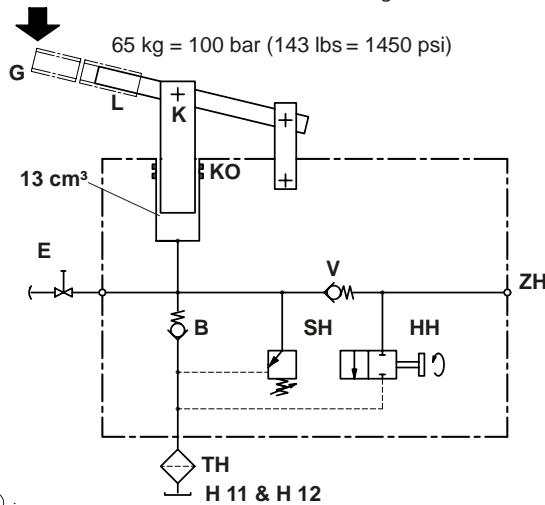
The inside diameter of the suction line should not be less than 8 mm diameter (5/16"). The connection of the suction line to the hand pump must be a perfect seal. A filter fitted to the bottom end of the suction line is recommended.

## Air Bleed

If the operation of the pump arm does not produce a build up of system pressure, it may be necessary to release trapped air out of the hand pump by opening the air bleed screw **E** half a turn and pumping several strokes until oil appears at the bleed screw thread.

## Elements

- V Check-Valve (Pressure line)
- VO Check-Valve (O-Ring)
- B Check-Valve (Suction line)
- K Piston
- KO O-Ring - Piston
- SH Relief-Valve
- HH Pressure bleed (optional)
- E Air bleed
- L Lever
- G Lever extension
- ZH Pressure Port
- ZO O-Ring - Port
- TH Suction Port



(F)

**Avertissement:** seul les techniciens qualifiés en ascenseur sont en droit d'effectuer de nouveaux réglages et des travaux d'entretien. Une utilisation non autorisée risque d'entraîner des blessures, des accidents mortels ou des dommages matériels. Avant tous travaux de maintenance sur des pièces internes, il faut s'assurer que le conduit de cylindre est bien fermé, que le courant de l'ascenseur est coupé et que la pression dans la valve au dessus de la soupape de vidange a bien été réduite à zéro.



## Installation

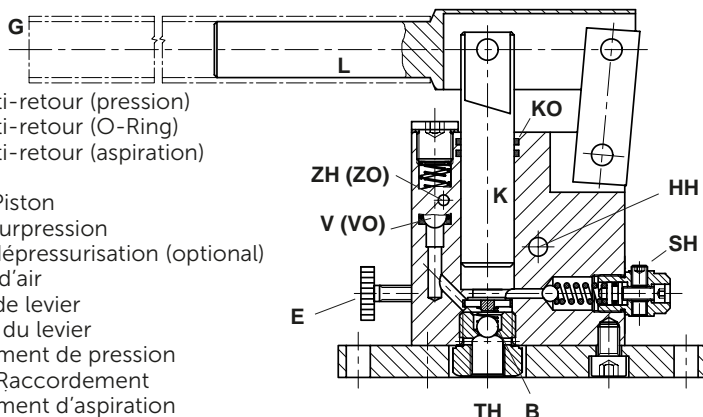
Le diamètre intérieur de la conduite d'aspiration doit être de 8 mm au minimum. Le raccordement de la conduite d'aspiration à la pompe à main doit être d'une étanchéité parfaite. Il est recommandé de munir d'un filtre l'extrémité inférieure de conduite d'aspiration.

## Purge de l'air

Au cas où l'utilisation du rallonge de levier ne cause pas la montée en pression du système il sera nécessaire de purger; pour cela ouvrir d'un demi tour la vis de purge **E** et pomper jusqu'à l'apparition d'huile à la vis de purge.

## Éléments

- V Clapet anti-retour (pression)
- VO Clapet anti-retour (O-Ring)
- B Clapet anti-retour (aspiration)
- K Piston
- KO O-Ring - Piston
- SH Valve de surpression
- HH Valve de dépressurisation (optional)
- E Vis purge d'air
- L Rallonge de levier
- G Extension du levier
- ZH Raccordement de pression
- ZO O-Ring - Raccordement
- TH Raccordement d'aspiration



# Handpumpe Bomba a mano

HP

(D)

**Warnung:** Neueinstellungen und Wartung dürfen nur durch qualifiziertes Aufzugspersonal durchgeführt werden. Nicht autorisierte Bedienung kann Verletzungen, tödliche Unfälle oder materielle Schäden zur Folge haben. Vor der Wartung innerer Teile ist sicher zustellen, dass die Zylinderleitung geschlossen, der elektrische Strom des Aufzuges abgeschaltet und der Druck im Ventil über das Notablassventil auf Null reduziert worden ist.



## Installation

Der Durchmesser der Ansaugleitung sollte mindestens 8 mm haben. Der Anschluss der Saugleitung an der Handpumpe muss einwandfrei dicht sein. Ein Sieb, angebracht am unteren Ende der Saugleitung, ist empfohlen.

## Entlüftung

Falls die Betätigung des Pumpenhebels zu keinem Aufbau des Systemdruckes führt, muss die Handpumpe entlüftet werden. Dazu die Entlüftungsschraube **E** 1/2 Umdrehung öffnen und den Hebel mehrmals betätigen, bis Öl aus dem Gewinde der Entlüftungsschraube kommt. Entlüftungsschraube wieder schließen.

## Elemente

- V Rückschlagventil (Druckleitung)
- VO Rückschlagventil (O-Ring)
- B Rückschlagventil (Saugleitung)
- K Plegel
- KO O-Ring - Plegel
- SH Überdruckventil
- HH Druckentlastung (auf Wunsch)
- E Entlüftungsschraube
- L Hebel
- G Hebelverlängerung
- ZH Druckanschluss
- ZO O-Ring - Anschluss
- TH Sauganschluss

(E)

**Aviso:** El ascensor sólo debe ser reajustado y mantenido por personal cualificado. Un manejo no autorizado puede producir lesiones, accidentes mortales y daños materiales. Antes de efectuar el mantenimiento, asegurar siempre que la línea del cilindro esté cerrada, que la alimentación de corriente del ascensor esté desconectada, y que la presión de la válvula haya sido reducida a cero a través de la válvula de escape de emergencia.



## Instalación

La tubería de aspiración deberá tener, como mínimo 8 mm. de diámetro interior. La conexión, entre tubería de aspiración y bomba, debe ser de una hermeticidad perfecta. Es recomendable colocar un filtro en el extremo inferior de la tubería de aspiración.

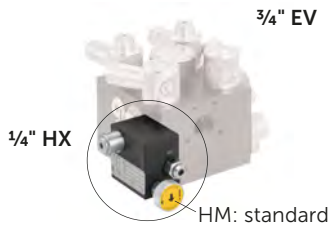
## Purga de aire

Si al accionar la palanca de la bomba no se consigue aumentar la presión del sistema, será necesario evacuar el posible aire que pueda encontrarse en la bomba. Para ello, se dará media vuelta al tornillo de descarga **E** y se accionará varias veces la palanca, hasta que se aprecie aceite en la rosca del tornillo de descarga.

## Elementos

- V Válvula de antiretorno (presión)
- VO Válvula de antiretorno (O-Ring)
- B Válvula de antiretorno (aspiración)
- K Pistón
- KO Anillo O - Pistón
- SH Válvula de seguridad (aspiración)
- HH Descarga de presión (opcional)
- E Purga de aire
- L Palanca
- G Alargadera de palanca
- ZH Conexión de presión
- ZO Anillo O - Conexión
- TH Conexión de aspiración





(GB)



(D)

**HX are manually operated down valves**, adjustable in their down speed. They close automatically upon release. They can be used for emergency manual lowering or in combination with the EV down valve to achieve an overspeed of the elevator for testing the pipe rupture valve.

**MX are solenoid operated down valves**, adjustable in their acceleration, down speed and deceleration. They can be used for the revision or inspection travel of the elevator or as a particularly slow down speed valve in addition to the two down speeds of the EV valve to obtain extremely exact floor stops.

**HX sind handbetätigte Senkventile**, die in der Senkgeschwindigkeit einstellbar sind. Beim Loslassen des Griffes schließt sich das Ventil automatisch. Es kann als Notablassventil oder kombiniert mit dem Senkventil des EV Blockes benutzt werden, um eine Übergeschwindigkeit des Aufzuges zu erreichen, damit das Rohrbruchventil geprüft werden kann.

**MX sind magnetbetätigte Senkventile**, die in der Beschleunigung, Senkgeschwindigkeit und Abbremsung einstellbar sind. Sie können entweder für die Revisions- oder Inspektionsfahrt eines Aufzuges benutzt werden oder mit dem EV Ventil als dritte, besonders langsame Senkgeschwindigkeit, um ein sehr präzises Halten des Aufzuges zu ermöglichen.

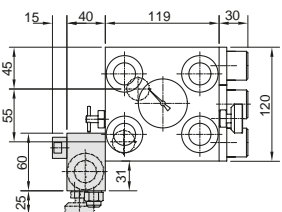
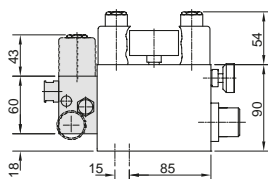
**HX sont des soupapes de descente à commande manuelle** dont la vitesse de descente est réglable. Les soupapes ferment automatiquement dès qu'on lâche le bouton de commande. Elles peuvent être utilisées comme descente de secours ou être combinées avec la soupape de descente du bloc EV pour obtenir une survitesse de descente afin de tester la valve de parachute pour ascenseur.

**MX sont des soupapes de descente à commande électromagnétique** dont l'accélération, la vitesse et le freinage en descente sont réglables. Elles peuvent être utilisées pour la révision ou l'inspection de l'ascenseur, ou être réglées comme une 3-ième vitesse de descente particulièrement lente pour permettre un arrêt très précis.

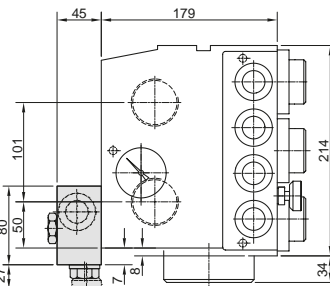
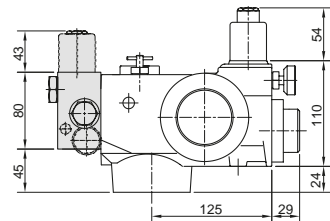
**Las HX son válvulas de bajada accionadas a mano** cuya velocidad se puede regular. Al soltar el manipulador la válvula se cierra automáticamente. Puede ser utilizada como válvula de descarga de emergencia junto con la válvula de bajada el EV, al objeto de conseguir una hipervelocidad, para que la válvula paracaídas para ascensor pueda ser controlada.

**Las MX son válvulas de bajada accionadas por imán**, regulables en la aceleración, velocidad de bajada y deceleración. Pueden emplearse para la marcha de la revisión o inspección del ascensor o como tercera, muy lenta velocidad de bajada, posibilitan una exactísima parada del ascensor.

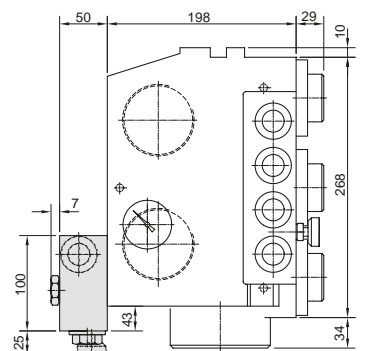
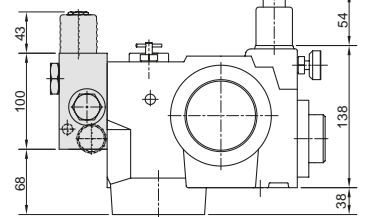
1/4" HX (3/4" EV) 0.50 kg  
1/4" MX



1/2" HX (1 1/2"-2" EV) 0.90 kg  
1/2" MX



3/4" HX (2 1/2" EV) 1.50 kg  
3/4" MX



See also EV prospect.

Siehe auch EV Prospekt.

Autres dates voir prospectus EV.

Véase también prospecto EV.

Blain Hydraulics GmbH  
Pfaffenstrasse 1  
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Germany

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GmbH

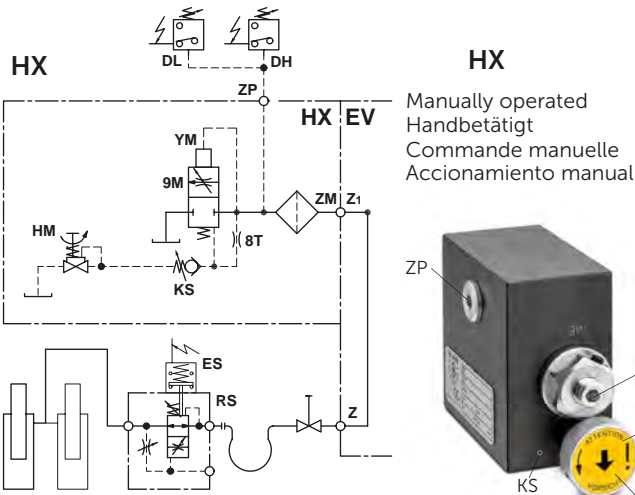
Designer and Manufacturer of the highest quality control valves & safety components for hydraulic elevators



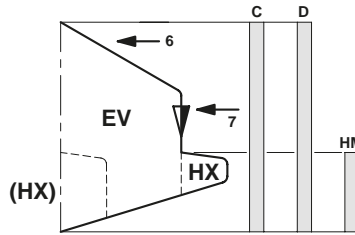
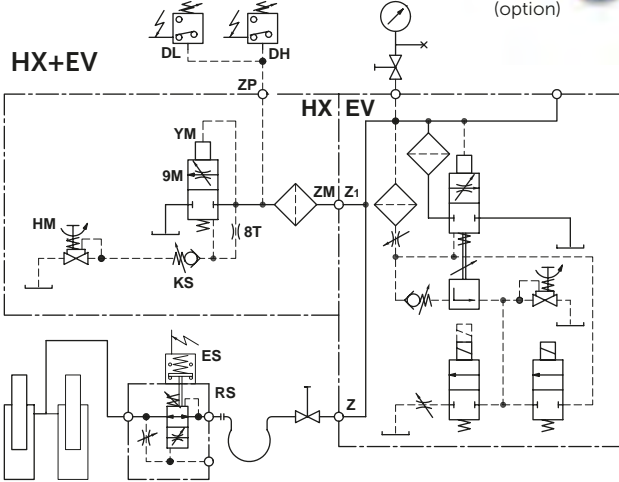
**Hydraulic Circuit**  
**Hydraulisches Steuerschema**  
**Schéma commande hydraulique**  
**Esquemas del mando hidráulico**

**Electrical Sequence**  
**Elektrisches Schaltdiagramm**  
**Diagramme de commande électrique**  
**Diagramas de conexiones eléctricas**

**HX**  
**MX**



HM knob, can be removed (M6 side screw)  
 HM Griff, kann entfernt werden (M6 Seitenschraube)  
 HM poignée, peut être démonté (M6 risserie au côté)  
 HM asidero, puede ser alejado (M6 tornillo a lado)



R 10 closes  
 R 10 schließt  
 R 10 ferme  
 R 10 se cierre

**(GB)**

**Adjustments**

- 6M** Down Acceleration
- 8M** Down Deceleration
- 8T** Fixed orifice
- 9M** Down Speed
- DM** Solenoid
- HM** Manual Lowering
- YM** Down Valve
- ZP** Connection - Pressure Switch

Optional Equipment:

- KS** Slack Rope Valve
- RS** Pipe Rupture Valve
- ES** Pipe Rupture Valve End Switch
- DH** High Pressure Switch
- DL** Low Pressure Switch

For EV control elements refer to EV literature.

**(D)**

**Einstellungen**

- 6M** Anfahrtdrossel 'ab'
- 8M** Abbremsdrossel 'ab'
- 8T** Düse
- 9M** Senkfahrteinstellung
- DM** Magnetventil
- HM** Handablass
- YM** Senkventil
- ZP** Anschluss - Druckschalter

Optionale Erweiterungen:

- KS** Kolbensicherung
- RS** Rohrbruchventil
- ES** Rohrbruchventil Endschalter
- DH** Druckschalter Hochdruck
- DL** Druckschalter Niederdruck

Für EV Steuerelemente siehe EV Prospekt.

**(F)**

**Réglages**

- 6M** Vis d' adjustment 'descente'
- 8M** Étrangleur de ralentissement 'descente'
- 8T** Tuyère
- 9M** Réglage de grande vitesse
- DM** Solénoïde
- HM** Descente manuelle
- YM** Soupape 'descente'
- ZP** Connection interrupteur à pression

Équipement sur demande:

- KS** Sécurité contre mou de câble
- RS** Soupape parachute
- ES** Interrupteur de soupape parachute
- DH** Contact de surpression
- DL** Contact de sous-pression

Pour les éléments de réglage de l'EV voir documentation EV.

**(E)**

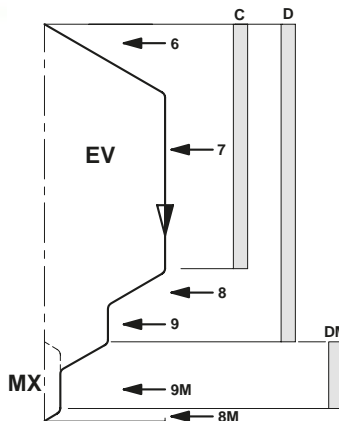
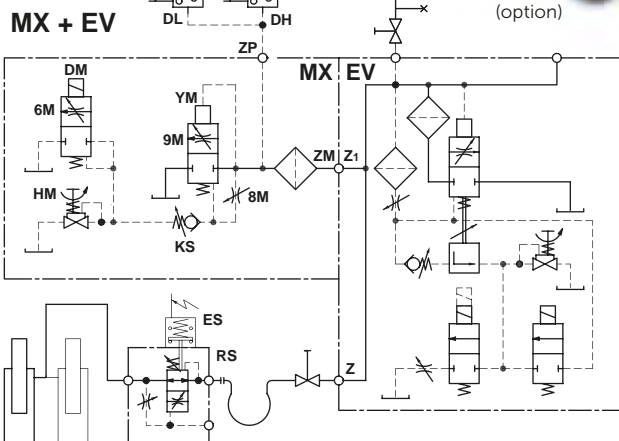
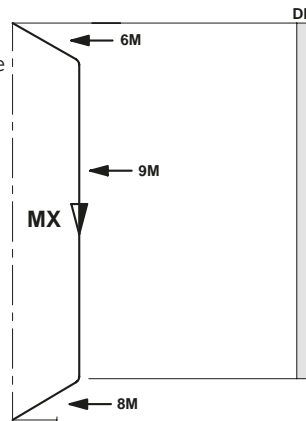
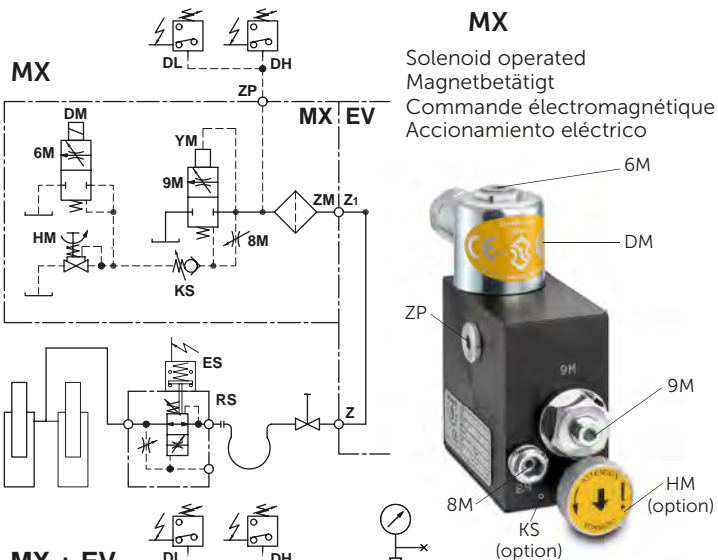
**Reglajes**

- 6M** Reglaje arranque 'bajada'
- 8M** Tornillo frenado en 'bajada'
- 8T** Tobera
- 9M** Reglaje velocidad 'bajada'
- DM** Válvula magnética
- HM** Descarga manual
- YM** Válvula bajada
- ZP** Conexión - Tornillo de presión

Implementos opcionales:

- KS** Válvula aflojamiento cables
- RS** Válvula paracaídas
- ES** Interruptor final válv. paracaídas
- DH** Interruptor de alta presión
- DL** Interruptor de baja presión

Para elementos de mando de la EV veáse el prospecto de la EV.





(GB)



**Warning:** Only qualified personnel should adjust or service valves.

**HX Manual:** **HM** Manual Lowering: Turning 'out' (c-clockwise) opens the valve and allows the car to be lowered.

**9M** Down Speed: The down speed of the car is according to the setting of adjustment **9M**. Turning 'in' (clockwise) provides a slower, turning 'out' (c-clockwise) a faster down speed.

Stop: Upon release, **HM** closes automatically. The car will stop according to the built in damping.

**MX Solenoid:** **6M** Down Acceleration: When solenoid **DM** is energized, the car will accelerate downwards according to the setting of adjustment **6M**. Turning 'in' (clockwise) provides a softer, turning 'out' (c-clockwise) a quicker down acceleration. Preadjustment: **6M** should be turned all the way 'in' (clockwise) and then solenoid **DM** energized. Turn **6M** slowly back 'out' (c-clockwise) until the car accelerates downwards.

**9M** Down Speed: See **9M** above (**HX**).

**8M** Stop: With solenoid **DM** de-energized, the car will decelerate according to the setting of adjustment **8M**. Turning 'in' (clockwise) provides a softer, turning 'out' (c-clockwise) a quicker deceleration.

**KS** Slack Rope Valve: All down solenoids must be de-energised! The **KS** is adjusted with a 3 mm Allan Key. With **K** turned all the way 'in', then half a turn back out, the unloaded car should descend when Manual Lowering **H** is opened. Should the car not descend, **K** must be backed off until the car just begins to descend, then backed off a further half turn to ensure that with cold oil, the car can still be lowered as required.

(F)



**Avertissement:** seul les techniciens qualifiés en ascenseur sont en droit d'effectuer de nouveaux réglages et des travaux d'entretien.

**HX Manuelle:** **HM** Descente manuelle: Ouvrir la valve et l'ascenseur descend à petite vitesse.

**9M** Vitesse en descente: La vitesse de l'ascenseur en descente est fonction de l'étrangleur **9M**. Pour ralentir la vitesse de descente 'visser' l'étrangleur pour l'accélérer, le 'dévisser'.

Stop: Dès qu'on lâche **HM**, l'ascenseur s'arrête en fonction de l'amortissement incorporé.

**MX Électromagnétique:** **6M** Démarrage descente: A la mise sous tension de **DM**, l'ascenseur accélère en descente en fonction du réglage de l'étrangleur **6M**. Pour obtenir un démarrage descente en douceur, 'visser', pour en obtenir un plus brusque, 'dévisser'. Préréglage: Fermer entièrement le réglage **6M** et mettre **DM** sous tension. Dévisser lentement **6M** jusqu'à ce que l'ascenseur démarre en descente.

**9M** Vitesse descente: Voir **9M** ci-dessus (**HX**).

**8M** Stop: Solénoïde **DM** étant sous courant, l'ascenseur ralentit en fonction du réglage de l'étrangleur **8M**. Pour obtenir un ralentissement en douceur, 'visser' l'étrangleur, pour en obtenir un brusque, le 'dévisser'.

**KS** Sécurité contre le mou de câble: Tous les solénoïdes étant sans courant! Elle est réglée au moyen d'un tournevis à empreinte. Veuillez faire baisser l'asc. sans charge et avec la vis **K** entièrement serrée, puis desserrée un demi tour, en même temps gardant la descente de secours **H** est ouverte. Si l'ascenseur s'arrête, la vis à réglage **K** doit être desserrée, jusqu'au point où l'asc. bouge à peine, puis veuillez desserrer la vis à réglage **K** encore un demi tour, ainsi que l'asc. continuellement peut baisser aussi avec d'huile froide.

(D)



**Warnung:** Neueinstellungen und Wartung dürfen nur durch qualifiziertes Aufzugspersonal durchgeführt werden.

**HX Handbetätigung:** **HM** Handablass: Das Drehen nach links öffnet das Ventil und der Aufzug fährt abwärts.

**9M** Senkgeschwindigkeit: Sie ergibt sich entsprechend der Drossel **9M**. 'Hinein' (Uhrzeigersinn) bewirkt eine langsamere, 'heraus' eine schnellere Senkgeschwindigkeit.

Halt: Beim Loslassen schließt **HM** automatisch und der Aufzug hält entsprechend der eingebauten Dämpfung an.

**MX Magnetbetätigung:** **6M** Anfahrt abwärts: Mit Spule **DM** unter Strom beschleunigt der Aufzug entsprechend der Drossel **6M** abwärts. 'Hinein' (Uhrzeigersinn) bewirkt eine weichere, 'heraus' eine härtere Anfahrt abwärts. Voreinstellung: Einstellung **6M** ganz zudrehen und dann Magnetventil **DM** unter Strom setzen. **6M** langsam herausdrehen bis der Aufzug abwärts beschleunigt.

**9M** Senkgeschwindigkeit: Siehe **9M** oben (**HX**).

**8M** Halt: Mit Spule **DM** stromlos, wird der Aufzug entsprechend der Drosseleinstellung **8M** abgebremst. 'Hinein' (Uhrzeigersinn) bewirkt eine weichere, 'heraus' eine härtere Abbremsung.

**KS** Kolbensicherung: Alle Senk-Magnetventile müssen stromlos sein! Mit **K** ganz hineingedreht, dann eine halbe Umdrehung zurück, soll der unbeladene Aufzug abwärts fahren, während Notablass **H** geöffnet ist. Bleibt der Aufzug noch stehen, so muss die Einstellschraube **K** herausgedreht werden bis der Aufzug gerade noch fährt, dann eine halbe Umdrehung herausdrehen, damit sich der Aufzug auch noch bei kaltem Öl absenken lässt.

(E)



**Aviso:** El ascensor sólo debe ser reajustado y mantenido por personal cualificado.

**HX Manual:** **HM** Descarga manual: Al girar a la izquierda de form manual se abre la válvula y el ascensor baja.

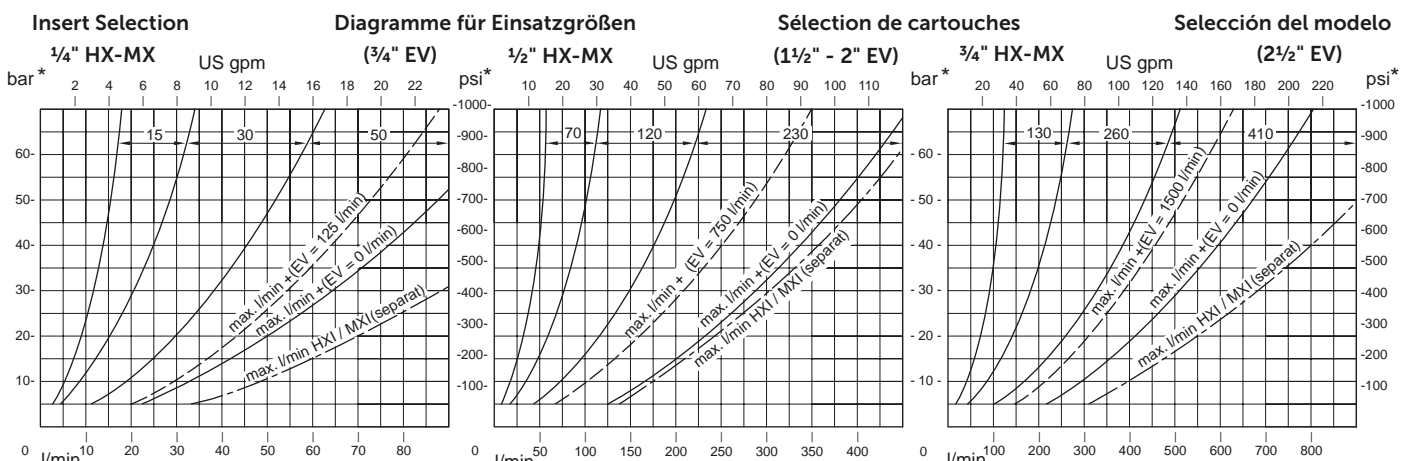
**9M** Velocidad en bajada: La velocidad en bajada del ascensor resulta según la regulación del ajuste **9M**. Girándolo a la derecha se consigue una velocidad en bajada más lenta, y en sentido contrario una más rápida. Stop: Al soltar de **HM**, el ascensor se para de conformidad con la amortiguación incorporada.

**MX Electromagnética:** **6M** Arranque descendente: Si la bobina **DM** está bajo corriente, el descenso del ascensor se acelera conforme al reglaje del tornillo de regulación **6M**. Girándolo a la derecha se obtiene un arranque descendente suave y a la izquierda una brusco. Reglaje preventivo: Girar el tornillo **6M** hasta el tope y después poner la válvula electromagnética **DM** bajo corriente. A continuación girar lentamente el tornillo **6M** en dirección contraria hasta que el ascensor acelere en descenso.

**9M** Velocidad de descenso: Ver **9M** arriba (**HX**).

**8M** Stop: Con la bobina **DM** sin corriente, el ascensor se frenará según la regulación del ajuste **8M**. Girándolo a la derecha, se consigue un frenado más suave, y en sentido contrario uno más brusco.

**KS** Válvula aflojamiento cables: Todas las bobinas sin corriente! Es ajustada con un 3 mm llave con macho hexagonal. Con **K** girado del todo y entonces una media vuelta atrás, el ascensor vacía debe marchar abajo mientras la descarga emergencia **H** está abierta. Si el ascensor todavía queda quieta, el tornillo reg. **K** debe ser desgirado hasta el momento en que el ascensor arranque y entonces **K** debe ser desgirado otra vez una media vuelta hasta el momento en que el ascensor arranque y entonces **K** debe ser desgirado otra vez una media vuelta para asegurar que con el óleo frío todavía se pueda bajar el ascensor.



\* Pressure with empty car \* Druckangaben bei unbeladenem Fahrkorb \* Pression avec cabine vide \* Presión con cabina vacía



# Parts List Liste des pièces de rechange

# Ersatzteil-Liste Lista de las piezas de recambio

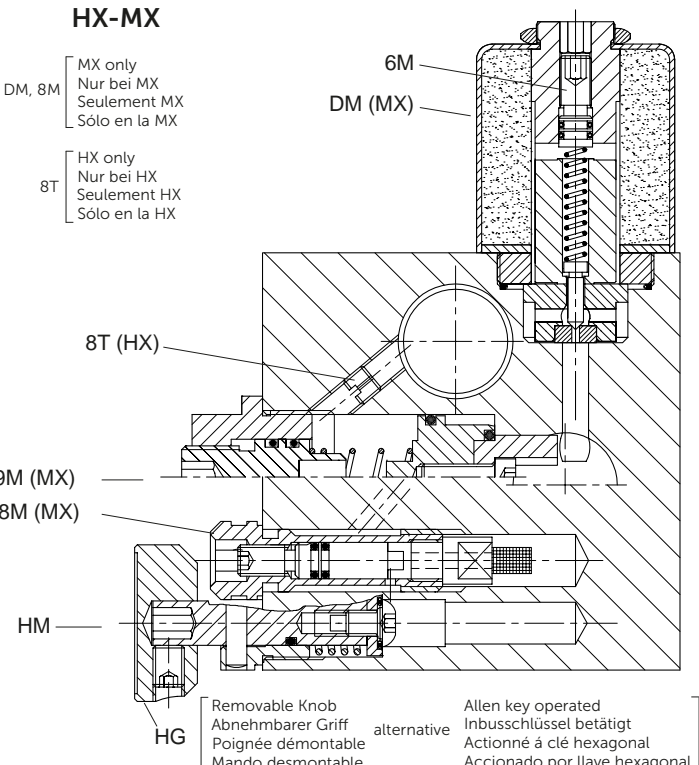
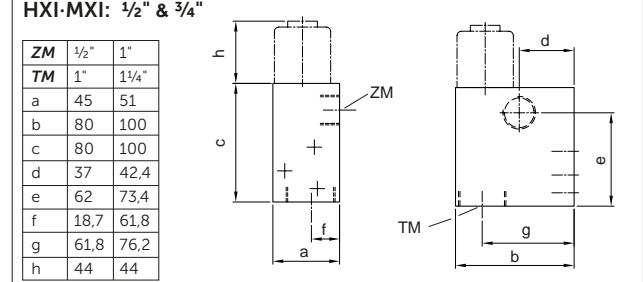
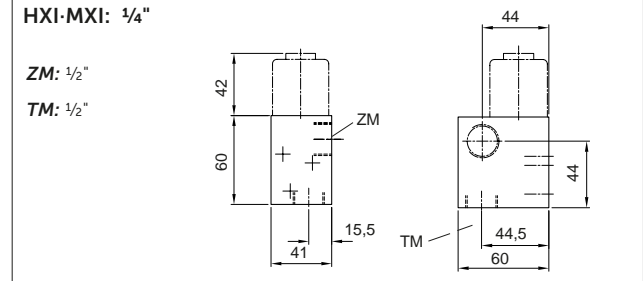
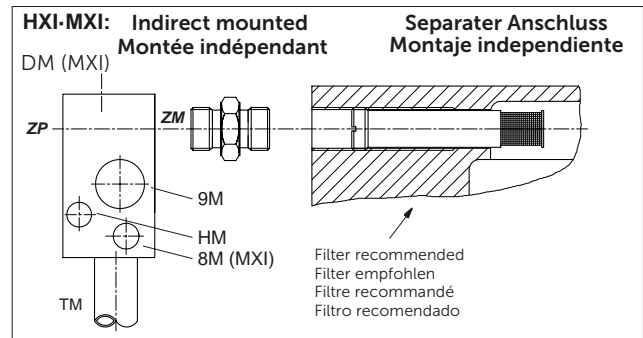
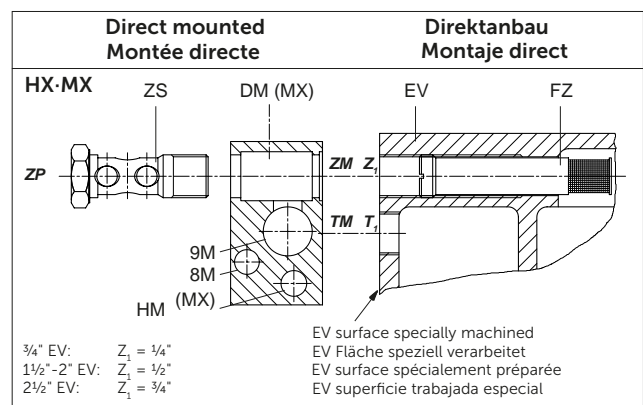
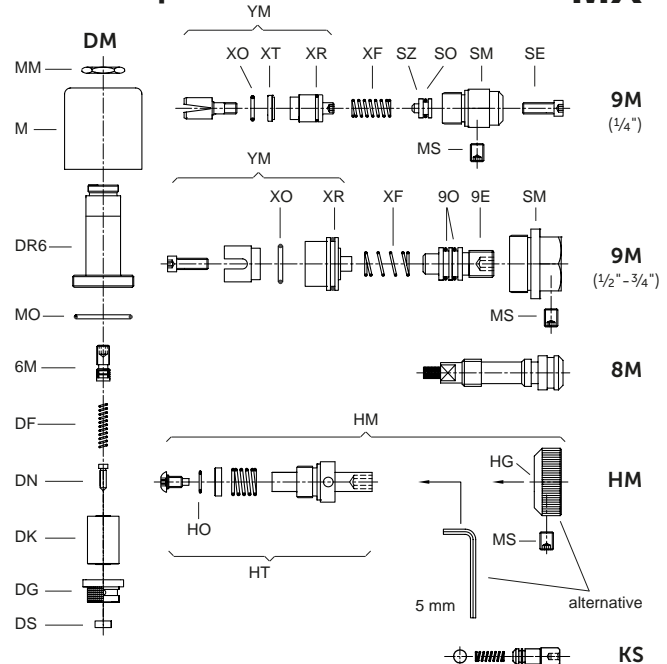
# HX MX

| Pos. No. | Item                                |
|----------|-------------------------------------|
| MM       | Nut - Solenoid                      |
| M        | Coil - Solenoid (indicate voltage)  |
| DR6      | Tube - Solenoid 'Down'              |
| MO       | 0-Ring - Solenoid                   |
| DM       | 6M Adjustment - 'Down' Acceleration |
| DF       | Spring - Solenoid 'Down'            |
| DN       | Needle - 'Down'                     |
| DK       | Core Solenoid                       |
| DG       | Seat Housing w. Screen Sol. 'Down'  |
| DS       | Seat Solenoid 'Down'                |
| 8M       | 8M Adjustment - 'Down' Deceleration |
| ZS       | ZS Connecting Screw                 |
| FZ       | FZ Screwed Filter                   |
| MS       | Locking Screw                       |
| HM       | HG Knurled Knob (self-closing)      |
| HO       | HO Seal Manual Lowering             |
| MS       | Locking Screw                       |
| 9E       | Adjustment - 'Down' Leveling        |
| 9O       | 0-Ring - Adjustment                 |
| XF       | Spring - 'Down' Valve               |
| XR       | 0-Ring - 'Down' Valve               |
| 9M       | YM 'Down' Valve                     |
| XO       | Seal - 'Down' Valve                 |
| XT       | Disc - 0-Ring - Centering           |
| SE       | Adjustment Screw                    |
| SM       | Hexagonal                           |
| SO       | 0-Ring Nipple                       |
| SZ       | Nipple                              |

| Pos. Nr. | Benennung                              |
|----------|--|
| MM       | Mutter - Magnetventil                  |
| M        | Magnetspule (Spannung angeben)         |
| DR6      | Rohr - Magnetventil 'ab' mit Einst. 6  |
| MO       | 0-Ring Magnetventil                    |
| DM       | 6M Anfahrddrossel 'ab'                 |
| DF       | Feder - Magnetventil 'ab'              |
| DN       | Nadel Magnetventil 'ab'                |
| DK       | Kern - Magnetventil 'ab'               |
| DG       | Sitzhalter mit Sieb - Magnetv. 'ab'    |
| DS       | Sitzscheibe - Magnetventil 'ab'        |
| 8M       | 8M Abbremsdrossel 'ab'                 |
| ZS       | ZS Anschlussschraube                   |
| FZ       | FZ Einschraubfilter                    |
| MS       | Sicherungsschraube                     |
| HM       | HG Griff-Handablass - selbstschließend |
| HO       | HO Dichtung - Handablass               |
| MS       | Sicherungsschraube                     |
| 9E       | Einstellschraube - Schleichfahrt       |
| 9O       | 0-Ring - Einstellschraube              |
| XF       | Feder - Senkventil                     |
| XR       | 0-Ring - Senkkolben                    |
| 9M       | YM Senkkolben                          |
| XO       | Dichtung - Senkkolben                  |
| XT       | Teller - 0-Ringzentrierung             |
| SE       | Einstellschraube                       |
| SM       | Sechskant                              |
| SO       | 0-Ring - Zapfen                        |
| SZ       | Zapfen                                 |

| Pos. No. | Dénomination                            |
|----------|---|
| MM       | Ecrout de l'électro - vanne             |
| M        | Bobine (indiquer tension)               |
| DR6      | Tube de l'électro - vanne 'descente'    |
| MO       | 0-Ring de l'électro - vanne             |
| DM       | 6M Vis d'ajustement - 'descente'        |
| DF       | Ressort de l'électro - vanne 'desc.'    |
| DN       | Pointeau de l'électro - vanne 'desc.'   |
| DK       | Noyau de l'électro - vanne 'desc.'      |
| DG       | Support de siège avec filtre - 'desc.'  |
| DS       | Disque de siège d'électro-vanne 'de.'   |
| 8M       | 8M Etrangleur de ralentissement 'desc.' |
| ZS       | ZS Vis de raccordement                  |
| FZ       | FZ Filtre insérable                     |
| MS       | Vis de fixation                         |
| HM       | HG Poignée de 'descente' manuelle       |
| HO       | HO Joint étanche de 'descente'          |
| MS       | Vis de fixation                         |
| 9E       | Vis d'ajustage de petite vitesse        |
| 9O       | 0-Ring de la vis d'ajustage             |
| XF       | Ressort de la valve 'descente'          |
| XR       | 0-Ring - Piston de 'descente'           |
| 9M       | YM Piston de 'descente'                 |
| XO       | Joint étanche du piston de 'desc.'      |
| XT       | Disque - 0-Ring de centrage             |
| SE       | Vis d'ajustage                          |
| SM       | Vis six pans creux                      |
| SO       | 0-Ring du tenon                         |
| SZ       | Tenon                                   |

| Pos. No. | Denominación                        |
|----------|-------------------------------------|
| MM       | Tuerca - válvula magnética          |
| M        | Bobina magnética (indicar tensión)  |
| DR6      | tubo - válvula magnética 'bajada'   |
| MO       | Anillo 0 - válvula magnética        |
| DM       | 6M Tornillo arranque en 'bajada'    |
| DF       | Muelle - válvula magnética 'bajada' |
| DN       | Aguja - válvula magnética 'bajada'  |
| DK       | Núcleo - válvula magnética 'bajada' |
| DG       | Soporte - asiento con tamiz 'baj.'  |
| DS       | Disco asiento - válv. mag. 'bajada' |
| 8M       | 8M Tornillo frenado en 'bajada'     |
| ZS       | ZS Tornillo de conexión             |
| FZ       | FZ Filtro para atornillar           |
| MS       | Tornillo de afianzamiento           |
| HM       | HG Mando accionamiento desc. manual |
| HO       | Junta - descarga manual             |
| MS       | Tornillo de afianzamiento           |
| 9E       | Tornillo regulación                 |
| 9O       | Anillo 0 - Tornillo regulación      |
| XF       | Muelle - válvula de 'bajada'        |
| XR       | Anillo 0 - émbolo 'bajada'          |
| 9M       | YM Émbolo de 'bajada'               |
| XO       | Junta - émbolo de 'bajada'          |
| XT       | Platillo centrage junta 0           |
| SE       | Tornillo de regulación              |
| SM       | Hexágono                            |
| SO       | Junta 0 - pivote                    |
| SZ       | Pivote                              |





Can cause down leak:  
replace complete flow guide.  
Kann ein Leck verursachen:  
Senkkolben ersetzen.  
Peut causer une fuite:  
remplacer le piston descente.  
Puede causar escape:  
Cambie embolo bajada.

EV 3/4" 9.00 x 1.50  
EV 1 1/2" 25.00 x 2.00

**Cannot** cause down leak.  
Kann **kein** Leck verursachen.  
**N'est pas** la cause de fuites en descente.  
**No** puede causar derrame.

EV 3/4" 26.00 x 2.00  
EV 1/2" 39.34 x 2.62

not recommended for Pmax > 50bar  
nicht empfohlen für Pmax > 50bar

**CX Pressure Compensated Down Flow Guide** recommended for use to maintain down speed within close limits when empty to full loading ratios of the elevator exceed 1:2.5. The CX is interchangeable with the standard flow guide and is selectable using the same chart.

**CX Druckkompensierter Senkkolben** wird empfohlen, um die Senkgeschwindigkeit bei Veränderung von Leerlast zu Vollast im Verhältnis 1:2,5 konstant zu halten. Der CX ist mit dem Standardkolben austauschbar und nach dem gleichen Diagramm auswählbar.

**CX soupape de descente compensée par pression** recommandée pour conserver une vitesse de descente constante pour des variations de charge de vide à maxi dans un rapport de 1:2.5. La CX est interchangeable avec le piston standard, et, sélectionné selon le même diagramme.

**CX Válvula de bajada compensada** se recomienda, para mantener la velocidad de bajada constante, cuando se cambie la carga vacía o llena en la proporción de 1:2.5. El CX es intercambiable con el pistón standard y es selectivo según el mismo diagrama.



EN Wiring Instructions  
EN instruction des fils conducteurs électriques

! Bei Wechselspannung – Transformatorereffekt. Separate Verdrahtung bei Verwendung von 2 EN-Spulen notwendig.  
! Courant alternatif - Effet de transformateur. En cas d'utilisation de 2 bobines EN - Câblage séparé à utiliser.  
! Corriente alterna - efecto de transformador (el caudal del corriente es revuelto) En caso de que conectan 2 EN bobinas - usa cableado separado

Standard Cable

- Main coil/Hauptspule/Bobine principal/Bobina principal
- Zero wire/Null Leiter/Conducteur neutre/Conductor neutro
- Emergency coil/Notstromspule/Bobine descente de secours/Válvula de emergencia
- Zero wire/Null Leiter/Conducteur neutre/Conductor neutro
- + Ground/Erde/Terre/Tierra

brown/braun/ bruno /marrón  
blue/blau/ bleu /azul  
black/schwarz/ noir /negro  
white/weiss/blanc /blanco  
yellow-green/gelb-grün /jaune-vert/amarillo-verde

**EN Emergency Power Coil.** Should there be an interruption of the main power to the elevator, the emergency lowering coil EN, fed by an emergency 12 V DC or 24 V DC supply, enables a command to be given from the car or elsewhere to lower the car to the floor below. When ordering please state main and emergency voltages. Is the main Voltage below 100 V, all emergency coils have 4 wires (black, blue, brown, white).

**EN Notstromspule.** Im Falle einer Stromunterbrechung in der Hauptstromleitung zum Aufzug, ermöglicht die Notstromspule EN, die durch 12 V = oder 24 V = angetrieben wird, ein Signal aus der Kabine oder woanders her zu geben, um die Kabine zur nächsten Etage abzusenken. Bei Bestellung bitte die Haupt- sowie die Notstromspannung angeben. Unter 100 V Hauptspannung besitzen alle Notstromspulen 4 Leiter (schwarz, blau, braun, weiss).

Is the main Voltage above 100 V, a 5th wire (green-yellow) is added for the ground.

Über 100 V Hauptspannung kommt noch ein 5. Leiter (grün-gelb) für die Erde hinzu.

**EN bobine descente de secours.** En cas de coupure du courant principal de l'ascenseur, la bobine EN alimentée en courant de secours 12 V DC ou 24 V DC, permet, à la suite d'une commande l'évacuation de la cabine à l'étage inférieur désiré. A la commande préciser s'il vous plaît la tension nominale ainsi que la tension de secours. Si la tension principale est d'en bas de 100 V toutes les bobines descente de secours ont 4 câbles (noir, bleu, brun, blanc).

**EN Bobina de corriente de emergencia.** En caso de interrupción del conductor principal de corriente para el ascensor, la válvula de emergencia EN, accionamiento por emergencia de 12 V CC o 24 V CC, posibilita que se pueda dar un comando de abajo de la cabina o otro sitio. Cuando pidan, por favor, nos den el voltaje principal y el de emergencia. De menos de 100 V de tensión principal todas las bobinas de emergencia tienen 4 conducciones (negro, azul, marrón, blanco). Más de 100 V de tensión principal se sobreviene aún una 5. dirección (amarillo-verde) por la tierra.

**DH/DL**

Adjustment external  
Einstellung außen  
Réglages externes  
Ajuste external

|       |              |
|-------|--------------|
| DL428 | 1 - 10 bar   |
| DL429 | 2 - 20 bar   |
| DH430 | 5 - 50 bar   |
| DH432 | 10 - 100 bar |
| DH433 | 25 - 250 bar |

Switch contact  
Contact

Schaltkontakt  
Interruptor de contacto

**Tech. data**  
Max. V. 4 A/250 V~  
Insulation: IP65  
Hysteresis: 10 - 30%

**Connector**  
Part. No. 1 180 652 002

Adjustment  
Einstellung  
Réglages  
Ajuste

|      |              |
|------|--------------|
| DL58 | 1 - 10 bar   |
| DH59 | 10 - 50 bar  |
| DH61 | 10 - 100 bar |

**DL, DH Pressure Switches**  
DL switches are used to signal a drop in hydraulic pressure below the normal operating pressure. DH switches are used to signal hydraulic pressure above the normal operating pressure.

**DL, DH Druckschalter**  
DL Schalter signalisieren ein Absinken des hydraulischen Druckes unter gewünschte Werte. DH Schalter signalisieren ein Ansteigen des hydraulischen Druckes über gewünschte Werte.

**DL, DH Interrupteur à pression**  
DL indique une baisse de pression par rapport à la pression de référence. DH indique une augmentation de pression par rapport à la pression de référence.

**DL, DH Interruptores de presión**  
DL Interruptores signalizan una disminución de la presión hidráulica por debajo de valores deseados. DH Interruptores signalizan una aumentación de la presión hidráulica por encima de valores deseados.

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Designer and Manufacturer of the highest quality control valves & safety components for hydraulic elevators

**Pressure Compensated Down Valve  
for EV Valves**

**Druckkompensiertes Senkventil  
für EV Ventile**



Standard Down Valve X  
Standard Senkventil X



Compensated Down Valve CX  
Kompensiertes Senkventil CX

Down valves X and CX are interchangeable

Senkventile X und CX sind austauschbar

**'X' Advantages**

- Smoother operation
- Shorter travel time with load
- Only the o-rings need to be serviced
- Lower cost

**'X' Vorteile**

- Weichere Fahreigenschaften
- Kürzere Fahrtzeit mit Zuladung
- Nur die O-Ringe müssen bei Wartungen getauscht werden
- Geringere Kosten

**'CX' Advantages**

- No overspeeding with excessive load

**'CX' Vorteile**

- Keine überhöhte Geschwindigkeit bei übermäßiger Zuladung

**Application**

We recommend using the standard 'X' down valve as long as the total full pressure is less than 2 times the empty car load. Compensated down valves are available for all EV 100 sizes.

**Anwendung**

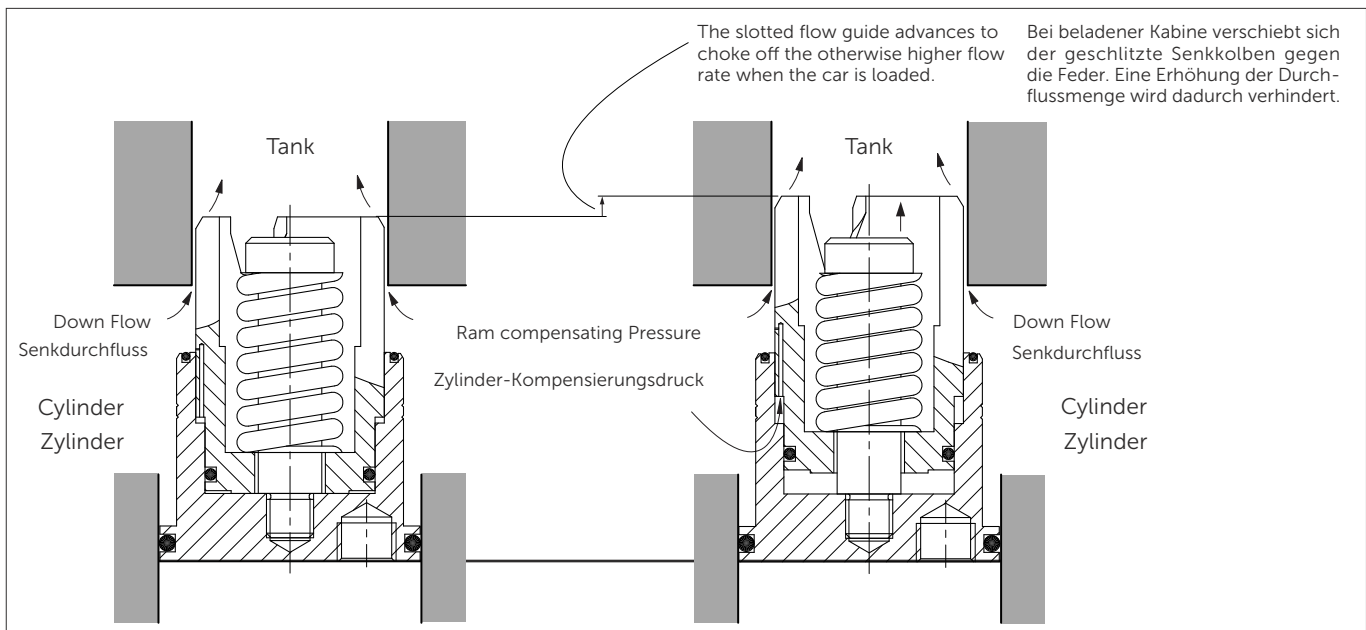
Wir empfehlen den Einsatz des kompensierten Senkventils 'CX', sobald das Gesamtdruck der beladenen Kabine das 2-fache der leeren Kabine überschreitet. Kompensierte Senkkolben sind für alle Größen des EV 100 erhältlich.

**Performance comparison**

Standard Down Valve X:  
An increase in load of 100% will cause an increase in down speed of approximately 60%.  
Compensated Down Valve:  
An increase in load of 100% will cause a change of down speed within  $\pm 10\%$ .  
Not recommended when system pressure exceeds above 50 bars.

**Leistungsvergleich**

Standard Senkventil X:  
Eine Erhöhung der Zuladung von 100% verursacht eine Erhöhung der Senkgeschwindigkeit um etwa 60%.  
Kompensiertes Senkventil:  
Eine Erhöhung der Zuladung von 100% verursacht eine Veränderung der Senkgeschwindigkeit von  $\pm 10\%$ .  
Eine Kompensierung erfolgt bis 50bar.



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# KS Slack Rope Valve (KS) option for EV, KV and L10

# Kolbensicherung (KS) Option für EV, KV und L10



GB

D

## Purpose

In the case of the operation of the safeties in a 2:1 hydraulic lift system where the weight of the car is no longer carried by the ropes, the electrical supply to the elevator should automatically be switched off. As the ram comes to a stop, usually after about 60 cm, a limited slack rope condition will occur. The **KS** Slack Rope Valve avoids the RAM being lowered by the opening of the manual lowering valve which would otherwise cause additional slack rope. The **KS** Slack Rope Valve prevents the pressure holding up the RAM from being evacuated through the manual lowering valve. The **KS** adjustment is next to adjustment **7** and **9** on the Down Flange on the EV valve and on the left hand side directly under the Manual Lowering on the KV valve.

## Function

The **KS** valve is adjusted to a pressure just above the pressure produced by the weight of the ram. When under normal operating conditions, the weight of the car acts upon the ram through the 1:2 roping, the resulting pressure is sufficient to open the poppet of the **KS** valve when the manual lowering **H** is opened, allowing the car to descend as required. When however the 'safeties' have operated and only the weight of the ram and sheave block are acting upon the hydraulic system, the resulting pressure is too low to open the **KS** valve. The ram and sheave block can not be lowered.

## Adjustment

The **KS** is adjusted with a 3 mm Socket Key by turning the screw **K** 'in' for higher pressure and 'out' for lower pressure. With **K** turned all the way 'in', then half a turn back out, the unloaded car should descend when the **D** solenoid alone is energised. Should the car not descend, **K** must be backed off until the car just begins to descend, then backed off a further half turn to ensure that with cold oil, the car can be lowered as required.

## Zweck

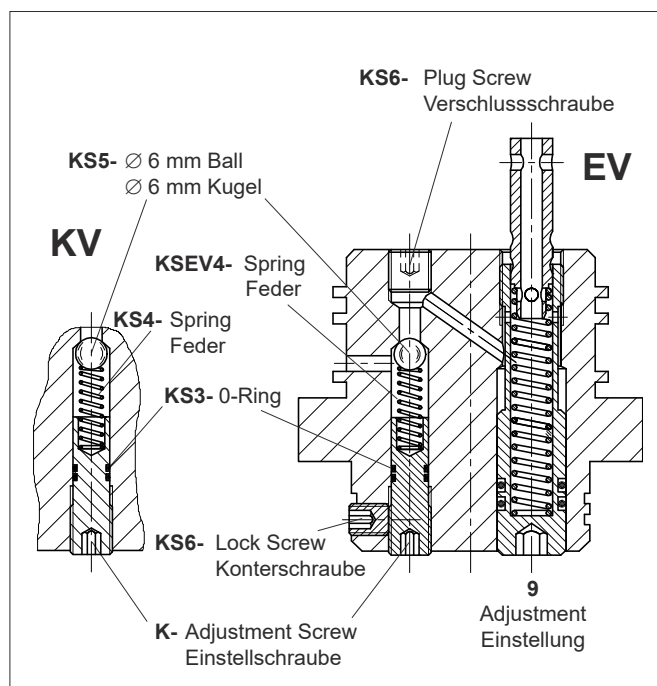
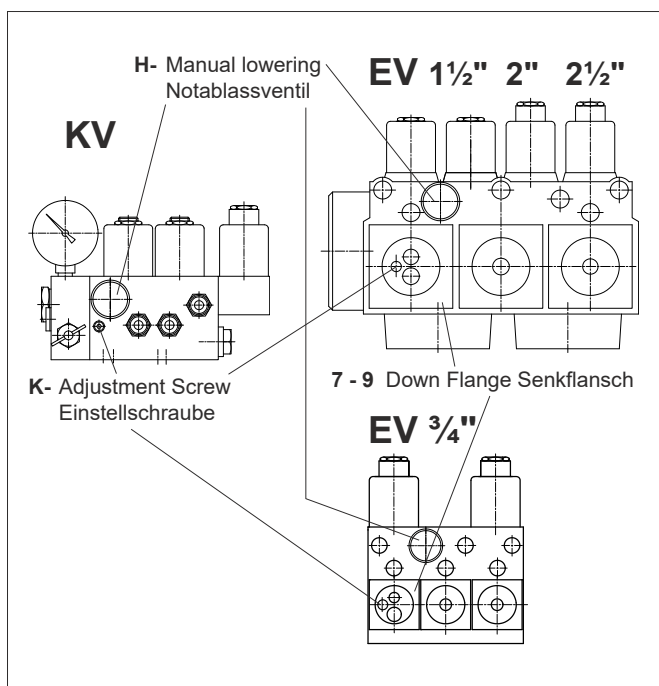
Bei einem 2:1-Aufzug, der in Fang geht, kommt der unbeladene Kolben erst nach ca. 60 cm zum Stillstand, sodass ein gewisses 'Schlaffseil' entsteht. Um zu verhindern, dass beim Öffnen des Notablassventils der Aufzugs-Kolben absinkt und die Seile schlaff werden, ist die Kolbensicherung **KS** vorzusehen. Diese befindet sich neben den Einstellungen **7** und **9** im Senkventilflansch am EV Ventil und direkt links unter dem Notablass am KV.

## Funktion

Durch den Druck, verursacht vom Gesamtgewicht des Zylinderkolbens mit Seil-Joch einerseits und der Aufzugskabine andererseits, öffnet sich die Kolbensicherung beim Betätigen des Notablassventils **H**. Dies verursacht das erwünschte Absinken des Aufzuges. Wenn jedoch die Aufzugskabine im "Fang" ist, wirkt lediglich das Gewicht von Aufzugs-Kolben mit Seil-Joch auf das hydraulische System, wodurch zu wenig Druck entsteht, um die Kolbensicherung **KS** zu öffnen. Der Aufzugs-Kolben mit Seil-Joch bleibt stehen.

## Einstellung

Zur Einstellung der Kolbensicherung (mit einem 3 mm Inbusschlüssel) vorher die Konterschraube lösen (nur bei EV). Anschließend, je nach Notwendigkeit, die Einstellschraube **K** hinein- (höherer Druck) oder herausdrehen (niederer Druck). Mit **K** ganz hineingedreht, dann eine halbe Umdrehung zurück, soll der unbeladene Aufzug abwärts fahren, während nur Spule **D** unter Strom steht. Bleibt der Aufzug noch stehen, so muss die Einstellschraube **K** herausgedreht werden bis der Aufzug gerade noch fährt, dann eine weitere halbe Umdrehung herausdrehen, damit sich der Aufzug auch bei kaltem Öl absenken lässt. Konterschraube wieder sichern.



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GmbH

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# Sécurité contre le mou de câble 'KS' pour EV, KV et L10 d'ascenseur

(F)

## Usage

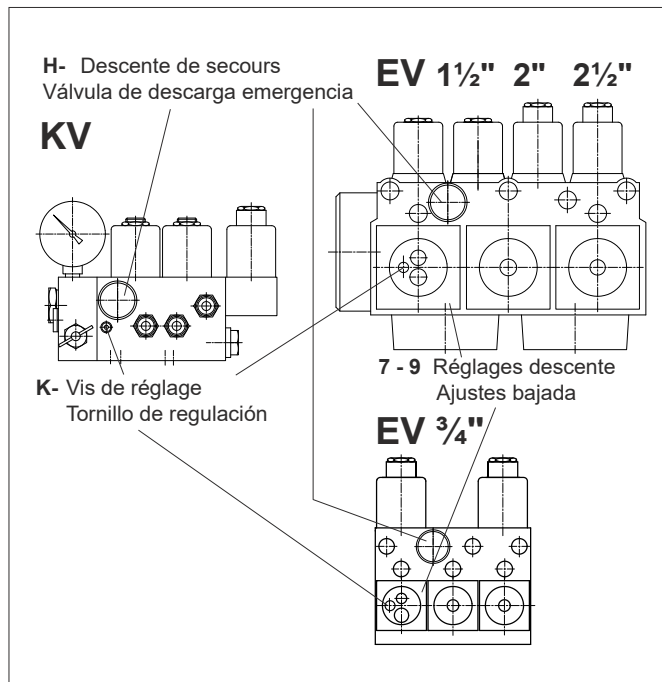
La valve de piston **KS** est conçue pour empêcher à un système d'élévation 1:2 en prise de sécurité que lors de l'ouverture du descente de secours, le piston d'élévation descende et que les câbles se détendent. Cette valve se trouve à côté des réglages **7** et **9** dans le manchon de la valve de descente sur la valve EV et directement à gauche sous le descente de secours du KV.

## Fonction

La valve du piston s'ouvre sous l'effet de la pression, causée par le poids total du piston cylindrique avec joug du câble d'une part et de la cabine d'élévation d'autre part, si l'on actionne descente de secours **H**. Ceci provoque la descente souhaitée de l'ascenseur. Cependant si la cabine de l'ascenseur est en „prise de sécurité”, seul le poids du piston d'élévation avec joug du câble agira sur le système hydraulique, ce qui aura pour conséquence que la pression pour ouvrir le sécurité contre le mou de câble **KS** sera trop faible. Le piston d'élévation et le joug du câble resteront immobiles.

## Réglage

On pourra ajuster le sécurité contre le mou de câble avec une clé mâle coudée de 3 mm en desserrant le contre-écrou (seulement à EV) et en faisant entrer (pression plus élevée) ou sortir (pression plus faible) la vis de réglage **K**. Alors que **K** est entièrement entrée et qu'on la dévisse ensuite d'une demi-rotation, l'ascenseur sans charge devra descendre alors que seule la bobine **D** est active. Si l'ascenseur reste immobile, il faut dévisser la vis de réglage **K** jusqu'à ce que l'ascenseur se mette en mouvement puis dévisser encore d'une autre demi-rotation afin que l'ascenseur descende même si l'huile est froide.



# Válvula de aflojamiento cables 'KS' para válvulas de control de ascensor EV, KV y L10

(E)

## Objetivo

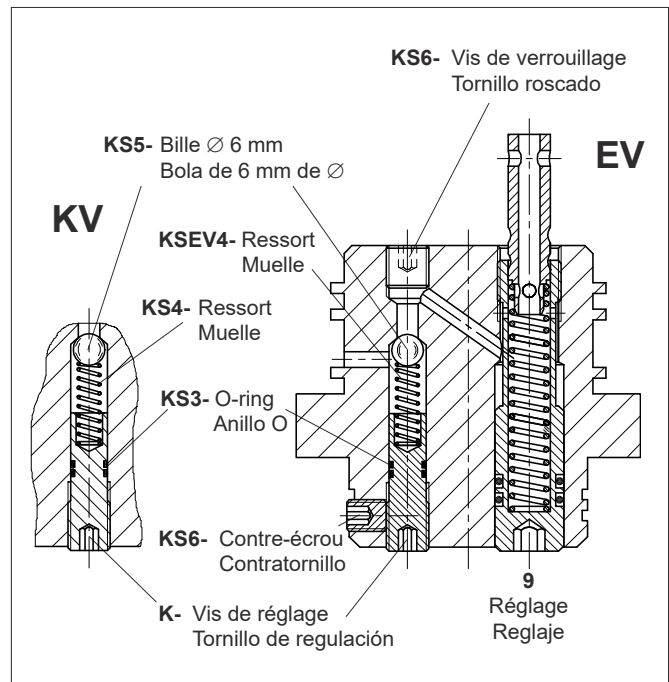
La válvula de aflojamiento cables **KS** sirve para evitar que en un ascensor 1:2 y el émbolo cual está detenido por maniobra de socorro manual, descienda al abrir la descarga de emergencia y se aflojen los cables. Está ubicado junto a los reglajes **7** y **9** en la brida de la válvula de bajada en la válvula EV y justo a la izquierda debajo de la descarga de emergencia en KV.

## Función

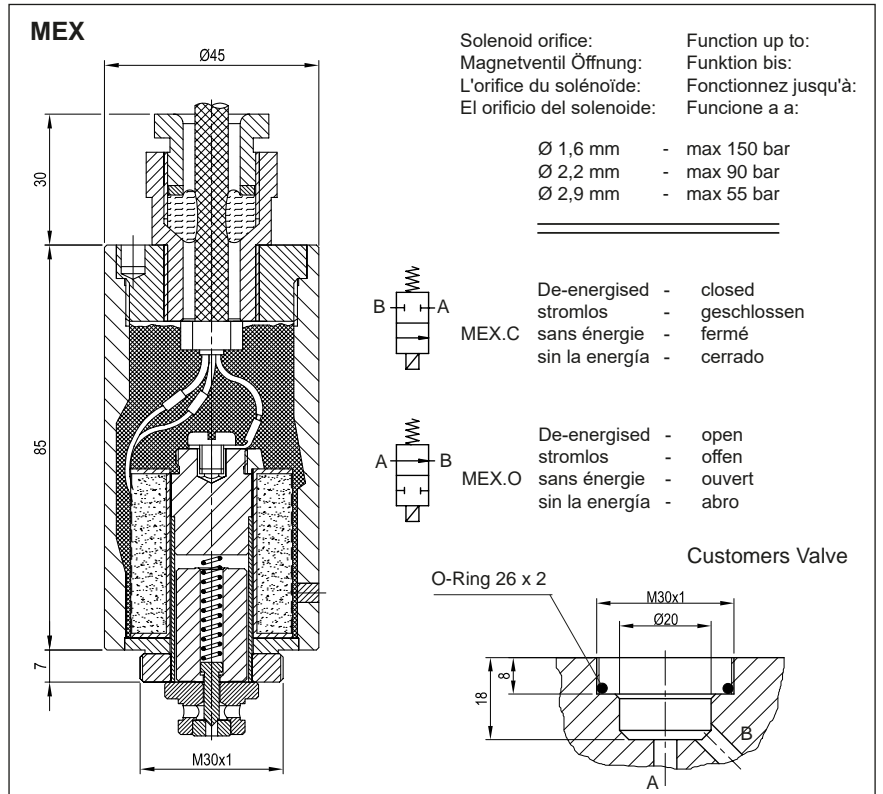
La presión originada por el peso total del émbolo del cilindro con el yunque de los cables y por la cabina del ascensor provoca la apertura de la válvula de aflojamiento cables al accionar la válvula de descarga de emergencia **H**. Así se consigue el descenso deseado del ascensor. Sin embargo, cuando la cabina del ascensor se encuentra detenida por maniobra de socorro manual, sobre el sistema hidráulico sólo ejerce peso el émbolo del ascensor con el yunque de los cables, por lo que la presión generada no es suficiente para abrir la válvula de aflojamiento cables **KS**. Consecuentemente, el émbolo del ascensor con el yunque de los cables se queda detenido.

## Reglaje

La válvula de aflojamiento cables se regula con una llave hexagonal de 3 mm soltando el contratornillo (sólo EV) y enroscando (más presión) o desenroscando (menos presión) el tornillo de regulación **K**. Cuando **K** se halla completamente enroscado y se da media vuelta en sentido inverso, el ascensor sin carga tiene que bajar, estando sólo bajo corriente la bobina **D**. Si el ascensor aún sigue parado, hay que desenroscar el tornillo de regulación **K** de tal forma que el ascensor aún se mueva; a continuación, desenroscar el tornillo una media vuelta más, para que el ascensor también pueda descender cuando el aceite esté frío.







(GB)

**Explosion Proof Solenoids**

For use with the electrical pilot control of hydraulic valves.  
 Maximum operating pressure: 160 bar depending on orifice diameter.  
 Maximum flow orifice: Ø 2.9 mm.  
 Cable: UNI-Therm 180 SIHF.  
 Standard length 2 metres.  
 For use with equipment and protective systems, intended for use in potentially explosive atmospheres-directive 94/9 EG.  
 EC-type-examination certificate-number: PTB 02 ATEX 2193 X.  
 Compliant with EN 50014: 1997 and EN 50028: 1987.  
 (Ex) II 2 G EEx m II T4  
 Ambient temp. -20°C to 60°C temperature class T4  
 Encapsulation 'm'  
 Housing protection class IP 68

(D)

**Explosiongeschütztes Magnetventil**

Verwendung zur elektr. Steuerungs-Kontrolle hydr. Ventile.  
 Max. Arbeitsdruck: 160 bar, vom Öffnungs-Durchmesser abhängig.  
 Maximale Strömungs-Öffnung: Ø 2,9 mm.  
 Kabel: UNI-Therm 180 SIHF.  
 Standard Länge 2 Meter.  
 Magnetventil zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - Richtlinie 94/9 EG.  
 EG-Baumusterprüfbescheinigung: PTB 02 ATEX 2193 X.  
 Übereinstimmung mit EN 50014: 1997 und EN 50028: 1987.  
 (Ex) II 2 G EEx m II T4  
 Umgebungstemp. -20°C bis 60°C; Temperatur-Klasse T4  
 Zündschutzart "m".  
 Gehäuseschutz-Klasse IP 68.

(F)

**L'explosion Solénoïdes Insensibles**

Pour usage comme le contrôle pilote électrique de valves.  
 La pression du fonctionnement maximale: 160 bar selon diamètre de l'orifice.  
 L'orifice du courant maximal: Ø 2,9 mm.  
 Le câble: UNI-therm 180 SIHF.  
 La longueur standard 2 mètres.  
 Pour usage avec matériel et systèmes protecteurs, projeté pour usage dans les atmosphères potentiellement explosives directive 94/9 EG.  
 CE type examen certificate - numéro: PTB 02 ATEX 2193 X.  
 Conforme avec EN 50014: 1997 et EN 50028: 1987.  
 (Ex) II 2 G EEx m II T4  
 Temp. ambiante. -20°C à 60°C classe de la température T4  
 Encapsulation 'm'  
 La logeant classe de la protection IP 68

(E)

**Los Solenoides de Prueba de explosión**

Para el uso como el mando modelo eléctrico de válvulas hidráulicas.  
 Presión máxima de operación: 160 bar que depende del diámetro del orificio.  
 El Orificio de Flujo máximo: Ø 2,9 mm.  
 El cable: UNI-Therm 180 SIHF.  
 La Longitud normal 2 metros.  
 Para el uso con el Equipo y Sistemas de la Protección, intencional para el uso en Potencialmente Explosivo Atmósfera-director 94/9 EG.  
 El Certificado-número del CEE-tipo-examen: PTB 02 ATEX 2193 X.  
 Dócil con EN 50014: 1997 y EN 50028: 1987.  
 (Ex) II 2 G EEx m II T4  
 Temp ambiente. -20°C a 60°C Clase de Temperatura T4  
 Encapsulación 'm'  
 Alojando la Clase de Protección IP 68

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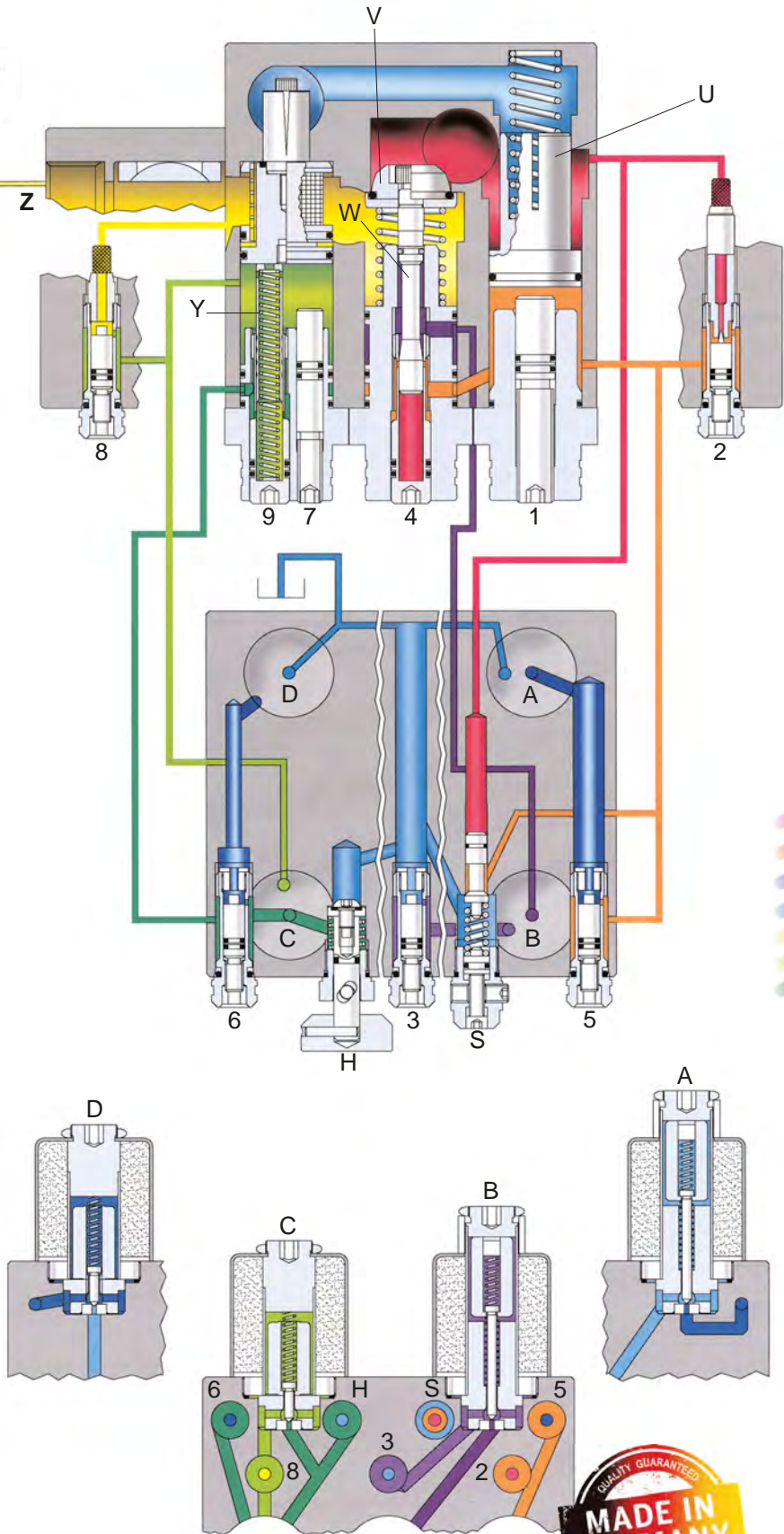
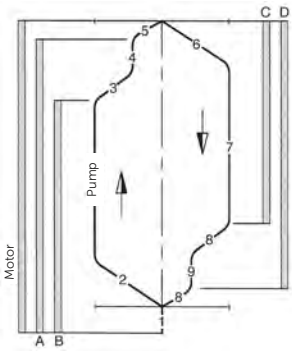
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EN ISO 9001

# Elevator Control Valves

# EV100 3/4"



P Pump Port  
T Tank Port  
Z Cylinder Port

Horizontal Sections

**Pressure**

- Pump
- Bypass Valve
- Up Leveling
- Tank
- Cylinder
- Down Valve
- Down Levelling

**Control Elements**

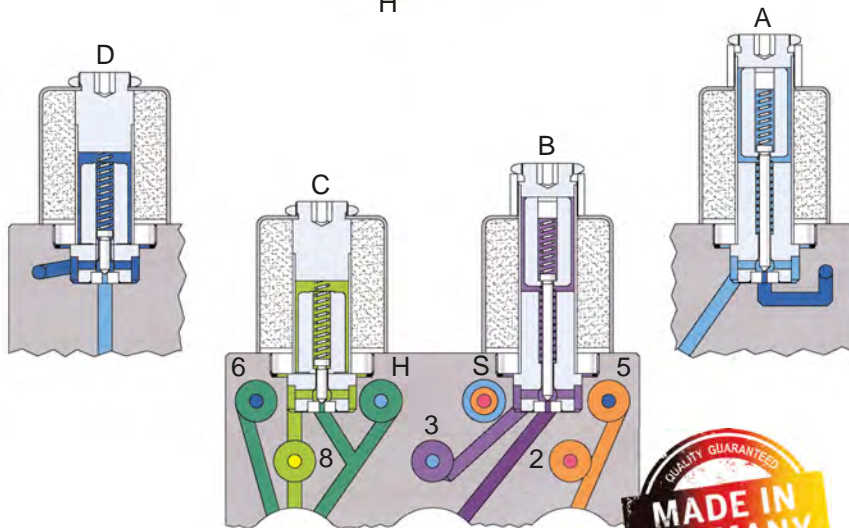
- A Solenoid (UP Stop)
- B Solenoid (UP Deceleration)
- C Solenoid (Down Deceleration)
- D Solenoid (Down Stop)
- H Manual Lowering
- S Relief Valve
- U By Pass Valve
- V Check Valve
- W Levelling Valve (Up)
- X Full Speed Valve (Down)
- Y Levelling Valve (Down)

**Adjustments UP**

- 1 By Pass
- 2 Up Acceleration
- 3 Up Deceleration
- 4 Up Levelling Speed
- 5 Up Stop

**Adjustments DOWN**

- 6 Down Acceleration
- 7 Down Full Speed
- 8 Down Deceleration
- 9 Down Levelling Speed



Vertical Section

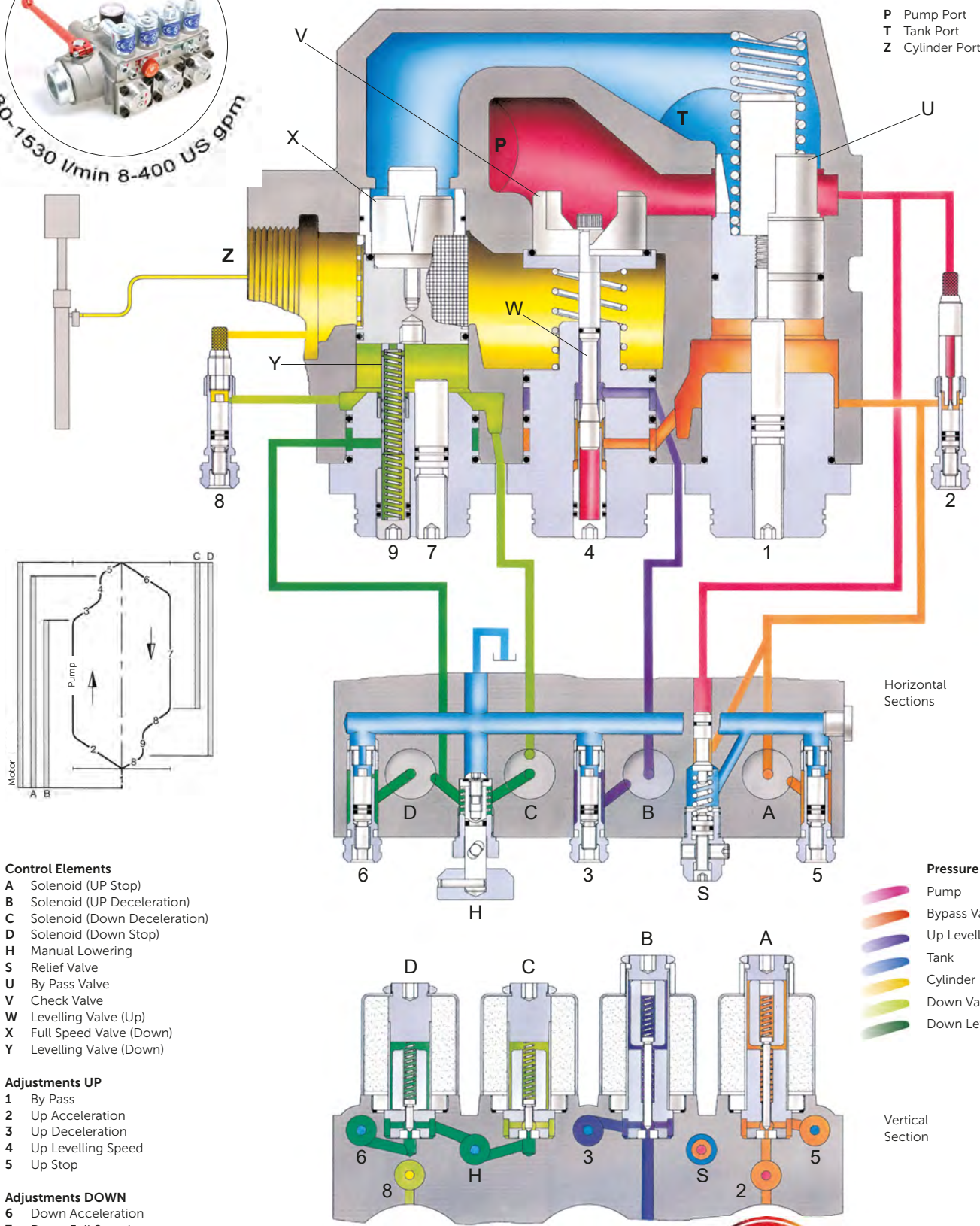


# EV100 1½"-2½"

# Elevator Control Valves



P Pump Port  
T Tank Port  
Z Cylinder Port



- Control Elements**
- A Solenoid (UP Stop)
  - B Solenoid (UP Deceleration)
  - C Solenoid (Down Deceleration)
  - D Solenoid (Down Stop)
  - H Manual Lowering
  - S Relief Valve
  - U By Pass Valve
  - V Check Valve
  - W Levelling Valve (Up)
  - X Full Speed Valve (Down)
  - Y Levelling Valve (Down)

- Adjustments UP**
- 1 By Pass
  - 2 Up Acceleration
  - 3 Up Deceleration
  - 4 Up Levelling Speed
  - 5 Up Stop

- Adjustments DOWN**
- 6 Down Acceleration
  - 7 Down Full Speed
  - 8 Down Deceleration
  - 9 Down Levelling Speed

- Pressure**
- Pump
  - Bypass Valve
  - Up Levelling
  - Tank
  - Cylinder
  - Down Valve
  - Down Levelling

Vertical Section

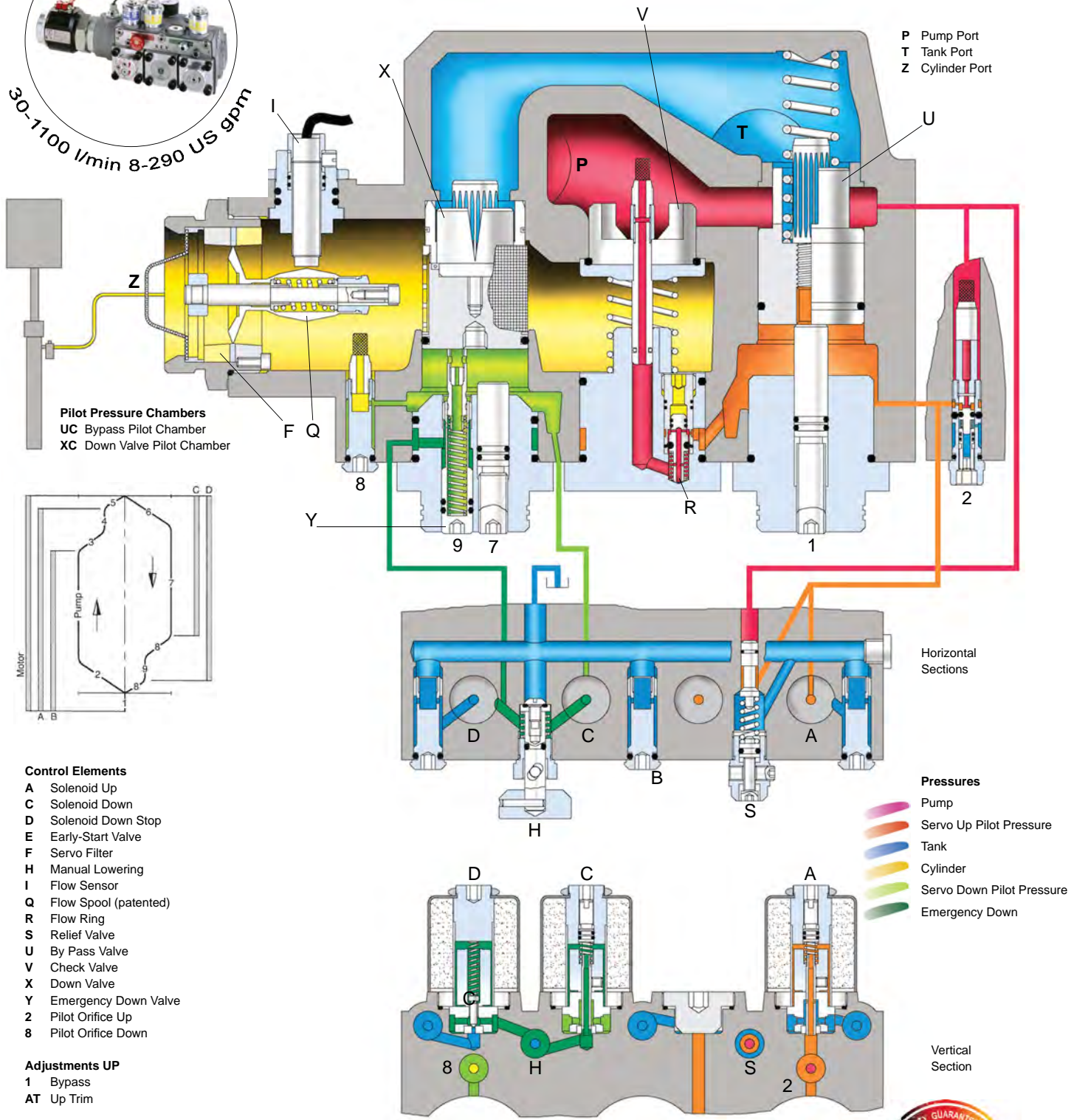


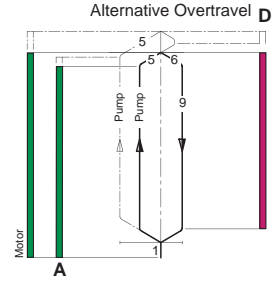
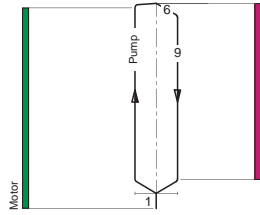


EN ISO 9001

# Servo Electronic Valve

# SEV





**Control Elements**

- A Solenoid Up
- D Solenoid Down
- F Main Filter
- H Manual Lowering
- L Gauge Shut Off Cock
- U Bypass Valve
- V Check Valve
- Y Down Levelling Valve

**Adjustments**

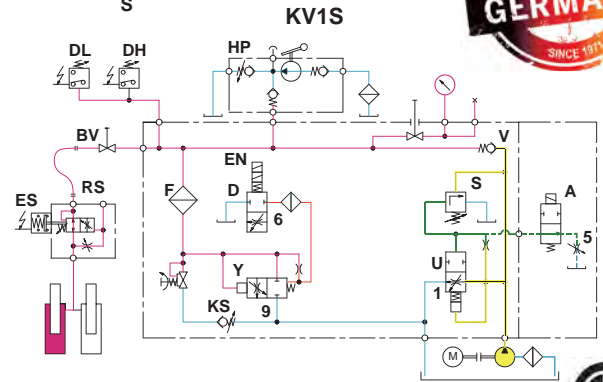
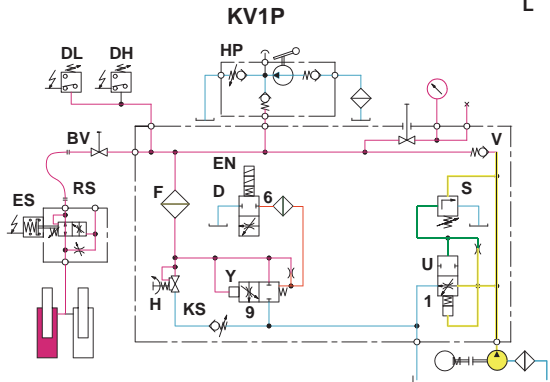
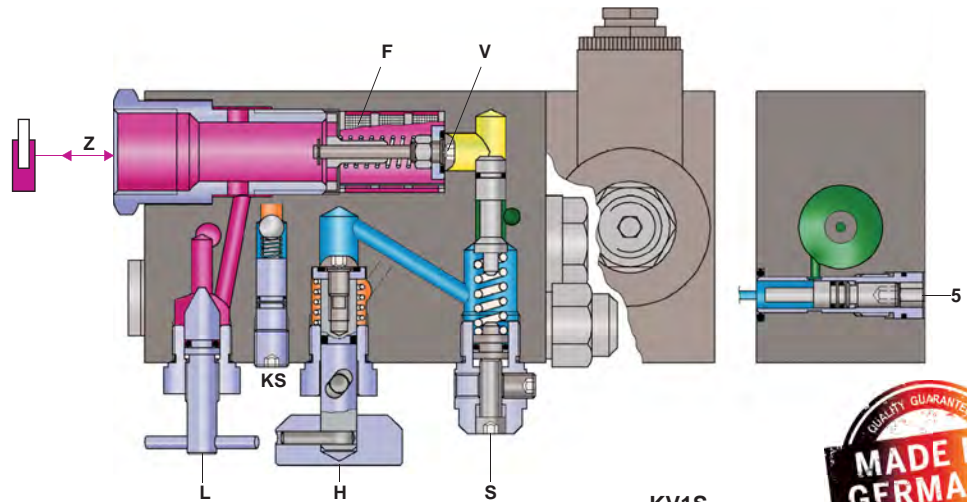
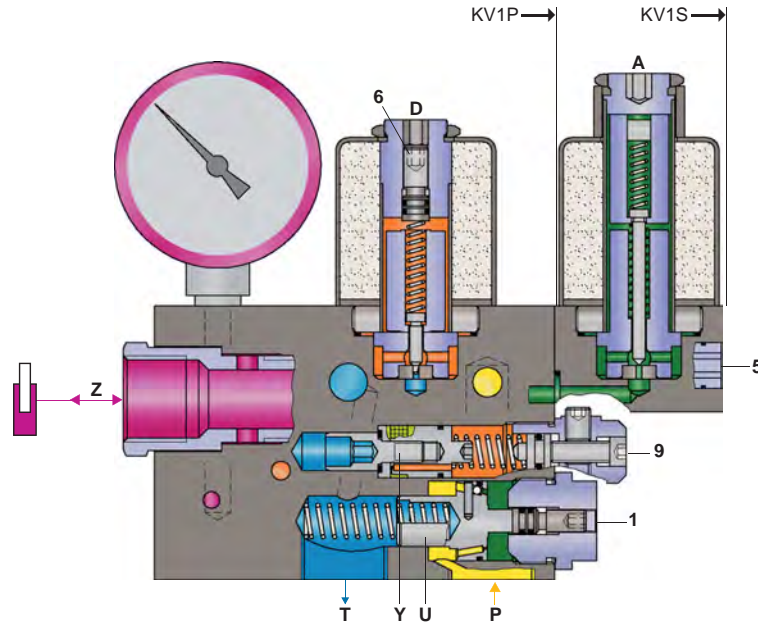
- 1 Bypass
- 5 Up Soft Stop
- 6 Down Acceleration
- 9 Down Speed
- S Relief Valve

**Connections**

- P Pump
- T Tank
- Z Cylinder

**Options**

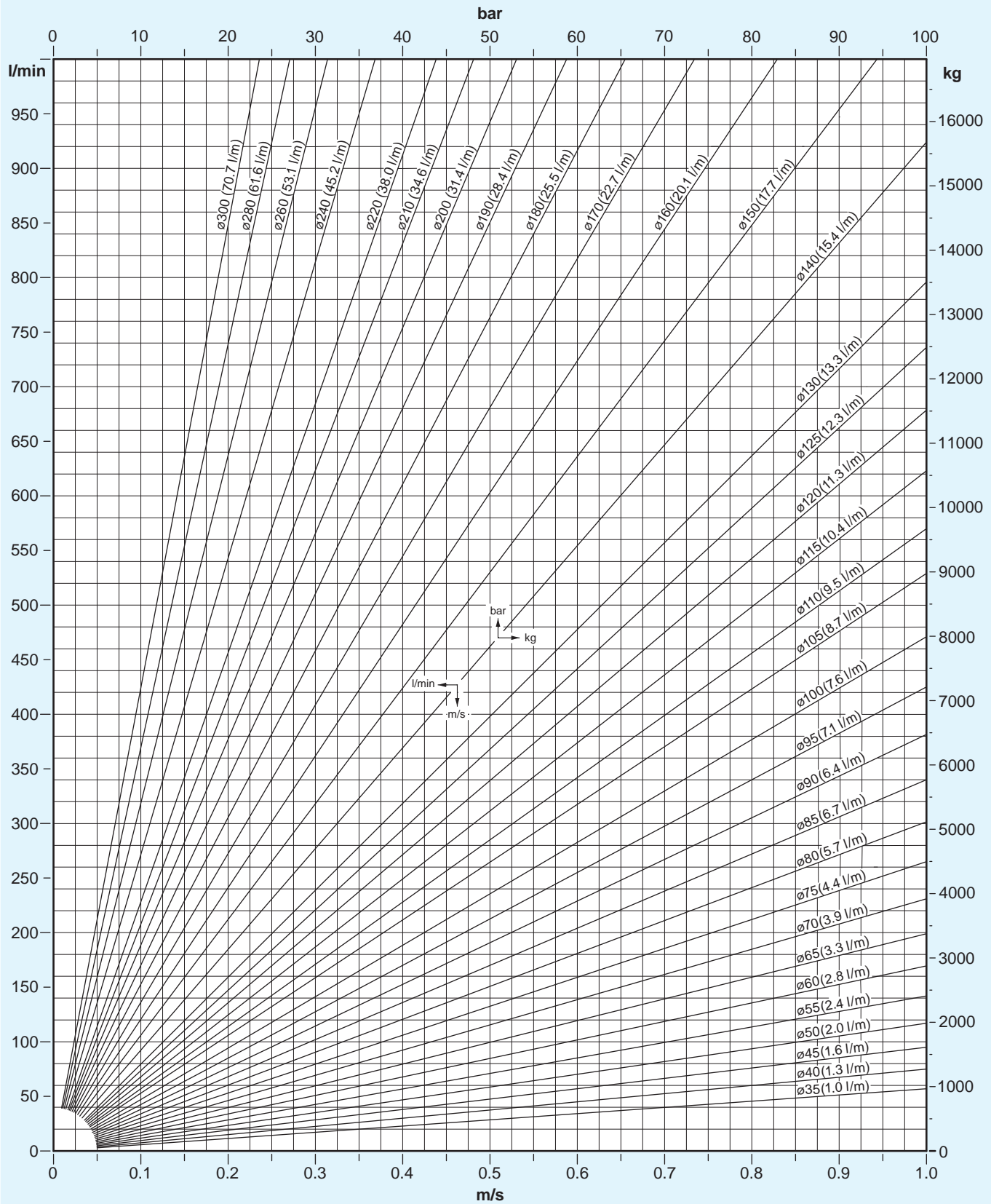
- BV Ball Valve built in
- EN Emergency Power Solenoid
- HP Hand Pump H 13
- KS Slack Rope Valve
- DH Pressure Switch 10-100 bar
- DL Pressure Switch 1-10 bar
- CSA CSA Solenoids
- HA Manual Down Speed Adj.
- RS Pipe Rupture Valve
- ES Pipe Rupture Valve Switch





EN ISO 9001

# Cylinder-Pump Selection Chart



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GmbH

Designer and Manufacturer of the highest  
 quality control valves & safety components  
 for hydraulic elevators



# About us

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## A brief history of Blain Hydraulics

Incorporated in 1971 by Roy W. Blain



Roy W. Blain 1932-2014

Born in May 1932 in Salford, Manchester and lived in Ilford, Essex, until he was 6, before moving back to the North where he later studied engineering at Salford Royal Technical College.

After serving 2 years in the Merchant Navy followed by 2 years in the army, he pursued a career in industrial hydraulics in England, Switzerland, Spain, USA and finally Germany, where he founded Blain Hydraulics which is known worldwide as the finest elevator control valve manufacturer.

With customers and installations in more than 75 countries, Mr. Blain was a true pioneer and believer in the hydraulic elevator technology. A true gentleman and very good person at heart he was a visionary who worked tirelessly in the hydraulic elevator industry for more than 5 decades.

### 1971-1980

Blain Hydraulics GmbH was incorporated in Heilbronn. With a modest infrastructure and man power, elevator control valves like EV & KV started rolling out initially with 1 person and eventually with 5 people on the outskirts of Heilbronn. For catering to growing demand, the factory was moved within Heilbronn and steadily expanded.

### 1981-1990

Blain adds new KV (small lift valve) models, especially keeping in mind the home and small lift market.

Pressure lock valve (L10) was also introduced as an additional safety valve which is now known as UCM-A3 valve.

Blain gets the CSA certification for export to North America.

Company infrastructure was expanded to meet growing demands.

### 1991-2000

Modernisation of machines to make production cost effective and productive.

Blain is awarded the ISO 9001 certification.

Blain gets EC Type certification for pipe rupture valves.

Blain introduces the SEV (servo electronic valve).

Other new products like MD (micro levelling) drive were also introduced.

Accessories like ball valves were introduced to expand the product range.

### 2001-2010

Blain becomes the first company to bring explosion proof solenoid valves for elevator industry in the market.

Blain becomes the largest producer of elevator control valves both in terms of production capacity & installations worldwide. Along with introducing new pipe rupture valve models.

### 2011-today

Blain launches the EV4 (vvvf driven valve) together with YASKAWA as a joint product.

Export of Blain products achieves new record with a footprint in more than 75 countries. Blain employs around 80 people from more than 14 nationalities to support customers worldwide.

Year 2015 saw Blain enlarging its presence in India by incorporating Blain India.

Blain has partnered with DAIKEN ELEVADORES (Brazil) to expand its presence and increase the penetration of hydraulic elevators in the Brazilian and South American market.

Summer 2017 Blain introduced the integrated pressure lock valve iL10 for EV 1½" & 2" valves and L20 for EV ¾"

valves. The new UCM-A3 valve allows to modernize existing installations with less cost and efforts.

Member of





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# Notes

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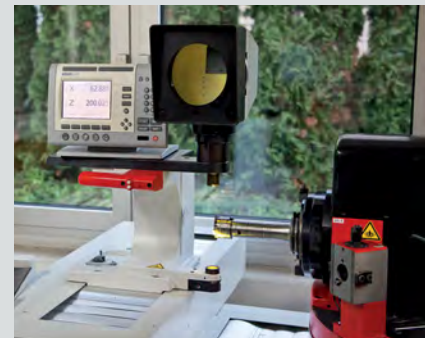
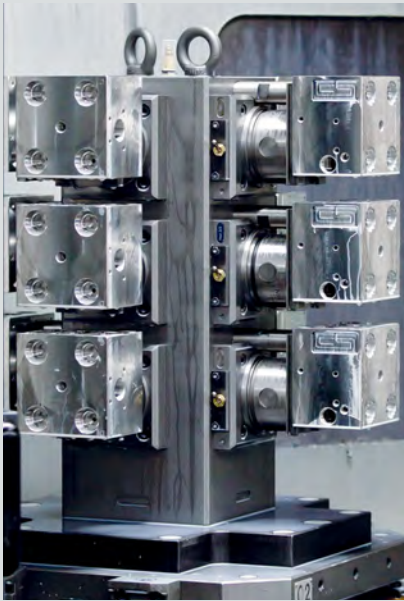
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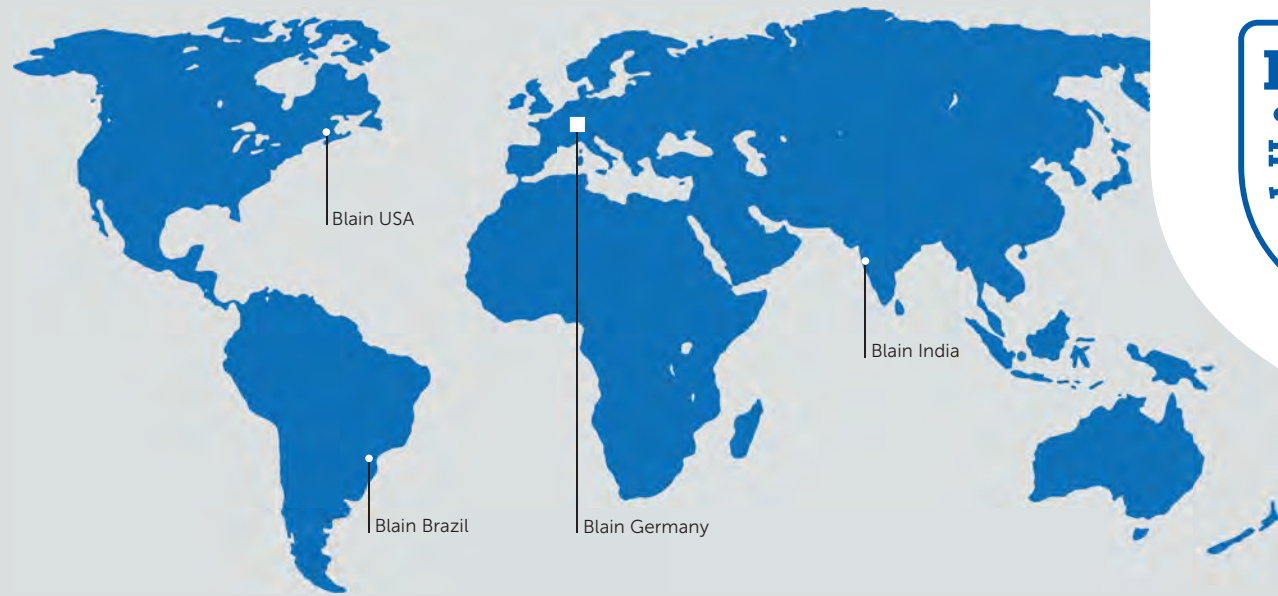
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# **BLAIN HYDRAULICS**

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