KV

Control Valves for Small Lifts

EN ISO 9001

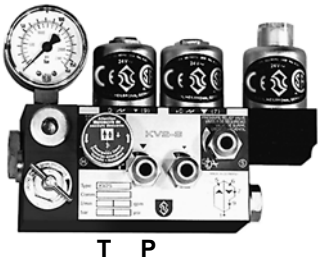
KV 1/2" solenoid valves are designed for small hydraulic lifts operating at speeds up to 0.16 m/s (32 fpm) depending on the valve selected. The smooth and accurate ride characteristics of the KV2S valve which includes 'soft stop' in both directions, render it highly suitable for quality home lifts and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

Flow Range: 5-80 l/min. (1.3-20 gpm) - see flow pressure charts on page 6
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: 3-100 bar (45-1500 psi)
Burst Pressure: 500 bar (7500 psi)
Max. Oil Temperature: 70°C (158°F)

B44

EN 81-2

		Speeds max. (EN code)	
KV1P	 Z T P 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	 Z T P 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	 Z T P 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	 Z T P 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.

Pfaffenstrasse 1
Boellinger Hoefe
74078 Heilbronn
Germany

BLAIN HYDRAULICS GmbH

Manufacturers of the Highest Quality:
Control Valves for Elevators
Tank Heaters - Hand Pumps
Pipe Rupture Valves - Ball Valves

EN ISO 9001

Control Elements

A Solenoid 'Up Stop'
C Solenoid 'Down Deceleration'
D Solenoid 'Down Stop'
U Bypass Valve
H Manual Lowering
HA Manual Down Speed Adjuster

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

For Options:
BV, EN, HP, KS, DH, DL and HA
see page 4.

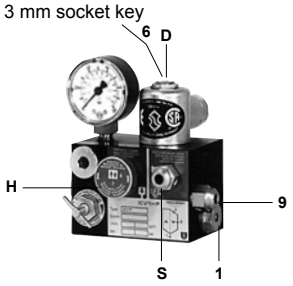
B44

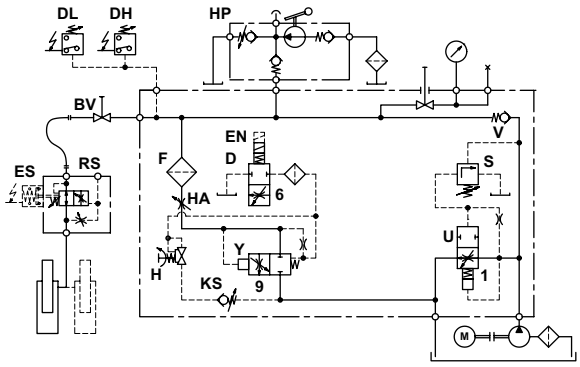
EN 81-2

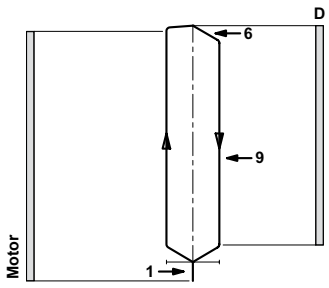
Hydraulic Circuit **Electrical Sequence**

KV1P

3 mm socket key

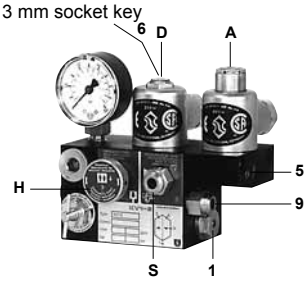


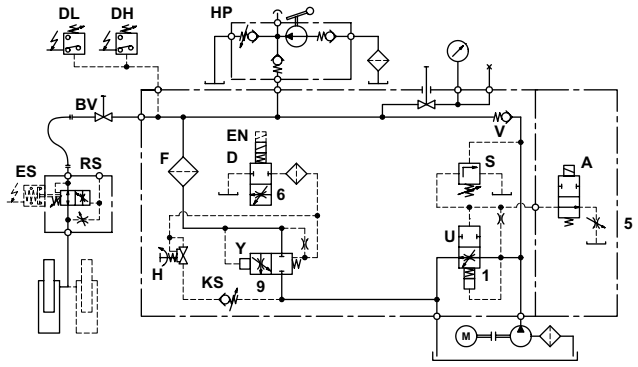




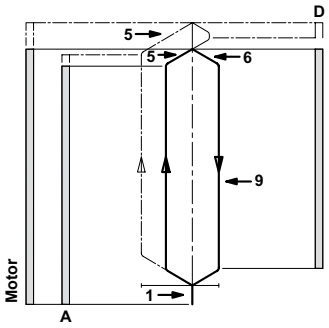
KV1S

3 mm socket key



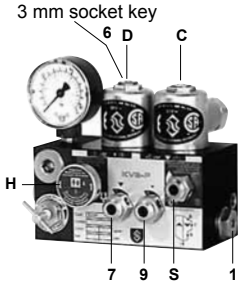


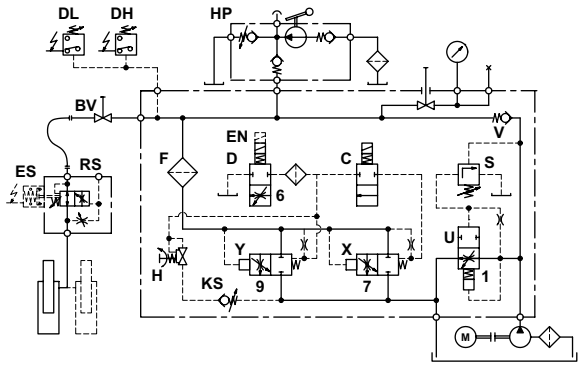
Alternative Overtravel

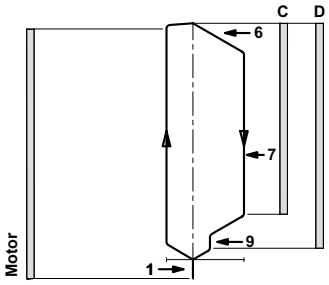


KV2P

3 mm socket key

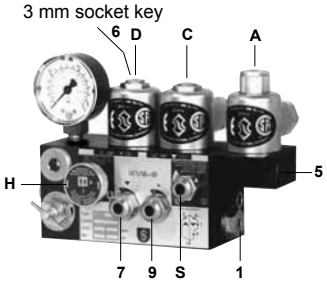


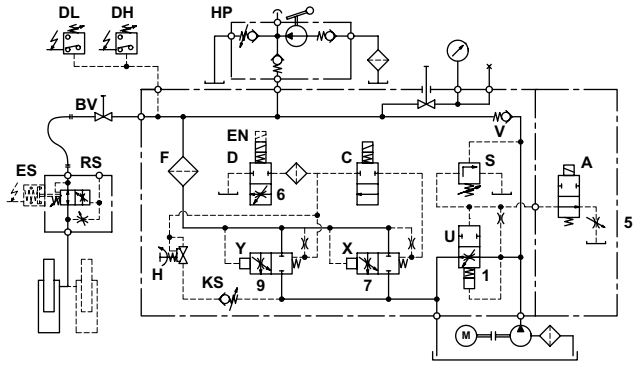




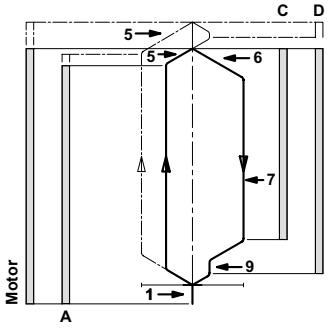
KV2S

3 mm socket key





Alternative Overtravel



Adjustments UP

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.

Valves are already tested and adjusted. Check electrical operation before changing valve settings. Test that the correct solenoid is energized by removing nut and raising 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, <u>do not</u> close ball valve sharply.

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. 1/2 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, <u>do not</u> close ball valve sharply.

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, <u>do not</u> close ball valve sharply.

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. 1/2 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, <u>do not</u> close ball valve sharply.

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

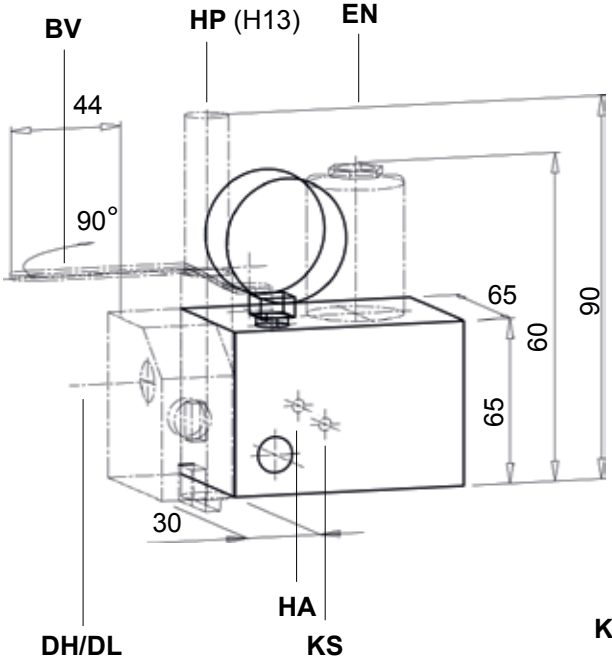
KV Optional Equipment

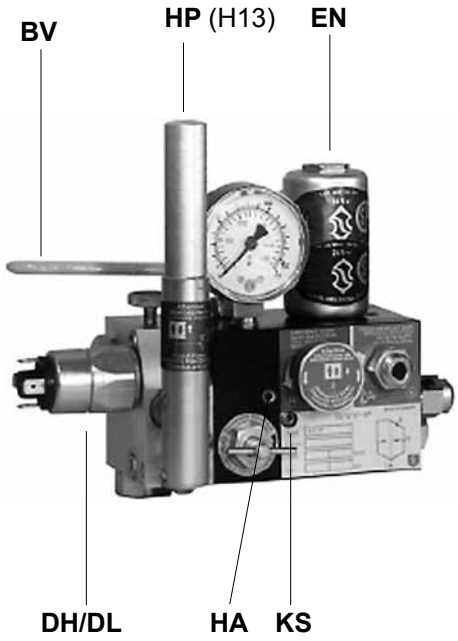
BV	Ball Valve built in
EN	Emergency Power Solenoid
HP	Hand Pump H 13
KS	Slack Rope Valve
DH	Pressure Switch 10-100 bar
DL	Pressure Switch 1-10 bar
CSA	CSA Solenoids
HA	Manual Down Speed Adj.

Separate Equipment

RS	Pipe Rupture Valve
ES	Pipe Rupture Valve End Switch

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

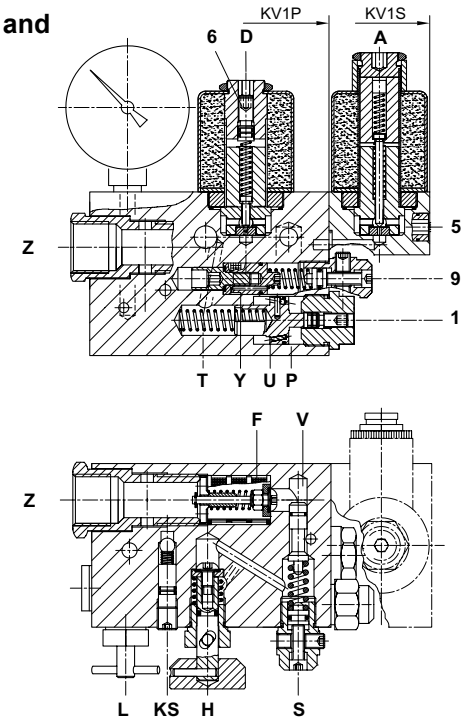




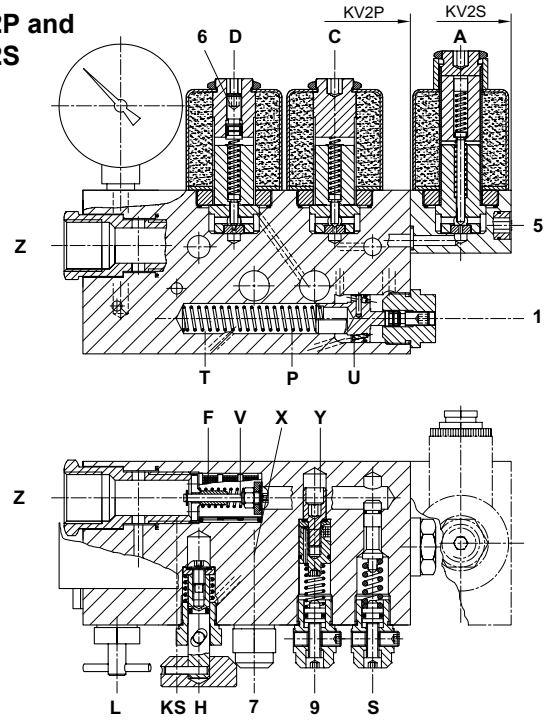
KV Example with Options

Assembly

KV1P and KV1S



KV2P and 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

Adjustments

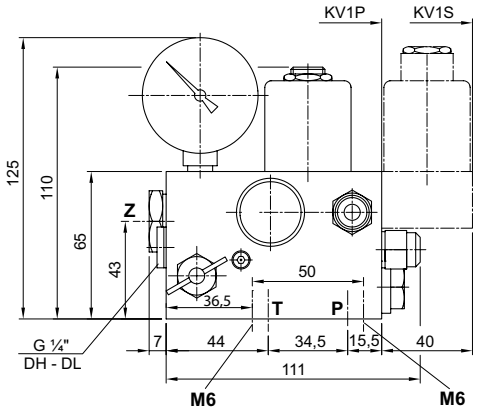
- **1** Bypass
- **5** Soft Stop ‚Up‘
- **6** Start ‚Down‘
- **7** Speed ‚Down‘
- **9** Levelling ‚Down‘
- **S** Relief Valve

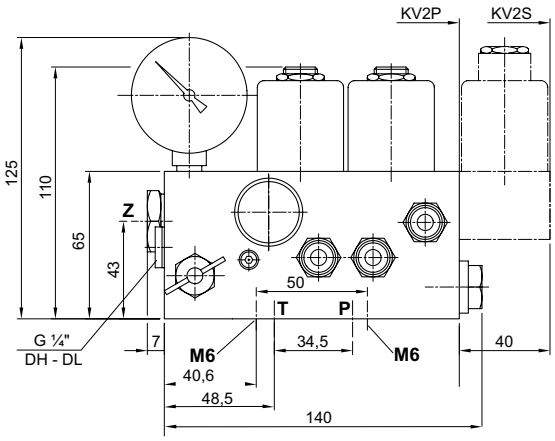
Connections

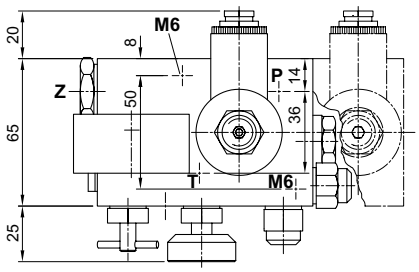
- **P** Pump
- **T** Tank - return
- **Z** Cylinder

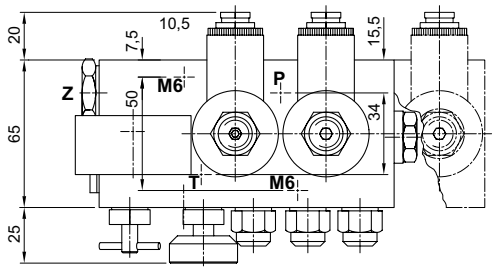
Important: Length of ½“ thread on pipe connections should not be longer than 14 mm!

Measurements



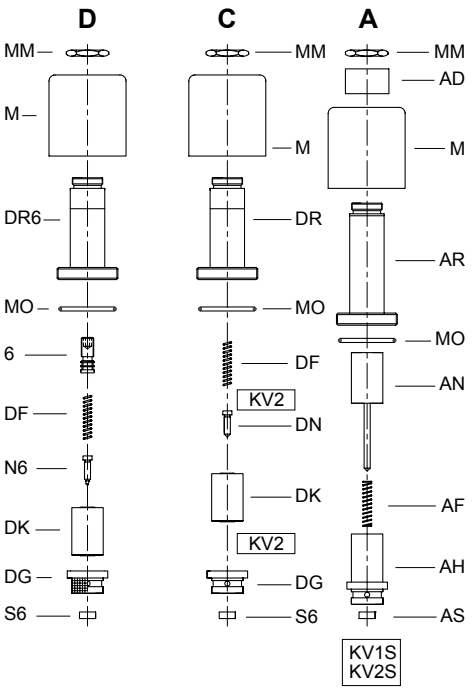




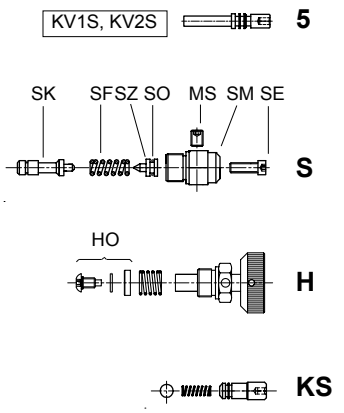


Pos.	No.	Item
1	1F	Flange - Bypass
	1E	Adjustment - Bypass
	EO	0-Ring - Adjustment (3,5x1,5 - P)
	U	Flow Guide - Bypass
	UO	0-Ring - Bypass (17x1 - V)
	UF	Spring - Bypass
5	5	Adjustment - Up Stop
6	6	Adjustment - Down Acceleration
7+9	7E	Adjustment - Down Valve
	9F	Spring - Down Valve
	YO	0-Ring - Flow 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	Adjustment Screw - Relief Valve
	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	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	Coil Solenoid (indicate voltage)
C	DR	Tube - Solenoid 'Down', w/o adj. 6
D	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'
	DK	Core Solenoid 'Down'
	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

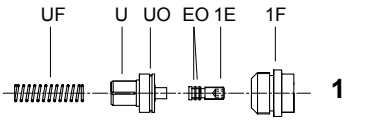
Solenoid Valves



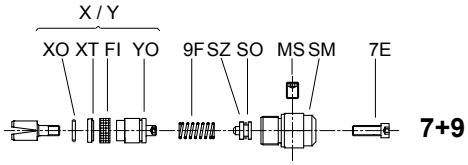
Adjustments

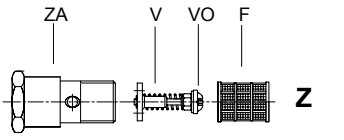


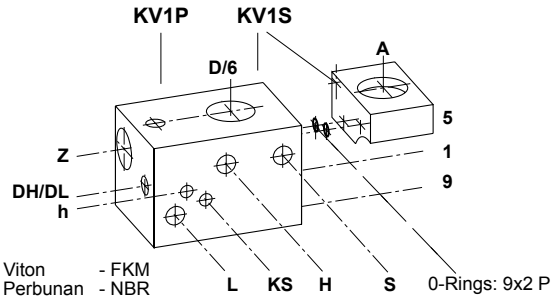
Flow Valves



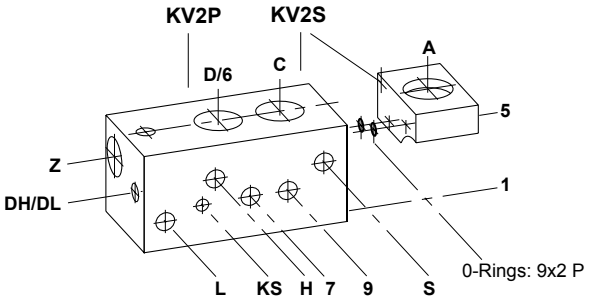
In case of down leakage, replace and test in the following order:
S6, N6, HO, V complete, XO, (2x XO with KV2).



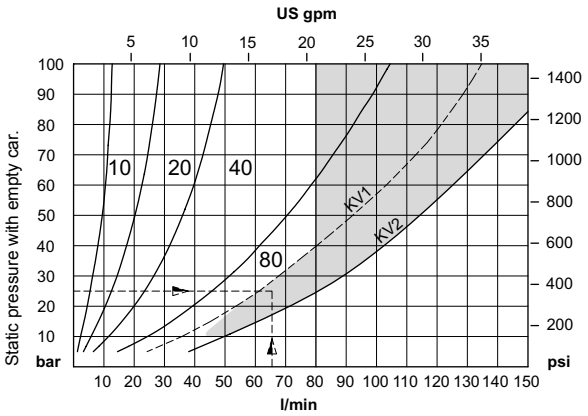




0-Rings: V - Viton - FKM
P - Perbunan - NBR



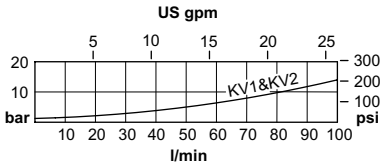
Insert Selection and Down Flow Chart



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

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

Pressure Drop P - Z



Lowest Relief Pressure