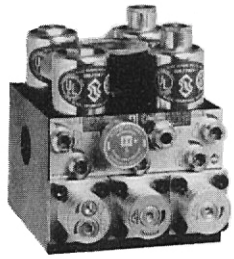
EV 100

Elevator Control Valves

EN ISO 9001

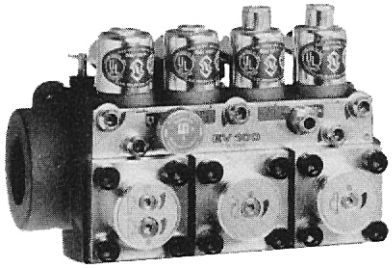
The BLAIN EV 100 program includes the widest range of options offered to the elevator industry for high performance passenger service. Easy to install, EV 100's are smooth, reliable and precise in operation throughout extreme load and temperature variations.

¾" EV



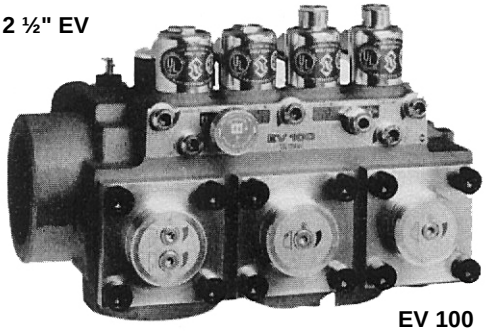
EV 100

1 ½" EV



EV 100

2 ½" EV



EV 100

Description

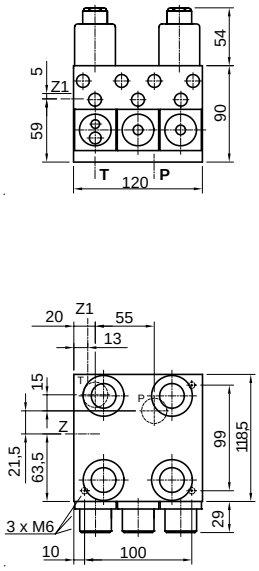
Available port sizes are 3/4", 1 ½", 2" and 2 ½" pipe threads, depending on flow. EV 100's start on less than minimum load and can be used for across the line or wye-delta starting. According to customers' information, valves are factory adjusted ready for operation and very simple to readjust if so 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 100 valves include the following features essential to efficient installation and trouble free service:

- Simple Responsive Adjustment
- Temperature and Pressure Compensation
- Solenoid 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

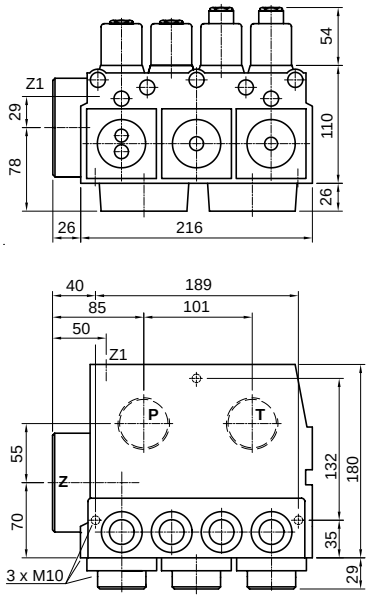
Technical Data:		**¾" EV**	**1 ½" & 2" EV**	**2 ½" EV**
Flow Range:	l/min	10-125 (2-33 USgpm)	30-800 (8-208 USgpm)	500-1530 (130-400 USgpm)
Pressure Range:	bar	5-100 (74-1500 psi)	3-100 (44-1500 psi)	3-68 (44-1000 psi)
Press. Range UL/CSA:	bar	5-100 (74-1500 psi)	3-70 (44-1030 psi)	3-47 (44-690 psi)
Burst Pressure Z:	bar	575 (8450 psi)	505 (7420 psi)	265 (3890 psi)
Pressure Drop P–Z:	bar	6 (88 psi) at 125 lpm	4 (58 psi) at 800 lpm	4 (58 psi) at 1530 lpm
Weight:	kg	5 (11 lbs)	10 (22 lbs)	14 (31 lbs)

Oil Viscosity: 25-60 mm²/sec. at 40°C (15-35 cSt. at 120°F). **Max. Oil Temperature:** 70°C (158°F)
Solenoids AC: 24 V/1.8 A, 42 V/1.0 A, 110 V/0.43 A, 230 V/0.18 A, 50/60 Hz. **Insulation Class, AC and DC:** IP 68
Solenoids DC: 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.

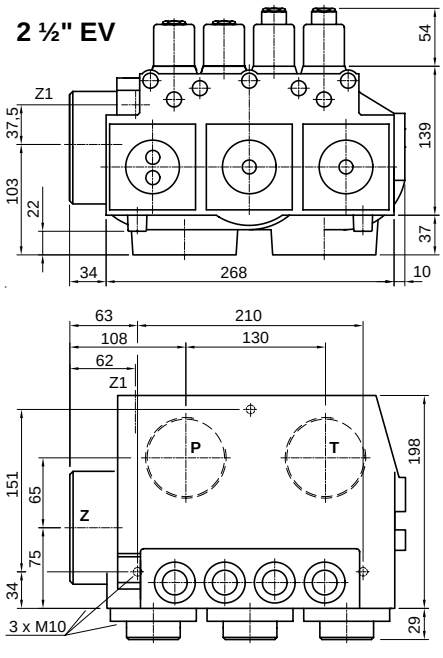
¾" EV



1 ½" & 2" EV



2 ½" EV



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BLAIN HYDRAULICS GmbH

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

EV Control Valve Types

Optional Equipment

EN	Emergency Power Solenoid
UL	UL/CSA Solenoids
KS	Slack Rope Valve
BV	Main Shut-Off Valve
HP	Hand Pump
RS	Pipe Rupture Valve
ES	Pipe Rupture Valve End Switch
DH	High Pressure Switch
DL	Low Pressure Switch
CX	Pressure Compensated Down
MX	Auxiliary Down

B44 EN 81-2

EV 0

¾" | 1 ½" and 2" EV | 2 ½"

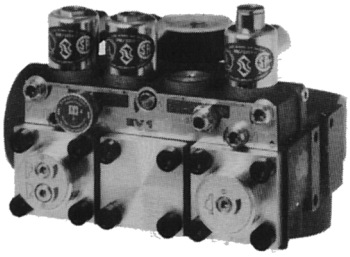


Up Up to 0.16 m/s (32 fpm). 1 Up Speed.
Up Start is smooth and adjustable.
Up Stop is by de-energising the pump-motor.

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. 4,601,366
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. ½ 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. ½ 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 personell 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.

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 slighty 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 **2 & 5** two turns 'out' (c-clockwise), **3** three turns out. 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, do not close ball valve sharply.

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. ½ 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, do not close ball valve sharply.

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, do not close ball valve sharply.

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. ½ 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, do not close ball valve sharply.

Warning: Only qualified personell 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 controller is switched off 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 slighty 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 three 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.

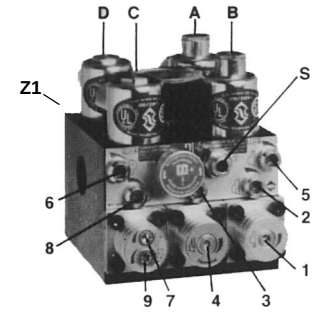
8. Down Deceleration: When solenoid **C** is de-energised whilst solenoid **D** remains energised, the car will decelerate according to the setting of adjustment **8**. 'In' (clockwise) provides a softer deceleration, 'out' (c-clockwise) a quicker deceleration. **Attention: Do not close all the way!**

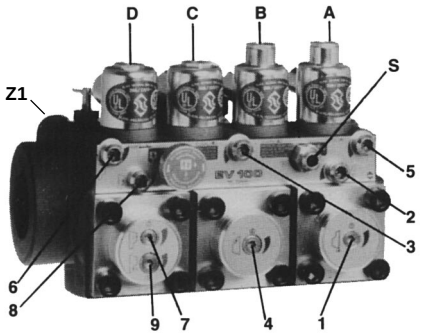
9. Down Levelling: With solenoid **C** de-energised and solenoid **D** energised as in **8** above, the car will proceed at its down levelling speed according to the setting of adjustment **9**. 'In' (clockwise) provides a slower, 'out' (c-clockwise) a faster down levelling speed.

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.

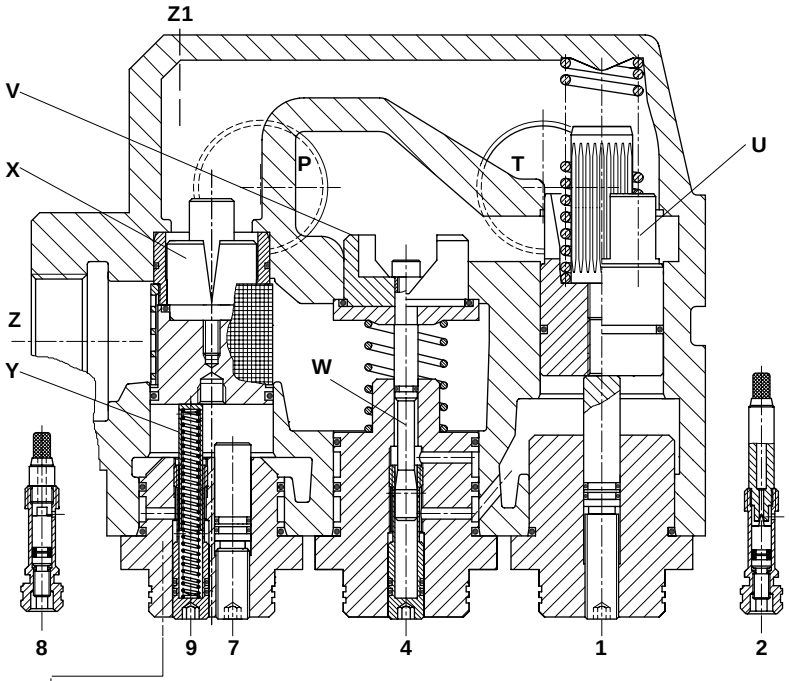
KS Slack Rope Valve: The KS is adjusted with a 3 mm Allan Key by turning the screw **K** 'in' for higher pressure and 'out' for lower pressure. With **K** turned all the way 'in', then half a turn back out, the unloaded car should descend when the **D** solenoid alone is energised. Should the car not 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.

Positions of Adjustments

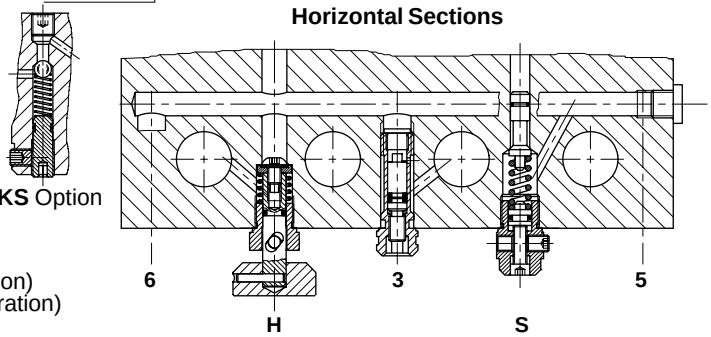




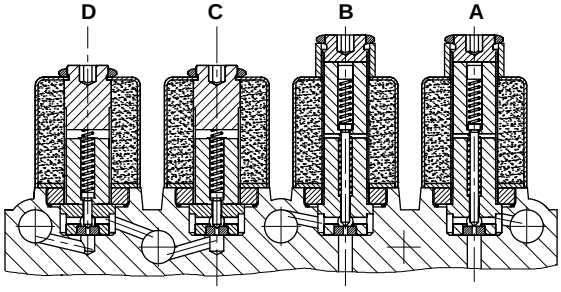
EV 100 1½", 2", 2½"



KS Option



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	Elements Omitted
EV 0	**A, B, W, 3, 4 & 5**
EV 1	**B, W, 3 & 4**
EV 10	**A & 5**
EV 100	as shown

EV

Elevator Valves

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)
F Filter

Adjustments UP

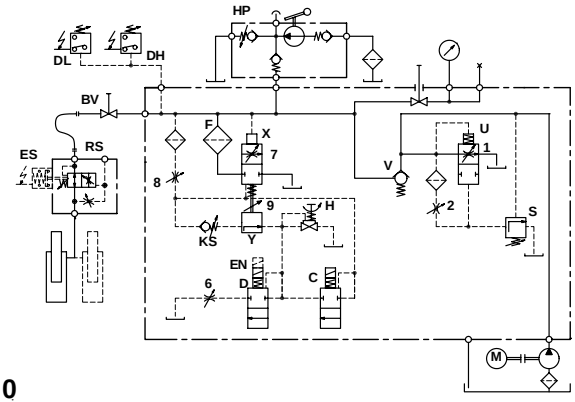
1 By Pass
2 Up Acceleration
3 Up Deceleration
4 Up Levelling Speed
5 Up Stop

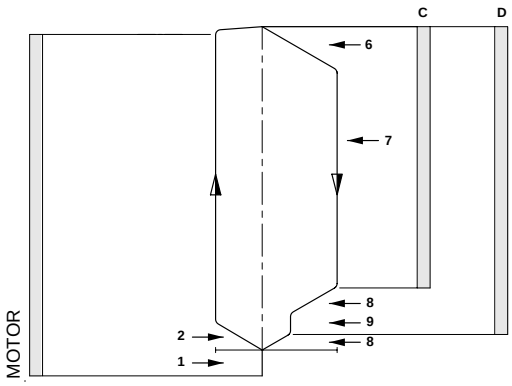
Adjustments DOWN

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

Hydraulic Circuit

Electrical Sequence





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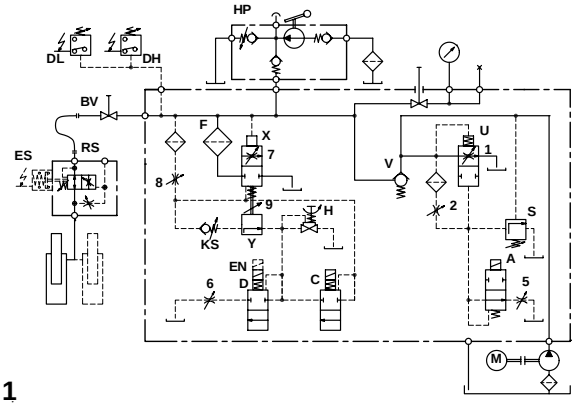
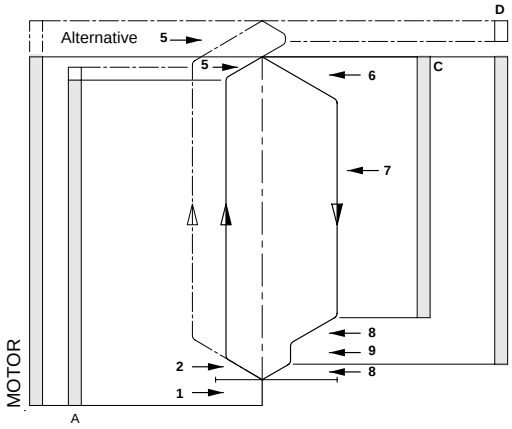
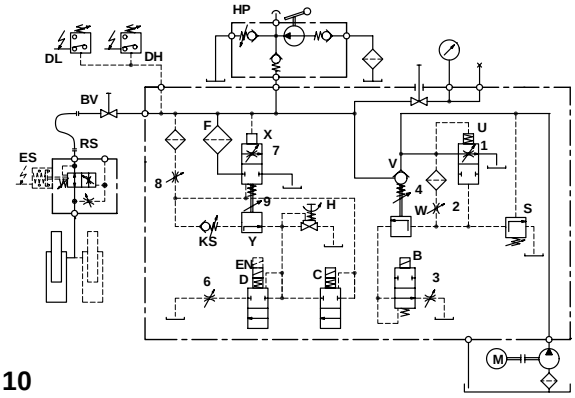
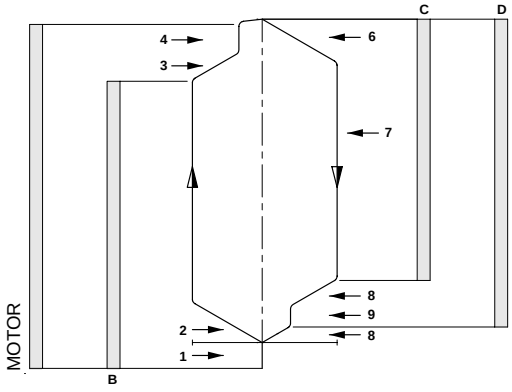


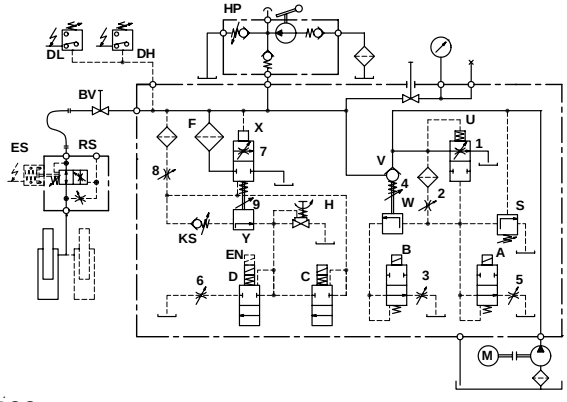


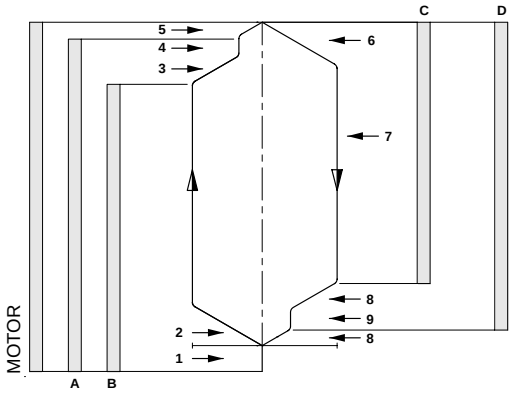
EV 1





EV 10





EV 100

Pos.	No.	Item
1	FS	Lock Screw - Flange
	FO	0-Ring - Flange
	1F	Flange - By Pass
	EO	0-Ring - Adjustment
	1E	Adjustment - By Pass
	UO	0-Ring - By Pass Valve
	U	By Pass Valve
	UD	Noise Suppressor
	UF	Spring - By Pass
2	2	Adjustment - Up Acceleration
3	3	Adjustment - Up Deceleration
4	EO	0-Ring - Adjustment
	4E	Adjustment - Up Levelling
	4F	Flange - Check Valve
	FO	0-Ring - Flange
	VF	Spring - Check Valve
	W	Up-Levelling Valve
	WO	0-Ring - Up Levelling Valve
	VO	Seal - Check Valve
	V	Check Valve
	W6	Screw - Check Valve
5	3	Adjustment - Up Stop
6	3	Adjustment - Down Acceleration
7	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
8	8	Adjustment - Down Deceleration
9	EO	0-Ring - Adjustment
	9E	Adjustment - Down Levelling
	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	0-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	0-Ring - Solenoid
	AN	Needle - 'Up'
	AF	Spring - Solenoid 'Up'
	AH	Seat Housing - 'Up'
	AS	Seat - Solenoid 'Up'
C+D	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'
	DS	Seat - Solenoid 'Down'

Some parts occur more than once in different positions of the valve.

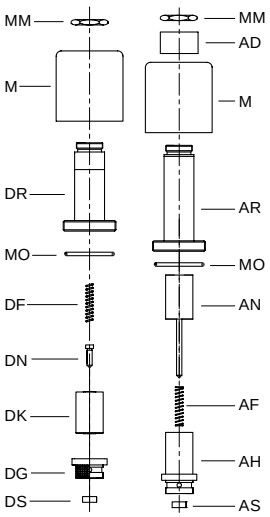
0-Ring-Size			
No.	¾"	1 ½"	2½"
FO	26x2P	47x2.5P	58x3P *
EO	9x2P	9x2P	9x2P
UO	26x2V	39.34x2.62V	58x3V
WO	5.28x1.78V	5.28x1.78V	5.28x1.78V
VO	23x2,5V	42x3V	60x3V **
7O	5.28x1.78P	9x2P	9x2P
XO	13x2V	30x3V	47x3V
HO	5.28x1.78V	5.28x1.78V	5.28x1.78V
SO	5.28x1.78P	5.28x1.78P	5.28x1.78P
MO	26x2P	26x2P	26x2P

* FO by 4F 2½" is 67x2.5P

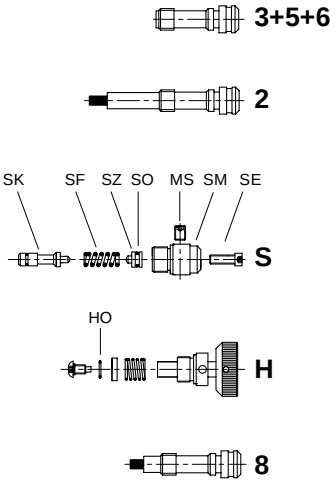
** 90 Shore

0-Ring: V - Viton
P - Perbunan

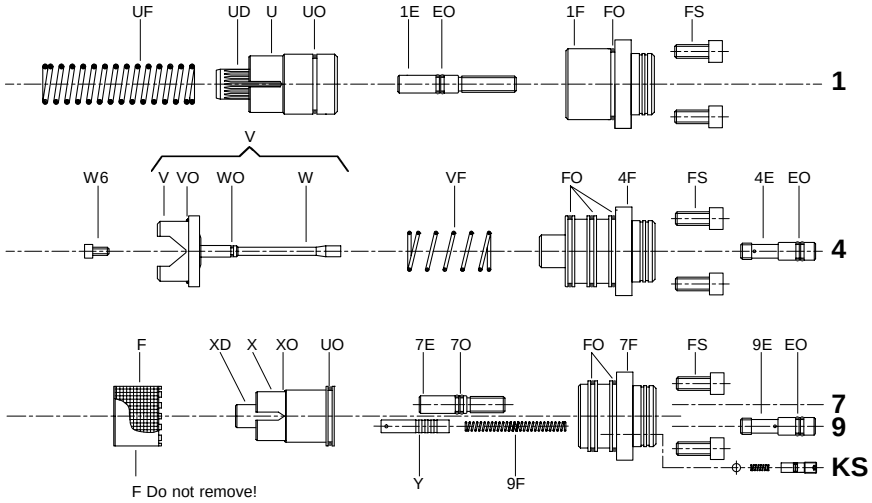
Solenoid Valves



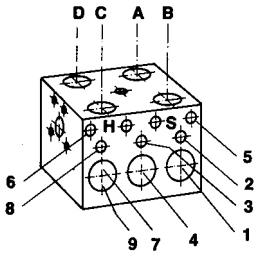
Adjustments

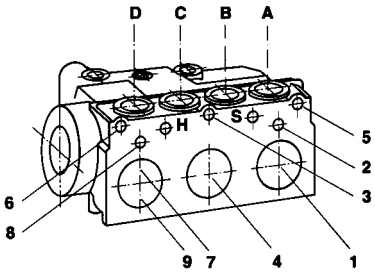


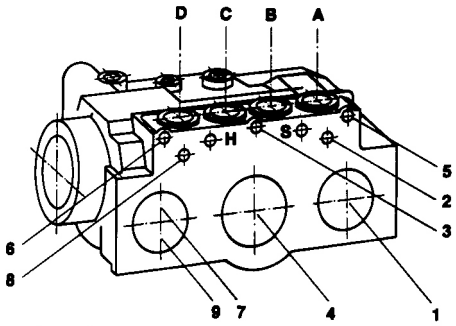
Flow Valves



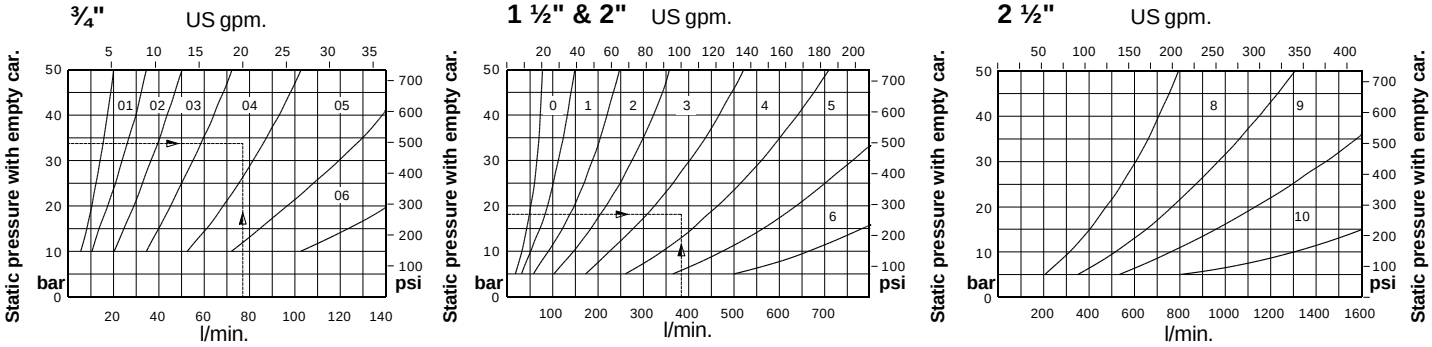
In case of down leakage, replace and test in the following order: DS & DN, XO, VO, WO, FO and HO.







Flow Guide Selection Charts



To order EV 100, state pump flow, empty car pressure (or flow guide size) and solenoid voltage.
Example order: EV 100, 210lpm, 15bar (empty), 110 AC ≡ EV 100/3/110AC