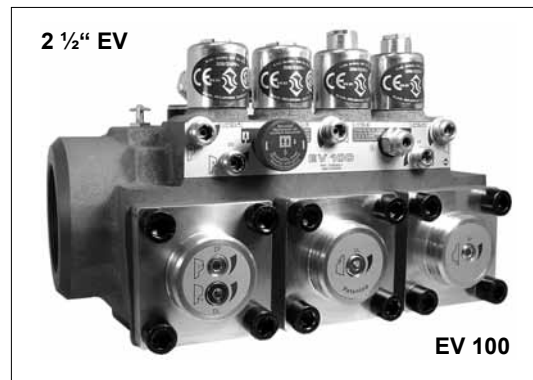


The BLAIN EV 100 program includes the widest range of options offered to the elevator industry for high performance passenger service. Easy to install, EV 100's are smooth, reliable and precise in operation throughout extreme load and temperature variations.



### Description

Available port sizes are 3/4", 1 1/2", 2" and 2 1/2" 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:



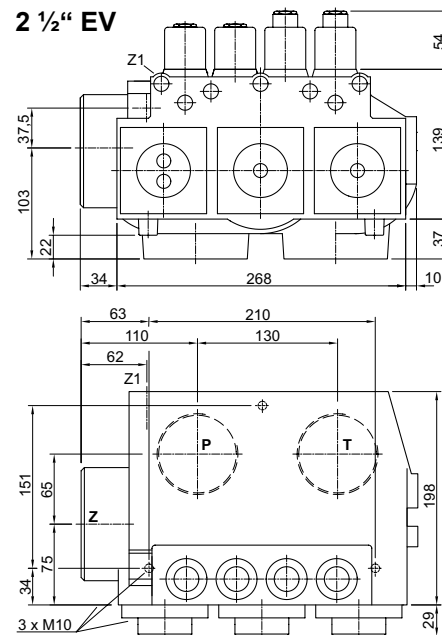
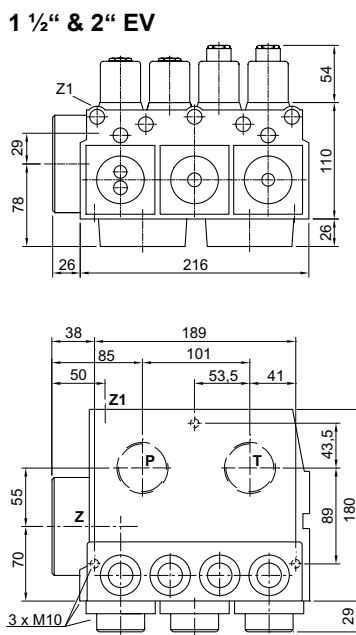
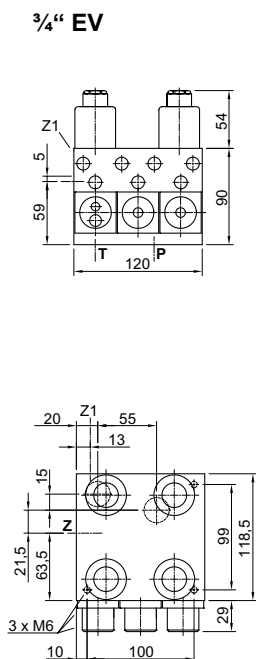
Simple Responsive Adjustment  
Temperature and Pressure Compensation  
Solenoid with Connecting Cables  
Pressure Gauge and Shut Off Cock  
Self Closing Manual Lowering



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 USgpm)	30-800 (8-208 USgpm)	500-1530 (130-400 USgpm)
<b>Pressure Range:</b>	bar	5-100 (74-1500 psi)	3-100 (44-1500 psi)	3-68 (44-1000 psi)
<b>Press. Range CSA:</b>	bar	5-100 (74-1500 psi)	3-70 (44-1030 psi)	3-47 (44-690 psi)
<b>Burst Pressure Z:</b>	bar	575 (8450 psi)	505 (7420 psi)	340 (5000 psi)
<b>Pressure Drop P-Z:</b>	bar	6 (88 psi) at 125 lpm	4 (58 psi) at 800 lpm	4 (58 psi) at 1530 lpm
<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>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	



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74078 Heilbronn  
Germany

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<http://www.blain.de>  
e-mail: info@blain.de



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

# 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		

High Pressure Switch  
Low Pressure Switch  
Pressure Compensated Down  
Auxiliary Down



### EV 0

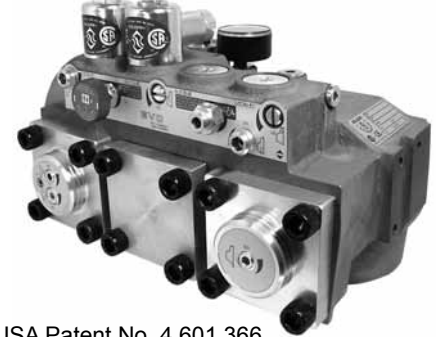
3/4"



1 1/2" and 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 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. 1/2 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. 1/2 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 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, 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 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 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 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.

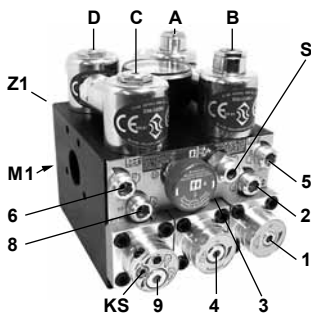
**Down Stop:** When solenoid D is de-energised with solenoid C remaining de-energised, the car will stop according to the setting of adjustment 8 and no further adjustment will be required.

**KS Slack Rope Valve:** Solenoids C and 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.

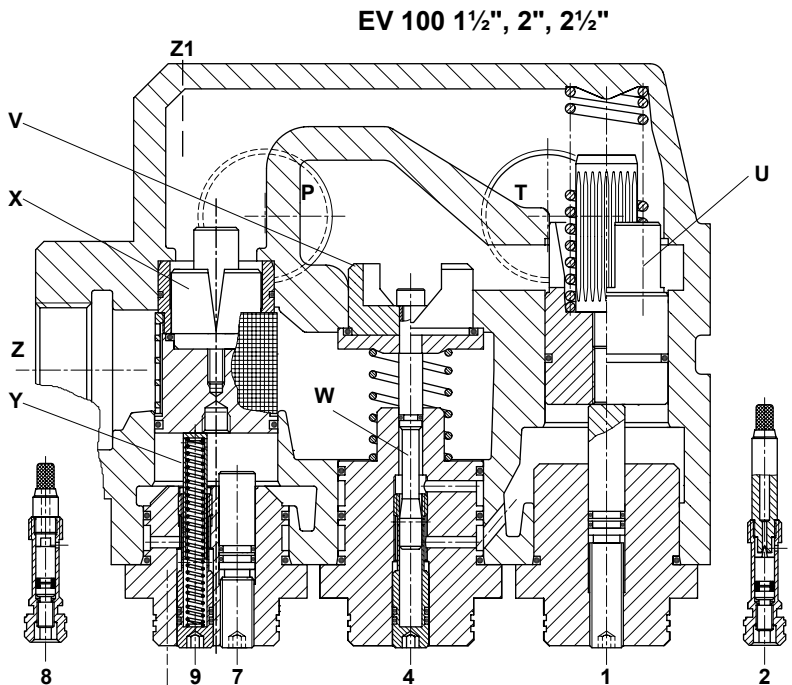
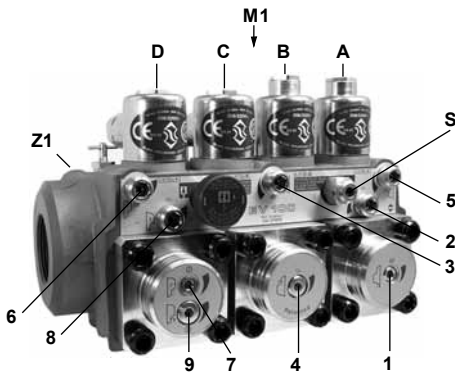
### Positions of Adjustments



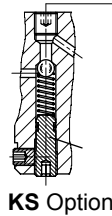
**Important:** Length of 3/4" thread on pump connections should not be longer than 17 mm!



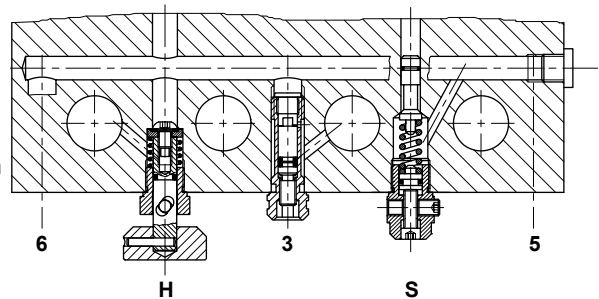
M1 Second pressure gauge connection, 1/2"  
Z1 Pressure switch connection, 1/4"



Horizontal Sections

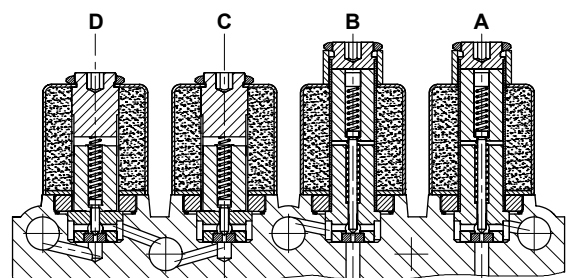


KS Option



H

S



Vertical Section

#### Adjustments UP

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

#### 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 DOWN

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

#### 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

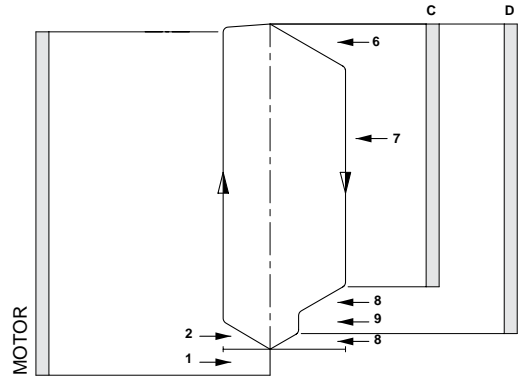
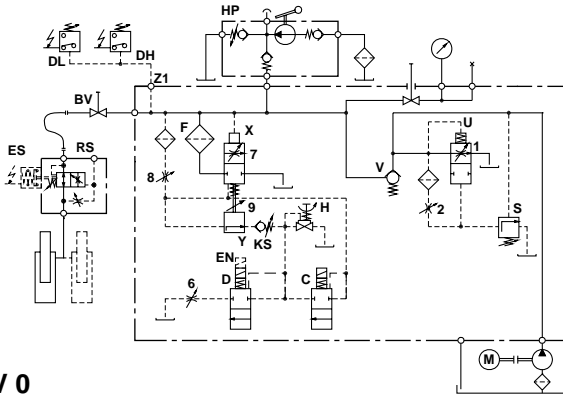
### Adjustments DOWN

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

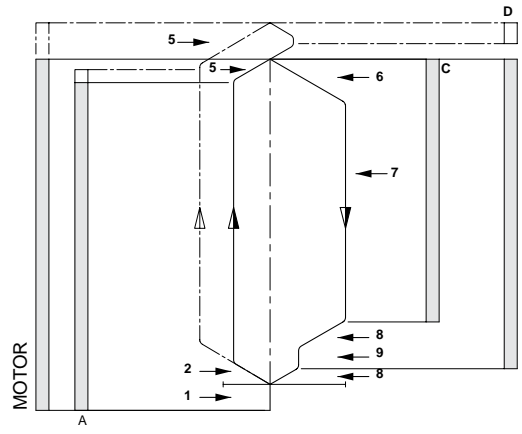
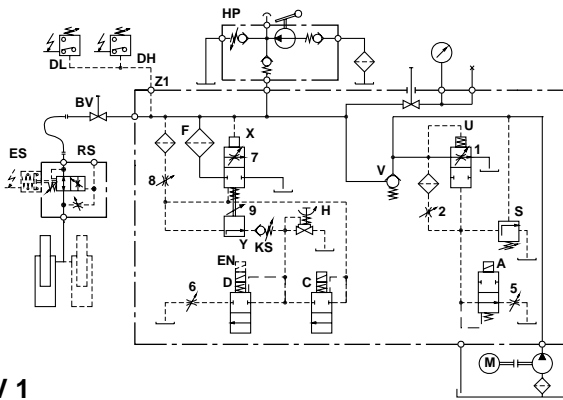
### Hydraulic Circuit

### Electrical Sequence

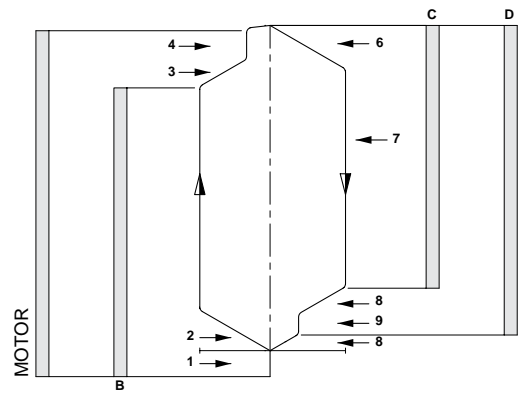
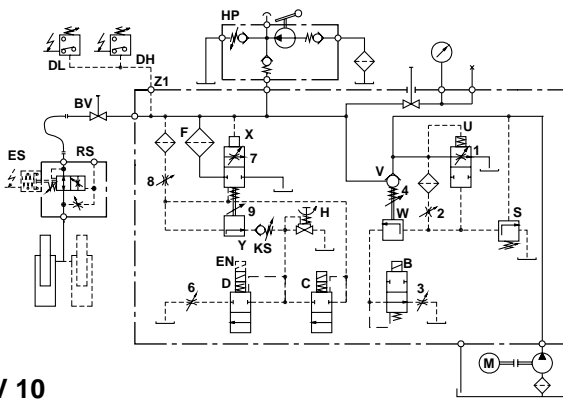
**EV 0**



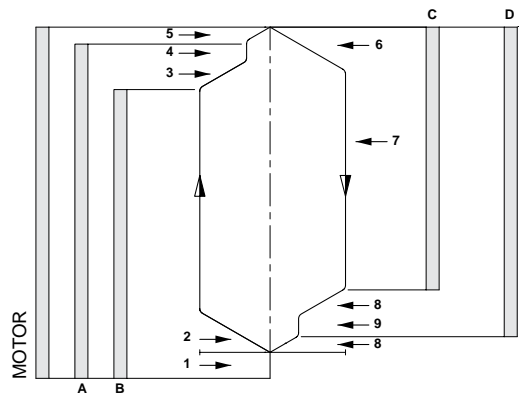
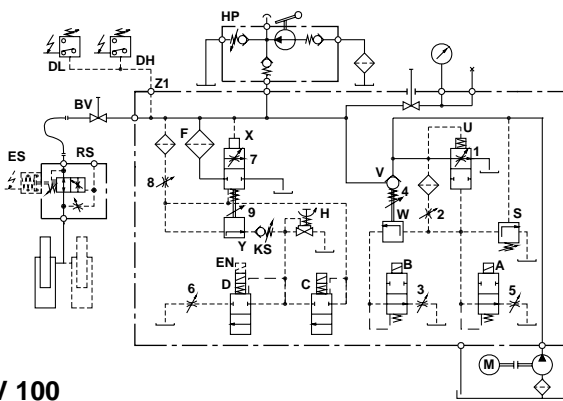
**EV 1**



**EV 10**



**EV 100**





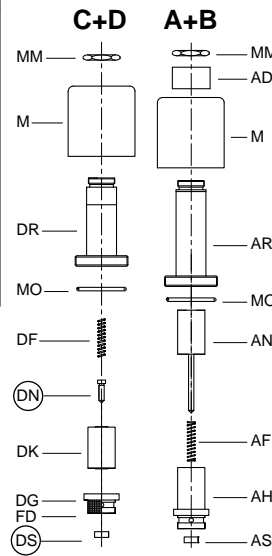
Pos.	No.	Item	
1	FS	Lock Screw - Flange	
	FO	O-Ring - Flange	
	1F	Flange - By Pass	
	EO	O-Ring - Adjustment	
	1E	Adjustment - By Pass	
	UO	O-Ring - By Pass Valve	
	U	By Pass Valve	
2	UD	Noise Suppressor	
	UF	Spring - By Pass	
2	2	Adjustment - Up Acceleration	
3	3	Adjustment - Up Deceleration	
4	EO	O-Ring - 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	
5	VO	Seal - Check Valve	
	V	Check Valve	
	W6	Screw - Check Valve	
	3	Adjustment - Up Stop	
	6	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	
8	XD	Noise Suppressor	
	F	Main Filter	
8	8	Adjustment - Down Deceleration	
9	9E	Adjustment - Down Levelling	
	EO	O-Ring - Adjustment	
H	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	
A+B	SF	Spring	
	SK	Piston	
	MM	Nut - Solenoid	
	AD	Collar - Solenoid	
	M	Coil - Solenoid (indicate voltage)	
C+D	AR	Tube - Solenoid 'Up'	
	MO	O-Ring - Solenoid	
	AN	Needle - 'Up'	
	AF	Spring - Solenoid 'Up'	
	AH	Seat Housing - 'Up'	
C+D	AS	Seat - Solenoid 'Up'	
	MM	Nut - Solenoid	
	M	Coil - Solenoid (indicate voltage)	
	DR	Tube - Solenoid 'Down'	
	MO	O-Ring - Solenoid	
	DF	Spring - Solenoid 'Down'	
	DN	Needle - 'Down'	
C+D	DK	Core - Solenoid	
	DG	Seat Housing with Screen-'Down'	
	FD	Filter Solenoid	
	DS	Seat - Solenoid 'Down'	
	Some parts occur more than once in different positions of the valve.		

O-Ring-Size			
No.	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

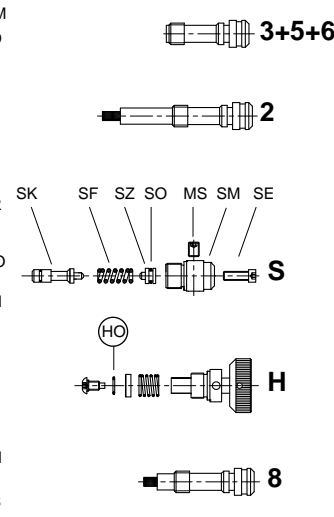
\* FO by 4F 2 1/2" is 67x2.5P  
 \*\* 90 Shore

O-Ring: V - Viton  
 P - Perbunan

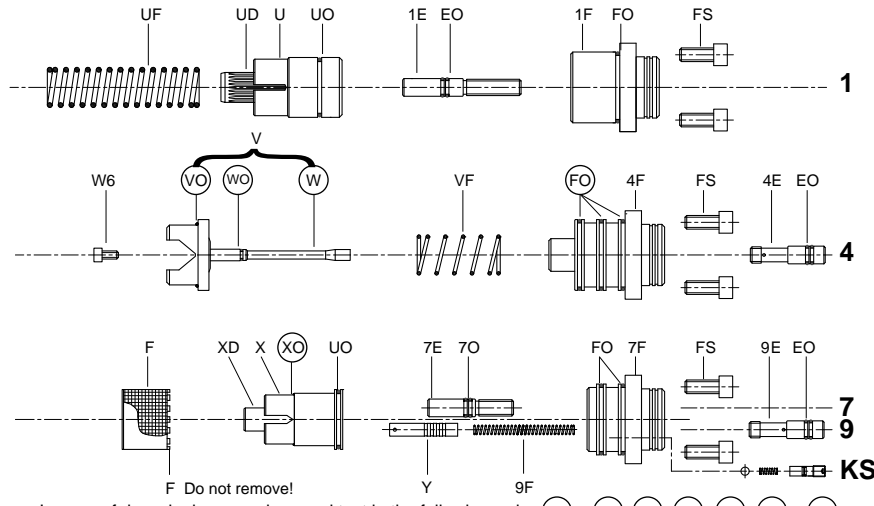
## Solenoid Valves



## Adjustments

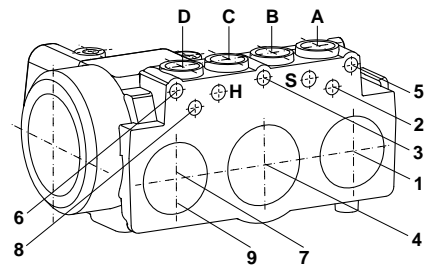
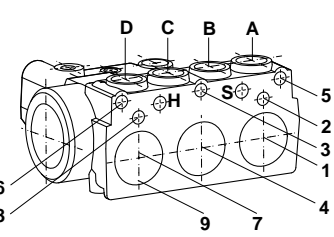
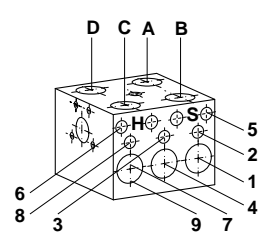


## Flow Valves

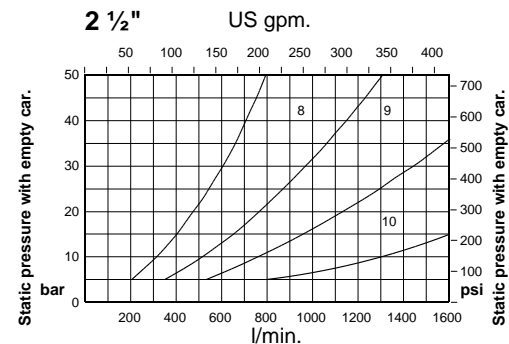
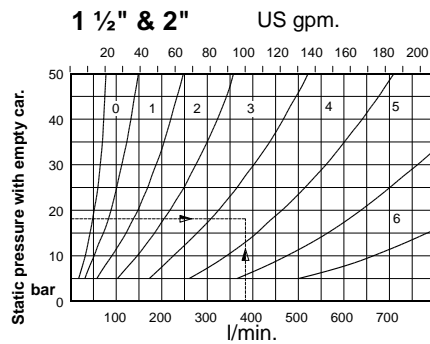
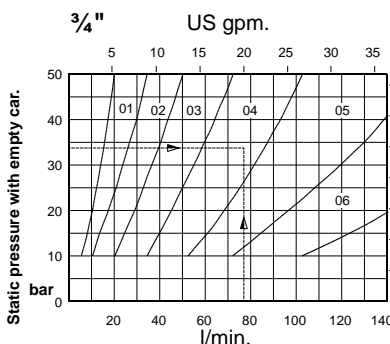


In case of down leakage, replace and test in the following order: (DS) & (DN), (XO), (VO), (WO), (FO) + (HO).

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



## 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, 380lpm, 18 bar (empty), 110 AC ≡ EV 100/4/110AC

