

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:

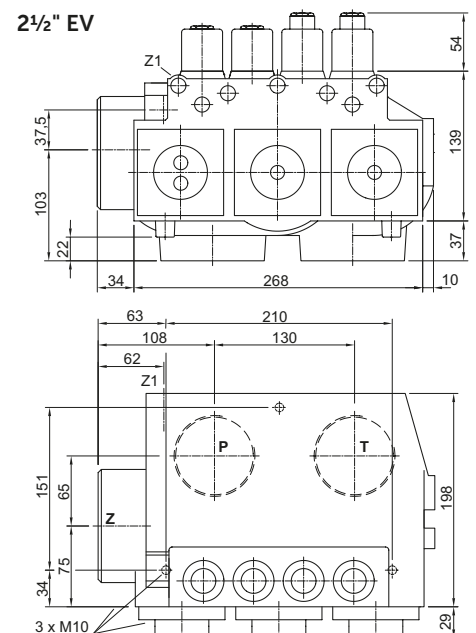
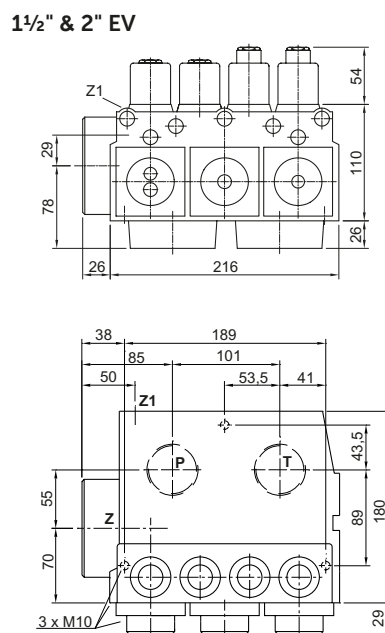
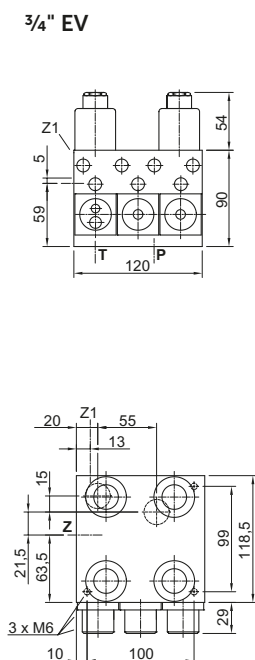


Simple Responsive Adjustment
Temperature and Pressure Compensation
Solenoid with Connecting Cables
Pressure Gauge and Shut Off Cock
Self Closing Manual Lowering

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:

Technical Data:		¾" EV	1½" & 2" EV	2½" EV
Flow Range:	l/min	10-125 (2-33 US gpm)	30-800 (8-211 US gpm)	500-1530 (132-404 US gpm)
Pressure Range (valve):	bar	8-100 (116-1450 psi)	8-100 (116-1450 psi)	8-68 (116-986 psi)
Press. Range CSA (valve):	bar	8-100 (116-1450 psi)	8-70 (116-1015 psi)	8-47 (116-682 psi)
Burst Pressure Z:	bar	575 (8339 psi)	505 (7324 psi)	340 (4931 psi)
Pressure Drop P-Z:	bar	6 (87 psi) at 125 l/min	4 (58 psi) at 800 l/min	4 (58 psi) at 1530 l/min
Weight:	kg	5 (11 lbs)	10 (22 lbs)	14 (31 lbs)
Coils 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		
Coils 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.			
Oil Viscosity:	25-60 cSt. at 40°C (104°F).	Max. Oil Temperature: 70°C (158°F)		
Operation oil temperature range:	10°C-60°C (50°F-140°F), for oil VGA46: 250cSt.-20 cSt.			
Optimal oil temperature range:	25°C-55°C (77°F-131°F), for oil VGA46: 100cSt.-24 cSt.			
Ambient temperature range:	0°C-70°C (32°F-158°F)			



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GmbH

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

EV Control Valve Types

Optional Equipment

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



EV 0

3/4"

1 1/2" & 2" EV

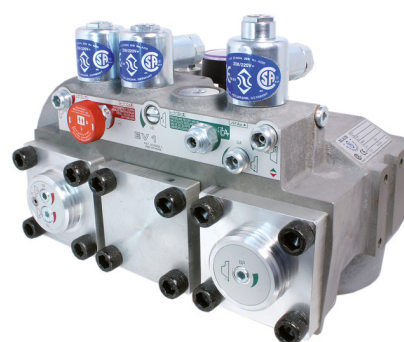
2 1/2"



- 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 coil is energized, by removing nut and raising the coil slightly to feel pull.

Standard settings: adj. **1** level with flange face, adjust bypass pressure (see document quick adjustments); adj. **4** level with flange face, then turn out adj. **4** for ½ a turn; turn in pressure relief valve **S** completely, then turn out **S** for 1½ turns; turn in adj. **2, 3 & 5** completely, turn out adj. **3 & 5** for 2½ turns and turn out adj. **2** for EV ¾": 1½ turns and for EV 1½" - 2½": 2½ turns.

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-energized. There is no adjustment.
Alternative Up Stop with Over-travel: The pump-motor is de-energized at floor level. Through the flywheel action of the pump-motor drive the car will travel to just above floor level. In overtravelling the floor, down levelling coil **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.

EV 1

- 1. By Pass:** When the pump is started and coil **A** energized, 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 coil **A** energized 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, coil **A** is de-energized. 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 coil **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.

EV 10

- 1. By Pass:** When the pump is started and coil **B** energized, 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 coil **B** energized 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 coil **B** is de-energized, 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 coil **B** de-energized 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 speed.
Up stop: The pump-motor is de-energized. 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 coils **A** and **B** energized, 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 coils **A** and **B** energized 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 coil **B** is de-energized, whilst coil **A** remains energized, 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 coil **A** energized and coil **B** de-energized 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 speed.
- 5. Up Stop:** At floor level, coil **A** is de-energized with coil **B** remaining de-energized. 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 coil is energized, by removing nut and raising the coil slightly to feel pull.

Standard settings: adj. **7 & 9** level with flange faces, then turn out adj. **9** for ½ a turn; turn in adj. **6 & 8** completely, then for EV¾": turn out adj. **6** for 2½ turns and turn out adj. **8** for 1 turn; for EV1½" - 2½": turn adj. **6** for 2 to 2½ turns out and adj. **8** for 1½ turns out.

6. Down Acceleration: When coils **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.

7. Down Speed: With coils **C** and **D** energized 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 coil **C** is de-energized whilst coil **D** remains energized, 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 coil **C** de-energized and coil **D** energized 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.

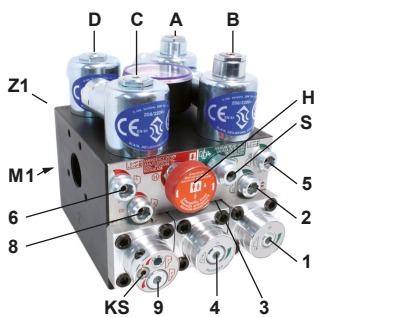
Down Stop: When coil **D** is de-energized with coil **C** remaining de-energized, the car will stop according to the setting of adjustment **8** and no further adjustment is required.

KS Slack Rope Valve: Both coils **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 turned out until the car just begins to descend, then turned out a further half turn to ensure that with cold oil, the car can be lowered as required.

Positions of Adjustments

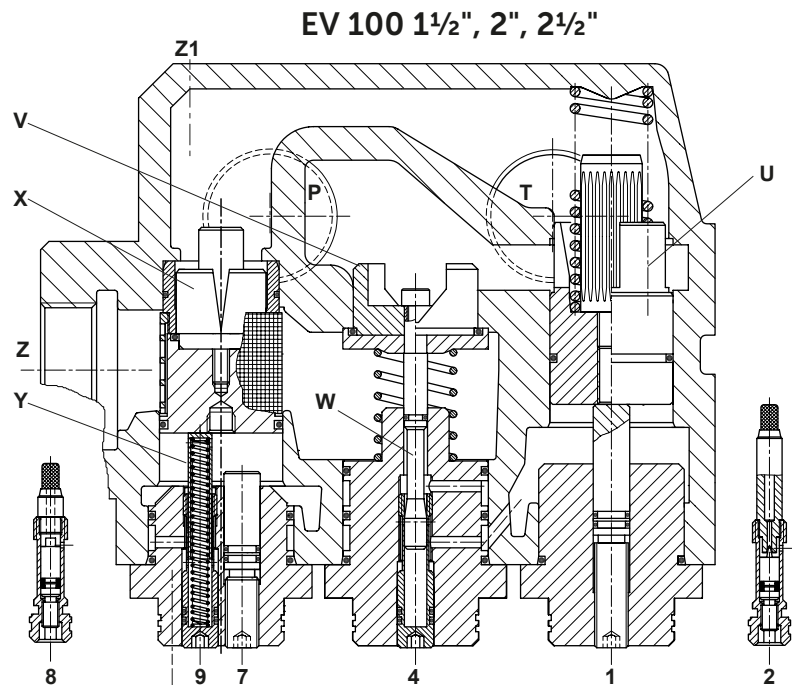
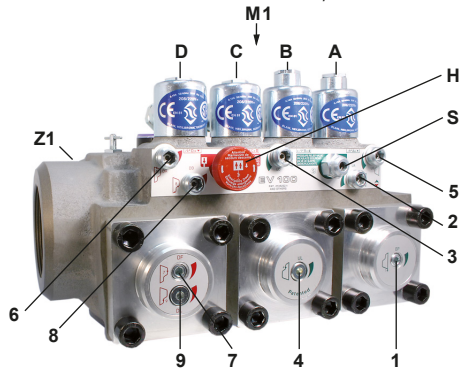


Important: Length of ¾" thread on pump connections should not be longer than 14 mm!

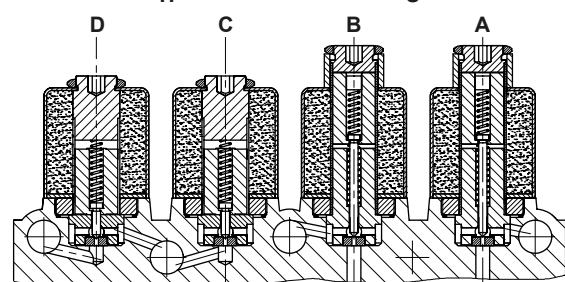
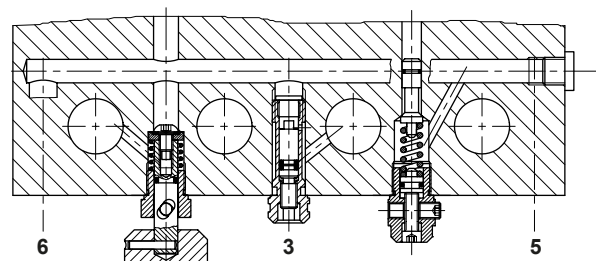


M1 Test pressure gauge connection, ½"

Z1 Pressure switch connection, ¼"



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

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

Adjustments UP

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

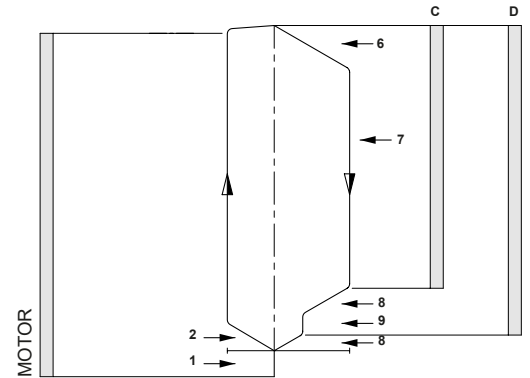
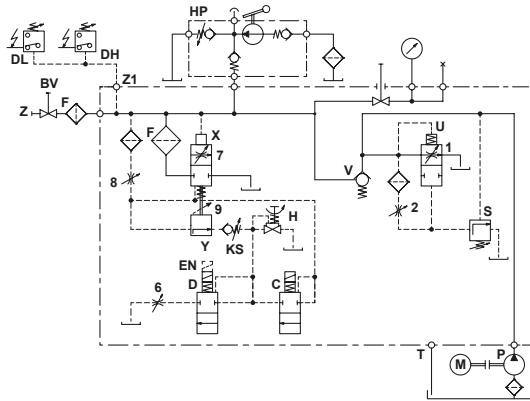
Adjustments DOWN

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

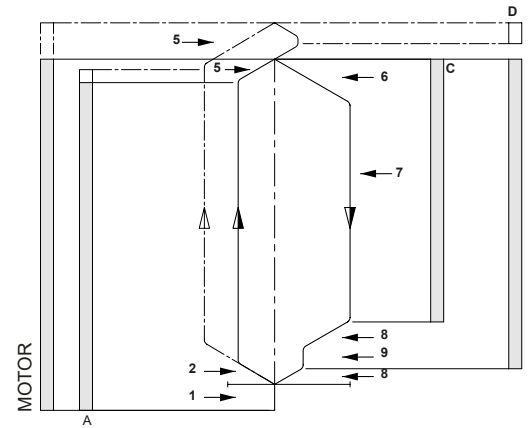
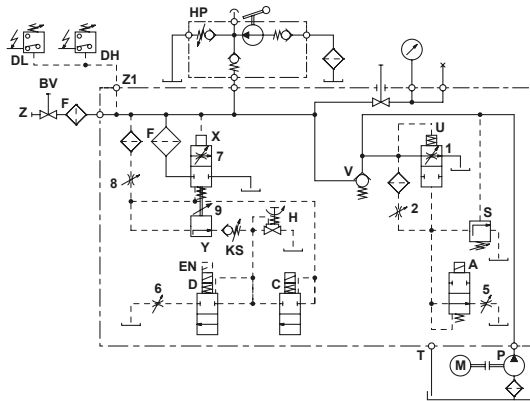
Hydraulic Circuit

Electrical Sequence

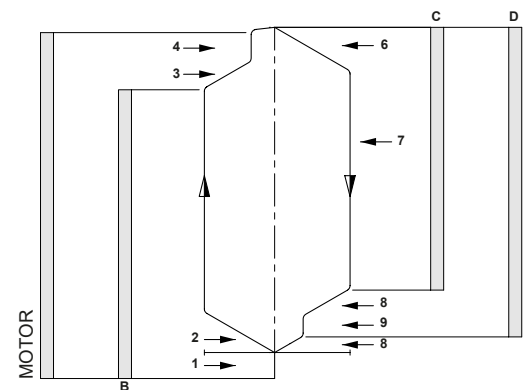
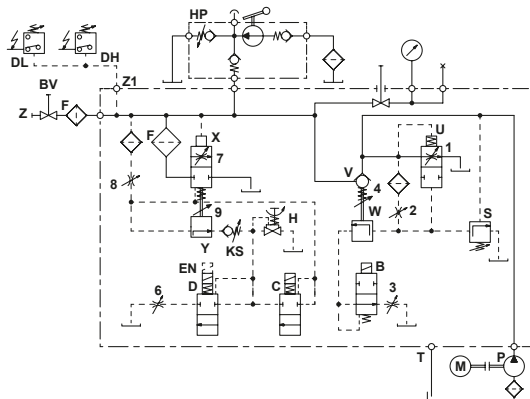
EV 0



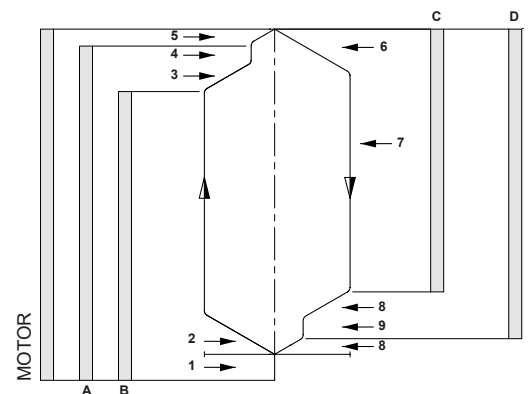
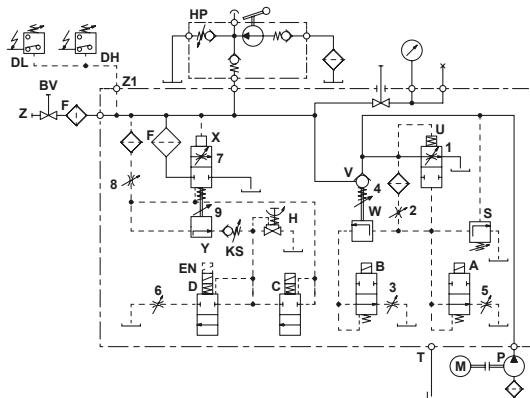
EV 1



EV 10



EV 100





EV Spare Parts List

EV

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
2	UF	Spring - By Pass
	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
	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	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
8	F	Main Filter
	8	Adjustment - Down Deceleration
9	9E	Adjustment - Down Levelling
	EO	O-Ring - Adjustment
	9F	Spring - Down Valve
H	Y	Down Levelling Valve
	H	Manual Lowering - Self Closing
HO	SE	Seal - Manual Lowering
	HO	Seal - Manual Lowering
S	SE	Adjustment - Screw
	SM	Hexagonal
	MS	Grub Screw
	SO	O-Ring - Nipple
	SZ	Nipple
	SF	Spring
A+B	SK	Piston
	MM	Nut - Solenoid
	AD	Collar - Solenoid
	M	Coil - Solenoid (indicate voltage)
	AR	Tube - Solenoid 'Up'
	MO	O-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	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'

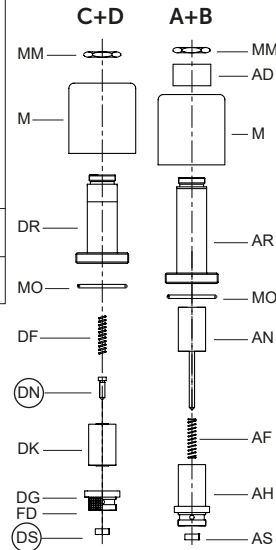
Some parts occur more than once in different positions of the valve.

No.	O-Ring-Size		
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

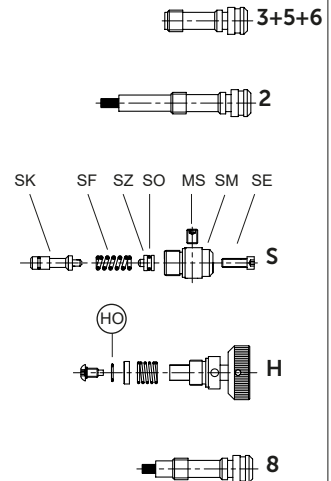
* FO by 4F 2 1/2" is 67x2.5P
** 90 Shore

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

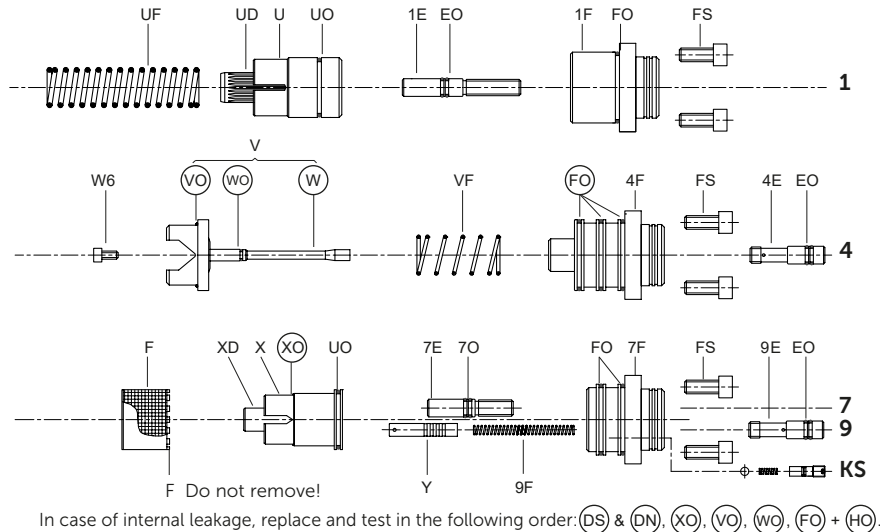
Solenoid Valves



Adjustments



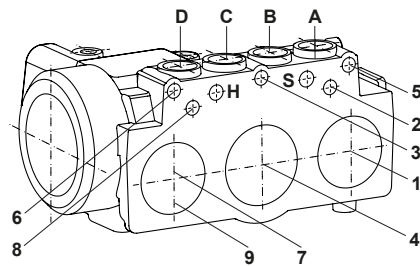
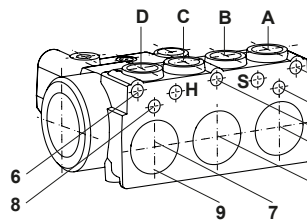
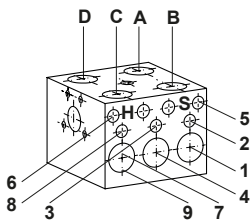
Flow Valves



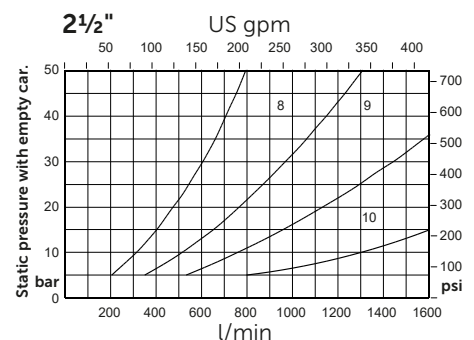
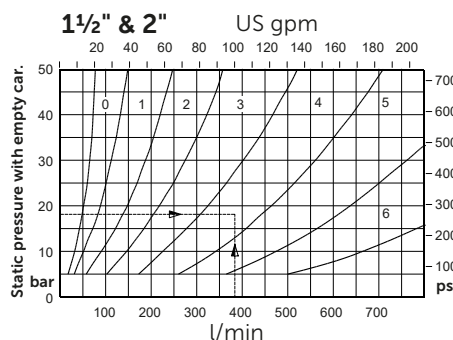
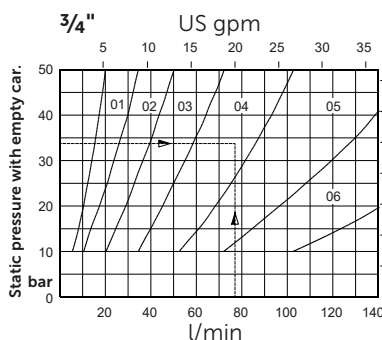
In case of internal leakage, replace and test in the following order: (DS) & (DN), (XO), (VO), (WO), (FO) + (HO).



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



Flow Guide Selection Charts



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

Example order: 1 1/2"EV100, 380l/min, 18bar (empty), 110 AC or 1 1/2"EV100/4/110AC