



Servovalves Series **BD, PH, SE**

Catalogue HY11-3292/UK
November 2003



Note

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General Description

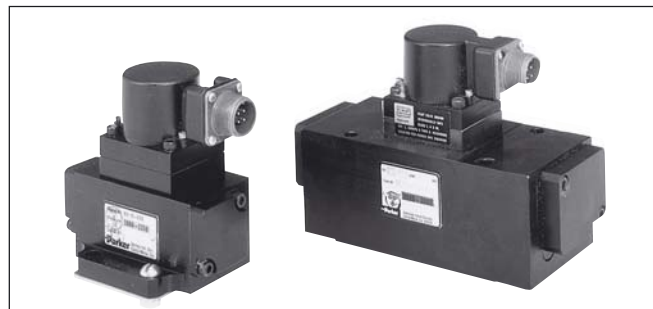
The BD Series servo valves provide high resolution in the control of position, velocity and force in motion control applications.

Features

- Rugged reliable trouble-free operation
- Reduced contaminant sensitivity
- Linear flow gain characteristics
- Intrinsically safe model available
- Explosion proof model available

Operation

When used in conjunction with our BD90/95 series of servo amplifiers or our PMC series of motion controllers, the BD series of valves will provide accurate control of rotary and linear actuators.



Specifications

Flow Rating ± 10% (at 70 bar)	[l/min]	3.78 to 151
Pressure Ranges	[bar]	0-207, 14-45, 48-66, 69-90 97-135, 138-173, 179-207
Quiescent flow (Std. spool lap)	BD15 [l/min] BD30 [l/min]	1.5-2.1 2.1-3.78
Non-linearity	[%]	≤ 5
Hysteresis	[%]	≤ 3
Threshold	[%]	≤ 0.5
Null Shift		
with temperature	[%]	< ±2 per 38°C
with pressure	[%]	< 2 per 69 bar
Pressure Gain % change in pressure per 1% change in input command		30% typical
Step response	BD15 BD30	10 - 90%, 26 ms 10 - 90%, 30 ms
Fluid		Mineral Oil, 60 to 225 SSU 1000 SSU maximum
Fluid cleanliness		SAE Class 3 or better, ISO Code 15/12
Operating temp.	[°C]	-1 to +106
Protection class		NEMA 1, IP54

* for optimum performance, Parker Servo Valves are designed to operate within specific system supply pressure ranges.

Flow-Load Characteristics

Control flow to the load will change with load pressure and valve current as shown in figure 1.

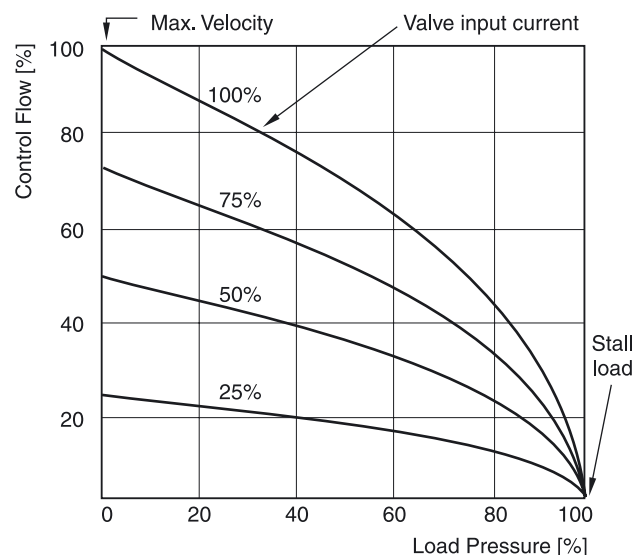
These characteristics closely follow the theoretical square-root relationship for sharp-edged orifices as illustrated in the equation below.

$$Q = K \sqrt{\Delta P}$$

Q = Control flow, cubic inches/sec

K = Valve constant

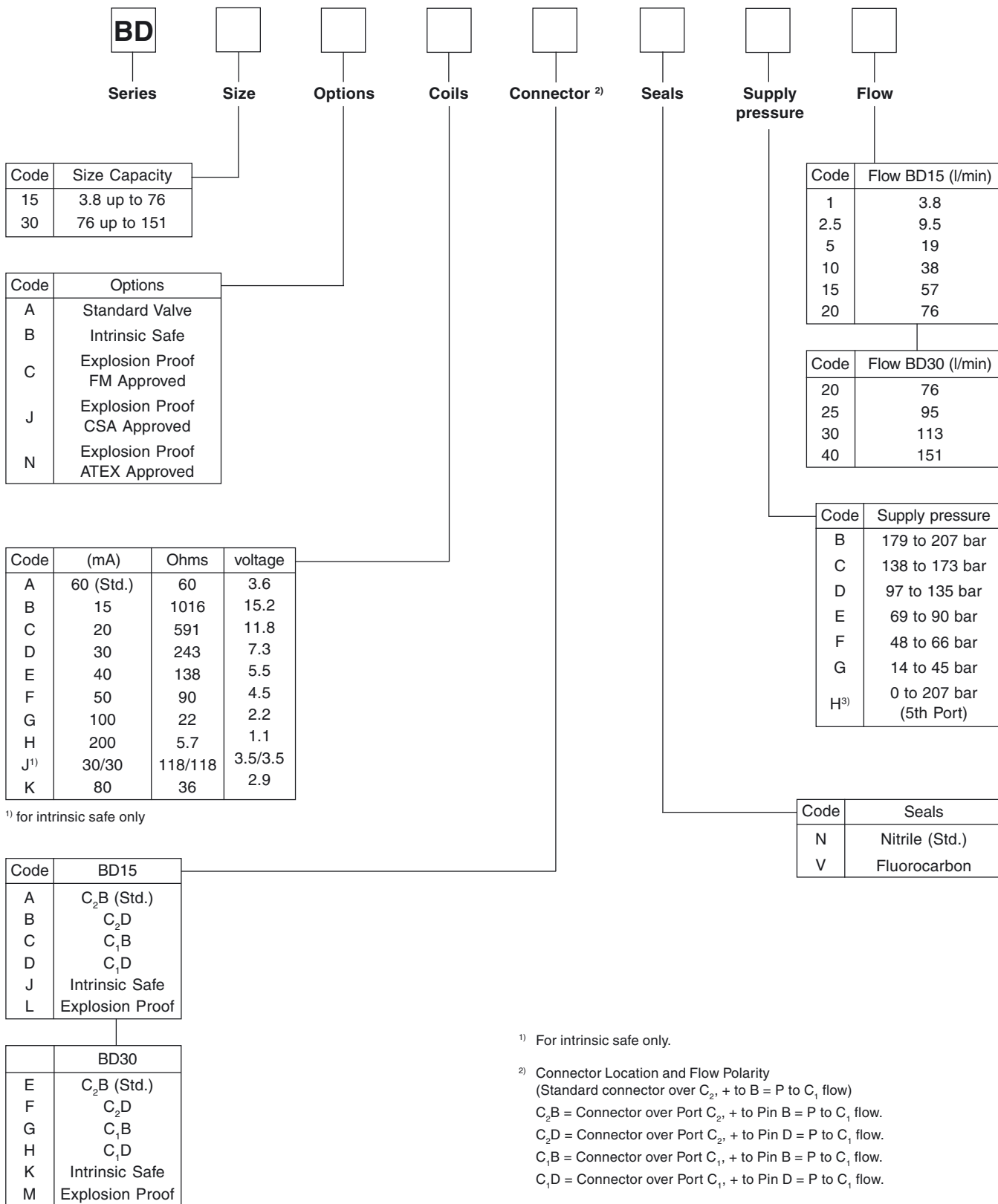
ΔP = Valve pressure drop



Change in flow with current and load pressure

Quick Reference Data Chart

Model	Flow Capacity (l/min)	Max. Pressure Rating	Max. Tank Pressure	Port Circle	Electrical input (Std.) Single Coil	Coil resistance (Std.) Each Coil	Weight
BD15	3.8, 9.5, 19, 37, 57, 76	210 bar	14 bar	0.875	60 mA (full flow)	60 Ohms	1.2 kg
BD30	76, 95, 113, 151	210 bar	14 bar	1.75	60 mA (full flow)	60 Ohms	2.9 kg



¹⁾ for intrinsic safe only

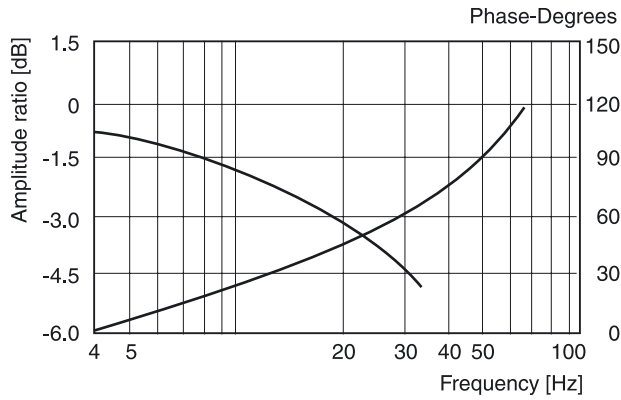
¹⁾ For intrinsic safe only.

²⁾ Connector Location and Flow Polarity
 (Standard connector over C₂, + to B = P to C₁ flow)
 C₂B = Connector over Port C₂, + to Pin B = P to C₁ flow.
 C₂D = Connector over Port C₂, + to Pin D = P to C₁ flow.
 C₁B = Connector over Port C₁, + to Pin B = P to C₁ flow.
 C₁D = Connector over Port C₁, + to Pin D = P to C₁ flow.

³⁾ Supply Pressure: Code "H" applies to 5th Port/External Pilot Option. This requires the use of a blank orifice "-00". First stage pressure should be limited to 400 PSI and no less than 250 PSI.
Pressures in excess of 600 PSI may damage pilot.

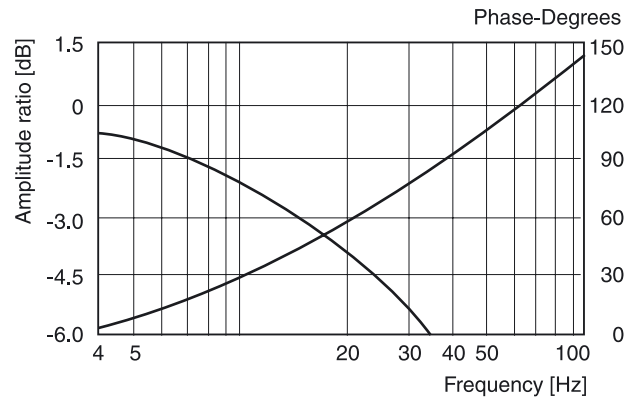
Typical Response Curves

BD15



BD15 Typical Frequency
 Response at $\pm 25\%$ Input Current

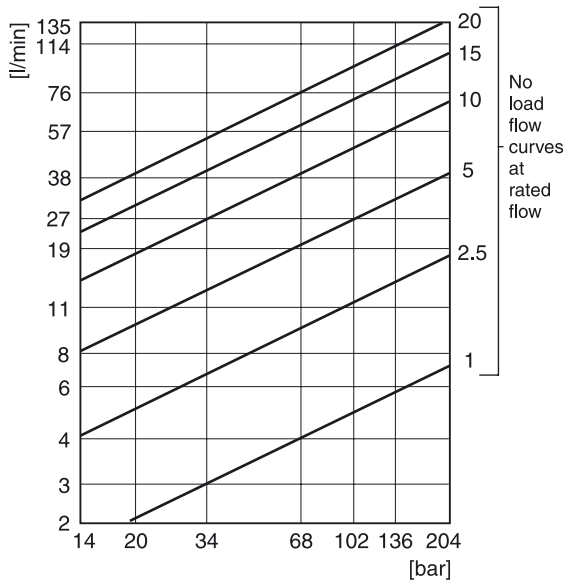
BD30



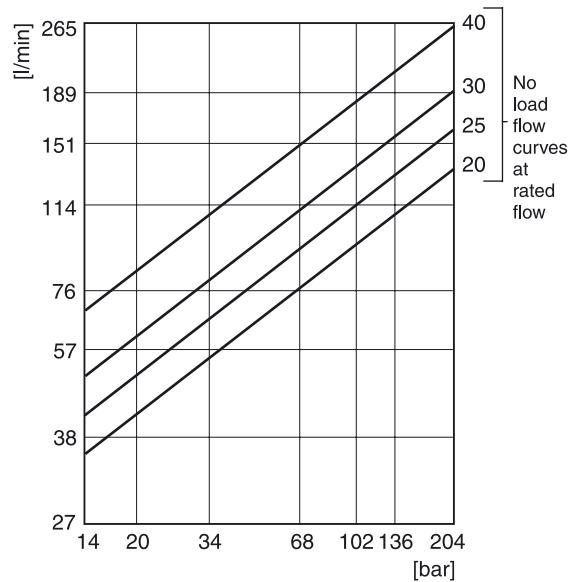
BD30 Typical Frequency
 Response at $\pm 25\%$ Input Current

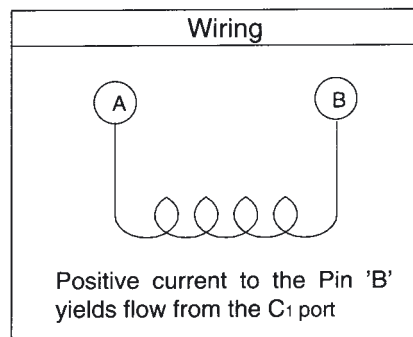
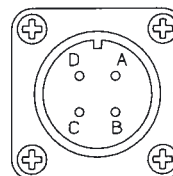
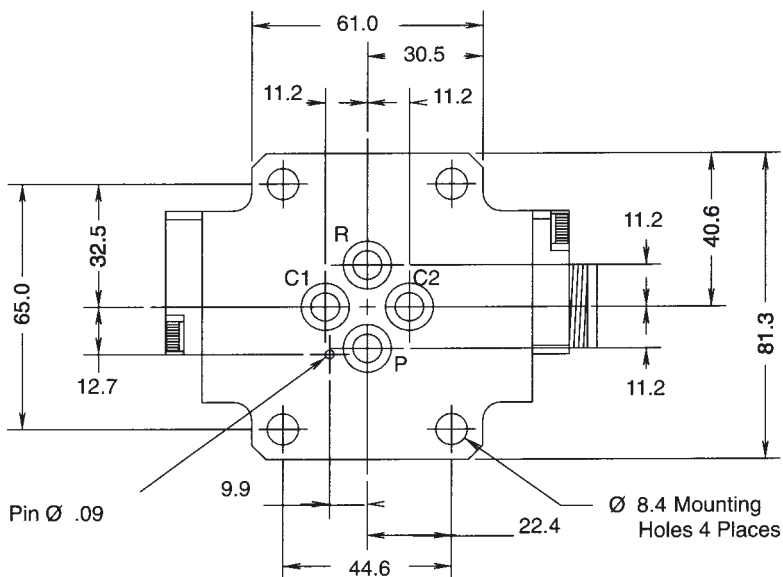
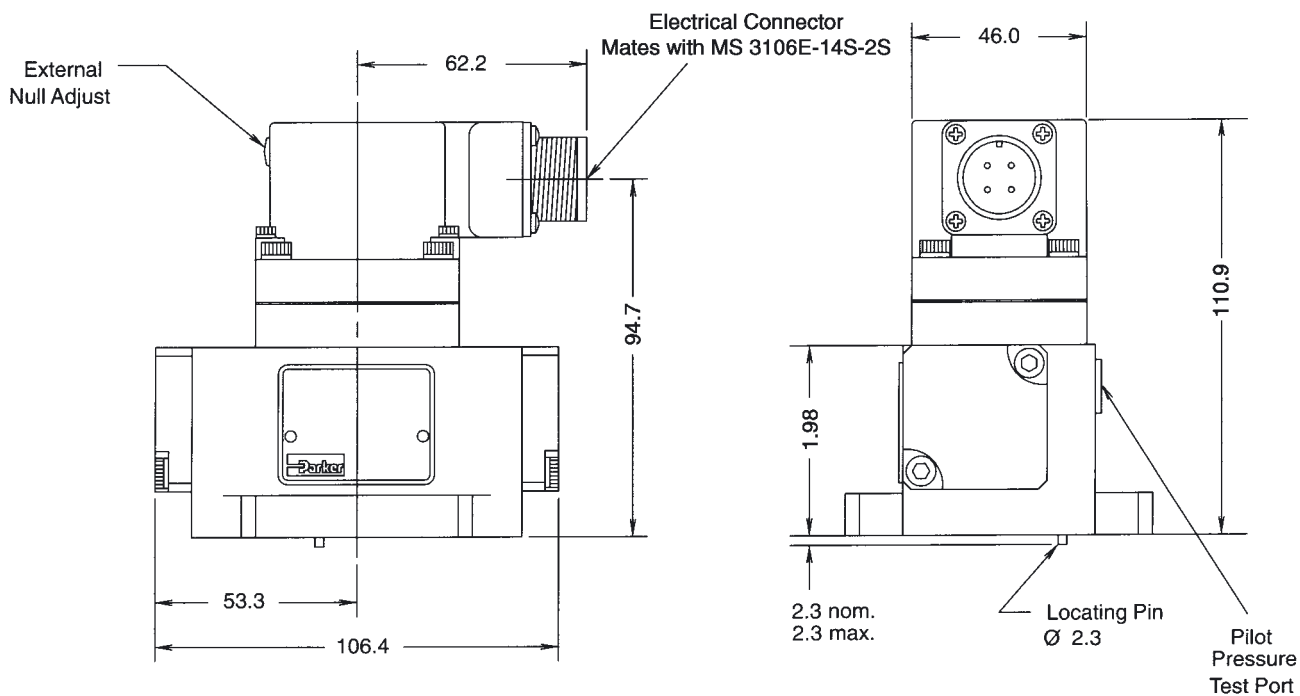
Pressure Drop Curves

BD15

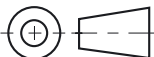


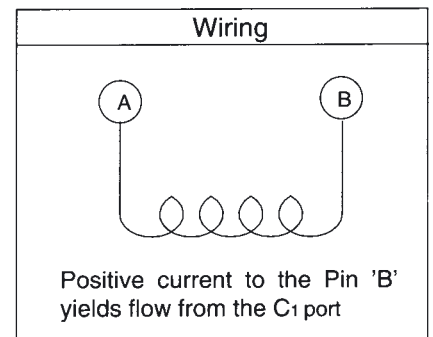
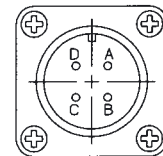
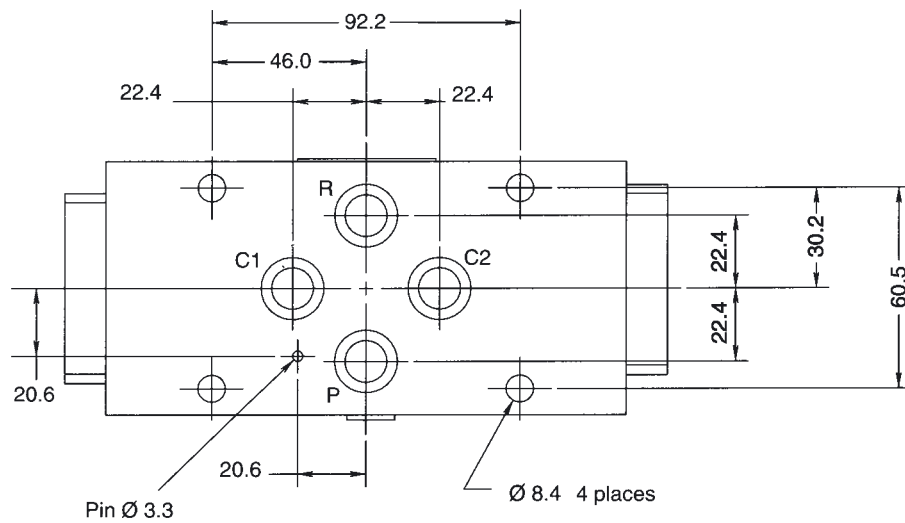
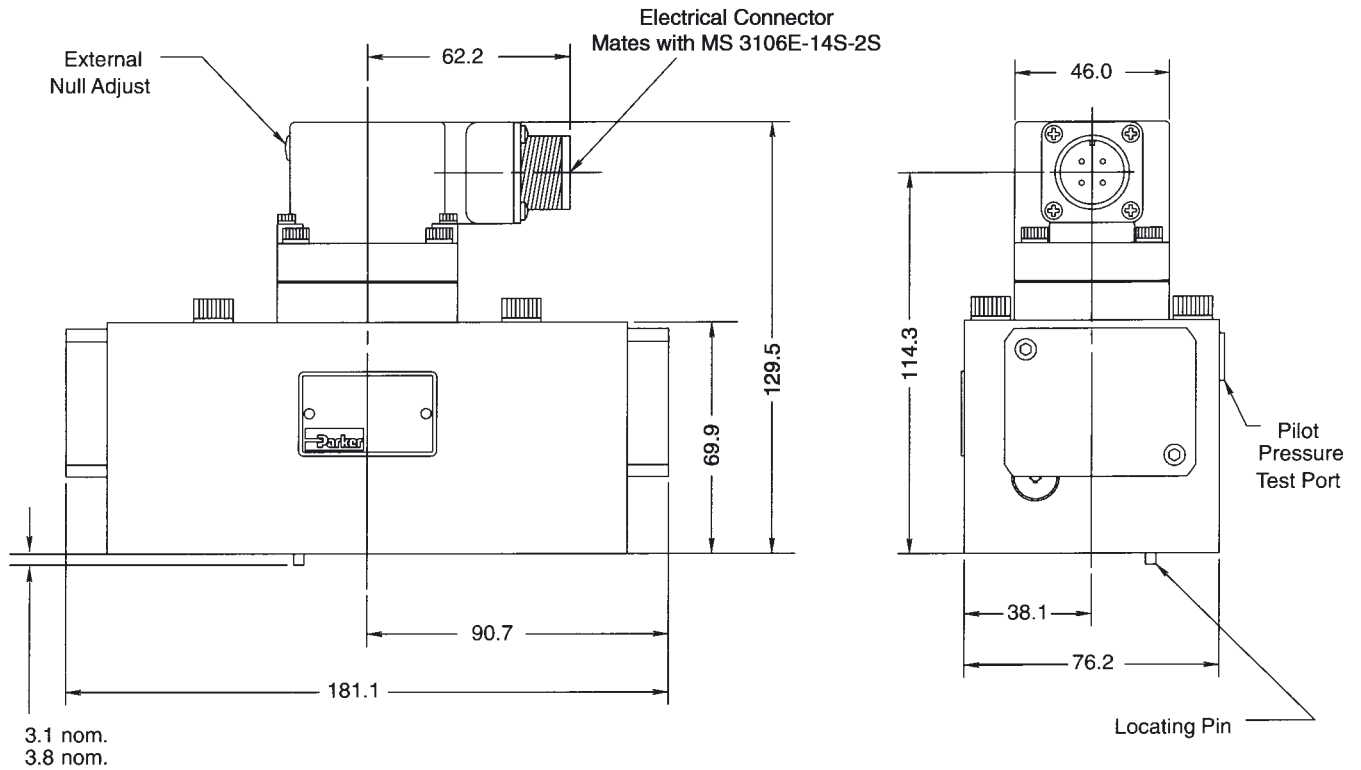
BD30



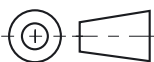


Note: Valve mating surface to be flat within 0.002 TIR, and smooth to within 63 RMS





Note: Valve mating surface to be flat within 0.002 TIR, and smooth to within 63 RMS

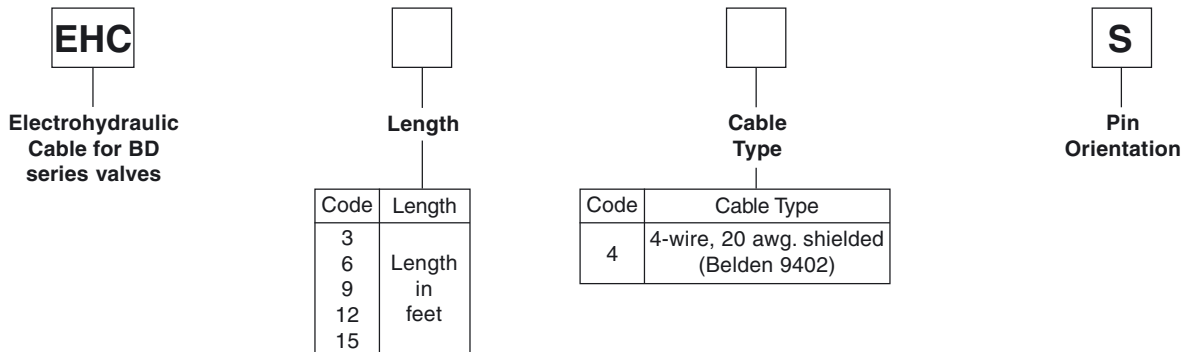


Accessories

Valve Model	Subplate	Port Size	Location	Bolt Kit	Torque Specifications	Flushing Valve
BD15	810090-3	SAE12	Side	BK07	23 Nm	1200127
BD30	820090-3	SAE16	Side	BK46	23 Nm	1200128

Use the Parker BD90 or BD95 amplifiers with these valves.

Cables

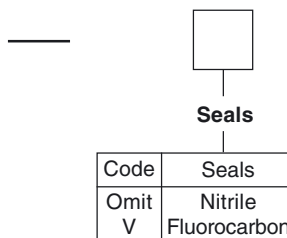
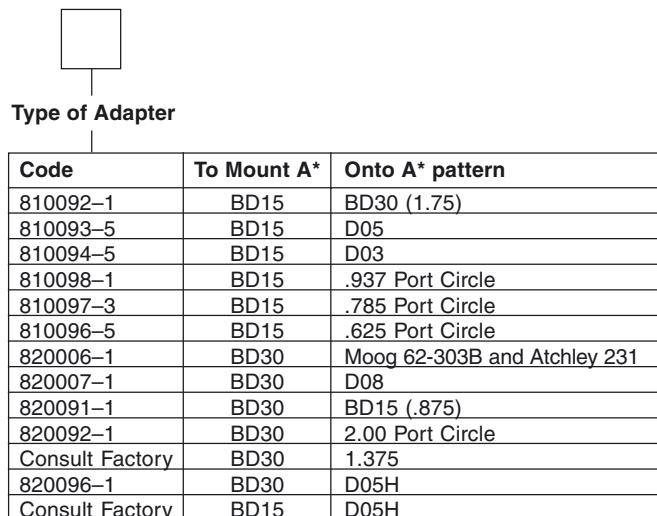


Accessories

Model	Description
6522A11	1/16" Hex Allen Wrench, Non-Magnetic for Null Adjustment
810005-1	Orifice Filter
810013-**	Valve Orifice Kit, Fluorocarbon
810014-**	Valve Orifice Kit, Nitrile
**Dash#	Operating Pressure
-16	180 - 210 bar
-18	138 - 176 bar
-20	96 - 134 bar
-22	69 - 93 bar
-33	48 - 66 bar
-50	14 - 45 bar
-00	0 -210 bar (5th Port)

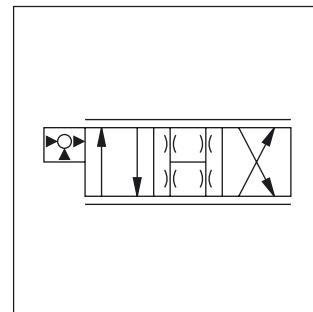
Model	Description
820089-1	BD30 Servovalve Shipping Container
BD830008	BD90/95 Amplifier Board Shipping Container
810089-1	BD15 Servovalve Shipping Container
820000-TF3	Filter Wrench
MS3106E-14S-2S	SV Mating Connector

Adapters



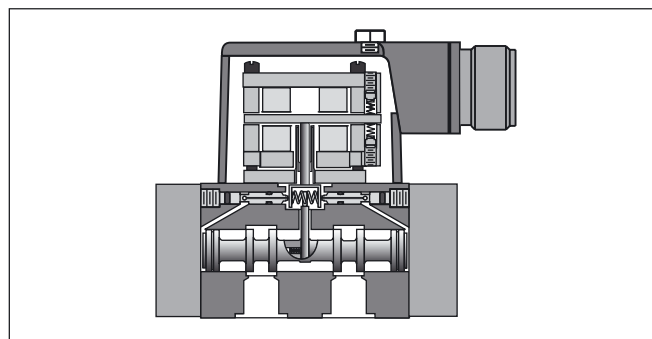
General Description

The PH76 servovalves are high performance, two stage valves, with a range of rated flows from 3.8 to 57 l/min. The pilot stage is a symmetrical double-nozzle and flap-per, driven by a double air gap, dry torque motor. A low current signal to the torque motor pilot stage results in a proportional flow from the output stage. The output stage is a 4-way, sliding spool which provides a mechanical feedback using an exclusive “no ball glitch” design.



Features

- Built to survive tank port pressure spikes
- No ball glitch
- Tool steel spool and body
- Optional 5th port for external pilot
- ISO 10372 standard 22.23 mm port circle



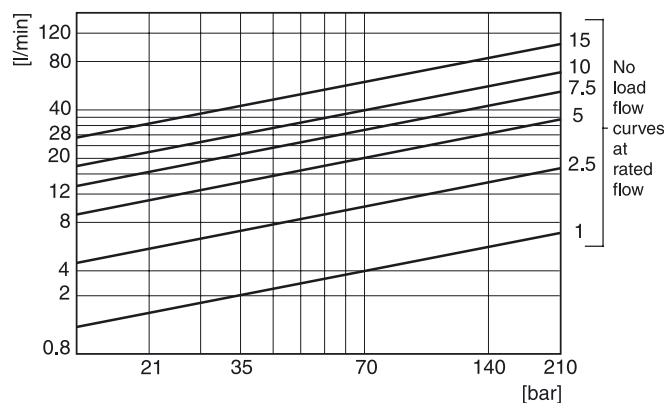
Specifications

Flow Rating ± 10% (at 70 bar)	[l/min]	3.8, 9.5, 19, 28, 38, 57
Supply pressure	[bar]	10 - 210
Tank port pressure	[bar]	max. 210 < 10 for best performance
Null leakage flow (at 70 bar)	[l/min]	0.2 - 0.8
Pilot flow (at 210 bar)	[l/min]	0.8 - 1.2
Input command	[mA]	±50 std.
Frequency response (at 90° phase shift)	[Hz]	> 90 (see Performance Curves)
Non-linearity	[%]	≤ 10
Hysteresis	[%]	≤ 4
Threshold	[%]	≤ 0.5
Null shift with temperature	[%]	≤ 2 per 55°C
Null shift with pressure	[%]	≤ 2 per 70 bar
Pressure gain % change in pressure per 1% change in input command		30% minimum, 70% maximum
Step response		0 - 100%, < 15 ms
Fluid		Mineral Oil, 60 to 225 SSU 1000 SSU maximum
Fluid cleanliness		ISO 4406 15/12 or better
Operating temp.	[°C]	-1 to +82
Protection class		NEMA 4, IP65

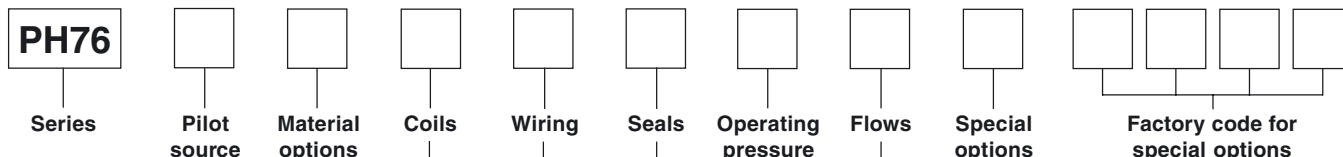
Performance Curves

Servovalve flow is proportional to the square root of the pressure drop through the valve. The nominal flow rating for the servo-valves is based upon a 70 Bar (1000 PSI) pressure drop.

Flow vs. pressure drop
at 100% command
Flow Path P→C1→C2→R



Ordering Code



Code	Pilot source
A	internal
C	external (5th port)

For internal pilot the 5th port is blocked internally.

Code	Material options
A	Steel (standard)
Z	Special (specify)

Code	Description	Parallel	Series
D	200 Ohms	50 mA	25 mA
F	80 Ohms	40 mA	20 mA
G	22 Ohms	200 mA	100 mA
K	40 Ohms	150 mA	75 mA
M	475 Ohms	40 mA	20 mA
T	1000 Ohms	8 mA	4 mA
Z	Special (specify)		

Code	Connector over	Flow P to C2 with:
B	Port C2	(+) signal to A, C
A	Port C1	(+) signal to A, C
P	Port P	(+) signal to A, C
T	Port T	(+) signal to A, C

Code	Special options
omit	Standard
S	(Specify) ¹⁾

¹⁾ Consult factory for price, delivery and availability of special options.

Code	Flows (l/min)
1	3.8
2.5	9.5
5	19
7.5	28
10	38
15	57

Code	Operating pressure
A	210 bar
Z	Special (specify)

Code	Seals
V	Fluorocarbon (std.)
N	Nitrile
E ²⁾	EPR
Z ²⁾	Special (specify)

²⁾ Consult factory for delivery

Weight: 1 kg

Cable with mating connector: EHC154S

Mating connector: MS3106E-14S-2S

Bolt kit: 4 of M8 x 20 mm, or 4 of 5/16-18 x 0.75"

Flushing valve: 1200127 (does not cover 5th port)

Subplate, 5 ports: 1402303 (4) #12 SAE side ports, (1) #4 SAE side ports

Subplate, 4 ports: 810090-3 (4) #12 SAE side ports

Metric subplate, 4 ports: DS04SPS12M (M27 x 2.0 ISO 6149 side ports)

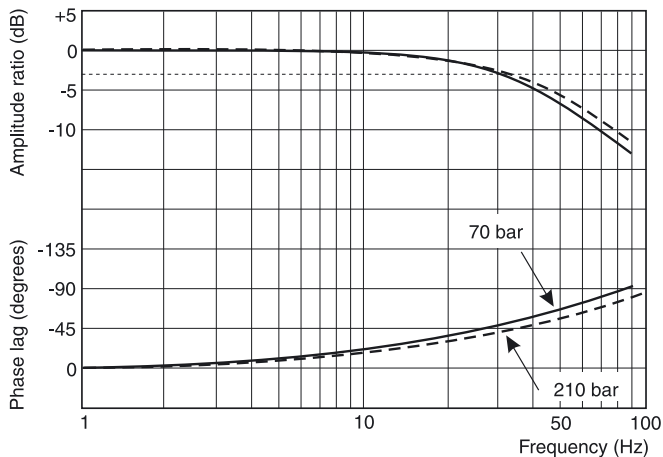
Metric subplate, 5 ports: Consult factory.



Flushing valve is rated for 3000 psi operation.

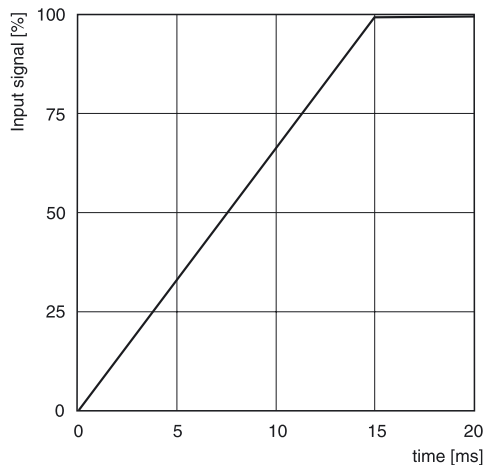
Frequency Response

The frequency response curves for the PH76 servovalves show no significant change for signal amplitudes between $\pm 10\%$ and $\pm 40\%$. Frequency response is unaffected by changes in supply pressures above 70 bar.



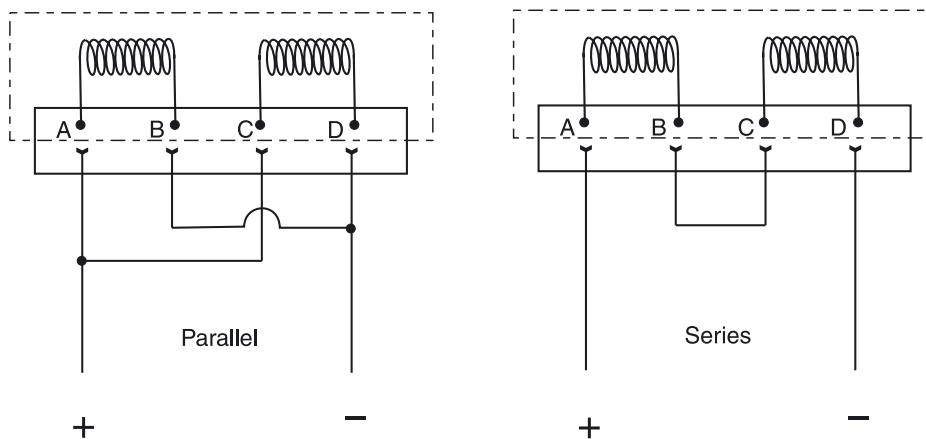
Step response at 210 bar

4 - 60 l/min

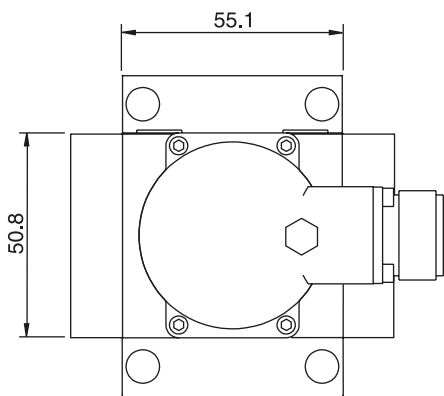


Installation Wiring Options

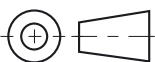
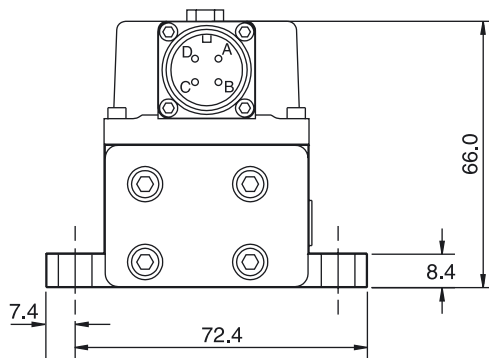
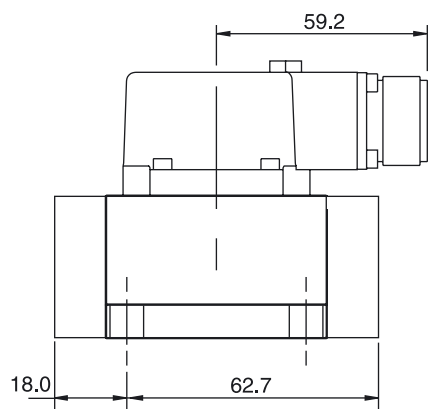
The PH76 servovalve has two coils. One is wired across pins A to B, the other across pins C to D. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. In either case, a positive voltage to pin A connects valve flow from ports P to C2 and ports C1 to R.



Polarity shown connects flow from P to C2 port.

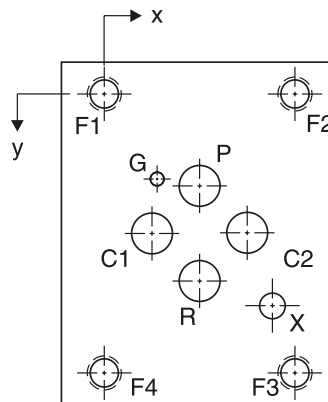


1. Recommended mounting bolt M8 x 20 mm high tensile strength socket head cap screws.
2. Mating connector is MS3106E-14S-2S.
3. Base O-Rings: Qty 5 of 2013V-7.
4. Null adjustment requires tool #27-0210.



Mounting Surface dimensions

1. The minimum depth of hole G is 2 mm.
 The ISO recommended full-thread depth is 22 mm.
2. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
3. Surface flatness: 0.025 mm as specified in ISO 1101.



Metric Dimensions (mm)						(± 0.1 mm)				
Axis	P	C1	R	C2	G	X	F1	F2	F3	F4
	Ø 8.2 max	Ø 8.2 max	Ø 8.2 max	Ø 8.2 max	Ø 3.5	Ø 5	M8	M8	M8	M8
x	22.2	11.1	22.2	33.3	12.3	49.5	0	44.4	44.4	0
y	21.4	32.5	43.6	32.5	19.8	39	0	0	65	65

Characteristics

Servovalves Series SEMT

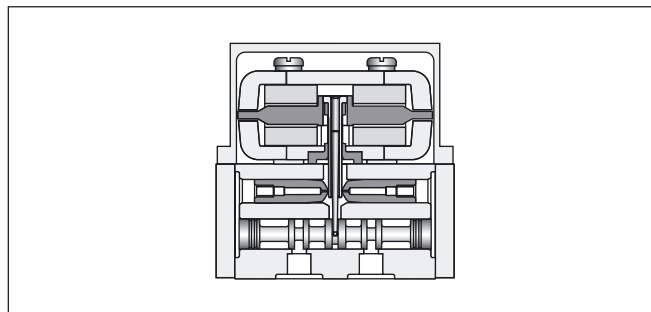
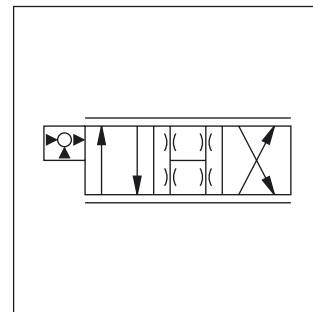
General Description

The Parker mini-valve, SEMT, is a two stage, 4-way, flapper and nozzle style servovalve. Its remarkably small size makes it optimal for Remotely Operated Vehicles (ROV), motorsport suspension control, or any application requiring a compact, and light weight, high performance servovalve.

A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. This valve is rated for 210 bar service. Higher pressure capability is available upon request.

Technical Features

- Jewel feedback ball for durability
- Compact steel body
- High performance
- ISO 10372 standard 12.2 mm port circle



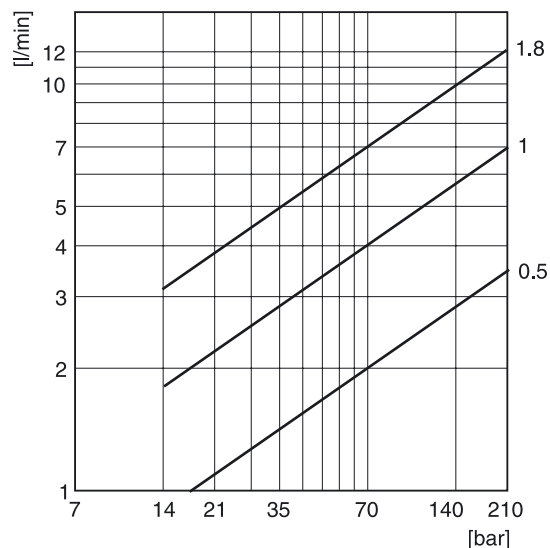
Specifications

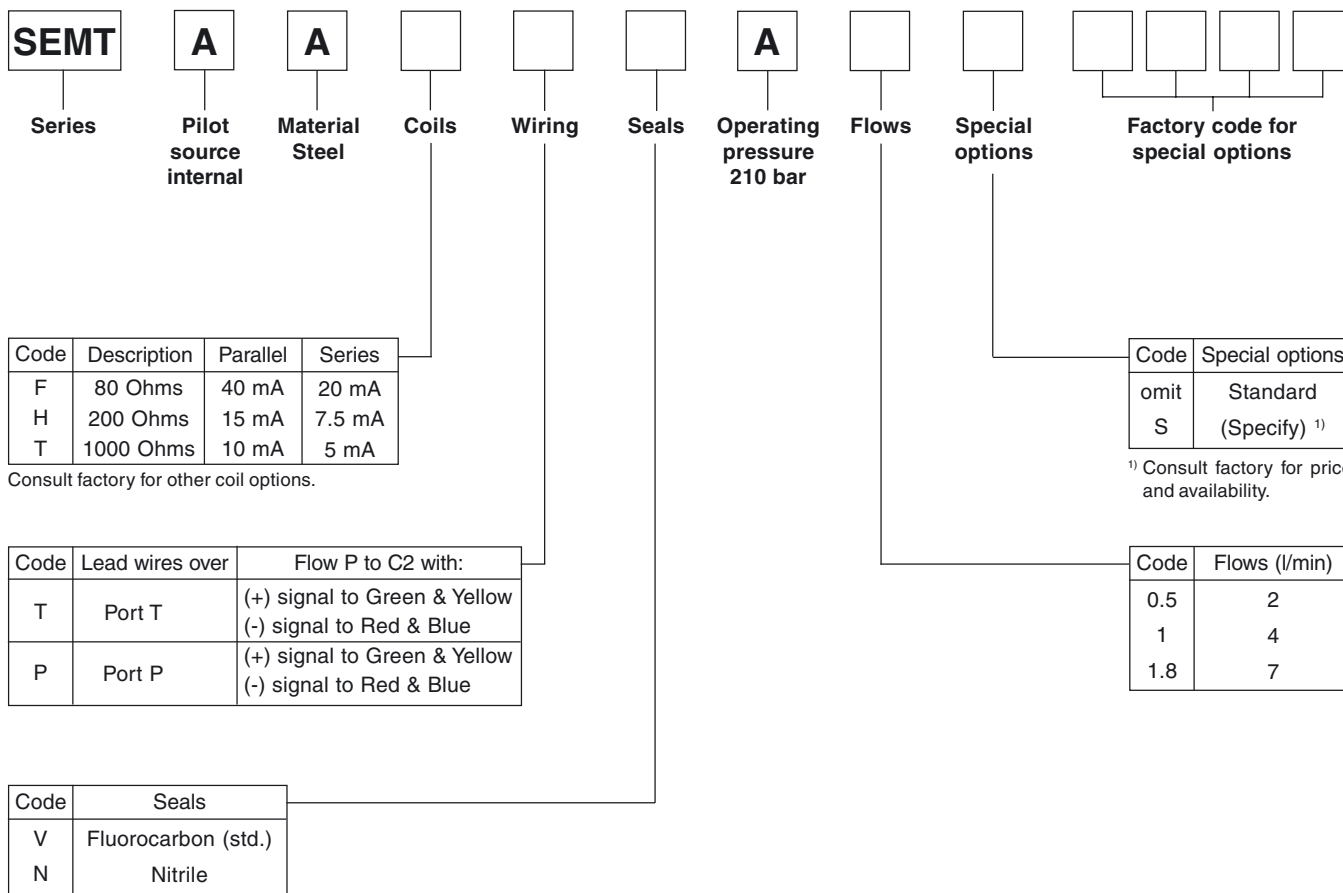
Flow Rating ± 10% (at 70 bar)	[l/min]	2, 4, 7
Supply pressure	[bar]	15 - 210
Tank port pressure	[bar]	max. 210 < 10 for best performance
Pilot and null leakage flow (at 140 bar)	[l/min]	0.4 - 0.7
Input command	[mA]	±10 std.
Frequency response (at 90° phase shift)	[Hz]	> 170 (see Bode plots)
Non-linearity	[%]	≤ 10
Hysteresis	[%]	≤ 3
Threshold	[%]	≤ 0.5
Null shift with temperature	[%]	≤ 2 per 55°C
with pressure	[%]	≤ 2 per 70 bar
Pressure gain % change in pressure per 1% change in input command		60% typical
Step response		0 - 100%, < 4 ms
Fluid		Petroleum based mineral oil 10 to 110 cSt at 38 °C
Fluid cleanliness		ISO 4406 15/12 or better
Operating temp.	[°C]	-30 to +130
Protection class		NEMA 4, IP65

Flow vs. pressure drop

at 100% command

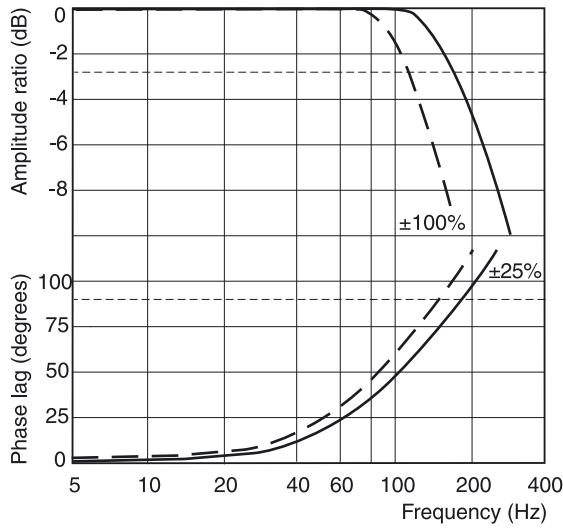
Flow Path P→C1→C2→R





Weight: 230 g
Bolt kit: Qty 4 of M4 x 10 mm, or Qty 4 of # 6-32 x 7/16"
Subplate: Consult factory.
Electronics: BD101, 23-5030, 23-7030, PMC10, BD90, or BD95

Dynamic response at 210 bar



**Step Response
at 100% command**

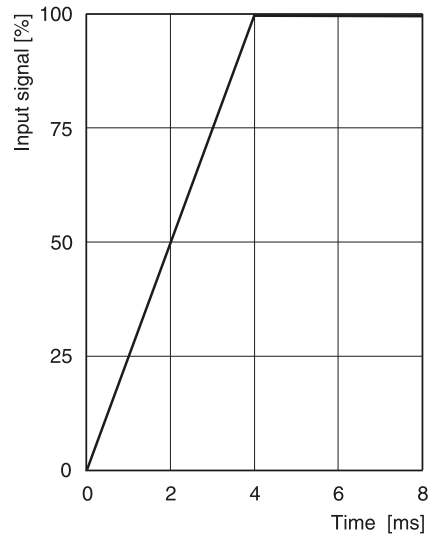
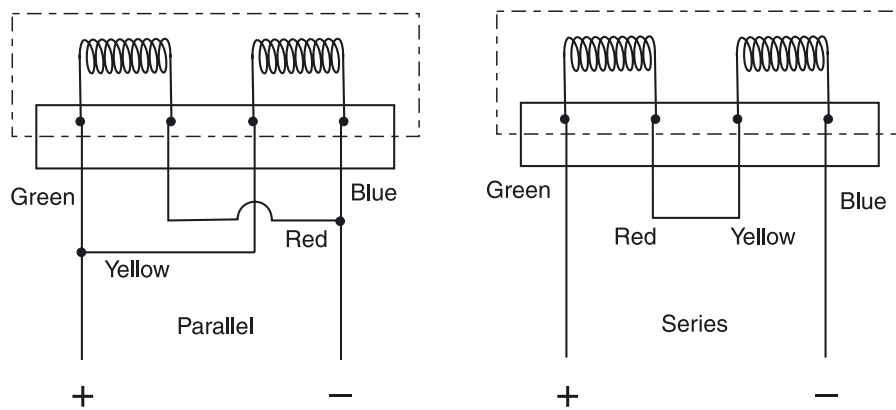


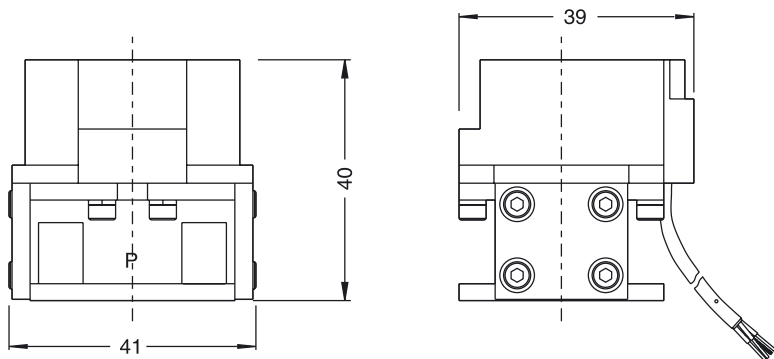
Figure for 7 l/min.

Installation Wiring Options

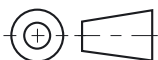
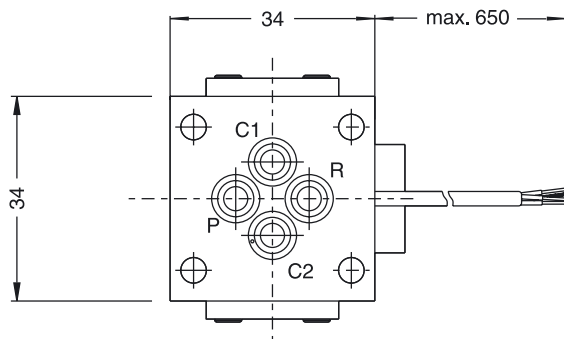
This servovalve has two coils. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. Refer to the illustrations below and to the mounting pattern for this valve to insure proper control phasing.



Polarity shown connects flow from P to C2 port.



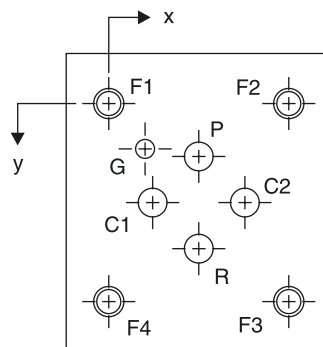
1. Recommended mounting bolts M4 x 10 mm high tensile strength socket head cap screws.
2. Base O-Rings: 6 mm x 1 mm section. 70 durometer.



Mounting Surface dimensions

ISO 10372-01-01-0-92

1. The minimum engagement of mounting threads is 1.5D, where D is the screw diameter. The ISO recommended full-thread depth is 14 mm.
2. The minimum depth of hole G is 2 mm.
3. Surface roughness Ra < 0.8 µm [N6], as specified in ISO 468 and ISO 1302.
4. Surface flatness: 0.025 mm as specified in ISO 1101.



Metric Dimensions (mm)		(± 0.1 mm)							
Axis	P	C1	R	C2	G	F1	F2	F3	F4
	Ø 3.8 max	Ø 3.8 max	Ø 3.8 max	Ø 3.8 max	Ø 2.5	M4	M4	M4	M4
x	11.9	5.8	11.9	18	4.8	0	23.8	23.8	0
y	7	13.1	19.2	13.1	6	0	0	26.2	26.2

Characteristics

Servovalves

Series SE05, SE10 and SE15

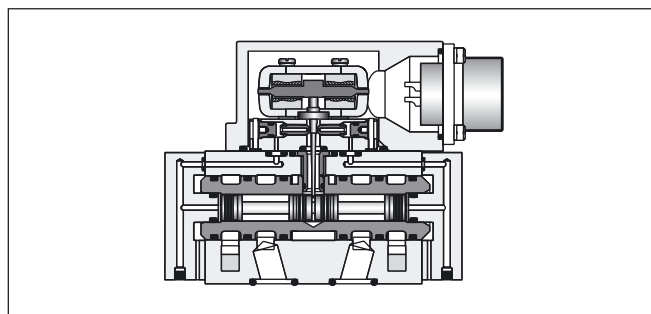
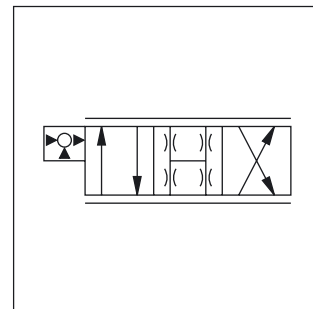
General Description

The Parker models SE05, SE10 and SE15 are two stage, 4-way, flapper and nozzle style servovalves. These valves have high performance spool and sleeve designs.

A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. These valves are rated for 315 bar service.

Technical Features

- Lapped spool and sleeve
- Jewel feedback ball for durability
- Aluminum body
- Medium and High performance
- SE05: 15.88 mm port circle
- SE10: 19.81 mm port circle
- SE15: 23.80 mm port circle



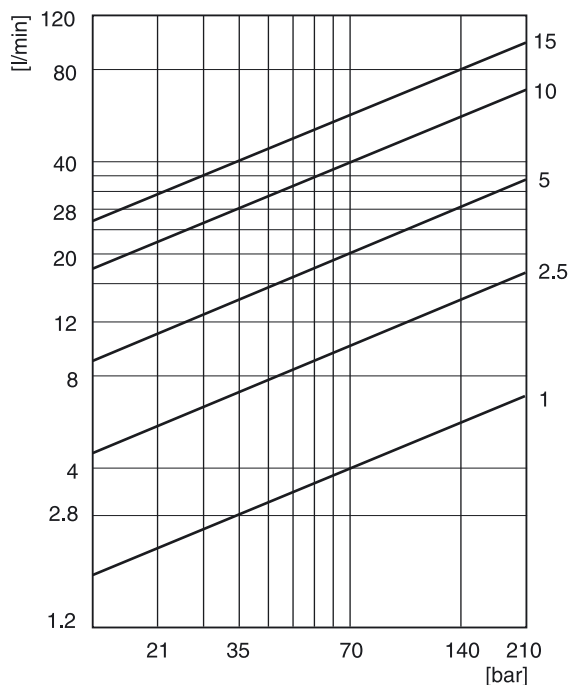
Specifications

Flow Rating $\pm 10\%$ (at 70 bar)	[l/min]	4, 10, 20, 40, 65
Supply pressure	[bar]	10 - 315
Tank port pressure	[bar]	max. 210 < 10 for best performance
Null leakage flow (at 70 bar)	[l/min]	1.2 - 1.9
Pilot flow (at 210 bar)	[l/min]	0.4 - 0.7
Input command	[mA]	± 40 std.
Frequency response (at 90° phase shift)	[Hz]	> 100
Non-linearity	[%]	≤ 10
Hysteresis	[%]	≤ 3
Threshold	[%]	≤ 0.5
Null shift with temperature	[%]	≤ 2 per 55°C
Null shift with pressure	[%]	≤ 2 per 70 bar
Pressure gain % change in pressure per 1% change in input command		60% typical
Step response		0 - 100%, < 6 ms
Fluid		Petroleum based mineral oil 10 to 110 cSt at 38 °C
Fluid cleanliness		ISO 4406 15/12 or better
Operating temp.	[°C]	-30 to +130
Protection class		NEMA 4, IP65

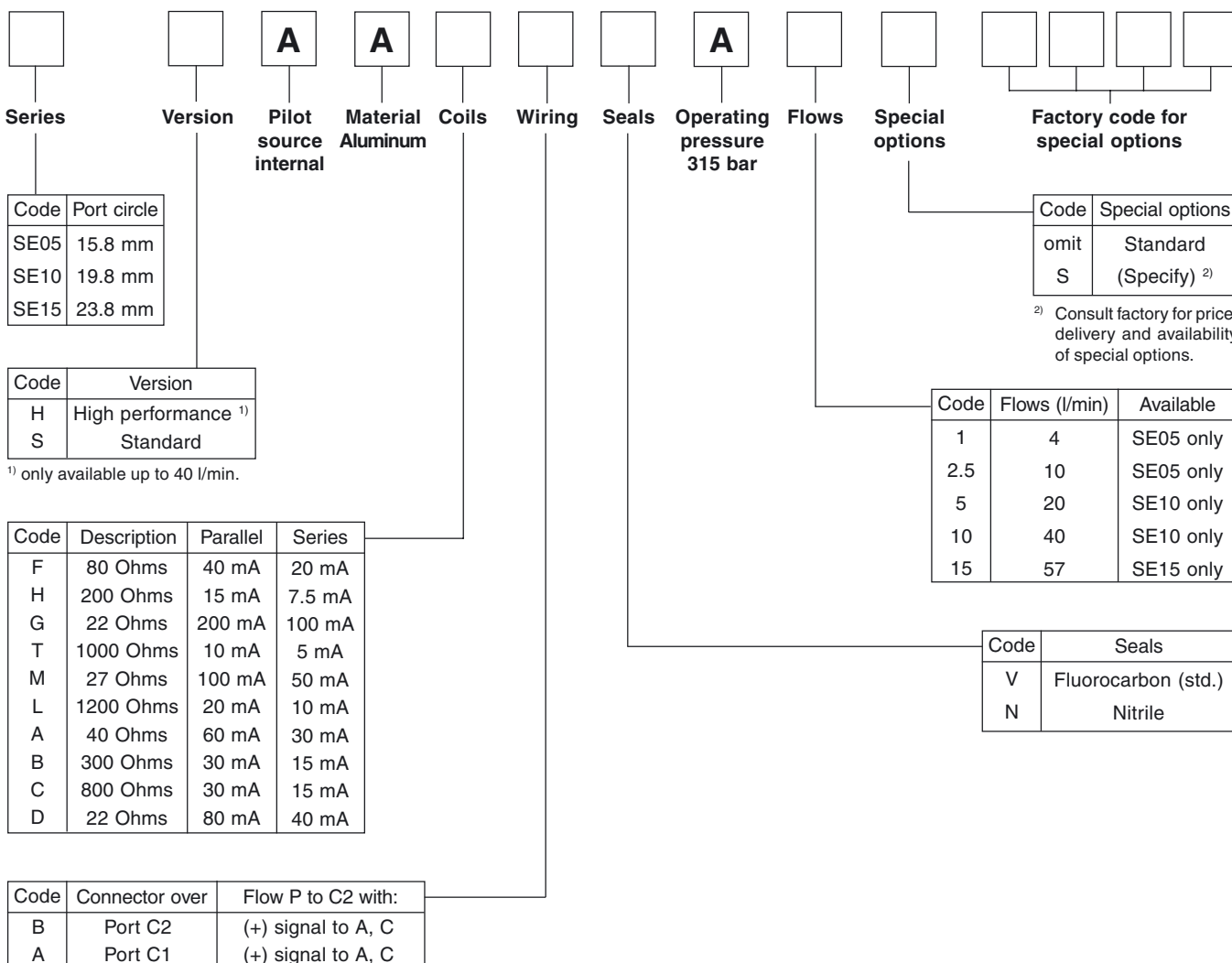
Flow vs. pressure drop

at 100% command

Flow Path P→C1→C2→R



Ordering Code



Weight: 1 kg

Cable with mating connector: EHC154S

Mating connector: MS3106E-14S-2S

Electronics: BD101, 23-5030, 23-7030, PMC10, BD90, or BD95

SE05

Bolt kit: 4 of M5 x 60 mm, or 4 of #10-32x2.25"

Flushing valve: 11-0500

Metric Subplate: DS02SPS8M (M18x1.5 ISO 6149 side ports)

English Subplate: DS02SPS8S (#8 SAE side ports)

SE10

Bolt kit: 4 of M5 x 60 mm, or 4 of #10-32x2.25"

Flushing valve: 11-0500

Metric Subplate: DS71SPS8M (M18x1.5 ISO 6149 side ports)

English Subplate: DS71SPS8S (#8 SAE side ports)

SE15

Bolt kit: 4 of M6 x 60 mm, or 4 of 1/4-20x2.25"

Flushing valve: 11-0500

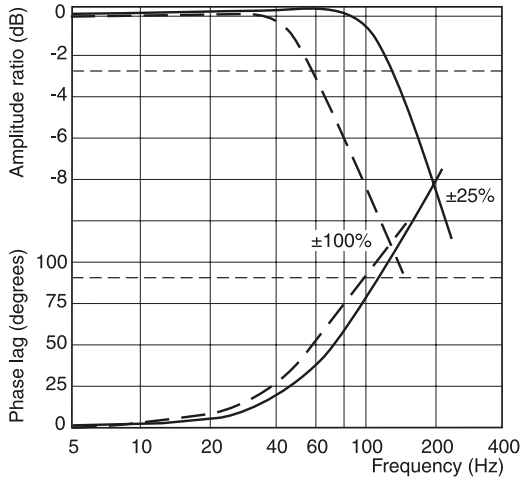
Metric Subplate: DS72SPS8M (M18x1.5 ISO 6149 side ports)

English Subplate: DS72SPS8S (#8 SAE side ports)

Dynamic response at 210 bar

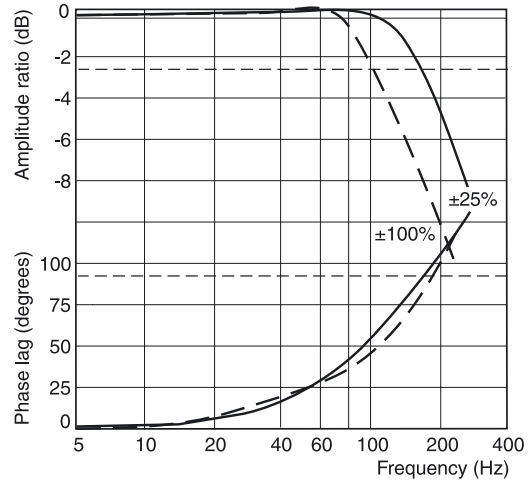
standard response

SE05: 4 - 20 l/min



high response

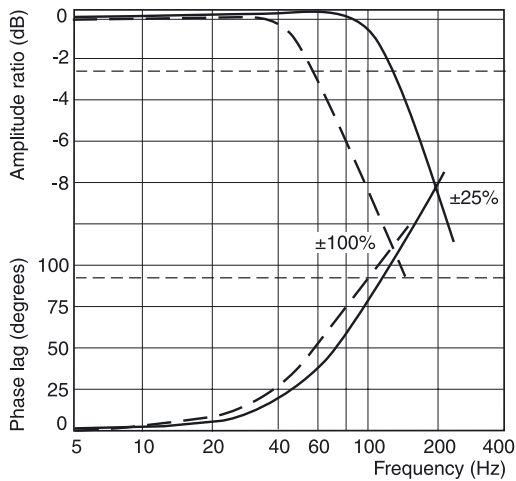
SE05: 4 - 20 l/min



Dynamic response at 210 bar

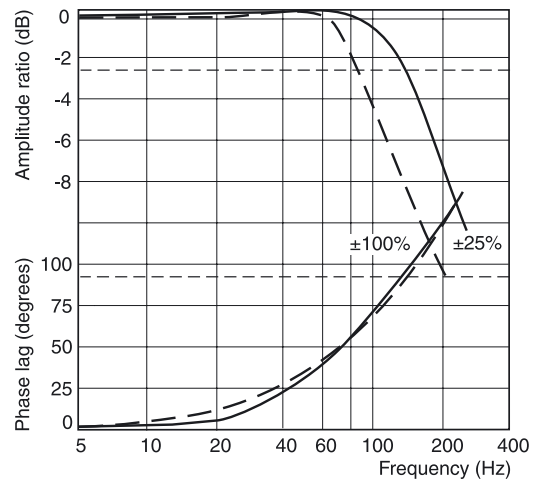
standard response

SE10: 40 l/min



high response

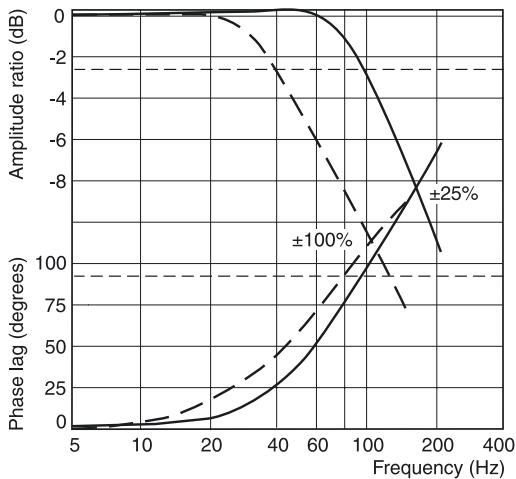
SE10: 40 l/min



Dynamic response at 210 bar

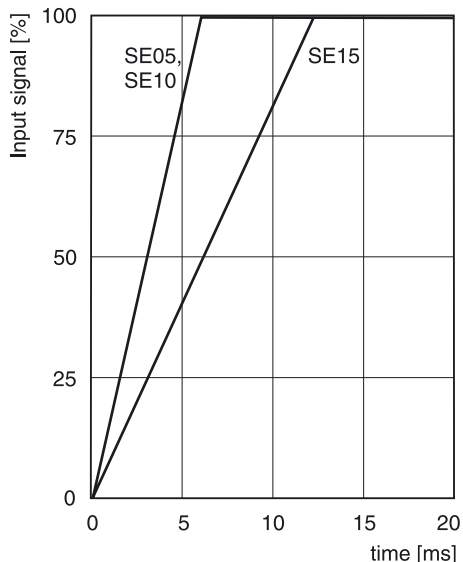
standard response

SE15: 60 l/min

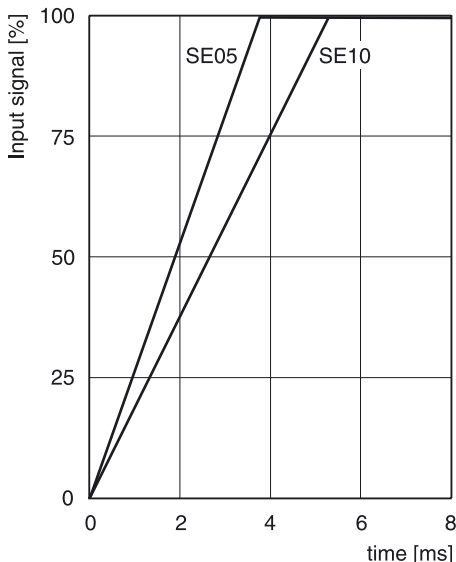


Step response at 210 bar

standard response
SE05/10/15: 4 - 40 l/min

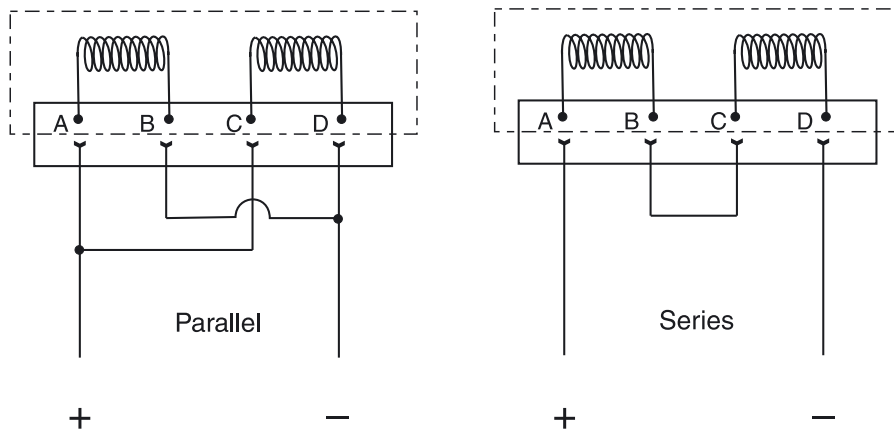


high response
SE05: 20 l/min, SE10: 40 l/min

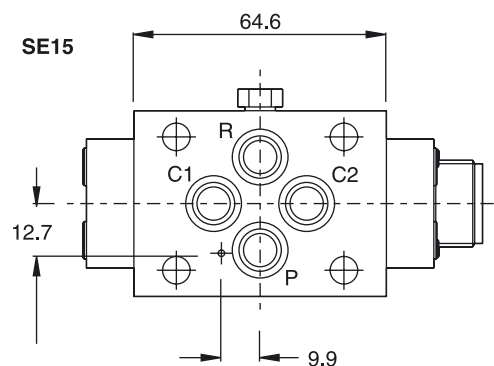
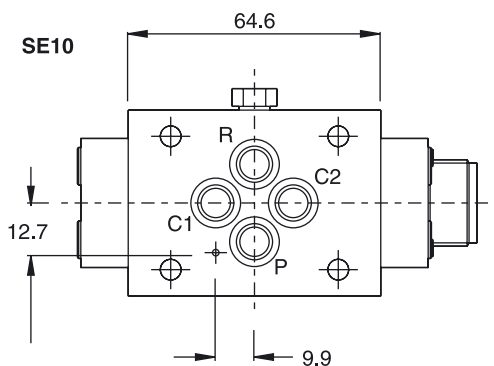
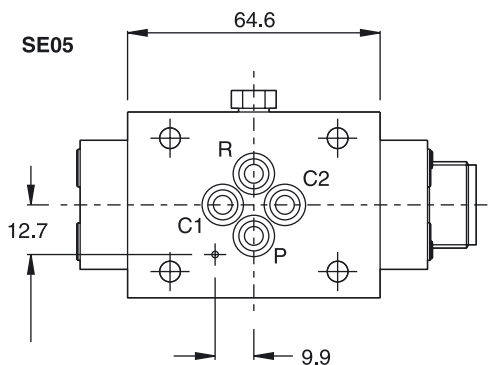
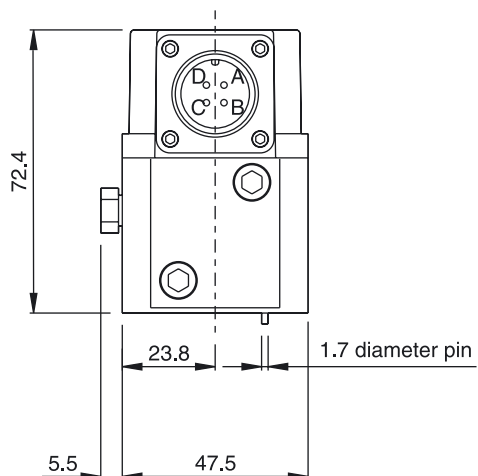
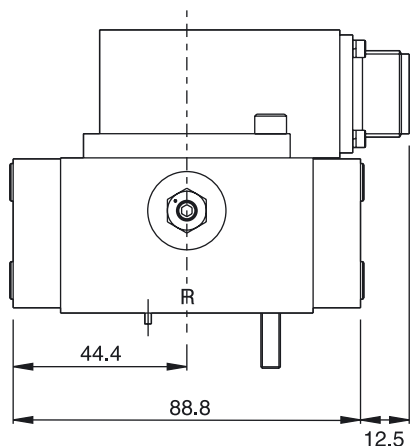


Installation Wiring Options

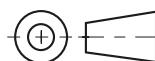
This servovalve has two coils. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. Refer to the illustrations below and to the mounting pattern for this valve to insure proper control phasing.



Polarity shown connects flow from P to C2 port.



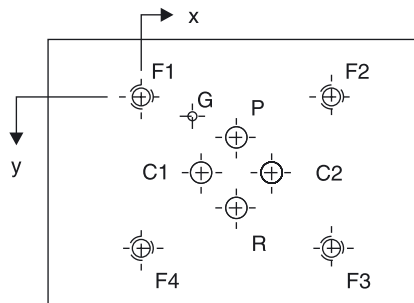
1. Suggested mounting bolts: For SE05 and SE10 use M5 x 60 mm long high tensile steel socket head cap screws. For SE15 use M6 x 60 mm long.
2. 4-way electrical connector mates with MS3106E-14S-2S or equivalent. Is available at 180° to position shown (advise desired position at time of order).
3. Base O-Rings:
 SE05 use Parker 2011V-9 (7.66 mm I/D x 1.78 section)
 SE10 use Parker 2012V-9 (9.25 mm I/D x 1.78 section)
 SE15 use Parker 2013V-9 (10.82 mm I/D x 1.78 section)
4. Null adjust requires 10 A/F ring spanner and 2.5 hexagon key. Flow out of C1 will increase with clockwise rotation of key.
5. See mounting dimensions for port size and locations.



SE05 Mounting Surface dimensions

1. The recommended full-thread depth is 16 mm.
2. The minimum depth of hole G is 4 mm.
3. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
4. Surface flatness: 0.025 mm as specified in ISO 1101.

15.88 port circle

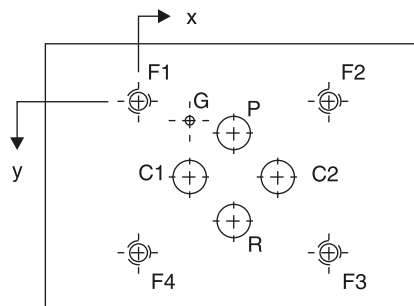


Metric Dimensions (mm)		(± 0.1 mm)							
Axis	P	C1	T	C2	G	F1	F2	F3	F4
	Ø 5 max	Ø 5 max	Ø 5 max	Ø 5 max	Ø 3.5	M5	M5	M5	M5
x	21.4	13.5	21.4	29.3	11.5	0	42.8	42.8	0
y	9.2	17.1	25	17.1	4.4	0	0	34.2	34.2

SE10 Mounting Surface dimensions

1. The recommended full-thread depth is 16 mm.
2. The minimum depth of hole G is 4 mm.
3. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
4. Surface flatness: 0.025 mm as specified in ISO 1101.

19.81 port circle

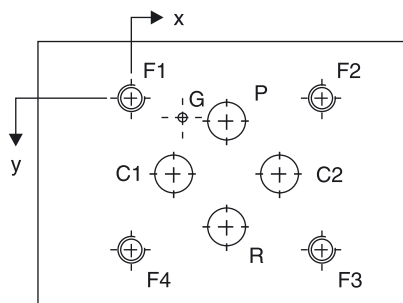


Metric Dimensions (mm)		(± 0.1 mm)							
Axis	P	C1	T	C2	G	F1	F2	F3	F4
	Ø 7.5 max	Ø 7.5 max	Ø 7.5 max	Ø 7.5 max	Ø 3.5	M5	M5	M5	M5
x	21.4	11.5	21.4	31.3	11.5	0	42.8	42.8	0
y	7.2	17.1	27	17.1	4.4	0	0	34.2	34.2

SE15 Mounting Surface dimensions

1. The recommended full-thread depth is 18 mm.
2. The minimum depth of hole G is 4 mm.
3. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
4. Surface flatness: 0.025 mm as specified in ISO 1101.

21.80 port circle



Metric Dimensions (mm)		(± 0.1 mm)							
Axis	P	C1	R	C2	G	F1	F2	F3	F4
	Ø 8 max	Ø 8 max	Ø 8 max	Ø 8 max	Ø 3.5	M6	M6	M6	M6
x	21.4	9.5	21.4	33.3	11.5	0	42.8	42.8	0
y	5.1	17.1	29	17.1	4.4	0	0	34.2	34.2

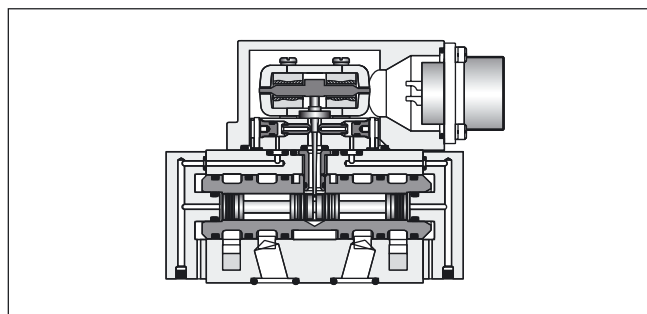
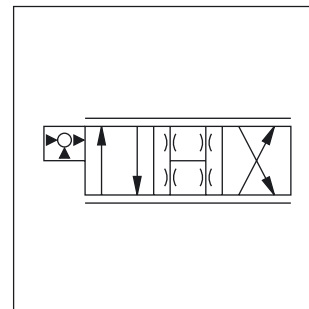
General Description

The Parker model SE2N is a two stage, 4-way, flapper and nozzle style servovalve. The SE2N has a narrow body that is a popular size for steam turbine control applications. This valve uses a high performance spool and sleeve design.

A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. This valve is rated for 210 bar service.

Technical Features

- Lapped spool and sleeve
- Jewel feedback ball for durability
- Aluminum body
- Medium and High performance
- Steam turbine pattern 34.93 mm port circle



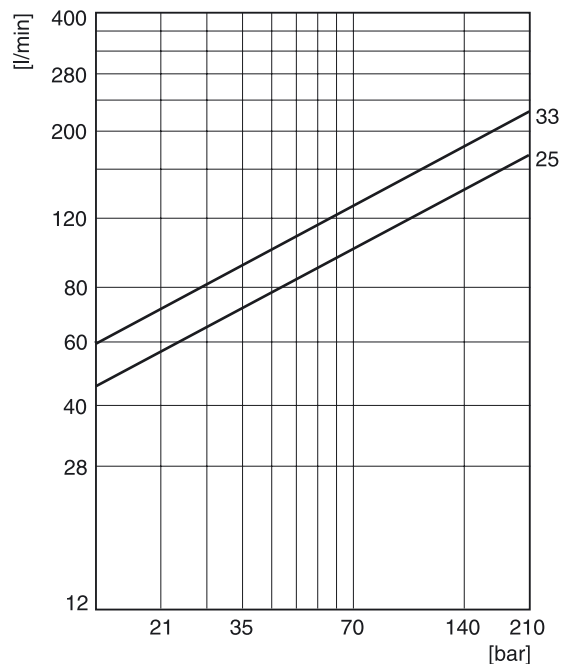
Specifications

Flow Rating ± 10% (at 70 bar)	[l/min]	95, 125
Supply pressure	[bar]	10 - 210
Tank port pressure	[bar]	max. 210 < 10 for best performance
Null leakage flow (at 70 bar)	[l/min]	2.4
Pilot flow (at 210 bar)	[l/min]	0.4
Input command	[mA]	±40 std.
Frequency response (at 90° phase shift)	[Hz]	> 50
Non-linearity	[%]	≤ 10
Hysteresis	[%]	≤ 3
Threshold	[%]	≤ 0.5
Null shift with temperature	[%]	≤ 2 per 55°C
with pressure	[%]	≤ 2 per 70 bar
Pressure gain % change in pressure per 1% change in input command		60% typical
Step response		0 - 100%, < 30 ms
Fluid		Petroleum based mineral oil 10 to 110 cSt at 38 °C
Fluid cleanliness		ISO 4406 15/12 or better
Operating temp.	[°C]	-20 to +130
Protection class		NEMA 4, IP65

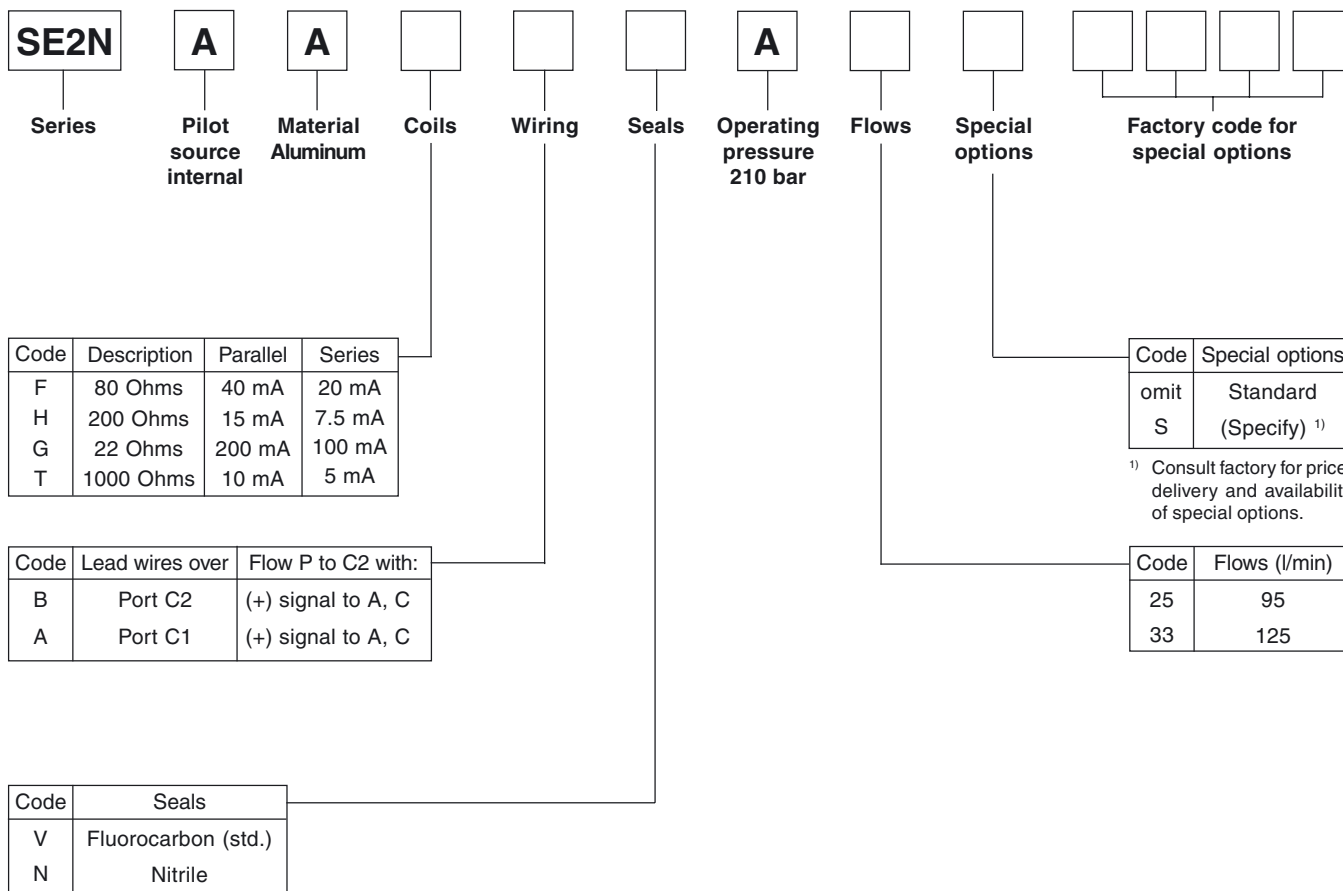
Flow vs. pressure drop

at 100% command

Flow Path P→C1→C2→R



Ordering Code



Weight: 1.1 kg

Cable with mating connector: EHC154S

Mating connector: MS3106E-14S-2S

Bolt kit: 4 of M8 x 70 mm, or 4 of 5/16-18 x 2.75"

Flushing valve: Consult factory

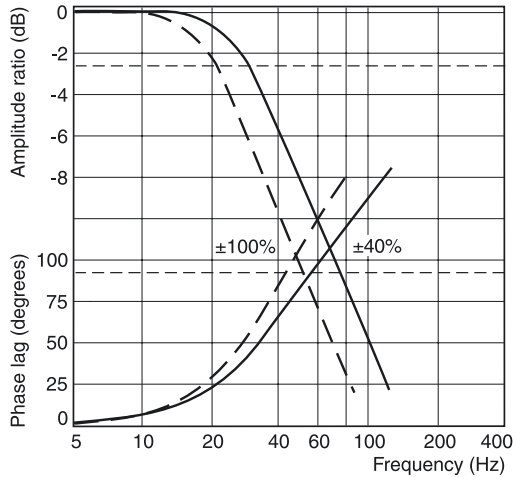
U.S. subplate: AS73SPS8S (SAE #8 side ports)

Metric subplate: AS73SPS8M (M18 x 1.5 ISO 6149 side ports)

Electronics: BD101, 23-5030, 23-7030, PMC10, BD90, or BD95

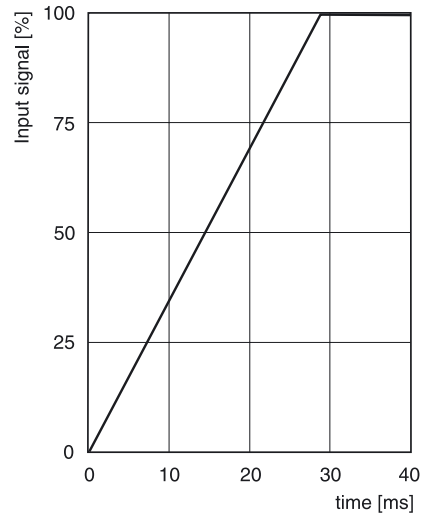
Dynamic response at 210 bar

standard response
 95 l/min



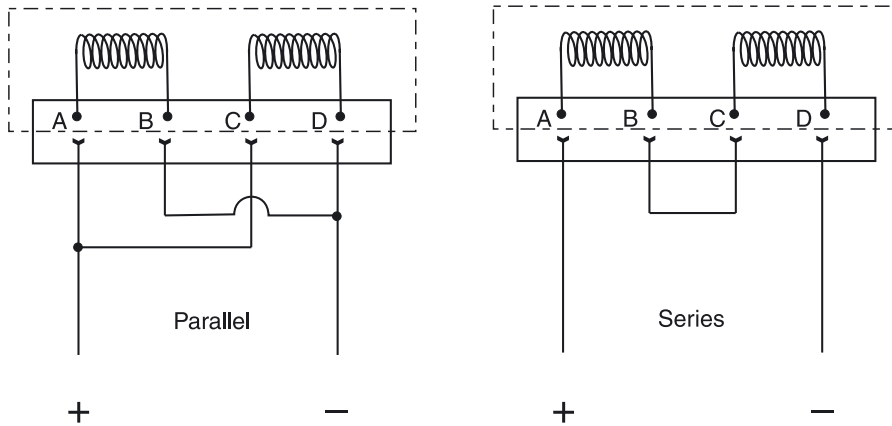
Step response at 210 bar

standard response
 95 l/min

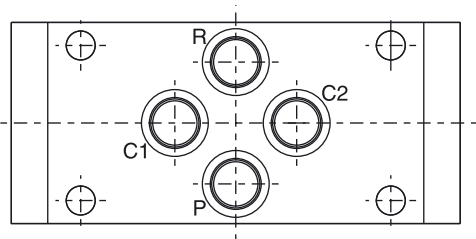
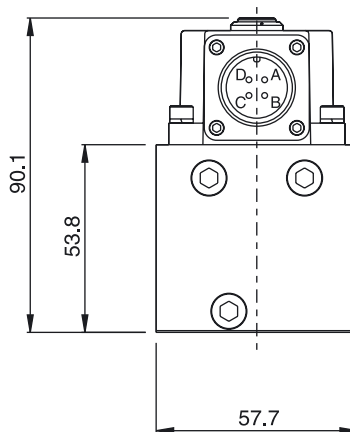
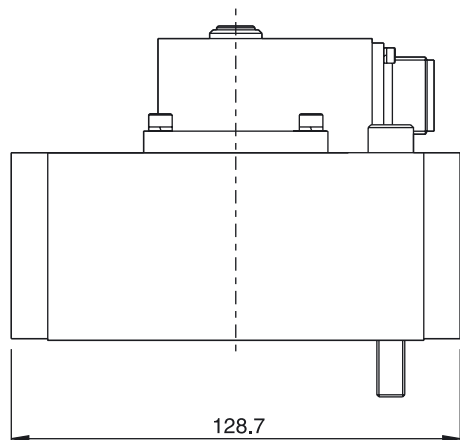


Installation Wiring Options

This servovalve has two coils. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. Refer to the illustrations below and to the mounting pattern for this valve to insure proper control phasing.



Polarity shown connects flow from P to C2 port.

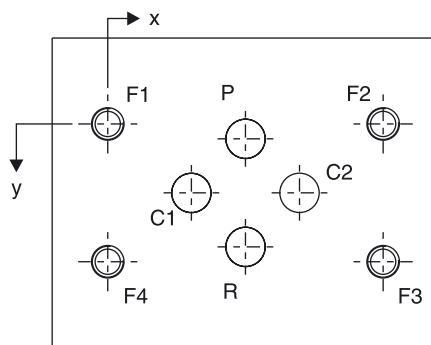


1. Suggested mounting bolts M8 x 70 mm long high tensile steel socket head cap screws.
2. The 4-way electrical connector mates with MS3106E-14S-2S or equivalent. Is available at 180° to position shown (advise desired position at time of order).
3. Null adjust requires 2.5 hexagon key. Flow out of C2 will increase with clockwise rotation of key.
4. Base O-Rings: 14.6 I/D x 2.4 section



Mounting Surface dimensions

1. The recommended full-thread depth is 22 mm.
2. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
3. Surface flatness: 0.025 mm as specified in ISO 1101.



Metric Dimensions (mm)								
(± 0.1 mm)								
Axis	P	C1	R	C2	F1	F2	F3	F4
	Ø 12.7 max	Ø 12.7 max	Ø 12.7 max	Ø 12.7 max	M10	M10	M10	M10
x	44.5	27	44.5	61.9	0	88.9	88.9	0
y	4.8	22.3	39.7	22.3	0	0	44.5	44.5

Characteristics

Servovalves Series SE20

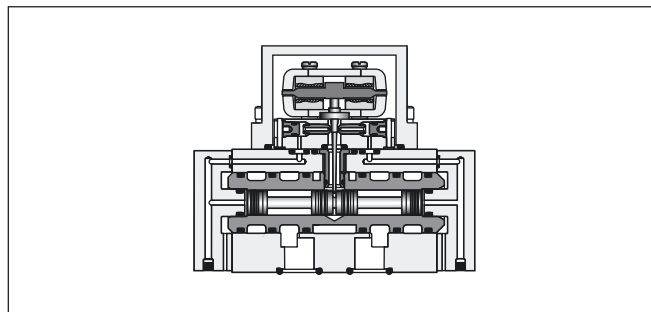
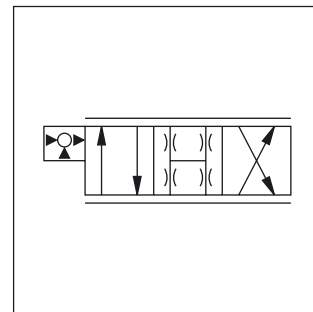
General Description

The Parker model SE20 is a two stage, 4-way, flapper and nozzle style servovalve. The SE20 has a wide range of flow ratings and a high performance spool and sleeve design.

A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. This valve is rated for 315 bar service (option for 500 bar).

Technical Features

- Lapped spool and sleeve
- Jewel feedback ball for durability
- Aluminum body
- Medium and High performance
- ISO 10372 standard 22.23 mm port circle



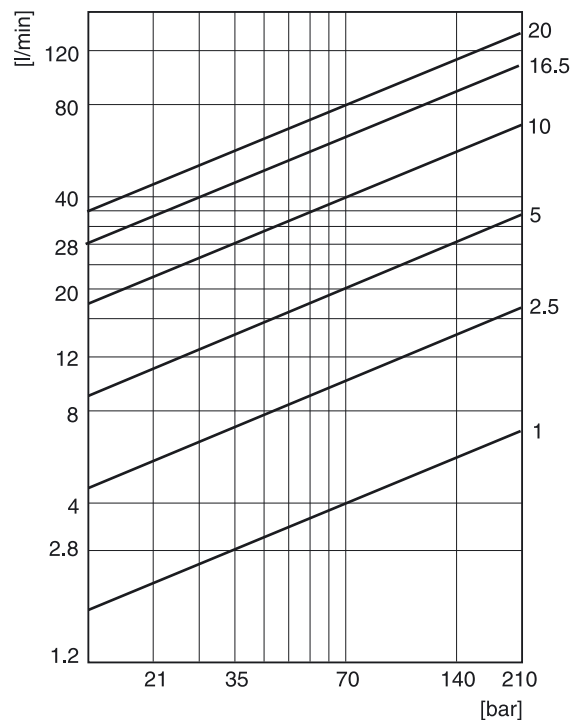
Specifications

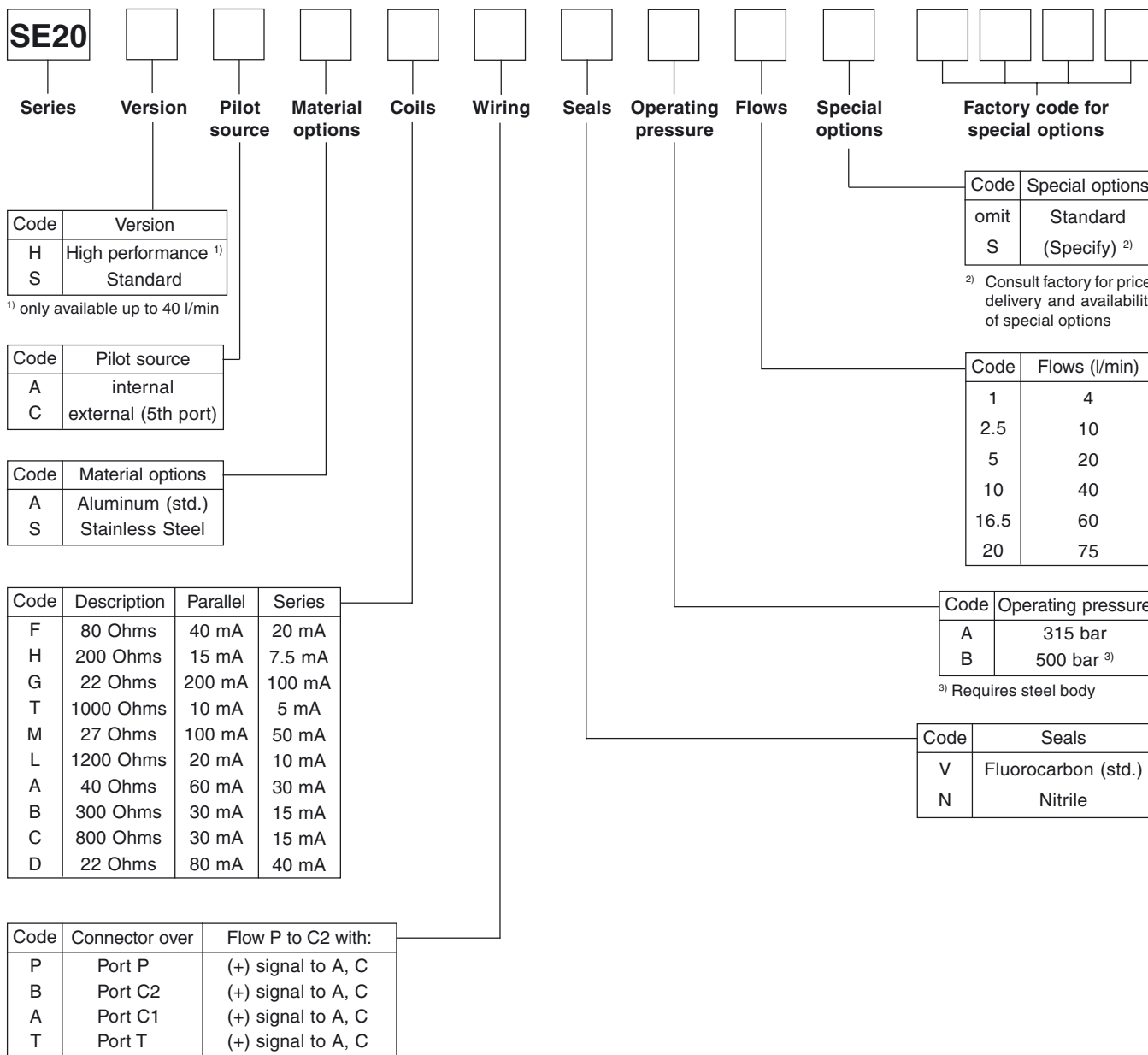
Flow Rating $\pm 10\%$ (at 70 bar)	[l/min]	3.8, 9.5, 19, 38, 63, 75
Supply pressure	[bar]	10 - 315 (500 optional)
Tank port pressure	[bar]	max. 210 < 10 for best performance
Null leakage flow (at 70 bar)	[l/min]	1.2 - 1.9
Pilot flow (at 210 bar)	[l/min]	0.4 - 0.7
Input command	[mA]	± 40 std.
Frequency response (at 90° phase shift)	[Hz]	> 100
Non-linearity	[%]	≤ 10
Hysteresis	[%]	≤ 3
Threshold	[%]	≤ 0.5
Null shift with temperature	[%]	≤ 2 per 55°C
Null shift with pressure	[%]	≤ 2 per 70 bar
Pressure gain % change in pressure per 1% change in input command		60% typical
Step response		see graphs
Fluid		Petroleum based mineral oil 10 to 110 cSt at 38 °C
Fluid cleanliness		ISO 4406 15/12 or better
Operating temp.	[°C]	-30 to +130
Protection class		NEMA 4, IP65

Flow vs. pressure drop

at 100% command

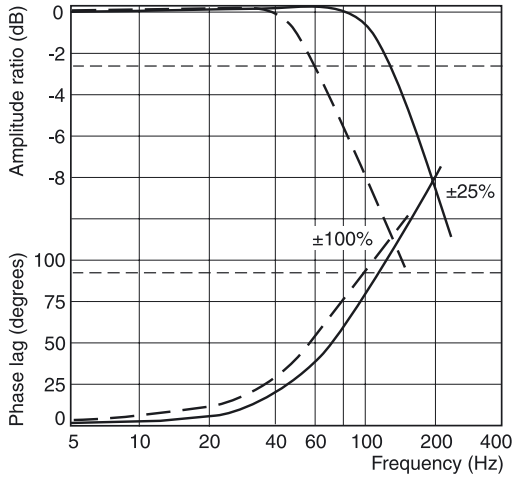
Flow Path P→C1→C2→R



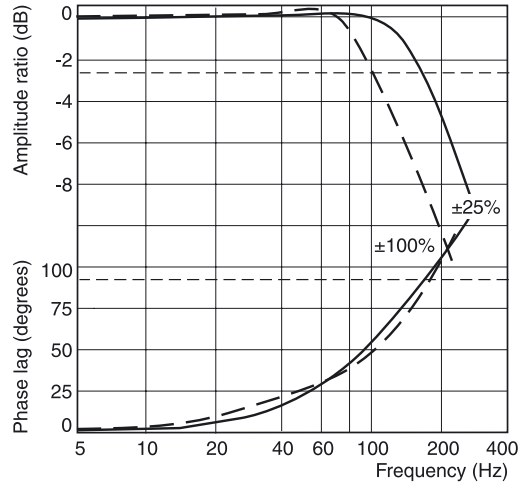


Weight: 1 kg
Cable with mating connector: EHC154S
Bolt kit: 4 of M8 x 60 mm, or 4 of 5/16-18x2.25"
Flushing valve: 1200127 (does not cover 5th port)
U.S. Subplate, 5 ports: 1402303 (4) #12 SAE side ports, (1) #4 SAE side ports
U.S. Subplate, 4 ports: 810090-3 (4) #12 SAE side ports
Metric Subplate, 4 ports: DS04SPS12M (M27 x 2.0 ISO 6149 side ports)
Electronics: BD101, 23-5030, 23-7030, PMC10, BD90, or BD95

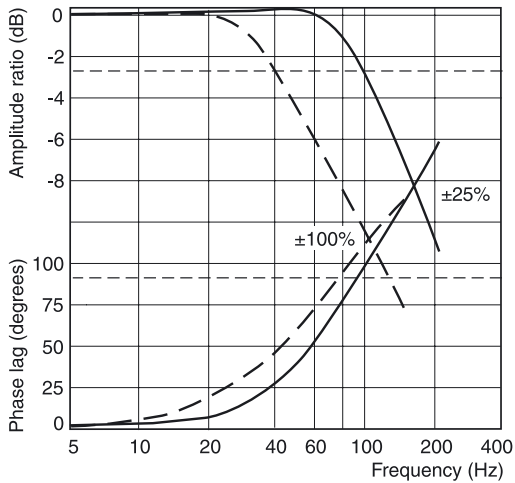
Dynamic response at 210 bar
standard response
SE20: 4 l/min



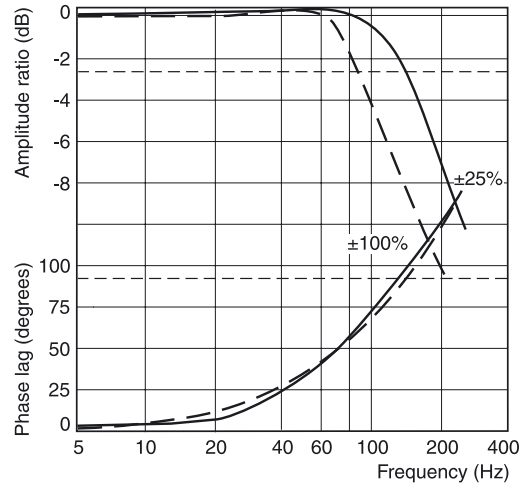
high response
SE20: 4 l/min



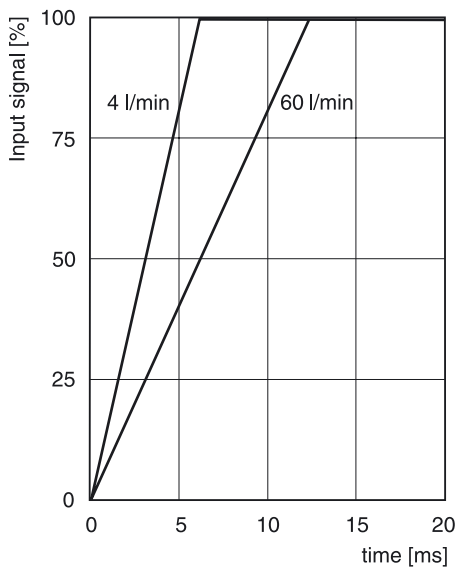
Dynamic response at 210 bar
standard response
SE20: 60 l/min



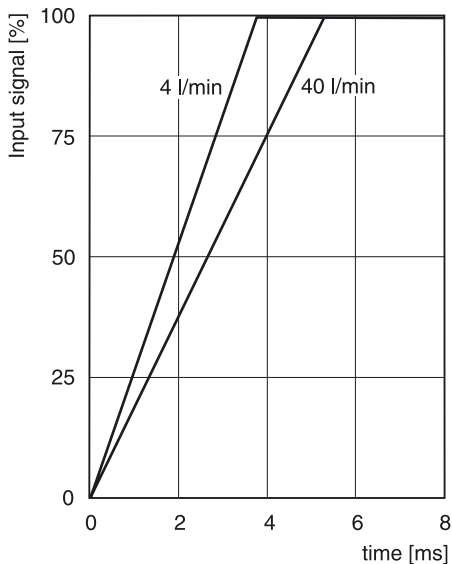
high response
SE20: 40 l/min



Step response at 210 bar
standard response

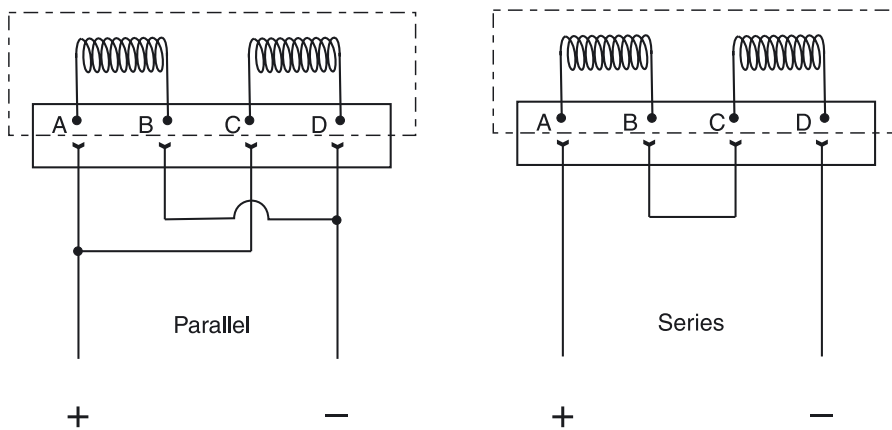


high response

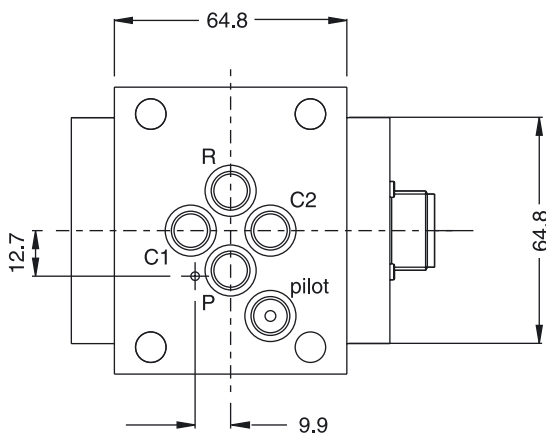
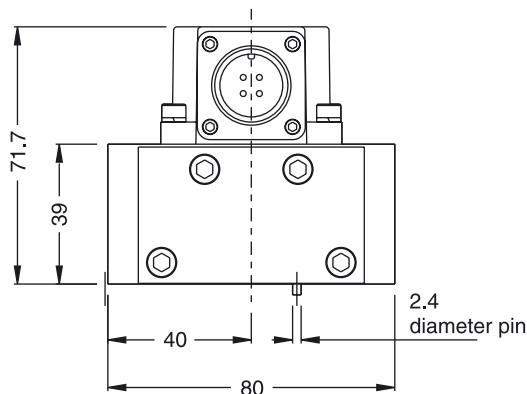
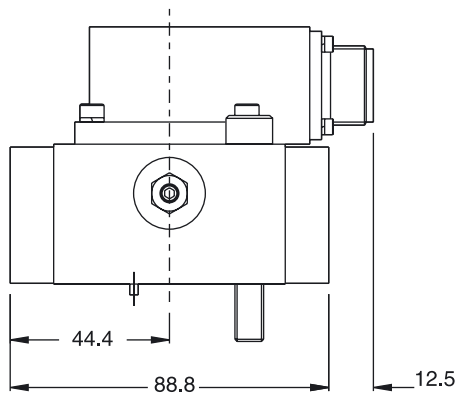


Installation Wiring Options

This servovalve has two coils. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. Refer to the illustrations below and to the mounting pattern for this valve to insure proper control phasing.

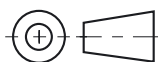


Polarity shown connects flow from P to C2 port.



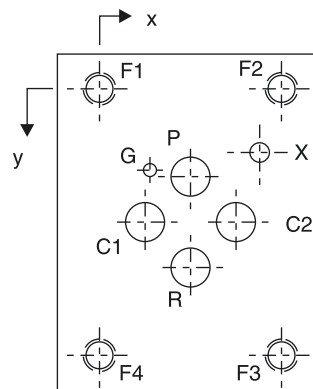
Mounting Torque 29 N-m

1. Suggested mounting bolts M8 x 60 mm high tensile steel socket head cap screws.
2. The 4-way electrical connector mates with MS3106-14S-2S or equivalent. It is available at $\pm 90^\circ$ and 180° to position shown (advise desired position at time of order).
3. Base O-Rings: 10.82 I/D x 1.78 section (2013N-9 or 2013V-9) 5 pcs.
4. Null adjust requires 10 A/F ring spanner (10 mm box-end wrench) and 2.5 hexagon key. Flow out of C1 will increase with clockwise rotation of key.



Mounting Surface dimensions

1. The minimum depth of hole G is 2 mm. The ISO recommended full-thread depth is 22 mm.
2. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
3. Surface flatness: 0.025 mm as specified in ISO 1101.



Metric Dimensions (mm)		$(\pm 0.1 \text{ mm})$								
Axis	P	C1	R	C2	G	X	F1	F2	F3	F4
	$\text{Ø } 8.2 \text{ max}$	$\text{Ø } 8.2 \text{ max}$	$\text{Ø } 8.2 \text{ max}$	$\text{Ø } 8.2 \text{ max}$	$\text{Ø } 3.5$	$\text{Ø } 5$	M8	M8	M8	M8
x	22.2	11.1	22.2	33.3	12.3	33.3	0	44.4	44.4	0
y	21.4	32.5	43.6	32.5	19.8	8.7	0	0	65	65

Characteristics

Servovalves Series SE2E

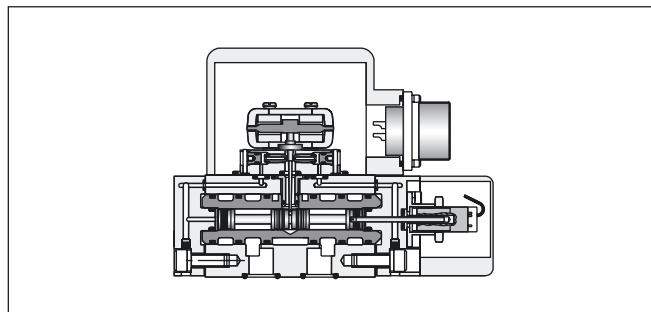
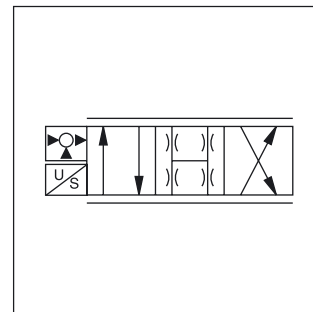
General Description

The Parker model SE2E features electronic spool position feedback and on-board electronics. Spool position feedback can be used as a safety monitoring tool, or for minimizing valve hysteresis. The SE2E is a two stage, 4-way, flapper and nozzle style servovalve.

A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. This valve is rated for 315 bar service.

Technical Features

- On-board electronics
- Electronic spool position feedback
- Jewel feedback ball for durability
- High performance
- ISO 10372 standard 22.23 mm port circle



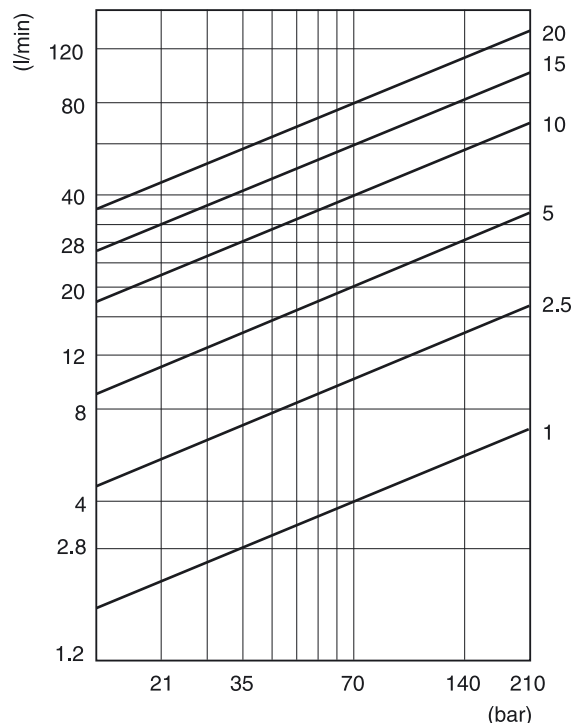
Specifications

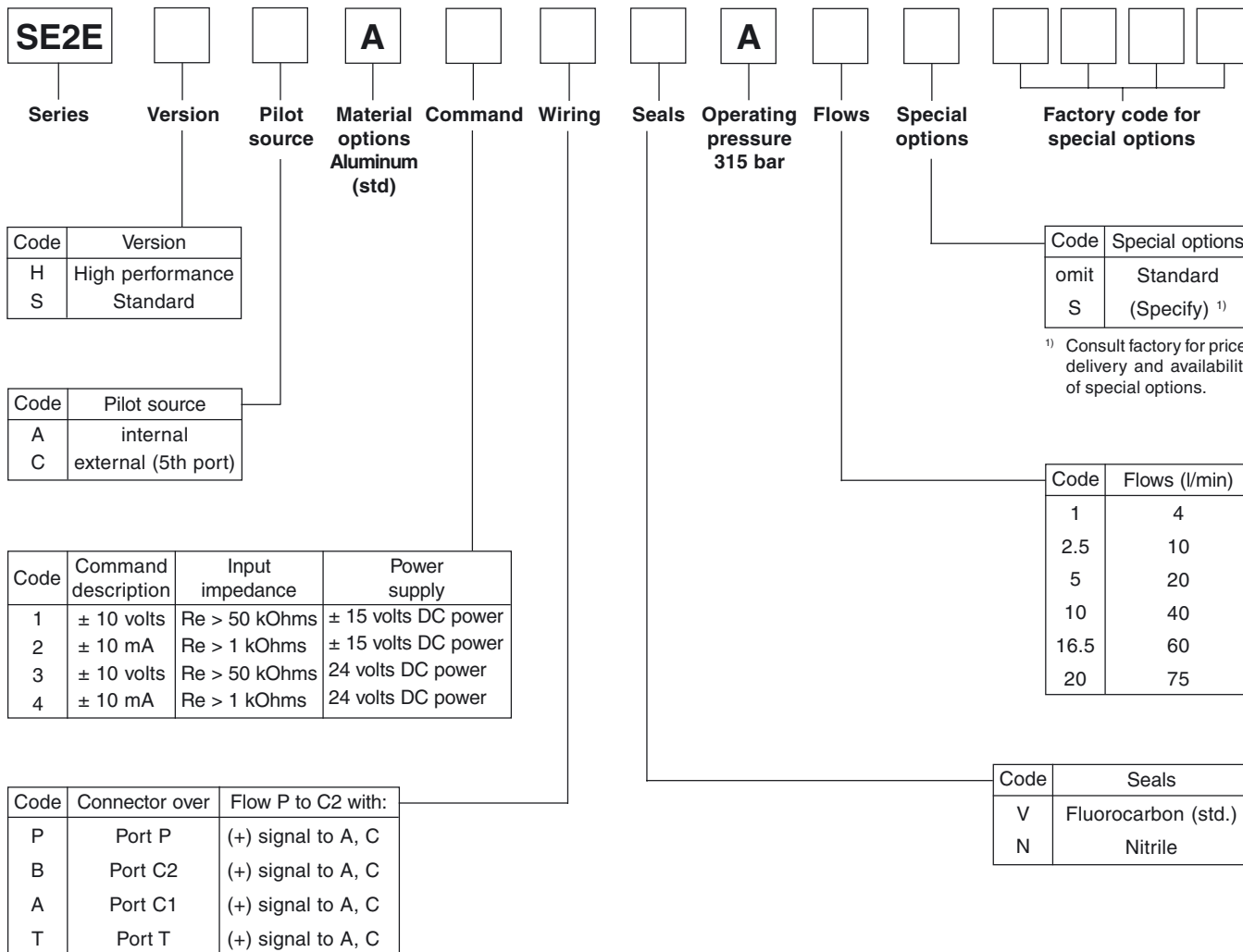
Flow Rating $\pm 10\%$ (at 70 bar)	[l/min]	3.8, 9.5, 19, 38, 60, 75
Supply pressure	[bar]	10 - 315
Tank port pressure	[bar]	max. 210 < 10 for best performance
Null leakage flow (at 70 bar)	[l/min]	1.2 - 1.9
Pilot flow (at 210 bar)	[l/min]	0.4 - 0.8
Input command	[V]	± 10 std.
Frequency response (at 90° phase shift)	[Hz]	≤ 300
Non-linearity	[%]	≤ 5
Hysteresis	[%]	≤ 0.5
Threshold	[%]	≤ 0.1
Null shift with temperature	[%]	≤ 1 per 55°C
Null shift with pressure	[%]	≤ 1 per 70 bar
Pressure gain % change in pressure per 1% change in input command		80% typical
Step response		0 - 100%, 4 to 9 ms
Fluid		Petroleum based mineral oil 10 to 110 cSt at 38 °C
Fluid cleanliness		ISO 4406 15/12 or better
Operating temp.	[°C]	-20 to +85
Protection class		NEMA 4, IP65

Flow vs. pressure drop

at 100% command

Flow Path P→C1→C2→R





Weight: 1.5 kg

Cable with mating connector: EHC158GE

Mating connector: 5004072 (a 7-pin metal CE connector)

Bolt kit: 4 of M8 x 60 mm, or 4 of 5/16-18x2.25"

Flushing valve: 1200127 (does not cover 5th port)

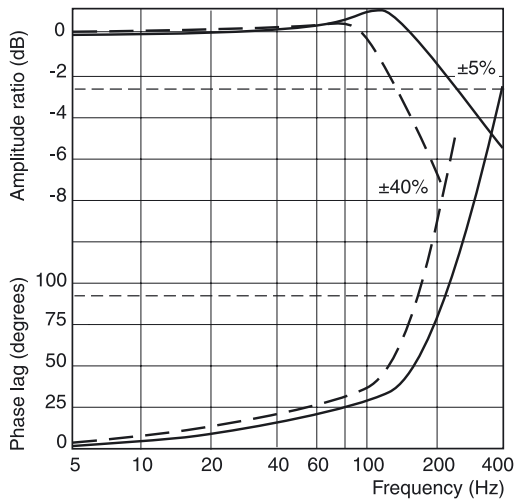
U.S. Subplate, 5 ports: 1402303 (4) #12 SAE side ports, (1) #4 SAE side ports

U.S. Subplate, 4 ports: 810090-3 (4) #12 SAE side ports

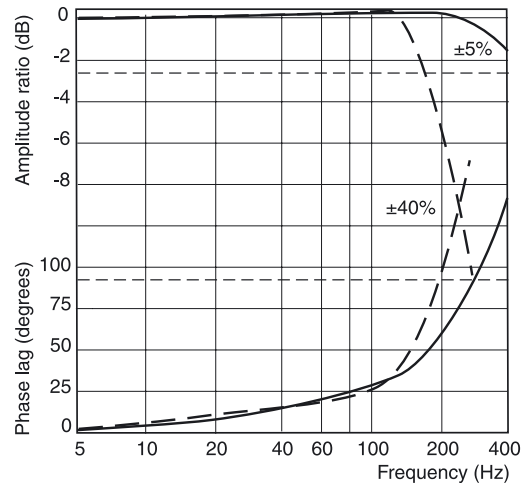
Metric Subplate, 4 ports: DS04SPS12M (M27 x 2.0 ISO 6149 side ports)

Electronics: BD101, 23-5030, 23-7030, PMC10, BD90, or BD95

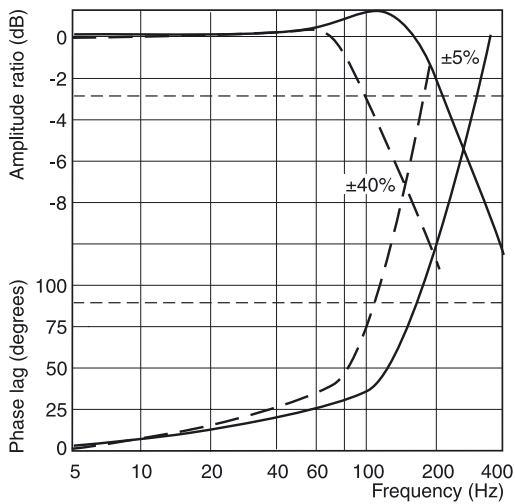
Dynamic response at 210 bar
standard response
SE2E: 20 l/min



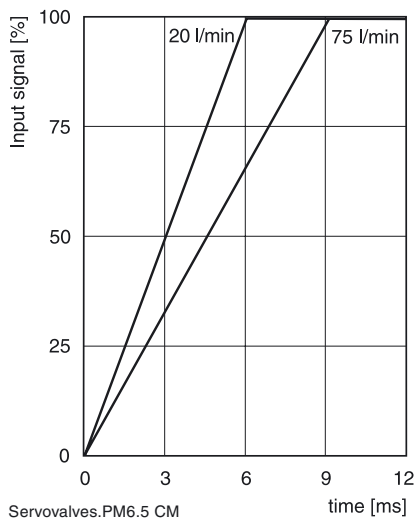
high response
SE2E: 4 - 40 l/min



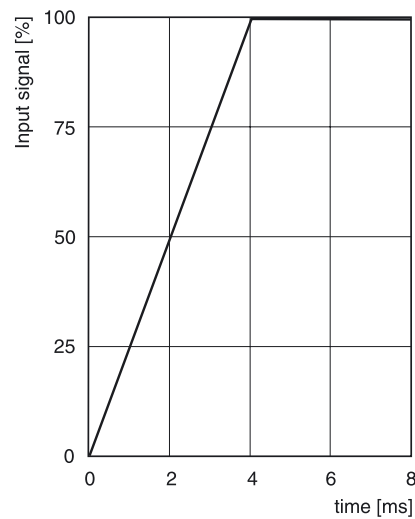
standard response
SE2E: 75 l/min



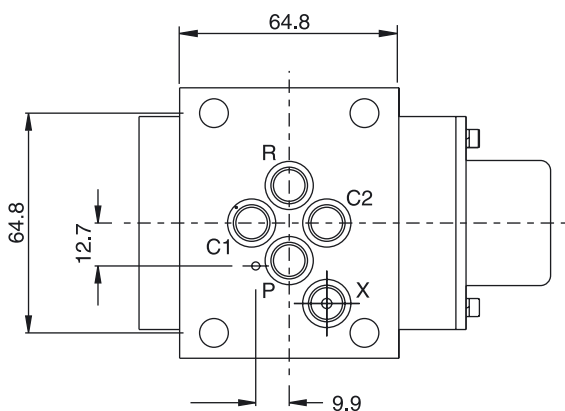
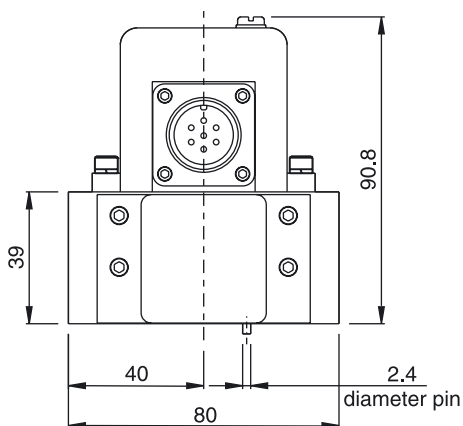
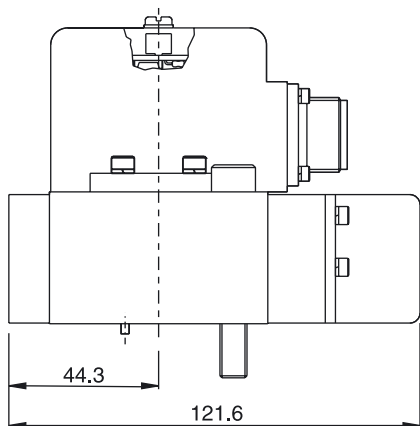
Step response at 210 bar
standard response



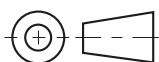
high response
SE2E: 4 - 40 l/min



Servovalves.PM6.5 CM

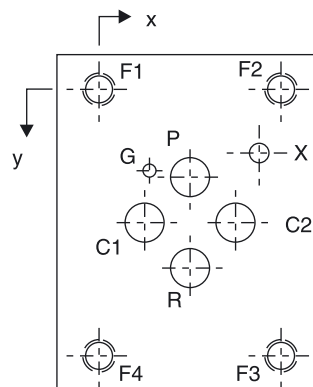


1. Suggested mounting bolts M8 x 60 mm long high tensile steel socket head cap screws.
2. The 7-pin electrical connector mates with Parker 5004072 connector or equivalent. The connector is available at 180° to position shown (advise desired position at time of order).
3. Base O-Rings: 10.82 I/D x 1.78 section (2013N-9 or 2013V-9) 5 pcs.
4. Null adjustment potentiometer.









Mounting Surface dimensions

1. The minimum depth of hole G is 2 mm.
The ISO recommended full-thread depth is 22 mm.
2. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
3. Surface flatness: 0.025 mm as specified in ISO 1101.




Metric Dimensions (mm)						(± 0.1 mm)				
Axis	P	C1	R	C2	G	X	F1	F2	F3	F4
	Ø 8.2 max	Ø 8.2 max	Ø 8.2 max	Ø 8.2 max	Ø 3.5	Ø 5	M8	M8	M8	M8
x	22.2	11.1	22.2	33.3	12.3	33.3	0	44.4	44.4	0
y	21.4	32.5	43.6	32.5	19.8	8.7	0	0	65	65

	Pin	Voltage Command	Current Command
Supply voltage +15/0/-15 VDC ±3% Ripple < 50 mV _{p-p}	A	+15 VDC	$I_{max} = 200 \text{ mA}$
	B	-15 VDC	$I_{max} = 200 \text{ mA}$
	C		
Command signal 	D	0...±10 VDC	$R_e \geq 50 \text{ k}\Omega$
	E		
Spool position output	F	0...±10 VDC	load resistance 10 kΩ
Protective Earth	G		

	Pin	Voltage Command	Current Command
Supply voltage +24 VDC ±3% Ripple < 50 mV _{p-p}	A	+24 VDC	$I_{max} = 200 \text{ mA}$
	B		
	C	Not used	
Command signal 	D	0...±10 VDC	$R_e \geq 50 \text{ k}\Omega$
	E		
Spool position output	F	0...±10 VDC	load resistance 10 kΩ
Protective Earth	G		

Spool stroke is proportional to command signal. +10 VDC to pin D causes 100% rated flow in the direction of P–C2, C1–R.

One input D or E must be connected to common if a single ended driver is used.

Connection cable to be 6-core, 0.75 mm², screened. External diameter 6.5~9.5 mm. Connect screening to  on supply side only.

Mating connector is Parker number 5004072. A mating cable with connector is Parker number EHC158GE.



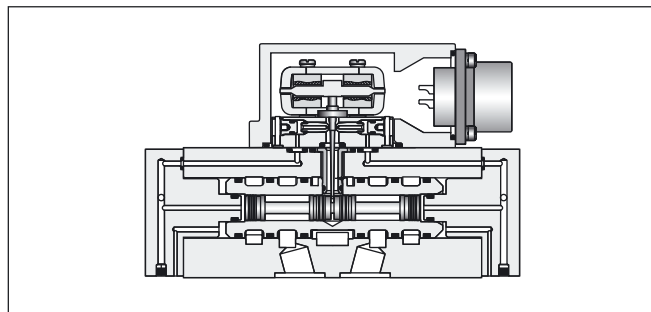
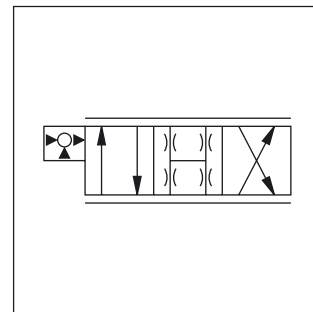
General Description

The Parker model SE31 is a two stage, 4-way, flapper and nozzle style servovalve. This valve is designed to fit onto DIN NG10 or NFPA D05 port patterns. The SE31 has a wide range of flow ratings and a high performance spool and sleeve design.

A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. This valve is rated for 315 bar service.

Technical Features

- Lapped spool and sleeve
- Jewel feedback ball for durability
- Aluminum body
- Medium and High performance
- ISO 440 -05-05-0-94 (4-ports), DO5HE (no "Y" port)



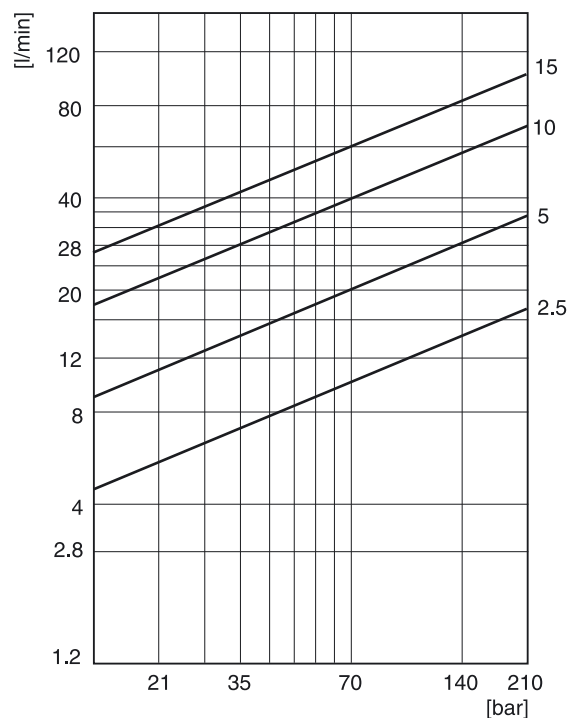
Specifications

Flow Rating ± 10% (at 70 bar)	[l/min]	10, 20, 40, 60
Supply pressure	[bar]	10 - 315
Tank port pressure	[bar]	max. 210 < 10 for best performance
Null leakage flow (at 70 bar)	[l/min]	1.2 - 1.9
Pilot flow (at 210 bar)	[l/min]	0.4 - 0.7
Input command	[mA]	±100 std.
Frequency response (at 90° phase shift)	[Hz]	> 100
Non-linearity	[%]	≤ 10
Hysteresis	[%]	≤ 3
Threshold	[%]	≤ 0.5
Null shift with temperature	[%]	≤ 2 per 55°C
with pressure	[%]	≤ 2 per 70 bar
Pressure gain % change in pressure per 1% change in input command		60% typical
Step response		0 - 100%, < 15 ms
Fluid		Petroleum based mineral oil 10 to 110 cSt at 38 °C
Fluid cleanliness		ISO 4406 15/12 or better
Operating temp.	[°C]	-30 to +130
Protection class		NEMA 4, IP65

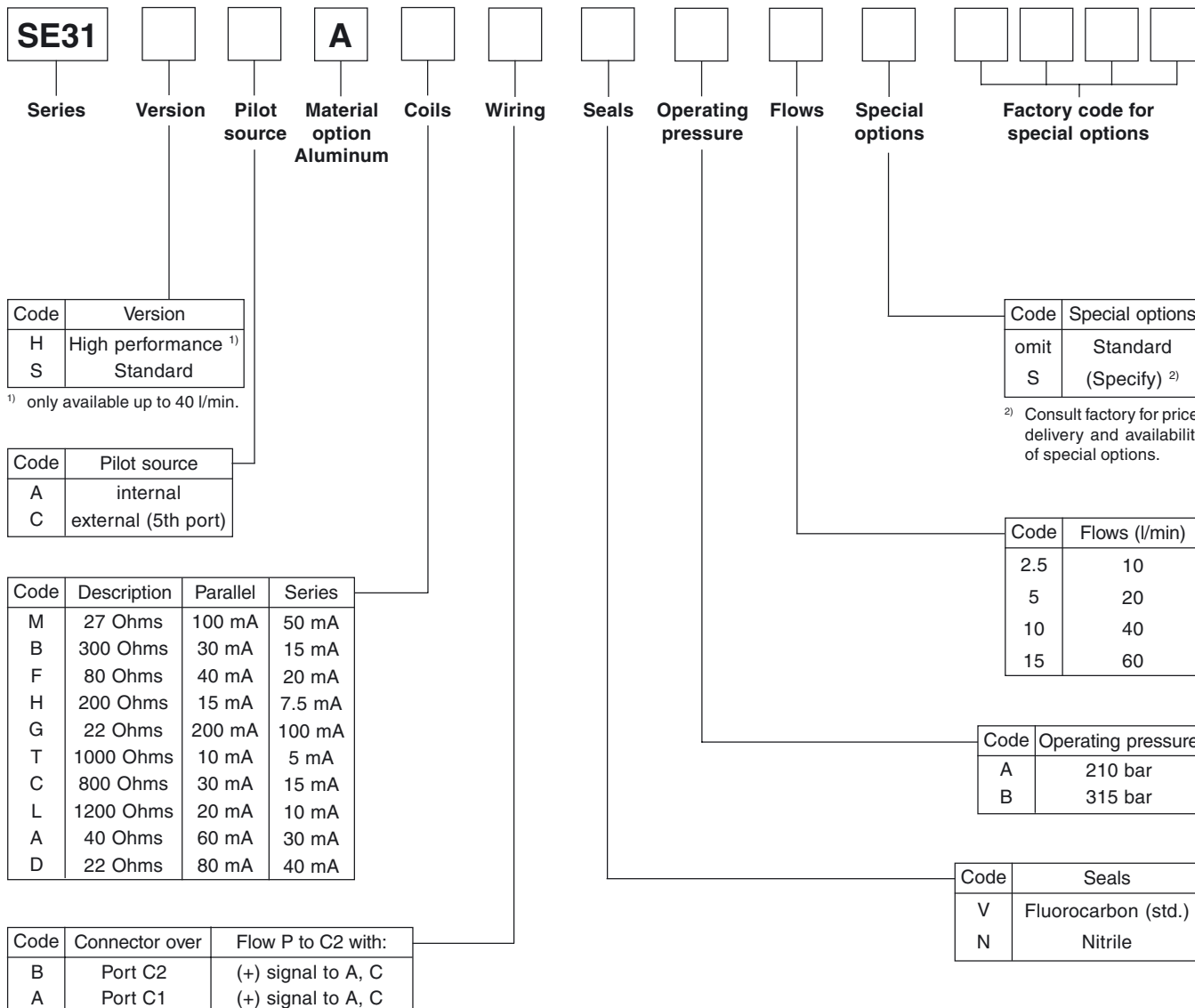
Flow vs. pressure drop

at 100% command

Flow Path P→C1→C2→R



Servovalves Series SE31



Weight: 1.1 kg

Cable with mating connector: EHC154S

Mating connector: MS3106E-14S-2S

Bolt kit: 4 of M6 x 50 mm, or 4 of 1/4-20x2.00"

Flushing valve: D3L8CV

Subplate, 5 ports: D31D6SA35 (4 side ports #12 SAE, 1 pilot port on P side is #4 SAE)

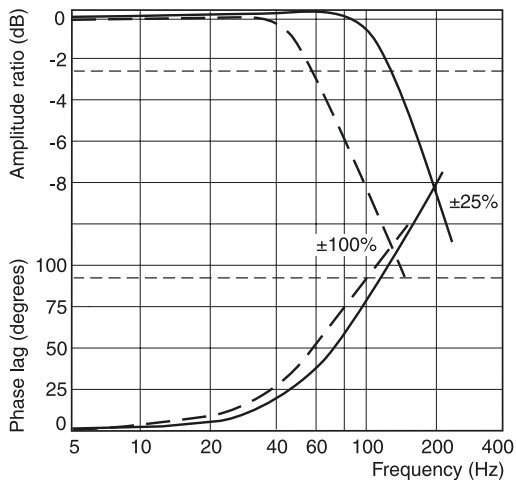
Subplate, 4 ports: D3H6SA35 (4 side ports #12 SAE)

Electronics: BD101, 23-5030, 23-7030, PMC10, BD90, or BD95

Dynamic response at 210 bar

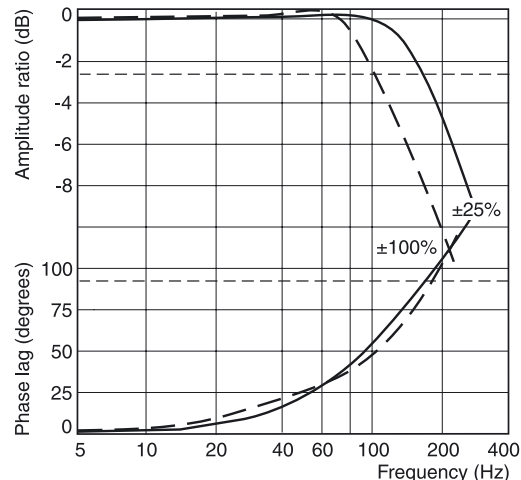
standard response

SE31: 4 l/min



high response

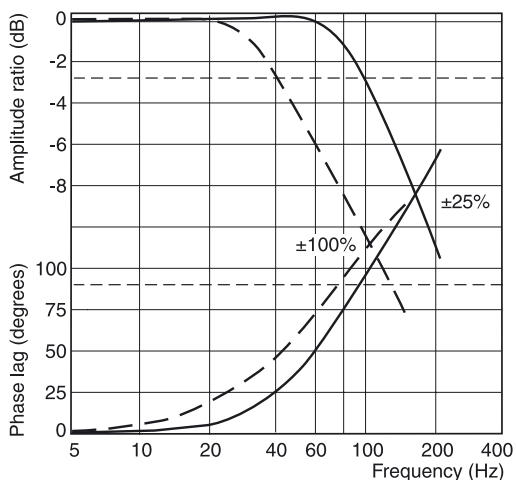
SE31: 4 l/min



Dynamic response at 210 bar

standard response

SE31: 60 l/min

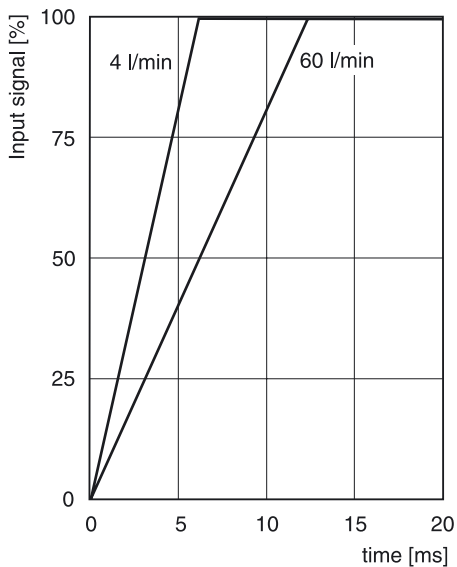


high response

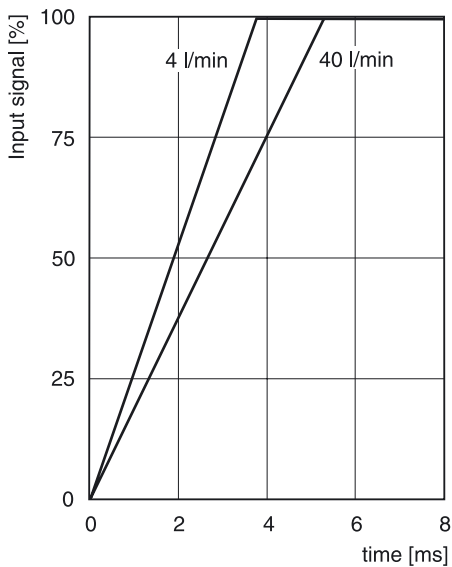
SE31: 40 l/min



Step response at 210 bar
standard response

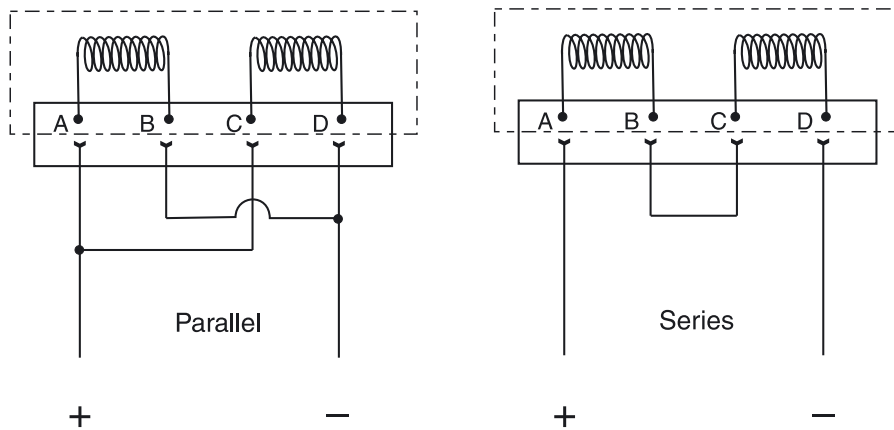


high response

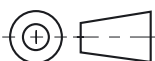
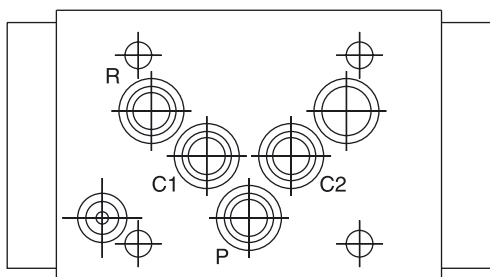
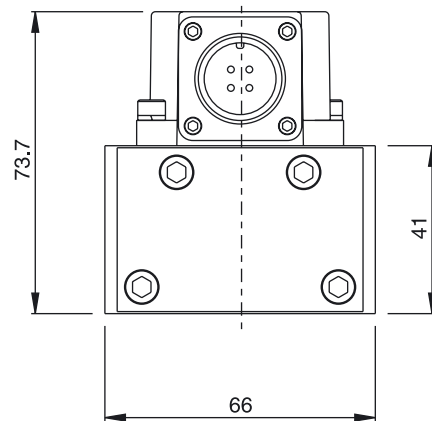
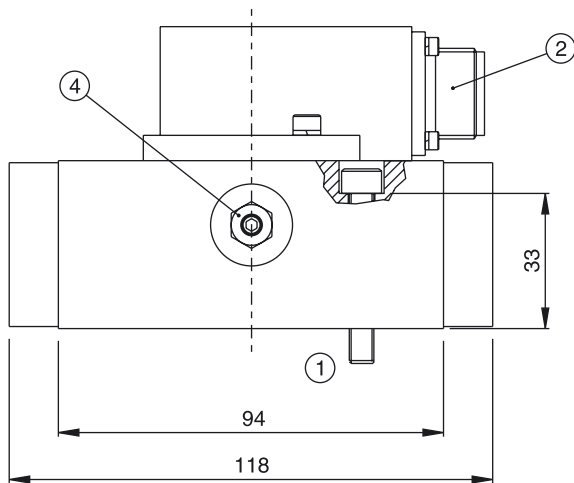


Installation Wiring Options

This servovalve has two coils. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. Refer to the illustrations below and to the mounting pattern for this valve to insure proper control phasing.



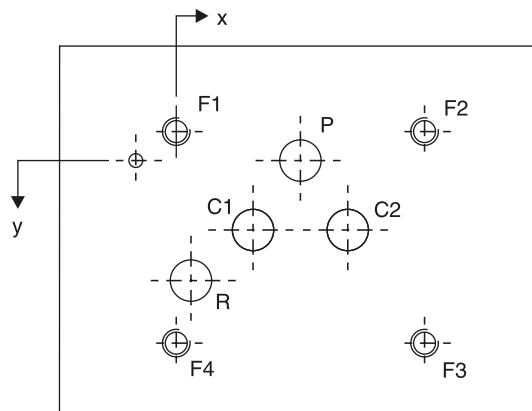
Polarity shown connects flow from P to C2 port.



1. Suggested mounting bolts M6 x 50 mm long high tensile steel socket head cap screws.
2. The 4-pin electrical connector mates with MS3106E-14S-2S or equivalent. The valve connector is available $\pm 90^\circ$ or 180° from the position shown.
4. Base O-Rings: 12 mm I.D. by 2.0 mm section, 90 durometer.
3. Null adjust requires a 10 A/F ring spanner (10 mm box-end wrench) and a 2.5 hexagon key. Flow out of C1 will increase with clockwise rotation of key.

Mounting Surface dimensions

1. The minimum depth of hole G is 2 mm. Recommended full-thread depth is 18 mm.
2. Surface roughness $R_a < 0.8 \mu\text{m}$ [N6], as specified in ISO 468 and ISO 1302.
3. Surface flatness: 0.025 mm as specified in ISO 1101.



Metric Dimensions (mm)					(± 0.1 mm)				
Axis	P	C1	R	C2	X	F1	F2	F3	F4
	$\text{Ø } 9 \text{ max}$	$\text{Ø } 9 \text{ max}$	$\text{Ø } 9 \text{ max}$	$\text{Ø } 9 \text{ max}$	$\text{Ø } 3$	M6	M6	M6	M6
x	27	16.7	3.2	37.3	-8.8	0	54	54	0
y	6.3	21.4	32.4	21.4	6.3	0	0	46	46

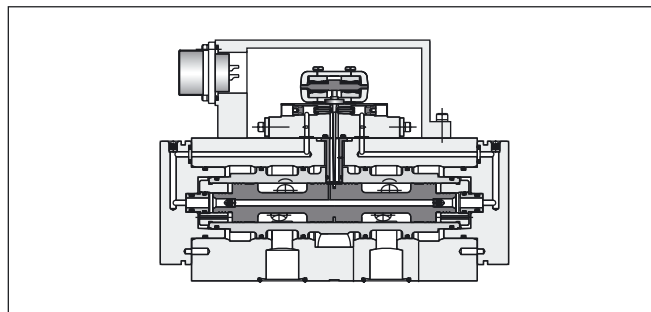
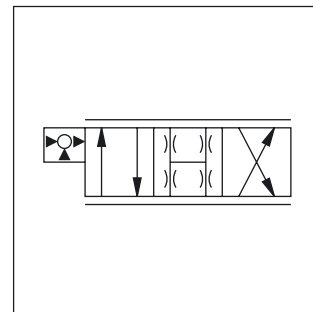
General Description

The Parker model SE60 is a two stage, 4-way, flapper and nozzle style servovalve. The SE60 has a wide range of flow ratings and a high performance spool and sleeve design.

A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. This valve is rated for 210 bar service.

Technical Features

- Lapped spool and sleeve
- Jewel feedback ball for durability
- Aluminum body
- Medium and High performance
- ISO 10372 size 6 standard 50.8 mm port circle



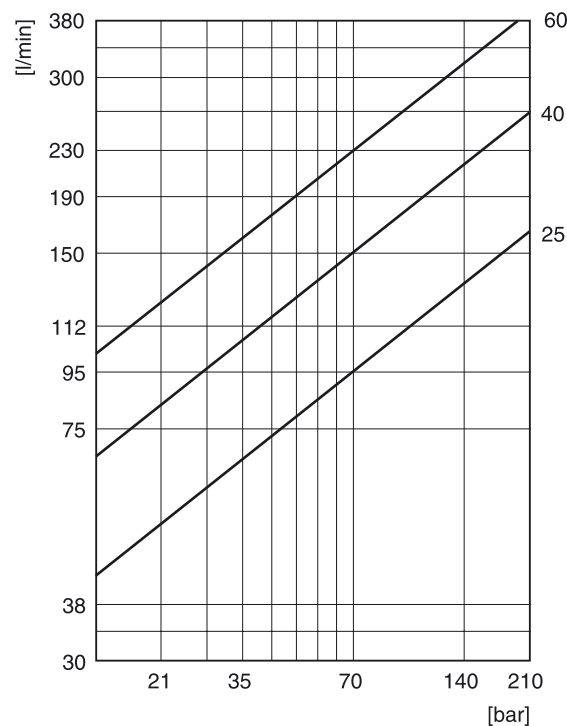
Specifications

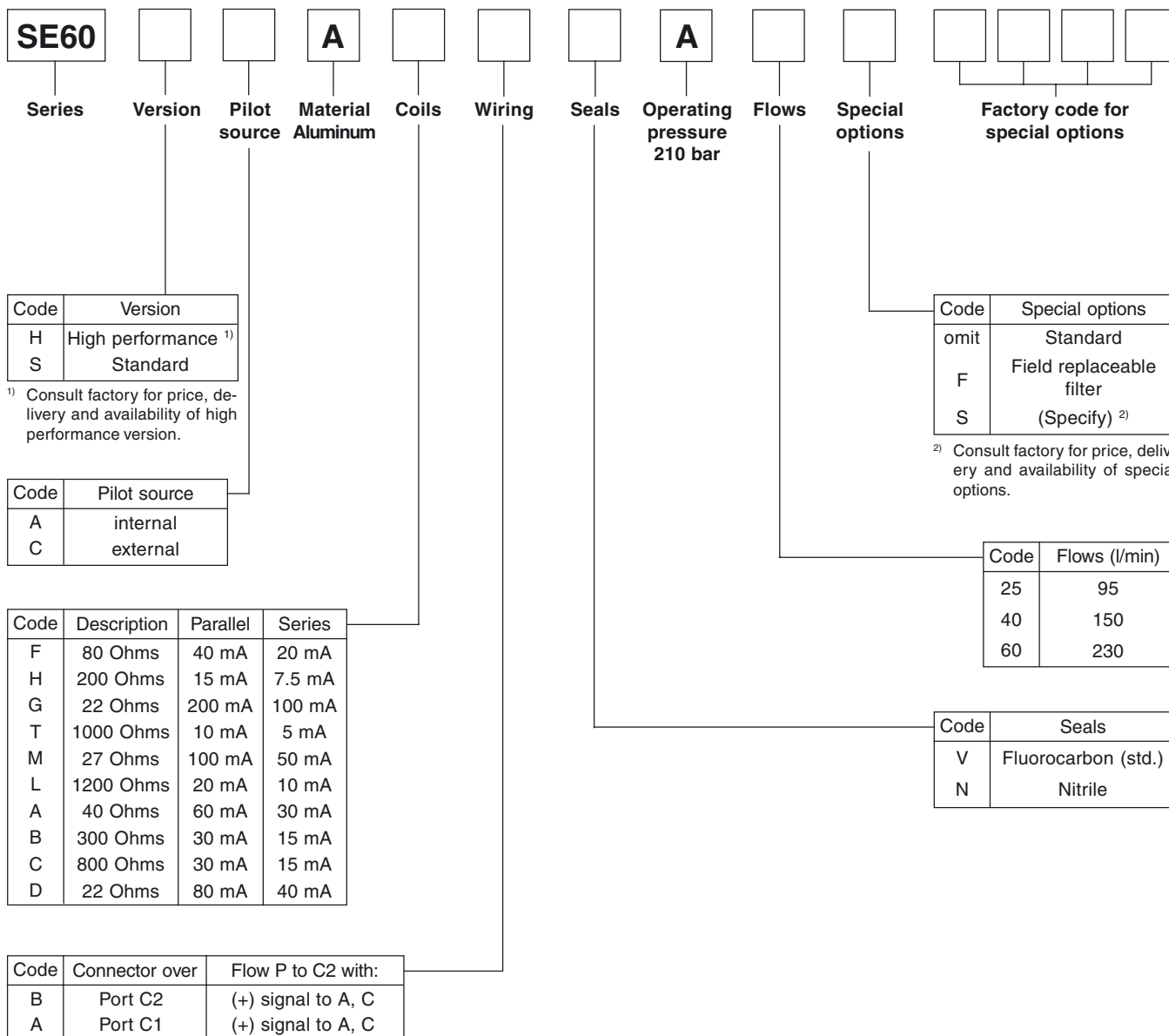
Flow Rating ± 10% (at 70 bar)	[l/min]	95, 150, 230
Supply pressure	[bar]	10 - 210
Tank port pressure	[bar]	max. 210 < 10 for best performance
Null leakage flow (at 70 bar)	[l/min]	2.4 - 3.6
Pilot flow (at 210 bar)	[l/min]	0.4
Input command	[mA]	±40 std.
Frequency response (at 90° phase shift)	[Hz]	> 100
Non-linearity	[%]	≤ 10
Hysteresis	[%]	≤ 4
Threshold	[%]	≤ 1
Null shift with temperature	[%]	≤ 2 per 55°C
Null shift with pressure	[%]	≤ 2 per 70 bar
Pressure gain % change in pressure per 1% change in input command		60% typical
Step response		0 - 100%, < 15 ms
Fluid		Petroleum based mineral oil 10 to 110 cSt at 38 °C
Fluid cleanliness		ISO 4406 15/12 or better
Operating Temp.	[°C]	-30 to +130
Protection class		NEMA 4, IP65

Flow vs. pressure drop

at 100% command

Flow Path P→C1→C2→R

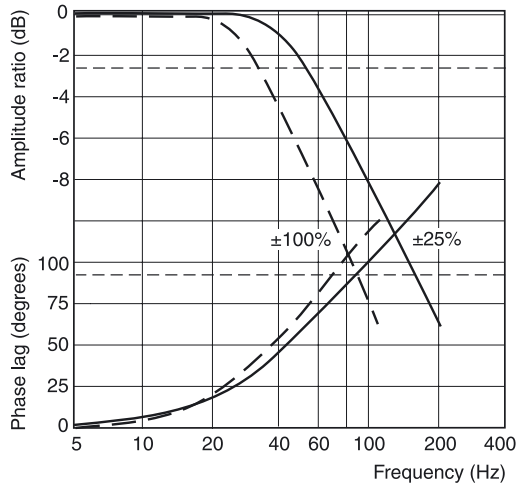




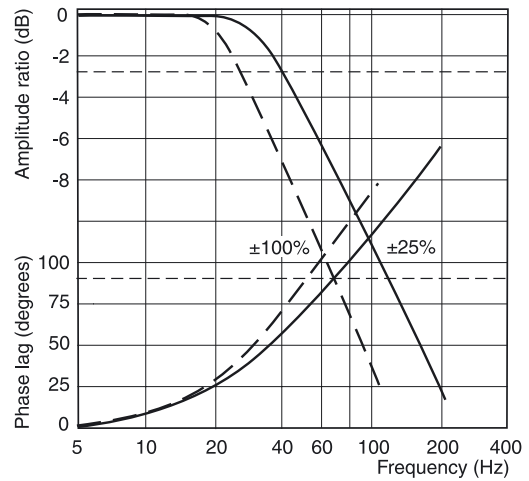
Weight: 3.4 kg
Cable with mating connector: EHC154S
Mating connector: MS3106E-14S-2S
Bolt kit: 4 of M10 x 60 mm, or 4 of 3/8-16x2.375"
Flushing valve: Consult factory.
US Subplate, 4 ports: AS06SPS20S (# 20 SAE side ports)
Metric Subplate, 4 ports: AS06SPS20M (M42 x 2.0 ISO 6149 side ports)
Electronics: BD101, 23-5030, 23-7030, PMC10, BD90, or BD95

Dynamic response at 210 bar
standard response

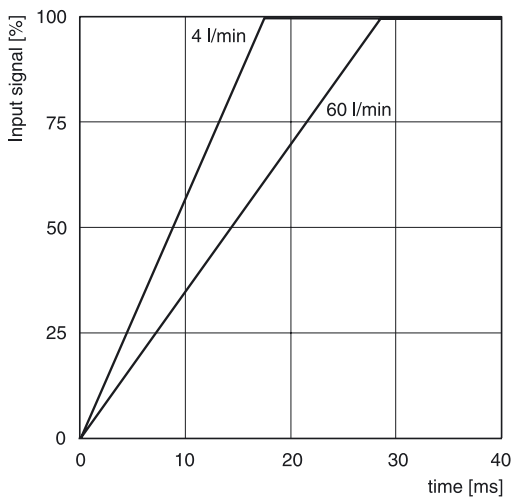
SE60: 95 l/min



SE60: 230 l/min

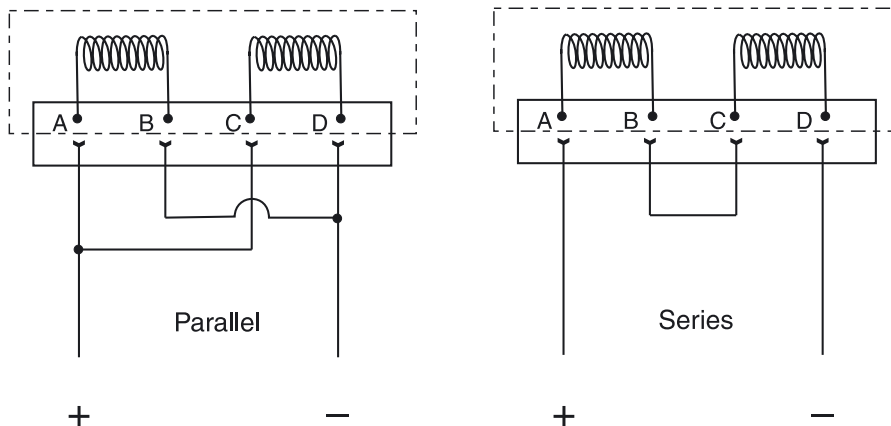


Step response at 210 bar
standard response

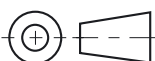
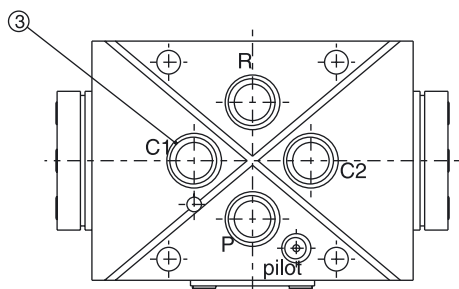
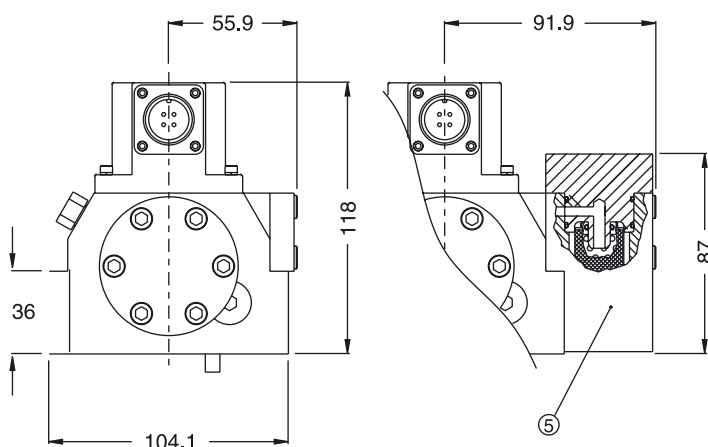
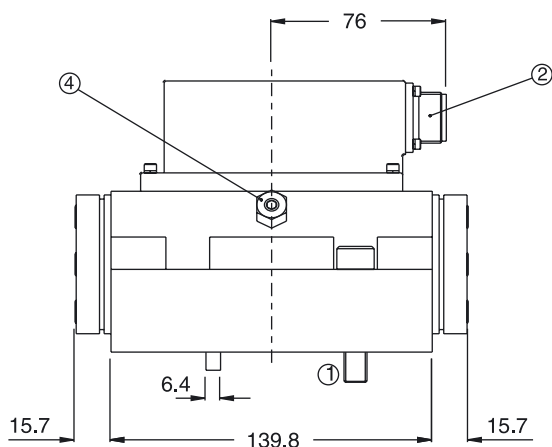


Installation Wiring Options

This servovalve has two coils. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. Refer to the illustrations below and to the mounting pattern for this valve to insure proper control phasing.



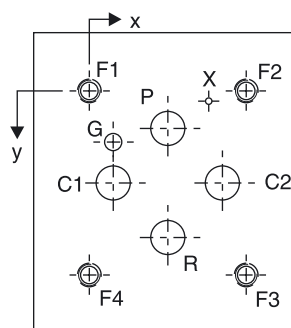
Polarity shown connects flow from P to C2 port.



1. Suggested mounting bolts M10 x 60 mm long high tensile steel socket head cap screws.
2. 4-way electrical connector mates with MS3106-14S-2S or equivalent. Is available at 180° to position shown (advise desired position at time of order).
3. Base O-Rings: 4 of Parker 2019V-7, 1 of Parker 2012V-7 (if external pilot is used).
4. Null adjust requires 12 A/F ring spanner and 3.0 hexagon key. Flow out of C2 will increase with clockwise rotation of key.
5. Optional field replaceable filter housing. Element P/ No. SRS1479.

Mounting Surface dimensions

1. The minimum depth of hole G is 2 mm. Recommended full-thread depth is 30 mm.
2. Surface roughness Ra < 0.8 µm [N6], as specified in ISO 468 and ISO 1302.
3. Surface flatness: 0.025 mm as specified in ISO 1101.



Metric Dimensions (mm)		(± 0.1 mm)								
Axis	P	C1	R	C2	G	X	F1	F2	F3	F4
	Ø 17.5 max	Ø 17.5 max	Ø 17.5 max	Ø 17.5 max	Ø 8	Ø 5	M10	M10	M10	M10
x	36.5	11.1	36.5	61.9	11.1	55.6	0	73	73	0
y	17.4	42.8	68.2	42.8	23.7	4.6	0	0	85.6	85.6

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