

Parker SE31 Series Two-stage, 4 way, Flapper and Nozzle Servovalve Service Manual

General Description

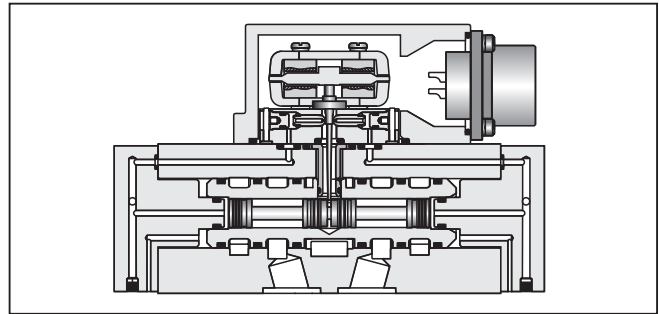
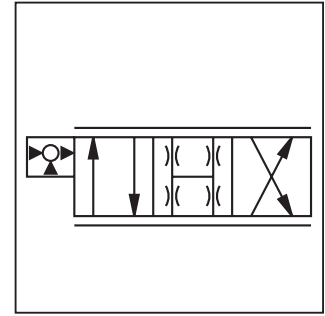
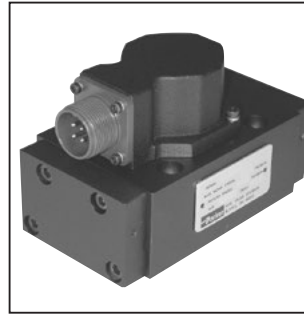
Series SE31 is a two stage, 4-way, flapper and nozzle style servovalve. This valve is designed to fit onto DIN NG10 or NFPA D05 port patterns. The SE 31 has a wide range of flow ratings and a high performance spool and sleeve design. A special jewel feedback design enhances durability and prevents ball glitch problems, which can occur in other types of servovalves. This valve is rated for 210 Bar (3000 PSI) service.

Features

- Lapped spool and sleeve
- Jewel feedback ball for durability
- Aluminum body
- Medium and High performance

Specifications

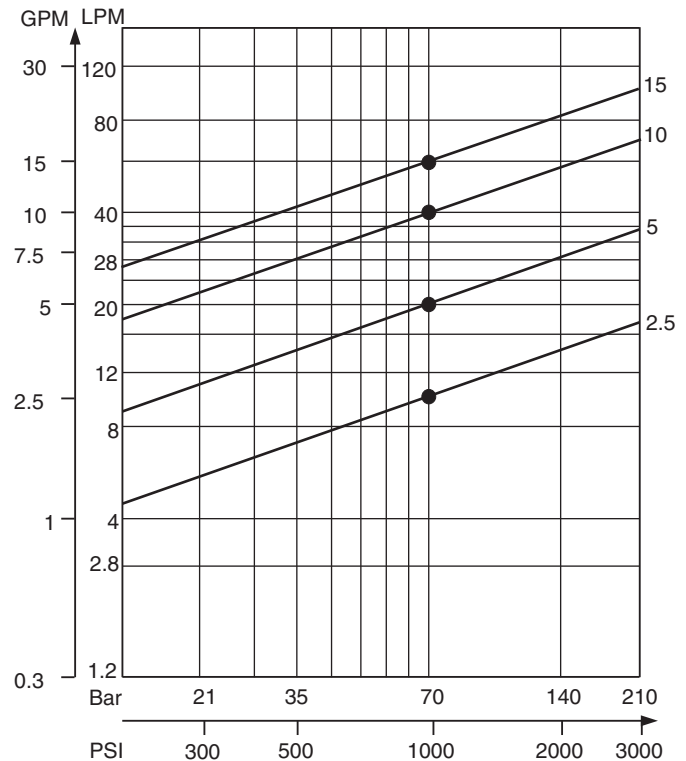
Flow Rating $\pm 10\%$ @ 70 Bar (1000 PSI)	10, 20, 40, 60 LPM (2.5, 5, 10, 15 GPM)
Supply Pressure	10 – 210 Bar (145 – 3000 PSI)
Tank Port Pressure	210 Bar (3000 PSI) Max. < 10 Bar (145 PSI) for best performance
Null Leakage Flow per 70 Bar (1000 PSI)	1.2 – 1.9 LPM (0.3 – 0.5 GPM)
Pilot Flow @ 210 Bar (3000 PSI)	0.4 – 0.7 LPM (0.1 – 0.2 GPM)
Input Command	± 100 mA std.
Frequency Response @ 90° phase shift	> 100 Hz (See Performance Curves)
Non-Linearity	$\leq 10\%$
Hysteresis	$\leq 3\%$
Threshold	$\leq 0.5\%$
Null Shift with temperature with pressure	$\leq 2\%$ per 55°C (100°F) $\leq 2\%$ per 70 Bar (1000 PSI)
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 – 110 cSt at 38°C (100°F)
Fluid Cleanliness	ISO 4406 15/12 or better
Operating Temperature	-30°C to +130°C (-22°F to +266°F)
Protection Class	NEMA 4, IP65



Flow vs. Pressure Drop

at 100% command

Flow Path P → C1 → C2 → R



WARNING: This product can expose you to chemicals including Lead, Nickel (Metallic), or 1,3-Butadiene which are known to the State of California to cause cancer, and Lead or 1,3-Butadiene which is known to the State of California to cause birth defects and other reproductive harm. For more information go to www.P65Warnings.ca.gov.

C01_Cat2550.indd, ddp, 04/19



SE31

Series

Version

Pilot Source

A

Material Aluminum

Coils

Wiring

Seal

Operating Pressure

Flows

Special Options

Factory Code for Special Options

Code

Description

H

High performance ¹⁾

S

Standard

¹⁾ Only available up to 40 LPM (10 GPM)

Code

Description

A

Internal

C

External (5th port)

Code	Description	Parallel	Series
M	27 Ohms	100 mA	50 mA
B	300 Ohms	30 mA	15 mA
F	80 Ohms	40 mA	20 mA
H	200 Ohms	15 mA	7.5 mA
G	22 Ohms	200 mA	100 mA
T	1000 Ohms	10 mA	5 mA
L	1200 Ohms	20 mA	10 mA
A	40 Ohms	60 mA	30 mA
C	800 Ohms	30 mA	15 mA
D	22 Ohms	80 mA	40 mA

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

Code

Description

Omit

Standard

S

(Specify) ²⁾

²⁾ Consult factory for price, delivery and availability of special options.

Code

Description

2.5

10 LPM (2.5 GPM)

5

20 LPM (5.0 GPM)

10

40 LPM (10.0 GPM)

15

60 LPM (15.0 GPM)

Code

Description

A

210 Bar (3000 PSI)

B

315 Bar (4500 PSI)

Code

Description

V

Fluorocarbon (std.)

N

Nitrile

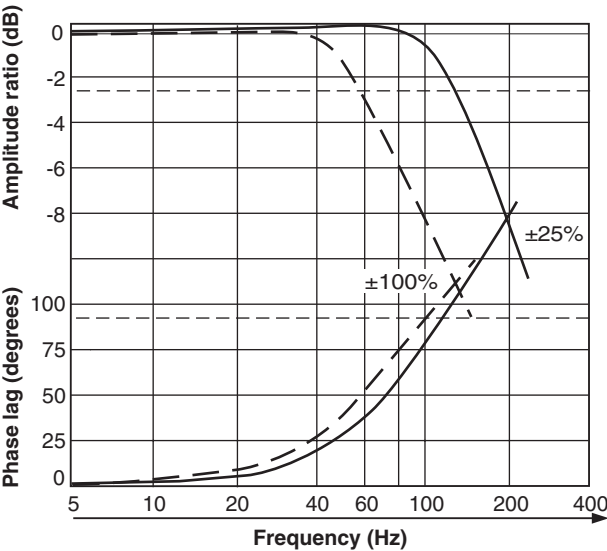
Weight: 1.1 kg (2.4 lbs.)
Cable with mating connector: EHC154S
Mating connector: MS3106E-14S-2S
Bolt kit: 4 of M6 x 50 mm, or 4 of 1/4-20x2.00"
Flushing valve: D3L8CV
Subplate, 5 ports: D31D6SA35 (4 side ports #12 SAE, 1 pilot port on P side is #4 SAE)
Subplate, 4 ports: D3H6SA35 (4 side ports #12 SAE)
Electronics: BD101, 23-7030, BD90, or BD95

Performance Curves

Frequency Response at 210 Bar (3000 PSI)

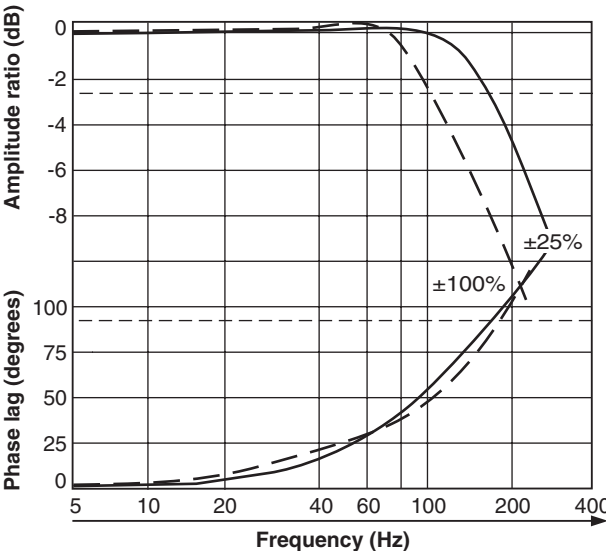
Standard Response

SE31 – 4 LPM (1.0 GPM)



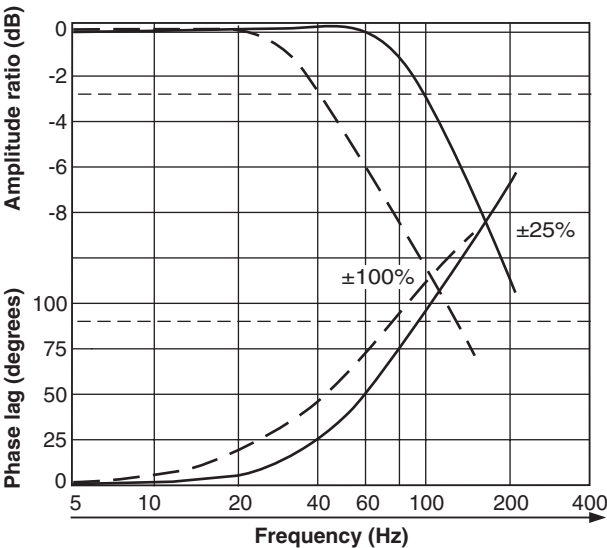
High Response

SE31 – 4 LPM (1.0 GPM)



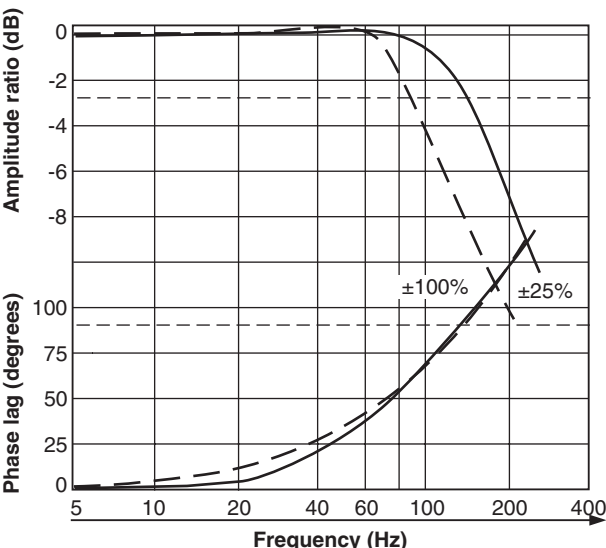
Standard Response

SE31 – 60 LPM (15 GPM)



High Response

SE31 – 40 LPM (10 GPM)

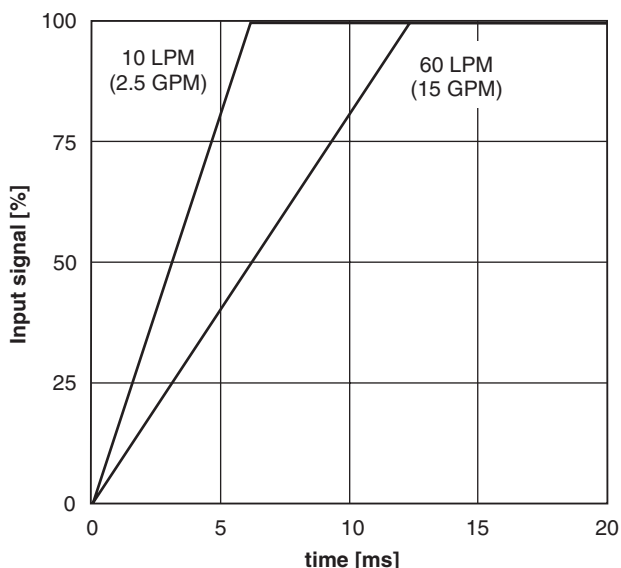


C

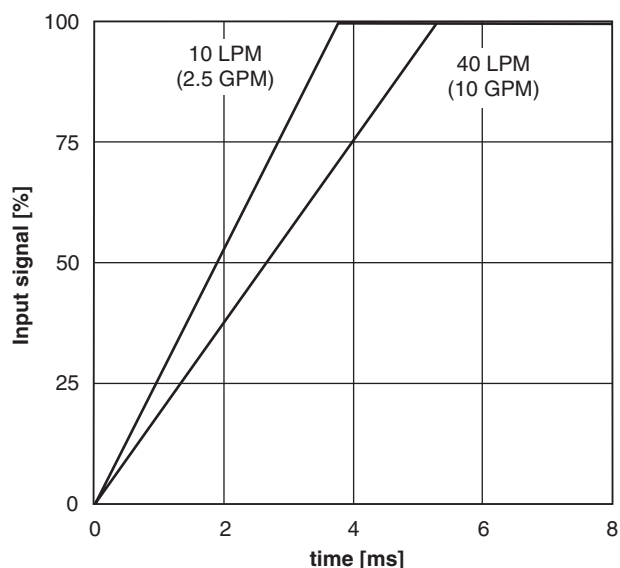
Performance Curves

Step Response at 210 Bar (3000 PSI)

Standard Response

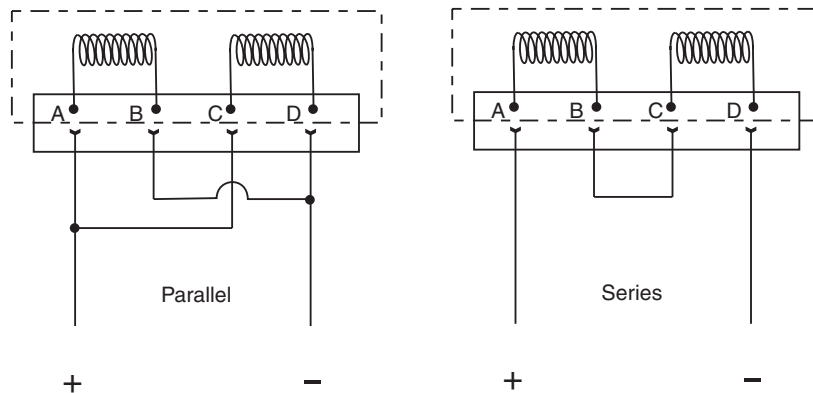


High Response



Installation Wiring Options

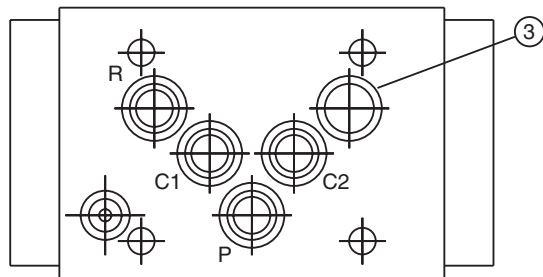
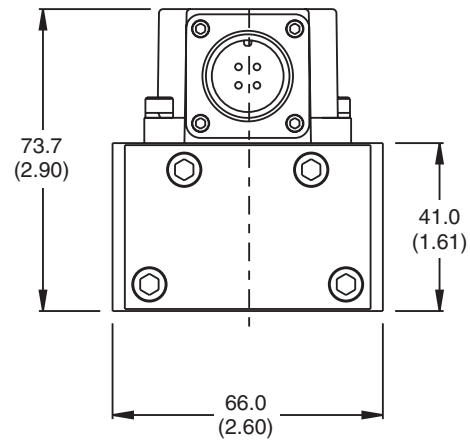
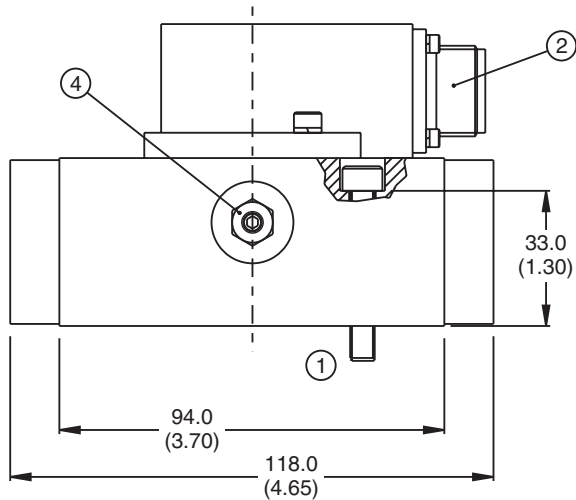
This servovalve has two coils. When connecting the valve to a drive amplifier, the user's external wiring may put the coils either in parallel or in series as needed. Refer to the illustrations below and to the mounting pattern for this valve to insure proper control phasing.



Polarity shown connects flow from P to C2 port.

Dimensions

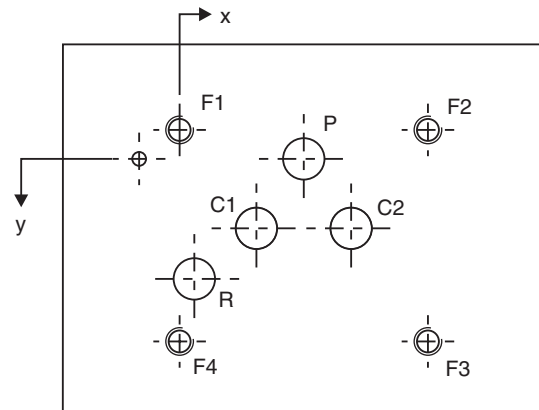
Inch equivalents for millimeter dimensions are shown in (**)



1. Suggested mounting bolts M6 x 50 mm or 1/4-20 x 2.25" 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.
3. Base O-Rings: 12 mm I.D. by 2.0 mm section, 90 durometer.
4. 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

1. The minimum depth of hole G is 2 mm (0.079 in.). The ISO recommended full-thread depth is 18 mm (0.709 in.).
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 (0.001 in.) as specified in ISO 1101.



Metric Dimensions (mm)					($\pm 0.1 \text{ mm}$)				
Axis	P	C1	R	C2	X	F1	F2	F3	F4
	$\varnothing 9 \text{ max}$	$\varnothing 9 \text{ max}$	$\varnothing 9 \text{ max}$	$\varnothing 9 \text{ max}$	$\varnothing 3$	M6	M6	M6	M6
x	27.0	16.7	3.2	37.3	-8.8	0	54.0	54.0	0
y	6.3	21.4	32.4	21.4	6.3	0	0	46.0	46.0

U.S. Dimensions (inches)					($\pm 0.004 \text{ in.}$)				
Axis	P	C1	R	C2	X	F1	F2	F3	F4
	$\varnothing 0.354 \text{ max}$	$\varnothing 0.354 \text{ max}$	$\varnothing 0.354 \text{ max}$	$\varnothing 0.354 \text{ max}$	$\varnothing 0.12$	1/4 - 20	1/4 - 20	1/4 - 20	1/4 - 20
x	1.063	0.657	0.126	1.469	-0.347	0	2.126	2.126	0
y	0.248	0.843	1.275	0.843	0.248	0	0	1.811	1.811