Clippard

# SPIDER TECHNOLOGY



# What is Spider Technology?

In 1973, Clippard patented a new valve design that utilized a unique sealing mechanism to improve performance and reliability. The design was a significant advancement and helped establish Clippard as a leading innovator in the field of pneumatic control. It featured a seal that was held in place by a very special spring, which consisted of a central plunger surrounded by several magnetically-responsive "legs" that moved in response to changes in pressure. When the valve was actuated, the legs moved outward, creating an opening that enabled media to flow through. It became known as the Clippard "spider."

This technology has since been copied and mimicked by other manufacturers, but none have come close to perfecting it. Today, Clippard's EV series—the original "spider" valve—remains the industry standard for long life and low leak. Building on this legacy, Clippard offers a wide range of valves that utilize this tried-and-true spider technology to meet the needs of many different industries and applications. All Clippard spider valves are extremely low leak. They provide exceptional reliability; long lifespans; and fast, precise control. They also consume very little power and have minimal internal volume.

Spider valves are well-suited for a broad range of medical, analytical, and niche industrial applications including biomedical, dental, test equipment, oxygen control, textile, packaging, pressure control, automation and portable systems.



# What Are the Benefits of a **Spider Valve** vs. a **Solenoid Valve**?

- Longer life—1,000,000,000+ cycles
- Lower vibration and noise
- Lower power
- Faster response time
- More compact and lightweight
- Less internal volume
- Better leak resistance

**Response Time** Page # Max. Flow Height Wattage **EV Series** 1.560" р. б 17 l/min @ 100 psig (7 bar) 0.67 5 to 10 ms **ES Series** p. 22 0.980" 1.0 17 l/min @ 100 psig (7 bar) 5 to 10 ms **EHS Series** p. 24 1.280" 58 l/min @ 1,000 psig (70 bar) 10 to 15 ms 1.0 **SV** Series p. 26 0.645" 0.5 12 l/min @ 100 psig (7 bar) < 5 ms **ST Series** p. 28 0.740" 0.5 5.4 l/min @ 100 psig (7 bar) < 5 ms **DV** Series р. 30 1.875" 100 l/min @ 100 psig (7 bar) 1.9 10 to 15 ms

# The EV Series

### Standard

2-way and 3-way manifold and in-line mounting. Normally-closed and universally ported versions.

### **High Pressure**

Precision-built 2-way control valves that accept low voltage, low current signals and convert them to high pressure (500 psig) pneumatic outputs.

### **Oxygen Clean**

Manufactured and assembled for use in oxygen-enriched environments for applications that are extremely sensitive to contamination.



р. 6

Electroless nickel-plated steel housing and core

Nitrile seals standard

Electroless nickel-plated brass body

> Stainless steel stud and nozzle



p. 12

Electroless nickel-plated steel housing and core

Nitrile seals standard

Electroless nickel-plated brass body

Stainless steel stud and nozzle



p. 14

Integral fitting and stud

No thread sealant

All wetted parts cleaned to meet and/or exceed ASTM G93 Level E NVR and Level 500 Particulate and Fibers

Electroless nickel-plated steel housing and core

FKM seals

Stainless steel nozzle

Electroless nickel-plated brass body

PFPE lubricant

### Analytical

### **Corrosion-Resistant**

N.O. Manifold

Normally-open, manifold mount

to allow normally-closed and

normally-open valves on the same

manifold.

Designed for applications where cleanliness is especially important. Utilizes special materials, processes, and strict quality standards to achieve the highest levels of cleanliness and ultra low leak rates.



<mark>р. 16</mark>

Integral fitting

No anaerobic sealant

Larger cross section o-ring improves sealing

Cleaned to meet and/or exceed ASTM G93 Level E NVR and Level 500 Particulate and Fibers

One-piece base eliminates many leak points

Outgassed FKM seals

2-way and 3-way manifold and in-line mounting. Normally-closed and universally ported versions. Optimized for applications where corrosion resistance is important.



p. 18

Stainless steel housing and core

Nitrile seals standard

Electroless nickel-plated spider

Electroless nickel-plated brass body



p. 20

Integral fitting

Spider above coil

Mounts side-by-side with normally-closed version

# **EV SERIES** ELECTRONIC VALVES



Clippard's original EV series valve design is a deceptively simple arrangement featuring a remarkably quiet, low power operation. The Clippard "spider" is the only moving part, and its motion to operate the valve is a mere 0.007" travel. As a result, this valve features an exceptionally long life—proven to last over 1,000,000,000+ cycles. Low voltage DC inputs move the spider, generating extremely fast response times of 5 to 10 milliseconds while using only 0.67 watts of power. The EV series is cool running and its compact, lightweight design makes it easy to mount in small spaces.

Also available in high flow, oxygen clean, analytical, corrosion-resistant, N.O. manifold, and proportional versions.





Coil Resistance	218 (12V), 864 (24V)
Connection	Pin connector, spade terminals, radial wire leads, or axial wire leads
Current	0.055A (12V), 0.028A (24V)
Cycle Life	>1,000,000,000 (ideal applications)
Filtration	40 micron filter (recommended)
Function	2-way normally-open or normally-closed; 3-way normally-open, normally-closed, or universally ported
Leak Rate	0.1 sccm
Material, Body	Nickel-plated brass, ENP carbon steel, nickel iron alloy, 300 series stainless steel
Material, Seals	Nitrile standard; FKM, EPDM <sup>1</sup> and silicone <sup>1</sup> available
Material, Spring	Nickel alloy
Material, Wetted	ENP brass, nickel alloy, stainless steel, ENP steel
Max. Flow	17 l/min @ 100 psig (7 bar), 14 l/min @ 50 psig (3.4 bar), or 12.5 l/min @ 25 psig (1.7 bar)
Max. psig	105 (7.2 bar)
Medium	Clean, dry air and compatible gases
Mount	In-line or manifold
Number of Ports	2 or 3
Operating Pressure	28" Hg to 25, 50, or 100 psig (1.7, 3.4, or 7 bar)
Operating Temp. Range	32 to 180°F (0 to 82°C)
Orifice	0.060", 0.040", or 0.025" (1.52, 1.02, or 0.64 mm)
Port, Exhaust	#10-32 or M5 (3-way)
Port, Inlet	Manifold: #10-32 or M5 male stud In-Line: #10-32 or M5 female
Port, Outlet	#10-32 or M5 (in-line)
Response Time	5 to 10 ms (nominal)
Voltage	12 or 24 VDC
Voltage Operating Range	90 to 150%
Wattage	0.67 watts (nominal)
More Details	clippard.com/link/ev-series

<sup>1</sup>Minimum order quantity required

#### Inline Mount

2-Way, 3-Way, and 3-Way Universally Ported

#### **Manifold Mount**

2-Way, 3-Way, and 3-Way Universally Ported



*Dimensions shown are in inches (millimeters listed in parentheses). Visit clippard.com for more detailed 2D and 3D drawings.* 



#### Example Part Number: EC-3-12

For more info, scan the QR code or visit clippard.com/link/ev-series



# **EFB SERIES** FILL & BLEED CIRCUITS



A fill and bleed circuit is a combination of pneumatic valve components used to inflate a volume or apparatus in one controllable function and to release or vent pressure in a second controllable function. Fill and bleed circuits are commonly used in many applications where a particular pressure, firmness, or position can be controlled with the addition or venting of pressure.

- Compact, robust design
- Extremely fast response
- Exceptionally long life
- Multiple flow and pressure options





Material, Body	Black anodized aluminum
Connection	Wire leads
Medium	Clean, dry air and compatible gases
Mount	In-line or manifold

#### **EV Valve Version** (See EV Series for more specifications)

Material, Body	Nickel-plated brass, ENP carbon steel, nickel iron alloy, 300 series stainless steel	
Material, Seals	Nitrile standard; FKM, EPDM <sup>1</sup> and silicone <sup>1</sup> available	
Material, Spring	Nickel alloy	
Material, Wetted	ENP brass, nickel alloy, stainless steel, ENP steel	
Max. psig	105 (7.2 bar)	
Operating Pressure	28" Hg to 25, 50, or 100 psig (1.7, 3.4, or 7 bar)	
Operating Temp. Range 32 to 180°F (0 to 82°C)		
Response Time	5 to 10 ms (nominal) @ 25 psig (1.7 bar)	
Voltage Op. Range	90 to 150%	
Wattage	0.67 watts (nominal)	

#### DV Valve Version (See DV Series for more specifications)

Material, Body	Stainless steel
Material, Seals	Nitrile standard; FKM, EPDM and silicone available
Material, Spring	Stainless steel
Material, Wetted	Polyetherimide, stainless steel, PPS
Max. psig	100 (6.9 bar)
Operating Pressure	28" (71 cm) Hg vac. to 50 or 100 psig (3.4 or 7 bar)
Operating Temp. Range	<b>a</b> 32 to 130°F (0 to 54°C)
Response Time	10 to 15 ms
Voltage Op. Range	95 to 125%
Wattage	1.9 watts

More Details

clippard.com/link/efb



### Example Part Number: EFB-1DV-12-L

For more info, scan the QR code or visit **clippard.com/link/efb** 



# EV VALVE BOOSTERS



	Available in Metric
2-way or 3-way normally-closed	
Nickel-plated brass, acetal, stainless steel	

More Details	clippard.com/link/evb	
Temperature Range	30 to 180°F (-1 to 82°C)	
Response Time	20 ms @ 20 psig (1.4 bar) 13 ms @ 100 psig (7 bar) nominal	
Ports	Inlet and outlet through manifold	
Operating Pressure	20 to 150 psig (1.4 to 10.3 bar)	
Medium	Air	
Max. Flow	176 l/min @ 100 psig (7 bar)	
Material, Seals	Nitrile	
material, bouy	meker platea brass, acetal, stanness steer	

Use only normally-closed 3-way pilot valves in conjunction with this booster.

These pressure piloted manifold mount valves are designed to fit the standard footprint of the EV valve and to be piloted by a manifold mount 3-way Clippard EV valve (not included). Output from the valve actuates the booster to produce outputs up to 175 l/min at 100 psig (7 bar). The EVB combines the low wattage, long life, and cool running of the EV valve with quick response and high flow.

#10-32 Pilot Valve Mounting Hole — #10-32 Manifold Connection / Inlet 0.218" (5.5) 1 Outlet Exhaust 2 (3-Way Only) 0.906" (23.0)3 dia. 1.000" O-Ring Seals لاً (4.0 ° 0.156 (25.4) 3-Way 2-Way 2

Dimensions shown are in inches (millimeters listed in parentheses).

> Visit clippard.com for more detailed 2D and 3D drawings.



Function Material Rody



### ORDERING INFORMATION







Function	3-way normally-closed	
Material, Body	Anodized aluminum, stainless steel	
Material, Seals	Nitrile	
Max. Flow	620 l/min @ 100 psig (7 bar)	
Medium	Air	
Operating Pressure	30 to 100 psig (2 to 7 bar)	
Pilot Pressure	60% of supply pressure	
Ports	Inlet and outlet, exhaust 1/8" NPT; pilot supply on 2020 is #10-32 female	
Response Time	20 ms	
More Details	clippard.com/link/evb	

Use only normally-closed 3-way pilot valves in conjunction with these boosters.

These pressure piloted valves are designed to be piloted by a manifold mount Clippard EV valve (not included). Output from the valve actuates the booster to produce outputs up to 620 l/min at 100 psig (7 bar). Combines low wattage, long life, and cool running of the EV valve with quick response and high flow. Available internally or externally piloted.



### ORDERING INFORMATION



Example Part Number: 2020

For more info, scan the QR code or visit **clippard.com/link/efb** 



# HIGH PRESSURE EV SERIES



Clippard's EHV series are a high pressure version of the renowned EV series. They are precision-built 2-way control valves that accept low voltage, low current signals and convert them to high pressure (500 psig, 34.5 bar) pneumatic outputs. Like the orginal EV series, EHV series valves consume very little power and provide exceptionally long life. In addition, they are small in size, quiet, and produce very little heat. These features make them wellsuited for a wide range of applications across a broad spectrum of industries.

#### **TYPICAL FLOW**





Coil Resistance	218 (12V), 864 (24V)	
Connection	Pin connector, spade terminals, or radial wire lead	
Current	0.055A (12V), 0.028A (24V)	
Filtration	40 micron filter (recommended)	
Function	2-way normally-closed (monodirectional)	
Material, Body	Nickel alloy, stainless steel, ENP steel	
Material, Seals	Nitrile standard; FKM and EPDM <sup>1</sup> available	
Material, Spring	Nickel alloy	
Material, Wetted	Nickel alloy, stainless steel, ENP steel	
Max. Flow	12, 29, or 60 l/min @ 500 psig (34.5 bar)	
Max. psig	500 (34.5 bar)	
Medium	Clean, dry air and compatible gases	
Mount	Manifold	
Number of Ports	2	
Operating Pressure	Vac. to 500 psig (34.5 bar)	
Operating Range	90 to 150% of rated voltage	
Operating Temp. Range	32 to 180°F (0 to 82°C)	
Orifice	0.009", 0.013", or 0.020" (0.23, 0.33, or 0.51 mm)	
Port, Inlet	#10-32 male or M5	
Port, Outlet	#10-32 or M5 (in-line)	
Response Time	5 to 10 ms (nominal)	
Voltage	12 or 24 VDC	
Voltage Operating Range	90 to 150%	
Wattage	0.67 watts (nominal)	
More Details	clippard.com/link/ehv-series	

<sup>1</sup>*Minimum order quantity required* 

**Manifold Mount** 

2-Way





Dimensions shown are in inches (millimeters listed in parentheses). Visit clippard.com for more detailed 2D and 3D drawings. EHV series valves are the "heart" of Clippard's CHP series high pressure electronic regulator.

- Extremely small dead volume
- Low vibration and noise
- Fast response time
- Low energy consumption
- Exceptional repeatability and reliability
- Compact and ideal for sub-assemblies
- 100% tested



#### TDS EHV-01, Rev. 081424 (2/2)

### **OXYGEN CLEAN** EV SERIES





For applications that are particularly sensitive to contamination, Clippard's EV series valves are also available in an oxygen clean version. Oxygen clean EV valves are manufactured and assembled using a special cleaning process that includes:

- Ultrasonic cleaning, assembly, inspection, and testing in one of Clippard's ISO 7 (class 10,000) rated clean rooms
- All wetted parts cleaned to meet and/or exceed ASTM G93 Level E NVR and Level 500 Particulate and Fibers
- No organic sealants, adhesives, or lubricants used in the manufacturing process
- Component parts lubricated with oxygen-compatible PFPE grease (only as needed for assembly)
- Invididual testing and inspection utilizing compressed Nitrogen and ultra-violet light

**TYPICAL FLOW** 



### (3.4 bar), or 12.5 l/min @ 25 psig (1.7 bar) Max. psig 105 (7.2 bar) Medium Clean, dry air and compatible gases Mount In-line or manifold Number of Ports 2 or 3 Operating Pressure 28" Hg to 25, 50, or 100 psig (1.7, 3.4, or 7 bar) Operating Range 90 to 150% of rated voltage Operating Temp. Range 32 to 180°F (0 to 82°C) Orifice 0.060" 0.040" or 0.025" (1.52, 1.02, or 0.64 m)

**Coil Resistance** 

Connection

Current

Cycle Life

Filtration

Function

Leak Rate

Material, Body

Material, Seals

Material, Spring

Material, Wetted

Max. Flow

Operating Range	90 to 150% of rated voltage	
Operating Temp. Range	32 to 180°F (0 to 82°C)	
Orifice	0.060", 0.040", or 0.025" (1.52, 1.02, or 0.64 mm)	
Port, Exhaust	#10-32 or M5	
Port, Inlet	Manifold: #10-32 male or M5 In-Line: #10-32 female or M5	
Port, Outlet	#10-32 or M5 (in-line)	
Response Time	5 to 10 ms (nominal)	
Voltage	12 or 24 VDC	
Voltage Operating Range	90 to 150%	
Wattage	0.67 watts (nominal)	
More Details	clippard.com/link/ev-series	

<sup>1</sup>Minimum order quantity required

Does your application have requirements beyond what is listed? Contact Clippard to discuss how this valve can be modified to meet your specific needs.



Pin connector, spade terminals, radial wire leads,

218 (12V), 864 (24V)

or axial wire leads

or universally ported

0.1 sccm

FKM

Nickel alloy

0.055A (12V), 0.028A (24V)

>1,000,000,000 (ideal applications)

2-way normally-open or normally-closed; 3-way normally-open, normally-closed,

Nickel-plated brass, ENP carbon steel, nickel iron

ENP brass, nickel alloy, stainless steel, ENP steel

17 l/min @ 100 psig (7 bar), 14 l/min @ 50 psig

40 micron filter (recommended)

alloy, 300 series stainless steel

#### Inline Mount

2-Way, 3-Way, and 3-Way Universally Ported

#### **Manifold Mount**

2-Way, 3-Way, and 3-Way Universally Ported



*Dimensions shown are in inches (millimeters listed in parentheses). Visit clippard.com for more detailed 2D and 3D drawings.* 



### Example Part Number: 0-EC-2-12

For more info, scan the QR code or visit **clippard.com/link/ev-series** 



# **ANALYTICAL** EV SERIES



Clippard's EV series valves are also available in an analytical version that is ideal for applications that are particularly sensitive to cleanliness and outgassing from the valve. Analytical series EV valves are manufactured and assembled using an optimized process which includes:

- Ultrasonic cleaning, assembly, inspection, and testing in one of Clippard's ISO 7 (class 10,000) rated clean rooms
- Cleaned to meet and/or exceed ASTM G93 Level E NVR and Level 500 Particulate and Fibers
- · No sealants used in the assembly
- · Parts lubed with isopropyl alcohol only for assembly
- · Individual testing with bottled nitrogen

Also available in high flow, oxygen clean, corrosionresistant, N.O. manifold, and proportional versions.







Coil Resistance	218 (12V), 864 (24V)
Connection	Pin connector, spade terminals, radial wire leads, or axial wire leads
Current	0.055A (12V), 0.028A (24V)
Cycle Life	>1,000,000,000 (ideal applications)
Filtration (recommended)	40 micron filter (recommended)
Function	2-way normally-open or normally-closed; 3-way normally-open, normally-closed, or universally ported
Leak Rate	0.1 sccm
Material, Body	Nickel-plated brass, ENP carbon steel, nickel iron alloy
Material, Seals	FKM standard, EPDM <sup>1</sup> and silicone <sup>1</sup> available
Material, Spring	Nickel alloy
Material, Wetted	ENP brass, nickel alloy, ENP steel
Max. Flow	17 l/min @ 100 psig (7 bar), 14 l/min @ 50 psig (3.4 bar), or 12.5 l/min @ 25 psig (1.7 bar)
Max. psig	105 (7.2 bar)
Medium	Clean, dry air and compatible gases
Mount	Manifold
Number of Ports	2 or 3
Operating Pressure	28" Hg to 25, 50, or 100 psig (1.7, 3.4, or 7 bar)
Operating Range	90 to 150% of rated voltage
Operating Temp. Range	32 to 180°F (0 to 82°C)
Orifice	0.060", 0.040", or 0.025" (1.52, 1.02, or 0.64 mm)
Port, Exhaust	#10-32 or M5
Port, Inlet	Manifold: #10-32 male or M5 In-Line: #10-32 female or M5
Port, Outlet	#10-32 or M5 (in-line)
<b>Response Time</b>	5 to 10 ms (nominal)
Voltage	12 or 24 VDC
Voltage Operating Range	90 to 150%
Wattage	0.67 watts (nominal)
More Details	clippard.com/link/ev-series

<sup>1</sup>*Minimum order quantity required* 

#### **Manifold Mount**

2-Way, 3-Way, and 3-Way Universally Ported



### ORDERING INFORMATION



-H

Vac. to 25 psig - 12.5 l/min @ 25 psig (1.7 bar)

<sup>1</sup>*Minimum order quantity required* <sup>4</sup>Available on pin connector (EC) models only

#### **Example Part Number:** A-EC-2M-12

For more info, scan the OR code or visit clippard.com/link/ev-series



## **CORROSION RESISTANT** EV SERIES



For applications that are susceptible to corrosion, the EV series is available in a special corrosion resistant version. The corrosion resistant series uses the same deceptively simple spider technology as the original EV series, but all the ENP steel components are swapped out for 430 stainless steel. The stainless steel components change the electrical characteristics by increasing the power consumption but do not affect the pressure or flow performance.



RoHS	100% <b>TESTED</b>	CE	Available in Metric

Coil Resistance	122 (12V), 486 (24V)	
Connection	Pin connector, spade terminals, radial wire leads	
Current	0.10A (12V), 0.05A (24V)	
Cycle Life	>1,000,000,000 (ideal applications)	
Filtration	40 micron filter (recommended)	
Function	2-way normally-open or normally-closed; 3-way normally-open, normally-closed, or universally ported	
Leak Rate	0.1 sccm	
Material, Body	Nickel-plated brass, nickel iron alloy, 300 stainless steel, 430 stainless steel	
Material, Seals	Nitrile standard; FKM, EPDM <sup>1</sup> and silicone <sup>1</sup> available	
Material, Spring	ENP nickel alloy	
Material, Wetted	ENP brass, ENP nickel alloy, 430 stainless steel	
Max. Flow	17 l/min @ 100 psig (7 bar), 14 l/min @ 50 psig (3.4 bar), or 12.5 l/min @ 25 psig (1.7 bar)	
Max. psig	105 (7.2 bar)	
Medium	Clean, dry air and compatible gases	
Mount	In-line or manifold	
Number of Ports	2 or 3	
Operating Pressure	28" Hg to 25, 50, or 100 psig (1.7, 3.4, or 7 bar)	
Operating Range	90 to 110% of rated voltage	
Operating Temp. Range	32 to 150°F (0 to 65°C)	
Orifice	0.060", 0.040", or 0.025" (1.52, 1.02, or 0.64 mm)	
Port, Exhaust	#10-32 or M5	
Port, Inlet	Manifold: #10-32 male or M5 In-Line: #10-32 female or M5	
Port, Outlet	#10-32 or M5 (in-line)	
<b>Response Time</b>	5 to 10 ms (nominal)	
Voltage	12 or 24 VDC	
Voltage Operating Range	90 to 110%	
Wattage	1.2 watts (nominal)	
More Details	clippard.com/link/ev-series	

<sup>1</sup>*Minimum order quantity required* 

#### Inline Mount

2-Way, 3-Way, and 3-Way Universally Ported

#### Manifold Mount

2-Way, 3-Way, and 3-Way Universally Ported



*Dimensions shown are in inches (millimeters listed in parentheses). Visit clippard.com for more detailed 2D and 3D drawings.* 



CR-EC-2-12

QR code or visit clippard.com/link/ev-series



# N.O. MANIFOLD EV SERIES



Clippard's normally-open series EV valves are ideal for applications where a manifold mount normally-open valve is required. The normally-open EV valve is a unique valve that offers the same low power and long life as the original EV series in a package that provides normally-open functionality.







Coil Resistance	218 (12V), 864 (24V)			
Connection	Pin connector, spade terminals or radial wire leads			
Current	0.055A (12V), 0.028A (24V)			
Cycle Life	>1,000,000,000 (ideal applications)			
Filtration	40 micron filter (recommended)			
Function	2-way normally-open or normally-closed; 3-way normally-open, normally-closed, or universally ported			
Material, Body	Nickel-plated brass, ENP carbon steel, nickel iron alloy, 300 series stainless steel			
Material, Seals	Nitrile standard; FKM, EPDM <sup>1</sup> and silicone <sup>1</sup> available			
Material, Spring	Nickel alloy			
Material, Wetted	ENP brass, nickel alloy, stainless steel, ENP steel			
Max. Flow	25 l/min @ 100 psig (7 bar)			
Max. psig	105 (7.2 bar)			
Medium	Clean, dry air and compatible gases			
Mount	Manifold			
Number of Ports	2 or 3			
Operating Pressure	100 psig (7 bar)			
Operating Range	90 to 150% of rated voltage			
Operating Temp. Range	32 to 180°F (0 to 82°C)			
Orifice	0.040" (1.02 mm)			
Port, Exhaust	#10-32 or M5			
Port, Inlet	#10-32 male or M5			
Port, Outlet	#10-32 or M5 (in-line)			
<b>Response Time</b>	5 to 10 ms (nominal)			
Voltage	12 or 24 VDC			
Voltage Operating Range	90 to 150%			
Wattage	0.67 watts (nominal)			
More Details	clippard.com/link/ev-series			

<sup>1</sup>Minimum order quantity required

#### **Manifold Mount**

2-Way, 3-Way, and 3-Way Universally Ported



*Dimensions shown are in inches (millimeters listed in parentheses). Visit clippard.com for more detailed 2D and 3D drawings.* 



<sup>1</sup>*Minimum order quantity required* <sup>2</sup>*Available on pin connector (ECN) models only* 

#### Example Part Number: ECN-2M-12

For more info, scan the QR code or visit **clippard.com/link/ev-series** 



# **ES SERIES** ELECTRONIC VALVES



The ES series features large cross sectional o-rings, minimal leak points, and proven poppet designs. To reduce the possibility of contamination, all mounting hardware is located outside of the flow path and no internal parts are threaded during assembly. The ES has the best performance-to-price ratio for low leak valves. The compact footprint coupled with the long life, and exceptional leak resistance make the ES line suited to improve reliability in a wide range of applications.



#### **TYPICAL FLOW**



Coil Resistance	36 (6V), 144 (12V), 576 (24V)			
Connection	Top terminal pins or radial wire leads			
Current	017A (6V), 0.083A (12V), 0.042A (24V)			
Cycle Life	Over 1 billion			
Filtration (recommended)	40 micron			
Function	2-way bidirectional; 3-way normally-closed or universally ported			
Leak Rate	0.01 sccm			
Material, Body	ENP carbon steel, nickel iron alloy, 300 series stainless steel, glass-filled nylon housing			
Material, Seals	Nitrile standard; FKM and EPDM available			
Material, Spring	Nickel alloy			
Material, Wetted	Nickel alloy, stainless steel, ENP steel			
Max. Flow	17 l/min @ 100 psig (7 bar) 14 l/min @ 50 psig (3.5 bar) 12.5 l/min @ 25 psig (1.7 bar)			
Max. psig	105 (7.2 bar)			
Medium	Clean, dry air and compatible gases			
Mount	Manifold			
Number of Ports	2 or 3			
Operating Pressure	28" Hg Vac. to 25, 50, or 105 psig (700 mm Hg to 1.2, 3.4, or 7.2 bar)			
Operating Temp. Range	32 to 150°F (0 to 65°C)			
Port, Exhaust	<b>3-Way:</b> #10-32 or M5			
Port, Inlet	No thread			
Port, Outlet	No thread			
Response Time	5 to 10 ms (nominal)			
Thread	#4-40 or M3 (torque to 1-3 in-lb.)			
Voltage	6, 12, or 24 VDC			
Voltage Operating Range	90-120%			
Wattage	1 watt (nominal)			
More Details	clippard.com/link/es-series			

<sup>1</sup>*Minimum order quantity required* 



# **EHS SERIES** HIGH PRESSURE VALVES



The EHS series is precision-engineered to deliver robust performance in higher pressure (up to 1,000 psig) applications, prioritizing both safe functionality and the reduction of potential leak points. Building upon the foundation set by the ES series, the EHS incorporates key features such as substantial cross sectional o-rings, proven poppet designs, and strategic placement of mounting hardware outside the flow path. The EHS series is the preferred choice for high-pressure applications that demand lasting, low leak performance.

#### **TYPICAL FLOW**





Coil Resistance	144 (12V), 576 (24V)			
Connection	Top terminal pins or radial wire leads (18")			
Current	0.083A (12V), 0.042A (24V)			
Filtration	40 micron (recommended)			
Function	2-way normally-closed (monodirectional)			
Material, Body	ENP steel, stainless steel, aluminum			
Material, Seals	Nitrile standard; FKM and EPDM available			
Material, Spring	Nickel alloy			
Material, Wetted	Nickel alloy, stainless steel, ENP steel, aluminum			
Max. Flow	25 or 58 l/min @ 1,000 psig (69 bar)			
Max. psig	1,000 psig (69 bar)			
Medium	Clean, dry air and compatible gases			
Mount	Inline			
Number of Ports	2			
Operating Pressure	Vac. to 1,000 psig (69 bar)			
Operating Temp. Range	32 to 150°F (0 to 65°C)			
Port, Inlet	1/8-27 NPT female or G1/8 female			
Port, Outlet	1/8-27 NPT female or G1/8 female			
Response Time	10 to 15 ms (nominal)			
Voltage	12 or 24 VDC			
Voltage Operating Range	90 to 120%			
Wattage	1 Watt (nominal)			
More Details	clippard.com/link/ehs			



- 1.100" (27.9) -







Dimensions shown are in inches (millimeters listed in parentheses). Visit clippard.com for more detailed 2D and 3D drawings.

- Specially engineered for reliability in demanding high-pressure applications (up to 1,000 psig)
- Easy installation and maintenance
- Proven poppet design
- Compact, space-saving design with optimized flow path

### ORDERING INFORMATION

0.650" (16.5) 0.175" (4.4)

0.275″ (7.0)



### ACCESSORIES

C3-RXB18

Wire lead connector, 18" (TE Connectivity #5-103956-2)

Example Part Number: EHS-2T-12-R For more info, scan the QR code or visit **clippard.com/link/ehs** 



# **SV SERIES** ELECTRONIC VALVES



These direct actuating valves offer an extremely fast response time for accurate dosing of minute volumes. Due to very low moving weights, they are extremely quiet and emit very low vibration. Subminiature size and low energy consumption make them ideal for transportable and mobile systems, among others.

Standard products offered will fit the needs of most applications, however this series can be fully customized according to the user's unique requirements. Consult Clippard with your specific application.





Connection	3" wire leads
Cycle Life	>100,000,000
Filtration	10 micron (recommended)
Function	2-way or 3-way, normally-closed
Leak Rate	1.0 sccm
Material, Body	Stainless steel
Material, Seals	FKM standard, EPDM available <sup>1</sup>
Material, Spring	302 stainless steel
Material, Wetted	303, 430, and 302 stainless steel
Max. Flow	7 l/min @ 145 psig (10 bar), 14 l/min @ 115 psig (8 bar), 12.5 l/min @ 72 psig (5 bar), 13 l/min @ 45 psig (3 bar)
Max. psig	145 (10 bar)
Medium	Air, water, gas, and compatible fluids
Mount	Cartridge
Number of Ports	2 or 3
Operating Pressure	0 to 145 psig (10 bar)
Operating Temperature	41 to 122°F (5 to 50°C)
Orifice	0.012", 0.020", 0.031", 0.039" (0.3, 0.5, 0.8, 1.0 mm)
Port, Exhaust	M1.6
Port, Inlet	No thread
Port, Outlet	No thread
Response Time	<5 ms
Voltage	12 or 24 VDC
Voltage Operating Range	95-105% of rated power
Wattage	0.5 to 1.2 watts
More Details	clippard.com/link/sv-series

<sup>1</sup>*Minimum order quantity required* 

Does your application have requirements beyond what is listed? Contact Clippard to discuss how this valve can be modified to meet your specific needs.

26 SV Series





#### TDS SV-01, Rev. 031425 (2/2)

\*Also available in stainless steel (add -SS to part number)

#### 877-245-6247 | clippard.com 27

# **ST SERIES** ELECTRONIC VALVES





These direct actuating valves offer an extremely fast response time for accurate dosing of minute volumes in a compact, 8 mm cartridge package. Due to very low moving weights, they are extremely quiet and emit very low vibration. Subminiature size and low energy consumption make them ideal for many medical and diagnostic applications. Standard products offered will fit the needs of most applications, however this series can be fully customized according to the user's unique requirements. Consult Clippard with your specific application.



Connection	Terminal pins
Cycle Life	>100,000,000
Filtration	10 micron (recommended)
Function	3-way
Leak Rate	1.0 sccm
Material, Body	Stainless steel
Material, Seals	FKM standard, EPDM available <sup>1</sup>
Material, Spring	302 stainless steel
Material, Wetted	302 stainless steel
Max. Flow	7.5 l/min @ 145 psig (10 bar), 11.7 l/min @ 87 psig (6 bar), 16.7 l/min @ 45 psig (3 bar)
Max. psig	145 (10 bar)
Medium	Air, water, gas, and compatible fluids
Mount	Cartridge
Number of Ports	3
Operating Pressure	0 to 29 psig (2 bar) to 0 to 145 psig (10 bar)
Operating Temperature	41 to 122°F (5 to 50°C)
Orifice	0.012" (0.3 mm), 0.017" (0.5 mm), 0.020" (0.8 mm), 0.031" (1.0 mm), 0.047" (1.2 mm)
Port, Exhaust	No thread
Port, Inlet	No thread
Port, Outlet	No thread
Response Time	<10 ms
Voltage	12 or 24 VDC
Voltage Operating Range	95-105% of rated power
Wattage	0.5 to 1.0 watts
More Details	clippard.com/link/st-series

<sup>1</sup>*Minimum order quantity required* 





#### S 3 Seals Voltage 🖥 V FKM 12 Pressure Range EPDM Е 24 3 0.012" orifice—0 to 145 psig (10 bar) 5 0.020" orifice—2-way: 0 to 87 psig (6 bar) Some configurations may not be valid or may have minimum order quantities. 8 0.031" orifice—2-way: 0 to 44 psig (3 bar) Consult the online configurator at clippard.com for more details. 10 0.039" orifice—0 to 29 psig (2 bar) 0.047" orifice—0 to 29 psig (2 bar) 12 ACCESSORIES STM-01\* Single-station manifold, #10-32 For more info, scan the **Example Part Number:** M-STM-01\* Single-station manifold, M5 OR code or visit ST-3C-12-3-V clippard.com/link/st-series \*Also available in stainless steel (add -SS to part number)

### ORDERING INFORMATION

TDS ST-01, Rev. 081424 (2/2)

# **DV SERIES** ELECTRONIC VALVES



Clippard electronic valves are precision-built control valves utilizing Clippard's patented valving principle. The powerful DV Series was designed as the next generation of the wellknown and trusted original EV line of Clippard spider valves. With a cycle life of over a billion, a solid, compact design, and extremely high flow rates, these valves are suitable for many applications across numerous diverse industries. A variety of voltage, connector and mounting options are available.

**TYPICAL FLOW** 





Coil Resistance	76 (12V), 304 (24V)
Connection	Spade terminals or wire leads
Cycle Life	750 million
Filtration (recommended)	40 micron
Function	2-way or 3-way normally-closed or normally-open; 3-way universally ported
Material, Body	Stainless steel
Material, Seals	Nitrile standard; FKM, EPDM and silicone available
Material, Spring	Stainless steel
Material, Wetted	Polyetherimide, stainless steel, PPS
Max. Flow	100 l/min @ 50 or 100 psig (3.4 or 7 bar), 70 l/min @ 100 psig (7 bar)
Max. psig	100 (6.9 bar)
Medium	Compatible fluids and gases
Mount	In-line, manifold, or cartridge (inserts into 3/4" bore)
Number of Ports	2 or 3
Operating Pressure	28" (71 cm) Hg vac. to 50 or 100 psig (3.4 or 7 bar)
Operating Temp. Range	32 to 130°F (0 to 54°C)
Orifice	0.044", 0.052", 0.070" (1.1, 1.3, 1.8 mm)
Port, Exhaust	<b>3-Way:</b> #10-32 or M5
Port, Inlet	Manifold: #10-32 male or M5 Inline: 1/8" NPT or BSPT female
Port, Outlet	Manifold: No thread Inline: 1/8" NPT or BSPT female
Response Time	10 to 20 ms
Voltage	12 or 24 VDC
Voltage Operating Range	95 to 125% of rated power
Wattage	1.9 watts
More Details	clippard.com/link/dv-series

<sup>1</sup>*Minimum order quantity required* 

Does your application have requirements beyond what is listed? Contact Clippard to discuss how this valve can be modified to meet your specific needs.

100





#### TDS DV-01, Rev. 120324 (2/2)

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## **PRECISION ORIFICE FITTINGS**





With tolerances of  $\pm 0.0001"$  (0.0025 mm), Clippard's precision orifice fittings are engineered for applications where minute flow adjustments are critical. Whether optimizing fuel injection in aerospace applications or fine-tuning fluid dynamics in industrial processes, or ensuring precise dosages in medical, analytical, and life science applications, these meticulously manufactured orifice fittings enable you to achieve the ultra-precise flow control your systems demand.

- Exceptional precision for unparalleled accuracy
- Tolerances of ±0.0001" (0.0025 mm)
- Seamlessly integrates into existing systems
- Orifice calibration available

# Applications

- · Precision flow control of gases or liquids
- Fuel injection systems
- Dynamic industrial fluid processes
- Pneumatic or hydraulic circuits requiring accurate timing
- Precision dosing for medical, analytical, and life science
- Ultra high pressure waterjet
- Liquid and gas control units
- Flow meters
- Inkjet printing

Filtration	5 micron filter (recommended)
Materials, Wetted	Stainless steel, FKM, and ruby or sapphire
Media	Air, liquid, and compatible gases
Mounting	Cartridge or in-line
Orifice	0.001" to 0.010" (0.03 to 0.25 mm)
Pressure, Max.	500 psig
Temperature Range	-20 to 400°F (-29 to 204°C)
Thread	#10-32 or M5
Tolerance	±0.0001" (0.0025 mm)
More Details	clippard.com/link/pof



#### **TYPICAL FLOW**



Pressure - psig (bar)

#### Cartridge



Dimensions shown are in inches (millimeters listed in parentheses).

*Visit clippard.com for more detailed 2D and 3D drawings.* 









### ORDERING INFORMATION



TDS PFO-01, Rev. 011625 (2/2)

# MANIFOLDS & ACCESSORIES

		MANIFOLDS		ACCESSORIES	
Valve	Description		Part No.	Description	Part No.
	Black anodized aluminum	Single-Sided, 2-Station	15481-2	Connector for FT Value 10"	FT_C/Q
		Single-Sided, 4-Station	15481-4	Connector for ET Valve 120"	FT_(1)0
		Single-Sided, 6-Station	15481-6	Connector for EC & ET Valves 18"	C2 DR19
EV		Double-Sided, 8-Station	15482-8	Connector for EC & El Valves, 10	C2-ND10
		Double-Sided, 12-Station	15482-12		C2-ND120
		#10-32 Inlet, 1/8" NPT Outlet	15490-1		
		1/8" NPT Inlet, #10-32 Outlet	15490-2		
	Specialized	Dual Outlet—1/8" NPT Inlet, #10-32 Outlet	15490-3		
	(also available in FNP brass and	#10-32 Inlet, 1/8" NPT Outlet	15491-1		
	oxygen clean)	1/8" NPT Inlet, #10-32 Outlet	15491-2		
		#10-32 Inlet, #10-32 Outlet	15490-4		
		1/8" NPT Inlet, 1/8" NPT Outlet	15490-5		
		Single-Station, Side Port	26090-1		
		Single-Station, Bottom Port	26090-2	Wire lead connector, 18" (TF Connectivity #5-103956-2)	C3-RXB18
	Black anodized aluminum	Double-Station	26090-3	(12 connecting #3 105550 2)	
		Dual Mount Single-Sided, 4-Station	26081-4		
ES		Dual Mount Single-Sided, 6-Station	26081-6		
		Dual Mount Single-Sided, 8-Station	26081-8		
		Dual Mount Double-Sided, 12-Station	26082-12		
		Dual Mount Double-Sided, 16-Station	26082-16		
	Black anodized	Single-station manifold, #10-32	SVM-01	Mounting din 9 corous	
cv	aluminum	Single-station manifold, M5	M-SVM-01	Mounting cip & screw	20101-101C
sv	Stainlass staal	Single-station manifold, #10-32	SVM-01-SS		
	Stanness steel	Single-station manifold, M5	M-SVM-01-SS		
	Black anodized aluminum	Single-station manifold, #10-32	STM-01		
ст		Single-station manifold, M5	M-STM-01		
51	Stainless steel	Single-station manifold, #10-32	STM-01-SS		
		Single-station manifold, M5	M-STM-01-SS		
	Black anodized aluminum	2-Station, 1/8" NPT	15781-2		
DV		4-Station, 1/8" NPT	15781-4		
		6-Station, 1/8" NPT	15781-6		
DV	ENP brass (other materials also avaiable)	Manifold Mount	15400 F		
		Cartridge Manifold	15400 1		
			13490-1		

# Special Cleaning Capabilities

Valves intended for laboratories and other low-leak, high precision environments often require higher quality cleaning and handling to limit contamination. To accommodate this, Clippard's **Analytical Series** electronic valves are designed with special cleaning and assembly standards.

Similarly, valves intended for use in oxygen-rich environments also have special requirements. Due to the high flammability of oxygen, parts used in oxygen-rich environments are extremely sensitive to contamination. To accommodate this, Clippard's **Oxygen-Clean Series** electronic valves include strict cleaning standards to meet these requirements.





Do you have an application which requires special cleaning for its manufacture, assembly or testing? Clippard is able to provide a wide range of special cleaning, inspection, and testing options for components or assemblies.

Call 877-245-6247 today to discuss how we can accommodate your unique needs.

		Analytical	Oxygen Clean	Specials
	Designed with reduced leak paths	$\checkmark$		$\checkmark$
Valves	Ultrasonically cleaned, assembled, inspected, and tested in a clean room	$\checkmark$	✓	✓
	No organic sealants, adhesives, or lubricants are used in the manufacturing process		$\checkmark$	$\checkmark$
Seals	Cleaned ultrasonically with high purity alcohol	$\checkmark$		$\checkmark$
	Heated to outgas before assembly	$\checkmark$	$\checkmark$	$\checkmark$
Inspection	Cleaned parts inspected under white and ultraviolet light to insure the absence of particulate and hydrocarbon contamination	$\checkmark$	√	~
	Isopropyl alcohol, only as needed for assembly	$\checkmark$		$\checkmark$
Lubricants	Oxygen compatible PFPE grease, only as needed for assembly		$\checkmark$	~
	Valves are tested using high purity compressed nitrogen in place of shop air	~	$\checkmark$	
Testing	Valves are pressure decay leak tested	$\checkmark$		<
	Helium leak testing for ultra low leak requirements			~
Packaging	Finished valves are double bagged in heat sealed polyethylene bags to ensure cleanliness		~	

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United States 1-877-245-6247 Europe +32 10-45-21-34 China +86 137-9527-9010

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