

# HY Series HYBRID Fluoropolymer Lined Butterfly Valves



PPG PPSG CRN REGISTRATION PENDING

SERIES: HY  
SIZES: 3" to 12"  
TYPE: Split Body, Wafer or Lug  
BODY: PPG or PPSG  
SEAT: PFA  
DISC: PFA covered SS  
OPERATION: Manual, Electrically or Pneumatically Actuated



The Chemline HY Series HYBRID butterfly valve is a composite valve with a steel core fully lined with PFA. These valves have bubble tight shut off and are used for flow modulation. Chemical resistance of PFA opens this valve to the most aggressive chemical process applications. They are perfect for composite (fibreglass), alloy or lined steel piping. The plastic/metal hybrid construction offers the chemical resistance and toughness of plastic along with the strength of metal.

## Features

### High Working Temperatures

- PPG valves maximum 266°F (130°C)
- PPSG valves maximum 320°F (160°C)

### 150 psi Pressure Rated

- See pressure/temperature graph

### Corrosion Resistant Inside and Out

- All inside wetted parts are fluoropolymer
- Valve exterior is composite

### For Composite Alloy and Lined Steel Piping

- Light enough for composite piping systems
- Strong enough for alloy or lined steel piping

### Easy to Actuate

- Valve top flange and shaft dimensions are to ISO 5211 dimensions
- Electric or pneumatic actuator may be direct mounted without brackets and couplings

## Technical Standards

### Flange Connections

- ASME/ANSI B16.10 Class 150
- DIN standard valves are also available

### Face-to-Face Dimensions

- Conform to ISO 5752 Basic Range 20

### Operator Mounting Flange

- ISO 5211 standard actuator mounting dimensions

### Shaft Dimensions

- Square shaft 3" to 12". Dimensions are according to ISO 5211.

### Liner Thickness

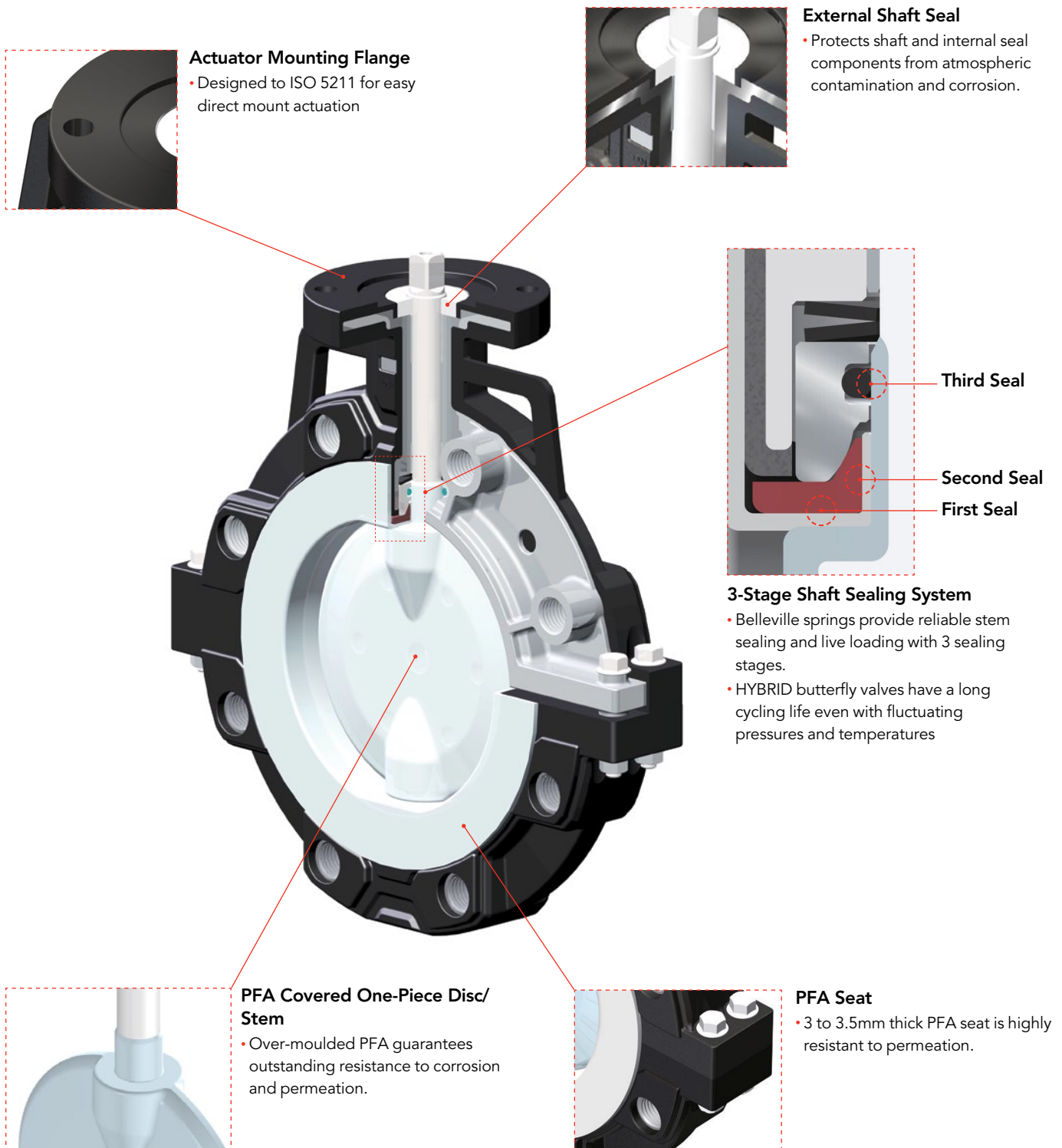
- Minimum 3 mm in compliance with ASTM F1545

### Leakage Testing

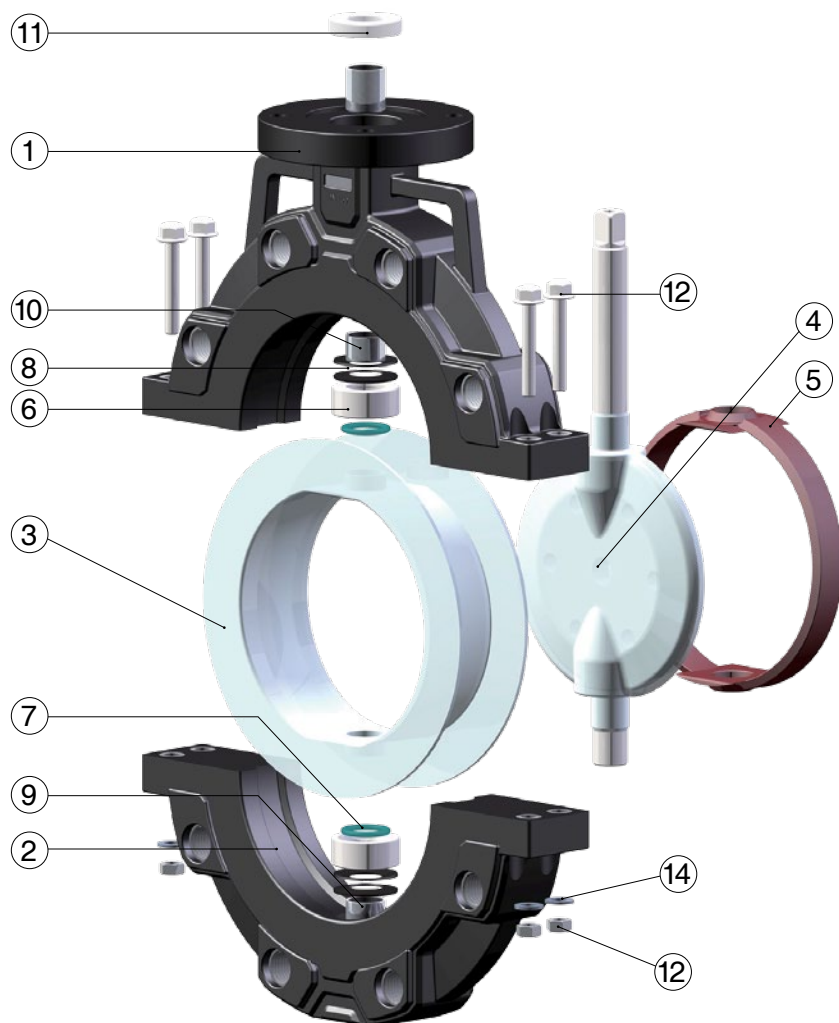
- Each valve is factory tested before shipment to confirm zero leakage. The test is EN 1226-1/P12, leakage rate A.



## Features



# HY Series HYBRID Fluoropolymer Lined Butterfly Valves



## PARTS

No.	Part	Pcs.	Materials
1	Upper Body	1	PPG, PPSG
2	Lower Body	1	PPG, PPSG
3	Liner	1	PFA
4	Disc/Shaft	1	PFA covered 304 SS
5	Liner Back up	1	FKM (Viton®)
6	Bushing	2	304 SS
7	O-Ring	2	FKM (Viton®)
8	Belleville Spring Set	2	SUP 10
9	Lower Bearing	1	304 SS PTFE coated
10	Upper Bearing	1	304 SS PTFE coated
11	Top Seal	1	PTFE
12	Hex Bolt	4	304 SS
13	Hex Nut	4	304 SS
14	Flat Washer	4	304 SS

## OPTIONS & ACCESSORIES

Consult Chemline for more details

- Electrically or Pneumatically Actuated
- Chain Wheel Operator
- Gear Operator on 3"
- Shaft Extensions

## Cv VALUES

## NET WEIGHTS LBS.

## BOLT TORQUES INCH.-LBS.

## SHAFT TORQUES INCH.-LBS.

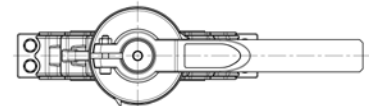
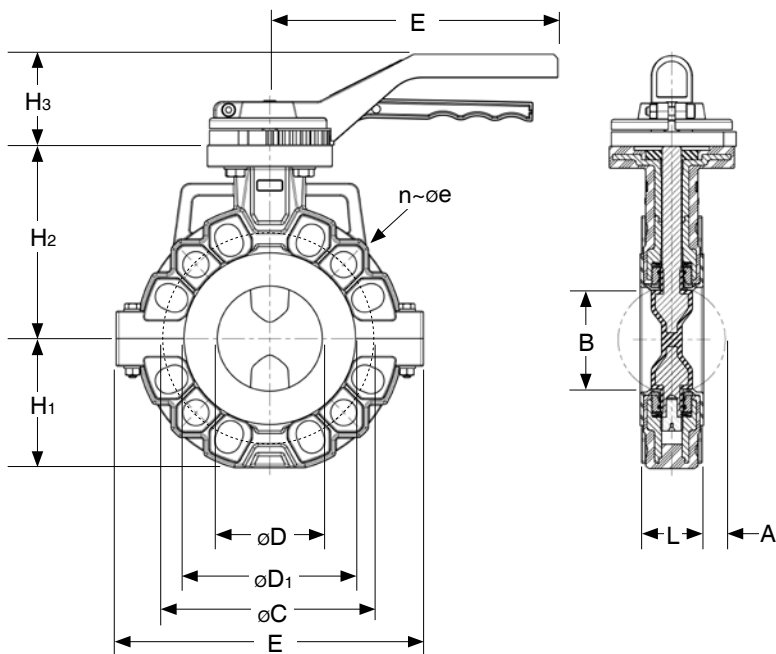
Size	USGPM@1 psi Pressure Drop	PPG Valves		Recommended Flange Bolt Torques	Minimum Recommended Actuator Output Torques <sup>1</sup>
		Wafer	Lug		
3"	334	10	11	492	696
4"	560	14	15	444	1,152
6"	1,730	24	25	708	1,608
8"	3,430	39	41	1,068	2,652
10"	6,370	61	64	888	4,836
12"	10,450	80	84	1,236	7,476

<sup>1</sup> Recommended actuator torques include 30% safety factor, the minimum recommended

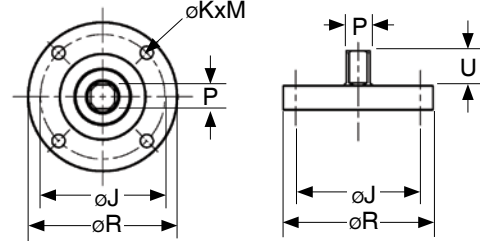
# HY Series HYBRID Fluoropolymer Lined Butterfly Valves



## 3" Lever Operated Wafer Body



Top View

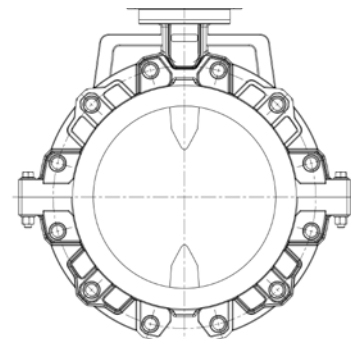
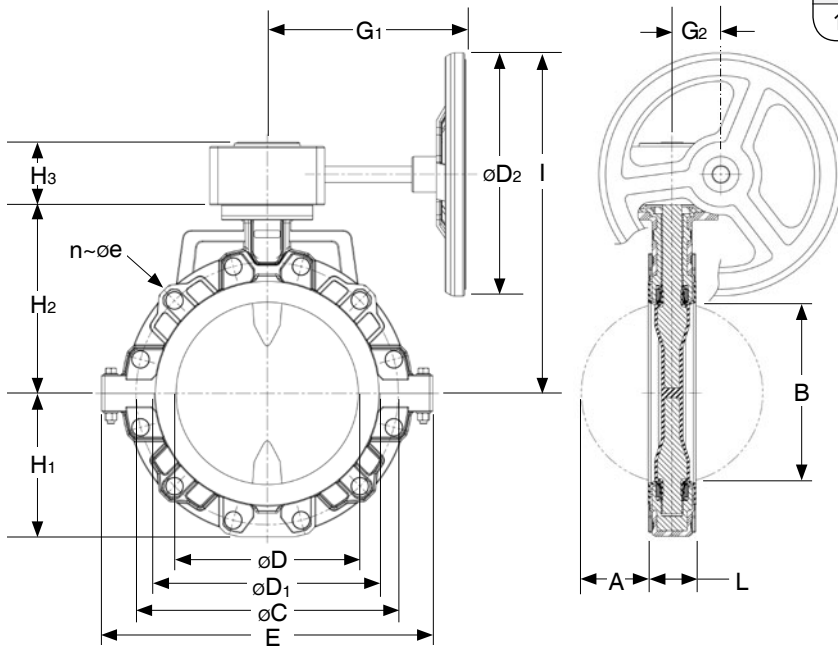


Square Shaft

### TOPWORKS DIMENSIONS INCHES

Size	R	J			KxM	P	U
		inches	mm	ISO			
3"	3.5	2.75	70	F07	0.35x4	0.43	0.75
4"	3.5	2.75	70	F07	0.35x4	0.55	0.75
6"	4.9	4.01	102	F10	0.43x4	0.55	0.75
8"	4.9	4.01	102	F10	0.43x4	0.67	0.83
10"	5.9	5.90	125	F12	0.51x4	0.94	1.24
12"	5.9	5.90	125	F12	0.51x4	0.94	1.24

## 3" to 12" Gear Operated Wafer Body



Lug Body

### DIMENSIONS INCHES

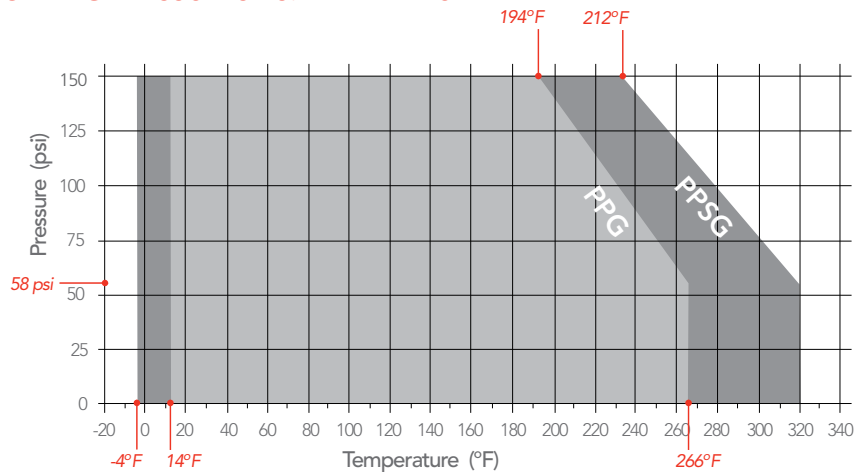
Size	Wafer			Lug			E/G <sub>1</sub>				H <sub>3</sub>				L			
	A	B*	C	n	e	n	e	D	D <sub>1</sub>	D <sub>2</sub>	E	Lever	Gear	H <sub>1</sub>		H <sub>2</sub>	Lever	Gear
3"	1.81	2.48	6.00	4	3/4	4	5/8	3.15	5.00	5.51	8.82	8.27	6.30	3.62	5.55	2.48	1.89	1.81
4"	2.05	3.36	7.50	8	3/4	8	5/8	3.94	5.87	7.87	10.00	-	6.30	4.21	6.30	-	2.13	2.05
6"	2.20	5.48	9.50	8	7/8	8	3/4	5.91	8.27	9.84	12.52	-	8.46	5.12	7.56	-	2.20	2.20
8"	2.70	7.39	11.75	8	7/8	8	3/4	7.87	9.65	9.84	14.72	-	8.46	6.34	9.06	-	2.20	2.36
10"	3.54	9.39	14.25	12	1	12	7/8	9.84	11.93	11.81	17.99	-	8.86	7.76	10.83	-	2.72	2.68
12"	4.33	11.30	17.00	12	1	12	7/8	11.81	14.06	15.75	21.46	-	12.80	9.29	12.20	-	3.74	3.07

\*B=Minimum inside diameter (I.D.) of mating pipe. If I.D. of pipe is B dimension or less, the inside of pipe and must be chamfered or spacers provided. Consult Chemline.

# HY Series HYBRID Fluoropolymer Lined Butterfly Valves



## WORKING PRESSURES VS. TEMPERATURE



## VACUUM RATING

• 29.9 inches mercury

## SAMPLE SPECIFICATION

**Note:** Specification below is for:

- valves with PPG bodies, suitable for temperatures up to 266°F/130°C \*, and for
- valves with PPSG bodies, suitable for temperatures up to 320°F/160°C.\*

- All composite fluoropolymer lined butterfly valves 3" to 12" will be Chemline HY Series HYBRID Butterfly valves or equal, pressure rated 150 psi.
- Flow direction will be bidirectional. Valve will seal closed with pressure on either side.
- Composite butterfly valves will have a steel core for durability.
- Composite body material will be (either)  
PPG engineering plastic – Polypropylene with 30% glass fiber (OR)  
PPSG high performance plastic – glass-filled Polyphenylene Sulfide
- Body will be "split" design, permitting disassembly and replacement of parts.
- Flange dimensions will be according to ASME/ANSI B16.5 Class 150.
- Wafer style bodies will have a full set of locating bolt holes.
- Lug body valves will be suitable for dead end service, full pressure rating when valve is installed either side. Lug threads will be in the valve's steel core, not insert lugs.
- Disc/shaft will be one-piece design, 304 stainless steel, over-moulded with minimum 3.0 mm thickness of PFA in compliance with ASTM F1545.
- Shaft sealing will be with a three-stage system incorporating Belleville spring washers.
- Seat will be PFA, minimum 3.0 mm thick. Inside surfaces contacting the disc will be spherically designed for optimal sealing and extended life.
- Elastomeric seat back-up pads will be precision moulded of FKM (Viton®) to ensure zero leakage, minimal seat wear, and long cycle life.
- Operator mounting flange will be integral to the body. Fasteners used to mount operators will not be pressure retaining. Mounting flange dimensions and exposed square shaft dimensions will be according to ISO 5211.
- All valves will be factory pressure tested according to API 598.

\* At maximum temperatures, pressure ratings are lower than the maximum 150 psi. Refer to manufacturer's data.

## ORDERING EXAMPLE

<b>Chemline HY Series HYBRID Butterfly Valves</b>		<b>HY</b>	<b>G</b>	<b>030</b>	<b>P</b>	<b>P</b>	<b>W</b>	<b>L</b>
Body	<b>G</b> – PPG	<b>S</b> – PPSG						
Size	<b>030</b> – 3"	<b>040</b> – 4"	<b>060</b> – 6"					
	<b>080</b> – 8"	<b>100</b> – 10"	<b>120</b> – 12"					
Disc	<b>P</b> – PFA							
Seat	<b>P</b> – PFA							
Style	<b>W</b> – Wafer	<b>L</b> – Lug						
Operator	<b>L</b> – Lever	<b>G</b> – Gear	<b>BLANK</b> – Bare Stem					

**Example:** Chemline HY Series HYBRID butterfly valve, PPG body, 3", PFA disc, PFA seat, wafer style body, lever operator

HY Series.DS.09.12.23



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## Electric Actuation

Refer to actuator data sheet for detailed information

All electric actuators have these STANDARD FEATURES:

- Polyamide plastic housings or covers – corrosion resistant and light weight
- NEMA 4X/IP65 water resistance enclosure rating
- CSA Approved or Special Inspection labelled
- Reversible operation
- Multi-voltage operation
- Standard ISO 5211 mounting dimensions
- Irreversible gearing - backlash is impossible
- Adjustable travel through the full range
- No maintenance is required
- Heater/thermostats for humid locations and cold weather operation
- Two extra switches for valve position feedback



ER Series



V Series



Optional Local Control Station

## Electric Actuator Selection

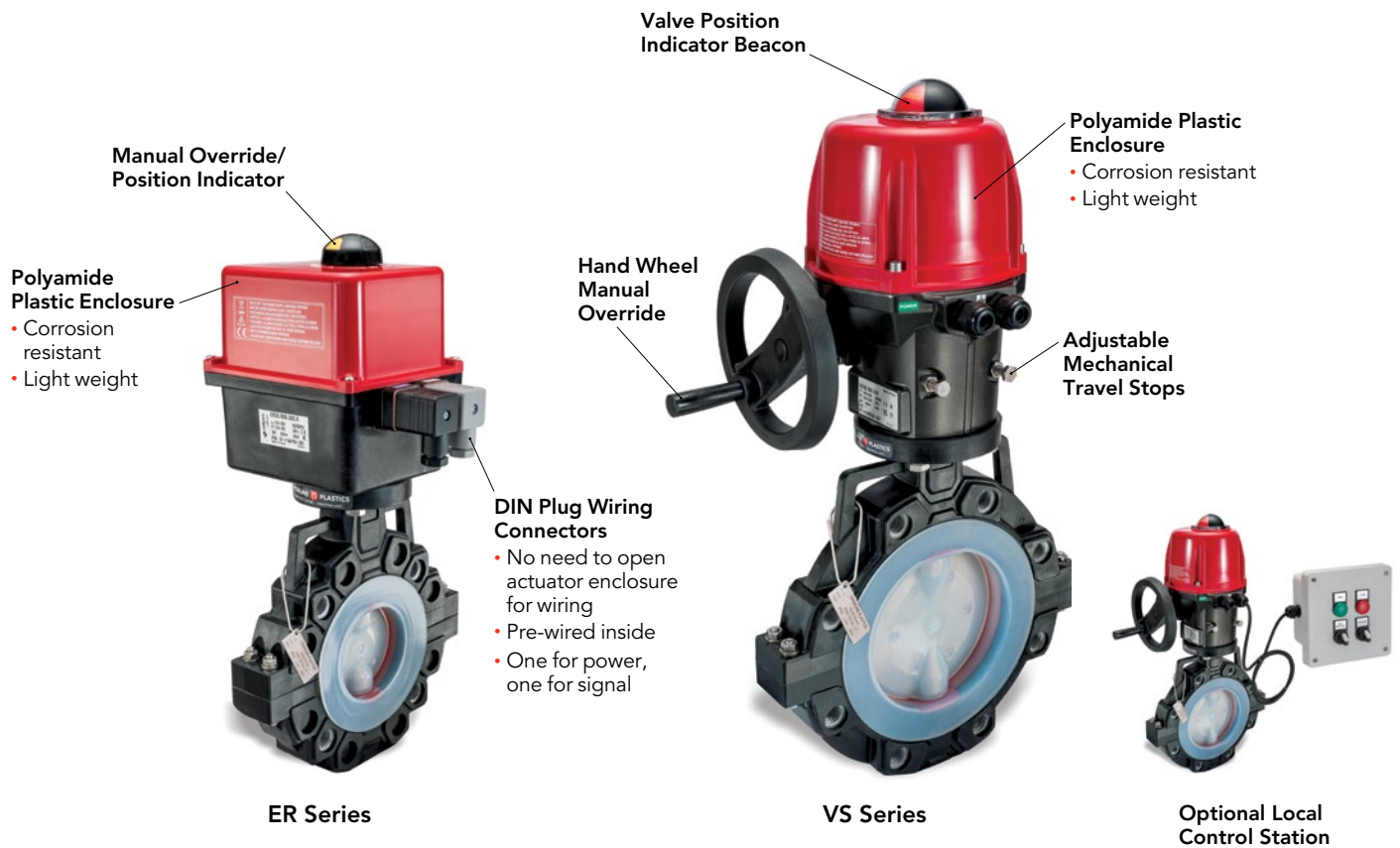
Model	ER Series	V Series
<b>FEATURES</b>	<b>FULL FEATURE</b>	<b>HIGHER TORQUE</b>
Type HY valve sizes	3"	3" to 12"
Voltage	120 - 240 VAC 12 - 24 VAC 12 VDC	120 - 240 VAC 12 - 24 VAC 12 VDC
Cycle Time sec/90°	12	30
Duty Cycle	80%	80%
CSA	Approved	Approved
ON/OFF Control	3-Wire/2-Wire	3-Wire/2-Wire
Gear Train	Spur Gears	Epicyclic
Mechanical Travel Stops	Fixed	Adjustable
DIN Plug Wiring Connectors	✓	✗
Two Position Feedback Switches	✓	✓
Valve Position Indicator	Knob	Dome
Manual Override	Declutching	Without Declutching
Override Device	Knob	Handwheel
Operating Temperature Range	-10 to 60C (15 to 140°F)	-20 to 70C (-4 to 158°F)
Onboard Electronic Torque Limiter	✓	✓
Onboard General Fault Relay	✓	✓
Onboard Diagnostics	✓	✓
<b>ENCLOSURE OPTIONS</b>		
Metal Cover for IP68 Rating	✗	✓
Low Temperature Option	✗	-50 to 70C (-58 to 158°F)
<b>POSITION FEEDBACK OPTIONS</b>		
Position Feedback Potentiometer	✓	✓
Transmitter	✓	✓
Extra Limit Switches <sup>1</sup>	✓	✓
<b>CONTROL OPTIONS</b>		
Digital Positioner	✓	✓
Failsafe Internal Battery Pack	✓	✓
Local/Remote Control Switch Box	✓	✓
MODBUS Module	✓	✓
Bluetooth Control	✓	✓

<sup>1</sup> 2 feedback switches are already supplied as standard



## Electric Actuation

Refer to actuator data sheet for detailed information



## Electric Actuation Item Numbers

Item numbers are for actuators including mounting to valve and bench testing

Model	ER Series			V Series		
	Max. Line Pressure (psi)	Cycle Time/90°	120-240 VAC Item No.	Max. Line Pressure (psi)	Cycle Time/90°	120-240 VAC Item No.
3"	150	12 sec	HY030-ER100.12	150	30 sec	HY030-VS150.12
4"	-	-	-	150	30 sec	HY040-VS150.12
6"	-	-	-	150	30 sec	HY060-VS300.12
8"	-	-	-	150	30 sec	HY080-VT600.12
10"	-	-	-	150	30 sec	HY100-VT600.12
12"	-	-	-	150	30 sec	HY120-VT1000.12

# HY Series HYBRID Fluoropolymer Lined Butterfly Valves



## Electric Actuation

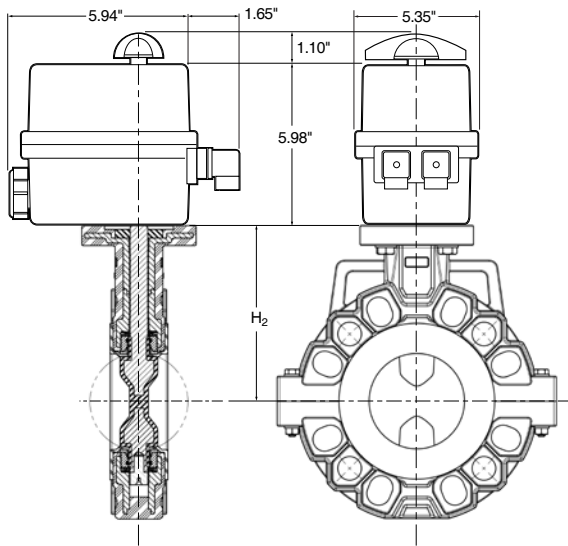
Refer to actuator data sheet for detailed information



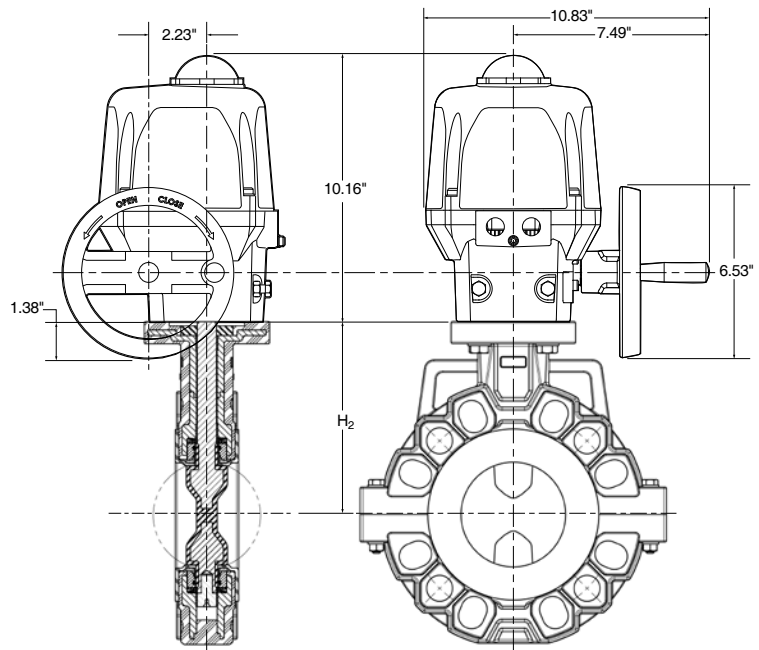
ER Series



VS Series



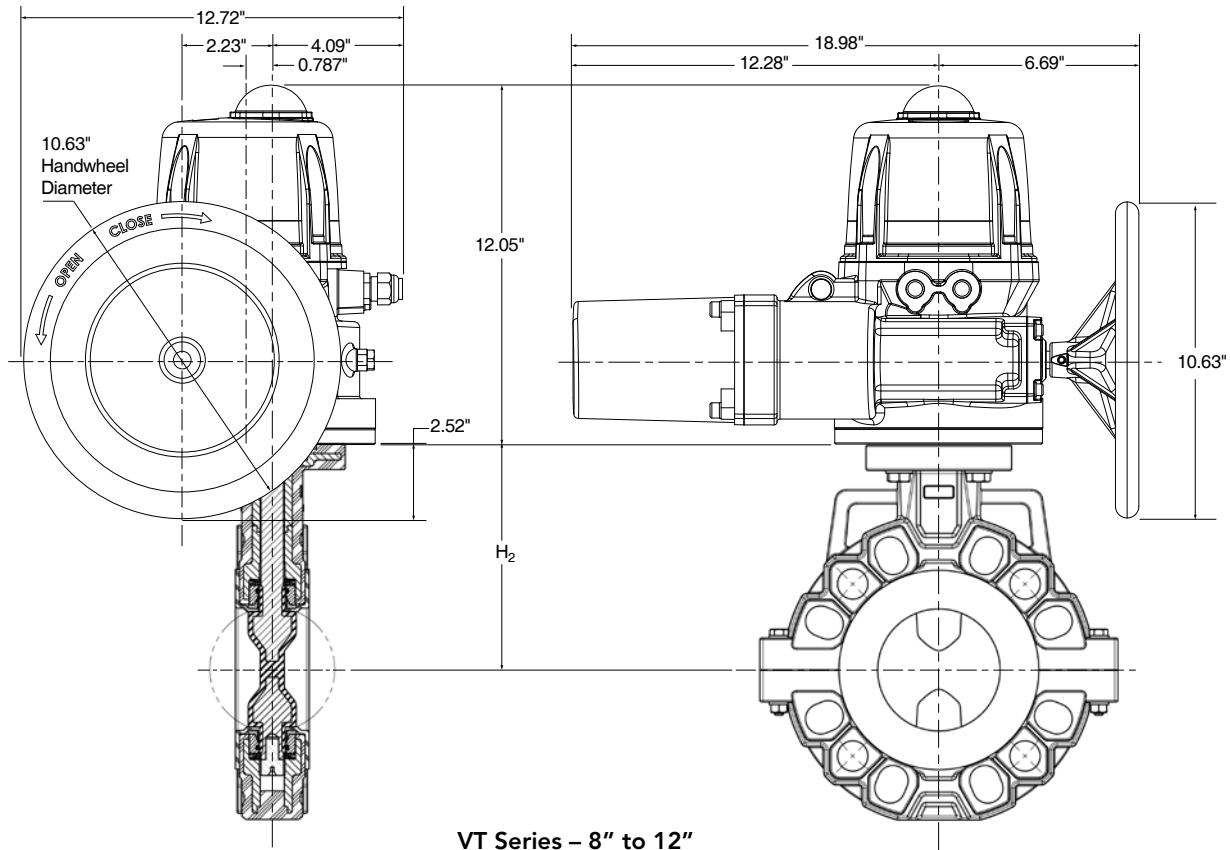
ER Series – 3"



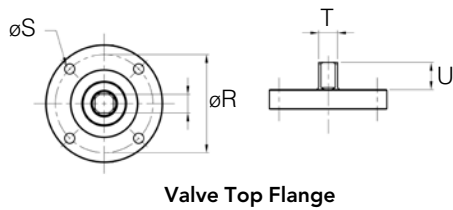
VS Series – 3" to 6"



# HY Series HYBRID Fluoropolymer Lined Butterfly Valves



VT Series – 8" to 12"



Valve Top Flange

## DIMENSIONS INCHES

Size	H <sub>2</sub>	ISO 5211 Topworks			øS	T	U
		øR		ISO			
		inches	mm				
3"	5.55	2.76	70	F07	0.35	0.433	0.75
4"	6.30	2.76	70	F07	0.35	0.551	0.75
6"	7.56	4.01	102	F10	0.433	0.551	0.75
8"	9.06	4.01	102	F10	0.433	0.669	0.83
10"	10.83	4.92	125	F12	0.511	0.944	1.25
12"	12.20	4.92	125	F12	0.511	0.944	1.36



## Pneumatic Actuation

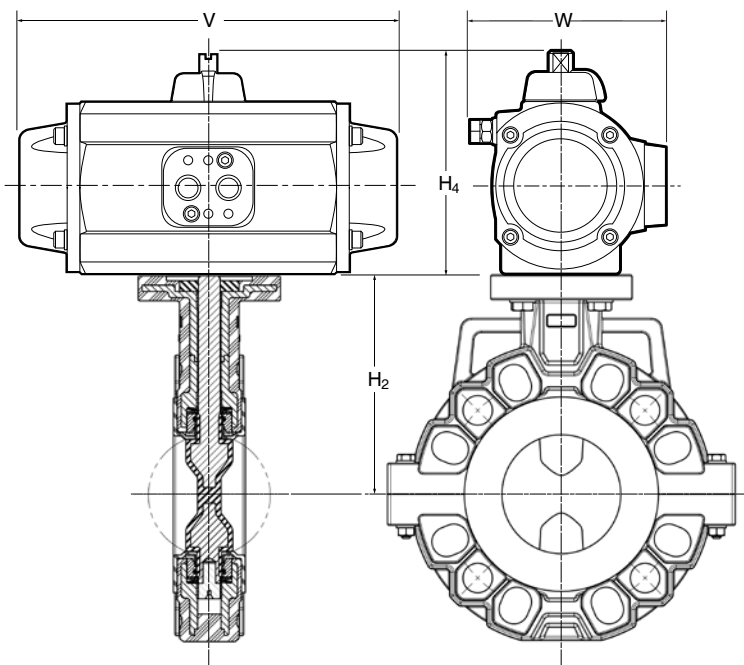
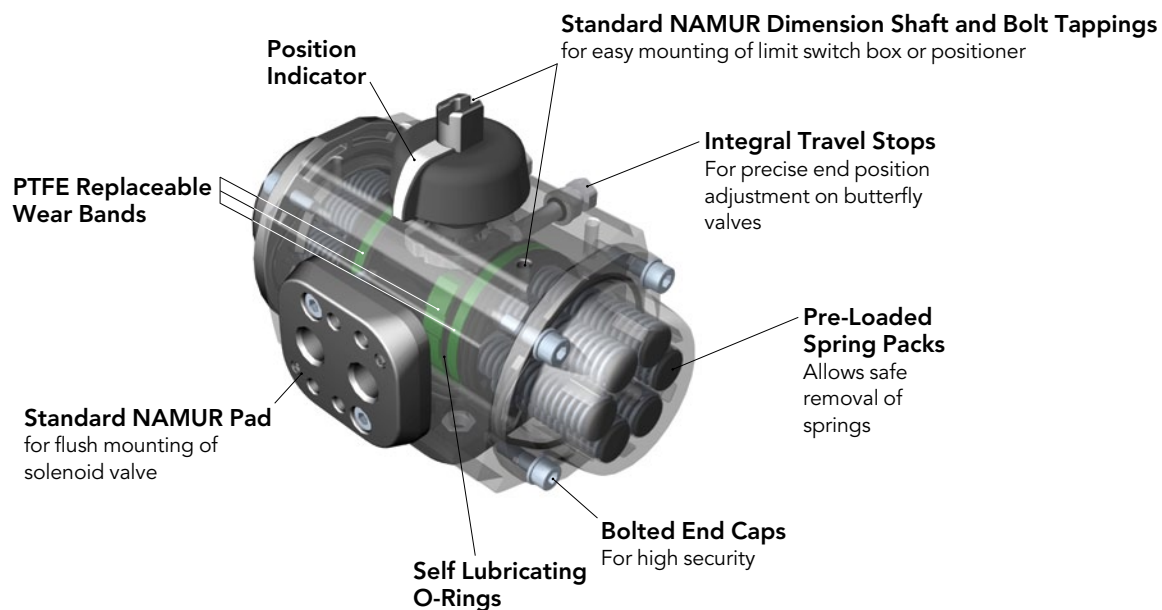
Refer to actuator data sheet for detailed information

All pneumatic actuators have these STANDARD FEATURES:

- Aluminum rack and pinion type
- Coating is two-part epoxy/Rilsan polyamide, applied inside and out. Epoxy offers high chemical resistance and Rilsan offers coating durability.
- Rated for over one million cycles
- ISO standard valve mounting dimensions allow for direct mounting of most valves
- Mechanical travel stops are standard. They allow up to 5 degrees of piston travel adjustment
- Standardized accessories (solenoid valves, limit switch boxes, positioners) may be direct mounted



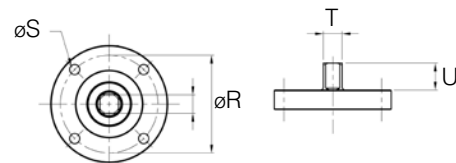
PA Series



### DIMENSIONS INCHES

Size	H <sub>2</sub>	Spring Return			Double Acting		
		H <sub>4</sub>	V	W	H <sub>4</sub>	V	W
3"	5.55	7.26	14.02	6.04	5.82	10.40	4.70
4"	6.30	8.31	16.83	6.97	6.15	12.19	5.02
6"	7.56	10.71	17.48	8.90	7.26	14.02	6.04
8"	9.06	10.71	17.48	8.90	8.31	16.83	6.97
10"	10.83	12.16	27.32	10.57	8.90	17.48	8.90
12"	12.20	14.49	26.40	13.01	8.90	17.48	8.90

For actuator sizes based on normal 80 psi available air supply  
For Top Works dimensions, see page 23



Valve Top Flange



## Pneumatic Actuation

Refer to actuator data sheet for detailed information

### Pneumatic Actuation Item Numbers

Item numbers are for actuators including mounting to valve and bench testing.



PA Series

### Double Acting

Valve Size	Max. Line Pressure (psi)	Air Supply Pressure (psi)		
		60	80	100
		Item No.	Item No.	Item No.
3"	150	HY030-PAD20	HY030-PAD15	HY030-PAD10
4"	150	HY040-PAD25	HY040-PAD20	HY040-PAD20
6"	150	HY060-PAD25	HY060-PAD25	HY060-PAD20
8"	150	HY080-PAD30	HY080-PAD30	HY080-PAD20
10"	150	HY100-PADA40	HY100-PADA40	HY100-PADA40
12"	150	HY120-PAD50	HY120-PADA40	HY120-PADA40

### Spring Return

Actuators listed are for valves in the fail closed position. For fail open, consult Chemline.

Valve Size	Max. Line Pressure (psi)	Air Supply Pressure (psi)		
		60	80	100
		Item No.	Item No.	Item No.
3"	150	HY030-PAS30	HY030-PAS25	HY030-PAS20
4"	150	HY040-PAS30	HY040-PAS30	HY040-PAS25
6"	150	HY060-PASR40	HY060-PASR40	HY060-PAS30
8"	150	HY080-PASR40	HY080-PASR40	HY080-PASR40
10"	150	HY100-PAS50	HY100-PAS50	HY100-PASR40
12"	150	HY120-PAS60	HY120-PAS60	HY120-PAS50

## Accessories



### Solenoid Valves

- Solenoid valves are electrically actuated. They control air supply in and out of the actuators to open or close the valve. They bolt flush onto the actuator.



### Positioners

- Positioners control actuator-valve position responding to a control signal. They are either 3-15 psi pneumatic, 4-20 mA electro-pneumatic or 4-20 mA Smart (fully digital with intelligent functions).



### Limit Switches

- Limit switches are for ON and/or OFF valve position feedback. They feature a valve position indicator dome with high visibility. The standard NEMA 4X/IP65 version has mechanical switches. Explosion proof versions are available.



### End Cap Travel Stops

- These are to adjust the full length of piston travel but for only one direction of travel - either open for a normally closed valve or closed position for a normally open valve



### Travel Stop Plate

- This is required to reduce end of travel by more than 5 degrees. It allows independent adjustment of the full length of piston travel for both opening and closing strokes.



### Declutchable Gear Override

- This allows manual operation of the actuated valve in case the supply air pressure fails. It is normally disengaged. To engage, press the lever bar down.