

Electrically Actuated Wafer Butterfly Valve Type 145



General

- **Size:** 2"–12"
- **Outer Body:** Glass-filled PP
- **Material:** PVC, CPVC, PROGEF® Standard PP, ABS, SYGEF® Standard PVDF
- **Seals:** EPDM, FPM, PTFE/FPM
- **Stem:** 316 stainless steel
- **Voltage:** 100-230VAC, 24VAC/DC
- **Connection:** Both ANSI 150 and DIN 2501
- **Actuator Housing:** Glass-filled PP
- **Manual Override:** Integrated
- **End Stops:** Open, close, programmable middle position
- **Position Indicator:** LED, optical, integrated
- **Position Feedback:** Open, close, middle
- **Heater:** 10 position adjustable

Sample Specification

The Type 145 Electrically Actuated Butterfly Valve shall be wafer style compatible with both ANSI B16.5 150 lb and DIN 2501 flange patterns. The disk operation shall utilize double eccentric design principles. The shaft shall be non-wetted by a bushing assembly with double O-ring seals and fixed at both ends. The face seal shall be a Q-ring compatible with flat and serrated flange adapters. The face, disk and shaft seals shall operate independently. The wetted body and disk shall be of like materials. Valves shall be rated for bidirectional use. All valves shall be tested in accordance to ISO9393 and designed to ISO16136 standards. All valves shall be manufactured under ISO9001 for Quality and ISO14001 for Environmental Management. Following assembly, every valve shall be tested and certified bubble tight exceeding Class VI standards.

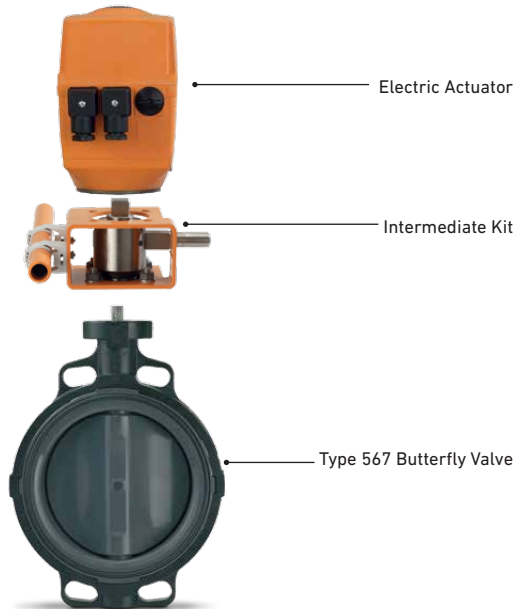
Material Specification

PVC valves shall meet ASTM D1784 cell classification 12454 standards. CPVC valves shall meet ASTM D1784 cell classification 23447-B standards. PP valves shall meet ASTM D5847-14 cell classification PP0510B66851 standards. ABS valves shall meet ASTM D3965 cell classification 42222 standards. PVDF valves shall be type 1, grade 2 according to ASTM D3222 standards. Valves of all materials shall be RoHS compliant.

Key Valve Certifications

- **NSF 61:** PVC and CPVC
- **FDA CFR 21 177.1520:** PP and PVDF
- **FDA CFR 21 177.2600:** EPDM and FPM
- **FDA CFR 21 177.1550:** PTFE
- **ABS:** All materials
- **USP Class VI (physiological non-toxic):** EPDM, FPM, PTFE, PP and PVDF

Components



Heater Dial Selector

| Dial Setting | Heater Turned On (°F) | Heater Turned Off (°F) |
|--------------|-----------------------|------------------------|
| 0 (default) | 32 | 41 |
| 1 | 41 | 50 |
| 2 | 50 | 59 |
| 3 | 59 | 68 |
| 4 | 68 | 77 |
| 5 | 77 | 86 |
| 6 | 86 | 95 |
| 7 | 95 | 104 |
| 8 | 104 | 113 |
| 9 | 104 | 113 |

Optional Features

- **Positioner:** Current, voltage
- **Network:** Profibus DP
- **Fail Safe Return:** Battery back up, externally powered board
- **Smart Module:** Cycle monitoring, cycle counter, cycle time extension, motor current monitoring
- **Manual Loading Station:** Local control box
- **Stem Extension:** Two piece stainless steel
- **Shaft:** Titanium, Hastelloy-C
- **Hardware:** Alternatives available upon request
- **Cleaned:** Silicone free/oil free

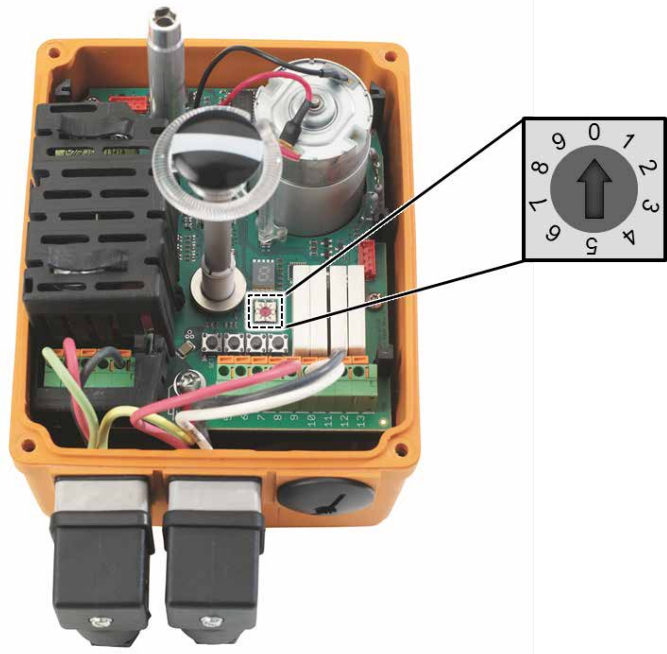
Actuator Certifications/Compliance

- **Machinery Directive 2006/42/EC, Annex II B**
- **EMV Directive CE 2004/108/CE**
- **EMV VDE 0843 Section 20**
- **Low Voltage Directive CE 2006/95/CE**
- **Vibration Testing EN 60068-2-6**
- **Actuators for Industrial Valves EN 15714-2**

Key Design Feature

Heater

An adjustable heater is integrated into the Type 145 Valve to protect the actuator subcomponents in cold applications and to prevent water from condensing inside the actuator housing in humid environments. The heater will turn on when the actuator's internal temperature reaches a designated value and turn off after it has heated to a designated value. These parameters can be adjusted by rotating the arrow on the dial selector shown below.



Actuator Technical Data

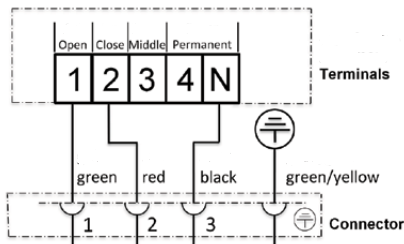
| | EA 45 | EA 120 | EA 250 |
|----------------------------------|-----------------------------------------------------------|--------------------------------------|--------------------------------------|
| Valve Size | 2"-2½" | 3"-6" | 8"-12" |
| Cycle Time | 6s/90° | 15s/90° | 20s/90° |
| Rated Cycles at 70°F | 100,000 | 100,000 | 75,000 |
| Actuating Angle | Standard set at 90°, max. 355° | | |
| Housing Material | Glass-filled PP | | |
| Position Feedback | 230V, 6 Amp | | |
| Emergency Manual Override | Integrated | | |
| Rated Voltage | 100- 230V, 50/60 Hz 24V, AC/DC, 50/60Hz | | |
| Rated Voltage Tolerance | +/- 15% | | |
| Rated Output | 55VA @ 100-230VAC 60VA @ 24VAC/DC | 50VA @ 100-230VAC 55VA @ 24VAC/DC | 60VA @ 100-230VAC 65VA @ 24VAC/DC |
| Duty Cycle | 50% | 50% | 35% |
| Protection Class | IP 67 per EN 60529 UL/CSA: For interior use Nema 4X | | |
| Overload Protection | Resetting, current-time dependant (1) | | |
| Overvoltage Category | Category II according to DIN EN 61010-1 | | |
| Power Connection | Connector plug 3 P+ E per DIN EN 175301-03 | | |
| Pollution Grade | Grade 2 according to DIN EN 61010-1 | | |
| Maximum Elevation | 6561 feet | | |
| Ambient Temperature | 14° to 122°F (2) | | |
| Allowable Humidity | 90% relative humidity, non condensing | | |

(1) Overload protection of the motor is dimensioned so that the motor and the power supply board are protected. As soon as the load is within the torque range, the actuator will begin operating again.
 (2) At temperatures below 14°F and if there is condensation, the heating element should be activated.

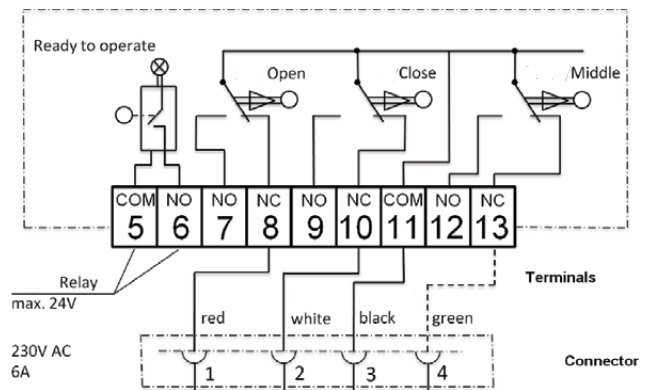


Wiring Diagrams

Control



Feedback



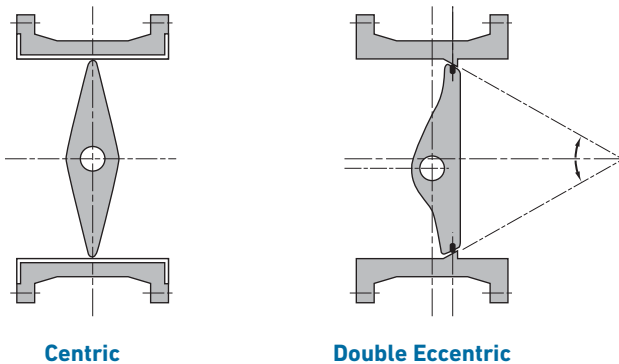
Key Design Features

The Type 145 Butterfly Valve utilizes several design features to protect electric actuators and increase the useful life of the valve.

Seals

The shaft is sealed with a bushing assembly on either side of the disc. Each bushing utilizes a double o-ring seal totaling eight shaft seals in every valve. Alternative o-ring shaft sealing designs are commonly found in competitive boot style thermoplastic butterfly valves. However, these solutions often rely upon elastomer on elastomer seals which can be unreliable, especially in chemical process applications or when working temperatures deviate from standard conditions. The Type 145 shaft seal design eliminates the need elastomer on elastomer seals, providing an industry tested dynamic double o-ring seal against a ridged thermoplastic surface.

The shaft, disc and face seals all operate independently from one another. This eliminates issues common to booted style centric valves such as crimping, where the compression of the valve between two flanges causes the boot to ripple. This can lead to increased operating torque and burn out electric actuators



Centric

Double Eccentric

Double Eccentric Design Principle

The Type 145 Butterfly Valve is designed using the double eccentric disc principle. When opening and closing, the disc is not in contact with the seat, significantly reducing component wear. This design principle greatly reduces the operating torque and required elastomeric sealing material. The reduction in sealing material decreases the impact of elastomeric swelling which can lead to increased operating torque and can cause electric actuators to burn out.

Technical Data

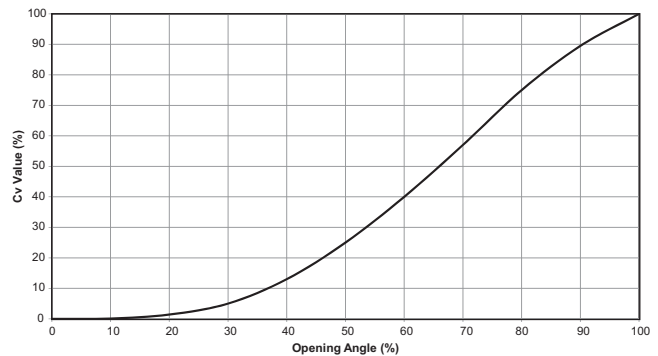
Flow

The following information is based on water applications at 68° F

Cv Value

| Size (inch) | d (mm) | Cv (gal/min) |
|-------------|--------|--------------|
| 2 | 63 | 103 |
| 2½ | 75 | 154 |
| 3 | 90 | 210 |
| 4 | 110 | 455 |
| 5 | 140 | 805 |
| 6 | 160 | 1162 |
| 8 | 225 | 2772 |
| 10 | 280 | 3570 |
| 12 | 315 | 5110 |

Flow Characteristics

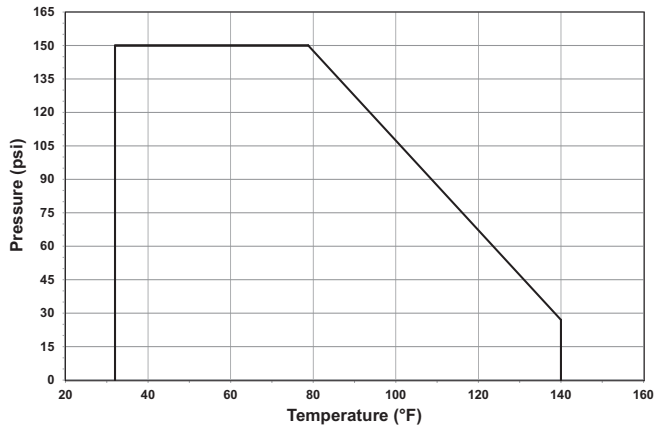


Technical Data

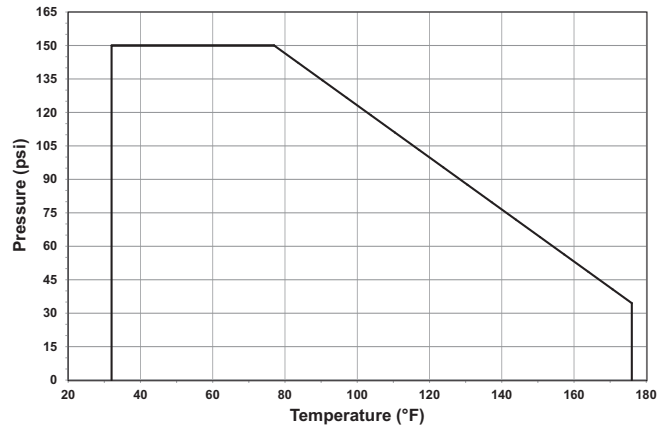
Pressure Temperature Curves

The following graphs are based on a 25 year lifetime water or similar media application

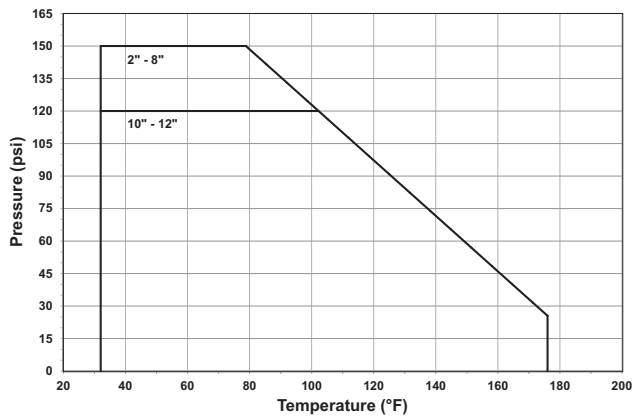
PVC



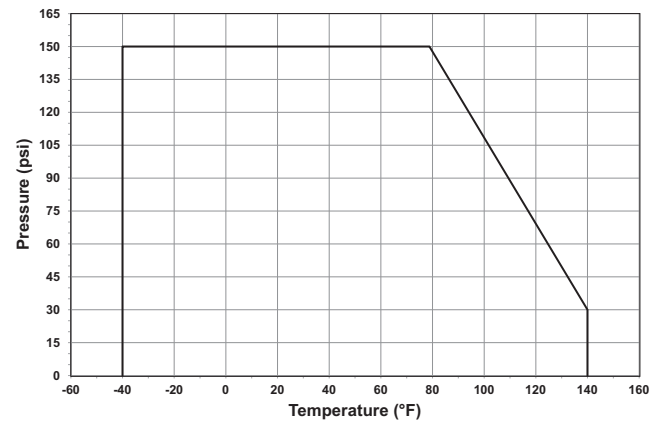
CPVC



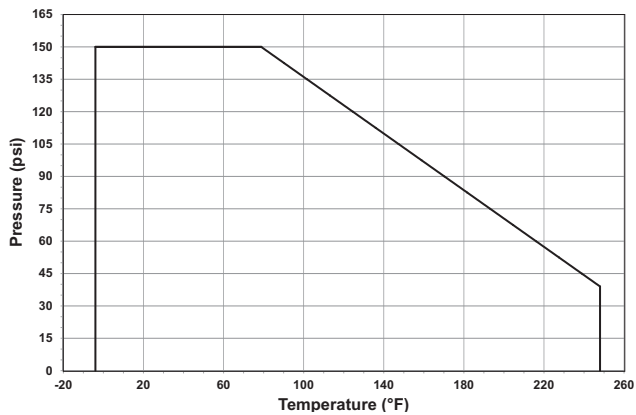
PP



ABS



PVDF



Pressure-Temperature

| Material | Temperature Range (°F) | Max Pressure (psi) |
|----------|------------------------|--------------------|
| PVC | 32 to 140 | 150 |
| CPVC | 32 to 176 | 150 |
| PP | 32 to 176 | 150* |
| ABS | -40 to 140 | 150 |
| PVDF | -4 to 284 | 150 |

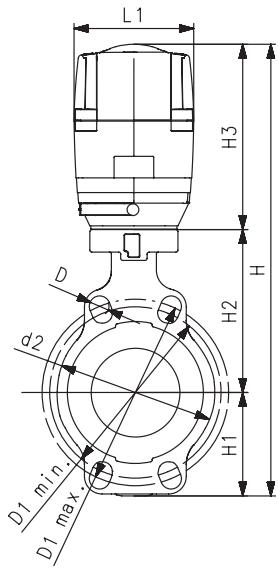
*Dependant on size as shown in P-T curves

Vacuum Service

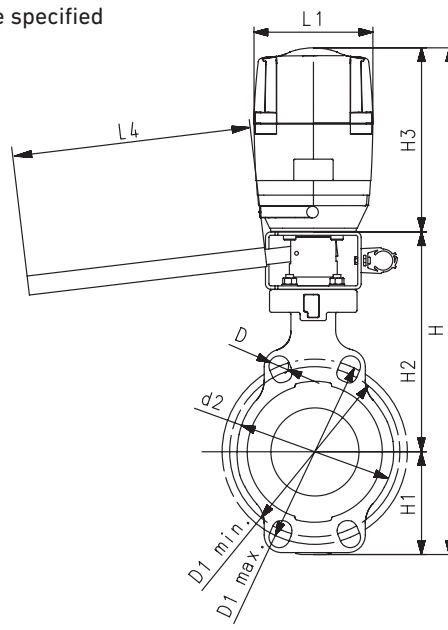
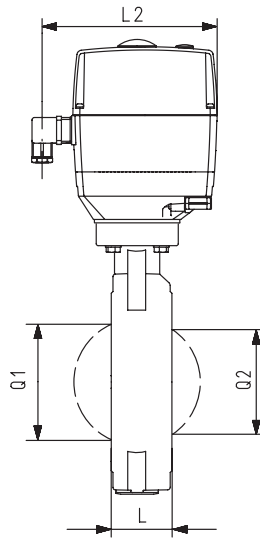
The Type 145 is rated for full vacuum service. Maximum differential pressure of 15psi at 122°F.

Dimensions

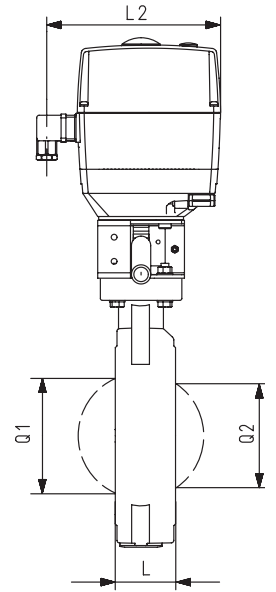
The following tables are shown in millimeters unless otherwise specified



All Materials w/o Manual Override



All Materials w/ Manual Override



All Materials without Manual Override

| Size (inch) | d2 | D | D1 min | D1 max | H | H3 | L | L1 | L2 | Q1 | Q2 |
|-------------|-----|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|
| 2 | 104 | 19 | 120 | 125 | 415 | 188 | 45 | 122 | 180 | 40 | - |
| 2½ | 115 | 19 | 140 | 145 | 428 | 188 | 46 | 122 | 180 | 54 | 35 |
| 3 | 131 | 19 | 150 | 160 | 428 | 188 | 49 | 122 | 180 | 67 | 50 |
| 4 | 161 | 19 | 175 | 191 | 460 | 188 | 56 | 122 | 180 | 88 | 74 |
| 5 | 187 | 23 | 210 | 216 | 487 | 188 | 64 | 122 | 180 | 113 | 97 |
| 6 | 215 | 24 | 241 | 241 | 508 | 188 | 72 | 122 | 180 | 139 | 123 |
| 8 | 267 | 23 | 290 | 295 | 575 | 208 | 73 | 122 | 180 | 178 | 169 |
| 10 | 329 | 25 | 353 | 362 | 677 | 208 | 113 | 122 | 180 | 210 | 207 |
| 12 | 379 | 25 | 400 | 432 | 721 | 208 | 113 | 122 | 180 | 256 | 253 |

All Materials with Manual Override

| Size (inch) | d2 | D | D1 min | D1 max | H | H1 | L | L1 | L2 | L4 | Q1 | Q2 |
|-------------|-----|----|--------|--------|-----|-----|----|-----|-----|-----|-----|-----|
| 2 | 104 | 19 | 120 | 125 | 475 | 77 | 45 | 122 | 180 | 200 | 40 | - |
| 2½ | 115 | 19 | 140 | 145 | 488 | 83 | 46 | 122 | 180 | 200 | 54 | 35 |
| 3 | 131 | 19 | 150 | 160 | 488 | 89 | 49 | 122 | 180 | 200 | 67 | 50 |
| 4 | 161 | 19 | 175 | 191 | 520 | 104 | 56 | 122 | 180 | 250 | 88 | 74 |
| 5 | 187 | 23 | 210 | 216 | 547 | 117 | 64 | 122 | 180 | 250 | 113 | 97 |
| 6 | 215 | 24 | 241 | 241 | 568 | 130 | 72 | 122 | 180 | 250 | 139 | 123 |
| 8 | 267 | 23 | 290 | 295 | 635 | 158 | 73 | 122 | 180 | 250 | 178 | 169 |