



## Nor-Cal Products

### Throttling Pendulum Valves

#### General Specifications

#### Construction

#### Wetted Materials:

**Body:** Cast aluminum AC4CH

**Valve plate:** Aluminum A5052

**Other parts:** A 6061, A7075, SS304 and SS316, Viton®

**Seals:** Viton® standard, other materials available upon request

**Body and plate surface treatment:** Bare aluminum standard, hard anodizing optional

#### Valve Design

**Operating Pressure:**  $3.8 \times 10^{-8}$  to 760 Torr ( $5 \times 10^{-8}$  to 1000 mbar)

#### Maximum Differential Pressure (while opening valve):

200mm - 20 Torr (26 mbar)

250mm - 24 Torr (32 mbar)

350mm - 29 Torr (38 mbar)

#### Heating or Bakeout Capabilities:

**Body:** 150°C max with optional heater jackets

**Actuator:** 60°C maximum

**Ambient Operating Conditions:** 0 to 60°C

**Leak Rate:**  $1 \times 10^{-9}$  atm·scc/sec He across seat and to atmosphere (hard anodized body)

#### Service Life :

200,000 cycles - Open to Fully Closed (All valves)

1 million cycles - Open to Partially Closed (3-position valves)

1 million cycles - Open to Control Closed Position (TPV)



### Throttling Pendulum Valves with APC Controller

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## Nor-Cal Products

### IQ Series Throttling Butterfly Valves

- **Specifications Construction:**
- **Wetted Materials:** 316 stainless steel, Viton®  
**Seals:** Viton® standard, other materials are available upon request
- **Operation:**
- **Power Input:** 24 VDC, 100 W max., 60 W nominal (with one heated gauge connected)  
**Differential pressure:** 15 psi maximum across the valve plate  
**Heating capabilities:** Up to 150°C with optional heater jackets  
**Ambient Operating Conditions:** 0 to 45°C @ 0 to 95% humidity, non condensing  
**Leak Rate:**  $1 \times 10^{-9}$  atm-scc/sec He
- **Peripheral I/O:**
- **Device Net Communications:** Micro-style 5-pin male connector  
**Serial Communication:** RS-232 or RS-485 on DB-15 female "Auxiliary" connector  
**Capacitance Diaphragm Gauge:** One or two gauge operation. Second gauge requires external power  
**Analog / TTL:** Two each, analog and open collector outputs
- **Inherent Performance:**
- **Maximum speed:** 125 msec open to closed  
**Control Plate Resolution:** 3.2 arc seconds  
**Maximum torque:** 280 in-oz
- **Pressure Control Performance:**
- **Accuracy:** The greater of 5 mV or 0.25% of reading  
**Repeatability:** Within 2.5 mV or 0.12% of reading  
**Control Range:** 0.5% to 100% of the vacuum gauge range
- **Reliability:**
- **O-ring Cycle life:** 1 million open-close cycles  
**MTBF:** > 10,000 hours continuous operation



**new IQ-Series  
Throttling  
Butterfly Valve**

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## Adaptive Pressure Controller

- **Specifications Power Input:**
- 3-pin 100-240 VAC Input Connector
- **System Interface:**
- **Serial Connector:** DB-9 receptacle for RS- 232 DCE or RS-485/ Modbus serial interface.
- **TTL Connector:** DB-37 receptacle contains all TTL and analog I/O
- **Analog Set Point:** 0-10 and 0-5 VDC linearly proportional to pressure or valve position
- **Pressure Output:** 0-10 VDC analog output signals proportional to pressure, one for each vacuum gauge attached
- **Valve Angle Output:** 0-10 and 0-5 VDC proportional to valve position, 0 V is closed, 10 V(5V) is open
- **Signal Interface:** 9 digital (TTL) control input signals to operate the APC. 4 open collector status outputs, 2 process limit relays, Form C contacts
- **Device Interface:**
- **Gauge Connector:** Two DB-9 receptacles provide  $\pm 15$  VDC @ 800mA for one or two vacuum gauges with differential signal input for increased noise immunity
- **Pressure Input:** 0-10 VDC linearly proportional to pressure
- **Valve Connector:** DB-15 receptacle provides power to operate the high performance valve
- **Approvals:**
- CE (EMC and Low Voltage Directives)
- **Operating Range:**
- 0 to 400C @ 0-95% humidity noncondensing

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