



Intellisys™ *The Fastest, Most Precise Pressure Control System*

Nor-Cal Products offers unequalled performance with the Intellisys downstream pressure control system, providing measurable process benefits through higher resolution, speed and reliability.

Adaptive Pressure Controller

The Intellisys Adaptive Pressure Controller (APC) merges closed loop motor control with adaptive pressure control to provide advanced control system performance. An advanced adaptive algorithm eliminates pressure overshoot or gradual ramps during pressure transition. A Digital Signal Processor (DSP) enables DeviceNet™ communications protocol and programming flexibility for customer or process specific requirements.

Throttling Butterfly Valves

Intellisys motor control technology eliminates belts, gears and position switches, improving reliability, while increasing speed by at least a factor of twenty. High-torque geared drives are also available as an option. Standard sizes range from one to twelve inches.

NEW! IQ-Series Butterfly Valves

Substantial cost and space savings can be realized with the IQ-Series butterfly valves. All the control electronics are incorporated on to the valve motor drive, resulting in a compact size that is easy to integrate on any system.

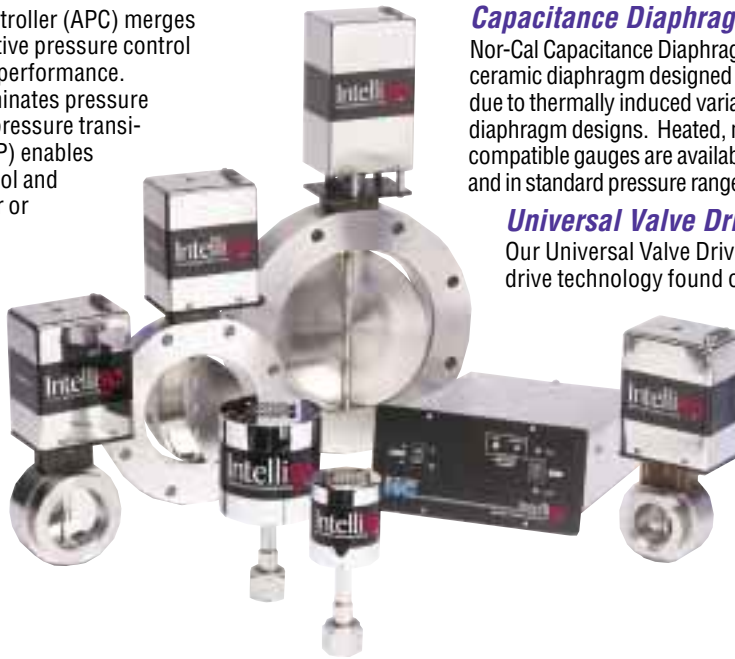
Capacitance Diaphragm Gauges

Nor-Cal Capacitance Diaphragm Gauges (CDG) feature a ceramic diaphragm designed to help stabilize output noise due to thermally induced variations found in other metal diaphragm designs. Heated, non-heated and DeviceNet™ compatible gauges are available with several tube fittings and in standard pressure ranges from 0.1 to 1000 Torr.

Universal Valve Drive

Our Universal Valve Drive (UVD) easily replaces older drive technology found on other manufacturers' pressure control valves. When used with our APC, the universal valve drive can upgrade a competitive valve to approach Intellisys performance levels.

Visit www.n-c.com for more detailed information

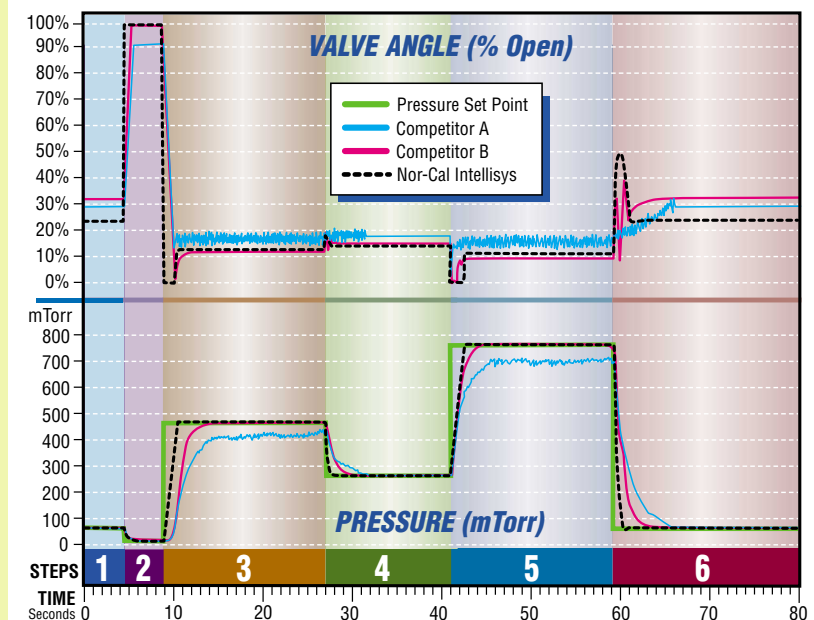


Intellisys System Increases Throughput

Using a typical semiconductor process "recipe", the performance of an Intellisys pressure controller and throttling butterfly valve is compared to two competitive brands. During the tests, pressure and valve plate angle are recorded simultaneously for each of the three brands.

Nor-Cal's valve closes completely in 0.125 seconds, as compared to 1.7 and 1.8 seconds, achieving pressure set point three seconds sooner. The other valves' slower speeds necessitate gradual ramps and partial openings to avoid set point undershoot or overshoot. With our advanced algorithm the Intellisys system can essentially achieve pressure step transitions.

The Nor-Cal Intellisys system shaved off over ten seconds from the closest competitors' time, with an average of about two to three seconds saved per pressure transition. This example represents a 15% increase in throughput.



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DeviceNet is a trademark of the Open DeviceNet Vendor Association (ODVA)
Viton is a registered trademark of DuPont Dow Elastomers.
Kalrez is a registered trademark of DuPont Dow Elastomers.
Chemraz is a registered trademark of Green Tweed Co.

Due to Nor-Cal's continued improvement program, pricing and specifications are subject to change without notice.

Prices subject to change without notice. - International product pricing will vary.



Intellisys Throttling Butterfly Valves (TBV)

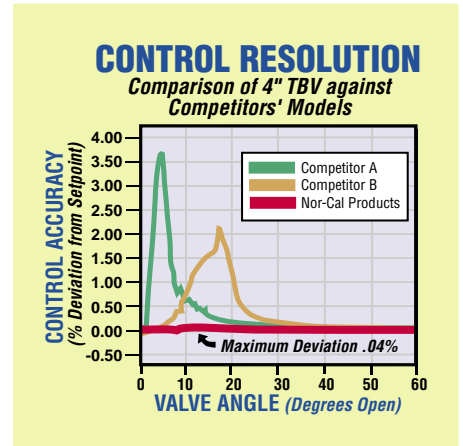
The Intellisys throttling butterfly valve's micro-stepped, direct-drive motor eliminates belts, gears and limit switches, extending MTBF while reducing the complexity and size of the drive assembly. High-torque, gear drives are also available in all sizes as an option. All wetted parts are made from 316 stainless steel for corrosion resistance.

Combined with a Nor-Cal APC, the high speed valve drive enables systems to reach process pressures sooner, reducing cycle time and increasing yield. The TBV can cycle from open to closed in 125 milliseconds, providing faster time to set point. Competing valves cycle in 1.6 to 7.5 seconds. The optimally designed throttle plate provides improved control linearity, higher open conductance leading to control accuracy within 0.25% of set point. (See chart to right)

Double O-rings on the top and bottom shaft seals ensure vacuum integrity, even during cycling.

Intellisys Throttling Butterfly Valves are now available in a full range of standard sizes from one to twelve inch IDs. Low cost, direct-drive valves are offered with NW-25, 40 and 50 flanges as well as ISO-63, 80, 100 and 160 flanges.

High-torque geared drives are available as an option. Other options include aluminum valve bodies, heaters for up to 200°C internal temperatures and special O-ring materials, such as Kalrez® or Chemraz®.



Features and Benefits

- Higher system throughput
- Optimally designed throttle plate for improved control linearity
- Smallest footprint available
- Direct-drive motor eliminates belts, gears and micro-switches
- Fully serviceable valve motor subassembly
- Easy installation and replacement
- 316 stainless steel and Viton® O-rings on all wetted parts
- High open conductance
- Low closed conductance

Specifications

Compatible Controllers: All Nor-Cal APC Controllers

Materials: Wetted materials 316 stainless steel, Viton®

Seals: Viton® (standard); other materials available upon request

Leak Rate: 1×10^{-9} atm-scc/sec He

Time Open-to-Close: 125 -250 millisecond, depending on size

Control Resolution: 3.2 arc second

Valve Position: Visual Indicator

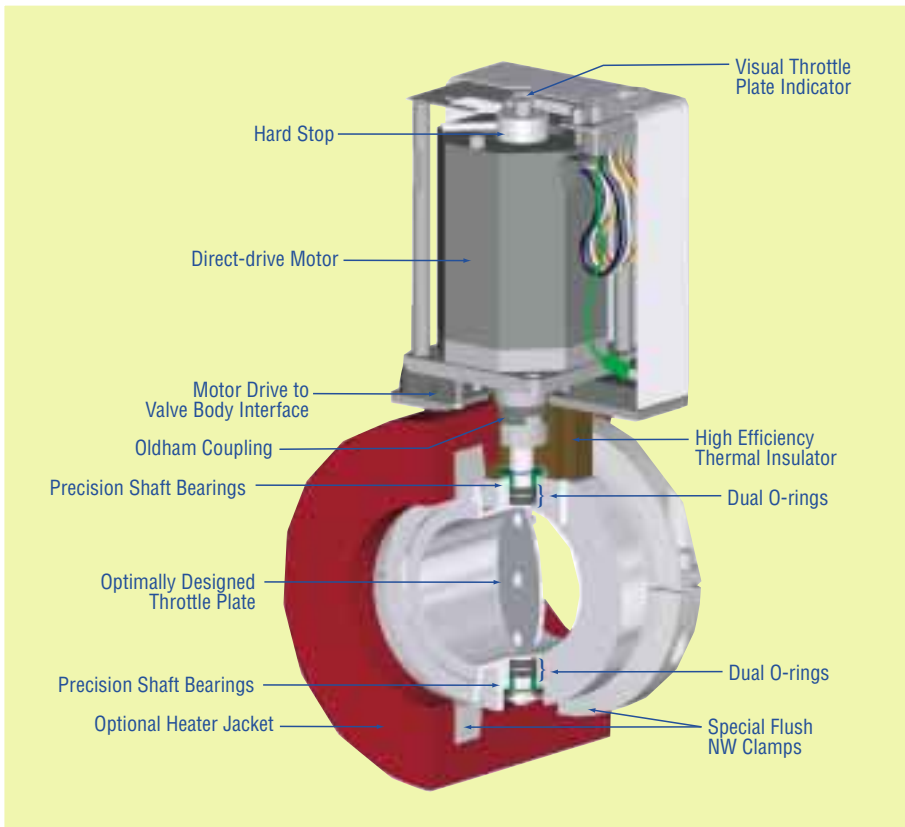
Differential Pressure: 15 psi maximum across valve plate

Cycle Life: 1 million open-close cycles

Heat Capabilities: Up to 200°C with optional heater kits

Ambient Operating Temp. Range: 0–50°C

CE Certified: Machinery and EMC Directives



Prices subject to change without notice. - International product pricing will vary.

INTELLISYS-LIT 6/02



TBV Order Information

Model Number	A	B	C	D	E	Flange Type	Price
TBV-100-NW-25	2.25	2.75	6.26	4.15	.87	NW-25	
TBV-150-NW-40	2.25	2.75	6.26	4.15	1.39	NW-40	
TBV-200-NW-50	2.00	3.36	6.57	4.15	1.98	NW-50	
TBV-250-ISO-63	1.00	5.12	7.02	4.15	2.44	ISO-63	
TBV-300-ISO-80	1.00	5.71	7.34	4.15	2.94	ISO-80	
TBV-400-ISO-100	1.00	6.50	7.77	4.15	3.85	ISO-100	
TBV-600-ISO-160	1.62	8.90	9.04	4.15	5.87	ISO-160	
TBV-800-ISO-200	1.62	11.22	10.20	4.15	7.88	ISO-200	
TBV-1000-ISO-250	1.62	13.19	11.14	4.15	9.88	ISO-250	
TBV-1200-ISO-320	1.62	16.73	12.98	4.15	12.42	ISO-320	

Includes Viton O-rings. All valves are available in aluminum construction and/or with JIS or ASA flanges as well as with high-torque gear drives. Call for part numbers and pricing.

Dimensions in inches

TBV O-ring Options

Option	Description	Price
KT	High Temperature Kalrez®	
KC	Chemical Resistant Kalrez®	
CR	Chemraz®	

Viton® O-rings are standard. As an option, other O-rings can be provided. Add the desired option suffix to the main part number. EXAMPLE: TBV-200-NW-50-KT

APC to Valve Cable

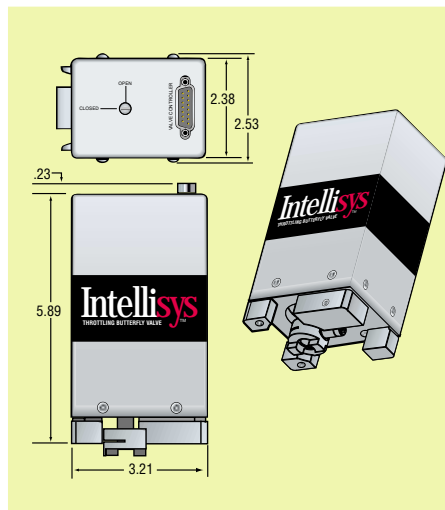
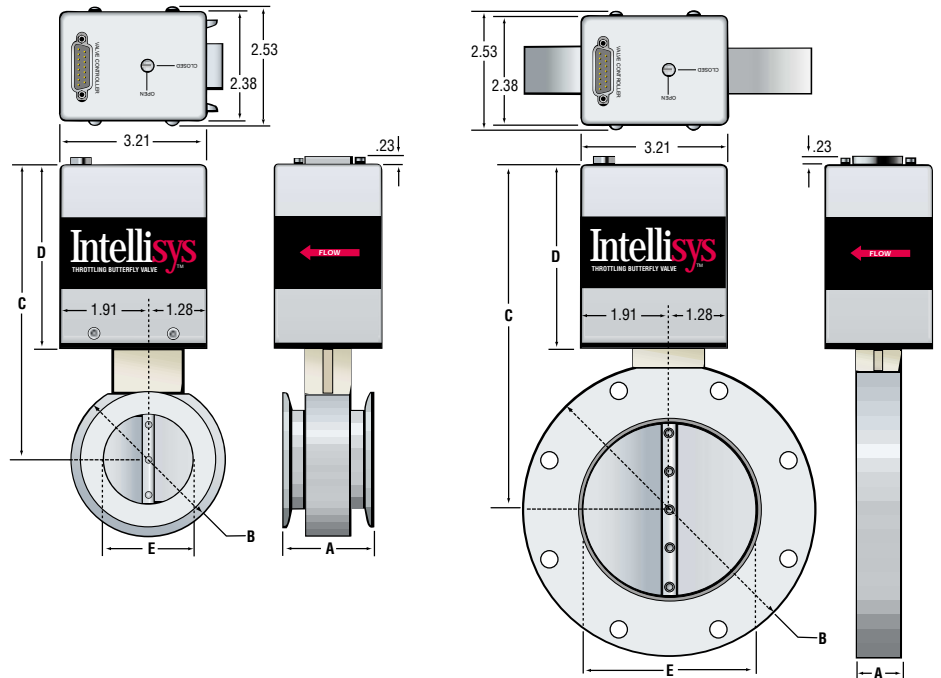
Model Number	Length	Price
TBV-CRD-10	10 feet	

Other cable lengths are available upon request.

Double Claw Clamp Kits

Model Number	Kit Fits Valve Sizes	Price
TBV-ISO-100-DCP	2.5, 3.0 and 4.0	
TBV-ISO-160-DCP	6.0, 8.0 and 10.0	

Kits contain a set of four clamps. Dimensions in inches



Universal Valve Drive (UVD)

Our Universal Valve Drive can easily replace the older drive technology found on other manufacturers' pressure control valves. When combined with our Intellisys adaptive pressure controller, the valve drive can upgrade a competitive valve to nearly the same performance levels provided by Intellisys. Drive-to-valve adapters for most manufacturers' valves are available from stock. Custom interfaces can quickly be designed for your specific application. The UVD can be customized to fit any manufacturer's throttle valve. Call for more details.



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IQ Series Throttling Butterfly Valves

Nor-Cal Products' new IQ-Series Throttling Butterfly Valve with on-valve control is the ideal choice for leading edge 200mm and 300mm tools with DeviceNet™ communications networks. In addition, IQ-TBVs can help the system designer meet continually scrutinized tool footprint allotments. With its compact, low cost design, the IQ valve is specifically produced with the system designer in mind. One of the unique features of the IQ valve is that the pressure control electronics are integrated on the valve. As a result, controller space requirements are reduced by over 80% compared to typical "buried box" controllers and by almost 50% compared to competitive "integral controller" products. Furthermore, all interface and communications connections are made directly to the valve greatly simplifying interconnecting cable installations.

The same patented closed loop motor control technology and proven adaptive pressure control algorithm found in Nor-Cal's stand-alone pressure controller is included in the IQ valve. As a result, the valve moves from the fully open to closed position in 1/8 second while offering over 100,000 steps of addressable control resolution throughout the stroke. In comparison, other standard "integral controller" products require nearly 8 seconds to actuate while only providing 10,000 control steps. Due to the IQ valve's fast speed and ultra-fine resolution, throughput increases of 5 to 15% with 2 to 10 fold reductions in wafer scrap are possible.

As with the traditional Intellisys downstream pressure control products, the IQ valve can be operated in a number of modes. The closed loop pressure control mode is enabled whenever the valve is allowed to modulate the valve plate position automatically so as to cause the chamber pressure to match the system pressure set point. Alternatively, the IQ valve can be operated in valve position control mode in which the tool software commands the valve to

a series of predetermined angles. A "slow mode" is also available, which is ideally suited for applications in which the rate of pressure change has to be controlled precisely. Operation in any of these three modes can be accessed and enabled "on the fly" or through activation of one of five pre-programmable set points stored in the IQ valve's non-volatile memory. Last, the popular PMI™ function can also be used with the IQ-series valves. This function allows the user to monitor the torque produced by the motor as it actuates the valve. Over time, as process by-products condense on the inner surfaces of the valve bore and plate, the torque profile will increase and register as a percentage of maximum torque. Needed valve maintenance can then be performed on a scheduled basis rather than running the valve until failure.



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 x 10⁻⁹ atm-cc/sec He

Peripheral I/O:

DeviceNet 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

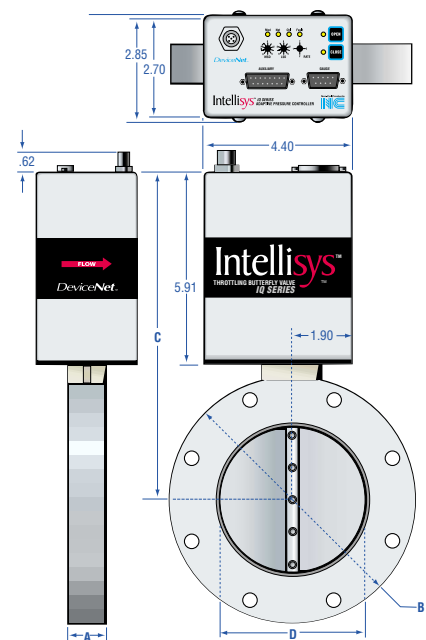
Reliability:

O-ring Cycle life: 1 million open-close cycles
MTBF: > 10,000 hours continuous operation

Model Number	A	B	C	D	Flange Type
TBV-IQ-100-NW-25	2.25	2.75	8.02	.87	NW-25
TBV-IQ-150-NW-40	2.25	2.75	8.02	1.39	NW-40
TBV-IQ-200-NW-50	2.00	3.36	8.33	1.98	NW-50
TBV-IQ-250-ISO-63	1.00	5.12	8.78	2.44	ISO-63
TBV-IQ-300-ISO-80	1.00	5.71	9.10	2.94	ISO-80
TBV-IQ-400-ISO-100	1.00	6.50	9.53	3.85	ISO-100
TBV-IQ-600-ISO-160	1.62	8.90	10.08	5.87	ISO-160
TBV-IQ-800-ISO-200	1.62	11.20	13.85	7.87	ISO-200

Other sizes, flanges and materials of construction are available. Call for pricing

Dimensions in inches



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Adaptive Pressure Controller (APC)

The Intellisys Adaptive Pressure Controller (APC) provides advanced control system performance by combining closed loop motor control with adaptive pressure control. The Intellisys APC system provides more than 100,000 control steps in the typical throttling butterfly valve operating range - a 60 times improvement over existing technology. The adaptive algorithm eliminates pressure overshoot, undershoot and gradual ramps during pressure transitions. Moreover, Digital Signal Processing (DSP) enables DeviceNet™ communications protocol and programming flexibility for customer or process specific requirements. When used with an Intellisys valve, the APC provides at least a twenty times increase in throttle valve speed over competitive products. An industry first preventative maintenance indicator (PMI™), reduces unscheduled maintenance and downtime by alerting the user when the throttle plate and bore should be cleaned. This is made possible by the APC's ability to sense changes in motor torque from condensable

by-product buildup in the valve. As a safety feature, the PMI will automatically stop the motor when maximum torque is reached, preventing damage to the valve.

The user can program up to five pressure control or valve position set points stored in non-volatile memory, while monitoring system pressure and valve position. Adjustable soft start routines can be programmed to reduce particle disturbance within the load lock or chamber.

The versatile auto-sensing power supply for the APC accepts 100-240 VAC input providing power to the valve, as well as filtered ±15 VDC for up to two heated CDGs. Flexible RS-232 and TTL/analog interface allows compatibility with most host controllers.



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 ±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 40°C @ 0-95% humidity noncondensing

Weight: 3 lbs. 8 oz. (1.7 Kg)

Valve Performance:

(when operated with an Intellisys APC)

Control Range: From 0.5% to 100% of the vacuum gauge range

Accuracy: The greater of 5 mV or 0.25% of reading

Repeatability: Within 2.5 mV or 0.25% of reading

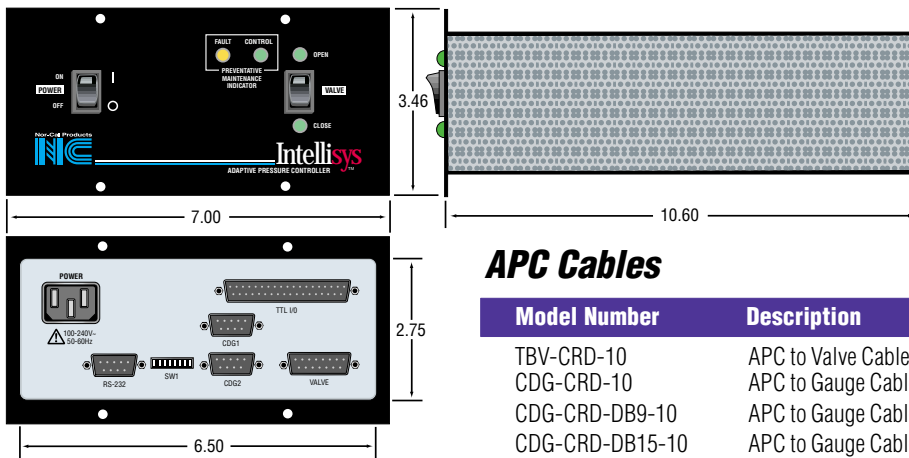
Maximum Speed: 0.125 to 0.250 seconds open-to-closed

Control Resolution: 100 thousand to 1.5 million steps

APC Order Information

Model Number	Description	Price
APC-001-B.1	For Gear Drive Throttling Valve. Buried Box.	
APC-001-B.2	For Direct Drive Throttling Valve. Buried Box.	

Includes 6 foot power cord. Other power cord lengths available upon request.



APC Cables

Model Number	Description	Length	Connectors	Price
TBV-CRD-10	APC to Valve Cable	10 feet		
CDG-CRD-10	APC to Gauge Cable	10 feet	Bare Leads	
CDG-CRD-DB9-10	APC to Gauge Cable	10 feet	DB-9 gauge	
CDG-CRD-DB15-10	APC to Gauge Cable	10 feet	DB-15 gauge	

Other lengths available on request.



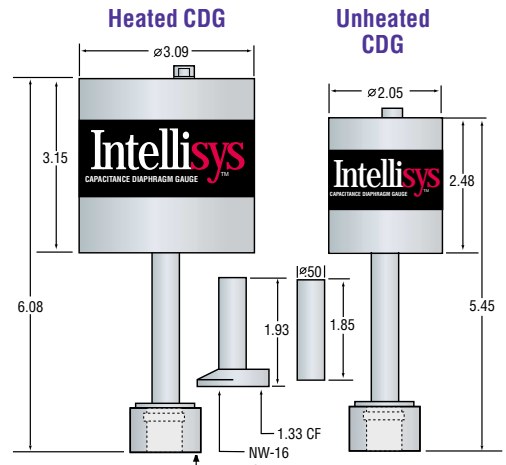
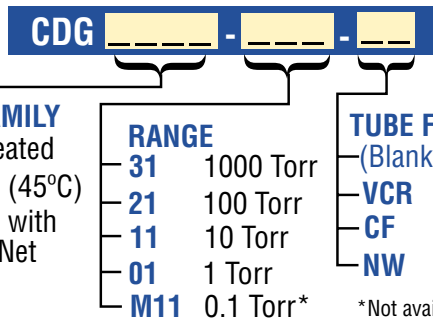
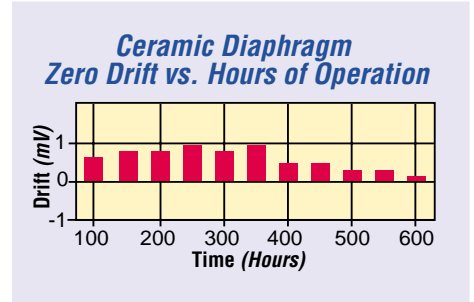
Capacitance Diaphragm Gauges

Nor-Cal Capacitance Diaphragm Gauges (CDGs) complement Intellisys adaptive pressure controllers and throttle valves with vacuum pressure measurements of superior accuracy and repeatability. The CDG's ceramic diaphragm helps minimize zero drift and stabilizes output noise due to thermally induced variations. 45°C heated and non-heated (temperature compensated) devices are available with several tube fittings and in standard pressure ranges from 0.1 to 1000 Torr. The unheated CDG achieves an accuracy of 0.2%, while the 45°C heated CDG achieves 0.15% accuracy.

Improved thermal and mechanical diaphragm properties reduce problems associated with metal diaphragms, such as hysteresis, non-linear motion range, temperature induced changes, material imperfections and corrosiveness.

The gauge's aluminum oxide ceramic diaphragm is created with no internal stress, surface tension ripples, grain or imperfections. The diaphragm returns quickly and accurately to the same position for a given pressure, so measurements remain repeatable over time. And, because the diaphragm isn't damaged by exposure to atmospheric pressure or repeated cycling, there is no need for isolation valves. The corrosion resistant ceramic diaphragm improves process consistency and prolongs sensor life. All CDG parts that come into contact with process gasses are made from inert materials to ensure consistent performance and long life in corrosive environments.

The Intellisys CDG is 100% electrically and mechanically compatible with competitive gauges for easy replacement installations. DeviceNet™ compatible gauges can also be ordered as an option. Please call for more information.



CDG Pricing

Part Number	Price
CDG090	
CDG091 (except M11 Range)	
CDG091D (except M11 Range)	
CDG091-M11	
CDG091D-M11	

Use part-tree to select family, range and fitting. Bare tube fitting is standard. For VCR, CF or NW fitting option add \$60 to cost. Example Part number: CDG091-M11-VCR

APC to CDG Cables

Model Number	Connectors	Price
CDG-CRD-10	Bare Leads	
CDG-CRD-DB9-10	DB-9 gauge	
CDG-CRD-DB15-10	DB-15 gauge	

10 foot standard length. Other lengths available.

CDG Specifications

	CR090 MODELS (Unheated)	CR091 MODELS (45°C Heated)
Pressure Range:	1, 10, 100, 1000 Torr 1.33, 13.3, 133, 1330 mbar 133, 1330, 13,300, 133,000 Pascal Full scale (FS)	0.1, 1, 10, 100, 1000 Torr 0.133, 1.33, 13.3, 133, 1330 mbar 13.3, 133, 1330, 13,300, 133,000 Pascal Full scale (FS)
Accuracy:	0.2% of reading ± temperature effects	0.15% of reading
Materials Exposed to Gases:	Ceramic (AlO ₂), 316 Stainless Steel	
Max. Overrange Pressure:	1000 Torr for 0.1, 1, 10 & 100 Torr sensors 1500 Torr for 1000 Torr sensor	
Resolution:	0.0025% of Full Scale for 0.1/1 Torr sensors 0.0015% of Full Scale for 10/100/1000 Torr sensors	
Sensor Temp. Effects:	Zero Coefficient: 0.005% of Full Scale/°C	0.1-Torr: 0.005% of FS/°C 1/10/100/1000 Torr: 0.0025% of FS/°C
Span Coefficient:	0.01% of reading/°C	
Time Constant:	<30 ms	
Operating Temps.:	5°C to 50°C	15°C to 40°C
Power:	23 mA	300 mA
Weight:	0.57 lbs.	1.07 lbs.
Internal Volume:	6 cc	7 cc

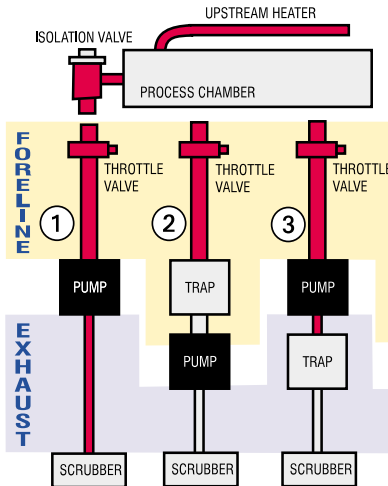
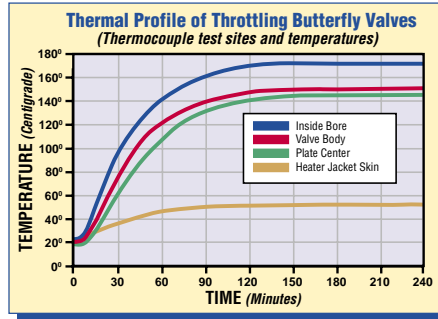
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TBV Heaters and Controllers

Many semiconductor processes are carried out in vacuum chambers with internal temperatures in the 700°C range. Process by-products exit the chamber in vapor phase, but sublimate in the foreline and vacuum pump exhaust when gas temperatures drop sufficiently for them to form solids. The resultant buildup can increase wafer defects from particle backstreaming, reduce throughput of vacuum lines, impede the function of throttle valves and isolation valves, damage some dry pumps and reduce the efficiency of the scrubber. This buildup can be reduced or eliminated by heating vacuum lines and associated components from the chamber to the scrubber, or by using a combination of heaters and foreline traps, which collect the by-products, preventing them from continuing downstream.

A CE certified, thermostat controlled heater jacket is available for Intellisys TBV's for 150°C internal temperatures. For temperatures up to 200°C a CE certified heater and PID controller provide precise temperature control. Heaters for all TBV valves cover the valve body as well as the mating flanges. Heaters for TBV valves with NW flanges are provided with special aluminum clamps. Standard sizes are available up to six inches. Larger sizes are available on request.



Typical Heated Line Configurations

1. Heated foreline to pump and heated exhaust line to scrubber. No foreline trap.
2. Heated foreline to foreline trap before pump.
3. Heated foreline to pump and heated exhaust to foreline

PID Heater Controller

The HC-935A-1-1 features single temperature sensor input from a thermocouple or RTD sensor, and dual control outputs. The outputs may operate in a variety of modes including: heat, cool, alarm and timer. The timer function operates in a choice of delay-ON, delay-OFF, signal-ON or signal-OFF modes. Front panel lock capability and a LED display round out the feature set. Other HC-935 controllers are available for one, two and four zones. Call for pricing.

Model Number	Max. Output Watts	Zones	Price
HC-935A-1-1	960 @ 120V	1	



Features

- 1/32 DIN package
- NEMA 4X
- Countdown timer
- Programmable alarms
- Universal power supply
- Small panel footprint
- ±0.25% accuracy
- Worldwide flexibility
- Low cost multi-zone temperature control

TBV Heater Jackets with Thermostats

Model Number	Use with TBV Part Number	Voltage	Price
HT-TBV-100-150-1*	TBV-100-NW-25	120 VAC	
HT-TBV-150-150-1*	TBV-150-NW-40	120 VAC	
HT-TBV-200-150-1*	TBV-200-NW-50	120 VAC	
HT-TBV-250-150-1	TBV-250-ISO-63	120 VAC	
HT-TBV-300-150-1	TBV-300-ISO-80	120 VAC	
HT-TBV-400-150-1	TBV-400-ISO-100	120 VAC	
HT-TBV-600-150-1	TBV-600-ISO-160	120 VAC	

Set point 150°C. 200°C manually resettable over-temp. Includes a 12" power cord with AMP connector. 240 VAC Option: Change "-1" at end of part number to "-2." Example: HT-TBV-100-150-2. Call for larger sizes and for temps. below 150°C. For temps. up to 200°C a PID controlled heater jacket is recommended. * Includes two special NW clamps.

TBV Heater Jackets for PID Control

Model Number	Use with TBV Part Number	Voltage	Price
HC-TBV-100-200-1*	TBV-100-NW-25	120 VAC	
HC-TBV-150-200-1*	TBV-150-NW-40	120 VAC	
HC-TBV-200-200-1*	TBV-200-NW-50	120 VAC	
HC-TBV-250-200-1	TBV-250-ISO-63	120 VAC	
HC-TBV-300-200-1	TBV-300-ISO-80	120 VAC	
HC-TBV-400-200-1	TBV-400-ISO-100	120 VAC	
HC-TBV-600-200-1	TBV-600-ISO-160	120 VAC	

Maximum temperature 200°C. Includes 12" power cord with AMP connector and two built-in type K thermocouples with 6' lead and mini-connector. 240 VAC Option: Change "-1" at end of part no. to "-2." Example: HC-TBV-100-200-2. * Includes two special NW clamps.

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Pin Assignments for the Intellisys TBV and TBV-IQ Valves, CDG and APC Controller

PIN	APC ANALOG/TTL Port DB-37 Female Plug	APC RS232 Serial Port DB-9 Female	APC CDG 1 & 2 Ports DB-9 Female	IQ CDG Connector DB-9 Female	IQ Auxiliary Connector DB-15 Female	CDG Gauge DB-15 Male
1	PLO #1 N.C.	N/C	Signal+	CDG1+	N/C	N/C
2	PLO #1 N.C.	232RX - APC to Host	N/C	+15VDC	232TX (or RS485A)	Signal +
3	PLO #2 N.C.	232TX - Host to APC	N/C	-15VDC	232RX (or RS485B)	N/C
4	Digital Common	N/C	+15VDC	N/C	Serial Common	N/C
5	CDG2	Serial Common	-15VDC	CDG2+	Power V-	Power Common
6	Valve	N/C	N/C	CDG2-	N/C	-15VDC
7	Softstart	N/C	N/C	N/C	Power V+	+15VDC
8	Close	N/C	Signal Common	CDG1-	N/C	N/C
9	Control Active	N/C	Power Common	Power Common	Analog Valve Position Out	N/C
10	Analog Div 10				Analog Pressure Out	N/C
11	SP Control				Analog Common	N/C
12	Common 1				TTL Common	Signal Common
13	Status Out of Common				TTL Valve Open Output	N/C
14	N/C				TTL Valve Closed Output	N/C
15	N/C				Chassis	N/C
16	N/C					
17	CDG2 Out					
18	Valve Out (0-5V)					
19	Valve Open Status					
20	PLO #1 Common					
21	PLO #2 Common					
22	PLO #2 N.C.					
23	Valve Closed Status					
24	Valve Fault Status					
25	Zero					
26	Stop Valve					
27	Open					
28	PLO #2 Status					
29	PLO #1 Status					
30	N/C					
31	N/C					
32	N/C					
33	SP In+					
34	SP In-					
35	Analog Common					
36	CDG1 Out					
37	Valve Out					

Active Low Input Signals

Active Low Output Signals

Active High Output Signals

View or download technical bulletins, frequently asked questions, PDF catalogs and operator's manuals for Intellisys adaptive pressure control products at www.n-c.com.

Call 1-800-824-4166 for Intellisys Technical Support.