

ProAct™ ITB

Integrated Actuator and Throttle Body for Large Bores (85 mm to 180 mm)



Description

The ProAct™ Integrated Throttle Bodies (ProAct ITBs) are butterfly valves electrically actuated by ProAct actuators to control flow output. With bore sizes ranging from 85 mm to 180 mm, these ProAct ITBs are designed for use with engines in the 1 MW to 2 MW range. This is an electromagnetic actuator with 75 degrees of travel, which alleviates the problems associated with linkages on gas engines (such as setup, non-linearity, and wear).

This direct combination of throttle and actuator results in excellent stability and transient characteristics, and requires no hydraulics, pneumatics, or governor gear train. Therefore, you end up with an efficient, long lasting, and easily-installed throttle option.

Application

The ProAct ITB integrated actuator and throttle body is designed to throttle air or air/fuel for gaseous engines. This system is designed for direct replacement of traditional throttle valves, and requires no linkage between valve and actuator. The three sizes are designed to cover a wide range of engines and should be selected using the sizing procedure described inside this specification.

- No linkage or couplings
- Cost effective and highly efficient
- Low maintenance
- Requires no hydraulics, pneumatics, or governor gear train
- Long lasting, easy to install throttle option
- Some may be configured as an integrated speed controller or a positioner

Determining the Proper Valve Size

The proper size valve can be determined using the equation below. The required Cv (flow coefficient) should be calculated for both the minimum and maximum flows expected on the application. This design allows for a nominal travel of 75 degrees of rotation.

Using the graph and table below, select the closest valve that has a Cv equal to or greater than the calculated maximum flow value at approximately 80 % opening (60 degrees) to ensure reasonable flow margin. Also, check that the particular valve's minimum Cv listed below is less than the minimum calculated Cv for good low idle performance. For further assistance, consult the Woodward engineering department.

$$Cv := \frac{Q \cdot 0.00976}{P1 \cdot Sg} \cdot \sqrt{\frac{(T + 460) \cdot P1 \cdot Sg}{P1 - P2}}$$

where:

Cv = Flow Coefficient

Q = Mass Flow (PPH [pounds/hour]) [1 pound = 0.45 kg]

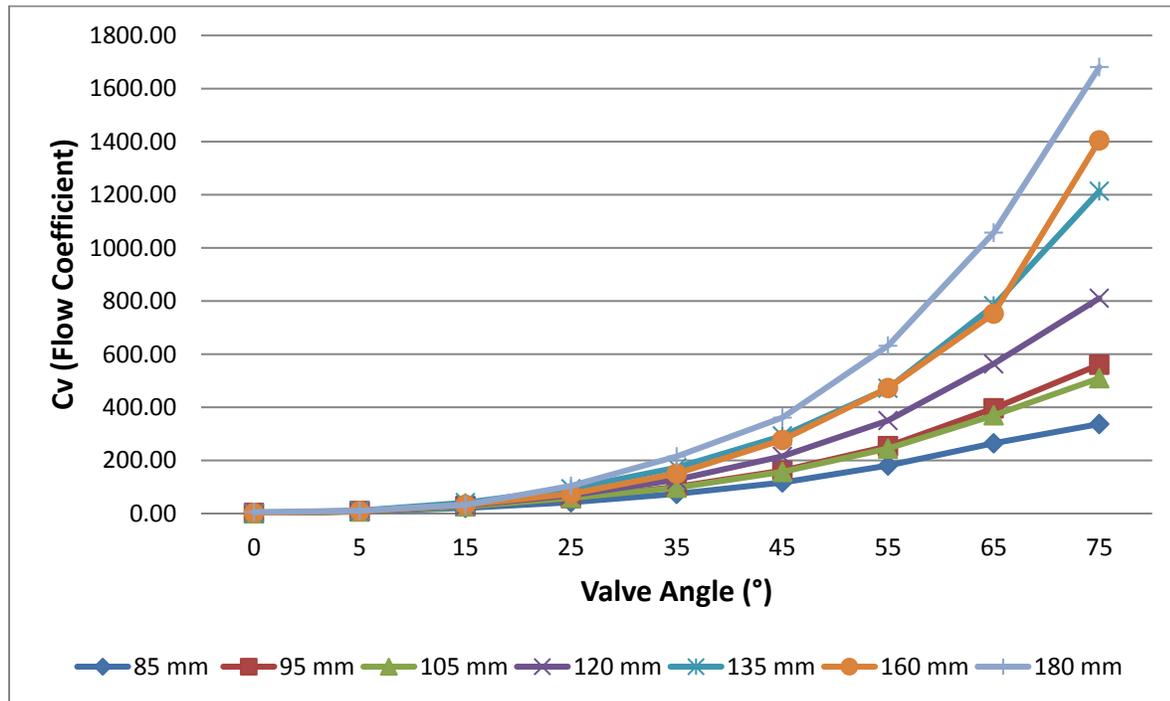
Sg = Specific Gravity of Gas (use 1.0 for air)

T1 = Upstream Gas Temperature (°F) [°F = 1.8 * °C + 32]

P1 = Inlet Pressure (psia) [1 psi = 6.895 kPa = 0.06895 bar]

P2 = Downstream Pressure (psia)

NOTE—P2 must be greater than 0.528 * P1 or flow becomes choked. If P2 is less than 0.528 * P1, then use P2= 0.528 * P1.



Flow Coefficient (Cv) vs Valve Angle for ProAct ITB Bore Diameters

Specifications

Available Sizes (mm)	85, 95, 105, 120, 135, 160, 180
Operating Temperature Range	(-40 to +85) °C / (-40 to +185) °F
Storage Temperature Range	(-55 to +125) °C / (-67 to +257) °F
Vibration Qualification Test Spec	Woodward RV2 (0.1 G ² /Hz Random, (10 to 2000) Hz, 12.8 Grms – 3 hours per axis)
Shock Qualification Test Spec	40 G, 11 ms sawtooth pulse
Weight	See table under mounting section of manual
Maximum Working Pressure	414 kPa / 4.1 bar / 60 psig

Regulatory Compliance

NOTE—Refer to the ProAct ISC manual (26246) for actuator compliance.

Other European Compliance:

Compliance with the following European Directive does not qualify this product for application of the CE Marking:

Pressure Equipment

Directive 2014/68/EU: Exempt per Article 2.f of 2014/68/EU per Category I

Machinery Directive: Compliant as partly completed machinery with Directive 2006/42/EC of the European Parliament and the Council of 17 May 2006 on machinery

