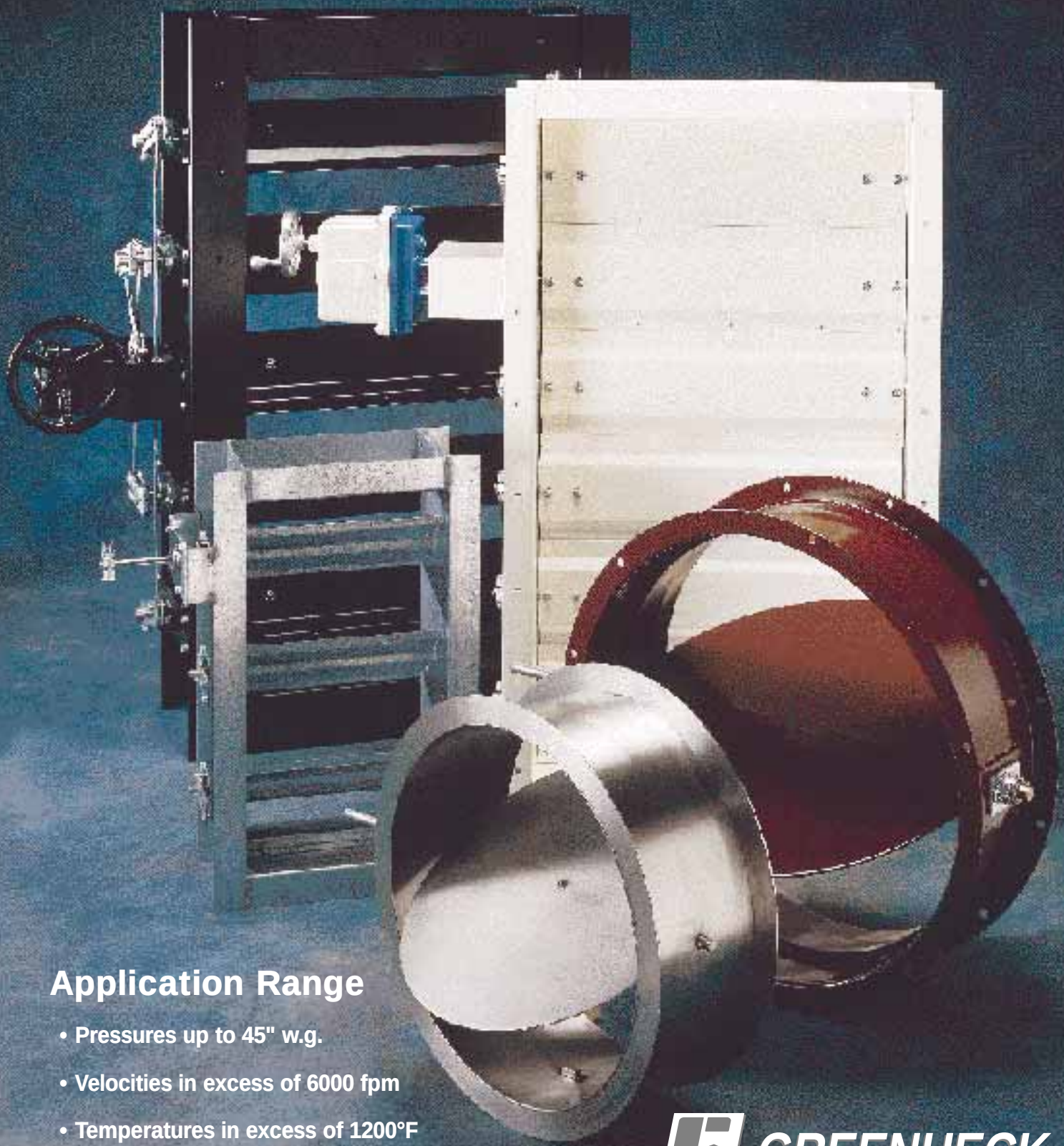
HCD SERIES
INDUSTRIAL
CONTROL DAMPERS



Application Range

- Pressures up to 45" w.g.
- Velocities in excess of 6000 fpm
- Temperatures in excess of 1200°F

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September 1996

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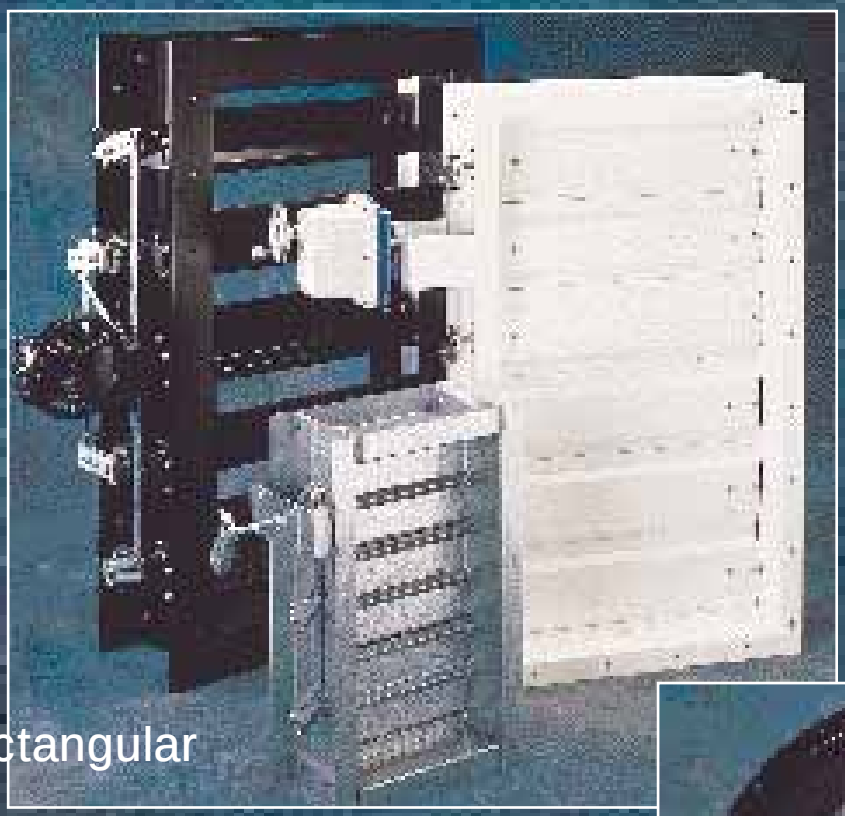
HCD SERIES *INDUSTRIAL* CONTROL DAMPERS

Greenheck's 'Vision of Excellence' is to be the market leader in the development, manufacturing and worldwide sale of quality air-moving and control equipment with total commitment to customer service. The industrial control damper line is one more way that Greenheck has added to that 'Vision.' Greenheck's industrial control dampers provide the same quality and performance that has become Greenheck's trademark over the past 50 years.

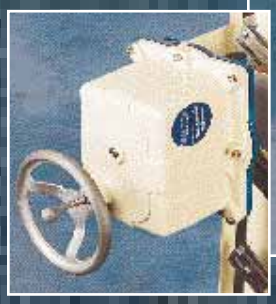


Rectangular

Industrial Control Dampers

Application & Design
Industrial control dampers are heavy duty flanged frame style dampers with various blade styles. They are designed to control airflow and provide shut off in HVAC or industrial process control systems.

Options
A variety of optional features are available that make these industrial control dampers extremely versatile, allowing their capabilities to be tailored to the application.



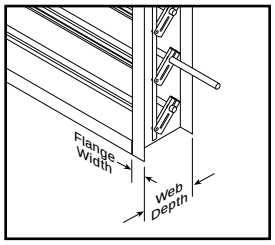
Actuators

Bearings

Round

Frame

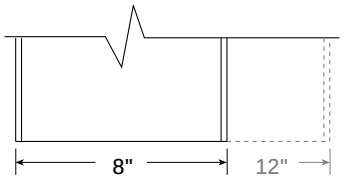
A variety of frame construction options are available to accommodate the damper's intended size and applications. Some of these options addressing frame depth and flange dimensions are illustrated.



Web Depth

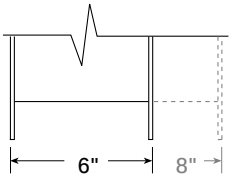
for **Rectangular**

Channel style frame with depths of 8" and 10" are standard depending on model. Optional web depths available in any increment.



for **Round**

Standard depth is 6" or 8", depending on diameter. See technical data sheets for specific model information.

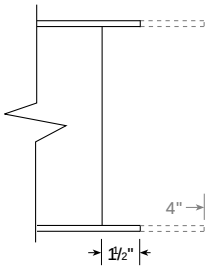


Flange Width

for **Rectangular**

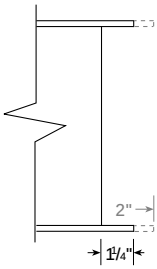
Standard flange width on HCDs is 2"–2½" depending on model.

Optional flange widths available.



for **Round**

Flange widths range from 1¼"–2" depending on model and diameter. See technical data sheets for specific model information.



Low Leakage

Damper leakage can be reduced significantly by the addition of optional seals. Seals may be applied to blade edges (blade seals) or to the frame at blade ends (jamb seals). Seal type and material should be selected to suit the application.

Blade Seals

for **Rectangular**

Significantly reduces leakage between adjacent blades.

Three types are available:

Vinyl - For applications up to 180°F.
EPDM - For applications up to 250°F.
Silicone Rubber - For applications up to 400°F.

for **Round**

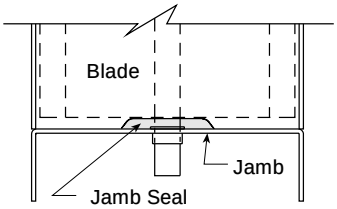
Significantly reduces leakage around blade perimeter. Blade seals on round dampers require rolled bar blade stops. Seals are attached to the blade stop (see below). Two types are available:

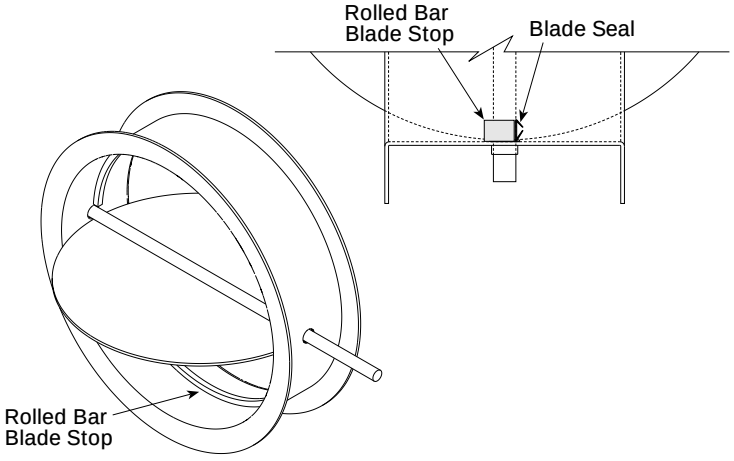
EPDM - For applications up to 250°F.
Silicone Rubber - For applications up to 400°F.

Jamb Seals

for **Rectangular (Only)**

Stainless steel jamb seals can be provided to reduce leakage between the frame and blade ends.





Mounting Holes

Prepunched flanges are an available option for all Flange Mounted Industrial Control Dampers. Custom mounting hole patterns are available if desired.

Material

Industrial applications often require special materials. Galvanized and Coated Steel as well as Stainless Steel construction can be supplied as required by the application or specification.

Galvanized

Rectangular industrial control dampers are constructed of galvanized material as standard.

Stainless Steel

All industrial control dampers are available in stainless steel. Stainless steel has excellent resistivity to corrosion.

Coated Steel

Round industrial control dampers are coated steel as standard.

Axle Bearings

From simple sleeve bearings pressed into the damper frame to relubricatable ball bearings mounted outboard of the frame for accommodation of extreme temperatures, the list of bearing and axle shaft seal options is extensive. A few more popular of these options are illustrated.

Stainless Steel Sleeve

The stainless steel sleeve bearing is standard on many models and works well for:

- Clean air applications
- Temperatures up to 400°F
- Applications where nominal leakage through frame is acceptable

External Bronze w/ O-Ring

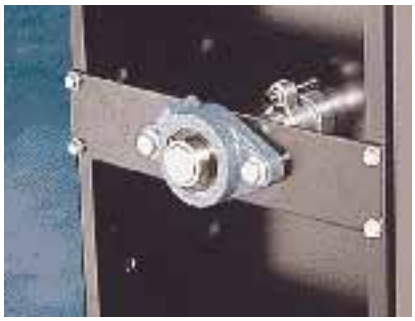
The external bronze bearing has the same benefits shown for the stainless steel sleeve bearing but also includes:

- Mounting which is external

External bearings may be removed and replaced if necessary.
The addition of the O-Ring shaft seal:

- Prevents air leakage where each blade axle penetrates the damper frame.

External bronze and ball bearings have a self-aligning feature which reduces binding under high loading conditions and therefore decreases torque requirements.



Outboard External Ball Bearing w/ Double Gland Stuffing Box

The external ball bearing goes beyond the external bronze and provides further benefits:

- Relubricable
- Sealed to provide extra protection against the environment

The double gland stuffing box is recommended for:

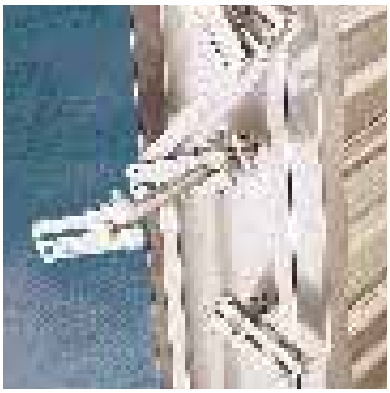
- Clean or dirty air applications
- Sealing against air or gas leakage where each blade axle penetrates the damper frame
- Flue gas applications

Outboard is described as mounting the bearings to plates that bridge between the damper flanges. Allows bearings to run cooler in higher temperature applications.

ACTUATORS

Several different actuator types are available for all industrial control dampers: 1) Crank Arm Type, 2) Manual Hand Quadrant, and 3) Electric & Pneumatic.

Crank Arm



Crank Arm
Allows for adaptation of customer supplied powered actuators.

Manual Operators

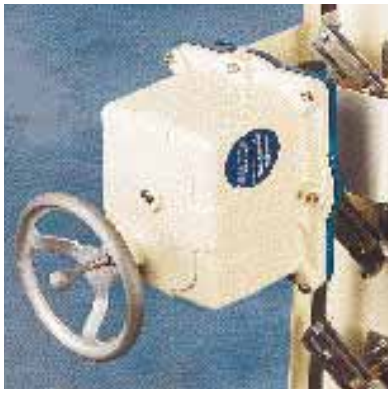
Manual Hand Quadrant
For manual operation at low torque.

Manual Worm Gears
For manual operation where torque requirements are high.

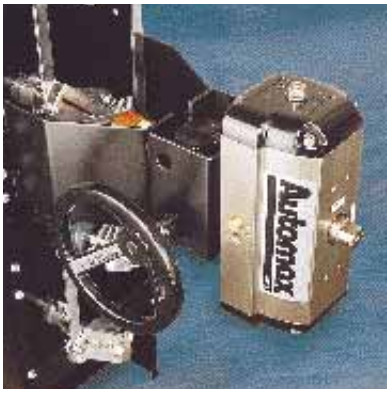
Electric & Pneumatic

Many electric and pneumatic actuators are available for all industrial models (mounted and linked by Greenheck). Manual overrides are available to provide control over the damper should the power to the actuator fail. Several of the more popular actuator installations are illustrated.

Electric Spring Return



Electric Reversible w/ Manual Override



Pneumatic Rack & Pinion w/ Manual Worm Gear Override

FINISHES

Greenheck can provide finishes on all industrial control dampers. Listed below are three commonly used finishes. Consult factory for other finishes.

- **Heresite (Air Dry Phenolic)**
- **Epoxy**
- **Sanitile E-H 210 (Eisenheiss)**

Industrial Fan Inlet/Outlet Dampers

Industrial Control Damper Mounted On Centrifugal Fan

The industrial damper (shown at right) is designed to control airflow and provide shut off on inlet or outlet of industrial fans in HVAC or industrial control systems.

Industrial Process Fan Outlet Damper

Linkage Detail

The industrial control damper (left) is used in industrial process fan applications that typically exceed the capabilities of other industrial control dampers. This damper comes standard with heavy duty flanged frame with deeper web, adjustable heavier duty linkage, airfoil blades, and self-aligning bearings with shaft seals and stainless steel thrust washers.

Inlet Vane Damper

The inlet vane damper is typically mounted to the inlet flange of an industrial fan to control the amount of airflow entering the fan. The blade action of an inlet vane damper directs the airflow into the fan in such a manner that allows the fan to perform more efficiently. The inlet vane damper is available with manual, electric, or pneumatic actuators. The maximum operating temperature for inlet vanes is 200°F.

SPECIFICATION CHECKLIST

DAMPER CHECKLIST

DAMPER MODEL SELECTION

1. **Model**
2. **Damper Size**
3. **Static Pressure When Closed**
4. **Flow Or Velocity**
5. **Temperature**

OPTION SELECTION

6. **Seals**
   - *Blade seal*
   - *Jamb seal*
   - *Axle seal*
7. **Frame Construction Options**
   - *Frame Depth*
   - *Flange Width*
8. **Material**
   - *Galvanized*
   - *Aluminum*
   - *Stainless Steel*
   - *Painted Steel (HCDR only)*
9. **Axle Bearings**
   - *Sleeve Type*
   - *External Type*
     - *Outboard Mounting*
10. **Shaft Seals**
    - *O-Ring*
    - *Double Gland*

ACTUATOR CHECKLIST

1. **Type**
   - *(electric, pneumatic, or manual)*
2. **Operation**
   - *Spring-Return*
   - *Power Open, Power Closed (electric)*
   - *Double Acting (pneumatic)*
3. **Operating Mode**
   - *Two-Position*
   - *Floating (fail-in-place)*
   - *Modulating*
4. **Fail Direction** *(spring-return only)*
5. **Power Supply**
   - *(examples: 120 Vac, 20 psi, 80 psi)*
6. **Control Signal** *(modulating only)*
   - *0-10 Vdc*
   - *4-20 mAdc*
   - *135 ohm resistance*
   - *(or other control signals)*
7. **NEMA Enclosure** *(electrical)*
   - *(examples: 1, 3R, 4, 4X, 7)*
8. **Accessories**
   - *Auxiliary Switch*
   - *Heater and Thermostat*
   - *Solenoid Valves*
   - *Positioners*

WARRANTY

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date.

Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid.

Due to continuing research, Greenheck reserves the right to change specifications without notice.

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Industrial Dampers