

## Tunnel Transit Damper

### Application and Design

Model HTD-630 is a heavy duty flanged frame style industrial control damper qualified for use in tunnel and transit systems. The airfoil blades, mechanically fastened silicone blade seals and stainless steel jamb seals meet the demanding requirements for strength, leakage, and operability to standards such as NFPA-130, 502, and UL555S.

As with all Greenheck heavy duty/industrial damper models, the design can be modified and the product can be qualified to meet the requirements of any specification.

### Ratings

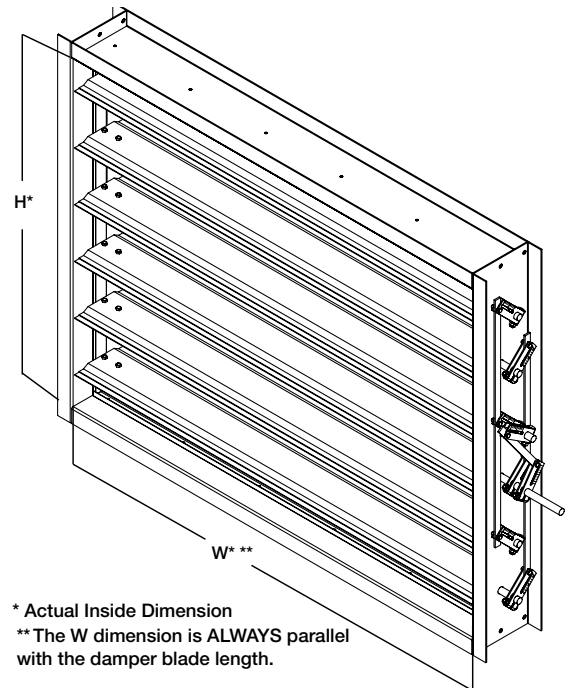
**Pressure:** 24 in. wg (6 kPa)

**Velocity:** 4000 fpm (20.3 m/s)

**Temperature:** 250°F (121°C) continuous  
482°F (250°C) for 2 hours (NFPA 130, 502)

**Fatigue Cycles:** 8 million reverse cycles at 24 in. wg (6 kPa). High temperature options available, consult factory.

	Standard Construction	Optional Construction
<b>Frame Depth</b>	12 in. (305mm)	8 in. (203mm)
		10 in. (254mm)
<b>Frame Material</b>	Galvanized (ASTM A653)	304SS
		316SS
<b>Frame Material Thickness</b>	12 ga. (2.7mm)	Minimum: 14 ga. (1.9mm)
		Maximum: 0.25 in. (6.4mm)
<b>Blade Type</b>	Double Skin Airfoil	-
<b>Blade Material</b>	Galvanized (ASTM A653)	304SS
		316SS
<b>Blade Skin Thickness</b>	12 ga. (2.7mm)	Minimum: 16 ga. (1.5mm)
		Maximum: 10 ga. (3.4mm)
<b>Blade Action</b>	Parallel	Opposed
<b>Blade Seal</b>	Mechanically Fastened Silicone	None
		Stainless steel
<b>Axle Type</b>	Stub	Full length
<b>Axle Diameter</b>	0.75 in. (19mm)	1 in. (25.4mm)
<b>Axle Material</b>	Zinc plated steel	304SS
		316SS
<b>Axle Seal</b>	None	O-ring
		Double gland
<b>Bearing</b>	Stainless steel sleeve	Oil impregnated bronze
		Relubricable ball
		High temperature carbon
<b>Linkage</b>	External industrial type, zinc plated steel	External industrial type, stainless steel
<b>Jamb Seal</b>	Compression type, stainless steel	None
<b>Flange Width</b>	2 in. (51mm)	1½ in. (38mm) - 4 in. (102mm)
<b>Blade Deflection</b>	L/180	L/360



### Size Limitations

The following table provides minimum and maximum single section size. Multiple sections can be linked together to create larger damper assemblies.

### Single Section Size

Minimum	12 in. W x 12 in. H (305mm x 305mm)
Maximum	60 in. W x 96 in. H (1524mm x 2438mm)

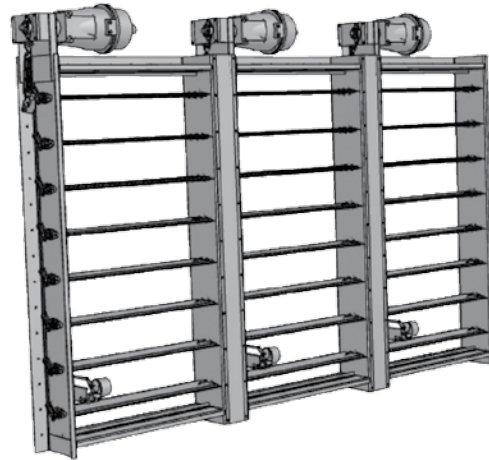
### Options

- Wide range of electric and pneumatic actuators available
- Limit Switches
- Multiple panel assemblies

Installation instructions available at [www.greenheck.com](http://www.greenheck.com).

## Multiple Panel Assemblies

Multiple panels can be stacked on top of each other and side-by-side to span opening that are larger than the maximum single panel damper. Jackshaftering can be added to couple multiple panels, allowing them to be operated using a single actuator. Consult the factory for design assistance for multiple panel assemblies.



## Pressure Drop Data

This pressure drop data was conducted in accordance with AMCA Standard 500-D using the two configurations shown. All data has been corrected to represent standard air at a density of .075 lb./ft<sup>3</sup> (1.2 kg/m<sup>3</sup>).

Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

## AMCA Test Figures

**Figure 5.3** illustrates a fully ducted damper. This configuration has the lowest pressure drop of the two test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

**Figure 5.2** illustrates a ducted damper exhausting air into an open area.

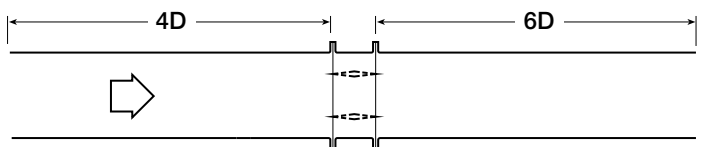


Fig. 5.3

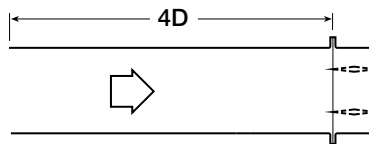


Fig. 5.2

**Pressure Drop (english version)**  
42 in. x 42 in. (1067mm x 1067mm) Damper

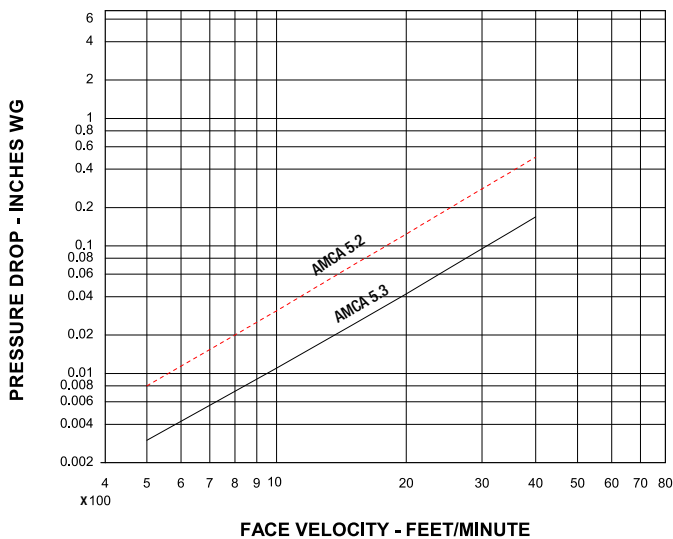


Figure 5.2:  $\log(P) = 2 \cdot \log(V) - 7.507618$   
Figure 5.3:  $\log(P) = 2 \cdot \log(V) - 7.977296$

**Pressure Drop (metric version)**  
42 in. x 42 in. (1067mm x 1067mm) Damper

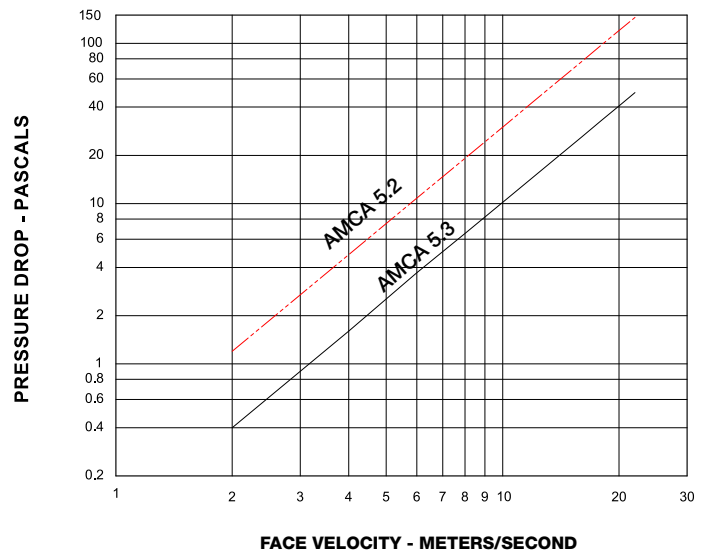
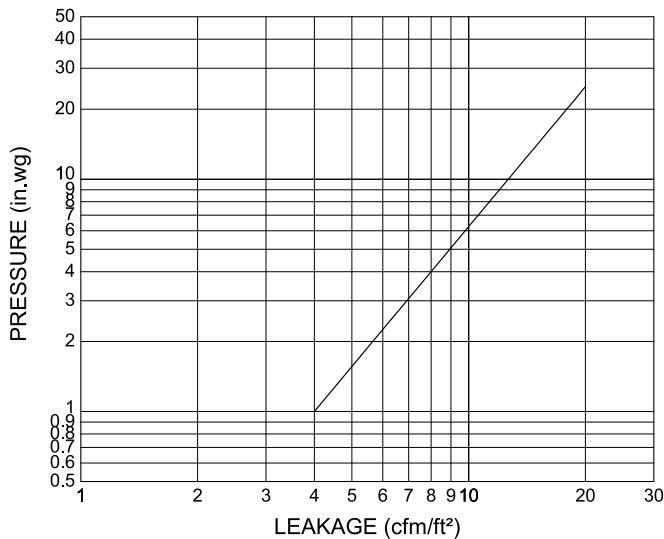


Figure 5.2:  $\log(P) = 2 \cdot \log(V) - .522991$   
Figure 5.3:  $\log(P) = 2 \cdot \log(V) - .992669$

## Leakage Data

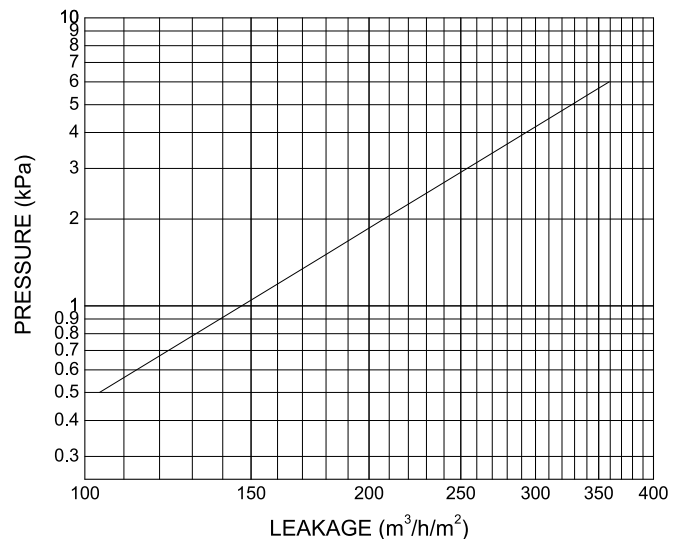
Damper leakage (with blades fully closed) varies based on the type of low leakage seals applied. Leakage testing was conducted in accordance with AMCA Standard 500-D and is expressed as CFM per sq. ft. of damper face area. All data has been corrected to represent standard air at a density of .075 lb./ft<sup>3</sup> (1.2 kg/m<sup>3</sup>).

**Leakage (english version)**  
42 in. x 42 in. (1067mm x 1067mm) Damper



$$\text{Log (leakage)} = 0.5 * (\text{log (pressure)} + 1.20412)$$

**Leakage (metric version)**  
42 in. x 42 in. (1067mm x 1067mm) Damper



$$\text{Log (leakage)} = 0.5 * (\text{log (pressure)} + 4.332098)$$

## Specifications

Industrial grade control dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules.

Dampers shall consist of: a 12 ga. (2.7mm) galvanized steel channel frame with 12 in. (305mm) minimum depth and 2 in. (51mm) flanges; double skin airfoil type blades fabricated from two layers of 12 ga. (2.7mm) galvanized steel; 3/4 in. (19mm) dia. plated steel axles turning in oil impregnated sintered stainless steel bearings press-fit into frame; and external (out of the airstream) blade-to-blade linkage. Blade seals shall be mechanically fastened silicone rubber and jamb seals shall be flexible stainless steel.

Damper manufacturer's printed application and performance data including pressure, velocity and temperature limitations shall be submitted for approval showing damper suitable for pressures to 24 in. wg (6 kPa), velocities to 4000 fpm (20.3 m/s) and temperatures to 482°F (250°C). Testing and ratings to be in accordance with AMCA Standard 500-D.

Dampers shall meet the requirements of NFPA-130, NFPA-502 and remain fully operational after exposure to a temperature of 482°F (250°C) for a minimum of 1 hour.

Basis of design is Greenheck model HTD-630.

