IP-2R

ARROW INDUSTRIAL PRODUCTS

For Applications in Industrial, Power Plant & Commercial Projects

ARROW UNITED INDUSTRIES

ARROW UNITED INDUSTRIES has specialized in the manufacturing of air control products for over 35 years. We have grown with exposure to state-of-the-art technology and the most advanced methods of manufacturing. This is reflected in Arrow United's quality products. This publication describes various types of our standard industrial products designed to meet special conditions of temperature, pressure, velocity, and system environment.

Arrow United is willing to work closely with engineers for any specific applications. Our staff is ready to assist you in meeting your requirements.

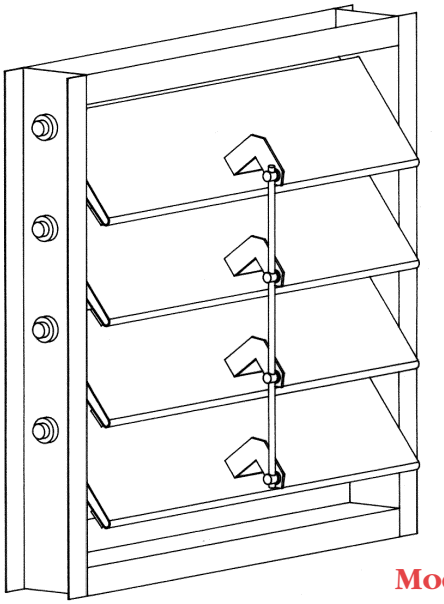
Heavy Duty Backdraft Dampers

These heavy duty dampers are designed to permit air flow in one direction at a specified pressure and to prevent a reverse air flow. Field-adjustable counterweights are available for pre-determined opening pressures.

Model 400 - "Tear Drop" Design.
To 10" wg Static Pressure at 6000 fpm.

STANDARD SPECIFICATIONS

Frame:	14 gauge galvanized steel when neither width nor height exceed 18". 10 gauge galvanized steel when either width or height exceeds 18".
Blades:	16 gauge galvanized steel.
Bearings:	Bronze Oilite.
Axle:	¾" diameter steel.
Linkage:	Single for panels under 20" wide. Double for panels over 20" wide.
Seals:	Polyurethane. Special seals on blades and jambs may be added for low leakage.
Counterweights:	Adjustable. To assist or resist opening. (Optional)
Maximum Temp.:	250°F.

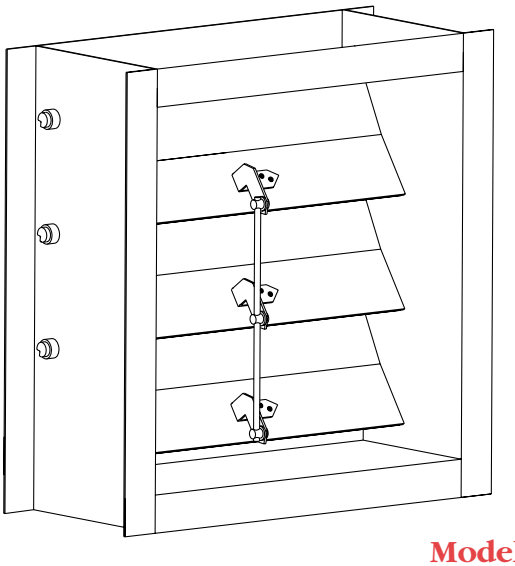


Model 400

Model 900 - "Tear-Drop" Design
For Extra Heavy-Duty Applications.

STANDARD SPECIFICATIONS

Frame:	2" x 10" x 2" - 12 gauge galvanized steel channel.
Blades:	6" wide, extruded aluminum
Bearings:	Ball bearings pressed into frame.
Axle:	¾" diameter steel, with positively locked to blade.
Linkage:	Plated steel.
Seals:	Silicone seals on blade ends. None at jambs.
Counterweights:	Adjustable, to assist or resist opening.



Model 900

PERFORMANCE DATA (dampers with assist counterweights)

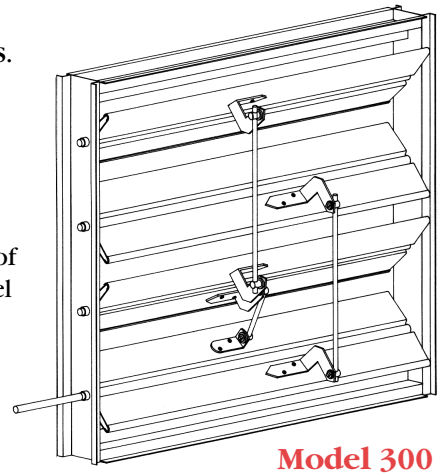
	WITHOUT DUCT				WITH DUCT			
	START OPEN		FULL OPEN		START OPEN		FULL OPEN	
MODEL	FACE VELOCITY	PRESSURE DROP	FACE VELOCITY	PRESSURE DROP	FACE VELOCITY	PRESSURE DROP	FACE VELOCITY	PRESSURE DROP
400	100 fpm	.20" wg	5000 fpm	5.8" wg	30 fpm	.10" wg	5000 fpm	1.5" wg
900	100 fpm	.05" wg	3500 fpm	2.4" wg	150 fpm	.05" wg	3500 fpm	.40"wg

Heavy Duty Dampers

Model 300 : To 12" wg Static Pressure
Reduction in blade lengths increases static pressure limits.

SPECIFICATIONS

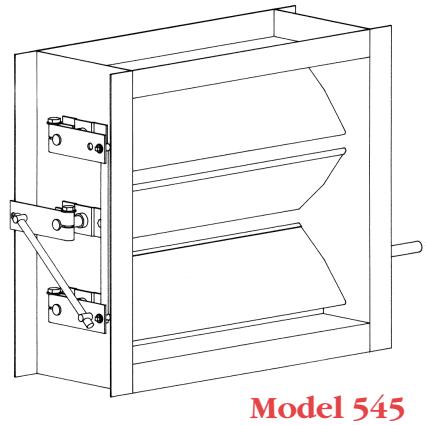
Frame:	16 gauge galvanized steel, 4" deep "Hat Shaped" frame.
Blade:	16 gauge galvanized steel airfoil - 8" wide max.
Shaft:	½" diameter plated steel shaft full length.
Bearings:	Stainless steel flanged sleeve, press fit into frame.
Linkage:	Face mounted, Located in the airstream. Formed bracket of ⅛" thick steel. Trunnion is a machined pivot of plated steel with a 5/16" diameter rod.
Operator:	6" Extended shaft.
Finish:	Mill.
Max. Temperature:	250°F. For temperature above 250°F, consult factory.
Max. Panel Size:	48" x 72" - "Hat-Shaped" frame. 48" x 96" - Channel frame.
Min. Panel Size:	12" x 8" Single blade. 12" x 12" Opposed.



Model 300

Model 545: To 10" wg Static Pressure
Fan Discharge Damper
For Clean Air Applications only.

8" wide, .080" extruded aluminum Arrow - Foil blade. 2" x 10" x 2" heavy duty, steel formed channel frame. Maximum temperature to 400°F.



Model 545

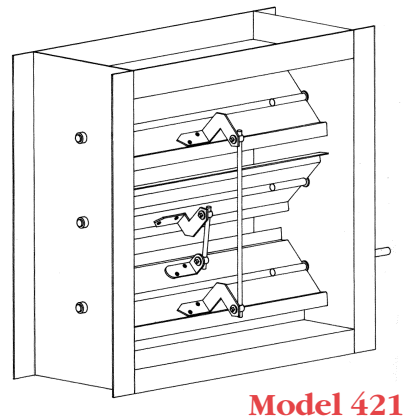
Model 421: To 6" wg Static Pressure at 2500 fpm

Model 422: To 8" wg Static Pressure at 2500 fpm

Model 423: To 10" wg Static Pressure at 2500 fpm
Velocities above 2500 to 4000 fpm (max.) require a double set of face linkage.

STANDARD SPECIFICATIONS

Frame:	2" x 10" x 2". Heavy duty galvanized, formed channel frame.
Blades:	Maximum 9¾"; minimum 6¾". Heavy duty galvanized, pressure formed single thickness.
Bearings:	Bronze oilite flanged sleeve pressed into frame.
Shafts:	Corrosion - resistant. Plated cold finished steel ½" or ¾" diameter.
Linkage:	Heavy duty, ⅛" steel brackets; machined pivots of plated steel.
Operator:	Manual or motor.
Max. Temperature:	250°F



Model 421

SELECTED PERFORMANCE DATA

MODEL	DAMPER WIDTH	SYSTEM PRESSURE	SYSTEM VELOCITY	PRESSURE DROP FULL OPEN	LEAKAGE WITH SEALS CFM / SQ. FT.
300	48"	12"	4,000 FPM	.50" wg	25.2
545	60"	10"	4,000 FPM	.42" wg	15.0
421,422,423	48"	10"	2,500 FPM	.28" wg	30.1

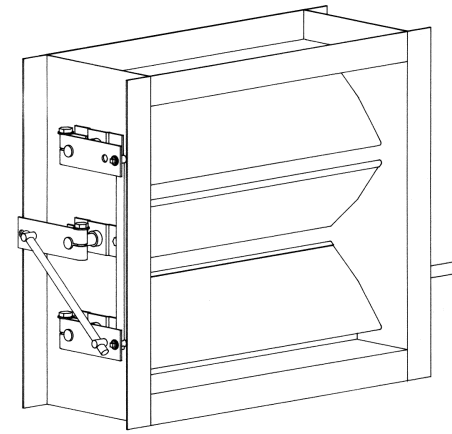
Dampers may be constructed of other than standard materials when required to meet special conditions.
For options and detailed specifications, see individual data sheets.
Reducing blade length will increase static pressure limits.

Heavy Duty Dampers

Model 530: To 12" wg Static Pressure
Model 531: To 20" wg Static Pressure

STANDARD SPECIFICATIONS

Frame:	2" x 10" x 2". Heavy duty galvanized, formed channel frame.
Blades:	Maximum 9¾"; minimum 6". Heavy duty galvanized, air- foil.
Bearings:	Stainless steel flanged sleeve, bolted to frame.
Shafts:	Corrosion - resistant. Plated cold finished steel.
Linkage:	Located in jamb. ½" diameter inter - connecting rod with trunnion pivot fastener.
Operator:	Manual or motor.
Max. Temperature:	450°F. (For temperatures above 450°F, consult factory.)

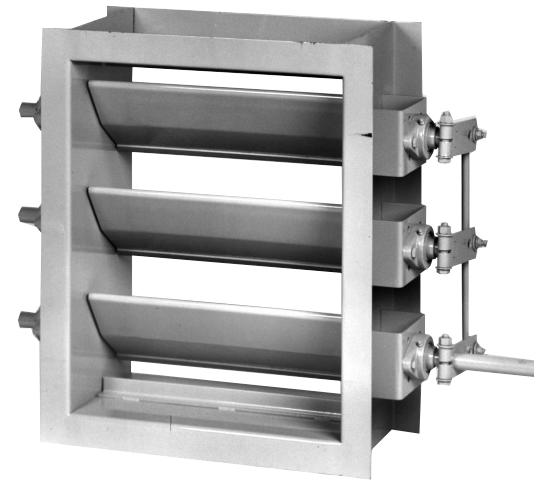


Model 530 / 531

Model 540: To 15" wg Static Pressure
Temperatures to 800°F.

STANDARD SPECIFICATIONS

Frame:	2" x 10" x 2". Heavy duty steel formed channel frame.
Blades:	Maximum 9¾"; minimum 6". Heavy duty steel, air - foil.
Bearings:	Ball bearings mounted on stand-off bracket.
Shafts:	Cold finished steel, 1" diameter.
Linkage:	Located in jamb. ½" diameter inter-connecting rod with trunnion pivot fastener.
Operator:	Manual or motor.
Max. Temperature:	800°F. (For temperatures above 800°F, consult factory.)



Model 540

PERFORMANCE DATA (48" x 48" DAMPER)

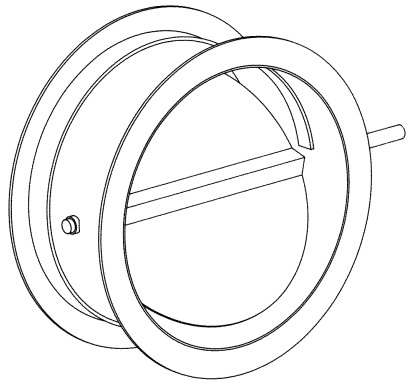
MODEL	DAMPER WIDTH	SYSTEM PRESSURE	SYSTEM VELOCITY	PRESSURE DROP FULL OPEN	LEAKAGE WITH SEALS - CFM PER SQ. FT.
530	60"	1"	4,000 fpm	.30" wg	5.5
	60"	4"	4,000 fpm	.30" wg	12.6
	60"	8"	4,000 fpm	.30" wg	19.8
	60"	12"	4,000 fpm	.30" wg	28.0
531	60"	1"	4,000 fpm	.30" wg	4.8
	60"	5"	4,000 fpm	.30" wg	10.6
	60"	10"	4,000 fpm	.30" wg	15.4
	60"	15"	4,000 fpm	.30" wg	18.8
	60"	20"	4,000 fpm	.30" wg	21.7

Reducing blade length will increase static pressure limits.

Heavy Duty Round Dampers

STANDARD SPECIFICATIONS

Frame:	Fabricated steel channel. Channel depth equal to blade diameter of 10" or less.
Blade:	Single thickness with reinforcing gussets welded to blade parallel to air flow as required.
Shaft:	Plated steel continuous length welded to blade.
Bearing :	Sintered stainless steel flanged sleeve pressed in the frame.
Stop:	¼" x ¼" metal bar for sizes to 12" diameter. ¼" x ½" metal bar beyond 12" diameter to 48" shall be welded to interior perimeter of frame.
Operator:	Extended shaft 6" long beyond frame flanges.
Finish :	Mill / galvanized / zinc rich touch up.
Minimum:	6" diameter.
Maximum:	48" diameter.
Max. Temperature:	250°F. (Consult factory for higher temperature requirements.)



Model 580-R / 581-R

Model 580 - R - Max S.P 12"wg

INSIDE DIAMETER		FRAME		BLADE THICKNESS	SHAFT DIA.
ABOVE	THROUGH	DEPTH	FLANGE		
6"	12"	10 GA.	1" x 11 GA. to 6" dia. 1 ⅛" x 11 GA. to 8" dia. 1 ¼" x 11 GA. to 9" dia. 1 ⅜" x 11 GA. to 10" dia. 1 ½" x 11 GA. to 12" dia.	12 GA.	½"
12"	24"	10" 10 GA.	1 ½" x 1 ½" x 3/16" to 24" dia.	10 GA.	¾"
24"	48"	10" 10 GA.	1 ½" x 1 ½" x 3/16" to 26" dia. 2" x 2" x 3/16" above 26" dia. to 48" dia.	10 GA. to 36" dia.	1"
				10 GA. w/ 2 gussets to 48" dia.	

Model 581-R
Low Leakage Configuration

Model 581 - R - Max. S.P 20" wg

INSIDE DIAMETER		FRAME		BLADE THICKNESS	SHAFT DIA.
ABOVE	THROUGH	DEPTH	FLANGE		
6"	10"	10 GA.	1" x 11 GA. to 6" dia. 1 ⅛" x 10 GA. to 8" dia. 1 ¼" x 10 GA. to 9" dia. 1 ⅜" x 10 GA. to 11" dia. 1 ½" x 10 GA. to 12" dia.	10 GA.	½"
10"	12"	10" 10 GA.		10 GA.	¾"
12"	24"	10" 10 GA.	1 ½" x 1 ½" x 3/16" to 24" dia.	7 GA.	1"
24"	36"	10" 10 GA.	1 ½" x 1 ½" x 3/16" to 24" dia. 2" x 2" x 3/16" above 26" dia.to 48" dia.	7 GA. w/ 2 gussets	1"
36"	48"			7 GA. w/ 3 gussets	

PERFORMANCE DATA (48" DIA. DAMPER SIZE)

DAMPERS WITH LOW LEAKAGE SYSTEM

MODEL	DAMPER WIDTH	SYSTEM PRES.	SYSTEM VELOCITY	PRES. DROP FULL OPEN	LEAKAGE CFM / SQ
580-R	48"	1"	4,000 fpm	.05" wg	.0005"
	48"	4"	4,000 fpm	.05" wg	.18"
	48"	8"	4,000 fpm	.05" wg	.24"
581-R	48"	1"	7,000 fpm	.18" wg	.0005"
	48"	5"	7,000 fpm	.18" wg	.20"
	48"	10"	7,000 fpm	.18" wg	.27"
	48"	15"	7,000 fpm	.18" wg	.34"

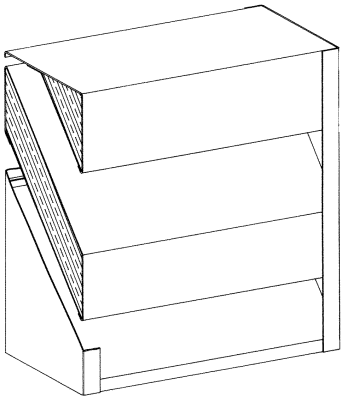
Construction may be with other than standard materials when required to meet special conditions as temperature, pressure, velocity, system environment or other specifications.

Acoustical Louvers

Model FS - 401

(LF / HF)
Formed Steel

45° STATIONARY
4" deep



SPECIFICATIONS

Frame:	16 GA. galvanized steel - 4" deep
Blade:	18 GA. galvanized steel on exterior with 22 GA. galvanized perforated steel on interior surface. Approximate blade centers 7½".
Insulation:	Arrow sound insulation.
Screen:	½" SQ. mesh, 19 GA. galvanized (.041"), when indicated.
Construction:	Riveted and or welded, with head, sill, and blades contained within jambs.
Finish:	Mill.
Min. Panel Size:	12" x 18".

Max. Single Panel Size: 60" x 96".

The Arrow Model FS - 401 acoustical louver low frequency and high frequency sound performance data is presented in two separate tables. Review the appropriate table and select the attenuation value for the design noise criteria corrective action required.

Model FS - 401 - LF (Low Frequency)

OCTIVE BAND / FREQUENCY	1 / 63	2 / 125	3 / 250	4 / 500	5 / 1000	6 / 2000	7 / 4000	8 / 8000
FREE FIELD OF NOISE REDUCTION (db)	12	14	12	12	9	11	13	15

Model FS - 401 - HF (High Frequency)

OCTIVE BAND / FREQUENCY	1 / 63	2 / 125	3 / 250	4 / 500	5 / 1000	6 / 2000	7 / 4000	8 / 8000
FREE FIELD OF NOISE REDUCTION (db)	8	7	9	10	14	16	16	18

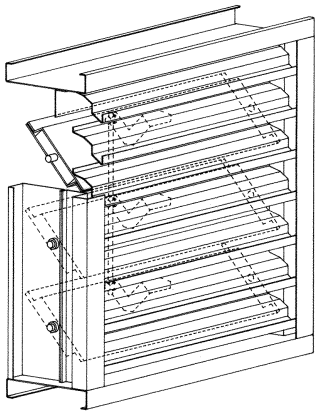
Operators

A variety of operators to meet the requirements of heavy duty applications is readily available. They include manual, electric, pneumatic and hydraulic operators. Functions can be as simple as two - position, spring return or very complex, modulating fail safe operation. Accessories such as auxiliary switches, maintenance lock outs or remote position indication can be incorporated. Users of industrial Dampers have learned to rely on our experience in providing actuators mounted and linked to dampers. We will recommend to you a damper - actuator system coordinated to survive the end - use environment.

Arrow United makes an extensive line of Commercial Dampers which can be used in light industrial applications.

Model FL - 700

Formed Steel Louver
Combination adjustable and stationary
7" deep - insulated / acoustical blade.



SPECIFICATIONS

Frame:	16 GA. galvanized steel.
Blades:	Stationary blade is 18 GA. galvanized steel. Adjustable blade is 18 GA. galvanized steel double thickness, 1" thick with 8 lb. density mineral wool insulation sandwiched between metal skins separated by a thermal break, mechanically fastened together.
Face of Louver:	Full head and sill with blade and jambs contained within.
Linkage:	Brackets are 12 GA. zinc plated steel, pivots are .50" dia. machined steel, zinc plated and chromate treated. Pivots rotate in a celcon bearing. A .312" dia. aluminum linkage rod is locked to the pivot by a ¼ - 20 set screw with an epoxy locking patch.
Seals:	Neoprene adhesive applied to blade edges and jambs.
Shafts:	½" diameter plated steel stub.
Bearings:	½" bore oilite bronze flanged sleeve, press fit into frame.
Screens:	Secured to the exterior.
Bird Screens:	½" SQ. mesh 19 GA. galvanized steel (.041") ½" flattened aluminum (.051").
Insect Screen:	18/16"mesh (.011" dia.).
Finish:	Mill.
Louver Sizes:	12" x 14" Minimum, 48" x 96" Maximum.

Louvers shall have (45%), 7.26 SQ. FT free area for a size 48"x 48" with a water penetration at .01 ounce per SQ. FT of free area at a free area velocity of 825 fpm (5989 cfm), with .11" water gauge pressure drop for intake.
Acoustical Valves For Noise Reduction Shall Not Be Less Than:

63	125	250	500	1000	2000	4000	8000
9	8	7	8	10	15	15	16

And provide a "U" .26 BTU per hour per SQ. foot per degree F° thermal characteristics.

In the interest of product improvement Arrow reserves the right to make changes without notice.
Arrow United products are marketed through an extensive network of Manufacturer's Representatives. Call our office for the one nearest you.

ARROW UNITED INDUSTRIES
314 Riverside Drive
Wyalusing, PA 18853
(570) 746-1888 FAX: (570) 746-9286
Check our website for other products.
arrowunited.com