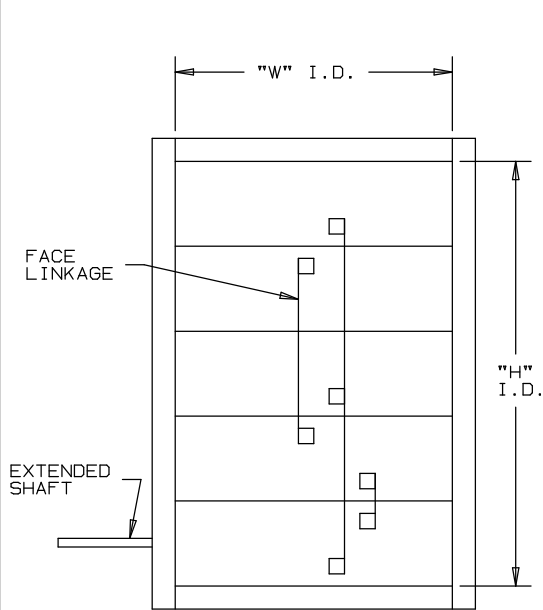


# ARROW INDUSTRIAL DAMPER FOR PROCESS-CONTROL

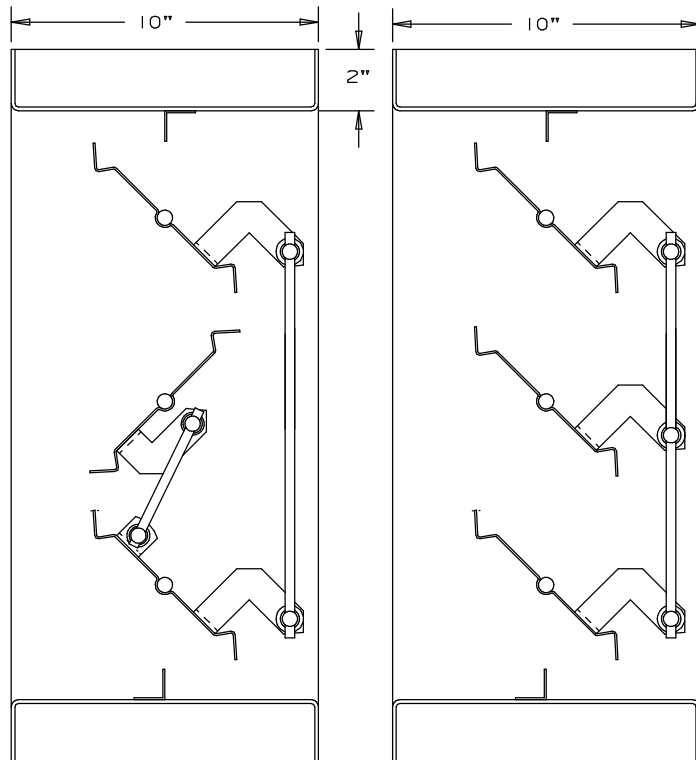
# MODEL 421

FOR USE UP TO 6" W.G. STATIC PRESSURE @ 2500 F.P.M.



OPPOSED BLADE OPERATION SHOWN,  
PARALLEL BLADE OPERATION AVAILABLE

FOR PERFORMANCE DATA  
- SEE REVERSE SIDE



OPPOSED BLADES

PARALLEL BLADES

NOT TO SCALE

VELOCITIES ABOVE 2500 FPM TO  
4000 FPM MAXIMUM SHALL REQUIRE  
A DOUBLE SET OF FACE LINKAGE

SEE PRICE LIST FOR OPTIONAL EXTRAS

### OPTIONAL EXTRAS

CONSTRUCTION MAY BE WITH OTHER THAN  
STANDARD MATERIALS WHEN REQUIRED TO  
MEET SPECIAL CONDITIONS AS TEMPERATURE,  
PRESSURE, VELOCITY, SYSTEM ENVIRONMENT  
OR OTHER SPECIFICATIONS.

LISTED BELOW ARE SOME OPTIONS USED FOR  
THE MORE COMMON TYPES OF APPLICATIONS.

1. NEOPRENE BLADE EDGE SEALS
2. STAINLESS STEEL JAMB SEALS
3. FLANGES OTHER THAN STANDARD  
(2") UP TO 3 1/2"
4. PAINTED FINISHES
5. PERIMETER HOLES-ONE FLANGE
6. PERIMETER HOLES-BOTH FLANGES
7. OTHER MATERIALS
8. EXTERNAL LINKAGE
9. OTHER BEARINGS



### STANDARD SPECIFICATIONS

FRAME: 2"x10"x2" - 12 GA. GALVANIZED STEEL FORMED  
CHANNEL FRAME, MECHANICALLY FASTENED  
TOGETHER.

BLADE: 12 GA. GALVANIZED PRESS FORMED SINGLE  
THICKNESS TO MAXIMUM 48" LENGTH, WELDED TO  
SHAFT. BLADE WIDTH - MAXIMUM 9 3/4",  
MINIMUM 6 3/4"

SHAFTS: CORROSION RESISTANT, PLATED COLD FINISHED  
STEEL STUB: 1/2" DIA. TO 48" LENGTH.  
DRIVE BLADE TO BE CONTINUOUS LENGTH.

BEARINGS: BRONZE OILITE FLANGED SLEEVE PRESSED  
INTO FRAME.

LINKAGE: CHEVRON TYPE FORMED BRACKET OF 1/8" THICK  
STEEL. TRUNNION IS A MACHINED PIVOT OF  
PLATED STEEL WITH A 5/16" DIAMETER ROD.

FINISH: FACTORY MILL.

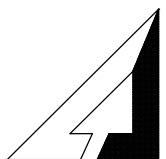
MAXIMUM TEMPERATURE: 250°F

MAXIMUM PANEL SIZE: 48" x 96" I.D. OF DAMPERS  
WITHOUT SEALS

48" x 72" I.D. OF DAMPERS

WITH SEALS

MINIMUM PANEL SIZE: 6" x 6 3/4" I.D. (SINGLE BLADE)  
6" x 15" I.D. (OPPOSED BLADES)



ARROW UNITED INDUSTRIES  
A DIVISION OF MESTEK, INC.

314 RIVERSIDE DRIVE  
WYALUSING, PA 18853

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WEB ADDRESS: WWW.ARROWUNITED.COM

AGENT: \_\_\_\_\_

ARCH./ENG.:

CONTR.:

PROJECT:

EDR: ECN: JOB:

DATE: DWN.: DWG.:

# ARROW MODEL 421 INDUSTRIAL DAMPER PERFORMANCE DATA

**LEAKAGE :**

AIR LEAKAGE QUANTITIES SHOWN IN THE CHART ARE RESULTS OF TESTS PER AMCA STANDARD 500 AND ARE SHOWN AT 1" W.G. DIFFERENTIAL PRESSURE AND CORRECTED TO .075 LB./CU.FT. AIR DENSITY.

**AIR LEAKAGE (TOTAL C.F.M.)**

		DAMPER WIDTH (INCHES)						
		12"	18"	24"	30"	36"	42"	48"
DAMPER HEIGHT (INCHES)	12"	7	10	13	17	20	23	27
	24"	13	20	27	33	40	47	54
	36"	20	30	40	50	60	70	80
	48"	27	40	54	67	80	94	107
	60"	33	50	67	84	100	117	134
	72"	40	60	80	100	121	141	161

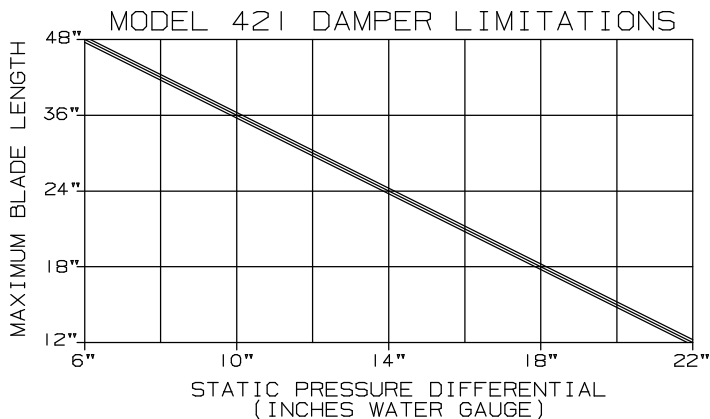
FOR DETERMINING LEAKAGE VALUES GREATER THAN 1" W.G. TO A MAXIMUM OF 6" W.G. USE THE MULTIPLIER CORRECTION CHART BELOW.

STATIC PRESSURE (IN)	2	3	4	5	6
MULTIPLIER CORRECTION FACTOR	1.4	1.7	2.1	2.5	2.8

AIR LEAKAGE RATINGS ARE BASED ON AMCA STANDARD 500 USING TEST SET UP 5.4 WITH A DAMPER CLOSING TORQUE APPLIED TO THE DAMPER OF 20 IN.LBS./SQ.FT. OF DAMPER AREA FOR A SIZE 48" x 72", WITH A MINIMUM OF 40 IN.LBS./SQ.FT. OF DAMPER AREA FOR A SIZE 48" x 6 3/4"

DAMPER AIR LEAKAGE SHOWN IS BASED UPON PUBLISHING ONLY THE MOST CONSERVATIVE LEAKAGE RESULTS FOR THE ARROW MODEL 421 INDUSTRIAL DAMPER FOR AN ENTIRE RANGE OF DAMPER SIZES.

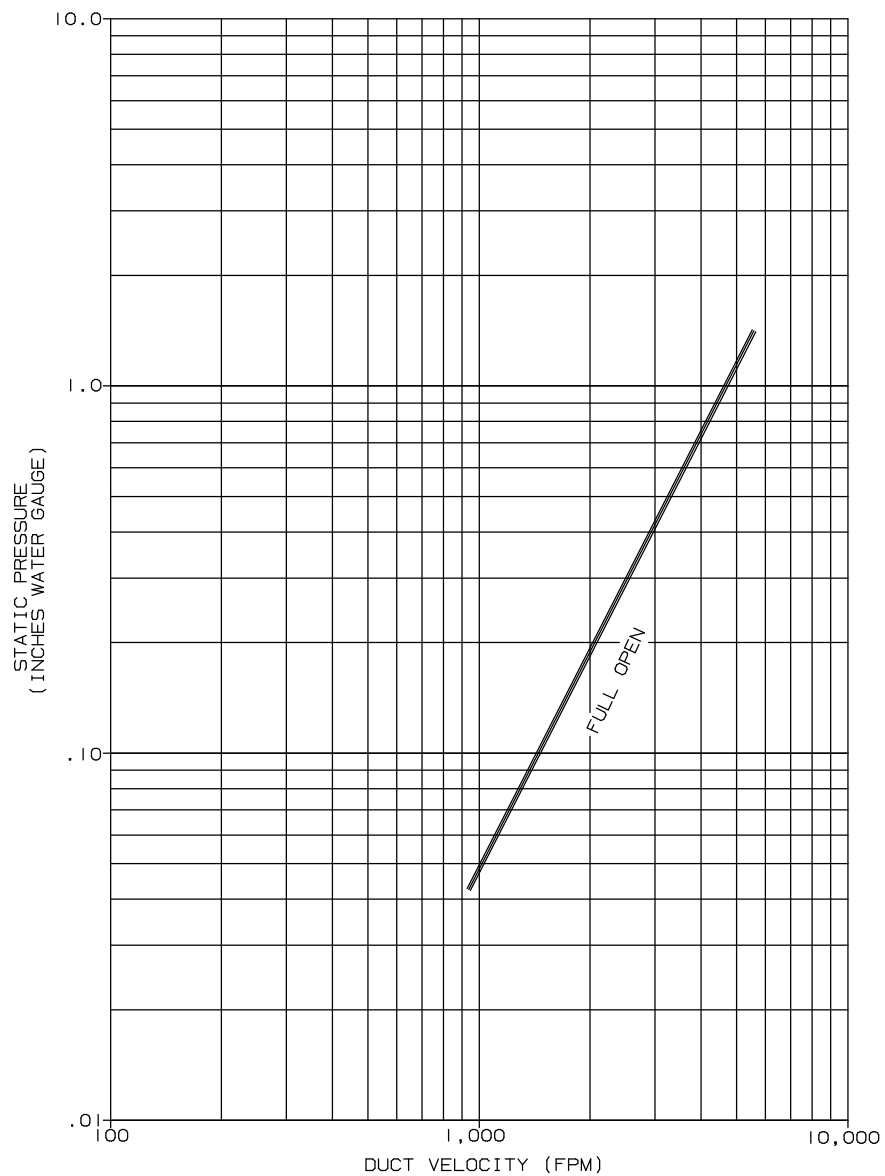
TO ENSURE PROPER DAMPER OPERATION AND AIR LEAKAGE PERFORMANCE FOR THIS DAMPER DESIGN, THE STATIC PRESSURE/BLADE LENGTH LIMITS SHOWN PROVIDE THE USER WITH THIS INFORMATION AND IN ADDITION PROVIDES A REALATIONSHIP BETWEEN DAMPER COST AND THE APPLICATION.



THE MODEL 421 DAMPER DESIGN AT A BLADE LENGTH OF 48" HAS A MAXIMUM ALLOWABLE BLADE DEFLECTION OF L/360 FOR THE STATIC PRESSURE INDICATED ON THE CHART. AT REDUCED BLADE LENGTHS HIGHER STATIC PRESSURE LIMITS CAN BE ATTAINED WITHOUT SACRIFICING DAMPER OPERATING AND PERFORMANCE CHARACTERISTICS.

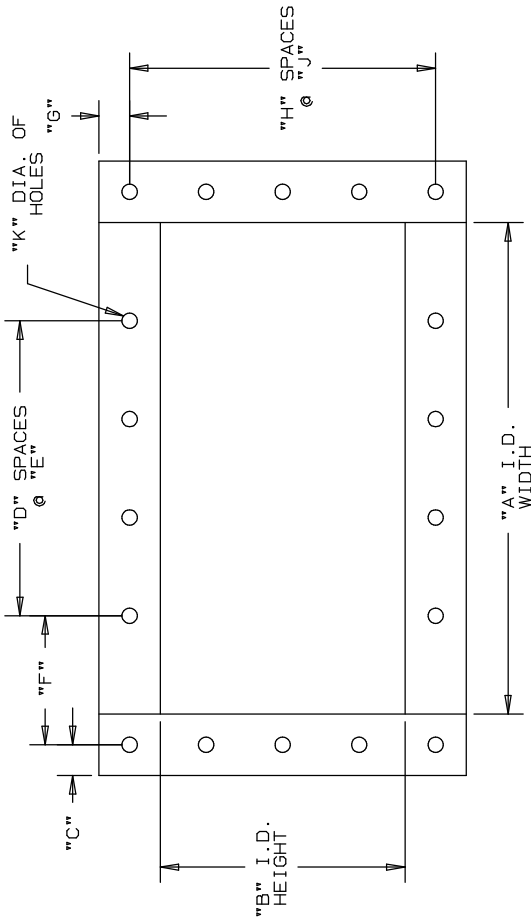
# ARROW MODEL 421 INDUSTRIAL DAMPER PERFORMANCE DATA

ARROW MODEL 421 (OPPOSED BLADE) 42" x 42" I.D.  
PRESSURE DROP vs. DUCT VELOCITY



PRESSURE DROP CURVES LISTED ARE BASED ON AMCA 500, USING  
TEST SET UP FIGURE 5.3 FOR DAMPER INSTALLED WITH DUCT UPSTREAM AND  
DOWNSTREAM. STATIC PRESSURES ARE CORRECTED TO .075 LB./CU. FT.  
AIR DENSITY.

NOTES:



ITEM	QUANTITY	PARALLEL	OPPOSED	"A" I.D. (WIDTH)	"B" I.D. (HEIGHT)	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"L"	"M"	HAND QUADRANT	MOTOR LEVER ARM	VARIATIONS

SHIP TO: \_\_\_\_\_ INVOICE TO: \_\_\_\_\_ PURCHASE ORDER: \_\_\_\_\_

MARK SHIPMENT: \_\_\_\_\_

SEND ORDER TO:

**ARROW UNITED INDUSTRIES**  
 A DIVISION OF MESTEK, INC.  
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