

Making

DURO DYNE

Multi-Blade Dampers

USE DURO-BLADE KIT^{T.M.} Pat. No. 2,863,374 For Parallel Dampers

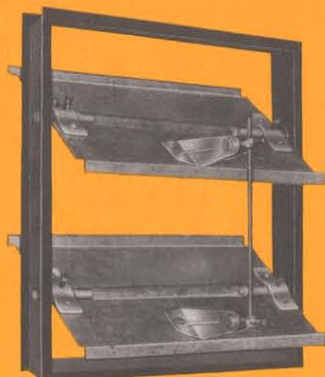
assemble quality dampers . . .
in less time . . . for less money

Unique 4-way self-adjustability of Duro-Dyne Blade Kits prevents binding, drastically reduces assembly time.

The Duro-Dyne Blade Kit, with patented "Neva-Bind" feature, allows connecting rod to remain straight regardless of any inaccuracies of damper construction. As a result,

- Smoothest damper each time.
- Greatly reduced assembly time.
- Substantial cut in damper cost.

The main cause of louver damper binding is inaccuracy in construction or assembly. Any such inaccuracy causes connecting rod to bend, making smooth operation difficult. Duro-Dyne's Neva-Bind Blade Kit automatically compensates for these inaccuracies, permits damper assembly with minimum care, no alignment afterward. Smooth operation is assured every time.



ORDERING INFORMATION & CHECK LIST

ALL DAMPERS

- ☐ Channels — Determine lengths from print.
- ☐ Blade Material — see print for quantity.
- ☐ Corner Brace Material — ($\frac{1}{2}$ " x $\frac{1}{8}$ " strap) or ($\frac{1}{4}$ " rod) or ($\frac{3}{8}$ " rod).
- ☐ End Stops — If needed.
- ☐ Felt for End Stops — If needed.

PARALLEL DAMPERS ONLY

- ☐ 1 DURO-BLADE Kit for each blade (1 Duro-Blade Kit includes all hardware required for 1 parallel blade).
Code BK-1 ($\frac{3}{16}$ " Pins and Bushings supplied).
Code BK-2 ($\frac{1}{2}$ " Pins and Bushings supplied).
- ☐ If double linkage required, add: 1 Duro-Bracket (BKP-814) for each blade.
- ☐ $\frac{1}{4}$ " Rod (Hot or Cold-Rolled) as required.

New Concept in Opposed Action Damper Construction

USE "OPAX"^{T.M.} BLADE KIT Pat. No. 2,863,374 For Opposed Action Dampers

Featuring Duro-Dyne's Exclusive Neva-Bind*
Action with 4-Way Self-Adjustability

Opposed Action Dampers are preferred by engineers. Turbulence is minimized . . . control of air more linear. Now you can build the finest dampers as easily as the conventional parallel blade type.

"OPAX" LINKAGE SET IS COMPLETE. Includes two brackets plus specially pre-assembled linkage rod.

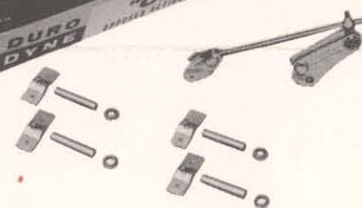
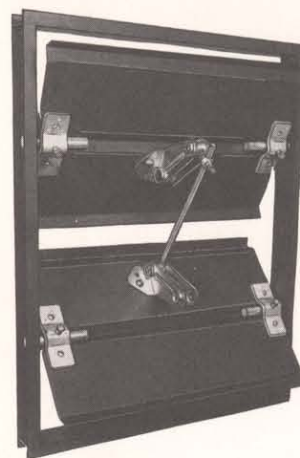
THIS ONE SET IS USED to provide perfect opposed action of damper blades 5 inches and wider.

INSTALLATION IS SIMPLE. Eliminates complicated calculation and layout.

NO STANDS or other auxiliary devices necessary.

EXCLUSIVE NEVA-BIND 4-Way Self-Adjustability automatically compensates for construction inaccuracies, thus assuring smooth, bind-free operation at all times.

RUGGED, HEAVY DUTY construction of the "OPAX" Linkage Set makes it suitable for largest commercial and industrial damper construction.



OPPOSED DAMPERS ONLY

- ☐ 1 "OPAX" Damper Kit ($\frac{1}{8}$ "-BKO-3, $\frac{1}{2}$ "-BKO-4) for each pair of damper blades (disregard odd blade, if it exists).
- ☐ 1 Duro-Bracket (BKP-814) for each "OPAX" set ordered (above). (disregard for 2-blade damper).
- ☐ If odd number of blades in damper: order 1 Duro-Blade Kit (BK-1 or BK-2) for each damper.
- ☐ If double linkage is used, add also for each of above you have ordered:
"OPAX" Kit — 1 "OPAX" Linkage Set (BKP-22 & BKP-23)
1 "Duro-Bracket" (BKP-814)
Duro-Blade Kit — 1 Duro-Bracket (BKP-814)
- ☐ $\frac{1}{4}$ " Rod as required.

MAKING THE FRAME

(Same for both parallel and opposed dampers)

1. Cut channel for frame $\frac{1}{4}$ " less than duct size, for clearance.

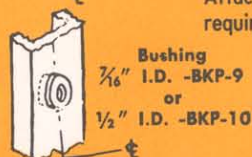
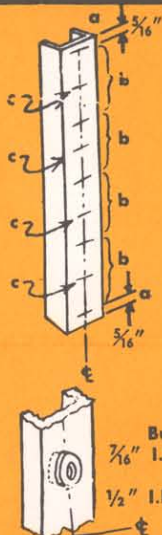
2. SIDES:

- Mark off $\frac{3}{16}$ " from each end.
- Divide section inside these marks into as many parts as blades required.
- Mark for pivot at center of each blade section (b)).
- Drill or punch a $\frac{3}{16}$ " hole at each pivot (c). self-oiling bushings (tap fit.).

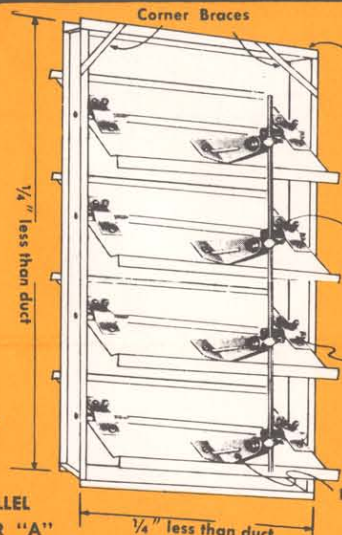
3. Weld sides and bottoms. **Keep square.**

4. On large frames weld on corner braces to keep square. Place on side of frame which will **not interfere with blade movement.**

Attach end stops if required, top and bottom. Cement felt, if required, with insulation adhesive.



PARALLEL DAMPER "A"



Channel
 $\frac{1}{2}$ " x $\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{1}{8}$ "
or
 $\frac{1}{2}$ " x $\frac{1}{2}$ " x 1 " x $\frac{1}{8}$ "

Pin
 $\frac{3}{16}$ " x $2\frac{1}{2}$ " BKP-1
or
 $\frac{1}{2}$ " x $2\frac{1}{2}$ " BKP-5

Strap
BKP-13

Duro-Bracket

$\frac{1}{4}$ " less than duct



1. MATERIAL:

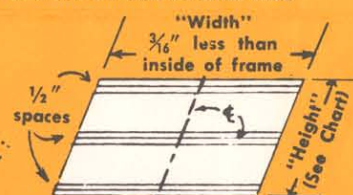
GAUGE	BLADE WIDTH	ACTIVATING BRACKETS REQUIRED PER BLADE
20	to 36"	1
16	to 48"	1 or 2
12	to 52"	2

2. CUT:

- "WIDTH" dimension $\frac{3}{16}$ " less than inside of frame.
- "HEIGHT" dimension (see chart). Chart automatically allows for approximately $\frac{7}{16}$ " "shrinkage" due to forming; approximately $\frac{1}{4}$ " blade overlap; approximately $\frac{3}{16}$ " end clearance to frame.

3. MARK:

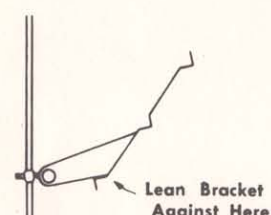
Mark as shown and bend on scribe lines.



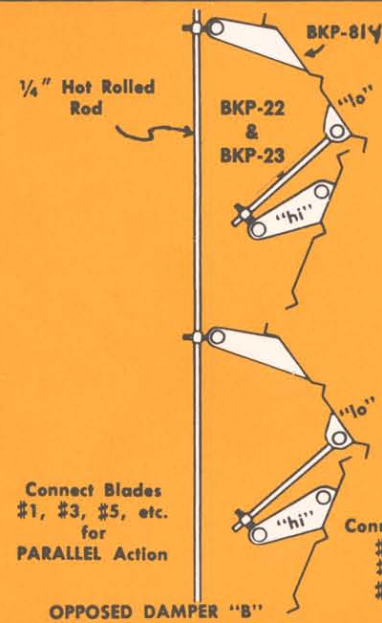
MOUNTING THE HARDWARE

PARALLEL

- Attach straps (weld, bolt or rivet).
- Attach brackets at center of blade. (see drawing "A")



Lean Bracket Against Here



Connect Blades #1, #3, #5, etc. for PARALLEL Action

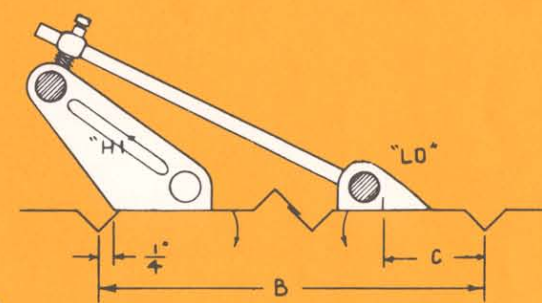
OPPOSED DAMPER "B"

OPPOSED

- Attach straps (weld, bolt or rivet).
- Attach brackets as in drawing "B". Always drive a "lo" blade, never a "hi" blade. Place brackets as follows:

DIMENSION "B"	DISTANCE "C"
5"	1"
6"	1 3/8"
7"	1 1/4"
8"	1 3/8"
9"	1 3/8"
* 10"	1 3/8"
* 11"	1 7/8"
* 12"	1 1/2"

*Use linkage rod coupling for extension.



NOTE: Always drive a "lo" blade, never a "hi"!

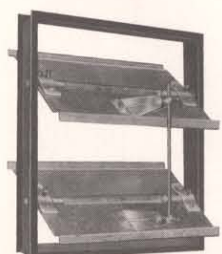
"C" is the distance from blade center to scribe mark on base of "lo" bracket.

ASSEMBLING THE DAMPER

- Lay frame flat on bench.
- Place blades inside frame in approximate required position (correct overlap, etc.)
- Place 2 bearing pins in each center blade groove.
- Slide pins under straps (loosen set-screws) and into frame. Tighten strap set-screws.

PARALLEL BLADES

- Slide $\frac{1}{4}$ " rod through each Duro-Bracket.
- With blades all in tightly closed position, tighten set-screws Duro-Brackets.



OPPOSED BLADES

- Connect opposed blades together (see drawing "B"). Do not tighten set-screws.
- Connect blades #1, 3, 5, etc., in parallel.
- With all blades in tightly closed position, tighten all set-screws.



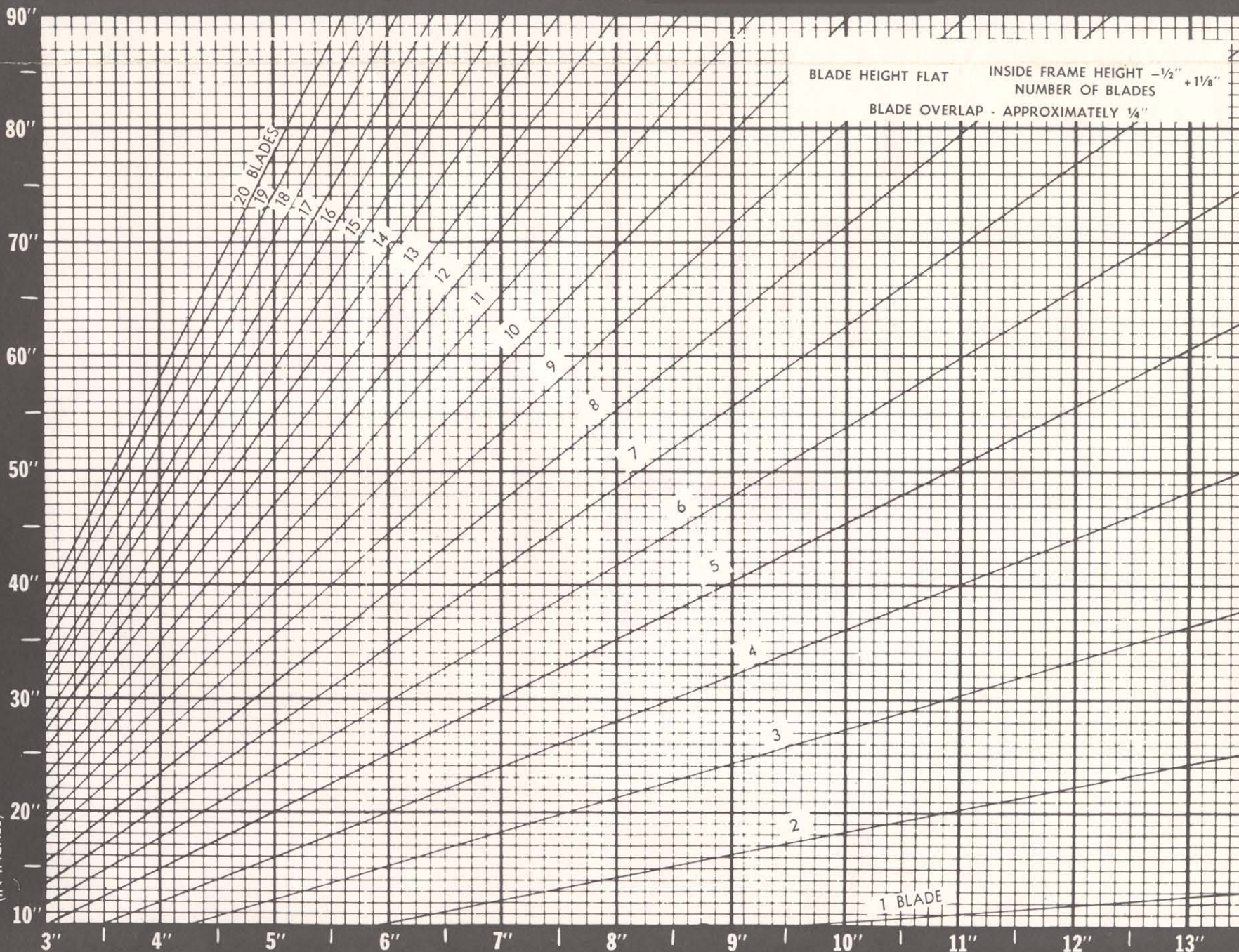
INSIDE FRAME HEIGHT

(IN INCHES)

BLADE HEIGHT FLAT

INSIDE FRAME HEIGHT $-\frac{1}{2}'' + \frac{1}{8}''$
NUMBER OF BLADES

BLADE OVERLAP - APPROXIMATELY $\frac{1}{4}''$



BLADE HEIGHT - FLAT