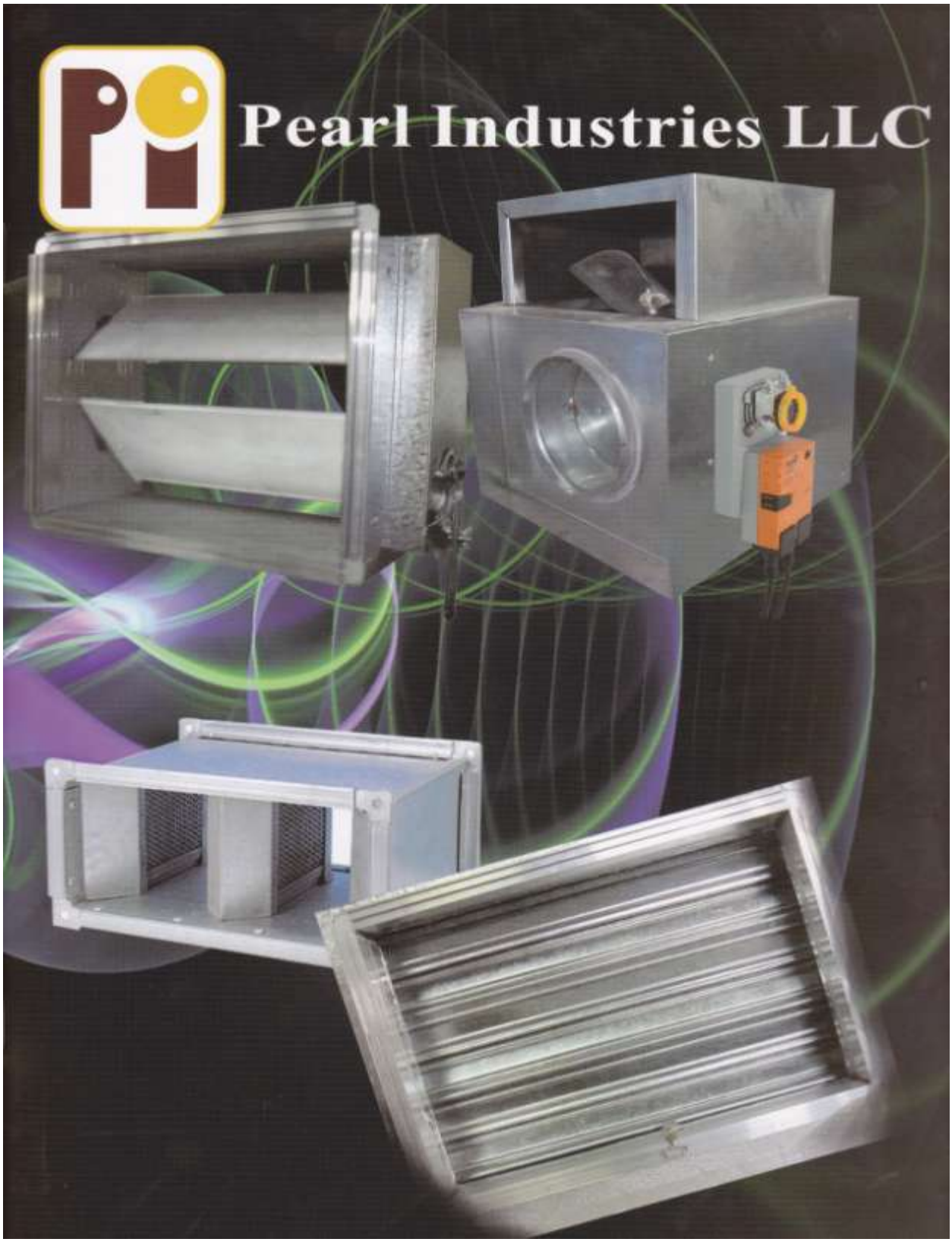
Pearl Industries LLC



INTRODUCTION

We Pearl Industries L.L.C., take this opportunity to inroduce ourselves as a leading manufacturing and trading company, operating in the Emirate of Sharjah, UAE.

As a company with diversified activities in construction and building materials, our major contribution to the air conditioning industry is the introduction of Pi Pre Insulated Duct Panels. A distributor since 2001 for pre insulated duct panels, we established our own manufactuing unit in 2004, with the brand name of Pi Pre Insulated Panels. Our range of products for the HVAC industry includes Pre Insulated Duct Panels, PIR and GI Ducts, Volume Control Dampers, Fire Dampers, Gravity Dampers, Non Return Damper, VAV's, Sound Attenuators, Access Doors, etc.

Our brand is approved by major consultants and contractors all over the GCC and is certified by the UAE Ministry of Civil Defense and Dubai Central Laboratory (DCL).

We aim to achieve customer satisfaction and long lasting relationship with our clients by providing best quality product, efficiency of service and cost competitiveness.

VOLUME CONTROL DAMPERS

Pi Volume Control Damper - Square & Rectangular

Frame: Available both in Galvanized steel 18 gauges and Polyisocyanurate 20 mm with embossed aluminium 80 microns.

Blade: Double skinned high quality aluminium aerofoil blades.

Bearing: 12mm Dia Nylon Bush.

Shaft: 12mm square Galvanized steel rod.

Linkage: 1.2mm thick galvanized steel linkage.

Quadrant: Manual Operation, locking type quadrant made of galvanized steel with full open and full shut markings.

Gasket: Black foam gasket at edges to prevent air leakage in shut off position.

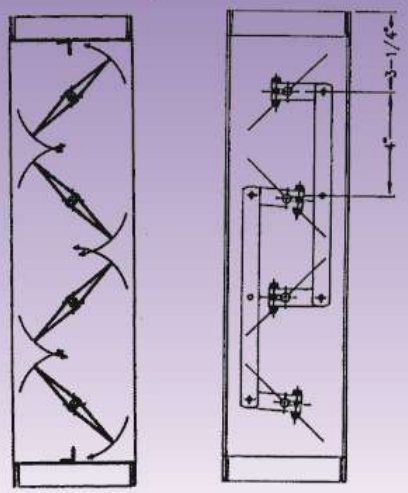
GI Round Volume Control Damper

Designed to control air volume in circular ducts, dampers are easily accessible with round duct. Casing and blades are made of galvanized steel. The blade is mounted on Nylon bushes and is manually operated with a quadrant.

VCD1 A

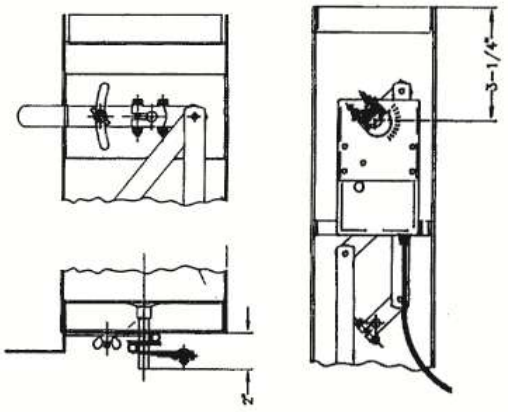
PIR frame with double skinned high quality aluminium aerofoil blade. Moving opposed blades are on 4" center. They are mounted in nylon bushes operated by an exterior linkage which allows the damper to be opened and closed with minium of air disturbance.

VCD1 A



VCD1 B

Same as VCD1A, but the frame is made of GI. The dampers are manufactured in multiple sections up to 80x80 inch.



Optional Extras
Manual control quadrant position indicator.
Control by electric motor directly coupled to the shaft.
Support plate for a electric motor mounted in place of the quadrant damper.
Bronze brushes.
Airtight lateral joint.
Airtight blades.
Channel frame of 4¾ inches width.

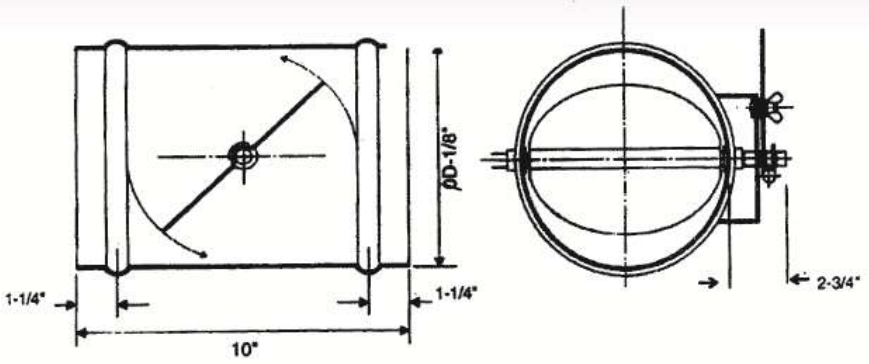
VCR-R1

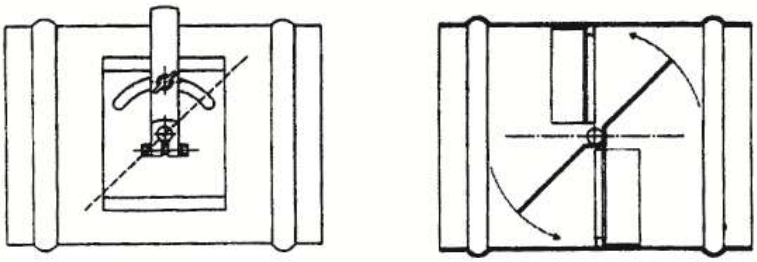
Casing and Blades made from galvanized steel sheet. Adjusting blade mounted on nylon bushes with a manually operated quadrant damper. The movement of the blade permits regulation from fully open to almost complete shut off.

Options:

- **Control by motor.**
- **Other system of control.**
- **Flanged ends for airtight joints.**
- **Bronze bushes.**

Ø D	Ø D
4	10
5	12
6	16
8	20

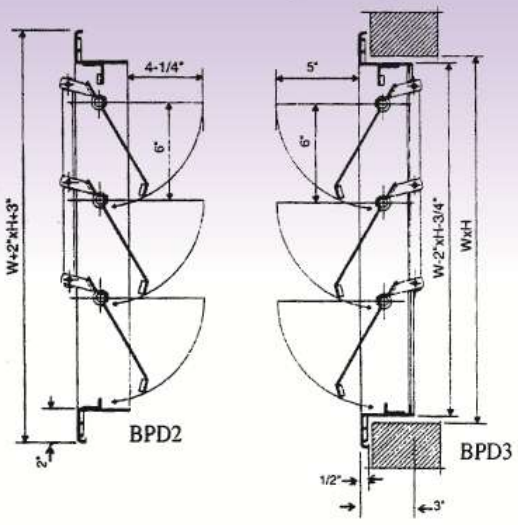




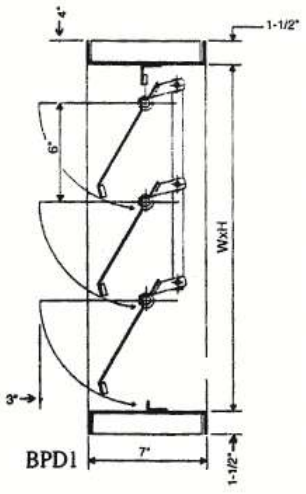
Back Pressure Relief Damper
Duct mounted of recess damper
Pressure relief damper
Non return damper

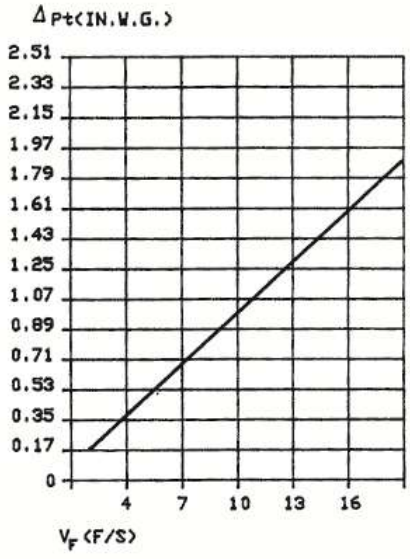
Adjustable blades made from aluminum sheet are connected by linkage at the upper edge.

BPD1
Valve design to be duct mounted or recessed. The frame is made from steel sheet rolled into a channel section.
BPD2
Pressure relief damper, wall mounted. Extruded aluminum frame.
BPD3
Non return damper, wall mounted. Extruded aluminum frame.



H	W
4	4
6	6
8	8
10	10
12	12
14	14
16	16
18	18
20	20
22	22
24	24
26	26
28	28
30	30



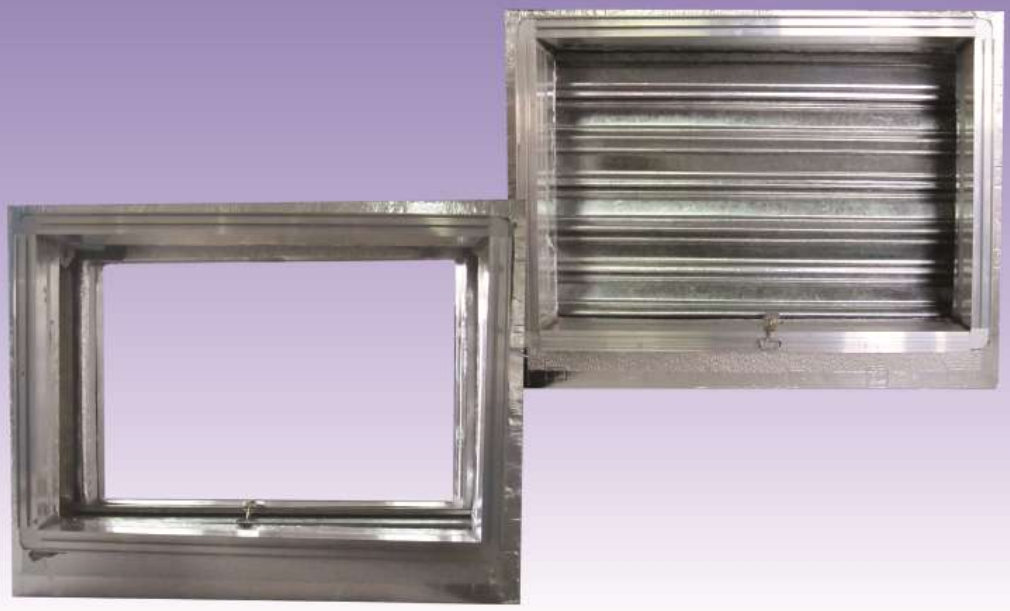


Fire Dampers

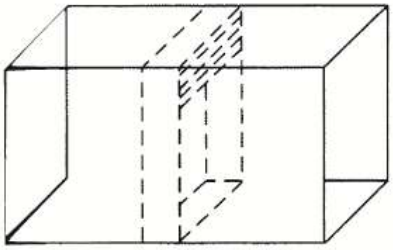
Pi Fire Damper

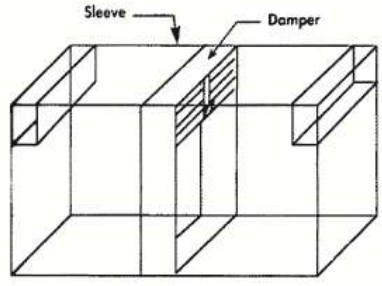
- **Pi Fire Dampers are suitable for installation in sheet metal ductwork or Pre-insulated ductwork**
- **Available in variety of different casing, fully welded, square, rectangular and round shape.**
- **Available in Curtain Type and Multi-blade type.**
- **Suitable for Low, Medium and High Velocity applications.**
- **Standard curtain Blade Type models are used for fire rating up to 2 hours.**
- **Suitable for vertical and horizontal mounting.**

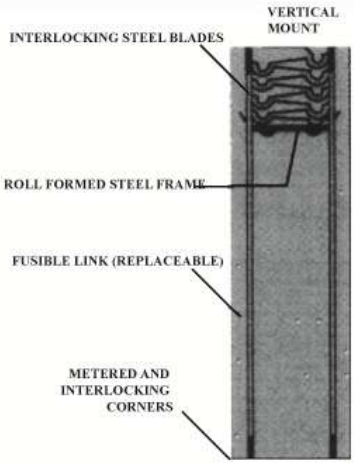
Specifications								
Type	**Frame**	**Blades**	**Fusible Link Holder**	**Fusible Link**	**Rivets**	**Closure Spring**	**Blade Lock Bracket**	**Mounting**
GI	Galvanized Steel Gauge 18	Galvanized Steel Gauge 20 Curtain Type	Galvanized Steel Gauge 22	165 Deg F	Galvanized Steel	Constant Force Type, Stainless steel	Galvanized Steel	Vertical & Horizontal
PIR	Polyisocyanurate 20 MM with embossed aluminium 80 microns	Galvanized Steel Gauge 20 Curtain Type	Galvanized Steel Gauge 22	165 Deg F	Galvanized Steel	Constant Force Type, Stainless steel	Galvanized Steel	Vertical & Horizontal

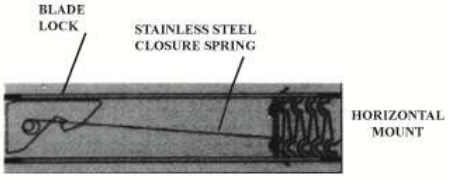


Fire Dampers are available complete with factory installed sleeves made of Pre-insulated sheet and Galvanized steel. Galvanized and stainless, are available from 22 gauge to 10 gauge and in length from 9" to 28".









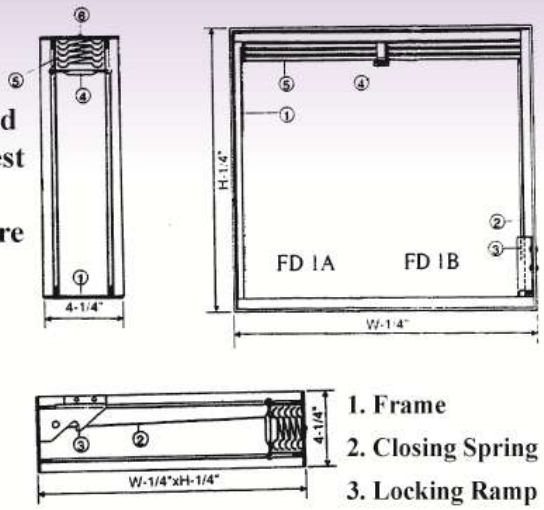
Curtain fire dampers with blades in air stream
Galvanized mild steel construction
Fire resistance rating 2 hr

Fire Dampers provide means of limiting fire areas in venitilating systems. The wide choice of sizes suitable for low, medium and high velocity applications that include rectangular, square, circular and flat connections of Fire Dampers makes them suitable for installation in walls and ceillings, ceasing the spread of fire through duct, walls or floors.

Fire Damper Models:

FD1A

Simple and reliable fire damper used in all low velocity systems with lowest airflow resistance of any in duct mounted damper. Closing springs are made of stainless steel.



1. Frame
2. Closing Spring
3. Locking Ramp
4. Fusible Link
5. Interlock Steel Blades
6. Top Blade Riveted to Frame.

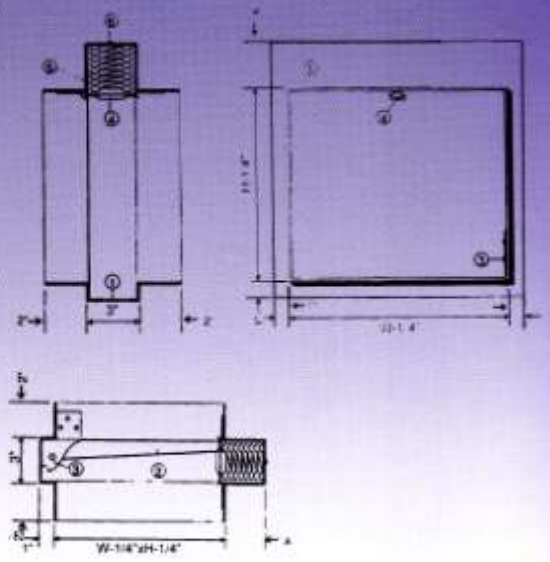
Fusible link operates at 74°C

Options:

- **135°F/57°C**
- **212°F/100°C**
- **248°F/120°C**
- **286°F/141°C**
- **360°F/182°C**

FD2A

100% free area design and all seams welded frame allow absolute safety with no sacrifice in air handling characteristics when used in hi-pressure system. Closing springs are made of stainless steel.

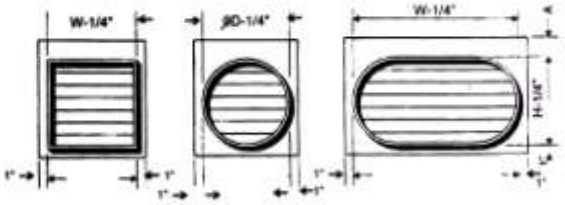


Sizing Chart

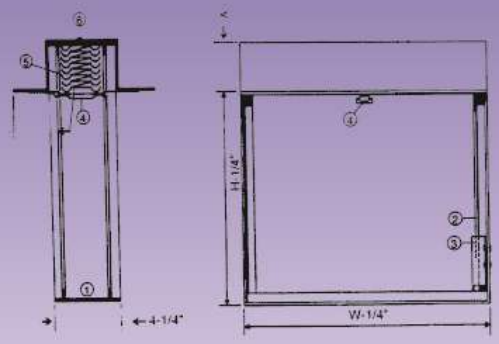
Opening (w)	Overall (A)
4" up to 12"	Extra 3"
13" up to 21"	Extra 4"
22" up to 28"	Extra 5"
29" up to 37"	Extra 6"
38" up to 46"	Extra 7"
47" up to 54"	Extra 8"

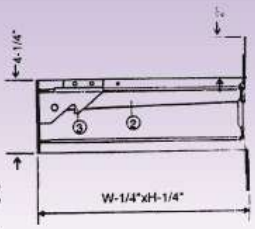
1. Frame
2. Closing Spring
3. Locking Ramp
4. Fusible Link
5. Interlock Steel Blades
6. Top Blade Riveted to Frame.

Codes:
FD2A for squared or rectangular spigots.
FD2A-R for circular spigots.
FD2A-V for oval spigots.



All Spigots are 1" far from each frame at each side.





FD3A

Completly recessed blade pack combined with standard (B) cap overlap for easiest installation. Suitable for medium and high velocity systems. Closing springs are made of stainless steel.

1. Frame
2. Closing Spring
3. Locking Ramp
4. Fusible Link
5. Interlock Steel Blades
6. Top Blade Riveted to Frame.

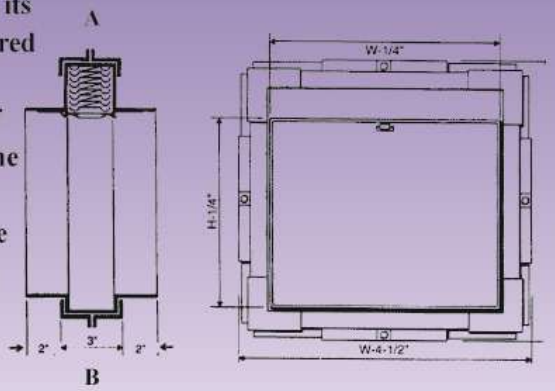
Available sizes:
Single unit
Minimum : 4x4 inch
Maximum : 48x41.8 inch
Multiple section units
Larger sizes can be achieved by use of multi-section contact factory for details

Sizing Chart

Duct open height (H)	Overall height (A)
4" up to 12"	Extra 2"
13" up to 21"	Extra 3"
22" up to 28"	Extra 4"
29" up to 37"	Extra 5"
38" up to 46"	Extra 6"

Mounting frame

The installation frame is Assembled with its respective Fire shutter damper and Delivered to site as one unit. This unit should be installed centrally within the thickness of the surrounding wall or floor such that the center line of the frame is a minimum distance of 2" from the nearest face of the wall or floor. The gap between the frame should then back-filled with concrete or mortar both sides of the frame.



Options:

Microswitches: These allow remote position indication of whether the damper is opened or closed both as status indication, during testing of fire dampers, or as an alarm tigger in the event of the fire damper closing.

Solenoids: Normally de-energized solenoids allow remote operation of the damper Available in 24V, 110V, or 240 V versions. A Fusible link is incorporated.

Galvanized steel frame and stainless steel blades

Stainless steel frame and stainless steel blades.

Holding magnets:

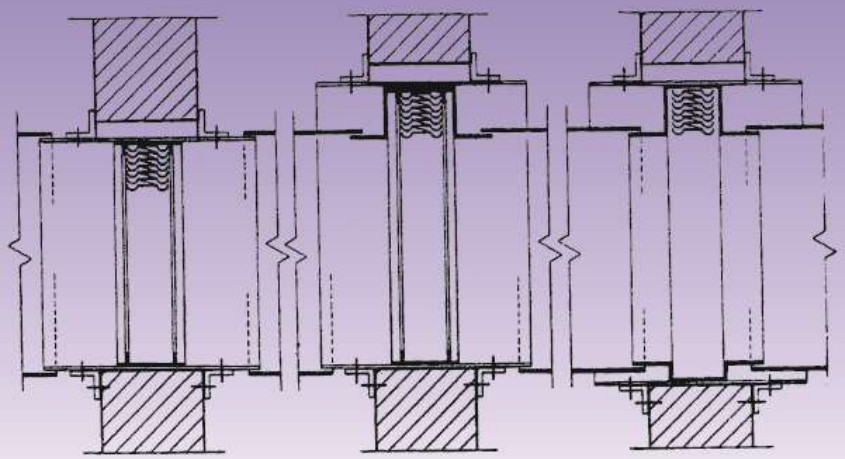
As an alternative to the solenoid for systems that are normally, energized, this type of actuator automatically operates in the event of an interruption to the electricity supply (24 VDC or 220 VAC). When complimented with a rectifier, maybe used with A/C supply. Also incorporates a fusible link.

Sizing Chart

Duct open (W)	Frame overall length(B)
4" up to 13"	Extra 5½"
13" up to 22"	Extra 6½"
22" up to 30"	Extra 7½"
30" up to 38"	Extra 8½"
38" up to 47"	Extra 9½"
47" up to 54"	Extra 10½"

Duct opening Height (H)	Frame Overall width (B)
4" up to 59"	Extra 4½"

Installation details



FD 1A FD 2A FD 3A

Installation Requirements

The installer should note that the installation and location of access panels is to be the satisfaction of the Fire Protection Authority.

Installation

The damper should be installed centrally within the surrounding wall or floor thickness with a minimum distance of 1" from the nearest face of the wall or floor. The damper should be installed in a rectangular galvaized steel sleeve with a minimum thickness of 0.048". This sleeve should be attached to the damper by means of 1/4" - bolts at maximum of 12" centers. This sleeve should be of suitable length through the wall or floor opening to enable the fitting of the cover angles and ductwork.

The cover angles should be attached to the sleeve by 0.24 inch-bolts at a maximum of 12 inches centers and should form a complete frame around the sleeve and cover over the expansion gap required between sleeve and wall or floor opening.

This gap should be in the order of 1% of linear measurement (width or height) and should be filled with compressible, non-combustible material or soft packing (mineral wool). The cover angle should be of such a size as to always form a cover over the wall or floor opening of 1 inch minimum, and should be manufactured from a minimum size of 30x40x3mm. steel angle. All fixing must be positioned clear of the damper blade path so as to prevent proper closure.

FD 1A

Attach damper inside sleeve and bolt up, and then fix one complete side the cover angle framing. The damper can now be slid into the wall or floor opening and positioned centrally with in this opening using soft packing in the expansion gap. Other side of the cover angle can now be fitted and then the ductwork can be connected to the sleeve.

FD 2A

All as FD1A but the ductwork will be fitted to the sleeve on three sides and the damper at the channel section keeping the blades out of air stream.

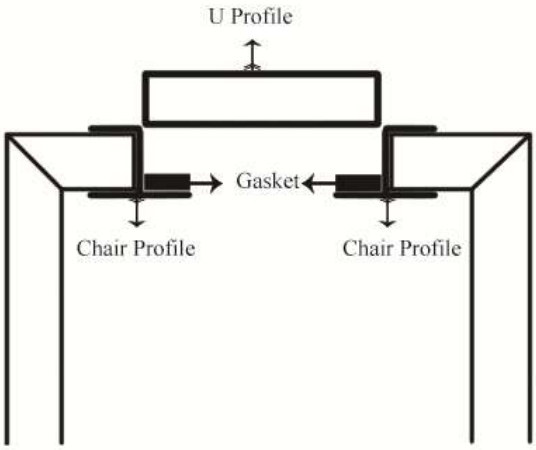
FD 3A

All as FD 1A, but the duct work will be fitted to the damper spigot and not the sleeve.

ACCESS DOOR

Features:

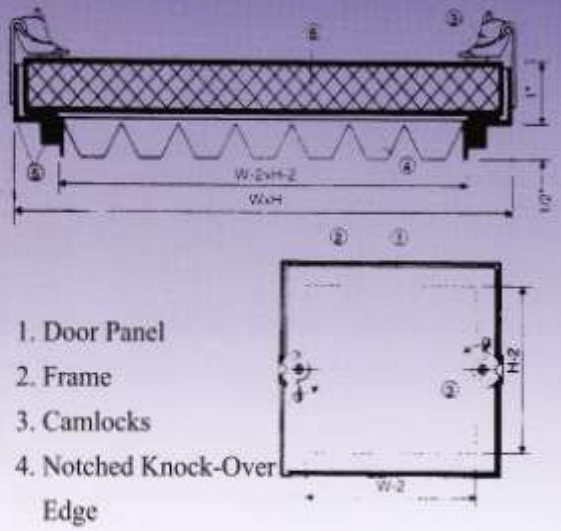
The insulated door panel, along with the gasketing between the door and frame assures a tight seal without obstruction in the air system. Insulated access doors are designed to provide entry to duct work for inspection and service of fire dampers and other equipment, they are available with either a removable or hinged door in sizes up to 24"x24".



AD 1A

Access Panels of 1 inch thickness with double walled and mineral wool insulation. Designed to provide access to fire dampers, volume control dampers filters etc., self tightening cam-locks 2 per unit upto 14 inch, 4 per unit on larger sizes.

AD 1A

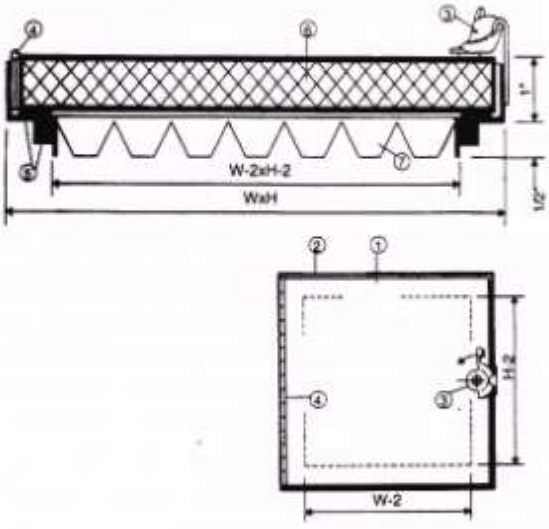


1. Door Panel
2. Frame
3. Camlocks
4. Notched Knock-Over Edge
5. Gasket
6. Mineral Wool Insulation

AD 1B

Continuos hinge on one edge. One cam-lock on opposite edge up to 14 inch. Two cam-lock on opposite edge on larger sizes.

AD 1B



1. Door Panel
2. Frame
3. Camlocks
4. Continuous Hinged
5. Gasket
6. Mineral Wool Insulation
7. Notched Knock-Over Edge

Series 100 BP
VAV Box - By Pass Type

General Information

Description: series 100 BP Air Terminal are designed to achieve variable air volume delivery of conditioned air to a room in single duct, constant volume air distribution system. Variable air volume control is achieved by directing air flow either to the room or to a bypass in a direct response to signals from the room thermostat. Series 100 BP Air Terminal are available with a variety of standard control sequences. Series 100 BP Air Terminal use a primary air damper working in cocert with a bypass port damper, As the primary air damper closes, the bypass sport damper opens, and vice versa so that a constant volume of air is delivered by the air terminal, but varying amounts are delivered to the room or the bypass plenum. A locking quadrant on the inlet balancing damper determines the total air flow through the air terminal. The round (or oval) primary air valve is enclosed in an insulated sheet metal casing. Primary air damper blades have precision die cast zinc alloy shafts which rotate in self lubricating custom nylon bearing results in extremely low friction damper operation. Control components are shipped piped and wired and piping/writing diagram is affixed to the mounting panel for field refrence.

Construction: Series 100 BP Air Terminals are constructed of galvanized steel. The terminal casing, inlet plate and damper (damper contains two 24 ga. layers) consist of 24. ga steel. The universal control mounting panel and damper cylinder are 20. ga steel. insulation is 1" thick, R = 4.2 and dual density, coated fibrous glass that complies with the requirements of NFPA 90A, ASTM c-665 and UL - 181. The outlet plenum interior wall is lined with 24 ga metal, preventing air flow insulation exposure to the room. Series 100 BP Air Terminals are available is standard sizes of 6", 8", 10", 12", 14" and 16". Sizes 6", 8", and 10" have round inlet collers and sizes 12", 14", and 16" have equal flat oval collars. All basic terminals are 18 1/2" in height and 21 1/4" in over all length.
Performance: Series 100 BP Air Terminal are available for system pressure dependent and system pressure independent applications. They are recommended for use in duct systems with static pressure up to 2" water gauge. Supply air capacity range from 200 to 4000 CFM, depending on air terminal size.

Size	CFM	Minimum Ps	NC Lp @ (derived from sound power data)					
			Minimum Ps		1" Ps		1½" Ps + Minium PS	
			Discharge	Radiated	Discharge	Radiated	Discharge	Radiated
406	200	0.03	20	<20	20	20	21	20
	300	0.08	20	<20	20	28	24	20
	400	0.13	20	<20	20	26	25	20
	600	0.30	20	<20	27	27	34	20
408	400	0.02	20	<20	20	<20	20	20
	500	0.03	20	<20	21	20	22	20
	700	0.05	20	<20	25	20	28	20
	1000	0.10	20	<20	30	22	34	26
410	600	0.02	20	<20	20	20	28	20
	800	0.03	20	<20	25	20	32	20
	1000	0.04	20	<20	26	20	34	21
	1600	0.10	21	<20	31	20	37	32
412	1100	0.04	20	<20	22	20	31	24
	1200	0.05	20	<20	23	20	29	24
	1700	0.09	20	<20	25	20	31	26
	2200	0.15	21	<20	28	26	31	32
414	1500	0.05	20	<20	26	20	32	24
	1800	0.07	20	<20	28	20	35	23
	2400	0.13	20	<20	32	20	37	29
	3000	0.20	30	<21	36	27	44	34
416	2000	0.06	20	<20	28	20	33	25
	2800	0.12	20	20	30	25	30	28
	3200	0.16	22	20	32	25	32	31
	3600	0.21	25	20	32	26	32	33
	4000	0.25	31	22	36	29	43	35

Notes:

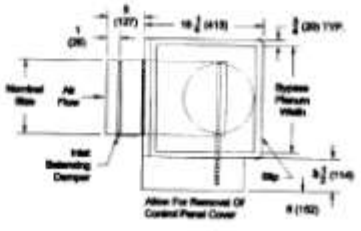
1. All data are calculated in accordance with international standard ISO 3741 comparison method and industry standard 880.
2. NC Lp=Lw - 10 dB room absorption.
3. Discharge Nc levels on this table reflect a reduction of 10 dB absorption per band plus 5 feet of lined duct the same size as the air terminal discharge and a maximum of 300 CFM per diffuser. To obtain actual room NC levels. all discharge duct, number of diffusers and difference in room attenaution factor must be considered.
4. Air Terminals are not intended for continuous operation in ambients over 95°F. Do not store in ambients over 115°F.

Dimensional Data

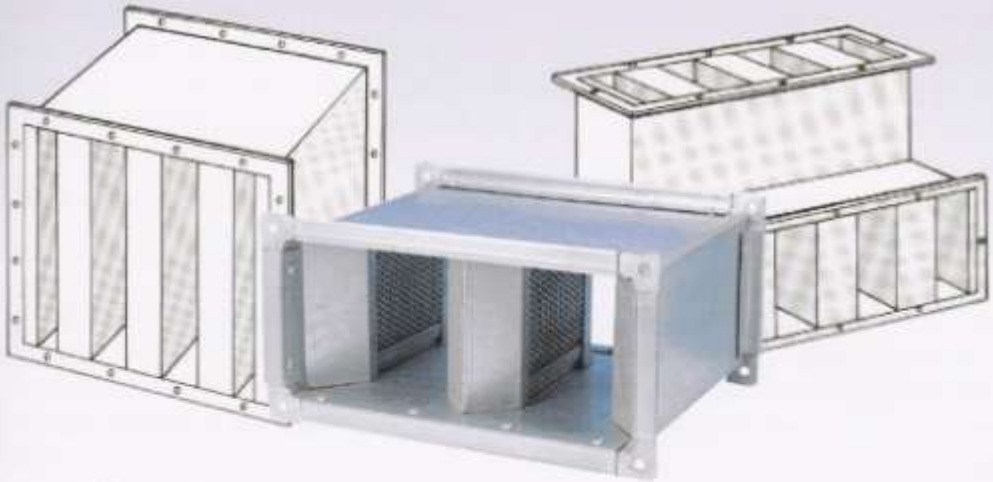
Basic Air Terminals: The basic 100 BP Air Terminal is supplied with a round or oval inlet collar, equipped with a locking flow balancing quadrant. a rectangular slip and drive primary air distribution outlet. and an externally mounted 20 gauge control mounting panel. An optional control panel cover may be specified. All down stream accessories are attached to the basic terminal

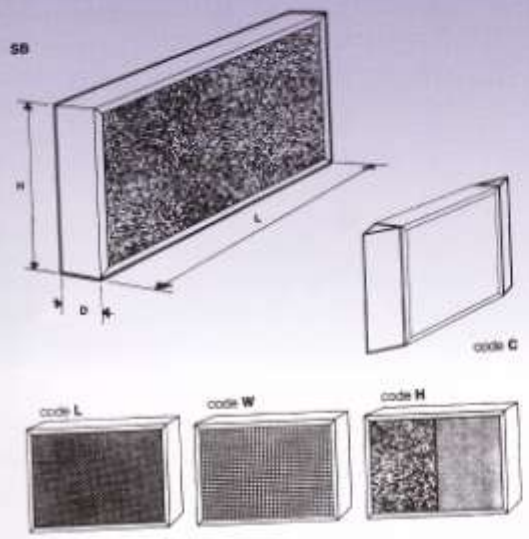
Model No.	Intel Size	Width
406	6" Round	12"
408	8" Round	14"
410	10" Round	16"
412	12" Round	18"
414	14" Round	24"
416	16" Round	28"

Air Terminals are 18½ " High.
Accessories are 12" High.



Sound Attenuators and Sound Baffles
Heavy duty type, galvanized mild steel construction
Air conditioning and industrial applications





SA 100 - SA 200

Assembly consisting of reinforced flanges, Factory-drilled holes and factory Installed baffles.

Coding

Type SA 100: D= 100 mm
S=40 to 100 mm

Type SA 200: D=200 mm
S=80 to 200 mm

Sizes

B (width) = n x (S+D)
From 150 to 1200 mm for SA 100
From 300 to 2400 mm for SA 200

H from 300 to 900 mm for SA 100
From 300 to 1800 mm for SA 200
In increments of 250 mm

Options

* **Double round to square adapters Code RT2**

Other options: see SB 100/200

Order procedure specification
SA20/1 6/2 B x H x L

1. **Width of baffle**
2. **Number of baffles**

SB 100 - SB 200

Sound baffles consisting of a U- Shaped Frame, filled with absorbing inert, Verminproof, non hygroscopic, non-Inflammable material, erosion protected, Allowing velocities upto 20 m/s. sizes.

D 100 mm for SB 100
200 mm for SB 200

H from 300 to 1800 mm
In increments of 150 mm

L from 500 to 2000 mm in increments of 250 mm

Note:

Baffles over 2000 x 1000
Will be delivered in sections.

Options

* **Galvanized screen mesh 12 x 12 x 1 mm Dia. On both sides, code W**
* **Preforated galvanized sheet steel on both sides improving erosion resistance, code L**
* **Polyethylene on both sides reducing Contamination risk, code P**
* **Aerodynamic caps on both ends, Code C**
* **Half metallic sound reonator absorber**

For maximum attenuation at low frequency, code H

Selection method

1 Determine the required attenuation (At) by means of general rule:

$At = L_{wi} - At_s - Atr - L_p$ (see symbols).

The value Lwi must be given by the fan Equipment manufacturer, the value At_s can be determined from the conventional can be estimated from the chart on page B.5.

The value L_p should be specified by the acoustics engineer or can be estimated from the table. Lwo = Lwi - At.2. In air movement, the critical frequency is very often f= 250 HZ, especailly if centrifiugal fans are used. A selection for this fequency is thus generally sufficient. The chart nos. 2 and 4 are based on this Frequency.

If other frequencies have to be controlled, charts 3 as will ensure this is possible.

3. Enter section 1 with the value at in the Charts 2 and 3.

The type H baffles will result in a higher At_{250} value than the standard baffles. On the other hand, their attenuation is lower at the higher frequencies (500, 1000, 2000) (r.f.charts 3 and 5). Several combination of L and S are possible. The selection depends on the values P and Lw +K which can be found in sections 2 and 3.

Since the radiated noise may bypass the attenuator and be recaptured by the downstream duct, attenuations in excess Fo 50 dB are practically impossible to achieve. The pressure loss applies only to the attenuator which are connected to straight upsteam and down steam ducts. installation just in front of or behind elbows or transition pieces and also at the intake or exhaust of the system may modify these values considerably (between 0.5 and several times the dynamic pressure).

4. The attenuator regenerated noise a Function of V_f $L_{wf} = L_w + K$. L_w can be found for all the frequencies (or in dB (A) in charts 3a and 5a, or for 250 HZ only in chartes 2 and 4 (section 3).

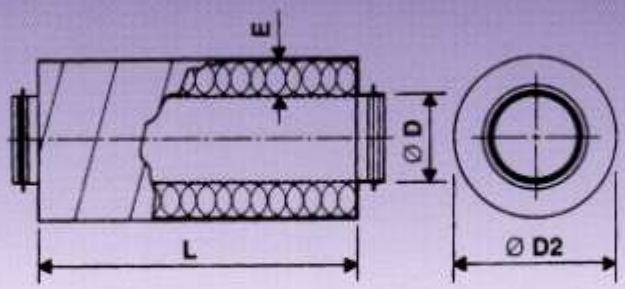
If L_{wt} is not have any effect on the system noise, the following equation must apply: $L_{wf} = L_{wo}$ - (8 to 10) dB.

5. For the selected values S and L, Determine $L_{wf250} + K$ by moving from section 2 towards section 3 as far as the flow rate line. Descend from sections 2 and 3 towards sections 5 and 4 to find the approprite values B and H (The value of "B" are always on line of value "n"). if L_{wt} is too high, either select H larger, thereby increasing F but decreasing V_f and V_s, or select S and L larger, thereby increasing B and F but decreasing V_f and V_s.

Symbols

At	*attenuation (dB)*
At_{250}	*attenuation at f = 250 Hz (dB)*
At_s	*natural attenuation of the air distribution system (dB)*
At_r	*attenuation of the room to be treated (dB)*
B	*Duct width (mm) or (m)*
D	*baffle thickness (mm)*
F	*duct cross-sectional area(m)*
F	*free area between baffles (m)*
H	*duct hight (mm)*
K	*correction factor as function of F (dB)*
L	*duct length (m)*
L_p	*sound pressure level in the room to be treated (dB)*
L_w	*regenerated sound power level for F=1 m (dB)*
L_{wf}	*regenerated sound power level for real "F" real (dB)*
L_{w250}	*Lw at f=250HZ (dB)*
L_{wf250}	*Lwf at f= 250 HZ (dB)*
L_{wi}	*a sound power level, generally at the inlet to the attenuator (dB)*
L_{wo}	*sound power level at the attenuator outlet(dB)*
N	*number of baffles*
P	*total pressure loss (Pa)*
q	*air flow rate (m/s) or (m/h)*
R'	*S/D ratio*
S	*width of gap between baffles (mm)*
V_f	*air velocity in area F(m/s)*
V_s	*air velocity in area Fs (m/s)*

Tubular sound absorbers construction in glavanized mild steel



Sound attenuator specially designed to integrate with ventilation systems having circular ductwork. Available in diameters from 80 to 630 mm and incorporating absorbing partitions available in two densities.
SAR 50: 50mm thickness
SAR 100 : 100mm thickness
the sound attenuator consists of an external body manufactured from galvanzied mild steel complete with internal circular duct manufactured from perforated plate. A mineral wool material is sandwiched between the outer body and the perforated plate. The unit features internal rubber gasket bands and the interface between the unit and the ductwork is secured by rivets or plated self tapping screws. Several sound abosrbers can be mounted in series in order to improve the performance criteria.

Ordering procedure secification
SAR 50 dia.315 /900 mm
1 2 3 4
1. Type of product
2. Density of the absorbing parition
3. Nominal diameter
4. Length

Available sizes and weight
Attenuation (dB) by octave bands (Hz)

دولة الإمارات العربية المتحدة
وزارة الداخلية
الإدارة العامة للدفاع المدني
إدارة الحماية المدنية و السلامة

4 /C/137
رقم الترخيص :

ترخيص مصنع

تم ترخيص المصنع لصناعة المواد المبينة استناداً إلى القانون الاتحادي رقم ٣ لسنة ١٩٧٩ بشأن الدفاع المدني وتعديلاته والقرارات الوزارية المنفذة لـه .

- الاسم التجاري للمنشأة: اللؤلؤة للصناعات .
- اسم صاحب الترخيص : علي حسن علي اللوغاني الجنسية الإمارات الجنسية
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- المعدات و الأجهزة والمواد المرخص بتصنيعها من رقم : (1) إلى (2)

مدير إدارة الحماية المدنية

مدير عام الدفاع المدني

4 /c/37
رقم الترخيص :

اللؤلؤة للصناعات .
اسم المنشأة :

خاص بالمعدات والأجهزة والمواد المعتمدة طبقاً للترخيص

م	اسم المعدة / العدة / الجهاز	النوع	ملاحظات
١	ألواح لمجاري أنظمة التكييف والتهوية معزولة مسبقاً	PI System	-
٢	مانع تسرب الحريق	PI FIRE DAMPER	-
٣			
٤			
٥			
٦			
٧			
٨			
٩			
١٠			
١١			
١٢			
١٣			
١٤			
١٥			

Normal Size	E	Attenuation in dB per octave bands (Hz)								ØD	ØD2	L	Weight Kg
		63	125	250	500	1000	2000	4000	8000				
80	50	3	4	12	20	26	30	29	23	80	200	300	2.5
		6	11	17	40	49	46	43	36	80	200	600	4.0
100	50	3	3	9	17	23	26	25	20	100	200	300	2.5
		6	9	15	34	40	40	37	30	100	200	600	4.0
		10	13	21	40	45	39	36	35	100	200	900	7.0
100	100	6	8	13	20	26	30	30	24	100	300	300	4.5
		11	15	19	33	39	42	38	31	100	300	600	9.5
		13	21	30	48	48	43	38	35	100	300	900	15.0
125	50	3	3	7	16	20	24	22	17	125	225	300	3.5
		5	8	13	29	35	35	32	22	125	225	600	4.5
		10	12	19	37	40	38	34	32	125	225	900	8.0
125	100	6	7	12	19	24	29	28	21	125	315	300	5.5
		8	13	17	27	33	40	34	23	125	315	600	11.00
		12	20	28	39	40	40	34	33	125	315	900	16.5
160	50	3	3	6	13	19	23	22	16	160	260	300	4.0
		5	7	12	24	30	35	31	20	160	260	600	6.00
		8	10	15	32	38	37	34	29	160	260	900	9.0
160	100	5	6	9	14	20	22	22	16	160	355	300	6.5
		8	11	16	25	30	35	30	20	160	355	600	23.5
		10	13	19	30	36	36	34	30	160	355	900	19.5
200	50	4	6	10	20	33	33	19	17	200	300	600	7.5
		8	9	14	28	35	35	28	25	200	300	900	11.0
		10	12	17	36	43	43	28	26	200	300	1200	14.0
200	100	6	9	13	22	32	32	21	18	200	400	600	16.0
		10	12	18	29	34	34	29	20	200	400	900	23.5
		12	16	24	37	41	41	30	22	200	400	1200	30.0
250	50	4	5	10	19	29	29	18	17	250	355	600	10.0
		6	7	12	23	30	30	22	19	250	355	900	14.5
		8	10	15	32	38	38	26	20	250	355	1200	18.0
250	100	6	7	12	21	29	29	19	17	250	450	600	18.0
		8	11	15	25	31	31	21	19	250	450	900	27.0
		10	14	21	33	38	38	26	20	250	450	1200	35.0
315	50	4	5	8	15	22	22	17	15	315	415	600	13.00
		5	7	10	20	29	29	18	16	315	415	900	17.5
		7	9	13	22	33	33	19	18	315	415	1200	21.0
315	100	5	7	10	16	22	22	16	15	315	515	600	21.0
		7	10	12	20	31	31	20	18	315	515	900	31.0
		9	13	17	25	35	35	24	19	315	515	1200	40.0
400	100	3	5	9	19	20	20	13	10	400	606	900	38.0
		6	8	14	24	28	28	17	13	400	606	1200	50.0
500	100	3	4	9	15	17	17	12	8	500	711	900	43.0
		5	7	13	18	23	23	15	12	500	711	1200	60.0
630	100	2	4	8	12	13	15	11	6	630	812	900	49.0
		5	7	12	16	16	16	12	8	630	812	1200	69.0

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