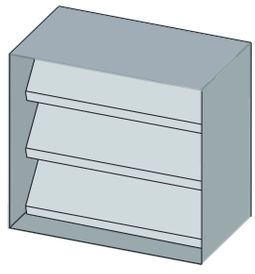
CHAPTER 11



GRAVITY LOUVERS AND NON RETURN DAMPERS

CHAPTER-11

GRAVITY LOUVERS AND NON RETURN DAMPERS

CONTENTS

GRAVITY LOUVERS AND NON RETURN DAMPERS

Gravity Louvers **GL** and Non Return Dampers **NRD** are generally used in intake and discharge applications in residential, commercial and industrial ventilated systems. GL's and NRD's guarantee that the automatic opening of the blades will occur when the fan or system is switched on and equally will close when switched off in order to avoid passage of air when the system is closed, i.e preventing the reverse of air flow. They are also used to maintain certain pressure in pressurized treated areas with respect to others, thus only when pressure is exceeding the designed limit, blades will automatically open to discharge or relieve the excessive air.
GL.'s and NRD.'s are also commonly named as "Pressure Relief Dampers", "Over Pressure Dampers", "Back Draft Dampers" or "Gravity Shatters" according to the purpose of their use.

Features & Characteristics

Gravity Louvers (GL) :

- Frame construction : made of high quality Extruded Aluminium Profiles of 6063 Alloy.
- Frame Flange width : 30 mm.
- Blades : fabricated from Aluminium sheet of 0.5 mm thickness.
- Aluminium Blades are fixed to the frame through a galvanized steel rods (axles) for rigid construction.
- Aluminium Blades are fitted with nylon bushes for corrosion resistance, rattle free and smooth operation.
- The blades are positioned on 45 mm minimum centers up to 100 mm maximum centers resulting in a high free area to provide minimum resistance to air flow.
- Available in wide variety of neck sizes with 100 x 100 mm minimum single section size and 2 mtr maximum single section height. Louvers height exceeding 2 mtr to be fabricated and supplied in multiple sections depending on length and height dimensions as well as site conditions.
- The assembly of multiple sections is unlimited where each section operates independently.
- Multiple sections : Supplied as separate sections and assembly by others on site.
- Usually used for external or internal wall mounting installations.

Non Return Dampers (NRD) :

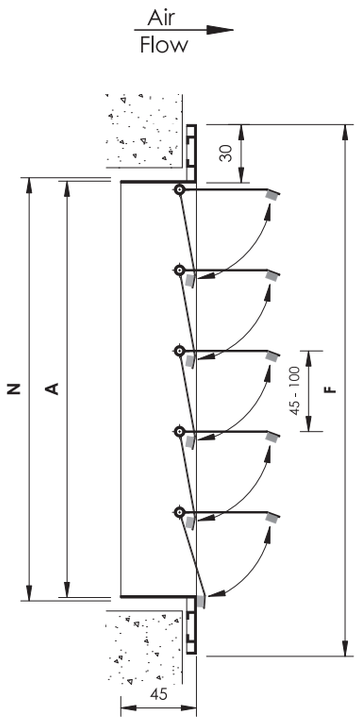
- Casing construction : made of 18 or 20 gauge formed galvanized steel sheet.
- Casing Flange width : 25 - 30 mm (Model NRD – F).
- Blades : fabricated from Aluminium sheet of 0.5 mm thickness in mill finish.
- Aluminium Blades are fixed to the frame through a galvanized steel rods (axles) for rigid construction.
- Aluminium Blades are fitted with nylon bushes for corrosion resistance, rattle free and smooth operation.
- The blades are positioned on 50 mm minimum centers up to 100 mm maximum centers resulting in a high free area to provide minimum resistance to air flow.
- Available in wide variety of neck sizes with 100 x 100 mm minimum single section size and 2 mtr maximum single section height. Louvers height exceeding 2 mtr to be fabricated and supplied in multiple sections depending on length and height dimensions as well as site conditions.
- All joints are welded and sealed for air tight operation and protected by Aluminium spray paint.
- Available in 3 types / models according to casing design. Slip , Clip and Flange type as shown in page No. GL-03.
- Usually used for duct mounting installations.

- Automatically, when the duct pressure is normalized, the blades drop to closed position by gravity effect.
- The specially designed blades have an overlapping lip which assures a tight closure while in closing position.
- Available with Foam type Rubber Gasket for air sealing (provided as an option).
- Mounting instructions : see page No. GL-04.

Gravity Louvers

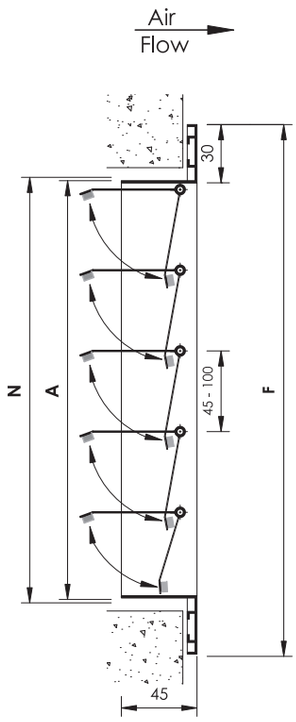
Construction and Dimensional Details

Model GL



- Mounting : usually used for **External** Wall mounting installations.

Model GL - R (Reversed Blades)



- Mounting : usually used for **Internal** Wall mounting installations with reversed blades as shown above.

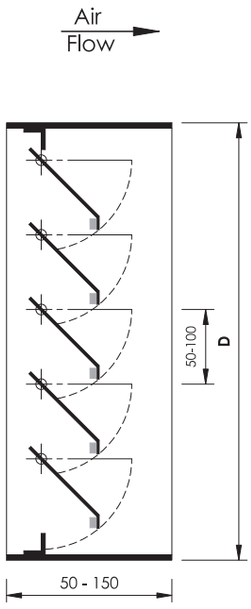
N : Nominal/Listed Size = Length (L) x Height (H)
A : Actual Size = (L-10) x (H-10)
F : Face Size = (L+50) x (H+50)

- Blades are sealed at the lower end of each by foam type Rubber Gasket as a standard for air tightness while closure.
- Gravity Louvers furnished approximately 10 mm less than the Nominal/Listed Size.
- All Dimensions are in mm and subject to ±1 mm tolerance.

Non Return Dampers

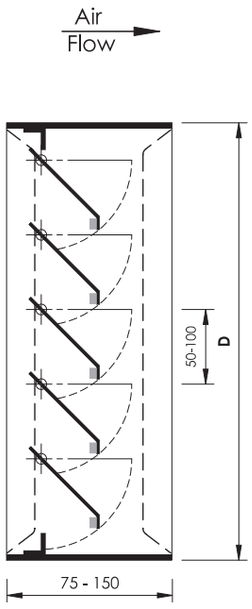
Construction and Dimensional Details

Model NRD-S



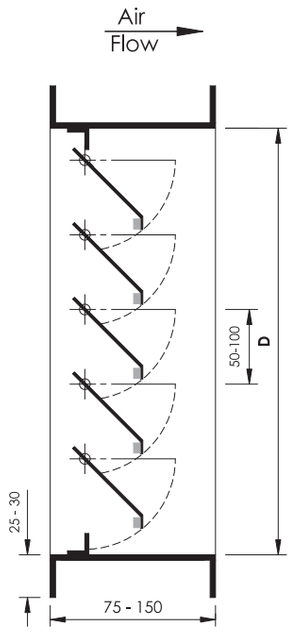
- Mounting : Usually used for duct mounting installations with open ends **(Slip type).**

Model NRD-C

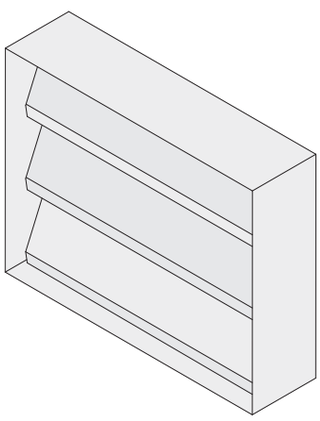


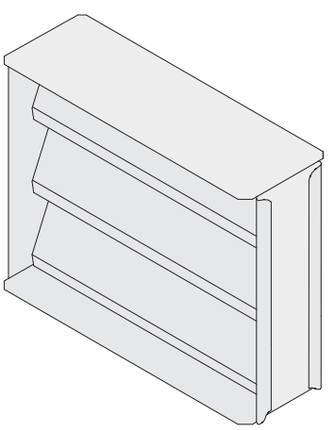
- Mounting : Usually used for duct mounting installations with cleat ends **(Clip type).**

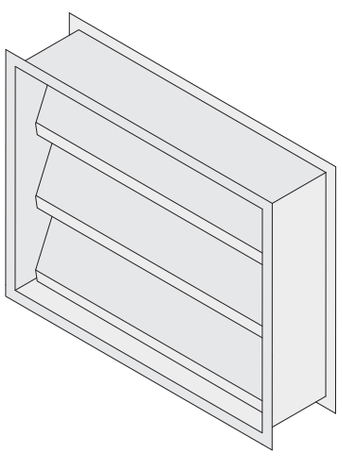
Model NRD-F



- Mounting : Usually used for duct mounting or recessed installations with flanged ends **(Flange type).**



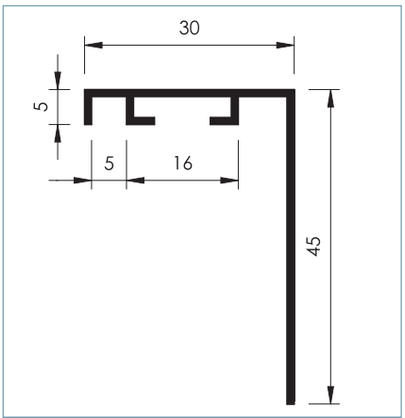




: Duct Exact Size.

- Blades are sealed at the lower end of each by foam type Rubber Gasket as a standard for air tightness while closure.
- All Dimensions are in mm and subject to ±1 mm tolerance.

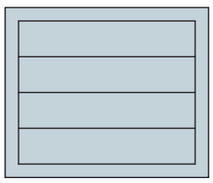
Cross Sectional Drawings for Profile used in Gravity Louvers



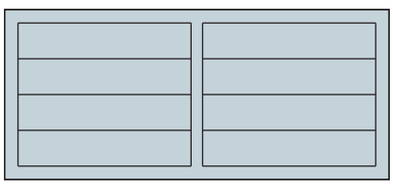
Frame Profile Section

Gravity Louvers

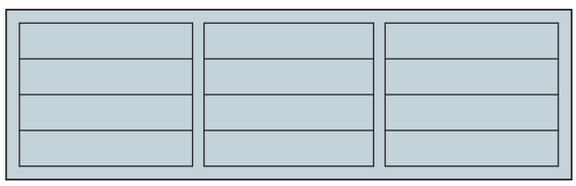
Mullion Arrangement - Model GL



Without Mullion
L ≤ 500 mm



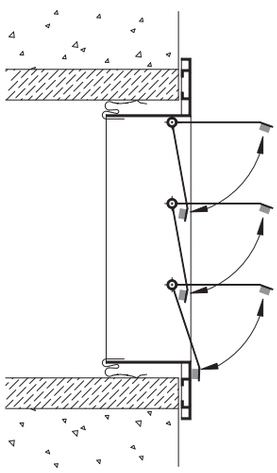
1 Mullion
500 mm < L ≤ 1000 mm



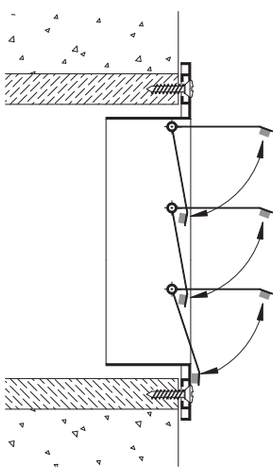
2 Mullions or more
L > 1000 mm

- All Dimensions are in mm and subject to ± 0.2 mm tolerance.

Available Fixing Mounting - Model GL



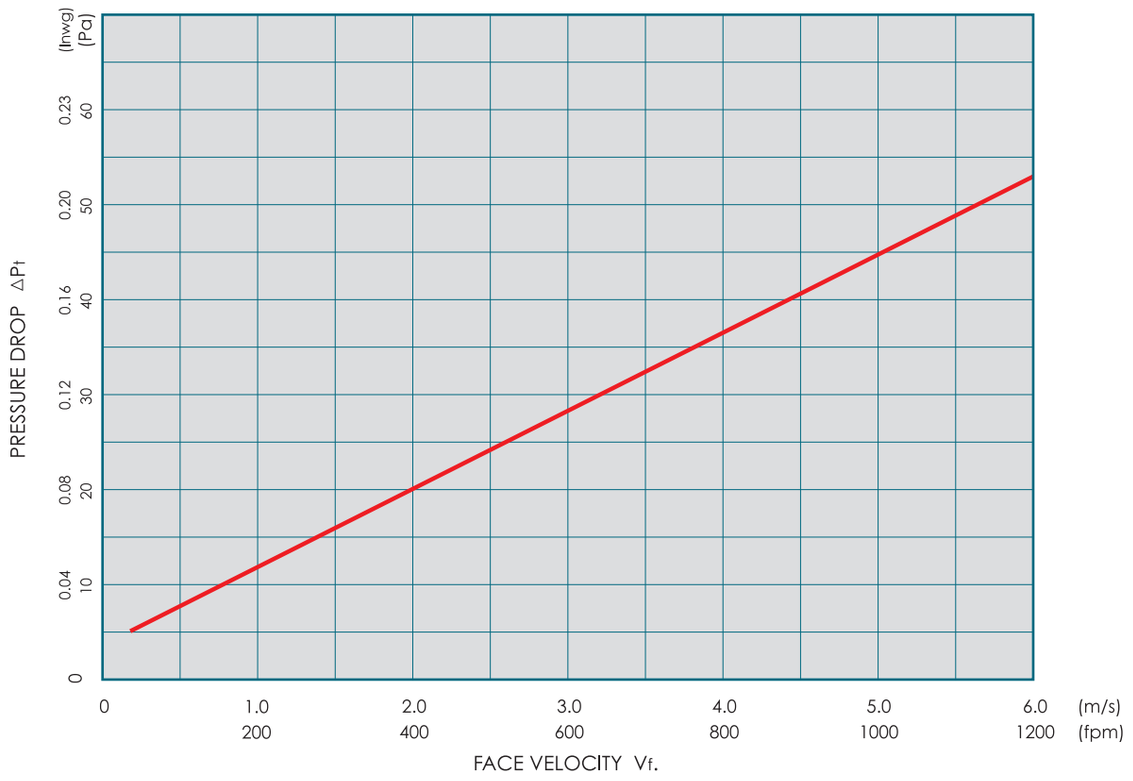
A. Concealed Fixing (Spring Clip Mounting)
The Gravity Louver is fixed by means of spring clips to the wall or partition where no screws are visible.



B. Face Screw Fixing
The Gravity Louver is fixed to the wall (with wooden Frame) by means of visible screws.

Engineering and Performance Data

Air Flow Resistance Diagram (All Models)
Pressure Drop (△ Pt) versus Face Velocity (Vf.)



To Calculate The Air Flow Rate (All Models)

Simply the Air Flow Rate in (L/S) or (CFM) can be calculated using any of the following equations :

$$\text{Air Flow Rate in (L/S)} = 0.80 \times \frac{L\ (mm) \times H\ (mm) \times V_{f.}\ (m/s}{1000}$$

or

$$\text{Air Flow Rate in (CFM)} = 0.80 \times \frac{L\ (inch) \times H\ (inch) \times V_{f.}\ (fpm).}{151}$$

L : Louver or Damper Length.
H : Louver or Damper Height.

Note : For quick selection, some selected sizes of Louvers / Dampers at specific Face Velocities (1.0 & 1.5 m/s) have been applied to the above equations and tabulated in the next two pages in the form of CFM values (table No. GL-01 & 02) in order to cover your needs of sizing selection.

Engineering and Performance Data

TABLE GL-01

Air Flow Rate Values In CFM For Selected Sizes of Gravity Louvers / Non Return Dampers @ V_f = 1.0 (m/s)

L \ H	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
100	17														
150	25														
200	34	68													
250	42	85													
300	51	102	153												
350	59	119	178												
400	68	136	203	271											
450	76	153	229	305											
500	85	170	254	339	424										
550	93	186	280	373	466										
600	102	203	305	407	509	610									
650	110	220	331	441	551	661									
700	119	237	356	475	593	712	831								
750	127	254	381	509	636	763	890								
800	136	271	407	542	678	814	949	1085							
850	144	288	432	576	720	865	1009	1153							
900	153	305	458	610	763	915	1068	1221	1373						
950	161	322	483	644	805	966	1127	1288	1449						
1000	170	339	509	678	848	1017	1187	1356	1526	1695					
1050	178	356	534	712	890	1068	1246	1424	1602	1780					
1100	186	373	559	746	932	1119	1305	1492	1678	1865	2051				
1150	195	390	585	780	975	1170	1365	1560	1755	1949	2144				
1200	203	407	610	814	1017	1221	1424	1627	1831	2034	2238	2441			
1250	212	424	636	848	1060	1271	1483	1695	1907	2119	2331	2543			
1300	220	441	661	882	1102	1322	1543	1763	1983	2204	2424	2645	2865		
1350	229	458	687	915	1144	1373	1602	1831	2060	2289	2517	2746	2975		
1400	237	475	712	949	1187	1424	1661	1899	2136	2373	2611	2848	3085	3323	
1450	246	492	737	983	1229	1475	1721	1966	2212	2458	2704	2950	3195	3441	
1500	254	509	763	1017	1271	1526	1780	2034	2289	2543	2797	3051	3306	3560	3814
1550	263	526	788	1051	1314	1577	1839	2102	2365	2628	2890	3153	3416	3679	3941
1600	271	542	814	1085	1356	1627	1899	2170	2441	2712	2984	3255	3526	3797	4068
1650	280	559	839	1119	1399	1678	1958	2238	2517	2797	3077	3356	3636	3916	4196
1700	288	576	865	1153	1441	1729	2017	2305	2594	2882	3170	3458	3746	4035	4323
1750	297	593	890	1187	1483	1780	2077	2373	2670	2967	3263	3560	3857	4153	4450
1800	305	610	915	1221	1526	1831	2136	2441	2746	3051	3356	3662	3967	4272	4577
1850	314	627	941	1254	1568	1882	2195	2509	2823	3136	3450	3763	4077	4391	4704
1900	322	644	966	1288	1610	1933	2255	2577	2899	3221	3543	3865	4187	4509	4831
1950	331	661	992	1322	1653	1983	2314	2645	2975	3306	3636	3967	4297	4628	4958
2000	339	678	1017	1356	1695	2034	2373	2712	3051	3390	3729	4068	4408	4747	5086

- L & H Dimensions are in mm.

Engineering and Performance Data

TABLE GL-02

Air Flow Rate Values In CFM For Selected Sizes of Gravity Louvers / Non Return Dampers @ $V_{f.}$ = 1.5 (m/s)

L \ H	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
100	25														
150	38														
200	51	102													
250	64	127													
300	76	153	229												
350	89	178	267												
400	102	203	305	407											
450	114	229	343	458											
500	127	254	381	509	636										
550	140	280	420	559	699										
600	153	305	458	610	763	915									
650	165	331	496	661	826	992									
700	178	356	534	712	890	1068	1246								
750	191	381	572	763	954	1144	1335								
800	203	407	610	814	1017	1221	1424	1627							
850	216	432	648	865	1081	1297	1513	1729							
900	229	458	687	915	1144	1373	1602	1831	2060						
950	242	483	725	966	1208	1449	1691	1933	2174						
1000	254	509	763	1017	1271	1526	1780	2034	2289	2543					
1050	267	534	801	1068	1335	1602	1869	2136	2403	2670					
1100	280	559	839	1119	1399	1678	1958	2238	2517	2797	3077				
1150	292	585	877	1170	1462	1755	2047	2339	2632	2924	3217				
1200	305	610	915	1221	1526	1831	2136	2441	2746	3051	3356	3662			
1250	318	636	954	1271	1589	1907	2225	2543	2861	3179	3496	3814			
1300	331	661	992	1322	1653	1983	2314	2645	2975	3306	3636	3967	4297		
1350	343	687	1030	1373	1716	2060	2403	2746	3090	3433	3776	4119	4463		
1400	356	712	1068	1424	1780	2136	2492	2848	3204	3560	3916	4272	4628	4984	
1450	369	737	1106	1475	1844	2212	2581	2950	3318	3687	4056	4424	4793	5162	
1500	381	763	1144	1526	1907	2289	2670	3051	3433	3814	4196	4577	4958	5340	5721
1550	394	788	1182	1577	1971	2365	2759	3153	3547	3941	4335	4730	5124	5518	5912
1600	407	814	1221	1627	2034	2441	2848	3255	3662	4068	4475	4882	5289	5696	6103
1650	420	839	1259	1678	2098	2517	2937	3356	3776	4196	4615	5035	5454	5874	6293
1700	432	865	1297	1729	2161	2594	3026	3458	3890	4323	4755	5187	5620	6052	6484
1750	445	890	1335	1780	2225	2670	3115	3560	4005	4450	4895	5340	5785	6230	6675
1800	458	915	1373	1831	2289	2746	3024	3662	4119	4577	5035	5492	5950	6408	6866
1850	470	941	1411	1882	2352	2823	3293	3763	4235	4704	5175	5645	6115	6586	7056
1900	483	966	1449	1933	2416	2899	3382	3865	4348	4831	5314	5798	6281	6764	7247
1950	496	992	1488	1983	2479	2975	3471	3967	4463	4958	5454	5950	6446	6942	7438
2000	509	1017	1526	2034	2543	3051	3560	4068	4577	5086	5594	6103	6611	7120	7628

- L & H Dimensions are in mm.

Ordering Data

- **Available Surface Finishes For Gravity Louvers :**
  - Natural / Matt Silver Anodized (Frame only) .
  - Powder Coating (Standard Colors are white RAL 9010/ 9016, other optional colors if required to be provided in RAL - No. only and charged extra).
  - Aluminium in Mill Finish.
  - Other Special Finishes (on request if available).

- **Available Surface Finishes For Non Return Dampers :**
  - Frame, only Galvanized steel sheet.
  - Blades, only Aluminium Sheet in Mill Finish.

- **Ordering Specifications :**

Specify :

1 . Louver or Damper Description / Model (GL, NRD - S, C or F).
2 . Nominal / Neck size.
3 . Quantity.
4 . Surface Finish - for Gravity Louvers only.
5 . RAL – No. - for Gravity Louvers only (only mention if powder coating surface finish is required).
6 . Type of Fixing - for Gravity Louvers only (Concealed or Face Screw Fixing).
7 . Rubber Gasket - for Gravity Louvers only (only mention if required).

Example 1 :

1	2	3	4	5	6	7
GL	10" x 10" 250 x 250 (mm)	15	Powder Coating	9010	Concealed	With Rubber Gasket

Example 2 :

1	2	3	4	5	6	7
NRD-S	12" x 6" 300 x 150 (mm)	110	–	–	–	–

Example 3 :

1	2	3	4	5	6	7
NRD-F	32" x 16" 800 x 400 (mm)	2	–	–	–	–