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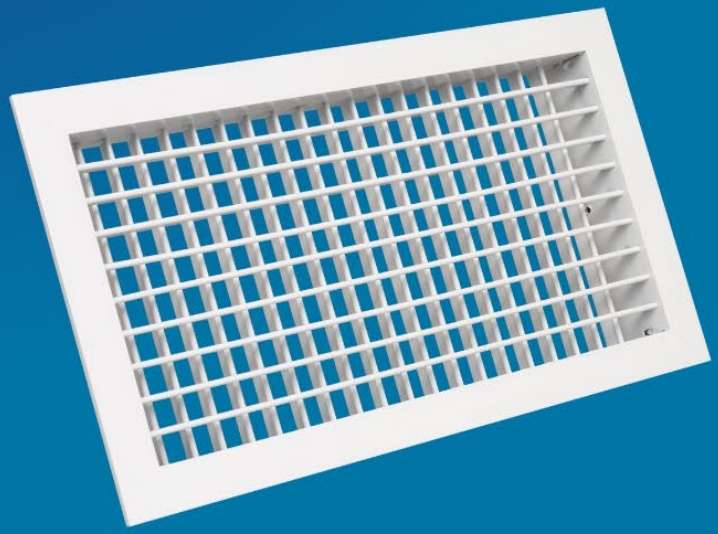
Ice Machines & Cooling Systems



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# DOUBLE DEFELECTION BLADE GRILLE

## Data Sheet

# Product Data Sheet

## Product Overview

The **ICEMAC Double Deflection Blade Grille (IC-DDBG Series)** is a high-performance air terminal device designed to deliver directional airflow control in modern HVAC systems. It features **dual sets of adjustable blades**, allowing for independent regulation of both vertical and horizontal air discharge, making it ideal for spaces that demand flexible and targeted air diffusion. The grille ensures precise airflow alignment without requiring additional diffusers or deflectors.

Constructed entirely from **extruded aluminum profiles**, the grille combines durability with a clean architectural finish. It is compatible with **supply air systems** in both commercial and industrial buildings and integrates seamlessly with **plenum boxes, dampers, and subframes** for efficient air distribution and easy maintenance.

Offered in multiple frame depths (28 mm and 32 mm), the IC-DDBG Series is optimized for suspended ceilings, ducts, or wall-mounted applications, and is available in a wide range of **RAL powder-coated** or **anodized finishes** to match diverse aesthetic and environmental needs.

## Materials and Construction

**Material:**
All components are crafted using top-grade materials for structural reliability and operational efficiency.

- **Frame & Blades**: Manufactured from **extruded aluminum profiles**.
- **Blade Mechanism**: Manual adjustment for both horizontal and vertical blades.
- **Profile Quality**: Only **1st class aluminum profiles** are used.

**Variants:**

- **IC-DDBG-HF:** Double Deflection Blade Grille with Horizontal Blades at the Front Prioritizes vertical airflow adjustment, suitable for upward or downward throw.
- **IC-DDBG-VF:** Double Deflection Blade Grille with Vertical Blades at the Front Allows horizontal airflow regulation, ideal for side-to-side air distribution.

## Surface Finishing

The IC-DDBG Series is finished to meet both functional and aesthetic standards:

- **Standard:**
  Electrostatic powder coating in **RAL 9010** or **RAL 9016**.
- **Optional:**
  - **Anodized aluminum** for enhanced durability
  - **Custom RAL colors** upon request

All coatings are applied uniformly to ensure long-lasting performance and consistent visual quality.

## Assembly Options

Multiple mounting options provide installation flexibility for various ceiling and wall systems:

- **Screw Mounting (Standard):** Visible and secure
- **Concealed Screw Mounting:** Clean appearance with hidden fixings
- **Plate Spring Mounting:** Tool-free, ideal for modular ceilings
- **Subframe Mounting:** Allows easy grille removal and stable alignment

Each method ensures a reliable fit and is compatible with ICEMAC accessories.

## Applications

The IC-DDBG Series is suited for a wide range of commercial and institutional environments where directional airflow control is essential:

- **Office Spaces & Educational Facilities:**
  Offers controlled air delivery tailored to occupancy and room layout.
- **Retail Stores & Shopping Malls:**
  Supports flexible throw direction to meet changing spatial requirements.
- **Public Buildings & Corridors:**
  Ensures stable ventilation with multi-directional control for supply and return air systems.
- **Industrial & Utility Areas:**
  Durable construction supports use in high-load environments with minimal maintenance needs.

Its dual-blade adjustability makes it ideal for spaces requiring **both horizontal and vertical airflow tuning** in cooling or heating operations.

## Accessories

The IC-DDBG Series supports optional accessories to enhance functionality and ease of integration:

- **Parallel Blade Damper (PD):**
  Provides uniform airflow control with blades moving in the same direction.
- **Opposed Blade Damper (OD):**
  Allows precise volume regulation by minimizing turbulence through alternating blade movement.
- **Plenum Box (PB):**
  Ensures smooth air transition from duct to grille while supporting stable pressure distribution.
- **Subframe (SF):**
  Facilitates quick installation and removal, while ensuring a clean, flush finish in ceiling or wall systems.

All accessories are factory-compatible and designed for easy integration without compromising airflow performance.

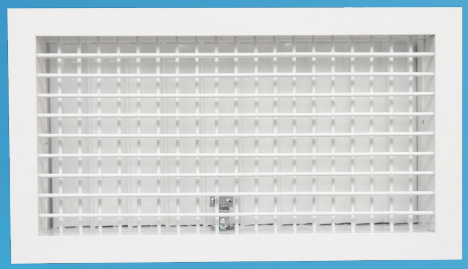
## Frame Types

Adaptable to different ceiling and duct systems:

- 28 mm frame
- 32 mm frame

## Double Deflection Blade Grille Dimensions

This table allows for quick and easy selection of the appropriate Grilles.



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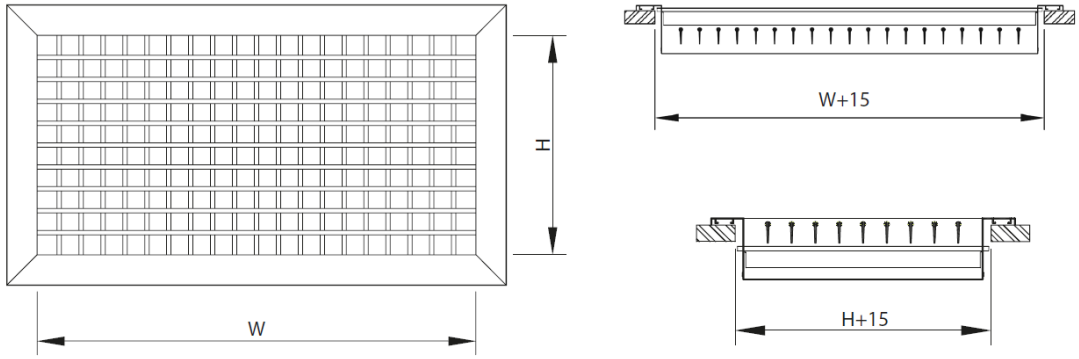
# ICEMAC Double Deflection Blade Grille Dimensions and Effective Areas

The ICEMAC Double Deflection Blade Grilles are available in a wide range of sizes to meet varied air distribution requirements and architectural demands. These sizes are optimized for compatibility with HVAC ductwork and plenum box connections while maintaining effective airflow regulation and directional control. Below are detailed tables outlining the standard dimensions and corresponding effective areas for each configuration and blade arrangement.




| | |
|---|---|
| **W (mm):** | Neck width |
| **H (mm):** | Neck height |
| **W+15 (mm):** | Plenum box neck width |
| **H+15 (mm):** | Plenum box neck height |

**For types other than screw mounting contact Icemac**

| Aeff($m^2$) | | W (mm) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| H(mm) | 100 | 0,006 | 0,010 | 0,013 | 0,016 | 0,019 | 0,022 | 0,026 | 0,029 | 0,032 | 0,035 | 0,038 | 0,042 | 0,045 | 0,048 | 0,051 | 0,054 | 0,058 | 0,061 | 0,064 |
| | 150 | 0,010 | 0,014 | 0,019 | 0,024 | 0,029 | 0,034 | 0,038 | 0,043 | 0,048 | 0,053 | 0,058 | 0,062 | 0,067 | 0,072 | 0,077 | 0,082 | 0,086 | 0,091 | 0,096 |
| | 200 | 0,013 | 0,019 | 0,026 | 0,032 | 0,038 | 0,045 | 0,051 | 0,058 | 0,064 | 0,070 | 0,077 | 0,083 | 0,090 | 0,096 | 0,102 | 0,109 | 0,115 | 0,122 | 0,128 |
| | 250 | 0,016 | 0,024 | 0,032 | 0,040 | 0,048 | 0,056 | 0,064 | 0,072 | 0,080 | 0,088 | 0,096 | 0,104 | 0,112 | 0,120 | 0,128 | 0,136 | 0,144 | 0,152 | 0,160 |
| | 300 | 0,019 | 0,029 | 0,038 | 0,048 | 0,058 | 0,067 | 0,077 | 0,086 | 0,096 | 0,106 | 0,115 | 0,125 | 0,134 | 0,144 | 0,154 | 0,163 | 0,173 | 0,182 | 0,192 |
| | 350 | 0,022 | 0,034 | 0,045 | 0,056 | 0,067 | 0,078 | 0,090 | 0,101 | 0,112 | 0,123 | 0,134 | 0,146 | 0,157 | 0,168 | 0,179 | 0,190 | 0,202 | 0,213 | 0,224 |
| | 400 | 0,026 | 0,038 | 0,051 | 0,064 | 0,077 | 0,090 | 0,102 | 0,115 | 0,128 | 0,141 | 0,154 | 0,166 | 0,179 | 0,192 | 0,205 | 0,218 | 0,230 | 0,243 | 0,256 |
| | 450 | 0,029 | 0,043 | 0,058 | 0,072 | 0,086 | 0,101 | 0,115 | 0,130 | 0,144 | 0,158 | 0,173 | 0,187 | 0,202 | 0,216 | 0,230 | 0,245 | 0,259 | 0,274 | 0,288 |
| | 500 | 0,032 | 0,048 | 0,064 | 0,080 | 0,096 | 0,112 | 0,128 | 0,144 | 0,160 | 0,176 | 0,192 | 0,208 | 0,224 | 0,240 | 0,256 | 0,272 | 0,288 | 0,304 | 0,320 |
| | 550 | 0,035 | 0,053 | 0,070 | 0,088 | 0,106 | 0,123 | 0,141 | 0,158 | 0,176 | 0,194 | 0,211 | 0,229 | 0,246 | 0,264 | 0,282 | 0,299 | 0,317 | 0,334 | 0,352 |
| | 600 | 0,038 | 0,058 | 0,077 | 0,096 | 0,115 | 0,134 | 0,154 | 0,173 | 0,192 | 0,211 | 0,230 | 0,250 | 0,269 | 0,288 | 0,307 | 0,326 | 0,346 | 0,365 | 0,384 |

# Double Deflection Blade Grille

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## Sand Trap Louvre Quick Selection Table

| | |
|---|---|
| **Aeff (m²):** | Effective area |
| **Ueff (m/s):** | Effective velocity |
| **V (m³/h):** | Air flow rate |

| | |
|---|---|
| **ΔPt (Pa):** | Total pressure drop |
| **X (m):** | Throw distance |

| | | Aeff (m²) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **V (m³/h)** | | **0,006** | **0,014** | **0,019** | **0,026** | **0,038** | **0,048** | **0,056** | **0,064** | **0,077** | **0,101** | **0,120** | **0,141** | **0,173** | **0,202** | **0,245** | **0,299** | **0,352** | **0,384** |
| 100 | **ueff. (m/s)** | 4,6 | 2,0 | 1,5 | | | | | | | | | | | | | | | |
| | **X (m)** | 2,6 | 3,0 | 2,4 | | | | | | | | | | | | | | | |
| | **ΔPt (Pa)** | 6 | 3 | 2 | | | | | | | | | | | | | | | |
| 150 | **ueff. (m/s)** | 6,9 | 3,0 | 2,2 | 1,6 | 1,1 | | | | | | | | | | | | | |
| | **X (m)** | 9,5 | 4,3 | 3,8 | 3,1 | 2,2 | | | | | | | | | | | | | |
| | **ΔPt (Pa)** | 27 | 7 | 4 | 2 | 1 | | | | | | | | | | | | | |
| 200 | **ueff. (m/s)** | 9,3 | 4,0 | 2,9 | 2,1 | 1,5 | 1,2 | | | | | | | | | | | | |
| | **X (m)** | 14,2 | 5,8 | 4,7 | 3,9 | 3,1 | 2,3 | | | | | | | | | | | | |
| | **ΔPt (Pa)** | 35 | 13 | 6 | 4 | 2 | 1 | | | | | | | | | | | | |
| 250 | **ueff. (m/s)** | | 5,0 | 3,7 | 2,7 | 1,8 | 1,4 | 1,2 | | | | | | | | | | | |
| | **X (m)** | | 7,1 | 6,0 | 5,0 | 3,5 | 2,4 | 2,0 | | | | | | | | | | | |
| | **ΔPt (Pa)** | | 20 | 9 | 6 | 2 | 1 | 1 | | | | | | | | | | | |
| 300 | **ueff. (m/s)** | | 6,0 | 4,4 | 3,2 | 2,2 | 1,7 | 1,5 | 1,3 | | | | | | | | | | |
| | **X (m)** | | 8,5 | 7,0 | 5,8 | 4,8 | 3,5 | 2,5 | 2,4 | | | | | | | | | | |
| | **ΔPt (Pa)** | | 23 | 14 | 8 | 4 | 2 | 2 | 1 | | | | | | | | | | |
| 350 | **ueff. (m/s)** | | 6,9 | 5,1 | 3,7 | 2,6 | 2,0 | 1,7 | 1,5 | 1,3 | | | | | | | | | |
| | **X (m)** | | 9,5 | 8,1 | 6,3 | 5,5 | 4,7 | 3,8 | 2,7 | 2,6 | | | | | | | | | |
| | **ΔPt (Pa)** | | 29 | 19 | 11 | 5 | 3 | 2 | 1 | 1 | | | | | | | | | |
| 400 | **ueff. (m/s)** | | 7,9 | 5,8 | 4,3 | 2,9 | 2,3 | 2,0 | 1,7 | 1,4 | | | | | | | | | |
| | **X (m)** | | 11,0 | 8,7 | 7,4 | 6,4 | 5,4 | 4,9 | 4,0 | 2,8 | | | | | | | | | |
| | **ΔPt (Pa)** | | 35 | 24 | 15 | 6 | 4 | 3 | 2 | 1 | | | | | | | | | |
| 500 | **ueff. (m/s)** | | | 7,3 | 5,3 | 3,7 | 2,9 | 2,5 | 2,2 | 1,8 | 1,4 | | | | | | | | |
| | **X (m)** | | | 10,8 | 8,5 | 7,2 | 6,6 | 6,1 | 5,6 | 4,8 | 3,0 | | | | | | | | |
| | **ΔPt (Pa)** | | | 33 | 23 | 10 | 7 | 5 | 4 | 2 | 1 | | | | | | | | |
| 600 | **ueff. (m/s)** | | | 8,8 | 6,4 | 4,4 | 3,5 | 3,0 | 2,6 | 2,2 | 1,7 | 1,4 | | | | | | | |
| | **X (m)** | | | 11,9 | 10,5 | 8,1 | 7,4 | 6,9 | 6,5 | 6,1 | 5,0 | 3,5 | | | | | | | |
| | **ΔPt (Pa)** | | | 42 | 31 | 14 | 10 | 7 | 5 | 4 | 3 | 1 | | | | | | | |
| 700 | **ueff. (m/s)** | | | | 7,5 | 5,1 | 4,1 | 3,5 | 3,0 | 2,5 | 1,9 | 1,6 | 1,4 | | | | | | |
| | **X (m)** | | | | 11,1 | 9,4 | 8,1 | 7,8 | 7,3 | 6,7 | 5,8 | 5,0 | 3,7 | | | | | | |
| | **ΔPt (Pa)** | | | | 36 | 19 | 14 | 10 | 7 | 5 | 4 | 2 | 1 | | | | | | |

# Double Deflection Blade Grille

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## Sand Trap Louvre Quick Selection Table

| | | Aeff ($m^2$) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V($m^3$/h) | | 0,006 | 0,014 | 0,019 | 0,026 | 0,038 | 0,048 | 0,056 | 0,064 | 0,077 | 0,101 | 0,120 | 0,141 | 0,173 | 0,202 | 0,245 | 0,299 | 0,352 | 0,384 |
| 800 | ueff. (m/s) | | | | 8,5 | 5,8 | 4,6 | 4,0 | 3,5 | 2,9 | 2,2 | 1,9 | 1,6 | | | | | | |
| | X (m) | | | | 12,9 | 9,9 | 9,3 | 8,2 | 8,0 | 7,4 | 6,3 | 5,9 | 5,1 | | | | | | |
| | ΔPt (Pa) | | | | 47 | 25 | 17 | 13 | 9 | 8 | 5 | 4 | 2 | | | | | | |
| 900 | ueff. (m/s) | | | | | 6,6 | 5,2 | 4,5 | 3,9 | 3,2 | 2,5 | 2,1 | 1,8 | 1,4 | | | | | |
| | X (m) | | | | | 11,6 | 9,7 | 9,4 | 8,3 | 7,9 | 6,7 | 6,3 | 5,9 | 5,0 | | | | | |
| | ΔPt (Pa) | | | | | 31 | 20 | 16 | 12 | 9 | 5 | 4 | 3 | 1 | | | | | |
| 1000 | ueff. (m/s) | | | | | 7,3 | 5,8 | 5,0 | 4,3 | 3,6 | 2,8 | 2,3 | 2,0 | 1,6 | | | | | |
| | X (m) | | | | | 12,4 | 11,2 | 9,6 | 9,2 | 8,2 | 7,1 | 6,6 | 6,2 | 5,7 | | | | | |
| | ΔPt (Pa) | | | | | 48 | 29 | 20 | 15 | 11 | 8 | 7 | 5 | 3 | | | | | |
| 1200 | ueff. (m/s) | | | | | 8,8 | 6,9 | 6,0 | 5,2 | 4,3 | 3,3 | 2,8 | 2,4 | 1,9 | 1,7 | | | | |
| | X (m) | | | | | 15,2 | 12,3 | 11,5 | 10,3 | 9,5 | 8,0 | 7,3 | 6,8 | 6,1 | 5,7 | | | | |
| | ΔPt (Pa) | | | | | 49 | 37 | 30 | 23 | 15 | 9 | 8 | 7 | 4 | 3 | | | | |
| 1400 | ueff. (m/s) | | | | | | 8,1 | 6,9 | 6,1 | 5,1 | 3,9 | 3,2 | 2,8 | 2,2 | 1,9 | 1,6 | | | |
| | X (m) | | | | | | 14,7 | 12,5 | 11,6 | 10,4 | 9,2 | 8,1 | 7,4 | 6,6 | 6,2 | 5,7 | | | |
| | ΔPt (Pa) | | | | | | 47 | 38 | 31 | 20 | 12 | 9 | 8 | 4 | 3 | 3 | | | |
| 1600 | ueff. (m/s) | | | | | | | 7,9 | 6,9 | 5,8 | 4,4 | 3,7 | 3,2 | 2,6 | 2,2 | 1,8 | | | |
| | X (m) | | | | | | | 14,6 | 12,7 | 11,4 | 9,8 | 9,0 | 8,3 | 7,3 | 6,8 | 6,4 | | | |
| | ΔPt (Pa) | | | | | | | 45 | 38 | 30 | 15 | 11 | 9 | 6 | 4 | 3 | | | |
| 1800 | ueff. (m/s) | | | | | | | | 7,8 | 6,5 | 5,0 | 4,2 | 3,5 | 2,9 | 2,5 | 2,0 | 1,7 | | |
| | X (m) | | | | | | | | 14,7 | 12,4 | 10,7 | 9,7 | 8,9 | 8,0 | 7,3 | 6,6 | 6,3 | | |
| | ΔPt (Pa) | | | | | | | | 45 | 36 | 20 | 14 | 10 | 8 | 7 | 5 | 3 | | |
| 2000 | ueff. (m/s) | | | | | | | | | 7,2 | 5,5 | 4,6 | 3,9 | 3,2 | 2,8 | 2,3 | 1,9 | 1,6 | |
| | X (m) | | | | | | | | | 14,2 | 11,3 | 10,2 | 9,5 | 8,5 | 8,0 | 7,2 | 6,5 | 6,3 | |
| | ΔPt (Pa) | | | | | | | | | 39 | 25 | 18 | 12 | 8 | 7 | 6 | 4 | 2 | |
| 2500 | ueff. (m/s) | | | | | | | | | 9,0 | 6,9 | 5,8 | 4,9 | 4,0 | 3,4 | 2,8 | 2,3 | 2,0 | 1,8 |
| | X (m) | | | | | | | | | 18,1 | 14,1 | 11,8 | 10,5 | 9,7 | 8,8 | 8,3 | 7,4 | 6,7 | 6,5 |
| | ΔPt (Pa) | | | | | | | | | 51 | 37 | 27 | 19 | 13 | 11 | 7 | 6 | 4 | 3 |
| 3000 | ueff. (m/s) | | | | | | | | | | 8,3 | 6,9 | 5,9 | 4,8 | 4,1 | 3,4 | 2,8 | 2,4 | 2,2 |
| | X (m) | | | | | | | | | | 17,9 | 14,3 | 12,0 | 10,6 | 10,0 | 9,0 | 8,6 | 7,7 | 7,3 |
| | ΔPt (Pa) | | | | | | | | | | 47 | 38 | 28 | 19 | 14 | 11 | 7 | 6 | 5 |
| 4000 | ueff. (m/s) | | | | | | | | | | | | 7,9 | 6,4 | 5,5 | 4,5 | 3,7 | 3,2 | 2,9 |
| | X (m) | | | | | | | | | | | | 17,7 | 14,2 | 11,9 | 10,5 | 9,9 | 9,0 | 8,6 |
| | ΔPt (Pa) | | | | | | | | | | | | 45 | 36 | 25 | 17 | 13 | 10 | 7 |
| 5000 | ueff. (m/s) | | | | | | | | | | | | | 8,0 | 6,9 | 5,7 | 4,6 | 3,9 | 3,6 |
| | X (m) | | | | | | | | | | | | | 18,6 | 15,9 | 12,5 | 10,9 | 10,4 | 9,9 |
| | ΔPt (Pa) | | | | | | | | | | | | | 47 | 39 | 28 | 18 | 13 | 11 |