

# BACKDRAUGHT DAMPER

## ARO / ARE RANGE - COMMERCIAL AND INDUSTRIAL HVAC

**Backdraught damper ARO / ARE** is designed for a one-way air flow direction. The blades prevent reverse flow in the ventilation ductworks.

- **ARO** : reinforced backdraught damper to withstand up to 1000 Pa for a 1 m length
- **ARE** : airtight backdraught damper equipped with gaskets on the blades

### CODIFICATION

- A** —————> Backdraught damper  
**X** —————> **R** - Reinforced  
**Y** —————> **O** - No upstream/downstream airtightness  
**E** - Airtight class 3 (EN 1751) with a 900 Pa counter-pressure

#### ARO backdraught damper



#### ARE backdraught damper

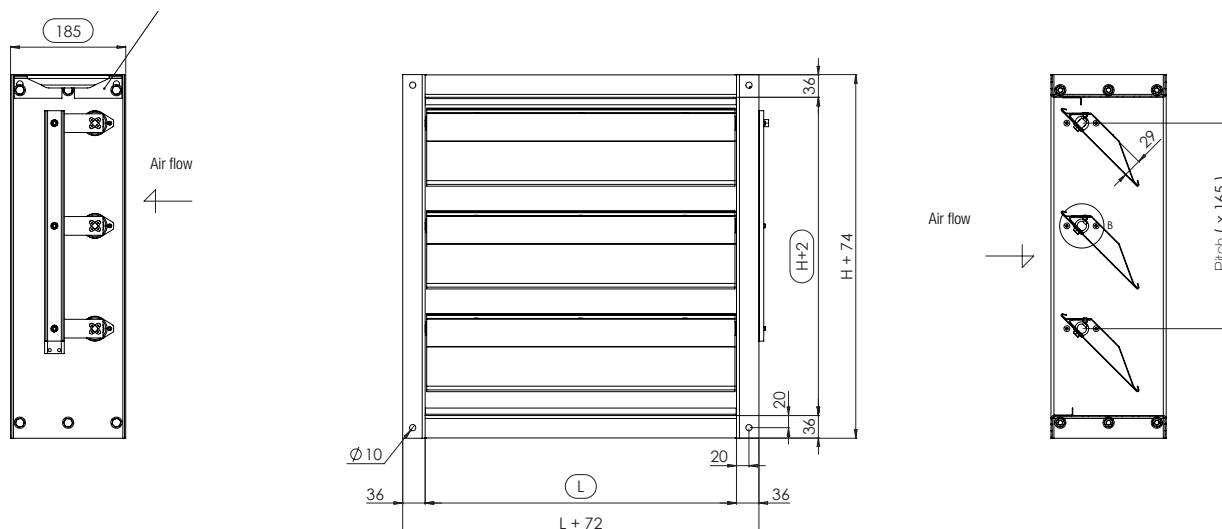


|                                                | ARO                                                                       | ARE                                        | Options                                                             |
|------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------|
| Frame                                          | Galvanized steel sheet, thickness 2.0 mm<br>Width 185 mm<br>Flanges 36 mm |                                            | Stainless steel 316L or 304L<br>Aluminium<br>Painted steel          |
| Drilling                                       | Ø10 mm in each angles                                                     |                                            | Standard F2A drilling (see p 100 F2A catalogue) or special drilling |
| Blades                                         | Aluminium<br>2 x 1 mm + 2 mm                                              | Galvanized steel<br>2 x 0,8 mm + 2 mm      | Stainless steel 304L or 316L<br>Galvanized or painted steel         |
| Bearings                                       | Teflon                                                                    |                                            | Bronze                                                              |
| Shaft                                          | Zinc coated steel - Ø15 mm                                                |                                            |                                                                     |
| Linkage                                        | Linkage in zinc-coated steel                                              |                                            | Zinc coated steel 316L or 304L                                      |
| Seals                                          | -                                                                         | EPDM                                       | Silicone on ARE type only                                           |
| Leakage rate                                   | -                                                                         | 75 m³/h under 1000 Pa<br>(see example p.2) | Frame's airtightness<br>class C (EN 1751)                           |
| Acceptable pressure<br>(for a length L=1000mm) | 1000 Pa                                                                   | 1800 Pa                                    |                                                                     |
| Operating temperature                          | From -20° to +90°C                                                        |                                            | From -20° to + 200°C                                                |
| Recommended<br>air velocity                    | From 5 to 15 m/s                                                          |                                            |                                                                     |
| Miscellaneous                                  | -                                                                         |                                            | Upward air flow<br>(horizontal position possible)                   |

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### DIMENSIONS



### WEIGHT

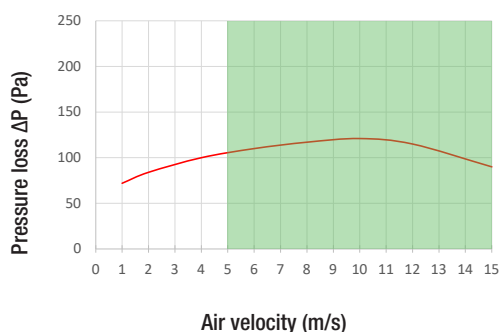
Weights are given for an ARO backdraught damper. A coefficient of 1.3 must be applied to the mentioned data for an ARE backdraught damper equipped with blades in galvanized steel.

| L \ H | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1500 |
|-------|-----|-----|-----|-----|------|------|------|------|
| 180   | 7   | 9   | 11  | 13  | 16   | 18   | 20   | 21   |
| 510   | 13  | 16  | 19  | 22  | 25   | 28   | 31   | 33   |
| 675   | 16  | 19  | 23  | 26  | 29   | 33   | 36   | 38   |
| 840   | 18  | 22  | 26  | 30  | 34   | 38   | 42   | 44   |
| 1170  | 24  | 29  | 34  | 38  | 43   | 48   | 53   | 55   |
| 1500  | 30  | 35  | 41  | 47  | 52   | 58   | 63   | 66   |

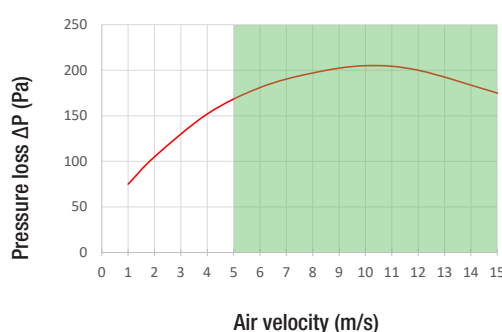
### PRESSURE LOSS

Backdraught damper pressure losses are given according to air velocity.

Backdraught damper ARO



Backdraught damper ARE



Recommended air velocity

# BACKDRAUGHT DAMPER

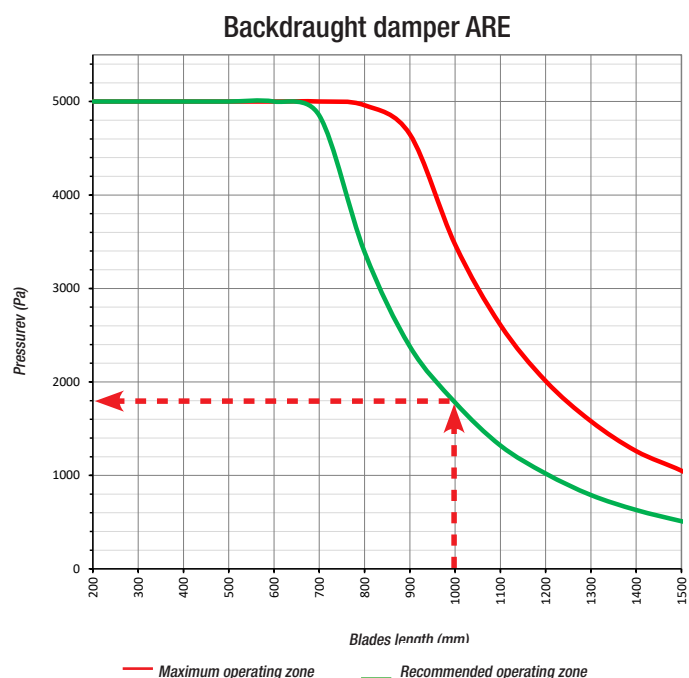
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### USE LIMITS

They correspond to the maximal counter-pressure that ARO/ARE backdraught dampers can withstand in closed position (reverse airflow). Use limits are given according to the blades length



We recommend that the counter-pressure does not exceed 1000 Pa for a 1000-mm long **ARO backdraught** damper



We recommend that the counter-pressure does not exceed 1800 Pa for a 1000mm long **ARE backdraught** damper

# BACKDRAUGHT DAMPER

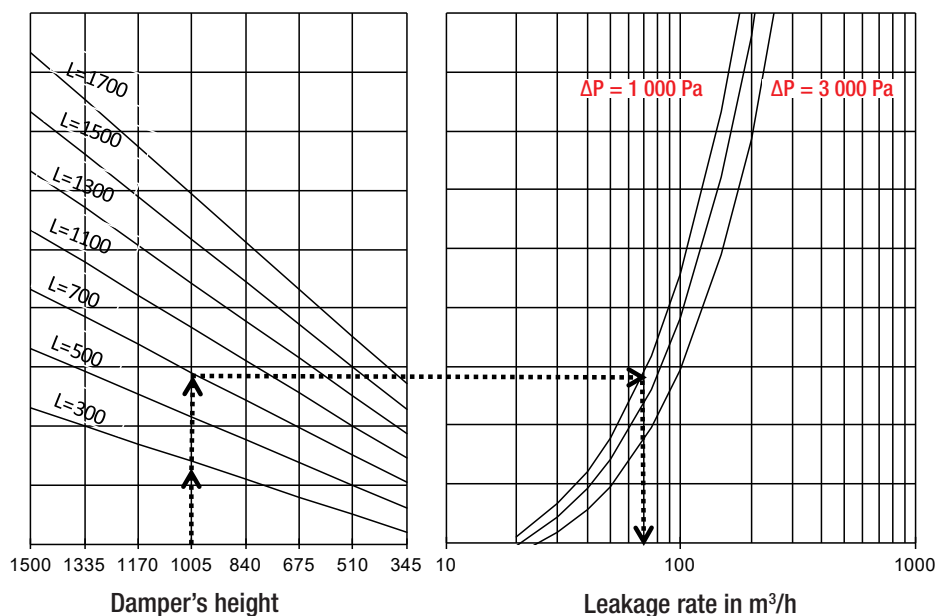
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### BLADES' LEAKAGE

Leakage rate below is given for an ARE type backdraught damper. It depends on the damper section and the differential pressure ( $\Delta P$ )

$\Delta P$  = differential pressure (upstream/downstream) with a backdraught damper in closed position.

Upstream/downstream airtightness is guaranteed for ARE backdraught damper, from a counter-pressure of 900 Pa.



#### Example :

Backdraught damper H = 1005 x L = 700 –  $\Delta P = 1000 \text{ Pa}$

Leakage rate < 70 m³/h

# BACKDRAUGHT DAMPER

## ARO / ARE RANGE - COMMERCIAL AND INDUSTRIAL HVAC

### REGENERATED NOISE

The acoustic performances of our backdraught dampers have been tested in an independent laboratory (CTTM) according to ISO 7235 : 2009 standard.



#### Air flow noise $L_w$ in dB

##### • ARO backdraught damper

| Air velocity<br>(m/s) | Frequency (Hz) |      |      |      |      |      |      |      |        |
|-----------------------|----------------|------|------|------|------|------|------|------|--------|
|                       | 63             | 125  | 250  | 500  | 1000 | 2000 | 4000 | 8000 | Global |
| 2                     | 53.7           | 51.8 | 52.9 | 58.7 | 56.2 | 51.4 | 43.3 | 34.8 | 62.8   |
| 4                     | 54.2           | 54.3 | 54.3 | 59.8 | 58.7 | 55   | 49   | 40.1 | 64.6   |
| 6                     | 57.8           | 56.4 | 55   | 59.8 | 59.5 | 56.6 | 51.8 | 43.2 | 65.9   |
| 8                     | 59.8           | 58.2 | 55.9 | 60.6 | 60.9 | 58.6 | 54.7 | 46.2 | 67.4   |
| 10                    | 59             | 59.3 | 57.1 | 61.6 | 61.7 | 59.8 | 56.4 | 48.5 | 68.1   |
| 12                    | 60.8           | 59.8 | 56.4 | 61.3 | 61.7 | 60.2 | 56.4 | 49   | 68.5   |
| 15                    | 67.1           | 61.2 | 57.7 | 61.4 | 61.9 | 60.1 | 56.4 | 49.7 | 70.6   |

##### • ARE backdraught damper

| Air velocity<br>(m/s) | Frequency (Hz) |      |      |      |      |      |      |      |        |
|-----------------------|----------------|------|------|------|------|------|------|------|--------|
|                       | 63             | 125  | 250  | 500  | 1000 | 2000 | 4000 | 8000 | Global |
| 2                     | 58.2           | 57.5 | 54.7 | 55   | 55   | 49.6 | 47.1 | 40.3 | 63.6   |
| 4                     | 60             | 63.7 | 59.3 | 59.8 | 60.3 | 56.4 | 54.9 | 49.1 | 68.5   |
| 6                     | 63.1           | 66   | 61.3 | 61.7 | 62.4 | 59.6 | 59.7 | 55.4 | 71.1   |
| 8                     | 64.1           | 67.4 | 62.3 | 63.5 | 64.2 | 61.7 | 62   | 58   | 72.6   |
| 10                    | 64.2           | 68.2 | 63.9 | 66.7 | 66   | 63.3 | 63.3 | 58.5 | 74     |
| 12                    | 63.6           | 68.5 | 63.3 | 65.4 | 65.9 | 63.4 | 65.1 | 59.1 | 74     |
| 15                    | 61.8           | 65.6 | 62.3 | 67.2 | 65.5 | 63.4 | 61   | 56.3 | 72.9   |

Datas are given for a damper L 500 x H 510 mm

From these data, you can calculate the regenerated noise of a damper of different dimensions by applying the formula below for every frequency band:

$$L_{w_{63}} = x_{63} + 10 \log \left( \frac{S}{0.25} \right)$$

$x_{63}$  = Air flow noise for 63 Hz (in dB) for a given air velocity => read the data in the table

$S$  = Damper section (in  $m^2$ ).

$L_{w_{63}}$  = Air flow noise required at 63 Hz (in dB) for a given air velocity..

#### Example – Calculation of regenerated noise for a damper ARO L800 x H 840 mm

- Damper section :  $S = 0.84 \times 0.8 = 0.672 m^2$

Calculation of the regenerated noise at 63Hz for **an air velocity of 6 m/s** :

$$L_{w_{63}} = 57.8 + 10 \log \left( \frac{0.672}{0.25} \right) = 62.1 \text{ dB}$$

Value in the table at a frequency of 63Hz and for an air velocity of 6 m/s.

Repeat this calculation rules to get the regenerated noise for all frequencies (63Hz - 8kHz).