

# Ceiling Diffusers

• Type DQ · Type ADQ

• recommended for room heights  
from 2.60 m to 4.00 m



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**DQ - 1**



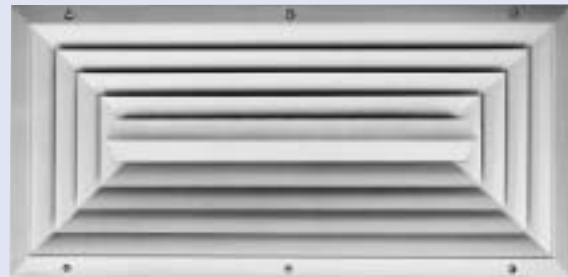
**DQ - 2**



**DQ - 3**



**DQ - 4**



Square or rectangular construction ceiling diffusers, either in aluminium (type ADQ) or steel (type DQ). Ideal for horizontal air discharge in a flat ceiling. The directions of discharge can be selected to meet the requirements of room geometry, with 1 to 4 ways available. These ceiling diffusers are suitable for both supply and extract air application.

# Construction · Dimensions · Materials · Installation

## Construction

The type DQ and ADQ diffuser faces consist of a border with counterpunched holes and fixed blades for horizontal discharge. Available with 1 to 4 ways discharge face. Additional rear mounted opposed blade damper, operable from the front face is also available.

## Materials DQ

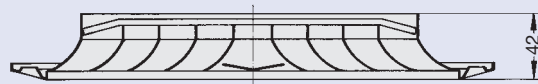
The diffuser face and rear-mounted ancillaries are in formed sheet steel. The surfaces are powder-coated white (RAL 9010) and the volume control damper stove enamelled black (RAL 9005). The installation subframe is rolled galvanised sheet steel.

## Materials ADQ

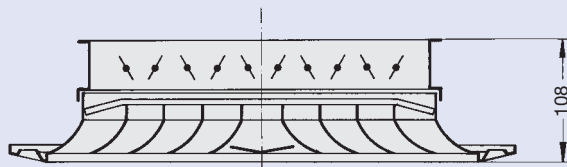
The diffuser face is in extruded aluminium sections natural anodised E6-C-0. The rear ancillaries are in formed sheet steel. The surfaces are phosphate treated and black stove-enamelled (RAL 9005). The installation subframe is rolled galvanised sheet steel.

## Installation

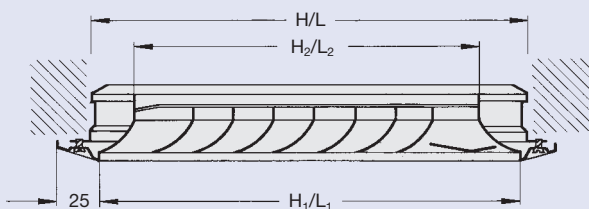
The diffusers can be installed directly onto a duct section or with installation subframe, e.g. in masonry walls. For horizontal discharge, a flat ceiling is necessary.



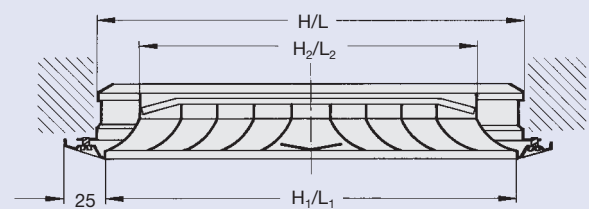
DQ - ... - A  
ADQ - ... - A



DQ - ... - AG  
ADQ - ... - AG



DQ - 1  
ADQ - 1



DQ - 2 ... 4  
ADQ - 2 ... 4

Opening size without installation subframe, H - 6 / L - 6 mm.

## Standard sizes

L x H in mm	L <sub>1</sub> x H <sub>1</sub> in mm	L <sub>2</sub> x H <sub>2</sub> in mm
473 x 264	457 x 248	400 x 191
573	557	500
673	657	600
873	857	800
1073	1057	1000
1273	1257	1200
573 x 364	557 x 348	500 x 291
673	657	600
873	857	800
1073	1057	1000
1273	1257	1200
673 x 464	657 x 448	600 x 391
873	857	800
1073	1057	1000
1273	1257	1200
873 x 564	857 x 548	800 x 491
1073	1057	1000
1273	1257	1200
<sup>1)</sup> 464 x 464	448 x 448	391 x 391
<sup>1)</sup> 964	948	891
<sup>1)</sup> 564 x 564	548 x 548	491 x 491
<sup>1)</sup> 1164	1148	1091
<sup>1)</sup> 589 x 589	573 x 573	516 x 516
<sup>1)</sup> 1214	1198	1141

<sup>1)</sup> Particularly suitable for panel ceilings

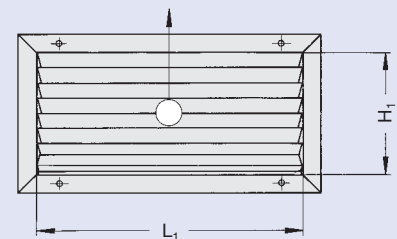
# Directions of Discharge

**Effective Air Outlet Area**

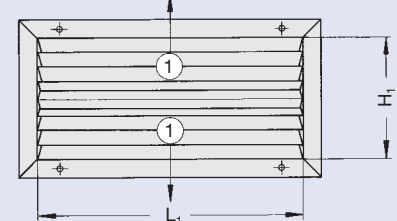
L x H in mm	A <sub>eff.G</sub> in m <sup>2</sup>	A <sub>eff.T①</sub> in m <sup>2</sup>	A <sub>eff.T②</sub> in m <sup>2</sup>	A <sub>eff.T③</sub> in m <sup>2</sup>	A <sub>eff.T④</sub> in m <sup>2</sup>
1) 473 x 264	0.036	0.0180	0.0158		0.0136
2) 573	0.045	0.0225	0.0203		0.0181
2) 673	0.054	0.0270	0.0248	1) 0.0044	0.0226
2) 873	0.072	0.0360	0.0338		0.0316
2) 1073	0.090	0.0450	0.0428		0.0406
2) 1273	0.108	0.0540	0.0518		0.0496
1) 573 x 364	0.063	0.0315	0.0269		0.0222
1) 673	0.075	0.0375	0.0329	1) 0.0093	0.0282
2) 873	0.101	0.0505	0.0459		0.0412
2) 1073	0.126	0.0630	0.0584		0.0537
2) 1273	0.152	0.0760	0.0714		0.0667
1) 673 x 464	0.094	0.0470	0.0386		0.0302
1) 873	0.125	0.0625	0.0541	1) 0.0168	0.0457
2) 1073	0.156	0.0780	0.0696		0.0612
2) 1273	0.188	0.0940	0.0856		0.0772
1) 873 x 564	0.157	0.0785	0.0647		0.0509
1) 1073	0.196	0.0980	0.0842	1) 0.0276	0.0704
2) 1273	0.236	0.1180	0.1042		0.0904
1) 464 x 464	0.068	0.0340	0.0256	1) 0.0168	0.0172
2) 964	0.152	0.0760	0.0676		0.0592
1) 564 x 564	0.110	0.0550	0.0412	1) 0.0276	0.0274
2) 1164	0.237	0.1185	0.1047		0.0909
1) 589 x 589	0.123	0.0615	0.0461	1) 0.0308	0.0307
2) 1214	0.267	0.1335	0.1181		0.1027

1) See diagram 4 for aerodynamic data  
2) See diagram 3 for aerodynamic data

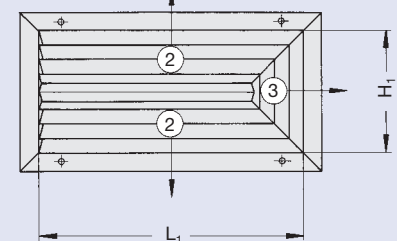
**Directions of Discharge**



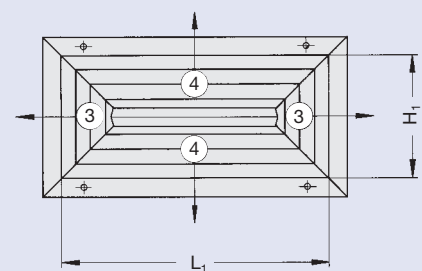
DQ - 1, ADQ - 1



DQ - 2, ADQ - 2



DQ - 3, ADQ - 3

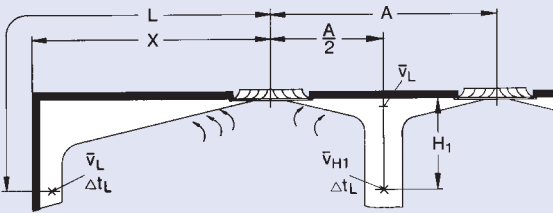


DQ - 4, ADQ - 4

**Correction Values for  $A_{\text{eff,G}}$**

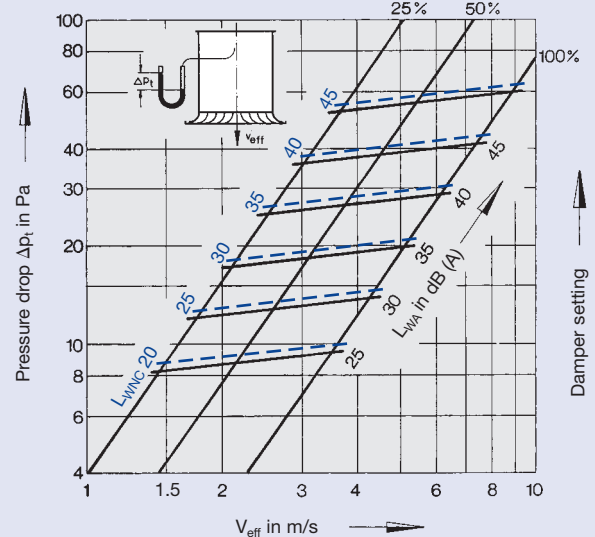
$A_{\text{eff,G}}$ in m <sup>2</sup>	0.005	0.01	0.02	0.05	0.1	0.2	0.4
$L_{\text{WA}} / L_{\text{WNC}}$	-13	-10	-7	-3	0	+3	+6

## Nomenclature

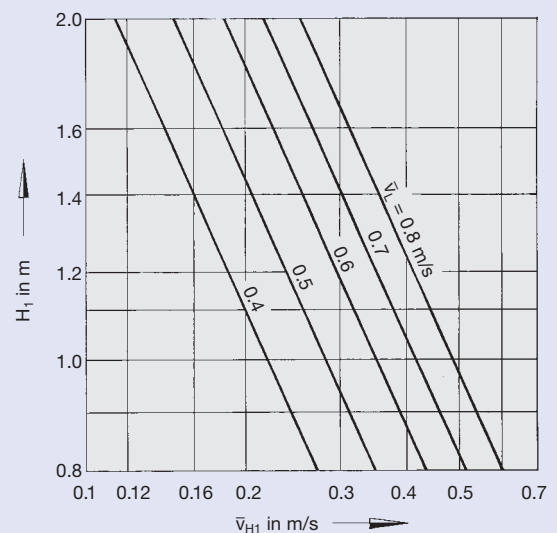


- $\dot{V}_t$  in l/s: Total volume flow per diffuser
- $\dot{V}_t$  in m<sup>3</sup>/h: Total volume flow per diffuser
- $\dot{V}$  in l/s: Volume flow in direction of discharge related to outlet areas ①, ②, ③ and ④
- $\dot{V}$  in m<sup>3</sup>/h: Volume flow in direction of discharge related to outlet areas ①, ②, ③ and ④
- A in m: Spacing between two diffusers
- X in m: Distance between centre of diffuser and the wall
- H<sub>1</sub> in m: Distance between ceiling and occupied zone area
- $\bar{v}_{H1}$  in m/s: Time average air velocity between two diffusers at distance H<sub>1</sub> from the ceiling
- L in m: Distance from diffuser  $L = X + H_1$
- $\bar{v}_L$  in m/s: Time average air velocity at the wall
- $\Delta t_Z$  in K: Temperature difference between supply and room air
- $\Delta t_L$  in K: Difference between core and room temperature at distance  $A/2 + H_1$  or  $L = X + H_1$
- $A_{\text{eff,G}}$  in m<sup>2</sup>: Total effective outlet area
- $A_{\text{eff,T}}$  in m<sup>2</sup>: Effective outlet area in direction of discharge
- i : Induction ratio =  $\frac{\text{total airstream volume flow}}{\text{volume flow at diffuser discharge}}$
- $v_{\text{eff}}$  in m/s: Effective jet velocity
- $\Delta p_t$  in Pa: Total pressure drop
- $L_{\text{WA}}$  in dB(A): A-weighted sound power level
- $L_{\text{WNC}}$  : NC rating of sound power level
- $L_{\text{WNR}}$  :  $L_{\text{WNR}} = L_{\text{WNC}} + 2$
- $L_{\text{pA}}, L_{\text{pNC}}$  : A-weighting and NC rating of room sound pressure level
  - $L_{\text{pA}} \approx L_{\text{WA}} - 8 \text{ dB}$
  - $L_{\text{pNC}} \approx L_{\text{WNC}} - 8 \text{ dB}$

**1 Sound power level and pressure drop**



**2 Air velocity between two diffusers**



# Aerodynamic Data

## Example

Data given:

Type ADQ - 2

Distance from diffuser

$$L = 10 \text{ m}$$

Total volume flow per diffuser

$$\dot{V}_t = 300 \text{ l/s}$$

Volume flow per direction of discharge  $\dot{V}_t/2$

$$\dot{V} = 150 \text{ l/s}$$

Air velocity

$$\bar{v}_L = 0.4 \text{ m/s}$$

Supply air temperature difference

$$\Delta t_z = 6 \text{ K}$$

Diagram 3:

$$A_{\text{eff.T} \textcircled{1}} = 0.037 \text{ m}^2$$

$$i = 17$$

$$\Delta t_L / \Delta t_z = 0.095$$

$$\Delta t_L = 0.095 \times 6 = 0.57 \text{ K}$$

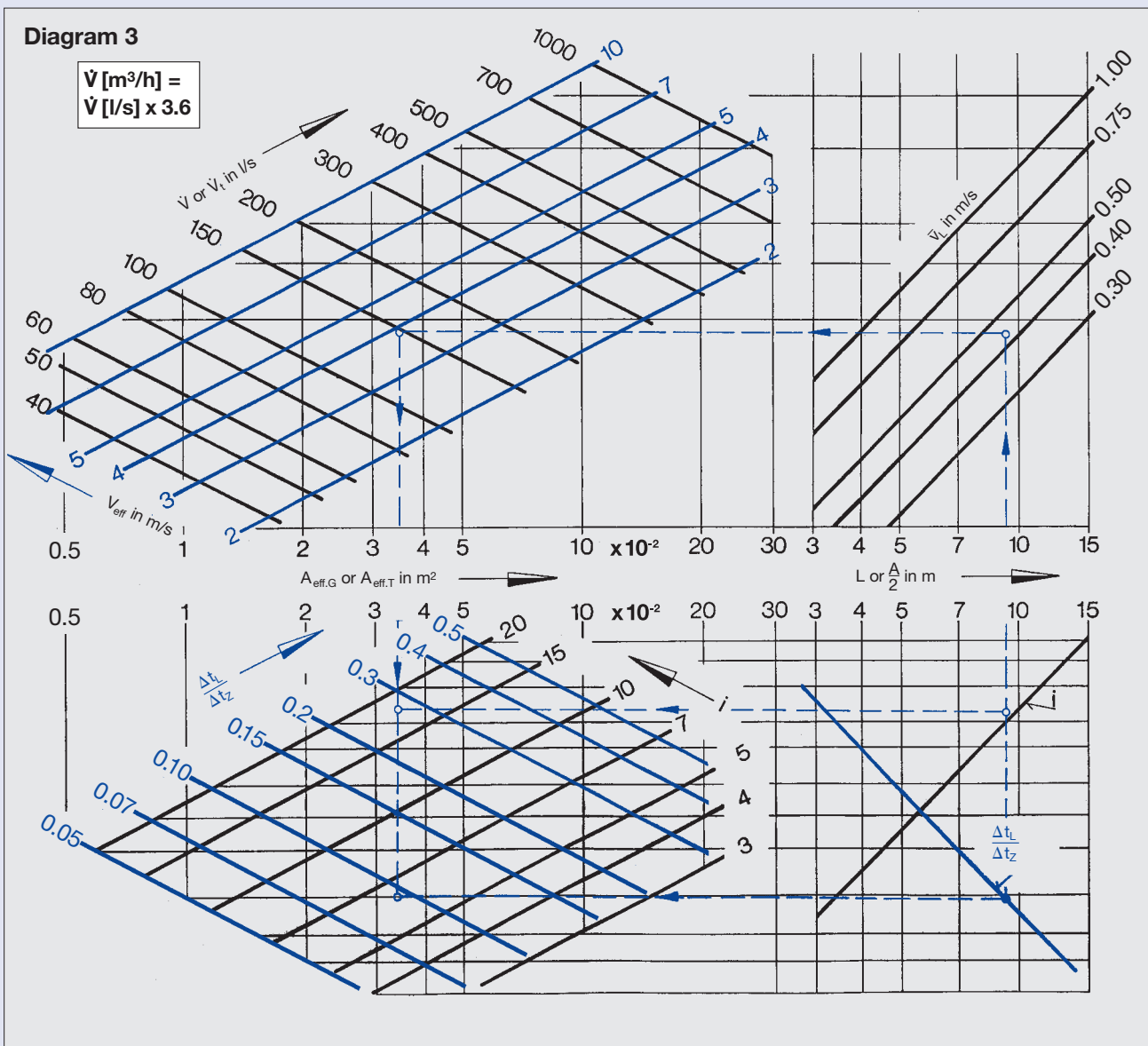
Table Page 4:

$$A_{\text{eff.T} \textcircled{1}} = 0.037 \text{ m}^2$$

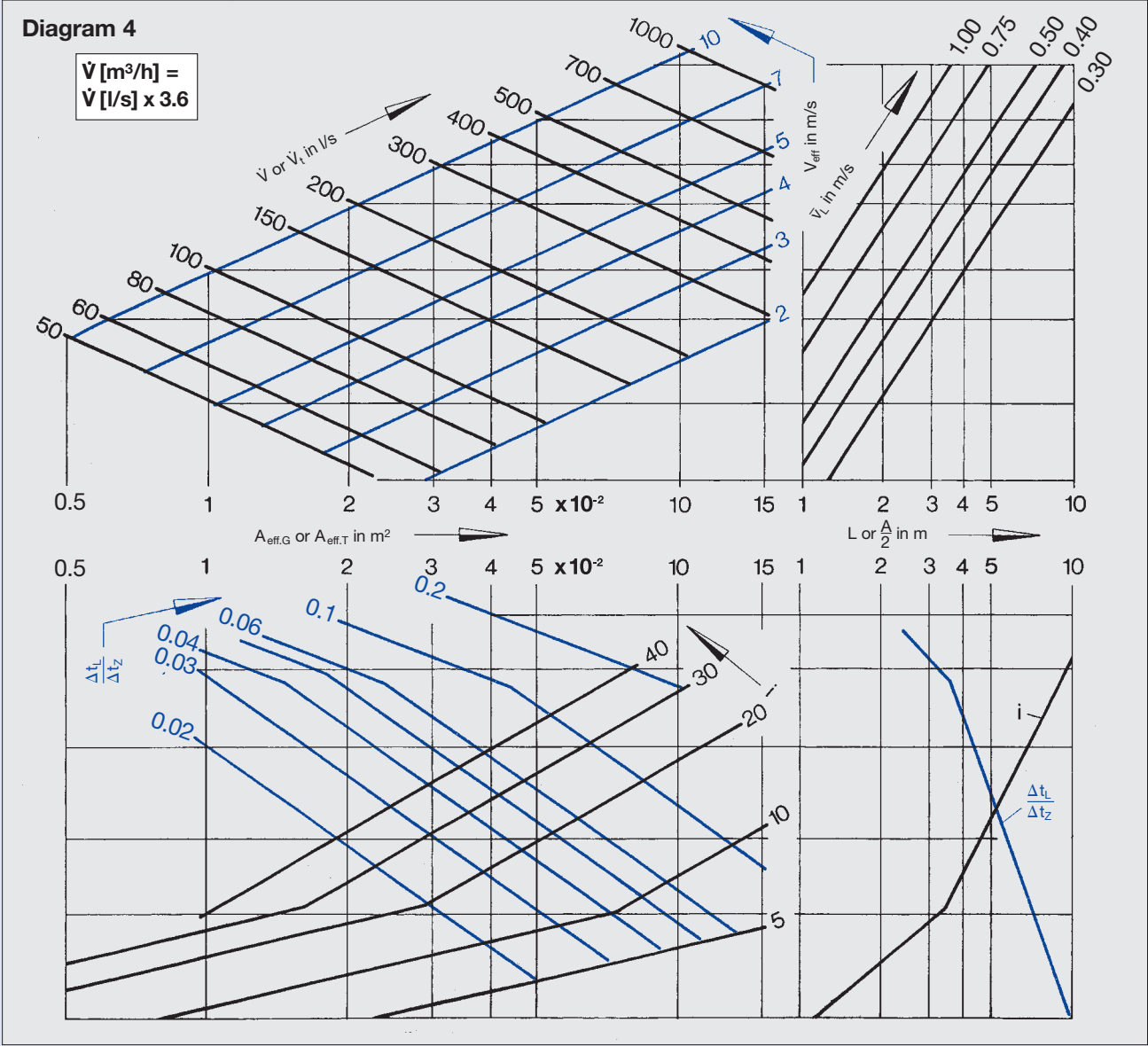
$$A_{\text{eff.T} \textcircled{1}} \approx 0.036 \text{ m}^2$$

$$L \times H = 873 \times 264 \text{ mm}$$

Applicable  $L / H > 2.1$  for DQ - 1 / ADQ - 1, and discharge directions ①, ② and ④



Applicable a)  $L / H < 2.1$  for DQ - 1 / ADQ - 1,  
and discharge directions ①, ② and ④  
b) Discharge directions ③ - all cases



# Aerodynamic Data

## Example

Data given:

Type ADQ - 4 / 673 x 464

Total volume flow per diffuser

$$\dot{V}_t = 550 \text{ l/s}$$

Table page 4:

$$A_{\text{eff.G}} = 0.0940 \text{ m}^2$$

$$A_{\text{eff.③}} = 0.0168 \text{ m}^2$$

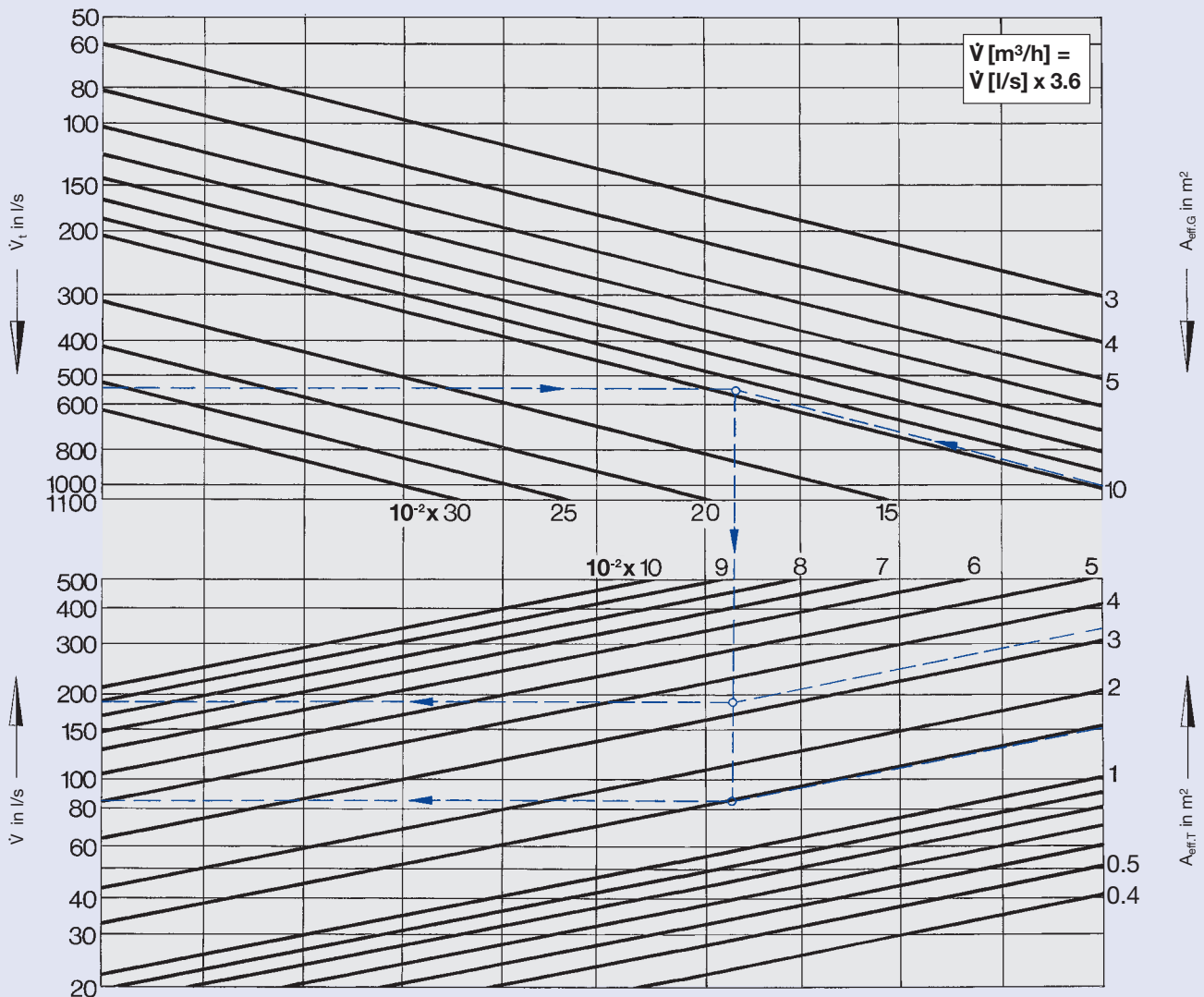
$$A_{\text{eff.④}} = 0.0302 \text{ m}^2$$

Diagram 5:

$$\dot{V}_{③} = 190 \text{ l/s}$$

$$\dot{V}_{④} = 85 \text{ l/s}$$

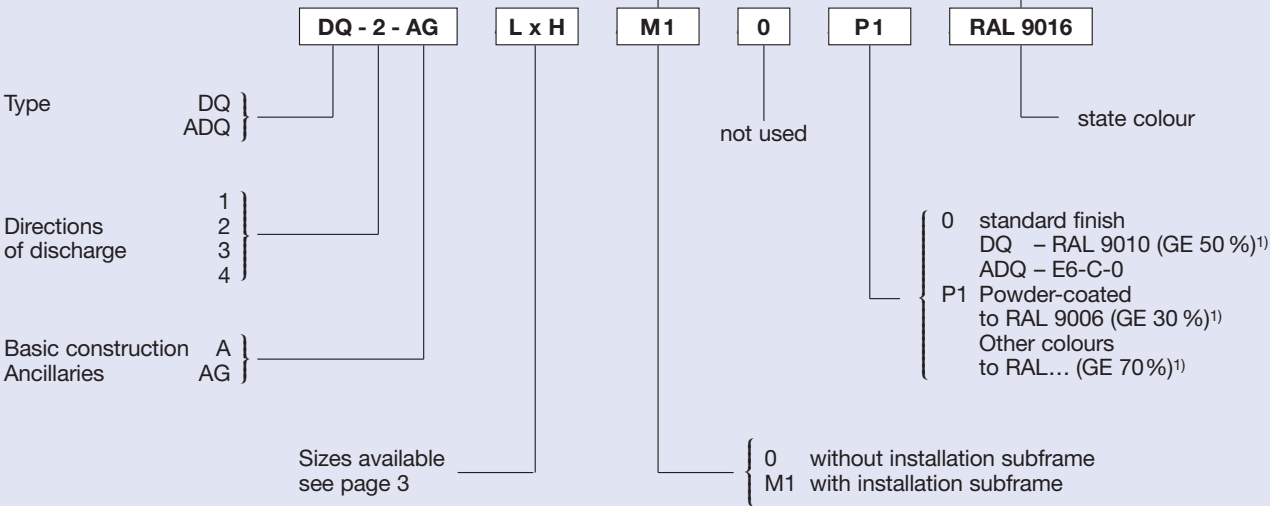
Diagram 5





### Order Code

These codes do not need to be completed for standard products



1) GE = gloss level

### Specification Text

Square or rectangular construction ceiling diffusers, suitable for horizontal air discharge, with 1 to 4 ways discharge, consisting of diffuser face with mitred perimeter border which is counter punched for screw fixing on site and has fixed blades for horizontal discharge, border has rear sealing strip. Optional rear mounted opposed blade volume control damper adjustable from the front face of the diffuser.

**Materials DQ:**  
Diffuser face and volume control damper in formed sheet steel. The surface is powder-coated white (RAL 9010) and the volume control damper stove-enamelled black (RAL 9005), resistant to saturated environment for a minimum of 100 hours without deterioration (DIN 50 017). Installation subframe in rolled galvanised sheet steel.

**Materials ADQ:**  
Diffuser face in extruded aluminium section, natural anodised to E6-C-0, volume control damper in formed sheet steel, surface stove-enamelled black (RAL 9005), resistant to saturated environment for a minimum of 100 hours without deterioration (DIN 50 017). Installation subframe in rolled galvanised sheet steel.

### Order Example

Make: TROX  
Type: DQ - 2 - AG / 573 x 364