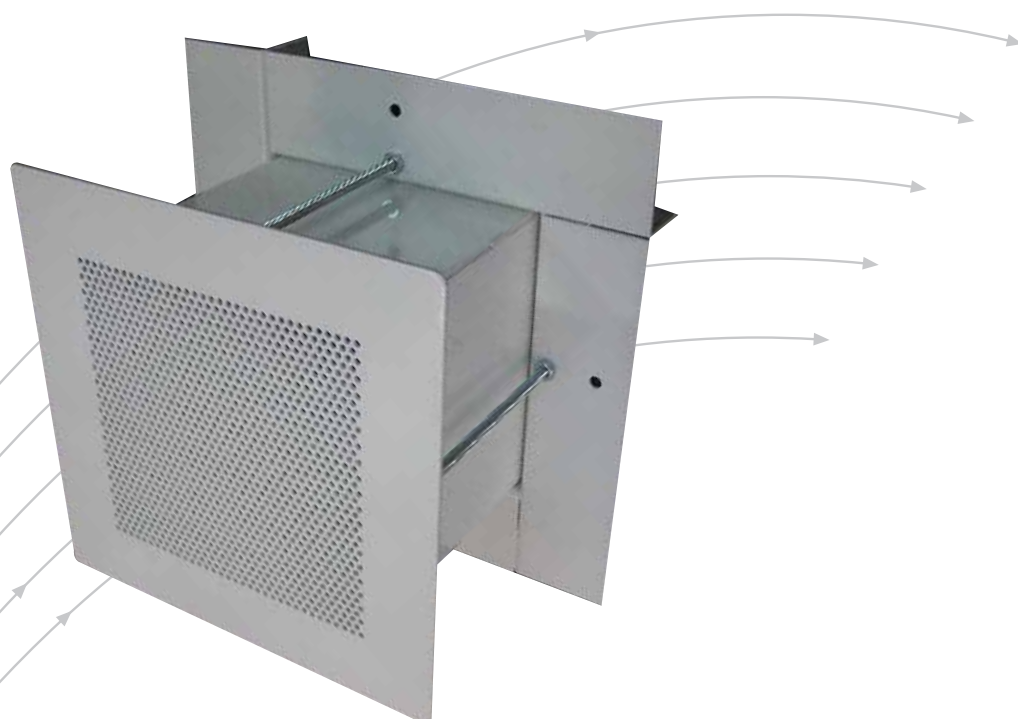


Cell Grilles

Type TCG



TROX[®] TECHNIK

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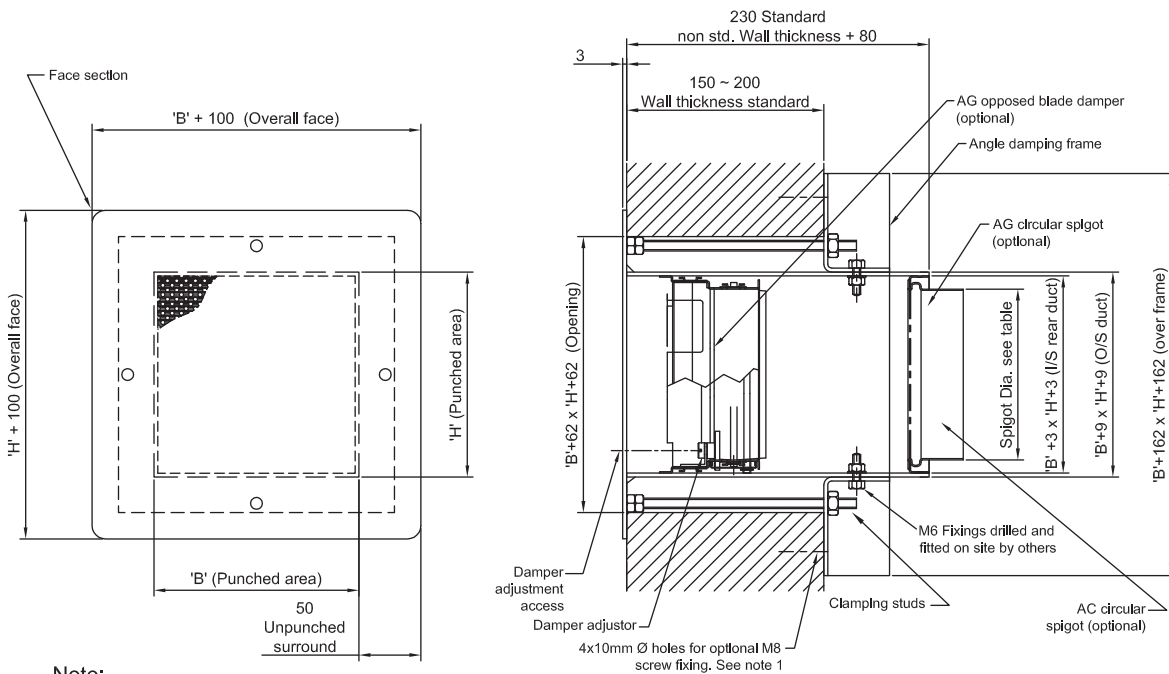
Description:

This Type 'TCG' grille is designed for the UK's Home Office requirements to provide mechanical ventilation into prison cells and, it is suitable for either supply or return air application. It is meant to be installed firmly into the wall opening and is tamper resistant.

Construction:

This grille has a 3 mm thick heavy duty perforated steel face plate, which is secured firmly to the back of the wall with a heavy duty steel frame. If required, it can be supplied with opposed blade volume control damper and / or a rear circular connection.

Type TCG1 High Security Grille



Note:

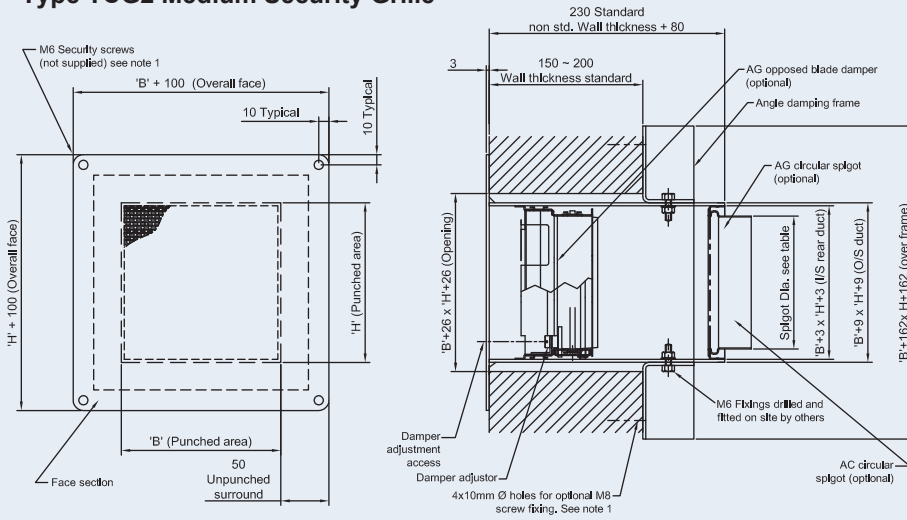
- Material: Faceplate - perforated steel 3mm thick with approximately 32% free area.
- When required: Spigot and end tray when specified - pre-galvanised steel sheet.
NB - refer to table 2 for spigot sizes.
- Opposed blade damper - standard Trox AG type.
- Other accessories e.g intumescent fire block available on request.
- Standard finish: Powdercoat to RAL 9010 (matt white)

Materials · Standard Sizes

Materials

The cell grilles are manufactured from 3.0 mm thick galvanized steel. It is powder coated in matt white to RAL 9010. The perforated face is made from 3 mm thick galvanized sheet steel and the border frame and duct section from 2 mm thick galvanized sheet steel. The rear mounting angle frame is made from 3 mm thick galvanized sheet steel.

Type TCG2 Medium Security Grille



Note 1

Site fixing screws to be fitted with 'Kemfix' or similar by others (chemical locking compound)

Type TCG3 Low Security Grille

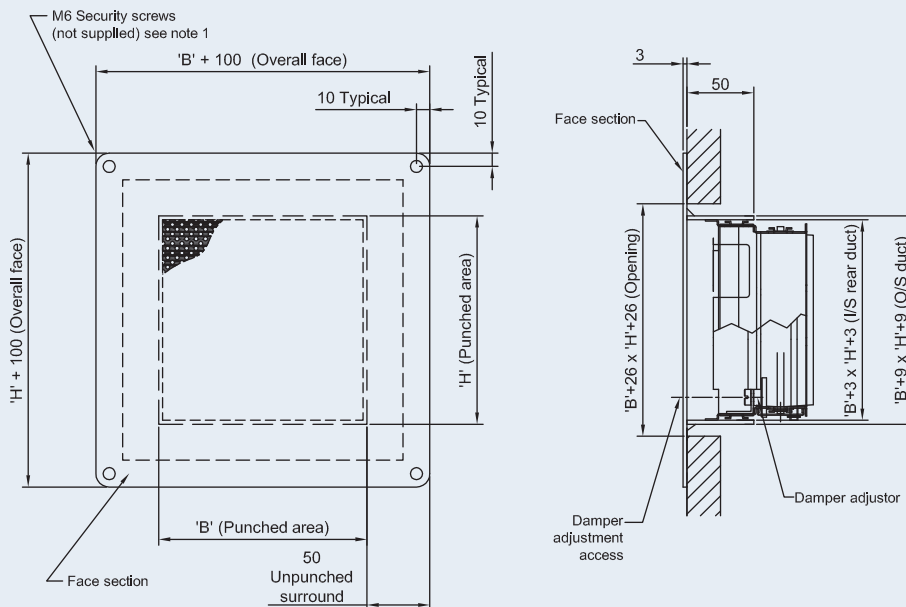


Table 1: Standard Sizes in mm

B	H	Spigot ϕ
150	150	123
200	150	123
250	150	123
200	200	158
250	200	158
250	250	198

Note :

Other sizes available on request

Table 2: Cell Grille Supply Air Data

Size (mm)	Vel. (m/s)	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50
	Δp (Pa)	1	3	5	8	12	16	21	27	33
150 x 150	Air Flow (l/s)	11	17	23	28	34	39	45	51	56
	Throw (m)	1.3	1.9	2.5	3.2	3.8	4.4	5.1	5.7	6.3
	SWL in dB(A)	-	-	21	27	32	36	39	43	45
200 x 150	Air Flow (l/s)	15	23	30	38	45	53	60	68	75
	Throw (m)	1.5	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.5
	SWL in dB(A)	-	-	22	28	33	37	40	44	46
250 x 150	Air Flow (l/s)	19	28	38	47	56	66	75	84	94
	Throw (m)	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3
	SWL in dB(A)	-	-	23	29	34	38	41	45	47
200 x 200	Air Flow (l/s)	20	30	40	50	60	70	80	90	100
	Throw (m)	1.7	2.6	3.5	4.3	5.2	6.1	6.9	7.8	8.7
	SWL in dB(A)	-	-	24	30	35	39	42	46	48
250 x 200	Air Flow (l/s)	25	38	50	63	75	88	100	113	125
	Throw (m)	1.9	2.9	3.9	4.8	5.8	6.8	7.7	8.7	9.7
	SWL in dB(A)	-	-	25	31	36	40	43	47	49
250 x 250	Air Flow (l/s)	31	47	63	78	94	109	125	141	156
	Throw (m)	2.1	3.2	4.3	5.3	6.4	7.5	8.5	9.6	10.7
	SWL in dB(A)	-	-	26	32	37	41	44	48	50
300 x 300	Air Flow (l/s)	45	68	90	113	135	158	180	203	225
	Throw (m)	2.5	3.8	5.1	6.3	7.6	8.9	10.1	11.4	12.7
	SWL in dB(A)	-	20	27	33	38	42	46	49	51

Nomenclature:

V in l/s: Volume Flow

ΔPS in Pa: Static Pressure Drop

L in M: Throw distance to 0.5m/s

V_k in m/s: Face Velocity

L_{wain} dB(A): A-weighted sound power level

L_{wnc} : Approx. $L_{wnc}:-5$

Table 3 – Supply and Extract Area, A_{eff} (m²)

L x H in mm	A_{eff} (m ²)
150 x 150	0.014
200	0.020
250	0.026
200 x 200	0.029
250	0.037
300	0.046
250 x 250	0.048
300	0.059
300 x 300	0.073
350	0.086
400	0.099
350 x 350	0.109
400	0.118
400 x 400	0.137

Recommended Sizing

This cell grille is usually used in small rooms with hard surfaces for supply or return air application. Therefore, it is recommended that selection of the cell grille should be based on a maximum sound power level of $L_{wnc} = 30$ dB (i.e., $L_{WA} = 35$ dBA).

Determination of Volume Flow

The volume flow rate through the cell grille can be determined by measuring the air velocity across the grille face using a rotating vane anemometer. The measuring instrument should be fitted to a calibrated hood which should cover the entire face area of each grille.

Technical Data · Nomenclature

Example

Data Given:

TCG – AG / 200 X 200

Area $V_{eff} = 0.029 \text{ m}^2$ (Taken from Table 3; p.4)

Extract flow rate, $V = 55 \text{ l/s}$

Damper setting = 100% (i.e., fully open)

$$v_{eff} = V / (A_{eff} \times 1000)$$

$$v_{eff} = 55 / (0.029 \times 1000)$$

$$v_{eff} = 1.9 \text{ m/s.}$$

From the Graph 1 below, the sound power level and pressure drop for the grille as selected are as follow;

$$LWA = 33 \text{ (LWNC = 28)}$$

$$\Delta p_{pt} = 20 \text{ Pa}$$

To allow for correction using information given in Table 4 for A_{eff} and, by extrapolation;
 $LWA : 33 - 5 = 28 \text{ dB (A)}$.

$$LWNC : 28 - 5 = 23 \text{ NC.}$$

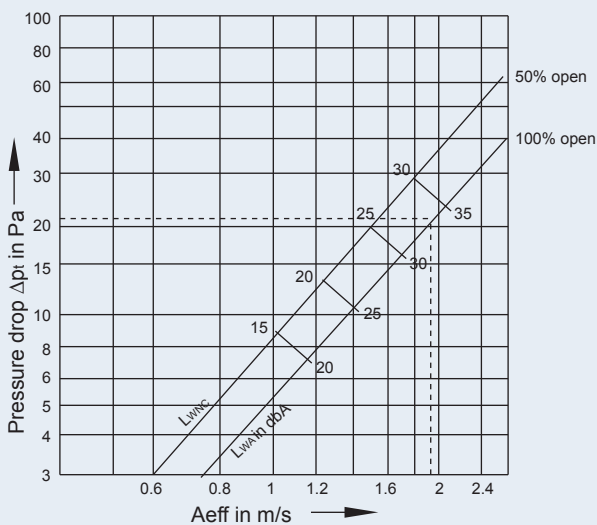
Nomenclature

	Unit	
V	l/s	Volume flow rate.
Δp_{pt}	Pa	Pressure drop for the grille.
v_{eff}	m/s	Effective face velocity.
A_{eff}	m^2	Effective area of grille.
LWA	dB(A)	A-weighted sound power level based on $A_{eff} = 0.1 \text{ m}^2$ (refer to Table 4 below for correction).
LWNC		NC rating of sound power level based on $A_{eff} = 0.1 \text{ m}^2$ (refer to Table 4 below for correction).

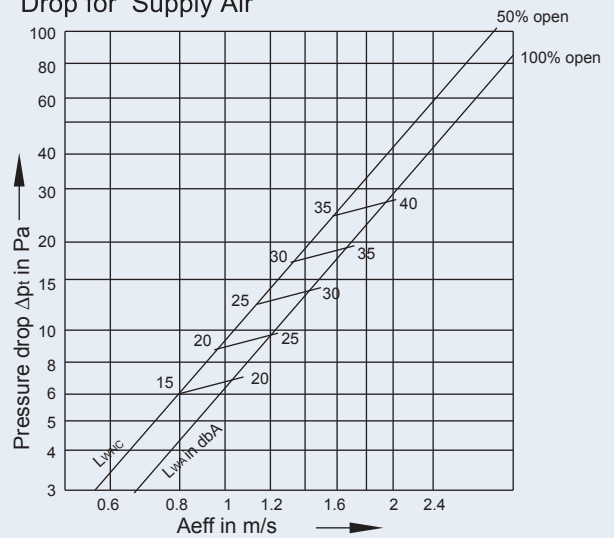
Table 4 – Corrections for A_{eff}

$A_{eff} (\text{m}^2)$	0.01	0.02	0.05	0.10	0.15
LWA/LWNC	- 10	- 7	- 3	0	+2

Graph 1 – Sound Power Levels and Pressure Drop for Extract Air

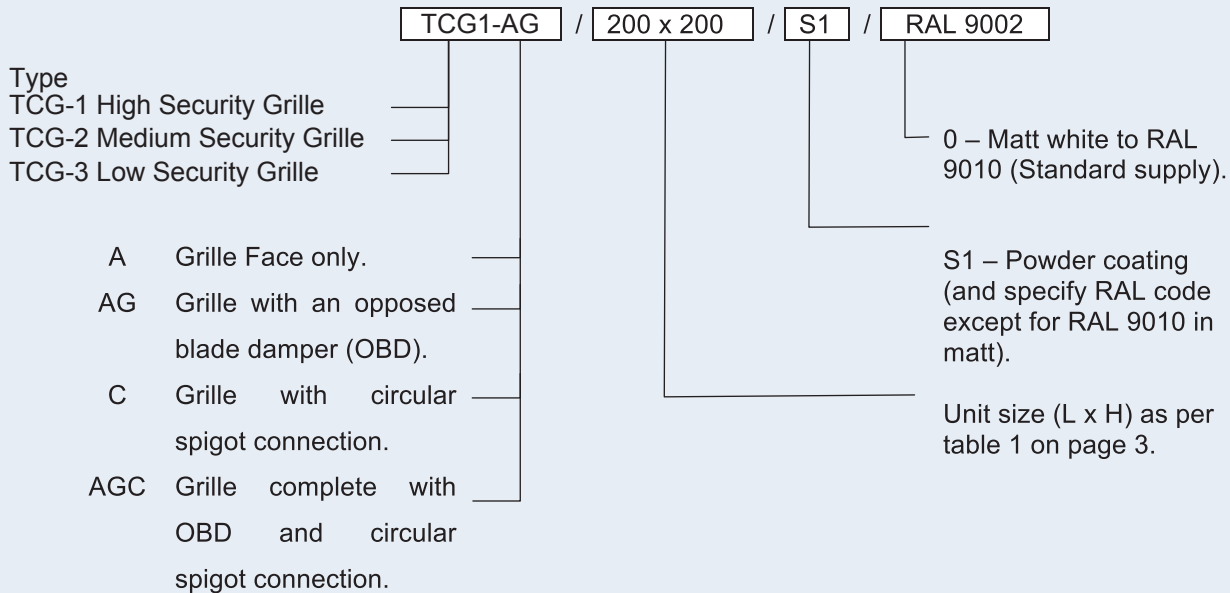


Graph 2 – Sound Power Levels and Pressure Drop for Supply Air



Order Details

Order Code



General Specification

The TCG Type Cell Grille is suitable for either supply or, exhaust air application. It is designed to the U.K. Home Office requirements for security application.

The face section of this grille is made from galvanised steel and is secured at rear with a heavy gauge steel mounting frame.

As optional extra, an opposed blade damper (OBD) can be provided to the back of each grille if required, which is adjusted from the grille face.

In addition, circular spigot connection can be provided if requested. Spigot connection sizes are given in Table 1 of in this catalogue.

It should be noted that fixing and jacking screws needed to fix the cell grille to the wall should be provided by others.

Finish

The grille section and the rear mounting frame will be powder coated in matt white to RAL 9010 as standard supply. Customer should state the required RAL colour code if they need a different colour for the grille as optional extra.

Order Example

Make: TROX
Type: TCG 1 – AG /250 x 250/S1/0
Quantity: 120 nos.