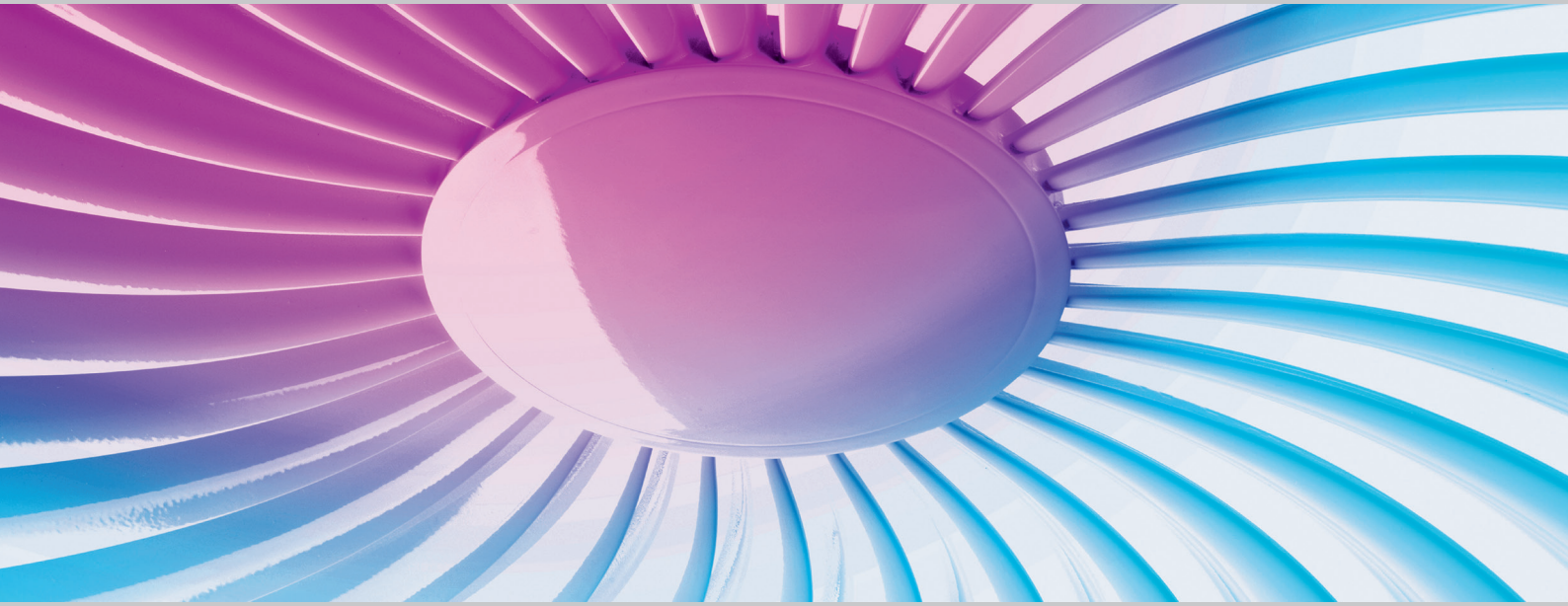
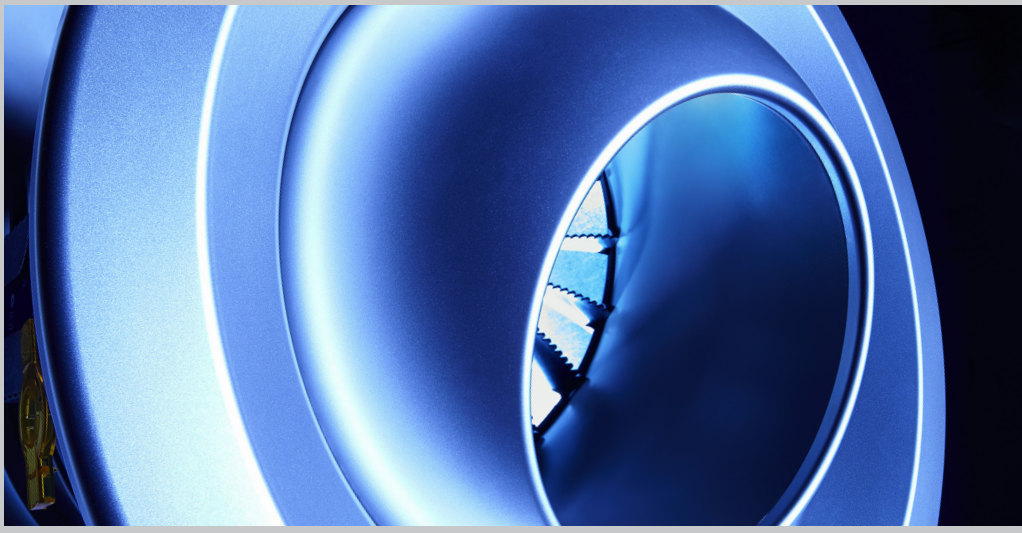
Quick Selection Guide
5th Edition





TROX® TECHNIK

The art of handling air

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KLIMA Asia Pacific

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Purpose of this Quick Selection Guide

This Quick Selection Guide has been prepared to assist you to select TROX products with ease. It also provides you with general technical information and dimensional details as guide for each product.

You should also visit TROX website and download TROX 'Easy Product Finder' to select the products you want. This software will also provide you with the relevant product information that include;

i. product codes
ii. technical data
iii. specification text
iv. product photos,
v. CAD-data (dxf, Step)

For detail information, you are advised to refer the full product information from our website at www.troxapo.com; on CD ROM and our KLIMA Asia Pacific catalogue. If you need a FREE copy of our CD ROM and/or KLIMA Asia Pacific catalogue, please send your request to our email address at enquiry@troxapo.com stating your full name, position, company name and address and telephone number for speedy response.

The full TROX product range for ventilation and air conditioning technology includes;

Components

- Air terminal devices
- Air terminal units
- Fire and smoke protection components
- Sound attenuators
- Dampers and weather louvers
- Air filter units and filter elements

Systems

- Air-water systems
- Laboratory ventilation systems
- Communication systems for fire and smoke protection
- Advance IT Cooling system for data centres

Introduction to indoor comfort environment

In mechanical air distribution systems, two criteria are of particular importance:

- Thermal comfort
- Noise Level

Thermal Comfort

The factors affecting thermal comfort condition within an enclosed space are influenced by air distribution system in the following ways;

a. Spatial air temperature difference
b. Air velocity
c. Asymmetric radiation

The air flow pattern from an air terminal device will influence the thermal comfort within the occupied space. Careful consideration is necessary when selecting and deciding on the location of supply air terminal devices to avoid draft.

Research in human comfort has suggested that the temperature difference between the ankle and the neck should not exceed 3°C. For thermal comfort, the recommended room temperature within the occupied zone during cooling mode should be around 24 °C (with a tolerance of ± 1.5 °C) and the mean air velocity should not exceed 0.25 m/s according to the International Standard, ISO 7730.

Asymmetry radiation occurs when there are hot or cold surfaces with the enclosed space such as direct solar gain through the window, which can be overcome with shading for example. Such condition is usually generated independently of the air distribution system.

Apart from maintaining an acceptable thermal environment, the purpose of a good air distribution system to provide adequate amount of ‘fresh’ air for respiration and effectively removing air contaminants that are generated from within the occupied space.

Noise Level

As an integral part of a good air distribution system, it is also important to achieve the recommended acceptable noise level for a particular application. In this Quick Selection Guide, the performance data given in this document is based on NC 35 with the assumption of 8dB room attenuation unless stated otherwise.

The table below provide recommendations on acceptable Noise Criteria (NC) rating for various applications. These recommendations are based on the NC curves that attempt to represent equal noise tolerance for the average person at each frequency band.

Table 1: Recommended Design Noise Criteria in accordance to the CIBSE Guide A

Type of ventilated space	Design NC Level
Live theatres (< 500 seats), auditoriums, television studios, large conference and lecture rooms (> 50 people).	25
Board rooms, top management offices, conference and lecture rooms (20 – 50 people), multi-purpose halls, libraries, bedrooms in hotels, banqueting rooms, operating theatres and cinemas.	30
Public rooms in hotels, ballrooms, hospital open wards, middle management and small offices, small conference and lecture rooms (< 20 people), school classrooms, small court rooms, museums, libraries banking halls, small restaurants, cocktail bars and quality shops.	35
Toilets and washrooms, large open offices, drawing offices, reception areas (offices), halls, corridors, lobbies in hotels and hospitals, laboratories, recreation rooms, post offices, large restaurants, bars and night clubs, department stores, shops, gymnasia.	40
Kitchens in hotels, hospitals, laundry rooms, computer rooms, office equipment rooms, cafeteria, canteens, supermarkets, swimming pools, large covered parking areas, bowling alleys.	45

DESIGN CRITERIA FOR A TYPICAL OFFICE

Generally for most comfort cooling application, the acceptable design criteria for occupied office space should be as follows;

Mean resultant temperature:	24 ± 1.5 °C
Mean air velocity in occupied zone:	0.25 m/s
NC Level in small offices or conference rooms according to the CIBSE Guide A:	NC 35
NC Level in large open offices or reception areas according to the CIBSE Guide A:	NC 40

It is important to note that performance data for air diffusion products as published by TROX were tested to international standards under uniform air flow and pressure conditions at the point of entry. If non-uniform entry condition occur on site, this could have the following impact on air distribution in the room;

a. The throw and spread of the supply air stream will not correspond with the manufacturer's published data.
b. Higher regenerated noise can be expected from the air terminal devices.
c. The supply air stream from the air terminal device may not create the Coanda effect as expected.
d. It may be difficult to obtain accurate air flow or velocity measurements during site commissioning.

Hence, it is advisable to adopt good engineering practices to ensure uniform air flow and pressure conditions at the entry point for all supply air terminal devices as recommended by ASHRAE or CIBSE Design Guidelines.

Table 1: Comparison between 4-way throw and swirl diffusers suitable for 600 by 600 mm T-bar suspended ceiling complete with plenum box (for ceiling height between 2.8 and 3.8 m).

TROX Product Type	Air Flow[1] (l/s)	Max. ΔP (Pa)	Spacing between the diffuser & wall X (m)	Spacing (A/B) between diffusers (m)	Plenum box ht. (mm)	Inlet spigot, Ø (mm)	Type of Ceiling Diffuser	Comments
ADTL-4/KM/ 500 x 500	330	43	2.7 to 5.7	4.8 to 6.0	475	298	Square Face with 4-way throw	This type of diffuser can handle higher air flow than swirl diffuser. Hence, fewer diffusers will be required.
ADLQL-P-H-M-S/ 600T	200	35	1.5 to 2.1	3.0 to 4.2	455	299		
ADLR-Q-ZH-M/ 598 -7	310	36	2.1 to 4.8	3.6 to 4.8	503	298	Round face with radial discharge	
ADLR-Q-ZH-M/ 598 - 8	365	40	1.8 to 4.8	4.8	503	298		
FD-Q-Z-H-M/ 600	160	40	1.5 to 4.2	3.6 to 4.8	350	248	Square face swirl diffuser. (NOTE: This is also available with round face.)	This type of diffuser is best suited for VAV system as it can handle lower flow rates with minimal down draft. It can also be used on CAV system but it delivers lower air flow rate compared to the ADT diffuser.
VDW-Q-Z-H-M/ 600 x 24	185	47	1.5 to 4.2	3.6 to 4.2	345	248		
VDW-Q-Z-H-M/ 600 x 48	200	43	1.5 to 4.2	3.6 to 4.2	345	248		
VDW-Q-Z-H-M/ 600 x 48	175	43	2.1 to 4.2	3.6 to 4.2	345	248		

NOTE: The selections given above are based on on the following assumptions;
1. Recommended air flow rate given above is based on the damper blade is set to partially closed at 45°.
2. Temperature differential between supply air and room tempearture, ΔT is 10°C.
3. The floor to ceiling height is between 2.8 and 3.0 metres high.
4. The design NC rating required is NC 35, assuming 8 dB room attenuation.
5. The diffusers are fitted with side inlet plenum with volume control damper.
6. Average air velocity within the occupied space is at 0.25 ± 0.10 m/s. But VL may be as high as 0.4 m/s.
7. The diffuser arrangement is assumed to be symmetry.

Most of the ceiling diffusers and slot diffusers found in TROX KLIMA Asia Pacific Catalogue or in this Quick Selection Guide are meant to be mounted at ceiling heights from 2.6 up to 4.0m high. For ceiling heights **greater than 3.8 metres high**, customers are advised to use one of the following;

1. Type 'VDL' Swirl Diffusers
2. Type 'VD' Swirl Diffusers

As a rule of thumb, if the room is very wide (i.e., in access of 8 metres) and preferably without any columns within the centre of the room, then jet nozzles or drum lourves should be considered, provided that the floor to ceiling height is greater than 4 metres high.

The table below shows where TROX products can be used in relation to the required air change rates;

Room height up to 4.0 metres						
Air change rate (hr^{-1})	Air Flow Control	Grille	Slot diffuser	Swirl diffuser	Blade diffuser	Perfo-rated diffuser
≤ 10	CAV	++	++	++	++	++
	VAV	+	+	++	+	+
10 - 20	CAV	-	++*	++	++	++
	VAV	-	++*	++	+	+
20 - 30	CAV	-	-	++	-	-
	VAV	-	-	++	-	-

LEGEND

CAV – Constant volume system
VAV – Variable volume system

++ Very suitable
+ Suitable
- Not suitable
* With alternating horizontal discharge (suitable with slot diffuser only)

UNIT CONVERSION FACTORS

Physical quantity	IP Unit	Conversion factor	SI Unit	SI Symbol
Length	inch feet	25.4 0.304	millimetre metre	mm m
Area	square feet	0.0929	square metre	m^2
Volume	cubic foot	0.0283	cubic metre	m^3
Velocity	foot/minute	0.0051	metre/second	m/s
Volume flow rate	cubic foot/minute cubic metre/hour	0.472 0.278	litre/second litre/second	l/s l/s
Pressure	inch of water foot of water bar	249.1 2.989 100	Pascal kiloPascal kiloPascal	Pa kPa kPa
Energy	British thermal unit	1.055	kiloJoule	kJ
Power	British thermal unit/hour horsepower ton of refrigeration	0.293 0.745 3.517	Watt kiloWatt kiloWatt	W kW kW
Temperature	Fahrenheit	(°F-32) ÷ 1.8	Celsius	°C

MINIMUM OUTDOOR-AIR REQUIREMENTS BASED ON CLASS OF OCCUPANCY

Occupancy type*	Nett floor area per person †, m^2	Minimum outdoor airflow rate		
		Quantity	Unit	Comments
Amusement centres				See sports centres.
Beverage services				See food services.
Churches				See theatres.
Colleges				See education.
Correction centres				See prisons.
Dormitories				See hotels.
Dry cleaners and laundries				More air may be required to laundries satisfy exhaust air requirements.
Commercial	10	10	l/s.person	
Coin-operated dry cleaning	5	10	l/s.person	
Coin-operated laundries	5	10	l/s.person	
Pick-up areas	3.5	10	l/s.person	
Storage areas	3.5	10	l/s.person	
Education				
Classrooms serving persons up to 16 years of age	2	12	l/s.person	
Classrooms serving persons over 16 years of age	2	10	l/s.person	
Laboratories	3.5	10	l/s.person	Special contaminant control systems may be required for processes or functions including laboratory animal occupancy.
Libraries	5	10	l/s.person	
Locker rooms	2	10	l/s.person	
Lounges	1.5	10	l/s.person	
Music rooms	2	10	l/s.person	
Training shops	3.5	10	l/s.person	
Food and drink services				
Bars	1	20	l/s.person	For occupancies where smoking is not permitted 10 L/s may be approved, subject to requirements such as the display of signs etc.
Cabarets	1.5	20	l/s.person	
Cafeterias	1	15	l/s.person	
Cocktail lounges	1	20	l/s.person	
Dining rooms	1.5	15	l/s.person	
Fast food outlets	1	15	l/s.person	
Food preparation, serving and storage	3.5	10	l/s.person	For cooking, see Section 3.
Funeral parlours		10	l/s.person	
Chapels	0.6	15	l/s.person	Air shall not be recirculated into spaces.
Embalming rooms	5	10	l/s.person	
Reception rooms	1			
General areas				General requirements (applies to all forms unless separately listed)
Corridors		1	l/s.m^2 floor	
Dressing rooms	2	10	l/s.person	
Foyers	—	1	l/s.m^2 floor	
Lobbies		1	l/s.m^2 floor	
Locker rooms	2	10	l/s.locker	
Pedestrian tunnels		1	l/s.m^2 floor	
Ramps		1	l/s.m^2 floor	
Rest rooms	1	10	l/s.person	
Smoking rooms	1.5	25	l/s.person	
Stairs	—	1	l/s.m^2 floor	For stairs, passageways, etc, used as a means of egress, see AS 1668.1.
Utility rooms	—	1	l/s.m^2 floor area	

(continued)

Occupancy type*	Nett floor area per person † m^2	Minimum outdoor airflow rate		
		Quantity	Unit	Comments
Health care				Applies to convalescent homes, dentists, doctors, hospitals, nursing homes, etc. Special requirements or codes and pressure relationships may determine minimum ventilation rates and filter efficiency.
Amphitheatres	0.6	10	l/s.person	
Autopsy rooms	5	50	l/s.person	NOTE: It should not be recirculated.
Consultation rooms	3.5	10	l/s.person	
Delivery rooms	5	20	l/s.person	} Procedures generating contaminants may require higher rates, laminar flow or
Intensive care rooms	5	10	l/s.person	
Operating rooms	5	20	l/s.person	
Patient rooms	10	10	l/s.person	dedicated systems.
Physical therapy area	5	10	l/s.person	
Procedure areas	10	10	l/s.person	
Ready rooms	5	10	l/s.person	
Recovery rooms	5	10	l/s.person	
Waiting areas	1.5	10	l/s.person	
Hotels, motels, resorts				
Assembly rooms (large)	1	15	l/s.person	
Bedrooms (single, double)	10	10	l/s.person	
Conference rooms (small)	2	15	l/s.person	
Dormitories	—	10	l/s.person	
Gambling casinos	1.5	15	l/s.person	
Living rooms (suites)	5	15	l/s.person	
Lobbies	3.5	10	l/s.person	
Laundries				See dry cleaners.
Merchandising				General requirements (apply to all forms unless separately listed).
Arcades	5	10	l/s.person	
Dispatch areas	10	10	l/s.person	
Fitting rooms	1	10	l/s.person	
Kiosks	1	10	l/s.person	
Malls	5	10	l/s.person	
Receiving areas	10	10	l/s.person	
Sales floors or: Showrooms Basement and street floors	3.5	10	l/s.person	
Upper floors	5	10	l/s.person	
Storage areas (serving sales and storerooms)	10	10	l/s.person	
Warehouses	20	10	l/s.person	
Motels				See hotels.
Museums				
Exhibits halls	1.5	10	l/s.person	
Warehouses	20	10	l/s.person	
Offices				
Art rooms	5	10	l/s.person	
Board rooms	1	15	l/s.person	
Committee rooms	1	15	l/s.person	
Computer rooms	25	10	l/s.person	
Conference rooms	1	15	l/s.person	
Drafting rooms	5	10	l/s.person	
Office areas	10	10	l/s.person	
Waiting areas	2	10	l/s.person	
Prisons				
Cell blocks	5	15	l/s.person	
Eating halls	1.5	15	l/s.person	
Guard stations	2.5	10	l/s.person	
Residential				
Private dwellings				Private dwelling places, multiple or single high or low rise.
Bedrooms	10	10	l/s.person	
Living areas— General	10	10	l/s.person	
Other dwellings				
Boarding houses				See hotels.
Guest houses				See hotels.
Hostels				See hotels.
Mobile homes	5	10	l/s.person	

(continued)

Occupancy type*	Nett floor area per person † m^2	Minimum outdoor airflow rate		
		Quantity	Unit	Comments
Resorts				See hotels.
Schools				See education.
Speciality services				
Animal rooms	—	5	l/s.m^2 floor	
Barber shops	4	15	l/s.person	
Beauty salons	4	5	l/s.person	
Broadcasting studios	1.5	10	l/s.person	
Electrical meter, switch rooms	—	4	l/s.m^2 floor	
Exercise rooms	5	10	l/s.person	
Fire control rooms	—	4	l/s.m^2 floor	
Florist	10	10	l/s.person	
Greenhouses	100	10	l/s.person	
Hairdressers	4	15	l/s.person	
Health spas	5	10	l/s.person	
PABX rooms	—	4	l/s.m^2 floor	
Pet shops	—	5	l/s.m^2 floor	
Press booths lounges	1.5	10	l/s.person	
Radio booths	1.5	10	l/s.person	
Reducing salons	5	10	l/s.person	
Saunas	—	4	l/s.person	
Shoe repair shops (combined workrooms trade areas)	10	10	l/s.person	
Steam rooms	—	4	l/s.person	
Survival shelters	1	10	l/s.person	
Telephone main distribution frame (MDF) rooms	10	10	l/s.person	
Television booths	1.5	10	l/s.person	
Sports and Amusement centres				When internal combustion engines are operated for maintenance of playing surfaces, or any other purpose, exhaust ventilation may be required.
Ballrooms	1.5	15	l/s.person	
Bowling alleys (seating areas)	1.5	15	l/s.person	
Discotheques	1.0	15	l/s.person	
Games rooms	1.5	15	l/s.person	Amusement machines, billiards, cards, etc.
Locker rooms	2	10	l/s.locker	
Playing floors	3.5	10	l/s.person	Cricket, gymnasiums, ice skating, roller skating, squash, tennis, etc.
Spectator areas	0.6	10	l/s.person	
Swimming pools				Higher values may be required for humidity control.
Deck and pool area	3.5	10	l/s.m^2 area	
Spectator areas	1.5	10	l/s.person	
Temples				See theatres.
Theatres				
Auditoriums	0.6	15	l/s.person	For auditoriums where smoking is prohibited the figure of 15 may be reduced to 10, subject to the requirements of the Regulatory Authority.
Concert halls	0.6	15	l/s.person	
Foyers	0.6	15	l/s.person	
Green rooms	5	15	l/s.person	
Lecture halls	0.6	15	l/s.person	
Lobbies	0.96	15	l/s.person	
Opera halls	0.6	15	l/s.person	
Stages	1.5	10	l/s.person	Special ventilation will be needed to eliminate special effect, e.g. dry ice vapours, mists, etc, used in television, film, and radio productions.
Studios	1.5	10	l/s.person	
Ticket booths	—	10	l/s.person	
Transportation centres				
Baggage areas	1.5	10	l/s.person	
Concourses	0.6	10	l/s.person	

(continued)

Occupancy type*	Nett floor area per person † m^2	Minimum outdoor airflow rate		
		Quantity	Unit	Comments
Control towers	2	10	l/s.person	
Corridors	1.5	10	l/s.person	
Gate areas	1.5	10	l/s.person	
Hangars	50	10	l/s.person	
Platforms	0.6	10	l/s.person	
Ticket areas	1.5	15	l/s.person	
Waiting rooms	1.5	15	l/s.person	
Air traffic control	2	20	l/s.person	Refer to aviation standards
Veterinary centres				
Kennels	—	5	l/s.m^2 floor	
Operating rooms	—	5	l/s.m^2 floor	
Reception rooms	—	5	l/s.m^2 floor	
Stalls	—	5	l/s.m^2 floor	
Workrooms				
Bank vaults	10	10	l/s.person	This requirement covers continuous occupancy. When occupancy is intermittent, infiltration will normally be sufficient ventilation.
Industrial process				General requirements processes (apply to all forms unless separately listed).
High activity level (2.5 met) ‖	—	15	l/s.person	Mining, foundry, etc.
Medium activity level (2.0 met) ‖	—	15	l/s.person	Automotive repair, assembly line etc.
Low activity level (1.5 met) ‖	—	10	l/s.person	Laboratory work, light assembly, etc.
Meat processing	10	5	l/s.person	This requirement covers low temperature (-23°C to 10°C) rooms occupied continuously. Where occupancy is intermittent, infiltration will normally be sufficient ventilation.
Pharmacists	5	10	l/s.person	
Photography				Installed equipment may require exhaust, to control contaminants.
Camera rooms	10	10	l/s.person	
Dark rooms	10	10	l/s.person	contaminants
Duplicating rooms	3.5	10	l/s.person	
Printing rooms	3.5	10	l/s.person	
Stages	5	10	l/s.person	
Refrigerated rooms				Same as meat processing.
Strongrooms				Same as bank vaults.
Voucher storerooms				Same as bank vaults.

* Where an occupancy type is only listed under one building type, the values given apply to that type of occupancy in all building types.

† This column applies where the number of occupants is not known.

‖ 1.0 met = sedentary level = 58.2/W per m^2 body surface.

NOTES TO TABLE A1:

1 Occupancy types listed are typical, omission of an applicable occupancy from the Appendix does not obviate the need to comply in principle with this Standard (see Clause 2.1).

2 The values of 'nett floor area per person' are approximate.

3 The requirements for ventilation air given in these Tables represent the minimum conditions. Values higher than the above are sometimes recommended, taking into account the required environmental performance, and the effects of intensive smoking and various contaminants on the health and welfare of the occupants.

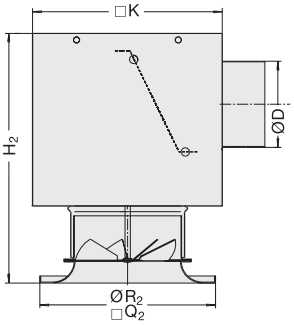
4 In enclosures where the temperature exceeds 27°C, the outdoor airflow rates need to be increased to compensate for the additional body odour generated at the elevated temperatures.

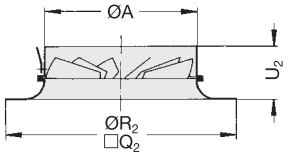
5 The tabulated values are a consensus judgement of appropriate minima to reduce odours and other contaminants to levels acceptable to the community. These are considerably in excess of the quantities required to ensure healthy breathing or maintain acceptable levels of oxygen, carbon dioxide, etc. Where normally bathed, cleanly clothed, relatively sedentary occupants are expected, the minima may be appropriate. Where unusual occupation or hygiene is expected, some appropriate increases should be made.

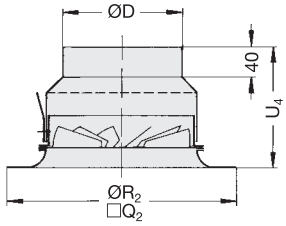
6 Some information given in the above Tables is drawn from ASHRAE publications. In some cases, the area per person is greater than existing regulation requirements for determination of exits, etc, since ventilation needs are based on a time-integrated requirement.

7 These values are based on current assessed levels of smoking for the listed occupancies.

1.0 Swirl Diffusers
Type 'RFD'







RFD-Q **RFD-Q/R-D-A** **RFD-Q/R-D-K** **RFD-Q/R-D-US**

Air Flow Rate (l/s) - For single row arrangement

Size	Distance between diffusers, A (m)						
	0	1.2	1.8	2.4	3.0	3.6	4.2
125	35	33	28	29	32	35	35
160	50	44	39	39	42	47	50
200	69	69	47	47	53	58	67
250	110	110	58	58	61	67	78
315	169	169	86	86	92	100	114
400	228	242	97	103	114	131	144

Dimensions (mm)

Size	ØA	ØD	H_2	U_2	U_4	$□Q_2$	$ØR_2$	□K
125	123	98	284	75	153	198	200	216
160	158	123	309	78	158	248	250	266
200	198	158	339	78	161	248	300	290
250	248	198	384	75	166	298	350	476
315	313	248	444	88	183	398	450	567
400	398	313	509	88	193	498	580	615

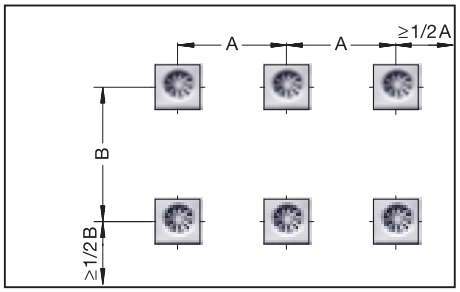
Air Flow Rate (l/s) - For multiple row arrangement

Size	B (m)	Distance between diffusers, A (m)					
		1.2	1.8	2.4	3.0	3.6	4.2
125	2.4	15	15	18	22	25	29
160		21	21	25	29	35	39
200		28	28	32	38	44	47
250		32	32	35	46	51	57
315				51	64	75	83
400					81	92	103
125	3.0	21	21	22	24	28	32
160		28	28	29	31	36	42
200		35	35	38	40	47	53
250		43	43	46	46	56	61
315		61	61	67	67	83	89
400				81	72	103	114
125	3.6	26	25	26	28	32	35
160		36	33	35	35	42	47
200		44	42	44	47	53	58
250		56	53	53	56	58	67
315		78	75	78	81	81	100
400		86	86	92	97	103	133
125	4.2	33	29	29	32	35	35
160		44	39	9	42	47	50
200		56	47	47	53	58	69
250		67	58	58	61	67	72
315		97	86	86	92	100	106
400		103	97	106	119	133	133

Minimum flow rate

Size	$\dot{V}_{min}$
125	10
160	14
200	17
250	31
315	50
400	69

Diffuser layout



Nomenclature

$\dot{V}$ in l/s = Flow rate
$\dot{V}_{min}$ in l/s = Minimum flow rate
A, B in m = Distance between two diffusers

Note

In all cases, the sound power level is $L_{WA} \leqq 40$ dB(A) per diffuser and the pressure drop $\Delta p_t \leqq 45$ Pa.

Selection valid for ceiling height 2.7 m to 3 m.

Order Code

These codes need not be completed for standard products

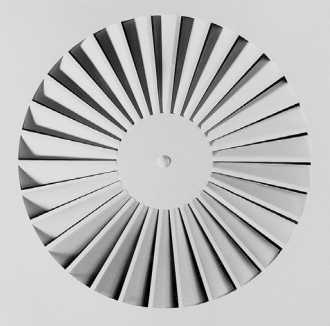
RFD - Q - D - A / 400 / 0 / 0 / P1 / RAL 9016

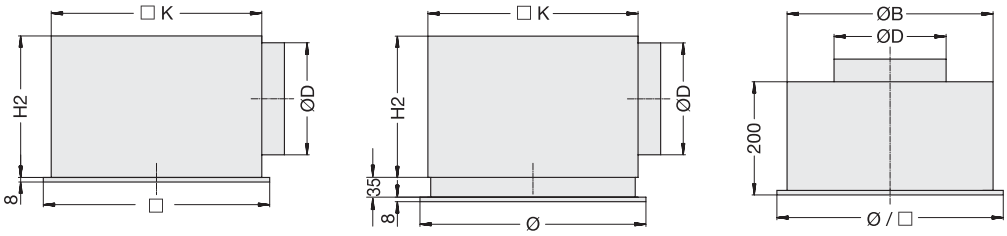
- Type
  - square: Q
  - circular: R
  - Nozzle: D
  - Collar: K
  - Top entry plenum: US
  - Plenum box: A
- Size
- Specify RAL colour
- 0 Standard finish powder coated to RAL 9010 (GE 50 %)[1]
- P1 Powder coating to RAL 9006 (GE 30 %)[1] Other colours to RAL… (GE 70 %)[1]

1) GE = Gloss level

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/4/EN/--.

1.0 Swirl Diffusers
Type ‘FD’





FD-Q **FD-Q-...-H** **FD-R-...-H** **FD-Q/R-...-V**

Air Flow Rate (l/s) - For single row arrangement

Size	Distance between diffusers, A (m)						
	0	1.2	1.8	2.4	3.0	3.6	4.2
300	56	56	56	56	56	56	56
400	110	100	86	92	92	110	110
500	144	119	100	106	106	136	144
600	164	128	111	119	119	150	164
625	164	128	111	119	119	150	164

Dimensions (mm)

Size	□	Ø	ØB	ØD	H_2	□ K
300	298	300	280	158	250	290
400	398	400	364	198	295	372
500	498	500	462	198	295	476
600	598	600	559	248	345	567
625	623	623	559	248	345	567

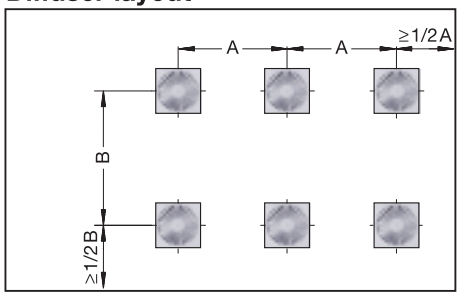
Air Flow Rate (l/s) - For multiple row arrangement

Size	B (m)	Distance between diffusers, A (m)					
		1.2	1.8	2.4	3.0	3.6	4.2
300	3.0	47	42	44	47	56	56
400		69	61	64	64	81	94
500		83	72	75	78	97	111
600		92		81	83	106	119
625		92		81	83	106	119
300	3.6	56	50	53	56	56	56
400		83	75	78	81	81	110
500		100	89	92	97	97	136
600		108	94	100	103	103	150
625		108	94	100	103	103	150
300	4.2	56	56	56	56	56	56
400		97	86	92	92	110	110
500		119	103	108	111	136	136
600		128	111	119	119	150	150
625		128	111	119	119	150	150

Recommended min. flow (l/s)

Size	$\dot{V}_{min}$
300	28
400	50
500	60
600	81
625	81

Diffuser layout



Nomenclature

$\dot{V}$ in l/s = Flow rate
$\dot{V}_{min}$ in l/s = Minimum flow rate
A, B in m = Distance between two diffusers

Note

In all cases, the sound power level $L_{WA} \leqq 40$ dB(A) per diffuser and the pressure drop $\Delta p_t \leqq 30$ Pa.

Selection valid for ceiling height = 2.7...3 m.

Order Code

These codes need not be completed for standard products

FD - Q - Z - H - M - L / 400 / P1 / RAL 9016

- **Type**
  - Square Q
  - Circular R
- Supply air Z
- Extract air A
- Top entry spigot V
- Side entry spigot H
- Adjustable flow rate control with single blade M
- **Size** 400
- L Spigot with lip seal
- **P1**
  - 0 Standard finish powder coated to RAL 9010 (GE 50 %)[1]
  - P1 Powder coating to RAL 9006 (GE 30 %)[1]
  - Other colours to RAL... (GE 70 %)[1]
- Specify RAL colour

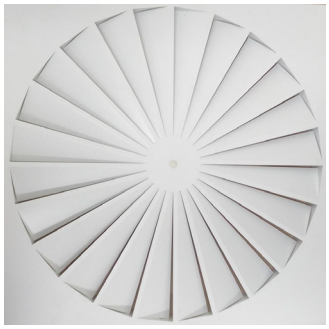
1) GE = Gloss level

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/6/EN/--

1.0 Swirl Diffusers
Type ‘FD24’

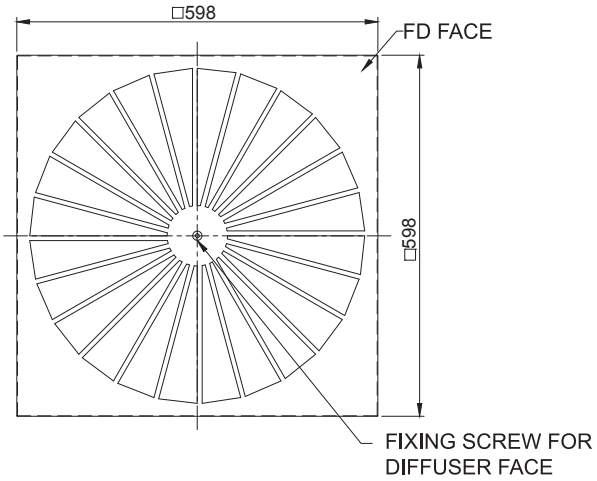
Description

The TROX ‘FD600/24’ High Flow Swirl Diffuser is designed to fit into a standard 600 mm square ceiling tile with 24 fixed blades and comes with either square or round face. It comes in only ONE size. But it can be supplied with blanking plates fitted to the rear of the diffuser face to reduce the air flow rate if required. This diffuser is designed to provide a radial air flow discharge pattern with high induction flow rate.



Recommended Mounting Height

2.6 to 4.0 m high



Performance Data

Type	Air Flow (l/s)	ΔP (Pa)	NC Level	SPL in dB(A)
FD600-24/ 0	275	20	NC 38	44
	220	12	NC 35	41
FD600-24/ 1	177	11	NC 35	41
	150	8	NC 30	36
	101	4	NC 25	29
FD600-24/ 2	165	17	NC 35	39
	141	12	NC 30	36
	100	7	NC 25	29
FD600-24/ 3	140	23	NC 35	40
	123	19	NC 30	36
	92	10	NC 25	29
FD600-24/ 4	108	34	NC 35	39
	91	24	NC 30	35
	72	15	NC 25	29

Order Code

FD600-24 / 0 / Q – Z – H – M – I0 / P1 / RAL 9006

Product Type

Blanking plate

0 – None
1 – Size 1
2 – Size 2
3 – Size 3
4 – Size 4

Face Variant
Q – Square face

Z – Supply
A - Extract

Powder coating finish:
P1 – Non-standard colour
0 – RAL 9010, matt white
(**Standard supply**)

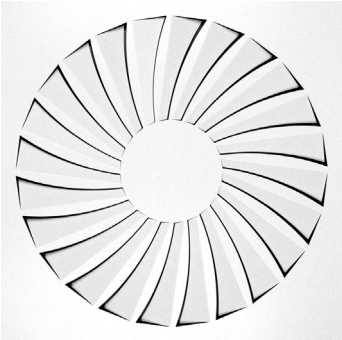
Internal Lining:
I0 – Without internal lining
I1 – 6 mm rubber foam
I2 – 25 mm fibre glass lining

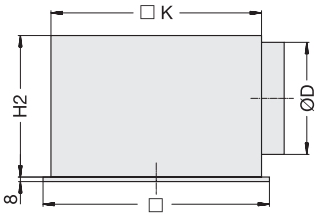
M – With volume control damper

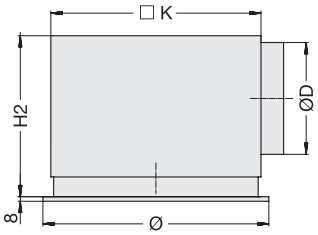
V – Plenum with top inlet spigot
H – Plenum with side inlet spigot

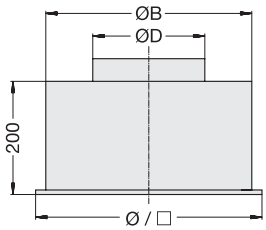
Note: For further details, please refer to TROX Product Information sheet Ref. PI M 2/6.1/EN/--.

1.0 Swirl Diffusers
Type 'TDF-SilentAIR'









TDF-SA-Q-... **TDF-SA-Q-...-H** **TDF-SA-R-...-H** **TDF-SA-Q/R-...-V**

Air Flow Rate (l/s) - For single row arrangement

Size	Distance between diffusers, A (m)						
	0	1.2	1.8	2.4	3.0	3.6	4.2
300	64	64	64	64	64	64	64
400	119	72	72	72	72	72	78
500	142	108	111	111	111	111	117
600	181	131	131	131	131	131	139
625	181	131	131	131	131	131	139

Dimensions (mm)

Size	□	Ø	ØB	ØD	H_2	□ K
300	298	300	280	158	250	290
400	398	400	364	198	295	372
500	498	500	462	198	295	476
600	598	600	559	248	345	567
625	623	623	559	248	345	587

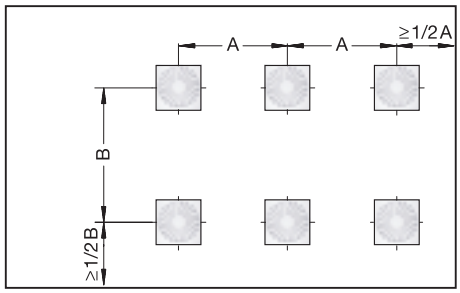
Air Flow Rate (l/s) - For multiple row arrangement

Size	B (m)	Distance between diffusers, A (m)					
		1.2	1.8	2.4	3.0	3.6	4.2
300	3.0	50	50	50	50	53	64
400		64	64	64	64	67	72
500		81	81	81	81	94	108
600		100	100	100	100	114	131
625		100	100	100	100	114	131
300	3.6	56	56	56	56	56	64
400		67	67	69	75	75	75
500		94	92	92	92	94	111
600		111	106	106	106	111	131
625		111	106	106	106	111	131
300	4.2	64	64	64	64	64	64
400		72	75	72	75	75	97
500		108	108	108	108	108	122
600		131	131	131	131	131	139
625		131	131	131	131	131	139

Recommended min. flow (l/s)

Size	$\dot{V}_{min}$
300	31
400	50
500	60
600	81
625	81

Diffuser layout



Nomenclature

$\dot{V}$ in l/s = Flow rate
$\dot{V}_{min}$ in l/s = Minimum flow rate
A, B in m = Distance between two diffusers

Note

In all cases, the sound power level is $L_{WA} \leqq 40$ dB(A) per diffuser and the pressure drop $\Delta p_t \leqq 40$ Pa.

Selection valid for ceiling height = 2.7...3 m.

Order Code

These codes need not be completed for standard products

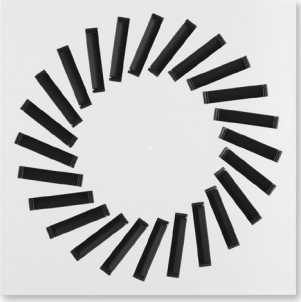
TDF-SA - Q - Z - M - L / 400 / P1 / RAL 9016

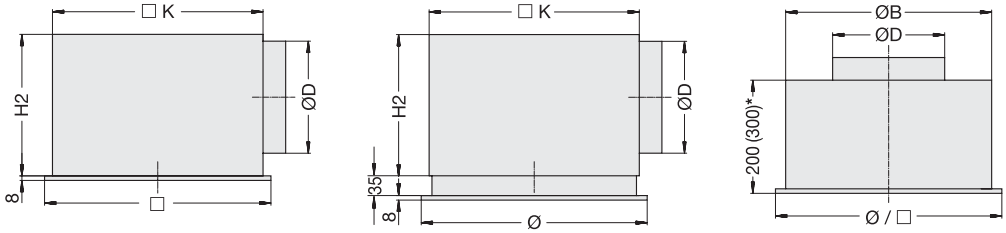
- **Type**
  - Square Q, Circular R
  - Supply air Z, Extract air A
  - Adjustable flow rate control with single blade M
  - Spigot with lip seal L
- Size: 400
- P1
  - 0 Standard finish powder coated to RAL 9010 (GE 50 %)[1]
  - P1 Powder coating to RAL 9006 (GE 30 %)[1] Other colours to RAL... (GE 70 %)[1]
- Specify RAL colour: RAL 9016

1) GE = Gloss level

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/6.2/EN/--.

1.0 Swirl Diffusers
Type 'VDW'





* Size: 600 x 48 / 625 x 54

VDW-Q **VDW-Q-...-H** **VDW-R-...-H** **VDW-Q/R-...-V**

Air Flow Rate (l/s) - For single row arrangement

Size	Distance between diffusers, A (m)						
	0	1.2	1.8	2.4	3.0	3.6	4.2
300 x 8	69	58	53	56	58	69	69
400 x 16	108	78	78	83	86	108	108
500 x 24	128	97	92	94	94	119	128
600 x 24	183	111	111	119	128	158	183
600 x 48	228	139	125	139	139	181	211
625 x 24	183	111	111	119	128	158	183
625 x 54	231	147	139	150	156	197	233

Dimensions (mm)

Size	□	Ø	ØB	ØD	H_2	□ K
300 x 8	298	300	280	158	250	290
400 x 16	398	400	364	198	295	372
500 x 24	498	500	462	198	295	476
600 x 24	598	600	559	248	345	567
600 x 48	598	600	580	248	345	590
625 x 54	623	–	605	248	345	615

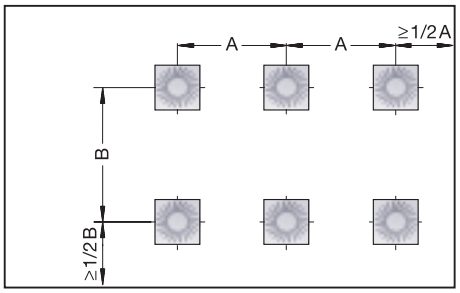
Air Flow Rate (l/s) - For multiple row arrangement

Size	B (m)	Distance between diffusers, A (m)					
		1.2	1.8	2.4	3.0	3.6	4.2
300 x 8	3.0	43	39	42	44	53	58
400 x 16		56	56	58	64	81	92
500 x 24		67	61	64	83	83	92
600 x 24		81	81	86	97	117	136
600 x 48		100	100	100	100	125	147
625 x 24		81	81	86	97	117	136
625 x 54						142	164
300 x 8	3.6	50	47	50	53	64	69
400 x 16		67	67	69	81	89	108
500 x 24		81	75	81	81	117	125
600 x 24		94	94	106	117	139	161
600 x 48		117	108	117	125	139	181
625 x 24		94	94	106	117	139	161
625 x 54				128	139	156	197
300 x 8	4.2	58	53	56	58	69	69
400 x 16		78	75	83	89	108	108
500 x 24		97	92	94	94	125	128
600 x 24		111	111	119	133	158	183
600 x 48		139	131	139	147	186	217
625 x 24		111	111	119	133	158	183
625 x 54		150	139	150	164	197	228

Minimum flow rate

Size	$\dot{V}_{min}$
300 x 8	54
400 x 16	108
500 x 24	144
600 x 24	216
600 x 48	360
625 x 54	432

Diffuser layout



Nomenclature

$\dot{V}$ in l/s = Flow rate
$\dot{V}_{min}$ in l/s = Minimum flow rate
A, B in m = Distance between two diffusers

Note

In all cases, the sound power level is $L_{WA} \leqq 40$ dB(A) per diffuser and the pressure drop $\Delta p_t \leqq 40$ Pa.

Selection valid for ceiling height = 2.7...3 m.

Order Code

These codes need not be completed for standard products

VDW - R - Z - V - M - L / 600 x 24 / Q21 / P1 / RAL 9016

- **Type**
  - Square Q / Circular R
  - Supply air Z / Extract air A
  - Top entry spigot V / Side entry spigot H
  - Adjustable flow rate control with single blade M
  - Spigot with lip seal L
- **600 x 24**: Size x No. of control blades
- **Q21**
  - 0 Supply air: black control blades; Extract air: no control blades
  - Q11 Extract air: black control blades
  - Q21 Supply air: white control blades; Extract air: white control blades
- **P1**
  - 0 Standard finish powder coated to RAL 9010 (GE 50 %)[1]
  - P1 Powder coating to RAL 9006 (GE 30 %)[1] Other colours to RAL... (GE 70 %)[1]

1) GE = Gloss level

- **RAL 9016**: Specify RAL colour

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/7/EN/--.

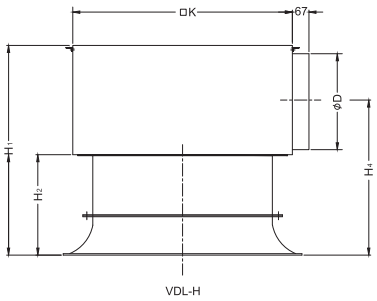
1.0 Swirl Diffusers
Type 'VDL'

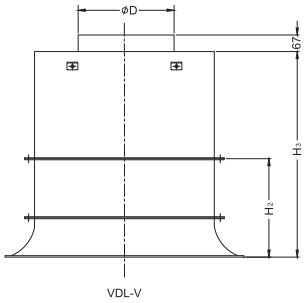
KEY FEATURES:

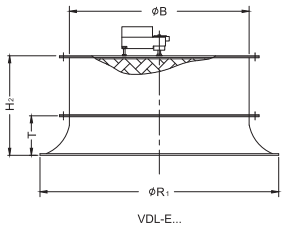
- Manually or automatically adjustable discharge angle.
- Suitable for cooling and heating application.
- Suitable for mounting height greater than
- 3.8 m high.
- Can be supplied with plenum box with either top or side entry spigot.
- Powder coating as standard finish in RAL 9010 matt white.

Type 'VDL-H'

Size	B	D	D_L	H_1	H_2	H_3	H_4	K	R_1	R_2	T	n
315	318.5	248	368	483	203	425	342.5	435	464	382	63	6
400	403.5	313	450	603	238	534	420.5	500	567	464	80	6
630	633.5	398	690	848	383	748	615.5	750	871	708	125	6
800	803.5	498	853	1133	568	998	850.5	1000	1077	871	160	12







Diffuser layout

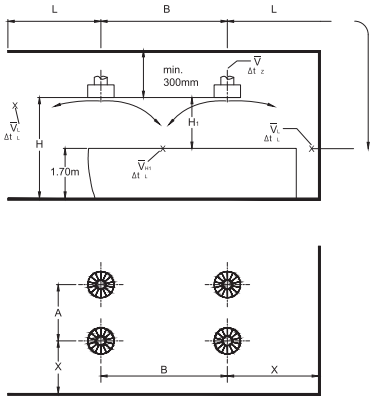


Table 1: Quick Selection for 'VDL-H' (without continuous ceiling)

Size	L_{WA} in dB(A)	Flow (l/s)	ΔP (Pa)	Cooling Mode only				L (m)	LWNC
				Amin	H1	Amax	H1		
315	43	140	35	2.0	2.0	-	-	3.5	NC 35
	47	160	47	2.0	2.2	2.3	2.0	3.8	NC 40
400	41	230	28	2.0	2.5	2.3	2.0	4.0	NC 35
	47	280	38	2.0	3.0	2.8	2.0	4.8	NC 40
630	41	400	26	2.0	3.1	3.2	2.0	5.0	NC 35
	46	480	34	2.0	4.0	3.8	2.0	6.0	NC 40
800	41	510	25	2.0	4.0	3.5	2.0	5.8	NC 35
	46	600	31	2.0	5.0	4.0	2.0	6.5	NC 40

Order Code

VDL-V-0 / **630** / **P1** / **RAL 9006**

Type
VDL-V - With top inlet
VDL-H - With side inlet

Rear Assemblies
0 - Face only.
E1 – 220V; 50 Hz Two position control.
E2 - 24V; 50 Hz Two position control.
E3 - 24V; 0 to 10 V for proportional control.

Diffuser size
315; 400; 630; 800.

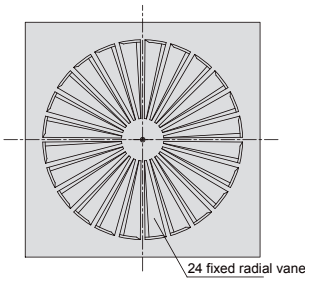
Finish
Powder coating
0 – Standard matt White in RAL 9010
P1 – Special colour

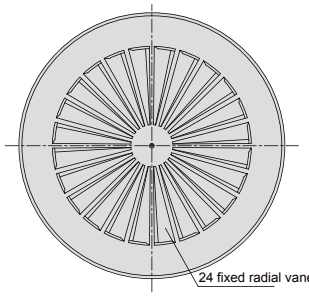
State RAL colour for 'P1' when non-standard colour is required.

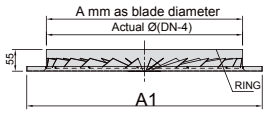
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M2.2/9/EN/--.

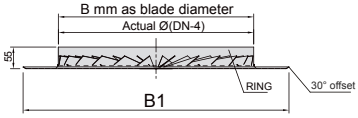
1.0 Swirl Diffusers
Type 'TCS'

The standard TROX TCS/400 – 600 High-Flow Swirl Diffuser is designed to fit into different T-Bar ceiling patterns as well as plaster board ceilings and is available in either a square or a round face plate ranging from 400 x 400 to 600 x600 square or 400 Dia to 600 Dia. The diffuser has a radial airflow discharge pattern allowing for a high induction flow rate suitable for both variable and constant volume flow.







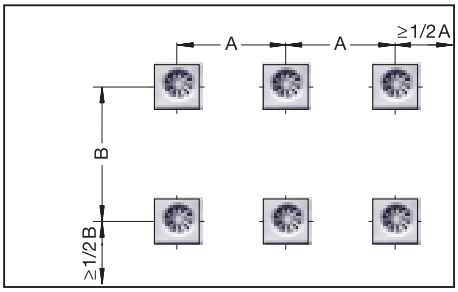


Air Flow Rate(l/s) for Multiple Rows*						
Size	B (m)	Distance between diffusers, A (m)				
		1.5	Vel m/s	2.0	Vel m/s	3.0	Vel m/s**
350	3.0	40	0.12	60	0.19	90	0.30
400		60	0.13	80	0.21	100	0.30
450		60	0.27	100	0.27	150	0.38
500		80	0.18	100	0.24	200	0.42
350	4.0	60	0.12	90	0.20	130	0.30
400		75	0.14	150	0.31	150	0.31
450		100	0.18	175	0.32	150	0.29
500		150	0.25	200	0.32	200	0.31
Distance between diffusers, A (m)							
	A = B (m)	3.0	Vel m/s	4.0	Vel m/s	5.0	Vel m/s
350		90	0.29	130	0.27	180	0.24
400		75	0.21	100	0.18	200	0.20
450		100	0.27	150	0.24	250	0.28
500		100	0.22	200	0.30	300	0.32

* Selections are based on a standard ceiling height of 2.7 m – Maximum effective operating height 4.0 m

** Vel =Velocity in the occupied zone 1.8 m AFFL

Diffuser layout



Diff Size	A Ø	A1 ☐	B Ø	B1 Ø
350	350	395 x 395	350	445
400	400,350	445 x 445	400	510
450	450,400,350	495 x 495	450	555
500	500,450,400,350	595 x 595	500	675

Order Code

TCS / 0 / Z – H – M – I0 / P1 / RAL 9006

Product Type
R – Round face
Q – Square face

Powder coating finish:
P1 – Non-standard colour
0 – RAL 9010, matt white (Standard supply)

Internal Lining:
I0 – Without internal lining (Standard supply)
I1 – 6 mm rubber foam
I2 – 25 mm fibre glass lining

Application
Z – Supply
A – Extract

M – With volume control damper

V – Plenum with top inlet spigot
H – Plenum with side inlet spigot

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. PI C 2.2/6. 1/EN/2

1.0 Swirl Diffuser
Type ‘Airnamic’

Advantages

- High volume flow rates and low sound power level thanks to three-dimensionally profiled blades
- Excellent comfort level as a result of low air velocities and low temperature differences in the occupied zone

Characteristics

- Circular and square swirl diffusers made of plastic
- For supply or extract air
- For installation into suspended ceilings
- Suitable for all types of ceilings

Materials

- Diffuser face, spigot and damper made of ABS plastic, UL 94 flame retardant (V0)

Supply air

Diffuser type	Volume flow rate and total differential pressure for a given sound power level, Damper blade open															Correction values for different damper blade positions			
			L_{WA} = 30 dB(A)			L_{WA} = 35 dB(A)			L_{WA} = 40 dB(A)			L_{WA} = 45 dB(A)			L_{WA} = 50 dB(A)			45°	90°	45°	90°
	$\dot{V}_{min}$		$\dot{V}$		Δp_t	$\dot{V}$		Δp_t	$\dot{V}$		Δp_t	$\dot{V}$		Δp_t	$\dot{V}$		Δp_t	Δp_t ×		L_{WA} +	
	l/s	m³/h	l/s	m³/h	Pa	l/s	m³/h	Pa	l/s	m³/h	Pa	l/s	m³/h	Pa	l/s	m³/h	Pa			dB	dB
R / 400L ○	40	145	65	235	12	80	290	18	95	340	26	115	415	38	140	505	55	1.3	1.9	2	2
R / 400H ○	70	250	95	340	23	120	430	34	145	520	51	180	650	77	220	790	115	1.5	2.4	4	8
R/ 600 ○	125	450	190	685	23	220	795	31	255	920	42	295	1060	56	345	1240	75	2.1	3.5	4	11
Q / 300L □	30	110	50	180	15	60	215	21	70	250	29	85	305	41	100	360	57	1.7	2.4	1	1
Q / 300H □	40	145	70	250	26	85	305	37	100	360	50	115	415	70	135	495	96	1.7	2.2	3	6
Q / 600 Q / 625 □	155	560	210	755	24	245	890	32	285	1025	43	330	1190	59	385	1385	80	2.3	4.1	7	16

Order code

AIRNAMIC - R - Z [1] [2] [3] / 400H [4] / S1 [5] / RAL 9006 [6]

[1] **Type**

[2] **Diffuser face**
- -R Circular swirl diffuser
- -Q Square swirl diffuser

[3] **Air type**
- -Z Supply air
- -A Extract air

[4] **Nominal size**

Circular diffuser
- 400L Low volume flow rate
- 400H High volume flow rate
- 600

Square diffuser
- 300L Low volume flow rate
- 300H High volume flow rate
- 600
- 625

[5] **Surface**[1]
- White (RAL 9010), no entry required
- S1 Painted RAL ...

[6] **Colour**

For S1 only
- RAL ... other colours

1.0 Swirl Diffusers
Type 'PFS'

Description

The TROX 'PFS' Diffuser is designed as a swirl diffuser with a perforated square face that fits onto a standard 600mm by 600mm T-bar ceiling, suitable for supply and return air application. It comes in only ONE size. But it can be supplied with blanking plates fitted to the rear of the diffuser face to reduce the air flow rate if required. This diffuser is designed to provide a radial air flow discharge pattern with high induction.

Recommended Mounting Height

2.6 to 4.0 m high

Performance Data

Type	Air Flow (l/s)[2]	ΔP (Pa)	NC Level	SPL in dB(A)
PFS – V*	121	15	NC 33	38
	140	20	NC 38	44
	149	25	NC 42	47
PFS – F*	139	15	NC 31	37
	161	20	NC 33	39
	181	25	NC 39	44

Notes:
*1. 'V' with "VDW/600-24" and 'F' with "FD/600" swirl diffuser, both for supply air application. For return air application the product type should read 'PFS – 0'
2. The air flow data given above is 'PFS' diffuser without blanking plate.

Order Code

PFS - V / 0 / Z – H – M – I0 / P1 / RAL 9006

Product Type

Blanking plate

0 – None
1 – Size 1
2 – Size 2
3 – Size 3
4 – Size 4

Data not available at this moment

Application
Z – Supply
A – Extract (i.e., Type 'PFS – 0'

Internal Lining:
I0 – Without internal lining (**Standard supply**)
I1 – 6 mm rubber foam
I2 – 25 mm fibre glass lining

M – With volume control damper

V – Plenum with top inlet spigot
H – Plenum with side inlet spigot

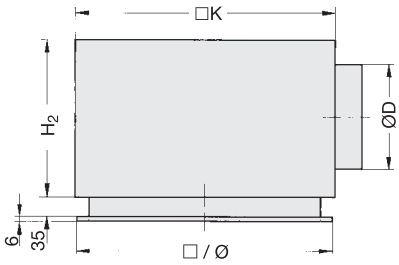
Powder coating finish:
P1 – Non-standard colour
0 – RAL 9010, matt white (**Standard supply**)

Note: For further details, please refer to TROX Product Information sheet Ref. PI M 2/4.1/EN/--.

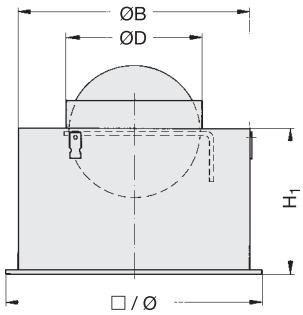
2.0 Ceiling Diffusers
Type ‘ADLR’

ADLR-Q

ADLR



ADLR-...-H



ADLR-...-V-M

Minimum distance between two diffusers

Size	Flow Rate, V̇ (l/s)																
	19	31	42	50	58	83	100	119	139	181	219	231	250	278	300	360	440	500
1	1.2	2.0	2.3	2.5	2.7													
2		1.2	2.0	2.2	2.4	2.9	3.2	3.5										
3				1.2	2.3	2.8	3.0	3.3	3.5	4.1								
4					1.8	2.7	3.0	3.3	3.5	4.0	4.3	4.3						
5								2.5	3.5	3.8	4.2	4.3	4.4	4.6	4.8			
6									2.5	3.7	4.1	4.2	4.4	4.6	4.7	5.1		
7										2.5	3.9	4	4.2	4.4	4.6	5	5.4	
8											3.8	3.9	4.1	4.4	4.5	4.9	5.4	5.7

Dimensions (mm)

Size	Ø	ØB	ØD	H_2	□K
1	244	202	123	220	266
2	300	258	158	250	290
3	356	314	198	295	372
4	412	370	248	345	476
5	468	426	248	345	476
6	542	482	313	410	567
7	598	538	313	410	590
8	654	594	313	410	615

Nomenclature

$\dot{V}$ in l/s = Flow rate
$\dot{V}_{min}$ in l/s = Minimum flow rate

Note

In all cases, the sound power level is $L_{WA} \leqq 40$ dB(A) per diffuser and the pressure drop $\Delta p_t \leqq 45$ Pa.

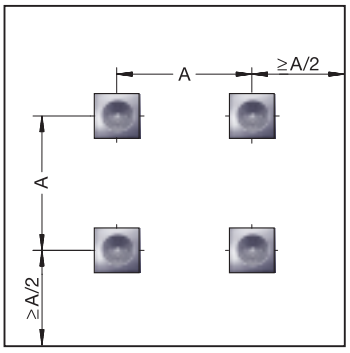
Selection valid for ceiling height = 2.7...3 m.

Available dimensions
Diffuser face ADLR-Q = □ 593, 598, 618 and 623 mm

Minimum flow rate

Size	$\dot{V}_{min}$
1	19
2	31
3	50
4	83
5	111
6	139
7	181
8	222

Diffuser layout



Order Code

These codes need not be completed for standard products

ADLR - Q - ZH - M - L / 400 / 0 / 0 / P1 / RAL 9016

Type
ADLR
(circular diffuser face)

Square diffuser face Q

Size

Specify RAL colour

L Spigot with lip seal

M Adjustable flow rate control with single blade

Diffuser face A
Top entry plenum: supply air ZV; extract air AV
Side entry plenum: supply air ZH; extract air AH

0 Standard finish powder coated to RAL 9010 (GE 50 %)[1)]
P1 Powder coating to RAL 9006 (GE 30 %)[1)]
Other colours to RAL... (GE 70 %)[1)]

1) GE = Gloss level

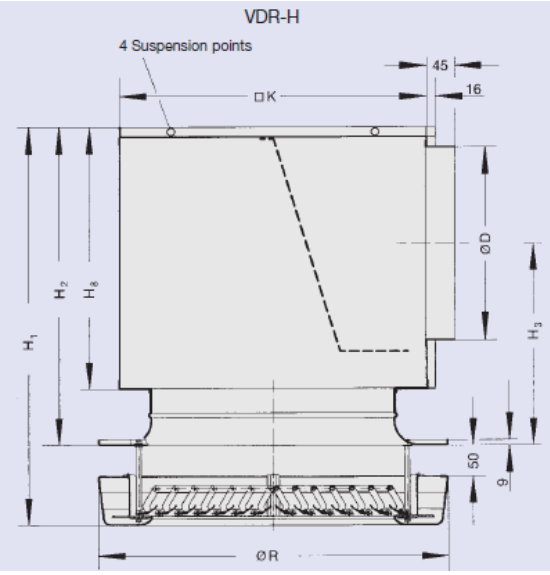
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/16/EN/--.

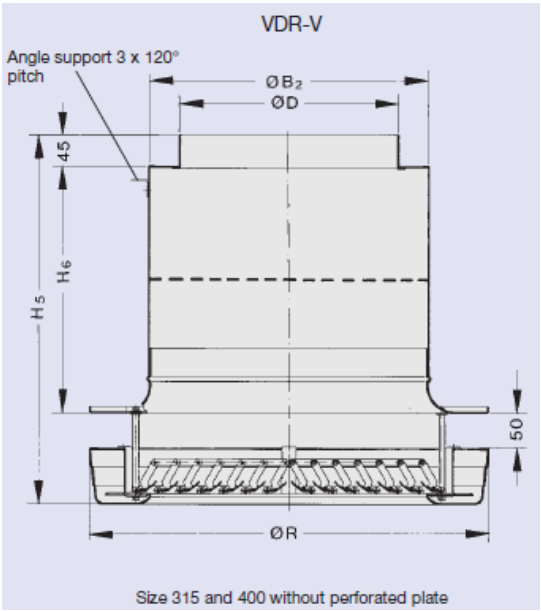
Type VDR

In rooms with changing heat loads the supply air is delivered into the room with either a heating or cooling temperature differential.
The type VDR ceiling air diffuser is suitable for both heating and cooling operations. An optimum movement of air through the occupied zone is achieved by changing the blade setting. High penetration of warm air is achieved at low acoustic levels when the blades are opened. Cold air is discharged horizontally when the blades are closed. The operation of the blades can be by hand or by electric actuator.

The type VDR ceiling diffuser can be used in industrial and office areas because of its attractive design and range of volume flow rates.

Suitable for mounting in very high ceilings, (e.g. factory areas, airports, theatres, banking halls) and also for lower ceilings ≧ 3,80 m (e.g. assembly rooms), especially suitable for systems having temperature differentials of between −10 K to +15 K.





Size 315 and 400 without perforated plate

TECHNOLOGY

circular

165 – 2,200 l/s

Ø 450 – 1,070 mm

Size	ϕ B1	Φ B2	Φ D	H1	H2	H3	H4	H5	H6	H7	H8	□K	Φ R
315	313	314	248	570	457	301	199	427	270	280	350	415	450
400	398	399	313	667	537	348	223	550	375	305	425	500	570
630	628	629	398	807	632	401	298	670	450	380	490	750	870
800	796	799	498	965	754	473	355	790	535	438	590	920	1070

Order code

These codes do not need to be completed for standard products

VDR-V-E1 / 630 / 0 / 0 / P1 / RAL 9016

Vertical spigot connection V
Horizontal spigot connection H

220 VAC, 50 Hz, Open and close control — E1
24 VAC, 50 Hz, Open and close control — E2
24 VAC~, 2...10 V-, Modulating control — E3

315
400
630
800
Size

Not used

State colour

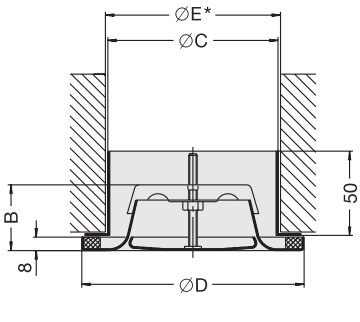
0 Standard finish powder-coated to RAL 9010 (GE 50 %)[1)]
P1 Powder-coated to RAL 9006 (GE 30 %)[1)] other colours to RAL... (GE 70 %)[1)]

1) GE = gloss level

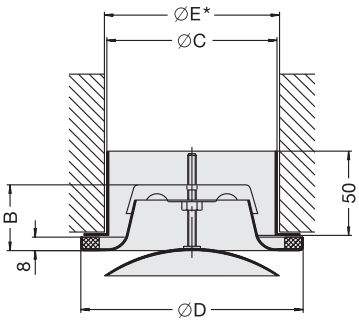
2.0 Air Valves
Type 'LVS'

LVS

Z-LVS



Installation LVS



Installation Z-LVS

Flow rate FOR LVS	
Size	V (l/s)
100	30
125	50
160	69
200	100

Flow rate for Z-LVS	
Size	V (l/s)
100	28
125	44
160	64
200	78

Dimensions (mm)				
Size	B	ØC	ØD	ØE*
100	40	99	132	104
125	46	124	162	129
160	54	159	205	164
200	61	199	245	204

Note: The sound power level (LWA) is ≤ 40 dB (A) in all cases for the data given in the tables above.

* Dimension "E" must be adjusted according to the ducts used.

Nomenclature

$\dot{V}$ in l/s = Flow rate per air valve

Note

The sound power level is $L_{WA} \leqq 40$ dB(A) in all cases.

Order Code

Standard finish RAL 9010

LVS / **125** / **G1**

Type
Supply air Z-LVS
Extract air LVS

100
125
160
200
Size

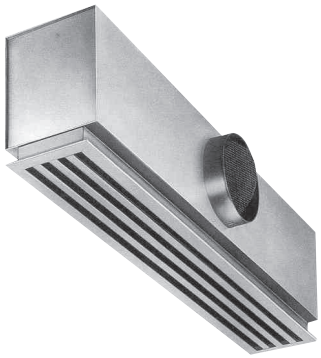
0 without subframe
G1 subframe (Standard)[1)]

1) Unless otherwise specified on order, equipment is delivered with subframe (G1).

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T 1.2/1/EN/--.

3.0 Slot Diffusers
Type 'ESD'

Type 'ESD' Slot Diffuser



Key features:

- Diffuser face is made from extruded aluminium.
- Can be supplied with 1 up to 8 slots. with adjustable air deflection blades in black.
- Standard finish in powder coating to RAL 9010 matt white.
- Plenum can be supplied with;
  - a. Volume control damper
  - b. Rubber foam lining or
  - c. Fibre glass lining

RECOMMENDATION:
Suitable for floor to ceiling heights from 2.6 to 4.0 m.

Table 1: Quick selection for ESD Slot diffuser with plenum box

Product Code	Length (m)	Air flow (l/s)	ΔP (Pa)	Throw (m) @ 0.75 m/s
ESD-1-AK-M	600	30	45	4.8
	900	45	48	4.8
	1200	55	50	4.8
	1500	70	55	4.8
	2000	100	56	4.8
ESD-2-AK-M	600	42	27	4.8
	900	63	33	4.8
	1200	80	44	4.8
	1500	100	48	4.8
	2000	140	35	4.8
ESD-3-AK-M	600	51	22	4.8
	900	76	29	4.8
	1200	100	43	4.8
	1500	127	61	4.8
	2000	170	32	4.8
ESD-4-AK-M	600	60	15	4.8
	900	90	18	4.8
	1200	120	23	4.8
	1500	150	30	4.8
	2000	200	20	4.8

Note: Selection is based on NC 35, assuming 8dB room attenuation.

Order Code

ESD – 1 – AK – M – I / 1200 / S1 / RAL 9016

Type
ESD

No. of slots
Ranging from 1 to 8

Rear assemblies
AK - With plenum box
0 - Without plenum box

M - With damper
0 - Without damper

Internal lining
IO - No internal insulation (Standard)
I1 - 6mm thick rubber foam
I2 - 25mm fibre glass insulation

Finish – Powder Coating

0 –Matt white to RAL 9010 (Standard supply).
S1 – For any other RAL colour code. Customer to state RAL number and % gloss required.

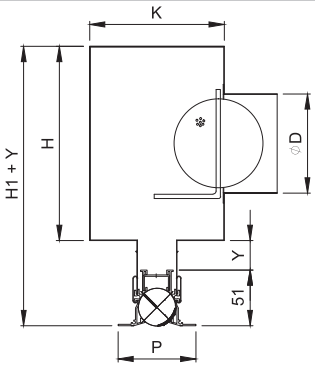
Length of diffuser, L_1
Standard lengths;
- 600 mm
- 900 mm
- 1200 mm
- 1500 mm
- 2000 mm

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 2/2.8/EN/--.

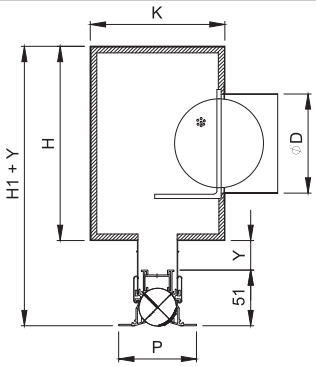
3.0 Slot Diffusers
Type 'VSD 35'

VSD35

Diffuser profile without flanges



VSD35-1…4-AK



VSD35-1…4-DK

Nomenclature

$\dot{V}$ in l/s = Flow rate
X in m = Throw distance
L_1 in mm = Length of plenum box
A in m = Distance between 2 diffusers
$\bar{v}_{H1}$ in m/s = Time average air velocity between 2 diffusers
$\bar{v}_L$ in m/s = Time average upstream velocity at the wall

Note

Room height = 3 m
$\bar{v}_{H1}$ = 0.15 – 0.17 m/s
$\bar{v}_L$ = 0.34 – 0.37 m/s

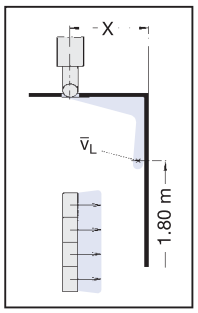
Sound power level is $L_{WA} \leqq 40$ dB(A) in all cases
Pressure drop $\Delta p_t \leqq 30$ Pa

If required, the length of the diffuser face can be greater than the length of the plenum box.

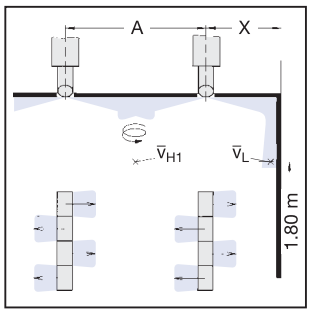
Dimensions (mm)							
No. of slots	P	Q	K	H1	H2	H	D
1	62	35	138	223	247	172	98 123
2	93	66	176	253	277	202	123 148
3	123	96	214	271	295	220	148
4	154	127	254	303	327	252	148 198

Diffuser layout

flow discharge horizontal, one direction



flow discharge alternating horizontal



Order Code

These codes need not be completed for standard products

VSD35 - 1 - AK - M - L	/	900x98 x y	/	C6	/	B00	/	P1	/	RAL 9016	/	WH	/	WW
Type		L_1 x D x y[1)+2)]		End cape[4)]						Specify RAL colour				

No. of slots: 1, 2, 3, 4

See leaflet for plenum box constructions: AK, DK, AA, AS, DS

Adjustable flow control: M

Lip seal: L

Front without edge flange: 000[3)]
Integral edge flange: B00

Standard finish E6-C-0: 0
Powder coating P0 to RAL 9010 (GE 50 %)
Powder coating to RAL 9006 (GE 30 %): P1
Other colours to RAL… (GE 70 %)

Horizontal left: HL
Horizontal right: HR
Alternating horizontal: WH

0 black control blades
WW white control blades

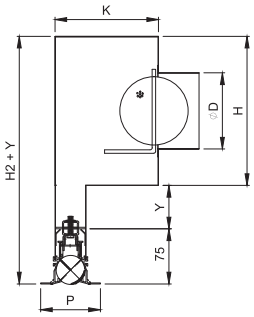
1) with concealed screw fix
if y = 0 (Standard),
further possible values for y = 30, 55, 80 and 104 mm
2) with screw fix
if y = 0 (Standard)
further possible values for y = 30, 55, 80, 105 and 129 mm
3) not with concealed slot fixture AS and DS
4) see leaflet or Internet

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/2.6/EN/--.

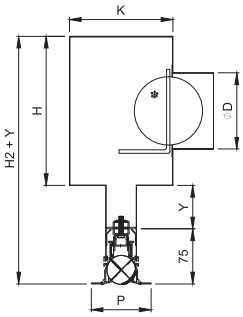
3.0 Slot Diffusers
Type 'VSD 35'

VSD35

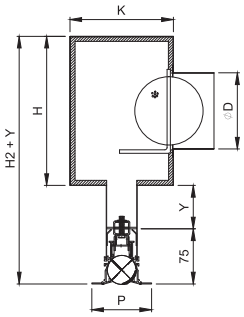
Diffuser profile without flanges



VSD35-1…4-AA



VSD35-1…4-AS



VSD35-1…4-DS

Throw distance, X (m) for VSD35 -1

Air flow discharge in one direction only

V̇	Unit length, L1 (mm)									
	600	750	900	1050	1200	1350	1500	1650	1800	1950
11	2.2									
14	4.2	2.2								
17	6.4	3.7	2.2							
19	8.2	5.4	3.4	2.2						
22		7.6	4.9	3.2	2.2					
25		8.7	6.4	4.5	3.1	2.2				
28			7.2	5.7	4.1	3.0	2.2			
31				7.2	5.3	3.9	2.9	2.2		
33				7.7	6.5	4.9	3.7	2.9	2.2	
39					8.2	7.1	5.4	4.3	3.4	2.8
44						8.5	7.6	6.0	4.9	3.9
50							8.7	8.1	6.4	5.4
56								8.8	8.1	6.9
61										7.5

Throw distance, X (m) for VSD35 -2

Air flow discharge in one direction only

V̇	Unit length, L1 (mm)									
	600	750	900	1050	1200	1350	1500	1650	1800	1950
22	5.5									
28	8.3	5.5	3.2							
33		7.5	5.5	3.2						
39			7.1	5.5	3.4					
44				6.7	5.5	3.6				
50				8.8	6.4	5.5	3.7			
56					8.3	6.2	5.5	3.8		
61						7.8	6.1	5.5	3.9	
67							7.5	5.9	5.5	3.9
72								7.3	5.8	5.5
78								8.7	7.1	5.8
83									8.3	6.9
89										8.0

Throw distance, X (m) for VSD35 -3

Air flow discharge in one direction only

V̇	Unit length, L1 (mm)									
	600	750	900	1050	1200	1350	1500	1650	1800	1950
28	5.1									
33	7.9	4.7								
39		6.7	4.1							
44			6.0							
50			7.9	5.4						
56				7.0	5.1					
61				8.8	6.4	4.8				
67					7.9	6.0				
72						7.2	5.6			
78						8.5	6.7	5.3		
83							7.9	6.3	5.1	
89								7.3	6.0	4.9
94								8.4	6.9	5.7
100									7.9	6.5
106										7.3
111										8.3

Throw distance, X (m) for VSD35 -4

Air flow discharge in one direction only

V̇	Unit length, L1 (mm)									
	600	750	900	1050	1200	1350	1500	1650	1800	1950
33	5.6									
39	8.1	4.8								
44		6.6								
50		8.7	5.6							
56			8.2	5.0						
61			8.7	6.4	4.5					
67				7.8	5.6					
72				8.8	6.9	5.2				
78					8.1	6.1	4.8			
83					8.4	7.2	5.6	4.5		
89						8.4	6.6	5.2		
94						8.6	7.6	6.1	4.9	
100							8.7	6.9	5.6	4.7
106								7.9	6.4	5.3
111								8.8	7.2	6.0
117									8.1	6.7
122										7.5
128										8.3

VSD50 slot diffuser with alternating horizontal discharge

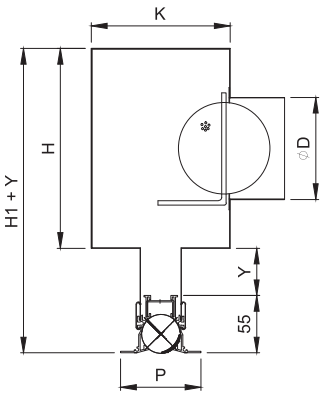
No. of slots "n"	Air flow ranges (l/s)																			
	Unit length, L1 (mm)																			
	600		750		900		1050		1200		1350		1500		1650		1800		1950	
	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max
1	11	25	14	28	17	33	19	39	22	50	25	56	28	56	31	67	33	72	39	78
2	25	33	31	39	39	50	44	61	50	67	56	78	61	83	67	89	72	100	83	106
3	11	25	14	28	17	33	19	39	22	50	25	56	28	56	31	67	33	72	39	78
4	25	33	31	39	39	50	44	61	50	67	56	78	61	83	67	89	72	100	83	106

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/2.6/EN/--.

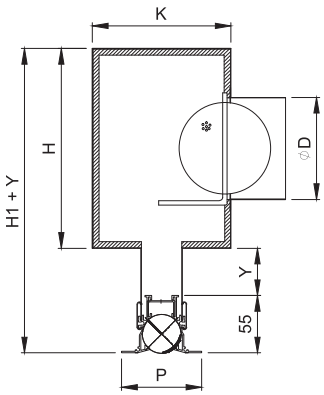
3.0 Slot Diffusers
Type ‘VSD 50’

VSD50

Diffuser profile without flanges



VSD50-1…2-AK



VSD50-1…2-DK

Nomenclature

$\dot{V}$ in l/s = Flow rate
X in m = Throw distance
L_1 in mm = Length of plenum box
A in m = Distance between 2 diffusers
$\bar{v}_{H1}$ in m/s = Time average upstream velocity between 2 diffusers
$\bar{v}_L$ in m/s = Time average upstream velocity at the wall

Note

Room height = 3 m
$\bar{v}_{H1}$ = 0.15 – 0.17 m/s
$\bar{v}_L$ = 0.34 – 0.37 m/s

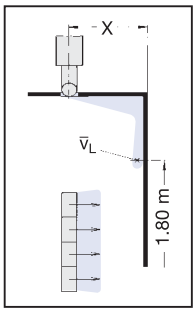
Sound power level is $L_{WA} \leqq 40$ dB(A) in all cases
Pressure drop $\Delta p_t \leqq 30$ Pa

If required, the length of the diffuser face can be greater than the length of the plenum box.

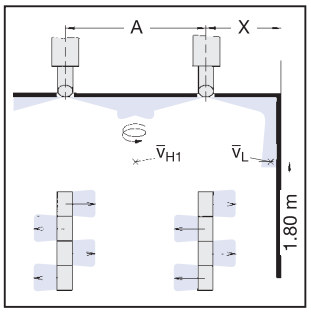
Dimensions (mm)						
No. of slots	P	K	H1	H2	H	D
1	77	138	262	286	207	123
						148
2	123	176	302	326	247	148
						198

Diffuser Layout

flow discharge horizontal, one direction



flow discharge alternating horizontal



Order Code

These codes need not be completed for standard products

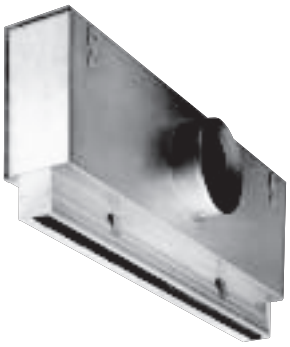
VSD50 - 1 - AK - M - L / 900x123 x y / C6 / B00 / P1 / RAL 9016 / WH / WW

- Type
- No. of slots: 1, 2
- For plenum box constructions, see leaflet: AK, DK, AA, AS, DS
- Adjustable flow rate control: M
- Lip seal: L
- L_1 x D x y[1)+2)]
- End caps[4)]: Without edge flange 000[3)], Integrated edge flange B00
- Standard finish E6-C-0: 0; Powder coating to RAL 9010 (GE 50 %): P0; Powder coating to RAL 9006 (GE 30 %) Other colours to RAL… (GE 70 %): P1
- Specify RAL colour
- Horizontal left HL, Horizontal right HR, Alternating horizontal WH
- 0 black control blades; WW white control blades

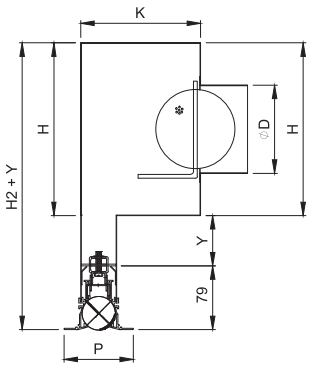
1) with concealed screw fixture
if y = 0 (Standard),
further possible values for y = 30, 55, 80 and 104 mm
2) with screw fix
if y = 0 (Standard)
further possible values for y = 30, 55, 80, 105 and 129 mm
3) not with concealed slot fixture AS and DS
4) see leaflet or Internet

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/2.7/EN/--.

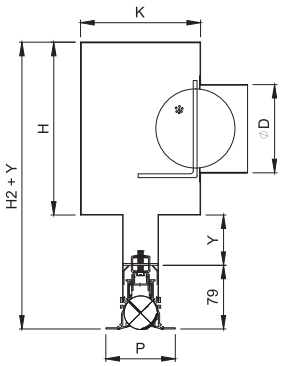
3.0 Slot Diffusers
Type ‘VSD 50’



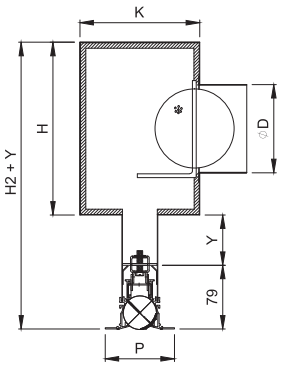
VSD50



VSD50-1…2-AA



VSD50-1…2-AS



VSD50-1…2-DS

Diffuser profile without flanges

Throw distance, X (m) for VSD50 -1

Air flow discharge in one direction only

V̇	Unit length, L_1 (mm)									
	600	750	900	1050	1200	1350	1500	1650	1800	1950
11	3.0									
14	3.0	3.0								
17	4.0	3.0	3.0							
19	5.5	3.4	3.0	3.0						
22	7.1	4.6	3.2	3.0	3.0					
25		5.8	4.0	3.0	3.0	3.0				
28		7.1	5.0	3.6	3.0	3.0	3.0			
31		8.7	6.0	4.4	3.5	3.0	3.0	3.0		
33			7.1	5.3	4.0	3.2	3.0	3.0	3.0	
39				7.1	5.5	4.3	3.5	3.0	3.0	3.0
44					7.1	5.7	4.6	3.7	3.2	3.0
50						7.1	5.8	4.8	4.0	3.3
56						8.8	7.1	5.9	5.0	4.3
61							8.7	7.1	6.0	5.2
67								8.5	7.1	6.1
72									8.3	7.1
78										8.3

Throw distance, X (m) for VSD50 -2

Air flow discharge in one direction only

V̇	Unit length, L_1 (mm)									
	600	750	900	1050	1200	1350	1500	1650	1800	1950
22	3.0									
25	5.5									
28	6.8	3.0								
31	8.1	5.3	3.0							
33		6.2	3.0	3.0						
39		8.4	5.9	3.0						
44			7.7	5.6	3.0					
50				7.1	5.5	3.0				
56				8.7	6.8	5.3	3.0			
61					8.1	6.5	5.3	3.0		
67						7.7	6.2	5.1	3.0	
72							7.3	6.1	5.0	
78							8.4	7.0	5.9	3.0
83								8.0	6.8	5.8
89									7.7	6.5
94									8.6	7.4
100										8.3

VSD50 slot diffuser with alternating horizontal discharge

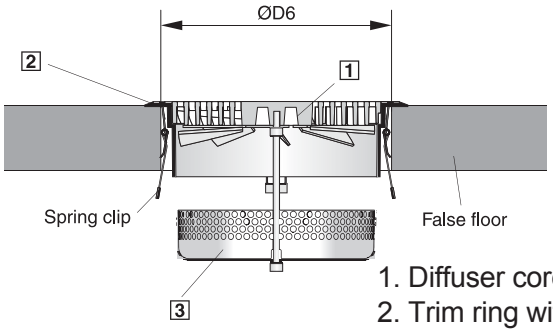
No. of slots “n”	Air flow ranges (l/s)																			
	Unit length, L1 (mm)																			
	600		750		900		1050		1200		1350		1500		1650		1800		1950	
	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$	$\dot{V}_{min}$	$\dot{V}_{max}$
1	11	25	14	28	17	33	19	39	22	50	25	56	28	56	31	67	33	72	39	78
2	25	33	31	39	39	50	44	61	50	67	56	78	61	83	67	89	72	100	83	106

4.0 Floor Diffusers
Type ‘FB’

Type ‘FBA’ Floor Diffuser

FB

Typical installation detail with trim ring



1. Diffuser core.
2. Trim ring with spring clip fixings.
3. Dirt tray with adjustable height.

Plastic Floor Diffuser (FBK)		
Type	Discharge setting	
	Vertical V (l/s)	Horizontal V (l/s)
FBK-150	28	14
FBK-200	37	25

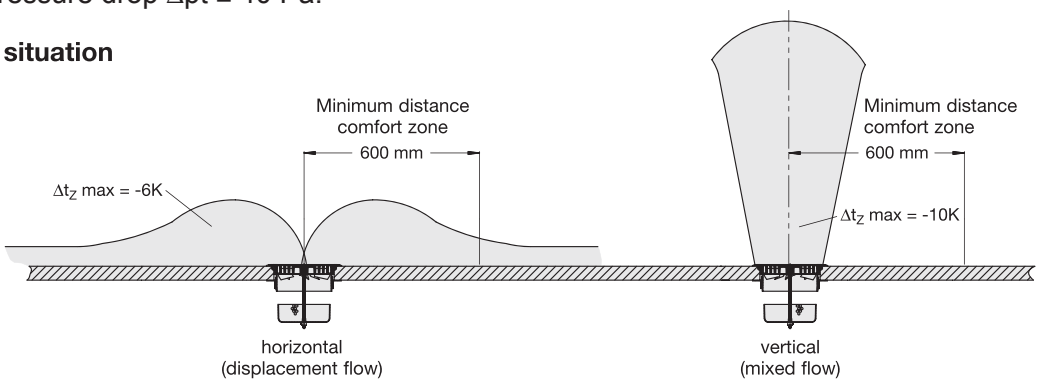
Aluminium Floor Diffuser (FBA)		
Type	Discharge setting	
	Vertical V (l/s)	Horizontal V (l/s)
FBA-150	30	17
FBA-200	37	25

Dimensions			
Nominal size	Overall Face Size (mm)	Core Face Diameter (mm)	Floor Opening (mm)
150	200	149 Ø	170 – 180 Ø
200	250	199 Ø	220 – 230 Ø

Note: Overall unit height is 167 mm

Notes:
1. Sound power level is LWA ≤ 35 dB(A) in all cases.
2. Total pressure drop Δpt ≤ 40 Pa.

Discharge situation



Order Code

FBA - 1 - V - K - SM - A / 150

- **Type**
- **Surface of diffuser core and trim ring: in aluminium**
  - Die cast and deburred 1
  - Die cast, deburred, tumble fettled black stove enamel, face skimmed 3
  - Die cast, deburred, face skimmed 4
- Adjustable swirl element[2] for discharge control: vertical V, horizontal H
- K[1] Trim ring
- SM Dirt trap including adjustable flow rate control at rear
- SV Dirt trap including adjustable flow rate control at face
- A Plenum box
- Size 150; 200

FBK - 1 - V - K - SM - A / 150 / V00

- **Type**
- **Surface of diffuser, core and trim ring: in plastic**
  - Dusty grey similar to RAL 7037 1
  - Black similar to RAL 9005 2
- Adjustable swirl element[2] for discharge control: vertical V, horizontal H
- K[1] Trim ring
- SM Dirt trap including adjustable flow rate control at rear
- SV Dirt trap including adjustable flow rate control at front
- A Plenum box
- Standard Plastic (PA6) 0
- flame retardant (PA6-V0) V00
- Size 150; 200

1) For orders without trim ring, a spacing ring is provided for technical performance reasons and to ensure correct height
2) For orders without adjustable swirl element, the discharge direction is vertical

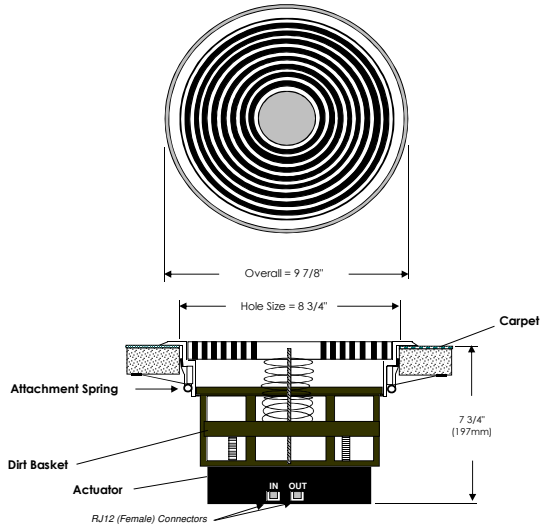
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T 1.3/6/EN/--

4.0 Floor Diffuser VAV Type 'FBA'

FB VAV terminals utilize the TROX FB series swirl diffuser core. Its high induction performance assures optimal occupant comfort as well as energy efficiency by rapidly mixing the supply air with room air near the diffuser face. FB-VAV terminals incorporate a 24VAC electric actuator which reconfigures its inlet area in response to the imposed control signal (by others). An adjustable maximum airflow limit assures that outlet airflow rates will remain between the minimum space ventilation requirement and the prescribed design outlet airflow, assuring a proper system airflow balance.

FEATURES AND ADVANTAGES

- Plastic and aluminum models are available in a variety of surface finishes
- Enables automatic VAV control of individual outlet airflow delivery
- Adjustable maximum and preset minimum air flow limits assure code required ventilation while maintaining air system balance
- Cleaning and maintenance can be accomplished without disturbance of the access floor tile or floor covering
- Modular connections facilitate easy field relocation of air terminal
- Affords accurate temperature control for retrofit applications requiring minimal finished floor heights
- Air control components can easily be added or relocated to other installed manually adjusted FB series diffusers



Actuator: ☐ **FBA-VAV-VF-K-FP** 3-wire (floating point) control, signal by others
☐ **FBA-VAV-VF-K-PC** Proportional (0-10 VDC signal by others)
Supply Voltage: 24VAC Supply Power: 3.3 VA maximum

Ordering Code

FBK - VAV - 1 - VF / 200 - FP

Basic Model
FBK-VAV (Plastic)
FBA-VAV (Aluminum)

Actuator Type
FP Floating Point
PP Proportional

Finish
FBK-VAV (Plastic) Model
1 Grey
2 Black
FBA-VAV (Aluminum)Model
3 Black with brushed aluminum concentric rings
4 Brushed aluminum

Control Element
VF Vertical (Fixed)
EU Adjustable (H/V)

4.0 Floor Diffusers
Type 'FBA/250'

KEY FEATURES

- The diffuser core and trim ring are in aluminium die cast.
- Twirl plate and dirt trap are made from ABS plastic.
- Provides vertical air discharge pattern only.
- Dirt tray can be supply with or without damper blades.
- Removable diffuser core to clean the dirt tray.
- Maximum point load at the centre of the diffuser over an area of 25 mm² is 9 kN.

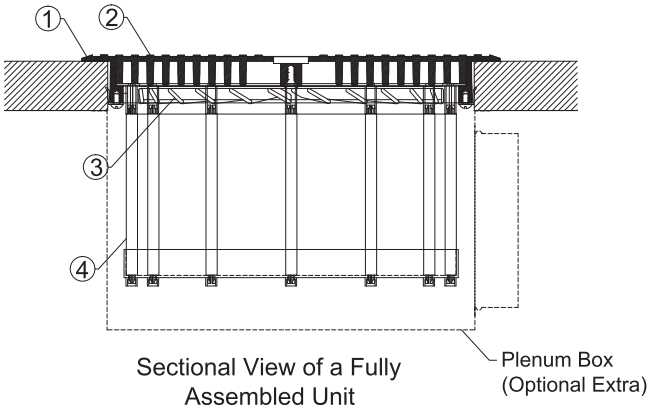
RECOMMENDATIONS

- Temperature differential of the supply air should range between 2 to 6°C.
- Hole size in the floor tile should be 268 ± 2 mm in diameter.

LEGEND

1. 250 mm diameter diffuser face.
2. Twirl plate.
3. Dirt trap.
4. Trim ring.
5. Overall height, H3 is 165 mm.

Type 'FBA/250' Floor Diffuser



Sectional View of a Fully Assembled Unit

Table 1: Quick selection for 'FBA/250' diffuser.

Diffuser Type/Size	Pressure Drop											
	5Pa		10Pa		15Pa		20Pa		25Pa		30Pa	
	l/s	NC	l/s	NC	l/s	NC	l/s	NC	l/s	NC	l/s	NC
FBA/250	36	>NC20	47	NC20	55	NC25	63	NC30	70	NC35	77	NC40

Order Code

FBA - 3 - T - K - S - A / 250

250 Size

Surfaces of diffuser core and trim flange :

- Die-cast and deburred — 1
- Die-cast, deburred, stove-enamelled in black, face skimmed — 3
- Die-cast, deburred, face skimmed — 4

Control element for swirling discharge pattern

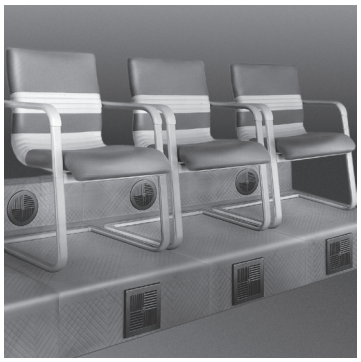
- without twirl — Ø
- with twirl — T

- A — Plenum Box
- Ø — Without dirt trap
- S — Dirt trap without volume adjustments elements
- SW — Dirt trap including winged volume adjustment elements
- K — Trim Flange

4.0 Staircase Diffusers Type 'SD'

The Staircase Diffuser is designed to be used in theatres, auditoriums, concert halls or cinemas to supply air at a temperature differential of between 3 to 6 °C. They can be mounted vertically on steps or horizontally directly below the seat, where they are not expected to take live or dead load.

Type 'SD' Staircase Diffuser



Key features:

- Provide high induction rate to minimise draft.
- Made from galvanised sheet steel.
- Comes in one size only with either square face or round face (see diagrams below).

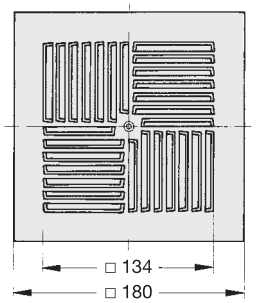
Table 1: Quick selection table of 'SD' Staircase Diffuser with sub-frame

TROX Product Code	Air flow (l/s)	ΔP (Pa)	Throw (m) @ 0.15 m/s	Remarks
SD-Q-LQ	16	14	0.55	With square discharge face
SD-Q-LR	14	13	0.50	With round discharge face
SD-R-LR				

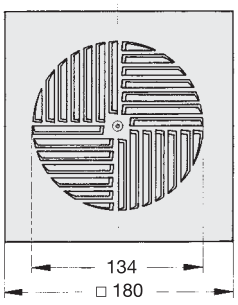
NOTE: Anticipated noise level is NC 20 assuming 8 dB room attentuation.

Options available:

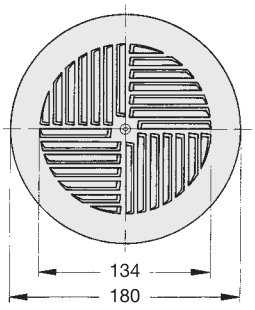
SD-Q-LQ



SD-Q-LR



SD-R-LR



Order Code

These codes do not need to be completed for standard products

SD - Q - LQ - S / **180** / **0** / **0** / **P1** - **RAL 9005**

Diffuser face: Square Q, Circular R

Discharge face: Square LQ [1], Circular LR

With spigot S
With subframe T

Size: 180

Not used: 0 / 0

State colour: RAL 9005

P1:
- 0 Standard finish powder-coated to RAL 9010 (GE 50%) [2]
- P1 Powder-coated to RAL 9006 (GE 30%) [2] other colours to RAL . . . (GE 70 %) [2]

[1] Only available with square diffuser face!
[2] GE = Gloss level

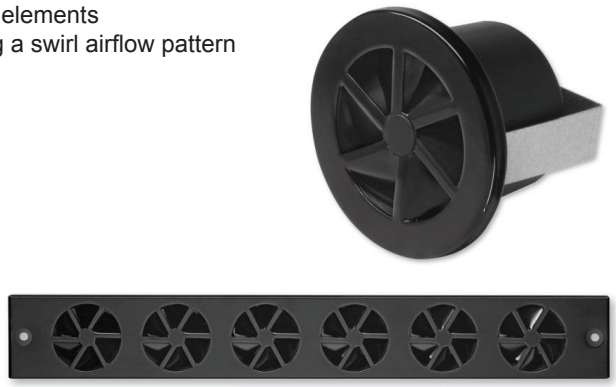
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 1/9/EN/--.

4.0 Staircase Diffusers Type 'SDRF'

The Staircase Diffuser is designed to be used in theatres, auditoriums, concert halls or cinemas to supply air at a temperature differential of between 3 to 6 °C. They can be mounted vertically on steps or horizontally directly below the seat.

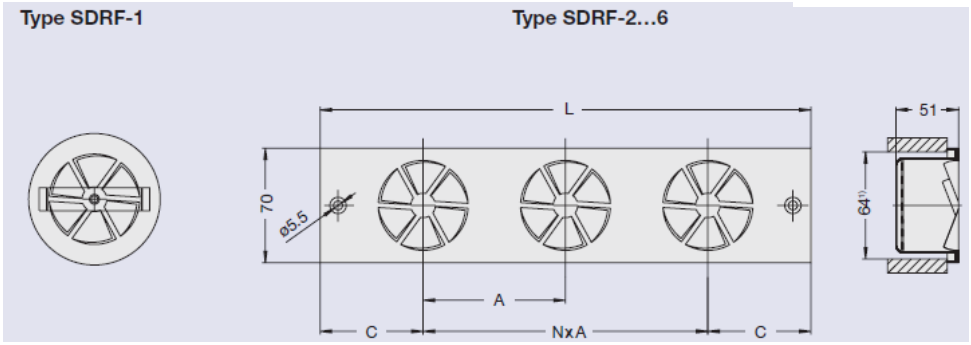
Key Features:

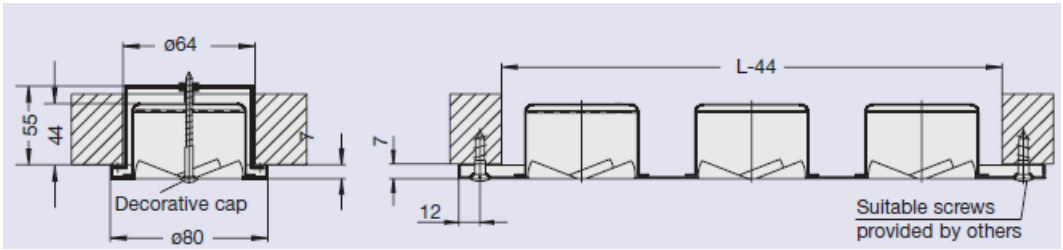
- The SDRF comprises a face plate with 1 to 6 standard stamped discharge elements
- Discharge elements are circular with fixed providing radial blades providing a swirl airflow pattern
- Draught free and silent airflow provision



Dimensions Type SDRF-2 to 6			
Type	L (mm)	C (mm)	N x A
SDRF-2	200	63	1 x 74
SDRF-3	300	63	2 x 87
SDRF-4	400	71	3 x 86
SDRF-5	500	66	4 x 92
SDRF-6	500	65	5 x 74

Type SDRF-1 **Type SDRF-2...6**





Order Code

These codes need not be completed for standard products

SDRF - K / 3 / 0 / 0 / P1 - RAL 9016

Fixing of complete diffuser face with

Spring clips K

Counterpunched holes for fixing screws provided by others S

1 2 3 4 5 6 — No. of discharge elements

Not used

State colour

0 Standard finish Powder-coated to RAL 9005 (GE 70 %)¹⁾

P1 Powder-coated to RAL 9006 (GE 30 %)¹⁾ Other RAL colours (GE 70 %)¹⁾

1) GE = Gloss level

Note:
Type SDRF-1 circular faceplate!
Types SDRF-2...6 rectangular face plate!

Note: For further details please refer to the TROX GmbH Catalogue 1/9.1/EN/3

4.0 Computer Floor Grilles Type ‘AFG’

The ‘AFG’ Type floor grille is designed to mount on any 600 x 600 mm sq. raised floor system, to provide supply air to computer or data processing centres where cooling load demand is high. This is heavy duty floor grille, which is able to high load head load and is robust in construction.

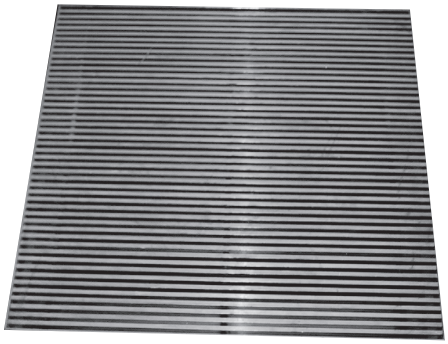
KEY FEATURES

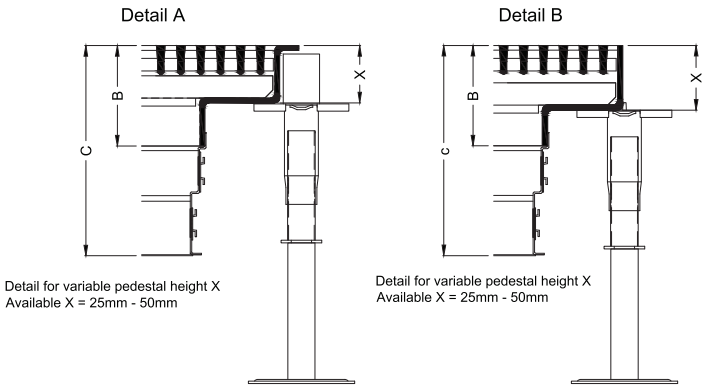
- Grille face is made from extruded aluminium with steel support frame at the back.
- Designed to suit 600 x 600 mm sq. floor tile.
- Opposed blade damper can be provided at the rear of the steel frame and is adjustable from the grille face.
- Actuator controlled motories damper can be provided

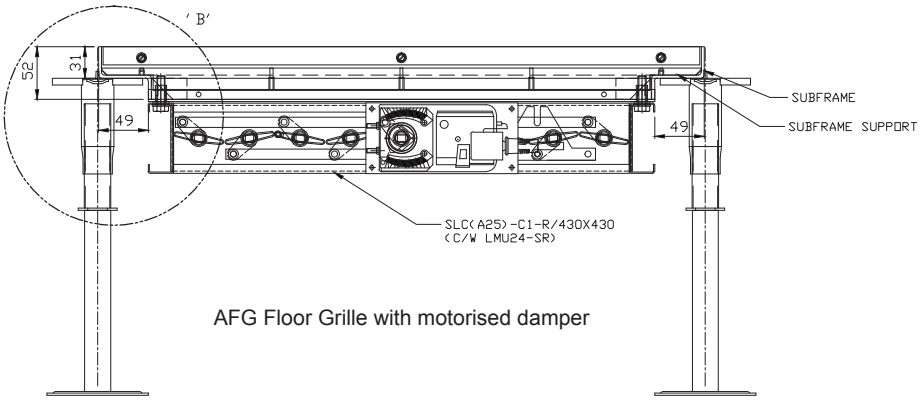
STANDARD FINISH

- Grille will be in mill finish
- Steel frame and opposed blade damper (OBD) at the rear will be in painted black to RAL 9005.

Type ‘AFG’ Floor Grille







AFG Floor Grille with motorised damper

Table No. 1: “AFG-A” (without OBD).

Static Press ΔP (Pa)	Air Flow Rate (l/s)
5	470
7	510
10	595

Table No. 2: “AFG-AG” (with OBD).

Static Press ΔP (Pa)	Air Flow Rate (l/s)
5	250
7	302
10	343

Order Code

AFG-A / 00 / 0 / F1

Type

Construction

A — Floor grille with support steel structure **(Standard supply**

AG — Floor grille with support steel structure and volume control damper.

Dirt Trap

00 — Without dirt trap (Standard supply)

SM — Dirt trap with shut-off damper

SO — Dirt trap without damper.

Plenum box

o — Without plenum (Standard supply)

A — Plenum box

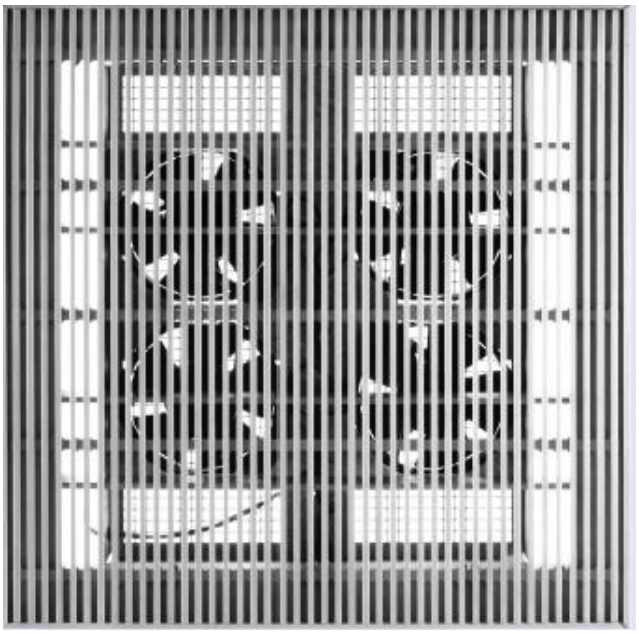
Finish

F0 — Deburred and natural skimmed face

F1 — Tumble fettled and polished with black stove enamel paint and face skimmed-natural (Standard supply)

4.0 Fan Asissted Computer floor Grilles Type 'CFG'

Type CFG

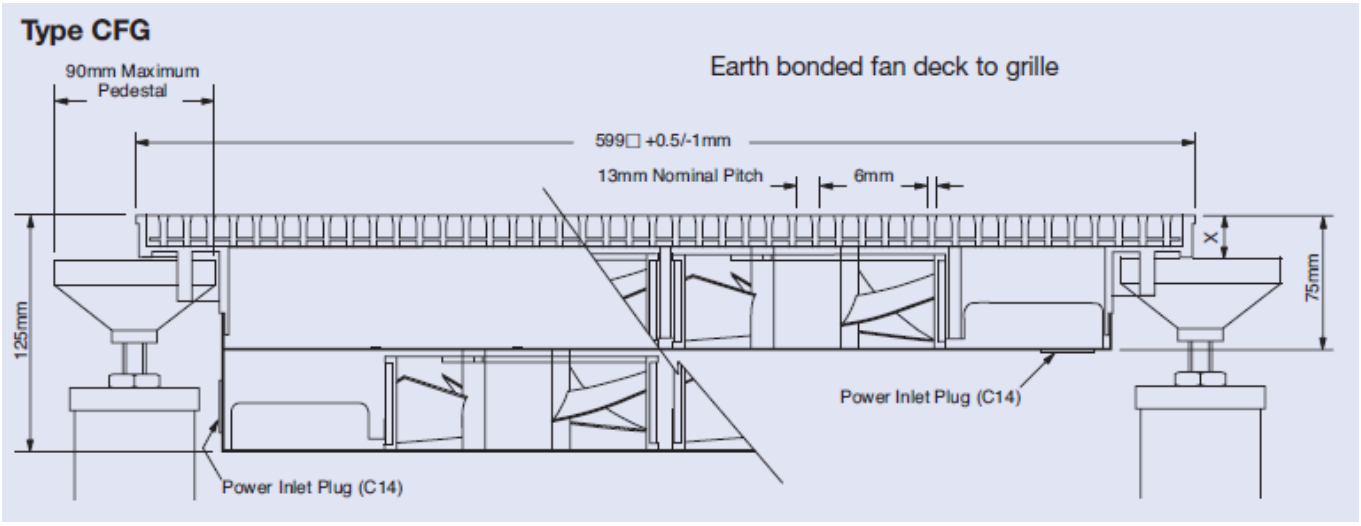


The TROX CFG combination fan and floor grille has been specifically developed for installations in raised access floors such as computer rooms, specialised control rooms and data centres. The robust construction of the floor grille pattern provides a secure operational platform in heavy trafficable areas.

Key features:

- Robust aluminium face construction with formed sheet frame
- Two fan options with either CFG-AC constant air flow or the CFG-EC with 0-10Vdc proportional control
- Plug and play connectivity
- Dynamic load toast to 4.5 kN
- Safety load test to 13.5 kN on central grille blade

Type	CFG-AC	CFG-EC
Mean Area, m^2	0.09284	0.102
Airflow, l/s	335	0-580
Current consumption, Amps	0.4	0-0.6 Depends on input signal
Input signal	NIL	0-10Vdc
Noise at maximum airflow	NC 53	NC 60
Airflow at NC 35	NIL	205 l/s



Order Code

CFG - AC / 600x600 / 35 / P4 / RAL 9006

Product Type

AC – constant
EC – proportional

Nominal Size

Frame Depth:
Between face of grille and face of pedestal
25mm standard
Optionally 26 – 50 in 1mm steps

Powder coating finish:
P1 – Non-standard colour
Finished:
A1 – Mill Finish (standard)
A4 – Natural Anodised (25 micros)
P4 – Painted Black and surface finished
P2 – Silver Grey RAL 9006
N1 – Nylon coated Black

4.0 Floor Diffusers - Fan Assisted Type 'FAT'

KEY FEATURES

- Each FAT unit comes with a wall mounted temperature sensor complete with fan speed controller to control the fan speed manually or automatically, with 3 speed settings (i.e., low, medium and high), on/off control and room temperature set point adjustment.
- Under automatic control mode the fan speed will be adjusted automatically if the room temperature rises or drop below the set point by 2° C.
- As optional extra, LSF electric power cable can be provided if requested for fire safety purpose.
- This can be setup in a master and slave control arrangement with up to 3 slave units to one master unit.

RECOMMENDATIONS

- Temperature differential of the supply air should range between 2 to 6°C.
- The floor void should have a clear depth of between 400 mm to 600 mm deep depending on the extent of engineering services to be accommodated.

Type 'FAT' Fan Powered Terminal Unit

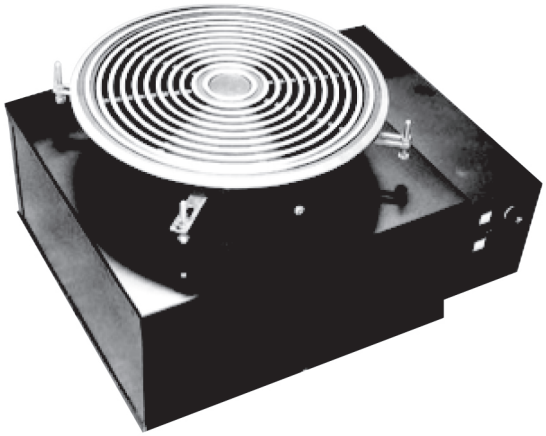
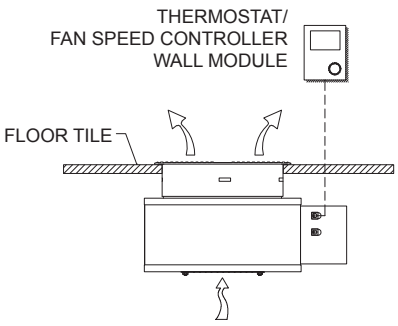


Table 1: Typical performance data for TFTU

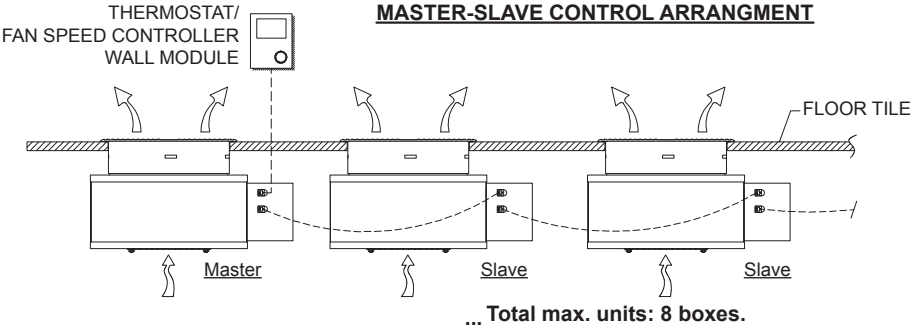
Fan Speed	Typical Flow Rate (l/s)	NC Level
Low	33	NC 30
Medium	45	NC 35
High	60	NC 40

Note: The flow rates given above are based on a face velocity of 4.5 m/s. Based on this, the anticipated pressure drop across the damper is not expected to exceed 40 Pa.

SINGLE CONTROL ARRANGMENT



MASTER-SLAVE CONTROL ARRANGMENT



* *Total length for communication cable max. 200m*

... **Total max. units: 8 boxes.**
**1 -master, 7 - Slave (max.) for controls connection only.*
power supply is only limited to four units.

Order Code

FAT / M / 0 / 00 / 0

Type

Unit Configuration
M – Master; **S** - Slave

Controls options
Similar to other VAV terminal units. Refer to page 61 as example.

Note: The product is usually made to suit specific application. For further details and technical assistance, please send your enquiry via email to enquiry@troxapo.com

4.0 Floor Diffuser - Fan Assisted Type 'TFTU'

KEY FEATURES

- Pressure independent series fan terminal unit suitable for under-floor air distribution system (UFAD).
- Rubber and plastic components are fire retardant to UL 94.
- Designed to be mounted on 600 mm by 600 mm raised floor systems.
- As optional extras, the following can be provided;
  - 750 Watts electric heater with manual reset thermal cut-out switch as standard supply
  - Washable filter panel
  - 3-speed fan control

RECOMMENDATIONS

- Temperature differential of the supply air should range between 2 to 6°C.
- The floor void should have a clear depth of between 400 mm to 600 mm deep depending on the extent of engineering services to be accommodated.

Type 'TFTU' Fan Terminal Unit

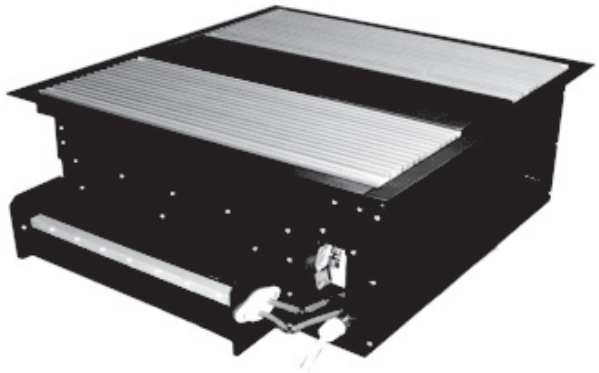


Table 1: Typical performance data for TFTU

Fan Speed	Typical Flow Rate (l/s)	NC Level
Low	75	NC 30
Medium	110	NC 35
High	125	NC 40

Order Code

TFTU / 600 / 0 / 00 / 0 / 46 – 125 l/s

Type

Unit Size
600

Air flow range
(V_{min} - V_{max})

Controls options
Similar to other VAV terminal units. Refer to page 61 of this guide for example.

Note: The product is usually made to suit specific application. For further details and technical assistance, please send your enquiry via email to enquiry@troxapo.com

5.0 Displacement Diffusers Type 'QLV'

KEY FEATURES:

- Suitable for commercial and industrial applications
- Manufactured in pre-galvanised sheet steel.
- Available in 90°; 180° or 360° radial air discharge.
- Comes with circular inlet spigot which can be located at the top or bottom of the diffuser.

RECOMMENDATION:

- Temperature differential for supply air should be between -1 and -6 K.

STANDARD FINISH:

- Powder coating to RAL 9010 in matt white.

Type 'QLV-360' Displacement Diffuser

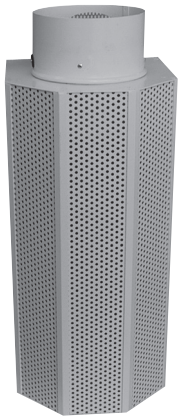


Table 1: Quick selection guide for 'QLV' Type 90°; 180° and 360° construction variants

Unit Size	Unit Ht. (mm)	QLV-90 @ 0.3 m/s discharge vel.				QLV-180 @ 0.3 m/s discharge vel.				QLV-360 @ 0.3 m/s discharge vel.			
		Air flow (l/s)	ΔP (Pa)	SWL in dB(A)	Throw ≤ 0.25 m/s	Air flow (l/s)	ΔP (Pa)	SWL in dB(A)	Throw ≤ 0.25 m/s	Air flow (l/s)	ΔP (Pa)	SWL in dB(A)	Throw ≤ 0.25 m/s
160	1000	104	46	32	1.3	148	89	42	1.3	192	148	50	1.3
200	1000	126	29	27	1.3	180	55	37	1.3	233	90	44	1.3
250	1000	155	18	21	1.3	218	35	31	1.3	281	55	38	1.3
316	1250	240	16	22	1.4	339	31	31	1.4	433	49	38	1.4
400	1500	360	14	21	1.6	508	26	31	1.6	646	40	37	1.6
500	1500	443	9	15	1.6	627	17	25	1.6	795	26	32	1.6
600	1750	644	7	<15	1.8	913	14	24	1.8	1154	21	21	1.8

NOTE: The selection given above assumes that the volume control damper is fully open.

Order Code

These codes not required for standard construction

QLV - 180 - O - M - L / 250 x 600 / W0 / 0 / P1 / RAL 9016

- Construction: 90, 180, 360
- Air connection spigot on top / at the bottom: O, U
- Volume flow control damper: M
- Lip seal: L[1)]
- 250 x 600: 160 x 500, 600, 800, 1000; 200 x 500, 600, 800, 1000; 250 x 500, 600, 800, 1000; 315 x 600, 800, 1000, 1250; 400 x 800, 1000, 1250, 1500; 500 x 1000, 1250, 1500; 630 x 1250, 1500, 1750; NW x H (mm)
- W0: 0 Without wall mounting kit; W0 With wall mounting kit (supplied loose) (only for QLV-90 and QLV-180); B0 With floor fixing plate (only for QLV-360)
- 0: Not used
- P1: 0 Standard finish powder-coated to RAL 9010 (GE 50 %)[2)]; P1 Powder-coated to RAL 9006 (GE 30 %)[2)] other RAL colour (GE 70 %)[2)]; S7 Galvanised variant
- RAL 9016: State colour

1) With order – air connection spigot at the bottom (U) – as standard supplied with lip seal

2) GE = gloss level

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T 1.3/2/EN/--.

5.0 Displacement Diffusers Type 'QLF'

KEY FEATURES:

- Suitable for commercial and industrial applications
- Manufactured in pre-galvanised sheet steel.
- Available in one (i.e., face only) or three (i.e.,
- face and sides) directional air discharge.
- Comes with rectangular inlet spigot located at the top or bottom of the diffuser

RECOMMENDATION:

- Temperature differential for supply air should be between -1 and -6 K.

STANDARD FINISH:

- Powder coating to RAL 9010 in matt white

Type 'QLF' Displacement Diffuser

Table1: Quick Selection for 'QLF-1'

H x B (mm)	Vmin (l/s)	Vmax (l/s)	LWA min in dB(A)	LWA max in dB(A)
450 x 300	13	40	< 15	26
450 x 450	20	60	< 15	27
600 x 300	18	54	< 15	27
600 x 450	27	81	< 15	29
600 x 600	36	108	< 15	28
750 x 450	34	101	< 15	30
750 x 600	45	135	< 15	27
750 x 750	56	168	< 15	24
1000 x 600	60	180	< 15	28
1000 x 750	75	224	< 15	25
1250 x 600	75	224	< 15	28
1250 x 750	94	281	< 15	26
1500 x 750	112	337	< 15	26
1500 x 1000	150	449	< 15	29
1750 x 750	131	303	< 15	26
1750 x 1000	175	524	< 15	30
1750 x 1250	218	655	< 15	32
2000 x 1000	200	599	< 15	30
2000 x 1250	250	749	< 15	33

Table2: Quick Selection for 'QLF-3'

H x B (mm)	Vmin (l/s)	Vmax (l/s)	LWA min in dB(A)	LWA max in dB(A)
450 x 300	25	75	< 15	45
450 x 450	32	95	< 15	42
600 x 300	33	99	< 15	47
600 x 450	42	126	< 15	45
600 x 600	55	164	< 15	40
750 x 450	52	157	< 15	45
750 x 600	68	204	< 15	42
750 x 750	79	238	< 15	36
1000 x 600	92	276	< 15	43
1000 x 750	107	321	< 15	37
1250 x 600	115	344	< 15	46
1250 x 750	133	400	< 15	38
1500 x 750	160	480	< 15	39
1500 x 1000	216	649	< 15	42
1750 x 750	186	559	< 15	39
1750 x 1000	252	757	< 15	42
1750 x 1250	296	888	< 15	43
2000 x 1000	290	869	< 15	43
2000 x 1250	340	1019	< 15	43

Order code

These codes do not need to be completed for standard products

QL - O - 1 / 450 x 1250 / 0 / 0 / P1 / RAL 9016

Type QLF

Air connection spigot
top O
bottom U

Discharge[1)]
1-directional 1
3-directional 3

1) Only for type QLF

QLF in mm H x B
450 x 300 450
600 x 300 450 600
750 x 450 600 750
1000 x 600 750
1250 x 600 750
1500 x 750 1000
1750 x 750 1000 1250
2000 x 1000 1250

Not used

State colour

0 Standard finish powder-coated to RAL 9010
P1 Powder-coated other colours to RAL...

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T1.3/1/EN/--.

5.0 Displacement Diffusers Type ‘QSH • ISH’

This Type ‘QSH’ and ‘ISH’ displacement diffusers are designed to be used in industrial areas with floor to ceiling heights if 3.5m to 10 m. These types of diffuser can be installed as free suspended units or to columns and walls as shown below.

They are suitable for either heating or cooling application since the supply air can be directed to discharge horizontally or vertically.

In a highly polluting process environment, it is recommended to use Type ‘QSH’ diffuser for such application.

The Type ‘ISH’ diffuser is better suited for clean process environment.

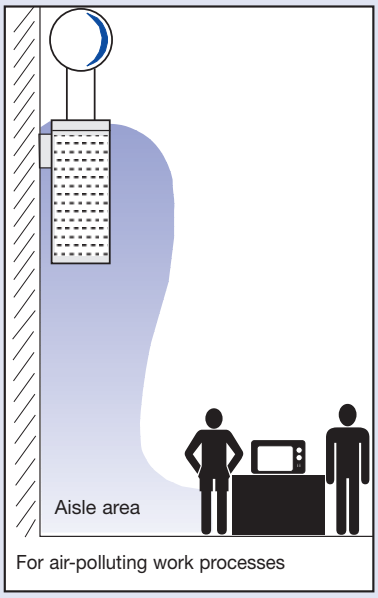
Both types come in four different sizes with a fixed height of 825 mm. Refer to the table below for more information.

Table 1: Quick selection for ‘QSH’ and ‘ISH’ diffusers.

Unit size	Spigot conn. (mm)	Product Type	Air flow (l/s)	ΔP (Pa)	Throw (m) @ ΔT = -5K
250	248	QSH	230	17	2.0
		ISH	210	15	
355	353	QSH	410	16	2.2
		ISH	375	14	
450	448	QSH	635	16	2.6
		ISH	550	13	
560	558	QSH	940	17	3.0
		ISH	830	14	

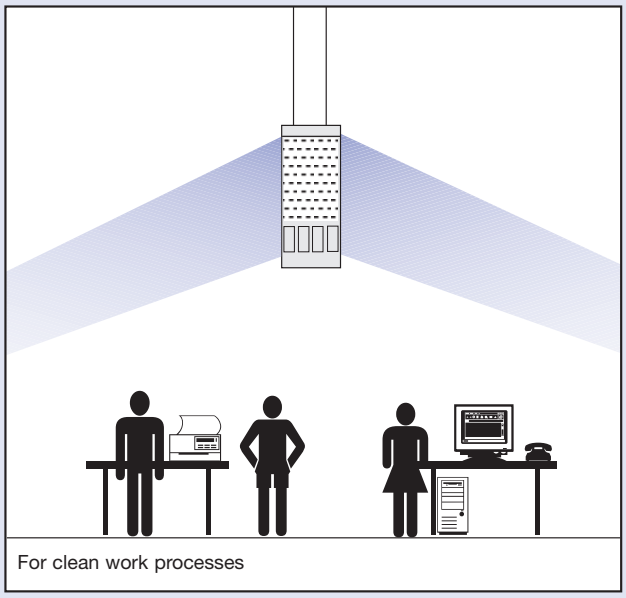
NOTE: Anticipated sound power level is 40 dB(A) or NC 35 assuming 8 dB room attenuation.

Type QSH



For air-polluting work processes

Type ISH



For clean work processes

Order Code QSH · ISH

These codes do not need to be completed for standard products

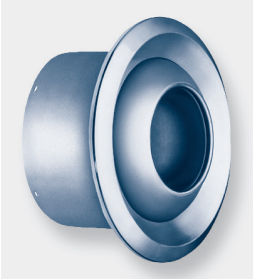
QSH - E2 / 450 / 0 / W00 / P1 / RAL 7035

- **QSH - E2**
  - With manual adjustment (chain pull): QSH, ISH
  - Electrical actuator 230 V, 50 Hz: E1
  - Electrical actuator 24 V, 50 Hz: E2
  - Electrical actuator 24 V, 50 Hz, 0…10 V-: E3
  - Thermal actuator: T
  - Bowden cable: B
- **450**: 250, 355, 450, 560, NW
- **0**: Not used
- **W00**
  - W00 With wall frame
  - K00 With chain fixing[2]
  - WK0 With wall frame and chain fixing[2]
- **P1**
  - 0 Standard finish galvanised
  - P0 Powder-coated RAL 9010 (GE 50 %)[1]
  - P1 Powder-coated RAL ... (GE 70 %)[1]
- **RAL 7035**: State colour

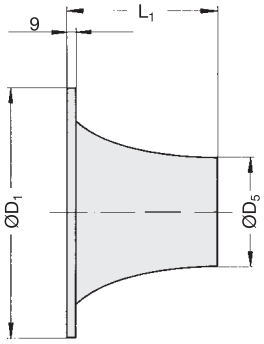
[1] GE = Gloss level !
[2] for manual adjustment only

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T 1.3/5/EN/--.

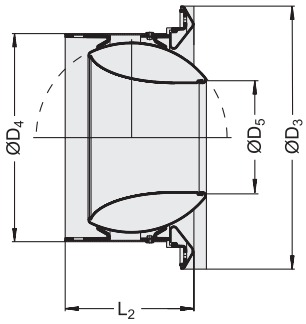
6.0 Jet Nozzles
Type ‘DUK’



DUK



DUK-F

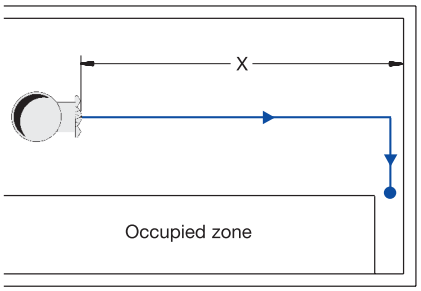


DUK-V

Air flow in l/s		21	28	42	69	111	167	222	278	347	417
Size		Throw distance and pressure drop									
100	X (m)	8	11								
	Δpt (Pa)	50	100								
125	X (m)	6	9	11							
	Δpt (Pa)	25	50	100							
160	X (m)	5	6	9	12						
	Δpt (Pa)	10	20	40	100						
200	X (m)		5	7	9	18					
	Δpt (Pa)		10	15	40	100					
250	X (m)			5	7	15	22				
	Δpt (Pa)			5	15	40	90				
315	X (m)				5	11	17	23	28		
	Δpt (Pa)				5	15	30	60	90		
400	X (m)					8	13	18	23	28	32
	Δpt (Pa)					5	10	15	25	40	60

Dimensions (mm)						
Size	$ØD_1$	$ØD_3$	$ØD_4$	$ØD_5$	L_1	L_2
100	136	146	98	50	94	78
125	159	169	123	64	112	86
160	225	200	158	82	122	98
200	265	257	198	108	153	117
250	315	302	248	136	187	155
315	400	384	313	174	224	183
400	485	467	398	230	287	208

Installation situation – isotherm –



Nomenclature

X in m = Throw distance
$Δp_t$ in Pa = Total pressure drop
Dimension of recess = $ØD_4$ + 15 mm

Note

The combinations of flow rate and size as shown in the table produce a sound power level:

L_{WA} = 35 dB(A) for axial connection
L_{WA} = 43 dB(A) for lateral connection

Order Code

These codes need not be completed for standard products

DUK - V - K - E1 / **400** / **P1** / **RAL 9016**

Type

Fixed F[1]
Adjustable V

Duct connection element K
Spigot A
Duct connection element for circular ducting R[3]

External rotary actuator E1...E3
Internal linear actuator E4...E6

Size[2]

Specify RAL colour

0 Standard finish “unfinished”
P0 Powder coating to RAL 9010 (GE 50 %)[4]
P1 Powder coating to RAL 9006 (GE 30 %)[4] Other colours to RAL… (GE 70 %)[4]

1) For attachment without counterpunched holes: Supplementary text necessary for order
2) For sizes 100 and 125, construction with actuator not available
3) Please indicate onsite duct diameter (ØR) as supplementary text
4) GE = Gloss level

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T 1.2/2/EN/--.

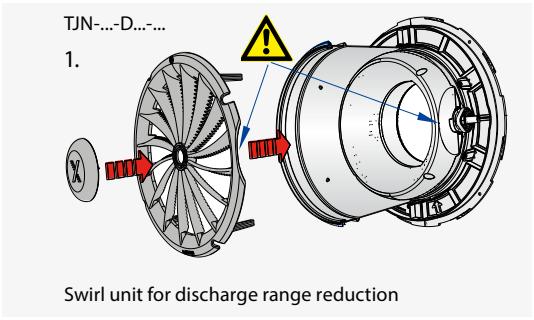
6.0 Jet Nozzles Type 'TJN'

The new TJN jet nozzle offers improved acoustic properties and is also more energy efficient.

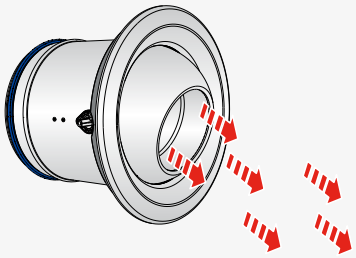
- Up to 6 dB less noise than with DUK jet nozzles due to optimised nozzle contours
- Discharge angle indication, limiting and setting (±30°) using a concealed scale
- Visible parts made of high-grade polymer in RAL white aluminium or pure white
- Easy to remove face cover ring with bayonet fixing
- 5 nominal sizes, each with a circular spigot or, as an option, with a connection piece for circular or rectangular ducts

Optional equipment and accessories

- Swirl unit for two-step reduction of the throw distance due to air control blades with unique saw tooth edges
- Compact height actuator that requires little additional space; mounted externally hence not affecting the differential pressure
- Actuator allows for integration into the central BMS
- All variants also with outer casing

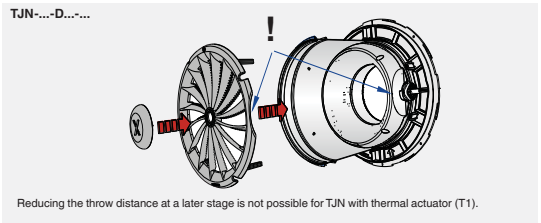


Swirl unit for discharge range reduction

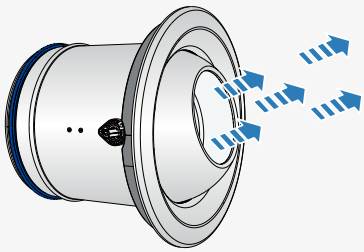


Heating

Scale for discharge



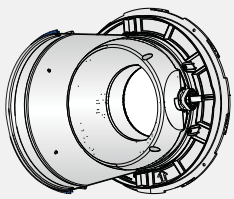
Reducing the throw distance at a later stage is not possible for TJN with thermal actuator (T1).



Cooling

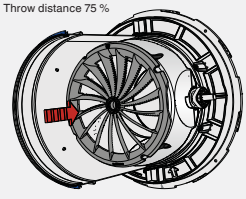
Throw distance 60% with swirl unit & cap

Throw distance 100 %

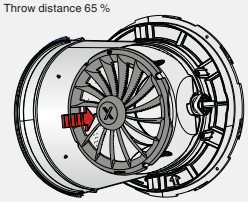


Throw distance 80% with swirl unit

Throw distance 75 %

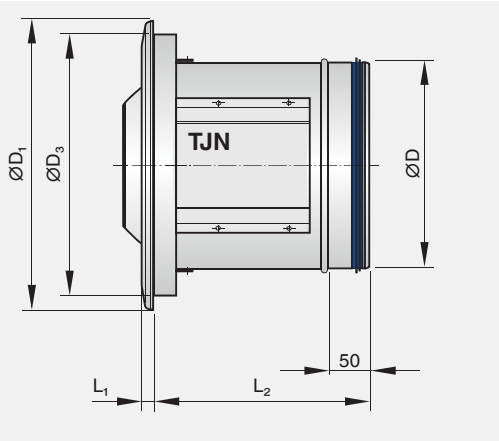


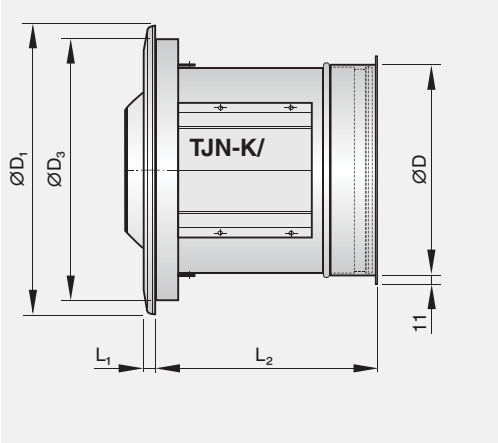
Throw distance 65 %



Throw distance 100%

Dimensions





Dimensions [mm]												
NG	ØD	$ØD_1$	$ØD_3$	L_1	L_2							
					TJN TJN/.../C	TJN-K TJN-R	TJN-K /.../C	TJN-R /.../C	TJN-T1	TJN-R-T1 TJN-K-T1	TJN-K-T1/.../C	TJN-R-T1/.../C
160	158	258	227	15	242	248	258	261	302	308	318	321
200	198	298	263	14	250	257	267	270	310	317	327	330
250	248	348	315	14	260	265	276	279	320	325	336	339
315	313	413	379	15	275	281	291	294	335	341	351	354
400	398	501	468	16	285	292	302	305	345	352	362	365

ØD4: Diameter of the circular duct, according to order details

Order code

TJN

TJN – R – E7 / 160 – 315 / C / D / S1
1 2 3 4 5 6 7 8

1 Type
TJN Adjustable jet nozzle

2 Connection piece
No entry: none
K For rectangular ducts
R For circular ducts (saddle connector), specify duct diameter under 5

3 Actuator
No entry: manual adjustment
E7 Min/max or 3-point, 230 V AC
E8 Min/max or 3-point, 24 V AC
E9 Modulating 2 – 10 V DC, 24 V AC

4 Nominal size [mm]
160
200
250
315
400

5 Circular duct diameter [mm]
Specify only for variant -R
315 Specify only for nominal size 160
500 Only up to nominal size 315
630
800

6 Attachments
No entry: none
C Outer casing

7 Accessories
No entry: none
D Swirl unit for throw distance reduction

8 Exposed surface
No entry: similar to RAL 9010, pure white
S1 Similar to RAL 9006, white aluminium

6.0 Jet Nozzles
Type 'AJA'

This jet nozzle is designed to deliver large volume of supply air to a large enclosed space that requires long throw, for example assembly halls, auditoriums and convention halls. They can be installed either to the side walls or mounted directly onto supply air ductwork.

The discharge nozzle can be tilted vertically and set at any angle between 30° up or down in the vertical plane (i.e., with up to 60° adjustment). This is Type 'AJA-1'.

Alternatively, as optional extra, each jet nozzle can be fitted with a circular mounting flange that will enable the nozzles to be manually rotated through 360°, giving it the ability to direct air in a 60° conical fashion. This is Type 'AJA-2'.

Each nozzle is held in the set position by friction-held fixings. The quick selection given in Table 1 is based on NC 35 with 8 dB room attenuation.

REAR ASSEMBLY:
The jet nozzle can be supplied with either;
a. Plenum box only.
b. Plenum box with opposed blade balancing damper.

STANDARD FINISH:
Powder coated to RAL 9010 matt white.

Type 'AJA' Jet Nozzles

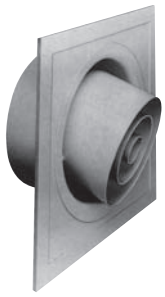


Table 1: Quick Selection table for AJA Jet Nozzles

Size	No. of elements	Flow (l/s)	ΔP (Pa)	Throw (m)	Drop (m)
200	1	190	60	12	7.0
	2	320	43	12	7.0
	3	455	39	13	7.0
	4	570	35	15	5.5
250	1	300	60	16	10.0
	2	550	48	16	10.0
	3	850	45	17	10.0
	4	1040	40	17	9.0
300	1	390	50	17	15.0
	2	740	40	18	15.0
	3	1040	35	18	14.0
	4	1320	30	18	13.0
350	1	470	30	17	17.0
	2	880	29	18	17.0
	3	1290	28	18	17.0
	4	1600	24	18	17.0

NOTE: Anticipated noise level is NC 35 with 8 dB room attenuation.

Order Code AJA -2-PG / 250 / 2 / 0 / 0 / RAL 9002

Type
AJA-1 with vertical angle adjustment only
AJA-2 with 60° conical angle adjustment.

Rear assemblies
0 – Without plenum
PG – With plenum and volume control damper.
PO – With plenum only.

Nozzle size
200; 250; 300 or 350.

Number of nozzles / unit
From 1 to 4 (max.)for AJA-2 only.

RAL Colour Code
To state colour code if it is any other colour other than RAL 9010.

Powder coating
0 – Matt white (RAL 9010) as **standard supply**.
1 – For any other RAL colour.

Fixing requirement
0 – Border with counter punched holes (**Standard supply**)
1 – Border without counter punched holes.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 1.2/5.1/EN/--.

6.0 Drum Louvres
Type 'AIL'

This Drum Louvre is designed to deliver large volume of supply air into a space that requires long throw such as assembly halls, auditoriums and convention halls. The Drum Louvre can be installed onto the side walls or, mounted directly to metal ducting.

It can be manually adjusted in the vertical plain to direct the supply air at any angle between 30° up or down in the vertical plane. Once the louvre position is set, that position is held by means of friction-held fixings. It is also fitted with manually adjustable guide vanes within the drum louvre to enable the supply airstream to be directed on either side if required.

The drum louver can also be supplied with opposed blade volume control damper fitted to the rear and, is easily adjustable from the face of the drum louvre.

STANDARD FINISH:
Powder coated to RAL 9010 matt white.

Type 'AIL-A' Drum Louvre

Size	Flow (l/s)	Throw (m) 0.50 m/s	Throw (m) 0.25 m/s	Drop (m) @ 0.5 m/s	ΔP (Pa)
1	214	8.0	19	0.50	110
2	311	10.0	24	0.80	120
3	403	11.5	27	1.00	125
4	583	13.5	31	2.00	135
5	639	10.0	24	0.85	110
6	792	12.0	27	1.35	120
7	1014	13.5	31	1.60	125
8	1222	15.0	35	2.40	135

Note:
The selection above is based on NC 35 or 40 dB(A) with a room attenuation of 8 dB.

Order Code AIL - A / 3 / 0 / S1 / RAL 9016

Type

AIL - A Louvre face only **(Standard supply)**.

AIL – AG Louvre with volume control damper.

Unit Size

Sizes ranging from1 to 8.

Powder Coating Colour

0 – RAL 9010 in Matt white **(Standard supply)**.

S1 – Non-standard RAL colour as per customer's requirement. **Note:** RAL Colour code should be stated as shown above.

Flange options

0 – 50 mm wide flange **(Standard supply)**
1 – 50 mm wide flange with counter punched holes.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 1.2/5.2/EN/--.

7.0 Cell Grilles
Type 'TCG'

The Cell Grille is suitable for either supply or, exhaust air application. The perforated grille face is made from heavy gauge galvanised steel sheet. The grille is secured to the wall with steel mounting frame.

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.

Fixings and jacking screws required to install the cell grille to the wall shall be provided by others. 32% free area with 3mm diameter holes on 5mm pitch centres

The grille section and the rear mounting frame is powder coated in matt white to RAL 9010 as standard supply. Other RAL colour code can be provided if requested.

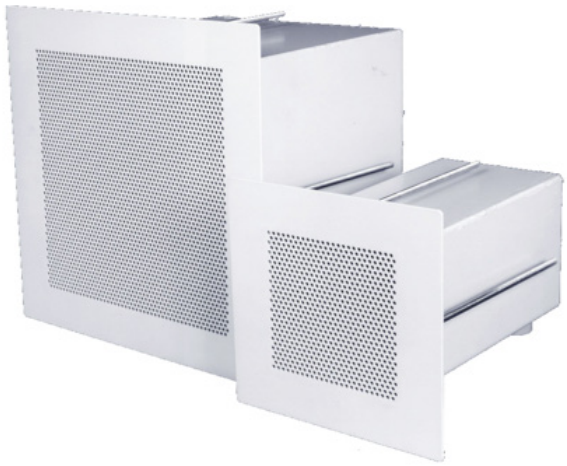
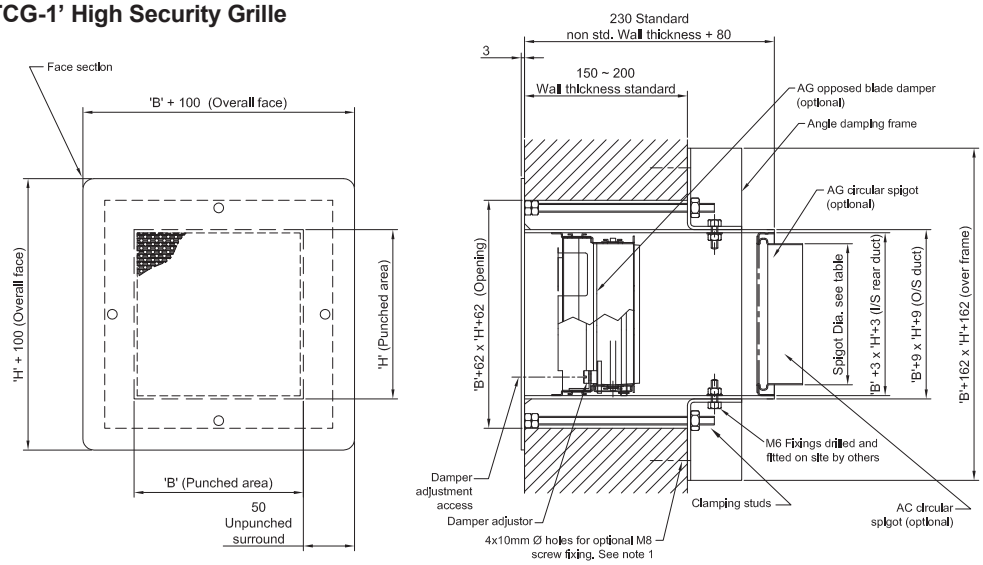


Table 1: Quick Selection Table for 'TCG' Grille

Grille Size (mm) L x H	Air flow (l/s)	ΔP (Pa)	Throw @ 0.5 m/s
150 x 150	51	27	5.7
200 x 200	80	21	6.9
250 x 250	120	19	8.3
300 x 300	158	16	8.9

Note: Based on NC 35 with 8 dB room attenuation and with only one grille in the room.

Type 'TCG-1' High Security Grille



Order Code

TCG1-AG / 200 x 200 / S1 / RAL 9002

Type
TCG-1 High Security Grille
TCG-2 Medium Security Grille
TCG-3 Low Security Grille

A Grille Face only.
AG Grille with an opposed blade damper (OBD).
C Grille with circular spigot connection.
AGC Grille complete with OBD and circular spigot connection.

0 – Matt white to RAL 9010 (Standard supply).

S1 – Powder coating (and specify RAL code except for RAL 9010 in matt).

Unit size (L x H) as per table 1 on page 3.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 1.1/4/EN/--.

8.0 Active Chilled Beams Type 'DID 604'

KEY FEATURES:

- Provides 4-way air discharge pattern.
- Comes with adjustable air deflection blades.
- Performance is certified by Eurovent.
- Comes in two standard sizes –see Table No.1 below.
- Suited for flush ceiling installation with heights between 2.6 and 4.0 m.

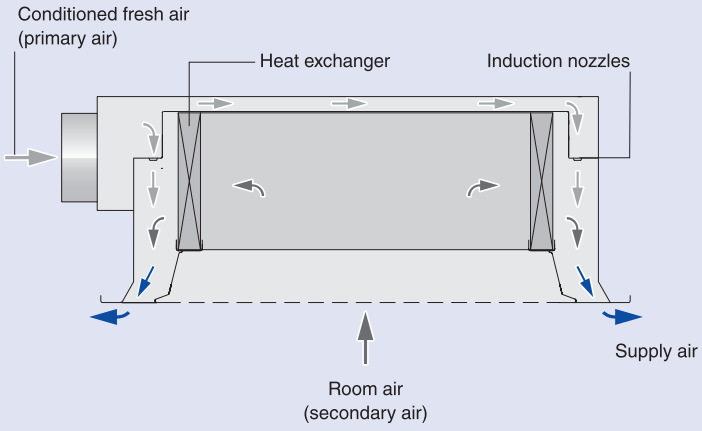
Type 'DID 604'

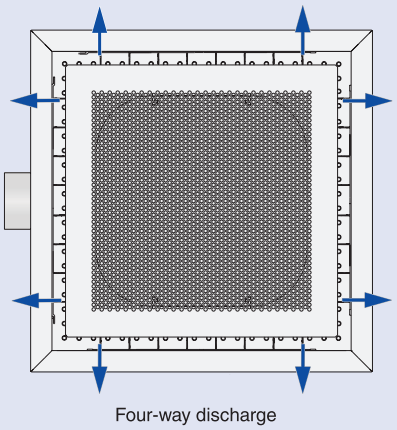
Table 1: Typical selection table for 'DID604' Type active chilled beams.

Unit size (L x W)	Design Output	Total Cooling Load (W)	Primary supply air		SWL in dB (A)	Δp water coil (kPa)
			Flow (l/s)	ΔP (Pa)		
600 x 600	Min.	184	8	34	<15	0.1
	Max.	785	25	106	27	4.8
1200 x 600	Min.	298	8	33	<15	0.2
	Max.	1152	39	105	35	6.2

Notes:
1. The air inlet spigot connection to these units is 123 mm diameter.
2. Unit overall height is 230 mm high.
3. Refer to the comprehensive catalogue for the total product range of eight different models.

Principle of operation





Four-way discharge

Order code

DID604-DE-LR-2-M-VR-A1 / Nominal size / P1 / RAL 9006 / G1 / 0

Nozzle size:
Z/ M/ G

P1 – Powder coated
(State RAL colour required)

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T 2.4/10/EN/--.

KEY FEATURES:

- Provides 2-way air discharge pattern.
- Standard construction do NOT come adjustable air deflection blades. This is an optional extra.
- Performance is certified by Eurovent.
- Comes in different sizes –see Table No.1 below for two common sizes.

Type 'DID 632'

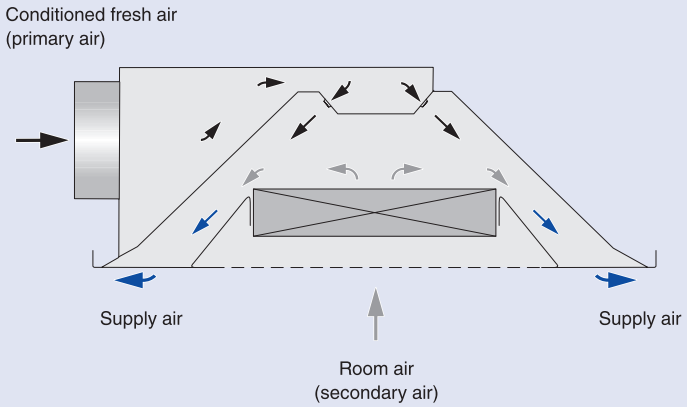
RECOMMENDATION
Chilled water supply temperature should be 1 °C above the room dew point temperature to avoid condensation.

Table 1: Typical selection table for 'DID632' Type active chilled beams.

Unit size (L x W)	Design Output	Total Cooling Load (W)	Primary supply air		SWL in dB (A)	Δp water coil (kPa)
			Flow (l/s)	ΔP (Pa)		
900x600	Min.	210	5	47	<15	0.3
	Max.	1181	40	116	37	10.9
3000x600	Min.	487	15	34	<15	0.8
	Max.	2806	95	66	50	40.4

Notes:
1. The air inlet spigot connection to these units is 123 mm diameter.
2. Unit overall height is 210 mm high.
3. Refer to the comprehensive catalogue for the total product range of eight different models.

Principle of operation



Order code

DID632-LR-2 – M-MR-O-A1 / L x Ln x W / P1 / RAL colour / O

Nozzle size
Z; M; G or U

Chilled water pipe connection
A1 – External thread G1/2", flat end seal.

Finish
0 – Powder coated in matt white in RAL 9010 (Standard supply).
P1 – Powder coating in other RAL colour (Customer to specify).

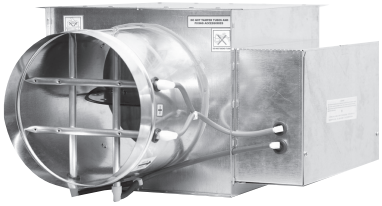
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. T 2.4/12/EN/--.

9.0 Single Duct VAV Boxes Type 'TVB/TVB-A-SSP'

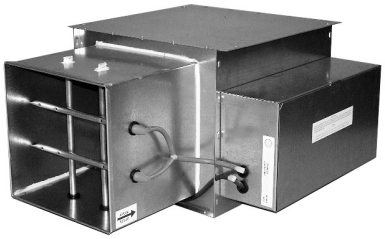
KEY FEATURES:

- Pressure independent control.
- Plastic components are fire retardant to UL 94.
- Comes with damper tip seal.
- With semi rigid and fire retardant fibre glass insulation.
- Fibre glass insulation is covered with a protec tive lining to prevent fibre erosion. This was successfully tested against fibre erosion for up to 30 m/s.
- Fitted with multi-point sensor grid for better air flow measurement accuracy.
- Terminal units that are supplied with actuators and controllers will be fully factory calibrated and tested for air flow accuracy within a toler ance of ± 3%.

Type 'TVB-A'



Type 'TVB-A-SSP'



This terminal unit is available in five different variants;

1. TVB-A; With short rectangular casing and round inlet spigot.
2. TVB-B; With long rectangular casing for better acoustic performance.
3. TVB-C; With long rectangular casing and multiple outlet spigots.
4. TVB-E; With long casing and electric air heater complete manual reset thermal cut-out switch.
5. TVB-A-SSP; With Short rectangular casing and square inlet spigot.

Note: Hot water heater coil can be provided with TVB-A or TVB-B Type unit if required.

Table No.1: Quick Selection for Type 'TVB-A'; 'TVB-B'; 'TVB-C' and 'TVB-S Units

Unit size	Recommended Air Flow Range (l/s) at NC 40											
	TVB-A				TVB-B				TVB-C			
	100 Pa		200 Pa		100 Pa		200 Pa		100 Pa		200 Pa	
	Vmin	Vmax	Vmin	Vmax	Vmin	Vmax	Vmin	Vmax	Vmin	Vmax	Vmin	Vmax
4	20	100	20	86	20	100	20	100	20	100	20	100
5	35	130	35	117	35	165	35	165	35	165	35	165
6	45	215	45	155	45	215	45	215	45	215	45	215
7	60	270	60	192	60	300	60	300	60	277	60	250
8	80	315	80	175	80	380	80	380	80	297	80	222
10	128	470	128	220	128	640	128	608	128	389	128	300
12	200	770	200	510	200	928	200	863	200	555	200	411
14	300	1030	300	568	300	1310	300	1163	300	953	300	602
16	380	1380	380	583	380	1783	380	1476	380	998	380	768

Unit Size	Flow range (l/s) up to NC 40				Min V htg (l/s)	Heater Output (W min)	Heater Output (W max)	No of stages	Min. ΔT (°C) @ V htg
	100 Pa		200 Pa						
	Vmin	Vmax	Vmin	Vmax					
4	20	100	20	100	39	500	2500	1	7.7
5	35	165	35	165	39	500	2500	1	7.7
6	45	215	45	215	45	500	3000	1	7.7
7	60	300	60	300	60	500	4500	1	7.7
8	80	365	80	341	80	500	5000	1	7.7
10	128	608	128	550	128	500	5000	1	7.7
12	200	781	200	657	200	500	5000	1	7.7
14	300	992	300	911	300	500	6000	2	7.7
16	380	1380	380	1380	567	500	10500	3	7.7

Note: The heater selected will cover at least 75% of the width for the discharge outlet.

Order Code

TVB - A - 2 / 8 / 0 / 00 / 0 / 40 – 380 l/s

Type
TVB

Construction variants
A – Short casing (Standard supply)
B – Long casing
C – Long casing with multi-outlet spigots
E – Long casing with electric heater

Hot Water Coil options;
2 – With two rows
4 – With four rows
Refer to tables 4 and 5 on page 4 for details.

Design flow range
V̇min and V̇max (in l/s)

Temperature sensor
Refer to price list

Controls options
Refer to page 20 on Accessories.

Controls Manufacturer
0 – None
Refer to price list for detail.

Unit size
Available from sizes 4 to 8; 10; 12; 14 & 16.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 5/1.2/EN/--.

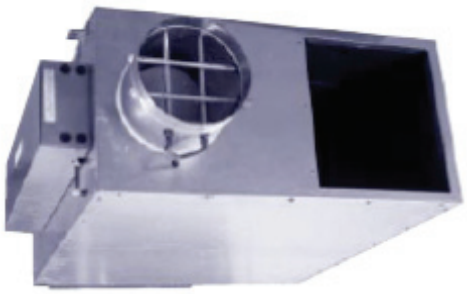
9.0 Series Fan VAV Box Type 'TFP'

This is series fan terminal unit with 5 different sizes.

KEY FEATURES

- Pressure independent control
- Plastic components are fire retardant to UL 94.
- Comes with damper tip seal.
- With semi rigid and fire retardant fibre glass insulation.
- Fibre glass insulation is covered with a protec tive lining to prevent fibre erosion. This was successfully tested against fibre erosion for up to 30 m/s.
- Fitted with multi-point sensor grid for better air flow measurement accuracy.
- Terminal units that are supplied with actuators and controllers will be fully factory calibrated and tested for air flow accuracy within a tole rance of ± 3%.
- Constant air flow at the fan discharge outlet.
- As optional extras, the unit can be supplied with;
  a. Disposable filter panel at air induction port.
  b. Electric air heater(s).

Type 'TFP' Series Fan Terminal Unit.



Air Flow Range for 'TFP' Series Fan Terminal Units

TFP Unit Size	Secondary & Primary Air flow	Air Flow Rate (l/s) Fan Speed Low	Med	High
2	Sec. Flow Vmin	150	200	250
	Sec. Flow Vmax	230	310	400
2-05	Pri. Flow Vmin - Vmax	15 - 170		
2-06	Pri. Flow Vmin - Vmax	25 - 240		
2-08	Pri. Flow Vmin - Vmax	40 - 400		
4	Sec. Flow Vmin	300	400	500
	Sec. Flow Vmax	480	650	700
4-08	Pri. Flow Vmin - Vmax	40 - 435		
4-10	Pri. Flow Vmin - Vmax	60 - 690		
4-12	Pri. Flow Vmin - Vmax	90 - 1000		
5	Sec. Flow Vmin	450	550	650
	Sec. Flow Vmax	680	850	1050
5-10	Pri. Flow Vmin - Vmax	60 - 690		
5-12	Pri. Flow Vmin - Vmax	90 - 1000		
5-14	Pri. Flow Vmin - Vmax	130 - 1375		
6	Sec. Flow Vmin	600	800	1000
	Sec. Flow Vmax	920	1280	1400
6-12	Pri. Flow Vmin - Vmax	90 - 1000		
6-14	Pri. Flow Vmin - Vmax	130 - 1375		
6-16	Pri. Flow Vmin - Vmax	170 - 1800		
7	Sec. Flow Vmin	900	1100	1300
	Sec. Flow Vmax	1300	1750	2100
7-12	Pri. Flow Vmin - Vmax	90 - 1000		
7-14	Pri. Flow Vmin - Vmax	130 - 1375		
7-16	Pri. Flow Vmin - Vmax	170 - 1800		

Estimated NC Level within the Occupied Space

TFP Unit Size	Sec. Air Flow, Vmax (l/s)	External Static Pressure at 100 Pa at Vmax Discharge Noise Inlet static pressure (Pa) 100	200	500	Radiated Noise Inlet static pressure (Pa) 100	200	500
2-05	200	< 15	< 15	< 15	< 15	< 15	< 15
2-06	400	18	19	19	24	25	26
2-08	400	19	19	20	22	22	24
4-08	500	< 15	< 15	< 15	17	17	19
4-10	650	< 15	15	16	20	21	23
4-12	650	15	16	18	21	23	25
5-10	750	21	21	22	26	27	29
5-12	1050	25	25	26	30	32	33
5-14	1000	28	28	29	33	34	36
6-12	1000	< 15	< 15	16	24	25	28
6-14	1300	16	17	19	27	28	32
6-16	1300	16	16	19	26	27	31
7-12	1300	19	21	22	30	31	33
7-14	1700	24	25	27	35	37	39
7-16	2000	26	27	29	39	39	41

Order Code

TFP - E - C / 2 - 10 / BC0 / 400-300-105

- TFP — Product Type
- E — **Reheat**: Electric reheat coil E, Hot water reheat coil H
- C — **Filter**: Throwaway or nor entry C
- 2 — Size
- 10 — Spigot
- BC0 — Controller
- 400 — Fan volume l/s
- 300 — Maximum primary air volume l/s
- 105 — Mininum primary air volume l/s

Size	Spigot
2	05 06 08
4	08 10 12
5	10 12 14
6	12 14 16
7	12 14 16

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 5/2.2/M/--.

KEY FEATURES

Casing
- Circular primary air spigot suitable for ducts to DIN 24 145 or DIN 24 146; rectangular secondary and supply air outlets connection
- Mounting brackets for unit support
- Bottom access panel for fan maintenance
- Leakage flow rate to Class II, VDI 3803 or DIN 24 194, Part 2

Volume Control
- DDC
- Primary volume flow range 100% to 10%
- Averaging differential pressure grid with multi-point sensor for accurate measurement
- Working pressure range 20 to 1500 Pa
- Blade airtight seal to DIN EN 1751, class 4
- Factory volume setting and aerodynamic testing of each unit

Fan and Motor
- centrifugal fan with direct drive motor
- alternatively available with AC motor to achieve 3-step regulation for motor speed depending on actual temperature difference signal

Reheat coil
- for reheat of supply air
- galvanized sheet steel casing, with flanges at both ends
- copper tubes and aluminum fins; one or two row
- factory fitted
- maximum operating pressure 20 bar

Materials
- galvanized sheet steel casing
- casing lined with attenuating glass wool (thickness of 25mm), conforming to Class "O" fire rating
- galvanized sheet steel damper blade with EPDM seal
- aluminium alloy sensor tubes
- polyurethane bearings

9.0 Parallel Type Fan Assisted VAV Box Type 'TCP'

Table No.1: Quick Selection for Type TCP

TCP Unit Size		Fanmotor tap Low (l/s)	Fanmotor tap Med. (l/s)	Fanmotor tap High (l/s)	Fan Power (W)	max. electrical power input (A)	Power Supply V/ph/Hz
1	$\dot{V}_{fan}$	55~103	83~130	97~144	60	0.7	220/1/50
1-05	$\dot{V}_{pri}$	15~170					
1-06		25~240					
1-08		40~435					
2	$\dot{V}_{fan}$	150~230	200~310	250~400	147	1.9	
2-06	$\dot{V}_{pri}$	25~240					
2-08		40~435					
2-10		60~690					
3	$\dot{V}_{fan}$	300~480	400~650	500~750	245	2.5	
3-08	$\dot{V}_{pri}$	40~435					
3-10		60~690					
3-12		90~1000					
4	$\dot{V}_{fan}$	450~680	500~850	650~1027	550	5.2	
4-10	$\dot{V}_{pri}$	60~690					
4-12		90~1000					
4-14		130~1375					
5	$\dot{V}_{fan}$	681~806	722~911	778~1250	500	6.8	
5-12	$\dot{V}_{pri}$	90~1000					
5-14		130~1375					
5-16		170~1800					

Note: $\dot{V}_{fan}$: fan flow rate; $\dot{V}_{pri}$: primary air flow rate

Order details

TCP — 2 H — R / 2 – 10 / HM0 / 220-370-100 l/s

Product type
TCP

Rows or levels of reheat

Reheat
Hot water reheat coil H
Electric heater E

Filter
Throwaway C
Metal mesh R

Unit Size	Primary air damper Size
1	05 06 08
2	06 08 10
3	08 10 12
4	10 12 14
5	12 14 16

Air volume unit

min. primary air volume

max. primary air volume

max. fan volume

Controller code

Order example:
Make: TROX
Type: TCP-H-R/2-10/HM0/200-370-100 l/s

Note: For further details, please refer to TROX China Catalogue Ref. 5/2.4/EN/1

9.0 Vary Control VAV Box Type 'TVL'

Equipment features and characteristics

- TROX Vary Control VAV type 'TVL' volume flow control unit is suitable for variable or constant air volume control
- Multiple aerofoil blade
- Suitable for small or large supply or extract air volumes
- Electronic volume flow control
- Differential pressure range 20 Pa to 1000 Pa
- Electric or hot water coil heating facilities are available
- TVL units can be operated with any DDC, electronic or pneumatic VAV controller

- TVL units are suitable for an airflow ranging from 45 l/s to 10,100 l/s
  A typical airflow accuracy of ± 5% depending on the airflow rate and Type of controller used

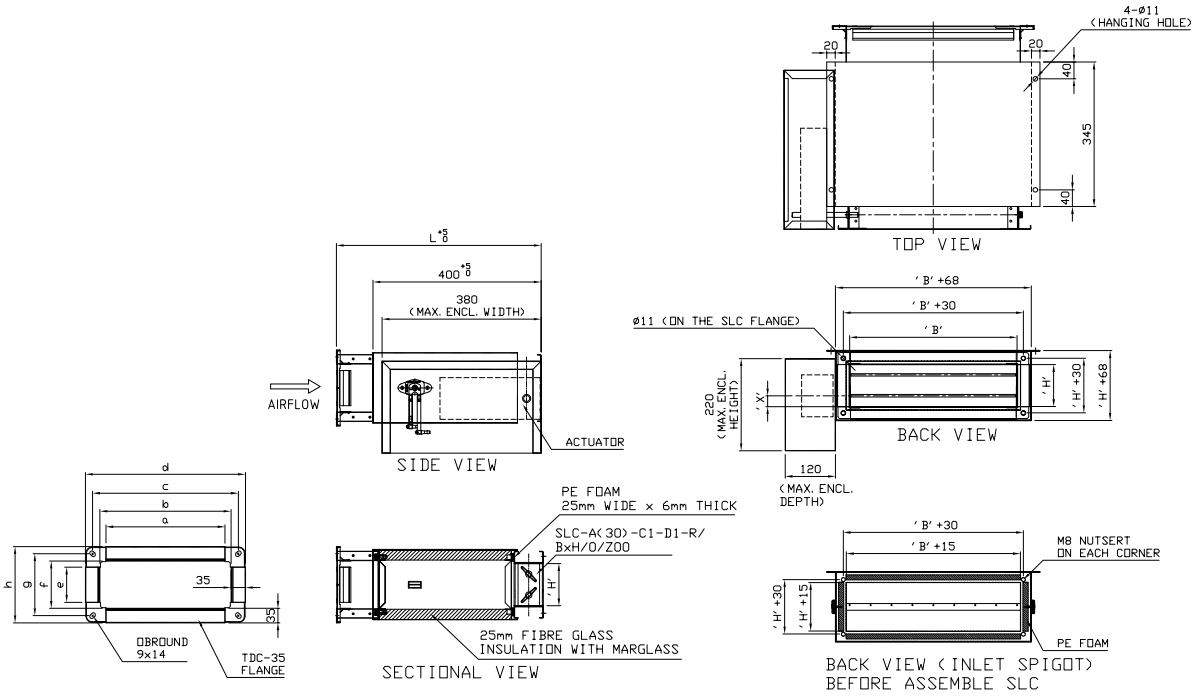
- The unit is tested to:
  - ISO 5220 for "Aerodynamic testing and rating of constant and variable dual or single units"
  - ISO 3741 for "Determination of sound levels of noise sources – Precision methods for broad-band sources in reverberation rooms"
  - The insulation material is tested to BS 470:Part 6 and 7 and is classified as Class 'O' under the British Building Regulations

Casing Construction

- The casing is made from 1mm thick galvanised sheet steel with and acoustic rectangular inlet spigot fitted with a complete aluminium multipoint airflow measuring grid. The TVL VAV unit is fitted with an aerofoil shaped blade.

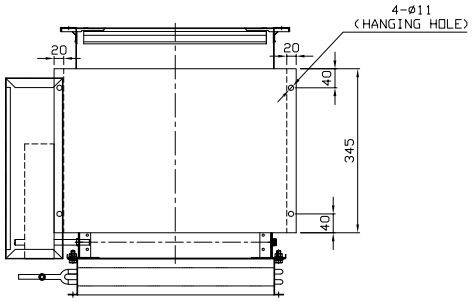
- **VAV Box Size Selections available from 200 x 200 to 1000 x 1000 with air flow rates of 45 l/s to 10100 l/s**

Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
200	100	25	184	213	248	283	84	113	148	183	488
300	100	25	284	313	348	383	84	113	148	183	488
400	100	25	384	413	448	483	84	113	148	183	488
500	100	25	484	513	548	583	84	113	148	183	488
600	100	25	584	613	648	683	84	113	148	183	488

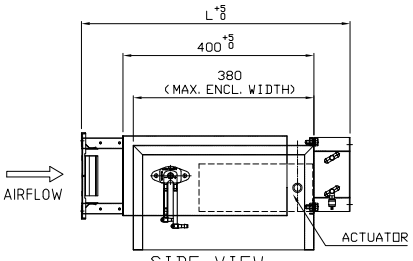


TVL VAV Box with hot water coil

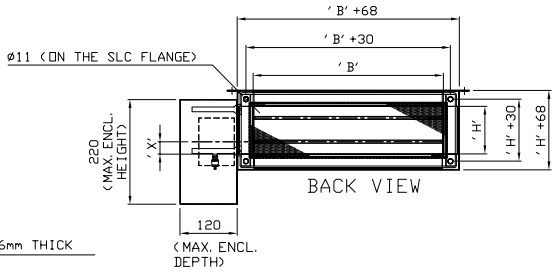
Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
200	100	25	184	213	248	283	84	113	148	183	565
300	100	25	284	313	348	383	84	113	148	183	565
400	100	25	384	413	448	483	84	113	148	183	565
500	100	25	484	513	548	583	84	113	148	183	565
600	100	25	584	613	648	683	84	113	148	183	565



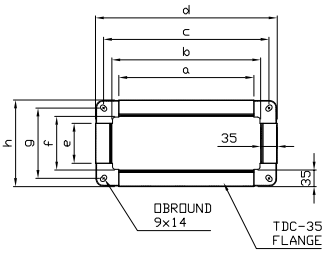
TOP VIEW

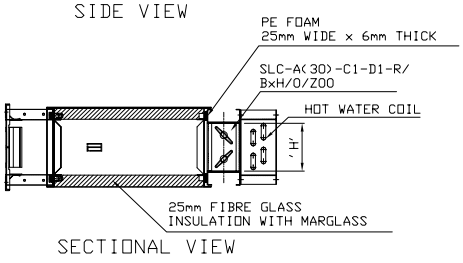


SIDE VIEW

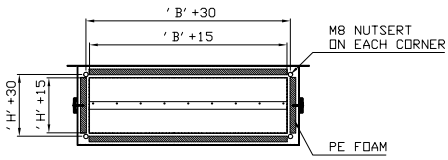


BACK VIEW





SECTIONAL VIEW



BACK VIEW (INLET SPIGOT)
BEFORE ASSEMBLE SLC

Aerodynamic Data – H = 100 to 300

Volume flow ranges and minimum pressure differentials				
B x H mm	l/s	m/s	Δ V ± %	Δ Pg min in Pa
200 x 100	45	2	14	20
	85	4	8	20
	150	7	5	30
	215	10	5	40
300 x 100	65	2	14	20
	120	4	8	20
	210	7	5	30
	320	10	5	40
400 x 100	85	2	14	20
	170	4	8	20
	300	7	5	30
	425	10	5	40
500 x 100	105	2	14	20
	200	4	8	20
	350	7	5	30
	535	10	5	40
600 x 100	130	2	14	20
	260	4	8	20
	450	7	5	30
	650	10	5	40
200 x 200	85	2	14	20
	160	4	8	20
	280	7	5	30
	415	10	5	40
300 x 200	125	2	14	20
	240	4	8	20
	420	7	5	30
	620	10	5	40
400 x 200	165	2	14	20
	330	4	8	20
	580	7	5	30
	825	10	5	40
500 x 200	205	2	14	20
	400	4	8	20
	700	7	5	30
	1035	10	5	40
600 x 200	250	2	14	20
	500	4	8	20
	870	7	5	30
	1250	10	5	40
700 x 200	290	2	14	20
	560	4	8	20
	980	7	5	30
	1450	10	5	40
800 x 200	330	2	14	20
	660	4	8	20
	1160	7	5	30
	1650	10	5	40

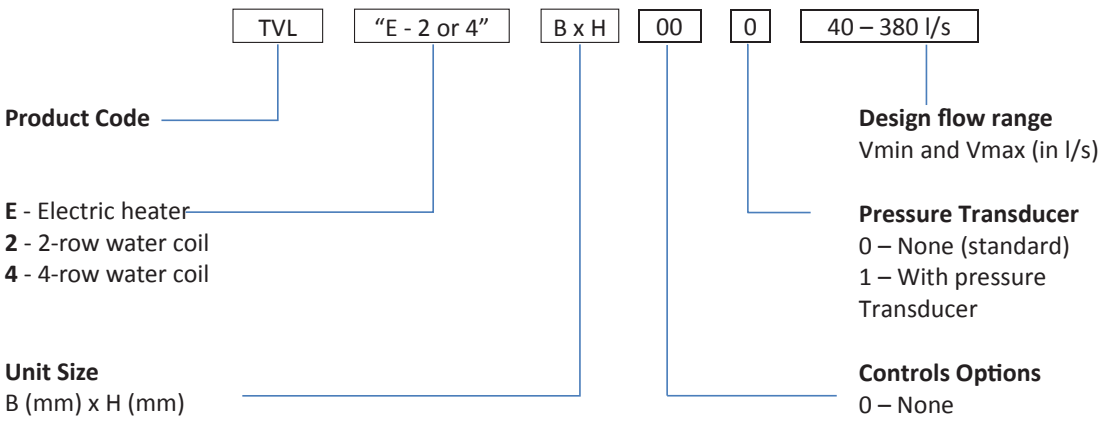
Volume flow ranges and minimum pressure differentials				
B x H mm	l/s	m/s	Δ V ± %	Δ Pg min in Pa
300 x 300	185	2	14	20
	360	4	8	20
	630	7	5	25
	920	10	5	35
400 x 300	245	2	14	20
	480	4	8	20
	840	7	5	25
	1230	10	5	35
500 x 300	305	2	14	20
	600	4	8	20
	1050	7	5	25
	1535	10	5	35
600 x 300	370	2	14	20
	740	4	8	20
	1290	7	5	25
	1850	10	5	35
700 x 300	430	2	14	20
	840	4	8	20
	1470	7	5	25
	2150	10	5	35
800 x 300	490	2	14	20
	980	4	8	20
	1720	7	5	25
	2450	10	5	35
900 x 300	555	2	14	20
	1080	4	8	20
	1890	7	5	25
	2770	10	5	35
1000 x 300	620	2	14	20
	1240	4	8	20
	2150	7	5	25
	3100	10	5	35

9.0 Vary Control VAV Box Type 'TVL'

Aerodynamic Data – H = 400 to 1000

Volume flow ranges and minimum pressure differentials				
B x H mm	l/s	m/s	Δ V ± %	Δ Pg min in Pa TVL
400 x 400	325	2	14	20
	640	4	8	20
	1120	7	5	25
	1630	10	5	35
500 x 400	410	2	14	20
	800	4	8	20
	1400	7	5	25
	2040	10	5	35
600 x 400	490	2	14	20
	980	4	8	20
	1720	7	5	25
	2450	10	5	35
700 x 400	570	2	14	20
	1120	4	8	20
	1960	7	5	25
	2850	10	5	35
800 x 400	650	2	14	20
	1300	4	8	20
	2280	7	5	25
	3250	10	5	35
900 x 400	735	2	14	20
	1440	4	8	20
	2520	7	5	25
	3670	10	5	35
1000 x 400	820	2	14	20
	1640	4	8	20
	2850	7	5	25
	4100	10	5	35
500 x 500	510	2	14	20
	1000	4	8	20
	1750	7	5	30
	2540	10	5	40
600 x 500	610	2	14	20
	1200	4	8	20
	2100	7	5	30
	3050	10	5	40
700 x 500	710	2	14	20
	1400	4	8	20
	2450	7	5	30
	3550	10	5	40
800 x 500	810	2	14	20
	1600	4	8	20
	2800	7	5	30
	4050	10	5	40
900 x 500	915	2	14	20
	1800	4	8	20
	3150	7	5	30
	4570	10	5	40
1000 x 500	1020	2	14	20
	2000	4	8	20
	3500	7	5	30
	5100	10	5	40

Volume flow ranges and minimum pressure differentials				
B x H mm	l/s	m/s	Δ V ± %	Δ Pg min in Pa TVL
600 x 600	730	2	14	20
	1440	4	8	20
	2520	7	5	30
	3650	10	5	40
800 x 600	970	2	14	20
	1920	4	8	20
	3360	7	5	30
	4850	10	5	40
1000 x 600	1220	2	14	20
	2400	4	8	20
	4200	7	5	30
	6100	10	5	40
800 x 800	1300	2	14	20
	2560	4	8	20
	4480	7	5	30
	6500	10	5	40
1000 x 800	1620	2	14	20
	3200	4	8	20
	5600	7	5	30
	8100	10	5	40
1000 x 1000	2020	2	14	20
	4000	4	8	20
	7000	7	5	30
	10100	10	5	40



9.0 Single Duct Terminal Units Type 'TVR/TVRD'

KEY FEATURES:

- Pressure independent control.
- Plastic components are fire retardant to UL 94.
- Comes with damper tip seal.
- With semi rigid and fire retardant fibre glass insulation.
- Fibre glass insulation is covered with a protec tive lining to prevent fibre erosion. This was successfully tested against fibre erosion for up to 30 m/s. This is only applicable for double skin construction, Type 'TVRD'.
- Fitted with multi-point sensor grid for better air flow measurement accuracy
- Terminal units that are supplied with actuators and controllers will be fully factory calibrated and tested for air flow accuracy within a toler ance of ± 3%.
- This is available in single skin construction, Type 'TVRD' or double skin construction, Type 'TVRD'

Type 'TVRD'

Table1: Quick selection for TVR/TVRD

Unit size	Flow range (l/s) up to NC 40			
	100 Pa		200 Pa	
	Vmin	Vmax	Vmin	Vmax
4	20	60	20	42
5	35	95	35	60
6	45	137	45	71
7	60	173	60	101
8	80	241	80	132
10	130	358	130	205
12	200	542	200	321
14	300	642	300	449
16	380	760	380	583

Order code

TVR / 8 / 0 / 00 / 0 / 40 – 260 l/s

Type:

TVR – VAV terminal unit
TVRD – VAV unit with acoustic cladding.

Sizes available:
4, 5, 6, 7, 8, 10, 12, 14 and16.

Control manufacturer
Refer to page 8 on 'Accessories' for more information.

Volume flow rates:

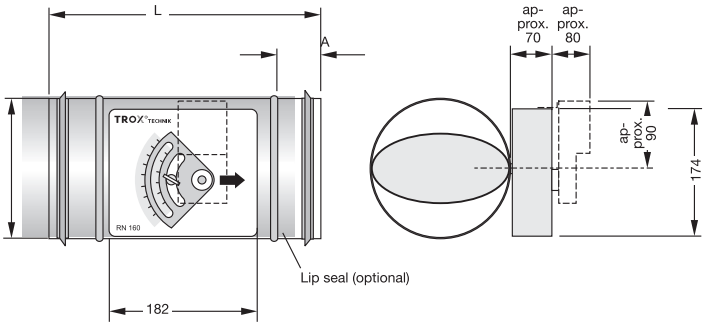
Temperature sensor:
0 – Sensor not included
1 – Wall mounted temperature sensor with setpoint adjustment.

Controller Type:
10 – Compact standalone controller.
2X – LONMark compliant controller.
3X – BACNet compliant controller.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M5/1.3/EN/--.

10.0 Constant Volume Dampers Type 'RN'

This is a mechanical self-balancing constant flow regulator suitable for circular ductwork. It does NOT require an actuator or electronic controller to operate. It saves cost and time!



Dimensions (mm)		
D	ØDa	L
80	79	310
100	99	310
125	124	310
160	159	310
200	199	310
250	249	400
315	314	400
400	399	400

RN

Sound pressure level (dB[A])

Size	$ØD_a$	Air Flow range	$\dot{V}$ vel= 5m/s	Δp_g = 100 Pa				Δp_g = 200 Pa			
				Air-regenerated noise		Case-radiated noise		Air-regenerated noise		Case-radiated noise	
				without silencer	with silencer Type CS (L = 1000 mm)	without acoustic cladding	with acoustic cladding	without silencer	with silencer Type CS (L = 1000 mm)	without acoustic cladding	with acoustic cladding
	(mm)	(l/s)	(l/s)	L_{pA}	L_{pA1}	L_{pA2}	L_{pA3}	L_{pA}	L_{pA1}	L_{pA2}	L_{pA3}
80	79	11 - 45	26	39	16	22	<	43	20	26	<
100	99	22 - 90	39	39	19	19	<	43	23	23	<
125	124	35 - 140	61	41	25	17	<	45	29	21	<
160	159	60 - 240	100	44	30	31	<	48	34	35	<
200	199	90 - 360	156	42	26	30	<	46	30	34	<
250	249	145 - 580	244	41	27	31	<	45	31	35	<
315	314	230 - 920	389	40	27	32	<	44	31	36	15
400	399	350 - 1400	628	46	34	46	16	50	38	50	20

< stands for values < 15

Nomenclature

Δp_g in Pa = Total pressure differential

v in m/s = Upstream velocity

L_{pA} in dB(A) = A-weighted sound pressure level of air-regenerated noise, system attenuation taken into account

L_{pA1} in dB(A) = A-weighted sound pressure level of air-regenerated noise with CS silencer, system attenuation taken into account

L_{pA2} in dB(A) = A-weighted sound pressure level of case-radiated noise, system attenuation taken into account

L_{pA3} in dB(A) = A-weighted sound pressure level of case-radiated noise with additional acoustic cladding, system attenuation taken into account

All sound pressure levels are based on 20 µPa.

System attenuation: See leaflet 5/9/EN/...

Order Code RN

RN - 00 - 00 / 125 / B50

Setpoint re-adjustment option

Type
Volume flow controller RN
with acoustic cladding RND

Size

Actuators
See leaflet

Material
Basic construction, steel, galv. 00
Surface powder-coated P1
Colour RAL 7001

Order Code RNS

RNS - 00 / 125 / 00

Type
Volume flow controller RNS

Size
80
100
125

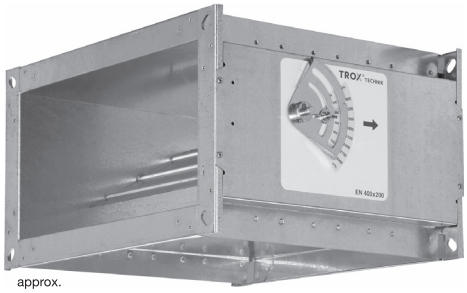
Accessories
00 without
D2 lip seal on both ends[1)]

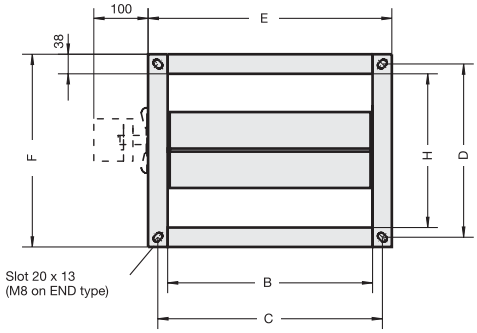
Material
Basic construction, steel, galv. 00
Surface powder-coated P1
Colour RAL 7001

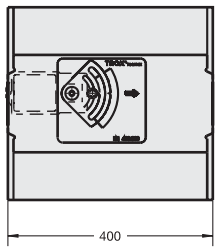
1) Nominal size 80 on RNS and RN-P1 with adapter

10.0 Constant Volume Dampers Type 'EN'

This is a mechanical self-balancing constant flow regulator suitable for rectangular ductwork. It does NOT require an actuator or electronic controller to operate. It saves cost and time!







EN

Sound pressure level (dB[A])									
Size mm		Air Flow range	V vel= 5m/s	Δp_g = 100 Pa				Δp_g = 200 Pa			
				Air-regenerated noise		Case-radiated noise		Air-regenerated noise		Case-radiated noise	
				without silencer Type TX	with silencer	without acoustic cladding	with acoustic cladding	without silencer Type TX	with silencer	without acoustic cladding	with acoustic cladding
B	H	(l/s)	(l/s)	L_{pA}	L_{pA1}	L_{pA2}	L_{pA3}	L_{pA}	L_{pA1}	L_{pA2}	L_{pA3}
200	100	40 - 160	100	40	30	32	27	48	35	38	32
300	100	65 - 260	150	42	31	34	29	49	36	41	34
300	150	105 - 420	225	42	29	34	27	49	35	40	32
300	200	128 - 520	300	43	27	34	25	52	35	42	33
400	200	210 - 840	400	40	24	33	25	49	33	41	32
500	200	230 - 920	500	38	23	31	23	47	31	39	31
600	200	255 - 1020	600	36	23	31	24	44	31	39	32
400	250	220 - 880	500	41	26	34	25	51	34	42	33
500	250	300 - 1200	625	39	23	32	23	48	32	40	31
600	250	320 - 1280	750	38	24	32	24	47	32	40	33
400	300	315 - 1260	600	44	27	37	27	52	35	44	35
500	300	375 - 1500	750	41	25	35	26	49	33	42	33
600	300	420 - 1680	900	39	24	32	24	47	31	40	31
400	400	420 - 1680	800	46	29	39	30	54	37	47	37
500	400	460 - 1840	1000	43	26	37	27	52	34	45	35
600	400	510 - 2040	1200	41	26	36	27	49	34	44	34
500	500	600 - 2400	1250	46	28	40	30	54	36	48	38
600	500	565 - 2560	1500	43	28	39	29	51	36	47	37
600	600	840 - 3360	1800	45	28	41	31	53	36	48	38

Nomenclature

Δp_g in Pa = Total pressure differential

v in m/s = Upstream velocity

L_{pA} in dB(A) = A-weighted sound pressure level of air-regenerated noise, system attenuation taken into account

L_{pA1} in dB(A) = A-weighted sound pressure level of air-regenerated noise with TX silencer, system attenuation taken into account

L_{pA2} in dB(A) = A-weighted sound pressure level of case-radiated noise, system attenuation taken into account

L_{pA3} in dB(A) = A-weighted sound pressure level of case-radiated noise with additional acoustic cladding, system attenuation taken into account

All sound pressure levels are based on 20 µPa.

System attenuation: See leaflet 5/9.1/EN/...

Order Code

Setpoint re-adjustment option

EN / 400 x 200 / B50

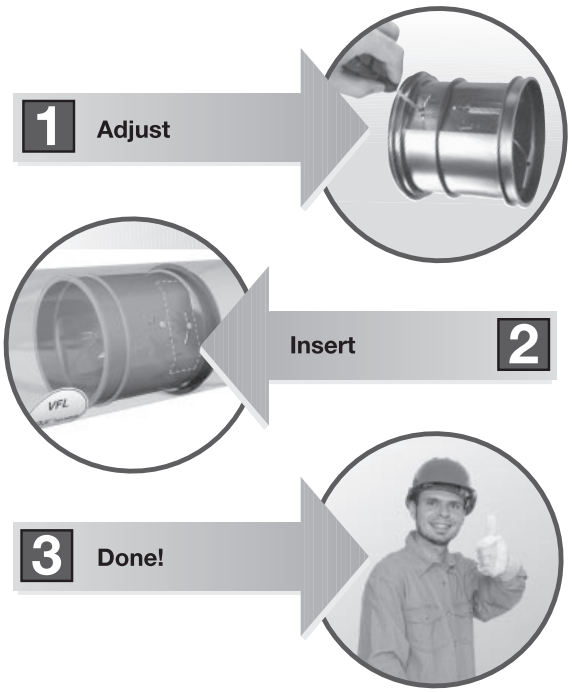
Actuators
See leaflet

B x H

Type
Volume flow controller with acoustic cladding
EN
END

10.0 Constant Volume Dampers Type 'VFL'

This is a mechanical self-balancing damper that does not require an actuator and controller to regulate the air flow in the duct. It saves valuable time on air flow balancing and measurement on site. As shown on the right, it is easy to set to the required air flow on site. Once it is done, the device can be inserted into the duct to operate as a self-balancing damper. It is that simple!



Key features:

- Easy to set the flow rate and install.
- Air flow accuracy of ± 10%.
- Damper blade and housing are made from fire retardant plastic (UL 94 V1).
- Recommended operating temperature range is between 0 and 50°C.
- Recommended storage temperature range is between -20 and 60°C.

Table 1: Quick Selection for 'VFL' units

Duct / Unit Size (mm)	Length, L (mm)	Flow range (l/s)		SPL in dB(A) at	
		V min	V max	Δpg 50 Pa	Δpg 100 Pa
80	86	4	25	28	35
100	100	4	33	32	38
125	118	11	57	36	42
160	148	14	97	35	42
200	175	17	158	31	37
250	220	35	250	31	39

Order code

VFL / 100

Type

Nominal size	Reference flow rate $\dot{V}$ 1) m³/h	l/s
80	35	10
100	70	19
125	100	28
160	150	42
200	290	81
250	450	125

1) Factory setting of different flow rate setpoint values can be offered at extra costs, only for quantity as of 50 per each size and flow rate.
See table on page 4 for range of values available as a function of size.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 5/ 9.2/ EN/--.

10.0 Constant Volume Dampers Type 'VCD'

KEY FEATURES

- Available in galvanised or stainless steel construction.
- Available with either parallel or opposed blade arrangement.
- Available with three different seal variants;

1. C – Without side or tip seal
2. C1 – With side seals only
3. C2 – With side and tip seal for improve closed blade leakage rating

- Can be supplied with hand locking quadrant or with either electric or pneumatic actuator.

Minimum module size: 100 mm x 100 mm
Maximum module size: 1200 mm x 1800 mm

Type 'VCD' Damper

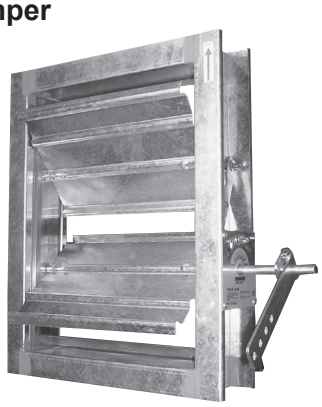


Table 1: Quick selection for 'VCD' Damper

Damper Size (mm)		Recommended Max. Air Flow (m³/s)	ΔP (Pa)
B	H		
200	200	0.32	50
250	250	0.50	45
300	300	0.72	43
400	400	1.28	38
500	500	2.00	35
600	600	2.88	33
700	700	3.92	30
800	800	5.12	28
900	900	6.48	25
1000	1000	8.00	25
1100	1100	9.68	25
1200	1200	11.52	25
1200	1300	12.48	25
1200	1400	13.44	25
1200	1500	14.40	25
1200	1600	15.36	25
1200	1700	16.32	25
1200	1800	17.28	25

Notes:
1. The pressure drop data given above is based on the damper in the fully open position with the damper connected to ductwork on both sides.
2. The minimum module size is
3. The maximum module size is 1200 mm wide by 1800 mm high.

Order Code VCD – A2 – B2 – C2 – D – R / 800 x 500 / Z00

Type

VCD (Standard supply)

VCP
VCE

Case options

A – Flange case with 40 mm wide flange **(Standard supply)**

A1 – With sleeve casing
A2 – With rectangular spigot
A3 – With circular spigot

Options on blade operation

B – Parallel arrangement with face linkage **(Standard supply)**

B1 – Parallel blade with external side linkage
B2 – Opposed blade with external side linkage

Seal options

C – Without side or tip seals **(Standard supply)**

C1 – With side seals only.
C2 – With side and tip seals (PVC) (Standard supply)
C3 – With side and silicon tip seals.

Bearing options

D – Sintered bronze **(Standard supply)**
D1 – Plastic

External control location choices

R – Right hand side **(Standard supply)**
L – Left hand side

Duct Size
In mm to suit connecting duct.

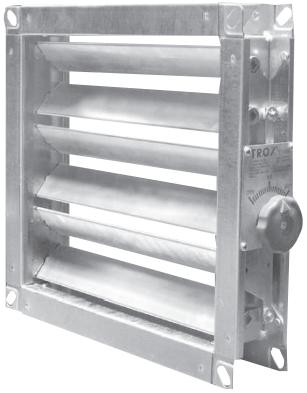
Accessories
Refer to page 10 for details.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 3.1/2/EN/--.

10.0 Constant Volume Dampers Type 'SLC'

The 'SLC' Type damper is a multi-leaf volume control with aerofoil blades with an opposed blade arrangement. It is designed for air flow regulation and control. If low closed blade leakage performance is required, it is advisable to consider using C2 seal variant, which includes tip and side seals.
It can be operated manually with a hand locking quadrant or with the aid of electric or pneumatic actuator(s) if required.

Type 'SLC' Damper



KEY FEATURES

- Ideal for air flow balancing or regulation.
- Low pressure drop (e.g., ΔP of 10 Pa at 10 m/s in fully open position when the damper is connected to ductwork at both ends).
- Low damper leakage rate with C2 seal variant (i.e., about 25 l/s/ m sq. at 1000 Pa).
- 30 mm wide flange (Standard supply).

MATERIAL

Casing – Galvanised steel
Blades – Extruded aluminium

Minimum module size: 100 mm x 100 mm
Maximum module size: 1000 mm x 1000 mm

Table1: Quick selection table for 'SLC' damper

Damper Size (mm)		Recommended Max. Air Flow (m^3/s)	ΔP (Pa)
B	H		
200	200	0.32	10
250	250	0.50	10
300	300	0.72	10
400	400	1.28	10
500	500	2.00	10
600	600	2.88	10
700	700	3.92	10
800	800	5.12	10
900	900	6.48	10
1000	1000	8.00	10

Note: Recommended air flow is based on duct velocity of 8 m/s.

Order Code

SLC – A – C1 – D1 - R / 800 x 500 / Z00

Type

SLC

Case options

A – Flanged casing with 30 mm wide flange **(Standard supply)**

A2 – With rectangular spigot
A3 – With circular spigot

Seal options

C1 – With side seals only **(Standard supply)**

C2 – With side and tip seals

Accessories

Duct Size
In mm to suit connecting duct.

External control location choices

R – Right hand side **(Standard supply)**
L – Left hand side

Bearing options

D – Sintered bronze

D1 – Plastic **(Standard supply)**

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 3.1/3/EN/--.

11.0 Pressure Relief Damper Type 'UL • KUL'

This is a pressure relief damper suitable for air intake or exhaust application. Three different construction variants are available to suit different installation.

KEY FEATURES

Type 'AL'
- Suitable to be mounted on a wall mounting with 45 mm wide border.
- Border is in galvanised steel.
- Blades are in aluminium sheet.

Type 'AUL'
- Suitable to be mounted on a wall with 28 mm wide border.
- Both border and blades are in aluminium.

Type 'KUL'
- Suitable to be mounted in a duct with 38 mm wide flanges on both sides of the casing.
- Damper casing is in galvanised steel.
- Blades are in aluminium sheet.

RECOMMENDATION

Air velocity through the damper should be limited at 5 m/s. Based on this, the anticipated maximum pressure drop is 45 Pa.

Type 'UL-1' Pressure Relief Damper

Table 1: Quick selection for Type 'UL/AUL/KUL' damper

Damper Size (mm)		Recommended Max. Air Flow (m^3/s)
B	H	
297	215	0.28
397	215	0.38
397	315	0.56
497	215	0.48
497	315	0.70
497	415	0.92
597	215	0.57
597	315	0.84
597	415	1.11
597	515	1.38

Note: The flow rates given above are based on a face velocity of 4.5 m/s. Based on this, the anticipated pressure drop across the damper is not expected to exceed 40 Pa.

Order Code

These codes do not need to be completed for standard products

UL-1 / 797 x 515 / 19

Type
UL-1
UL-2
KUL
KUL 1 (both flanges drilled)

Standard sizes
W x H in mm
(see page 2)

Masonry sub-frame
(Refer to catalogue on page 3.)

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 3.1/4/EN/--.

11.0 Back Draught Dampers Type 'BDD'

The 'BDD' damper is a non-return damper intended to be used in mechanical ventilation systems to prevent back flow. It is designed to allow air to flow in only one direction. It will close automatically when the supply fan upstream of the damper is switched off.

It can also serve as an adjustable pressure relief damper by manually adjusting the weight or the position of weights on each counter weight arm.

KEY FEATURES

- Maximum operating temperature is 80 °C.
- Comes with 40 mm wide flanges at both ends of the damper casing as standard supply.

RECOMMENDATION

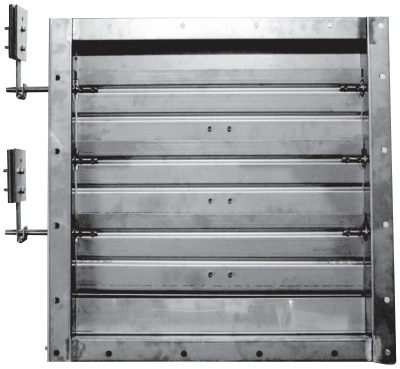
Air velocity through the damper should be limited to 10 m/s.

MATERIAL

Galvanised Sheet (Standard supply)
Stainless steel construction is available if requested.

Minimum module size: 150 mm x 210 mm
Maximum module size: 1200 mm x 1860 mm

Type 'BDD' Damper



Order Code

BDD - A - R / 500 x 500

Type

BDD (Standard supply)

BDP
BDE

Case variants

A – Flange casing **(Standard supply)**

A2 – Rectangular spigot
A3 – Circular spigot

Location of counter-weight arm

R – Right hand side **(Standard)**

L – Left hand side
R & L – On both sides of the damper (see *Note below).

***Note:**
If the damper is made out of two modules and, arranged side by side, then counter-weight arms will be located on both sides of the damper casing.

Duct size (in mm)

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 3.1/5/EN/--.

11.0 Non-return Dampers Type 'ARK'

The Type 'ARK' Damper comes in three different construction variants.

Type 'ARK' and 'ARK1' are designed to shut-off a section of the ventilation system when the fan is switched off. The main difference between the two is the Type 'ARK1' comes with external adjustable blade stop to limit the blade opening angle.

The recommended maximum operating pressure and temperature are 5000 Pa and 80°C respectively. Anticipated maximum leakage through these dampers are 7.5 and 9.0 l/s per metre square at 1100 Pa and 2000 Pa respectively.

Type 'ARK2' is designed to be used to prevent access pressure from building up in ventilation systems or in rooms. The damper blades will open automatically once the specific pressure is exceeded.

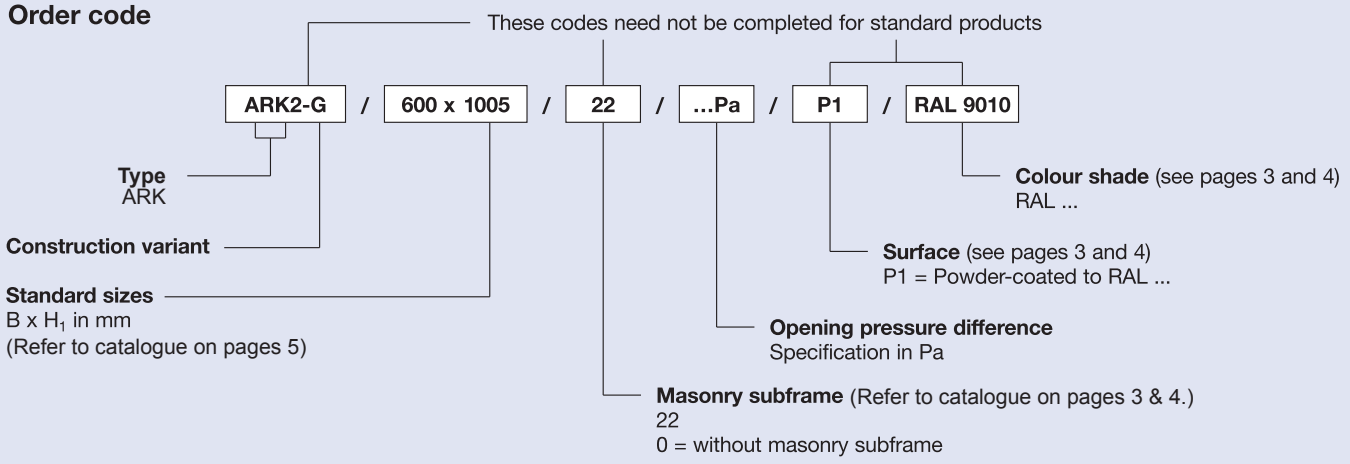
Type 'ARK' Non-return Damper

Table 1: Standard damper sizes

Damper Size (mm)	
B	**H**
200	345
400	675
600	1005
800	1335
1000	1665
1200	1995

Notes:
1. Available damper size can be any combination of B and H given in the table above.
2. Anticipated total pressure drop across the damper at 7 m/s is 100 Pa with the damper mounted vertically.

Order code



Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 3/5/EN/--.

12.0 Gas-tight Shut-off Dampers Type 'NAK'

This is a gas tight shut-off damper designed for extreme safety requirements to the KTA 3601 Guidelines for Nuclear Plant. Under this guideline, the **maximum permissible closed blade leakage rate is 0.0027 l/s /m² at 2000 Pa.** It is a very robust and compact damper capable of operating at pressures up to **5000 Pa** when it is fully closed.

This damper has a mechanism to keep the damper blades shut tightly even if there is a power cut to the actuator.

Anticipated maximum pressure drop across the damper at 8 m/s is 60 Pa.

Please note that only standard damper sizes are available and it can be any combination of B and H as given in the Table 1.

Type 'NAK'

Table 1: Standard damper sizes

Damper Size (mm)	
B	**H**
400	270
600	510
800	755
1000	1000

Order code

These codes do not need to be completed for standard products

NAK-P-G-R / **800 x 755** / **0** / **Z05**

Type
NAK-H
NAK-H-G
NAK-P
NAK-P-G
NAK-E
NAK-E-G
NAK-E1
NAK-E1-G

Side for controls
Right "R"
Left "L"
(if not specified, "R" is supplied)

Standard sizes
B x H in mm
(see page 4)

Not used

Accessories
Z01 to Z11
(Refer to product catalogue on page 5.)

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 3/6/EN/--.

12.0 Marine Fire & Gas Dampers Type 'JFD'

TROX Type 'JFD' Damper is classified as an **'A-60' Marine Multi-leaf Fire and Gas Damper**, designed for marine and offshore applications. This damper is certified by Lloyd's Register and ABS for the 'compliance with the essential Fire protection requirements of Marine Equipment Directive (MED) 96/98/EC' in accordance with IMO Fire Test Procedures Code, Annex 1; Part 3.

The damper is designed for **horizontal or vertical mounting,** suitable to be used in 'A-0' divisions, and 'A-15', 'A-30' and 'A-60' divisions with 900 mm length of insulated duct including the damper.

It complies with Directive 94/9/EG (ATEX 95), Appendix 1 and is classified under equipment group II, category 2G. According to Directive 99/92/EC (ATEX 137), this damper can be used in Zone 1 and 2, and Group IIA, IIB and IIC, which is for potentially explosive environment with the presence of flammable materials at temperature classes T1 to T6.

In addition, under Directive 94/9/EC (ATEX 95), Appendix 1, this damper is classified under equipment group II, category 2D. In accordance with Directive 99/92/EC (ATEX 137), this damper can be used in Zone 21 or 22 subject to combustible dusts.

The maximum recommended operating pressure for this damper is 3000 Pa.

Type 'JFD' Marine Fire Damper

MATERIAL
Galvanised Sheet (Standard supply)
Stainless steel construction is available if requested.

Minimum module size: 200 mm x 200 mm
Maximum module size: 1050 mm x 1250 mm

Order Code

Note: If the order codes below are incomplete, then it is assumed that standard damper construction is required.

JFD- G – FL1- F4 – 0 -G2 / 600 x 600 / 12 / R / V / Z01 / A1

Type 'JFD'

Material Variants
G – Galvanised steel construction **(Standard supply)**

E – Stainless Steel 304
E1 – Stainless Steel 316
E2 – Stainless Steel 316L

Case variants

FL1 – With side seals only (**Standard supply**)
FL2 – With side seals and blade tip seals.

Flange variants

F1 – With 30mm wide flange
F2 – With 40mm wide flange
F3 – With 45mm wide flange
F4 – With 50 mm wide flange **(Standard supply)**
F5 – With 55mm wide flange
F6 – With 65mm wide flange
F7 – With 75mm wide flange
F8 – With 80mm wide flange

Extended Flange One Side

0 – No Extended Flange **(Standard supply)**
50 – 50mm extended flange
80 – 80mm extended flange
100 – 100mm extended flange
150 – 150mm extended flange

Drilling Details
0 – Undrilled
G1 – 40 Flange
G2 – 50 Flange **(Standard Supply)**
Others - Special

Duct Size
Breadth (mm) by Height (mm)

Blade Material Thickness
12 – 1.2mm
20 – 2.0mm

External controls location
R – Right hand side **(Standard supply)**
L – Left hand side

Damper Orientation
V – Vertical **(Standard Supply)**
H - Horizontal

Controls
Z00 – Manual
Z01 – Pneumatic Spring Return
Z02 – Pneumatic Double Acting
Z03 – Electric Spring Return
Z04 – Electric Double Acting

Accessories
(refer to page 6 – Table 2)

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 3.2/2/EN/--.

For shutting off the airflow in air conditioning systems

Rectangular multileaf dampers for volume flow and pressure control as well as for shutting off ducts and openings in walls and ceiling slabs

- Maximum dimensions of steel and stainless steel variants: 2000 × 1995 mm; of aluminium variant: 1200 × 1050 mm
- Casing air leakage to EN 1751, class C
- Aerofoil parallel or opposed action blades
- Steel and stainless steel variants: blades interconnected by external linkage (for parallel or opposed blade action)
- Aluminium variant: blades interconnected by gears (for opposed action)
- Installation with horizontal or vertical blades
- Available in standard sizes and many intermediate sizes
- Can be combined with external weather louvres

Optional equipment and accessories

- Actuators: Open/Close actuators, modulating actuators
- Explosion-proof construction with pneumatic actuator or spring return actuator (not for JZ-AL)
- Powder-coated construction
- Aluminium variant also as anodised construction

Multileaf damper, variant JZ-S

Multileaf damper with quadrant stay

Multileaf damper, variant JZ-P

Multileaf damper with installation subframe and actuator

Multileaf damper, variant JZ-S-A2

Multileaf damper with actuator

Multileaf damper, variant JZ-P-A2

Multileaf damper with actuator

Multileaf damper, variant JZ-AL

Multileaf damper with actuator

Parallel blades

Opposed blades

Blade mechanism with gears

Nominal sizes	200 × 100 mm – 2000 × 1995 mm
Volume flow rate range	200 – 40,000 l/s
Volume flow rate range	720 – 143,640 m^3/h
Maximum static differential pressure	Up to 3500 Pa
Operating temperature	–20 to 150 °C

Order code **JZ**

JZ – P – A2 – G – M – L / 1000×1005 / ER / Z64 / NC / P1 – RAL ...

1 2 3 4 5 6 7 8 9 10

1 Type
JZ Multileaf damper

2 Function
S Opposed (standard)
P Parallel

3 Material
No entry: galvanised steel
A2 Stainless steel

4 Construction
No entry: corner holes on both sides; plastic bearings
G Flange holes on both sides (no corner holes)
M Brass bearings
E Stainless steel bearings
M-V Brass bearings and reinforced blades (not for JZ-A2)
E-V Stainless steel bearings and reinforced blades (not for JZ-A2)
M, E, M-V, E-V can be combined with G

5 Operating side
No entry: on the right
L Left

6 Nominal size [mm]
B × H
B > 2000 = width subdivided
H > 1998 = height subdivided

7 Installation subframe
No entry: none
ER With (only for construction G)

8 Attachments
No entry: none
Z04 – Z07 Quadrant stay
Z12 – Z51 Actuators
ZF01 – ZF15 Spring return actuators
Z60 – Z77 Pneumatic actuators
Explosion-proof actuators
Z1EX, Z3EX Electric
Z60EX – Z77EX Pneumatic

9 Damper blade safety function
Only for spring return actuators or pneumatic actuators
NO Pressure off/power off to OPEN
NC Pressure off/power off to CLOSE

10 Surface
No entry: standard construction
P1 Powder-coated, RAL CLASSIC colour
PS Powder-coated, DB colour
Gloss level:
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

13.0 Fire Damper Type 'FK-EU'

Special features

- Complies with the requirements of EN 15650
- Tested for fire resistance properties according to EN 1366-2
- Classified according to EN 13501-3
- Low differential pressure and sound power level
- Equipped with optional accessories approved for potentially explosive atmospheres
- Easy dry mortarless installation with installation kit
- Integration into the central BMS with TROXNETCOM

Design information

- The class of performance of FK-EU fire dampers depends on the application
- Installation in solid walls and ceiling slabs, in lightweight partition walls with metal support structure and cladding on both sides, and in shaft walls whose class of performance is lower than EI 90 is approved. In this case the class of performance of the wall or ceiling slab applies also to the FK-EU.
- For use in ventilation systems, ducts must be connected to both ends of the FK-EU fire damper or one duct on one end and a cover grille on the other.
- Installation of fire dampers must be carried out in compliance with provisions of federal state law and the generally recognised codes of practice.
- Ducting must be installed in such a manner that it does not impose any loads on the fire damper in case of a fire.
- For information on how to limit such loads please refer to the guideline regarding fire protection requirements on ventilation systems (Lüftungsanlagen-Richtlinie, LüAR).
- It is recommended to use flexible connectors to connect rigid ducting to the fire damper for particular applications.

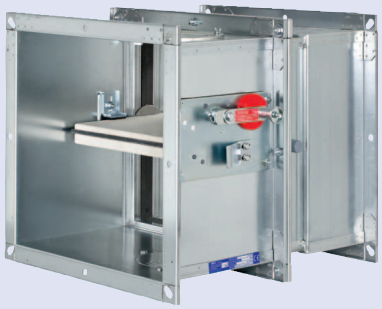
Characteristics

- Classified according to EN 13501-3
- For classes of performance see the tables on pages 4 and 5
- Airflow in either direction
- Release temperature 72 °C or 95 °C (for use in warm air ventilation systems)

Construction features

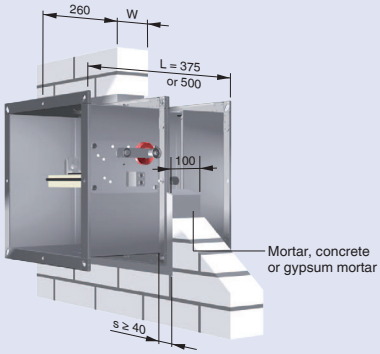
- Two casing lengths to allow for wall and ceiling slabs of various thicknesses
- Rectangular construction, rigid frame
- Flanges with pre-drilled holes on both sides
- Two inspection panels
- Intermediate dimensions in 1 mm increments for both width and height are available
- Closed blade air leakage according to EN 1751, class 2
- Casing air leakage to EN 1751, class C; (B + H) ≤ 700, class B

FK-EU with fusible link

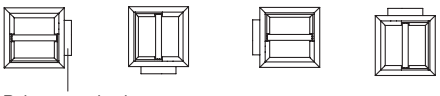


Wall installation

W = 100 up to ≤ 240 mm



Approved installation positions for horizontal ducts



Order code

FK-EU - 1	/	DE	/	600 × 400 × 500	/	ES	/	SS	/	Z43
1 2		3		4		5		6		7

1 Type

2 Construction

	No entry: standard construction
1	Powder-coated casing
2[1]	Stainless steel casing
7	Coated damper blade
1-7	Powder-coated casing and coated damper blade
2-7[1]	Stainless steel casing and coated damper blade
W[2]	With fusible link 95 °C (only for use in warm air ventilation systems)

3 Country of destination

DE Germany
Other destination countries upon request

4 Nominal size [mm]

B × H × L

5 Accessories 1

No entry: none
VP – GL100[3]

6 Accessories 2

No entry: none
R0 – 0A

7 Attachments

Z00 – ZEX2

[1] Not for fire batt installation

[2] W can be combined with all construction variants listed under 2, but not with attachments 7 ZEX1 – ZEX2 and Z43RM – Z45RM

[3] GL100 for wall thickness 100 mm when 50 mm profiles are used.
Other wall thicknesses and profile widths upon request.

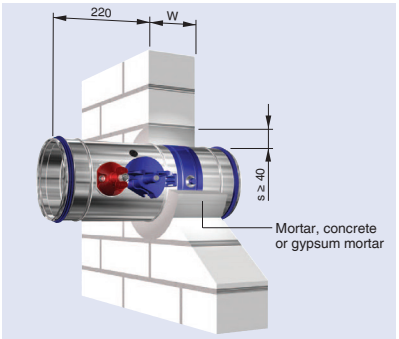
13.0 Fire Damper Type 'FKRS-EU'

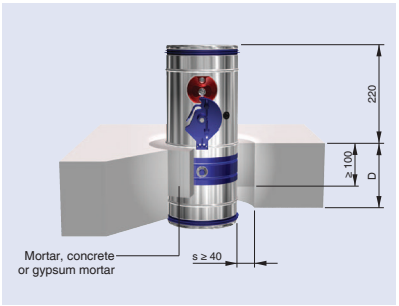
Special features

- Complies with the requirements of EN 15650
- Tested for fire resistance properties according to EN 1366-2
- Classified according to EN 13501-3
- For mortar-based installation in lightweight partition walls and lightweight fire walls
- Easy dry mortarless installation with installation block, dry mortarless installation kit or wall face frame
- Integration into the central BMS with TROXNETCOM

Design information

- The class of performance of FKRS-EU fire dampers depends on the application, see table.
- Installation in solid walls and ceiling slabs whose class of performance is lower than that of the fire damper is approved. In this case the class of performance of the wall or ceiling slab applies also to the FKRS-EU.
- The FKRS-EU fire damper is approved only for use in ventilation systems. Ducts must be connected on both ends, or a duct on one end and a cover grille on the other end.
- Installation of fire dampers must be carried out in compliance with provisions of federal state law and the generally recognised codes of practice.
- Ducting must be installed in such a manner that it does not impose any loads on the fire damper in case of a fire.





Installation opening dimensions [mm]									
Nominal size	100	125	150	160	200	224	250	280	315
ØD2	130	155	180	190	230	254	280	310	345

Dimensions [mm]									
Nominal size	100	125	150	160	200	224	250	280	315
ØDN / □DN	99	124	149	159	199	223	249	279	314

Quick Selection Table									
L_{WA} [dB(A)]	Volume flow rate [l/s] at Δp_t < 35 Pa Nominal size								
	100	125	150	160	200	224	250	280	315
25	22	40	70	80	140	170	215	280	360
35	35	65	105	125	210	245	315	405	525
45	50	90	150	180	295	345	445	570	735

Order code

FKRS-EU - 1	/	DE	/	160	/	ER	/	A0	/	Z43
1 2		3		4		5		6		7

1 Type

2 Construction

	No entry: standard construction
1	Powder-coated casing
2[1]	Stainless steel casing
7	Coated damper blade
1-7	Powder-coated casing and coated damper blade
2-7[1]	Stainless steel casing and coated damper blade
W[2]	With fusible link 95 °C (only for use in warm air ventilation systems)

3 Country of destination

-DE	Germany
	Other destination countries upon request

4 Nominal size [mm]

100
125
150
160
200
224
250
280
315

5 Accessories 1

	No entry: none
ER	Circular installation block
EQ	Square installation block
TQ	Square dry mortarless installation kit
WA	Wall face frame

6 Accessories 2

No entry: none
S0 to AS

7 Attachments

Z00 to ZL08

[1] Not for fire batt installation.

[2] W can be combined with all construction variants listed under 2.

Order example for FKRS-EU with fusible link 72 °C

Make: TROX
Type: FKRS-EU / DE / 160 / Z00

Order example for FKRS-EU, powder-coated, with installation block, operating side cover grille and spring return actuator 230 V AC

Make: TROX
Type: FKRS-EU - 1 / DE / 160 / ER / A0 / Z43

13.0 Fire Shutter Dampers Type 'FSD'

KEY FEATURES

The Fire Shutter Damper provides a means to isolate and prevent the spread of fire and products of combustion through mechanical and air conditioning ventilation systems.

This damper is designed to be installed into walls or floor slabs. It is available in a wide range of sizes that are suitable for low and medium pressure system application.

Each damper module is fitted with a standard fusible link rated at 72 °C.

This damper has been tested successfully for up to four hours fire integrity to the **British Standard, BS 476 Part 20, 1987 and Australian Standard, AS 1530.4, 1997.**

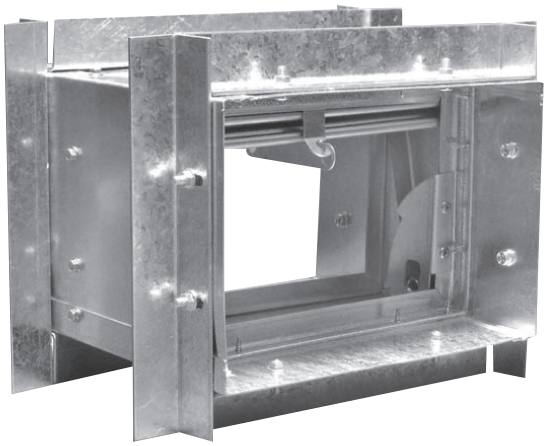
This damper has been approved by BOMBA, the Malaysian Fire Services Department and, the Hong Kong Fire Services Department (HKFSD) has given a letter of no objection.

INSTALLATION

Please note that the damper installation method, which includes the provision of access panel and breakaway joint (to be provided by the others), should meet the requirements of the local standards and fire authority's requirements.

This damper can be mounted in the vertical or horizontal position EXCEPT for construction variant Type 'FSD-CM' since it does not have a set of closing springs. The Type 'FSD-CM' can only be mounted vertically.

Type 'FSD' Fire Shutter Damper



This damper should be installed into the wall or floor structure with the means of;

I. Sleeve and peripheral angles or,
II. HEVAC Sub-frame.

Note: Silicon based sealant will be used on TROX 'FSD' Type fire dampers. If requested, special silicon free sealant can be applied to these dampers.

MATERIAL

Galvanised Sheet (Standard supply)
Stainless steel construction is available if requested.

Minimum module size: 150 mm x 150 mm
Maximum module size: 1000 mm x 1000 mm

Order Code: FSD-AM / 1000 x 1000 / S150 / Z01

Type

FSD (Standard supply)
FSP
FSE

Constriction Variants

AM (Standard supply)
BM
CM

DM, EM } With damper blades outside the airstream

Duct size (mm):

'B' and 'H' refer to the widths and heights for square and rectangular ductwork.

'D' is the diameter for circular ducting.

Notes:
1. FSD-AM will be regarded as standard supply unless stated otherwise.
2. FSD-CM is only suitable for **vertical** mounting.

Other options:

0 – Damper only (Standard supply).
S – With sleeve and retaining angles. E.g.,
- S150
- S225 or,
- S300

for 150, 225 or 300 mm thick wall or floor slab respectively.

Accessories

Refer to page 6 for further information.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 4/1.1/EN/--.

Type 'MSD' Smoke Damper

The Smoke Damper is designed to provide an automatic to prevent the spread smoke through mechanical ventilation systems.

This damper is capable of operating for a maximum period of 120 minutes at 250 °C using an electric spring return actuator in a thermal enclosure.

Type 'SFD' Smoke and Fire Damper

This damper is designed to provide an automatic means of preventing the spread of fire and/or smoke the mechanical ventilation system.

The damper was independently tested for fire integrity for up to 4 hours to AS 1530.4, 1997 and for up to 3 hours to BS 476: Part 20, 1987 by an internationally recognised fire test centre.

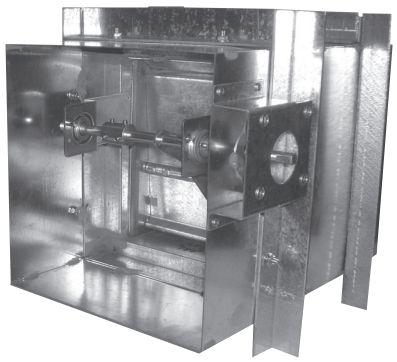
The Type SFD damper is capable of operating for a maximum period of 60 minutes with air temperature at 250 °C passing through the damper, using an electric spring return actuator housed in a thermal enclosure.

Both types of dampers (i.e., 'SFD' and 'MSD') can be supplied with low closed blade leakage characteristics, for smoke control application. Both dampers have been tested independently for closed blade leakage and cycling tests, having completed more than 20,000 cycles with electric spring return actuator to comply with the requirements of UL 555S.

Three different seal variants are available with both 'MSD' and 'SFD' Type dampers;

1. C – Without side or tip seal
2. C1 – With side seals only (Class 3 to UL555S).
3. C2 – With side and tip seal for improve blade leakage rating (to Class 2 of UL555S).

Type 'MSD' Smoke Damper



MATERIAL
Galvanised Sheet (Standard supply)
Stainless steel construction is available if requested.

Minimum module size: 100 mm x 100 mm
Maximum module size: 1200 mm x 1800 mm

Type 'SFD' Smoke and Fire Damper

MATERIAL
Galvanised Sheet (Standard supply)
Stainless steel construction is available if requested.

Minimum module size: 250 mm x 250 mm
Maximum module size: 1000 mm x 1000 mm

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 4/2.2/EN/--.

13.0 Combination Smoke & Fire Dampers Type 'MSD'

Order Code for Type MSD/MSP/MSE Smoke Damper

Note: If the order codes below are incomplete, then it is assumed that a standard damper construction is required.

Type

MSD (Standard supply)

MSP
MSE

Case variants

A – Casing with 40 mm wide flange(Standard)

A1 – Sleeve casing
A2 – Rectangular spigot
A3 – Circular spigot

Blade Operation variants

B – Face link parallel blade arrangement (**Standard supply)**

B1 – External link parallel blade arrangement

Seal variants

C – None **(Standard supply)**

C1 – Side seals only
C2 – Side and tip seals included.

Duct Size (refer to the relevant table for standard sizes on pages 3 to 5)

External controls location

R – Right hand side **(Standard supply)**

L – Left hand side

Bearing variants

D – Sintered bronze **(Standard supply)**

Accessories (refer to page 13).

General Specification:

Smoke damper Type MSD is designed for smoke isolation in sections of ducting in a typical mechanical ventilation system. Generally this damper consists of flanged casing and shut-off blades with overlapping interlocking joints as a standard construction. The blades are connected by internal face linkage for parallel blade operation. This damper has been independently tested for;

a. Closed blade leakage to UL 555S Standard.
b. Damper cycling test for more that 20,000 complete cycles with electric actuator as required under UL 555S.
c. Elevated temperature test at **250°C for 120 minutes** with actuator in a thermal housing.

Order Code for Type SFD/SFP/SFE Smoke Damper

Note: If the order codes below are incomplete, then it is assumed that a standard damper construction is required.

SFD - A1- C1 - D - R / 800 x 800 / 0 / Z01

Type

SFD (Standard)

SFP
SFE

Case variants

A – 40 mm wide flange casing (**Standard**)

A1 – Sleeve casing
A2 – Rectangular spigot
A3 – Circular spigot

Seal variants

C – None **(Standard)**

C1 – Side seals only
C2 – Side and tip seals included.

Accessories (refer to page 13)

Installation option

0 – Damper only **(Standard supply)**

H – HEVAC Sub-frame
S – Sleeve and retaining angles
- S150 for 150 mm thk wall/slab
- S225 for 225 mm thk wall/slab
- S300 for 300 mm thk wall/slab

Duct Size (refer to the relevant table for standard sizes on pages 6 to 8)

External controls location

R – Right hand side **(Standard)**
L – Left hand side

Bearing variants

D – Sintered bronze **(Standard)**

General Specification:

The combination fire and smoke damper Type SFD is designed for fire and/or smoke isolation in sections of ducting for a typical mechanical ventilation system. Generally this damper consists of flanged casing and shut-off blades with overlapping interlocking joints as a standard construction. The blades are connected by internal face linkage for parallel blade operation. This damper has been independently tested for;

a. **Three hours** fire integrity to BS 476 Part 20, 1987 and for **four hours** to AS 1530.4, 1997.
b. Closed blade leakage test to UL 555S Standard.
c. Damper cycling test for more that 20,000 complete cycles with actuator as required under UL 555S.
d. Elevated temperature test at **250°C for 60 minutes** with actuator in a thermal housing.

13.0 Industrial Tunnel Dampers Type 'JFM'

The TROX Type 'JFM' is an industrial damper designed to operate in arduous environment, suitable for tunnel ventilation, offshore oil and gas and nuclear applications. This damper is suitable for isolation, regulation of air flow and to control the spread of fire and smoke in mechanical ventilation systems. It can be operated manually or automatically using either electric or pneumatic actuators with associated ancillary controls in accordance with the system design requirements.

This damper can be manufactured in either galvanised sheet steel or in stainless steel with a pressure rating up to 3 kPa for standard supply or, 6 kPa for high pressure applications.

The 'JFM' damper has been successfully tested for fire integrity for up to 4 hours to BS 476: Part 20, 1987 and, for 1 hour to BS EN 1366 Part 2, in both horizontal and vertical mounting positions by an independent fire test centre.

The Type 'JFM' damper is capable of operating for TWO hours at an elevated ambient temperature of 400°C.

Actuator ratings are:

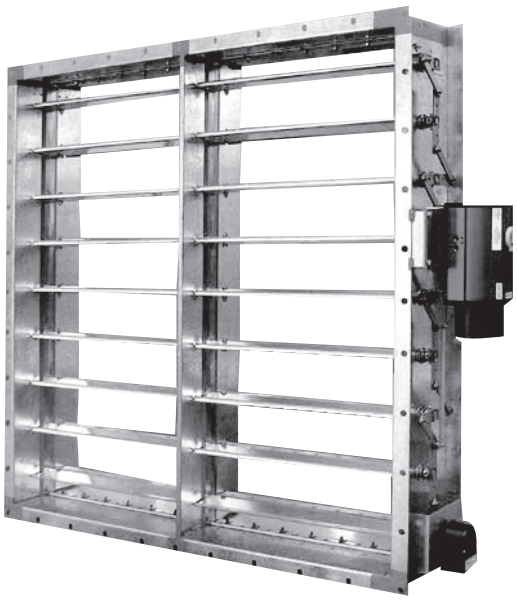
Pneumatic: 250°C for 2 hours, 400°C for 1 hour without thermal enclosure including external end position switches.

Electric: 400°C for 2 hours with thermal enclosure including integral end position switches.

They can be mounted vertically or horizontally, directly to structural walls or concrete floor slabs and directly onto connecting ductwork. In all cases, this damper should be installed to manufacturer's recommendations and comply with the local by-laws and fire authority requirements.

This damper complies with the European Directive 94/9/EC (ATEX 95), Appendix 1 and is classified under equipment group II, category 2D and 2G. It can therefore be used in Zone 21 and Zone 22 hazardous areas where combustible dust is present and Zone 1 and 2 hazardous areas where Group IIA, IIB and IIC gases are present at temperature classes T1 to T6 in accordance with European Directive 99/92/EC (ATEX 137),

Type 'JFM' Tunnel Fire and Smoke Damper



MATERIAL
Galvanised Sheet (Standard supply)
Stainless steel construction is available if requested.

Minimum module size: 200 mm x 200 mm
Maximum module size: 2100 mm x 2100 mm

Order Code

Note: If the order codes below are incomplete, then it is assumed that a standard damper construction is required.

JFM / E / FL1 / 6 / F4 / 0 / 0 / 1200 x 1800 / 12 / R / V / Z01 / TE

Type JFM

Material:
G – Galvanised steel **(Standard supply)**
E – 304 Grade stainless steel
E1 – 316 Grade stainless steel
E2 – 316L Grade stainless steel

Mode Variants
FL1 – Low leak case **(Standard)**

FL2 – Low leak case with Kerlane tip seals

Pressure Rating
3 – For max. operating pressure of 3 kPa (**Standard supply**).

6 – For max. operating pressure of 6 kPa.

Flange Variants

F1 – 30 mm wide flange
F2 – 40 mm wide flange
F4 – 50 mm wide flange **(Standard)**
F6 – 65 mm wide flange
F7 – 75 mm wide flange
F8 – 80 mm wide flange

Blade Material Thickness
12 – 1.2 mm thick **(Standard)**
20 – 2.0 mm thick

Actuator Position
R – Right **(Standard)**
L – Left
T – Top
B – Base
F – Face

Damper Mounting Position
V – Vertical mounted **(Standard)**
H – Horizontally

Controls Option
Z00X – Manual
Z01X – Pneumatic Spring Return
Z02X – Pneumatic Double Acting
Z03X – Electric Spring Return
Z04X – Electric Double Acting

Thermal Enclosure
TE1: 250 °C for 2 hours
TE2: 400 °C for 2 hours
TE3: Others

Damper Size (refer Table No. 2 on page for standard sizes

Drilling Details
0 – Undrilled **(Standard supply).**
1 – Drilled (TROX to supply detail)
2 – Special (to customer requirements).

One-sided Extented Flange
0 – No extended flange **(Standard)**
50 – 50 mm extended flange
80 – 80 mm extended flange
100 – 100 mm extended flange
150 – 150 mm extended flange

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 3.2/1/EN/--.

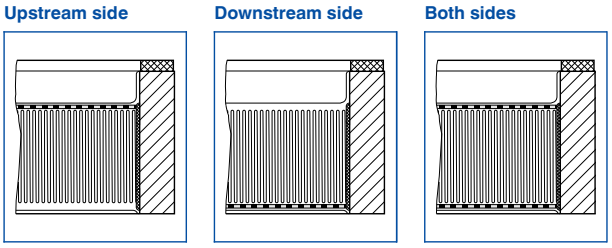
14.0 Hepa Filters
Type GAL, STA, ALN, ALZ & ALY

For the most demanding requirements of air purity and sterility

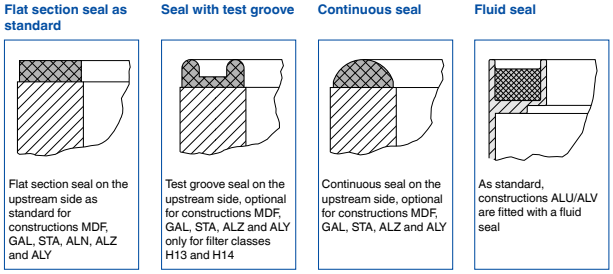
Prefilters or final filters for the separation of fine dust and suspended particles. Used for industrial, research, medical, pharmaceutical, and nuclear engineering applications.

- Filter classes H13 and H14 for high efficiency
- Performance data tested to EN 779 or EN 1822 Meets hygiene requirements according to VDI 6022
- Eurovent certification for fine dust filters
- Filter media for special requirements, glass fibre papers with spacers made of thermoplastic hot-melt adhesive
- Low initial differential pressure due to ideal pleat position and largest possible filter area
- Perfect adjustment to individual requirements due to different pleat depths, filter frame made of various materials
- Automatic factory filter scan available test for all filters for filter class H14

Protection Grid



Seal



Construction features

- Perimeter flat section seal on the upstream side for constructions GAL, STA, ALN, ALZ, ALY
- Foamed continuous seal or with a test groove seal (filter classes H13, H14) on the upstream side; the flat section or continuous seal can also be fitted on the downstream side or on both sides
- As standard, constructions ALU/ALV are fitted with a fluid seal
- Protection grid to prevent media distortion is made from expanded metal and is fitted on the downstream or upstream side of the filter

Filter class according to EN 1822	H13	H14
Efficiency according to EN 1822	>99.95 %	>99.995 %
Initial differential pressure at nominal volume flow rate	250 Pa	120/140 Pa
Recommended final differential pressure	600 Pa	600 Pa
Maximum operating temperature	80°C	80°C
Maximum relative humidity	100 %	100 %

Dimensions [mm] and weight [kg]

Nominal size			①	②	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	~ kg
305	305	150	50	H13	79	285	250	2,4	3
345	345	150	50	H13	104	375	250	3,1	4
435	435	150	50	H13	174	625	250	5,0	5
457	457	150	50	H13	194	700	250	5,5	5
535	535	150	50	H13	272	980	250	7,6	7
575	575	150	50	H13	318	1145	250	8,7	7
305	610	150	50	H13	168	605	250	4,9	5
457	610	150	50	H13	264	950	250	7,4	6
610	610	150	50	H13	361	1300	250	9,8	8
762	610	150	50	H13	457	1645	250	12,3	9
915	610	150	50	H13	554	1995	250	14,8	11
1220	610	150	50	H13	746	2685	250	19,7	13

① Pleat depth ② Filter class ③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP

MFP – H13 – ALU / 610 × 610 × 78 × 50 / PD / FNU / ST

1 2 3 4 5 6 7 8

14.0 Hepa Filter Casings Type 'TFC/TFP'

Ceiling mounted particulate filter casings designed and manufactured to house a range of Mini Pleat filter panels suitable for medical facilities, laboratories and pharmaceutical facilities

Construction features

- Particulate filter air terminal device type TFC for ceiling installation as final filter stage and for air distribution
- Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract

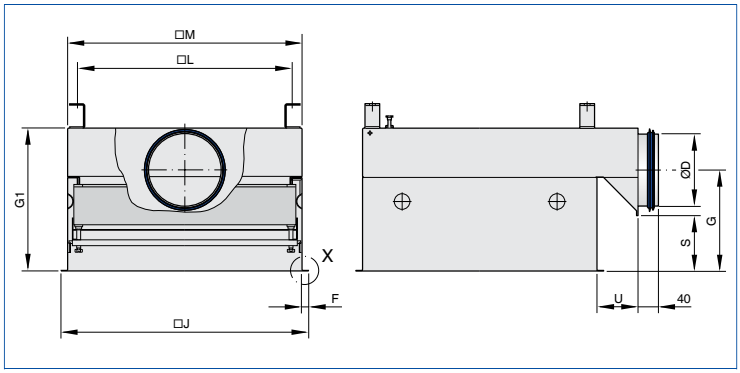
Special Features

- Compact construction
- Easy operation
- High operational reliability

TFC

TFP

Dimensional drawing of TFC-SC



Typical Selection Table for size 400 – available up to size 680

Nominal size	Nominal size VDW	Filter size	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
		B × H × T	Ø D	G1	K	M	J	L	F	U	S	G	~ kg
400	400 × 16	345 × 345 × 78/91	158	299	398	371	388	330	10	135	69	189	17
400	400 × 16	345 × 345 × 78/91	198	299	398	371	388	330	10	135	69	189	17
400	400 × 16	345 × 345 × 150	158	371	398	371	388	330	10	135	141	261	17
400	400 × 16	345 × 345 × 150	198	371	398	371	388	330	10	135	141	261	17

① Spigot diameter
② Casing height
③ Overall dimension of diffuser face plate
④ Overall dimension of casing
⑤ Overall dimension of flange
⑥ Top suspension, distance between holes
⑦ Flange width
⑧ Casing extension
⑨ Distance from casing flange to edge of spigot plate
⑩ Dimension from flange face to centre line of spigot
⑪ Weight

14.0 Hepa Filter Casings Type ‘TFM’

Ceiling mounted particulate filter casings designed and manufactured to house a range of Mini Pleat filter panels suitable for medical facilities, laboratories and pharmaceutical facilities.

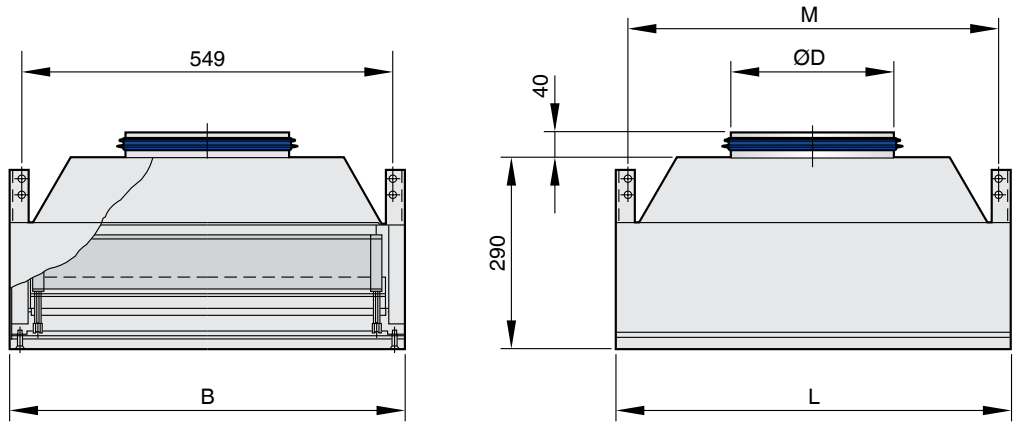
Application

- Particulate filter module type TFM for ceiling installation as final filter stage and for air distribution in clean room technology
- Individual casings can be combined to ceiling sections
- Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air

Construction features

- Clamping mechanism with 4 fixing points for filter elements
- Sealing integrity test facility for checking the filter function
- Pressure measurement points to monitor the differential operating pressure
- Spigot (circular, top entry)

Dimensional drawing of TFM



Dimensions [mm] and weight [kg]

Nominal size		Filter size	①	②	③
B	L	B × H × T	M	ØD	~ kg
600	600	535 × 535 × 78	549	248	22
600	900	835 × 535 × 78	849	313	27
600	1200	1135 × 535 × 78	1149	348	32

① Top suspension, distance between holes ② Spigot diameter ③ Weight

14.0 Hepa Filter Casings Type 'DCA'

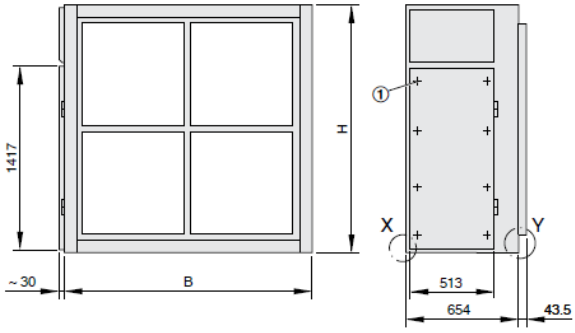
Duct casing for Mini Pleat filter panels for ductwork installations in a variety of ventilation and air conditioning applications suitable for critical areas

Application

- Duct casing for particulate filters type DCA for installation into the ductwork of ventilation systems
- Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air
- Fitting of activated carbon filter cells for the separation of gaseous odorous substances and contaminants from the supply and extract air

Construction features

- Side service door for easy filter change, optionally arranged on the left or right when viewed in the direction of airflow
- Frame system made of welded aluminium profiles with support angle for fixing the filter elements
- Clamping mechanism for secure sealing between the frame system and the filter elements



Dimensions [mm] and weight [kg]

Nominal size			①			②
B	H	T	horizontal	vertical	total	~ kg
804	804	654	1	1	1	40
804	1428	654	1	2	2	55
804	2052	654	1	3	3	70
1428	804	654	2	1	2	55
1428	1428	654	2	2	4	70
1428	2052	654	2	3	6	90
1428	2676	654	2	4	8	110
2052	804	654	3	1	3	70
2052	1428	654	3	2	6	90
2052	2052	654	3	3	9	110
2052	2676	654	3	4	12	135
2676	804	654	4	1	4	85
2676	1428	654	4	2	8	110
2676	2052	654	4	3	12	135

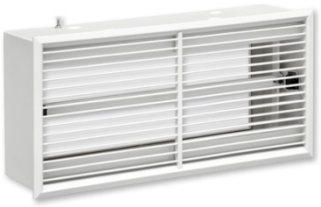
① No. of filter elements 610 × 610 × 292 ② Weight

14.0 Hepa Filter Casings Type 'TFW'

Wall mounted particulate filter casings designed and manufactured to house a range of Mini Pleat filter panels suitable for medical facilities, laboratories and pharmaceutical facilities

Application

- Particulate filter air terminal device type TFW for wall installation as final filter stage and for air distribution
- Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air

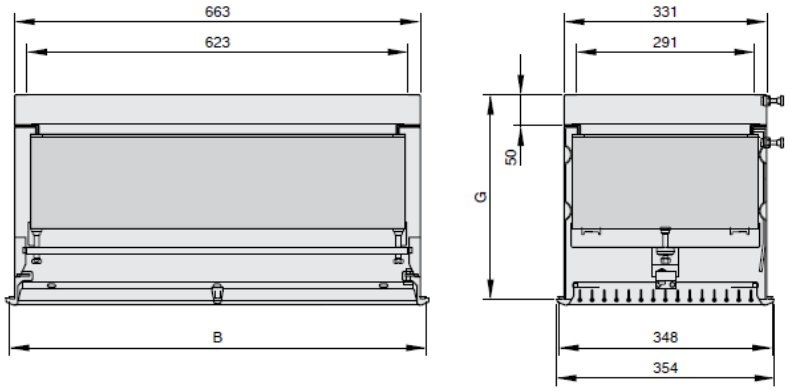


Special features

- Compact construction
- Easy connection to ducts
- High operational reliability

Nominal sizes [mm]

- Casing depth 262, 334, and 476



Wall mounted particulate filter with ventilation grille ASL

Nominal size		Filter size	①	②
B	H	B × H × T	G	~ kg
662	325	305 × 610 × 78	262	10
662	325	305 × 610 × 150	334	11
662	325	305 × 610 × 292	476	12

① Casing depth ② Weight

Wall mounted particulate filter with ventilation grille SL

Nominal size		Filter size	①	②
B	H	B × H × T	G	~ kg
680	325	305 × 610 × 78	262	10
680	325	305 × 610 × 150	334	11
680	325	305 × 610 × 292	476	12

① Casing depth ② Weight

14.0 Hepa Filter Casings Type 'KSF'

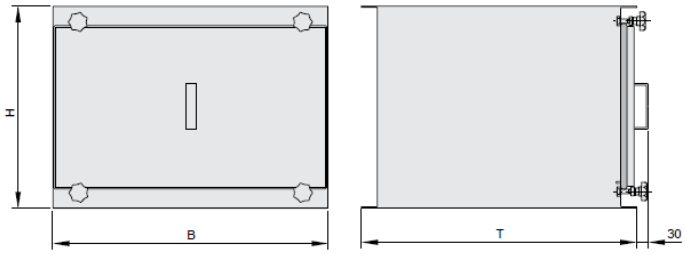
Duct casing for Mini Pleat filter panels for ductwork installations in a variety of ventilation and air conditioning applications suitable for critical areas

Application

- Ducted particulate filter type KSF for installation into the ductwork of ventilation systems
- Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air
- Fitting of activated carbon filter cells for the separation of gaseous odorous substances and contaminants from the supply and extract air

Construction features

- Casing with robust connecting flanges
- Turnbuckles for secure sealing between casing and filter element
- Cover plate with profiled seal and four clamping screws with star grips



Dimensions [mm] and weight [kg]

Nominal size			①	②
B	H	T	B × H × T	~ kg
405	378	405	305 × 305 × 150	16
405	378	710	305 × 610 × 150	19
710	378	405	305 × 610 × 150	19
710	378	710	610 × 610 × 150	24
710	378	862	762 × 610 × 150	27
405	520	405	305 × 305 × 292	18
405	520	710	305 × 610 × 292	21
710	520	405	305 × 610 × 292	21
710	520	710	610 × 610 × 292	28
710	520	862	762 × 610 × 292	30

① Filter size ② Weight

14.0 Hepa Filter Casings Type 'KSFS'

Duct casing for Mini Pleat filter panels for ductwork installations in a variety of ventilation and air conditioning applications suitable for critical areas

Application

- Ducted particulate filter type KSFS for critical requirements
- Casing for duct installation
- Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air
- Fitting of activated carbon filter cells for the separation of gaseous odorous substances and contaminants from the supply and extract air

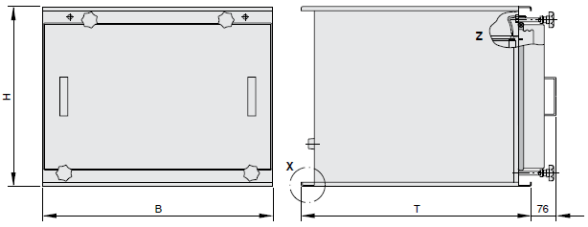
Construction features

- Casing with robust, doubled-edged connecting flanges with pre-drilled holes.
- Automatically adjusting clamping mechanism which guarantees sealing integrity between the casing and the filter element; this clamping mechanism can only be closed when the filter element is properly seated
- Cover plate with profiled seal and four clamping screws with star grips
- Prefilter casing for fitting Mini Pleat filter panels as fine dust filters
- Double-groove service board and plastic service bag for contamination-free filter change
- Sealing integrity test facility for Mini Pleat filter panels as particulate filters
- Casing with indentations to ensure the precise fitting of the filter elements
- Leakage test for each individual casing

Dimensions [mm] and weight [kg]

Nominal size			①	②
B	H	T	B × H × T	~ kg
710	411	405	305 × 610 × 150	40
710	411	710	610 × 610 × 150	50
710	553	405	305 × 610 × 292	55
710	553	710	610 × 610 × 292	65
710	553	862	762 × 610 × 292	70

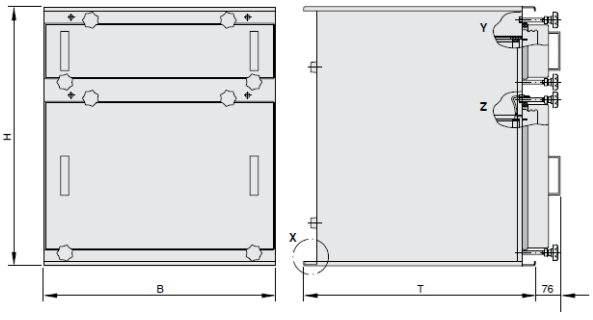
① Filter size ② Weight



Dimensions [mm] and weight [kg]

Nominal size			①	②	③
B	H	T	B × H × T	B × H × T	~ kg
710	652	405	305 × 610 × 60	305 × 610 × 150	60
710	652	710	610 × 610 × 60	610 × 610 × 150	70
710	794	405	305 × 610 × 60	305 × 610 × 292	70
710	794	710	610 × 610 × 60	610 × 610 × 292	85
710	794	862	762 × 610 × 60	762 × 610 × 292	95

① Filter size prefilter ② Filter size mainfilter ③ Weight



14.0 Hepa Filter Casings Type ‘FHD’

Ceiling mounted laminar flow hood type particulate filter casings designed and manufactured to house a range of Mini Pleat filter panels suitable for medical facilities, laboratories and pharmaceutical facilities

Application

- Mini Pleat filter panel with hood, type FHD, for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in clean room systems with controlled air purity and airflow
- Particulate filters: Final filters for the most critical requirements of air purity and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering

Construction

- Without centre mullion, spigot with fixed baffle plate
- D: Centre mullion with pressure measurement point on the downstream side, spigot with fixed baffle plate
- R: Centre mullion with pressure measurement point on the downstream side, spigot with adjustable baffle plate for volume flow rate balancing
- V: Centre mullion with pressure measurement point on the downstream side, spigot with damper blade for volume flow rate balancing

Construction

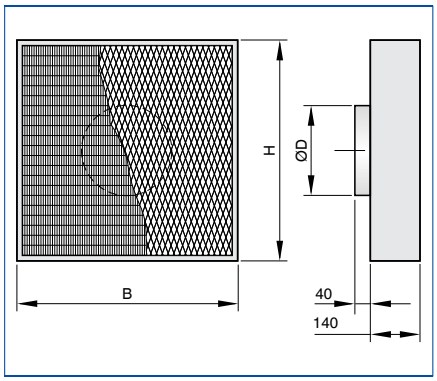
- Particulate filters E11, H13, H14, U15

Spigot with fixed baffle plate

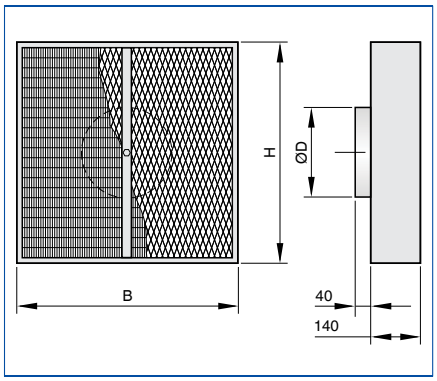
Spigot with adjustable baffle plate

Spigot with damper blade

Dimensional drawing of FHD-…



Dimensional drawing of FHD-…-D/…, FHD-…-R/…, FHD-…-V/…



Dimensions [mm] and weight [kg]

Nominal size			①	②	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	~ kg
305	305	140	E11	148	76	275	125	2.8	4
457	457	140	E11	198	172	620	125	6.2	6
305	610	140	E11	198	153	550	125	5.7	6
610	610	140	E11	248	306	1100	125	11.1	8
915	610	140	E11	248	458	1650	125	16.6	11
1220	610	140	E11	313	611	2200	125	22.1	14
305	305	140	H13	148	76	275	250	2.8	4
457	457	140	H13	198	172	620	250	6.2	6
305	610	140	H13	198	153	550	250	5.7	6
610	610	140	H13	248	306	1100	250	11.1	8
915	610	140	H13	248	458	1650	250	16.6	11
1220	610	140	H13	313	611	2200	250	22.1	14

15.0 Lab Control
Type ‘TVLK’

Application

- Circular LABCONTROL VAV terminal units of Type TVLK, made of plastic, to control the volume flow rate of fume cupboards and fume hoods
- Suitable for contaminated air
- Closed-loop volume flow control using an external power supply
- Shut-off by means of switching (equipment supplied by others)

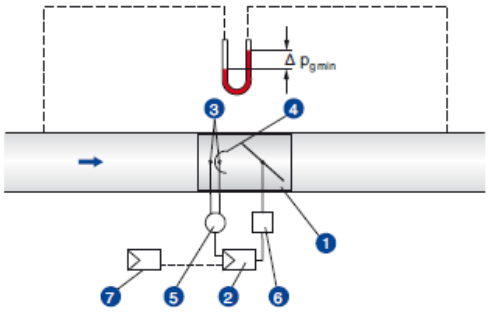
Special features

- High control accuracy even in case of unfavourable upstream conditions
- Integral slide-out differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- No metal parts come into contact with the airflow
- Factory set-up or programming and aerodynamic function testing
- Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool or configuration software may be necessary

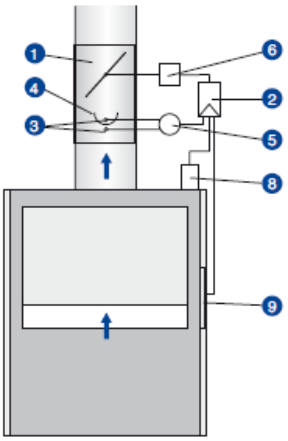
Nominal sizes

- Bluff body: 250 – 100, 250 – 160
- Venturi nozzle: 250 – D10, 250 – D16
- Bluff body and Venturi nozzle available in two sizes each for different volume flow rate ranges

Flow rate control



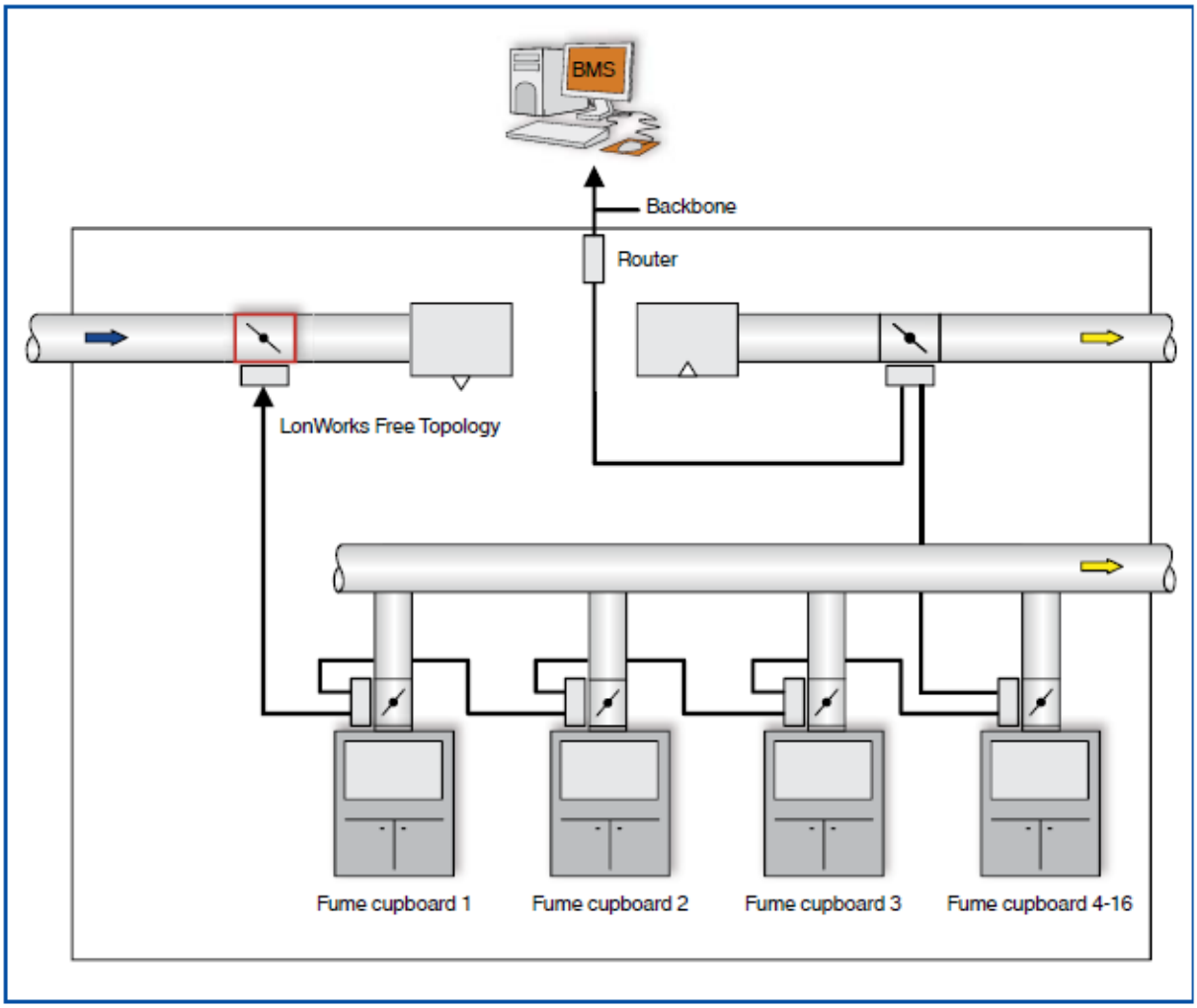
Fume cupboard control



Legend

1. VAV controller
2. Flow rate controller
3. Differential pressure sensor
4. Flow screen
5. Diaphragm pressure transducer
6. Actuator
7. External setpoint setting possible (by others)
8. Sash velocity sensor or sash position sensor
9. Control unit

Room control with TCU-LON-II



Technical data

Supply voltage	24 V AC ± 10 %, 50 Hz
Power consumption	25 VA
Glass fuse	MT2.5 A
Operating temperature	10 – 40 °C
Switch rating of the alarm relay	250 V AC, 5 A
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2004/108/EG
Dimensions (B × H × T)	approx. 210 × 261 × 84 mm
Weight	1.7 kg

Order code

TVLK with EASYLAB for fume cupboard control

TVLK – FL / 250 – 100 / GK / ELAB / FH – VS / ULZS / 200 – 900

1 2 3 4 5 6 7 8

1 Type
TVLK VAV terminal unit made of plastic

2 Flange
No entry: none
FL Flanges on both ends

3 Nominal size
250 – 100 Bluff body 100
250 – 160 Bluff body 160
250 – D10 Venturi nozzle D10
250 – D16 Venturi nozzle D16

4 Accessories
No entry: none
GK Matching flanges for both ends

5 Control component
ELAB EASYLAB controller TCU3 with fast-running actuator

6 Equipment function – fume cupboard control
With face velocity transducer
FH-VS Face velocity control

With sash distance sensor
FH-DS Linear control strategy
FH-DV Safety-optimised control strategy

With switching steps for on-site switch contacts
FH-2P 2 switching steps
FH-3P 3 switching steps

Without signalling
FH-F Volume flow rate constant value

7 Expansion modules
Option 1: Supply voltage
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communications interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU

Option 3: Automatic zero point correction
No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Option 4: Lighting
No entry: none
S EM-LIGHT Wired socket for the connection of lighting and for switching the lighting on/off using the control panel (only with EM-TRF or EM-TRF-USV)

8 Operating values [m³/h or l/s]
Depending on the equipment function
FH-VS: $\dot{V}_{min} - \dot{V}_{max}$
FH-DS: $\dot{V}_{min} - \dot{V}_{max}$
FH-DV: $\dot{V}_{min} - \dot{V}_{max}$
FH-2P: $\dot{V}_1 / \dot{V}_2$
FH-3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
FH-F: $\dot{V}_1$

Useful additions
Control panel for fume cupboard controllers, for displaying the functions of the control system according to EN 14175
BE-SEG-** with 2-character display
BE-LCD-01 with 40-character display

15.0 Lab Control VAV Box Type 'TVJ'

- Suitable for the control of volume flow rate, room pressure or duct pressure
- Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
- High control accuracy
- Suitable for airflow velocities up to 10 m/s
- Casing air leakage to EN 1751, class B

Application

– Rectangular VARYCONTROL VAV terminal units of Type TVJ for the precise supply air or extract air flow control in variable air volume systems
– Closed-loop volume flow control using an external power supply
– For controlling, restricting, or shutting off the airflow in air conditioning systems

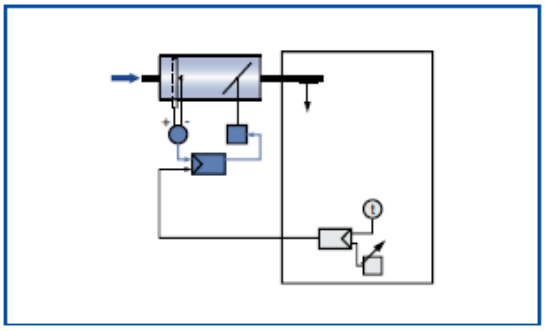
Attachments

– Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
– Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
– Universal controller: Controller, differential pressure transducer and actuators for special applications
– LABCONTROL: Control components for air management systems

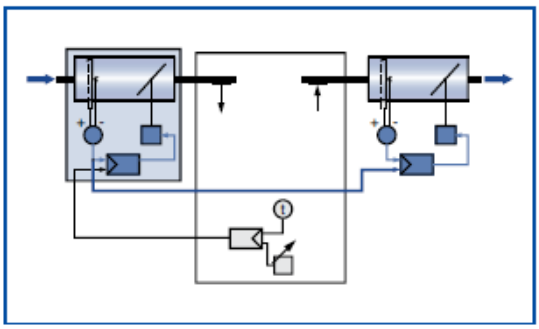
Technical data

– Nominal sizes: 200 × 100 to 1000 × 1000 mm
– Volume flow rate range: 45 – 10100 l/s or 162 – 36360 m^3/h
– Volume flow rate control range (unit with dynamic differential pressure measurement): approx. 20 to 100 % of the nominal volume flow rate
– Differential pressure: 20 – 1000 Pa

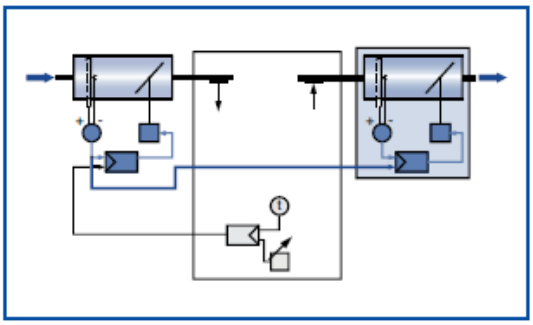
Single operation



Master slave operation (master)



Master slave operation (slave)



TVJ, TVJ/.../Easy

TVJ – D – P1 / 600×400 / B1B / E 0 / 200 – 900 / NO
1 2 3 4 5 6 7 8 9

TVJ – D / 900×300 / Easy
1 2 4 5

16.0 Sand Trap Louvres Type 'WSL • AWSL'

Description

The sand trap louvre is used as pre-filter for the protection of air conditioning plants in areas exposed to extreme levels of industrial pollution. It has a degree of separation of sand and large dust particles, even in cases of high dust concentrations. The vertically arranged sections and holes for sand drainage ensure the sand trap louvre is self cleaning and maintenance-free. The sand trap louvre is designed to separate large particles at low air velocities, thus avoiding excessive dust loading on conventional plant filters. It is not intended as a substitute for conventional supply air filtration plant.

Materials

Basic construction either aluminium (AWSL) or galvanized steel (WSL). Bird screen galvanized steel mesh 12 x 12 x 1 mm.

Standard finish AWSL mill, WSL galvanized or powder coated RAL RAL 9010 25% gloss, other RAL colours and of gloss finish on request. For all external application AWSL powder coat finish to BS EN 12206-1;2004, WSL powder coat finish to BS EN 13438:2005.

Louvre Fixing

Louvre rear section to be site drilled for fixings supplied by others.

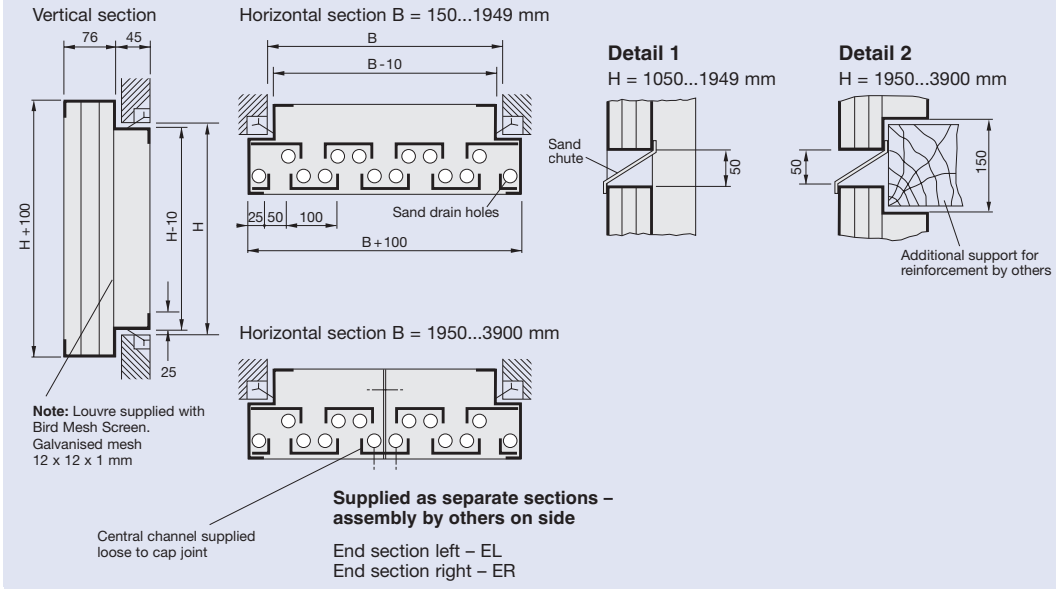
Dimensions

Standard Sizes · Single Section

Width B in mm	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1949
Height H in mm	150	300	450	600	750	900	1050[1)]	1200[1)]	1350[1)]	1500[1)]	1650[1)]	1800[1)]	1949[1)]

[1)] With Split blades and sand chute (see Detail 1)

Construction



Supplied as separate sections – assembly by others on side

End section left – EL
End section right – ER

Order Code

- WSL	/	900 x 900	/	0	/	0	/	P9	/	RAL 9010	/	25% Gloss

Complete Louvre or multi-section [1) 2)]
M = middle section
EL = end left section
ER = end right section

Standard Sizes B x H

Not used

Finish/colour
A1 = Aluminium mill finish
G0 = Pre Galvanised sheet
P9 = External use Powder coat finish to RAL colour

RAL colours and levels of gloss finish on request

Type
AWSL - Aluminium sand trap louvre with galvanised steel bird screen.
WSL - Galvanised steel sand trap louvre with galvanised steel bird screen.

16.0 Weather Resistant Louvres Type 'AWG • AWK'

Both 'AWG' and 'AWK' Type weather louvers are made from extruded aluminium with an approximate free area of 60%.

KEY FEATURES

Type 'AWG' Louvre
- 50 mm flange for 'AWG' Louvre.
- 20 x 20 mm sq. wire mesh screen.
- 95 mm deep frame.
- Max. module size – 1985 mm (B) x 1980 mm (H).

Type 'AWK' Louvre
- 28 mm flange for 'AWG' Louvre
- 6 x 6 mm sq. wire mesh screen.
- 34 mm deep frame.
- Max. module size – 1197 mm (B) x 497 mm (H).

RECOMMENDATION

Limit the face velocity to 3 m/s in order to maintain a pressure drop of 60 Pa.

STANDARD FINISH:

- Powder coating to RAL 9010 in matt white.

Order Code

AWG – 1 – BM / 4800 x 1815 / 12 / P1 / RAL 9003

Type (refer to page 9 for product range)

AWG, WGE, AWK } Basic louvre with wire mesh screen.

Type of screen
1 – With galvanised insect screen.
2 – With 20 x 20 mm sq. 430 grade stainless steel wire mesh screen.
3 – With 430 grade stainless steel wire mesh and insect screen.

Modular construction

BM – When the width, B > 1985 mm wide.
HM – When the height, H > 1980 mm high.
B – When the louvre comes with corner section(s).

Finish

0 – Standard supply in powder coating to RAL 9010 (white) with approximately 30% gloss.

P1 – Powder coating to the colour specified by customer.
(**NB:** Customer to state the required RAL colour code.)

Masonry Sub-frame
Refer to page 6 for detail.

Standard Sizes
For B x H (in mm), refer to this catalogue on page 6 of this catalogue for AWG/WGE and AWK Type louvres.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 3.1/1/EN/--.

16.0 Acoustic Louvres
Type ‘NL ● NLH’

The Type NL acoustic louvre provides a positive solution where noise attenuation is required at the weather louvre. This type of louvre is available in either steel or aluminium construction for both ‘standard’ (Type ‘NL’) and ‘high’ (Type ‘NLH’) acoustic performance options.

A non- acoustic version (Type ‘NLD’) is also available to complement these two options to provide a consistent visual external appearance.

Type ‘NL’ Acoustic Louvre

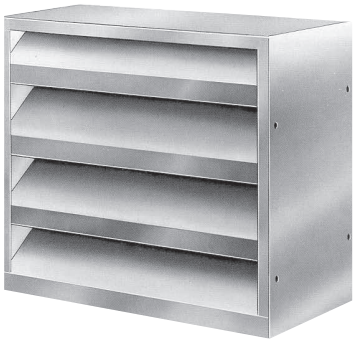
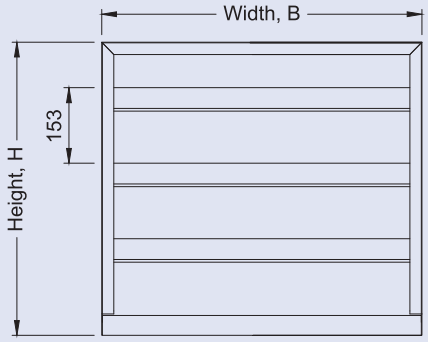


Table 1: Recommend maximum velocity for 'NL' and 'NLH' Acoustic Louvres with a maximum pressure drop of 70 Pa across the louvre.

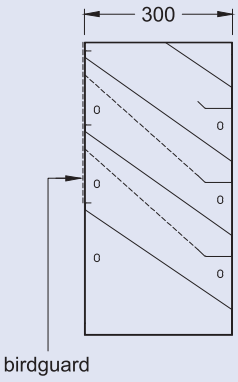
Louvre Ht. (mm)	Louvre Type	
	NL	NLH
450	1.5 m/s	0.7 m/s
600	2.0 m/s	1.0 m/s
750	2.5 m/s	1.2 m/s
900	3.0 m/s	1.5 m/s
1500	3.0 m/s	1.8 m/s
2400	3.5 m/s	2.0 m/s

Minimum module size: 300 mm (B) x 450 mm (H)
Maximum module size: 1800 mm (B) x 2400 mm (H)

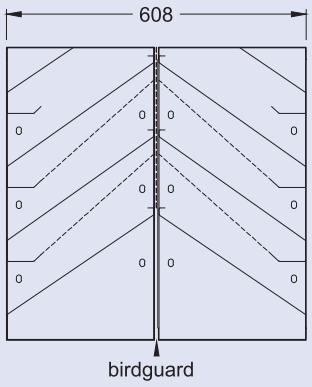
Type NL · NLH · NLD



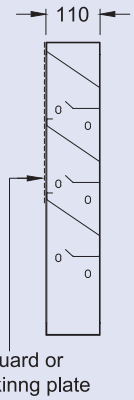
Type NL



Type NLH



Type NLD



Order Code

These codes do not need to be completed for standard products

NL	/	H	/	A	/	4000	/	1800	/	S1	/	RAL 9010
Louvre Type						Width, B		Height, H				RAL ...

Type Suffix :
H = High performance
D = Non acoustic

Material :
S = Galvanised steel
A = Natural aluminium

Finish :
O : Standard finish (galvanised).
S1 : Powder coated according to RAL ….

1) Only applicable to aluminium construction.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 6/ 6/ EN/--.

17.0 Rectangular Duct Attenuators Type 'DS'

The 'DS' Type rectangular attenuator is made from galvanised sheet steel with 40 mm wide Doby slide on flanges. The infill acoustic material is fire retardant and complies with Class 'O' Building Regulations. The infill acoustic material is protected with a lining which prevents fibre erosion. This was successfully tested against fibre erosion for up to 30 m/s. This is available in galvanised or stainless steel construction. Vertical or horizontal bend construction is also available on request.

'DK' Type splitters can be supplied separately to be installed in AHU section or builder's work duct by others. For detail selection, please contact TROX.

Type 'DS' Attenuator

Table 1: Quick selection table for DS20 to maintain a design Noise Criteria of NC 40

Duct Height (mm)	Duct Width (mm)	300	350	400	550	600	700	800	900	1050	1200
	Type DS20 -	100	150	200	75	100	150	200	100	150	200
200	Flow, Vmax (m³/s)	0.342	0.539	0.712	0.506	0.684	1.078	1.424	1.026	1.617	2.136
	ΔP (Pa)	97	81	66	124	98	81	66	98	81	66
300	Flow, Vmax (m³/s)	0.513	0.809	1.068	0.759	1.026	1.617	2.136	1.539	2.426	3.204
	ΔP (Pa)	95	78	64	120	96	78	63	96	78	63
400	Flow, Vmax (m³/s)			1.424	1.012	1.368	2.156	2.848	2.052	3.234	4.272
	ΔP (Pa)			62	118	95	77	62	95	77	62
500	Flow, Vmax (m³/s)				1.265	1.710	2.695	3.560	2.565	4.043	5.340
	ΔP (Pa)				118	94	76	61	94	76	61
600	Flow, Vmax (m³/s)					2.052	3.234	4.272	3.078	4.851	6.408
	ΔP (Pa)					94	76	61	94	76	61
700	Flow, Vmax (m³/s)						3.773	4.984	3.591	5.660	7.476
	ΔP (Pa)						75	61	94	75	61
800	Flow, Vmax (m³/s)							5.696	4.104	6.468	8.544
	ΔP (Pa)							60	93	75	60
900	Flow, Vmax (m³/s)								4.617	7.277	9.612
	ΔP (Pa)								93	75	60
1000	Flow, Vmax (m³/s)									8.085	10.680
	ΔP (Pa)									75	60
1100	Flow, Vmax (m³/s)										11.748
	ΔP (Pa)										60
1200	Flow, Vmax (m³/s)										12.816
	ΔP (Pa)										60

Table 2: Insert Loss for 600 mm long DS20 attenuator

Product Type @	Insert Loss, De (in dB) at Octave Band Freq. (Hz)					
600 mm long	125	250	500	1000	2000	4000
DS20-200	3	8	16	18	13	8
DS20-150	3	9	20	23	17	11
DS20-100	4	11	25	31	22	15
DS20-75	5	12	29	36	26	18

Order Code

DS / 0 / 20 - 100 / 0 / 800 X 800 X 1200

Type
DS - Attenuator type
DK - Splitters only to be installed in ductwork by others.

Construction variants
0 - With vertical air ways (Standard supply)
Note: for other variants, please refer to product catalogue.

Width of splitter and air gap

Material
0 – Galvanised steel (Standard supply)
S – Stainless steel. Customer to state grade of stainless steel required.

Attenuator size
Width by Height by unit length in mm.
Standard length available (mm):
600; 900; 1200; 1500; 1800; 2100 and 2400.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 6/ 1.1/ EN/--.

17.0 Circular Duct Attenuators Type 'CA'

KEY FEATURES:

The outer casing and the internal perforated duct of this circular attenuator is made from galvanised sheet steel. This attenuator can be supplied with either 50 mm or 100mm thk non-combustible acoustic insulation that is referred to as 'CA50' and 'CA100' respectively.

The 'CA50' and 'CA100' Type attenuators are available in two standard lengths;
a. 500 mm long and,
b. 1000 mm long

Both inlet and outlet connections for this type of attenuator, as a standard supply, is designed for a plain socket and spigot joint.

The infill acoustic material is fire retardant and complies with Class 'O' Building Regulations. The infill acoustic material is protected with a lining which prevents fibre erosion. This was successfully tested against fibre erosion for up to 30 m/s.

Type 'CA' Circular Attenuator

Table 1: Standard sizes

Unit Size	Inlet spigot conn. (mm)	External Dia. (mm)	
		CA50 500 mm Long	CA100 1000 mm Long
4	99	199	299
5	124	224	324
6	149	249	349
7	174	274	374
8	199	299	399
10	249	349	449
12	299	399	499
14	349	449	549
16	399	499	599
18	448	n/a	648

Order Code

CA50 / 5 x 1000 / 00

Type
CA50
CA100

Unit size
Standard sizes available are 4; 5; 6; 7; 8; 10; 12; 14; 16 & 18*(see **Note**).

Unit length
500 mm long
1000 mm long

00 – Plain socket and spigot joint. (**Standard supply**)
SP – Special requirement. This must be clearly stated in writing.

***Note**: Size 18 is only available with CA100 at 1000 mm long.

Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 6/ 2.1/ EN/--.

1. Ventilation Grilles & Jet Nozzles

Item	Description	Unit	Data Input			
1	Design Air Flow Rate					
2	Connecting Duct /Opening Size		Width		Height	
3	Grille mounting height					
4	Throw required					
5	Height between ceiling and grille					
6	Max. permissible press. drop					
7	Room design NC level					
8	Material required					
9	Fixing method required (Tick appropriate box)	Option A	Screw fixing on the face			
		Option B	Concealed fixing			
10	Is opposed blade damper required? State 'Yes/No'.					

2. Ceiling Diffusers

Item	Description	Unit	Data Input			
1	Design Air Flow Rate					
2	Diffuser Face Size		Width		Height	
3	Diffuser mounting height					
4	Throw required					
5	Max. permissible press. drop					
6	Room design NC level					
7	Type of diffuser preferred (Tick appropriate box)	a	4-Way throw diffuser			
		b	Slot diffuser			
		c	Swirl diffuser			
		d	Others (Please specify)			
8	System application. State 'VAV/CAV'.					
9	Material required					
10	Accessories required (Tick appropriate box)	a	None required - Face only			
		b1	Plenum box with top inlet spigot			
		b2	Plenum box with side inlet spigot			
		c	Volume control damper			
		d	With internal rubber lining			

3. Volume Control Dampers

Item	Description	Unit	Data Input			
1	Design Air Flow Rate					
2	Damper Size		Width		Height	
			Diameter			
3	Max. permissible press. drop					
4	Specified closed blade leakage		Max leakage rate			
			Pressure			
5	Application (Tick appropriate box)		For 'on/off' application			
			For air flow regulation			
6	Accessories required	a.	Hand locking quadrant			
		b.	Limit switch for 'open' position			
		c.	Limit switch for 'closed' position			
		d.	Mode of operation			
			Electric actuator			
		Volts	If electric, state the power supply available.			
			Pneumatic actuator			

4. Fire and Smoke Dampers

Item	Description	Unit	Data Input			
1	Design Air Flow Rate					
2	Damper Size		Width		Height	
			Diameter			
3	Max. permissible press. drop					
4	Fire integrity required	Hours				
5	Standard of compliance					
6	Damper mounting arrangement		Vertical / Horizontal *(Delete if not applicable)*			
7	Specified closed blade leakage		Max leakage rate			
			Pressure			
8	Application (Tick appropriate box)		Fire control application only			
			Smoke control application only			
			Both fire and smoke control			
9	Accessories required	a.	Hand locking quadrant			
		b.	Limit switch for 'open' position			
		c.	Limit switch for 'closed' position			
		d.	Mode of operation			
			Electric actuator			
		Volts	If electric, state the power supply available.			
			Pneumatic actuator			

5. Air Flow Control Terminal unit

item	Description	Unit	Data Input			
1	Design Air Flow Rate		Min. Flow		Max. Flow	
2	Application (Tick appropriate box)		VAV		CAV	
3	Design Inlet Static Pressure					
4	Specified NC level		Regenerated noise			
			Case Radiated noise			
5	Type of VAV controller required (Tick appropriate box)		Stand alone controller			
			LonMark compliant controller			
			BACNet compliant controller			

6. Inlet Duct Attenuator

item	Description	Unit	Data Input							
1	Design air flow rate									
2	Connecting duct size		Width			Height			Diameter	
3	- Upstream - Downstream									
4	Octave band frequency	Hz	63	125	250	500	1k	2k	4k	8k
5	Design insert loss	dB								
6	Max. permissible press. drop	Pa								
7	Max. permissible unit length									

Notes

Notes

Headquarters Germany

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