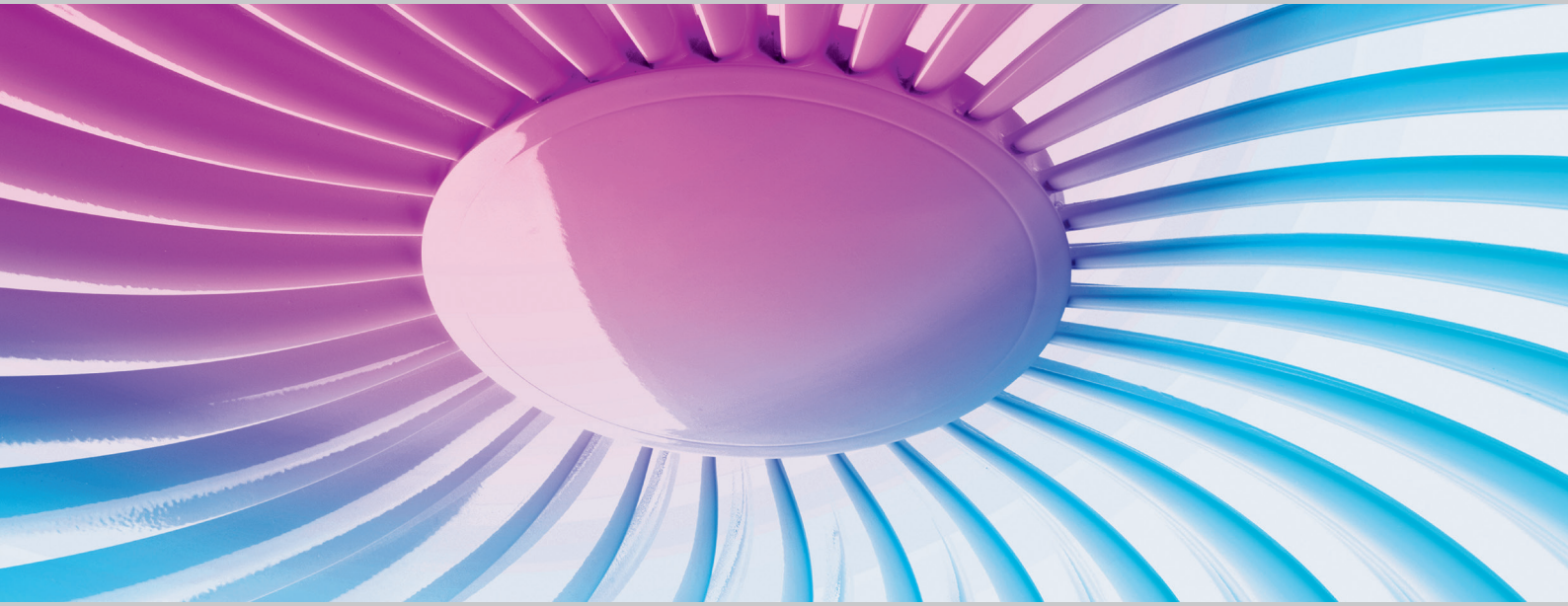
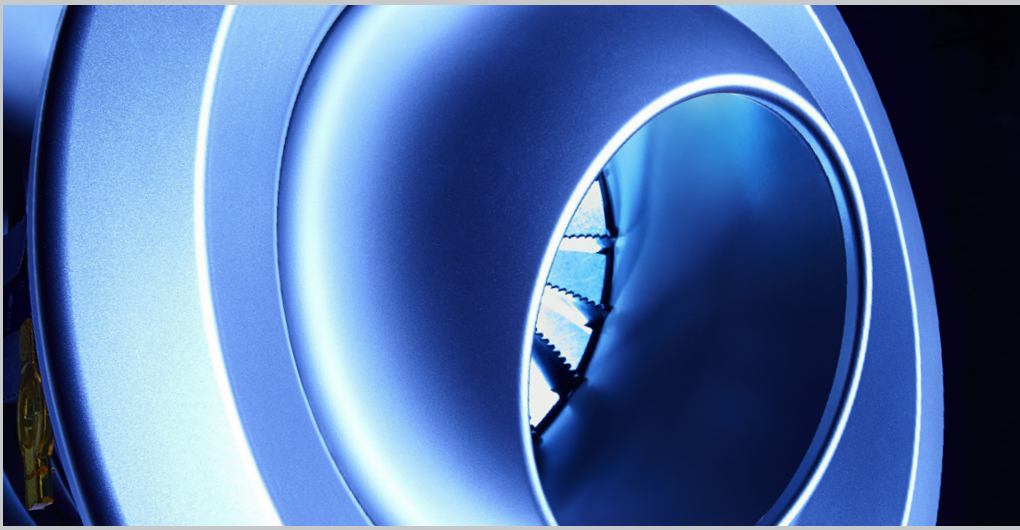




TROX® TECHNIK

The art of handling air

8.1 TROX
APPLICATION AND CONVERSION TABLE

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

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.

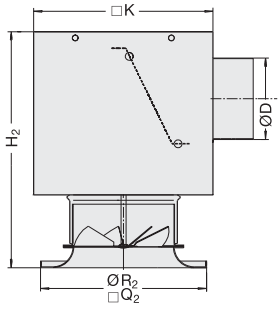
Most of the ceiling diffusers and slot diffusers found in TROX KLIMA Asia Pacific Catalogue or in this Quick Selection Guide are meant to be mounted at ceiling heights from 2.6 up to 4.0m high. For ceiling heights **greater than 3.8 metres high**, customers are advised to use one of the following;

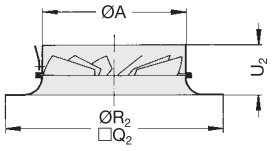
1. Type 'VDL' Swirl Diffusers
2. Type 'VD' Swirl Diffusers

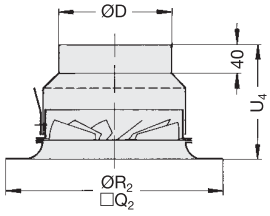
As a rule of thumb, if the room is very wide (i.e., in access of 8 metres) and preferably without any columns within the centre of the room, then jet nozzles or drum lourves should be considered, provided that the floor to ceiling height is greater than 4 metres high.

8.3 TROX SWIRL DIFFUSERS
TYPE RFD

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK







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

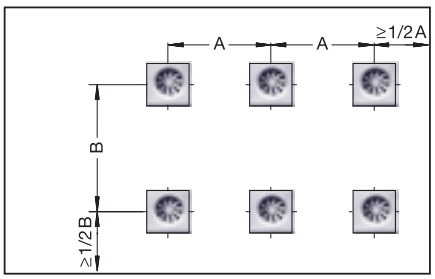
Air Flow Rate (l/s) - For multiple row arrangement

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

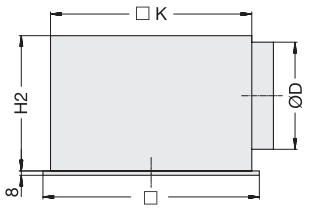
RFD - Q - D - A / 400 / 0 / 0 / P1 / RAL 9016

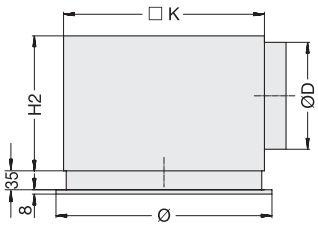
- Type
  - square: Q
  - circular: R
  - Nozzle: D
  - Collar: K
  - Top entry plenum: US
  - Plenum box: A
- Size: 400
- Specify RAL colour: RAL 9016
- 0: Standard finish powder coated to RAL 9010 (GE 50 %)[1]
- P1: Powder coating to RAL 9006 (GE 30 %)[1] Other colours to RAL… (GE 70 %)[1]

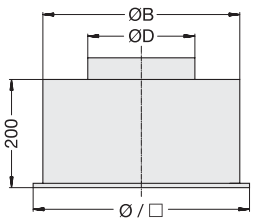
1) GE = Gloss level

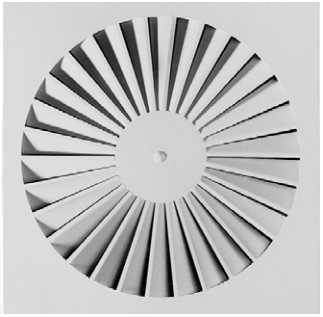
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/4/EN/--.

8.3 TROX 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

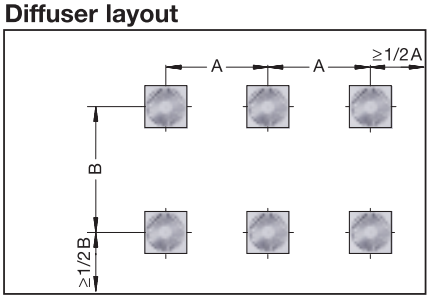
Air Flow Rate (l/s) - For multiple row arrangement

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

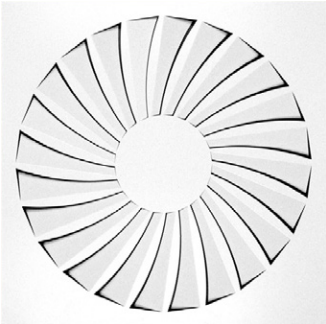
- **Type**
  - Square Q
  - Circular R
- Supply air Z
- Extract air A
- Top entry spigot V
- Side entry spigot H
- Adjustable flow rate control with single blade M
- L Spigot with lip seal
- Size: 400
- P1
  - 0 Standard finish powder coated to RAL 9010 (GE 50 %)[1]
  - P1 Powder coating to RAL 9006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

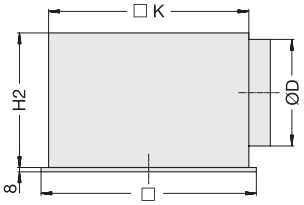
1) GE = Gloss level

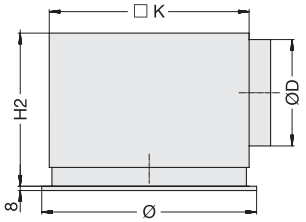
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/6/EN/--

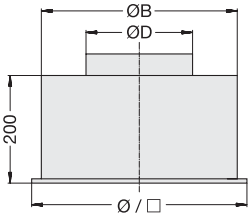
8.3 TROX SWIRL DIFFUSERS
TYPE 'TDF-SILENT AIR'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK









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

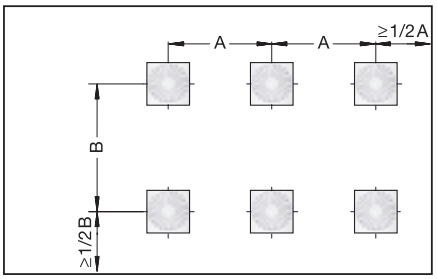
Air Flow Rate (l/s) - For multiple row arrangement

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.

These codes need not be completed for standard products

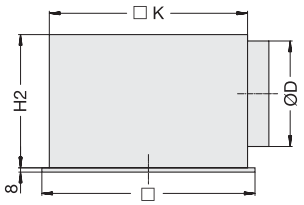
Order Code TDF-SA - Q - Z - M - L / 400 / P1 / RAL 9016

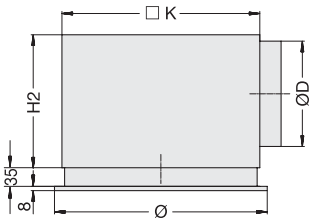
- Type
  - Square Q / Circular R
  - Supply air Z / Extract air A
  - Adjustable flow rate control with single blade M
  - Spigot with lip seal L
- Size
- Specify RAL colour
- 0 Standard finish powder coated to RAL 9010 (GE 50 %)[1]
- P1 Powder coating to RAL 9006 (GE 30 %)[1] Other colours to RAL...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

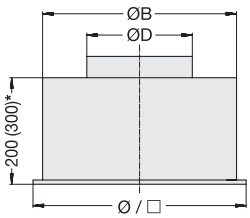
1) GE = Gloss level

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

8.3 TROX 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

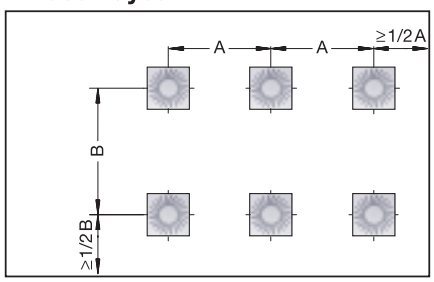
Air Flow Rate (l/s) - For multiple row arrangement

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

Size x No. of control blades

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

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

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

8.3 TROX SWIRL DIFFUSERS
TYPE 'VDL'

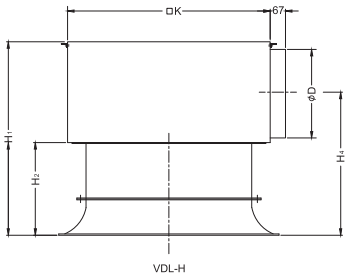
AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

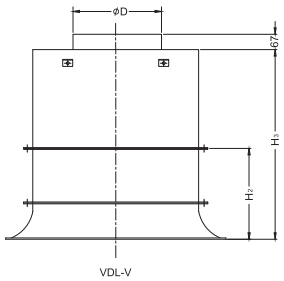
Type 'VDL-H'

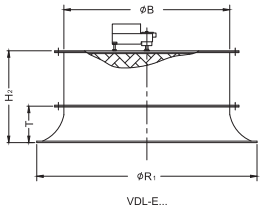
KEY FEATURES:

- 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.

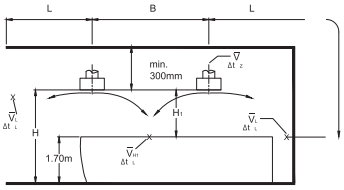
Size	B	D	D_L	H_1	H_2	H_3	H_4	K	R_1	R_2	T	n
315	318.5	248	368	483	203	425	342.5	435	464	382	63	6
400	403.5	313	450	603	238	534	420.5	500	567	464	80	6
630	633.5	398	690	848	383	748	615.5	750	871	708	125	6
800	803.5	498	853	1133	568	998	850.5	1000	1077	871	160	12







Diffuser layout



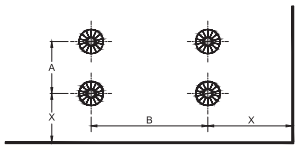


Table 1: Quick Selection for 'VDL-H' (without continuous ceiling)

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.

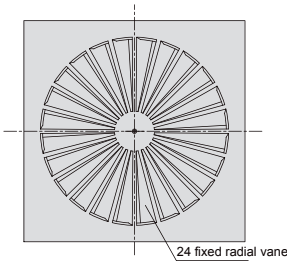
Finish
Powder coating
0 – Standard matt White in RAL 9010
P1 – Special colour

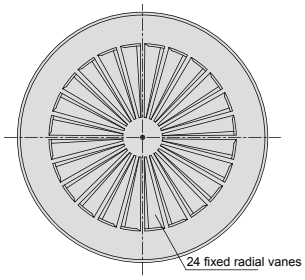
State RAL colour for 'P1' when non-standard colour is required.

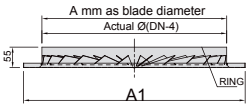
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M2.2/9/EN/--.

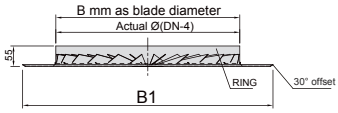
8.3 TROX SWIRL DIFFUSERS
TYPE 'TCS'

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.







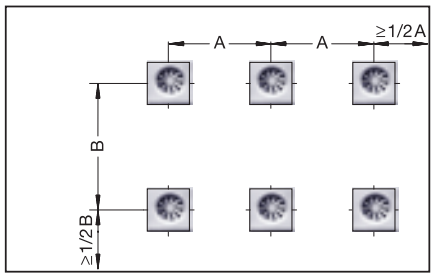


Air Flow Rate(l/s) for Multiple Rows*							
Size	B (m)	Distance between diffusers, A (m)					
		1.5	Vel m/s	2.0	Vel m/s	3.0	Vel m/s**
350	3.0	40	0.12	60	0.19	90	0.30
400		60	0.13	80	0.21	100	0.30
450		60	0.27	100	0.27	150	0.38
500		80	0.18	100	0.24	200	0.42
350	4.0	60	0.12	90	0.20	130	0.30
400		75	0.14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

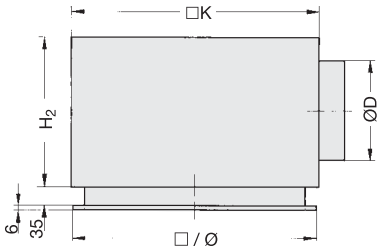
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. PI C 2.2/6. 1/EN/2

8.3 TROX SWIRL DIFFUSERS
TYPE 'ADLR'

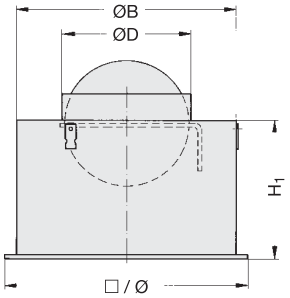
AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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.

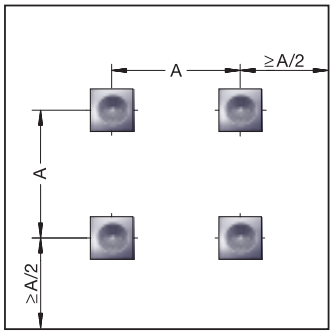
Selection valid for ceiling height = 2.7...3 m.

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

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

Specify RAL colour

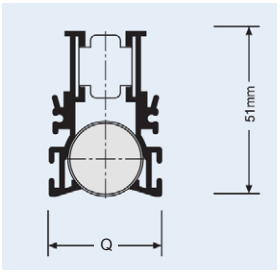
0 Standard finish powder coated to RAL 9010 (GE 50 %)[1)]

P1 Powder coating to RAL 9006 (GE 30 %)[1)] Other colours to RAL... (GE 70 %)[1)]

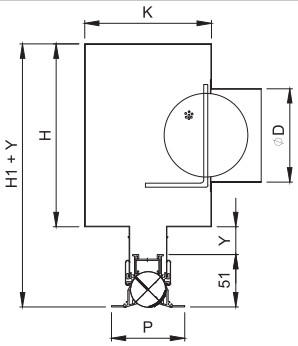
1) GE = Gloss level

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

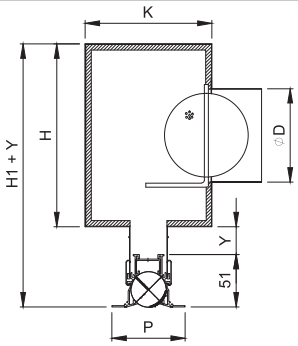
8.4 TROX SLOT DIFFUSERS
TYPE 'VSD 35'



Flangeless Slot Profile - Z4



VSD35-1…4-AK



VSD35-1…4-DK

VSD35

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

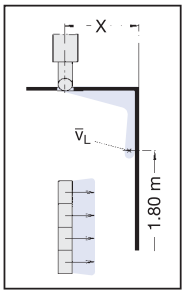
Sound power level is $L_{WA} \leqq 40$ dB(A) in all cases
Pressure drop $\Delta p_t \leqq 35$Pa

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

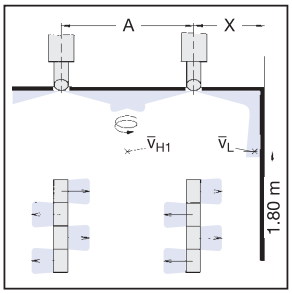
Dimensions (mm)							
No. of slots	P	Q	K	H1	H2	H	D
1	62	35	138	223	247	172	98 123
2	93	66	176	253	277	202	123 148
3	123	96	214	271	295	220	148
4	154	127	254	303	327	252	148 198

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	/	Z0	/	P1	/	RAL 9016	/	WH	/	WW

Type

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

L_1 x D x y[1)+2)]

End cape[4)]

Front without edge flange: Z4[3)]
Integral edge flange: Z0

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 %)

Specify RAL colour

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

0 black control blades
WW white control blades

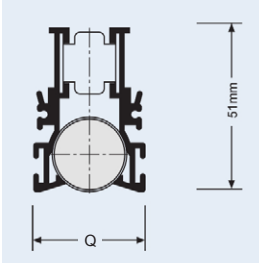
1) with concealed screw fix
if y = 0 (Standard),
further possible values for y = 30, 55, 80 and 104 mm
2) with screw fix
if y = 0 (Standard)
further possible values for y = 30, 55, 80, 105 and 129 mm
3) not with concealed slot fixture AS and DS
4) see leaflet or Internet

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

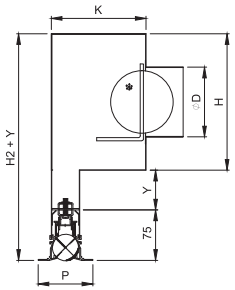
8.4 TROX SLOT DIFFUSERS
TYPE 'VSD 35'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

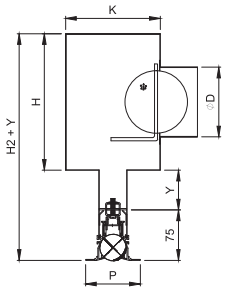
VSD35



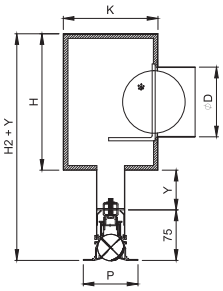
Flangeless Slot Profile - Z4



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

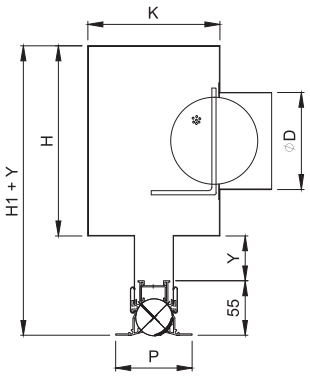
VSD35 slot diffuser with alternating horizontal discharge

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	27	14	30	17	34	19	36	18	41	20	43	20	47	25	54	15	58	21	60
2	25	41	19	45	39	52	26	56	30	60	34	65	38	68	41	81	45	86	49	90
3	24	60	38	68	36	77	40	84	46	89	51	95	57	102	63	119	68	126	74	131
4	50	81	38	80	45	104	53	98	60	106	68	109	75	117	83	142	90	148	98	154

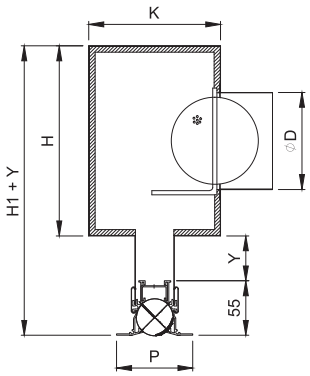
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/2.6/EN/--.

8.4 TROX SLOT DIFFUSERS
TYPE 'VSD 50'

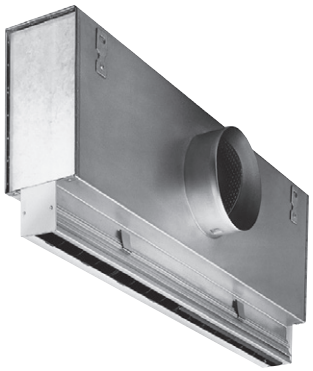
Diffuser profile without flanges



VSD50-1…2-AK



VSD50-1…2-DK



VSD50

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

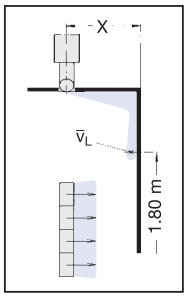
Sound power level is $L_{WA} \leqq 40$ dB(A) in all cases
Pressure drop $\Delta p_t \leqq 35$ Pa

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

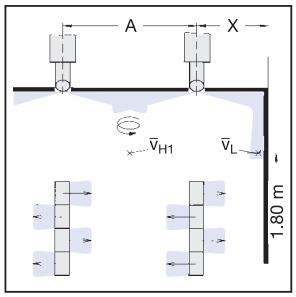
Dimensions (mm)						
No. of slots	P	K	H1	H2	H	D
1	77	138	262	286	207	123 / 148
2	123	176	302	326	247	148 / 198

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

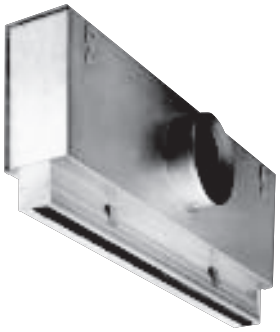
- Type
- No. of slots: 1, 2
- For plenum box constructions, see leaflet: AK, DK, AA, AS, DS
- Adjustable flow rate control: M
- Lip seal: L
- L_1 x D x y[1)+2)]
- End caps[4)]
- Without edge flange / Integrated edge flange: 000[3)], B00
- Standard finish E6-C-0: 0
- Powder coating to RAL 9010 (GE 50 %): 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

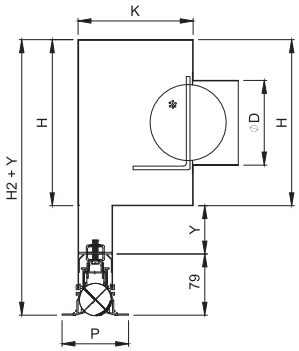
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 2/2.7/EN/--.

8.4 TROX SLOT DIFFUSERS
TYPE 'VSD 50'

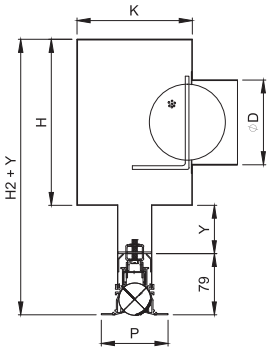
AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK



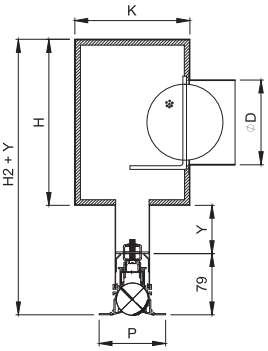
VSD50



VSD50-1…2-AA



VSD50-1…2-AS



VSD50-1…2-DS

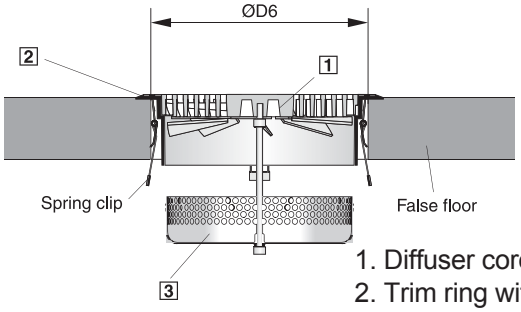
Diffuser profile without flanges

Throw distance, X (m) for VSD50 -1										
Air flow discharge in one direction only										
V̇	Unit length, L1 (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, L1 (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	
	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max	V̇min	V̇max
1	11	38	14	58	17	50	19	54	22	59	25	62	28	66	31	76	33	79	39	86
2	25	65	31	66	39	84	39	92	44	100	50	108	56	113	61	129	67	139	72	144

Typical installation detail with trim ring



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

Type 'FBA' Floor Diffuser

FB

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

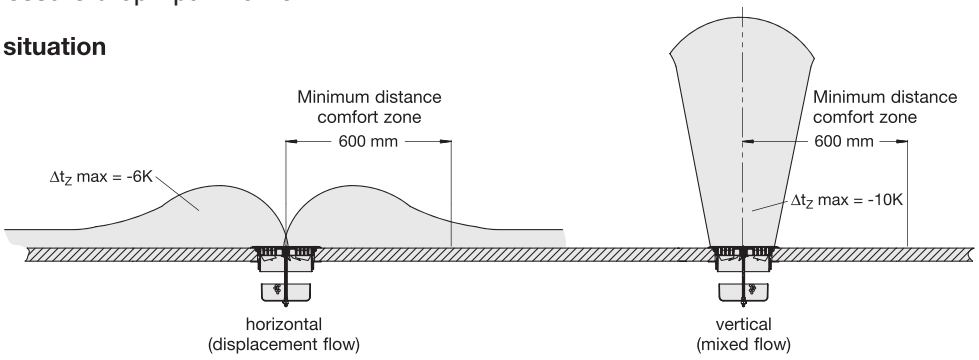
Aluminium Floor Diffuser (FBA)		
Type	Discharge setting	
	Vertical V (l/s)	Horizontal V (l/s)
FBA-150	30	17
FBA-200	37	25

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

Size 150; 200

- Standard Plastic (PA6) 0
- flame retardant (PA6-V0) V00

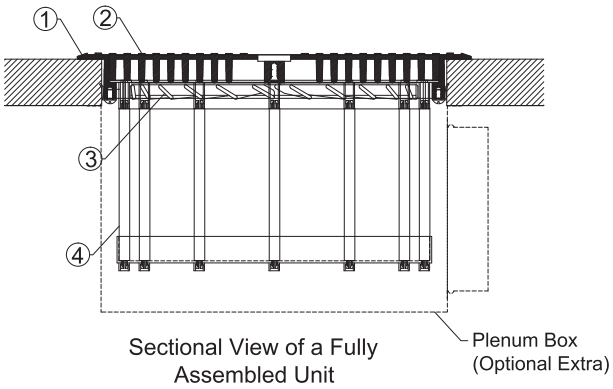
1) For orders without trim ring, a spacing ring is provided for technical performance reasons and to ensure correct height
2) For orders without adjustable swirl element, the discharge direction is vertical

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

8.5 TROX FLOOR DIFFUSERS
TYPE 'FBA/250'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

Type 'FBA/250' Floor Diffuser



Sectional View of a Fully Assembled Unit

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.

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

Pressure Drop												
Diffuser Type/Size	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

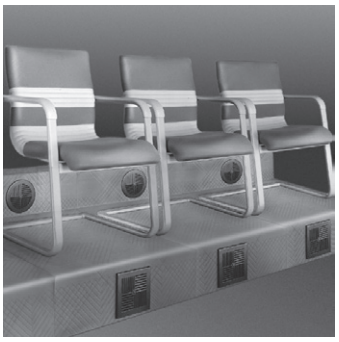
SW — Dirt trap including winged volume adjustment elements

K — Trim Flange

8.6 TROX 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).

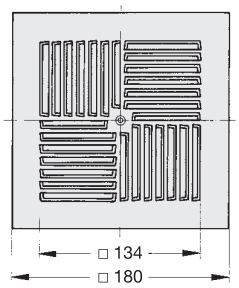
Table 1: Quick selection table of 'SD' Staircase Diffuser with sub-frame

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				

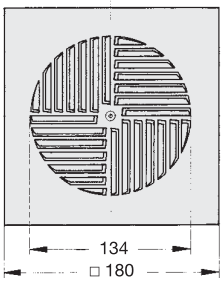
NOTE: Anticipated noise level is NC 20 assuming 8 dB room attentuation.

Options available:

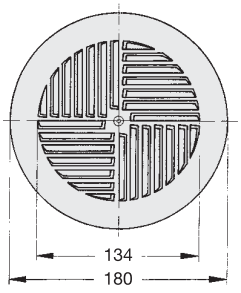
SD-Q-LQ



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

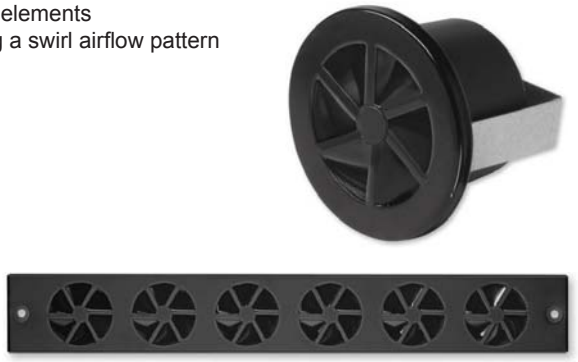
8.6 TROX STAIRCASE DIFFUSERS
TYPE 'SDRF'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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.

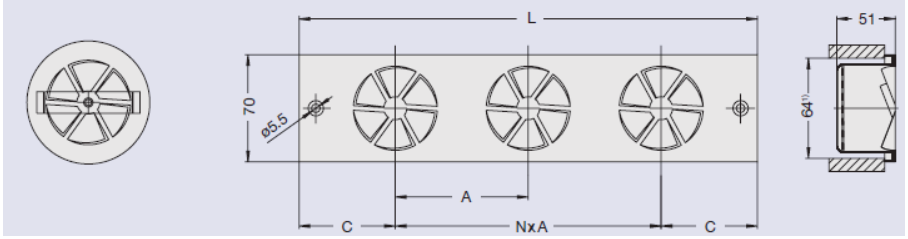
Key Features:

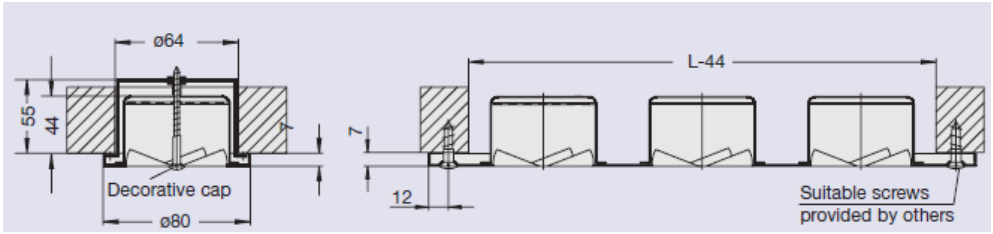
- The SDRF comprises a face plate with 1 to 6 standard stamped discharge elements
- Discharge elements are circular with fixed providing radial blades providing a swirl airflow pattern
- Draught free and silent airflow provision



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

No. of discharge elements: 1, 2, 3, 4, 5, 6

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

8.7 TROX 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.

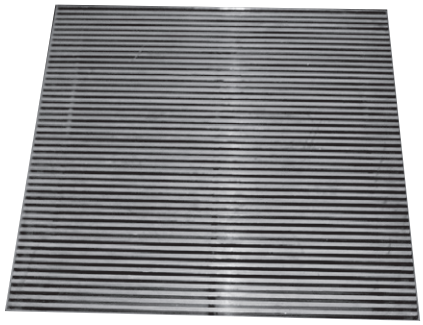
KEY FEATURES

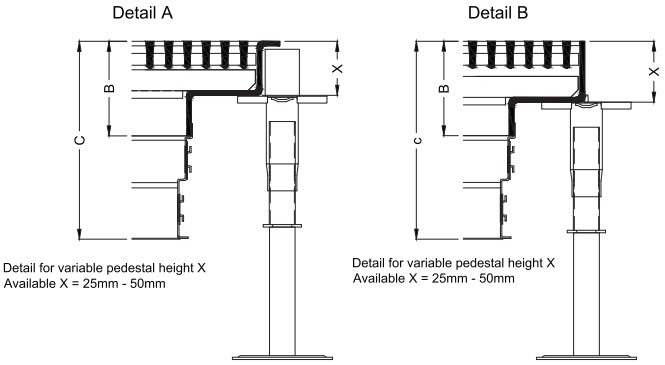
- Grille face is made from extruded aluminium with steel support frame at the back.
- Designed to suit 600 x 600 mm sq. floor tile.
- Opposed blade damper can be provided at the rear of the steel frame and is adjustable from the grille face.
- Actuator controlled motories damper can be provided

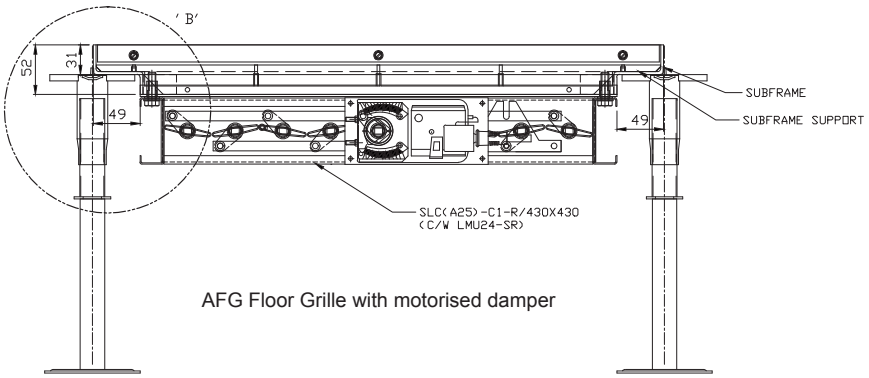
STANDARD FINISH

- 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)

8.8 TROX DISPLACEMENT DIFFUSERS

TYPE 'QLV'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

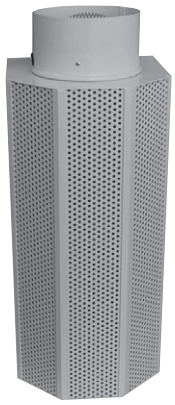


Table 1: Quick selection guide for 'QLV' Type 90°; 180° and 360° construction variants

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: O; at the bottom: U

Volume flow control damper: M

Lip seal: L[1)]

250 x 600 options:

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/--.

8.8 TROX DISPLACEMENT DIFFUSER TYPE 'QLF'

Type 'QLF' Displacement Diffuser

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

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

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...

1) Only for type QLF

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

8.8 TROX 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.

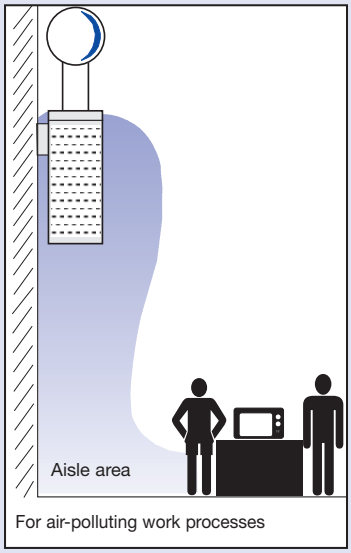
Both types come in four different sizes with a fixed height of 825 mm. Refer to the table below for more information.

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

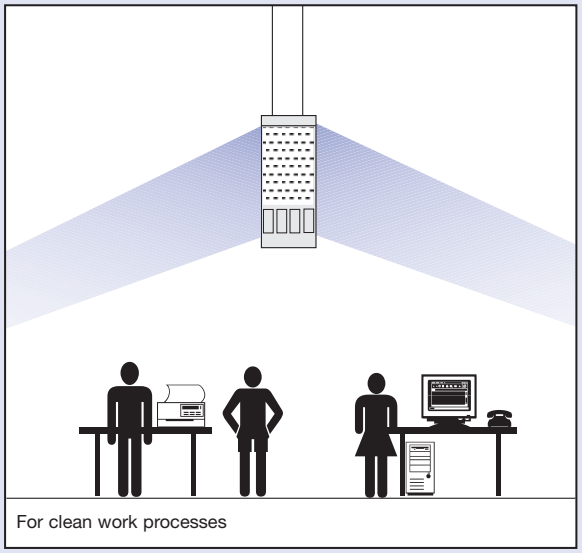
Unit size	Spigot conn. (mm)	Product Type	Air flow (l/s)	ΔP (Pa)	Throw (m) @ ΔT = -5K
250	248	QSH	230	17	2.0
		ISH	210	15	
355	353	QSH	410	16	2.2
		ISH	375	14	
450	448	QSH	635	16	2.6
		ISH	550	13	
560	558	QSH	940	17	3.0
		ISH	830	14	

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

Type QSH



Type ISH



Order Code QSH · ISH

These codes do not need to be completed for standard products

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

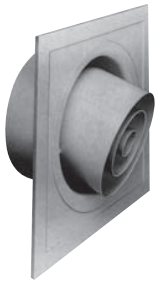
- QSH - E2: With manual adjustment (chain pull) { QSH / ISH; Electrical actuator 230 V, 50 Hz E1; Electrical actuator 24 V, 50 Hz E2; Electrical actuator 24 V, 50 Hz, 0…10 V- E3; Thermal actuator T; Bowden cable B
- 450: 250 / 355 / 450 / 560 / NW
- 0: Not used
- W00: { W00 With wall frame; K00 With 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/--.

8.9 TROX JET NOZZLES
TYPE 'AJA'

Type 'AJA' Jet Nozzles



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.

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/--.

8.9 TROX JET NOZZLES
TYPE 'TJN'

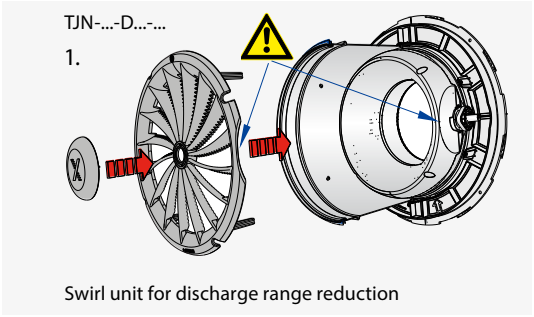
AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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

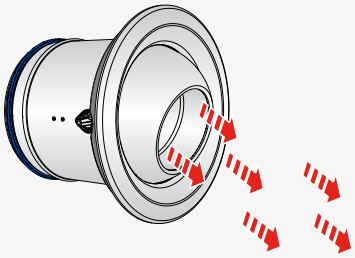
- Up to 6 dB less noise than with DUK jet nozzles due to optimised nozzle contours
- Discharge angle indication, limiting and setting (±30°) using a concealed scale
- Visible parts made of high-grade polymer in RAL white aluminium or pure white
- Easy to remove face cover ring with bayonet fixing
- 5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

Optional equipment and accessories

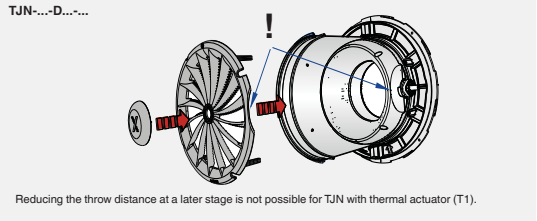
- Swirl unit for two-step reduction of the throw distance due to air control blades with unique saw tooth edges
- Compact height actuator that requires little additional space; mounted externally hence not affecting the differential pressure
- Actuator allows for integration into the central BMS
- All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



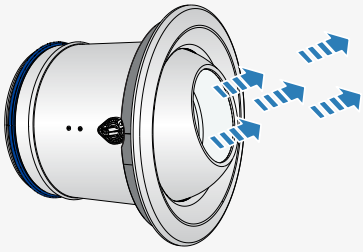
Swirl unit for discharge range reduction



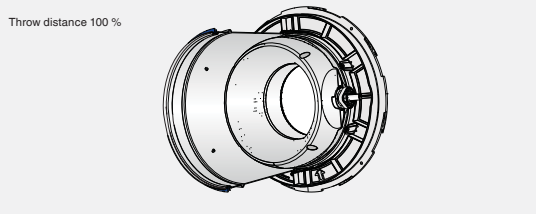
Heating

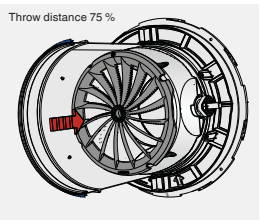


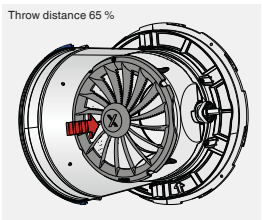
Reducing the throw distance at a later stage is not possible for TJN with thermal actuator (T1).



Cooling







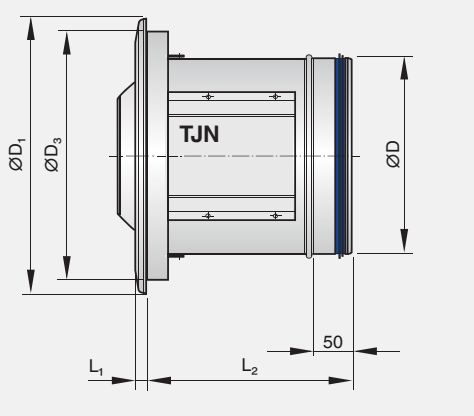
Scale for discharge

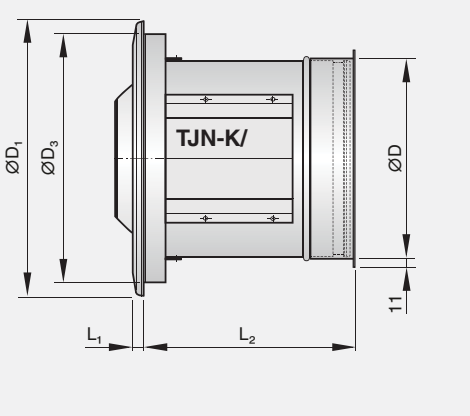
Throw distance 60% with swirl unit & cap

Throw distance 80% with swirl unit

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

8.10 TROX DRUM LOUVRES
TYPE 'AIL'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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)**.

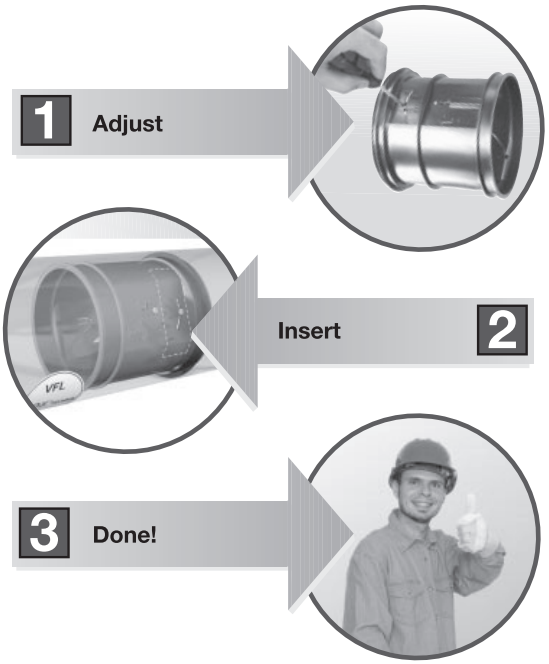
S1 – Non-standard RAL colour as per customer's requirement. **Note:** RAL Colour code should be stated as shown above.

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/--.

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.

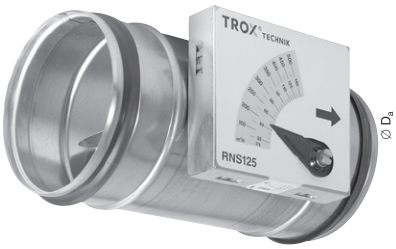
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. 5/ 9.2/ EN/--.

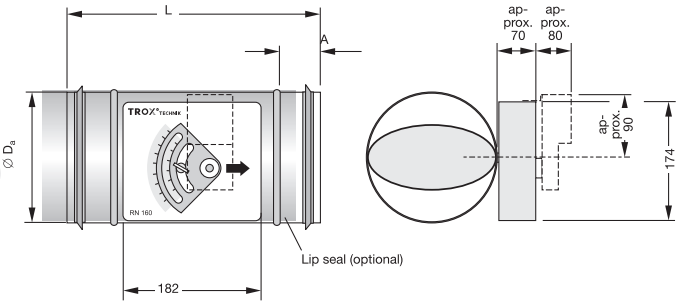
8.11 TROX DAMPERS

CONSTANT VOLUME DAMPER TYPE 'RN'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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

Setpoint re-adjustment option

RN - 00 - 00 / 125 / B50

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

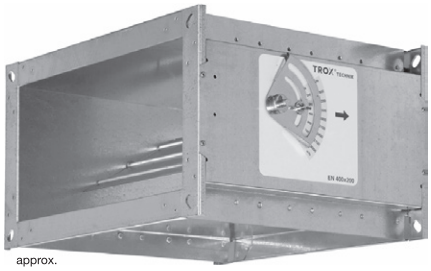
80
100
125
Size

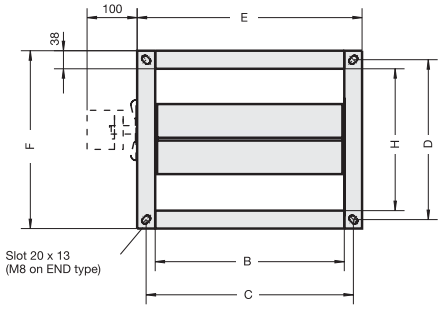
Accessories
00 without
D2 lip seal on both ends[1)]

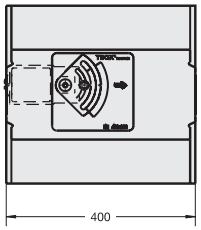
Material
Basic construction, steel, galv. 00
Surface powder-coated P1
Colour RAL 7001

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

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 B	Size mm H	Air Flow range (l/s)	V vel= 5m/s (l/s)	Δp_g = 100 Pa Air-regenerated noise without silencer Type TX L_{pA}	Δp_g = 100 Pa Air-regenerated noise with silencer L_{pA1}	Δp_g = 100 Pa Case-radiated noise without acoustic cladding L_{pA2}	Δp_g = 100 Pa Case-radiated noise with acoustic cladding L_{pA3}	Δp_g = 200 Pa Air-regenerated noise without silencer Type TX L_{pA}	Δp_g = 200 Pa Air-regenerated noise with silencer L_{pA1}	Δp_g = 200 Pa Case-radiated noise without acoustic cladding L_{pA2}	Δp_g = 200 Pa Case-radiated noise with acoustic cladding 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

Type
Volume flow controller with acoustic cladding
EN
END

B x H

Actuators
See leaflet

8.11 TROX DAMPERS

CONSTANT VOLUME DAMPER 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.

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

Type 'SLC' Damper

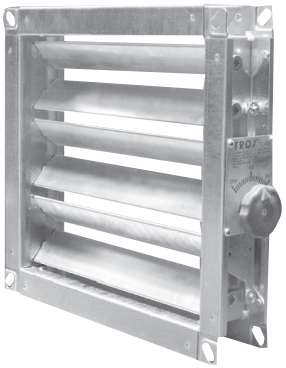


Table1: Quick selection table for 'SLC' damper

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/--.

Type 'UL-1' Pressure Relief Damper

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

Damper Size (mm)		Recommended Max. Air Flow (m³/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

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.

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/--.

8.11 TROX DAMPERS

BACK DRAFT DAMPER TYPE 'BDD'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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

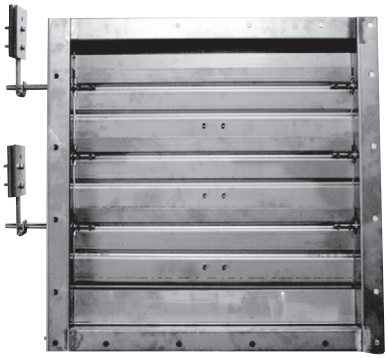
Air velocity through the damper should be limited to 10 m/s.

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

Duct size (in mm)

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.

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

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.

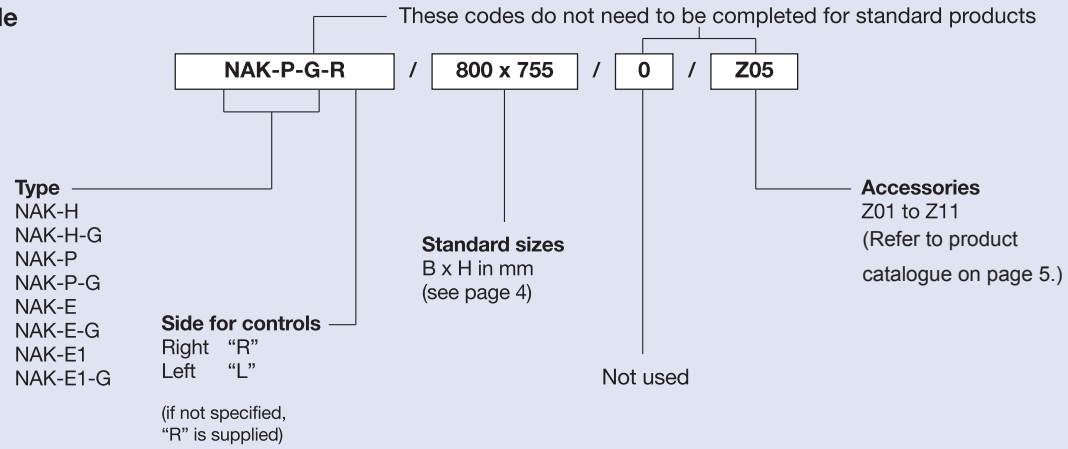
Anticipated maximum pressure drop across the damper at 8 m/s is 60 Pa.

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.

Table 1: Standard damper sizes

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

Order code



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

8.11 TROX DAMPERS

MARINE FIRE AND 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.

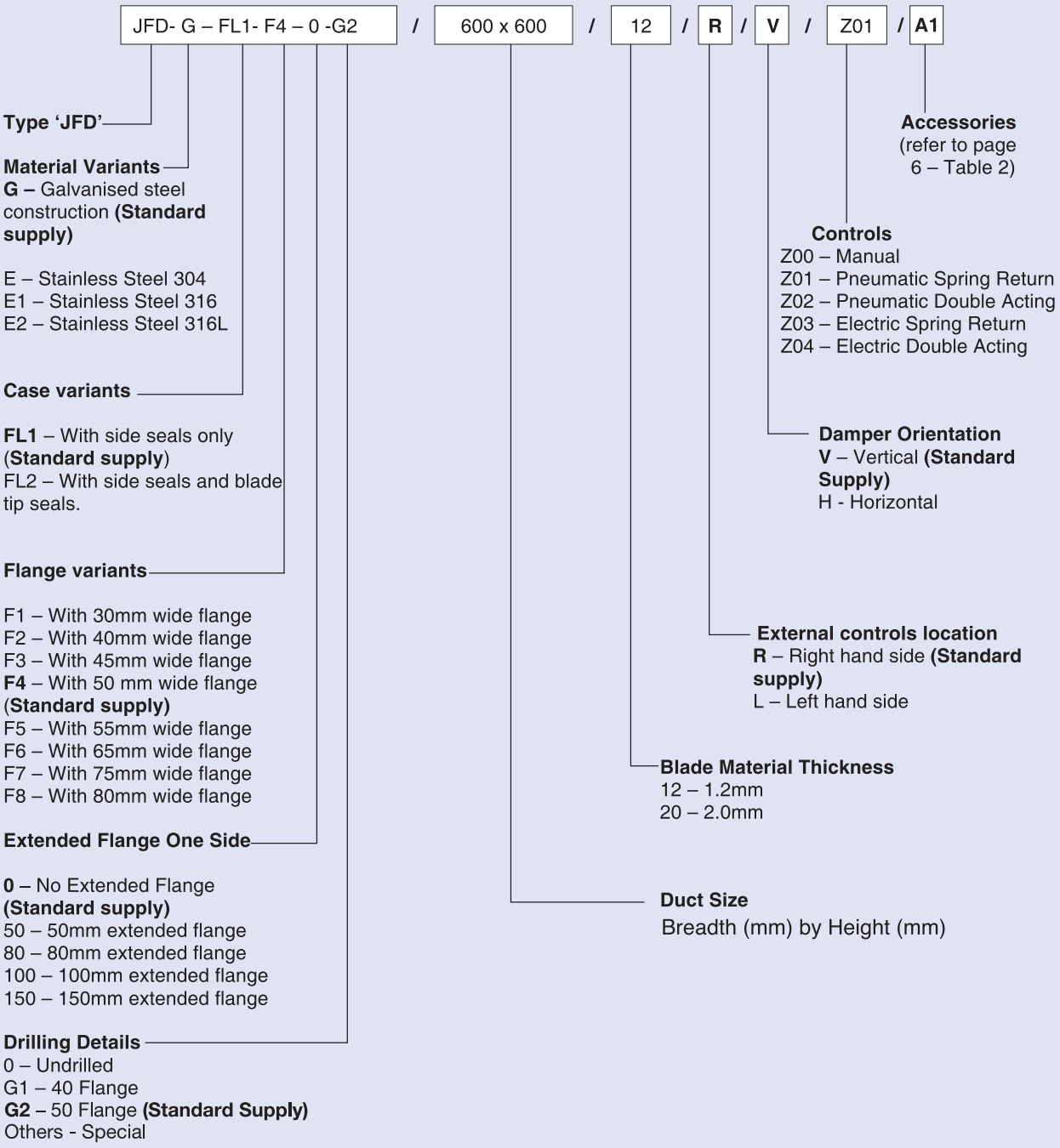
Type 'JFD' Marine Fire Damper

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.



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

8.12 TROX VAV BOXES

SINGLE DUCT THERMINAL UNIT 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.

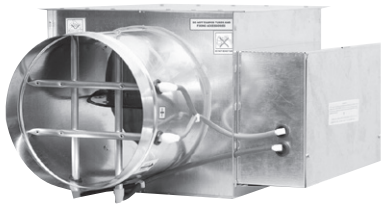
Volume flow rates:

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

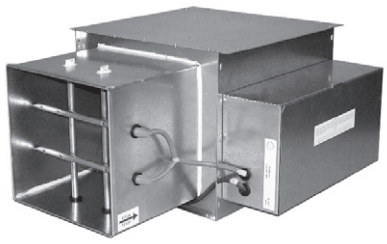
Controller Type:
10 – Compact standalone controller.
2X – LONMark compliant controller.
3X – BACNet compliant controller.

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

Type 'TVB-A'



Type '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%.

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

8.12 TROX VAV BOXES
TYPE 'TVB/TVB-A-SSP'

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.

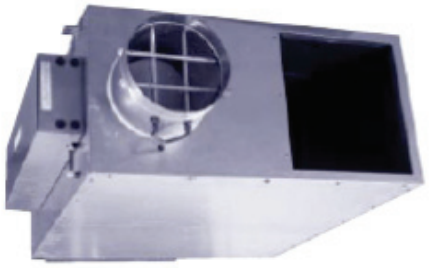
Note: For further details, please refer to TROX KLIMA Asia Pacific catalogue Ref. M 5/1.2/EN/--.

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 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

Product Type — TFP

Reheat
Electric reheat coil E
Hot water reheat coil H

Filter
Throwaway or nor entry C

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

Controller — BC0

Mininum primary air volume l/s — 105

Maximum primary air volume l/s — 300

Fan volume l/s — 400

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

8.12 TROX VAV BOXES

PARALLEL FAN ASSISTED VAV BOX TYPE 'TCP'

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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

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

8.12 TROX VAV BOXES
TYPE 'TVL' VARYCONTROL VAV

Equipment features and characteristics

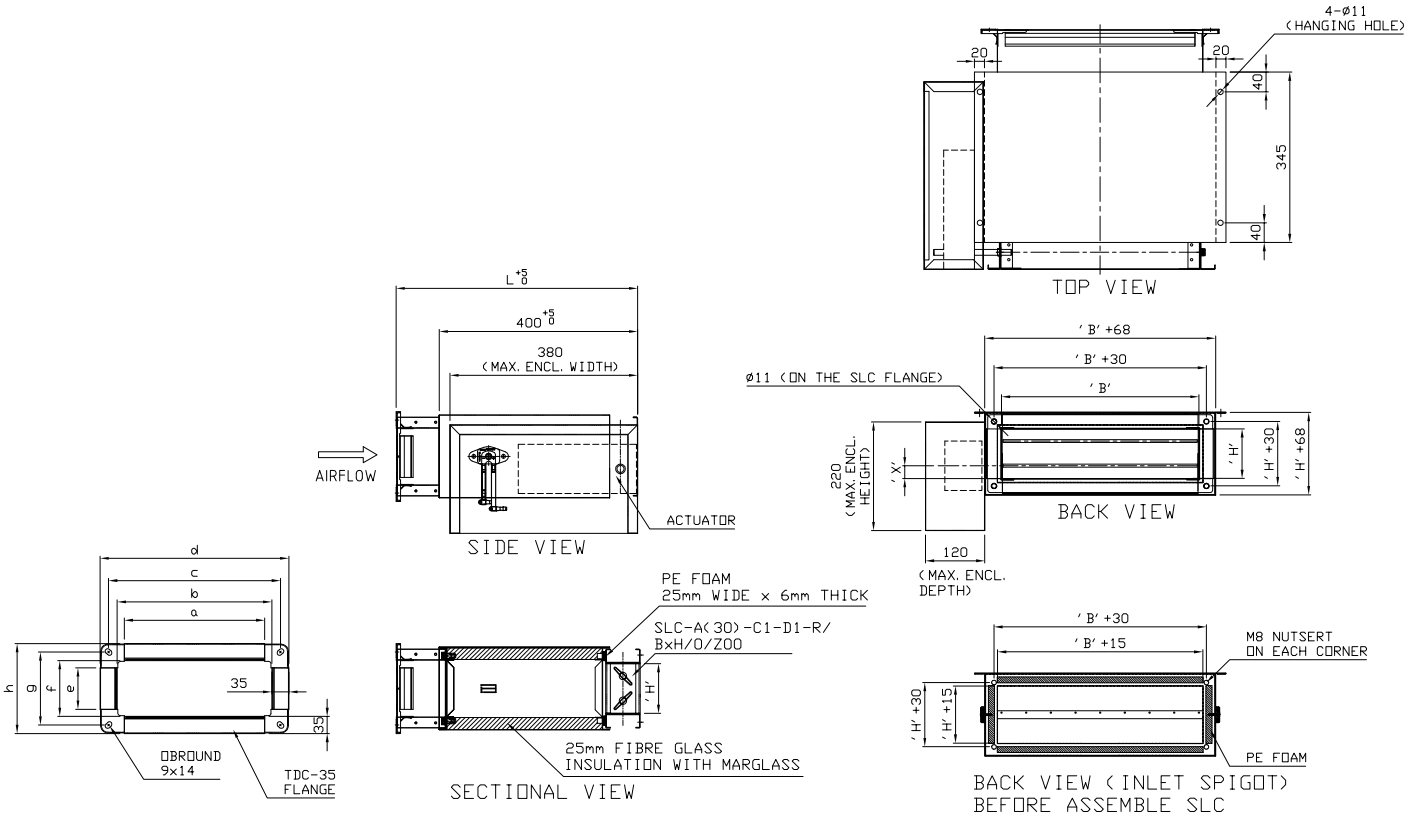
- TROX Vary Control VAV type 'TVL' volume flow control unit is suitable for variable or constant air volume control
- Multiple aerofoil blade
- Suitable for small or large supply or extract air volumes
- Electronic volume flow control
- Differential pressure range 20 Pa to 1000 Pa
- Electric or hot water 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.

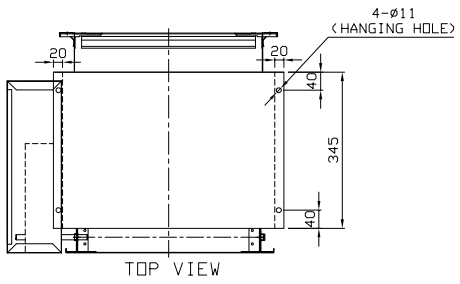
(Height 100mm)

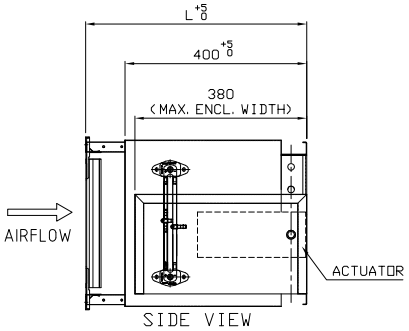
Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
200	100	25	184	213	248	283	84	113	148	183	488
300	100	25	284	313	348	383	84	113	148	183	488
400	100	25	384	413	448	483	84	113	148	183	488
500	100	25	484	513	548	583	84	113	148	183	488
600	100	25	584	613	648	683	84	113	148	183	488

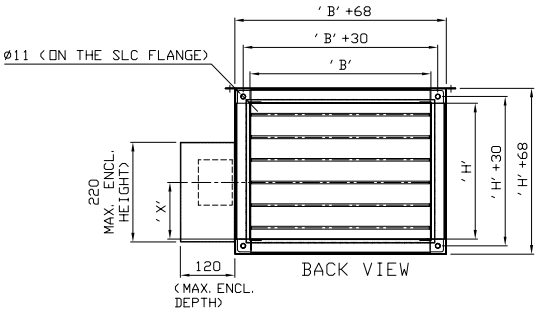


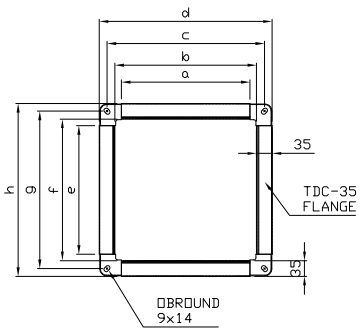
(Height 200mm to 400mm)

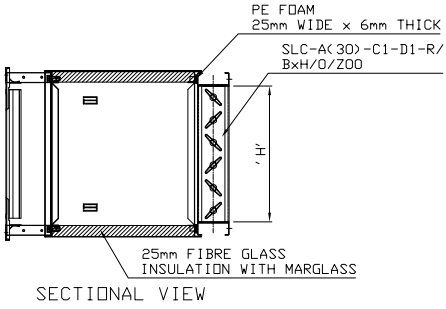
Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
200	200	125	184	213	248	283	184	213	248	283	488
300	200	125	284	313	348	383	184	213	248	283	488
400	200	125	384	413	448	483	184	213	248	283	488
500	200	125	484	513	548	583	184	213	248	283	488
600	200	125	584	613	648	683	184	213	248	283	488
700	200	125	684	713	748	783	184	213	248	283	488
800	200	125	784	813	848	883	184	213	248	283	488
300	300	125	284	313	348	383	284	313	348	383	488
400	300	125	384	413	448	483	284	313	348	383	488
500	300	125	484	513	548	583	284	313	348	383	488
600	300	125	584	613	648	683	284	313	348	383	488
700	300	125	684	713	748	783	284	313	348	383	488
800	300	125	784	813	848	883	284	313	348	383	488
900	300	125	884	913	949	983	284	313	348	383	488
1000	300	125	984	1013	1048	1083	284	313	348	383	488
400	400	225	384	413	448	483	384	413	448	483	488
500	400	225	484	513	548	583	384	413	448	483	488
600	400	225	584	613	648	683	384	413	448	483	488
700	400	225	684	713	748	783	384	413	448	483	488
800	400	225	784	813	848	883	384	413	448	483	488
900	400	225	884	913	948	983	384	413	448	483	488
1000	400	225	984	1013	1048	1083	384	413	448	483	488

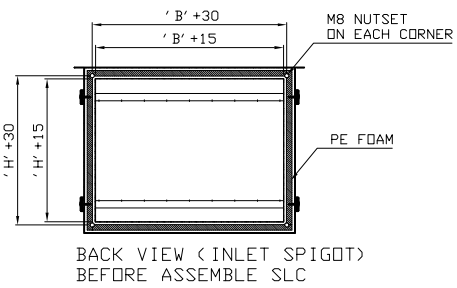






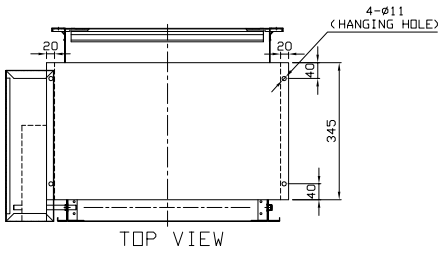


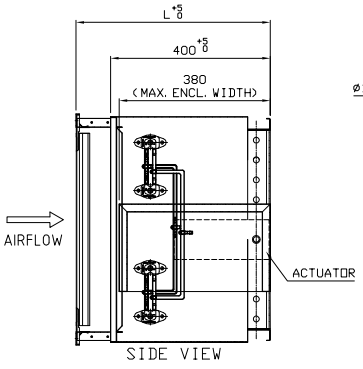


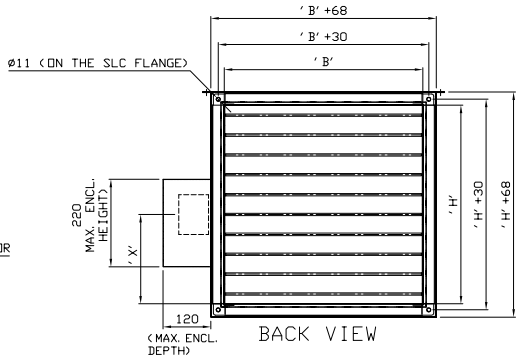


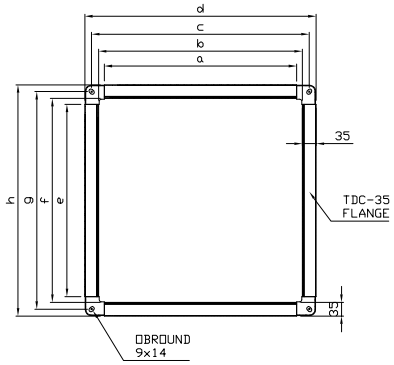
(Height 500mm to 1000mm)

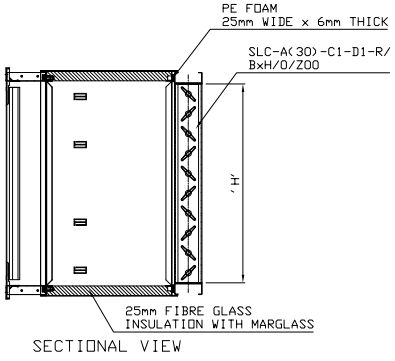
Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
500	500	225	484	513	548	583	484	513	548	583	488
600	500	225	584	613	648	683	584	513	548	583	488
700	500	225	684	713	748	783	684	513	548	583	488
800	500	225	784	813	848	883	784	513	548	583	488
900	500	225	884	913	948	983	884	513	548	583	488
1000	500	225	984	1013	1048	1083	984	513	548	583	488
600	600	325	584	613	648	683	584	613	648	683	488
700	600	325	684	713	748	783	684	613	648	683	488
800	600	325	784	813	848	883	784	613	648	683	488
900	600	325	884	913	948	983	884	613	648	683	488
1000	600	325	984	1013	1048	1083	984	613	648	683	488
700	700	325	684	713	748	783	684	713	748	783	488
800	700	325	784	813	848	883	784	713	748	783	488
900	700	325	884	913	948	983	884	713	748	783	488
1000	700	325	984	1013	1048	1083	984	713	748	783	488
800	800	325	784	813	848	883	784	813	848	883	488
900	800	325	884	913	948	943	884	813	848	883	488
1000	800	325	984	1013	1048	1043	984	813	848	883	488
900	900	425	884	913	948	983	884	913	948	983	488
1000	900	425	984	1013	1048	1083	094	913	948	983	488
1000	1000	425	984	1013	1048	1083	984	1013	1048	1083	488

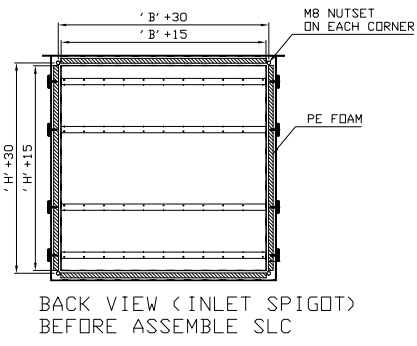










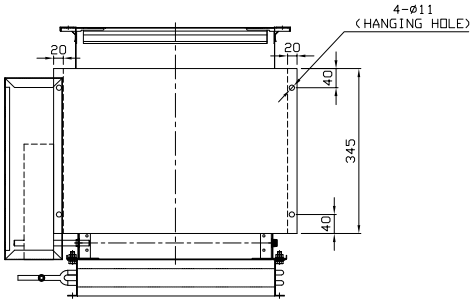


8.12 TROX VAV BOXES

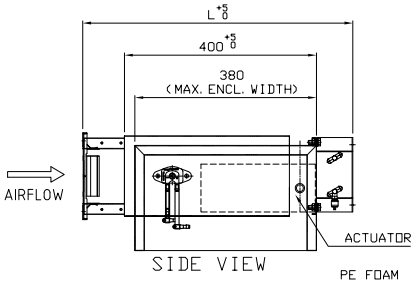
TYPE 'TVL' VAV BOX WITH HOT WATER COIL

(Height 100mm)

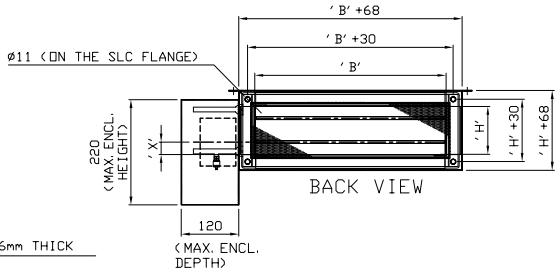
Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
200	100	25	184	213	248	283	84	113	148	183	565
300	100	25	284	313	348	383	84	113	148	183	565
400	100	25	384	413	448	483	84	113	148	183	565
500	100	25	484	513	548	583	84	113	148	183	565
600	100	25	584	613	648	683	84	113	148	183	565



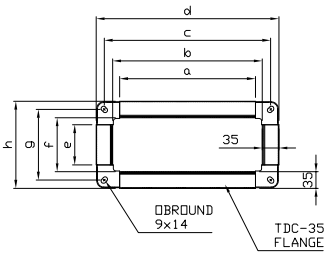
TOP VIEW

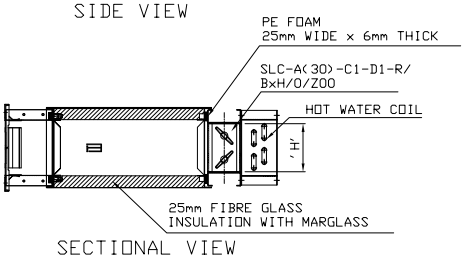


SIDE VIEW

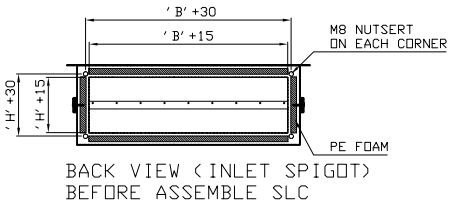


BACK VIEW





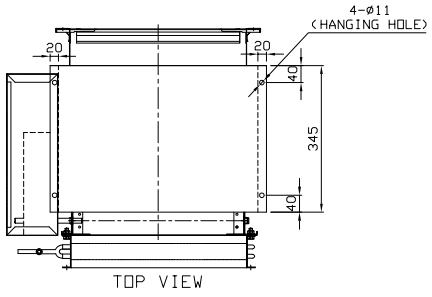
SECTIONAL VIEW

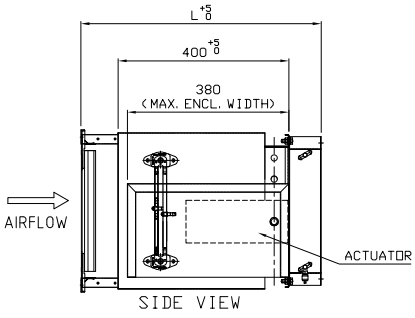


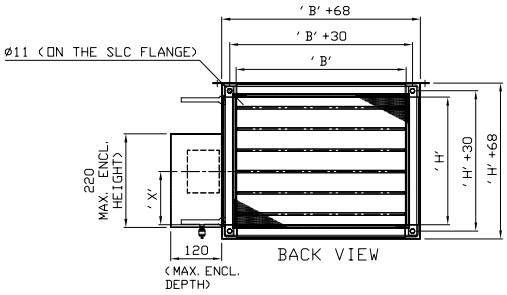
BACK VIEW (INLET SPIGOT)
BEFORE ASSEMBLE SLC

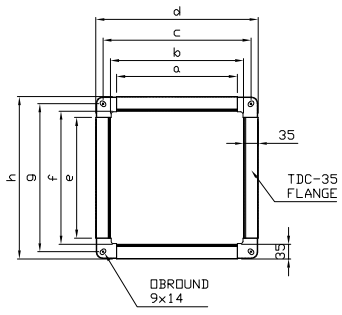
(Height 200mm to 400mm)

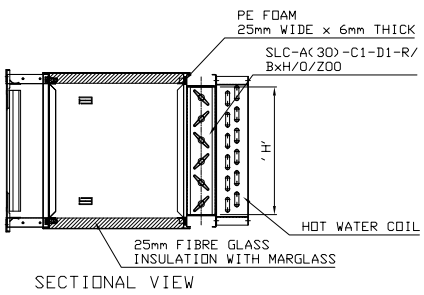
Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
200	200	125	184	213	248	283	184	213	248	283	565
300	200	125	284	313	348	383	184	213	248	283	565
400	200	125	384	413	448	483	184	213	248	283	565
500	200	125	484	513	548	583	184	213	248	283	565
600	200	125	584	613	648	683	184	213	248	283	565
700	200	125	684	713	748	783	184	213	248	283	565
800	200	125	784	813	848	883	184	213	248	283	565
300	300	125	284	313	348	383	284	313	348	383	565
400	300	125	384	413	448	483	284	313	348	383	565
500	300	125	484	513	548	583	284	313	348	383	565
600	300	125	584	613	648	683	284	313	348	383	565
700	300	125	684	713	748	783	284	313	348	383	565
800	300	125	784	813	848	883	284	313	348	383	565
900	300	125	884	913	949	983	284	313	348	383	565
1000	300	125	984	1013	1048	1083	284	313	348	383	565
400	400	225	384	413	448	483	384	413	448	483	565
500	400	225	484	513	548	583	384	413	448	483	565
600	400	225	584	613	648	683	384	413	448	483	565
700	400	225	684	713	748	783	384	413	448	483	565
800	400	225	784	813	848	883	384	413	448	483	565
900	400	225	884	913	948	983	384	413	448	483	565
1000	400	225	984	1013	1048	1083	384	413	448	483	565

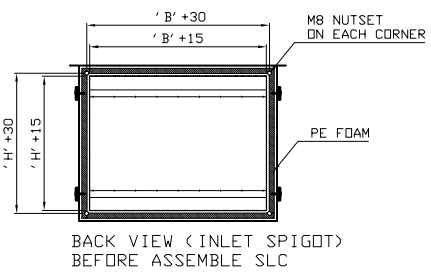










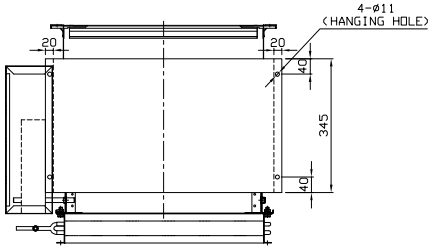


8.12 TROX VAV BOXES

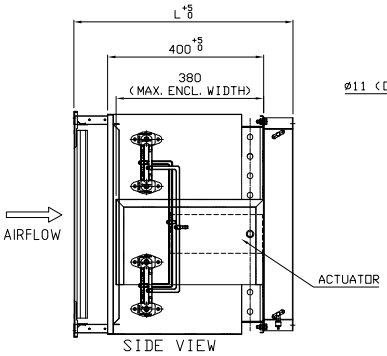
TYPE 'TVL' VAV BOX WITH HOT WATER COIL

(Height 500mm to 1000mm)

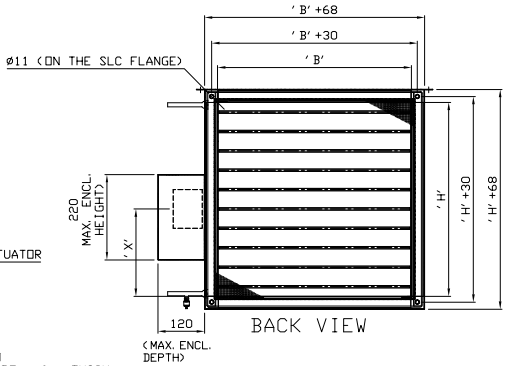
Damper Width B	Damper Height H	Shaft Height X	a	b	c	d	e	f	g	h	L
500	500	225	484	513	548	583	484	513	548	583	565
600	500	225	584	613	648	683	584	513	548	583	565
700	500	225	684	713	748	783	684	513	548	583	565
800	500	225	784	813	848	883	784	513	548	583	565
900	500	225	884	913	948	983	884	513	548	583	565
1000	500	225	984	1013	1048	1083	984	513	548	583	565
600	600	325	584	613	648	683	584	613	648	683	565
700	600	325	684	713	748	783	684	613	648	683	565
800	600	325	784	813	848	883	784	613	648	683	565
900	600	325	884	913	948	983	884	613	648	683	565
1000	600	325	984	1013	1048	1083	984	613	648	683	565
700	700	325	684	713	748	783	684	713	748	783	565
800	700	325	784	813	848	883	784	713	748	783	565
900	700	325	884	913	948	983	884	713	748	783	565
1000	700	325	984	1013	1048	1083	984	713	748	783	565
800	800	325	784	813	848	883	784	813	848	883	565
900	800	325	884	913	948	943	884	813	848	883	565
1000	800	325	984	1013	1048	1043	984	813	848	883	565
900	900	425	884	913	948	983	884	913	948	983	565
1000	900	425	984	1013	1048	1083	094	913	948	983	565
1000	1000	425	984	1013	1048	1083	984	1013	1048	1083	565



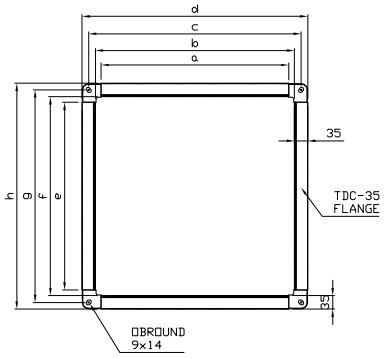
TOP VIEW

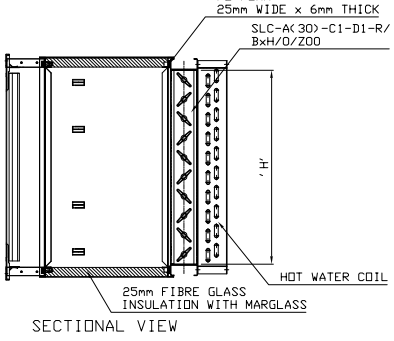


SIDE VIEW

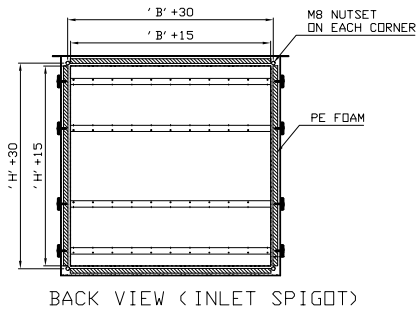


BACK VIEW





SECTIONAL VIEW



BACK VIEW (INLET SPIGOT)
BEFORE ASSEMBLE SLC

Leakage flow and sound power level, TVL in shut – off position						
Dimensions B x H (mm) mm	ΔP_g = 100 Pa		ΔP_g = 200 Pa		ΔP_g = 500 Pa	
	V_L In l/s	L_{WAL} in dBA	V_L In l/s	L_{WAL} in dBA	V_L In l/s	L_{WAL} in dBA
200 x 100	9	39	13	47	20	57
300	9	41	13	49	21	59
400	10	42	14	50	22	60
500	11	43	16	51	25	61
600	13	44	18	52	28	62
200 x 200	10	42	14	50	22	60
300	11	44	16	52	25	62
400	13	45	18	53	28	63
500	14	45	20	53	32	63
600	16	46	22	54	35	64
700	17	47	25	55	39	65
800	19	48	27	56	42	66
300 x 300	15	45	21	53	33	63
400	17	46	24	54	38	64
500	20	47	28	55	44	65
600	22	48	31	56	49	66
700	24	49	34	57	53	67
800	25	50	35	58	56	68
900	26	49	37	57	59	67
1000	27	50	39	58	61	68
400 x 400	22	48	32	56	50	66
500	25	49	35	57	56	67
600	27	50	39	58	61	68
700	30	49	43	57	68	67
800	34	50	47	58	75	68
900	35	51	50	59	79	69
1000	37	51	52	59	83	69
500 x 500	29	50	41	58	65	68
600	32	50	46	58	72	68
700	35	50	49	58	78	68
800	38	51	53	59	84	69
900	40	51	57	59	90	69
1000	43	52	61	60	96	70
600 x 600	36	51	51	59	80	69
800	44	52	62	60	98	70
1000	51	53	73	61	115	71
800 x 800	54	53	76	61	120	71
1000	65	54	92	62	145	72
1000 x 1000	76	55	108	63	170	73

8.12 TROX VAV BOXES

TYPE 'TVL' 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

8.12 TROX VAV BOXES
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

8.12 TROX VAV BOXES

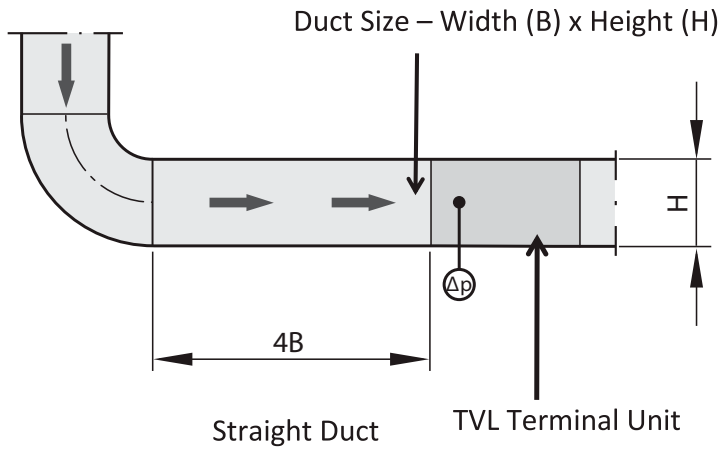
TYPE 'TVL' QUICK SELECTION DATA

Quick selection table – sound pressure level in dB (A)							
B x H mm	V m/s	Δ P_g = 100 Pa		Δ P_g = 200 Pa		Δ P_g = 500 Pa	
		Air Generated Noise LpA	Case Radiated Noise LpA_1	Air Generated Noise LpA	Case Radiated Noise LpA_1	Air Generated Noise LpA	Case Radiated Noise LpA_1
600 x 100	2	43	30	49	35	60	46
	4	44	34	50	39	60	48
	7	44	39	51	43	59	51
	10	45	43	51	46	59	54
600 x 200	2	43	32	49	38	60	48
	4	43	37	50	42	59	50
	7	44	42	50	46	58	54
	10	44	45	50	49	58	57
600 x 300	2	42	33	49	39	60	49
	4	43	38	49	44	59	52
	7	43	43	50	48	58	56
	10	44	47	50	51	58	60
600 x 400	2	42	34	49	40	60	50
	4	43	39	49	45	58	53
	7	43	45	49	49	58	58
	10	44	49	48	50	59	62
600 x 500	2	42	35	48	41	59	51
	4	42	40	49	46	58	55
	7	43	46	49	50	58	59
	10	44	50	48	51	59	63
600 x 600	2	42	36	48	42	59	52
	4	42	41	49	46	58	55
	7	43	46	49	51	58	60
	10	44	50	48	52	59	64
1000 x 800	2	41	39	48	45	59	55
	4	42	45	48	50	58	60
	7	43	50	49	55	59	66
	10	44	54	47	55	61	70
1000x 1000	2	41	40	47	46	58	56
	4	42	46	48	51	58	62
	7	43	51	48	56	59	68
	10	44	56	47	56	61	72

Installation Guide
There should be at least 4B length (i.e., 4 times the duct width) of straight duct before the TVL terminal unit. Refer to Figure No.1.

Duct connections on the inlet and out of the TVL unit should be provided with 30mm TDC flanges.

Figure No.1: Installation requirement



TVL	"E - 2 or 4"	B x H	00	0	40 – 380 l/s

Product Code

E - Electric heater
2 - 2-row water coil
4 - 4-row water coil

Unit Size
B (mm) x H (mm)

Design flow range
Vmin and Vmax (in l/s)

Pressure Transducer
0 – None (standard)
1 – With pressure Transducer

Controls Options
0 – None

8.13 TROX
PRODUCT SECTION CHECK LIST

AIRFOIL GRILLES DUCT FITTINGS
TROX® TECHNIK

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									