

**TID**

Vertical connection  
Vertical connection



**TID**

Horizontal connection  
Horizontal connection



**TID**

Vertical connection with  
perforated standard metal ceiling  
tile

Vertical connection with  
perforated standard metal ceiling  
tile



**TID**

Horizontal connection with  
perforated standard metal ceiling  
tile or factory-made perforated  
plate diffuser face

Horizontal connection with  
perforated standard metal ceiling  
tile or factory-made perforated  
plate diffuser face

**TID**

**NON-VISIBLE AIR TERMINAL DEVICE FOR COMBINATION  
WITH FINELY PERFORATED STANDARD METAL CEILING  
TILES**

These swirl diffusers allow for a seamless ceiling appearance without any visual interruptions

- Invisible due to the black coated functional unit located on the rear of the diffuser face or ceiling tile
- Flexible combination options with various perforated standard metal ceiling tiles or a factory-made perforated plate diffuser face
- Maximum comfort due to swirling air distribution, swift reduction of supply air velocities and temperature differences
- Easy installation, with either plenum box or direct air connection

**APPLICATION**



Application

- Type TROX INVISIBLE DIFFUSER (TID) ceiling swirl diffusers as supply air and extract air diffusers for use in ventilation and air conditioning systems

- For installation in comfort and industrial zones
- Can be combined with perforated standard metal ceiling tiles, but without acoustic fleece or factory-made perforated plate diffuser face (LBK or LBS)
- The functional unit installation is not visible, which is why it is particularly suitable as an attractive design element for building owners and architects with demanding aesthetic requirements
- Horizontal swirling supply air discharge for mixed flow ventilation
- The efficient swirl creates high induction levels, thereby rapidly reducing the temperature difference and airflow velocity (supply air variant)
- For variable and constant volume flows
- For supply air to room air temperature differences from  $-12$  to  $+10$  K
- For room heights up to 4 m (lower edge of suspended ceiling)
- For all types of ceiling systems, particularly for standard metal ceilings with perforated standard ceiling tiles (free cross section  $\geq 15$  %)

#### Special characteristics

- Inconspicuous or non-visible swirl diffuser
- Installation behind on-site perforated standard ceiling tile, without affecting the appearance of the ceiling, ceiling tile thickness must be  $\leq 1$  mm, preferably  $\leq 0.7$  mm
- Optionally with factory-made perforated plate diffuser face, to cover the functional unit consisting of discharge nozzle, swirling element and spigot
- Functional unit always dip coated black
- Non-visible installation of technical components

#### Nominal sizes

- 300, 400, 600, 625
- $\varnothing$ : 125, 160, 200, 250, 315

## DESCRIPTION



### Variants

#### Connection

- Vertical: In the case of a vertical connection, a spigot is attached to the discharge nozzle; it can be mounted directly to the on-site duct network. Suspension lugs are attached to the spigot to retain the dead load of the air diffuser
- Horizontal: In the case of a horizontal connection, the TID air diffuser is combined with a suitable Type AK-Uni plenum box
- Variants with a perforated plate diffuser face (LBK and LBS) are only available with plenum boxes

#### Perforated plate diffuser face

- Without perforated plate diffuser face: This variant is suitable for installation behind standard metal ceiling tiles perforated on site (free cross section  $\geq 15$  %), which must be  $\leq 1$  mm thick, and ideally  $\leq 0.7$  mm thick
- LBK – clamped perforated plate diffuser face: A perforated plate diffuser face with a perforation of RV 6.0–8.0 with a free cross section of approx. 51 % is included in the supply package ex works; the perforated plate diffuser face is attached to the discharge nozzle by means of clamps; this variant is particularly suitable for insertion in T-bar ceilings and is only available with a plenum box; the diffuser face is permanently connected to the plenum box
- LBS – screwed perforated plate diffuser face: A perforated plate diffuser face with a perforation of RV 6.0–8.0 with a free cross section of approx. 51 % is included in the supply package ex works; the perforated plate diffuser face is attached to the discharge nozzle with lugs at the edges; this variant is particularly suitable for direct installation below suspended ceilings and only available with a plenum box; the air diffuser is secured to the cross bar in the plenum box with the central fixing screw. The entire air diffuser can be removed to access the plenum box behind it up to the equalising element, e.g. for cleaning

### Attachments

#### Perforated plate diffuser face

- Without perforated plate diffuser face: This variant is suitable for installation behind standard metal ceiling tiles perforated on site (free cross section  $\geq 15$  %), which must be  $\leq 1$  mm thick, and ideally  $\leq 0.7$  mm thick
- LBK – clamped perforated plate diffuser face: A perforated plate diffuser face with a perforation of RV 6.0–8.0 with a free cross section of approx. 51 % is included in the supply package ex works; the perforated plate diffuser face is attached to the discharge nozzle by means of clamps; this variant is particularly suitable for insertion in T-bar ceilings and is only available with a plenum box; the diffuser face is permanently connected to the plenum box
- LBS – screwed perforated plate diffuser face: A perforated plate diffuser face with a perforation of RV 6.0–8.0 with a free cross section of approx. 51 % is included in the supply package ex works; the perforated plate diffuser face is attached to the discharge nozzle with lugs at the edges; this variant is particularly suitable for direct installation below suspended ceilings and only available with a plenum box; the air diffuser is secured to the cross bar in the plenum box with the central fixing screw. The entire air diffuser can be removed to access the plenum box behind it up to the equalising element, e.g. for cleaning

### Attachments

- M: Damper blade for volume flow rate balancing
- MN: Pressure tap and cord-operated damper blade for volume flow rate balancing with the diffuser face in place

### Materials and surfaces

- Discharge nozzle, swirling element, spigot and optional factory-made perforated plate diffuser face made from galvanised sheet steel
- Perforated plate diffuser face, powder-coated, RAL 9010, pure white
- P1: Perforated plate diffuser face, powder-coated according to RAL Classic

### Standards and guidelines

- The sound power level of the air-regenerated noise is measured according to EN ISO 5135.

### Nominal sizes

- 300, 400, 600, 625
- Ø: 125, 160, 200, 250, 315

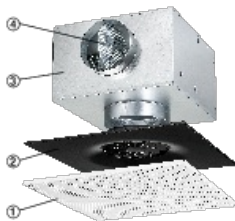
## TECHNICAL INFORMATION

FUNCTION, TECHNICAL DATA, QUICK SIZING, SPECIFICATION TEXT, ORDER CODE



Ceiling swirl diffusers in air conditioning systems create a swirl to supply air to rooms. The resulting airflow induces high levels of room air, thereby rapidly reducing the airflow velocity and the temperature difference between supply air and room air. Ceiling swirl diffusers allow for large volume flow rates. The result is a mixed flow ventilation in comfort zones, with good overall room ventilation, creating only very little turbulence in the occupied zone. TROX INVISIBLE DIFFUSERS (TID) feature invisible or inconspicuous installation methods. The swirl unit required for the swirling air discharge is not visible from the room. The special shape of the discharge nozzle allows the swirl effect to be used even behind perforated standard metal ceiling tiles or factory-made perforated plate diffuser faces. Type TID ceiling swirl diffusers have fixed air control blades. Air discharge is horizontal, with an omni-directional flow. The supply air to room air temperature difference may range from  $-12$  to  $+10$  K. A damper blade in the plenum box simplifies volume flow rate balancing for commissioning. To give rooms a uniform aesthetic, Type TID diffusers may also be used for extract air.

### TID schematic illustration, with horizontal air connection



- ① Perforated standard metal ceiling tile / perforated plate diffuser face
- ② Functional unit including discharge nozzle, swirling element and spigot
- ③ Plenum box
- ④ Damper blade for volume flow rate balancing

TID schematic illustration, with vertical air connection



- ① Perforated standard metal ceiling tile
- ② Functional unit including discharge nozzle, swirling element and spigot

Nominal sizes	300, 400, 600, 625 mm
Nominal diameter	125, 160, 200, 250, 315 mm
Supply air to room air temperature difference	-12 to +10 K

The quick sizing table gives a good overview of the possible volume flow rates and the corresponding sound power levels and differential pressure levels for the combinations with the different perforated plate diffuser faces. The minimum volume flow rates apply to a supply air to room air temperature difference of -6 K. The maximum volume flow rates apply to a sound power level of approx. 50 dB (A) with damper blade position 0°. Exact values for all parameters can be determined with our Easy Product Finder design programme. The quick sizing tables for various sample perforations are listed below:

TID (RG 2516 or RG 2.5-5.5), sound power level and total differential pressure

NW	qv [l/s]	qv [m³/h]	Damper blade position					
			0° Δpt [Pa]	0° LWA [dB(A)]	45° Δpt [Pa]	45° LWA [dB(A)]	90° Δpt [Pa]	90° LWA [dB(A)]
125	21	76	41	38	49	40	72	39
	25	90	56	43	68	44	100	43
	29	103	75	47	90	48	133	47
	32	117	95	50	116	51	170	50
160	23	83	17	27	21	29	33	28
	33	118	34	37	41	38	66	38
	42	152	58	44	69	46	111	46
	52	187	87	50	103	51	167	52
200	37	132	19	28	19	28	30	29
	51	182	36	37	37	38	57	38
	65	233	59	44	60	45	94	46
	79	284	87	50	90	50	139	51
250	58	207	20	28	24	29	32	31
	77	276	35	37	42	39	57	40
	96	344	54	44	65	46	89	47
	115	413	78	50	93	52	128	53
315	90	325	25	33	28	34	37	34
	112	402	38	39	43	40	57	41
	133	480	54	45	62	46	81	46
	155	557	73	50	83	51	110	50

TID (RD 2820 or RD 2.8–5.5), sound power level and total differential pressure

NW	qv [l/s]	qv [m³/h]	Damper blade position					
			0° Δpt [Pa]	0° LWA [dB(A)]	45° Δpt [Pa]	45° LWA [dB(A)]	90° Δpt [Pa]	90° LWA [dB(A)]
125	17	63	24	32	30	33	46	33
	23	83	43	39	53	41	80	40
	29	103	66	45	81	47	123	46
	34	123	93	50	116	51	175	51
160	36	130	38	38	45	40	77	40
	45	163	59	45	71	46	122	47
	55	196	86	50	103	51	176	52
200	39	139	19	28	20	29	31	30
	53	191	36	37	37	38	59	39
	68	243	58	44	60	45	96	46
	82	296	86	50	89	51	142	51
250	54	194	16	25	19	27	27	28
	76	272	30	36	38	37	52	39
	97	349	50	44	62	45	86	47
	119	427	75	50	93	52	128	53
315	87	312	20	30	23	31	31	32
	111	401	33	38	39	39	52	39
	136	491	50	45	58	46	78	46
	161	580	70	50	81	51	109	51

TID (RV 5046 or RV 5–7), sound power level and total differential pressure

NW	qv [l/s]	qv [m³/h]	Damper blade position					
			0° Δpt [Pa]	0° LWA [dB(A)]	45° Δpt [Pa]	45° LWA [dB(A)]	90° Δpt [Pa]	90° LWA [dB(A)]
125	14	49	12	25	15	27	25	27
	21	76	29	36	38	38	61	37
	29	104	54	44	70	45	112	45
	36	131	87	50	112	51	180	51
160	23	83	12	25	16	27	29	27
	34	123	27	36	34	38	63	38
	45	163	47	44	60	45	110	46
	56	203	74	50	93	51	170	52
200	37	132	13	27	14	27	24	28
	54	195	29	37	31	38	54	38
	72	259	51	44	54	45	94	46
	90	322	79	50	83	51	146	51
250	52	187	11	24	13	24	21	26
	77	277	25	35	30	36	47	38
	102	367	43	44	52	44	82	46
	127	457	67	50	81	51	127	53
315	69	249	10	23	12	25	17	25
	103	372	22	35	27	36	38	36
	138	495	39	43	48	45	68	45
	172	618	61	50	75	51	106	51

### Specification text

Ceiling swirl diffusers for invisible or inconspicuous installation behind standard metal ceiling tiles or factory-made perforated plate diffuser faces. The ceiling swirl diffuser is suitable for comfort and industrial zones and is installed as a supply or extract air diffuser in the suspended ceiling. The swirling element with fixed air control blades enable a horizontal swirling supply air discharge creating high induction levels so that the airflow velocities and temperature differences are quickly reduced. The special shape of the discharge nozzle allows the ceiling swirl diffuser to be used behind perforated standard metal ceiling tiles, which must not be thicker than 1.0 mm, and should ideally be preferably less than or equal to 0.7 mm thick, without any visual interruptions in the ceiling appearance. The ceiling swirl diffuser can be combined with all types of ceilings using a factory-made perforated plate diffuser face. The ready-to-install functional unit, consisting of a specially shaped discharge nozzle, swirling element with fixed blades and spigot, is always coated in black and can be connected directly to the on-site air duct system or combined with a Type AK-Uni plenum box. In the case of a vertical connection, suspension lugs are provided for on-site fixing to the spigot. The plenum box has drilled holes for on-site fixing. All spigots are suitable for ducts according to EN 1506 or EN 13180. The sound power level of the air-regenerated noise is measured according to EN ISO 5135.

### Special characteristics

- Inconspicuous or non-visible swirl diffuser
- Installation behind on-site perforated standard ceiling tile, without affecting the appearance of the ceiling, ceiling tile thickness must be  $\leq 1$  mm, preferably  $\leq 0.7$  mm
- Optionally with factory-made perforated plate diffuser face, to cover the functional unit consisting of discharge nozzle, swirling element and spigot
- Functional unit always dip coated black
- Non-visible installation of technical components

### Materials and surfaces

- Discharge nozzle, swirling element, spigot and optional factory-made perforated plate diffuser face and/or plenum box made from galvanised sheet steel
- Perforated plate diffuser face, powder-coated, RAL 9010, pure white
- P1: Perforated plate diffuser face, powder-coated according to RAL Classic

### Technical data

- Nominal sizes: 300, 400, 600, 625
- $\varnothing$ : 125, 160, 200, 250, 315 mm
- Supply air to room air temperature difference:  $-12$  to  $+10$  K

### Sizing data

$q_v$  \_\_\_\_\_ [m<sup>3</sup>/h]  
 $\Delta p_t$  \_\_\_\_\_ [Pa]

Air-regenerated noise  
 $L_{WA}$  \_\_\_\_\_ [dB(A)]

TID	-	Z	-	H	-	M	-	L	/	600	x	160	/	LBS	/	P1-RAL 9016
									/							
1		2		3		4		5	/	6		7		8		9

1 Type  
TID Ceiling swirl diffuser

2 System  
Z Supply air  
A Extract air

3 Connection  
V Vertical  
H Horizontal

4 Damper blade for volume flow rate balancing (only for connection H)  
No entry: none  
M With

5 Lip seal (only for connection H)  
No entry: none  
L With lip seal

6 Nominal size [mm]  
300  
400  
600  
625

7 Nominal diameter [mm]  
125  
160  
200  
250  
315

8 Perforated sheet  
No entry: none (standard ceiling plate)  
LBK Clamped with perforated diffuser face (only with connection H)  
LBS Screwed with perforated diffuser face (only with connection H)

9 Exposed surface (only LBK or LBS)  
No entry: powder-coated RAL 9010, pure white  
P1 Powder-coated, specify RAL CLASSIC colour  
Gloss level  
RAL 9010 50 %  
RAL 9006 30 %  
All other RAL colours 70 %

Order example: TID-Z-V/600x160

System      Supply air  
Connection   Vertical  
Nominal size   600  
Nominal width   160

## Variants, Dimensions, Product details



### Variants

#### Connection

- Horizontal: In the case of a horizontal connection, the TID air diffuser is combined with a suitable Type AK-Uni plenum box

#### Perforated plate diffuser face

- Without perforated plate diffuser face: This variant is suitable for installation behind a standard metal ceiling tile perforated on site (free cross section  $\geq 15\%$ ), which must be  $\leq 1$  mm thick, and ideally  $\leq 0.7$  mm thick
- LBK – clamped perforated plate diffuser face: A perforated plate diffuser face with a perforation of RV 6.0–8.0 with a free cross section of approx. 51 % is included in the supply package ex works; the perforated plate diffuser face is attached to the discharge nozzle by means of clamps; this variant is particularly suitable for insertion in T-bar ceilings and is only available with a plenum box; the diffuser face is permanently connected to the plenum box
- LBS – screwed perforated plate diffuser face: A perforated plate diffuser face with a perforation of RV 6.0–8.0 with a free cross section of approx. 51 % is included in the supply package ex works; the perforated plate diffuser face is attached to the discharge nozzle with lugs at the edges; this variant is particularly suitable for direct installation below suspended ceilings and only available with a plenum box; the air diffuser is secured to the cross bar in the plenum box with the central fixing screw. The entire air diffuser can be removed to access the plenum box behind it up to the equalising element, e.g. for cleaning

#### Variants

##### Connection

- Vertical: In the case of a vertical connection, a spigot is attached to the discharge nozzle; it can be mounted directly to the on-site duct network. Suspension lugs are attached to the spigot to retain the dead load of the air diffuser

#### Perforated plate diffuser face

- Without perforated plate diffuser face: This variant is suitable for installation behind a standard metal ceiling tile perforated on site (free cross section  $\geq 15\%$ ), which must be  $\leq 1$  mm thick, and ideally  $\leq 0.7$  mm thick

#### TID



TID with perforated standard metal ceiling tile / perforated plate diffuser face





TID



TID with perforated standard metal ceiling tile



Dimension Q<sub>1</sub> [mm]

NW	Nominal size							
	① 300	① 400	① 600	LBK 600	LBS 600	① 625	LBK 625	LBS 625
125	290	390	590	593	598	615	618	623
160	290	390	590	593	598	615	618	623
200		390	590	593	598	615	618	623
250			590	593	598	615	618	623
315			590	593	598	615	618	623

① Perforated standard metal ceiling tiles

TID with plenum box [mm]

NW	ØD <sub>1</sub>	H <sub>1</sub>	H LBK	H LBS	H <sub>5</sub>	H <sub>5</sub> LBK	H <sub>5</sub> LBS	H <sub>4</sub>	H <sub>3</sub>	□Q <sub>3</sub>	C	A	ØD	AK
125	125	66	66	67	8	10	8	195	255	216	50	170	98	AK028
160	160	69	69	70	8	10	8	220	280	266	48	182	123	AK029
200	200	75	75	76	8	10	8	250	310	290	50	194	158	AK030
250	250	76	76	77	8	10	8	295	355	476	50	219	198	AK031
315	315	78	78	79	8	10	8	345	395	567	48	244	248	AK032

① Perforated standard metal ceiling tiles

Air diffuser [kg]

NW	Nominal size							
	① 300	① 400	① 600	LBK 600	LBS 600	① 625	LBK 625	LBS 625
125	1,0	1,5	3,5	7,0	7,0	3,5	7,0	7,0
160	1,0	1,5	3,5	7,0	7,0	3,5	7,0	7,0
200		1,5	3,5	7,0	7,0	3,5	7,0	7,0
250			3,5	7,0	7,0	3,5	7,0	7,0
315			3,5	7,0	7,0	3,5	7,0	7,0

① Perforated standard metal ceiling tiles

Plenum box [kg]

NW	AK	Weight
125	AK028	2,5
160	AK029	3
200	AK030	10
250	AK031	7,5
315	AK032	3,5

Note: Total weight for variants with plenum box: air diffuser + plenum box

TID with vertical connection [mm]

NW	ØD	H <sub>1</sub>	H LBK	H LBS	H <sub>5</sub>	H <sub>5</sub> LBK	H <sub>5</sub> LBS
125	123	66	66	67	8	10	8
160	158	69	69	70	8	10	8
200	198	75	75	76	8	10	8
250	248	76	76	77	8	10	8
315	313	78	78	79	8	10	8

① Perforated standard metal ceiling tiles

,

Dimension Q<sub>1</sub> [mm]

NW	Nominal size							
	⌀ 300	⌀ 400	⌀ 600	LBK 600	LBS 600	⌀ 625	LBK 625	LBS 625
125	290	390	590	593	598	615	618	623
160	290	390	590	593	598	615	618	623
200		390	590	593	598	615	618	623
250			590	593	598	615	618	623
315			590	593	598	615	618	623

① Perforated standard metal ceiling tiles

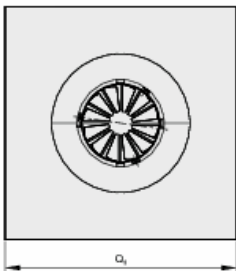
,

Air diffuser [kg]

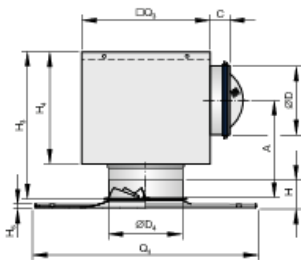
NW	Nominal size							
	⌀ 300	⌀ 400	⌀ 600	LBK 600	LBS 600	⌀ 625	LBK 625	LBS 625
125	1,0	1,5	3,5	7,0	7,0	3,5	7,0	7,0
160	1,0	1,5	3,5	7,0	7,0	3,5	7,0	7,0
200		1,5	3,5	7,0	7,0	3,5	7,0	7,0
250			3,5	7,0	7,0	3,5	7,0	7,0
315			3,5	7,0	7,0	3,5	7,0	7,0

① Perforated standard metal ceiling tiles

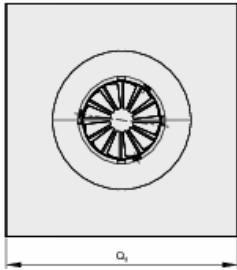
### Horizontal connection



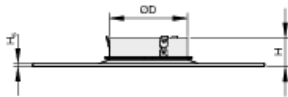
### Horizontal connection



### Vertical connection



Vertical connection



### Installation and commissioning

- Preferably for rooms with a clear height up to 4.0 m
- For use behind perforated standard metal ceiling tiles or with factory-made perforated plate diffuser face
- LBK for inserting in T-bar ceilings
- LBS for installation directly below suspended ceilings
- Perforated standard metal ceiling tiles are not included in the TID supply package and must always be provided on site

Note: In the case of the LBK variant, the optional flow adjustment damper can only be adjusted before installation. It is not possible to adjust the damper from the outside at a later point in time.

These are only schematic diagrams to illustrate installation details.

### Installation in suspended ceiling systems

