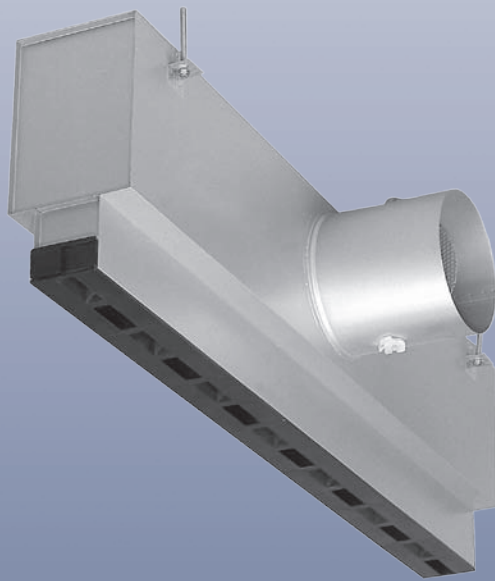


**Please note,**  
type code is new,  
see on last page.



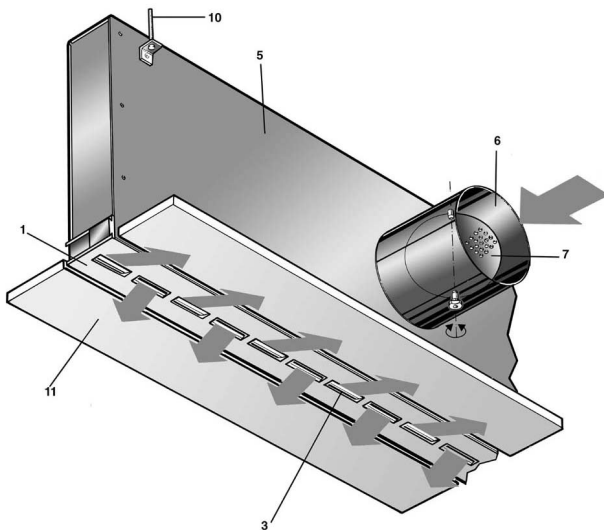
## **Induction outlet IN-N6....** – with preset discharge direction

## Preliminary remarks

Induction outlets from KRANTZ KOMponenten are linear ceiling air outlets and are eminently suited for installation in suspended ceiling systems in the commercial sector. They have been in successful use for decades and are available with **preset discharge direction** <sup>1)</sup> as described here, for discharge heights of 4 m to 7 m and volume flow rates of 28 to 83 l/(s · m); 100 to 300 m<sup>3</sup>/(h · m).

## Construction and function

The main components of the induction outlet are the discharge element **1** and the connection box **5** with connection spigot **6**. The discharge element has many consecutively placed jet canals **3** alternately inclined at a certain angle to horizontal. This enables alternate discharge where half the air outlet volume flow rate is discharged to the right and the other half to the left.



*Induction outlet installed in a false ceiling*

An optional momentum control device **2**, fitted directly on the inside of the discharge element, enables the alteration of the free discharge cross section between 100% and 0%, individually per discharge side. The discharge cross section can therefore be fully or partially closed. So the jet momentum can be adapted exactly to the layout volume flow rate. Also, one discharge side can be fully closed for one-sided discharge as required, with air outlet place-

1) With adjustable discharge direction, see publication DS 4082

ment near a wall, for example. The outlet then operates with half the volume flow rate. The momentum control device **2** is easy to adjust manually from the room.

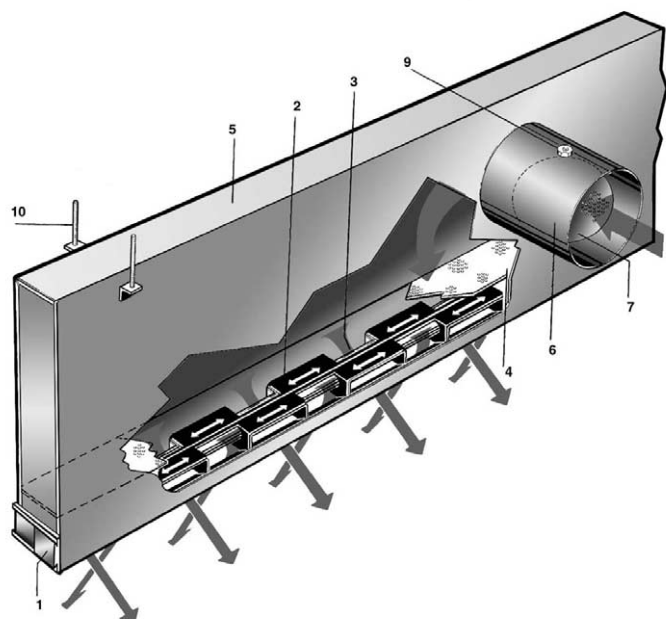
The connection to the supply air duct is made with the connection box **5**. For higher insertion loss, the connection box is also available with acoustic lining **8** on request. At the side of the connection box is the spigot **6** for duct connection. An optional volume flow damper **7** can be installed in the connection **spigot** and operated directly at the spigot. Alternatively, a throttle device **7a** built into the connection **box** is available for operation from the room.

Two suspension brackets **10** fitted to the connection box are available for ceiling suspension.

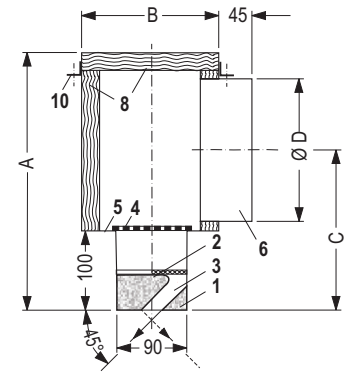
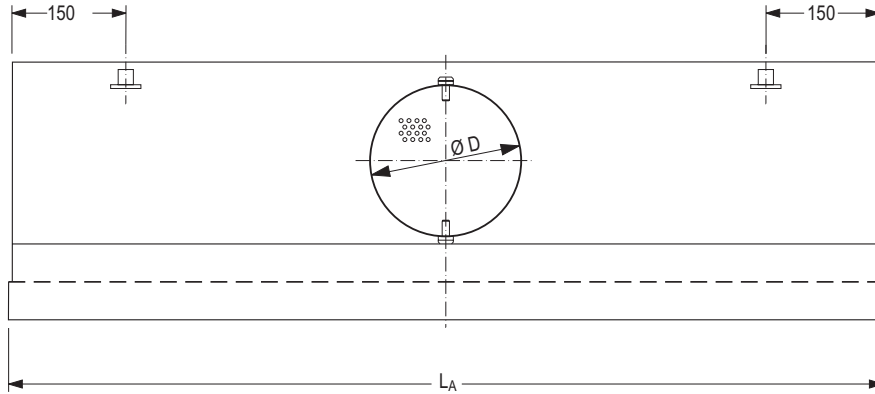
Where streamlined air outlet rows are required for uniform ceiling appearance, for example, blind rails are available whose visible part corresponds to that of the induction outlets.

As the air flows through the jet canals many single high-stability and high-induction jets form. This results in rapid equalization of supply air temperature and room temperature.

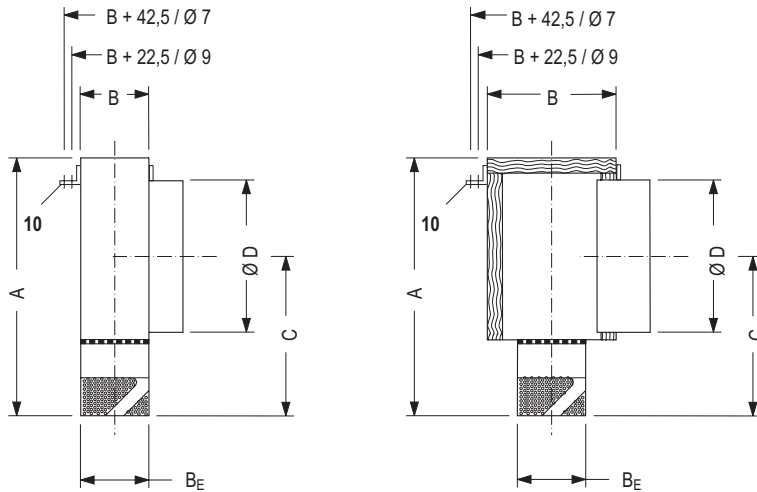
The induction outlet generates a diffuse indoor air flow with draught-free, intensive flushing of the occupied zone. Permissible indoor air velocities to DIN 1946, Part 2 are met.



*Induction outlet with momentum control device to adapt jet momentum to the given volume flow rate*

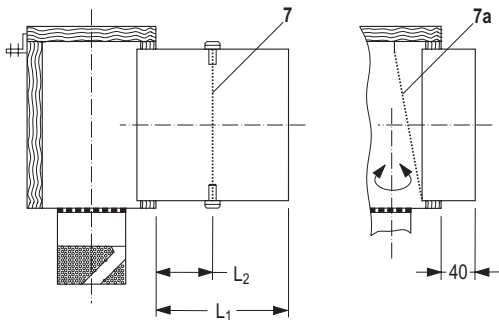


Bore spacing in two-sided suspension bracket 10



Connection box, shown without acoustic lining, without V-damper

Connection box, shown with acoustic lining, without V-damper



V-damper 7 in connection spigot, adjustable at spigot

V-damper 7a in connection box, adjustable from room

Key for all pages	Material
1 Discharge element	Polystyrene
2 Momentum control device <sup>1)</sup>	Polystyrene
3 Jet canal	—
4 Perforated metal sheet	Galvanized sheet metal
5 Connection box	
6 Connection spigot	
7 V-damper in connection spigot <sup>1)</sup>	Galvanized sheet metal
7a V-damper in connection box <sup>1)</sup>	
8 Acoustic lining <sup>1)</sup>	Mineral fibre (non-combustible DIN 4102-A1)
9 Adjustment screw	Galvanized sheet metal
10 Suspension bracket	
11 False ceiling	—

<sup>1)</sup> optional

DS 1125 E Bl. 3 03.2005

Type IN-N	Nominal length L <sub>N</sub>	Air outlet		Discharge height H m	Actual length L <sub>A</sub> mm	Element width B <sub>E</sub> mm	Connection box													
		Volume flow rate Ḃ <sub>A</sub> l/(s·m)	Ḃ <sub>A</sub> m <sup>3</sup> /(h·m)				without acoustic lining					with acoustic lining								
							A mm	B mm	C mm	D mm	L <sub>1</sub> mm	L <sub>2</sub> mm	G approx. kg	A mm	B mm	C mm	D mm	L <sub>1</sub> mm	L <sub>2</sub> mm	G approx. kg
-6/.....	1000	28 – 83	100 – 300	4 – 7	990	90	300	200	179	180	90	8	320	200	179	155	65	10.5		
	1200						320	90	210	199	200	100	9.5	340	170	210	199	175	75	11.5
	1600						345	222	223	220	110	12.5	365	222	223	195	85	15		

### Comfort criteria

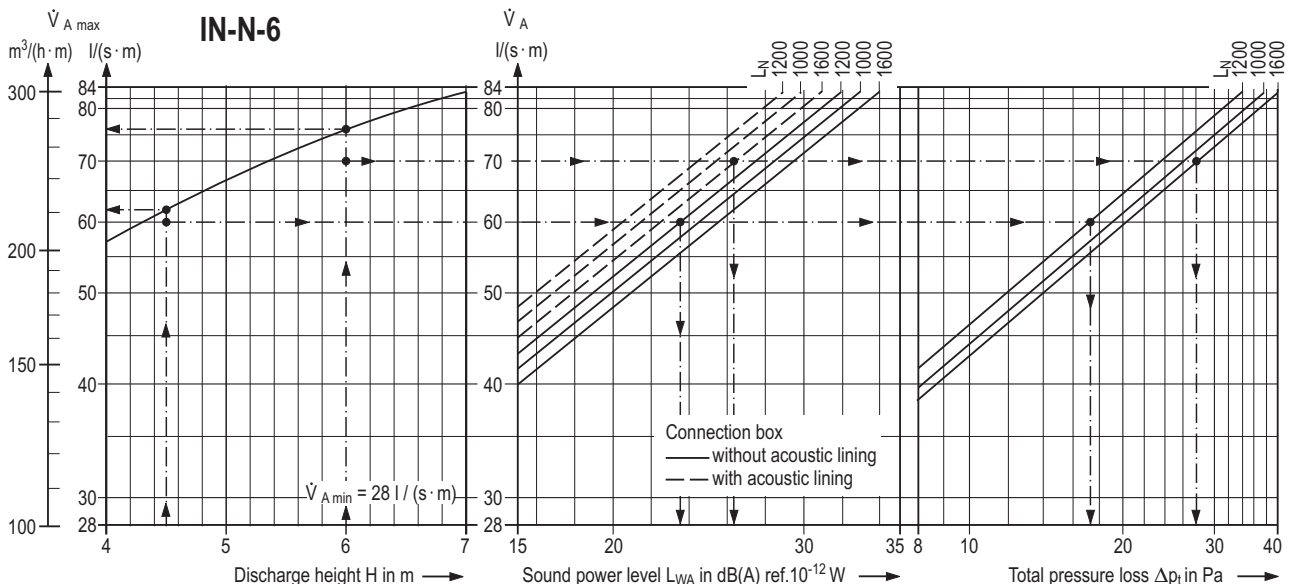
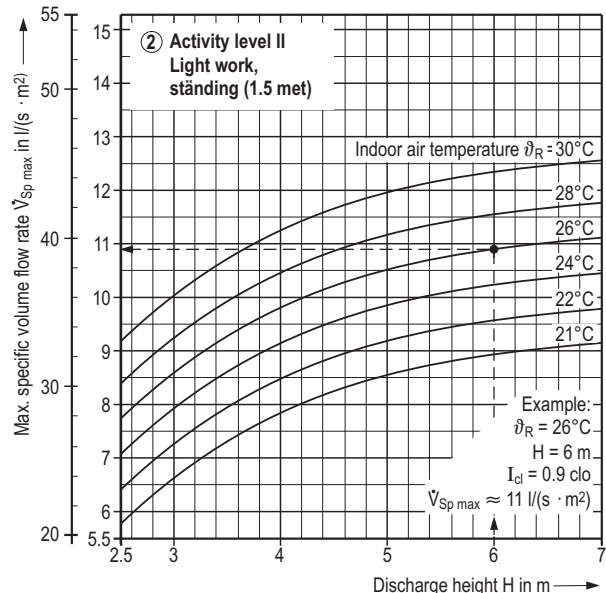
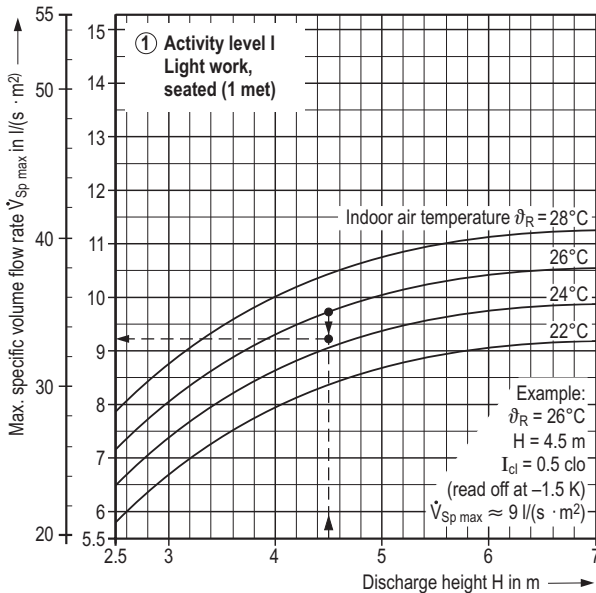
The layout of the induction outlet is based on compliance with allowable indoor air velocities to DIN 1946, Part 2, and VDI 3802 as well as DIN EN ISO 7730 and the resultant max. specific volume flow rate  $\dot{V}_{Sp\ max}$  related to floor area.  $\dot{V}_{Sp\ max}$  for different activity levels can be read off the graphs in correlation with discharge height and indoor air temperature. The type of clothing must be taken into account <sup>1)</sup>.

#### Key for all graphs:

- $\dot{V}_{A\ max}$  = Max. volume flow rate per air outlet when cooling
- $\dot{V}_{A\ min}$  = Min. volume flow rate per air outlet when cooling
- $\dot{V}_A$  = Selected volume flow rate per air outlet
- $\dot{V}_{Sp\ max}$  = Max. specific volume flow rate per m<sup>2</sup> of floor area
- H = Discharge height
- L<sub>N</sub> = Air outlet-nominal length

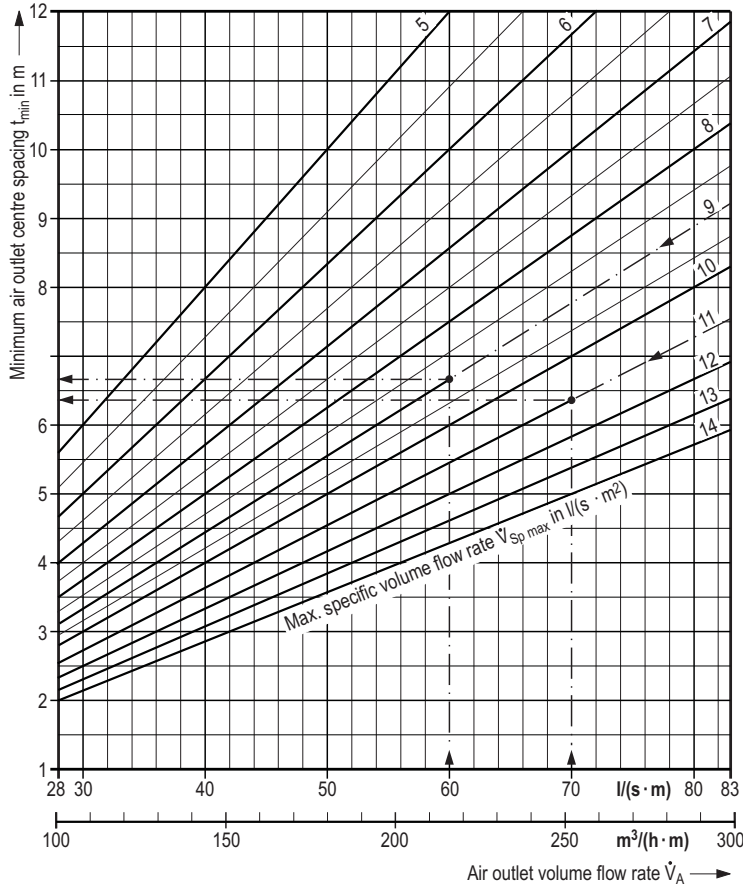
Type of clothing	Insulation value I <sub>cl</sub> in clo	Correction factor: read off at $\Delta\vartheta_R$
<b>General clothing</b>		
Light summer clothing	0.5	-1.5 K
Medium clothing (light business suit)	1.0	0
Warm clothing (business suit with warm underwear)	1.5	+2.0 K
<b>Work clothing</b>		
Light work clothing (shirt)	0.6	-1.5 K
Normal work clothing	0.9	0
Heavy work clothing (protective jacket)	1.3	+2.0 K

1) The graphs for activity levels are based on a clothing insulation value of I<sub>cl</sub> = 0.9 clo. For other insulation values, the  $\Delta\vartheta_R$  values in the conversion table must be used to convert and read off the corresponding indoor air temperatures. For examples, see graphs.



The values for sound power level and pressure loss apply for damper position "open". The pressure loss is not affected by the acoustic lining.

## Minimum air outlet centre spacing



Layout example				
Application:		Office	Museum	
1 Nominal length	mm	1200	1600	
Connection box (acoustic lining)		without	with	
2 Supply air volume flow rate	$\dot{V}$	$m^3/h$	4 000	14 000
3 Discharge height	H	m	4.5	6
4 Room area	A	$m^2$	720	1 900
5 Max. perm. sound power level	$L_{WA}$	dB(A)	35	40
6 Comfort criteria (see page 4)				
- Aktivität level			I	II
- Max. indoor air temperature	$^{\circ}C$		26	26
- Insulation value of clothing	$I_{cl}$	clo	0.5	0.9
- Max. spezif. volume flow rate	$\dot{V}_{Sp max}$	$l/(s \cdot m^2)$	[Graph 1] 9	[Graph 2] 11
- Actual spezif. volume flow rate	$\dot{V}_{Sp tats}$	$l/(s \cdot m^2)$	[from 2 : 4] 5.6	[from 2 : 4] 7.3
<b>From nomogram</b>				
7 $\dot{V}_{A max}$	$l/(s \cdot m)$		62	75
8 $\dot{V}_{A selected}$	$l/(s \cdot m)$		60	70
9 $Z_1$	[from 2 : 8]	lfdm	67	200
10 $Z_2$	[from 9 : 1]	units	56	125
11 $L_{WA}$	dB(A)		$\approx 24$	$\approx 26$
12 $\Delta p_t$	Pa		$\approx 18$	28
13 $t_{min}$	[Graph of page 5]	m	$\approx 6.7$	$\approx 6.4$

Air outlet volume flow rate $\dot{V}_A$		Total pressure loss $\Delta p_t$	Type IN-N-6						
$l/(s \cdot m)$	$m^3/(h \cdot m)$		$L_{WA}$ dB(A)	Sound power level $L_w$ in dB ref. $10^{-12} W$ 1)					
		Pa		Octave band centre frequency in Hz					
			125	250	500	1 K	2 K	4 K	
<b>Nominal length = 1000</b>									
50	180	13	17	24	19	16	—	—	—
61	220	20	22	26	28	20	—	—	—
72	260	28	26	35	30	25	16	—	—
83	300	38	30	40	34	27	20	16	—
50	180	13	20	25	20	18	—	—	—
61	220	20	25	31	28	24	15	—	—
72	260	28	29	39	32	28	21	17	—
83	300	38	33	44	37	31	21	19	15
<b>Nominal length = 1200</b>									
50	180	12	16	20	17	15	—	—	—
61	220	18	21	24	26	19	—	—	—
72	260	26	25	35	29	24	—	—	—
83	300	34	29	39	33	25	19	16	—
50	180	12	19	26	21	18	—	—	—
61	220	18	24	32	28	23	15	—	—
72	260	26	28	37	32	24	20	15	—
83	300	34	32	41	36	28	23	20	15
<b>Nominal length = 1600</b>									
50	180	14	18	25	20	16	—	—	—
61	220	21	23	27	27	22	—	—	—
72	260	30	27	36	32	24	18	—	—
83	300	40	31	42	36	27	18	17	15
50	180	14	21	24	25	20	—	—	—
61	220	21	26	34	31	23	16	—	—
72	260	30	30	39	34	28	17	15	—
83	300	40	34	47	38	25	18	16	15

	Insertion loss in dB							
	Octave band centre frequency in Hz							
	63	125	250	500	1 K	2 K	4 K	8 K
Connection box with acoustic lining								
IN-N-6	0	0	6	14	21	18	20	17
Connection box without acoustic lining								
IN-N-6	0	0	3	5	9	11	12	9

1) The values apply for "open" damper.  
Pressure loss is not altered by the lining.

Connection box with acoustic lining  
 Connection box without acoustic lining

### Applications

#### Type IN-N-6

Discharge element made of polystyrene with optional manually adjustable momentum control device,

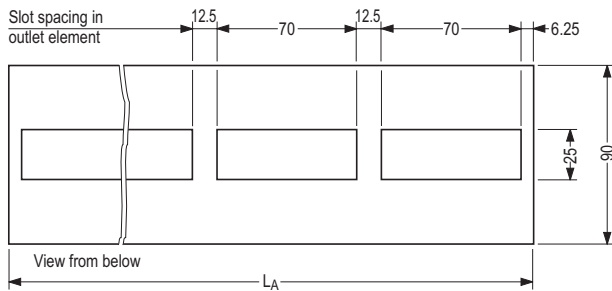
Air outlet volume flow rate: 28 – 83 l/(s · m);  
100 – 300 m<sup>3</sup>/(h · m),

Visible air outlet width 90 mm,

Discharge direction: 45° to horizontal.

#### Application:

Rooms with discharge heights of 4 m to 7 m.



If type IN-N-6 is used in HVAC plants also intended for room heating, about 50 % of the return air is collected in the floor zone to improve room flushing.

The induction outlet is suitable for one-sided discharge with half the volume flow rate.

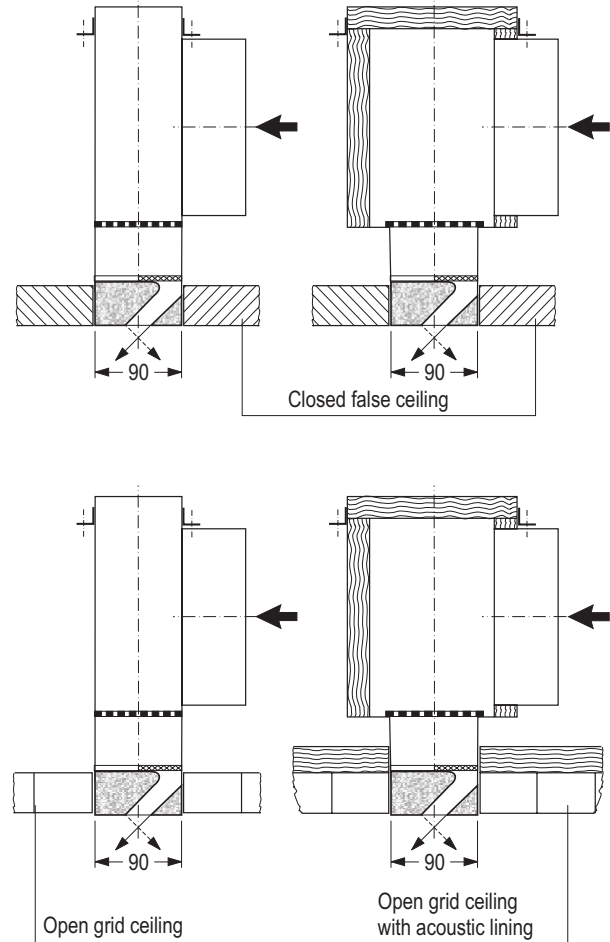


Induction outlet with preset discharge direction and connection box with acoustic lining

### Installation examples

Connection box without acoustic lining

Connection box with acoustic lining



Lateral attachment of false ceiling for discharge element, visible air outlet width = 90 mm.

## Features

- Single jets with alternating discharge at 45° to horizontal, for any ceiling type
- Air volume flow rate ranging from 28 to 83 l/(s · m) 100 to 300 m<sup>3</sup>/(h · m)
- Diffuse, draught-free indoor air flow
- Discharge height between 4 and 7 m
- Max. temperature difference between supply air and indoor air: – 10 K when cooling, + 6 K when heating
- Low sound power level
- V̇ damper available on request, either
  - built into the connection spigot, adjustable at spigot,
  - or built into the connection box, adjustable from room
- Momentum control device manually adjustable for optimum adjustment of jet momentum to layout volume flow rate, or for one-sided air discharge at half volume flow rate
- Available in nominal lengths of 1, 1.2 and 1.6
- Connection box made of galvanized sheet metal, air discharge element made of polystyrene
- Blind rails for visually streamlined air outlet rows

## Type code

IN – N – 6 / \_\_\_\_ – \_\_\_\_

Induction outlet  
Function / Kind  
Model  
Nominal length  
Connection type

Please note,  
type code is new,  
see last page.

### Function / Kind

N = Non-adjustable

### Model

6

### Nominal length

1 = 1000  
1.2 = 1200  
1.6 = 1600

### Connection type

- K = Connection box
- \_R = With volume flow damper adjustable from room
- \_I = With acoustic lining
- \_S = With volume flow damper adjustable at spigot
- B = Blind rail

## Tender text

### ..... units induction outlet

with high induction effect for diffuse air flow in room with single jets at minimum temperature gradients in the occupied zone, particularly suitable for installation in suspended ceiling systems, consisting of:

Linear discharge elements with consecutive jet canals, alternately inclined at a certain angle, through which the air jet discharges at an incline alternately right and left into the room.

Discharge element made of polystyrene,  
Discharge angle 45°,

Visible air outlet width 90 mm,

Standard: body-tinted deep black, similar to RAL9005

Visible surface painted to RAL .....

with momentum control device,

Connection box made of galvanized sheet metal, with lateral suspension brackets,

with acoustic lining,

with V̇-damper in connection spigot, adjustable at spigot.

with V̇-damper in connection box, adjustable from room.

## Technical data

Volume flow rate: ..... l/(s · m); m<sup>3</sup>/(h · m)

Perm. sound power level: ..... dB(A) ref. 10<sup>-12</sup> W

Air outlet nominal length: .....

Connection spigot ø: ..... mm

Make: KRANTZ KOMPONENTEN

Type: IN – N – 6 / \_\_\_\_ – K\_\_

### ..... units blind rail

for visually streamlined air outlet rows,  
visible air outlet part corresponding to induction outlet type:

Blind rail made of polystyrene,

Visible width 90 mm,

Standard: body-tinted deep black, similar to RAL9005

Visible surface painted to RAL .....

Nominal length: .....

Make: KRANTZ KOMPONENTEN

Type: IN – N – 6 / \_\_\_\_ – B

Subject to technical alterations.

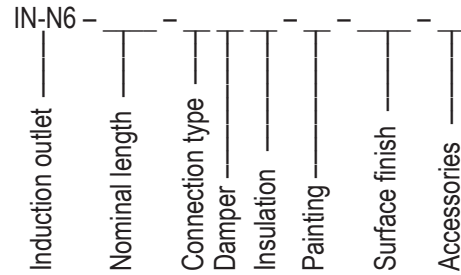


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Induction outlet

## Type code



## Nominal length

- 1000 = Nominal length 1000
- 1200 = Nominal length 1200
- 1600 = Nominal length 1600

## Connection type

- K = Connection box
- B = Blind rail

## Damper

- O = no volume flow damper
- R = with volume flow damper adjustable from room
- S = with volume flow damper adjustable at spigot

## Insulation

- O = without acoustic lining
- I = with acoustic lining

## Painting

- N = wet painted
- E = body-tinted

## Surface finish

- 9005 = Face painted to RAL9005, matt
- 9010 = Face painted to RAL9010, semi-matt
- .... = Face painted to RAL ....

## Accessories

- O = none
- I = Momentum control device

Subject to technical alteration.