

Floor Induction Units

Type BID



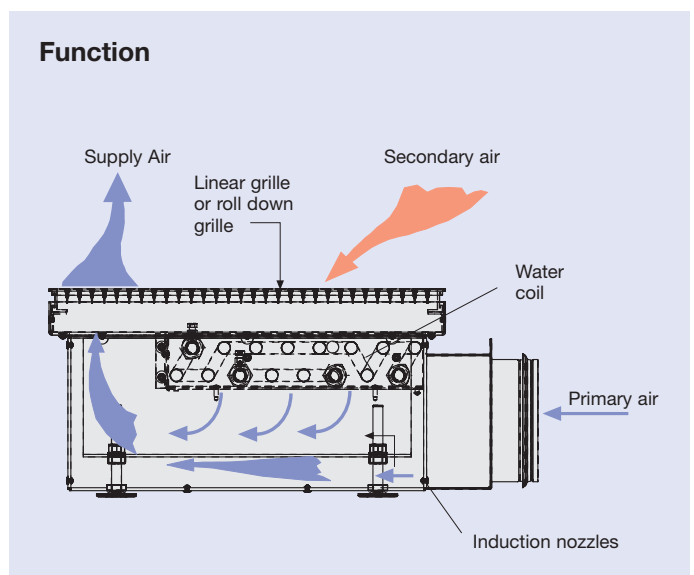
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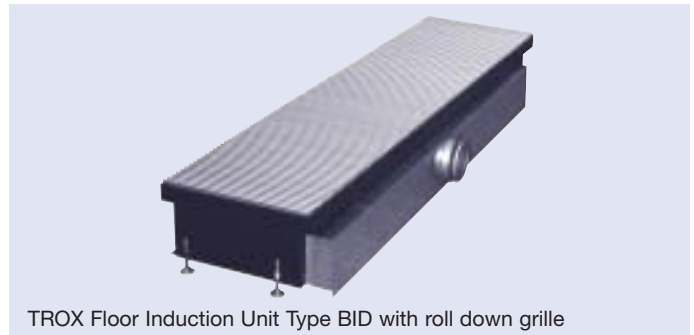
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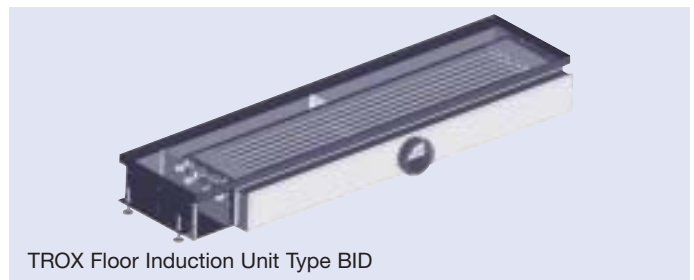
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TROX Floor Induction Unit Type BID with linear grille



TROX Floor Induction Unit Type BID with roll down grille



TROX Floor Induction Unit Type BID

Description

TROX type BID floor induction units are used in air-water based air conditioning systems. They can help in exploiting the energy-economy benefits of load dissipation (heating/cooling) through the medium of water; even in buildings where rooms have full height glazing without false ceilings and hence have smaller floor slab to slab heights.

The external primary air volume flow required for ventilation enters a spigot into the primary air plenum and is discharged through nozzles. The secondary air is taken in from the room, passing through coils where it is heated or cooled, as appropriate. The secondary air is mixed with the primary air in the BID's mixing zone and then supplied to the room via a linear grille or roll down grille in the floor area adjacent to the façade. BID diffusers may be used for cooling or for heating.

When used for heating, BID units prevent discomfort caused by cold air downdraughts at the façade, when used for cooling, BID units minimise the thermal load and thermal radiation from the façade into the room.

Because of their low height design, type BID floor induction units are particularly suited for use where floor slab to slab heights or false floor voids are small. The type BID unit is thus well suited

for use in new buildings, but also in refurbishment projects and provides maximum architectural freedom, as neither a perimeter sill nor a suspended ceiling is required.

If connected appropriately, the units can be used both for servicing individual rooms and for servicing zones with multiple units.

The unit casing is sized so that control valves including actuators can be built in and thus remain easily accessible. A row of nozzles is stamped into a plate at the primary air plenum opposite the supply air spigot. Three different nozzle variants are available, depending on the required air volume flow rate. The linear grille or roll down grille can easily be removed for cleaning purposes.

Caution!

The cold water supply temperature must be selected such that it never falls below room dew point.

Max. pressure:

for 2-pipe and 4-pipe system

6 bar at 90°C

7 bar at 20°C

Other operating pressures available on request!

Construction

TROX Type BID floor induction units consist of a load-bearing casing with a primary air duct and integral nozzles with various nozzle free areas for optimum induction at low sound power levels and pressure losses. The primary air side is connected via a centrally mounted spigot with a lip seal. The coils may be designed either for cooling or heating operation as a 2-pipe system or for cooling and heating operation as a 4-pipe system with copper pipe connections (Ø 12 x 1 mm), alternatively with a 1/2" external thread and with optional air venting. In addition, the units have a mixing chamber and a discharge area for supply air. The height of the unit may be altered by means of the adjustable feet.

The grille ledge is suitable for:

- AFN-0-A aluminium linear floor grille (blades parallel to the façade, grille height 23 mm)
- ARR 20 aluminium roll down grille (bars perpendicular to the façade, grille height 20 mm)

Combination with other grille options on request.

Materials

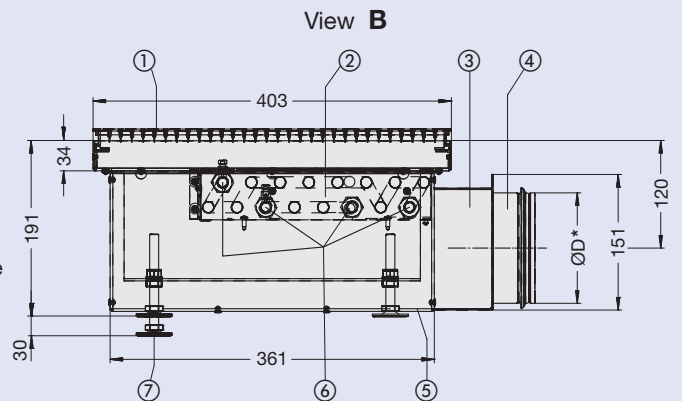
Casing and primary air duct are made of galvanised steel sheet. The coil consists of copper pipes with formed aluminium fins. The lip seal is made of rubber.

The surfaces are untreated. On request, the casing and/or the coil can be powder-coated to RAL 9005 (black).

Dimensions in mm

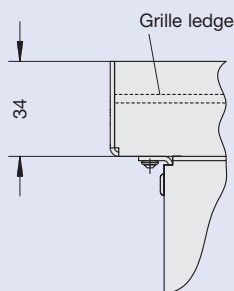
L ₁	L _N	A	B
1100...1249	900	895	875
1250...1399	1050	1045	1025
1400...1549	1200	1195	1175
1550...1699	1350	1345	1325
1700...1849	1500	1495	1475

- ① Linear floor grille type AFN-0-A or aluminium roll down grille type ARR20 (order separately)
- ② Coil
- ③ Primary air plenum with integral discharge nozzles
- ④ Primary air connection spigot with lip seal
- ⑤ Casing
- ⑥ Water connection Cu-pipe Ø 12 x 1 mm, on request R1/2" external thread
- ⑦ Height-adjustable feet

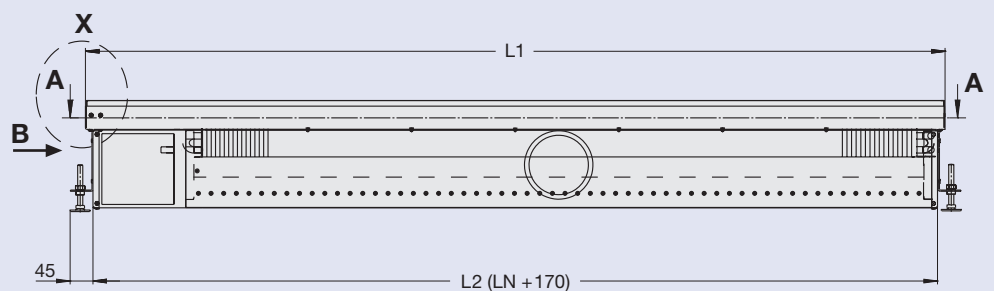
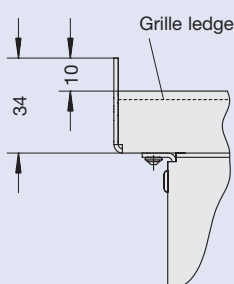


*ØD either Ø98 or Ø123

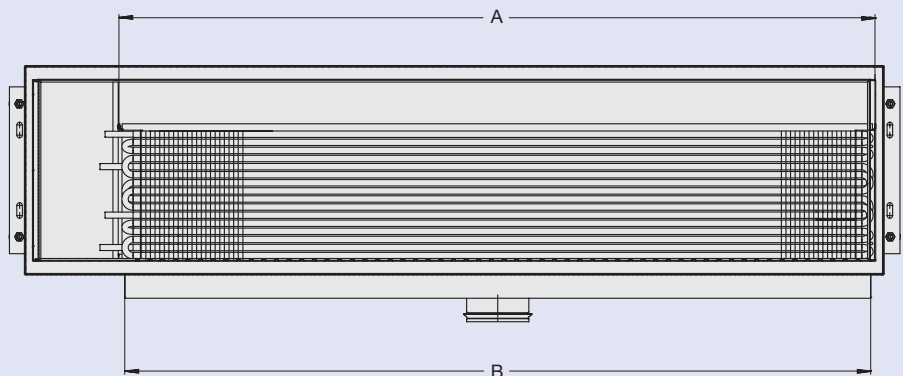
Detail X
(rotated 90° degrees)
Individual unit with perimeter frame



Detail X
(rotated 90° degrees)
Unit for linear assembly
(open-end)



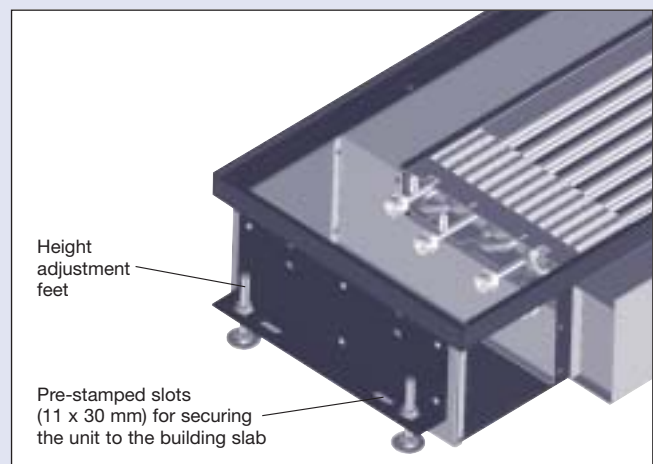
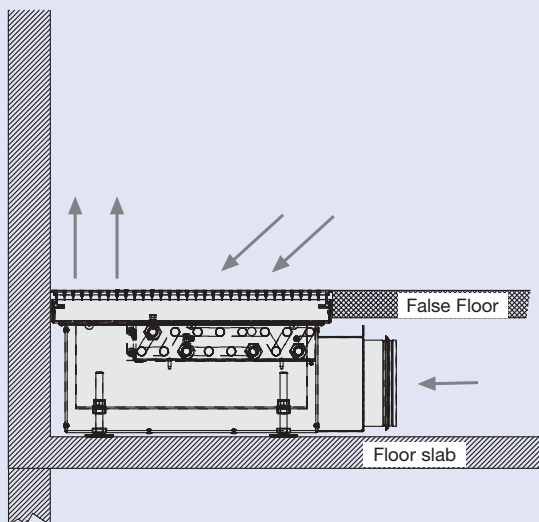
View A-A



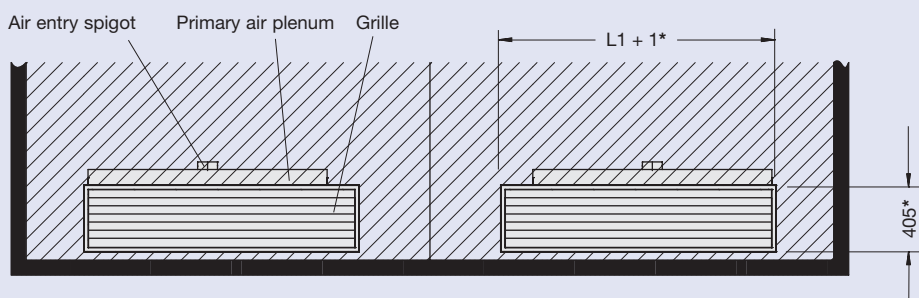
Installation

Once the BID unit has been lined up with the façade, the height-adjustable feet can be used to compensate for building tolerances. Care should be taken to ensure horizontal installation is achieved. Once this is complete, it is possible to secure or bolt the unit to the floor using the pre-stamped slots (11 x 30 mm). The grille or roll down grille selected is then laid on the BID's grille ledge.

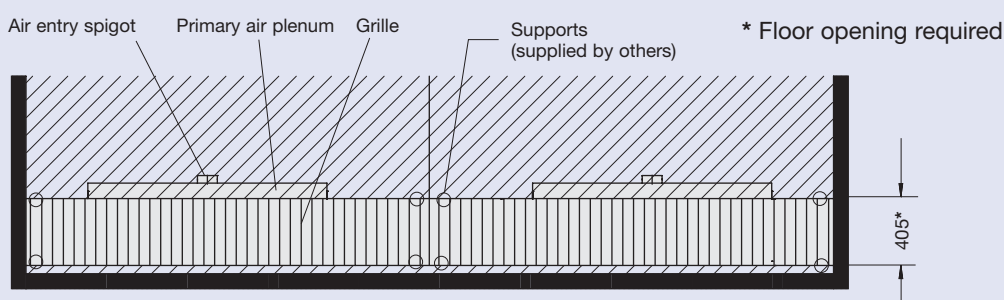
In a continuous grille core installation the core must be suitably supported if its length is greater than the L_1 dimension selected.

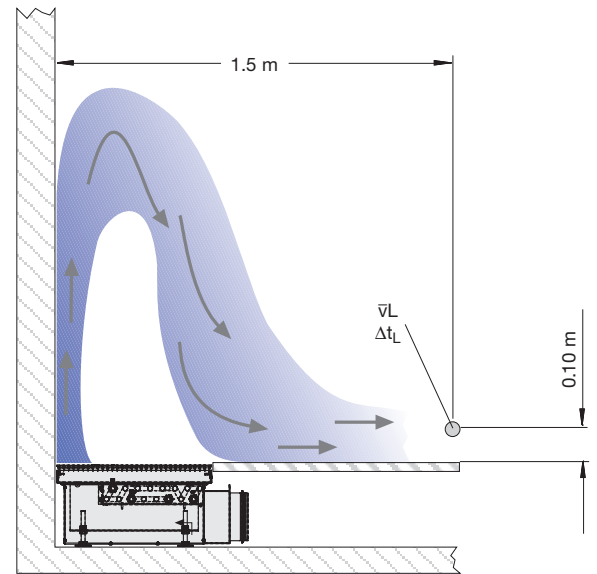
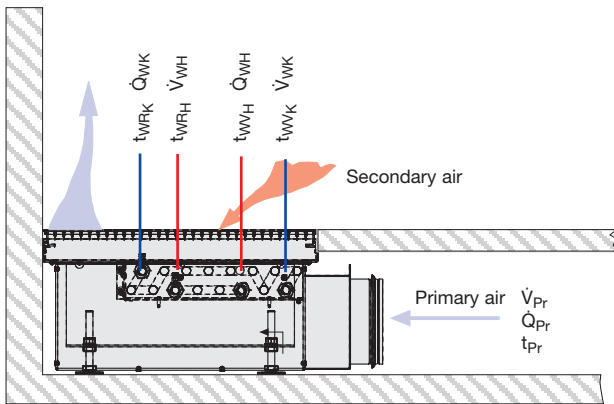


Single unit installation, e.g. with the AFN-0-A linear grille



Continuous installation, e.g. with the ARR 20 roll down grille





Nomenclature

Δt_L	in K: Temp. diff. between room air t_R and core t_L
Δt_{Pr}	in K: Temp. diff. between room air and primary air
Δt_W	in K: Temp. diff. between water flow and return
Δt_{RWV}	in K: Temp. diff. between room air and water flow temperature
Δp_t	in Pa: Primary air pressure drop
Δp_W	in kPa: Water pressure drop
t_R	in °C: Room temperature
t_{AN}	in °C: Induced secondary air temperature
t_{WK}	in °C: Water flow temperature – cooling
t_{WK}	in °C: Water return temperature – cooling
t_{WH}	in °C: Water flow temperature – heating
t_{WH}	in °C: Water return temperature – heating
t_{Pr}	in °C: Primary air temperature
F_W	: Correction factor water volume flow rate
\dot{Q}_{WH}	in W: Water heating capacity
\dot{Q}_{WK}	in W: Water cooling capacity
\dot{Q}_{ges}	in W: Total cooling/heating capacity $\dot{Q}_{Pr} + \dot{Q}_S$
\dot{Q}_{Pr}	in W: Primary air cooling/heating capacity
\dot{Q}_S	in W: Secondary air cooling/heating capacity (for cooling $\dot{Q}_S = \dot{Q}_{WK}$ /for heating $\dot{Q}_S = \dot{Q}_{WH}$)
\dot{Q}_{HK}	in W: Convective heating capacity
\dot{V}_{WK}	in l/h: Water volume flow rate – cooling
\dot{V}_{WH}	in l/h: Water volume flow rate – heating
\dot{V}_{Pr}	in l/s: Primary air volume flow rate
\bar{v}_L	in m/s: Max. time average air velocity
L_{WA}	in dB(A): A-weighted sound power level
L_N	in mm: Nominal length
L_1	in mm: Total length of casing

Performance Overview · Technical Data

with 2-pipe / 4-pipe system

Reference values cooling

$t_R = 26^\circ\text{C}$
 $t_{AN} = 24.5^\circ\text{C}$
 $F_W = 1.0$
 $t_{WVK} = t_{Pr} = 16^\circ\text{C}$
 $\dot{V}_{WK} = 110 \text{ l/h}$
 $\Delta t_{Pr} = t_{Pr} - t_R = -10 \text{ K}$
 $\Delta t_{RWV} = t_{WVK} - t_R = -10 \text{ K}$

Reference values heating

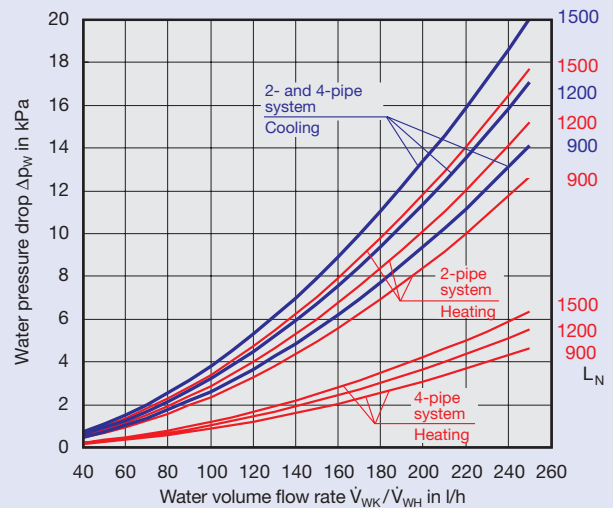
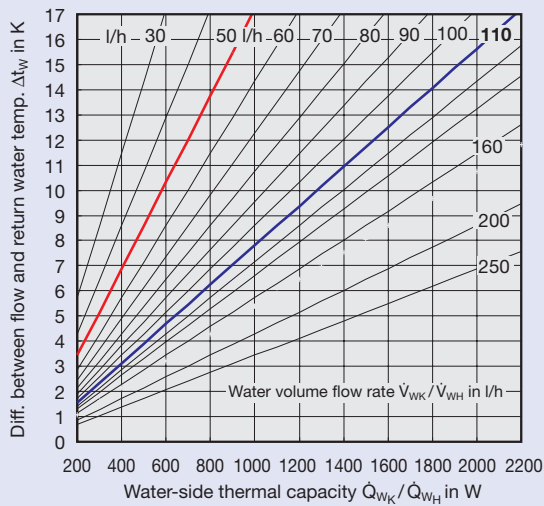
$t_R = t_{AN} = t_{Pr} = 22^\circ\text{C}$
 $F_W = 1.0$
 $t_{WVH} = 50^\circ\text{C}$
 $\dot{V}_{WH} = 50 \text{ l/h}$
 $\Delta t_{RWV} = t_{WVH} - t_R = 28 \text{ K}$

Room height: 3 m

L _N	Nozzle type	ṽ _{Pr}		Connecting spigot			Cooling										Heating			Heating		
				Ø98 Ø123		2- and 4-pipe system										2-pipe system			4-pipe system			
				L _{WA}	L _{WA}	ΔP _t	ṽ _L	Δt _L	Q̇ _{Pr}	Q̇ _S	Q̇ _{ges}	Δt _w	ΔP _w	Q̇ _S = Q̇ _{ges}	Δt _w	ΔP _w	Q̇ _S = Q̇ _{ges}	Δt _w	ΔP _w			
l/s	m ³ /h	dB(A)	dB(A)	Pa	m/s	K	Watt	Watt	Watt	K	kPa	Watt	K	kPa	Watt	K	kPa					
900	M	4	14	<20	<20	52	0.07	1.82	48	181	229	1.4	3.1	454	7.8	0.64	244	4.2	0.24			
		6	22	<20	<20	117	0.10	1.59	72	230	303	1.8		569	9.8		311	5.4				
		9	32	27	23	264	0.15	1.39	109	291	400	2.3		704	12.1		395	6.8				
	G	8	29	<20	<20	54	0.09	1.96	96	228	324	1.8		563	9.7		308	5.3				
		12	43	23	<20	122	0.13	1.75	145	290	435	2.3		703	12.1		394	6.8				
		17	61	33	28	244	0.19	1.58	205	355	560	2.8		842	14.5		483	8.3				
	U	15	54	22	<20	64	0.12	2.03	181	276	457	2.2		671	11.5		374	6.4				
		20	72	30	23	144	0.16	1.89	241	328	570	2.6		785	13.5		446	7.7				
		30	108	42	35	256	0.24	1.71	362	417	778	3.3		968	16.7		569	9.8				
1050	M	4	14	<20	<20	38	0.06	1.98	48	190	238	1.5	3.5	475	8.2	0.72	256	4.4	0.26			
		8	29	20	<20	151	0.12	1.57	96	285	381	2.2		691	11.9		387	6.6				
		11	40	29	25	285	0.17	1.41	133	341	474	2.7		812	14.0		468	8.0				
	G	10	36	<20	<20	62	0.10	1.99	121	272	393	2.1		663	11.4		375	6.4				
		15	54	27	21	138	0.15	1.76	181	345	526	2.7		820	14.1		466	8.0				
		20	72	35	30	246	0.20	1.62	241	405	646	3.2		945	16.3		533	9.5				
	U	15	54	20	<20	47	0.11	2.18	181	287	468	2.2		695	12.0		391	6.7				
		25	90	35	27	131	0.18	1.92	301	389	691	3.0		912	15.7		513	9.0				
		35	126	44	36	256	0.25	1.76	422	471	893	3.7		1076	18.5		647	11.1				
1200	M	5	18	<20	<20	45	0.07	1.98	60	226	286	1.8	3.8	559	9.6	0.79	306	5.3	0.29			
		9	32	21	<20	145	0.13	1.62	109	317	425	2.5		761	13.1		431	7.4				
		12	43	29	25	257	0.17	1.47	145	372	516	2.9		876	15.1		506	8.7				
	G	10	36	<20	<20	47	0.09	2.13	121	282	403	2.2		685	11.8		383	6.6				
		15	54	24	<20	105	0.14	1.88	181	357	538	2.8		846	14.6		486	8.4				
		24	86	38	32	269	0.22	1.63	289	463	752	3.6		1061	18.2		634	10.9				
	U	16	58	21	<20	41	0.11	2.29	193	308	501	2.4		742	12.8		419	7.2				
		24	86	32	23	93	0.16	2.06	289	392	682	3.1		919	15.8		535	9.2				
		36	130	44	35	208	0.24	1.85	434	493	927	3.9		1119	19.3		676	11.6				
1350	M	5	18	<20	<20	35	0.07	2.11	60	234	295	1.8	4.2	578	9.9	0.86	317	5.5	0.31			
		10	36	21	<20	140	0.13	1.67	121	348	468	2.7		826	14.2		473	8.1				
		13	47	29	24	237	0.17	1.52	157	401	558	3.1		937	16.1		547	9.4				
	G	10	36	<20	<20	37	0.09	2.26	121	292	412	2.3		706	12.1		396	6.8				
		15	54	22	<20	83	0.13	1.99	181	369	550	2.9		870	15.0		502	8.6				
		25	90	37	30	230	0.22	1.70	301	487	789	3.8		1108	19.1		668	11.5				
	U	17	61	22	<20	37	0.11	2.38	205	330	535	2.6		788	13.5		448	7.7				
		25	90	33	23	80	0.15	2.15	301	413	715	3.2		962	16.5		564	9.7				
		40	144	46	36	205	0.25	1.90	482	536	1018	4.2		1201	20.7		736	12.7				
1500	M	6	22	<20	<20	41	0.08	2.10	72	269	341	2.1	4.5	656	11.3	0.93	365	6.3	0.33			
		11	40	21	<20	137	0.14	1.70	133	378	510	3.0		889	15.3		515	8.9				
		15	54	30	26	254	0.19	1.53	181	445	626	3.5		1026	17.6		609	10.5				
	G	14	50	<20	<20	59	0.11	2.15	169	365	534	2.9		862	14.8		497	8.5				
		22	79	31	25	144	0.18	1.86	265	468	733	3.7		1070	18.4		640	11.0				
		28	101	38	32	234	0.23	1.73	338	531	868	4.1		1191	20.5		729	12.5				
	U	20	72	27	<20	42	0.12	2.39	241	372	614	2.9		878	15.1		507	8.7				
		33	119	41	29	115	0.19	2.09	398	495	893	3.9		1122	19.3		678	11.7				
		40	144	46	35	169	0.23	1.98	482	549	1031	4.3		1224	21.1		754	13.0				

Convective heating capacity, related to water flow only (without primary air)

Δt_{RWV} in K	L_N in mm				
	900	1050	1200	1350	1500
	\dot{Q}_{HK} in W				
10	84	98	112	126	140
15	114	133	152	172	191
20	145	170	194	218	242
25	177	207	236	266	295
30	210	245	280	314	349
35	242	283	323	364	404
40	276	322	368	414	459
45	309	361	412	464	515
50	343	400	458	515	572



Correction factors (F_w) water volume flow rate

Cooling											
\dot{V}_{WK} in l/h											
50	60	70	80	90	100	110	120	140	160	200	250
0.86	0.89	0.92	0.94	0.96	0.98	1.00	1.02	1.04	1.06	1.08	1.09
Heating											
\dot{V}_{WH} in l/h											
30	40	50	60	70	80	90	100	110	120	140	160
0.92	0.97	1.00	1.03	1.07	1.09	1.12	1.14	1.16	1.19	1.21	1.23

See also our selection programme for air-water systems on the internet at www.trox.de

Order Details

Specification Text

Modular floor induction units for air-water air conditioning systems, in 5 nominal sizes, for ventilating rooms requiring high levels of comfort, for load dissipation (heating/cooling) at the façade using water as the medium, for installation in false floors and cavity flooring.

Comprising: load bearing casing with installation space for the incorporation of control valves and actuators, side fixed brackets with height-adjustable feet and slotted holes for securing to the structure, flange-mounted, interchangeable primary air duct with integral, non-flammable induction nozzles and primary air duct spigot with lip seal, three nozzle variants with varying free cross-sections, circular, deburred stamped nozzles with a projection height of 2 – 4 mm depending on the nozzle variant, optimised for high induction performance at minimum sound power levels and pressure

losses, for adapting to room layout changes nozzles can be individually closed with plugs, easy-to-clean coils complying with VDI 6022, optional as a 2-pipe version for heating or cooling, and as a 4-pipe version for heating and cooling, copper 12 x 1 mm water connections with the option of right or left hand, optional with bleed valves and/or pipe connections with 1/2" external thread, a grille ledge for a linear grille or roll down grille.

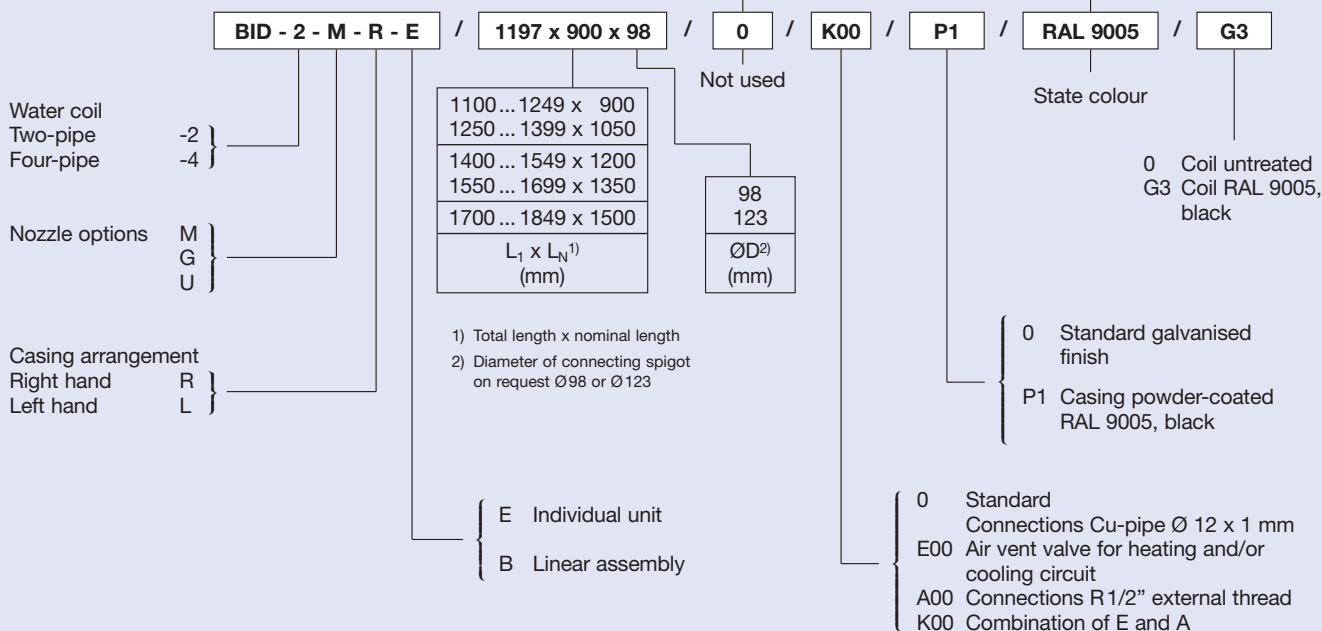
Materials

Casing and primary air duct of galvanised sheet steel, coils with copper pipes and pressed aluminium fins, untreated surface, rubber lip seal.

Casing option powder-coated to RAL 9005 (black) and/or coils black, RAL 9005.

Order Code

These codes do not need to be completed for standard products



Order example

Make: TROX
 Type: BID - 2 - M - R - E / 1197 x 900 x 98 / K00 / P1 / G3

Please order separately linear grille or roll down grille:
 Aluminium roll down grille (ARR20)
 see product information leaflet PI/T1.1/2/EN/...
 Aluminium linear grille (AFN-0-A)
 see product information leaflet PI/T1.1/3/EN/...