



► **Tandem**
door air curtains

Tandem

Door air curtains with patented Tandem technology
for effective cold air screening

► **Technical Catalogue**

Kampmann.eu/tandem
Kampmann.co.uk/tandem

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Tandem door
air curtains.
Effective cold air
screening for a
comfortable indoor
climate.





Adverse weather stays outside all year round, thanks to the enhanced penetration depth produced by two parallel air streams of different temperature.

01 ▶ Product information



Tandem 300 – Door air curtains with patented Tandem technology

The screening effect of Tandem door air curtains creates a comfortable indoor climate with open doors.

The perceptible warm air stream creates a rapid feeling of comfort around people.

Unlike conventional door air curtains, a patented dynamic and self-regulating ambient air stream provides for more effective and energy-saving screening of cold outside air.

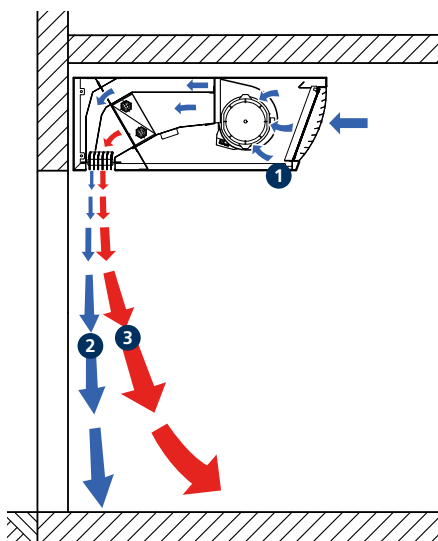
The cold ambient air stream has a greater penetration depth than the warm air stream and acts as a back-up air stream. The contraction of both air streams causes the ambient air stream to pull the warm air stream downwards with it. Adverse energy-intensive turbulence occurs primarily between the outside air and the unheated ambient air stream.

The Coanda effect produces even greater penetration depth. The contraction of both air streams causes the ambient air stream to pull the warm air stream downwards with it. Energy-saving benefits are provided by the ambient air stream, and not just as it does not have to be heated as part of the entire air stream. It also provides for even greater screening, enabling it to be installed at even greater heights.

To the product video: <https://www.kampmann.co.uk/products/videos/tandem-operation.html>

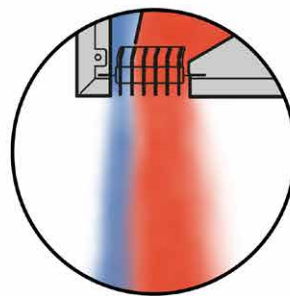


Effectiveness of Tandem 300



- 1 Tandem door air curtain
- 2 Ambient air stream
- 3 Warm air stream

38% energy savings



Approx. 38% energy savings over conventional systems can be obtained by a combination of:

- ▶ unheated ambient air stream
- ▶ increased penetration depth due to the Coanda effect
- ▶ comparatively smaller warm air volume

Product data



Product features

- ▶ 38% energy savings due to unheated ambient air stream (patented Tandem technology)
- ▶ minimal heating requirement with the same screening effect
- ▶ valves (optional) can be concealed behind the casing
- ▶ energy-efficient EC fans



Features

- ▶ free-hanging unit (extensions possible) or cassette ceiling unit
- ▶ ambient and warm air stream
- ▶ EC fans

Heating Installation

KaControl

- ▶ LPHW
- ▶ wall or ceiling-mounted
- ▶ installation flush with the ceiling
- ▶ optional

Connections

- ▶ heat exchanger connection 3/4"

Performance data

Heat output ¹⁾ [kW]

- ▶ 4.6–30.1

Air volume ²⁾ [m³/h]

- ▶ 700–5810

Sound pressure level ³⁾ [dB(A)]

- ▶ 32–64

Operating limits

- ▶ max. operating pressure: 10 bar
- ▶ max. entering water temperature: 90 °C
- ▶ min. entering air temperature: 6 °C
- ▶ max. entering air temperature: 40 °C

Applications

Tandem door air curtains efficiently screen cold outside air at open doorways.



Retail chains



Showrooms and retail outlets



Restaurants and cafés



Public buildings

¹⁾ with LPHW 75 / 65, $t_{L1} = 20^{\circ}\text{C}$

²⁾ total, continuously variable control

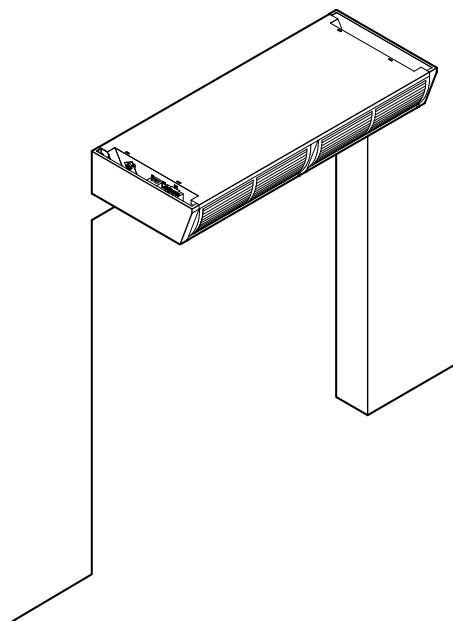
³⁾ The sound pressure level was calculated based on an assumed room insulation of 16 dB(A). This corresponds to a distance of 3 m, a room volume of 2000 m³ and a reverberation time of 1.0 s (in accordance with VDI 2081).

Selection guide: Overview of models

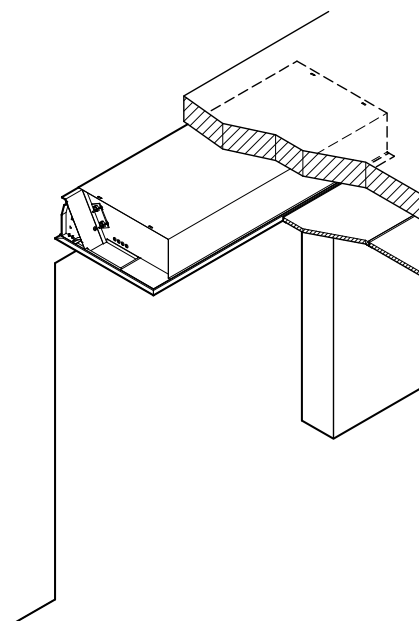
Max. discharge height ¹⁾	Model	Max. door width	Unit design	Total air volume ²⁾	Heat outputs ³⁾	Sound pressure level ⁴⁾	Sound power level	Further information
[m]		[m]		[m³/h]	[kW]	[dB(A)]	[dB(A)]	
2.7 - 3.2	12	1.25	Tandem 300	700 - 2030	4.6 - 9.6	32 - 61	48 - 77	▶ page 14 – 17
			Tandem 300 ceiling cassette unit					▶ page 22 – 25
	20	2.0	Tandem 300	1200 - 3830	8.3 - 18.5	35 - 63	51 - 79	▶ page 18 – 21
			Tandem 300 ceiling cassette unit					▶ page 26 – 29
	25	2.5	Tandem 300	1480 - 5410	10.8 - 26.5	37 - 63	53 - 79	▶ page 18 – 21
			Tandem 300 ceiling cassette unit					▶ page 26 – 29
	30	3.0	Tandem 300	1850 - 5810	13.5 - 30.1	37 - 64	53 - 81	▶ page 18 – 21
			Tandem 300 ceiling cassette unit					▶ page 18 – 21

Installation options

Tandem 300



Tandem 300 ceiling cassette unit



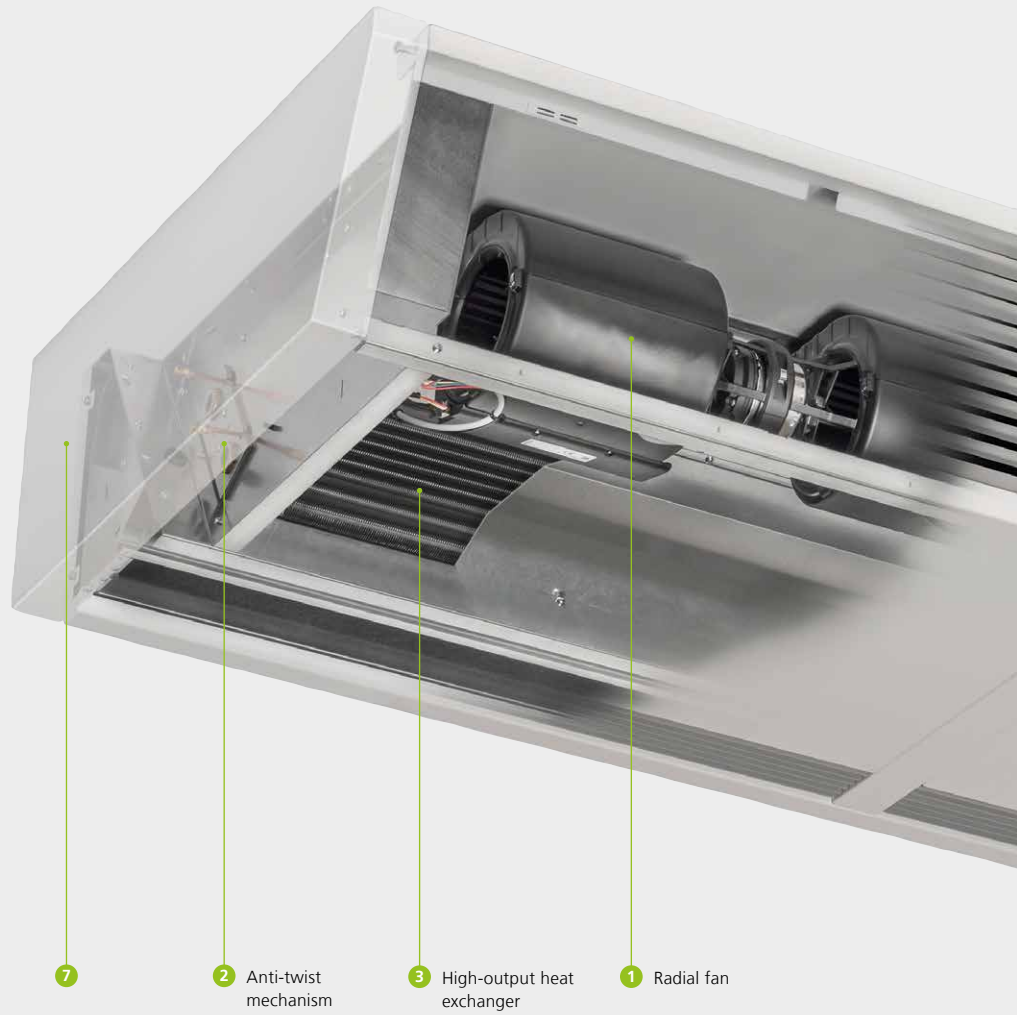
¹⁾ with low to medium pressure, requirements and conditions, see page 19

²⁾ continuously variable control

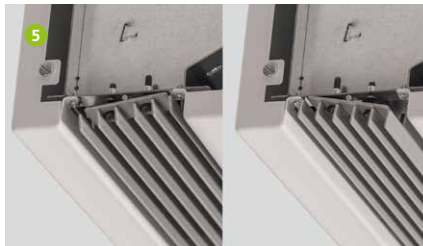
³⁾ with LPHW 75 / 65, $t_{L1} = 20^\circ\text{C}$

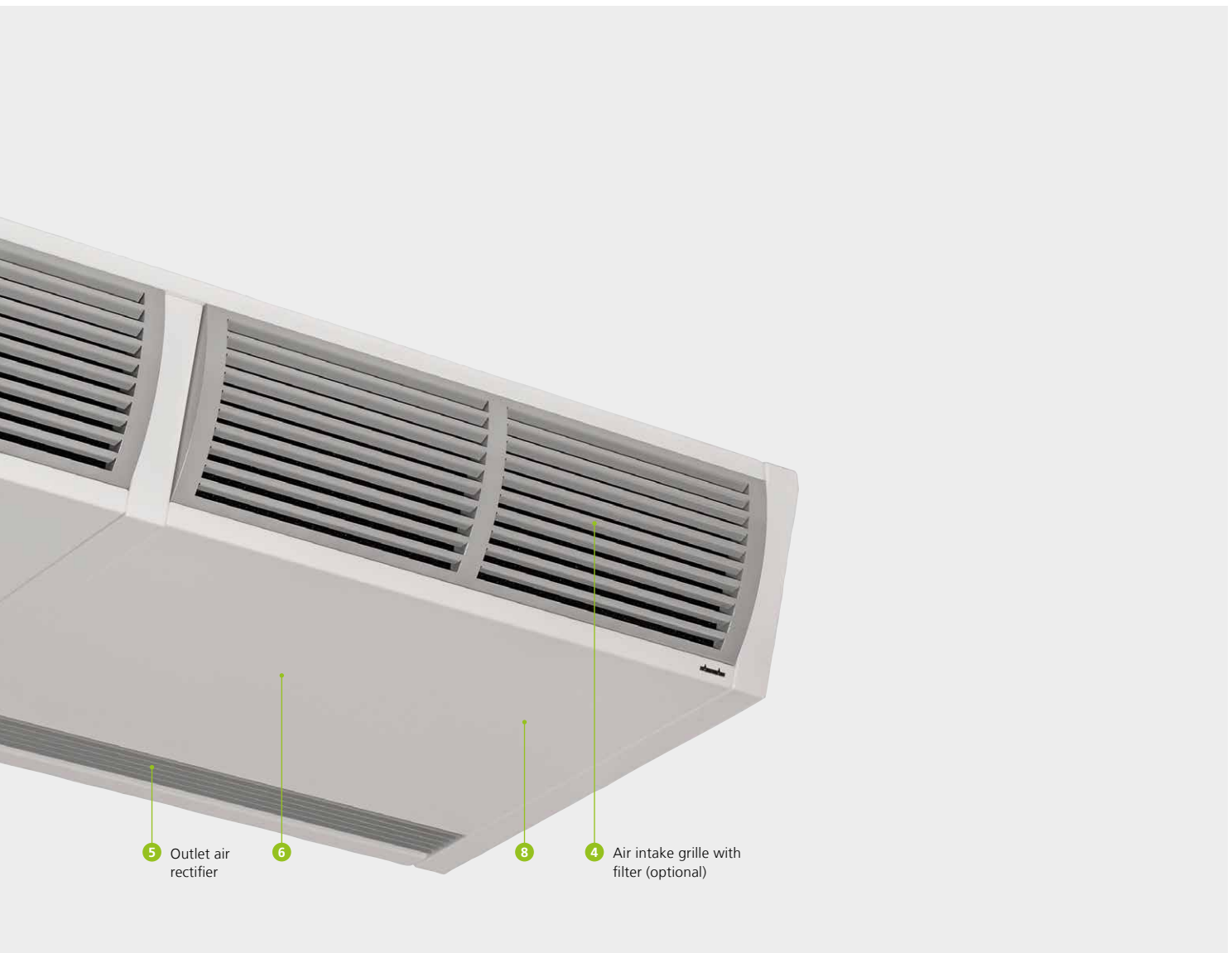
⁴⁾ The sound pressure levels was calculated based on an assumed room insulation of 16 dB(A). This corresponds to a distance of 3 m, a room volume of 2000 m³ and a reverberation time of 1.0 s (in accordance with VDI 2081).

Tandem at a glance



Features



**1 Radial fan:**

- ▶ patented generation of an ambient and warm air stream (Tandem technology) by a single fan group for the effective and energy-saving screening of outside cold air
- ▶ direct-driven radial fan with backward curved impeller, continuously variable EC model

2 Anti-twist device for heating connection:

- ▶ prevents damage to the heat exchanger when fitting the valves
- ▶ optional: valves (accessories)

3 High-output heat exchanger:

- ▶ the proven combination of copper/aluminium

4 Air intake grille with filter (optional):

- ▶ opens with minimal effort
- ▶ simple filter replacement without tools

5 Outlet air rectifier:

- ▶ consisting of an airflow-optimised, adjustable louvre package
- ▶ outlet air rectifier in the air outlet for minimal turbulence and even air discharge, powder-coated in RAL 9006
- ▶ the discharged flat air stream has less divergence but improved penetration depth, significantly reducing air exchange
- ▶ adjusts up to 20° to adjust the direction of the air outlet

6 Service hatch:

- ▶ simple and quick to open
- ▶ fast access for maintenance work

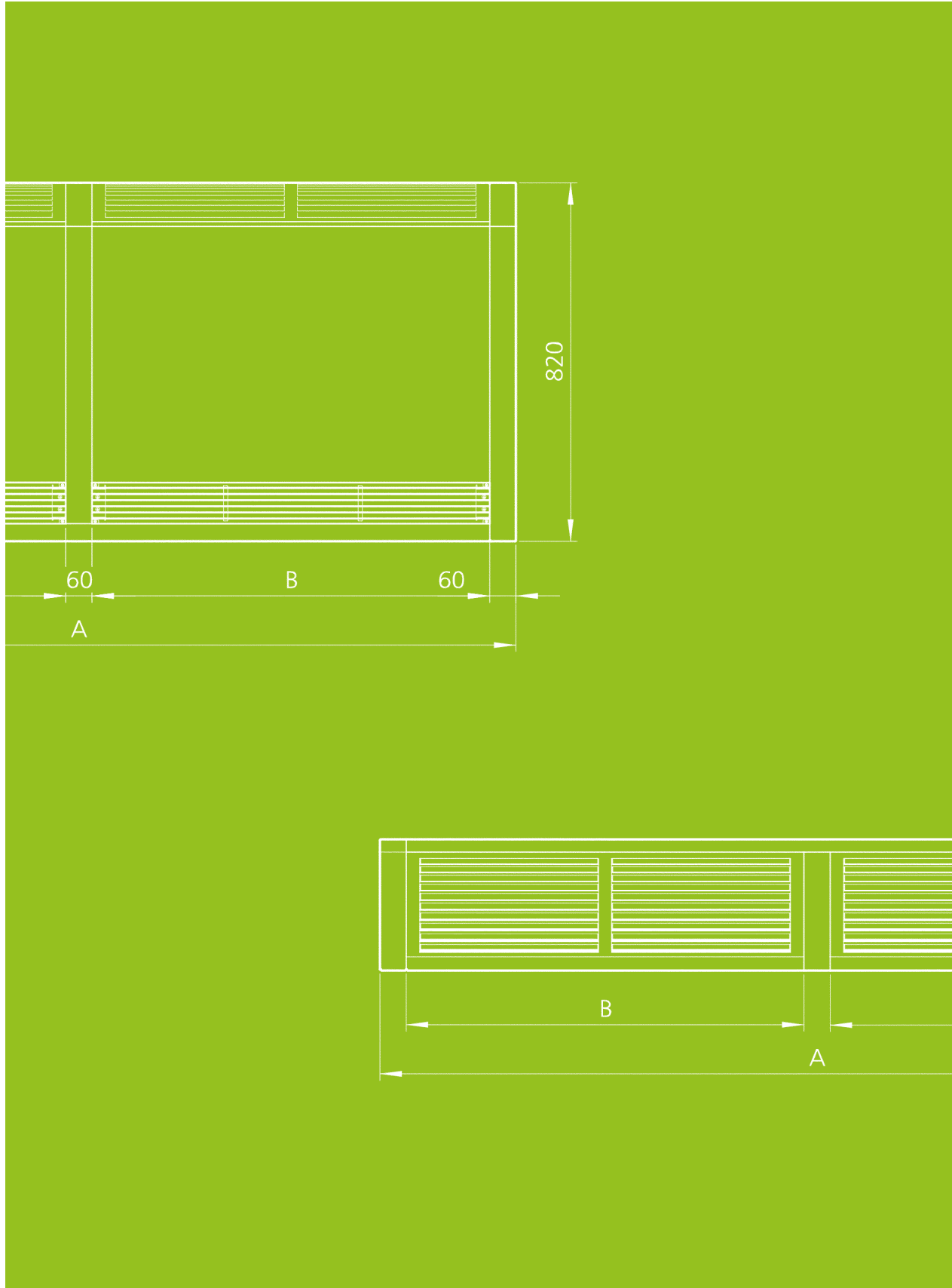
7 Side panel:

- ▶ opens without the need for tools for fast access to valves (accessories) and electrical connections

8 Casing:

- ▶ powder-coated sheet steel construction, with an elegant design
- ▶ side panels, simple to dismantle for maintenance purposes
- ▶ powder-coated in RAL 9016, other non-standard colours available
- ▶ lengths of > 3.0m are possible by coupling the units with a connection set to provide a continuous run
- ▶ rounded air intake grille, powder-coated in RAL 9006, simple to remove for filter maintenance

02 ▶ Technical data



Information on use

Ideally, door air curtains should have a largely continuous air discharge opening to cover the entire width or height of the doorway.

Ensure that the outlet air temperature is controlled depending on the heating or cooling requirement. In heating mode, preferably design the outlet temperature at 32°C, although 36°C is recommended. This requirement applies to the room-side layer with multi-stream systems.

Door air curtains are generally sized in line with VDI 2082 taking into consideration:

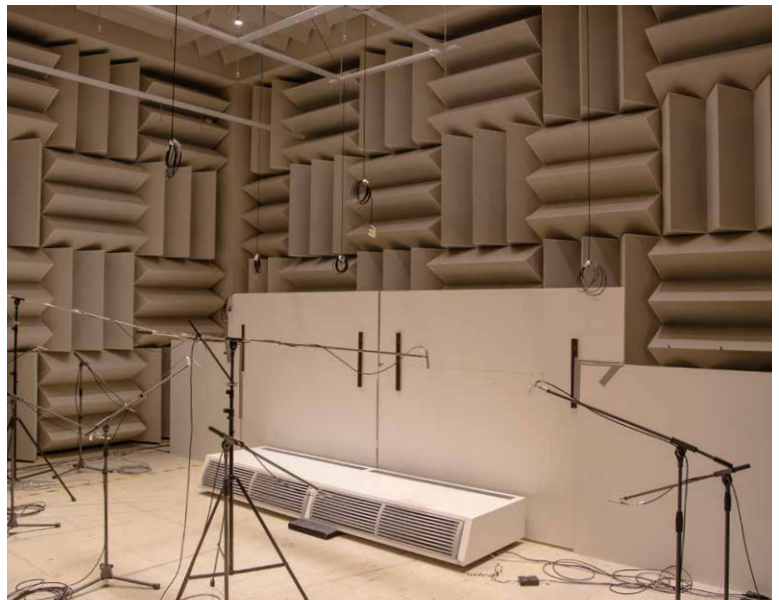
- ▶ door width and door height
- ▶ building position and height
- ▶ wind pressure conditions
- ▶ number and position of entrances
- ▶ type of entrance doors
- ▶ size of sales floor
- ▶ installation height
- ▶ volume of traffic



European patent

The European Patent Office issued a European patent at the start of 2016 for the air guidance of Tandem door air curtains.

The unique feature of Tandem door air curtains is their air guidance: Tandem door air curtains have a multi-stream air outlet with two air superimposed air streams, generated by a single fan group. An unheated ambient air stream automatically adapts to the air volume of the heated air stream when the fan speed changes. The heated air is protected by the ambient air stream and cannot escape to the outside. The ambient air stream has a greater flow velocity than the warm air stream and so acts as a back-up air stream, ensuring the greater stability of the air stream and greater penetration depth.



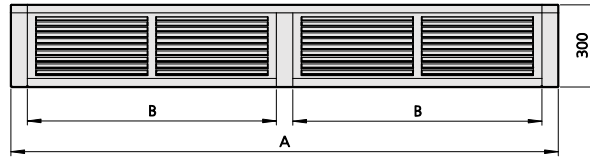
Tandem in an acoustic measuring chamber

Tandem 300

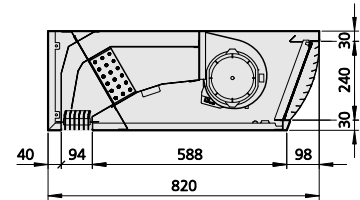
Technical drawings (dimensions in mm)



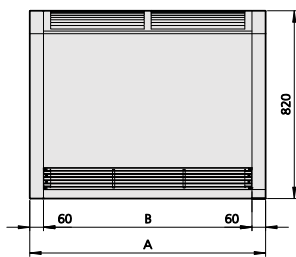
Front view (e.g. Model 12)



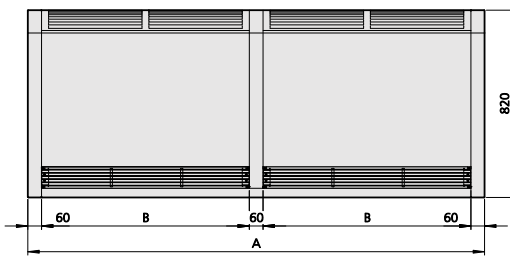
Front view (e.g. Model 20)



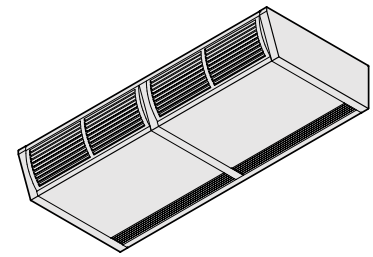
Cross-section



View from below (e.g. Model 12)



View from below (e.g. Model 20)



Isometric drawing, view from below (e.g. Model 200)

Model	A	B
[mm]	[mm]	[mm]
12	1250	1130
20	2000	910
25	2500	1160
30	3000	1410

Specifications

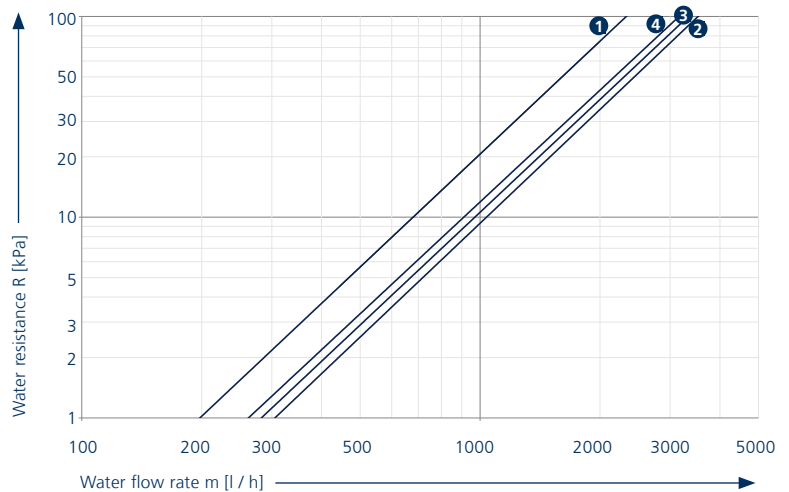
Weight of basic unit including casing

Model	Weight
	[kg]
12	64
20	109
25	136
30	158

Water content of heat exchanger

Model	Internal volume
	[l]
12	1.2
20	2.1
25	2.7
30	3.3

Pressure drop diagram



- ① Model 12
- ② Model 20
- ③ Model 25
- ④ Model 30

Model outputs: LPHW



Model	Max. discharge height ¹⁾	Max. door width	Control voltage	Air volume			Heat outputs ²⁾				Power consumption	Current consumption	Sound pressure level ³⁾	Sound power level
				Total	Ambient air stream	Warm air stream	at LPHW 75/65°C		at LPHW 82/71°C					
							Q _H [kW]	t _{L2} [°C]	Q _H [kW]	t _{L2} [°C]				
V [m ³ /h]	V [m ³ /h]	V [m ³ /h]	P [W]	I [A]	L _{pA} [dB(A)]	L _{WA} [dB(A)]								
12	2.7 - 3.2	1.25	10	2030	810	1220	9.6	43.1	11.0	46.6	262	1.91	61	77
			8	1900	760	1140	9.2	43.7	10.6	47.3	216	1.56	59	75
			6	1620	650	970	8.3	45.2	9.5	48.9	128	0.88	54	70
			4	1200	480	720	6.8	47.8	7.8	51.9	53	0.38	47	63
			2	700	280	420	4.6	52.2	5.3	57.0	13	0.10	32	48
20	2.7 - 3.2	2.00	10	3830	1530	2300	18.5	43.7	21.3	47.2	485	3.49	63	79
			8	3580	1430	2150	17.7	44.2	20.4	47.8	399	2.86	61	77
			6	2970	1190	1780	15.6	45.8	17.9	49.6	231	1.60	56	72
			4	2140	860	1280	12.4	48.5	14.3	52.8	96	0.70	48	64
			2	1200	480	720	8.3	53.9	9.5	59.0	25	0.20	35	51
25	2.7 - 3.2	2.50	10	5410	2160	3250	26.5	44.0	30.5	47.6	670	4.75	63	79
			8	5050	2020	3030	25.3	44.6	29.1	48.2	548	3.90	62	78
			6	4040	1620	2420	21.8	46.5	25.1	50.5	308	2.16	57	73
			4	2850	1140	1710	17.2	49.6	19.8	54.0	129	0.97	48	64
			2	1480	590	890	10.8	55.7	12.4	61.0	36	0.30	37	53
30	2.7 - 3.2	3.00	10	5810	2320	3490	30.1	45.4	34.6	49.2	741	5.11	65	81
			8	5400	2160	3240	28.7	46.1	33.0	50.0	612	4.20	63	79
			6	4420	1770	2650	25.0	47.7	28.8	51.9	344	2.40	58	74
			4	3270	1310	1960	20.3	50.5	23.3	55.0	149	1.06	51	67
			2	1850	740	1110	13.5	55.8	15.5	61.1	37	0.31	37	53

V [m³/h] = air volume, free-blowing; Q_H [kW] = heat output; t_{L1} [°C] = air inlet temperature; t_{L2} [°C] = air outlet temperature

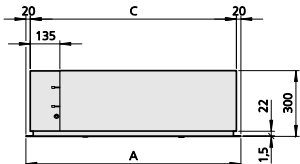
¹⁾ with low to medium pressure requirements and conditions, see page 19

²⁾ with air intake temperature t_{L1} = 20°C

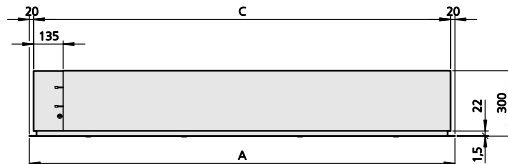
³⁾ The sound pressure levels was calculated based on an assumed room insulation of 16 dB(A). This corresponds to a distance of 3 m, a room volume of 2000 m³ and a reverberation time of 1.0 s (in accordance with VDI 2081).

Tandem 300 ceiling cassette unit

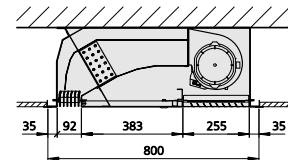
Technical drawings (dimensions in mm)



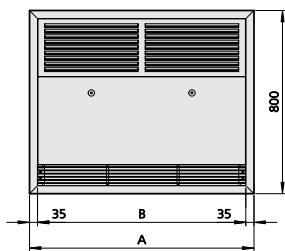
Front view (e.g. Model 12)



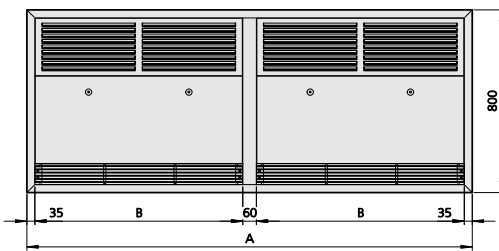
Front view (e.g. Model 20)



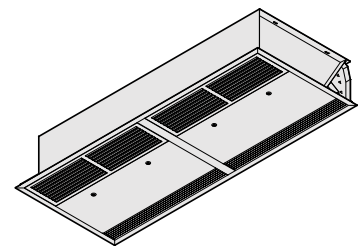
Cross-section



View from below (e.g. Model 12)



View from below (e.g. Model 20)



Isometric drawing, view from below (e.g. Model 200)

Model	A	B	C
[mm]	[mm]	[mm]	[mm]
12	1200	1130	1160
20	1950	910	1910
25	2450	1160	2410
30	2950	1410	2910

Specifications

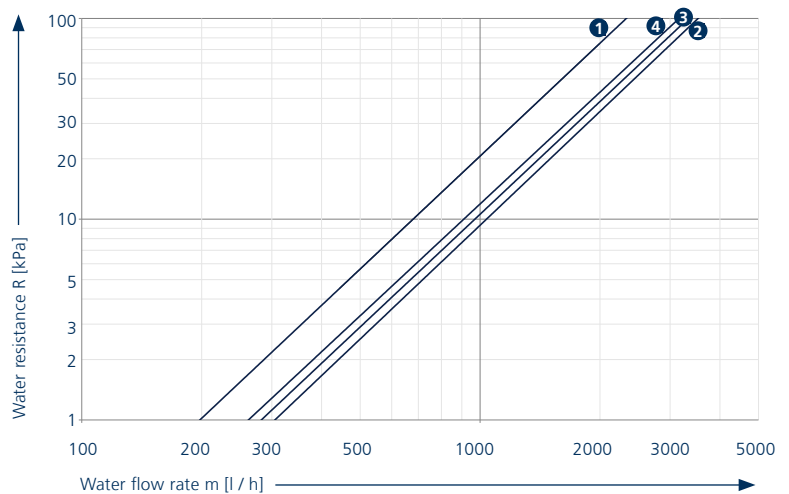
Weights of ceiling cassette unit

Model	Weight
	[kg]
12	64
20	103
25	130
30	152

Water content of heat exchanger

Model	Internal volume
	[l]
12	1.2
20	2.1
25	2.7
30	3.3

Pressure drop diagram



- 1 Model 12
- 2 Model 20
- 3 Model 25
- 4 Model 30

Model outputs: LPHW



Model	Max. discharge height ¹⁾ [m]	Max. door width [m]	Control voltage [V]	Air volume			Heat outputs ²⁾				Power consumption [W]	Current consumption [A]	Sound pressure level ³⁾ [dB(A)]	Sound power level [dB(A)]
				Total V [m ³ /h]	Ambient air stream V [m ³ /h]	Warm air stream V [m ³ /h]	at LPHW 75/65°C		at LPHW 82/71°C					
							Q _H [kW]	t _{L2} [°C]	Q _H [kW]	t _{L2} [°C]				
12	2.7 - 3.2	1.25	10	2030	810	1220	9.6	43.1	11.0	46.6	262	1.91	61	77
			8	1900	760	1140	9.2	43.7	10.6	47.3	216	1.56	59	75
			6	1620	650	970	8.3	45.2	9.5	48.9	128	0.88	54	70
			4	1200	480	720	6.8	47.8	7.8	51.9	53	0.38	47	63
			2	700	280	420	4.6	52.2	5.3	57.0	13	0.10	32	48
20	2.7 - 3.2	2.00	10	3830	1530	2300	18.5	43.7	21.3	47.2	485	3.49	63	79
			8	3580	1430	2150	17.7	44.2	20.4	47.8	399	2.86	61	77
			6	2970	1190	1780	15.6	45.8	17.9	49.6	231	1.60	56	72
			4	2140	860	1280	12.4	48.5	14.3	52.8	96	0.70	48	64
			2	1200	480	720	8.3	53.9	9.5	59.0	25	0.20	35	51
25	2.7 - 3.2	2.50	10	5410	2160	3250	26.5	44.0	30.5	47.6	670	4.75	63	79
			8	5050	2020	3030	25.3	44.6	29.1	48.2	548	3.90	62	78
			6	4040	1620	2420	21.8	46.5	25.1	50.5	308	2.16	57	73
			4	2850	1140	1710	17.2	49.6	19.8	54.0	129	0.97	48	64
			2	1480	590	890	10.8	55.7	12.4	61.0	36	0.30	37	53
30	2.7 - 3.2	3.00	10	5810	2320	3490	30.1	45.4	34.6	49.2	741	5.11	65	81
			8	5400	2160	3240	28.7	46.1	33.0	50.0	612	4.20	63	79
			6	4420	1770	2650	25.0	47.7	28.8	51.9	344	2.40	58	74
			4	3270	1310	1960	20.3	50.5	23.3	55.0	149	1.06	51	67
			2	1850	740	1110	13.5	55.8	15.5	61.1	37	0.31	37	53

V [m³/h] = air volume, free-blowing; Q_H [kW] = heat output; t_{L1} [°C] = air inlet temperature; t_{L2} [°C] = air outlet temperature

¹⁾ with low to medium pressure requirements and conditions, see page 19

²⁾ with air intake temperature t_{L1} = 20°C

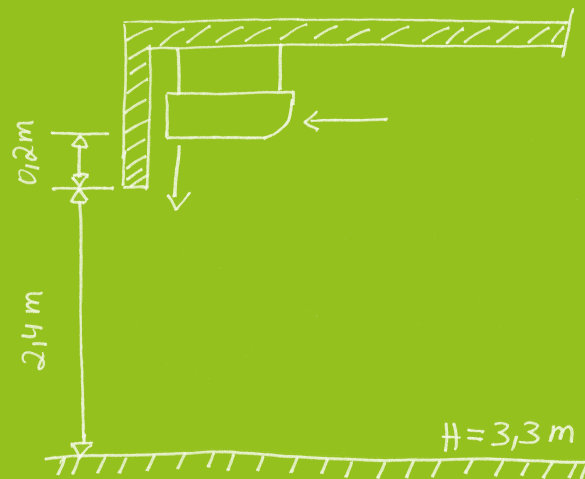
³⁾ The sound pressure levels was calculated based on an assumed room insulation of 16 dB(A). This corresponds to a distance of 3 m, a room volume of 2000 m³ and a reverberation time of 1.0 s (in accordance with VDI 2081).

03 ▶ Design information

Eingang Foyer EG

Außen:

- geschützte Lage
- kein Windfang!



Raum:

- $A = 200 \text{ m}^2$
- $t_i = 20^\circ\text{C}$
- Türbreite 2m
- kein Aufenthaltsbereich in Türnähe
- Betrieb mit Zeitschaltung gewünscht!

- Punkte nach Auswahlblatt: 8

- geforderte Ausblashöhe H : 2,6 m

⇒ Diagramm Auswahlblatt: Tandem 300 BG20, Ansteuerung 8V

Systemtemperatur: 55/45°C

Ansaugtemperatur $t_{L1} = t_i$: 20°C

⇒ Tandem 300, Ansteuerung 8V:

Wärmeleistung Q_h : 9,9 kW

Ausblastemperatur t_{L2} : 33,6°C

⇒ empfohlene Ausblastemperatur nach VDI 2082 ✓

Komponenten:

- 1x Tandem 300 Typ 3120430C1

- 1x Deckenkonsole Typ 100995

- 1x Ausblastemp. begrenzungsventil Typ 100965

- 1x thermoel. Absperrventil Typ 100910

- 1x KaController mit Funktionstasten Typ 3210002

Art. - Nr.

251003120430C1

251 000 100 995

196 000 100 965

196 000 100 910

196 003210 002

Layout

When positioned over the door, the equipment needs to be installed in such a way that the air outlet grille is positioned as closely as possible to the door opening, preferably directly adjacent to the door.

With horizontal and vertical gaps of more than 500 mm between the door opening and outlet grille, select the next model length up or provide for side panelling similar to a corridor.

Operating limits

Extremely poor operating conditions, such as

- ▶ strong negative pressure in the rooms, e.g. produced by mechanical ventilation without the supply of outside air,
- ▶ extremely adverse weathering conditions with high wind speeds in an unprotected position,
- ▶ several open openings to the outside, especially if they are positioned opposite each other,

can impair the effective screening effect of the door air curtains. Additional measures, may need to be put in place, to compensate for the pressure in the room. When designing thoroughfares, note that it may be necessary to close the doors during business hours as well.

Provide for units with higher air outputs and heat outputs should doors need to remain open in large department stores, even in the event of unfavourable or extreme weather.

They have to be in a position to heat up the large volumes of cold air, which can penetrate under certain circumstances.

Filters

Tandem door air curtains are supplied ex-works without the filter fitted. Note when using filter type 2510031**925 that it can reduce the air volume by about 3% (even with a clean filter).

Low temperature operation

Modern low temperature and condensing boilers only achieve the highest levels of efficiency with low flow temperatures. Kampmann Tandem door air curtains have high-output copper / aluminium heat exchangers and are suitable for low temperature operation at a flow temperature of approx. 50°C. Thanks to their extremely low water content and fan operation with high air volumes, they react extremely quickly after long cooling down periods.

Sound pressure level

The aerodynamic construction of Tandem units only produces a very low noise level, in spite of the high outlet air speeds. Nevertheless, it is important to note that the sound levels may be troubling at high control voltages.

Sound pressure levels are listed in the technical data tables.

The sound pressure levels were calculated with an assumed room insulation of 16 dB(A). This corresponds to a distance of 3 m, a room volume of 2000 m³ and a reverberation time of 1.0 s (in accordance with VDI 2081). As the actual sound pressure level is seriously dependent on the acoustic properties of the space, the stated figures can deviate in practice.

Increased sound levels of approx. 3–6 dB (A) can occur under acoustically unfavourable conditions, such as „acoustically hard“ ceilings, closed doors and poor absorption surfaces. If two models of the same door air curtain are arranged adjacent to each other, the sound pressure level will increase approx. 2 - 3 dB (A).

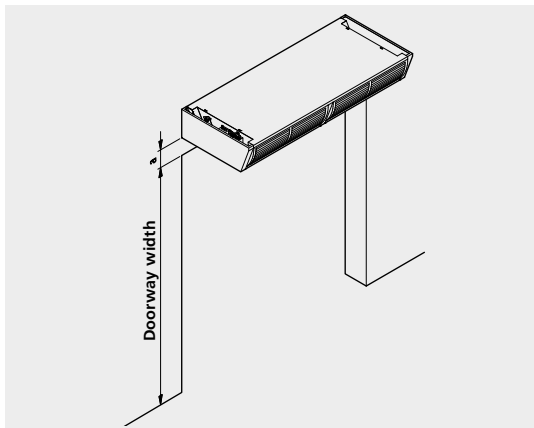
Max. electrical rating of Tandem

Unit design	Model	Voltage [V] / Frequency [Hz]	Power consumption [kW]	Current consumption [A]	Speed [rpm]
Tandem 300 and Tandem 300 ceiling cassette unit	Model 12	230 / 50/60	0.5	3.6	1400
	Model 20	230 / 50/60	1.0	7.2	1400
	Model 25	230 / 50/60	1.5	10.8	1400
	Model 30	230 / 50/60	1.9	14.4	1400

The power and current consumption of the control and actuators (optional) is not taken into account.

Unit selection and combination options

Selection of the unit configuration based on maximum discharge height



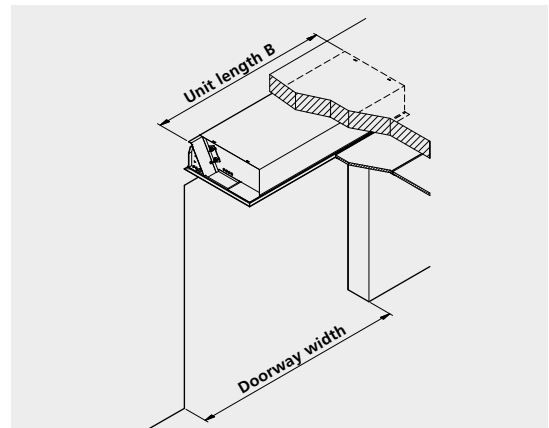
1. Based on discharge height:
- ▶ max. discharge height $H_{max} = \text{doorway height} + a$

Also consider:

- ▶ wind pressure conditions
- ▶ impact of thoroughfare, porch, position of the building
- ▶ space occupied by people
- ▶ pressure conditions caused by mechanical ventilation etc.

Max. discharge height H_{max} ¹⁾ [m]	Door air curtains
2.7 – 3.2	Tandem 300
2.7 – 3.2	Tandem 300 ceiling cassette unit

Selection of the unit configuration based on door / doorway width



2. Based on door / doorway width:
- The required model of door air curtain is selected on the basis of the door width:

- ▶ door / doorway width = unit length B

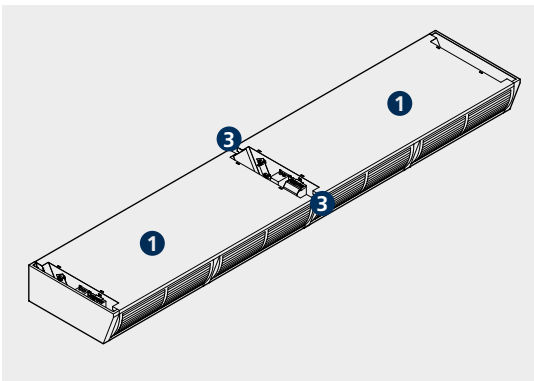
The unit lengths are based on common door opening dimensions.

Other unit lengths can be obtained by combining units of the same or different model, possibly using the connecting set available.

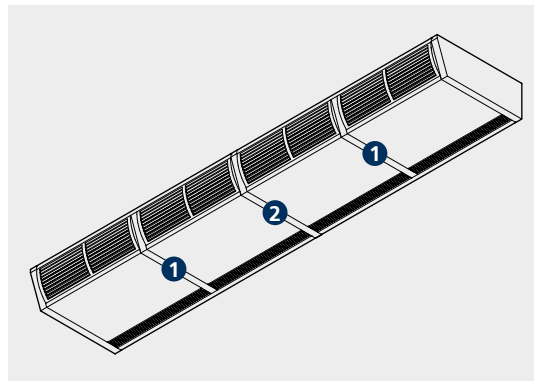
Door/doorway width [m]	Models of door air curtains	
	Tandem 300	Tandem 300 ceiling cassette unit
< 1,25	Model 12	Model 12
2,0	Model 20	Model 20
2,5	Model 25	Model 25
3,0	Model 30	Model 30

¹⁾ up to doorways 4.5 m wide; other widths are possible using other combinations

Modular design with combined units



Isometric drawing, view from above



Isometric drawing, view from below

- ❶ Tandem door air curtain (e.g. Model 20)
- ❷ Connecting panel
- ❸ Spacer

Lengths of > 3 m can be achieved, thanks to the modular construction and can be seamlessly extended (see table below)

Door/doorway width	Combination options with casing extensions ¹⁾
	Tandem 300
[m]	
3,0	1 × Model 30
3,2	Model 20 + Model 12
4,0	2 × Model 20
4,5	Model 20 + Model 25

¹⁾ up to doorways 4.5m wide; other widths are possible using other combinations

To assist with selection

Assessment criteria	Pressure / Requirements / Conditions	Points*														
1. Wind pressure conditions	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td colspan="3">weak air flow, densely populated position</td> <td colspan="2">medium air flow</td> <td colspan="2">strong air flow, close to the sea, on a slope</td> </tr> </table>	0	1	2	3	4	5	6	weak air flow, densely populated position			medium air flow		strong air flow, close to the sea, on a slope		<input type="text"/>
0	1	2	3	4	5	6										
weak air flow, densely populated position			medium air flow		strong air flow, close to the sea, on a slope											
2. Passage / Porch	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td colspan="2">available, closed</td> <td colspan="2">open</td> <td>not available</td> </tr> </table>	0	1	2	3	4	available, closed		open		not available	<input type="text"/>				
0	1	2	3	4												
available, closed		open		not available												
3. Position of building	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td colspan="3">normal, protected</td> <td colspan="2">open buildings</td> <td colspan="2">free-standing, unprotected</td> </tr> </table>	0	1	2	3	4	5	6	normal, protected			open buildings		free-standing, unprotected		<input type="text"/>
0	1	2	3	4	5	6										
normal, protected			open buildings		free-standing, unprotected											
4. Area constantly occupied by people	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>Zone I</td> <td>Zone II</td> <td>Zone III</td> </tr> </table> <p>B = door width</p>	0	1	2	Zone I	Zone II	Zone III	<input type="text"/>								
0	1	2														
Zone I	Zone II	Zone III														
5. Pressure conditions caused by mechanical ventilation	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td colspan="2">overpressure</td> <td colspan="2">pressure equalisation</td> <td>slight negative pressure</td> </tr> </table>	0	1	2	3	4	overpressure		pressure equalisation		slight negative pressure	<input type="text"/>				
0	1	2	3	4												
overpressure		pressure equalisation		slight negative pressure												
6. Other thoroughfares / doors	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td colspan="2">none</td> <td colspan="2">at the side of the door opening</td> <td>opposite the door opening</td> </tr> </table>	0	1	2	3	4	none		at the side of the door opening		opposite the door opening	<input type="text"/>				
0	1	2	3	4												
none		at the side of the door opening		opposite the door opening												
7. Ceiling height	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td colspan="2">up to 2.5 m</td> <td colspan="2">up to 3.5 m</td> <td>more than 4.5 m and/or with staircase</td> </tr> </table>	0	1	2	3	4	up to 2.5 m		up to 3.5 m		more than 4.5 m and/or with staircase	<input type="text"/>				
0	1	2	3	4												
up to 2.5 m		up to 3.5 m		more than 4.5 m and/or with staircase												
8. Floor area	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td colspan="2">up to 100 m²</td> <td colspan="2">400 m²</td> <td>above 800 m²</td> </tr> </table>	0	1	2	3	4	up to 100 m ²		400 m ²		above 800 m ²	<input type="text"/>				
0	1	2	3	4												
up to 100 m ²		400 m ²		above 800 m ²												
9. Gap between door opening – air outlet	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td colspan="2">a = 0</td> <td colspan="3">a = 300 mm</td> <td colspan="2">a = 600 mm</td> </tr> </table> <p>1 = Door air curtain, 2 = Door a = Gap</p>	0	1	2	3	4	5	6	a = 0		a = 300 mm			a = 600 mm		<input type="text"/>
0	1	2	3	4	5	6										
a = 0		a = 300 mm			a = 600 mm											

Points total

* Please enter points.

Selection process

Selection process

Enter points on each scale in line with the site conditions for the various factors / assessment criteria.

- ▶ intermediate values are also possible
- ▶ in extreme cases, factors outside of the point scale can also be taken into consideration. The total of points in the right column of the table gives the total points for determining the maximum discharge heights and discharge widths depending

on the switching stage in diagram 1

- ▶ note the limits of use (see page 19) when the doors are continuously open.

H_{\max} here represents the maximum discharge height for both horizontal and vertical Tandem door air curtains.

Selection example

Specification: door air curtain for showroom,
Door: height 2.40m, width 2.00m

- ▶ weak to moderate air flow (2 points)
- ▶ no porch or passage installed (4 points)
- ▶ normal, protected location (0 points)
- ▶ no people standing/working directly adjacent to the doorway (0 points)
- ▶ balanced pressure conditions (2 points)
- ▶ no other thoroughfares (0 points)
- ▶ room height 3.30m (2 points)
- ▶ room area 200 m² (1 point)
- ▶ distance from door opening - air outlet 200mm (2 points)

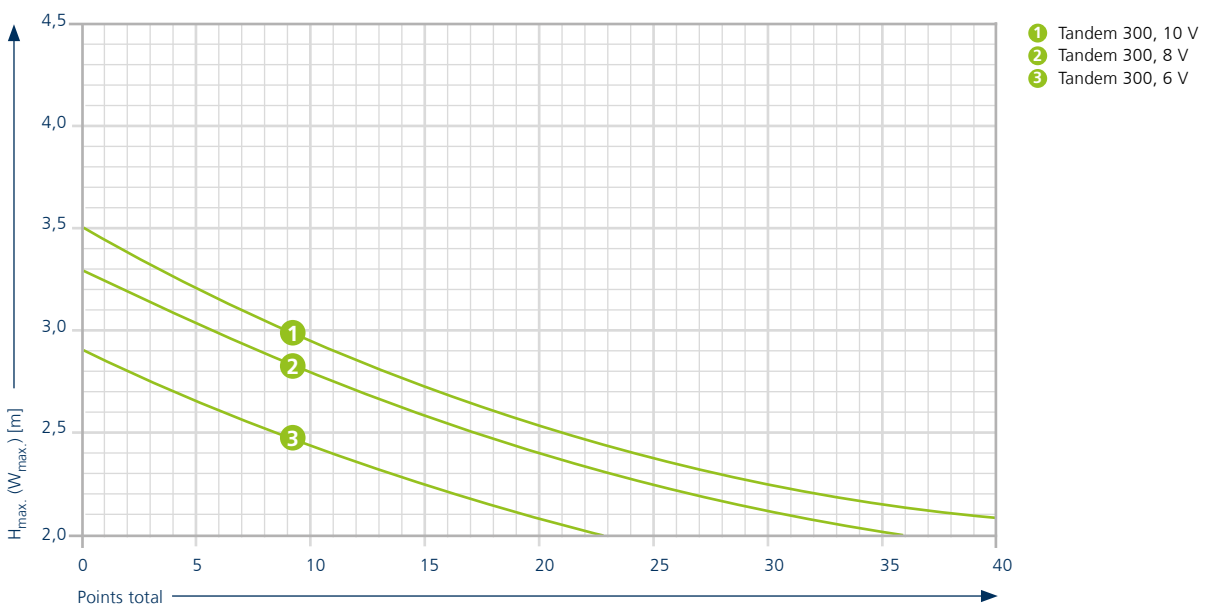
Total points: 13 points

Selection

- ▶ door air curtain size 20, thus unit length = door width
- ▶ assessment as per table: Total points = 13
- ▶ discharge height = door height + a = 2.4 m + 0.2 m = 2.6 m
- ▶ from diagram 1:
at least 13 points, as a minimum:
Tandem 300 door air curtain with $H_{\max.} = 2.70$ m with 8 V actuation

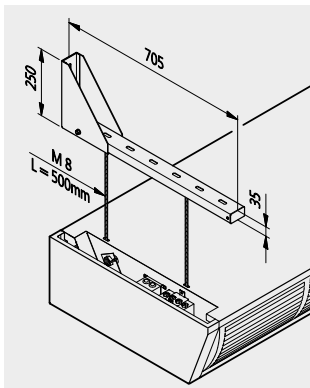
Result: Tandem 300 door air curtain, size 20

Diagram 1

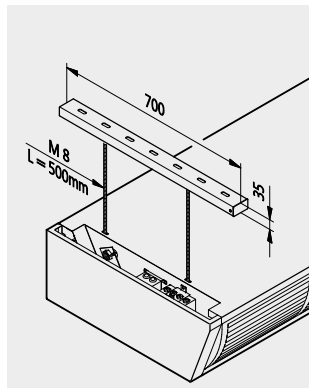


Brackets

Overview of types



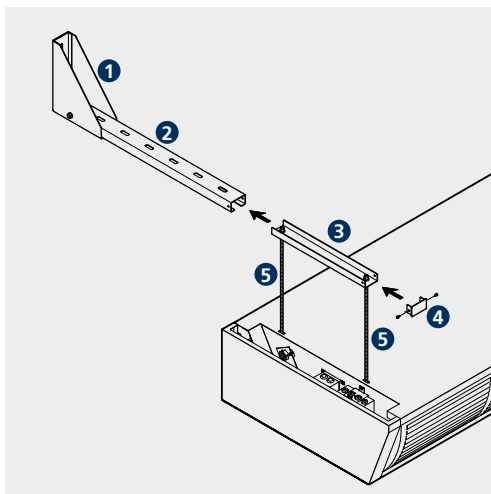
Wall bracket



Ceiling bracket

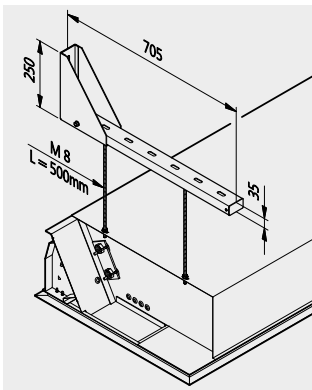
- ▶ adjustable towards the door
- ▶ brackets powder coated traffic white RAL 9016
- ▶ precise height adjustment is possible with the use of threaded rods

Slot-in design for wall and ceiling brackets

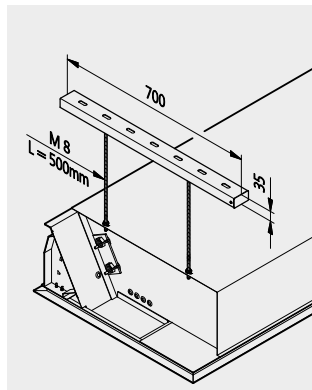


- 1 Fixing bracket for wall bracket
- 2 U-shaped rail
- 3 Slide-in rail
- 4 Cover
- 5 Threaded rod

Overview of types



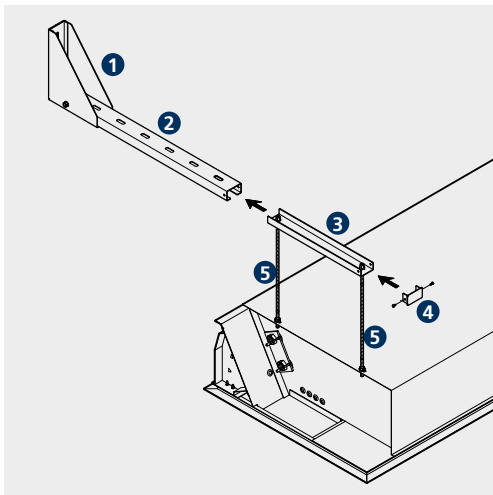
Wall bracket



Ceiling bracket

- ▶ adjustable towards the door
- ▶ brackets powder coated traffic white RAL 9016
- ▶ precise height adjustment is possible with the use of threaded rods

Slot-in design for wall and ceiling brackets



- 1 Fixing bracket for wall bracket
- 2 U-shaped rail
- 3 Slide-in rail
- 4 Cover
- 5 Threaded rod

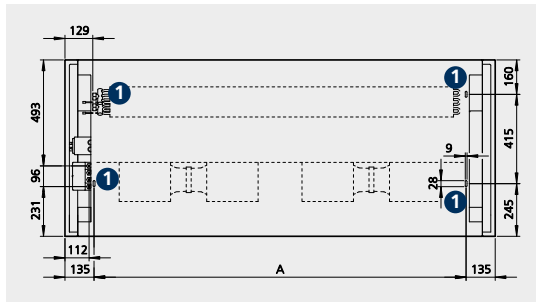
Overview

Door air curtains	Model	Wall bracket	Ceiling bracket
Tandem 300	Model 12-25	Type 100990	Type 100995
	Model 30	Type 100992	Type 100997
Tandem 300 ceiling cassette unit	Model 12-25	Type 100990	Type 100995
	Model 30	Type 100992	Type 100997

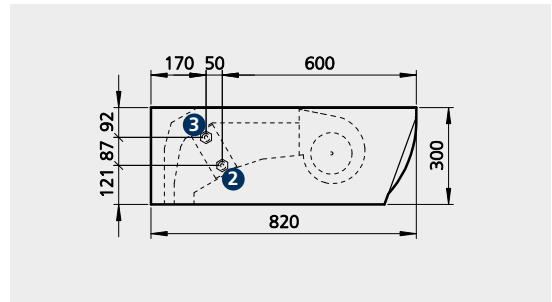
Tandem 300: Fixing points and LPHW connection

Tandem door air curtains are either suspended using wall or ceiling brackets or a bracket on site. 4 no. slots (additionally 2 no. M8 rivet nuts for model 30) are fitted to the unit.

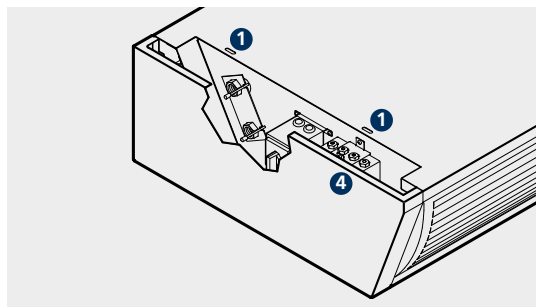
The LPHW and electrical connection are located on the upper side of the unit behind the side panel, on the left-hand side, seen from the air intake. Dimensions and spacings can be taken from the following drawings and table.



View from above



Side view



Isometric view, connection area

- 1 Fixing point
- 2 Flow 3/4"
- 3 Return 3/4"
- 4 Electrical connection

The side panel can be removed without the need for a tool to access the electrical wiring, PCB settings, for permanent decommissioning, valve adjustment or for

maintenance purposes, providing access for all connection work.

Spacing of fixing points (dimensions in mm)

Model	A
	[mm]
12	980
20	1730
25	2230
30	2 x 1365

Tandem 300 ceiling cassette unit:

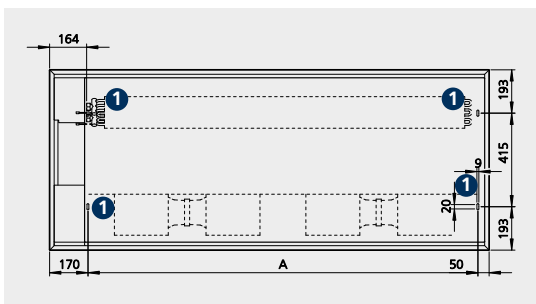
Fixing points and LPHW connection

Tandem ceiling cassette door air curtains are either suspended using wall or ceiling brackets or a bracket on site. 4 no. slots (additionally 2 no. M8 rivet nuts for model 30) are fitted to the unit.

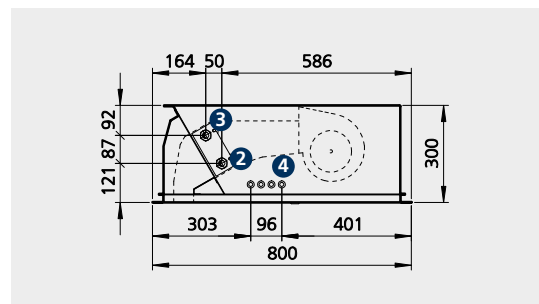
The LPHW connection is located on the side of the unit, on the left-hand side, seen from the air intake. Valves can be adjusted and the heat exchanger vented through the service hatch.

The electrical connection is located on the underside of the unit, on the left-hand side, seen from the air intake.

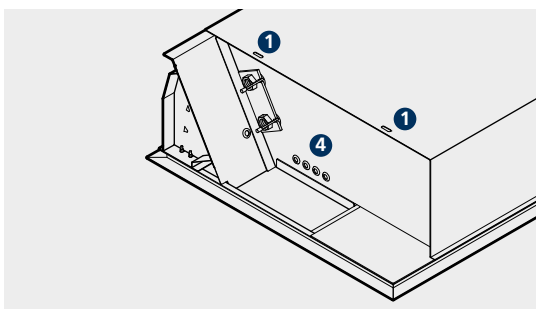
Dimensions and spacings can be taken from the following drawings and table.



View from above



Side view



Isometric view, connection area

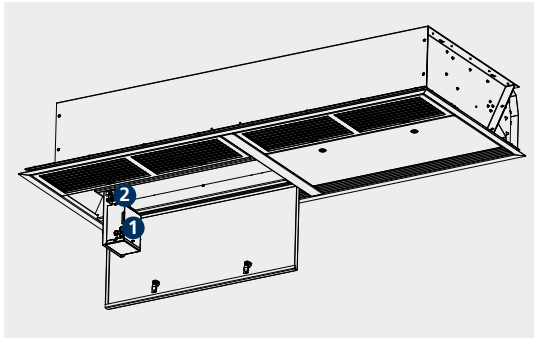
- 1 Fixing point
- 2 Flow 3/4"
- 3 Return 3/4"
- 4 Cable openings

Spacing of fixing points (dimensions in mm)

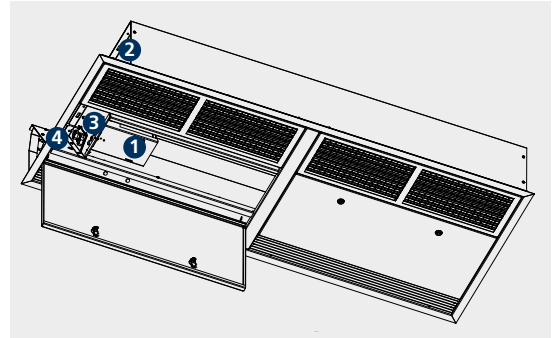
Model	A
	[mm]
12	980
20	1730
25	2230
30	2 x 1365

The electrical junction box can be hinged downwards and fixed to the side bracket (with C1 and T control configuration) to access the electrical wiring, PCB settings, for permanent decommissioning or for maintenance.

Fit the valves before completing the ceiling (plasterboard ceiling or acoustic ceiling grid etc.) The valves can be adjusted and the heat exchanger vented through the service hatch.



General view, electrical connection (e.g. Model 20, C1 control configuration)



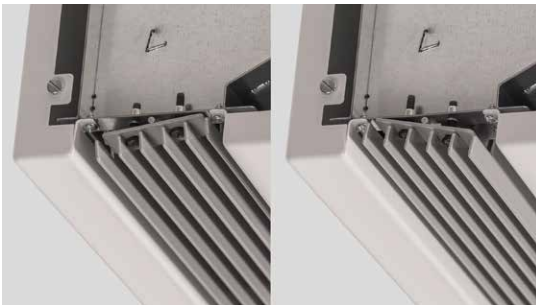
General view, LPHW connection (e.g. Model 20, C1 control configuration)

- ❶ Electrical junction box (e.g. C1 control configuration)
- ❷ Main side bracket
- ❸ Cable openings
- ❹ LPHW connection with heat exchanger bleeding

Tandem 300 door air curtain

Adjustment of air outlet

The air outlet rectifier has an adjustment range of 20° to tailor the air outlet to individual requirements. The air stream can be specifically and operationally reliably directed outwards or inwards. The air outlet rectifier is factory-set for vertical air outlet.



Air outlet adjustment inwards or outwards

04 ▶ Controls

Description of control for Tandem EC with electromechanical control

Product features of electromechanical control (*00)

The version with intuitive control units and internal fault signal monitoring. The EC fans used in Tandem door air curtains can be controlled continuously variably. Any motor fault is then internally evaluated and switches the fans off.

This configuration can be controlled via the combined controller type 30158 and an external building management system.

Product features of electromechanical control with external fault signal monitoring (*T)

The version with intuitive control units and external fault signal monitoring and reporting. The EC fans used in Tandem door air curtains can be controlled continuously variably. Any motor fault that occurs is reported potential-free via a fault signalling PCB and, depending on the control unit connected, can be displayed and called up.

This configuration can be controlled by speed controller type 146936, combined controller type 30158 and an external building management system.

Control valves

The discharge temperature is a key factor for the effectiveness of a door air curtain system. Too high outlet air temperatures reduce the penetration depth of the air stream and can have an unpleasant effect. For energy-saving reasons, the discharge temperature of the heating period should not be higher than 40°C, between 32°C and 36°C is recommended in accordance with VDI 2082. Control to a constant value is possible by the use of an outlet temperature limit valve. The use of a thermoelectric shut-off valve is also possible to avoid the air stream being heated up.

Operation by a speed controller type 146936



The speed controller offers the simplest method of continuously variable fan speed control.

Operation by a combined controller type 30158



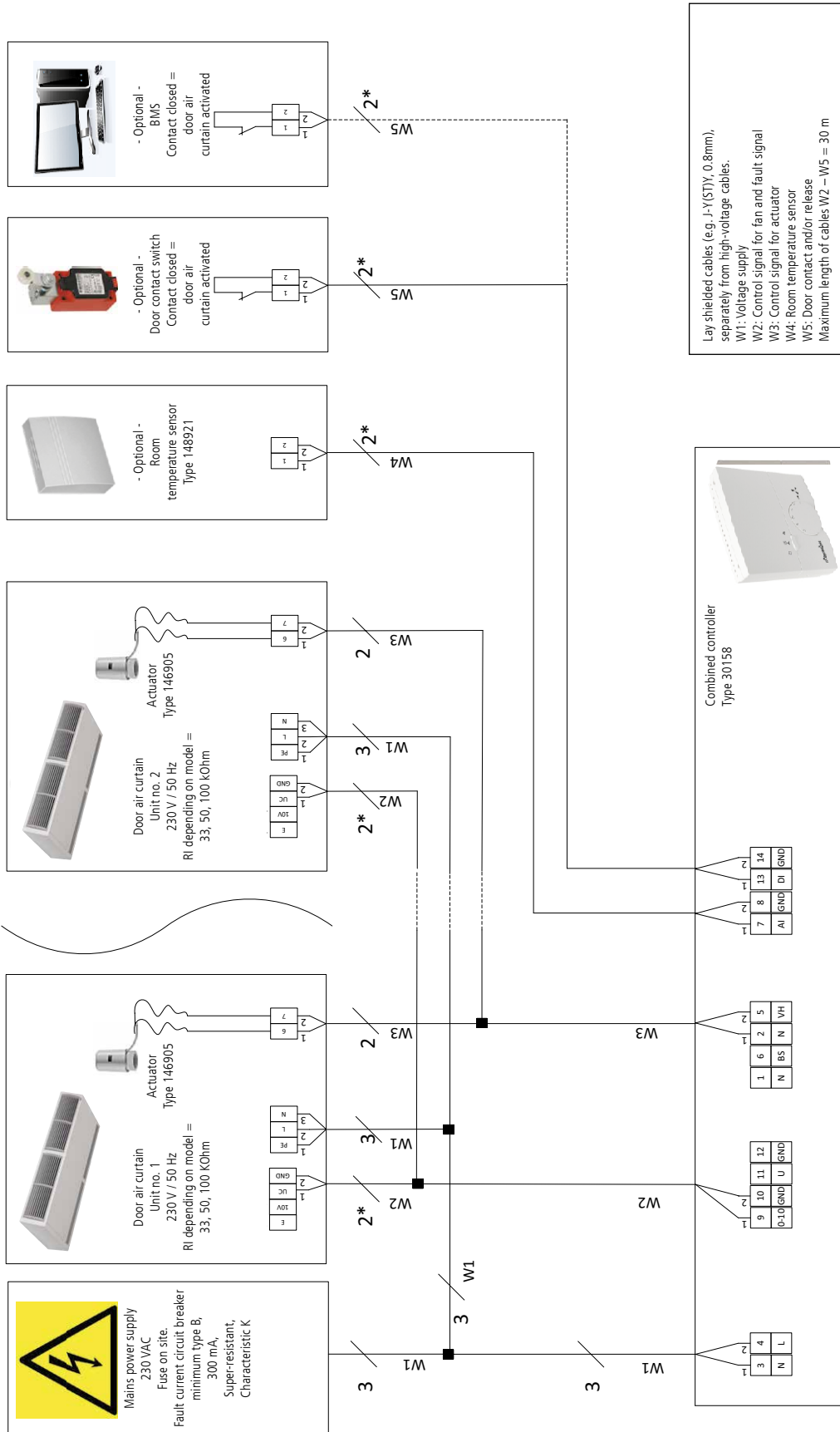
The combined controller offers all key functions in a single control:

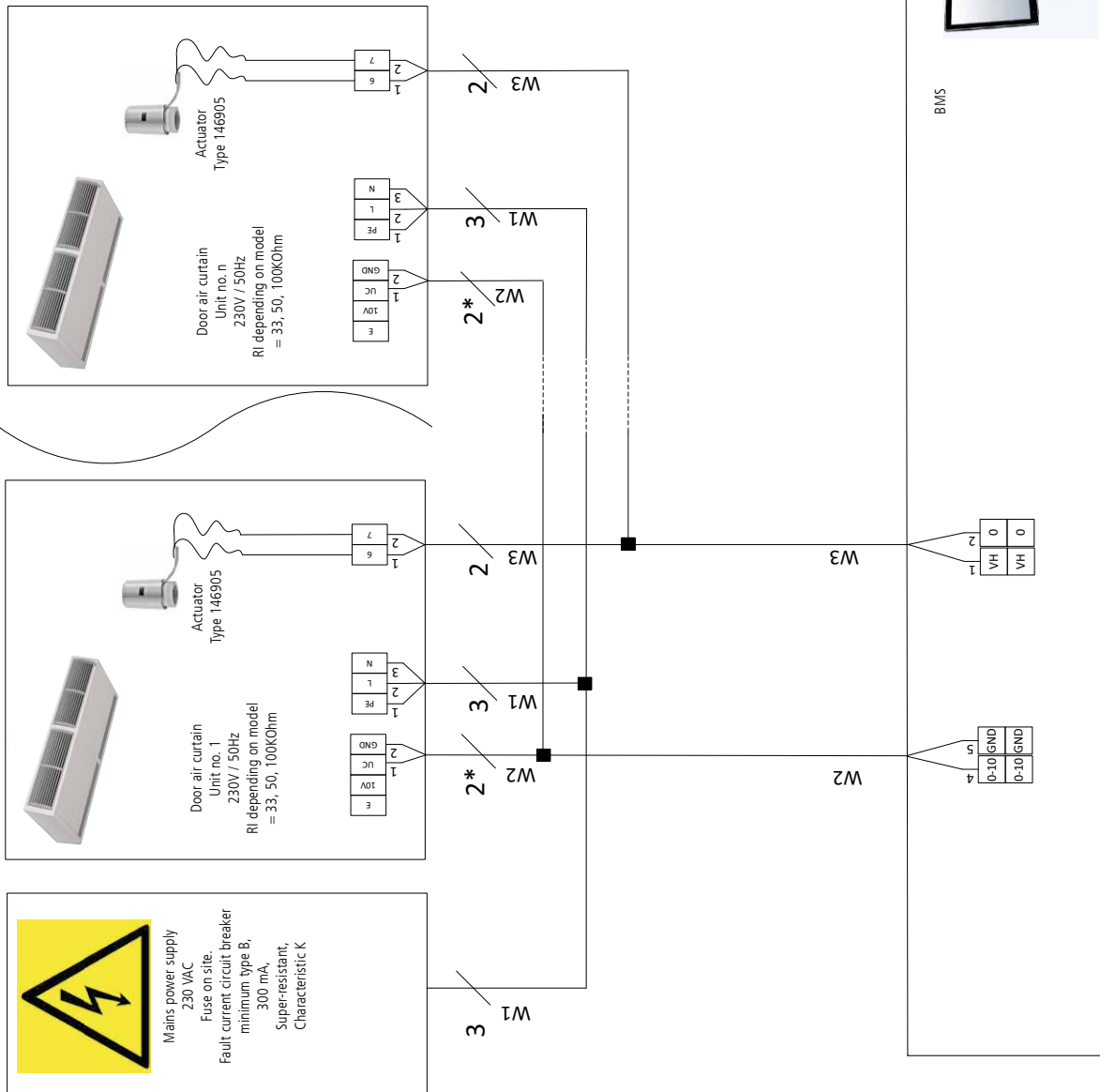
- ▶ continuously variable speed control
- ▶ standby, Winter, Summer operating mode changeover using large rotary dial
- ▶ door contact control input for automatic fan speed increase and enabling of the equipment
- ▶ evaluation and display of a possible motor fault signal
- ▶ optional filter monitoring
- ▶ optional room temperature control (back-up mode) when absent
- ▶ three-coloured LED control for operating modes and signals
- ▶ room temperature control: optional use of an internal or external room temperature sensor.
- ▶ factory standard setting parameterisable on site

Operation by an external building management system

In the event of operation by a BMS, this needs a continuous control signal of 0-10 VDC for fan speed and optionally a 230 VAC signal for actuation. The fan speed is proportional to the pending control signal. The thermoelectric actuator can also be operated by a signal. If there are several units, the control signals can be connected in parallel. If a motor fault is triggered, this can be called up and evaluated by the external BMS.

Tandem EC door air curtains, electromechanical model (*00), electrical installation

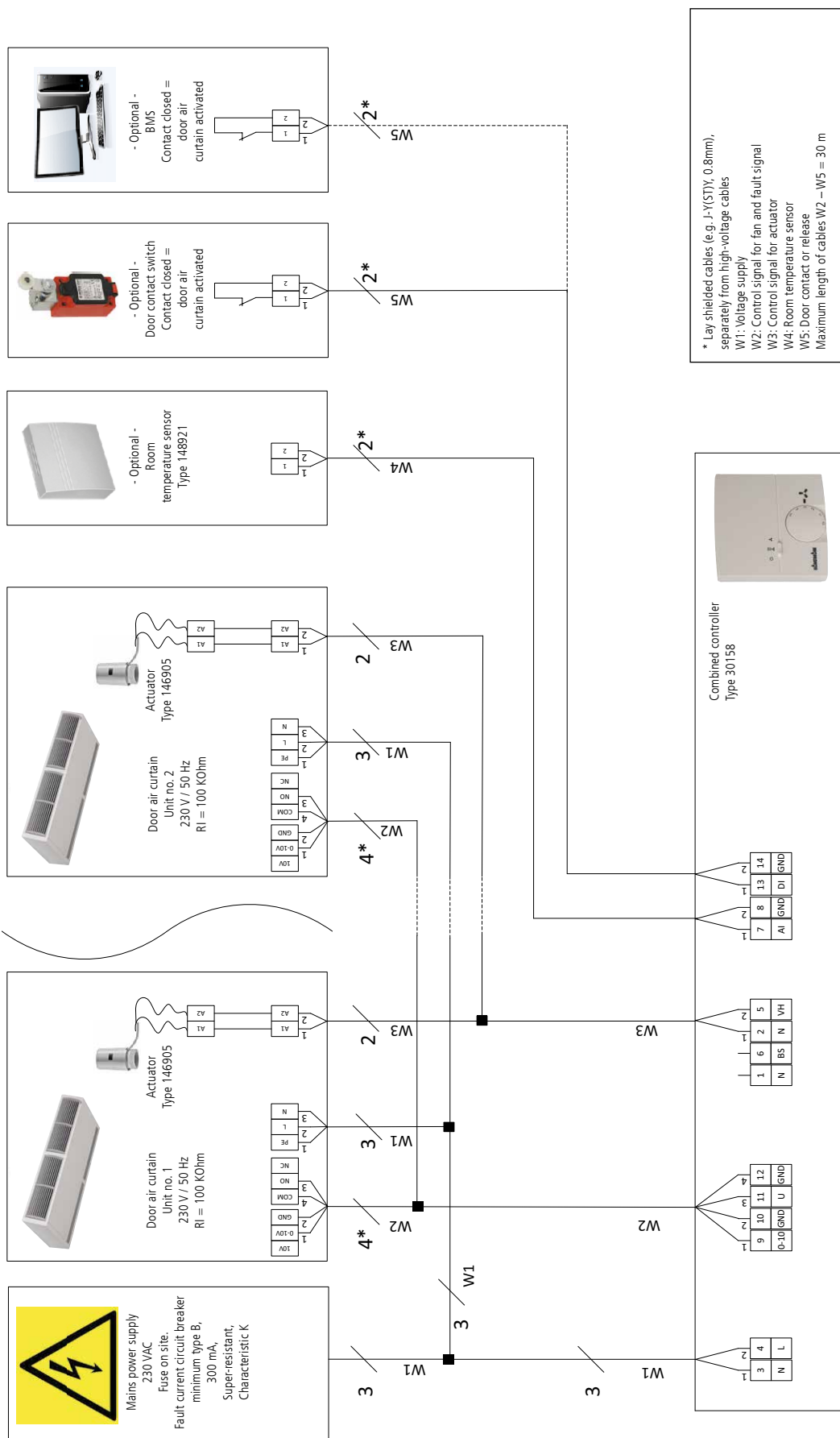




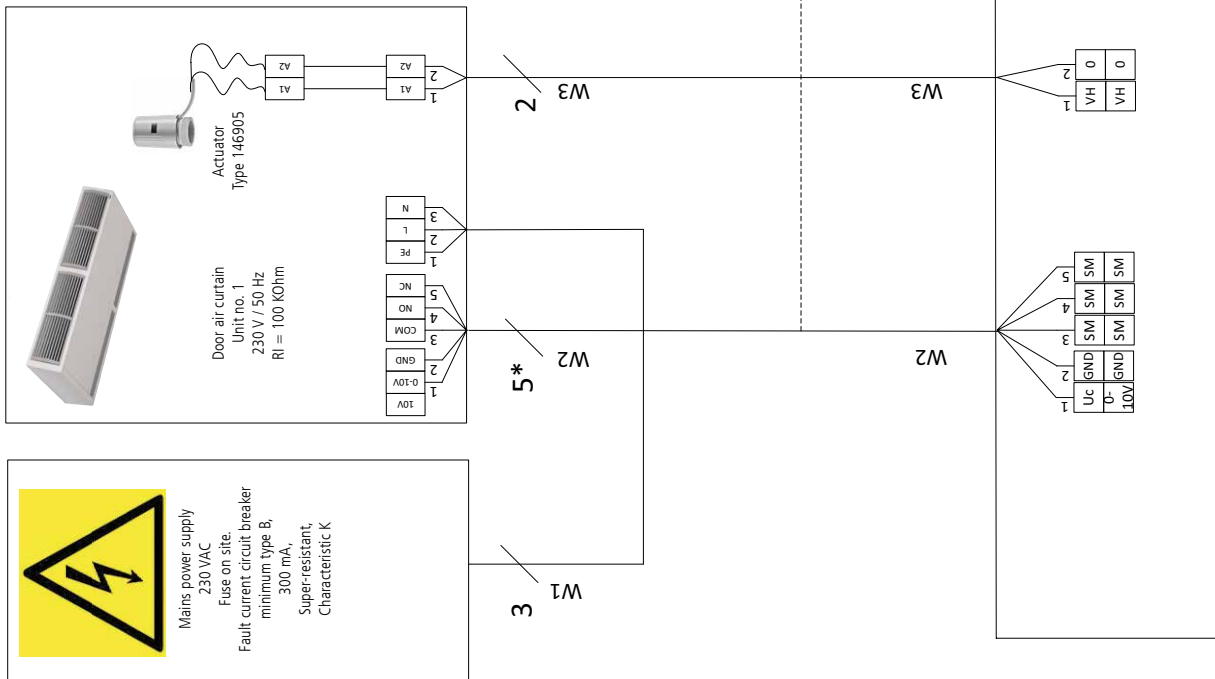
* Lay shielded cables (e.g. J-Y(ST)Y, 0.8mm), separately from high-voltage cables
 W1: Voltage supply
 W2: Control signal for fan and fault signal
 W3: Control signal for actuator
 Maximum length of cables W2 = 30 m



Tandem EC door air curtains, electromechanical model with fault signal monitoring (*T), – Electrical installation



* Lay shielded cables (e.g. J-(ST)X; 0.8mm), separately from high-voltage cables.
 W1: Voltage supply
 W2: Control signal for fan and fault signal
 W3: Control signal for actuator
 Maximum length of cables W2 = 30 m



Description of KaControl

The all-inclusive solution for Tandem EC

Tandem door air curtains with KaControl operating units are supplied fully wired and factory-fitted with all electrical parts ready for connection.

A high-performance parametrised microprocessor is designed to carry out all necessary functions. Each door air curtain is thus equipped with its own „intelligence“ and can be operated in groups via Kampmann-T-LAN or CANbus networks. Door air curtains with KaControl can be equipped with plug-in communication interfaces for single room control mode or for control via higher-order control systems. Each Therefore, each basic unit has potential for integration into a technical building network.

Electrical connection and commissioning

Each door air curtain with KaControl is supplied factory-fitted with a basic program and wired ready for operation with factory presettings for all control parameters. If required, the parameters can be accessed and changed via the operating unit (KaController) on site. When using a communication card, it is also possible to set comfort parameters on the unit via IT networks or even directly via a Notebook Groups of up to six door air curtains can be commissioned with automatic addressing. All electrical cables in the KaControl module unit are laid in the door air curtain. This includes mains supply and bus/communication cables in standard units. As a result, the installation costs can be kept to a minimum. Each door air curtain is fitted with an electrical fuse.

Motor protection

Any faults with the motor, e.g. overloading, are analysed by the thermal contacts integrated in the motor with KaControl. This shuts down the fans and relays the fault message to the KaControl system. A fault message is issued via the operating unit. Faults on higher-level systems can also be relayed via a 24 V DC output or a data interface on the KaControl unit integrated into the door air curtain.

Control functions of KaControl for Tandem EC

The parametrisable KaControl offers a wide range of functions:

- ▶ continuously variable fan control
- ▶ control of hot water shut-off valve (heating) for thermoelectric valve drives Open / Close 230 V AC
- ▶ integrated timer program for programming day and week switching functions in the KaController unit
- ▶ operation of several door air curtains via a control unit
- ▶ motor monitoring with fault signal processing
- ▶ optional: Interfaces for BMS connection (Modbus, LON, KNX), plug-in

Integration of KaControl into different building management systems

KaControl provides interfaces and applications on all levels of modern building automation. The system – or parts of the system – can be linked into any building management strategies.

Field level

Individual room-based systems with an operating unit can be created with the Kampmann T-LAN bus or a CANbus system.

BMS

The individual systems in several rooms can be combined into a network via the fieldbus interfaces. There is also the option of controlling units with difference modes of operation in a small database system.

Management / automation level

A CANbus system or connection via RS485 technology offers the option of functionally connecting units from the field layer with centralised ventilation units. A complete building management solution for ventilation and air conditioning technology can be set up using KaControl building management applications with a PC and industrial PC.

Integration into higher-level systems

KaControl offers the option of defined data transfer via BMS systems between air conditioning system and higher-level management system. Defined communication profiles between KaControl and the management system can be used via the building management standards BACnet or LON.

KaController operating unit



The „face“ of the KaControl BMS: the KaController operating unit.

With a large display and one-touch operation, the KaController is very easy to use. With the basic principle, „as little as possible, as much as required“, even untrained users can intuitively get to grips with the control options.

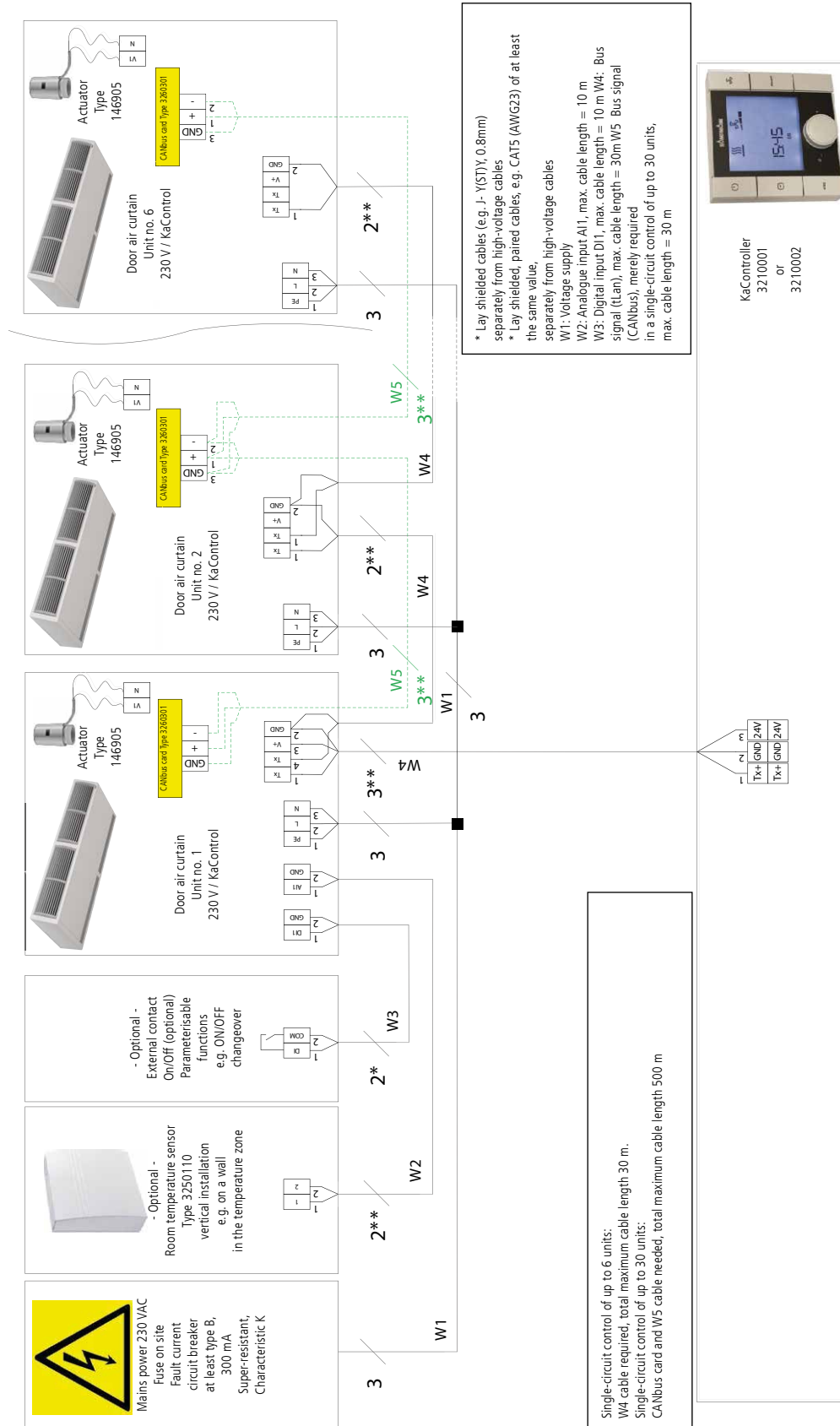
The basic functions for comfortable interior temperatures are set in a user-friendly way using the KaController.

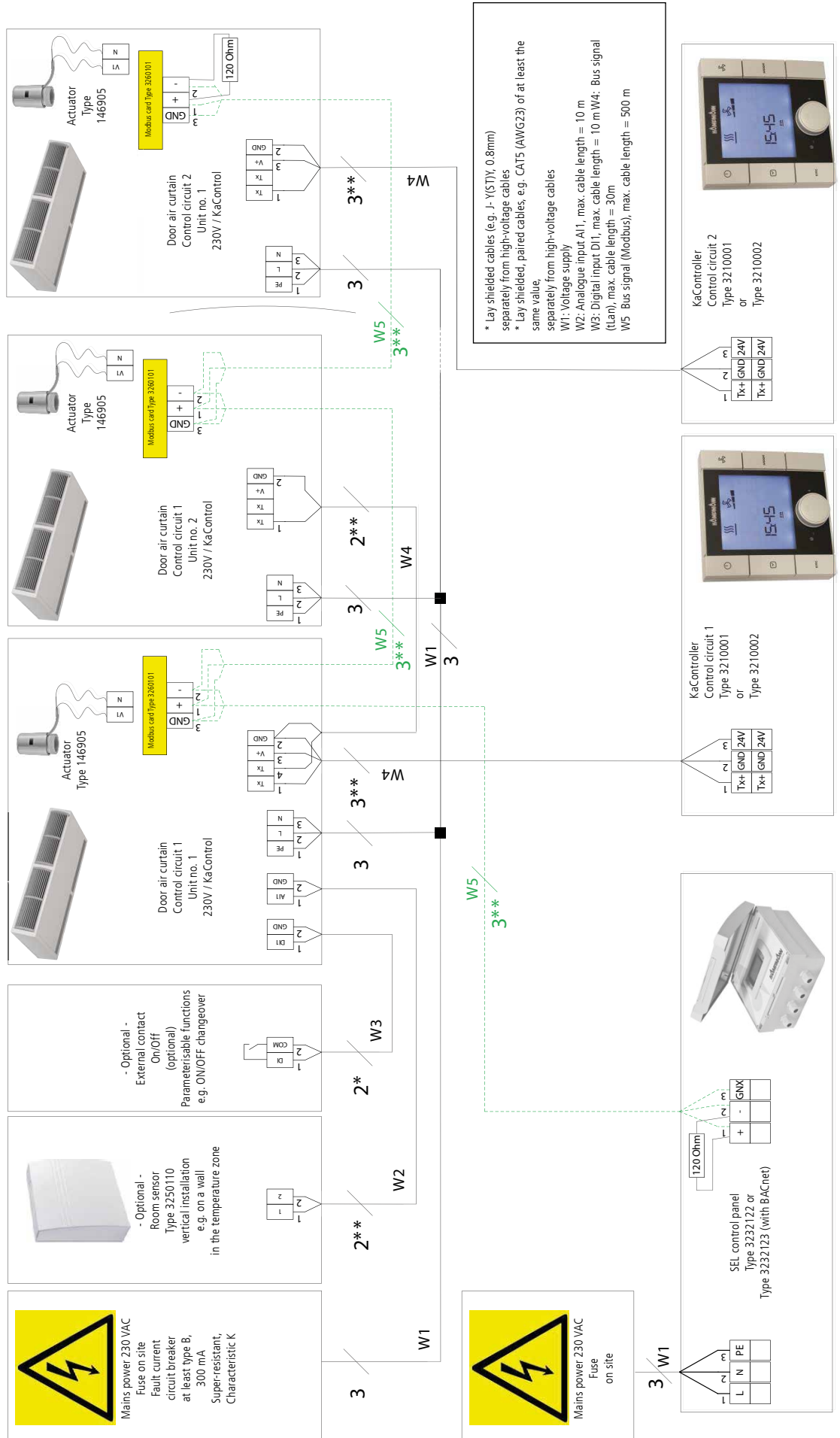
Product features of the KaController

- ▶ attractively designed wall-mounted operating units
- ▶ available with or without function buttons on the side
- ▶ plastic housing, colour similar to RAL 9010
- ▶ communication interface to Kampmann T-LAN bus system
- ▶ large display with automatic back light
- ▶ integral room temperature sensor
- ▶ push-turn navigator dial with endless turn/lock function
- ▶ built-in weekly switching program
- ▶ password-protected parameter level

Tandem EC door air curtains with KaControl, electrical installation

Single-circuit control – configuration for up to 6 or 30 door air curtains





05 ▶ Ordering information

Tandem door air curtains

Model	Max. discharge height ¹⁾	Unit model	Length ²⁾	Heat output ³⁾	Air volume ⁴⁾	Sound pressure level ⁵⁾	Sound power level	Control option	Art. No.
	[m]		[mm]	[kW]	[m ³ /h]	[dB(A)]	[dB(A)]		
12	2.7 - 3.2	Tandem 300	1250	4.6 - 9.6	700 - 2030	32 - 61	48 - 77	electro-mechanical	251003112430
								electro-mechanical with fault signal monitoring	251003112430T
								KaControl	251003112430C1
		Tandem 300 ceiling cassette unit	1200	4.6 - 9.6	700 - 2030	32 - 61	48 - 77	electro-mechanical	251003312430
								electro-mechanical with fault signal monitoring	251003312430T
								KaControl	251003312430C1
20	2.7 - 3.2	Tandem 300	2000	8.3 - 18.5	1200 - 3830	35 - 63	51 - 79	electro-mechanical	251003120430
								electro-mechanical with fault signal monitoring	251003120430T
								KaControl	251003120430C1
		Tandem 300 ceiling cassette unit	1950	8.3 - 18.5	1200 - 3830	35 - 63	51 - 79	electro-mechanical	251003320430
								electro-mechanical with fault signal monitoring	251003320430T
								KaControl	251003320430C1
25	2.7 - 3.2	Tandem 300	2500	10.8 - 26.5	1480 - 5410	37 - 63	53 - 79	electro-mechanical	251003125430
								electro-mechanical with fault signal monitoring	251003125430T
								KaControl	251003125430C1
		Tandem 300 ceiling cassette unit	2450	10.8 - 26.5	1480 - 5410	37 - 63	53 - 79	electro-mechanical	251003325430
								electro-mechanical with fault signal monitoring	251003325430T
								KaControl	251003325430C1
30	2.7 - 3.2	Tandem 300	3000	13.5 - 30.1	1850 - 5810	37 - 65	53 - 81	electro-mechanical	251003130430
								electro-mechanical with fault signal monitoring	251003130430T
								KaControl	251003130430C1
		Tandem 300 ceiling cassette unit	2950	13.5 - 30.1	1850 - 5810	37 - 65	53 - 81	electro-mechanical	251003330430
								electro-mechanical with fault signal monitoring	251003330430T
								KaControl	251003330430C1

¹⁾ with low to medium pressure/requirements/conditions, see page 19

²⁾ incl. casing elements

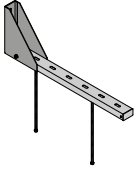
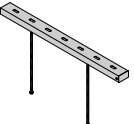
³⁾ LPHW 75/65, $t_{L1} = 20^{\circ}\text{C}$

⁴⁾ continuously variable speed control

⁵⁾ The sound pressure levels was calculated based on an assumed room insulation of 16 dB(A).



This corresponds to a distance of 3 m, a room volume of 2000 m³ and a reverberation time of 1.0 s (in accordance with VDI 2081).

Accessories

Figure	Article	Properties	suitable for		Art. No.
Replacement filter Replacement filter					
	Filter with frame	1 no. (two required with Model 20 and larger)	Tandem 300, Tandem 300 ceiling cassette unit	Model 12	251003112925
				Model 20	251003120925
				Model 25	251003125925
				Model 30	251003130925
Brackets					
	Wall brackets	1 set = 2 brackets	Tandem 300, Tandem 300 ceiling cassette unit	Models 12 – 25	251000100990
		1 set = 3 brackets		Model 30	251000100992
	Ceiling brackets	1 set = 2 brackets	Tandem 300, Tandem 300 ceiling cassette unit	Models 12 – 25	251000100995
		1 set = 3 brackets		Model 30	251000100997
Sheet steel accessories/Casing extension					
	Connecting kit for unit extension	To connect several Tandem 300, powder-coated, RAL 9016 traffic white	Tandem 300	All models	251003100910
Valves					
	Thermoelectric shut-off valve	230 V, 3/4", for KaControl, combined controller and speed controller	Tandem 300, Tandem 300 ceiling cassette unit	All models	196000100913
	Outlet temperature limit valve	3/4", temperature setting range 20 – 50°C	Tandem 300, Tandem 300 ceiling cassette unit		196000103968

[more »](#)

Control accessories for Tandem door air curtains

Figure	Article	Properties	suitable for	Art. No.
Control accessories for electromechanical control (*00) and electromechanical control with fault signal evaluation (*T)				
	Speed controller	For continuously variable fan control, flush-mounted unit	All Tandem door air curtains with control version *T	194000146936
	Surface-mounted frame	For surface-mounted installation of the speed controller 194000146936	All Tandem door air curtains with control version *T	196000148915
	Combined controller	Combined controller for fan speed control and room temperature control, surface-mounted	All Tandem door air curtains with control version *00 and *T	196000030158

[more »](#)

Control accessories for Tandem door air curtains

Figure	Article	Properties	suitable for	Art. No.
KaControl accessories				
	KaController operating unit with one-touch operation	Room control unit for wall mounting, high-quality design, plastic housing, colour similar to RAL 9010, with large LCD multifunctional display, integrated room temperature sensor, communication interface to Kampmann T-LAN bus system, automatically switching LED backlight, press/turn dial with click stop function, individually adjustable basic display, integrated day, night and week program, password-protected parameter level for C1 control option	All Tandem door air curtains with control version *C1	196003210001
	KaController operating unit with side operating keys	For quick access to fan settings, operating modes, Eco mode, time and timer program, otherwise as art. no. 196003210001		196003210002
	KaControl room temperature sensor	For wall mounting, IP30 surface-mounted, colour white RAL 9010, alternative to the temperature sensor in the KaController		196003250110
	Serial CANBus card	To increase the number of units in a single-circuit control system		196003260101
	Cable sensor	Length 600 mm, with plug, to protect unit against frost		196003250114
	Serial Modbus card	For the formation of a Modbus network, single-circuit control or multi-circuit control		196003260301
	SEL control panel	KaControl electronics including KaControl control unit for the centralised control of Kampmann products via a central bus communication (Modbus) in a wall-mounted housing		196003232122
	SEL control panel BACnet	KaControl electronics with integrated BACnet interface including KaControl control unit for the centralised control of Kampmann products via a central bus communication (Modbus) in a wall-mounted housing		196003232123



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