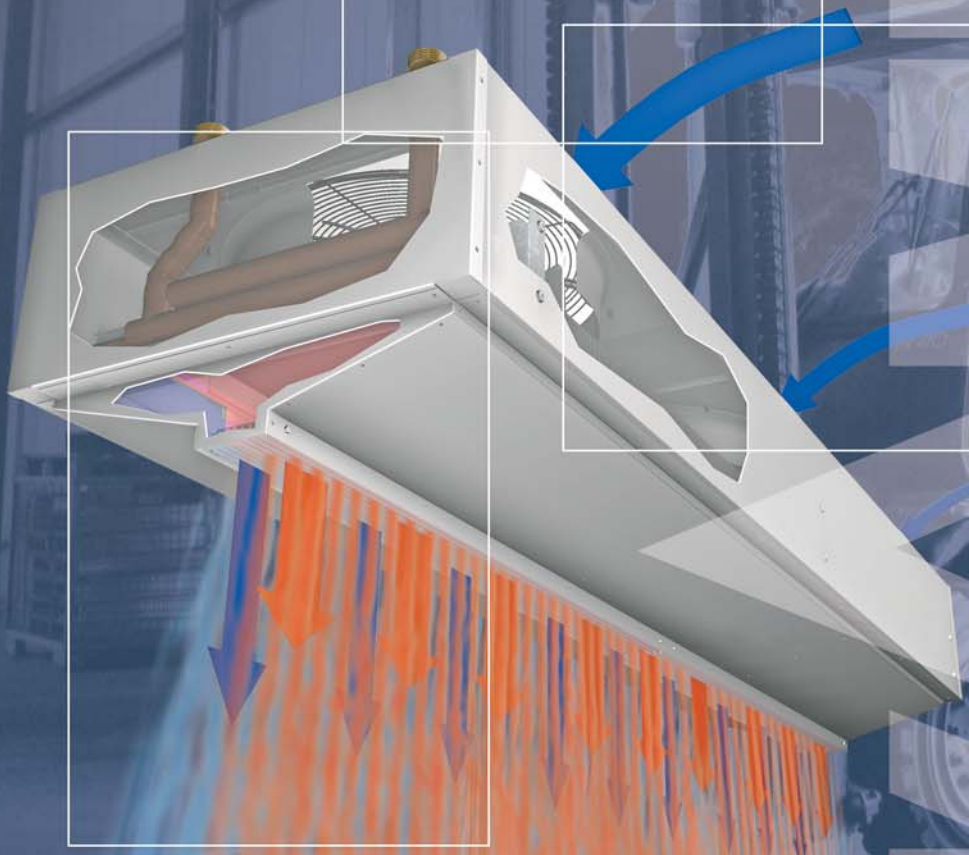
Article group
2.55

11/2007

ProtecTor

A new dimension in industrial door screening



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Innovative, professional, international

In over 35 years, Kampmann GmbH has grown from being a family-led company to become an internationally renowned group of companies. Kampmann systems for heating, cooling and ventilation are today market leaders in a number of different market sectors. Innovation and the highest standards of quality guarantee this success into the future.

We have an "ear on the market" and the knowledge and expertise gained from 35 years of experience in development, production and sales. This, combined with a professionally-manned research and development department, is the basis for our continuous product development. This is what allows us to provide our customers with the best technical product at any time.

Traditionally, Kampmann's skills and expertise have been in the production of standard products with an extraordinary range of adapted products, as well as in the production of technically and visually high-quality tailor-made design solutions. Our specialist staff deal with the building in its entirety and develop unique and efficient system solutions. Our entire range is reflected in mix of standard, non-standard and tailor-made products for project-orientated solutions.

We set ourselves very high standards in production. Today an exceptionally well-trained specialist workforce manufactures high-quality Kampmann products in three plants for customers throughout the world. A number of different certificates are evidence of our high standards of quality, which have become the standard at Kampmann. Our products are characterised by the high guaranteed DIN EN-tested heat outputs. In terms of quality management the requirements of TÜV certification according to DIN EN ISO 9001 have been met since 1996.

For decades, Kampmann customers have valued our excellent service. Local external engineers and technicians, in-house measuring engineers and the Kampmann customer service team are available to customers. Kampmann good air quality is now to be found across the globe. Our sales engineers now cover the whole of Germany and Europe.

This ProtecTor Door air curtain brochure provides you with an insight into our wide product range. Take a look and make up your own mind – do not hesitate to arrange a personal visit with us. It is our aim to meet your high quality expectations, right down to the last detail.

Well-being is our product - Quality is our benchmark!

Hendrik Kampmann
Managing Director

Peter Kaß
Managing Director

ProtecTor door air curtains manufactured in the Kampmann plant in Lingen

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ProtecTor door air curtains - A new dimension in industrial door screening

Contents
Article group 2.55

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ProtecTor door air curtain with short outlet nozzle

ProtecTor with long outlet nozzle, arranged centrally, powdercoated

ProtecTor door air curtains – A new dimension in industrial door screening

A new development in the field of industrial heating: this door air curtain operates with a warm air curtain and a secondary air curtain, saving up to 38% in energy.

- **with outlet nozzle:**
The outlet nozzle directs the air and concentrates it for targeted discharge - there is thus no inefficient air turbulence.

- **with continuous dynamic air distribution:**
The unheated primary air curtain, which acts as a "back-up" air stream, automatically aligns any changes in the speed of the fan to the air volume of the door air curtain. The heated air cannot break through the primary air stream and thus does not escape outside.

- **with Coanda effect:**
The warm air curtain is held back further by the Coanda effect between the primary and warm air curtains. Both air curtains contract. The penetration depth and screening effect are further increased by this without additional energy having to be used.

- **with PowerKon heat exchanger:**
Made of copper/aluminium with a larger surface area for greater output and stability, with only one waterside pipe connection.
Galvanised steel heat exchangers can also be supplied.

- **Patent pending:**
The airflow caused by the primary and warm air curtain is so unique that a patent is pending under no. DE 103 20 490.

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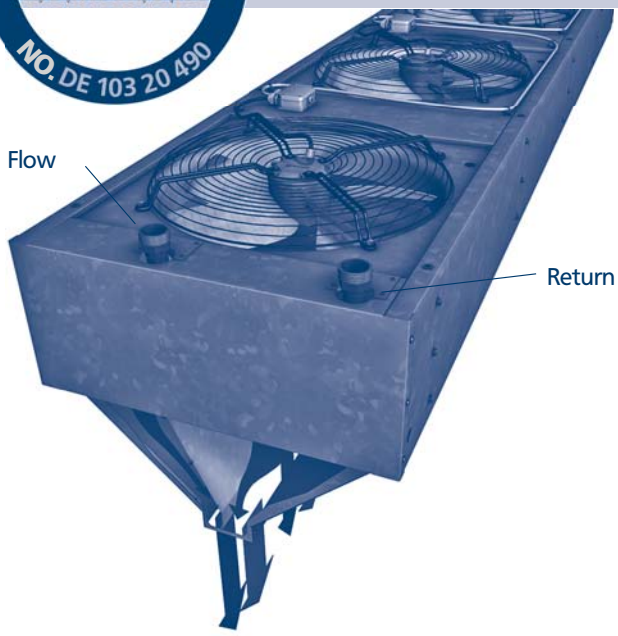
PATENT PENDING
KAMPMANN
NO. DE 103 20 490

A new dimension in industrial door screening

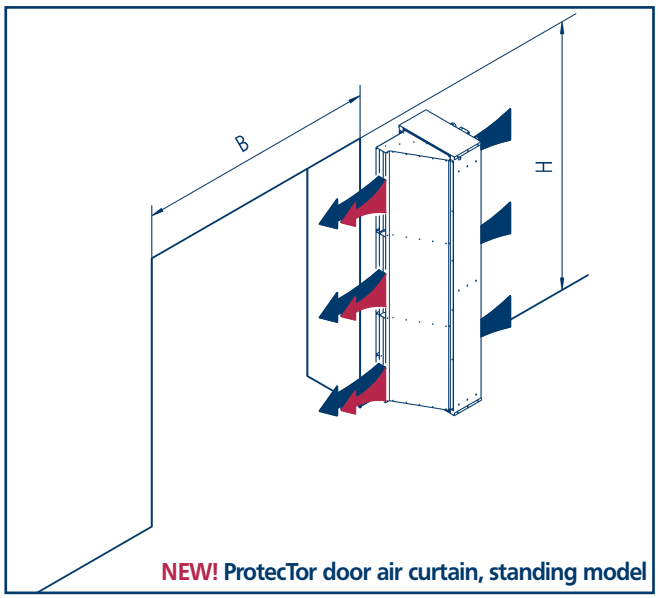


The unique design of ProtecTor door air curtains means that they provide the same screening effect with a lower heat output - and thus provide substantial energy savings over conventional systems.

- Ideal for use in industrial premises to prevent uncontrolled energy losses through open doorways
- Excellent comfort with low noise levels but with a high air volume
- Available in 3.0 m, 4.0 m and 5.0 m lengths

Housing

- Robust, compact housing made of sendzimir galvanised steel
- Neutral paint finish or powdercoated finish in any RAL colour at a surcharge
- Complete with standard fixings for fitting to site support structure when mounted horizontally
- Side air curtain (standing model) complete with feet and wall fixings (supplied loose)



NEW! ProtecTor door air curtain, standing model

PowerKon Heat exchanger

- Made of copper pipes joined by expansion to profiled aluminium special fins
- Suitable for use with LPHW 120 °C and 10 bar continuous operating pressure
- Low weight whilst providing the same heat output

Made-to-measure design on request

Fan

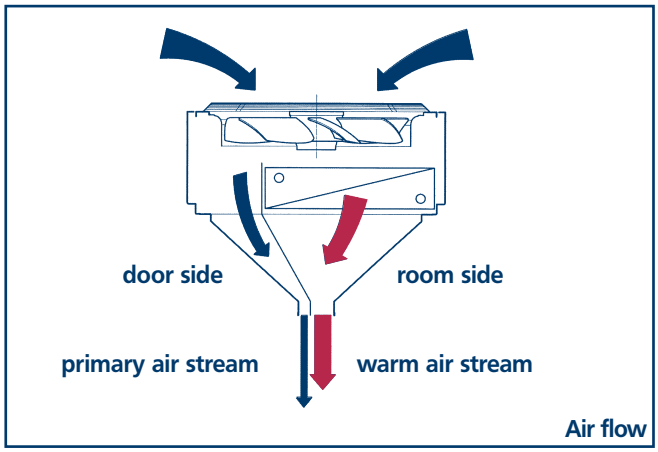
- 2-stage Ziehl-Abegg 3-phase sickle-blade, whisper-quiet fans guarantee optimum noise levels by reducing the rotational noise
- External rotor motors, 3-phase, 400 V/50 Hz

Control

The units are controlled by a stage switch combined with a door contact switch; made-to-measure design on request.

Energy-saving effect

- Greater penetration of the unheated primary air stream, owing to lower thermal upcurrent; the primary unheated air stream "screens" the warm air curtain perfectly.
- Greater penetration of both air curtains by the Coanda effect; the primary air curtain pulls the warm air stream down with it
- The unheated air stream acts as a "back-up" air stream, which adjusts itself when the fan speed changes and adapts itself to the warm air stream
- Reduced turbulence of the primary air curtain owing to the lower mixing figure (< 0.2)
- Less turbulence, which uses up energy, between the unheated air stream and the outside air



Air flow

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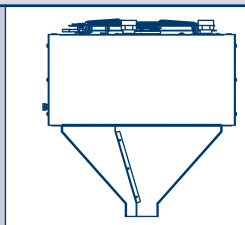
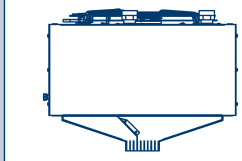
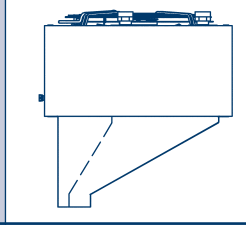
Essential accessory - Outlet nozzle

Overview of type numbers - Outlet nozzle

Outlet nozzle, made of sendzimir galvanised steel can also be powdercoated in any RAL colour		to fit ProtecTor type	_302066	_402066	_502066	_302076	_402076	_502076
Outlet nozzle, central, no guard H = 360 mm		**Type**	300060	400060	500060	300070	400070	500070
Outlet nozzle, short, central, with guard Short nozzle H = 140 mm, central air outlet only, ideal where space is at a premium		**Type**	300160	400160	500160	300170	400170	500170
Outlet nozzle, one-sided, no guard One-sided nozzle, directed towards doorway, with wide air stream to direct airflow; H = 360 mm		**Type**	301060	401060	501060	301070	401070	501070

See pages 10-11 for further dimensions

Article no. for DataNorm/EDV entry: 255 000 _ _ _ _ _ _ (Insert type)

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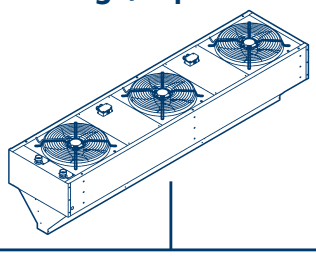
Essential accessories - Switches and controllers

ProtecTor door air curtain

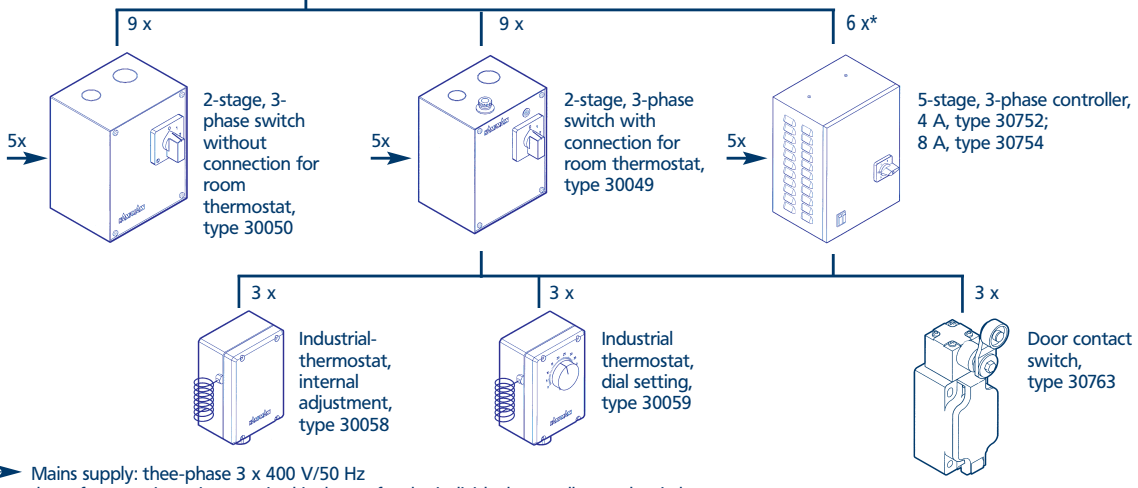
Stage switches

Thermostats/ Door contact switch

2-stage, 3-phase motor

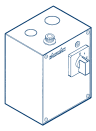


Maximum number of ProtecTor door air curtains per switch						
Switch type	ProtecTor door air curtain type					
	_302066	_402066	_502066	_302076	_402076	_502076
30050	3	2	2	2	1	1
30049	3	2	2	2	1	1
30752	1	1	-	1	-	-
30754	3	2	1	2	1	1



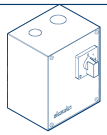
→ Mains supply: thee-phase 3 x 400 V/50 Hz
The number of connection wires required is shown for the individual controllers and switches.

Controls



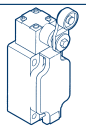
2-stage, 3-phase switch with connection for room thermostat 10 A, type 30049

for manual control of units; terminals for room thermostats or door contact switches; motor output terminals; standby indicator; polystyrene housing, wall-mounted; protection class IP 43



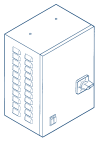
2-stage, 3-phase switch without connection for room thermostat 10 A, type 30050

no connection possible to room thermostats or door contact switches; no fault indicator; polystyrene housing; wall-mounted; protection class IP 43



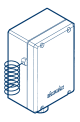
Door contact switch, type 30763

Robust mechanical design, potential-free NO/NC contact; plastic housing, protection class IP 65



5-stage, 3-phase controller, 4 A, type 30752 and 8 A, type 30754

2-stage 3-phase motors can be switched between 5 stages; voltage reduction via integral 3-stage transformer; connection possible to room thermostats or door contact switches and thermoelectric actuators; protection class IP 20; painted sheet steel housing; wall-mounted



Industrial thermostat, type 30058

Setpoint is set using a screwdriver only after removing cover of unit; ideal for areas with high humidity levels or high levels of contamination or dust in the air; impact-resistant plastic housing; protection class IP 54

Industrial thermostat, type 30059

Room temperature setpoint is set using the dial; design and technical details all as per type 30058

Article no. for DataNorm/EDV entry: 196 0000 _____ (Insert type)

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Conversion using other water temperatures

Calculation formulae

$$Q_{eff} = Q_B \bullet f_{Q1} \quad (1)$$

$$t_{wm} = \frac{t_{w1} + t_{w2}}{2} \quad (2)$$

$$\triangle t_w = t_{w1} - t_{w2} \quad (3)$$

$$\triangle t = t_{wm} - t_{L1} \quad (4)$$

$$t_{L2} = t_{L1} + \frac{Q_{eff} \bullet 1000}{V_{Lwarm} \bullet C} \quad (5)$$

$$m = \frac{Q_{eff}}{\triangle t_w} \bullet 0{,}86 \quad (6)$$

AbbreviationsFormulae

Q_{eff}	[kW]	=	Effective heat output from ProtecTor
Q_B	[kW]	=	Basic heat output from ProtecTor (technical data) LPHW : t_{w1} = 75 °C, t_{w2} = 65 °C, t_{L1} = 20 °C
f_{Q1}	[/]	=	Heat output corr. factor for water temp.
t_{wm}	[°C]	=	Mean water temperature
t_{w1}	[°C]	=	Flow temperature
t_{w2}	[°C]	=	Return temperature
$\triangle t_w$	[K]	=	Water temperature difference
$\triangle t$	[K]	=	Mean excess temperature
t_{L1}	[°C]	=	Entering air temperature
t_{L2}	[°C]	=	Leaving air temperature
V_{Lwarm}	[m³/h]	=	Air volume from ProtecTor warm air stream
V_L	[m³/h]	=	Total air volume from ProtecTor
C	[wh/m³K]	=	Multiplier for calculating leaving air temp.
m	[m³/h]	=	Water flow rate
$\triangle P_w$	[kPa]	=	Water pressure drop

t_{L1}	C
+ 20 °C	0.34 wh/m³K
+ 10 °C	0.35 wh/m³K
± 0 °C	0.36 wh/m³K
- 10 °C	0.37 wh/m³K

Calculation

given:
ProtecTor type 302066
Flow temperature 65 °C
Return temperature 55 °C
Entering air temperature +18 °C

required:
Heat output Q_{eff} at fan stage 1
Leaving air temperature t_{L2} (warm air stream)
Water pressure drop $\triangle P_w$

Calculation

(2) $t_{wm} = \frac{t_{w1} + t_{w2}}{2} = \frac{65\,°C + 55\,°C}{2} = 60\,°C$

(3) $\triangle t_w = t_{w1} - t_{w2} = 65 - 55 = 10\,K$

(4) $\triangle t = t_{wm} - t_{L1} = 60 - 18 = 42\,K$

from diagram 1: $f_{Q1} = 0{,}82$
from Technical data on page 10:
Type 302066, fan stge 1:
Q_B (LPHW 75/65 °C, t_{L1} = 20 °C) = 50.0 kW
V_{Lwarm} = 6920 m³/h

(1) $Q_{eff} = Q_B \bullet f_{Q1} = 50.0 \bullet 0.82 = 41.0\,kW$

(5) $t_{L2} = t_{L1} + \frac{Q_{eff} \bullet 1000}{V_{Lwarm} \bullet C} = 18 + \frac{41{,}0 \bullet 1000}{6920 \bullet 0.34} = 35.4\,°C$

(6) $m = \frac{Q_{eff}}{\triangle t_w} \bullet 0.86 = \frac{41{,}0}{10} \bullet 0.86 = 3.5\,m^3/h$

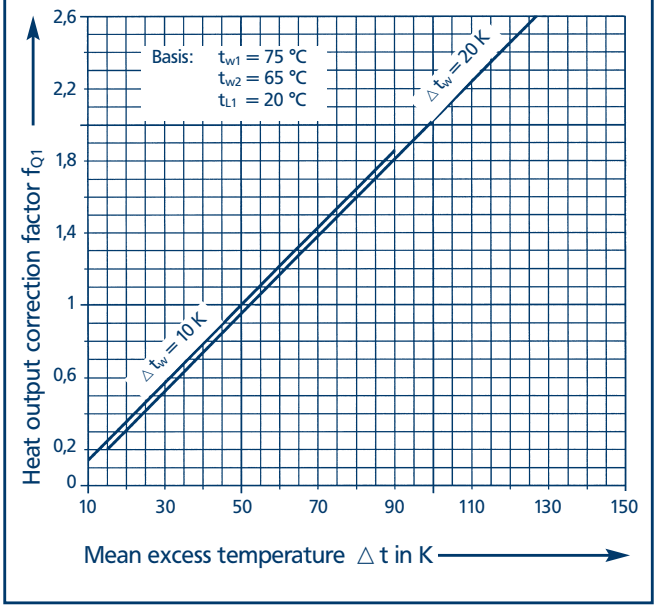
from water pressure drop diagram (see p 7):

$\triangle P_w = 7\,kPa$

Result

Heat output Q_{eff}	=	41.0 kW
Leaving air temperature t_{L2}	=	35.4 °C
Water pressure drop $\triangle P_w$	=	7 kPa

Heat output correction factor **Diagram 1**



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Design information

Calculating pressure loss

Ascertain the water pressure loss from the adjacent diagram. This is calculated from

- the effective heat output Q_{eff}
- the water temperature

$$\Delta t_w = t_{w1} - t_{w2} \qquad (3)$$

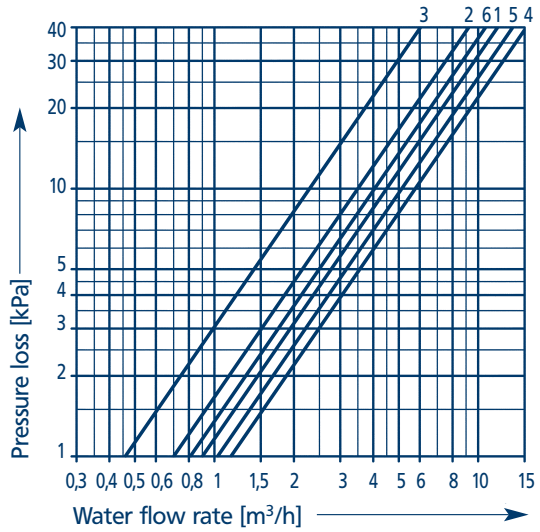
- the water flow rate

$$m = \frac{Q_{eff}}{\Delta t_w} \cdot 0.86 \qquad (6)$$

The figures apply to an average water temperature of 70 °C but, owing to the minor influence of the water temperature, can also be used for other water temperatures.

The figures apply to both horizontal and standing models.

Water pressure loss diagram **Diagram 2**



ProtecTor type	302066	402066	502066	302076	402076	502076
Line no.	1	2	3	4	5	6

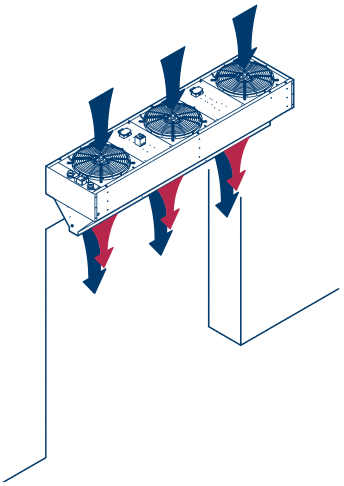
Noise

Sound pressure level
The actual sound pressure level (see Technical data on pages 10 - 13) can deviate from the measured figures, depending on the geometry of the room, absorption properties and the fittings and furniture in the room. If only very low sound levels are permitted, then we would recommend designing the system to operate at low to medium fan speed.

Sound power level
The sound power level (see pages 10-13) is a figure, independent of the surroundings and distance, to describe the air noise according to VDI 2081, which is transmitted by a fitted ductwork system. The sound power levels are determined using the enveloping surface method according to DIN 45635 (comparative method).

Mounting height · Dimensions of horizontal model

Mounting heights of horizontal model

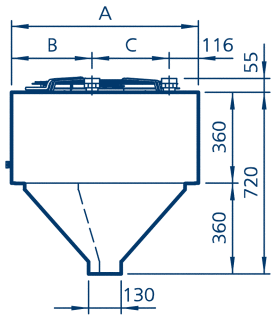


Dimensions of horizontal model		
ProtecTor type no.	Max. mounting height H m	Max. door width B m
302066	3.50	3.25
402066	3.50	4.25
502066	3.50	5.25
302076	4.50	3.25
402076	4.50	4.25
502076	4.50	5.25

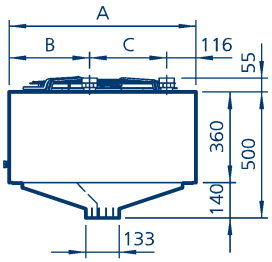
The following applies to all ProtecTor units:
Minimum clearance between fan guard and ceiling: 320 mm

Dimensions of horizontal model

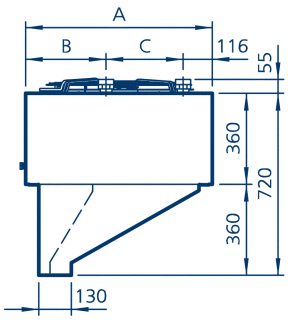
ProtecTor type no.		0302066	0402066	0502066	0302076	0402076	0502076
A	mm	742			842		
B	mm	320					
C	mm	306			406		
D	mm	695			795		
E	mm	23					



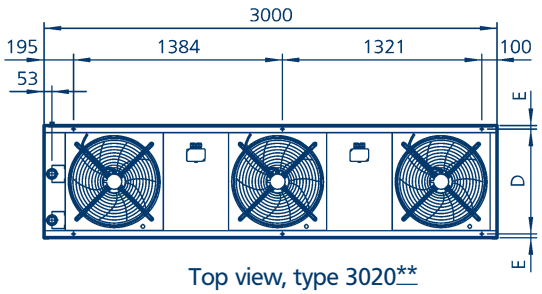
Side view of basic unit with outlet nozzle, long
type *00060, type *00070



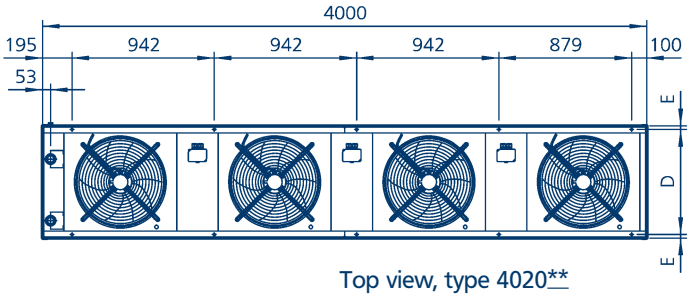
Side view of basic unit with outlet nozzle, short,
type *00160, type *00170



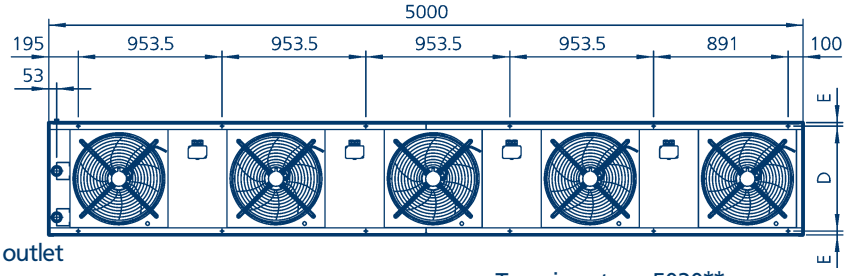
Side view of basic unit with one-sided outlet
nozzle, type *01060, type *01070



Top view, type 3020**



Top view, type 4020**



Top view, type 5020**

*Insert length of nozzle: 3 = 3.0 m, 4 = 4.0 m, 5 = 5.0 m; **Insert motor number

Article no. for DataNorm/EDV entry: 255 000 _ _ _ _ _ _ (Insert type no.)

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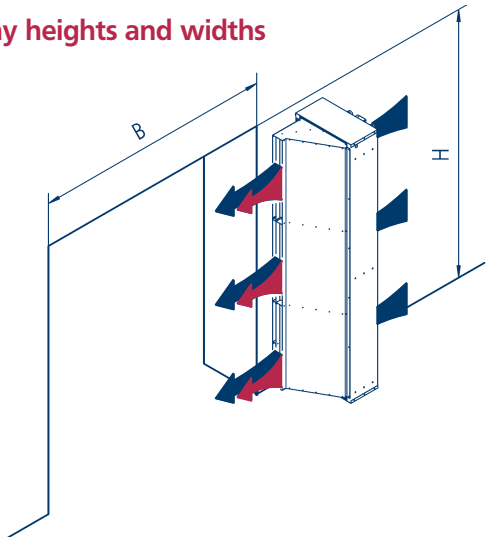
Mounting height · Dimensions of standing unit

Doorway heights and widths

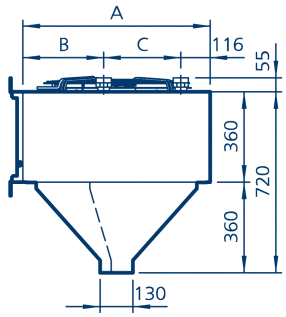


Dimensions of standing model		
ProtecTor type no.	Max. door height H m	Max. door width B m
2302066	3.25	3.50
2402066	4.25	3.50
2502066	5.25	3.50
2302076	3.25	4.50
2402076	4.25	4.50
2502076	5.25	4.50

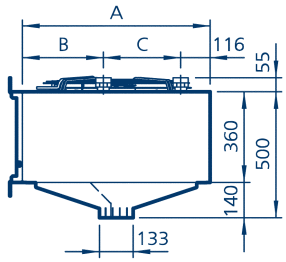
The following applies to all ProtecTor units:
Minimum clearance between fan guard and wall: 320 mm

Dimensions of standing model

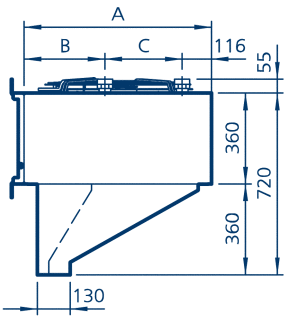
ProtecTor type no.		2302066	2402066	2502066	2302076	2402076	2502076
A	mm	742			842		
B	mm	320					
C	mm	306			406		
F	mm	448			498		
G	mm	294			344		



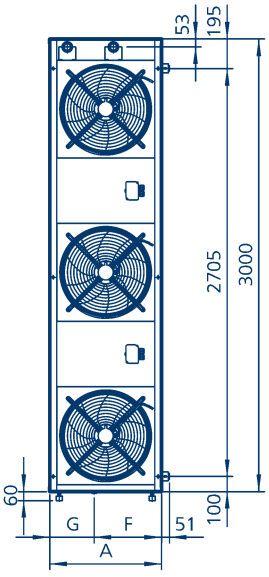
Top view of basic unit with outlet nozzle, long, type *00060, type *00070



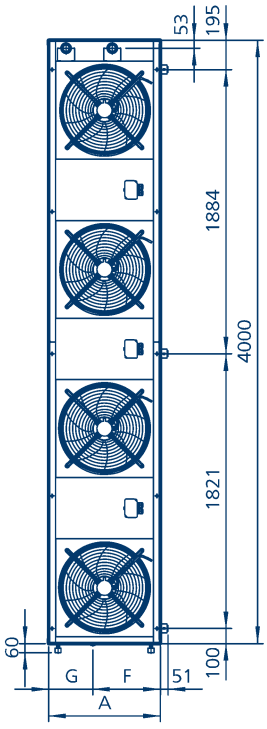
Top view of basic unit with outlet nozzle, short, type *00160, type *00170



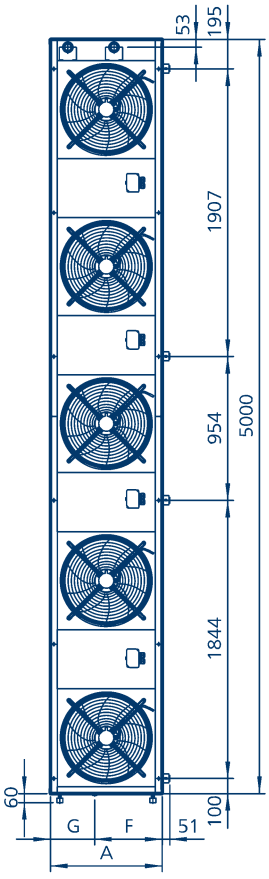
Top view of basic unit with one-sided outlet nozzle, type *01060, type *01070



Side view, type 23020**



Side view, type 24020**



Side view, type 25020**

*Insert length of nozzle: 3 = 3.0 m, 4 = 4.0 m, 5 = 5.0 m; **Enter motor number

Article no, for DataNorm/EDV entry: 255 000 _ _ _ _ _ _ (Insert type)

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SYSTEMS FOR HEATING · COOLING · VENTILATING

Heat output type *302066, type *402066, type *502066

Model horizontal	standing	Type	*302066		*402066		*502066	
Dimensions Length	Height	mm	3000		4000		5000	
Height	Depth	mm	360		360		360	
Depth	Length	mm	740		740		740	
Max. mounting height H	Max. door width B	m	3.5		3.5		3.5	
Max. door width B	Max. mount. height H	m	3.25		4.25		5.25	
Weight[3]		kg	185		246		311	
Water content		l	10.8		13.9		17.1	
Connections		inch	2"		2"		2"	
Fan stage			**2**	**1**	**2**	**1**	**2**	**1**
Air volume, total		**m³/h**	**13900**	**11000**	**18500**	**14700**	**23200**	**18300**
Air volume, primary air stream		m³/h	5200	4080	6930	5440	8700	6800
Air volume, warm air stream		m³/h	8700	6920	11570	9260	14500	11500
Electrical power consumption Power consumption		W A	1080 2,49	660 1,38	1440 3,32	880 1,84	1800 4,15	1100 2,30
Sound pressure level[1]		dB(A)	62.5	55.5	64.0	57.0	65.0	58.0
Sound power level		dB(A)	78.5	71.5	80.0	73.0	81.0	74.0

Water temperature	Entering air temp. t_{L1} [°C]	Heat output											
		Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]
LPWW 55/45 °C	14	45,5	29,1	35,0	28,6	60,7	29,2	46,6	28,6	75,8	29,1	58,3	28,7
	16	42,7	30,3	32,9	29,8	57,0	30,3	43,8	29,7	71,2	30,3	54,7	29,8
	18	39,9	31,4	30,7	31,0	53,3	31,5	40,9	30,9	66,5	31,4	51,2	31,0
	20	37,1	32,6	28,6	32,1	49,5	32,6	38,1	32,1	61,9	32,6	47,6	32,2
	22	34,4	33,7	26,4	33,3	45,8	33,7	35,2	33,2	57,2	33,7	44,0	33,3
LPHW 70/55 °C	14	60,6	34,1	46,6	33,5	80,8	34,2	62,1	33,4	100,9	34,1	77,6	33,5
	16	57,8	35,3	44,5	34,7	77,1	35,4	59,2	34,6	96,3	35,3	74,1	34,7
	18	55,0	36,5	42,3	35,9	73,4	36,5	56,4	35,8	91,7	36,5	70,5	35,9
	20	52,2	37,7	40,2	37,1	69,7	37,7	53,5	37,0	87,0	37,7	66,9	37,1
	22	49,4	38,8	38,0	38,3	65,9	38,9	50,7	38,2	82,4	38,8	63,4	38,3
LPHW 70/60 °C	14	66,4	36,1	51,1	35,3	88,6	36,1	68,0	35,2	110,6	36,0	85,1	35,4
	16	63,6	37,3	48,9	36,6	84,8	37,3	65,2	36,5	106,0	37,2	81,5	36,6
	18	60,8	38,4	46,8	37,8	81,1	38,5	62,3	37,7	101,3	38,4	77,9	37,8
	20	58,0	39,6	44,6	39,0	77,4	39,7	59,5	38,9	96,7	39,6	74,4	39,0
	22	55,2	40,8	42,5	40,2	73,7	40,8	56,6	40,1	92,1	40,8	70,8	40,2
LPHW 75/65 °C	14	73,4	38,4	56,4	37,6	97,8	38,4	75,2	37,5	122,2	38,4	94,0	37,6
	16	70,6	39,6	54,3	38,8	94,1	39,7	72,3	38,7	117,6	39,6	90,4	38,9
	18	67,8	40,8	52,1	40,0	90,4	40,8	69,5	39,9	112,9	40,8	86,9	40,1
	20	65,0	42,0	50,0	41,3	86,7	42,0	66,6	41,2	108,3	42,0	83,3	41,3
	22	62,2	43,2	47,9	42,5	83,0	43,2	63,7	42,4	103,7	43,2	79,7	42,5
LPHW 82/71	14	81,2	41,4	62,5	40,5	108,3	41,5	83,3	40,4	135,4	41,4	104,1	40,6
	16	78,0	42,3	60,0	41,5	104,0	42,4	79,9	41,4	130,0	42,3	99,9	41,5
	18	74,7	43,2	57,5	42,4	99,7	43,3	76,6	42,3	124,5	43,2	95,8	42,5
	20	71,5	44,1	55,0	43,3	95,4	44,2	73,3	43,3	119,1	44,1	91,6	43,4
	22	68,2	45,0	52,5	44,3	91,0	45,1	69,5	44,0	113,7	45,0	87,5	44,4
LPHW 90/70 °C	20	75,8	45,6	58,3	44,8	101,2	45,7	77,7	44,7	126,4	45,6	97,2	44,9

*Insert figure for model:
0 = horizontal
2 = standing

[1] measured at a distance of 5 m in an open room
[2] air temperature based on warm air stream
3) with outlet nozzle

Article no. for DataNorm/EDV entry: 255 00 _____ (Insert type)

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Heat outputs type *302076, type *402076, type *502076

Model horizontal	standing	Type	*302076		*402076		*502076	
Dimensions Length	Height	mm	3000		4000		5000	
Height	Depth	mm	360		360		360	
Depth	Length	mm	840		840		840	
Max. mounting height H	Max. door width B	m	4.5		4.5		4.5	
		m	3.25		4.25		5.25	
Weight[3]		kg	210		279		351	
Water content		l	13.4		17.2		21.2	
Connections		inch	2"		2"		2"	
Fan stage			**2**	**1**	**2**	**1**	**2**	**1**
Air volume, total		**m³/h**	**21500**	**17900**	**28600**	**23900**	**35800**	**29800**
Air volume, primary air stream		m³/h	8030	6640	10700	8870	13350	11030
Air volume, warm air stream		m³/h	13470	11260	17900	15030	22450	18770
Electrical power consumption		W	1590	1080	2120	1440	2650	1800
Power consumption		A	3,0	1,86	4,0	2,48	5,0	3,10
Sound pressure level[1]		dB(A)	65.5	61.5	67.0	63.0	68.,0	64.0
Sound power level		dB(A)	81.5	77.5	83.0	79.0	84.0	81.0

Water temperature	Entering air temp. t_{L1} [°C]	Heat output											
		Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]	Q [kW]	t_{L2}[2] [°C]
LPWW 55/45 °C	14	70,2	29,1	55,6	28,3	93,7	29,1	74,2	28,3	117,0	29,1	92,7	28,3
	16	65,9	30,2	52,2	29,5	87,9	30,3	69,7	29,5	109,9	30,2	87,1	29,5
	18	61,6	31,4	48,8	30,7	82,2	31,4	65,1	30,7	102,7	31,4	81,4	30,7
	20	57,3	32,5	45,4	31,9	76,5	32,6	60,6	31,9	95,5	32,5	75,7	31,9
	22	53,0	33,6	42,0	33,0	70,7	33,7	56,0	33,0	88,4	33,6	70,0	33,0
LPHW 70/55 °C	14	93,5	34,1	74,1	33,0	124,7	34,1	98,8	33,0	155,8	34,1	123,5	33,0
	16	89,2	35,2	70,7	34,3	119,0	35,3	94,3	34,2	148,7	35,3	117,8	34,2
	18	84,9	36,4	67,3	35,5	113,2	36,5	89,7	35,5	141,5	36,4	112,1	35,5
	20	80,6	37,6	63,9	36,7	107,5	37,7	85,2	36,7	134,3	37,6	106,5	36,7
	22	76,3	38,8	60,5	37,9	101,8	38,8	80,6	37,9	127,2	38,8	100,8	37,9
LPHW 70/60 °C	14	102,4	36,0	81,2	34,8	136,7	36,1	108,3	34,8	170,8	36,0	135,3	34,8
	16	98,2	37,2	77,8	36,1	130,9	37,3	103,7	36,1	163,6	37,2	129,7	36,1
	18	93,9	38,4	74,4	37,3	125,2	38,5	99,2	37,3	156,5	38,4	124,0	37,3
	20	89,6	39,6	71,0	38,5	119,5	39,6	94,6	38,5	149,3	39,6	118,3	38,5
	22	85,3	40,7	67,6	39,8	113,7	40,8	90,1	39,7	142,1	40,7	112,6	39,8
LPHW 75/65 °C	14	113,2	38,3	89,7	37,0	151,0	38,4	119,6	37,0	188,7	38,3	149,5	37,0
	16	108,9	39,5	86,3	38,3	145,3	39,6	115,1	38,3	181,5	39,5	143,9	38,3
	18	104,6	40,7	82,9	39,5	139,5	40,8	110,5	39,5	174,4	40,7	138,2	39,5
	20	100,3	41,9	79,5	40,8	133,8	42,0	106,0	40,7	167,2	41,9	132,5	40,8
	22	96,0	43,1	76,1	42,0	128,1	43,2	101,5	42,0	160,0	43,1	126,8	42,0
LPHW 82/71	14	125,4	41,4	99,4	40,0	167,2	41,5	132,5	39,9	209,0	41,4	165,6	39,9
	16	120,3	42,3	95,4	40,9	160,6	42,4	127,2	40,9	200,6	42,3	159,0	40,9
	18	115,3	43,2	91,4	41,9	153,9	43,3	121,9	41,9	192,3	43,2	152,4	41,9
	20	110,3	44,1	87,4	42,8	147,2	44,2	116,6	42,8	183,9	44,1	145,8	42,8
	22	105,3	45,0	83,5	43,8	140,5	45,1	111,3	43,8	175,6	45,0	139,1	43,8
LPHW 90/70 °C	20	117,0	45,6	92,8	44,2	156,1	45,6	123,7	44,2	195,1	45,6	154,6	44,2

*Insert figure for model:
0 = horizontal
2 = standing

[1] measured at a distance of 5 m in an open room
[2] air temperature based on warm air stream
3) with outlet nozzle

Artcle no. for DataNorm/EDV entry: 255 000 _ _ _ _ _ (Insert type)

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Qty.	Article no.	Description	Price/each	Total price
pc.	255 00 **0** **30** **20** **6** **6**	**ProtecTor door air curtain** for fitting above or at the side of industrial or retail doorways, with fan speed-dependent, dynamic, air distribution from primary and secondary warm air curtains; patent pending no. 10320490; The Coanda effect (from the optional outlet nozzles) between the primary and secondary warm air curtain causes the two air streams to contract and increases the screening effect; greater penetration depth by the unheated primary air stream owing to the low thermal upcurrent and the higher air speed. With standard fixing points for universal mounting brackets; self-supporting, sendzimir galvanised housing, neutral in colour, robust; wired as far as terminal box.		
	6	**2-stage 3-phase sickle-blade whisper-quiet fans** 400 V, 50 Hz, protection class IP 54; electrical wiring in compliance with VDE regulations, heating class F; motor protection by integral thermal contacts; with external terminal box		
	6 **7**	**Fan model 6;** depth of unit: 740 mm **Fan model 7;** depth of unit: 840 mm		
	20	**PowerKon heat exchanger with round copper pipes** with profiled aluminium special fins, expansion-joined for optimum heat transfer; suitable for use wth LPHW up to a maximum continuous operating pressure of 10 bar at 120 °C		
	30 **40** **50**	**Horizontal model:** **Length 3000 mm;** Height 360 mm **Length 4000 mm;** Height 360 mm **Length 5000 mm;** Height 360 mm Standing model: **Height 3000 mm;** Length 360 mm **Height 4000 mm;** Length 360 mm **Height 5000 mm;** Length 360 mm		
	0 **2**	**Fixing** Horizontal, connection left hand side Standing (side air curtain), connection left hand side (on the right of the doorway)		
		Technical data Fan stage 2 1 Speed _____ _____ Air volume _____ _____ m^3/h Heat output _____ _____ W Leaving air temperature[1] _____ _____ °C Power consumption _____ _____ W Sound power level _____ _____ dB(A) Sound pressure level[2] _____ _____ dB(A) Water temp. LPHW _____/_____ _____ °C Entering air temperature _____ °C Weight _____ kg Connection _____ " Type _____		
		Article/discount group 2.55 Manufacturer Kampmann, article no. 25500_ _ _ 20 _ 6 , type _ _ _ 20 _ 6		
		Important: Select outlet nozzle (see p 15) separately from the unit!		

Required for complete article no. for DataNorm/EDV

[1] Air temperature based on warm air curtain
[2] Measured at a distance of 5 m in an open room

Specification/ Ordering

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Essential accessory: Outlet nozzle

Qty.	Article no.	Description	Price/each	Total price
pc.	255 000 30 0 0 6 0	**Outlet nozzle for ProtecTor door air curtain**		

Width of the outlet nozzle:
6 740 mm
7 840 mm

Type of outlet nozzle:
0 **long**, without guard, H = 360 mm
1 **short with guard**, as a short nozzle H = 140 mm, only as a central air outlet for where space is at a premium

Position of the outlet nozzle:
0 **central,**
1 **at one side of the door, as a one-sided outlet nozzle, with a wide air stream, in order to direct the air stream in a targeted way towards the doorway**

Length of the outlet nozzle:
30 3.0 m
40 4.0 m
50 5.0 m

Article/discount group 2.55
Manufacturer Kampmann, article no. 255000_ _ _ _ _ 0 , type _ _ _ _ _ 0

Important:
The outlet nozzle is essential for the ProtecTor door air curtain to operate properly!

Required for complete article no. for DataNorm/EDV

Essential accessories: Switches and controllers

Qty.	Article no.	Description	Price/each	Total price
pc.	196 0000 30050	**2-stage, 3-phase switch** with 0-1-2 stage switch, without possible connection to a room thermostat, for the manual control of recirculating air with motor protection relay to monitor the thermal contacts, restart block; polystyrene housing; Protection class: IP 43; switching current max. 10 A Dimensions W x H x D: 127 x 160 x 100 mm Article / Discount group 2.55 Manufacturer Kampmann, Article no. 196000030050, type 30050		
pc.	196 0000 30049	**2-stage, 3-phase switch** with 0-1-2 stage switch, with possible connection to room thermostats or door contact switches; with motor protection relay to monitor motor thermal contacts, restart block, control relay and operation standby indicator; automatic restart after power failure polystyrene housing; Protection class IP 43; switching current max. 10 A Dimensions W x H x D: 127 x 160 x 100 mm Article / Discount group 2.55 Manufacturer Kampmann, Article no. 196000030049, Type 30049		
pc.	196 0000 30752 752 754	**5-stage 3-phase controller** with 0-1-2-3-4-5 stage switch, via transformer, possible connection to room thermostats or door contact switches; with motor protection relay to monitor motor thermal contacts; operating standby indicator, control relay, restart block, automatic restart after power failure; steel housing, painted; protection class IP 20 Dimensions W x H x D: 220 x 300 x 165 mm; Switching current max. 4.0 A: Manufacturer Kampmann, Article no. 196000030752, type 30752; Switching current max. 8.0 A Article / Discount group 2.55 Manufacturer Kampmann, Article no. 196000030754, type 30754		
pc.	196 0000 30763	**Door contact switch** robust mechanical design, potential-free NC / NO contact; protection class IP 65; switching capacity 240 V~, 50 Hz Article / Discount group 2.55 Manufacturer Kampmann, Article no. 196000030763, type 30763		
pc.	196 0000 30058	**Industrial thermostat** Housing made of impact-resistant plastic, setpoint can only be adjusted by removing cover of housing with a screwdriver; Protection class IP 54, temperature setting range 0-40 °C; Switching capacity 250 V~, 50 Hz, 8 (4) A Article / Discount group 2.55 Manufacturer Kampmann, Article no. 196000030058, type 30058		
pc.	196 0000 30059	**Industrial thermostat** Housing made of impact-resistant plastic, setpoint can only be adjusted by removing cover of housing with a screwdriver; Protection class IP 54, temperature setting range 0-40 °C; Switching capacity 240 V~, 50 Hz, 8 (4) A Article / Discount group 2.55 Manufacturer Kampmann, Article no. 196000030059, type 30059		

Required for complete article no. for DataNorm/EDV

Order form

255 00 _ _ _ 20 _ 6 — Article no. ProtecTor door air curtain

- **Article group** 2.55 ProtecTor door air curtain
- **Mounting design**
  0 - horizontal, connection lhs
  2 - standing (side air screen), connection lhs (on rhs of door)
- **Length - horizontal unit**
  30 = 3000 mm, Height 360 mm
  40 = 4000 mm, Height 360 mm
  50 = 5000 mm, Height 360 mm
- **Height - standing unit**
  30 = 3000 mm, Length 360 mm
  40 = 4000 mm, Length 360 mm
  50 = 5000 mm, Length 360 mm
- **PowerKon heat exchanger**
- **6 - size 6 fan**
  7 - size 7 fan
- **2-stage 3-phase sickle-blade, whisper-quiet fan**

255 000 _ _ _ _ _ 0 — Article no. Outlet nozzle

- **Article group** 2.55 ProtecTor door air curtain
- **Length**
  30 = 3000 mm
  40 = 4000 mm
  50 = 5000 mm
- **Arrangement of outlet nozzle**
  0 = central
  1 = at side of door
- **Type of outlet nozzle**
  0 = long, no guard, H = 360 mm
  1 = short, wth guard, H = 140 mm
- **Width of outlet nozzle**
  6 = 740 mm
  7 = 840 mm

Please state article numbers when ordering.

Pos.	Quantity	Article number	Description	Price (see HKL Pricelist)
1		_ _ _ _ _ _ _ _ _ _ _ _		
2		_ _ _ _ _ _ _ _ _ _ _ _		
3		_ _ _ _ _ _ _ _ _ _ _ _		
4		_ _ _ _ _ _ _ _ _ _ _ _		
5		_ _ _ _ _ _ _ _ _ _ _ _		
6		_ _ _ _ _ _ _ _ _ _ _ _		
7		_ _ _ _ _ _ _ _ _ _ _ _		
8		_ _ _ _ _ _ _ _ _ _ _ _		
9		_ _ _ _ _ _ _ _ _ _ _ _		
10		_ _ _ _ _ _ _ _ _ _ _ _		
11		_ _ _ _ _ _ _ _ _ _ _ _		
12		_ _ _ _ _ _ _ _ _ _ _ _		
13		_ _ _ _ _ _ _ _ _ _ _ _		
14		_ _ _ _ _ _ _ _ _ _ _ _		

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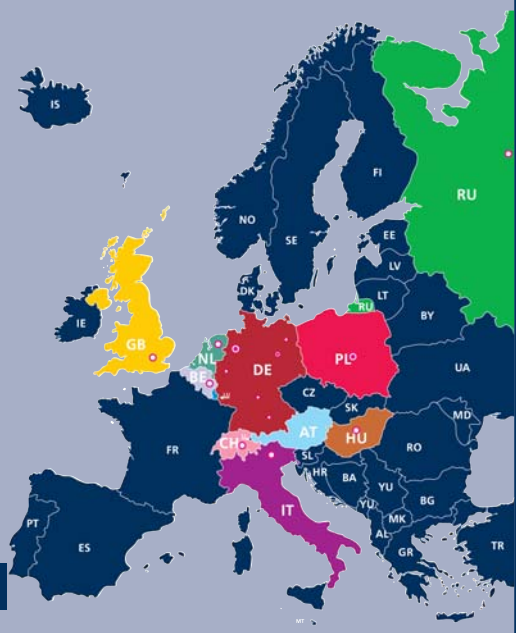

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Spedition Rhenus, Velten near Berlin

Rhenus (freight forwarding), Velten near Berlin


Detail of outlet nozzle

Product-specific data on the above project

- Movement of up to 2,000 pallets of highly temperature-sensitive pharmaceutical products
- Doorway to free zone: 16 three or four metre long door air curtains provide a stable temperature in the loading area

KAMPMANN
SYSTEMS FOR HEATING · COOLING · VENTILATING

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