

# AlfaBlue Dry Coolers

## General Content

### General Features

A dry cooler is a forced convection air-cooled fluid cooler, designed for outdoor installation. Air is forced over a finned coil which contains the working fluid such as water or a water and glycol mix. All products are designed to satisfy both commercial and industrial refrigeration, air conditioning, and retail refrigeration. Dry coolers are available in the following versions:

- Vertical installation (V)
- Horizontal installation (H)

Relative footprint, low consumption and low noise levels are the keys to this series' success.

### Certifications and reliability

All Dry coolers are guaranteed by Eurovent "Certify All". Alfa Laval quality systems fully comply with ISO 9001, and all of our products are manufactured in strict accordance with CE regulations.

### Capacity

The standard conditions stated in the catalogue are in accordance with EN 1048 (water, T.air= 25°C, Tin= 40°C, Tout= 35°C). All models have many circuiting options which can be selected to optimise duty with required fluid pressure drops and flow rates. Due to the multiple combinations of temperatures, flow rates and working fluids that can be encountered, it is not possible to display all the capacities in the catalogue.

#### How to determine the dry cooler's capacity:

Capacity required (e.g. 34%) = Nominal Capacity. (water) x 1.07 x F1 x F2

Altitude (m)	0	500	1000	1500	2000
F1	1	1,028	1,06	1,09	1,12

Fin material	Al	Al Prv	Cu
F2	1	1,03	0,97

### Against Freezing

Given that the tubes are permanently in a horizontal position, it cannot be guaranteed that they drain completely when stoppages occur. As a result of this, a dry cooler containing water must be protected against freezing with an adequate amount of glycol.

### Tube Protection



Due to the thermal expansion of the copper pipes, all metal sheets are equipped with an aluminium plate with collars. This plate supports the tube and therefore the pipes must not come into contact with the metal sheets. With this solution, the vibrations and thermal expansion are absorbed by the aluminium sheet. Leaks caused by friction cannot occur. The rigidity of the coil is sustained effectively.

### Energy Efficiency Class

Energy efficiency class of air cooled condensers		
Class	Energy consumption	R
A	Extremely low	R>110
B	Very low	70≤R<110
C	Low	45≤R<70
D	Medium	30≤R<45
E	High	R<30

R = Condenser capacity (ΔT15K) / motor power consumption.

### Test and cleaning

Coils are cleaned thoroughly in order to remove any traces of oil. Each heat exchanger undergoes a pressure and leak test with dry air at 10bar (PS= 9bar).



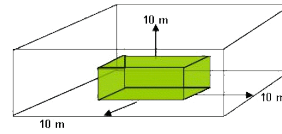
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**Sound Data**

The sound pressure level is based on the calculation (according to EN 13487) of the sound pressure level on the surface of a cuboid area which is at a 10 metre distance and is parallel to the reference envelope of the sound source. (Standard sound pressure level; annex C EN 13487)



Sound pressure correction for distances other than 10 metres.

Distance (m)	2	3	4	5	7	10	15	20	30	40	50	60	80
Correction dB(A)	11	8,5	7	5	2,5	0	-3	-5,5	-9	-11	-12	-14	-16

Sound pressure level for several fans at nominal speed rating.

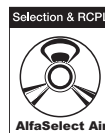
N° units	2	3	4	5	6	7	8	9	10
dB(A)	3	5	6	7	8	8,5	9	9,5	10

To calculate the sound pressure level, take the sound power of the individual fans according to their position, and calculate the sound propagation taking into consideration the local and ambient conditions. Speed change, start-up and control noises are not taken into account.

Fan Model	Speed rpm		Total Lw dB(A)		LW octave band spectrum dB(A)															
					63Hz		125Hz		250Hz		500Hz		1 000Hz		2 000Hz		4 000Hz		8 000Hz	
					Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y	Δ	Y
630 S	1340	1070	90	84	-	-	68	66	76	72	78	74	83	77	81	76	78	72	70	65
630 L	900	690	77	71	-	-	62	55	69	63	72	65	75	68	72	63	64	56	58	50
630 Q	650	480	70	62	-	-	51	48	60	55	63	58	65	59	60	53	53	47	46	45
630 R	430	330	60	54	-	-	46	45	53	47	54	51	53	49	48	43	43	40	42	41
800 S	880	660	83	76	-	-	69	56	67	62	74	69	78	74	79	72	72	64	62	54
800 L	680	530	76	71	-	-	57	49	62	57	69	63	74	68	72	63	65	55	55	45
800 Q	440	340	66	60	-	-	47	42	57	48	59	54	63	56	58	51	50	43	39	34
800 R	380	240	63	52	-	-	47	42	54	44	57	47	59	48	55	42	47	34	35	26
910 T	890	700	90	83	-	-	72	70	79	73	82	76	84	79	82	76	79	73	73	66
910 S	860	660	85	79	-	-	72	70	79	73	82	76	84	79	82	76	79	73	73	66
910 L	640	440	78	70	-	-	68	62	73	68	76	70	77	70	76	70	73	67	66	60
910 Q	440	330	68	62	-	-	57	49	61	58	64	57	67	60	61	53	52	45	43	35
910 R	390	250	65	53	-	-	56	46	59	45	59	46	61	49	56	44	48	35	38	22
1000 L	680	550	86	81	-	-	58	53	68	60	70	63	73	68	75	67	71	62	62	53
1000 Q	425	325	72	65	-	-	50	45	58	50	62	54	65	58	60	50	54	42	44	30
1000 R	390	260	70	61	-	-	50	44	56	45	60	49	64	52	55	44	48	36	37	25

**Guarantee**

All our products are protected under warranty for 18 months from the shipping date. If a defect should occur within the warranty period, please return the equipment or part to our factory free of charge where we will repair or replace the goods, depending on what is required. Unfortunately, We cannot take responsibility for damage caused by the misuse or incorrect installation of our products. Brochure subject to technical changes without prior notice



We recommend that you use the Alfa Select Air software for a precise thermal and mechanical design.



# BDM - Single Fan Row

## Product description

### Application

Alfa Laval Dry Coolers can be used in refrigeration, air conditioning equipment and in industrial cooling (cooling of water or other different fluids, food, power, process and general industry).

### Standard design

#### Coil

This innovative heat exchanger gives excellent heat transfer with minimal refrigerant charge, as a result of new fin corrugation and smooth tubing developed by Alfa Laval. In the standard execution, the heat exchanger is manufactured from copper tubes and aluminum fins with spacing 2.1 mm. BDM is a Single coil model; each manifold provided with draining and venting nozzles. Each heat exchanger undergoes a pressure and leak test with dry air at 10bar (design pressure is 9bar).

#### Casing

Casework made with pre-painted galvanized steel sheets. A new frame design provides high rigidity for heavy applications. The new system protects the heat exchanger tubes completely during transportation and against vibration and thermal expansion while in operation. Supports manufactured in galvanized steel, with optimized length to permit uniform air suction in the coil.

### Benefits

- Footprint: Optimised footprint with higher capacity.
- 630, 800, 910, 1000 mm fan
  - More performance available
  - Low power consumption fan motor
  - More noise level options
  - Flexible design
- All parts are painted in accordance with RAL 9002
  - No cut edges
  - Higher corrosion resistance, double surface treatment
  - External Corrosion Class C4
- Coil design: Increased heat transfer thanks to innovative fin corrugation
- Casing: Strong casing with new design
- High Energy Efficiency: best performance with low energy consumption

### Options

- Non-standard fin spacing: for heavy dusty environment
- Coil treatment: corrosion resistance, ideal for aggressive environments
- Vibration Dampers: for reducing vibrations
- Electrical parts
  - Switch on/off: Local safety switch is wired to isolate the fan, and is also available for EMC switches.
  - Terminal Box: all fans wired for an easy electrical connection
  - Switchboard



- Cabling: ready to install
- Frequency Converter design: units can run under frequency control (when air temperature is below the design, it allows energy saving, noise reduction and longer fan motor life)
- Fan step control:
  - Energy saving
  - Cheapest method of controlling performance
- Fan speed control
  - Energy saving
  - Noise reduction when the air temperature is below the design temperature.
  - Variable and efficient speed control according to the heat rejected
  - Better performance control
- Special fans
  - 480/3ph-60Hz IP54: High adaptability for every market
  - IP 55: High protection fan for use in tropical or desert areas
  - High temperature Electric Motors: Suitable for high temperature fluids when the outlet air is too hot for the standard fan motors.

**Fans**

On the BDM, four different fan diameters are available: 630, 800, 910, 1000 mm. Diameter 630, 800, 910, 1000 mm with three-phase motor 400V-50Hz, for 630 (L, Q, R) also single-phase 230V-50Hz. The motors come with external rotors, protection class IP 54 according to DIN 40050, while integrated thermo contacts provide reliable protection against any instances of thermal overload. These BDM Dry Coolers are available in five fan motor noise levels: (S) standard, (L) low, (Q) quiet, (R) residential and the new (T) high performance fan. The fans are suitable for operation in air temperatures between -40°C and +40°C.

For air temperatures lower than +20°C, the full load current (FLC) can be calculated using the correction factor table. The overload protection should have a 20% margin to accommodate fan motor supplier variations.

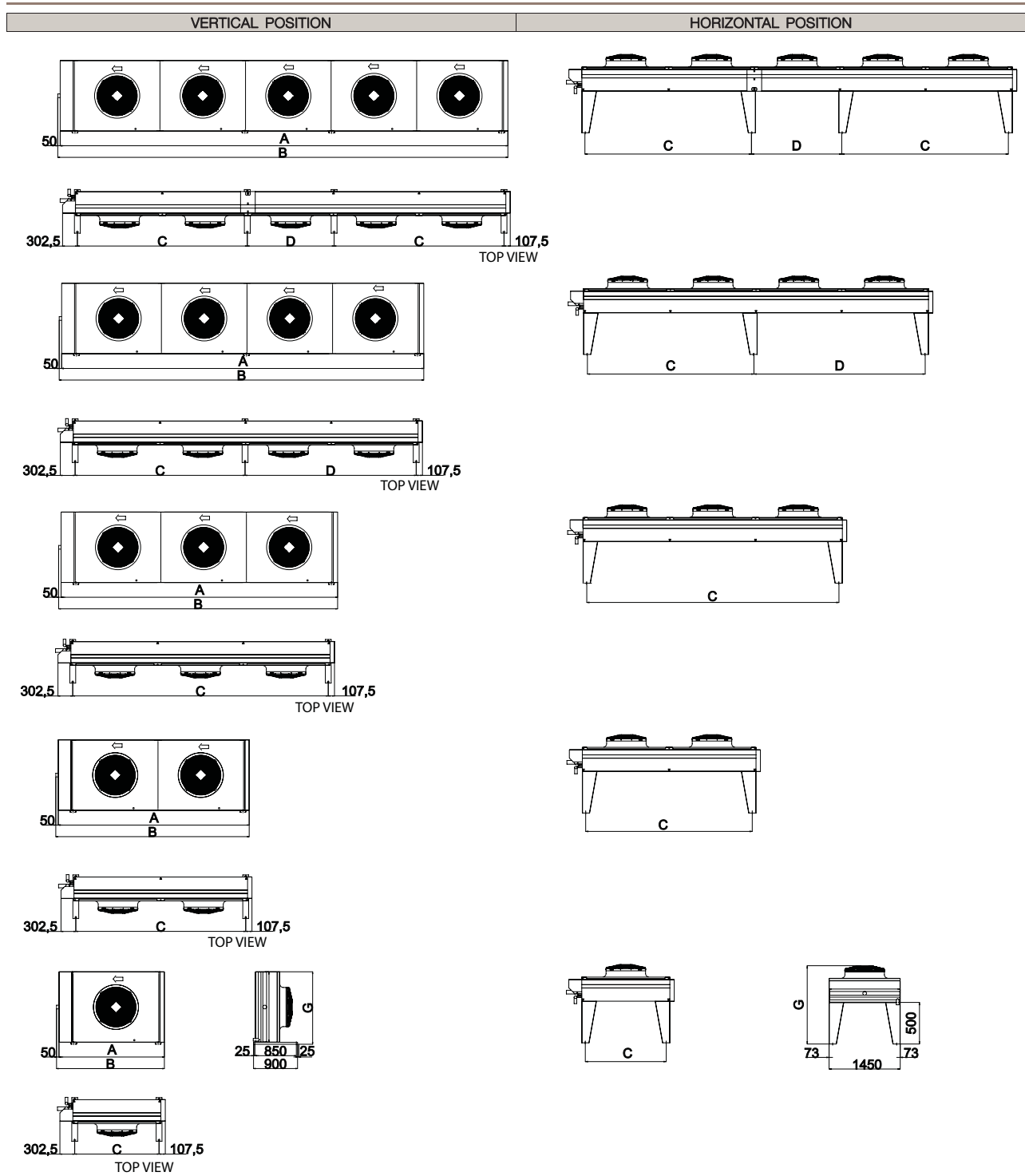
<b>T [°C]</b>	20	10	0	-10	-15	-20	-25	-30
<b>Fc</b>	1	1,04	1,08	1,12	1,14	1,16	1,18	1,2



Serie	Weight [kg]	Dimensions (mm)					N° feet	
		A	B	C	D	G	V	H
<b>Ø 800</b>								
BDM_801A	180	2135	2185	1725(V)/1664(H)	-	1495(V)/1250(H)	2	4
BDM_801B	200	2135	2185	1725(V)/1664(H)	-	1495(V)/1250(H)	2	4
BDM_801C	220	2135	2185	1725(V)/1664(H)	-	1495(V)/1250(H)	2	4
BDM_801D	240	2135	2185	1725(V)/1664(H)	-	1495(V)/1250(H)	2	4
BDM_802A	360	3885	3935	3475(V)/3404(H)	-	1495(V)/1250(H)	2	4
BDM_802B	400	3885	3935	3475(V)/3404(H)	-	1495(V)/1250(H)	2	4
BDM_802C	440	3885	3935	3475(V)/3404(H)	-	1495(V)/1250(H)	2	4
BDM_802D	480	3885	3935	3475(V)/3404(H)	-	1495(V)/1250(H)	2	4
BDM_803A	540	5635	5685	5225(V)/5154(H)	-	1495(V)/1250(H)	2	4
BDM_803B	600	5635	5685	5225(V)/5154(H)	-	1495(V)/1250(H)	2	4
BDM_803C	660	5635	5685	5225(V)/5154(H)	-	1495(V)/1250(H)	2	4
BDM_803D	720	5635	5685	5225(V)/5154(H)	-	1495(V)/1250(H)	2	4
BDM_804A	720	7385	7435	3475(V)/3404(H)	3500	1495(V)/1250(H)	3	6
BDM_804B	800	7385	7435	3475(V)/3404(H)	3500	1495(V)/1250(H)	3	6
BDM_804C	880	7385	7435	3475(V)/3404(H)	3500	1495(V)/1250(H)	3	6
BDM_804D	960	7385	7435	3475(V)/3404(H)	3500	1495(V)/1250(H)	3	6
BDM_805A	900	9135	9185	3475(V)/3404(H)	1775(V)/1846(H)	1495(V)/1250(H)	4	8
BDM_805B	1000	9135	9185	3475(V)/3404(H)	1775(V)/1846(H)	1495(V)/1250(H)	4	8
BDM_805C	1100	9135	9185	3475(V)/3404(H)	1775(V)/1846(H)	1495(V)/1250(H)	4	8
BDM_805D	1200	9135	9185	3475(V)/3404(H)	1775(V)/1846(H)	1495(V)/1250(H)	4	8
<b>Ø 910</b>								
BDM_901A	215	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_901B	240	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_901C	265	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_901D	290	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_902A	430	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_902B	480	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_902C	530	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_902D	580	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_903A	645	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_903B	720	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_903C	795	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_903D	870	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_904A	860	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BDM_904B	960	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BDM_904C	1060	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BDM_904D	1160	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
<b>Ø 1000</b>								
BDM_1001A	215	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_1001B	240	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_1001C	265	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_1001D	290	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BDM_1002A	430	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_1002B	480	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_1002C	530	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_1002D	580	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BDM_1003A	645	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_1003B	720	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_1003C	795	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_1003D	870	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BDM_1004A	860	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BDM_1004B	960	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BDM_1004C	1060	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BDM_1004D	1160	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6

Standard Feet 500 mm.

We reserve the right to change our technical data without prior notice.



# BDM - Single Fan Row

## Code description

Code No.

	1	2	3	4
BDM	S	63	2	A

1) Type of noise level (number of dB(A) to reduce compared with "base" version)

	Turbo noise level	Standard noise level	Low noise level	Quiet noise level	Residential noise level
	T	S*	L*	Q*	R*
Fan diameter Ø 630mm (normal / long)	-	base	-10	-18	-29
Fan diameter Ø 800mm	-	base	-7	-16	-20
Fan diameter Ø 910 mm	base	-2	-9	-19	-20
Fan diameter Ø 1 000 mm	-	-	base	-14	-16

2) Fan diameter Ø

63	630 mm
80	800 mm
90	910 mm
100	1 000 mm

3) Number of Fans (\* available in this version)

	Fan diameter Ø 630mm	Fan diameter Ø 630 mm	Fan diameter Ø 800mm	Fan diameter Ø 910 mm	Fan diameter 1000mm
1	*	*	*	*	*
2	*	*	*	*	*
3	*	*	*	*	*
4	-	*	*	*	*
5	-	-	*	-	-

4) Number of coil rows

A	2
B	3
C	4
D	5

### General Alfa Select Air Legend

Description 1		Description 2	
<b>D</b>	D fan cabling (three phase)	<b>AL</b>	Aluminium fin
<b>Y</b>	Y fan cabling (three phase)	<b>CU</b>	Copper fin
<b>D/Y</b>	D/Y fan cabling (three phase), single speed fan motor	<b>PR</b>	Pre-coated fin
<b>S</b>	Single phase	<b>SS</b>	Stainless steel tube
<b>P</b>	Packaged on a pallet	<b>TH</b>	Thermoguard treatment
<b>CR</b>	Packaged in a crate	<b>CF</b>	Cataphoresis treatment
<b>BO</b>	Packaged in a box	<b>SC</b>	Sub-cooling circuit
<b>Feet</b>	Feet-mounted	<b>KW</b>	Spray water kit
<b>SW</b>	Safety Switch	<b>FL</b>	Flanges
<b>CB</b>	Terminal Box	<b>FH</b>	Fan ring heater
<b>B</b>	Basic Switch Board	<b>IS</b>	Insulated Drip Tray
<b>BS</b>	Basic Switch Board + Signal	<b>RH</b>	Reheating coil
<b>BP</b>	Basic Switch Board + Step Control Pressure	<b>SR</b>	Air socket adapter ring
<b>PT</b>	Basic Switch Board + Step Control Temperature	<b>CW</b>	Air throw fan cowling
<b>BSP</b>	Basic Switch Board + Step Control Pressure + Signal	<b>ER</b>	120° elbow reducer
<b>BST</b>	Basic Switch Board + Step Control Temp. + Signal	<b>HN</b>	Hinged fan cowling
<b>BFP</b>	Basic Switch Board + Speed Control Pressure		
<b>BFT</b>	Basic Switch Board + Speed Control Temperature		
<b>BSFP</b>	Basic Switch Board + Speed Control Pres. + Signal		
<b>BSFT</b>	Basic Switch Board + Speed Control Temp. + Signal		
<b>BI</b>	Basic Switch Board + Frequency Converter (Inverter)		
<b>BSI</b>	Basic Switch Board + Frequency Converter (Inverter) + Signal		
<b>C</b>	Switch Board + Cooling fan		
<b>R</b>	Switch Board + Resistor		
<b>F</b>	Switch Board + Cooling fan + Resistor		
<b>PT</b>	Ammonia pump top		
<b>PB</b>	Ammonia pump bottom		
<b>AL</b>	Aluminium casing		
<b>SS</b>	Stainless Steel casing		
<b>AP</b>	Pre-painted Aluminium casing		
<b>PL</b>	Plastic casing		
<b>E</b>	Electrical defrost		
<b>LE</b>	Low Electrical defrost		
<b>A</b>	Air Defrost		
<b>HG</b>	Hot Gas Defrost		
<b>HG+E</b>	Hot Gas Defrost + Electrical Defrost on drip tray		
<b>W</b>	Water Defrost		
<b>W+E</b>	Water Defrost + Electrical Defrost on drip tray		

Note: valid for the entire product range

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