AlfaBlue Condensers

General Contents

General Features

All products are designed to satisfy both commercial and industrial refrigeration, air conditioning, and retail refrigeration. All axial condensers are available in the following versions:

- Vertical installation (V)
- Horizontal installation (H)
- Most common refrigerant HFC, such as R404A, R507C, R407C, R134a
- A dedicated product line is available for the natural refrigerant NH_3

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

Certifications and reliability

All Air Cooled condensers 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 are in accordance with EN 327 (R404A, T. air = 25°C, T.cond.= 40°C, ΔT sub-cool < 3K, ΔT superheat = 25K).

How to work out the condenser's capacity:

$$Qc = Qf \times Fr \times F1 \times F2 \times F3 \times F4 \times F5 \times F6$$

Qc = Condenser capacity
Qf = Evaporator capacity
Fr = Condensing Temp (Tc) and evaporating Temp factor. (Te).
F1 = Compressor factor
F2 = Refrigerant factor
F3 = ΔT factor (15/ΔT)
F4 = Altitude factor
F5 = Fin material
F6 = Ambient temperature factor

Compressor	Open	Semi-hermetic	Hermetic
F1	1	1,08	1,14

Refrigerant	R507A	R404A	R134a	R22	R407C
F2	1	1	0,93	0,96	0,87

Altitude (m)	0	500	1000	1500	2000
F4	1	1,028	1,06	1,09	1,12

Fin material	Al	Al Prv	Cu
F5	1	1,03	0,97

Ambient Temp.	15	20	25	30	35
F6	0,975	0,988	1,00	1,013	1,026

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.		

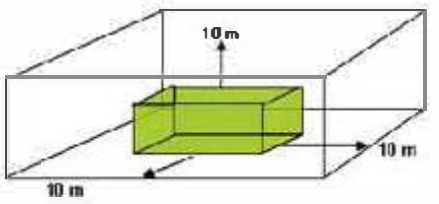
Test and cleaning

The coils are cleaned and dehydrated in order to remove any traces of oil.

Each heat exchanger undergoes a pressure and leak test with dry air at 34 bar, before being supplied with a nitrogen pre-charge.

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	
Connection	Δ	Y	Δ	Y	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	46
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	65	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. The brochure is subject to technical changes without prior notice

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

BCM - Single Fan Row

Product description

Application
The Alfa Laval Condenser can be used in refrigeration and air conditioning equipment

Standard design

Coil
The innovative heat exchanger gives excellent heat transfer with minimised refrigerant charge, thanks to the new fin corrugations developed by Alfa Laval, combined with advance cross-fin tubes. The standard heat exchanger is manufactured from copper tubes and aluminium fins with 2.1mm spacing.

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: optimized footprint with higher capacity
- 630, 800, 910, 1000 mm fan:
  - More performance available
  - Low power consumption fan motor
  - More options on noise levels
  - Flexible design
- RAL 9002 all parts painted:
  - No cut edges
  - Higher corrosion resistance, double surface treatment
  - External Corrosion Class C4
- Coil design: increased heat transfer thanks to innovative fin corrugations
- Casing: strong casing with new design
- High Energy Efficiency: best performance with low energy consumption

Options
- Non-standard fin spacing: for heavy dusty environment
- Multi-circuits: total capacity split in multiple compressor lines
- Sub-cooling circuit. Additional circuit to further cool the condensate
- Coil treatment: corrosion resistance, ideal for aggressive environments
- Vibration Dampers: for reducing vibrations
- Electrical parts:
  - Switch on/off: local safety switch wired to isolate the fan and also the switch EMC type
  - 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: for use when the air temperature is higher than permitted for the use of standard fans.

Fans

Four different fan diameters are available for the BCM: 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. This Axial Condenser BCM is available in five noise levels: (S) standard, (L) low, (Q) quiet, (R) residential and the new (T) high performance fan. The motors are fitted with a thermal contact. The fans are suitable for operation in air temp. application between -40°C and +40°C.

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

T [°C]	20	10	0	-10	-15	-20	-25	-30
Fc	1	1,04	1,08	1,12	1,14	1,16	1,18	1.2

Model	Capacity [kW]		Airflow [m³/h]		Lp [dB(A)]*		Motor (3/400V-50Hz)		Fans	E.E.C.**		Surface	Tube volume	Conn. Size	
														mm	
	Δ	Y	Δ	Y	Δ	Y	Δ	Y	N° x D [mm]	Δ	Y	m²	dm³	Inlet	Outlet
Ø 910															
BCMT 901 B	115,1	98,3	30615	24823	65	50	P=3600W In=7,2A n=890min-1	P=2500W In=4,3A n=700min-1	1X900	D	D	176,3	25	42	28
BCMT 901 C	124,1	103,9	29339	23505	55	50			1X900	D	C	235	34	42	28
BCMT 902 B	227,3	195,2	61080	49485	58	53			2X900	D	D	348,4	50	60	48
BCMT 902 C	247,5	207,0	58472	46808	58	53			2X900	D	E	464,6	67	60	48
BCMT 903 A	236,3	214,2	97197	81109	60	55			3X900	E	D	589,7	51	60	48
BCMT 903 B	300,2	265,5	95395	78612	60	55			3X900	E	D	884,6	77	76	54
BCMT 903 C	341,3	295,3	93167	75938	60	55			3X900	D	D	1179,5	103	76	54
BCMT 904 A	315,4	287,2	129582	108125	61	56			4X900	E	D	784,8	68	76	54
BCMT 904 B	403,0	357,7	127166	104781	61	56			4X900	E	D	1177,2	103	76	54
BCMT 904 C	459,6	398,7	124181	101203	61	56			4X900	D	D	1569,6	137	88,9	60
BCMS 901 B	88,1	72,0	21539	16780	53	48	P=1650W In=3,5A n=860min-1	P=1000W In=1,8A n=660min-1	1X900	C	B	176,3	25	42	28
BCMS 901 C	93,7	75,1	20753	16039	53	48			1X900	C	B	235	34	42	28
BCMS 902 B	175,4	143,9	42983	33469	66	51			2X900	C	B	348,4	50	60	48
BCMS 902 C	186,8	149,7	41383	31965	56	51			2X900	C	B	464,6	67	60	48
BCMS 903 A	194,4	168,6	68521	54240	68	53			3X900	D	C	689,7	51	60	48
BCMS 903 B	238,7	201,6	67026	52710	58	53			3X900	C	C	884,6	77	76	54
BCMS 903 C	264,6	220,3	65472	51170	68	53			3X900	C	B	1179,5	103	76	54
BCMS 904 A	261,7	227,8	91348	72306	59	54			4X900	D	C	784,8	68	76	54
BCMS 904 B	322,4	272,8	89347	70260	59	54			4X900	C	C	1177,2	103	76	54
BCMS 904 C	357,7	295,6	87268	68200	59	54			4X900	C	B	1569,6	137	88,9	60
BCML 901 A	60,6	46,6	16566	11686	46	39	P=900W In=2,2A n=640min-1	P=470W In=1,05A n=440min-1	1X900	B	B	117,5	17	42	28
BCML 901 B	69,0	51,2	15929	11056	46	39			1X900	B	A	176,3	25	42	28
BCML 901 C	72,2	51,8	15329	10512	46	39			1X900	B	A	235	34	42	28
BCML 902 A	120,9	92,9	33081	23319	49	42			2X900	B	B	232,3	34	54	42
BCML 902 B	138,0	101,4	31784	22043	49	42			2X900	B	A	348,4	50	60	48
BCML 902 C	143,9	103,1	30566	20944	49	42			2X900	B	A	464,6	67	60	48
BCML 903 A	162,2	129,6	51050	36525	51	44			3X900	C	B	589,7	51	60	48
BCML 903 B	193,2	150,7	49739	35100	51	44			3X900	B	A	884,6	77	76	54
BCML 903 C	211,8	160,1	48463	33817	61	44			3X900	B	A	1179,5	103	76	54
BCML 904 A	219,4	175,8	68054	48687	52	45			4X900	C	B	784,8	68	76	54
BCML 904 B	261,6	200,4	66301	46782	62	45			4X900	B	A	1177,2	103	76	54
BCML 904 C	283,1	212,1	64595	45067	52	45			4X900	B	A	1569,6	137	88,9	60
BCMQ 901 A	43,8	36,4	10801	8592	36	30	P=330W In=0,83A n=440min-1	P=185W In=0,38A n=300min-1	1X900	A	A	117,5	17	42	28
BCMQ 901 B	48,4	39,3	10347	8126	36	30			1X900	A	A	176,3	25	42	28
BCMQ 901 C	49,1	38,8	9917	7709	36	30			1X900	A	A	235	34	42	28
BCMQ 902 A	87,4	72,7	21565	17144	39	33			2X900	A	A	232,3	34	54	42
BCMQ 902 B	95,9	77,9	20641	16199	39	33			2X900	A	A	348,4	50	60	48
BCMQ 902 C	97,8	77,3	19768	15355	39	33			2X900	A	A	464,6	67	60	48
BCMQ 903 A	121,5	105,1	33345	26802	41	35			3X900	A	A	589,7	51	60	48
BCMQ 903 B	142,2	119,1	32430	25805	41	35			3X900	A	A	884,6	77	76	54
BCMQ 903 C	150,9	122,8	31525	24864	41	35			3X900	A	A	1179,5	103	76	54
BCMQ 904 A	165,0	140,7	44452	35727	42	36			4X900	A	A	784,8	68	76	54
BCMQ 904 B	188,2	157,9	43228	34393	42	36			4X900	A	A	1177,2	103	76	54
BCMQ 904 C	200,2	166,0	42017	33136	42	36			4X900	A	A	1569,6	137	88,9	60
BCMR 901 A	41,5	29,1	10081	6496	35	25	P=270W In=0,70A n=390min-1	P=140W In=0,32A n=250min-1	1X900	A	A	117,5	17	42	28
BCMR 901 B	45,6	30,3	9632	6110	35	25			1X900	A	A	176,3	25	42	28
BCMR 902 A	82,7	58,0	20124	12960	38	28			2X900	A	A	232,3	34	54	42
BCMR 902 B	90,3	60,2	19212	12178	38	28			2X900	A	A	348,4	50	60	48
BCMR 903 A	116,0	86,7	31189	20378	40	30			3X900	A	A	589,7	51	60	48
BCMR 903 B	135,0	94,3	30269	19514	40	30			3X900	A	A	884,6	77	76	54
BCMR 903 C	142,1	94,6	29371	18728	40	30			3X900	A	A	1179,5	103	76	54
BCMR 904 A	157,3	114,9	41577	27163	41	31			4X900	A	A	784,8	68	76	54
BCMR 904 B	178,8	125,2	40347	26008	41	31			4X900	A	A	1177,2	103	76	54
BCMR 904 C	188,5	125,8	39146	24958	41	31			4X900	A	A	1569,6	137	88,9	60

Nominal capacities according to standard ENV327 (R404A Tair=25°C, Tcond=40°C, ΔTsubcool<3K, ΔTsuperheat=25K).

*See "General Contents" for more details.

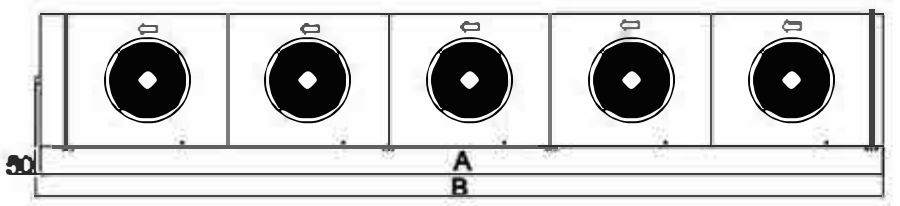
**Energy Efficiency Class: see "General Contents" for more details.

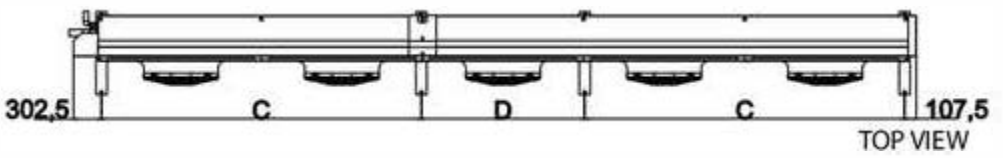
Model	Weight [kg]	Dimensions (mm)					N° feet	
		A	B	C	D	G	V	H
Ø 910								
BCM_901 A	210	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BCM_901 B	235	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BCM_901 C	260	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BCM_902 A	420	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BCM_902 B	470	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BCM_902 C	520	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BCM_903 A	645	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BCM_903 B	720	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BCM_903 C	795	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BCM_904 A	860	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BCM_904 B	960	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BCM_904 C	1060	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
Ø 1000								
BCM_1001 A	210	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BCM_1001 B	235	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BCM_1001 C	260	2485	2535	2075(V)/2004(H)	-	1495(V)/1290(H)	2	4
BCM_1002 A	420	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BCM_1002 B	470	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BCM_1002 C	520	4585	4635	4175(V)/4104(H)	-	1495(V)/1290(H)	2	4
BCM_1003 A	645	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BCM_1003 B	720	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BCM_1003 C	795	6685	6735	6275(V)/6204(H)	-	1495(V)/1290(H)	2	4
BCM_1004 A	860	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BCM_1004 B	960	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6
BCM_1004 C	1060	8785	8835	4175(V)/4104(H)	4200	1495(V)/1290(H)	3	6

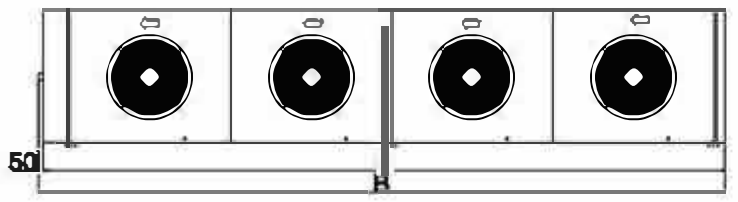
Standard feet 500 mm.

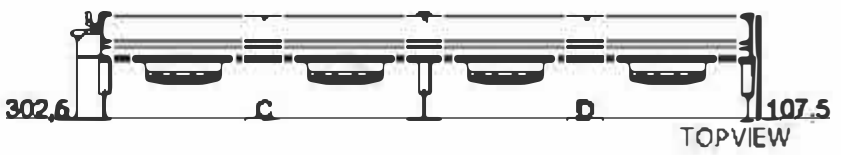
We reserve the right to change our technical data without prior notice.

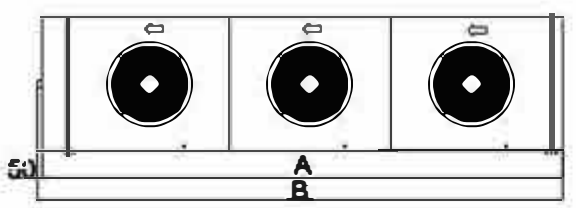
BCM VERTICAL POSITION

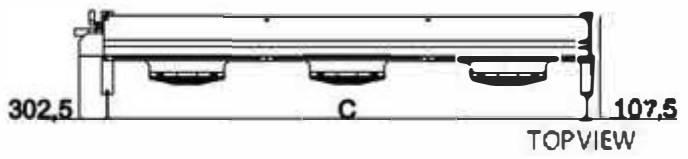


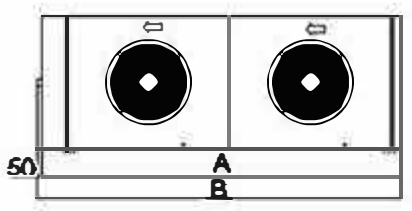


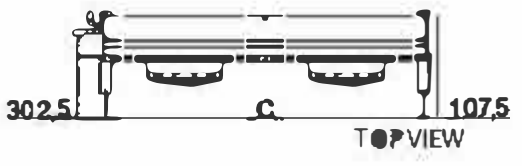


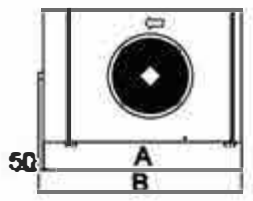


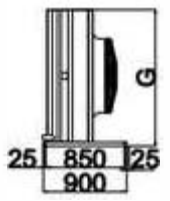


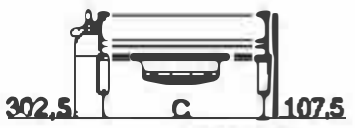




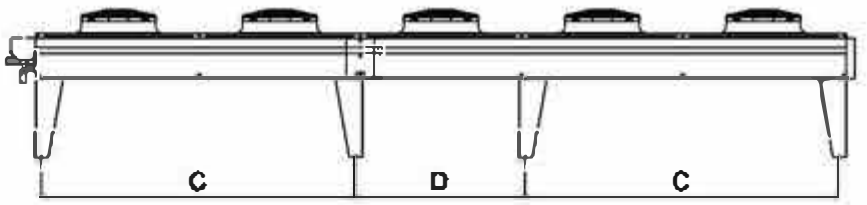


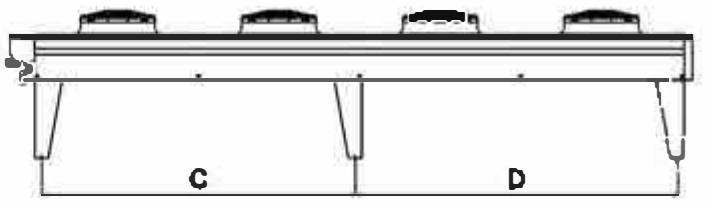


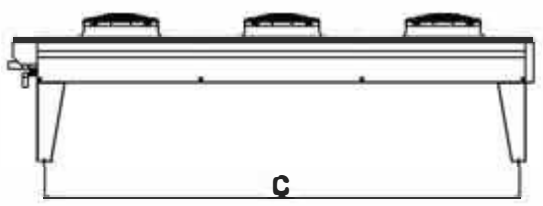


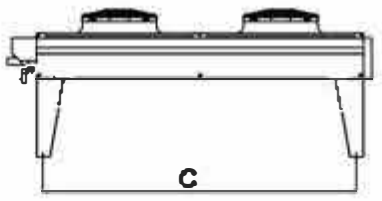


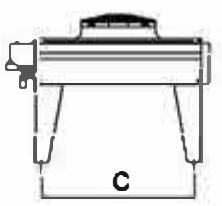
BCM HORIZONTAL POSITION

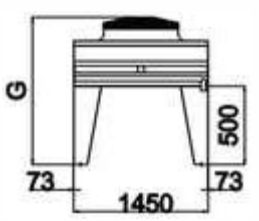












BCM/BNM - Single Fan Row

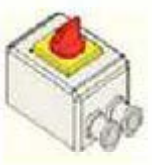
Options

Motor fans

(a) Fan motor 400 V/3ph - 60Hz, IP54: C/R for Ø 630/800/910/1000 and also S/L for Ø 630/800/910
(b) Fan motor 460 V/3ph - 60Hz, IP54: C/R for Ø 630/800/910/1000 and also S/L for Ø 630/800/910
(c) Fan motor 230V/1ph - 50/60Hz, IP54: L/O for Ø 630

Model:
Ø 630 (a,b,c)
Ø 800 (a,b)
Ø 910 (a,b)
Ø 1000 (a,b)

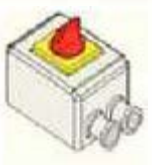
Local safety switch wired



See Electrical Data Page.

Model:
All Models

Local safety switch EMC



See Electrical Data Page

Model:
All Models

Terminal Box

See Electrical Data Page.

Model:
All Models

Switchboard and cabling

Function

Switchboard for supply and control of fan motors.

A switchboard can supply up to 8 individual motors or 8 paired motors (i.e. max. of 16 motors).

Switchboard and cabling are supplied as standard for vertical installation of the unit.

If you have different needs, please specify these when placing your order.

Operating conditions

Type of installation: External wall mounted

protection class: IP55 door closed

Climate: Normal

Operating temperature: -10 ÷ +35°C (base) -25 ÷ +50°C (with options)

Ambient relative humidity: <95%

Altitude: <1000metres above sea level

Electrical data

Insulating nominal voltage: 690V

Operating voltage: 3Ph. 400Vac

Frequency: 50Hz

Auxiliaries voltage: 24230V

Nominal current: Max 80A

Mechanical data

Material: Pre-painted galvanized steel

Fixing plate: Sheet of steel (min. thickness 15/10 Sendzimir galvanized)

Gasket: Polyurethane

Door: opening more than 180°.

Colour: RAL 7035

Cable gland: metric ISO

Model:
All Models

Switchboard Options

R anti-condensate resistor 230Vac (operating temperature -25 ÷ +35°C)

C cooling fan 230Vac (operating temperature -10 ÷ +50°C)

F cooling fan + anti-condensate resistor

Model:
All Models

Switchboard with Fan Speed control

Switchboard and cabling including an electronic fan motor speed controller. This equipment continually checks and regulates the rotation speed of the fan's motor, keeping the condensing pressure within the range or pre-defined values. Constant control of the fan speed is achieved by variation of the electrical supply by phase-cut, as determined by the probe signal. The fan speed controller comes pre-connected to the switchboard. If you have different needs, please specify these when placing your order.

Model:
All Models

Switchboard with Fan Step control

Switchboard and cabling including an automatic on/off switch that checks and regulates the rotation speed of the fan's motor, keeping the condensing pressure within the range or pre-defined values. Control of the fan speed is achieved by variation of the electrical supply by the ON/OFF device, as determined by the probe signal. The fan step controller comes pre-connected to the switchboard. If you have different needs, please specify these when placing your order.

Model:
All Models

Switchboard with Frequency Converter (Inverter)

See Electrical Data Page

Model:
All Models

Coil Treatment / Material

Thermoguard for industrial or sea coast application.

Aluminium fins pre-coated.

Copper fins.

Application Use: More information on corrosion prevention can be found in the Miscellaneous section.

Model:
All Models