

CASCA-TECH SERIES

CO₂ CASCADE EVAPORATORS

DIRECT EXPANSION EVAPORATORS & LIQUID RECIRCULATION AIR COOLERS

ORIGINAL MANUFACTURED EQUIPMENT

CASCA-TECH
Series



HX-406-4 AUS



Product Specifications

As part of our total solution, Buffalo Trident has developed a complete range of direct expansion evaporators suitable for use in a CO₂ cascade application.

The evaporators are designed for low temperature freezer applications, ranging from -20°C SST to -40°C SST. A substantial amount of research has been undertaken to provide this "State of the Art" technology. Each evaporator coil has been re-designed to provide the optimum heat exchange efficiency, taking full advantage of the benefits provided by CO₂.

Refrigeration capacity has been increased for a given coil size, while oil circulation within the system has also been improved. Defrosting is achieved with a dry coil (pump down coil) to remain within system pressure limits. This is achieved through a re-design of the electric defrost methods.

The Buffalo Trident CO₂ evaporators are offered in two series:

Our CASCA-TECH CO₂ BRLC range is ideally suited for smaller commercial applications, while the large CASCA-TECH CO₂ BBLC series is available specifically for heavy duty freezer and blast freezer applications.

Standard Features

- Natural refrigerant - environmentally safe and non-toxic
- Smaller line sizes - easier installation for contractors
- More capacity for same cooler compared to other refrigerants
- Internal ripple finned tube for higher heat transfer performance, low parasitic fan power and better oil return
- Hinged access doors both ends - easily removable where coil installed close to adjacent wall
- All fans statically and dynamically balanced, aerodynamically constructed for economical and quiet operation
- Sickle blade fans
- Stucco embossed aluminium case
- Defrost elements fitted into the coil block for better heat dissipation

Optional Extras

- Epoxy coated fins (not available with Electric Defrost)
- Copper fins for harsh environments
- Stainless steel case
- Single phase motors (BBLC & BBM-CLR models)
- Special application designs
- Hazardous location motors (eg. flameproof)
- Multiple circuits
- Glycol Defrost
- Other fin series: 3, 4 and 6 FPI
- Blygold coil protection

Explanation Of Type Designation

BR**LCE** - 77

BR Model Series

BR**LCE** - 77

LC - Low Temperature, CLR - Medium Temperature

BRLC**E** - 77

E = Electric Defrost, G = Glycol Defrost

BRLCE - **77**

Nominal Kilowatts

BBLC-320 Series Evaporator



BBLC-323 Series Evaporator





Performance Data

Direct Expansion Model BRLCE Low Temperature Evaporators (CO₂)

Specifications - 300mm Diameter Fan Models Fin Series 6 (236 Fins/m)

Capacities in accordance with European $\pm$ DT1 conditions, and based on -24°C saturated suction temperature

MODEL		BRLCE 14	BRLCE 22	BRLCE 31	BRLCE 40	BRLCE 50	BRLCE 62
R744	Watts @ 6ktd	1339	2242	3101	4016	4965	6201
	Watts @ 1ktd	223	374	517	669	827	1034
Air flow	L/s	418	412	788	1254	1101	1576
	CFM	886	873	1669	2657	2333	3339
Air throw (metres) (**)		7.4	7.2	8.9	10.8	10.3	2.1
Number of 300mm fans		1	1	2	3	3	4
Fan Motor(s)	Total watts	70	70	140	210	210	280
	*Total amps	0.32	0.32	0.64	0.96	0.96	1.28
Motor heat / 24hrs watts		1680	1680	3360	5040	5040	6720
Defrost heaters 240v	Total watts	1060	1530	1960	2700	2700	3580
	Total amps	4.4	6.4	8.2	11.3	11.3	14.9

$\pm$ DT1 = (Air On Temp) - (Saturated Suction Temperature)

* Based On Manufacturers Nominal Data

Specifications - 350mm Diameter Fan Models Fin Series 6 (236 Fins/m)

Capacities in accordance with European $\pm$ DT1 conditions, and based on -24°C saturated suction temperature

MODEL		BRLCE 77	BRLCE 87	BRLCE 103	BRLCE 118	BRLCE 136	BRLCE 146
R744	Watts @ 6ktd	7690	8812	10254	11749	13621	14687
	Watts @ 1ktd	1282	1469	1709	1958	2270	2448
Air flow	L/s	2283	2090	3044	2786	3570	3482
	CFM	4837	4427	6449	5903	7564	7378
Air throw (metres) (**)		16.1	15.5	18.1	17.4	18.7	17.8
Number of 350mm fans		3	3	4	4	5	5
Fan Motor(s)	Total watts	495	495	660	660	825	825
	*Total amps	2.19	2.19	2.92	2.92	3.65	3.65
Motor heat / 24hrs watts		11880	11880	15840	15840	19800	19800
Defrost heaters 240v	Total watts	4300	4300	5720	5720	7160	7160
	Total amps	17.9	17.9	23.8	23.8	29.8	29.8

* Based On Manufacturers Nominal Data

** Distance at which horizontal velocity falls below 0.5 m/s measured at 0.5, 0.75 and 1 metres from ceiling, average reading to equal 0.5 m/s

$\pm$ DT1 = Air On Temp - Saturated Suction Temperature

Capacity Correction Factors

SUCTION TEMPERATURE °C	-40	-35	-30	-25	-24.
CAPACITY MULTIPLIER	0.50	0.71	0.85	0.98	1

Performance Data

Liquid Recirculation

Model BR-CLR Medium Temperature Induced Draft Coolers CO₂

Specifications - 300mm Diameter Fan Models Fin Series 6 (236 Fins/m)

MODEL		BR-CLR 38	BR-CLR 58	BR-CLR 94	BR-CLR 119	BR-CLR 140	BR-CLR 189
R744	Watts @ 12ktd*	3794	5772	9391	11880	14050	18859
	Watts @ 1ktd	316	481	783	990	1171	1572
Air flow	L/s	402	406	708	1206	1062	1416
	CFM	852	860	1500	2555	2250	3000
Air throw-std fan (metres) **		8.4(11.7)	8.4(11.7)	9.8(13.0)	12.3(16.3)	11.7(15.5)	13.4(17.4)
Number of 300mm fans		1	1	2	3	3	4
Fan Motor(s)	Total watts	70	70	140	210	210	280
	Total amps	0.32	0.32	0.64	0.96	0.96	1.28
Nominal fluid flow (kg/hr)		46	69	114	142	171	228
Liquid connections (mm)		12.7	15.9	15.9	19.1	19.1	22.2
Dimensions (mm)	A	676	845	1057	1438	1438	1819
	B	425	594	806	1187	1187	1568
C & D		Note: not applicable for 300mm diameter series					
E		345	345	345	345	345	345
F		420	420	420	420	420	420

Specifications - 350mm Diameter Fan Models Fin Series 6 (236 Fins/m)

MODEL		BR-CLR 158	BR-CLR 213	BR-CLR 255	BR-CLR316	BR-CLR 361	BR-CLR 425
R744	Watts @ 12ktd*	15786	21256	25477	31571	36147	42525
	Watts @ 1ktd	1316	1771	2123	2631	3012	3544
Air flow	L/s	1458	2331	2133	2916	3885	3555
	CFM	3090	4939	4519	6178	8231	7532
Air throw-std fan (metres) **		16.9(21.0)	18.7(23.3)	17.9(22.3)	20.8(25.7)	22.6(27.5)	20.6(25.1)
Number of 350mm fans		2	3	3	4	5	5
Fan Motor(s)	Total watts	330	495	495	660	825	825
	Total amps	1.46	2.19	2.19	2.92	3.65	3.65
Nominal fluid flow (kg/hr)		205	276	340	412	456	567
Liquid connections (mm)		22.2	28.6	28.6	28.6	28.6	34.9
Dimensions (mm)	A	1544	2154	2154	2764	3373	3373
	B	1263	1873	1873	2483	3092	3092
C		-	-	-	1263	1873	1873
D		-	-	-	1219	1219	1219
E		415	415	415	415	415	415
F		495	495	495	495	495	495

* Capacities based on liquid entering temperature of -10°C (nominal air-on temperature of 2°C)

** Air throw test based on a distance at which horizontal velocity falls below 0.5 m/s measured at 0.5, 0.75 And 1 metre from ceiling, average reading to equal 0.5 m/s.

~ Standard design suitable for 2°C to 4°C room temperature

~ Nominal liquid circulation ratio is 2.5:1

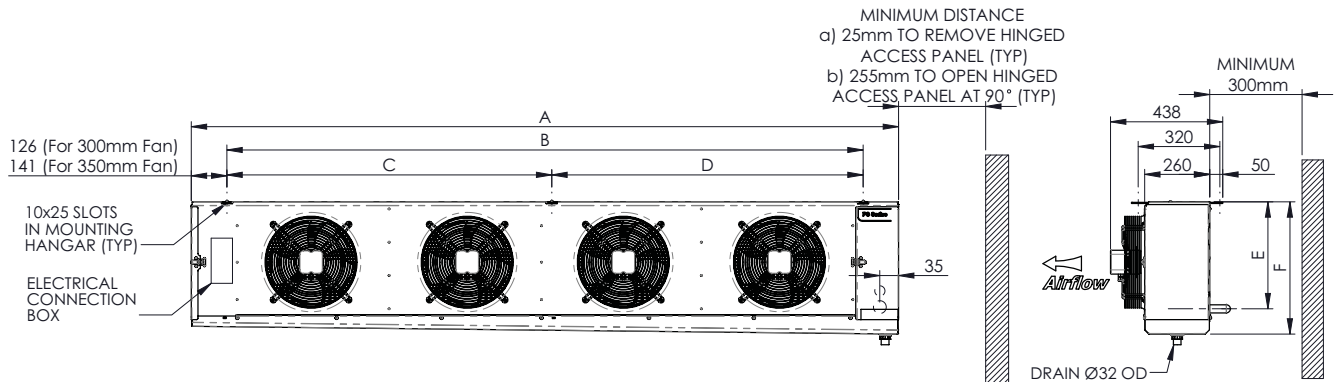
~ Design fluid pressure drop is in the range of 15 kPa to 35 kPa

Capacity Correction Factors

FIN SERIES	4	5	6
CAPACITY MULTIPLIER	0.82	0.91	1

Dimensional Drawing

Model BR** Low Temperature Evaporators (CO₂)



BRLCE Electric Defrost

Physical Data - 300mm Diameter Fan Models

MODEL	BRLCE 14	BRLCE 22	BRLCE 31	BRLCE 40	BRLCE 50	BRLCE 62
Suction Connection (mm)	12.7	12.7	12.7	12.7	12.7	22.2
Liquid Connection (mm)	12.7	12.7	12.7	12.7	12.7	12.7
External Equaliser (mm)	-	-	-	6.35	6.35	6.35
Dimensions (mm)						
A	676	845	1057	1438	1438	1819
B	425	594	806	1187	1187	1568
C & D	NOTE: Not applicable for 300mm Diameter Series					
E	345	345	345	345	345	345
F	420	420	420	420	420	420
Weight - Unpacked (kg)	13.9	20.3	23.9	29.9	36.0	42.2

Physical Data - 350mm Diameter Fan Models

MODEL	BRLCE 77	BRLCE 87	BRLCE 103	BRLCE 118	BRLCE 136	BRLCE 146
Suction Connection (mm)	28.6	28.6	28.6	28.6	28.6	28.6
Liquid Connection (mm)	12.7	12.7	12.7	12.7	12.7	12.7
External Equaliser (mm)	6.35	6.35	6.35	6.35	6.35	6.35
Dimensions (mm)						
A	2154	2154	2764	2764	3373	3373
B	1873	1873	2483	2483	3092	3092
C	-	-	1263	1263	1873	1873
D	-	-	1219	1219	1219	1219
E	415	415	415	415	415	415
F	495	495	495	495	495	495
Weight - Unpacked (kg)	53.5	65.1	69.8	84.9	89.8	98.3

Performance Data

Direct Expansion

Model BBLCE Low Temperature Evaporators CO₂

Specifications - Fin Series 5 (197 Fins/m)

Capacities In Accordance With European $\pm$ Dt1 Conditions, And Based On -24°C Saturated Suction Temperature

MODEL			BBLCE 82	BBLCE 140	BBLCE 185	BBLCE 246	BBLCE 320	BBLCE 405
R744	High Speed							
	Watts @ 6Ktd		8229	13950	18584	24688	32038	40546
	Watts @ 1Ktd		1372	2325	3097	4115	5340	6758
	Low Speed							
	Watts @ 6Ktd		6172	10462	13938	18516	24028	30410
	Watts @ 1Ktd		1029	1744	2323	3086	4005	5068
Air Flow	L/S	High Speed	2409	2471	4680	7227	6639	8600
		Low Speed	1645	1643	3220	4935	4326	5716
	CFM	High Speed	5104	5235	9915	15311	14066	18220
		Low Speed	3485	3481	6822	10456	9801	12110
Air Throw (Metres) (*)		High Speed	19	20	21	23	23	24
		Low Speed	15	16	17	19	19	20
No. Of 500mm Fans			1	1	2	3	3	4
Fan Motors	High Speed							
	Total Watts		830	830	1660	2490	2490	3320
	***Total Amps		1.45	1.45	2.90	4.35	4.35	5.80
	Low Speed							
	Total Watts		550	550	1100	1650	1650	2200
	***Total Amps		0.97	0.97	1.94	2.91	2.91	3.88
	Single Phase							
	Total Watts		750	750	1500	2250	2250	3000
	***Total Amps		3.35	3.35	6.7	10.05	10.05	13.4
Defrost Heaters 240V	Total Watts		4350	5925	8650	12950	12950	13725
	Total Amps		18.1	24.7	36.1	54.0	54.0	57.2
** Sound Pressure dB(A)	High Speed		61	61	64	66	66	67
	Low Speed		55	55	58	60	60	61

* Distance at which horizontal air velocity falls below 0.5m/s measured at 0.5, 0.75 and 1 metre from ceiling average reading to equal 0.5m/s.
Temperature corrected for -18°C room.

** Sound Pressure Levels dB(A) calculated @ 3m distance

*** Based on Manufacturers Nominal Data. (3Ph, 400V $\pm$ 10%, 50Hz) (1Ph, 230V $\pm$ 10%, 50Hz)

Note: Actual amps may vary in application

$\pm$ DTI = Air on Temp - Saturated Suction Temperature

Capacity Correction Factors

SUCTION TEMPERATURE °C	-40	-35	-30	-25	-24.
CAPACITY MULTIPLIER	0.50	0.71	0.85	0.98	1



Performance Data

Liquid Recirculation

Model BBM-CLR Medium Temperature Induced Draft Coolers (CO₂)

Specifications 500mm Diameter Fan Models - Fin Series 5 (197 Fins/m)

MODEL		BBM-CLR 320	BBM-CLR 415	BBM-CLR 508	BBM-CLR 624	BBM-CLR 765	BBM-CLR 974
R744	Watts @ 12Ktd*	32023	41454	50789	62403	76452	97337
	Watts @ 1Ktd	2669	3455	4232	5200	6371	8111
Air Flow	L/S	2454	4628	4360	6942	6540	8456
	M ³ /H						
	CFM	5199	9805	9237	14708	13856	17915
Air Throw (Metres) (**)		22	23	23	25	25	26
No. Of 500mm Fans		1	2	2	3	3	4
Fan Motors	High Speed						
	Total Watts	830	1660	1660	2490	2490	3320
	***Total Amps	1.45	2.90	2.90	4.35	4.35	5.80
	Low Speed						
	Total Watts	550	1100	1100	1650	1650	2200
	***Total Amps	0.97	1.94	1.94	2.91	2.91	3.88
	Single Phase						
	Total Watts	750	1500	1500	2250	2250	3000
	***Total Amps	3.35	6.7	6.7	10.05	10.05	13.4
Nominal Fluid Flow (Kg/Hr)		415	522	661	785	992	1263
Liquid Connections (mm)		28.6	28.6	34.9	34.9	41.2	2 x 34.9
Dimensions (mm)	A	1610	2210	2210	3160	3160	3310
	B	1336	1936	1936	2886	2886	3036
	C	-	-	-	950	950	1500
	D	-	-	-	1936	1936	1536

* Capacities based on liquid entering temperature of -10°C (nominal Air-On Temperature of 2°C)

** Air throw test based on a distance at which horizontal velocity falls below 0.5 m/s measured at 0.5, 0.75 and 1 metre from ceiling, average reading to equal 0.5 m/s.

~ Standard design suitable for 2°C to 4°C room temperature

~ Nominal Liquid Circulation Ratio is 2.5:1

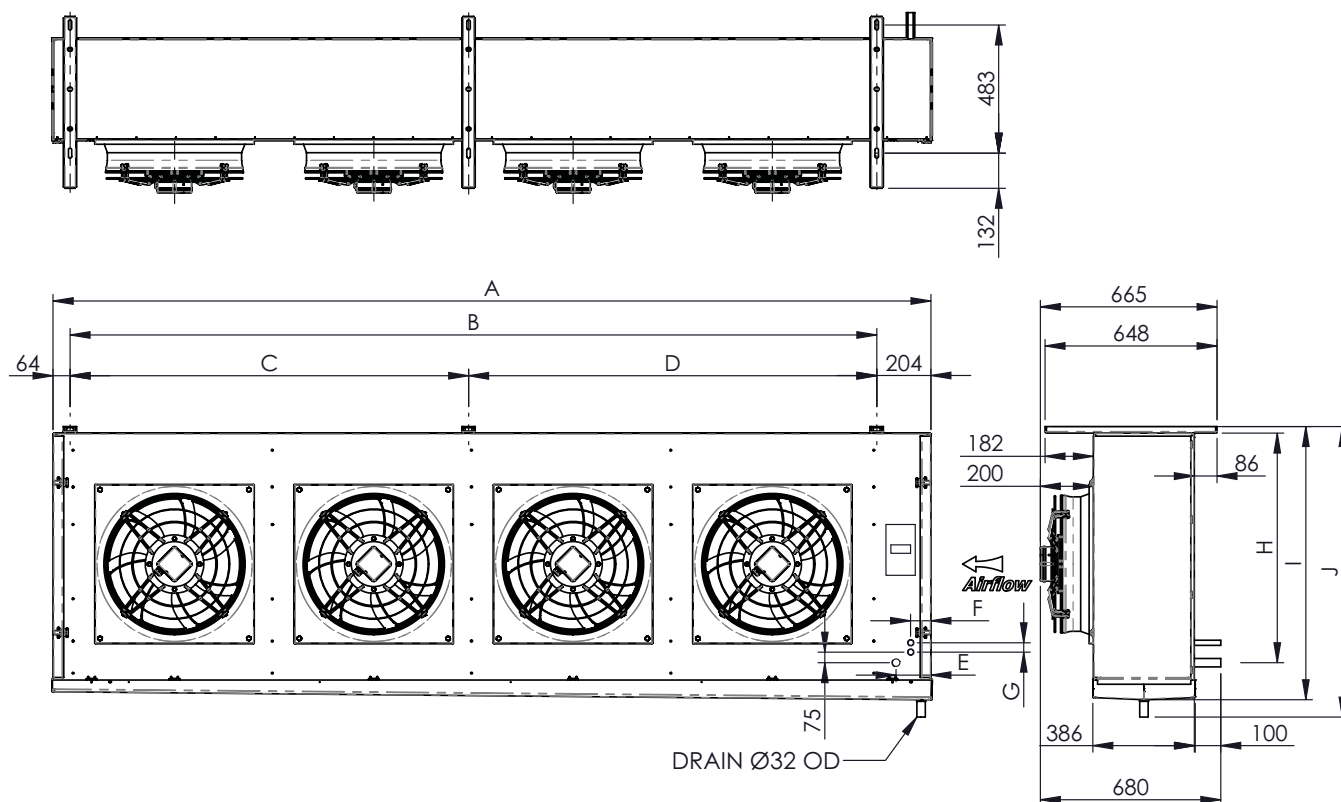
~ Design Fluid Pressure Drop is in the range of 15 kPa to 35 kPa

Capacity Correction Factors

FIN SERIES	3	4	5	6
CAPACITY MULTIPLIER	0.75	0.91	1	1.1

Dimensional Data

Model BB** Low Temperature Evaporators (CO₂)



Physical Data

MODEL	BBLC82	BBLC140	BBLC185	BBLC246	BBLC320	BBLC405
Suction Connection (mm)	28.5	28.5	34.9	34.9	41.20	41.2
Distributor Connection (mm)	15.9	15.9	15.9	15.9	15.9	15.9
Dimensions (mm)						
A	1260	1610	2210	3160	3160	3310
B	986	1336	1936	2886	2886	3036
C	-	-	-	950	950	-
D	-	-	-	-	-	1536
E	65	60	45	45	125	125
F	65	60	45	45	70	70
G	-	-	-	-	55	55
H	705	832	737	737	705	832
I	905	1030	905	905	905	1030
J	955	1080	955	955	955	1080
Weight - Unpacked (kg)	66	113	131	169	230	287

BITZER Australia Pty Limited

134 Dunheved Circuit,
St Marys, NSW 2760
Australia
tel +61 (2) 8801 9300
fax +61 (2) 9673 4698
info@bitzer.com.au

Victoria

tel +61 (3) 8326 8200
fax +61 (3) 9310 2520

Queensland

tel +61 (7) 3725 1360
fax +61 (7) 3274 3621

South Australia

tel +61 (8) 8345 6110
fax +61 (8) 8268 4555

Western Australia

tel +61 (8) 6350 6297
fax +61 (8) 9359 2077

BITZER New Zealand

BITZER Australia Pty Ltd

9a Douglas Alexander Parade
Rosedale 0632
Auckland
New Zealand
tel +64 9 415 2030

www.bitzer.com.au



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