

FRIGA-BOHN®

BORA

Cubic unit cooler

Commercial and semi-industrial range

WG

HFC



حسونة للتبريد

Hassounah Refrigeration

0.8 - 33 kW



سهولة الصيانة والتركيب

- وصول سريع لجميع المكونات
- توصيل كهربائي بسيط بضل Wago وتعريف الكبلات
- مراوح مجهزة بصندوق كهربائي خارجي.

يتيح تصميم الملف المحسن والمحركات عالية الكفاءة تحسين *كفاءة الطاقة*

يوفر إعادة التصميم الكامل لنظام إذابة الجليد تحسينات كبيرة ليس لتعزيز الكفاءة والموثوقية
فحسب بل تبسط أيضاً الصيانة وتقلل استهلاك الطاقة بنسبة تصل إلى 30%

CASING

الغلاف

سهل التنظيف : ألواح فولاذية مجلفنة، مطلية مسبقاً باللون الأبيض بالكامل

وعاء تصريف مفصلي ومحوري بزوايا دائرية منسوج من الألمنيوم المطلي مسبقاً مما يقضي على مناطق التجمع ويضمن السلامة الكاملة من خلال عدم وجود زوايا حادة،



COILS

الملفات

مصنوع مع زعانف ألومنيوم بتباعد 4 أو 6 مم. مدمجة مع أنابيب ذات هيكل داخلي محرز، والملفات فعالة ومدمجة للغاية.

الإصدارات المتاحة

- مركبات الكربون الهيدرو فلورية (HFCs)
- متعدد التبريد.
- ماء جليكول، سائل تبريد (WCO)



VENTILATION

التهوية

مراوح محرك محورية مشحمة وطويلة العمر وموصلة من المصنع

	models	voltage	freq.	IP	class
Ø 315 mm 4P - 1390 rpm	BORA 3XXX	230V/1	50/60Hz	54	F
Ø 450 mm* 4P - 1280 rpm	BORA 4XXX	230-400V/3	50/60Hz	54	F

محركات مراوح ثنائية الجهد. موصلة في 400 فولت بشكل افتراضي



DEFROST

إذابة الصقيع

- # وضعها ن لإذابة الصقيع للملف : (230 فولت أو 400 فولت 3/) وغاز ساخن
- # إذابة سريعة للصقيع في صينية تجميع الثلج المذاب بفضل عنصر تسخين مركب أسفل صينية الوسطى.
- # استخدام عناصر تسخين منحنية لضمان إذابة فعالة لصقيع صمام التمدد، والموزع، manifold
- # إضافة نقاط تثبيت لضمان إعادة وضع عناصر التسخين الكهربائي بشكل صحيح، مما يقلل من مخاطر العطل
- # ترميز لوني لسهولة تحديد توصيلات الكهربائية لعناصر التسخين.

- غازات ساخنة (الملف : غازات ساخنة، صينية التصريف : سخانات كهربائية)
- ترموستات لإذابة الصقيع والسلامة (5709L + 5708L) **KIT TO INSTALL**
- ترموستات لإذابة الصقيع (5709L) **KIT TO INSTALL**
- ترموستات للسلامة (5708L) **KIT TO INSTALL**
- إذابة صقيع كربائية خفيفة
- إذابة صقيع كربائية خفيفة **KIT TO INSTALL**
- إذابة صقيع كربائية كاملة **KIT TO INSTALL**

الخيارات

HG1
2TH
THD
THS
E1U
E1K
E3K

	+10	+2	-5	-10	-25°C
tA1	BORA .. R/L	+E1K /E1U		+E3K	BORA .. E/C

Easy maintenance and installation:

- Quick access to all components.
- Simple and intuitive electrical connection thanks to Wago terminals and cable identification.
- Fans equipped with an external electrical box.

The optimized coil design and high-efficiency motors enable improved **energy efficiency**.

The complete redesign of the defrost system delivers significant improvements that not only enhance efficiency and reliability, but also simplify maintenance and **reduce energy consumption by up to 30%**.

CASING

- # Easy to clean: galvanized sheet steel, fully pre-painted white.
- # Pivoting, hinged drain pan with rounded corners, made from pre-painted aluminium, eliminating retention zones and ensuring complete safety through the absence of sharp corners.



COILS

- # Made from aluminium fins with 4 or 6 mm spacing, combined with copper tubes with a grooved internal structure, the coils are very efficient and compact.
- # Versions available:
 - Multi-refrigerant HFCs,
 - WCO (glycol water, coolant).

“
Select your coil treatment to extend your unit cooler's lifespan!
 Contact us.
 ”

VENTILATION

Long-lubricated, factory-wired axial motor fans:

	models	voltage	freq.	IP	class
Ø 315 mm 4P - 1390 rpm	BORA 3XXX	230V/1	50/60Hz	54	F
Ø 450 mm* 4P - 1280 rpm	BORA 4XXX	230-400V/3	50/60Hz	54	F

* Dual-voltage fan motors, wired in 400V by default.



DEFROST

- # Two defrosting modes for the coil: electric (230V/1 or 400V/3) and hot gas.
- # Rapid defrosting of the condensate drain pan thanks to a heating element mounted beneath the intermediate drip tray.
- # Use of bent heating elements to ensure effective defrosting of the expansion valve, distributor, and manifold.
- # Addition of fixing points to guarantee correct repositioning of the electric heating elements, thereby reducing the risk of failure.
- # Color coding for easy identification of the heating elements' electrical connections.

OPTIONS

HG1	Hot gases (coil: hot gases, drain pan: electric heaters).	
2TH	Defrost and safety thermostats (5709L + 5708L).	KIT TO INSTALL
THD	Defrost thermostat (5709L).	KIT TO INSTALL
THS	Safety thermostat (5708L).	KIT TO INSTALL
E1U	Light electric defrost.	
E1K	Light electric defrost.	KIT TO INSTALL
E3K	Full electric defrost.	KIT TO INSTALL

	+10	+2	-5	-10	-25°C
tA1	BORA .. R/L	+E1K / E1U		+E3K	
				BORA .. E/C	

BORA 3^(A) 1^(B) 52^(C) -R^(D)

- (A) Fan diameter: **3** = Ø 315 mm - **4** = Ø 450 mm
- (3) Number of fans
- (C) Model
- (D) Fin spacing: **R** = 4 mm (positive) **E** = 4 mm (negative)
L = 6 mm (positive) **C** = 6 mm (negative)

The BORA is available with HFCs and glycol water. For more information, please consult our software.

BORA (1/2)

4 mm

CONDITIONS	REFRIGERANTS	BORA ... -R
SC2 (1)	R449A	kW
	R404A	kW

3152	3153	3154	3155	3156	3243	3244	3245	3343	3344
1,8	2,53	3,11	3,45	3,67	4,43	5,48	5,96	7	8,04
2	2,62	3,22	3,38	3,5	4,53	5,55	5,89	7	8,11

CONDITIONS	REFRIGERANTS	BORA ... -E
SC3 (1)	R449A	kW
	R404A	kW
SC4 (1)	R449A	kW
	R404A	kW

3152	3153	3154	3155	3156	3243	3244	3245	3343	3344
1,23	1,75	2,2	2,41	2,67	3,07	3,85	4,24	4,86	5,72
1,48	1,9	2,4	2,6	2,75	3,27	4,2	4,51	5,43	5,98
0,9	1,3	1,65	1,83	2,04	2,27	2,9	3,22	3,63	4,3
1,13	1,46	1,86	2,03	2,15	2,5	3,26	3,51	4,21	4,62

Surface area		m ²
Circuit volume		dm ³
Airflow		m ³ /h
Air throw (2)		m
		Nb
		Ø
Fan		W max
1,350 rpm	230V/1/50Hz	A max (3)
		W max
	230-400V/3/50Hz	A max (3)
		Nb
BORA ... -R		W Total
Electric defrost	230V/1/50Hz	A Total
EIK (4)	400V/3/50Hz	A Total
	Coil + Drain pan	Nb
BORA ... -E		W Total
Electric defrost standard	230V/1/50Hz	A Total
	400V/3/50Hz	A Total
Connections	Inlet (5)	Ø OD
HFCs	Outlet (5)	Ø ODF
Net weight		kg

3152	3153	3154	3155	3156	3243	3244	3245	3343	3344
5,1	7,7	10,3	12,8	15,4	12,3	16,4	20,5	18,5	24,6
0,8	1,3	1,7	2,1	2,5	2,0	2,7	3,3	3,0	4
1850	1760	1660	1580	1500	3260	3030	2830	4900	4540
17	16	15	14	13	17	15	15	21	19
1	1	1	1	1	2	2	2	3	3
315	315	315	315	315	315	315	315	315	315
105	105	105	105	105	210	210	210	315	315
0,45	0,45	0,45	0,45	0,45	0,9	0,9	0,9	1,35	1,35
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
1+1	1+1	2+1	2+1	2+1	2+1	2+1	3+1	2+1	2+1
860	860	1290	1290	1290	1545	-	2060	2310	2310
3,74	3,74	5,61	5,61	5,61	6,72	6,72	8,96	10,04	10,04
-	-	-	-	-	-	-	-	-	-
1+1	2+1	3+1	3+1	4+1	2+1	3+1	4+1	2+1	3+1
860	1290	1720	1720	2150	1545	2060	2575	2310	3080
3,74	5,61	7,48	7,48	9,35	6,72	8,96	11,2	10,04	13,39
-	-	-	-	-	-	-	-	-	-
D 1/2"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"
10mm	5/8"	5/8"	5/8"	5/8"	7/8"	7/8"	7/8"	7/8"	7/8"
19	20	22	22	23	28	31	32	41	43

(1) Standard conditions:
SC2 / 0 °C (air inlet temperature) / -8 °C (evaporation temperature) / DTM = 8 K
SC3 / -18 °C (air inlet temperature) / -25 °C (evaporation temperature) / DTM = 7 K
SC4 / -25 °C (air inlet temperature) / -31 °C (evaporation temperature) / DTM = 6 K

(2) Residual air velocity: 0.25 m/s.

(3) Overload protection settings. For air temperatures "ti" other than +20 °C, multiply the current values by the ratio 293 / (273 + "ti") in order to obtain the approximate current value after the cold room has reached operating temperature.

(4) Electric defrost option.

(5) OD: male connection – ODF: female connection to receive a tube of the same diameter.

R404A is a refrigerant available only for markets outside the EU (not compliant with the F-Gas regulation).

BORA 3^(A)3^(B)45^(C)-R^(D)

- (A) Fan diameter: 3 = Ø 315 mm - 4 = Ø 450 mm
- (3) Number of fans
- (C) Model
- (D) Fin spacing: **R** = 4 mm (positive) **E** = 4 mm (negative)
L = 6 mm (positive) **C** = 6 mm (negative)

The BORA is available with HFCs and glycol water. For more information, please consult our software.

BORA (2/2)

4 mm

CONDITIONS	REFRIGERANTS	BORA ... -R	3345	4263	3444	3445	4264	4266	4364	4366	4466
SC2 (1)	R449A	kW	9,07	10,55	10,81	12,18	12,78	16,47	19,34	24,59	32,91
	R404A	kW	8,67	11,3	10,9	11,99	13,46	15,77	20,34	23,83	32,35
CONDITIONS	REFRIGERANTS	BORA ... -E	3345	4263	3444	3445	4264	4266	4364	4366	4466
SC3 (1)	R449A	kW	6,37	7,44	7,71	8,79	9,13	11,61	13,91	17,65	24
	R404A	kW	6,31	8,4	8,24	9,02	10,1	12,37	15,31	18,73	24,52
SC4 (1)	R449A	kW	4,79	5,58	5,86	6,69	6,9	8,88	10,53	13,53	18,38
	R404A	kW	4,85	6,49	6,41	7,03	7,85	9,73	11,93	14,74	19,21
Surface area		m ²	30,8	27,7	32,8	41,1	37,0	55,4	55,4	83,1	110,9
Circuit volume		dm ³	5	4,5	5,4	6,7	6,0	9,0	9,0	13,5	18,1
Airflow		m ³ /h	4240	8250	6060	5660	7800	7080	11700	10610	14150
Air throw (2)		m	18	25	23	22	24	22	28	26	29
Fan	230V/1/50Hz	Nb	3	2	4	4	2	2	3	3	4
		Ø	315	450	315	315	450	450	450	450	450
1,350 rpm	230-400V/3/50Hz	W max	315	-	420	420	-	-	-	-	-
		A max (3)	1,35	-	1,8	1,8	-	-	-	-	-
BORA ... -R	Electric defrost EIK (4)	W max	-	700	-	-	700	700	1050	1050	1400
		A max (3)	-	1,28	-	-	1,28	1,28	1,92	1,92	2,56
BORA ... -E	Coil + Drain pan	Nb	3+1	2+1	2+1	3+1	3+1	4+1	3+1	4+1	4+1
		W Total	3080	2640	2940	3920	3520	4400	5280	6600	8800
Electric defrost standard	230V/1/50Hz	A Total	13,39	11,48	12,78	17,04	15,3	6,35	7,62	9,53	12,7
		A Total	-	11,48	-	-	15,3	6,35	7,62	9,53	12,7
Connections HFCs	Inlet (5)	Ø OD	D 5/8"	D 7/8"	D 5/8"	D 7/8"	D 1 1/8"	D 1 1/8"	D 1 1/8"	D 1 1/8"	D 1 3/8"
		Ø ODF	7/8"	1 3/8"	7/8"	1 1/8"	1 3/8"	1 3/8"	1 5/8"	1 5/8"	2 1/8"
Net weight	Outlet (5)	kg	45	58	54	37	62	69	84	95	107

(1) Standard conditions:

SC2 / 0 °C (air inlet temperature) / -8 °C (evaporation temperature) / DTM = 8 K

SC3 / -18 °C (air inlet temperature) / -25 °C (evaporation temperature) / DTM = 7 K

SC4 / -25 °C (air inlet temperature) / -31 °C (evaporation temperature) / DTM = 6 K

(2) Residual air velocity: 0.25 m/s.

(3) Overload protection settings. For air temperatures "ti" other than +20 °C, multiply the current values by the ratio 293 / (273 + "ti") in order to obtain the approximate current value after the cold room has reached operating temperature.

(4) Electric defrost option.

(5) OD: male connection - ODF: female connection to receive a tube of the same diameter.

R404A is a refrigerant available only for markets outside the EU (not compliant with the F-Gas regulation).

BORA 3^(A)3^(B)52^(C)-L^(D)

- (A) Fan diameter: **3** = Ø 315 mm - **4** = Ø 450 mm
- (3) Number of fans
- (C) Model
- (D) Fin spacing: **R** = 4 mm (positive) **E** = 4 mm (negative)
L = 6 mm (positive) **C** = 6 mm (negative)

The BORA is available with HFCs and glycol water. For more information, please consult our software.

BORA (1/2)

 6 mm

CONDITIONS	REFRIGERANTS	BORA ... -L
SC2 (1)	R449A	kW
	R404A	kW

3152	3153	3154	3155	3156	3243	3244	3245	3343
1,56	2,15	2,76	3,04	3,39	3,79	4,79	5,3	5,99
1,58	2,27	2,75	3,1	3,29	3,97	4,95	5,4	6,15

CONDITIONS	REFRIGERANTS	BORA ... -C
SC3 (1)	R449A	kW
	R404A	kW
SC4 (1)	R449A	kW
	R404A	kW

3152	3153	3154	3155	3156	3243	3244	3245	3343
1,05	1,5	1,93	2,19	2,42	2,66	3,41	3,78	4,17
1,12	1,67	2,14	2,31	2,57	2,9	3,67	4,12	4,73
0,77	1,13	1,45	1,65	1,85	2	2,57	2,89	3,16
0,84	1,29	1,66	1,8	2,01	2,24	2,84	3,24	3,69

Surface area		m ²
Circuit volume		dm ³
Airflow		m ³ /h
Air throw (2)		m
		Nb
		Ø
Fan 1,350 rpm	230V/1/50Hz	W max
		A max (3)
	230-400V/3/50Hz	W max
		A max (3)
		Nb
BORA ... -L		W Total
Electric defrost EIK (4)	230V/1/50Hz	A Total
	400V/3/50Hz	A Total
	Coil + Drain pan	Nb
BORA ... -C		W Total
Standard electric defrost	230V/1/50Hz	A Total
	400V/3/50Hz	A Total
	Connections	Inlet (5)
HFCs	Outlet (5)	Ø ODF
Net weight		kg

3152	3153	3154	3155	3156	3243	3244	3245	3343
3,5	5,3	7,1	8,9	10,6	8,5	11,4	14,2	12,8
0,8	1,3	1,7	2,1	2,5	2,0	2,7	3,3	3,0
1900	1820	1750	1680	1610	3450	3250	3070	5180
17	17	16	15	14	18	17	16	22
1	1	1	1	1	2	2	2	3
315	315	315	315	315	315	315	315	315
105	105	105	105	105	210	210	210	315
0,45	0,45	0,45	0,45	0,45	0,9	0,9	0,9	1,35
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
1+1	1+1	2+1	2+1	2+1	1+1	2+1	3+1	1+1
860	860	1290	1290	1290	1030		2060	1540
3,74	3,74	5,61	5,61	5,61	4,48	6,72	8,96	6,7
-	-	-	-	-	-	-	-	-
1+1	2+1	2+1	3+1	4+1	2+1	3+1	4+1	2+1
860	1290	1290	1720	2150	1545	2060	2575	2310
3,74	5,61	5,61	7,48	9,35	6,72	8,96	11,2	10,04
-	-	-	-	-	-	-	-	-
1/2"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"	D 5/8"
10mm	5/8"	5/8"	5/8"	5/8"	7/8"	7/8"	7/8"	7/8"
19	20	21	21	22	28	29	30	39

(1) Standard conditions:
SC2 / 0 °C (air inlet temperature) / -8 °C (evaporation temperature) / DTM = 8 K
SC3 / -18 °C (air inlet temperature) / -25 °C (evaporation temperature) / DTM = 7 K
SC4 / -25 °C (air inlet temperature) / -31 °C (evaporation temperature) / DTM = 6 K

(2) Residual air velocity: 0.25 m/s.

(3) Overload protection settings. For air temperatures "ti" other than +20 °C, multiply the current values by the ratio 293 / (273 + "ti") in order to obtain the approximate current value after the cold room has reached operating temperature.

(4) Electric defrost option.

(5) OD: male connection – ODF: female connection to receive a tube of the same diameter.

R404A is a refrigerant available only for markets outside the EU (not compliant with the F-Gas regulation).

BORA 3_(A)3_(B)44_(C)-L_(D)

- (A) Fan diameter: 3 = Ø 315 mm - 4 = Ø 450 mm
- (3) Number of fans
- (C) Model
- (D) Fin spacing: **R** = 4 mm (positive) **E** = 4 mm (negative)
L = 6 mm (positive) **C** = 6 mm (negative)

The BORA is available with HFCs and glycol water. For more information, please consult our software.

BORA (2/2)

6 mm

CONDITIONS	REFRIGERANTS	BORA ... -L	3344	3345	3444	3445	4264	4266	4364	4366	4466
SC2 (1)	R449A	kW	7,03	8,11	9,45	10,82	11,32	14,71	17,27	22,27	29,65
	R404A	kW	7,27	8,02	9,74	10,99	11,72	14,58	17,53	22,11	29,81
CONDITIONS	REFRIGERANTS	BORA ... -C	3344	3345	3444	3445	4264	4266	4364	4366	4466
SC3 (1)	R449A	kW	5,04	5,78	6,78	7,88	7,93	10,4	12,06	16,11	21,64
	R404A	kW	5,42	5,9	7,39	8,32	8,92	11,34	13,51	16,59	22,66
SC4 (1)	R449A	kW	3,83	4,35	5,17	6,02	6,03	7,97	9,19	12,3	16,63
	R404A	kW	4,21	4,55	5,77	6,51	6,97	8,92	10,58	12,91	17,77
			3344	3345	3444	3445	4264	4266	4364	4366	4466
Surface area		m ²	17	21,3	22,7	28,4	25,5	38,3	38,3	57,5	76,6
Circuit volume		dm ³	4	5	5,4	6,7	6,0	9,0	9,0	13,5	18,1
Airflow		m ³ /h	4880	4600	6500	6140	8220	7560	12330	11340	15110
Air throw (2)		m	21	19	24	23	25	24	29	27	30
		Nb	3	3	4	4	2	2	3	3	4
		Ø	315	315	315	315	450	450	450	450	450
Fan 1,350 rpm	230V/1/50Hz	W max	315	315	420	420	-	-	-	-	-
		A max (3)	1,35	1,35	1,8	1,8	-	-	-	-	-
	230-400V/3/50Hz	W max	-	-	-	-	700	700	1050	1050	1400
		A max (3)	-	-	-	-	1,28	1,28	1,92	1,92	2,56
		Nb	2+1	3+1	2+1	3+1	3+1	4+1	3+1	4+1	4+1
		W Total	2310	3080	2940	3920	3520	4400	5280	6600	8800
BORA ... -L Electric defrost EIK (4)	230V/1/50Hz	A Total	10,04	13,39	12,78	17,04	15,3	6,35	7,62	9,53	12,7
		A Total	-	-	-	-	15,3	6,35	7,62	9,53	12,7
	Coil + Drain pan	Nb	3 + 1	4 + 1	3 + 1	4 + 1	4 + 1	6 + 1	4 + 1	6 + 1	6 + 1
		W Total	3080	3850	3920	4900	4400	6160	6600	9240	12320
BORA ... -C Standard electric defrost	230V/1/50Hz	A Total	13,39	-	-	-	-	-	-	-	-
		A Total	-	5,56	5,66	7,07	6,35	8,89	9,53	13,34	17,78
Connections HFCs	Inlet (5)	Ø OD	D 5/8"	D 5/8"	D 5/8"	D 7/8"	D 1 1/8"	D 1 1/8"	D 1 1/8"	D 1 1/8"	D 1 3/8"
	Outlet (5)	Ø ODF	7/8"	7/8"	7/8"	1 1/8"	1 3/8"	1 3/8"	1 5/8"	1 5/8"	2 1/8"
Net weight		kg	41	43	52	37	59	65	81	90	100

(1) Standard conditions:

SC2 / 0 °C (air inlet temperature) / -8 °C (evaporation temperature) / DTM = 8 K

SC3 / -18 °C (air inlet temperature) / -25 °C (evaporation temperature) / DTM = 7 K

SC4 / -25 °C (air inlet temperature) / -31 °C (evaporation temperature) / DTM = 6 K

(2) Residual air velocity: 0.25 m/s.

(3) Overload protection settings. For air temperatures "ti" other than +20 °C, multiply the current values by the ratio 293 / (273 + "ti") in order to obtain the approximate current value after the cold room has reached operating temperature.

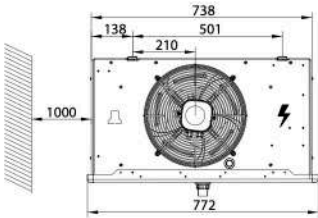
(4) Electric defrost option.

(5) OD: male connection – ODF: female connection to receive a tube of the same diameter.

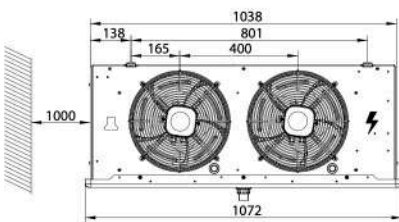
R404A is a refrigerant available only for markets outside the EU (not compliant with the F-Gas regulation).

BORA | Ø 315 mm

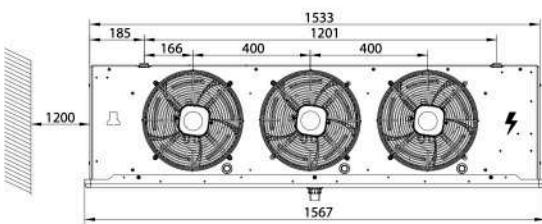
BORA 315 ..



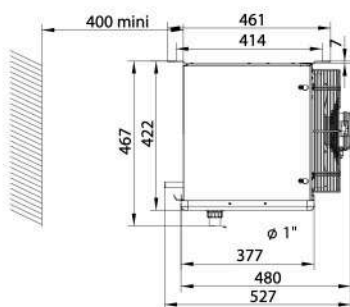
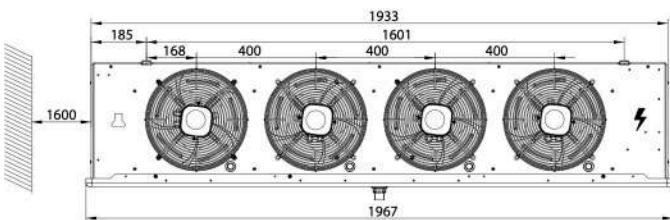
BORA 324 ..



BORA 334 ..

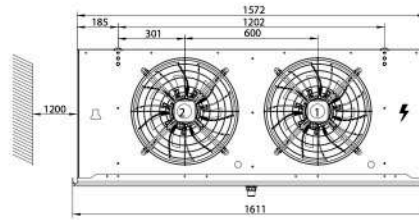


BORA 344 ..

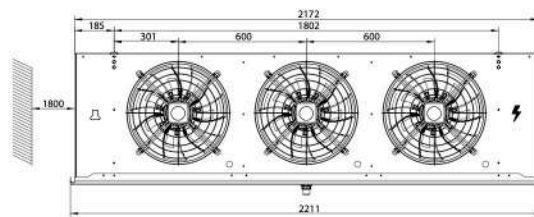


BORA | Ø 450 mm

BORA 426 ..



BORA 436 ..



BORA 446 ..

