Precision Cooling for
Business-Critical Continuity

Liebert HCR

Air Cooled Remote Condensers with R410A Refrigerant

PRODUCT DOCUMENTATION

Liebert HCR – PD – 273534 – 15.10.2012

Liebert®

EMERSON
Network Power

Index

The Quality Management System of Emerson Network Power S.r.l. High Performance Air Conditioning has been approved by Lloyd's Register Quality Assurance to the quality management system standard ISO 9001:2008

The product conforms to following European Union Directives
Machine Directive 2006/42/EC
PED 97/23/CEE
LVD 2006/95/EC
EMC 2004/108/EC (EN61000-6-2; EN 61000-6-3)

Further, the Company Quality System of Air Conditioning Division is approved by LRQA according to the UNI EN ISO 9001:2008 standard. The product is the result of activities performed in compliance with the provisions contained in the Quality procedures and plans.

Units are supplied complete with a test certificate and conformity declaration and control component list.
Liebert HCR units are CE marked as they comply with the European directives concerning mechanical, electrical, electromagnetic and pressure equipment safety.

1 Features and Benefits

Features and Benefits

The Liebert HCR heat exchangers are our new range of remote air−cooled condensers especially designed to be coupled with the Liebert CRV (A type) air conditioning units power supplied at 50Hz (CE market), within a standard range of external air temperature from −20°C to + 46°C.
They cover a complete range of nominal heat rejection capacities, from 7 to 100kW.
The HCR family comes with a factory−installed stepless fan speed controller (Variex) especially designed and set for R410A refrigerant and digital scroll refrigerant circuit use.
The Liebert HCR condensers have suction type axial fans.
They are suitable for both vertical and horizontal air flow installation.

Power supply

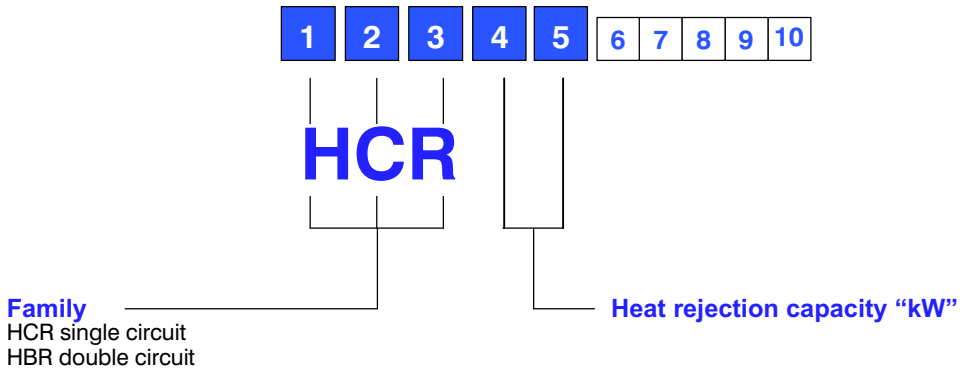
All models are available for 230V/1ph/50Hz power supply.

Low noise and Energy Efficiency ratio

The achievement of a low sound pressure level during the night is obtained by the already factory−installed electronic voltage variator (Variex).
The achievement of a low sound pressure level 24 hours a day is obtained by using a condenser with a higher capacity, according to the required operating conditions. The proper solution should be calculated case by case.
The achievement of an higher energy efficiency ratio of the system is obtained moving the set point value of Variex from the factory preset higher value (default mode) to the factory preset lower value just acting on terminals 70−71 of electrical panel by means of an external contact (normally open 24Vac terminals 70−71 means higher set point, normally closed 24Vac terminals 70−71 means lower set point).

2 Model Number Description

Model Nomenclature / Digit Numbers



Digits 1 to 5 - Basic Unit
Air condenser, inclusive of:
- 6 pole axial fan(s), IP54
  4 pole axial fan, IP44 (only for HCR07–10)
- Main switch IP65
- Power supply 230V/1ph/50

Digit 6 - Condensation Control
1 ⇒ With digital Variex for R410A

Digit 7 - free

Digit 8 - Refrigeration Pipeline Connections
0 ⇒ With shut–off valve kit

Digit 9 - Packing
C⇒ Cardboard and Wooden Crate
S ⇒ Seaworthy

Digit 10 - Coil and Power input
G⇒ Copper tube / aluminium fins
H⇒ Copper tube / copper fins
I ⇒ Epoxy coating

3 Mechanical Specifications

Mechanical Specifications

Cabinet
It is made of aluminium. In the multifan models the air flow is maintained separated. The models are delivered provided with movable protection on the side of terminal box / refrigerant connections. The attaching legs are in aluminium for both horizontal and vertical installation.

Coil
The circuits are in counterflow. All the collectors for the refrigerant connections are provided with pressure intakes with connection 1/4" SAE.
The single–circuit HCR coils are made with copper tubes and aluminium fins (default option), according to the geometry with staggered ranks, and are tested in dry air at the pressure of 45 barg after they have been carefully cleaned, chemically degreased and dehydrated, then delivered pressurised (2 barg dry air). The diameter of the tubes is 5/16" for all models.

Fan Motors
The axial fan motors are built with external rotor.
The motors are single – phase 230/1/50 (V/Ph/Hz), built according to the norms VDE (EN60034) and class of insulation F.
The protective grills produced with anti – corrosive clading, are in accordance with the safety norms EN13857.
The electrical connections between the fans and the terminal box IP65 are made of electrical cables for the outdoor installation, non – combustible in accordance with the norms CEI 20–22 and IEC 332–3 category A.
The main switch (IP65) is externally installed on the fan panel.

Variex
Each HCR condenser is equipped (as standard) with a factory set and installed stepless fan speed controller (triac cut phase) formally called Variex (230V single phase). This device have been especially designed for usage with R410A refrigerant and digital scroll circuit. It allows to operate with two different levels of condensing pressure set point, as default it works with the higher level of set point (equal to 23barg). By acting on terminals 7–71 of electrial board it is possible to switch from high to low set point: normally open 24Vac terminals 70–71 (default condition) means higher set point, normally closed 24Vac terminals means lower set point.

Shut off valve kit
Each HCR condenser is supplied with a shut off valve kit to be welded on field.

Filter
A filter can be placed on the suction side of the coil, in order to reduce the frequency of coil cleaning maintenance. The filter locking fasteners are provided as standard.

Packing
Condensers are packed in wooden crate packing. A plastic film protects the surfaces.
The units with their packages can be stacked for max. three units/stack, overlapping them.

Options
- coils with copper pipes and pre–painted aluminium fins with epoxy/acrylic resin
- coils with copper pipes and copper fins
- seaworthy packing

4 Test and Reference

Test and Reference Norms

Safety

Liebert HCR units are designed, manufactured and tested according to the European Union Directives:

- Machine Directive 2006/42/EC
- PED 97/23/EC
- LVD 2006/95/EC
- EMC 2004/108/EC (EN61000−6−2; EN 61000−6−3)

Electrical Board

Design and manufacturing is compliant with EN 60204−1, CEI 20−22 II and IEC 332−3 cat. A.

Electro−Magnetic Compability (EMC)

Liebert HCR complies with the following EMC standards:

- EN 61000−6−2:2005 Electromagnetic compatibility (EMC) − Part 6−2: Generic standards − Immunity for industrial environments
- EN 61000−6−3:2007 Electromagnetic compatibility (EMC) − Part 6−3: Generic standards − Emission standard for residential, commercial and light−industrial environments

Performances

Heat rejection capacities − with refrigerant R410A − have been evaluated following to the European Standard UNI EN 327.
Sound pressure levels have been evaluated according to the norm EN13487 (referred to 5m far from the unit).

Mark

Each unit is supplied complete with individual test certificate and a certificate of conformity to the European Union directives. The units are marked “CE”.

Quality

The Quality Management System of Emerson Network Power S.r.l. High Performance Air Conditioning has been approved by Lloyd’s Register Quality Assurance to the quality management system standard ISO 9001:2008.

5 Technical Data and Performances

Technical Data and Performances

Tab. 5.1 — Liebert HCR — HBR

Model	Power supply [V/Ph/Hz]	Heat Rejection Capacity (THR)* R410A [kW]	Air Volume [m^3/h]	Sound pressure level ** [dB(A)] @ 5 m	Input Power [kW]	Current Absorption [A]	FLA [A]	LRA [A]
HCR07	230/1/50	6.64	2700	45.5	0.18	0.85	0.85	2.3
HCR10	230/1/50	10.1	2500	45.5	0.18	0.85	0.85	2.3
HCR14	230/1/50	13.9	4800	44.5	0.27	1.20	1.20	2.7
HCR17	230/1/50	17.0	4410	44.5	0.27	1.20	1.20	2.7
HCR24	230/1/50	24.0	8600	51.0	0.55	2.50	2.70	4.8
HCR33	230/1/50	33.0	7400	50.0	0.55	2.50	2.70	4.8
HCR43	230/1/50	46.0	17000	53.0	1.10	5.00	5.24	9.6
HCR51	230/1/50	52.0	17000	53.0	1.10	5.00	5.24	9.6
HBR51	230/1/50	52.0	17000	53.0	1.10	5.24	5.24	9.6
HCR59	230/1/50	62.0	15600	53.0	1.10	5.00	5.24	9.6
HCR76	230/1/50	77.0	25500	55.0	1.65	7.50	7.86	14.4
HBR76	230/1/50	77.0	25500	55.0	1.65	7.86	7.86	14.4
HCR88	230/1/50	92.0	23400	55.0	1.65	7.50	7.86	14.4
HBR88	230/1/50	92.0	23400	55.0	1.65	7.86	7.86	14.4
HCR99	230/1/50	118.0	33200	57.0	2.20	7.50	10.80	19.2
HBR99	230/1/50	118.0	33200	57.0	2.20	10.80	10.80	19.2

Model	Capacitor (each fan) [µF]	Number of fans	Impeller Diameter [mm]	Maximum Fan Speed [rpm]	Internal volume [dm^3]	Coil Rows	Fins space [mm]	Tubes per Row	Refrigerant connections		Dimensions [mm]	Weight [kg]
									Gas line [mm]	Liquid line [mm]		
HCR 07	5	1	350	1450	12	2	2.1	22	16	16	L=700 H=680 W=600	12
HCR 10	5	1	350	1450	24	4	2.1	22	16	16		16.5
HCR14	8	1	500	915	25.5	2	2.1	32	16	16	L=1050 H=980 W=896	45
HCR 17	8	1	500	915	38.3	2	2.1	32	16	16		49
HCR24	14	1	630	890	4.6	2	2.1	40	16	16	L=1340 H=910 W=1112	60
HCR33	14	1	630	890	9.6	4	2.1	40	16	16		75
HCR43	14	2	630	890	8.2	2	2.1	40	16	16	L=2340 H=910 W=1112	92
HCR51	14	2	630	890	9.4	2	2.1	40	22	16		93
HBR51	14	2	630	890	6.1	2	2.1	40	2x16	2x16		93
HCR59	14	2	630	890	13.4	3	2.1	40	22	16		102
HCR76	14	3	630	890	13.7	2	2.1	40	22	16	L=3340 H=910 W=1112	136
HBR76	14	3	630	890	9.1	2	2.1	40	2x16	2x16		136
HCR88	14	3	630	890	19.7	3	2.1	40	22	16	L=3340 H=910 W=1112	165
HBR88	14	3	630	890	13.7	3	2.1	40	2x16	2x16		165
HCR99	14	4	630	890	33.0	4	2.1	40	28	22	L=4338 H=910 W=1009	220
HBR99	14	4	630	890	24.3	4	2.1	40	2x22	2x22		190

(*) The nominal capacities refer to the following operative conditions:

- R410A refrigerant
- Temperature differences = 15 K
  T condensation (dew point) – T coil air inlet
- T coil air inlet = 35°C
- Liquid sub–cooling = 3K
- Height of the installation = 0 m, above the sea level. For different altitudes, see the table below.
- Clean exchange surfaces.
- For different conditions refer to NewHirating program.

(**) The sound pressure levels here included are measured in the same operative conditions, and are referred to 5 m far from the unit, in an essentially free field over a reflecting plane (according to EN13487).

Tab. 5.2 — Altitude correction factors (multiply THR by the factors below)

Alltitute [m]	0	200	400	600	800	1000	1200	1400	1600	1800	2000
Factor	1	0.99	0.97	0.96	0.95	0.93	0.92	0.90	0.89	0.88	0.87

For heights over 2000 m, contact our Technical Support Department or refer to NewHirating program.

Technical Data and Performances

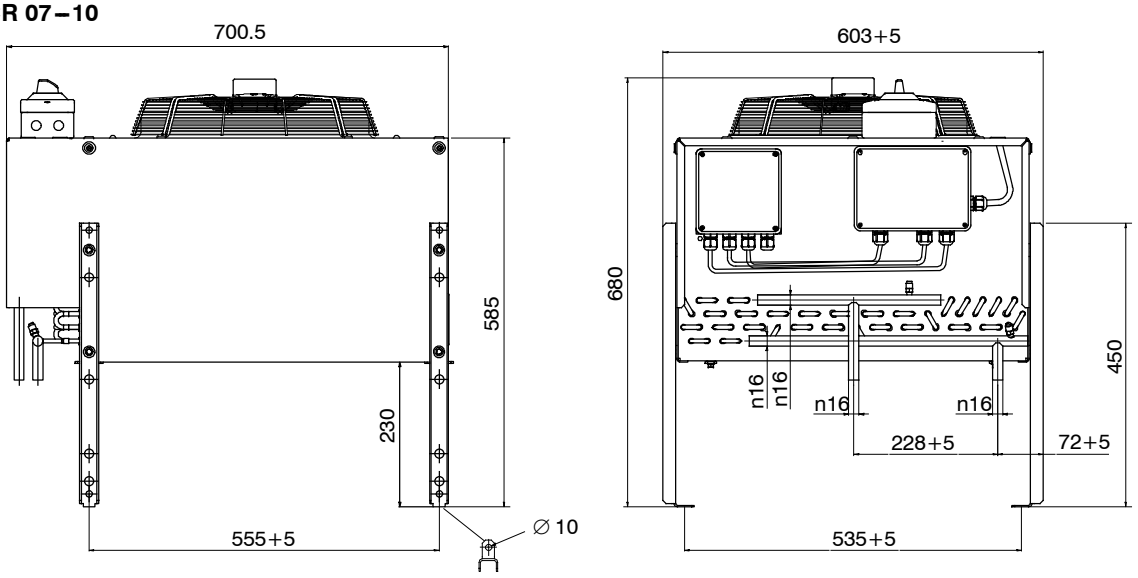
Operating limits

- Power tolerances 230V/1ph/50Hz
  Voltage: 230V +/– 10%
  Frequency: 50Hz +/– 2 Hz
- The maximum allowed air temperature, at the suction side of HCR condensers, depends on the coupled air conditioning unit and can reach max. +46°C.
  The minimum allowed outdoor air temperature is –20°C.
  The max allowable refrigerant condensing temperature is + 60°C.
  For different air temperature contact our Technical Support Department.
- This device cannot be used in explosive, acid or anyway aggressive atmospheres, not compatible with the materials used for its manufacturing.
- This device cannot be air ducted.
- The Liebert HCR series of condensing units is designed to work with refrigerant R410A, the maximum working pressure of condensing coil is 43 barg.

6 Dimensional Data

Dimensional Data

Fig. 6.1 – HCR 07–10

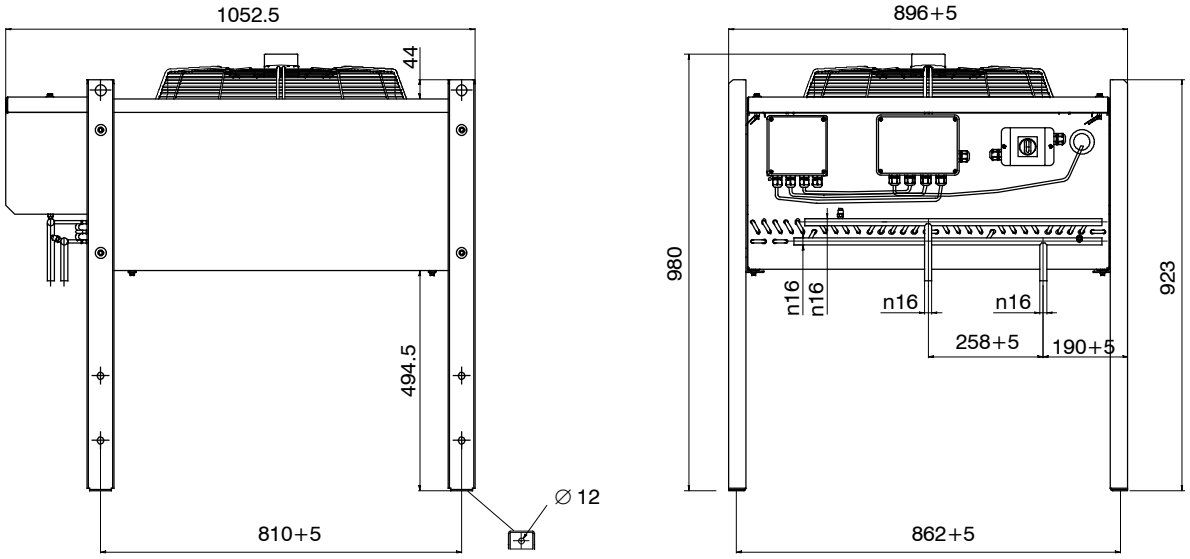


Frontal view *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded) GAS IN (A) [mm]	REFRIGERATION CONNECTIONS (welded) LIQUID OUT (B) [mm]	WEIGHT [kg]	DIMENSIONS [mm] C	DIMENSIONS [mm] D
HCR 07	16	16	12	300	72
HCR 10	16	16	16.5	300	72

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Fig. 6.2 – HCR 14–17



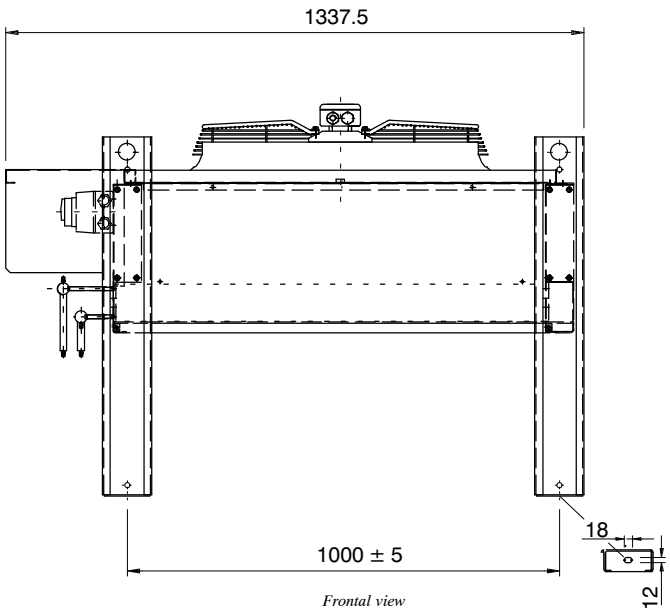
Frontal view *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded) GAS IN (A) [mm]	REFRIGERATION CONNECTIONS (welded) LIQUID OUT (B) [mm]	WEIGHT [kg]	DIMENSIONS [mm] C	DIMENSIONS [mm] D
HCR 14	16	16	45	445	190
HCR 17	16	16	49	445	190

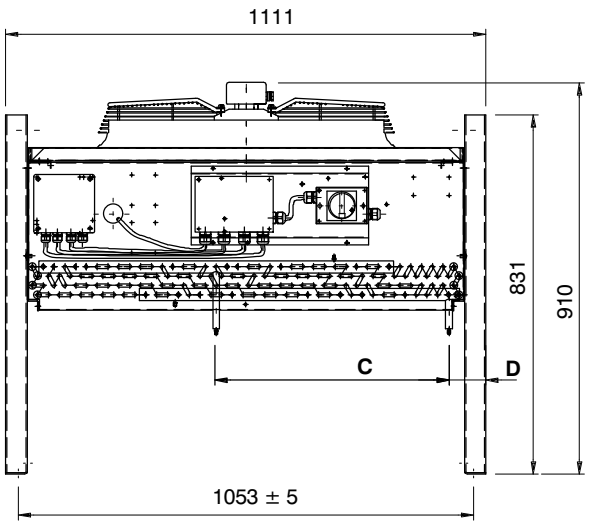
N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Dimensional Data

Fig. 6.3 – HCR 24–33



Frontal view



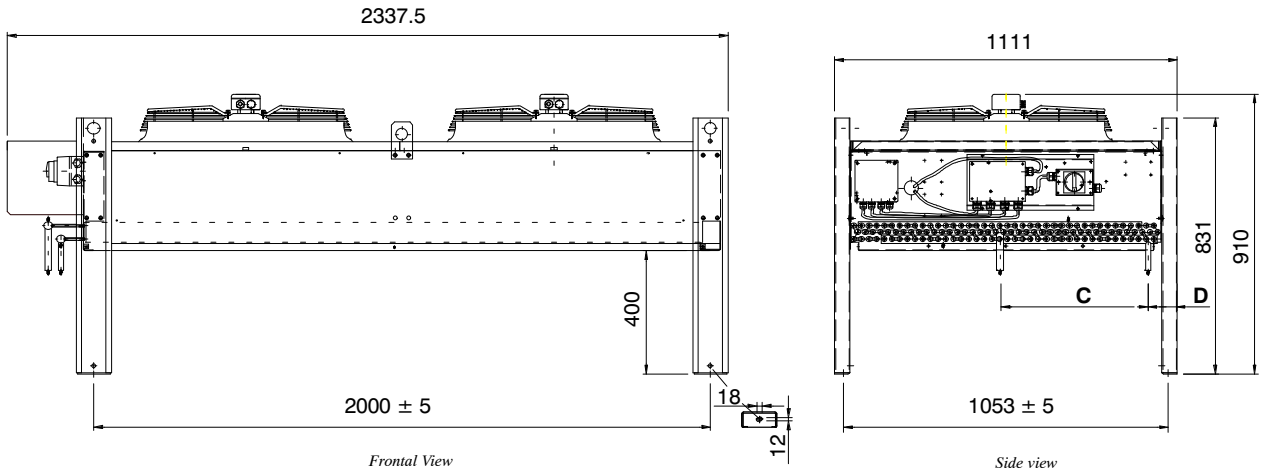
Side view

MODEL	REFRIGERATION CONNECTIONS (welded)		WEIGHT [kg]	DIMENSIONS [mm]	
	GAS IN (A) [mm]	LIQUID OUT (B) [mm]		C	D
HCR 24	16	16	60	525 ± 10	83.5 ± 5
HCR 33	16	16	75	541 ± 10	86 ± 5

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Dimensional Data

Fig. 6.4 — HCR 43 - 51 - 59

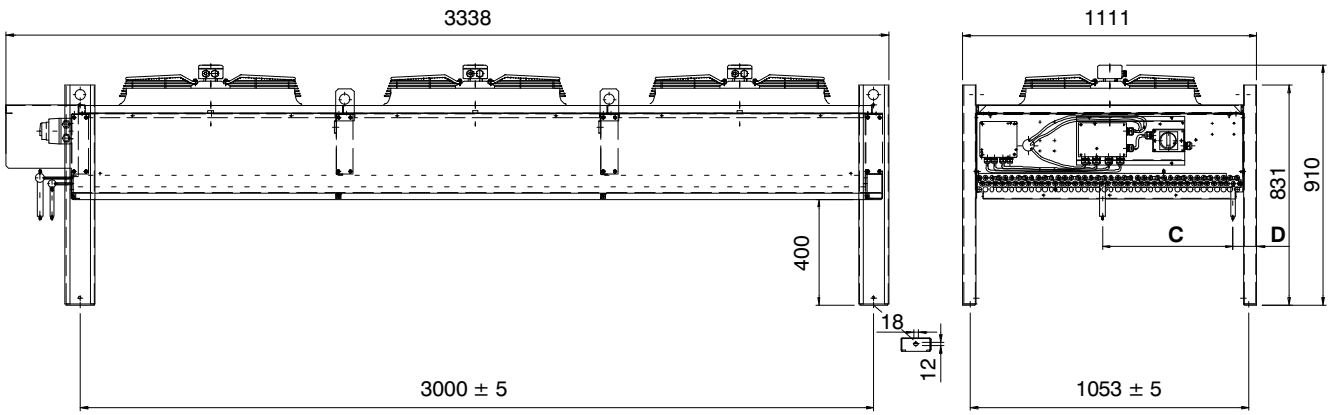


Frontal View *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded)		WEIGHT [kg]	DIMENSIONS [mm]	
	GAS IN (A) [mm]	LIQUID OUT (B) [mm]		C	D
HCR43	16	16	92	495.5 ± 10	85 ± 5
HCR51	22	16	93	509.5 ± 5	90 ± 5
HCR59	22	16	102	477 ± 10	94 ± 10

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Fig. 6.5 — HCR 76 - 88



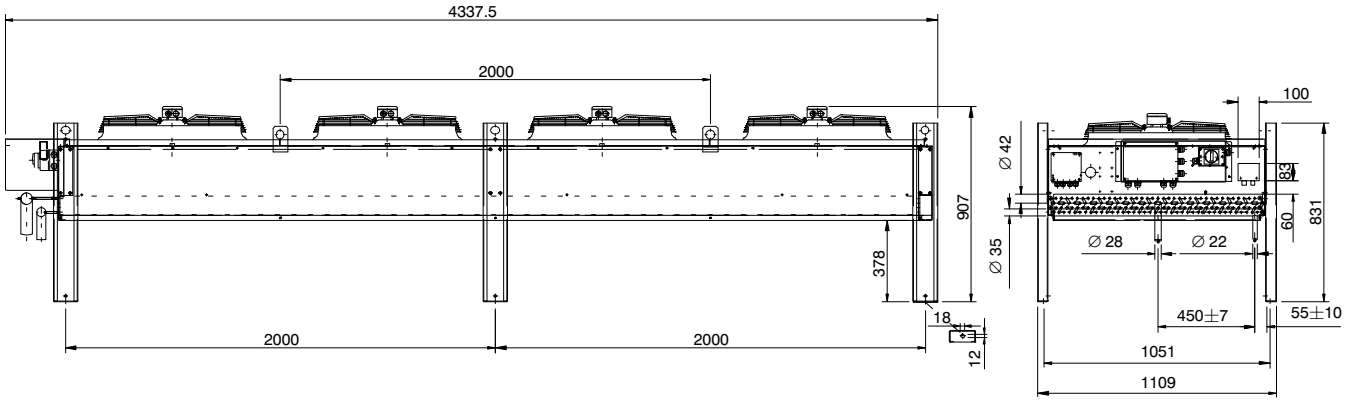
Front view *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded)		WEIGHT [kg]	DIMENSIONS [mm]	
	GAS IN (A) [mm]	LIQUID OUT (B) [mm]		C	D
HCR76	22	16	136	493 ± 10	90 ± 5
HCR88	22	16	165	476 ± 10	94 ± 5

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Dimensional Data

Fig. 6.6 – HCR 99

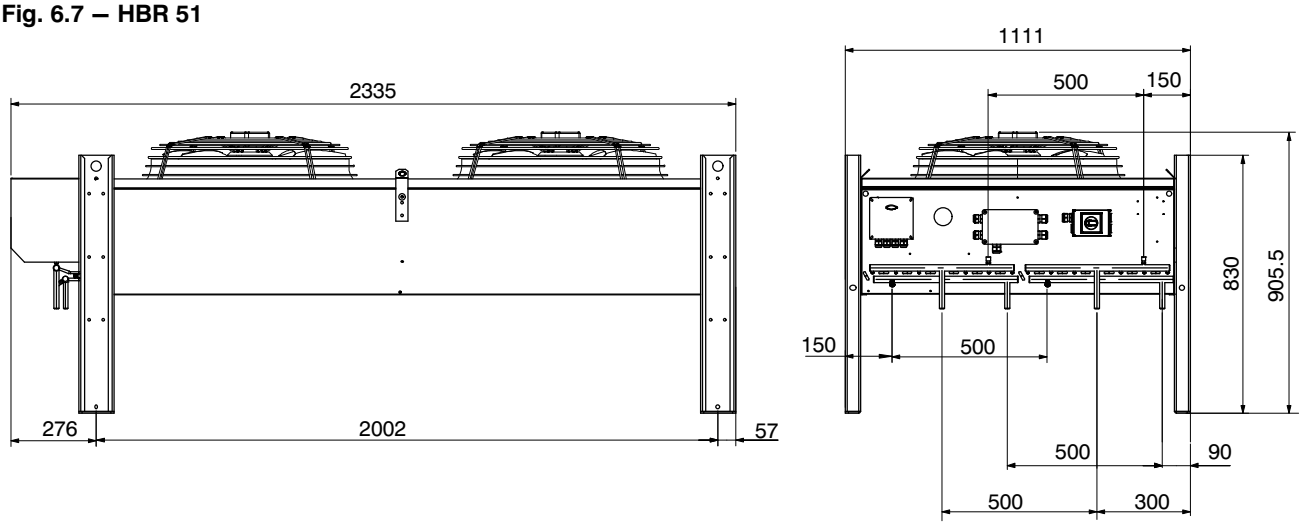


Front view *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded)		WEIGHT [kg]
	GAS IN (A) [mm]	LIQUID OUT (B) [mm]	
HCR99	28	22	220

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Fig. 6.7 – HBR 51



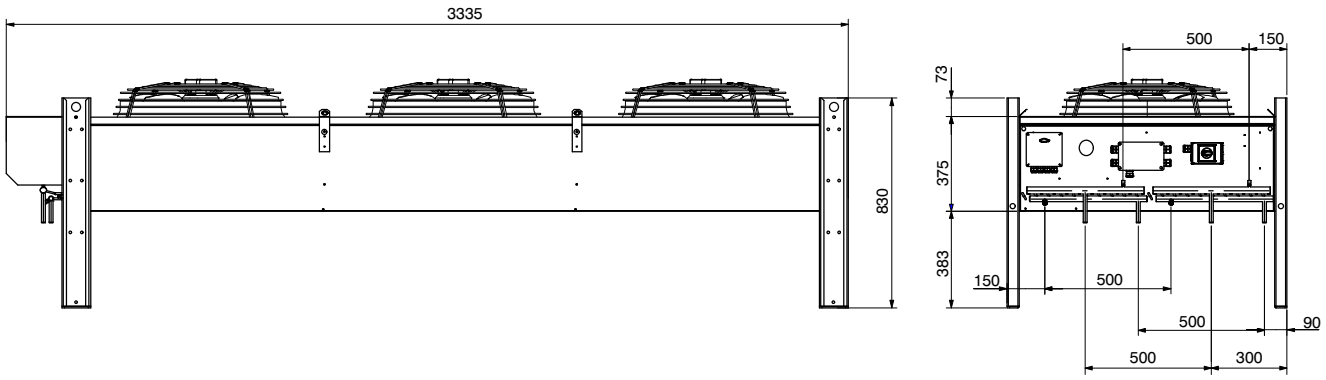
Front view *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded)		WEIGHT [kg]
	GAS IN (A) [mm]	LIQUID OUT (B) [mm]	
HBR51	2x16	2x16	93

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Dimensional Data

Fig. 6.8 – HBR 76 – 88

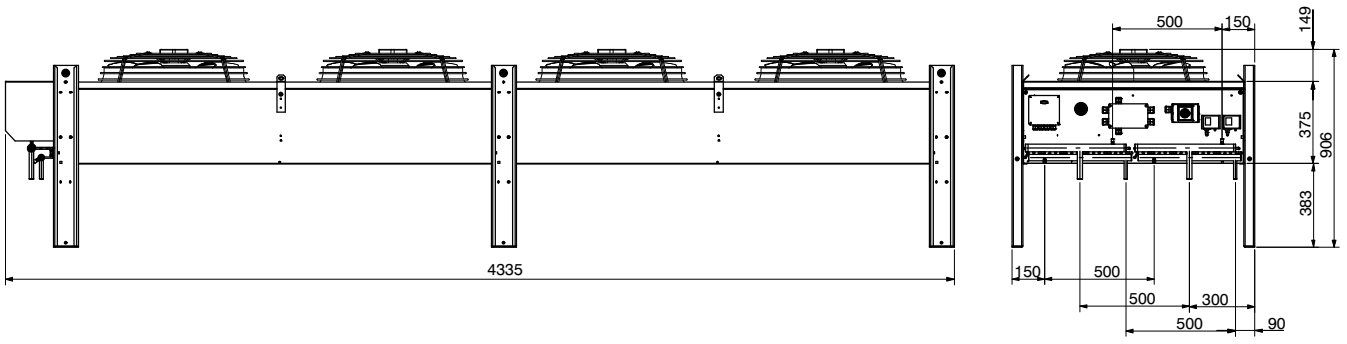


Front view *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded)		WEIGHT [kg]
	GAS IN (A) [mm]	LIQUID OUT (B) [mm]	
HBR76	2x16	2x16	136
HBR88	2x16	2x16	165

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Fig. 6.9 – HBR 99



Front view *Side view*

MODEL	REFRIGERATION CONNECTIONS (welded)		WEIGHT [kg]
	GAS IN (A) [mm]	LIQUID OUT (B) [mm]	
HBR99	2x22	2x22	190

N.B.: *Copper reducers are supplied with the unit which must be welded to the condenser inlet and outlet.*

Il Fabbricante dichiara che questo prodotto è conforme alle direttive Europee:
The Manufacturer hereby declares that this product conforms to the European Union directives:
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2006/42/EC; 2004/108/EC; 2006/95/EC; 97/23/EC

Ensuring the High Availability Of Mission-Critical Data and Applications

Emerson Network Power, a business of Emerson (NYSE:EMR), is the global leader in enabling Business-Critical Continuity™ from grid to chip for telecommunication networks, data centers, health care and industrial facilities. Emerson Network Power provides innovative solutions and expertise in areas including AC and DC power and precision cooling systems, embedded computing and power, integrated racks and enclosures, power switching and controls, monitoring, and connectivity. All solutions are supported globally by local Emerson Network Power service technicians. Liebert power, precision cooling and monitoring products and services from Emerson Network Power improve the utilization and management of data center and network technologies by increasing IT system availability, flexibility and efficiency. For more information, visit www.liebert.com, www.emersonnetworkpower.com or www.eu.emersonnetworkpower.com

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