EN

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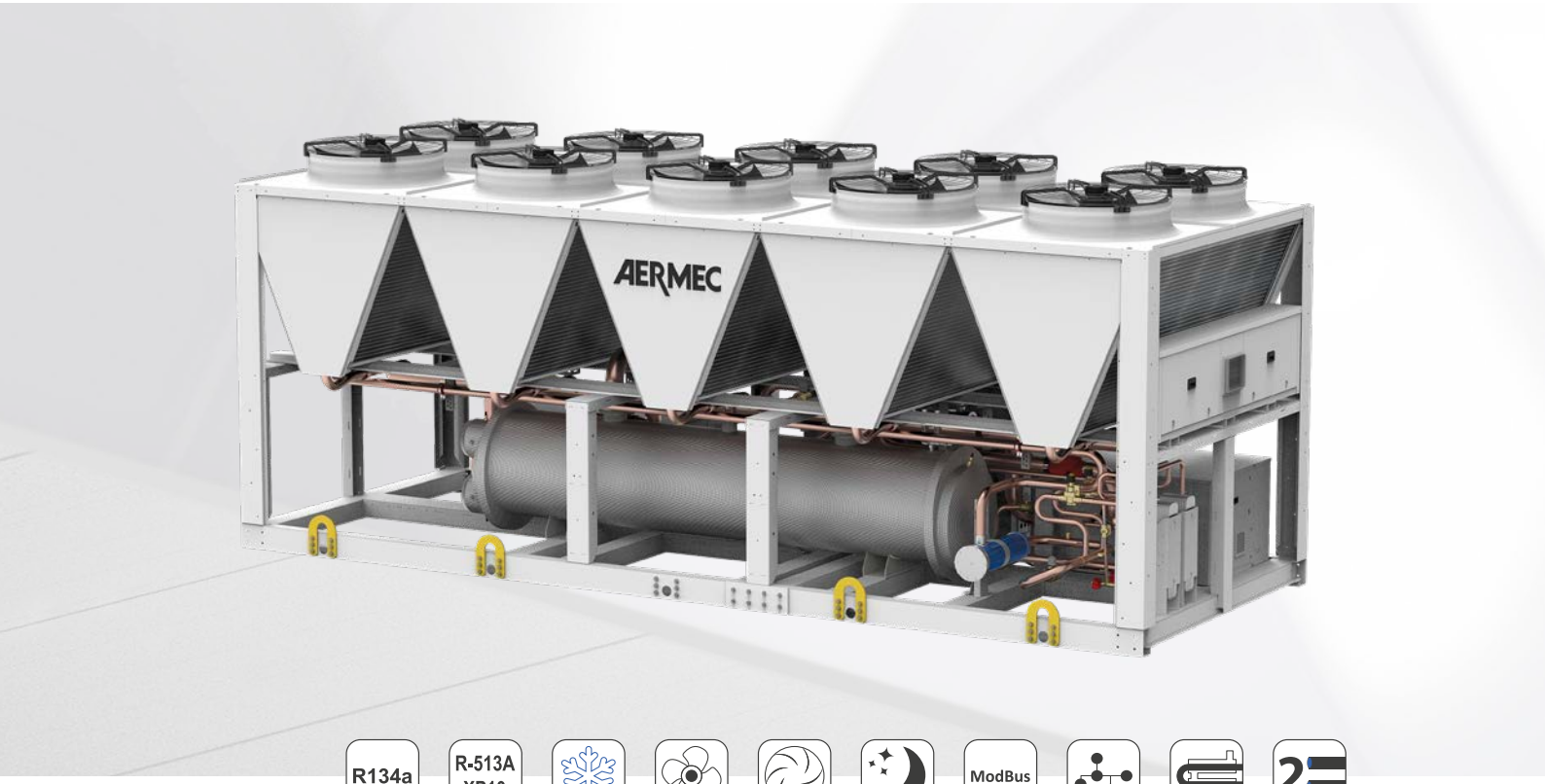
Translation from original

TBA

Technical manual



AIR/WATER CHILLERS

Cooling capacity 328÷1404 kW

AERMEC

www.aermec.com

Dear customer,
Thank you for choosing an AERMEC product. It is the fruit of many years of experience and special design studies and has been made of the highest grade materials and with cutting edge technology.
In addition, all our products bear the EC mark indicating that they meet the requirements of the European Machine Directive regarding safety. The quality level is being constantly monitored, so AERMEC products are synonymous with Safety, Quality and Reliability.

The data may undergo modifications considered necessary for the improvement of the product, at any time and without the obligation for any notice thereof.

Thank you once again.
AERMEC S.p.A

This marking indicates that this product should not be disposed with other household wastes throughout the EU.
To prevent possible harm to the environment or human health from uncontrolled disposal of Waste Electrical and Electronic Equipment (WEEE), please return the device using appropriate collection systems, or contact the retailer where the product was purchased. Please contact your local authority for further details.
Illegal dumping of the product by the user entails the application of administrative sanctions provided by law.

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CERTIFICATIONS

COMPANY CERTIFICATIONS

PERFORMANCE CERTIFICATIONS

Aermec participate in the EUROVENT program: LCP
the products are present on the site
www.eurovent-certification.com

SAFETY CERTIFICATIONS

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DICHIARAZIONE DI CONFORMITÀ CE / EC DECLARATION OF CONFORMITY / DECLARATION DE CONFORMITE CE KONFORMITÄTSERKLÄRUNG EG / DECLARACIÓN DE CONFORMIDAD CE

TBA
1300÷4325

MODEL _____

SERIAL NUMBER_____

DATE_____

Noi, firmatari della presente, dichiariamo sotto la nostra esclusiva responsabilità che l'insieme in oggetto così definito:
We, the undersigned, hereby declare under our own responsibility that the assembly in question, defined as follows:
Nous, Signataires du présent acte, déclarons sous notre responsabilité exclusive que le groupe cité à l'objet défini de la façon suivante:
Die Unterzeichner erklären unter eigener Verantwortung, dass die oben genannte Maschineneinheit, bestehend aus:
Nosotros, los abajo firmantes, declaramos bajo nuestra exclusiva responsabilidad, que el conjunto en cuestión, denominado:

Nome / Name / Nom / Name / Nombre	**TBA**
Tipo / Type / Type / Typ / Tipo	**Air/Water chillers**
Modello / Model / Modèle / Model / Modelo	**Cooling only**

A cui questa dichiarazione si riferisce è conforme a tutte le disposizioni pertinenti delle seguenti direttive:
To which this declaration refers, complies with all the provisions related to the following directives:
Auquel cette déclaration se réfère, est conforme à toutes les dispositions relatives des directives suivantes:
Das Gerät, auf welches sich diese Erklärung bezieht, entspricht allen Verordnungen im Zusammenhang mit den folgenden Richtlinien:
A la que esta declaración se refiere, es conforme con todas las disposiciones pertinentes de las siguientes directivas:

Direttiva Macchine: 2006/42/CE
Direttiva Compatibilità Elettromagnetica EMCD: 2014/30/UE
Direttiva PED in materia di attrezzature a pressione: 2014/68/UE
Direttiva RoHS sulla restrizione dell'uso di determinate sostanze pericolose nelle AEE: 2011/65/UE
Direttiva ErP per la progettazione ecocompatibile: 2009/125/CE

L'oggetto della dichiarazione di cui sopra è conforme alle pertinenti normative di armonizzazione dell'Unione:
The above-mentioned declaration complies with the harmonised European standards:
L'objet de la déclaration reportée ci-dessus est conforme aux normes d'harmonisation relatives de l'Union:
Der Gegenstand der genannten Erklärung entspricht den diesbezüglichen harmonisierten Normen der europäischen Gemeinschaft:
El objeto de la declaración de arriba es conforme con las normativas pertinentes de armonización de la Unión:

CEI EN 60204-1: 2018
UNI EN ISO 12100: 2010
CEI EN 61000-6-2: 2006
CEI EN 61000-6-4: 2007
UNI EN 378-2: 2017
UNI EN 12735-1: 2016

Bevilacqua (VR)

Commercial Director
Luigi Zucchi

La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante.
La persona autorizzata a costituire il fascicolo tecnico è Luca Martin.
L'unità è conforme ai dati di progetto riportati nel fascicolo tecnico al paragrafo Definizione dell'Insieme, è in accordo con la direttiva 2014/68/UE e soddisfa la procedura di Garanzia qualità Totale con controllo della progettazione (modulo H1) con certificato n.19/296-EP18767 Rev. 0 emesso dall'organismo notificato n. 1131 CEC via Pisacane 46 Legnano (MI) - Italia.
L'elenco dei componenti critici pertinenti al numero di fabbrica sopra riferito, secondo quanto previsto dalla Direttiva 2014/64/UE, è fornito a corredo della presente Dichiarazione di Conformità (doc. "Lista componenti per Dichiarazione di Conformità").
Dichiariamo inoltre che, al momento dell'immissione sul mercato Europeo di tale apparecchiatura precaricata da parte di Aermec S.p.A (che importa o produce nell'Unione), gli idrofluorocarburi, in essa contenuti, sono considerati nel sistema di quote dell'Unione di cui al Capo IV del regolamento UE 517/2014 in quanto sono stati immessi sul mercato da un produttore o importatore di idrofluorocarburi cui si applica l'articolo 15 del regolamento UE 517/2014.

This declaration of conformity has been released under the exclusive responsibility of the manufacturer.
The person authorised to compile the technical file is Luca Martin.
The unit complies with the project data reported in the technical file in the Definition of the Assembly paragraph, it is in agreement with Directive 2014/68/EU and satisfies the full quality assurance plus design examination procedure (form H1) with certificate no. 19/296-EP18767 Rev. 0 issued by the notified body no. 1131 CEC via Pisacane 46 Legnano (MI) - Italy.
The list of critical components relevant to the factory number shown above, in accordance with Directive 2014/64/EU, is provided together with this Declaration of Conformity (doc. "Component List for Declaration of Conformity").
We also declare that, when such equipment preloaded by Aermec SpA (which imports or produces into the Union) is placed on the European market, the hydrofluorocarbons contained therein are considered in the Union quota system referred to in Chapter IV of UE Regulation no.517/2014 as they have been placed on the market by a producer or importer of hydrofluorocarbons to which Article 15 of UE Regulation no.517/2014.

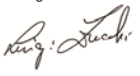
La déclaration de conformité présente est délivrée sous la responsabilité exclusive du fabricant.
La personne autorisée à constituer le dossier technique est Luca Martin.
L'unité est conforme aux données du projet figurant dans le dossier technique dans le paragraphe Définition de l'assemblage, est conforme à la directive 2014/68/UE, et respecte la procédure de l'assurance complète de la qualité et du contrôle de la conception (module H1) par le certificat n. 19/296-EP18767 Rév. 0 émis par l'organisme notifié n. 1131 CEC via Pisacane 46 Legnano (MI) - Italie.
La liste des composants critiques correspondant au numéro d'usine indiqué ci-dessus, conformément à la directive 2014/64/UE, est fournie avec la présente déclaration de conformité (doc. «Liste des composants pour la déclaration de conformité»).
Nous déclarons également que, lors de la mise sur le marché européen de cet équipement préchargé par Aermec SpA (qui importe ou produit dans l'Union), les hydrofluorocarbures qu'il contient sont pris en compte dans le système de quotas de l'Union visé à Le chapitre IV du règlement (UE) n.517/2014 car ils ont été mis sur le marché par un producteur ou un importateur d'hydrofluorocarbures auxquels l'article 15 du règlement (UE) n.517/2014.

Diese Konformitätserklärung wurde unter der ausschließlichen Verantwortung des Herstellers ausgestellt.
Die bevollmächtigt, die technischen Unterlagen zusammenzustellen ist Luca Martin.
Die Einheit entspricht den Projektdaten, die in der technischen Datei im Abschnitt Definition der Baugruppe angegeben sind, entspricht der Richtlinie 2014/68/EU und erfüllt das Produkt die Anforderungen des Verfahrens der umfassenden qualitätssicherung mit entwurfsprüfung (Modul H1), Zertifikat n. 19/296-EP18767 Rev. 0, ausgestellt durch benannte Stelle n. 1131 CEC Via Pisacane 46, Legnano (MI) - Italy.
Die Liste der kritischen Komponenten, die für die oben angegebene Fabriknummer gemäß der Richtlinie 2014/64/EU relevant sind, wird zusammen mit dieser Konformitätserklärung bereitgestellt (Dokument "Komponentenliste für die Konformitätserklärung").
Wir erklären außerdem, dass beim Inverkehrbringen dieser von Aermec SpA (die in der Union importiert oder produziert) vorinstallierten Ausrüstung in Europa die darin enthaltenen Fluorwasserstoffe in dem in genannten Unionsquotensystem berücksichtigt werden Kapitel IV der Verordnung (EU) n.517/2014, da sie von einem Hersteller oder Importeur von Fluorkohlenwasserstoffen in Verkehr gebracht wurden, für die Artikel 15 der Verordnung (EU) n.517/2014.

Esta declaración de conformidad se ha otorgado bajo la responsabilidad exclusiva del fabricante.
La persona facultada para elaborar el expediente técnico es Luca Martin.
La unidad cumple con los datos del proyecto reportados en el archivo técnico en el párrafo Definición de la Asamblea, està conforme a la directiva 2014/68/UE y cumple con el procedimiento de el pleno aseguramiento de la calidad más el examen del diseño (módulo H1) con certificado n. 19/296-EP18767 Rev. 0 emitido por el organismo autorizado n. 1131 CEC via Pisacane 46 Legnano (MI) - Italia.
La lista de componentes críticos relevantes para el número de fábrica que se muestra arriba, de acuerdo con la Directiva 2014/64/UE, se proporciona junto con esta Declaración de conformidad (doc. "Lista de componentes para la Declaración de conformidad").
También declaramos que, al colocar en el mercado europeo de este equipo precargado por Aermec SpA (que importa o produce en la Unión), los hidrofluorocarbonos contenidos en él se consideran en el sistema de cuotas de la Unión mencionado en El Capítulo IV del Reglamento (UE) n.517/2014 ya que han sido puestos en el mercado por un productor o importador de hidrofluorocarbonos al que se refiere el artículo 15 del Reglamento (UE) n.517/2014.

Bevilacqua (VR)

Commercial Director
Luigi Zucchi



PRODUCT DESCRIPTION

THE TBA CHILLER

It was designed to meet the air conditioning needs in residential and commercial buildings, or the refrigeration needs in industrial buildings. It is an outdoor unit with magnetic levitation compressors, micro-channel batteries and tube core exchangers. The base, the structure and the panels are made of steel treated with polyester anti-corrosion paints RAL 9003.

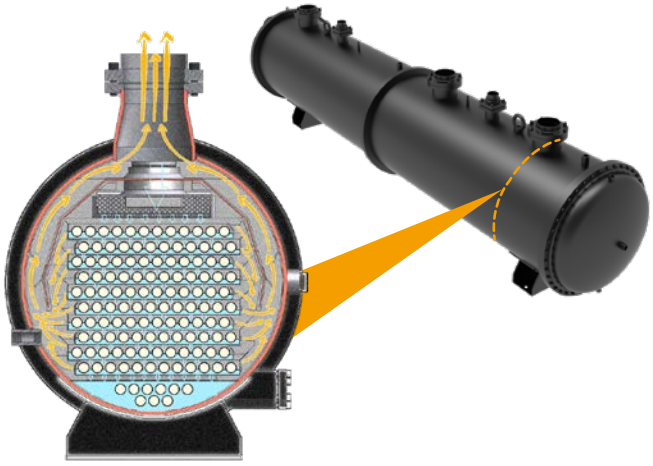
TECHNOLOGICAL CHOICES

Magnetic levitation compressors
The efficiency levels achieved by the magnetic levitation compressors are far superior to the ones of the traditional screw compressors.
This technology, besides reducing weight and dimensions compared to traditional compressors, makes it possible the completely **"oil free"** operation improving thus the performance that can be obtained from the thermal exchange surfaces. In magnetic levitation centrifugal compressors, vibrations in any operation conditions are eliminated, similarly to the loads induced by current peaks during the start-up phase (the total input current is only 6 A) which results in the minimum wear and tear of the unit.

Inverter fans
EC electronic commutation fans are characterised by a high performance motor and by an efficiency degree that is considerably higher than the one of any other AC fan.
The intrinsic energy efficiency of the brushless DC motor further enhances the chiller performance with partial loads, and it contributes to improve the overall reliability of the machine. The combination of these elements entails therefore important operation costs savings.
Finally the capacity to adapt the continuous operation rotation speed ensures the following:

- reduced energy and emission consumption in any operating condition;
- reduced management costs;
- high efficiency in all operating conditions.

Shell & tube heat exchangers



The high-efficiency and low-refrigerant load shell & tube heat exchanger is the answer to the increasing market demand, considering the constant price and tax increases on refrigerants. The new distribution system makes it possible to control the refrigerant around the tubes in all operation conditions, both at full load and with partial loads. Combines the advantage of flooded evaporators, high yield and the falling film ones with low refrigerant load, -40 % of gas compared to the conventional flooded exchangers.

Energy efficiency
Energy efficiency is an important requirement for new projects and redevelopment of the existing ones.
The TBA series is one of the best solution, as it guarantees high energy efficiency levels calculated in compliance with European Standard EN14511: 2018.

Acoustic efficiency
This new product range does not consider the energy class as the only selection parameter. Chillers can be chosen between different noise levels that do not affect the energy class but maintain the best energy efficiency status. The different versions have been designed to identify the unit according to the intended use of the system. The TBA range excludes any compromise in technological choices, as efficiency and silence can coexist perfectly.

Maximum adaptability
To obtain a solution that allows you to save money and to facilitate installation. These units can be configured with an integrated hydronic system. The kit includes the main hydraulic components and it is available in different configurations: with single pump or spare pump, with various static pressures. (see configurator)

State of the art control
The controller with liquid crystal display is supplied as per standard with all the units. It has a multilingual user interface, which is available also in remote version (accessory) to be connected to the unit with serial connection.
The presence of an internal clock allows you to program the operation in time periods in order to improve the system efficiency and reduce consumption during periods of non-use.
This option (Night Mode) is perfect for night operation, since it guarantees greater acoustic comfort in the evenings, and a high efficiency in the time of greater load.

Systems consisting of two chillers allow the unit to be adjusted via (Master/Slave), supplied as per standard. In case of several chillers through the Multichiller_EVO. The supervision is possible thanks to different options, with proprietary devices or by integrating other systems via ModBus, Bacnet, LonWorks etc. protocols.

CONFIGURATOR

Field		Description
1,2,3		**TBA**
4,5,6,7		**Sizes**
		1300 - 1350 - 2300 - 2325 - 2350 - 3300 - 3320 - 3340 - 3350 - 4325
8		**Model**
	°	Cooling only
9		**Heat recovery**
	°	Without heat recovery
10		**Version**
	A	High efficiency
	E	Silenced high efficiency
	U	Very high efficiency
	N	Silenced very high efficiency
11		**Coils**
	°	Alluminium microchannel
	O	Painted aluminium microchannel
	R	Copper-Copper
	S	Copper-Tinned copper
	V	Copper-painted alumimium
12		**Fans**
	J	Inverter
13		**Power supply**
	°	400V ~ 3 50Hz with magnet circuit breakers
14-15		**Integrated hydronic kit**
	00	Without hydronic kit
With n°1 pump ON/OFF: (1)		
	PA	Pump A
	PB	Pump B
	PC	Pump C
	PD	Pump D
	PE	Pump E
	PF	Pump F
	PG	Pump G
	PH	Pump H
	PI	Pump I
	PJ	Pump J
With n°2 pumps ON/OFF: (1)		
	DA	Pump A + stand-by pump
	DB	Pump B + stand-by pump
	DC	Pump C + stand-by pump
	DD	Pump D + stand-by pump
	DE	Pump E + stand-by pump
	DF	Pump F + stand-by pump
	DG	Pump G + stand-by pump
	DH	Pump H + stand-by pump
	DI	Pump I + stand-by pump
	DJ	Pump J + stand-by pump
Operation of pumps in parallel ON/OFF (1)		
	TF	Double pump F
	TG	Double pump G
	TH	Double pump H
	TI	Double pump I
	TJ	Double pump J
With n°1 pump INVERTER: (1)		
	IA	Pump A equipped with inverter device
	IB	Pump B equipped with inverter device
	IC	Pump C equipped with inverter device
	ID	Pump D equipped with inverter device
	IE	Pump E equipped with inverter device
	IF	Pump F equipped with inverter device
	IG	Pump G equipped with inverter device
	IH	Pump H equipped with inverter device
	II	Pump I equipped with inverter device
	IJ	Pump J equipped with inverter device
With n°2 pumps INVERTER (1)		
	JA	Pump A + stand-by pump, both equipped with inverter device
	JB	Pump B + stand-by pump, both equipped with inverter device
	JC	Pump C + stand-by pump, both equipped with inverter device
	JD	Pump D + stand-by pump, both equipped with inverter device
	JE	Pump E + stand-by pump, both equipped with inverter device
	JF	Pump F + stand-by pump, both equipped with inverter device
	JG	Pump G + stand-by pump, both equipped with inverter device
	JH	Pump H + stand-by pump, both equipped with inverter device
	JI	Pump I + stand-by pump, both equipped with inverter device
	JJ	Pump J + stand-by pump, both equipped with inverter device
Operation of pumps in parallel INVERTER (1)		
	KF	Double pump F equipped with inverter device
	KG	Double pump G equipped with inverter device
	KH	Double pump H equipped with inverter device
	KI	Double pump I equipped with inverter device
	KJ	Double pump J equipped with inverter device
16		**Refrigerant gas**
	°	R134a
	G	R513A (XP10)

(1) For all configurations including pump J please contact the factory.

COMPATIBILITY WITH HYDRONIC KIT

ON/OFF PUMPS

Size	Version	Evaporator	Module	Hydronic kit with single pump										Hydronic kit with main pump + stand-by pump										Hydronic kit with double pump - in parallel (all pumps running)				
				PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	TF	TG	TH	TI	TJ
		n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°
1300	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
1350	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
2300	A-E-U-N	1	1	-	-	1	1	1	1	1	1	1	*	-	-	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
2325	A-E-U-N	1	1	-	-	-	1	1	1	1	1	1	*	-	-	-	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
2350	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3300	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3320	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3340	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3350	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*	-	-	-	-	-	1+1	1+1	1+1	1+1	*	2	2	2	2	*
4325	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*	-	-	-	-	-	1+1	1+1	1+1	1+1	*	2	2	2	2	*

COMPATIBILITY WITH HYDRONIC KIT

INVERTER PUMPS

Size	Version	Evaporator	Module	Hydronic kit with single pump										Hydronic kit with main pump + stand-by pump										Hydronic kit with double pump - in parallel (all pumps running)				
				IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	JA	JB	JC	JD	JE	JF	JG	JH	JI	JJ	KF	KG	KH	KI	KJ
		n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°
1300	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
1350	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
2300	A-E-U-N	1	1	-	-	1	1	1	1	1	1	1	*	-	-	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
2325	A-E-U-N	1	1	-	-	-	1	1	1	1	1	1	*	-	-	-	1+1	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
2350	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3300	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3320	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3340	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*	2	2	2	2	*
3350	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*	-	-	-	-	-	1+1	1+1	1+1	1+1	*	2	2	2	2	*
4325	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*	-	-	-	-	-	1+1	1+1	1+1	1+1	*	2	2	2	2	*

**** WARNING! For particular needs or information about the compatibility of the pumps, contact the main office.***

WEIGHTS OF THE GROUPS OF PUMP ON/OFF

PUMP GR.	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	TF	TG	TH	TI	TJ
Weights tot. (Kg)	123	160	165	174	198	216	229	296	307	316	168	206	216	234	277	328	346	453	475	493	328	346	453	475	493
Water volume (m^3)	18	27	27	27	27	27	27	40	40	40	18	27	27	27	27	27	27	40	40	40	27	27	40	40	40
Empty weight (Kg)	105	133	138	147	171	189	202	256	267	276	150	179	189	207	250	301	319	413	435	453	301	319	413	435	453

WEIGHTS OF THE GROUPS OF PUMP INVERTER

PUMP GR.	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	JA	JB	JC	JD	JE	JF	JG	JH	JI	JJ	KF	KG	KH	KI	KJ
Weights tot. (Kg)	123	160	165	174	198	216	229	296	307	316	168	206	216	234	277	328	346	453	475	493	328	346	453	475	493
Water volume (m^3)	18	27	27	27	27	27	27	40	40	40	18	27	27	27	27	27	27	40	40	40	27	27	40	40	40
Empty weight (Kg)	105	133	138	147	171	189	202	256	267	276	150	179	189	207	250	301	319	413	435	453	301	319	413	435	453

DESCRIPTION OF COMPONENTS

COOLING CIRCUIT

Compressor
Two stage centrifugal compressor, with variable speed aluminium impeller, designed to operate without lubricating oil, fitted with radial and axial magnetic levitating bearings for the driven shaft, thereby eliminating mechanical contact.
Position sensors integrated in the magnetic bearings to centralise the suspended driven shaft communicating with the controller for instant repositioning. The controller integrated with the compressor controls the magnetic field for the suspension of the driven shaft and determines the voltage to the motor to vary the speed of rotation, in real time, on the basis of the load variations on the compressor.
The compressor is fitted with:
— Permanent magnet synchronous motor to operate at variable speed. Motor cooling by refrigerant injection.
— Check valve on the discharge to prevent the reverse flow of refrigerant.
— Internal thermal motor protection to protect against current overload conditions.
— Soft start function to control starting current **(only 6 Amps!)**.

Microchannel coils

the full range uses aluminium microchannel coils, ensuring very high levels of efficiency. This allows using less refrigerant compared to traditional copper coils.

Flooded shell & tube heat exchangers
Heat exchanger, with evaporator function with water passage on the tube side and refrigerant on the housing side, of the flooded type with reduced load content. The liquid level in the evaporator is kept very low whereas most of the tubes are lapped by a thin film that ensures an excellent thermal exchange although it contains the refrigerant load, reducing it thus by 50% compared to the solution with traditional flooded evaporator. The housing is covered with an anti-condensation protection in closed-cell foam elastomer. The heads can be opened to allow inspections and cleaning of the tubes on the water side. The heat exchanger is fitted with a differential pressure switch to monitor the correct water flow when the unit is in operation, preventing thus the formation of ice inside it. The heat exchanger was constructed in compliance with the PED standard, regarding the operation pressures and the resistance to shock respectively. Water side connection with grooved joints (with nozzle for the connection).
With electric resistor on the water side fitted as standard.

Dehydrator filter

Mechanical with cartridge made of ceramics and hygroscopic material, able to withhold impurities and any traces of humidity present in the cooling circuit.

Liquid indicator

Used to check the refrigerant gas load and the possible presence of humidity in the cooling circuit.

Electronic thermostatic valve
Compared to the classic thermostatic valve, the electronic thermostatic valve stands out for its best overheating regulation. This way, the evaporator is fully exploited increasing the machine yield.
Its use in applications intended for comfort provides important benefits, especially in the presence of variable loads, as it allows you to maintain maximum efficiency with any outdoor air temperature.
In industrial applications, where temperature changes are often required in relation to various environmental conditions, the electronic valve is ideal to prevent the system from continuous calibration, thus adapting the system to different load conditions, making it independent.

Taps
Present on liquid and pressing line to interrupt the refrigerant in the case of extraordinary maintenance.

Solenoid valve
The valves close when the compressor switches off, blocking the flow of refrigerant gas to the evaporator, recovery and the coil.

Economizer Thermostatic valve
Mechanical, with external equaliser positioned at economizer input, it laminates a part of the cooled refrigerant fluid, taking it to an intermediate pressure between that of condensation and evaporation.

Economizer
The plate type (AISI 316). This allows to sub-cool the liquid refrigerant leaving the condenser further and at the same time make a certain vapour flow rate available to be injected in an intermediate point of the compression process, reducing both the flow temperature and the electrical absorption.

HYDRAULIC CIRCUIT

IP54 differential pressure switch - 1 per circuit

Positioned between the evaporator inlet and outlet, it has the task of verifying that there is water circulation. Otherwise, it blocks the unit.

Expansion vessel (only in versions with pump)

with nitrogen pre-load membrane.

Circulation pump (optional with configurator)

It offers, based on the characteristics of the chosen pump, an external static pressure to overcome the air pressure drop of an installation.
If the reserve pump, or a parallel double pump, were present, it is managed electronically.

Air drain valve
Manual type, discharges any air pockets in the hydraulic circuit.

Flow shut-off valves

Drain valve

FRAME AND FANS

Ventilation unit
Helical type with IP54 protection rating and balanced statically and dynamically. The electric fans are protected electrically by magnet-circuit breakers and mechanically by anti-intrusion metal grids, according to the IEC EN 60335-2-40 Standard.

Support frame
Made in hot galvanised sheet steel with suitable thickness and painted with polyester powders able to resist atmospheric agents through time (RAL 9003).

Acoustic protection cover compressor
As per standard, all TBA versions consist of a thick galvanised steel compartment and a sound-absorbent lining. Allows to reduce the sound power level emitted by the unit and also protects the compressors from atmospheric agents.

WATER FEATURES

System: Chiller with shell and tube exchanger	
PH	6,8 - 8
Electric conductivity	<800 µS/cm
Total hardness (CaCO3)	<200 ppm
Total dissolved solids	<15000 ppm
Max solid particles dimension	0,5 mm
Max. glycol amount	50%
Iron (Fe)	<1 ppm
Copper (Cu)	<1 ppm
Alkalinity (CaCO3)	<100 ppm
Chloride ions (Cl-)	<150 ppm
Sulphate ions (SO42-)	<100 ppm
Sulphide ions (S-)	none
Ammonium ions (NH4+)	<1 ppm
Silica (SiO2)	<50 ppm
Silica (SiO2)	< 30ppm

CONTROL AND SAFETY COMPONENTS

Manually reset high pressure switch
With fixed calibration, placed on the high pressure side of the cooling circuit, it inhibits the operation of the compressor if abnormal work pressure occurs.

Low pressure transducer

Allows to view the value of the compressor intake pressure on the microprocessor board display (one per circuit). Placed on the low pressure side of the cooling circuit

High pressure transducer

Allows to view the value of the compressor intake pressure on the microprocessor board display (one per circuit). Placed on the high pressure side of the cooling circuit

Twin safety valve with interception tap
The kit contains two valves, one for immediate use and the other a replacement piece. If the safety valve needs to be replaced, the interception tap allows this to be done without having to drain the cooling circuit.
They are fitted on both the high pressure and low pressure sides, to discharge the overpressure in the event of abnormal values, and are calibrated at 20 bar (high pressure) - 16 bar (low pressure).

Compressor fuses or magnet circuit-breaker protections to be specified when placing the order

— Fans magnet-circuit breakers protection
— Auxiliary magnet circuit-breaker protection
— Pumps magnet-circuit breakers protection (versions with pumps)

ELECTRIC COMPONENTS

Electric Control Board

Contains the power section and the management of controls and safety devices.

Board itself

the electric control board can be accessed by removing the voltage. Act on the opening lever of the control board itself. This lever can be locked using one or more padlocks during maintenance interventions to prevent the machine being powered up accidentally.

Control board

Allows the complete control of the appliance.
For a More in-depth description please refer to the user Manual.

ELECTRONIC ADJUSTMENT

The electronic adjustment on TBA chillers is made up of a control board for every compressor connected to each other in a network and a control panel with display. For models with more compressors, the board controlling compressor n° 1 is the "MASTER" board, while the others are "SLAVE". Relative to the compressor that controls, transducers, loads and alarms are connected to every board, while only the machine general ones are connected to the "MASTER" board.

Microprocessor

— Remote on/off with voltage-free external contact.
— Multi-language menu
— Phase sequence control
— Separate control of the individual compressors
— Amperometric transformer
— Cumulative faults block signal
— Historical alarms function
— Daily/weekly programming
— Inlet/outlet water temperature display
— Alarms display
— Integral proportional regulation on the temperature of the output water
— Programmable timer function
— Function with double calibration point linked to an external contact
— Fan adjustment
— Can be interfaced with Modbus protocol (accessory)
— Pump/s control
— Compressors rotation management
— Analogue input from 4 to 20 mA
— External air temperature probe
— "Always Working" function In the case of critical conditions (e.g. an environmental temperature that is too high) the machine does not stop but can adjust itself and supply the maximum power in those conditions
— "Switching Histeresys" self-adapting work differential to always ensure the correct work times of the compressors even in systems with low water content or insufficient flow rate. This system decreases wear of the compressors
— AFFP "Anti-Freezing Fan Protection" system that periodically switches the fans on when external temperatures are very low.
— PDC "Pull Down Control" system to prevent the activation of power steps when the water temperature quickly approaches the set-point. Optimises machine functioning when working normally and in the presence of load variations, ensuring the best machine efficiency in all conditions.
— For further information please refer to the user manual.

HYDRAULIC DIAGRAMS

INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT TBA (00)

COMPONENTS PROVIDED AS STANDARD

1 Flooded shell & tube heat exchangers
2 Differential pressure switch
3 Water temperature sensors
4 Air vent valve
5 Drain valve

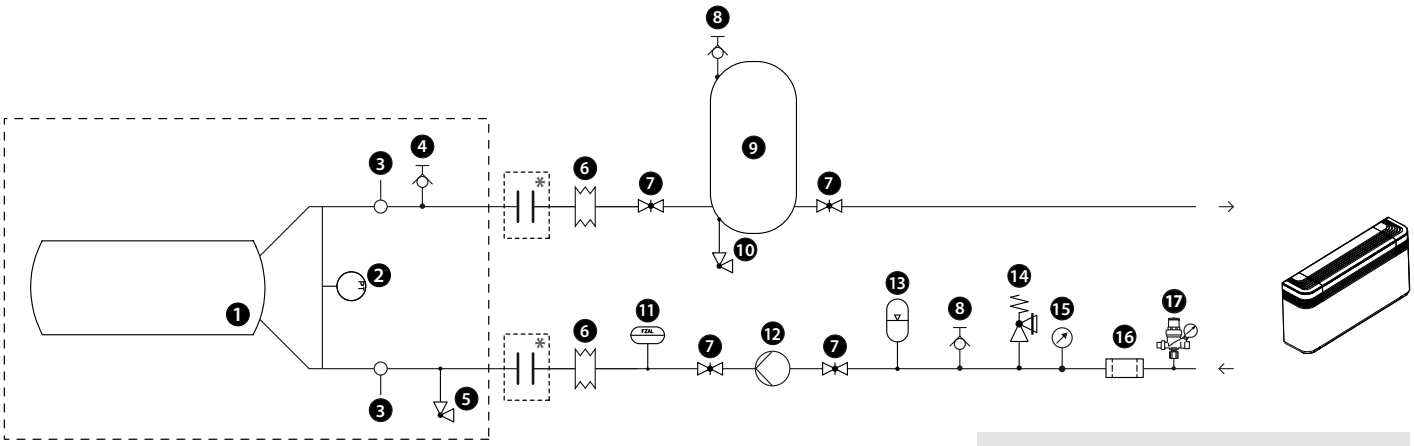
HYDRAULIC COMPONENTS RECOMMENDED EXTERNAL TO UNIT (RESPONSIBILITY OF THE INSTALLER)

6 Anti-vibration joints
7 Cut-off valve
8 Air vent valve
9 System buffer tank
10 Drain valve
11 Flow switch **(MANDATORY)**
12 Pump
13 Expansion vessel
14 Safety valve
15 Pressure gauges
16 Water filter **(MANDATORY)**
17 Automatic Filling Valve

ATTENTION! It is mandatory to install the flow switch and the water filter, in the hydraulic circuit upstream of the each heat exchanger. THE LACK OF INSTALLATION OF THESE COMPONENTS INVALIDATES THE WARRANTY.

WATER FEATURES

System: Chiller with shell and tube exchanger	
PH	6,8 - 8
Electric conductivity	<800 µS/cm
Total hardness (CaCO3)	<200 ppm
Total dissolved solids	<15000 ppm
Max solid particles dimension	0,5 mm
Max. glycol amount	50%
Iron (Fe)	<1 ppm
Copper (Cu)	<1 ppm
Alkalinity (CaCO3)	<100 ppm
Chloride ions (Cl-)	<150 ppm
Sulphate ions (SO42-)	<100 ppm
Sulphide ions (S-)	none
Ammonium ions (NH4+)	<1 ppm
Silica (SiO2)	<50 ppm
Silica (SiO2)	< 30ppm



**** Grooved joints supplied***

INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT TBA (VERSION WITH PUMPS - PA÷PJ / IA÷IJ)

COMPONENTS PROVIDED AS STANDARD

1 Flooded shell & tube heat exchangers
2 Differential pressure switch
3 Water temperature sensors
4 Air vent valve
5 Cut-off valve
6 Drain valve
7 Pump
8 Expansion vessel

HYDRAULIC COMPONENTS RECOMMENDED EXTERNAL TO UNIT (RESPONSIBILITY OF THE INSTALLER)

9 Anti-vibration joints
10 Cut-off valve
11 Air vent valve
12 System buffer tank
13 Drain valve
14 Flow switch **(MANDATORY)**
15 Water filter **(MANDATORY)**
16 Automatic Filling Valve

ATTENTION! It is mandatory to install the flow switch and the water filter, in the hydraulic circuit upstream of the each heat exchanger. THE LACK OF INSTALLATION OF THESE COMPONENTS INVALIDATES THE WARRANTY.

WATER FEATURES

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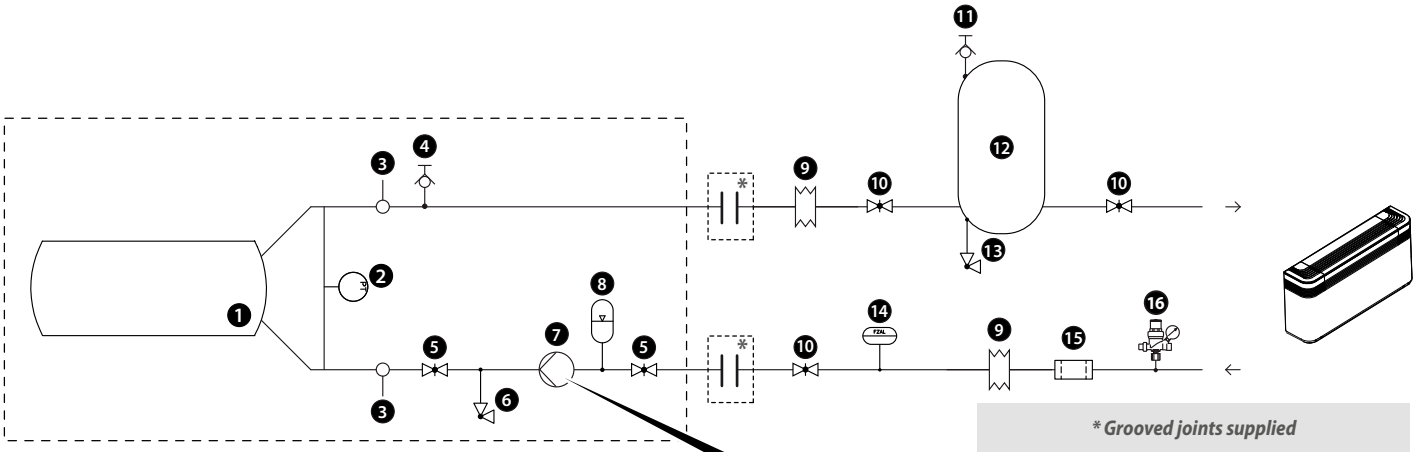
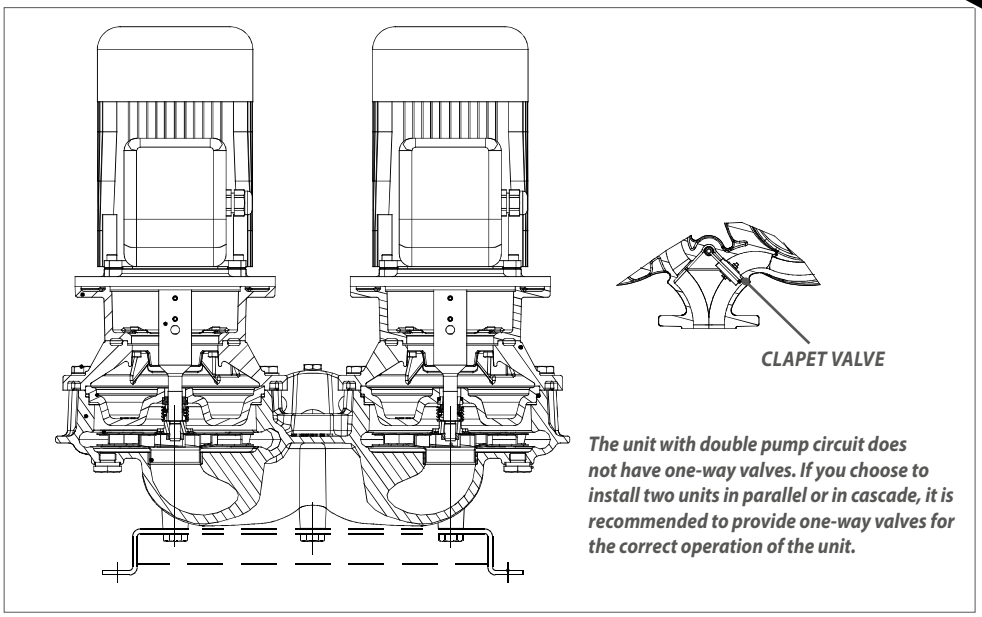
Total hardness (CaCO3)	<200 ppm
Total dissolved solids	<15000 ppm
Max solid particles dimension	0,5 mm
Max. glycol amount	50%
Iron (Fe)	<1 ppm
Copper (Cu)	<1 ppm
Alkalinity (CaCO3)	<100 ppm
Chloride ions (Cl-)	<150 ppm
Sulphate ions (SO42-)	<100 ppm
Sulphide ions (S-)	none
Ammonium ions (NH4+)	<1 ppm
Silica (SiO2)	<50 ppm
Silica (SiO2)	< 30ppm

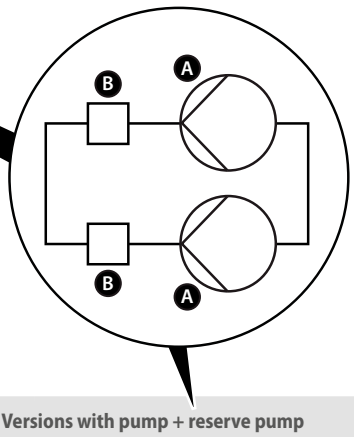


**** Grooved joints supplied***



CLAPET VALVE

The unit with double pump circuit does not have one-way valves. If you choose to install two units in parallel or in cascade, it is recommended to provide one-way valves for the correct operation of the unit.



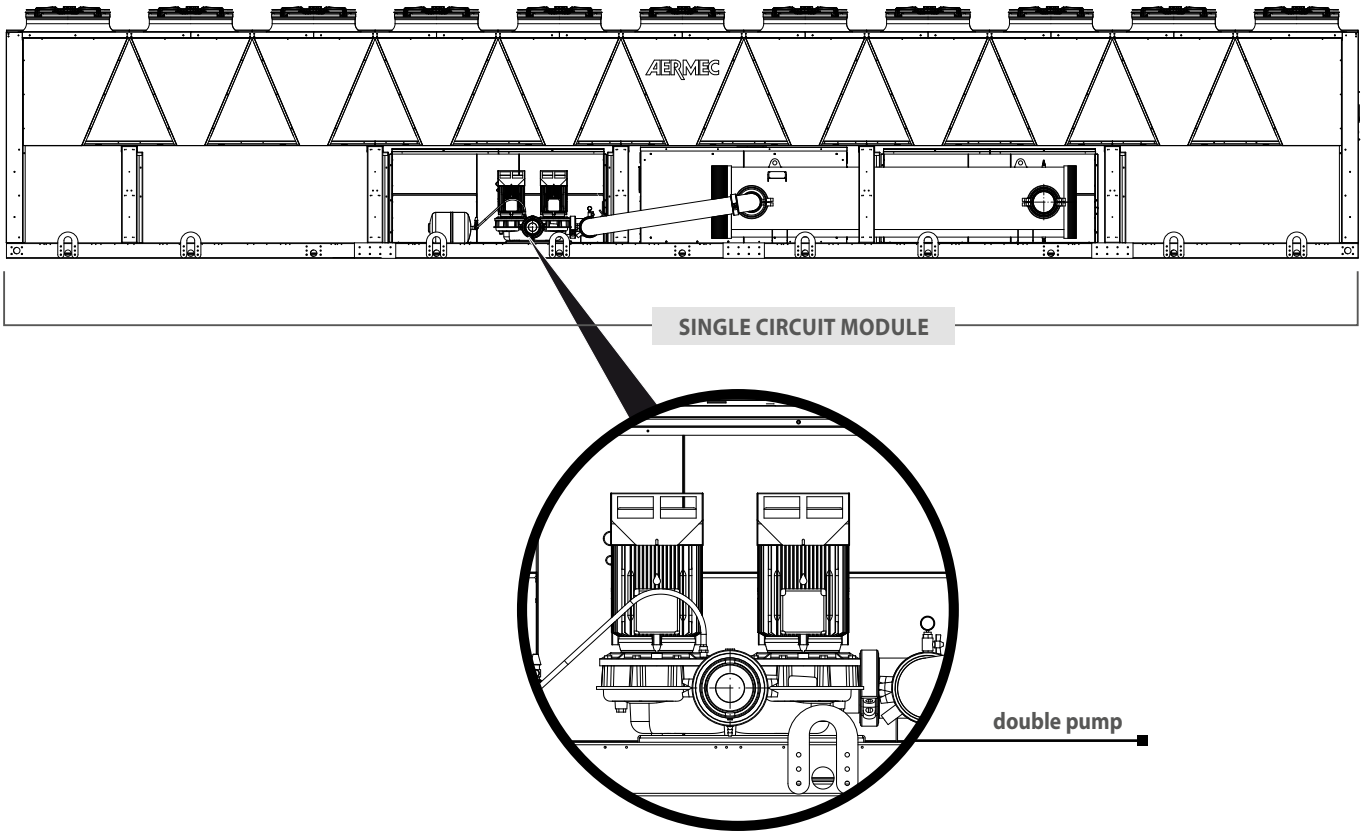
Versions with pump + reserve pump (DA÷DJ/JA÷JJ)

Versions with double pump, in parallel (TF÷TJ/ KF÷KJ)

A Pump
B Clapet valve

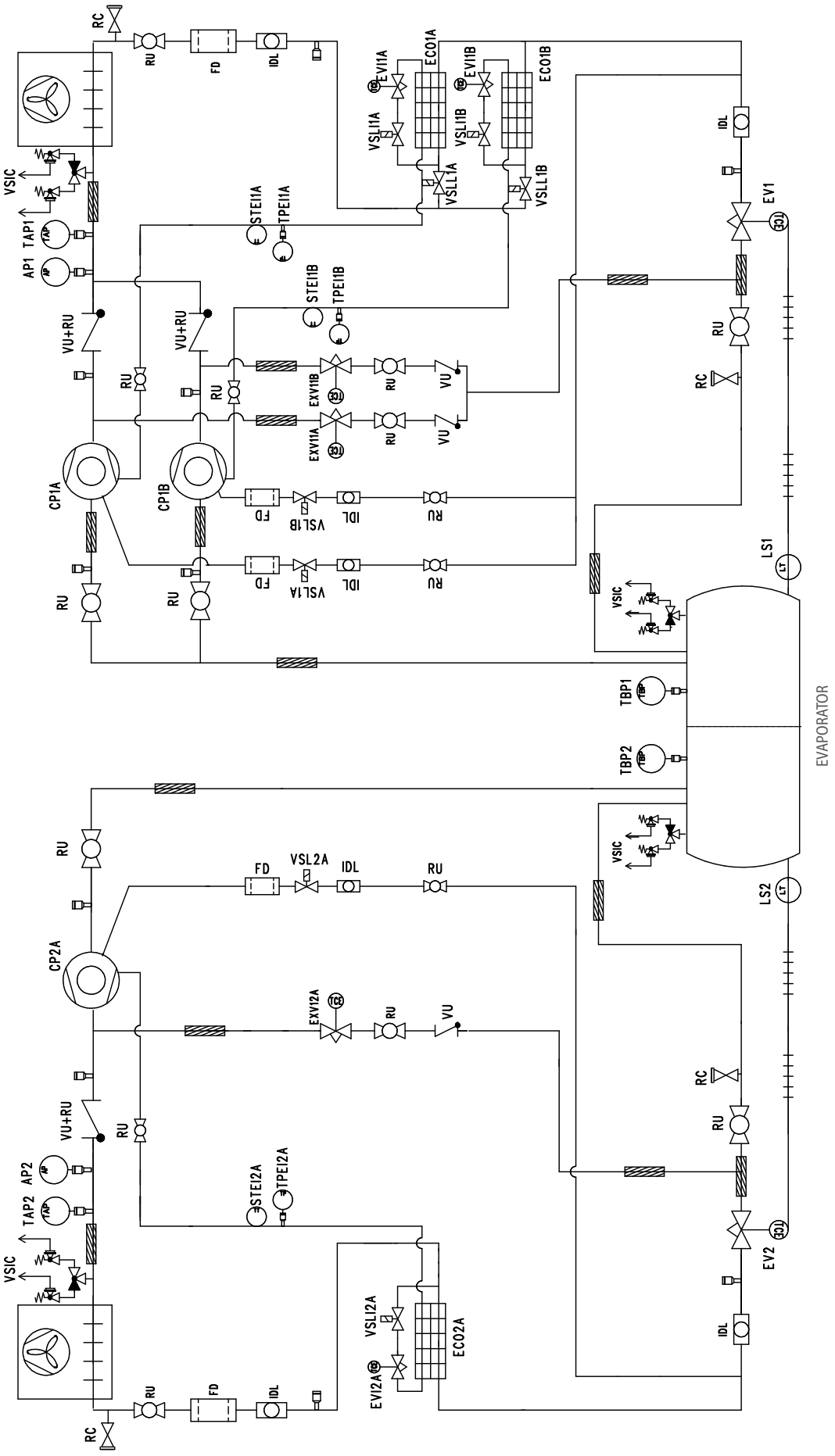
POSITION OF PUMPS IN PARALLEL - HYDRONIC KIT (TF÷TJ / KF÷KJ)

EXAMPLE OF UNIT WITH HYDRONIC KIT (TF÷TJ / KF÷KJ)

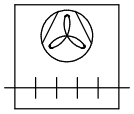
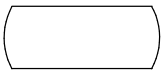
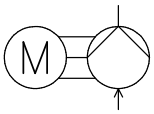


PRINCIPLE FUNCTIONING DIAGRAMS

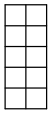
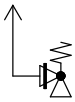
TBA 3320 A-E-U-N (2 CIRCUITS - 3 COMPRESSORS)



Key:

SYMBOL	SYMBOL NAME	FUNCTION
	AP	high pressure switch
	BATTERIA ALETTATA	finned heat exchanger
	COMPRESSORE	centrifugal compressor
	EV	electronic expansion valve
	EVAPORATORE ALLAGATO	flooded shell&tube evaporator
	EVI	vapour injection electronic expansion valve
	EXV1	staging valve *****
	FD	drier filter
	GV	victaulic connection
	IDL	sight glass
	ISOL	insulated pipe
	LINEE-REGOL	regulation line
	LS	level sensor
	MP	pump
	PDIFF	differential pressure switch
	RACC-DR_CF	Pressure connection
	RC	refrigerant charge spigot
	RCAR	System loading tap *****
	RS	changeover valve

Key:

SYMBOL	SYMBOL NAME	FUNCTION
	RSC	drain tap
	RU	tap valve
	PLATE HEAT EXCHANGER	brazed plate heat exchanger
	SF	air vent
	SFCW	water inlet temperature probe
	SIW	water inlet temperature probe
	STEI	injection electronic expansion valve temperature probe
	SUW	water outlet temperature probe
	TAP	pressure transducer
	TBP	low pressure transducer
	TPEI	injection electronic expansion valve pressure transducer
	V2V	Motorized Two-way valve *****
	VD	Diverter valve
	VESP	expansion vessel
	VSIC	safety valve
	VSL	solenoid valve
	VSLI	solenoid valve on the injection line
	VSLL	Liquid solenoid valve *****
	VU+RU	check and stop valve

ACCESSORIES

AER485P1
RS-485 interface for supervision systems with MODBUS protocol.

AER485P1 x n° 2
RS-485 interface for supervision systems with MODBUS protocol.

AERNET
The device allows the control, the management and the remote monitoring of a Chiller with a PC, smartphone or tablet using Cloud connection. AERNET works as Master while every unit connected is configured as Slave (max. 6 unit); also, with a simple click is possible to save a log file with all the connected unit datas in the personal terminal for post analysis.

MULTICHILLER_EVO
Control system for control, switch-on and switch-off of single chillers, in a plant where multiple units are installed in parallel, always ensuring constant flow to the evaporators.

PGD1
Allows you to control the unit at a distance.

AVX
Spring anti-vibration supports.

Factory fitted accessories

XLATB
This kit allows to extend the working range of the unit from 0 °C to -10 °C ambient temperature, thanks to an additional electric heater and a special insulating material for the heat exchanger.

GP_T
Anti-intrusion grid kit

ACCESSORIES COMPATIBILITY

Mod. TBA		vers.	1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
AER485P1		AEUN	•	•	•		•	•		•	•	
AER485P1 x n°2 (1)		AEUN				•			•			•
AERNET		AEUN	•	•	•	•	•	•	•	•	•	•
MULTICHILLER_EVO		AEUN	•	•	•	•	•	•	•	•	•	•
PGD1		AEUN	•	•	•	•	•	•	•	•	•	•
AVX		AEUN	AVX (2)	AVX (2)	AVX (2)	AVX (2)	AVX (2)	AVX (2)	AVX (2)	AVX (2)	AVX (2)	AVX (2)
Factory fitted accessories												
XLATB		A/E	XLATB1	XLATB3	XLATB5	XLATB6	XLATB7	XLATB6	XLATB7	XLATB7	XLATB8	XLATB8
		U/N	XLATB2	XLATB5	XLATB5	XLATB5	XLATB7	XLATB6	XLATB6	XLATB7	XLATB8	XLATB8
GP_T		A/E	GP3T	GP4T	GP5T	GP6T	GP7T	GP8T	GP9T	GP10T	GP10T	GP11T
		U/N	GP3T	GP4T	GP6T	GP7T	GP8T	GP9T	GP10T	GP11T	GP11T	GP11T

(1) x n°_ Indicates the quantity of accessories to match.
(2) Contact the factory

SELECTION CRITERIA OF THE HEAT EXCHANGERS ACCORDING TO THE PLACE OF INSTALLATION OF THE UNIT

The guide provides advice for applications. Although recommendations are given, all the details about the real world application of our products cannot be fully covered in this document.

For these reasons, this section contains the basic warnings and precautions to be taken into account in general, it being understood that:
- **The final choice of the type of exchanger according to the place of installation is left to the client (or to the professional appointed by him).**
- **In any case, it is recommended to wash the coils with adequate frequency (a maximum time interval of three months is recommended, shorter in conditions of particularly dirty and aggressive atmospheres) to preserve their condition and ensure the proper functioning of the unit.**

Potentially corrosive outdoor environments include areas near coasts, industrial sites, densely populated urban areas, certain rural areas or a combination of these environments. Other factors, including the presence of effluent gas, sewage vents or open sewage systems and the exhaust of diesel engines can all be harmful for the microchannel coil.
The purpose of this application guide is to provide general information on the mechanisms of corrosion and corrosive environments.

SEA COAST ENVIRONMENTS

Coastal or marine environments are characterized by the abundance of sodium chloride (salt) which is carried by sea spray, mist, or fog. Most importantly, this salt water can be carried more than several miles by ocean breezes and tidal currents. It's not uncommon to experience salt-water contamination as far as 10km from the coast.
For this reason, it may be necessary to protect the exchangers from electrolytes of marine origin through the appropriate choice of materials and / or appropriate protective treatment.

INDUSTRIAL ENVIRONMENTS

Industrial applications are associated with several different conditions that can potentially produce a variety of atmospheric emissions.
Contaminants from sulphur and nitrogen oxides are most often linked to high-density urban environments. The combustion of coal oils and fuel oils releases sulphur oxides (SO_2, SO_3) and nitrogen oxides (NO_x) into the atmosphere. These gases accumulate in the atmosphere and return to the ground as acid rain or low pH dew.
Industrial emissions are not only potentially corrosive: many industrial dust particles can be loaded with harmful components such as metal oxides, chlorides, sulphates, sulfuric acid, carbon and carbon compounds.
In the presence of oxygen, water or high humidity environments, these particles can be extremely corrosive and in several forms, including general and localised corrosion, such as pitting and anthill.

MIX OF SEASIDE AND INDUSTRIAL ENVIRONMENTS

Sea mist loaded with salt, associated with the harmful emissions of an industrial environment, poses a serious risk.
The combined effects of the salt loaded mist and in-dustrial emissions accelerate corrosion.
Within the manufacturing plants, corrosive gas may result from the processing of chemicals or by the typical industrial processes used in manufacturing.
Potential sources of risk to be considered are open sewage systems, exhaust vents, diesel engine exhaust, emissions from heavy traffic, landfills, aircraft and ocean-going ship engine exhaust, industrial production, chemical treatment facilities (cooling towers in the vicinity) and fossil fuel power plants.

URBAN ENVIRONMENTS

Densely populated areas generally have high levels of emissions of motor vehicles and increases in duel use for heating buildings.
Both conditions elevate sulfur oxide (SO_x) and nitrogen oxide (NO_x) concentrations.
Corrosive atmospheres may even occur in some closed areas, such as facilities with swimming pools and water treatment systems.
It is advisable to pay particular attention to the positioning of the units if it occurs in the immediate vicinity of these places, and to avoid that they are installed in the vicinity of outlets for the expulsion of air coming from them, or in any case exposed to such atmospheres.
Corrosion severity in this environment is a function of the pollution levels, which in turn depend on several factors including population density in the area.
Any equipment installed in locations immediately adjacent to diesel engine exhausts, incinerator flues, fuel-fired boiler flues, or areas exposed to fossil fuel emissions shall be considered subject to the same measures as an industrial application.

RURAL ENVIRONMENTS

Rural environments may contain high levels of pollution from ammonia and nitrogen products from animal excrements, fertilizers and high concentration of diesel engine exhaust. The approach to these environments must be entirely similar to that of industrial environments.
Local weather conditions have a major role in the concentration or disper-sion of outdoor gaseous contaminants.
Thermal inversions can trap pollutants, thereby producing serious air pollution problems.

ADDITIONAL TIPS

Although each of the above corrosive environments can be detrimental to the life of the heat exchanger, several additional factors must be considered before choosing the final design.
The local climate surrounding the site of application may be influenced by the presence of:
- wind
- dust
- road salts
- swimming pools
- diesel engines discharge / traffic
- Localised mist
- cleaning agents for domestic use
- Sewage system outlets
- many other separate contaminants

Even within 3-5 km from these particular local climates a normal environment with moderate characteristics can be classified as an environment that requires preventive corrosion measures. When these factors are directly and immediately part of the environment, their influence is further aggravating.
Only in the absence of potentially risky situations such as those indicated above can an environment be considered moderate.

Application	Tip
Severe environments	Coils with suitable protection
Moderate environments	Standard coil °

BASIC PRINCIPLES ON MICROCHANNEL COIL CORROSION

The main material in Aermec heat exchangers is aluminium.
Aluminum is a very reactive metal, which is easily oxidized on its surface. As long as this hard layer of aluminum oxide remains intact, the aluminum at the base will remain resistant to corrosion (unlike other materials, such as steel, where the oxide layer peels off the surface and flakes off, allowing the constant attack of the underlying metal).
However, aggressive environments can damage the oxide layer, which may not regenerate as quickly as necessary to provide the product with sufficient protection.
These harsh environments are typified by very high or very low pH levels.
Normally, aluminum's protective oxide layer is generally stable in the pH range of 4.5 to 8.5; the lack of exposure to excessively acidic or basic pH conditions is not in itself sufficient to exclude the need for appropriate protective treatments on the batteries.
The presence of salt (associated with marine environments) as well as the presence of other aggressive substances can in fact induce widespread or localized galvanic corrosion (pitting or anthill corrosion).

OTHER RISK FACTORS FOR CORROSION

The principal cause of corrosion is elevated humidity and/or temperatures in the presence of contaminant gases. These conditions alone, or in combination, accelerate the natural corrosion process in metals.

Humidity

Moisture in air can be considered the lifeblood of galvanic corrosion. A galvanic corrosion cell requires an electrolyte or current carrying media, to reach a dynamic state. The electrolyte can be water or any water-soluble substance with good conducting properties. Moisture in the air is one such electrolyte. Humid air contaminated with corrosive gasses further accelerates the corrosion rate as the air's current carrying otential increases.

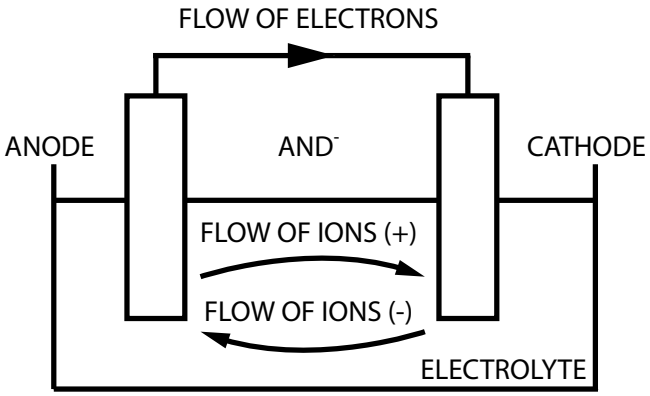
Temperature

Chemical reactions generally depend on the temperature, for reactions that involve corrosion of aluminum by an increase in temperature, faster reaction frequencies usually arise.

Corrosive gases

Not all gases cause corrosion. Specifically, we are concerned with three types of gases:
— Acidic gases, such as hydrogen sulfide, sulfur oxides, chlorides, hydrogen fluoride (HF) and nitrogen oxides;
— Caustic gases, such as ammonia;
— Oxidizing gases, such as ozone

■ *Of the gases that can cause corrosion, the acidic gases are typically the most harmful.*



CLEANING MICRO-CHANNEL COIL

Keeping the surfaces of the microchannel coils clean is essential to ensure the correct operation of the unit and to avoid punctures on the coil with the consequent loss of refrigerant gas which would lead to the replacement of the coil itself.

⚠ **WARNING Damage to the coil due to neglect or lack of or poor cleaning is not covered by the warranty.**

Dirt, grease, oil, and other foreign material must be removed periodically from the surface of the battery according to the following recommendations.
Required elements:
— Personal protective equipment
— Hot water
— High-pressure washing
Procedure:
Use a high-pressure washer with a large cast and enough force to remove all foreign material, proceed with care to avoid damage and possible wear of the louvers.
Lastly, also rinse the carpentry and the fans thoroughly to be sure that all impurities have been removed.

■ *Aermecwe assume no liability for the completeness of the information contained in this document.*

PERFORMANCE SPECIFICATIONS

TBA			1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
Performance in cooling mode 12 °C / 7 °C [1]												
Cooling capacity	**A**	kW	330,7	437,3	633,9	741,5	871,9	974,8	1087,0	1155,9	1256,9	1404,1
	E	kW	330,7	437,3	633,9	741,5	871,9	974,8	1087,0	1155,9	1256,9	1404,1
	U	kW	328,1	443,8	633,5	758,5	876,4	985,0	1088,0	1154,9	1256,9	1342,4
	N	kW	328,1	443,8	633,5	758,5	876,4	985,0	1088,0	1154,9	1256,9	1342,4
Cooling capacity	**A**	kW	95,3	125,9	183,0	214,9	254,8	279,5	314,9	334,9	369,1	413,3
	E	kW	95,3	125,9	183,0	214,9	254,8	279,5	314,9	334,9	369,1	413,3
	U	kW	92,3	124,4	178,8	213,2	245,5	275,4	306,8	326,3	358,1	386,6
	N	kW	92,3	124,4	178,8	213,2	245,5	275,4	306,8	326,3	358,1	386,6
Total input current (when cold)	**A**	A	151	201	286	346	417	447	502	547	592	668
	E	A	151	201	286	346	417	447	502	547	592	668
	U	A	146	201	281	342	402	437	487	523	583	628
	N	A	146	201	281	342	402	437	487	523	583	628
EER	**A**	W/W	3,47	3,47	3,46	3,45	3,42	3,49	3,45	3,45	3,41	3,4
	E	W/W	3,47	3,47	3,46	3,45	3,42	3,49	3,45	3,45	3,41	3,4
	U	W/W	3,56	3,57	3,54	3,56	3,57	3,58	3,55	3,54	3,51	3,47
	N	W/W	3,56	3,57	3,54	3,56	3,57	3,58	3,55	3,54	3,51	3,47
System side water flow rate	**A**	l/h	56903	75228	109011	127504	149890	167604	186876	198728	216075	241381
	E	l/h	56903	75228	109011	127504	149890	167604	186876	198728	216075	241381
	U	l/h	56452	76308	108940	130424	150669	169356	187070	198556	216075	230760
	N	l/h	56452	76308	108940	130424	150669	169356	187070	198556	216075	230760
System side pressure drops	**A**	kPa	60	55	48	42	30	52	45	54	36	42
	E	kPa	60	55	48	42	30	52	45	54	36	42
	U	kPa	51	25	49	50	30	53	56	53	36	38
	N	kPa	51	25	49	50	30	53	56	53	36	38

1 Data 14511:2018; Water temperature system side (in/out) 12°C/7°C; Outdoor air temperature 35°C

ENERGY INDICES (REG. 2016/2281 EU)

Size			1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
SEER - (EN14825:2018) 12/7 with inverter fans (1)												
SEER	A,E	W/W	5,15	5,23	5,48	5,25	5,54	5,54	5,51	5,49	5,57	5,35
	N,U	W/W	5,35	5,41	5,60	5,48	5,76	5,80	5,62	5,71	5,73	5,62
Seasonal efficiency	A,E	%	203,1%	206,0%	216,0%	206,8%	218,4%	218,4%	217,5%	216,5%	219,8%	211,0%
	N,U	%	211,0%	213,5%	221,0%	216,1%	227,3%	229,1%	221,9%	225,4%	226,3%	221,6%
SEPR - (EN14825: 2018) High temperature with inverter fans (2)												
SEPR	A,E	W/W	6,31	6,65	6,11	6,32	6,41	6,13	6,26	6,33	6,28	6,12
	N,U	W/W	6,47	6,61	6,52	6,80	6,49	6,62	6,57	6,50	6,47	6,40

(1) Calculation performed with FIXED water flow rate and VARIABLE outlet temperature.
(2) Calculation performed with FIXED water flow rate.

GENERAL SPECIFICATIONS

TBA			1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
Eletrical data												
Maximum current (F.L.A.)	**A**	A	165	249	319	404	488	483	568	727	727	797
	E	A	165	249	319	404	488	483	568	727	727	797
	U	A	165	249	329	413	498	493	577	737	737	797
	N	A	165	249	329	413	498	493	577	737	737	797
Peak current (L.R.A.)	**A**	A	36	45	200	210	305	374	470	565	565	720
	E	A	36	45	200	210	305	374	470	565	565	720
	U	A	36	45	210	305	315	384	479	575	575	720
	N	A	36	45	210	305	315	384	479	575	575	720
Compressors												
Type							Centrifugal					
N° compressors	**all**	n°	1	1	2	2	2	3	3	3	3	4
N° circuits	**all**	n°	1	1	1	2	1	1	2	1	1	2
Partialisation (of the unit) with electronic thermostatic valve	**A**	%	30-100	40-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100
	E	%	30-100	40-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100
	U	%	30-100	40-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100
	N	%	30-100	40-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100	15-100
Refrigerant												
Type							R134a					
Refrigerant load	**A**	kg	81	166	152	243	285	264	306	317	387	398
	E	kg	81	166	152	243	285	264	306	317	387	398
	U	kg	81	166	163	254	296	275	317	328	398	398
	N	kg	81	166	163	254	296	275	317	328	398	398
System side heat exchanger												
Type							Shell and tube					
Number	**all**	n°	1	1	1	1	1	1	1	1	1	1
Min. flow rate	**A**	l/h	22730	25515	51345	64500	90935	77325	94775	90935	106280	112800
	E	l/h	22730	25515	51345	64500	90935	77325	94775	90935	106280	112800
	U	l/h	25800	51345	51345	62465	90935	77325	81660	90935	106280	112800
	N	l/h	25800	51345	51345	62465	90935	77325	81660	90935	106280	112800
Max. flow rate	**A**	l/h	61370	76544	138625	174150	245515	208770	255885	245515	286955	304550
	E	l/h	61370	76544	138625	174150	245515	208770	255885	245515	286955	304550
	U	l/h	69660	138625	138625	168655	245515	208770	220480	245515	286955	304550
	N	l/h	69660	138625	138625	168655	245515	208770	220480	245515	286955	304550
Hydraulic connections type							Grooved joints					
Hydraulic connections (in/out) (version 00)	**A**	ø	3"	4"	6"	6"	6"	6"	6"	6"	8"	8"
	E	ø	3"	4"	6"	6"	6"	6"	6"	6"	8"	8"
	U	ø	6"	6"	6"	6"	6"	6"	6"	6"	8"	8"
	N	ø	6"	6"	6"	6"	6"	6"	6"	6"	8"	8"
Hydraulic connections (in/out) (versions PA÷KJ)	**A**	ø	3"	4"	4"	5"	5"	5"	5"	6"	6"	6"
	E	ø	3"	4"	4"	5"	5"	5"	5"	6"	6"	6"
	U	ø	3"	4"	4"	5"	5"	5"	5"	6"	6"	6"
	N	ø	3"	4"	4"	5"	5"	5"	5"	6"	6"	6"
Unit water content												
Water content	**A**	l	66	65	129	176	251	197	251	251	336	282
	E	l	66	65	129	176	251	197	251	251	336	282
	U	l	80	129	129	147	251	197	208	251	336	282
	N	l	80	129	129	147	251	197	208	251	336	282
Trace heating as standard	**all**	n°/kW	1/0,25	1/0,25	1/0,25	1/0,25	1/0,25	1/0,25	1/0,25	1/0,25	1/0,25	1/0,25
Expansion vessel												
Expansion vessel (PA÷KJ)	**A**	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25
	E	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25
	U	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25
	N	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25

GENERAL SPECIFICATIONS

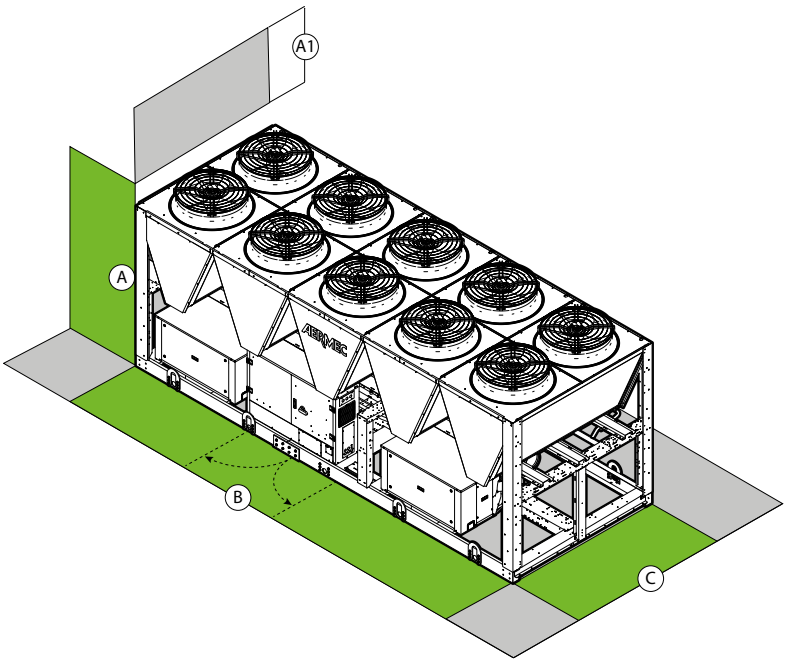
TBA			1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
Standard fans												
Type							Axial					
Number	**A**	n°	6	8	10	12	14	16	18	20	20	22
	E	n°	6	8	10	12	14	16	18	20	20	22
	U	n°	6	8	12	14	16	18	20	22	22	22
	N	n°	6	8	12	14	16	18	20	22	22	22
Air flow rate	**A**	m^3/h	112920	150560	188200	225840	263480	301120	338760	376400	376400	414040
	E	m^3/h	112920	150560	188200	225840	263480	301120	338760	376400	376400	414040
	U	m^3/h	112920	150560	225840	263480	301120	338760	376400	414040	414040	414040
	N	m^3/h	112920	150560	225840	263480	301120	338760	376400	414040	414040	414040
Useful static pressure	**A**	Pa	0	0	0	0	0	0	0	0	0	0
	E	Pa	0	0	0	0	0	0	0	0	0	0
	U	Pa	0	0	0	0	0	0	0	0	0	0
	N	Pa	0	0	0	0	0	0	0	0	0	0
Total Input current	**A**	A	15,9	21,2	26,5	31,8	37,1	42,4	47,7	53,0	53,0	58,3
	E	A	15,9	21,2	26,5	31,8	37,1	42,4	47,7	53,0	53,0	58,3
	U	A	15,9	21,2	31,8	37,1	42,4	47,7	53,0	58,3	58,3	58,3
	N	A	15,9	21,2	31,8	37,1	42,4	47,7	53,0	58,3	58,3	58,3
Total input power	**A**	kW	10,0	13,4	16,7	20,0	23,4	26,7	30,1	33,4	33,4	36,7
	E	kW	10,0	13,4	16,7	20,0	23,4	26,7	30,1	33,4	33,4	36,7
	U	kW	10,0	13,4	20,0	23,4	26,7	30,1	33,4	36,7	36,7	36,7
	N	kW	10,0	13,4	20,0	23,4	26,7	30,1	33,4	36,7	36,7	36,7
Sound data												
Sound power level (Eurovent)	**A**	dB(A)	88,3	89,9	90,8	92,5	93,0	92,8	93,9	95,3	95,3	95,3
	E	dB(A)	82,3	83,9	84,8	86,5	87,0	86,8	87,9	89,3	89,3	89,3
	U	dB(A)	88,3	90,0	91,3	92,8	93,1	93,1	94,1	95,5	95,5	95,3
	N	dB(A)	82,3	84,0	85,3	86,8	87,1	87,1	88,1	89,5	89,5	89,3
Sound pressure level (10 m)	**A**	dB(A)	56,1	57,5	58,3	59,9	60,2	59,9	60,9	62,2	62,2	62,1
	E	dB(A)	50,1	51,5	52,3	53,9	54,2	53,9	54,9	56,2	56,2	56,1
	U	dB(A)	56,1	57,6	58,7	60,0	60,2	60,1	61,0	62,3	62,3	62,1
	N	dB(A)	50,1	51,6	52,7	54,0	54,2	54,1	55,0	56,3	56,3	56,1
Sound pressure level (1 m)	**A**	dB(A)	68,7	69,7	70,1	71,3	71,4	70,8	71,6	72,7	72,7	72,4
	E	dB(A)	62,7	63,7	64,1	65,3	65,4	64,8	65,6	66,7	66,7	66,4
	U	dB(A)	68,7	69,8	70,1	71,2	71,1	70,8	71,5	72,6	72,6	72,4
	N	dB(A)	62,7	63,8	64,1	65,2	65,1	64,8	65,5	66,6	66,6	66,4

Sound power Aermec determines sound power values in agreement with the 9614-2 Standard, in compliance with that requested by Eurovent certification.
Sound Pressure Sound pressure measured in free field conditions with reflective surface (directivity factor Q=2) at 10mt distance from external surface of unit, in compliance with ISO 3744 regulations.

Sound data (with maximum fan speed)												
Sound power level MAX.	**A**	dB(A)	90,9	91,9	93,3	94,6	94,9	95,3	96,1	97,2	97,2	97,3
	E	dB(A)	85,9	86,9	88,3	89,6	89,9	90,3	91,1	92,2	92,2	92,3
	U	dB(A)	90,9	92,0	93,9	95,1	95,2	95,7	96,5	97,1	97,5	97,3
	N	dB(A)	85,9	87,0	88,9	90,1	90,2	90,7	91,5	92,1	92,5	92,3

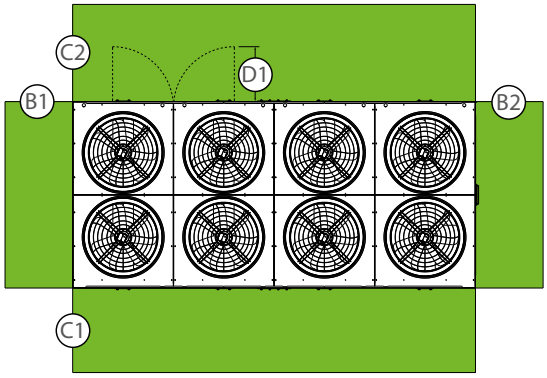
GENERAL SPECIFICATIONS

TBA			1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
Dimensions + Weights												
Height (A)	**all**	mm	2450	2450	2450	2450	2450	2450	2450	2450	2450	2450
Width (C)	**all**	mm	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Depth (B)	**A**	mm	3570	4760	5950	7140	8330	9520	10710	11900	11900	13090
	E	mm	3570	4760	5950	7140	8330	9520	10710	11900	11900	13090
	U	mm	3570	4760	7140	8330	9520	10710	11900	13090	13090	13090
	N	mm	3570	4760	7140	8330	9520	10710	11900	13090	13090	13090

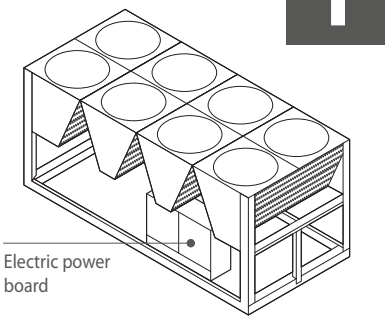


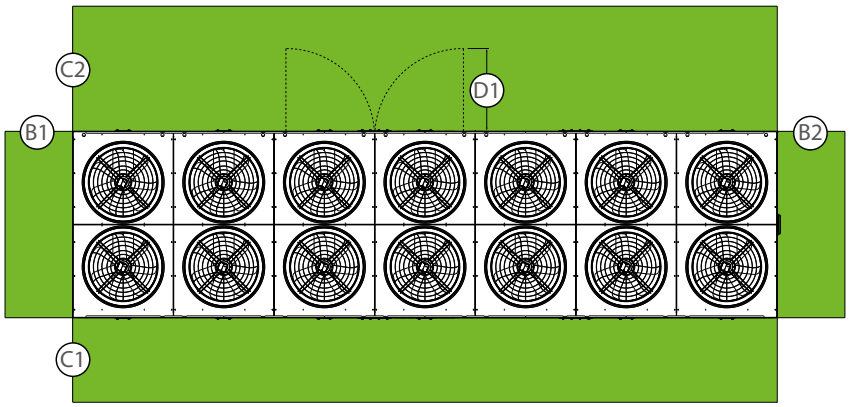
MINIMUM TECHNICAL SPACES

Type of board

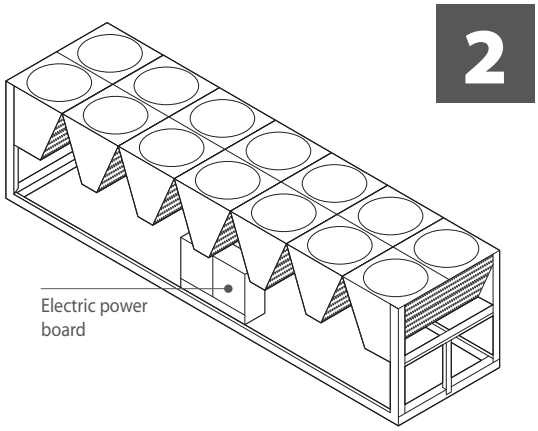


1





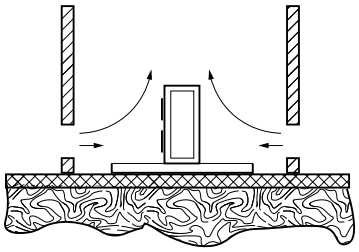
2



Unit	Vers.	V-block	Fans	Panel type	A1	B1	B2	C1	C2	D1
TBA		n°	n°		mm	mm	mm	mm	mm	mm
1300	A	3	6	1	3000	800	800	1000	1150	650
	E	3	6	1	3000	800	800	1000	1150	650
	U	3	6	1	3000	800	800	1000	1150	650
	N	3	6	1	3000	800	800	1000	1150	650
1350	A	4	8	1	3000	800	800	1000	1150	650
	E	4	8	1	3000	800	800	1000	1150	650
	U	4	8	1	3000	800	800	1000	1150	650
	N	4	8	1	3000	800	800	1000	1150	650
2300	A	5	10	1	3000	800	800	1000	1150	650
	E	5	10	1	3000	800	800	1000	1150	650
	U	6	12	1	3000	800	800	1000	1150	650
	N	6	12	1	3000	800	800	1000	1150	650
2325	A	6	12	1	3000	800	800	1000	1150	650
	E	6	12	1	3000	800	800	1000	1150	650
	U	7	14	1	3000	800	800	1000	1150	650
	N	7	14	1	3000	800	800	1000	1150	650
2350	A	7	14	1	3000	800	800	1000	1150	650
	E	7	14	1	3000	800	800	1000	1150	650
	U	8	16	1	3000	800	800	1000	1150	650
	N	8	16	1	3000	800	800	1000	1150	650
3300	A	8	16	2	3000	800	800	1000	1480	980
	E	8	16	2	3000	800	800	1000	1480	980
	U	9	18	2	3000	800	800	1000	1480	980
	N	9	18	2	3000	800	800	1000	1480	980
3320	A	9	18	2	3000	800	800	1000	1480	980
	E	9	18	2	3000	800	800	1000	1480	980
	U	10	20	2	3000	800	800	1000	1480	980
	N	10	20	2	3000	800	800	1000	1480	980
3340	A	10	20	2	3000	800	800	1000	1480	980
	E	10	20	2	3000	800	800	1000	1480	980
	U	11	22	2	3000	800	800	1000	1480	980
	N	11	22	2	3000	800	800	1000	1480	980
3350	A	10	20	2	3000	800	800	1000	1480	980
	E	10	20	2	3000	800	800	1000	1480	980
	U	11	22	2	3000	800	800	1000	1480	980
	N	11	22	2	3000	800	800	1000	1480	980
4325	A	11	22	2	3000	800	800	1000	1480	980
	E	11	22	2	3000	800	800	1000	1480	980
	U	11	22	2	3000	800	800	1000	1480	980
	N	11	22	2	3000	800	800	1000	1480	980

OPERATING RANGE

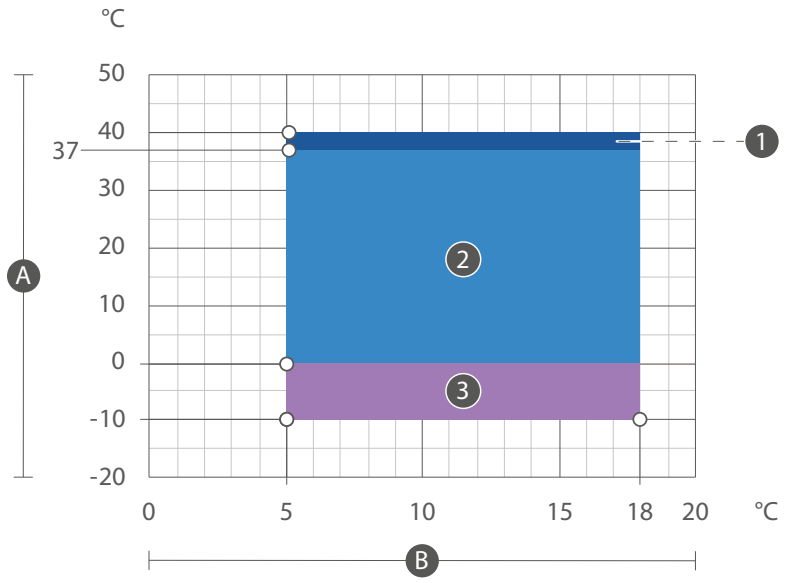
The units, in standard configuration, are not suitable for installation in salty environment.
The values indicated in the table refer to the min. and max. limits of the unit. For further information, valid for ΔT = 5°C.
If the unit operates beyond the operational limits, we recommend you first contact our technical-sales service.
Note: If the unit is installed in particularly windy areas, it is mandatory to have windbreak barriers to prevent unit malfunctions. It should be installed if wind speed is above 2.5 m/s



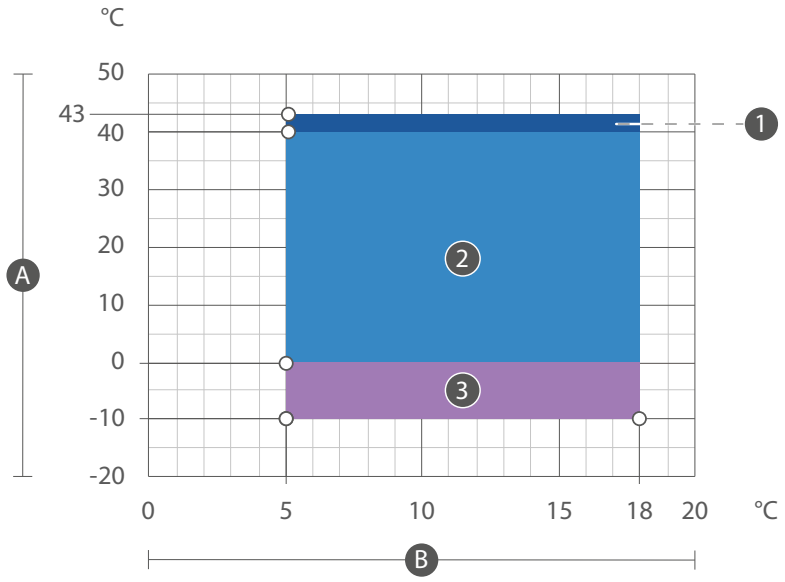
Windbreak
recommended with wind above 2,5 m²/s

SIZES: 1300-2300-3300

VERSIONS A - E



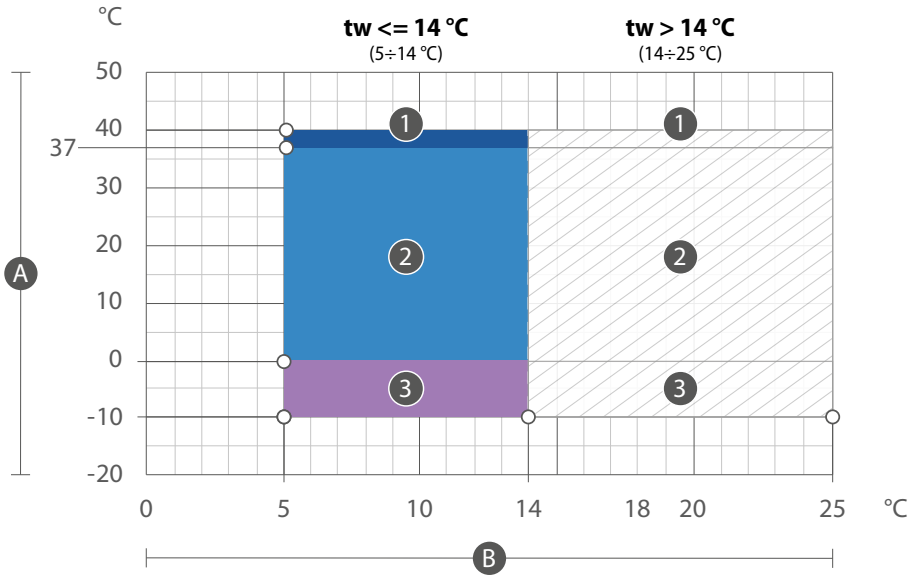
VERSIONS U - N



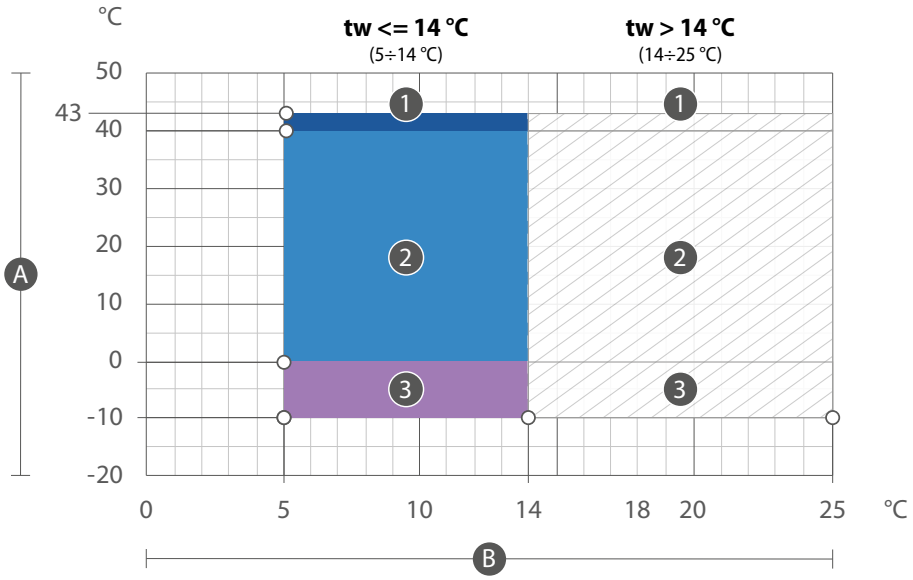
A - Outside air temperature °C
B - Outlet water temperature °C (tw)

1 - Operation with maximum fan speed **(refer to the MAX. sound power in the "General technical data" chapter)**
2 - Standard operation **(refer to the sound power (Eurovent) in the "General technical data" chapter)**
3 - Operation with XLATB

VERSIONS A - E



VERSIONS U - N

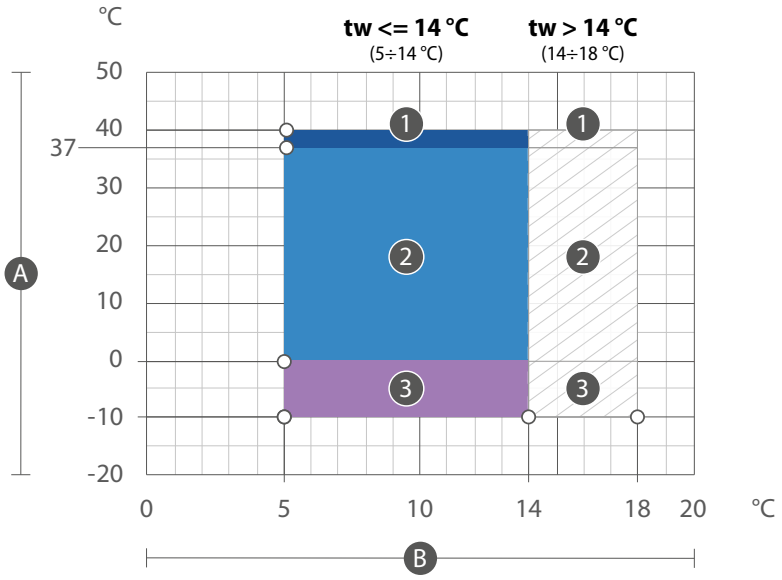


WARNING: for water temperatures higher than 14°C at the evaporator outlet, refer to the Magellano selection program.

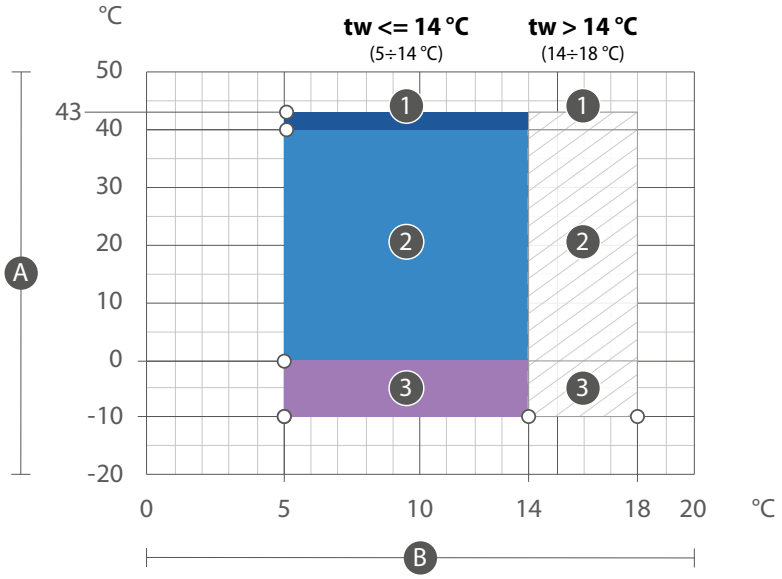
A - Outside air temperature °C
B - Outlet water temperature °C (tw)

1 - Operation with maximum fan speed **(refer to the MAX. sound power in the "General technical data" chapter)**
2 - Standard operation **(refer to the sound power (Eurovent) in the "General technical data" chapter)**
3 - Operation with XLATB

VERSIONS A - E



VERSIONS U - N



⚠ ***WARNING: for water temperatures higher than 14°C at the evaporator outlet, refer to the Magellano selection program.***

A - Outside air temperature °C
B - Outlet water temperature °C (tw)

1 - Operation with maximum fan speed **(refer to the MAX. sound power in the "General technical data" chapter)**
2 - Standard operation **(refer to the sound power (Eurovent) in the "General technical data" chapter)**
3 - Operation with XLATB

PRESSURE DROPS

VERSIONS WITHOUT HYDRONIC KIT 00

The water flow rate is calculated with the following formula:
Q = Pc x 860 / ΔT.
Q Water flow rate (l/h)
Pc Cooling capacity (kW)
ΔT Water heat drop (°C)
Pressure drops are calculated with the following formula:
Δp = K x (Q)2
Δp Pressure drops (kPa)
Coefficient for the various sizes and versions
Q Water flow rate (l/h)

Versions without hydronic kit 00				
Mod.	Ver.	System side heat exchanger		
TBA		K	Q min	Q max
			l/h	l/h
1300	A	1,8524E-08	22730	61370
1350		9,6779E-09	25515	76544
2300		3,9972E-09	51345	138625
2325		2,5527E-09	64500	174150
2350		1,3326E-09	90935	245515
3300		1,8444E-09	77325	208770
3320		1,2886E-09	94775	255885
3340		1,3699E-09	90935	245515
3350		7,6850E-10	106280	286955
4325		7,1982E-10	112800	304550
1300	E	1,8524E-08	22730	61370
1350		9,6779E-09	25515	76544
2300		3,9972E-09	51345	138625
2325		2,5527E-09	64500	174150
2350		1,3326E-09	90935	245515
3300		1,8444E-09	77325	208770
3320		1,2886E-09	94775	255885
3340		1,3699E-09	90935	245515
3350		7,6850E-10	106280	286955
4325		7,1982E-10	112800	304550
1300	U	1,6141E-08	25800	69660
1350		4,2900E-09	51345	138625
2300		4,1465E-09	51345	138625
2325		2,9335E-09	62465	168655
2350		1,3325E-09	90935	245515
3300		1,8444E-09	77325	208770
3320		1,6019E-09	81660	220480
3340		1,3327E-09	90935	245515
3350		7,6850E-10	106280	286955
4325		7,0685E-10	112800	304550
1300	N	1,6141E-08	25800	69660
1350		4,2900E-09	51345	138625
2300		4,1465E-09	51345	138625
2325		2,9335E-09	62465	168655
2350		1,3325E-09	90935	245515
3300		1,8444E-09	77325	208770
3320		1,6019E-09	81660	220480
3340		1,3327E-09	90935	245515
3350		7,6850E-10	106280	286955
4325		7,0685E-10	112800	304550

PRESSURE DROPS

VERSIONS WITH HYDRONIC KIT PA÷PJ / DA÷DJ / TF÷TJ/ IA÷IJ / JA÷JJ/ KF÷KJ

The water flow rate is calculated with the following formula:
Q = Pc x 860 / ΔT.
Q Water flow rate (l/h)
Pc Cooling capacity (kW)
ΔT Water heat drop (°C)
Pressure drops are calculated with the following formula:
Δp = K x (Q)2
Δp Pressure drops (kPa)
Coefficient for the various sizes and versions
Q Water flow rate (l/h)

Versions with hydronic kit PA÷PJ / DA÷DJ / TF÷TJ / IA÷IJ / JA÷JJ / KF÷KJ				
Mod.	Ver.	System side heat exchanger		
TBA		K	Q min	Q max
			l/h	l/h
1300	A	2,3019E-08	22730	61370
1350		1,1155E-08	25515	76544
2300		5,4398E-09	51345	138625
2325		3,1697E-09	64500	174150
2350		2,0227E-09	90935	245515
3300		2,5328E-09	77325	208770
3320		1,9756E-09	94775	255885
3340		1,7068E-09	90935	245515
3350		1,0960E-09	106280	286955
4325		1,0466E-09	112800	304550
1300	E	2,3019E-08	22730	61370
1350		1,1155E-08	25515	76544
2300		5,4398E-09	51345	138625
2325		3,1697E-09	64500	174150
2350		2,0227E-09	90935	245515
3300		2,5328E-09	77325	208770
3320		1,9756E-09	94775	255885
3340		1,7068E-09	90935	245515
3350		1,0960E-09	106280	286955
4325		1,0466E-09	112800	304550
1300	U	2,0347E-08	25800	69660
1350		5,6721E-09	51345	138625
2300		5,5714E-09	51345	138625
2325		3,5212E-09	62465	168655
2350		1,9897E-09	90935	245515
3300		2,4998E-09	77325	208770
3320		2,2564E-09	81660	220480
3340		1,6451E-09	90935	245515
3350		1,0804E-09	106280	286955
4325		1,0130E-09	112800	304550
1300	N	2,0347E-08	25800	69660
1350		5,6721E-09	51345	138625
2300		5,5714E-09	51345	138625
2325		3,5212E-09	62465	168655
2350		1,9897E-09	90935	245515
3300		2,4998E-09	77325	208770
3320		2,2564E-09	81660	220480
3340		1,6451E-09	90935	245515
3350		1,0804E-09	106280	286955
4325		1,0130E-09	112800	304550

K Coefficient for various sizes and versions
Q min Minimum water flow rate to the exchanger
Q max Maximum water flow rate to the exchanger

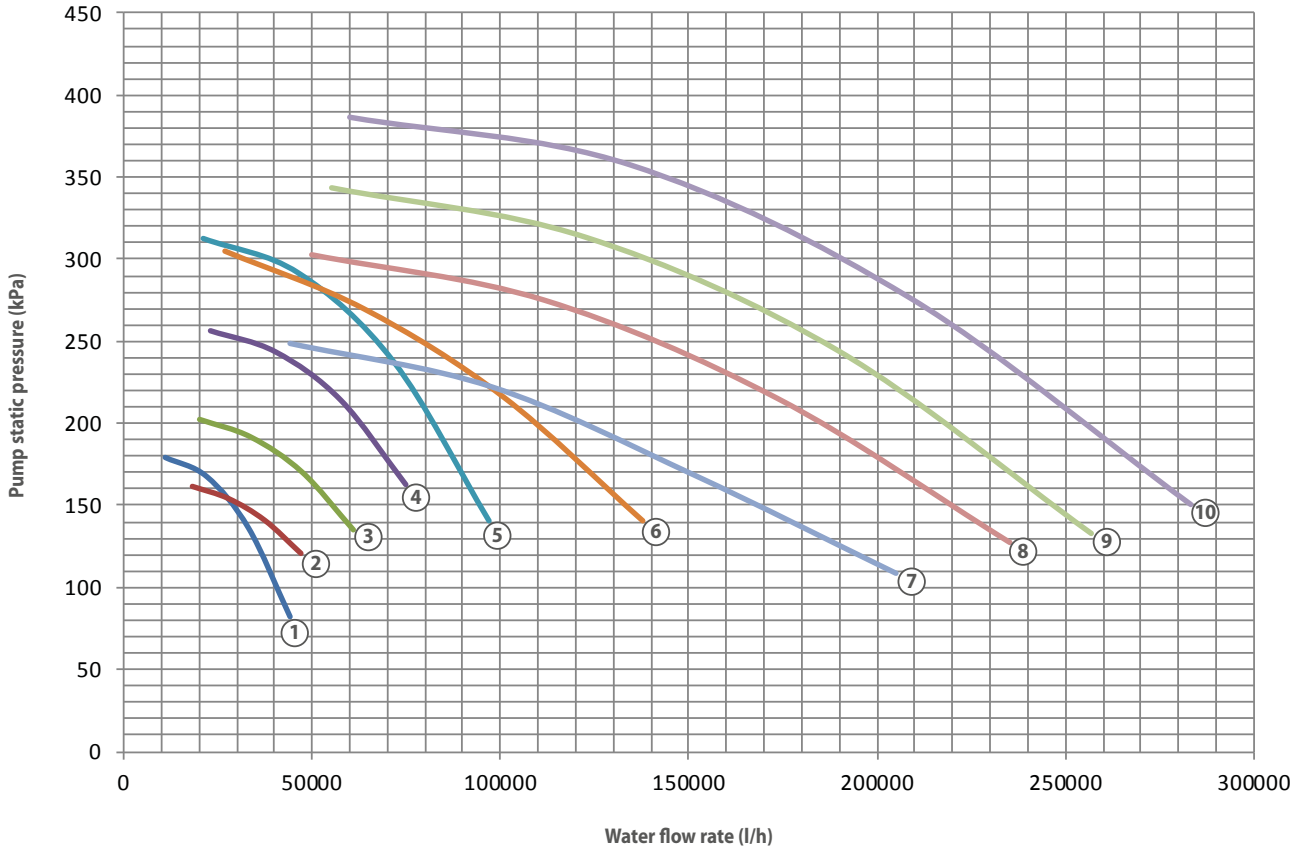
STATIC PRESSURES

The table shows the characteristic curves of the pumps, **and therefore they do not represent the useful static pressures of the system.**
The useful static pressures of the system must be calculated by subtracting the pressure drop (Δp) of the unit from the static pressure of the pump that is read in this graph, which can be calculated using the above tables.

	Rif. Pump	n° Poles	F.L.I. (kW)	F.L.A. (A)	QminP (l/h)	QmaxP (l/h)
Pump						
PA-IA	(1)	2	2,53	4,56	11000	44000
PB-IB	(2)	2	3,46	6,33	18000	47000
PC-IC	(3)	2	4,49	7,62	20000	61000
PD-ID	(4)	2	6,18	10,50	23000	75000
PE-IE	(5)	2	8,30	14,10	21000	97000
PF-IF	(6)	2	10,13	17,20	27000	138000
PG-IG	(7)	2	12,04	20,20	44000	205000
PH-IH	(8)	2	16,22	26,60	50000	235000
PI-II	(9)	2	20,12	33,00	55000	257000
PJ-IJ	(10)	2	23,79	40,40	60000	283000

F.L.I. Pump maximum input power
F.L.A. Pump maximum input current

QminP Minimum water flow rate of the pump
QmaxP Maximum water flow rate of the pump



COMPATIBILITY WITH HYDRONIC KIT

ON/OFF PUMPS

Size	Version	Evaporator	Module	Hydronic kit with single pump									
				PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ
		n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°
1300	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*
1350	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*
2300	A-E-U-N	1	1	-	-	1	1	1	1	1	1	1	*
2325	A-E-U-N	1	1	-	-	-	1	1	1	1	1	1	*
2350	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3300	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3320	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3340	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3350	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*
4325	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*

* For all configurations including pump J please contact the factory.

COMPATIBILITY WITH HYDRONIC KIT

INVERTER PUMPS

Size	Version	Evaporator	Module	Hydronic kit with single pump									
				IA	IB	IC	ID	IE	IF	IG	IH	II	IJ
		n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°
1300	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*
1350	A-E-U-N	1	1	1	1	1	1	1	1	1	1	1	*
2300	A-E-U-N	1	1	-	-	1	1	1	1	1	1	1	*
2325	A-E-U-N	1	1	-	-	-	1	1	1	1	1	1	*
2350	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3300	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3320	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3340	A-E-U-N	1	1	-	-	-	-	1	1	1	1	1	*
3350	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*
4325	A-E-U-N	1	1	-	-	-	-	-	1	1	1	1	*

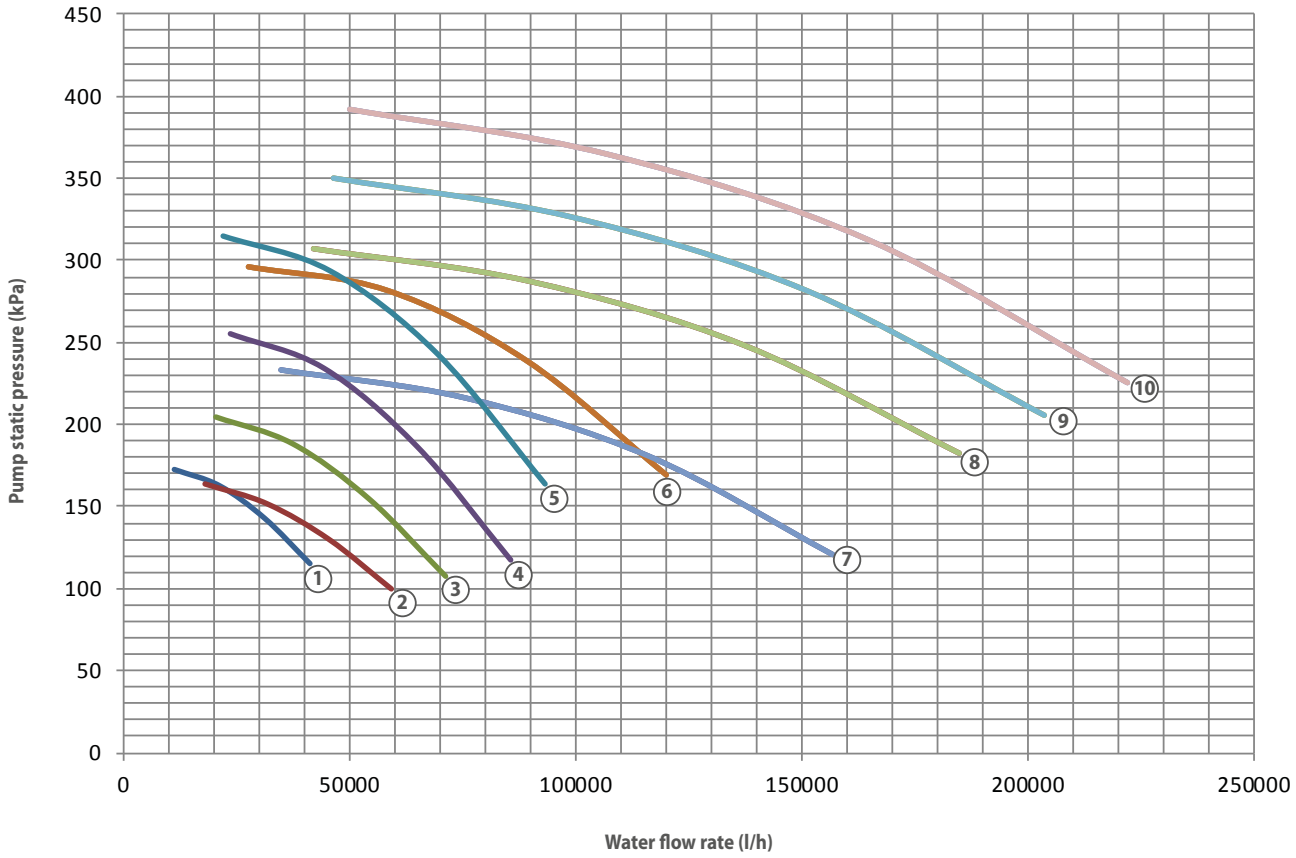
STATIC PRESSURES

The table shows the characteristic curves of the pumps, **and therefore they do not represent the useful static pressures of the system.**
The useful static pressures of the system must be calculated by subtracting the pressure drop (Δp) of the unit from the static pressure of the pump that is read in this graph, which can be calculated using the above tables.

	Rif.	n°	F.L.I.	F.L.A.	QminP	QmaxP
	Pump	Poles	(kW)	(A)	(l/h)	(l/h)
Pump						
DA-JA (1)	(1)	2	2,53	4,56	11000	41000
DB-JB (1)	(2)	2	3,46	6,33	18060	59000
DC-JC (1)	(3)	2	4,49	7,62	20430	71000
DD-JD (1)	(4)	2	6,18	10,50	23670	85500
DE-JE (1)	(5)	2	8,30	14,10	22020	93000
DF-JF (1)	(6)	2	10,13	17,20	27660	120000
DG-JG (1)	(7)	2	12,04	20,20	34710	156990
DH-JH (1)	(8)	2	16,22	26,60	42150	185000
DI-JI (1)	(9)	2	20,12	33,00	46230	203420
DJ-JJ (1)	(10)	2	23,79	40,40	50000	222000

F.L.I. Pump maximum input power
F.L.A. Pump maximum input current
QminP Minimum water flow rate of the pump
QmaxP Maximum water flow rate of the pump

(1) Hydronic kits DA÷DJ and JA÷JJ have two pumps, 1 of which in operation and 1 as a spare.



COMPATIBILITY WITH HYDRONIC KIT

ON/OFF PUMPS

Size	Version	Evaporator	Module	Hydronic kit with main pump + stand-by pump									
				DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ
		n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°
1300	A-E-U-N	1	1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*
1350	A-E-U-N	1	1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*
2300	A-E-U-N	1	1	-	-	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*
2325	A-E-U-N	1	1	-	-	-	1+1	1+1	1+1	1+1	1+1	1+1	*
2350	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3300	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3320	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3340	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3350	A-E-U-N	1	1	-	-	-	-	-	1+1	1+1	1+1	1+1	*
4325	A-E-U-N	1	1	-	-	-	-	-	1+1	1+1	1+1	1+1	*

* For all configurations including pump J please contact the factory.

COMPATIBILITY WITH HYDRONIC KIT

INVERTER PUMPS

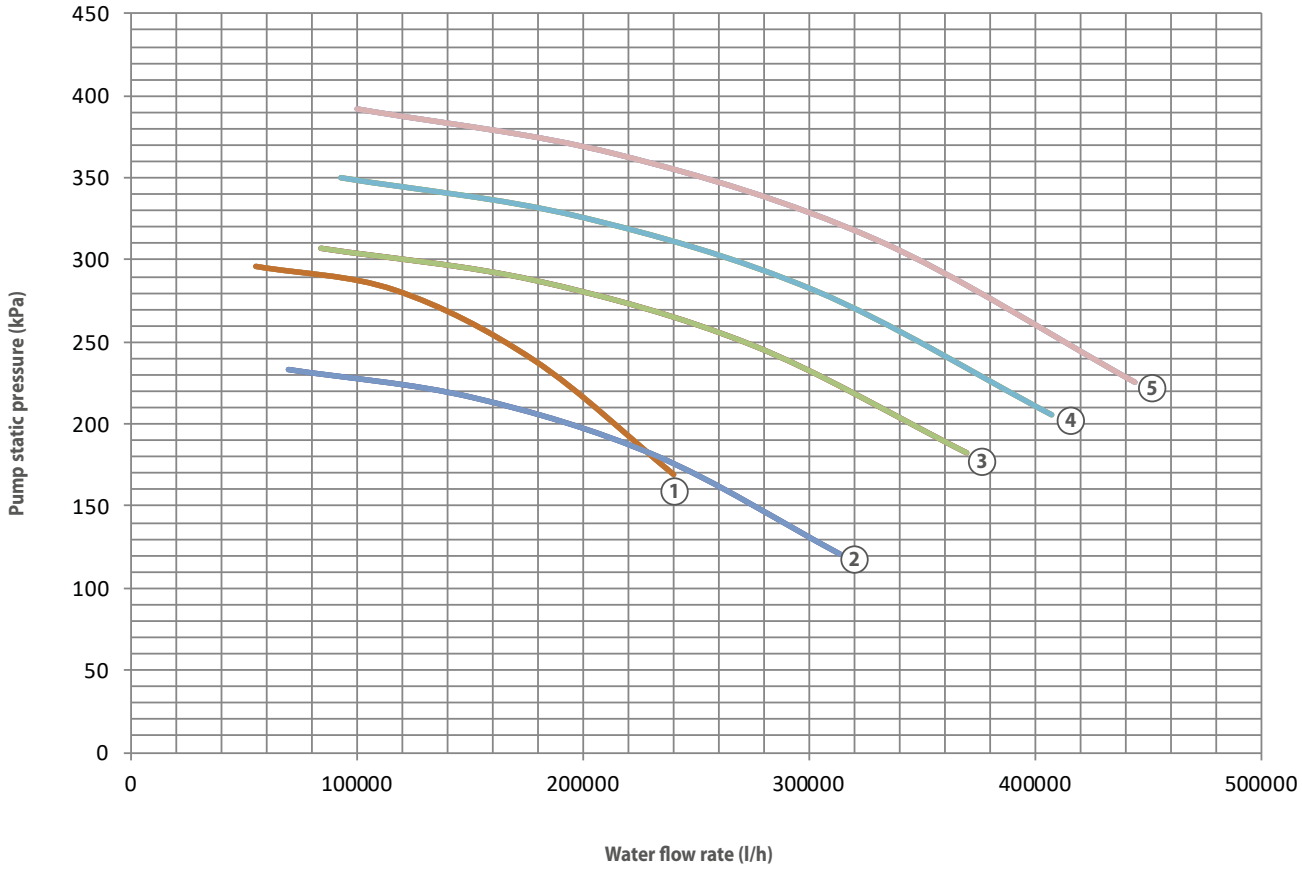
Size	Version	Evaporator	Module	Hydronic kit with main pump + stand-by pump									
				JA	JB	JC	JD	JE	JF	JG	JH	JI	JJ
		n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°	n°
1300	A-E-U-N	1	1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*
1350	A-E-U-N	1	1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*
2300	A-E-U-N	1	1	-	-	1+1	1+1	1+1	1+1	1+1	1+1	1+1	*
2325	A-E-U-N	1	1	-	-	-	1+1	1+1	1+1	1+1	1+1	1+1	*
2350	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3300	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3320	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3340	A-E-U-N	1	1	-	-	-	-	1+1	1+1	1+1	1+1	1+1	*
3350	A-E-U-N	1	1	-	-	-	-	-	1+1	1+1	1+1	1+1	*
4325	A-E-U-N	1	1	-	-	-	-	-	1+1	1+1	1+1	1+1	*

STATIC PRESSURES

The table shows the characteristic curves of the pumps, **and therefore they do not represent the useful static pressures of the system.**
The useful static pressures of the system must be calculated by subtracting the pressure drop (Δp) of the unit from the static pressure of the pump that is read in this graph, which can be calculated using the above tables.

	Rif.	n°	F.L.I.	F.L.A.	QminP	QmaxP
	Pump	Poles	(kW)	(A)	(l/h)	(l/h)
Pump						
TF-KF	(1)	2	10,13	17,20	55320	240000
TG-KG	(2)	2	12,04	20,20	69420	313980
TH-KH	(3)	2	16,22	26,60	84300	370000
TI-KI	(4)	2	20,12	33,00	92460	406840
TJ-KJ	(5)	2	23,79	40,40	100000	444000

F.L.I. Pump maximum input power
F.L.A. Pump maximum input current
QminP Minimum water flow rate of the pump
QmaxP Maximum water flow rate of the pump



COMPATIBILITY WITH HYDRONIC KIT

ON/OFF PUMPS

Size	Version	Evaporator	Module	Hydronic kit with double pump - in parallel (all pumps running)				
				TF	TG	TH	TI	TJ
		n°	n°	n°	n°	n°	n°	n°
1300	**A-E-U-N**	1	1	2	2	2	2	*
1350	**A-E-U-N**	1	1	2	2	2	2	*
2300	**A-E-U-N**	1	1	2	2	2	2	*
2325	**A-E-U-N**	1	1	2	2	2	2	*
2350	**A-E-U-N**	1	1	2	2	2	2	*
3300	**A-E-U-N**	1	1	2	2	2	2	*
3320	**A-E-U-N**	1	1	2	2	2	2	*
3340	**A-E-U-N**	1	1	2	2	2	2	*
3350	**A-E-U-N**	1	1	2	2	2	2	*
4325	**A-E-U-N**	1	1	2	2	2	2	*

* For all configurations including pump J please contact the factory.

COMPATIBILITY WITH HYDRONIC KIT

INVERTER PUMPS

Size	Version	Evaporator	Module	Hydronic kit with double pump - in parallel (all pumps running)				
				KF	KG	KH	KI	KJ
		n°	n°	n°	n°	n°	n°	n°
1300	**A-E-U-N**	1	1	2	2	2	2	*
1350	**A-E-U-N**	1	1	2	2	2	2	*
2300	**A-E-U-N**	1	1	2	2	2	2	*
2325	**A-E-U-N**	1	1	2	2	2	2	*
2350	**A-E-U-N**	1	1	2	2	2	2	*
3300	**A-E-U-N**	1	1	2	2	2	2	*
3320	**A-E-U-N**	1	1	2	2	2	2	*
3340	**A-E-U-N**	1	1	2	2	2	2	*
3350	**A-E-U-N**	1	1	2	2	2	2	*
4325	**A-E-U-N**	1	1	2	2	2	2	*

CORRECTIVE FACTORS

Corrective factors for Average water temperatures different from the nominal															
System side heat exchanger		**Operation in cooling mode**							**Operation in heating or recovery mode**						
Average water temperatures	**(°C)**	**5**	**10**	**15**	**20**	**30**	**40**	**50**	**23**	**28**	**33**	**38**	**43**	**48**	**53**	**58**
Corrective factor		1.02	**1**	0.98	0.97	0.95	0.93	0.91	1.04	1.03	1.02	1.01	**1**	0.99	0.98	0.97

DIRT

Fouling corrective factors [K*m²]/[kW]				
	0,0	**0,00005**	**0,0001**	**0,0002**
Cooling capacity correction factors	**1,0**	**1,00**	0,98	0,94
Input power correction factors	**1,0**	**1,00**	0,98	0,95

MINIMUM WATER CONTENT IN THE SYSTEM

The minimum water content of the system allows you to limit the switch-ons and offs of the compressor.
To calculate it use the formula Pc (kW) X l.

Minimum system water content	ver	u.m.	1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
For air conditioning systems		l/kW					4					
For systems with process water		l/kW					8					

MAXIMUM WATER CONTENT IN THE SYSTEM

Units with the hydronic kit mounted come standard with the expansion vessel set at 1.5 bar and the safety valve mounted.
The maximum system water content depends on the capacity of the expansion vessel and on the calibration of the safety valve.

Model	ver	u.m.	1300	1350	2300	2325	2350	3300	3320	3340	3350	4325
Expansion vessel with hydronic kit only pumps												
PA ÷ KJ	A	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25
	E	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25
	U	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25
	N	n°/l	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25	2/25
Safety valve	A/E/U/N	n°/bar					1/6					

The table gives an example of the maximum water content calculated at the indicated operating conditions and only to protect the unit. If the volume of water in the system is higher, add another expansion vessel which is correctly sized.

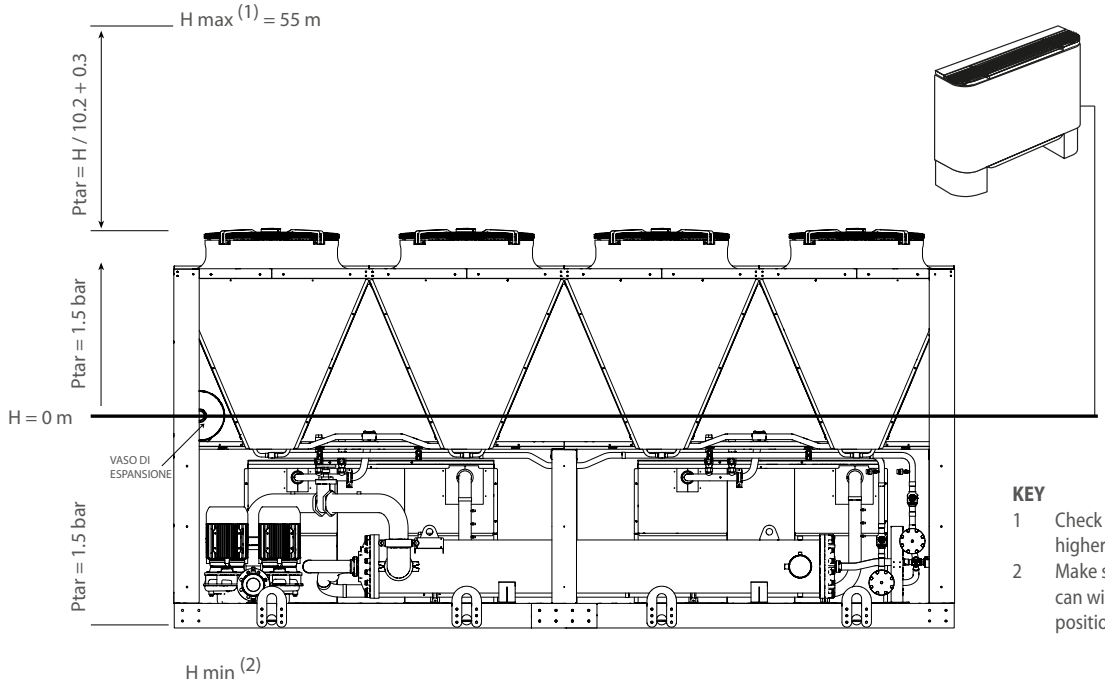
System water temperature max/min	°C			40/4		
Hydraulic height	**m**	**30**	**25**	**20**	**15**	**≤12.25**
Expansion vessel pre-load	bar	3.2	2.8	2.3	1.8	1.5
Maximum water content	l	2174	2646	3118	3590	3852
System water temperature max/min	**°C**			**60/4**		
Expansion vessel pre-load	bar	3.2	2.8	2.3	1.8	1.5
Maximum water content	l	978	1190	1404	1616	1732
System water temperature max/min	**°C**			**85/4**		
Expansion vessel pre-load	bar	3.2	2.8	2.3	1.8	1.5
Maximum water content	l	510	622	732	844	904

The data in the table refer to units with a 24l expansion vessel and a water temperature (in/out) of 12°C/7°C.

EXPANSION VESSEL CALIBRATION

The expansion tank volume is 24L. The standard value of the expansion tank pre-charge pressure is 1.5 bar, but this can be calibrated up to a maximum of 6 bar.
Calibration of the vessel must be regulated using the maximum level difference (H) of the user (see diagram) by using the following formula:
p (calibration) [bar] = H [m] / 10.2 + 0.3.

For example: if level difference H is equal to 20 m, the calibration value of the vessel will be 2.3 bar.
If the calibration value obtained from the formula is less than 1.5 bar (i.e. for H < 12.25), use the standard calibration.



KEY

1 Check that highest installation is not higher than 55 metres.
2 Make sure that lowest installation can withstand global pressure in that position.

ETHYLENE GLYCOL

COOLING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - COOLING MODE											
Freezing Point	°C	0	-3.63	-6.10	-8.93	-12.11	-15.74	-19.94	-24.79	-30.44	-37.10
Percent ethylene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1.000	1.033	1.040	1.049	1.060	1.072	1.086	1.102	1.120	1.141
Pc	-	1.000	0.990	0.985	0.980	0.975	0.970	0.965	0.960	0.955	0.950
Pa	-	1.000	0.996	0.994	0.992	0.990	0.988	0.986	0.984	0.982	0.980
Dp	-	1.000	1.109	1.157	1.209	1.268	1.336	1.414	1.505	1.609	1.728

Average water temperature = 9.5 °C

HEATING MODE

CORRECTION FACTOR WITH ETHYLENE GLYCOL - HEATING MODE											
Freezing Point	°C	0	-3.63	-6.10	-8.93	-12.11	-15.74	-19.94	-24.79	-30.44	-37.10
Percent ethylene glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1.000	1.027	1.038	1.050	1.063	1.078	1.095	1.114	1.135	1.158
Ph	-	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Pa	-	1.000	1.002	1.003	1.004	1.005	1.007	1.008	1.010	1.012	1.015
Dp	-	1.000	1.087	1.128	1.175	1.227	1.286	1.353	1.428	1.514	1.610

Average water temperature = 42.5 °C

Qwc: Corrective factor of flow rates (middle water temperatur 9.5°C)
Qwh: Corrective factor of flow rates (middle water temperatur 42.5°C)
Pc: Corrective factor of cooling capacity
Ph: Corrective factor of heating capacity
Pa: Corrective factor of imput power
Dp: Corrective factor of pressure drop

PROPYLENE GLYCOL

COOLING MODE

CORRECTION FACTOR WITH PROPILENE GLYCOL - COOLING MODE											
Freezing Point	°C	0	-3.43	-5.30	-7.44	-9.98	-13.08	-16.86	-21.47	-27.04	-33.72
Percent PROPILENE glycol	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1.000	1.007	1.006	1.007	1.010	1.015	1.022	1.032	1.044	1.058
Pc	-	1.000	0.985	0.978	0.970	0.963	0.955	0.947	0.939	0.932	0.924
Pa	-	1.000	0.996	0.994	0.992	0.990	0.988	0.986	0.984	0.982	0.980
Dp	-	1.000	1.082	1.102	1.143	1.201	1.271	1.351	1.435	1.520	1.602

Average water temperature = 9.5 °C

HEATING MODE

CORRECTION FACTOR WITH PROPILENE GLYCOL - HEATING MODE											
Freezing Point	°C	0	-3.43	-5.30	-7.44	-9.98	-13.08	-16.86	-21.47	-27.04	-33.72
Percent PROPILENE glycol	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1.000	1.008	1.014	1.021	1.030	1.042	1.055	1.071	1.090	1.112
Ph	-	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Pa	-	1.000	1.003	1.004	1.005	1.007	1.009	1.011	1.014	1.018	1.023
Dp	-	1.000	1.050	1.077	1.111	1.153	1.202	1.258	1.321	1.390	1.467

Average water temperature =42.5 °C

Qwc: Corrective factor of flow rates (middle water temperatur 9.5°C)
Qwh: Corrective factor of flow rates (middle water temperatur 42.5°C)
Pc: Corrective factor of cooling capacity
Ph: Corrective factor of heating capacity
Pa: Corrective factor of imput power
Dp: Corrective factor of pressure drop

Do not fill up the hydraulic system by glycol near the suction of the pump. High concentration of glycol could stuck the pump. Do not use the pump to mix water and glycol

SOUND DATA

Unit TBA A	Note	Total sound levels			Octave band (Hz)						
		Pow.	Pres. 10m	Pres. 1m	125	250	500	1000	2000	4000	8000
		dB(A)	dB(A)	dB(A)	Sound power for central band [dB] (A) frequency						
1300		88,3	56,1	68,7	83,1	77,7	79,4	83,1	79,2	75,1	69,3
1350		89,9	57,5	69,7	84,7	79,2	81,0	84,7	80,8	76,6	70,6
2300		90,8	58,3	70,1	85,7	80,1	81,9	85,7	81,7	77,4	71,4
2325		92,5	59,9	71,3	87,4	81,7	83,5	87,4	83,3	79,0	72,9
2350		93,0	60,2	71,4	87,9	82,2	84,0	87,9	83,8	79,4	73,3
3300		92,8	59,9	70,8	87,7	82,0	83,8	87,7	83,6	79,3	73,1
3320		93,9	60,9	71,6	88,8	83,1	84,9	88,8	84,7	80,3	74,1
3340		95,3	62,2	72,7	90,2	84,4	86,2	90,2	86,0	81,5	75,2
3350		95,3	62,2	72,7	90,2	84,4	86,3	90,3	86,0	81,6	75,2
4325		95,3	62,1	72,4	90,2	84,4	86,3	90,3	86,0	81,5	75,2

Unit TBA E	Note	Total sound levels			Octave band (Hz)						
		Pow.	Pres. 10m	Pres. 1m	125	250	500	1000	2000	4000	8000
		dB(A)	dB(A)	dB(A)	Sound power for central band [dB] (A) frequency						
1300		82,3	50,1	62,7	77,1	71,7	73,4	77,1	73,2	69,1	63,3
1350		83,9	51,5	63,7	78,7	73,2	75,0	78,7	74,8	70,6	64,6
2300		84,8	52,3	64,1	79,7	74,1	75,9	79,7	75,7	71,4	65,4
2325		86,5	53,9	65,3	81,4	75,8	77,6	81,4	77,3	73,0	66,9
2350		87,0	54,2	65,4	81,9	76,2	78,0	81,9	77,8	73,4	67,3
3300		86,8	53,9	64,8	81,7	76,0	77,8	81,7	77,6	73,3	67,1
3320		87,9	54,9	65,6	82,8	77,1	78,9	82,8	78,7	74,3	68,1
3340		89,3	56,2	66,7	84,2	78,4	80,2	84,2	80,0	75,5	69,2
3350		89,3	56,2	66,7	84,2	78,4	80,3	84,3	80,0	75,6	69,3
4325		89,3	56,1	66,4	84,2	78,4	80,3	84,3	80,0	75,6	69,2

Unit TBA U	Note	Total sound levels			Octave band (Hz)						
		Pow.	Pres. 10m	Pres. 1m	125	250	500	1000	2000	4000	8000
		dB(A)	dB(A)	dB(A)	Sound power for central band [dB] (A) frequency						
1300		88,3	56,1	68,7	83,1	77,7	79,4	83,1	79,2	75,1	69,3
1350		90,0	57,6	69,8	84,8	79,3	81,1	84,8	80,9	76,6	70,7
2300		91,3	58,7	70,1	86,1	80,6	82,3	86,2	82,1	77,8	71,8
2325		92,8	60,0	71,2	87,7	82,0	83,8	87,7	83,6	79,2	73,1
2350		93,1	60,2	71,1	88,0	82,3	84,1	88,0	83,9	79,5	73,4
3300		93,1	60,1	70,8	88,0	82,3	84,1	88,0	83,9	79,5	73,4
3320		94,1	61,0	71,5	89,0	83,3	85,1	89,0	84,9	80,4	74,2
3340		95,5	62,3	72,6	90,4	84,6	86,4	90,4	86,2	81,7	75,4
3350		95,5	62,3	72,6	90,4	84,6	86,5	90,5	86,2	81,7	75,4
4325		95,3	62,1	72,4	90,2	84,4	86,3	90,3	86,0	81,5	75,2

Unit TBA N	Note	Total sound levels			Octave band (Hz)						
		Pow.	Pres. 10m	Pres. 1m	125	250	500	1000	2000	4000	8000
		dB(A)	dB(A)	dB(A)	Sound power for central band [dB] (A) frequency						
1300		82,3	50,1	62,7	77,1	71,7	73,4	77,1	73,2	69,1	63,3
1350		84,0	51,6	63,8	78,8	73,3	75,1	78,8	74,9	70,6	64,7
2300		85,3	52,7	64,1	80,1	74,6	76,4	80,2	76,1	71,9	65,8
2325		86,8	54,0	65,2	81,7	76,0	77,8	81,7	77,6	73,2	67,1
2350		87,1	54,2	65,1	82,0	76,3	78,1	82,0	77,9	73,5	67,4
3300		87,1	54,1	64,8	82,0	76,3	78,1	82,0	77,9	73,5	67,4
3320		88,1	55,0	65,5	83,0	77,3	79,1	83,0	78,9	74,4	68,2
3340		89,5	56,3	66,6	84,4	78,6	80,4	84,4	80,2	75,7	69,4
3350		89,5	56,3	66,6	84,4	78,6	80,5	84,5	80,2	75,7	69,4
4325		89,3	56,1	66,4	84,2	78,4	80,3	84,3	80,0	75,6	69,2

Data 14511:2018; System side water temperature (in/out) 12°C/7°C, Outdoor air temperature 35°C

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