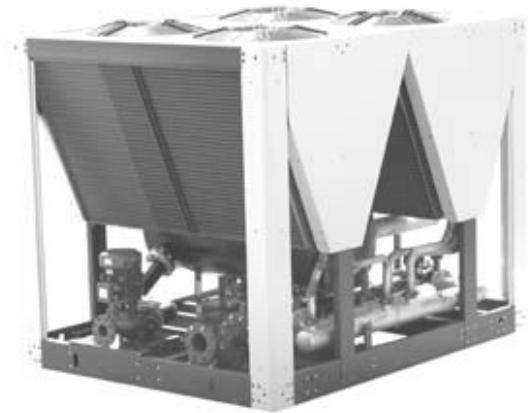




Water chillers

Free cooling modules for
AQUACIAT2 700V to 1100V
AQUACIAT^{POWER} 1200V to 1800V



Cooling capacity: 185 to 485 kW



Cooling only



Hydraulic module



Free cooling



USE

AQUACIAT^{FREE COOLING} units have been developed directly from the **AQUACIAT2** and **AQUACIAT^{POWER}** ranges, to which a free cooling module equipped with its hydraulic circuit has been added.

AQUACIAT^{FREE COOLING} LDC - LDH series monobloc air-cooled water chillers are medium-power units particularly suited to air conditioning applications for premises in the office, health care, administration and shopping centre sectors.

These packaged units are specifically designed for outdoor installation and require no special protection from adverse weather.

Each unit is delivered fully assembled, wired (control and power), charged with refrigerant and factory tested.

Simply make the necessary electrical and hydraulic connections, and your unit is ready to operate.

RANGE

AQUACIAT^{FREE COOLING} LDC series

Version with circulation pump only
9 models: 702V to 1800V

AQUACIAT^{FREE COOLING} LDH series

Version with circulation pump and buffer tank
9 models: 702V to 1800V

To consult the detailed specifications for the LDC - LDH units, refer to the **AQUACIAT2** and **AQUACIAT^{POWER}** instruction manuals.



DESCRIPTION

AQUACIAT^{FREE COOLING} modules are supplied with the following components as standard:

- Exchanger coils with axial fan motor assemblies.
- Hydraulic circuit with 3-way flow distribution valve, coil shut-off valve, drain and bleed valves, etc.
- Command and control electrics box.
- Aeroconnect electronic control module.

■ Complies with European EC directives

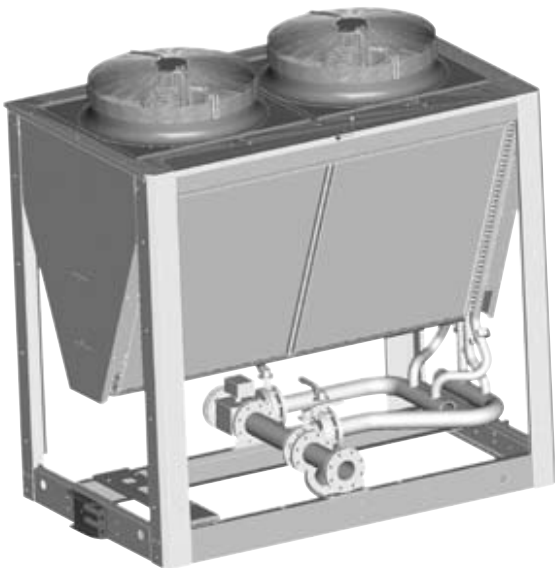
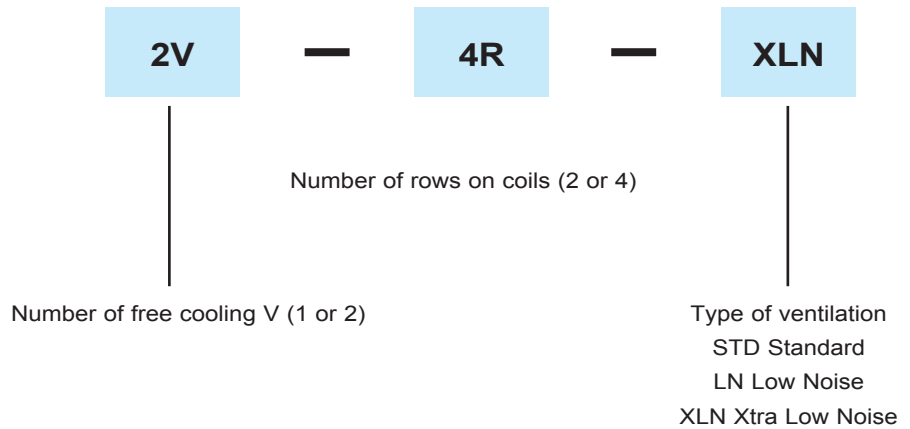
- 2006/42/EC machines
- EMC 2004/108/EC electromagnetics
- 2006/95/EC low voltage
- PED 97/23 EC pressure equipment: Article 3.3

■ Complies with standards

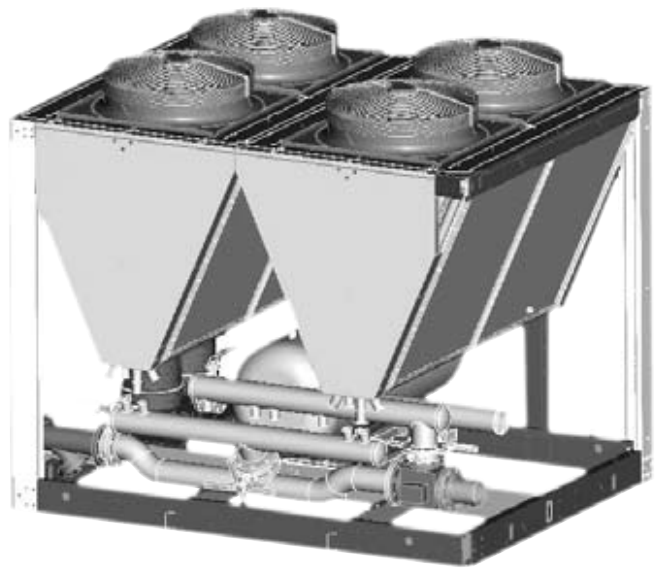
- EN 60-204, EN 378-2

DESIGNATION (EXAMPLE)

Free cooling module



1V module



2V module



Water chillers

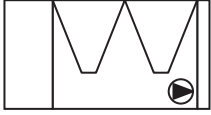
CONFIGURATION OF UNITS

aquaciat

+ Free cooling module

= aquaciat free-cooling

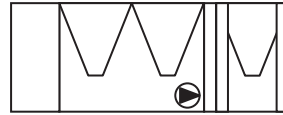
LDC 702V - 1100V



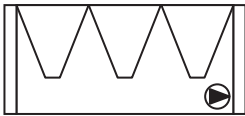
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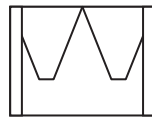
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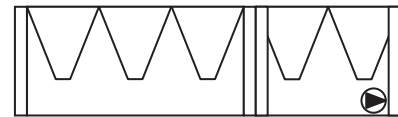
LDC 1200V - 1400V



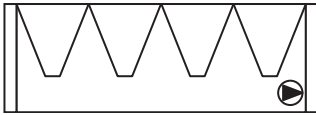
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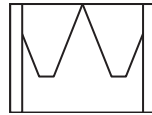
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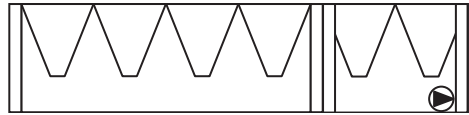
LDC 1600V - 1800V



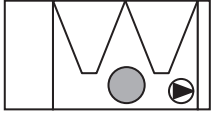
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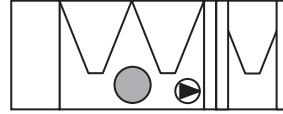
LDH 702V - 1100V



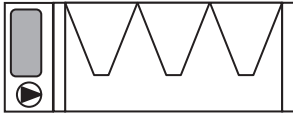
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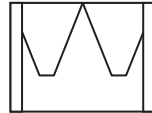
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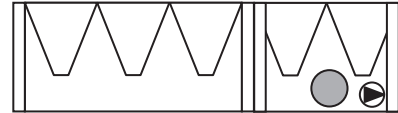
LDH 1200V - 1400V



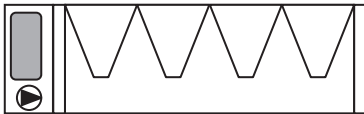
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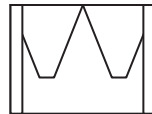
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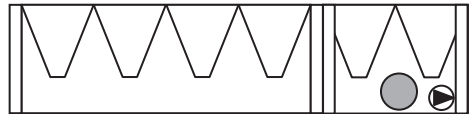
LDH 1600V - 1800V



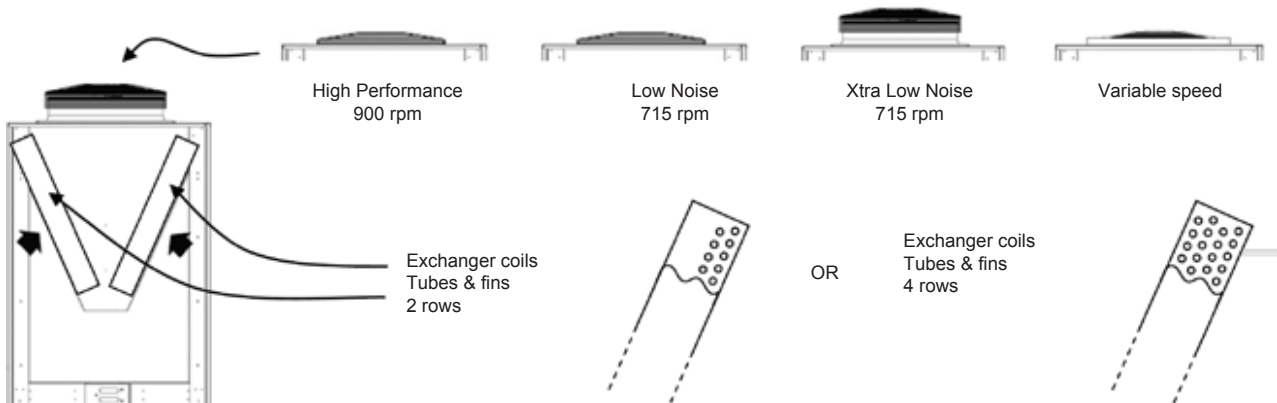
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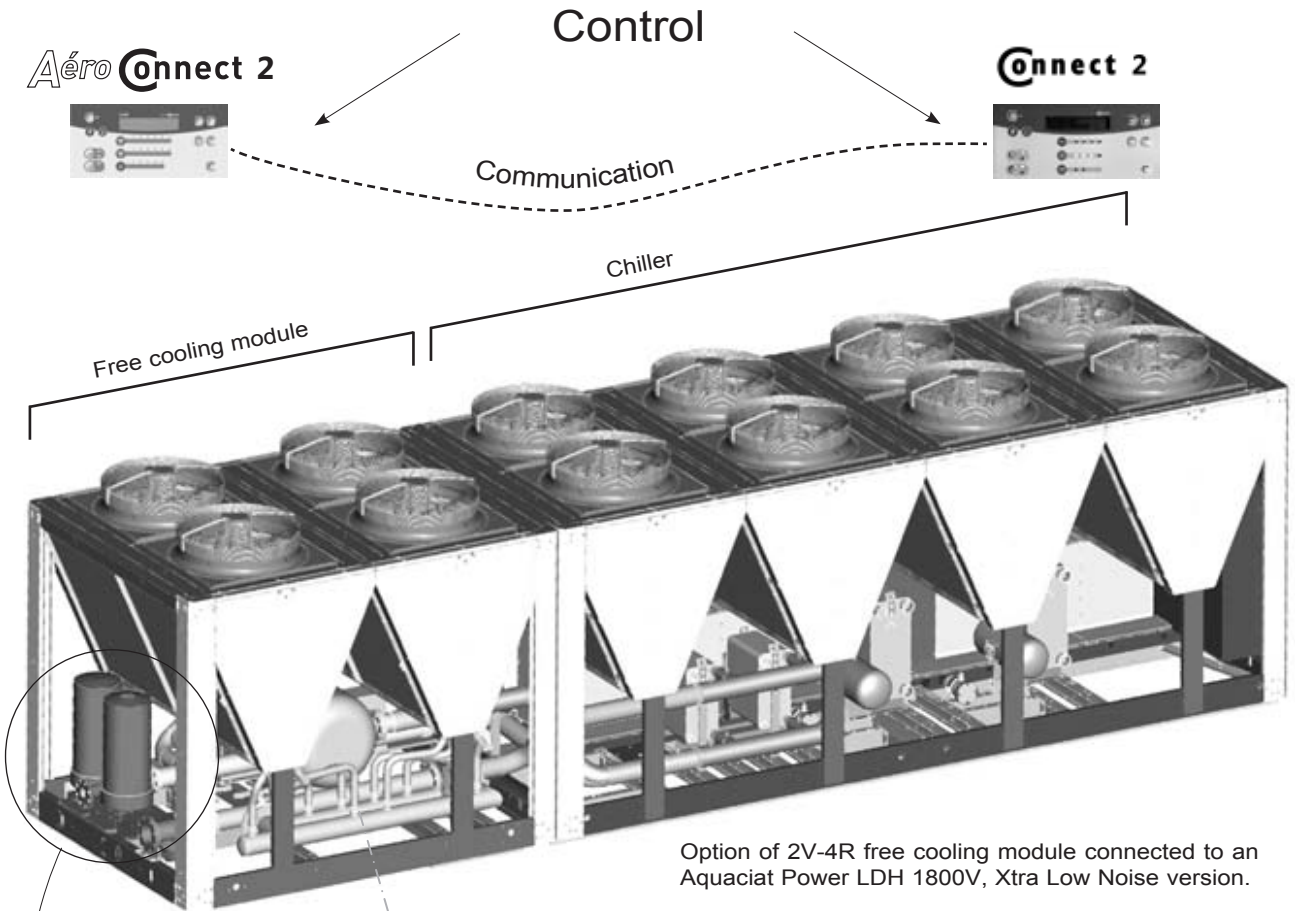


FREE COOLING MODULE OPTIONS



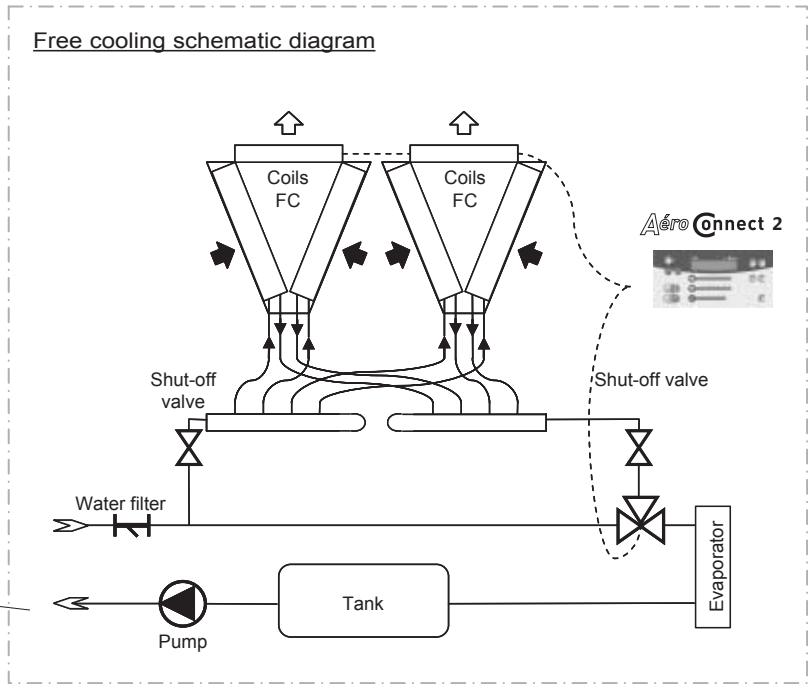


FREE COOLING MODULE ILLUSTRATION

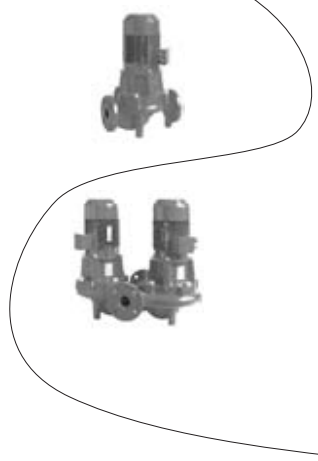


Option of 2V-4R free cooling module connected to an Aquaciat Power LDH 1800V, Xtra Low Noise version.

Free cooling schematic diagram



13 single pump or dual pump models



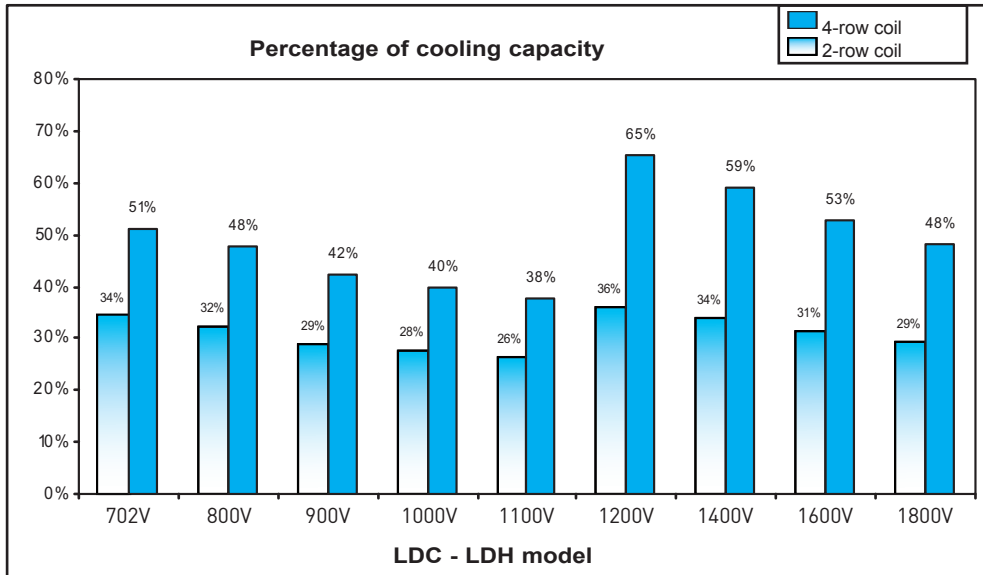


Water chillers

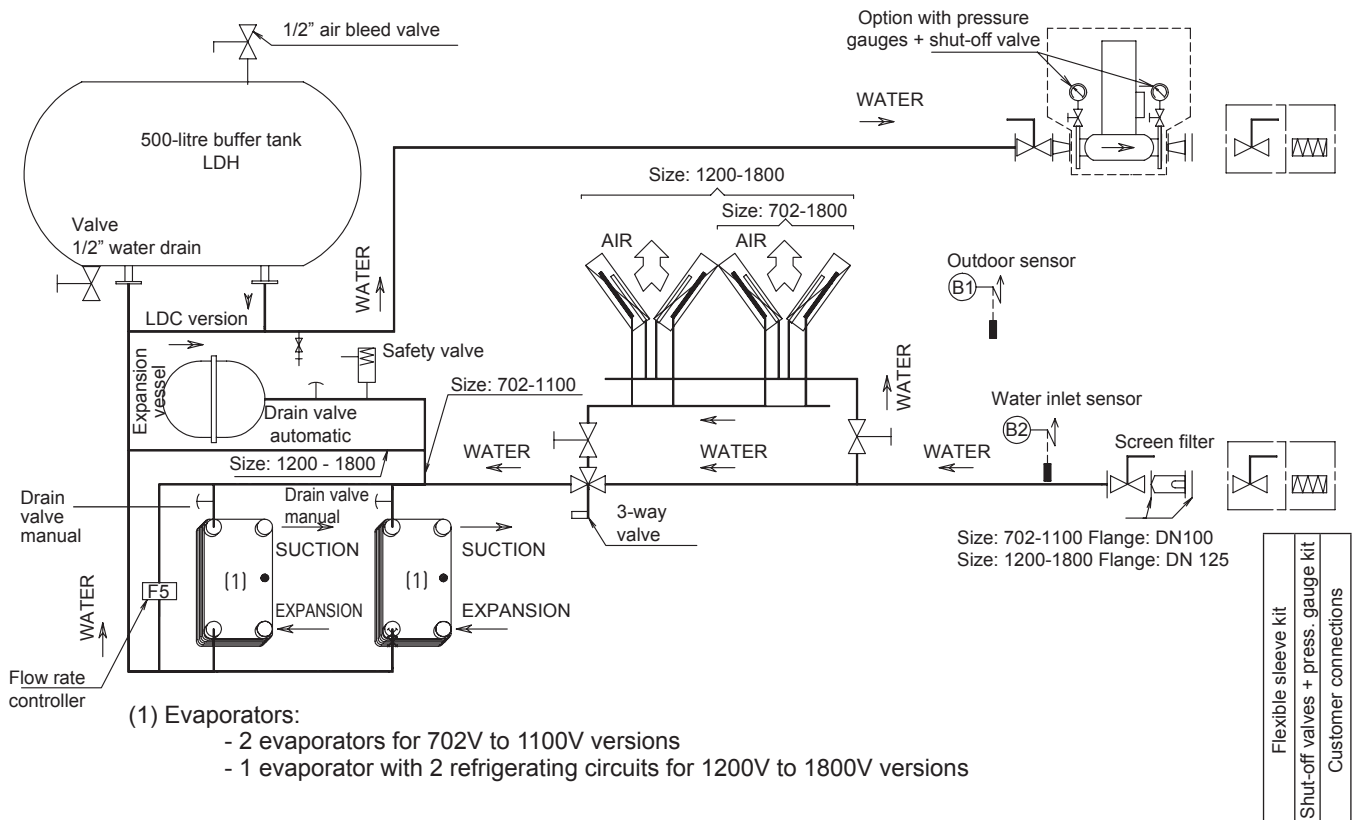
AQUACIAT FREE COOLING modules are available with 2- or 4-row chilled water coils according to winter or mid-season refrigeration requirements.

The diagram below indicates, per model, the percentage of the unit's nominal capacity generated during free cooling operation with 2- or 4-row options under the following conditions:

Water inlet temperature +12°C and outdoor air temperature +2°C.



HYDRAULIC DIAGRAM





PERFORMANCE OF CHILLERS AND FREE COOLING MODULES

AQUACIAT ^{FREE COOLING}		702V	800V	900V	1000V	1100V	1200V	1400V	1600V	1800V	
High-performance version - HP	Chiller's cooling capacity (1)	kW	185	206	246	265	286	327.0	373.0	429.0	483.0
	Chiller's absorbed power	kW	60.3	69.7	81.5	89.6	100.2	110	127	145	163
	Chiller's EER efficiency		3.08	2.95	3.02	2.96	2.85	2.96	2.92	2.95	2.96
	Lw/Lp HP version (3)	dB(A)	90/58					94/62	95/63	97/65	95/63
	Free cooling module		1 V - 2 R					2 V - 2 R			
	Cooling capacity (2)	kW	62.9	66.1	70.9	72.8	74.5	117.7	126.2	134.5	140.9
	Absorbed power	kW	4.0	4.0	4.0	4.0	4.0	8.0	8.0	8.0	8.0
	Free cooling EER efficiency		15.73	16.53	17.73	18.20	18.63	14.71	15.78	16.81	17.61
	Lw/Lp HP version (3)	dB(A)	85 / 53					88 / 56			
	Free cooling module		1 V - 4 R					2 V - 4 R			
	Cooling capacity (2)	kW	91.7	95.2	100.5	102.4	104.1	173.7	183.7	193.1	200.0
	Absorbed power	kW	4.0	4.0	4.0	4.0	4.0	8.0	8.0	8.0	8.0
	Free cooling EER efficiency		22.93	23.80	25.13	25.60	26.03	21.71	22.96	24.14	25.00
	Lw/Lp HP version (3)	dB(A)	86 / 54					89 / 57			
	Low Noise - LN and Xtra Low Noise - XLN versions	Chiller's cooling capacity (1)	kW	181.0	200.0	241.0	258.0	278.0	321.0	364.0	421.0
Chiller's absorbed power		kW	60.4	70.6	81.7	90.9	102.0	111	129	146.0	164
Chiller's EER efficiency			3.00	2,83	2.95	2.84	2.72	2.89	2.81	2.88	2.87
Lw/Lp LN version (3)		dB(A)	84/52	85/53	84/52	84/52	85/53	87/55	88/56	90/58	88/56
Lw/Lp XLN version (3)		dB(A)	81/49	82/50	81/49	81/49	83/51	85/53	86/54	88/56	86/54
Free cooling module			1 V - 2 R					2 V - 2 R			
Cooling capacity (2)		kW	57.1	59.6	63.4	64.8	66.1	107.5	114.4	121.0	126.0
Absorbed power		kW	2.54	2.54	2.54	2.54	2.54	5,08	5,08	5,08	5,08
Free cooling EER efficiency			22.48	23.46	24.96	25.51	26.02	21.16	22.52	23.82	24.80
Lw/Lp LN version (3)		dB(A)	78 / 46					81 / 49			
Lw/Lp XLN version (3)		dB(A)	76 / 44					79 / 47			
Free cooling module			1 V - 4 R					2 V - 4 R			
Cooling capacity (2)		kW	78.5	80.9	84.3	85.5	86.6	150.3	157.2	163.5	167.9
Absorbed power		kW	2.54	2.54	2.54	2.54	2.54	5,08	5,08	5,08	5,08
Free cooling EER efficiency			30.91	31.85	33.19	33.66	34.09	29.59	30.94	32.19	33.05
Lw/Lp LN version (3)	dB(A)	79 / 47					82 / 50				
Lw/Lp XLN version (3)	dB(A)	77 / 45					80 / 48				

(1) Cooling capacity based on: COOLING +12°C/+7°C MEG 30% and condenser air inlet temperature +35°C

(2) Cooling capacity of free cooling module based on: Water inlet +12°C MEG 30% and outdoor air temperature +2°C

(3) Overall sound power level (Lw) overall sound pressure level (Lp) measured at 10 metres in a free field, as per ISO 3744



Water chillers

CHILLERS' TECHNICAL DATA

AQUACIAT ^{FREE COOLING}		702V	800V	900V	1000V	1100V	1200V	1400V	1600V	1800V
Compressors		Hermetic scroll (2900 rpm)								
Start-up mode		Direct in line in series								
Quantity		4	4	4	4	4	4	4	4	6
No. of stages		8	8	6	8	8	4	6	4	6
		100-78-71-57-	100-81-69-62.5-	100-83-66-55-	100-80-70-60-	100-77-73-54-	100-75-100-75-	100-78-71-50	100-75-50-25	100-83.3-66.6-50-
Power control		50-43-28-21-0	50-37.5-31-19-0	33-16-0	50-40-30-20-0	50-45-27-23-0	50-25-0	28-21-0	0	33.3-16.6-0
	%									
Refrigerant oil type		Polyolester Kow 3MAF (32 cSt)								
Oil capacity	l	17.6	21.8	20.8	22.2	26.2	25.2	25.2	25.2	37.8
No. of refrigerant circuits		2								
Refrigerant (GWP)		R410A (1720)								
Refrigerant load	kg	2x20	2x19	2x23	2x25	2x25	2x30	2x40	2x45	2x49
Electrical power supply	ph/Hz/V	3-50 Hz - 400 V (+10%/-10%) + Earth								
Machine protection rating		IP 44								
Control circuit voltage	ph/Hz/V	1-50Hz 230V (+10% / -10%) transformer fitted								
Evaporator		Brazen plate heat exchangers								
Water capacity	l	15.8	15.8	18	20.4	20.4	32	37	50	57
Chilled water outlet temp. (min./max.)	°C	-12 / +18								
Minimum water flow rate	m ³ /h	22.1	24.4	29.3	31.6	34	38	43	50	56
Maximum water flow rate	m ³ /h	63.2	69.5	77	77	77	113	124	137	150
Water connection	dia.	DN 100 flange					DN 125 flange			
Max. pressure, water end	bar	4 bar								
Air-cooled condenser		Finned heat exchanger								
Fan dia.	mm	800								
No. x Motor output, high-performance (HP) version	kW	4x1.55	4x1.55	4x1.66	4x1.66	4x1.66	6x1.64	6x1.64	8x1.64	8x1.64
Nb x motor output, Low Noise - LN and XTRA Low Noise - XLN versions	kW	4x1.06	4x1.06	4x1.1	4x1.1	4x1.1	6x1.13	6x1.13	8x1.13	8x1.13
Air flow, high-performance (HP) version	m ³ /h	81200	81200	78000	78000	78000	121800	117000	159200	156000
Air flow, Low Noise - LN and XTRA Low Noise - XLN versions	m ³ /h	60000	60000	58400	58400	58400	90000	87600	118400	116800
Minimum system water volume	l	213	212	213	290	364	1165	1107	1520	1116
Tank volume, model H	l	500								
Expansion vessel, C & H	l	35					50			
Pump	Qty.	According to table selection (section p9)								
Storage temperature	°C	+50								



FREE COOLING MODULE TECHNICAL DATA

AQUACIAT ^{FREE COOLING}		702V	800V	900V	1000V	1100V	1200V	1400V	1600V	1800V		
High-performance version - HP	Free cooling module	1 V - 2 R					2 V - 2 R					
	Free cooling coil	2-row finned heat exchanger					2-row finned heat exchanger					
	Fan dia.	mm	800					800				
	Number x motor output	kW	2x2					4x2				
	Air flow	m ³ /h	43900					87800				
	Free cooling module	1 V - 4 R					2 V - 4 R					
	Free cooling coil	4-row finned heat exchanger					4-row finned heat exchanger					
	Fan dia.	mm	800					800				
	Number x motor output	kW	2x2					4x2				
	Air flow	m ³ /h	42000					84000				
Low Noise - LN and Xtra Low Noise - XLN versions	Free cooling module	1 V - 2 R					2 V - 2 R					
	Free cooling coil	2-row finned heat exchanger					2-row finned heat exchanger					
	Fan dia.	mm	800					800				
	Number x motor output	kW	2x1.27					4x1.27				
	Air flow	m ³ /h	34800					69600				
	Free cooling module	1 V - 4 R					2 V - 4 R					
	Free cooling coil	4-row finned heat exchanger					4-row finned heat exchanger					
	Fan dia.	mm	800					800				
	Number x motor output	kW	2x1.27					4x1.27				
	Air flow	m ³ /h	33500					67000				
Chilled water outlet min./max. temp.		-12 / +18										
Minimum water flow	m ³ /h	22.1	24.4	29.3	31.6	34	38	43	50	56		
Maximum water flow	m ³ /h	63.2	69.5	77	77	77	106	110	110	110		
Water connection	dia.	DN 100 flange					DN 125 flange					
Max. pressure, water end	bar	4 bar										
Storage temperature	°C	+50										

ELECTRICAL CHARACTERISTICS

AQUACIAT FREE COOLING		702V	800V	900V	1000V	1100V	1200V	1400V	1600V	1800V		
Electrical supply	ph/Hz/V	3-50 Hz - 400 V (+10%/-10%) + Earth										
COMPRESSORS												
Maximum nominal current	A	144	161	190	207	224	237	266	295	356		
Starting current	A	333	388	440	457	474	488	586	615	607		
Starting current with SOFT START option	A	243	279	317	333	350	364	429	458	483		
FAN MOTORS												
HIGH PERFORMANCE 905 rpm version												
Maximum nominal current	A	13.6 (4x3.4)					20.4 (6x3.4)		27.2 (8x3.4)			
LOW NOISE - XTRA LOW NOISE 715 rpm versions												
Maximum nominal current	A	8.4 (4x2.1)					12.6 (6x2.1)		16.8 (8x2.1)			
Control circuit voltage	ph/Hz/V	1-50Hz 230V (+6% / -10%) transformer fitted										
Control circuit current	A	2.0			3.0		4.0	5.0				
FREE COOLING OPTION												
Free cooling module		1 V - 2 R					2 V - 2 R					
HIGH PERFORMANCE 905 rpm version												
Maximum nominal current	A	8.6 (2x4.3)					17.2 (4x4.3)					
LOW NOISE - XTRA LOW NOISE 715 rpm versions												
Maximum nominal current	A	5.0 (2x2.5)					10.0 (4x2.5)					
Free cooling module		1 V - 4 R					2 V - 4 R					
HIGH PERFORMANCE 905 rpm version												
Maximum nominal current	A	8.6 (2x4.3)					17.2 (4x4.3)					
LOW NOISE - XTRA LOW NOISE 715 rpm versions												
Maximum nominal current	A	5.0 (2x2.5)					10.0 (4x2.5)					



NOISE LEVELS

■ Sound power level ref 2×10^{-12} Pa \pm 3 dB

AQUACIAT FREE COOLING	SOUND POWER LEVEL SPECTRUM (dB)							Overall level Lw dB(A)	
	125	250	500	1000	2000	4000	8000		
HP version	1V	84	85	82	82	75	69	64	85
	2V	87	88	85	85	78	72	67	88
LN version	1V	81	78	76	73	67	61	56	78
	2V	84	81	79	76	70	64	59	81
XLN version	1V	76	75	74	72	66	61	57	76
	2V	79	78	77	75	69	64	60	79

■ Sound power level ref 2×10^{-5} Pa \pm 3 dB

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

AQUACIAT FREE COOLING	SOUND POWER LEVEL SPECTRUM (dB)							Overall level Lw dB(A)	
	125	250	500	1000	2000	4000	8000		
HP version	1V	52	53	50	50	43	37	32	53
	2V	55	56	53	53	46	40	35	56
LN version	1V	49	46	44	41	35	29	24	46
	2V	52	49	47	44	38	32	27	49
XLN version	1V	44	43	42	40	34	29	25	44
	2V	47	46	45	43	37	32	28	47

Note: Sound pressure levels depend on the installation conditions. As such, the levels listed are given for information only.

We remind you that only sound power levels are comparable and certified.

As per ISO 3744: $L_p = L_w - 10 \log S$

HYDRAULIC PUMPS (C AND H VERSIONS)

Single pump



Qty.	102	103	104	105	106	107	108	109	110	112	117	118	119
For models from 702V to 1100V	x	x		x		x					x	x	x
For models from 1200V to 1800V			x	x	x	x	x	x	x	x			
Power kW	3	4	4	5.5	5.5	7.5	7.5	11	11	15	2.2	4	7.5
Maximum nominal current A	6.3	8.0	8.0	10.3	10.3	13.8	13.8	20.0	20.0	26.5	4.5	7.8	13.8

Dual pump

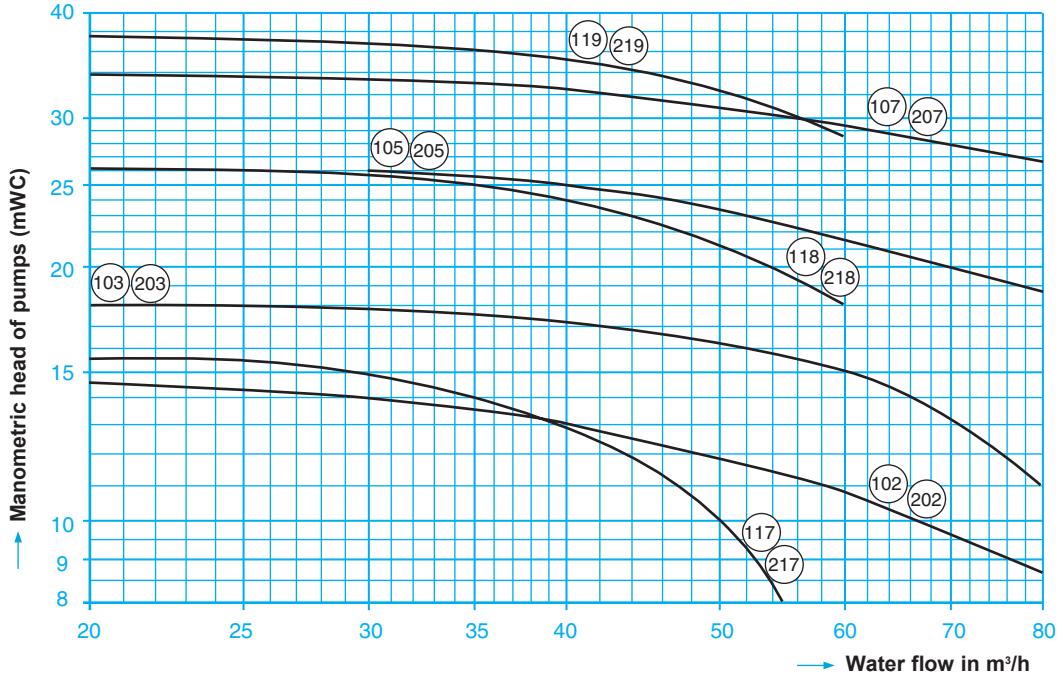


Qty.	202	203	204	205	206	207	208	209	210	212	217	218	219
For models from 702V to 1100V	x	x		x		x					x	x	x
For models from 1200V to 1800V			x	x	x	x	x	x	x	x			
Power kW	3	4	4	5.5	5.5	7.5	7.5	11	11	15	2.2	4	7.5
Maximum nominal current A	6.3	8.0	8.0	10.3	10.3	13.8	13.8	20.0	20.0	26.5	4.5	7.8	13.8



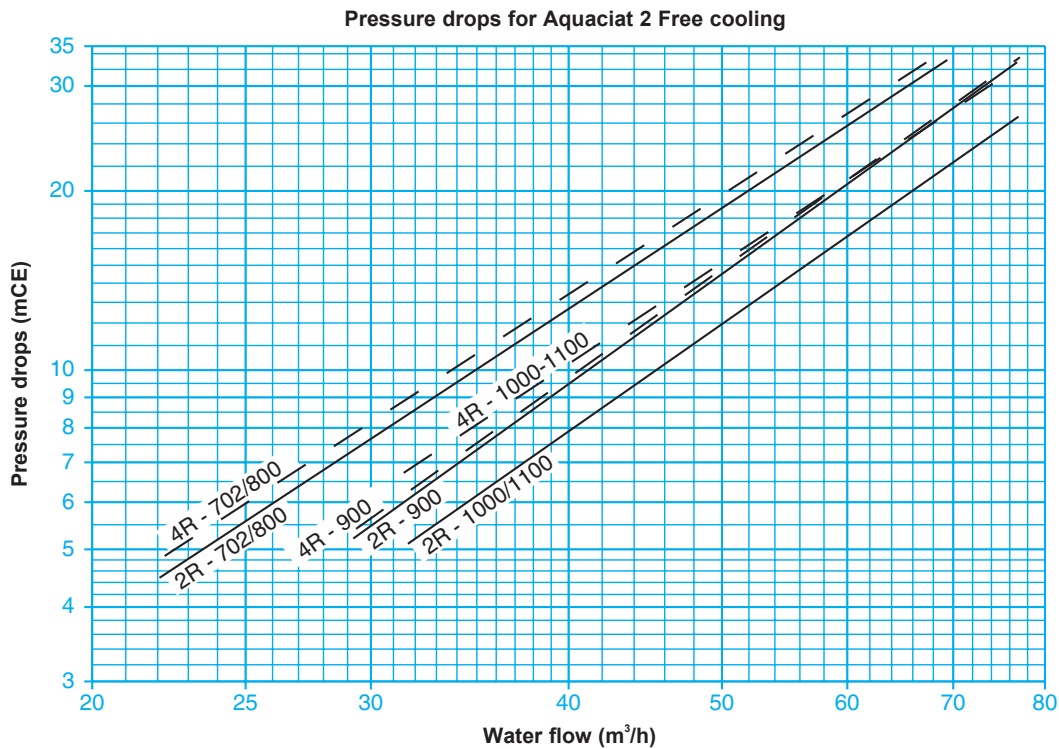
PUMP SELECTION FOR 1V MODELS - SIZES 702 TO 1100

Nos. 102 to 119: single pumps Nos. 202 to 219: dual pumps



WATER PRESSURE DROP CURVES - SIZES 702-1100

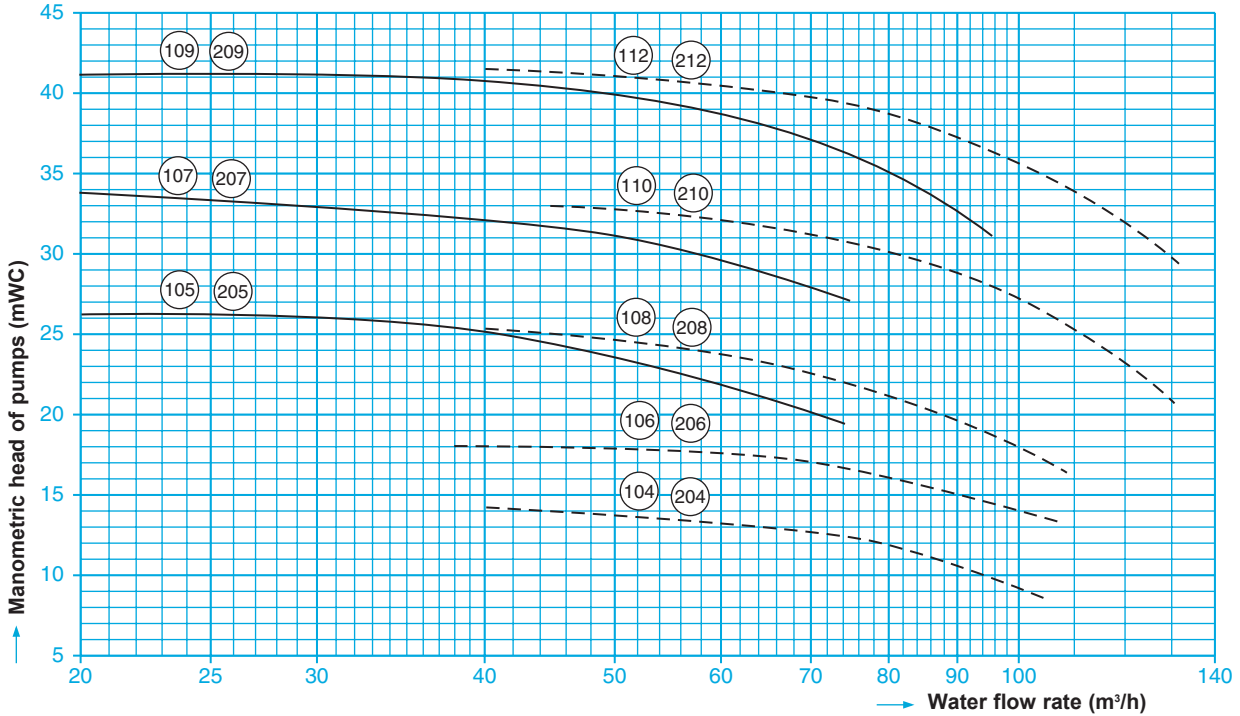
Pressure drops are given for a water mix +30 % MEG





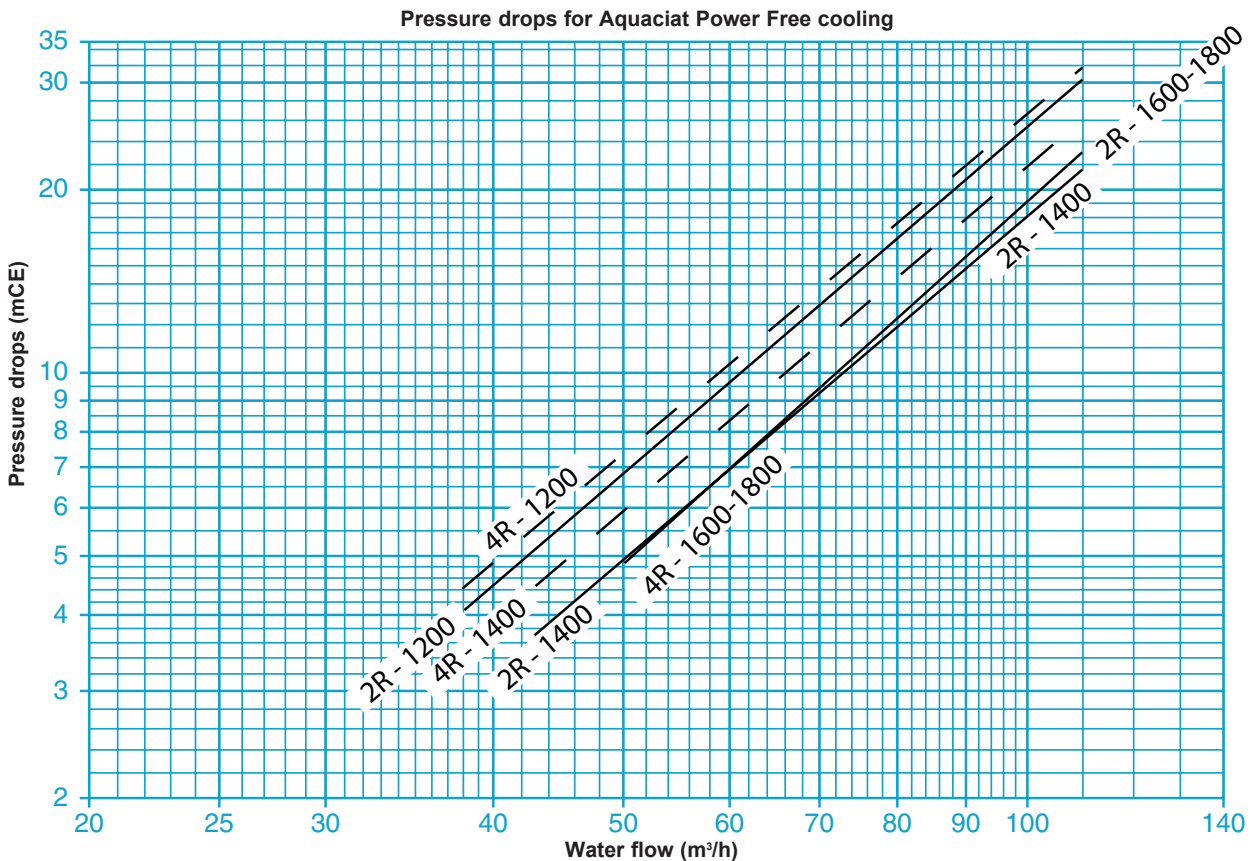
PUMP SELECTION FOR 2V MODELS - SIZES 1200 TO 1800

Nos. 104 to 112: single pumps Nos. 204 to 212: dual pumps



WATER PRESSURE DROP CURVES - SIZES 1200-1800

Pressure drops are given for a water mix +30 % MEG



This document is non-contractual. As part of its policy of continual product improvement, CIAT reserves the right to make any technical modification it feels appropriate without prior notification.

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