

Operating limits

Operating limits 30RW/RWA

30RW/30RWA	At start-up		At shut-down
	Minimum, °C	Maximum, °C	Maximum, °C
Evaporator			
Entering water temperature	7.5	30	50
	During operation		
Leaving water temperature	5 (note 1)	15	50

30RW	With hydronic module and variable-speed pump	
	At start-up and during operation	During operation
	Minimum	Maximum
Condenser		
Entering water temperature	-15	47 (note 3)
Leaving water temperature	-	52
Drycooler		
Entering air temperature	-20	(note 4)

30RW	Without hydronic module	
	At start-up and during operation	During operation
	Minimum	Maximum
Condenser		
Entering water temperature	20 (note 2)	47 (note 3)
Leaving water temperature	25	52
Drycooler		
Entering air temperature	(note 5)	(note 4)

30RWA	With variable-speed fan	
	At start-up and during operation	
	Minimum	Maximum
Air-cooled condenser		
Entering air temperature	-10	(note 6)
30RWA	With fixed-speed fan	
	At start-up and during operation	
	Minimum	Maximum
Air-cooled condenser		
Entering air temperature	0	(note 6)

Notes

- 30RW/30RWA units can operate from 4°C to 0°C without modification. In all cases the units must be configured for low leaving-water temperature, and use of antifreeze is required.
- 30RW units without hydronic module operating below 20°C entering condenser water temperature require the use of a three-way valve controlled from the 0-10 V analogue output of the PRO-DIALOG control.
- For a flow rate corresponding to a condenser Δt of 5 K.
- The maximum entering air temperature is based on the drycooler selection.
- The minimum entering air temperature range is between 15 and 20°C (without the use of three-way valves). Operation at -15°C ambient temperature is possible with the use of a three-way valve to maintain the required minimum condensing temperature (see note 2).
- The maximum entering air temperature is based on the remote condenser selection.

IMPORTANT: Maximum ambient temperatures. For storage and transport of 30RW units the minimum and maximum temperatures must not go beyond -20°C and 50°C. It is recommended that these temperatures are used for transport by container.

Evaporator water flow rate

30RW 30RWA	Evaporator water flow rate, l/s			
	Minimum flow rate	Maximum flow rate*		Maximum flow rate**
		Single pump	Dual pump	
020	0.3	1.7	-	1.7
025	0.4	2.5	-	3.1
030	0.5	2.5	-	3.1
040	0.7	3.4	-	3.7
045	0.8	3.8	-	4.7
060	0.9	5.7	5.6	5.9
070	1.2	6.2	6.1	7.3
080	1.4	6.4	6.2	8.0
090	1.5	6.6	6.3	8.4
110	1.8	8.3	11.7	10.3
120	2.2	8.5	12.4	11.4
135	2.4	8.8	13.1	12.8
150	2.7	9.0	13.7	14.3
160	2.7	14.2	14.2	15.9
185	3.1	14.5	14.5	17.0
210	3.8	17.4	22.0	24.0
245	4.4	17.4	22.0	24.0
275	5.0	18.1	23.3	29.1
300	5.5	18.1	23.3	29.1

* Maximum flow rate for an available pressure of 50 kPa (unit with hydronic module)

** Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger (unit without hydronic module)

Condenser water flow rate

30RW	Condenser water flow rate, l/s		
	Minimum flow rate* at min. condenser capacity $\Delta t = 10$ K	Nominal condenser flow rate at Eurovent conditions	Maximum flow rate** at max. condenser capacity $\Delta t = 5$ K
020	0.5	1.2	1.4
025	0.7	1.5	1.8
030	0.8	1.7	2
040	1.0	2.3	2.7
045	1.2	2.7	3.1
060	1.4	3.3	3.8
070	1.8	4.1	4.8
080	2.1	4.7	5.5
090	2.3	5.4	6.2
110	2.8	6.4	7.4
120	3.3	7.3	8.5
135	3.6	8.3	9.5
150	4.0	9.1	10.3
160	4.2	9.4	10.9
185	4.7	10.8	12.5
210	5.7	12.7	14.6
245	6.5	14.5	16.8
275	7.3	16.6	19
300	8.0	18.2	20.5

* The minimum flow rate given is for units without hydronic module that have a fixed condenser flow rate.

Units with a hydronic module have a variable flow rate and no minimum fixed flow rate. The minimum flow rate is optimised by unit control in parallel with the drycooler fan stages for all operating conditions, especially at low outdoor temperature and low load conditions.

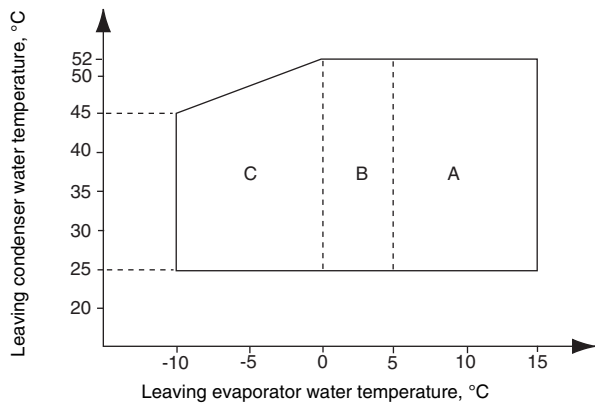
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Units with a hydronic module have a variable flow rate.

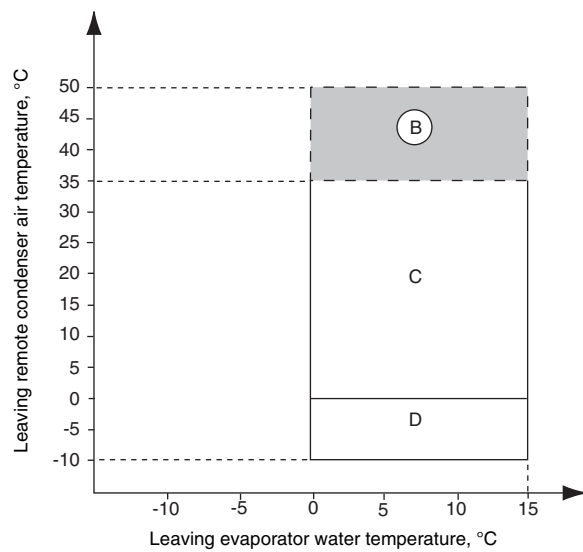
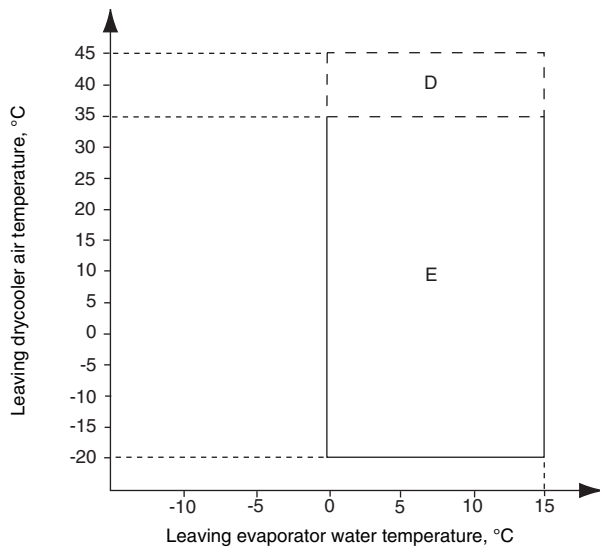
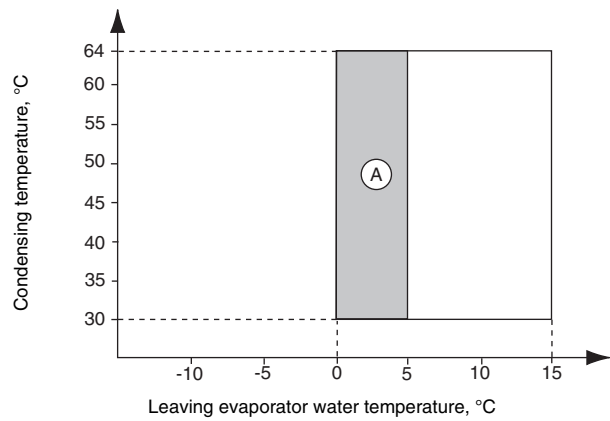
The maximum flow rate is optimised by unit control at all operating conditions, based on pump capacity, system pressure losses and outdoor temperature.

Operating range

30RW



30RWA



Notes 30RW

- 1 Evaporator and condenser $\Delta T = 5 \text{ K}$
- 2 For 30RW units without hydronic module with an entering condenser water temperature below 20°C a three-way valve is required to allow operation, while maintaining the correct condensing temperature.
- 3 For 30RW units equipped with a hydronic module the minimum entering water temperature is -15°C .
- 4 Maximum leaving condenser water temperature is 52°C (at full load)

- A Standard unit with without antifreeze solution
- B Standard unit operation with the anti-freeze solution required and control configuration for a leaving water temperature down to 0°C .
- C Standard unit operation with the anti-freeze solution required and control configuration for a leaving water temperature down to -10°C .
- D Operation at high air temperature is based on the drycooler selected.
- E Operation at low air temperature is possible down to -20°C with a drycooler.

Notes 30RWA

- 1 Evaporator $\Delta T = 5 \text{ K}$
- 2 Unit operation is limited by the maximum compressor condensing temperature of 64°C .

- A Standard unit operation with the anti-freeze solution required and special control configuration.
- B Operation at high air temperature is based on the condenser selected.
- C Operating range down to 0°C , if the air-cooled condenser is not equipped with a variable-speed head fan.
- D Extended operating range with variable-speed fan.

Water loop volume

Evaporator

1. Minimum volume

A minimum water volume is required for correct chiller operation. The minimum water loop volume can be calculated in accordance with the following formula:

Volume = CAP(kW) x N* = litres, where CAP is the cooling capacity at nominal operating conditions.

Air conditioning application	N*
30RW 020-045	3.5
30RW 060-300	2.5

Industrial process cooling

Certain industrial process applications may require high stability of the leaving water temperature levels. In this case the values above must be increased.

2. Maximum volume

Units with hydronic module incorporate an expansion tank sized for the maximum water loop volume.

The table below gives the maximum water loop volume (in litres) for pure water or ethylene glycol with various concentrations.

30RW/RWA	020-045	060-080	090-150	160-210	245-300
Pure water	673	1000	2080	2900	4162
10% ethylene glycol	487	730	1525	2135	3053
20% ethylene glycol	358	540	1120	1570	2236
35% ethylene glycol	290	430	910	1260	1800

Condenser

1. Minimum volume

The condenser water loop volume has no impact on the chiller operation

Note: For heat pump operation (unit control based on the hot-water temperature) the minimum condenser water loop volume must be calculated in accordance with the method used for the evaporator loop, replacing the cooling capacity with the heating capacity.

2. Maximum volume

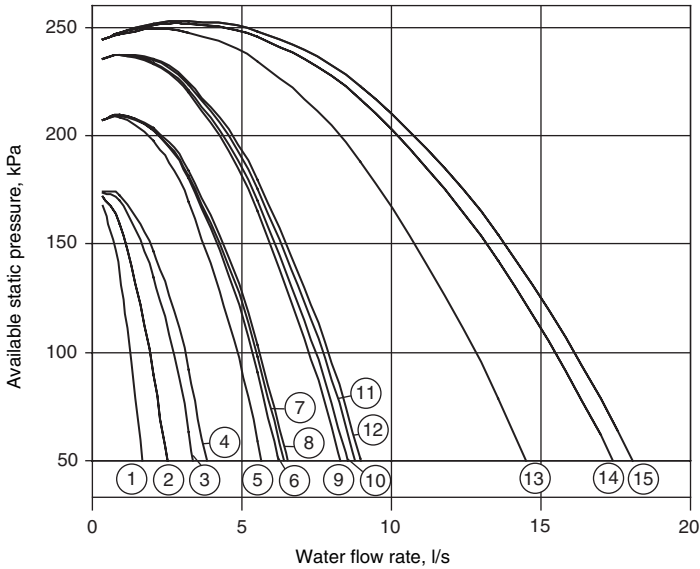
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Available static pressure, evaporator side 30RW/30RWA

Single pump

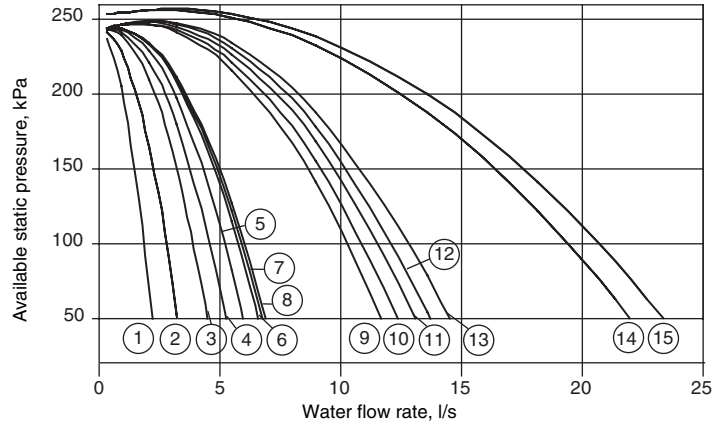


Legend

- | | |
|------------------------|-------------------------|
| 1 30RW / 30RWA 020 | 9 30RW / 30RWA 110 |
| 2 30RW / 30RWA 025-030 | 10 30RW / 30RWA 120 |
| 3 30RW / 30RWA 040 | 11 30RW / 30RWA 135 |
| 4 30RW / 30RWA 045 | 12 30RW / 30RWA 150 |
| 5 30RW / 30RWA 060 | 13 30RW / 30RWA 160-185 |
| 6 30RW / 30RWA 070 | 14 30RW / 30RWA 210-245 |
| 7 30RW / 30RWA 080 | 15 30RW / 30RWA 275-300 |
| 8 30RW / 30RWA 090 | |

Available static pressure, condenser side, 30RW

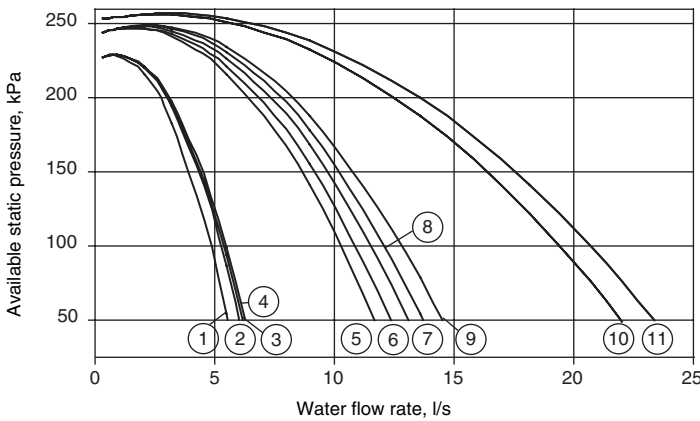
Single pump



Legend

- | | |
|----------------|-----------------|
| 1 30RW 020 | 9 30RW 110 |
| 2 30RW 025-030 | 10 30RW 120 |
| 3 30RW 040 | 11 30RW 135 |
| 4 30RW 045 | 12 30RW 150 |
| 5 30RW 060 | 13 30RW 160-185 |
| 6 30RW 070 | 14 30RW 210-245 |
| 7 30RW 080 | 15 30RW 275-300 |
| 8 30RW 090 | |

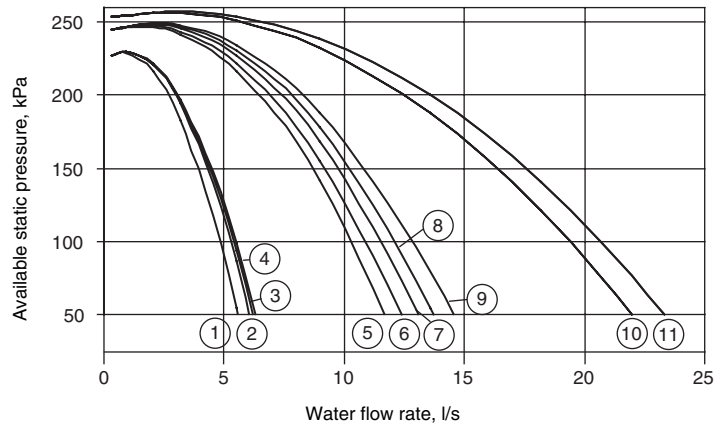
Dual pump



Legend

- | | |
|--------------------|-------------------------|
| 1 30RW / 30RWA 060 | 7 30RW / 30RWA 135 |
| 2 30RW / 30RWA 070 | 8 30RW / 30RWA 150 |
| 3 30RW / 30RWA 080 | 9 30RW / 30RWA 160-185 |
| 4 30RW / 30RWA 090 | 10 30RW / 30RWA 210-245 |
| 5 30RW / 30RWA 110 | 11 30RW / 30RWA 275-300 |
| 6 30RW / 30RWA 120 | |

Dual pump



Legend

- | | |
|------------|-----------------|
| 1 30RW 060 | 7 30RW 135 |
| 2 30RW 070 | 8 30RW 150 |
| 3 30RW 080 | 9 30RW 160-185 |
| 4 30RW 090 | 10 30RW 210-245 |
| 5 30RW 110 | 11 30RW 275-300 |
| 6 30RW 120 | |