



TRANE®

Multi-pipe Units with Scroll Compressors

Model CMAA

Cooling capacity 45 - 485 kW

Heating capacity 50 - 670 kW

CMAA multi-pipe units

Simultaneous heating and cooling with one product

Standard versions

- Acoustic packages available: low noise or super low noise
- Different built-in hydraulic kits available with cooling and heating circuit pumps of 150/250/450 kPa

Unit description

- Two completely independent circuits, one for chilled water and one for hot water
- Scroll compressors
- ECO profile axial fans, statically and dynamically balanced
- Electronic expansion valve
- Evaporator stainless steel AISI 316 brazed plate type externally insulated complete of differential pressure switch and antifreeze protection electric heater
- Communication card RS 485
- Phase failure protection relay
- Recovery stainless steel AISI 316 brazed plate type externally insulated
- Double set point temperature for air conditioning water
- Microprocessor
- Casing: galvanised steel base frame and panels in powder painted galvanised steel sheet for outdoor installation



TO BE COMBINED WITH STANDARD VERSIONS

L: Low noise with condensing control with reduced fans speed and sound compressors jackets.

S: Super low noise with condensing control with variable fan speed modulation, oversized coils, muffler on the compressor discharge lines and soundproof insulation of compressor boxes.

Options and accessories

Factory-mounted options

- Stand by pump for cooling circuit + stand by pump for heating circuit, 150 / 250 / 450 kPa
- Condensing/evaporating pressure control with variable fan speed modulation for external temperature up to -20°C
- Automatic circuit breakers
- Softstarter
- Numbered wires
- Gas gauges
- Power factor correction to cos phi 0.91
- Control panel electric heater with thermostat
- EC fan motors
- High static pressure EC fans (100 Pa)

- Condensing coil protection grilles
- Epoxy coated condensing coils fins
- Copper/copper condensing coils
- Tinned copper/copper condensing coils
- BLYGOLD treated coils
- Pre painted condensing coils

Accessories

- Remote control display
- Flow switch
- Automatic water filling
- Threaded strainer
- Water gauges
- Rubber anti vibration mounts
- Spring anti vibration mounts

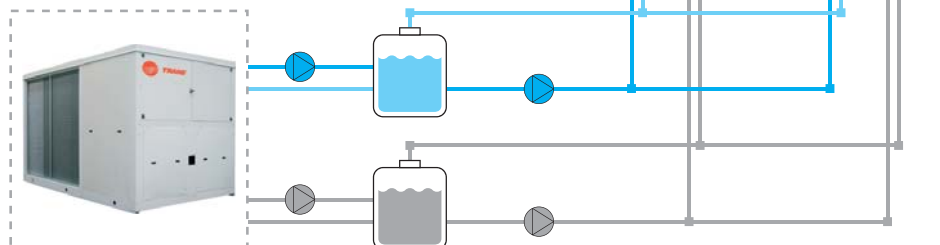
Sustainability

The continuous drive to improve energy efficiency of building systems requires an optimal balancing in the demand and supply of both heating and cooling. Trane's multi-pipe units can simultaneously deliver heating and cooling. A sustainable solution for many applications.

Operating modes

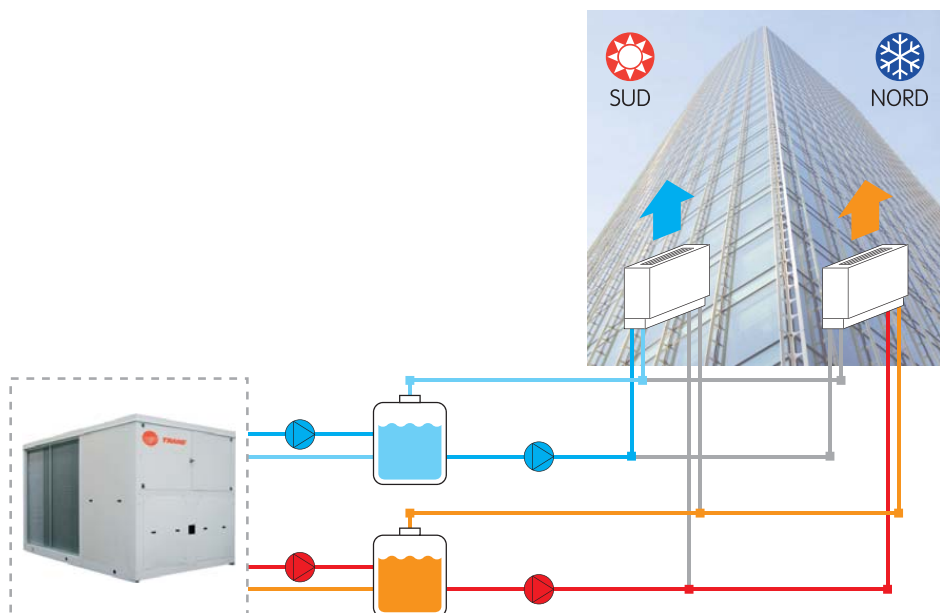
Chiller only mode

Production of chilled water for air conditioning use.



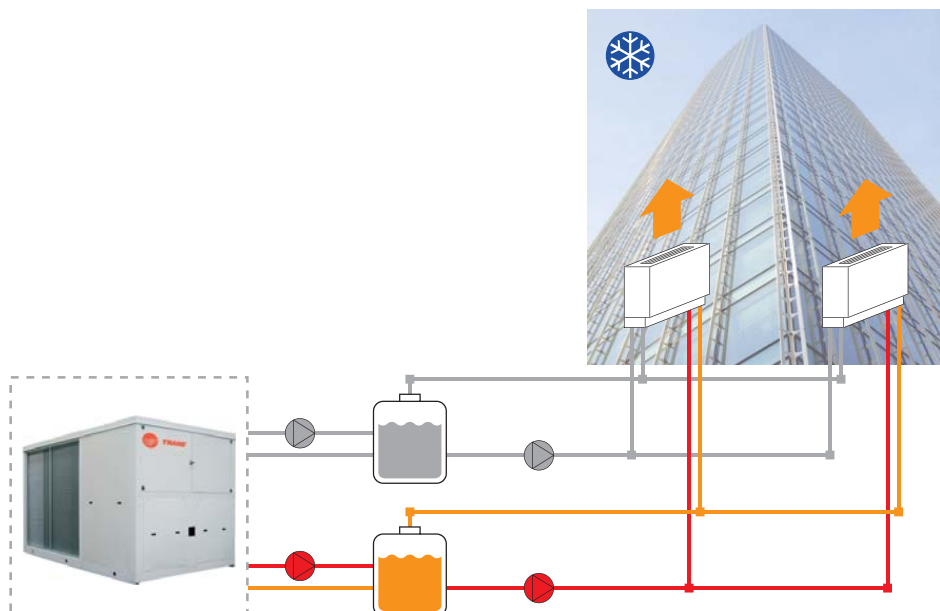
Chiller mode + partial or total heat recovery

Simultaneous production of chilled water on the evaporator and hot water from heat recovery exchanger.



Heat pump only mode

Hot water production for air conditioning use.



TEC: Total Efficiency Coefficient

The best coefficient measuring the unit performance during the whole year is the TEC coefficient. It represents the total seasonal efficiency properly developed to measure the multifunction real efficiency. The TEC is calculated on the base of the efficiencies of each operating mode of the unit and properly weighted (cooling, cooling + heating, heating).

Equation For TEC calculation

$$TEC = EER_{COOLING} * \alpha + DMEC_{COOLING+HEATING} * \beta + COP_{HEATING} * \gamma$$

α, β, γ = weight for operating modes (%)

DMEC = Dual Mode Efficiency Coefficient

DMEC = sum of the heating plus cooling capacity divided by total compressors power input (in chiller + recovery mode)

Max. value is reached when heating and cooling loads are fully balanced.

Possible operating combinations			
Circuit 1	Circuit 2	Cooling capacity	Heating capacity
Chiller	Off	50%	0%
Chiller	Chiller	100%	0%
Chiller	Chiller + total recovery	100%	50%
Chiller + total recovery	Chiller + total recovery	100%	100%
Heat pump	Chiller + total recovery	50%	100%
Chiller + total recovery	Off	50%	50%
Heat pump	Heat pump	0%	100%
Off	Heat pump	0%	50%



General technical data

Mod.		CMAA	012	015	018	023	030	033	037	044	047
Cooling											
Cooling capacity		kW	44.60	55.20	63.50	80.70	106.10	117.80	131.40	153.70	165.80
Compressors power input		kW	13.80	15.80	19.90	21.90	31.90	34.80	41.10	43.40	47.80
Total EER (incl.fans)			2.89	3.17	2.95	3.22	3.02	3.10	2.97	3.09	3.06
Heating											
Heating capacity		kW	51.70	62.30	73.30	92.80	118.70	140.40	156.40	183.20	197.00
Compressors power input		kW	14.90	17.10	20.90	25.30	35.30	39.00	44.50	50.00	54.20
Total COP (incl.fans)			3.14	3.33	3.26	3.26	3.08	3.33	3.28	3.25	3.25
Cooling + Heating											
Cooling capacity		kW	44.60	55.20	63.50	80.70	106.10	117.80	131.40	153.70	165.80
Heating capacity		kW	58.40	71.00	83.40	102.60	138.00	152.60	172.50	197.10	213.60
Compressors power input			13.80	15.80	19.90	21.90	31.90	34.80	41.10	43.40	47.80
Dual mode efficiency coefficient			7.50	8.00	7.40	8.40	7.70	7.80	7.40	8.10	7.90
Total energy coefficient			5.30	5.70	5.30	6.00	5.50	5.60	5.40	5.80	5.60
Number of refrigerant circuits			2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Number of scroll compressors			2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Sound pressure level (calculated according to ISO)		dB(A)	46.00	46.00	47.00	49.00	52.00	54.00	54.00	55.00	57.00
Sound power level		dB(A)	78.00	78.00	79.00	81.00	84.00	86.00	86.00	87.00	89.00
Sound pressure level (calculated according to ISO)	S	dB(A)	41.00	41.00	42.00	44.00	47.00	49.00	49.00	50.00	52.00
Sound power level	S	dB(A)	73.00	73.00	74.00	76.00	79.00	81.00	81.00	82.00	82.00
Maximum power input		kW	26.40	29.40	35.20	45.80	61.10	68.80	76.40	85.90	91.80
Maximum full load current		A	44.90	49.90	59.90	77.90	103.90	116.90	129.90	146.00	156.00
Full load starting current		A	165.90	172.80	190.90	241.50	271.90	316.30	330.90	397.00	411.00
Electrical power supply		V/Ph/Hz	400/3+n/50								

Mod.		CMAA	057	070	087	097	102	120	130	140
Cooling (1)										
Cooling capacity		kW	201.20	249.5	307.50	340.10	361.90	421.60	460.00	485.00
Compressors power input		kW	61.80	72.50	96.10	100.50	105.10	125.80	130.00	139.00
Total EER (incl.fans)			2.95	3.16	3.00	3.09	3.15	3.11	3.10	3.10
Heating (2)										
Heating capacity		kW	235.70	279.30	346.60	383.00	407.40	472.00	530.00	557.00
Compressors power input		kW	67.70	78.00	96.10	105.00	111.90	125.10	133.00	143.00
Total COP (incl.fans)			3.18	3.31	3.38	3.34	3.35	3.50	3.52	3.46
Cooling + Heating (3)										
Cooling capacity		kW	201.20	249.50	307.50	340.10	361.90	421.60	504.30	529.50
Heating capacity		kW	263.00	322.00	403.70	440.50	467.00	547.40	639.10	674.60
Compressors power input			61.80	72.50	96.10	100.50	105.10	125.80	135.00	145.00
Dual mode efficiency coefficient			7.51	7.90	7.40	7.80	7.90	7.70	8.50	8.30
Total energy coefficient			5.30	5.60	5.30	5.50	5.60	5.50	5.80	5.80
Number of refrigerant circuits			2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00
Number of scroll compressors			4.00	4.00	4.00	4.00	4.00	4.00	6.00	6.00
Sound pressure level (calculated according to ISO)		dB(A)	57.00	60.00	60.00	62.00	62.00	63.00	62.00	63.00
Sound power level		dB(A)	89.00	92.00	92.00	94.00	94.00	95.00	95.00	96.00
Sound pressure level (calculated according to ISO)	S	dB(A)	52.00	55.00	55.00	57.00	57.00	58.00	57.00	58.00
Sound power level	S	dB(A)	83.00	84.00	84.00	85.00	85.00	89.00	90.00	91.00
Maximum power input		kW	114.70	135.90	164.70	180.00	190.00	220.00	287.40	306.90
Maximum full load current		A	195.00	231.00	280.00	306.00	323.00	374.00	476.00	510.00
Full load starting current		A	367.60	485.00	541.00	575.00	668.00	698.00	717.00	751.00
Electrical power supply		V/Ph/Hz	400/3+n/50							

(1) Outdoor temperature 35°C - evaporator water temperature 12/7°C

(2) Outdoor temperature 7°C 90% R.H. - condenser water temperature 40/45°C

(3) Condenser water temperature in/out 40/45°C - evaporator water temperature in/out 12/7°C

Dimensions and weights

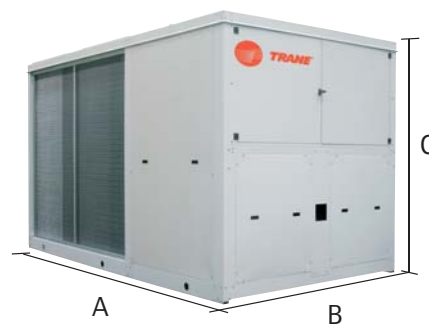
Mod.	CMAA		012	015	018	023	030	033	037	044	047
Length		mm	2300.00	2300.00	2300.00	3550.00	3550.00	3550.00	3550.00	3850.00	3850.00
Width		mm	1350.00	1350.00	1350.00	1550.00	1550.00	1550.00	1550.00	2250.00	2250.00
Height		mm	1550.00	1550.00	1550.00	1965.00	1965.00	1965.00	1965.00	2312.00	2312.00
Shipping weight		kg	1169.00	1230.00	1263.00	1859.00	1892.00	1921.00	1974.00	2551.00	2586.00
Shipping weight (1)	Single pump 150 kPa pressure head	kg	111.00	110.00	142.00	141.00	142.00	142.00	156.00	156.00	156.00
Shipping weight (1)	Single pump 250 kPa pressure head	kg	123.00	123.00	139.00	155.00	154.00	162.00	155.00	162.00	162.00
Shipping weight (1)	Single pump 450 kPa pressure head	kg	159.00	159.00	175.00	193.00	193.00	193.00	200.00	250.00	250.00

Mod.	CMAA		057	070	087	097	102	120	130	140
Length		mm	3850.00	3850.00	3850.00	4460.00	4460.00	4460.00	7035.00	7035.00
Width		mm	2250.00	2250.00	2250.00	2250.00	2250.00	2250.00	2260.00	2260.00
Height		mm	2312.00	2312.00	2312.00	2312.00	2312.00	2312.00	2400.00	2400.00
Shipping weight		kg	2757.00	2976.00	3280.00	3520.00	3634.00	3806.00	4679.00	4785.00
Shipping weight (1)	Single pump 150 kPa pressure head	kg	169.00	169.00	169.00	268.00	268.00	268.00	346.00	346.00
Shipping weight (1)	Single pump 250 kPa pressure head	kg	191.00	205.00	205.00	296.00	296.00	296.00	478.00	478.00
Shipping weight (1)	Single pump 450 kPa pressure head	kg	257.00	257.00	257.00	338.00	338.00	338.00	720.00	720.00

(1) Extra weight for hydraulic versions



CMAA size 130-140



CMAA size 012-120



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