



Advanced Heat Pump Technology

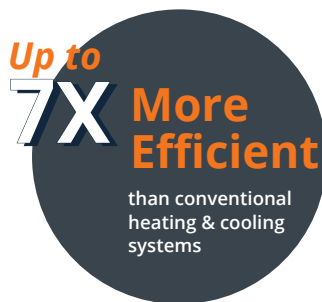
PRODUCT CATALOG

DCT One Series

DCT One Series heat pumps replace traditional water heaters, steam boilers, cooling towers, or chillers.

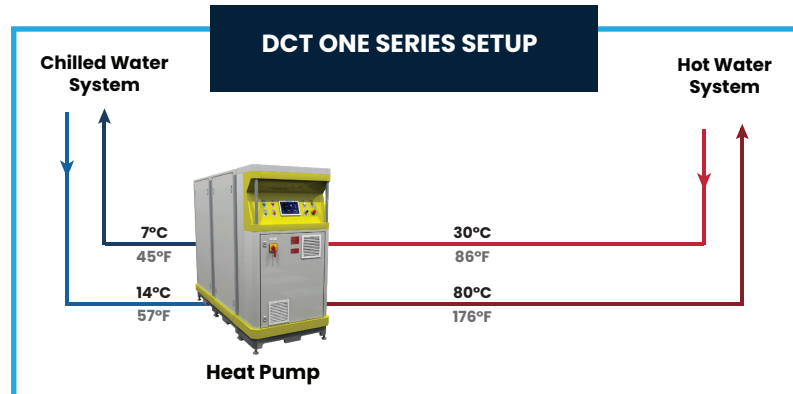
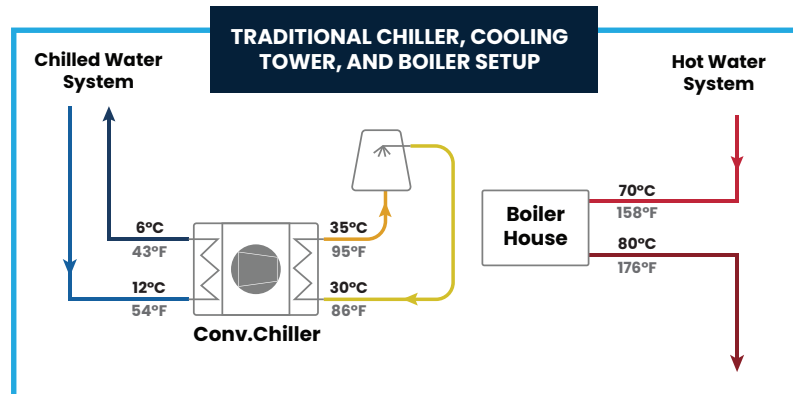
DCT ONE SERIES CRITICAL ADVANTAGES

- Efficiently decarbonizes heat
- Combustion-free process
- Reduces global warming potential (GWP)
- Uses carbon dioxide (CO₂) as refrigerant in transcritical refrigeration cycle
- Retrofittable design, modular build
- Climate agnostic, works in multiple regions
- Easily implemented into new and existing building infrastructures
- Real-time performance data enabled with advanced control module



INDUSTRIES & APPLICATIONS

- Hotels, Gyms & Spas
- Commercial Buildings
- Data Centers
- Hospitals & Medical Facilities
- Schools & Universities
- Food Production & Processing



1. HOT & COLD COUPLING

Innovative technology for use in applications that link to local heat networks, where hot and cold coupling is a necessity (IT, server cooling, district heating, and more).

2. COST & ENERGY EFFICIENT

Exponential cost savings and reduced carbon emissions – immediately and over time. Up to 75% increased energy efficiency plus eligibility for tax credits and incentives.

3. F-GAS EXEMPT REFRIGERANT

Non-toxic, non-flammable, and eco-friendly R744 Carbon Dioxide (CO₂). This natural refrigerant is CFC and HFC free with an ODP of 0 and GWP of 1.

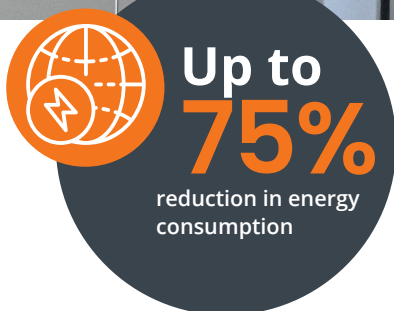
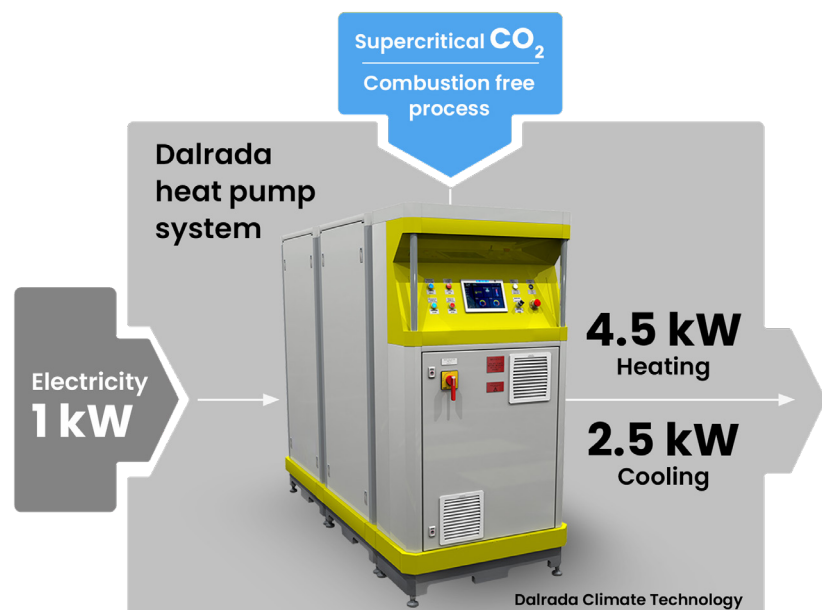


TECHNOLOGY OVERVIEW

Dalrada Climate Technology's combustion-free heat pumps increase heating and cooling efficiency by capturing and reusing thermal energy, ultimately reducing global warming potential (GWP) through the use of carbon dioxide (CO₂) as the refrigerant.

This specialized technology helps support the global initiative of transitioning to Net Zero through renewable and sustainable energy technology and innovation, minimizing carbon emissions and improving energy efficiency.

Dalrada Climate Technology heat pump systems replace traditional combustion boilers and can eliminate carbon emissions at a local level when scaled accordingly and when "cleaner" electricity sources are used.



BY THE NUMBERS

- Up to 7 times more efficient than traditional boilers and chiller systems
- 1 kW of electrical energy produces 4.5 kW of heating and extracts 2.5 kW of cooling energy from the waste heat source
- Hot water supply range: +50°C – +85°C (+122°F – +185°F)
Cold water supply range: 0°C – +15°C (32°F – +59°F)

DCT ONE SERIES TECHNICAL SPECIFICATIONS

Dimensions	
Length	2375 mm
Height	1975 mm
Depth	950 mm
Weight	1500 kg
Noise	
Sound pressure	70dB
Circulation pump	No circulation pump
Electrical Data	
Electrical power supply	CE 400/3ph/50Hz: UL 480v /3ph /60 Hz
Maximum absorbed power	45
Start up current	100

Compressor	
Compressor type	Semi hermetic compressor
Oil quantity	2.5L
Type of oil	ZEROL RFL 68 EP
User Hydronic Circuit	
Water inlet connection cold	1" 1/2
Water inlet connection hot	1"
Maximum allowable pressure	6 bar
Number of compressors/circuits	1/1
Refrigerant	CO2

DCT ONE SERIES PERFORMANCE DATA

Hot Water Inlet: Outlet(°C)	Cold Water Inlet: Outlet(°C)*	Specifications	Hot Water Circuit	Cold Water Circuit
20/60	12/7	Thermal power	129 [kW]	90 [kW]
		Combined COP	5.78	
		Flow rate	2820 [l/h]	14640 [l/h]
		Absorbed power	37.87 [kW]	
20/60	17/12	Thermal power	139 [kW]	99 [kW]
		Combined COP	6.18	
		Flow rate	2355 [l/h]	14568 [l/h]
		Absorbed power	38.4 [kW]	
20/70	12/7	Thermal power	127 [kW]	89 [kW]
		Combined COP	5.17	
		Flow rate	2066 [l/h]	14526 [l/h]
		Absorbed power	42.04 [kW]	

*All tests performed with the absence of glycol

DCE DCE W



NATURAL
REFRIGERANT

GWP=1

ODP=0

Specially designed for the production of very high temperature water using R744 natural refrigerant gas (CO2).

Can reach hot water temperatures up to 90°C with an external air temperature of -20°C.

DCE RANGE

Heating capacity (A7;W80) 14,5 ÷ 124,9 kW

DCE W RANGE

Heating capacity (W7;W80) 15,8 ÷ 133,2 kW



Heating



Semi-hermetic
reciprocating compressors



Axial fans

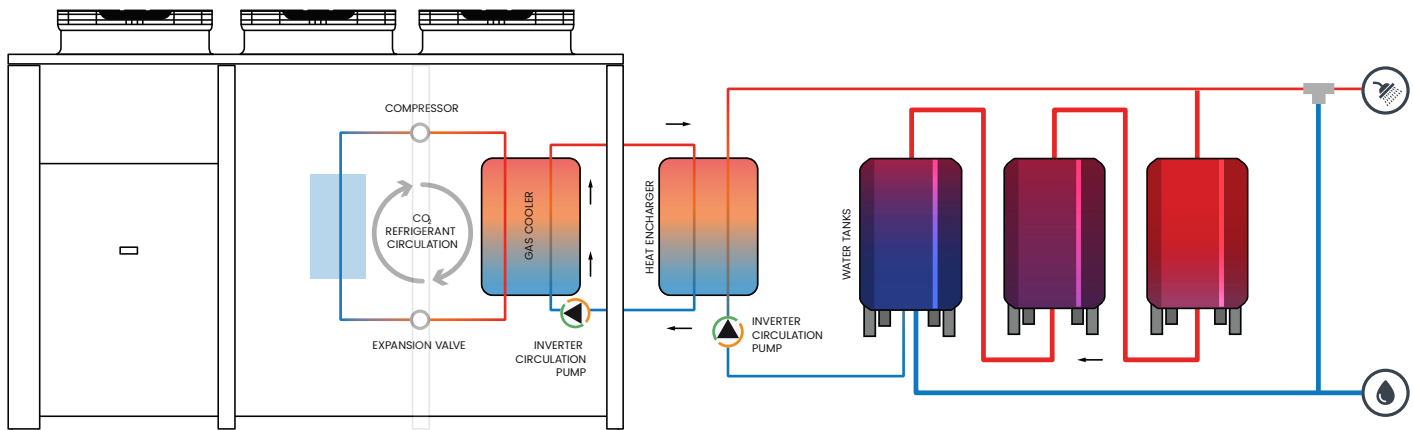


Total cool recovery
(Optional)

WORKING PRINCIPLE

Both DCE and DCE W heat pumps can produce hot water at a constant temperature at a specified set point.

- The inverter circulation pump on the unit is managed by the microprocessor.
- Installing a stratified water tank or several water tanks in a series will be necessary once the temperature probes are installed in order to manage the unit's on/off cycles.



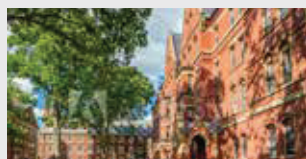
DHW PRODUCTION

OPTIONAL COOL RECOVERY: it can provide chilled water to fan coils and air handling units



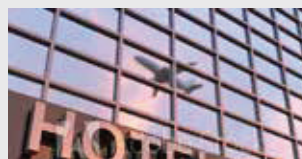
Sport centres

2.500 l/day



Retirement homes

5.000 l/day



Hotels

10.000 l/day



Apartment blocks

Hospitals
15.000 l/day

PROCESS

OPTIONAL COOL RECOVERY: it can provide chilled water to control the process



Dairy factories

3.000 l/day



Breweries

5.000 l/day



Cleaning and Sanification

10.000 l/day

Industrial and food production processes

15.000 l/day

DCE AIR / WATER – TECHNICAL DATA

Model			DCE 18 kW	DCE 26 kW	DCE 48 kW	DCE 70 kW	DCE 100 kW	DCE 150 kW
USER: Heating (EN 14511 values) (A7;W80)								
Nominal heating capacity (A7;W80)	(1), (6)	kW	14,8	25,0	45,2	56,5	85,0	124,3
Total Power input	(1), (2), (6)	kW	4,7	8,1	13,1	17,5	26,6	39,4
COP	(1), (6)		3,15	3,09	3,44	3,23	3,19	3,16
Cool recovery version								
Heating + Cool recovery (EN 14511 values) (W80;W7)								
Nominal heating capacity	(7)	kW	16,0	27,8	46,7	63,2	93,4	137,9
Nominal cooling capacity	(7)	kW	11,5	20,4	34,0	46,1	67,8	100,6
Total Power input	(7)	kW	4,6	7,4	12,7	17,1	25,7	37,3
TER - Total efficiency ratio			6,02	6,51	6,37	6,40	6,28	6,40
Compressor								
Type			Reciprocating					
Quantity/Refrigerant circuits		n° / n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Capacity steps		n°	-	-	-	-	-	-
Circuit refrigerant charge		kg	9	11	19	20	20	25
Axial Fans								
Quantity		n°	1	1	3	3	2	2
User Side exchanger								
Type			Plate exchanger					
Water flow (A7/W80)	(1)	l/h	213	360	649	812	1222	1786
Pressure drops (A7/W80)	(1)	kPa	11	14	20	20	14	13
Source Side exchanger (Cold recovery version)								
Type			Plate exchanger					
Water flow (W7/W80)	(7)	l/h	1982	3527	5883	7952	11720	17380
Pressure drops (W7/W80)	(7)	kPa	35,0	47,5	57,4	28,0	53,2	45,1
Hydraulic module user side								
Type			EC motor circulation pump					
Nominal Power input of pump		W	72	90	90	90	90	90
Available pressure head (W7/W80)	(1)	kPa	55,3	75,3	70,9	70,6	74,8	73,7
Connection			1"	1"	1"	1"1/2"	1"1/2"	1"1/2"
Hydraulic module source side (Cold recovery version)								
Nominal Power input of pump		W	75	190	500	1.100	1.100	1.100
Available pump pressure (W7/W80)	(1)	kPa	100,7	12,3	37,9	120,4	86,3	161,3
Connection			1"	1"	1"	1"1/2"	1"1/2"	2"

- (1) External air temperature, 7°C U.R. 87%, User side inlet-outlet water 20-80 °C
(2) Total power input is sum of compressors and fans power input and pump, according with EN 14511
(3) Sound power level calculated in compliance with ISO 3744
(4) Sound pressure level at 10 m calculated in compliance with ISO 3744
(5) Sound level at the follow conditions: External Air temperature 7°C, use side water 20-80°C .
(6) Values calculate in compliance with EN 14511
(7) Source side inlet/outlet water temperatura, 12/7°C, User side inlet-outlet water 20-80 °C

Model			DCE 18 kW	DCE 26 kW	DCE 48 kW	DCE 70 kW	DCE 100 kW	DCE 150 kW
Sound level STD version								
Sound power value	(3), (5)	dB(A)	77	82	86	88	94	97
Sound pressure value	(4), (5)	dB(A)	45	50	54	56	62	65
Sound level LN version								
Sound power value	(3), (5)	dB(A)	75	80	84	86	92	95
Sound pressure value	(4), (5)	dB(A)	43	48	52	54	60	63
Basic unit size and weights								
Width		mm	1600	1408	2650	1200	3510	3510
Depth		mm	850	1268	1040	1040	1210	1260
Height		mm	1780	2015	1820	1819	1916	1916
Delivery weight		kg	644	554	752	791	1185	1270
Operating weight		kg	649	557	757	796	1193	1281

DCE – AIR / WATER ELECTRICAL DATA

Model			DCE 18 kW	DCE 26 kW	DCE 48 kW	DCE 70 kW	DCE 100 kW	DCE 150 kW
Maximum absorbed power	(1)	kW	6	10	16	19	33	47
Maximum starting current	(2)	A	13	27	37	47	66	80
Full load current	(3)	A	47	114	144	186	255	300
Fan motor nominal power		n° x kW	1 x 0,6	1 x 1,6	3 x 0,6	3 x 0,6	2 x 1,6	2 x 1,6
Fan motor nominal absorbed current		n° x A	1 x 2,62	1 x 3,9	3 x 2,62	3 x 2,62	2 x 3,9	2 x 3,9
User side pump nominal absorbed power		W	72	90	90	90	90	90
User side pump nominal absorbed current		A	0,7	0,7	0,7	0,7	0,7	0,7
Power supply		V/ph/Hz	400/3N~/50 ±5%					
Power supply		V/ph/Hz	230/1~/50 ±5%					

(1) Mains power supply to allow unit operation

(2) Maximum current before safety cut-outs stop the unit. This value is never exceeded and must be used to size the electrical supply cables and relevant safety devices (refer to electrical wiring diagram supplied with the unit).

(3) Maximum starting current calculated considering the bigger size compressor starting current plus the maximum absorbed power of the other electrical devices (pumps, fans)

DCE W WATER / WATER – TECHNICAL DATA

Model			DCE W 18 kW	DCE W 26 kW	DCE W 48 kW	DCE W 70 kW	DCE W 100 kW	DCE W 150 kW
USER: Heating (EN 14511 values) (W7;W80)								
Nominal heating capacity (W7;W80)	(1), (6)	kW	16,0	27,8	46,7	63,2	93,4	137,9
Total Power input	(1), (2), (6)	kW	4,6	7,4	12,7	17,1	25,7	37,3
COP	(1), (6)		3,51	3,72	3,69	3,70	3,64	3,70
SOURCE: Cooling (EN 14511 values) (W7;W80)								
Nominal cooling capacity	(1), (6)	kW	11,5	20,4	34,0	46,1	67,8	100,6
Compressor								
Type			Reciprocating					
Quantity/Refrigerant circuits		n° / n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Capacity steps		n°	-	-	-	-	-	-
Total oil charge		kg	1,3	2,5	2,5	2,5	2,5	2,5
Circuit refrigerant charge		kg	3,5	4,5	6,5	7,0	8,0	8,0
User Side exchanger								
Type			Plate exchanger					
Water flow rate (W7/W80)	(1)	l/h	230,6	399,8	670,9	908,1	1343,0	1982,0
Pressure drop (W7/W80)	(1)	kPa	7,9	17,3	22,0	24,5	16,4	14,5
Source Side exchanger								
Type			Plate exchanger					
Water flow rate (W7/W80)	(1)	l/h	1982	3527	5883	7952	11720	17380
Pressure drop (W7/W80)	(1)	kPa	35,0	47,5	57,4	28,0	53,2	45,1
Hydraulic module user side								
Type			EC motor circulation pump					
Nominal Power input of pump		W	72	90	90	90	90	90
Available pump pressure (W7/W80)	(1)	kPa	58,3	72,6	69,1	66,3	71,3	71,9
Connection			1"	1"	1"	1"1/2"	1"1/2"	1"1/2"
Hydraulic module source side								
Nominal Power input of pump		W	75	190	500	1.100	1.100	1.100
Available pump pressure (W7/W80)	(1)	kPa	12,3	37,9	86,3	161,3	120,4	100,7
Connection			1"	1"	1"	1"1/2"	1"1/2"	2"
Sound level LN version								
Sound power value	(3), (5)	dB(A)	68,0	70,0	71,0	73,0	78,0	81,0
Sound pressure value	(4), (5)	dB(A)	36,5	38,5	39,5	41,5	46,5	49,5
Basic unit size and weights								
Width		mm	1150	1150	1150	1400	1400	1400
Depth		mm	790	790	790	1040	1040	1040
Height		mm	1764	1764	1764	1306	1306	1306
Delivery weight		kg	349	420	446	495	521	566
Operating weight		kg	349	425	446	498	513	566

- (1) Source side inlet/outlet water temperatura, 12/7°C, User side inlet-outlet water 20-80 °C
(2) Total power input is sum of compressors and power input of pump, according with EN 14511
(3) Sound power level calculated in compliance with ISO 3744
(4) Sound pressure level at 1 m calculated in compliance with ISO 3744
(5) Sound level at the follow conditions: source side water 12/7°C, user side water 20-80°C
(6) Values calculate in compliance with EN 14511

DCE W WATER / WATER – ELECTRICAL DATA

Model			DCE W 18 kW	DCE W 26 kW	DCE W 48 kW	DCE W 70 kW	DCE W 100 kW	DCE W 150 kW
Maximum absorbed power	(1),(3)	kW	5,2	7,4	14,4	16,8	28,2	42,1
			(5,3)	(7,6)	(14,9)	(17,9)	(29,3)	(43,2)
Maximum starting current	(2),(3)	A	10,0	22,3	28,7	38,7	56,7	70,7
			(10,6)	(23,6)	(32,2)	(41,1)	(59,1)	(73,1)
Full load current	(4)	A	44,1	109,0	135,0	178,0	246,0	291,0
			(44,7)	(110,3)	(138,5)	(180,4)	(248,4)	(293,4)
Power supply		V/ph/Hz	3/380-430/50.0					
Power supply		V/ph/Hz	1/230/50.0					

(1) Mains power supply to allow unit operation

(2) Maximum current before safety cut-outs stop the unit. This value is never exceeded and must be used to size the electrical supply cables and relevant safety devices (refer to electrical wiring diagram supplied with the unit).

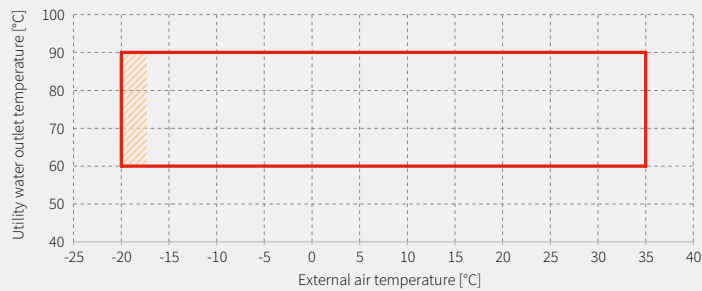
(3) Values in brackets refer to ST version units (units with pump on surce side)

(4) Maximum starting current calculated considering the bigger size compressor starting current plus the maximum absorbed power of the other electrical devices (pumps)

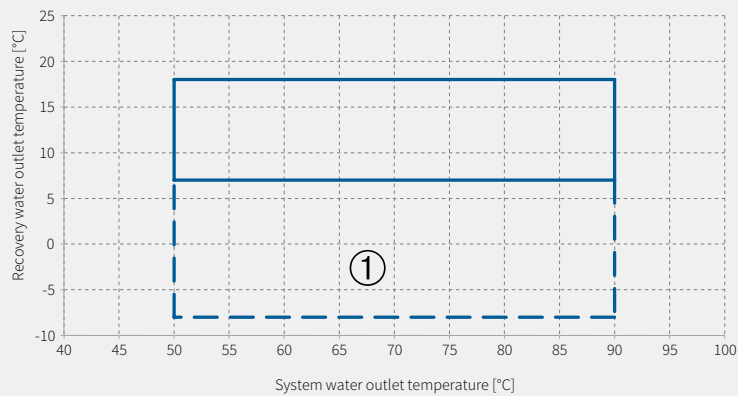
OPERATING LIMITS

DCE

HEATING



COOLING

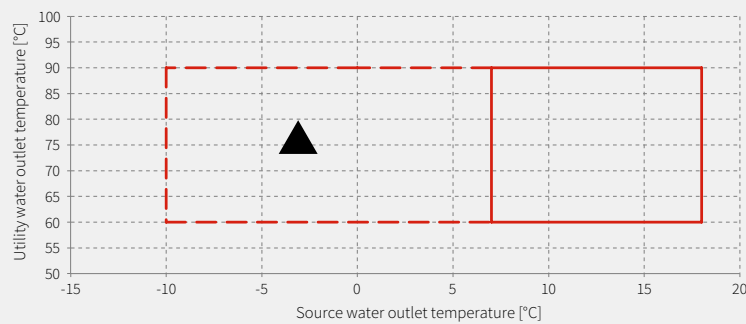


Notes

- The water inlet temperature must range between +5°C and +30°C
- Unit operation beyond the limits described above may cause malfunctioning and breakage of the unit itself
- ① Operating limits with glycoled water
- For continuous operation in this area, contact the sales department

DCE W

HEATING & COOLING

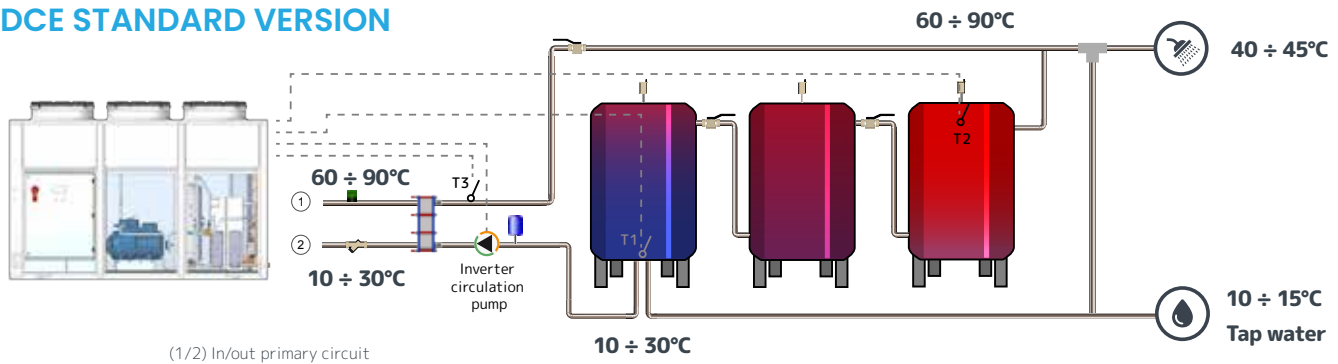


Notes

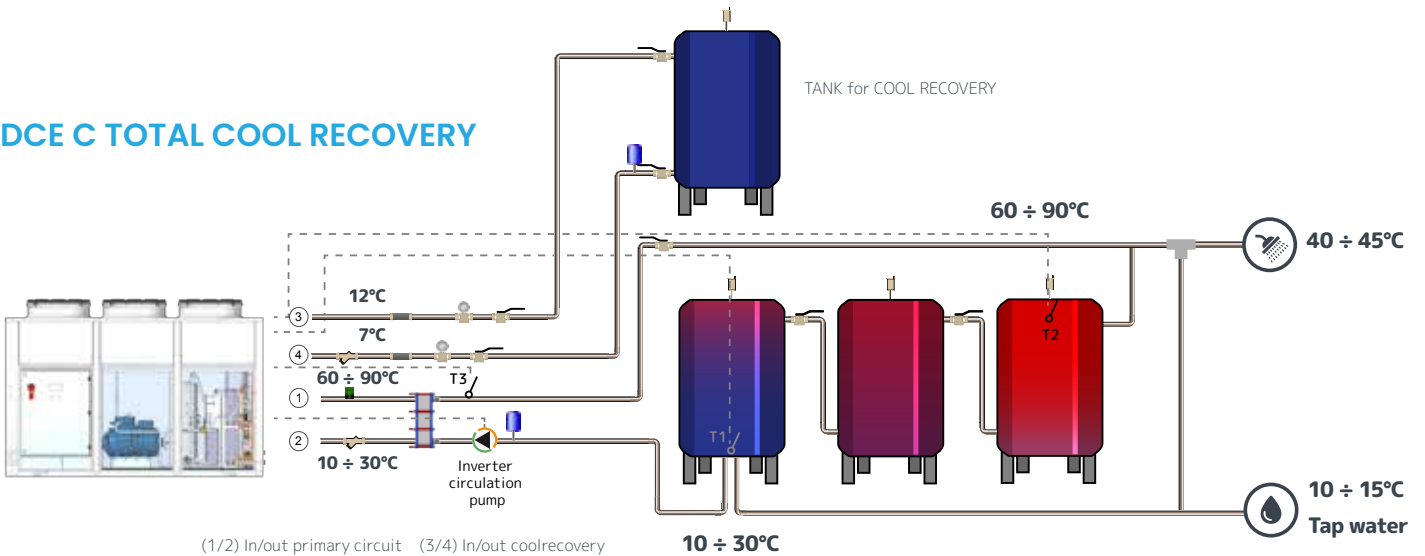
- The water inlet temperature to the unit or HOT heat exchanger must range between +5°C and +30°C
- The delta T in the cold heat exchanger must range between 3 and 6 °C
- ▲ Operating limits with glycoled water
- Unit operation beyond the limits described above may cause malfunctioning and breakage of the unit itself.

INSTALLATION DIAGRAMS

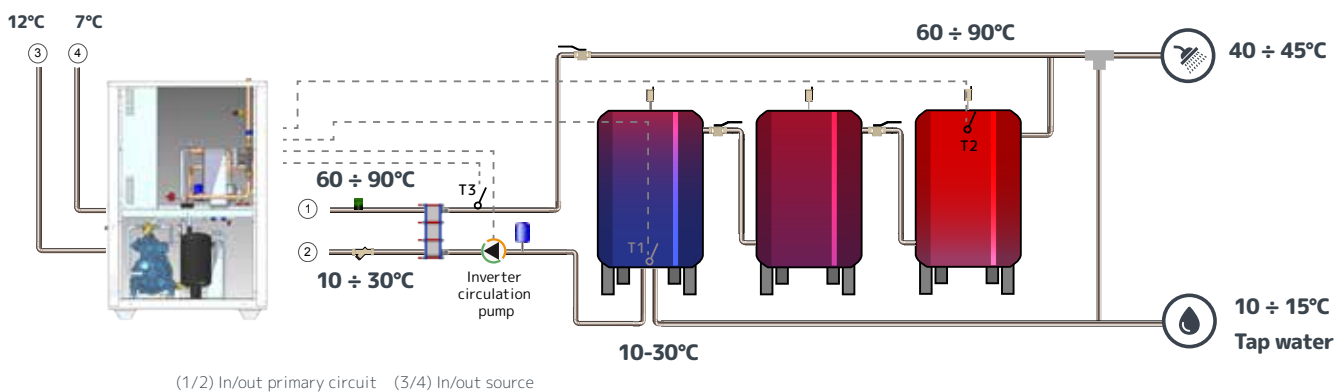
DCE STANDARD VERSION



DCE C TOTAL COOL RECOVERY



DCE W



ON-SITE EXAMPLES



RADISSON BLU ATLANTIC HOTEL

Stavanger – Norway

- 1x DCE size 100 + recovery
- 1x DCE size 100



ATRIUM RESIDENCE

Baška, Krk – Croatia

- DCE size 48



WHITE ISLAND RESORT (Hotel)

Ibiza – Spain

- 2x DCE W size 48



ON-SITE PROCESSING EXAMPLE



MAMMEN DAIRY CHEESE FACTORY

BJERRINGBRO – Denmark

- 6x DCE W size 100
- 4x DCE W size 150





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Challenge accepted:
**Driving the
Clean Energy Revolution.**