

## C-series

# WATER COOLING STATIONS

**Adwatec Heavy Duty Water Cooling Stations** are compact and reliable solutions for power electronics cooling in a closed-loop water cooling system.

The cooling station circulates coolant between the power electronics and heat exchanger. A 3-way valve is used to ensure a constant temperature and to avoid condensation in power electronics.

All cooling stations can be delivered as an open frame solution or pre-installed into a standard Rittal VX25 cabinet.

C-series cooling stations are type approved by DNV. All cooling stations can be also approved in projects by any classification societies.

Full range of single and redundant pump stations.  
**Flow rates from 10 l/min to 1400 l/min.**

### KEY FACTS

- ◆ High flow rates with a minimal footprint. Footprints starting from W302 x D556.
- ◆ Wide selection of pumps and heat exchangers
- ◆ Temperature control with a PLC-controlled 3-way valve to avoid any condensation risks.
- ◆ Minimized commissioning time at the site
  - ◆ Microbubble collector system enables even up to 12 times faster de-airing
- ◆ Coolant level indicator in the expansion tank
- ◆ Sight glass to check the coolant quality
- ◆ Standard connection pipe product range
- ◆ IP54 rated components
- ◆ Pressure class PN6 (PN10 as an option)



CCE104R-3-W-P

*Project-specific approvals e.g. with following classification societies:*



# PRODUCT RANGE

PRODUCT CODE	Motor frequency (Hz)	Flow rate range (l/min)	Max. cooling power (kW) at $\Delta T = 5\text{ }^{\circ}\text{C}$ <sup>(2)</sup> and at max flow rate	Main dimensions W x D x H Open frame	Connection pipe size class	Pump motor power (kW) <sup>(3)</sup>	Supply voltages for pump motor (V)	Dry weight (kg)
	Frequency drive available as an option	Depends on the pressure losses <sup>(1)</sup>	Based on the standard heat exchanger	Based on selected options, page 3				Based on selected options, p. 3
<b>Single-pump models</b>								
CCE36S	50	15 - 70	29	302 x 556 x 1747	DN32	0,6	380-440, 660-690	120
	60	15 - 90	35			1,1		
CCE56S	50	40 - 140	45	302 x 556 x 1747	DN32	1,1	380-440, 660-690	120
	60	50 - 170	51			2,2		
CCE104S	50	90 - 210	115	304 x 597 x 1797	DN40	1,5	380-440, 660-690	148
	60	100 - 250	125			3		
CCE153S	50	150 - 360	157	304 x 597 x 1797	DN50	3	380-440, 660-690	202
	60	175 - 470	185			4		
CCE204S	50	200 - 480	243	690 x 739 x 1924	DN65	5,5	380-440, 660-690	415
	60	250 - 580	272			7,5		
CCE322S	50	250 - 660	293	690 x 739 x 1924	DN65	4	380-480, 660-690	430
	60	300 - 800	330			7,5		
CCE6421S	50	500-1260	440	1380 x 880 x 1895	DN80	11	380-480, 660-690	987
	60	600-1400	475			18,5		
<b>Two-pump (redundant) models</b>								
CCE36R	50	10 - 70	29	507 x 570 x 1802	DN40	0,6	380-440, 660-690	219
	60	10 - 90	35			1,1		
CCE56R	50	40 - 140	45	507 x 570 x 1802	DN40	1,1	380-440, 660-690	239
	60	50 - 170	51			2,2		
CCE104R	50	90 - 210	100	507 x 570 x 1802	DN40	1,5	380-440, 660-690	263
	60	100 - 250	112			3		
CCE153R	50	150 - 360	139	507 x 598 x 1841	DN50	3	380-440, 660-690	311
	60	175 - 470	163			4		
CCE204R	50	200 - 480	243	690 x 739 x 1924	DN65	5,5	380-440, 660-690	506
	60	250 - 580	272			7,5		
CCE322R	50	250 - 660	293	690 x 739 x 1924	DN65	4	380-480, 660-690	536
	60	300 - 800	330			7,5		

**The chart is only indicative. Check the exact values from the pump selection chart on page 4 or by contacting Adwatec.**

- (1) Max flow rate depends on the pressure losses in customer cooling circuit. Please see operation curve at page 4  
 (2)  $\Delta T = \text{Coolant OUT} - \text{Technical water IN}$ . Also higher cooling capacities are possible with special heat exchangers.  
 (3) Follow 60Hz values always when a frequency converter is selected

## PRODUCT KEY

COMPONENT	ALTERNATIVES	CODE	DEFAULT CODE
Cooling unit	Open frame	CCE	CCE
	With cabinet	CCC	
Pump size  (performance curves at page 5)	3-6	36	104
	5-6	56	
	10-4	104	
	15-3	153	
	20-4	204	
	32-2	322	
	64-2-1	6421	
Number of pumps	Single	S	R
	Redundant	R	
Bypass valve	No temperature control	0	3
	PLC-controlled 3-way valve	3	
	Thermostatic 3-way valve <sup>(1)</sup>	T	
Heat exchanger  (introduction to these options at page 5)	Standard, water-to-water	W	W
	Brazed, full stainless steel W-W	S	
	Sea water resistant W-W, titanium <sup>(2)</sup>	T	
	Gasketed W-W, stainless steel <sup>(2)</sup>	G	
	Water-to-air (external component) <sup>(2)</sup>	E	
Control/wiring  (introduction to these options at page 6)	No control/wiring	0	V
	Connection box	C	
	Siemens PLC control system	P	
	Vacon AC Drive with integrated PLC <sup>(3)</sup>	V	
	Siemens PLC + frequency converters <sup>(2)</sup>	PV	
Supply voltage and frequency <sup>(4)</sup>	50 Hz, 380 – 480 V	D5	D5
	60 Hz, 380 – 480 V	E6	
	50 Hz, 660 – 690 V <sup>(2)</sup>	F5	
	60 Hz, 660 – 690 V <sup>(2)</sup>	F6	
	50 Hz, other supply voltage	X5	
	60 Hz, other supply voltage	X6	
Remote control / monitoring  (Introduction to these options at page 6)	Hardwired, no fieldbus <sup>(5)</sup>	0	0
	Profinet	N	
	Profibus	B	
	DNP3	D	
	Modbus TCP	M	
	Other, contact Adwatec	X	

**Product key writing example: CCE104R-3-W-V-D5-0**

**OTHER OPTIONS ARE PRESENTED ON NEXT PAGE AND TO BE ORDERED WITH AN INDEPENDENT CODE**

*(1) This option affects also to the product footprint and a lead time.*

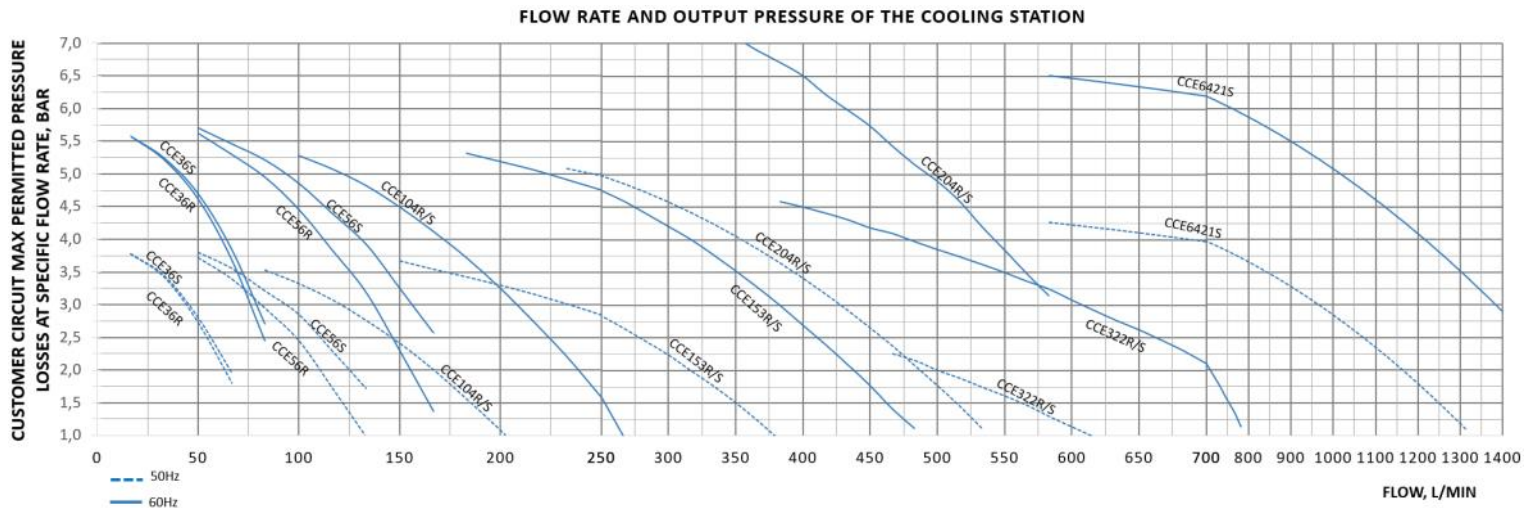
*(2) This option may require more footprint than the default selection*

*(3) The combination of a control system (V) and a supply voltage 690V (F5) / (F6) not recommended*

*(4) If AC drive is chosen please follow 60Hz pump performance curve. Product code is always acc. to supply frequency*

*(5) With limited I/O of Vacon AC drive, the remote control can be used with certain device configuration*

# PUMP SELECTION



# CONTROL SYSTEM SELECTION

<b>NO CONTROL/WIRING (0)</b>	No internal wiring. M12 sensor connectors. Pressure and temperature sensors 4..20 mA. 3-way valve actuator 24 VDC, 0...10 V.
<b>CONNECTION BOX (C)</b>	All internal electrics of the cooling station are wired to connection box. No control system included.
<b>SIEMENS PLC (P)</b>	Preferred choice when <b>1)</b> supply voltage is > 500V or <b>2)</b> water-to-air heat exchanger is selected or <b>3)</b> extra I/O's or extra functions are needed
<b>VACON 100 AC DRIVE + INTEGRATED PLC (V)</b>	Preferred choice always when a supply voltage is < 500V. Enables both a 60Hz pump curve and an accurate flow rate adjustment. Limited amount of I/Os.
<b>SIEMENS PLC + FREQUENCY CONVERTERS (PV)</b>	Preferred choice when both a water-to-air heat exchanger and an accurate flow rate adjustment is needed. The right choice also if the design pressure is under 3bar(g).

# REMOTE CONTROL / MONITORING SELECTION

		SIEMENS PLC (P)	VACON PLC (V)
Hardwired	0	•••	•••
Modbus TCP	M	•••	•••
Profinet	N	•••	•
Ethernet/IP	X1	–	•
Modbus RTU	X2	•	•
Profibus DP	B	•	•
CanOpen	X4	–	•
EtherCat	X5	–	•
IEC60870	X6	•	–
DNP3	D	•	–

COOLING SYSTEM

**STANDARD DELIVERY**  
Hardwired signals

Cooling system in function, Alarm, Trip alarm, Pump 1 running\*, Pump 2 running\*

**(\*) these only with Siemens PLC**

Start\*, Stop\*, Reset alarm\*

**OPTIONS**  
Fieldbus signals

Same signals as hardwired, Measurements, Running hours of pumps, Alarms, Trip alarms

Start, stop, reset alarm, etc..

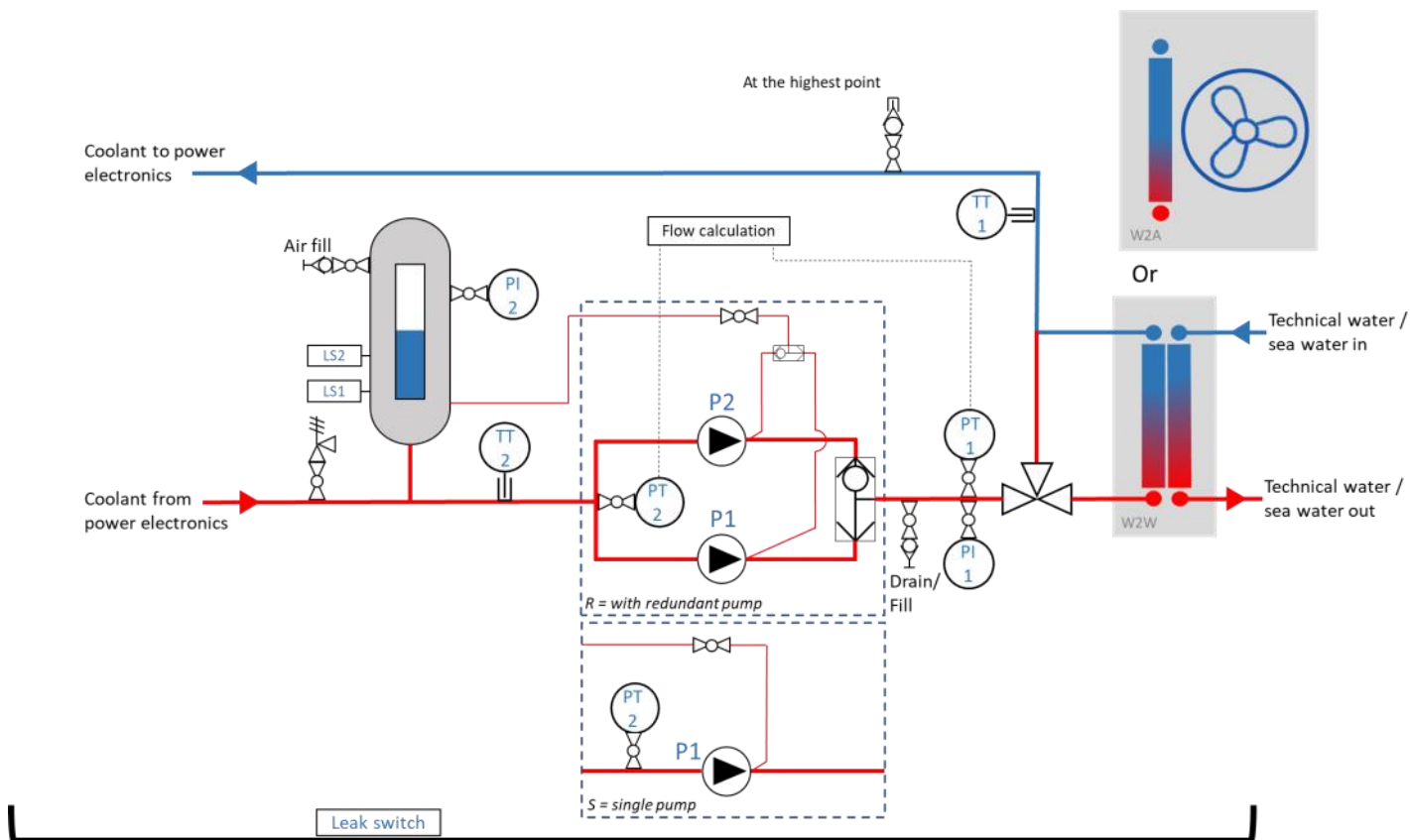
END USER'S MASTER CONTROL

••• Available by default

• Available as option

– Not available

# PROCESS AND INSTRUMENTATION DIAGRAM



Leakage pool and leak switch available as an option  
 P&ID shows cooling station with standard sensors

# HEAT EXCHANGER SELECTION



**W** Standard solution and the most compact choice. Copper brazed stainless steel plates.



**S** Fully stainless steel brazed heat exchanger. The correct choice e.g. if the system is equipped



**T, G** Titanium (T) sea water resistant and stainless steel (G) plate heat exchangers are easy to open and clean.



**E** Water-to-air heat exchanger (= dry cooler). Project-specific sizing. Delivered as a loose item. Piping as an option.



## ACCESSORIES

	ITEM NUMBER	DESCRIPTION
Cabinet installation Rittal VX25; sizes CCE36 – CCE153	AD0009646	Including following <ul style="list-style-type: none"> <li>• Rittal cabinet RAL7035 IP55 with plinth / base 100mm</li> <li>• Leakage pool (leakage detector sensor excluded)</li> </ul> This option available only with connection pipe sets.
Cabinet installation Rittal VX25; sizes CCE204 & CCE322	AD0009647	“
Connection pipe sets, standard	*	Ready connection pipe sets for coolant side circuit and raw water side circuit. See connection pipe tables from <a href="http://adwatec.com/connection-pipes/">adwatec.com/connection-pipes/</a>
Leakage detector sensor	AD0006124	Leakage detector set and an amplifier
DI module, Right hand version	AD0009643	<ul style="list-style-type: none"> <li>• De-ionization (DI) module is needed if a coolant should have a low conductivity level.</li> <li>• A module is attached to the cooling station and it can be either right hand or left hand version depending on how connection pipes are routed.</li> <li>• Delivered without a cabinet by default</li> </ul>
DI module, Left hand version	AD0009644	“
Portable filling pump set	AD0006127	Including following <ul style="list-style-type: none"> <li>• Filling pump</li> <li>• Hoses 5+5 meters</li> <li>• Quick connectors</li> <li>• Air pump</li> </ul>
Electric pre-heater	AD0005674	This is needed in extremely cold environment to pre-heat a coolant before system start-up. By default this option will be delivered as a loose item component. Heating power 1kW / 3kW.
Pressure control function	AD0008263	<ul style="list-style-type: none"> <li>• This option is preferred if a design pressure of the power electronics (or other) is relatively low (meaning &lt; 2-3 bar).</li> <li>• This option includes an additional loose item pressure sensor assembly and a software for the pressure control function.</li> <li>• Note! This option can be selected only if the cooling station includes a frequency converter</li> </ul>
Spare part recommendation	*	Adwatec recommended spare part kit.
Inspection survey by classification society	*	Inspection Survey and witness of the pressure test at Adwatec site. Inspection Survey Report issued by classification society.

\* Item number to be specified by Adwatec sales