

C-series Water Cooling Stations

HEAVY DUTY SERIES

The Adwatec Heavy Duty Series water cooling stations are compact and reliable solutions for cooling power electronics in a closed-loop water cooling system.

The cooling station circulates coolant between the power electronics and a heat exchanger. A 3-way valve is used to ensure a constant temperature and to avoid a 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-GL. 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 1600 l/min.

KEY FEATURES

- ◆ High flow rates with a minimal footprint. Footprints starting from W300 x D560.
- ◆ Pump and heat exchanger type according to customer needs
- ◆ Temperature control with a PLC-controlled 3-way valve. Avoid any condensation risks.
- ◆ Advanced leakage detection system
- ◆ Minimized commissioning time at the site
 - ◆ Microbubble collector system enables 7 to 12 times faster de-airing
 - ◆ Coolant level indicator in the expansion tank
- ◆ Sight glass to check the coolant quality
- ◆ IP54 or better rated components
- ◆ Pressure class PN6 without a cabinet



CCE104R-3-W-P

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



PRODUCT RANGE

PRODUCT CODE	Motor frequency (Hz)	Flow rate range (l/min)	Max. cooling power (kW) at $\Delta T = 5\text{ }^{\circ}\text{C}$ ⁽²⁾	Main dimensions W x D x H Open frame	Connection pipe size class	Electric power (kW)	Supply voltages for pump motor (V)	Dry weight (kg)
	Frequency drive available as an option	Depends on the pressure losses ⁽¹⁾	Based on the standard heat exchanger	Based on selected options, page 3	Also bigger size pipes can be used			Based on selected options, p. 3
Single-pump models								
CCE36S	50	15 - 70	30	300 x 560 x 1490 ⁽³⁾	DN20	0,6	380-440, 660-690	120
	60	15 - 90	35			1,1		
CCE56S	50	40 - 140	45	300 x 560 x 1490 ⁽³⁾	DN32	1,1	380-440, 660-690	140
	60	50 - 170	50			2,2		
CCE104S ⁽⁴⁾	50	90 - 210	110	508 x 575 x 1800	DN40	1,5	380-440, 660-690	200
	60	100 - 250	120			3		
CCE153S ⁽⁴⁾	50	150 - 360	150	508 x 595 x 1835	DN50	3	380-440, 660-690	210
	60	175 - 470	170			4		
CCE204S	50	200 - 480	170	690 x 745 x 1910	DN65	5,5	380-440, 660-690	350
	60	250 - 580	280			7,5		
CCE322S	50	250 - 660	300	690 x 745 x 1910	DN65	4	380-480, 660-690	400
	60	300 - 800	340			7,5		
Two-pump (redundant) models								
CCE36R ⁽⁴⁾	50	10 - 70	30	500 x 575 x 1800	DN20	0,6	380-440, 660-690	180
	60	10 - 90	40			1,1		
CCE56R ⁽⁴⁾	50	40 - 140	60	500 x 575 x 1800	DN32	1,1	380-440, 660-690	200
	60	50 - 170	80			2,2		
CCE104R ⁽⁴⁾	50	90 - 210	110	508 x 575 x 1800	DN40	1,5	380-440, 660-690	230
	60	100 - 250	120			3		
CCE153R ⁽⁴⁾	50	150 - 360	145	508 x 595 x 1835	DN50	3	380-440, 660-690	290
	60	175 - 470	170			4		
CCE204R	50	200 - 480	170	690 x 745 x 1910	DN65	5,5	380-440, 660-690	590
	60	250 - 580	280			7,5		
CCE322R	50	250 - 660	300	690 x 745 x 1910	DN65	4	380-480, 660-690	660
	60	300 - 800	340			7,5		
CCE1800R	50	600 - 1400	450	1100 x 760 x 1850	DN80	7,5	380-480, 660-690	1200
	60	700 - 1550	550			15		

The chart is only indicative. Check the exact values from the pump selection chart on page 5 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) ΔT = Coolant OUT - Technical water IN. Also higher cooling capacities are possible with special heat exchangers.

(3) These dimensions are with Siemens PLC (P) control system. With a Vacon PLC (V) it will be W300 x D560 x H1800

(4) These cooling stations are type approved by DNV-GL according the following configuration: CCExxxR-3-W-0-xx-x

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	
	1800	1800	
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 ⁽¹⁾	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 ⁽²⁾	T	
	Gasketed W-W, stainless steel ⁽²⁾	G	
	Water-to-air (external component) ⁽²⁾	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 ⁽³⁾	V	
	Siemens PLC + frequency converters ⁽²⁾	PV	
Supply voltage and frequency ⁽⁴⁾	50 Hz, 380 – 480 V	D5	D5
	60 Hz, 380 – 480 V	E6	
	50 Hz, 660 – 690 V ⁽²⁾	F5	
	60 Hz, 660 – 690 V ⁽²⁾	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 ⁽⁵⁾	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 is **not** available for all cooling station sizes. Selection affects also to the product footprint and a lead time.*

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

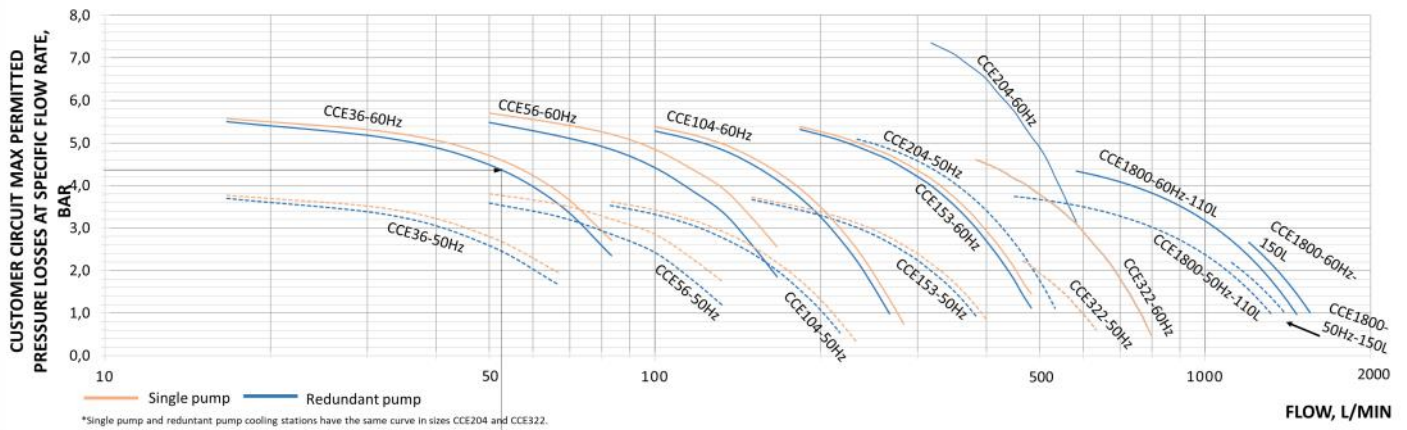
(3) The combination of a control system (V) and a supply voltage (F5) / (F6) in size CCE36S & CCE56S → Ask more info.

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

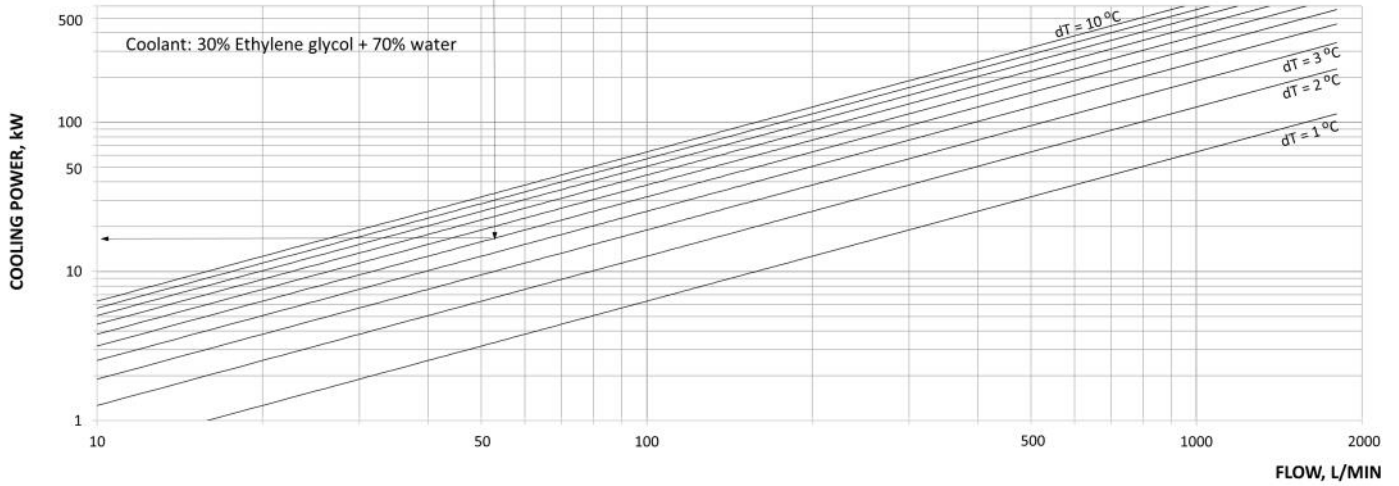
(5) With limited I/O of Vacon AC drive, the remote control can be used with certain device configuration

PUMP SELECTION

FLOW RATE AND OUTPUT PRESSURE OF THE COOLING STATION



COOLING POWER (kW) WITH TEMPERATURE DIFFERENCE (dT) BETWEEN COOLANT TO AND FROM POWER ELECTRONICS



HEAT EXCHANGER SELECTION



W Standard solution and the most compact choice. Stainless steel flow channels and copper brazing. Max particle size 0,8 mm.



S All materials are stainless steel. Welded structure. The correct choice e.g. if the system is equipped with a de-ionizing circuit.

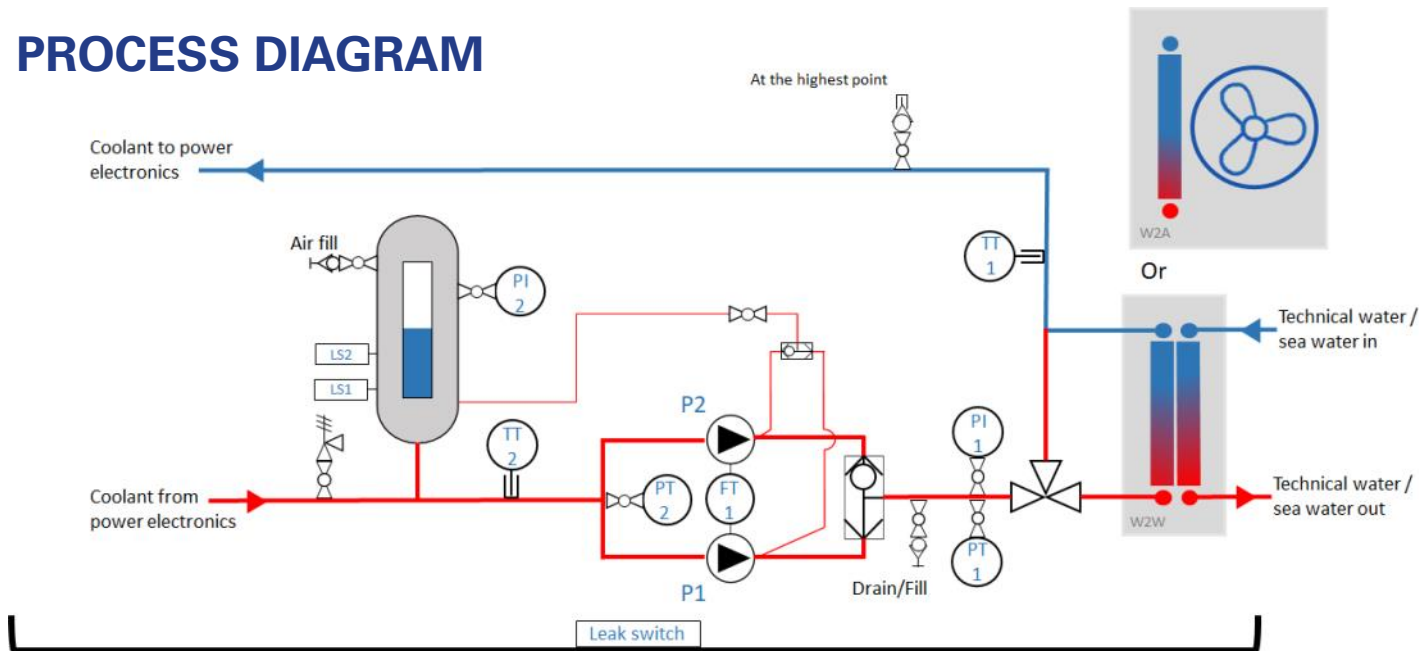


T, G Sea water resistant (titanium) and stainless steel HX's are easy to open and clean. Max. Particle size 1mm.



E Water-to-air heat exchanger. Project-specific sizing. Delivered a loose item. Piping as an option.

PROCESS DIAGRAM



Leakage pool and leak switch available as an option

CONTROL SYSTEM SELECTION

NO CONTROL/WIRING (0)	No internal wiring. M12 sensor connectors. Pressure and temperature sensors 4..20 mA. 3-way valve actuator 24 VDC, 0...10 V.
CONNECTION BOX (C)	All internal electric of the cooling station are wired to connection box. No control system included.
SIEMENS PLC (P)	Preferred choice when 1) supply voltage is > 500V or 2) water-to-air heat exchanger is selected or 3) extra I/O's or extra functions are needed
AC DRIVE + INTEGRATED PLC (V)	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.
SIEMENS PLC + FREQUENCY CONVERTERS (PV)	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	•••	•••	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*
Modbus TCP	M	•••	•••	
Profinet	N	•••	•	
Ethernet/IP	X1	–	•	
Modbus RTU	X2	•	•	
Profibus DP	B	•	•	
CanOpen	X4	–	•	
EtherCat	X5	–	•	
IEC60870	X6	•	–	
DNP3	D	•	–	
		••• Available by default	• Available as option	– Not available
				OPTIONS Fieldbus signals Same signals as hardwired, Measurements, Running hours of pumps, Alarms, Trip alarms Start, stop, reset alarm, etc..

STANDARD FEATURES AND OPTIONS

CATEGORY	NAME	STANDARD (X) OPTION (O)	TYPE CODE ⁽¹⁾
Measurements (locations shown in P&ID at page X)	Temperature sensor PT100, 4-20 mA (2 pcs)	X	AD0005035
	Pressure sensor, 4-20 mA (2 pcs)	X	AD0005036
	Tank level switch (2pcs)	X	AD0005037
	Coolant flow (as a standard with control systems (V) and (P))	X	AD0005038
	Leakage detector sensor	O	AD0005039
	Ambient temperature sensor	O	AD0005040
process instrumentation, internal	Pressure gauge (CCE36S & CCE56S 1pcs, other models 2pcs)	X	AD0005041
	Tank coolant level visual indicator	X	AD0005042
	Sight glass (to see the coolant quality)	X	AD0005043
	Pressure relief valve	X	AD0005044
	Temperature control valve (PLC controlled)	X	AD0005045
Process instrumentation, outside of the frame	Additional frequency converter (model: Vacon100)	O	AD0005046
	Additional draining valve assembly	O	AD0005047
	Additional air bleeding valve assembly	O	AD0005048
	Coolant de-ionizator module (de-ionizer + filtration + sensors)	O	AD0005049
	Electric 3kW pre-heater for coolant	O	AD0005050
	Additional expansion tank for large scale w-2-a systems	O	AD0005051
	Shut-off ball valve, welded	O	AD0005052
	Shut-off butterfly valve, flange connection	O	AD0005053
	Flow control valve, welded, stainless steel	O	AD0005054
	Rotameter (=local flow indicator)	O	AD0005055
	Leakage pool (compatible with Rittal VX25 cabinet)	O	AD0005056
	Flow sensor, Vortex, 4..20mA	O	AD0005057
	Strainer, Y-type, filtration grades 0,3 / 0,5 / 1 mm	O	AD0005058
	Bag filter, filtration grades starting from 0,01 mm (=10 µm)	O	AD0005059
	Sea water circuit project-specific filtration kit	O	AD0005060
	Sea water pump, project-specific sizing	O	AD0005061
	Portable make-up pump set	O	AD0005062
Piping	Standard connection pipe set, power electronics circuit	O	AD0005063
	Standard connection pipe set, technical water circuit	O	AD0005064
	Project-specific connection pipes, stainless steel	O	AD0005065
	Project-specific connection pipes, sea water resistant	O	AD0005066
	Pipe rubber joint, anti-vibration element, flange connection	O	AD0005067
	Additional pipe clamp (Axilock-type)	O	AD0005068
Accessories	Frame vibration damper set	O	AD0005069
	AdwaCoolant - ready ethylene-glycol based coolant mixture	O	AD0005070
Classifications	Project-specific survey report by any classification society	O	AD0005071

(1) Type code is a generic code. Check a specific code for right-size and type component from option catalogue.