M- & C-series Water Cooling Stations

HEAVY DUTY SERIES

The Adwatec Heavy Duty Series water cooling stations are compact and reliable solutions for cooling a power electronics in a closed-loop water cooling system. The stations can be delivered as an open frame solutions or pre-installed into a standard cabinet. C-series units (CCExxx) are type approved by DNV-GL.

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

A modular structure and multiple available options such as different heat exchangers, control systems and pumps ensure the right solution with suitable cooling power and flow rate.

TYPE APPROVED PRODUCT

DNV·GL

DNVGL.COM/AF

BENEFITS

- Easy to install and to maintenance

- Minimum cabinet footprint starting from W400xD600 mm

- Several advanced features as a standard:

  - visual coolant level indication

  - Leakage detection, flow measurement etc. with PLC

  - micro-bubble collector and automatic de-airing valves.

  - Sight glass to check coolant quality

- Stainless steel components ensure long and reliable operation

- Use of hydraulic block technique minimizes the

MCE54R-T-W-0

CCE104R-3-W-P

DNV·GL   Lloyd's Register   BUREAU VERITAS   ABS   RINA

PRODUCT RANGE

PRODUCT CODE	Motor frequency (Hz) (Vacon AC Drive with PLC & 60Hz is preferred choice)	Max. flow rate (l/min) (depends on the system pressure losses)	Max. cooling power (kW) at ΔT = 5 °C	Cooling unit dimensions W x D x H (Siemens PLC included in these dimensions if not otherwise mentioned)		Electric power (kW)	Default supply voltages for pump motor (V) (also other supply voltages are available on request)	Approx. Skid dry weight standard delivery (kg)
				Open frame	With cabinet			
Single-pump models								
MCE34S	50	55	40	300 x 570 x 1893	400 x 600 x 2000 (2)	0,5	380–415, 660–690	115
	60	80	60			0,8	380–440, 660–690	
MCE54S	50	100	65	300 x 570 x 1893	400 x 600 x 2000 (2)	0,9	380–415, 660–690	115
	60	130	75			1,7	380–440, 660–690	
MCE103S	50	230	110	300 x 570 x 1893	400 x 600 x 2000 (2)	2,2	380–415, 660–690	140
	60	270	120			4	380–440, 660–690	
CCE104S	50	210	110	300 x 547 x 1725 (1)(2)	400 x 600 x 2000 (1)(2)	1,5	380–415, 660–690	160
	60	250	120			3	380–480, 660–690	
CCE153S	50	360	150	300 x 595 x 1870 (1)(2)	400 x 600 x 2000 (1)(2)	3	380–415, 660–690	210
	60	450	170			4	380–480, 660–690	
CCE322S	50	660	300	550 x 714 x 1886	800 x 800 x 2000	4	380–415, 660–690	400
	60	800	340			5,5	380–480, 660–690	
Two-pump models								
MCE34R	50	55	40	330 x 707 x 1220 (1)(2)	400 x 800 x 2000 (2)	0,5	380–415, 660–690	135
	60	80	60			0,8	380–440, 660–690	
MCE54R	50	100	65	310 x 715 x 1166 (1)(2)	400 x 800 x 2000 (2)	0,9	380–415, 660–690	210
	60	130	75			1,7	380–440, 660–690	
CCE104R	50	210	110	500 x 577 x 1800	600 x 600 x 2000	1,5	380–415, 660–690	230
	60	250	120			3	380–480, 660–690	
CCE153R	50	360	145	500 x 595 x 1835 (3)	600 x 600 x 2000 (3)	3	380–415, 660–690	290
	60	480	170			4	380–480, 660–690	
CCE203R	50	420	160	500 x 595 x 1835 (3)	600 x 600 x 2000 (3)	3	380–480, 660–690	390
CCE322R	50	660	300	687 x 714 x 1886 (3)	800 x 800 x 2000 (3)	4	380–415, 660–690	660
	60	800	340			5,5	380–480, 660–690	

The chart is only indicative. Check the exact values from the pump selection chart on page 5 or by contacting Adwatec.
(1) These dimensions are without any control system.
(2) If Vacon AC drive PLC is chosen as a control system the width will increase and a cabinet footprint is 600x600mm.
(3) If U=690V and Vacon AC drive PLC is chosen the width dimension will be bigger. Please contact Adwatec.

TECHNICAL DETAILS

	STANDARD DELIVERY	AVAILABLE OPTIONS
Installation	Open-frame cooling skid	Cabinet installation (includes Rittal VX25 cabinet, leakage pool, leakage detection sensor and frame supports)
Materials	Stainless steel and corrosion resistant aluminium. All piping materials contacted with liquid are copper free. No surface coatings.	
Water connections	DN-sized pipe ends (DN25—DN65), stainless steel.	• Pipe clamp couplings to fasten connection pipes to cooling station • Customer-specific coupling types
Instrumentation	Temperature sensors (2 pcs)* Pressure sensors (2 pcs)* Coolant level indicator Coolant level switches (2 pcs)* Pressure gauge	• Coolant flow rate • Coolant conductivity • Duplicated instrumentation
External connections	No external pipes	• Custom-made connection pipes • Wide range of different coupling types such as DIN and ANSI flanges, Victaulic and pipe clamp
Pumps	Vertical, multistage centrifugal pumps. All wetted parts stainless steel.	
Temperature control	PLC-controlled 3-way valve	• No temperature control • Autonomic thermostatic valve
Heat exchanger	Water-to-water brazed plate heat exchanger. Stainless steel pipes, copper brazing.	• Sea water resistant heat exchanger (titanium) • External water-to-air heat exchanger • Full stainless, welded
Control/wiring	Vacon AC Drive with integrated PLC control	• No control, only M12 connectors to sensors • No control, only connection box • Siemens PLC control
Expansion tank	Closed-type stainless steel tank. 25 years lifetime. Enables fast commissioning.	
Remote control/ monitoring	Hardwired, no fieldbus	• Profinet • Profibus • Modbus TCP • DNP3
Coolant	Coolant type: water-glycol mixture with appropriate additives. Sight glass to check coolant quality.	• Water de-ionization and purification modules • Coolant
Pressure class	PN6	• PN10
Other		• Filter to remove particles from the liquid • Electrical heater for cold environments

*MCE/MCC type cooling units do have 1 temperature sensor , 1 pressure sensor and 1 coolant level switch by default. Except with PLC there will be always 2 pressure sensors.

PRODUCT KEY

Example code: CCE104R-3-W-V-D5-0

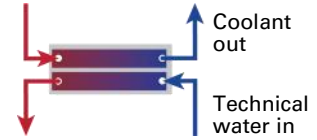| COMPONENT	ALTERNATIVES	CODE	EXAMPLE CODE
Cooling unit	Open frame	CCE/MCE (see pump selection table)	**CCE**
	With cabinet	CCC/MCC (see pump selection table)	
Pump size (see pump selection table)	34	34	**104**
	54	54	
	103	103	
	104	104	
	153	153	
	203	203	
	322	322	
Number of pumps	Single	S	**R**
	Redundant	R	
Bypass valve	No temperature control	0	**3**
	PLC-controlled 3-way valve	3	
	Autonomic thermostatic valve	T	
Heat exchanger	Water-to-water, brazed SS	W	**W**
	Water-to-water, welded SS	S	
	Water-to-water, titanium	T	
	Water-to-water, gasketed SS	G	
	Water-to-air (outside skid)	E	
Control/wiring	No control/wiring	0	**V**
	Connection box (with internal wiring)	C	
	Siemens PLC control	P	
	Vacon AC Drive with integrated PLC control [1]	V	
Voltage and frequency	50 Hz, 380–440, 380–415 V [2]	D5	**D5**
	60 Hz, 380–440, 380–480 V [2]	E6	
	50 Hz, 660–690 V	F5	
	60 Hz, 660–690 V	F6	
	50 Hz, other supply voltage	X5	
	60 Hz, other supply voltage	X6	
Remote control / monitoring	Hardwired, no fieldbus [3]	0	**0**
	Profinet	N	
	Profibus	B	
	DNP3	D	
	Modbus TCP	M	
	Other, contact Adwatec	X	

Options not shown in product key, please enquire Adwatec
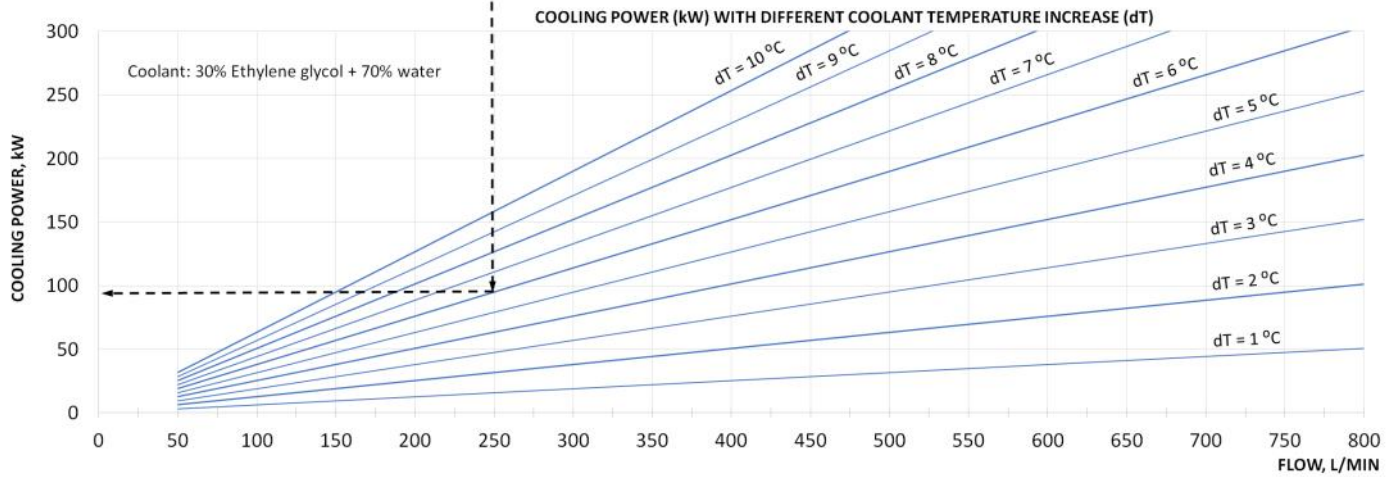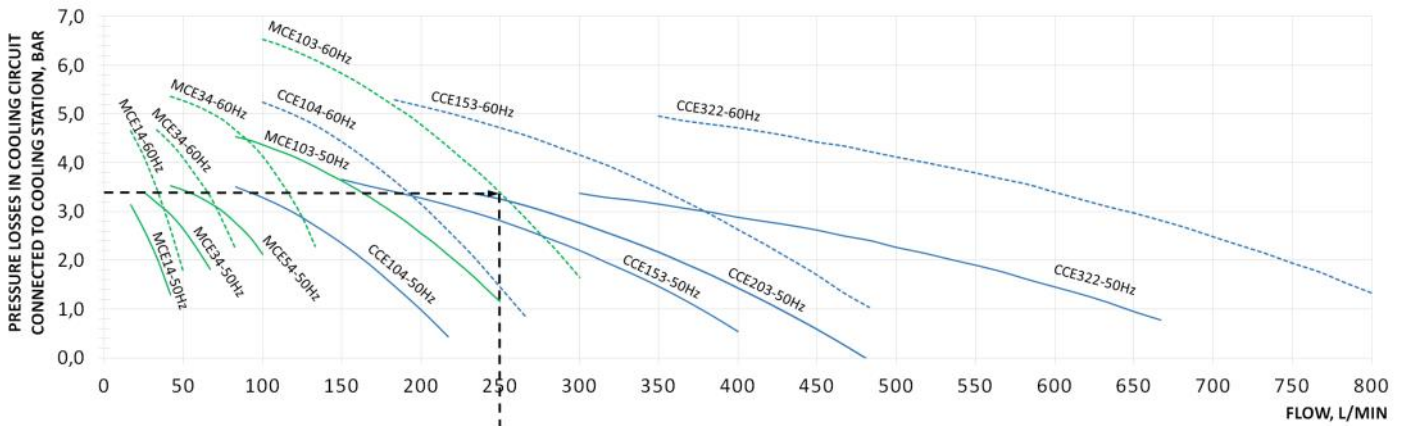(1) This option together with supply voltage over 500 V will result in special structure and price.
(2) MCE/MCC products 380-440V, CCE/CCE products 380-415, 380-480V
(3) With Vacon AC drive limited hardware, remote control can be used with certain device configuration

PUMP SELECTION

Coolant out

Technical water in

dT = coolant out – technical water in

Cooling power (kW) with different coolant temperature increase (dT)

Coolant: 30% Ethylene glycol + 70% water

PIPE INTERFACES
## for technical water and coolant lines

Technical water (=raw water) circuit interfaces are located on top of the cooling station by default.

Interfaces for power electronics are located on the bottom of the cooling station by default.

Default connection type is DN-sized (DN25-DN65) stainless steel pipe.

External connection pipes shall be fastened to cooling station pipe connections with pipe clamp connectors. As well customer-specific connection pipes as pipe coupling parts are available as an option.

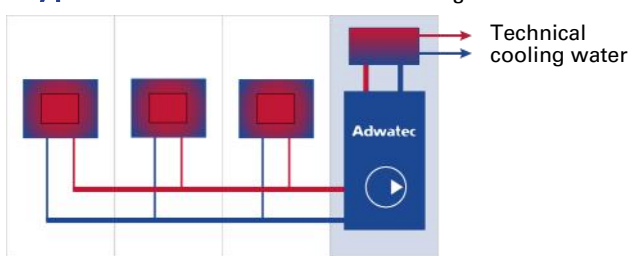Flow directions of technical water circuit
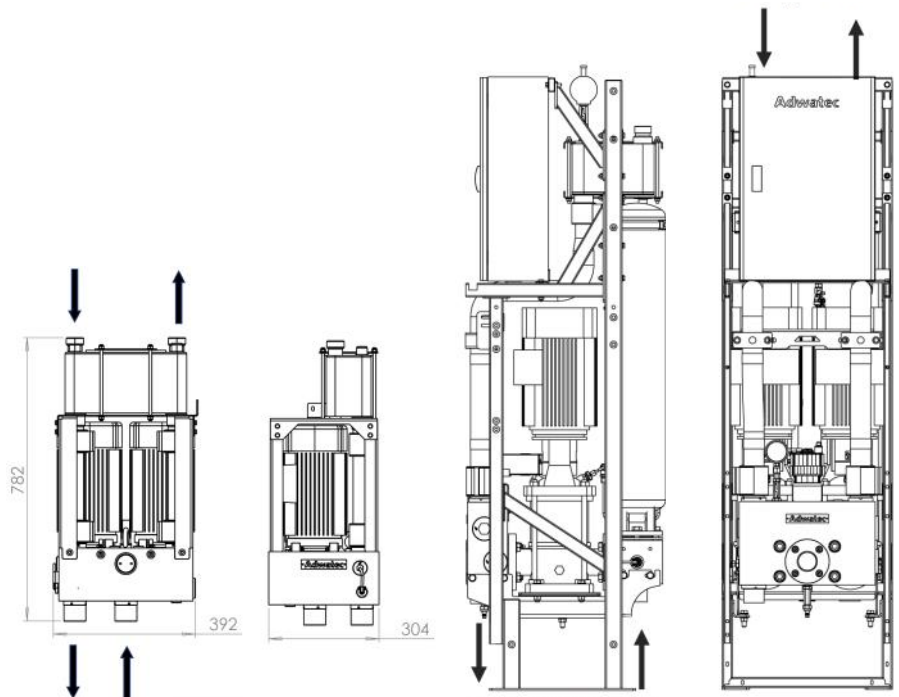
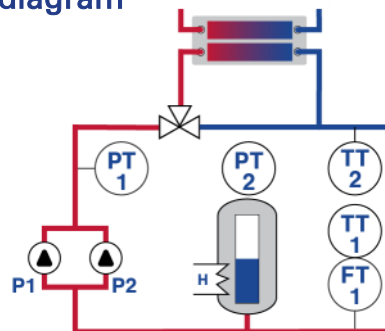Flow directions of power electronics circuit

HEAT EXCHANGERS

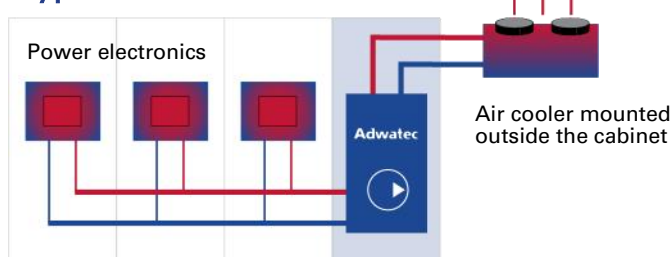## Water to water heat exchanger

Typical installation

Water to water heat exchanger

Technical cooling water

Cooling station with external water to water heat exchanger

Flow diagram

Water to air heat exchanger

Typical installation

Power electronics

Air cooler mounted outside the cabinet

Cooling station with external water to air heat exchanger

Flow diagram
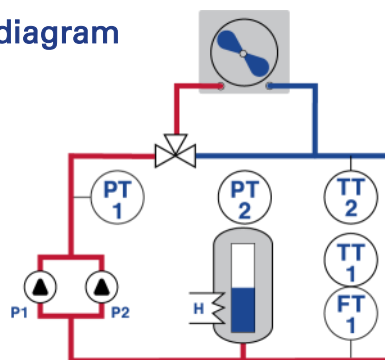
REMOTE CONTROL / MONITORING

	SIEMENS PLC (P)	VACON PLC (V)
Hardwired	•••	•••
Modbus TCP	•••	•••
Profinet	•••	•
Ethernet/IP	–	•
Modbus RTU	•	•
Profibus DP	•	•
DeviceNet	–	•
CanOpen	–	•
EtherCat	–	•
IEC60870	•	–
DNP3	•	–
••• Available by default	• Available as option	– Not available

STANDARD DELIVERY
Hardwired signals

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

Start*, Stop*, Reset alarm*

OPTIONS
Fieldbus signals

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

Start, stop, reset alarm, etc..

COOLING SYSTEM

MASTER CONTROL

* Only with Siemens PLC