

## C-series

## WATER COOLING STATIONS—SLIM

**Adwatec Slim Water Cooling Stations** are compact and reliable solutions for power electronics cooling in a closed-loop water cooling system with extra narrow design

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.

All cooling stations can be approved in projects by any classification societies.

Single pump design for narrow installations.

**Flow rates from 10 l/min to 400 l/min.**

## KEY FACTS

- ◆ High flow rates with a minimal footprint. Footprints starting from W308 x D597.
- ◆ Wide selection of pumps and heat exchangers
- ◆ Cabinet-installation friendly design structure.
  - ◆ Fits to Rittal VX25 W400xD600xH2000 cabinet
- ◆ Temperature control with a PLC-controlled 3-way valve to avoid any condensation risks.
- ◆ Minimized commissioning time at the site
  - ◆ Microbubble collector system enables faster de-airing
- ◆ Coolant level indicator in the expansion tank
- ◆ Standard connection pipe product range
- ◆ IP54 rated components
- ◆ Pressure class PN6 (PN10 as an option)



*Picture for reference only.  
Actual products may vary based of selected options.*

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



## PRODUCT RANGE

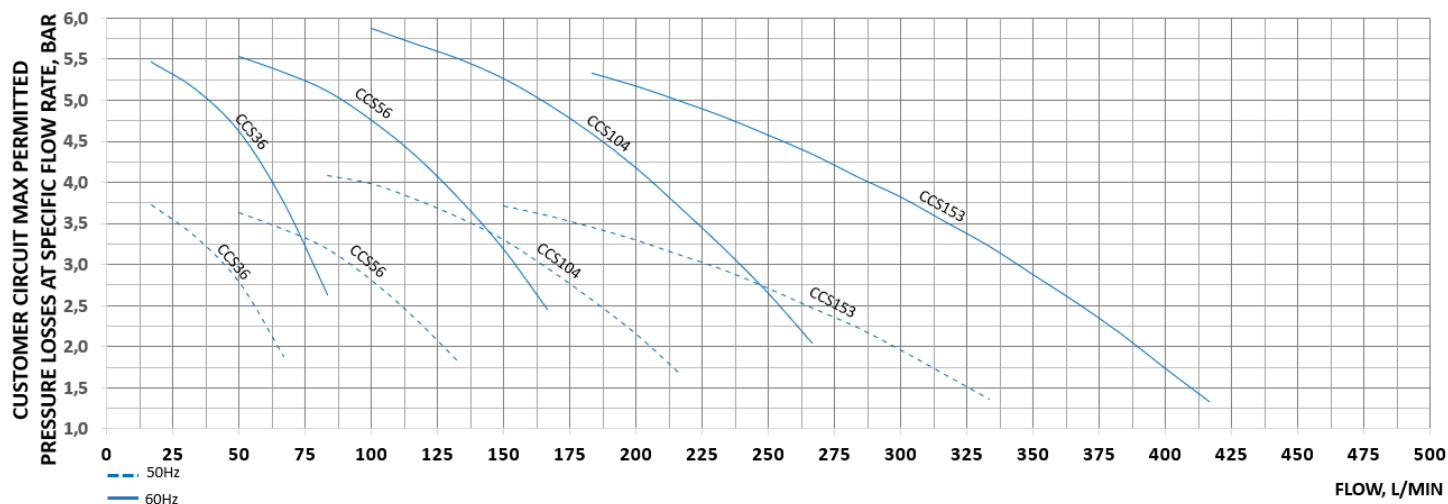
PRODUCT CODE	Motor frequency (Hz)	Flow rate range (l/min)	Max. cooling power (kW) <sup>(2)</sup> at max flow rate Based on the standard HX			Main dimensions W x D x H Open frame	Conn. pipe size class	Pump motor power (kW) <sup>(3)</sup>	Supply voltages for pump motor (V)	Dry weight (kg)
	Frequency drive available as an option		Depends on the pressure losses <sup>(1)</sup>	ΔT = 3 °C	ΔT = 5 °C					ΔT = 7 °C
Single-pump models										
CCS36S	50	10 - 70	36	53	70	308 x 597 x 1797	DN50	0,6	380–480, 660–690	120
	60	10 - 90	42	63	82			1,1		
CCS56S	50	40 - 140	57	85	112	308 x 597 x 1797	DN50	1,1	380–480, 660–690	120
	60	50 - 170	67	95	130			2,2		
CCS104S	50	90 - 217	76	110	148	308 x 597 x 1797	DN50	1,5	380–480, 660–690	149
	60	100 - 267	86	125	166			3		
CCS153S	50	150 - 330	97	144	191	308 x 597 x 1797	DN50	3	380–480, 660–690	200
	60	175 - 400	108	162	214			4		

**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)  $\Delta T$  = Coolant OUT - Technical water IN. Also higher cooling capacities are possible with special heat exchangers.  
 (3) Follow 60Hz values always when a frequency converter is selected

## PUMP SIZE SELECTION

FLOW RATE AND OUTPUT PRESSURE OF THE COOLING STATION



The chart is only indicative, exact values depend on the used coolant mixture and heat exchanger model.  
 Check the exact values by contacting Adwatec.

## PRODUCT KEY

COMPONENT	ALTERNATIVES	CODE	DEFAULT CODE
Cooling unit	Open frame	CCS	CCS
Pump size	3-6	36	104
	5-6	56	
(performance curves at page 5)	10-4	104	
	15-3	153	
Number of pumps	Single	S	S
Bypass valve	No temperature control	0	3
	PLC-controlled 3-way valve	3	
Heat exchanger (introduction to these options at page 5)	Standard, water-to-water	W	W
	Brazed, full stainless steel W-W	S	
	Water-to-air (external component) <sup>(2)</sup>	E	
Control/wiring (introduction to these options at page 6)	No control/wiring <sup>(6)</sup>	0	V
	Connection box <sup>(6)</sup>	C	
	Siemens PLC control system	P	
	Vacon AC Drive with integrated PLC <sup>(3)</sup>	V	
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	
	Ethernet/IP	X1	
	Modbus RTU	X2	
	Modbus TCP	M	
	Other, contact Adwatec	X	

### Product key writing example: CCS104S-3-W-V-D5-0

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

(3) The combination of control system (V) or (A) 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

(6) Operating voltage 660/690VAC with VFD requires a sine filter to be used

## CONTROL SYSTEM SELECTION

<b>NO CONTROL/WIRING (0)</b>	No <b>internal wiring</b> . M12 sensor connectors. Pressure sensors 4..20 mA. Pressure sensors PT1000. 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 (junction box). No control system included.
<b>VACON 100 AC DRIVE WITH INTEGRATED PLC (V)</b>	Preferred choice always when a supply voltage is less than 500V. Enables both a 60Hz pump curve and an accurate flow rate adjustment. Limited amount of I/Os.
<b>SIEMENS PLC (P)</b>	Preferred choice when <b>1)</b> supply voltage is over 500V or <b>2)</b> a dry cooler is selected or <b>3)</b> extra I/O's or extra functions are needed

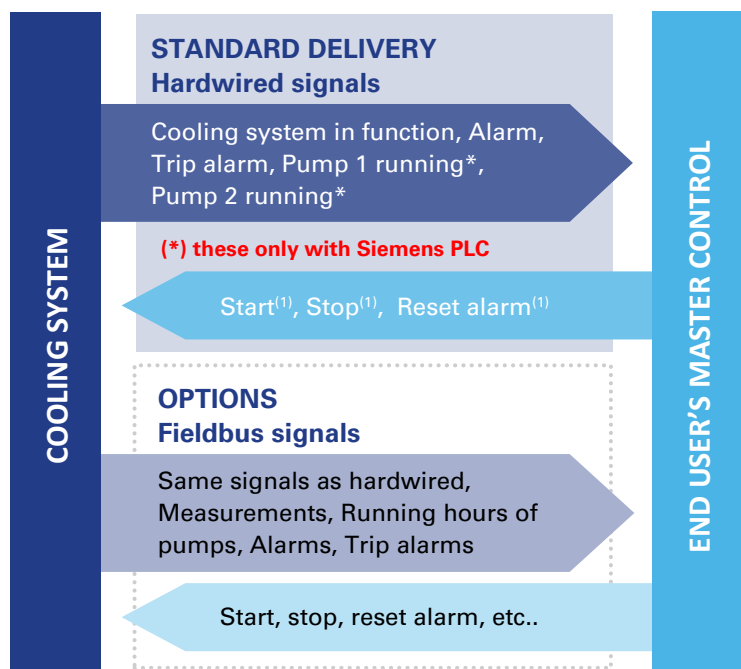
## REMOTE CONTROL / MONITORING SELECTION

		SIEMENS PLC (P)	VACON PLC (V)
Hardwired	0	...	...
Modbus TCP	M	...	...
Profinet	N	...	.
Ethernet/IP	X1	–	.
Modbus RTU	X2	.	.
Profibus DP	B	.	.

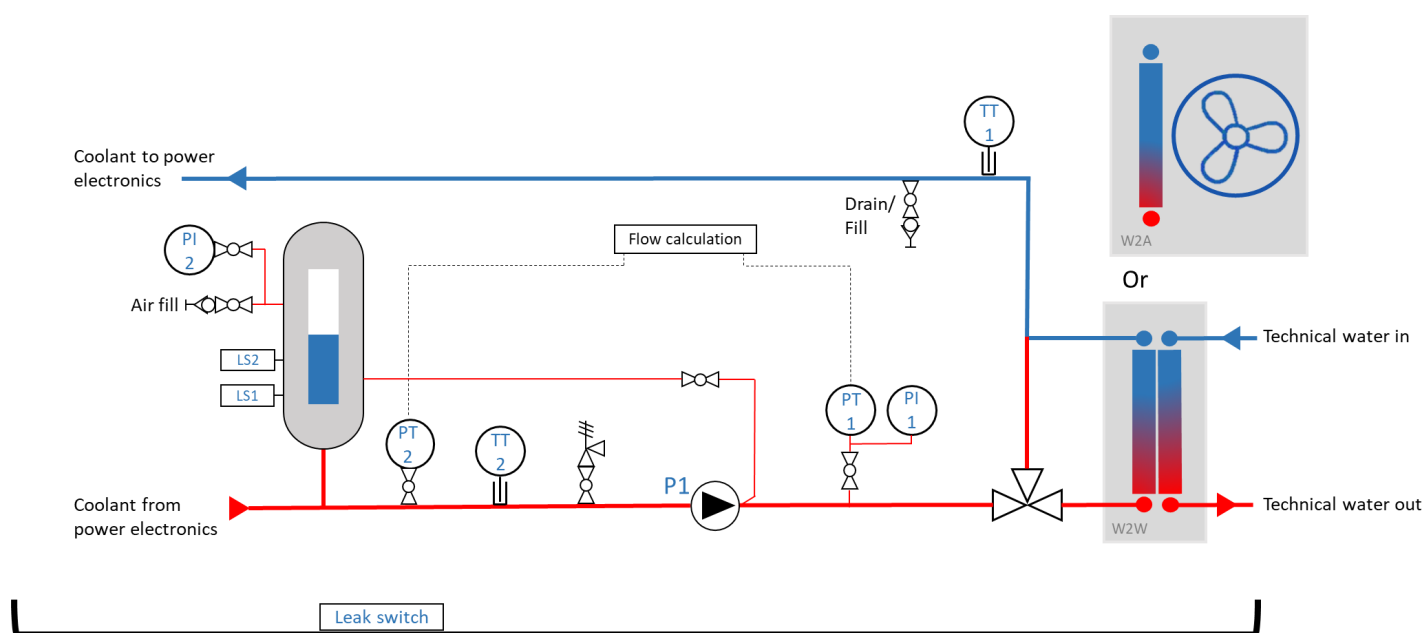
  

... Available by default	• Available as an option	– Not available
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(1) *Hardwired **controls** and field-bus **controls** cannot be used simultaneously in a project in case of Vacon or ABB control system*



## PROCESS AND INSTRUMENTATION DIAGRAM



## HEAT EXCHANGER SELECTION


**W**

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


**S**

Fully stainless steel brazed heat exchanger.


**E**

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

## AMBIENT CONDITIONS

The equipment shall be installed in a well-ventilated, air-conditioned space with an ambient temperature range of +5°C ... +45°C and a maximum humidity of 95%, non-corrosive and non-condensing.

All components in standard C-series cooling station are IP54 rated or higher. Cooling station corrosion class is C1 according to ISO12944 in standard solutions

Coolant temperature range is +0°C ... +60°C. Higher temperatures may be also possible, but it must be considered in design phase.

## MATERIALS

All parts and components in contact with coolant are made of stainless steel, 6000 series aluminium or plastic

- |                         |                                          |
|-------------------------|------------------------------------------|
| • Pump                  | AISI 304                                 |
| • Pipes and fittings    | AISI316, FEP for visual indicator        |
| • Not welded components | AISI 304 / 316 and 6000 series Aluminium |
| • Gaskets               | PTFE, EPDM, NBR, Viton, Fiber            |