Evapco Europe Srl

ECDS BE

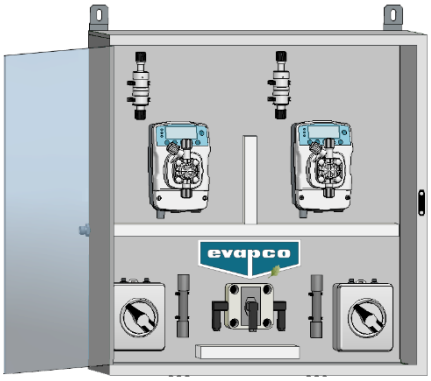
Evapco Chemical Dosing System

Product Description

An evaporative cooling system rejects heat through water evaporation and its thermodynamic advantages. A portion of the cooling water is discharged into atmosphere as warm, saturated discharge air, while the dissolved salts remain in the liquid water by increasing its concentration. In order to prevent cooling system damage connected to the dissolved salts and microorganisms, a chemical water treatment is required, using anti-scale agents, corrosion inhibitors and biocides.

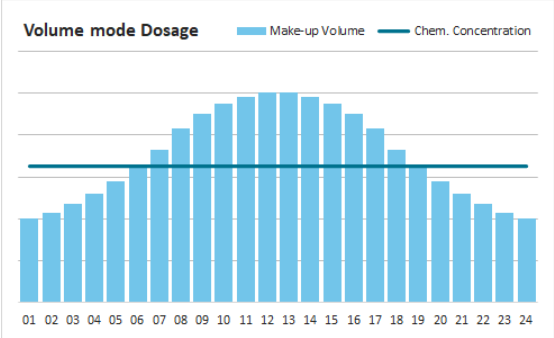
ECDS is an **automatic** dosing system for injecting liquid chemicals through multifunctional metering dosing pumps. The dosage can be set in volume mode (proportionally to the make-up water flow) or timed mode (scheduled shock dose).

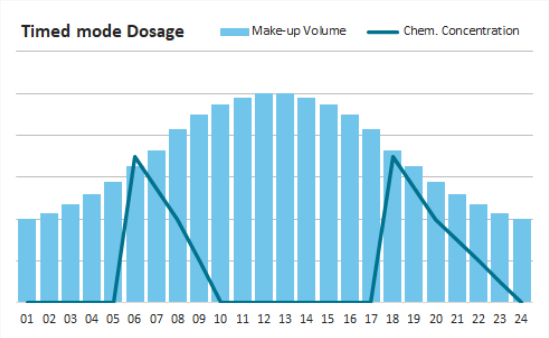
ECDS BE presents all the basic components preassembled, wired and tested in a **closed and protective box**, simplifying the installation on site to assemble the suction and dosing pipes, injectors and any other accessories.



Example ECDS BE-205 with the optional chemical flow switch

Operation





On the left is an example of the hourly trend of make-up water volume and cooling water circuit chemical concentration with the "Volume mode Dosage".
On the right is an example of the hourly trend of make-up water volume and cooling water circuit chemical concentration with the "Timed mode Dosage".
ECDS operates completely automatically according to customer settings:

- **Volume mode:** to keep a **precise and constant chemical concentration** inside the water cooling system. The chemical concentration is independent from the make-up water flow;
- **Timed mode:** it is a **chemical shock dose** with a hourly/daily/weekly scheduled injection. The chemical concentration reaches a maximum value and drops to zero during the following open/close cycles of the bleed off and make-up valves.

Water Meter Selection Table

	Max Thermal Capacity Vs Minimum CoC*		
Diameter	**1,5**	**2,0**	**2,5**
3/4"	500 kW	800 kW	900 kW
1"	700 kW	1100 kW	1300 kW
1"1/2	2100 kW	3200 kW	3800 kW
DN50	3200 kW	4800 kW	5700 kW
DN65	5300 kW	8000 kW	9500 kW
DN80	8500 kW	12600 kW	15400 kW
DN100	12800 kW	19200 kW	23200 kW

**This table shows the sizes of water meter combined with maximum thermal capacity values of cooling system, as a function of three minimum CoC.*
The water meter pressure drop is lower than 0,25 bar.
Make-up water pressure must be enough to compensate Blowdown + Evaporation.

Flow, Pressure and Shipping Weights

	# Pumps	Flow	P max	Weight**
ECDS BE-105	1	6 - 11 l/h	7 bar	24 kg
ECDS BE-205	2	6 - 11 l/h	7 bar	30 kg
ECDS BE-110	1	10 - 16 l/h	12 bar	24 kg
ECDS BE-210	2	10 - 16 l/h	12 bar	30 kg

***Shipping weights (without accessories: Operating weight = Shipping weight)*

Technical Data

Dimensions (L x W x H)	700 x 300 x 800 mm
Suction and dosing pipes	4 x 6 mm
Injectors	1/2"
Temperature (min - max)	5 - 40 °C
Electrical supply	230 Volt - single phase - 50 Hz

Alternative Options

- ☐ **05**: Electronic dosing pump: flow 6 l/h - max pressure 7 bar
- ☐ **10:** Electronic dosing pumps: flow 10 l/h - max pressure 12 bar

Available Accessories

- ☐ Pulse-emitting Water Meter
- ☐ Chemical Flow Switch
- ☐ Chemical Tank with suction pipe and level probe
- ☐ Safety Bund

ECDS BE

Evapco Chemical Dosing System BOX

PART 1 - GENERAL

1.1 Related Documents

Drawings and general provisions of the contract, terms and conditions of Evapco Europe, apply to this section.

1.2 Summary

This section includes factory assembled and tested, automatic chemical dosing system.

1.3 Submittals

- Unit-specific data with design information include: performance information, pressure drop, alternative options and available accessories.
- Technical drawings with unit details, hydraulic and electrical connections location and dimensions.
- Unit maintenance and management information included in the maintenance booklet.

1.4 Warranty

The warranty applied is the Evapco Express Standard Warranty downloadable at http://evapco.eu/terms-conditions-and-warranty-statements and detailed in the offer.

1.5 Note

ECDS is a liquid chemical dosing system for water of evaporative cooling units. As any other machinery, it needs to be started, managed, controlled and maintained by competent and qualified personnel, including water treatment as scope of supply.

PART 2 - PRODUCTS

2.1 Contractual item

ECDS is an automatic liquid chemical dosing system for evaporative cooling units, pre-assembled and factory tested, that falls within the definition of machine, CE marked and supplied with Declaration of Conformity in compliance with the Machinery Directive 2006/42/EC.

The installation of ECDS on existing plants, carried out state-of-the-art and following the instructions of the handbook, does not require the updating of the CE marking of the plant.

ECDS injects chemicals into the cooling water circuit through volume mode (proportionally to the make-up water flow), or through alternative timed mode. The regular dosage and correct concentration of water treatment chemicals in the evaporative cooling circuit, allow to handle any risk of scaling, corrosion and microbiological development.

Thanks to the box which contains all the basic devices, ECDS BE can be easily installed on vertical surfaces to operate both indoors and outdoors.

However, in case of external installation the liquid chemicals require a particular attention and customer shall provide suitable prevention during installation (e.g. covers and specific protections against wind, rain, frost and direct sunlight).

2.2 Components

- <u>Box Pre-assembly</u>

  The hydraulic and electric pre-assembly of all the components inside a closed box allows the installation of the dosing system in a single and specific area of the plant to operate both indoors and outdoors. However, the outdoor installation requires suitable protections to preserve chemicals.

  Box pre-assembly reduces the costs and errors of on-site installation, as it offers a pre-tested system and leaves few external connections of the machine to be made on site.

- <u>Box</u>

  The closed box includes all the basic system components. The Box has corrosion-resistant PP or PVC structure, transparent front door, closing hook, fixing brackets and suction, dosing and venting pipe connections.

- Dosing pumps

  The solenoid-driven dosing pumps with a digital multifunctional microcontroller and an IP65 degree of protection, have high injection frequencies (up to 300 strokes/minute), power consumption and flow control according to circuit pressure variations, underload and overload stop operation due to lack of liquid or overpressure, wide supply voltage range (100 and 250 Vac - 50/60 Hz).

  The pump has a reinforced PP case, highly resistant techno polymer PVDF body, PTFE membrane and TFE/P seals, which are elastomers compatible with acid or alkaline chemical compounds, and an automatic air vent with priming system.

  The pump can be set through buttons and display with different modes, for constant and proportional operation 1xN, 1xN(m), 1/N, ppm, ml x pulse, ml x mc, mA, or timed with multiple daily and weekly programs.

  The pump has several electrical connections, such as electrical input for the pulse emitting water meter, mA signal, free contact level probe, free contact chemical flow sensor and an electrical output for the alarm signal with configurable NC/NO relay contact.

  The pumps are equipped with injectors with non-return valve, base filter and wall mounting plate.

- Switch disconnector

  One rotary switch disconnector allows opening or closing the power supply circuit of each pump.

  Wall-mounted IP66 rotary disconnector switch with insulating housing and black padlockable control knob.

- Pipe kit

  Pipe kit, 6x4 mm diameter, consisting of following components for each pump: 2 meters long PVC crystal flexible suction pipe, 2 meters long PVC flexible vent pipe and 5 meters long PE semi-rigid dosing pipe.

- Signal splitter (only with 2 pumps ECDS model)

  The signal splitter simultaneously transmits incoming pulses from make-up water meter to the two dosing pumps, in order to allow the mode volume operation.

  The signal splitter has a waterproof box and Hirschmann connectors with cables.

2.3 Optional accessory components

The following accessories are available and selectable with this system. If any of these components are included in the current supply, they shall be remarked, verified in the offer and later in the order confirmation.

- Pulse-emitting Water Meter

  The pulse-emitting water meter has to be installed on the make-up pipe of the evaporative cooling system, in order to measure and transmit the make-up water flow signal to the dosing pumps and carry out a volume mode chemical dosage.

  The water meter with diameter between 3/4" to 1"1/2, presents threaded connections, brass body, dry dial, reel axis perpendicular to the pipe, 5 meters long cable and horizontal mounting.

  The water meter with diameter between Dn50 to Dn100, presents flanged connections, painted cast iron body, removable and rotating dry dial, magnetic coupling group between turbine and dial, turbine axis parallel to the pipe, 5 meters long cable and horizontal, or vertical, or sloped mounting.

  Depending on the cooling system thermal capacity, the following water meter type shall be used:

C20	3/4"	Nominal flow rate 2,5 mc/h and Pulse frequency 1 pulse/liter	Weight 1 kg;
C25	1”	Nominal flow rate 3,5 mc/h and Pulse frequency 1 pulse/liter	Weight 1,5 kg;
C40	1”1/2	Nominal flow rate 10 mc/h and Pulse frequency 1 pulse/liter	Weight 2 kg;
C50	Dn50	Nominal flow rate 15 mc/h and Pulse frequency 1 pulse/10 liters	Weight 9 kg;
C65	Dn65	Nominal flow rate 25 mc/h and Pulse frequency 1 pulse/10 liters	Weight 11 kg;
C80	Dn80	Nominal flow rate 40 mc/h and Pulse frequency 1 pulse/10 liters	Weight 13 kg;
C100	Dn100	Nominal flow rate 60 mc/h and Pulse frequency 1 pulse/100 liters	Weight 17 kg.

- SFC Chemical Flow Switch

  The chemical flow switch is installed on the dosing pump pipeline, to detect and transmit the chemical flow to the dosing pump through its magnetic contact, in order to check the pump stroke and the chemical injection. In case of pump strokes without the corresponding chemical flow dosing, the pump goes into alarm.

  The flow switch has a PVDF body, PTFE coated magnetic ball and TFE/P o'ring. It includes a hydraulic sensitivity adjustable through the reed sensor excursion to adapt itself to the various dosed fluid densities and different use conditions.

- Chemical Tank with suction pipe and level probe

  The liquid chemical storage tank has an opaque white cylindrical PE body with graduated scale, closure cap, threaded studs to prevent chemical contact, PVC suction pipe with threaded connection for tank installation, chemical level magnetic probe, non-return valve and base filter.

  Depending on the cooling system thermal capacity, the following tank type shall be used:

S10	110 liters	Diameter: 500 mm and Height: 750 mm	Weight 6 kg;
S20	200 liters	Diameter: 610 mm and Height: 850 mm	Weight 9 kg;
S50	500 liters	Diameter: 780 mm and Height: 1200 mm	Weight 20 kg.

- Safety Bund

  The safety bund contains a storage tank to prevent chemical leaking in the event of tank accidental breakage

  The safety bund has an opaque white cylindrical PE body.

  Depending on the volume of the selected chemical tank, the following safety bund type shall be used:

V10	120 liters	suitable with S 110 liters - Diameter 550 mm and Height 620 mm	Weight 4 kg;
V20	300 liters	suitable with S 200 liters- Diameter 700 mm and Height 880 mm	Weight 7 kg;
V50	600 liters	suitable with S 500 liters- Diameter 840 mm and Height 1100 mm	Weight 18 kg.