Non-corroding cooling towers

Evaporative condensers

MCC MCE
Series

MITA

Closed circuit evaporative cooling towers Series MCC and evapo

MCC Series: closed circuit evaporative cooling towers

The **MCC series closed circuit evaporative cooling towers** are employed as an alternative to open-type cooling circuits with heat exchangers, in those cases in which the cooling fluid for the user's equipment (generally water or water with glycol) must maintain its chemical and physical characteristics constant over time and unpolluted by external elements. In fact the fluid to be cooled circulates within the tubes constituting the heat exchanger coil placed inside the cooling tower: the coil, in turn, is continuously wetted by the water, contained in the basin of the tower, which is sent to a spray system with nozzles via the appropriate pump.
Thanks to the combined effects of the evaporation of a small part of the spray water and of the turbulence created inside the tubes, the cooling of the fluid, which can hence be returned to the user's equipment, is achieved.

MCE Series: evaporative condensers

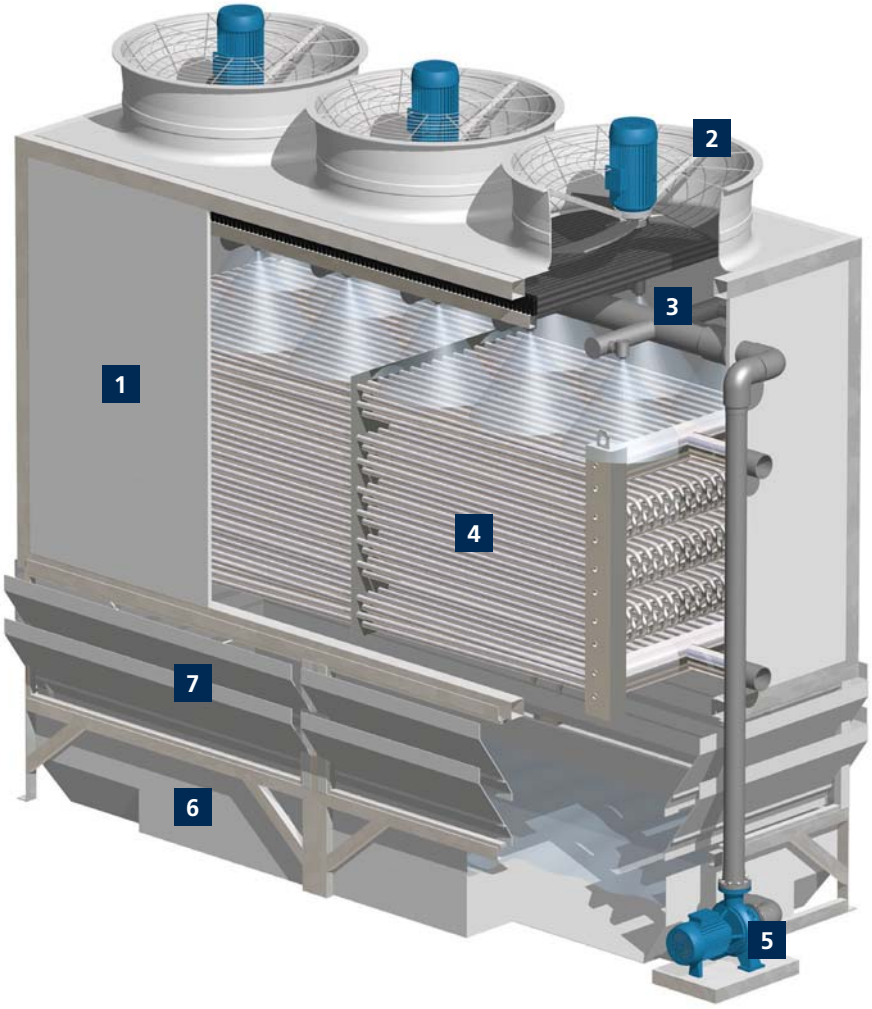
The **MCE series evaporative condensers** can be employed in air conditioning and industrial refrigeration installations, representing in their operation an alternative to the classical water-cooled condenser with evaporative cooling tower or systems with air-cooled finned coils.
The refrigerant gas to be condensed is fed to the upper header of a coil of smooth-surface tubes which, continuously wetted by water appropriately sprayed and in contact with an adequate counter-current airflow, permits the progressive condensation of the gas. The gas, thus cooled and condensed to the liquid state, can be returned via the lower header to the installation.
Hence the evaporative condenser, in the context of water-cooled condensing systems combines the "open circuit cooling tower/S&T condenser" system in a single and compact unit exploiting, inside the unit, the forced evaporation of a small quantity of the recirculating spray water to achieve the heat load rejection which is necessary to condensate the refrigerant gas.

Constructional features

Fitted with one or more axial fans according to the model, the MCC and MCE series are built with a strong supporting structure in hot-dip galvanised steel and side walls made of fibreglass sandwich panels. The internal heat exchanger is composed of smooth-tube coils, fabricated in compliance with PED directive 97/23/EC for MCE series only. The standard configuration is completed by the water collecting basin and the fan cylinders made entirely of fibreglass (FRP).
The range includes 36 models suitable for installations with requested refrigeration loads between approx. 80 and 1500 kW.

MCC MCE Series

Structural characteristics



1 **Structure and main casing**
Construction Materials:
steel supporting structure, hot-dip galvanised after fabrication, sandwich panelling in 22 mm thick fibreglass.
Characteristics:
- optimum mechanical resistance
- good sound-absorption properties
- non-corroding
- easy internal inspection (with optional man holes).

2 **Multi-blade axial fan**
Construction Materials:
hot-dip galvanised steel (support), electric motor, plastic (fan blades), stainless steel (protective grid).
Characteristics:
- high performance, low absorbed electric power, fan directly driven by the motor
- safety function of the protective grid unaltered over time
- easy blade replacement.

3 **Water distribution system**
Construction Materials:
normalised PN 10 PVC pipes, polypropylene tangential nozzles.
Characteristics:
- non-corroding
- uniform and complete spraying of the coil, full-cone spray
- exclusive MITA-design nozzles: the water flow is induced in the diffuser cone solely by the tangential connection to the main body of the nozzle, hence there are no internal parts which could give rise to obstructions.

4 **Heat exchange coil (in compliance with PED directive 97/23/EC for the MCE Series)**
Construction Materials:
hot-dip galvanised steel (stainless steel, on request for MCC Series).
Characteristics:
- large heat exchange surface
- easy maintenance (thanks to the optional man holes).

5 **Centrifugal water recirculating pump and piping of the spray water circuit**

6 **Basin with sloping bottom and top of the tower**
Construction Materials:
glass-mat reinforced orthophthalic polyester resin in several layers.
Characteristics:
- external surface protection by means of a gelcoat resistant to UV-radiation, to cold and hot water, to abrasion from the elements/weather conditions and to chemicals
- internal water-proofing/ impermeability obtained by means of an isophthalic, paraffin-containing, impermeable and hydro-repellent gel-coat (for the basin)
- light-weight
- non-corroding.

7 **Anti-splash louvers on the air inlet openings**
Construction Materials:
PVC or fibreglass.
Characteristics:
- non-corroding
- easy dismounting even after many years in service.

TECHNICHAL CHARACTERISTICS

TYPE	EVAPORATIVE CONDENSER - SERIES MCE THERMAL CAPACITY											
	Condensing temp. 35 °C - Wet bulb temp. 24 °C				Condensing temp. 35 °C - Wet bulb temp. 25 °C				Condensing temp. 35 °C - Wet bulb temp. 26 °C			
	R717	R134a	R404a	R507a	R717	R134a	R404a	R507a	R717	R134a	R404a	R507a
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
A1	166	146	144	146	154	135	133	135	141	124	121	124
A2	196	175	172	175	182	162	159	162	167	148	145	148
A3	218	197	193	197	202	182	179	182	186	167	163	167
B1	242	213	210	213	224	198	194	197	205	181	177	181
B2	285	255	250	254	264	236	231	236	242	216	211	216
B3	316	286	281	285	293	265	260	264	269	243	237	242
D1	312	275	270	274	289	254	250	254	265	233	228	232
D2	368	328	322	327	341	303	298	303	313	278	272	277
D3	408	368	362	367	378	341	334	340	347	312	306	312
E1	405	356	350	356	375	329	323	329	344	302	296	301
E2	477	425	418	424	442	393	386	393	405	361	353	360
E3	529	477	469	477	490	442	433	441	450	405	397	404
H1	515	452	445	451	477	418	410	417	438	383	375	382
H2	609	542	533	541	565	501	492	501	518	460	450	459
H3	679	611	600	610	629	565	555	564	578	518	507	517
I1	647	568	558	567	599	525	515	524	550	481	471	480
I2	765	680	668	678	708	629	617	628	650	576	564	575
I3	851	765	751	764	788	708	694	707	723	649	635	648
M1	646	566	557	565	598	524	514	522	549	480	470	479
M2	763	678	666	677	707	627	615	626	649	575	563	574
M3	849	763	750	762	787	707	693	705	722	648	634	647
N1	835	733	720	731	774	677	665	676	710	621	608	619
N2	986	877	862	875	914	811	796	810	839	743	728	742
N3	1.097	987	969	985	1017	913	896	912	934	837	820	836
P1	1.041	914	898	912	964	845	829	843	885	774	758	772
P2	1.230	1.094	1.075	1.092	1140	1012	993	1010	1.046	927	908	925
P3	1.369	1.231	1.210	1.229	1269	1140	1118	1137	1.164	1.045	1.023	1.043
Q1	1.243	1.091	1.072	1.086	1151	1008	989	1007	1.056	924	905	922
Q2	1.467	1.305	1.283	1.303	1359	1208	1185	1205	1.247	1.107	1.084	1.104
Q3	1.633	1.469	1.444	1.467	1513	1360	1334	1357	1.389	1.247	1.220	1.244
R1	1.283	1.127	1.108	1.125	1188	1042	1022	1040	1.090	955	935	953
R2	1.516	1.349	1.326	1.347	1404	1248	1224	1246	1.289	1.144	1.120	1.141
R3	1.687	1.519	1.492	1.516	1563	1405	1379	1403	1.435	1.289	1.261	1.286
S1	1.546	1.357	1.334	1.355	1431	1254	1231	1252	1.314	1.149	1.126	1.147
S2	1.826	1.624	1.596	1.621	1691	1502	1474	1500	1.552	1.377	1.348	1.374
S3	2.032	1.828	1.796	1.825	1882	1692	1659	1689	1.728	1.551	1.518	1.548

TYPE	CLOSED CIRCUIT – SERIES MCC THERMAL CAPACITY					
	Wet bulb temp. 24 °C		Wet bulb temp. 25 °C		Wet bulb temp. 26 °C	
	35/30	40/30	35/30	40/30	35/30	40/30
		kW	kW	kW	kW	kW
A1	105	103	90	86	74	68
A2	128	130	110	112	91	91
A3	143	147	124	127	102	104
B1	165	170	143	147	119	122
B2	195	203	169	175	141	145
B3	214	222	185	191	153	158
D1	215	222	186	192	155	159
D2	249	265	220	229	183	190
D3	278	289	240	249	200	205
E1	289	303	251	264	210	220
E2	337	354	293	306	244	254
E3	367	382	318	328	264	271
H1	371	392	324	341	271	285
H2	436	459	379	398	317	331
H3	477	499	414	430	344	356
I1	477	507	417	441	350	370
I2	555	585	482	506	404	421
I3	603	629	522	541	434	447

TYPE	CLOSED CIRCUIT – SERIES MCC THERMAL CAPACITY					
	Wet bulb temp. 24 °C		Wet bulb temp. 25 °C		Wet bulb temp. 26 °C	
	35/30	40/30	35/30	40/30	35/30	40/30
	kW	kW	kW	kW	kW	kW
M1	449	466	390	404	325	335
M2	533	557	462	482	385	400
M3	586	610	507	526	421	435
N1	601	634	524	551	439	460
N2	704	741	612	641	511	533
N3	769	802	666	691	554	571
P1	768	815	671	710	564	595
P2	893	941	777	815	650	677
P3	971	1.012	841	871	700	719
Q1	929	990	812	863	684	723
Q2	1.075	1.134	936	981	783	815
Q3	1.166	1.213	1.010	1.044	839	861
R1	945	1.004	826	875	694	733
R2	1.100	1.160	957	1.005	801	835
R3	1.197	1.248	1.036	1.074	862	887
S1	1.157	1.233	1.011	1.075	852	901
S2	1.339	1.412	1.165	1.222	975	1.015
S3	1.451	1.511	1.257	1.300	1.045	1.072

Fields of application

The closed circuit cooling tower is employed in industrial plants and civil air conditioning installations, in particular:

- cooling of delicate equipment such as air compressors, moulds and plastic extrusion machines, pipe-manufacturing (using an emulsion of anti-corrosion additive in the water of the closed circuit) or induction furnaces (with demineralised water)
- evaporative chilling (cooling tower's direct production of chilled water for an air conditioning installation when the chiller is shut-down in the low season) and load shaving (direct production of chilled water upstream of a chiller thus only subjected to part-load).

The evaporative condenser serving refrigeration plants can be employed in the following sectors:

- civil and industrial air conditioning installations
- industrial logistics
- refrigerated warehouses (e.g. storage of food products)
- industrial refrigeration.

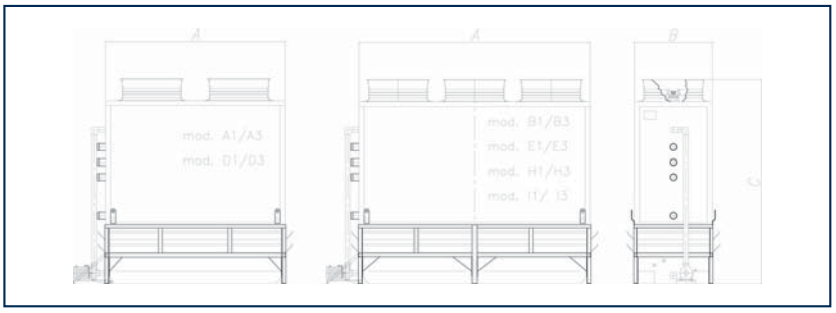
Accessories and optional constructional alternatives available on request

For all models the following optional alternatives are available:

- AISI 304 or 316 stainless steel coil (for corrosive spray water and/or aggressive environments, for semi-open circuits or for cooling circuits containing demineralised water), available for MCC series only
- "double-passage" coils with split headers to maximise the thermal performance
- two-speed electric motor with multi-step thermostat (or alternatively an automatic centralised cascade control system, or control system with inverter)
- "Silent" version, characterized by a reduced sound emission
- electric heater complete of thermostat and switch for minimum level
- big man holes for the access to the internal parts for inspection, clenaning or maintenance operations.

DIMENSIONS AND WEIGHTS

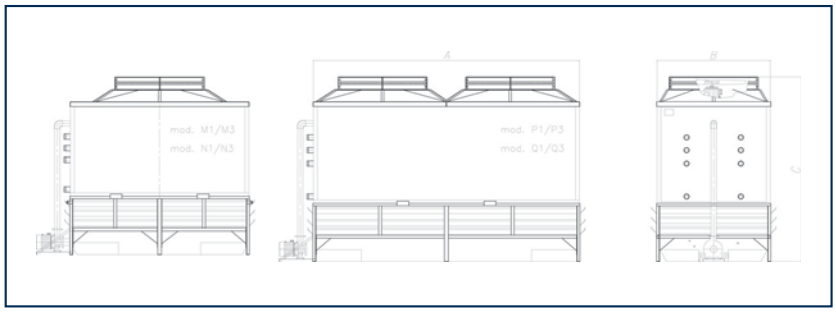
Series MCC-MCE



TYPE	WEIGHT			FANS			PUMP		ELECTRIC HEATHER*		DIMENSIONS		
	empty	operation	heaviest section	N°	POWER	AIR FLOW	POWER	CAPACITY	N°	POWER	A	B	C
	kg	kg	kg		kW (each)	m³/s (each)	kW	l/s		kW (each)	mm	mm	mm
A1/A3	1200	2200	910	2	0,75	2,68	1,1	4,72	1	2	1870	1030	3160
B1/B3	1645	3100	1295	3	0,75	2,5	1,1	7,3	1	3	2770	1030	3160
D1/D3	1865	3630	1485	2	1,5	4,86	1,1	9,72	1	3	2850	1235	3250
E1/E3	2200	4500	1780	3	1,5	4,17	1,5	12,5	1	5	3670	1235	3250
H1/H3	2710	5330	2230	3	1,5	5,61	2,2	13,9	1	5	3670	1505	3460
I1/I3	3260	6550	2680	3	2,2	6,95	3	18,9	1	7,5	4570	1505	3610

* optional

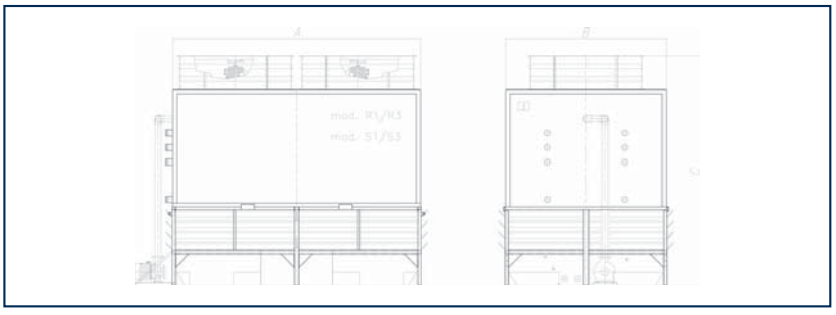
Series MCC-MCE



TYPE	WEIGHT			FANS			PUMP		ELECTRIC HEATHER*		DIMENSIONS		
	empty	operation	heaviest section	N°	POWER	AIR FLOW	POWER	CAPACITY	N°	POWER	A	B	C
	kg	kg	kg		kW (each)	m³/s (each)	kW	l/s		kW (each)	mm	mm	mm
M1/M3	3510	7100	2860	1	5,5	20,55	3	18,9	1	7,5	2850	2340	3650
N1/N3	4135	8685	3435	1	7,5	26,8	3	25	1	7,5	3690	2340	3650
P1/P3	5215	10800	4465	2	5,5	16,67	4	30,55	2	5	4570	2340	3800
Q1/Q3	6215	12500	5135	2	5,5	20,14	4	36,11	2	7,5	5500	2340	3800

* optional

Series MCC-MCE



TYPE	WEIGHT			FANS			PUMP		ELECTRIC HEATHER*		DIMENSIONS		
	empty	operation	heaviest section	N°	POWER	AIR FLOW	POWER	CAPACITY	N°	POWER	A	B	C
	kg	kg	kg		kW (each)	m³/s (each)	kW	l/s		kW (each)	mm	mm	mm
R1/R3	6500	13000	5250	2	5,5	20,55	4	36,11	2	7,5	4520	2960	4235
S1/S3	7500	15500	6000	2	5,5	24,72	5,5	44,5	2	7,5	5470	2960	4235

* optional

ENG/MCC-MCE Rev.03-10 - Realizzato da: GRUPPO STAMPA GB

MITA

Via Antonio M. Fontana, 1
Tel. +39 0382.67.599
www.mita-tech.it

I - 27010 Siziano (PV)
Fax +39 0382.617.640
e-mail: info@mita-tech.it