

All ratings XF line

Design cases per CTI Std 210 in deg C																																																		cti nom		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50		
wet bulb	10,00	10,00	10,00	10,00	10,00	13,00	13,00	13,00	13,00	13,00	16,00	16,00	16,00	16,00	16,00	18,00	18,00	18,00	18,00	18,00	21,00	21,00	21,00	21,00	21,00	24,00	24,00	24,00	24,00	24,00	27,00	27,00	27,00	27,00	27,00	29,00	29,00	29,00	29,00	29,00	32,20	32,20	32,20	32,20	32,20	21,00	25,56	27,00	28,00	21,00		
cooling range	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00	6,00
approach	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	6,00	7,00	4,00	7,00	4,00	
inlet temperature	20,00	22,00	23,00	22,00	25,00	23,00	25,00	26,00	25,00	28,00	26,00	28,00	29,00	28,00	31,00	28,00	30,00	31,00	30,00	33,00	31,00	33,00	34,00	33,00	36,00	34,00	36,00	37,00	36,00	39,00	37,00	39,00	40,00	39,00	42,00	39,00	41,00	42,00	41,00	44,00	42,20	44,20	45,20	44,20	47,20	32,00	35,00	37,00	37,00	35,00		
outlet temperature	14,00	16,00	17,00	14,00	17,00	17,00	19,00	20,00	17,00	20,00	20,00	22,00	23,00	20,00	23,00	22,00	24,00	25,00	22,00	25,00	25,00	27,00	28,00	25,00	28,00	28,00	30,00	31,00	28,00	31,00	33,00	34,00	31,00	34,00	33,00	35,00	36,00	33,00	36,00	36,20	38,20	39,20	36,20	39,20	27,00	29,44	32,00	32,00	25,00			

Rated waterflow (m3/h)																																																		
Model Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
XL 2.320-VL-235_60	59,52	82,11	93,93	50,10	76,97	65,20	90,16	103,25	54,76	84,59	71,59	99,41	113,96	60,23	93,33	76,46	106,31	121,93	64,31	99,94	84,62	117,87	136,45	71,15	110,74	93,91	131,02	150,63	78,92	123,12	104,67	146,14	169,02	87,74	137,32	112,47	157,15	180,84	94,27	147,69	126,38	176,95	192,00	105,89	166,36	134,53	192,04	141,95	122,19	63,03
XL 2.320-VL-235_60	77,79	107,62	123,14	65,39	100,80	85,17	118,10	135,45	71,59	110,72	93,66	130,15	149,37	78,70	122,11	100,19	139,13	159,73	84,01	130,75	110,80	154,33	177,41	92,90	144,91	122,88	171,59	192,00	103,02	160,98	136,59	191,00	192,00	114,68	179,55	146,75	192,00	192,00	123,14	192,00	165,05	192,00	138,22	192,00	176,30	133,49	185,55	159,78	82,22	
XL 2.320-L-235_60	96,02	132,63	151,94	80,48	124,17	105,06	145,69	166,99	88,07	136,51	115,46	160,42	184,06	96,80	150,45	123,22	171,60	192,00	103,31	160,84	136,24	190,22	192,00	114,40	178,31	151,34	192,00	192,00	126,77	192,00	168,06	192,00	192,00	140,81	192,00	180,68	192,00	192,00	151,21	192,00	192,00	192,00	169,89	192,00	192,00	164,31	192,00	192,00	100,99	
XL 2.320-M-235_60	113,74	157,41	180,36	95,32	147,31	124,42	172,75	192,00	104,29	161,69	136,71	190,37	192,00	114,78	178,28	145,89	192,00	192,00	122,45	190,72	161,48	192,00	192,00	135,31	192,00	179,17	192,00	192,00	149,95	192,00	192,00	192,00	166,74	192,00	192,00	192,00	192,00	178,96	192,00	192,00	192,00	192,00	192,00	192,00	192,00	192,00	192,00	119,47		
XL 2.320-VL-235_90	71,80	97,65	110,98	61,31	92,46	78,86	107,37	122,39	67,34	101,93	87,01	118,75	135,33	74,29	112,66	93,12	127,26	145,12	79,32	120,77	103,37	141,55	161,57	87,98	134,37	114,84	157,87	180,35	97,86	149,88	128,38	176,47	201,99	109,10	167,54	138,25	190,28	217,88	117,44	180,65	155,89	215,29	246,60	132,34	204,33	159,74	124,61	170,85	148,68	78,74
XL 2.320-VL-235_90	94,43	128,33	145,97	80,39	121,44	103,68	141,27	160,88	88,23	133,80	114,33	156,16	178,03	97,25	148,00	122,29	167,29	191,09	103,99	158,61	135,65	185,97	212,57	115,30	176,38	150,88	207,58	237,08	128,19	196,86	168,21	231,80	265,47	142,86	219,89	181,08	250,12	286,28	154,00	236,99	204,10	282,48	288,00	173,39	288,00	210,27	163,73	224,53	195,36	103,00
XL 2.320-L-235_90	116,70	158,71	180,59	99,21	150,07	128,05	174,64	199,18	108,85	165,29	141,13	192,97	220,27	119,94	183,00	150,90	206,95	236,02	128,23	196,03	167,29	229,87	262,62	142,13	217,87	186,01	256,31	288,00	158,22	243,04	207,35	286,27	288,00	176,21	271,48	223,53	288,00	288,00	189,56	288,00	251,73	288,00	288,00	213,44	288,00	259,87	201,84	277,28	241,24	126,95
XL 2.320-M-235_90	138,61	188,70	214,98	117,78	178,35	152,04	207,85	236,72	129,18	196,58	167,51	229,52	261,88	142,32	217,27	179,08	246,05	280,75	152,38	232,71	198,51	273,30	288,00	168,79	258,77	221,05	288,00	288,00	187,52	288,00	246,20	288,00	288,00	208,86	288,00	265,25	288,00	288,00	225,01	288,00	288,00	288,00	253,14	288,00	288,00	239,77	288,00	286,46	150,46	

Where to get the correct **Rated Fan Power, kW** for a tested Kelvion CTI certified tower

Cooling Technology Institute

Test Calculations - SI Units (°C, lpm & kPa)

File No. T15-131A Date 30 JUN 2015 Time Period 1030-1130
 Model No. CMC6-DM90-PS9/3 Location Polacel Lab TAN# T25A-131-15A

Test Data

Hot Water, °C = <u>30.75</u>	Cold Water, °C = <u>24.43</u>	Wet Bulb, °C = <u>16.26</u>
Tower Flow, m³/h = <u>85.18</u>	Makeup Flow, m³/h = <u>N/A</u>	Makeup Temp, °C = <u>N/A</u>
Test Fan Power, kW = <u>4.95</u>	Pump Pressure, kPa = <u>N/A</u>	Barometer, kPa = <u>102.104</u>
Rated Fan Power, kW = <u>???</u>	Dry Bulb, °C = <u>23.01</u>	Relative Humidity, % = <u>49.93</u>

Calculated Values

Pump Correction = 0.000239 * kPa / Pump Efficiency (0.8 assumed)	PC = <u>0.00</u> °C
Evaporation = 0.00153 * Flow * Range	Evap = <u>N/A</u> m³/h
Makeup Correction = (CWT + PC - MUT) * MUF / (Tower Flow - MUF)	MC = <u>N/A</u> °C
CCWT = CWT + PC + MC	CCWT = <u>24.43</u> °C
Range = HWT - CCWT	Range = <u>6.32</u> °C
Approach = CCWT - WBT	Approach = <u>8.17</u> °C

This information can be found in column AB of the DOR of the model, where there are three rows, to provide different values for different waterloads (see picture to the right taken from DOR). The permissible waterload (aka rain density) can be calculated as water flow divided by wet area. For tower evaluation the tower flow from the test table must be taken. The wet area can be found in column BJ of the DOR.

Max permissible waterload for model m3/m2.h
R=10
R=20
R=30

After calculating the tested water load one can directly read out the searched value in the DOR.

Example below illustrates the procedure.

From DOR

R	Abs	Installed	Taken from test protocol / DOR		
m3/m2.h	kW	kW			
0,00	4,18	5,50	Water flow	85,18 m3/h	(a) test protocol
10,00	4,18	5,50	Wet area	4,24 m	(b) DOR column BJ
10,01	4,40	5,50	Rain density	20,1 m3/m2.h	=(a)/(b)
20,00	4,40	5,50			
20,01	4,84	5,50	Rated fan power	4,84 kW	waterload > than 20 thus 3rd row in table
30,00	4,84	5,50			

Model Number	Nominal Water Flow Rate m3/h	Nominal Temperature Conditions C	Number of Cells	No. of Fans per Cell	Fan Motors per Cell	Total Nameplate Motor Power per Model [3]	Total Rated Motor Power per Model	Crossflow Airtravel mm	Internal Cell Length mm	Internal Cell Width mm	Total Gross Face Area per Cell m2	Film Fill No. of Sheets over Cell Width	Film Fill No. of Sheets over Cell Length
CMC6-DM-90	51,0	35-25-21	1	1	1	4,18	5,5		2560	1760	4,24	214	147
CMC6-DM-90	51,0	35-25-21	1	1	1	4,40	5,5		2560	1760	4,24	214	147
CMC6-DM-90	51,0	35-25-21	1	1	1	4,84	5,5		2560	1760	4,24	214	147
CMC6-DH-90	60,5	35-25-21	1	1	1	5,16	7,5		2560	1760	4,24	214	147
CMC6-DH-90	60,5	35-25-21	1	1	1	6,93	7,5		2560	1760	4,24	214	147

