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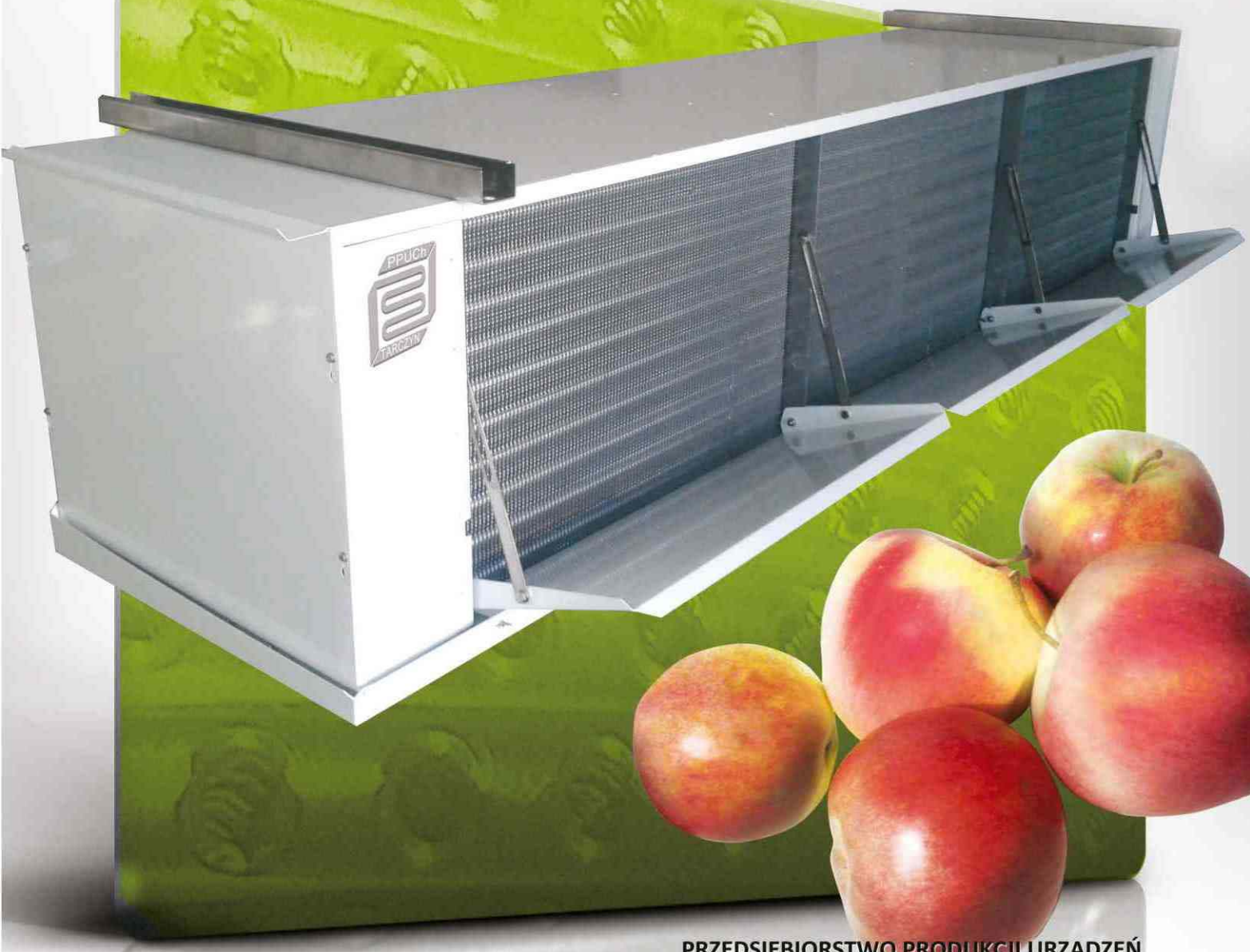
PRODUKT POLSKI

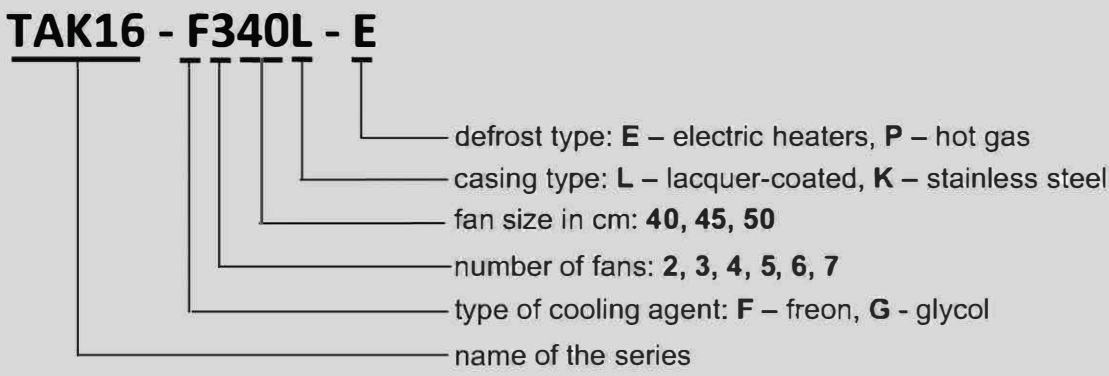
TAK16
AIR COOLERS



PRZEDSIĘBIORSTWO PRODUKCJI URZĄDZEŃ CHŁODNICZYCH TARCZYN SP. Z O.O.
ul. Błońska 85, 05-555 Tarczyn
tel. +48 22 727 86 86
fax: +48 22 727 81 61
kom. +48 697 702 206
www.ppuch.pl
info@ppuch.pl

Application:
The TAK... series of new generation fan air coolers was designed especially for fruit and vegetables storage rooms. Using our experience gained during many years of operation, we have developed a series of air coolers working at minimal temperature differences in order to limit the shrinkage of the stored products. A mild stream of air directed by flaps and large heat transfer surface enable to maintain high humidity in the room. The height of the cooler allows for making the most effective use of the space in the cold room. The series includes 16 sizes with capacities between 9.5kW and 85kW at dt_1=8K, extended by subsequent modules and equipped with ø400, ø450, or ø500 fans.

Product description:



Design:
The coolers are built with a Cu-Al fin coil evaporator with 7 mm fin spacing and a variable finning on ø16 tubes along the air flow, covered with paint-coated galvanized steel. The suction fans ensure an air stream range between 22 and 30 metres, depending on the fan size. The integrated electric heaters enable fast defrost. As an option, the coolers may be equipped with a fin coil adapted to be defrosted with hot gas. All units are equipped with an appropriate fluid separator and prepared to be fed with the cooling agent through a thermostatic expansion valve with an external pressure equalizer or an electronic throttle. Each cooler undergoes a tightness test, then it is dried and filled with an inert gas to a slight overpressure.

Technical data – designations:
- **T_k** - average air temperature in the room
- **dt_1** - temperature difference between the air temperature before the cooler and t_0 volatilization temperature of the cooling agent at the cooler outlet
- **dt_m** - logarithmic temperature difference between the average air temperature and the t_0 volatilization temperature
- refrigerating capacity was defined for incoming air with 85% humidity and the temperature of Freon R404A or R507 before the throttling valve at +25°C with volatilization temperature at -5°C

If other cooling agents are used, a correction coefficient **Wk** should be applied

Power calculation: $Q_{rz} = Q_{st} * Wk$
Q_{rz} - real capacity of the cooler
Q_{st} - cooler capacity from the table
Wk - correction coefficient for different cooling agents

cooling agent			
R404A R507	R22	R134a	R407C
1,00	**0,96**	**0,93**	**0,87**

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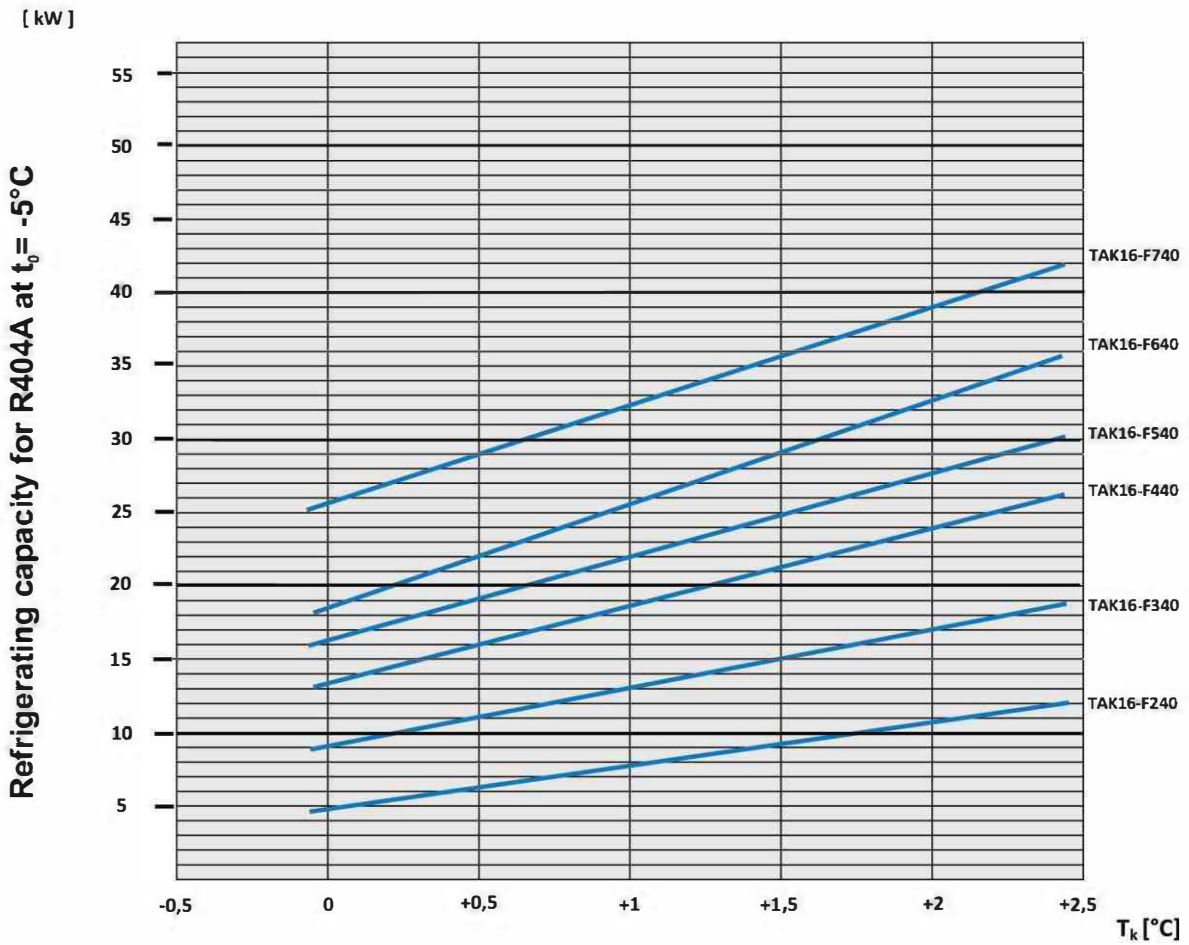
TAK16 series with ø400 fan – Freon version

Specification			Unit	TAK16-F240	TAK16-F340	TAK16-F440	TAK16-F540	TAK16-F640	TAK16-F740
Heat parameters for R404A Freon, volitilization at t_0 = -5°C	dt_1=9K	Capacity	[W]	**11 400**	**17 540**	**23 240**	**29 020**	**36 270**	**41 380**
		dt_m	[K]	6,62	6,36	6,18	6,07	6,49	6,60
		separator pressure drop	[kPa]	272	341	383	414	364	304
	dt_1=8K	Capacity	[W]	**9 520**	**14 990**	**20 070**	**25 200**	**30 850**	**34 820**
		dt_m	[K]	6,11	5,87	5,71	5,62	5,96	6,07
		separator pressure drop	[kPa]	180	250	286	313	265	216
	dt_1=7K	Capacity	[W]	**7 430**	**12 200**	**16 620**	**21 050**	**25 000**	**27 620**
		dt_m	[K]	5,60	5,36	5,22	5,14	5,42	5,53
		separator pressure drop	[kPa]	110	166	197	219	175	137
	dt_1=6K	Capacity	[W]	**4 760**	**8 980**	**12 720**	**16 390**	**18 340**	**19 060**
		dt_m	[K]	5,13	4,86	4,73	4,65	4,89	5,02
		separator pressure drop	[kPa]	49	91	116	134	95	66
External surface			[m^2]	**66**	**99**	**132**	**165**	**198**	**231**
Internal surface			[dcm^3]	19	27	35	43	50	58
Fan - Ø400 - 230W/400V			[pcs]	2	3	4	5	6	7
Fan capacity			[m^3/h]	6 800	10 200	13 600	17 000	20 400	23 800
Defrost heaters power - voltage 400V			[kW]	3	4,5	6	7,8	9	10,8
Connections inlet - outlet			[mm]	12 - 22	12 – 28	12 - 28	16 - 35	16 - 35	16 - 42



Average temperature in the room

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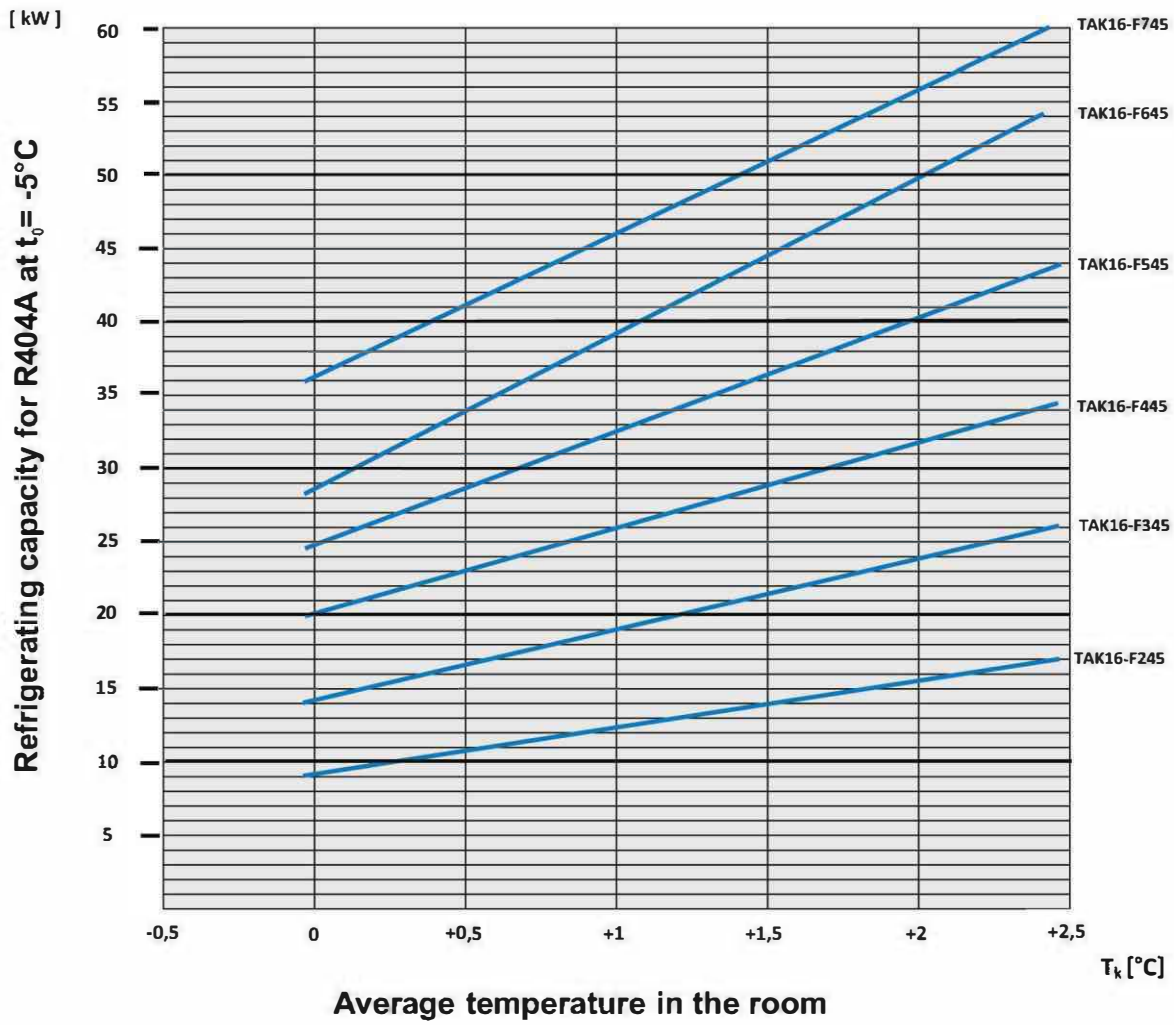
Fax: +48 22 727 81 61
kom.+48 697 702 206

www.ppuch.pl e-mail: info@ppuch.pl

TAK16 series with ø450 fan – Freon version

Specification			Unit	TAK16-F245	TAK16-F345	TAK16-F445	TAK16-F545	TAK16-F645	TAK16-F745
Heat parameters for R404A Freon, volatilization at t_0 = -5°C	dt_1=9K	Capacity	[W]	**17 120**	**26 060**	**34 450**	**43 430**	**52 910**	**60 530**
		dt_m	[K]	6,31	6,36	6,0	6,1	6,41	5,97
		separator pressure drop	[kPa]	345	355	455	435	366	477
	dt_1=8K	Capacity	[W]	**14 650**	**22 240**	**30 000**	**37 650**	**45 070**	**52 810**
		dt_m	[K]	5,83	5,87	5,55	5,63	5,90	5,52
		separator pressure drop	[kPa]	254	260	346	330	267	364
	dt_1=7K	Capacity	[W]	**11 930**	**18 080**	**25 180**	**31 410**	**36 560**	**44 450**
		dt_m	[K]	5,34	5,36	5,08	5,15	5,38	5,05
		separator pressure drop	[kPa]	170	173	245	230	176	260
	dt_1=6K	Capacity	[W]	**8 780**	**13 290**	**19 800**	**24 410**	**26 820**	**35 170**
		dt_m	[K]	4,85	4,86	4,60	4,65	4,87	4,56
		separator pressure drop	[kPa]	93	94	152	140	96	86
External surface			[m^2]	**99**	**149**	**198**	**248**	**297**	**347**
Internal surface			[dcm^3]	27	39	51	63	74	86
Fan - Ø450 - 415W/400V			[pcs]	2	3	4	5	6	7
Fan capacity			[m^3/h]	9 980	14 970	19 960	24 950	29 940	34 930
Defrost heaters power - voltage 400V			[kW]	5,9	9	11,7	14,4	17,1	19,8
Connections inlet - outlet			[mm]	16 - 28	16 - 35	16 - 35	22 - 42	22 - 54	22 - 54



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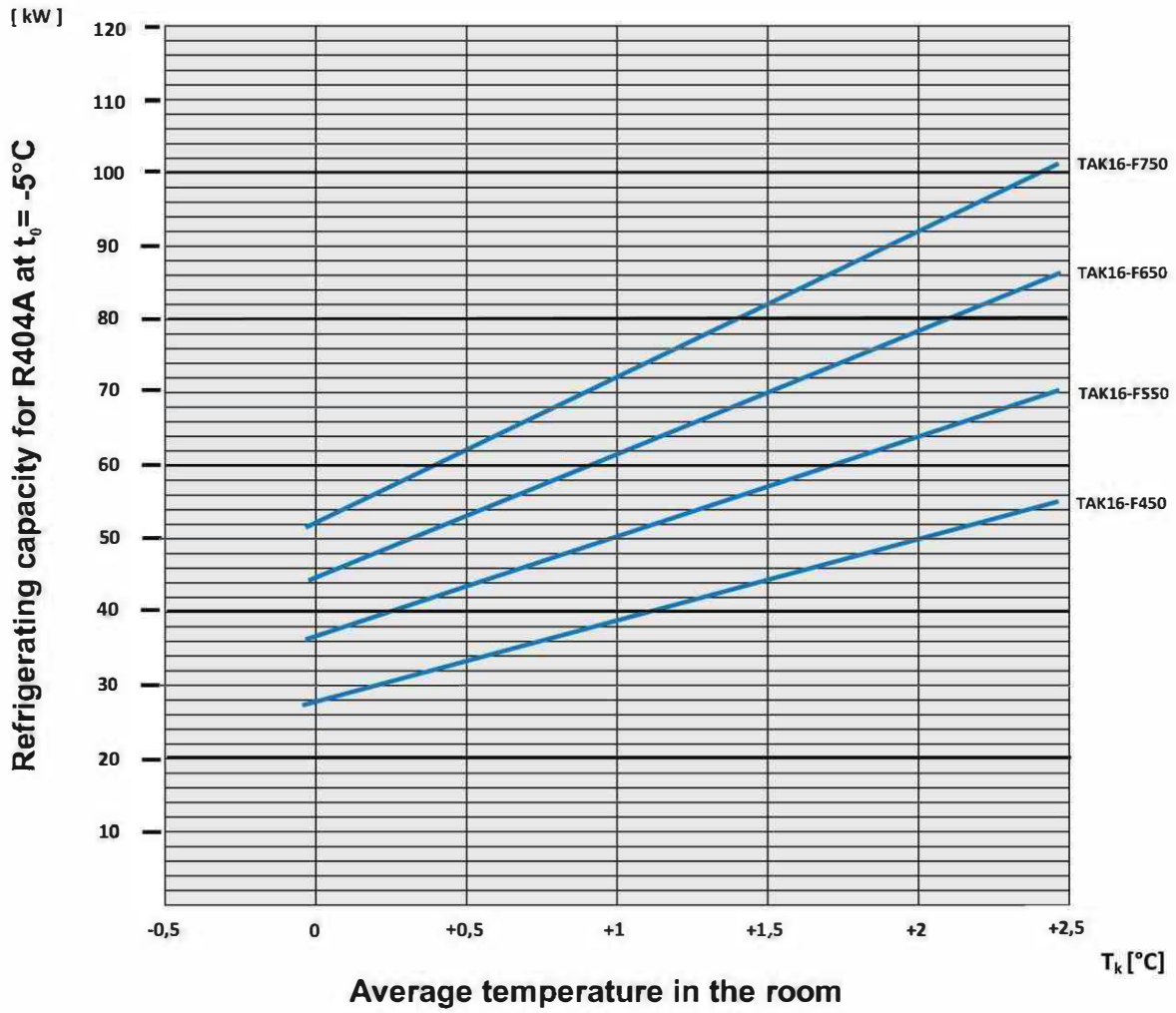
TAK16 series with ø500 fan – Freon version

Specification			Unit	TAK16-F450	TAK16-F550	TAK16-F650	TAK16-F750
Heat parameters for R404A Freon, volatilization at t_o = -5°C	dt_1=9K	Capacity	[W]	**55 020**	**69 060**	**85 580**	**98 890**
		dt_m	[K]	6,45	6,64	6,58	6,42
		separator pressure drop	[kPa]	440	391	473	511
	dt_1=8K	Capacity	[W]	**47 040**	**58 250**	**72 830**	**84 920**
		dt_m	[K]	5,94	6,11	6,04	5,90
		separator pressure drop	[kPa]	324	280	345	379
	dt_1=7K	Capacity	[W]	**38 320**	**46 410**	**59 080**	**69 850**
		dt_m	[K]	5,42	5,57	5,48	5,37
		separator pressure drop	[kPa]	216	179	228	258
	dt_1=6K	Capacity	[W]	**28 280**	**32 340**	**43 410**	**52 920**
		dt_m	[K]	4,90	5,04	4,93	4,83
		separator pressure drop	[kPa]	119	88	125	150
External surface			[m^2]	**294**	**367**	**440**	**514**
Internal surface			[dcm^3]	75	92	110	128
Fan - Ø500 - 840W/400V			[pcs]	4	5	6	7
Fan capacity			[m^3/h]	33 600	42 000	50 400	58 800
Defrost heaters power - voltage 400V			[kW]	16,8	21,6	25,2	30
Connections inlet - outlet			[mm]	22-42	22-54	28-54	28-64



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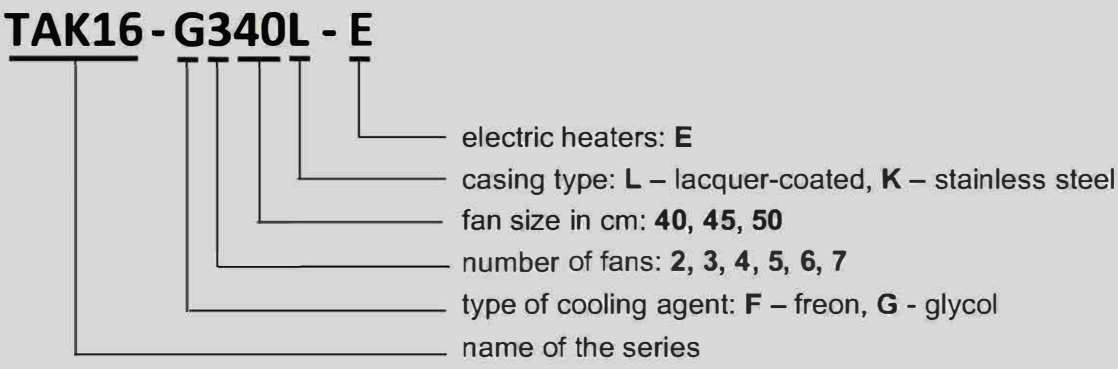
TAK16 – glycol version

Application:
The TAK... series of new generation fan air coolers – glycol version for intermediate cooling systems, was designed especially for fruit and vegetables storage rooms. They are particularly useful in those rooms, where the possibility to maintain high air humidity is needed. These coolers, thanks to their special design, may work at minimal temperature differences [dt1] ensuring the best possible conditions for storage. The special guide vanes at the cooler outlet stabilise the stream of air and make it possible to leave a relatively small space between the top layer of products and the room ceiling. The series includes 16 sizes with capacities between 10.4kW and 72.7kW at dt_1=8K, extended by subsequent modules and equipped with ø400, ø450, or ø500 fans.

Product description:



Design:
The coolers are built with a Cu-Al fin coil with 7 mm fin spacing and a variable finning on ø16 tubes along the air flow, covered with powder-painted galvanized steel. The suction fans ensure an air stream range between 22 and 30 metres, depending on their size and power. As an option, the coolers may be equipped with electric heaters enabling fast defrost of the fin coil and the drip tray. Each cooler undergoes a tightness test performed with dry nitrogen.

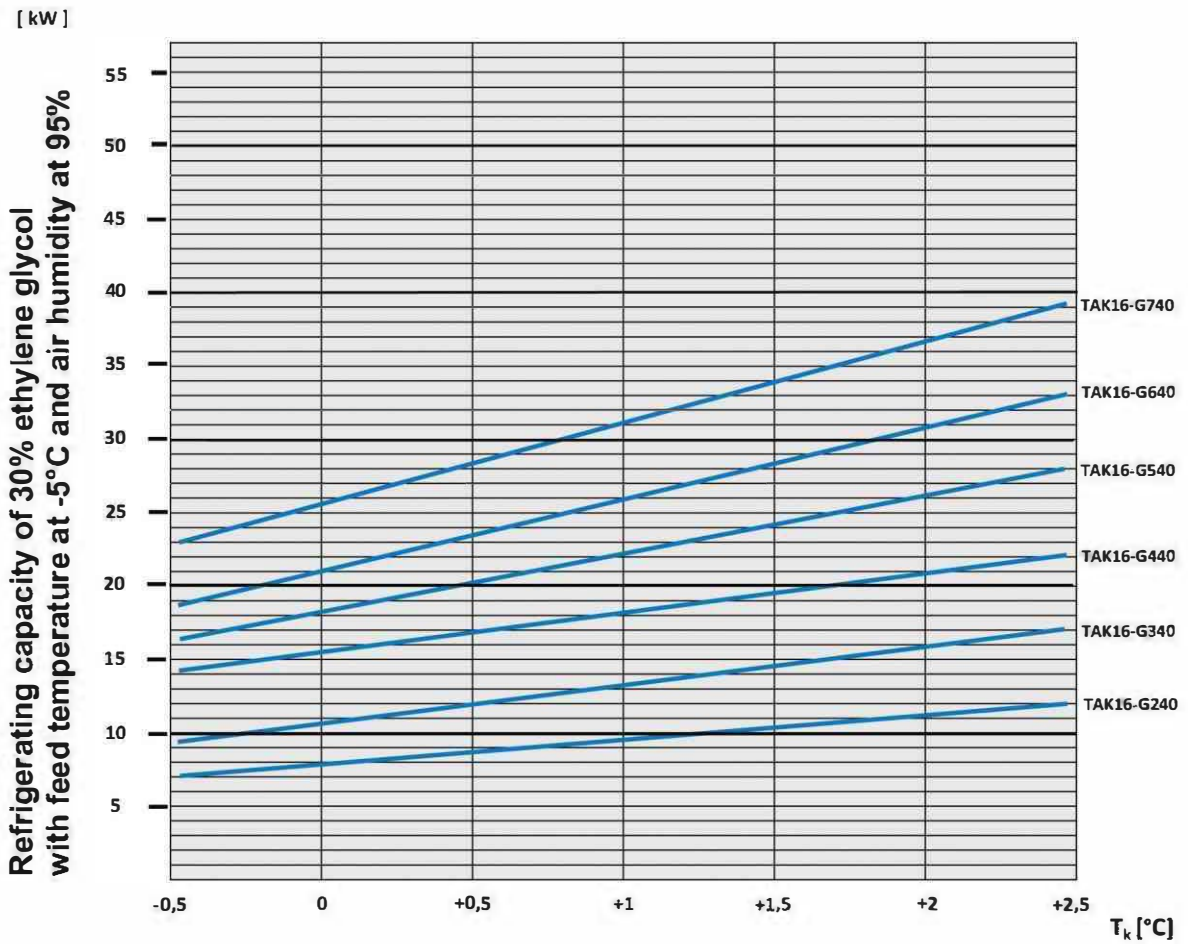
Technical data – designations:
Efficiencies in the tables are provided for 30% ethylene glycol with feed temperature at -5°C and air humidity at 95%.
If other cooling agents are used, a correction coefficient Wk should be used

Glycol type	Glycol concentration								
	5%	10%	15%	20%	25%	30%	35%	40%	45%
ethylene	1,12	1,1	1,08	1,06	1,03	1	0,96	0,91	0,85
propylene	1,11	1,08	1,04	0,99	0,92	0,83	0,72	0,60	0,48

Power calculation: $Q_{rz} = Q_{st} * Wk$
Q_{rz} - real capacity of the cooler
Q_{st} - cooler capacity from the table
Wk - correction coefficient for different cooling agents
- T_k - average air temperature in the room
- dt_1 - temperature difference between the air temperature before the cooler and glycol temperature at the cooler inlet

TAK16 series with ø400 fan – glycol version

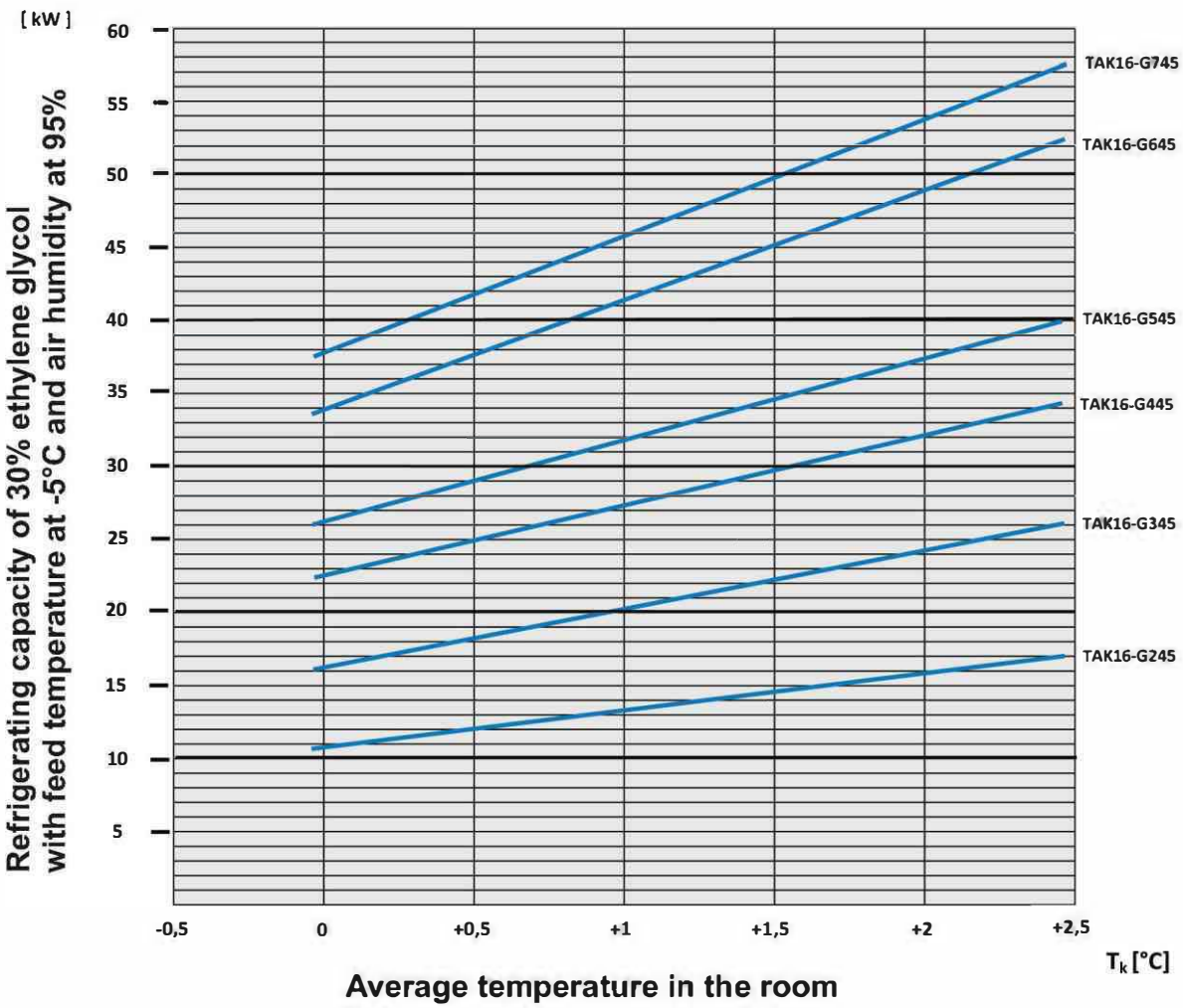
Specification		Unit	TAK16-G240	TAK16-G340	TAK16-G440	TAK16-G540	TAK16-G640	TAK16-G740
Capacity for 30% ethylene glycol with feed temperature at -5°C and air humidity at 95%	dt_1=8K	[W]	**10 410**	**14 640**	**21 280**	**24 960**	**28 030**	**35 860**
	dt_1=7K	[W]	**9 060**	**12 750**	**18 530**	**21 740**	**24 410**	**31 230**
	dt_1=6K	[W]	**7 720**	**10 850**	**15 780**	**18 510**	**20 780**	**26 590**
	dt_1=5K	[W]	**6 370**	**8 960**	**13 030**	**15 290**	**17 160**	**21 960**
Glycol flow at 75kPa pressure drop		[m^3/h]	**4,8**	**5,3**	**10,1**	**9,1**	**8,4**	**14,3**
External surface		[m^2]	**49**	**74**	**99**	**124**	**148**	**173**
Internal capacity		[dcm^3]	20	28	37	44	52	61
Fan - Ø400 - 230W/400V		[pcs]	2	3	4	5	6	7
Fan capacity		[m^3/h]	6 800	10 200	13 600	17 000	20 400	23 800
Defrost heaters power - voltage 400V		[kW]	3	4,5	6	7,8	9	10,8
Connections		[inch]	1"	1"	1½"	1½"	1½"	2"



Average temperature in the room

TAK16 series with ø450 fan – glycol version

Specification		Unit	JAK16-G245	JAK16-G345	JAK16-G445	JAK16-G545	JAK16-G645	JAK16-G745
Capacity for 30% ethylene glycol with feed temperature at -5°C and air humidity at 95%	dt_1=8K	[W]	**14 860**	**22 680**	**30 770**	**34 830**	**46 380**	**51 080**
	dt_1=7K	[W]	**12 940**	**19 750**	**26 790**	**30 330**	**40 380**	**44 340**
	dt_1=6K	[W]	**11 020**	**16 810**	**22 820**	**25 840**	**34 380**	**37 590**
	dt_1=5K	[W]	**9 100**	**13 880**	**18 840**	**21 340**	**28 380**	**30 850**
Glycol flow at 75kPa pressure drop		[m^3/h]	**5,2**	**8,1**	**11,1**	**9,7**	**16,9**	**15,6**
External surface		[m^2]	**99**	**149**	**198**	**248**	**297**	**347**
Internal capacity		[dcm^3]	29	41	54	65	79	91
Fan - Ø450 - 415W/400V		[pcs]	2	3	4	5	6	7
Fan capacity		[m^3/h]	9 980	14 970	19 960	24 950	29 940	34 930
Defrost heaters power - voltage 400V		[kW]	5,9	9	11,7	14,4	17,1	19,8
Connections		[inch]	1"	1½"	2"	2"	2½"	2½"



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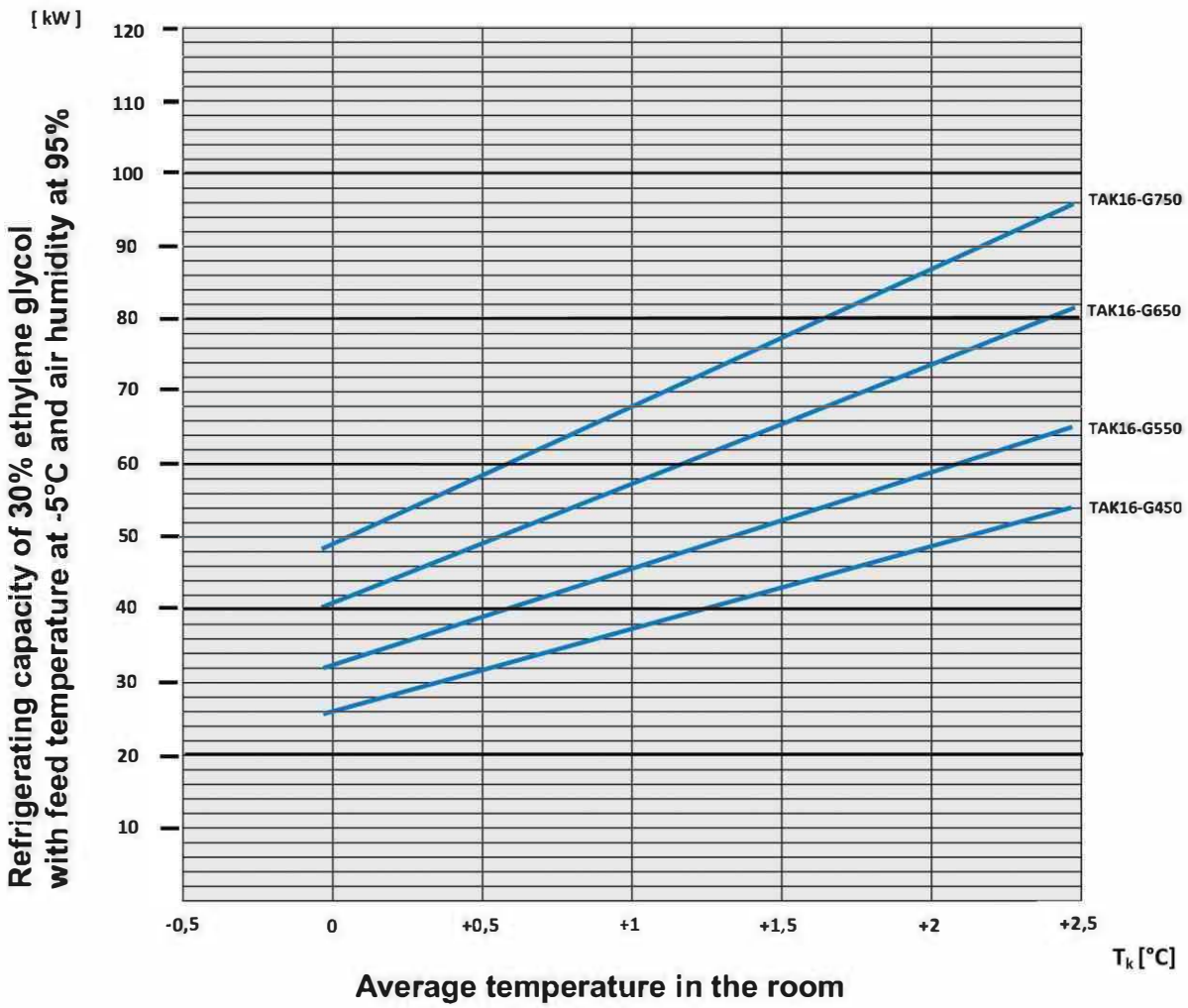
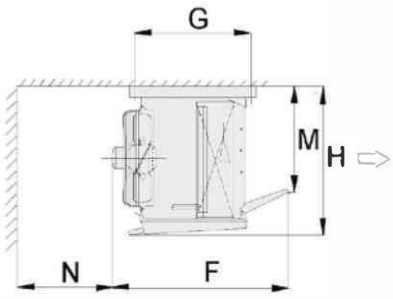
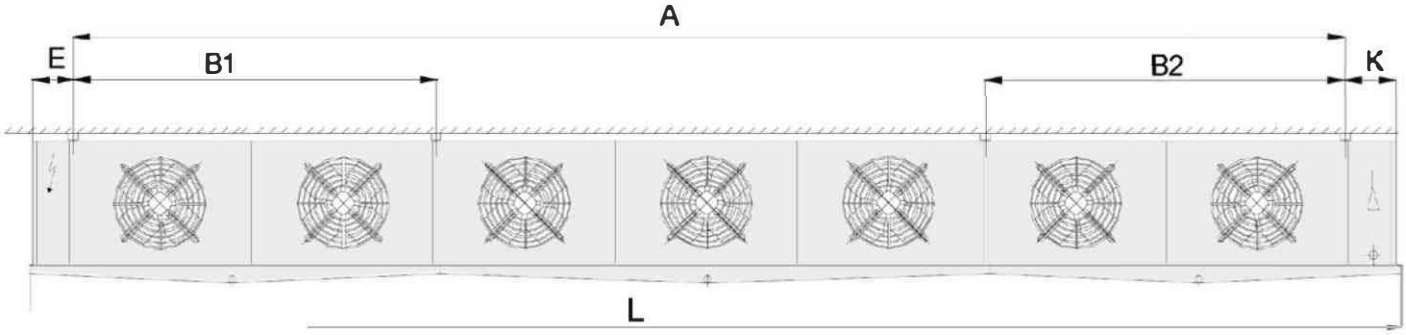
TAK16 series with ø500 fan – glycol version

Specification		Unit	TAK16-G450	TAK16-G550	TAK16-G650	TAK16-G750
Capacity for 30% ethylene glycol with feed temperature at -5°C and air humidity at 95%	dt_1=8K	[W]	**44 220**	**57 930**	**66 650**	**72 770**
	dt_1=7K	[W]	**38 510**	**50 440**	**58 040**	**63 370**
	dt_1=6K	[W]	**32 800**	**42 960**	**49 440**	**53 970**
	dt_1=5K	[W]	**27 090**	**35 470**	**40 830**	**44 570**
Glycol flow at 75kPa pressure drop		[m^3/h]	**13,7**	**19,3**	**20,9**	**19,3**
External surface		[m^2]	**294**	**367**	**440**	**514**
Internal capacity		[dcm^3]	79	98	115	133
Fan - Ø500 - 840W/400V		[pcs]	4	5	6	7
Fan capacity		[m^3/h]	33 600	42 000	50 400	58 800
Defrost heaters power - voltage 400V		[kW]	16,8	21,6	25,2	30
Connections		[inch]	2"	2½"	2½"	2½"



Dimensions:





	Basic dimensions [mm] mm											Connections Inlet/Outlet [mm] [inch]	Weight [kg]	Drip outlet
	L	B1	B2	A	E	K	G	H	F	M	N			
TAK16-F240	1760	-	-	1410	145	185	650	590	1000	445	650	12/22	100	1"
TAK16-G240												1"		
TAK16-F340	2480	-	-	2130								12/28	145	
TAK16-G340												1"		
TAK16-F440	3200	1440	1410	2850								12/28	190	
TAK16-G440												1½"		
TAK16-F540	3920	2160	1410	3570								16/35	235	
TAK16-G540												1½"		
TAK16-F640	4630	2160	2130	4290								16/35	280	
TAK16-G640												1½"		
TAK16-F740	5350	1440	1410	5010								16/42	325	
TAK16-G740												2"		
TAK16-F245	2120	-	-	1770	145	185	690	690	1000	520	650	16/28	145	1"
TAK16-G245												1"		
TAK16-F345	3020	-	-	2670								16/35	205	
TAK16-G345												1½"		
TAK16-F445	3920	1800	1770	3570								16/35	265	
TAK16-G445												2"		
TAK16-F545	4820	2700	1770	4470								22/42	325	
TAK16-G545												2"		
TAK16-F645	5720	2700	2670	5370								22/54	380	
TAK16-G645												2½"		
TAK16-F745	6620	1800	1770	6270								22/54	435	
TAK16-G745												2½"		
TAK16-F450	4360	2000	1970	3970	150	190	720	890	1050	670	700	22/42	355	1"
TAK16-G450												2"		
TAK16-F550	5360	3000	1970	4970								22/54	435	
TAK16-G550												2½"		
TAK16-F650	6360	3000	2970	5970								28/54	510	
TAK16-G650												2½"		
TAK16-F750	7360	2000	3000	6970								28/64	590	
TAK16-G750												2½"		

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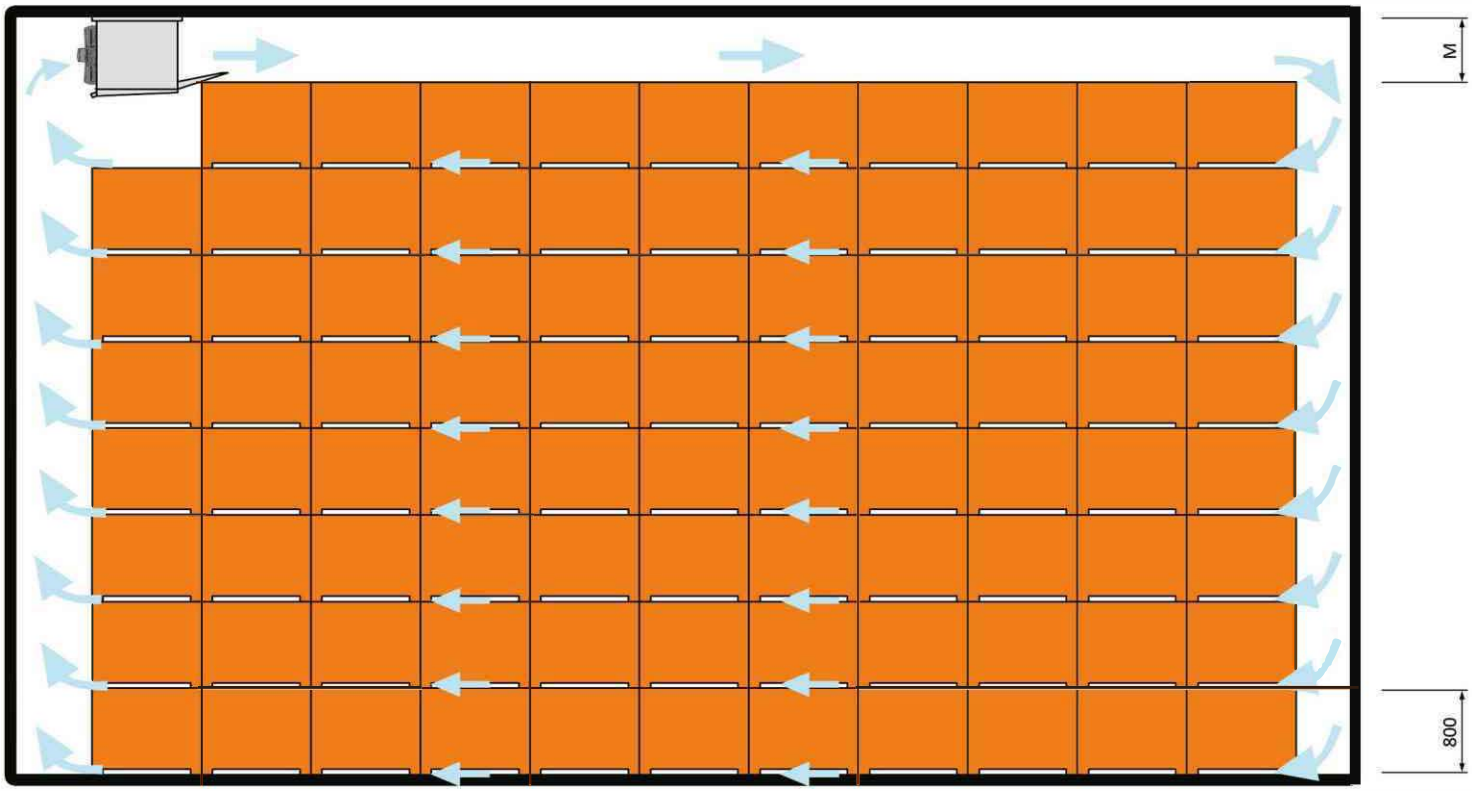
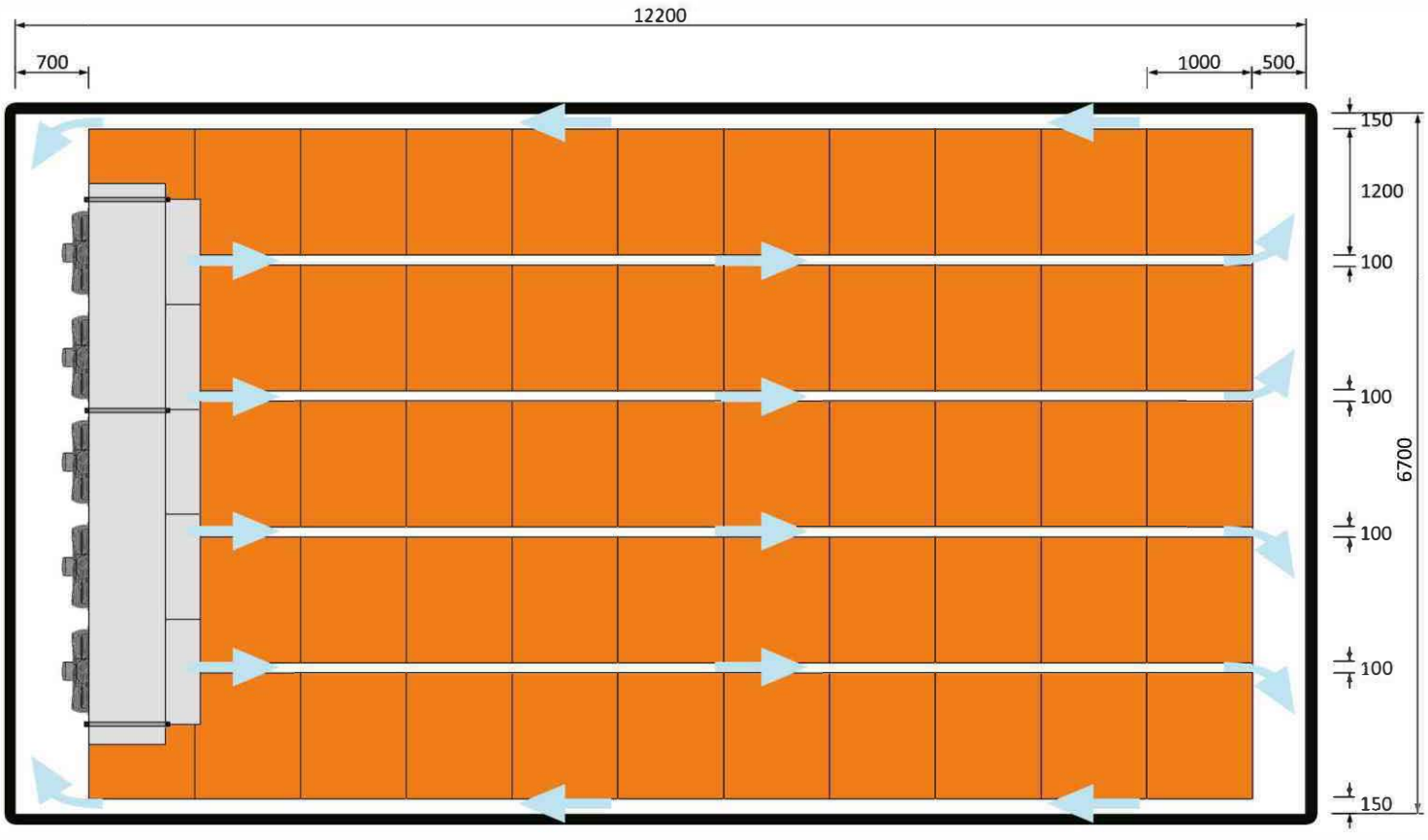
NOTES

Example of a typical layout of pallets in the room – air flow is optimized and high quality of the stored goods is ensured.





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