PPUCh TARCZYN

PRODUKT POLSKI

JAK16
AIR COOLERS

PRZEDSIĘBIORSTWO PRODUKCJI URZĄDZEŃ CHŁODNICZYCH TARCZYN SP. Z O.O.
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Application:
The JAK… 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 20 sizes with capacities between 8.83kW and 94.88kW at dt_1=8K, extended by subsequent modules and equipped with ø400, ø450, ø500, or ø560 fans.

JAK16 - F340L - E

- E — defrost type: E – electric heaters, P – hot gas
- L — casing type: L – lacquer-coated, K – stainless steel
- 40 — fan size in cm: 40, 45, 50, 56
- 3 — number of fans: 2, 3, 4, 5, 6, 7
- F — type of cooling agent: F – freon, G - glycol
- JAK16 — name of the series

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 36 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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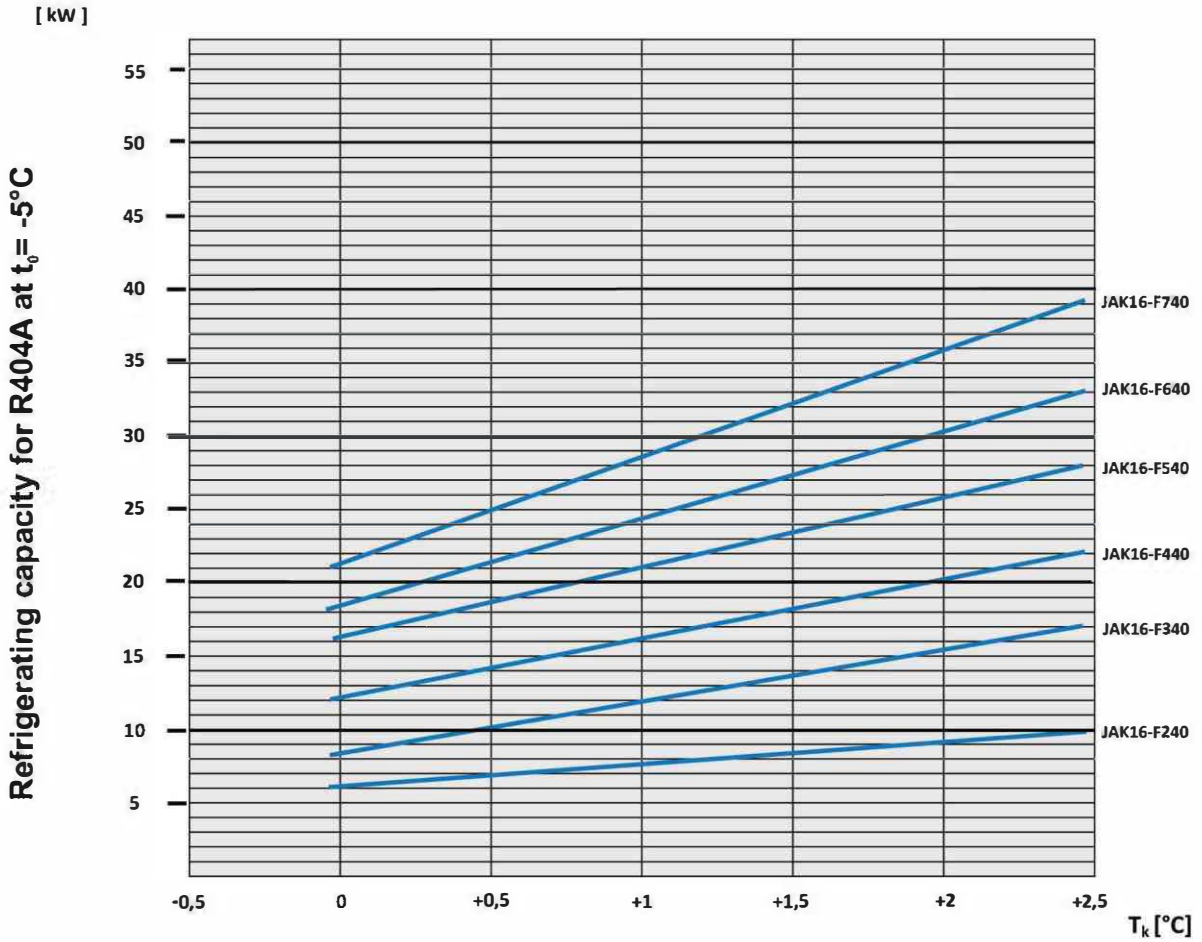
JAK16 series with ø400 fan – Freon version

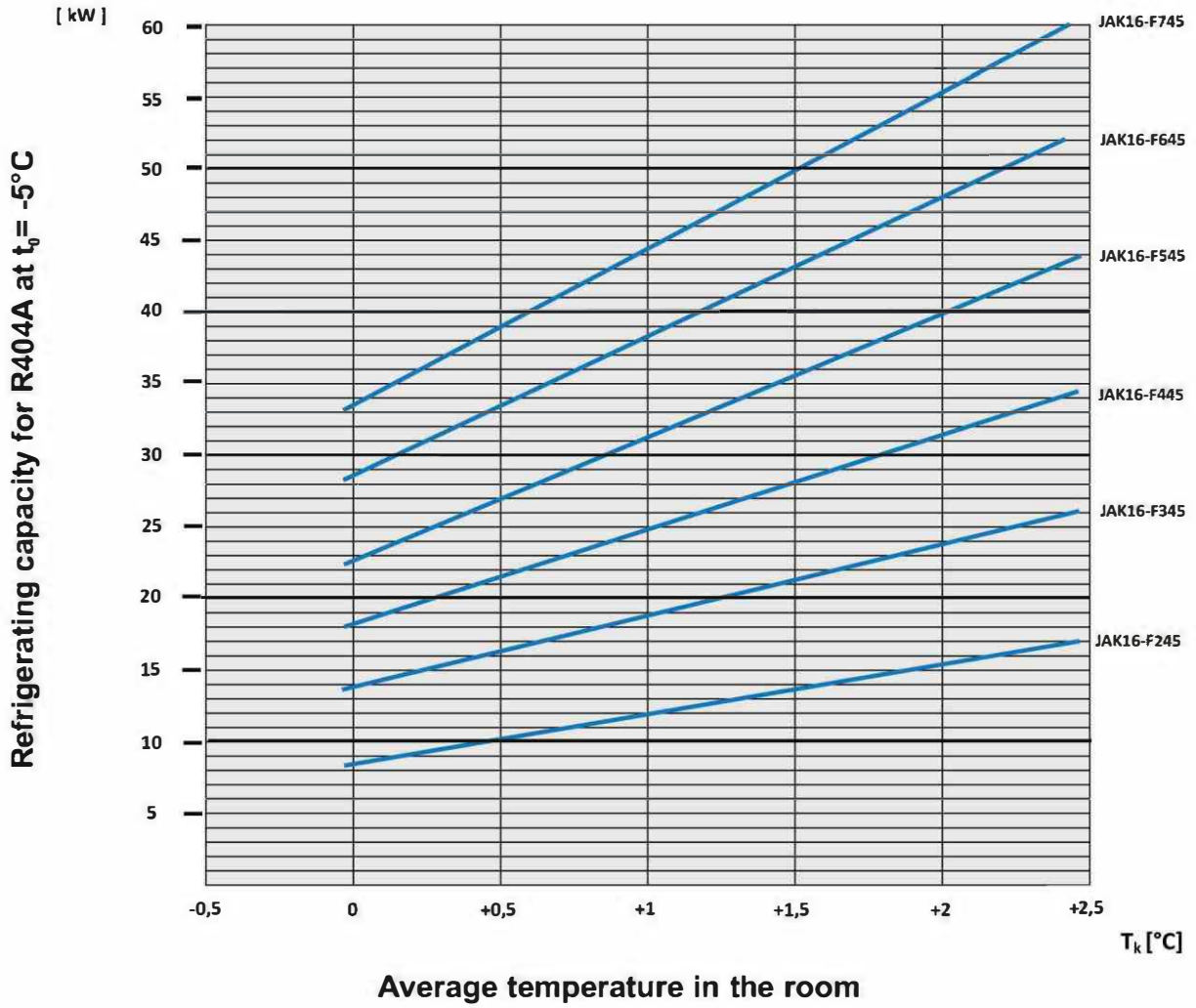
Specification			Unit	JAK16-F240	JAK16-F340	JAK16-F440	JAK16-F540	JAK16-F640	JAK16-F740
Heat parameters for R404A Freon, volatilization at t_0 = 5°C	dt_1=9K	Capacity	[W]	**9 920**	**16 610**	**22 100**	**27 650**	**34 210**	**38 930**
		dt_m	[K]	5,58	6,64	6,46	6,36	6,75	6,86
		separator pressure drop	[kPa]	420	296	335	363	313	360
	dt_1=8K	Capacity	[W]	**8 830**	**14 110**	**18 990**	**23 890**	**28 960**	**32 570**
		dt_m	[K]	5,20	5,55	5,95	5,86	6,18	6,28
		separator pressure drop	[kPa]	334	214	248	272	225	183
	dt_1=7K	Capacity	[W]	**7 630**	**11 400**	**15 620**	**19 830**	**23 290**	**25 610**
		dt_m	[K]	4,80	5,55	5,42	5,34	5,60	5,71
		separator pressure drop	[kPa]	250	140	168	188	147	114
	dt_1=6K	Capacity	[W]	**6 280**	**8 270**	**11 820**	**15 290**	**16 830**	**17 200**
		dt_m	[K]	4,38	5,01	4,88	4,81	5,03	5,15
		separator pressure drop	[kPa]	170	75	97	112	77	52
External surface			[m^2]	**49**	**74**	**99**	**124**	**148**	**173**
Internal surface			[dcm^3]	19	27	34	42	50	58
Fan - Ø400 - 230W/400V			[szt.]	2	3	4	5	6	7
Fan capacity			[m^3/h]	6 900	10 350	13 800	17 250	20 700	24 150
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

JAK16 series with ø450 fan – Freon version

Specification			Unit	JAK16-F245	JAK16-F345	JAK16-F445	JAK16-F545	JAK16-F645	JAK16-F745
Heat parameters for R404A Freon, volatilization at t_0 = 5°C	dt_1=9K	Capacity	[W]	**16 840**	**25 600**	**34 790**	**43 930**	**51 950**	**62 110**
		dt_m	[K]	6,59	6,64	6,71	6,75	6,69	6,79
		separator pressure drop	[kPa]	334	343	356	363	353	370
	dt_1=8K	Capacity	[W]	**14 370**	**21 810**	**29 570**	**37 280**	**44 170**	**52 650**
		dt_m	[K]	6,07	6,11	6,16	6,18	6,14	6,21
		separator pressure drop	[kPa]	244	250	258	263	256	267
	dt_1=7K	Capacity	[W]	**11 670**	**17 680**	**23 910**	**30 110**	**35 730**	**42 460**
		dt_m	[K]	5,53	5,56	5,59	5,61	5,58	5,63
		separator pressure drop	[kPa]	162	165	170	172	169	175
	dt_1=6K	Capacity	[W]	**8 550**	**12 920**	**17 440**	**21 920**	**26 080**	**30 890**
		dt_m	[K]	5,00	5	5,02	5,03	5,02	5,04
		separator pressure drop	[kPa]	88	89	91	92	91	94
External surface			[m^2]	**74**	**111**	**148**	**186**	**223**	**260**
Internal surface			[dcm^3]	27	39	50	63	74	86
Fan - Ø450 - 415W/400V			[pcs]	2	3	4	5	6	7
Fan capacity			[m^3/h]	11000	16 500	22 000	27 500	33 000	38 500
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	22-42	22-54



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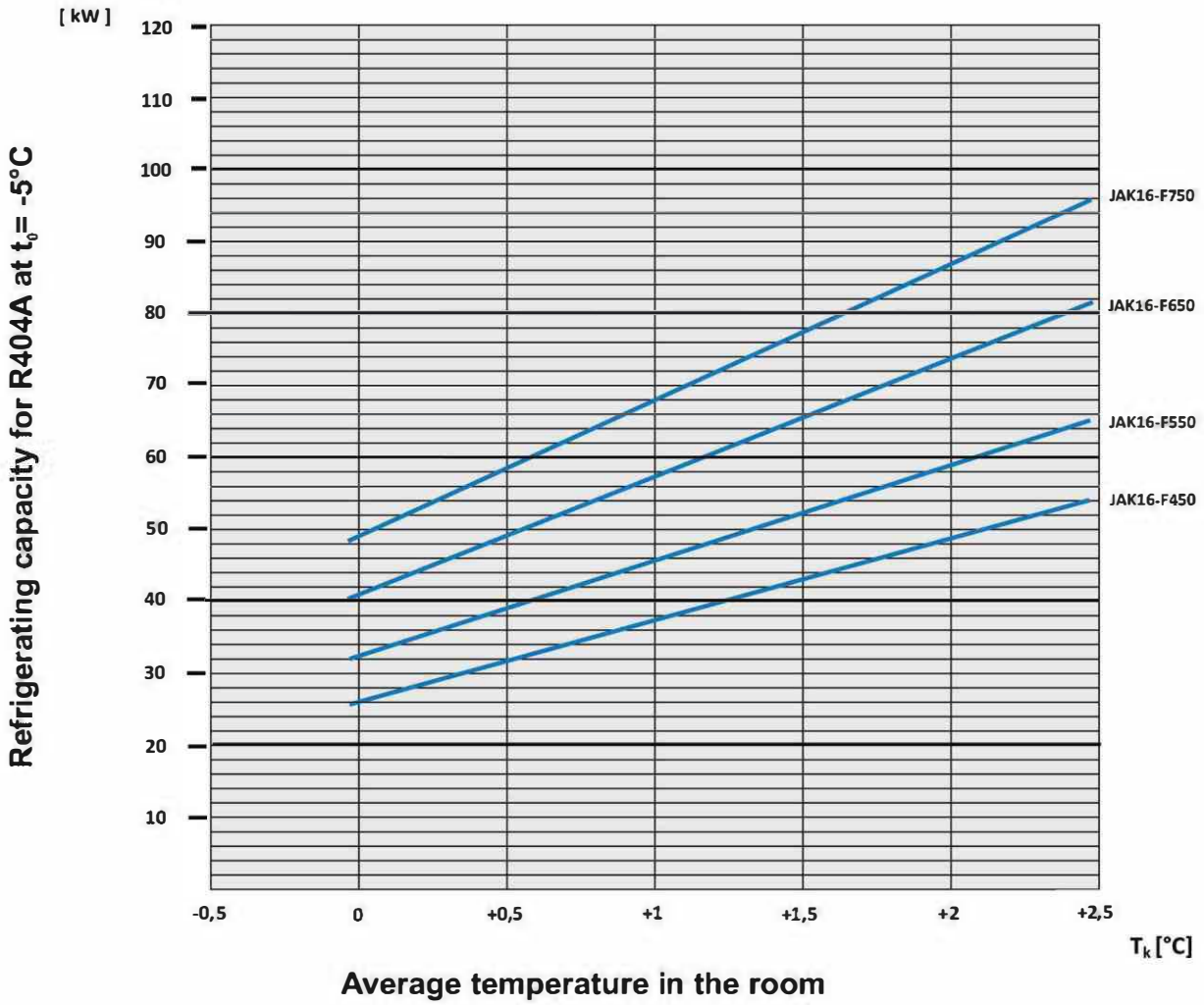
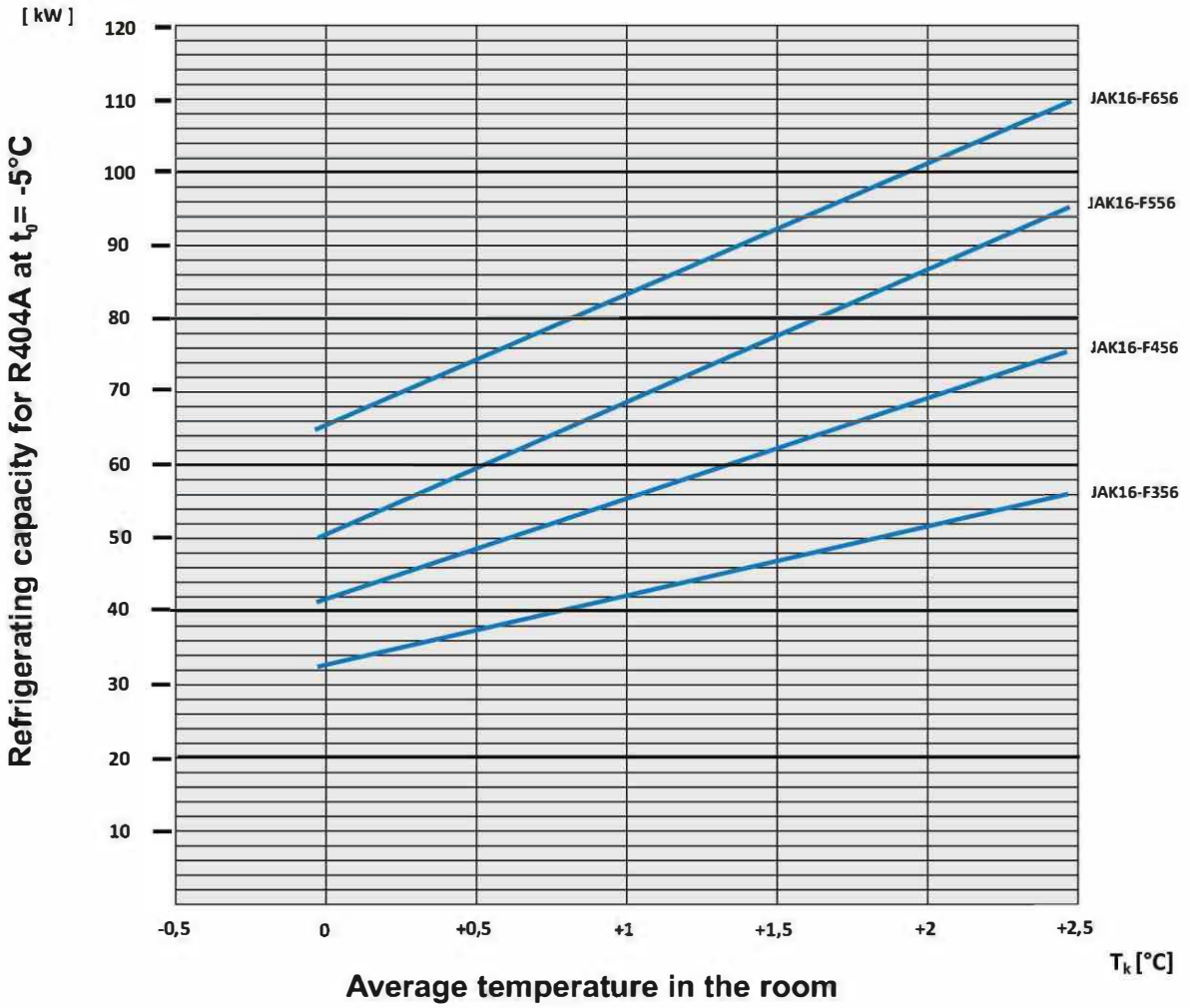
JAK16 series with ø500 fan – Freon version

Specification			Unit	JAK16-F450	JAK16-F550	JAK16-F650	JAK16-F750
Heat parameters for R404A Freon, volatilization at t_0 = 5°C	dt_1=9K	Capacity	[W]	**52 330**	**65 380**	**81 110**	**93 530**
		dt_m	[K]	6,71	6,90	6,84	6,79
		separator pressure drop	[kPa]	351	351	426	416
	dt_1=8K	Capacity	[W]	**44 520**	**54 870**	**68 700**	**79 380**
		dt_m	[K]	6,17	6,32	6,26	6,22
		separator pressure drop	[kPa]	255	249	307	301
	dt_1=7K	Capacity	[W]	**36 030**	**43 360**	**55 350**	**64 020**
		dt_m	[K]	5,60	5,74	5,66	5,64
		separator pressure drop	[kPa]	168	157	201	198
	dt_1=6K	Capacity	[W]	**26 220**	**29 520**	**40 150**	**46 490**
		dt_m	[K]	5,04	5,17	5,07	5,06
		separator pressure drop	[kPa]	90	74	107	106
External surface			[m^2]	**220**	**275**	**330**	**386**
Internal surface			[dcm^3]	75	92	110	128
Fan - Ø500 - 840W/400V			[pcs]	4	5	6	7
Fan capacity			[m^3/h]	34 400	43 000	51 600	60 200
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



JAK16 series with ø560 fan – Freon version

Specification			Unit	JAK16-F356	JAK16-F456	JAK16-F556	JAK16-F656
Heat parameters for R404A Freon, volatilization at t_o = 5°C	dt_1=9K	Capacity	[W]	**52 800**	**73 710**	**93 450**	**107 780**
		dt_m	[K]	5,70	6,13	6,34	5,78
		separator pressure drop	[kPa]	504	437	396	525
	dt_1=8K	Capacity	[W]	**46 570**	**63 900**	**80 150**	**94 880**
		dt_m	[K]	5,30	5,67	5,85	5,36
		separator pressure drop	[kPa]	393	329	292	408
	dt_1=7K	Capacity	[W]	**39 780**	**53 260**	**65 690**	**80 830**
		dt_m	[K]	4,88	5,18	5,34	4,92
		separator pressure drop	[kPa]	288	230	197	297
	dt_1=6K	Capacity	[W]	**32 200**	**41 300**	**49 280**	**66 300**
		dt_m	[K]	4,44	4,69	4,83	4,46
		separator pressure drop	[kPa]	190	139	112	195
External surface			[m^2]	**262**	**349**	**436**	**523**
Internal surface			[dcm^3]	78	103	126	151
Fan - Ø560 - 1200W/400V			[pcs]	3	4	5	6
Fan capacity			[m^3/h]	32 700	43 600	54 500	65 400
Defrost heaters power - voltage 400V			[kW]	16,5	22,5	28,5	34,5
Connections inlet - outlet			[mm]	16-42	22-54	22-54	22-64



JAK16 – glycol version

Application:
The JAK… 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 optimized height of the cooler selected to fit the fans allows for making the most effective use of the space in the cold room. The series includes 20 sizes with capacities between 10.4kW and 91.29kW at dt_1=8K, extended by subsequent modules and equipped with ø400, ø450, ø500, or ø560 fans.

Product description:

JAK16 - G340L - E

- E – electric heaters: E
- L – casing type: L – lacquer-coated, K – stainless steel
- 40 – fan size in cm: 40, 45, 50, 56
- 3 – number of fans: 2, 3, 4, 5, 6, 7
- G – type of cooling agent: F – freon, G - glycol
- JAK16 – name of the series

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 36 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

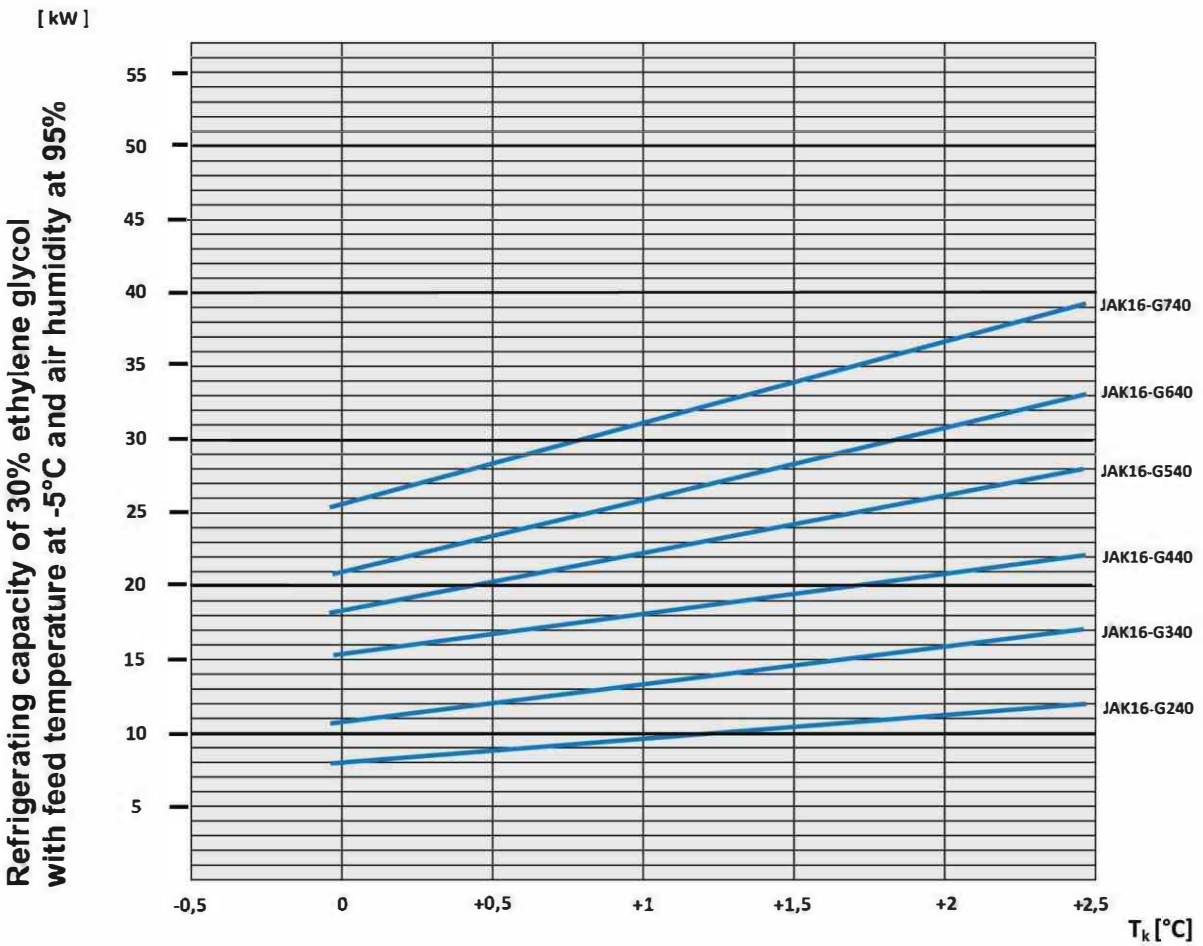
Glycol type	Glycol concentration								
	5%	10%	15%	20%	25%	30%	35%	40%	45%
ethylene	1,12	1,1	1,08	1,06	1,03	1	0,96	0,91	0,85
propylene	1,11	1,08	1,04	0,99	0,92	0,83	0,72	0,60	0,48

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

JAK16 series with ø400 fan – glycol version

Specification		Unit	JAK16-G240	JAK16-G340	JAK16-G440	JAK16-G540	JAK16-G640	JAK16-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]	6 900	10 350	13 800	17 250	20 700	24 150
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

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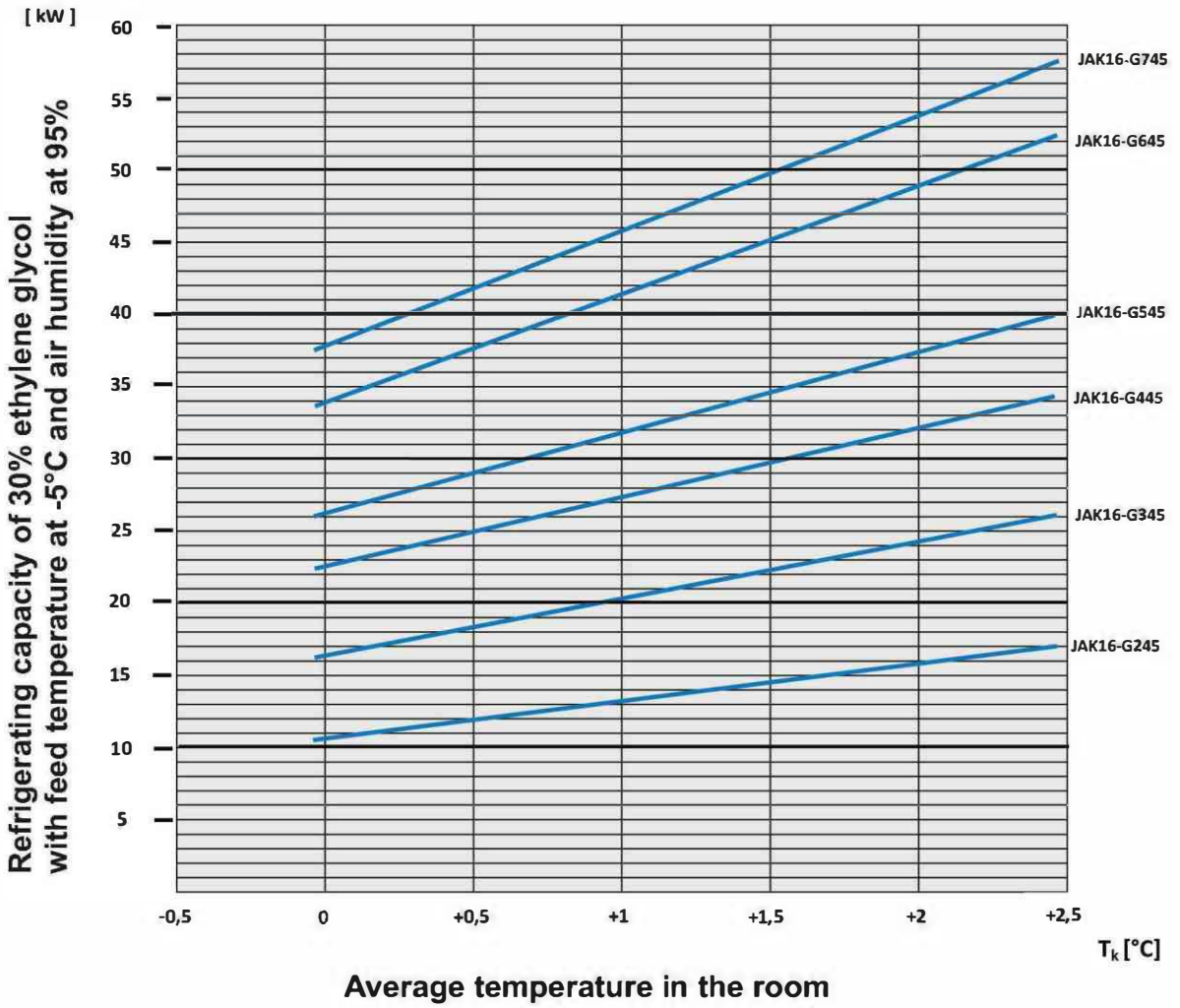
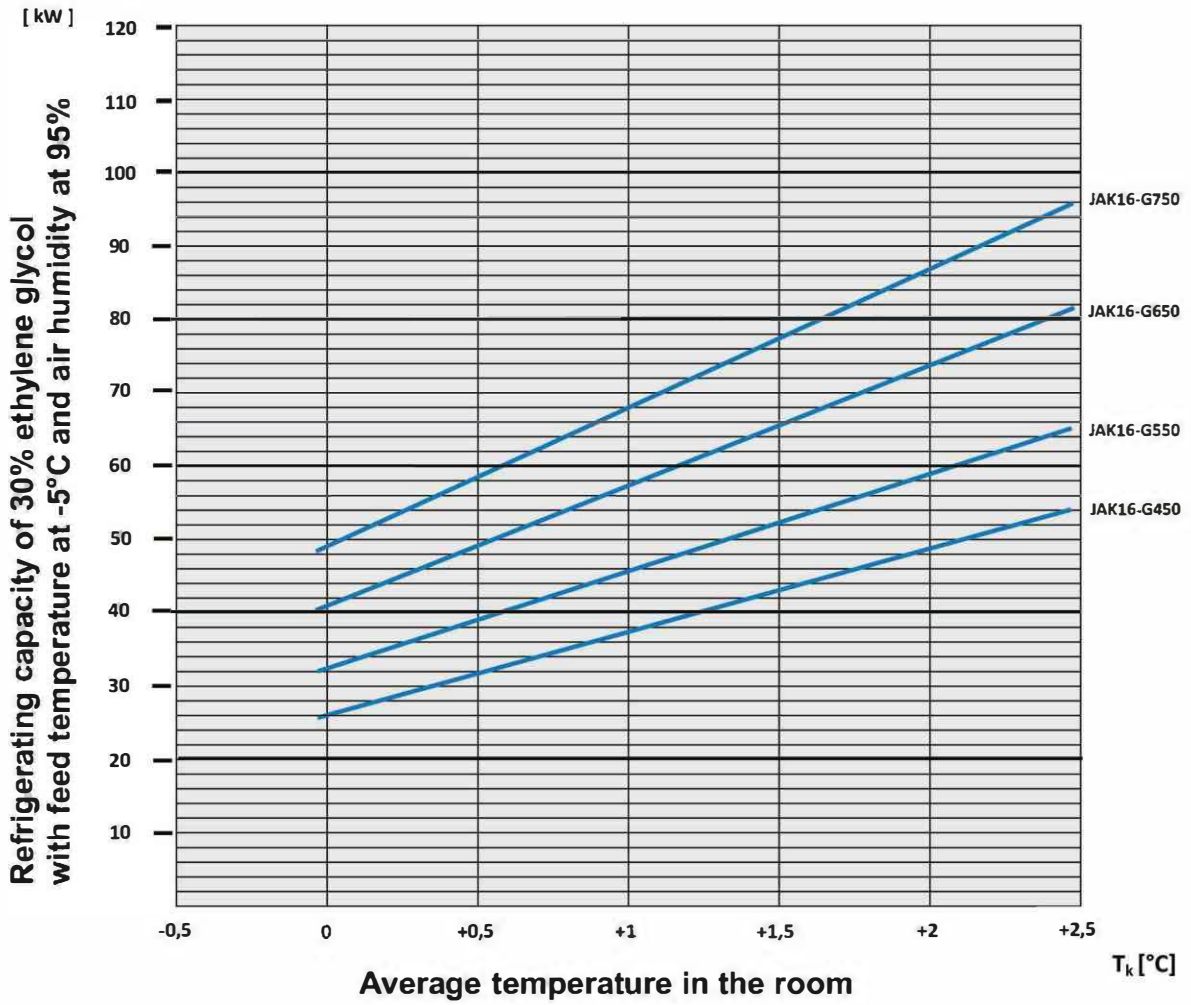
JAK16 series with ø450 fan – glycol version

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]	**74**	**111**	**148**	**186**	**223**	**260**
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]	11000	16 500	22 000	27 500	33 000	38 500
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"



JAK16 series with ø500 fan – glycol version

Specification		Unit	JAK16-G450	JAK16-G550	JAK16-G650	JAK16-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]	**220**	**275**	**330**	**386**
Internal capacity		[dcm^3]	79	98	115	133
Fan - Ø500 - 840W/400V		[pcs]	4	5	6	7
Fan capacity		[m^3/h]	34 400	43 000	51 600	60 200
Defrost heaters power - voltage 400V		[kW]	16,8	21,6	25,2	30
Connections		[inch]	2"	2½"	2½"	2½"



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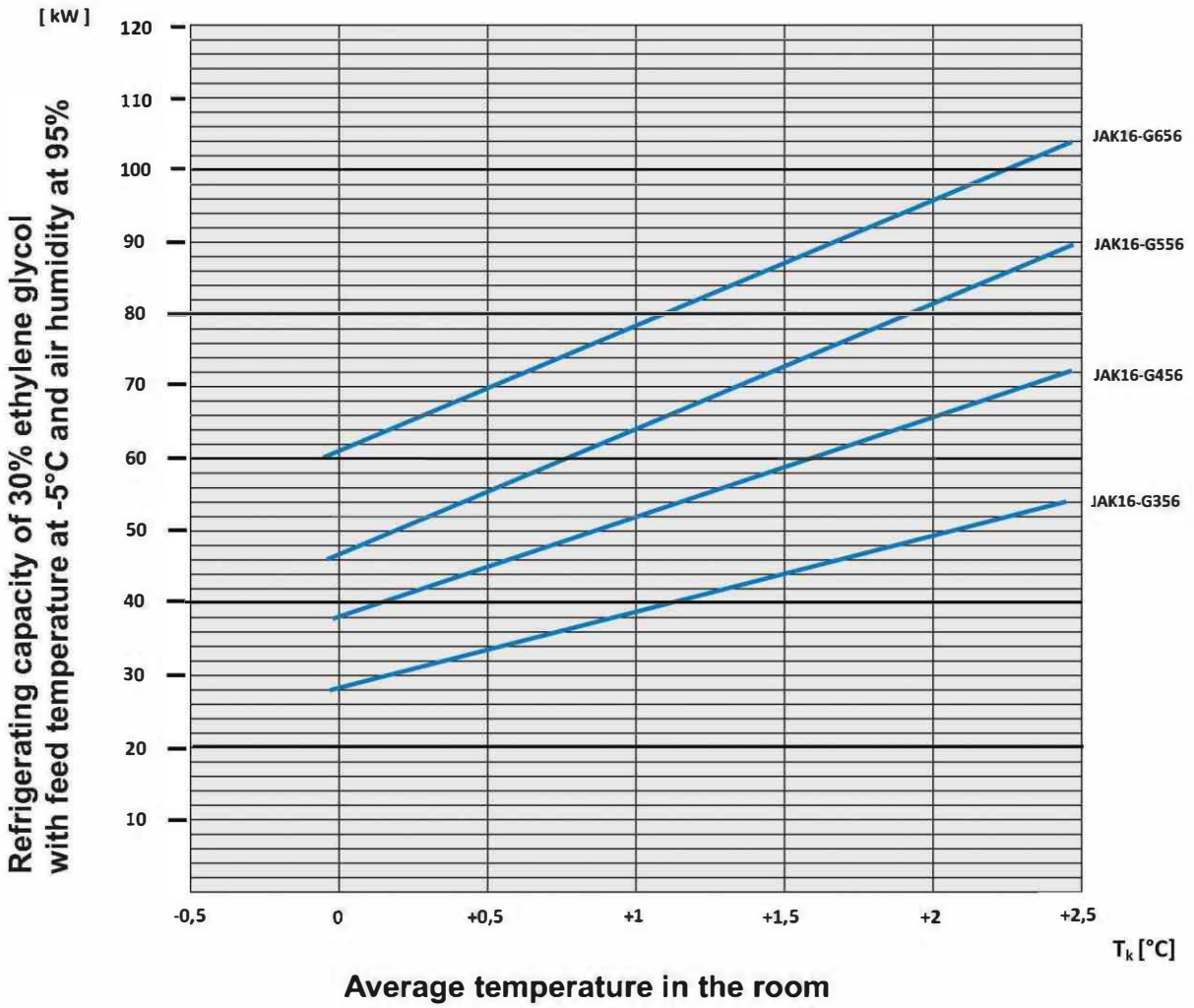
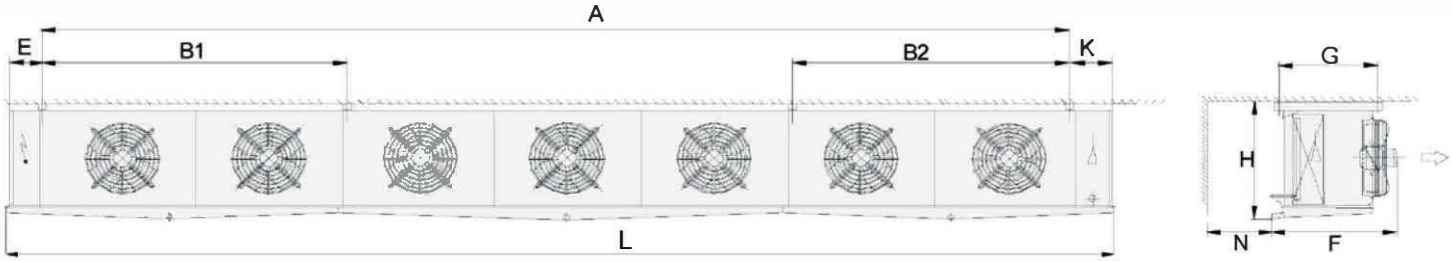
JAK16 series with ø560 fan – glycol version

Specification		Unit	JAK16-G356	JAK16-G456	JAK16-G556	JAK16-G656
Capacity for 30% ethylene glycol with feed temperature at -5°C and air humidity at 95%	dt_1=8K	[W]	**44 620**	**60 680**	**78 050**	**91 290**
	dt_1=7K	[W]	**38 810**	**52 790**	**67 890**	**79 420**
	dt_1=6K	[W]	**33 040**	**44 940**	**57 800**	**67 620**
	dt_1=5K	[W]	**27 320**	**37 170**	**48 430**	**55 910**
Glycol flow at 75kPa pressure drop		[m^3/h]	**12,2**	**16,6**	**21,7**	**25,1**
External surface		[m^2]	**262**	**349**	**436**	**523**
Internal capacity		[dcm^3]	83	110	133	160
Fan - Ø560 - 1200W/400V		[pcs]	3	4	5	6
Fan capacity		[m^3/h]	32 700	43 600	54 500	65 400
Defrost heaters power - voltage 400V		[kW]	16,5	22,5	28,5	34,5
Connections		[inch]	2"	2½"	2½"	3"



Dimensions:



	Basic dimensions [mm]										Connections Inlet/Outlet [mm] [inch]	Weight [kg]	Drip outlet
	L	B1	B2	A	E	K	G	H	F	N			
JAK16-F240	1760	-	-	1410	145	185	650	590	750	400	12/22	100	1"
JAK16-G240											1"		
JAK16-F340	2480	-	-	2130							12/28	145	
JAK16-G340											1"		
JAK16-F440	3200	1440	1410	2850							12/28	190	
JAK16-G440											1½"		
JAK16-F540	3920	2160	1410	3570							16/35	235	
JAK16-G540											1½"		
JAK16-F640	4640	2160	2130	4290							16/35	280	
JAK16-G640											1½"		
JAK16-F740	5360	1440	1410	5010							16/42	325	
JAK16-G740											2"		
JAK16-F245	2120	-	-	1770	145	185	690	690	750	450	16/28	145	1"
JAK16-G245											1"		
JAK16-F345	3020	-	-	2670							16/35	205	
JAK16-G345											1½"		
JAK16-F445	3920	1800	1770	3570							16/35	265	
JAK16-G445											2"		
JAK16-F545	4820	2700	1770	4470							22/42	325	
JAK16-G545											2"		
JAK16-F645	5720	2700	2670	5370							22/42	380	
JAK16-G645											2½"		
JAK16-F745	6620	1800	1770	6270							22/54	435	
JAK16-G745											2½"		
JAK16-F450	4360	2000	-	3970	150	190	720	890	800	500	22/42	355	1"
JAK16-G450											2"		
JAK16-F550	5360	3000	-	4970							22/54	435	
JAK16-G550											2½"		
JAK16-F650	6360	3000	-	5970							28/54	510	
JAK16-G650											2½"		
JAK16-F750	7360	2000	3000	6970							28/64	590	
JAK16-G750											2½"		
JAK16-F356	3670	2200	1070	3270	150	200	740	1100	850	600	16/42	426	1"
JAK16-G356											2"		
JAK16-F456	4770	2200	2170	4370							22/54	522	
JAK16-G456											2½"		
JAK16-F556	5870	2200	2170	5470							28/54	612	
JAK16-G556											2½"		
JAK16-F656	6970	2200	2170	6570							28/64	708	
JAK16-G656											3"		

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We reserve the right to implement changes.