since 1963
50 YEARS
Grain Cooling
GRANIFRIGOR™
FRIGOR TEC
Cooling to the point

Genuine for over 50 years!

FRIGOR TEC
Cooling to the point



GRANIFRIGOR™ –
ecological grain conservation

www.frigortec.com

FRIGOR TEC

Cooling to the point







GRANIFRIGOR™	KK 20 Europe	KK 60 Tropic	KK 80 Europ
Cooling performance in 24 hours [1) 2)] [t/day]	**16 – 30**	**55 – 100**	**65 – 120**
Chilled air fan			
Volume flow [m^3 / h] [3)]	1.300	4.600	4.600
Pressure [Pa] maximum [5)]	3.200	3.400	3.400
Refrigerating capacity compressor [kW] [6) 7)]	5	25	20
Electrical data [9)]			
Output (average) [kW]	2,6	9	9
Max. current consumption [A]	12	23	32
Electrical connection [4)] [A]	16	32	32
Connections			
Ø Connection cold air hose [mm]	200	300	300
Condensation water runoff average [l / h]	3	15	12
Ø Condensation water runoff hose [inch]	$^3/_4$	$^3/_4$	$^3/_4$
Dimensions [L x W x H in mm] / **weight** [kg]			
with tyres	1.750 x 850 x 1.500 / 370	3.570 x 1.320 x 1.880 / 700	3.570 x 1.320 x 1.880
with swivelling casters	1.750 x 850 x 1.500 / 360	2.230 x 990 x 1.695 / 650	2.230 x 990 x 1.695

All specifications are valid for 400 V-3 Ph-50 Hz

1) Cooling of air to 10 °C
2) At an average outside temperature (day's median) of 20 °C, an average relative air humidity (outside air) of 52 %, and an average grain moisture of 16 % up to maximum capacity under favourable conditions and at 1000 Pa counter pressure.
3) At 1000 Pa counterpressure
4) acc. CEE
5) Higher pressures are possible upon request
6) Europe versions at 0 °C evaporation temperature and 30 °C condensation temperature
7) Tropic versions at 10 °C evaporation temperature and 40 °C condensation temperature
8) HP version (high pressure)
9) HYGROMAT™ is included as a standard feature

Subject to technical change.

GRANIVENT™ 200 SL and 280 SL:

The GRANIVENT is ideal for aerating promptly after bringing in the harvest.
The subsequent cooling with a GRANIFRIGOR™ ensures that insects and fungi do not damage the grain.

- Humidistat and thermostat for safe and reliable aerating
- Robust and sound-proofed with broad-faced filters and filter monitoring
- BMEP models – Ideal for tower silos
- Swivelling casters and forklift slots for safe transport



Telescopic and static ventilation pipes for grain and rape seed.












	KK 150 Europe	KK 180 Europe	KK 220 Tropic	KK 240 Europe	
	140 – 220	170 – 280	220 – 370	220 – 390	
	7.700	10.800	12.500	12.500	
	4.700	6.000 / 8.000 [8)]	6.000 / 8.000 [8)]	6.000 / 8.000 [8)]	
	38	46	105	63	
	17	20	35	28	
	57	63	108	92	
	63	63	125	100	
	300	400	400	400	
	20	30	40	35	
	3/4	3/4	3/4	3/4	
/ 700	3.620 x 1.330 x 2.265 / 950	3.800 x 1.650 x 2.280 / 1.150	3.300 x 1.550 x 2.450 / 1.650	3.300 x 1.550 x 2.450 / 1.650	3.
/ 650	2.520 x 1.130 x 2.085 / 860	2.680 x 1.320 x 2.150 / 1.060	2.950 x 1.550 x 2.250 / 1.500	2.950 x 1.550 x 2.250 / 1.500	3.

Technical characteristics GRANIFRIGOR™:

- Frequency controlled energy efficient version
- Fans and compressors in sound-optimized versions
- HYGROTHERM™-switch, HYGROMAT™-control capable for all climatic conditions (rain, fog, heat and cold) by modification of the air moisture content
- Effective large air-filters, easily to clean
- Filter monitoring
- Solid model for industrial application
- Total unit casing
- Silo counter-pressure indication
- Standard pressure sufficient for tower silos
- Cool stop
- Quality control during the test-run in our factory
- Fully automatic DDC/ MP control for different operation modes (quiet / quick cool-down / ventilation / normal) with timer
- Energy saving winter and summer thermostat
- Fully automatic use of cool climatic conditions by electric heating
- Air-cooler with sight glass
- Corrosion protected heat transformer by coating
- Speed-controlled condensed water fans for trouble-free start-up in cool outside temperatures
- Stainless steel condensate collector
- Ecological safety refrigerant without FCKWs and without H-FCKWs capable for high environmental temperatures
- Chassis with tyres, optional with castors
- Easy transport by forklift by forklift slots
- Indicator light
- Cable holder
- Protection grid agains animals
- Remote diagnosis
- Phase and undervoltage monitoring









KK 310 Tropic	KK 320 Europe	KK 440 Europe	KK 440 Tropic
310 – 520	300 – 500	430 – 700	440 – 730
18.000	18.000	25.000	25.000
6.000 / 8.000 [8)]	6.000 / 8.000 [8)]	6.000	6.000
160	82	133	217
53	34	65	78
125	112	210	197
125	125	250	250
600 (400)	600	600 (800)	600 (800)
65	45	65	100
3/4	3/4	3/4	3/4
710 x 1.810 x 2.550 / 2.000	3.710 x 1.810 x 2.550 / 2.000	3.950 x 2.130 x 2.900 / 3.000	3.950 x 2.130 x 2.900 / 3.000
370 x 1.810 x 2.410 / 1.900	3.370 x 1.810 x 2.410 / 1.900	3.740 x 2.130 x 2.690 / 2.750	3.740 x 2.130 x 2.690 / 2.750

FrigorTec GmbH is certified according to DIN EN ISO 9001 : 2008.
FrigorTec GmbH is member of:

- Society for the Support of the German Milling School Braunschweig e.V., Bonn / Germany
- Rationalisation Curatorship for Agriculture, Rendsburg / Germany
- School providing vocational education in Agribusiness Burg Warberg e.V., Warberg / Germany
- Corn exchange, Luzern / Swiss
- ALB, Stuttgart / Germany
- AGF, Detmold / Germany

TÜV acceptance testing in our factory.
An additional test at the installation site is usually not necessary for the GRANIFRIGOR™.



Prevent the spoiling of your harvest – the ecological and effective way!

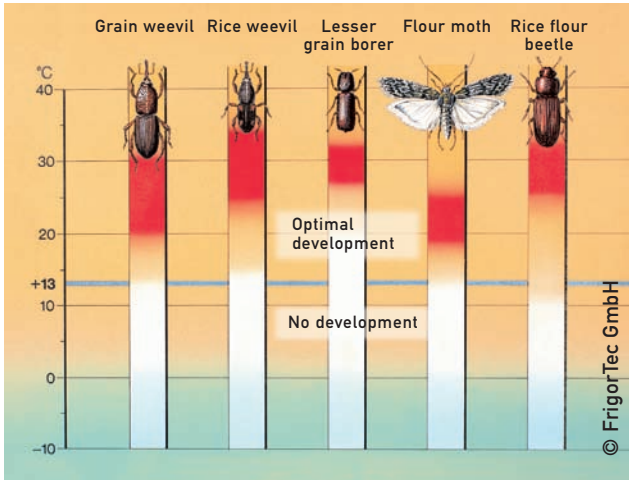
Spontaneous heating of the grain often causes great damage. Systematic hygiene regulations and the call for natural treatment of the produce grain without chemical substances are standards that must be attained. We have an answer for all these demands: GRANIFRIGOR™.

The GRANIFRIGOR™ cooling device is used to cool down grain immediately after the harvest, independent of the weather. This effective method prevents the spoiling of freshly harvested grains, which heats up spontaneously due to its cellular respiration.
Carbon dioxide, water and heat are released by this respiration – with extensive consequences: Loss of dry substance as well as the development of insects, microbes and mildew. Spontaneous heating depends on the grain's moisture and temperature. The principle is also valid for oil seeds such as rapeseed.

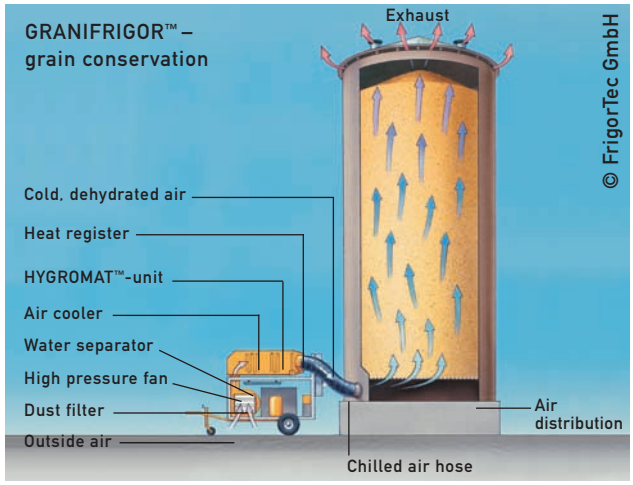
Since we know how grain "functions", the GRANIFRIGOR™ operates according to two successful principles:

1. Prompt cooling to below +13 °C once the grain has been stored in: This puts insects into diapause so that they have no chance to multiply (see illustration below). Additionally the development of mildew is effectively prevented, respiration losses are minimised, and drying expenditures are also reduced by the drying effect of the cooling.
2. No ventilation with non-conditioned outside air: Grain seeds are hygroscopic. This means that depending on the temperature an equilibrium develops between the moisture content of the seeds and the relative humidity of the ambient air. Moisture develops if dry grain is exposed to humid air. The grain begins to spoil. Therefore aeration by fans is completely dependent on the weather. Furthermore, the ambient temperature during harvest time is usually much too high.

Mode of operation:
The fan of a GRANIFRIGOR™ grain cooler draws in the surrounding air (see illustration below). This air is cooled by an air conditioner (evaporator) to the desired temperature. The following HYGROMAT™ unit warms the cold air again automatically. This lowers the relative humidity and adapts to the conditions of the bulk grain. No moisturizing can occur, which would be rather damaging. This cooled and dried air is fed through the air distribution of the warehouse or the silo system and is forced through the grain. The air is then released to the outside through the exhaust vents of the storage facility. The outgoing air extracts the absorbed heat and moisture.



Insects that are dangerous to grain can develop at a temperature starting at 13 °C. GRANIFRIGOR™ cools the grain to below 13 °C and thereby ensures optimal freshness and quality of the harvest.



The GRANIFRIGOR™ process was developed by FrigorTec GmbH (formerly product devision of Axima and Sulzer Escher Wyss) in co-operation with the Düsseldorf University and the Bundesforschungsanstalt für Getreide (Federal Grain Research Institute) in Detmold and since 1963 manufactured.

We pass on only what we have produced by our own hands – Made in Germany.



In the parent plant in Amtzell, Germany all products made by FrigorTec GmbH are developed, constructed and produced. Every device passes a quality inspection with test runs before delivery. We sell the FrigorTec solutions in over 80 countries through our worldwide distribution network.

SERVICE



Our service keeps the units maintained and ensures the spare parts supply - worldwide.
service@frigortec.de

- Grain cooling GRANIFRIGOR™
- Crane air conditioning CRANEFRIGOR™
- Standard cooling STANDARDFRIGOR
- Special solutions SHELTERFRIGOR
- Insect heat treatment DEBUGGER
- Hay dryer AGRIFRIGOR™

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Cooling to the point

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