



The DANFOSS OEM NEWS

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Electronic temperature controllers - new generation coming

Focusing on the customers' needs & applications, Danfoss has established a new generation of EKC and ETC electronic temperature controllers with smarter functions dedicated to small refrigeration applications.

New EKC 102 & 202 range



Substituting and extending the existing EKC101/201&301 products, this new range is dedicated to small refrigeration applications (ice cream cabinets, wine cellars, bottle coolers, commercial refrigerators, bakery refrigeration equipment, remote display cabinets etc.). It is characterized by the following key advantages:

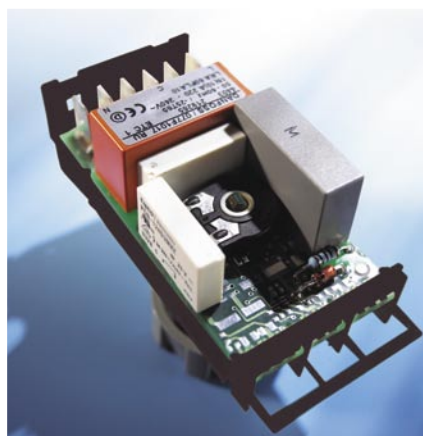
- **Reliable:** Improved IP rating (IP65 for the panel) & integrated gaskets in the front cover make the new generation of EKC safe to place in areas where vapours, humidity, water drops, etc. are present.
- **Quick and easy installation:**
 - Integrated display;
 - Integrated mounting clamps;
 - 230 V power supply;
 - High rated relays for direct connection of high loads;
 - Wide range from 1 relay

(EKC 102) to 4 relays (EKC 202);
- and quick coupling connectors.

- **Flexibility** via "add-on" functions (communication, RTC, etc) for EKC 202.
- **Fast and easy programming** tools during installation through copy key.

This new range will be available third quarter 2005.

ETC1H



Due to its **optional features** the ETC1H is suitable for an extended range of applications, and can **reduce the amount of**

components used in system design. Standard types of the ETC1H are well suited for many applications, **and special customer requirements are possible with changes only in the software.**

- **Flexibility and reliability:** Micro controller operated.
- **Highly accurate** control of temperature due to direct cabinet temperature measurement.
- **Handles up to 16A (FLA)** on the main relay for the compressor and has two additional relays for heater, fan or light (optional).
- **Several defrosting methods** to ensure correct handling of the application.
- **Ensures minimum energy consumption** for the application.
- **Fault detection** on both the application and internally on the control.
- **Ready to install** - all programming done according to customer needs.
- **Protects the application** from over or under voltage situations ("brown-out" and "black-out" protection).
- **Optional remote control / display.**

This new ETC1H range is available now.

Unilever Solar assisted Ice Cream Cabinet with Danfoss direct operated propane compressor

In 2000, Unilever issued a policy to introduce environmentally friendly “Green” Systems where commercially viable and legally allowed. Within this policy, ice cream cabinets using hydrocarbon, R290, were tested during the Olympic Games 2000 in Sydney, Australia.

An extension of the project has been to investigate whether solar panels could be used to reduce energy consumption. This project was run jointly with Danfoss, who developed a twin compressor using R290 refrigerant, that is able to run on a DC power supply with a low power requirement on start up and running. Therefore the compressors can work with solar panels and battery.

These compressors were fitted in an Ice Cream Cabinet where part of the energy supply comes from an 80 W solar panel, and the remaining part is coming from a 130 Ah solar deep cycle maintenance free battery. The surplus of energy from the solar panel is charged into the battery. At night the cabinets are moved to a place with mains supply to charge the battery. A detailed energy supply diagram can be seen on Fig. 2.

During the Athens Olympic Games, four of these ice cream cabinets were tested and showed optimistic results:

- **Energy efficient:** Compressor (incl. electronic equipment) able to run on DC power, specifically designed to work with solar panel:
 - Low starting current
 - Low energy consumption
- **Environmental friendly product:**
 - Systems with HFC-free refrigerant, R290 work efficiently.
 - 35 % / 24 h of the total energy was solar contribution. By using better isolation and more solar area it will be possible to produce more energy out of the sun.
- **Work in high ambient temperature:** the compressor is able to maintain the tem-

perature inside the cabinet even at +50 °C ambient temperature.

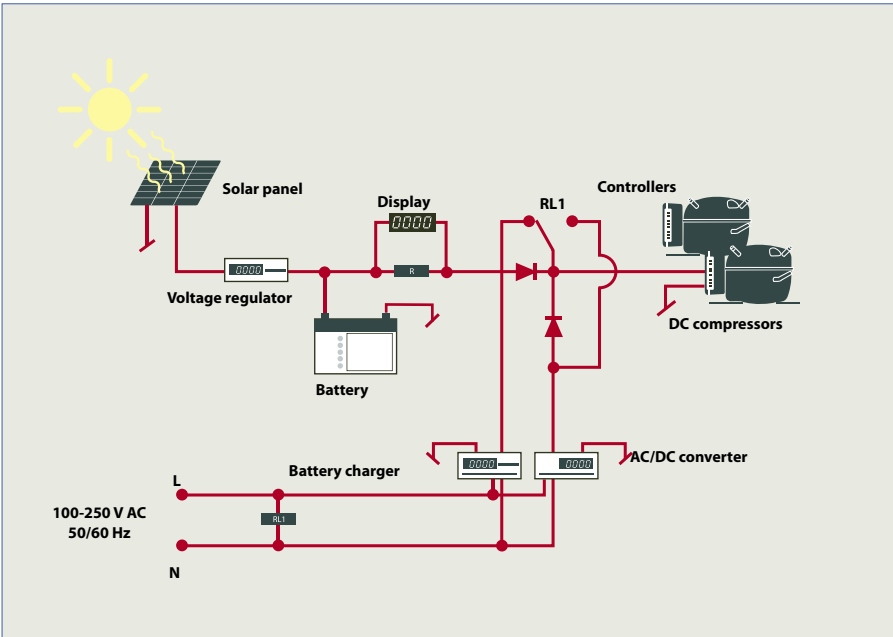


Fig. 1 - Energy supply diagram

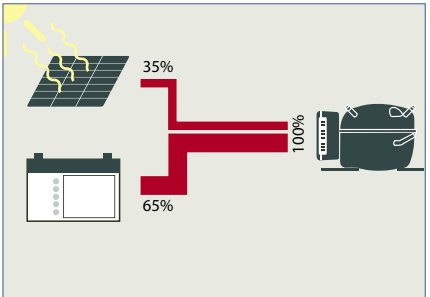


Fig. 3 - Solar contribution per 24 hours

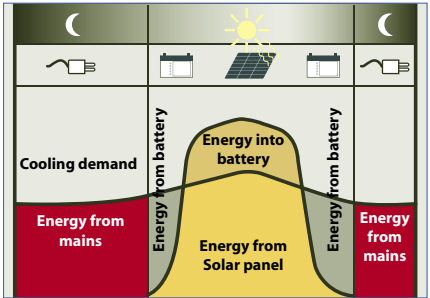


Fig. 2 - Energy Flow

New NL-MF compressor range

The new NL-MF compact compressor model range demonstrates an example of the innovative compressor technology of today.

With its compact design, it is perfect for drink coolers and small commercial refrigeration systems. This compressor offers significant energy savings with a high cooling capacity and the highest COP of its range.

More cooling capacity with more energy saving

A capacity adapted to the predominant appli-

cations in the market enables considerable energy savings with small compressor dimensions and displacement respectively.

Versatile

Each model of this range is suitable for 220-230 V 50 / 60 Hz applications. This characteristic enables considerable stock leanness & flexibility.

Quiet

Another advantage of this range is the low noise level. It has been reduced even further by using the technologies based on the strict household noise requirements.

Rated capacities and consumption according to EN 12900

Compressor	Code number	Voltage and frequencies	Cooling capacity				Power capacity				Current consumption				COP			
			[W]				[W]				[A]				[W/W]			
			Evaporating temperature [°C]															
			-10	0	7.2	10	-10	0	7.2	10	-10	0	7.2	10	-10	0	7.2	10
NL6.1MF	105G6660	187-254 V/50 Hz	246	416	552	611	183	224	254	265	1.36	1.50	1.62	1.66	1.34	1.86	2.17	2.31
		198-254 V/60 Hz	302	491	645	-	220	281	331	-	1.35	1.63	1.87	-	1.37	1.75	1.95	-
NL7.3MF	105G6772	187-254 V/50 Hz	304	494	650	717	226	277	314	329	1.60	1.80	1.92	1.99	1.35	1.78	2.07	2.18
		198-254 V/60 Hz	370	585	769	-	277	356	420	-	1.60	1.95	2.22	-	1.34	1.64	1.83	-
NL8.4MF	105G6879	187-254 V/50 Hz	353	570	735	813	257	322	367	383	1.83	2.08	2.26	2.29	1.37	1.77	2.00	2.12
		198-254 V/60 Hz	433	672	883	-	315	410	484	-	1.82	2.23	2.55	-	1.37	1.64	1.82	-
NL10MF	105G6885	187-254 V/50 Hz	439	692	926	1028	323	396	452	475	2.21	2.45	2.66	2.75	1.36	1.75	2.05	2.16
		198-254 V/60 Hz	523	813	1068	-	377	490	581	-	2.17	2.65	3.07	-	1.39	1.66	1.84	-

Test conditions
 Refrigerant R134a
 Condensing temperature 55°C
 Ambient and suction temperature 32°C
 Liquid temperature 55°C
 220V 50Hz resp. 60 Hz fan cooling 1.5 m/s
 (compressor compartment temperature equal to ambient temperature)

Application range -20°C to +7.2°C for 50 Hz
 -25°C to +7.2°C for 60 Hz

Approvals according to EN 60335-2-34, UL984, CSA-C22, CCC (on inquiry)

The NL-MF range is also available with smaller ground plate and 90° connectors.
 For more information ask for the brochure DEHC.PB.400.A.02

The new generation of GBC ball valves

A strong and reliable shut-off valve solution.

Danfoss is now producing a new generation of GBC ball valves. The new ball valve is recognizable by its **laser welded slim-line valve body design**.

- **Designed for high pressures:** Both the design, welding and choice of sealing material enables the new ball valve to meet the most demanding requirements i.e. for high maximum working pressure when operating with R410A (MWP = 45 bar).

The GBC can also work with all fluorinated refrigerants: CFC, HCFC, HFC

- **Easy operation:** Besides the high precision laser welded joints and the slim-line design the new GBC ball valves have standard hex socket fit for easy operation.
- **Safety:** GBC ball valves are fitted with a one-piece wire seal cap solution for safety reasons (EN 378).

All GBC ball valves are 100% helium leak tested ensuring security for the user. Approvals: UL, CSA and CE. The new GBC valves will be available from April 2005 onwards.



Standard valves:

Type	GBC 6s	GBC 10s	GBC 12s	GBC 16s	GBC 18s	GBC 22s	GBC 28s	GBC 35s	GBC 42s	GBC 54s	GBC 67s	GBC 79s
Solder ODF connections in.	1/4	3/8	1/2	5/8	3/4	7/8	1' 1/8	1' 3/8	1' 5/8	2' 1/8	2' 5/8	3' 1/8
Solder ODF connections mm.	6	10	12	16	18	22	28	35	42	54	67	79
Kv Value* / m ³ /h	1,96	5,68	10,58	14,11	20,42	28,17	51,95	80,89	121,07	224,96	245,78	222,52

*) CFD calculated values (Computational Fluid Dynamics)
 The range also is available with access port (optional)



Global support all over the world

Our efforts to meet our global customer's needs were rewarded last May by receiving from one of the world-wide leaders in Global Food Service Equipment the award of "Gold Top Supplier 2004"

On top of providing our customers with the broadest range of refrigeration compressors and controls at a high quality level, Danfoss can be your global solution provider with:

- **Overall total cost reduction:** thanks to a "better regulation" concept mixing energy optimized compressors and systems in general.

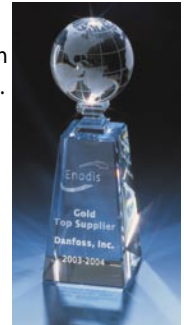
- **World wide R&D support** by testing your applications in our factories especially in difficult, complex, or challenging applications.

- **A constant technical support both locally and globally** in the world. **A dedicated global delivery system.**

- **World class manufacturing:** Danfoss

has more than 53 high technology production sites all over the world.

- **A proactive coordination for efficiency** in managing global customer projects worldwide.



Solenoid valves: an even larger range

Danfoss offers a complete range of solenoid valves for use in refrigeration and air conditioning systems. The best materials are used in the production and constant testing through every step of the production process ensures the superior quality and durability.

To complete the well established EVR range, Danfoss launched the **low energy consumption EVU range** (3.2-16 kW) designed for refrigeration systems and units where high quality in combination with **small physical dimensions is essential.**

- **Easy to solder** with its bi-metal trumpet shaped connections.
- **Ideal for modern refrigerants like R 410A** and all types of fluorinated refrigerants with a high performance as regards working pressure and opening differential pressure.
- **Easy mounting and dismantling coil:** clip on coil system. A wide choice of coils for a.c. and d.c.

In the smaller sizes, Danfoss Saginomiya introduced to the market the small solenoid valves type NEV & TEV, which are used in a wide range of applications, for example air conditioners, dehumidifiers, vending machines and ice making machines.

- These **compact and light weight valves** fit perfectly in small dimension applications.
- **High quality** ensures reliable and efficient operation over many years and very low service costs.

The most popular models are the **90° angle type**, allowing installation in machines where space is at a premium, and saving in

the cost of pipe bends (special variants can also be supplied).



R407C - liquid line

	1/4	5/16	3/8	1/2	5/8	7/8	1 1/8	1 3/8	1 5/8	2 1/8
	6 mm	8 mm	10 mm	12 mm	16 mm	22 mm	28 mm	35 mm	42 mm	54 mm
EVR										
EVU					15 kW					
NEV (202-603)			10 kW							

472 kW

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