

Danfoss Cooling | EKE 400 Evaporator Controller

# Industrial refrigeration control Easier than ever before

The Danfoss EKE 400 Evaporator Controller is specifically designed for industrial and heavy commercial refrigeration systems, significantly reducing installation time and costs.

It helps achieve the optimal cooling mode and defrost sequence for efficient, safe, and trouble-free evaporator operation. The decentralized approach makes standardizing system design easier.

Reduce installation  
costs by up to

**50%**



# Making evaporator control intuitive, faster and flexible

The new EKE 400 is specifically designed to control industrial refrigeration evaporators – in small as well as large systems. Following the Distributed Control System (DCS) architecture, advanced control algorithms, and wizard for quick setup and commissioning, the EKE 400 significantly reduces control installation time and costs and provides operational safety and efficiency.

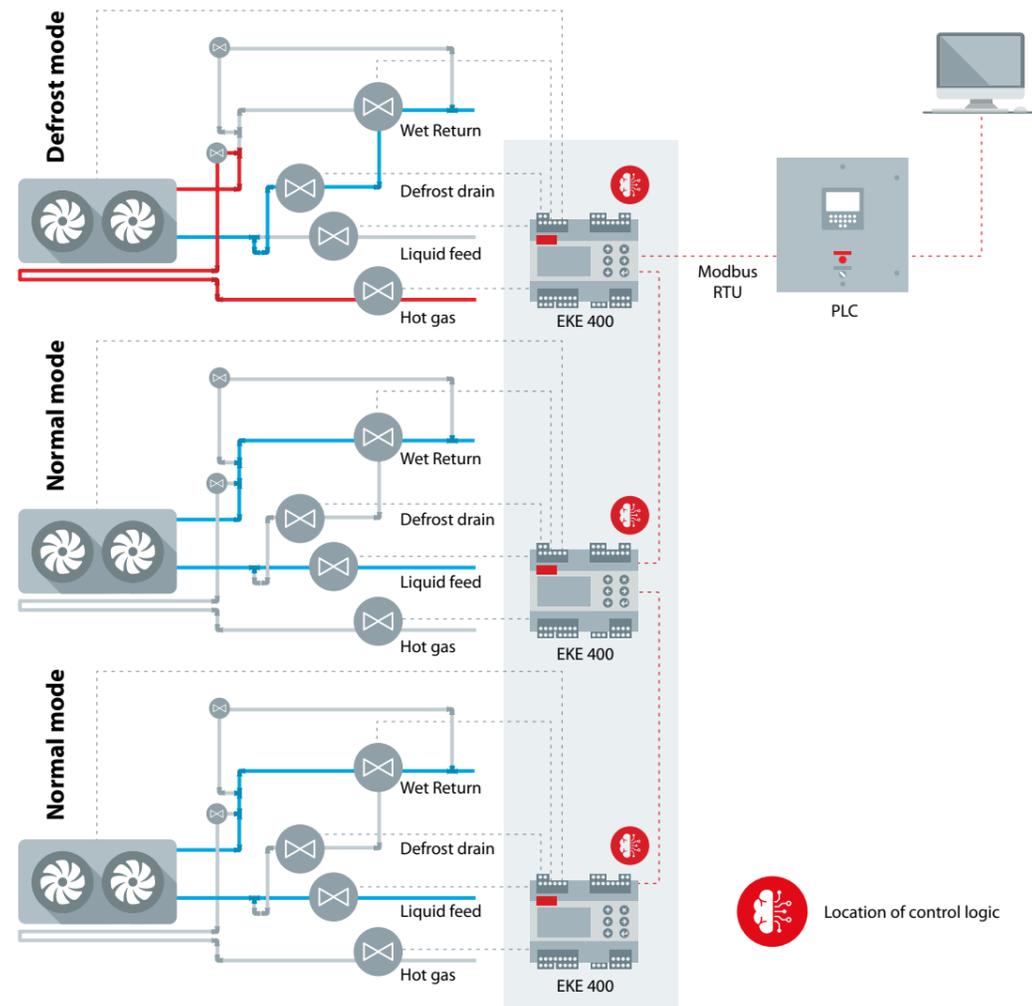
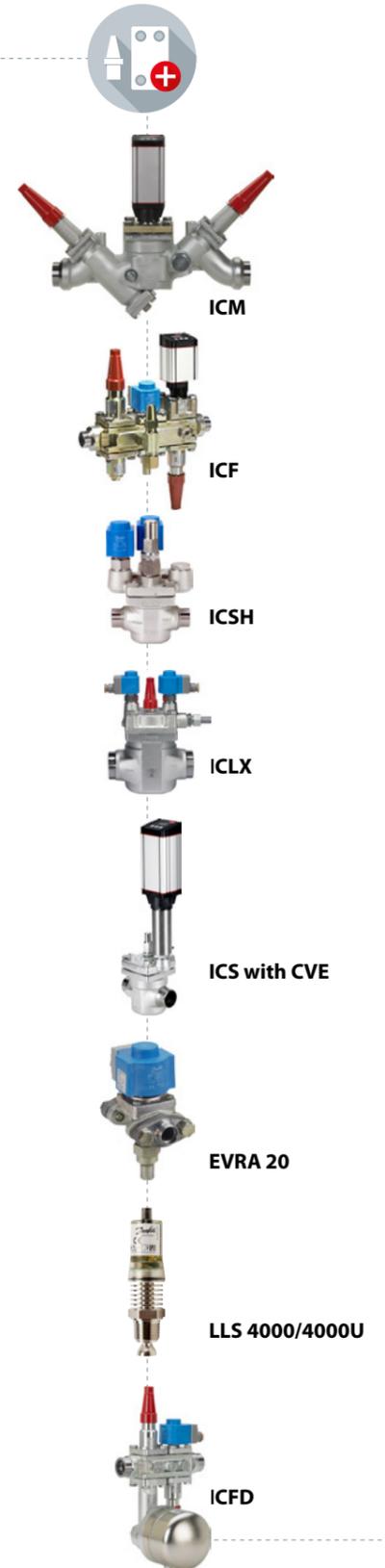
The EKE 400 Evaporator Controller manages the complete operation in cooling and defrost mode for optimal operation and defrost sequence (ammonia, CO<sub>2</sub>, and HFC/HCFC based systems). It is applicable for defrosting both flooded evaporators and DX evaporators and supports multiple defrost methods, including hot gas defrost (pressure control/ liquid drain), electrical defrost, and water/brine defrost.

An easy-to-use wizard enables quick setup of key parameters and efficient commissioning, and the predefined process sequence ensures reliable operation and defrost. The EKE 400 is specially designed to get the best performance from Danfoss valves. However, it also works with non-Danfoss valves. The EKE 400 includes MODBUS communication, which allows integration to a central PLC system. However, it can also be used without central PLC as standalone.



**The EKE400 is designed to get optimum performance from Danfoss valves and sensor which is part of the complete Danfoss solution for the evaporator subsystem.**

It supports various configurations across wet return, defrost drain, liquid feed, and hot gas drain lines.



# EKE 4



### The EKE 400 philosophy

## Improving job site efficiency

The distributed controls system reduces total installation costs by up to 50% by optimizing hardware, installation, and commissioning for the evaporator. EKE 400 variants cover a wide voltage range from 85–265V and frequency AC 50/60 Hz which reduces the number of variants you need to stock and bring to the job-site to cover various regional and country needs. The EKE 400 evaporator controller is prepared for easy DIN rail mounting and comes with screw plug-in connectors for ease of wiring. Copying configuration settings to other EKE 400 units saves setup and commissioning time.

Need to expand an installation with additional evaporators? No problem. Additional EKE 400 evaporator controllers are simply installed with each evaporator. The specific configuration of set-points is done using the wizard or copied from existing EKE 400 devices, of compressors and improved operational efficiency.



### Intuitive interface and setup wizard

## Simplicity – from setup to daily operation and service

The easy-to-use wizard enables quick setup of key parameters and correct valve selection for the specific applications. The wizard guides the user through the parameter settings and filters out irrelevant parameters based on actual selections and only shows parameters that are relevant based on previous selections. This approach ensures correct and reliable operation. The EKE 400 provides a multi-language menu and settings overview supports easy commissioning and hand-over documentation.

### Adapt to local conditions

- Multi-language menu - commissioning can be done in one language and handed-over to customer in another language (English, Spanish, Portuguese or Chinese languages; more to come)
- Commissioning can be done in metric units and handed over to customer in imperial units – or opposite.
- Metric (Celsius (°C) and Kelvin (°K)) or Imperial units (Fahrenheit (°F) and Rankine (°R))
- Real Time Clock / 24 hour or AM/PM

### Quick setup wizard

Filters out irrelevant parameters based on actual selections

Only shows parameters that are relevant based on previous selection

Adapt to local conditions with multi-language menu

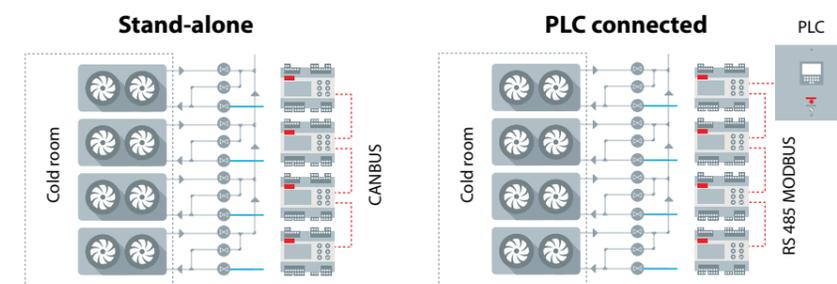
### How it works

## Distributed control with PLC or standalone – no problem

EKE 400 includes both MODBUS communication which allows integration to central third party equipment like PLC systems as well a CANBUS to manage internal communication between EKE 400 controllers.

With the MODBUS communication established to PLC, you can have read/write access to the most parameters in EKE 400, including set-points, alarm settings, valve opening degree, gas concentration etc.

EKE 400 controllers can also easily operate without a PLC. Multiple EKE 400 can be interconnected for signal sharing via integrated CANBUS. (defrost coordination, temperature sharing etc.)



### What's in it for me

## The superior benefits of the EKE 400 evaporator controller



### Improved job site efficiency

Up to 50% reduction of controls hardware, installation and commissioning costs for the evaporator due to distributed controls system.



### Intuitive interface and setup

Easy-to-use wizard enables quick setup of key parameters and correct valve selection for the specific applications.



### Design flexibility

Integrates with central PLC system as well as works without a PLC (standalone) if required.



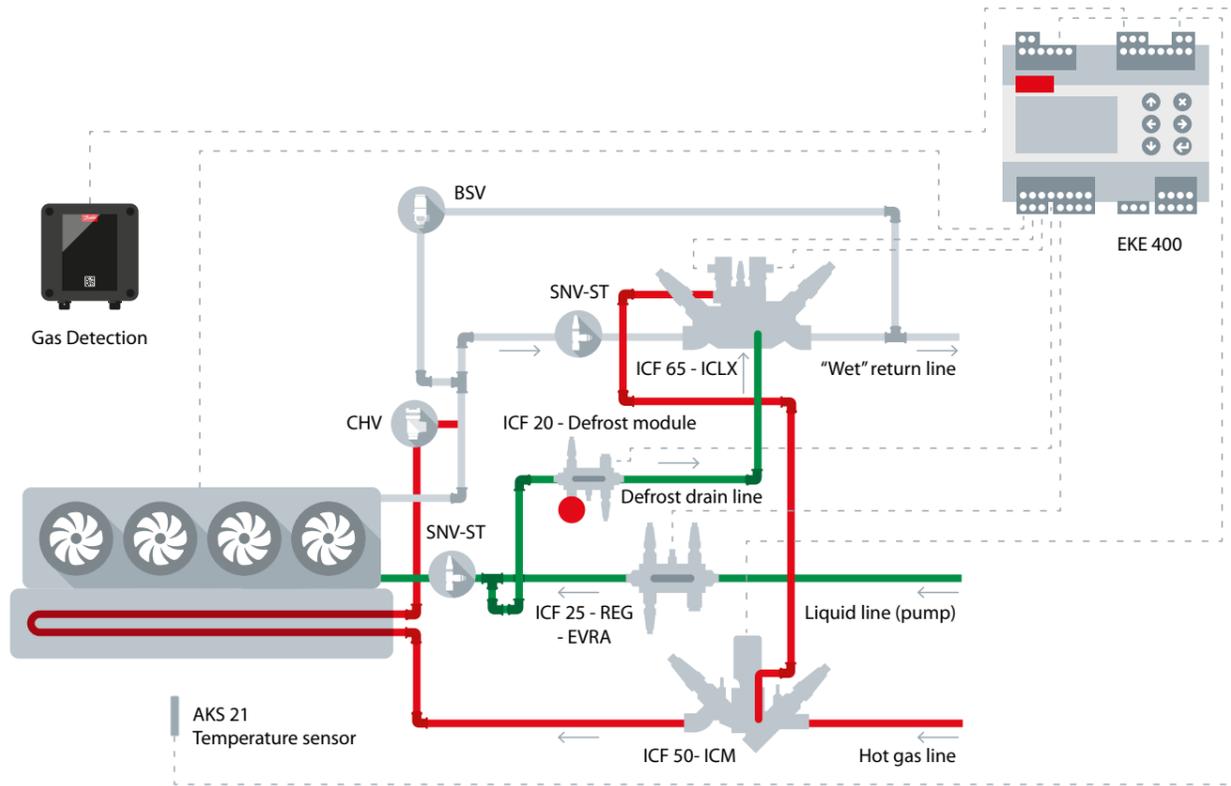
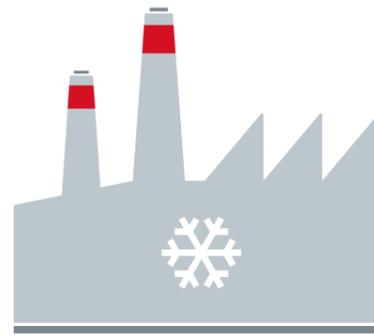
### Reliable operation

Standardized solution with predefined process sequences supports correct and reliable operation.

# Complete evaporator station

EKE 400 is an important and intelligent part of your complete evaporator solution.

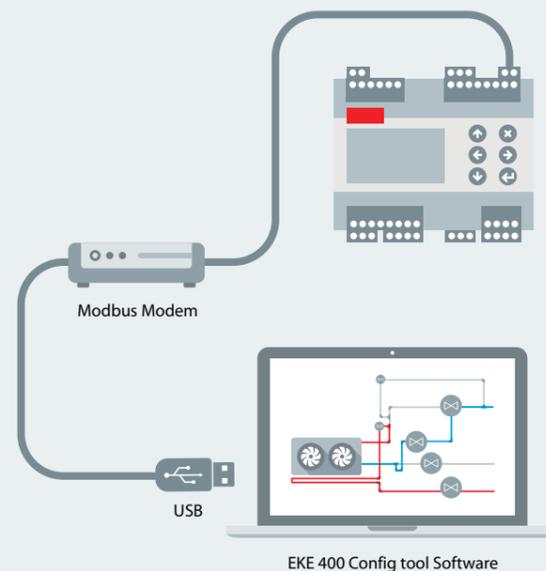
Consider EKE 400 as the very center of your evaporator solution. It will manage an optimal control of the complete evaporator including Danfoss industrial valves and sensors like gas detection, pressure and temperature sensors.



## CoolConfig ensures problem-free copying and storing of settings

The coolconfig tool allows the project engineer to generate the settings for the EKE 400s off-line and hand over the file to the commissioning engineer at the appropriate time for the installation on one or multiple EKE 400 controllers.

- Generate settings off-line on PC using CoolConfig tool
- Settings file can be copied to multiple EKE 400 units
- Copy of settings of EKE 400 units installed at job site can be stored on PC



# Data and ordering

|                                  |  |  |
|----------------------------------|--|--|
| Supply voltage                   | 24 V AC +/-15% 50/60 Hz, 17 VA<br>24 V DC (20-60 V), 17 VA<br>230 AC (85-265 V) 50/60 Hz, 20 VA  |  |
| 8 analog input                   | Pressure measuring:<br>Ratiometric pressure transmitter type AKS 32R<br>1-5 volt pressure transmitter type AKS 32<br>0-20 (4-20) mA pressure transmitter type AKS 33       |  |
|                                  | Temperature measurement<br>Pt 1000 ohm/0 °C<br>NTC - 86K from digital scroll / stream  |  |
| 8 digital input                  | From contact function e.g. to:<br>Start/stop of regulation<br>Monitoring of safety circuits<br>General alarm function  |  |
| Relay output to capacity control | 4 pcs. SPDT (8A)   | AC-1: 6 A (ohmic)<br>AC-15: 4 A (inductive)  |
|                                  | 2 pcs. SPST (16A)  | AC-1: 10 A (ohmic)<br>AC-15: 3.5 (inductive)   |
|                                  | 2 pcs. Solid State.<br>PWM for scroll -<br>unload  | I <sub>max</sub> = 0.5A<br>I <sub>min</sub> = 50 mA.<br>Leak < 1.5 mA<br>Not short-circuit protected |
| 2 Voltage output                 | 0-10 V d.c. R <sub>i</sub> = 1kohm<br>Separate 24 V supply required  |  |
| HMI                              | Remote HMI, type MMIGRS2   |  |
| Data communication               | MODBUS RS 485 for:<br>Danfoss AK-SM 800<br>Third party equipment like e.g PLC<br><br>CANBUS<br>Communication between EKE 400 units and HMI                                 |  |
| Environments                     | -20 - 60 °C, During operations<br>-40 - 70 °C, During transport  |  |
|                                  | 20 - 80% Rh, not condensed<br><br>No shock influence / vibrations  |  |
| Enclosure                        | IP 20  |  |
| Weight                           | 0,4 kg   |  |
| Mounting                         | DIN-rail   |  |
| Connection terminals             | Max. 2.5 mm <sup>2</sup> multi core  |  |
| Approvals                        | EU Low Voltage Directive and EMC demands re<br>CE-marking complied with<br>LVD tested acc. EN 60730-1 and EN 60730-2-9<br>EMC-tested acc. EN61000-6-2 and 3<br>UL approval |  |

| Type    | Function                             | Operation                    | Supply voltage    | Code number |
|---------|--------------------------------------|------------------------------|-------------------|-------------|
| EKE 400 | Evaporator controller                | <br>With HMI                 | 230 V             | 080G5003    |
|         |                                      |                              | 24 V              | 080G5004    |
|         |                                      | <br>Without HMI              | 230 V             | 080G5005    |
|         |                                      |                              | 24 V              | 080G5006    |
| MMIGRS2 | Remote HMI                           | <br>For front panel mounting | -                 | 080G0294    |
|         | Cable between remote HMI and EKE 400 | <br>L = 1.5 m, 1 pcs.        |                   | 080G0075    |
|         |                                      |                              | L = 3.0 m, 1 pcs. | 080G0076    |

## Let's talk

At Danfoss, we believe that long-term business relationships start with a conversation.

- To understand your situation
- To learn how we can meet your needs
- To give you confidence in our solutions

So contact your local Danfoss representative – **and let's talk.**

## Coolselector®2 application tool

The Coolselector®2 provides a – EKE400 relevant text inserted – In addition, the tool offers specific sales/order codes and easy access to consult Danfoss Industrial Refrigeration experts for advice.



## Support Tools for Professionals (TBD)



**Hexact:**  
Plate heat exchanger design and configuration tool



**3D CAD symbols:**  
Download symbols and illustrations



**IR App:**  
Complete overview of spare parts and service kits



**IR Application Tool:**  
How a two-stage ammonia plant works



**Application Handbook:**  
How to select control methods for different refrigeration systems

## Training for Professionals



**Danfoss Learning**  
Your personal learning portal is fast, easy and always accessible.  
[www.learning.danfoss.co.uk](http://www.learning.danfoss.co.uk)

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