ENGINEERING
TOMORROW

Data Sheet

Superheat Controller and stepper valve driver
Type **EKE 100** (PV03)

For Air conditioning, commercial and industrial heat pumps, commercial refrigeration and food retail applications

The flexible pre-programmed EKE 100 superheat controller and stepper valve driver from Danfoss provides ultimate software control, allowing you to tailor the performance of your system to your exact requirements. EKE 100 is ideal for controlling a wide range of air conditioning, commercial and industrial heat pumps, commercial refrigeration and food retail applications, such control helps you to achieve the highest efficiency in the system. EKE 100 is generally used where there is a requirement for accurate control of superheat or as stepper valve driver. The superheat is regulated to the lowest possible value within a short period of time. It regulates the superheat of the evaporator by charging optimally even when there are great variations of load resulting in reduction of energy consumption and operational cost.

Features

- 1 valve and 2 valve output variants
- Supports NTC10K and PT1000 sensor types.
- Superheat control and stepper driver modes
- Fast installation and setup
- Lost step prevention
- Open circuit detection
- LED indication for valve movement and alarm/warnings
- 4 pole terminal block connections for valves
- Digital output for alarm signal
- Battery backup connection for emergency closing
- Modbus Communication

Portfolio overview

Table 1: EKE 100 1V variant (1 valve output)

Hardware Features	EKE 100 1V		
Code number	080G5050	080G5051	080G5052
Power Supply			
Power supply	24 V AC/DC[1], 50/60 Hz, SELV [2]	24 V AC/DC[1], 50/60 Hz, SELV[2]	24 V AC/DC[1], 50/60 Hz, SELV[2]
Battery backup support	Yes	Yes	Yes
Battery backup Input (Danfoss recommends EKE 2U)	24 V DC	24 V DC	24 V DC
Valve Support			
Number of valve outputs	1 stepper motor valve	1 stepper motor valve	1 stepper motor valve
Valve type	Bipolar	Bipolar	Bipolar
Data Communication			
Modbus RS485 RTU	Yes	Yes	Yes
Baud rate (default setting)	19200	19200	19200
Mode (default setting)	8E1	8E1	8E1
Node (default setting)	1	1	1
Sensor support for SH control			
No of temperature sensors	1	1	1
Type of temperature sensors	PT 1000/NTC 10K	PT 1000/NTC 10K	PT 1000/NTC 10K
List of temperature sensors	PT1000, NTC 10K 3435, EKS 221, ACCPBT NTC10K, MBT 153 10K, 112CP, AKS, NTC10K G	PT1000, NTC 10K 3435, EKS 221, ACCPBT NTC10K, MBT 153 10K, 112CP, AKS, NTC10K G	PT1000, NTC 10K 3435, EKS 221, ACCPBT NTC10K, MBT 153 10K, 112CP, AKS, NTC10K G
No of Pressure transmitter [3]	1	1	1
Type of pressure transmitter [3]	Ratiometric 0.5 - 4.5 V DC , 0-10 V DC, Current 4-20 mA	Ratiometric 0.5 - 4.5 V DC , 0-10 V DC, Current 4-20 mA	Ratiometric 0.5 - 4.5 V DC , 0-10 V DC, Current 4-20 mA
List of pressure transmitter [3]	DST P110 standard, DST P310 Ratio, DST P310 current, AKS 32R, AKS 32 1-5 V, AKS 32 1-6 V, AKS 32 0-10 V, AKS 33, AKS 3000, ACCPBP Ratio, ACCPBP current, 112CP, NSK, XSK, OEM ratio, OEM voltage, OEM current	DST P110 standard, DST P310 Ratio, DST P310 current, AKS 32R, AKS 32 1-5 V, AKS 32 1-6 V, AKS 32 0-10 V, AKS 33, AKS 3000, ACCPBP Ratio, ACCPBP current, 112CP, NSK, XSK, OEM ratio, OEM voltage, OEM current	DST P110 standard, DST P310 Ratio, DST P310 current, AKS 32R, AKS 32 1-5 V, AKS 32 1-6 V, AKS 32 0-10 V, AKS 33, AKS 3000, ACCPBP Ratio, ACCPBP current, 112CP, NSK, XSK, OEM ratio, OEM voltage, OEM current
Digital Input			
No of digital inputs	1	1	1
Use of digital input (1 function per input)	Start/Stop regulation, Heat/Cool mode, Battery backup health signal (SOH)	Start/Stop regulation, Heat/Cool mode, Battery backup health signal (SOH)	Start/Stop regulation, Heat/Cool mode, Battery backup health signal (SOH)
Digital outputs			
Number of digital outputs (Open Collector, max sink current 10mA)	1	1	1
User interface			
Display	No	No	Integrated
PC suite	KoolProg	KoolProg	KoolProg
Gateway to PC suite	EKA 200 + EKE 100 service cable	EKA 200 + EKE 100 service cable	EKA 200 + EKE 100 service cable
Installation and IP			
IP rating	00	20	20
Mounting	35 mm DIN rail	35 mm DIN rail	35 mm DIN rail
Environmental Conditions			
Storage temperature	-30 – 80 °C / -22 – 176 °F	-30 – 80 °C / -22 – 176 °F	-30 – 80 °C / -22 – 176 °F
Operating temperature	-20 – 70 °C / -4 – 158 °F	-20 – 70 °C / -4 – 158 °F	-20 – 70 °C / -22 – 158 °F
Humidity	<90% RH, non-condensing	<90% RH, non-condensing	<90% RH, non-condensing

[1] The unit is suitable for use on a circuit capable of delivering not more than 50A RMS (symmetrical Amperes)

[2] For US and Canada, use class 2 power supply

[3] By default the power supply for pressure transmitter is set for 0V. Supply will change to 5V if pressure transmitter is selected as ratiometric and 18V if selected as current type. Supply can be changed manual by selecting it in parameter P014 in advanced I/O configuration. When using 2 valve model both terminals will always supply the same voltage.

Table 2: EKE 100 2V variant (2 valve output)

Hardware Features	EKE 100 2V		
Code number	080G5055	080G5056	080G5057
Power Supply			
Power supply	24 V AC/DC(4), 50/60 Hz, SELV(5)	24 V AC/DC(4), 50/60 Hz, SELV(5)	24 V AC/DC(4), 50/60 Hz, SELV(5)
Battery backup support	Yes	Yes	Yes
Battery backup Input (Danfoss recommends EKE 2U)	24 V DC	24 V DC	24 V DC
Valve Support			
Number of valve outputs	2 stepper motor valves	2 stepper motor valves	2 stepper motor valves
Valve type	Bipolar	Bipolar	Bipolar
Data Communication			
Modbus RS485 RTU	Yes	Yes	Yes
Baud rate (default setting)	19200	19200	19200
Mode (default setting)	8E1	8E1	8E1
Node (default setting)	1	1	1
Sensor support for SH control			
No of temperature sensors	2	2	2
Type of temperature sensors	PT 1000/NTC 10K	PT 1000/NTC 10K	PT 1000/NTC 10K
List of temperature sensors	PT1000, NTC 10K 3435, EKS 221, ACCPBT NTC10K, MBT 153 10K, 112CP, AKS, NTC10K G	PT1000, NTC 10K 3435, EKS 221, ACCPBT NTC10K, MBT 153 10K, 112CP, AKS, NTC10K G	PT1000, NTC 10K 3435, EKS 221, ACCPBT NTC10K, MBT 153 10K, 112CP, AKS, NTC10K G
No of Pressure transmitter (6)	2	2	2
Type of pressure transmitter (6)	Ratiometric 0.5 - 4.5 V DC , 0-10 V DC, Current 4-20 mA	Ratiometric 0.5 - 4.5 V DC , 0-10 V DC, Current 4-20 mA	Ratiometric 0.5 - 4.5 V DC , 0-10 V DC, Current 4-20 mA
List of pressure transmitter (6)	DST P110 standard, DST P310 Ratio, DST P310 current, AKS 32R, AKS 32 1-5 V, AKS 32 1-6 V, AKS 32 0-10 V, AKS 33, AKS 3000, ACCPBP Ratio, ACCPBP current, 112CP, NSK, XSK, OEM ratio, OEM voltage, OEM current	DST P110 standard, DST P310 Ratio, DST P310 current, AKS 32R, AKS 32 1-5 V, AKS 32 1-6 V, AKS 32 0-10 V, AKS 33, AKS 3000, ACCPBP Ratio, ACCPBP current, 112CP, NSK, XSK, OEM ratio, OEM voltage, OEM current	DST P110 standard, DST P310 Ratio, DST P310 current, AKS 32R, AKS 32 1-5 V, AKS 32 1-6 V, AKS 32 0-10 V, AKS 33, AKS 3000, ACCPBP Ratio, ACCPBP current, 112CP, NSK, XSK, OEM ratio, OEM voltage, OEM current
Digital Input			
No of digital inputs	2	2	2
Use of digital input (1 function per input)	Start/Stop regulation, Heat/Cool mode, Battery backup health signal (SOH)	Start/Stop regulation, Heat/Cool mode, Battery backup health signal (SOH)	Start/Stop regulation, Heat/Cool mode, Battery backup health signal (SOH)
Digital outputs			
Number of digital outputs (Open Collector, max sink current 10mA)	1	1	1
User interface			
Display	No	No	Integrated
PC suite	KoolProg	KoolProg	KoolProg
Gateway to PC suite	EKA 200 + EKE 100 service cable	EKA 200 + EKE 100 service cable	EKA 200 + EKE 100 service cable
Installation and IP			
IP rating	00	20	20
Mounting	35 mm DIN rail	35 mm DIN rail	35 mm DIN rail
Environmental Conditions			
Storage temperature	-30 – 80 °C / -22 – 176 °F	-30 – 80 °C / -22 – 176 °F	-30 – 80 °C / -22 – 176 °F
Operating temperature	-20 – 70 °C / -4 – 158 °F	-20 – 70 °C / -4 – 158 °F	-20 – 70 °C / -22 – 158 °F
Humidity	<90% RH, non-condensing	<90% RH, non-condensing	<90% RH, non-condensing

(4) The unit is suitable for use on a circuit capable of delivering not more than 50A RMS (symmetrical Amperes)

(5) For US and Canada, use class 2 power supply

(6) By default the power supply for pressure transmitter is set for 0V. Supply will change to 5V if pressure transmitter is selected as ratiometric and 18V if selected as current type. Supply can be changed manual by selecting it in parameter P014 in advanced I/O configuration. When using 2 valve model both terminals will always supply the same voltage.

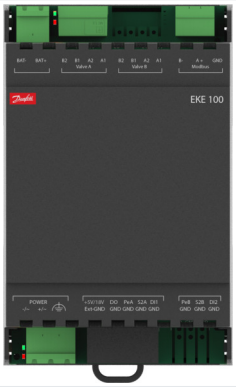
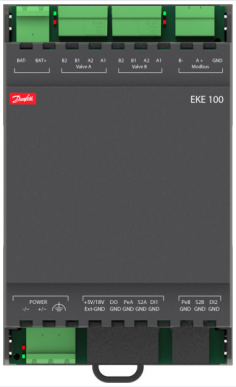
Table 3: Software Features for EKE100 1V and EKE100 2V

Software Features	EKE 100 1V	EKE 100 2V
SH control		
Minimum stable Superheat (MSS)	Yes	Yes
Load AP	Yes	Yes
Delta T	Yes	Yes
Fixed Superheat	Yes	Yes

Software Features	EKE 100 1V	EKE 100 2V
Startup Mode		
Proportional control	Yes	Yes
Fixed opening degree with Proportional control	Yes	Yes
Fixed opening degree without Proportional control	Yes	Yes
Thermostatic Mode		
Cut in/ Cut off	Yes[1]	Yes[2]
MTR	Yes[1]	Yes[2]
Limiter function and other modes		
Heating/Cooling Mode	Yes	Yes
Defrost function	Yes	Yes
SH Close function	Yes	Yes
MOP	Yes	Yes
LOP	Yes	Yes
External refence offset	Yes[1]	Yes[2]
Alarm Management		
Battery Alarm	Yes	Yes
Low Superheat alarm	Yes	Yes
High Superheat alarm	Yes	Yes
Open Circuit detection	Yes[3]	Yes[3]
Minimum S4 limitation	Yes[2]	Yes[2]

[1] Sensor value should be read via Modbus
[2] The input value for second temprerature/Pressure sensor should be read via modbus or use the EKE 100 2V variant ulitizing the second set of temperature/pressure ports with only 1 valve output
[3] Turn OFF open circuit detection when using with ETS 6 valves

Table 4: Product visuals

080G5050	080G5051	080G5052
		
080G5055	**080G5056**	**080G5057**
		

Product specification

Table 5: Technical data

Supply Voltage	24 V AC/DC[1], 50/60 Hz, SELV[2]
Power consumption	Idle operating: < 1.5 W (without valve) Power consumption for using 1 valve. CCMT 16 – CCMT 42: 25 VA / 15 W ETS 12C – ETS 100C, KVS C: 30 VA /15 W ETS 12.5 – 400: 10 VA / 5 W ETS 500P, 800P: 28 VA / 20 W CCMT 2- CCMT 8: 10 VA / 5 W CTR 20: 14 VA / 10 W CCMT L, ETS 6 : 20 VA / 10 W ETS 175L – 550L: 10 VA / 5 W ETS 8M Bipolar: 8 VA / 4 W When using two valves sum the power consumption of each valve
Max drive current	1000 mA Peak
Total steps	10000 steps
Digital outputs	1 output for EKE 100: D01 (open collector), max sink current 10 mA
Valve support	EKE 100 1V: 1 stepper motor valve output EKE 100 2V: 2 stepper motor valve output Valve A: A1, A2, B1, B2 Valve B: A1, A2, B1, B2 Bipolar stepper motor output: - Danfoss ETS/ETS L / KVS / ETS C / KVS C / CCMT 2 – CCMT 42 / CTR / CCMT L Valves / ETS 8M Bipolar Coil / User defined valves.
Battery backup	1 input for EKE 100:Bat-, Bat+ Nominal 24 V DC, Min 16 V DC - Max 28 V DC (Danfoss EKE 2U recommended)
Connector terminal pitch	5mm pitch: Power supply, Battery backup 3.5mm pitch: Analog inputs, Digital inputs, Digital outputs, Stepper valve connection, Modbus communication

[1] The unit is suitable for use on a circuit capable of delivering not more than 50A RMS (symmetrical Amperes)
[2] For US and Canada, use class 2 power supply

Table 6: Productpart numbers

Description	IP	Display	CodeNo.
Superheat controller EKE 100 1V	00	No	080G5050
Superheat controller EKE 100 1V	20	No	080G5051
Superheat controller EKE 100 1V	20	Yes	080G5052
Superheat controller EKE 100 2V	00	No	080G5055
Superheat controller EKE 100 2V	20	No	080G5056
Superheat controller EKE 100 2V	20	Yes	080G5057

Table 7: Accessories

Description	CodeNo.
EKE 2U battery backup	080G5555
EKA 200 KoolKey 2.0	080N0020
EKE 100 service cable	080G5058

Identification

Figure 1: Produt label

Above product label is an example. While programming the product its important to check the SW version and code number and make configuration for the specific version.

Table 8: Description

Superheat Controller	Product description
EKE 100 2V	Product type designation
080G5057	Product code number
24V AC/DC 50/60Hz	Input power rating
PV00	Product version
SW0.92	Software version
Made in Slovakia	Country of Origin
Danfoss A/S, 6430 Nordborg, Denmark	Company address

Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 9: Approvals

ENGINEERING
TOMORROW

Online support

Danfoss offers a wide range of support along with our products, including digital product information, software, mobile apps, and expert guidance. See the possibilities below.

The Danfoss Product Store

The Danfoss Product Store is your one-stop shop for everything product related—no matter where you are in the world or what area of the cooling industry you work in. Get quick access to essential information like product specs, code numbers, technical documentation, certifications, accessories, and more.
Start browsing at store.danfoss.com.

Find technical documentation

Find the technical documentation you need to get your project up and running. Get direct access to our official collection of data sheets, certificates and declarations, manuals and guides, 3D models and drawings, case stories, brochures, and much more.

Start searching now at www.danfoss.com/en/service-and-support/documentation.

Danfoss Learning

Danfoss Learning is a free online learning platform. It features courses and materials specifically designed to help engineers, installers, service technicians, and wholesalers better understand the products, applications, industry topics, and trends that will help you do your job better.

Create your Danfoss Learning account for free at www.danfoss.com/en/service-and-support/learning.

Get local information and support

Local Danfoss websites are the main sources for help and information about our company and products. Find product availability, get the latest regional news, or connect with a nearby expert—all in your own language.

Find your local Danfoss website here: www.danfoss.com/en/choose-region.

Coolselector®2 - find the best components for you HVAC/R system

Coolselector®2 makes it easy for engineers, consultants, and designers to find and order the best components for refrigeration and air conditioning systems. Run calculations based on your operating conditions and then choose the best setup for your system design.

Download Coolselector®2 for free at coolselector.danfoss.com.

Danfoss A/S
Climate Solutions • danfoss.com • +45 7488 2222