Data sheet

SH controller and valve driver

EKE 100

For Air conditioning, commercial and industrial heat pumps, commercial refrigeration and food retail applications
Product version 04

Description

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 & benefits

- 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
- Modbus communication and battery backup connection for emergency closing

Ordering

Product code numbers

Table: Product part numbers

Material Description	Enclosure rating IP	Display - option	Code number
Superheat controller EKE 100 1V. IP00	IP00	No	080G5050
Superheat controller EKE 100 1V. IP20	IP20	No	080G5051
SH controller EKE 100 1V, IP20 . display	IP20	Integrated	080G5052
Superheat controller EKE 100 2V. IP00	IP00	No	080G5055
Superheat controller EKE 100 2V. IP20	IP20	No	080G5056
SH controller EKE 100 2V, IP20 . display	IP20	Integrated	080G5057

Accessories code numbers

Table: Accessories

Description	Code no.
EKE 2U battery backup	080G5555
EKA 200 KoolKey 2.0	080N0020
EKE 100 service cable	080G5067

Overview

Product portfolio

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

Hardware features	**EKE 100 1 V**		
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 10 mA)	1	1	1

Hardware features	EKE 100 1 V		
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 50 A 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 0 V. Supply will change to 5 V if pressure transmitter is selected as ratiometric and 18 V 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: EKE 100 2 V variant (2 valve output)

Hardware features	EKE 100 2 V		
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 in- put)	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 10 mA)	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

Hardware features	EKE 100 2 V		
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 50 A 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 0 V. Supply will change to 5 V if pressure transmitter is selected as ratiometric and 18 V 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: Software features for EKE100 1 V and EKE100 2 V

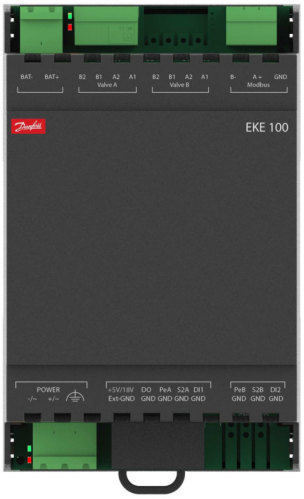
Software features	EKE 100 1 V	EKE 100 2 V
SH control		
Minimum stable superheat (MSS)	Yes	Yes
Load AP	Yes	Yes
Delta T	Yes	Yes
Fixed superheat	Yes	Yes
Startup mode		
Proportional control	Yes	Yes
Fixed opening degree with proportional control	Yes	Yes
Fixed opening degree without proportional control	Yes	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 temperature / Pressure sensor should be read via modbus or use the EKE 100 2 V variant utilizing 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: Product visuals

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

Product details

General data

Table: 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 1 V: 1 stepper motor valve output EKE 100 2 V: 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 / PTS valves / ICFL20 / ETS P / ETS 5M Bipolar / ETS 5T Bipolar / 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	5 mm pitch: Power supply, Battery backup 3.5 mm 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 50 A RMS (symmetrical Amperes)

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

Identification

Figure: Product label

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

Table: Description

Superheat Controller	Product description
EKE 100 2 V	Product type designation
080G5057	Product code number
24 V AC / DC 50 / 60 Hz	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.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
Export Control Declaration	Electronic Superheat Controller and Electronic Valve driver and injection controller	Danfoss	
Manufacturer's Declaration	Manufacturers Declaration 080R5341-AA (EU 2023/2854)	Danfoss	
Manufacturer's Declaration	Information to the User in accordance with Article 3(2) and 3(3) of EU Regulation 2023/2854 (the Data Act) 080R5341 080R5341	Danfoss	Compliance misc. Standards
EU Declaration	Danfoss EU - 080R5333.AC	Danfoss	EMC, EU RoHS
Manufacturer's Declaration	Danfoss MD 080R5334.AE	Danfoss	China RoHS, EAEU RoHS
Electrical Safety Certificate	UL E31024 UL-CA-2320815-3	UL - Underwriters Laboratories inc.	

Table: Approvals

Contact details

Online support

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

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