
# Danfoss EKE 1P Stepper Valve Extension Module Installation Guide

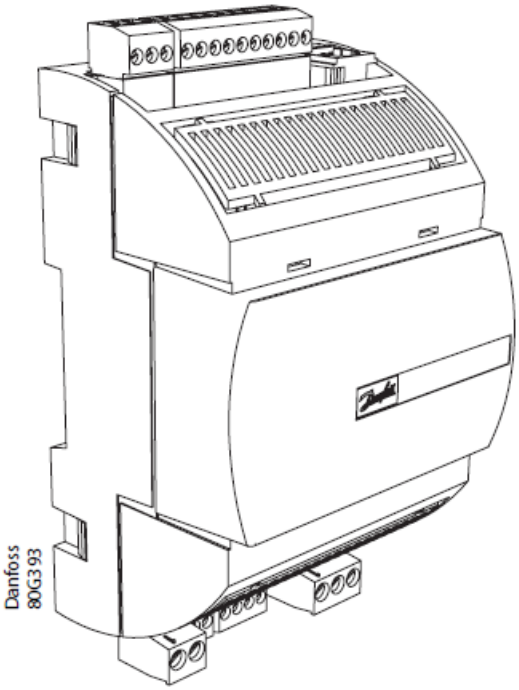


Contents

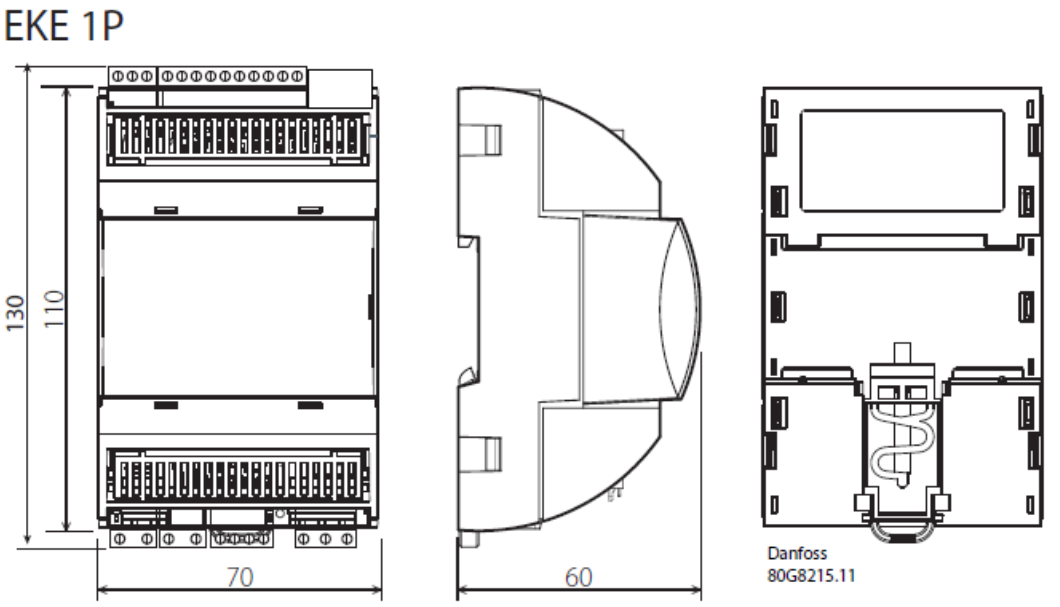


## Danfoss EKE 1P Stepper Valve Extension Module


**Identification**

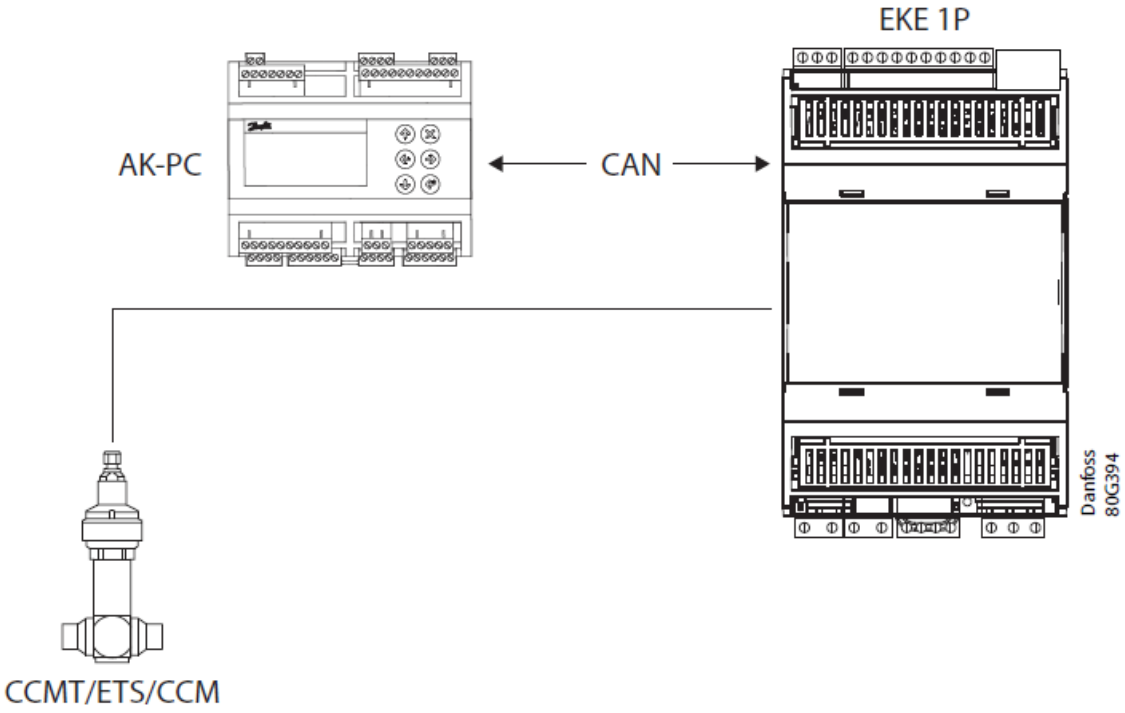



**Dimensions [mm]**




Weight: 152 g / Gewicht: 152 g / Poids : 152 g / Peso: 152 g / Peso:

**Application 1**




**Application 2**

Fig. 1

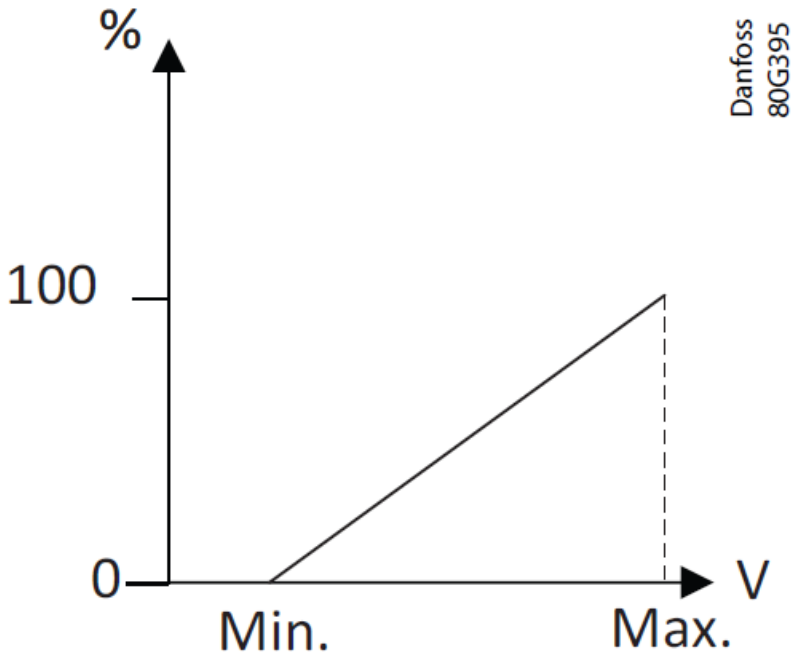
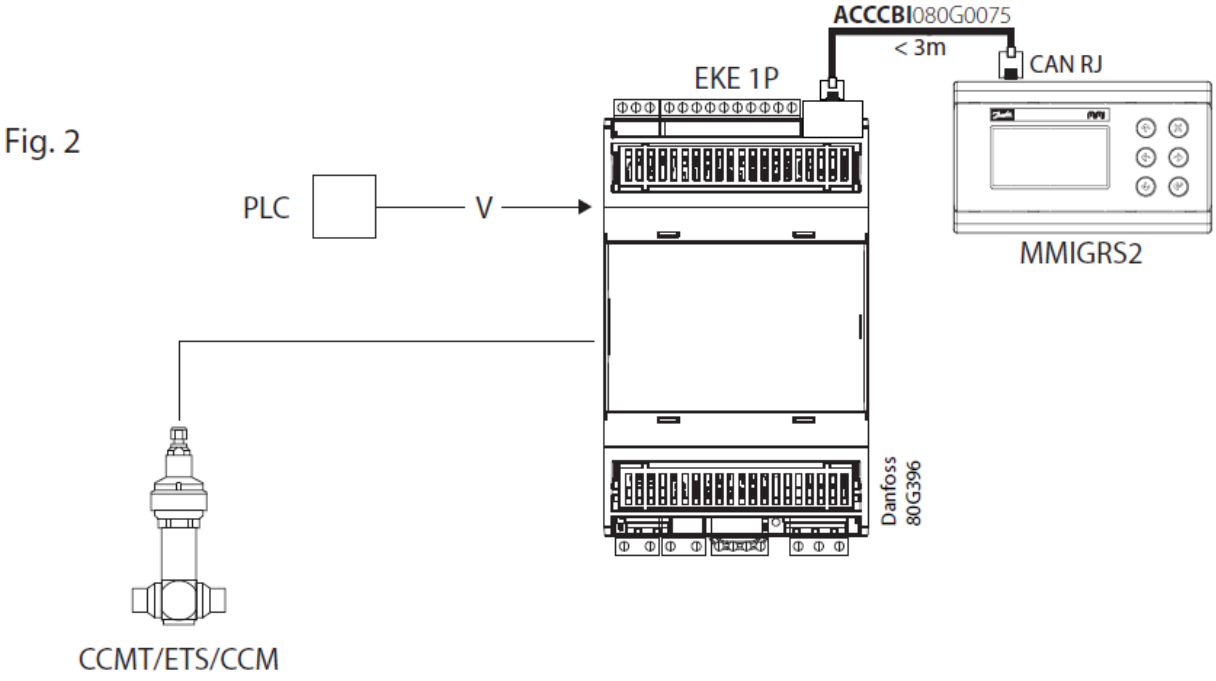
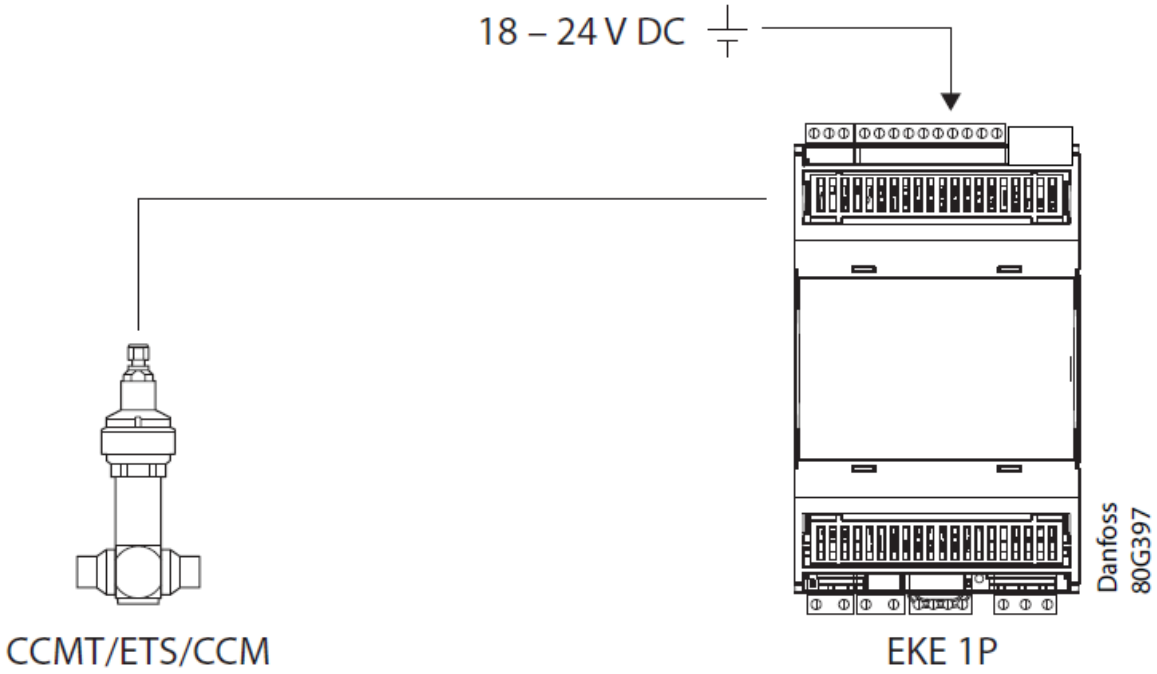


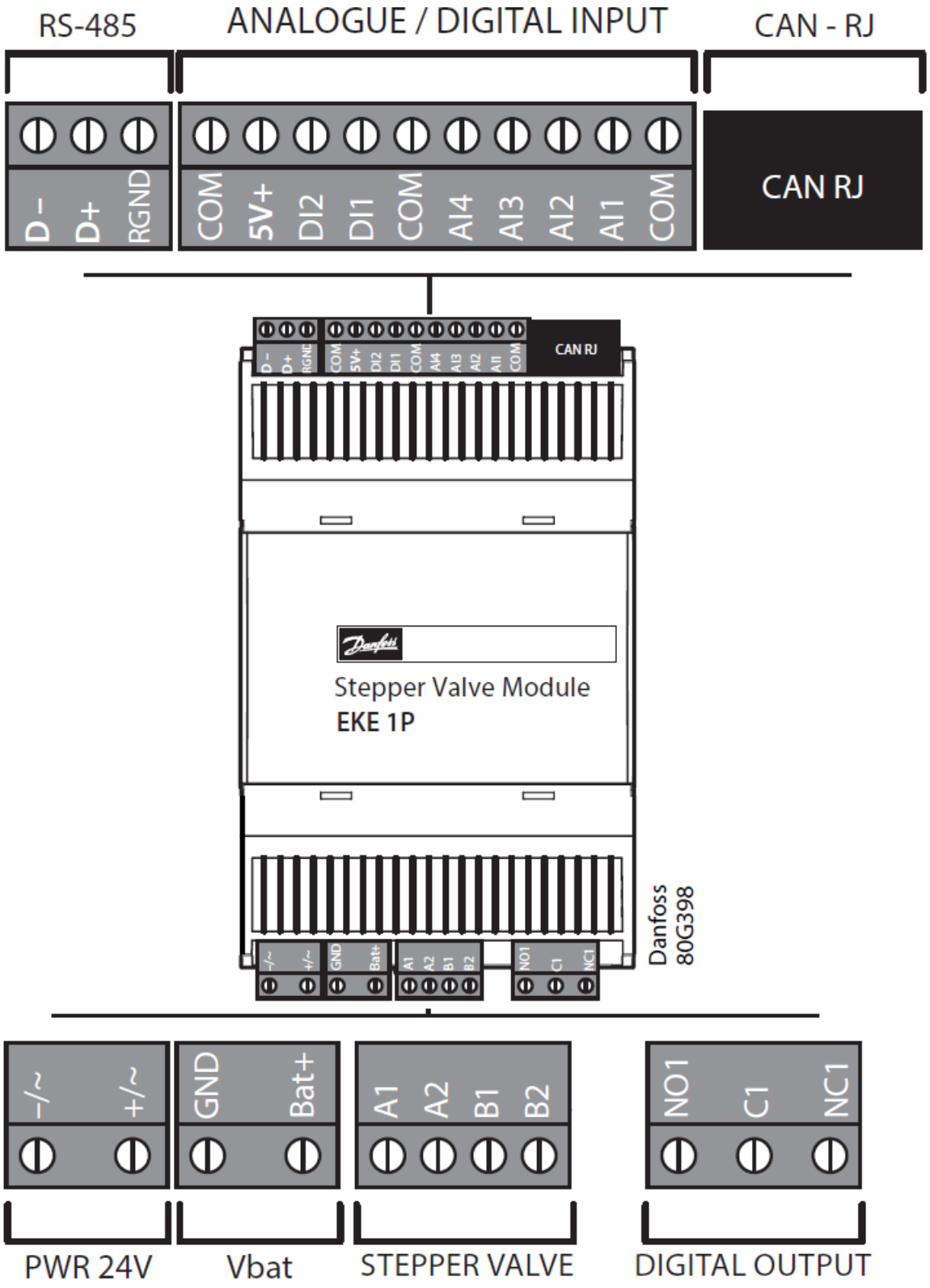

Fig. 2




**Battery back-up**




**Connection overview: EKE 1P**




**Valve connection**

| CCMT/ETS/CCM | ETS 6 | EKE 1P |
|---|---|---|
| White | Orange | A1 |
| Black | Yellow | A2 |
| Red | Red | B1 |
| Green | Black | B2 |

**Application 1 driver configuration**
AI4 open circuit or connected to 0V (COM): high-pressure valve driver
AI4 connected to 5V+: receiver valve driver

**Recommended wire size and cable distance between EKE controller and stepper motor valve**

| | |
|---|---|
| Cable length | 1 – 15 m |
| Wire diameter | 0.52 / 0.33 mm2 (20 / 22 AWG) |

## Technical specifications

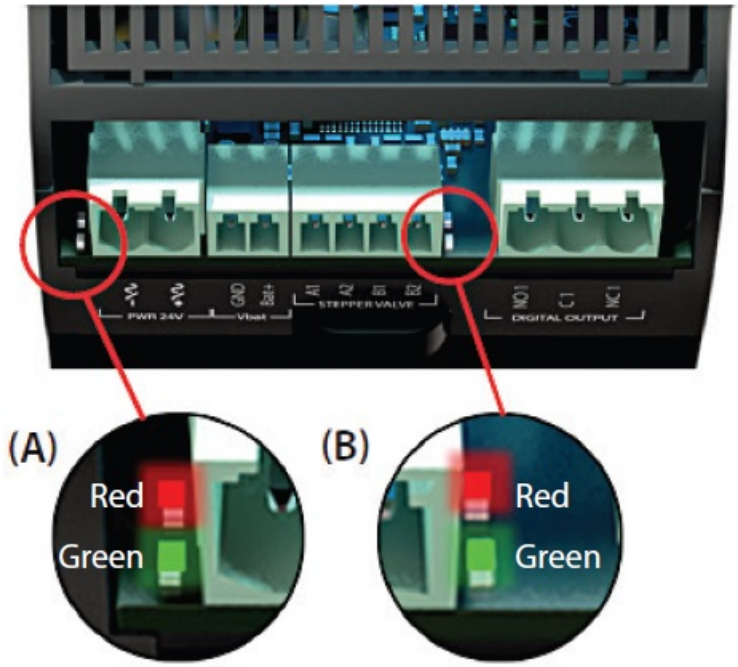
**Power supply:**
EKE has galvanic isolation by switch-mode power supply. 24 V AC ± 20 %, 50/60 Hz. Maximum power consumption: 18 VA. Input voltage rating (DC): 24 V DC ± 20%, 15 W.

| I/O | Type | No. | Specification |
|---|---|---|---|
| Analogue inputs | | | Max. 15 V input voltage<br>Do not connect voltage sources to unpowered units without limiting the current to analogue inputs (overall 80 mA). Open circuit HW diagnostics available for voltage input on: **AI4** |
| | Voltage | 2 | **AI3***<br>0 – 5 V ratiometric<br>**AI4**<br>0 – 5 V, 0 – 10 V |
| | PT1000 | 2 | **AI1***, **AI2*** |
| | Auxiliary Supplies | 1 | **5 V +**<br>Sensor supply: 5 V DC / 15 mA, overload protection approximately 150 mA |
| Digital inputs | Voltage free contacts | 2 | **DI1*, DI2**<br>Steady current minimum 1 mA Cleaning current 100 mA at 15 V DC On: RIL < = 300 Ω<br>Off: RIH > = 3.5 k Ω |
| Digital output | Relay | 1 | **C1-NO1***<br>Normally Open: 3 A General purpose, 250 V AC, 100 k cycle Normally Open: 3 A Inductive (AC-15), 250 V AC, 100 k cycle Normally Closed: 2 A General purpose, 250 V AC, 100 k cycle |

| | | | |
|---|---|---|---|
| Stepper motor | Bipolar / unipolar | 1 | **Stepper valves: A1, A2, B1, B2**<br>Bipolar and unipolar stepper motor output:<br>• Danfoss CCMT 3L – CCMT 8L / CCMT 0 – CCMT 42 / CCM 10 – CCM 40 / ETS 6 – ETS 400 / CTR 20<br>Other valves:<br>• speed 10 – 400 pps<br>• drive mode 1/8 microstep<br>• max. peak phase current: 1.2 A (848 mA RMS)<br>• max. drive voltage 40 V<br>• max. output power 12 W |
| Battery backup | | 1 | **VBATT:** 18 – 24 V DC (24 V DC recommended):<br>• max. battery current: 850 mA at 18 V<br>• battery alarm will be activated below 16 V DC and above 27 V DC |
| Communication | RS-485 RTU | 1 | **RS-485***<br>Galvanic isolation<br>No built-in termination |
| | CAN | 1 | **CAN – RJ**<br>Application 1: Connect directly to AK-PC<br>Application 2: Connect directly to graphical display, MMIGRS2. Activate the termination on the graphical display. |

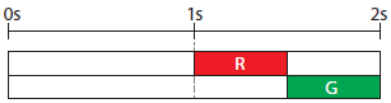
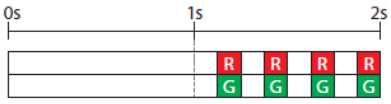
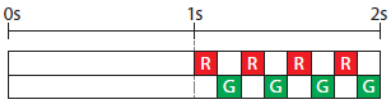
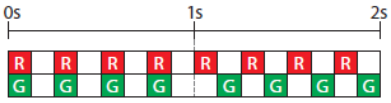
* Only used in application 1

**LED indication:**
Two sets of Light Emitting Diodes make it possible to follow the operation status of the valve and the controller.

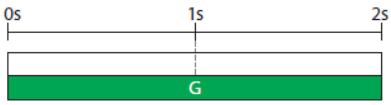
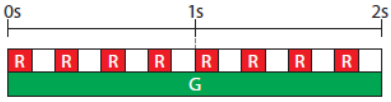
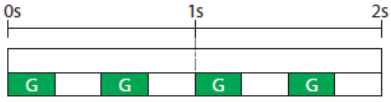
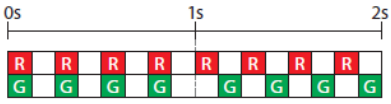



## LED A: Two status LEDs indicate power and controller operation

### Power-up:

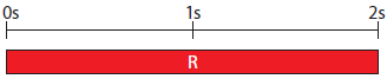
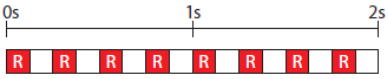
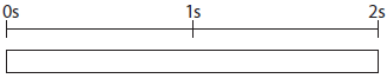
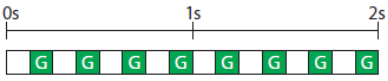
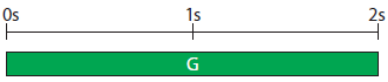
| | | |
|---|---|---|
| 1. AI valve driver module |   | Configured as AI controlled stepper valve - will blink for 30 sec. after power-up. |
| 2. HP module |   | Configured as HP module - will blink for 30 sec. after power-up. |
| 3. Receiver module |   | Configured as receiver module - will blink for 30 sec. after power-up. |
| |   | Hardware problem. |

### Normal operation:

| | | |
|---|---|---|
| 4. Power |  | Pattern during normal operation. |
| 5. MODBUS error power |  | Pattern during normal operation, but MODBUS error. |
| 6. Power main switch OFF |  | Pattern during normal operation, main switch = OFF. |
| |  | Hardware problem. |

R = Red
G = Green

## LED B: Two status LEDs to indicate valve operation

| | | |
|---|---|---|
| V1. Valve closed |  | Steady red = valve fully closed. |
| V2. Valve closing |  | Flashing red (2 Hz) = valve closing. |
| V3. Valve idle |  | Running on target. Both Red and Green off. |
| V4. Valve opening |  | Flashing green (2 Hz) = valve opening. |
| V5. Valve open |  | Steady green = valve fully open. |

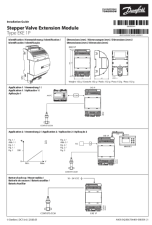
R = Red
G = Green

## Commonly used parameter identification in application 2

**Note:** In application 1, the most commonly used parameters are conÿgured in the AK-PC. Default commissioning password: “300”

| Parameter | Default | Description |
|---|---|---|
| Main switch | 0 | 0 = Off, 1 = ON |
| Mode | 0 | 0=Application 1 – selection by AI4<br>1=Application 1 – High Pressure expansion module 2=Application 1 – Receiver Expansion module 3=Application 2 – Valve Driver<br>Note: changing this setting also changes the EKE 1P address, causing communication with the graphical display to stop. Communication will resume after a power cycle. |
| AI valve input scale | 2 | 0 = 0 – 5 V |
| | | 1 = 1 – 5 V |
| | | 2 = 0 – 10 V |
| | | 3 = 2 – 10 V |
| | | 4 = 5 – 0 V |
| | | 5 = 5 – 1 V |
| | | 6 =10 – 0 V |
| | | 7 =10 – 2 V |
| | | 8 = User Defined |
| Valve configuration | 0 | **Application mode 1**: Set from AK-PC except if the valve type is set to User Defined in AK-PC then it is |
| | | according to below list (see Application mode 2) |
| | | **Application mode 2**: |
| | | **0** = no valve, **1** = UserDef |
| | | **2** = ETS 12C, **3** = ETS 24C, **4** = ETS 25C, **5** = ETS 50C, **6** = ETS 100C |
| | | **7** = ETS 6, **8** = ETS 12.5, **9** = ETS 25, **10** = ETS 50, **11** = ETS 100 |
| | | **12** = ETS 250, **13** = ETS 400 |
| | | **14** = KVS 2C, **15** = KVS 3C, **16** = KVS 5C |
| | | **17** = KVS 15, **18** = KVS 42 |
| | | **19** = CCMT 0, **20** = CCMT 1 |
| | | **21** = CCMT 2, **22** = CCMT 4, **23** = CCMT 8, **24** = CCMT 16, **25** = CCMT 24 |
| | | **26** = CCMT 30, **27** = CCMT 42 |
| | | **28** = CCM 10, **29** = CCM 20, **30** = CCM 30, **31** = CCM 40 |
| | | **32** = CTR 20 |
| | | **33** = CCMT 3L, **34** = CCMT 5L, **35** = CCMT 8L |

## Documents / Resources

| | |
|---|---|
|  | Danfoss EKE 1P Stepper Valve Extension Module [pdf] Installation Guide<br>EKE 1P Stepper Valve Extension Module, Stepper Valve Extension Module, Extension Module, Module |

## References

- User Manual