

## Installation guide

**Colibri® Electric Expansion Valves**

Type ETS 12C, ETS 24C, ETS 25C, ETS 50C, ETS 100C

**Colibri® Electric Regulating Valves**

Type KVS 1C, KVS 2C, KVS 3C, KVS 5C

**EU DECLARATION OF CONFORMITY****Danfoss A/S**  
**Cooling segment, RAC**

Declares under our sole responsibility that

Products: Electric Expansion Valve and Electric Regulation Valve  
Types: **ETS 12C, ETS 24C, ETS 25C,** **KVS 1C, KVS 2C**  
**ETS 50C and ETS 100C** **KVS 3C and KVS 5C**

covered by this declaration are in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions

**Electromagnetic Compatibility (EMC) Directive 2014/30/EU**

The above products have been tested together with cable types 034G2323, 034G7074 or IfmEVC05A and controller type EKE1V. The combinations are approved compliant acc. to below standards used:

- Radiated EMI: CISPR16-2-3/IEC61000-4-20, Class B limit.
- Radiated RF Immunity: IEC61000-4-20, test level 20 and 60 V/m, fault criteria A.
- Conducted RF Immunity: IEC61000-4-6, test level 10 Vrms, fault criteria A
- EFT/Burst Immunity: IEC 61000-4-4, test level: 1, 2, 3 and 4 kV; fault criteria A for 1 and 2 kV, B for 3 kV and C for 4kV.

**Pressure Equipment Directive 2014/68/EU**

The above products have been evaluated in relation to the Directive 2014/68/EU and found falling under the clauses of Article 4 §3 for the valve, regardless of connected pipe dimensioning.

The products are compliant acc. to below standard:

- EN 12284:2003 Refrigerating systems and heat pumps. Valves. Requirements, testing and marking, for valve body.
- EN 14276-2:2011 Pressure equipment for refrigerating systems and heat pumps – Part2: Piping, for extended connectors.

**Equipment for use in potentially explosive atmospheres (ATEX) Directive 2014/34/EU**

The above products have been tested and certified acc. to below classification and standards used

- EN 60079-0:2012 + A11:2013 Explosive atmospheres – Part 0: Equipment – General requirements
- EN 60079-7:2015 + A11:2018 Explosive atmospheres – Part 7: Equipment protection by increased safety “e”
- EC-Type Examination: **DTI 17ATEX 0065x**
- Issued by: Teknologisk Institut
- Technical file: 034R7030



Date	Issued by	Date	Approved by
2024-04-10 Nordborg	Ivan Martinez Lead Design engineer	2024-04-10 Nordborg	Jesper Kirkegaard Director, Engineering

Danfoss only vouches for the correctness of the English version of this declaration. In the event of the declaration being translated into any other language, the translator concerned shall be liable for the correctness of the translation.

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## Operating instructions (safety related part ATEX)

### Remarks for safe use of the ETS Colibri and KVS Colibri products in potentially explosive atmospheres

#### Specification:

- Use of the product in hazardous areas according to the classification II 3G (Group II, category 3G, apparatus for gas atmosphere)  
Complies with the requirements of the standards
    - o EN 60079-0:2012 + A11:2013 Explosive atmospheres – Part 0: Equipment – General requirements
    - o EN 60079-7:2015 + A11:2018 Explosive atmospheres – Part 7: Equipment protection by increased safety “e”
  - In compliance with ATEX 2014/34/EU, Annex VIII
    - o **DTI 17ATEX 0065x**
  - Marking
- Do not separate if energized

**CE** **Ex** II 3G

Ex ec IIB T4 Gc

DTI 17ATEX 0065x
- Operating ambient temperature: -40 to 70 °C
  - Operating media temperature is:
    - \*For ETS 12C - 100C and KVS 1C - 5C
    - 40 to 70 °C at 100 % duty rate, in normal and reverse flow.
    - \*For ETS 12C - 100C and KVS 1C - 5C
    - 70 to 95 °C at 20 % duty rate, in normal and reverse flow.
    - \*For KVS 1C - 5C
    - 95 to 100 °C at 20 % duty rate, in normal and reverse flow.
  - Further limitations may apply due to temperature ratings of applied cable assembly
  - Maximum surface temperature  
Acc. to classification level T4; 135 °C

#### Special conditions of use

- Do not separate the electrical connector on the valve when energized (The connection is marked “Warning – Do not separate when energized”).
- The valve shall be installed in a location where it is unlikely to be exposed to impact above 4 Joule.
- The valve shall through the cooling / pipe system be connected to ground.
- The valve shall be powered by a step motor driver, supplying a current controlled signal of nominally 600 mA RMS, not exceeding 700mA RMS, and max AC voltages 48, supply from an SELV voltage per EN60079-14 §6.3.5.
- The Stepper motor driver must include a transient protection not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.
- KVSc -40 ... +100 °C (KVSc controller setup; 1/8 micro step, PPS 260 and duty cycle 20%).
- The valves shall only be used in the ambient temperature range  $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +70^{\circ}\text{C}$ .  
If the applied power cable and connector assembly has a specified ambient temperature which is lower than ambient temperature range  $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +70^{\circ}\text{C}$  actual for the valve, then the valve with cable shall only be used within the limited ambient temperature range specified for the cable assembly.
- The applied cable assembly must be fitted with an appropriate M12 connector according to standard EN 61076-2-101.
- The applied cable assembly must be suitable for installation in environments where it is intended to be used and rated at least IP54.
- The connector shall be evaluated for 2G IIB and be rated for 2 A and 60 V AC or DC.
- The lock nut at the socket / connector shall be tightly screwed to the valve, so that it is no longer possible to disconnect the plug without tools. The tightening torques is recommended to be between 1.2 Nm and 1.5 Nm or as specified by the manufacturer of the cable assembly.
- The valve connector must be protected by a protective cap that provides at least IP 54 protection of the connector when not in use / service.
- The cable assembly shall be fixed properly when installed to protect it against mechanical damage. Max. bending angle of wires when installed in cold conditions must be considered as specified by the manufacturer of the cable assembly.
- The internal is hermetically sealed when installed in accordance to Danfoss instructions and not considered as ignition source in normal operation. The motor shall therefore only be operated in hermitic sealed cooling system where no flammable atmosphere is present. The oxygen shall always be above the UFL for the fluid.
- The upstart procedure for the sealed cooling system, using flammable fluid and where the valve is installed shall follow the procedure in EN378-2 and for maintenance the procedure in EN378-4 is relevant.
- The valve may not be used in systems where the system pressure can drop below the ambient environment pressure as this will increase the risk for oxygen entering into the system in an abnormal situation (leakage in the system).

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