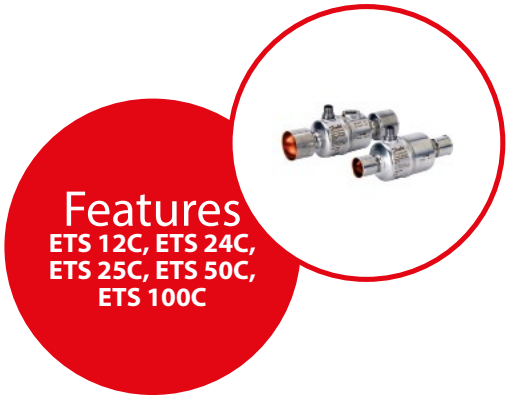
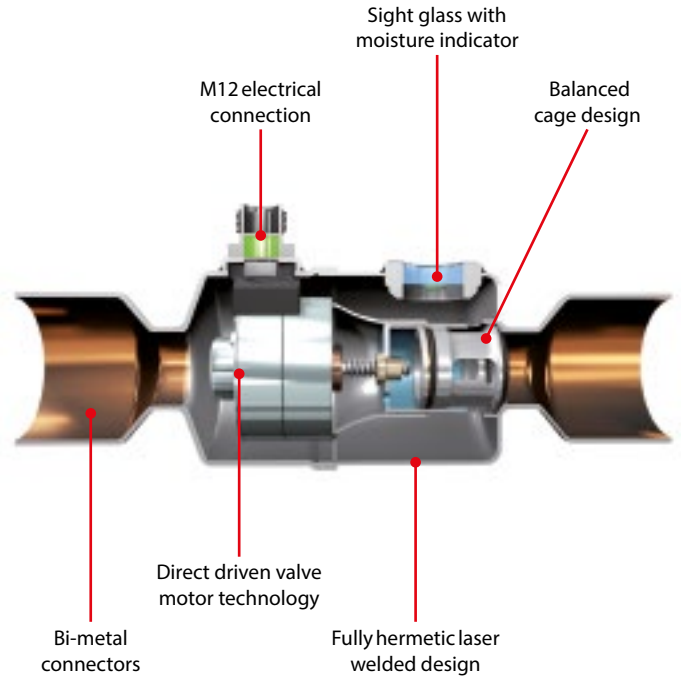
ETS 12C / ETS 24C / ETS 25C / ETS 50C / ETS 100C, Electric expansion valves

ETS Colibri® is an electric stepper motor valve. The valve has been designed for precise liquid injection into evaporators for air conditioning and refrigeration applications.
The valves are compact, lightweight and in-line design. The valves are compact, lightweight and in-line design includes a balanced cage and slider assembly operated by the direct driven motor technology.
This ensures solenoid tight shut-off in both flow directions, thus providing smooth operation of the system.
The valve incorporates a powerful bi-polar motor which precisely controls flow regulation.
ETS Colibri® valves are compatible with electronic control solutions from Danfoss and other manufacturers.





Facts

Applications:
- Air Conditioning
  - Chillers, heat pumps
  - Roof top and ducted split systems
  - VRF and other split systems
  - Close control cooling
- Refrigeration
  - Cold Rooms, Food retail and Transport
- Applicable to R410A, R404A, R507, R134a, R407A, R407B, R407C, R407F, R32, R290, R1234ze, R1234yf, R449A, R449B, R452A, R1270, R600, R600a, R22, R23, R227, R417A, R444B, R447A, R448A, R454B, R422A, R422D, R427A, R502, R513A, R413A, R438A, R450A, R455B, R454C, R454A, R452B, L40*)
  For a fully updated list of approved refrigerants, visit www.products.danfoss.com and search for individual code numbers, where refrigerants are listed as part of product specifications.
- Precise control of liquid injection
- Linear Flow characteristic
- Higher MOPD and MWP
- ETS Colibri® approvals:
  CE, REACH, UL, LLC CDC EURO TYSK, EAC, ATEX II 3G Ex nA T6 (applied for)
- Supports variety of refrigerants, approved for oil free applications
- Fast opening/closing time of 4 sec.
- Solenoid tight shut-off
- Sight glass / moisture indicator
- Compact, lightweight and in-line design
- Bi-metal connectors allows fast and improved brazing process
- Internal and external corrosion resistant
- Manufactured according to ISO/TS16949

*)R-number allocation by ASHRAE is pending

Technical data and ordering

ETS Colibri®

Technical data

Refrigerant oil	POE, PVE, All mineral oils, ester oils and supports oil free
Complies with PED	Yes, Fluid group 1*) and group 2.
MOPD	40 bar / 580 psi
Max. working pressure PS/MWP	50 bar(g) / 725 psi(g)
Refrigerant temperature range (measured at the inlet of the valve)	-40 – 70 °C / -40 – 158 °F
Ambient temperature	-40 – 70 °C / -40 – 158 °F
Capacity control range	10% - 100% of total opening degree
Initial opening	5% = 30 full steps
Environmental transport / storage temperature and humidity	Max. +75 °C / 167 °F, Humidity: <100% RH
Material of construction	Body: Stainless Steel / Connector: Bimetal (stainless steel and copper)
Sightglass / moisture indicator	Type N moisture indicator

*) Variants with connector size 1-1/8 in. and smaller.

Electrical data

Motor enclosure	IP67
Stepper motor type	Bi-polar - permanent magnet
Step mode	Microstepping (recommended), 2 phase full step or half step
Phase current	800 mA peak / 600 mA RMS
Holding current	No permanent holding current needed. Max. 20% permanent holding current allowed with refrigerant flow through valve. For optimal performance, driver should keep 100% current on coils 10ms after last step
Phase resistance	10 Ω ±10% at 20 °C / 68 °F
Inductance	14 mH ±25%
Duty cycle	100% possible, requiring refrigerant flow through valve. Less than 50% over 120 sec period recommended
Nominal Power consumption	7.44 W RMS at 20 °C (total, both coils)
Total number of full steps	600
Step rate	Current control driver: a. Step type: Microstep (1/4th or higher): 160 full steps/sec. recommended b. Step type: Full step or Half steps: 50 full steps/sec. recommended Emergency close : 250 full steps/sec. OEMs with 3rd party controller, please contact Danfoss.
Step translation	0.0167 mm / step
Full travel time	3.75 at 160 steps/sec
Opening stroke	10 mm / 0.4 in.
Reference position	Overdriving against the full close position
Overdriving performance	1% (6 full steps) Overdrive is recommended for optimum performance 628 steps in closing direction recommended for initialisation Overdriving in open position not recommended
Electrical connection	According to EN 61076-2-101
Compatible controllers / driver	Danfoss EKE 1A, EKE 1B, EKE 1C, MCX061V, MCX152V Certain third party controllers / drivers. Contact Danfoss for details

Technical data and ordering

ETS Colibri®

Ordering - Without sight glass

Type	K_v value	C_v value	Rated capacity [1]										Connection		Code no. single pack
			R410A		R407C		R1234ze		R134a		R290		ODF × ODF (A × B)		
	[m^3/h]	[gpm]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[in]	[mm]	
ETS 12C	0.60	0.69	105	29.8	95.1	27.0	53.6	15.2	68.0	19.0	91.0	26.0	½ × ½	–	034G7500
	0.60	0.69	105	29.8	95.1	27.0	53.6	15.2	68.0	19.0	91.0	26.0	⅝ × ⅝	16 × 16	034G7501
	0.60	0.69	105	29.8	95.1	27.0	53.6	15.2	68.0	19.0	91.0	26.0	⅞ × ⅞	22 × 22	034G7502
ETS 24C	1.20	1.39	170	48.5	155	44.0	87.3	24.8	111	31.5	149	42.0	½ × ½	–	034G7900
	1.20	1.39	170	48.5	155	44.0	87.3	24.8	111	31.5	149	42.0	⅝ × ⅝	16 × 16	034G7901
	1.20	1.39	170	48.5	155	44.0	87.3	24.8	111	31.5	149	42.0	⅞ × ⅞	22 × 22	034G7902

Ordering - With sight glass

Type	K_v value	C_v value	Rated capacity [1]										Connection		Code no. single pack
			R410A		R407C		R1234ze		R134a		R290		ODF × ODF (A × B)		
	[m^3/h]	[gpm]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[kW]	[TR]	[in]	[mm]	
ETS 25C	1.20	1.39	170	48.5	155	44.0	87.3	24.8	111	31.5	149	42.0	⅞ × ⅞	22 × 22	034G7602
ETS 50C	2.50	2.89	323	92.0	294	83.5	166	47.1	210	59.7	282	80.0	⅞ × ⅞	22 × 22	034G7700
	2.50	2.89	323	92.0	294	83.5	166	47.1	210	59.7	282	80.0	⅞ × 1 ⅛	22 × 28	034G7701
	2.50	2.89	323	92.0	294	83.5	166	47.1	210	59.7	282	80.0	1 ⅛ × 1 ⅛	28 × 28	034G7702
	2.50	2.89	323	92.0	294	83.5	166	47.1	210	59.7	282	80.0	1 ⅛ × 1 ⅜	28 × 35	034G7703
ETS 100C	5.00	5.78	635	181	577	164	325	92.5	413	117	554	157	1 ⅛ × 1 ⅛	28 × 28	034G7800
	5.00	5.78	635	181	577	164	325	92.5	413	117	554	157	1 ⅛ × 1 ⅜	28 × 35	034G7801
	5.00	5.78	635	181	577	164	325	92.5	413	117	554	157	1 ⅜ × 1 ⅜	35 × 35	034G7802
	5.00	5.78	635	181	577	164	325	92.5	413	117	554	157	1 ⅝ × 1 ⅝	–	034G7803

[1]) The above estimated capacities, are based on the following conditions:
Evaporating temperature t_e : 5 °C / 40 °F
Liquid temperature t_l : 28 °C / 82 °F
Condensing temperature t_c : 32 °C / 90 °F.
Full stroke opening in normal flow direction.
Capacity is ± 10% in full open state in reverse flow direction.

Note: for fast and precise selection of valve, use Danfoss' CoolSelector2® software. You can download it from http://coolselector.danfoss.com

M12 angle cable

Specification

Jacket	PVC - black
Cable outer sheath	Oil - resistant
Water proof rating	IP 67
Operating temperature range	-40 – 80 °C
Wire type	Twisted pair, cross section 20 AWG / 0.5 mm^2
Cable outer diameter	7.0 mm
Minimum bending radius	10 x cable diameter
Cable combustibility / test	Flame retardant / VW-1 / CSA FT - 1
M12 standard	EN 61076-2-101
Reference standard	UL style 2464 and DIN VDE 0812
LVD directive	2014/35/EU
Approval	CE, RoHS, UL, EAC, LLC CDC EURO TYSK

Ordering

Cable	Cable length (L)	Insulation	Packing format	Code no.
PVC - Black	2 m / 6.6 ft	SR-PVC	Single pack	034G7073
	8 m / 26.2 ft	SR-PVC	Single pack	034G7074

Caution: M12 angle cable is not approved for flammable applications.