ENGINEERING
TOMORROW

A world leader in climate and energy technology

The Danfoss Group operates globally with the primary aims of making modern living possible for our stakeholders and being a leader in refrigeration, heating, power electronics, and mobile hydraulics.

We employ 24,000 people, 6,000 of whom work in Denmark at 11 different locations.

We produce approximately 250,000 components each day at our 76 factories in 25 countries.

We promise leadership in our businesses through reliability, excellence, and innovation – driving true customer satisfaction and solutions within climate and energy.

Extensive experience in all key HVAC/R segments

Danfoss plays a leading role in research, development and production in a wide spectrum of industries, and has been a key player in the HVAC/R field for more than 75 years. Our Refrigeration & Air Conditioning Division designs, produces and markets a comprehensive range of automated solutions and compressors for a wide variety of HVAC/R segments, including

- Commercial Air Conditioning
- Residential Air Conditioning
- Heat Pumps
- Commercial Refrigeration
- Household, Light Commercial and Mobile Refrigeration
- Wholesalers & Installers
- Industrial Refrigeration
- Food Retail

Learn more at **www.danfoss.com**

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Reduce energy consumption with **precise flow control** in A/C

ETS 6 Electronic Expansion Valve and EIM 336 Superheat Controller

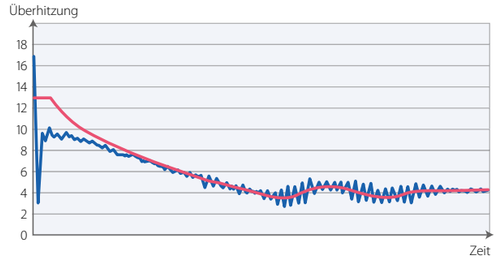
up to
15%
increased energy efficiency when installed together: ETS 6 + EIM 336

www.danfoss.com/ets

Your air conditioning is only as efficient as two superheat control components

Effective superheat control depends on a pair of components to continuously adapt to exact capacity demands: a responsive electronic expansion valve and an intelligent, accurate superheat controller. That's why Danfoss engineered the new ETS 6 Electronic Expansion Valve and the EIM 336 Superheat Controller together.

Sometimes, good things really do come in pairs. Two of our latest innovations let you and your customers relax while their A/C works precisely and reliably. Both were designed to let you fine-tune systems in a cost-efficient way. The ETS 6 valve together with the EIM 336 can be used in the A/C units with evaporator capacity ranging from 3 kW to 37 kW. Because the EIM 336 controls ETS 6 in microsteps, it gives a smooth superheat curve and less noise. With EIM 336 and corresponding ETS 6 valve, you can achieve a Maximum Operating Pressure Differential (MOPD) of up to 45 bar.



Save energy by utilising Minimum Stable Superheat
The controller searches for the minimum stable superheat between maximum and minimum set point values, sets a reference, then adjusts the reference according to superheat stability.

Use external sensor values
Instead of using built-in sensor inputs for suction pressure and evaporator temperature, external sensor values can be communicated to the EIM 336 via Modbus.

Control defrost
Enter a special defrost sequence to overrule normal control of the valve and defrost the evaporator.

Minimise compressor strain by setting Maximum Operating Pressure limits
If pressure exceeds this limit, then the controller adjusts the value on the expansion valve to reduce pressure, without lowering superheat.

EIM 336 Superheat Controller with ETS 6 Electronic Expansion Valve: Co-engineered for maximum energy efficiency

PRECISE:

- Minimum Stable Superheat algorithm keeps superheat at optimal level for capacity controlled systems
- Individually calibrated for all OEM solutions

FLEXIBLE:

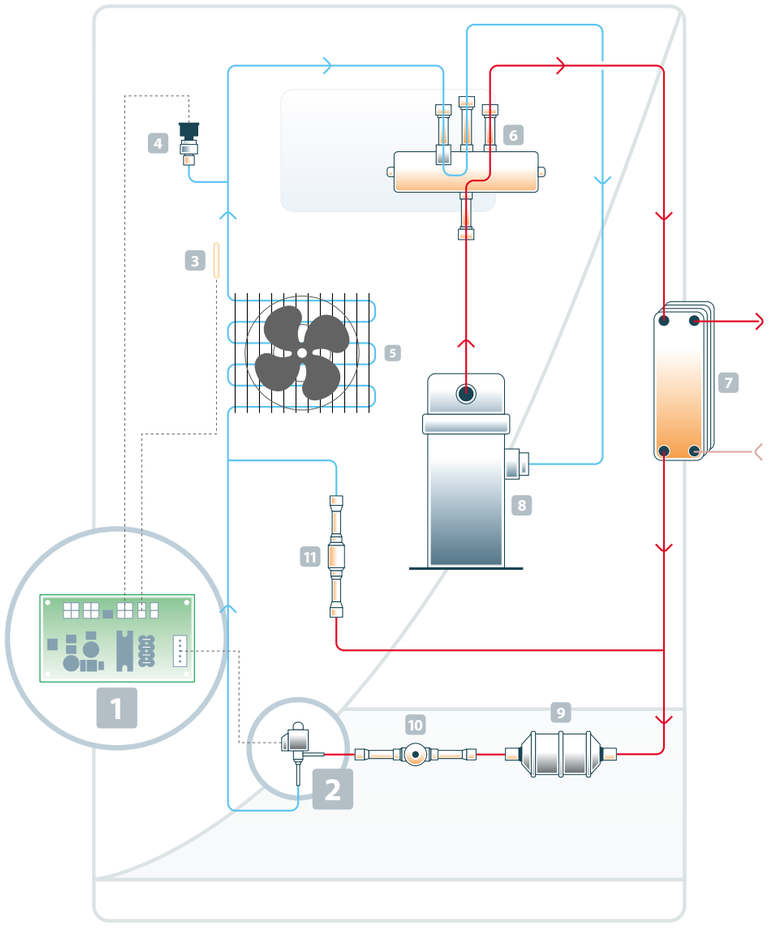
- Easy to install
- Controller works with Modbus interface or as stand-alone
- Works with all common refrigerants
- Compact and lightweight

RELIABLE:

- Protects compressors with Maximum Operating Pressure functionality
- Forced opening at start up and when off
- Loss of Charge indicator
- Designed and produced by Danfoss using best-in-class, proven technology and expertise

Technical specifications

This diagram illustrates how the EIM 336 Superheat Controller and ETS 6 Electronic Expansion Valve work together in a sample system. Actual system configuration and components will vary.



1 EIM 336 Superheat Controller:

Supply voltage	24 V AC/DC (+/-15%) Class II isolation	
Power consumption	Idle	Max. 10 mA @ 24V DC
	Operating	Max. 150 mA @ 24V DC
Input signals	P_O	AKS 32R (or similar ratiometric pressure transmitter)
	S2	PT1000
	S4	PT1000 or digital input from external contact
EEV driver	Max. current 150 mA	
EEV	Uni- or bipolar coil	
Data communication	RS485 – Modbus RTU	
Environment	Storage: -34°C to 71°C (-30°F to 160°F)	
	Operating: -25°C to 60°C (-13°F to 140°F)	
	Humidity: <95% RH, non condensing	
Dimensions	25 × 50 × 80 mm (0.98 × 1.97 × 3.15 inches)	
Operation	Via Modbus data communication	

2 ETS 6 Electronic Expansion Valve:

Maximum working pressure	47 bar (682 psig)
Compatible refrigerants	HCF, HCFC (R22, R134a, R404A, R407C, R410A)
Refrigerant oil	All mineral oils and ester oils (to lubricate ETS 6 valve)
Ambient temperature	-30°C to 60°C (-22°F to 140°F)
Fluid temperature	-30°C to 70°C (-22°F to 158°F)
Durability	Tested for 60 million total pulses supplied to partially open valve, which is comparable to 150,000 cycles if the valve is operated between 100 to 300 pulses when open. Tested for 30,000 full-stroke cycles, including 20-pulse overdrive at each closing.
Ambient humidity	95% RH or less
Modulation	Permanent magnet type, direct operating stepper motor
Electrical connection	JST XHP-6 and JST XHP-5
Excitation speed	Min. 30 pps (pulses per second) to max. 90 pps; 31.3 pps recommended
Operating range	0 to 480 pulses, no holding power required
Full motion transit time	Examples: 16 sec @ 30 pps, 6 sec @ 80 pps
Installation position	With coil on the upper side and the valve/coil assembly within ±15°of the vertical axis
Max. coil winding temperature	115°C (239°F)

A/C components in typical system

1. EIM 336 Superheat Controller
2. ETS 6 Electronic Expansion Valve
3. AKS 11 Temperature Sensor
4. AKS 32 Pressure Sensor
5. Evaporator
6. 4-Way Reverse Valve
7. Condenser
8. Variable Speed Compressor
9. DML Filter Drier
10. SGN Sight Glass
11. NRV Check Valves