

ENGINEERING  
TOMORROW



# Highly **reliable** and **efficient** **solutions** for **close controls** / **CRAC units**

Data centers demand the highest levels of reliability, uptime and energy efficiency. With a booming demand and higher evaporating temperatures, solutions need to evolve and become even more efficient. Discover the broadest portfolio of solutions available in the market.



Up to

**70%**

of the system value  
maximizes your  
system efficiency

[www.danfoss.com](http://www.danfoss.com)

## R410A/R454B | Component selection

R410A	Compressor	Electronic Expansion Valve	Filter Drier	Ball Valve	Check Valve	Sight Glass
20kW	VZH028	ETS5M-24	DCL165	GBC16s	NRVH16	SGP16s
25kW	VZH035	ETS6-30	DCL165	GBC18s	NRVH19	SGP16s
30kW	VZH044	ETS6-30	DCL165	GBC18s	NRVH19	SGP18s
40kW	VZH052	ETS6-40	DCL165	GBC22s	NRVH22	SGP22s
50kW	VZH065	ETS12C-12	DCL307	GBC22s	NRVH22	SGP22s
60kW	VZH088	ETS12C-12	DCL309	GBC28s	NRVH28	SGP22s
80kW	VZH117	ETS12C-16	DCL759s	GBC28s	NRVH28	SGS 1 1/8
110kW	VZH170	ETS24C-12	DCL759s	GBC35s	NRVH35	SGS 1 3/8

R410A	Compressor	Electronic Expansion Valve	Filter Drier	Ball Valve	Check Valve	Sight Glass
30kW	DSH090	ETS6-30	DCL165	GBC18s	NRVH19	SGP18s
35kW	DSH105	ETS6-32	DCL165	GBC22s	NRVH22	SGP19s
40kW	DSH120	ETS6-40	DCL165	GBC22s	NRVH22	SGP22s
45kW	DSH140	ETS6-40	DCL167s	GBC22s	NRVH22	SGP22s
52kW	DSH161	ETS12C-12	DCL307	GBC22s	NRVH22	SGP22s
58kW	DSH184	ETS12C-12	DCL309	GBC28s	NRVH28	SGP22s

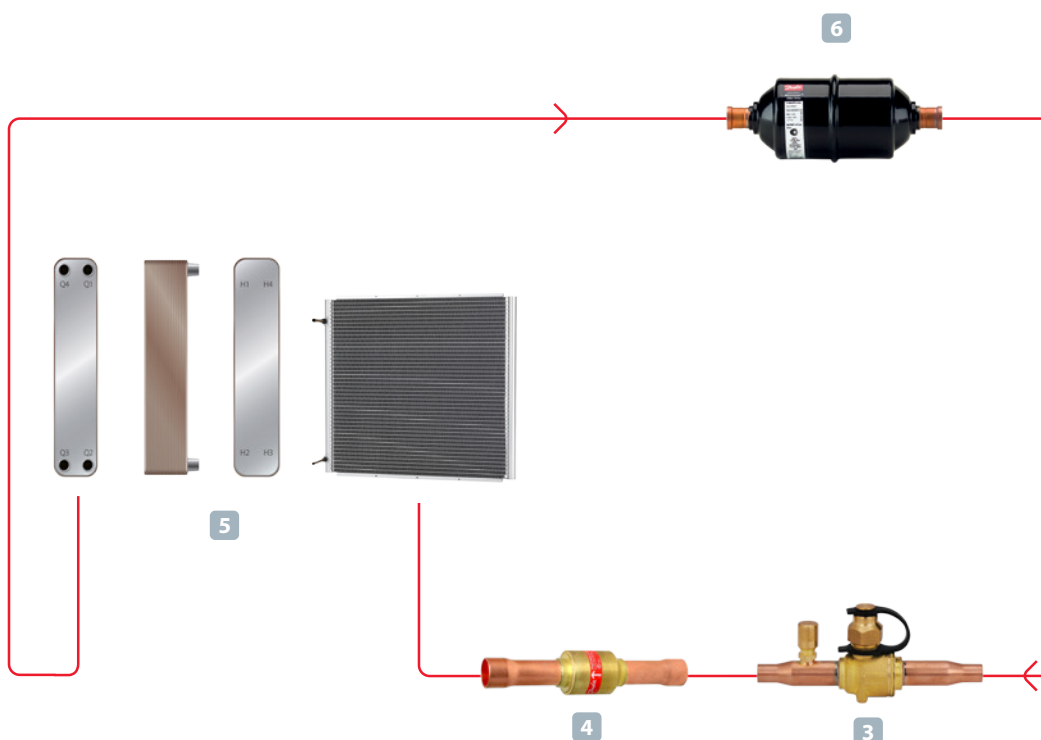
2-circuit units are frequent. Usual design features one fixed-speed compressor on one circuit and one variable-speed compressor on the second circuit.

Rating conditions: Evaporating Temp 15°C; Condensing Temp 50°C; Superheat 5K; Subcooling 5K.

## Application Diagram

Close Control Air-Conditioning components in typical system

- 1 Compressors
- 2 Pressure switch
- 3 Ball valve
- 4 Check valve
- 5 Condensers: MPHE or MCHE heat exchangers
- 6 Filter drier
- 7 Sight glass
- 8 Expansion device
- 9 Evaporators: MCHE
- 10 DST P110 pressure sensor  
EKS 221 temperature sensor
- 11 Pressure sensor



## R32 | Component selection

R32	Compressor	Electronic Expansion Valve	Filter Drier	Ball Valve	Check Valve	Sight Glass
30kW	DSF090	ETS6-30	DCL165	GBC18s	NRVH19	SGP18s
33kW	DSF100	ETS6-32	DCL165	GBC22s	NRVH22	SGP19s
39kW	DSF115	ETS6-40	DCL165	GBC22s	NRVH22	SGP22s
44kW	DSF130	ETS6-40	DCL167s	GBC22s	NRVH22	SGP22s
50kW	DSF155	ETS12C-12	DCL307	GBC22s	NRVH22	SGP22s
57kW	DSF175	ETS12C-12	DCL309	GBC28s	NRVH28	SGS22s
63kW	DSF200	ETS12C-12	DCL309	GBC28s	NRVH28	SGS22s

Rating conditions: Evaporating Temp 15°C; Condensing Temp 50°C; Superheat 5K; Subcooling 5K.

### Your toolbox



**Coolselector®2:** Use Coolselector for component selection based on your system settings

[Coolselector®2 free cooling calculation software | Danfoss](#)



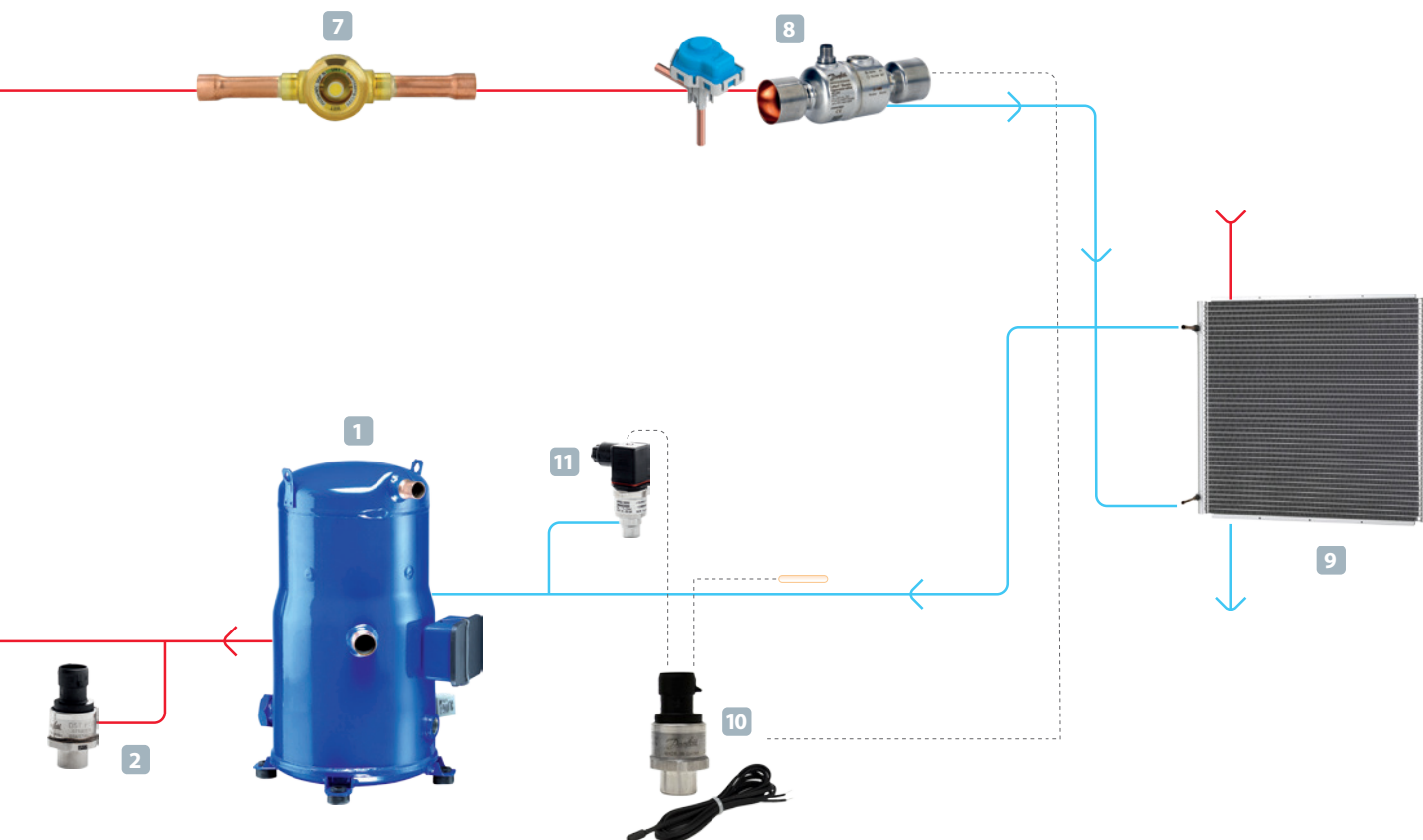
**Hexact:** heat exchanger design software

[Hexact | Heat exchanger design software | Danfoss](#)



**RefTool:** the essential, all-in-one mobile app for air conditioning and refrigeration technicians

[Ref Tools | Refrigerant slider and other support tools in one app | Danfoss](#)





## The most extensive range of components for close controls / CRAC units



### Compressors

Broadest range of inverter scrolls VZH and fixed-speed scrolls DSH and DSF from 20 to 110 kW as single circuit for VZH options, 4 to 52TR and 7.5 to 150 TR per circuit respectively, with wide operating maps to fit IT cooling conditions and help lower data center cooling costs. Variable speed ensures a temperature setting as precise as  $\pm 0.3^{\circ}\text{C}$ .



### Electronic controllers

From a basic valve driver to a complete system controller capable of monitoring and controlling fans, pumps, valves and compressors as needed. Danfoss electronic systems are based on a global, open and flexible system and can be programmed using standard communication protocols.



### Electronic expansion valves

The ETS series comprises a complete range of electrically operated expansion valves for precise liquid injection into evaporators. For the highest precision and reliability, it is recommended to use the Danfoss Superheat Controllers range.



### Heat exchangers

Danfoss offers a comprehensive range of highly efficient and customizable Micro-Channel and Micro-plate heat Exchangers to bring system efficiency to the next level and reduce on refrigerant charge.



### Sensors and switches

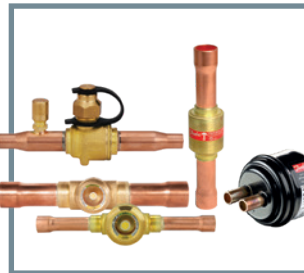
Danfoss pressure and temperature sensors are fully compatible with all Danfoss controllers and ensures reliable and accurate control for air conditioning applications.

The sensors ensure precise measurements of pressures and temperature allowing safe & energy efficient operation of the system controls and are approved for all common refrigerants in use.



### Solenoid valves

Direct or servo-operated valves for liquid, suction and hot gas lines with fluorinated refrigerants. Delivered as a parts program, so you can design your valves according to your requirements.



### System protectors

Our line of driers, check valves, ball valves, and other system protectors are designed to perform under the most strenuous operating conditions and protect your equipment from potential failures during your system's lifetime.



### Thermostatic expansion valves

Regulate the injection of refrigerant liquid into evaporators. Injection is controlled by the refrigerant superheat. The range comprises a variety of valves designed for specific applications