ENGINEERING TOMORROW

NeoCharge
Take the shortcut to low-charge

NeoCharge is a game changer in industrial refrigeration. This unique yet simple technology reduces the charge in both new and existing systems. With easy installation in any type of system, NeoCharge gives you a shortcut to low-charge.

Reduce energy costs by up to 20% and increase capacity by up to

40%

www.danfoss.com/NeoCharge

Low-charge your system.

Super-charge your business

Introducing NeoCharge:
Cut ammonia charge and reduce energy cost

NeoCharge is a complete control system that gives industrial refrigeration systems low-charge capabilities. This allows refrigeration facilities to either cut energy and refrigerant costs–or increase capacity with the same charge in existing system.

In Direct Expansion (DX) systems, NeoCharge eliminates superheat by operating evaporators in a much more stable and controlled way. This means that ammonia returns from evaporators with zero superheat or slightly wet.

In recirculating systems, the NeoCharge solution delivers a stable and controllable low recirculating ratio regardless of changing conditions. This reduces the ammonia charge by 30-40% in existing systems or even more in new systems.

In short, NeoCharge is a complete solution that turns the tables when it comes to low-charge.

How **NeoCharge works**

NeoCharge is a simple solution that takes evaporator control to a new level. In essence, it ensures evaporators are always fed with the exact right refrigerant charge.

The solution includes sensors, electronic control and valves.

Put simply, NeoCharge detects how much liquid is leaving each evaporator to control the injection valve. The heart of the solution is the controller, which runs with just a few parameters.

The system relies on differences in liquid gas heat conductivity to make reliable two-phase measurements; it is equipped with a dual-sensor system that relies on superheat and heat assisted superheat signals.

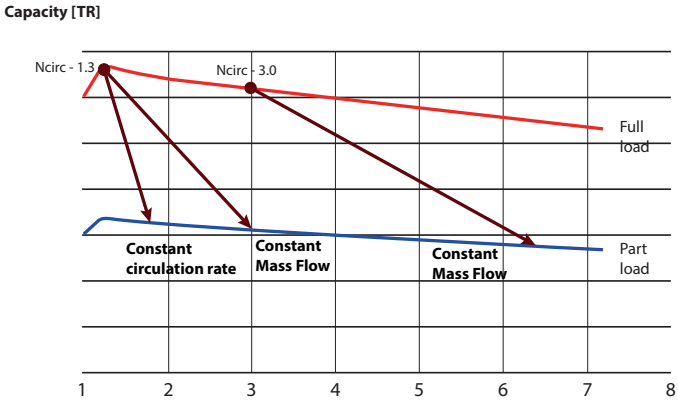
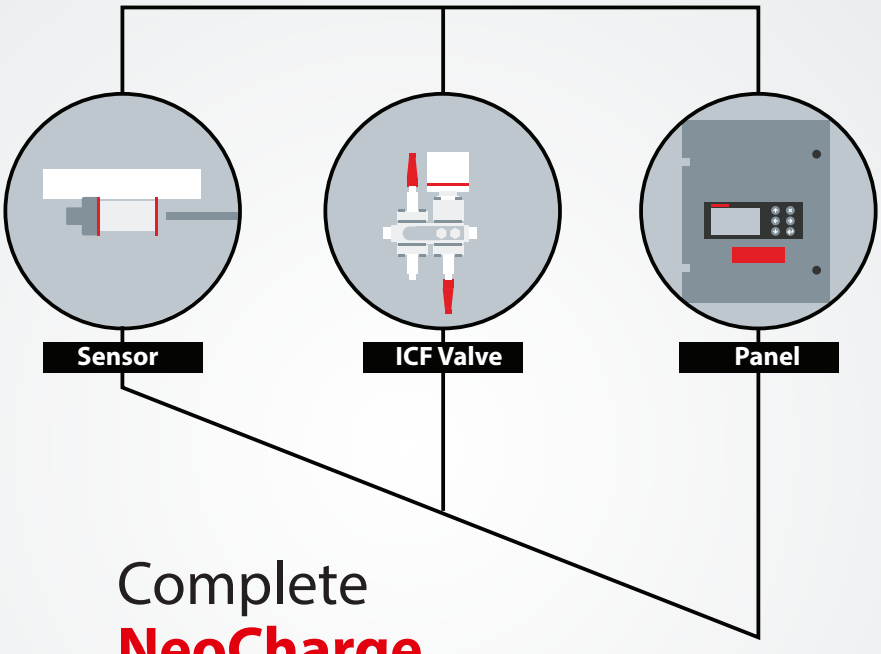


Figure 2: A stable system

NeoCharge feeds each evaporator with the exact right charge at all times. Even during capacity reduction, the circulation rate remains fixed. With NeoCharge dynamic control, all cooling processes remain stable.



Complete **NeoCharge** solution

Take the shortcut to **low-charge**

NeoCharge
The new
game changer

NeoCharge benefits

- Reduce energy costs by up to 20%
- Increase capacity by up to 40%
- Easy to install in any model of air cooler: traditionally overfeed or direct expansion systems
- Self-adaptive technology and Modbus connectivity
- Retrofit existing systems or deploy in new-construction
- Smaller system footprint, accumulator vessels, and piping

Cut costs for refrigerants and energy

NeoCharge drastically improves the performance of both new and existing refrigeration systems.

In traditional overfeed systems, the charge is reduced by up to 45%. In Direct Expansion systems, evaporator performance is kept at zero superheat, lowering operatoinal costs. In new systems, performance is optimized for annual savings.

Ammonia charge
with NeoCharge technology

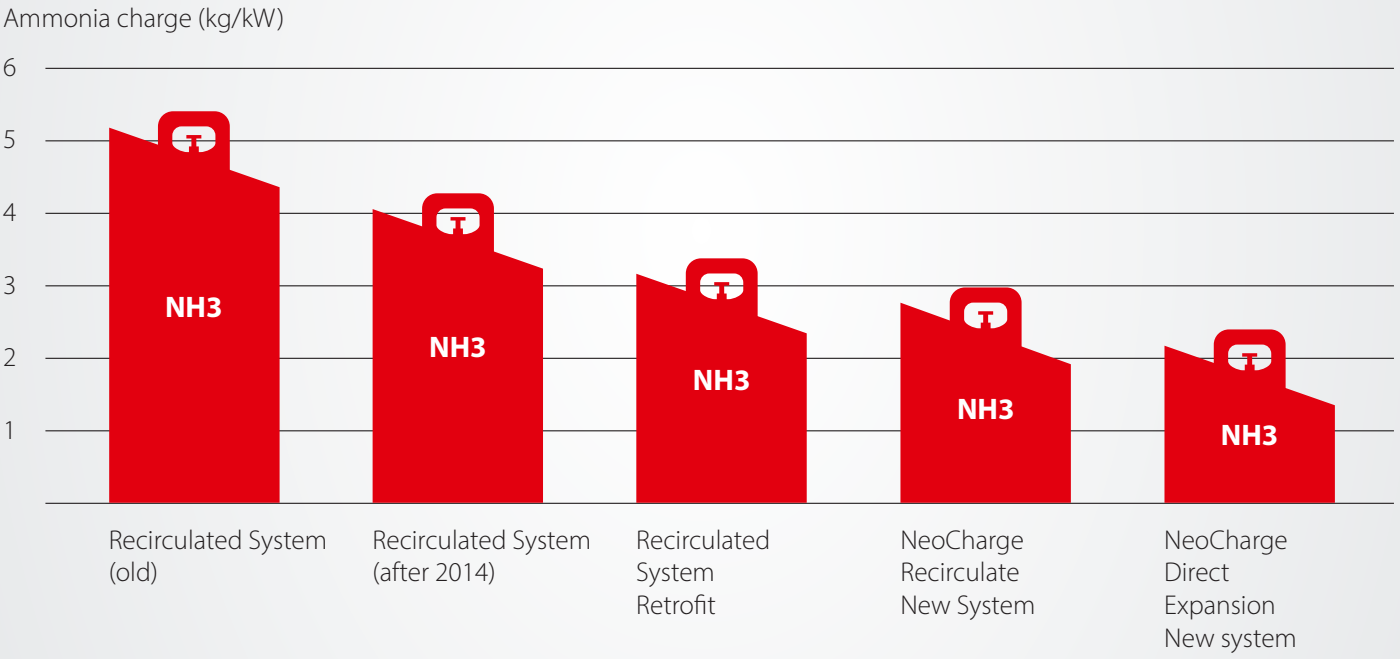


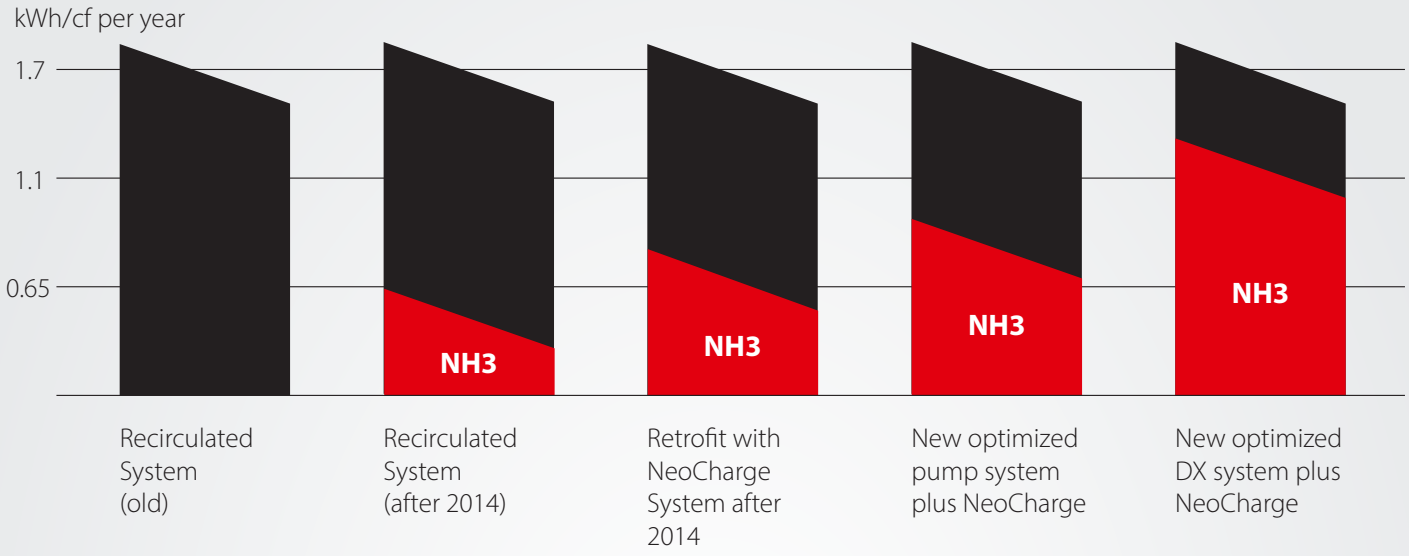
Figure 3: Charge reduction with NeoCharge

- *Charge reduction up to 45%*
- *40% extra capacity with the same charge in case of retrofit*

NH3 29 TR -31 °F	Design r=3	Actual r=4.65	Controlled r=1.5	Saving
Evaporator V=26 gal	51 lb	60 lb	35 lb	25 lb
Wet suction pipe Ø4" 32 sq. ft.	29 lb	37 lb	15 lb	22 lb
Tot	80 lb	97 lb	51 lb	47 lb

Figure 4: Ammonia savings in systems retrofit with NeoCharge
r = recirculation rate

Energy savings potential
with NeoCharge technology



Based on 3.5m cf cold storage energy consumption.

Figure 5: Power savings in different systems with NeoCharge

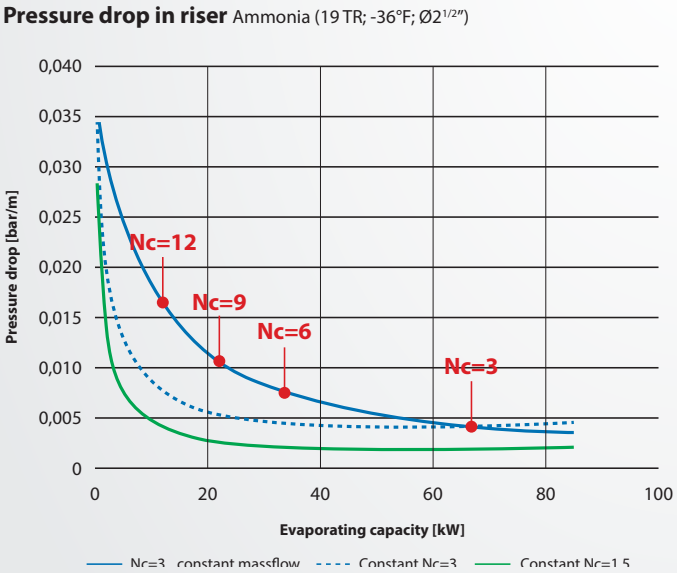
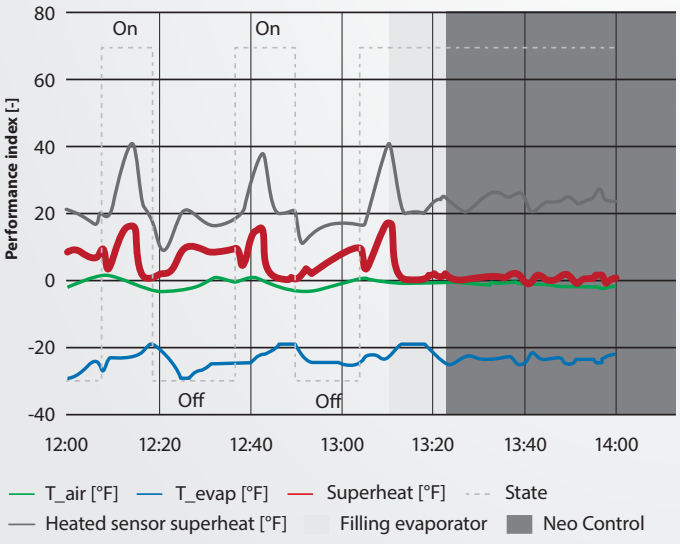
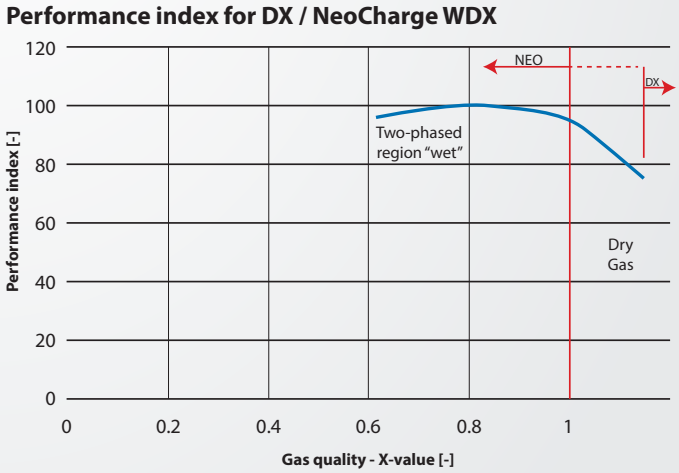


Figure 6: Reduction of suction pressure loss

With NeoCharge, suction pressure loss can be reduced by up to 60% for a 16 ft riser at -31°F reducing compressor power consumption. This means pump size can be reduced by 30% (285 TR cooling capacity @-31°F).

DX energy savings





Figures 7 and 8: Direct Expansion energy savings

Direct Expansion (DX) systems are commonly controlled using the superheat signal. But the used superheat must be compensated. This results in a lower evaporating temperature, which in turn results in a 5-15% higher energy consumption. NeoCharge eliminates this need.

A plug-and-play system
for easy installation

Application
NeoCharge can be applied to both NH3 and CO2 air coolers. It is easy to mount on bottom-, top-, or side-fed systems and is suitable for stainless steel pipes as well as carbon-steel galvanized pipes.

Signal required
Minimum signal required is Cooling ON, OFF and defrost ON/OFF (in existing system).

Defrost in new systems
In new systems, the Danfoss NeoCharge Control Panel can manage defrost in addition to injection control.

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About **Danfoss**

Danfoss is focused on engineering a better tomorrow. From one of the world's first radiator thermostats and mass-produced frequency converters to the many solutions and technologies that push the boundaries of what's possible today, we have always kept an eye on building a better future. Our journey began in 1933 when Mads Clausen founded Danfoss in his parent's farmhouse in Nordborg, Denmark. Since then, the business has grown from a solo enterprise into one of the world's leading innovative and energy-efficient solutions suppliers.

The passion for technology and our customers has led to a legacy of rising to increasingly complex challenges and delivering exceptional results. With the promise of quality, reliability, and innovation deeply rooted in our DNA, we deliver an extensive range of products and solutions across a multitude of business segments. Our focus on meeting ESG ambitions sets us apart, and we believe it allows us to pioneer decarbonization solutions, best-in-class circular products, transparency, and a better customer experience.
Partner with us, and let's engineer the future together.

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