

# Johnson Controls Marine

## CO<sub>2</sub> provision plant

### Example of project success factors:

- Design and project management builds on decades of industry experience
- Understanding of shipowners' and shipbuilders' requirements
- Highest system efficiency



### Johnson Controls

#### Cruise & Advanced Offshore

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## Reducing the carbon footprint by CO<sub>2</sub> units?

### Project overview

In the search for energy efficient and low emission units for provision cooling on board cruise liners, the old technology of using carbon dioxide (CO<sub>2</sub>) is now seeing new light.

### Customer needs

This technology was very common in the early to mid 1900's after which synthetic refrigerants took over during several decades. Now, however, there are cost effective solutions available that also take advantage of the environmental aspects and high efficiency CO<sub>2</sub> units provide.

The unit with its multiple compressors and variable frequency drives, is compact yet serviceable, based on an industrial and robust design and can be approved by any major classification society. Another of the many advantages is its reduced footprint compared with conventional provision units – the space used for a conventional set-up of one freeze and one chiller unit can be reduced by roughly 50% with our CO<sub>2</sub> unit.

### Product and services application

Even though, at first impression, it may seem strange to use CO<sub>2</sub> units in the current days of chasing CO<sub>2</sub> reductions, it is obvious when you look at the facts this is a very clever solution.

Basically, the CO<sub>2</sub> units contain a relatively small amount of refrigerant (CO<sub>2</sub>), and moreover the Global Warming Potential (GWP) = 1. Compare this with the numbers of e.g. R448A (1273) or R407C/F (1774/1825) and you will see the superiority of using a unit operating with CO<sub>2</sub>.

So, if you need a compact, clever and clean provision cooling unit, contact us to see even more of the benefits we can offer.

### Johnson Controls solution

As Johnson Controls is your go-to-guys for a complete offering of marine refrigeration, we now provide CO<sub>2</sub> Transcritical Booster Units specially designed for cruise ships. Our cutting-edge design capabilities enable the correct level of customization – if any – to fit your specific needs and budget.

The standard, which our units build upon, is a cascade unit operating in transcritical, mode, offering the highest possible efficiency for freeze and chill systems. The unit is easily connected to the glycol/ brine system, which also facilitates a retrofit installation of a CO<sub>2</sub> from an existing HFC plant.