

# PRODUCT SHEET

## SUBCOOLER

Transfer Lines

Conditioning Equipment

Automatic Gas Vent

Degasser

Phase Separator

**Subcooler**

Components

Filling Stations

Controlling

The presence of boil-off gas within a vacuum insulated transfer line, created by static and dynamic losses, may reduce the functionality or capacity of your system. Vacuum-insulated subcoolers are used to condition two-phase cryogenic gases into a one-phase flow. With this one-phase flow, control systems can operate better and become more stable. Stabilisation of control systems reduces over-spillage, and sometimes transfer line diameters can be downsized.

The liquid nitrogen subcooler consists of a heat exchanger submerged in a bath of liquid nitrogen at atmospheric pressure. By diverting some liquid from the incoming process line to the atmospheric bath, the system is self-supplying. The level inside the atmospheric bath is automatically controlled by a combination of an electro-pneumatic (regulating) valve, level sensor and level controller.



### BENEFITS

One-phase flow allows better and stable temperature control

Possibility of spraying liquid on products

Works ideally in situations when the nitrogen supply from a bulk tank becomes unstable

### FEATURES

All stainless steel design

Vertical orientation

Universal inlets and outlets with Demaco Johnston bayonet couplings

Up to 16 bar working pressure

Integrated DC-LS-050 capacitive level sensor

Electro-pneumatic valve for filling atmospheric bath

Standard cleanliness: Process clean

PED approved design with CE certificate

### APPLICATION

Directly after bulk storage tank to maintain one-phase flow of large consumptions

At the end of transfer lines directly before consuming machine(s)

Freeze tunnels in food industries or aluminium extruders

### STANDARD STOCK MODELS

Type	Cooling Spirals	Max mass flow [kg/h] <sup>(1)</sup>
DC-SC-500	1	500
DC-SC-1500	3	1500
DC-SC-3500	7	3500

<sup>(1)</sup>Large gas volumes in pre-supplied liquid results in less cooling capacity

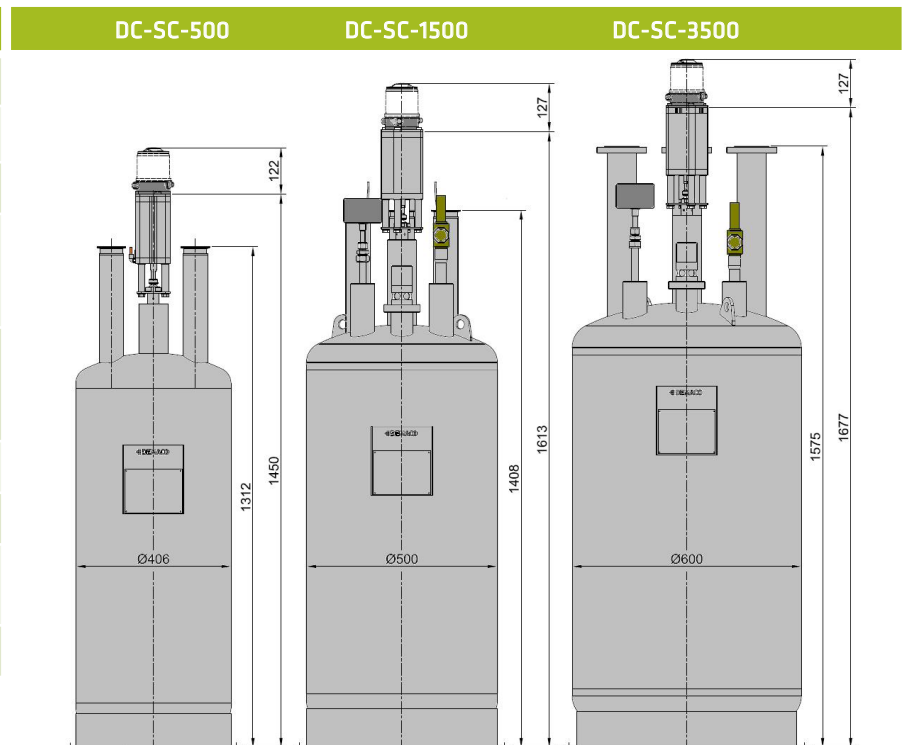
→ [www.demaco.nl](http://www.demaco.nl)

**DEMACO**

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TECHNICAL DATA	
Positioning	Indoor / Outdoor
Ingress protection	IP65
Ingress protection	Vertical
Design pressure	
- Spiral	PN 18
- Bath	PN 0,5
Working pressure	
- Spiral	Max. 16 barg
- Bath	Atmospheric
Level indication	Capacitive
Safety precautions	Pressure relief valve
Power supply	24/110/240 VAC or 24 VDC
Pneumatic supply	Minimum 6 barg



### OPTIONS

2x PT100 to measure inlet and outlet temperature

Regulating filling valve

Two media coolers

Oxygen clean on request

FDA certification on request

### MATERIALS

Inner vessel and cooling spiral  
1.4301/1.4306/1.4307 ~304(L)

Vacuum jacket  
1.4301/1.4306/1.4307 ~304(L)

Spacers  
Epoxy-reinforced glass-fibre

Multi-Layer Insulation  
Glass paper and Aluminium foil

Johnston bayonet coupling  
Fe36Ni and Buna N

(1) Large gas volumes in pre-supplied liquid results in less cooling capacity

### DESIGN SPECIFICATIONS

Standard according to Pressure Equipment Directive (PED)

Design according to AD2000

Cleanliness level:

Cleaned oil and fat-free, inspected for process clean

Oxygen clean on request

Static vacuum with Multi-Layer Insulation

Standard testing for each subcooler:

Dimensional check

Pressure test

NDE by X-ray or PT

Helium leak test (<math>1 \times 10^{-9}</math> mbarL/sec)

Vacuum retention test after 24h at ambient temp. (acceptance level <math>2 \times 10^{-4}</math> mbar)

Functional test at -196°C

### DOCUMENTATION

A standard manufacturer data book record is part of each project and contains:

As-built isometrics (if applicable)

Safety guidelines

User manuals

Declaration of conformity