Linde Gas

VERISEQ® SLG150.
Sterile liquid gas.

Sterile liquid gas

The VERISEQ® SLG150 unit supplies sterile liquid nitrogen by liquefying sterile-filtered gaseous nitrogen. The fully automatic process can be operated either batchwise or continuously. The filter cartridge is easily replaced when the normal operating interval for the sterile filter has passed. The VERISEQ® SLG has been designed to allow for a non-destructive inline integrity test of the sterile filter. Steam In Place (SIP) is used to sterilize the unit prior to operation.

Aseptic engineering and Good Engineering Practice (GEP)

The VERISEQ® SLG150 unit has been designed and manufactured in accordance with Good Engineering Practice (GEP) and ISO 9001: 2000. Specifications adhere to the guidelines of ISPE. All parts in contact with sterile nitrogen have been designed for aseptic operation. Every unit is submitted to a Pre-Delivery Inspection (PDI) before leaving the factory. Additionally, we offer assistance with regard to FAT and SAT as well as with IQ and OQ protocols for validation.

Critical process data

The critical process values are available as 4–20 mA analog signals for monitoring purposes.

Documentation

Each VERISEQ® SLG150 unit delivery is accompanied by a complete set of documents that include manuals for installation, maintenance, safety, and operation. This documentation also contains component data sheets and electrical/dimensional drawings, as well as complete manufacturing control records comprising welding documentation, material certificates and test protocols.

Pressure vessel approval

The VERISEQ® SLG150 complies with the Pressure Equipment Directive (PED), 97/23/EC. The unit design has undergone a full HAZOP inspection.

Electrical safety

The VERISEQ® SLG150 complies with the Low Voltage Directive (LDV), 73/23/EEC, as well as with the Electromagnetic Compatibility Directive (EMC), 89/336/EEC.

Materials used in construction

The materials in contact with sterile nitrogen are stainless steel 1.4401, 1.4404 and 1.4435 (all of which correspond to AISI 316 and AISI 316L). Gaskets and seals are EPDM and PTFE and the heat exchangers are brazed with copper (nickel brazing is optional).

Technical data

Process data

Nominal flow rate:	150 kg/h sterile liquid nitrogen

Operative pressure range

Sterile nitrogen side:	7.0 to 10.0 bar g
Cooling nitrogen side:*)	3.0 to 6.0 bar g
Steam:	1.5 to 2.5 bar g

*) The desired pressure and flow capacity of the sterile liquid nitrogen determines the required pressure of the cooling nitrogen.

Temperature range

Sterile nitrogen side:	+140 to -196 °C
Cooling nitrogen side:	+50 to -196°C

Dimensions

Width:	1,000 mm
Depth:	600 mm
Height:	2,000 mm
Weight:	290 kg

Control system

Control system:	Siemens PLC Simatic S7 with CPU313C-2DP
Operator panel:	OP170B

Utilities

Electricity:	(1P+N) 230 V, max 16 A, 50/60 Hz
Compressed air:	5.0 to 7.0 bar g
Clean steam:	1.5 to 2.5 bar g
Plant steam:	1.0 to 2.5 bar g
Cooling nitrogen:	3.0 to 6.0 bar g

Connections

Sterile nitrogen	Inlet:	DN20	TC
Sterile nitrogen	Outlet:	12x1 mm	Mini-TC
Cooling nitrogen	Inlet:	DN10	Flange
Cooling nitrogen	Outlet:	DN25	Flange
Clean steam	Inlet:	DN15	TC
Plant steam	Inlet:	DN15	TC
Steam condensate	Outlet (2x):	12x1 mm	Mini-TC
Exhaust nitrogen/ventilation	Outlet:	SMS38	TC
Filter integrity test	Connections:	12x1 mm	Mini-TC

Linde Gas - ideas become solutions.

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