

Cryo Line Systems

Cold remains cold –
wherever you want!



Cryogenic liquefied gases...

...like nitrogen, oxygen and argon are stored in special storage vessels

Cryotherm offers vacuum super-insulated transfer line systems as well as the appropriate equipment, so that the gases coming from the vessels reach the „point of use“ only with low evaporation losses.

In order to ensure that your project can be realised within a very short period of time and that you can make immediate use of the economic benefits, we stand by your side right from the beginning. Together with you, we carry out the planning, the design and the assembly of the cryogenic line system tailored to your requirements.

A modular construction specially developed for the nominal widths DN 14 and DN 25 is suitable for the most varying tasks and can be supplied from stock in the standard lengths of 3, 6 and 12 metres.

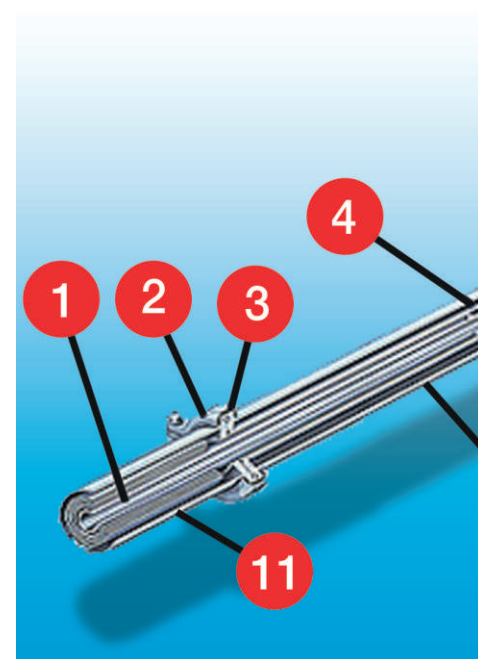
General constructive features

- Welded construction made of non-magnetic, highly corrosion resistant stainless steel
- In rigid or flexible design
- Super-insulated couplings for flexible possible extension or combination

- Coupling types: easily removable plug-in couplings and firmly installed weld couplings
- Long service life of the insulation vacuum by the application of adsorption material and special getter
- Quality control in each production phase
- Leak tests of the inside and outside lines

High thermal quality

Thanks to computer-aided optimised thermal design and multi-layer vacuum super-insulation between inside and outside lines



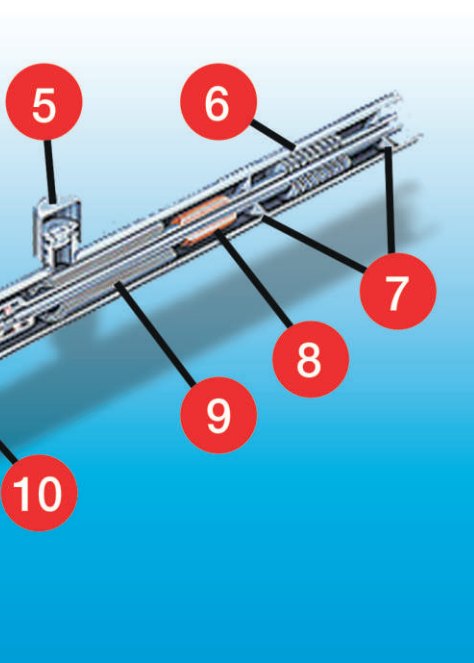
Essential constructive features

- 1 Inside line made of highly corrosion-resistant cryogenic steel (1,4301), completely welded
- 2 Flanged joint consisting of straining ring and fastening screws
- 3 O-ring-seal
- 4 Cryogenic seal
- 5 Combined vacuum seal-off and pressure relief device protects the vacuum room against unacceptable high pressure

Flexible and rigid line systems



The right module for every task



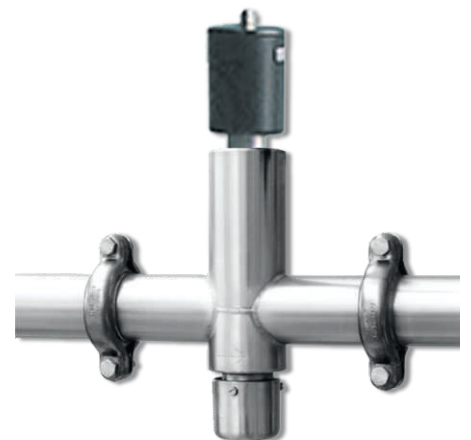
Flexible line systems

Vacuum super-insulated flexible line
DN 20 with plug-in coupling DN 14



Rigid line systems

Vacuum superinsulated straight line
elements and angles with plug-in
coupling DN 14



- 6 Expansion compensator for the compensation of the linear expansion due to heat
- 7 Distance blocking: Distance holder between inside and outside line
- 8 Adsorption material
- 9 Super-insulation: Multilayer vacuum insulation by means of computer-optimised thermodynamic design
- 10 Line parts 1 and 2
- 11 (vacuum super-insulated, vacuum system closed in itself)

Advantages of flexible and rigid line systems

- Optically appealing
- Made of non-magnetic highly corrosion-resistant stainless steel. Therefore, they can also be used in clean rooms and in food industry
- By the application of plug-in couplings, they are expandable and can be combined without any problems
- Long service life of the vacuum by the application of adsorption material and special getter. Thus, your gas consumption and the maintenance intervals can be optimized

Super-insulated gas separators and phase separators

The phase separator and the gas separator serve to separate the gas evolving from the liquid phase even with the best insulation and to discharge it from the line system. They are advantageously arranged directly close to the place of withdrawal.

Super-insulated gas separators

- Efficient with continuous withdrawal
- The complete line between places of filling (e. g. storage tank) and withdrawal is permanently kept cold
- Constant filling pressure (e. g. storage tank) to the place of withdrawal
- Arrangement at the highest point of the line system
- Ideal for large-scale consumers



Super-insulated phase separators

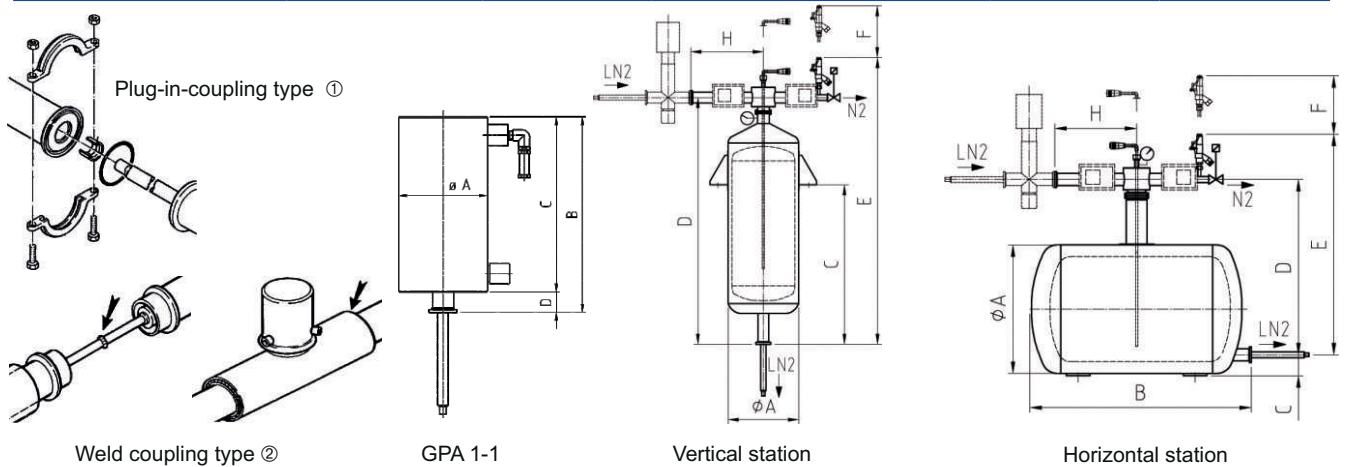
- Efficient with discontinuous withdrawal
- The line part between phase separator and place of withdrawal is permanently kept cold
- Low pressure at the place of withdrawal (= geodetic height of the liquid column)
- Arrangement at any place in the line system
- Ideal for small-scale consumers and/or numerous places of withdrawal
- With emergency supply functions



Specifications

The modular construction at a glance

Design	Gas Separator	Phase Separator Stations with Pressure-Maintaining Device				
	GPA 1-1	vertical		horizontal		
Content, geometrical [l]	5	50	100	50	100	200
Working Pressure [barg]	18	1.5/3	1.5/3	1.5/3	1.5/3	1.5/3
Weight empty/full [kg]	17/21	50/95	68/158	50/95	68/158	90/270
Ø A [mm]	219	340	450	450	550	650
B [mm]	480	-	-	740	940	1100
C [mm]	430	772	837	90	90	90
D [mm]	50	1192	1312	650	750	772
E [mm]	-	1360	1480	830	930	1280
F [mm]	-	270	270	350	350	270
H [mm]	-	350	350	350	350	450
Filling port	DN 14 F	DN 14 F	DN 14 F	DN 14 F	DN 14 F	DN 25 F
Withdrawal port	DN 14 M	DN 14 M	DN 14 M	DN 14 M	DN 14 M	DN 25 M
Exhaust gas port	1/4" NPT	DN 25	DN 25	DN 25	DN 25	DN 25
Control system	mechanical	electrical	electrical	electrical	electrical	electrical
Item number	78203542	78206619	78206617	78200335	78200285	78203475



Transfer Lines / Systems	Rigid Design					Flexible Design	
	DN 14	DN 25	DN 40	DN 50	DN 100	DN 20	DN 32
Nominal ø	DN 14	DN 25	DN 40	DN 50	DN 100	DN 20	DN 32
Coupling type: ①=plug-in; ②=weld	①/②	①/②	①/②	①/②	②	① - DN14	① - DN25
Outer ø of line [mm]	52	76,1	84	104	159	68	86
Outer ø of weld coupling [mm]	76.1	88.9	104	129	204	-	-
ø of wall opening [mm]	150	200	250	250	300	150	200
Smallest laying radius [mm]	-	-	-	-	-	400	500
Assembly requirement for plug-in coupling [mm]	300	400	400	450	-	300	400
Rec. Working Pressure [barg]	8	8	8	8	8	8	8
Design Pressure [barg]	18	18	18	18	18	18	18
Weight empty [kg/m]	2.4	5.3	6	7.5	14	3.5	6.6
Weight with LIN [kg/m]	2.6	5.7	6.65	9	20.3	3.8	6.6
Cold-down quantity LIN [l/m]	0.21	0.42	0.70	1.20	2.95	0.38	0.58
Heat admission rates							
Line without mounting parts [W/m]	0.45	0.50	0.60	0.70	1.30	1.1	1.3
or related to LIN [l/m * h]	0.010	0.012	0.014	0.016	0.030	0.025	0.029
per coupling [W]	2.8	4.5	5.5	8.1	15.5	2.8	4.5
or related to LIN [l/h]	0.06	0.1	0.14	0.22	0.45	0.06	0.1



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