MESSER
Gases for Life

CRYOSOLV™ VEC System.

Cryogenic condensation and recovery of volitile organic compounds, VOCs.

CRYOSOLV™ M50, M150 and M500 modules. The CRYOSOLV M50 module is equipped with an optional valve.

General

The CRYOSOLV Vapor Emission Control (VEC) system provides flexible, compact, and efficient equipment and solutions to minimize the atmospheric emission of volatile organic compounds (VOCs) by using cryogenic liquid nitrogen.

Advantages

- Nitrogen is an inert gas that is not harmful to the environment
- The nitrogen does not mix with the VOCs, therefore both the nitrogen and the condensed VOCs can be reused for other purposes within the process
- The process is free of chlorofluorocarbons (CFC's) and generates no wastewater or secondary pollution
- The equipment has no sources of ignition and has been designed to safely operate in potentially explosive atmospheres
- Costs are recovered through nitrogen recycling, solvent recovery, and increased production
- Operators interact with the equipment through a simple and easy-to-use control panel

Areas of use

CRYOSOLV VEC systems are most suitable for cleaning process gases containing elevated VOC levels and process gas flows less than about 35,000 scf/hr. The freezing point of the substances to be condensed should preferably be below -22 ºF. This technology is used for recovering VOCs either as pure compounds or as mixtures. Examples of such compounds include:

- Hydrocarbons
- Halocarbons
- Alcohols
- Solvents
- Volatile natural compounds

Multiple solutions

- Condensation modules: CRYOSOLV M50, M150, M500 with nominal flow capacity of 50, 150, and 500 Nm^3/h respectively. Any of these solutions can combine with each other to create a system to treat emissions with flow ranges between 10 and 1,000 Nm^3/h.
- Condensate tank module: CRYOSOLV TM100 can be connected to any of the three condensate modules for safe and convenient collection of condensate.

Technical data

	CRYOSOLV M50	CRYOSOLV M150	CRYOSOLV M500
Process Data			
Nominal flow rate [Nm³/h] / [SCFM][1]	50/32	150/95	500/317
Nominal cooling duty [kW][1] / [BTU/hr]	6/20,470	25/85,300	80/273,000
Min./max. pressure [bar(g)] ([psi(g)])[2]			
- Process gas side	-1/+5.5 (-14.5/80)[3]	-0.5/+0.5 (-7.25/7.25)	-0.5/+0.5 (-7.25/7.25)
- Nitrogen side	3/19 (44/275)	3/14.8 (44/215)	3/14.8 (44/215)
Min. / max. temperature [°C] ([°F])[4]			
- Process gas side	-200/+200 (-328/+392)	-200/+200 (-328/+392)	-200/+200 (-328/+392)
- Nitrogen side	-196/+150 (-320/+302)	-196/+150 (-320/+302)	-196/+150 (-320/+302)
Skid dimensions[5]			
Width [mm] / (in.)	800/31	800/31	1200/47
Depth [mm] / (in.)	1200/47	1200/47	1600/63
Height [mm] / (in.)	2800/110	3400/134	4300/169
Weight [kg] / (lbs.)	420/926*	820/1808	1680/3704
Control Panel dimensions[5]			
Width [mm] / (in.)	760/30	1000/39	1000/39
Depth [mm] / (in.)	300/12	400/16	400/16
Height [mm] / (in.) including Socket Elements	760/30	1920/75	1920/75
Weight [kg] / (lbs.)	100/220*	110/242	110/242
Control system	Siemens PLC Simatic S7 with CPU314		
Operator panel	OP177B	OP177B	OP177B
Connections[5]			
Process gas			
- Inlet flange 150# RF	DN100 / 4"	DN100 / 4"	DN200 / 8"
- Outlet flange 150# RF	DN50 / 2"	DN100 / 4"	DN150 / 6"
Condensate, outlet flange 150# RF	2 x DN25 / 1"	DN50 / 2"	DN100 / 4"
Liquid nitrogen, inlet flange 300# RF	ISO G 1/2" Female[6]	DN15 / 0.5"	DN25 / 1"
Gaseous nitrogen			
- Inlet flange 300# RF	n/a	DN15 / 0.5"	DN25 / 1"
- Outlet flange 300# RF	1/2" NPT[6]	1/2" FNPT[6]	DN50 / 2"
Utilities			
Electricity (EU)	230V, 25A, 1P+N	400V, 32A, 3P+N	400V, 50-60 Hz, 32A, 3P+N
Electricity (NEC)	230 VAC, 25 A, 2P	460-480 VAC, 60 Hz, 32 A, 3 Ph	460-480 VAC, 60 Hz, 32 A, 3 Ph
Compressed air			
- Pressure [bar(g)] / [psi(g)]	5-7 / 70-100	5-7 / 70-100	5-7 / 70-100
- Dew point [°C] / [°F]	<-40 / <-40	<-40 / <-40	<-40 / <-40

[1] These values are nominal values. For most applications, the system can handle loads that range anywhere from 20% to a full 100% of these nominal values. In some cases, the upper load limit can even exceed 100%.

[2] Minimum/Maximum allowable pressure for which the equipment, with its internal components, is designed.

[3] Option for maximum allowable pressure of 10 bar(g) available.

[4] Minimum/Maximum allowable temperature for which the equipment, with its internal components, is designed.

[5] Without installed options and pipe connection.

[6] Internal threaded fitting.

* As measured by Tramega on 2/21/18.

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