

Steam Heated Vaporisers for CO₂

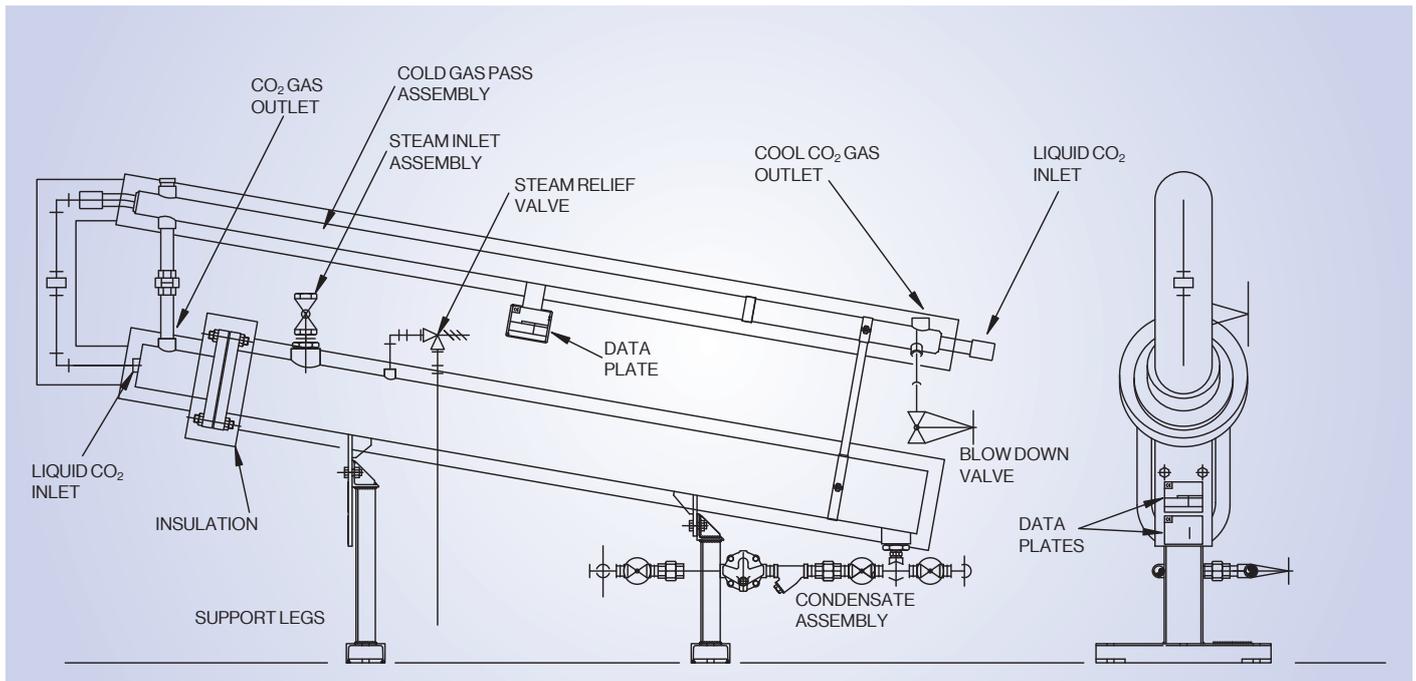


Steam heated vaporisers provide an easy and cost effective method of vaporising large quantities of liquid CO₂ to gas. Designed for direct connection to the outlet of a bulk storage tank, the steam vaporisers are available with nominal vaporisation capacities of 0.5 te/h, 1.0 te/h and 2.0 te/h.

The steam vaporisers are double tube heat exchangers with CO₂ in the inner tube and steam in the outer. The whole assembly is inclined at an angle of 10° from the horizontal. The vaporisers conform to PED 2014/68/EU and vessels are constructed to PD 5500 : 2012 Cat II. They are CE marked.

The steam vaporisers are designed to operate with a steam inlet valve and condensate assembly. When large quantities of cool CO₂ gas are required, a cold gas pass can be attached to the vaporiser, which will reduce the outlet temperature of the gas. A pressure relief device must be fitted to protect the vaporiser against over-pressure.

Steam heated CO₂ vaporiser with cold gas pass



Steam Inlet Assembly

The steam inlet valve controls the flow of steam into the vaporiser. It is a bronze globe valve, sized to suit the capacity of the vaporiser, complete with a nipple to connect the valve to the vaporiser inlet port.

Part Numbers

Vaporiser nominal capacity tonne/h	Steam inlet valve	Part number
0.5	Rc1	2224.2211
1	Rc1½	2224.2212
2	Rc2	2224.2209

Steam Relief Valve

The steam side of the steam vaporiser should be protected against over pressure by the steam relief valve, preset to 7.6 bar. This is threaded R1½ and screws directly into the steam relief valve connection on the vaporiser body - part number 2224.2207.

Cold Gas Pass

The cold gas pass is an energy-efficient attachment to the steam vaporiser which will cool the out-flowing CO₂ gas and reduce steam consumption. The cold gas pass is a single pass tube heat exchanger, arranged so that the incoming low temperature liquid CO₂ cools the warm outgoing gas, resulting in cool gas at the outlet point of the assembly.

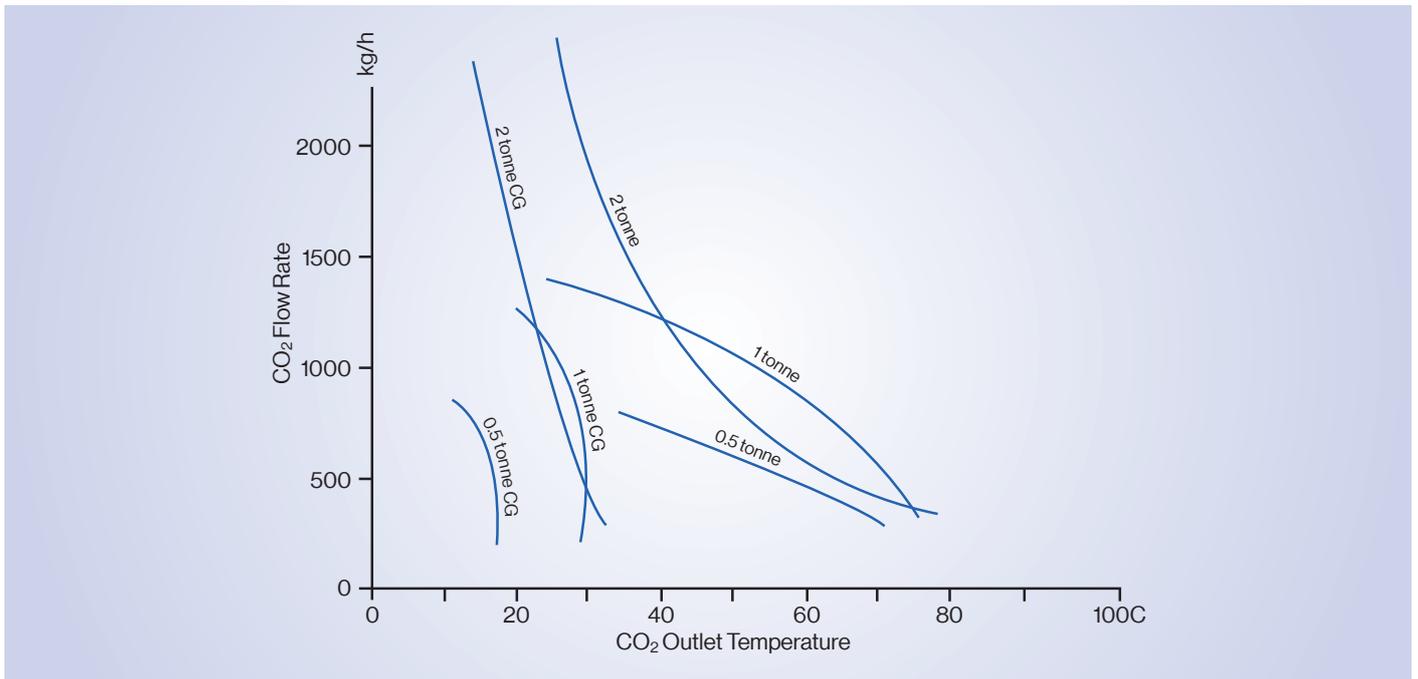
Condensate Assembly

The condensate assembly is connected to the condensate outlet port on the steam vaporiser and removes water from the system by means of a steam trap. The assembly contains a by-pass, allowing quick drainage before vaporiser start up and continuous use even when the assembly is being maintained. Two sizes are available to suit the three capacities of steam vaporiser.

Specification

Vaporiser nominal capacity tonne/h	0.5 & 1	2
Inlet connection	R¾	R1
Outlet connection	Rp¾	Rp1
Max working pressure (bar)	7	7
Length (mm)	990	1004
Net weight (kg)	9.2	11.5
Part number	2224.2201	2224.2202

Outline performance curves for steam heated CO₂ vaporisers with a CO₂ inlet pressure of 20.7 bar and a steam inlet pressure of 2.7 bar.



Specification

Nominal vaporisation capacity (tonne/h)	Max CO ₂ design pressure (bar)	Approx min CO ₂ outlet temperature (inlet at -17°C)		Steam consumption (dry saturated) at 2.7 bar (kg/h)	CO ₂ connections		Steam connections	
		without cold gas pass	with		Inlet	Outlet	Inlet	Condensate
0.5	29	40°C	15°C	84	Rc1	Rc1	Rc1	Rc¾
1	29	40°C	20°C	168	Rc1	Rc1	Rc1½	Rc¾
2	29	25°C	15°C	304	Rc1	Rc1½	Rc2	Rc1

Dimensions (excluding insulation)				Approx net weights (excluding insulation)		
Vaporiser nominal capacity (tonne/h)	Length of body (mm)	Diameter of vaporiser body (mm)	Max vaporiser height when mounted on supports (mm)	Vaporiser and supports (kg)	Vaporiser, supports steam inlet and condensate assembly (kg)	Vaporiser, supports steam inlet, condensate assembly and cold gas pass (kg)
0.5	1735	114	842	61	72	90
1	2090	168	978	119	134	152
2	2895	219	1177	243	263	295

Part numbers for vaporisers and accessories								
Vaporiser nominal capacity (tonne/h)	Vaporiser body	Vaporiser support legs		Steam inlet valve	Condensate assembly	steam relief valve 7.6 bar	Cold gas pass body	Support for cold gas pass
		Front	Rear					
0.5	2224.2001	2224.2319	2224.2320	2224.2211	2224.2201	2224.2207	2224.2101	2224.2316
1	2224.2002	2224.2319	2224.2320	2224.2212	2224.2201	2224.2207	2224.2101	2224.2317
2	2224.2003	2224.2319	2224.2320	2224.2209	2224.2202	2224.2207	2224.2102	2224.2318

Vaporiser with Cold Gas Pass	Capacity (tonne/h)	Insulated	Uninsulated
	0.5	2224.2010	2224.2009
	1	2224.2014	2224.2013
	2	2224.2018	2224.2017

Air Liquide CO₂ Equipment: Freeze, Pump, Vaporise, Protect



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