



## CRU 200 and 500 Series Condensate Recovery Units

### Description

The Spirax Sarco CRU 200 and 500 series condensate recovery units are designed to handle hot flashing condensate, which is commonly returned for use as boiler feedwater. The standard range can handle quantities up to 20 m<sup>3</sup>/hr, duty / assist up to 98 °C with varying pump delivery heads. For higher duties please contact Spirax Sarco.

The package comprises - receiver, frame, pumps, valves, level controls and prewired control panel.

### Receiver

Receivers are manufactured from 304 stainless steel. They are fitted with an adequately sized vent, overflow and inlet connections flanged to PN16. Vessels are leak tested. A water level gauge is fitted as standard, with integrated level control and high alarm.

### Frame

The frames are manufactured from carbon steel powder coated (black) or 304 stainless steel.

### Pumps

Pump housing and impellers are constructed from stainless steel and are designed for low NPSH conditions to handle hot condensate with the minimum of flooded suction. They are directly coupled to TEFC motors having class F insulation (class B temperature rise) motor enclosure class IP55.

### Control

Receivers are fitted with Spirax Sarco Colima Viscorol level indicators and SPDT switches which provide duty / assist control. Included is a control feature that alternates which pump starts first. This ensures both pumps will operate for the same duration over its life.

The control panel is a metal enclosure rated to IP65. The electrical supply required is 380 - 415 volts, 3 phase, 4 wire, 50 Hz. BMS interface is provided to monitor pump healthy and high level alarm conditions.

### Pump fitting

The motors and pumps are mounted under the receiver and are each connected to suction pipework incorporating isolation valves. Each pump discharge is fitted with a non-return valve suitable to connect to a PN16 flange.

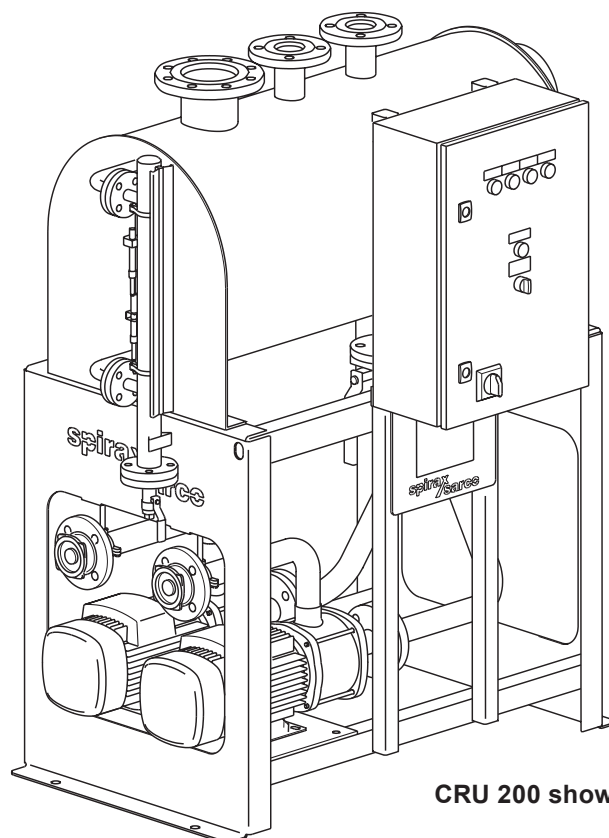
**Note:** System head regulation valves are not supplied as part on the unit, but it is recommended they are incorporated into the discharge pipework.

### Standards

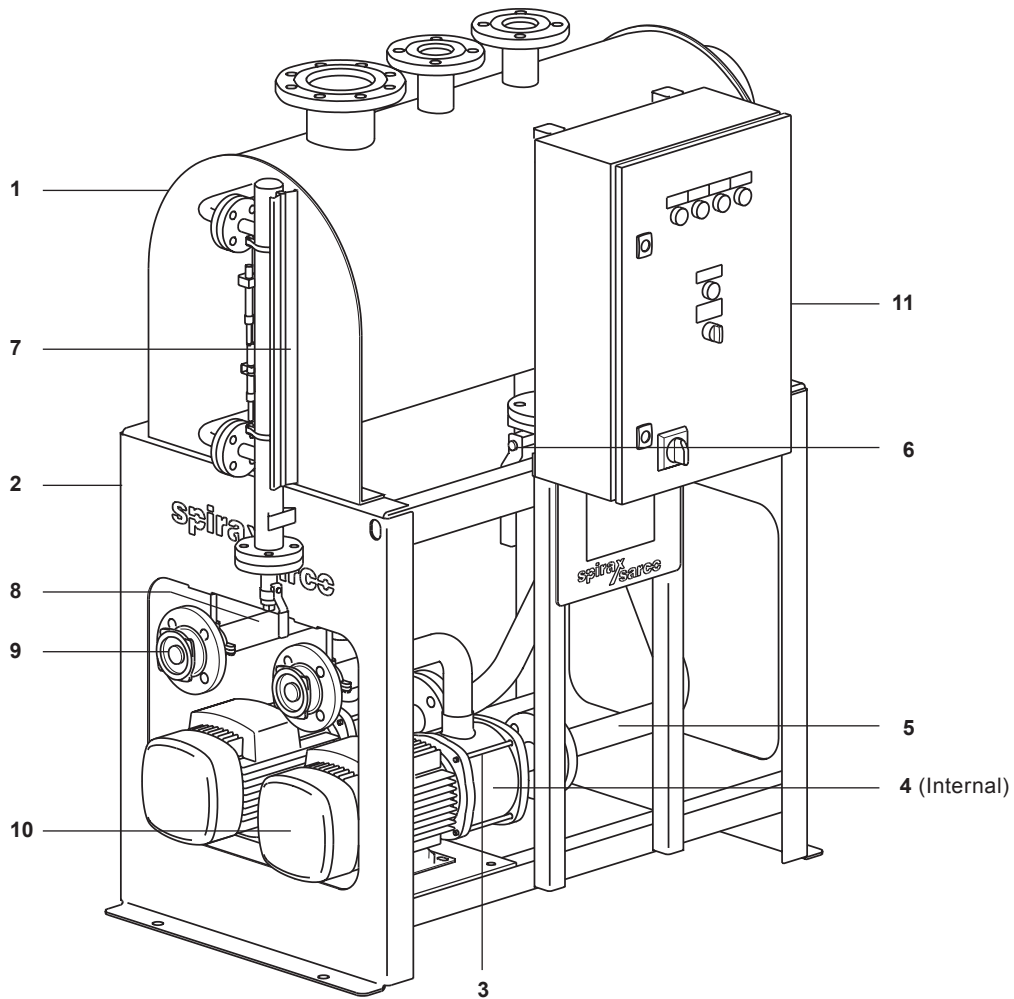
This product fully complies with the following directives

- European Machinery Directive 2006/42/EC,
- European Low Voltage Directive 2006/95/EC
- European Electromagnetic Compatibility Devices Directive 2004/108/EC.

The receiver is not a pressurised vessel and is designed to operate at atmospheric pressure and therefore falls outside the scope of European Pressure Directive.



CRU 200 shown

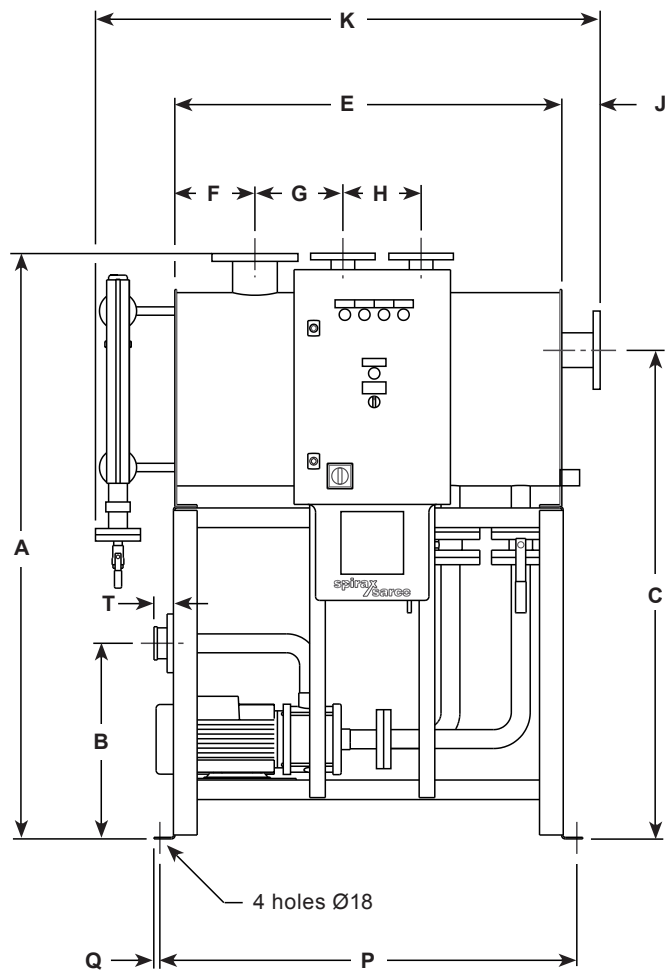
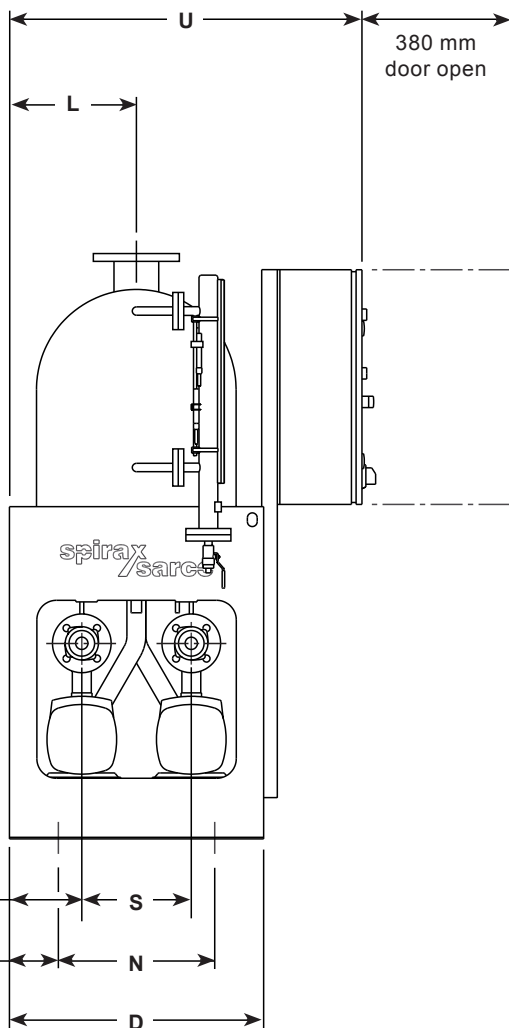


## Materials

No.	Part	Material
1	Receiver	304 stainless steel
2	Frame	Carbon steel with powder coating, or stainless steel 304
3	Pump casing	304 stainless steel
4	Pump impeller	304 stainless steel
5	Suction pipework	304 stainless steel
6	Isolation valves	304 stainless steel
7	Gauge glass	304 stainless steel / Polycarbonate
8	Discharge pipework	304 stainless steel
9	Check valve	Stainless steel (WS 1.4581)
10	Motor casing	Silumin (Alu)
11	Panel	Carbon steel with polyester finish or stainless steel 304
12	Cable covering (not shown)	Adaptaflex

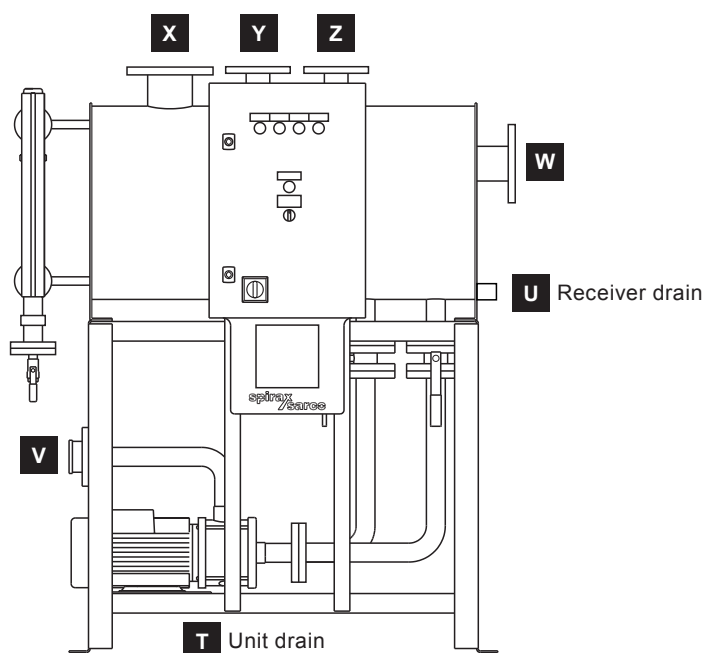
**Dimensions (approximate ) in mm**

<b>CRU 200</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>P</b>	<b>Q</b>	<b>R</b>	<b>S</b>	<b>T</b>	<b>U</b>
<b>CRU200-2D-CM33-CS</b> <b>CRU200-2D-CM33-SS</b>	1500	500	1280	650	990	205	225	200	100	1300	325	125	400	1056	20	210	230	50	950
<b>CRU200-2D-CM34-CS</b> <b>CRU200-2D-CM34-SS</b>																		70	
<b>CRU200-4D-CM101-CS</b> <b>CRU200-4D-CM101-SS</b>	1500	500	1215	650	990	180	250	200	100	1300	325	125	400	1056	20	185	280	50	950
<b>CRU200-4D-CM102-CS</b> <b>CRU200-4D-CM102-SS</b>																			
<b>CRU200-4D-CM103-CS</b> <b>CRU200-4D-CM103-SS</b>																			
<b>CRU 500</b>																			
<b>CRU500-4D-CM101-CS</b> <b>CRU500-4D-CM101-SS</b>	1800	625	1485	910	1250	205	350	300	100	1560	455	105	698	1317	20	315	280	80	1200
<b>CRU500-4D-CM102-CS</b> <b>CRU500-4D-CM102-SS</b>																			
<b>CRU500-4D-CM103-CS</b> <b>CRU500-4D-CM103-SS</b>																			
<b>CRU500-5D-CM151-CS</b> <b>CRU500-5D-CM151-SS</b>	1800	625	1485	910	1250	205	350	300	100	1560	455	105	698	1317	20	245	420	80	1200
<b>CRU500-5D-CM152-CS</b> <b>CRU500-5D-CM152-SS</b>																			



## Inlet and outlet connection and weights (approximate in kg)

CRU 200	Connections	V	W	X	Y	Z	Weight
		Outlet	Overflow	Vent	Inlet	Inlet	
CRU200-2D-CM33-CS CRU200-2D-CM33-SS	PN16	DN25	DN50	DN80	DN40	DN40	215
CRU200-2D-CM34-CS CRU200-2D-CM34-SS							
CRU200-4D-CM101-CS CRU200-4D-CM101-SS	PN16	DN40	DN80	DN100	DN50	DN50	245
CRU200-4D-CM102-CS CRU200-4D-CM102-SS	PN16	DN40	DN80	DN100	DN50	DN50	250
CRU200-4D-CM103-CS CRU200-4D-CM103-SS	PN16	DN40	DN80	DN100	DN50	DN50	275
CRU 500							
CRU500-4D-CM101-CS CRU500-4D-CM101-SS	PN16	DN40	DN80	DN100	DN80	DN80	TBA
CRU500-4D-CM102-CS CRU500-4D-CM102-SS	PN16	DN40	DN80	DN100	DN80	DN80	TBA
CRU500-4D-CM103-CS CRU500-4D-CM103-SS	PN16	DN40	DN80	DN100	DN80	DN80	TBA
CRU500-5D-CM151-CS CRU500-5D-CM151-SS	PN16	DN50	DN80	DN100	DN80	DN80	TBA
CRU500-5D-CM152-CS CRU500-5D-CM152-SS	PN16	DN50	DN80	DN100	DN80	DN80	TBA



### Vent pipework sizing

Consideration should be given to increasing the Vent Pipework from the receiver to prevent excessive back pressure and loss of the Overflow water seal. This is particularly important where the Vent Pipe run is longer than 10 m, has more than two elbows in the run or where there is known to be a substantial amount of Flash Steam in the condensate return pipework to the receiver.

Based on a 10 m equivalent length (including fittings) Vent Pipe capacities are shown in the table opposite

Flash Steam up to (kg/hr)	Vent Pipework nb (mm)
150	80
200	100
400	125
500	150
1000	200
1500	250

## Sizing and selection – Duty/assist pumps (50 Hz )

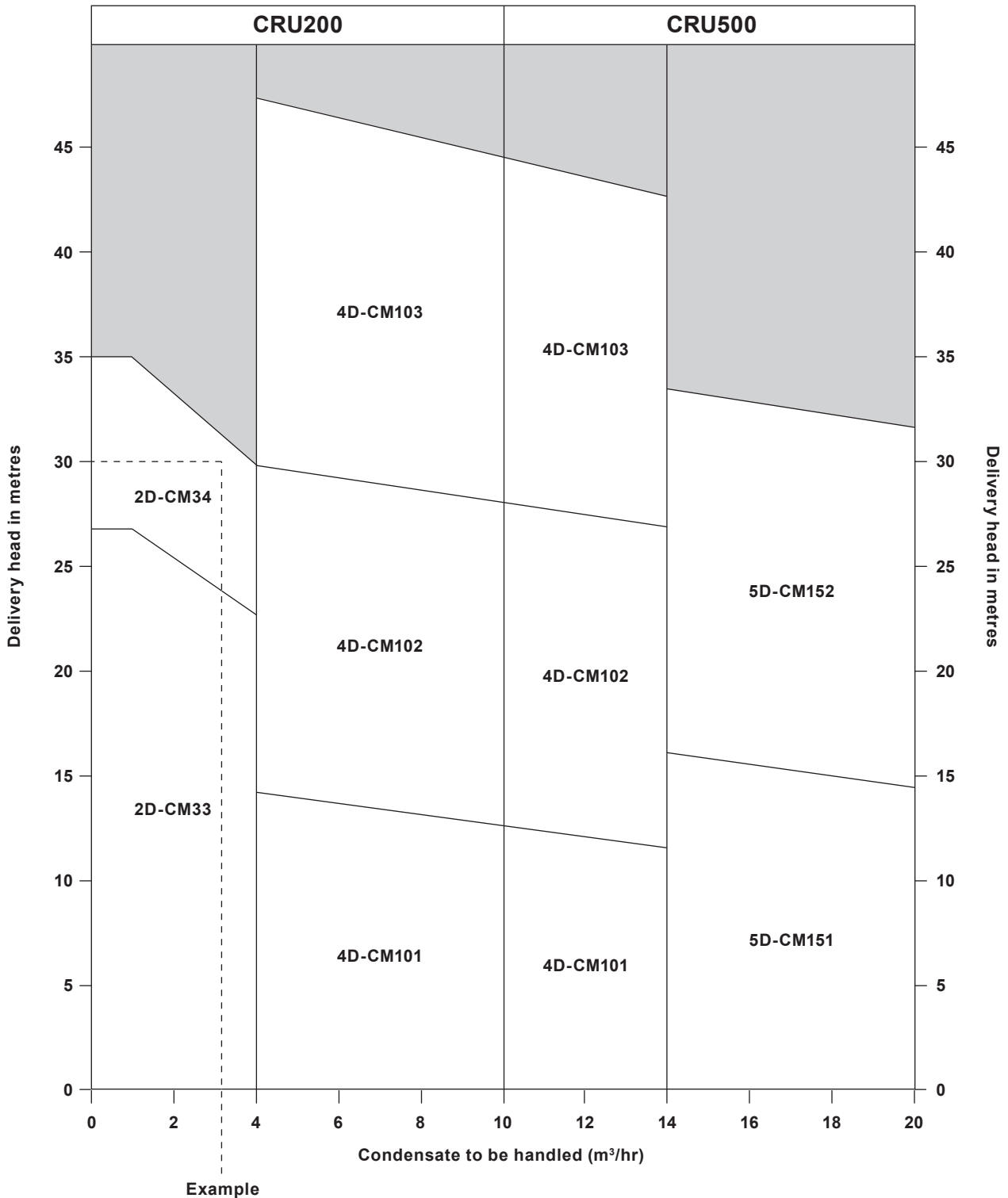
### Information required for sizing and selection:

1. Maximum load at which condensate returns to the receiver in m<sup>3</sup>/hr.
2. Total pumping delivery head, including lift and friction losses in pipework and fittings.

### Sizing and selection

For correct selection plot the condensate return rate to be handled against the total head required (static + friction) and select the appropriate unit. If selection is borderline then select the next largest unit.

**Selection example:** The condensate return rate is 3 m<sup>3</sup>/hr and the total head required is 30 m with a carbon steel frame. Draw a horizontal line from the known 30 m head required until it intersects with the vertical line that represents the 3 m<sup>3</sup>/hr of condensate to be handled. For this example the selection would be a CRU200-2D-CM34-CS.



## Nomenclature

<b>Unit</b>		CRU	CRU
<b>Receiver volumes (l)</b>		200	200
		500	
<b>Pump outlet size (D = Duplex pumps)</b>	DN25	2D	2D
	DN40	4D	
	DN50	5D	
<b>Pump selection</b>		CM33	CM34
		CM34	
		CM101	
		CM102	
		CM103	
		CM151	
		CM152	
<b>Frame options</b>	Carbon steel	CS	CS
	Stainless steel	SS	

## Typical specification

The condensate recovery unit shall be a Spirax Sarco CRU 200 Series CRU200-2D-CM34-CS condensate recovery unit, with a carbon steel frame and stainless steel receiver, designed and built to handle 3 m<sup>3</sup>/hr of condensate against a required delivery head of 30 m.

## How to order

**Example:** 1 off CRU200-2D-CM34-CS condensate recovery unit.

## Certification

A declaration of conformity to EN 10204 2.1 is available on request.

## Standard Options

- Loop seal kit (supplied loose) piping in stainless steel 304

## Bespoke Options (contact Spirax Sarco)

- ANSI 150 connections.
- Galvanized frames
- 60 Hz pump (do not use 50 Hz sizing chart for duties)
- CRU units with pumps operating duty / stand