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# spirax/sarco

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CH Issue 1

## CSM-PD

# Pre-heating and Degassing System for use with Clean and Pure Steam Generators

### Description

The pre-heating and degassing packaged system is available in several tank capacities enabling suitable feedwater to be supplied for clean and pure steam generators up to a steam production rate of 4 200 kg/h. Larger capacities are available upon request.

The unit comes tested and ready to commission once connected to available services.

### Available types

**CSM-PD500** Shell capacity 500 litres (working capacity 370 litres)

**CSM-PD1000** Shell capacity 1000 litres (working capacity 700 litres)

**CSM-PD2000** Shell capacity 2000 litres (working capacity 1 400 litres)

CSM-PD packages are also available using superheated water as the primary heating medium. Details are available on request from Spirax Sarco.

### Applications

The use of a pre-heating and degassing unit, for use with feedwater in unfired clean or pure steam generators solves a number of problems, reducing the life cycle costs of a steam generation system. In these systems chemicals cannot be used for treating or degassing the feedwater and therefore 'thermophysical/mechanical' systems are used instead, such as pre-heating of the generator feedwater to a temperature above 85°C.

### Principal features:

- External heat exchanger
- Microprocessor feedwater control
- All components in contact with clean water are stainless steel

### Sizes and pipe connections

Connection	Connection type	Connection size CSM-PD500 CSM-PD1000 CSM-PD2000
Plant steam	Flanged PN16	DN20 - DN40
Treated water	Flanged PN16	DN25 - DN50
Condensate drain	Flanged PN16	DN20 - DN32
Feedwater	Flanged PN16	DN25 - DN32
Drain	Flanged PN16	DN25
Air supply	Push fit for nylon pipe	8 mm ØD
Pre-heat tank overflow	Flanged PN16	DN40



### Pressure / temperature limits

Primary side (plant steam)	Working	Pressure	10 bar g
		Temperature	184°C
	Design	Pressure	10 bar g
		Temperature	200°C
Secondary side (feedwater) and heat exchanger	Working	Pressure	0.5 - 4 bar g
		Temperature	0 - 100°C
	Design	Pressure	10 bar g
		Temperature	110°C
Secondary side (treated water)	Working	Pressure	0 bar g
		Temperature	0 - 100°C
	Design	Pressure	0.49 bar g
		Temperature	110°C

### Materials

Part	Material
Pre-heat tank	Stainless steel 304L
Heat exchanger tubes	Stainless steel 316L
Frame	Mild steel Fe 360, painted
Feedwater pipework	Stainless steel 316L
Cabinet enclosure	Carbon steel, painted
Insulation covers	Aluminium
Insulation	Glass fibre
Pre-heat tank overflow pipework	Stainless steel 316L

## Technical date

<b>Pneumatics</b>	<b>Compressed air:</b> A 6 bar g compressed air supply is required; where this is unavailable an optional compressor can be supplied with the unit (at extra cost).	
<b>Electrical</b>	<b>Electrical requirements:</b> 400 V 3-phase 50 Hz (+ NEUTRAL). A fused isolator must be incorporated in the supply line as near as possible to the unit.	
<b>Feedwater quality</b>	If the CSM-PD is to form part of a system to meet the HTM 2010 and HTM 2031 requirements we would recommend operating at >85°C and using the following feedwater quality/purity. Whilst not mandatory the table below gives a guide to recommended typical values.	
	<b>Property</b>	<b>Maximum value</b>
	Ammonium	0.2 mg/l
	Heavy metals substitute	0.1 mg/l
	Chloride	0.5 mg/l
	Nitrate	0.2 mg/l
	Residue on evaporation	30.0 mg/l
	Phosphate	0.1 mg/l
	Silicate	0.1 mg/l
	Electrical conductivity at 25°C	35.0 µS/cm
<b>Control</b>	The control unit in addition to the logic and temperature and level PID controllers, include;	
	<ul style="list-style-type: none"> <li>- Minimum and maximum water level alarms</li> <li>- Visual level indication</li> <li>- Water temperature alarms</li> <li>- Lock-out devices</li> <li>- Interface with supervision system (BMS)</li> </ul>	

## Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the unit.

For spares information refer to the Installation and Maintenance Instructions supplied with the pre-heating and degassing package.

## Typical specification

The CSM-PD package is to provide a clean or pure steam generator designed and built to produce steam to the HTM 2031 standard. The operating condition of the steam generator is to raise 600 kg/h of clean steam at 3 bar g when supplied with plant steam at 8 bar g. The CSM-PD will provide a minimum of 20 minutes autonomy. All items are to be pre-assembled and mounted on to a skid base.

## Sizing

Sizing is totally dependant upon the clean steam generation requirements (secondary, clean steam production flowrate)

**For example:** A clean steam generator producing 600 kg/h clean steam will require a CSM-PD500.

**That is:** 600 kg/h multiplied by a factor of 0.33 = 200 kg/20 min = CSM-PD500 (working capacity = 370 litres).

## How to order

**Example:** 1 off Spirax Sarco CSM-PD500 pre-heating and degassing package.

**Please provide** details of primary steam pressure, clean steam pressure, clean steam flowrate, feedwater system and flowrate.

### Ancillary items to be used depending on installation:

- Isolation valves
- Separators
- Strainers

Other items may be required, please contact Spirax Sarco to discuss the full installation.

## Dimensions / weights (approximate) in mm and kg

Model reference	A	B	C	Weight kg	
				Dry	Wet
CSM-PD500	1 950	1 500	2 200	700	1 300
CSM-PD1000	1 950	1 900	2 700	1 100	2 300
CSM-PD2000	2 400	2 100	3 100	1 400	3 600

**Please note:** to allow for safe and comfortable working access we would recommend that at least 500 mm is kept clear of obstacles at the front and the back of the unit.

