

TI-P089-07 ST Issue 5

Series III Condensate Recovery Unit



Description

The Spirax Sarco condensate recovery units are designed to handle hot condensate, which is commonly returned for use as boiler feedwater. They can handle quantities up to 34 000 kg/h at 98° C with pump delivery heads up to 30 - 35 metres. A unit comprises three main parts - receiver, pump/pumps and control gear.

Standards

This product fully complies with the requirements of the European Machinery Directive 98/37/EC, European Low Voltage Directive 72/73/EEC and European Electromagnetic Compatibility Devices Directive 89/336/EEC. This product is not a pressurised vessel and therefore does not need to comply with the European Pressure Directive 97/23/EC.

Certification

The product is available with material certification to EN 10204 2.1 and EN 10204 2.2. **Note:** All certification/inspection requirements must be stated at the time of order placement.

Receiver

Mild steel receivers are hot dip galvanized after manufacture and mounted in a galvanised steel frame with plated fastenings. Copper receivers are mounted in lined cradles. Both types are fitted with an inspection cover and adequately sized vent, overflow, drain and two inlet connections screwed BSPT. They are pressure tested to 2.1 bar.

Water level gauges complete with brass shut-off and drain cocks can be provided as an extra.

Pumps

Pumps are constructed of cast iron fitted with Crane mechanical seals and gunmetal impellers specially developed for operation under conditions of extremely low NPSH to handle boiling condensate with the minimum of flooded suction. They are close-coupled to TEFC motors having class F insulation (class B temperature rise) motor enclosure rating IP55 minimum and running at 2 850 rpm (50 Hz) or 3 400 (60 Hz).

Control gear

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Receivers are fitted with a magnetic switch float level control. The single unit uses this to operate a single pump designed to discharge at the rate of 1.5 times the maximum condensate rate shown on the pump sizing chart.

The cascade unit uses two pumps, each rated at 1.1 times the maximum rate shown on the sizing chart.

The control panel incorporates a selector switch which allows the duty pump to take precedence in handling the load. If it is unable to cope with any peak load then the cascade method of control brings in the stand-by pump. This arrangement effectively provides automatic changeover in the event of pump electrical or mechanical failure.

Electrical equipment is suitable for 415 volt 3 phase 50 Hz or 60 Hz 4 wire supply (380 volt to special order). Control equipment is installed in a separate IP65 rated metal enclosure. Interconnecting wiring is not included.

Connection for BMS interface are provided to monitor pump run or tripped condition.

Fitting

Single or duplicate motorpumps are mounted under the receiver and have individual suction pipework, incorporating an isolating valve and resilient coupling. Pump deliveries are fitted with non-return valves screwed BSPT. With duplicate pumps, both discharges are on the same side of the unit.

Note: It is recommended that a lockshield valve should be fitted in the delivery pipework so that, in the event of the system head being substantially less than the unit head, the valve may be adjusted to increase the system head, thus reducing possible cavitation and noise.

Local regulations may restrict the use of this product to below the conditions quoted. In the interests of development and improvement of the product, we reserve the right to change the specification.

Nomenclature

The Spirax Sarco condensate recovery unit is described by a four figure code with a prefix letter and a suffix letter. Prefix letter - denotes nominal receiver size

- A = 100 litres B = 225 litres C = 550 litres D = 750 litres E = 1000 litres Two numbers indicate size of motor e.g.
 - 07 = 0.75 kW22 = 2.2 kW
- Suffix letter indicates number of pumps e.g.

S = Single pump C = Duplicate pumps with cascade control Example: E40C is therefore a unit with 1000 litre receiver and duplicate pumps, each with 4.0 kW motor.

Sizing

See TI-P089-05 and TI-P089-06

Information required for quotation or with order

- 1. Average rate at which condensate returns to the receiver in kg/h or lb/h.
- 2. Maximum temperature of condensate.
- **3.** Total pumping delivery head, including static and friction loss in pipe and fittings. In calculating the pipe friction, it must be remembered that the pumping rate is approximately 1.1 times the rate which the condensate returns to the receiver in the case of a cascade unit and 1.5 times in the case of a unit with single pump.
- 4. Electric supply available and voltage.
- 5. Any abnormal operating conditions which may be encountered.



Pump and motor details, connections and weights

Motor	Connections BSP		Weight Single Cascade			Motor	Connections BSP		Weight Single Cascade	
kW	A - A	B - B	pump	pumps	Unit	kW	A - A	B - B	pump	pumps
0.75	11⁄2	1	125 kg	145 kg	C5830	3.0	21⁄2	11⁄2	290 kg	390 kg
0.75	11⁄2	1	130 kg	150 kg	C5840	4.0	21⁄2	11⁄2	300 kg	400 kg
1.10	11⁄2	1	135 kg	155 kg	C5930	3.0	21⁄2	2	320 kg	450 kg
0.75	11⁄2	11⁄2	140 kg	160 kg	C5940	4.0	21⁄2	2	330 kg	460 kg
					C5955	5.5	21⁄2	2	350 kg	485 kg
1.10	2	11⁄2	155 kg	190 kg						
0.75	2	11⁄2	155 kg	190 kg	D5822	2.2	3	11⁄2	330 kg	435 kg
1.10	2	11⁄2	205 kg	275 kg	D5830	3.0	3	11⁄2	340 kg	445 kg
1.50	2	11⁄2	215 kg	285 kg	D5840	4.0	3	11⁄2	350 kg	455 kg
2.20	2	11⁄2	255 kg	295 kg	D5930	3.0	3	2	354 kg	473 kg
3.00	2	11⁄2	260 kg	360 kg	D5940	4.0	3	2	364 kg	483 kg
4.00	2	11⁄2	280 kg	385 kg	D5955	5.5	3	2	383 kg	500 kg
1.10	21⁄2	11⁄2	240 kg	270 kg	E5930	3.0	4	2	390 kg	530 kg
1.50	21⁄2	11⁄2	290 kg	400 kg	E5940	4.0	4	2	400 kg	540 kg
2.20	21/2	11⁄2	300 kg	410 kg	E5955	5.5	4	2	420 kg	560 kg
	Motor 0.75 0.75 1.10 0.75 1.10 0.75 1.10 2.20 3.00 4.00 1.10 1.50 2.20 3.00 4.00 2.20 2.20	Motor BS kW $A - A$ 0.75 $11/2$ 0.75 $11/2$ 1.10 $11/2$ 0.75 $11/2$ 0.75 $11/2$ 0.75 $11/2$ 0.75 $11/2$ 1.10 2 0.75 2 1.10 2 1.50 2 3.00 2 4.00 2 1.10 $21/2$ 1.50 $21/2$ 2.20 $21/2$	Motor BSP kW $A - A$ $B - B$ 0.75 $11/2$ 1 0.75 $11/2$ 1 0.75 $11/2$ 1 1.10 $11/2$ $11/2$ 0.75 $11/2$ $11/2$ 0.75 $11/2$ $11/2$ 0.75 2 $11/2$ 0.75 2 $11/2$ 1.10 2 $11/2$ 1.50 2 $11/2$ 3.00 2 $11/2$ 4.00 2 $11/2$ 1.10 $21/2$ $11/2$ 1.50 $21/2$ $11/2$ 2.20 $21/2$ $11/2$	Motor BSP Single pump 0.75 1½ 1 125 kg 0.75 1½ 1 130 kg 1.10 1½ 1 130 kg 0.75 1½ 1 130 kg 1.10 1½ 1 135 kg 0.75 1½ 1½ 140 kg 1.10 2 1½ 155 kg 0.75 2 1½ 155 kg 1.10 2 1½ 205 kg 1.10 2 1½ 215 kg 2.20 2 1½ 255 kg 3.00 2 1½ 280 kg 4.00 2 1½ 280 kg 1.10 2½ 1½ 240 kg 1.50 2½ 1½ 290 kg 2.20 2½ 1½ 300 kg	Motor kWBSP A - ABs BSingle pumpCascade pumps 0.75 $1\frac{1}{2}$ 1 125 kg 145 kg 0.75 $1\frac{1}{2}$ 1 130 kg 150 kg 1.10 $1\frac{1}{2}$ 1 135 kg 155 kg 0.75 $1\frac{1}{2}$ 1 135 kg 155 kg 0.75 $1\frac{1}{2}$ $1\frac{1}{2}$ 140 kg 160 kg 1.10 2 $1\frac{1}{2}$ 155 kg 190 kg 0.75 2 $1\frac{1}{2}$ 155 kg 190 kg 1.10 2 $1\frac{1}{2}$ 205 kg 275 kg 1.50 2 $1\frac{1}{2}$ 255 kg 295 kg 3.00 2 $1\frac{1}{2}$ 260 kg 360 kg 4.00 2 $1\frac{1}{2}$ 240 kg 270 kg 1.50 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 300 kg 410 kg	Motor kWBSP A - AB - BSingle pumpCascade pump 0.75 $1\frac{1}{2}$ 1 125 kg 145 kg 0.75 $1\frac{1}{2}$ 1 130 kg 150 kg 1.10 $1\frac{1}{2}$ 1 135 kg 155 kg 0.75 $1\frac{1}{2}$ 1 135 kg 155 kg 0.75 $1\frac{1}{2}$ $1\frac{1}{2}$ 140 kg 160 kg 0.75 $1\frac{1}{2}$ $1\frac{1}{2}$ 160 kg C5930 0.75 2 $1\frac{1}{2}$ 155 kg 190 kg 0.75 2 $1\frac{1}{2}$ 205 kg 275 kg 1.10 2 $1\frac{1}{2}$ 205 kg 275 kg 1.50 2 $1\frac{1}{2}$ 260 kg 360 kg 4.00 2 $1\frac{1}{2}$ 240 kg 270 kg 1.10 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 300 kg 410 kg	Motor BSP Single pump Cascade pumps Motor 0.75 1½ 1 125 kg 145 kg C5830 3.0 0.75 1½ 1 130 kg 150 kg C5840 4.0 1.10 1½ 1 135 kg 155 kg C5930 3.0 0.75 1½ 1½ 140 kg 160 kg C5940 4.0 0.75 1½ 1½ 155 kg 190 kg C5930 3.0 0.75 2 1½ 155 kg 190 kg D5822 2.2 1.10 2 1½ 205 kg 275 kg D5830 3.0 1.50 2 1½ 255 kg 295 kg D5930 3.0 2.20 2 1½ 260 kg 360 kg D5940 4.0 4.00 2 1½ 240 kg 270 kg D5955 5.5 1.10 2½ 1½ 240 kg 270 kg D5950 3.0	Motor kWBSP A - ASingle pumpCascade pumpMotor pumpsMotor kWA - A 0.75 $1\frac{1}{2}$ 1 125 kg 145 kg 0.75 $1\frac{1}{2}$ 1 130 kg 150 kg 0.75 $1\frac{1}{2}$ 1 135 kg 155 kg 0.75 $1\frac{1}{2}$ $1\frac{1}{2}$ 140 kg 160 kg 0.75 $1\frac{1}{2}$ $1\frac{1}{2}$ 140 kg 160 kg 0.75 $1\frac{1}{2}$ $1\frac{1}{2}$ 155 kg 190 kg 0.75 2 $1\frac{1}{2}$ 155 kg 190 kg 0.75 2 $1\frac{1}{2}$ 205 kg 275 kg 1.10 2 $1\frac{1}{2}$ 205 kg 275 kg 1.50 2 $1\frac{1}{2}$ 255 kg 295 kg 3.00 2 $1\frac{1}{2}$ 260 kg 360 kg 4.00 2 $1\frac{1}{2}$ 240 kg 270 kg 1.10 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 1.10 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 1.50 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 300 kg 410 kg	Motor kWBSP A - ASingle pumpCascade pumpsMotor pumpsMotor kWMotor A - AB - B 0.75 $1\frac{1}{2}$ 1 125 kg 145 kg $C5830$ 3.0 $2\frac{1}{2}$ $1\frac{1}{2}$ 0.75 $1\frac{1}{2}$ 1 130 kg 150 kg $C5840$ 4.0 $2\frac{1}{2}$ $1\frac{1}{2}$ 1.10 $1\frac{1}{2}$ $1\frac{1}{2}$ 140 kg 160 kg $C5930$ 3.0 $2\frac{1}{2}$ 2 0.75 $1\frac{1}{2}$ $1\frac{1}{2}$ 155 kg 190 kg $C5955$ 5.5 $2\frac{1}{2}$ 2 1.10 2 $1\frac{1}{2}$ 155 kg 190 kg $D5822$ 2.2 3 $1\frac{1}{2}$ 1.10 2 $1\frac{1}{2}$ 205 kg 275 kg $D5830$ 3.0 3 $1\frac{1}{2}$ 2.20 2 $1\frac{1}{2}$ 255 kg 295 kg $D5930$ 3.0 3 2 4.00 2 $1\frac{1}{2}$ 260 kg 360 kg $D5940$ 4.0 3 2 1.10 $2\frac{1}{2}$ $1\frac{1}{2}$ 240 kg 270 kg $E5930$ 3.0 4 2 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 25955 5.5 4 2 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg 25955 5.5 4 2 2.20 $2\frac{1}{2}$ $1\frac{1}{2}$ 290 kg 400 kg	Motor kW A - A B - B Single pump Cascade pump Motor pumps Motor kW A - A B - B Single pump 0.75 1½ 1 125 kg 145 kg C5830 3.0 2½ 1½ 290 kg 0.75 1½ 1 130 kg 150 kg C5840 4.0 2½ 1½ 300 kg 1.10 1½ 1 135 kg 160 kg C5930 3.0 2½ 2 320 kg 0.75 1½ 1½ 140 kg 160 kg C5930 3.0 2½ 2 330 kg 1.10 2 1½ 155 kg 190 kg C5955 5.5 2½ 2 350 kg 1.10 2 1½ 205 kg 275 kg D5830 3.0 3 1½ 330 kg 1.50 2 1½ 260 kg 360 kg 2 555 3 2 384 kg 0.59540 4.0 3 2 364 kg