

**YIA Millennium™  
SINGLE-STAGE  
STEAM or WATER  
ABSORPTION LIQUID  
CHILLER**

**COOLING CAPACITIES**

Steam: 420 to 4850 kW

Hot Water: 420 to 4850 kW

Warm Water: 200 to 4000kW

**YPC-ST Millennium™  
TWO-STAGE STEAM  
ABSORPTION LIQUID  
CHILLER**

**COOLING CAPACITIES**

Steam: 1050 to 2370 kW

**YPC-FS Millennium™  
TWO-STAGE  
DIRECT-FIRED  
ABSORPTION LIQUID  
CHILLER/HEATER**

**COOLING CAPACITIES**

700 to 2370 kW

**HEATING CAPACITIES**

565 to 1970 kW

York Absorption chillers use the earth's most environment friendly refrigerant – WATER – which is totally free of ozone depletion and global warming effects. By using waste heat or clean burning natural gas these machines are responsible for far less carbon dioxide production and acid rain producing emissions per kW of cooling than electrically driven machines.

In contrast to many absorption chillers using chromates or arsenates as corrosion inhibitors York absorption chillers use molybdate inhibitors which are not classified as a hazardous waste.

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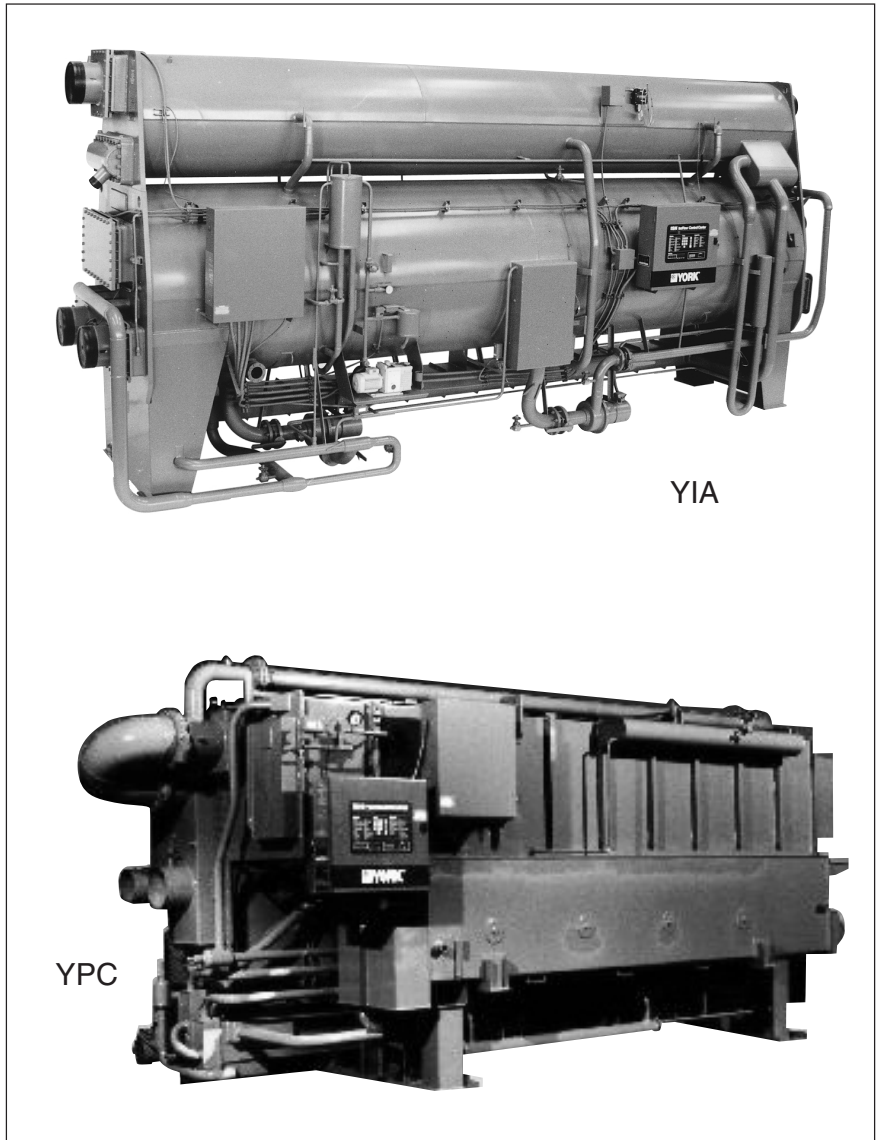
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**AVAILABLE MODELS & NOMINAL COOLING CAPACITIES** TABLE 1

YIA		YPC-ST		YPC-FS		
Model	Cooling kW	Model	Cooling kW	Model	Cooling kW	Heating kW
1A1	420					
1A2	550					
2A3	600					
2A4	720			12SC	703	563
2B1	830			13SC	809	675
3B2	960					
3B3	1090	14SC	1055	14SC	1055	844
4B4	1170					
4C1	1280			15SL	1231	1013
5C2	1440			16S	1407	1125
5C3	1570	16SL	1547	16SL	1547	1268
6C4	1820	17S	1705	17S	1705	1407
7D1	1990					
7D2	2170	18S	2039	18S	2039	1688
8D3	2480	19S	2373	19S	2373	1969
8E1	2790					
9E2	3190					
10E3	3380					
12F1	4040					
13F2	4340					
14F3	4840					

## FEATURES

### YIA

- Single-stage including economical operation mode with warm water at 80 °C.
- Refrigerant: water, absorbent: lithium bromide, non-acidic, non-toxic, non-flammable, odourless with ADVAGuard 750 added as corrosion inhibitor.
- Safe programming and servicing capabilities through *Millennium*<sup>TM</sup> control panel.
- Microprocessor control board with alphanumeric text display and memory for display and storage of operating and fault information.
- High reliability and long operation life.
- Hermetic pumps with 55,000 hour service inspection interval.
- Suction and discharge isolation valves on the hermetic pumps for quick and easy pump servicing without draining, or loss of vacuum.
- Fully automatic operation.
- Continuously operating purge system.
- Automatic protection against excessive concentration.
- Automatic decrystallisation.
- Continuous operation due to stabiliser and unloader controls.
- Electrical equipment CE certified according to EN 292-2, EN 60204-1, EN 50081-2 and EN 50082-2.
- Compact and sturdy.
- Small footprint due to arrangement of both shells on top of each other.
- Easy transport, installation and operation.

### YPC-ST

- Two-stage operation, making for low energy costs.
- Water is used as the refrigerant and lithium bromide as the absorbent. Advantages: non-caustic, non-toxic, non-combustible, corrosion control via ADVAGuard 750 inhibitor.
- Operational reliability by virtue of the Millennium's internal parallel flow of the solution.
- Control Centre featuring a display and shutdown memory.
- Optimal leak protection and long life.
- Hermetic pumps featuring isolating valves to facilitate maintenance and servicing.
- Fully automatic operation.
- Continuous purging.
- Automatic protection against excess concentration.
- Design for 9 bar g to 3 bar g steam pressure possible.
- Easy installation and commissioning.

### YPC-FS

- Two-stage operation, making for low energy costs.
- Water is used as the refrigerant and lithium bromide as the absorbent. Advantages: non-caustic, non-toxic, non-combustible, corrosion control via ADVAGuard 750 inhibitor.
- Operational reliability by virtue of the Millennium's internal parallel flow of the solution.
- Control Centre featuring a display and shutdown memory.
- Optimal leak protection and long life.
- Hermetic pumps featuring isolating valves to facilitate maintenance and servicing.
- Fully automatic operation.
- Continuous purging.
- Automatic protection against excess concentration.
- Fuelling via natural gas, heating oil or propane gas possible.
- Heating up to 79.4 °C possible with optional heat exchanger (also with simultaneous cooling).
- Evaporator comes standard for cooling and for switch over to heating to up to 60 °C.
- Easy installation and commissioning.

## SPECIFICATION

### GENERAL

As absorption chillers are not electrically driven considerable operating cost savings can be realised especially when compared to electric drive machines operating at peak load demand kW-hour periods. If waste heat is used to fuel the machine operating costs are basically zero.

Direct fired natural gas machines are also available providing cooling capacity during summer when gas prices are normally at their lowest.

YIA Single-stage Absorption Chillers are fuelled by low pressure steam, hot or warm water.

Two-stage chillers have a second stage generator which increases the refrigerant vapour to give a higher operating efficiency.

YPC Two-stage Direct Fired Absorption Chiller-Heaters are fuelled by natural gas, liquid propane gas, oil or diesel fuel. All YPC Direct Fired chillers are available with dual fuel burners. They provide alternate chilled or hot water and if equipped with an optional hot water heat exchanger can supply simultaneous chilled and hot water.

YPC Two Stage steam chillers use steam 3.0 bar g to 9.0 bar g.

### YIA

Range of Models - shells arranged on top of each other. Models YIA 1A1 to YIA 10E3 are shipped as a single assembly and models YIA 12F1 to YIA 14F3 are shipped in two pieces, upper and lower shells. Optimum enlargement of the effective surface area for evaporation and absorption by vapour distribution of liquid through high-grade steel spray nozzles. Droplet eliminator baffles are fitted between both the evaporator and absorber, as well as between the condenser and generator. Copper heat exchanger tubes in absorber, evaporator and condenser, cupro-nickel heat exchanger tubes in generator, with smooth or enhanced surfaces, the tubes are rolled into carbon steel tube sheets welded to the ends of the shells. Operation pressure on the water side is 10 bar g, and internally is 0.95 bar a.

**Sight Glasses** are provided in absorber and evaporator.

**Water Box** covers have nozzle connections for welding or victautic connection.

**Microprocessor Control System** for control and display of all parameters on a 40 character alphanumeric display. Memory for 4 operation or fault modes. Remote control, remote setting of chilled water leaving temperature. YORK ISN energy management interface (optional interface for "non-ISN" building automation systems).

**Main Power Panel** for single point connection, Voltage 380/400-3-50 N + PE, with control and protection for internal pumps.

**Hermetic Solution and Refrigerant Pumps**, self-lubricated. Connections welded onto pipe system. Isolation valves on suction and discharge for easy maintenance.

**Purge System** with water cooled purge chamber for continuous removal of non-condensable gases. Factory mounted and wired vacuum pump with electric motor for periodic removal of gases to atmosphere.

**Factory Testing** - Each unit is subjected to rigorous leak and vacuum leak tests. The last test is a vacuum test using a mass spectrometer whilst the unit is immersed in an atmosphere of helium. The water side of the heat exchanger is tested with 1.5 times design working pressure.

**Finish** - alkyd-vinyl base coat, 2 layers, "Caribbean blue" finish coat, electronic boards with final coating.

**Equipment** delivered separately for field installation:

- **Steam or Hot Water Regulation Valve**, choice of 1-way or 2-way, controls unit output depending on chilled water leaving temperature, variable settings from 100 % to 20 %.

## SPECIFICATION

• **Chilled Water Flow Switch** with paddle. **English Language** Installation, Commissioning, Operation and Maintenance manual.

### YIA Optional Equipment:

- Special tubes for the heat exchangers
  - Marine water boxes
  - High pressure water flanges
  - Two optional printed circuit boards for remote reset of chilled leaving water temperature and remote steam/hot water limit using 4 - 20 mA or 0 - 10 Vdc signals
- Two part shipment on units YIA 1A1 to YIA 10E3

### YPC-ST

**Main shell**, with vertically arranged tube heat exchangers, absorber, evaporator, second-stage generator and condenser housed in 2 separate sections. Optimal geometrical enhancement of the heat exchanger surface in the absorber and evaporator by virtue of atomised distribution via stainless steel spray nozzles. There are finned eliminator baffles between each evaporator/absorber pair and between the second-stage generator and the condenser. The heat exchanger tubing in the absorber, evaporator, second-stage generator and condenser is made of copper and, depending on the application, features a smooth or enhanced surface. Each tube is roller-expanded into rugged tube sheets. Operating pressure: water side 10 bars, unit side 0.95 bars.

**First-Stage Generator** positioned next to the shell assembly. The unit features a welded design with U-shaped Cu/Ni 70/30 piping. It comes equipped with a condensate drain cooler.

**Control Centre** for precision system control and monitoring. All messages are displayed in plain text on the 40-character alphanumeric display. Memory for 4 cycling or safety shutdowns. Remote unit start/stop, remote reset of chilled water leaving temperature and/or steam limiting signal upon startup. YORK ISN Energy Management Interface (also optionally available for "non-ISN" building automation systems).

**Main Control Panel** for single-point wiring connection, voltage 380/400-3-50 + NE + PE, with controllers and safety units for the internal pumps. Unit capacity is modulated between 100 % and 20 % by the steam valve in keeping with the chilled water leaving temperature.

**Hermetic Solution and Refrigerant Pumps**, self-lubricating. The ports are welded into the piping. Isolating valves at the inlet and outlet to facilitate maintenance.

### YPC-ST Optional Equipment:

- Heat exchanger with special tubing.
- Marine water boxes.
- Water boxes for elevated working pressures.
- Optional board for remote resetting of leaving chilled water temperature or steam input limitation using a 4 - 20 mA or 0 - 10 Vdc signal.

### YPC-FS

**Main Shell**, with vertically arranged tube heat exchangers, absorber, evaporator, second-stage generator and condenser housed in 2 separate sections. Optimal geometrical enhancement of the heat exchanger surface in the absorber and evaporator by virtue of atomised distribution via stainless steel spray nozzles. There are finned eliminator baffles between each evaporator/absorber pair and between the second-stage generator and the condenser. The heat exchanger tubing in the absorber, evaporator, second-stage generator and condenser is made of copper and, depending on the application, features a smooth or enhanced surface. Each tube is roller-expanded into rugged tube sheets. Operating pressure: water side 10 bars, unit side 0.95 bars.

**First-Stage Generator** positioned next to the shell assembly. It features a welded design with vertical carbon steel boiler tubes, the tubes possessing an enhanced surface in part.

**Control Centre** for precision system control and monitoring. All messages are displayed in plain text on the 40-character alphanumeric display. Memory for 4 cycling or safety shutdowns. Remote unit start/stop, remote reset of chilled water leaving temperature. YORK ISN Energy Management Interface (also optionally available for "non-ISN" building automation systems).

**Main Control Panel** for single-point wiring connection, voltage 380/400-3-50 + NE + PE, with controllers and safety units for the internal pumps.

**Modulating Forced Draft Burner** featuring a gas control train and controller for regulation and flame detection (oil burner and dual fuel burner optional). Modulates unit capacity between 100 % and 30 % in keeping with the chilled water leaving temperature. YPC 20 G uses 2 burners. Gas control train incorporating manual shut-off cock, main gas pressure regulator, gas pressure switches, gas pressure gauges, 2 main motorised gas valves, and normally open vent valve. The oil control train (optional) incorporates a twin shut-off cock and filter, in addition to flexible tubing for installation on site.

**Hermetic Solution and Refrigerant Pumps**, self-lubricating. The ports are welded into the piping. Isolating valves at the inlet and outlet to facilitate maintenance.

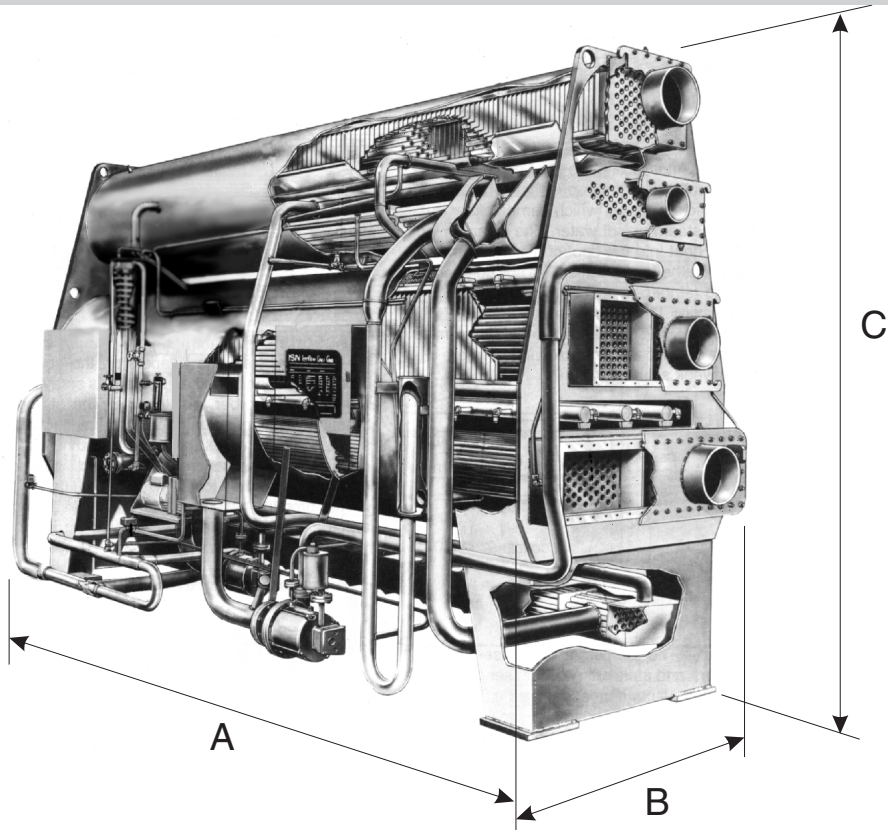
### YPC-FS Optional Equipment:

- Additional system hot water heat exchanger for 79.4 °C leaving hot water temperature.
- Heat exchanger with special tubing.
- Marine water boxes.
- Water boxes for elevated working pressures.
- Optional board for remote resetting of leaving chilled water temperature using a 4 - 20 mA or 0 - 10 Vdc signal.
- Special burner characteristics exceeding those satisfied by a standard burner, including the potentially resulting reduction in burner capacity.

## OPERATING LIMITS

<b>YIA</b>	Chilled water leaving temperature min. 4.4 °C, minimum cooling water entering temperature with steam 7.2 °C, or with hot water 20 °C, steam input pressure 0.2 to 1.0 barg, hot water temperature 80 °C to 128 °C.
<b>YPC-ST</b>	Chilled water leaving temperature min. 5.6 °C (special design temperature down to 5.0 °C possible), cooling tower entering temperature 20 °C, design for steam pressure 3 barg to 9 barg possible.
<b>YPC-FS</b>	Chilled water leaving temperature min. 5.6 °C (special design temperature down to 5.0 °C possible), cooling tower water entering temperature min. 20 °C, 20 mbar gas pressure for models 12SC to 16 S, 50 mbar for models 16SL to 19S, (design for lower gas pressures available on request).

## YIA TECHNICAL DATA



Model	Nominal Capacity <sup>1</sup> kW	Pump Input kW	Dimensions <sup>2</sup>			Transport Weight <sup>2</sup>		Operating Weight <sup>2</sup> kg	Emergency Weight <sup>4</sup> kg
			A <sup>3</sup> mm	B mm	C mm	Total kg	Solution kg		
1A1	420	2.6	3720	1760	2320	4040	710	4950	6920
1A2	550	2.8	4330	1420	2320	4450	840	5500	8860
2A3	600	3.0	4940	1420	2320	4910	970	6130	8920
2A4	720	3.5	5550	1420	2320	5310	1100	6590	9770
2B1	830	3.6	4940	1580	2640	6090	1220	7900	11730
3B2	960	3.8	5550	1580	2640	6720	1420	8540	12890
3B3	1090	4.3	6160	1580	2640	7360	1550	9490	14440
4B4	1170	4.5	6770	1580	2640	7990	1740	10490	15980
4C1	1280	4.5	5550	1770	3020	8400	1800	11400	17450
5C2	1440	5.0	6160	1770	302	9170	2130	12260	19270
5C3	1570	5.5	6770	1770	302	9900	2320	13620	21080
6C4	1820	5.9	7530	1770	302	10670	2640	14760	23110
7D1	1990	5.5	6160	2110	3540	13030	2640	17890	28650
7D2	2170	6.0	6770	2110	3540	14620	2960	19840	31770
8D3	2480	6.2	7530	2110	3540	16210	3280	21800	35290
8E1	2790	6.2	6870	2290	3840	17710	4050	24110	38760
9E2	3190	7.4	7630	2290	3840	19710	4570	26830	43320
10E3	3380	8.6	8390	2290	3840	22020	5020	29790	48170
12F1	4040	8.3	7630	2480	4240	25020	5790	35550	56100
13F2	4340	8.7	8390	2480	4240	27110	6500	39050	61910
14F3	4840	9.2	9150	2480	4240	28920	7140	41140	66250

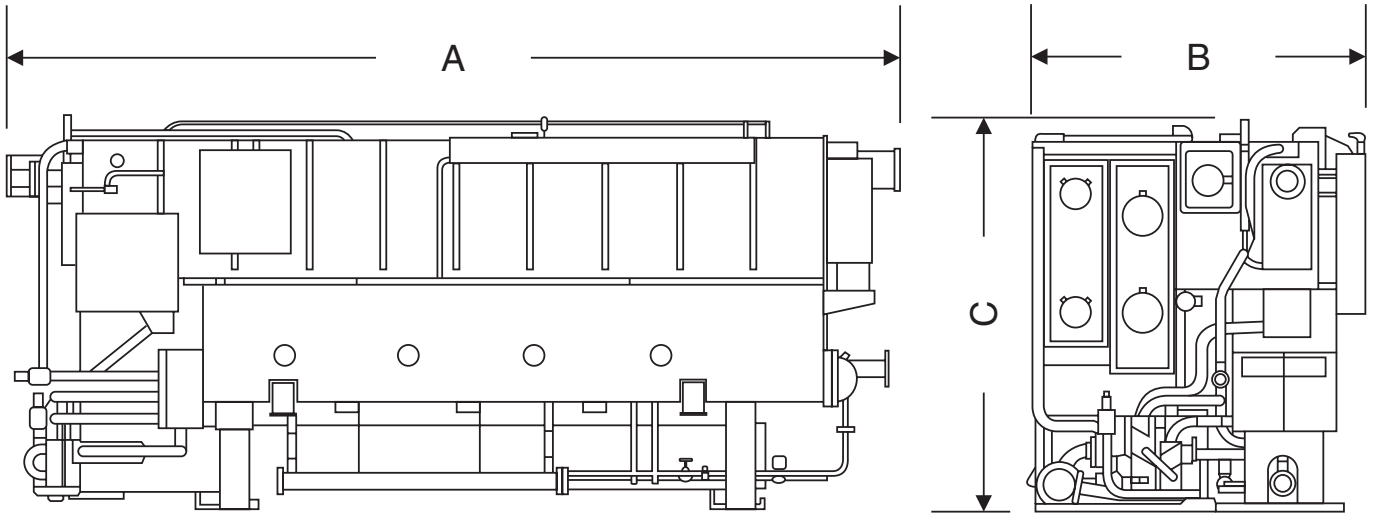
1 The values given are for a chilled leaving water temperature 12.6/6.7°C, cooling water temperature 29.4/39.4°C, steam 0.8 g dry/saturated or hot water 115/109°C, fouling factor 0.044m<sup>2</sup>K/kW (ARI 560-92).

2 Measurements and weights are approximate values.

3 A space of the same length as the length of the unit should be kept for maintenance and tube extraction at one end of the unit. This space can be secured by doors or other openings.

4 The emergency weight is the maximum weight, caused by the failure of a heat exchanger tube (through external reasons) which results in the complete filling of the entire unit by a connected water circuit.

## YPC-ST TECHNICAL DATA



Model	Dimensions <sup>1</sup>			Transport Weight <sup>1</sup>	Transport Weight <sup>2</sup>	Operating Weight	Emergency Weight <sup>3</sup>	Steam Inlet	Cond. Outlet	Insulation Areas		Electrical Power
	A	B	C							Cold	Hot	
	mm	mm	mm	kg	kg	kg	kg	DN	DN	m <sup>2</sup>	m <sup>2</sup>	kW
<b>14SC</b>	5110	1880	2240	10210	9480	11030	15600	65	20	11	24	7.5
<b>16SL</b>	5970	2270	2620	15490	13700	17150	25800	100	20	16	37	16.2
<b>17S</b>	5970	2270	2620	15860	14060	17510	26300	100	20	16	37	16.2
<b>18S</b>	6960	2290	2770	18870	16740	20780	31200	100	20	19	44	16.2
<b>19S</b>	7980	2290	2770	22500	20190	24190	37400	100	20	22	47	21.2

<sup>1</sup> A clearance equal to the length of the unit is to be maintained at one end of the unit for maintenance and tube withdrawal. This clearance can also be present by virtue of doors or other openings. The tube withdrawal clearance for the first stage generator may be located across from the steam inlet only.

<sup>2</sup> Unit supplied with charge filling.

<sup>3</sup> Option: unit supplied without charge filling. Filling supplied separately in drums.

<sup>4</sup> The emergency weight is the maximum weight which results when an externally induced rupture of a heat exchanger tube causes the content of a connected water circuit to completely fill the unit.

Model	Cooling Capacity	Steam Input	Condenser			Absorber/Evaporator		
			Flow	No. of Passes	Pressure Drop (kPa)	Flow	No. of Passes	Pressure Drop (kPa)
	kW	kW	l/s			l/s		
<b>14SC</b>	1055	1334	45.3	2	36	84.6	1	68
<b>16SL</b>	1547	1956	66.5	2	40	124.1	2	64
<b>17S</b>	1705	2156	73.3	2	39	136.8	2	70
<b>18S</b>	2039	2579	87.7	2	63	163.6	2	96
<b>19S</b>	2373	3000	102.0	2	94	190.3	2	127

Capacity data at 12.2/6.7 °C chilled water, 29.4/35 °C cooling water.

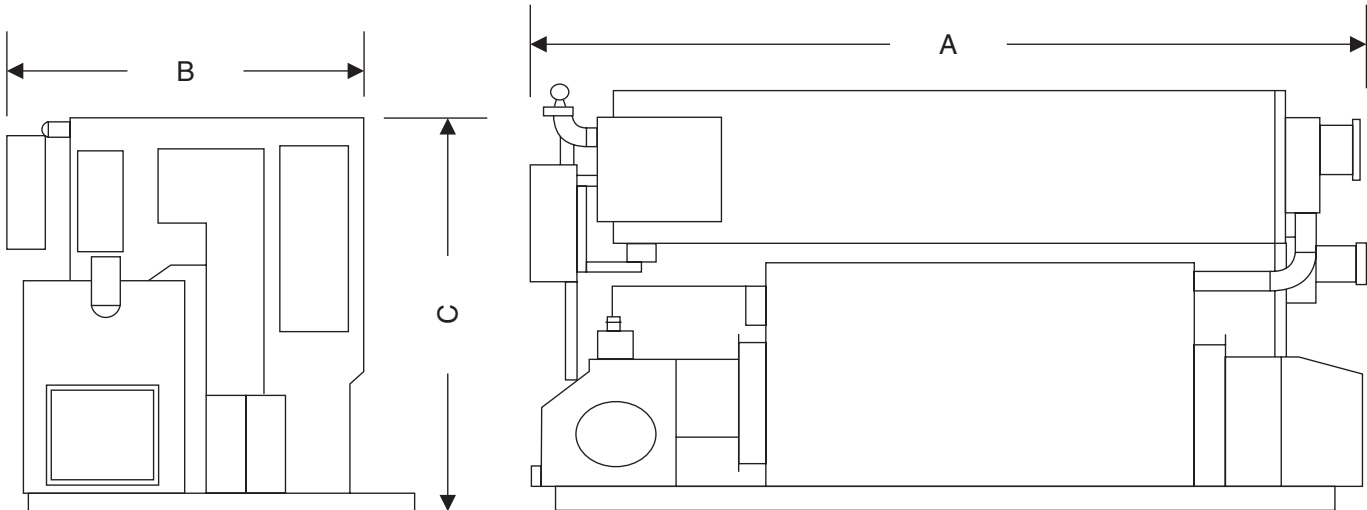
Saturated steam pressure upstream of control valve: 8 bar g

Fouling factor 0.044 m<sup>2</sup> C/kW.

Condensate leaving pressure 1 bar g, condensate leaving temperature 90 °C.

Design specifications for other temperatures and fouling factors available on request.

## YPC-FS TECHNICAL DATA



Model	Dimensions <sup>1</sup>				Transport Weight <sup>4,6</sup> kg	Transport Weight <sup>5,6</sup> kg	Operating Weight <sup>6</sup> kg	Emergency Weight <sup>8</sup> kg	Gas Connection <sup>7</sup> DN	Exhaust Flange W/H mm	Insulation Areas		Electrical Power kW
	A mm	B <sup>2</sup> mm	B <sup>3</sup> mm	C mm							Cold m <sup>2</sup>	Hot m <sup>2</sup>	
12SC	3970	1850	1940	2280	8990	7900	9490	13290	65	470/520	8	16	9
13SC	3990	1850	1970	2280	9990	8770	10830	14880	65	470/520	8	18	9.8
14SC	4950	1890	1940	2300	11450	9990	12130	16980	80	475/525	11	24	9.8
15SL	5000	2260	2450	2730	16270	14600	17360	24300	100	590/590	13	33	14.6
16S	5000	2260	2450	2730	16500	14800	17580	24700	125	590/590	13	33	14.6
16SL	5960	2300	2600	2810	19810	17760	21180	29700	125	740/740	16	37	19.6
17S	5960	2300	2600	2810	20180	18120	21580	30300	65	740/740	16	37	19.6
18S	6960	2360	2670	2990	23500	21020	25190	35300	80	775/775	19	44	19.6
19S	7980	2360	2670	2990	27760	24880	29720	41600	80	775/775	22	47	30.2

- 1 A clearance equal to the length of the unit is to be maintained at one end of the unit for maintenance and tube withdrawal. This clearance can also be present by virtue of doors or other openings.  
 2 Width of standard unit, without optional hot water heat exchanger.  
 3 Width including optional hot water heat exchanger.  
 4 Unit supplied with charge filling.  
 5 Option: unit supplied without charge filling. Filling supplied separately in drums.  
 6 The weights indicated here increase by 450 kg when including the optional hot water heat exchanger.  
 7 Required gas pressure for up to YPC-F 16 SL: minimum 20 mbars. All larger units with 50 mbars. DN for other gas pressures available on request.  
 8 The emergency weight is the maximum weight which results when an externally induced rupture of a heat exchanger tube causes the content of a connected water circuit to completely fill the unit.

Model	COOLING							
	Cooling Capacity kW	Power Input kW	Condenser			Absorber/Evaporator		
			Flow l/s	No. of Passes	Pressure Drop (kPa)	Flow l/s	No. of Passes	Pressure Drop (kPa)
12SC	703	629	30.2	3	44	55.4	2	39
13SC	809	736	34.8	3	57	64.9	1	38
14SC	1055	944	45.4	2	36	84.6	1	68
15SL	1231	1130	52.9	3	67	98.6	2	39
16S	1407	1292	60.5	3	70	112.8	2	49
16SL	1547	1421	66.5	2	40	124.1	2	63
17S	1705	1566	73.3	2	39	136.8	2	70
18S	2039	1873	87.7	2	63	163.6	2	96
19S	2373	2180	102.0	2	94	190.3	2	127

Model	HEATING							
	Heating Capacity kW	Power Input kW	Condenser			HT - HZW - WT		
			Flow l/s	No. of Passes	Pressure Drop (kPa)	Flow l/s	No. of Passes	Pressure Drop (kPa)
12SC	563	625	30.5	3	48	12.4	3	20
13SC	675	750	36.9	3	67	14.9	3	18
14SC	844	938	46.1	2	40	18.6	3	20
15SL	1013	1125	55.3	3	78	22.3	3	15
16S	1125	1250	61.5	3	78	24.8	3	18
16SL	1268	1407	69.2	2	46	27.9	3	41
17S	1407	1563	76.8	2	46	31.0	3	50
18S	1688	1875	92.2	2	74	37.1	3	43
19S	1969	2188	107.6	2	112	43.3	3	57

Capacity data at 12.2/6.7 °C chilled water, 29.4/35 °C cooling water, 55/60 °C hot water when heating in the evaporator and 68.3/79.4 °C when heating in a high temperature hot water heat exchanger.  
 Fouling factor 0.044 m<sup>2</sup> C/kW. Design specifications for other temperatures and fouling factors available on request.