

# YLAE SE/HE *Tempo*<sup>™</sup>

AIR COOLED LIQUID CHILLER

**Scroll Compressors**




STYLE: **A**  
REFRIGERANT TYPE: **R410A**  
COOLING CAPACITIES: **180 KW to 465 kW**

EN ISO 9001

EUROVENT  
CERTIFIED PERFORMANCE



  
A JOHNSON CONTROLS COMPANY

(04/06) 

## TEMPO FEATURES

Tempo is a fully packaged air-cooled liquid chiller, with scroll compressors, designed to be located outside on the roof of a building or at ground level.

There are two levels of operating efficiency:

1. Standard Efficiency SE models.
2. High Efficiency HE models.

Standard SE and HE chillers have normal speed fans and no compressor enclosure.

Each efficiency level has a selection of acoustic options:

1. Two speed fans.
2. Acoustically lined compressor enclosure.
3. Acoustically lined compressor enclosure and two speed fans.
4. Low Sound (LS) models with acoustically lined compressor enclosure and fixed low speed fans.

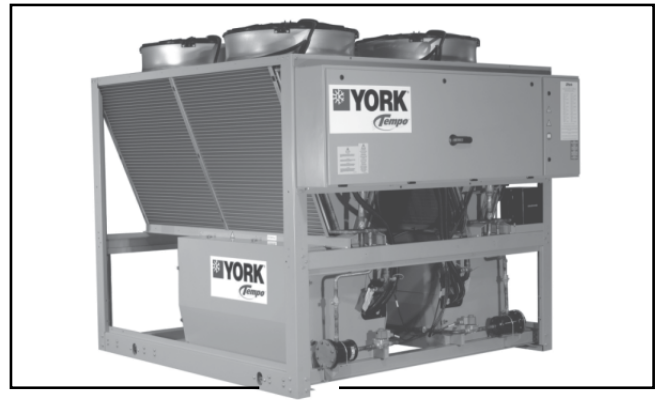
### Economical Operating Costs Year Round

The incorporation of multiple scroll compressors results in high full and part load efficiencies. As each compressor represents a cooling capacity step there is no efficiency reduction when the chiller operates at part load. As the cooling capacity demand falls the available condenser surface increases, in comparison to the load demand, and therefore the part load efficiency exceeds the full load efficiency.

### Specifically Designed For Low Sound Operation

Most major cities today have rigorous noise control legislation and many applications such as medical, educational, hotels and theatres are extremely noise sensitive. In such situations a chiller must not only meet sound level requirements during the day, when background noise levels often mask chiller sound levels, but also during evenings and at night when legislated levels are more stringent and back ground levels are diminished.

The **TEMPO LS** chiller has been specifically designed for low sound operation, to satisfy these varied requirements, by incorporating slow speed fans and arranging all the compressors together in one location and enclosing them in an acoustically treated chamber.



### Suits Locations Where Space Is Restricted

Tempo has a compact design to suit locations where space is restricted.

### Fast And Easy Installation

Tempo has a single electrical power connection and optional, factory fitted, water circulating pumps/expansion device, water filter and flow switch to provide fast and easy installation.

### Buffer Tank Not Normally Required

Tempo requires a minimum water volume to satisfy only one minute of chiller operation at minimum cooling capacity. Therefore on standard air-conditioning systems, such as Fan-Coil etc. a buffer tank is not normally required.

### Tested For Operating Reliability

Tempo units are fully factory tested to provide trouble free installed operation.

### Dual Refrigeration Circuits

Tempo has dual refrigerant circuits and multiple scroll compressors to provide system standby security.

### Plain Language 40-Character Display

Tempo has a microprocessor controller with a 40 character, plain language, display of temperatures, pressures, operating hours, number of starts and start stop/holiday times. Control functions include accurate leaving liquid temperature, compressor lead/lag, system safety protection and integral circulating pumps.

### Efficient Low Sound Fans

Tempo has aerodynamically designed low sound fans located in separate compartments to prevent air recirculation and to reduce inefficient fan start/stop operation.

### Non-Corrosive Plate Evaporator

Tempo has a non-corrosive stainless steel plate evaporator. An optional factory fitted water filter and flow switch can be provided to reduce installation time.

## NOMINAL DATA

Tempo Standard Efficiency Models	Fan Speed	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE
		0190SE	0215SE	0235SE	0255SE	0305SE	0330SE	0375SE	0395SE	0450SE	0490SE
Cooling Capacity kW <sup>(1)</sup>	Normal	178	201	222	243	277	304	344	361	410	450
Energy Efficiency Ratio (EER) <sup>(1a)</sup>		2.8	2.8	2.6	2.6	2.7	2.5	2.7	2.6	2.6	2.5
Eurovent Class		C	C	D	D	C	D	C	D	D	D
ESEER <sup>(2)</sup>		3.86	3.78	3.81	3.89	3.96	3.75	3.79	3.8	3.72	3.69
Cooling Capacity kW <sup>(1)</sup>	Low LS Models	172	194	214	235	266	292	331	347	394	432
Energy Efficiency Ratio (EER) <sup>(1a)</sup>		2.7	2.7	2.5	2.5	2.5	2.3	2.5	2.4	2.4	2.3
Eurovent Class		C	C	D	D	D	E	D	E	E	E
ESEER <sup>(2)</sup>		4.02	3.83	3.89	3.94	3.96	3.74	3.92	3.96	3.85	3.81
Sound Pressure at 10 Metres dB(A) <sup>(3)</sup>	Normal <sup>(4)</sup>	58.0	59.0	61.0	60.9	60.8	61.8	62.8	63.8	63.7	63.7
	Low <sup>(5)</sup>	56.3	57.1	59.5	59.2	58.9	60.1	61.1	62.1	62.0	62.0
	Normal <sup>(6)</sup>	53.2	54.1	57.5	58.1	56.1	57.2	58.2	59.2	59.2	59.2
	Low <sup>(7)</sup>	51.1	50.7	54.1	54.2	52.7	53.8	54.8	55.8	55.7	55.7
	Low <sup>(8)</sup>	52.1	51.7	55.1	55.2	53.5	54.8	55.8	56.8	56.7	56.7
Tempo High Efficiency Models	Fan Speed	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE	YLAE
		0195HE	0220HE	0240HE	0265HE	0315HE	0355HE	0380HE	0405HE	0465HE	0510HE
Cooling Capacity kW <sup>(1)</sup>	Normal	181	205	227	244	286	328	349	370	423	465
Energy Efficiency Ratio (EER) <sup>(1a)</sup>		2.9	2.9	2.7	2.8	2.8	2.9	2.8	2.8	2.8	2.7
Eurovent Class		B	B	C	C	C	B	C	C	C	C
ESEER <sup>(2)</sup>		3.95	3.84	3.88	3.94	4.17	3.88	3.81	3.87	3.76	3.75
Cooling Capacity kW <sup>(1)</sup>	Low LS Models	172	194	214	235	274	315	335	355	406	447
Energy Efficiency Ratio (EER) <sup>(1a)</sup>		2.8	2.8	2.6	2.6	2.6	2.7	2.7	2.6	2.6	2.5
Eurovent Class		C	C	C	D	D	C	C	D	D	D
ESEER <sup>(2)</sup>		4.07	3.93	4.05	4.11	4.07	3.94	4.05	4.03	3.85	3.81
Sound Pressure at 10 Metres dB(A) <sup>(3)</sup>	Normal <sup>(4)</sup>	57.9	58.9	60.9	60.8	60.8	61.7	62.7	63.7	63.7	63.7
	Low <sup>(5)</sup>	56.0	57.0	59.8	59.1	59.1	60.0	61.0	62.0	62.0	62.0
	Normal <sup>(6)</sup>	52.1	54.0	57.4	56.2	56.2	57.1	58.1	59.1	59.1	59.4
	Low <sup>(7)</sup>	48.5	50.6	52.8	52.8	52.8	53.7	54.7	55.7	55.7	55.9
	Low <sup>(8)</sup>	49.7	51.6	53.4	53.8	53.8	54.7	55.7	56.7	56.7	56.9

(1) At 7°C leaving chilled water and 35°C ambient.

(1a) EER = Cooling Capacity/Total kW input from compressors and fans.

(2) ESEER is European Energy Efficiency Ratio. ESEER = 0.03A x 0.33B x 0.41C x 0.23D.

A = EER is 100% capacity at 35°C ambient. B = EER is 75% capacity at 30°C ambient.

C = EER is 50% capacity at 25°C ambient. D = EER is 25% capacity at 20°C ambient.

(3) Sound Pressure in free field conditions.

(4) Fans operating at normal speed without compressor enclosure at 7°C leaving chilled water and 35°C ambient.

(5) Optional dual speed fans operating at low speed without compressor enclosure at 7°C leaving chilled water and 25°C ambient.

(6) Fans operating at normal speed with compressor enclosure at 7°C leaving chilled water and 35°C ambient.

(7) Optional dual speed fans operating at low speed with compressor enclosure at 7°C leaving chilled water and 25°C ambient.

(8) LS Model: fixed low speed fans with compressor enclosure at 7°C leaving chilled water and 35°C ambient.

## SPECIFICATION

YLAE air-cooled chillers are completely factory assembled with all interconnecting refrigerant piping and wiring ready for field installation. The unit is pressure tested, evacuated, and fully factory charged with refrigerant R410A and oil in each of the independent refrigerant circuits. After assembly, an operational test is performed with water flowing through the evaporator to ensure that each refrigerant circuit operates correctly.

The unit structure is manufactured from heavy-gauge, galvanised steel coated with baked-on powder paint (Champagne (RAL 7006, Munsell No. 9.8YR4.36/1.2)).

YLAE chillers are designed and built within an EN ISO 9001 accredited organisation and in conformity with the following European Directives:

- Machinery Directive (89/392/EEC)
- Low Voltage Directive (73/23/EEC, EN 60204)
- EMC Directive (89/336/EEC)
- Pressure Equipment Directive (97/23/EC)
- Safety Code for Mechanical Refrigeration (EN378)

### Compressors

The unit has hermetic scroll compressors. High efficiency is achieved through a controlled orbit and the use of advanced scroll geometry. All rotating parts are statically and dynamically balanced. The compressor motors have integral protection against overloads. The overload protection will automatically reset. Starting is direct on line. The motor terminal boxes have IP-54 weather protection.

The compressors are switched On and Off by the unit microprocessor to provide capacity control. Each compressor is fitted with a crankcase strap heater.

### Refrigerant Circuits

Two independent refrigerant circuits are provided. Each circuit uses copper refrigerant pipe formed on computer controlled bending machines to reduce the number of brazed joints resulting in a reliable and leak resistant system.

Liquid line components include: a service valve, a high absorption removable core filter-drier, a solenoid valve, a sight glass with moisture indicator and a thermal expansion valve.

Suction line components include: a pressure relief valve, a pressure transducer and a service valve. Suction lines shall be covered with closed-cell insulation.

Discharge lines include service and isolation (ball) valves, one or two high pressure cutout switches, a pressure transducer and a pressure relief valve on larger models.

## Evaporator

The evaporator is a stainless steel plate type heat exchanger with a design working pressure of 10 barg on the water side. The evaporator is equipped with a heater for frost protection to  $-20^{\circ}\text{C}$  and insulated with flexible closed-cell foam. Water connection to the evaporator is via 3 inch Victaulic groove connections.

### Air Cooled Condensers

The condenser coils are seamless copper tubes, arranged in staggered rows, mechanically expanded into epoxy coated aluminium fins. Integral sub-cooling is included.

The condenser fans have metal 'sickle' blades integrated into the rotor of an external rotor motor. They are designed for maximum efficiency and statically and dynamically balanced for vibration free operation. They are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed from heavy-gauge, corrosion resistant, coated steel.

The IP54 fan motors are the totally enclosed air-over type. They will feature ball bearings that are double-sealed and permanently lubricated.

### Power and Control Panels

All power and controls are contained in a IP55 cabinet with hinged and lockable outer doors. Power and control sections are housed in separate enclosures.

#### The power panel includes:

- A factory mounted non-fused disconnect switch with external, lockable handle to enable connection of the unit power supply. The disconnect switch can be used to isolate the power for servicing.
- Factory mounted compressor contactors, compressor fuses and overloads to provide overload and short circuit protection.
- Factory mounted fan contactors and manual motor starters for overload and short circuit protection.
- Factory mounted control transformer to convert the unit supply voltage to 110 V - 1  $\emptyset$  - 50 Hz for the control system.
- Control supply fuses and connections for a remote emergency stop device.

#### The control panel includes:

- A Liquid Crystal Display (two display lines of twenty characters per line) with Light Emitting Diode back lighting for outdoor viewing.
- A Colour coded 12-button keypad.
- Customer terminal block for control inputs and liquid flow switch.

## The microprocessor control includes:

Status Key for display of:

- Status of the unit and each refrigerant circuit
- System and unit safety fault messages

Display/Print Keys for display of:

- Chilled liquid and ambient air temperatures
- System pressures (each circuit)
- Operating hours and starts (each compressor)
- Load and unload timers and cooling demand
- Liquid pump, evaporator heater, solenoid valve and condenser fan status
- Operating data for the systems
- History including time, date and reason for last fault shutdown

An RS-232 port, in conjunction with this press-to-print button, is provided to permit the capability of hard copy print-outs via a separate printer (by others).

Entry Keys

- To program and modify system values

Setpoints Keys for programming:

- Chilled liquid temperature setpoint and range
- Remote reset temperature range
- Set daily schedule/holiday for start/stop
- Manual override for servicing
- Low and high ambient cutouts
- Low liquid temperature cutout
- Low suction pressure cutout
- High discharge pressure cutout
- Anti-recycle timer (compressor start cycle time)

Unit Keys

- To set time and unit options

Unit ON/OFF switch

- To activate or deactivate the unit

The microprocessor control system is capable of displaying the following:

- Leaving liquid temperature
- Low leaving liquid temperature cutout setting
- Low ambient temperature cutout setting
- Ambient air temperature
- Metric or Imperial data
- Discharge and suction pressure cutout settings
- System discharge and suction pressures
- Anti-recycle timer status
- Anti-coincident system start timer condition
- Compressor run status
- No cooling load condition
- Day, date and time
- Daily start/stop times
- Holiday status
- Automatic or manual system lead/lag control
- Lead system definition
- Compressor starts & operating hours (each compressor)
- Status of evaporator heater and fan operation
- Run permissive status
- Number of compressors running
- Liquid solenoid valve status
- Load & unload timer status
- Water pump status
- Liquid Temperature Reset via a YORK ISN DDC or Building Automation System (by others)

Provisions is included for: pumpdown at shutdown; optional remote chilled water temperature reset or up to two steps of demand load limiting (depending on model) from an external building automation system.

The operating program is stored in a non-volatile memory (EPROM) to eliminate chiller failure due to AC power failure/battery discharge. Programmed setpoints are retained in a lithium battery backed RTC memory.

**COOLING CAPACITIES - SE MODELS WATER COOLING**

Model	Leaving Water °C	Condenser Coil Entering Air Temperature °C																	
		25			30			35			40			45			46		
		kWo	kWci	EER	kWo	kWci	EER	kWo	kWci	EER	kWo	kWci	EER	kWo	kWci	EER	kWo	kWci	EER
YLAE 0190SE	5	186.2	45.8	3.5	177.4	50.3	3.1	167.7	55.2	2.7	157.2	60.9	2.3	146.2	67.3	2.0	144.0	68.9	1.9
	6	<b>192.1</b>	<b>46.2</b>	<b>3.6</b>	<b>182.6</b>	<b>50.7</b>	<b>3.2</b>	<b>172.7</b>	<b>55.6</b>	<b>2.8</b>	<b>162.0</b>	<b>61.3</b>	<b>2.4</b>	<b>151.1</b>	<b>67.7</b>	<b>2.0</b>	<b>148.8</b>	<b>69.1</b>	<b>2.0</b>
	7	198.0	46.6	3.7	187.9	51.1	3.2	177.8	56.0	2.8	166.9	61.7	2.4	155.9	68.1	2.1	153.5	69.3	2.0
	8	<b>203.7</b>	<b>47.0</b>	<b>3.8</b>	<b>193.5</b>	<b>51.5</b>	<b>3.3</b>	<b>183.0</b>	<b>56.5</b>	<b>2.9</b>	<b>171.9</b>	<b>62.2</b>	<b>2.5</b>	<b>160.7</b>	<b>68.7</b>	<b>2.1</b>	<b>153.0</b>	<b>69.3</b>	<b>2.3</b>
	9	209.5	47.4	3.9	199.2	52.0	3.4	188.3	57.0	2.9	176.9	62.8	2.5	165.5	69.3	2.2	156.8	70.6	2.3
	10	<b>215.3</b>	<b>47.8</b>	<b>3.9</b>	<b>204.8</b>	<b>52.5</b>	<b>3.4</b>	<b>193.5</b>	<b>57.4</b>	<b>3.0</b>	<b>181.9</b>	<b>63.4</b>	<b>2.6</b>	<b>170.2</b>	<b>69.9</b>	<b>2.2</b>	<b>160.6</b>	<b>70.6</b>	<b>2.4</b>
	11	221.1	48.2	3.8	210.5	53.0	3.5	198.8	57.9	2.9	186.9	63.9	2.5	175.0	70.5	2.2	164.4	71.9	2.5
YLAE 0215SE	5	210.1	53.1	3.5	200.0	58.3	3.1	187.9	64.0	2.6	175.7	70.8	2.3	164.6	78.4	1.9	161.9	81.9	2.0
	6	<b>217.6</b>	<b>53.5</b>	<b>3.6</b>	<b>206.4</b>	<b>58.8</b>	<b>3.1</b>	<b>194.4</b>	<b>64.6</b>	<b>2.7</b>	<b>181.8</b>	<b>71.2</b>	<b>2.3</b>	<b>170.2</b>	<b>79.1</b>	<b>2.0</b>	<b>165.7</b>	<b>83.9</b>	<b>2.1</b>
	7	225.0	53.9	3.7	212.9	59.3	3.2	201.0	65.2	2.8	187.9	71.6	2.4	175.7	79.8	2.0	169.5	84.2	2.2
	8	<b>231.3</b>	<b>54.5</b>	<b>3.8</b>	<b>218.8</b>	<b>60.0</b>	<b>3.3</b>	<b>206.6</b>	<b>65.9</b>	<b>2.8</b>	<b>193.3</b>	<b>72.5</b>	<b>2.4</b>	<b>170.2</b>	<b>80.4</b>	<b>2.3</b>	<b>170.2</b>	<b>83.9</b>	<b>2.2</b>
	9	237.6	55.2	3.8	224.7	60.7	3.3	212.2	66.6	2.9	198.8	73.4	2.5	178.3	81.7	2.4	174.1	84.8	2.3
	10	<b>243.9</b>	<b>55.8</b>	<b>3.9</b>	<b>230.6</b>	<b>61.3</b>	<b>3.4</b>	<b>217.8</b>	<b>67.4</b>	<b>2.9</b>	<b>204.2</b>	<b>74.3</b>	<b>2.5</b>	<b>182.1</b>	<b>82.6</b>	<b>2.5</b>	<b>179.9</b>	<b>85.1</b>	<b>2.4</b>
	11	250.2	56.5	3.7	236.5	62.0	3.3	223.5	68.1	2.8	209.7	75.1	2.4	189.9	84.3	2.6	184.7	86.4	2.5
YLAE 0235SE	5	233.3	63.6	3.3	221.2	69.5	2.9	209.1	77.0	2.5	195.9	84.8	2.1	184.4	91.2	2.2	180.0	94.4	2.1
	6	<b>240.9</b>	<b>64.3</b>	<b>3.4</b>	<b>228.3</b>	<b>70.4</b>	<b>3.0</b>	<b>215.6</b>	<b>77.9</b>	<b>2.5</b>	<b>202.3</b>	<b>85.6</b>	<b>2.2</b>	<b>188.1</b>	<b>92.5</b>	<b>2.2</b>	<b>185.7</b>	<b>95.7</b>	<b>2.1</b>
	7	248.5	65.0	3.5	235.3	71.2	3.0	222.2	78.8	2.6	208.7	86.4	2.2	191.8	95.8	2.3	189.4	97.0	2.2
	8	<b>254.9</b>	<b>65.8</b>	<b>3.5</b>	<b>241.8</b>	<b>72.0</b>	<b>3.1</b>	<b>228.5</b>	<b>79.7</b>	<b>2.6</b>	<b>214.6</b>	<b>87.5</b>	<b>2.3</b>	<b>195.5</b>	<b>96.1</b>	<b>2.3</b>	<b>192.1</b>	<b>98.3</b>	<b>2.2</b>
	9	261.4	66.6	3.6	248.3	72.8	3.1	234.7	80.6	2.7	220.5	88.6	2.3	202.1	98.3	2.4	196.8	100.5	2.3
	10	<b>267.9</b>	<b>67.4</b>	<b>3.6</b>	<b>254.7</b>	<b>73.6</b>	<b>3.2</b>	<b>241.0</b>	<b>81.4</b>	<b>2.7</b>	<b>226.5</b>	<b>89.7</b>	<b>2.3</b>	<b>208.9</b>	<b>99.6</b>	<b>2.4</b>	<b>200.5</b>	<b>101.8</b>	<b>2.3</b>
	11	274.3	68.2	3.5	261.2	74.4	3.1	247.2	82.3	2.7	232.4	90.8	2.3	215.7	101.9	2.5	205.3	104.0	2.4
YLAE 0255SE	5	255.4	71.3	3.3	243.1	77.8	2.9	228.7	85.0	2.5	214.2	93.5	2.1	200.0	101.2	2.2	196.0	104.8	2.1
	6	<b>263.7</b>	<b>71.9</b>	<b>3.3</b>	<b>250.3</b>	<b>78.7</b>	<b>2.9</b>	<b>235.9</b>	<b>85.7</b>	<b>2.5</b>	<b>220.4</b>	<b>94.3</b>	<b>2.2</b>	<b>208.1</b>	<b>102.1</b>	<b>2.2</b>	<b>198.1</b>	<b>106.0</b>	<b>2.2</b>
	7	271.9	72.5	3.4	257.5	79.6	3.0	243.1	86.4	2.6	226.6	95.1	2.2	218.5	103.1	2.3	203.5	108.1	2.2
	8	<b>279.7</b>	<b>73.2</b>	<b>3.5</b>	<b>264.9</b>	<b>80.3</b>	<b>3.0</b>	<b>250.1</b>	<b>87.3</b>	<b>2.7</b>	<b>233.2</b>	<b>96.0</b>	<b>2.3</b>	<b>222.8</b>	<b>104.6</b>	<b>2.4</b>	<b>208.8</b>	<b>110.6</b>	<b>2.3</b>
	9	287.6	74.0	3.6	272.3	81.0	3.1	257.1	88.2	2.7	239.8	96.9	2.3	227.1	106.1	2.5	213.1	112.1	2.4
	10	<b>295.4</b>	<b>74.7</b>	<b>3.6</b>	<b>279.7</b>	<b>81.8</b>	<b>3.2</b>	<b>264.1</b>	<b>89.0</b>	<b>2.7</b>	<b>246.4</b>	<b>97.7</b>	<b>2.4</b>	<b>234.4</b>	<b>107.6</b>	<b>2.5</b>	<b>218.4</b>	<b>114.6</b>	<b>2.5</b>
	11	303.2	75.4	3.5	287.2	82.5	3.1	271.1	89.9	2.7	253.0	98.6	2.3	241.7	109.1	2.6	223.7	116.1	2.5
YLAE 0305SE	5	289.0	79.0	3.4	275.9	86.2	3.0	260.7	95.2	2.6	243.8	105.5	2.4	230.0	111.1	2.3	217.9	118.1	2.4
	6	<b>298.2</b>	<b>80.1</b>	<b>3.4</b>	<b>284.6</b>	<b>87.2</b>	<b>3.0</b>	<b>268.8</b>	<b>96.3</b>	<b>2.6</b>	<b>251.2</b>	<b>106.6</b>	<b>2.4</b>	<b>238.1</b>	<b>112.6</b>	<b>2.4</b>	<b>224.2</b>	<b>120.6</b>	<b>2.4</b>
	7	307.6	81.2	3.5	293.6	88.2	3.1	277.1	97.4	2.7	258.7	107.6	2.5	245.7	114.1	2.5	231.7	122.1	2.5
	8	<b>317.1</b>	<b>81.9</b>	<b>3.6</b>	<b>302.2</b>	<b>89.0</b>	<b>3.1</b>	<b>285.2</b>	<b>98.4</b>	<b>2.7</b>	<b>266.5</b>	<b>108.7</b>	<b>2.6</b>	<b>253.6</b>	<b>115.6</b>	<b>2.6</b>	<b>239.2</b>	<b>124.6</b>	<b>2.5</b>
	9	326.8	82.5	3.7	311.1	89.9	3.2	293.7	99.4	2.8	274.6	109.8	2.7	261.7	117.1	2.7	247.3	126.1	2.5
	10	<b>336.6</b>	<b>83.2</b>	<b>3.7</b>	<b>320.1</b>	<b>90.7</b>	<b>3.3</b>	<b>302.3</b>	<b>100.5</b>	<b>2.8</b>	<b>282.7</b>	<b>110.9</b>	<b>2.7</b>	<b>270.4</b>	<b>118.6</b>	<b>2.7</b>	<b>255.4</b>	<b>128.6</b>	<b>2.6</b>
	11	346.5	83.8	3.8	329.1	91.6	3.3	310.8	101.5	2.9	290.8	112.0	2.8	278.9	120.1	2.8	263.9	130.1	2.7
YLAE 0330SE	5	318.4	92.0	3.2	303.6	100.0	2.8	286.8	111.0	2.4	268.0	123.0	2.1	254.4	128.1	2.3	240.4	136.1	2.2
	6	<b>328.3</b>	<b>93.0</b>	<b>3.3</b>	<b>313.0</b>	<b>101.5</b>	<b>2.9</b>	<b>295.2</b>	<b>112.5</b>	<b>2.5</b>	<b>275.4</b>	<b>124.5</b>	<b>2.1</b>	<b>262.9</b>	<b>130.6</b>	<b>2.3</b>	<b>248.9</b>	<b>138.6</b>	<b>2.2</b>
	7	338.5	94.0	3.4	322.7	103.0	2.9	303.9	114.0	2.5	283.1	126.0	2.1	270.9	132.1	2.4	256.9	141.1	2.3
	8	<b>348.6</b>	<b>94.9</b>	<b>3.4</b>	<b>331.7</b>	<b>104.0</b>	<b>3.0</b>	<b>312.5</b>	<b>115.2</b>	<b>2.6</b>	<b>291.1</b>	<b>127.4</b>	<b>2.2</b>	<b>279.4</b>	<b>133.6</b>	<b>2.4</b>	<b>265.4</b>	<b>143.6</b>	<b>2.3</b>
	9	359.0	95.8	3.5	341.2	105.0	3.0	321.5	116.4	2.6	299.5	128.8	2.2	287.9	135.1	2.5	273.9	146.1	2.4
	10	<b>369.5</b>	<b>96.8</b>	<b>3.6</b>	<b>350.6</b>	<b>106.0</b>	<b>3.1</b>	<b>330.5</b>	<b>117.6</b>	<b>2.7</b>	<b>307.8</b>	<b>130.2</b>	<b>2.2</b>	<b>296.4</b>	<b>136.6</b>	<b>2.5</b>	<b>281.4</b>	<b>148.6</b>	<b>2.4</b>
	11	380.1	97.7	3.6	360.1	107.0	3.2	339.6	118.8	2.7	316.3	131.6	2.3	305.9	138.1	2.6	290.9	151.1	2.5
YLAE 0375SE	5	358.9	96.4	3.4	341.6	105.1	3.0	323.5	115.0	2.6	303.9	127.1	2.2	292.4	135.1	2.3	279.9	146.1	2.4
	6	<b>370.1</b>	<b>97.1</b>	<b>3.4</b>	<b>352.6</b>	<b>106.1</b>	<b>3.0</b>	<b>333.8</b>	<b>116.1</b>	<b>2.6</b>	<b>313.5</b>	<b>128.1</b>	<b>2.3</b>	<b>300.9</b>	<b>136.6</b>	<b>2.4</b>	<b>287.4</b>	<b>148.6</b>	<b>2.4</b>
	7	381.6	97.9	3.5	364.0	107.2	3.1	344.4	117.2	2.7	323.5	129.2	2.3	310.9	138.1	2.4	296.9	151.1	2.5
	8	<b>393.1</b>	<b>98.7</b>	<b>3.6</b>	<b>374.8</b>	<b>108.1</b>	<b>3.2</b>	<b>354.7</b>	<b>118.2</b>	<b>2.8</b>	<b>333.2</b>	<b>130.4</b>	<b>2.4</b>	<b>319.4</b>	<b>139.6</b>	<b>2.5</b>	<b>304.4</b>	<b>153.6</b>	<b>2.5</b>
	9	405.1	99.6	3.7	386.0	108.9	3.2	365.5	119.1	2.8	343.2	131.5	2.4	329.9	141.1	2.5	314.9	156.1	2.6
	10	<b>417.1</b>	<b>100.4</b>	<b>3.8</b>	<b>397.3</b>	<b>109.8</b>	<b>3.3</b>	<b>376.4</b>	<b>120.0</b>	<b>2.9</b>	<b>353.3</b>	<b>132.7</b>	<b>2.5</b>	<b>339.4</b>	<b>142.6</b>	<b>2.6</b>	<b>324.4</b>	<b>158.6</b>	<b>2.6</b>
	11	429.1	101.2	3.8	408.6	110.6	3.4	387.2	121.0	2.9	363.5	133.8	2.5	349.9	144.1	2.6	334.9	161.1	2.7
YLAE 0395SE	5	377.7	105.6	3.3	358.9	115.3	2.9	339.6	125.9	2.5	318.0	138.4	2.1	307.5	143.1	2.2	296.9	151.1	2.3
	6	<b>389.6</b>	<b>106.6</b>	<b>3.3</b>	<b>370.5</b>	<b>116.3</b>	<b>2.9</b>	<b>350.1</b>	<b>127.1</b>	<b>2.5</b>	<b>327.9</b>	<b>139.8</b>	<b>2.2</b>	<b>319.0</b>	<b>144.6</b>	<b>2.2</b>	<b>308.4</b>	<b>153.6</b>	<b>2.3</b>
	7	401.9	107.6	3.4	382.5	117.3	3.0	361.1	128.3	2.6	338.1	141.1	2.2	329.9	146.1	2.3	318.9	156.1	2.4
	8	<b>413.6</b>	<b>108.6</b>	<b>3.5</b>	<b>393.6</b>														

**COOLING CAPACITIES - SE MODELS GLYCOL COOLING**

Model	Leaving Water °C	Condenser Coil Entering Air Temperature °C														
		25			30			35			40			45		
		kWo	kWci	EER	kWo	kWci	EER	kWo	kWci	EER	kWo	kWci	EER	kWo	kWci	EER
YLAE 0190SE	4	172.6	43.6	3.4	164.4	48.0	3.0	155.6	53.2	2.6	147.2	59.2	2.2	138.4	67.6	1.9
	2	160.4	43.1	3.2	152.8	47.4	2.8	144.7	52.5	2.4	136.6	58.4	2.1	128.1	66.0	1.8
	0	148.4	42.6	3.0	141.3	46.8	2.6	134.1	51.8	2.3	126.2	57.6	2.0	118.0	64.4	1.7
	-2	136.2	41.9	2.8	129.7	46.1	2.4	122.9	50.9	2.1	115.7	56.7	1.8			
	-4	123.1	41.1	2.6	117.1	45.3	2.2	110.9	50.1	1.9	104.4	55.7	1.7			
	-6	110.5	40.4	2.3	105.1	44.6	2.0	99.4	49.2	1.8	93.6	54.8	1.5			
YLAE 0215SE	4	196.8	51.6	3.4	187.2	56.8	2.9	177.0	62.8	2.5	166.4	69.2	2.2	155.0	78.6	1.8
	2	182.9	50.8	3.2	173.8	56.0	2.8	164.2	61.8	2.4	154.6	68.2	2.1			
	0	169.1	50.0	3.0	160.7	55.2	2.6	151.7	60.8	2.2	143.1	67.2	1.9			
	-2	155.3	49.1	2.8	147.4	54.0	2.4	139.1	59.6	2.1	131.0	66.0	1.8			
	-4	140.3	48.1	2.5	133.1	52.8	2.2	125.5	58.4	1.9	118.0	64.8	1.6			
	-6	126.0	47.2	2.3	119.3	51.6	2.0	112.5	57.2	1.8	105.7	63.6	1.5			
YLAE 0235SE	4	218.0	61.2	3.2	207.4	68.0	2.8	195.2	75.6	2.4	182.0	83.6	2.0			
	2	203.9	60.2	3.0	194.1	66.8	2.6	182.6	74.3	2.2	169.7	82.3	1.9			
	0	190.1	59.2	2.9	181.1	65.6	2.5	170.1	73.0	2.1	157.6	81.0	1.8			
	-2	174.6	57.9	2.7	166.4	64.3	2.3	156.7	71.6	2.0	145.5	79.6	1.7			
	-4	157.9	56.7	2.5	150.5	62.9	2.2	142.1	70.2	1.8						
	-6	141.8	55.4	2.3	135.4	61.6	2.0	128.2	68.8	1.7						
YLAE 0255SE	4	233.0	67.6	3.1	222.0	74.4	2.7	210.0	82.0	2.4	198.0	91.2	2.0			
	2	217.3	66.4	3.0	206.6	73.2	2.6	195.2	80.6	2.2	183.2	89.6	1.9			
	0	201.9	65.2	2.8	191.5	72.0	2.4	180.7	79.2	2.1	168.6	88.0	1.8			
	-2	185.6	63.9	2.6	176.4	70.6	2.3	165.9	77.7	2.0						
	-4	168.0	62.5	2.4	160.0	69.2	2.1	149.9	76.3	1.8						
	-6	151.2	61.2	2.2	144.4	67.8	1.9	134.6	74.8	1.6						
YLAE 0305SE	4	273.8	76.8	3.3	260.4	84.8	2.8	247.0	93.5	2.5	231.6	104.2	2.1			
	2	255.0	75.6	3.1	242.5	83.4	2.7	229.8	92.1	2.3	215.6	102.2	2.0			
	0	236.6	74.4	2.9	224.8	82.0	2.5	212.9	90.6	2.2	199.8	100.2	1.9			
	-2	217.4	73.1	2.7	206.6	80.6	2.4	195.3	89.0	2.0						
	-4	196.7	71.8	2.5	186.9	79.3	2.2	176.5	87.4	1.9						
	-6	176.9	70.5	2.3	168.0	77.9	2.0	158.4	85.8	1.7						
YLAE 0330SE	4	307.6	90.0	3.2	292.4	99.2	2.8	276.8	109.6	2.4	258.0	122.8	2.0			
	2	286.5	88.4	3.0	272.4	97.4	2.6	257.8	107.7	2.2	241.1	120.0	1.9			
	0	265.8	86.8	2.8	252.8	95.6	2.5	239.1	105.8	2.1	224.4	117.2	1.8			
	-2	244.5	84.9	2.7	232.4	93.7	2.3	219.5	103.5	2.0						
	-4	221.5	83.1	2.5	210.4	91.7	2.1	198.4	101.1	1.8						
	-6	199.4	81.2	2.3	189.4	89.8	2.0	178.2	98.8	1.7						
YLAE 0375 SE	4	344.0	91.6	3.4	327.6	101.0	2.9	310.0	111.4	2.5	291.0	123.6	2.2	273.0	138.8	1.8
	2	320.3	90.1	3.2	304.9	99.4	2.8	288.5	109.6	2.4	271.1	121.5	2.1	252.9	136.1	1.7
	0	296.9	88.5	3.0	282.6	97.7	2.6	267.3	107.8	2.3	251.5	119.3	1.9			
	-2	272.5	86.8	2.8	259.3	95.9	2.4	245.4	105.9	2.1	230.5	117.3	1.8			
	-4	246.2	85.1	2.6	234.1	94.2	2.2	221.7	104.1	1.9	207.9	115.3	1.7			
	-6	221.0	83.4	2.4	210.1	92.4	2.0	199.1	102.2	1.8						
YLAE 0395SE	4	362.0	99.2	3.3	344.0	109.6	2.9	325.0	120.8	2.5	305.0	134.0	2.1	286.0	150.0	1.8
	2	337.0	97.7	3.1	320.0	107.9	2.7	302.2	119.0	2.3	283.8	131.8	2.0	263.3	147.4	1.7
	0	312.4	96.2	2.9	296.4	106.2	2.5	279.9	117.2	2.2	263.0	129.6	1.9			
	-2	286.5	94.4	2.7	271.7	104.3	2.4	256.8	115.1	2.0	241.0	127.6	1.7			
	-4	258.5	92.6	2.5	245.3	102.3	2.2	232.0	113.1	1.9	217.1	125.4	1.6			
	-6	231.8	90.8	2.3	220.0	100.4	2.0	208.3	111.0	1.7						
YLAE 0450SE	4	410.5	114.8	3.3	390.8	126.4	2.9	369.8	139.4	2.5	347.2	155.0	2.1			
	2	381.9	112.9	3.1	363.8	124.4	2.7	343.9	137.3	2.3	322.8	152.2	2.0			
	0	353.8	111.0	2.9	337.3	122.4	2.5	318.5	135.2	2.2	298.9	149.3	1.9			
	-2	324.6	108.7	2.7	309.2	120.0	2.4	292.1	132.7	2.0						
	-4	293.3	106.5	2.5	279.1	117.6	2.2	263.7	130.1	1.9						
	-6	263.3	104.2	2.3	250.2	115.2	2.0	236.6	127.6	1.7						
YLAE 0490SE	4	452.4	133.6	3.1	430.6	146.8	2.7	407.6	162.0	2.4	382.0	180.8	2.0			
	2	421.4	131.0	3.0	401.4	144.4	2.6	379.5	159.4	2.2	355.9	177.0	1.9			
	0	391.0	128.4	2.8	372.8	142.0	2.4	351.8	156.8	2.1	330.3	173.2	1.8			
	-2	359.0	125.6	2.6	342.0	138.9	2.3	322.9	153.6	2.0						
	-4	324.6	122.8	2.4	308.9	135.9	2.1	291.7	150.4	1.8						
	-6	291.6	120.0	2.2	277.2	132.8	1.9	261.9	147.2	1.7						

Notes: kWo = Full load cooling capacity. kWci = kW input of all compressors. EER = Energy Efficiency Ratio and includes compressors and fans.

Data based on 5°C chilled liquid temperature difference and 0.044m<sup>2</sup> °C/kW fouling factor

Units with two Speed Fans: The data in the tables is for normal fan speed operation.

Fans will operate at low speed when the ambient is at 27°C or below.

For low speed fan operation cooling capacities and compressor kW at 25°C ambient see LS chiller data.

Part Load with largest compressor per system operating

## PHYSICAL DATA - SE MODELS

YLAE-SE (Refrigerant R410A)			190SE	0215SE	0235SE	0255SE	0305SE
Quantity Refrigerant Circuits			2	2	2	2	2
Refrigerant Charge <sup>(1)</sup>	Circuit 1/Circuit 2)	kg	12/12	13.5/13.5	14.5/14.5	17/17	32.9, 31.3
Oil Charge	Circuit 1/Circuit 2)	Litre	8.8/8.8	9.4/9.4	12.3/12.3	13.6/13.6	11.2/13.6
Compressor	Quantity (Circuit 1/Circuit 2)		2/2	2/2	3/3	2/2	2/2
Unit Capacity Control		%	22 (28), 50, 72 (78), 100	25, 50, 75, 100	17, 33, 50, 67, 83, 100	25, 50, 75, 100	20.3, (29.6) 50, 70.3 (79.6), 100
Evaporator	Water Volume	Litre	13.0	18.0	18.0	20.0	33.3
	Water Connections Nominal Bore	inch	3	3	3	3	3
Air	Total Coil Face Area	m <sup>2</sup>	8.3	8.3	8.3	10.3	12.7
Cooled	Number of Tube Rows		3	3	3	3	3
Condenser	Number Fins per metre		669	669	669	669	669
	Number Fans (Circuit 1/Circuit 2)		2/2	2/2	2/2	2/2	2/2
Normal Fans	Total Air Flow	m3/s	21.1	21.1	21.1	21.1	21.1
Dual	Normal Speed Total Air Flow	m3/s	21.1	21.1	21.1	21.1	21.1
Speed Fans	LS & Low Speed Total Air Flow	m3/s	16.4	16.4	16.4	16.4	16.4
Sound Level <sup>(2)</sup> to EN 292 1991	Standard Unit	dB(A)	71	72	74	74	74
	Low Sound Unit	dB(A)	66	65	68	68	66
Dimensions	Length	mm	2500	2500	2500	2960	3550
	Width	mm	2214	2214	2214	2214	2214
	Height	mm	2149	2149	2149	2149	2246
Weight (coated Aluminium Fins)	Operating	kg	1573	1671	1771	1782	2301
	Shipping	kg	1558	1651	1751	1759	2267
Additional weight-units with optional copper fin coils		kg	220	220	220	268	307
Additional weight optional Hydrokit	Single Pump - maximum	kg	196	196	196	239	235
	Dual Pump - maximum	kg	315	315	315	356	365
Additional weight-units with optional Full Louvred Kit		kg	205	205	205	205	230
Additional weight-Low Sound Units		kg	93	93	93	93	110

YLAE-SE (Refrigerant R410A)			0330SE	0375SE	0395SE	0450SE	0490SE
Quantity Refrigerant Circuits			2	2	2	2	2
Refrigerant Charge <sup>(1)</sup>	Circuit 1/Circuit 2)	kg	40.5, 40.5	42.6, 42.2	40.8, 40.8	48.1, 47.8	48.1, 48.1
Oil Charge	Circuit 1/Circuit 2)	Litre	11.2/11.2	20.4/11.2	20.4/20.4	16.8/20.4	16.8/16.8
Compressor	Quantity (Circuit 1/Circuit 2)		2/2	3/2	3/3	3/3	3/3
Unit Capacity Control		%	25, 50, 75, 100	16.9, (24.6) 5, 58.4, (66) 83, 100	17, 33, 50, 67, 83, 100	13.5,(19.7) 33.3,46.9 (53),66.6 80.2,(86.4) 100	17, 33, 50, 67, 83, 100
Evaporator	Water Volume	Litre	33.3	33.3	33.3	37.7	44.0
	Water Connections Nominal Bore	inch	3	3	3	3	3
Air	Total Coil Face Area	m <sup>2</sup>	16.9	16.9	16.9	16.9	16.9
Cooled	Number of Tube Rows		3	3	3	3	3
Condenser	Number Fins per metre		669	669	669	669	669
	Number Fans (Circuit 1/Circuit 2)		3/3	3/3	3/3	3/3	3/3
Normal Fans	Total Air Flow	m3/s	31.6	31.6	31.6	42.1	42.1
Dual	Normal Speed Total Air Flow	m3/s	31.6	31.6	31.6	42.1	42.1
Speed Fans	LS & Low Speed Total Air Flow	m3/s	24.6	24.6	24.6	32.8	32.8
Sound Level <sup>(2)</sup> to EN 292 1991	Standard Unit	dB(A)	74	75	76	76	76
	Low Sound Unit	dB(A)	67	68	69	69	69
Dimensions	Length	mm	4550	4550	4550	4550	4550
	Width	mm	2214	2214	2214	2214	2214
	Height	mm	2246	2246	2246	2246	2246
Weight (coated Aluminium Fins)	Operating	kg	2491	2763	2879	3043	3109
	Shipping	kg	2447	2719	2835	2999	3065
Additional weight-units with optional copper fin coils		kg	408	408	408	408	408
Additional weight optional Hydrokit	Single Pump - maximum	kg	235	235	235	235	235
	Dual Pump - maximum	kg	365	365	365	365	365
Additional weight-units with optional Full Louvred Kit		kg	260	260	260	260	260
Additional weight-Low Sound Units		kg	110	110	110	110	110

(1) Liquid sub-cooling measured at the liquid line should be between 8.5 and 11.0 °C at circuit full load.

Sub-cooling is determined by the level of refrigerant charge in each system.

(2) Sound Pressure levels are 1 m from the Control Panel, at a height of 1.6 m from the unit base.

Levels may vary at different positions around the unit. Levels do not include Hydro Kit Option.

Unit capacity step values in brackets are with the largest compressor on the system starting first.



## ELECTRICAL DATA - SE AND HE MODELS

Model YLAE	Nominal Running @ 400 V		Maximum Running			Start-up <sup>(3)</sup> Amps	Locked Rotor <sup>(4)</sup> Current Amps @ 400V
	kW	Amps <sup>(1)</sup>	kW	Amps@360 V <sup>(2)</sup>	Amps@400 V <sup>(2)</sup>		
	Without Power Factor Correction						
	With Optional Power Factor Correction fitted						
<b>0190SE</b>	63.0	112.2	78.8	132.2	127.2	310.0	225.0
		104.2		127.2	119.8	304.0	
<b>0215SE</b>	72.2	126.8	87.8	147.4	141.8	323.6	225.0
		118.0		142.2	133.8	317.0	
<b>0235SE</b>	85.6	150.8	99.4	167.8	162.4	333.0	198.0
		140.0		161.8	152.8	324.0	
<b>0255SE</b>	93.4	164.0	107.0	181.8	174.2	397.6	272.0
		149.2		173.0	161.4	387.4	
<b>0305SE</b>	107.2	178.0	123.8	210.4	198.2	445.3	314.0
		167.2		203.0	188.4	436.4	
<b>0330SE</b>	121.0	200.8	140.2	239.0	221.8	468.1	314.0
		193.2		233.0	214.6	462.4	
<b>0375SE</b>	126.2	217.6	152.7	258.7	244.0	488.2	314.0
		203.1		249.1	230.9	475.5	
<b>0395SE</b>	137.1	240.6	156.3	266.1	255.9	476.0	272.0
		219.6		252.9	236.7	458.5	
<b>0450SE</b>	155.4	265.5	183.3	312.0	293.7	533.5	314.0
		249.0		301.2	279.0	519.0	
<b>0490SE</b>	178.5	297.0	205.5	350.1	326.7	565.0	314.0
		285.0		341.7	314.7	555.0	
<b>0195HE</b>	61.8	110.8	78.2	137.8	133.2	308.8	225.0
		102.4		133.2	126.0	302.7	
<b>0220HE</b>	71.0	125.2	87.0	153.2	147.6	322.4	225.0
		116.4		147.6	139.6	315.8	
<b>0240HE</b>	83.8	148.4	100.6	177.2	171.2	324.0	198.0
		137.6		170.6	161.0	315.0	
<b>0265HE</b>	87.0	154.4	107.0	188.8	181.2	391.3	272.0
		140.4		180.0	168.4	380.8	
<b>0315HE</b>	100.8	174.3	126.6	222.9	210.4	403.2	272.0
		163.3		215.5	200.3	394.2	
<b>0355HE</b>	110.5	187.8	140.5	247.4	231.0	460.1	314.0
		179.8		241.8	223.8	454.1	
<b>0380HE</b>	121.4	210.9	150.8	265.9	251.7	483.2	314.0
		196.4		254.7	238.8	470.7	
<b>0405HE</b>	132.3	234.0	161.1	284.4	272.4	470.5	272.0
		213.0		271.2	253.8	453.0	
<b>0465HE</b>	151.4	262.3	185.9	328.0	310.0	490.7	272.0
		245.5		317.2	295.3	475.9	
<b>0510HE</b>	171.8	289.6	209.0	367.6	343.0	560.0	314.0
		277.6		359.2	325.2	550.0	

(1) Nominal running amps at 35°C ambient air temperature and 7°C leaving liquid temperature.

(2) Maximum running amps at highest ambient air temperature and cooling capacity before compressor unloading.

(3) Start-up amps is the largest compressor starting with all other compressors/fans operating at nominal conditions at 400 V.

(4) Locked rotor conditions are for the largest compressors.