WATER-COOLED SCREW CHILLER

YEWS (High Efficiency)

Cooling capacity: 215–415TR
In order to meet continuously changing and increasing requirements, Johnson Controls introduces the brand new high efficient HFC-134a water-cooled screw chiller YEWS. Compared to typical water-cooled screw chillers, YEWS high efficiency series can meet customers’ efficiency requirements better and continuously reduces the carbon dioxide emission. YEWS operates additionally very reliable and its flexible configuration combined with a compact footprint can meet a large number of application and project requests.

Its semi-hermetic twin-screw compressor ensures high energy efficiency and long service life. The high efficiency hybrid falling film evaporator helps to increase the COP level to an industry leading level. Equipped with advanced smart control logic, the system is capable to monitor key variables and adjusts the chiller operation precisely. The microprocessor can also be connected to any Building Automation System via MODBUS Protocol.

Chiller Features

Efficiency

All YEWS high efficiency models are energy saving products with proven high performance.

- The industry leading design concept combined with latest technology innovations contribute to the high efficient operation of the chiller.
- The patented hybrid falling film evaporator assures excellent heat exchange efficiency.
- The advanced refrigerant and oil system design upgrades the chiller efficiency even further.
- The smart control logic assures efficient operation at each load point.

Flexibility

YEWS high efficiency series is suitable for a large number of applications: not only comfort cooling but also ice thermal storage or industry cooling.

- The special compressor design can meet high delta pressure condition.
- The real time detecting parameter and system protection let the chiller to work stable even under extreme conditions.

Reliability

Johnson Control’s long term experience and continuous improvement for compressor and chiller design results in highest product reliability.

- The internal oil system provides adequate protect to the unit’s compressor.
- The chiller’s smart control software allows smooth loading and operation.

Sustainability

YEWS reduces indirect & direct carbon dioxide emission and advocates sustainable development.

- The high efficiency of the YEWS chiller offers substantial reduction in power consumption and the facility’s CO₂ footprint.
- The patented hybrid falling film evaporator operates with less refrigerant charge.
Compressor

Highly efficient and precisely manufactured direct drive, semi-hermetic, oil-injected compressor for highest efficiency. 29% - 100% step-less capacity control for highest part-load efficiency. Compressor design working pressure of 2.0 MPa. The compressor housing is made of cast iron and provides optimal space for two ground-facing screw rotors. The rotors are manufactured from forged steel with very small clearances but no direct contact. The design ensures that the rotors keep in the right position, reduces wear, prevents leak and prolongs life span. The unique oil separation system design assures a constant supply of oil to the bearings at all times. An automatic control valve ensures the compressor starts at the minimum motor load and an internal discharge check valve prevents a rotor backspin upon shutdown.

Compressor Motor Protection - The microprocessor motor protection provides over current protection to ensure that the motor is not damaged due to voltage, excess refrigerant or other problems that could cause excessive motor current.

The microprocessor also provides low motor current protection when it senses a motor current of less than 10% FLA. A motor protector module prevents a rotor backspin upon shutdown.

Capacity Control - The compressor slide valve modulates the capacity from 100% to 25% for one compressor unit and 100% to 12.5% for two compressor units. The slide valve will be adjusted according to the system’s load requirement.

Refrigerant System – The efficient high efficiency oil separation system provides adequate protection to the unit’s compressor. It is equipped with an oil heater in oil sump to avoid a refrigerant and oil mix when the chiller is not operating. During the chiller operation, the system operation pressure automatically transfers the oil in the oil sump back to the compressor. An oil filter is equipped to each compressor to prevent any particles entering the compressor.

Heat Exchanger Condenser - The refrigerant circuit water-cooler condenser is a cleanable in the shell and tube with seamless external finned 10mm OD copper tubes rolled into tube plates. The design working pressure on the water side is 3.0 MPa. The factory offers by standard groove type water pipe connections. Alternatively H2G0615 flange type connections can be offered. The refrigerant side has a safety valve with trip pressure of 2.07 MPa. The condenser can be manufactured and tested according to ASME or China National Standard GB515.

Evaporator - The evaporator utilizes a hybrid falling film design. It contains a balance of flooded and falling film technology to optimize efficiency, minimize refrigerant charge, and maintain reliable control. A specifically designed spray distributor provides uniform distribution of refrigerant over the entire length to yield optimum heat transfer. The hybrid falling film evaporator design has suction baffles around the sides and above the falling film section to prevent liquid refrigerant carryover into the compressor. A sight glass of 40mm diameter is on the shell side for refrigerant level observation. The design working pressure is 2.1 MPa for shell, 1.0 MPa for tube side. The refrigerant side has a safety valve with trip pressure of 2.07 MPa. The refrigerant side is manufactured and tested according to China National Standard GB515. The evaporator shell is covered with 10mm closed-cell insulation. The factory offers by standard groove type water pipe connections. Alternatively H2G0615 flange type connections can be offered. The user can program and modify percent limit require a password.

Electronic Starter and Control Panel - The unit comes equipped with a mounted wye-delta starter and control panel. All wiring is completed and tested by the factory but does not include any field installation. The painted galvanized steel panel enclosure is designed and meets the need of IP22 protection. The control panel is divided into a power section and a control section. Power and control sections have separated hinged, latched and gasket sealed doors. The control section is a single power connection. Each power compartment contains compressor starting contractors, control circuit serving compressor capacity control, compressor contractor coils and compressor motor overloads. The compressor motor overloads contain current transformers as an input to the microprocessor. Compressor power supply protection modular protects high input voltage, low input voltage, phase reversal and lack of phase. The control section contains key pad, HMI and microprocessor board.

Compact Water Box - A removable Compact Water Box is fabricated from steel pipe with 1.0 MPa design working pressure. Steel diaphragms are welded inside the water box per the number of the flow pass. The factory offers by standard groove type water pipe connections. Alternatively H2G0615 flange type connections can be offered. 20mm vent and drain pipes are provided on each evaporator and condenser water box.

Codes & Standards - YEWS meets the requirements according to:

- AHRI 550/590 and 551/591.
- China Refrigeration and Air Conditioning Association.

Compact Water Box – YEWS has been certified to the Air Conditioning, Heating and Refrigeration Institute (AHRI) as complying with the latest issue of AHRI Standards 550/590 and 551/591. Under this Certification Program, chillers are regularly tested in strict compliance with standards. This provides an independent, third party verification of chiller performance.

AHRI Certification Program – The performance of YORK YEWS has been certified to the Air Conditioning, Heating and Refrigeration Institute (AHRI) as complying with the latest issue of AHRI Standards 550/590 and 551/591. Under this Certification Program, chillers are regularly tested in strict compliance with this Standard. This provides an independent, third party verification of chiller performance.

The microprocessor system is allowed to monitor and control many key variables and can display the following items at its 120 character and 8-line big LCD display in metric unit (°C and kPa):

**Nomenclature**

**Design Series**
- 50: 380V-3P-50Hz
- 53: 400V-3P-50Hz
- 55: 415V-3P-50Hz

**Refrigerant:** A-HFC134a

**High efficiency**

**Premium efficiency**

**Water cooled**

**Screw compressor**

**Unit Model**

**Options**

**25mm Spring Isolators**
The unit comes by standard with four lose 19mm thick anti-vibration neoprene pads, for field installation. When the unit is installed on the floor, Spring Isolators are recommended to replace the standard neoprene pads. 4 level adjustable Spring Isolators with non-slip mat will be delivered lose and can be conveniently mounted under the tube sheet.

**Marine Waterbox**
The Marine Water box option makes it easy to clean the copper pipes of the heat exchanger without disconnecting the water pipes. Marine Water boxes are available for both condenser and evaporator. The factory offers by standard groove type water pipe connections. Alternatively HG20615 flange type connections can be offered.

**Left/Right Pipe connection**
Left or Right Pipe connection is the perfect option for small machine room or retrofit projects. It allows to choose the pipe connection either from the right or from the left side.

**Compressor Sound Attenuator**
This option provides higher comfort to the user by lowering the sound emission of the chiller.

**Thicker Evaporator Insulation (38mm)**
The 38mm thicker insulation is an option in case of relative humidity up to 90% and dry bulb temperatures ranging from 10 to 32°C. It is especially suitable for ITS, low temperature or high humidity areas and helps to avoid the sweat on the surface of the unit.

**Refrigerant isolation valve and refrigerant storage**
The condenser shell will be capable of storing the entire system refrigerant charge during servicing if the unit is equipped with the optional isolation valve.

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**Chiller Standard configuration**

**Chiller Insulation**
The unit comes factory fitted with a 19mm thick flexible closed-cell plastic anti-sweat insulation attached to the evaporator shell, tube sheets, suction connection, and (if necessary) to the auxiliary tubing. The 19mm thick insulation can prevent sweating in environments with relative humidity up to 75% and dry bulb temperatures ranging from 10 to 32°C.

**Flow switch**
The design working pressure of paddle type flow switch is 103MPa (Gauge). It is suitable for chilled liquid and condenser liquid pipes. The power supply of flow switch is 125 V.A.C., 1 Phase, 50 Hz.

**Painting**
The chiller surface is painted with anticorrosion and durable caribbean blue epoxy primer and propionic acid one-component top coat.

**Shipping**
Production covers are provided for the control center and controller on the unit. Plastic caps or fabriccover plate are provided for all water pipe connectors.

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**Compressor operating hours and starts**

**Discharge pressure and temperature**

**Load limit set points for high discharge pressure and high motor current**

**Evaporation and condensing temperature**

**Anti-recycle timer counting the timing of the next compressor start**

**System suction (and suction superheat), discharge, and oil pressures**

**Percent of full load compressor motor current**

**Chiller Control Center**

**Available display languages are Chinese and English**

**Compressor motor current**

**Cut-out status and set-points for entering chilled liquid**

**Evaporation and condensing temperature**

**Chilled liquid entering and leaving temperature**

**Condenser liquid entering and leaving temperature**

**Day, date and time, daily start/stop time, holiday and manual override status**

**Compressor operating hours and starts**

**Compressor run status**

**Compressor Sound Attenuator**

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**Compressor motor current**

**Cut-out status and set-points for entering chilled liquid**

**Evaporation and condensing temperature**

**Chilled liquid entering and leaving temperature**

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**Percent of full load compressor motor current**

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**Refrigerant isolation valve and refrigerant storage**
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### Technical Data

#### High Efficiency Chiller Performance Data

<table>
<thead>
<tr>
<th>Model</th>
<th>Cooling capacity</th>
<th>TR</th>
<th>kW</th>
<th>Input Power kW</th>
<th>COP</th>
<th>FLA</th>
<th>Part Load Capacity</th>
<th>Full Load Capacity</th>
<th>Discharge</th>
<th>Superheat</th>
<th>Superheat</th>
<th>Water Pressure Drop</th>
<th>Water Pressure Drop</th>
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<tbody>
<tr>
<td>YEWS300</td>
<td>226</td>
<td>328</td>
<td>355</td>
<td>12.5~100</td>
<td>3.7</td>
<td>180</td>
<td>301/280</td>
<td>355/350</td>
<td>3.5</td>
<td>165/150</td>
<td>140</td>
<td>650/600</td>
<td>650/600</td>
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<td>265</td>
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<td>355</td>
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<td>3.7</td>
<td>220</td>
<td>374/350</td>
<td>360/350</td>
<td>3.5</td>
<td>205/180</td>
<td>150</td>
<td>750/700</td>
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<tr>
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<td>3.7</td>
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<td>374/350</td>
<td>315/350</td>
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<td>180/165</td>
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<td>260</td>
<td>423/400</td>
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<tr>
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<td>496/475</td>
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<td>3.5</td>
<td>300/280</td>
<td>180</td>
<td>900/850</td>
<td>900/850</td>
</tr>
</tbody>
</table>

**Remark:** 1. Air conditioning: 7/12
2. Condenser liquid entering temperature 30°C, Flow rate 3GPM/ton, fouling factor 0.00025hr ft² °F / Btu.
3. The above data are based on Johnson Control’s selection software: AECworks 4.1. Please refer to the latest version of the computer selection for specific projects.

#### High Efficiency ITS Dual Duty Performance Data

<table>
<thead>
<tr>
<th>Model</th>
<th>Cooling capacity</th>
<th>TR</th>
<th>kW</th>
<th>Input Power kW</th>
<th>COP</th>
<th>FLA</th>
<th>Part Load Capacity</th>
<th>Full Load Capacity</th>
<th>Discharge</th>
<th>Superheat</th>
<th>Superheat</th>
<th>Water Pressure Drop</th>
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<tr>
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<tr>
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<td>3.7</td>
<td>220</td>
<td>374/350</td>
<td>360/350</td>
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<td>750/700</td>
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<td>315</td>
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<td>220</td>
<td>374/350</td>
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<tr>
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<td>3.7</td>
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<td>423/400</td>
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<td>496/475</td>
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<td>3.5</td>
<td>300/280</td>
<td>180</td>
<td>900/850</td>
<td>900/850</td>
</tr>
</tbody>
</table>

**Remark:** 1. Chilled liquid leaving temperature 85°F, Flow rate 3GPM/ton, fouling factor 0.00025hr ft² °F / Btu.
2. Condenser liquid entering temperature 85°F, Flow rate 3GPM/ton, fouling factor 0.00025hr ft² °F / Btu.
3. The above data are based on Johnson Control’s selection software: AECworks 4.1. Please refer to the latest version of the computer selection for specific projects.

#### Physical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>Refrigerant circuit</th>
<th>Refrigerant Charge (L)</th>
<th>Lubrication oil Charge (L)</th>
<th>Compressors Qty</th>
<th>Unit Capacity (kW/ton)</th>
<th>Water Volume per Refrigerant L</th>
<th>Water Volume per Lubrication Oil L</th>
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<tr>
<td>YEWS300</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>12.5~100</td>
<td>350</td>
<td>520</td>
<td>650/670</td>
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<td>YEWS340</td>
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<td>2</td>
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<td>390</td>
<td>480</td>
<td>610/700</td>
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<tr>
<td>YEWS260</td>
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<td>2</td>
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<td>1</td>
<td>12.5~100</td>
<td>480</td>
<td>580</td>
<td>660/760</td>
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<tr>
<td>YEWS375</td>
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<td>2</td>
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<td>1</td>
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<td>550</td>
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<td>710/870</td>
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<td>1</td>
<td>12.5~100</td>
<td>720</td>
<td>880</td>
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</tbody>
</table>

**Remark:** 1. Air conditioning: 7/12°C, 30/35°C; Ice making: Chilled liquid leaving temperature -5.6°C.
2. If refrigerant isolation valve is selected, 50mm will be added to the chiller height “H”.
3. If 2.1MPa water box is selected, 35mm will be added to the chiller length “L”.

#### Electric Data

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<td>605</td>
<td>510</td>
<td>180</td>
<td>565</td>
<td>140</td>
<td>180</td>
<td>565</td>
<td>140</td>
<td>180</td>
</tr>
</tbody>
</table>

**Remark:** 2. If 2.1MPa water box is selected, 35mm will be added to the chiller length “L.”
### YEWS415

![Diagram of YEWS415](image)

#### Spring Isolator

- the central line of the unit
- the central line of the unit
- tube sheet
- tube sheet
- tube sheet

#### Rubber Isolator

- YEWS215
  - Model: YEWS215
  - A (mm): 3798
  - B (mm): 1620
  - C (mm): 4004
  - D (mm): 1736
  - E (mm): 152

- YEWS260
  - Model: YEWS260
  - A (mm): 3798
  - B (mm): 1430
  - C (mm): 4004
  - D (mm): 1546
  - E (mm): 114

- YEWS300
  - Model: YEWS300
  - A (mm): 3798
  - B (mm): 1570
  - C (mm): 4004
  - D (mm): 1686
  - E (mm): 152

- YEWS340
  - Model: YEWS340
  - A (mm): 3798
  - B (mm): 1570
  - C (mm): 4004
  - D (mm): 1686
  - E (mm): 152

- YEWS375
  - Model: YEWS375
  - A (mm): 3798
  - B (mm): 1670
  - C (mm): 4004
  - D (mm): 1786
  - E (mm): 152

- YEWS415
  - Model: YEWS415
  - A (mm): 3798
  - B (mm): 1720
  - C (mm): 4004
  - D (mm): 1836
  - E (mm): 152

### Evaporator Water Pipe Connection

- Single pass
- Two pass

#### Condenser Water Pipe Connection

- Single phase one pass
- Dual phase two pass

### Wiring Diagram (Wye-Delta Starter)

- Power wiring panel
- Customer supplied
- Grounding wire
- Power supply (380V/3Phase/50Hz)
- Flow switch
- External interlock
- Remote switch
- Air conditioning/ITS transition
- Air conditioning/Heat pump transition
- Water pump running
- Alarm output
- Compressor
- 1# running
- Compressor 2# running
- Starter
- Starter
- Main control panel

### Remark

1. If refrigerant isolation valve is selected, 50mm will be added to the chiller height “H”.
2. If 2.1MPa water box is selected, 35mm will be added to the chiller length “L”.

### Models

<table>
<thead>
<tr>
<th>Model</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
<th>E (mm)</th>
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<td>152</td>
</tr>
</tbody>
</table>

### Remark

1. If there is no “external interlock EXT”, please jumper connect terminal “6” and “13”.
2. The contact resistance of flow switch, mode transition switch, external interlock and remote switch should be less than 0.5 ohm.
3. The 485 communication cable from 485 converter to terminal must be of the same type of cable.
4. Use twisted-pair cable with characteristic impedance 120 plus / minus 20% ohm as the bus cable.
5. The length of communication cable should be within 1000 meters.

The picture only for: YEWS260, 300, 340, 375, 415
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