Marketing News

AN ELCO HOLDINGS DIVISION

Date: August, 2007

Re: MB-04-07

AQL – AQH 20- 35

R410A

New Product offer

We are pleased to announce the new family AQL – AQH 20- 35 equipped with R410A refrigerant. This new series is available in 4 sizes and covers a cooling capacity range from 19.1 kW to 35.9 kW.

All units are equipped with one refrigerant circuit with a tandem scroll compressors.

A microprocessor controls the general status of the machine.

AQL and AQH can work without water tank thanks to ILTC microprocessor features like auto adaptive CONTROL STRATEGY at different load or water volume conditions. The minimum water volume requested is 2.5l/kW. Anyway it is possible to buy as accessory an external water tank.

All units have the **pump** fitted on board as **standard** but it is possible to buy as accessory a kit that allows the customer to remove the pump and use an external pump.

Fan speed control is **available** and is supplied loose as accessory.

New gauge kit is now available: more easy to install compared to the previous one for R407C. In fact now it can be installed easily and directly inside the machine. This is an accessory only supplied loose.

Improvement on new family

- ✓ High Efficiency (A and B Class) and High ESEER, see the comparison with the same size equipped with R407C on graphic below.

- ✓ Wide Operating Limits : down to -10°C in Heating Mode and up to +50°C in Cooling Mode
- ✓ Low water temperature application: down to -8°C
- ✓ External Control Panel
- ✓ Less noisy compared to the R407C: see the comparison with the same size with R407C on graphic below
- ✓ Main switch factory mounted
- ✓ Fan Speed Control Now Available (Accessory)
- ✓ Pump as standard
- ✓ Phase Sequencer monitor as standard
- ✓ Double Water Set Point
- ✓ **Return** and **Leaving** Water Temp Control Logic now available

Constructive Features

Structure

Structure beams and panels are made with galvanized carbon steel.

All the galvanized steel components are individually painted by means of a polyester powder with special process before the assembly of the unit. This system performs a homogenous protection to the corrosion.

The colour is RAL 9001 with minimum thickness paint of 40 microns.

These units can be installed outside, directly on the building roof or at the ground level.

Refrigerant and hydraulic circuit

All units have one refrigerant circuits with a scroll tandem compressors, plate heat exchanger, thermostatic valve and coil. In heat pump unit it is possible to reverse cycle and pass from cooling to heating mode and viceversa thanks to a four way valve.

Inspection on refrigerant can be done by a sight glass during service operation without removing any panel but by a hole located in one side of the unit.

The refrigerant circuit is equipped with high pressure switch and high and low pressure transducer.

Heat pump unit are also equipped with PED safety valve mounted directly on the liquid receiver.

As accessory it is possible to fit inside the unit a gauge kit that permits to read high and low pressure value.

Concerning hydraulic circuit, all units comes out from factory with pump that provide the high static pressure needed. The head of the pump is insulated with a 10mm insulation that avoid air condensation on it.

Water filter is given as **standard**.

Safety valve ad expansion tank are located on suction side of the pump. Both high and low pressure side are equipped with 3/8" gauge that allow to drain the water or connect manometer during service operations.

Water connections are 1" ½ Male GAS Threaded type.

Compressor

All units have one tandem compressors.

They are mounted on a rail and strongly connected to it in order to make one block between the two compressors.

The tandem is mounted then on soft grommets in order to reduce vibrations and insulate it from the rest of the unit.

Motors have direct start-up, it is gas cooled and equipped with overload protection.

Soft start system is available as option and the **phase sequence monitor** is fitted as **standard** on the units.

Thanks to the low sound level, R410A unit doesn't need to use sound jackets.

Evaporator and condenser

Evaporator is a stainless steel plates heat exchanger with a 10mm thermal insulation realized by an heavy thickness flexible blanket realized by closed cells synthetic foam in order to prevent air condensation with air temperature. Evaporator is protected by a 35W anti-freeze electrical heater to ensure a good antifreeze protection even at low ambient air temperature (-10°C) when the units is switched off.

This heat exchanger can works with a water pressure of maximum 10 bar and a maximum refrigerant pressure of 46 bar.

The condenser is a coils realized with internally grooved copper tubes expanded into corrugated aluminium fins. Corrugated fins allow the water to go away during de-icing cycles. The standard supply includes grilles to protect the coil from shocks and hurt.

Fans

This units have two axial fan with 610mm of diameter. They are placed direcly in front of the coil in order to increase the air flow and the heat transfer between air and refrigerant.

They can work with two steps of velocity: 630rpm for normal operating conditions and 450 rpm for night mode in order to have low noise sound level.

Pressostatic Fan speed controller can be installed by the customer as accessory. It will allow to operate in cooling mode also at low ambient (-10°C) operating temperature because it will regulate the fan speed rotation in order to maintain constant the condensing pressure.

Fan motors have a IP54 grade, and thermostat protection placed in the bearings.

Both fans are equipped with a safety grill.

Electrical panel-control device

The control panel contains an electrical board with keyboard and display for the visualization of the operating parameters and alarms. This control panel is accessible from outside because it is placed on an external panel. A Plexiglas cover protect the control from external agent.

AQL/H chillers are equipped with a microprocessor control with ILTC logic that permits an intelligent control of the Entering Water Temperature or of Leaving Water Temperature.

The main characteristics of this systems are:

- User friendly: it is possible to control the unit easily with only 3 buttons and a tree-logic
- Reliable: all the indications on the display are visible in every weather condition
- Test procedure
- Night Mode
- Alarm visualization with a Logging of the last 10 alarms
- Switch on/off possible by remote control
- Compressors and pump working hour Counter
- Pressure transducers to control discharge and suction temperatures
- Maximum discharge temperature control
- Part load operating mode
- Possibility to switch from cooling to heating and viceversa by remote

- Compatibility with BMS (Modbus protocol in RS485)
- Compressors operation limits stored in the flash memory that allows unit running keeping the compressor operative conditions always in its “safe area”

Each unit is complete with following safety and control devices:

Safety

- Fan motor overload protection.
- Compressor motor overload protection.
- Water differential pressure switch.
- High pressure switch.
- High and Low pressure trasducer
- Evaporator antifreeze electrical heater.
- Crankcase oil electrical heater

Control

- Entering water temperature sensor
- Leaving water temperature sensor
- Coil temperature sensor
- Discharge temperature sensor
- Air temperature sensor
- Suction and Discharge pressure transducers

Technical data

Please see the enclosed excel t for all technical details of AQL/H R410A units.

Table 1: General technical data either for cooling only and heat pump units.

Table 2: Electrical data

Table 3 Performance data according to the external air temperature and leaving water temperature.

Table 4 Refrigerant and hydraulic circuits and their details.

Table 5 Hydraulic data: pump high static available pressure, its power input and the pressure drop of plate heat exchanger. All these data are given according to water flow rate.

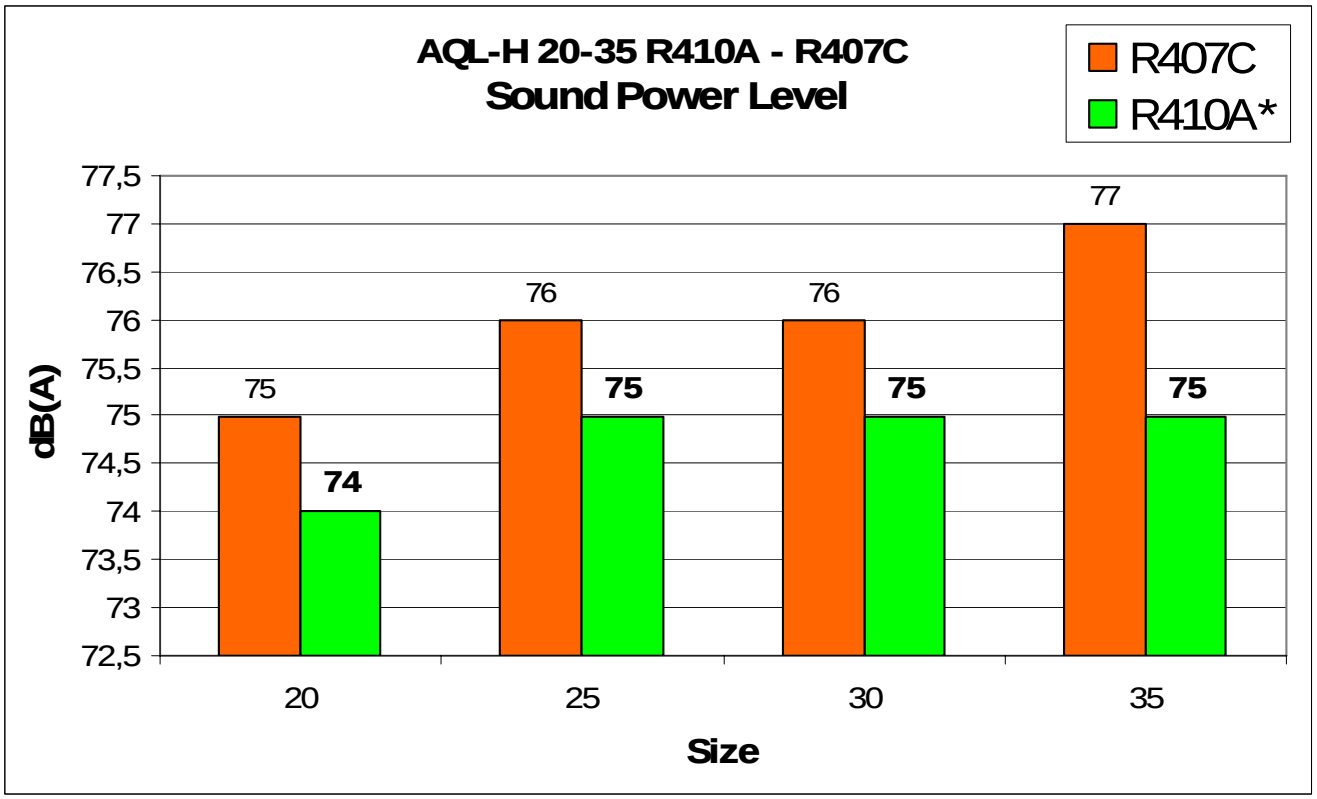
Table 6: Performance corrective coefficient

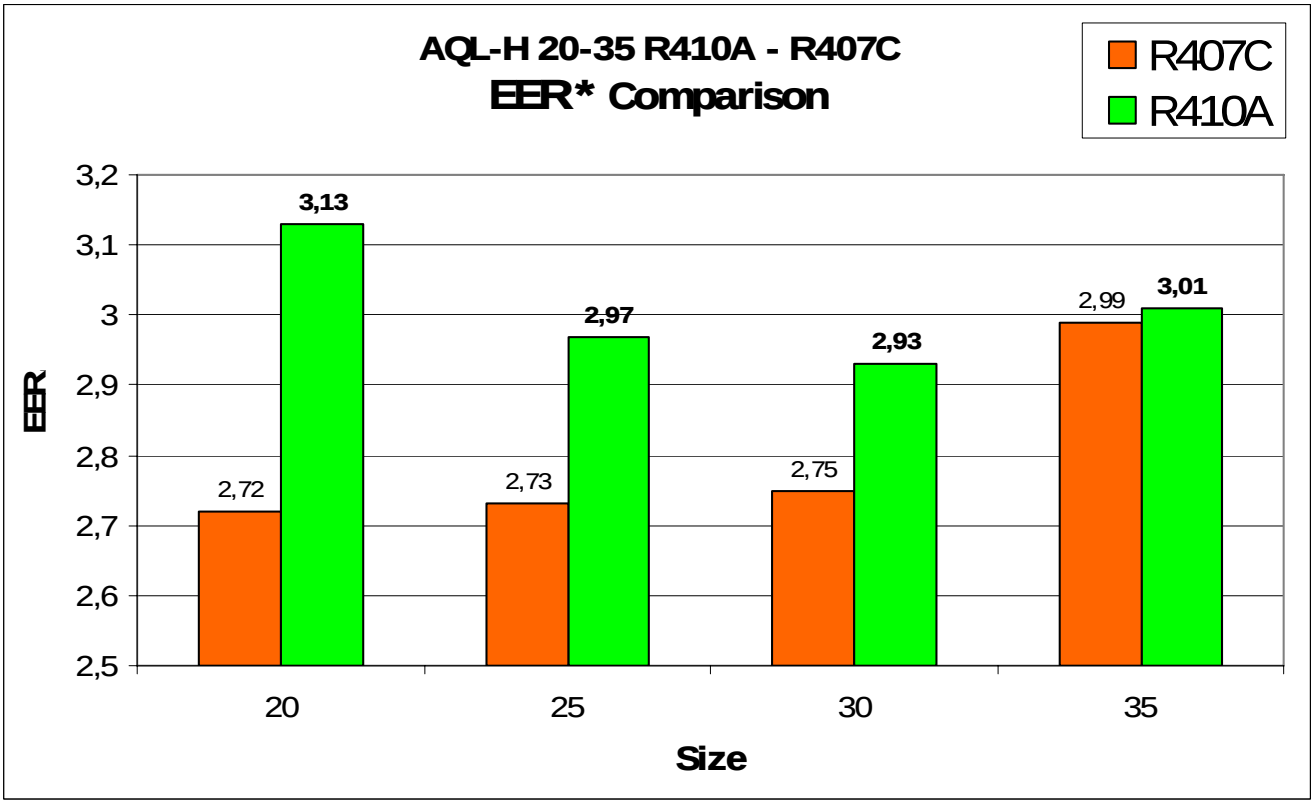
Table 7: Operating limit of the unit.

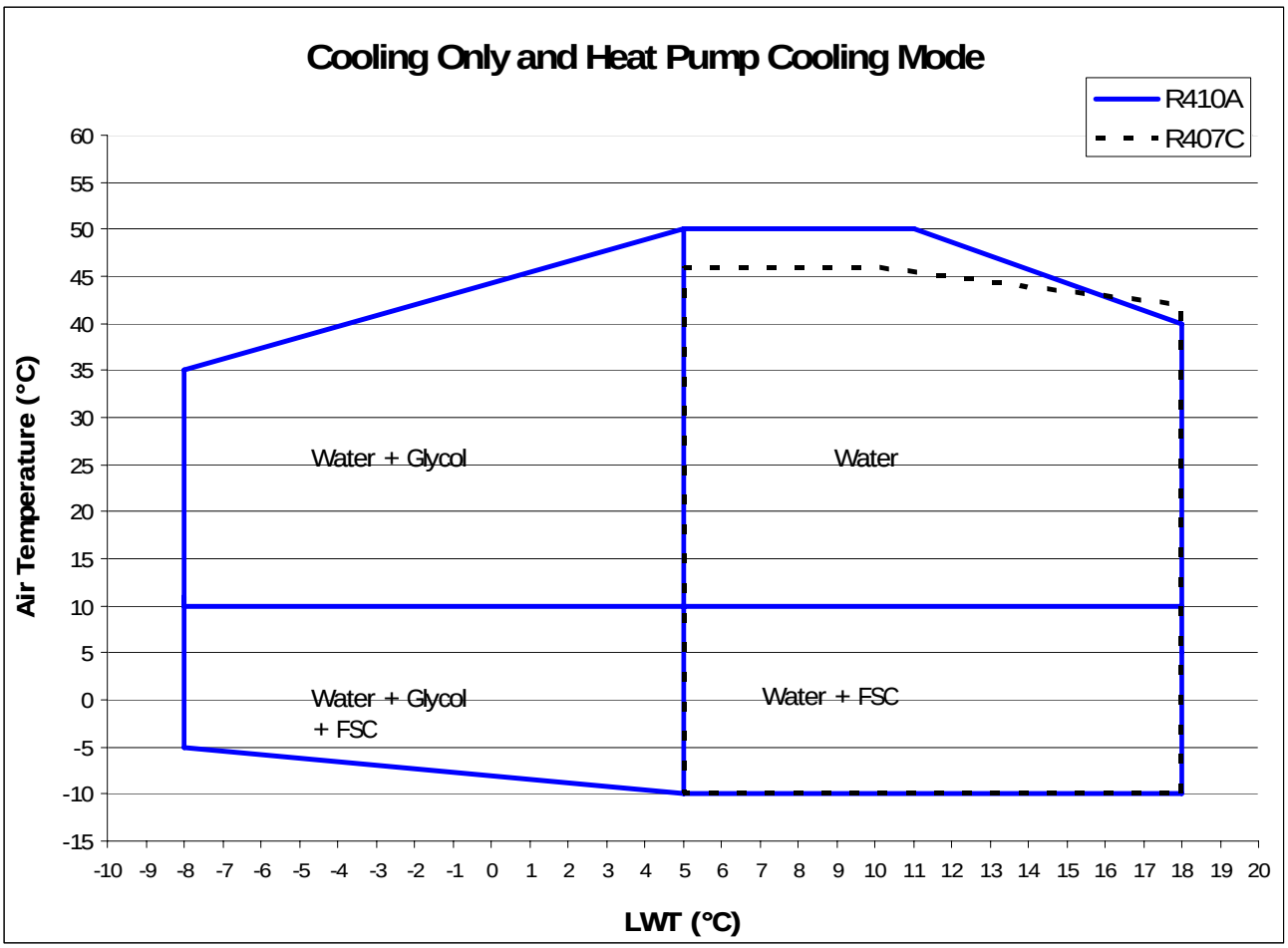
Table 8: Sound power level and the sound pressure level.

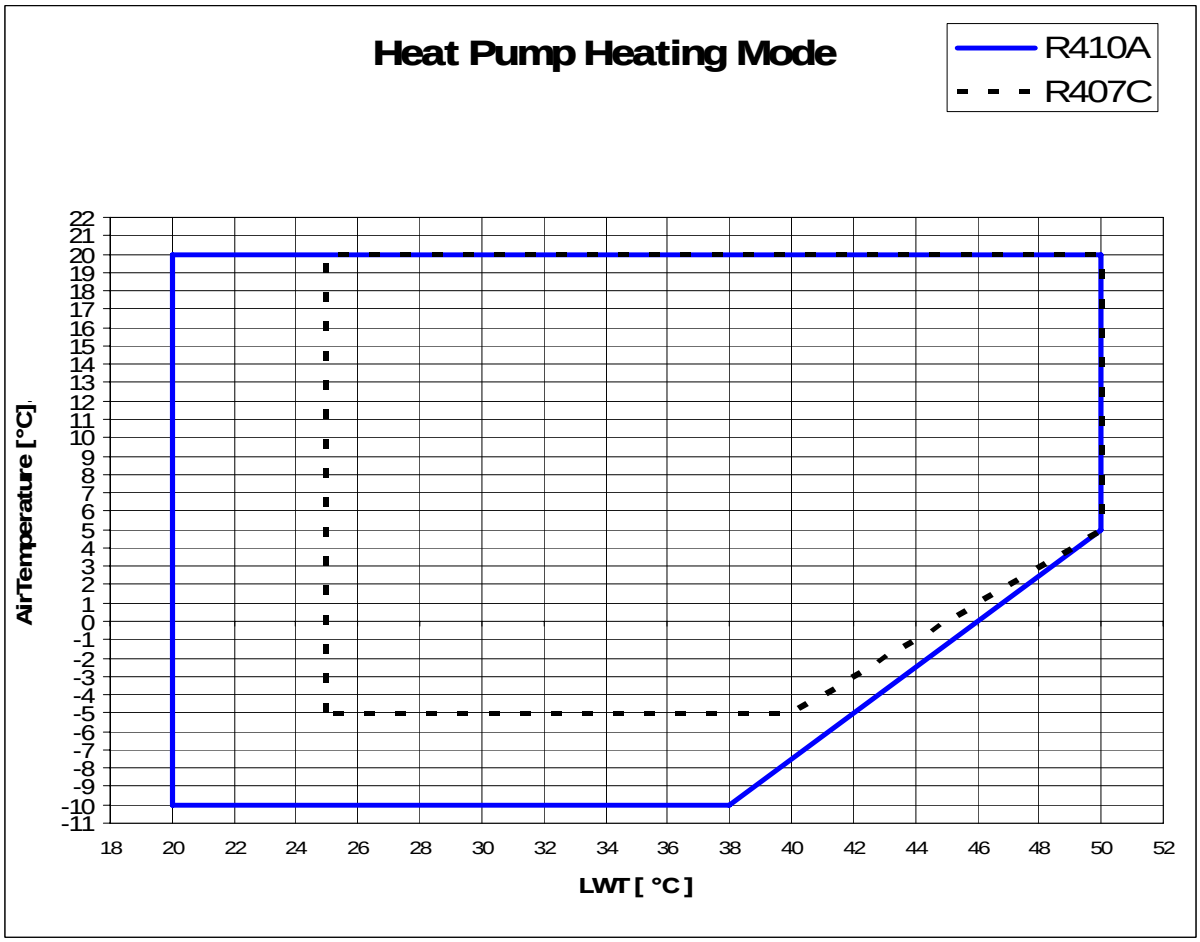
Table 9: Dimensional drawings

Table 10: Clearances


AQL-H 20-35 R410A - R407C
Sound Power Level
R407C
R410A*
dB(A)
77,5
77
76,5
76
75,5
75
74,5
74
73,5
73
72,5
75
74
76
75
76
75
77
75
20
25
30
35
Size


AQL-H 20-35 R410A - R407C
EER* Comparison
R407C
R410A
EER
3,2
3,1
3
2,9
2,8
2,7
2,6
2,5
2,72
3,13
2,73
2,97
2,75
2,93
2,99
3,01
20
25
30
35
Size


Cooling Only and Heat Pump Cooling Mode
R410A
R407C
Air Temperature (°C)
LWT (°C)
Water + Glycol
Water
Water + Glycol
+ FSC
Water + FSC


Heat Pump Heating Mode
R410A
R407C
AirTemperature [°C]
LWT [°C]