

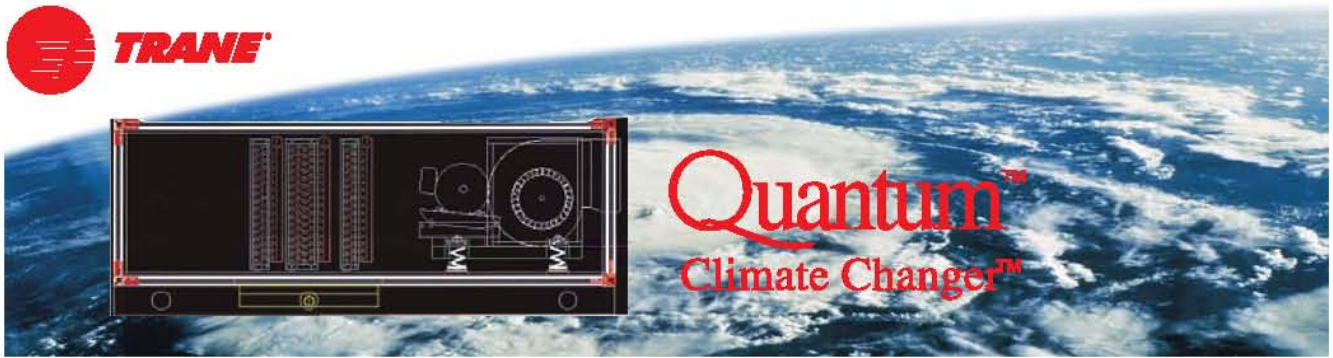


***Quantum Climate Changer  
World Class Air Handling Technology***

**Model CLCP  
Double Skin Air Handling Unit  
1,000 - 58,000 cfm (0.5-27 m<sup>3</sup>/s)**







## World Class Air Handling Technology



Picture at left: Trane's Technology Center in La Crosse, Wisconsin. This facility includes a technical library, a full-scale laboratory with full instrumented test bays, heat transfer tunnels, chemistry, metallurgy, acoustics and refrigeration laboratories. Here at the Technology Center, engineers, designers, laboratory technicians and researchers design and test the HVAC equipment of the future.

### World Class Manufacturing Facility - Trane Thailand

The Quantum Climate Changer is manufactured in Trane Thailand, a facility that is certified to ISO 9001 - 2000 and is one of the earliest American Standard facilities certified to Demand Flow Technology (DFT). DFT is a technology that takes quality to the people and the machines they produce. In addition, Total Quality Control (TQC) methodology brings quality into the manufacturing process at the point where work is being performed, resulting in consistent product quality.

Various testing and verification procedures are incorporated into the manufacturing process to ensure highest product quality and reliability;

- All complete fan/motor/drive assemblies are statically and dynamically tested and balanced at actual speed. This is on top of the balancing done by the supplier on the fan assembly only.
- All coils are leak tested at 380 psig.
- Aluminium fins as standard with anti-corrosion coated fins and copper fins as option.
- All factory engineered controls such as micro-processors and sensors are fully installed and tested.
- All incoming components to the factory are checked and verified to ensure zero defect.
- Forward curved, Backward curved and Airfoil fan are available.
- Unit is designed for easy field assembly.

### Globally integrated Research & Development

With the vision of creating a world class air handler;

- a global marketing team comprising air handling specialists from Europe, Asia Pacific & China, Middle East, Africa and South America was formed to provide critical customer and market needs.
- a global designing team comprising design specialists from the Trane USA Technology Center, Trane Europe and the Air Handling International Development Center in Asia was formed to develop a new world class Air Handling Technology. This dedication brings us Trane's New Quantum Climate Changer.

### Quantum Climate Changer Performance Assurance and Commitment to Quality

Trane combines comprehensive performance certifications with thorough laboratory testing and manufacturing methods. Together, these elements help assure that each Quantum Climate Changer operates predictably and reliably throughout the life of the unit.

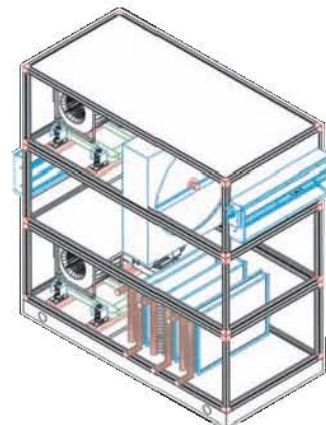
All AHU fans are tested as per ANSI/AMCA 210, ANSI/ASHRAE Standard 51 "Laboratory Method of Testing Fans for Rating" and AMCA 300 "Reverberant Room Method for Sound Testing of fans".

All coil capacities, pressure drops and selection procedures are rated in accordance to ARI Standard 410.

Exposed insulation system meets UL 94 : Underwriters Laboratories Incorporated, standard for safety and flammability of plastic material for parts in devices and appliances.



Amair Limited - Air Handling Center of Excellence



Stacked Quantum Climate Changer designed with heat recovery wheel



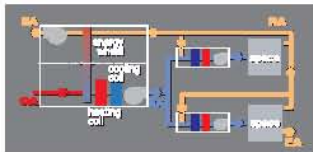


## Worldwide Air Conditioning Application Knowledge

The building industry is continuously evolving and the rate of change is accelerating. Technological, economic, regulatory and environmental factors are very different now than there were just a few years ago, which will affect the application and installation of the HVAC systems. Recognizing this and utilizing the Trane worldwide air conditioning system experience, the new Quantum Climate Changer was developed and packaged to suit most current air conditioning system application needs.

### Energy Efficient Quantum Climate Changer

The Quantum Climate Changer offers various energy efficient packages for different building applications that will reduce the operating cost of HVAC systems. Some of the well known energy saving options incorporated in these packages are heat recovery coil loops, rotary heat wheels, heat plate exchangers, heat pipes and variable frequency drives.



Typical Energy Recovery System

### Factory Engineered Controls

The Quantum Climate Changer is available with a Turnkey control package that is designed to lower installation cost and risk while dramatically improving the quality of the application. The entire air handler control system is engineered, mounted, wired and tested in a world class manufacturing environment with strict quality control. The controls component used in the control package are:

- unit mounted DDC controllers
- variable frequency drives
- starters
- modulating valves
- damper actuators
- inlet guide vane actuators
- face and bypass actuators
- temperature sensors
- humidity sensors
- pressure sensors
- low-limit switches
- fan or filter status switches
- high and low pressure switches

The control package can be a stand-alone air handler operation or can be tied to other Trane products through Trane Integrated Comfort System (ICS)...a powerful system architecture that unifies Trane HVAC equipment, direct digital control and building management into a coherent whole with an assured source of support. Benefits to the owners, facilities managers, designers and contractor are:

- single source responsibilities
- comprehensive monitoring and diagnostic capabilities
- system optimization resulting in effective operation of entire HVAC system
- allows integration and interpretability through the communication protocol, BACnet



Integrated Comfort System (ICS)

### Indoor Air Quality Ready

Why should a building owner take pains to create a "good - IAQ building"? Simply stated, "good IAQ-building" offer proven value. Providing occupants with an enjoyable, productive environment makes the building easier to rent, easier to sell and less prone to litigation. Realizing that building's air handling system plays a key role in creating this environment, Quantum Climate Changer is developed with IAQ as an integral part of the design.

- Double wall construction for easy cleaning and disinfecting of interior surface
- Non-hydroscopic polyurethane insulation which will not rot nor promote fungus growth
- Three Dimensional Pitched drain pan to provide total condensate removal
- Non-corrosive aluminium frame which is easily cleanable
- Traq Damper option which allow accurate controls of the fresh air and return air ratio
- Wide range of filters options to ensure effective control of particulate and contaminants

### Industrial Application

Trane's Centrifugal and Helical Rotary chillers are well-known for their "Reliability" and "Efficiency"! How do you define "Reliability" and "Efficiency" in air handling units? We are convinced it is the Quantum Climate Changer !

The features that help to assure the Quantum Climate Changer's reliability and efficiency include:

- Rigid and sturdy 50 mm casing that can withstand high static pressure and large airflow applications.
- Proven and tested low unit leakage rate that will ensure better control of a contaminant free environments.
- Fan bearings selected with L-50 life of at least 200,000 hrs.
- Direct drive fan assembly option that eliminate belt dust and potential down time due to drives breakdown.
- Energy efficient packages that will ensure efficient energy usage.

The Trane Quantum Climate Changer is simply the best match for Trane's famous Centrifugal and Helical Rotary Chillers. It's a partnership designed for reliability and efficiency.



CentraVac

Quantum Climate Changer

Simply the best match!



**Quick selection Procedure**

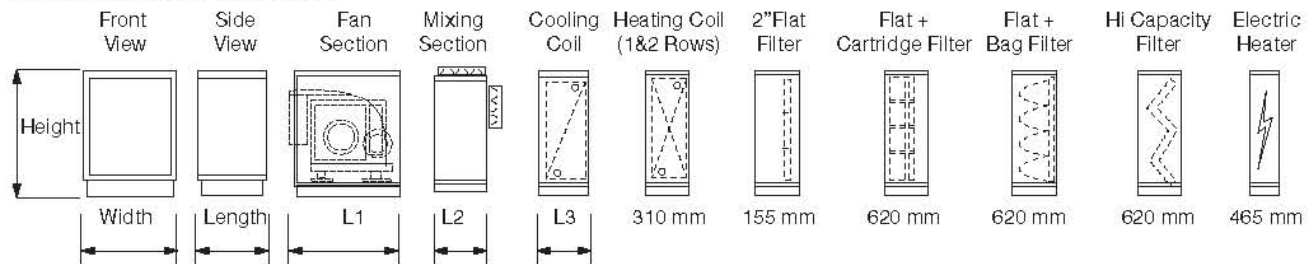
- Step 1: Determine what is the design airflow cfm (m<sup>3</sup>/s) or total cooling capacity MBH (kW).
- Step 2: Use the table below to determine the unit size by picking the closest airflow or total cooling capacity.
- Step 3: The unit width and height are the same for all sections Unit length in Table A is based on basic fan+coil+ flat filter sections only.  
For other combinations, use Table B: Standard Section Length to determine the overall unit length.
- Step 4: Determine the nominal unit details (unit weight, coil water pressure drop, water flow rate and motor installed power) using Table A.

**Table A: Quick Select**

Model Size	Coil Face Area		Airflow At 2.55 m/s Face Velocity		Total Cooling Capacity		External Static Pressure		Unit Dimension (Fan+Coil+Flat Filter)			Unit Weight		Cooling Coil Water Pressure Drop		Water flow Rate		Motor Installed Power	
	ft <sup>2</sup>	(m <sup>2</sup> )	cfm	(m <sup>3</sup> /s)	MBH	(kW)	in.wg	(Pa)	Width mm	Height mm	Length mm	kg	ft.wg. (kPa)	GPM	(L/s)	hp	(kW)		
CLCP 003	2.58	(0.24)	1,292	(0.61)	38	(11)	1.2	(300)	748	868	1368	160	0.5	(1.5)	7.61	(0.48)	2.0	(1.5)	
CLCP 004	4.30	(0.40)	2,161	(1.02)	75	(22)	1.2	(300)	1058	868	1368	200	1.2	(3.7)	14.90	(0.94)	2.0	(1.5)	
CLCP 006	6.13	(0.57)	3,072	(1.45)	92	(27)	1.2	(300)	1368	868	1368	260	2.5	(7.5)	20.61	(1.30)	3.0	(2.2)	
CLCP 008	7.85	(0.73)	3,941	(1.86)	123	(36)	1.2	(300)	1678	868	1368	300	1.6	(4.7)	24.25	(1.53)	4.0	(3.0)	
CLCP 010	9.68	(0.90)	4,873	(2.30)	140	(41)	1.2	(300)	1368	1178	1523	330	1.2	(3.6)	27.74	(1.75)	5.5	(4.0)	
CLCP 012	12.47	(1.16)	6,271	(2.96)	205	(60)	1.2	(300)	1678	1178	1523	420	2.9	(8.6)	41.21	(2.60)	5.5	(4.0)	
CLCP 014	15.27	(1.42)	7,669	(3.62)	270	(79)	1.2	(300)	1988	1178	1523	470	5.3	(15.8)	54.05	(3.41)	7.5	(5.5)	
CLCP 016	17.10	(1.59)	8,581	(4.05)	276	(81)	1.2	(300)	1678	1488	1523	530	2.3	(6.9)	55.32	(3.49)	7.5	(5.5)	
CLCP 020	20.97	(1.95)	10,530	(4.97)	365	(107)	2.0	(500)	1988	1488	1678	700	4.3	(12.9)	72.91	(4.60)	15.0	(11.0)	
CLCP 025	25.81	(2.40)	13,072	(6.17)	467	(137)	2.0	(500)	1988	1798	1833	750	6.1	(18.3)	93.36	(5.89)	15.0	(11.0)	
CLCP 030	31.18	(2.90)	15,678	(7.40)	546	(160)	2.0	(500)	1988	2108	1988	850	4.9	(14.7)	109.21	(6.89)	15.0	(11.0)	
CLCP 035	36.88	(3.43)	18,538	(8.75)	672	(197)	2.0	(500)	2298	2108	1988	990	8.0	(23.9)	134.41	(8.48)	20.0	(15.0)	
CLCP 040	42.69	(3.97)	21,441	(10.12)	802	(235)	2.0	(500)	2608	2108	2143	1150	12.0	(36.0)	160.09	(10.10)	20.0	(15.0)	
CLCP 045	48.39	(4.50)	24,322	(11.48)	928	(272)	2.0	(500)	2918	2108	2143	1250	17.1	(51.1)	185.45	(11.70)	25.0	(18.5)	
CLCP 050	54.19	(5.04)	27,225	(12.85)	1,054	(309)	2.0	(500)	3228	2108	2298	1460	23.4	(70.0)	211.29	(13.33)	30.0	(22.0)	
CLCP 060	63.98	(5.95)	32,140	(15.17)	1,242	(364)	2.0	(500)	3228	2418	2453	1870	22.9	(68.4)	248.22	(15.66)	40.0	(30.0)	
CLCP 065	70.75	(6.58)	35,551	(16.78)	1,385	(406)	3.0	(750)	3538	2418	2608	2110	26.4	(78.8)	278.13	(17.61)	50.0	(37.0)	
CLCP 070	77.53	(7.21)	38,962	(18.39)	1,399	(410)	3.0	(750)	3848	2418	2608	2210	8.7	(25.9)	272.94	(17.22)	50.0	(37.0)	
CLCP 080	84.41	(7.85)	42,415	(20.02)	1,515	(444)	3.0	(750)	4158	2418	2608	2450	10.9	(32.6)	302.90	(19.11)	60.0	(45.0)	
CLCP 085	91.18	(8.48)	45,805	(21.62)	1,662	(487)	3.0	(750)	4468	2418	2608	2570	13.3	(39.9)	331.91	(20.94)	60.0	(45.0)	
CLCP 090	97.96	(9.11)	49,216	(23.23)	1,815	(532)	3.0	(750)	4778	2418	2608	2840	16.2	(48.5)	362.97	(22.90)	75.0	(55.0)	
CLCP 095	105.16	(9.78)	52,839	(24.94)	1,938	(568)	3.0	(750)	5088	2418	2608	2940	15.4	(46.0)	387.86	(24.47)	75.0	(55.0)	

- Note:
- Cooling capacities are based on EDB 26.7 C / EWB 19.5 C and EWT 6.7 C / LWT 12.2 C.
  - Unit dimension and weight includes forward curved fan section, 4row 120pf coil (1/2Inch cu tube) section and flat filter section (with filter media).
  - All dimensions and weights above are based on 50 mm. casing design.
  - Product design and specification are subject to change without notice.

**Table B: Standard Section Length**



**Fan Section, L1**

Model Size	003	004	006	008	010	012	014	016	020	025	030
Length, mm	775	775	775	775	930	930	930	930	1085	1240	1240
Model Size	035	040	045	050	060	065	070	080	085	090	095
Length, mm	1240	1395	1395	1550	1705	1860	1860	1860	1860	1860	1860

**Mixing Section, L2**

Model Size	003	004	006	008	010	012	014	016	020	025	030
Length, mm	310	310	310	310	465	465	465	465	465	465	620
Model size	035	040	045	050	060	065	070	080	085	090	095
Length, mm	620	620	620	620	930	930	1085	1085	1240	1240	1240

**Coil Section, L3**

Model Size	003 - 025	030 - 095
1 and 2 row coil	310mm	310mm
4 row coil	310mm	465mm

Model Size	003 - 025	030 - 095
6 row coil	465mm	465mm
8, 10 and 12 row coil	620mm	620mm

- Note:
- Total unit length shall be calculated based on total sum of all the individual section lengths added together.
  - Add 128mm to overall unit length for end frame for all models.
  - Fan section lengths are indicative only as the length varies according to the fan arrangement and motor kW range.
  - All dimension is for 50mm casing.
  - Product design and specification are subject to change without notice.





## Casing

- Casing shall be pentapost perimeter frame with a modular system based on standardized double wall panels.
- Panel shall be attached to the frame through a self-locking mechanism represented by a wedge and frame, exerting pressure evenly onto the panel and the seal attached to the frame, and hence a better air tight cabinet construction.
- Removal of any of the panels for any maintenance or repair works, must not affect the structural integrity of the unit.
- There shall be no sharp edges or pointed corners on the casing exterior that might cause accident or injury.
- There shall be no exposed gaps between fixed panels and between fixed panels and frame, to minimize potential air leaks.
- The frame shall be made of extruded aluminum channels fitted together with non-metal corner pieces.

## Panel

- Panels shall be 25 & 50mm thick with injected polyurethane foam insulation for a rigid non-vibrating construction.
- The insulation shall be rot-resistant and shall not absorb moisture that will promote fungus growth and also cause it lose its insulating properties.
- The insulation material shall be enclosed in the panel to avoid insulation being exposed to the air stream.
- The panel insulation material shall have a heat transfer "K" value of 0.02 w/mK.
- The panels shall be flush mounted to the frames.
- The floor panels shall be double wall construction to allow maintenance personnel access without damage to the insulation.
- The outer wall shall be galvanized steel painted with baked polyester powder paint that is resistant to nicks and scratch and allow for easy cleaning. The inner wall shall be galvanized steel.
- The paint shall be ultra violet resistant, weather resistant and shall not be affected by detergent cleaning.

## Access & Inspection Doors

- The door construction shall consist of a door panel that compresses evenly a durable rubber seal onto a rigid frame
- Opening or closing of the door shall not affect the structural integrity of the unit.
- The hinged door design shall be able to be lifted off or removed totally for easy access.

## Base Rail

- The whole unit shall be mounted on a galvanized steel base rail for ease of shipping and handling.
- The minimum height of the base shall be 120mm to ensure proper air circulation and avoid entrapment of moisture below the unit.
- The base rail is to be used in lieu of concrete plinths or other additional bases that are used at site.

## Fan section

- supply fan shall be certified as per AMCA 210 and AMCA 300 Standards.
- All Centrifugal fans shall be statically and dynamically balanced
- The entire fan/motor/drives assembly shall be mounted on a common framework and isolated from the unit by rubber-in-shear or spring isolators. The fan discharge shall be isolated from the casing by a vibration absorbing or flexible duct.
- Fan shall be double width, double inlet, multi blades type.
- Fan shall be equipped with bearings with an L-50 life of 200,000 hours.
- Forward curved fan shall be made of galvanized steel blades.
- Backward curved fan shall be made of treated and coated heavy gauge steel blades.
- Fan shaft design shall not exceed the first critical speed at any cataloged rpm and equipped with self-aligning bearings.

## Motor and Drives

- Motors shall be totally enclosed fan-cooled with IP54 protection with class F insulation and maximum ambient temperature is 40 degree C.
- The motor mounting base design shall allow movement on three dimensions for ease of drives alignment and belt tensioning.
- Drives shall be constant speed, fixed pitch sheaves selected at 1.5 service factor.

## Coil Section

- Coils performance shall be rated in accordance with ARI Standard 410.
- Coil shall be fabricated by the air handling manufacturer to maintain consistence in quality and reliability.
- Cooling coils shall be cartridge type mounted on steel channel for easy removal when required.
- Coil face velocity shall not exceed what is specified on the coil schedule.
- The number of fins provided should be the minimum needed to meet the performance requirements to minimize the pressure drop across the coil.
- Coil casing shall be 1.5 mm thick galvanized steel with drain holes in the bottom channels to ensure condensate drainage.

- Coil tubes shall be copper and mechanically expanded into aluminum plate fins. No soldering or finning shall be used in the bonding process.
- The fins shall be sine-wave design for better heat transfer efficiency and moisture carry-over limit performance.
- Coil shall be leak tested at 380 psig (26 bar).
- Three Dimensional Pitched drain pan shall be installed under the coil to ensure total removal of condensate.
- The drain pan shall be 1.0 mm thick galvanized steel, coated with a mastic compound for comosion protection.
- In case of stacked coils, and intermediate drain pan shall be installed between the coils to drain condensate to the main drain pan without flooding the lower coil and passing condensate through the air of the lower coil.

## Filter Section

- The filter section shall be fabricated by the air handling manufacturer with the same casing construction as the unit.
- Throwaway filters shall be 50mm thick, pleated media type. Filters shall be UL Class 2 with Average Efficiency of 25-30% in accordance to ASHRAE 52.1-1992 Test Standard.
- Aluminium filters shall be 50mm thick, washable type. Filters shall be UL Class 2 with Average Arrestance of 72% in accordance to ASHRAE 52.1-1992 Test Standard.
- Synthetic filters shall be 50 mm thick, washable type. Filters shall be UL class 2 with Average Arrestance of 80-85% in accordance to ASHRAE 52.1-1992 Test Standard.
- Cartridge filters shall be 100mm thick and shall be UL Class 2 with Average Efficiency of 60-65%, 80-85% and 90-95% in accordance to ASHRAE 52.1-1992 Test Standard.
- Bag filters shall be 380mm deep and shall be UL Class 2 with Average Efficiency of 60-65%, 80-85% and 90-95% in accordance to ASHRAE 52.1-1992 Test Standard.

## Mixing Section

- The mixing section shall be fabricated by the air handling manufacturer with the same casing construction as the unit.
- Damper shall be provided to modulate the volume of outside or return air.
- Damper shall be opposed blade type fitted into a casing of galvanized sheet steel.

# Quantum™ Climate Changer™



Trane optimizes the performance of home and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable, and energy efficient environments, Trane offers a broad portfolio of advance controls and HVAC systems, comprehensive building services, and parts. For more information, visit [www.tranethailand.com](http://www.tranethailand.com)

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CLCH-SLB015-E4 December 24, 2010

