Air Handling Unit
Chilled Water / DX

Customized AHU’s for Critical Environments
- Hospitals / Labs
- Medical Equipment Rooms
- Pharmaceuticals Industries
- Telecommunication Facilities
- FMCG Industries
- Textile Mills
- Printing Areas
- Commercial Buildings

Pakistan’s Largest Manufacturers of Air-Conditioners
Equipment is manufactured on latest CNC machines with prompt deliveries
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- HVAC System Concept & Design
- Supply of HVAC Equipment
- Installation
- Testing & Commissioning
- Operation & Maintenance

COOL POINT (Pvt.) Ltd. Introduces new phenomenon of Water Cooled Air Conditioning System in small capacity units (1-Ton, 1.5-Ton, 2-Ton and 2.5-Ton)
Introduction

COOL POINT Air Handling (CWAHU). Units are designed to a high engineering standard to provide the requirements of ventilation, heating, cooling, dehumidification and air distribution to a conditioned space.

CWAHU are available in 16 sizes to deliver from 1200 cfm (566 l/s) to 45,000 cfm (21240 l/s) nominal air flow rate against total static pressure upto 8.0 inwg (2000 Pa).

CWAHU are applicable for indoor and outdoor installation and they are ideal for large halls, schools, offices, banks, workshops, laboratories, restaurants, cinemas, hospitals, departmental stores, mosques and super markets, etc.

COOL POINT double skin air handling units are designed to meet the Indoor Air Quality requirements as per ARI standard 62/89.

General Features

CWAHU are manufactured in combine single unit and insections. All components of CWAHU are easily accessible. Different sectional arrangements & fan discharge positions are possible depending on the site constraints and requirements. CWAHU units are suitable both for duct connection or free discharge applications.

A typical CWAHU consists of a wide choice of a combination but not limited to the following sections, fan, cooling coil, heating coil, humidifier, filter section, mixing box, return air fan, plenums as standard or optional.

COMPONENT FEATURES

Casing & Construction

Aluminum Profile Frame

CWAHU section casings are constructed of framed modules for maximum rigidity and strength. Structure frame is made of aluminum profile, called which has excellent mechanical characteristics. The cross section of this profile is specially designed for this type of applications. Aluminum profiles are connected by means of special corner pieces.

Panels

Access and fixed panels are constructed of hot dip galvanized steel. Access panels are provided with quick
release fasteners to facilitate access to all internal components for maintenance and service. Suitable handles are provided for ease of handling. All fixed panels are bolted to the frame and provided with special gasket between panels and frames to ensure air tightness. This bolted construction makes all sections accessible from both sides.

**Internal skin**

Inner panel skin, so called “double skin” [DS] to retain the insulation, is made of galvanized steel, is easy to clean and has smooth surface. This eliminates any chance of dirt and bacteria accumulation, making Cool Point double skin units ideally suitable for hygienic applications, such as, pharmaceutical industries, hospitals, operation theatres and food processing industries, etc. Stainless steel inner skin are available as an option.

**Painting**

CWAHU are supplied with painted panels. Units are not painted only when specified. Painted CWAHU are made out of a zinc coated galvanized steel thoroughly de-greased and then phosphated before application of an average 60 micron backed electrostatic polyester dry powder coating. This finish and coating can pass a 1000 hour, 5% salt spray testing at 95°F (35°C) and 95% relative humidity as per ASTM B 117-95.

**Insulation**

For best thermal and acoustical performance, all panels and profiles frame is internally insulated.

Special gaskets are provided for thermal bridge protection to avoid condensation. CWAHU comes standard with 1” (25mm) insulation for sizes 12-150 and with 1 5/8” (38mm) for sizes 200-450.

1” (25mm) or 2” (50mm) polyurethane foam injection or board, with density in the range of 2 to 3 lb/ft³ (32 to 48 kg/m³) and thermal conductivity of 0.16 BTU in/ft² °F h (0.023 W/m°K). The injection is only possible for double skin units.

**Base Frame**

Since CWAHU is constructed from Aluminum profile, which has inherent rigidity and stability. Sheet metal frame with holes for vibration mounts are provided on each side of the unit. A steel structure is provided coated with galvanized primer enamel finish.

**MAJOR SECTION**

CWAHU is constructed of suitable sized casing module and following sub-assemblies:

**Fan Section**

**Fan**

Double inlet double width centrifugal fans are standard supply in COOL POINT CWAHU. The impellers can have forward curved or, backward inclined or airfoil profile depending on the requirements. All fans are belt-driven by motors with adjustable pitch motor pulleys and fixed drive blower pulleys. The impellers are keyed to the shafts. All fans are statically and dynamically balanced.

COOL POINT fans uses self-aligned ball or pillow block bearings that are greased for life. Pillow block bearings are provided with re-greasing fittings. Fans are selected for best sound characteristics based on maximum fan efficiency. Different fan positions are available depending on the requirement. Refer to dimensional data for details.
Blower Selection Software

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<tr>
<th>Fan Catalog</th>
<th>Product Description</th>
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<td>Double inlet centrifugal fan with inverted curved blades.</td>
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<td>AT 9-5G2</td>
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Options Available:
- Non-standard fan size.
- Explosion proof motor.
- Variable speed drive (Frequency Inverter).
- Standby motor (additional) with manual change over.
- Coating on fans.
- Motorized dampers / manual dampers.
- 2” Insulation

Variety of coils including chilled water, direct expansion, hot water and steam are available to meet a wide range of application requirements. Coils are constructed from seamless copper tubes of 3/8” (9.5 mm) OD and 5/8” (15.9mm) OD and ½” (12.7 mm), arranged in a staggered form in the direction of airflow.

Copper tubes are mechanically expanded into continuous corrugated aluminum fins, available in 8 fpi (3.2 mm), 10 fpi (2.54 mm) and 12 fpi (2.1 mm) fin spacing to provide continuous compression bond over the entire finned length for maximum heat transfer rates.

Headers are made out of seamless copper pipe. The headers joints are extruded to provide large bearing surface for maximum strength. Air vents are standard for water coils. Coils can be provided with moisture eliminator depending on the air conditions, with shape of eliminator specially designed to trap water droplets blown off the coil.

Cooling coil section is provided with insulated drain pan with drain connection, in order to hold and remove the condensate formed during dehumidification. Drain pan is made of painted zinc coated steel sheet. Coils are tested by air pressure while coils are submerged in water to a pressure of 300 psig (2060 kPa). COOL POINT coils are rated as per ARI standard.

Motors

Fan motors are totally enclosed fan cooled, foot mounted, 4 pole, IP-55 protected and Class-F insulated. The motor is mounted on adjustable base, so that belt tension can be easily adjusted. The complete fan motor drive assembly is mounted on floating sub base. In order to limit transmission of noise and vibration the complete fan motor sub-base assembly is mounted on anti-vibration mounts and, therefore, it is not necessary to install external vibration mounts. Flexible connection is provided between fan discharge and casing panel to avoid transmission of vibration to the connecting duct.
Options Available

- Copper Fins
- Electro-tinned coils.
- Protective coating on coils.
- Stainless steel drain pan.
- MPT, FPT or flanged coil connectors.
- Expansion valve for direct expansion coils.
- Pipe size 3/8", 1/2", 5/8" are available in coils.

Filter Section

Wide varieties of air filtration systems are available to choose from depending on the requirement. These include:

Panel filters: 2" (50 mm) panel filters with aluminum washable media or 2" (50 mm) fiberglass/synthetic disposable/washable media. Average efficiency of filter ranges from 62% to 95%.

Vee filters: Filters arranged in a vee bank to increase the filtration area. Media options are the same as in Panel filters.

Bag Filter: 22" (559 mm), 30" (762 mm) or 36" (914 mm) deep high efficiency bag filters with average dust spot efficiency ranging from 75% to 95%. Combination of bag & flat filters are available.

HEPA Filter: Ultra high Absolute HEPA (High Efficiency Particulate Air) filter with efficiency in excess of 99% when measured by using DOP (Di-Octyle Phthalate) method.

Electrical Heater Section

Two different types of electric heater element batteries are available:

Open Type: constructed from 80/20 nickel chrome resistance elements.

Finned Type: constructed from 80/20 nickel chrome resistance wire centered in stainless steel sheath metal tubes by compressed magnesium oxide.

Electric heater batteries are available in a wide range of capacity (KW) and steps. Electric heater batteries are supplied with primary and secondary manual safety cutouts, as standard. Recommended KW capacity on standard (nominal airflow) rate is given in the table. Batteries other than this can be supplied upon request.

Electric heater capacity in KW can be calculated in IP system as:

\[ \text{Capacity (KW)} = 1.085 \times \text{Airflow Rate (cfm)} \times \text{Air Temperature Rise (F)/3412} \]

or in SI system as:

\[ \text{Capacity (KW)} = 1.21 \times \text{Airflow Rate (l/s)} \times \text{Air Temperature Rise (°C)/1} \]

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<th>Model Size</th>
<th>Capacity (KW)</th>
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Humidifier Section

Humidifiers are available depending on application and as per requirement.

Dampers (Optional)

CWAHU are also available with multi blade, low leakage, heavy duty dampers to control the air flow rate by introducing resistance to air flow in the system. Dampers are available with parallel blades and opposed blades. Links are provided for either manual or motorized operation. The following dampers are available:

The damper frame is constructed from galvanized steel, blades from galvanized steel, shafts from steel, bearing from bronze and linkage and brackets from galvanized steel. Aluminum damper blades in airfoil profile are available, as an optional.
Motor Data

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1. Motors up to 3 KW are STAR connected for all power supplies.
2. The motors including and above 4 KW are DELTA connected and are suitable for STAR/DELTA starting.
3. Refer inside of the motor terminal box for actual connections.
## Nominal Capacity Rating - Cooling Coils

### Chilled Water Coils

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<tr>
<th>Model</th>
<th>Coil Area</th>
<th>Rows</th>
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### Direct Expansion Coils

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**Coolpoint**

Chilled Water / DX Type Air Handling Unit
### Nominal Capacity Rating - Heating Coils

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<td>326.2 95.6</td>
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#### Note:
For Capacities at different air conditions please refer to Cool Point Factory.
### Air Pressure Drop

<table>
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<tr>
<th></th>
<th><strong>AIR PRESSURE DROP, in wg</strong></th>
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<th><strong>AIR PRESSURE DROP, Pascals</strong></th>
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<td><strong>Coil Face Velocity, m/s</strong></td>
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<td>HEPA FILTER</td>
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<td>8 fpi</td>
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<tr>
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<td>0.03</td>
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<td>0.03</td>
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<td></td>
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<td>12 fpi</td>
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<td>12 fpi</td>
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<td>SF</td>
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<td>B. F. 36&quot;</td>
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Note: For Capacities at different air conditions please refer to Cool Point Factory.
## Fan Performance Data

<table>
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<tr>
<th>Model</th>
<th>AirFlow</th>
<th>Total Static Pressure, inwg (Pa)</th>
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<tr>
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<tr>
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<td>l/s</td>
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<td>566</td>
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<td>16</td>
<td>1600</td>
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<td>24</td>
<td>2400</td>
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<td>32</td>
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</tr>
<tr>
<td>450</td>
<td>45000</td>
<td>21235</td>
</tr>
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</table>

* Performance shown at nominal airflow rates. For other airflow variety of fan types are available, please contact Cool Point Factory.
GUIDE SPECIFICATIONS

General

Air Handling Units shall be factory assembled. To meet project requirements, units may consist of a wide choice of combinations of sections like fan, cooling coil, heating coil, humidifier, filter, mixing box, return air fan, plenums, etc as indicated on the equipment schedule.

Units may be shipped fully or partially assembled in accordance with jobsite requirements. Units shall be horizontal or vertical arrangements as shown on attached drawings.

Casing & Construction

- CWAHU units casing shall be constructed of heavy-gauge steel structure frame with horizontal and vertical members and panels. Fixed panels shall be bolted to the frame and removal of access panels shall not affect on the structural integrity of the unit.
- Units casing shall be in galvanized or painted finish as indicated on the equipment schedule.
- Galvanized casing shall be made of hot-dip galvanized steel sheets.
- Painted casing shall be made of hot-dip galvanized steel sheets. Fabricated steel shall be thoroughly degreased and then phosphatized before application of an average 60 micron baked electrostatic polyester dry powder coating. This finish can pass 1000-hour, 5% salt spray test at 95°F (35°C) and 95% relative humidity (ASTM B 117/95).
- Units casing can be made of stainless steel or aluminum if so specified (optional).
- All access panels can be provided with quick release fasteners and handles (optional).
- In addition to quick release fasteners and handles, all access panels shall be provided with hinges if so specified.
- To ensure air tightness and to avoid thermal bridges, all panels shall be provided with closed-cell foam gaskets.
- All panels and frames shall be internally insulated.
- To prevent insulation erosion into air stream, the unit shall be provided with double wall panels “Double Skin”, if so specified.
- Interior skin of the panels shall be made of hot dip galvanized steel.
- Interior skin of the panels can be made of perforated galvanized steel, aluminum or stainless steel if so specified.
- Insulation thickness shall be 1” (25mm), 1.5” (38mm) or 2” (50mm) (based on unit’s size and application).

Following optional insulations shall be provided if so specified:
- 1” (25mm) or 2” (50mm) thick polyisocynurate board with density in the range 2-3 lb/ft^2 (32-48 kg/m^2) and thermal conductivity of 0.16 BTU in/ft F.h (0.023 W/m k)
- Units (up to size 100) shall be provided with painted steel base frame. Larger units shall be provided with painted rigid steel structure base frame.
- Units for outdoor installation shall be provided with weatherproof top cover.

Fan Section

- Fan shall be double width, double inlet, multi blades, and centrifugal type wheels.
- Fan shall be statically & dynamically balanced and tested.
- Fan blades shall be forward curved or backward inclined or backward inclined air foil as indicated on the equipment schedule.
- Forward curved blades shall be made of galvanized steel.
- Fan shaft shall be made of C-45 carbon steel with an anti corrosion varnish.
- Backward inclined blades shall be made of mild steel finished with epoxy paint Fan shaft shall be made of C-45 carbon steel with an anti corrosion varnish
- Backward inclined airfoil blades shall be made of corrosion resistance steel coated with an anti corrosion primer and a final layer of synthetic paint Fan shaft shall be made of hardened steel, precision ground and polished with protection paint.
- Fan impeller shall be keyed to fan shaft to prevent slipping.
Fan bearings shall be ball type, hermetically sealed, self-aligning with eccentric ring for clamping to the shaft.

Fan shaft shall be stainless steel if so specified (Optional).

Flexible connection shall be provided between fan discharge and casing panel.

Fan motor shall be mounted inside fan section on adjustable base. Motor shall be totally enclosed fan cooled (TEFC), foot mounted, 4 poles, IP-55 protected with class-F insulation.

Motor size and electrical characteristics shall be as indicated on the equipment schedule.

To limit transmission of noise and vibration, the complete fan motor subassembly shall be mounted on rubber in shear isolators.

Stand by motor with manual change over, spark proof fan, explosion proof motor, fan with polygly coating, belt guard shall be provided if so specified (Optional).

Fan shall be belt-driven by using anti static belts and adjustable pitch drives.

For variable air volume controls, fan with inlet guide vanes or variable frequency drive shall be installed as indicated on the equipment schedule.

**Coil Section**

- Chilled water, hot water, steam & DX coils shall be provided as indicated on the equipment schedule.

- Coil shall be constructed of seamless copper tubes of 1/2", 3/8" (9.5mm) (for models 12-20) or 5/8" (15.9mm) (for models 80 - 450) outside diameter arranged in a staggered form.

- All water coils shall be provided with automatic air vents (Optional).

- DX coil shall be provided with distributor. Expansion valve shall be provided if so specified.

- Coil circuiting shall be counter flow (Direction of coil water / refrigerant flow shall be counter to direction of unit airflow).

- Supply and return water connections of coil section shall be labeled with “WATER IN” & “WATER OUT” respectively.

- DX coil section shall be labeled with “LIQUID” & “SUCTION”.

- Coil tubes shall be mechanically expanded into continuous corrugated aluminum fins to provide compression bond of tubes to fins. Fins shall have drawn collars.

- Optional copper fins, electro-tinned coils or coils with protective coating shall be provided if specified (optional).

- Maximum fins spacing shall be 12 fpi (2.1mm).

- Coil connections shall be sweat type. Optional MPT, FPT or flanged connections shall be provided if so specified.

- Coil shall be rated as ARI - 410 and tested by compressed air under water to the pressure of 300 psig (21.09kg/cm²).

- Cooling coil shall be provided with drain pan to remove the condensate formed during the dehumidification. Drain pan shall be constructed of 1.5 mm (for models 12-200) or 2.0 mm (for models 250-450) thick zinc coated steel sheets, painted and insulated from outside with minimum 1fl (25mm) thick fiberglass insulation. To meet the requirement of ASHRAE Standard 62, the bottom of drain pan shall be tapered sloping towards the center and its connection shall be MPT.

- Drain pan shall be provided with one connection (for models 12-200) or two connections (for models 250-450).

- Drain pan shall be constructed of stainless steel if so specified.

- Drain pan shall be constructed such that coil headers & U-bends are enclosed by it.

- Moisture eliminator shall be provided if so indicated on the equipment schedule.

**Filter Section**

- Filter type & efficiency shall be as indicated on the equipment schedule.

- Filter section of CWAHU shall be constructed to accommodate one or more of the following filters:
  - Panel Filter:
    - Thickness: 1”-2”
    - Media: Washable Aluminum
    - Form: Flat
    - Average dust arrestance: 75 %
Thickness: 2” (50mm)
Media: Disposable Synthetic
Form: Flat
Average dust arrestance: 87%

Thickness: 2” (50mm)
Media: Blend of non woven cotton and polyester
Form: Pleated
Average dust arrestance: 93%

- V Filters: Filters shall be arranged in a V bank to increase the filtration area. Media options are the same as in flat form panel filters (optional).
- Bag Filters: Bag filter media shall be 22fl (559mm), 30fl (762mm) or 36fl (914mm) deep with average dust spot efficiency (opacimetric measure) 85% or 95% as per ASHRAE test # 52/76 (optional).
- HEPA Filters: Ultra high absolute HEPA filter media shall be 12fl (300mm) deep with efficiency >99% when measured by using DOP method (optional).
- To monitor air pressure drop across filter, manometers shall be provided if so specified (optional).

**Electrical Heater Section**

- Electric heater capacity and steps shall be as indicated on the equipment schedule.
- Electric heater batteries shall be supplied with contactors, fuses, disconnect switch and airflow switch if so specified.
- Control panel consisting of all controls shall be provided as integral part of the unit.

**Humidifier Section (Optional)**

Humidification capacity and efficiency shall be as indicated on the equipment schedule.

The humidifier type shall be steam or water as specified on the equipment schedule.

**Dampers**

- To control the fresh, return and exhaust airflow rates in mixing box, exhaust box, economizer, face & bypass and multi-zone sections, CWAHU shall be provided with dampers.
- Damper shall be arranged in parallel or opposed blades configuration.
- Damper frame, shaft, linkages and brackets shall be constructed of galvanized steel.
- Damper blades shall be constructed of stainless steel if so specified.
- Damper blades shall be rotate in bronze bearings which lubrication is not required.
THE LARGEST MANUFACTURER OF AIR CONDITIONING EQUIPMENT

COMPANY PROFILE

Cool Point (Pvt) Ltd. is a subsidiary of M/s Cool Industries (Pvt.) Ltd, leading manufacturer of Deep Freezers, Refrigerators and Split Air Conditioners in Pakistan of renowned brand.

On a modes level, Cool Point (Pvt.) Ltd. has grown into one of the prime Manufacturers of Air Conditioners & Coils in Pakistan. Out professional staff and dedicated management is fully committed to quality and Service of its product. Our system is certified for ISO 9001:2000 Standard.

We possess the latest machinery and technology required for production of high quality products. Our team of professional engineers and technical staff is capable of responding to the market’s most expecting demands for that we are continuously struggling to improve our Manufacturing capability and quality to become the leader of the market.

We have efficient network of After Sales Services throughout the country for the entire satisfaction of our customers.

DISPLAY CENTERS

Lahore: Shop No. 13, Ground Floor, Raja Chamber, 35 Fatima Jinah Road. Ph: 042-7534623-4
159-Karim Block, Alama Iqbal Town, Mian Wahdat Road. 042-45-46-47


Faisalabad: Kotwali Road, Opp. Thana Kotwali. Ph: 041-601684

Multan: Mian Market, Hussain Agahi Road.

MAJOR CLIENTS FOR COMMERCIAL AC UNITS

MCR (Pvt.) Ltd.
Raazee Therapeutics (Pvt.) Ltd.
Nishat Group of Companies
Package Limited
Cool Industries (Pvt.) Ltd.
Dyno Research Laboratories
Shifa International Hospital
Dewan Salman Fibre Ltd.
Prime Dearies Limited
Akhtar Textile Industries (Pvt.) Ltd.
Mumtaz Engineering (Pvt.) Ltd.
Colgate Palmolive Pakistan Limited
Uni Lever Pakistan Limited
Elahi Group of Companies
H. Nizam Din & Sons (Pvt.) Ltd.
H. Karim Bukhsh Enterprises
Siza International Pharma (Pvt.) Ltd.
Aneeb Pharmaceuticals (Pvt.) Ltd.
PACE Pakistan Limited
Punjab Institute of Computer Science
Olympia Group of Industries
KIDCO (Agro Chemicals (Pvt.) Ltd.
Galapa (Pakistan) Limited
Pakistan Beverage Limited (PEPSI)
Pakistan International Airport (PIA)
Food & Beverages Co. (Pvt.) Ltd.
Novinit Internationals
Conimex Hatchery
Peace Engineering Services
Paksol (Pvt.) Ltd.
Ran foil Textiles
Master Textile Limited
A. A. Associates
United Engineering
WAPDA
Orthon Engineering Company
Premier Industries (Pvt.) Ltd.
Argand Nine
Top Food & Beverages
Doctors Hospitals
Union Fabrics Limited
ILF Pakistan (Pvt.) Ltd.
Alliance Pharmaceuticals (Pvt.) Ltd.
Bentley Pharmaceuticals
Sitara Chemicals Industries Limited
Inter Food Industries
PC Hotels
Atchison College
Toyota Defence Motors
Al-Khair Industries
Pak Gulf Constructions
The Layton Rehmatullah Benevolent Trust
Lahore Chamber of Commerce (LCCI)
CMH (Combine Military Hospital
Pakistan Telecommunication Company Limited
International Industries
Angotech International
Derbarwala Industries
Horizon Developers
Bilal Engineering
Frooto Industries (Pvt.) Ltd.
Vetcon Pharmaceuticals
Drug Pharmaceuticals
CHS Pharmaceuticals
Zephyr Pharmaceuticals
HighTech Chemicals
Pakistan Petroleum Limited
Medicraft (Pvt.) Ltd.
Rexo Engineering (Pvt.) Ltd.
Engineering Kinetics (Pvt.) Ltd.
Newage Garments
S. T. Associates
Engineering Enterprises
Defence Housing Authority
Electrical and Mechanical Engineering
Lasani Groups
ICI Kheera
US Capital Textile (Pvt.) Ltd.
Kamal Spinning Mills
Al-Khair Industries
Pak Gulf Constructions
The Layton Rehmatullah Benevolent Trust
Lahore Chamber of Commerce (LCCI)
General Electro-Mechanique Company
TELENOR (Pvt.) Ltd.
Stitches (Pvt.) Ltd.
ISI Headquarters
Zafer Cool Comfort
Luck Traders
Diamonds Paints
Zantock Pharmaceuticals Labs.
Fedro pharmaceuticals
Festal Laboratories
Ocean Pharmaceuticals
Safina Pharmaceuticals
Heimza Pharmaceuticals
Caridid Pharmaceuticals
Cardex Pharmaceuticals
Crescent Bahuman
Star Laboratories (Pvt.) Ltd.
Techno Pak Industries (Pvt.) Ltd.
Pakistan Air Force
Bataola Pharmaceuticals
TCS (Pvt.) Ltd.
Asia Tent Services
Telephone Industries Pakistan (TIP)
National Development Complex (NDC)
Pakistan Military Office (PMO)
Pakistan Army
Standard Chartered Bank
Masood Textile
Nazar Sons
Shallimar Hospital
Mobilink GSM Pakistan
NBS PAK (Pvt.) Ltd.
Himont Pharmaceuticals
Rafhan Bestfood
Farmaceutics International
W & All Sons Pharmaceuticals
Rafey Associates
U. I. G. (Pvt.) Ltd.
LMK Resources
M. M. Engineering
Geofman Pharmaceuticals
Silver Sands
Dr. Ziauddin Hospital
Salt’N’Pepper
Shaun Pharmaceuticals
Glaxo Welcome Pakistan
Frezoli (Pvt.) Ltd.
The Monal (Pvt.) Ltd.
Naloo (Pvt.) Ltd.
AES Lelpir