Bry-Air®

Adsorption Chiller

Energysmart Cooling using Waste Heat

Partners in innovation

Bry-Air® Leaders in Dehumidification... Worldwide

PPI Power Partners, Inc. USA

www.bryair.com

Partners in innovation

Bry-Air®

Leaders in Dehumidification...Worldwide

Customized Solutions

Bry-Air, the leader in dehumidification…worldwide, is a global solution provider for desiccant dehumidification, product drying, gas phase filtration, high temperature waste heat recovery and plastics auxiliaries.

With over 50 years of experience, Bry-Air has pioneered many new technologies .

Bry-Air is one of the flagship companies of the Pahwa Group with two state-of-the-art manufacturing facilities in India, fully owned subsidiaries in China, Malaysia, Switzerland, Brazil and Nigeria, and a worldwide sales network. Bry-Air Asia's plants are among the most modern in the industry, supported by strong R&D and testing, computerized 3D designing, CNC fabrication, powder coating facilities and automated conveying systems.

PAHWA™ GROUP

Innovation is life

Innovation, both in technology as well as business processes, is the driving philosophy of the Pahwa Group.

Pahwa Group comprises of Knowledge Based, Technology Driven Airgineering companies specializing in products and services **"with desiccant at the core, in relation to air".**

PPI

Power Partners, Inc. markets energy-efficient, environmentally friendly ECO-MAX **Adsorption Chillers** that are manufactured in Athens, GA, USA. **Adsorption Chillers** technology is ideal for tri-generation facilities, processing plants, manufacturing plants and Power Plants.

Power Partners is part of PPI, a groundbreaking manufacturing company whose brands include Power Partners, ECO-MAX, Gap Partners and Change Partners. Learn more at www.powerpartners-usa.com

It's not magic.
It's an advanced green technology
using inert **'Silica Gel** – **Water'** Pair
(*Adsorbent*) (*Refrigerant*)

Bry-Air®

Adsorption Chiller

Use low grade waste heat to produce chilled water for process cooling and air-conditioning (HVAC)

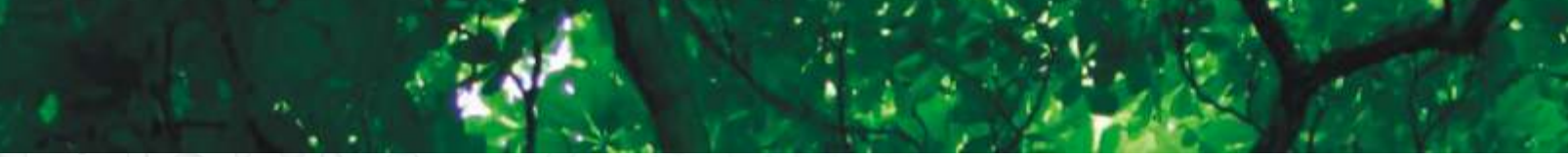
Why do we need Adsorption Chillers?

Capturing and using waste heat could be one of the largest conservation and greenhouse gas reduction opportunities. Heat recovery is an opportunity to recycle energy that is typically wasted.

Bry-Air **Adsorption Chillers** save up to minimum 70% in electrical power consumption compared to conventional systems and thereby, help reduce operating costs significantly. No matter which type of waste heat is used to drive chillers, the chillers always operate with utmost efficiency and ease of use.

Adsorption Chillers are a unique approach to save energy cost for air-conditioning and process cooling. Low grade waste heat is the driver for **Adsorption Chillers** rather than from large amounts of electricity like conventional air-conditioners. This continuous hot water may come from any number of industrial sources including waste heat from industrial processes, from solar thermal installations or from the exhaust or jacket water heat of an engine or from turbine exhaust. The heat extracted from the chilled water and the heat consumed from the hot water is directed into a cooling water system used to dissipate this energy.

Very little electric power is consumed for running the chiller, The electric power used by the chiller drives the internal process computer, a PLC, (programmable logic controller) and the intermittent running of a fractional horsepower vacuum pump. Amount of electricity is same as a handful of old-fashioned incandescent light bulbs.



ACCORDING TO THE EPA, IN THE UNITED STATES ALONE IT IS ESTIMATED THAT THE POTENTIAL FOR WASTE HEAT RECOVERY COULD SUBSTITUTE APPROXIMATELY 9% OF THE TOTAL US ENERGY USAGE.

WHY

RECOVER WASTE HEAT?

Industrial operations represent a significant source of greenhouse gas emissions and most of the waste heat is simply rejected via cooling towers to the atmosphere. It can be thought of as “dumped” heat.

Waste heat is the by-product of system inefficiencies found in industrial and commercial process and represents a waste of resources, opportunities, and money. Waste heat is commonly generated during:

- Steam generation;
- Power generation;
- Fuel Fired Furnaces;
- Process heating.

PREVENT
TONNES OF CO_2
EMISSIONS FROM
ENTERING
THE ATMOSPHERE.

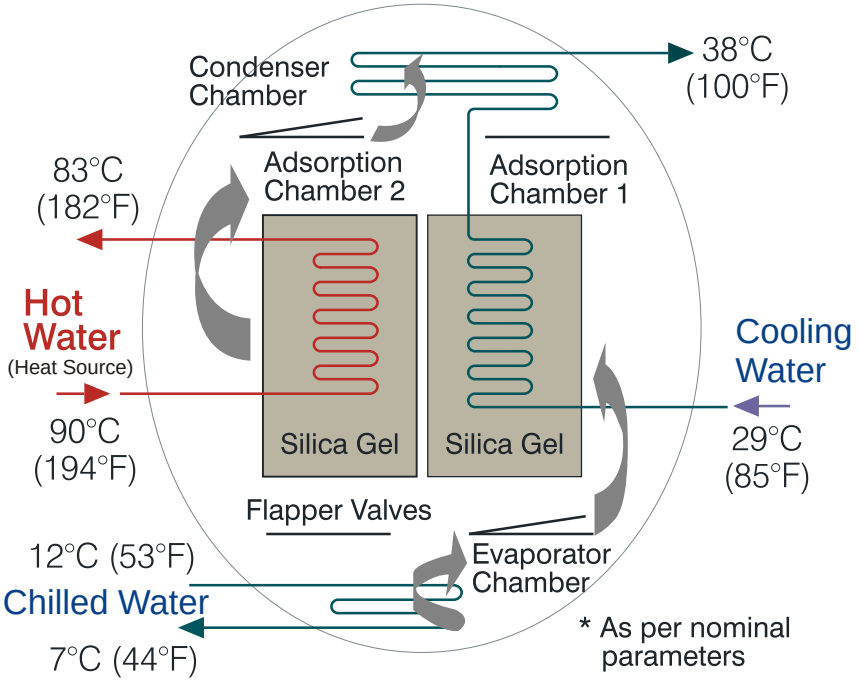
GREENHOUSE GAS REDUCTION

Consensus is emerging among scientists that the global climate is warming and that a significant effort to stabilize and even reduce the amount of greenhouse gases in the atmosphere is needed. It will take a combination of technologies and process changes to meet the emerging greenhouse gas reduction targets.

By installing an **Adsorption Chillers**, tonnes of CO_2 emissions will be prevented from entering the atmosphere. An **Adsorption Chiller** consumes very little electricity to operate, especially in comparison to conventional chilling systems, and avoids the greenhouse gases that would have been produced by an electric-driven chiller. Additionally, installing an **Adsorption Chiller**, as part of a renewable energy system will provide even greater greenhouse gas reductions.

Future Ready
Energysmart
GREEN COOLING

How does our Adsorption Chiller Work?



Operating Principle

The principle of **Adsorption** works with the interaction of gases and solids. With adsorption chilling, the molecular interaction between the solid and the gas allows the gas to be adsorbed into the solid. The **Adsorption** chamber of the chiller is filled with solid material, special silica gel S_2, eliminating the need for moving parts and eliminating the noise associated with those moving parts. The silica gel creates an extremely low humidity condition that causes the water refrigerant to evaporate at a low temperature.

As the water evaporates in the evaporator, it cools the chilled water. The **Adsorption Chiller** has four chambers; an evaporator, a condenser and two **Adsorption** chambers. All four chambers are operated at nearly a full vacuum.

The Adsorption Chiller uses a simple refrigeration process

The chiller cycles the **Adsorption** chambers 1 and 2 between the processes of adsorbing and desorbing. In the figure above, the water vapor flashes off the surface of the tubes in the evaporator, creating the chilling effect captured in the output of chilled water. The water vapor enters Chamber 1 through the open ports in the bottom of the chamber and is adsorbed into the silica gel in Chamber 1. Cool water is circulated in this chamber to remove the heat deposited in Chamber 1 by the **Adsorption** process.

Hot water enters Chamber 2 to regenerate, or desorb, the silica gel while Chamber 1 is in the **Adsorption** process. The water vapor is driven from the silica gel by the hot water. The refrigerant water vapor rises to the condenser portion of the **Adsorption Chiller** where it is then condensed to a liquid state. The condenser water is recycled in a closed-loop to the bottom of the machine where it is immediately available for re-use.

As the machine cycles, the pressure in Chamber 1 is slightly lower than in the evaporator chamber. A portion of the water refrigerant evaporates and moves to Chamber 1. Simultaneously, the pressure in Chamber 2 elevates slightly as the water vapor is driven from the silica gel. The water vapor is then pushed to the condenser chamber where it is condensed back to the liquid state and returns to the evaporator chamber.

When the silica gel in Chamber 1 is saturated with water and the silica gel in Chamber 2 is dry, the machine's process reverses. The first step is the opening of a valve between the two chambers, allowing the pressure to equalize. Then, cool water is sent through Chamber 2 to transfer any residual heat to Chamber 1, which begins the heating process. The reversal is completed and the **Adsorption** in Chamber 2 commences while Chamber 1 is dried by the desorption heating.

The **Adsorption Chiller** is capable of operating within a wide range of temperatures. The machine self-regulates and balances the performance of the system by the control programs, shifting to the program best suited for the system conditions. For optimal performance of the **Adsorption Chillers** the hot water should be 90°C(194°F), the cool water about 24°C to 35°C (75°F to 95°F) and the output cold water 7°C to 12°C (45°F to 55°F).

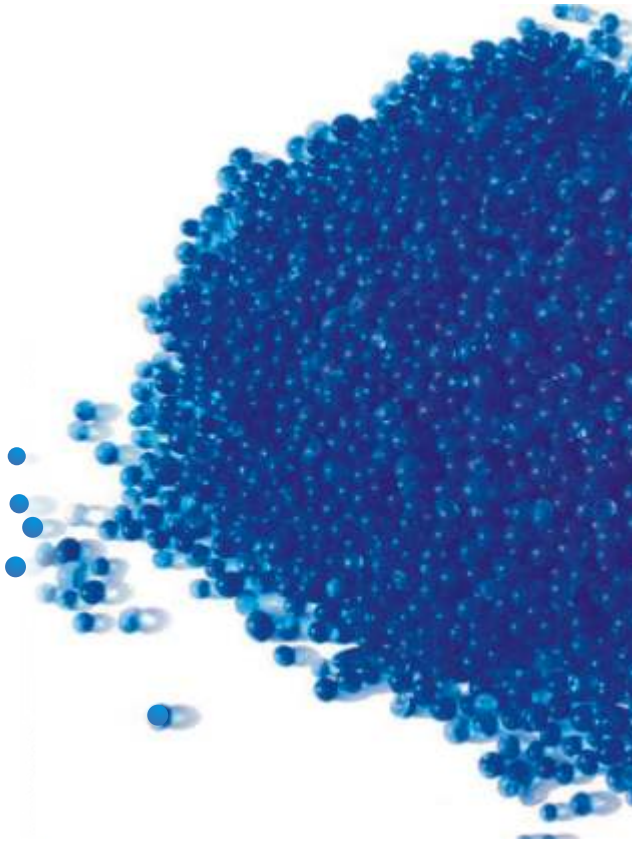
Advantage: Adsorption Chillers

Factors	Adsorption Chillers
Life Expectancy	**Long life (more than 25 years)**
Maintenance	**Negligible Maintenance**
Replacement Requirements (Periodic Maintenance)	**Not Required**
Regeneration Temperature (Hot Water)	Down to 50°C (122°F)
Energy Consumption	Ultra-low electricity consumption
Desiccant Used	Special Silica Gel (Inert)-S_2
Noise Levels	No noise or vibration
Operations	Ideal for extended operating times
Refrigerant	"Green" refrigerant (water) and desiccant (silica gel)

The Bry-Air Airgineer

Additional Advantages

- Start-up time 5 to 7 minutes compared to 15 minutes for Absorption
- Chilled water output 5°C-10°C (40°- 55°F)
- No crystallization, corrosion, hazardous leaks, or chemical disposal issues
- No vibration or noise. Simple and continuous operations
- COP of 0.55 (Coefficient of Performance)
- Versatile operation – Can be used for a wide range of industrial and commercial applications



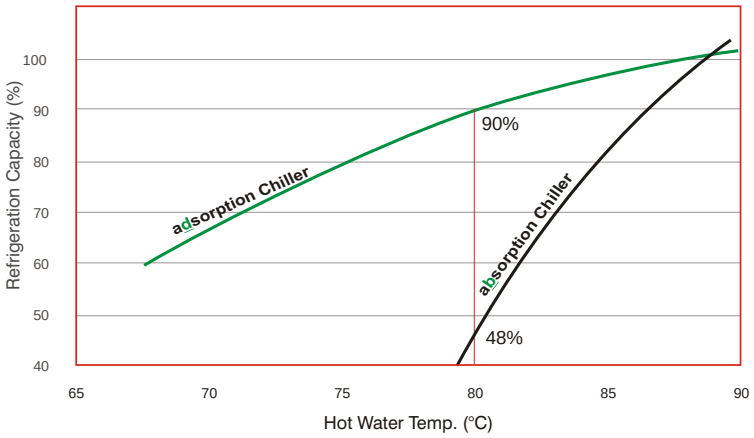
WHY

Adsorption is a Better Choice?

Adsorption Vs **Absorption** Comparison

Factors	**Adsorption Chillers**	**Absorption Chillers**
Life Expectancy	Greater than 25 Years	7 to 9 Years
Maintenance	Negligible Maintenance	Require High Maintenance
Regeneration Temperature (Hot Water)	Down to 50°C (122°F)	Shuts down at 82°C (180°F), Needs Back-up Heater
Desiccant Used	Special Silica Gel (Inert)-S_2	Lithium Bromide (Highly Corrosive)
Replacement Requirements (Periodic Maintenance)	Not Required	Heat Exchangers, Boilers, Absorbent Replacement Required

Adsorption Vs Absorption



High Efficiency even at Low Hot Water Temperature

Thermally driven chillers are effective but have been burdened with significant maintenance and upkeep. **Absorption Chiller** systems often depend on a corrosive solution of lithium bromide salt that tends to corrode the internal copper tubing and steel shell of the unit. Additionally, **Absorption Chillers** produce hydrogen gas as a by-product, requiring an expensive palladium cell inside the chiller unit to remove the hydrogen.

The lithium bromide solution in **Absorption Chillers** also has phase state challenges and has a tendency to solidify within the system while operating. If the regeneration temperature becomes too hot or too cold, or the conditions change too rapidly for the system to adapt, the liquid salt will solidify and crystallize inside the chiller unit. Many installations of absorption units require a dedicated caretaker to maintain.

Adsorption Chillers use municipal water as the refrigerant and solid silica gel as the desiccant. There are no CFCs or freons, no Li-Br, and no ammonia. Not using these chemicals equates to no potential for hazardous material leaks, no aggressive corrosion, no chemical testing required, and no damage to upper-level atmospheric ozone.

An **Adsorption Chiller** significantly reduces the maintenance and upkeep costs by substituting the corrosive salt desiccant with a benign silica gel. Reliability and machine availability are significantly improved. **Adsorption Chillers** have very few moving parts and do not require the maintenance and attention that the **Absorption Chiller** systems require.

WATER IS THE REFRIGERANT

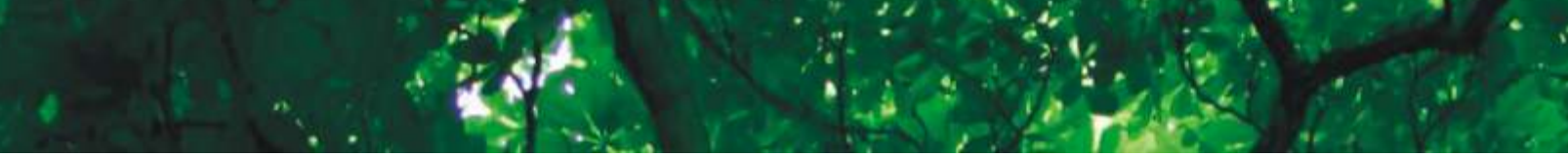
Adsorption Vs Conventional Mechanical Chillers

Why an Adsorption Chiller is a better choice?

Adsorption Chillers eliminate noisy compressors, high-pressure refrigerant systems, high amperage electrical connections, refrigerant monitoring and alarm systems, and high maintenance costs. **Adsorption Chillers**, will provide a 99% reduction in the chiller's electrical usage.

Chiller reduces electrical usage by

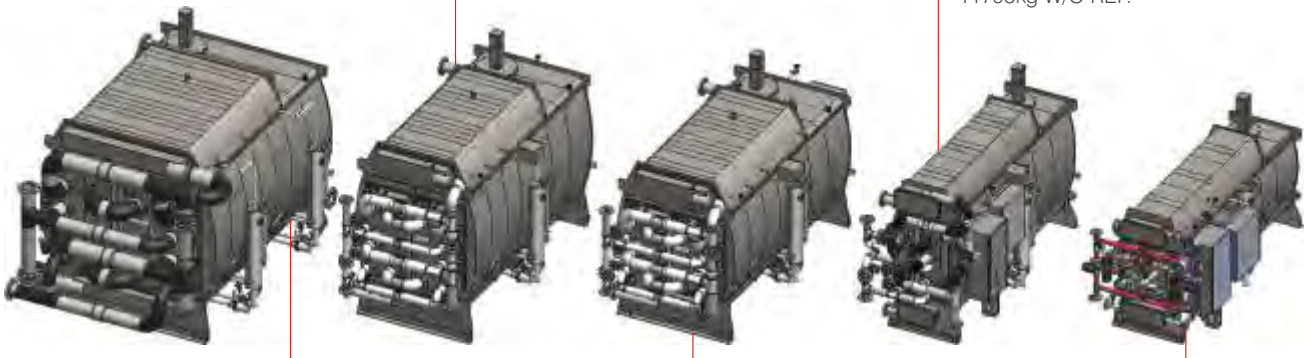
99%



Adsorption Vs **Mechanical Chiller** Comparison

Attribute	Adsorption Chiller	Mechanical Chiller
Sound Pressure Level	Very low <50 db (A)	Loud > 80db (A)
Operating Cost	Negligible	High
Maintenance	Virtually none	Seasonal maintenance required. Annual oil analysis Replace oil every 5 years Periodic tear down and rebuild required Replacement of bearings every 15 years
Chemistry	Municipal water and special silica gel-S_2	HFC and HCFC refrigerant with synthetic oils
Energy Requirements	Hot water: 50°C to 93°C (122°F to 200 °F)	Electricity – 230/415 - 3Ph - 50Hz 460 - 3Ph - 60Hz 240 - 3Ph - 60Hz
Cooling Water Requirement	Preferably< 30°C to 10°C (85°F to 50°F) Lower temperatures increase capacity of the system	30°C to 18°C (85°F to 65°F) minimum temperature - unstable at low temperatures
End-of-life	No special disposal requirements	Certified technician required to reclaim all refrigerant for release to the atmosphere

Range



EXT E- FRAME,
150-190 TONNES,
2489mmW X 5080mmL X 3251mmH,
18144kg W/O REF.

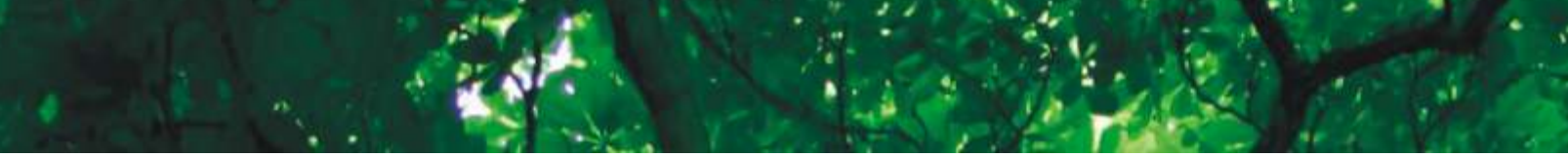
D- FRAME
50-75 TONNES
2159mmW X 5055mmL X 2921mmH
11793kg W/O REF.

F- FRAME
200-330 TONNES
3658mmW X 5334mmL X 3505mmH,
21319kg W/O REF.

E- FRAME
100-150 TONNES
2489mmW X 5080mmL X 2921mmH
14969kg W/O REF.

C- FRAME
10-40 TONNES
2032mmW X 4826mmL X 2388mmH
7250kg W/O REF.

Adsorption Chiller Test Units



HEAT SOURCES

The **Adsorption Chillers** can be ranged from 70kW to 1180kW (20 to 355 tonnes)

An **Adsorption Chillers** is effective as a stand-alone system either as an enhancement to a current HVAC system or as a replacement technology to a current chiller system.

Waste Heat Streams

Preferred applications have a steady stream of waste heat as well as a demand for either chilled air or water. Examples include:

- Power Plants
- Food and Beverage Industry
- Chemical Industry
- Petrochemical and Refineries
- CHP

Renewable Energy Systems

The **Adsorption Chillers** can easily be integrated to utilize solar hot water collectors and concentrators to produce the heat source for the chiller. The energy to run the chillers is obtained by solar hot water collectors and is stored in a large hot water tank for continuous use. Since the chiller can operate on input hot water temperatures as low as 54°C (130°F), the **Adsorption Chiller** works well with solar thermal systems.

Tri-generation or CHP

Building owners and facility managers are installing electricity generation systems that run on natural gas and have the potential to use the waste heat from jacket water and exhaust gases to operate a waste heat recovery system. Natural gas systems have the advantage of producing half the CO_2 emissions per kilowatt when compared to electricity generated from a coal-fired power plant. By integrating a waste heat recovery system with on-site generation, the system has the potential to further reduce the CO_2 emissions, eliminating the chilling system's electricity consumption as well as eliminating additional heating requirements in winter. Tri-generation systems can have fuel efficiency rates of 85-95%, more than double the standard fuel utilization rates at most coal-fired power plants.

Process Waste Heat

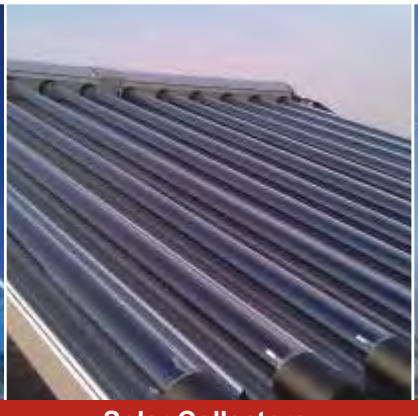
Food & Beverage

Power Plant

Tri-Generation (CHP)

Generators

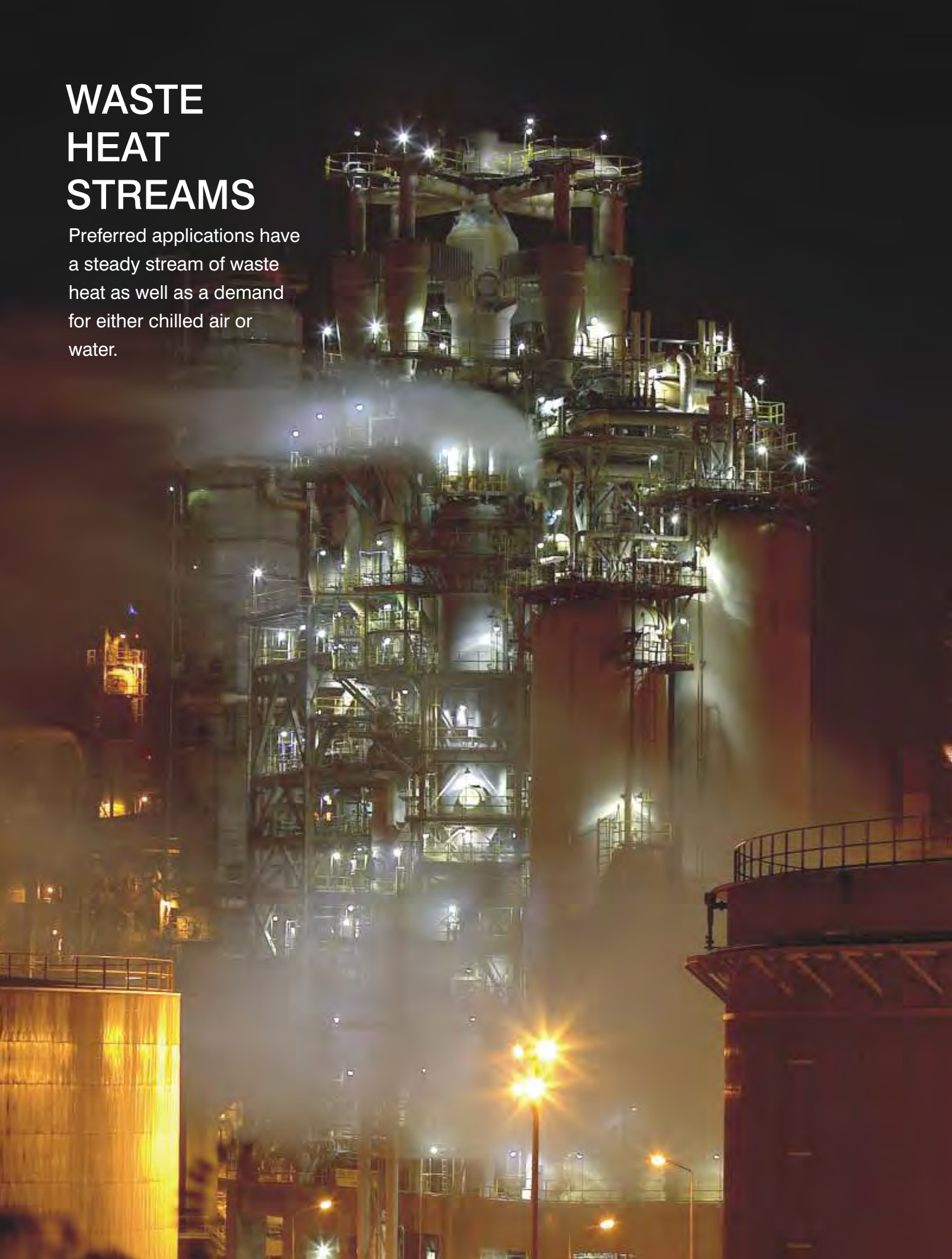
Solar Heat



Solar Collectors

WASTE HEAT STREAMS

Preferred applications have a steady stream of waste heat as well as a demand for either chilled air or water.



Power Plants

- Boiler Exhaust (150°C–200°C) – can be tapped by recovering waste heat to generate hot water for **Adsorption Chillers**
- **Boiler Blow Down** – 3% of the total boiler capacity that is used for blow down, can be utilized in **Adsorption Chillers** as heat source
- **Boiler Condensate** – can be utilized in **Adsorption Chillers** as heat source
- Some power plants generate hot water at 60°C in PRDS stations to cool down the steam, which can be used as heat source

Gas Engines/DG Sets

DG set jacket cooling water used in these engines can be utilized as hot water input source to generate chilled water.

Food & Beverages

Low grade waste heat source is available in the form of oven exhaust at 200-250°C which can be converted in hot water for **Adsorption Chillers**. Some industries have boiler waste heat at 200°C and engine waste heat at 80°C available which can be tapped for **Adsorption Chillers**.

Automobile Manufacturing Plants

Low grade waste heat is available from Boiler Exhaust, Incinerator Exhaust, Paint Shop Exhaust and CHP Waste Heat.

Chemical Industries

Low grade heat source is mainly from Boiler exhaust at 200°C where Boilers are used for process or for Cogen for own power generation. Condensate recovery is also one more option to recover low grade heat source. Evaporator Condensate heat at 60-70°C is also available from chemical, distillation and refinery plants.

Sugar

Boiler Exhaust/Boiler Blow Down/Condentate is low grade heat source available and condensate is also available at 80-85°C for **Adsorption Chillers.**

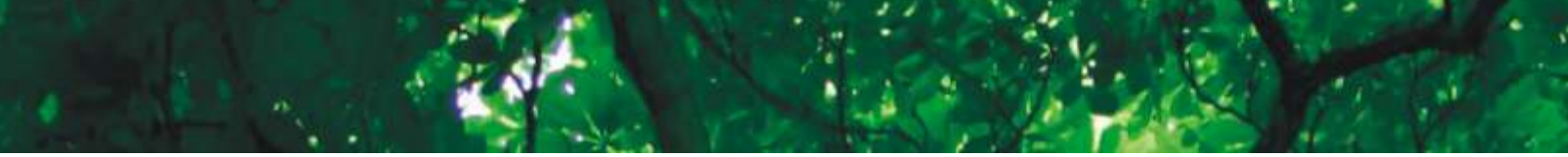
Pulp and Paper

Boiler Exhaust/Boiler Blow Down is low grade heat source available and condensate is also available at 80-85°C for **Adsorption Chillers**. Abundant low grade heat source is available from pulp and paper and in some factories incinerator waste heat is also available at 200°C in the form of exhaust which can be converted to hot water by installation of heat exchanger on exhaust.

Aluminum

Fuel Fired Furnaces are an abundant heat source to generate hot water for **Adsorption Chillers** in aluminum industry.

Cement, steel, plastic processing, hospitality, healthcare And many more....



Technical Data–ADC Series

C-Frame

MODEL	C-40	C-30	C-20	C-10
Rated Capacity (Tonnes)	41	30	20	10
Chilled Water				
Inlet Temperature (°C)	12.8	12.8	12.8	12.8
Outlet Temperature (°C)	7.2	7.2	7.2	7.2
Flow Rate (l/min)	371	273	182	91
Pressure Drop (mtr.H_2O)	8.5	5.8	3.4	1.2
Connection Size: (mm)	65	65	65	65
Condenser Water				
Inlet Temperature (°C)	29	29	29	29
Outlet Temperature (°C)	35	35	35	35
Flow Rate (l/min)	1120	821	549	273
Pressure Drop (mtr. H_2O)	11.9	7.9	4.6	1.8
Connection Size: (mm)	100	80	65	65
Hot Water				
Inlet Temperature (°C)	90.6	90.6	90.6	90.6
Outlet Temperature (°C)	84	84	84	84
Flow Rate (l/min)	621	454	303	151
Pressure Drop (mtr. H_2O)	4.3	2.7	1.8	0.6
Connection Size: (mm)	80	65	65	65

Electrical

Voltage/Ph.....415-3
Frequency.....50/60 Hz
Operating kW Consumption.....0.6 kW
Maximum kW Consumption.....1.7 kW

Air Supply

Air Pressure (bar).....4.89
Air Consumption (cfm).....0.34

Unit Dimensions*

Width (mm).....2032
Length (mm).....4826
Height (mm).....2388
*with cabinets mounted on the side as shown

Weight

Empty (kg).....7250
Operating (kg).....8165

Refrigerant type.....Water (H_2O)

Operating Range

Chilled Water (°C).....3 to 20
Hot Water (°C).....52 to 93
Condenser Water (°C).....10 to 39
Maximum Pressure (bar)..... 4.82

Available in all international voltages

D-Frame

MODEL	D-75	D-60	D-50
Rated Capacity (Tonnes)	76	61	51
Chilled Water			
Inlet Temperature (°C)	12.8	12.8	12.8
Outlet Temperature (°C)	7.2	7.2	7.2
Flow Rate (l/min)	689	553	462
Pressure Drop (mtr. H_2O)	8.5	6.4	5.2
Connection Size: (mm)	100	100	100
Condenser Water			
Inlet Temperature (°C)	29	29	29
Outlet Temperature (°C)	35	35	35
Flow Rate (l/min)	2078	1669	1397
Pressure Drop (mtr. H_2O)	11.9	8.8	7.0
Connection Size: (mm)	125	125	125
Hot Water			
Inlet Temperature (°C)	90.6	90.6	90.6
Outlet Temperature (°C)	84	84	84
Flow Rate (l/min)	1151	924	772
Pressure Drop (mtr. H_2O)	4.3	3.4	2.4
Connection Size: (mm)	100	100	100

Electrical

Voltage/Ph.....415-3

Frequency.....50/60 Hz

Operating kW Consumption.....0.8 kW

Maximum kW Consumption.....1.9 kW

Air Supply

Air Pressure (bar).....4.89

Air Consumption (cfm).....0.34

Unit Dimensions*

Width (mm).....2159

Length (mm).....5055

Height (mm).....2921

*with cabinets mounted on the side as shown

Weight

Empty (kg):.....11793

Operating (kg):.....13154

Refrigerant type.....Water (H_2O)

Operating Range

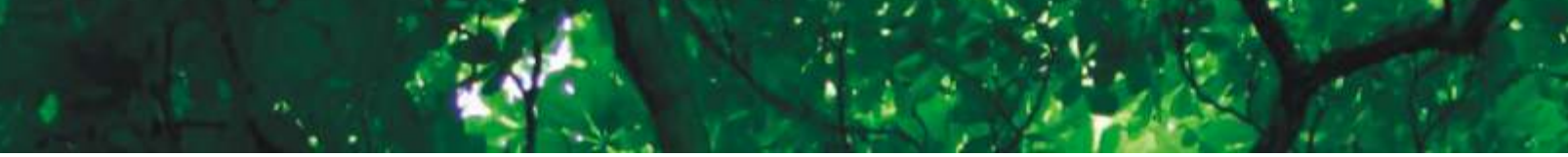
Chilled Water (°C).....3 to 20

Hot Water (°C).....52 to 93

Condenser Water (°C).....10 to 39

Maximum Pressure (bar)..... 4.82

Available in all international voltages



Technical Data–ADC Series

E-Frame

MODEL	E-150	E-140	E-120	E-100
Rated Capacity (Tonnes)	152	142	124	104
Chilled Water				
Inlet Temperature (°C)	12.8	12.8	12.8	12.8
Outlet Temperature (°C)	7.2	7.2	7.2	7.2
Flow Rate (l/min)	1382	1291	1128	946
Pressure Drop (mtr. H_2O)	9.1	8.2	7.0	5.5
Connection Size: (mm)	100	100	100	100
Condenser Water				
Inlet Temperature (°C)	29	29	29	29
Outlet Temperature (°C)	35	35	35	35
Flow Rate (l/min)	4164	3887	3395	2846
Pressure Drop (mtr. H_2O)	13.7	12.5	10.7	8.2
Connection Size: (mm)	150	150	150	150
Hot Water				
Inlet Temperature (°C)	90.6	90.6	90.6	90.55
Outlet Temperature (°C)	84	84	84	84
Flow Rate (l/min)	2301	2150	1877	1575
Pressure Drop (mtr. H_2O)	6.7	6.1	5.2	4.0
Connection Size: (mm)	100	100	100	100

Electrical

Voltage/Ph.....415-3

Frequency .....50/60 Hz

Operating kW Consumption .....0.8 kW

Maximum kW Consumption .....1.9 kW

Air Supply

Air Pressure (bar).....4.89

Air Consumption (cfm).....0.34

Unit Dimensions*

Width (mm).....2489

Length (mm).....5080

Height (mm).....2921

*with cabinets mounted on the side as shown

Weight

Empty (kg).....14969

Operating (kg).....16366

Refrigerant type.....Water (H_2O)

Operating Range

Chilled Water (°C).....3 to 20

Hot Water (°C).....52 to 93

Condenser Water (°C).....10 to 39

Maximum Pressure (bar)..... 4.82

Available in all international voltages

Ext-E-Frame

MODEL	E-190
Rated Capacity (Tonnes)	190
Chilled Water	
Inlet Temperature (°C)	12.8
Outlet Temperature (°C)	7.2
Flow Rate (l/min)	1726
Pressure Drop (mtr. H_2O)	10.7
Connection Size: (mm)	100
Condenser Water	
Inlet Temperature (°C)	29
Outlet Temperature (°C)	35
Flow Rate (l/min)	5201
Pressure Drop (mtr. H_2O)	13.7
Connection Size: (mm)	150
Hot Water	
Inlet Temperature (°C)	90.55
Outlet Temperature (°C)	84
Flow Rate (l/min)	2877
Pressure Drop (mtr. H_2O)	9.1
Connection Size: (mm)	100

Electrical

Voltage/Ph.....415-3
Frequency .....50/60 Hz
Operating kW Consumption .....0.8 kW
Maximum kW Consumption .....1.9 kW

Air Supply

Air Pressure (bar).....4.89
Air Consumption (cfm).....0.34

Unit Dimensions*

Width (mm).....2489
Length (mm).....5080
Height (mm).....3251
*with cabinets mounted on the side as shown

Weight

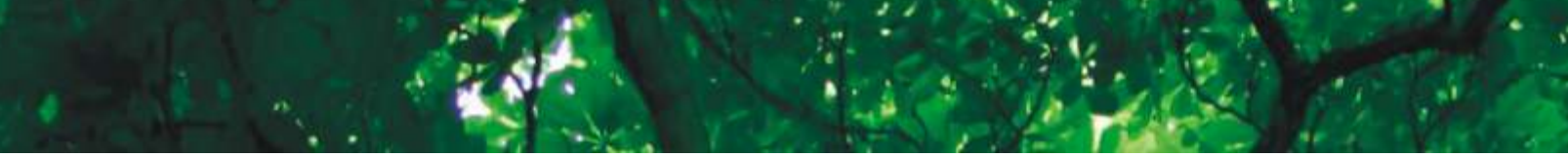
Empty (kg).....18144
Operating (kg).....19958

Refrigerant type.....Water (H_2O)

Operating Range

Chilled Water (°C).....3 to 20
Hot Water (°C).....52 to 93
Condenser Water (°C).....10 to 39
Maximum Pressure (bar)..... 4.82

Available in all international voltages



Technical Data–ADC Series

F-Frame

MODEL	F-330	F-300	F-250	F-200
Rated Capacity (Tonnes)	335	305	254	203
Chilled Water				
Inlet Temperature (°C)	12.8	12.8	12.8	12.8
Outlet Temperature (°C)	7.2	7.2	7.2	7.2
Flow Rate (l/min)	3043	2771	2309	1843
Pressure Drop (mtr. H_2O)	8.8	7.9	6.1	4.6
Connection Size: (mm)	200	200	200	200
Condenser Water				
Inlet Temperature (°C)	29	29	29	29
Outlet Temperature (°C)	35	35	35	35
Flow Rate (l/min)	9167	8346	6949	5556
Pressure Drop (mtr. H_2O)	12.8	11.3	8.8	6.7
Connection Size: (mm)	250	250	250	250
Hot Water				
Inlet Temperature (°C)	90.6	90.6	90.6	90.6
Outlet Temperature (°C)	84	84	84	84
Flow Rate (l/min)	5072	4618	3846	3073
Pressure Drop (mtr. H_2O)	6.1	5.5	4.3	3.0
Connection Size: (mm)	200	200	200	200

Electrical

Voltage/Ph.....415-3
Frequency .....50/60 Hz
Operating kW Consumption .....1.3 kW
Maximum kW Consumption .....2.4 kW

Air Supply

Air Pressure (bar).....4.89
Air Consumption (cfm).....0.34

Unit Dimensions*

Width (mm).....3658
Length (mm).....5334
Height (mm).....3505
*with cabinets mounted on the side as shown

Weight

Empty (kg).....21319
Operating (kg).....24040

Refrigerant type.....Water (H_2O)

Operating Range

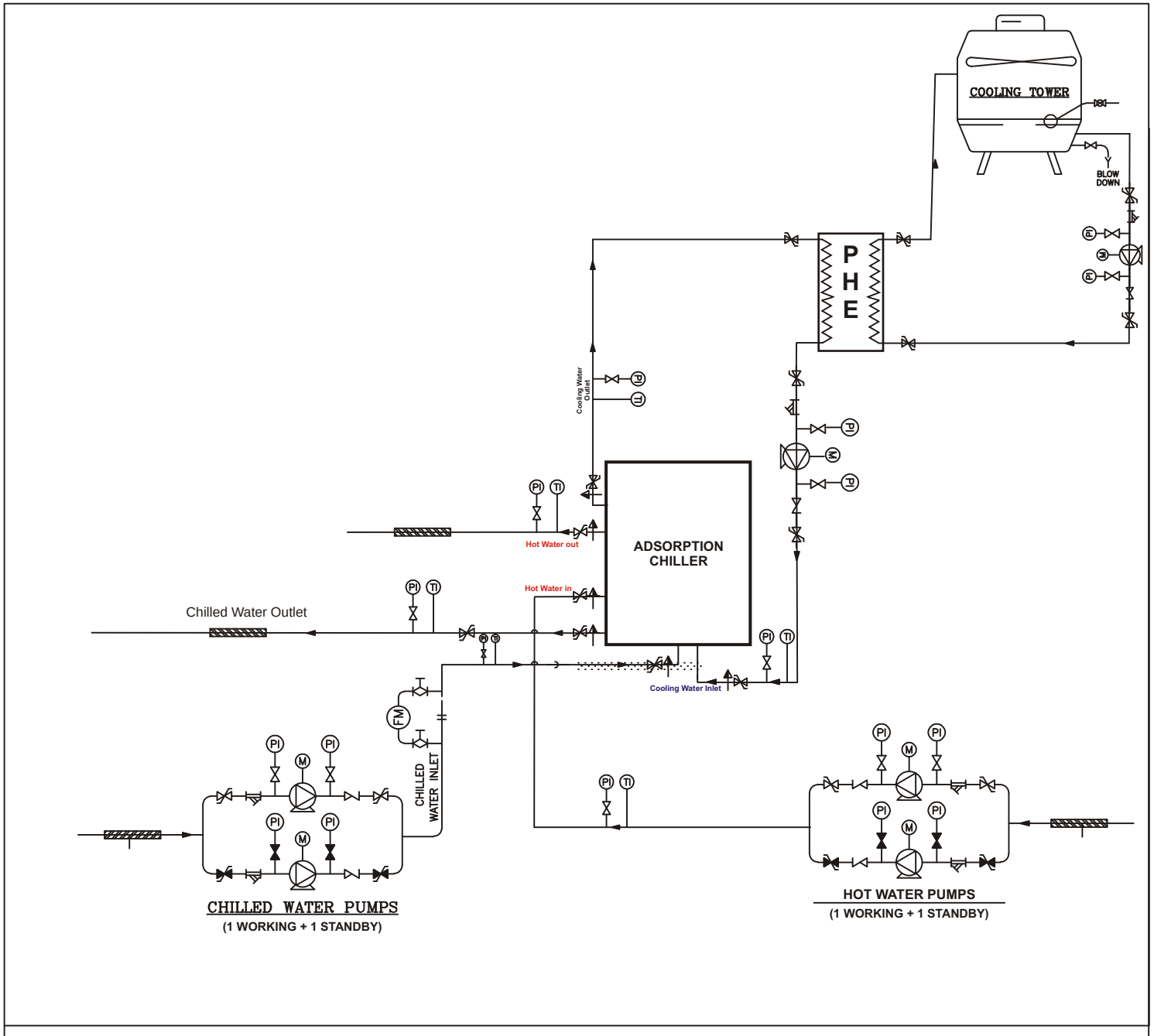
Chilled Water (°C).....3 to 20
Hot Water (°C).....52 to 93
Condenser Water (°C).....10 to 39
Maximum Pressure (bar)..... 4.82

Available in all international voltages

Notes:

* Rated for maximum capacity mode. Higher efficiencies are available at reduced capacities.
* Maximum pressure 4.82 for hot, chilled & condenser water
* All data is preliminary and subject to change without notice

P&I Drawing


COOLING TOWER
BLOW DOWN
P
H
E
Cooling Water Outlet
Hot Water out
Hot Water in
ADSORPTION CHILLER
Chilled Water Outlet
Cooling Water Inlet
FM
CHILLED WATER INLET
CHILLED WATER PUMPS
(1 WORKING + 1 STANDBY)
HOT WATER PUMPS
(1 WORKING + 1 STANDBY)
GATE VALVE (OPEN)
GATE VALVE (CLOSED)
GLOBE VALVE (OPEN)
GLOBE VALVE (CLOSED)
NON RETURN VALVE
STOP COCK
BUTTERFLY VALVE (OPEN)
BUTTERFLY VALVE (CLOSED)
PUMP
MOTOR
"Y" STRAINER
P - PRESSURE
T - TEMPERATURE
F - FLOW
I - INDICATOR
M - MOTOR
CLIENT SCOPE
Bry-Air Scope

Test Lab for Adsorption Chillers

PAWA™ GROUP

Bry-Air® DRI™

Cutting Edge Technology

11 International Patents

The Group has filed 11 international patents in the last 5 years in energy smart technologies related to air engineering.

Strong R&D and Testing

Govt recognized R&D labs and **8** in-house Test labs for

- Energy Recovery
- Chemical Analysis
- Gas Phase Filtration (GPF)
- Desiccant Rotors (2)
- Evaporative Cooling
- Chilled Beams
- Adsorption Chiller – Adsorber Beds

ECODRY™ for Desiccant Rotors

- Upto-65°C dew points applications.
- Customised design for any size and depth

ECOSCRUB™ for Gas Phase Filtration

- Extremely High Efficiency
- Longer Life (Low MTBR)

ECOFRESH™ for Enthalpy Wheels

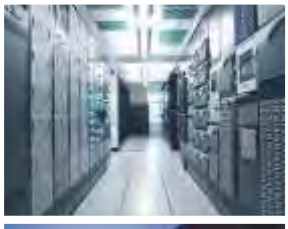
- #1 in performance ... worldwide
- Highest Recovery Efficiency (RER Value)

ECOBEAM™ for Chilled Beams

Chilled beam testing facility set up in collaboration with WSP Gmbh, Germany, official Eurovent testing lab for chilled beams

PAWA™ GROUP
Innovation is life

End-to-End Solutions in Air Treatment















Bry-Air®
Leaders in Dehumidification... Worldwide

Desiccant Dehumidification
for humidity control & drying

Plastics Auxiliaries for Drying, Conveying, Blending, Heating & Cooling and Mould Dehumidification

Gas Phase Filtration
for removal of corrosive & odorous gases

High Temperature
Waste Heat Recovery

Adsorption Chillers
Use low grade waste heat for
Energysmart Green Cooling









...for almost all industries

- Airports
- Automobile
- Aviation
- Chemicals & Petrochemicals
- Commercial Buildings
- Construction
- Electronics
- Food Processing
- General industry
- Green Buildings
- Healthcare
- Hospitality
- Indoor Swimming Pools
- Investment Casting
- Large Industrial Spaces
- Leather
- Lithium Battery Production
- Museums & Archives
- Pharmaceuticals
- Spray Drying
- Power

Special Applications

- Crocodile Enclosure
- Falcon Breeding Area
- Ostrich Egg Incubation

and many more...




TDS™
Air Solutions on Rent

Air Solutions on RENT for

- Industrial Projects Solutions
- Surface Preparation & Coating
- Water Damage Restoration
- Comfortable Working Conditions

AIR ON RENT SOLUTIONS

delair®
The Compressed Air Treatment System Company

Compressed Air & Gas Dryers
and Accessories

DRI™
Innovative Air Solutions

Fresh Air Solutions for Green
HVAC and Evaporative Cooling

Energy Recovery Wheels, DOAS, Evaporative Cooling Pads,
Evaporative & Dew Point Cooler, Chilled Beams, Desiccant Rotors

Bry-Air®

We are never too far from you...

PAWA GROUP
Innovation is life

- Installations in over 80 Countries
- 11 Manufacturing Facilities
- 1400+ Employees in 6 Continents
- Representatives in over 60 Countries

Bry-Air®

- Plants
- Associate Plant
- Own Sales & Service offices
- Rep. Network

Bry-Air®

Leaders in Dehumidification... Worldwide

Enter Bry-Air... exit moisture™

BRY-AIR (ASIA) PVT. LTD.

Corporate Office:
21C, Sector-18, Gurgaon 122015
Phone: +91-124-4091111
Fax: +91-124-4091100
E-mail: bryairmarketing@pahwa.com

Registered Office:
20, Rajpur Road, Delhi 110054
Phone: +91-11-23906666
Fax: +91-11-23906600
E-mail: enquire@pahwa.com
Web.: www.bryair.com
CIN: U74210DL1981PTC012456

City	Phone	E-mail
DELHI	+91-11-23906666	enquire@pahwa.com
CHANDIGARH	+91-172-4678806/7	bryairchandigarh@pahwa.com
MUMBAI	+91-22-24935155/24947475	bryairmumbai@pahwa.com
VADODARA	+91-265-2351493	bryairbaroda@pahwa.com
KOLKATA	+91-33-22814841/22814877	bryairkolkata@pahwa.com
BENGALURU	+91-80-25271232	bryairbangalore@pahwa.com
HYDERABAD	+91-40-27154243	bryairhyderabad@pahwa.com
CHENNAI	+91-44-26163820/29/40	bryairchennai@pahwa.com
KOCHI	+91-484-2395940	bryairkochi@pahwa.com

BRY-AIR (USA)
Phone: +1-740-965-2974
Fax: +1-740-965-5470
E-mail: bryair1@bry-air.com
Website: www.bry-air.com

BRY-AIR (CHINA)
Phone: +86-21-51591555
Fax: +86-21-51591559
E-mail: info@bryair.com.cn
Website: www.bryair.com.cn

BRY-AIR (MALAYSIA)
Phone: +60-3-89256622
Fax: +60-3-89259957
E-mail: bryair@bryair.com.my
Website: www.bryair.com.my

BRY-AIR (BRAZIL)
Phone: +55-41-36982222
E-mail: contato@bryair.com.br
Website: www.bryair.com.br

Country	Phone	E-mail	Website
BRY-AIR (UAE)	+971-6-5574622	info@bryair.ae	www.bryair-mena.com
BRY-AIR (PHILIPPINES)	+63-2-8078436	mail@bryair.com.ph	www.bryair.com/philippines
BRY-AIR (INDONESIA)	+62-21-79199023	indonesia@bryair.com.my	www.bryair.com.my/indonesia
BRY-AIR (VIETNAM)	+84-8-39956498	vietnam@bryair.com.my	www.bryair.com.my
BRY-AIR (NIGERIA)	+234-8097276772	bryairmarketing@pahwa.com	www.bryair.com
BRY-AIR (SWITZERLAND)	+41-91-6830971	msammartini@pro-kon.ch	www.pro-kon.ch
BRY-AIR (BANGLADESH)	+880-1819409100	bryairbangladesh@pahwa.com	www.bryair.com

An ISO 9001:2008 and 14001:2004 Company

PAWA GROUP
Innovation is life

ADC/2015/101