



# GT AIR



## TECHNICAL DATA SHEETS



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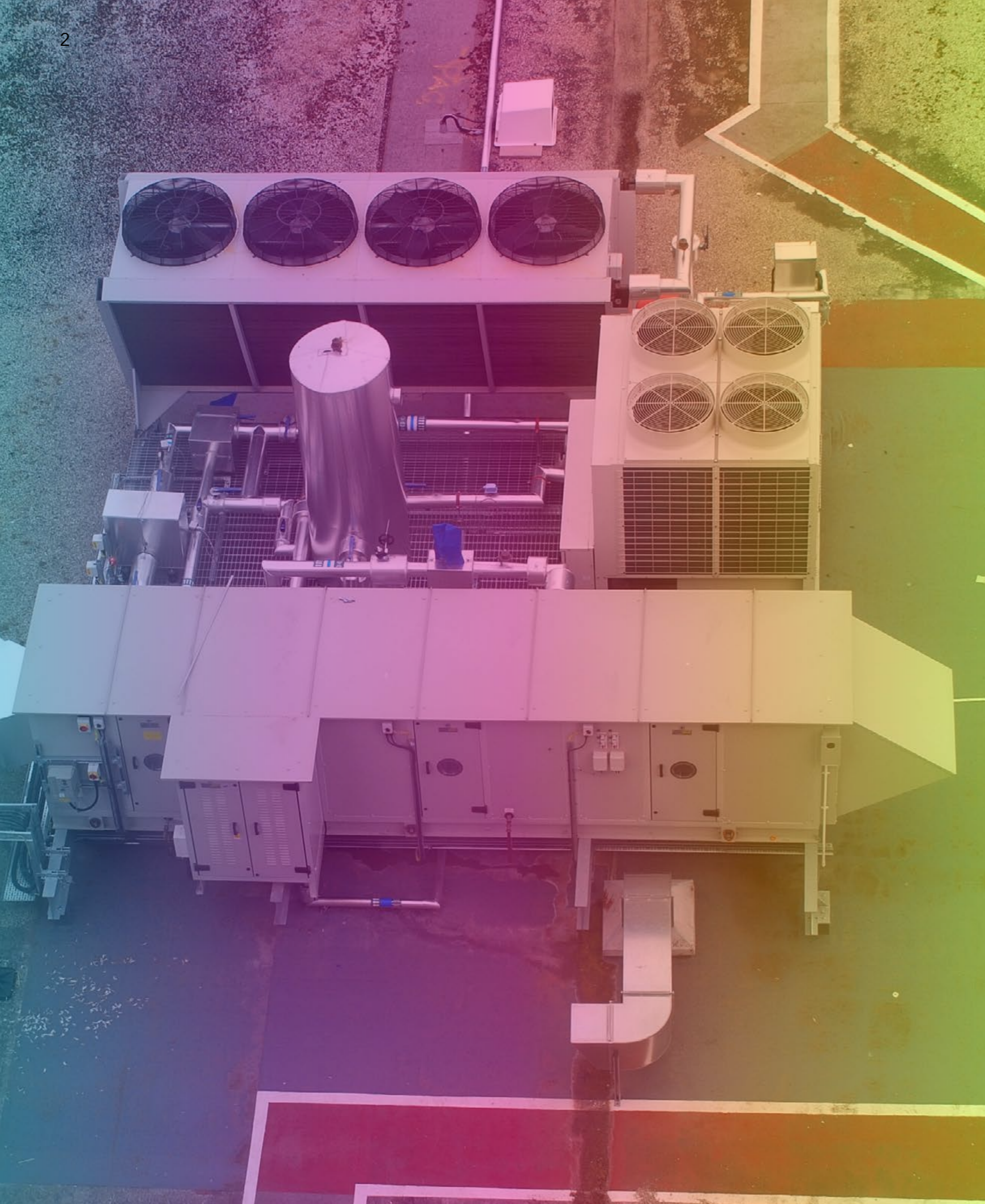


[sales@guardtech.com](mailto:sales@guardtech.com)



Guardtech House, Unit 1A Homefield Road, Haverhill, Suffolk, CB9 8QP





# DIRECTORY



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# GT AIR

## AIR CONDITIONING



Air treatment and air movement are fundamental principles that must be considered in every cleanroom design. Filtration naturally plays an essential part in achieving classification, however, the methodology of moving air through that media must also be considered.

Added to air movement are the principles of air treatment or conditioning, this may include heating, cooling, humidification and dehumidification. The parameters to which these must be controlled and the accepted tolerances balanced against the constraints of the budget will be the guiding influence behind the decision-making process.

The following pages outline alternative HVAC methods with clear and detailed explanation of the differences between the system types and comparisons of benefits and compromises.

Let Guardtech take your operation to the next level.



### AIR MAX

Guardtech's elite-level HVAC solution – a range of high-performance air-cooled and water-cooled chillers that deliver a level of close control and large-scale facility competence unmatched by any other GT Air solution.



### AIR PRO

A high-performance customised HVAC solution – these high-performance Air Handling Units (AHUs) provide optimum temperature and humidity conditions for a diverse range of applications.



### AIR PLUS

A series of high-specification close control CRAC units that offer tight temperature and humidity conditions with a reduced plant footprint, offering significant benefits in terms of redundancy and maintenance.



### AIR LITE

A range of high-capacity fan coil units that provide temperature control only, either directly ducted or used for distribution within a plenum.



### AIR FIRE

ATEX-rated air handling solutions for high-risk applications that also require classification and conditioning. For more information on your potential options, contact the Guardtech Commercial team via [sales@guardtech.com](mailto:sales@guardtech.com).







# GT AIR MAX

Guardtech's elite-level HVAC solution – a range of high-performance air-cooled and water-cooled chillers that deliver a level of close control and large-scale facility competence unmatched by any other GT Air solution.



High efficiency, low noise and close control are the hallmarks of the GT Air Max air-cooled chiller range.

A robust portfolio of options features a wide operating map – so we can find the ideal solution for your facility.

The Guardtech Group offer an array of tonnage sizes, efficiencies and performance features to meet your requirements. GT Air Max delivers exceptional close control tolerance

of at least 20°C +/- 0.1°C and relative humidity of +/- 1%, helping to achieve the level of performance that your process requires.

You define the outcomes, and we'll get you there. GT Air Max air-cooled chillers give you the flexibility to choose from a wide range of capacities and features.

From outstanding efficiency to amazing acoustics, occupant comfort and well-being. You can have it all – in varying degrees!



**AIR-COOLED CHILLERS**

## TECHNICAL FEATURES



GT Air Max air-cooled chillers deliver amazing efficiency under all operating conditions, plus

free cooling in units up to 550 tons. The GT Air Max Ascend Model ACR can maximise savings,

especially in spaces that require more energy. An optional harmonic filtration system utilises a matrix filter design to meet the requirements of IEEE@ 519, while also reducing harmonic distortion to 5% (or less) total demand distortion (TDD).

The environmentally conscious free-cooling option takes advantage of cooler ambient air temperature to reduce energy consumption.

## PRODUCT FEATURES

### SUSTAINABILITY

High efficiency solution with optional free cooling. No cooling toward helps to conserve water usage.

### PRECISION

Maintains temperatures within tight tolerances.

### ACOUSTICAL PERFORMANCE

Acoustical data used to help system designers achieve appropriate sound levels for any context.

### RELATIVE LOW COST

Best performance for your budget guaranteed with long-lasting reliable HVAC solution.



**WATER-COOLED CHILLERS**

The Guardtech Group offer a comprehensive portfolio of GT Air Max water-cooled chillers. This innovative product line-up meets a variety of application challenges.

The CenTraVac® chiller (above) is one of the industry's quietest, most reliable and efficient low-emission chillers. Critical industrial and

low-temperature process cooling requires precision — precision that GT Air Max chillers excel at providing.

The combination of sophisticated controls, compressors and expansion valve technology can deliver exceptionally precise chilled water temperature control, with variance as tight as 0.3°C.

## PRODUCT FEATURES

### CAPACITY COVERED

Broad range of cooling capacities – from 150 to 430 tons.

### ENERGY EFFICIENCY

Up to 39 percent better than the industry standard requires.

### ULTIMATE CONTROL

Tracer controls are integrated with an easy-to-use 7-inch color touch-screen display that shows vital, at-a-glance information about current chiller performance.



### RELIABLE, LOW-MAINTENANCE OPERATION

Designed to make costs as low as possible with reliable, low-maintenance operation you can depend on.

## BENEFITS

- Exceptional close control tolerance of at least 20°C +/- 0.1°C and relative humidity of +/- 1%
- Highly efficient and sustainable option
- Engineered to deliver excellent acoustical performance
- Relatively low running costs for large-scale facility management

## COMPROMISES

- More expensive solution than GT Air Plus and Lite
- Longer lead times than GT Air Plus and Lite
- Not suitable for smaller applications
- Requires substantial roof or exterior plant space for housing

## APPLICATIONS



- Pharmaceuticals
- Semiconductor
- Graphene
- Cell & Gene
- Battery
- Laser & Optical

GT Air Max suits the most demanding of applications, typically where temperature & humidity need to be controlled to extremely tight tolerances. Bespoke air handling units provide a high degree of flexibility in regard to component specification, ensuring that quality and consistency of air delivery can be achieved.







# GT AIR PRO



A high-performance customised HVAC solution – these high-performance Air Handling Units (AHUs) provide optimum temperature and humidity conditions for a diverse range of applications.

Air handling units (AHUs) provide conditioned and controlled air movement throughout the cleanroom.

A typical GT Air Pro Air Handling Unit will clean the incoming fresh air, temperature condition and provide a measured amount of flow of air into the building distributed via a ductwork system – with a close control tolerance of at least 20°C +/- 1°C and

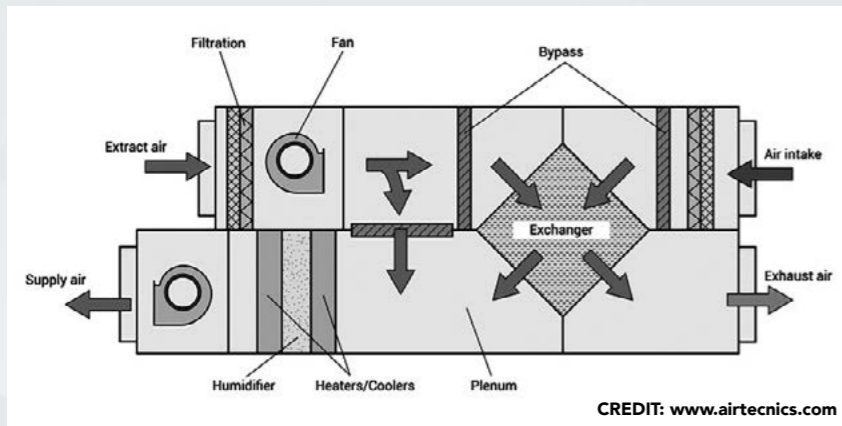
relative humidity of +/- 5%.

All equipment is designed to fit through the specific available access, delivered to site, positioned and fully assembled by Guardtech Group engineers.

The Guardtech installation team have experience of fitting units into a wide variety of applications with a range of different challenges and obstacles.



## AIR HANDLING UNITS EXPLAINED



The **Fan** forms part of the electromechanical system that powers the air, expelling it from the AHU to the ducts which distribute it throughout the rooms.

**Heat exchangers** transfer temperature between two fluids, such as coolant and air, separated by a solid barrier.

The air passing through a **Cooling Coil** module is cooled.

Water droplets can be generated, which are then collected in a condensate tray thanks to a built-in droplet separator. Coatings that considerably reduce the sound level of the installation are known as **Silencers**. The empty spaces in which airflow is homogenised are called **Plenums**.

Air Handling Units (AHUs) collect **Air Intake** from outside, which is then treated and distributed throughout the cleanrooms and/or indoor air that is "recycled". Depending on the

air purity requirements, the **Filter** applied will have a higher or lower particle retention level – countering viruses, bacteria, odours, and other air pollutants.



### PRODUCT FEATURES

FULLY CUSTOM-BUILT EQUIPMENT

ENERGY-EFFICIENT DESIGNS

FULLY PRE-WIRED ENERGY EFFICIENT CONTROLS

HIGH EFFICIENCY HEAT RECOVERY AHUs

STATE-OF-THE-ART FAN TECHNOLOGY

### BENEFITS

- Close control, tight tolerance temperature & humidity parameters achievable
- Centralised plant supports simplified maintenance schedule
- Connection to BMS for central control and monitoring
- Can be sited externally
- Available with different utility connections, such as LTHW, chilled water, DX & steam

### COMPROMISES

- Single point of failure
- Higher running costs
- Large plant space requirement
- Higher power consumption

### APPLICATIONS



Medical Device



Healthcare



Oil & Gas



Cell & Gene



Battery



Laser & Optical

GT Air Pro suits a wide variety of applications in a diverse range of sectors. Whilst it may not boast the same capacity for catering to the needs of the largest-scale facilities as GT Air Max, as an air handling solution GT Air Pro has the capability to cover the same spectrum of demanding applications.





# GT AIR PLUS



A series of high-specification close control CRAC units that offer tight temperature and humidity conditions with a reduced plant footprint, offering significant benefits in terms of redundancy and maintenance.

The GT Air Plus series of Air Handling Units (AHUs) is designed for use in a wide range of process, manufacturing and other cleanroom applications.

GT Air Plus units, which deliver a close control tolerance of at least 20°C +/- 2°C and relative humidity of +/- 10% combine precise temperature and humidity control with outstanding reliability. The units feature EC fans and inverter compressor technology, using remote air-cooled condensers for optimised energy efficiency.

**Key engineered features:**

- Precise control
- Various supply air arrangements
- Corrosion-proof
- Easy maintenance
- EC Fan
- Air Filter
- Scroll compressor
- Isolated control panel
- Forced dehumidification system
- Electrode Humidifier (optional)
- Electric Heater (optional)
- Self-diagnosis

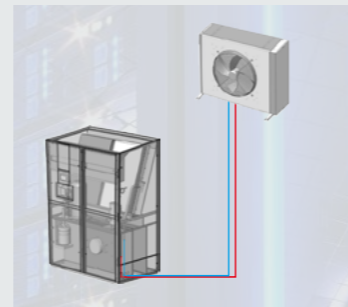


## TECHNICAL FEATURES

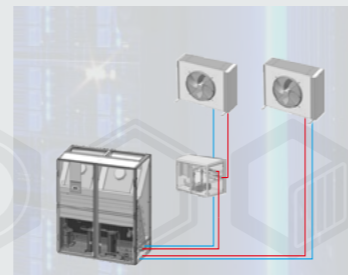
Unit model	16V1A1	20V1A1	25V1A1	30V1A2	35V1A2	40V1A3
Supply air scheme(1)	O/U					
<b>Cooling capacity</b>						
Total (2)	kW	16.3	22.3	25.1	30.2	36.9
Sensible (2)	kW	15.0	20.7	23.3	27.5	34.0
Total (3)	kW	17.9	24.5	27.6	33.2	40.6
Sensible (3)	kW	16.0	22.2	24.9	29.4	36.4
<b>Compressor</b>						
Type	Hermetic inverter scroll					
Power input (2)	kW	4.2	5.9	7.1	7.9	10.6
Current (2)	A	6.8	9.5	11.4	12.7	14.7
Max power input (4)	kW	6.8	11.5	11.5	13.7	15.2
Max current input (4)	A	10.9	18.4	18.4	22.0	24.5
<b>Supply fan</b>						
Type	Caseless backward EC centrifugal fan					
Qty. of fan	n.	1	1	1	1	2
Air volume	m <sup>3</sup> /h	5750	6500	7300	8800	9600
Extra pressure (5)	Pa	Standard ESP is 75Pa, adjustment range is 50-300Pa				
Power input	kW	1.1	1.25	1.46	1.7	2.0
Current	A	1.7	2	2.3	2.6	3
<b>Condenser fan (3)</b>						
MAE Model		AMAE6	AMAE6	AMAE8	AMAE10	AMAE12
Quantity	n.	1	1	1	1	1
<b>Electric heater</b>						
Type	kW	6	6	9	9	13.5
Heating capacity	A	9.1	9.1	13.5	13.5	20.4
Working steps	n.	2	2	2	2	2
<b>Humidifier</b>						
Type	Electrode					
Capacity	kg/h	3	3	5	5	8
Power input	kW	2.3	2.3	3.8	3.8	5.9
Current	a	3.4	3.4	5.7	5.7	9
<b>Power supply</b>						
Power supply	380V/3Ph/50Hz					
Unit maximum operation power (6)	kW	17.0	21.7	24.7	26.9	33.4
Unit maximum operation current (6)	A	28.6	36.1	40.5	44.1	56.5
<b>Air filter</b>						
Unit connection pipe	1/2					
Humidifier water supply	in	3/4				
Condensing water drainage	in	3/4				
Gas pipe	mm	19	22	22	22	2x22
Liquid pipe	mm	12.7	12.7	12.7	16	2x12.7
<b>Unit dimension and weight</b>						
Width	mm	875	875	1480	1480	1750
Depth	mm	890	890	890	890	890
Height	mm	1960	1960	1960	1960	1960
Weight	kg	280	320	380	420	525

### Working Flow Schematic Diagram

Air cooled direct expansion system

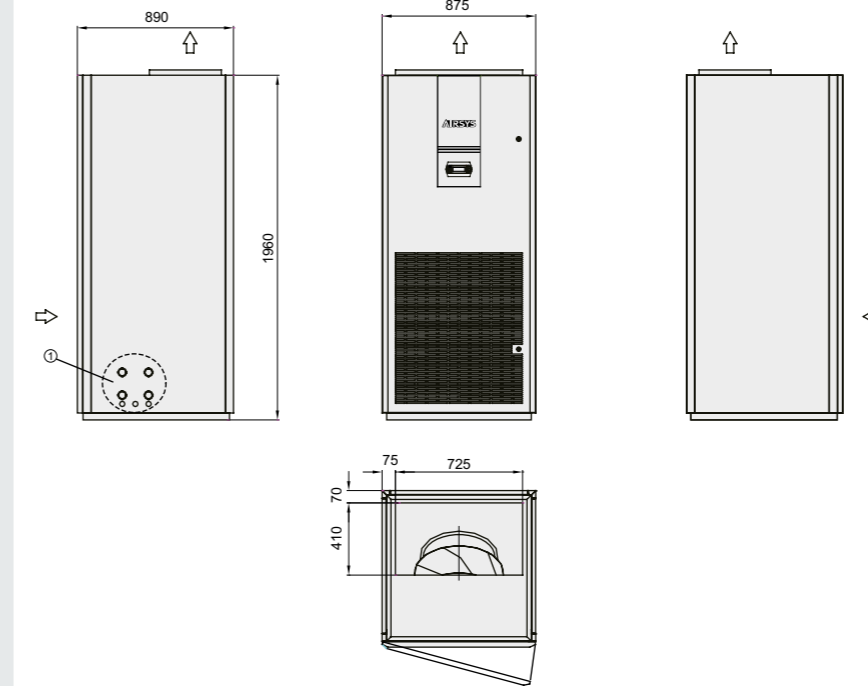


Air cooled direct expansion with indirect free cooling

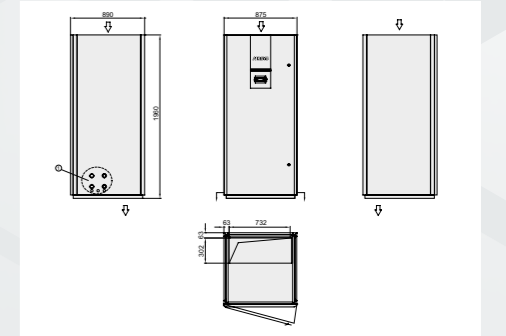


## TECHNICAL DRAWINGS

### Typical unit cabinet dimension drawing for upflow unit



### Typical unit cabinet dimension drawing for underflow unit



### BENEFITS

- Strong close control tolerance of at least 20°C +/- 2°C and relative humidity of +/- 10%
- Tight temperature and humidity conditions
- Reduced plant footprint
- Significant functionality advantages in terms of redundancy and maintenance
- Efficient, reliable option

### COMPROMISES

- Not as equipped to cope with the rigours of considerably large-scale facilities as GT Air Max and Pro
- Potentially longer lead times than Lite option
- More expensive price point than Lite option

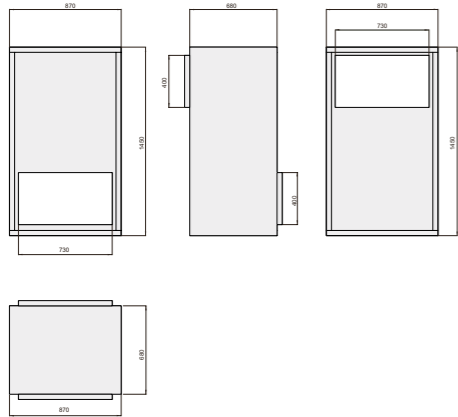
### APPLICATIONS



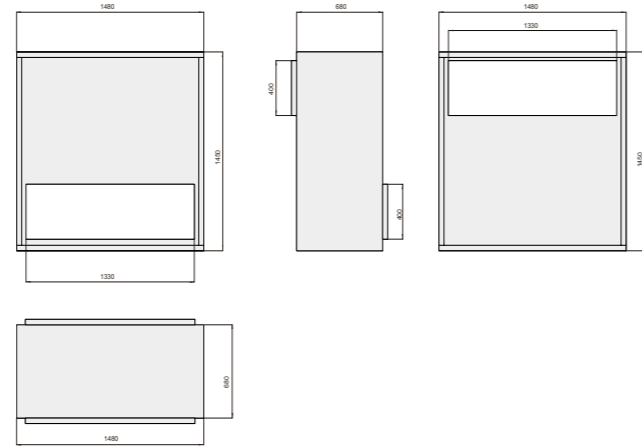
GT Air Plus is a robust cleanroom air handling solution suitable for a number of different industries using controlled environments as part of their process. However, because this solution only offers temperature control, the spectrum of applications it supports is significantly decreased compared to GT Max and Pro.



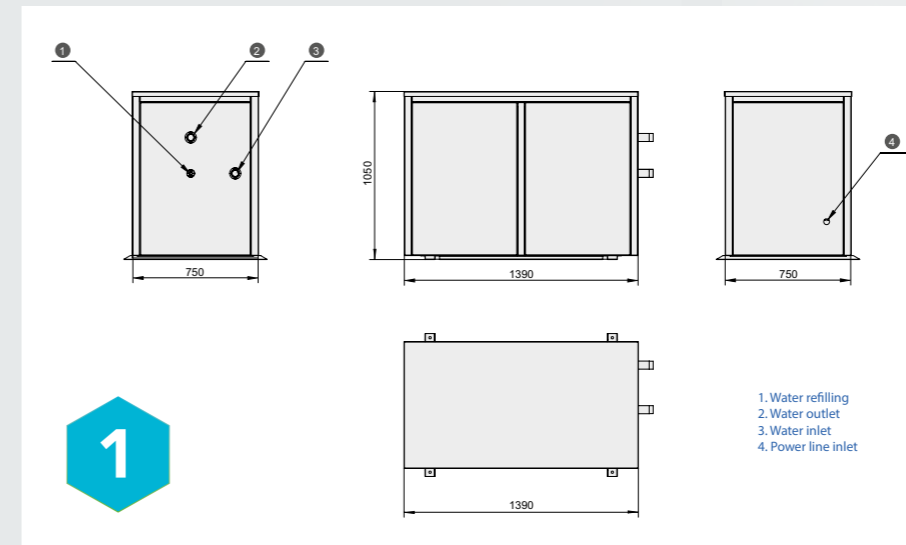
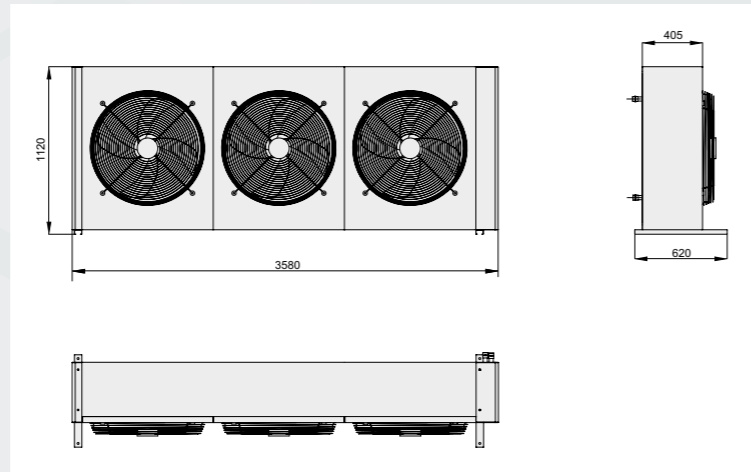
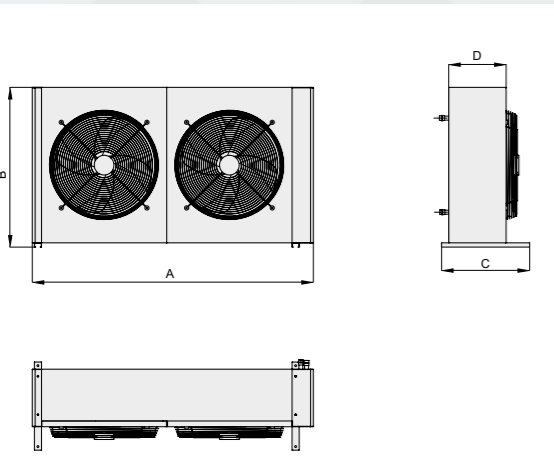
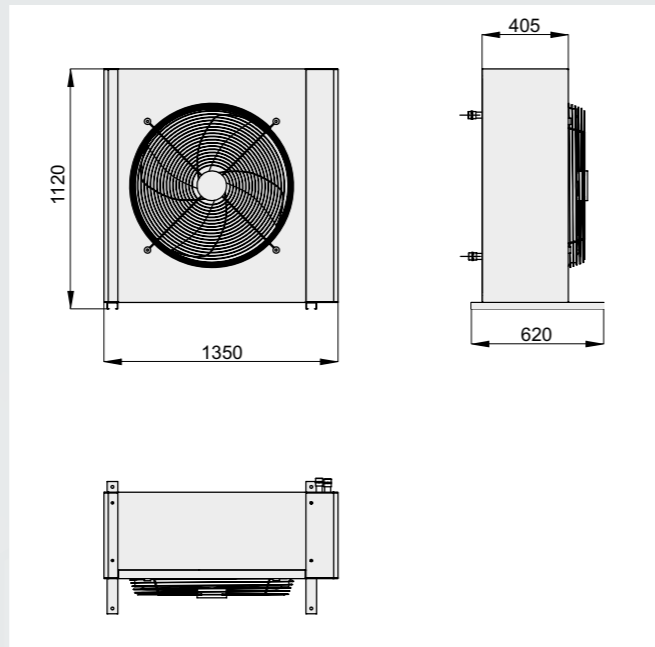
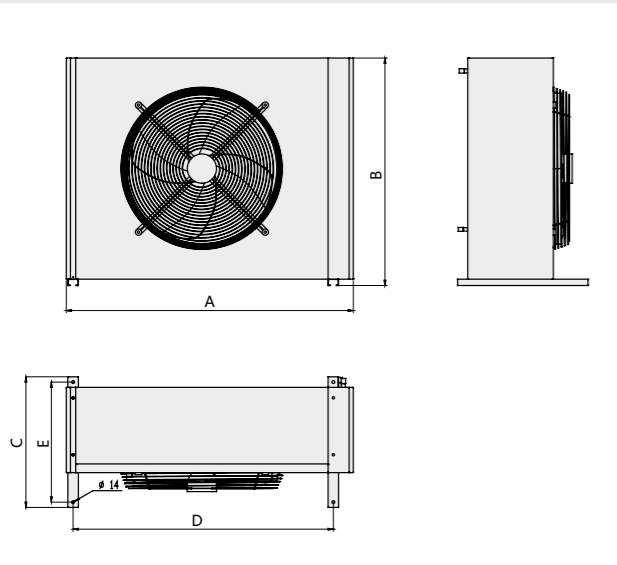
Fresh air inlet box



Fresh air inlet box



CMEH dry cooler



PUG Pump Group

1

Direct Free Cooling (DFC)

2

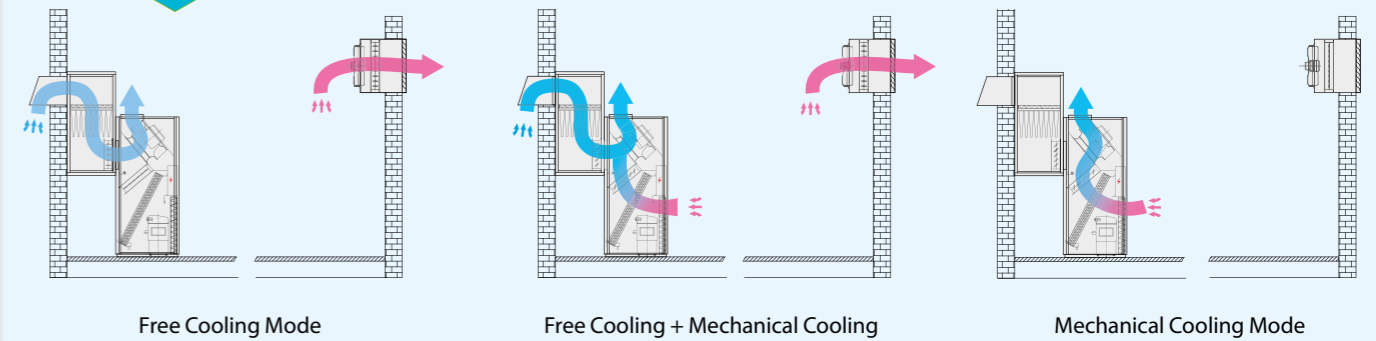
Indirect Free Cooling

3

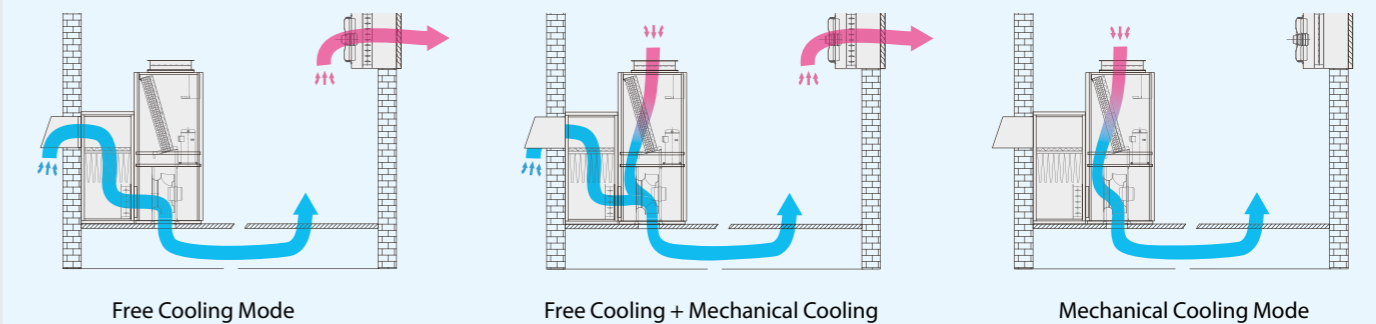
- 1. Water refilling
- 2. Water outlet
- 3. Water inlet
- 4. Power line inlet

2

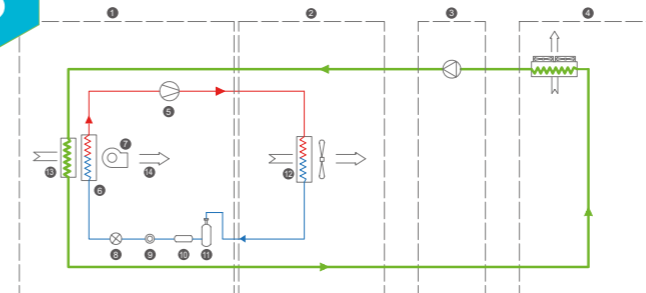
Up Flow Unit



Down Flow Unit



3



- 1 Indoor unit
- 2 Outdoor unit
- 3 Pump group(optional)
- 4 Dry cooler(optional)
- 5 Compressor
- 6 Evaporator
- 7 Supply fan
- 8 Expansion valve
- 9 Sight glass
- 10 Filter dryer
- 11 Liquid receiver
- 12 Air cooled condenser
- 13 Return air
- 14 Supply air





# GT AIR LITE

A range of high-capacity fan coil units that provide temperature control only, either directly ducted or used for distribution within a plenum.



As the most discreet space heating solution available, ducted systems – like the GT Air Lite – offer a stylish, quiet alternative that is largely hidden from view with only subtle air grilles visible.

The ducted GT Air Lite's high-static airflow allows air to be directed to different areas of your cleanroom with ease. GT Air Lite features close control tolerance of at least 20°C +/- 3°C

but with no humidity control. This unit is ideal for heating or cooling a large number of rooms at once and includes a Deluxe PAR wired controller with backlit LCD display and user-friendly menus.

Take control of your power consumption via the PAR Controller's inbuilt energy-saving feature whilst also setting up to eight temperature patterns per day.



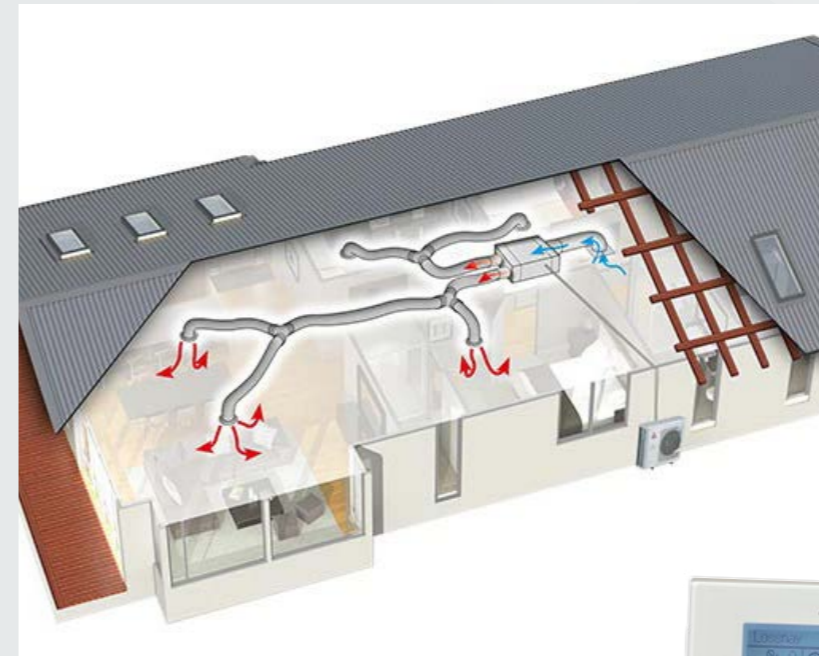
## TECHNICAL FEATURES

TECHNICAL DATA	
Function	Cooling/Heating
Capacity - Cooling	22.0kW
Capacity - Cooling (min. - max.)	11.2 - 27.0kW
Power input - Cooling	6.11 kW
EER / COP	3.60 / 3.62
Type	Single Split, Inverter
Capacity - Heating	25.0kW
Capacity - Heating (min. - max.)	12.5 - 29.0kW
Power input - Heating	6.89 kW
AEER / ACOP	3.27 / 3.37
Operation Range - Cooling	-5 / +46°C
Airflow (Lo-Hi, Litre/sec)	967 / 1,183 / 1,400

Current Indoor - Cooling (Running)	3.6
Power supply	230V / Single Phase / 50Hz
Liquid pipe size (OD, mm)	9.52
Max. pipe length (m)	75
Dimensions (WxDxH, mm)	1370 x 1120 x 470
External Static Pressure	60-75-100-150Pa
Operation Range - Heating	-20 / +21°C
Sound Level (Lo-Hi, dB(A))	40 - 43 - 46
Current Indoor - Heating (Running)	3.6
Refrigerant	R410A
Gas pipe size (OD, mm)	22.2
Max. pipe height (m)	30
Weight	108 kg



## TECHNICAL DRAWINGS



Designed for easy installation in ceiling or bulkhead spaces, ducted heat pumps are largely hidden from view, with only subtle grilles visible.

Using concealed ducting to connect multiple rooms for heating or cooling, these systems are ideal for a wide range of applications.

### BENEFITS

- Quiet alternative that is largely hidden from view – with only subtle air grilles visible
- Ideal for heating or cooling a large number of rooms at once
- Includes a Deluxe PAR wired controller with backlit LCD display and user-friendly menus
- Suits virtually all room layouts airflow-wise
- More cost-effective than GT Air Max and Pro



## PRODUCT FEATURES

### LOSSNAY FRESH AIR VENTILATION

The Lossnay system recovers the energy from stale air to pre-heat or pre-cool incoming fresh air, reducing the amount of additional heating or cooling required.

### UNOBTRUSIVE

Ducted units are the ultimate hidden heating and cooling solution with only grilles visible.

### EASY INSTALLATION

Versatile and easy installation is possible – adjust the distance between the air-intake and air-outlet vents to create the optimal airflow configuration.

### IDEAL AIRFLOW

The flexible duct design and high-pressure of our ducted systems increase variation in airflow options ensuring the system operates in a way that best suits virtually all room layouts.

### DELUXE PAR CONTROLLER

This attractive liquid crystal display (pictured left) incorporates a backlit screen and simple menus.



### COMPROMISES

- Temperature control-only solution
- Unsuitable for applications requiring humidity control

## APPLICATIONS



GT Air Lite suits the least demanding of applications – most commonly laboratories or non-classified controlled environments where considerations on the movement of air and type of airflow is of far less significance.





# QUICK-LOOK COMPARISON GUIDE

## FEATURES



FEATURES	MAX	PRO	PLUS	LITE
Temperature control	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Humidity control	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Custom-built solution	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Higher power consumption	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Suitable for cGMP environments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Regular maintenance advised	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Superior precise control	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Can be ducted – either directly or to plenum	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wall or ceiling-mounted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Plant room(s)/external area required	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Straightforward maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>







Guardtech  

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group

[www.guardtech.com](http://www.guardtech.com)

Guardtech House,  
Unit 1A Homefield Road,  
Haverhill, Suffolk,  
CB9 8QP