



GT AIR



TECHNICAL DATA SHEETS



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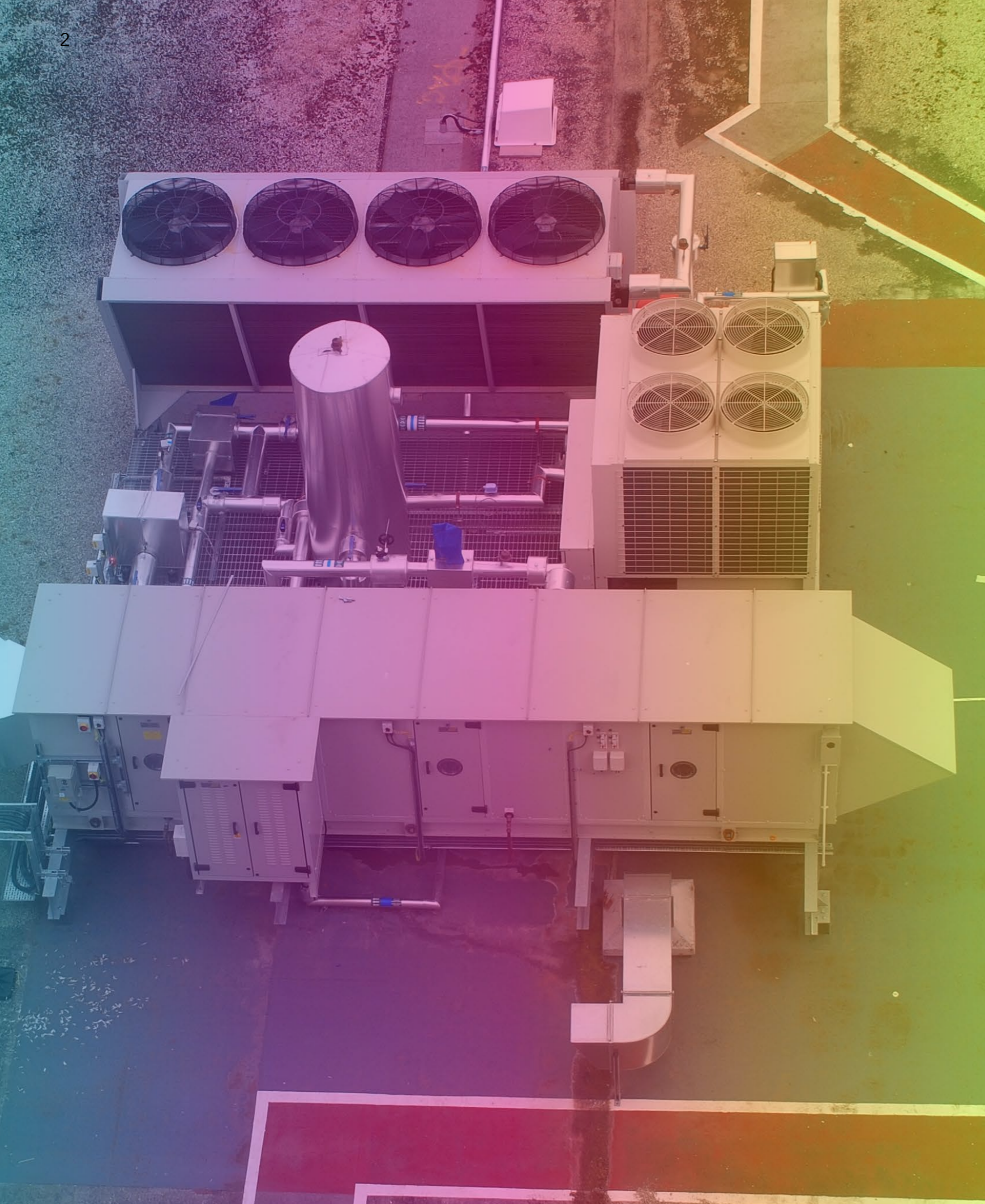
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DIRECTORY



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Comparisons **pg 16**



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



AIR PRO

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 PLUS

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



AIR LITE

Guardtech's entry-level air conditioning solution – ceiling or wall-mounted power inverter heat pump systems, providing comfort cooling for non-classified laboratory spaces, the cost-effective A/C option.



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.





GT AIR MAX

Guardtech's elite-level 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.

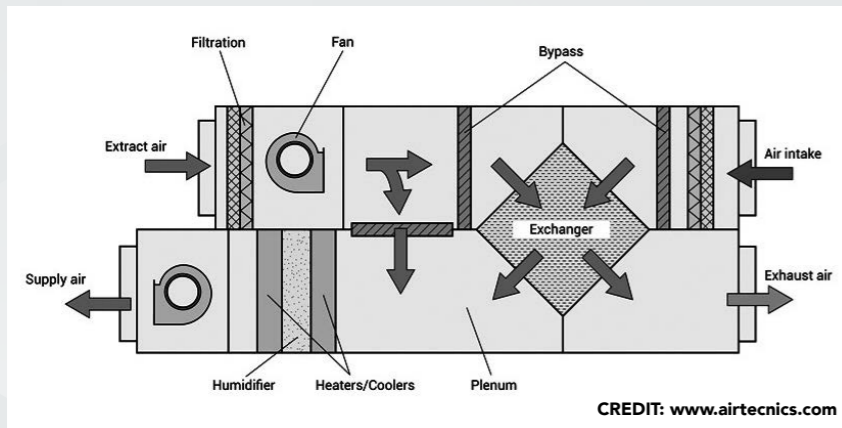
A typical GT Air Max Air Handling Unit will clean the incoming fresh air, temperature condition and provide a measured amount of flow of air into the building distributed via a ductwork system.

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.



BENEFITS & COMPROMISES

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 a number of 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

PRODUCT FEATURES

FULLY CUSTOM BUILT EQUIPMENT

STATE-OF-THE-ART FAN TECHNOLOGY

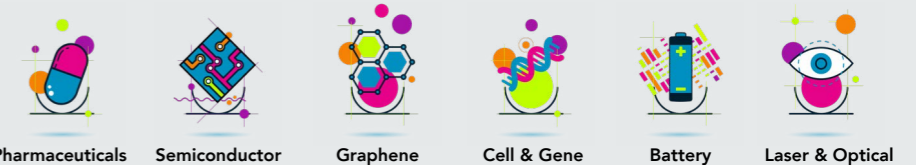
ENERGY-EFFICIENT DESIGNS

FULLY PRE-WIRED ENERGY EFFICIENT CONTROLS

HIGH EFFICIENCY HEAT RECOVERY AHUs



APPLICATIONS



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

GT Air Pro units 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

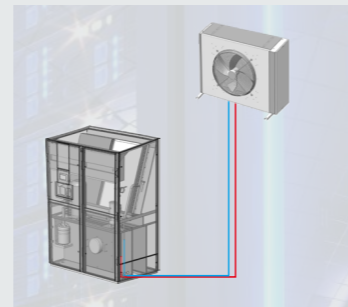


TECHNICAL FEATURES

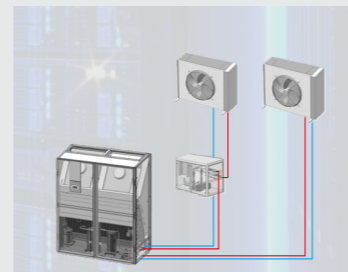
Unit model		16V1A1	20V1A1	25V1A1	30V1A2	35V1A2	40V1A3
Supply air scheme(1)		O/U					
Cooling capacity							
Total (2)	kW	16.3	22.3	25.1	30.2	36.9	40.6
Sensible (2)	kW	15.0	20.7	23.3	27.5	34.0	38.2
Total (3)	kW	17.9	24.5	27.6	33.2	40.6	44.7
Sensible (3)	kW	16.0	22.2	24.9	29.4	36.4	40.9
Compressor							
Type		Hermetic inverter scroll					
Power input (2)	kW	4.2	5.9	7.1	7.9	9.2	10.6
Current (2)	A	6.8	9.5	11.4	12.7	14.7	17
Max power input (4)	kW	6.8	11.5	11.5	13.7	15.2	11.5
Max current input (4)	A	10.9	18.4	18.4	22.0	24.5	18.5
Supply fan							
Type		Caseless backward EC centrifugal fan					
Qty. of fan	n.	1	1	1	1	1	2
Air volume	m ³ /h	5750	6500	7300	8800	9600	12600
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	2.4
Current	A	1.7	2	2.3	2.6	3	3.7
Condenser fan (3)							
MAE Model		AMAE6	AMAE6	AMAE8	AMAE10	AMAE12	AMAE15
Quantity	n.	1	1	1	1	1	1
Electric heater							
Type	kW	6	6	9	9	9	13.5
Heating capacity	A	9.1	9.1	13.5	13.5	13.5	20.4
Working steps	n.	2	2	2	2	2	2
Humidifier							
Type		Electrode					
Capacity	kg/h	3	3	5	5	5	8
Power input	kW	2.3	2.3	3.8	3.8	3.8	5.9
Current	a	3.4	3.4	5.7	5.7	5.7	9
Power supply							
Power supply		380V/3Ph/50Hz					
Unit maximum operation power (6)	kW	17.0	21.7	24.7	26.9	33.6	33.4
Unit maximum operation current (6)	A	28.6	36.1	40.5	44.1	56.5	56.1
Air filter							
Unit connection pipe		1/2					
Humidifier water supply	in	3/4					
Condensing water drainage	in	3/4					
Gas pipe	mm	19	22	22	22	22	2x22
Liquid pipe	mm	12.7	12.7	12.7	16	16	2x12.7
Unit dimension and weight							
Width	mm	875	875	1480	1480	1480	1750
Depth	mm	890	890	890	890	890	890
Height	mm	1960	1960	1960	1960	1960	1960
Weight	kg	280	320	380	420	460	525

Working Flow Schematic Diagram

Air cooled direct expansion system

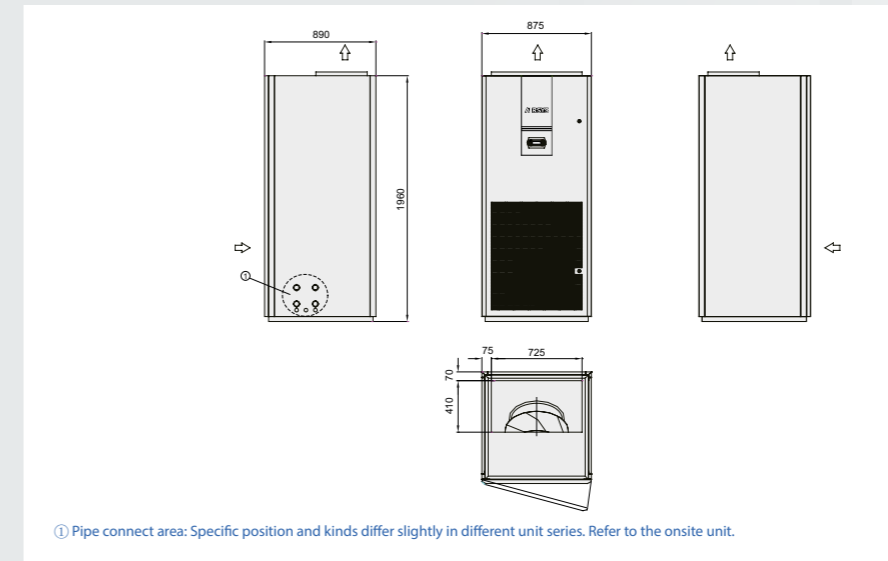


Air cooled direct expansion with indirect free cooling

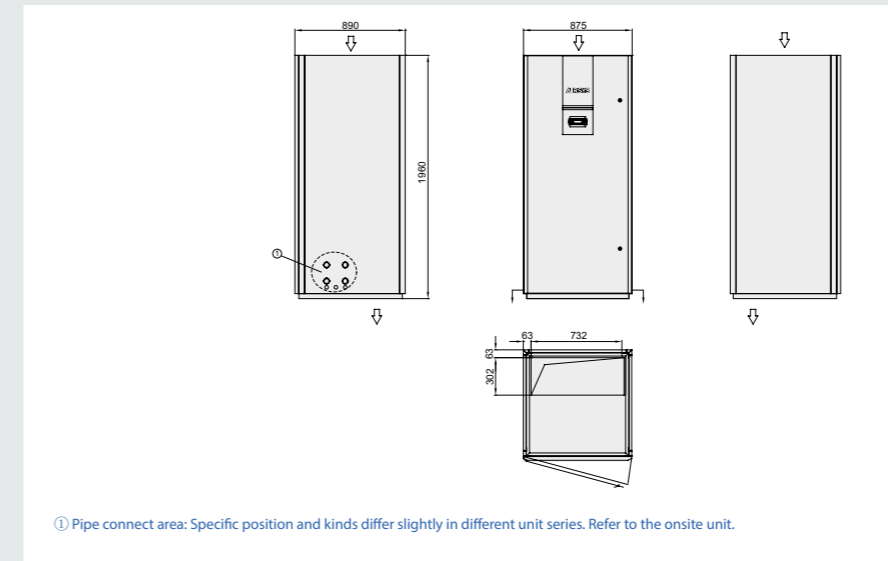


TECHNICAL DRAWINGS

Unit cabinet dimension drawing for upflow unit



Unit cabinet dimension drawing for underflow unit



BENEFITS & COMPROMISES

Benefits

- 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
- Potentially longer lead times than Plus and Lite options
- More expensive price point than Plus and Lite options



APPLICATIONS

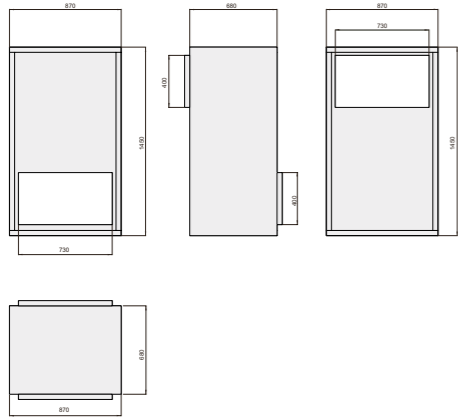


GT Air Pro suits a wide variety of applications in a diverse range of sectors. Whilst it may not boast the same capacity for catering to the needs of the largest-scale facilities as GT Air Max, as an air handling solution GT Air Pro has the capability to cover the same spectrum of demanding applications.

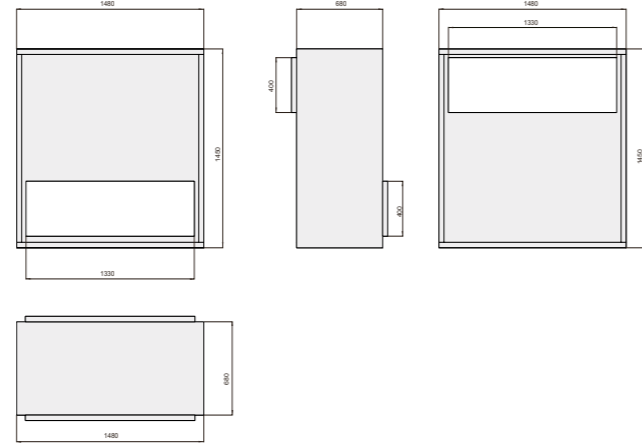
TECHNICAL DRAWINGS



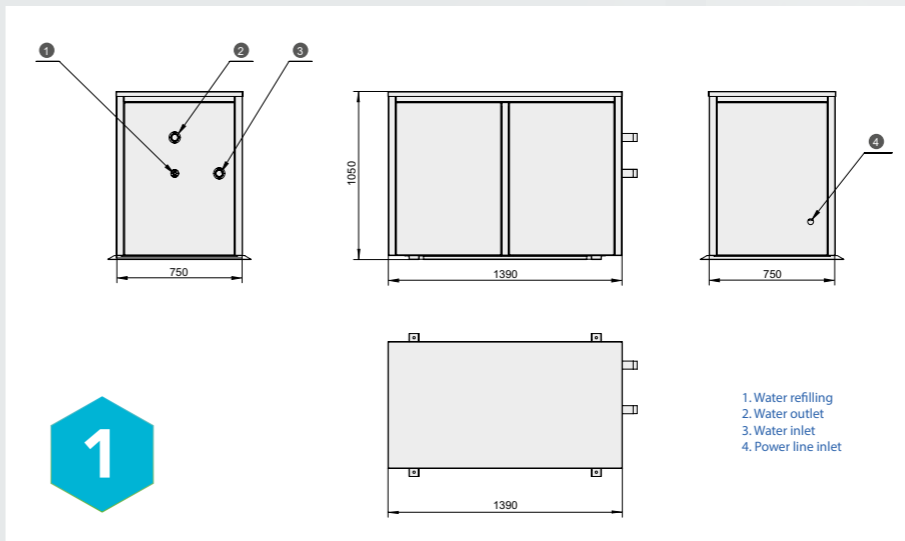
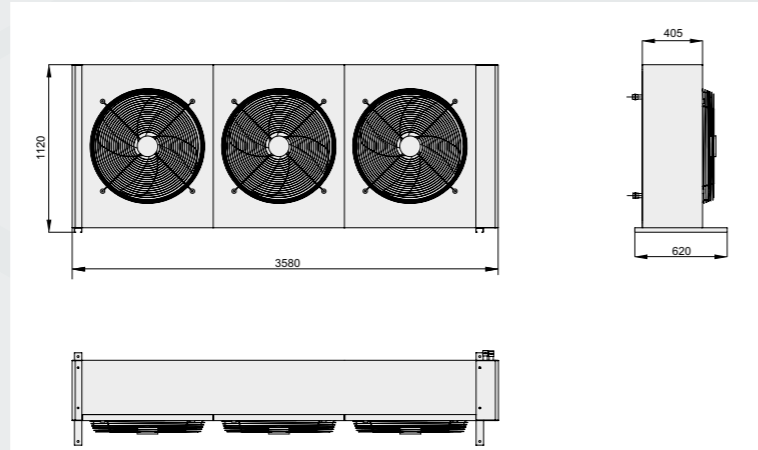
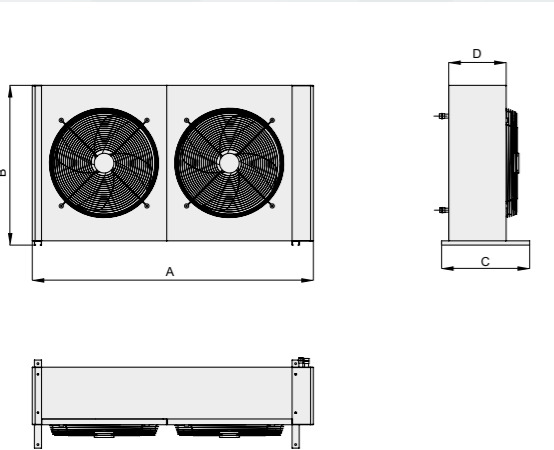
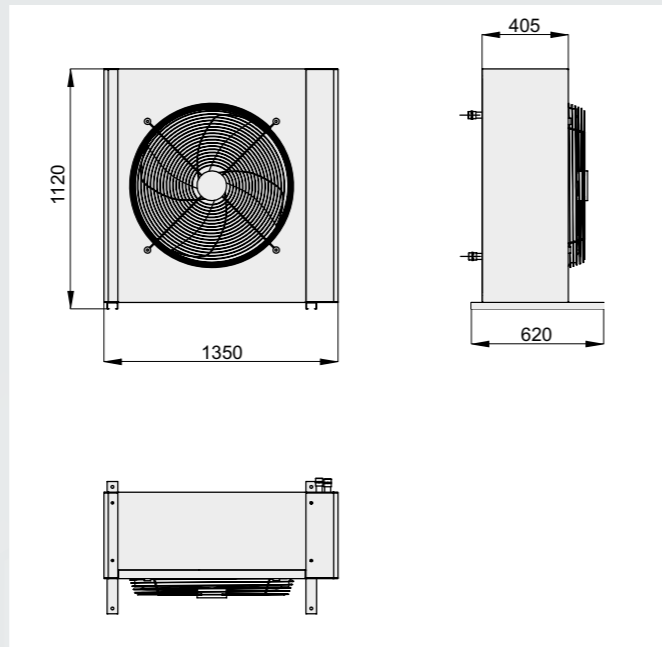
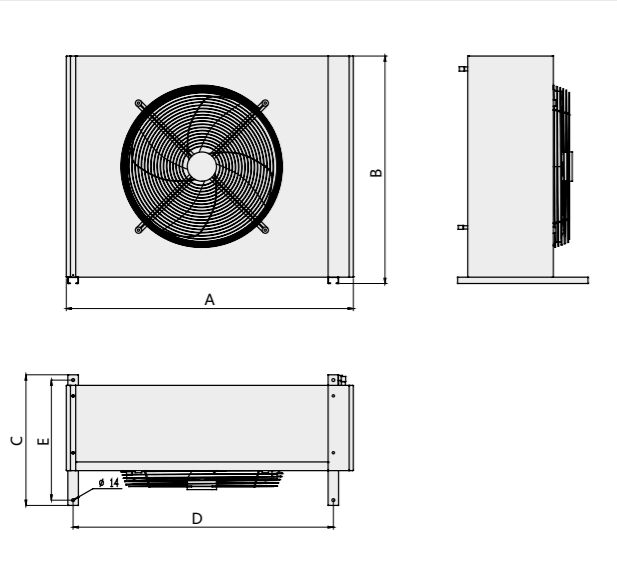
Fresh air inlet box



Fresh air inlet box



CMEH dry cooler



PUG Pump Group

1

Direct Free Cooling (DFC)

2

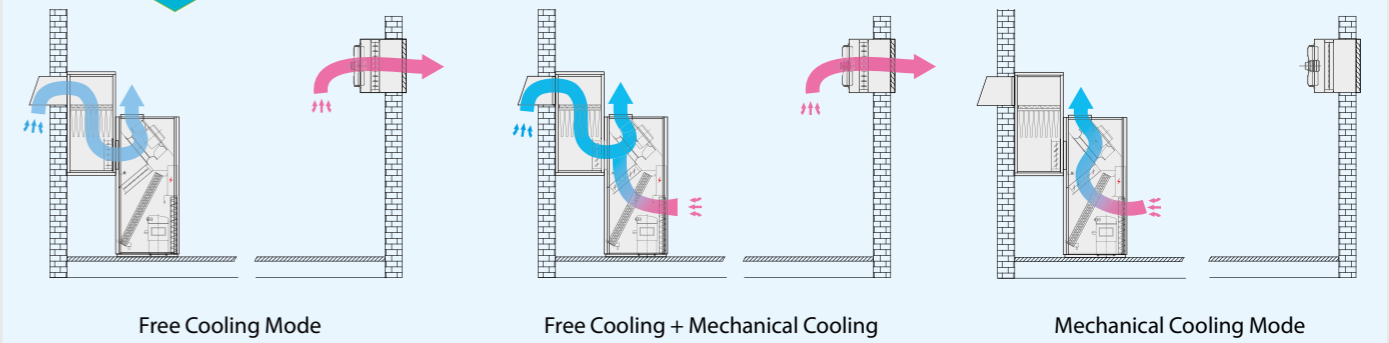
Indirect Free Cooling

3

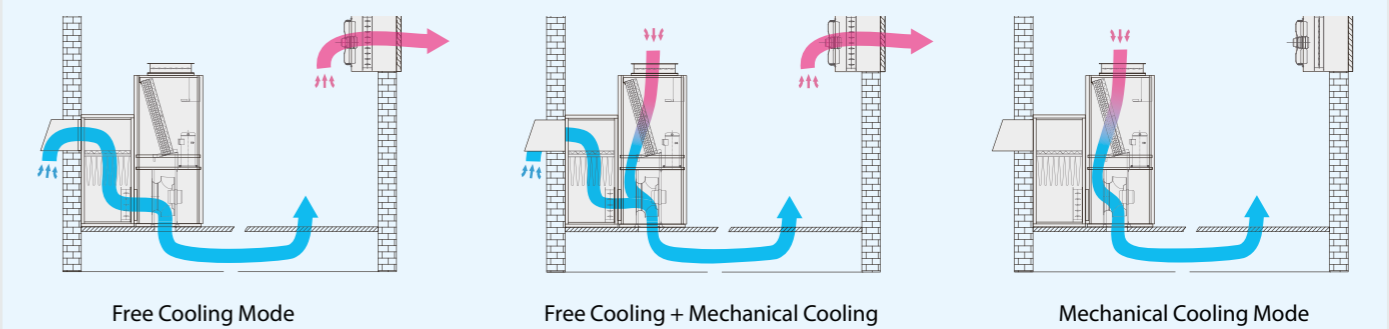
- 1. Water refilling
- 2. Water outlet
- 3. Water inlet
- 4. Power line inlet

2

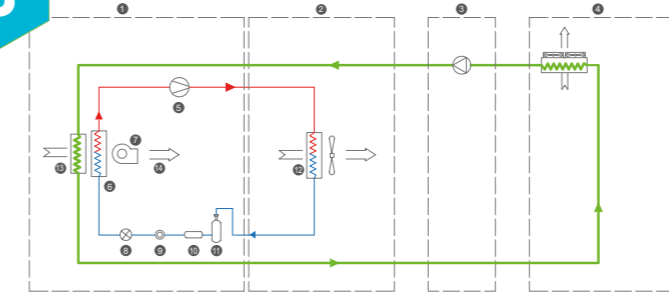
Up Flow Unit



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 PLUS

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 Plus – offer a stylish, quiet alternative that is largely hidden from view with only subtle air grilles visible.

The ducted GT Air Plus' high static air-flow allows air to be directed to different areas of your cleanroom with ease. 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.



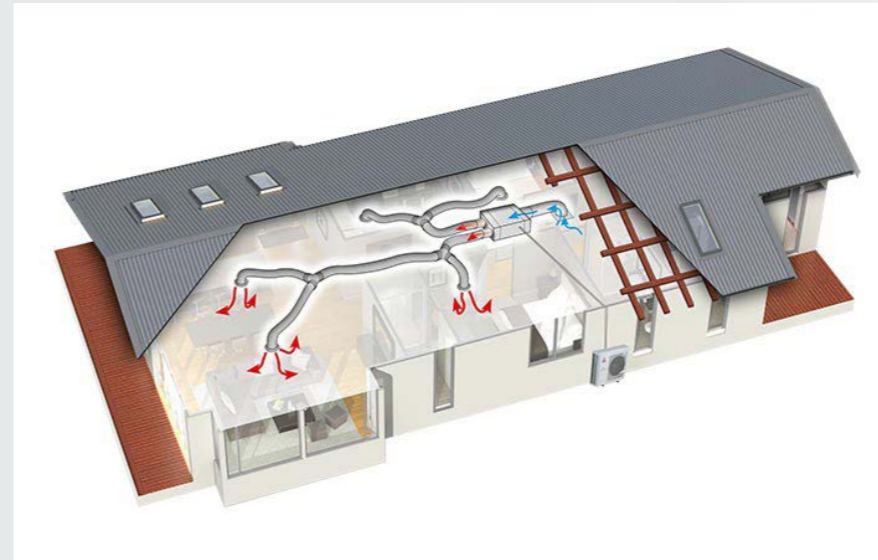
TECHNICAL FEATURES

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.

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 (right) incorporates a large backlit screen and simple menus.

BENEFITS & COMPROMISES

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

Compromises

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



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.



GT AIR LITE

Guardtech's entry-level air conditioning solution – ceiling or wall-mounted power inverter heat pump systems, providing comfort cooling for non-classified laboratory spaces, the cost-effective A/C option.



GT Air Lite is a wall-mounted power inverter heat pump system that blends a host of outstanding features with a sophisticated, streamlined design.

Offering high seasonal efficiency, advanced control options and extended pipe runs, this range provides extreme flexibility and a smooth installation process.

- Improved airflow control, including adjustable louvres for uniform air distribution
- Internal pipe connection to wall-mounted unit for easy and neat installation
- Compact Indoor Units.



TECHNICAL FEATURES

Table represents data from the mid-range 7kW (nominal heating) indoor mounted unit

TECHNICAL DATA	
CAPACITY - Heating (nominal)	7.0 (2.8-8.2)
CAPACITY - Cooling (nominal)	6.1 (2.7-6.7)
CAPACITY - Heating (UK)	5.95 (2.4-6.95)
CAPACITY - Cooling (UK)	5.5 (2.5-6.15)
SHF (nominal)	0.86
COP / EER (nominal)	4.04 / 3.91
SCOP / SEER (BS EN14825)	4.2 / 6.8
ErP ENERGY EFFICIENCY CLASS	A+ / A++
AIRFLOW (l/s) - Lo-Mi2-Mi1-Hi	300-333-367
PIPE SIZE mm (in) - Gas	15.88 (5/8")

PIPE SIZE mm (in) - Liquid	9.52 (3/8")
SOUND PRESSURE LEVEL (dBA)	39-42-45
SOUND POWER LEVEL (dBA)	64
DIMENSIONS (mm)	1170 x 295 x 365
WEIGHT (kg)	21
ELECTRICAL SUPPLY	Fed by Outdoor Unit
FUSE RATING (BS88) - HRC (A)	6
INTERCONNECTING CABLE No. CORES	4
WIRED REMOTE CONTROLLER REFERENCE	PAR-40MAA
WIRELESS REMOTE CONTROLLER REFERENCE	PAR-FL32MA



PRODUCT FEATURES

IMPROVED AIRFLOW CONTROL

Including adjustable louvres for uniform air distribution

FULL HEATING CAPACITY

Down to -3°C

100M PIPE RUN

(Size 100)

REPLACE TECHNOLOGY

Available in the range

CN22 CONNECTOR

As standard for connection to PAR-40MAA hard wired controller

INTERNAL PIPE CONNECTION

To wall mounted unit for easy and neat installation

BENEFITS & COMPROMISES

Benefits

- Improved airflow control, including adjustable louvres for uniform air distribution
- Compact solution
- Internal pipe connection to wall-mounted unit for easy and neat installation
- By far the most cost-effective option in the range

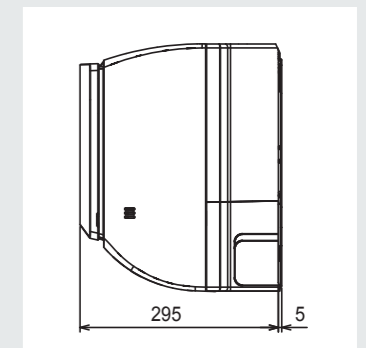
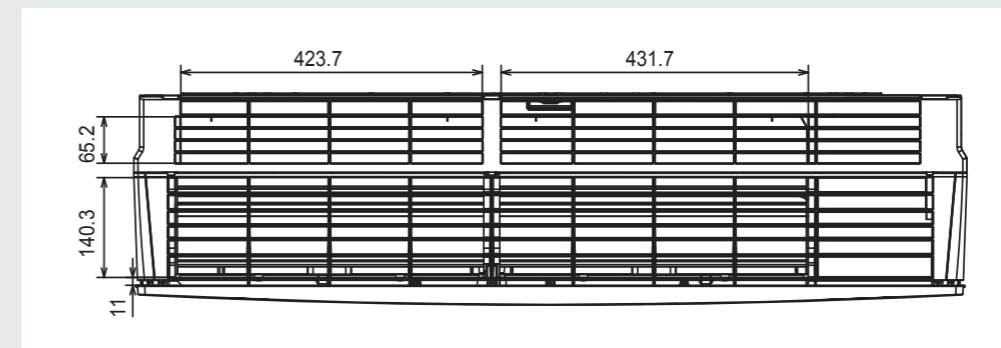
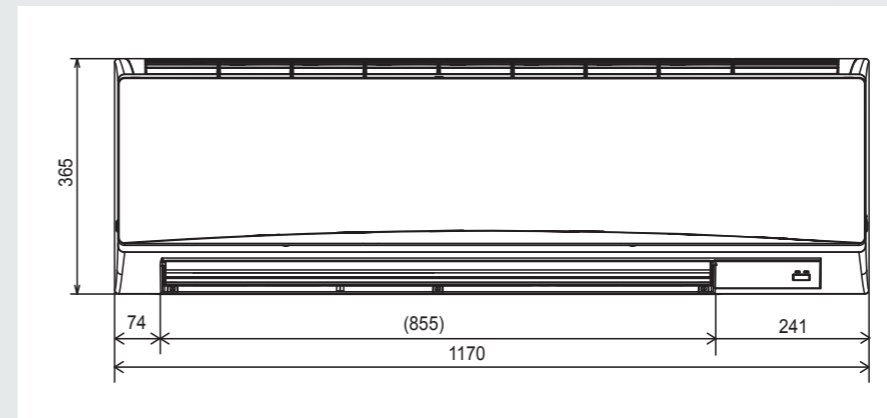
Compromises

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

Front view (top left)
Upper view (bottom left)
Side view (right)

Drawings based on 7kW, 8kW and 11.2kW (nominal heating options)

TECHNICAL DRAWINGS



APPLICATIONS



- Universities
- R&D
- Packaging
- Injection Moulding
- Food
- Diagnostics

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	LITE	PLUS	PRO	MAX
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 type="checkbox"/>	<input type="checkbox"/>
Custom-built solution	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Higher power consumption	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suitable for cGMP environments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regular maintenance advised	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 type="checkbox"/>
Wall or ceiling-mounted	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Plant room(s)/external area required	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compact solution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>





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group

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