



AIR HANDLING UNIT





GMECH GROUP

Table of Contents

- Introduction** 3
- Air Handling Unit** 5
- Cleanroom air conditioning** 7
- Design criteria** 7

Features of ClimaVac Air handling unit

- Air inlets and outlets** 7
- Cooling Section** 8
- Heating section** 8
- Multi-sloped Drain pan** 8
- Sound attenuator** 8
- Sandwich panel** 9
- Fan sections** 9
- Aluminum Pre filter** 9
- Synthetic Pre filter** 10
- Pocket Filter Fine Filtrationt** 10
- HEPA filter** 10
- Active Carbon filter** 10
- Rotary heat exchanger** 11
- Plate heat exchanger** 11

- Selection procedures** 13
- Selection software** 15
- Installation** 16
- AHU request form** 17
- Our success partners** 18

Introduction

ClimaVac is a well-established brand for Air Handling Units, Fan Sections, DX Condensing Units and hygienic HVAC equipment which are designed to Italian technology. It is owned today by the GMECH Group.

GMECH Group is one of the fast-developing private business groups in Egypt. It has 4 companies in diverse business sectors such as Consultancy, Contracting and Manufacturing.

ClimaVAC units are manufactured in a fully integrated facility in Abou Rawash industrial Zone, equipped with the most modern machinery. Our core production team has more than 25 years of technical experience.

The product range features premium components with AHRI certified coils, AMCA certified fans and CE certified motors and optionally UL certified filters.

ClimaVAC quality assurance policy assures that the quality of all manufactured air handling units and fan sections meets the highest international standards. We are committed to continuous quality improvement and maintain focus on enhanced customer satisfaction levels.

ClimaVAC units are ideal for installation in residential and commercial buildings, cinemas, sports complexes, hotels, hospitals, pharmaceutical installations and shopping malls.

Our units have been supplied to numerous projects in the middle east. We offer our clients the best technical support and quick responding after-sales services.

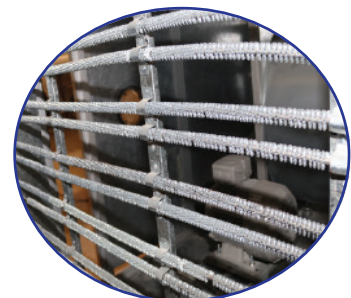
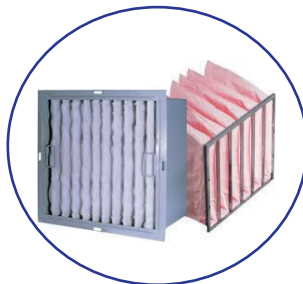
GMECH Group of Companies has a strong foothold in the Egyptian HVAC sector. It expands its manufacturing base and precise procedures to increase production volumes, accelerate production times and improve project delivery times.

ClimaVAC commitment to research the product range features premium components with AHRI certified coils, AMCA certified fans and CE certified motors, and optionally UL certified filters and development has led the company to constantly improve its products and thus guarantee system reliability and performance.

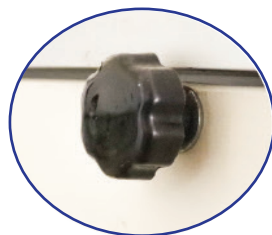
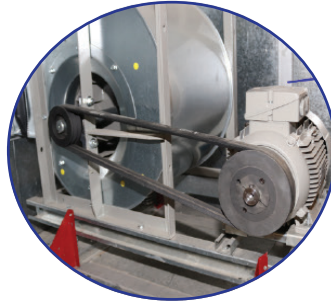
Our vision is to support all HVAC projects with our products and improve the Group's position as a leading HVAC manufacturer and supplier in Egypt, Africa and the Middle East with a global vision.



Smart Air



Handling Unit



Cleanroom air conditioning

Viewing an ever-increasing environmental pollution the quality of air that we breathe is of vital importance, Hygienic air-handling units are designed for essential features and sensitive installations of high-demanding cleanroom air conditioning applications like hospitals, operating rooms, laboratories, pharmaceutical and electronic facilities, etc, Standards, regulations and guidelines govern the air handling unit's calculation, design, manufacture, installation and maintenance.



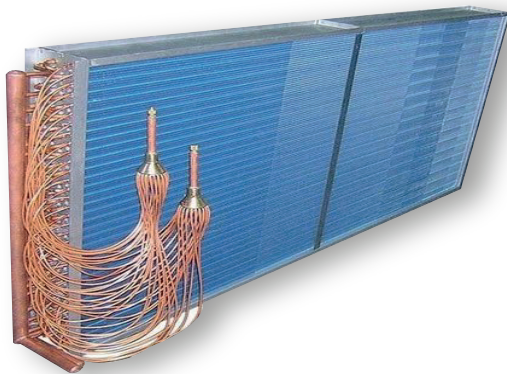
Design Criteria

When developing, designing and manufacturing air-handling units in hygienic Air Conditioning field, the major objectives are to apply only those materials that do not pose any threat to human health and do not facilitate the growth of harmful micro organisms Internal surfaces of the units must be made of wear-resistant materials and easily accessible for cleaning and disinfection purposes all parts for air movement should allow easy inspection, cleaning and disinfection.

Features of ClimaVac Air-handling unit

Air Inlets and Outlets

All units are equipped with airtight volume control dampers according to DIN 1946 Part 4 for regulation of air volume and pressure. Inlet sections can be equipped with weather resistant louvers or sand trap louvers.



Cooling Section

Chilled Water cooler

Copper pipe with aluminum plate fins (cu/Al)
Used in complex air conditioning systems-or
in care of using a unit with relatively high
cooling capacity.

Direct expansion cooler

Copper pipe with aluminum plate fins (cu /Al)
Used for lower cooling capacity
systems and single air condition systems.

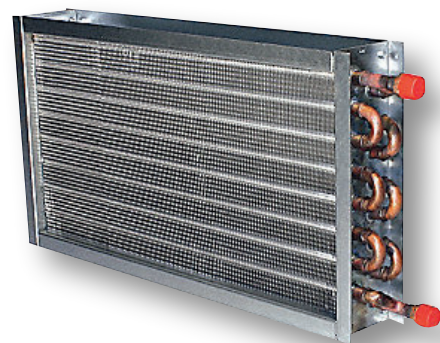
Heating Section

Water heater

Copper pipe with aluminum plate fins (cu /Al)
frame of galvanized sheet metal.

Electrical heater

A complex of resistance heating elements
380 V

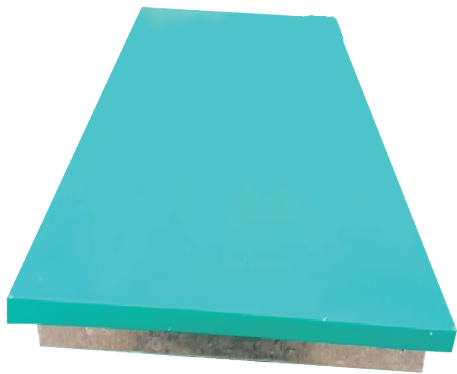


Multi-sloped Drain pan

Our drain pan is designed according to ASHRAE 2001-62, section 5.11.1 states that drain pans "shall sloped 8/1" per foot from horizontal toward the drain outlet whether the fan is in the on or off position.

Sound attenuator

Our unit can be provided with sound attenuator as option in case of reducing AHU noise, we manufacture it according to AMCA 300.



Sandwich panel

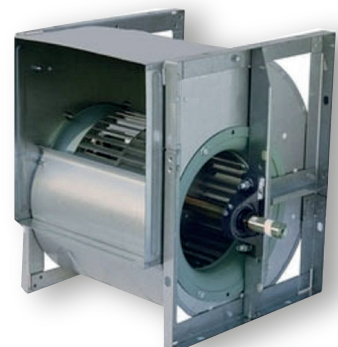
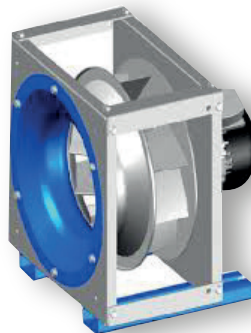
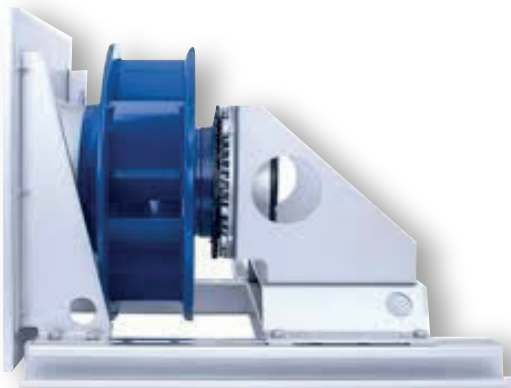
Double skin panel, unitary structure design, less connecting joints, multi sealing strips in the contact surfaces, around sealing service door/ panel, all ensure almost total air can be supplied to the air-conditioned room. The air leakage rate is less than %0.29.

The inner skin for the panel can be stainless steel electrostatic sheet metal painting galvanized sheet metal.

The outer skin for the panel can be stainless steel / Plastified sheet metal / Electrostatic sheet metal.

FAN SECTIONS

Standard units use PLUG-FANS or DIDW built driven fans., single or double inlet fan units complete with accessories such as condensate drain plug, inspection hatches and special EPOXY paints are used at request.



Aluminum Pre filter

Frame: Galvanized Steel or Aluminum
Media: Multiple Layers of corrugated and fine mesh expanded metal sheets



Synthetic Pre filter

Panel-type pre filters, G3, and G4 class, in accordance to EN779.

Filter depth 50 mm Reinforced with steel mesh
Panel frame made of galvanized steel.

Pocket Filter Fine Filtration

Filter Class F6 (60-65%) - Green Color
Filter Class F7 (80-85%) - Pink Color
Filter Class F8 (90-95%) - Yellow Color
Filter Class F9 (95>98%) - Off white Color



HEPA filter

Absolute standard box style HEPA filters for use in built-up bank systems, side access air filter housings and equipment that accepts rectangular configurations All Absolutes is individually tested and is available in efficiencies of 99.97 % at 0.3 μ to 99.9995 % at 0.3 μ .

Active Carbon filter



A filter based on active carbon is used for absorption of substances, that cannot be caught by other types of filters (like odors, gases and pairs of toxic substances).

Rotary heat exchanger

A rotary heat exchanger is a rotary honeycomb matrix with layers of aluminum ribbon, which is slowly rotated within the supply and exhaust air streams. As the wheel rotates, heat is picked up from the exhaust air stream in one half of the rotation and given up to the fresh air stream in the other half of the rotation. Thus waste heat energy from the exhaust air stream is transferred to the matrix material and then from the matrix material to the fresh air stream, raising the temperature of the supply air stream.



Plate heat exchanger

Heat exchanger where heat is transferred from the flow of exhaust air to the incoming air from the street.

Heat exchanger is made of profiled aluminum plates, packed with elastic heat-resistant sealant. The sealing provides a reliable separation of the supply and exhaust air, eliminating internal flows, and not allowing moisture, dirt, odors and microorganisms transfer between streams.

To avoid frosting heat exchanger provides active protection by means of the bypass channel. Drain pan is installed under the heat exchanger.





Selection procedures

01 STEP

determine the air flow (m /hr) inlet air condition , total cooling capacity (kw), or total heating capacity (kw) if the inlet air condition is beyond the standard condition of the the above specifications, please check to the follwing formula.

$$Q = Q_{st} \times F_1 \times F_2 \times F_3$$

Note :

- Q_{st} Cooling capacity of standard cooling condition , refer to the unit specifications.
- F₁ Temperature correction coefficient of cooling coil refer to table A.
- F₂ Temperature difference correction coefficient of water , refer to figure.
- F₃ Water velocity correction coefficient ,refer to figure.

EWB \ EWT	EWT	Entering water temperature Ć						
		4	5	6	7	8	9	10
Entering air WB temperature C	17	0.978	0.89	0.801	0.711	0.626	0.523	0.423
	18	1.093	1.001	0.915	0.823	0.731	0.635	0.538
	19	1.213	1.124	1.032	0.94	0.846	0.75	0.652
	19.5	1.247	1.184	1.093	1.000	0.906	0.809	0.711
	20	1.337	1.246	1.155	1.061	0.967	0.869	0.77
	21	1.464	1.373	1.281	1.186	1.09	0.993	0.893
	22	1.597	1.504	1.411	1.316	1.219	1.121	1.02
	23	1.733	1.641	1.547	1.45	1.352	1.252	1.151
	24	1.874	1.781	1.685	1.589	1.49	1.389	1.287
	26	2.172	2.076	1.978	1.879	1.779	1.676	1.571
	28	2.489	2.391	2.291	2.189	2.086	1.981	1.874
	30	2.824	2.725	2.623	2.519	2.414	2.306	2.196

Table A Temperature correction coefficient of cooling coil F1

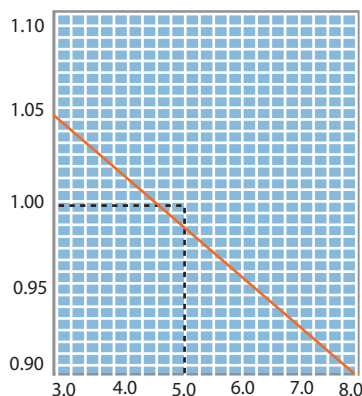


Figure 1 Temperature difference correction coefficient of water F2

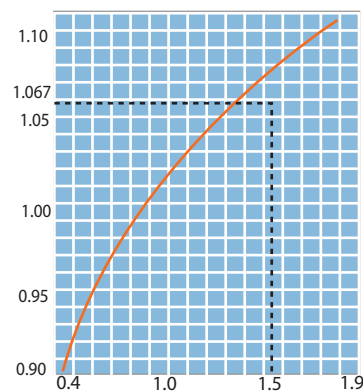


Figure 2 water velocity correction coefficient F3

02 STEP

Determine the external static pressure (pa) if the ESP is beyond the standard value of the above specifications, please the required EPS when you take the order, take table bas reference to estimate the air pressure in the duct.

Air speed (m/s)	Total air pressure of the duct (pto)					
	On . way resistancy (pa /m)				Bend	Plenum
10	1.35	30	20 (air outlet speed ≤ 5m/s)	30	20	
9	1	25		25	18	
8	0.7	20		20	15	
7	0.55	15		15	12	
6	0.4	12		12	10	

Table B Air resistance of duct

Note :

- Pto = on - way resistance + Local resistance, pa
- ESP≈ PTO

03 STEP

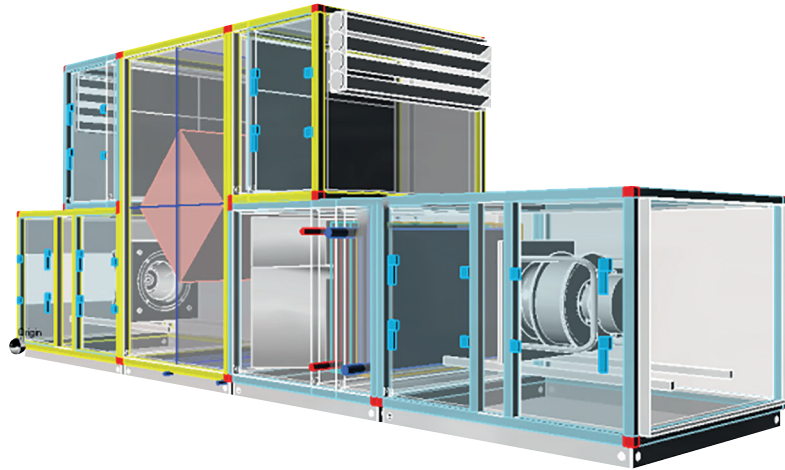
Determine the unit structure horizontal type (w) , vertical type (L) and suspended type (D)

04 STEP

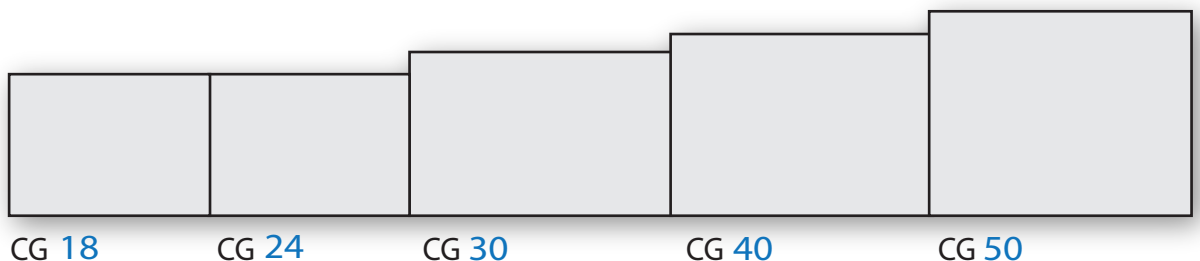
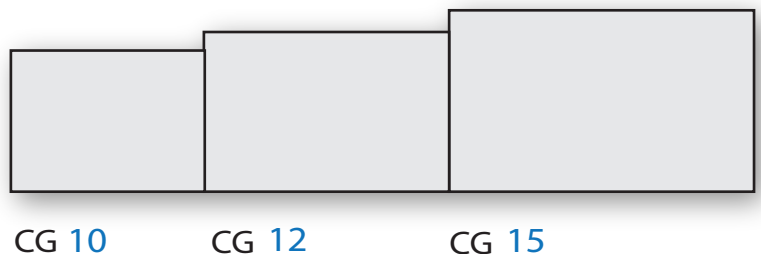
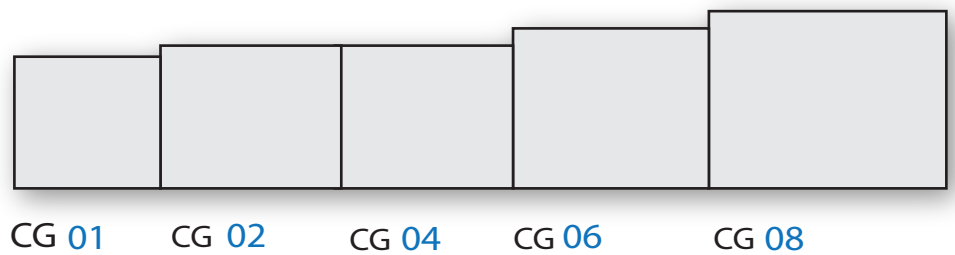
Determine the pipe connecting mode mode: right-handed (y) left -handed (Z)

Selection software

- You can make selections under varies entering air conditions, entering water conditions, different air and cooling capacity or heating capacity.
- User friendly interface make selection visual and easy.
- powerful project manage makes functions.
- Selection interface.



Unit size	CG 01	CG 02	CG 03	CG 04	CG 06	CG 08	CG 10	CG 12	CG 15	CG 18	CG 24	CG 30	CG 40	CG 50
Nominal air flow (CFM)	1000	2000	3000	4000	6000	8000	1000	12000	15000	18000	24000	30000	40000	50000
Cross section hight (mm)	400	800	800	800	1100	1400	1400	1400	1700	2050	2050	2050	2700	3300
Cross section width (mm)	400	800	1100	1400	1400	1400	1800	2050	2050	2050	2700	3300	3300	3300



Installation

- Unit should be installed on a horizontal to avoid running noise and keep the condensing water draining smoothly.
- Allow sufficient space for maintenance, at least im width should be reserved in the direction off setting up the accesses door as shown in figure installation space.

Piping

- Flexible fittings should be used in water piping to absorb thermal expansion and contraction strains.
- Drainage pipe should be equipped a U shape water seal to keep water draining fluently as shown in figure draining pipe.

Wiring

- Wiring according to electric diagram as shown in the right picture Unit shell must have reliable ear thing.
- One motor one protection switch.
- During unit running time, the power voltage fluctuate value must less than 10 % frequency fluctuate value less than 2 % .

Water Supply

- The water supplied in the water system should be soft, clean water. Before water supply, the water system should be washed to clean away all the scraps and patches compounds first. At last, exhaust the air in the coil by discharge valve on the top of the water outlet pipe.
- If unit is running in winter season and is planning to stop for some time, the following steps should be taken to avoid damage on the coil: keep the water in coil circulating continuously, added in some antifreeze, close the fresh air inlet damper.
- If unit stop running in winter season, water in the coil must be drained out completely to keep the coil dry.

Start-up requirements

- Before start-up the units, do make sure that ductwork is clean, filters are in place, bearings lubricated, condensate properly trapped, piping connections verified and leak tested, belts aligned and tensioned, all shipping braces have been removed, and fan has been test run under observation. Maintenance.

Maintenance

- Check and make sure valves in water pipe and air duct are in normal working condition before unit running.
- Check the lubrication of fan bearings and tension of belts regularly.
- Check and adjust the connection, operation and transmission of fan, motor and other moving parts regularly.
- Wash the air filters once a month.
- Exhaust the water in the coil if the unit stops using for a long period.
- In winter, keep the water in the coil circulating when stop the unit for a short time.
- The water in the coil should be softened water, Clear away scale in the coil and dirty thing among the fins once a year For the detail information about installation, usage and maintenarice, please refer to the installation manual, or consult Midea company.



AHU request form

Company		Building	
Contact			
Tel			
E-mail			
General			
Unit	Exhaust <input type="checkbox"/>	Supply <input type="checkbox"/>	Supply & Exhaust <input type="checkbox"/>
Mounting	Outdoor <input type="checkbox"/>	Indoor <input type="checkbox"/>	Supply & Exhaust with heat recovery <input type="checkbox"/>
Supply & exhaust parts	Linear <input type="checkbox"/>	side by side <input type="checkbox"/>	One on other <input type="checkbox"/>
Capacity and pressure		<i>Supply</i>	<i>Exhaust</i>
Capacity	.....	$m^3/hour$	..... $m^3/hour$
Pressure (system resistance)	.....	Pa	..... Pa
Air parameters		<i>Winter</i>	<i>Summer</i>
Supply	Outdoor air temperature and relative humidity		
	Conditioned air temperature and relative humidity		
Exhaust	Extract air temperature and relative humidity		
	Exhaust air temperature and relative humidity		
Sections required			
Fan	Belt - driven <input type="checkbox"/>		Plug fan <input type="checkbox"/>
Filter	Supply	G4 <input type="checkbox"/>	F7 <input type="checkbox"/>
	Exhaust	G4 <input type="checkbox"/>	F7 <input type="checkbox"/>
Heater <input type="checkbox"/>	Air temp before / after heater		..... $^{\circ}C$ / $^{\circ}C$
Electric <input type="checkbox"/>	Heater power		..... KWt
Mixing set <input type="checkbox"/>	Water temp before / after heater		..... $^{\circ}C$ / $^{\circ}C$
Cooling section <input type="checkbox"/>	Air temp before / after heater		..... $^{\circ}C$ / $^{\circ}C$
Freon <input type="checkbox"/>	Heater power		..... KWt
Mixing set <input type="checkbox"/>	Water temp before / after heater		..... $^{\circ}C$ / $^{\circ}C$
Heat recovery section <input type="checkbox"/>	<input type="checkbox"/>	Inlet temperature.....	..... $^{\circ}C$ Outlet temperature $^{\circ}C$
Plates <input type="checkbox"/>	<input type="checkbox"/>	inlet humidity .....	..... % Outlet humidity %
Rotor <input type="checkbox"/>	<input type="checkbox"/>	Efficiency.....	
Silencer <input type="checkbox"/>	Supply <input type="checkbox"/>	1200 mm long <input type="checkbox"/>	Other.....
	Exhaust <input type="checkbox"/>		
Air damper	Supply <input type="checkbox"/>		Exhaust <input type="checkbox"/>
Mixing section <input type="checkbox"/>	Circulating air		
	Inlet air temperature .....		..... $^{\circ}C$
	Inlet air humidity .....		..... $^{\circ}C$
Accessories	Flexible connection (inlet) <input type="checkbox"/>	Flexible connection (outlet) <input type="checkbox"/>	Mounting base frame <input type="checkbox"/>
Control system	Included <input type="checkbox"/>	Excluded <input type="checkbox"/>	
Additional information			

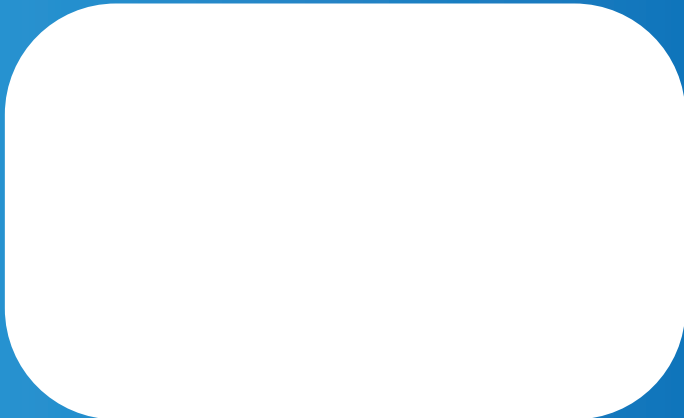


OUR SUCCESS PARTNERS



for more information
scan this QR code





+20 2 383 41 51 4
+201206765636
+20 10 21 75 75 11



Office : Villa 202 , Near Vodafone square , 5th
District , 6th October City , Giza , Egypt .
Factory : Km 26 Cairo Alex road Abou-rawash
industrial zone , Giza , Egypt.



climavac@gmechgroup.com



www.gmechgroup.com