

MT Series (Clever)

Chilled / Hot Water Air Handling Units

Installation & Maintenance

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1. GENERAL

Follow these instructions to ensure the optimum performance, reliability and durability.

Units must be installed in accordance with all national and regional regulations and bylaws. National Health and Safety regulations must be followed to avoid personal injuries.

The appropriate local permits must be acquired and adhered to.

This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

2. SAFETY INSTRUCTIONS

All paragraphs preceded by this symbol \triangle require great attention as they underline dangerous situations or important information.

2.1 General

CLEVER Air handling units are to be installed, operated and maintained only by qualified technical personnel. The units are suitably designed for air conditioning, heating, cooling and ventilation.

2.2 Fan Coil Section

\triangle DANGER. ROTATING MACHINERY.

It is strictly forbidden to enter into the fan area while the fan is operating. When necessary, the operator should be equipped with proper safety equipment and clothes in compliance with local regulations. Once turned off, the fan will take time to come to a complete stop.

2.3 Heating Coil

Pay attention to the heating coil high temperature. The maintenance personnel should treat the surface as hot and be equipped with gloves and clothes to prevent accidents.

2.4 Electrical Connections

Turn all isolators off before touching any electrical connections. The electric cables and cables sockets should be in compliance with local wiring regulations.

2.5 Filter Plenum Section

Turn the power supply OFF, before entering into this area. The filter section should be treated as highly flammable due to fine dust build-up present. As such it is forbidden to smoke or to light flames inside the filters area. Dirty filters can easily ignite.

2.6 Moving Parts

Pay attention when the dampers are operating. DO NOT place your hands on moving components such as blades or fan wheels.

2.7 Sharp Objects

Sharp objects have been minimised in access areas, however beware of projecting parts and sharp sheet-metal edges in other places.

3. PACKING & TRANSPORT

3.1 Packing

CLEVER air handling units are usually supplied dis-assembled in two parts; a Fan Coil section and a Plenum section.

Temperzone disclaims all responsibilities concerning any damages once the goods have been received. Receivers are responsible to inspect the goods on delivery for damages. Upon finding damage, IMMEDIATELY notify the freight company and Temperzone. Failure to provide immediate notice will cause any warranty / damage claims to be invalid.

CLEVER air handling units are generally supplied with shrink wrapped plastic finish with heavy plastic covers on wooden pallets to provide weather / site protection. This will not prevent damage during transport and inspection. Unwrapping should also be undertaken to check for any damage.

3.2 Transportation

Always secure unit with straps (never use chains). For long or difficult transportation, sections should be fixed carefully considering factors such as: internal weight of the components, condition of the roads, etc, to ensure the CLEVER air handling unit suffers no damage. Temperzone disclaims all responsibilities concerning damages due to incorrect loading and unloading.

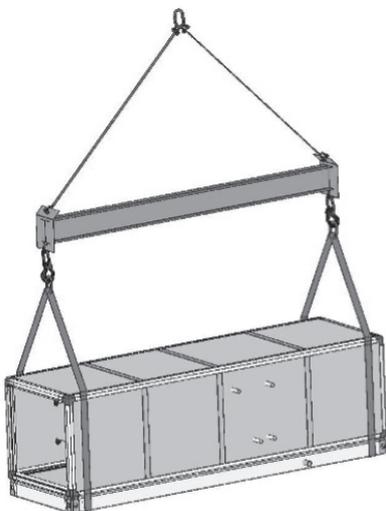
⚠ The various sections should be loaded and unloaded with attention to the projecting parts: hinges, handles, drain trays and connections, pipe connections, and so on. Never use these points to move the air handling unit.

3.3 Loading & Unloading

CLEVER air handling units are supplied on a wooden pallet designed to allow easy lifting with a fork-lift truck.

STROPS/SLINGS AND SPREADER BARS ARE THE RECOMMENDED METHOD OF LIFTING AIR HANDLING UNITS.

To reduce the risk of damage we recommend that protection be added to the casing when lifting or unloading



Gently manoeuvre unit in order to avoid high impacts that could cause damage, eg cracks to rivets, screws etc.

Air handling units should be stored in dry rooms and protected from atmospheric conditions. Only with these precautions oxidation, etc can be avoided.

3.4 Panel Clear Protective Film

⚠ The external clear protection film on the external panels MUST BE REMOVED WITHIN 30 DAYS OF DELIVERY. The material is applied to protect the panel lining during panel manufacture and transportation. Failure to remove this protective film may cause damage of the lining surface. Claims for damage caused by prolonged time the film left on the panels are not the responsibility of Temperzone.

4. POSITIONING & MOUNTING

4.1 Location

The MT range is designed to be installed indoors and typically in a plant/machinery room. The unit can be mounted outdoors, but only if adequate roof protection is provided over the unit. Refer Specifications document supplied for clearance requirements for future servicing and maintenance.

4.2 Mounting

The unit should be fastened to a firm flat horizontal plinth via the mounting base channels. L-shape shipping brackets are supplied at each corner which can be re-used for this purpose. Ensure vibration isolating mounts or pads are included.

A water level is required to position the CLEVER air handling unit, using wedges when necessary to ensure correct clearances for opening of inspection doors. The CLEVER air handling unit can be installed directly on a floor able to support its weight. We however recommend advisable to build a base plinth made of concrete or sheet metal.

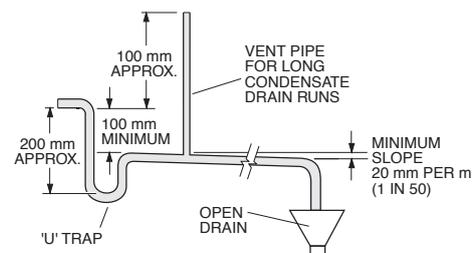
Flexible duct connections are recommended between the supply and return ducts and the unit.

4.3 Condensate Drains

Condensation can form on the indoor cooling coils. This is normal during unit operation. It is recommended the condensate be piped to a suitable drainage point to prevent ponding and/or slippery mould growth around the base of the unit.

For a drip free installation a separate drain tray beneath the unit could be used to drain condensate to a suitable drainage point.

Condensate drains should be 'U' trapped outside the unit. The trap should have a vertical height of at least 100 mm. The drain should have a slope of at least 1 in 50 and must not be piped to a level above the unit drain pipe. (refer diagram below)

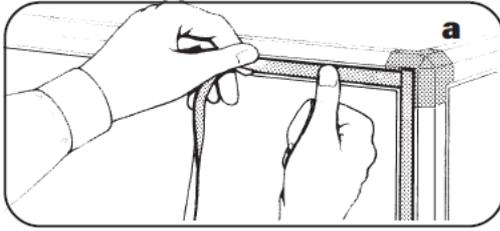


5. ASSEMBLY & INSTALLATION

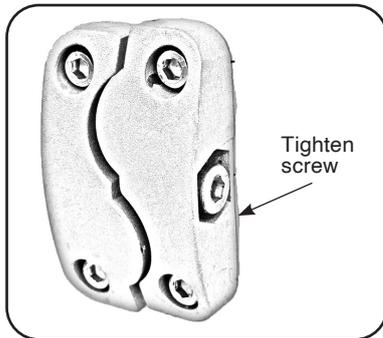
5.1 Section Assembly

During installation, pay attention to fixing clamp plates positioned on sections. A self-adhesive backed foam gasket is supplied with the unit.

1. Apply self-adhesive gasket (supplied) around the joining faces of one section (figure 'a')

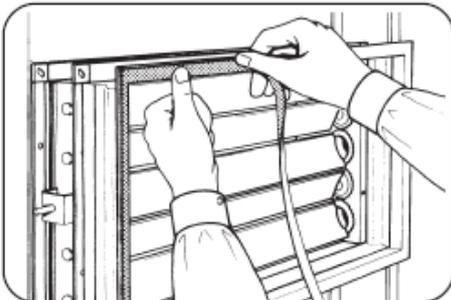


2. Align and push the two sections together for a perfect match. During this operation, keep the sections level with the help of a spirit level. Tighten clamps using a hex-key size 6 (CRV6).



5.2 Connection To Ducts

Flexible connections should avoid transmitting vibration through the air duct from the CLEVER air handling unit and vice versa. The rubberized canvas / PVC should be sufficiently released. Never connect ducts directly to the CLEVER air handling unit. Place a gasket on flanges to avoid air leakage. Tighten screws, even those difficult to reach. Use silicone to seal slots created by the gasket.



5.3 AHU Components

Filters

Secure filters (supplied separately) in place using the appropriate clipped or screwed frames. Filters must be installed in the CLEVER air handling unit from the initial start-up. Make sure that gaskets/seals are intact and have been placed correctly to avoid air bypass.

Coils

Pipes of coils supplied by water should be installed perfectly horizontal. The fluid should run through the coil in counter-flow direction in drain headers to obtain the maximum heat output couplings. Air vents are supplied on the upper part of the unit's coil/s.

When establishing the dimensions of the flow/return pipework do not refer to the coil connections diameter. This

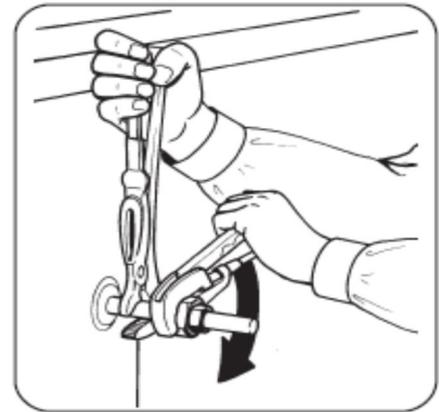
dimension has been standardized and will not reflect the internal workings of the coil. Do not load coil connections with connection pipes weight. Provide pipe support where appropriate.

Anti-freeze

To avoid coil cracks caused by freezing, when the temperature drops below 3 °C, add anti-freeze to water or completely pre-drain the coil. This precaution is required for all units not operating continuously.

Water Connections

The external hydraulic system should not transfer vibrations to the CLEVER unit's coils. Preventive measures should be taken to isolate the transfer of vibrations, otherwise damage caused by work hardening will lead to early failure. Be careful when connecting the coil connections, as if they are twisted, you may damage copper pipes and drain tanks pan discharge couplings. During pre-test operations, carefully check the coil for possible cracks.



6. WIRING

Electrical work must be done by a qualified electrician and meet standard AS/NZS 3000.

⚠ DANGER! LIVE ELECTRICAL CONNECTIONS. ISOLATE MAINS POWER BEFORE WORKING ON UNIT.

⚠ CAUTION! Parts within the electrical enclosure are still LIVE when local isolator is OFF.

The unit must be wired directly from a distribution board using an appropriately sized circuit breaker. The termination point for the mains cable is in the electrical compartment. An isolating switch is required, near but not on the unit.

External wiring conduit should be routed along the units aluminium framework. DO NOT install wiring in contact with piping. Refer Specification Sheet for correct power wiring and control connection points.

1. Ensure all electrical connections are fastened and continuous.
2. Check motor starter and overloads for correct rating and trip setting.
3. All circuit breakers or protective devices associated with the motor must be rated to suit motor running current and starting characteristics.
4. Field connection cables must be appropriately selected considering the voltage drop.
5. When using long supply cables, check with motor supplier recommendations to avoid high voltage transients occurring at motor terminals.
6. Check the connection diagram on the motor terminal box and make sure the supply leads are properly connected considering the supply phase sequence.

7. Ensure that the supply cable terminations on to the motor terminal board are firm, without loss of strands while using crimped lugs. Ensure enough clearances are provided between supply cable lugs and to earth.
8. Ensure that proper earthing connections are made.
9. If using conduit for the supply cable, ensure the conduit are completely threaded in and seal the threads appropriately.

7. START-UP & OPERATION

7.1 Start-Up

1. Check tightness of electrical connections.
2. Check the air filters have been correctly installed.
3. Check that all indoor fan motors can freely rotate.
4. Apply mains power to the unit by closing the mains isolating switch.
5. Check the supply voltage between each phase and neutral.
6. For units with water coils, check air has been bleed from the water loop prior to unit operation.
7. Check air diffusers are open

7.2 Motor

1. Before running the motor make sure that the terminal box lid is closed and secured with appropriate clearance to live parts.
2. Make sure that appropriate earthing are done.
3. Make sure that the moving parts are adequately guarded for safety.
4. Check the mounting bolts and/or flanges are firmly secured.
5. Make sure of no loose objects around that may be sucked by the cooling fan on the motor or the fan.
6. Make sure that the load applied is within the nameplate specification.
7. Check that the running current on no-load and full-load are reasonably balanced within 10% of the average and record the figures on the Commissioning Sheet p.6 for future reference.
8. While the fan is running, check for the correct direction of rotation of the impeller. It should be the same as shown by the arrow.

8. COMMISSIONING

A Commissioning Sheet is included on page 6 to assist in recording appropriate checks.

A unit equipped with variable speed (EC) indoor plug fan allows adjustment of the fan speeds to obtain the desired indoor supply airflows.

⚠ Setting the indoor fan speed too high can bring a risk of water carry-over, ie condensation can be sucked off the fins off the indoor coil and into the supply air duct. Water could then start leaking from the supply air vents and diffusers, damaging items below, and corrosion of ducting may occur.

9. MAINTENANCE

Maintenance operations should only be undertaken BY AUTHORIZED TECHNICAL PERSONNEL. All maintenance shall to strictly comply with local and national safety regulations. Before any service is begun, the person responsible for it should switch off the power supply and switch off the unit. A safety sign with maintenance operation should be displayed as a warning.

Before you start:

⚠ DANGER. TURN OFF POWER TO AVOID ELECTRICAL SHOCK AND ROTATING MACHINERY

9.1 Air Mixing Dampers

CLEVER opposed blade dampers are manufactured from extruded aluminium profiles with nylon gears wheels. This type of damper does not normally require lubrication, but only normal cleaning. If the damper environment is dusty or dirty, cleaning of the damper gears are necessary and regular lubrication will help prevent binding. Silicon based lubricants are recommended.

Ensure the dampers are always installed square without any additional twisting pressure from connecting ductwork, etc. Excessive external pressure can cause damper binding and premature failure of the nylon gear wheels.

9.2 Holding Frames & Clips

CLEVER air handling unit can be fitted with stainless steel holding frames. The holding frames are provided with a gasket in order to ensure a perfect airtightness and avoid air bypass. The four retaining clips should be fitted and clipped in the correct position. Incorrectly fitted clips or missing of one of them could cause air bypass. For a correct tight seal the gasket should not be damaged, so it should be checked every time you replace a filter. If the seal is damaged replace or repair it.

9.3 Coils Supplied By Water

Coils are fitted with manual air bleeds. Additional bleeding should not be required unless any work has been done on the external chilled water system. Bleed prior to operation of the CLEVER air handling unit.

9.5 Six Monthly Checks

1. Check the tightness of all electrical connections.
2. Check for signs of corrosion on electrical connections in high salt atmospheres; replace where necessary.
3. Check the tightness of all fans motor mountings.
4. Check and/or replace indoor air filters; more frequently if required.
5. Check condensate drain for free drainage and clean as necessary.

9.6 Annual Checks

1. Check all piping for chafing and vibration.
2. Check the operation of electric heaters, if fitted
3. Check air supply at all diffusers
4. Check for excessive noise and vibration and correct as necessary.
5. Check for insulation and duct damage and repair as necessary.
6. Touch up any paintwork damage to prevent corrosion

10. TROUBLE SHOOTING

EFFECT	CAUSE
Insufficient air flow rate	Dampers have not been correctly adjusted; system air balancing not done
	Impeller rotation opposite to direction shown by the arrow
	Fan speed not set-up correctly
	Accidental coil / filter clogging
Excessive air flow rate	Dampers have not been adjusted
	Filters are not installed
	Inspection doors are opened or some panels are missing
High fan motor current draw	Impeller rotation opposite to direction shown by the arrow
Coil insufficient coil output	Temperature or water supply rate lower than design
	Water flow rate decrease, control devices have not been adjusted/ balanced; lime deposits due to inadequate water treatment
	Back-to-front water connections
	External control systems are not setup correctly
Noise	Damper blades vibration
	Hissing due to pipes, baffles and inlet vibrations from leakage
	Excessive air flow rate
Air flow rate decrease	Increasing flow resistance in the fan system caused by:
	Filters clogged by dust, debris, etc
	Coil fins deposits
	Dampers have not been adjusted
Air flow rate increase	Dampers have not been adjusted
	Filters have not been installed
	Inspections doors are opened or some panels are missing
	Inlets have not been properly regulated
	Filters and coils have just been cleaned
Heating output decrease	Water temperature lower than design in Heating mode
	Water flow rate decrease, control devices have not been adjusted/ balanced, lime deposits in coil due to inadequate water treatment
	Airflow rate decrease
	Air temperature lower than design in Heating mode (
Cooling output decrease	Water temperature higher than design in Cooling mode.
	Water flow rate decrease, control devices have not been adjusted, lime deposits in coil
	Air temperature higher than design in Cooling mode
Water leaking	Check the drain trap/vent/slope.
	Check the coils and connections.
	Water carry-over: reduce the maximum fan speed (refer also Air Flow above)

11. WARRANTY

Please refer to the separate warranty document supplied with the unit, or visit www.temperzone.com for details.

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warranty@temperzone.com.au

spares@temperzone.com.au

Telephone: 1800 21 1800

New Zealand:

customerservices@temperzone.co.nz

Telephone: 0800 TZWARRANTY (899 2777)

Disclaimer

Temperzone disclaims all responsibility in the following cases:

- The installation and maintenance of the CLEVER air handling unit that are not carried out by the qualified and authorized personnel.
- Use not in compliance with the specific national regulations.
- Use of non-original spare parts.
- Power supply faults.
- Removal of safety protections.
- Total or partial non-compliance with instructions.
- Modifications to the CLEVER air handling unit.
- Negligence.

COMMISSIONING CHECK LIST

Site Name/address:

Installing Company Date:

Serviceman: Tel:

Model Serial No..... Site Ref.

Unit mounted level?	Y / N
Temperzone recommended drain trap fitted?	Y / N
Water drains tested okay? (all doors closed, fan running)	Y / N
Does unit have adequate safe access?	Y / N
All electrical terminals are tight?	Y / N
Air filters fitted and seals intact?	Y / N
Is air flow set and balanced?	Y / N
Fan/Plenum Section joiner clamps are all tight?	Y / N
Supply voltage checked?	Y / N
External electrical isolator fitted?	Y / N
Fan's set voltage	___ V
Fan motor full load running current	___ A/ph. per fan
Fan/s rotation direction checked?	Y / N
Checked for excessive noise & vibration of unit?	Y / N
Electrical Certificate Of Compliance issued?	Y / N
Fresh air and Return air dampers set (if applicable)	Y / N
Air bled from water coil (if applicable) ?	Y / N

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Materials and specifications are subject to change without notice due to the manufacturer's ongoing research and development programme.