Handling Unit
TR 020 > TR 1000

Specification guide GS TR – W.1 GB	**GUIDE SPECIFICATION** **Air Handling Unit**	Date February, 2007

GENERAL FEATURES

The air handling units shall be manufactured in a company certified in accordance with the ISO 9001, Version 2000 standard. The air handling unit supplied shall be of the @irTwin type, or equivalent.

The unit construction shall comply with the requirements of the European standard : EN 1886.

	Aluminium profile +glass wool
Casing strength	Class D1 minimum
Casing air leakage	Class L2 minimum under negative and positive pressures
Filter bypass leakage	Class F9 minimum
Thermal conductivity	Class T4 minimum
Thermal bridging	Class TB3 minimum

The AHU's shall be selected with the aid of an EUROVENT certified software programme that shall deliver AUTOCAD compatible execution plans, scaled to the AHU's size, fan performance curves with operating points and a printout of the air humidity diagram with the requested change points.

Noise levels

They shall be expressed in accordance with the EUROVENT standard. Minimum attenuation shall be 40 dB.

Module construction / assembly

- The AHU's shall be of the framework structure, and of perfectly smooth, metallic interior construction (Public Building compatible).
- For the specific cases, the thermal bridge free offer (on TR 400 to 1000) shall be proposed as optional. This option shall be of the composite framework or equivalent.
- The liaisons between modules shall ensure perfect continuity of the air passage tunnel with a smooth interior finish without any rough points at the joining surfaces to prevent any dust build-ups encouraging microbial growth.
- The modules shall be fastened from the outside by means of a thermal bridge breakage system (angle pieces and bolts).
- The AHU's shall be delivered with a continuous base frame under each module. This base frame (optional on TR 20 to 360) shall comprise the required openings of sling hooks / handling as well as openings for attaching rubber pads.
- Rain hoods and fresh air louvres with bird screen as well as a weatherproof roof, shall be provided for the outdoor installations.

Panels

- The panels shall be of the doubl e skin type with a uniform thickness of 25 or 50 mm with a choice of : Rock wool – Glass wool – Polyurethane foam.
- The inner skin shall be made of galvanised steel. Thickness = 8/10 mm.
- The outer skin shall be made of sheet steel, pre-painted in RAL 9010 colour with an epoxy primer undercoat and a 25 micron thick polyester topcoat.

• The panels shall be fixed, according to the unit sizes, by means of screws set flush to the exterior panel or screws countersunk in the panel (absence of localized thermal bridges). The screws, where applicable, shall be equipped with panel-coloured plastic caps.

• The insulation shall be completely enclosed inside the panels (6 faces covered) in order to prevent any humidity penetration and any loss of insulation efficiency.

• The construction of the access doors shall be identical to the AHU's panel construction.

• The hinges shall be of the polyamide (anticorrosion) offset type.

• The door locking system shall comprise, according to the unit sizes, quarter-turn fasteners or progressive tightening "rotor" locking handles for door alignment and perfect seal continuity (on both the positive pressure and negative pressure sides) between the doors and the panels. These locking devices shall be operated with the aid of a triangular key (in compliance with the EC directive on machinery safety).

INTERNAL EQUIPMENT

Fan/motor assembly

• The link between the fan-motor assembly and the end panel shall be assured by a high density foam gasket or by a flexible connector inside the unit and mounted on a removable frame.

Forward/Backward curved fans with double inlets shall be dynamically and statically balanced in compliance with VDI 2060 standards down to an accuracy of 6.3.

• The drive shall be of the belted pulley type.

• Direct driven plug fans associated with an electronic frequency inverter shall be provided as optional.

Mechanical safety

• As standard equipment, the motors shall have an internal thermal overload protection (TOP) sensor.

• The minimum motor insulation class shall be IP55 in compliance with EN 60529 (IK08 in compliance with EN 50102). They shall have a minimum coefficient of efficiency of EFF2 in accordance with CEMEP criteria.

• A non-removable, hinge-mounted door guard (optional), requiring a special tool for opening, in compliance with EN 292.2, shall guarantee personal safety.

• Mechanical adjustment of the Fan/Motor assembly (belt tension) shall be by way of a single piece sliding platform (notched rails for motors > 22 kW) adjustable by a single screw, without having to slacken the motor mounting. Thus, motor alignment shall remain fixed.

• As standard equipment, Fan/Motor assemblies shall be mounted on rubber vibration-absorbing pads (spring mounting available as an option). This assembly shall not rest directly on the floor panel but shall rest on an intermediate base frame comprising at least 2 main cross members in order to spread the load generated by the Fan / Motor assembly in a even manner (without any excess pressure points) in order to retain the rigidity characteristics of the AHU's lower panel.

Filters

• The filtration systems shall meet the requirements of the EN 779 standard in terms of gravimetric and opacimetric categories and the requirements of the EN 1822 standard for very high efficiency categories.

• The air tightness of the filtering surface shall comply with Class F9 of the EN 1886 standard.

• The filtration surface shall comprise rail-mounted filter cells, with the addition of a foam seal between the holding frame's outer surround and the filter cells, and the addition of mastic sealing between the filtration surface holding frame and the air handling unit tunnel.

• The filtration surface air tightness shall be ensured by way of a sliding rail actuated by a compression device.

• The filters shall be selected in averagely clogged mode.

Water coils

• The coils shall comprise a finned block with copper tubes. The copper tubes shall be deoxidised by the phosphorous electrolysis method. The aluminium fins shall be with a pitch of 2.1, 2.5 or 3.2 mm on TR 20 to 360 and 2.0 or 3.0 mm on TR 400 to 1000.

• The coils shall be mounted on slide rails.

• A condensate tray shall be integrated in the coil. It shall be inclined to prevent any water retention. It shall have folded edges and be slide rail mounted for easy removal with the aim of perfect decontamination.

• The fitment of a water droplet eliminator shall be obligatory when the air velocity across the coil exceeds 2.7 m/sec.

• Hydraulic connections shall be of the gas thread male threaded type or smooth type for diameters > 50/60.

• The coil shall be tested to a pressure of 16 bar for a service pressure of 10 bar.

Electric heating coils

• The electric heating coils shall comprise a series of stainless steel sheathed heating resistances. They shall be pre-wired and connected to a terminal block located behind an access door. The coils shall be mounted on sliding rails. The equipment shall be protected by a manual reset safety thermostat and an automatic reset safety one. The power supply to the electric heating coil shall be dependent on fan operation.

Dampers

They shall be capable of being motorized and be selected from the following versions :

• **Standard :** galvanised steel blades, blades driven by tie rods, polyamide bearings, 1300 Pa admissible pressure for a 1 metre length.

• **Isolation (airtight) :** as a minimum requirement, the tightness shall be in compliance with EN 1751, galvanised steel blades, blades driven by tie rods, nylon bearings, 1300 Pa admissible pressure for a 1 metre length.

Heat recovery (heat pipe, thermal wheel or run around coils as an option)

Plate recuperator : It shall be made of aluminium and adapted for a differential pressure of 1000 Pa.

• The leakage rate between the two air streams shall be less than 1 %.

• A condensate tray with a threaded condensate drainage pipe shall be mounted on the extracted air side and on the fresh air side, if necessary.

• A by-pass shall be proposed as an option for free cooling, for reducing or eliminating the antifreeze coil upstream of the recuperator or for preventing plate clogging during periods when heat recovery is not required.

Thermal wheels

• They shall comprise a constant speed aluminium hygroscopic rotor driven by belt. The assembly shall be installed in a rail-mounted galvanised steel frame inside the unit. A high performance seal shall provide tightness around the wheel surround and between the air inlet and the air outlet. The thermal wheel shall be equipped with a purge section to enable continuous wheel cleaning.
• A speed controller shall be provided as an option.
For the wheel a minimum angle of 45° for the discharge and aspiration shall be respected to ensure a good repartition of the air

Run around coils

• Run around coils shall consist of finned coils placed in the supply and exhaust air units. The supply coil shall comply with the specification for hot water heating coils and the exhaust coil shall comply with the specification for chilled water cooling coils.

HUMIDIFIERS

Wet deck type humidifiers

The wet deck type humidifier shall be equipped with its own water-recycling pump, entirely integrated inside the section.
The recovery tray located in the lower part of the humidifier shall be equipped with a float tap for the water inlet, an opening for the overflow and a drainage system.
The “Glasdek” type humidification medium shall be 100 mm thick for an efficiency rating of up to 60 % and 200 mm thick for an efficiency rating of 85 %. It shall be classified M1.

Spray type humidifiers (air washers)

The air washer shall be equipped with its own water-recycling pump, installed outside the section.
The recovery tray located in the lower part of the washer shall be equipped with a float tap for the water inlet, an opening for the overflow and a drainage system.
The water shall be sprayed through PVC nozzles attached by a clip system onto the distribution rails.

Steam humidifier

To enable the steam generator blow pipe to be integrated in the section, it shall be equipped with an empty section of the same construction as the other air handling unit’s sections, and equipped with a galvanized or optional stainless steel condensate drain pan.