

Mobile Air-Conditioning & Cooling Trolley

The engines are off. The electronics are not.

NOT COMFORT COOLING

An aircraft on the ground has no ram air and no engine-driven cooling, but its avionics still have to run for checks, loading and pre-flight - and a vessel alongside with its own plant opened up has the same problem. Those boxes dump heat into a closed volume that is also sitting in the sun. So the duty is holding equipment below the temperature at which it DERATES OR TRIPS, and the trolley is sized on HEAT LOAD - equipment dissipation plus solar gain plus the fresh-air load - never on volume or floor area. A compact bay full of powered boxes under a clear canopy can need several times the capacity of a much larger empty compartment.

MAKING THE COLD IS THE EASY HALF

The air travels down a long flexible insulated duct to a coupling on the airframe or through a hatch, and that duct is where the performance goes: heat gain through its wall, pressure drop that consumes the fan, and a duct lying on hot tarmac. The machine is therefore specified and proven AT THE DELIVERY END, not at its own outlet - which sets fan static pressure, duct insulation and a stated maximum length, and makes duct stowage a design item rather than an accessory. A trolley that meets its rating at its outlet and misses it at the aircraft has failed.

WHATEVER POWER IS THERE - AND IT GETS TOWED

Aprons and jetties offer inconsistent supplies: differing voltages and frequencies, long cables with real volt drop, sometimes nothing at all. A compressor's starting current depresses that supply further at the moment the motor most needs it, so the electrical design assumes the WORST CREDIBLE SUPPLY and the starting method is chosen to survive it - or the diesel variant removes the argument entirely. Mechanically this is a towed vehicle left outdoors, so the refrigeration circuit lives with continuous vibration and shock a fixed plant never sees: brazed joints in preference to flared, pipework routed and clipped for movement, and the compressor on designed anti-vibration mounts.

TWO WAYS TO MAKE COLD - NOT INTERCHANGEABLE

Vapour-compression compresses a refrigerant and is efficient and compact for the capacity it gives - this class. Air-cycle compresses air, cools it and expands it through a turbine, so the working fluid is simply air and there is NO REFRIGERANT IN THE MACHINE AT ALL - less efficient, but nothing can leak that matters. Neither is a variant of the other: compressor, heat exchangers, controls and failure modes all differ, so the cycle is settled first and the machine designed from there. The same trolley is usually also asked to deliver hot air in winter, so heating sits in the same box.

THE MACHINE

- Refrigeration circuit - with capacity control, so light load does not short-cycle it
- Air handling and delivery - blower sized for duct static, insulated duct, couplings
- Power, drive and control - starting against a weak supply, or its own diesel
- Chassis, mobility and environment - drawbar, brakes, towing stability, corrosion

VARIANTS

Electric mobile cooling trolley · Diesel-driven self-powered trolley · Naval / shipboard trolley · Heating-and-cooling trolley

SCOPE

Ours: trolley design and integration, heat-load sizing and delivery-end performance, refrigeration circuit design and vibration-tolerant construction, air handling and the duct and coupling arrangement, power scheme and starting behaviour, chassis, drawbar, braking and towing stability, weatherproofing and corrosion protection, controls and protections, installation, commissioning, performance proving at the delivery end, training and AMC. Bought-in certified: compressors, motors and diesel prime movers, heat exchangers, refrigerant components and controls, tyres and braking components, instruments. The customer's: the aircraft or compartment, the supply available, the applicable standard and the acceptance programme.

STATUS

Engineered to order. Equipment of this class has been quoted across naval air-conditioning trolley and aircraft ground cooling trolley requirements; no delivered air-conditioning trolley is claimed.