

THE COOL TUBE[®]

MKII



Application Summary



Simple Affordable Functional Effective

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Overview

THE COOL TUBE® MKII works based on a drop of the temperature of the compressed air delivered to the unit. Typically, Australian underground mines compressed air temperatures in the warmer months range from 25 – 28°C, due to no exposure to direct sunlight on delivery lines.

As standard, **THE COOL TUBE® MKII** is designed to give a **temperature drop** of 24 - 30°C (pending model), of the compressed air inlet temperature. For this reason, it is of great benefit to know what the inlet temperature that you will be working with is, to better understand the resulting temperature of the cold air from **THE COOL TUBE® MKII**.

***IE** – If using a 180CFM unit and the compressed air inlet temperature is 26°C, then the expected cold air outlet temperature blowing from unit should be 0 - 2°C on average.*

Additionally, for the best performance, an inlet compressed air pressure should be between 6 - 8 Bar / 85 – 115 PSI. The option to install a water trap or filtration in the compressed air circuit is based on the sites understanding of their compressed air quality. Compressed air laden with moisture will reduce the overall efficiency and performance of the units. Moisture and general oil mist particles in the compressed air, will tend to be exhausted from the warm end as priority.

Cool Tech Specs

Model Number	MKII050	MKII120	MKII150	MKII180	MKII210
Ideal Inlet Pressure	5 – 8 Bar	5 – 8 Bar	5 – 8 Bar	5 – 8 Bar	5 – 8 Bar
CFM @ 7 Bar Inlet Pressure	50 CFM	120 CFM	150 CFM	180 CFM	210 CFM
Tested Air Inlet Temp	25°C	25°C	25°C	25°C	25°C
Cold End Discharge Temp / Flow	-5°C @ 18 LPS	-5°C @ 40 LPS	-3°C @ 50 LPS	0°C @ 58 LPS	1°C @ 70 LPS
Cold End Discharge Temp Drop	30°C	30°C	28°C	25°C	24°C
Warm End Heat Shield Surface Temp	46°C	58°C	60°C	62°C	64°C
Warm End Air Temp	38°C	39°C	44°C	44°C	45°C
Volume at 3m with hose and 250mm silencer.	74 dBA	81 dBA	84 dBA	84 dBA	85 dBA



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Australian Owned & Operated
Made in Australia

THE COOL TUBE® MKII

THE COOL TUBE® MKII, with design operational testing traceable back to **National Standards** by the **NATA certified laboratory, SIMTARS**.

Mine Spec, compressed air driven portable “air conditioners”, delivering super cooled air to the workspace to combat the environmental condition of heat stress, and or assist in controlling the operational temperatures of equipment and infrastructure both internal and external.

THE COOL TUBE® MKII, developed and manufactured for the intended use of:

- Hot humid underground mining activities that are low ventilation.
- Confined space locations such as vessels, dragline tubs, hoppers and tank compartments.
- Concealed areas, tunnels and shafts.
- Positive pressure air-conditioned refuge chambers, COBs and crib areas.
- Fixed equipment and infrastructure cooling - IE transformers, electric motors, gearboxes, radiators and bearings.
- Any hot and or humid work area with sufficient compressed air available.

*With no moving or maintainable parts, **THE COOL TUBE® MKII** has a size to suit your application.*



Work Group and Roadway Cooling

If the application is for personal workspace cooling, then we generally see **THE COOL TUBE® MKII** set up approximately 3 - 6m from the work group, with the cold air blowing toward the work group. Dual or multiple units see this application reaping the best results in most mining applications.

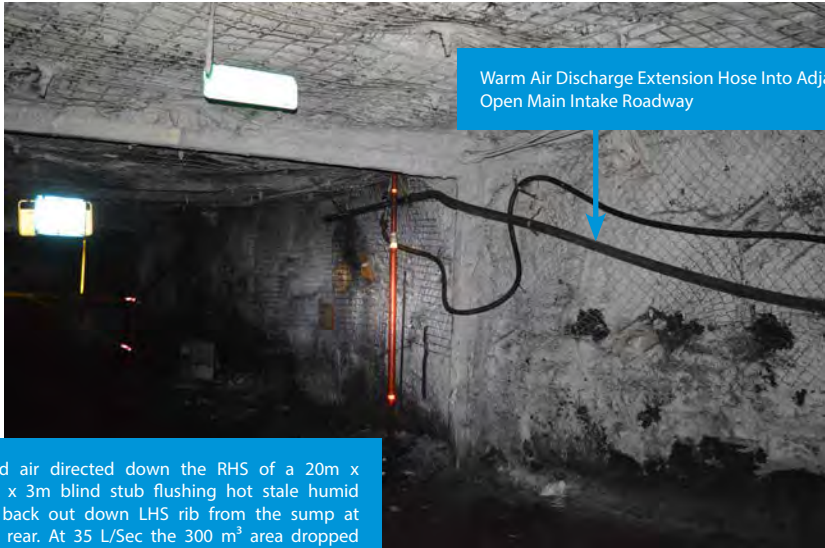
It is best to think of **THE COOL TUBE® MKII** as an air conditioner and treat it as such. A single unit set up 30m from a work group blowing down a heading or roadway, is not going to see any benefit, as they are **not intended for bulk air cooling**. However, if you had a 20m x 5m x 5m stub or dead heading to ventilate and cool, then with 1-3 correctly sized units supplying cool air, the area should be flushed and cooler within a short period. As with all forms of air conditioning, **containment of the cool** air in an area is the best method to allow the warm air to be flushed out. Many such applications of this are in place, where change over bases / refuge chambers, confined spaces, crib / lunch areas and recovery areas are cooled to 16 - 20°C with **THE COOL TUBE® MKII**,

Typically, in an underground mining environment, closure of an area to contain the chilled air, other than that of a permanent refuge or confined space, is achieved with the erection of a temporary brattice wing or stopping, commonly used to control low to medium mine ventilation velocities.

As per below photo, directing the cold air into a blind roadway is effective in flushing the warm humid air from the rear out into the adjacent roadway. Additional brattice installed across this stub would add further benefit in **containing the cooled air**.

Cold air directed down the RHS of a 20m x 5m x 3m blind stub flushing hot stale humid air back out down LHS rib from the sump at the rear. At 35 L/Sec the 300 m³ area dropped from 26.5°C WBT, to 22°C WBT in 2HRS with no containment of the air in the adjacent end of the cut through which opened onto a main intake airway.





Warm Air Discharge Extension Hose Into Adjacent Open Main Intake Roadway

Cold air directed down the RHS of a 20m x 5m x 3m blind stub flushing hot stale humid air back out down LHS rib from the sump at the rear. At 35 L/Sec the 300 m³ area dropped from 26.5°C WBT, to 22°C WBT in 2HRS with no containment of the air in the adjacent end of the cut through which opened onto a main intake airway.



The Cool Tube® roof mounted delivering cooled air to a work space.

Concealed and Confined Space Cooling (50, 120 CFM)

Positive pressure air conditioning for underground change over bases (COB), refuge chambers, work stations and containers. This 130m³ sealed space with exposed coal ribs and sandstone floor & roof, at approximately 320m underground in Central Queensland Australia.

Internal measured temperature prior the installation of THE COOL TUBE® MKII -

- 24°C Wet Bulb and 25°C Dry Bulb
- Calculated Effective Temperature 23.6°C at 92% Relative Humidity.

Internal measured temperature (middle of room) post installation of THE COOL TUBE® -

- 18°C Wet Bulb and 23.5°C Dry Bulb
- Calculated Effective Temperature 21.5°C at 72% Relative Humidity.

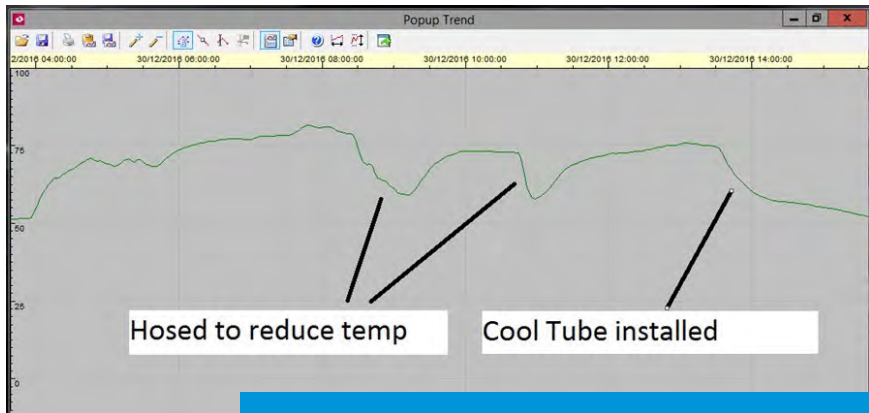


The Cool Tube® with air inlet filtration cooling and positive pressure ventilation in an Underground Mine sealed refuge area.

Fixed Infrastructure Cooling (150, 180 & 210 CFM)

Another popular application of **THE COOL TUBE® MKII**, is for the cooling of infrastructure in poorly ventilated areas and or overheating from a high load situation. Below is a snapshot of the cooling of an Underground Mine Conveyor drive motor, that was being cooled with water and then **THE COOL TUBE® MKII** applied as a better option, than running water on a drive bearing as an interim solution till effective maintenance could be administered. **THE COOL TUBE® MKII** saw an immediate better result without the risks associated with running water in such situations.

Other such applications used regularly are the installation of **THE COOL TUBE® MKII** to underground mining transformer, substation and equipment areas where ventilation is low and equipment loading is high. This in turn aids in the reduction of radiant heat into adjacent roadways, that would otherwise add to the mine ventilation accumulated temperature.



The Cool Tube® applied to a conveyor drive motor for cooling. Graph representation of extended temperature drop post removal of the controlled water cooling that was being used prior to The Cool Tube®.



The Cool Tube® external cooling to an underground mine nitrogen filled 11KV transformer in a poorly ventilated roadway. Total 3 units were installed in the 160m² contained roadway.

Machine and Enclosure Flush Mounting (150, 180 & 210 CFM)

This installation method is a useful application for mounting on equipment such as:

- Longwall chocks / shields
- Continuous Miners
- Jumbo's
- COBS – Fixed and mobile self-rescuer change over bases
- Refuge Chambers
- Containers and other fixed ferrous metal equipment

Application in this method allows for the units to be permanently mounted in a safe secure location, with the cold and warm air being delivered to their respective areas via separate 2-inch hoses attached either end as per below.

Let your imagination be the guide for the endless applications of this installation method in your workplace.



Plumb the cool air to an
"Adjustable
Magnetic Remote Silencer
Mount"



Base Mount Magnet Application *(150, 180 & 210 CFM)*

This installation method is a useful application for mounting on equipment such as:

- Fixed equipment structures such as transformers, gearboxes and benches
- Continuous Miners
- Jumbo's
- Longwall infrastructure

As with the flush mount application, this method allows for the units to be either permanently or temporarily mounted in a safe secure location, with the cold and warm air being delivered to their respective areas via separate 2-inch hoses attached either end or to raise the unit to a position to point **THE COOL TUBE® MKII** to its intended target area for cooling, whilst plumbing the warm air away with the usual 2-inch bull hose as required.



Additional Accessories - THE COOL TUBE® MKII

Contact us if you require a specific mounting solution to your application. Additional hardware:

- Handrail mount brackets
- Magnetic hose clamps – 1" to 3"
- Stainless Steel Coupling clamps for multiple units paralleled
- M16, M20 & M24 Male / Female extension posts all configurations.
- Baffled Diffusers
- 250mm and 500mm Extension Silencers





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