



5. CLEANING AND MAINTENANCE

The Meech-Artx model 60015 Cold Stream Air Gun has no moving parts. Clean compressed air moving through the tube will cause negligible wear on the parts and will provide you with reliable service for an indefinite period of time.

Occasionally, dirt, water and oil may enter the tube from the compressed air supply and hinder the performance. When this happens, simply take the unit apart, clean the parts, and reassemble, tightly replacing the cold end cap so that the generator is properly seated.

MEECH-ARTX STAINLESS STEEL CABINET CONTROL COOLER

1. COMPRESSED AIR SUPPLY

Air supplies are plagued with condensed water vapour and droplets in the air lines. This condensation leads to rust and dirt building up in the air lines. Also, some compressors will allow oil or oil vapour to enter the air line which may also cause problems.

Small orifices in the Meech-Artx Vortex Tube, Control Cooler and Cold Stream Air Gun may become clogged with the rust, dirt and water droplets. A five micron filter will separate 99% of the foreign material from the air supply, allowing virtually dirt free air to enter the tube. The use of an oil filter with an effective filtration of 0.01 micron will remove the oil droplets for an even cleaner air supply.

Keep in mind that the current line or air hose might contain dirt or oil and should be blown out before installation. Also, pipe thread sealant or tape must be applied carefully to avoid clogging the product orifices.

When the temperature of the air inside the Vortex Tube, Control Cooler and Cold Stream Air Gun drops to 0°C, the water vapour in the air will start to freeze. If this poses a problem with the ice clogging the orifices of the generator inside the tube, an air dryer must be used to lower the dew point to keep out the water vapour. A dryer rated at 19°C will produce a dew point low enough to eliminate the water vapour freezing in the orifices of the generator.

2. COMPRESSED AIR SUPPLY LINE SIZE

To obtain maximum performance from the Meech-Artx products, the required air pressure (psi) and air volume (cfm) must be maintained.

Line pressure of 70-90 psi can be present without a sufficient volume (cfm) of air. To ensure that both pressure and volume are present to efficiently operate the Meech-Artx products, a line size of 3/8" or 1/2" hose should be used for applications up to 10ft from the main header. Use 1/2" or 3/4" hose up to 20ft and 3/4" or 1" hose up to 50ft from main header.

3. USE AND INSTALLATION OF STAINLESS STEEL CONTROL COOLER

The Meech-Artx generator determines the volume of air through the Vortex Tube. These generators are rated for 10, 15, 25 and 35cfm at 80psi (280, 420, 700, 900 lpm at 5.5 bar). To ensure that your compressor can generate these volumes, the horsepower of the compressor can be multiplied by 4 to determine the cfm capacity. A multiple of 5 can be used to newer compressors over 30 horsepower.

The standard model Control Cooler is equipment with a 25 cfm (700lpm) generator. This will provide 1500 BTU of cooling (380 Kcal/h). This is sufficient to cool a cabinet that is 6ft x 6ft x 2ft (1.8 x 1.8 x 0.6m) from a 55°C maximum inside temperature to 32°C provided 80 psi (5.5 bar) air is available, with dry 23°C compressed air going into the Meech-Artx Control Cooler.

When 80 psi (5.5 bar) is not available, the cooling values will be reduced by 25% at 60 psi (4 bar) or 50% at 40 psi (2.5 bar).

The thermostat model 70325 is very useful at controlling compressed air usage as it only operates when cooling is needed.

4. OPERATION OF COOLING

The Meech-Artx stainless steel Control Cooler is factory-set to deliver the maximum cooling needed to maintain a desired temperature inside your control panel.

At 80 psi (5.5 bar), 17.5 cfm (70% of 25cfm) of cold air will exit from the Vortex Tube into an electrical cabinet, providing 1500 BTU (439.88 WATTS) of cooling. The bladder valve will automatically release hot air from the cabinet, maintaining a positive pressure inside the cabinet of 8 inches water column.

The automatic release of air through the bladder valve enables you to close off open conduit entrances, louvres and air leaks. A sealed cabinet is also more efficient, as the cold air enters only the cabinet and does not escape to the atmosphere, and therefore waste air.

5. INSTALLATION AND MOUNTING

The installation drawing (fig.1) indicates the mounting of the Control Cooler regardless of whether you ordered model 70025, the Control Cooler only, or model 70325, containing the Control Cooler, Thermostatic Control, Solenoid Valve and ducting kit.

Also, the drawing shows the Thermostatic Control and Solenoid Valve if you ordered model 70325. Remember that the range of the thermostat is very large and even 1/16 turn of the thermostat screw will vary the temperature by 10°C. For this reason, the factory setting of 32°C should not be changed other than under severe conditions.

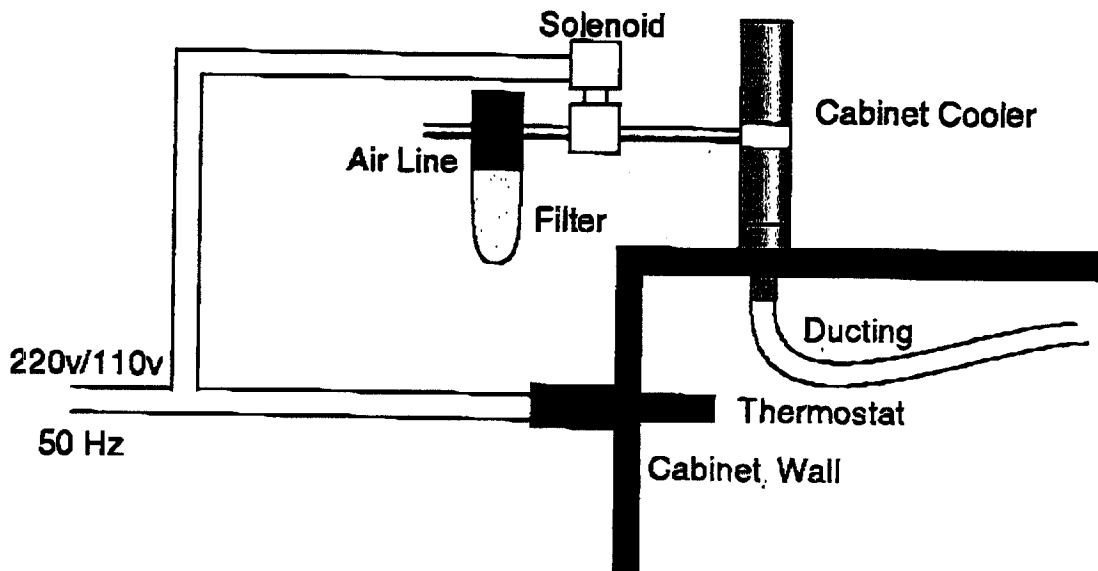


Figure 1. Installation Drawing.

The Control Cooler requires a standard electrical knockout of 3/4". The thermostat requires a 1/2" standard electrical knockout for installation.

6. DUCTING

The 10ft (3.04m) of vinyl ducting connects to the cold end of the Control Cooler inside the electrical cabinet. The ducting allows more efficient use of the cold air by directing the cold air to the hottest spots. By punching a hole in the tube by the hot spot, the cold air cools more effectively, restricting the high temperature increase of the particular hot control.

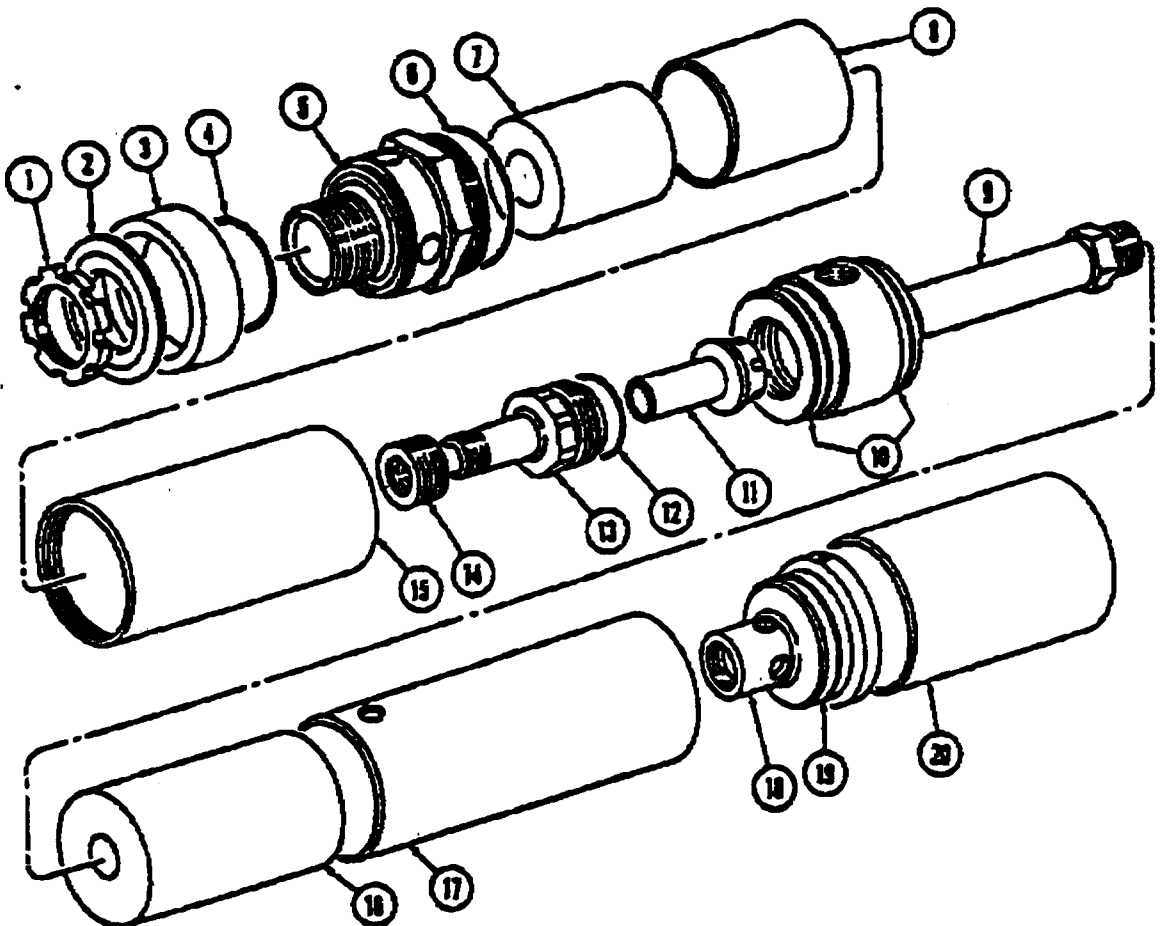
The open end of the ducting should be placed at the bottom of the cabinet. As the cold air exits from the tubing, it rises as it heats and provides more open cooling throughout the cabinet.

7. CLEANING AND MAINTENANCE

The Meech-Artx Control Cooler has no moving parts. Clean, compressed air moving through the tube will cause negligible wear on the parts and will provide you with the same service for an indefinite period of time.

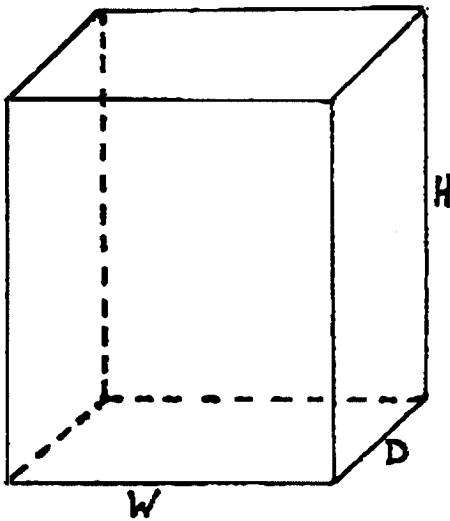
Occasionally, dirt, water and oil may enter the tube from the compressed air supply and hinder the performance. When this happens, simply take the unit apart, clean the parts, and reassemble, tightly replacing the cold end cap to properly seat the generator.

Figure 2. Parts and Assembly.



SIZING OF THE CONTROL COOLER

If the overheating problem is due to high ambient temperatures and the cabinet is sealed (not vented) but may have openings, such as knockout holes or loose door seals, then one 25 cfm (700 lpm) Control Cooler will solve the overheating problem.



$(2 W+2D) H =$ Square feet of cabinet for determining heat load area

1. Maximum ambient temp =

2. Maximum desired temp inside cabinet =

$\Delta t =$ temp difference ambient to desired =

Convert Δt into BTU/HR/FT² using conversion table.

Multiply BTU/HR/FT² x square feet of cabinet.

= Heat load due to outside temperature.

Add heat load due to electronics inside cabinet to the above to determine total heat load.

To convert watts into BTU/HR x 3.41

TEMPERATURE CONVERSION TABLE

TEMPERATURE (Δt)

DIFFERENTIAL C°	BTU/HR/FT ²	WATTS/HR/M ²
2 ½	1.5	0.43
5 ½	3.3	0.96
8 ½	5.1	1.49
12	7.1	2.08
14	9.1	2.66
16 ½	11.3	3.31
19 ½	13.8	4.04
22	16.2	