CONTHERM *Scientific Limited*

TECHNICAL MEMORANDUM **PRODUCT :STEAM INJECTOR** **No : 0092**

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FROM : Contherm Scientific Ltd **DATE :** 01/09/2004 Updated:10/04/2005
TO : ALL AGENTS

SUBJECT: Replacing/Upgrading the Steam Injection coil on PRECISION Cabinets

If the cabinet is fitted with the Steam Injection System for humidity control there will be a Steam Module located at the rear of the cabinet. The water used **must** be distilled or deionised to minimise the risk of blockage to the injector coil, additionally it is strongly recommended that waste water be taken directly to a drain and NOT be recirculated. The water inlet filter (if fitted) may be removed from the system as it is no longer needed if the water is NOT recirculated. The steam injector coil should typically be replaced every 12months.

The latest larger bore swaged end coil is simpler in design and should be treated as a consumable item – being replaced about every 12 months. The previous steam injector coils have the copper ferrules directly welded to the end(s) of the stainless injector coils, thus minimising the risks due to leaking fittings. When replacing the steam injector coil, the correct type of coil (Long or Short) must be ordered to minimise installation problems.

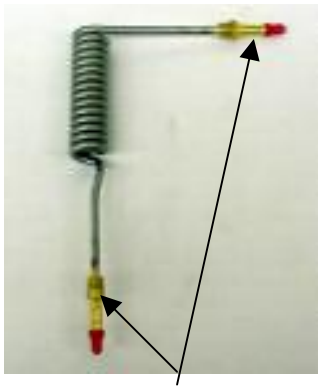
If the INLET to the coil is directly below the steam injector it is fitted with the LONG injector coil (Pt No:P2005) else it is fitted with the SHORT injector coil (Pt No: P2007).

- Ensure all electrical power is removed from the chamber by tripping the RCD breaker and removing the plug from the wall socket.
- Allow 60 minutes for the temperature of the Steam Injector heater to cool so that it can be safely handled. The steam Module is located at the rear of the cabinet outside wall.
- Remove the four screws holding the Steam Module cover to the steam module and lift the cover clear off the module.

Consumable Long Coil (P2005)

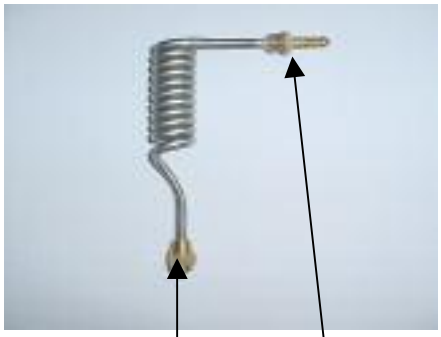
Swaged ends

Previous Long Coil (P2005)



Hosetails

Short Coil (P2007)



Ferrule Hosetail

On units with an INTEGRAL water pump (pump is INSIDE the steam injector module):

This system uses the SHORT (P2007) Injector Coil.

- Disconnect the water inlet pipe by loosening the ferrule at the bottom of the injector coil.
- Disconnect the steam outlet pipe by loosening the ferrule at the RHS of the steam module.

The new (short) injector coil only has a ferrule on the INLET side of the coil, replace the outlet fittings with the short piece of hose and extension pipe when fitting this coil. The new arrangement does away with several fittings on the outlet side, simplifying the system and minimising the risk of water leaks.

- Remove the top cover from the injector heater (test carefully first to ensure that the heater is not too hot to handle before attempting removal) by removing the two OUTSIDE screws (do NOT loosen the centre screw) and carefully lift the top cover free of the heater module (note that the regulating thermostat capillary is trapped under the top cover).
- Firmly tap the end of the bottom ferrule to try and knock the injector coil upwards (it lifts out from the top) until it comes free of the heater block.
- Replace the injector coil with a new unit and reverse the above procedure to reassemble.
- Plug the cabinet back into the power outlet and Turn the RCD main switch back on.
- Prime the injector system using diagnostic No3 until the pump is fully primed with water (usually indicated by the loud buzzing noise abating.).
- Test the humidity operation and inspect for any obvious leaks.

We strongly recommend following TECHMEMO_087 so that the water used by the steam injection system is NOT recirculated, this allows the inlet filter to be discarded and results in a MUCH longer injector coil life. Be aware however that when the waste water is NOT recirculated that the water tank will not last as long. If you are going to keep recirculating the water, a new steam injection filter (P2006) should be fitted when the coil is replaced.

NB: Use **ONLY** distilled or deionised water for the steam modules, using any other type of water will greatly reduce the operating life of the injection coil.

On other units with the SHORT steam injector coil):

This system uses the SHORT (P2007) Injector Coil.
These units can be identified by the fact that the steam module water INLET enters at the lower RHS of the steam module (NOT from underneath the steam module).

- Disconnect the water inlet pipe by loosening the ferrule at the bottom of the injector coil.
- Disconnect the steam outlet pipe by loosening the ferrule at the RHS of the steam module.

The new (short) injector coil only has a ferrule on the INLET side of the coil, replace the outlet fittings with the short piece of hose and extension pipe when fitting this coil. The new arrangement does away with several fittings on the outlet side, simplifying the system and minimising the risk of water leaks.

- Remove the top cover from the injector heater (test carefully first to ensure that the heater is not too hot to handle before attempting removal) by removing the two OUTSIDE screws (do NOT loosen the centre screw) and carefully lift the top cover free of the heater module (note that the regulating thermostat capillary is trapped under the top cover).
- Firmly tap the end of the bottom ferrule to try and knock the injector coil upwards (it lifts out from the top) until it comes free of the heater block.
- Replace the injector coil with a new unit and reverse the above procedure to reassemble.
- Plug the cabinet back into the power outlet and Turn the RCD main switch back on.
- Prime the injector system using diagnostic No3 until the pump is fully primed with water (usually indicated by the loud buzzing noise abating.).
- Test the humidity operation and inspect for any obvious leaks.

We strongly recommend following TECHMEMO_087 so that the water used by the steam injection system is NOT recirculated, this allows the inlet filter to be discarded and results in a MUCH longer injector coil life. Be aware however that when the waste water is NOT recirculated that the water tank will not last as long. If you are going to keep recirculating the water, a new steam injection filter (P2006) should be fitted when the coil is replaced.

NB: Use **ONLY** distilled or deionised water for the steam modules, using any other type of water will greatly reduce the operating life of the injection coil.

On later units with the LONG steam injector coil):

This system uses the LONG (P2005) Injector Coil.
These units can be identified by the fact that the steam module water INLET enters at the RHS underneath the steam module.

- Disconnect the water inlet pipe by loosening the ferrule(if fitted) or hose at the bottom of the injector coil.
- Disconnect the steam outlet pipe by loosening the ferrule at the RHS of the steam module (if fitted) or by releasing the steam outlet hose.

The latest (long) larger bore injector coil has swaged ends on the coil, replace any outlet fittings with the short piece of hose and extension pipe when fitting this coil using hoseclips to fasten the hoses onto the new coil. The new arrangement does away with several fittings on the outlet side, simplifying the system and minimising the risk of water leaks.

- Remove the top cover from the injector heater (test carefully first to ensure that the heater is not too hot to handle before attempting removal) by removing the two OUTSIDE screws (do NOT loosen the centre screw) and carefully lift the top cover free of the heater module (note that the regulating thermostat capillary is trapped under the top cover).
- Firmly tap the end of the bottom end to try and knock the injector coil upwards (it lifts out from the top) until it comes free of the heater block.
- Replace the injector coil with a new unit and reverse the above procedure to reassemble.
- Plug the cabinet back into the power outlet and Turn the RCD main switch back on.
- Prime the injector system using diagnostic No3 until the pump is fully primed with water (usually indicated by the loud buzzing noise abating.).
- Test the humidity operation and inspect for any obvious leaks.

We strongly recommend following TECHMEMO_087 so that the water used by the steam injection system is NOT recirculated, this allows the inlet filter to be discarded and results in a MUCH longer injector coil life. Be aware however that when the waste water is NOT recirculated that the water tank will not last as long. If you are going to keep recirculating the water, a new steam injection filter (P2006) should be fitted when the coil is replaced.

NB: Use **ONLY** distilled or deionised water for the steam modules, using any other type of water will greatly reduce the operating life of the injection coil.

CONTHERM *Scientific Limited*

TECHNICAL MEMORANDUM **PRODUCT :STEAM UNITS** **No : 0087**

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FROM : Contherm Scientific Ltd **DATE :** 14/4/2004

TO : ALL AGENTS

SUBJECT: NON RECIRCULATION OF WATER

There have several instances where the injector pipe on a humidity steam injection system gets clogged after a relatively short period. Having analysed the deposits when this occurs it has been determined that the water has a high concentration of copper (15%), iron (15%) and aluminium 7%). This appears to be caused by the injected steam coming into contact with the copper refrigeration tubing and the aluminium finning used on the refrigeration evaporator. It is therefore recommended that the water used in a steam injection system be drained to waste rather than being recirculated back to the original tank. Where recirculation is not possible – the effect could be reduced by frequently changing the tank water (every two or three days) to reduce the buildup of mineral concentration.

To change the existing tubing from recirculation to waste follow the following procedure.

- Replace the plastic pipe between the steam unit and the pump.
- Cut the cabinet drain tube where it joins the tee connector and let this piece of tubing run to waste out the rear of the cabinet. (will require a drain or bucket or similar container of at least the same capacity as the tank to hold the waste water).
- Remove the remaining tubing, tee piece and filter from the pump and fit new plastic tubing. If the water is NOT being recirculated the filter and tee piece are not required.

This will only allow delivery of clean water to the pump and steam injection system.