



Department
of Energy &
Climate Change

Appendix C – Operational Verification Example

Electricity Demand Reduction pilot
M&V manual

Operational Verification Example

© Crown copyright 2014

URN 14D/279

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence.

To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/ or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gsi.gov.uk.

Any enquiries regarding this publication should be sent to us at edr-project@decc.gsi.gov.uk

Contents

| | |
|--|---|
| Appendix A – Operational Verification Example..... | 5 |
| Example Commissioning Procedure Document for AHUs..... | 5 |

Operational Verification Example

Example Commissioning Procedure Document for Air Handling Units

ON ARRIVAL

DO:

- Make contact with relevant contractor.
- Discuss site & emergency rules (generally done as part of site induction).
- Complete risk assessment, if any areas are identified discuss with site contractor, levels to be used to reduce or eliminate risks.
- Allow site contractor to make a copy of risk assessment form.
- Use provided PPE.

CHECK:

- Damage to unit, either in transit, or during installation.
- All sections joined together in the correct manner.
- The unit is installed level.
- Ductwork completed in and out of unit on both supply and exhaust.
- Three phase supply connected and available when ready.
- All wiring by third party, from unit to control panel has been completed, and that the correct size cable has been used as laid down in the wiring diagrams.
- All wiring to auxiliary components, actuators etc. (when applicable) has been completed.
- Pipe work to/from heating/cooling coils (when fitted) is complete, and hot/chilled water supply is available. Check flow and return are the correct way round. (Refer to manual for correct layout and positioning of 3-way valve).
- 3-way valve spindle/s properly connected to actuator/s.
- Drain/s fitted to drip tray outlet.
- Visual inspection inside all compartments, and remove any debris.
- Rain cover fitted, if outside.

PRE COMMISSIONING

FILTER/COIL SECTION:

- Remove filter bags.
- Inspect frost coil (where fitted) for damage to fins.
- Check frost thermostat capillary across surface of coil, and stat set to 4 °C.
- Check seal between fan/coil section and recuperator section.

FAN/S SECTION:

- Remove any transit bolts and straps.
- Remove motor terminal cover and check connections for tightness.
- Check motor/fan pulley/s for correct alignment and tightness.
- Check belt tension.
- Check all nuts/bolts in the entire compartment for correct tightness.
- Record motor/fan pulley, bush and belt sizes.

RECUPERATOR:

- Check plate exchanger for signs of damage.
- Check damper fitted correctly.
- Check belimo fitted correctly, and manually operate both ways.
- Check drip tray properly fitted and sealed.
- Check eliminators for signs of damage.
- Check sensors are fitted correctly and not damaged.
- Check all wiring to PCB properly terminated.

CONTROL PANEL:

- Check all wiring to the panel has been properly terminated.
- Check the correct breakers are fitted as described in the wiring diagram.
- Set the motor overloads to the correct value.
- Set the time clock to suit the customers' requirements.
- Re-tighten every terminal in the panel in case of looseness through transit.

DRY START:

When all of the above has been completed, turn the mains supply on to the panel (Green light on panel door). Measure the voltage on each phase. Turn all the breakers to the OFF position except the 24volt control. We can now put the unit through a dry run without the fans running. This enables us to witness the correct contactors, energizing at the right time. We can switch from automatic to manual and watch for the correct response. We can switch from low to high speed and watch for the correct response.

The following checks can also be made without running the fans:

- i. Set the room set point potentiometer to maximum and observe:
 - a) Re-heat actuator motors fully open to the coil. (By-pass closed). In this position, check and adjust as necessary.
 - b) By-pass damper fully closed, directing airflow across the recuperator. Check and reverse cycle if needed.
- ii. Set the room set point potentiometer to minimum and observe:
 - a) Re-heat actuator motors fully closed to the coil. (By-pass opens).
 - b) By-pass damper fully open, directing airflow through the bypass.
- iii. Set the pre-heat potentiometer to maximum and observe that the pre-heat actuator motors fully open.
- iv. Set the pre-heat potentiometer to minimum and observe that the pre-heat actuator motors fully closed.

RUNNING CHECKS:

Now that we are satisfied with the above, put the panel selector switch to MANUAL and the toggle switch to LOW, turn on the exhaust low speed breaker and check that the rotation is correct. This should be ok if the wiring diagrams have been observed correctly by the third party. Next, switch on the exhaust high-speed breaker, turn the toggle switch to HIGH and check that the rotation stays the same. When satisfied, turn both breakers off, return the toggle switch to LOW and repeat the steps for the supply fan.

To record RPM readings, follow the same steps as above and note the speed of both fan and motor.

Close all inspection doors, set the control switch to MANUAL, the toggle switch to LOW and once the unit has started up in low speed, take and record the running current for both exhaust and supply motors. Turn the toggle switch to HIGH, when the unit has changed to high speed, take and record the running current. (Incomplete ductwork or grills missing can have an effect on these readings).

FLOW READINGS:

With the unit running at high speed, take and record the flow readings on both exhaust and supply. This can often prove difficult depending on the location of the Dan-X and the layout of the ductwork. The site-commissioning agent along with the final balancing of the system should record these, but Dantherm will take readings where possible.

FINAL RUNNING CHECKS:

- Set the control switch to AUTO.
- Turn the Humidistat to its highest setting; the unit should run at low speed.
- Turn the Humidistat to its lowest setting; the fans should step up to high speed.
- Record the actual R/H in the return air near the Humidistat; check that the fans switch from low to high at the recorded value by manually turning the dial. (Calibrate if required).
- Record the temperature changes through the unit in both supply and exhaust.
- Fill manometers to the correct level (Where fitted).
- Set filter DP gauges to correct setting (Where fitted).
- Prime the drain water trap.
- The minimum air in temp can be set on the potentiometer in the control panel (0-30°C). This would usually be set between 5-10°C.
- Check for air leaks from any seals where the sections are joined and around the inspection doors.

© Crown copyright 2014
Department of Energy & Climate Change
3 Whitehall Place
London SW1A 2AW
www.gov.uk/decc
URN 14D/279