

The Assessor shall determine the business's commitment and support to good and safe working practices; also that it has a positive culture in all aspects of its work. In particular, the assessor shall check that the business's health, safety and environmental arrangements are followed while the work is carried. The details that the assessor will expect to find in use, are given in the BESCA standard BS.5 and BS.6. The level of assessment will be appropriate for, the size and the complexity of the business.

Ventilation, A/C and refrigeration plant and equipment - technical standards

BESCA standard	Scheme Requirement	Typical evidence required	
		Work done in domestic premises	Work done in non-domestic premises
TS.8.1	<p>Air handling units, fans and heating / cooling batteries</p> <p>Technical standards that apply to this work: <i>The Building Regulations Approved Documents Compliance guides</i> <i>BS 7671- Requirements for electrical installations</i> <i>British Standards</i> <i>BESA standards</i> <i>Manufacturer's instructions</i></p>	<ul style="list-style-type: none"> • Only Competent individuals who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, including where required, a suitable refrigerant handling certificate, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people as set out in BESCA standards BS.9 and/or BS.10. • The unit shall be sited on a base in accordance with the manufacturer and designer instructions, and shall have adequate clearances around it for maintenance and servicing. Air handling units shall be adequately bolted up on to a base frame, sealed to prevent air leakage, and have lockable doors that seal properly. • The return air ductwork, fresh air ductwork and the supply air ductwork shall be connected in accordance with the designer and manufacturer's instructions. Flexible joint connections shall be used at fan inlet and/or outlets and other points where the transmission of vibration needs to be avoided. These shall be between 50mm and 250mm wide, shall be aligned correctly so that they are not distorted, and shall not be too taut. Where required, access panels shall be provided to give access for inspection and servicing. Panels/covers shall be positioned so that there are no external obstructions preventing them from being removed and used. The ductwork shall be installed to BESCA standards TS.7.1 and/or TS.7.2. • The energy supplies to the unit shall be installed so that there is sufficient space between and around them to allow the energy that it uses to be monitored. If carried out as part of the installation, the electrical isolation, wiring, controls, etc, shall be installed and tested as set out in BS 7671- 'Requirements for electrical installations' and BESCA standard TS.13. • The pipework services to water fed heater and/or cooler battery inlets and outlets shall be connected to the correct ports, and shall be fitted with valves so that they can be isolated. The pipework shall be installed to BESCA standards TS.5.1, TS.5.3 and/or TS.5.4. A drain point and an air vent shall be provided to allow the heat and/or cooler battery to be drained for maintenance. Control valves operated from the building control system shall be fitted so that there is adequate space around them for maintenance and servicing. Drains off the cooler batteries and/or humidifiers shall run freely. • Pipework services to direct expansion (DX) cooler battery inlets and outlets shall be connected to the correct ports, and shall be fitted with valves so that they can be isolated. The pipework shall be installed to BESCA standard TS.5.2. • Leakage checks, and where required pressure tests, shall be carried out when the pipework installation is completed. This shall be done as set out in the BESCA Technical Schedule TS.5.8. • Humidifiers shall have an isolating valve on the water inlet and operate as required. Manual and motorised dampers shall have undamaged blades and, where required, have linkages that are connected up and operate. Air filters shall be fitted in accordance with the manufacturer's and/or the designer's instructions. • Water and/or refrigeration pipework services around the heating and/or cooling batteries shall be insulated, as specified by the designer, and as set out in BESCA standard TS.5.9. • Ductwork carrying heated or conditioned air shall be insulated as set out in BESCA standard TS.7.4 to prevent heat loss or gain. All ducts shall be identified using a triangular symbol that shows the direction of airflow and the type of service. • The unit shall be set to work and commissioned in accordance with the manufacturer instructions and as set out in BESCA standard TS.3. • On completion, notes shall be made or a drawing of the installation marked to show any deviations from the original specification or envisaged layout. This information shall be passed back to the office to use when the final record drawings are produced. 	

<p>TS.8.2</p>	<p>Refrigeration plant and heat pumps</p> <p>Technical standards that apply to this work:</p> <p><i>The Building Regulations Approved Documents Compliance guides</i></p> <p><i>The F Gas Regulations BS 7671- Requirements for electrical installations British Standards BESA standards Manufacturer's instructions</i></p>	<ul style="list-style-type: none"> • Only Competent individuals who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, including a suitable refrigerant handling certificate, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people as set out in BESCA standards BS.9 and/or BS.10. • The chiller, refrigeration plant, or heat pump shall be sited on a base in accordance with the manufacturer's and designer instructions. Where a structural steel base shall be used it shall be protected against corrosion. If the unit shall be mounted above ground level then there shall be adequate protection for operatives carrying out maintenance and servicing. • The energy supplies to the unit shall be installed so that there is sufficient space between and around them to allow the energy that it uses to be monitored. If carried out as part of the installation, the electrical isolation, wiring, controls, etc, shall be installed and tested as set out in BS 7671- 'Requirements for electrical installations' and BESCA standard TS.13. • Where an air cooled condenser is used, it shall be installed as set out on BESCA standard TS.8.3. Where an evaporative condenser or a cooling tower is used, it shall be installed as set out on BESCA standard TS.8.4. • On water cooled chillers, the chilled water and cooling water flow and return connections shall be correctly piped and valves shall be fitted to isolate the chiller. The pipework shall be installed to BESCA standards TS.5.1, TS.5.3 and/or TS.5.4. Drain points shall be provided to allow the chiller to be drained for maintenance. Where control valves operated from the building control system are fitted, there shall be adequate space around them for maintenance and servicing. • Leakage checks to the water pipes, and where required pressure tests, shall be carried out once the installation of the chiller and associated plant and pipework is completed. This shall be as set out in the BESCA Technical Schedule TS.5.8. • Where refrigerant lines are run to air-cooled or evaporative condensers, the pipework shall be installed as set out in BESCA standard TS.5.2. The refrigerant pipework to the unit shall be connected to the correct ports, and a suitably sized drier shall be installed in the liquid line, unless this has already been incorporated into the unit by the manufacturer. After the installation shall be finished, the refrigeration line shall be tested for leaks, as set out in BESCA standard TS.5.8. The refrigeration system shall be then evacuated and dehydrated before being charged with the correct type and amount of refrigerant. The refrigerant access valves shall be leak tested and securely capped. • Chilled water and/or refrigeration pipework services shall be insulated to prevent heat from being gained, as specified by the designer and/or manufacturer, and as set out in BESCA standard TS.5.9. • The controls and limit protection devices on the chiller or refrigeration plant shall be installed as set out in the BESCA Technical Schedule TS.14.1, and shall be correctly set and function. • The chiller, or refrigeration plant, shall be set to work and commissioned, and a load test shall be carried out, in accordance with the manufacturer's instructions, and as set out in BESCA standard TS.3. • On completion, notes shall be made or a drawing of the installation marked to show any deviations from the original specification or envisaged layout. This information shall be is passed back to the office to use when the final record drawings are produced.
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<p>TS.8.3</p>	<p>Air cooled condensers and outdoor heat pumps</p> <p>Technical standards that apply to this work:</p> <p><i>The Building Regulations</i> <i>Approved Documents</i> <i>Compliance guides</i></p> <p><i>The F Gas Regulations</i> <i>BS 7671- Requirements for electrical installations</i> <i>British Standards</i> <i>BESA standards</i> <i>Manufacturers instructions</i></p>	<ul style="list-style-type: none"> • Only Competent individuals who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, including a suitable refrigerant handling certificate, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people as set out in BESCA standards BS.9 and/or BS.10. • The condenser, or outdoor heat pump, shall be sited on a base in accordance with the manufacturer and designer instructions. Where a structural steel base is used it shall be protected against corrosion. • If the unit is sited inside a building, there shall be adequate ventilation so that the unit does not overheat. Where the air supply to or out of the unit is ducted, the ductwork shall be installed as set out in BESCA standards TS.7.1 and/or TS.7.2. • There shall be adequate clearance around the unit so that there are no restrictions to the airflow and for ease of maintenance and servicing. If the unit is installed near vegetation, there shall be adequate protection to prevent it from being blocked with leaves. If it is mounted above ground level then there shall be adequate protection for operatives carrying out maintenance and servicing. • The energy supplies to the unit shall be installed so that there is sufficient space between and around them to allow the energy that it uses to be monitored. If carried out as part of the installation, the electrical isolation, wiring, controls, etc, shall be installed and tested as set out in BS 7671- 'Requirements for electrical installations' and BESCA standard TS.13. • The refrigeration pipework shall be installed as set out in BESCA standard TS.5.2 and shall be connected to the correct ports on the unit. After the installation is finished, the refrigeration line shall be tested for leaks, as set out in BESCA standard TS.5.8. The refrigeration system shall be then evacuated and dehydrated before being charged with the correct type and amount of refrigerant. The refrigerant access valves shall be leak tested and securely capped. • The refrigeration pipework services shall be insulated to prevent heat from being gained; as specified by the designer and/or the manufacturer, and as set out in BESCA standard TS.5.2. • Fans should rotate freely and shall be fitted with protective guards to protect people from injury. • The controls and limit protection devices on the plant shall be installed as set out in the BESCA Technical Schedule TS.14.1, and shall be correctly set and function. • The unit shall be set to work and shall be commissioned as part of the overall system. This is shall be done in accordance with the manufacturer's instructions, and as set out in BESCA standard TS.3. • On completion, notes shall be made or a drawing of the installation marked to show any deviations from the original specification or envisaged layout. This information shall be is passed back to the office to use when the final record drawings are produced.
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<p>TS.8.4</p>	<p>Cooling towers and evaporative condensers</p> <p>Technical standards that apply to this work:</p> <p><i>The Building Regulations</i></p> <p><i>Approved Documents</i></p> <p><i>Compliance guides</i></p> <p><i>The F Gas Regulations</i></p> <p><i>BS 7671- Requirements for electrical installations</i></p> <p><i>British Standards</i></p> <p><i>BESA standards</i></p> <p><i>Manufacturer instructions</i></p>	<ul style="list-style-type: none"> • Only Competent individuals who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, including where required, a suitable refrigerant handling certificate, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people as set out in BESCA standards BS.9 and/or BS.10. • The cooling tower, or evaporative condenser, shall be sited on a base in accordance with the manufacturer's and designer's instructions. Where a structural steel base is used it shall be protected against corrosion. The unit shall be adequately bolted-up and sealed to prevent water leakage, and shall have lockable doors that seal properly. Where the unit is installed near vegetation, there shall be adequate protection to prevent it from being blocked with leaves. • There shall be adequate clearance around the unit so that there are no restrictions to the airflow and for ease of maintenance and servicing. If it is mounted above ground level then there shall be adequate protection for operatives carrying out maintenance and servicing. • Where the air supply to or out of the unit is ducted, the ductwork shall be installed as set out in BESCA standards TS.7.1 and/or TS.7.2. • The energy supplies to the unit shall be installed so that there is sufficient space between and around them to allow the energy that it uses to be monitored. If carried out as part of the installation, the electrical isolation, wiring, controls, etc, shall be installed and tested as set out in BS 7671- 'Requirements for electrical installations' and BESCA standard TS.13. • Fans shall rotate freely and those fitted with drive belts shall have a motor and drive guard to protect people from injury. Drive belts, where fitted, shall be aligned and tensioned. • The pipework services to the inlets and outlets shall be connected to the correct ports, and shall be fitted with isolation and by-pass valves in accordance with the manufacturer's recommendations. The cold water supply to the sump shall be fitted with an isolation valve. The sump shall be fitted with an overflow and a drain to allow the tower pond to be emptied for maintenance. The pipework shall be installed to BESCA standards TS.5.1, TS.5.3 and/or TS.5.4. • A strainer shall be fitted between the outlet of the cooling tower sump and the re-circulating pump and a filter shall be fitted on the return water inlet to the tower. A non-return valve shall be fitted where there is a possibility of drain-back through the water circuit. • Where control valves operated from the building control system shall be fitted as set out in BESCA standard TS.14. There shall be adequate space around them for maintenance and servicing. The pipework and associated fittings shall be supported so no unnecessary weight is put on the structure of the tower or condenser. • Leakage checks, and where required pressure tests, shall be carried out when the pipework installation is completed. This shall be done as set out in BESCA standard TS.5.8. Exposed water pipework shall be fitted with trace heating and shall be insulated to prevent it from freezing, as set out in BESCA standard TS.5.9. • Where refrigeration pipework is installed, it shall be done as set out in BESCA standard TS.5.2 and shall be connected to the correct ports on the unit. After the installation is finished, the refrigeration line shall be tested for leaks, as set out in BESCA standard TS.5.8. The refrigeration system shall be then evacuated and dehydrated before being charged with the correct type and amount of refrigerant. The refrigerant access valves shall be leak tested and securely capped. • The refrigeration pipework services shall be insulated to prevent heat from being gained, as specified by the designer and/or the manufacturer, and as set out in BESCA standard TS.5.2. • Before the system is put into operation, the cooling water that is re-circulated shall be treated to minimise corrosion, and shall be protected against the growth of legionella or other harmful bacteria. • The cooling tower, or evaporative condenser, shall be set to work and shall be commissioned as part of the overall system. This shall be done in accordance with the manufacturer's instructions and as set out in BESCA standard TS.3. When the unit is put into operation, it shall be checked to make sure that any moisture losses in the air from the tower will not cause a problem with any surrounding installations, buildings, etc and that there shall be no undue noise or vibration problems. • On completion, notes shall be made or a drawing of the installation marked to show any deviations from the original specification or envisaged layout. This information shall be passed back to the office to use when the final record drawings are produced.
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<p>TS.8.5</p>	<p>Split air conditioning units and domestic heat pumps</p> <p>Technical standards that apply to this work: <i>The Building Regulations Approved Documents Compliance guides</i> <i>The F Gas Regulations BS 7671- Requirements for electrical installations</i> <i>British Standards BESA standards</i> <i>Manufacturer's instructions</i></p>	<ul style="list-style-type: none"> • Only Competent individuals who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, including a suitable refrigerant handling certificate, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people as set out in BESCA standards BS.9 and/or BS.10. • The energy supplies to the units shall be installed so that there is sufficient space between and around them to allow the energy that it uses to be monitored. • Outdoor unit <ul style="list-style-type: none"> ○ The outdoor unit shall be sited in accordance with the manufacturer's and designer's instructions on a level base that can take its weight and that of any relevant pipework. Where a steel base is used it shall be protected against corrosion. There shall be no restrictions to the airflow in the area where the unit has been sited that will effect the operation of the heat exchanger. ○ There shall be adequate access around the unit to enable all the required maintenance procedures to be safely carried out. If the unit is mounted above ground level then there shall be adequate protection for people carrying out maintenance and servicing. The guards on rotating equipment shall be in place, secure and give adequate protection. ○ The control piping fitted to the unit shall be free from vibration and not rubbing or in contact with other pipes or components. A suitable drain shall be installed so that the defrost water, which will occur when the heat pump switches to its cooling mode, can run away. ○ The unit has an electrical isolator next to it, which shall be protected against the ingress of water and comply with BS 7671- 'Requirements for electrical installations'. • Indoor Unit <ul style="list-style-type: none"> ○ The indoor unit shall be securely located, in accordance with the manufacturer's and designer's instructions. There shall be adequate access around the unit to enable maintenance work to be carried out safely. Additionally, there shall be no restrictions to the air flow either into or out from the unit. The movement of any motorised air distribution louvers on the unit shall be not restricted and shall give a balanced airflow over the conditioned area. ○ The control piping fitted to the unit shall be free from vibration and not rubbing or in contact with other pipes or components. A suitable drain shall be installed to remove any condensate from the indoor unit. ○ The unit shall have an electrical isolator next to it, which shall be protected by a fuse, or an MCB, and complies with BS 7671- 'Requirements for electrical installations'. • Pipework <ul style="list-style-type: none"> ○ The refrigeration pipework shall be installed as set out in BESCA standard TS.5.2. On a heat pump, the pipework incorporates the correct reversing valve (if used) and expansion devices, together with a bi-directional drier where the system does not have a reversing valve. ○ The pipes shall be insulated in accordance with the recommendations of the system manufacturer, to control the loss or gain of heat from or to the pipework, and as set out in BESCA standard TS.5.8. Pipework and/or fittings that may freeze in cold conditions shall be insulated to prevent this happening. All pipes shall be labelled and/or have coloured bands applied to identify them. • Electrical <ul style="list-style-type: none"> ○ If carried out as part of the installation, the electrical isolation, wiring, controls, etc, shall be installed and tested as set out in BS 7671- 'Requirements for electrical installations' and BESCA standards TS.13 and TS.14. • On completion, the pipework system shall be tested using a compressed gas as set out on BESCA standard TS.5.8. After testing it shall be evacuated and dehydrated before being charged with the correct type and amount of refrigerant. The refrigerant access valves shall be leak tested and securely capped. • The units shall be set to work and shall be commissioned as set out in BESCA standard TS.3. Following this a load test shall be carried out in accordance with the manufacturer's instructions. • On completion, notes shall be made or a drawing of the installation marked to show any deviations from the original specification or envisaged layout. This information shall be passed back to the office to use when the final record drawings are produced.
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<p>TS.8.6</p>	<p>Terminal Cooling Devices - fan coils, chilled beams, etc</p> <p>Technical standards that apply to this work: <i>The Building Regulations Approved Documents Compliance guides</i> <i>The F Gas Regulations</i> <i>BS 7671- Requirements for electrical installations</i> <i>British Standards</i> <i>Manufacturer's instructions</i></p>	<ul style="list-style-type: none"> • Only Competent individuals who have the necessary skills, knowledge and experience, as set out in BESCA standard BS.9, including where required, a suitable refrigerant handling certificate, shall undertake the work so that it meets the standards set by BESCA. The business's training and/or subcontract records shall identify these people as set out in BESCA standards BS.9 and/or BS.10. • Each fan coil unit shall be adequately and securely supported as required by the manufacturer or the designer. There shall be adequate access around the unit to enable maintenance to be carried out effectively and safely. • The energy supplies to the fan coil unit shall be installed so that there is sufficient space between and around them to allow the energy that it uses to be monitored. If carried out as part of the installation, the electrical isolation, wiring, controls, etc, shall be installed and tested as set out in BS 7671- 'Requirements for electrical installations' and BESCA standard TS.13. • Isolating and regulating valves shall be fitted to the pipework serving the inlet and outlet to the fan coil. A drain point and air vent shall be provided to allow the unit to be drained for maintenance. Where required, the unit has a control valve fitted that is operated from the building control system. • The pipework to and from the fan coil shall be installed as set out in BESCA standard TS.5.1, TS.5.3 or TS.5.4. The finished pipework shall be tested as set out in BESCA standard TS.5.6. Where flexible connections are used to reduce vibration and sound transmission, they shall be aligned correctly, not distorted and shall not be too taut. • Ductwork to and from the fan coil shall be installed as set out in BESCA standard TS.7.1. • A locally mounted fan coil, with its own thermostat and/or programmer, shall be wired and fitted with fuses as required by BS 7671- 'Requirements for electrical installations'. If carried out as part of the installation, the electrical isolation, wiring, controls, etc, shall be installed and tested as set out in BESCA standard TS.13 and TS.14. • The locally mounted thermostat and/or programmer shall be correctly sited and set at the required speed and temperature. • Leakage checks, and where required pressure tests, shall be carried out when the installation of the fan coils is completed. This shall be done as set out in BESCA standard TS.5.8. • The fan coil shall be set to work and commissioned as part of the overall system. This shall be done in accordance with the manufacturer's instructions and as set out in BESCA standard TS.3. • On completion, notes shall be made or a drawing of the installation marked to show any deviations from the original specification or envisaged layout. This information shall be passed back to the office to use when the final record drawings are produced.
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