Document Title	**Method Statement – January 2018, Small Installations**
Customer / Site Details	*TBC =*
Brief Description of Work	**Installation of Smaller Split System Air Conditioning / Heat Pump / Ventilation or Refrigeration Equipment.**
P&R Job Reference / Nº	*TBC =*

Introduction.

This document is intended to provide an outline to the work scope and details of the overall method for the works, it will be issued to clients upon request and held by the P&R contract manager and competent persons. It is not intended to be a step by step instruction manual, as the work will be carried out by competent and experienced persons who are able to adapt their working practices to various site conditions and situations using our set of task based risk assessments and dynamic risk assessment processes.

If required prior to or at the start of the works / work shift, the P&R contract manager or competent person will carry out a detailed 'walk round' and outline the work scope and potential impacts of the work to the clients representative. This if required, will outline the need to evacuate areas to allow for the installation and testing work to be carried out safely.

Document Index.

1. Description of Work.

The work scope is ……..

……...

……...

……...

Where relevant see attached diagrams / sketches indicating the general location of the main items of equipment and approximate interconnecting services routes.
Where relevant see any relevant system schematic diagrams.

2. Site Specific Information / Work Procedures.

2.1. The P&R engineer/s will report to the site contact / site security upon arrival at the site. As required the necessary sign in / sign out procedures used by the site will be followed. Note: On some smaller sites this may not be a formal requirement.

2.2. The client may require persons working on site to have undertaken a site induction prior to starting any works. The need for this will either be pre-determined or advised to the engineer when first attending site.

2.3. The site also may operate a 'Permit to Work' system for various work activities. The need for this will either be pre-determined or advised to the P&R engineer when first attending site by the customer.

In this instance the P&R competent person will agree the permit requirements with the site contact for the anticipated work scope to ensure full compliance with the clients HSE system.
The competent person will be responsible for ensuring the necessary Permits to Work are in place before work starts and correctly signed off and completed following the completion of the works or at the end of the work shift.

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2.4. If the site does not have in place its own site induction process and or a permit to work system, Pitkin & Ruddock's standard 'Safe Systems of Work' will form the basis of our site operations.
This will provide the required level of HSE management and operational structure for this type of work.
Note; Under no circumstances must these systems be ignored at the request of a customer.

3. P&R Contacts.

Pitkin & Ruddock, Lowestoft	Main Contact Number	01502 563629
Pitkin & Ruddock, Ipswich	Main Contact Number	01473 740500
Pitkin & Ruddock, Bury St Edmunds	Main Contact Number	01284 767579
Three Counties Refrigeration	Main Contact Number	01284 767579

4. Risk Assessment and Hazards Identification Processes.

4.1 Risk Assessments.

A Project Risk Assessment based on document PRHS RA21 has been created to cover the overall work scope, this will be issued with this method statement.

In addition to this a number of the standard task based Risk Assessments produced by Pitkin & Ruddock will also apply to the anticipated work scope. These are listed below and the highlighted documents are those initially identified as applicable to the contract works.
During the course of the work developing other task based assessments may also need to be applied. All P&R engineers are issued with a HSE folder, which contains a full set of task based risk assessments and they are aware of the control measures required to carry out the tasks in a safe manner. In addition to these recorded documents, dynamic risk assessment is carried out by the engineering teams who are experienced and competent in the various tasks being undertaken.

Task Based Risk Assessment Title	Yes	No
PRHS RA01 - Use of Refrigerant Gases / Liquids		
PRHS RA02 - Use of Ammonia Refrigerant / Working on Ammonia Systems.		
PRHS RA03 - Pressure Testing Refrigeration Systems.		
PRHS RA04 - Electrical Testing Refrigeration Systems.		
PRHS RA05 - Storage / Use of Bottled Gases.		
PRHS RA06 - Brazing / Silver Soldering / Burning.		
PRHS RA07 - Portable Scaffolding (Zip Up Type).		
PRHS RA08 - Manual Lifting / Rigging.		
PRHS RA09 - Use of Ladders / Steps.		
PRHS RA10 - Use of Electric Jigsaw.		
PRHS RA11 - Use of Electric Hand Grinder.		
PRHS RA12 - Drilling with Electric Drill.		
PRHS RA13 - Arc Welding.		
PRHS RA14 - Working at Height / On Roofs.		
PRHS RA15 - Use of Mechanical Lifting Equipment.		
PRHS RA16 - Vehicle Safety in the Work Place.		
PRHS RA17 - Use of Electric Chop Saw.		
PRHS RA19 - Work in Confined Spaces.		
PRHS RA20 - Use of Mobile Elevated Work Platforms.		
PRHS RA22 - Use of Standard Cleaning Chemicals & Oils.		

Upon request copies of the task based Risk Assessments can also be issued to the client for information prior to or during the work. If a specific hazard outside the scope of normal conditions or engineers experience is identified during the installation, the work should not proceed until further consideration of correct control measures is carried out.
In some circumstances a further hazard specific risk assessment may need to be carried out, agreed and recorded for this activity by the competent person or P&R contract manager in conjunction with the site representative / HSE / technical staff.

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Where installations are of a simple and straight forward nature, a standard P&R Point of Work Safety Assessment will be completed by the competent person prior to starting any work.
The Point of Work Safety Assessment takes the form of a checklist, which requires completion; it leads the engineer via the **STAR** principle (Stop, Think, Act & Review) to consider various aspects of the work to be carried out including;

- Documentation / permit requirements.
- Plant identification.
- PPE requirements.
- Hazard identification.
- Application of relevant task based risk assessments.

4.2 Site Access for P&R Vehicles.
P&R competent person to liaise with site representative to locate suitable locations for unloading, loading and parking. If required a vehicle permit should be obtained and left visible at all times whilst vehicles are on site.

4.3 Asbestos.
Where the fabric of the building may be disturbed or there is a requirement to enter potentially dusty areas, the P&R engineer/s will ask the site contact if they have knowledge of any asbestos being present in the work areas, the site asbestos register may also be consulted.
If no Asbestos has been specifically identified in the work area the work can proceed, however operatives should always maintain a high level of awareness whilst working with the building fabric.
If Asbestos is identified as being present or there is in any doubt regarding substances present the engineer/s should stop work and not proceed further until consultation with P&R contract manager has taken place.

4.4 Site Operated & Third Party Vehicles.
Operatives should wear Hi – Visibility vests or jackets when in areas subject to traffic movement and use protection barriers where practical to separate themselves / work platforms from any vehicles moving around the site.
Be aware vehicles are responsible for a number of workplace deaths and major injuries each year.

4.5 Working at Height.
With nearly all installation activities some working at height is likely to be required.
Suitable staging, steps and protection measures are to be used dependant upon the amount and type of work to be carried out.
Prior to every work at height task, a dynamic assessment should be made to determine which access method best suits the site conditions and the particular work task. Where a safe method of access is unable to be determined and implemented the work should not proceed and the contract manager informed.

4.6 Manual Handling.
All installation work will require a reasonable amount of manual handling, these activities include lifting tools and equipment and the location and fixing of equipment. Operatives must carefully consider the specific method to be used with each manual handling activity and implement a safe system of lifting for each one.
Again if in doubt do not proceed and refer to the contract manager for guidance / instruction.

4.7 Good House Keeping.
Good house keeping procedures are essential to ensure the site is kept in a tidy condition. Rubbish is to be tidied / removed regularly to ensure fire and trip hazards are minimised.
Fire / emergency exits must be kept clear at all times.
At the end of each shift the work area is to be inspected and left in a safe state.

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4.8 Others in The Work Area.
Other trades persons, customers staff or members of the public may be present in or close to the work area, their actions may endanger operatives or operatives actions may endanger others, due consideration of these factors must be taken at every stage of the work and reasonable steps taken to avoid any incident. The correct use of separation, signage, supervision and co-operation should be made to eliminate or minimise such risk.

5. General Safety Considerations.

- Pitkin & Ruddock Ltd company safety procedures to be complied with at all times.
  (Copy of Company HSE Policy Manual is available at all P&R offices for client inspection).
- All persons involved in the work shall be fully trained and competent in relation to the tasks they are required to undertake, no person will be required to carry out any tasks that they feel unhappy about doing in relation to health and safety. Pitkin & Ruddock promote and operate a culture where any employee can discuss concerns they have with senior management at any time. The senior management are fully committed to operating our business to the highest standards both in terms of HSE and quality.
- All persons shall, prior to commencing any work covered by this method statement, read this method statement and any relevant task based risk assessments, be aware of their content, instructions and what actions to take in the event of doubt or uncertainty regarding the Health & Safety of themselves and others or impact of our activities on the Environment.
- All members of the working party shall be made aware of the potential hazards of the working area. This, dependant on location, may require a site induction to be carried out *(see section 2 above).*
- Where scaffolding / platforms / ladders are used these shall be erected by competent persons, in accordance with the manufacturers instructions and checked prior to each use.
- Low-level work platforms should be used in preference to ladders and steps wherever possible.
- 'A' frame steps should only be used for short-term access, wherever possible work platforms should be employed.
  Refer to task based risk assessments PRHS RA09 and RA07
- All electrical tools, access equipment and brazing equipment will be subject to regular test and inspection to ensure these are maintained in good condition. Records of test and inspection will be held by P&R and labels indicating test dates and future test requirements will be fixed to the relevant equipment. Check these are in date before each use.
- Where lifting operations are to be carried out manually, due care is to be taken.
  Refer to task based risk assessment PRHS RA08
  Any potential hazards relating to accidental dropping during lifting or locating equipment will need to be considered, as required by circumstances adequate protection may need to be provided before lifts commence.
- The work scope associated with installations often includes activities classed as hot work, in these instances a site-specific Hot Work permit may be required, this will list precautions and fire extinguisher requirements, in the event such a system is not operated by the site, as a minimum P&R hot work requirements must be adopted.
  Refer to task based risk assessments PRHS RA05 and RA06
- ***PLEASE MAKE SURE A REASONABLE AMOUNT OF TIME IS SPENT BEFORE STARTING EACH SHIFT TO CONSIDER ALL THE HEALTH, SAFETY AND ENVIRONMENTAL ASPECTS OF THE WORK TO BE CARRIED OUT.***
  IF IN ANY DOUBT PLEASE ASK THE MANAGER RESPONSIBLE.

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6. Common Practice / Procedures.

6.1 Materials / Substances.

A C.o.S.H.H Assessment and Material Safety Data Sheets (MSDS) for the substances commonly used by P&R in the course of works including refrigerants, industrial gases, oils and cleaning chemicals are kept in the engineers Health, Safety & Environmental folders, a further copy is maintained in each of the P&R service offices. P&R engineering staff are experienced and competent in the use and control of these substances.

6.2 PPE.

Personal protective equipment (PPE) is supplied to all P&R personnel.
Suitable PPE shall be worn dependent on the task being performed and any identified site specific requirements, if in doubt P&R engineers will refer to task based risk assessments and individual site safety rules to ensure the correct level of PPE is applied to the work being carried out / location.
PPE used during the normal course of our work includes but is not limited to the following;

- Head protection; hard hats and bump caps.
- Eye protection; safety glasses, goggles or face shields.
- Ear protection; ear plugs or ear defenders.
- Gloves; type depending on task / environment.
- Safety footwear.
- Respirators. Our preferred option is powered respirators due to face fit issues.
- Hi Vis clothing; coats or vests.
- General work wear, coveralls and thermal protection including knee and elbow protection.
- Hygienic protection; disposable coveralls, hairnets, gloves and beard snoods. (These are normally site specific and therefore supplied by site)

6.3 Fire Detection System.

Competent person to investigate with the site representative to determine if a fire detection system is used in the areas work is being undertaken.
If this is the case then the potential impact of the works upon the system should be investigated.
Fire detection systems of different types are used, some can be set off by movement or dust as well as heat / flame / light so ensure these are all investigated prior to starting work to avoid false alarms and the impact these have on production and emergency services call outs.
If a fire detection system requires isolation for any reason to carry out specific works it must be re-instated as soon as the work is complete to ensure ongoing protection. This should be included in any Permit to Work descriptions.

6.4 Site Access.

P&R competent person to determine access routes for personnel and equipment, where permission is required this is to be obtained.
Any special access procedures to be listed and the working party informed.
This may require liaison with the site representative or site security personnel.

6.5 Safe Working Order.

The P&R competent person (engineer) will assess the installation tasks to determine the correct and safe order of works. The identified activities will then be carried out using the relevant control measures stated in the risk assessments for each task. If during the course of the works additional hazards or further scope is identified these will be reviewed and if necessary modifications made to the 'Point of Work Safety Assessment' to ensure the revised work scope / activities are fully covered.
If at any time there is any question that a safe working environment cannot be maintained, then the work should be stopped in a controlled manner and guidance sought from the P&R line manager and or site representative.

The order of works, once fully determined should be confirmed and agreed with the clients representative, this process will take into account the site access, site operational requirements, equipment availability, program, good working practice and the need for efficient working.

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6.6 Hot Works.
Where hot works are included in the work scope, P&R Hot Work restrictions, relevant risk assessments and any customer specific requirements must be strictly adhered to at all times.
Be aware hot work is likely to be an activity that requires a Permit to Work on most large sites, investigate this requirement fully before proceeding.

6.7 Existing Equipment.
Any existing equipment requiring removal will be de-commissioned and safely removed.
As determined by system type, refrigerant and lubricating oil will be recovered in a safe manner and returned for recycling / destruction. This activity is covered by the Hazardous Waste Regulations and will therefore require traceability.
Any other items of redundant equipment will be treated as scrap, which will also be removed in a safe manner.

6.8 Equipment Locations / Fixing.
The locations of the new equipment, controls and fixing / location methods will be determined / agreed with the customers representative.
The agreed location of equipment must specifically consider the following points.

- Ability to safely locate the equipment.
- Future maintenance and service requirements of the equipment.
- The need for safe access to equipment in future will impact on its proposed location.
- Impact of equipment and airflow on persons in conditioned / refrigerated areas.
- Impact of equipment (outdoor units) and airflow / ventilation requirements of the equipment.
- Condensate water discharge points and outdoor unit drainage points to avoid potential freezing / slip issues in winter conditions.

The method of fixing each item of equipment and inter-connecting service items need to be fully considered and suitable fixings used to support the weight of individual items with a built in safety factor.

Following full consideration, these items can be sited and securely fixed in position using correct number of persons / lifting equipment to match the weight / loads.

6.9 Interconnecting Service Routes.
Trace any new refrigerant pipe, condensate drain pipe, cable and ductwork runs carefully and mark where new brackets / supports / penetrations are to be installed, these should be agreed with the contract manager and site representative at an early stage of the installation program.
Where possible pipe runs should be as direct as practically possible and restrictions such as bends kept to a minimum, any high lifts and extended runs need to be identified and discussed with the contract manager to ensure an unacceptable loss in equipment refrigeration / heating capacity does not happen.
Be aware all RAC equipment has practical design limits in terms of pipe run lengths and oil return criteria.
Any unusual or specified support method requirements for the interconnecting services will be advised by the contract manager at the start of the job, otherwise industry good practice installation standards will be adopted for this activity.

6.10 Refrigerant Pipe.
The pipe sizes and installation system method will be advised by the contract manager at the start of the job, if for any reason this needs to be changed please consult before proceeding.

Pipe material will also be determined this may be refrigeration grade copper or aluminium tube depending on which system best suits the application and site installation / environment requirements.
Measure carefully pipe runs, install correctly sized refrigerant pipes with flared, compression and or brazed joints.

Where brazed joints are to be used, before commencement of any brazing, ensure a suitable working fire extinguisher is to hand, further ensure it is correct for use in the area you are working and fire watcher is available for Oxy / Acet / Propane work.

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Also refer to section 6.3 Fire Detection System and ensure this has been implemented BEFORE STARTING.

A small amount of Dry Nitrogen is to be purged through the pipework whilst any brazing is being carried out to eliminate oxidisation during the brazing process. If not carried out correctly this contamination may lead to future problems with system operation / reliability. Sufficient ventilation is required during this process to avoid oxygen / air displacement where Nitrogen is discharged.

Brazed joints will be made using high content silver solder or eutectic alloy, excess flux to be removed and joints left clean following brazing.

6.11 Refrigerant Pipe Thermal Insulation.

The need for thermal insulation on the interconnecting refrigerant and condensate pipes will be advised by the contract manager at the start of the job.

As pipe runs progress, slip uncut insulation material onto pipes, mark location of joints under pipework with tape on outside of insulation (this will facilitate easier testing at commissioning stage). Following successful pressure-testing, any joints in the thermal insulation should be glued to provide a vapour seal and eliminate / reduce moisture ingress to the cold pipe surfaces.

Depending on system type, thermal insulation requirements will be determined and applied in accordance with equipment manufacturers instructions and good refrigeration engineering practice.

Where exposed directly to sunlight a suitable paint or cover should be applied to reduce long term UV or wildlife damage to the insulation.

6.12 Condensate Pipework.

Any route and terminations for condensate water piping will be determined and agreed with the contract manager and site representative.
Avoid routes over electrical and IT equipment where leakage may result in operational damage and disruption.
If required condensate pumps will be fitted to allow the water to be taken to a local drainage point, if required by site conditions install a suitable water trap / air gap to avoid cross contamination of drainage systems.
Condensate pumps require a separately fused electrical supply with local isolation, this would normally be in the form of a dedicated fused spur, normally protected at 3 amp. (Check pump instructions)
Attention should be paid to future maintenance / cleaning of the drain piping and suitable access points should be installed to facilitate cleaning of the condensate drain pipes.
Specific consideration needs to be paid to the discharge points of condensate water that is routed to outside where condensate piping may freeze and block the line or the removed condensate water may form ice on paths / walkways in sub zero temperatures.

6.13 Cables.

Where existing power supplies are reused or new cabling installed, these need to be checked for suitability in terms of breaker and cable sizing against the new equipment electrical ratings.

Any interconnecting power and control cables will normally be supplied, installed and tested by Pitkin & Ruddock. New power supplies normally by an electrical contractor working directly for the client / main contractor or as a sub contractor to Pitkin & Ruddock.
Normally power supply / Interconnecting cables will be SWA / SY to suit run lengths, equipment operating current and general site conditions / client specification.
Connect cables to units using proprietary glands as required and make terminations with crimp connectors to ensure good connections.

Armour braiding must not to be used as the only form of earthing, a separate core either as part of a multi core or separate cable will be used for the Earth connection.
Where plastic boxes are used suitable connections are to be made to ensure any required earth continuity of any cable armour is maintained.

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6.14 Waste.
Good house keeping is essential to maintaining a safe working environment.
Clear waste material as it builds up, at least once per working shift.
Attention should be paid to the identification and correct disposal of waste.
In instances where large quantities of waste are anticipated, a separate waste management plan may need to be put in place. If this is the case, the arrangements for waste disposal will be outlined by the contract manager / project engineer at the start of the works.

6.15 Penetrations.
The nature of installation works often require services to pass through walls or structures. Any penetrations that are made need to be suitable for the services to run through and maintain the structural and or fire integrity of the building.
Standard penetrations need to be finished in a neat tidy manner, where fire walls / fire breaks have been penetrated any remaining voids / holes are to be filled with intumescent foam or suitable sealant / cover to maintain the original fire rating / integrity.
Where dust and air borne particles are created by the process of creating penetrations, suitable measures are to be taken to reduce dust at source and if required respiratory protection should also be worn by operatives.

6.16 Testing and Commissioning.
All new cables to be inspected / tested before final connections and readings recorded.
Verification of fuse / circuit breaker, sizes and locations should be confirmed before connection of power supplies are made.

The interconnecting refrigerant pipe systems will be pressure tested and then evacuated in accordance with the equipment manufacturers recommendations and P&R pressure test procedures.

Nitrogen only to be used for pressure testing, always double check connected cylinders as accidental use of Oxygen which has the same connections as Nitrogen has a very high potential to cause an explosion due to the oil content of a refrigeration / air conditioning.

Following successful pressure testing, the relevant parts of the system will be evacuated to remove any air or moisture from the pipe system. The vacuum will be broken with the systems design refrigerant.

Systems will then be charged with the correct type and quantity of refrigerant according to manufacturers recommendations for the system.

A record of the total refrigerant charge weight should be noted on the outdoor unit / charging point.
It is important that any refrigerant added is compatible with the system components and overall design.
A record of total system charge will be kept and form part of the documentation supplied to the site represenative.

Fully test every condensate drain pipe, joint and pump to ensure no water leakage.

Carry out overall performance testing and commissioning as per the manufacturers recommendations and complete the relevant P&R / manufacturers commissioning sheets.

6.17 Hand Over.
Advise customers representative / users of equipment operation and provide practical demonstration.
Operation and Maintenance documentation will be prepared and provided to the site representative by the P&R Contract Manager.
If required by refrigerant type and charge volume (equivalent CO2 charge weight) then an F Gas log sheet should be completed or created and handed to the site representative for future service and inspection activities. (one for each refrigeration system)

6.18 Accidents or Incidents.

In the event of an accident or incident during the course of the installation works, following any immediate actions of seeking assistance, first aid or making the area safe, the accident / incident should be reported to the site representative at the earliest opportunity, it should also be reported to the relevant P&R line manager. Both site and P&R procedures such as accident book completion and accident / incident investigation should also be carried out at the earliest opportunity.

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7. Attachment List (Documents and Drawings).

- Overall Project Risk Assessment PRHS RA21 (Job Number) …….
- Pitkin & Ruddock Point of Work Safety Assessment & Work Report
- Identified Task Based Risk Assessments (as identified in section 4.1 table).
- Marked Up Site Layout Diagram/s.
- System Schematic Diagram/s.
- Equipment Manufacturers Installation Instructions
- Equipment Manufacturers Operation & Maintenance Instructions
- Pitkin & Ruddock Engineers Heath, Safety & Environmental Folder (Held by all engineering staff) This document includes;
    - Task Based Risk Assessments.
    - C.o.S.H.H. Assessment and Material Safety Data Sheets for Commonly Used Substances.
    - Safe Systems of Work - Descriptions
    - Isolation Details
    - Equipment Test & Inspection Regimes
    - Hot Work Procedures
    - Pressure Test Procedures
    - Various Tool Box Talks
    - F-Gas Requirements
- P&R Company HSE Policy Manual (Held at all P&R Offices)
- Client Permit to Work (Where Applicable / Site Specific Document)
- Client Site Rules & Regulations for Contractors (Where Applicable / Site Specific Document)

Job Specific Reference Documents

- Pitkin & Ruddock Quotation Nº ……
- Client Purchase Order Nº ……

8. Job Specific Details.

P&R Competent Person; ……

Emergency Contact Number; ……

Other P&R Engineers; ……

……

Site Representative; ……

Emergency Contact Number; ……