| **INFORMATION TO BE INCLUDED** | **MEASUREMENT RULES** | **MEASUREMENT & PRICES** | **DEFINITIONS** |
| --- | --- | --- | --- |
| 1. Refer to Introduction, General Rules and Recommendations
2. Refer to relevant Specification sections containing particulars of mechanical services
3. Items will be given for all plant, equipment, ductwork and terminals, pipework, fixtures, fittings, seismic restraints, associated electrical work as required for the complete system
4. Items will be given for:
5. balancing air conditioning installation, adjustment of lift levels, tuning, optimisation and similar work
6. testing installations as required stating whether fuel, water and electricity for this purpose will be supplied free of charge or not
7. preparing shop and as installed drawings or diagrams and instruction manuals of each installation
8. specific service and maintenance requirements
9. commissioning
10. warranties
11. training
12. A note will be given stating:
13. work will conform to the requirements of any statutory authorities
14. on what basis the installations have been measured, where installation drawings are not provided, or the contract documents do not otherwise clearly indicate the full extent of all lines required
 | M1. measure each different type of installationunder an appropriate headingM2. state the quality and **kind of material** involved in each description or in the appropriate sub- headingM3. describe work to be primed or painted before fixing or delivery to the siteM4. describe work to be surface treated other than by paintingM5. measure painting to work required to be painted on site in accordance with section 29 PaintingM6. measure separately work fixed to metal or steel background surfaces, otherwise include in the description for fixing to various background surfaces | P1. measurement and prices deemed to include for:sockets, running joints, connectors, back nuts, nipples and pipe and duct fixings such as supporting clips, saddles, brackets, hangers, straps, screws, nails, explosive and low velocity tool fastenings and other metal fastening anchors and/or systems and fixing complete including cutting and forming holes, supplying and building in sleeves (other than fire rated), adaptor plates, test holes and covers | D1. kind of material such as steel, copper, cast iron |

| **CLASSIFICATION TABLE** | **MEASUREMENT RULES** | **MEASUREMENT & PRICES** | **DEFINITIONS** |
| --- | --- | --- | --- |
| 1. Pipework
 | 1. pipework
 |  | 1. in stages of **1m height increments** between the item and the supporting structure
2. in stages of **1m height increments** between the underside of item being installed and the floor level where >3.5m
3. separate measurement of vertical and horizontal installations and identify any non-standard installations (such as in a riser)
 |  | M7. measure in accordance with section 32 Hydraulics |  |  |
| 1. fire rated sleeves
2. lagging
3. fittings
4. valves
 |  | 1. cocks and valves
2. steam traps
3. strainers
4. gauges
5. thermometers
6. similar items
 | 1. lagging to include protective sheaths etc.
2. lagging includes insulation and this is to be measured separately
 |  |  |  |
| 1. Ductwork
 | 1. ducting
2. curved ducting stating the mean radius
3. external ductwork insulation
 | m | 1. stating type and size (airway or ductwork)
2. stating metal gauge thickness
3. separate smoke rated
4. separate fire rated
5. separate internally insulated
6. in stages **of 1m height increments** between the item and the supporting structure
7. in stages **of 1m height increments** between the underside of item being installed and the floor level where >3.5m
8. separate measurement of vertical and horizontal installations and identify any non- standard installations (such as in a riser)
 | 1. stating if flexible ~~or extensible~~ or rigid
2. including joints stating method of jointing
3. including internal insulation and linings ~~and eternal insulation where applicable~~
 | M8. measure ducting to the net length along the centre line of ducts over all bends, offsets, diminishing pieces, change of section pieces, junction pieces, shoes and similar duct fittingsM9. measure flexible ~~and extensible~~ ducting to the net length as installed |  |  |
| 1. special connections
2. special joints
3. fire rated penetration treatment
 | no. | 1. connections between ducting of differing materials
2. connections between ducting and equipment stating the nature of the equipment
3. **isolated joints** which differ from those given in the description of the ducting
4. flexible connections between ducting and plant
 | 1. stating the size and kind of ducting concerned and method of jointing
 | M10. measure special connections, ~~and~~ joints and balancing dampers except where included in the description of another numbered item (such as air handling units) |  | D2. isolated joints such as flange joints in ducts with slide and drive joints generally |
| 1. stop ends
2. bends
3. offsets
4. diminishing pieces
5. change of section pieces
6. junction pieces
7. shoes
8. nozzle outlets
9. spigots
10. similar items
 | no. | 1. stating type and size
 |  |  |  |  |
| 1. specially designed brackets or hangers (such as seismic requirements)
 | no. | 1. stating type and size
 | 1. stating the method of fixing
 | M11. describe fully |  |  |
| 1. manually operated regulating dampers and louvres / grills in ducts
2. vanes
3. turning vanes
4. ~~test holes and covers~~
5. access doors
6. openings other than for branches
7. similar items
 | no. | 1. stating type and size
 |  |  |  |  |
| 1. mechanically operated regulating dampers
2. special damper units
3. fire dampers
4. smoke dampers
 | no. |  | 1. including operating motors with linkage, fusible links and integral operating gear
 |  |  |  |
| 1. louvre and butterfly back draught shutters
2. grilles
3. diffusers
4. diffusers with special dampers
5. deflectors
6. equalisers
7. anti-smudge rings
8. cushion heads and boxes
9. similar items
 | no. |  | 1. stating the method of jointing
2. stating if insulated (internal or external)
3. stating if fixed or removable core (as per diffuser schedule)
 | M12. describe fully |  |  |
| 1. cowls
2. terminals
3. similar items
 | no. | 1. stating type and size, the size of the ducting to which it is attached and method of jointing
 |  |  |  |  |
| 1. roof ventilators
 | no. | 1. stating the type, rated output of air, temperature, min static resistance, max output velocity, min efficiency and the number, type and size of the connections for ducts
 | 1. including prime movers, drives and guards
 |  |  |  |
| 1. extract hoods
2. similar items
 | no. | 1. stating type, min and max dimensions and the size of outlet
 | 1. including all supports and filters etc.
2. including filters etc
 |  |  |  |
| 1. Equipment and ancillaries
 | 1. equipment
 | no. | 1. boilers
2. calorifiers
3. steam generators
4. firing equipment
5. pressurising units
6. water treatment plants
7. automatic stokers
8. fuel conveyors
9. water tanks and cylinders
10. oil tanks
11. pumps
12. compressors
13. fans
14. unit coolers
15. air filtering purification and washer
16. air conditioning units
17. radiators
18. convectors
19. unit heaters
20. radiant panels
21. meters
22. similar items
 | 1. stating type, size and capacity
2. measure air conditioning units separately (eg. air handling units, fan coil units, packaged units, variable refrigerant flow units, variable refrigerant volume units, split units, evaporative coolers, precision cooling units)
3. if suspended measure in stages of **1m height increments** between the item and the supporting structure
4. in stages of **1m height increments** between underside of item being installed and the floor level where >3.5m
 |  |  |  |
| 1. ancillaries
 | no. | 1. ~~cocks and valves~~
2. ~~steam traps~~
3. ~~strainers~~
4. ~~gauges~~
5. ~~thermometers~~
6. ~~automatic control and alarm units~~
7. chillers
8. cooling towers
9. coils
10. in-duct heat recovery
11. attenuators
12. dampers
13. filters
14. cool rooms
15. refrigeration equipment for cool rooms
16. hoods
17. similar items
 | 1. including connection to piping, duct and equipment
2. stating type, size and method of jointing
 |  |  |  |
| 1. loose keys
2. tools
3. spare parts
4. similar items
 | item |  |  |  |  |  |
| 1. work to existing services and equipment
 | item |  |  | ~~M14.~~ M13. measure separately and identify any restrictions |  |  |
| 1. ~~Performance work~~
 | 1. ~~Performance work~~
 |  |  |  | ~~M15. describe fully~~ |  |  |
| 1. ~~Preparation and submission of design data for approval~~
 |  |  |  | ~~M16. measure where required in the contract documents~~ |  |  |
| 1. ~~Control systems~~
 |  |  |  | ~~M17. measure electrical work in accordance with section 34 Electrical Installations~~ |  |  |
| 1. Control systems
 |  |  |  |  | ~~M20. Measure electrical work in accordance with section 34 Electrical Installation~~ |  |  |
| 1. ~~electric~~
2. ~~electronic~~
3. ~~pneumatic~~
4. ~~similar items~~
 | ~~Item~~ |  |  | ~~M21. describe fully~~ |  |  |
| 1. ~~preparation and submission of design data for approval~~
 |  |  |  | ~~M22. measure where required in the contract documents~~~~M23. measure for each type of installation~~ |  |  |
| 1. BMS and controls labour
 | item | 1. project management
2. engineering
3. commissioning
4. graphics
 |  | M14. describe fully |  |  |
| 1. subcontract / installation
 | item | 1. BMS installation
 |  |  |  |  |
| no. | 1. design, manufacture and supply of mechanical control panels
 |  |  |  |  |
| 1. hardware
2. materials
3. software
 | item | 1. head end software
2. head end hardware
3. active network components (such as core & edge switches)
4. BMS controllers (such as panel & field plant controllers including io modules)
5. specialist devices (such as nitrogen, hydrogen sensors)
 |  |  |  |  |
| no. | 1. valves
2. actuators
3. variable speed drives
4. field devices (such as sensors, switches, waterflow, after hours)
 | 1. stating the associated damper and control valves etc.
 |  |  |  |
| 1. Identification
 | 1. marking pipes, ductwork, equipment and similar items
 | item | 1. colour bands
2. tags
3. plates
4. badges
5. lettering
6. **arrows**
 | 1. stating quantity and scope of the work where possible
 | ~~M22.~~ M15. measure where required in the contract documents~~M23. Measure for each type of installation~~M16 measure as single lump sum items |  | D3. arrows for indicating direction of flow |
| 1. Work covered by other sections in connection with mechanical installation
 |  |  |  |  | ~~M24.~~ M17. include under an appropriate heading in the section concerned (such as mechanical electrical and mechanical painting)~~M25~~. M18. describe where required to be carried out as part of the mechanical installation and give with the installation concerned and measure in accordance with the rules of the relevant section |  |  |
| 1. Excavation in rock
 |  |  |  |  | ~~M26~~. M19. measure in accordance with section 33 Drainage |  |  |
| 1. Refrigeration
 | 1. pipework
2. insulation
3. refrigerant
4. ancillaries
 | item |  |  | M20. measure refrigeration as a series of lump sum items as per specification |  |  |