

Competition brief:

The competition involves 2 tasks;

Task	Title	Hours
A	Refrigeration system refrigerant replacement and electrical test	2.5
B	Pipe work fabrication and pressure test	2.5

A. Refrigeration system electrical fault find and component replacement

Competitors are provided a vapour compression system and are required to perform the following:

1. Safe isolation
2. Recover and replace refrigerant to standards
3. Fix component leaks.
4. Calculate & Pressure test to standards
5. Evacuate to standards
6. Carry out electrical checks to ensure system is safe to start
7. Diagnose an electrical wiring fault using multi meter
8. Reinstall wiring according to wiring diagram
9. Check superheat, sub-cooling and set point.
10. Complete records

B. Refrigeration pipe work fabrication

1. Competitors are to fabricate and flame braze copper/copper/brass/steel pipe work and fittings according to a detailed diagram

Safe Working:

Candidates must follow the control measures noted in the risk assessment and work safely at all times. Risk Assessment is available on the SkillFRIDGE web site

Skills & Knowledge to be demonstrated:

- Interpreting detailed drawings including location dimensions
- Measuring, fitting and use of materials in an efficient way
- Installation of components using general hand tools
- Copper Pipe fabrication
- Flame brazing similar and dissimilar materials using a range of LPG gases
- Installation of non-permanent mechanical copper pipe joints (flare)
- Use of weigh scales
- Recovery of refrigerant
- Legislative record completion
- Pressure testing & evacuation testing
- Charging and recovery of refrigerants according to Fgas category 1 procedures
- Use of electrical testing equipment
- Reading wiring diagrams to fault find control circuits
- Connection of wiring conductors to components

Standards

- Measurements should be within +/- 2mm of the specification
- Brazed joints to be full all around, with no parent metal loss, no excess alloy on exterior, with flux removed
- Nitrogen used during flame brazing
- All components to be positioned and laid out according to diagram
- Fgas regulations / BSEN378:2016
- Wiring terminations to be tight and without conductors showing when viewed at 90°
- All components to be earthed
- Electrical instruments used to test & prove the control circuit is safe to energise
 - Earth and Neutral continuity
 - Short circuit
- Superheat between 5 & 10K
- Sub-cooling between 3 & 8K
- Adherence to risk assessment and safe work practice at all times

The competition judges will mark the work of each competitor according to a detailed mark scheme. The summary marking scheme is provided below.

Marking Scheme and Weighting Summary

Weighting	Aspect	Criteria	Maximum mark
2	A	REFRIGERANT RECOVERY	16
6	B	PIPE WORK FABRICATION	22
5	C	ELECTRICAL WIRING & CONTROL FAULT FINDING	12
1	D	PRESSURE TESTING & EVACUATION	14
3	E	REFRIGERANT ADDITION	16
4	F	REFRIGERATION SYSTEM COMMISSIONING	20
	Total marks		100