

TECHNICAL SPECIFICATIONS

Leak detection		
2.1	A1/A2L Leak Detector	Technical Specification Hand-help electronic leak detector for most common A1/A2L classified refrigerants, e.g. R22, R134a and R410A. Minimum sensitivity should be 2 g/year for CFC, HCFC, HFC and HFO refrigerants.
2.2	A2/A3 Leak Detector	Technical Specification Hand-help electronic leak detector for most common A2/A3 classified refrigerants, e.g. R290 and R600a. Minimum sensitivity should be 2 g/year for HC refrigerants.

Vacuum, Recovery and recycling equipment		
6.1	Vacuum Pump	Technical Specification Vac pump, min. 6cfm, 15 microns or better final vacuum. Power supply 230V/50Hz, including electronic vacuum gauge.
6.2	A1 Recovery Equipment	Technical Specification Recovery machine, suitable to recover all common kinds of A1 classified refrigerants, e.g. R22, R134a and R410A, using at least an ½ HP oil-less compressor. HP/LP pressure gauges must be included. Recovery rates should be minimum 0.4 lb/m (vapor), 2 lb/m (liquid), 10 lb/m (Push-Pull). Low and High pressure shut off should be automatic. Enclosure should be heavy duty reinforced and ventilations fan should be able to work with ambient temperatures up to 50 degC. Power supply 230V/50Hz. Necessary hoses and fittings for easy connection to refrigerant cylinders.
6.3	A2/A3 Recovery Equipment	Technical Specification Recovery machine, suitable to recover all common kinds of A2/A3 classified refrigerants, e.g. R32 and Y1234yf, using at least an ½ HP oil-less compressor. HP/LP pressure gauges must be included. Recovery rates should be minimum 0.4 lb/m (vapor), 2 lb/m (liquid), 10 lb/m (Push-Pull). Low and High pressure shut off should be automatic. Enclosure should be heavy duty reinforced and ventilations fan should be able to work with ambient temperatures up to 50 degC. Power supply 230V/50Hz. Necessary hoses and fittings for easy connection to refrigerant cylinders.
6.4	Recycling Filter Kit	Technical Specification Filter accessories for demonstration of recycling - Filter kit for removal of moisture and oil - Large capacity oil separator - High performance dryer - Sight glass monitor - 5 additional filter dryers - 5 additional external burnout filters - Robust carrying case, portable, max 5kg weight - Capacity : 2lb/min liquid recovery rate. Hose and connectors for connection to a standard recovery machine.

General Technicians Tools

7.1	Gauge Service Manifold	Technical Specification Gauge Service Manifold - Electronic Gauge Manifold with LCD display. - Build in Vacuum sensor with down to 1 micron resolution. - Suitable for all common refrigerants including hydrocarbons. - Rechargeable battery. - Working temperature range 10-45 °C or wider. - Robust design for field service use. - Measuring units for pressure: psi, bar, MPa, kg/cm2, kPa. - Measuring units for temperature: °F or °C - Measuring units for vacuum: micron, mBar, kPa, Pa, Torr, mTorr, mmHg. - Bluetooth connectivity, including app for handheld devices. 3 sets of necessary service hoses including valves and other fittings, including service port coupler.
7.2	Valve Core Removal Tool	Technical Specification Valve core removal tool - Universal valve core removal tool.
7.3	Piercing Plier	Technical Specification Piercing plier - Tube piecing plier ¼" - 5 extra replacement tips - Connection hose with ball valve.
7.4	Pinch Off Plier	Technical Specification General Pinch Off Plier - Tube dimensions: 1/8" to 5/8" or wider range.
7.5	Tube Cutter	Technical Specification General tube cutter - Tube materials: Copper, Aluminum, Stainless steel. - Tube dimensions: 1/8" to 5/8" or wider range.
7.6	Capillary Tube Cutter	Technical Specification Capillary tube cutter - Capillary tube cutter for general use.
7.7	Tube Flaring Tool	Technical Specification Tube flaring tool - Standard flaring tool for tube dimensions: 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" and 5/8" O.D. tubing.
7.8	Tube Bending Tool	Technical Specification 180° standard tool bender - Tube dimensions: 3/16, 1/4, 5/16 and 3/8" O.D. Tubing.
7.9	Expander	Technical Specification Tube expander tool - Tool dimensions: 3/8", 1/2", 5/8", 3/4", 7/8", 1", 1 1/8". - Tube materials: Copper, Aluminum, soft steel.

		- Recommended replacement parts to be included.
7.10	Reamer	Technical Specification Inner-outer standard reamer tool
7.11	Swaging tool (expander)	Technical Specification Swaging tool - Lever type, expanding Swaging Kits for HVAC Tool Set
7.12	Vulkan Lokring	Technical Specification Vulkan Lokring Crimping Tool
7.13	Vulkan Lokring Kit	Technical Specification Vulkan Lokring Crimping Tool Kit with fittings
7.14	Inspection Mirror	Technical Specification Inspection Mirror - Inspection mirror for general use
7.15	Ratchet Wrench Set	Technical Specification Wrench Set - Minimum 24 pieces standard set - Rusk proof
7.16	Brazing Equipment	Technical Specification Brazing equipment with auto ignition - Propane driven brazing equipment. - Pressure regulator and accessories for connections to common type of propane cylinders. - Robust design in stainless steel for field service use. Consumables to be included.
7.17	N2 Equipment	Technical Specification Nitrogen flushing kit for safe venting of flammable refrigerants - Nitrogen flushing unit - Necessary hoses and accessories for safe venting of flammable refrigerants, hereunder R290 and R600A. - Venting hose 5 m length, inner diameter min 3/8"
7.18	Electronic Scale for charging of A1/A2L refrigerants	Technical Specification Electronic Scale for A1/A2L refrigerants - Electronic charging scale for refrigerant recharge of non-flammable refrigerants (class A1/A2Æ). - Robust design including carrying case. - Weighing capacity up to 100kg. - Charging hose and fittings. - Heating belt with thermostat control - Operating temperature 10-45 °C
7.19	HC Charging Scale	Technical Specification High Precision scale for HC charging - Designed for use with R290 and R600A - Charging precision +/- 1 gr or better - Charging capacity up to 3000 gr - Carrying case for field service use to be included - Battery driven

		- Charging hose and accessories to be included
7.20	Thermometer	Technical Specification Electronic thermometer - Non-contact and direct contact thermometer. - Laser target indicator for non-contact measurements. - K-Type thermocouple sensor for direct contact measurement. - Measuring range -60 to 500 °C - Battery driving
7.21	Multimeter	Technical Specification HVAC digital multimeter Amp range: 20mA to 600 Amp clamp measurement or wider. - AC/DC Voltage range: 1V to 750V or wider. - Resistance range: 200 mOhm to 20 kOhm or wider. - Frequency range: 10 Hz to 2 kHz or wider.
7.22	Safety Protection	Technical Specification Safety protection equipment - Gloves suitable for safe handling of refrigerants - Safety glasses
7.23	First Aid Tool Kit	Technical Specification Standard First Aid Tool Kit

R290 Demonstration Equipment

9.1	HC Split Air conditioner	Technical Specification Air conditioner with HC natural refrigerant - Wall mounted mini split type - Cooling Capacity: 12.000-18.000 BTU/H - Refrigerant: R290 - Option 1: 12.000 BTU/H Max 400 gr charging amount - Option 2: 18.000 BTU/H Max 600 gr charging amount - Compressor type: Inverter - Supply voltage: 230V 50Hz - Installation height for indoor unit: 1.8 m - Design standards: IEC 60335-1, IEC 60335-2-40, EN 378
9.2	Energy Monitoring	Technical Specification Power meter with datalogger function - Single phase power measurement - Power range: 100- 3000 Watts @230V 50Hz - Accuracy: +/- 0.5% of reading (Power) or better - Digital display showing actual Power Consumption, Voltage and Amp - Design able to work with inductive load (refrigeration compressor with starting current up to 150 Amps) - Memory: 30 days storage @10 secs sample interval (power, voltage, amps), including date/time stamp for each sample. - Temperature range 10 – 50 degC or wider - Connection port cables for notebook including software for download of data and export to Microsoft Excel or other common file format - PC software for notebook based on Microsoft Windows Operating System (Version 7 or higher)