For individual building types, the selection of water heaters system shall be based on building usage type, total hot water demand and area available for the implementation strategy. Individual or centralised systems can be opted, given the proposed system shall be proven energy efficient than the conventional models.

Air source heat pump works by extracting heat from ambient air using a fan to move hot air across the evaporator coil containing refrigerant, which further completes the vapor compression cycle to release the hot thermal energy to the cold water inside the heater system. Dubai's hot ambient temperature condition is perfect for utilising the renewable heat source via a heat pump system to meet the domestic hot water demand. Though the capital cost is higher compared to the electric resistance water heater, better payback period is achieved through reduced annual utility cost. Typical schematic of the air source heat pump is shown in fig. 504.02(1).

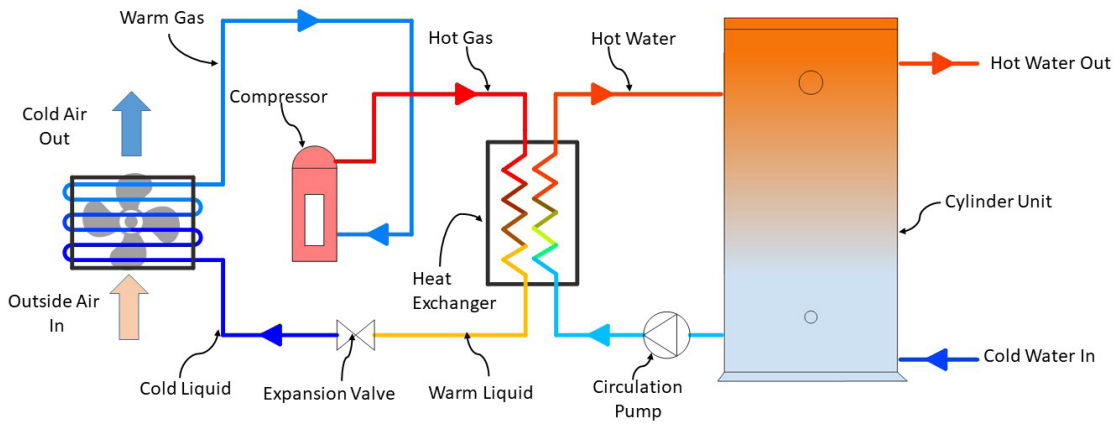

Fig. 504.02(1): Air Source Heat Pump Water Heater

Solar System

Design team shall identify the solar water heater systems whether suitable for the building application based on usage types. Hot water demand calculation and solar thermal analysis to be performed considering facility load profile and peak demand criteria for conforming the final collector sizing required to meet the hot water demands.

All design factors shall be in accordance with Dubai Municipality Circular (183), 2011, related to use of Solar Water Heating Systems (SWHS) to supply hot water to buildings in the Emirate of Dubai. Design calculation conforming the load requirements and supporting drawings / documents shall be submitted to DM for approval.

Proposed solar hot water system must provide at least 75% of the hot water demand required for the building and remaining 25% shall be supplemented by other sources, commonly, electric water heater. Backup source shall be employed to ensure hot water supply is uninterrupted when solar energy is not sufficient to provide required output. For collection of highest sun radiations throughout the year, Solar collectors must be directed south with an angle approximately equal to the latitude (25°).

Solar hot water system shall be supplied, installed and maintained by DM/DEWA approved companies. Also, it is mandatory for SHW systems to be certified by Dubai Central laboratory. During construction, contractor should propose SHW system conforming the design demand requirements through technical data sheets, drawings and calculations if required.