



High Temperature Compact Heat Pumps

Features and Benefits

- High outlet temperatures.
- Low carbon emissions.
- Ease of installation.
- Complete kit available.
- UK manufactured.
- Access to industry grants.



Available in Single & Twin Compressors
[Single phase \(to 17kW\)](#) & [Three phase \(to 20.5kW\)](#)

Product Description

The [Kensa High Temperature range](#) of Compact heat pumps are designed to provide high temperature space heating and domestic hot water production (optional extra) for well insulated buildings. Kensa heat pumps use low grade renewable energy from the ground and concentrates this to a higher temperature to provide heat into a buildings heating system.

High Temperature Compact heat pumps can be used to produce hot water up to a 60°C outlet flow temperature. This allows the heat pump to be used in applications where there is a requirement for higher flow temperatures that can be provided

from a standard heat pump. The heat pumps use R134a refrigerant, which allows a higher outlet temperature as opposed to the R407C used in standard heat pumps.

At the higher flow temperatures the pump's efficiency will be decreased and hence it is important to assess the viability of installing a unit against the alternative fuels available.

As a UK manufacturer, Kensa offers a high quality product which is supported by industry leading technical support to ensure the application engineering is performed to the highest standard.



High Temperature Compact Heat Pumps

| | Single Phase | | | | | | | Three Phase | | | | | | | | |
|--|--|----------------|----------------|----------------|----------------|----------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Nominal thermal kW rating @ B0/W35 | 3.5 | 4.3 | 6 | 7 | 8.5 | 12 | 17 | 3.5 | 4.3 | 6.1 | 7.1 | 8.6 | 10.3 | 12.1 | 17.1 | 20.5 |
| Nominal thermal kW rating @ B0/W60 | 3.3 | 4 | 5.7 | 6.4 | 7.7 | 11.3 | 15.3 | 3.1 | 3.9 | 5.5 | 6.3 | 7.7 | 9.2 | 10.9 | 15.3 | 18.4 |
| Nominal thermal kW rating @ B0/W65 | 3.2 | 3.9 | 5.5 | 6.3 | 7.5 | 11.0 | 15.0 | 3.1 | 3.8 | 5.3 | 6.2 | 7.5 | 9.0 | 10.6 | 15.0 | 18.0 |
| Model Ref | H035 -S1H | H043 -S1H | H062 -S1H | H070 -S1H | H085 -S1H | H124 -T1H | H170 -T1H | H034 -S3H | H046 -S3H | H061 -S3H | H070 -S3H | H085 -S3H | H103 -S3H | H122 -T3H | H170 -T3H | H206 -T3H |
| MCS Approved | BBA00 55/19 | BBA00 55/20 | BBA00 55/21 | BBA00 55/22 | BBA00 55/23 | BBA00 55/28 | BBA00 55/29 | No | No | No | No | No | No | No | No | No |
| Compressors | Single | | | | Twin | | | Single | | | | Twin | | | | |
| Performance data—rated heating output at BS EN14511 | | | | | | | | | | | | | | | | |
| Power consumption @ B0/W65 | 1.79 | 2.28 | 2.98 | 3.14 | 3.69 | 5.79 | 7.23 | 1.77 | 2.18 | 2.78 | 2.98 | 3.69 | 4.39 | 5.39 | 7.11 | 8.51 |
| Coefficient of performance @ B0/W65 | 2.11 | 2.10 | 2.08 | 2.16 | 2.10 | 2.08 | 2.10 | 2.25 | 2.33 | 2.31 | 2.42 | 2.39 | 2.30 | 2.31 | 2.39 | 2.30 |
| Coefficient of performance @B0/W35 | 4.13 | 4.13 | 4.17 | 4.20 | 4.15 | 4.16 | 4.15 | 4.09 | 4.34 | 4.37 | 4.47 | 4.40 | 4.21 | 4.37 | 4.40 | 4.21 |
| Immersion heater output | Kensa heat pumps do not feature back-up electric immersion heaters** | | | | | | | | | | | | | | | |
| Brine (primary) - figures quoted @ 0°C in -4°C out | | | | | | | | | | | | | | | | |
| Design flow rate kg/min | 10.8 | 13.4 | 19.5 | 22.0 | 27.5 | 39.0 | 43.9 | 10.3 | 13.5 | 19.4 | 22.7 | 27.5 | 33.6 | 38.8 | 55.0 | 67.2 |
| Pressure drop kPa at design flow rate | 4.28 | 6.22 | 6.79 | 8.41 | 12.6 | 6.79 | 12.6 | 3.9 | 6.32 | 6.74 | 8.91 | 12.6 | 17.6 | 6.74 | 12.6 | 17.6 |
| Max inlet temperature °C | 20 | | | | | | | | | | | | | | | |
| Min outlet temperature °C | -5 (at standard settings) | | | | | | | | | | | | | | | |
| Heating water (secondary) - figures quoted @ 30°C in 35°C out | | | | | | | | | | | | | | | | |
| Design flow rate l/min | 10.1 | 12.5 | 17.8 | 20.1 | 24.4 | 40.2 | 48.8 | 9.65 | 12.4 | 17.4 | 20.3 | 24.6 | 29.4 | 34.8 | 49.1 | 58.9 |
| Pressure drop kPa at design flow rate | 2.83 | 4.32 | 4.66 | 5.94 | 8.70 | 5.94 | 8.71 | 2.62 | 4.27 | 4.47 | 6.02 | 8.81 | 12.6 | 4.47 | 8.81 | 12.6 |
| Max flow temperature °C*** | 65 | | | | | | | | | | | | | | | |

* The COP figures quoted are calculated according to EN14511 at the stated conditions.

** In-built immersion heaters will increase running costs and CO2 emissions as they use direct electricity, because of this Kensa heat pumps do not include them.

*** By decreasing the flow temperature from the heat pump the efficiency and COP of the unit will increase.

**** Kensa single phase compact heat pumps incorporate smart starts as standard to limit the starting current of the compressors. For full details on how the starting currents are calculated please contact Kensa.



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| | Single Phase | | | | | | | Three Phase | | | | | | | | | |
|---|------------------------|------|------|------|------|----------------|------|-----------------|------|------|------|------|-----------------|------|------|------|--|
| Nominal thermal kW rating @ B0/W35 | 3.5 | 4.3 | 6 | 7 | 8.5 | 12 | 17 | 3.5 | 4.3 | 6.1 | 7.1 | 8.6 | 10.3 | 12.1 | 17.1 | 20.5 | |
| Electrical Values | | | | | | | | | | | | | | | | | |
| Rated Voltage | 220 – 240 V / 50-60 Hz | | | | | | | 400V / 50-60 Hz | | | | | | | | | |
| Power supply rating amps | 16 | 25 | 25 | 32 | 32 | 50 | 60 | 16 | 16 | 25 | 25 | 25 | 25 | 32 | 32 | 32 | |
| Rated current (max) amps | 15.2 | 18.4 | 21.8 | 26.2 | 26.7 | 42.9 | 52.2 | 5.73 | 7.21 | 8.01 | 9.41 | 11.8 | 13.5 | 15.3 | 22.4 | 25.8 | |
| Typical running current @ B0/W65 amps | 7.2 | 10.1 | 13.8 | 13.2 | 13.8 | 26.9 | 27.9 | 3.56 | 4.53 | 5.94 | 6.24 | 7.92 | 9.17 | 11.2 | 14.7 | 17.2 | |
| Starting current amps**** | 25 | 30 | 30 | 30 | 30 | 42 | 42 | 23 | 29 | 41 | 46 | 57 | 66 | 48 | 55 | 79 | |
| Refrigerant circuit | | | | | | | | | | | | | | | | | |
| Process medium | R134a | | | | | | | | | | | | | | | | |
| Fill volume kg | 1.2 | 1.3 | 1.0 | 1.3 | 1.3 | 2.0 | 2.6 | 1.2 | 1.2 | 1.0 | 1.3 | 1.3 | 1.4 | 2.0 | 2.6 | 2.8 | |
| Compressor type | Scroll | | | | | | | | | | | | | | | | |
| Dimensions | | | | | | | | | | | | | | | | | |
| H x W x L (mm) | 900 x 550 x 570 | | | | | 900 x 900x 570 | | 900 x 550 x 570 | | | | | 900 x 900 x 570 | | | | |
| Dry weight kg | 85 | 90 | 95 | 100 | 105 | 165 | 167 | 85 | 90 | 95 | 100 | 105 | 110 | 165 | 167 | 170 | |
| Operating pressure | | | | | | | | | | | | | | | | | |
| Brine circuit min (primary) bar g | 0.3 | | | | | | | | | | | | | | | | |
| Heating water circuit min (secondary) bar g | 0.3 | | | | | | | | | | | | | | | | |
| Low pressure reset bar g | 1.8 | | | | | | | | | | | | | | | | |
| Connection sizes | | | | | | | | | | | | | | | | | |
| Primary IN and OUT (speedfit) mm | 28 | | | | | 50 | | 28 | | | | | 50 | | | | |
| Heating flow and return (speedfit) mm | 28 | | | | | 50 | | 28 | | | | | 50 | | | | |



High Temperature Compact Heat Pumps

Sizing

SPACE HEATING: Assumes 40 watts per square metre peak heating requirement. Precise sizing can be established by referring to the SAP report. In every instance reviewed in 2007/8, heat losses are between 30 - 40 watts per square metre for properties built to Part L 2006 (England and Wales). As a result, it may be possible to offer a smaller, less expensive heat pump and accessories. In every instance, Kensa heat pumps are sized to handle the peak heating load; Kensa appliances do not feature integral immersion heaters.

DOMESTIC HOT WATER - SLINKY REQUIREMENT: Sizing a heat pump and its ground arrays for domestic hot water is more complex. Whereas occupancy levels and lifestyle habits will not greatly affect the space heating load, they will impact on domestic hot water requirements. Clearly, an additional burden is imposed on the ground arrays; in addition, the year round requirement for domestic hot water means there is a lesser opportunity for the ground to recover temperature. As a consequence, extra pipework must be buried. The Slinky requirement outlined in the table below reflects typical water usage; please contact Kensa if requirements are considered exceptional.

DOMESTIC HOT WATER - METHOD OF OPERATION: The heat pump can be in space heating OR domestic hot water mode. When in DHW mode, the heat pump will achieve the highest possible stored water temperature which means its performance will be enhanced in the summer months (when ground conditions are warmest). After completing its DHW duty, the heat pump will return to space heating mode, if required. The heat pump will not be able to return to DHW model for two hours. For this reason, a suitably -sized storage cylinder should be specified. Any cylinder should be equipped with integral immersion heaters to provide a

| Nominal thermal kW rating | 3.5 | 4.3 | 6 | 7 | 8.5 | 10 | 12 | 17 | 20 |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Building size (assumes a heat loss of 40W/m² and a space heating flow temperature of 35°C) | | | | | | | | | |
| Building size m ² | 85 | 105 | 150 | 175 | 200 | 250 | 300 | 425 | 500 |
| Space heating | | | | | | | | | |
| Slinkies | 1 x 40m | 1 x 40m | 2 x 30m | 2 x 40m | 2 x 40m | 2 x 50m | 3 x 40m | 4 x 40m | 4 x 50m |
| Manifold | 1 way | 1 way | 2 way | 2 way | 2 way | 2 way | 3 way | 4 way | 4 way |
| Antifreeze* litres | 50 | 50 | 50 | 75 | 75 | 125 | 125 | 150 | 150 |
| Space heating and domestic hot water production | | | | | | | | | |
| Slinkies | 2 x 30m | 2 x 30m | 2 x 40m | 2 x 50m | 2 x 50m | 3 x 40m | 3 x 50m | 4 x 50m | 5 x 50m |
| Manifold | 2 way | 2 way | 2 way | 2 way | 2 way | 3 way | 3 way | 4 way | 5 way |
| Antifreeze* litres | 50 | 50 | 75 | 100 | 100 | 125 | 125 | 150 | 200 |
| Recommended minimum heat transfer area in DHW tank (optional extra) | 0.7m ² | 0.9m ² | 1.2m ² | 1.4m ² | 1.7m ² | 2.0m ² | 2.4m ² | 3.4m ² | 4.0m ² |

* Antifreeze quantities quoted are a minimum and may need to be increased depending on the distance between the heat pump and ground array manifold. The concentration should be a minimum of 20% and offer a protection to -10 °C.

Please note the above methodology is not compliant with MCS which requires a full heat loss calculation to be carried out. The values in the table are a guide only and Kensa would require a copy of the buildings SAP or heat loss report to provide a more accurate sizing before ordering.