MITSUBISHI HEAVY INDUSTRIES

HOT WATER SOLUTIONS

HIGH EFFICIENCY CO2 HOT WATER SOLUTION

Q-TON: AIR TO WATER

About Q-ton

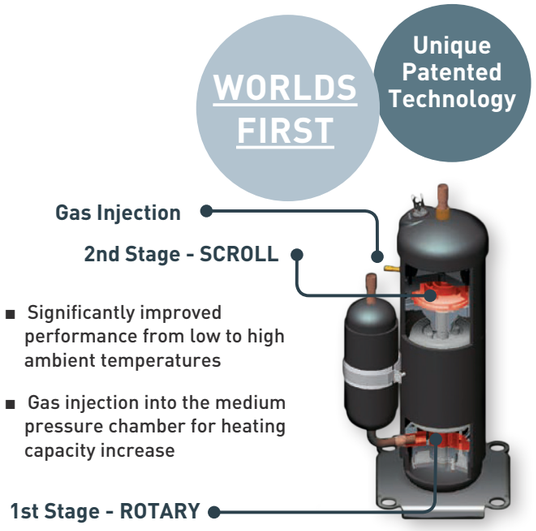
Q-ton is a high efficiency, air-to-water heat pump which utilises patented compressor technology and CO_2 gas as a refrigerant to deliver a reliable sanitary grade, hot water solution for a range of commercial applications.

The Q-ton utilises the world's first two-stage compressor (combining rotary and scroll technology) to maintain high efficiency and significantly high performance, even with cold outside air temperatures.

Mitsubishi Heavy Industries design team launched this innovative unique air source heat pump to allow maximum efficiency, with minimal carbon footprint all controlled from a comprehensive touch screen panel.

With increasing pressure for companies to use low GWP (Global Warming Potential) refrigerant, we believe CO2 heat pump is the way forward to comply with future regulations as well as market trends.

Q-ton meets a range of disparate demands including the need for medium to large sanitary hot water generation. This involves low electricity consumption and a high level of environmental friendliness.



COMMERCIAL APPLICATIONS

With an industry leading coefficient of performance of 4.3 and the ability to deliver reliable, sanitary grade hot water for either processing or cleaning purposes, the Q-ton is the ideal system for commercial applications such as hotels, apartment blocks, restaurants, fitness centres, universities, hospitals, aged care homes, laundries, breweries as well as beverage and food manufacturing plants.

Systems can be set up to meet specific requirements and a touch screen controller makes the system simple to operate while the user-friendly graphic display enables to monitor hot water production and availability.

Leisure Centres / Restaurants	Universities / Aged Care Centres	Hotels / Spas	Food Processing / Breweries
3,000L / Day	5,000L / Day	10,000L / Day	15,000L / Day

Features and Benefits

Q-ton delivers outstanding performance and environmental benefits to a varied number of applications and is exceptionally energy efficient ensuring large reductions in both power consumption and carbon emissions.

Q-ton uses safe and highly efficient CO2 as a refrigerant which is environmentally friendly as it is a natural gas and does not contain harmful ecological components compared to other products using standard refrigerants.

The Q-ton is also able to maintain full capacity down to -7°C. This is made possible by the rotary scroll compressor with gas injection.

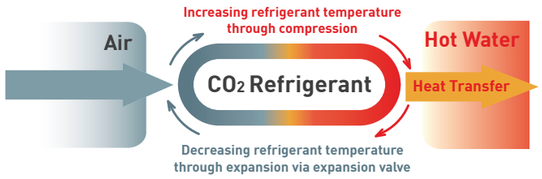
High Performance	■ **60°C to 90°C** water supply in **-25°C** ambient temperature ■ *Maintain **100%** capacity down to **-7°C**
High Efficiency	■ High coefficient of performance (**4.3** in intermediate season) ■ Massive reductions in both running costs and CO2 emissions
Easy Operation	■ Easy to use **touch screen** control with advanced functions ■ User friendly scheduling options and one-touch fill up
Environmentally Responsible	■ ***48% less emissions** than an electric heater ■ ***74% less emissions** than a gas boiler
Long Term Reliability	■ High quality, robust technology and components ■ Long life expectancy with regular maintenance

* Intermediate season, Outside Air on at 16°C, Feed Water inlet temperature at 17°C, Hot Water setpoint temperature at 65°C.

How Q-ton Works

The Q-ton works by absorbing heat contained in the air and then the world's first patented rotary scroll (2 stage) compressor, compresses the CO2 refrigerant before transferring this absorbed heat to the water instantaneously supplying hot water from 60°C to 90°C.

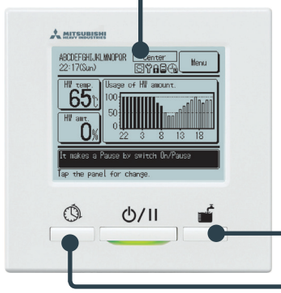
HEAT EXCHANGE PROCESS



Why Q-ton?

EASY OPERATION

- Advanced touch screen remote controller panel
- Full dot liquid crystal display
- Allows finely adjusted operation for energy savings



User Friendly

- Easy to use, touch screen LCD panel
- Large 3.8 inch full dot display
- Back light function

Manual Fill

- Easy to use manual operation to manually fill water tank to suit demand

Schedule Setting

- Variety of schedule options including weekly and daily timers and a peak-cut timer.

Q-ton heat pumps can be configured as stand-alone units or run with up to 16 units in tandem, providing anything from 3,000 to 100,000 litres of safe hot water daily. Whether single or multiple units are used, the Q-ton system is controlled from a single control panel that can be remotely installed for ease of access and operation.

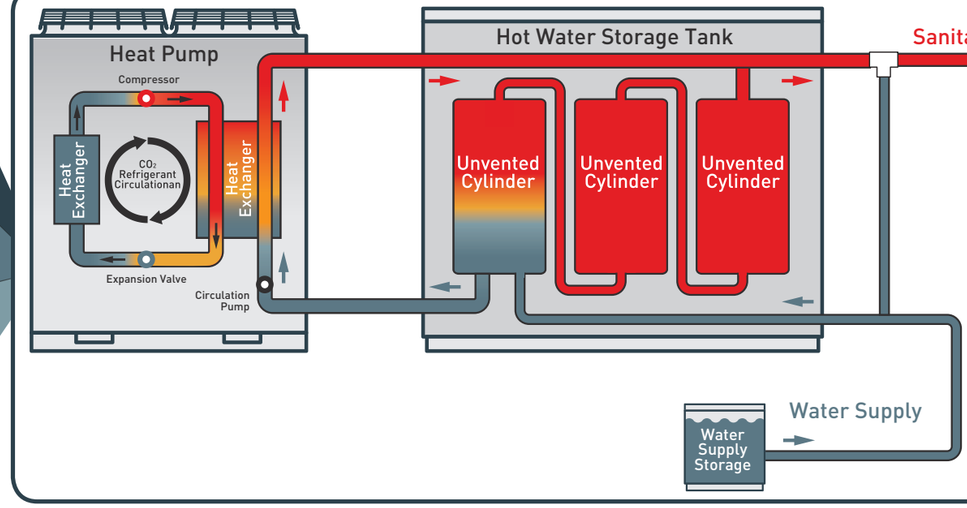
Q-ton can be installed as a replacement, addition or whole new system, and can produce hot water during off peak times of tariff electricity which is then stored in a tank for daytime use.

Usually chosen as a direct boiler replacement, Q-ton efficiently produces high-volume hot water using just ambient air heat and allows complete control of the water supply and storage temperature.

PERFORMANCE
-25°C → 90°C
90°C water supply even in extremely cold regions with temps as low as -25°C

CAPACITY
-7°C → 100
Keeping 100% capacity down to -7°C

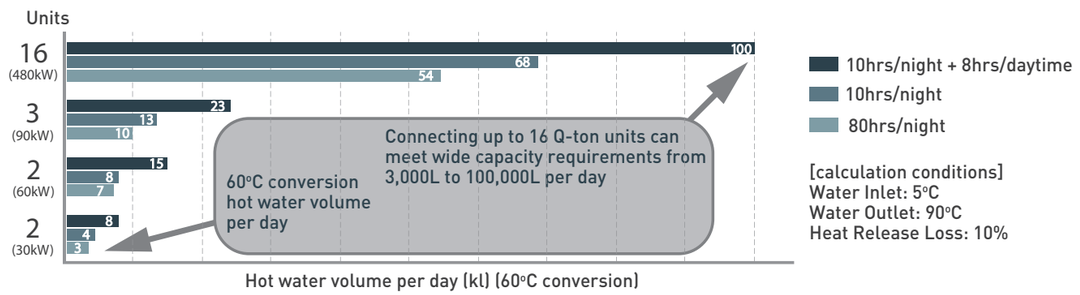
EFFICIENCY
COP 4.3
The industry's highest COP level COP4.3 (intermediate season)



Q-ton seeks to provide energy, cost and carbon savings. It is most efficient when cold water is used to supply the heat pump. For that reason the cold feed water is provided to the heat pump, via the base of the storage stratified vessel.

Each storage vessel has five pockets into which temperature sensors can be fitted to detect the volume (in % terms) of hot water held in the vessel at any particular time. The programming of the control system to hold specific volumes of hot water at different times of day is based on a balance of hot water demand and electricity tariffs, to ensure security of supply at minimum cost.

SIZING AND GUIDANCE



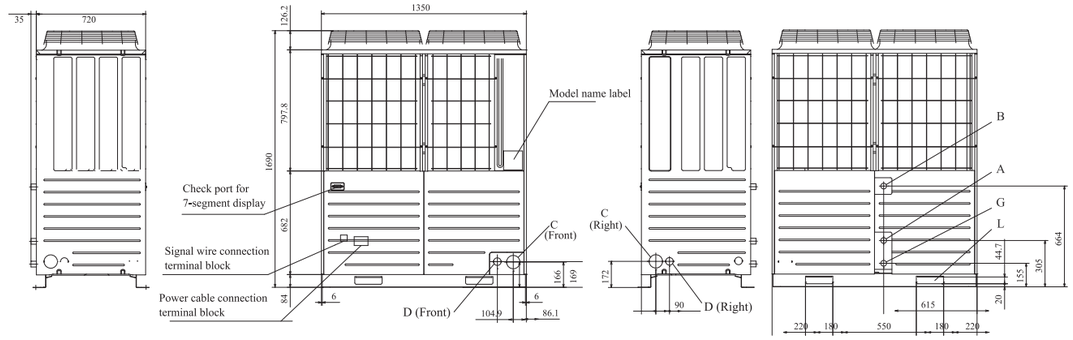
Specifications

Items	Model		ESA30E-25
Power source			3 Phase 380V±5%, 400V±5%, 415V±5%, 50/60Hz
Operation to top up (Intermediate season)*1	Heating capacity	kW	30.0
	Water amount	L/min	8.97
	Power consumption	kW	6.98
	COP	-	4.30
Operation to top up (cold season)*2	Heating capacity	kW	30.0
	Water amount	L/min	5.06
	Power consumption	kW	10.73
	COP	-	2.80
Operating sound pressure (In intermediate season)*1, 3		dB(A)	58
Operating sound power (In intermediate season)*1		dB(A)	70
External dimensions (HXWXD)		mm	1690 x 1350 x 720 + 35 (water pipe connection)
Current	Maximum	A	21
	Starting	A	5
Unit weight		kg	Off: 375 During operation: 385
Colour			Sutcco white (4.2Y 7.5/1.1 Approx)
Compressor	Type x Pcs		Hermetic inverter compressor x 1
	Nominal output	kW	6.4
Refrigerant	Type		R744 (CO_2)
	Charged amount	kg	8.5
Refrigerant Oil	Type		MA68
	Charged volume	cc	1200
Crackcase Heater		W	20
Anti-freezing heater	For water pipe	W	21 x 3
	For drain pan	W	40 x 2
	For drain hose	W	16 x 3
Heat exchanger, air-side	Type		Copper pipe straight fin type
Heat exchanger, water side (gas cooler)	Type		Copper pipe coil, indirect heat exchanger
	Possession quantity of water		10
Fan	Type		Axial flow type (direct coupled motor) x 2
	Output x pcs	W	386 x 2
	Air volume	m^3/min	260
	External statis pressure	Pa	50
Water pump	Type x output		Non-self-suction spiral type inverter pump×100W
	Materials contacting water		PPS
	Actual pump head	m (kPa)	5m (49kPa) @ 17Litre/min
Usage temperature range	Outdoor air temperature	°C	-25 to +43
	Feed water inlet temperature	°C	Top up 5-35, Warm up 35-63
	Hot water outlet temperature	°C	60 - 90
Water pressure range		kPa	500 or lower (Keep water pressure more than 0kPa at the inlet of heat pump water heater)
Defrost			Hot gas type
Vibration and sound proofing devices			Compressor ;placed on anti-vibration rubber and wrapped with sound insulation
Protection devices			High pressure switch over current protection, power transistor overheat protection and anomalous high pressure protection
Pipe connection	Feed water inlet		Rc3/4 (Copper 20A)*4
	Hot water outlet		Rc3/4 (Copper 20A)*4
	Drain water outlet		Rc3/4 (Copper 20A)*4
Design pressure		MPa	High pressure:14.0, Low pressure: 8.5
IP Code			IP24

1. Performance of operation to top up during intermediate season shows the capacity measured under the conditions that outdoor temp is 16°C DB/12°C WB, water inlet temp is 17°C and how water outlet temp is 65°C.
2. Performance of operation to top up in cold region shows the capacity measured under the conditions that outdoor air temperature is -7°C DB/-8°C WB, water inlet temperature is 5°C and hot water outlet temperature is 90°C excluding heater for anti-freezing water (191W).
3. Operating sound shows a value is measured at 1m in front of the unit and 1m above the floor in an echoic room where the sound is slightly resonated. Accordingly, if the unit is installed on an actual site, it is normal that the measured sound levels may be higher than the value shown above, due to surrounding noise and echo within the room.
4. Pipe size 20A=DN20=20mm=3/4in.
5. The actual hot water outlet temp may vary ±3°C from target temp according to the change of outdoor air temp and water inlet temp. If feed water inlet temp is 30°C of high and outdoor air temp is 25°C or higher the water temp may be controlled to ensure temp does not increase too much.
6. Ensure clean water is used. Water quality should follow the standard which MTH specifies. If the water quality if not up to standard it may cause issues within the unit such as scale build-up and/or corrosion.
7. These articles mentioned above may vary without notice accordingly to development status.
8. Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country. Electrical installation work must be executed according to the technical standards and other regulations applicable to the electrical installations in the country.

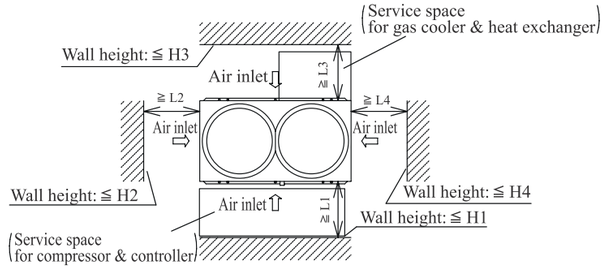
Dimensions

Model: ESA30E-25



Symbol	Contents	
A	Feed water inlet port	RC3/4 (Copper tube 20A)
B	Hot water outlet port	RC3/4 (Copper tube 20A)
C	Heat pump unit-Tank unit connecting wire outlet port	φ 88 (or φ100)
D	Power cable inlet port	φ 50 (right, front) Long hole 40x80 (bottom)
G	Drain water pipe outlet port	RC3/4 (Copper tube 20A)
L	Hole for carrying in or hanging	180 × 44.7

Installation space (Service space)



Dimension \ Installation example	1	2
L1	800	800
L2	10	10
L3	800	800
L4	100	500
H1	500	1500
H2	No limit	No limit
H3	1000	1000
H4	No limit	No limit

Note
(1) Be sure to fix the unit with anchor bolts
(2) Be sure to keep space above the unit at least 2m
(3) the connection of water pipes (Feed water inlet, Hot water outlet, Drain water outlet) should be done on site locally.
(4) The holes for power cable inlet, and connection wire outlet from heat pump unit to tank unit are half-blanked.
Therefore please punch out the hole by cutting the residual portion and use it.
(5) In heavy snow region, please take following measures in order for the air inlet/outlet port and the bottom part of unit not to be covered with snow
① Place the unit on the rack in order to make the bottom of unit higher than the snow surface.
② Install a snow prevention hood on the outlet port of the unit.
③ Install the unit at the space under the eaves or the snow prevention roof.
(6) If ambient temp becomes below 0ºC, it may cause break of water pipes and damage on the unit due to freezing
Be sure to apply anti-freezing heater to feed water piping , hot water piping and drain water piping in order to prevent from freezing.
(7) Be sure to keep enough service spaces of more than 800mm in front of the unit service panel for easy inspection of the unit and replacement of components.
When piping work is done, be sure not to interfere the pipes with the unit service space.
If the service space cannot be kept, please install the piping below the unit by placing the unit on the rack.

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OUTLASTS AND OUTPERFORMS

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Mitsubishi Heavy Industries Air conditioners Australia, Pty. Ltd.

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Our Air Conditioning & Refrigeration Systems Headquarters is an ISO9001 approved factory for residential air conditioners and commercial-use air conditioners (including heat pumps).

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