MITSUBISHI ELECTRIC HYDRONICS & IT COOLING SYSTEMS S.p.A.





EW-HT-Y

Seeking high efficiency and sustainable heating equipment, able to achieve very high temperatures while perfectly integrating the overall system is the greatest challenge of today's modern buildings.



EFFICIENCY IN VERY HOT WATER PRODUCTION

Heating loads of residential and commercial buildings are typically aligned on two different temperature levels: one around 35-45°C, for space heating, and the other around 65-75°C for domestic hot water.

While the first load can be covered by efficient and sustainable equipment such as heat pumps, solar collectors, district heating systems, etc., a concrete and reliable alternative to gas boilers for the high temperature loads until now had not been found.

INTEGRATION AND SYNERGY

The knowledge that one gets the best results not by optimising the single component but the whole system itself, leads to an increase in the level of integration and synergy between different kinds of devices and technologies.

Flexibility and aptitude to synergy makes a good machine become the ideal solution for both new generation plants and refurbishment of already existing structures.

GAS NETWORK INDEPENDENCE

The most common means to produce very high-temperature water are gas boilers.

Nevertheless the gas network connection is not always dependable and sometimes it is not available at all.

Being dependent on an unreliable primary energy source is definitely risky, especially in the applications where the service needs to be uninterrupted.

INDOOR INSTALLATION

Plant rooms are usually located within the buildings. Narrow spaces and tangled unorganised pipes are huge obstacles for the installation and the maintenance operations of a machine.

Furthermore raised noise levels and vibrations may seriously compromise the usability of the adjacent rooms.

Today, reduced footprint, easy installation and quiet operation are crucial features for any technical unit.









EW-HT-Y

The revolution in the hot water production

BEYOND ORDINARY OPERATING LIMITS

EW-HT-Y redefines the heat pump operating limits: this unique heat pump exploits medium temperature water as a source to provide water up to 78°C. This incredibly extended operating range allows EW-HT-Y to be perfectly integrated in any heating systems.



NO NEED FOR GAS BURNERS AND ELECTRIC HEATERS

WHEN VERY HIGH TEMPERATURE WATER IS NEEDED, GAS BURNERS AND ELECTRIC HEATERS ARE NOT THE ONLY ANSWERS ANYMORE

EW-HT-Y makes it possible to have a very high temperature source without a gas burner, nor any electric heaters. It just needs an ordinary electric connection and a medium temperature water source.

The possibility to avoid fossil fuel is much more than a matter of energy saving and sustainability, it's also a matter of plant simplification: no gas network nor oversized electric connection are needed.



ONE SINGLE UNIT FOR MULTIPLE USES

EW-HT-Y is the ideal solution for every application where very high temperature water is needed.

FROM RESIDENTIAL TO IT COOLING APPLICATIONS

In the era of heat pump technology maturity, most of the time domestic hot water production is still provided by gas or electric boilers. EW-HT-Y offers a smart alternative: thanks to its innovative operating range, it fills the gap between the medium temperature level required by space heating terminals, and the high temperature level needed for domestic hot water. EW-HT-Y is the perfect water temperature 'upgrader' in residential applications.

In IT Cooling systems, EW-HT-Y can reutilise the heat coming from the server rooms in order to serve the heating requirements of the buildings located nearby.

DISTRICT HEATING SYSTEMS

In district energy plants, a network of insulated pipes delivers hot and cold water from one or more centralized generation sites to the nearby users. In these plants, the temperature of the water delivered depends on both consumers' needs and available heat sources.

A medium temperature water network can successfully cover the space heating demand and, thanks to EW-HT-Y, can also be the source to produce domestic hot water avoiding fossil fuels or electrical heaters

INDUSTRIAL PROCESS

Industrial processes are characterised by many heat transfers: machines, motors, molds must be cooled, whereas material streams, air flows, working fluids must be heated or pre-heated. Medium/low temperature heat recovery is often not economical, so great amounts of thermal energy is simply lost.

EW-HT-Y represents the most important opportunity to recover and move this heat from one process to another, avoiding kWh waste.

LOW PRIMARY **ENERGY CONSUMPTION**



* evaporation 45/40°C

SUPERIOR RELIABILITY

Developed to be the only source of high temperature water for a building, EW-HT-Y represents a no-compromise solution in terms of reliability.

High quality components, accurate design, devoted control algorithms and redundancies grant uninterrupted unit operation in any conditions.



REDUCED SIZE AND NOISE LEVEL

This water to water heat pump is purposely designed to fit the requirement of indoor installation. The smart component disposal minimizes the footprint but still grants simple and safe access to the internal parts. Furthermore, as a result of a soundproofing oriented design and a dedicated acoustical enclosure, the units achieve a remarkable noise emission of only 70 dB(A).









EW-HT-Y

FOR INDUSTRIAL PROCESS APPLICATIONS

The flexible link that completes today's systems and creates new usage opportunities



Heat recovery is surely a recommended and cost-effective practice, especially in the industrial sector, where processes involve so many heat transfers between several different temperature levels.

The ability to use any water stream up to 45°C as a source and the possibility to reach a water temperature production of 78°C is the key feature that makes EW-HT-Y the perfect link between the different heat levels available. The heat removed from electrical motors or industrial machines is transferred from medium-low temperature levels, which make it not usable, to higher temperature levels, which make it attractive for several usages.

The extraordinary operating range of EW-HT-Y opens the doors to an infinite number of recovered heat usages, till now impossible.

> Some examples are plastic or food drying, material pre-heating processes or also facilities space heating through high temperature ceiling radiant panels.



IN DISTRICT HEATING NETWORKS

Bringing 6-pipe system benefits to a larger scale

ON THE ROAD TO SMART CITIES

Triggering renewables and cutting waste.

Favouring the development of systems based on medium temperature water loops, EW-HT-Y unlocks attractive opportunities in district heating planning. A medium temperature water network can successfully cover the space heating demand and, thanks to EW-HT-Y, can also be the source to produce domestic hot water avoiding fossil fuels or electrical heaters.



CUT OF PIPELINE HEAT LOSSES

Thermodynamics state that the rate of heat loss of a body is proportional to the temperature difference between the body and its surroundings. In other words, the higher the pipeline water temperature, the higher the heat losses.

In a district heating network, pipelines snake for several kilometres throughout a urban area or even an entire city. Lowering the city loop water temperature cuts heat losses and pipe insulation costs, really making a world of difference.

HIGHER HEAT DISTRIBUTION EFFICIENCY

Circulating water at very high temperature lowers heat distribution system efficiency and bind to "heat degradation": before serving medium temperature hydronic terminals (fan coils, heating floors) the water temperature must be reduced.

EW-HT-Y produces very hot water only when and where it is needed, avoiding unnecessary very high temperature pipelines and switching from a "heat degradation" scheme to a "heat upgrade" one.



TECHNOLOGICAL CHOICES

The innovation of EW-HT-Y is the result of the best technology and the most accurate design.



DEDICATED SCROLL COMPRESSORS

EW-HT-Y adopts the new generation compressors dedicated to heat pumps. They feature a special scroll design, which greatly extends the operating envelope towards both high evaporating and condensing pressures. Additionally, fewer moving parts, robust running gear and the low vibrations resulting from a balanced compression mechanism ensure perfect durability, safety and quietness.



DOUBLE REFRIGERANT CIRCUIT

Redundancy is the key to reliability. Two independent refrigerant circuits ensure continuous and dependable operation in all conditions or situations that may arise. This technical feature makes EW-HT-Y suitable to be the sole source of high temperature heating.



ELECTRONIC EXPANSION VALVE

The electronic valve ensures ideal unit operation in all conditions. The fast processing of the acquired data allows a quick, fluctuatingfree regulation, and therefore a highly accurate adjustment to the load swings. Due to an integrated design, the synergy among the expansion valve, the compressor and the compressor driver is complete.



ADVANCED CONTROL SYSTEM

The W3000TE control, thanks to dedicated algorithms, ensures the optimised management of the units in every working condition. It features an LCD display and an easy-to-use interface. The internal clock allows the scheduling of a time frame to plan unit operations. The control is also available with a remote keyboard and is compatible with BMS.

DUAL CIRCUIT PLATE HEAT EXCHANGERS

The evaporator and the condenser are two high efficiency dual circuit plate heat exchangers, properly designed to be connected with two independent refrigerant circuits. The special design ensures that each refrigerant circuit is in contact with the entire water flow, therefore the partial load (only one circuit running) efficiency is maximized.

The second great benefit is that water heating is always uniform, also at partial loads, unlike in traditional configurations. This ensures to get the best advantage from the extended operating range of the compressors.



Traditional solution vs dual circuit solution - set point 78°c, constant water flow rate

100% HEATING DEMAND (WATER INLET 70°C)

Both solutions fulfill the demand, heating the water up to 78°C.

50% HEATING DEMAND (WATER INLET 74°C)

With the traditional solution, in order to get a 78°C overall outlet, the water flow rates coming from the two independent PHEs should be 74°C (refrigerant circuit off) and 82°C (refrigerant circuit on). However, the maximum water condensing temperature allowed by the compressor envelope is 78°C. Therefore neither of the two refrigerant circuits are able to run. The water is not heated at all and the 78°C set point is not achieved. With the dual circuit PHE solution, when only one refrigerant circuit is running, the water is heated from 74°C to 78°C and the set point is met.



REFRIGERANT R134A

Thanks to its physical characteristics, R134a is particularly suitable to work at high temperatures with an excellent heat exchange performance.





0152 - 0612

Water to water heat pumps for very high temperature water production (70-279 kW)



			0152	0182	0202	0262	0302	0412	0512	0612
Power supply		V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE										
HEATING ONLY (GROSS VALUE)										
Total heating capacity	(1)	kW	70,2	79,3	92,5	113	139	181	225	279
Total power input	(1)	kW	17,0	18,9	22,0	27,9	34,2	43,7	55,1	67,6
COP	(1)	kW/kW	4,13	4,20	4,20	4,05	4,08	4,14	4,08	4,13
HEATING ONLY (EN14511 VALUE)										
Total heating capacity	(1)(2)	kW	70,4	79,5	92,7	113	140	181	225	280
COP	(1)(2)	kW/kW	4,01	4,07	4,08	3,94	3,98	4,04	4,01	4,06
ENERGY EFFICIENCY										
SEASONAL EFFICIENCY IN HEATING (Reg. EU 813/	2013)									
PDesign	(3)	kW	38,6	43,6	50,0	61,6	78,1	104	128	157
SCOP	(3)(8)		3,27	3,39	3,45	3,30	3,30	3,25	3,27	3,30
Performance ns	(3)(9)	%	123	128	130	124	124	122	123	124
Seasonal efficiency class	(3)		A+	A++	A++	A+	-	-	-	-
EXCHANGERS										
HEAT EXCHANGER USER SIDE IN HEATING										
Water flow	(1)	l/s	2,15	2,42	2,83	3,45	4,26	5,52	6,87	8,54
Pressure drop	(1)	kPa	23,9	25,0	24,2	24,2	19,7	19,8	19,8	20,1
HEAT EXCHANGER SOURCE SIDE IN HEATING										
Water flow	(1)	l/s	2,62	2,97	3,47	4,19	5,18	6,74	8,35	10,41
Pressure drop	(1)	kPa	45,4	46,7	51,8	53,8	49,7	50,1	37,6	37,7
REFRIGERANT CIRCUIT										
Compressors nr.		N°	2	2	2	2	2	2	2	2
No. Circuits		N°	2	2	2	2	2	2	2	2
Refrigerant charge		kg	6,00	7,00	8,00	9,00	10,0	11,0	12,0	13,0
NOISE LEVEL										
Sound Pressure	(4)	dB(A)	58	58	58	60	60	62	62	64
Sound power level in heating	(5)(6)	dB(A)	74	74	74	76	76	78	78	80
SIZE AND WEIGHT										
A	(7)	mm	1223	1223	1223	1223	1223	1223	1223	1223
В	(7)	mm	877	877	877	877	877	877	877	877
Н	(7)	mm	1496	1496	1496	1496	1496	1496	1496	1496
Operating weight	(7)	kg	365	380	390	415	430	610	675	740

Notes

1 Plant (side) heat exchanger water (in/out) 70°C/78°C; Source (side) heat exchanger water (in/out) 45°C/40°C.

Values in compliance with EN14511-3:2013.
Seasonal space heating energy efficiency class MEDIA TEMPERATURE in AVERAGE climate conditions [REGULATION (EU) N. 813/2013]

Average sound pressure level at 1m distance, unit in a free field on a reflective surface: non-binding value

calculated from the sound power level. 5 Sound power on the basis of measurements made in compliance with ISO 9614.

Main accessories:

- Phase sequence relay
- Numbered wiring on electrical board (std)
- Automatic circuit breakers on loads (std)
- Set-up for for remote connectivity (Modbus, Lonworks, Bacnet MS/TP RS485, Bacnet over IP)
- Remote signal for double set point
- Demand limit
- Touch screen interface

- Remote control keyboard with LCD display (distance up to 200m or 500m)
- Soft starters
- High pressure and low pressure gauges
- Compressor suction and discharge valves
- Acoustical enclosure: extra insulation on
- compressor section
- Rubber type anti-vibration mounting
- Grooved coupling kit with threaded pipe user side (std)





W3000TE

Proprietary settings allow for the perfect integration of the EW-HT-Y control with another Climaveneta smart heat pump equipped with W3000TE software or later. The integration provides several benefits in terms of equipment sequencing and management, delivering a complete 6-pipe system control.

Notes:

- Maximum distance between the units: 100 m.
- In the case of an older software version,
- please contact Mitsubishi Electric Hydronics and IT Cooling Systems Sales Dept.

6 Sound power level in heating, indoors.7 Unit in standard configuration/execution, without optional accessories

S Seasonal space heating energy efficiency The units highlighted in this publication contain HFC R134a [GWP $_{100}$ 1430]

8 Seasonal performance coefficient

fluorinated greenhouse gases





PLANT (SIDE) WATER (IN/OUT) 70°C/78°C

				0152	0182	0202	0262	0302	0412	0512	0612	
		Heating capacity	kW	70,2	79,3	92,5	113	139	181	225	279	
_	1500/1000	Total power input	kW	17,0	18,9	22,0	27,9	34,2	43,7	55,1	67,6	
ouť	40 0/40 0	Cooling capacity	kW	54,2	61,5	71,8	86,8	107	140	173	215	
(in/		COP	-	4,13	4,20	4,20	4,05	4,06	4,14	4,08	4,13	
ter		Heating capacity	kW	63,4	71,5	83,4	102	123	160	199	247	
Wa.	₩ ⊕ 40°C/35°C	Total power input	kW	17,0	18,9	22,1	28	33,8	43,5	54,9	67,4	
de)		Cooling capacity	kW	47,4	53,7	62,6	75,7	91,2	119	147	184	
(sic		COP	-	3,73	3,78	3,77	3,65	3,68	3,63	3,67	3,67	
LCe		Heating capacity	kW	56,9	64,2	74,8	91,9	109	142	176	219	
Sou	2500/2000	Total power input	kW	17,0	18,9	22,1	28,0	33,6	43,5	54,9	67,3	
0,0	35 0/30 0	Cooling capacity	kW	40,9	46,4	54,0	65,6	77,4	101	124	156	
		COP	-	3,35	3,40	3,38	3,28	3,25	3,26	3,21	3,26	

PLANT (SIDE) WATER (IN/OUT) 60°C/65°C

				0152	0182	0202	0262	0302	0412	0512	0612
		Heating capacity	kW	72,1	81,5	94,9	116	151	195	242	300
	45°C/40°C	Total power input	kW	12,7	14,1	16,5	20,9	26,9	32,5	41,1	50,3
ont		Cooling capacity	kW	60,2	68,2	79,4	96,4	126	164	203	253
(in/		COP	-	5,68	5,78	5,75	5,56	5,61	5,99	5,88	5,97
ter		Heating capacity	kW	66,4	75,0	87,5	107	133	172	213	265
Wa.	1000/2500	Total power input	kW	12,9	14,4	16,8	21,2	26,4	32,1	40,5	49,6
de)	40 0/30 0	Cooling capacity	kW	54,3	61,5	71,7	87,1	108	142	175	218
rce (sid		COP	-	5,15	5,21	5,21	5,05	5,05	5,34	5,26	5,34
		Heating capacity	kW	60,5	68,3	79,8	97,7	118	151	187	233
noc	2500/2000	Total power input	kW	13,0	14,5	16,9	21,4	26,0	31,9	40,2	49,2
05	30 0/30 0	Cooling capacity	kW	48,3	54,7	63,9	77,6	93,6	121	149	187
		COP	-	4,65	4,71	4,72	4,57	4,52	4,73	4,66	4,73



ClimaPRO

According to the units' actual efficiency curves, ClimaPRO continuously optimizes plant working conditions by promptly adjusting equipment staging and sequencing, managing operating set-points and controlling water flows throughout the entire system.

ClimaPRO can be interfaced with any BMS or it can successfully perform all functions on its own.







Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a

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