

mu echos A

6÷48 kW

Water/water
chiller and heat pump





TECHNICAL FEATURES

MU ECHOS

Water/water chiller and heat pump with scroll compressors and plate heat exchangers.

STRUCTURE

The units are designed to be installed from inside. The structure is in steel sheet coated with epoxy-polyester powder paint, with removable panels insulated with sound absorbing material. The sizes 6, 8 and 11 are painted with RAL 7032 colour, suited for installation on the wall, the sizes from 16 to 48 are painted in RAL 5014 colour for installation on the floor.

COMPRESSOR

Rotary screw hermetically sealed scroll type compressors with internal thermal protection, heater for the crankcase, supported by rubber antivibration mounts to reduce the vibrations transmission to the unit. Cooling circuit Compende: feed inlets, dehydrating filter, thermostatic expansion valve, high and low pressure switches. Units of sizes from 16 to 48 are also provided with safety valve and fluid sight glass.

EVAPORATOR

Brazed plate heat exchanger in stainless steel AISI 316 insulated against condensate, temperature probe on the vane-operated flow switch antifreeze protection (installed on sizes 6, 8 and 11 and supplied with the unit for the other sizes).

CONDENSER

Brazed plate condenser in stainless steel AISI 316 sized to operate with well water (in/out 15/30 °C). The chiller units can be fitted upon request with condenser sized to operate with tower water (in/out 30/35°C).

ELECTRICAL PANEL

The panel consists of: main disconnect switch, automatic disconnect switch for the main and auxiliary power circuit protection, compressor remote disconnect switch, on/off digital signal input contact, microprocessor for parameter setting control of the following functions:

- Regulation of water temperature;
- Control of set-point self-regulation;
- Anti-freeze protection
- Compressor timing
- Alarm signalig
- Alarm reset
- Cumulative alarm contact for remote signaling;The control display shows the following information:
- Ingoing and outgoing water temperature;
- Currently set temperature and differential
- Alarm description
- Operation hour counter;

CONTROL AND SAFETY DEVICES

The units are equipped with:

- Manual reset high pressure switch
- Controlled manual reset low pressure switch;
- High pressure safety valve (except for the 6, 8 and 11 sizes, basic and /HP version);
- Water temperature probe on the user side, installed on the heat exchanger inlet;
- Antifreeze probe on the user side heat exchanger outlet;
- Vane-operated mechanical flow switch fitted on sizes 6, 8 and 11 and supplied with the unit for the other sizes;
- Compressor overtemperature internal protection.

TESTING

All units are factory-tested and supplied complete with oil and refrigerant (except for the LE, LE/HP, LC and LC/HP units).

VERSIONS

Check the table with the available configurations for any interferences between one option and the other.
The basic version consists of a cooled-water water chiller.

/HP:

reversible heat pump

Besides the components of the MU ECHOS A, the cooling circuit is equipped with 4-way inversion valve and a second thermostatic expansion valve. The hydraulic circuit consists of a pressure switch valve, a bypass solenoid valve and a second vane-operated water flow switch. These components are already installed on the 6, 8 and 11 sizes and for the other sizes they are supplied with in the kit). The electrical panel has a digital input contact for summer/winter switching.

/LE:

motocondensing unit

Motocondensing unit: The unit is designed to operate with an air-cooled evaporator therefore it does not have a heat exchanger on the user side or a thermostatic valve (can be supplied in the kit upon request). The unit is loaded with nitrogen instead of refrigerant

/LE /HP

reversible motocondensing unit

The unit is designed to operate with a remote air-cooled evaporator/condenser therefore it does not have a heat exchanger on the user side or a thermostatic valve suited for chiller operation mode (can be supplied in the kit upon request). The unit has a fluid receiver sized for the split unit supplied by Blue Box and the thermostatic valve for the heat pump operation mode. The unit is loaded with nitrogen instead of refrigerant

/LC

motoevaporating unit

The unit has no heat exchanger on the source side in order to allow connection to a remote air-cooled condenser. The unit is loaded with nitrogen instead of refrigerant

/LC /HP

reversible motoevaporating unit

The unit has no thermostatic valve for heat pump operation mode and no heat exchanger on the source side in order to allow connection to a remote air-cooled condenser/evaporator. The unit has a fluid receiver sized for the remote condenser supplied by Blue Box.

The unit is loaded with nitrogen instead of refrigerant.

/LN

low-noise unit

The sizes 6, 8 and 11 with this outfit require the replacement of the standard sound absorbing material with a multi-layer acoustic insulation of high impedance.

The sizes from 16 to 48 require the installation of a sound-proof cover on the compressor. This outfit can be combined with all aforementioned versions of the unit

HYDRAULIC SYSTEM OPTIONS

The unit basic version has no circulation device or pump installed (except for the 6, 8 and 11 sizes). All the outfits (except for LE and LE/HP) can be equipped upon request with one of the following hydraulic modules:

/ST 1P

Besides the standard components installed, the unit has a circulation pump. This version is not suitable for the 6, 8 and 11 sizes.

/ST 1PS

Besides the standard components installed, the unit has an inertial insulated storage tank and a circulation pump. The sizes 6, 8, 11 and from 16 to 48 of the HP version have the safety valve and the expansion vessel fitted as standard. This version is standard for the sizes 6, 8 and 11 while for the other sizes it must be requested when ordering.

ACCESSORIES

The unit in basic version and of various outfits can also be fitted with extra accessories. For a complete list of accessories refer to the price list.

Mu Echos A

basic version general technical data

UNIT SIZE		6	8	11	16	19	22	24	28	32	35	42	48
Heating													
Heating capacity (W 10°C/W 35°C)	(1) kW	7,7	10,5	12,9	19,2	23,2	27,0	29,6	34,7	39,4	43,0	51,4	57,8
Absorbed power	(1) kW	1,4	1,9	2,3	3,5	4,2	4,9	5,4	6,3	7,0	7,8	8,8	9,8
COP	(1)	5,45	5,58	5,65	5,48	5,52	5,48	5,50	5,51	5,64	5,53	5,85	5,88
Heating capacity (W 10°C/W 45°C)	(2) kW	7,5	10,2	12,6	18,2	22,0	25,5	28,7	33,6	38,0	41,5	48,9	55,0
Absorbed power	(2) kW	1,8	2,5	3,0	4,4	5,3	6,2	6,7	7,8	8,7	9,7	10,7	12,1
COP	(2)	4,13	4,12	4,24	4,17	4,16	4,14	4,28	4,29	4,38	4,29	4,56	4,56
Heating capacity (W 0°C/W 35°C)	(3) kW	5,3	7,5	9,1	13,4	16,3	18,9	21,6	25,3	28,5	31,1	35,5	39,9
Absorbed power	(3) kW	1,4	2,0	2,4	3,5	4,1	4,8	5,6	6,5	7,4	8,1	8,4	9,8
COP	(3)	3,86	3,79	3,79	3,89	3,93	3,91	3,86	3,87	3,88	3,83	4,20	4,08
Heating capacity (W 0°C/W 45°C)	(4) kW	5,4	7,5	9,2	13,0	15,7	18,3	21,2	24,8	27,8	30,4	34,5	38,6
Absorbed power	(4) kW	1,8	2,6	3,2	4,3	5,2	6,1	6,6	7,7	8,6	9,6	10,5	12,1
COP	(4)	3,04	2,90	2,93	3,01	3,01	3,00	3,21	3,23	3,23	3,18	3,29	3,20
Cooling													
Cooling capacity (W 15°C/W 7°C)	(5) kW	6,4	8,8	11,0	16,5	19,2	22,5	24,8	28,0	34,5	36,9	43,9	48,8
Absorbed power	(5) kW	1,3	1,6	2,0	3,1	3,7	4,3	4,8	5,6	6,2	7,0	7,8	8,9
EER	(5)	4,89	5,51	5,52	5,34	5,19	5,22	5,16	4,99	5,56	5,26	5,63	5,48
Cooling capacity (W 35°C/W 18°C)	(6) kW	8,4	11,5	14,6	22,5	26,1	30,4	32,9	37,3	45,7	49,4	58,4	65,4
Absorbed power	(6) kW	1,4	1,7	2,2	3,4	4,1	4,9	5,4	6,3	7,1	7,8	9,0	10,0
EER	(6)	6,12	6,59	6,57	6,59	6,30	6,26	6,12	5,93	6,43	6,32	6,49	6,53
Cooling capacity (W 35°C/W 7°C)	(7) kW	5,9	8,3	10,4	15,6	18,1	21,0	23,5	26,7	32,5	35,2	41,8	46,6
Absorbed power	(7) kW	1,4	1,8	2,3	3,4	4,1	4,8	5,3	6,2	7,0	7,7	8,7	9,9
EER	(7)	4,24	4,61	4,52	4,58	4,40	4,38	4,44	4,31	4,65	4,57	4,80	4,71
Cooling capacity (B 30°C/W 18°C)	(8) kW	8,4	11,4	14,6	22,4	25,9	30,2	32,8	37,1	45,6	49,2	58,2	65,2
Absorbed power	(8) kW	1,4	1,8	2,3	3,5	4,2	4,9	5,4	6,4	7,2	7,9	9,1	10,1
EER	(8)	6,01	6,54	6,48	6,47	6,19	6,15	6,03	5,83	6,36	6,25	6,42	6,45
Cooling capacity (B 30°C/W 7°C)	(9)	5,9	8,3	10,4	15,5	17,9	20,9	23,4	26,6	32,4	35,1	41,7	46,4
Absorbed power	(9)	1,4	1,8	2,3	3,4	4,1	4,9	5,4	6,3	7,1	7,8	8,8	10,0
EER	(9)	4,20	4,57	4,47	4,52	4,33	4,30	4,38	4,25	4,60	4,52	4,76	4,66
ESEER		4,83	5,31	5,16	5,10	4,95	4,91	4,91	4,80	5,14	5,07	5,31	5,18
Compressor													
Quantity/Cooling circuits	n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Capacity steps	%	0-100	0-100	0-100	0-100	0-100	0-100	0-100	0-100	0-100	0-100	0-100	0-100
User side heat exchanger													
Water flow	(6) l/h	1.451	1.972	2.518	3.874	4.488	5.224	5.663	6.413	7.864	8.490	10.048	11.245
Pressure drop	(6) kPa	6	4	5	50	49	48	46	45	40	47	46	45
Source side heat exchanger													
Water flow	(6) l/h	563	757	967	1.488	1.733	2.019	2.196	2.498	3.029	3.278	3.866	4.323
Pressure drop	(6) kPa	22	21	17	19	25	21	19	14	26	31	25	32
Hydraulic module													
Pump head rating	(10) kPa	46	45	42	78	69	100	92	82	87	119	114	85
Storage tank capacity	(10) l	35	35	35	50	50	50	100	100	100	100	100	100
Noise levels													
Noise power level	(11) dB(A)	61	61	62	62	62	69	69	71	71	71	72	74
Noise pressure level	(12) dB(A)	47	47	48	48	48	55	55	57	57	57	58	60
LN version noise power level	(11) dB(A)	59	59	60	60	60	67	67	69	69	69	70	72
LN version noise pressure level	(12) dB(A)	45	45	46	46	46	53	53	55	55	55	56	58

(1) User side ingoing-outgoing water temperature 30/35 ; source side ingoing-outgoing water temperature 15/10°C

(2) User side ingoing-outgoing water temperature 40/45 ; source side ingoing-outgoing water temperature 15/10°C

(3) User side ingoing-outgoing water temperature 30/35 ; source side ingoing-outgoing glycol solution temperature 0/-3

(4) User side ingoing-outgoing water temperature 40/45 ; source side ingoing-outgoing glycol solution temperature 0/-3

(5) User side ingoing-outgoing water temperature 12/7 ; source side ingoing water temperature 15/30°C

(6) User side ingoing-outgoing water temperature 23/18 ; source side ingoing water temperature 30/35°C

(7) User side ingoing-outgoing water temperature 12/7 ; source side ingoing water temperature 30/35°C

(8) User side ingoing-outgoing water temperature 23/18 ; source side ingoing-outgoing glycol solution temperature 30/35

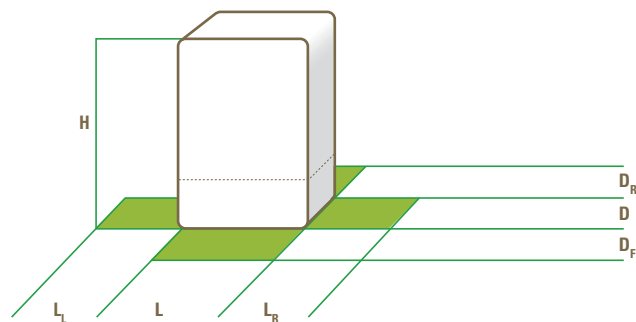
(9) User side ingoing-outgoing water temperature 12/7 ; source side ingoing-outgoing glycol solution temperature 30/35

(10) For ST 1PS version

(11) Noise power levels calculated according to ISO 3744

(12) Noise pressure levels measured at 1 meter from the unit in free field, with a directivity factor Q=4

basic version general technical data



Basic version and ST1P		6	8	11	16	19	22	24	28	32	35	42	48
L	Length	mm	-		507			861				862	
D	Depth	mm	-		537			543				537	
H	Height	mm	-		671			671				1020	
W	Operating weight	(1) kg	-	-	102	106	112	164	168	200	203	204	252

Version ST1PS		6	8	11	16	19	22	24	28	32	35	42	48
L	Length	mm	456		925			861				862	
D	Depth	mm	398		537			543				537	
H	Height	mm	1.000		1.221			1.220				2.050	
W	Operating weight	(1) kg	158	164	169	226	231	238	344	348	371	378	426

Clearance areas		6	8	11	16	19	22	24	28	32	35	42	48
L _L	Left side	(2) mm	100		300			300				300	
L _R	Right side	(2) mm	100		300			300				300	
D _F	Front side	(2) mm	500		500			500				500	
D _R	Rear side	(2) mm	0		300			300				300	

(1) The weight is only indicative and may vary depending on the unit outfit

(2) The clearance areas are indicated considering that the unit is controlled from the front side.