

APPLICATION GUIDE



AIR COOLED CONDENSING UNIT

ASC/ASH

20 - 230 kW

ASC/ASH-AGU-1801-E



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LENNOX

ASC/ASH

APPLICATION GUIDE

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Product designed and manufactured under quality management systems certified ISO 9001 and ISO 14001.



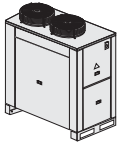
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CONDENSING UNIT

ASC / ASH	020S	025S	030S	035S	040S	045D	055D	070D	085D	100D	120D	140D	200D	230D
Box	A	B			C			D			E			

A BOX



B BOX



C BOX



D BOX



E BOX



MODEL NUMBER DESCRIPTION

EXAMPLE : ASC 020S NM3M

CONDENSING UNIT	
A	ASC/ASH
S	Condensing unit
C	C = Cooling only H = Heat pump
020	Cooling capacity in kW
S	S = 1 circuit D = 2 circuits
N	Not used
M	R410A
3	Revision number
M	400 V / 3 / 50 Hz

CONDENSING UNIT: ASC/ASH

Casing

- Casing made of galvanized steel sheet metal painted with a white RAL 9002 powdered polyester paint and a RAL3003 red stripe.
- Rigid, hot dipped galvanized chassis.
- Unit lifting and handling via the base frame.
- Side grilles as option to protect the unit during transportation and against human aggressions.

High efficiency multiscroll technology

- Exclusive Compliant Scroll® design with both axial and radial compliance to increase compressor operation tolerance to liquid refrigerant, substantially improving durability and reliability.
- Motor cooled by suction gas.
- Motor protection device against high temperature or over current situations.
- Discharge non-return valve.
- Crankcase heater as standard on heat pump and optional with winter operation down 0°C for cooling only units.
- Direct on line start.
- Low noise scroll compressors insulated with a compressor acoustic jacket.
- Compressors mounted on high efficiency cellular polyurethane vibration absorbers.

Advanced condenser fan design

Fan-motor assembly using external rotor technology associated with OWLET high performance aluminum fan blades of the latest fan technology to improve energy consumption and airflow rate on the outdoor coils while reducing sound power level. Axial fans speed are 700 or 900 rpm according to models, direct coupling, with available static pressure up to 75 Pa as standard. Pressure version for size 100 to 230 : speed axial fans are 1450 RPM, direct coupling, with available static pressure up to 250 Pa.

Heat exchanger

Made of copper tubes and aluminum corrugated swirl fins, the coil heat exchanger are designed to maximize the output.

Refrigerant circuit:

ASC/ASH units operate with R410A refrigerant. For cooling only units, each circuit includes as standard:

- High pressure switch with automatic reset.
- Low and high pressure transducers.

On heat pumps units, each circuit includes in addition, as standard :

- Four-way valve
- Liquid receiver
- Thermostatic expansion valve
- Filter drier

Each refrigerant circuit is pressure and leak tested with a Hydrogen/Nitrogen mixture, and vacuumed before being charged with nitrogen. All units are then subjected to a complete functional

and operational run test to guarantee perfect sealing before leaving the factory.

Electrical box:

- Unit wiring in compliance with standard EN 60204-1.
- IP54 water protection.
- Circuit breaker protection for compressors and fans.
- Compressor and fan working contactors.
- Terminal block and wiring for power supply to the unit.
- Power supply 400V/3/50Hz without neutral except for size 20S with neutral.

PLUG AND PLAY UNIT

Power supply

To make installation easier, ASC/ASH power supply does not require «neutral» connection. It is powered by 400 V, 3 phases, 50 Hz except size 20S

Circuit breakers

To improve the safety of the ASC/ASH and extend its life, circuit breakers protect against over-loading, over intensity and a disconnected supply phase. Maintenance is also improved as there is no requirement to change fuses. The electrical panel is manufactured in accordance with EN60204-1 (1998) electrical directive.

Refrigerant pressure reading

No need to access to refrigerant pressure gauges. Refrigerant pressures and superheat on each circuit can be read directly on the service display DS60 or a BMS as all units are equipped with high and low pressure transducers and refrigerant suction temperature probes

Easy access

All access to internal components of the ASC/ASH units are closed by panels equipped by locks and handle for quick and easy dismounting. No more screws are used as panel fixtures.

ENERGY SAVINGS

R410A refrigerant

Efficient systems such as ASC/ASH are designed around R410A refrigerant to achieve the best performances.

- Energy efficient refrigerant thanks with pressure drop in the pipes: Higher evaporating pressure and lower condensing pressure improve compressor EER & COP.
- R410A compressors have a better isentropic efficiency.
- Environmentally friendly refrigerant: It contains No Chlorine (ODP = 0).

Dynamic and alternate defrost

Defrost is necessary to ensure efficient operation of heat pumps in winter. The unit starts defrost cycle when the outside temperature is below a set temperature and repeat the defrost cycles periodically. It results sometimes in starting an expensive defrost cycle when it is very cold outside but very dry, or too warm, in other words when the coil is not frozen.

- Dynamic defrost is Lennox' answers to unnecessary defrost cycles. Dynamic defrost detects icing of the coil by monitoring the difference between refrigerant and outside temperature and starts the defrost cycle only when required. Under certain conditions a rooftop unit equipped with this built in dynamic defrost feature can run several hours in heat pump mode without starting any defrost cycle. Dynamic defrost can save up to 15% on annual energy consumption.
- Alternate defrost saves energy by reducing the need for auxiliary heating during defrost cycles. With Alternate defrost when one circuit starts a defrost cycle the other circuit is running in heat pump at full capacity to minimize the need for auxiliary heating.

Morning anticipation and dynamic set point

The unit can be programmed to switch-on in the morning to reach the occupied zone temperature set point just in time.

Dynamic set point can be used in summer to offset the ambient temperature set point according to the outdoor temperature. This is to avoid large temperature difference between indoor and outdoor. The indoor temperature set point would then increase with the outdoor temperature improving comfort and saving large amount of energy

Scheduling / Time zone Management

In order to ensure the unit perfectly matches the requirements of the most difficult applications in terms of occupation and varying internal loads, the CLIMATIC 60 offers now up to 7 time zones per day (Z0 to Z6) adjustable by steps of 10 minutes. Each time zone can be programmed to follow one of four possible operating modes: A, B, C & D

CONTROL

The new generation of microprocessor based control, CLIMATIC 60 equip the ASC/ASH range.

It inherits more than 20 years of technology and field operating experience from its predecessors Climatic control platforms. CLIMATIC 60 controller intelligently improves efficiency and helps set up and service operations to guarantee long lasting performance.

CLIMATIC 60 is designed to provide the best energy efficiency throughout unit's life cycle while ensuring reliable and consistent operation with user friendly interfaces.

This new controller constantly monitors more machine parameters than ever to improve unit operation and maximize efficiency and reliability

The PI algorithm of the CLIMATIC 60 controls the supply air temperature and a temperature difference between supply and return. It is able to optimize the refrigeration circuit operation to match perfectly the required cooling or heating load maximizing efficiency and comfort.

It will also improve reliability with features such as compressor operating limits monitoring, (High and Low refrigerant pressure and temperature now measured and displayed on DS60 and Bus) refrigerant leak detection or compressor operating time equalization and protection against excessive short cycling.

Faults and alarms

CLIMATIC 60 manages more than 90 different faults and alarms codes and can store the last 32 with time and date. The stored faults and alarms can then be displayed on the DS60 and on the communication bus with the full text detail.

BE60 Extension control board

This board has been developed for any customer who wants to take over the control of the unit using digital or analogue input signal. With this dry contact board option the customer can set:

- 4 digital inputs (On/Off, clear faults, various component unloading, heating priority modifications, thermostat orders....)
- 4 digital Outputs (alarms reporting, components status, scheduling time zone and operating mode status, cooling, heating, defrost and auxiliary heating status...)
- Up to 4 analogue inputs (external temperature humidity probes, fresh air input signal, force fan speed and temperature setpoint offset).
- 1 analogue output (Humidifier)

Note that CLIMATIC controller always stays in charge of all safety algorithms, defrost operation and free-cooling.

The BE60 expansion board is an additional board fixed on DIN rail, delivered as standard.

REFRIGERATION OPTIONS

Winter cooling operations down to 0 °C

This option allows the ASC/ASH to operate in cooling mode with an outside temperature down to 0°C (instead of 15°C on the standard unit).

This is especially needed when free-cooling operation is not possible. This function is made of condenser fan alternate start/stop that maintains a constant condensing pressure.

This equipment is standard on heat pump versions

Winter cooling operations down to -15 °C

Unit fitted with variable speed fans. This option also allows cooling operation in very low outside temperature (-15°C), with good performance on condenser fan, belt lifecycle extension and starting peak current reduction.

Strongly recommended for applications where cooling is required during winter.

Active Acoustic Attenuation System with variable speed fans

Low Noise option consists in an acoustic jackets. Besides, with the variable speed fan include in Winter cooling operations down to -15 °C option, the CLIMATIC 60 controls the fan speed limited by the Smart Acoustic System which allows progressive adaptation of the unit to the building load while respecting the noise level constraints and the operating limits.

The maximum sound level and the fan strategies can be adjusted according to the schedule mode in order to benefit from the different modes “Auto”, “Auto Quiet” and “Quiet” operation as well as in heating or cooling mode.

The Active Acoustic Attenuation System can be adjusted according to the scheduling and can take different values for each schedule mode.

Service valves

This option consists in liquid and gas service valves that isolate the refrigerant section during maintenance. This is particularly useful when components of the circuit have to be changed. It reduces the time and cost of maintenance operation.

INSTALLATION AND SAFETY OPTIONS

Main disconnect switch

Main disconnect switch is lockable to make a safe access to electrical panel. It is installed on the electrical panel door of the compressor section and controls all parts. Is also used as emergency cut off: it is mandatory to guarantee a proper access to this switch. Main disconnect switch is sized accordingly to the options fitted in the unit.

Compressor electrical protection

Return lock against 3 phases inversion at installation. This protection prevents the Scroll compressor from starting and operating in the wrong sense: in case of the electrical phases are wrongly connected, the compressor will not start. The compressor electrical protection option is particularly required when the installation of the air conditioning unit is made before the electrical wirings.

Anti-vibration mounts rubber type (supplied loose)

These parts reduce the transmission of vibration to the ground and the general sound level. They are fixed under the unit at the points specified by our technical drawing.

Pallet packaging

This unit protection option is wooden pallet packaging with plastic bag useful during potentially bad shipment condition: long distance by truck or container.

EXTENDED LIFECYCLE

Assembly quality, compliance to PED 97-23, EN 60204-1, CE, made in an ISO 9001v2000 factory.

What makes the difference are the small details which have given LENNOX its reputation. Electrical components are selected to the highest standards, refrigeration components are generously sized to ensure maximum performance and reliability. Quality manufacturing procedures together with a culture of continuous improvement at all LENNOX factories, ensures the products are built to the highest standards.

ASC/ASH complies to EN60204 norms, PED 97-23 directive, is CE compliant and is built in an ISO 9001 certified Factory

CONTROL AND COMMUNICATIONS OPTIONS

DC60 remote comfort display (supplied loose)

This is a remote controller for non-technical customer. It has been designed to aesthetically fit inside a room and be very easy to use. It can be installed at maximum 50 meters from the unit. There are two levels : In the first level, ambient temperature is provided and the setpoint temperature or offset to this setpoint temperature can be adjusted (according to settings and rights offered by the technician). The unit can be turned On and Off in this level. The full level additionally provides information such as outdoor temperature, supply temperature, ambient humidity level, air quality, fresh air damper opening percentage, time zone and working mode of the given time zone. DC60 Comfort display shows faults number when the unit is in the failure mode. Customer can reset fault thanks to a combination of keys. Time and day of the unit can be seen and modified easily through the DC60.

DS60 Service display (supplied loose)

This plug and play service display and controller allows maintenance staff to set up, read and modify all unit parameters (unit settings, operating time and number of compressor starts, low and high pressure reading, airflow rate of supply fan, and read the history of last 32 faults...). This controller has been designed to be very user-friendly, with 6 different keys and a graphic display. It includes scrolling menus and full text (no codes) explanation. It is available in English or other languages.

DM60 Multi-units display (supplied loose)

The DM60 remote display can manage up to 8 units on a single Bus. On a multiunit site it makes the installation less expensive because, not only because of DM60 price, but because only one bus-wire has to be connected down to the DM60. In addition to the functions offered by the DC60 display, the DM60 display provides the percentage of power factor for compressors and auxiliary heater. Moreover DM60 display allows to set time zones and to modify working modes for the given time zone. These information are available for each of the units connected to the Bus. It can be installed up to 1000 meters from the unit.

Modbus communication interface RS485

Communication card using ModBus protocol with RS485. Communication interface with a building management system.

BACnet® communication interface RS485

Communication card using Bacnet® protocol with RS485. Communication interface with a building management system.

LonWorks® communication interface

Communication card using LonTalk® protocol. Communication interface with a building management system.

Modbus or BACnet® communication interface TCP/IP

Communication card using Bacnet ® or Modbus with TCP/IP. Communication interface with building management system.



	Cooling only	Heat pump
ASC/ASH		
Refrigeration option		
Winter cooling operation down to 0°C outdoor temperature	X	STD
Winter cooling operation down to -15°C outdoor temperature	X	N/A
Service valves	X	X
Electrical and safety		
Main disconnect switch	X	X
Compressor electrical protection	X	X
Condenser coil guards	X	X
Control & Communication		
Advanced control pack (enthalpy and humidity control)	N/A	N/A
Modbus communication interface RS485	X	X
Lonworks® communication interface	X	X
Bacnet® communication interface RS485	X	X
Modbus or bacnet® communication interface TCP/IP	X	X
DC60 remote comfort display (supplied loose)	X	X
DS60 service display (supplied loose)	X	X
DM60 service display (supplied loose)	X	X
BE60 expansion control board	STD	STD
Other options		
High static pressure up to 250 Pa	Size 100 - 230	
Low noise version	X	X
Coil anticorrosion protection	X	X
Condenser coil guards	X	X
Pallet packaging	X	X

ASC/ASH		020S	025S	030S	035S	040S	045D	055D
Cooling mode - ASC								
Cooling capacity ⁽¹⁾	kW	19,7	24,7	28,4	36,1	42	49,4	56,7
EER ⁽¹⁾		3,06	3,05	2,95	3,03	2,98	3,05	2,94
Heating mode - ASH								
Heating capacity ⁽²⁾	kW	19,8	25,0	28,6	36,0	40,2	50,1	57,1
COP ⁽²⁾		3,20	3,21	3,12	3,24	2,98	3,21	3,1
Refrigerant circuit								
Number of compressors/Number of circuits		1/1	1/1	1/1	1/1	1/1	2/2	2/2
Capacity steps		1	1	1	1	1	2	2
Electrical data								
Voltage		400V/3 Ph/50Hz						
Maximum absorbed power	kW	8,55	10,8	12,5	16,4	17,7	21,6	25
Acoustic data								
Sound power level ⁽³⁾	dB(A)	76	78	81	80	81	81	84

ASC/ASH		070D	085D	100D	120D	140D	200D	230D
Cooling mode - ASC								
Cooling capacity ⁽¹⁾	kW	72,1	83,9	104	115	141	197	228
EER ⁽¹⁾		3,04	2,96	3,03	3,1	3,05	3,11	3,06
Heating mode - ASH								
Heating capacity ⁽²⁾	kW	71,9	80,3	105	114	137	191	218
COP ⁽²⁾		3,24	3,1	3,24	3,2	3,13	3,19	3,06
Refrigerant circuit								
Number of compressors/Number of circuits		2/2	2/2	3/2	3/2	3/2	4/2	4/2
Capacity steps		2	2	2	2	2	2	2
Electrical data								
Voltage		400V/3 Ph/50Hz						
Maximum absorbed power	kW	32,8	35,5	45,6	48,7	59,9	83,0	96,2
Acoustic data								
Sound power level ⁽³⁾	dB(A)	83	84	87	87	90	89	82

(1) Evaporating temperature = 7°C / Ambient temperature = 35°C

(2) Condensing temperature = 50°C / Ambient temperature = 7°C DB/6°C WB

(3) EUROVENT conditions data

COOLING CAPACITIES

ASC 020S		Air inlet temperature at condenser											
		25 °C		30 °C		35 °C		40 °C		45 °C			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
Evaporating temperature °C													
0		17,3	5,27	16,8	5,55	15,9	6,01	14,7	6,67	13,5	7,42		
5		20,3	5,49	19,8	5,71	18,6	6,30	17,2	6,97	15,8	7,73		
7		21,6	5,59	21,0	5,84	19,7	6,43	18,3	7,10	16,8	7,86		
10		24,0	5,64	23,0	6,03	21,5	6,64	20,0	7,31	18,4	8,08		
15		-											

HEATING CAPACITIES

ASH 020S		Air inlet temperature at condenser													
		-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
		TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C															
30		12,9	3,89	15,0	3,92	17,4	3,95	20,0	3,98	21,1	3,99	22,4	4,01	29,9	4,15
35		12,9	4,36	14,8	4,38	17,1	4,41	19,6	4,43	20,8	4,45	22,0	4,46	29,2	4,58
40		12,8	4,88	14,7	4,90	16,9	4,92	19,3	4,94	20,4	4,96	21,6	4,97	28,6	5,07
45		-	-	14,6	5,49	16,7	5,51	19,0	5,52	20,1	5,53	21,2	5,54	27,9	5,61
50		-	-	-	-	16,6	6,17	18,8	6,18	19,8	6,18	20,9	6,19	27,3	6,24
55		-	-	-	-	-	-	18,6	6,93	19,5	6,93	20,5	6,93	26,6	6,95

Outdoor fan power input (kw)	
Nominal airflow	0,4

COOLING CAPACITIES

ASC 025S		Air inlet temperature at condenser											
		25 °C		30 °C		35 °C		40 °C		45 °C			
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI		
Evaporating temperature °C													
0		21,9	6,71	21,3	7,01	20,0	7,64	18,5	8,46	16,8	9,41		
5		25,6	6,95	24,9	7,25	23,3	7,95	21,6	8,78	19,8	9,73		
7		27,2	7,05	26,4	7,39	24,7	8,10	22,9	8,93	21,0	9,88		
10		30,1	7,11	28,6	7,64	26,8	8,35	24,9	9,18	22,9	10,1		
15		-											

HEATING CAPACITIES

ASH 025S		Air inlet temperature at condenser													
		-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
		TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C															
30		16,5	5,22	19,0	5,22	22,0	5,21	25,3	5,20	26,7	5,19	28,3	5,20	37,8	5,29
35		16,3	5,77	18,8	5,76	21,7	5,74	24,9	5,73	26,3	5,73	27,9	5,73	37,0	5,84
40		16,2	6,41	18,7	6,38	21,5	6,35	24,5	6,32	25,9	6,32	27,4	6,32	36,1	6,41
45		-	-	18,5	7,11	21,2	7,05	24,1	7,01	25,5	6,99	26,9	6,98	35,2	7,06
50		-	-	-	-	20,9	7,88	23,8	7,8	25,0	7,78	26,4	7,76	34,4	7,79
55		-	-	-	-	-	-	23,4	8,74	24,6	8,70	25,9	8,67	33,5	8,63

Outdoor fan power input (kw)	
Nominal airflow	0,67

TC (kW) : Total cooling capacity	TH (kW) : Total heating capacity	PI (kW) : Power input
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COOLING CAPACITIES

ASC 030S	Air inlet temperature at condenser										
	25 °C		30 °C		35 °C		40 °C		45 °C		
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Evaporating temperature °C											
0	25,4	7,94	24,7	8,25	23,0	9,11	21,1	10,1	19,1	11,2	
5	29,7	8,20	28,8	8,60	26,8	9,48	24,6	10,5	22,4	11,6	
7	31,8	8,21	30,5	8,76	28,4	9,63	26,1	10,6	23,8	11,7	
10	35,2	8,24	33,1	9,01	30,8	9,90	28,4	10,9	25,9	12,0	
15	-										

HEATING CAPACITIES

ASH 030S	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	18,9	6,01	21,8	6,01	25,2	6,00	28,9	5,99	30,5	5,99	32,3	6,00	42,7	6,11
35	18,7	6,70	21,5	6,69	24,8	6,67	28,4	6,65	30,0	6,65	31,8	6,65	41,9	6,71
40	18,5	7,46	21,3	7,45	34,5	7,42	28,0	7,39	29,5	7,38	31,2	7,37	41,0	7,39
45	-	-	21,1	8,32	24,2	8,28	27,5	8,24	29,0	8,22	30,7	8,20	40,1	8,17
50	-	-	-	-	23,9	9,26	27,1	9,20	28,6	9,18	30,1	9,15	39,1	9,07
55	-	-	-	-	-	-	26,7	10,3	28,1	10,3	29,6	10,2	38,1	10,1

Outdoor fan power input (kw)

 Nominal airflow 0,8
COOLING CAPACITIES

ASC 035S	Air inlet temperature at condenser									
	25 °C		30 °C		35 °C		40 °C		45 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	32,0	9,83	31,4	10,2	29,4	11,2	27,3	12,3	25,0	13,5
5	37,5	10,1	36,4	10,6	34,1	11,7	31,6	12,8	29,0	14,1
7	40,1	10,1	38,5	10,8	36,1	11,9	33,5	13,0	30,7	14,3
10	44,2	10,2	41,8	11,2	39,1	12,2	36,3	13,4	33,3	14,7
15	50,4	10,8	47,5	11,8	44,5	12,8	41,2	14,0	37,8	15,3

HEATING CAPACITIES

ASH 035S	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	23,9	7,41	27,4	7,46	31,5	7,49	36,0	7,51	37,9	7,52	40,0	7,55	53,1	7,84
35	23,7	8,10	27,2	8,19	31,2	8,24	35,5	8,25	37,4	8,26	39,5	8,27	52,1	8,45
40	23,5	8,85	27,0	8,99	30,9	9,07	35,1	9,10	37,0	9,10	39,0	9,11	51,2	9,20
45	23,4	9,65	26,7	9,86	30,5	9,98	34,7	10,0	36,5	10,1	38,5	10,1	50,2	10,1
50	23,2	10,5	26,5	10,8	30,2	11,0	34,2	11,1	36,0	11,1	37,9	11,1	49,1	11,2
55	23,0	11,4	26,3	11,8	29,9	12,1	33,8	12,2	35,4	12,3	37,3	12,3	48,0	12,4

Outdoor fan power input (kw)

 Nominal airflow 0,82

TC (kW) :	Total cooling capacity	TH (kW) :	Total heating capacity	PI (kW) :	Power input
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COOLING CAPACITIES

ASC 040S	Air inlet temperature at condenser										
	25 °C		30 °C		35 °C		40 °C		45 °C		
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Evaporating temperature °C											
0	37,5	11,6	36,6	12,0	34,3	13,2	31,8	14,5	29,1	16,0	
5	44,3	11,8	42,4	12,6	39,7	13,9	36,8	15,2	33,7	16,7	
7	47,4	11,8	44,9	12,9	42,0	14,1	38,9	15,5	35,7	17,0	
10	51,6	12,2	48,6	13,3	45,5	14,6	42,2	16,0	38,6	17,5	
15	58,6	12,9	55,2	14,1	51,6	15,4	47,7	16,8	-	-	

HEATING CAPACITIES

ASH 040S	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	26,5	8,54	30,4	8,64	34,9	8,68	39,8	8,70	42,0	8,71	44,3	8,73	58,7	8,99
35	26,3	9,34	30,2	9,48	34,6	9,56	39,4	9,59	41,5	9,59	43,7	9,60	57,7	9,74
40	26,2	10,2	30,0	10,4	34,3	10,5	39,0	10,6	41,0	10,6	43,2	10,6	56,7	10,7
45	16,1	11,1	29,8	11,4	34,0	11,6	38,6	11,7	40,6	11,7	42,7	11,7	55,7	11,8
50	25,9	12,1	29,6	12,5	33,8	12,8	38,2	12,9	40,2	12,9	42,2	13,0	54,7	13,0
55	25,8	13,2	29,5	13,7	33,5	14,0	37,8	14,2	39,7	14,3	41,7	14,4	53,7	14,4

Outdoor fan power input (kw)	
Nominal airflow	0,82

COOLING CAPACITIES

ASC 045D	Air inlet temperature at condenser									
	25 °C		30 °C		35 °C		40 °C		45 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	43,8	13,4	42,5	14,0	40,0	15,3	37,0	16,9	33,7	18,8
5	51,2	13,9	49,8	14,5	46,6	15,9	43,2	17,6	39,6	19,5
7	54,5	14,1	52,7	14,8	49,4	16,2	45,8	17,9	42,0	19,8
10	60,2	14,2	57,2	15,3	53,6	16,7	49,8	18,4	45,7	20,3
15	-	-	-	-	-	-	-	-	-	-

HEATING CAPACITIES

ASH 045D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	32.9	10.4	38.0	10.4	44.0	10.4	50.5	10.4	53.4	10.4	56.7	10.4	75.7	10.6
35	32.7	11.5	37.7	11.5	43.4	11.5	49.8	11.5	52.6	11.5	55.7	11.5	73.9	11.7
40	32.4	12.8	37.3	12.8	42.9	12.7	49.0	12.7	51.7	12.7	54.7	12.7	72.2	12.8
45	-	-	36.9	14.2	42.4	14.1	48.3	14.0	50.9	14.0	53.8	14.0	70.5	14.1
50	-	-	-	-	41.8	15.8	47.5	15.6	50.1	15.6	52.8	15.5	68.7	15.6
55	-	-	-	-	-	-	46.8	17.5	49.3	17.4	51.9	17.3	67.0	17.3

Outdoor fan power input (kw)	
Nominal airflow	1,34

TC (kW) : Total cooling capacity	TH (kW) : Total heating capacity	PI (kW) : Power input
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COOLING CAPACITIES

ASC 055D	Air inlet temperature at condenser										
	25 °C		30 °C		35 °C		40 °C		45 °C		
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Evaporating temperature °C											
0	50,8	15,9	49,4	16,5	45,9	18,2	42,2	20,2	38,2	22,4	
5	59,5	16,4	57,5	17,2	53,5	19,0	49,3	20,9	44,8	23,2	
7	63,7	16,4	60,9	17,5	56,7	19,3	52,3	21,2	47,5	23,5	
10	70,4	16,5	66,2	18,0	61,6	19,8	56,9	21,8	51,8	24,0	
15	-										

HEATING CAPACITIES

ASH 055D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	37,7	12,0	43,6	12,0	50,4	12,0	57,8	12,0	61,0	12,0	64,6	12,0	85,4	12,2
35	37,3	13,4	43,1	13,4	49,7	13,3	56,9	13,3	60,0	13,3	63,6	13,3	83,8	13,4
40	37,0	14,9	42,6	14,9	49,0	14,9	56,0	14,8	59,0	14,8	62,5	14,8	82,1	14,8
45	-	-	42,2	16,6	48,4	16,6	55,1	16,5	58,1	16,4	61,4	16,4	80,2	16,3
50	-	-	-	-	47,8	18,5	54,2	18,4	57,1	18,4	60,2	18,3	78,3	18,1
55	-	-	-	-	-	-	53,5	20,6	56,2	20,5	59,1	20,5	76,3	20,2

Outdoor fan power input (kw)

 Nominal airflow 1,6
COOLING CAPACITIES

ASC 070D	Air inlet temperature at condenser									
	25 °C		30 °C		35 °C		40 °C		45 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	64,1	19,7	62,7	20,3	58,7	22,3	54,5	24,5	50,0	26,9
5	75,0	20,3	72,8	21,2	68,2	23,3	63,3	25,6	58,1	28,1
7	80,3	20,3	77,0	21,7	72,1	23,7	66,9	26,1	61,4	28,6
10	88,5	20,5	83,5	22,3	78,3	24,4	72,6	26,8	66,6	29,3
15	101	21,7	95,0	23,6	88,9	25,7	82,4	28,1	75,5	30,7

HEATING CAPACITIES

ASH 070D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	47,9	14,8	54,9	14,9	63,0	15,0	71,9	15,0	75,8	15,1	80,1	15,1	106	15,7
35	47,5	16,2	54,4	16,4	62,3	16,5	71,0	16,5	74,9	16,5	79,0	16,5	104	16,9
40	47,1	17,7	53,9	18,0	61,7	18,1	70,2	18,2	73,9	18,2	78,0	18,2	102	18,4
45	46,7	19,3	53,5	19,7	61,1	20,0	69,3	20,1	72,9	20,1	76,9	20,1	100	20,2
50	46,3	21,0	53,0	21,6	60,4	22,0	68,4	22,2	71,9	22,2	75,8	22,2	98,2	22,3
55	46,0	22,9	52,5	23,7	59,8	24,2	67,5	24,5	70,9	24,6	74,6	24,6	96,1	24,7

Outdoor fan power input (kw)

 Nominal airflow 1,64

TC (kW) :	Total cooling capacity	TH (kW) :	Total heating capacity	PI (kW) :	Power input
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COOLING CAPACITIES

ASC 085D	Air inlet temperature at condenser										
	25 °C		30 °C		35 °C		40 °C		45 °C		
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Evaporating temperature °C											
0	74,9	23,3	73,3	24,1	68,6	26,5	63,6	29,1	58,3	31,9	
5	88,6	23,6	84,9	25,3	79,4	27,7	73,6	30,5	67,5	33,4	
7	94,8	23,7	89,7	25,8	83,9	28,3	77,8	31,0	71,3	34,0	
10	103,2	24,3	97,3	26,6	90,9	29,1	84,3	31,9	77,2	35,0	
15	117	25,9	110	28,1	103	30,7	95,5	33,5	-	-	

HEATING CAPACITIES

ASH 085D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	53,0	17,1	60,8	17,3	69,7	17,4	79,6	17,4	84,0	17,4	88,5	17,5	117	18,0
35	52,7	18,7	60,4	19,0	69,1	19,1	78,8	19,2	83,0	19,2	87,4	19,2	115	19,5
40	52,4	20,4	60,0	20,8	68,6	21,1	78,0	21,2	82,1	21,2	86,4	21,2	113	21,3
45	52,1	22,2	59,6	22,8	68,0	23,2	77,2	23,4	81,2	23,4	85,4	23,4	111	23,5
50	51,9	24,2	59,3	25,0	67,6	25,5	76,5	25,8	80,3	25,9	84,4	25,9	109	26,0
55	51,7	26,3	59,0	27,3	67,1	28,0	75,7	28,5	79,4	28,6	83,5	28,7	107	28,9

Outdoor fan power input (kw)	
Nominal airflow	1,64

COOLING CAPACITIES

ASC 100D	Air inlet temperature at condenser									
	25 °C		30 °C		35 °C		40 °C		45 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	92,0	28,4	89,1	29,8	84,1	32,3	78,0	35,5	71,5	39,1
5	108	29,1	104	30,7	97,7	33,7	90,7	37,0	83,3	40,6
7	115	29,3	110	31,3	104	34,3	96,1	37,6	88,2	41,3
10	126	30,1	120	32,3	112	35,3	104	38,6	95,8	42,4
15										

HEATING CAPACITIES

ASH 100D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	69,4	28,8	79,8	21,9	91,9	22,0	105	22,0	111	22,0	117	22,1	156	22,9
35	68,8	23,9	79,1	24,1	90,8	24,1	104	24,1	109	24,1	116	24,2	153	24,7
40	68,2	26,2	78,3	23,5	89,8	26,6	102	26,6	108	26,6	114	26,6	150	26,9
45	-	-	77,5	29,1	88,7	29,3	101	29,3	106	29,3	112	29,3	146	29,5
50	-	-	-	-	87,6	32,3	99,4	32,4	105	32,4	110	32,4	143	32,5
55	-	-	-	-	-	-	97,9	35,9	103	35,9	108	36,0	140	36,0

Outdoor fan power input (kw)	
Nominal airflow	2,78

TC (kW) : Total cooling capacity	TH (kW) : Total heating capacity	PI (kW) : Power input
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COOLING CAPACITIES

ASC 120D	Air inlet temperature at condenser										
	25 °C		30 °C		35 °C		40 °C		45 °C		
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Evaporating temperature °C											
0	102	30,8	99,0	32,2	93,4	35,0	86,6	38,5	79,3	42,4	
5	119	31,8	116	33,2	109	36,4	101	40,1	92,5	44,1	
7	127	32,0	123	33,8	115	37,1	107	40,7	97,9	44,8	
10	140	32,3	133	34,8	125	38,1	116	41,8	106	45,9	
15	-										

HEATING CAPACITIES

ASH 120D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	75,8	23,6	87,2	23,8	100	23,8	115	23,9	121	23,9	128	24,0	170	24,9
35	75,1	26,0	86,3	26,2	99,1	26,3	113	26,3	119	26,3	126	26,3	167	26,9
40	74,5	28,5	85,5	28,8	98,0	29,0	112	29,0	118	29,0	124	29,0	163	29,3
45	-	-	84,7	31,8	96,9	32,0	110	32,1	116	32,1	122	32,1	160	32,2
50	-	-	-	-	95,8	35,4	109	35,5	114	35,6	120	35,6	156	35,6
55	-	-	-	-	-	-	107	39,4	112	39,4	118	39,5	153	39,4

Outdoor fan power input (kw)

 Nominal airflow 2,78
COOLING CAPACITIES

ASC 140D	Air inlet temperature at condenser									
	25 °C		30 °C		35 °C		40 °C		45 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	125	38,5	122	39,8	115	43,5	106	47,8	97,1	52,5
5	146,6	39,1	142,5	41,5	133,1	45,4	123,4	49,7	113	54,6
7	157	40,1	151	42,3	141	46,2	131	50,6	120	55,5
10	174	40,3	164	43,6	153	47,6	142	52,0	130	56,9
15	-									

HEATING CAPACITIES

ASH 140D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	90,7	29,3	104	29,6	120	29,7	138	29,9	146	30,0	154	30,1	205	30,9
35	90,1	32,2	103	32,4	119	32,6	136	32,7	143	32,8	152	32,9	201	33,5
40	89,7	35,4	103	35,7	118	35,8	134	36,0	141	36,0	149	36,1	197	36,5
45	-	-	102	39,3	116	39,5	132	39,6	139	39,7	147	39,7	192	40,0
50	-	-	-	-	115	43,6	131	43,8	137	43,8	145	43,8	188	44,0
55	-	-	-	-	-	-	129	48,5	135	48,5	142	48,5	184	48,7

Outdoor fan power input (kw)

 Nominal airflow 3,68

TC (kW) :	Total cooling capacity	TH (kW) :	Total heating capacity	PI (kW) :	Power input
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COOLING CAPACITIES

ASC 200D	Air inlet temperature at condenser										
	25 °C		30 °C		35 °C		40 °C		45 °C		
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Evaporating temperature °C											
0	174	52,7	170	54,6	160	59,4	148	65,3	136	72,0	
5	204	54,7	199	56,7	186	62,1	173	68,3	159	75,3	
7	218	55,1	211	57,9	197	63,4	183	69,6	168	76,6	
10	241	55,5	229	59,8	214	65,3	199	71,7	183	78,9	
15	277	58,3	261	63,3	244	69,0	227	75,5	210	83,0	

HEATING CAPACITIES

ASH 200D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	126	40,0	145	40,3	167	40,6	191	40,9	202	41,0	213	41,2	284	42,4
35	125	43,7	143	44,1	165	44,4	188	44,7	199	44,8	210	44,9	279	45,9
40	124	47,9	142	48,4	163	48,7	186	49,0	196	49,1	207	49,2	273	50,0
45	-	-	142	53,2	162	53,6	184	54,0	193	54,1	204	54,2	267	54,9
50	-	-	-	-	161	59,3	181,7	59,7	191	59,8	201	59,9	262	60,5
55	-	-	-	-	-	-	180	66,2	189	66,3	198	66,4	256	67,0

COOLING CAPACITIES

ASC 230D	Air inlet temperature at condenser									
	25 °C		30 °C		35 °C		40 °C		45 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	202	62,5	195	66,0	184	70,7	172	76,7	158	84,0
5	238	64,5	228	68,2	215	73,3	200	79,7	183	87,4
7	254	65,3	242	69,3	228	74,5	212	81,0	194	88,9
10	277	66,8	264	70,9	248	76,4	230	83,2	210	91,2
15	317	69,6	302	74,1	283	79,9	263	87,1	240	95,5

HEATING CAPACITIES

ASH 230D	Air inlet temperature at condenser													
	-11 °C		-6 °C		-1 °C		4 °C		6 °C		8 °C		18 °C	
	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI	TH	PI
Condensing temperature °C														
30	146	48,7	169	49,2	194	49,6	220	50,0	231	50,2	253	50,5	328	51,2
35	145	52,9	168	53,4	192	53,8	217	54,2	228	54,4	249	54,7	322	55,4
40	145	57,8	167	58,3	190	58,7	214	59,1	224	59,3	245	59,6	315	60,3
45	145	63,4	166	63,9	188	64,3	212	64,7	221	64,9	241	65,2	309	65,9
50	145	69,8	166	70,2	187	70,7	209	71,1	218	71,2	237	71,5	303	72,1
55	146	76,8	165	77,3	185	77,7	206	78,1	215	78,2	233	78,5	297	79,1

TC (kW) :	Total cooling capacity	TH (kW) :	Total heating capacity	PI (kW) :	Power input
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**COOLING CAPACITIES
HIGH AMBIENT APPLICATION (Non standard request)**

ASC 085D	Air inlet temperature at condenser									
	46 °C		47 °C		48 °C		49 °C		50 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	57,0	32,6	55,9	33,2	54,7	33,8	53,5	34,5	52,4	35,1
5	65,8	34,2	64,4	34,9	63,0	35,6	-			
7	69,4	34,9	68,0	35,6	-					
10	75,1	36,1	-							
15	-									

ASC 100D	Air inlet temperature at condenser									
	46 °C		47 °C		48 °C		49 °C		50 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	72,11	38,52	70,69	39,27	69,19	40,08	-			
5	84,13	39,87	82,49	40,64	80,82	41,43	79,14	42,24	77,47	43,04
7	89,12	40,47	87,39	41,25	85,68	42,02	83,9	42,83	82,13	43,64
10	86,89	41,42	95,03	42,19	93,16	42,98	91,27	43,77	-	
15	110,48	43,18	108,41	43,93	-					

ASC 120D	Air inlet temperature at condenser									
	46 °C		47 °C		48 °C		49 °C		50 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	78,88	42,37	77,29	43,22	75,67	44,10	-			
5	91,9	43,86	90,14	44,69	88,28	45,56	86,40	46,46	84,55	47,35
7	97,38	44,50	95,51	45,33	93,54	46,21	91,61	47,09	89,63	47,99
10	105,9	45,51	103,84	46,36	101,8	47,2	99,65	48,09	-	
15	120,89	47,34	118,56	48,18	-					

ASC 140D	Air inlet temperature at condenser									
	46 °C		47 °C		48 °C		49 °C		50 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	97,85	52,04	95,92	53,09	94,02	54,14	-			
5	114,09	53,89	111,96	54,90	109,76	55,96	107,56	57,04	105,31	58,16
7	120,96	54,69	118,73	55,70	116,40	56,77	114,07	57,85	111,77	58,95
10	131,73	55,95	129,22	57,0	126,79	58,05	124,27	59,14	-	
15	150,68	58,31	147,92	59,35	-					

ASC 200D	Air inlet temperature at condenser									
	46 °C		47 °C		48 °C		49 °C		50 °C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
Evaporating temperature °C										
0	133,5	73,5	130,9	75,0	128,2	76,5	125,6	78,0	122,9	79,5
5	155,1	77,0	152,0	78,6	148,9	80,2	145,8	81,8	92,02	43,38
7	164,3	78,6	161,0	80,2	157,7	81,8	99,92	43,04	98,23	43,90
10	178,8	81,0	175,3	82,6	111,65	43,07	109,81	43,91	107,98	44,77
15	133,90	43,03	131,86	43,82	129,75	44,66	127,72	45,50	125,63	46,39

Values in grey cells

Derating capacity, 2 compressors unload due to high discharge temperature

TC (kW) : Total cooling capacity	TH (kW) : Total heating capacity	PI (kW) : Power input
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CAPACITY STEPS

Cooling and heating capacities

ASC/ASH		020S	025S → 040S	045D → 085D	100D	120D	140D	200D	230D
Capacity steps %	Standard	0-100 %		0-50-100 %	0-59-100 %	0-62-100 %	0-50-100 %	0-53-100 %	0-50-100 %
	Non Standard Request (NSR)	0-100 %		0-50-100 %	0-33-66 100 % ⁽¹⁾			0-25-50-100 ⁽¹⁾	

(1) : The unit balances the operation of its compressors (number of starting/operating times), capacity steps are the average of possible steps.

CORRECTION FACTORS

To find out the performances for units installed with air ducts, apply the following coefficients on capacity and consumption data, over the performance tables of standard fan units without ducts.

Cooling mode

		Version	Models	Available static pressure Pa	Maximum ambient temperature °C	Correction factor for cooling capacity	Correction factor for power consumption (FP1 only)
Air available static pressure up to	50 Pa	Standard	020S → 200D	30	43	0.95	1.06
				50	39	0.89	1.16
	125 Pa	FP1 Low speed	100D → 200D (230D)	50	45 (38)	0.964	1.072
				75	42 (35)	0.935	1.094
				100	38 (-)	0.9	1.174
	250 Pa	FP1 High speed	100D → 200D (230D)	125	36 (-)	0.856	1.269
				150	47 (43)	1.01	0.98
				200	44 (40)	0.97	1.037
				250	41 (37)	0.94	1.099

Heating mode

		Version	Models	Available static pressure Pa	Maximum ambient temperature °C	Correction factor for heating capacity	Correction factor for power consumption (FP1 only)
Air available static pressure up to	50 Pa	Standard	020S → 200D	30	-9	0.94	1.02
				50	-8	0.89	1.03
	125 Pa	FP1 Low speed	100D → 200D (230D)	50	-10 (-8)	1	1
				75	-8 (-6)	0.94	1.02
				100	-6 (-)	0.89	1.03
	250 Pa	FP1 High speed	100D → 200D (230D)	125	-5 (-)	0.87	1.04
				150	-10 (-10)	1.01	0.99
				200	-10 (-8)	1	1
				250	-8 (-6)	0.94	1.02

EXTRA POWER CONSUMPTION
Cooling and heating modes

ASC/ASH	100D	120D	140D	200D	230D
FP1 Low speed	2	2	1	5.8	2
FP1 High speed	6.2	6.2	5.2	14.2	10.4

OPERATING LIMITS

Cooling only units		Maximum temperatures	Minimum temperatures
Cooling operation	Indoor temperature	32°C DB / 23°C WB	21°C DB / 15°C WB
	Outdoor temperature	45°C (020S-025S-030S-045D-055D) 47°C (035S-040S-070D-085D-100D-120D-140D-200D-230D)	+15°C (standard unit) 0°C (*) -15°C (**)

Heat pumps		Maximum temperatures	Minimum temperatures
Cooling operation	Indoor temperature	32°C DB / 23°C WB	21°C DB / 15°C WB
	Outdoor temperature	45°C (020S-025S-030S-045D-055D) 47°C (035S-040S-070D-085D-100D-120D-140D-200D-230D)	0°C
Heating operation	Indoor temperature	27°C DB	15°C DB
	Outdoor temperature	Depending on models See heating capacities tables	-10°C DB / -11°C WB

DB : Dry bulb temperature
WB : Wet bulb temperature

(*) : With optional 0°C low temperature kit

(**) : With optional -15°C low temperature kit

NOISE LEVEL OF OUTDOOR UNITS

STANDARD UNITS

ASC/ASH		Spectrum per octave band (dB(A))						Sound power	Sound pressure 10 meters from the unit	
		125 Hz	250	500	1000	2000	4000			8000
									LW dB(A)	Lp dB(A)
	020S	67,6	70,6	71,2	71,1	69,2	67,0	59,1	75,9	47,9
	025S	73,8	69,6	71,9	69,6	73,4	69,9	61,5	77,9	49,9
	030S	72,7	74,7	75,8	76,9	71,2	65,5	81,5	83,1	53,5
	035S	72,7	74,3	75,8	75,6	69,2	62,7	80,7	82,1	52,7
	040S	72,7	74,3	76,3	76,2	68,8	63,3	81,1	82,5	53,1
	045D	76,8	72,7	74,9	72,6	76,4	73,0	64,5	80,9	52,9
	055D	83,3	75,3	77,2	78,3	79,4	73,7	68,0	84,0	56,0
	070D	83,3	75,2	76,9	78,4	78,2	71,7	65,2	83,2	55,2
	085D	83,3	75,2	76,8	78,8	78,7	71,3	65,8	83,6	55,6
100D	Low speed	73,3	70,9	74,7	77,9	76,6	71,3	64,6	82,0	54,0
	High speed	81,9	78,4	78,9	82,6	81,9	75,8	67,0	86,9	58,9
120D	Low speed	73,3	70,9	74,5	78,4	78,2	72,3	66,1	82,9	54,9
	High speed	81,9	78,4	78,9	82,8	82,4	76,2	67,9	87,2	59,2
140D	Low speed	75,0	73,4	76,8	82,0	83,6	76,5	69,4	87,4	59,4
	High speed	84,2	80,8	80,8	85,4	86,1	79,7	71,0	90,4	62,4
200D	Low speed	76,3	74,9	78,1	82,1	83,8	75,5	66,0	87,5	59,5
	High speed	79,3	77,4	79,9	83,6	84,8	75,7	66,6	88,7	60,7
230D	Low speed	78,0	76,3	79,3	84,8	86,1	78,6	71,2	90,0	62,0
	High speed	85,2	81,8	82,0	87,0	88,0	81,2	72,5	92,1	64,1

STANDARD UNITS + LOW NOISE OPTION

ASC/ASH		Spectrum per octave band (dB(A))						Sound power	Sound pressure 10 meters from the unit	
		125 Hz	250	500	1000	2000	4000			8000
									LW dB(A)	Lp dB(A)
	020S	67,6	70,6	71,1	70,6	68,3	65,4	58,0	75,2	47,2
	025S	73,8	69,6	69,8	66,4	71,7	67,4	61,5	75,9	47,9
	030S	72,7	73,8	74,5	74,2	66,0	65,5	79,4	80,8	51,4
	035S	72,7	73,8	74,5	73,9	65,7	62,7	79,2	80,6	51,2
	040S	72,7	73,8	74,5	74,0	65,8	63,3	79,3	80,6	51,3
	045D	76,8	72,6	72,8	69,4	74,7	70,4	64,5	78,9	50,9
	055D	83,3	75,2	76,3	77,0	76,7	68,5	68,0	81,9	53,9
	070D	83,3	75,2	76,3	77,0	76,4	68,2	65,2	81,7	53,7
	085D	83,3	75,2	76,3	77,0	76,5	68,3	65,8	81,8	53,8
100D	Low speed	73,3	70,8	72,4	75,4	71,2	62,6	64,6	78,3	50,3
	High speed	81,9	78,4	78,2	81,9	80,9	74,2	67,0	86,0	58,0
120D	Low speed	73,3	70,8	72,3	75,4	72,0	63,0	66,1	78,6	50,6
	High speed	81,9	78,4	78,2	81,9	80,9	74,2	67,9	86,0	58,0
140D	Low speed	75,0	72,6	74,1	77,2	76,1	65,5	69,4	81,2	53,2
	High speed	84,2	80,6	80,0	83,9	83,5	77,1	71,0	88,3	60,3
200D	Low speed	73,5	71,2	72,9	75,8	76,3	64,5	65,7	80,5	52,5
	High speed	79,3	76,9	78,3	81,3	80,6	68,0	66,6	85,3	57,3
230D	Low speed	78,0	75,6	77,1	80,2	78,7	68,0	71,2	84,0	56,0
	High speed	85,2	81,6	81,0	84,9	84,7	78,1	72,5	89,5	61,5

NOISE LEVEL OF OUTDOOR UNITS

UNITS WITH HIGH PRESSURE OPTION (FP1)

ADC/ADH		Spectrum per octave band (dB(A))							Sound power	Sound pressure 10 meters from the unit
		125 Hz	250	500	1000	2000	4000	8000		
									LW dB(A)	Lp dB(A)
100D	Low speed	84,2	80,6	80,5	84,3	81,0	74,4	68,4	87,4	59,4
	High speed	96,4	93,6	91,6	93,0	89,4	86,3	81,9	96,9	68,9
120D	Low speed	84,2	80,6	80,4	84,4	81,7	74,9	69,1	87,7	59,7
	High speed	96,4	93,6	91,6	93,1	89,5	86,3	81,9	96,9	68,9
140D	Low speed	84,2	80,8	80,8	85,4	84,9	77,7	71,0	89,6	61,6
	High speed	96,4	93,6	91,6	93,2	90,2	86,6	82,0	97,2	69,2
200D	Low speed	87,2	83,7	83,6	87,6	86,0	78,0	70,8	91,3	63,3
	High speed	99,4	96,6	94,6	96,1	92,7	89,3	84,8	100,0	72,0
230D	Low speed	87,2	83,8	83,7	88,3	87,5	80,0	73,2	92,4	64,4
	High speed	99,4	96,6	94,6	96,2	93,1	89,5	85,0	100,2	72,2

UNITS WITH HIGH PRESSURE AND LOW NOISE OPTIONS

ADC/ADH		Spectrum per octave band (dB(A))							Sound power	Sound pressure 10 meters from the unit
		125 Hz	250	500	1000	2000	4000	8000		
									LW dB(A)	Lp dB(A)
100D	Low speed	84,2	80,6	80,0	83,8	79,7	72,0	68,4	86,6	58,6
	High speed	96,4	93,6	91,5	93,0	89,2	86,2	81,9	96,8	68,8
120D	Low speed	84,2	80,6	79,9	83,8	79,9	72,0	69,1	86,7	58,7
	High speed	96,4	93,6	91,5	93,0	89,2	86,2	81,9	96,8	68,8
140D	Low speed	84,2	80,6	80,0	83,9	80,7	72,3	71,0	87,0	59,0
	High speed	96,4	93,6	91,5	93,0	89,3	86,2	82,0	96,9	68,9
200D	Low speed	87,2	83,6	83,0	86,9	83,2	75,0	70,8	89,8	61,8
	High speed	99,4	96,6	94,5	96,0	92,3	89,2	84,8	99,9	71,9
230D	Low speed	87,2	83,6	83,0	86,9	83,6	75,2	73,2	89,9	61,9
	High speed	99,4	96,6	94,5	96,0	92,3	89,2	85,0	99,9	71,9

EXHAUST FAN SOUND LEVEL

SIZE	020S --> 035S	040S --> 055D	070D - 085D	100D
Lw dB(A) *	64	66	73	76

ELECTRICAL CONSUMPTION FOR OUTDOOR UNITS

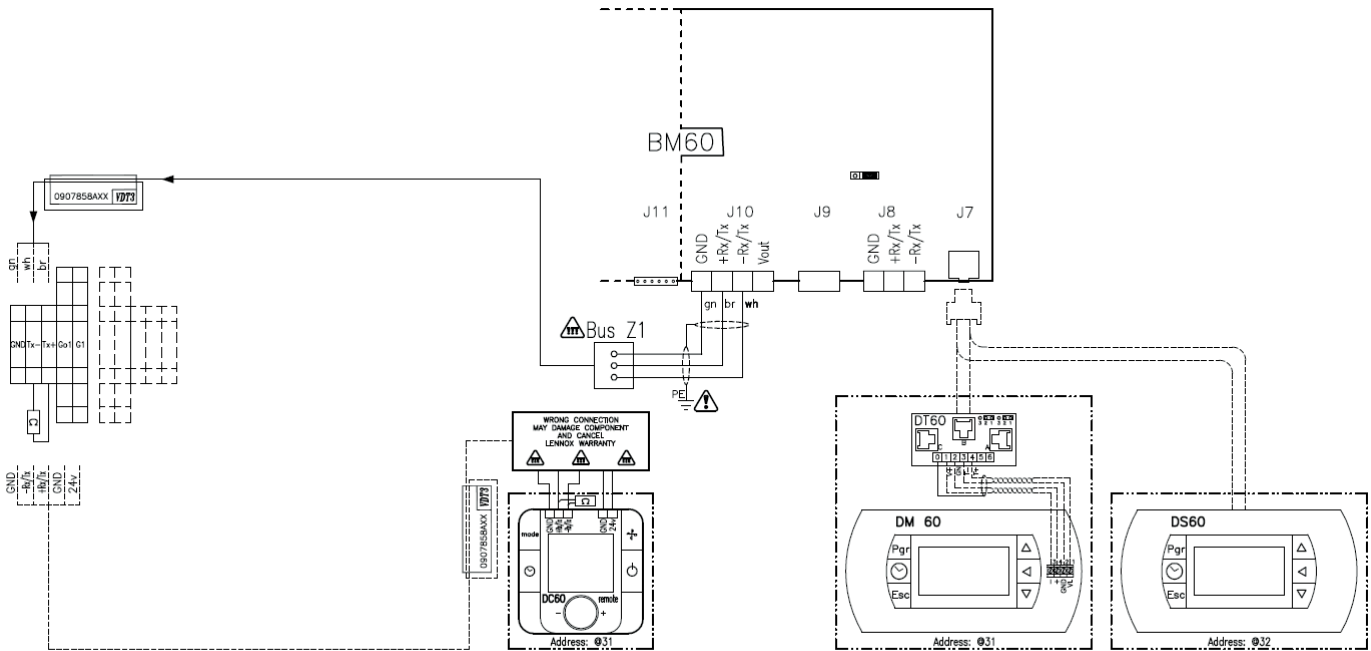
ASC/ASH		020S	025S	030S	035S	040S	045D	055D
Voltage	Ph/V/Hz	3N~400V 50Hz		3~400V 50Hz				
Maximum absorbed power (kW)								
Compressor		8,25	10,1	11,8	15,6	16,9	20,2	23,6
Fan		0,3	0,69	0,69	0,84	0,84	1,38	1,38
Total power		8,55	10,79	12,49	16,44	17,74	21,58	24,98
Maximum current (A)								
Compressor		15	21	22	25,6	31	42	44
Fan		1,6	3	3,4	3,4	3,4	6	6,8
Total current		16,6	24	25,4	29	34,4	48	50,8
Start up current (A)		87,5	97,4	104	138	151	121	129

MODELS ASC/ASH		070D	085D	100D	120D	140D	200D	230D
Voltage	Ph/V/Hz	3~400V 50Hz						
Maximum absorbed power (kW)								
Compressor		31,1	33,8	42,6	45,6	55,9	78,8	88,2
Fan		1,68	1,68	3,05	3,05	4	4,2	8
Total power		32,78	35,48	45,65	48,65	59,9	83	96,2
Maximum current (A)								
Compressor		51,2	62	77,6	84	102	142	159
Fan		6,8	6,8	6,4	6,4	8	9,6	16
Total current		58	68,8	84	90,4	110	151,6	175
Start up current (A)		167	206	221	228	292	302,9	358

FP1 OPTION

ASC/ASH		100D FP1	120D FP1	140D FP1	200D FP1	230D FP1
Voltage	Ph/V/Hz	3/400V/50Hz				
Maximum absorbed power Low speed / High speed	kW	2,00 / 6,20	2,00 / 6,20	1,00 / 5,2	5,8 / 14,2	2 / 10,4
Maximum current Low speed / High speed	A	3,2 / 9,8	3,2 / 9,8	1,6 / 8,2	9,6 / 22,8	3,2 / 16,4
Start up current Low speed / High speed	A	3,2 / 9,8	3,2 / 9,8	1,6 / 8,2	9,6 / 22,8	3,2 / 16,4

COMFORT AND SERVICE TERMINAL CONNECTION



DRY CONTACT BOARD CONTROL

The ASC/ASH condensing unit can be remotely controlled via dry contacts on the BM60 and BE60. The expansion board BE60 is an additional board fixed on DIN rail. This board is supplied in stand on ASC/ASH condensing unit.

Description of the various connectors :

- 1 Power supply of the board
- 2 Analog output 0/10V : not used
- 3 Network bus to the CLIMATIC 60 BM60
- 4 4 digital inputs : dry contacts only
- 5 LED status of the network bus
- 6 Serial address dip-switch of the network bus
- 7 4 analog input configurable by pair B1-B2 and B3-B4
- 8 4 digital outputs : dry contact only

6 digital inputs are dry contacts. They are factory configured as follow :

2 inputs on the BM60

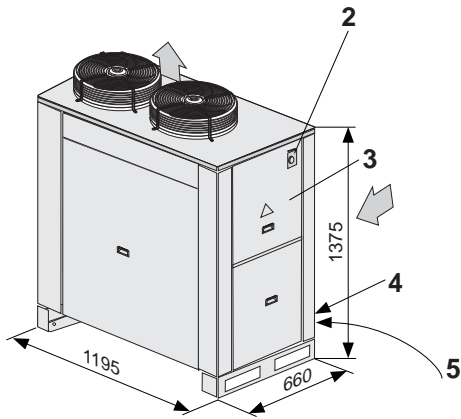
- BM-J4-ID4 : TCB B = Cooling/Heating - Contact closed = the unit operates in heating mode and open contact = the unit operates in cooling mode
- BM-J4-ID7 : TCB G = On/Off - Contact closed = On.

4 inputs on the BE60

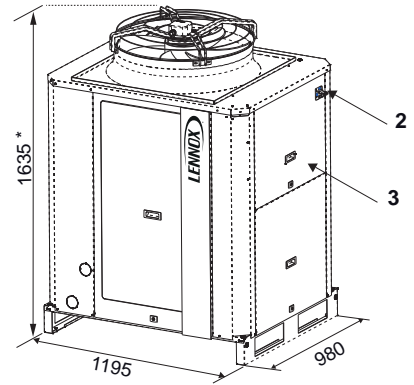
Size	Standard		Non standard request (NSR)				
	020 → 040	045 → 230D	020 - 040	045D-085D	100D-140D	200D-230D	
BE-J4-ID1 : TCB Y1	100 %	50 %	100 %	50 %	33 %	25 %	
BE-J4-ID2 : TCB Y2	Available	100 %	Available	100 %	66 %	50 %	
BE-J4-ID3		Available		Available	Available	100 %	75 %
BE-J4-ID4				Available	Available	Available	100 %

ASC/ASH

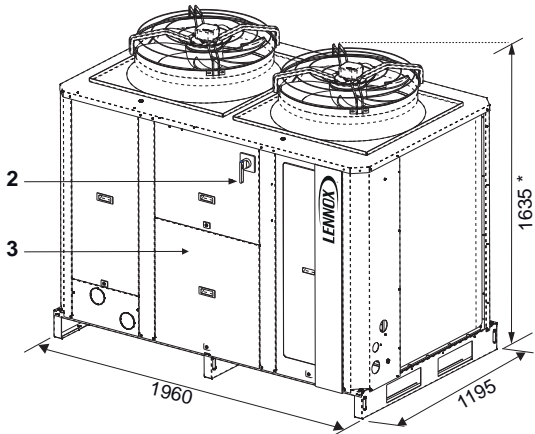
020S



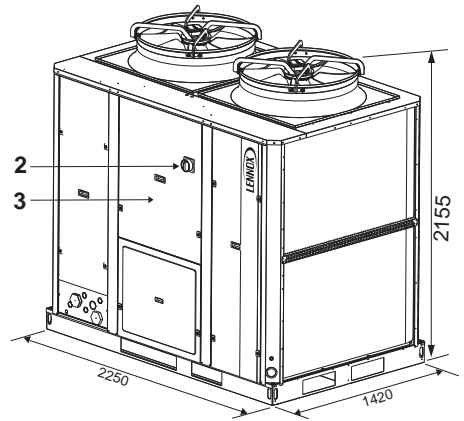
025S/030S/035S/040S



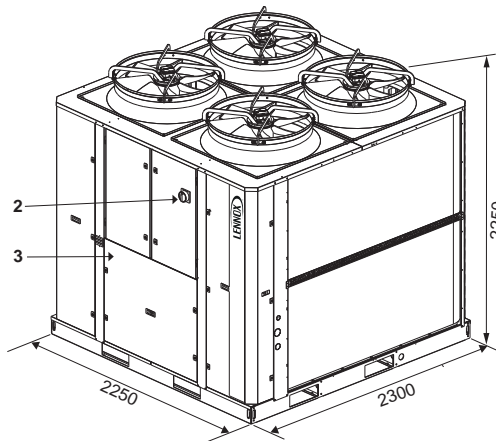
045D/055D/070D/085D



100D/120D/140D



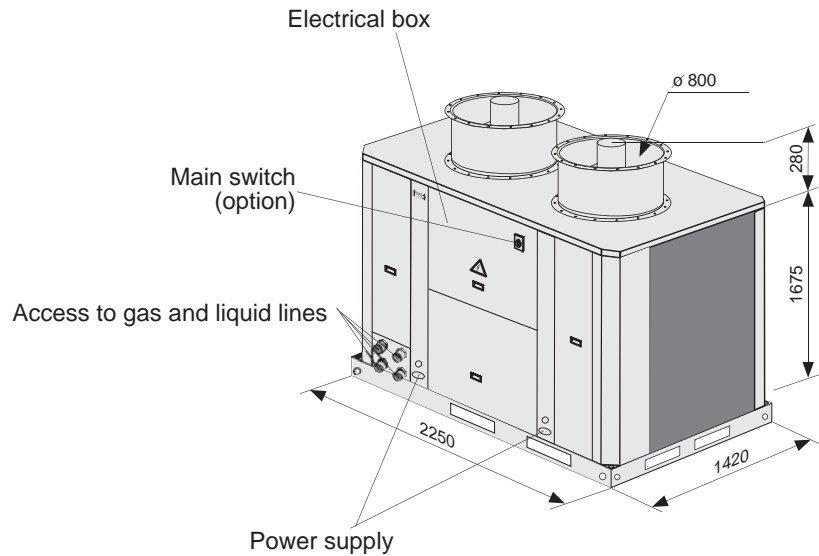
200D - 230D



2	Main switch (option)	4	Power supply cable entry
3	Electrical box	5	Access to gas and liquid lines

UNITS WITH HIGH PRESSURE FANS

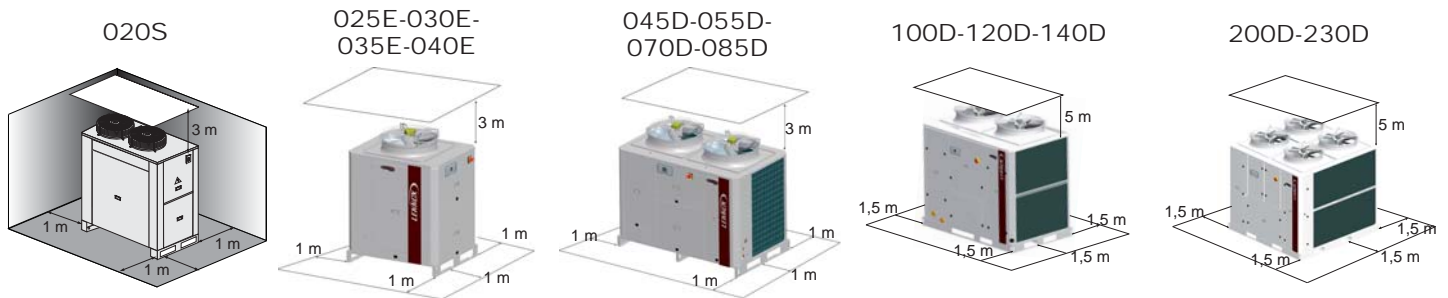
This option is available only for outdoor units, sizes 100D, 120D and 140D.
Available static pressure up to 250 Pa.



CLEARANCES

Space should be left free for access or servicing, to ease the installation of cables, drainage connections, electric installation and cleaning filters, as well as easy access to the unit.

ASC/ASH




WEIGHT DATA

ASC/ASH		020S	025S	030S	035S	040S	045D	055D
ASC Cooling only	kg	160	210	216	233	255	443	452
ASH Heat pump		168	219	221	239	258	452	463
Soft starter		3	3	3	3	3	6	6
FP1 option		-	-	-	-	-	-	-
ASC/ASH		070D	085D	100D	120D	140D	200D	230D
ASC Cooling only	kg	481	520	632	797	906
ASH Heat pump		499	537	748	828	932	1684	1704
Soft starter		6	6	9	9	9
FP1 option		-	-	40	40	40

Operating weights

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Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.

Installation and service must be performed by a qualified installer and servicing agency

ASC/ASH-AGU-1801-E



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