



Chiller units and air-water heat pumps

RTB-ITB



Cooling capacity: 16,1 to 61,6 kW
Heating capacity: 18,1 to 69,4 kW



Silent and compact design

Air-conditioning solution where an outdoor installation is impossible

DESCRIPTION

Heat pumps and cooling units **RTB - ITB series** are external air/water units of compact construction designed for indoor installation.

These units produce cold and/or hot water, suitable for heating, cooling installations as well as for industrial applications. Equipped with centrifugal fan and plates exchanger.

All units are tested and checked in factory.

SERIES

RTB Series

Air-condensed chillers.

ITB Series

Air-water reversible heat pump.

RANGE

- Units with 1 cooling circuit, 1 compressor, 4 models: 80 / 95 / 120 / 155.
- Units with 1 cooling circuit, 2 compressors, 3 models: 195 / 255 / 315.

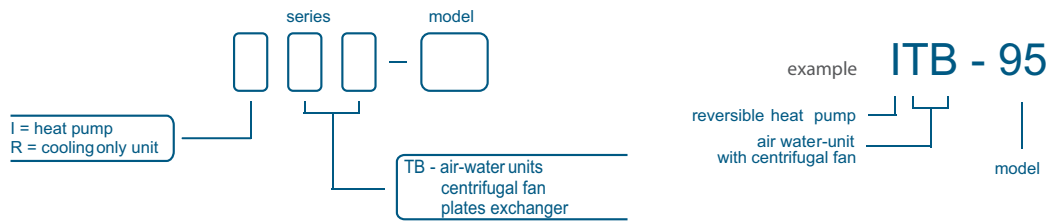
OPERATING LIMITS

SERIES	HEAT PUMP				COOLING			
	AIR		WATER (outlet T)		AIR		WATER (outlet T)	
	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
ITB	22°C WB	-7°C WB	55°C	30°C	44°C	14°C ①	15°C	5°C ②
RTB	--	--	--	--	44°C	14°C ①	15°C	5°C ②

① With condensing pressure control operating up to -7°C WB.

② Minimum outlet temperature. For operating until -5°C, glycol water is required.

DESIGNATION



UNITS COMPOSITION

Standard equipment

- Anticorrosion casing in galvanized metal plate covered with a polyester and varnish lacquer. Chassis support.

External circuit

- Centrifugal fan(s) driven by motor or by belts and pulleys.
- Coil with crimped aluminium fins and copper tubes.
- Condensates drain pan.

Internal circuit

- Exchanger with stainless steel welded plates thermically isolated.

Cooling circuit

- Piston hermetic compressor with internal protection, mounted on anti-vibratory supports, with gas discharge silencer.
- Crankcase heater (ITB serie).
- Thermostatic expansion valve, with external equalization.
- Antiacid dryer filter.
- Liquid vessel (ITB series).
- Four ways reverse valve (ITB series).

Protections

- HP and LP pressostats.
- Water flow control by differential pressostat in RTB - ITB model 80, and with flow switch in RTB - ITB models 95 to 315.
- Anti-frost protection, integrated in the control.
- Main door switch.
- Automatic circuit switch.
- Motor fans and compressors circuits protection devices by circuit breaker fuse(s).
- Fan thermal protection(s).

Electrical panel

- Complete electrical panel, totally wired.
- General ground plug.
- Compressor(s) and motor fan(s) contactor(s).

Models 80 to 155:

S55E1 electronic control (consult manual)

Control system by microprocessor equipped with:

Control board

- Control of operating parameters and safeties management.
- Failures diagnosis.
- Anti-short-cycle timing.
- Defrosting in reversible units.

Electronic thermostat: AQUAGES 11N

- Operating modes: cooling or heating.
- Display on LCD screen of the functions and configuration of unit operation in each moment.
- Introduction of the set point and operation mode.
- Memorization of operation parameters before lack of voltage.
- Alarm display.

Models 195 to 315:

GESCLIMA+ electronic control (consult manual)

Control system by microprocessor equipped with:

Control board

- Control of operating parameters and safeties management.
- Temperature probe for defrosting operation.
- Anti-short-cycle timing.
- Self-adapting control of compressor operating time, reducing the number of start-ups of the compressor and therefore reducing the power consumption and increasing the life span of components. It also allows to reduce the buffer tank size.
- Set point offset depending on external temperature.
- Possibility of communication with a building management system BMS with Modbus protocol.

Electronic thermostat: DOMO

- Operating modes: cooling or heating.
- Operating parameters modification (set points, differential and timings).
- Time and daily scheduling. Night reduction mode.
- Alarm display by codes.

Options

- Coil of copper tubes and aluminium fins with polyurethane coating.
- Options for control and controls.
- Compressor acoustic isolation.
- Condensing pressure control.
- Air filter.
- Flexible hydraulic connections.
- Rubber anti-vibratory supports.

TECHNICAL CHARACTERISTICS

ITB - RTB SERIES		80	95	120	155	195	255	315	
Cooling Capacities	Cooling capacity ① (kW)	16,1	18,5	23,9	30,8	37,0	47,8	61,6	
	Power input ③ (kW)	7,6	8,9	11,8	14,6	17,7	23,7	29,2	
	EER Performance	2,1	2,1	2,0	2,1	2,1	2,0	2,1	
Heating Capacities	Heating capacity ② (kW)	18,1	20,9	27,0	34,7	41,8	54,0	69,4	
	Power input ③ (kW)	7,3	8,1	11,1	13,8	16,1	22,1	27,2	
	COP Performance	2,5	2,6	2,4	2,5	2,6	2,4	2,5	
Internal circuit	Nominal water flow (m³/h)	2,8	3,2	4,1	5,3	6,4	8,2	10,6	
	Pressure drop (m.W.G.)	2,8	2,1	1,6	1,5	2,5	2,8	2,8	
	Number of circuits	1							
	Water inlet connection	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"	2"	2"	
	Water outlet connection	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"	2"	2"	
External circuit	Nominal air flow (m³/h)	6.500	7.000	10.000	12.200	14.000	20.000	24.400	
	Avail. static. pressure (mm.W.G)	7	7	8	11	7	8	11	
	Fan type	CENTRIFUGAL							
	Number	1				2			
	Motor power (kW)	1,1	1,5	2,2	3 ⑤	2x1,5	2x2,2	2x3 ⑤	
r.p.m.	630	678	650	617	678	650	617		
Compressor	Type	PISTON HERMETIC							
	Number of compressors	1				2			
	Number of circuits	1							
Maximum power input	230 V / III ph / 50 Hz (A)	33,7	41,1	51,7	62,9	82,2	103,4	125,8	
	400 V / III ph / 50 Hz (A)	25,7	25,6	32	42,9	51,2	64	85,8	
Refrigerant (R-407c)	RTB load (kg)	3,5	3,6	5,8	7,7	7,4	11,6	14,7	
	ITB load (kg)	3,5	3,6	5,8	7,7	7,4	11,6	14,7	
	Climate warming potential (CWP) ④	1652,5							
Dimensions	Length (mm)	1.174	1.174	1.440	1.440	2.161	2.704	2.704	
	Width (mm)	828	828	877	877	838	880	880	
	Height (mm)	1.227	1.227	1.312	1.312	1.227	1.312	1.312	
Weight	RTB (kg)	245	295	328	370	502	600	695	
	ITB (kg)	250	303	340	382	516	616	708	

① Cooling capacity for a water outlet temperature of 7 °C and 35 °C of outdoor temperature.

② Heating capacity for a water outlet temperature of 50 °C and 6 °C WB of outdoor temperature.

③ Total power input by compressor(s) and motorfans in nominal conditions.

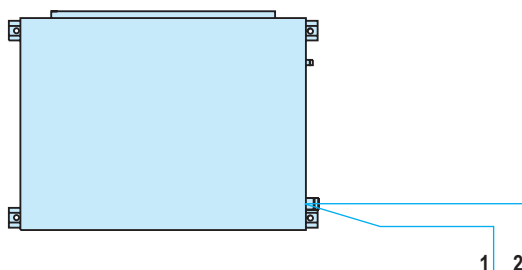
④ Climate warming potential of one kg of greenhouse-effect fluored gas relative to one kilogram of carbon dioxide over a period of 100 years.

⑤ In these models with vertical discharge it is necessary to change fan.

MAXIMUM CURRENTS (A)

RTB - ITB SERIES		80	95	120	155	195	255	315
COMPRESSOR	230 V / III ph / 50 Hz	29	35	43	51	2 x 35	2 x 43	2 x 51
	400 V / III ph / 50 Hz	23	22	27	36	2 x 22	2 x 27	2 x 36
EXTERNAL FAN	230 V / III ph / 50 Hz	4,7	6,1	8,7	11,9	2 x 6,1	2 x 8,7	2 x 11,9
	400 V / III ph / 50 Hz	2,7	3,6	5	6,9	2 x 3,6	2 x 5	2 x 6,9
TOTAL	230 V / III ph / 50 Hz	33,7	41,1	51,7	62,9	82,2	103,4	125,8
	400 V / III ph / 50 Hz	25,7	25,6	32	42,9	51,2	64	85,8

ELECTRICAL WIRING



THE CONNECTIONS TO EXECUTE ARE THE FOLLOWING ONES:

Nº	DESCRIPTION	80	95	120	155	195	255	315
1	POWER SUPPLY							
	230 V / III ph / 50 Hz ($\pm 5\%$)	3 + GND						
	400 V / III ph / 50 Hz ($\pm 5\%$)	3 + N + GND						
2	THERMOSTAT CONNECTION	2 x 1 mm ²						

NOTE: If the unit is going to be installed in an industrial ambient with high level of EMC interferences, it is recommended to shield the wires of the control thermostat.

NOTE: In 195 / 255 / 315 models the cooling/heating control is of two stages.

NOTE: The installer should plan two wires of 0,75 mm² in order to install an ON/OFF switch external to the unit. In ITB units, it is also necessary to provide three wires of 0,75 mm² in order to install a cooling/heating switcher.

CONTROL

RTB - ITB SERIES	80	95	120	155	195	255	315	
COOLING CONTROL (ITB / RTB)	12 °C				12 - 13 °C			
HEATING CONTROL (ITB)	45 °C				45 - 44 °C			
ANTIFROST SAFETY (ITB / RTB)	3 °C				3 °C			

NOTE: Manufactured control: it is necessary to verify the water flow checking that the inlet and water outlet temperatures are between the operating limits. Other control values are allowed once verified that the flow and the temperatures are within the operating limits.

SOUND LEVEL GIVEN FOR 10 MMWG AVAILABLE PRESSURE

Global sound pressure level at 5 meters from the unit, at 1.5 meters from the ground, in free field, directivity 2, with inlet and outlet connected to the duct:

RTB - ITB	80	95	120	155	195	255	315
dB(A)	50	50	54	54	56	57	57

Global sound power level at the inlet (values to be taken into account for the calculations of the silencers):

RTB - ITB	80	95	120	155	195	255	315
dB(A)	74,4	76,3	81,3	83,1	79,3	84,3	86,1

Global sound power level at the outlet (values to be taken into account for the calculations of the silencers):

RTB - ITB	80	95	120	155	195	255	315
dB(A)	82	82	84	84	84	84	90

When planning the installation, take into consideration the location (residential area, housings, industrial area...) and if the radiated noise from the unit is higher than the noise estimated for the installation:

- An acoustic study.
- An appropriate acoustic treatment if necessary.
- Implementation precautions.

COOLING CAPACITY (kW)

Units 1 compressor / 1 stage / 1 circuit

RTB ITB	Chilled water outlet temperature in °C	EXTERNAL AIR TEMPERATURE												
		29 °C		32 °C		35 °C		38 °C		40 °C		44 °C		
		Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
80	Glycol water	-4	11,00	5,50	10,60	5,60	10,20	5,75	9,80	5,95	9,60	6,05	9,10	6,20
		-2	12,10	5,70	11,70	5,80	11,30	5,90	10,80	6,10	10,60	6,25	10,10	6,40
		0	13,10	5,90	12,70	6,00	12,30	6,10	11,90	6,20	11,60	6,45	11,10	6,60
		2	14,20	6,10	13,80	6,20	13,40	6,30	12,90	6,35	12,60	6,60	12,10	6,80
	Pure water	5	15,80	6,40	15,40	6,50	15,00	6,60	14,50	6,80	14,20	7,00	13,60	7,20
		6	16,40	6,50	15,90	6,60	15,50	6,70	15,00	6,90	14,70	7,10	14,10	7,30
		7	16,90	6,60	16,50	6,70	16,10	6,80	15,60	7,00	15,20	7,20	14,60	7,40
		8	17,50	6,70	17,00	6,80	16,60	6,90	16,10	7,10	15,80	7,30	15,10	7,50
		10	18,70	6,80	18,20	6,90	17,80	7,00	17,20	7,25	16,80	7,50	16,10	7,70
		12	19,90	6,90	19,40	7,00	18,90	7,20	18,10	7,45	17,90	7,70	17,10	7,80

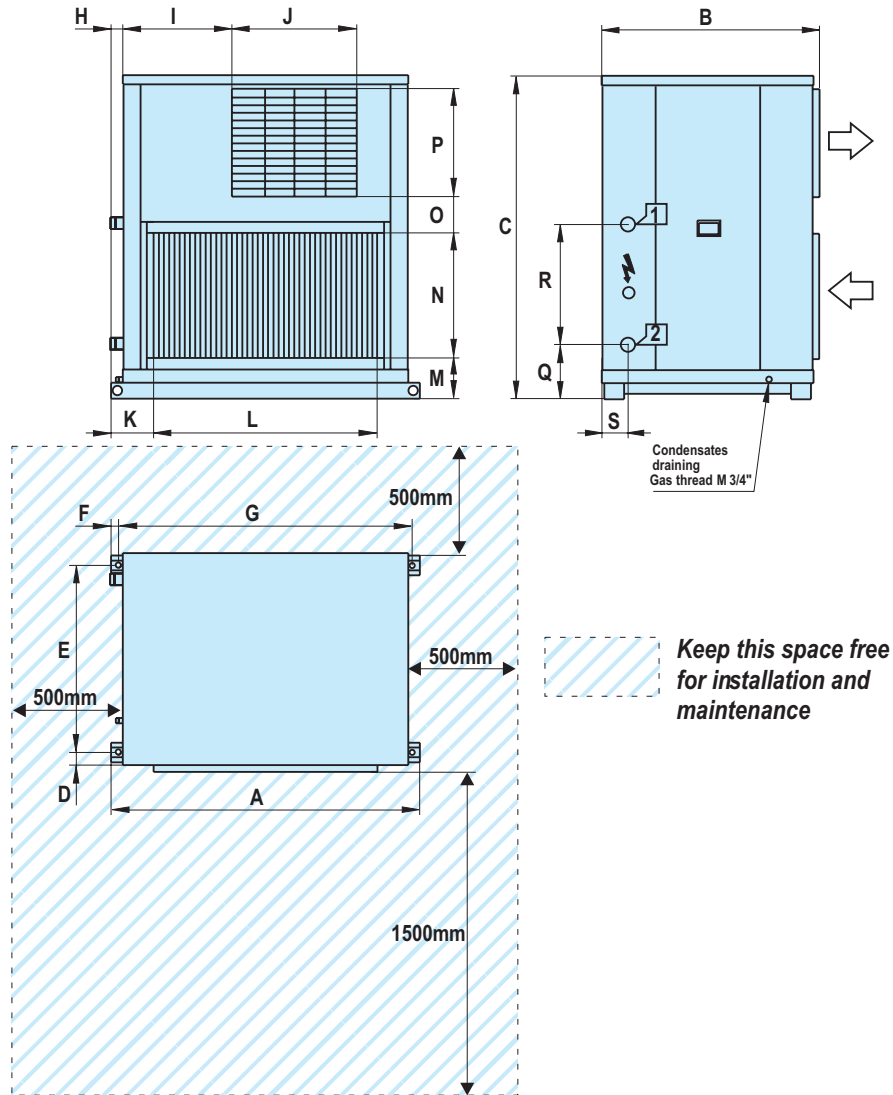
Pf: Cooling capacity in KW

Pa: Power input by the compressor.

These values can be interpolated, but never extrapolated

DIMENSIONS SCHEMES

RTB / ITB / 80 / 95 HORIZONTAL DISCHARGE



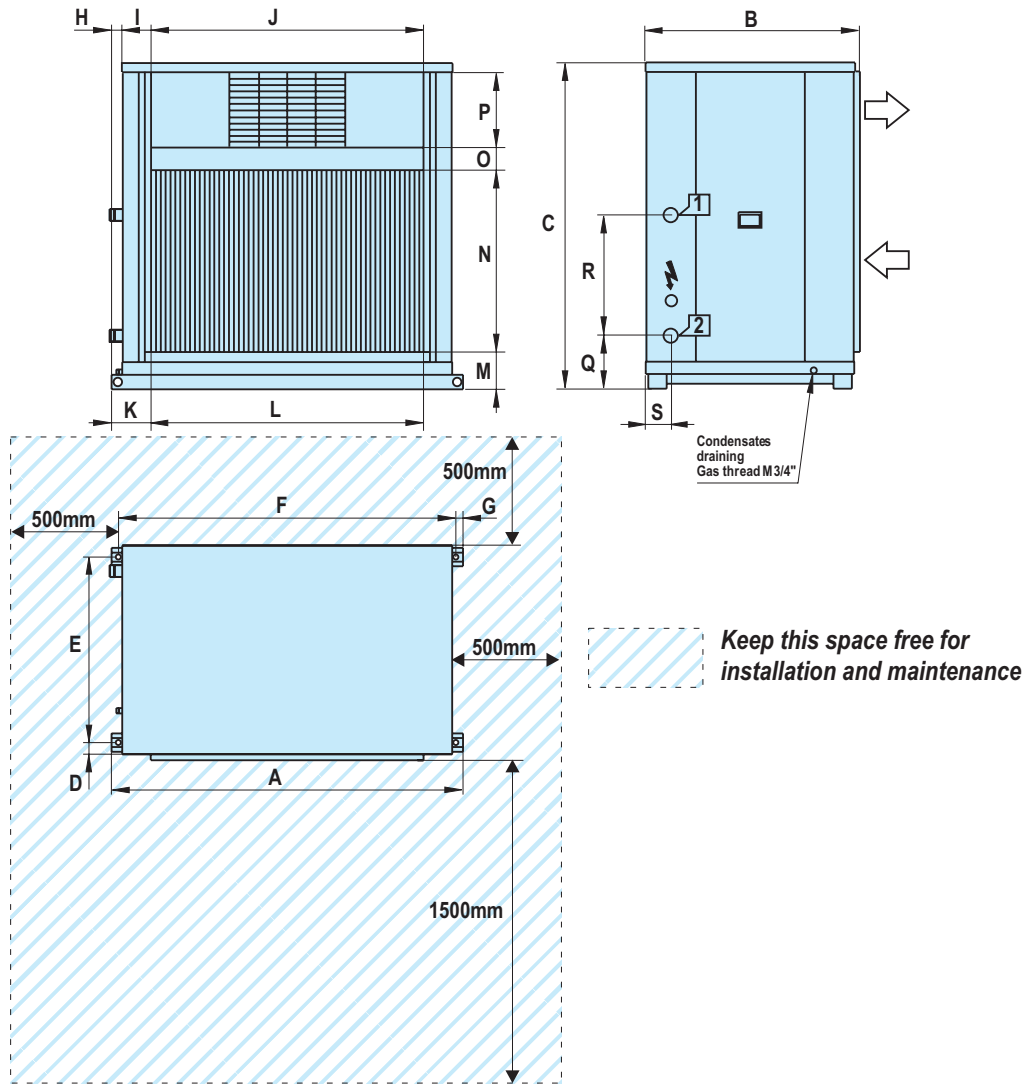
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
80 / 95	1.174	828	1.227	47,5	710	29	1.116	44	415,5	475	161,5	850	139	476	152	408	244	520	102,5

LEGEND:

- AIR FLOW
- POWER SUPPLY AND ELECTRICAL PANEL
- WATER INLET
- WATER OUTLET

Note: All models have 4 drills (18 mm diameter) for antivibratory - supports

RTB / ITB - 120 / 155 HORIZONTAL DISCHARGE



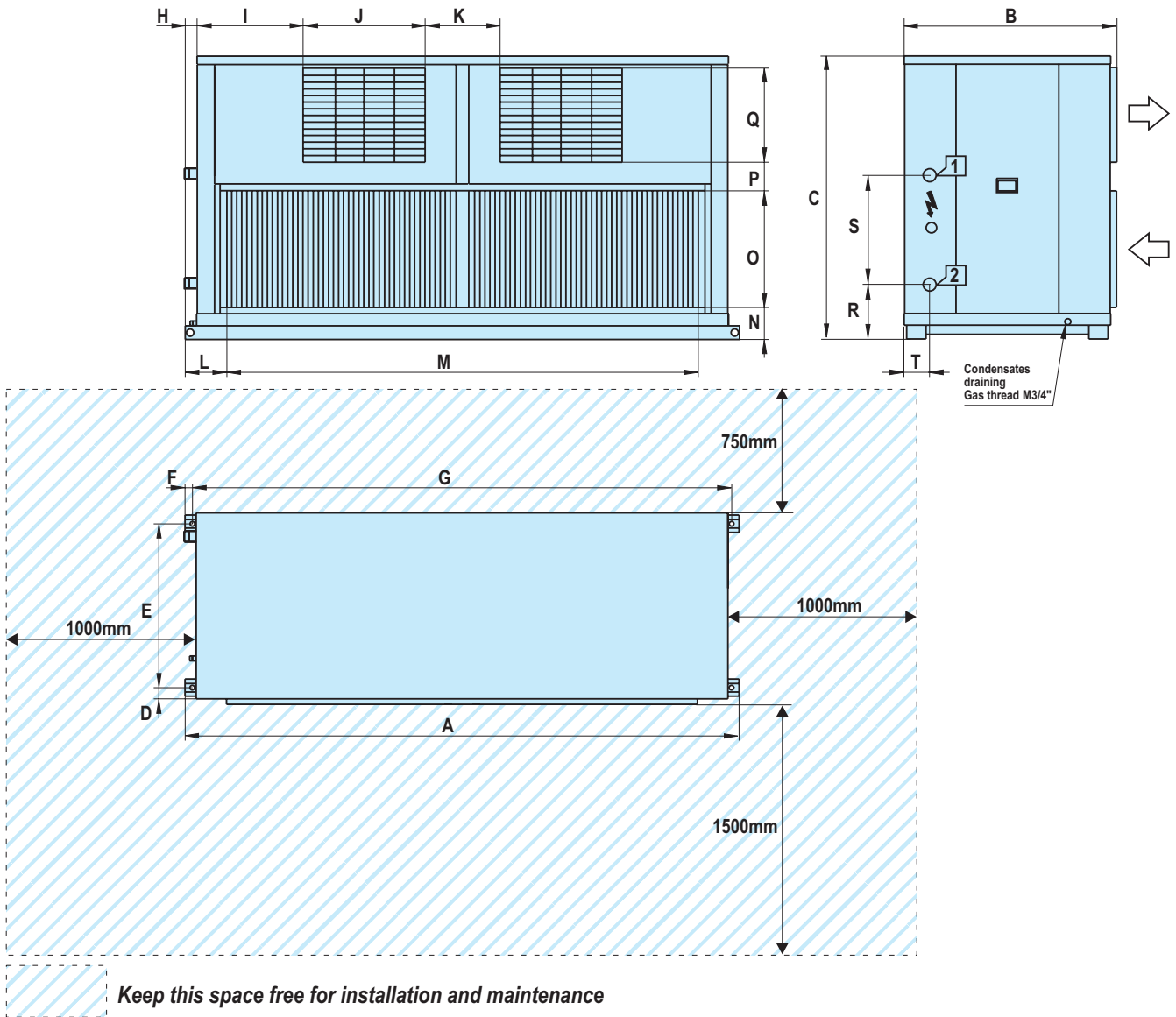
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
120 / 155	1.440	877	1.312	47,5	759	1.382	29	44	117,5	1.117	161,5	1.117	138	790	62	294	200	520	102,5

LEGEND:

- AIR FLOW
- POWER SUPPLY AND ELECTRICAL PANEL
- WATER INLET
- WATER OUTLET

Note: All models have 4 drills (18 mm diameter) for antivibratory - supports

RTB / ITB - 195 HORIZONTAL DISCHARGE



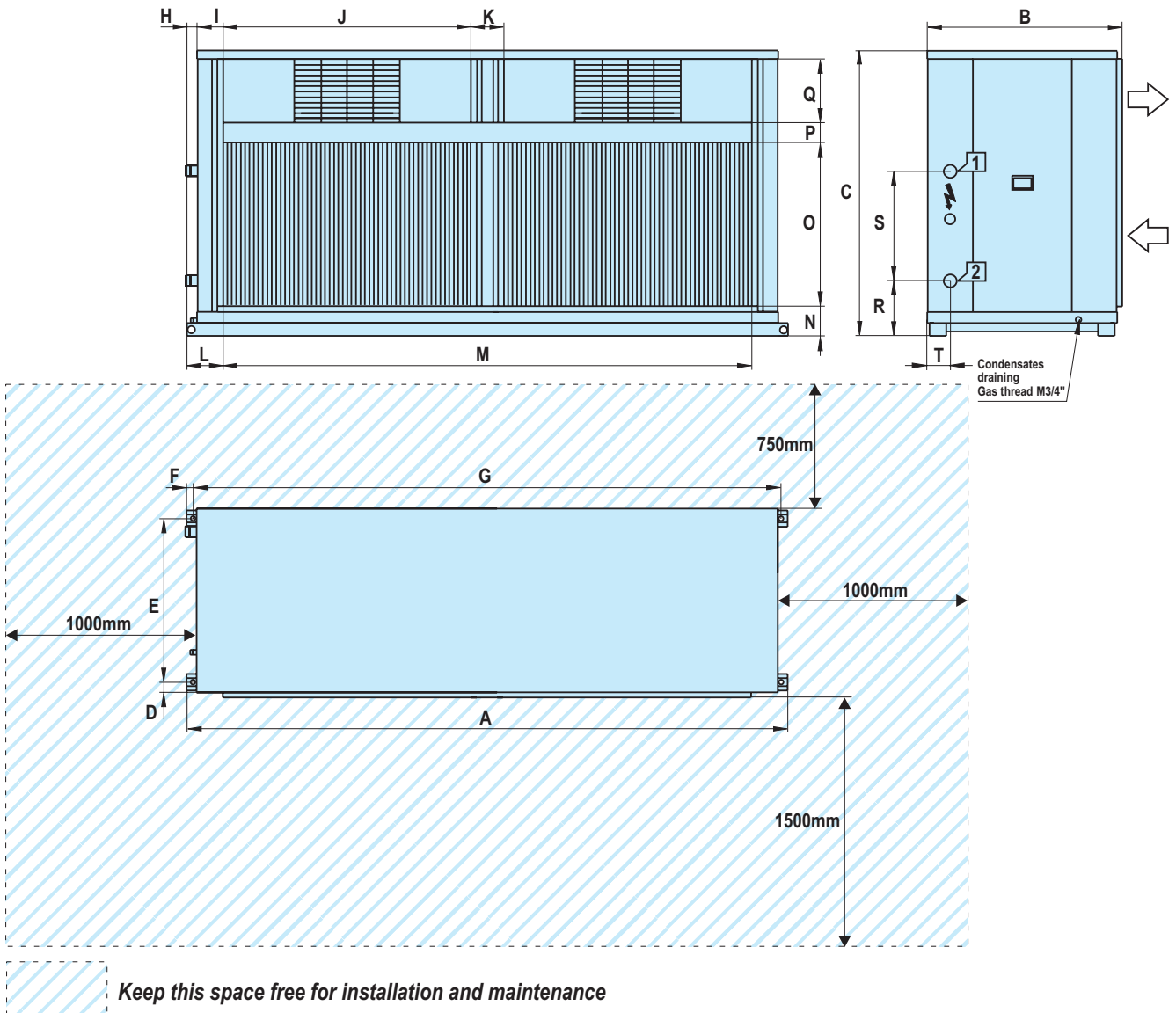
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
195	2.161	837,5	1.227	47,5	710	29	2.103	44	415,5	475	292	161,5	1.838	139	506	122	408	244	526	102,5

LEGEND:

- AIR FLOW
- POWER SUPPLY AND ELECTRICAL PANEL
- WATER INLET
- WATER OUTLET

Note: All models have 4 drills (18 mm diameter) for antivibratory - supports

RTB / ITB - 255 / 315 HORIZONTAL DISCHARGE



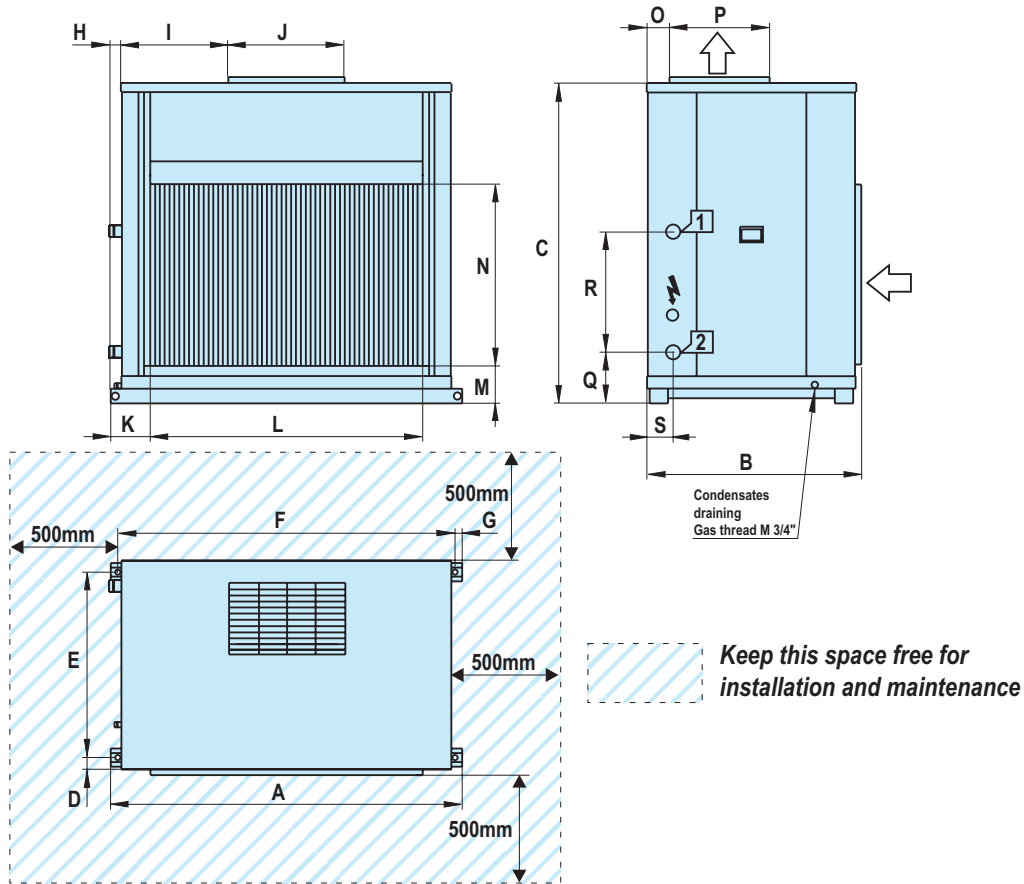
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
255 / 315	2.704	880	1.312	47,5	759	29	2.646	44	117,5	1.117	147	161,5	2.381	138	790	62	294	200	520	102,5

LEGEND:

- AIR FLOW
- POWER SUPPLY AND ELECTRICAL PANEL
- WATER INLET
- WATER OUTLET

Note: All models have 4 drills (18 mm diameter) for antivibratory - supports

RTB / ITB - 80 / 95 / 120 / 155 VERTICAL DISCHARGE (OPTIONAL)



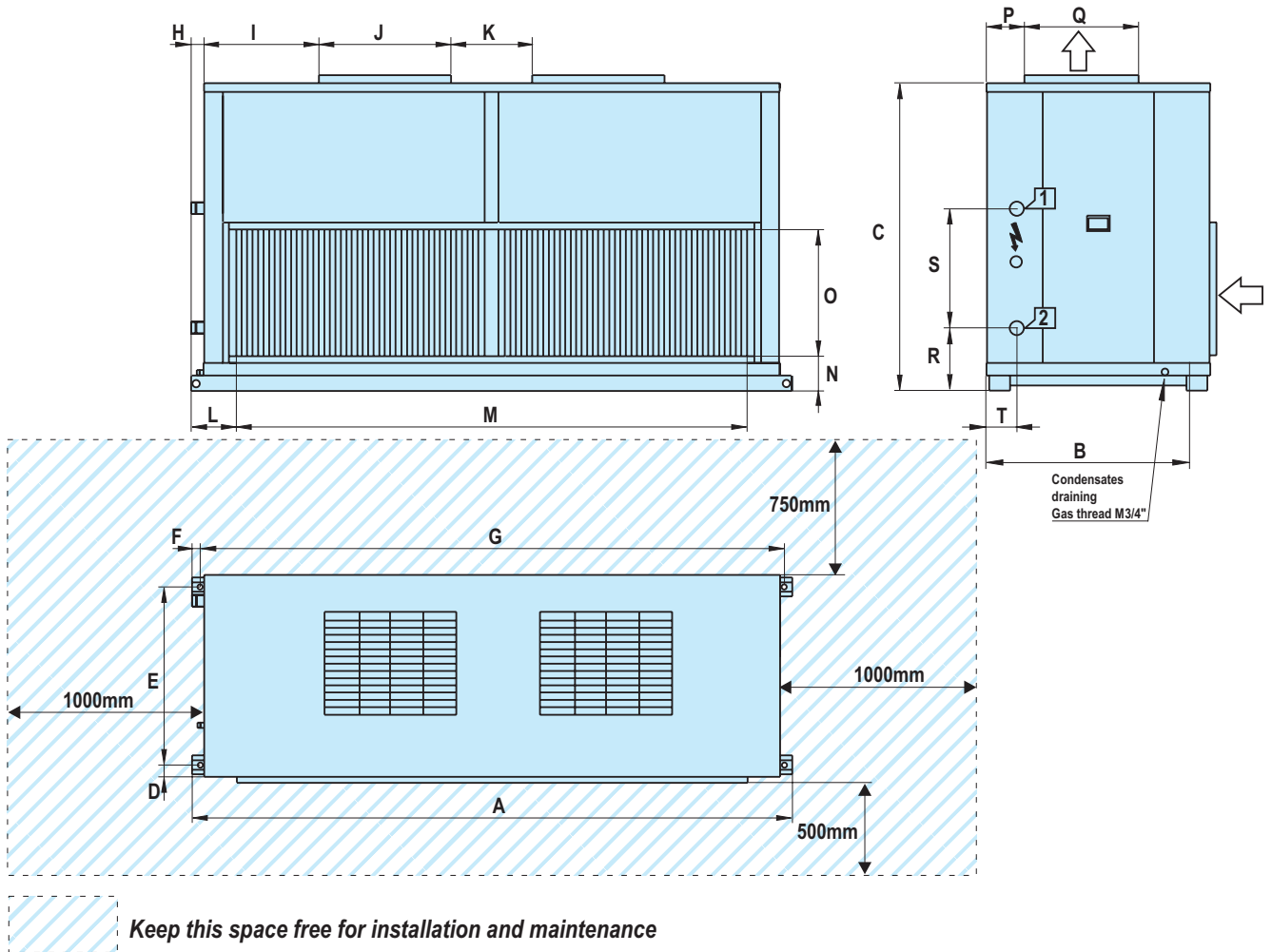
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
80 / 95	1.174	828	1.227	47,5	710	1.116	29	44	415,5	475	161,5	850	139	476	259,5	408	244	520	102,5
120 / 155	1.440	877	1.312	47,5	759	1.382	29	44	437,5	477	161,5	1.117	138	790	91	408	200	520	102,5

LEGEND:

- AIR FLOW
- POWER SUPPLY AND ELECTRICAL PANEL
- WATER INLET
- WATER OUTLET

Note: All models have 4 drills (18 mm diameter) for antivibratory - supports

RTB / ITB - 195 / 255 / 315 VERTICAL DISCHARGE (OPTIONAL)



MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
195	2.161	837,5	1.227	47,5	710	29	2.103	44	415,5	475	292	161,5	1838	139	506	135	408	246	526	102,5
255 / 315	2.704	880	1.312	47,5	759	29	2.646	44	434,5	475	796	161,5	2.381	138	790	91	408	200	520	102,5

LEGEND:

- AIR FLOW
- POWER SUPPLY AND ELECTRICAL PANEL
- WATER INLET
- WATER OUTLET

Note: All models have 4 drills (18 mm diameter) for antivibratory - supports

MAXIMUM SERVICE PRESSURE (Bar)

RTB - ITB SERIES	COOLING CIRCUIT	HYDRAULIC CIRCUIT
WATER EXCHANGER	29	10
AIR COIL	29	--

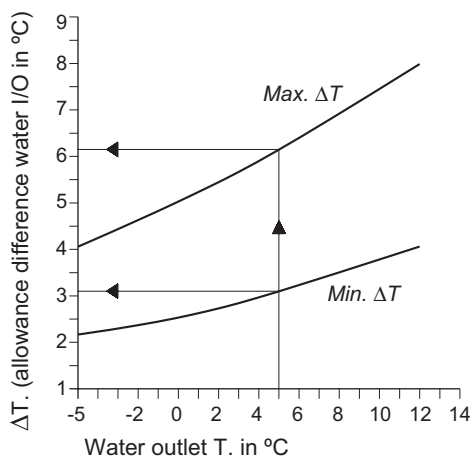
OPERATION WITH GLYCOL WATER

	CORRECTION COEFFICIENTS		POSITIVE RATE	NEGATIVE RATE
EVAPORATOR	Cooling capacity	E1	0,98	According to capacities table
	Chilled water flow	E2	1,05	1,1
	Water pressure drop	E3	1,15	1,3
	Medium rate	°C	12 / 7	See graphic
CONDENSER	Heating capacity	E1	0,97	--
	Hot water flow	E2	1,05	--
	Water pressure drop	E3	1,10	--
	Medium rate	°C	35 / 40	--

Anti-frost protection with glycol water: Freezing point

Concentration	%	0	10	20	30	40
Etylen-glicol	°C	0	-3,8	-8,3	-14,5	-23,3
Propylen-glicol	°C	0	-2,7	-6,5	-11,4	-20,0

OPERATING LIMITS



For a water outlet T of +5°C:

ΔT minimum: 3,1°C → Water T rate: 8,1°C / 5°C

ΔT maximum: 6,2°C → Water T rate: 11,2°C / 5°C

For T differences not included between the curves: consult.