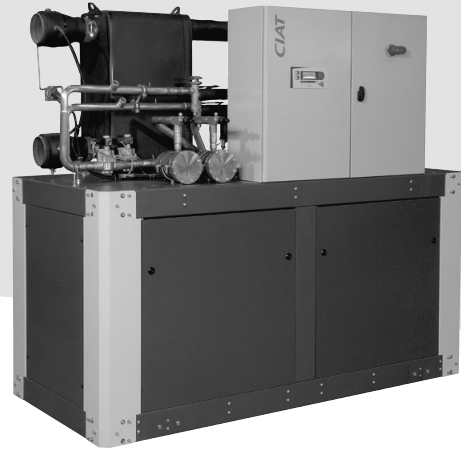




DYNACIAT POWER™

Water cooled
water chillers



High energy efficiency

Compact and quiet

Scroll compressors

High-efficiency brazed-plate

heat exchangers

*CIAT self-adjusting
electronic control*

Cooling capacity: 200 to 700 kW

Heating capacity: 230 to 800 kW



Heating



Cooling
only



Cooling
and
heating

R-410A 



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USE

The new generation of **DYNACIAT POWER™** water cooled water chillers offers an optimal solution for all heating or process cooling applications.

These units are designed to be installed in machine rooms that are protected against freezing temperatures and inclement weather.

The new range has been optimised to use ozone-friendly HFC R410A refrigerant. The use of this refrigerant guarantees compliance with the most demanding requirements for environmental protection and increased seasonal energy efficiency.

RANGE

DYNACIAT POWER™ LG series

Cooling-only or heating-only models with water cooled condenser.

The design of the **DYNACIAT POWER™ LGP series** heat pump range is identical to that of the **DYNACIAT POWER™ LG series**. These machines provide solutions for the most diverse heating problems.

They can also be used in cooling mode by reversing the cycle on the hydraulic circuits.

Acoustic configuration:

- a - STANDARD version
- b - LOW NOISE version. Compressor casing
- c - XTRA LOW NOISE version. Casing with compressor acoustic insulation

DESCRIPTION

The DYNACIAT POWER™ LG series units are monoblock machines supplied as standard with the following components:

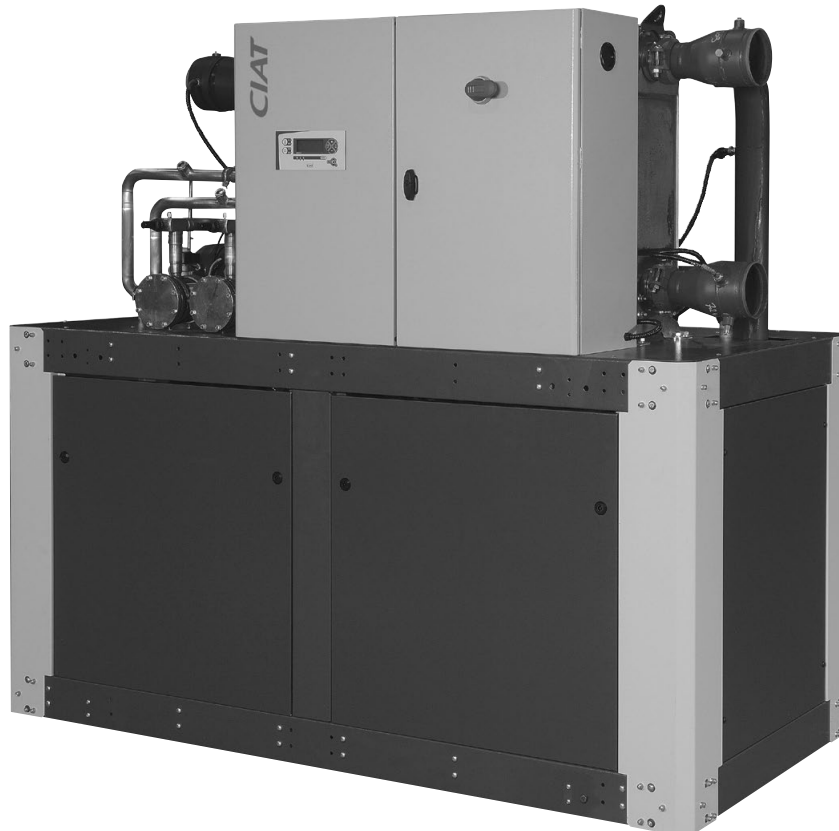
- Hermetic SCROLL compressors,
- Chilled water evaporator with brazed plates,
- Hot water condenser with brazed plates,
- Electrical power and remote control cabinet:
 - 400V-3ph-50Hz (+10%/-10%) general power supply + earth,
 - Transformer fitted as standard on the machine for supplying the remote control circuit with 230V-1ph-50Hz,
- CIAT CONNECT2 electronic control module.

The entire DYNACIAT POWER™ range complies with the following EC directives and standards:

- Machinery directive 2006/42/EC, modified
- Electromagnetic compatibility directive 2014/30/EU, modified
- EMC Immunity and Emissions EN 61800-3 "C3"
- Low voltage directive 2014/35/EU, modified
- RoHS 2011/65/EU
- Pressure equipment directive (PED) 2014/68/EU
- Machinery directive EN-60-204-1
- Refrigeration systems and heat pumps EN 378-2

DESCRIPTION

LG	>	Cooling only version	1200	>	Unit size
P	>	Heating only version	V	>	R410A refrigerant



**LG models 700V to 1600V
Xtra Low Noise Version**

DESCRIPTION OF THE MAIN COMPONENTS

■ Compressors

- Hermetic SCROLL type.
- Built-in electric motor, cooled by intake gases.
- Motor protected by internal winding thermostat.
- Placed on anti-vibration mounts.

■ Evaporator

- Brazed-plate exchanger.
- Stainless steel plates.
- Plate patterns optimised for high efficiency.
- Armaflex thermal insulation.

■ Condenser

- Brazed-plate exchanger.
- Stainless steel plates.
- Plate patterns optimised for high efficiency.

■ Refrigerating accessories

- Dehumidifier filters with rechargeable cartridges.
- Hygroscopic sight glasses.
- Solenoid valves on refrigerant lines (700V to 1200V models).
- Thermostatic expansion valves (700V to 1000V models).
- Electronic expansion valves (1100V to 2400V models).

■ Regulation and safety instruments

- High and low pressure sensors.
- High pressure safety valves.
- Water temperature control sensors.
- Evaporator antifreeze protection sensor.
- Factory-fitted evaporator water flow controller.

■ Electrics box

- IP 21.
- 400V-3Ph-50 Hz power supply + Earth (+10%/-10%).
- Disconnect switch with handle on front.
- Control circuit transformer.
- Circuit breaker for compressor motor.
- Contact switches for compressor motor.
- CONNECT2 microprocessor-controlled electronic control module.
- Wire numbering.
- Marking of the main electrical components.
- RAL 7035.

■ CONNECT2 electronic control module

The CIAT electronic control module performs the following main functions:

- Regulation of the chilled or hot water temperature
- Regulation of the water temperature based on the outdoor temperature (water law).
- Regulation for low temperature energy storage.
- Second setpoint management.
- Complete management of compressors with start-up sequence, metering and runtime balancing.
- Self-adjusting and proactive functions with adjustment of parameters on drift control.
- In-series staged capacity-reduction system on compressors based on cooling and heating demands.
- Management of compressor short cycle protection.
- Management of the machine operation limit according to outdoor temperature.
- Operating and fault status diagnostics.

- Management of a fault memory allowing a log of the last 20 incidents to be accessed, with operating readings taken when the fault occurs.
- Master/slave management of the two machines in parallel with runtime balancing and automatic changeover if a fault occurs on one machine.
- Machine time schedule.
- Display and access to the operating parameters via a multilingual LCD screen with 4 lines of 24 characters.

■ Remote management

CONNECT2 is equipped as standard with an RS485 serial port offering a range of remote management, monitoring and diagnostic options via the communication bus.

Several contacts are available as standard which enable the DYNACIAT POWER™ to be controlled remotely by wired link:

- Automatic operation control: when this contact is open, the machine stops.
- Setpoint 1/setpoint 2 selector: when this contact is closed, a second cooling setpoint is activated (energy storage mode, for example).
- Heating/cooling operating mode selection: this input switches from one operating mode to another.
 - Contact closed = heating mode.
 - Contact open = cooling mode.
- Setpoint adjustable via 4-20 mA signal: this input is used to adjust the setpoint in heating or cooling mode.
- Compressor load shedding: closing the contact(s) concerned allows the power or refrigerating consumption of the machine to be limited by stopping one or more compressors.
- Water pump 1 and 2 control: these outputs control the switches for one or two water pumps.
- Fault reporting: this contact indicates the presence of a major fault which has caused one or both refrigerating circuits to stop.

■ Power control

In-series staged power control system on the compressors:

- 4 stages for 700V to 1600V models.
- 6 stages for 1800V and 2400V models.
- 8 stages for 2100V models.

■ Casing

Casing made from RAL 7024 and RAL 7035 painted panels.

DESCRIPTION OF THE MAIN COMPONENTS

■ BluEdge® Digital, the CIAT supervision solution

BluEdge® Digital is a remote supervision solution dedicated to monitoring and controlling several CIAT machines in real time.

Advantages

- Access to the operating trend curves for analysis
- Improved energy performance
- Improved availability rate for the machines

Functions

BluEdge® Digital will send data in real time to the supervision website.

The machine operating data can be accessed from any PC, smartphone or tablet.

Any event can be configured to trigger a mail alert.

Parameters monitored:

- Overview
- Control panel for the controllers
- Events
- Temperature curves

Monthly and annual reports are available to analyse:

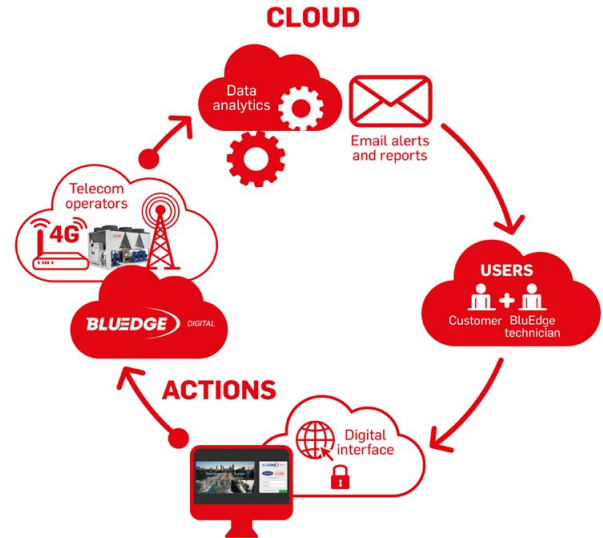
- The performance and operation of the machine
Example: operating curves and time, number of compressor start-ups, events, preventive maintenance actions to be performed, etc.

Incidents such as a drift in the measurements on a temperature sensor, incorrectly set control parameters, or even incorrect settings between one compressor stage and the other, are immediately detected, and the corrective actions put in place.

Equipment

This kit box can be used on both machines which are already in use (existing inventory), or on new machines.

- 1 transportable cabinet



Contents of the box (available in 230v and 400v)

- 1 GPRS / 4G LTE-M modem
- 1 SIM SMART card
- 1 24 VDC power supply
- 1 power protection device
- 1 GSM antenna
- Rail mounting
- Enclosed casing to protect the equipment during transport
- Packing box for cable routing (bus, power supply)

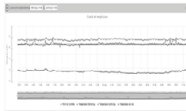
Compatibility

Up to five machines per box

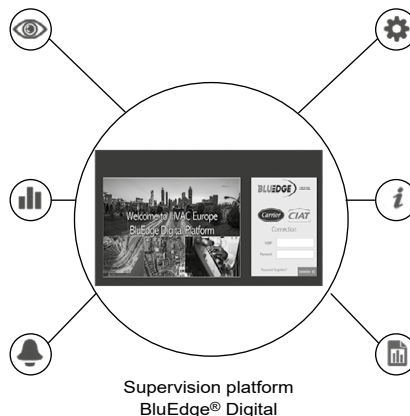
Overview



Curves



Events (real time and archives)



Parameters

Information

Reports

STANDARD EQUIPMENT/AVAILABLE OPTIONS

DYNACIAT POWER™ LG	700V to 2400V
Low-temperature glycol/water mix (0°C to -12°C)	●
Safety switch	●
Control circuit transformer	●
Electrical cabinet wire numbers	●
RS485 communication interface	●
Water flow controller	●
Master/slave control of two machines	●
ETHERNET gateway MODBUS	●
Electronic expansion valve ⁽¹⁾	▲
Low Noise version (compressor casing)	▲
Xtra Low Noise version (compressor casing with acoustic insulation)	▲
Compressor intake shut-off valves	▲
Soft start	▲
Electrical energy meter	▲
Water filter on evaporator and condenser	■
Phase controller (reversal, loss, asymmetry)	■
Anti-vibration mounts	■
Flanged connections	■
Flexible hydraulic couplings on evaporator and condenser	■
Relay board with dry contacts	■
LONWORKS/BACNET gateway	■
Outdoor temperature sensor	■

● Supplied as standard

▲ Factory-mounted option

■ Option supplied as a kit

(1) Standard equipment for 1100V to 2400V models

TECHNICAL SPECIFICATIONS

DYNACIAT POWER TM LG			700V	800V	900V	1000V	1100V	1200V	1400V	1600V	1800V	2100V	2400V	
Heating														
Standard unit Seasonal energy efficiency**	HA1	SCOP _{30/35°C}	kW / kW	5,30	5,53	5,45	5,47	5,43	5,49	5,49	5,48	5,44	5,46	5,24
		η _s heat _{30/35°C}	%	204	213	210	211	209	212	212	211	210	211	202
		P _{rated}	kW	246	293	335	384	419	463	530	593	687	795	876
Cooling														
Standard unit Full load performances*	CA1	Net cooling capacity	kW	203	242	278	320	348	382	439	495	574	651	703
		Net power input	kW	49	56	64	71	79	86	97	108	125	145	165
		EER	kW / kW	4,18	4,32	4,33	4,50	4,42	4,42	4,55	4,60	4,60	4,49	4,27
Standard unit Seasonal energy efficiency**		SEPR _{-2/-8°C} Process medium temp ***	kWh/ kWh	3,89	4,03	3,87	4,18	3,97	4,16	4,41	4,47	4,51	4,54	4,69
Standard unit Seasonal energy efficiency**		SEER _{12/7°C} Comfort Low temp.	kW / kW	5,22	5,47	5,48	5,42	5,41	5,31	5,34	5,24	5,35	5,23	4,86
Standard unit		Lw / Lp ⁽¹⁾	dB(A)	89/57	90/58	90/58	89/57	90/58	91/59	95/63	96/64	93/61	95/63	97/65
Unit + Low Noise option		Lw / Lp ⁽¹⁾	dB(A)	84/52	85/53	85/53	86/54	87/55	88/56	90/58	91/59	89/57	90/58	91/59
Unit + Xtra Low Noise		Lw / Lp ⁽¹⁾	dB(A)	79/47	80/48	80/48	80/48	81/49	82/50	85/53	86/54	85/53	86/54	87/55
Refrigerating circuit														
Refrigerant (GWP)			R410 (GWP=2088)											
Number			2											
Refrigerant circuit 1			kg	13,5	15,5	16,4	17	19,7	21,3	21,5	23	31	33	34
Refrigerant circuit 2			kg	14	15	16,4	17,2	19,7	21,3	21	22	31	34	34
Tonne of CO ₂ equivalent			TCO ₂ Eq	57,42	63,68	68,49	71,41	82,27	88,95	88,74	93,96	129,46	139,9	141,98
Compressor														
Type			Hermetic SCROLL - 2900 rpm											
Number			4											
Start-up mode			Direct in line in series											
			Number of stages	6	4	6	4	6	4	6	4	6	8	6
Capacity control			%	100-78-71-50-28-21-0	100-75-50-25-0	100-78-71-50-28-21-0	100-75-50-25-0	100-78-71-50-28-21-0	100-75-50-25-0	100-78-71-50-28-21-0	100-75-50-25-0	100-83-66-50-33-16-0	100-84-66-48-36-30-18-15-0	100-83-66-50-33-16-0
Type of oil for R410A			Polyolester POE 160SZ (32cP)											
Oil capacity per circuit			l	6,7 + 6,7	6,7 + 6,7	6,7 + 6,7	6,7 + 6,7	6,7 + 7,2	7,2 + 7,2	6,3 + 6,3	6,3 + 6,3	3 x 6,3	3 x 6,3	3 x 6,3
Evaporator														
Type/Number			Brazed-plate heat exchanger/ 1											
Water capacity			l	20	23	26	29	32	37	50	57	64	77	
Hydraulic connection			Ø	VICTAULIC DN100			VICTAULIC DN125			VICTAULIC DN150				
Max. pressure, water end			bar	10 bars										
Min/max water flow rate			m ³ /h	22 / 70	26 / 81	29 / 92	33 / 105	35 / 113	38 / 124	44 / 137	51 / 151	61 / 150	68 / 150	74 / 150

* In accordance with standard EN14511-3:2018.
 ** In accordance with standard EN14825:2018, average climate
 *** With EG 30%.
 HA1 Heating mode conditions: Water heat exchanger water entering/leaving temperature 30°C/35°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fouling factor 0 m². kW/W.
 CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². kW/W
Values in bold comply with Ecodesign Regulation (EU) No. 813/2013 for Heating applications.
 Values calculated according to EN14825:2018.
Values in bold comply with Ecodesign Regulation (EU) No. 2015/1095 for Process application
 Lw : overall power level in accordance with standard ISO3744
 Lp : overall pressure level at 10 metres in a free field calculated using the formula Lp=LW-10logS



Eurovent certified values

TECHNICAL SPECIFICATIONS

DYNACIAT POWER™ LG	700V	800V	900V	1000V	1100V	1200V	1400V	1600V	1800V	2100V	2400V		
Water condenser													
Type/ Number	Braze-plate heat exchanger/ 1												
Water capacity	l	23	26	29	32	37	40	55	61	73	77	77	
Hydraulic connection	Ø	VICTAULIC DN100			VICTAULIC DN125				VICTAULIC DN150				
Max. pressure, water end	bar	10 bars											
Min/max water flow rate	m³/h	19/ 64	22/ 74	25/ 84	28/ 95	31/ 103	33/ 112	38/ 129	43/ 143	52/ 150	59/ 150	66/ 163	
Dimensions													
Length	mm	2099					2499			3350			
Width	mm	996											
Height	mm	1869					1887			1970			
Weight													
Weight (empty)	kg	1044	1156	1189	1312	1363	1425	1613	1708	2284	2376	2418	
Weight in operation	kg	1088	1205	1246	1378	1436	1510	1713	1818	2472	2588	2637	
Max. storage temperature	°C	+50°C											

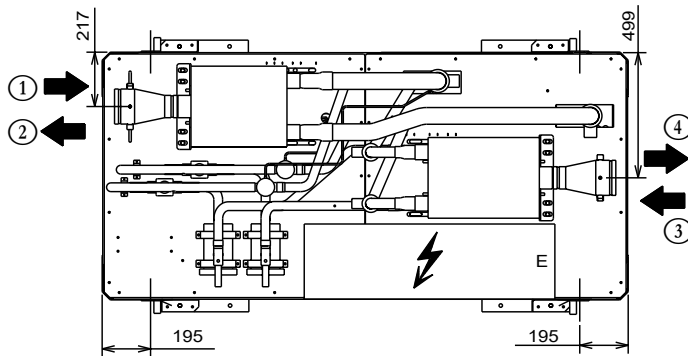
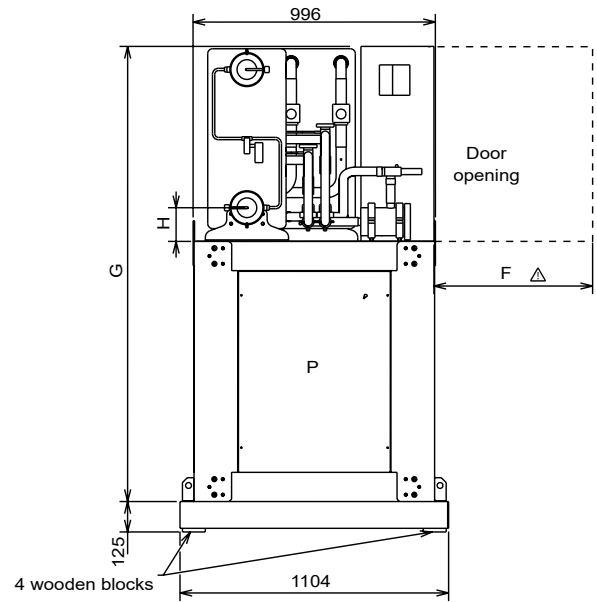
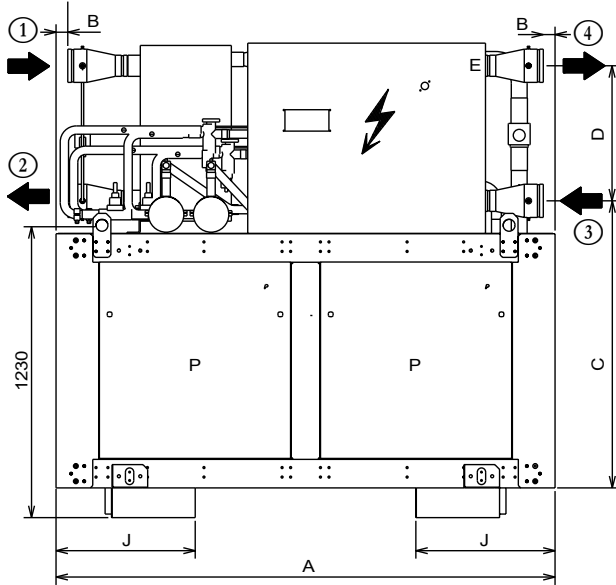
ELECTRICAL DATA

DYNACIAT POWER™ LG	700V	800V	900V	1000V	1100V	1200V	1400V	1600V	1800V	2100V	2400V	
COMPRESSOR												
Voltage	V	400V - 3Ph - 50Hz (+10/- 10%)										
Maximum nominal current	A	140	160	182	205	218	232	266	295	356	399	443
Starting current ⁽¹⁾	A	316	334	391	414	480	494	586	615	607	720	763
Starting current with Soft Start option ⁽¹⁾	A	230	248	287	310	352	366	429	458	483	562	605
REMOTE CONTROL AUXILIARY CIRCUIT												
Voltage	V	230V - 1Ph - 50Hz (+10/- 10%)										
Maximum nominal current	A	0,8					1,3					
Transformer capacity	VA	160					250					
Machine protection rating		IP 21										

(1) Starting current of largest compressor + maximum current of other compressors under full load
Cable selection nominal current = sum of maximum nominal currents in above tables

DIMENSIONS

700V to 1600V models



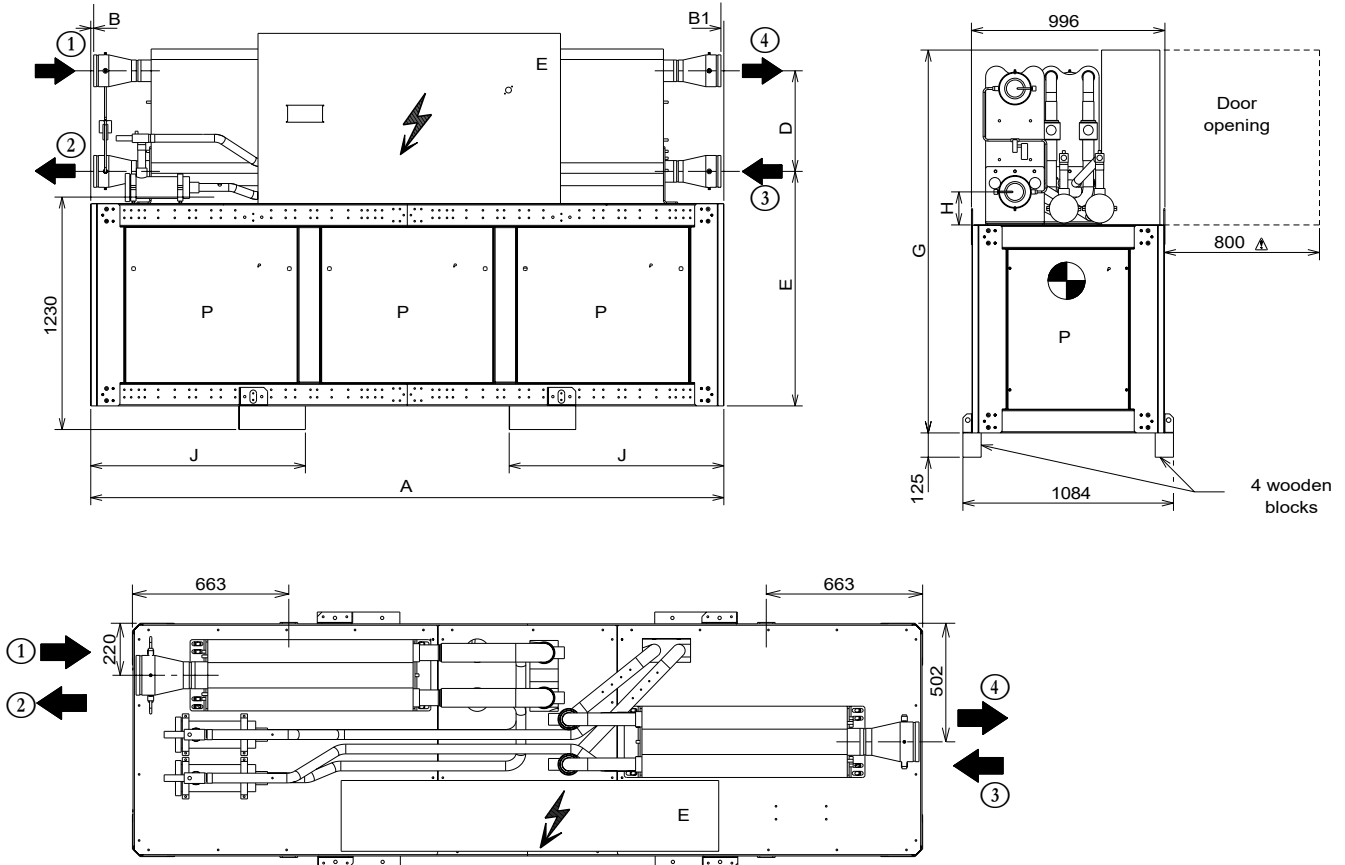
E Electrical connection on the side

P Noise insulation panels option

Models	Dimensions (mm)								Chilled water		Hot water		Weight (kg)	
	A	B	C	D	F	G	H	J	Input 1	Outlet 2	Input 3	Outlet 4	empty	in operation
700V	2099	49	1207	568	1000	1869	137	585	VICTAULIC DN 100		VICTAULIC DN 100		1044	1088
800V													1156	1205
900V													1189	1246
1000V									VICTAULIC DN 125		VICTAULIC DN 125		1312	1378
1100V													1363	1436
1200V													1425	1510
1400V	2499	60	1240	532	600	1887	170	715					1613	1713
1600V													1708	1818

DIMENSIONS

■ 1800V to 2400V models



E Electrical connection on the side
P Noise insulation panels option

Models	Dimensions (mm)								Chilled water		Hot water		Weight (kg)	
	A	B	B1	C	D	G	H	J	Input 1	Outlet 2	Input 1	Outlet 2	empty	in operation
1800V	3350	159	63	1240	532	1970	170	1135	VICTAULIC DN 150	VICTAULIC DN 150	VICTAULIC DN 150	VICTAULIC DN 150	2284	2472
2100V		15	15										2376	2588
2400V		2418	2637											