



# WAVE

## Technical Description

### Wave IC550

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# WAVE IC550

Table 1: Performance Table – Summary

# Notation	Description	Performance
<b>1</b>	<b>Vacuum chamber</b>	
1.1	Maximum extraction capacity	15 kg/h (infinite)
1.2	Chamber volume	980 L
1.3	Chamber diameter	1300 mm x 90 mm x 82 mm
	Material of chamber	Aluminium
<b>2</b>	<b>Shelves</b>	
2.1	Number of trays	60
2.2	Tray dimension (half tray)	600 mm x 400 mm
2.3	Total usable tray area (basic version with 8 shelves)	14,4 m <sup>2</sup>
2.4	Distance between shelves (basic version with 30 shelves)	50 mm
<b>3</b>	<b>Vacuum system</b>	
3.1	Vacuum pump type	Recommended: Edwards Drystar 80 or Wave 48
3.2	Pump down time to 0.1 mbar	40 minutes
3.3	Maximum system vacuum	10 mTorr
3.4	System leak rate	10 <sup>-4</sup> mTorr/sec
<b>4</b>	<b>Heating system</b>	
4.1	Maximum shelf temperature	+80°C
4.2	Minimum shelf temperature	No cooling capacity
4.3	Heating capacity	Up to 400 Watt/tray
4.4	Defrost mechanism	Dual chamber
4.5	Defrost time	0 min
<b>5</b>	<b>Refrigeration system</b>	
5.1	Number of compressors	2
5.2	Compressor Type	Embraco
5.3	Maximum cooling capacity	-40°C in defrost

5.4	Compressor energy consumption	1,8 kW
5.5	Size of freezedryer	1700 mm x 1600 mm x 1150 mm
5.6	Weight of freezedryer	900 kg
5.7	Control of freezedryer	Siemens simatic / Wave

**Table 2: Utility Requirements**

# Notation	Description	Performance
<b>1</b>	<b>Electricity</b>	400 V, 50Hz, 3 phases, Neutral, Ground, 5 wires/ 230V, 60Hz, Neutral, Ground
1.1	Maximum electrical load	30 kW, can be lowered to 9 kW
<b>2</b>	<b>Water</b>	Only needed for cleaning trays, shelves etc
<b>3</b>	<b>Internet connection</b>	CAT6 Ethernet for software updates
<b>4</b>	<b>Ambient temperature</b>	< 23°C

**Table 3: Detailed Technical Specifications**

# Notation	Description	Performance
<b>1</b>	<b>General Information</b>	
1.1	Model	IC550
1.2	Maximum ice capacity / 24 h	infinite
1.3	Control	Siemens Simatic PLC + KINCO + WAVE
1.4	Dimensions of unit (as well refer to drawing) (L x W x H)	1700 mm x 1500 mm x 1150 mm
1.5	Floor space with maintenance area	Extra 1 m at each side
1.6	Weight (approx..)	900 kg
1.7	Noise	Sound pressure level less than 65 db (A) measured from a distance of 1 meter from the machine
<b>2</b>	<b>Chamber</b>	
2.1	Chamber form	Tube
2.2	Internal finish	Hard anodized 25u

2.3	Outside finish	Hard anodized 25u
2.4	Vacuum nanometer for chamber vacuum measurement	WAVE S2 vacuum sensor
<b>3</b>	<b>Door</b>	
3.1	Door	50 mm
3.2	Door Material	Acrylic sheet
3.3	Chamber door open direction	Moving to the front
3.4	Door closing mechanism	Manual
3.5	Gasket	Silicone rubber
3.6	Locking arrangement	Manual door lock
<b>4</b>	<b>Shelves</b>	
4.1	Temperature range	Up to +80°C
4.2	Temperature sensors	PT100 "A"
4.3	Number of shelves	30
4.4	Total usable area (48 compartments)	14,4 m <sup>2</sup>
4.5	Tray dimension (half tray)	600 mm x 400 mm x 20 mm / 2 trays in each shelf
4.6	Material	Anodized aluminium or stainless steel
4.7	Shelf temperature precision	+/- 1°C
<b>5</b>	<b>Refrigeration System</b>	
5.1	Compressor	Embraco
5.1	Compressor current load	1,8 kW
5.2	Refrigerant depending on local regulations	R449A or R404A
5.3	Defrost/De-icing	Dual chamber system
5.4	Defrost time	0 min
<b>6</b>	<b>Heating System</b>	
6.1	Heating method	Kapton mat
6.2	Heating capacity	Up to 400 Watt/tray
6.3	Maximum heating mat temperature	+80°C
<b>7</b>	<b>Vacuum System</b>	
7.1	Vacuum pump	Recommended: Edwards Drystar 80
7.2	Pump isolation valve on main vacuum pipeline	Butterfly or ballvalve

<b>6</b>	<b>Heating System</b>	
6.1	Heating method	Heating mat
6.2	Heating capacity	Up to 400 Watt/tray
6.3	Maximum heating mat temperature	+80°C
<b>7</b>	<b>Vacuum System</b>	
7.1	Vacuum pump	Recommended: Edwards Drystar 80
7.2	Pump isolation valve on main vacuum pipeline	Butterfly or ballvalve
7.3	Anti-suck valve	Inside vacuum pump
7.4	Vacuum manometer for vacuum pipeline vacuum measurement	WAVE S2 vacuum sensor
7.5	Final vacuum	<0.01 mbar
7.6	Time to build up final vacuum	<20 min
7.7	Leakage rate of system	10 <sup>-3</sup> mTorr/sec
<b>8</b>	<b>Control system</b>	
8.1	PLC	Siemens simatic + Wave
8.2	Touchscreen	Kinco
8.3	Software	Inherent software, automatic control as well as manual control of all control options possible. Control points are shown on screen, advanced statistics of drying cycle are shown and can be saved. Individual programmes can be created and saved.
<b>9</b>	<b>Documentation</b>	
9.1		Operation manual
9.2		Layout drawing
9.3		Electrical wiring drawing
9.4		Loose parts list

Table 4: Loose Parts List

# Notation	System	Description	Quantity
<b>1</b>	<b>Electrical System</b>		
1.1		Vacuum pump oil	4 L
<b>2</b>	<b>Valves</b>	Relays	2
2.1		Vacuum valve for pump	1
2.2		KF25 clamp	2
2.3		KF25 seal	2
<b>4</b>	<b>Control</b>		
4.1		CAT6 Ethernet cable	1
<b>5</b>	<b>Tool</b>		
5.1		Phase screwdriver	1
<b>6</b>	<b>Extras</b>		
6.1		Thermo gloves	1
6.2		USB Stick	2