

**PRODUCT INFORMATION SHEET**

<b>Supplier's name or trade mark (b),(d) :</b>		GRUNDIG			
<b>Supplier's address (b),(d) :</b>		Arctic S.A Gaesti, Dambovita, 13 Decembrie Street, No 210, Romania			
Model identifier (d) :		GQN21235GBN			
Type of refrigerating appliance:					
Low-noise appliance:		NO	Design type:		Free-Standing
Wine storage appliance:		NO	Other refrigerating appliance:		YES
General product parameters:					
Parameter		Value	Parameter		Value
Overall dimensions (millimetre)	Height	1820	Total volume (dm <sup>3</sup> or l)		572
	Width	908	Energy efficiency class		F
	Depth	705	Airborne acoustical noise emission class		C
EEI		125	Climate class:		Extended temperature / Subtropical
Airborne acoustical noise emissions (dB(A) re 1 pW)		39			
Annual energy consumption (kWh/a)		414			
Minimum ambient temperature (°C), for which the refrigerating appliance is suitable		10	Maximum ambient temperature (°C), for which the refrigerating appliance is suitable		38
Winter setting		NO			
Compartment Parameters:					
Compartment type		Compartment parameters and values			
		Compartment Volume (dm <sup>3</sup> or l)	Recommended temperature setting for optimised food storage (°C) These settings shall not contradict the storage conditions set out in Annex IV, Table 3	Freezing capacity (kg/24 h)	Defrosting type (auto-defrost=A, manual defrost=M)
Pantry	NO	-	-	-	-
Wine storage	NO	-	-	-	-
Cellar	NO	-	-	-	-
Fresh food	YES	376,0	4	-	A
Chill	NO	-	-	-	-
0-star or ice- making	NO	-	-	-	-
1-star	NO	-	-	-	-
2-star	NO	-	-	-	-
3-star	NO	-	-	-	-
4-star	YES	98,0	-18	4,6	A
4-star (2)	NO	-	-	-	-
2-star section	NO	-	-	-	-
Variable temperature compartment	Fresh food / 4-star	98,0	4 / -18	4,6	A
For 4-star compartments					
Fast freeze facility		YES			
<b>For wine storage appliances</b>					
Number of standard wine bottles		-			
Light source parameters (a) (b):					
Type of light source		LED			
Energy efficiency class		G			
Minimum duration of the guarantee offered by the manufacturer (b),(d) :		24 Months			
Additional information (b),(d) :					
<b>Weblink to the manufacturer's website, where the information in point 4(a) Annex of Commission Regulation (EU) 2019/2019 (1) (b) is found:</b>					
http://support.grundig.com					
( a ) as determined in accordance with Commission Delegated Regulation (EU) 2019/2015 (2) . ( b ) changes to this item shall not be considered relevant for the purposes of point 4 of Article 4 of Regulation (EU) 2017/1369 . ( d ) this item shall not be considered relevant for the purpose of Article 2(6) of Regulation (EU) 2017/1369 .					

# TECHNICAL DOCUMENTATION

A general description of the refrigerating model, sufficient for it to be unequivocally and easily identified:

Brand name GRUNDIG  
 Model identifier (d) : GQN21235GBN

Product specifications:

General product specifications:

Parameter	Value	Parameter	Value
Annual energy consumption (kWh/a)	413,86	EEl (%)	124,7
Standard annual energy consumption (kWh/a)	331,80	Combi parameter	1,52
Temperature rise time (h)	10,00	Load factor	1,0
Door heat loss factor	1,020	Climate class:	Extended temperate / Subtropical
Anti-condensation heater type	Ambient	Airborne acoustical noise emissions (dB(A) re 1 pW)	39

Additional product specifications for refrigerating appliances, except for low noise refrigerating appliances:

Parameter	Value
Daily energy consumption at 32 °C (kWh/24h)	1,590

Additional product specifications for low noise refrigerating appliances:

Parameter	Value
Daily energy consumption at 25 °C (kWh/24h)	-

**Additional product specifications for wine storage appliances**

Parameter	Value	Parameter	Value
Internal humidity (%)	-	Number of bottles	-

Compartment specifications:

Compartment parameters and values

Compartment type	Target temperature (°C)	Compartment Volume (dm <sup>3</sup> or l)	Freezing capacity (kg/24 h)	Thermodynamic parameter (rc)	Nc	Mc	Defrost factor (Ac)	Built-in factor (Bc)
Pantry	-	-	-	-	-	-	-	-
Wine storage	-	-	-	-	-	-	-	-
Cellar	-	-	-	-	-	-	-	-
Fresh food	4	376,0	-	1,00	75	0,12	1,00	1,00
Chill	-	-	-	-	-	-	-	-
0-star or ice- making	-	-	-	-	-	-	-	-
1-star	-	-	-	-	-	-	-	-
2-star	-	-	-	-	-	-	-	-
3-star	-	-	-	-	-	-	-	-
4-star	-18	98,0	4,6	2,10	138	0,15	1,10	1,00
4-star (2)	-	-	-	-	-	-	-	-
2-star section	-	-	-	-	-	-	-	-
Variable temperature compartment	-18	98,0	4,6	2,10	138	0,15	1,10	1,00
The sum of the volumes of the chill compartment(s) and the unfrozen compartment(s) [l or dm <sup>3</sup> ]		376						
The sum of the volumes of the frozen compartment(s) [l or dm <sup>3</sup> ]		196						

Additional information (b),(d) :

The references of the harmonised standards or other reliable accurate and reproducible methods applied: EN 62552-1:2020, EN 62552-2:2020, EN 62552-3:2020, EN60704-2-14:2019

## Calculations

### Annual energy consumption (kWh/a) , T average (°C) :

$$E_{\text{daily}} = P \times 24 + \frac{\Delta E_{df} \times 24}{\Delta t_{df}} \quad (2)$$

Where

$E_{\text{daily}}$  is the energy in Wh over a period of 24 h

24 is h/d

$P$  is the **steady state** power in watt for the selected **temperature control setting** as per Annex B.

$\Delta E_{df}$  is the representative incremental energy for **defrost and recovery** in Wh in accordance with Annex C (see C.5).

$\Delta t_{df}$  is the estimated **defrost interval** in hours in accordance with Annex D.

Where there are additional defrost systems (each with its own **defrost control cycle**), the value of term based on  $\Delta E_{df}$  and  $\Delta t_{df}$  is also added in Formula (2) for each additional defrost system.

$$T_{\text{average}} = T_{ss} + \frac{\Delta T h_{df}}{\Delta t_{df}} \quad (3)$$

Note : EN 60552-3:2020 , 6.8.2 clause, Equation 2-3 ,

### Annual Energy , Daily energy consumption at 16 °C/ 32°C (kWh/24h) :

$$AE = 365 \times E_{\text{daily}}/L + E_{\text{aux}} \quad E_{\text{daily}} = 0,5 \times (E_{16} + E_{32})$$

Note : EN 60552-3:2020 , 6.8.2 clause, Equation 4,(EU) 2019/2019 Ecodesign Requirements Directive

### Standard annual energy consumption (kWh/a)

SAE, expressed in kWh/a and rounded to two decimal places, is calculated as follows:

$$SAE = C \times D \times \sum_{c=1}^n A_c \times B_c \times [V_c/V] \times (N_c + V \times r_c \times M_c)$$

The modelling parameters are set out in Table 4.

Table 4

The values of the modelling parameters per compartment type

Compartment type	$r_c$ (°)	$N_c$	$M_c$	C
Pantry	0,35			
Wine storage	0,60	75	0,12	between 1,15 and 1,56 for combi appliances with 3- or 4-star compartments (°), 1,15 for other combi appliances, 1,00 for other refrigerating appliances
Cellar	0,60			
Fresh food	1,00			
Chill	1,10	138	0,12	
0-star & ice-making	1,20	138	0,15	
1-star	1,50			
2-star	1,80			
3-star	2,10			
Freezer (4-star)	2,10			

(°)  $r_c = (T_c - T_s)/20$ ; with  $T_s = 24^\circ\text{C}$  and  $T_c$  with values as set out in Table 3.

(°) C for combi appliances with 3- or 4-star compartments is determined as follows:  
 where  $fr_{df}$  is the 3- or 4-star compartment volume  $V_p$  as a fraction of V with  $fr_{df} = V_p/V$ :  
 — if  $fr_{df} \leq 0,3$  then  $C = 1,3 + 0,87 \times fr_{df}$ ;  
 — else if  $0,3 < fr_{df} < 0,7$  then  $C = 1,87 - 1,0275 \times fr_{df}$ ;  
 — else  $C = 1,15$ .

The compensation factors are set out in Table 5.

Table 5

The values of the compensation factors per compartment type

Compartment type	A <sub>i</sub>		B <sub>i</sub>		D			
	Manual defrost	Auto-defrost	Freestanding appliance	Built-in appliance	≤ 2 (*)	3 (*)	4 (*)	> 4 (*)
Pantry	1,00		1,00	1,02	1,00	1,02	1,035	1,05
Wine storage								
Cellar								
Fresh food								
Chill				1,03				
0-star & ice-making	1,00	1,10		1,05				
1-star								
2-star								
3-star								
Freezer (4-star)								

(\*) number of external doors or compartments, whichever is lowest.

Note : (EU) 2019/2019 Ecodesign Requirements Directive, Clause 5, Table 4-5

5. Determination of the EEI:

EEI, expressed in % and rounded to the first decimal place, calculated as:

$$EEI = AE/SAE.$$

Note : (EU) 2019/2019 Ecodesign Requirements Directive, Clause 5

Auxiliary energy (kWh/a)

$$W_{heaters} = \left[ \sum_{i=1}^k (R_i \times P_{H_i}) \right] \times 1,3 \quad (40)$$

Table F.1 — Format for temperature and humidity data – Ambient controlled anti-condensation heaters

Relative Humidity	RH band mid-point	Probability R <sub>i</sub> at 16 °C	Probability R <sub>i</sub> at 22 °C	Probability R <sub>i</sub> at 32 °C	Heater W at 16 °C	Heater W at 22 °C	Heater W at 32 °C
0 to 10 %	5 %	0,00 %	0,00 %	0,34 %	P <sub>H1</sub>	P <sub>H11</sub>	P <sub>H21</sub>
10 to 20 %	15 %	0,61 %	6,86 %	2,01 %	P <sub>H2</sub>	P <sub>H12</sub>	P <sub>H22</sub>
20 to 30 %	25 %	3,11 %	14,57 %	1,61 %	P <sub>H3</sub>	P <sub>H13</sub>	P <sub>H23</sub>
30 to 40 %	35 %	5,03 %	14,83 %	0,86 %	P <sub>H4</sub>	P <sub>H14</sub>	P <sub>H24</sub>
40 to 50 %	45 %	5,09 %	11,67 %	0,18 %	P <sub>H5</sub>	P <sub>H15</sub>	P <sub>H25</sub>
50 to 60 %	55 %	4,67 %	8,31 %	0,01 %	P <sub>H6</sub>	P <sub>H16</sub>	P <sub>H26</sub>
60 to 70 %	65 %	3,39 %	5,54 %	0,00 %	P <sub>H7</sub>	P <sub>H17</sub>	P <sub>H27</sub>
70 to 80 %	75 %	3,17 %	2,51 %	0,00 %	P <sub>H8</sub>	P <sub>H18</sub>	P <sub>H28</sub>
80 to 90 %	85 %	2,85 %	0,66 %	0,00 %	P <sub>H9</sub>	P <sub>H19</sub>	P <sub>H29</sub>
90 to 100 %	95 %	2,05 %	0,07 %	0,00 %	P <sub>H10</sub>	P <sub>H20</sub>	P <sub>H30</sub>

Incremental defrost and recovery energy consumption at 16 /32 °C (Wh)

$$\Delta E_{df} = (E_{end-F} - E_{start-D}) - \frac{(P_{SS-D} + P_{SS-F})}{2} \times (t_{end-F} - t_{start-D}) \quad (19)$$

$$\Delta E_{df} = \frac{\sum_{j=1}^m \Delta E_{df}}{m} \quad (22)$$

Note : EN 62552-3:2020 Annex C, Clause C.3.3, Equation 19-22

Defrost interval at 16 /32 °C (h)

for Compressor Run Time Defrost Controller

$$\Delta t_{df} = \frac{\Delta t_{rt} - \Delta t_{dr} - \Delta t_{dh}}{CRt_{SS}} + \Delta t_{dxy} \quad (26)$$

for Variable Defrost Controller

$$\Delta t_{df32} = \frac{\Delta t_{d-max} \times \Delta t_{d-min}}{[0.2 \times (\Delta t_{d-max} - \Delta t_{d-min}) + \Delta t_{d-min}]} \quad (27)$$

$$\Delta t_{df16} = 2 \times \Delta t_{df32}$$

Note : EN 62552-3:2020, Annex D, Equation 26-27