

PRODUCT INFORMATION SHEET

| | | | | | |
|--|--------|--|---|-----------------------------|--|
| Supplier's name or trade mark (b),(d) : | | GRUNDIG | | | |
| Supplier's address (b),(d) : | | Arctic S.A Gaesti, Dambovita, 13 Decembrie Street, No 210, Romania | | | |
| Model identifier (d) : | | GQN490ZXRN 7299147584 | | | |
| 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 | 1920 | Total volume (dm ³ or l) | | 481 |
| | Width | 760 | Energy efficiency class | | F |
| | Depth | 725 | Airborne acoustical noise emission class | | D |
| EEI | | 125 | Climate class: | | Extended temperate / Subtropical |
| Airborne acoustical noise emissions (dB(A) re 1 pW) | | 42 | | | |
| Annual energy consumption (kWh/a) | | 383 | | | |
| 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 ³ 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 | 274,0 | 4 | - | A |
| Chill | YES | 33,0 | 2 | - | A |
| 0-star or ice- making | NO | - | - | - | - |
| 1-star | NO | - | - | - | - |
| 2-star | NO | - | - | - | - |
| 3-star | NO | - | - | - | - |
| 4-star | YES | 174,0 | -18 | 8,0 | A |
| 2-star section | NO | - | - | - | - |
| Variable temperature compartment | NO | - | - | - | - |
| For 4-star compartments | | | | | |
| Fast freeze facility | | YES | | | |
| For wine storage appliances | | | | | |
| 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) : | | | | | |
| Weblink to the manufacturer's website, where the information in point 4(a) Annex of Commission Regulation (EU) 2019/2019 (1) (b) is found: | | | | | |
| 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) : GQN490ZXRN 7299147584

Product specifications:

General product specifications:

| Parameter | Value | Parameter | Value |
|--|--------|---|----------------------------------|
| Annual energy consumption (kWh/a) | 382,88 | EI (%) | 124,9 |
| Standard annual energy consumption (kWh/a) | 306,60 | Combi parameter | 1,49 |
| Temperature rise time (h) | 15,00 | Load factor | 1,0 |
| Door heat loss factor | 1,000 | Climate class: | Extended temperate / Subtropical |
| Anti-condensation heater type | None | Airborne acoustical noise emissions (dB(A) re 1 pW) | 42 |

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

| Parameter | Value |
|---|-------|
| Daily energy consumption at 32 °C (kWh/24h) | 1,450 |

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 type | Compartment parameters and values | | | | | | | |
|--|-----------------------------------|---|-----------------------------|------------------------------|-----|------|---------------------|----------------------|
| | Target temperature (°C) | Compartment Volume (dm ³ 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 | 274,0 | - | 1,00 | 75 | 0,12 | 1,00 | 1,00 |
| Chill | 2 | 33,0 | - | 1,10 | 138 | 0,12 | 1,00 | 1,00 |
| 0-star or ice- making | - | - | - | - | - | - | - | - |
| 1-star | - | - | - | - | - | - | - | - |
| 2-star | - | - | - | - | - | - | - | - |
| 3-star | - | - | - | - | - | - | - | - |
| 4-star | -18 | 174,0 | 8,0 | 2,10 | 138 | 0,15 | 1,10 | 1,00 |
| 2-star section | - | - | - | - | - | - | - | - |
| Variable temperature compartment | - | - | - | - | - | - | - | - |
| The sum of the volumes of the chill compartment(s) and the unfrozen compartment(s) [l or dm ³] | | 307 | | | | | | |
| The sum of the volumes of the frozen compartment(s) [l or dm ³] | | 174 | | | | | | |

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_{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.

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

Δt_{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 ΔE_{df} and Δt_{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 _i | | B _i | | 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 | 1,00 | 1,05 | 1,00 | 1,02 | 1,035 | 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 _i at 16 °C | Probability R _i at 22 °C | Probability R _i 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 _{H1} | P _{H11} | P _{H21} |
| 10 to 20 % | 15 % | 0,61 % | 6,86 % | 2,01 % | P _{H2} | P _{H12} | P _{H22} |
| 20 to 30 % | 25 % | 3,11 % | 14,57 % | 1,61 % | P _{H3} | P _{H13} | P _{H23} |
| 30 to 40 % | 35 % | 5,03 % | 14,83 % | 0,86 % | P _{H4} | P _{H14} | P _{H24} |
| 40 to 50 % | 45 % | 5,09 % | 11,67 % | 0,18 % | P _{H5} | P _{H15} | P _{H25} |
| 50 to 60 % | 55 % | 4,67 % | 8,31 % | 0,01 % | P _{H6} | P _{H16} | P _{H26} |
| 60 to 70 % | 65 % | 3,39 % | 5,54 % | 0,00 % | P _{H7} | P _{H17} | P _{H27} |
| 70 to 80 % | 75 % | 3,17 % | 2,51 % | 0,00 % | P _{H8} | P _{H18} | P _{H28} |
| 80 to 90 % | 85 % | 2,85 % | 0,66 % | 0,00 % | P _{H9} | P _{H19} | P _{H29} |
| 90 to 100 % | 95 % | 2,05 % | 0,07 % | 0,00 % | P _{H10} | P _{H20} | P _{H30} |

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