

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) :		GKN 27960 FHXRN			
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)		514
	Width	700	Energy efficiency class		D
	Depth	745	Airborne acoustical noise emission class		C
EEI		80	Climate class:		Extended temperate / Tropical
Airborne acoustical noise emissions (dB(A) re 1 pW)		38			
Annual energy consumption (kWh/a)		243			
Minimum ambient temperature (°C), for which the refrigerating appliance is suitable		10	Maximum ambient temperature (°C), for which the refrigerating appliance is suitable		43
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	356,0	4	-	A
Chill	NO	-	-	-	-
0-star or ice- making	NO	-	-	-	-
1-star	NO	-	-	-	-
2-star	NO	-	-	-	-
3-star	NO	-	-	-	-
4-star	YES	158,0	-18	7,8	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) : **GKN 27960 FHXRN**

Product specifications:

General product specifications:

Parameter	Value	Parameter	Value
Annual energy consumption (kWh/a)	243,10	EI (%)	79,8
Standard annual energy consumption (kWh/a)	304,73	Combi parameter	1,55
Temperature rise time (h)	16,00	Load factor	1,0
Door heat loss factor	1,000	Climate class:	Extended temperate / Tropical
Anti-condensation heater type	None	Airborne acoustical noise emissions (dB(A) re 1 pW)	38

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

Parameter	Value
Daily energy consumption at 32 °C (kWh/24h)	0,889

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	356,0	-	1,00	75	0,12	1,00	1,00
Chill	-	-	-	-	-	-	-	-
0-star or ice- making	-	-	-	-	-	-	-	-
1-star	-	-	-	-	-	-	-	-
2-star	-	-	-	-	-	-	-	-
3-star	-	-	-	-	-	-	-	-
4-star	-18	158,0	7,8	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]		356						
The sum of the volumes of the frozen compartment(s) [l or dm ³]		158						

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