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SPECIFICATIONS

SIZE AND WEIGHT

WIDTH	280 MM
HEIGHT	480 MM
DEPTH	380 MM
WEIGHT	19 KGs

POWER REQUIREMENTS

POWER CONSUMPTION	1300 W
VOLTAGE	230 V
FREQUENCY	50 Hz

CHARACTERISTICS

100 "open" programs	
Quartz-tube muffle	
Alphanumeric display (5 languages)	
Standby temperature	0 to 600°C
Pre-drying temperature	0 to 1000°C
Pre-drying time	0 to 30 min
Number of stages	6
Internal pre-drying	0 to 30 min
Heat-rise rate	0 to 200°C/min
Vacuum start	0 to 1000°C
Vacuum cancel	0 to 1200°C
Vacuum level	0 to 99%
Vacuum hold time	0 to 60 min
Final temperature	0 to 1200°C
Hold time	0 to 60 min
Internal cooling	0 to 10 min
External cooling	0 to 30 min
Number of stages	6
Automatic standby cycle	0 to 60 min

ADVANTAGES

Alphanumeric display 2 x 20 characters
 Continuous information on ongoing phase
 Highly flexible programming
 "In-cycle" program modification
 (to change or cancel one or several settings)
 Full protection against power failures and voltage fluctuations
 Nonvolatile memory (no batteries)
 Controlled cooling
 Choice of five languages for parameter displays
 (French, German, Spanish, English or Italian)

INSTALLATION AND START-UP

- ◆ When unpacking the furnace, check that it is in perfect condition and notify the shipper and supplier of any damage.
- ◆ Remember to have the deliveryman sign the shipping bill, after marking down any reservations you may have, and to confirm the letter by registered mail with acknowledgment of receipt.

INSTALLATION

⇒ Install the furnace in a well-ventilated area and make sure it is at least 10 cm from walls or other surfaces.

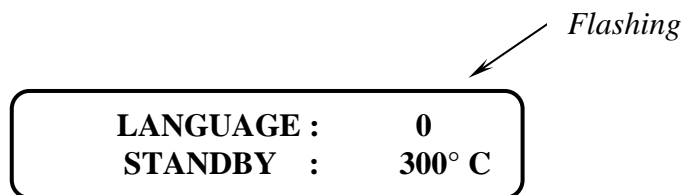
IMPORTANT: We recommend that the furnace be operated on a separate electric circuit.

START-UP

- ⇒ Connect the vacuum pump socket ⑤.
- ⇒ Plug the vacuum hose into the connector ④.
- ⇒ After checking that the mains voltage matches that noted on the rating plate ⑥, plug the cord into a standard 10/16 A socket with a ground terminal.
- ⇒ Turn on the main switch ①; you will hear a beep.
- ⇒ Press the "STANDBY" key (FRONT PANEL). The platform moves down, stopping in low position (FOR ROUGHLY 5 MINUTES).
- ⇒ Put the refractory base on the platform.
- ⇒ You may now set the program parameters.

NOTE: the furnace is delivered with the display screen in "french"

To modify this parameter push simultaneously on ◀ and ▶

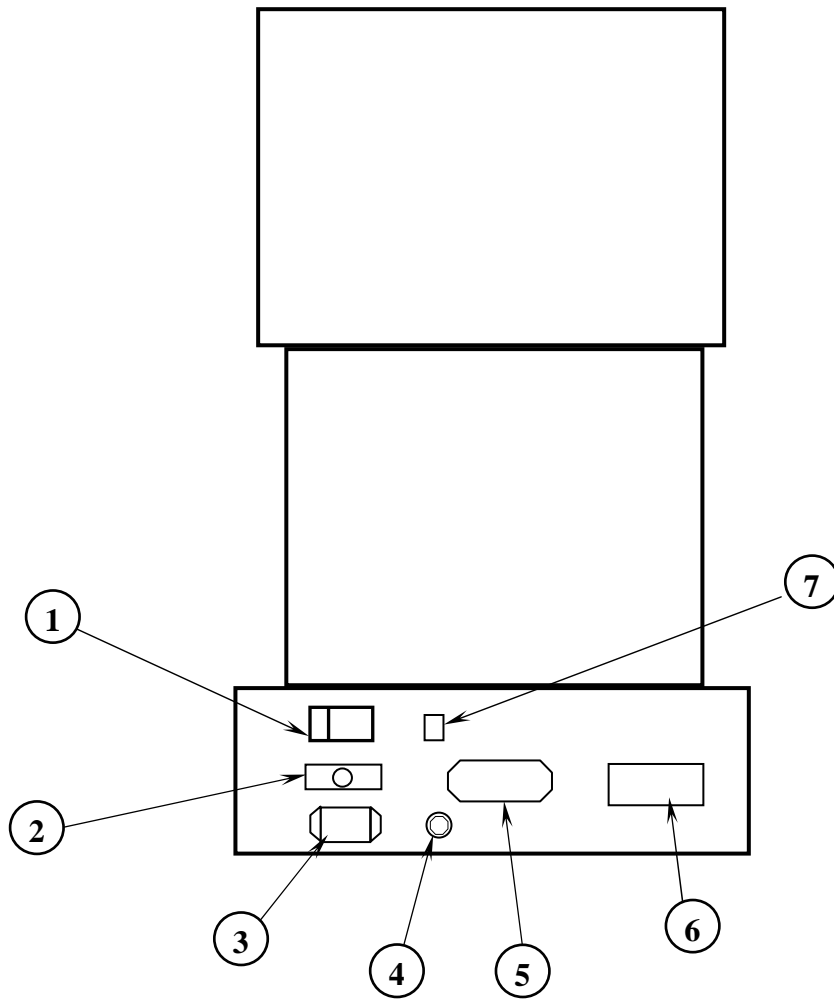


With the key ▲ or ▼ choose the language needed and enter by pressing.



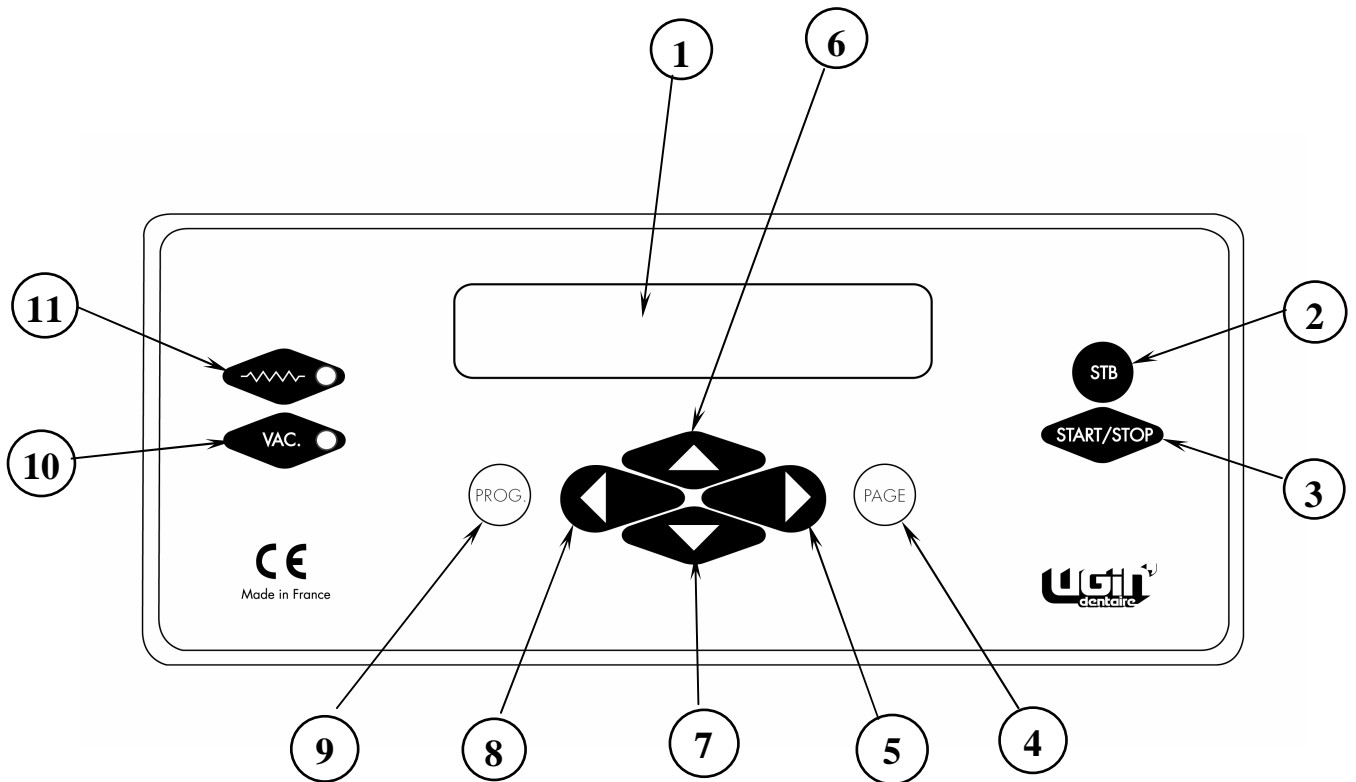
- | | | |
|-------------|-------------|-------------|
| 0 → FRENCH | 1 → GERMAN | 2 → SPANISH |
| 3 → ENGLISH | 4 → ITALIAN | 5 → FRENCH |



REAR PANEL



- ① MAIN ON/OFF SWITCH
- ② THERMAL CIRCUIT BREAKER
- ③ MAINS POWER OUTLET
- ④ VACUUM HOSE CONNECTOR
- ⑤ VACUUM PUMP CONNECTION SOCKET
- ⑥ RATING PLATE
- ⑦ PRINTING CONNECTION

DESCRIPTION OF PROGRAMMING UNIT



- ① ALPHANUMERIC DISPLAY
- ② STANDBY KEY
- ③ START/STOP KEY
- ④ PAGE KEY
- ⑤ ⑥ ⑦ ⑧ ARROW KEYS
- ⑨ PROGRAMMING KEY
- ⑩ VACUUM INDICATOR  = VACUUM
- ⑪ HEATING INDICATOR  = HEATING

1/ ALPHANUMERIC DISPLAY

There are two different display modes, which must be clearly differentiated:


1/ The programming mode (initiated by pressing the key )

In this mode, you can select or modify the parameters in a program, which are displayed flashing.

To change the value of each parameter, press the ▲ or ▼ arrow.

To move on to the next parameter, press the ► arrow.

Once you have programmed all the parameters on the page, you move on to the following

page by pressing the key 

The programming mode comprises 5 pages.

2/ The operating mode (not flashing)

The top line displays: the temperature in °C
- the vacuum in %
the program number, from 0 to 99

The lower line displays: the ongoing phase
the time count.

NOTE:

If the furnace is on idle, press the ▲ or ▼ arrow to change the program number.
The lower line displays: the program name .

2/ STANDBY KEY

When the furnace is on idle, with the platform in low position, press this key to switch to standby.

The platform closes, and the temperature is maintained at 300°C. When the furnace is not used for 5 minutes, the platform closes automatically.

NOTE: You can change the standby temperature and the automatic standby delay timer - see section on secondary parameters.

To exit the standby position, press the key again



3/ KEY




Press this key to initiate the firing cycle.

By pressing the key a second time during the cycle, you interrupt the firing operation and return the furnace to IDLE.

4/ KEY



When programming (push on ) it allows to pen the 5 pages of parameters

Page 1





Flashing →

It can be modified by pushing the keys ▲ and ▼, that gives access to the alphabet (capital and minuscule) as well as number from to 9.

Go to second character by push on ► key etc....

Return to precedent by push on ◀ key.

Confirm by push on  or go to the next page with  key.

*Pre drying temperature
(0 to 1000° C)*

Page 2



Flashing →

*Platform rise time
(0 to 30min)*

*Internal pre dry time
(0 to 30min)*

As previously discribed push the keys ▲ and ▼ to modify ,the parameter flashing.

Push the key ► to go on to the next parameter.

The procedure is the same as of « **page 1** ».

Page 3

Vacuum start (0 to 1000°C)

*Vacuum cancel
(0 to 1200°C)*

**VACUUM:700°C 930°C
LEVEL : 90% STAB : 2' - 0'**

Vacuum level (0 to 99°C)

*Vacuum hold time
de (0 to 60 min)
In minutes and seconds*

Heat rise rate (0 to 200°C/min)

Page 4

**HEAT RISE : 55°C /min
TEMP : 960° STAB:1'30''**

*final Température
(0 to 1200°C)*

*Hold time(0 to 60 min)
In minutes and seconds*

Page 5

**COOLING TIME
INTERN : 1' LIFT : 2'**

*Internal cooling time
(0 to 10 min)*

*Plaform lowering time
(0 to 30 min)*

5/ ARROW KEY - to right ▶

- ◆ During programming, press this key to switch from one parameter to the next.
- ◆ During a firing cycle, press this key to cancel the ongoing phase and move on to the next.

6/ ARROW KEY - upward ▲

- ◆ When the furnace is idle, press this key to change the program number.
- ◆ During programming, press this key to change the value of the flashing parameter.
- ◆ During a firing cycle, press this key to cancel the ongoing phase and move on to the next.


7/ ARROW KEY - downward ▼

- ◆ When the furnace is idle, press this key to change the program number.
- ◆ During programming, press this key to change the value of the flashing parameter.
- ◆ During firing, press this key to cancel the cycle and switch to IDLE.

8/ ARROW KEY - to left ◀

- ◆ During programming, press this key to return to the preceding parameter.

9/ PROGRAMMING KEY

Use this key to initiate the programming mode. After pressing  you can enter or modify the firing parameters.

Once the program is entered, press  again to "confirm" the program settings.

10/ VACUUM INDICATOR

This indicator shows that the pump is in operation.

The pump continues to operate until the programmed vacuum level has been reached.

It is normal for the pump to stop and start several times during the firing cycle.

11/ HEATING INDICATOR

This indicator shows that the muffle is heating.

As the temperature rises, it goes on and off regularly as the muffle heats up at the programmed rate.

FIRING PARAMETERS

Pre-drying Temperature: 0 to 1000°C

Once the furnace has completed a cycle, the temperature drops to 300°C.

After placing the porcelain on the platform, you then initiate the next cycle.

At that point, the temperature rises from 300°C to the value set for the "pre-dry temperature". The platform will only begin to rise once the "pre-drying" temperature has been reached. That temperature will be maintained as long as the platform continues to rise.

Platform Rise Time: 0 to 30 min

The platform rise time is divided into six stages. The platform will only begin rising once the pre-drying temperature has been reached.

Internal Pre-Drying: 0 to 30 min

While the platform is closed, the temperature is maintained at the "pre-dry temperature" for a period programmable from 0 to 30 minutes. The temperature will only begin to rise at the end of that time.

Vacuum Start: 0 to 1000°C

Use this function to create a vacuum in the heating chamber at a different temperature from the introduction temperature.

For a cycle without vacuum, program:

Vacuum start: 0
Vacuum level: 0
Vacuum stop: 0
Hold: 0

Vacuum Stop: 0 to 1200°C

For vacuum firing, use this function to either cancel the cycle or maintain it starting at a defined temperature.

Vacuum Level: 0 to 99%

The programming unit on the ELLIPSE furnace has an electronic vacuum sensor. As it is more accurate and reliable than a conventional pressure gage, the vacuum level can be adjusted to within + or - 3% of the programmed value. Unit conversion

NOTE: The pump delivered with the furnace has a 95% vacuum level capacity.

Vacuum Hold Time: 0 to 60 min

Starting at the vacuum stop temperature, you can prolong the vacuum time by 0 to 60 minutes.

Heat-Rise Rate: 0 to 200°C/min

The temperature rises at a perfectly linear rate from the beginning to the end of the firing cycle. You can adjust the temperature degree by degree. The heat-rise rate is maintained, even if the supply voltage varies within a maximum of + or - 20 volts.

Final Temperature: 0 to 1200°C

The programming unit maintains the temperature within $\pm 2^\circ\text{C}$ of the programmed value. This temperature can be maintained with or without a vacuum. (see Hold Time below).

Hold Time: 0 to 60 min

The final temperature in the heating chamber can be maintained for a period ranging from a few seconds to 60 minutes.

This function is programmed in minutes and seconds.

a) Hold time without vacuum

The VACUUM STOP temperature is lower than or equal to the final temperature. The vacuum hold time is programmed at 0.

b) Hold time with vacuum

The VACUUM STOP temperature is higher than the final temperature → the entire hold time will be run with a VACUUM.

The VACUUM STOP temperature is lower than or equal to the final temperature, but the VACUUM HOLD function has been programmed.

In that case, the programming unit runs through the entire hold time, part of which may be with a vacuum.

Internal Cooling: 0 to 10 min

At the end of the hold time, it is possible to leave the porcelain inside the muffle for slow cooling.

The slow cooling time may be programmed to last for 0 to 10 minutes.

To open the platform immediately, set INTERNAL COOLING at 0.

Platform Lowering: 0 to 30 min

The platform lowering time is divided into six stages.

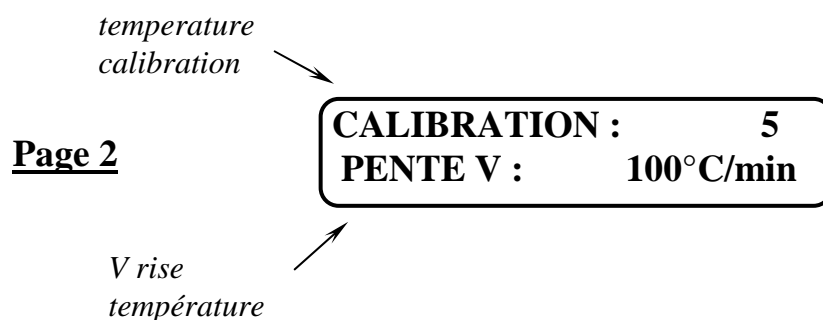
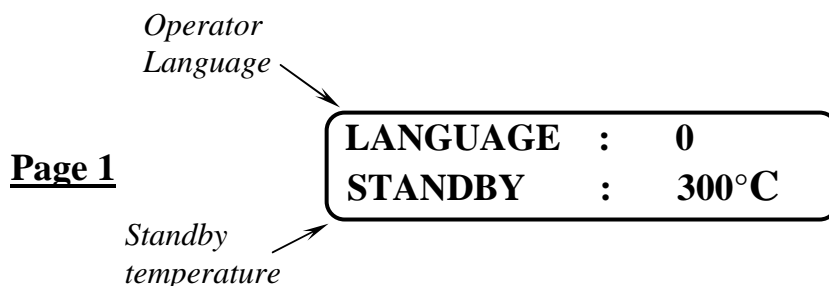
When the platform is in low position, the temperature drops naturally to the standby temperature.

SECONDARY PARAMETERS

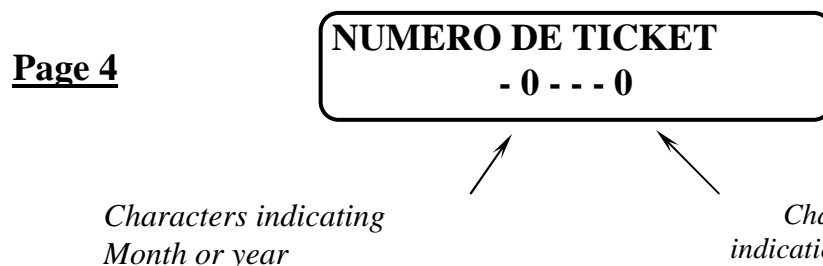
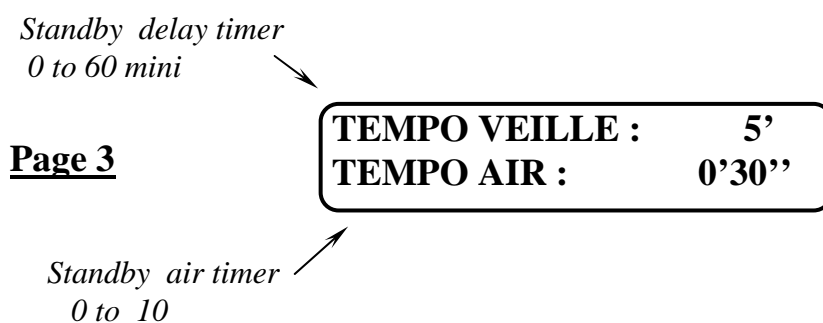
This is a second series of parameters that can be modified.

These parameters correspond to the appliance's technical data, but only some of them affect the firing functions.

To access the latter, when the furnace is on "STANDBY" or "IDLE", press both the ◀ and ▶ keys at the same time.



Temperature rise speed from standby mode to preheating mode (**20 to 200°/min**)



MAINTENANCE AND GENERAL CARE

1 - MAINTENANCE

Aside from cleaning the outside, ELLIPSE furnace maintenance entails only two other operations:

- Cleaning the platform sealing joint regularly with alcohol.
- Replacing the muffle after 3000 hours of service.

2 - GENERAL CARE

Always press the control panel keys with your fingers; never use metal or very hot instruments which would damage the plastic film.

- Clean the panel with a solvent-free product.
- Keep hot pieces away from the panel to avoid the risk of damage by heat radiation.
- Leave the furnace hooked up at all times except during prolonged absence.

DECONTAMINATION PROGRAM

Set the program parameters as follows:

- Pre-drying temperature = 700°C
- Platform rise time = 0 min
- Internal pre-drying = 0 min
- Vacuum start = 700°C
- Vacuum stop = 1030°C
- Vacuum level = 94%
- Vacuum hold time = 2 min
- Heat-rise rate = 100°C/min
- Final temperature = 1040°C
- Hold time = 4 min
- Internal cooling time = 2 min
- Platform lowering time = 0


-Then place the "CARBONET" decontamination graphite on the firing platform.

- Initiate the cycle by pressing the key.



TROUBLE-SHOOTING

TYPE OF FAULT DISPLAYED, CONTINUOUS ALARM SOUNDS: OPERATOR ACTION REQUIRED

→ First stop the alarm by pressing the key 

→ Depending on the type of fault displayed, consult the list below to determine the cause or causes of failure and contact your After-Sales Service.

The different types of faults are numbered 1 to 63 (broken down by powers of 2)

FAILURE 1: THERMOCOUPLE MALFUNCTION

The thermocouple is broken.

FAILURE 2: HEAT MALFUNCTION

The temperature exceeds the programmed final temperature by + 50°C.

This malfunction is generally caused by an anomaly in triac 6 on the furnace circuit board.

FAILURE 4: VACUUM PUMP MALFUNCTION

There are two main causes:

- * The pump is out of order
- * The electric or pneumatic connection is defective or non-existent.

FAILURE 8: AIR MALFUNCTION

The solenoid valve is clogged or improperly connected to the board (GREEN/GREEN WIRE).

FAILURE 16-32: PLATFORM MALFUNCTION (UP-DOWN)

The platform is blocked in position, for three possible reasons:

- * The back-gear motor is out of order
- * The transmission belt is broken
- * The electric connection on the board is defective (RED/BLUE WIRE).
- * After the correction of the problem, push the button ▲ in order to restore the normal display
«Start the cycle again for verification (just for a test).

CAUTION: The list given above is only partial, in that certain displays may combine several failures:

Example: FAILURE 22 → FAILURE 16+4+2

Whatever the case, it is essential that you contact your After-Sales Service.

PROTECTION

➔ **PROGRAMS:** Your programs are protected by an EEPROM memory, which operates without batteries.

➔ **OVERVOLTAGE:** The power supply to furnaces with microprocessing units requires perfect filtering. The ELLIPSE furnace is protected against overvoltage by a system of active and passive filters. However, very high overvoltages may interfere with your programs.

As a precautionary measure, we recommend that you keep a record of your programs in the notebook provided for that purpose.

➔ **"WATCHDOG":** A separate circuit continually monitors microprocessor operation. In the event of a malfunction, it switches the unit to safeguard status.

➔ **OUTLET VOLTAGE VARIATION:** Within a limit of ± 20 volts, the furnace self-corrects the variation and maintains the same accuracy.

➔ **INTERRUPTION OF POWER SUPPLY:** If the power supply is cut off, the cycle stops but will begin again at the same point once the mains voltage is re-established.

Depending on the length of the interruption, the operator will decide whether to continue or cancel the cycle.

VACUUM UNITS CONVERSION TABLE

% Vacuum	mm mercury	inches mercury	torr	mbar
0	0	0	760	1000
5	38	1.495	722	950
10	76	2.99	684	900
15	114	4.48	646	850
20	152	5.98	608	800
25	190	7.47	570	750
30	228	8.97	532	700
35	266	10.46	494	650
40	304	11.96	456	600
45	342	13.45	418	550
50	380	14.95	380	500
55	418	16.44	342	450
60	456	17.94	304	400
65	494	19.43	266	350
70	532	20.93	228	300
75	570	22.42	190	250
80	608	23.92	152	200
85	646	25.41	114	150
90	684	26.91	76	100
95	722	28.40	38	50
99	752	29.60	7.6	10
(100)	(760)	(29.9)	(0)	0

NOTE:

To calculate the vacuum % from a value expressed in mm mercury, divide the value by 7.6.

◆ Example: 700 mm Hg \rightarrow $700 : 7.6 \cong 92\%$

To calculate the vacuum % from a value expressed in inches mercury, divide the value by 0.299.

◆ Example: 27 inches HG \rightarrow $27 : 0.299 \cong 90.3\%$

CONVERSION TABLE °C/°F

C	REF	F	C	REF	F	C	REF	F	C	REF	F	C	REF	F	C	REF	F	C	REF	F			
-17.8	0	32	24.4	76	168.8	321	610	1130	743	1370	2498	1166	2130	3866	1588	2890	5234	2010	3650	6602	2432	4410	7970
-17.2	1	33.8	25.0	77	170.6	327	620	1148	749	1380	2516	1171	2140	3884	1593	2900	5252	2016	3660	6620	2438	4420	7988
-16.7	2	35.6	25.6	78	172.4	332	630	1166	754	1390	2534	1177	2150	3902	1599	2910	5270	2021	3670	6638	2443	4430	8006
-16.1	3	37.4	26.1	79	174.2	338	640	1184	760	1400	2552	1182	2160	3920	1604	2920	5288	2027	3681	6656	2449	4440	8024
-15.6	4	39.2	26.7	80	176.0	343	650	1202	766	1410	2570	1188	2170	3938	1610	2930	5306	2032	3690	6674	2454	4450	8042
-15.0	5	41.0	27.2	81	177.8	349	660	1220	771	1420	2588	1193	2180	3956	1616	2940	5324	2038	3700	6692	2460	4460	8060
-14.4	6	42.8	27.8	82	179.6	354	670	1238	777	1430	2606	1199	2190	3974	1621	2950	5342	2043	3710	6710	2466	4470	8078
-13.9	7	44.6	28.3	83	181.4	360	680	1256	782	1440	2624	1204	2200	3992	1627	2960	5360	2049	3720	6728	2471	4480	8096
-13.3	8	46.4	28.9	84	183.2	366	690	1274	788	1450	2642	1210	2210	4010	1632	2970	5378	2054	3730	6746	2477	4490	8114
-12.8	9	48.2	29.4	85	185.0	371	700	1292	793	1460	2660	1216	2220	4028	1638	2980	5396	2060	3740	6764	2482	4500	8132
-12.2	10	50.0	30.0	86	186.8	377	710	1310	799	1470	2678	1221	2230	4046	1643	2990	5414	2066	3750	6782	2488	4510	8150
-11.7	11	51.8	30.6	87	188.6	382	720	1328	804	1480	2696	1227	2240	4064	1649	3000	5432	2071	3760	6800	2493	4520	8168
-11.1	12	53.6	31.1	88	190.4	388	730	1346	810	1490	2714	1232	2250	4082	1654	3010	5450	2077	3770	6818	2499	4530	8186
-10.6	13	55.4	31.7	89	192.2	393	740	1364	816	1500	2732	1238	2260	4100	1660	3020	5468	2082	3780	6836	2504	4540	8204
-10.0	14	57.2	32.2	90	194.0	399	750	1382	821	1510	2750	1243	2270	4118	1666	3030	5486	2088	3790	6854	2510	4550	8222
-9.44	15	59.0	32.8	91	195.8	404	760	1400	827	1520	2768	1249	2280	4136	1671	3040	5504	2093	3800	6872	2516	4560	8240
-8.89	16	60.8	33.3	92	197.6	410	770	1418	832	1530	2786	1254	2290	4154	1677	3050	5522	2099	3810	6890	2521	4570	8258
-8.33	17	62.6	33.9	93	199.4	416	780	1436	838	1540	2804	1260	2300	4172	1682	3060	5540	2104	3820	6908	2527	4580	8276
-7.78	18	64.4	34.4	94	201.2	421	790	1454	843	1550	2822	1266	2310	4190	1688	3070	5558	2110	3830	6926	2532	4590	8294
-7.22	19	66.2	35.0	95	203.0	427	800	1472	849	1560	2840	1271	2320	4208	1693	3080	5576	2116	3840	6944	2538	4600	8312
-6.67	20	68.0	35.6	96	204.8	432	810	1490	854	1570	2858	1277	2330	4226	1699	3090	5594	2121	3850	6962	2543	4610	8330
-6.11	21	69.8	36.1	97	206.6	438	820	1508	860	1580	2876	1282	2340	4244	1704	3100	5612	2127	3860	6980	2549	4620	8348
-5.56	22	71.6	36.7	98	208.4	443	830	1526	866	1590	2894	1288	2350	4262	1710	3110	5630	2132	3870	6998	2554	4630	8366
-5.00	23	73.4	37.2	99	210.2	449	840	1544	871	1600	2912	1293	2360	4280	1716	3120	5648	2138	3880	7016	2560	4640	8384
-4.44	24	75.2	37.8	100	212.0	454	850	1562	877	1610	2930	1299	2370	4298	1721	3130	5666	2143	3890	7034	2566	4650	8402
-3.89	25	77.0	43	110	230	460	860	1580	882	1620	2948	1304	2380	4316	1727	3140	5684	2149	3900	7052	2571	4660	8420
-3.33	26	78.8	49	120	248	466	870	1598	888	1630	2966	1310	2390	4334	1732	3150	5702	2154	3910	7070	2577	4670	8438
-2.78	27	80.6	54	130	266	471	880	1616	893	1640	2984	1316	2400	4352	1738	3160	5720	2160	3920	7088	2582	4680	8456
-2.22	28	82.4	60	140	284	477	890	1634	899	1650	3002	1321	2410	4370	1743	3170	5738	2166	3930	7106	2588	4690	8474
-1.67	29	84.2	66	150	302	482	900	1652	904	1660	3020	1327	2420	4388	1749	3180	5756	2171	3940	7124	2593	4700	8492
-1.11	30	86.0	71	160	320	488	910	1670	910	1670	3038	1332	2430	4406	1754	3190	5774	2177	3950	7142	2599	4710	8510
-0.56	31	87.8	77	170	338	493	920	1688	916	1680	3056	1338	2440	4424	1760	3200	5792	2182	3960	7160	2604	4720	8528
0	32	89.6	82	180	356	499	930	1706	921	1690	3074	1343	2450	4442	1766	3210	5810	2188	3970	7178	2610	4730	8546
0.56	33	91.4	88	190	374	504	940	1724	927	1700	3092	1349	2460	4460	1771	3220	5828	2193	3980	7196	2616	4740	8564
1.11	34	93.2	93	200	392	510	950	1742	932	1710	3110	1354	2470	4478	1777	3230	5846	2199	3990	7214	2621	4750	8582
1.67	35	95.0	99	210	410	516	960	1760	938	1720	3128	1360	2480	4496	1782	3240	5864	2204	4000	7232	2627	4760	8600
2.22	36	96.8	100	212	413	521	970	1778	943	1730	3146	1366	2490	4514	1788	3250	5882	2210	4010	7250	2632	4770	8618
2.78	37	98.6	104	220	428	527	980	1796	949	1740	3164	1371	2500	4532	1793	3260	5900	2216	4020	7268	2638	4780	8636
3.33	38	100.4	110	230	446	532	990	1814	954	1750	3182	1377	2510	4550	1799	3270	5918	2221	4030	7286	2643	4790	8654
3.89	39	102.2	116	240	464	538	1000	1832	960	1760	3200	1382	2520	4568	1804	3280	5936	2227	4040	7304	2649	4800	8672
4.44	40	104.0	121	250	482	543	1010	1850	966	1770	3218	1388	2530	4586	1810	3290	5954	2232	4050	7322	2654	4810	8690
5.00	41	105.8	127	260	500	549	1020	1868	971	1780	3236	1393	2540	4604	1816	3300	5972	2238	4060	7340	2660	4820	8708
5.56	42	107.6	132	270	518	554	1030	1886	977	1790	3254	1399	2550	4622	1821	3310	5990	2243	4070	7358	2666	4830	8726
6.11	43	109.4	138	280	536	560	1040	1904	982	1800	3272	1404	2560	4640	1827	3320	6008	2249	4080	7376	2671	4840	8744
6.67	44	111.2	143	290	554	566	1050	1922	988	1810	3290	1410	2570	4658	1832	3330	6026	2254	4090	7394	2677	4850	8762
7.22	45	113.0	149	300	570	571	1060	1940	993	1820	3308	1416	2580	4676	1838	3340	6044	2260	4100	7412	2682	4860	8780
7.78	46	114.8	154	310	590	577	1070	1958	999	1830	3326	1421	2590	4694	1843	3350	6062	2266	4110	7430	2688	4870	8798
8.33	47	116.6	160	320	608	582	1080	1976	1004	1840	3344	1427	2600	4712	1849	3360	6080	2271	4120	7448	2693	4880	8816
8.89	48	118.4	166	330	626	588	1090	1994	1010	1850	3362	1432	2610	4730	1854	3370	6098	2277	4130	7466	2699	4890	8834
9.44	49	120.2	171	340	644	593	1100	2012	1016	1860	3380	1438	2620	4748	1860	3380	6116	2282	4140	7484	2704	4900	8852
10.0	50	122.0	177	350	662	599	1110	2030	1021	1870	3398	1443	2630	4766	1866	3390	6134	2288	4150	7502	2710	4910	8870
10.6	51	123.8	182	360	680	604	1120	2048	1027	1880	3416	1449	2640	4784	1871	3400	6152	2293	4160	7520	2716	4920	8888
11.1	52	125.6	188	370	696	610	1130	2066	1032	1890	3434	1454	2650	4802	1877	3410	6170	2299	4170	7538	2721	4930	8906
11.7	53	127.4	193	380	716	616	1140	2084	1038	1900	3452	1460	2660	4820	1882	3420	6188	2304	4180	7556	2727	4940	8924
12.2	54	129.2	199	390	734	621	1150	2102	1043	1910	3470	1466	2670	4838	1888	3430	6206	2310	4190	7574	2732	4950	8942
12.8	55	131.0	204	400	752	627	1160	2120	1049	1920	3488	1471	2680	4856	1893	3440	6224	2316	4200	7592	2738	4960	8960
13.3	56	132.8	210	410	77	632	1170	2138	1054	193													