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Issue Date:	13 August 2021	Purchase Order:	PO-5706-B	Line #:	1
Test Start:	27 July 2021	NTS Opportunity:	OP0587178	Line #:	1
Test Complete:	03 August 2021				

HIGH TEMPERATURE STORAGE TEST REPORT

FOR THE

P/N PB10-MAX-06-B OUTDOOR COOLING DEVICE

TESTING PERFORMED BY:

NATIONAL TECHNICAL SYSTEMS
5325 Old Winter Garden Road
Orlando, Florida 32811-1520

TESTING PERFORMED FOR:

BREEZER HOLDINGS LLC
4835 Sirona Drive, Suite 400
Charlotte, North Carolina 28273

TEST REPORT PREPARED BY:

Matthew Matrisciano, Technical Writer

TEST REPORT APPROVED BY:

Ross Blanco, Climatic/Dynamic Manager

ABSTRACT

The P/N PB10-MAX-06-B Outdoor Cooling Device was subjected to high temperature storage testing in accordance with MIL-STD-810H, Method 501.7 High Temperature, Procedure I Storage, Table 501.7-III High Temperature Cycles, Induced Conditions and in accordance with Qualtest Inc test report #07732, Rev A. The test hardware was subjected to seven (7) twenty-four (24)-hour temperature cycles with a low temperature of 33°C and peak temperature of 71°C. A visual examination of the test hardware after application of the test environment did not reveal any notable changes or anomalies. The test hardware operated normally during pre- and post-test functional checks.

REPORT REVISION RECORD

REV.	DATE	DESCRIPTION OF CHANGE
N/A	2021-08-13	ORIGINAL RELEASE

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HIGH TEMPERATURE STORAGE TEST SUMMARY

Responsible Test Conductor: Jeremy Hill

1.0 TEST HARDWARE

One (1) P/N PB10-MAX-06-B Outdoor Cooling Device
1. S/N PB60060723

2.0 TEST REQUIREMENTS WITH TOLERANCES

The purpose of this test is to determine whether the test hardware can withstand non-operational storage at high temperature conditions.

Install the test hardware in the test chamber under standard ambient conditions. Stabilize the test hardware at ambient, then perform seven (7) temperature cycles per Table 1.

TABLE 1: HIGH TEMPERATURE PROFILE – CYCLES, CATEGORY A1, INDUCED

Hour	°C	Hour	°C	Hour	°C
0100	35	0900	44	1700	67
0200	34	1000	51	1800	63
0300	34	1100	56	1900	55
0400	33	1200	63	2000	48
0500	33	1300	69	2100	41
0600	33	1400	70	2200	39
0700	36	1500	71	2300	37
0800	40	1600	70	2400	35

Tolerance:
- Standard Ambient: 25±10°C, 20 to 80% Relative Humidity, Site Pressure

2.1 Test Specification:

- MIL-STD-810H, Method 501.7 High Temperature, Procedure I Storage, Table 501.7-III High Temperature Cycles, Induced Conditions
- Qualtest Inc test report #07732, Rev A

3.0 TEST SETUP

TABLE 2: NTS ORLANDO–FURNISHED MEASUREMENT & TEST EQUIPMENT

(Measuring instruments used in testing are calibrated per ANSI/NCSL Z540-1, and are NIST traceable)

Asset #	Item	Manufacturer	Model #	Calibration Date	Calibration Due
WC057410	Recorder (Chart)	Honeywell	DR45AT	04/26/2021	04/26/2022
WC065465	Chamber (Temperature/Humidity)	Espec	ENX176-12NWL	NCR	NCR
WC067406	Controller (System)	Espec	P-300	NCR	NCR
WC067590	Thermocouple	Omega Engineering	TT-T-20-SLE	NCR	NCR
WC071839	Sensor (Temperature)	Omega Engineering	PR-10-1-100-1/4-15-E-SB	NCR	NCR
WC071912	Meter (Hygrometer)	Extech Instruments	445814	01/19/2021	01/19/2022

NOTE: Calibration dates are formatted *mm/dd/yyyy*. "NCR" means "No calibration required."

TABLE 3: DATA RECORDER SETUP

Asset #	Channel	Type of Sensor	Function	Unit
WC057410	1	100 Ω RTD	Chamber Air Temperature	°C
WC057410	2	Type T Thermocouple	Test Item Temperature	°C

Prior to installing the test hardware in the test chamber, all instrument settings were checked and the temperature profile was validated.

4.0 TEST DESCRIPTION

4.1 Non–NTS Orlando Personnel, Including Organization, Present for All or Part of the Test:

None.

4.2 Powered/Operational State of the Hardware and by Whom:

The test hardware was not operated during the test. Pre- and post-test functional checks were performed by the customer. NTS witnessed functional testing and the test hardware operated normally.

4.3 Test Activities and Resulting Measurements from Observed/Recorded Data:

Initial Ambient Conditions: Temp (°C): 23 Relative Humidity (%): 51 Pressure: Site Ambient

The test hardware was installed in the test chamber as shown in Figure 6 and subjected to the high temperature activities in Table 4. Charts 1–3 (see the Appendix) provides the supporting test data.

TABLE 4: HIGH TEMPERATURE STORAGE TEST ACTIVITIES

Step	Date	Cycle	Activity	°C[α]	Time[α] HH:MM	Duration DD:HH:MM:SS	Time[ω] HH:MM	°C[ω]
1	27 Jul 2021	–	Start	–	–	–	–	–
2	27 Jul 2021	–	Stabilize	–	08:54	00:00:05:00	08:59	24
3	27 Jul 2021	–	Ramp	24	08:59	00:00:05:00	09:04	35
4	27 Jul 2021	–	Stabilize	35	09:04	00:03:00:00	12:04	35
5	27 Jul 2021	1	Ramp	35	12:04	00:01:00:00	13:04	35
6	27 Jul 2021	1	Ramp	35	13:04	00:01:00:00	14:04	34
7	27 Jul 2021	1	Ramp	34	14:04	00:01:00:00	15:04	34
8	27 Jul 2021	1	Ramp	34	15:04	00:01:00:00	16:04	33
9	27 Jul 2021	1	Ramp	33	16:04	00:01:00:00	17:04	33
10	27 Jul 2021	1	Ramp	33	17:04	00:01:00:00	18:04	33
11	27 Jul 2021	1	Ramp	33	18:04	00:01:00:00	19:04	36
12	27 Jul 2021	1	Ramp	36	19:04	00:01:00:00	20:04	40
13	27 Jul 2021	1	Ramp	40	20:04	00:01:00:00	21:04	44
14	27 Jul 2021	1	Ramp	44	21:04	00:01:00:00	22:04	51
15	27 Jul 2021	1	Ramp	51	22:04	00:01:00:00	23:04	56
16	27 Jul 2021	1	Ramp	56	23:04	00:01:00:00	00:04	63
17	28 Jul 2021	1	Ramp	63	00:04	00:01:00:00	01:04	69
18	28 Jul 2021	1	Ramp	69	01:04	00:01:00:00	02:04	70
19	28 Jul 2021	1	Ramp	70	02:04	00:01:00:00	03:04	71
20	28 Jul 2021	1	Ramp	71	03:04	00:01:00:00	04:04	70
21	28 Jul 2021	1	Ramp	70	04:04	00:01:00:00	05:04	67
22	28 Jul 2021	1	Ramp	67	05:04	00:01:00:00	06:04	63
23	28 Jul 2021	1	Ramp	63	06:04	00:01:00:00	07:04	55
24	28 Jul 2021	1	Ramp	55	07:04	00:01:00:00	08:04	48
25	28 Jul 2021	1	Ramp	48	08:04	00:01:00:00	09:04	41
26	28 Jul 2021	1	Ramp	41	09:04	00:01:00:00	10:04	39
27	28 Jul 2021	1	Ramp	39	10:04	00:01:00:00	11:04	37
28	28 Jul 2021	1	Ramp	37	11:04	00:01:00:00	12:04	35
29	28 Jul 2021	2	Ramp	35	12:04	00:01:00:00	13:04	35
30	28 Jul 2021	2	Ramp	35	13:04	00:01:00:00	14:04	34
31	28 Jul 2021	2	Ramp	34	14:04	00:01:00:00	15:04	34
32	28 Jul 2021	2	Ramp	34	15:04	00:01:00:00	16:04	33
33	28 Jul 2021	2	Ramp	33	16:04	00:01:00:00	17:04	33
34	28 Jul 2021	2	Ramp	33	17:04	00:01:00:00	18:04	33
35	28 Jul 2021	2	Ramp	33	18:04	00:01:00:00	19:04	36
36	28 Jul 2021	2	Ramp	36	19:04	00:01:00:00	20:04	40
37	28 Jul 2021	2	Ramp	40	20:04	00:01:00:00	21:04	44
38	28 Jul 2021	2	Ramp	44	21:04	00:01:00:00	22:04	51
39	28 Jul 2021	2	Ramp	51	22:04	00:01:00:00	23:04	56
40	28 Jul 2021	2	Ramp	56	23:04	00:01:00:00	00:04	63
41	29 Jul 2021	2	Ramp	63	00:04	00:01:00:00	01:04	69

Step	Date	Cycle	Activity	°C[α]	Time[α] HH:MM	Duration DD:HH:MM:SS	Time[ω] HH:MM	°C[ω]
42	29 Jul 2021	2	Ramp	69	01:04	00:01:00:00	02:04	70
43	29 Jul 2021	2	Ramp	70	02:04	00:01:00:00	03:04	71
44	29 Jul 2021	2	Ramp	71	03:04	00:01:00:00	04:04	70
45	29 Jul 2021	2	Ramp	70	04:04	00:01:00:00	05:04	67
46	29 Jul 2021	2	Ramp	67	05:04	00:01:00:00	06:04	63
47	29 Jul 2021	2	Ramp	63	06:04	00:01:00:00	07:04	55
48	29 Jul 2021	2	Ramp	55	07:04	00:01:00:00	08:04	48
49	29 Jul 2021	2	Ramp	48	08:04	00:01:00:00	09:04	41
50	29 Jul 2021	2	Ramp	41	09:04	00:01:00:00	10:04	39
51	29 Jul 2021	2	Ramp	39	10:04	00:01:00:00	11:04	37
52	29 Jul 2021	2	Ramp	37	11:04	00:01:00:00	12:04	35
53	29 Jul 2021	3	Ramp	35	12:04	00:01:00:00	13:04	35
54	29 Jul 2021	3	Ramp	35	13:04	00:01:00:00	14:04	34
55	29 Jul 2021	3	Ramp	34	14:04	00:01:00:00	15:04	34
56	29 Jul 2021	3	Ramp	34	15:04	00:01:00:00	16:04	33
57	29 Jul 2021	3	Ramp	33	16:04	00:01:00:00	17:04	33
58	29 Jul 2021	3	Ramp	33	17:04	00:01:00:00	18:04	33
59	29 Jul 2021	3	Ramp	33	18:04	00:01:00:00	19:04	36
60	29 Jul 2021	3	Ramp	36	19:04	00:01:00:00	20:04	40
61	29 Jul 2021	3	Ramp	40	20:04	00:01:00:00	21:04	44
62	29 Jul 2021	3	Ramp	44	21:04	00:01:00:00	22:04	51
63	29 Jul 2021	3	Ramp	51	22:04	00:01:00:00	23:04	56
64	29 Jul 2021	3	Ramp	56	23:04	00:01:00:00	00:04	63
65	30 Jul 2021	3	Ramp	63	00:04	00:01:00:00	01:04	69
66	30 Jul 2021	3	Ramp	69	01:04	00:01:00:00	02:04	70
67	30 Jul 2021	3	Ramp	70	02:04	00:01:00:00	03:04	71
68	30 Jul 2021	3	Ramp	71	03:04	00:01:00:00	04:04	70
69	30 Jul 2021	3	Ramp	70	04:04	00:01:00:00	05:04	67
70	30 Jul 2021	3	Ramp	67	05:04	00:01:00:00	06:04	63
71	30 Jul 2021	3	Ramp	63	06:04	00:01:00:00	07:04	55
72	30 Jul 2021	3	Ramp	55	07:04	00:01:00:00	08:04	48
73	30 Jul 2021	3	Ramp	48	08:04	00:01:00:00	09:04	41
74	30 Jul 2021	3	Ramp	41	09:04	00:01:00:00	10:04	39
75	30 Jul 2021	3	Ramp	39	10:04	00:01:00:00	11:04	37
76	30 Jul 2021	3	Ramp	37	11:04	00:01:00:00	12:04	35
77	30 Jul 2021	4	Ramp	35	12:04	00:01:00:00	13:04	35
78	30 Jul 2021	4	Ramp	35	13:04	00:01:00:00	14:04	34
79	30 Jul 2021	4	Ramp	34	14:04	00:01:00:00	15:04	34
80	30 Jul 2021	4	Ramp	34	15:04	00:01:00:00	16:04	33
81	30 Jul 2021	4	Ramp	33	16:04	00:01:00:00	17:04	33
82	30 Jul 2021	4	Ramp	33	17:04	00:01:00:00	18:04	33
83	30 Jul 2021	4	Ramp	33	18:04	00:01:00:00	19:04	36
84	30 Jul 2021	4	Ramp	36	19:04	00:01:00:00	20:04	40

Step	Date	Cycle	Activity	°C[α]	Time[α] HH:MM	Duration DD:HH:MM:SS	Time[ω] HH:MM	°C[ω]
85	30 Jul 2021	4	Ramp	40	20:04	00:01:00:00	21:04	44
86	30 Jul 2021	4	Ramp	44	21:04	00:01:00:00	22:04	51
87	30 Jul 2021	4	Ramp	51	22:04	00:01:00:00	23:04	56
88	30 Jul 2021	4	Ramp	56	23:04	00:01:00:00	00:04	63
89	31 Jul 2021	4	Ramp	63	00:04	00:01:00:00	01:04	69
90	31 Jul 2021	4	Ramp	69	01:04	00:01:00:00	02:04	70
91	31 Jul 2021	4	Ramp	70	02:04	00:01:00:00	03:04	71
92	31 Jul 2021	4	Ramp	71	03:04	00:01:00:00	04:04	70
93	31 Jul 2021	4	Ramp	70	04:04	00:01:00:00	05:04	67
94	31 Jul 2021	4	Ramp	67	05:04	00:01:00:00	06:04	63
95	31 Jul 2021	4	Ramp	63	06:04	00:01:00:00	07:04	55
96	31 Jul 2021	4	Ramp	55	07:04	00:01:00:00	08:04	48
97	31 Jul 2021	4	Ramp	48	08:04	00:01:00:00	09:04	41
98	31 Jul 2021	4	Ramp	41	09:04	00:01:00:00	10:04	39
99	31 Jul 2021	4	Ramp	39	10:04	00:01:00:00	11:04	37
100	31 Jul 2021	4	Ramp	37	11:04	00:01:00:00	12:04	35
101	31 Jul 2021	5	Ramp	35	12:04	00:01:00:00	13:04	35
102	31 Jul 2021	5	Ramp	35	13:04	00:01:00:00	14:04	34
103	31 Jul 2021	5	Ramp	34	14:04	00:01:00:00	15:04	34
104	31 Jul 2021	5	Ramp	34	15:04	00:01:00:00	16:04	33
105	31 Jul 2021	5	Ramp	33	16:04	00:01:00:00	17:04	33
106	31 Jul 2021	5	Ramp	33	17:04	00:01:00:00	18:04	33
107	31 Jul 2021	5	Ramp	33	18:04	00:01:00:00	19:04	36
108	31 Jul 2021	5	Ramp	36	19:04	00:01:00:00	20:04	40
109	31 Jul 2021	5	Ramp	40	20:04	00:01:00:00	21:04	44
110	31 Jul 2021	5	Ramp	44	21:04	00:01:00:00	22:04	51
111	31 Jul 2021	5	Ramp	51	22:04	00:01:00:00	23:04	56
112	31 Jul 2021	5	Ramp	56	23:04	00:01:00:00	00:04	63
113	01 Aug 2021	5	Ramp	63	00:04	00:01:00:00	01:04	69
114	01 Aug 2021	5	Ramp	69	01:04	00:01:00:00	02:04	70
115	01 Aug 2021	5	Ramp	70	02:04	00:01:00:00	03:04	71
116	01 Aug 2021	5	Ramp	71	03:04	00:01:00:00	04:04	70
117	01 Aug 2021	5	Ramp	70	04:04	00:01:00:00	05:04	67
118	01 Aug 2021	5	Ramp	67	05:04	00:01:00:00	06:04	63
119	01 Aug 2021	5	Ramp	63	06:04	00:01:00:00	07:04	55
120	01 Aug 2021	5	Ramp	55	07:04	00:01:00:00	08:04	48
121	01 Aug 2021	5	Ramp	48	08:04	00:01:00:00	09:04	41
122	01 Aug 2021	5	Ramp	41	09:04	00:01:00:00	10:04	39
123	01 Aug 2021	5	Ramp	39	10:04	00:01:00:00	11:04	37
124	01 Aug 2021	5	Ramp	37	11:04	00:01:00:00	12:04	35
125	01 Aug 2021	6	Ramp	35	12:04	00:01:00:00	13:04	35
126	01 Aug 2021	6	Ramp	35	13:04	00:01:00:00	14:04	34
127	01 Aug 2021	6	Ramp	34	14:04	00:01:00:00	15:04	34

Step	Date	Cycle	Activity	°C[α]	Time[α] HH:MM	Duration DD:HH:MM:SS	Time[ω] HH:MM	°C[ω]
128	01 Aug 2021	6	Ramp	34	15:04	00:01:00:00	16:04	33
129	01 Aug 2021	6	Ramp	33	16:04	00:01:00:00	17:04	33
130	01 Aug 2021	6	Ramp	33	17:04	00:01:00:00	18:04	33
131	01 Aug 2021	6	Ramp	33	18:04	00:01:00:00	19:04	36
132	01 Aug 2021	6	Ramp	36	19:04	00:01:00:00	20:04	40
133	01 Aug 2021	6	Ramp	40	20:04	00:01:00:00	21:04	44
134	01 Aug 2021	6	Ramp	44	21:04	00:01:00:00	22:04	51
135	01 Aug 2021	6	Ramp	51	22:04	00:01:00:00	23:04	56
136	01 Aug 2021	6	Ramp	56	23:04	00:01:00:00	00:04	63
137	02 Aug 2021	6	Ramp	63	00:04	00:01:00:00	01:04	69
138	02 Aug 2021	6	Ramp	69	01:04	00:01:00:00	02:04	70
139	02 Aug 2021	6	Ramp	70	02:04	00:01:00:00	03:04	71
140	02 Aug 2021	6	Ramp	71	03:04	00:01:00:00	04:04	70
141	02 Aug 2021	6	Ramp	70	04:04	00:01:00:00	05:04	67
142	02 Aug 2021	6	Ramp	67	05:04	00:01:00:00	06:04	63
143	02 Aug 2021	6	Ramp	63	06:04	00:01:00:00	07:04	55
144	02 Aug 2021	6	Ramp	55	07:04	00:01:00:00	08:04	48
145	02 Aug 2021	6	Ramp	48	08:04	00:01:00:00	09:04	41
146	02 Aug 2021	6	Ramp	41	09:04	00:01:00:00	10:04	39
147	02 Aug 2021	6	Ramp	39	10:04	00:01:00:00	11:04	37
148	02 Aug 2021	6	Ramp	37	11:04	00:01:00:00	12:04	35
149	02 Aug 2021	7	Ramp	35	12:04	00:01:00:00	13:04	35
150	02 Aug 2021	7	Ramp	35	13:04	00:01:00:00	14:04	34
151	02 Aug 2021	7	Ramp	34	14:04	00:01:00:00	15:04	34
152	02 Aug 2021	7	Ramp	34	15:04	00:01:00:00	16:04	33
153	02 Aug 2021	7	Ramp	33	16:04	00:01:00:00	17:04	33
154	02 Aug 2021	7	Ramp	33	17:04	00:01:00:00	18:04	33
155	02 Aug 2021	7	Ramp	33	18:04	00:01:00:00	19:04	36
156	02 Aug 2021	7	Ramp	36	19:04	00:01:00:00	20:04	40
157	02 Aug 2021	7	Ramp	40	20:04	00:01:00:00	21:04	44
158	02 Aug 2021	7	Ramp	44	21:04	00:01:00:00	22:04	51
159	02 Aug 2021	7	Ramp	51	22:04	00:01:00:00	23:04	56
160	02 Aug 2021	7	Ramp	56	23:04	00:01:00:00	00:04	63
161	03 Aug 2021	7	Ramp	63	00:04	00:01:00:00	01:04	69
162	03 Aug 2021	7	Ramp	69	01:04	00:01:00:00	02:04	70
163	03 Aug 2021	7	Ramp	70	02:04	00:01:00:00	03:04	71
164	03 Aug 2021	7	Ramp	71	03:04	00:01:00:00	04:04	70
165	03 Aug 2021	7	Ramp	70	04:04	00:01:00:00	05:04	67
166	03 Aug 2021	7	Ramp	67	05:04	00:01:00:00	06:04	63
167	03 Aug 2021	7	Ramp	63	06:04	00:01:00:00	07:04	55
168	03 Aug 2021	7	Ramp	55	07:04	00:01:00:00	08:04	48
169	03 Aug 2021	7	Ramp	48	08:04	00:01:00:00	09:04	41
170	03 Aug 2021	7	Ramp	41	09:04	00:01:00:00	10:04	39

Step	Date	Cycle	Activity	°C[α]	Time[α] HH:MM	Duration DD:HH:MM:SS	Time[ω] HH:MM	°C[ω]
171	03 Aug 2021	7	Ramp	39	10:04	00:01:00:00	11:04	37
172	03 Aug 2021	7	Ramp	37	11:04	00:01:00:00	12:04	35
173	03 Aug 2021	–	Ramp	35	12:04	00:01:00:00	13:04	24
174	03 Aug 2021	–	Stabilize	24	13:04	00:03:00:00	16:04	24
175	03 Aug 2021	–	End	–	–	–	–	–

For temperature (°C) versus time data, see the Appendix.

4.4 Limitations or Departures from the Test Requirements and Authorizing Source:

None.

5.0 CONCLUSION

A visual examination of the test hardware after application of the test environment did not reveal any notable changes or anomalies. The test hardware operated normally during pre- and post-test functional checks.

Figure 1: Test hardware before temperature storage testing

Figure 2: Test hardware before temperature storage testing

Figure 3: Test hardware before temperature storage testing

Figure 4: Test hardware before temperature storage testing

Figure 5: Test hardware before temperature storage testing

Figure 6: Temperature storage setup

Figure 7: Temperature storage setup

Appendix: High Temperature Storage Data Charts

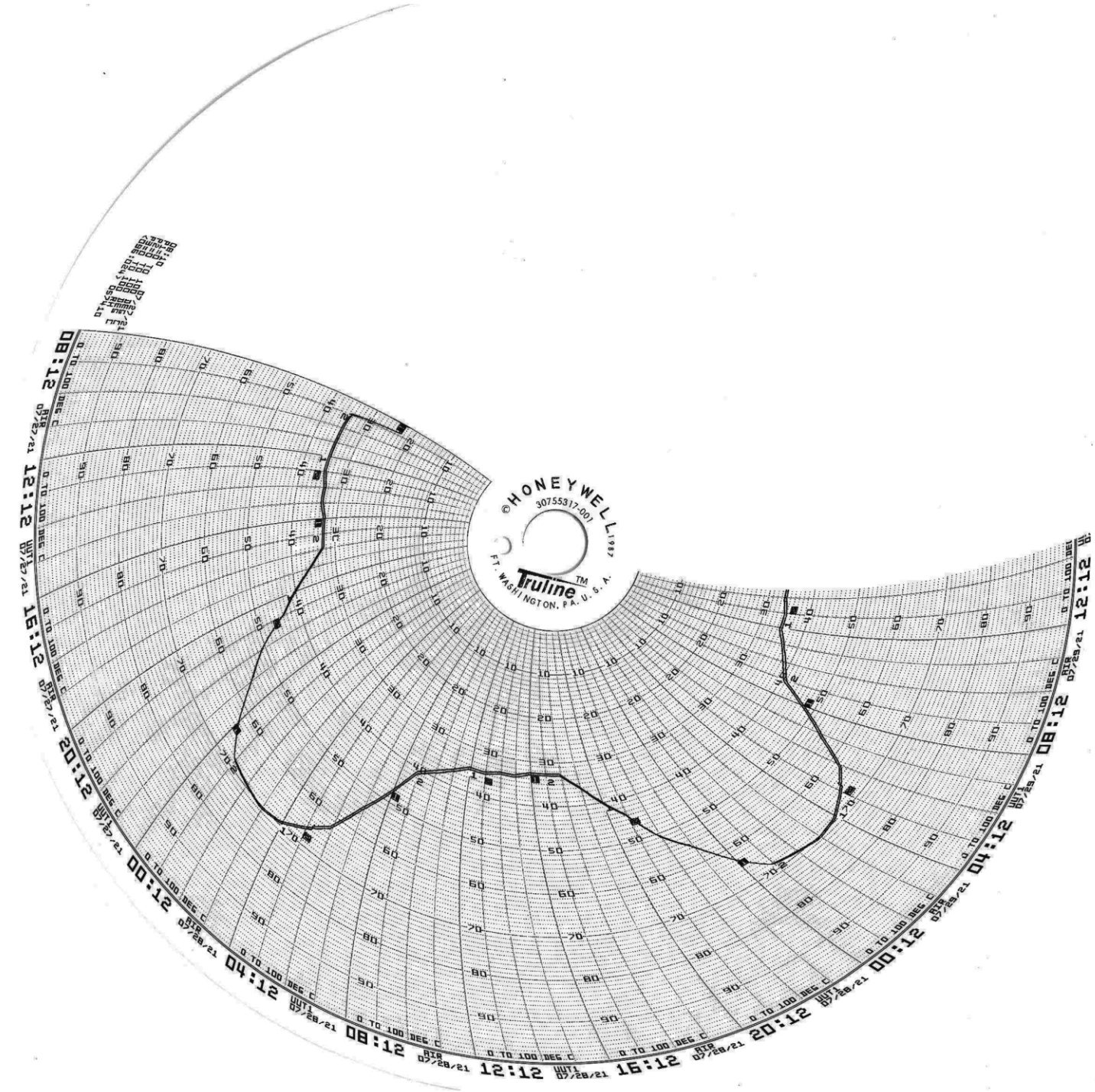

Chart 1: Temperature (°C) – 27–29 Jul 2021

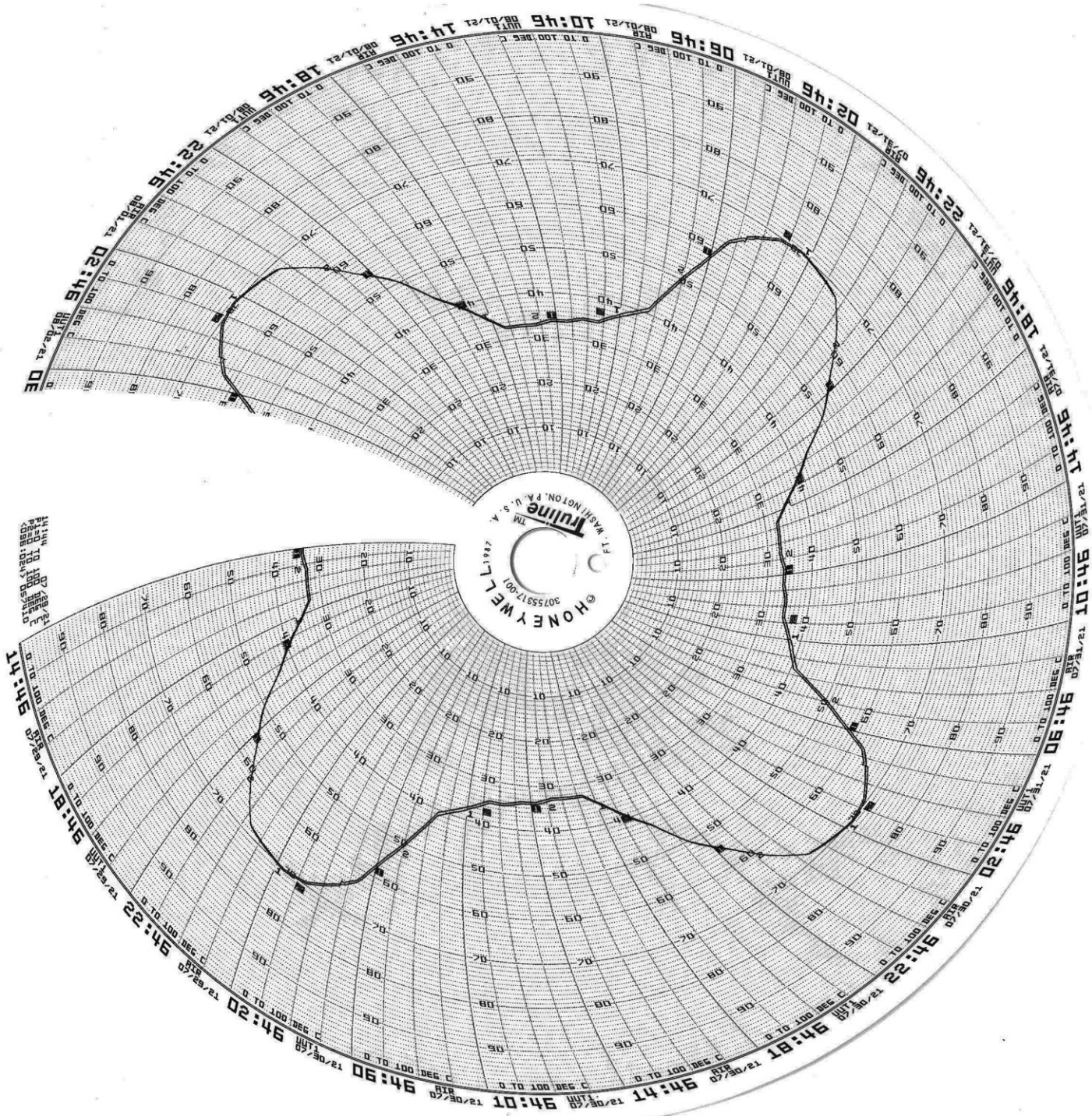

Chart 2: Temperature (°C) – 29 Jul to 02 Aug 2021

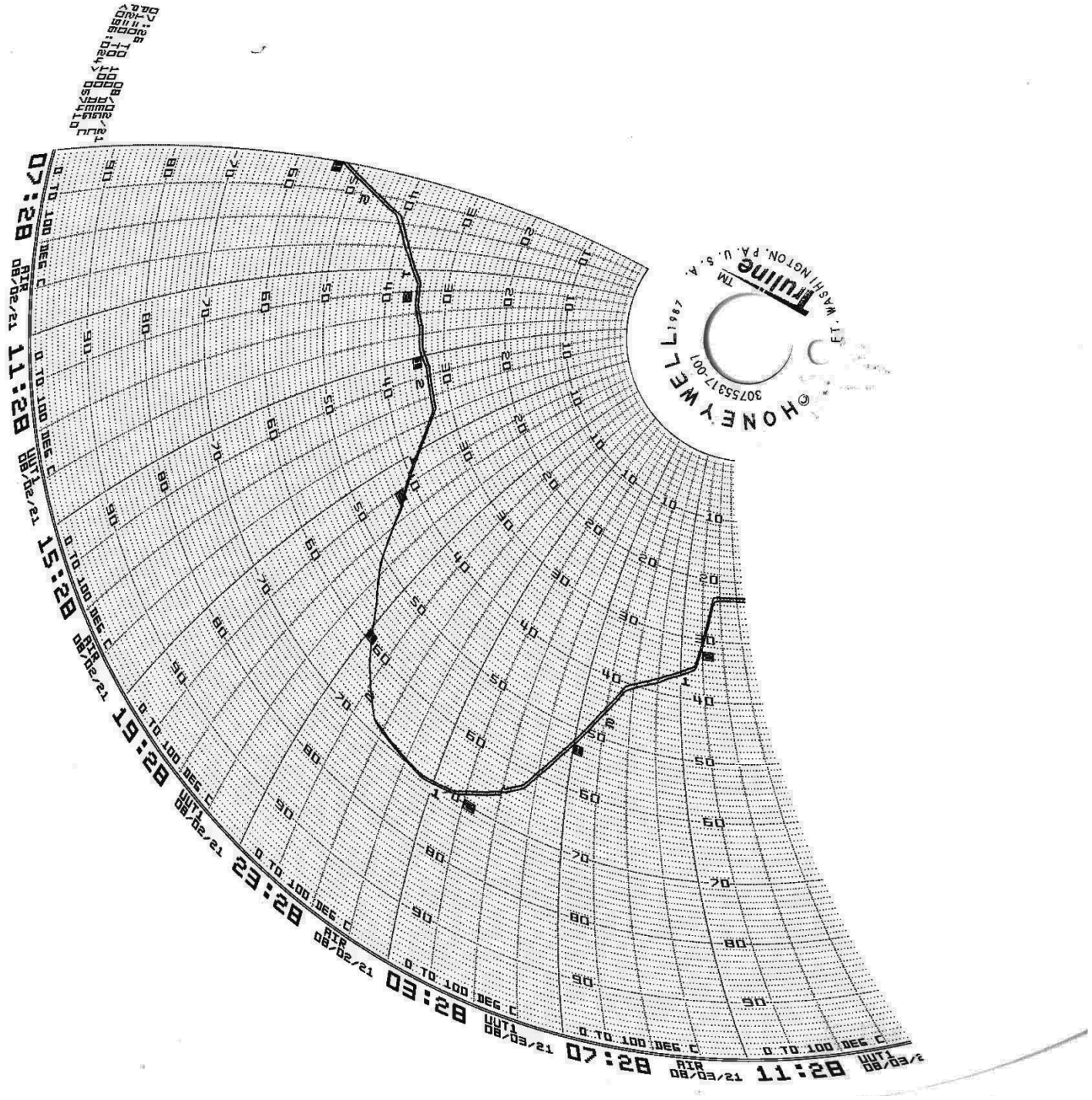

Chart 3: Temperature (°C) – 02–03 Aug 2021

END OF REPORT