**Product Information - DART** **FOOD**

# Digital Reference Thermometer

## Introduction

The "DART" Digital Reference Thermometer is the only digital thermometer available today that complies with the applicable provisions of the Pasteurized Milk Ordinance (PMO). With accuracy greater than twice that of mercury-in-glass pasteurization thermometers, the DART assures consistent processing. Unlike conventional thermometers which must be viewed at the process location, the "DART" display may be located up to 1500 feet from the sensor.

Its dual-element sensor and proprietary comparator circuitry assure fail-safe performance. Self-diagnostics guarantee continued, reliable service and an internal test feature allows for easy verification of accuracy and performance by regulators. The DART not only meets or exceeds the requirements of the PMO, it stands up to the demands of the pasteurization loop. Dual element DART sensors are built to meet 3-A standards, and are interchangeable requiring no field calibration. As with all critical temperature instruments, DARTs are calibrated to Anderson's exacting performance requirements and are traceable to the National Institute of Standards and Technology (N.I.S.T.).

For Retort applications, the unique features of the DART also meet the requirements of the updated 21 CFR Part 113 document covering the use of Alternative Temperature Indicating Devices (ATID's). The DARTs' dual element comparator circuit ensures that readings are never compromised. With the ability to locate the display up to 1500' from the sensor, Retort process monitoring can easily be performed in the control room.

## Features

- Meets PMO Provisions
- Digital display reads to 0.1°F (0.01°C) providing precise and accurate temperature indication
- Display blanks providing failsafe performance if the differential between RTD elements exceeds .5° F; sensor fails; lead broken; electrical short
- Sensors can be easily replaced without the need to recalibrate the instrument and with no effect on the DART's accuracy
- Degree F/C is user selectable enabling global performance
- Meets requirements for use as Alternative Temperature Indicating Device (ATID) on Retort cookers
- Quick Disconnect Receptacle (QDR) sensor connection optional for Retort and Non-PMO applications

## Specifications

**SENSOR**

| | |
|---|---|
| Type: | 8 wire, dual-element, resistive |
| Material: | Type 316 stainless steel |
| Finish: | Meets or exceeds 3-A sanitary standards (#09-08) |
| Process Connections: | Split ferrule or sanitary-clamp type available in various sizes. |
| Wiring Connection: | Integral conduit housing with cap sealable by health authority |
| Cable Length: | 25' standard, 1500' maximum |
| Stability: | Within 0.45°F (0.22°C) per year |
| Linearity: | ±0.036°F between 32°F and 212°F (±0.02°C between 0°C and 100°C) |
| Interchangeability: | ±0.10°F (±0.06°C) |
| Service Range: | -50°F to +350°F (-45°C to +176°C) |

**DIGITAL DISPLAY**

| | |
|---|---|
| Housing Type: | Remote mount, wall or panel |
| Housing Material: | Die cast aluminum coated with two-part urethane paint |
| Closure: | Fully gasketed and splashproof (provision for health authority seal) |
| Dimensions: | 8-1/6" W x 10" H x 4" D |
| Power: | 115 Volt A.C. nominal, 50/60 Hz, 85.0 volt A.C. minimum, 138.0 Volt A.C. maximum |
| Effect of Line Voltage Changes: | None within stated min. and max. VAC |
| Power Consumption: | 5 watts maximum |
| Display: | 1/2" LED, 4-1/2 active digits |
| Display Value: | Fahrenheit or Celsius, user selectable |
| Display Range: | -50°F to +350°F (-45°C to +176°C) |
| Resolution: | 0.1°F (0.01°C) |
| Calibrated Accuracy: | ±0.1°F (±0.06°C) at room temperature, 70°F - 80°F (21°C - 26°C) |
| Linearity: | ±0.1°F (±0.06°C) |
| Repeatability: | ±0.1°F (±0.01°C) at room temperature |
| Ambient Temperature Limits: | 40°F to 120°F (5°C to 49°C) |
| Interchangeability: | 0.1°F (±0.06°C) |
| Long-term Stability: | Within 0.5°F (0.28°C) per year |
| Warm-up Time: | One hour to meet stated specifications |

**OVERALL SPECIFICATIONS (Display Unit and Sensor)**

| | |
|---|---|
| Calibrated Accuracy: | ±0.22°F from 32°F-212°F (±0.12°C from 0°C-100°C), ±0.45°F from 212°F-302°F (±0.25°C from 100°C-150°C) including drift, linearity and repeatability |
| Stability: | 3 months minimum to calibrated accuracy |
| Calibration Adjustment: | "Fine" zero ±2.5°F (±1.39°C) only; (tracks for °F and °C) All factory adjustments sealed |
| Speed of Response: | Within four seconds for standard PMO test (Appendix I, Test 7) |
| Interchangeability of Cable: | Changing, adding or subtracting cable length has no effect on system specifications |
| Special Applications: | Consult factory |

## Order Information

### DISPLAY

F D ☐ ☐ ☐ | ☐ ☐ ☐ ☐

**THERMOMETER TYPE**
1 Digital Reference Thermometer for Pasteurizers
2 Digital Reference Thermometer for Retort and Non-PMO applications
3 Digital Reference Thermometer with Quick Disconnect Receptacle(QDR) for Retort and Non-PMO applications

**VOLTAGE**
1 115 VAC 50/60 Hz
2 230 VAC 50/60 Hz

**RETRANSMISSION**
0 None[1]
3 w/ 4-20mA Retransmission (only with code FD2 or FD3)

**RETRANSMISSION POWER**
1 Internal
2 External

**OFFSET POINT**

| | | | |
|---|---|---|---|
| 1 | -50°F | 4 | 100°F |
| 2 | 0°F | 5 | 150°F |
| 3 | 50°F | 6 | 200°F |

**SPAN**

| | | | |
|---|---|---|---|
| 3 | 50°F | 6 | 200°F |
| 4 | 100°F | 7 | 250°F |
| 5 | 150°F | 8 | 300°F |

**FAIL MODE**
1 Display Blanks and RTR signal goes to zero (0) mA
2 Display Blanks and no effect on RTR signal

### SENSOR

S K ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

**FITTING (TRI-CLAMP)**
004 1-1/2" Tri-Clamp
005 2" Tri Clamp
006 2-1/2" Tri Clamp
007 3" Tri Clamp
008 4" Tri Clamp
061 Split Ferrule (button)
062 Projectile Well (41247) [3]
101 Projectile Well (41074) [3]
119 3/4" Swagelok [4]
120 1" Swagelok [4]
179 Retort Port (1 1/4" x 18 UNEF) [3]

**HOUSING**
1 Straight
2 Bent (for split ferrule only)

**PROBE LENGTH** [2]
025 2" (req'd for 119 fitting)
029 2-1/4" (req'd for 120 fitting)
081 5-1/2" (req'd for 004 thru 061)
091 6-1/8" (req'd for 101 fitting)
139 9-1/8" (req'd for 062 fitting)
049 3 1/2" (optional for 179 fitting)
091 6 1/8" (optional for 179 fitting)
139 9 1/8" (optional for 179 fitting)

**CABLE LENGTH** [2]

| | | | | | |
|---|---|---|---|---|---|
| 00 | No Cable | 08 | 200' | | |
| 01 | 25' | 10 | 250' | | |
| 02 | 50' | 12 | 300' | | |
| 03 | 75' | 14 | 350' | | |
| 04 | 100' | 16 | 400' | | |
| 05 | 125' | 18 | 450' | | |
| 06 | 150' | 20 | 500' | | |
| 07 | 175' | | | | |

**Quick Disconnect Option** (FD3 only)
A0 Quick Disconnect Receptacle(QDR) no cable

Spare Parts

| | |
|---|---|
| 42117L0006 | 6' Molded Cordset |
| 42117L0025 | 25' Molded Cordset |
| 42117L0050 | 50' Molded Cordset |
| 42117L0100 | 100' Molded Cordset |

[1] For Option "0", no additional coding required.
[2] For longer or intermediate lengths, consult factory.
[3] Meets 3-A when used with a 3-A compliant well
[4] Not 3-A compliant



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