

I. Warranty

The manufacturer shall make standard a warranty for the thermal imager, all features and accessories installed in the thermal imager to be free of defects in material and workmanship, under normal use and service, for a period of five years. Under the same terms the manufacturer shall offer a warranty of two years on batteries. In addition, the imager's housing shall carry a limited lifetime warranty.

II. Service

The manufacturer must be located in the U.S.A. and provide a full-service repair center in the U.S.A. to ensure timely and efficient processing of any service related issues concerning the imager. Warranty repairs must carry a guaranteed 48-hour turnaround (2 full business days from the time of receipt at the service center to the time that the manufacturer ships the imager). Non-warranty repairs must carry a guaranteed 48-hour (2 full business days) turnaround from the time the manufacturer receives purchase order authorization to complete the repairs to the time the manufacturer ships the imager.

Wear parts, such as silicon boots shall be available from the manufacturer for self-service.

III. Standards / Quality

The manufacturer must ensure quality design and manufacturing methods through third party certification to ISO 9001, or its equivalent. To ensure that the product is of the highest quality, documentation must be presented upon request illustrating a battery of tests that have been conducted to verify water resistance, heat resistance, and shock/impact resistance.

IV. Physical Configuration

The imager shall be a hand-held scope-type design with a total weight not exceeding 1.6 pounds (0.75 kg) with all standard features installed. The imager's physical dimensions shall not exceed (180mm/7.1in) length, (120mm/4.7in) width, (117mm/4.6in) height. The imager shall ship in a recyclable cardboard packaging.

V. Durability

The imager shall remain operational after being submerged under 3 feet of water for 30 minutes. The imager shall withstand a 2-meter drop in any orientation and sustain no operational damage. The imager shall be able to withstand an environment temperature of 350° F (177° C) for 15 minutes without operational impact or damage to the unit.

VI. Technology

The imaging array shall utilize 320x240 pixel uncooled vanadium oxide (VOx) focal plane array. The pixel pitch shall be no more than 12 μ m. The Noise Equivalent Temperature Difference (NETD) shall be less than 60 mK. The imager shall exhibit an ability to evade whiteout when pointed directly at flames. The detector shall operate with core temperature ranges of -40°F to 175°F (-40°C to 79°C). The dynamic range of the detector and associated electronics shall be nominally 1022°F (550°C). The detector spectral response shall be 7 to 14 microns. Mid-wave or short-wave infrared products that operate below this portion of the infrared spectrum (below 7.5 microns) are not acceptable due to unreliable performance in smoky conditions. The frame rate of the infrared engine shall be no less than 30 Hertz.

VII. Image Colorization

In order to provide a greater degree of safety, the imager shall utilize a tri-color automatic colorization mode. This colorization mode shall utilize a yellow/orange/red color scheme. The display will show yellow colorization at temperatures of 500°F (260°C) to 799°F (426°C), orange colorization at temperatures of 800°F (427°C) to 999°F (537°C), and red colorization at temperatures of 1000 °F (538°C) or hotter. Such colorization shall be graduated in nature to be able to discern scene details such as visible thermal flows though the color. The imager shall employ one single colorization scheme of yellow/orange/red which does not vary with ambient thermal energy. Color palettes which colorize objects that are below 500° F are not acceptable.



VIII. Outer Housing

The imager shall be ergonomically designed, and the outer shell or housing must be manufactured from heat resistant PPSU[®] thermoplastic. Due to the likelihood of rigorous use, the thermoplastic must be molded with color pigment throughout to mask small surface scratches. Outer shells or housings which are painted or otherwise lacking consistent color through their entire thickness are not acceptable.

IX. Colors

The imager shall be a bright scratch-resistant color with reflective striping to ease locating it in low visibility environments. Battery packs shall be presented in an anthracite grey color.

X. Monitor/Screen

The imager shall have a 3.5" (89 mm) diagonal LED backlit Liquid Crystal Display (LCD) screen. The display shall consist of no less than 76,800 pixels for high quality resolution. The screen must be visible in thick smoke to the operator while using it at arms-length. In addition, a clear abrasion and impact resistant cover, compliant with NFPA 1971-52, must protect the display screen.

XI. Lens

The imager shall possess an f/1.1 lens fabricated of germanium and have no less than a 40° (V) x 50° (H) field of view. The lens shall be protected with a curved, watertight, germanium cover window with a diameter of at least 19mm / 0.74in such that it be easily cleaned with a gloved finger.

XII. Visual Indicators

The imager shall have a battery status indicator on the viewing display to reduce imager size. Battery indicators that are not located on the display, such as separate LED based indicators, are unacceptable as they increase imager size. The imager shall be capable to provide, on the viewing display, surface temperature measurement of objects. The imager must be able to provide simultaneous presentation of bar graph and numeric temperature indicators.

XIII. Switches, Features, and Modes of Operation

The imager shall use only one switch to activate the unit. The switch shall employ an electronic press-and-hold protection mechanism which prevents accidental shut-off. The imager may not have any other buttons or features to avoid confusing or confusing the user. The imager shall have only one colorization mode. The imager must not have a standby switch or mode.

XIV. Strap Systems

To reduce bulk, the imager must not have an integral strap system; however, the imager shall accommodate an available self-retracting strap. This retractable strap shall be attachable to a D-ring at the base of the thermal imager, under the display, and must be capable of holding the unit to the firefighter's body with the full weight of the imager, with battery, hanging unsupported from the strap. All straps must be field replaceable.

XV. Power Supply

When fully charged, the imager shall provide a minimum of 6 hours of continuous use. The imager shall have a field replaceable battery pack, that is IP67 certified for ease of cleaning. The battery pack release should be operable with a gloved hand. To release the pack, the user must press multiple buttons simultaneously to avoid accidental release.

XVI. Charging System

The manufacturer must offer a truck mounted charging system to mount the imager and battery pack into a vehicle, fire apparatus, or on the wall of a fire station.

The system must be compliant to NFPA 1901 when properly mounted in a vehicle or fire.

Apparatus and have an ingress protection of at least IP21. The truck mount must carry at least a one-year warranty. The truck mount charging system must allow for different charging configurations: two imagers, two batteries, or a mix of the two such that an optimal deployment and charging strategy can be designed per vehicle.

In addition to the truck mount charging system, it should be possible to charge the battery of the imager with a USB charger.

XVII. Software and Personalization

The manufacturer must offer a way to change the startup screen of the imager to a custom image, such that different imagers can be easily identified on startup. The imager software must be updateable by the end-user without sending in the imager to a service center.

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