THERMAL VISION FOR PROFESSIONAL MARINERS

THERMAL IMAGING BASICS

Thermal imaging works night and day, in total darkness or bright sunlight, through smoke, dust, and even light fog to keep your passengers and crew safe from hazards and threats.

See natural and man-made hazards, such as floating debris, rocks, ice, land, bridge abutments, and other vessels.

Thermal night vision helps you find a person in the water faster than any other night vision technology.

FLIR cameras and thermal video are incredibly intuitive and easy to understand. Quite simply, what you see is what you get.

Daylight cameras, image intensified night vision (I^2), and the human eye all create images from reflected visible light. Traditional night vision scopes and goggles all take in small amounts of visible light and magnify it. However, traditional imagers have the same limitations as the human eye: if there isn't enough light available, they don't work well. Plus, during daylight and twilight hours, they aren't useful either because there is too much light for them to work effectively.

FLIR thermal cameras work both day and night, regardless of light. They're totally immune to the effects of darkness, glare, or even direct sunlight.

YOUR VISION

TRADITIONAL GEN3 IMAGE INTENSIFIED NIGHT VISION

FLIR THERMAL IMAGE

RESOLUTION, DETAIL, AND RANGE

FLIR offers a range of thermal imaging cameras with varying levels of image resolution. Much like a digital camera, FLIR cameras with higher pixel counts offer more detail, clarity, and range than models with less resolution. FLIR also offers models with advanced optics for extreme long-range performance.

LOWER RESOLUTION IMAGERS PROVIDE GOOD, BASIC TARGET DETECTION

HIGHER RESOLUTION THERMAL IMAGERS OFFER INCREASED LEVELS OF DETAIL AND LONG-RANGE PERFORMANCE

FLIR FOR COMMERCIAL MARINERS

THE SEA CAN BE A DANGEROUS PLACE, ESPECIALLY AT NIGHT

But professional mariners can't call it a day when the weather turns foul. FLIR thermal imagers offer an "early warning system" against common hazards so mariners can sail with confidence, whatever the conditions. FLIR maritime thermal imagers display the invisible heat energy from a myriad of potential hazards, including floating debris, shipping lane traffic, vessels riding at anchor, and small boats. FLIR imagers can also reveal man-made structures, such as buoys, bridge abutments, docks and piers. They can even spot icebergs and surfacing whales.

FLIR FOR FIRST RESPONDERS

THERMAL VISION: THE 24/7 TACTICAL ADVANTAGE

First responders gain critical tactical awareness using FLIR thermal cameras, day or night, in good weather and bad. With FLIR thermal vision you can observe suspicious activity in total darkness, quickly locate people in the water, and avoid obstacles while going full throttle in response to emergencies. From border patrols to port security, search and rescue to drug interdiction, FLIR thermal imaging cameras can greatly enhance critical mission success.

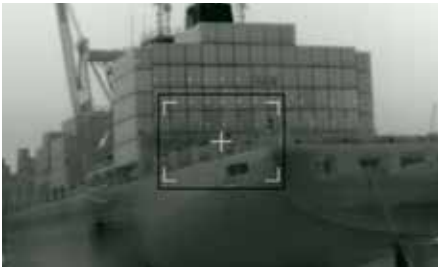| MONITOR CREW ON DECK	TRACK POTENTIALLY THREATENING VESSELS	LOCATE ICEBERGS

SEE SUSPECTS IN THE DARK	GAIN SITUATIONAL AWARENESS WHEN APPROACHING VESSELS	OBSERVE LATE NIGHT ACTIVITY ON SHORE

RECOMMENDED COMMERCIAL SYSTEMS:

MD Series	M100/200	M-Series	M400	M500

RECOMMENDED FIRST RESPONDER SYSTEMS:

| Ocean Scout	LS-Series	BHM-Series	MD Series	M-Series	M400

M132 AND M232 THERMAL VISION CAMERAS

NAVIGATING AT NIGHT JUST GOT EASIER

The M100 and M200 Series thermal night vision cameras from FLIR take affordability and easy integration to a whole new level. Packing 320x240 thermal resolution, video over IP, and 4x digital zoom into the smallest, lightest pan/tilt housing on the market, the M100 and M200 are the perfect additions to any vessel. Installation is plug-and-play easy with Raymarine's family of LightHouse powered multifunction displays.

NEW FOR 2017

320x240 resolution for clear, detailed images (9Hz)

4x e-Zoom for extended range performance

Ethernet-enabled for simple integration with your other electronics

Tilt only or full pan/tilt options

Rugged, waterproof gimbal enclosure with automatic window heaters for ice management.
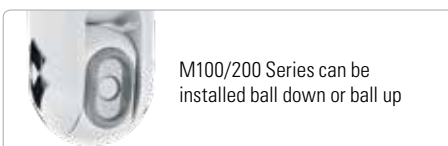
M100/200 Series can be installed ball down or ball up

Optional compact JCU-3 controller

ENHANCED AWARENESS WITH FLIR AND RAYMARINE
Combine the M132 or M232 with a Raymarine Axiom MFD and take advantage of ClearCruise™ intelligent thermal analytics. ClearCruise™ provides audible and visual alerts when "non-water" objects such as boats, obstacles, or navigation markers are identified in the scene.

DETECTION RANGES

M100-200		
🚶		~ 1,500 ft / 457 m
⛵		~ 0.67 nm / 1.3 km

THE POWER OF THERMAL VISION

• See bridges, docks, buoys, and debris in the water for improved navigation and safety
• Thermal vision helps you see other vessels, avoid collisions, and verify radar returns
• Helps boaters find people in the water faster than with spotlights and radar alone

MORE THERMAL CAPABILITY FOR LESS

• Full 320x240 resolution for optimal image detail
• The M200 is equipped with a pan/tilt housing for horizon-to-horizon viewing
• 2X digital zoom for longer range performance

EASY INSTALLATION ON ANY VESSEL

• IP video for easier integration on multiple MFDs
• Smaller size and lighter weight make mounting easy
• M100's tilt option lets you position the camera for optimum visibility, whether you're running fast or slow

AVAILABLE CLEARCRUISE IR ANALYTICS ALERT YOU TO HAZARDS AND OBSTACLES ON THE WATER

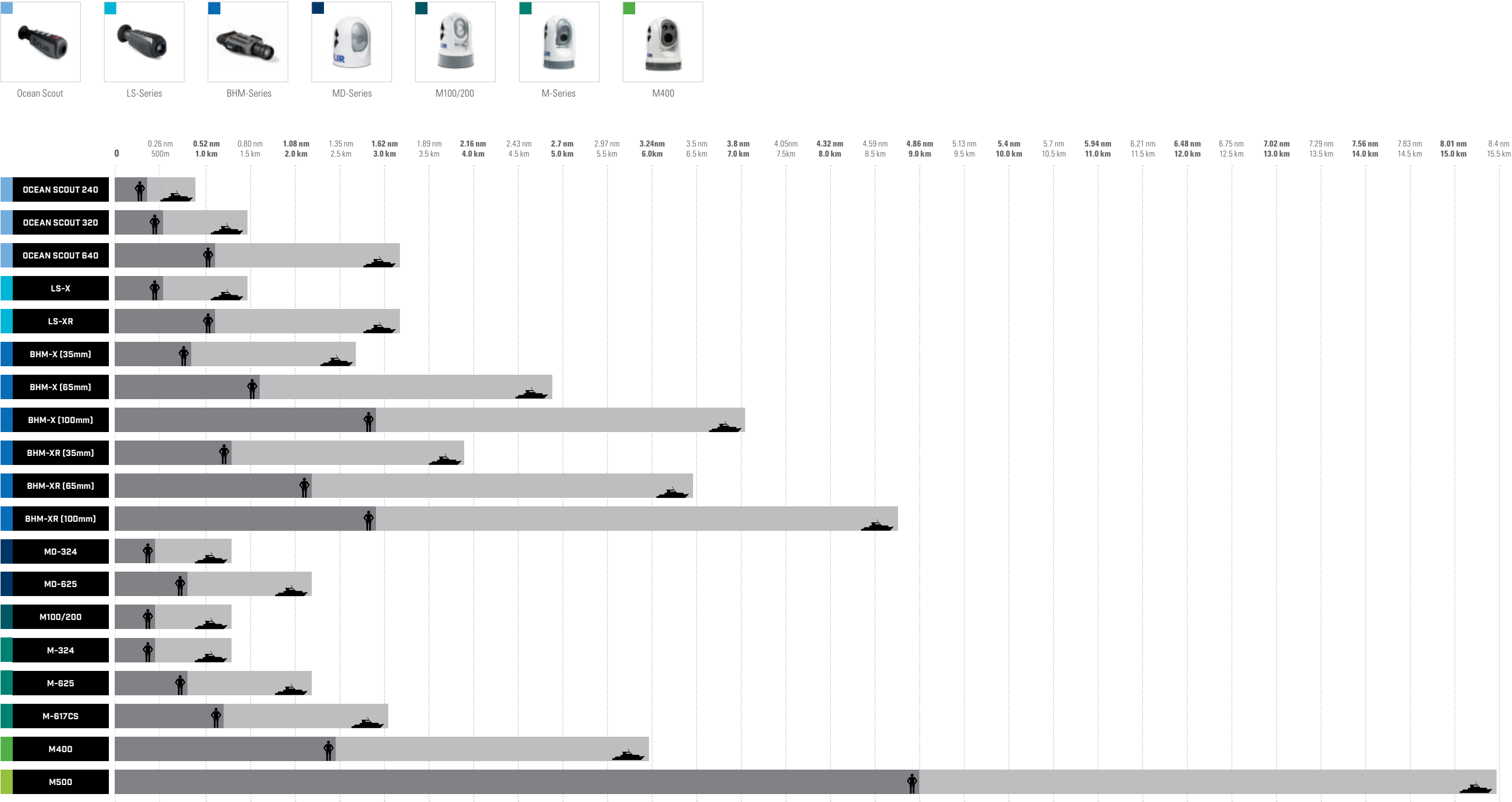**GENUINE FLIR THERMAL TECHNOLOGY FOR CRISP, CLEAR IMAGERY**

4X CONTINUOUS DIGITAL ZOOM FOR ENHANCED VIEWING OF DISTANT OBJECTS

www.flir.com

Specifications subject to change without prior notice. Images for reference purposes only

RANGE COMPARISON CHART

The following chart compares the man-overboard and small vessel detection distances for the FLIR range of thermal cameras.

Ocean Scout | LS-Series | BHM-Series | MD-Series | M100/200 | M-Series | M400

Distance scale		
0		
0.26 nm / 500m		
0.52 nm / 1.0 km		
0.80 nm / 1.5 km		
1.08 nm / 2.0 km		
1.35 nm / 2.5 km		
1.62 nm / 3.0 km		
1.89 nm / 3.5 km		
2.16 nm / 4.0 km		
2.43 nm / 4.5 km		
2.7 nm / 5.0 km		
2.97 nm / 5.5 km		
3.24 nm / 6.0km		
3.5 nm / 6.5 km		
3.8 nm / 7.0 km		
4.05nm / 7.5km		
4.32 nm / 8.0 km		
4.59 nm / 8.5 km		
4.86 nm / 9.0 km		
5.13 nm / 9.5 km		
5.4 nm / 10.0 km		
5.7 nm / 10.5 km		
5.94 nm / 11.0 km		
6.21 nm / 11.5 km		
6.48 nm / 12.0 km		
6.75 nm / 12.5 km		
7.02 nm / 13.0 km		
7.29 nm / 13.5 km		
7.56 nm / 14.0 km		
7.83 nm / 14.5 km		
8.01 nm / 15.0 km		
8.4 nm / 15.5 km		

Chart rows:
- OCEAN SCOUT 240
- OCEAN SCOUT 320
- OCEAN SCOUT 640
- LS-X
- LS-XR
- BHM-X (35mm)
- BHM-X (65mm)
- BHM-X (100mm)
- BHM-XR (35mm)
- BHM-XR (65mm)
- BHM-XR (100mm)
- MD-324
- MD-625
- M100/200
- M-324
- M-625
- M-617CS
- M400
- M500

IMAGE RESOLUTION AND SAMPLE IMAGES

M100/M200 SERIES MARINE THERMAL VISION CAMERAS

Get the clear vision you need to navigate around obstacles, avoid collisions, and find people in the water at night. M232 provides full pan/tilt for horizon-to-horizon vision, while the M132 allows for tilt position to compensate for changes in deck angle.

M132	M232
320 x 240 pxl	320 x 240 pxl

VIDEO ANALYTICS: BOAT

VIDEO ANALYTICS: MAN OVERBOARD

M-SERIES: NEXT GENERATION MULTI-SENSOR THERMAL NIGHT VISION

The M-Series creates thermal images with tremendous detail for such an affordable night vision system. You will see more—and see farther—even in the dead of night. An optional lowlight TV camera provides enhanced navigational abilities during twilight hours. And M-Series cameras also feature detailed, color on-screen symbology for instant access to system status, position, and configuration. Resolution (320 x 240 or 640 x 480 pixels) is model dependent.

M-324	M-625
320 x 240 pxl	640 x 480 pxl

VESSEL & CREW – WHITE HOT MODE

FREIGHTER – BLACK HOT MODE
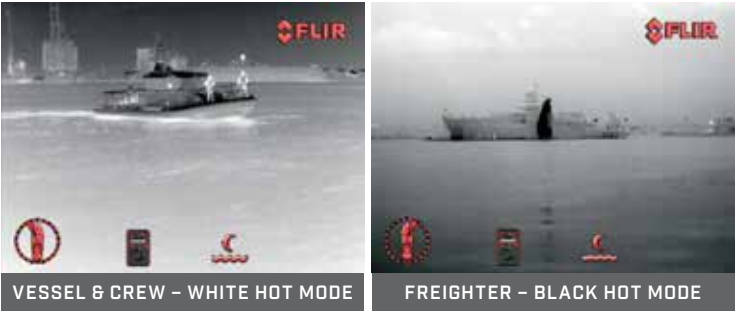
M400 & M400XR: ADVANCED MULTI-SENSOR THERMAL NIGHT VISION

The FLIR M400's advanced 640x480 sensor delivers crisp thermal video images in total darkness and low-light conditions. An integrated HD color visible camera and narrow-beam LED spotlight augment target identification for added safety.

M400	M400-XR
640 x 480 pxl	640 x 480 pxl

FIREFIGHTING MODE

FERRY AND PASSENGERS

SMALL BOAT – VISIBLE CAMERA

SMALL BOAT – THERMAL IMAGE

M500: HIGH-PERFORMANCE MARINE MULTI-SENSOR CAMERA SYSTEM

The FLIR M500's advanced 640x512 sensor delivers crisp thermal video images in total darkness and low-light conditions. An integrated HD color visible camera augments target identification for added safety.
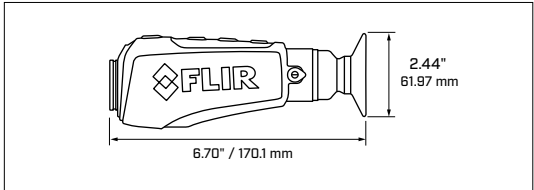
M500
640 x 512 pxl

PORT SECURITY AT NIGHT

HIGH CONTRAST IMAGES

BRIDGE AND WATERWAYS

LOW LIGHT VISIBLE CAMERA

Images for illustrative purposes only

Images for illustrative purposes only

OCEAN SCOUT SPECIFICATIONS

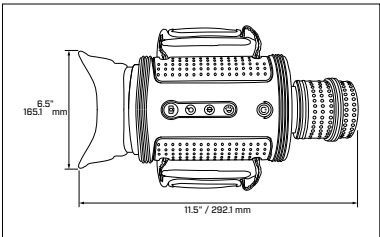|	OCEAN SCOUT 240	OCEAN SCOUT 320	OCEAN SCOUT 640
GENERAL			
Detector Resolution	240 x 180	336 x 256	640 x 512
Refresh Rate	9 Hz		
Field of View	24° x 18°	17° x 13°	18° x 14°
Zoom	NA	2x E-Zoom	2x, 4x, and E-Zoom
Color Palettes	White Hot / Black Hot / InstAlert™		
Battery	Internal Lithium Ion rechargeable (5-hour typical life)		
Waterproofing	IP-67 Submersible to 1 Meter		
Weight	0.75lb (0.34 kg)		
RANGE PERFORMANCE			
Man	1,150 ft (350 m)	1,800 ft (550 m)	3,705ft (1.14 km)
Vehicle/vessel	0.48 nm (0.90 km)	0.84 nm (1.5 km)	1.73 nm (3.2 km)

2.44"
61.97 mm

6.70" / 170.1 mm

LS-SERIES SPECIFICATIONS

|	LS-X	LS-XR
GENERAL		
Detector Resolution	336 x 256	640 x 512
Refresh Rate	9 Hz or 30 Hz	
Field of View	17° x 13°	18° x 14°
Zoom	2x and 4x E-Zoom	2x,4x, and 8x E-Zoom
Color Palettes	White Hot / Black Hot / InstAlert™	
Battery	Internal Lithium Ion rechargeable, (5-hour typical life)	
Laser Pointer	Red Laser Pointer	
Video Output	NTSC or PAL composite via supplied cable	
Waterproofing	IP-67 Submersible to 1 meter	
Weight	0.75lb (0.34 kg)	
RANGE PERFORMANCE		
Person in the Water (6 x 1.6 ft / 1.8 x 0.5 m)	1,870 ft (570 m)	0.62 nm (1.14 km)
Small Vessel (13 x 5.0 ft / 4.0 x 1.5 m)	0.84 nm (1.55 km)	1.62 nm (3 km)

2.44"
61.97 mm

6.70" / 170.1 mm
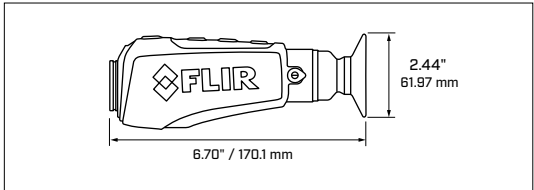
BHM-SERIES SPECIFICATIONS

	BHM-X+	BHM-XR+
GENERAL		
Detector Resolution	320 x 240	640 x 480
Refresh Rate	9 Hz or 30 Hz	
Field of View: 35 mm lens 65 mm lens 100 mm lens	13° x 10° 7° x 5° 5° x 3°	18° x 13° 10° x 8° 6° x 4°
Zoom	2× E-Zoom	2× and 4× E-Zoom
Color Palettes	White Hot / Black Hot / InstAlert™; Selectable	
Battery	4 AA Batteries, NiMH Li-Ion or Alkaline	
Video Output	NTSC or PAL composite via supplied cable	
Waterproofing	IP-67 Submersible to 1 Meter	
Weight: with 35 mm lens with 65 mm lens with 100 mm lens	0.84 lbs (0.38 kg) 3.05 lbs (1.38 kg) 3.06 lbs (1.39 kg)	
RANGE PERFORMANCE		
Person in the Water (6 x 1.6 ft / 1.8 x 0.5 m): 35 mm lens 65 mm lens 100 mm lens	2,887 ft (880 m) 0.89 nm (1.65 km) 1.30 nm (2.4 km)	0.70 nm (1.3 km) 1.18 nm (2.2 km) 1.59 nm (2.95 km)
Small Vessel (13 x 5.0 ft / 4.0 x 1.5 m): 35 mm lens 65 mm lens 100 mm lens	1.46 nm (2.7 km) 2.65 nm (4.9 km) 3.83 nm (7.1 km)	2.1 nm (3.9 km) 3.5 nm (6.5 km) 4.75 nm (8.8 km)

6.5"
165.1 mm

11.5" / 292.1 mm

MD-SERIES SPECIFICATIONS

	MD-324	MD-625
MAIN THERMAL CAMERA		
Detector Type	320 × 240 VOx Microbolometer	640 × 480 VOx Microbolometer
Video Refresh Rate	<9 Hz or 30 Hz (NTSC and PAL)	<9 Hz or 30 Hz (NTSC and PAL)
Field of View	24° × 18° (NTSC)	25° × 20° (NTSC)
Focal Length	19 mm	25 mm
Focus	Fixed 12ft (3.6m) to infinity	Fixed 12ft (3.6m) to infinity
Optical Zoom	N/A	N/A
E-Zoom	2×	2×, 4×
Image Processing	FLIR Proprietary Digital Detail Enhancement	FLIR Proprietary Digital Detail Enhancement
SYSTEM SPECIFICATIONS		
Video Tracking	No	No
Firefighter Mode	No	No
Pan/Tilt Adjustment Range	Pan: ±30° per key, Tilt: +34°, -27° (Locked in at Installation)	Pan: ±30° per key, Tilt: +34°, -27° (Locked in at Installation)
Analog Video Output	NTSC or PAL, 30 Hz or <9 Hz	NTSC or PAL, 30 Hz or <9 Hz
Analog Video Connector Types	F-type BNC with BNC-to-RCA adapter included for video out	F-type BNC with BNC-to-RCA adapter included for video out
Network Video Output	No	No
HD-SDI Lossless Video Output	No	No
Power Requirements	12-24 V DC via included PoE injector	12-24 V DC via included PoE injector
Power Consumption	4.8 W nominal; 12.5 W max	4.8 W nominal; 12.5 W max
ENVIRONMENTAL		
Operating Temperature Range	-13°F to +131°F (-25°C to +55°C)	-13°F to +131°F (-25°C to +55°C)
Storage Temperature Range	-40°F to +185°F (-40°C to +85°C)	-40°F to +185°F (-40°C to +85°C)
Automatic Window Defrost	Standard at Power-Up	Standard at Power-Up
Sand/Dust Ingress	Mil-Std-810E	Mil-Std-810E
Water Ingress	IPX 6 (heavy seas, powerful jets of water)	IPX 6 (heavy seas, powerful jets of water)
Shock	15 g vertical, 9 g horizontal	15 g vertical, 9 g horizontal
Vibration	IEC 60945; MIL-STD-810E	IEC 60945; MIL-STD-810E
Lightning Protection	Standard	Standard
Salt Mist	IEC60945	IEC60945
Wind	100 knot (115.2 mph)	100 knot (115.2 mph)
EMI	IEC 60945	IEC 60945
PHYSICAL		
Weight	~ 3 lbs (1.36 kg)	~ 3 lbs (1.36 kg)
Size	6" (152.4 mm) dia. × 7" (177.8 mm) ht.	6" (152.4 mm) dia. × 7" (177.8 mm) ht.
RANGE PERFORMANCE		
Person in the Water	1,500 ft (457 m)	2,700 ft (823 m)
Small Vessel	4,200 ft (1280 m)	1.2 nm (2.2 km)

6.0" / 152.4 mm

7.0"
177.8 mm
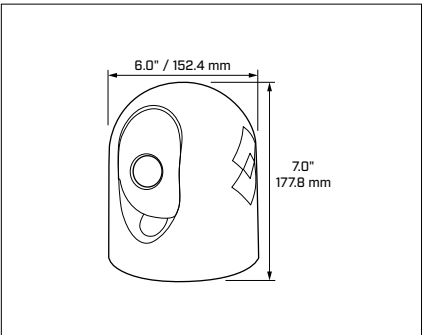
M100/200 SPECIFICATIONS

	M100/M200
GENERAL	
Detector Type	320 x 240 VOx Microbolometer
Video Refresh Rate	9 Hz
Field of View	24° x 18°
Focal Length	19 mm
E-Zoom	4x
Image Processing	FLIR Proprietary Digital Detail Enhancement
SYSTEM SPECIFICATIONS	
Pan/Tilt Range	M100 — Tilt: +110°, -90° M200 — Pan: 360° (continuous), Tilt: +110°, -90°
Video Output	H264 IP Video stream
Power Requirements	12 or 24 VDC
Power Consumption	15 W (typical) 18 W (max)
ENVIRONMENTAL	
Operating Temperature Range	-13°F to +131°F (-25°C to +55°C)
Storage Temperature Range	-30°F to +158°F (-30°C to +70°C)
Relative Humidity	95% max
Automatic Window Defrost	Standard at Power-Up
Water Ingress	IPX 6 (heavy seas, powerful jets of water)
Shock	15 g vertical, 9 g horizontal
Vibration	IEC 60945; MIL-STD-810E
Salt Mist	IEC 60945
Wind	100 mph (161 kph)
EMI	IEC 60945
PHYSICAL	
Weight	6.0 lb (2.7 kg) w/o top-down riser 6.6 lb (3.0 kg) w/ top-down riser
Size	6.34" (dia. @ base) x 9.03" (ht.) 161.1 (dia.) x 229.3 (ht.) mm
RANGE PERFORMANCE	
Person in the Water	~1,500 ft (457 m)
Small Vessel	~0.67 nm (1.3 km)

7.0" / 177.8 mm

11.2"
284.4 mm

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Specifications subject to change without prior notice. Images for reference purposes only.

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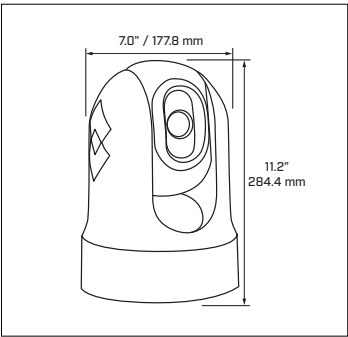
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WARRANTY

FLIR's service commitment of outstanding warranty and technical support now offers you even more; by registering your system with FLIR at www.flir.com/productreg, the 2-Year Standard Limited Warranty is upgraded and replaced by the 3-Year Extended Limited Warranty for FREE.

For complete details on FLIR's industry-leading warranty please visit **www.flir.com/maritime.**

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